



IBM PureData System for Operational Analytics Fixpack Readme FP5

V1.1.0.5 (FP5)

Change Notes:

Change Notes:

Date	Change
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PureData System for Operational Analytics for V1.1.0.5

Introduction

PureData System for Operational Analytics (PDOA), the appliance, fixpacks provide the following:

- A downloadable set of images from IBM FixCentral which includes all the software and firmware updates required to update the appliance to the latest validated stack level as indicated for their version of the appliance in the validated stack pages.
- This readme distributed as a technote with the set of instructions necessary to apply the update.
- A technote that includes the known issues related to the application of the fixpack as well as any known issues with the appliance after the fixpack has been applied.
- A technote that contains the updated validated stack for V1.1.0.5.
- Note that V1.0.0.8 (V1.0 FP8) was not released. V1.0.0.7 or (V1.0 FP7) is the last fixpack available for that appliance. The V1.0 environment with the machine type 8279 has reached its end of support (EOS) date as of 9/2020. For customers with extended support contracts please contact IBM for more information about update options.

Important Notes about V1.1.0.5

These fixpacks represent an important change to how fixpacks will be applied on the appliance now and in the future.

Brief history of the PDOA Fixpack model

In V1.0.0.5/V1.1.0.1 and earlier the fixpacks ran in simple stages managed by the UI. The stages were:

- Registration
- Preview
- Management Apply
- Prepare
- Core Apply
- Commit

Benefits:

- Consistent and tested update methodology managed by code.
- Benefits of the herd. Each application of the fixpack provided useful information for fixpack applications on subsequent appliances.
- Resume feature addressed some issues allowing fixpack to continue after some failures.

Challenges:

- The UI did not always consistently reflect the current state of the fixpack or its progress. Customers often had to run the fixpack at the UI and command line levels which lead to some confusion and exposed the complexities of the fixpack mechanism.
- Apply phases required full downtime of their respective components. Core apply downtimes often cited as the biggest reason for customers to avoid or postpone updates.
- Fixpack failures lead to missed outage windows. The design of the fixpack did not accommodate entering back into production if a stage was not completed.
- In some fixpack failure scenarios it was difficult to get the fixpack into a state where it could resume, even after addressing the failure.
- The fixpack had a specific way to update some components. In some failure cases component support teams used methods that were not compatible to the appliance fixpack.
- Resume did not support all scenarios and lead to more challenging support efforts when multiple resumes were run in succession.

Important changes to the PDOA fixpack model

- The appliance console has been removed in FP6_FP2.
- The fixpack methodology will take advantage of the concurrent update features in the storage. Customers can choose to update their storage while servicing low impact business requirements.
- The fixpack methodology will take advantage of the redundant features of the appliance in the SAN fabric.
 - Redundant SANs allow one SAN to go offline while providing reduced I/O bandwidth through the other SAN.
- The fixpack methodology will take advantage of the redundant features that can be updated without degradation of appliance performance.
 - Standby Servers and the ability to failover services
 - Redundant HMCs
- The fixpack methodology will take advantage of some mixed mode features.
 - RSCT Mixed Version Domains
 - Mixed AIX Levels Across Servers
 - Mixed Power Firmware Levels across servers.
 - Mixed component firmware levels for some adapters across servers.
- The fixpack methodology will provide more opportunities to return to production within the fixpack application with more granular updates.
- The fixpack methodology will allow more freedom for component support team to address issues in line with their respective components.
- The fixpack will continue to use fixpack scripting where possible as provided by the platform layer.
- Fixpack Stages have been modified to reflect the new methodology.

New Challenges arising out of the above fixpack process change:

- Customer or a customer agent will be responsible to run several hundred command line instructions as part of this update.
- Requires System Administration skills to apply the fixpack.

Appliance fixpack stage definitions

Stage and Stage Impacts	Notes
Stage 1: Prerequisites	Budget: 1 Week. • Preview Steps • This should be done at least a week before the planned update.
Stage 2: Platform Updates	Budget: 7 Hours • Deploy AIX 7.2 Nim Server on Management Standby • Migrate AIX to 7.2 on management host. • Reset Management Standby • Restore Sendmail, hatools and NIM on Management NIM Server. • Deploy AIX 7.2 Artifacts on Management NIM Server • Update Platform Layer
Stage 3: HMC Updates • While one HMC is updating and intermittently offline, the other HMC is operating.	Budget: 2 Hours • Update HMC1 • Update HMC2 • FP3->FP5 (Add 2 hours) • FP2->FP5 (Add 4 hours)
Stage 4: Storage Updates • Reduced paths while canisters are updated. • Updates can be spread over multiple update windows.	Budget ~ 3 Hours / Rack • Update Foundation Storage By MTM • Update Core Storage in Multiple Phases • FP3->FP5 (Add 3 hours / rack) • FP2->FP5 (Add 6 hours / rack)
Stage 5: SANs • Reduced Paths while SAN switches are updated. • Updates can be spread over multiple update windows.	Budget FP4->FP5 N/A • Update Odd Number SAN Switches • Update Even Numbered SAN Switches. • FP3->FP5 (Add 2 hours) • FP2->FP5 (Add 2 hours)
Stage 6: Update Management Hosts	Budget: ~ 6 hours Update Management and Management Standby hosts • Quiesce management nodes • Migrate and Update AIX on management standby • Reboot • Stop GPFS • Update FC Adapter Firmware (N/A FP4->FP5) • Update NIC Adapter Firmware (N/A FP4->FP5) • Update Internal RAID Adapter Firmware

	• Update GPFS • Update TSA • Update DB2 (N/A FP4->FP5)
Stage 7: Update Standby hosts OS/Adapter/Power Firmware • No HA System Available while Server is quiesced. • Requires failover interruption when preparing for next round of server updates. • Updates can be spread over multiple update windows.	Budget: ~ 6 Hours / Pass (Min: 2 Passes, Max: 5 Passes) • Update Standby Servers = 1 Pass ○ Quiesce Standby Servers [HA is degraded] ○ Migrate and Update AIX on quiesced nodes. ○ Reboot ○ Stop GPFS on quiesced nodes. ○ Update Internal Raid Adapter Firmware ○ Update FC Adapter Firmware (N/A FP4->FP5) ○ Update NIC Adapter Firmware (N/A FP4->FP5) ○ Update Power Firmware ○ Validate Updates ○ Unquiesce Servers ○ Plan for next failover from non-updated servers to updated servers ○ System may run in production mode until next interrupt window is available. ○ Perform Failovers if necessary. ○ Repeat Update as needed based on schedule and plans.
Stage 8: CORE Update GPFS/TSA/DB2/BNT • System will be down during update time. • Requires one update window.	Budget: ~ 11 hours ~3 Hours (Outage) add 1 hour for Db2 update add 7 Hours (no outage time) post Db2 update for mksysb, commits, remirroring steps. • Quiesce Appliance • Perform Updates ○ Update BNT Switches ○ Update GPFS ○ Update TSA ○ Update HA Tools ○ Update DB2 • Restart Appliance Features • mksysbs • Commit Features ○ GPFS Clusters ○ GPFS Filesystems ○ Db2 Database ○ Power Firmware • Restore rootvg mirrors on AIX hosts.
Stage 9: Other Removals • Remove obsolete software • No Outages Required.	Budget: ~ 1 Hour • Update the appliance catalog. • Verifying the fixpack.

NOTE: Timings are for V1.1 FP4 to V1.1 FP5 only. Additional time will be needed for customers updating from earlier fixpacks. Timings do not include steps needed outside of the appliance.

Is it possible to skip a fixpack level?

The fixpack delivered in FP5_FP1 was a milestone fixpack and was the last fixpack to be applied using the PDOA console and the previous fixpack stage definitions. The changes made to the fixpack model in FP6_FP2 will allow a customer to plan an upgrade that combines the updates into a single planned event. The goal for PDOA development is to test 'N-2' and 'N-1' to 'N' update scenarios. For customers who are more than 2 fixpacks behind the latest fixpack, it may still be possible to plan an update that does not involve fully updating from 'N-3' to 'N-2' first. Special notes are provided in this document for fixpack scenarios using "FPX->FPY" notation. At the time of this writing only FP4->FP5 has been tested, notations for other scenarios are provided for planning purposes only and are only assumed to be correct.

- Tested Fixpack Scenarios
 - V1.1 FP4->V1.1 FP5
 - V1.1 FP3->V1.1 FP4
 - Download updated platform layer to allow FP4 pplayer to apply FP3 level updates.
 - HMC [Apply FP3 levels before FP4 during Stage 3]
 - AIX [Apply FP3 levels before FP4 during Stage 2, Stage 6 and Stage 7]
 - V7000 [Apply FP3 levels before FP4 during Stage 4.]
 - Foundation FC Cards [Apply FP3 Levels]
 - All NIC Cards [Apply FP3 levels]
 - V1.1 FP2->V1.1 FP4
 - V1.1 FP2->V1.1 FP3
 - V1.1 FP1->V1.1 FP3
 - V1.1 FP1->V1.1 FP2
 - V1.1 GA->V1.1 FP1
- Potentially Supported Fixpack Scenarios
 - V1.1 FP3->V1.1 FP5 [3 months after V1.1 FP5 GA]
- Higher Risk Fixpack Scenarios
 - V1.1 FP1 -> V1.1 FP4
 - This scenario will not be tested in the lab.
 - Scenario has been performed in the field.
- Unsupported Scenarios
 - V1.1 GA -> V1.1 FP2
 - V1.1 GA-> V1.1 FP3
 - V1.1 GA-> V1.1 FP4
 - V1.1 GA ->V1.1 FP5
 - V1.1 FP1 -> V1.1 FP5
 - V1.1 FP2 -> V1.1 FP5

For untested higher risk update scenarios the following steps need to be taken.

- High risk updates should be done using a full outage model.
- Downloading the readme and fixpack images for all fixpacks involved.

- Reading through the Readmes to look for what has been updated. It is especially important to watch for configuration type changes. For example, in FP6_FP2 there were important updates to the ssh_config and sshd_config files as part of the transition from FP5_FP1 to FP6_FP2.
- For each component updated checking the individual components rules and complexities between the two validated stack versions.
 - In the past it has been necessary to apply multiple hops within the fixpack for the following components:
 - V7000 Enclosures
 - Flash900 Enclosures
 - HMC
 - Power Firmware
 - GPFS
 - AIX
 - These components tend to support direct updates without requiring additional hops.
 - TSA
 - DB2
 - The following components require updates to FP6_FP2 levels prior to applying FP7_FP3 levels. This will add additional time to account for these extra hops.
 - HMC
 - Must apply the updated HMC images in FP6_FP2 prior to applying the latest images in FP7_FP3. PDOA Platform Layer 2.0.7.0 from FP7_FP3 may be used to apply this update.
 - AIX
 - AIX 7.1 TL3->TL5 using the base image in FP6_FP2 before applying the fixpack images from FP7_FP3.
 - GPFS
 - GPFS base images are only included in FP6_FP2 and must be applied before FP7_FP3's updates can be applied.
- Checking for any Cross Compatability issues that may exist.
 - For example:
 - AIX 7.1 TL5 had updates to OpenSSL and OpenSSH as security defaults had changed. This led to connectivity issues connecting to/from the SAN and BNT switches in the appliance.
 - Power Firmware and HMC Level Compatibility.
 - AIX 7.2 compatibility.
- Determining if updates managed through the pplayer (appl*) commands is compatible with the component update scenario.
 - The pplayer commands are automation that work with components and have been tested in specific scenarios. Over time the pplayer has been updated to accommodate changes to the API and command line calls as well as their expected outputs as they have changed with the updates to the firmware, software and configuration details of the system.

- In some cases as part of the planning it may be necessary to skip using the pplayer commands and instead to follow the regular instructions for an update to a specific component.
- The FP7_FP3 pplayer can be used to apply FP6_FP2 updates as needed. FP6_FP2 images are required solely for the intermediate software and firmware updates.
- In FP8_FP4 a layer of fixpack tools has been added. There are specific instructions on using these tools when starting with V1.1 FP2 to update to V1.1 FP4.
- Determining if it is necessary to take a full outage versus the staged approach to the fixpack.
 - In almost all cases it is recommended to plan for a full outage versus the stages approach to avoid edge cases that could arise on systems that are not fully updated and have not been tested in a mixed update configuration.

Security Updates

The main purpose of the fixpack is to deliver a tested combination of components. With the large gap between fixpack deliveries it is expected that security updates to some or all the components in the stack will occur in between the time the validated stack was selected, delivered and ultimately applied at a customer site.

This is particularly true for AIX, HMCs, and DB2 which have frequent security bulletins but is no less true for other components.

The remediation method for this appliance is for customers to subscribe to the components in the validated stack for pre-emptive security notifications as well as to scan their system and then to engage with IBM Support for anything that needs an appropriate remediation. It is through that process the proper remediation option for the appliance and the customer can be discussed and planned.

Component	Link
AIX Download Site (FTP)	ftp://aix.software.ibm.com/aix/efixes/security/
Db2 Security Related Special Builds	https://www.ibm.com/support/pages/published-security-vulnerabilities-db2-linux-unix-and-windows-including-special-build-information
HMC Security Bulletin Searches	https://www.ibm.com/blogs/psirt/?s=power+hmc

Alternative Staging Option

The stages are designed to reduce outage time by allowing the stages to be run with the system operational as much as possible. The stages are also designed to be clear enough that it is possible to design other patterns.

One alternative pattern is to perform the stages 3-5 in an outage window and to update all like components in parallel versus the staged approach. While this can shorten the outage window time, it does introduce risks related to unexpected outages.

Additional alternative patterns are to take full outages for Stage 6 and/or Stage 7.

- Option: Combine Stage 7 and Stage 8 in a full outage window.
 - Stage 6 as documented.
 - Quiesce Appliance.
 - Combine Stage 7 and Stage 8 and remove need for complexity of failover logic.
- Option: Combine Stage 6, Stage 7 and Stage 8 in a full outage window.
 - Quiesce Appliance
 - Combine Stage 6 through 8 in a full outage window.

The documentation for Stages 6 through 8 will have different output if the full outage model is used and some procedures will not be necessary and the customer or practitioner should have expert knowledge of the system to understand how to verify the system after each step, phase and stage.

It is still highly recommended to update components in sets that reduce risks and can allow going back to production in case of unexpected errors during updates.

- Update only 3 to 4 storage enclosures of the same type in parallel.
- Update only even numbered and then odd numbered SAN switches.
- Update Servers (Stage 6/7) such that only one server per rack is updated.

One strawman example of a different Stage plan is shown in the table below.

An example of a full outage scenario might be:

Stage and Stage Impacts	Notes
Stage 1: Prerequisites	Preview Steps
Stage 2: Platform Updates	- Migrate and Update AIX on management - FP3->FP5 [May require FP4 AIX update first.] - FP2->FP5 [May require FP4 AIX updates first.] - Update Platform Layer
Stage 3: HMC Updates While one HMC is updating and intermittently offline, the other HMC is operating.	- Update HMC1 - Update HMC2 - FP3->FP5 [Apply HMC1, HMC2 FP4 updates] - FP2->FP5 [Apply HM1, HMC2 FP3+FP4 updates]
Appliance Quiesce [Optional]	- Stop Db2 - Stop DPM - Stop TSA Domains - Stop GPFS
Stage 4: Storage Updates	- Update Foundation Storage By MTM - Update Core Storage in Multiple Phases - FP3->FP5 [Apply FP4 V7000 updates] - FP2->FP5 [Apply FP3+FP4 V7000 updates] - FP2->FP5 [May require FP4 Flash900 updates first]
Stage 5: SANs [From FP3 or lower only]	- Update Odd Number SAN Switches - Update Even Numbered SAN Switches.
Appliance Quiesce [Optional]	If the appliance was not quiesced prior to Stage 4, it can be quiesced here instead.
Combined Staging Stage 6, Stage 7, Stage 8	- Appliance Quiesced. - Perform AIX Migration and updates on all non management hosts and management standby. (Migration limited to 4 LPARs in parallel due to resource constraints on the management host.) - Update BNT Switches - Update Internal Raid Adapter Firmware - Update Power Firmware All Servers - Update Adapter Firmware - Update GPFS (Stage6/Stage8 steps) - FP3->FP5 [Apply FP4 GPFS updates] - FP2->FP5 [Apply FP3+FP4 GPFS updates] - Update TSA (Stage 6/ Stage 8 steps) - Update DB2 all steps (Stage 6 / Stage 8) [Stage 6 only if OPM is not removed.] - Restart Appliance Features - mksysbs

	• Commit Features ○ GPFS Clusters ○ GPFS Filesystems ○ Db2 Database ○ Power FirmwareRestore rootvg mirrors on AIX hosts.
Stage 9: Other Removals • Remove obsolete software • No Outages Required.	• Update the appliance catalog. • Verify the fixpack.

Fixpack details

Where to get the fixpack

Each PDOA Fixpack is available from IBM Fixcentral. Each PDOA Version has its own downloadable compressed (gzip) and packaged (tar) file. V1.1 FP4 and higher also have cksum files for the package as well as cksum files for each file shipped in the package used for package verification. If needed, interim fixes are smaller fixes that are applied to the associated unpacked fixpack directory.

The following table shows the fixpack file associated with the edition as available from IBM Fix Central.

Please review the following technote ([Preparing customer firewalls and proxies for the upcoming infrastructure changes on IBM Electronic Fix Distribution / IBM Fix Central system](#)). This technote describes changes to IBM FixCentral download locations in June 2022 that may impact a customer's ability to download.

PDOA fixpack images are not cumulative. It is necessary to download all fixpack versions above the current appliance level. It is generally not necessary to download any interim fixes (IFxx) associated with earlier fixpacks. For example, do not download IF01 (released after V1.1 FP1) or IF02 (released after V1.1 FP4) when applying V1.1 FP5. Interim fixpacks are uniquely identified at the IFIX level and increment by one.

Save all files to '/BCU_share' on the management host.

Edition	Filename	Fix Central Direct Link
PDOA V1.1 FP5	1.1.0.5-IM-PureData_System_for_OpAnalytics-fp005_20220921_150326.tgz 1.1.0.5-IM-PureData_System_for_OpAnalytics-fp005_20220921_150326.tgz.cksum 1.1.0.5-IM-PureData_System_for_OpAnalytics-fp005_20220921_150326.files.cksum 1.1.0.5-IM-PureData_System_for_OpAnalytics-fp005_20220921_150326.tgz.files	FC
FP3->FP5 PDOA V1.1 FP4	1.1.0.4-IM-PureData_System_for_OpAnalytics-fp004.tgz 1.1.0.4-IM-PureData_System_for_OpAnalytics-fp004.tgz.cksum 1.1.0.4-IM-PureData_System_for_OpAnalytics-fp004.files.cksum	FC
FP2->FP5 PDOA V1.1 FP3	1.1.0.3-IM-PureData_System_for_OpAnalytics-fp003.tgz	FC
FP1->FP5 PDOA V1.1 FP2	1.1.0.2-IM-PureData_System_for_OpAnalytics-fp002.tgz	FC

Fixpack contents

The following table lists the software and firmware included in this update. The most recent validated stack recommendations can be found at the following [link](#).

Component	V1.1.0.5
AIX	7.2.5.4
DB2 V10.5 or DB2 V11.1	Db2 10.5.0.11.41072 or Db2 11.1.04.07
GPFS	5.1.1.4
IBM InfoSphere Optim Performance Manager Extended Edition	Removed in V1.1 FP4 Stage 9
IBM Systems Director Platform Control for Power	4.0.9.1
IBM Reliable Scalable Cluster Technology (RSCT)	3.2.6.4
IBM Tivoli System Automation for Multiplatforms	4.1.0.7
OpenSSH	8.1.102.2105
OpenSSL	1.0.2.2104
Java 5 and Java 6	Removed in V1.1 FP4 Stage 9
Java 7	7.0.0.710
Java 8	8.0.0.710
8 Gb Fiber Channel Adapter (FC 5729) [3]	No Update
8 Gb Fiber Channel Adapter (FC EN0Y) [3]	No Update
PCIe3 x8 SAS RAID Internal Adapter 6Gb (CCIN 57D7) [2]	19512c00
10 Gb + 1 Gb Ethernet SR+RJ45 Adapter (FC EN0S, FC EN0T) [3]	No Update
Hardware Management Console [CR8 – CR9]	V9.1.942 MH01898
IBM Power S822	860.B0
IBM Power S824	
IBM RackSwitch G8052 1Gb switch	7.11.24
IBM RackSwitch G8264 10Gb switch	
IBM Storwize V7000	8.2.1.15
IBM Storwize v7000 Drive Microcode Package	220621
IBM FlashSystem 900	1.5.2.10
IBM System Storage SAN48B0-5 (Brocade) switch [3]	No Update.

Notes:

[1]: Updated or Installed as part of AIX Update.

[2]: This RAID adapter was not previously tracked in validated stacks before V1.1 FP3.

[3]: No Change. This is listed for completeness and this level is not included in the fixpack package.

Registering the fixpack with PDOA.

1. In previous fixpacks registering a fixpack was performed through the PDOA console. This fixpack is not compatible with the model so instead follow the instructions below to upload the file and extract the file into the right location.
2. Copy the fixpack files to the /BCU_share directory on the management host.
3. Login to the management host as the root user.

4. Command: Change the working directory to /BCU_share.

```
cd /BCU_share
```

5. Command: Verify the cksum of the fixpack matches the cksum shown in the command below for the fixpack file that was downloaded.

```
prefix=$(ls -rt 1.1.0.5-IM-PureData_System_for_OpAnalytics-fp005*.tgz | tail -1 | sed 's|\.tgz||');echo ${prefix};cksum  
${prefix}.tgz | diff ${prefix}.tgz.cksum -
```

Example Output:

```
$ prefix=$(ls -rt 1.1.0.5-IM-PureData_System_for_OpAnalytics-fp005*.tgz | tail -1 | sed 's|\.tgz||');echo ${prefix};cksum  
${prefix}.tgz | diff ${prefix}.tgz.cksum -
```

```
1.1.0.5-IM-PureData_System_for_OpAnalytics-fp005_20220921_150326
```

6. Command: Use the following command line to unpack the contents of the compressed tar file.

```
prefix=$(ls -rt 1.1.0.5-IM-PureData_System_for_OpAnalytics-fp005*.tgz | tail -1 | sed 's|\.tgz||');echo ${prefix};time gzip -d <  
${prefix}.tgz | tar -xof - -C /BCU_share
```

Example Output:

```
$ prefix=$(ls -rt 1.1.0.5-IM-PureData_System_for_OpAnalytics-fp005*.tgz | tail -1 | sed 's|\.tgz||');echo ${prefix};time gzip -d  
< ${prefix}.tgz | tar -xof - -C /BCU_share  
1.1.0.5-IM-PureData_System_for_OpAnalytics-fp005_20220921_150326
```

```
real    4m54.56s  
user    2m45.36s  
sys     1m3.19s
```

7. Command: Verify the number of files and directories in /BCU_share/FP9_FP5. This check will not work after the fixpack begins as new files will be added to the directory during the update.

```
find /BCU_share/FP9_FP5 | wc -l
```

Example Output:

```
$ find /BCU_share/FP8_FP4 | wc -l  
2152
```

8. Command: Verify the file cksums. After the fixpack is applied newly extracted files and some log files will appear in the difference output.

```
prefix=$(ls -rt 1.1.0.5-IM-PureData_System_for_OpAnalytics-fp005*.tgz | tail -1 | sed 's|\.tgz||');echo ${prefix};find FP9_FP5 -  
type f | xargs cksum | diff ${prefix}.files.cksum -
```

Example Output:

PureData System for Operational Analytics for V1.1.0.5

```
$ prefix=$(ls -rt 1.1.0.5-IM-PureData_System_for_OpAnalytics-fp005*.tgz | tail -1 | sed 's|\.tgz||');echo ${prefix};find FP9_FP5  
-type f | xargs cksum | diff ${prefix}.files.cksum -  
  
1.1.0.5-IM-PureData_System_for_OpAnalytics-fp005_20220921_150326
```

9. FP1->FP5, FP2->FP5, FP3->FP5 customers. If your system is currently at V1.1 FP1, V1.1 FP2 or V1.1 FP3, then see Appendix - Registering Previous Fixpacks at the end of this document for instructions on how to download and register those fixpack packages.

Preparing to use screen sessions.

As part of the transition in V1.1 FP2 from the console based fixpack to manual steps it was necessary to add the ability to handle interruptions to long running commands. As part of V1.1 FP2 each fixpack includes a basic copy of screen that will be installed on the management host to allow long running commands to continue running without an active connection. V1.1 FP5 includes components to improve the experience of using screen by automatically setting up screen sessions if needed, automatically change the working directory of those screen sessions as appropriate, and automatically logging terminal output for fixpack sessions as part of the logging sessions.

1. Command: Login as root on the management host and Install Screen from the FP9_FP5 directory.

```
rpm -i /BCU_share/FP9_FP5/software/rpm/screen-3.9.10-2.aix4.3.ppc.rpm
```

Example Output:

```
$ rpm -i /BCU_share/FP9_FP5/software/rpm/screen-3.9.10-2.aix4.3.ppc.rpm
(0) root @ kf5hostname03: 7.1.0.0: /BCU_share/FP8_FP4/software/rpm
$ rpm -qa | grep screen
screen-3.9.10-2.ppc
```

2. Command: Run the following command to create three screen sessions. This command can be re-run and it will open start new screen sessions when a session isn't running. Note the screen will flash as each sessions is started and detached. These screen sessions will need to be restarted whenever the management server is rebooted.

```
/BCU_share/FP9_FP5/fixpack_tools/application/enable_screensessions.sh
```

3. Command: Verify the three sessions are running, fprun, fplog and pplayerlog.

```
screen -ls
```

Example Output:

```
$ screen -ls
There are screens on:
  2163048.pplayerlog      (Detached)
  2228524.fprun          (Attached)
  2818270.fplog          (Detached)
3 Sockets in /tmp/screens/S-root.
```

Screen Usage notes:

1. The screen.rc files included with PDOA configure the following:
 - a. Sessions:
 - i. fprun: Run all fixpack commands through this session.
 - ii. fplog: View and verify log files for fixpack scripts.
 - iii. pflayerlog: View and verify log files from platform layer.
 - b. Settings:
 - i. Current Working Directories appropriate for the session type.
 - ii. 50000 line scrollback buffers
 - iii. Automatic Terminal Logging for fplog and fprun in /BCU_share/support/FP9_FP5/log/
2. If not connected to a screen use: (note, you may need to use the full pid.<label> if there are multiple screen sessions which similar names). See option 5 on how to exit screen sessions without stopping them.


```
screen -r fprun
screen -r fplog
screen -r pflayerlog
```
3. If a session is disconnected but screen still shows as active it is possible to force a screen using the following:


```
screen -dr fprun
screen -dr fplog
screen -dr pflayerlog
```
4. It is possible to determine which screen session is being used. This only works if you have not initiated another shell or logged into another system from that screen session. Examining the \$STY variable. Below shows using the fplog session.


```
$ echo $STY
5505526.fplog
```
5. Once in a screen session use: <ctrl>+a d to leave the session without closing it.
6. Once in a screen session use: <ctrl>+a <esc> to enter copy mode which allows you to scroll using vi keys to scroll through the output. Use 'q' + enter to exit copy mode. Note that screen will not work with scrollbars.
7. Screen documentation can be found here: <https://linux.die.net/man/1/screen>.
8. Be careful when using 'exit'. If in a screen session this will exit the session. If this happens, restart the screen sessions using the "enable_screensessions.sh" script. This script will only restart sessions that are not currently running. Terminal logging will append to the log file.

Uninstalling Screen

When finished with the fixpack, it may be desirable to remove screen on the management host.

1. Command: Removing Screen. Login as root on the management host.

```
$ rpm -e screen-3.9.10-2.ppc  
$ rpm -qa | grep screen
```

Using the new e-mail notifications feature in the fixpack scripts.

The fixpack scripts now offer e-mail notifications when some fixpack scripts complete. This is an experimental feature and may lead to excessive e-mails, but does allow an admin to watch for e-mails when processes complete. This will require a functioning sendmail server. More information about how to setup sendmail in a PDOA environment can be found [here](#).

To enable the notification feature do the following

1. As root on management. Create the notifylist.txt file in /pschome/config.

```
$ cat notifylist.txt
FIXPACK_TO:user@company.com
FIXPACK_CC:root@localhost,user2@company.com
```

2. Update the FIXPACK_TO: list for the user to be e-mailed. This is required and can only be a single e-mail address.
3. Update the FIXPACK_CC: list with a comma separated list of e-mails addresses. This is an OPTIONAL parameter.
4. Command: Verify that the system works by using the notify script An easy way to do this is to connect to the 'fprun' screen session. This session defaults to the directory '/BCU_share/FP9_FP5/fixpack_tools/application'.

```
./pdoa_notify.sh "Hello!"
```

Example Output:

```
$ ./pdoa_notify.sh "Hello!"
20220617_184252 (reverseflash01:pdoa_notify.sh): Normalizing management hostname.
20220617_184253 (reverseflash01:pdoa_notify.sh): Management hostname is 'reverseflash01'.
20220617_184253 (reverseflash01:pdoa_notify.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from script './pdoa_notify.sh'.' to 'user@company.com' '-c root@localhost,user2@company.com'.
20220617_184253 (reverseflash01:pdoa_notify.sh): Notification sent.
20220617_184253 (reverseflash01:pdoa_notify.sh): pdoa_notify.sh completed with rc=0.
```

Example E-mail to root on the management host (part of the CC list).

```
Message 120:
From root Fri Jun 17 18:43:53 2022
Date: Fri, 17 Jun 2022 18:43:53 -0400
From: root
To: user@company.com
Subject: Message from PDOA fixpack on 'reverseflash01' from script './pdoa_notify.sh'.
Cc: n9a5h5n8v2f5q0u9@ibm-analytics.slack.com, root@reverseflash01

20220617_184253 (reverseflash01:pdoa_notify.sh): Hello!
```


Removed Components

The following table lists the software removed as part of this update.

Component	Notes

Deprecated Components

The following table lists the software that is currently deprecated.

Component	Notes

Requirements and Planning

Requirements

1. This fixpack is only applicable to PDOA V1.1 (machine type 8280) environments. PDOA V1.0 (machine type 8279) cannot be updated as part of this fixpack.
2. These instructions were applied and tested on a V1.1 FP4 environment (FP4->FP5). If starting on V1.1 FP3 (FP3->FP5, FP2->FP5, FP1->FP5) or lower please contact IBM for information on applying V1.1 FP5 on earlier fixpack levels
3. Prior to applying this fixpack, it is recommended to verify and address any issues with the current environment.
4. It is recommended to review the backup and recovery procedures for mksysb based backup and restore. During the update the mirrored hdisks protecting rootvg will be broken, leaving rootvg vulnerable to disk failures during parts of the update.
5. As time passes between the fixpack release date and the application of the fixpack on a system many components such as AIX, Db2 and the HMCs will have security updates. Those security updates can be evaluated and incorporated into the fixpack planning.
6. This update will migrate all PDOA appliances to a higher AIX Version, 7.2. It is highly recommended that customers verify the support and compatibility status of any third-party software on AIX 7.2 TL5 SP4.
7. This update may require multiple roles to perform the update. It is important to verify the availability of those resources.
 - a. Access to root on management.
 - b. Access to the instance owner, the default is *bcuaix*.
 - c. Application Users and DBAs that may need to perform tests against the database after the DB2 update.
 - d. Access to hscroot on the HMCs.
 - i. Ability to use vtmenu to login to server console sessions for troubleshooting.
 - e. Access to hscpe on the HMCs.
 - i. Ability to use PESH and root on the HMC for troubleshooting.
 - f. Storage enclosure GUI access. This requires SSH tunnelling and knowledge of the superuser passwords on the enclosures.
 - g. Network Switch admin. The customer should know the admin user passwords for their network switches. This may be required for troubleshooting or workarounds.
 - h. SSR or CE access to data center as part of support related actions if needed.
8. This update requires planning and in general can take 1 to 2 weeks to apply all of the stages per environment. The design of the fixpack is flexible and has many accommodations to manage risks and outage timeframes.
9. Important Links:
 - a. This Readme: <https://www.ibm.com/support/pages/node/6593119>
 - b. Known Issues Links: <http://www.ibm.com/support/docview.wss?uid=swg21647099>
 - c. Validated Stack Links: <https://www-01.ibm.com/support/docview.wss?uid=swg21610644>

Planning

Fixpack conventions:

- This fixpack readme lays out the step-by-step commands to apply V1.1 FP5. Commands can be found where the word “Command:” is listed in the step. The command should follow in Courier New 6-point bold font. After the command there may be the words “Example Output” which shows an example of the expected output or may show examples of some potentially expected errors. The commands are almost always one line and are designed to be cut and paste directly from this document. In a few cases it may be necessary to change a hostname or user and those commands should have clear explanations when those changes are needed.
- When using fixpack tool commands, the standard output and standard error are logged to files in /BCU_share/support/FP9_FP5/log. The filename includes the script name, the host, and the timestamp when the command is run. New in V1.1 FP5 is that fprun and fplog screen session terminal output is automatically logged to a file in this directory. Terminal logging includes non-visible characters such as backspace ^H and carriage return ^M which can make the output difficult to read.
- When using platform layer commands, the stdout and stderr are logged in /BCU_share/aixappl/pfplayer/log in log and trace files. These files are rotated over time so a tool is provided that can collect these files in a timestamped and labelled .tgz file and copied to /BCU_share/support/FP9_FP5/log/pfplayer when needed.
- In general, the philosophy of the appliance is to always continue forward through an update and to not rollback changes.
- This document makes heavy use of the ‘dsh’ or distributed shell command. Using ‘dsh’ as the root user on the management host and the shell variables BCUMGMT, BCUMGMTSTDBY, BCUDB2ALL, and ALL allows for commands lines that work on the appliance level regardless of the size of the system. Here are the definitions for the shell variables.
 - ALL: Lists all of the AIX hosts in the appliance.
 - BCUMGMT: Lists the management host in the appliance.
 - BCUMGMTSTDBY: Lists the standby management host.
 - BCUDB2ALL: Lists the core hosts, admin, data and their associated standby hosts.
- This fixpack methodology has the following risk mitigation techniques in place.
 - Limiting how many components are at risk at any one time.
 - Providing plenty of check commands to verify the state prior to proceeding.
 - Allowing customers to stop in between stages and even within some stages to return to full production status.
-

Fixpack Duration and Timings

- Be sure to include in your planning timeframes any tasks related to the following:
 - If using DR, the time to move applications from Production to DR and back again as needed.
 - Time needed to stop applications before entering an outage or limiting applications when running updates with reduced workloads (such as in Stage 4 or Stage 5 during the storage and SAN updates).
 - Time needed for validation, such as application or DBA time.

- This fixpack document and process includes many commands. It is not recommended to try to apply this fixpack in a marathon style without having adequate staffing who can apply the updates in shifts. This is particularly true for customers who may be applying this fixpack for the first time on their systems. While there are many safeguards and checks to help avoid mistakes, mental fatigue is a real risk. The fixpack is designed and tested to explicitly allow the update to span days or weeks and to run in production even if not all of the updates are applied within the same update period.
- It is recommended to read through this document thoroughly to understand the new fixpack methodology. For any questions on the update, please contact your IBM representative or open a ticket to contact IBM support.
- It is recommended as part of any fixpack planning that the customer opens a pro-active ticket to alert IBM Support that they are planning a fixpack update and when they are planning to do the update.
- While this fixpack provides more options for utilizing the redundant and HA features of the appliance to help reduce downtime, it is entirely possible to perform some or all updates during outage windows.

Compatibility Issues

- Sudo:
Can sudo be used? The commands in this document are not tested for use with sudo and therefore the use of sudo is not supported.

Risks and Mitigations

Backups

- Filesystems:
 - Filesystems
 - Safe guards:
 - All non-rootvg filesystems are protected in Storage Enclosures using RAID technology.
 - All V7000 filesystems are protected by RAID-5 arrays with multiple spares for each enclosure.
 - All Flash900 filesystems are protected by flash RAID-5 like arrays with 1 spare per array.
 - Customers may have tier 3 filesystems in GPFS. If used for cooling/cold db2 container storage see /bkpfs comments.
 - Non-GPFS Filesystems:
 - /BCU_share, /BCU_share/securefs
 - Location: Foundation V7000
 - Use: PDOA ATK, Fixpack, Support, NFS. Hosted by management and accessible when needed on all AIX hosts. Pflayer databases.
 - Recovery: savevg to backup these filesystems.
 - /pscfs
 - Location: Foundation V7000
 - Use: Console database up to V1.1 FP1. Console removed in V1.1 FP2 and this space is reserved for future use.
 - Recovery: savevg to backup this filesystem.
 - GPFS Filesystems:
 - /db2home:
 - Location: Foundation Flash
 - Use: db2home contains db2 instance directories, dba and other user files.
 - Recovery: Instance files can be recreated without data loss. Non Db2 files need to be backed up outside of this using filesystem backup recovery means.
 - /dwhome:
 - Location: Foundation Flash
 - Use: User directories.
 - Recovery: If used for non Db2 files those need to be backed up outside using filesystem backup recovery tools.
 - /db2fs/<instance>/NODE####
 - Location: Flash enclosures
 - Use: Hot Database containers. Temp containers, db2diag target. Customer may also use for their own purposes.
 - Recovery: Db2 BAR. If used for non Db2 files those need to be backed up outside using filesystem backup recovery tools.

- /db2path/<instance>/NODE####
 - Location: Flash enclosures
 - Use: Transaction Logs
 - Recovery: Db2 BAR. If used for non Db2 files those need to be backed up outside using filesystem backup recovery tools.
- /bkpfs/<instance>/NODE####
 - Location: V7000 enclosures
 - Use: Customer can choose.
 - Cooling / Cold database containers.
 - Db2 Local Backups.
 - ETL other uses.
 - Recovery:
 - Db2 containers are handled by Db2 backup.
 - If used for non Db2 files those need to be backed up outside using filesystem backup recovery tools
- /stage
 - Location: Foundation V7000 enclosure.
 - Use: Customer choice.
 - Recovery: If used for non Db2 files those need to be backed up outside using filesystem backup recovery tools
- /opmfs
 - Location: Foundation Flash
 - Use: OPM. After FP4 if OPM is removed this space is reserved for future use.
- /usr/IBM/dwe/appserver_001:
 - Location: Foundation V7000:
 - Use: This filesystem is no longer used as V1.1 FP2 but is still reserved for future use.
- Network Switch Configurations.
 - Backed up as part of Stage08 by the pplayer. (/BCU_share/net_switch_backup/)
- SAN Switch Configurations
 - Backed up as part of Stage05.
- mksysb
 - Taken before starting the update.
 - Taken after Stage 6 (especially if this update is performed over a long time frame) for management LPARs.
 - Taken after Stage 8 (before rebuilding the mirror).
- Db2
 - The update should be arranged to be consistent with the customers current backup and recovery strategy.

GPFS / Spectrum Scale

- Some PDOA customers have exemptions for sharing GPFS/Spectrum Scale filesystems from/to PDOA with external GPFS clusters. This will require additional update planning to ensure continued interoperability of this environment.

AIX 7.2 Migration Management Server Process (Stage 2)

- Reduce rootvg on management standby to free one of the internal SAS disks.
- Install a vanilla AIX 7.2 image on management standby on the free disk.
- Boot the management standby on the AIX 7.2 level.
- Create new LUNs on the Foundation V7000 to be used for the nimvg volume group and /pdoa_nimrestore filesystem for the NIM server resources on the management and management standby hosts.
- Configure NIM with AIX 7.2 migration artifacts on the management standby.
- Reduce rootvg on the management host to free one of the internal SAS disks for migration.
- Migrate the management host via nimadm on the management standby to the free disk.
- Boot the management host from the migrated free disk.
- Verify the management host migration is completed.
- Restore the NIM Server configuration on the management host, the sendmail configuration and ha tools logs from backups taken before the migration.
- Use mksysb to backup the management host. In case of disk failure, this should allow faster recovery to a point after migration.
- Boot the management standby host back to it's original AIX 7.1 image.
- Remove the vanilla image on the management standby to free a local hdisk.

AIX 7.2 Migration Non-Management Server Migration Process (Stage 6, Stage 7)

- Supports up to 4 LPARs in parallel per migration step.
- Configure NIM on the management server with the AIX 7.2 migration artifacts.
- Backup the target server via mksysb
- Unmirror the rootvg volume group on the target server, freeing up a disk that will be used as the migration target for nimadm.
- Using nimadm on the management server, initiate migration. In stage 7 up to 4 servers can be updated in parallel.
- Reboot the target server.

Third Party Tooling and AIX

- AIX will be updated as part of this fixpack. The following AIX packages will be updated and may impact third party tools that have dependencies on them.
 - OpenSSL and OpenSSH
 - Each update of these components contain fixes to address security vulnerabilities.
 - FP3->FP5, FP2->FP5, FP1->FP5: Perl is updated to 5.28 from 5.14. This will impact customers who update from V1.1 FP3 or earlier. V1.1 FP4 customers have already updates Perl to 5.28.

- AIX 7.1 TL5 SP7 includes significant updates to Perl in 5.28 with removed and deprecated features. <https://metacpan.org/pod/release/XSAWYERX/perl-5.28.0/pod/perldelta.pod>
- If there are third party or internal tools that are running on PDOA that depend on the system installed Perl these changes could cause unexpected output (deprecated messages) or errors.

DB2

- Db2 databases should be protected as part of a backup and restore strategy. If your PDOA environment is using Db2 V11.1 please review this page for compatibility across mod packs. <https://www.ibm.com/support/pages/compatibility-between-db2-luw-version-111-mod-packs-and-fix-packs>
- This is particularly important on systems using Db2 V11.1 FP2 or earlier.
- Db2 is the most commonly updated component in a PDOA system and the Db2 level should be checked to understand if there is already a special build applied and whether the level shipped in this fixpack contains that special build.
- Db2 11.5 was not supported on V1.1 FP4 and earlier due to the requirement of AIX 7.2. While PDOA V1.1 FP5 will now migrate to AIX 7.2, Db2 11.5 is not yet supported on the appliance.
- Extra planning may be required when using replication between a production and DR environment.

Server Updates

- Power Firmware (PFW): In the event of an issue with the power firmware the core environment can continue running in full production while a failed server is being addressed.
- AIX and rootvg: IBM Smart Analytics and IBM PureData System for Operational Analytics updates to AIX include breaking the internal rootvg mirror and using the alt_disk_install method to keep a copy of rootvg prior to the update. This is a common practice to provide a fast option to restore the system to a state just prior to the update for some issues with corruption or boot issues. In systems running for 5 or more years, it is highly recommended that recent mksysb are taken prior to breaking the mirror and stored offsite (all hosts in the appliance should have mksysb taken near the same time to ensure that the appliance is consistent upon restore). It is also recommended to take mksysb right after the OS is updated before restoring the mirror. It is then recommended to restore the mirrors as soon as possible. This readme includes explicit instructions to take mksysbs. As V1.1 FP5 includes an AIX migration, there are some differences in how backups are protected depending on the host type. For the management servers, updates and migrations are performed on the clone versus the currently booted disk.
- One advantage of the new methodology is that updates to the OS are done incrementally with each host being updated in quiesced mode. Any issues with the update on the server can be addressed while the database is up and servicing the business.

Storage Enclosures

- In the appliance the storage enclosures are protected by redundant canisters and RAID arrays. Access to the storage enclosures is protected through redundant MPIO connections from the servers through redundant SAN switches. In the past it is possible to encounter canister errors

(this has improved dramatically since V1.0.0.4) which can degrade the enclosure during an update. In this fixpack the methodology is to only put a subset of enclosures at risk. While this can elongate the time necessary to update all the storage enclosures, since this method allows for no downtime (just reduced workload) this update can be spread over the course of several days. In the case of canister failures, the local parts depot will have enough replacements to replace the at risk canisters quickly. Before a system can be returned to full production all enclosures must be online with two canisters in healthy state, however it is no longer necessary to update all enclosures before resuming production workloads.

SAN Switches

- FP3->FP5, FP2->FP5, FP1->FP5: SAN switch failures during updates are rare. However, it is recommended to backup the current SAN Switch configuration prior to beginning the SAN switch update and there are instructions provided in Phase 5 of Stage 2 to do that. Note that V1.1 FP5 does not include an update to the SAN switches from V1.1 FP4.

Security Updates

- Many security updates are tightening the default behaviors of many components. This is most often seen in Java applications, sshd and ssh default configuration settings, SSL certificate handling, and GSKit handling. In this update the fixpack is removing many security vectors by removing unused software components. It also includes security related updates to SSH and SSL within the appliance that may lead to issues with outside connectivity to the system.

Networking

- During the update the platform layer will backup the network configuration to /BCU_share/net_switch_backup/
- HMCs are accessible from corporate network connections as well as 1 connection to one 1Gb internal switch. If that internal switch is down, then the associated HMC will not be able to manage the servers nor connect to any internal ip address. However, the other HMC will be able to take on that role.
- SAN Switches have one, and only one, network connection to a 1 1Gb switch. If that 1Gb switch is down it will not be possible to access that SAN, however it will still provide full access to the SAN fabric.
- V7000 and Flash900 Storage enclosures. Each enclosure has 1 connection to each 1Gb switch. This can provide access to the enclosure via service ips (these are assigned to each canister). In the event of a 1Gb switch failure access to the management ip or floating ip address may not be available if the configuration node is on a canister connected to the failed switch. This can be rectified by stopping the configuration node and having that duty moved to the other canister. This does not impact the ability of a canister to provide full access to all available bandwidth.
- Each server has 2 1-Gb connections, 1 to each 1Gb switch, for the purposes of HMC management of the server. Each management LPAR has 2*10Gb connections (1 per 10Gb switch) and each core LPAR has 4*10Gb connections (2 per 10Gb switch) configured in an etherchannel.

- The best practice for external network connection uplinks in PDOA V1.1 systems is to have at least 4 connections (2 per 10Gb switch) for corporate access and at least 2 connections (1 per 10Gb switch) for backup or other network access. During the network switch updates all 4 switches are rebooted in parallel resulting in a short full network outage during the update.

STAGE 1 - Prerequisites

Stage 1 Description

This is an important opportunity to take a good look at your environment. This is like the preview step used in the automated fixpack. It is recommended that these prerequisite steps are done in the week or two prior to starting Stage 2. This will allow time to address issues with hardware and any questions about the system.

Steps/Phases

- Phase 1: Checking the system.
- Phase 2: Unpacking Db2 Images

Outage Requirements

- There are no outage requirements for this stage.

Time Per Step

- Phase 1: Budget an hour to run the steps. Perform these steps up to a week prior to the update to accommodate any issues that may be found.
- Phase 2: 30 Minutes to unpack and verify the contents.

Risk Mitigation

- N/A

Backout Options

- N/A

Phase 1: Checking the system.

1. Login as root on the management host.
2. Verify that you are using a screen session for *fprun*. For more information on screen use refer to page 28 Preparing to use screen sessions.
 - a. Command: Check the status of the current screen sessions.

```
$ screen -ls
There are screens on:
 2163048.pplayerlog      (Detached)
 2228524.fprun          (Attached)
 2818270.fplog           (Detached)
 3 Sockets in /tmp/screens/S-root.
```

- b. Command: Check if you are in a screen session. If blank you are not in a screen session. If “<PID>.fprun” then you are in the right screen session.

```
echo $STY
```

- c. Command: If not in a screen session and all three screen sessions are not running use the following to start all three screen sessions. The display will flash as each session is initiated based on provided screen rc files. Rerun the screen -ls command to verify all three sessions are running.

```
/BCU_share/FP9_FP5/fixpack_tools/application/enable_screensessions.sh
```

- d. Command: Connect to the fprun screen session.

```
screen -r fprun
```

3. Command: Change the working directory. This is the default directory for the fprun session.

```
cd /BCU_share/FP9_FP5/fixpack_tools/application
```

4. Command: Verify PDOA V1.1 FP3 or PDOA1.1 FP4 is installed on the cluster. The appl_ls_cat command should show 4.0.7.0 or 4.0.8.0 as the latest version and it should be committed. The example output shows a GA->FP1->FP3 scenario and a GA->FP1->FP2->FP4 scenario. If 4.0.7.0 nor 4.0.8.0 is not the latest level contact IBM Support.

```
appl_ls_cat
```

Example Output:

```
$ appl_ls_cat
NAME          VERSION      STATUS      DESCRIPTION
bwr0          4.0.4.0      Committed   Updates for IBM_PureData_System_for_Operational_Analytics
bwr1          4.0.5.0      Committed   Updates for IBM_PureData_System_for_Operational_Analytics_DB2105
bwr2          4.0.6.0      Committed   Updates for IBM_PureData_System_for_Operational_Analytics
bwr3          4.0.7.0      Committed   Updates for IBM_PureData_System_for_Operational_Analytics
```

Example Output:

```
$ appl_ls_cat
NAME          VERSION      STATUS      DESCRIPTION
bwr0          4.0.4.2      Committed   Updates for IBM_PureData_System_for_Operational_Analytics
bwr1          4.0.5.0      Committed   Updates for IBM_PureData_System_for_Operational_Analytics_DB2105
bwr2          4.0.6.0      Committed   Updates for IBM_PureData_System_for_Operational_Analytics
bwr3          4.0.8.0      Committed   Updates for IBM_PureData_System_for_Operational_Analytics
```

5. The stage01_phase01_checking_the_system.sh tool can be used to check the system. This tool will do the following:
 - Log and stderr output is available in /BCU_share/support/FP9_FP5/log/
 - Displays the appl_ls_cat output.

STAGE 1 - Prerequisites

- Check for fiber channel path health.
- Check for password validation.
- Check for evidence of the PDOA Console which should have been removed in FP2.
- Check for evidence of IBM Systems Director which should have been removed in FP2.
- Check the status of the hardware as seen by pflayer.
- Check for evidence of Warehouse Tools which should have been removed in FP2.

6. Command: Run the tool: (~10 minutes per rack)

```
./stage01_phase01_checking_the_system.sh
```

Example Output:

```
$ ./stage01_phase01_checking_the_system.sh
20220607_130044 (reverseflash01:stage01_phase01_checking_the_system.sh): Starting date: Tue Jun 7 13:00:44 EDT 2022.
20220607_130044 (reverseflash01:stage01_phase01_checking_the_system.sh):
20220607_130044 (reverseflash01:stage01_phase01_checking_the_system.sh): ***** Running test
/BCU_share/FP9_FP5/fixpack_tools/application/check_console.sh *****
20220607_130045 (reverseflash01:stage01_phase01_checking_the_system.sh): ***** Completed test
/BCU_share/FP9_FP5/fixpack_tools/application/check_console.sh with result Passed *****
20220607_130045 (reverseflash01:stage01_phase01_checking_the_system.sh):
20220607_130045 (reverseflash01:stage01_phase01_checking_the_system.sh): ***** Running test
/BCU_share/FP9_FP5/fixpack_tools/application/check_devicestatus.sh *****
20220607_131213 (reverseflash01:stage01_phase01_checking_the_system.sh): ***** Completed test
/BCU_share/FP9_FP5/fixpack_tools/application/check_devicestatus.sh with result Passed *****
20220607_131213 (reverseflash01:stage01_phase01_checking_the_system.sh):
20220607_131213 (reverseflash01:stage01_phase01_checking_the_system.sh): ***** Running test
/BCU_share/FP9_FP5/fixpack_tools/application/check_director.sh *****
20220607_131215 (reverseflash01:stage01_phase01_checking_the_system.sh): ***** Completed test
/BCU_share/FP9_FP5/fixpack_tools/application/check_director.sh with result Passed *****
20220607_131215 (reverseflash01:stage01_phase01_checking_the_system.sh):
20220607_131215 (reverseflash01:stage01_phase01_checking_the_system.sh): ***** Running test
/BCU_share/FP9_FP5/fixpack_tools/application/check_fcpaths.sh *****
20220607_131218 (reverseflash01:stage01_phase01_checking_the_system.sh): ***** Completed test
/BCU_share/FP9_FP5/fixpack_tools/application/check_fcpaths.sh with result Passed *****
20220607_131218 (reverseflash01:stage01_phase01_checking_the_system.sh):
20220607_131218 (reverseflash01:stage01_phase01_checking_the_system.sh): ***** Running test
/BCU_share/FP9_FP5/fixpack_tools/application/check_fixpacks.sh *****
20220607_131219 (reverseflash01:stage01_phase01_checking_the_system.sh): ***** Completed test
/BCU_share/FP9_FP5/fixpack_tools/application/check_fixpacks.sh with result Passed *****
20220607_131219 (reverseflash01:stage01_phase01_checking_the_system.sh):
20220607_131219 (reverseflash01:stage01_phase01_checking_the_system.sh): ***** Running test
/BCU_share/FP9_FP5/fixpack_tools/application/check_passwords.sh *****
20220607_131247 (reverseflash01:stage01_phase01_checking_the_system.sh): ***** Completed test
/BCU_share/FP9_FP5/fixpack_tools/application/check_passwords.sh with result Passed *****
20220607_131247 (reverseflash01:stage01_phase01_checking_the_system.sh):
20220607_131247 (reverseflash01:stage01_phase01_checking_the_system.sh): ***** Running test
/BCU_share/FP9_FP5/fixpack_tools/application/check_warehousestools.sh *****
20220607_131247 (reverseflash01:stage01_phase01_checking_the_system.sh): ***** Completed test
/BCU_share/FP9_FP5/fixpack_tools/application/check_warehousestools.sh with result Passed *****
20220607_131247 (reverseflash01:stage01_phase01_checking_the_system.sh):

20220607_131247 (reverseflash01:stage01_phase01_checking_the_system.sh): Test Results
20220607_131247 (reverseflash01:stage01_phase01_checking_the_system.sh): check_console.sh Validation
Passed
20220607_131247 (reverseflash01:stage01_phase01_checking_the_system.sh): check_devicestatus.sh Validation
Passed
20220607_131247 (reverseflash01:stage01_phase01_checking_the_system.sh): check_director.sh Validation
Passed
20220607_131247 (reverseflash01:stage01_phase01_checking_the_system.sh): check_fcpaths.sh Validation
Passed
20220607_131247 (reverseflash01:stage01_phase01_checking_the_system.sh): check_fixpacks.sh Validation
Passed
20220607_131247 (reverseflash01:stage01_phase01_checking_the_system.sh): check_passwords.sh Validation
Passed
20220607_131247 (reverseflash01:stage01_phase01_checking_the_system.sh): check_warehousestools.sh Validation
Passed

20220607_131247 (reverseflash01:stage01_phase01_checking_the_system.sh): Starting date: Tue Jun 7 13:00:44 EDT 2022 Ending
Date: Tue Jun 7 13:12:47 EDT 2022.
```

STAGE 1 - Prerequisites

7. Examine the output of the tool. All tests should show Passed. For all failures, see /BCU_share/support/FP9_FP5/log/stage01_phase01_checking_the_system.sh*.stderr for more details.

a. Console Check Failures:

- i. In the FP8_FP4 version of the tool this failure will most likely be due to the existence of 'mi*' commands in the path. In FP9_FP5, the tool was updated to not check for some mi* commands as they are part of the pflayer packaging and not the console. Check the Appendix – Removing the PDOA Console for the steps to remove the PDOA console if this verification step fails

```
20210127_004703 (kf5hostname01:check_console.sh): Checking for PDOA console mi commands.
20210127_004704 (kf5hostname01:check_console.sh): Warning: the PDOA Console command mistart has been found.
20210127_004704 (kf5hostname01:check_console.sh): Warning: the PDOA Console command mistop has been found.
20210127_004704 (kf5hostname01:check_console.sh): Warning: the PDOA Console command mistatus has been found.
20210127_004704 (kf5hostname01:check_console.sh): Checking for PDOA console smash applications.
20210127_004704 (kf5hostname01:check_console.sh): Checking for PDOA console Db2 Artifacts.
no db2greg in /usr/bin /etc /usr/sbin /usr/ucb /pschome/db2psc/bin /usr/bin/X11 /sbin .
20210127_004704 (kf5hostname01:check_console.sh): Warning: The PDOA Console has been found. Consult the V1.0
FP6/V1.1 FP2 readme for instructions on how to remove this console.
```

b. Device Status Failures:

- i. This uses the appl_ls_hw commands to check the hardware for Online status. This will check the health of your platform layer database which impacts several of the firmware updates in this fixpack. Depending on the type of failure, it may not be required resolve this failure prior to starting the fixpack.

c. System Director detection failures:

- i. Most likely errors are related to left over installed software. Check the Appendix – ISD and CAS Uninstall for more information about removing IBM Systems Director.

```
kf5hostname01: Path: /usr/lib/objrepos
kf5hostname01: tivoli.tivguid 1.3.4.1 COMMITTED IBM Tivoli GUID on AIX
kf5hostname01:
```

d. FC Path failures:

- i. This detects fiber channel paths that are not enabled on all AIX hosts in the system. Many updates may be possible even with Fiber Channel path failures. Open a case to consult with IBM support about options to proceed with the fixpack with fiber channel path failures.

e. Fixpack Failure:

- i. This looks for 4.0.8.0 in the appl_ls_cat output.
- ii. For customers updating from V1.1 FP3 and earlier this failure is expected. Ensure that the latest level from appl_ls_cat is 4.0.7.0 and that PDOA supports FP3->FP5 scenarios.

f. Check Passwords:

- i. This validates that the platform layer password registry is still valid. This is required for many of the firmware updates managed by the platform layer. Depending on the password failure it may not be required to resolve this issue before starting the fixpack.

g. Warehouse Tools:

- i. As of V1.1 FP2, Warehouse tools should have been removed as part of the fixpack process, however the instructions in FP6_FP2 README did not remove all of the Warehouse Tools

STAGE 1 - Prerequisites

resource definitions in the TSA domain causing this check to fail. As of V1.1 FP4, DPM (PDOA's name for OPM) was removed which includes removing the entire Management domain, also removing the Warehouse Tools resources. If you elected to not remove OPM in V1.1 FP4 as part of an exception then this check may fail here and if the failure matches the output below in the warehouse tools logs then this failure can be ignored.

```
20210127_010105 (kf5hostname01:check_warehousetools.sh): Checking for Warehouse Tools Resources
"db2whse_ha_kf5hostname01_type1.adminconsole-rs":
"db2whse_ha_kf5hostname01_type1.adminconsole-rs":
"db2whse_ha_kf5hostname01_type1.adminconsole-rs":
20210127_010105 (kf5hostname01:check_warehousetools.sh): Warning: Warehouse Tools resources discovered in the
management domain.
```

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8. Command: Check to verify that there are no logical volumes in rootvg with 12 or more characters. Any LV on rootvg with 12 characters or more will need to be renamed to allow the alt_disk_install command to successfully clone rootvg. Do not proceed with the fixpack until this validation check is passed.

```
./check_rootvg_lvnamelengths.sh
```

Example Output: (Healthy)

```
$ ./check_rootvg_lvnamelengths.sh
20220328_165207 (host01:check_rootvg_lvnamelengths.sh): Starting date: Mon Mar 28 16:52:07 EDT 2022.
20220328_165207 (host01:check_rootvg_lvnamelengths.sh): Collecting logical names.
20220328_165208 (host01:check_rootvg_lvnamelengths.sh): Starting date: Mon Mar 28 16:52:07 EDT 2022 Ending Date: Mon Mar 28 16:52:08 EDT 2022.
```

Example Output: (2 LVs with 12 characters)

```
$ ./check_rootvg_lvnamelengths.sh
20220328_165002 (host01:check_rootvg_lvnamelengths.sh): Starting date: Mon Mar 28 16:50:02 EDT 2022.
20220328_165002 (host01:check_rootvg_lvnamelengths.sh): Collecting logical names.
20220328_165003 (host01:check_rootvg_lvnamelengths.sh): Error: Found hosts with logical volume names that exceed the maximum
length supported by cloning.
HOSTS -----
host01, host02, host04, host05, host06
-----
hdlladmin0000 exceeds 11 chars at 12 characters long.
lg_dump1v0000 exceeds 11 chars at 12 characters long.
20220328_165003 (host01:check_rootvg_lvnamelengths.sh): Starting date: Mon Mar 28 16:50:02 EDT 2022 Ending Date: Mon Mar 28
16:50:03 EDT 2022.

(1) root @ host01: 7.1.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
$
```

9. Check your SSH Client Settings. OpenSSH is updated as part of the AIX 7.1 TL5 SP2 update and as per this [technote link](#). This impacts the ssh client behavior as determined by the files /.ssh/config (root), /etc/ssh/ssh_config (global). For any questions regarding SSH configuration details please contact IBM Support.

PDOA V1.0 FP5 IF01 and PDOA V1.1 FP1 IF01 (aka: FP5_FP1 to FP5_FP1_IF01) customers would have experienced connectivity issues to the BNT switches from the management host after updating AIX on the management host.

PDOA V1.0 FP5->FP6 and PDOA V1.1 FP1->FP2 (FP5_FP1 to FP6_FP2) customers would see the same issue. After completing the update another hidden symptom would appear in SAN connectivity as the settings meant to fix BNT access do not work with the SANs. This is usually not recognized until preparing for FP7_FP3 when the password validation check is run.

PDOA V1.0 FP5->F7, FP6->FP7 and PDOA V1.1 FP1->FP3, FP2->FP3 (aka: FP5_FP1->FP7_FP3 and FP6_FP2->FP7_FP3) customers would experience BNT issues after updating AIX, SAN issues after updating the SAN switches, and V7K/Flash issues in the middle of the update for the storage leading to a failure.

After testing a V1.1 FP1->FP3 scenario it was found the following settings are recommended for root's /.ssh/config file after Stage 6. This is only needed on AIX hosts that need to connect to the BNT switches. For FP5_FP1 customers these settings cannot be added until after AIX is updated on the management host as part of Stage 6 as the options are not valid until AIX is updated.

STAGE 1 - Prerequisites

- a. Command: Obtain the list of ip addresses for the network switches. This list may include 4 or 8 entries. Use the following command:

```
appl_ls_hw -r net -M
```

Example Output:

```
$ appl_ls_hw -r net -M
NAME      HOSTNAME      IP          MODULE      STATUS      DESCRIPTION
net0      mgt_switch1   172.23.1.254 Online      IBM System Networking RackSwitch
net1      mgt_switch2   172.23.1.253 Online      IBM System Networking RackSwitch
net2      fcm_switch1   172.23.1.252 Online      IBM System Networking RackSwitch
net3      fcm_switch2   172.23.1.251 Online      IBM System Networking RackSwitch
```

- b. Create the file `/.ssh/config` on the management host. This is the easiest way to add specific settings for the BNT hosts for the root user. Note that PDOA does not enable key based authentication from root on the management host to the BNT switches even though BNT switch firmware updates have enabled that feature. The `PubkeyAuthentication no` option is required when applying OpenSSH version 7.5.102.2000 which prevents the ssh session from crashing when connecting to the BNT switches. This step will only enable access to the switches by the root user. If non-root ssh access is needed see 'd' below for instructions on how to update `/etc/ssh/ssh_config`.

```
$ cat /.ssh/config
Match host "172.23.1.251,172.23.1.252,172.23.1.253,172.23.1.254"
    HostKeyAlgorithms +ssh-dss
    PubkeyAcceptedKeyTypes +ssh-dss
    PubkeyAuthentication no
```

- c. Check the `/etc/ssh/ssh_config` file for similar settings. This file may have been updated as part of an earlier fixpack. See item d if these settings appear in that file.

STAGE 1 - Prerequisites

- d. If it is desired to use these Match settings in the /etc/ssh/ssh_config file for global use then the Match stanza should be entered early in the file and in addition a Match host * needs to be added after this stanza. This is due to the way the ssh client handles configuration parameters where it uses the 'first' available setting in the file.

In the file find the segment:

```
# configuration file, and defaults at the end.  
  
# Site-wide defaults for various options  
  
# Host *
```

And change it by adding the Match stanza before the '# Host *' lines and then uncomment the "# Host *" line as below.

```
# configuration file, and defaults at the end.  
Match host "172.23.1.251,172.23.1.252,172.23.1.253,172.23.1.254"  
    HostKeyAlgorithms +ssh-dss  
    PubkeyAcceptedKeyTypes +ssh-dss  
    PubkeyAuthentication no  
  
# Site-wide defaults for various options  
  
Host *
```

STAGE 1 - Prerequisites

10. Also impacted by the SSH updates is the ssh daemon behavior as represented by the `/etc/ssh/sshd_config` file.

Many of the security related parameters have updated default settings. During testing, the default changes created issues for the fixpack instructions, and it recommended to explicitly set the following variables in `sshd_config` and `ssh_config`.

Verify `/etc/ssh/sshd_config` settings are explicitly set.

`PermitRootLogin` is required to be “yes” on all hosts during the fixpack to allow the proper functioning of the `pplayer` commands throughout the update process.

After the update is complete, the `PermitRootLogin` setting can be set to “without-password” which will still allow `dsh` and `GPFS` to function as expected. Some platform layer commands will not function, however, with this setting.

Also check `sshd_config` on all hosts for the PDOA known issue KIG00067 in our Known Issues technote. <https://www.ibm.com/support/pages/node/872628>. These issues should have been discovered after V1.1 FP2 or V1.1 FP3 was applied, but are easy to miss unless the system log is frequently checked.

11. Command: Verify the validity of the instance owner and that the account is not locked. The default instance owner is 'bcuaix' but may be different in your environment. In HA environments like PDOA, issues with this user on standby hosts may not be noticed until failovers are attempted. Physical hosts with locked accounts will prevent the Db2 instance from starting on that host.

```
dsh -n ${ALL} 'lsuser -a account_locked bcuaix' | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} 'lsuser -a account_locked bcuaix' | dshbak -c
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
bcuaix account_locked=false
```

STAGE 1 - Prerequisites

12. Command: Check the health of the storage enclosures. The following command, run as root on the management host, will show the event log for all storage enclosures in the environment. This command is run again as part of Stage 4 but attending to issues earlier can help prevent disruptions in plans. Use the pre-emptive PMR or SF ticket to address any issues listed by the command.

```
./check_storage.sh
```

Example Output:

```
$ ./check_storage.sh
20201118_003647 (flashdancehostname01:check_storage.sh): Checking the storage status.
**** 172.23.1.181 ****
**** 172.23.1.182 ****
sequence_number last_timestamp object_type object_id object_name copy_id status fixed event_id error_code description
secondary_object_type secondary_object_id
134 200214060932 internal 0 alert no 085153 3087 Quorum device error
**** 172.23.1.183 ****
sequence_number last_timestamp object_type object_id object_name copy_id status fixed event_id error_code description
934 201118003559 io_grp 0 io_grp0 alert no 072901 1052 Inter-canister PCIe
link degraded
**** 172.23.1.184 ****
**** 172.23.1.185 ****
sequence_number last_timestamp object_type object_id object_name copy_id status fixed event_id error_code description
847 200214072150 enclosure 1 alert no 045102 1260 SAS cable fault type 2
**** 172.23.1.186 ****

(1) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

13. Command: PDOA V1.1 Servers were shipped between 2015 and 2017 and included a new feature called Update Access Keys. These keys have expiration dates that expire after 3 years from ship date. This is described in the technote <https://www.ibm.com/support/pages/how-complete-uak-expiration-updates-required-ibm-puredata-system-operational-analytics-v11-power8-hardware>. It is recommended to check your keys running the following command. During our internal testing with V1.1 FP4 we did not encounter any errors with updating power firmware with expired keys using the updlic command line call.

```
./check_uaks.sh
```

Example output:

```
$ ./check_uaks.sh
20220426_132303 (reverseflash01:check_uaks.sh): Checking update access key status.
20220426_132303 (reverseflash01:check_uaks.sh): Retrieving HMC.
20220426_132304 (reverseflash01:check_uaks.sh): Found HMC IP is '172.23.1.245'.
20220426_132304 (reverseflash01:check_uaks.sh): Running command to list update access key expiration dates.
03/21/2019
03/21/2019
03/21/2019
03/21/2019
20220426_132308 (reverseflash01:check_uaks.sh): Script './check_uaks.sh' with arguments '' ended with rc='0'. Start: End: .
Elapsed Time (Seconds): 5.
20220426_132308 (reverseflash01:check_uaks.sh): Normalizing management hostname.
20220426_132309 (reverseflash01:check_uaks.sh): Management hostname is 'reverseflash01'.
20220426_132309 (reverseflash01:check_uaks.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from script
'./check_uaks.sh'.' to 'user@company.com' '-c root@localhost'.
20220426_132309 (reverseflash01:check_uaks.sh): Notification sent.

(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

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14. Early V1.1 FP3 customers updating to the 9.1.941 HMC level have experienced daily SRCE3325009 alerts after updates related to domain naming issues. Verify that your HMC has a valid hostname and DNS entry. This is documented here. <https://www.ibm.com/support/pages/callhome-src-e3325009-reported-version-9>. The command in a. will fail as the dns attribute is not valid on the HMC level included in V1.1 FP2 or lower. Remove the “:dns” entry in the command line. The command in b. however will work and will show errors if not properly setup.

- a. Command: The following command shows the HMC network settings.

```
appl_ls_hw -r hmc -A M_IP_address | sed 's|'|g' | while read ip;do echo "*** ${ip} ***";ssh -n hscroot@${ip} 'lshmc -n -Fhostname:domain:nameserver:dns:domainsuffix';done
```

V1.1 FP2 or lower (removes the dns attribute from the lshmc command).

```
appl_ls_hw -r hmc -A M_IP_address | sed 's|'|g' | while read ip;do echo "*** ${ip} ***";ssh -n hscroot@${ip} 'lshmc -n -Fhostname:domain:nameserver:domainsuffix';done
```

Example Output:

```
$ appl_ls_hw -r hmc -A M_IP_address | sed 's|'|g' | while read ip;do echo "*** ${ip} ***";ssh -n hscroot@${ip} 'lshmc -n -Fhostname:domain:nameserver:dns:domainsuffix';done
*** 172.23.1.245 ***
dsshmc49:torolab.ibm.com:9.26.32.5,9.26.33.5:enabled:localhost,torolab.ibm.com,canlab.ibm.com
*** 172.23.1.246 ***
dsshmc50:torolab.ibm.com:9.26.32.5,9.26.33.5:enabled:localhost,torolab.ibm.com,canlab.ibm.com
```

- b. Command: The following command will check the ability of each hmc to look its own hostname in DNS.

```
appl_ls_hw -r hmc -A M_IP_address | sed 's|'|g' | while read ip;do echo "*** ${ip} ***";ssh -n hscroot@${ip} 'lshmc -n -Fhostname | while read h;do host $h;done';done
```

Example Output:

```
$ appl_ls_hw -r hmc -A M_IP_address | sed 's|'|g' | while read ip;do echo "*** ${ip} ***";ssh -n hscroot@${ip} 'lshmc -n -Fhostname | while read h;do host $h;done';done
*** 172.23.1.245 ***
dsshmc49.torolab.ibm.com has address 9.26.18.135
*** 172.23.1.246 ***
dsshmc50.torolab.ibm.com has address 9.26.18.136

(0) root @ flashdancehostname01: 7.1.0.0: /
```

Example Output: (In Error)

```
$ appl_ls_hw -r hmc -A M_IP_address | sed 's|'|g' | while read ip;do echo "*** ${ip} ***";ssh -n hscroot@${ip} 'lshmc -n -Fhostname | while read h;do host $h;done';done
*** 172.23.1.245 ***
Host hmc1 not found: 3 (NXDOMAIN)
*** 172.23.1.246 ***
Host hmc2 not found: 3 (NXDOMAIN)
```

Phase 2: Unpacking Db2

This step used to be described in Stage 6. However, it has always been important for both the Management and Core nodes. In V1.1 FP4 Stage 9, Db2 was removed from the management nodes, so if that is skipped, and it is desired to update Db2, then some confusing may occur during Stage 8, extending that outage time.

This phase will unpack Db2 images, create shell scripts to perform the installation from the latest appropriate image, and will create scripts to migrate the instance, migrate the database, and to update the global registries on the standby hosts. If through planning it was decided to not update Db2, then this step isn't necessary. If a different level of Db2 is desired, then the universal fixpack image can be copied into the same directory and can be unpacked.

1. Command: Verify the Db2 Directory as part of this fixpack. This fixpack includes Db2 10.5 and 11.1 Special Builds. The latest available at the time of testing. These are the exact files available for FixCentral. The parens will not change the current directory.

```
(cd /BCU_share/FP9_FP5/software/DB2;ls -l)
```

Example Output:

```
$ (cd /BCU_share/FP9_FP5/software/DB2;ls -l)
total 6659968
lrwxrwxrwx    1 root    system          32 Jul 19 13:01 rspfiles -> ../../fixpack_tools/DB2/rspfiles
lrwxrwxrwx    1 root    system          31 Jul 19 13:01 scripts -> ../../fixpack_tools/DB2/scripts
-r-xr-x---    1 root    system 1360599532 Jun 20 16:02 special_41072_aix64_universal_fixpack.tar.gz
-rwxr-x---    1 root    system  338413324 Feb 02 2022 v10.5fp11_aix64_nlpack.tar.gz
-rw-r--r--    1 root    system 1710882359 Apr 21 18:50 v11.1.4fp7_aix64_universal_fixpack.tar.gz
```


STAGE 1 - Prerequisites

2. Command: Unpack the Db2 images shipped with this fixpack. This utility will unpack the files, create descriptive links for each unpacked directory, and print out the cksums for the files. If new universal fixpacks or special builds are available then the .tar.gz file can be placed in this directory and this tool will process those files as well. If you re-run the prepare command it will not display db2 directories that were previously unpacked.

```
(cd /BCU_share/FP9_FP5/software/DB2;./scripts/prepare_db2.sh)
```

Example Output:

```
$ (cd /BCU_share/FP9_FP5/software/DB2;./scripts/prepare_db2.sh)
Processing package special_41072_aix64_universal_fixpack.tar.gz.
Processing package v10.5fp11_aix64_nlpack.tar.gz.
Processing package v11.1.4fp7_aix64_universal_fixpack.tar.gz.
```

Unpack Report:

Filename	Files	Checksum
special_41072_aix64_universal_fixpack.tar.gz	1148	544853353 1360599532
v10.5fp11_aix64_nlpack.tar.gz	465	2502269405 338413324
v11.1.4fp7_aix64_universal_fixpack.tar.gz	1079	3195925657 1710882359

Link Report:

Version	V String	Link Name	Filename
10.5	10.5.0.11..10	unpack_10.5.0.11..10	special_41072_aix64_universal_fixpack.tar.gz
10.5	10.5.0.11..0	unpack_nlpack_10.5.0.11..0	v10.5fp11_aix64_nlpack.tar.gz
11.1	11.1.4.7..0	unpack_11.1.4.7..0	v11.1.4fp7_aix64_universal_fixpack.tar.gz

3. Command: Verify the unpacked directory. There will be new _unpack folders and unpack_ descriptive links. These links are used by the next command to generate install and other migration scripts.

```
(cd /BCU_share/FP9_FP5/software/DB2;ls -l)
```

Example Output:

```
$ (cd /BCU_share/FP9_FP5/software/DB2;ls -l)
total 6660000
-rw-r--r-- 1 root system 1665 Aug 04 16:52 db2aese_addpart_10.5.0.11..10.rsp
-rw-r--r-- 1 root system 227 Aug 04 16:52 db2aese_addpart_10.5.0.11..10.sh
-rw-r--r-- 1 root system 1663 Aug 04 16:52 db2aese_addpart_11.1.4.7..0.rsp
-rw-r--r-- 1 root system 221 Aug 04 16:52 db2aese_addpart_11.1.4.7..0.sh
drwxr-xr-x 2 root system 256 Aug 04 16:51 log
lrwxrwxrwx 1 root system 32 Jul 19 13:01 rspfiles -> ../../fixpack_tools/DB2/rspfiles
lrwxrwxrwx 1 root system 31 Jul 19 13:01 scripts -> ../../fixpack_tools/DB2/scripts
-r-xr-x-- 1 root system 1360599532 Jun 20 16:02 special_41072_aix64_universal_fixpack.tar.gz
drwxr-xr-x 3 root system 256 Aug 04 16:51 special_41072_aix64_universal_fixpack.tar.gz_unpack
51 Aug 04 16:51 unpack_10.5.0.11..10 -> special_41072_aix64_universal_fixpack.tar.gz_unpack
lrwxrwxrwx 1 root system 48 Aug 04 16:52 unpack_11.1.4.7..0 -> v11.1.4fp7_aix64_universal_fixpack.tar.gz_unpack
lrwxrwxrwx 1 root system 36 Aug 04 16:51 unpack_nlpack_10.5.0.11..0 -> v10.5fp11_aix64_nlpack.tar.gz_unpack
-rwxr-x-- 1 root system 338413324 Feb 02 2022 v10.5fp11_aix64_nlpack.tar.gz
drwxr-xr-x 3 root system 256 Aug 04 16:51 v10.5fp11_aix64_nlpack.tar.gz_unpack
-rw-r--r-- 1 root system 1710882359 Apr 21 18:50 v11.1.4fp7_aix64_universal_fixpack.tar.gz
drwxr-xr-x 3 root system 256 Aug 04 16:51 v11.1.4fp7_aix64_universal_fixpack.tar.gz_unpack
```

STAGE 1 - Prerequisites

4. **Command:** Generate the management and core install scripts and instance migration scripts. This command will run dsh scripts to examine what is installed on the system and which instances are assigned. The Example output below shows that dweadmin and db2psc instances are no longer present. It also shows multiple Db2 installations on the core nodes. This output also shows consistent information for the management and core nodes. The core nodes have Db2 11.1.1.4.5..0 installed and the instance owner (bcuaix) is assigned to that copy. If the Db2 global registries are not consistent or there are more complicated setups then this script may produce incorrect results. If using a more complex environment, contact IBM Support for guidance on how to update Db2.

```
(cd /BCU_share/FP9_FP5/software/DB2;scripts/gen_update_script.sh)
```

Example Output: (When using Db2 10.5 for core database)

```
$ (cd /BCU_share/FP9_FP5/software/DB2;scripts/gen_update_script.sh)
Running db2 collection script on all nodes.
HOSTS -----
reverseflash02
-----
/usr/IBM/dwe/db2/V10.5.0.10..6|10.5|10.5.0.10|10.5.0.10..6|||
/usr/IBM/dwe/db2/V10.5.0.11..2|10.5|10.5.0.11|10.5.0.11..2|bcuaix|bcuaix||

HOSTS -----
reverseflash04, reverseflash05, reverseflash06
-----
/usr/IBM/dwe/db2/V10.5.0.10..6|10.5|10.5.0.10|10.5.0.10..6|||
/usr/IBM/dwe/db2/V10.5.0.11..2|10.5|10.5.0.11|10.5.0.11..2|bcuaix|bcuaix||
/usr/IBM/dwe/db2/V11.1.4.4.a.2|11.1|11.1.4.4|11.1.4.4.a.2|||
/usr/IBM/dwe/db2/V11.1.4.5..0|11.1|11.1.4.5|11.1.4.5..0|||

Preparing management updates.
Preparing core updates.
Looking for fixpacks for vr 10.5 from path /usr/IBM/dwe/db2/V10.5.0.11..2|10.5|10.5.0.11|10.5.0.11..2|bcuaix|bcuaix||.
Comparing unpack_10.5.0.11..2 to unpack_10.5.0.11..10.
VRC=1
Generated instance update script instance_update_bcuaix.sh.
Generated instance registry update script db2greg_update_bcuaix.sh.
Generated management script corefixpack.sh.
```

Example Output: (When using Db2 11.1 for core database)

```
$ (cd /BCU_share/FP9_FP5/software/DB2;scripts/gen_update_script.sh)
Running db2 collection script on all nodes.
HOSTS -----
flashdancehostname02, flashdancehostname04, flashdancehostname05, flashdancehostname06, flashdancehostname07
-----
/usr/IBM/dwe/db2/V10.5.0.5..1|10.5|10.5.0.5|10.5.0.5..5|||
/usr/IBM/dwe/db2/V11.1.4.4.a.2|11.1|11.1.4.4|11.1.4.4.a.2|||
/usr/IBM/dwe/db2/V11.1.4.5..0|11.1|11.1.4.5|11.1.4.5..0|||
/usr/IBM/dwe/db2/V11.1.4.5..4|11.1|11.1.4.5|11.1.4.5..4|bcuaix|bcuaix||

Preparing management updates.
Preparing core updates.
Looking for fixpacks for vr 11.1 from path /usr/IBM/dwe/db2/V11.1.4.5..4|11.1|11.1.4.5|11.1.4.5..4|bcuaix|bcuaix||.
ls: 0653-341 The file unpack_nlpack_11.1* does not exist.
Comparing unpack_11.1.4.5..4 to unpack_11.1.4.7..0.
VRC=1
Generated instance update script instance_update_bcuaix.sh.
Generated instance registry update script db2greg_update_bcuaix.sh.
Generated management script corefixpack.sh.

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

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5. Examine the generated files.

- a. Command: Management installation script. This script will be run on both the management and management standby hosts to update the Db2 copy in the /usr/IBM/dwe/mgmt_db2/V10.5 directory. This is an inplace update. On the management host that is the primary according to db2nodes.cfg for each instance this command will also automatically run db2iupdate to migrate the instance. When applying on V1.1 FP4, this file will not be created if OPM was uninstalled per Stage 9 of that fixpack.

```
(cd /BCU_share/FP9_FP5/software/DB2;cat mgmtfixpack.sh)
```

Example Output: (Example from FP4 application)

```
$ (cd /BCU_share/FP9_FP5/software/DB2;cat mgmtfixpack.sh)

/BCU_share/FP8_FP4/software/DB2/unpack_10.5.0.11..2/universal/installFixPack -n -b /usr/IBM/dwe/mgmt_db2/V10.5 -c
/BCU_share/FP8_FP4/software/DB2/unpack_nlpack_10.5.0.11..0/nlpack -f NOTSAMP -f update -t
/tmp/${hostname}_db2_10.5.0.11..2_${date +%Y%m%d_%H%M%S}.trc -n
```

- b. Command: Core nodes installation script. This script is used to install a new Db2 copy based on the current base copy as specified by the -b option. The -p option indicates the new installed copy using the PDOA and Smart Analytics naming convention. This provides a unique location for all fixpacks and special builds. This script will not be used until Stage08 and is run on all nodes in parallel.

```
(cd /BCU_share/FP9_FP5/software/DB2;cat corefixpack.sh)
```

Example Output: (Shows update for Db2 10.5 example)

```
$ (cd /BCU_share/FP9_FP5/software/DB2;cat corefixpack.sh)
/BCU_share/FP9_FP5/software/DB2/unpack_10.5.0.11..10/universal/installFixPack -n -b /usr/IBM/dwe/db2/V10.5.0.11..2 -p
/usr/IBM/dwe/db2/V10.5.0.11..2 -c /BCU_share/FP9_FP5/software/DB2/unpack_nlpack_10.5.0.11..0/nlpack -f NOTSAMP -f update -t
/tmp/${hostname}_db2_10.5.0.11..10_${date +%Y%m%d_%H%M%S}.trc -n
```

- i. Correct the corefixpack.sh script to use '-F ha_standby_ignore' instead of '-f update'. This will prevent automatic instance migration.
- ii. Command, backup current file.

```
cp /BCU_share/FP9_FP5/software/DB2/corefixpack.sh /BCU_share/FP9_FP5/software/DB2/corefixpack.sh.bak
```

- iii. Command: Replace the '-f update' argument.

```
cat /BCU_share/FP9_FP5/software/DB2/corefixpack.sh.bak | sed 's|-f update|-f ha_standby_ignore|' >
/BCU_share/FP9_FP5/software/DB2/corefixpack.sh
```

- iv. Command: Verify the difference between the backup and updated file.

```
diff /BCU_share/FP9_FP5/software/DB2/corefixpack.sh /BCU_share/FP9_FP5/software/DB2/corefixpack.sh.bak
```

Example Output:

```
$ diff /BCU_share/FP9_FP5/software/DB2/corefixpack.sh /BCU_share/FP9_FP5/software/DB2/corefixpack.sh.bak
1c1
< /BCU_share/FP9_FP5/software/DB2/unpack_11.1.4.7..0/universal/installFixPack -n -b /usr/IBM/dwe/db2/V11.1.4.5..4
-p /usr/IBM/dwe/db2/V11.1.4.7..0 -f NOTSAMP -f ha_standby_ignore -t /tmp/${hostname}_db2_11.1.4.7..0_${date
+%Y%m%d_%H%M%S}.trc -n
---
> /BCU_share/FP9_FP5/software/DB2/unpack_11.1.4.7..0/universal/installFixPack -n -b /usr/IBM/dwe/db2/V11.1.4.5..4
-p /usr/IBM/dwe/db2/V11.1.4.7..0 -f NOTSAMP -f update -t /tmp/${hostname}_db2_11.1.4.7..0_${date
+%Y%m%d_%H%M%S}.trc -n
```

- c. Command: Instance Migration Scripts. There should be only one script generated for most if not all PDOA customers as PDOA does not natively support multiple instances. Note if there are multiple

STAGE 1 - Prerequisites

instances and the instances are supported by different DB2 copies the contents of corefixpack.sh will be indeterminable. Below the core instance owner is shown as the default *bcuaix*. This script is run during Stage08 on the designated admin host (as determined by db2nodes.cfg partition 0) to migrate the instance to the newly installed Db2 copy.

```
(cd /BCU_share/FP9_FP5/software/DB2;ls instance_update*)
(cd /BCU_share/FP9_FP5/software/DB2;cat instance_update*)
```

Example Output:

```
$ (cd /BCU_share/FP9_FP5/software/DB2;ls instance_update*)
instance_update_bcuaix.sh
```

```
$ (cd /BCU_share/FP9_FP5/software/DB2;cat instance_update*)
/usr/IBM/dwe/db2/V10.5.0.11..2/instance/db2iupdt bcuaix
```

- d. Command: Db2 Global Registry correction script. This script is used to update the core standby nodes global registries after the instance is migrated. Db2iupdate is not aware of the standby hosts in PDOA's HA architecture. This script identifies the old entries on the standby nodes, removes the old entry, and adds the correct instance registry entry reflecting the updated Db2 copy.

```
(cd /BCU_share/FP9_FP5/software/DB2;cat db2greg_update_bcuaix.sh)
```

Example Output:

```
$ (cd /BCU_share/FP9_FP5/software/DB2;cat db2greg_update_bcuaix.sh)
pdir=$(/usr/IBM/dwe/db2/V10.5.0.11..2/bin/db2greg -dump | grep '^I,DB2' | cut -d, -f 4,9 | grep bcuaix, | cut -d, -f2)
if [ ! "${pdir}" == "/usr/IBM/dwe/db2/V10.5.0.11..2" ];then echo "Updating registry for instance bcuaix on
$(hostname)";/usr/IBM/dwe/db2/V10.5.0.11..2/bin/db2greg -delinstrec
instancename=bcuaix,installpath=${pdir};/usr/IBM/dwe/db2/V10.5.0.11..2/instance/db2iset -a bcuaix;else echo "Instance is
correctly assigned.";fi
```

Phase 3: Linking Earlier Fixpacks to Latest Fixpack Tools

1. FP3->FP4, FP4->FP5: Customers upgrading from FP3 or FP4 can skip this phase.
2. FP1->FP5: Customers upgrading from FP1. This scenario is not supported using this readme. Contact IBM support for more information on planning a FP1->FP5 scenario.
3. FP2->FP5: Customers upgrading from FP2. These instructions were taken from the V1.1 FP4 readme and updated to use FP9_FP5 tooling, however, this scenario was not tested internally.
 - a. Update the V1.1 FP3 extraction directory to adjust that level to work with 4.0.9.1 Platform Layer and the FP5 fixpack tooling. There are four commands to run.

- i. Command: Link FP9_FP5 tools to FP7_FP3 install path.

```
ln -s /BCU_share/FP9_FP5/fixpack_tools /BCU_share/FP7_FP3/fixpack_tools
```

- ii. Command: Create a new directory structure in the FP7_FP3 path that is compatible with FP9_FP5 tool expectations.

```
mkdir -p /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports/
```

- iii. Command: Create links to allow the FP9_FP5 tools to find the V1.1 FP3 HMC updates.

```
ln -s /BCU_share/FP7_FP3/firmware/hmc/CR7/image/imports/HMC_Recovery_V9R191_1  
/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports/HMC_Recovery_V9R191_1
```

```
ln -s /BCU_share/FP7_FP3/firmware/hmc/CR7/image/imports/HMC_Update_V9R193_SP0_2.iso  
/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports/HMC_Update_V9R1_SP930_2.iso
```

STAGE 2 - Updating Pflayer

Stage 2 Description

Steps/Phases

- Phase 1: Ensuring recent mksysb backups have been taken.
- Phase 2: Prepare management hosts for migration.
- Phase 3: Migrate AIX on the management host.
- Phase 4: Update the platform layer..
- Phase 5: Backup the SAN Switch Configuration

Outage Requirements

- The Management host will be quiesced during the AIX update. Access to /BCU_share and to the Platform Layer will be interrupted during Phase 3. DPM resources can be moved (*failed over*) to the management standby host.

Time Per Step

- Phase 1: mksysb times vary depending on the method used. In the lab this process takes between 30 minutes to an hour for each host when backed up to the /stage filesystem.
- Phase 2: 30 Minutes.
- Phase 3: 6 Hours.
- Phase 4: 10 Minutes.
- Phase 5: 10 Minutes.

Risk Mitigation

- mksysb and alt_disk_install mechanism.
- The mksysb step and the alt_disk step may exercise the internal disks in a way that can reveal errors. Like the system check, do this step early enough to allow time to address any issues with the internal disks on the Power 8 servers.

Backout Options

- Use alt_disk_install to boot off the system prior to the removal steps or mksysb restores.

Phase 1: mkysyb

During this update the internal disk mirror on the management hosts will be removed with updates taking place on one hdisk and a copy of the disk before this update will be started on the other. It is, therefore, recommended to take mkysyb's of both management hosts before beginning Phase 2. This script uses '/stage' as it is accessible to all hosts, is directly accessible by the admin and admin standby hosts, and generally has enough space to hold mkysybs. The one drawback is that NIM does not support GPFS filesystems. Once mkysyb's are taken, it is recommended to copy those outside of the environment.

1. Login to the management node as the root user
2. Command: Verify the screen session is *fprun* by checking the '\$STY' environment variable.

```
$ echo $STY
2097898.fprun
```

3. If the above is blank and not fprun. Then verify that fprun is available and connect to it.
 - a. Command: Check which screen sessions are available.

```
screen -ls
```

Example Output:

```
$ screen -ls
There are screens on:
  2097898.fprun      (Detached)
  2883706.pflayerlog (Detached)
  3342412.fplug     (Detached)
3 Sockets in /tmp/screens/S-root.
```

- b. Command: If there are no screen sessions, or fprun doesn't exist, run the following to create the sessions. Rerun 3.a above to verify the sessions were created.

```
/BCU_share/FP9_FP5/fixpack_tools/application/enable_screensessions.sh
```

- c. Command: Connect to the screen session.

```
screen -dr fprun
```

- d. Recheck the \$STY variable to verify it shows the fprun session.
4. Command: Ensure that the current working directory is correct. By default, the fprun screen session is created so that all sessions use this as the working directory.

```
cd /BCU_share/FP9_FP5/fixpack_tools/application
```

5. The following scripts will run mkysyb to /stage/backups/FP9_FP5/<timestamp>/<hostname> for all hosts. The first script ensures the '/stage' filesystem is mounted on all hosts. The second script runs the mkysyb commands and backs up the /image.data and /bosinst.data files for all hosts.

- a. Command: Ensure all hosts have access to the /stage filesystem which is the target for the mkysybs.

STAGE 2 - Updating Pflayer

```
./enable_stage.sh
```

Example Output: (All hosts show already mounted.)

```
$ ./enable_stage.sh
20210301_123313 (kf5hostname01:enable_stage.sh): Checking for /stage on all hosts.
20210301_123314 (kf5hostname01:enable_stage.sh): Success: The /stage filesystem is mounted on all hosts.
20210301_123314 (kf5hostname01:enable_stage.sh): enable_stage.sh completed with rc=0.
```

Example Output: (One host missing mount and the script successfully mounts /stage.)

```
$ ./enable_stage.sh
20210301_123513 (kf5hostname01:enable_stage.sh): Checking for /stage on all hosts.
20210301_123514 (kf5hostname01:enable_stage.sh): Warning: The following hosts are missing /stage mounts.
kf5hostname02: Warning: Missing /stage mount.
20210301_123514 (kf5hostname01:enable_stage.sh): Attempting to mount /stage on all hosts.
20210301_123515 (kf5hostname01:enable_stage.sh): Checking for /stage on all hosts.
20210301_123516 (kf5hostname01:enable_stage.sh): Success: The /stage filesystem is mounted on all hosts.
20210301_123516 (kf5hostname01:enable_stage.sh): enable_stage.sh completed with rc=0.
```


STAGE 2 - Updating Pflayer

- b. **Command:** Run the script to take mksysbs from the management hosts. When used without arguments this command will take mksysb backups for all hosts. In FP9_FP5 this command now takes a comma separated list of hosts to limit the hosts that are backed up, it takes a BACKUPIFNEEDED argument which will check to see if there are any mksysb backups within the last 90 days (can be overridden by using the environment variable PDOAHISTORYDAYS) that match the current version of the OS within the backup directory on the /stage filesystem. In this case, /stage/backups/FP9_FP5/.

```
./stage02_phase01_mksysb.sh ${BCUMGMT},${BCUMGMTSTDBY} BACKUPIFNEEDED
```

Example Output: (Abridged):

```
$ ./stage02_phase01_mksysb.sh
20210127_153007 (kf5hostname01:stage02_phase01_mksysb.sh): Starting date: Wed Jan 27 15:30:07 -02 2021.
20210127_153007 (kf5hostname01:stage02_phase01_mksysb.sh): Verifying /stage is mounted on all nodes.
20210127_153007 (kf5hostname01:enable_stage.sh): Checking for /stage on all hosts.
20210127_153008 (kf5hostname01:enable_stage.sh): Success: The /stage filesystem is mounted on all hosts.
20210127_153008 (kf5hostname01:enable_stage.sh): enable_stage.sh completed with rc=0.
20210127_153008 (kf5hostname01:stage02_phase01_mksysb.sh): Looking for mkssyb backups in /stage/backups/FP8_FP4/.
find: 0652-010 The starting directory is not valid.
20210127_153008 (kf5hostname01:stage02_phase01_mksysb.sh): Running mksysb on all hosts to
/stage/backups/FP8_FP4/20210127_153008.
...
kf5hostname01:
kf5hostname01: Creating information file (/image.data) for rootvg.
kf5hostname01:
kf5hostname01: Creating list of files to back up.
kf5hostname01: .....
kf5hostname01: Backing up 206775 files.....
kf5hostname01: 77353 of 206775 files (37%).....
kf5hostname01: 179387 of 206775 files (86%).....
kf5hostname01:
kf5hostname01: 206775 of 206775 files (100%)
kf5hostname01: 0512-038 mksysb: Backup Completed Successfully.
```

The output of this script is logged automatically to the following file.

```
/BCU_share/support/FP9_FP5/log/stage02_phase01_mksysb.sh_<hostname>_<timestamp>.log
```

- c. **Command:** Verify mksysbs have been taken. Each host should have three files (bosinst.data, image.data, hostname.mksysb).

```
find /stage/backups/FP9_FP5/ -type f | sort
```

Example Output:

```
$ find /stage/backups/FP9_FP5/ -type f | sort
/stage/backups/FP9_FP5/20211011_150412/reverseflash01/bosinst.data
/stage/backups/FP9_FP5/20211011_150412/reverseflash01/image.data
/stage/backups/FP9_FP5/20211011_150412/reverseflash01/reverseflash01.mksysb
/stage/backups/FP9_FP5/20211011_150412/reverseflash03/bosinst.data
/stage/backups/FP9_FP5/20211011_150412/reverseflash03/image.data
/stage/backups/FP9_FP5/20211011_150412/reverseflash03/reverseflash03.mksysb
```

Phase 2: Prepare Management Hosts for AIX migration.

1. Verify the status of rootvg on the management hosts. The two commands below show that rootvg has two disks and that, except for the sysdump logical volume, all logical volumes are mirrored with 1 LP to 2 PP ratio. All LVs should be syncd and none should indicate that they are 'stale'. If there are 'stale' LVs contact IBM Support for further guidance and do not proceed to further steps until the 'stale' LVs are resolved.

- a. Command: Verify rootvg spans two hdisks and both have PV States as Active.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "lsvg -p rootvg" | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "lsvg -p rootvg" | dshbak -c
HOSTS -----
kf5hostname01
-----
rootvg:
PV_NAME      PV STATE      TOTAL PPs   FREE PPs   FREE DISTRIBUTION
hdisk0       active        532         231        103..00..00..21..107
hdisk1       active        532         338        106..18..01..106..107

HOSTS -----
kf5hostname03
-----
rootvg:
PV_NAME      PV STATE      TOTAL PPs   FREE PPs   FREE DISTRIBUTION
hdisk0       active        532         331        106..26..01..91..107
hdisk1       active        532         338        106..18..01..106..107
```

STAGE 2 - Updating Pflayer

b. Command: Verify all rootvg LVs are syncd.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "lsvg -l rootvg" | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "lsvg -l rootvg" | dshbak -c
HOSTS -----
kf5hostname01
-----
rootvg:
LV NAME          TYPE      LPs    PPs    PVs  LV STATE    MOUNT POINT
hd5              boot      1       2       2  closed/syncd  N/A
hd6              paging    64     128     2  open/syncd    N/A
hd8              jfs2log   1       2       2  open/syncd    N/A
hd4              jfs2      7       14      2  open/syncd    /
hd2              jfs2     20      40      2  open/syncd    /usr
hd9var           jfs2      9      18      2  open/syncd    /var
hd3              jfs2      5      10      2  open/syncd    /tmp
hd1              jfs2     29      58      2  open/syncd    /home
hd10opt          jfs2     29      48      2  open/syncd    /opt
hd11admin        jfs2      1       2       2  open/syncd    /admin
lg_dumplv        sysdump   7       7       1  open/syncd    N/A
livedump         jfs2      1       2       2  open/syncd    /var/adm/ras/livedump
hd7              sysdump   3       6       2  closed/syncd  N/A
fslv00           jfs2     20      40      2  open/syncd    /BCU_fs
fslv01           jfs2     40      80      2  open/syncd    /BCU_share_stage2a
paging00         paging    64     128     2  open/syncd    N/A

HOSTS -----
kf5hostname03
-----
rootvg:
LV NAME          TYPE      LPs    PPs    PVs  LV STATE    MOUNT POINT
hd5              boot      1       2       2  closed/syncd  N/A
hd6              paging    64     128     2  open/syncd    N/A
hd8              jfs2log   1       2       2  open/syncd    N/A
hd4              jfs2      5      10      2  open/syncd    /
hd2              jfs2     20      40      2  open/syncd    /usr
hd9var           jfs2      9      18      2  open/syncd    /var
hd3              jfs2      5      10      2  open/syncd    /tmp
paging00         paging    64     128     2  open/syncd    N/A
hd10opt          jfs2     15      30      2  open/syncd    /opt
hd11admin        jfs2      1       2       2  open/syncd    /admin
lg_dumplv        sysdump   7       7       1  open/syncd    N/A
livedump         jfs2      1       2       2  open/syncd    /var/adm/ras/livedump
hd7              sysdump   3       6       2  closed/syncd  N/A
fslv02           jfs2      5      10      2  open/syncd    /backup
```

STAGE 2 - Updating Pflayer

2. Command: Use the following script to unmirror rootvg on the management host.
stdout is logged to /BCU_share/support/FP9_FP5/log/mirror_utility.sh_<host>_<timestamp>.log
stderr is logged to /BCU_share/support/FP9_FP5/log/mirror_utility.sh_<host>_<timestamp>.log.stderr

```
dsh -s -n ${BCUMGMT} 'cd /BCU_share/FP9_FP5/fixpack_tools;application/mirror_utility.sh -action unmirror'
```

Example Output: (Only from Management Host)

```
reverseflash01: 20220607_170319 (reverseflash01:mirror_utility.sh): Starting date: Tue Jun 7 17:03:19 EDT 2022.
reverseflash01: 20220607170319: (mirror_utility.pl) Retrieving the current boot disk.
reverseflash01: 20220607170319: (mirror_utility.pl) Running command 'getconf -a | grep "^BOOT_DEVICE" | cut -d: -f2'.
reverseflash01: 20220607170319: (mirror_utility.pl) Found boot disk is hdisk1.
reverseflash01: 20220607170319: (mirror_utility.pl) Retrieving disk statistics for volume groups.
reverseflash01: 20220607170320: (mirror_utility.pl) Retrieving Internal Disks.
reverseflash01: 20220607170320: (mirror_utility.pl) Retrieving Free Disks.
reverseflash01: 20220607170321: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk0 -g menu.
reverseflash01: 20220607170321: (mirror_utility.pl) Running cmd lspv -l hdisk0.
reverseflash01: 20220607170321: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk1 -g menu.
reverseflash01: 20220607170321: (mirror_utility.pl) Running cmd lspv -l hdisk1.
reverseflash01: 20220607170321: (mirror_utility.pl) Retrieving lv stats for rootvg.
reverseflash01: 20220607170321: (mirror_utility.pl) Running command lsvg -l rootvg with paging filter.
reverseflash01: 20220607170321: (mirror_utility.pl) Determining rootvg status.
reverseflash01: 20220607170321: (mirror_utility.pl) Attempting to unmirror rootvg.
reverseflash01: 20220607170321: (mirror_utility.pl) Status of rootvg_mirrored, rootvg_bootbalid and rootvg_target_reducedisk are valid.
reverseflash01: 20220607170321: (mirror_utility.pl) Performing unmirror activity.
reverseflash01: 20220607170321: (mirror_utility.pl) Running command 'unmirrorzvg rootvg hdisk0'.
reverseflash01: 20220607170347: (mirror_utility.pl) Returned rc = 0.
reverseflash01: 20220607170347: (mirror_utility.pl) Running command 'chpv -c hdisk0'.
reverseflash01: 20220607170347: (mirror_utility.pl) Returned rc = 0.
reverseflash01: 20220607170347: (mirror_utility.pl) Running command 'bootlist -m normal hdisk1'.
reverseflash01: 20220607170348: (mirror_utility.pl) Retrieving the current boot disk.
reverseflash01: 20220607170348: (mirror_utility.pl) Running command 'getconf -a | grep "^BOOT_DEVICE" | cut -d: -f2'.
reverseflash01: 20220607170348: (mirror_utility.pl) Found boot disk is hdisk1.
reverseflash01: 20220607170348: (mirror_utility.pl) Retrieving disk statistics for volume groups.
reverseflash01: 20220607170348: (mirror_utility.pl) Retrieving Internal Disks.
reverseflash01: 20220607170348: (mirror_utility.pl) Retrieving Free Disks.
reverseflash01: 20220607170348: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk0 -g menu.
reverseflash01: 20220607170348: (mirror_utility.pl) Running cmd lspv -l hdisk0.
reverseflash01: 20220607170348: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk1 -g menu.
reverseflash01: 20220607170348: (mirror_utility.pl) Running cmd lspv -l hdisk1.
reverseflash01: 20220607170348: (mirror_utility.pl) Retrieving lv stats for rootvg.
reverseflash01: 20220607170348: (mirror_utility.pl) Running command lsvg -l rootvg with paging filter.
reverseflash01: 20220607170348: (mirror_utility.pl) Determining rootvg status.
reverseflash01: 20220607170349: (mirror_utility.pl) Attempting to reduce rootvg.
reverseflash01: 20220607170349: (mirror_utility.pl) Verifying target disk hdisk0 contains no logical volumes.
reverseflash01: 20220607170349: (mirror_utility.pl) rootvg is not reduced and is reducible.
reverseflash01: 20220607170349: (mirror_utility.pl) Running cmd 'reducevg rootvg hdisk0'.
reverseflash01: 20220607170350: (mirror_utility.pl) Returned rc = 0.
reverseflash01: 20220607170350: (mirror_utility.pl) Retrieving the current boot disk.
reverseflash01: 20220607170350: (mirror_utility.pl) Running command 'getconf -a | grep "^BOOT_DEVICE" | cut -d: -f2'.
reverseflash01: 20220607170350: (mirror_utility.pl) Found boot disk is hdisk1.
reverseflash01: 20220607170350: (mirror_utility.pl) Retrieving disk statistics for volume groups.
reverseflash01: 20220607170350: (mirror_utility.pl) Retrieving Internal Disks.
reverseflash01: 20220607170350: (mirror_utility.pl) Retrieving Free Disks.
reverseflash01: 20220607170351: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk1 -g menu.
reverseflash01: 20220607170351: (mirror_utility.pl) Running cmd lspv -l hdisk1.
reverseflash01: 20220607170351: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk0 -g menu.
reverseflash01: 20220607170351: (mirror_utility.pl) Running cmd lspv -l hdisk0.
reverseflash01: 20220607170351: (mirror_utility.pl) Retrieving lv stats for rootvg.
reverseflash01: 20220607170351: (mirror_utility.pl) Running command lsvg -l rootvg with paging filter.
reverseflash01: 20220607170351: (mirror_utility.pl) Determining rootvg status.
reverseflash01: 20220607_170351 (reverseflash01:mirror_utility.sh): Script 'application/mirror_utility.sh' with arguments '-action unmirror' ended with rc='0'. Start: Tue Jun 7 17:03:19 EDT 2022 End: Tue Jun 7 17:03:51 EDT 2022. Elapsed Time (Seconds): 32.
reverseflash01: 20220607_170351 (reverseflash01:mirror_utility.sh): Normalizing management hostname.
reverseflash01: 20220607_170352 (reverseflash01:mirror_utility.sh): Management hostname is 'reverseflash01'.
reverseflash01: 20220607_170352 (reverseflash01:mirror_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from script 'application/mirror_utility.sh.' to 'user@us.ibm.com' '-c root@localhost'.
reverseflash01: 20220607_170352 (reverseflash01:mirror_utility.sh): Notification sent.
reverseflash01: 20220607_170352 (reverseflash01:mirror_utility.sh): mirror_utility.sh completed with rc=0.
```

3. Command: Unmirror rootvg on the management standby host.

```
dsh -s -n ${BCUMGMTSTDBY} 'cd /BCU_share/FP9_FP5/fixpack_tools;application/mirror_utility.sh -action unmirror'
```

Example Output:

```
$ dsh -s -n ${BCUMGMTSTDBY} 'cd /BCU_share/FP9_FP5/fixpack_tools;application/mirror_utility.sh -action unmirror'
reverseflash03: 20220305_080505 (reverseflash03:mirror_utility.sh): Starting date: Sat Mar 5 08:05:05 EST 2022.
```

STAGE 2 - Updating Pflayer

```
reverseflash03: 20220305080505: (mirror_utility.pl) Retrieving the current boot disk.
reverseflash03: 20220305080505: (mirror_utility.pl) Running command 'getconf -a | grep "^BOOT_DEVICE" | cut -d: -f2'.
reverseflash03: 20220305080506: (mirror_utility.pl) Found boot disk is hdisk0.
reverseflash03: 20220305080506: (mirror_utility.pl) Retrieving disk statistics for volume groups.
reverseflash03: 20220305080507: (mirror_utility.pl) Retrieving Internal Disks.
reverseflash03: 20220305080507: (mirror_utility.pl) Retrieving Free Disks.
reverseflash03: 20220305080507: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk0 -g menu.
reverseflash03: 20220305080507: (mirror_utility.pl) Running cmd lspv -l hdisk0.
reverseflash03: 20220305080507: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk1 -g menu.
reverseflash03: 20220305080507: (mirror_utility.pl) Running cmd lspv -l hdisk1.
reverseflash03: 20220305080507: (mirror_utility.pl) Retrieving lv stats for rootvg.
reverseflash03: 20220305080508: (mirror_utility.pl) Running command lsvg -l rootvg with paging filter.
reverseflash03: 20220305080508: (mirror_utility.pl) Determining rootvg status.
reverseflash03: 20220305080508: (mirror_utility.pl) Attempting to unmirror rootvg.
reverseflash03: 20220305080508: (mirror_utility.pl) Status of rootvg_mirrored, rootvg_bootbalid and rootvg_target_reducedisk are valid.
reverseflash03: 20220305080508: (mirror_utility.pl) Performing unmirror activity.
reverseflash03: 20220305080508: (mirror_utility.pl) Running command 'unmirrorvg rootvg hdisk1'.
reverseflash03: 20220305080528: (mirror_utility.pl) Returned rc = 0.
reverseflash03: 20220305080528: (mirror_utility.pl) Running command 'chpv -c hdisk1'.
reverseflash03: 20220305080528: (mirror_utility.pl) Returned rc = 0.
reverseflash03: 20220305080528: (mirror_utility.pl) Running command 'bootlist -m normal hdisk0'.
reverseflash03: 20220305080528: (mirror_utility.pl) Retrieving the current boot disk.
reverseflash03: 20220305080528: (mirror_utility.pl) Running command 'getconf -a | grep "^BOOT_DEVICE" | cut -d: -f2'.
reverseflash03: 20220305080528: (mirror_utility.pl) Found boot disk is hdisk0.
reverseflash03: 20220305080529: (mirror_utility.pl) Retrieving disk statistics for volume groups.
reverseflash03: 20220305080529: (mirror_utility.pl) Retrieving Internal Disks.
reverseflash03: 20220305080529: (mirror_utility.pl) Retrieving Free Disks.
reverseflash03: 20220305080529: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk0 -g menu.
reverseflash03: 20220305080529: (mirror_utility.pl) Running cmd lspv -l hdisk0.
reverseflash03: 20220305080529: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk1 -g menu.
reverseflash03: 20220305080529: (mirror_utility.pl) Running cmd lspv -l hdisk1.
reverseflash03: 20220305080529: (mirror_utility.pl) Retrieving lv stats for rootvg.
reverseflash03: 20220305080529: (mirror_utility.pl) Running command lsvg -l rootvg with paging filter.
reverseflash03: 20220305080529: (mirror_utility.pl) Determining rootvg status.
reverseflash03: 20220305080530: (mirror_utility.pl) Attempting to reduce rootvg.
reverseflash03: 20220305080530: (mirror_utility.pl) Verifying target disk hdisk1 contains no logical volumes.
reverseflash03: 20220305080530: (mirror_utility.pl) rootvg is not reduced and is reducible.
reverseflash03: 20220305080530: (mirror_utility.pl) Running cmd 'reducevg rootvg hdisk1'.
reverseflash03: 20220305080531: (mirror_utility.pl) Returned rc = 0.
reverseflash03: 20220305080531: (mirror_utility.pl) Retrieving the current boot disk.
reverseflash03: 20220305080531: (mirror_utility.pl) Running command 'getconf -a | grep "^BOOT_DEVICE" | cut -d: -f2'.
reverseflash03: 20220305080531: (mirror_utility.pl) Found boot disk is hdisk0.
reverseflash03: 20220305080531: (mirror_utility.pl) Retrieving disk statistics for volume groups.
reverseflash03: 20220305080531: (mirror_utility.pl) Retrieving Internal Disks.
reverseflash03: 20220305080531: (mirror_utility.pl) Retrieving Free Disks.
reverseflash03: 20220305080532: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk0 -g menu.
reverseflash03: 20220305080532: (mirror_utility.pl) Running cmd lspv -l hdisk0.
reverseflash03: 20220305080532: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk1 -g menu.
reverseflash03: 20220305080532: (mirror_utility.pl) Running cmd lspv -l hdisk1.
reverseflash03: 20220305080532: (mirror_utility.pl) Retrieving lv stats for rootvg.
reverseflash03: 20220305080532: (mirror_utility.pl) Running command lsvg -l rootvg with paging filter.
reverseflash03: 20220305080532: (mirror_utility.pl) Determining rootvg status.
reverseflash03: 20220305_080532 (reverseflash03:mirror_utility.sh): Starting date: Sat Mar 5 08:05:05 EST 2022 Ending Date: Sat Mar 5 08:05:32 EST 2022.
reverseflash03: 20220305_080532 (reverseflash03:mirror_utility.sh): mirror_utility.sh completed with rc=0.
```

(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP9_FP5/fixpack_tools/application

STAGE 2 - Updating Pflayer

4. Before proceeding with the update, verify that the unmirror operation has completed on both management hosts. The output below shows only one hdisk associated with rootvg and that the LP to PP ratio is now 1 to 1.

- a. Command: Verify only one hdisk is assigned to rootvg.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "lsvg -p rootvg" | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "lsvg -p rootvg" | dshbak -c
HOSTS -----
kf5hostname01
-----
rootvg:
PV_NAME          PV STATE          TOTAL PPs   FREE PPs   FREE DISTRIBUTION
hdisk0            active              532         231         103..00..00..21..107

HOSTS -----
kf5hostname03
-----
rootvg:
PV_NAME          PV STATE          TOTAL PPs   FREE PPs   FREE DISTRIBUTION
hdisk0            active              532         331         106..26..01..91..107
```

- b. Command: Verify all LVs in rootvg are Syncd and have only 1 PV assigned.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "lsvg -l rootvg" | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "lsvg -l rootvg" | dshbak -c
HOSTS -----
kf5hostname01
-----
rootvg:
LV NAME          TYPE      LPs    PPs    PVs  LV STATE    MOUNT POINT
hd5              boot      1      1      1    closed/syncd N/A
hd6              paging    64     64     1    open/syncd  N/A
hd8              jfs2log   1      1      1    open/syncd  N/A
hd4              jfs2      7      7      1    open/syncd  /
hd2              jfs2      20     20     1    open/syncd  /usr
hd9var           jfs2      9      9      1    open/syncd  /var
hd3              jfs2      5      5      1    open/syncd  /tmp
hd1              jfs2      29     29     1    open/syncd  /home
hd10opt          jfs2      29     29     1    open/syncd  /opt
hd11admin        jfs2      1      1      1    open/syncd  /admin
lg_dumplv        sysdump   7      7      1    open/syncd  N/A
livedump         jfs2      1      1      1    open/syncd  /var/adm/ras/livedump
hd7              sysdump   3      3      1    closed/syncd N/A
fslv00           jfs2      20     20     1    open/syncd  /BCU_fs
fslv01           jfs2      40     40     1    open/syncd  /BCU_share_stage2a
paging00         paging    64     64     1    open/syncd  N/A

HOSTS -----
kf5hostname03
-----
rootvg:
LV NAME          TYPE      LPs    PPs    PVs  LV STATE    MOUNT POINT
hd5              boot      1      1      1    closed/syncd N/A
hd6              paging    64     64     1    open/syncd  N/A
hd8              jfs2log   1      1      1    open/syncd  N/A
hd4              jfs2      5      5      1    open/syncd  /
hd2              jfs2      20     20     1    open/syncd  /usr
hd9var           jfs2      9      9      1    open/syncd  /var
hd3              jfs2      5      5      1    open/syncd  /tmp
paging00         paging    64     64     1    open/syncd  N/A
hd10opt          jfs2      15     15     1    open/syncd  /opt
hd11admin        jfs2      1      1      1    open/syncd  /admin
lg_dumplv        sysdump   7      7      1    open/syncd  N/A
livedump         jfs2      1      1      1    open/syncd  /var/adm/ras/livedump
hd7              sysdump   3      3      1    closed/syncd N/A
fslv02           jfs2      5      5      1    open/syncd  /backup
```

STAGE 2 - Updating Pflayer

- c. Command: Verify that there are no clones of rootvg.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "lsvg | grep altinst_rootvg" | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "lsvg | grep altinst_rootvg" | dshbak -c
```

- d. Command: Verify that the management host bootlist contains one hdisk and the management standby contains only one hdisk

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "bootlist -m normal -o" | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "bootlist -m normal -o" | dshbak -c
HOSTS -----
reverseflash01
-----
hdisk1 blv=hd5 pathid=0

HOSTS -----
reverseflash03
-----
hdisk0 blv=hd5 pathid=0
```

5. Command: Backup the NIM Database on the management host to the /stage backup directory.

```
/usr/lpp/bos.sysmgmt/nim/methods/m_backup_db /stage/backups/FP9_FP5/${hostname}_NIMDB_Backup.$(date +%Y%m%d%H%M%S)
```

Example Output:

```
$ /usr/lpp/bos.sysmgmt/nim/methods/m_backup_db /stage/backups/FP9_FP5/${hostname}_NIMDB_Backup.$(date +%Y%m%d%H%M%S)
a ./etc/objrepos/nim_attr 24 blocks.
a ./etc/objrepos/nim_attr.vc 24 blocks.
a ./etc/objrepos/nim_object 8 blocks.
a ./etc/objrepos/nim_object.vc 8 blocks.
a ./etc/NIM.level 1 blocks.
a ./etc/niminfo 1 blocks.
a ./etc/NIM.primary.cpuid 1 blocks.

(0) root @ kf5hostname01: 7.1.0.0: /BCU_share/support/FP8_FP4/log
```

6. Command: Verify the NIM DB was backed up.

```
ls -la /stage/backups/FP9_FP5/${hostname}_NIMDB_Backup.*
```

Example Output:

```
$ ls -la /stage/backups/FP9_FP5/${hostname}_NIMDB_Backup.*
-rw-r--r--  1 root    system      40960 Jan 29 13:14 /stage/backups/FP8_FP4/kf5hostname01_NIMDB_Backup.20210129131410
```

7. Command: Backup sendmail configuration on management. This will be lost as part of the AIX 7.2 migration process.

```
tar -cvf - /etc/mail | gzip > /stage/backups/FP9_FP5/${hostname}_sendmail.tgz
```

Example Output:

```
$ tar -cvf - /etc/mail | gzip > /stage/backups/FP9_FP5/${hostname}_sendmail.tgz
a /etc/mail
a /etc/mail/access 1 blocks.
a /etc/mail/access.db 24 blocks.
a /etc/mail/aliases 3 blocks.
a /etc/mail/aliases.db 24 blocks.
a /etc/mail/domaintable 1 blocks.
```

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```
a /etc/mail/domaintable.db 24 blocks.
a /etc/mail/genericstable 1 blocks.
a /etc/mail/genericstable.db 24 blocks.
a /etc/mail/local-host-names 1 blocks.
a /etc/mail/local-host-names.db 24 blocks.
a /etc/mail/mailertable 1 blocks.
a /etc/mail/mailertable.db 24 blocks.
a /etc/mail/pdoa_sendmail.cf 130 blocks.
a /etc/mail/relay-domains 1 blocks.
a /etc/mail/relay-domains.db 24 blocks.
a /etc/mail/sendmail.cf symbolic link to pdoa_sendmail.cf.
a /etc/mail/sendmail.cf.1532338336 105 blocks.
a /etc/mail/sendmail.cf.1534850632 105 blocks.
a /etc/mail/sendmail.cf.1620158350 105 blocks.
a /etc/mail/sendmail.cf.1620161068 105 blocks.
a /etc/mail/sendmail.cf.abk 105 blocks.
a /etc/mail/sendmail.pid 1 blocks.
a /etc/mail/virtusertable 1 blocks.
a /etc/mail/virtusertable.db 24 blocks.

(0) root @ reverseflash01: 7.1.0.0: /etc/mail
```


Phase 3: Update AIX on the management host.

The AIX update on the management host is an AIX migration from 7.1 to 7.2. This requires bootstrapping a plain or vanilla AIX 7.2 image on the management standby, setting up NIM on that image, and then using nimadm to migrate the management host to AIX 7.2. During this update both management hosts will be at risk of single internal disk failures which is why mksysb backups are collected and placed on the /stage filesystem. Once AIX is migrated on the management host, the management standby will be reverted to its original AIX 7.1 image awaiting its turn for migration in Stage 6.

The migration process is as follows:

- Reduce rootvg on management standby to free one of the internal SAS disks.
- Install a vanilla AIX 7.2 image on management standby on the free disk.
- Boot the management standby on the AIX 7.2 level.
- Create new LUNs on the Foundation V7000 to be used for the nimvg volume group and /pdoa_nimrestore filesystem for the NIM server resources on the management and management standby hosts.
- Configure NIM on the management standby.
- Reduce rootvg on the management host to free one of the internal SAS disks for migration.
- Migrate the management host via nimadm on the management standby to the free disk.
- Boot the management host from the migrated free disk.
- Verify the management host migration is completed.
- Restore the NIM Server configuration on the management host, the sendmail configuration and ha tools logs from backups taken before the migration.
- Use mksysb to backup the management host. In case of disk failure, this should allow faster recovery to a point after migration.
- Boot the management standby host back to it's original AIX 7.1 image.
- Remove the vanilla image on the management standby to free a local hdisk.
- Clone the management standby to protect rootvg until Stage 6.

For customers who are starting at V1.1 FP3, if and when that is supported, Note that AIX 7.1 TL5 SP7 updates the system Perl from 5.10 to 5.28. This update causes FP7_FP3 and all earlier pflayer versions to fail. As part of FP8_FP4 testing the AIX update to the management host was moved to Stage 02 before the update to pflayer. Pflayer 4.0.8.0 and 4.0.9.0 will require AIX 7.1 TL5 SP7 and may not be compatible with higher levels of AIX if those levels include perl updates.

During this stage the management host services will have a small outage while the host is rebooted.

- E-mail alerting for call-home.
- Access to /BCU_share
- Platform Layer appl* commands.
- DPM, if used, can be failed over to the management standby host.

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Phase 3: Step 1: Stop DPM and Management Domain

1. Instructions to remove DPM were provided in V1.1 FP4 readme. Most if not all customers should be able to skip these steps as DPM and the TSA management domain should have been removed. Please note that DPM will not be tested on PDOA V1.1. FP5's validated stack. Skip to the 5th bullet if DPM has been removed.
2. Check DPM State.
 - a. Command: Use hals to check the state and CURRENT location of services.

```
hals -mgmt
```

Example Output: (FP3->FP5, FP2->FP5, FP1->FP5)

```
$ hals -mgmt
MANAGEMENT DOMAIN
=====+=====+=====+=====+=====+=====+=====+
| COMPONENT | PRIMARY | STANDBY | CURRENT | OPSTATE | HA STATUS | RG REQUESTS |
=====+=====+=====+=====+=====+=====+=====+
| DPM       | flashdancehostname01 | flashdancehostname03 | flashdancehostname01 | Online | Normal | - |
| DB2DPM    | flashdancehostname01 | flashdancehostname03 | flashdancehostname01 | Online | Normal | - |
=====+=====+=====+=====+=====+=====+=====+
```

Example Output: (Domain is offline.)

```
$ hals -mgmt
none are available... returning
```

3. FP3->FP5, FP2->FP5, FP1->FP5: Stop DPM and the Management Domain if online.
 - a. Command: Use hastopdpm to stop DPM.

```
hastopdpm
```

Example Output:

```
$ hastopdpm
Stopping DPM and DB2 instance.....Resources offline
MANAGEMENT DOMAIN
=====+=====+=====+=====+=====+=====+=====+
| COMPONENT | PRIMARY | STANDBY | CURRENT | OPSTATE | HA STATUS | RG REQUESTS |
=====+=====+=====+=====+=====+=====+=====+
| DPM       | flashdancehostname01 | N/A | N/A | Offline | Offline | - |
| DB2DPM    | flashdancehostname01 | N/A | N/A | Offline | Offline | - |
=====+=====+=====+=====+=====+=====+=====+
```

- b. Command: use hadomain to stop the management domain. There is no output.
- c. Command: Use hals -mgmt to determine if the management domain is stopped.

```
hals -mgmt
```

Example Output:

```
$ hals -mgmt
none are available... returning
```

- d. Proceed to next item

STAGE 2 - Updating Pflayer

Phase 3: Step 2: Deploy AIX 7.2 Image To Management Standby Node

This step is introduced in V1.1 FP5 to bootstrap AIX 7.2 into the PDOA environment for migration purposes. The management standby will become an AIX 7.2 based NIM server to facilitate the initial migration of AIX 7.2 to the management host. After the management host is migrated to AIX 7.2 the management standby will be reverted to its management standby role and will be properly migrated as part of Stage 6.

The management standby node in this temp role:

- Will only be available on the IAN network.
- Will appear to be down to monitoring utilities.
- Will not participate in LDAP configuration and will have its own limited user/password setup.
- Will not have any additional software installed outside of being NIM server.
- Will be used along with nimadm to migrate the management host to AIX 7.2
- Will not have access to Spectrum Scale filesystems such as /db2home, /dwhome, /stage,/opmfs or /usr/IBM/dwe/appserver_001 and will not participate in any Spectrum Scale clusters.
- Will not participate in any TSA domains, although as of FP4 there is no TSA domain the management hosts.
- Will allow key based authentication in ssh from the root user on the management host.

1. Command: Ensure /BCU_share is mounted on the management standby.

```
./enable_bcushare.sh
```

2. Command: Apply the vanilla AIX 7.2 image to the standby management host.

```
./deploy_aix72_managementstandby.sh -install
```

Example Output:

Click the link or open the included file

[deploy_aix72_managementstandby.sh reverseflash01_20220620_184323.log](#) for the full example output.

```
20220620_184939 (reverseflash01:deploy_aix72_managementstandby.sh): Checking 'reverseflash03mgt' for indications of a
successful alt_disk_mkysyb application with target level '7.2.0.0'.
20220620_184942 (reverseflash01:deploy_aix72_managementstandby.sh): Discovered alternate install variables as:
OSVERSION='7.2.0.0' ALTVG='altinst_rootvg' BOOTABLE='YES'
20220620_184942 (reverseflash01:deploy_aix72_managementstandby.sh): Discovered 'altinst_rootvg' volume group with
version '7.2.0.0' that matches '7.2.0.0'.
20220620_184942 (reverseflash01:deploy_aix72_managementstandby.sh): Install validation succeeded.20220620_184942
(reverseflash01:deploy_aix72_managementstandby.sh): Script './deploy_aix72_managementstandby.sh' with arguments '-
install' ended with rc='0'. Start: Mon Jun 20 18:43:23 EDT 2022 End: Mon Jun 20 18:49:42 EDT 2022. Elapsed Time
(Seconds): 379 (H:M:S):(00:06:19).
```

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3. Command: Verify altinst_rootvg exists on the management standby.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "lsvg | grep altinst_rootvg" | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "lsvg | grep altinst_rootvg" | dshbak -c
HOSTS -----
reverseflash03
-----
altinst_rootvg

(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
$
```

4. Command: Verify the location of the altinst_rootvg.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "lspv | grep altinst_rootvg" | dshbak -c
```

Example Output:

```
(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "lspv | grep altinst_rootvg" | dshbak -c
HOSTS -----
reverseflash03
-----
hdisk1          00fa574e4718478b          altinst_rootvg

(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

5. Command: Verify that the bootlist on the management standby is assigned to the hdisk associated with altinst_rootvg.

```
dsh -n ${BCUMGMTSTDBY} "bootlist -m normal -o" | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMTSTDBY} "bootlist -m normal -o" | dshbak -c
HOSTS -----
reverseflash03
-----
hdisk1 blv=hd5 pathid=0

(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

6. Command: Quiesce the standby management host.

```
dsh -s -n ${BCUMGMTSTDBY} 'cd /BCU_share/FP9_FP5/fixpack_tools/application;./quiesce_node.sh'
```

Example Output:

```
$ dsh -s -n ${BCUMGMTSTDBY} 'cd /BCU_share/FP9_FP5/fixpack_tools/application;./quiesce_node.sh'
reverseflash03: 20220815_223334 (reverseflash03:quiesce_node.sh): Attempting to source ./profile to define BCU* variables.
reverseflash03: 20220815_223334 (reverseflash03:quiesce_node.sh): Starting date: Mon Aug 15 22:33:34 EDT 2022.
reverseflash03: 20220815_223334 (reverseflash03:quiesce_node.sh): Attempting to quiesce host reverseflash03.
reverseflash03: 20220815_223335 (reverseflash03:check_server_state.sh): Starting date: Mon Aug 15 22:33:35 EDT 2022.
reverseflash03: 20220815_223335 (reverseflash03:check_server_state.sh): Service States:
reverseflash03:
reverseflash03:
reverseflash03: 20220815_223335 (reverseflash03:check_server_state.sh): Service States (Number of db2sysc processes
running): 0.
reverseflash03: 20220815_223335 (reverseflash03:check_server_state.sh): Starting date: Mon Aug 15 22:33:35 EDT 2022   Ending
Date: Mon Aug 15 22:33:35 EDT 2022.
reverseflash03: 20220815_223335 (reverseflash03:check_server_state.sh): Starting date: Mon Aug 15 22:33:35 EDT 2022.
reverseflash03: 20220815_223335 (reverseflash03:check_server_state.sh): Domain state: ''.
reverseflash03: 20220815_223335 (reverseflash03:check_server_state.sh): Starting date: Mon Aug 15 22:33:35 EDT 2022   Ending
Date: Mon Aug 15 22:33:35 EDT 2022.
```

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```
reverseflash03: 20220815_223335 (reverseflash03:check_server_state.sh): Starting date: Mon Aug 15 22:33:35 EDT 2022.
reverseflash03: 20220815_223336 (reverseflash03:check_server_state.sh): Domain state: ''.
reverseflash03: 20220815_223336 (reverseflash03:check_server_state.sh): Starting date: Mon Aug 15 22:33:35 EDT 2022   Ending
Date: Mon Aug 15 22:33:36 EDT 2022.
reverseflash03: 20220815_223336 (reverseflash03:check_server_state.sh): Starting date: Mon Aug 15 22:33:36 EDT 2022.
reverseflash03: 20220815_223339 (reverseflash03:check_server_state.sh): GPFS State: 'active'.
reverseflash03: 20220815_223339 (reverseflash03:check_server_state.sh): Starting date: Mon Aug 15 22:33:36 EDT 2022   Ending
Date: Mon Aug 15 22:33:39 EDT 2022.
reverseflash03: 20220815_223341 (reverseflash03:quiesce_node.sh): Unmounting all GPFS Filesystems on this host.
reverseflash03: Mon Aug 15 22:33:41 EDT 2022: 6027-1674 mmumount: Unmounting file systems ...
reverseflash03: 20220815_223348 (reverseflash03:quiesce_node.sh): Stopping GPFS on this host.
reverseflash03: Mon Aug 15 22:33:48 EDT 2022: 6027-1341 mmshutdown: Starting force unmount of GPFS file systems
reverseflash03: Mon Aug 15 22:33:53 EDT 2022: 6027-1344 mmshutdown: Shutting down GPFS daemons
reverseflash03: Shutting down!
reverseflash03: 'shutdown' command about to kill process 3014816
reverseflash03: Mon Aug 15 22:33:59 EDT 2022: 6027-1345 mmshutdown: Finished
reverseflash03: 20220815_223359 (reverseflash03:quiesce_node.sh): Script './quiesce_node.sh' with arguments '' ended with
rc='0'. Start: Mon Aug 15 22:33:34 EDT 2022 End: Mon Aug 15 22:33:59 EDT 2022. Elapsed Time (Seconds): 25
(H:M:S):(00:00:25).
reverseflash03: 20220815_223401 (reverseflash03:quiesce_node.sh): Normalizing management hostname.
reverseflash03: 20220815_223401 (reverseflash03:quiesce_node.sh): Management hostname is 'reverseflash01'.
reverseflash03: 20220815_223401 (reverseflash03:quiesce_node.sh): Sending notification 'Message from PDOA fixpack on
'reverseflash03' from script './quiesce_node.sh' to 'user@company.com' '-c root@localhost' via reverseflash01.
reverseflash03: 20220815_223402 (reverseflash03:quiesce_node.sh): Notification sent.
```

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7. Command: Reboot the management standby host and wait for it to reboot. If the check_connection.sh script times out, either rerun the command changing 'reboot' to 'online', or periodically check to see if the host has booted. If the host does not boot within 30 minutes call support.

```
dsh -n ${BCUMGMTSTDBY} 'echo "shutdown +0 -r" | at now'; ./check_connection.sh ${BCUMGMTSTDBY} reboot both 30 1000
```

Example Output:

```
(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
$ dsh -n ${BCUMGMTSTDBY} 'echo "shutdown +0 -r" | at now'; ./check_connection.sh ${BCUMGMTSTDBY} reboot both 30 1000
reverseflash03: Job root.1649979525c0.a will be run at Thu Apr 14 19:38:45 EDT 2022.
20220414_193909 (reverseflash01:check_connection.sh): Testing 'reverseflash03mgt' using 'ping' targeting a '1' value.
20220414_193909 (reverseflash01:check_connection.sh): timediff: 0 | prc: 0 | trc: 1 | to: 1000
20220414_193909 (reverseflash01:check_connection.sh): Sleeping '30' seconds.
20220414_193939 (reverseflash01:check_connection.sh): timediff: 30 | prc: 0 | trc: 1 | to: 1000
20220414_193939 (reverseflash01:check_connection.sh): Sleeping '30' seconds.
20220414_194019 (reverseflash01:check_connection.sh): timediff: 70 | prc: 1 | trc: 1 | to: 1000
20220414_194019 (reverseflash01:check_connection.sh): Status achieved.
20220414_194019 (reverseflash01:check_connection.sh): Testing 'reverseflash03mgt' using 'ssh' targeting a '1' value.
20220414_194029 (reverseflash01:check_connection.sh): timediff: 10 | prc: 1 | trc: 1 | to: 1000
20220414_194029 (reverseflash01:check_connection.sh): Status achieved.
20220414_194029 (reverseflash01:check_connection.sh): Testing 'reverseflash03mgt' using 'ping' targeting a '0' value.
20220414_194039 (reverseflash01:check_connection.sh): timediff: 10 | prc: 1 | trc: 0 | to: 1000
20220414_194039 (reverseflash01:check_connection.sh): Sleeping '30' seconds.
20220414_194119 (reverseflash01:check_connection.sh): timediff: 50 | prc: 1 | trc: 0 | to: 1000
20220414_194119 (reverseflash01:check_connection.sh): Sleeping '30' seconds.
20220414_194159 (reverseflash01:check_connection.sh): timediff: 90 | prc: 1 | trc: 0 | to: 1000
20220414_194159 (reverseflash01:check_connection.sh): Sleeping '30' seconds.
20220414_194239 (reverseflash01:check_connection.sh): timediff: 130 | prc: 1 | trc: 0 | to: 1000
20220414_194239 (reverseflash01:check_connection.sh): Sleeping '30' seconds.
20220414_194319 (reverseflash01:check_connection.sh): timediff: 170 | prc: 1 | trc: 0 | to: 1000
20220414_194320 (reverseflash01:check_connection.sh): Sleeping '30' seconds.
20220414_194400 (reverseflash01:check_connection.sh): timediff: 211 | prc: 1 | trc: 0 | to: 1000
20220414_194400 (reverseflash01:check_connection.sh): Sleeping '30' seconds.
20220414_194440 (reverseflash01:check_connection.sh): timediff: 251 | prc: 1 | trc: 0 | to: 1000
20220414_194440 (reverseflash01:check_connection.sh): Sleeping '30' seconds.
20220414_194520 (reverseflash01:check_connection.sh): timediff: 291 | prc: 1 | trc: 0 | to: 1000
20220414_194520 (reverseflash01:check_connection.sh): Sleeping '30' seconds.
20220414_194600 (reverseflash01:check_connection.sh): timediff: 331 | prc: 1 | trc: 0 | to: 1000
20220414_194600 (reverseflash01:check_connection.sh): Sleeping '30' seconds.
20220414_194640 (reverseflash01:check_connection.sh): timediff: 371 | prc: 1 | trc: 0 | to: 1000
20220414_194640 (reverseflash01:check_connection.sh): Sleeping '30' seconds.
20220414_194720 (reverseflash01:check_connection.sh): timediff: 411 | prc: 1 | trc: 0 | to: 1000
20220414_194720 (reverseflash01:check_connection.sh): Sleeping '30' seconds.
20220414_194800 (reverseflash01:check_connection.sh): timediff: 451 | prc: 1 | trc: 0 | to: 1000
20220414_194800 (reverseflash01:check_connection.sh): Sleeping '30' seconds.
20220414_194840 (reverseflash01:check_connection.sh): timediff: 491 | prc: 1 | trc: 0 | to: 1000
20220414_194840 (reverseflash01:check_connection.sh): Sleeping '30' seconds.
20220414_194920 (reverseflash01:check_connection.sh): timediff: 531 | prc: 1 | trc: 0 | to: 1000
20220414_194920 (reverseflash01:check_connection.sh): Sleeping '30' seconds.
20220414_195000 (reverseflash01:check_connection.sh): timediff: 571 | prc: 1 | trc: 0 | to: 1000
20220414_195000 (reverseflash01:check_connection.sh): Sleeping '30' seconds.
20220414_195030 (reverseflash01:check_connection.sh): timediff: 601 | prc: 0 | trc: 0 | to: 1000
20220414_195030 (reverseflash01:check_connection.sh): Status achieved.
20220414_195030 (reverseflash01:check_connection.sh): Testing 'reverseflash03mgt' using 'ssh' targeting a '0' value.
20220414_195031 (reverseflash01:check_connection.sh): timediff: 1 | prc: 0 | trc: 0 | to: 1000
20220414_195031 (reverseflash01:check_connection.sh): Status achieved.

(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

8. Command: Verify that the AIX level on the management standby is 7.2.

```
ssh ${BCUMGMTSTDBY} 'oslevel -s'
```

Example Output:

```
$ ssh ${BCUMGMTSTDBY} 'oslevel -s'
7200-05-02-2114
```


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9. Command: Mount /BCU_share on the management standby.

```
./enable_bcushare.sh
```

Example Output:

```
$ ./enable_bcushare.sh
20220329_124850 (reverseflash01:enable_bcushare.sh): Checking for /BCU_share on all hosts.
20220329_124851 (reverseflash01:enable_bcushare.sh): Warning: The following hosts are missing /BCU_share mounts.
reverseflash03: Warning: Missing /BCU_share mount.
20220329_124851 (reverseflash01:enable_bcushare.sh): Attempting to mount /BCU_share on all hosts.
20220329_124852 (reverseflash01:enable_bcushare.sh): Checking for /BCU_share on all hosts.
20220329_124853 (reverseflash01:enable_bcushare.sh): Success: /BCU_share is mounted on all hosts.
20220329_124853 (reverseflash01:enable_bcushare.sh): enable_bcushare.sh completed with rc=0.
```

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Phase 3: Step 3: Create LUNs for NIMVG

During the NIM Migration step that migrates AIX from 7.1 to 7.2 there is a requirement to create a set of cache logical volumes for the host that is migrated. This step runs against the Foundation V7000 and uses some of the currently reserved space to create two LUNs and their host to vdisk mappings, one for the management node and one for the standby node as the volume group (VG) that will house these cached logical volumes. Testing shows that performance of the migration using this VG reduces the time versus using rootvg by over 2 hours from 3.5 hours to 1.5 hours.

1. Command: Create or verify the two NIMVG LUNs (FOUNDATION_MDISKPOOL7_LUN4_600_MGMTNIM, FOUNDATION_MDISKPOOL7_LUN5_600_MGMTSTDBYNIM) are created on the Foundation V7000.

```
./deploy_nim_luns.sh
```

Example Output:

Click the link or open the included file

[PDOA FP9 FP5 Readme References\deploy_nim_luns.sh reverseflash01 20220620 210247.log](#) for the full output. Look for an rc=0 and indications that the /pdoa_nimrestore filesystem was created on both management and management standby nodes.

```
20220620_210347 (reverseflash01:deploy_nim_luns.sh): Checking if '/pdoa_nimrestore' is mounted on 'reverseflash01mgt'.
/dev/fslv03      83886080 83872616 1%      4      1% /pdoa_nimrestore
20220620_210347 (reverseflash01:deploy_nim_luns.sh): The filesystem '/pdoa_nimrestore' is mounted on 'reverseflash01mgt'.
20220620_210347 (reverseflash01:deploy_nim_luns.sh): The NIM Filesystem '/pdoa_nimrestore' was successfully created and mounted
on 'reverseflash01mgt'.
...
20220620_210433 (reverseflash01:deploy_nim_luns.sh): Checking if '/pdoa_nimrestore' is mounted on 'reverseflash03mgt'.
20220620_210433 (reverseflash01:deploy_nim_luns.sh): The filesystem '/pdoa_nimrestore' is not mounted on 'reverseflash03mgt'.
20220620_210433 (reverseflash01:deploy_nim_luns.sh): Attempting to mount '/pdoa_nimrestore' on 'reverseflash03mgt'.
20220620_210434 (reverseflash01:deploy_nim_luns.sh): Checking if '/pdoa_nimrestore' is mounted on 'reverseflash03mgt'.
/dev/fslv00      83886080 83872616 1%      4      1% /pdoa_nimrestore
20220620_210434 (reverseflash01:deploy_nim_luns.sh): The filesystem '/pdoa_nimrestore' is mounted on 'reverseflash03mgt'.
20220620_210434 (reverseflash01:deploy_nim_luns.sh): The NIM Filesystem '/pdoa_nimrestore' was successfully created and mounted
on 'reverseflash03mgt'.
20220620_210434 (reverseflash01:deploy_nim_luns.sh): All operations completed successfully.
20220620_210434 (reverseflash01:deploy_nim_luns.sh): Script './deploy_nim_luns.sh' with arguments '' ended with rc='0'. Start:
Mon Jun 20 21:02:47 EDT 2022 End: Mon Jun 20 21:04:34 EDT 2022. Elapsed Time (Seconds): 107 (H:M:S):(00:01:47). $
```

2. Command: Verify '/pdoa_nimrestore' filesystem was created on both management hosts.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'df -g /pdoa_nimrestore'
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'df -g /pdoa_nimrestore'
reverseflash01: Filesystem      GB blocks      Free %Used      Iused %Iused Mounted on
reverseflash01: /dev/fslv03      40.00      39.99 1%          4      1% /pdoa_nimrestore
reverseflash03: Filesystem      GB blocks      Free %Used      Iused %Iused Mounted on
reverseflash03: /dev/fslv00      40.00      39.99 1%          4      1% /pdoa_nimrestore
```

STAGE 2 - Updating Pflayer

Phase 3: Step 4: Configure the management standby as a NIM Server

1. Command: Configure the nim server, register the AIX 7.2 lpp_source, apply AIX 7.2 TL5 SP4 update to the lpp_source, applypost SP4 filesets and efices to the lpp_source, and generate and update the SPOT on the management standby.

```
ssh -n ${BCUMGMTSTDBY} "cd /BCU_share/FP9_FP5/fixpack_tools/application;./deploy_nim_server.sh ent11 ${BCUMGMT}"
```

Example Output:

Click the link or open the included file

[PDOA FP9 FP5 Readme References\deploy_nim_server.sh reverseflash03 20220912 140154.log](#) for full output. Look for a successful return code, rc=0.

```
20220620_204206 (reverseflash03:deploy_nim_server.sh): Checking fileset levels on nim server.
20220620_204206 (reverseflash03:deploy_nim_server.sh): Checking fileset 'bos.alt_disk_install.rte' for version '7.2.5.101' on
nimserver.
20220620_204206 (reverseflash03:deploy_nim_server.sh): Found versions '7.2.5.101'.
20220620_204206 (reverseflash03:deploy_nim_server.sh): All operations completed successfully.
20220620_204206 (reverseflash03:deploy_nim_server.sh): Script './deploy_nim_server.sh' with arguments 'ent11 reverseflash01mgt'
ended with rc='0'. Start: Mon Jun 20 20:05:17 CDT 2022 End: Mon Jun 20 20:42:06 CDT 2022. Elapsed Time (Seconds): 2209
(H:M:S): (00:36:49).
```

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2. Command: Verify the NIM server is configured with the management server registered as a machine by its hostname + the suffix 'mgt'. The name of the management server standalone resource will vary by environment.

```
ssh ${BCUMGMTSTDBY} 'lsnim'
```

Example Output:

```
$ ssh ${BCUMGMTSTDBY} 'lsnim'
master      machines      master
boot        resources    boot
nim_script  resources    nim_script
certificate resources    certificate
master_net  networks     ent
reverseflash0lmgmt machines    standalone
7200-05-02-2113 resources    lpp_source
7200-05-02-2113_ifixes_bnd resources    installp_bundle
SPOT-7200-05-02-2113 resources    spot
```

STAGE 2 - Updating Pflayer

Phase 3: Step 5: Migrate the management server to AIX 7.2 using nim.

These steps will modify the NIM configuration, users, and groups on the management host. The only backup of the original management host's rootvg volume group will be the mksysb taken.

1. **Command:** Validate that the user smmsp and group smmsp exist on the management host. This user and group are required as part of the sendmail fileset installation. If this user does not exist on the management host the sendmail filesets will fail to install during migration.

```
./sendmail_utility.sh -validate
```

Example Output (Does not exist):

```
./sendmail_utility.sh -validate
20220401_160004 (reverseflash01:sendmail_utility.sh): Starting date: Fri Apr 1 16:00:04 EDT 2022.
20220401_160004 (reverseflash01:sendmail_utility.sh): Arguments: -validate
20220401_160004 (reverseflash01:sendmail_utility.sh): Processing option '-validate'.
20220401_160004 (reverseflash01:sendmail_utility.sh): Running option 'validate'.
20220401_160004 (reverseflash01:sendmail_utility.sh): Verifying the group 'smmsp' exists.
20220401_160004 (reverseflash01:sendmail_utility.sh): Group 'smmsp' does not exist.
20220401_160004 (reverseflash01:sendmail_utility.sh): Verifying the user 'smmsp' exists.
20220401_160004 (reverseflash01:sendmail_utility.sh): User 'smmsp' does not exist.
20220401_160004 (reverseflash01:sendmail_utility.sh): Starting date: Fri Apr 1 16:00:04 EDT 2022 Ending Date: Fri Apr 1
16:00:04 EDT 2022. RC='1'
```

```
(1) root @ reverseflash01: 7.1.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

Example Output: (Exists):

```
./sendmail_utility.sh -validate
20220401_160504 (reverseflash01:sendmail_utility.sh): Starting date: Fri Apr 1 16:05:04 EDT 2022.
20220401_160504 (reverseflash01:sendmail_utility.sh): Arguments: -validate
20220401_160504 (reverseflash01:sendmail_utility.sh): Processing option '-validate'.
20220401_160504 (reverseflash01:sendmail_utility.sh): Running option 'validate'.
20220401_160504 (reverseflash01:sendmail_utility.sh): Verifying the group 'smmsp' exists.
smmsp id=25
20220401_160504 (reverseflash01:sendmail_utility.sh): Group 'smmsp' exists.
20220401_160504 (reverseflash01:sendmail_utility.sh): Verifying the user 'smmsp' exists.
smmsp id=25
20220401_160504 (reverseflash01:sendmail_utility.sh): User 'smmsp' exists.
20220401_160504 (reverseflash01:sendmail_utility.sh): Starting date: Fri Apr 1 16:05:04 EDT 2022 Ending Date: Fri Apr 1
16:05:04 EDT 2022. RC='0'
```

```
(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

2. If the user and group exist, then skip to the next step. If the user and/or group do not exist, then determine how to create users and groups on your system. The next steps will use 'mkuser' and 'mkgroup' to create the user 'smmsp' and group 'smmsp' with the default ids of 25 for both. These defaults can be overridden using '-gid' and '-uid' options as shown in 'b'. Use any of the options below to create this user and group on the management host, or follow in house procedures to create this user and group.

- a. **Command:** To create the smmsp user and group using the fixpack scripting using the default ids.

```
./sendmail_utility.sh -create
```

Example Output:

```
./sendmail_utility.sh -create
20220401_160456 (reverseflash01:sendmail_utility.sh): Starting date: Fri Apr 1 16:04:56 EDT 2022.
20220401_160456 (reverseflash01:sendmail_utility.sh): Arguments: -create
20220401_160456 (reverseflash01:sendmail_utility.sh): Processing option '-create'.
20220401_160456 (reverseflash01:sendmail_utility.sh): Running option 'create'.
20220401_160456 (reverseflash01:sendmail_utility.sh): Verifying the group 'smmsp' exists.
20220401_160456 (reverseflash01:sendmail_utility.sh): Group 'smmsp' does not exist.
20220401_160456 (reverseflash01:sendmail_utility.sh): Verifying the user 'smmsp' exists.
20220401_160456 (reverseflash01:sendmail_utility.sh): User 'smmsp' does not exist.
```

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```
20220401_160456 (reverseflash01:sendmail_utility.sh): Verifying the group 'smmsp' exists.
20220401_160456 (reverseflash01:sendmail_utility.sh): Group 'smmsp' does not exist.
20220401_160456 (reverseflash01:sendmail_utility.sh): Creating group 'smmsp'.
20220401_160458 (reverseflash01:sendmail_utility.sh): Verifying the user 'smmsp' exists.
20220401_160458 (reverseflash01:sendmail_utility.sh): User 'smmsp' does not exist.
20220401_160458 (reverseflash01:sendmail_utility.sh): Creating user 'smmsp'.
20220401_160458 (reverseflash01:sendmail_utility.sh): Verifying the group 'smmsp' exists.
smmsp id=25
20220401_160458 (reverseflash01:sendmail_utility.sh): Group 'smmsp' exists.
20220401_160458 (reverseflash01:sendmail_utility.sh): Verifying the user 'smmsp' exists.
smmsp id=25
20220401_160459 (reverseflash01:sendmail_utility.sh): User 'smmsp' exists.
20220401_160459 (reverseflash01:sendmail_utility.sh): Starting date: Fri Apr 1 16:04:56 EDT 2022 Ending Date: Fri Apr 1
16:04:59 EDT 2022. RC='0'

(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

b. Command: To create a user and group using user id 1300 and group id 1301.

```
$ ./sendmail_utility.sh -create -gid 1301 -uid 1300
```

Example Output:

```
$ ./sendmail_utility.sh -create -gid 1301 -uid 1300
20220401_161258 (reverseflash01:sendmail_utility.sh): Starting date: Fri Apr 1 16:12:58 EDT 2022.
20220401_161258 (reverseflash01:sendmail_utility.sh): Arguments: -create
20220401_161258 (reverseflash01:sendmail_utility.sh): Processing option '-create'.
20220401_161258 (reverseflash01:sendmail_utility.sh): Processing option '-gid'.
20220401_161258 (reverseflash01:sendmail_utility.sh): Processing option '1301'.
20220401_161258 (reverseflash01:sendmail_utility.sh): Processing argument '1301' to '-gid'.
20220401_161258 (reverseflash01:sendmail_utility.sh): Processing option '-uid'.
20220401_161258 (reverseflash01:sendmail_utility.sh): Processing option '1300'.
20220401_161258 (reverseflash01:sendmail_utility.sh): Processing argument '1300' to '-uid'.
20220401_161258 (reverseflash01:sendmail_utility.sh): Running option 'create'.
20220401_161258 (reverseflash01:sendmail_utility.sh): Verifying the group 'smmsp' exists.
20220401_161258 (reverseflash01:sendmail_utility.sh): Group 'smmsp' does not exist.
20220401_161258 (reverseflash01:sendmail_utility.sh): Verifying the user 'smmsp' exists.
20220401_161258 (reverseflash01:sendmail_utility.sh): User 'smmsp' does not exist.
20220401_161258 (reverseflash01:sendmail_utility.sh): Verifying the group 'smmsp' exists.
20220401_161258 (reverseflash01:sendmail_utility.sh): Group 'smmsp' does not exist.
20220401_161258 (reverseflash01:sendmail_utility.sh): Creating group 'smmsp'.
20220401_161258 (reverseflash01:sendmail_utility.sh): Verifying the user 'smmsp' exists.
20220401_161258 (reverseflash01:sendmail_utility.sh): User 'smmsp' does not exist.
20220401_161258 (reverseflash01:sendmail_utility.sh): Creating user 'smmsp'.
20220401_161259 (reverseflash01:sendmail_utility.sh): Verifying the group 'smmsp' exists.
smmsp id=1301
20220401_161259 (reverseflash01:sendmail_utility.sh): Group 'smmsp' exists.
20220401_161259 (reverseflash01:sendmail_utility.sh): Verifying the user 'smmsp' exists.
smmsp id=1300
20220401_161259 (reverseflash01:sendmail_utility.sh): User 'smmsp' exists.
20220401_161259 (reverseflash01:sendmail_utility.sh): Starting date: Fri Apr 1 16:12:58 EDT 2022 Ending Date: Fri Apr 1
16:12:59 EDT 2022. RC='0'

(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

c. Command: Run the sendmail validation again to verify the ids are created.

```
./sendmail_utility.sh -validate
```

3. Command: Configure the management server as a NIM client.

```
./deploy_nimclient_management.sh
```

Expected Output:

Click the link or open the included file

[PDOA FP9 FP5 Readme References\deploy_nimclient_management.sh_reverseflash01_20220621_170934.log](#) for full output. Look for a successful return code, rc=0.

```
20220621_171030 (reverseflash01:deploy_nimclient_management.sh): Found NIM_NAME, NIM_HOSTNAME and NIM_MASTER_HOSTNAME defined
with expected values.
```

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```
20220621_171030 (reverseflash01:deploy_nimclient_management.sh): NIM client successfully configured.
20220621_171030 (reverseflash01:deploy_nimclient_management.sh): Successfully configured the management server as a NIM client.
20220621_171030 (reverseflash01:deploy_nimclient_management.sh): Script './deploy_nimclient_management.sh' with arguments ''
ended with rc='0'. Start: Tue Jun 21 17:09:34 EDT 2022 End: Tue Jun 21 17:10:30 EDT 2022. Elapsed Time (Seconds): 56
(H:M:S):(00:00:56).
```

4. Command: Migrate management host to AIX 7.2 on free hdisk. This command will take approximately 90 minutes when using NIMVG and 3.5 hours when using rootvg for the caching VG.. This will migrate the management host to AIX 7.2 SP3, including some fileset updates and efices that were applied to the lpp_source.

```
./migrate_aix72.sh -migrate -server ${BCUMGMT} -nimserver ${BCUMGMTSTDBY}
```

Example Output:

Click the link or open the included file

[PDOA FP9 FP5 Readme References\migrate aix72.sh reverseflash01 20220912 162456.log](#) for full output. Look for a successful return code, rc=0. Also, see the file [PDOA FP9 FP5 Readme References\migrate aix72.sh reverseflash01 20220912 162456.log.stderr](#) for nimadm migration output.

```
20220621_171104 (reverseflash01:migrate_aix72.sh): Migrating target 'reverseflash01mgt' via 'reverseflash03mgt' using command
'nimadm -c reverseflash01mgt -s SPOT-7200-05-02-2113 -l 7200-05-02-2113 -Y -d hdisk0 -j nimvg -b 7200-05-02-2113_ifixes_bnd'.
Output can be found in /BCU_share/support/FP9_FP5/log/migrate_aix72.sh_reverseflash01_20220621_171050.log.stderr.
20220621_184455 (reverseflash01:migrate_aix72.sh): the CMD: 'nimadm -c reverseflash01mgt -s SPOT-7200-05-02-2113 -l 7200-05-02-
2113 -Y -d hdisk0 -j nimvg -b 7200-05-02-2113_ifixes_bnd' completed with rc='0'.
20220621_184455 (reverseflash01:migrate_aix72.sh): Checking 'reverseflash01mgt' for indications of a successful alt_disk_mksysb
application with target level '7.2.0.0'.
20220621_184458 (reverseflash01:migrate_aix72.sh): Discovered alternate install variables as: OSVERSION='7.2.0.0'
ALTVG='altinst_rootvg' BOOTABLE='YES'
20220621_184458 (reverseflash01:migrate_aix72.sh): Discovered 'altinst_rootvg' volume group with version '7.2.0.0' that matches
'7.2.0.0'.
20220621_184458 (reverseflash01:migrate_aix72.sh): Install validation succeeded.
20220621_184458 (reverseflash01:migrate_aix72.sh): Successfully completed.
20220621_184458 (reverseflash01:migrate_aix72.sh): Script './migrate_aix72.sh' with arguments '-migrate -server reverseflash01mgt
-nimserver reverseflash03mgt' ended with rc='0'. Start: Tue Jun 21 17:10:50 EDT 2022 End: Tue Jun 21 18:44:58 EDT 2022. Elapsed
Time (Seconds): 5648 (H:M:S):(01:34:08).
```

5. Command: Verify hdisk assigned to altinst_rootvg

```
lsnv | grep altinst_rootvg
```

Example Output:

```
$ lsnv | grep altinst_rootvg
hdisk0          00fa574d3debf33a          altinst_rootvg
```

6. Command: Verify altinst_rootvg hdisk is first in the bootlist. It is likely the only disk in the bootlist due to the way the nim migration command works.

```
bootlist -m normal -o
```

Example Output:

```
$ bootlist -m normal -o
hdisk0 blv=hd5 pathid=0
```

7. Command: Reboot the management host into the migrated AIX 7.2 hdisk. The following script will verify that the management host is ready to be rebooted, will quiesce (stop TSA, unmount GPFS filesystems, stop GPFS) the management host, and will issue a reboot command and exit. Now is a good time to

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verify that you have access to the hscroot user on either of the two HMCs, know the root password on the management host, and know how to use vtmenu to access the management LPAR's console in case the system does not boot. The first reboot after migration takes longer (~15 minutes) than subsequent reboots.

```
./migrate_aix72.sh -reboot NOFORCE -server ${BCUMGMT} -nimserver ${BCUMGMTSTDBY}
```

Example Output:

```
$ ./migrate_aix72.sh -reboot NOFORCE -server ${BCUMGMT} -nimserver ${BCUMGMTSTDBY}
20220406_205812 (reverseflash01:migrate_aix72.sh): Starting date: Wed Apr 6 20:58:12 EDT 2022.
20220406_205812 (reverseflash01:migrate_aix72.sh): Arguments '-reboot
20220406_205812 (reverseflash01:migrate_aix72.sh): Setting operation to validate.
20220406_205812 (reverseflash01:migrate_aix72.sh): Processing server.
20220406_205812 (reverseflash01:migrate_aix72.sh): Setting targetserver to 'reverseflash01mgt'.
20220406_205812 (reverseflash01:migrate_aix72.sh): Processing nimserver.
20220406_205812 (reverseflash01:migrate_aix72.sh): Setting nimserver to 'reverseflash03mgt'.
20220406_205812 (reverseflash01:migrate_aix72.sh): Rebooting LPAR.
20220406_205812 (reverseflash01:migrate_aix72.sh): Verify 'reverseflash01mgt' oslevel.
20220406_205812 (reverseflash01:migrate_aix72.sh): Running 'ssh -n reverseflash01mgt oslevel'.
7.1.0.0
20220406_205813 (reverseflash01:migrate_aix72.sh): 'ssh -n reverseflash01mgt oslevel' returned rc='0'.
20220406_205813 (reverseflash01:migrate_aix72.sh): Server 'reverseflash01mgt' is '7.1.0.0'.
20220406_205813 (reverseflash01:migrate_aix72.sh): Server 'reverseflash01mgt' matches target oslevel.
20220406_205813 (reverseflash01:migrate_aix72.sh): Server 'reverseflash01mgt' is not migrated.
20220406_205813 (reverseflash01:migrate_aix72.sh): Checking 'reverseflash01mgt' for indications of a successful alt_disk_mksysb
application with target level '7.2.0.0'.
20220406_205816 (reverseflash01:migrate_aix72.sh): Discovered alternate install variables as: OSVERSION='7.2.0.0'
ALTVG='altinst_rootvg' BOOTABLE='YES'
20220406_205816 (reverseflash01:migrate_aix72.sh): Discovered 'altinst_rootvg' volume group with version '7.2.0.0' that matches
'7.2.0.0'.
20220406_205817 (reverseflash01:quiesce_node.sh): Starting date: Wed Apr 6 20:58:17 EDT 2022.
20220406_205817 (reverseflash01:quiesce_node.sh): Attempting to quiesce host reverseflash01.
20220406_205817 (reverseflash01:check_server_state.sh): Starting date: Wed Apr 6 20:58:17 EDT 2022.
20220406_205817 (reverseflash01:check_server_state.sh): Service States:

20220406_205817 (reverseflash01:check_server_state.sh): Starting date: Wed Apr 6 20:58:17 EDT 2022 Ending Date: Wed Apr 6
20:58:17 EDT 2022.
20220406_205818 (reverseflash01:check_server_state.sh): Starting date: Wed Apr 6 20:58:18 EDT 2022.
20220406_205818 (reverseflash01:check_server_state.sh): Domain state: ''.
20220406_205818 (reverseflash01:check_server_state.sh): Starting date: Wed Apr 6 20:58:18 EDT 2022 Ending Date: Wed Apr 6
20:58:18 EDT 2022.
20220406_205818 (reverseflash01:check_server_state.sh): Starting date: Wed Apr 6 20:58:18 EDT 2022.
20220406_205818 (reverseflash01:check_server_state.sh): Domain state: ''.
20220406_205818 (reverseflash01:check_server_state.sh): Starting date: Wed Apr 6 20:58:18 EDT 2022 Ending Date: Wed Apr 6
20:58:18 EDT 2022.
20220406_205818 (reverseflash01:check_server_state.sh): Starting date: Wed Apr 6 20:58:18 EDT 2022.
20220406_205820 (reverseflash01:check_server_state.sh): GPFS State: 'active'.
20220406_205820 (reverseflash01:check_server_state.sh): Starting date: Wed Apr 6 20:58:18 EDT 2022 Ending Date: Wed Apr 6
20:58:20 EDT 2022.
20220406_205822 (reverseflash01:quiesce_node.sh): Unmounting all GPFS Filesystems on this host.
Wed Apr 6 20:58:22 EDT 2022: 6027-1674 mmumount: Unmounting file systems ...
20220406_205826 (reverseflash01:quiesce_node.sh): Stopping GPFS on this host.
Wed Apr 6 20:58:27 EDT 2022: 6027-1341 mmshutdown: Starting force unmount of GPFS file systems
Wed Apr 6 20:58:32 EDT 2022: 6027-1344 mmshutdown: Shutting down GPFS daemons
Shutting down!
'shutdown' command about to kill process 3670490
Master did not clean up; attempting cleanup now
2022-04-06 20:59:32.636-0400: GPFS: 6027-311 [N] mmfsd is shutting down.
2022-04-06 20:59:32.637-0400: [N] Reason for shutdown: mmfsadm shutdown command timed out
Wed Apr 6 20:59:33 EDT 2022: mmcommon mmfsdown invoked. Subsystem: mmfs Status: down
Wed Apr 6 20:59:33 EDT 2022: 6027-1674 mmcommon: Unmounting file systems ...
Wed Apr 6 20:59:37 EDT 2022: 6027-1345 mmshutdown: Finished
20220406_205937 (reverseflash01:quiesce_node.sh): Starting date: Wed Apr 6 20:58:17 EDT 2022 Ending Date: Wed Apr 6 20:59:37
EDT 2022.
20220406_205938 (reverseflash01:check_server_state.sh): Starting date: Wed Apr 6 20:59:38 EDT 2022.
20220406_205940 (reverseflash01:check_server_state.sh): GPFS State: 'down'.
20220406_205940 (reverseflash01:check_server_state.sh): Domain state: ''.
20220406_205941 (reverseflash01:check_server_state.sh): Service States:

20220406_205941 (reverseflash01:check_server_state.sh): Starting date: Wed Apr 6 20:59:38 EDT 2022 Ending Date: Wed Apr 6
20:59:41 EDT 2022.
20220406_205941 (reverseflash01:migrate_aix72.sh): Sending reboot signal 'echo "shutdown +0 -r" | at now' to server
'reverseflash01mgt'.
20220406_205941 (reverseflash01:migrate_aix72.sh): Rebooting management 'reverseflash01mgt' host.
20220406_205941 (reverseflash01:migrate_aix72.sh): Exiting script in anticipation of shutdown.
20220406_205941 (reverseflash01:migrate_aix72.sh): Starting date: Wed Apr 6 20:58:12 EDT 2022 Ending Date: Wed Apr 6 20:59:41
EDT 2022. RC=0
```


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Example Output: The script may have the following final output if it doesn't exit. It will show the error: "Error: Unable to validate reboot as oslevel is '7.1.0.0'". This error can be ignored and the server will eventually reboot into the migrated AIX 7.2 level.

```
20221005_022829 (flashdancehostname01:migrate_aix72.sh): Exiting script in anticipation of shutdown.
20221005_022829 (flashdancehostname01:migrate_aix72.sh): Validating reboot into AIX 7.2.
20221005_022829 (flashdancehostname01:migrate_aix72.sh): Testing 'flashdancehostname01mgt' using 'ssh' targeting a '0' value.
20221005_022830 (flashdancehostname01:migrate_aix72.sh): ip: flashdancehostname01mgt | op: ssh | timediff: 1 | prc: 0 | trc: 0 |
to: 600
20221005_022830 (flashdancehostname01:migrate_aix72.sh): 'flashdancehostname01mgt' Status achieved.
20221005_022831 (flashdancehostname01:migrate_aix72.sh): Error: Unable to validate reboot as oslevel is '7.1.0.0'.
20221005_022831 (flashdancehostname01:migrate_aix72.sh): An error occurred while validating AIX 7.2 after reboot.
20221005_022831 (flashdancehostname01:migrate_aix72.sh): Script './migrate_aix72.sh' with arguments '-reboot NOFORCE -server
flashdancehostname01mgt -nimserver flashdancehostname03mgt' ended with rc='1'. Start: Wed Oct 5 02:27:58 IST 2022 End: Wed Oct
5 02:28:31 IST 2022. Elapsed Time (Seconds): 33 (H:M:S):(00:00:33).
20221005_022831 (flashdancehostname01:migrate_aix72.sh): Normalizing management hostname.
20221005_022832 (flashdancehostname01:migrate_aix72.sh): Management hostname is 'flashdancehostname01'.
20221005_022832 (flashdancehostname01:migrate_aix72.sh): Sending notification 'Message from PDOA fixpack on
'flashdancehostname01' from script './migrate_aix72.sh' to 'user@company.com' '-c root@localhost'.
20221005_022832 (flashdancehostname01:migrate_aix72.sh): Notification sent.
```

```
Broadcast message from root@flashdancehostname01 (tty) at 02:28:32 ...
```

```
shutdown: PLEASE LOG OFF NOW !!!
System maintenance is in progress.
All processes will be killed now.
```

```
Broadcast message from root@flashdancehostname01 (tty) at 02:28:32 ...
```

```
shutdown: THE SYSTEM IS BEING SHUT DOWN NOW
```

8. After the management server restarts. Login to the management host as root.
9. Command: Restart the screen sessions. This will start three screen sessions (fprun, fplog, and fppflayerlog).

```
/BCU_share/FP9_FP5/fixpack_tools/application/enable_screensessions.sh
```

10. Command: Connect to the fprun screen session. By default the working directory will be '/BCU_share/FP9_FP5/fixpack_tools/application'.

```
screen -r fprun
```

11. Verify the oslevel.

```
oslevel -s
```

Expected Output:

```
$ oslevel -s
7200-05-04-2220
```

12. Command: Verify Java, OpenSSL and OpenSSH updates are applied.

```
ls1pp -l Java7.sdk Java7_64.sdk Java8.sdk Java8_64.sdk openssl.base openssl.base.server
```

Example Output:

```
$ ls1pp -l Java7.sdk Java7_64.sdk Java8.sdk Java8_64.sdk openssl.base openssl.base.server
Fileset              Level State      Description
-----
Path: /usr/lib/objrepos
Java7.sdk             7.0.0.710 COMMITTED  Java SDK 32-bit Development
```

STAGE 2 - Updating Pflayer

```

Java7_64.sdk          7.0.0.710  COMMITTED  Kit
                    Java SDK 64-bit Development
Java8.sdk              8.0.0.710  COMMITTED  Kit
                    Java SDK 32-bit Development
Java8_64.sdk          8.0.0.710  COMMITTED  Kit
                    Java SDK 64-bit Development
openssh.base.server   8.1.102.2105 COMMITTED  Open Secure Shell Server
openssl.base          1.0.2.2104 COMMITTED  Open Secure Socket Layer

Path: /etc/objrepos
openssh.base.server   8.1.102.2105 COMMITTED  Open Secure Shell Server
openssl.base          1.0.2.2104 COMMITTED  Open Secure Socket Layer

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

13. Command: Verify that the two efices are applied. If the efix IJ29552s7b is present their may be three efices instead of two. To safely remove this efix see Appendix – Safely removing IJ29552s7b efix after migration.

```
emgr -l
```

Example Output:

```
$ emgr -l

ID  STATE LABEL          INSTALL TIME          UPDATED BY ABSTRACT
===  =====
1   S    IJ40615m4b 08/16/22 09:31:39    IJ40615 for AIX 7.2 TL5 SP2 SP4
2   S    IJ39876s3a 08/16/22 09:31:52    IJ39876 POTENTIAL SECURITY ISSUE

STATE codes:
S = STABLE
M = MOUNTED
U = UNMOUNTED
Q = REBOOT REQUIRED
B = BROKEN
I = INSTALLING
R = REMOVING
T = TESTED
P = PATCHED
N = NOT PATCHED
SP = STABLE + PATCHED
SN = STABLE + NOT PATCHED
QP = BOOT IMAGE MODIFIED + PATCHED
QN = BOOT IMAGE MODIFIED + NOT PATCHED
RQ = REMOVING + REBOOT REQUIRED
```

Example Output: (Shows IJ29552s7b efix was not removed.)

```
$ emgr -l

ID  STATE LABEL          INSTALL TIME          UPDATED BY ABSTRACT
===  =====
1   S    IJ29552s7b 05/24/21 14:53:08    IJ29552 LOAD MODULE AUTH ISSUES
2   S    IJ40615m4b 09/19/22 19:46:34    IJ40615 for AIX 7.2 TL5 SP2 SP4
3   S    IJ39876s3a 09/19/22 19:46:49    IJ39876 POTENTIAL SECURITY ISSUE

STATE codes:
S = STABLE
M = MOUNTED
U = UNMOUNTED
Q = REBOOT REQUIRED
B = BROKEN
I = INSTALLING
R = REMOVING
T = TESTED
P = PATCHED
N = NOT PATCHED
SP = STABLE + PATCHED
SN = STABLE + NOT PATCHED
QP = BOOT IMAGE MODIFIED + PATCHED
QN = BOOT IMAGE MODIFIED + NOT PATCHED
RQ = REMOVING + REBOOT REQUIRED
```

14. Command: Verify Spectrum Scale (GPFS) has started, and it has mounted GPFS filesystems. If the state is ‘arbitrating’ rerun the mmgetstate command until it has started. If it does not start open a case with IBM Support or update the case related to the current fixpack to alert IBM Support to the problem.

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```
/usr/lpp/mmfs/bin/mmgetstate
```

Expected Output:

```
$ /usr/lpp/mmfs/bin/mmgetstate
```

Node number	Node name	GPFS state
1	reverseflash01	active

STAGE 2 - Updating Pflayer

Phase 3: Step 6: Restore Management Server NIM and Sendmail Functions

1. The file `reconfig_management_server.sh` was determine to have an error. Use the following commands to correct the error.

- a. Command: Backup the file.

```
cp reconfig_management_server.sh reconfig_management_server.sh.bak
```

- b. Command: Update the file to correct source the `nim_include.script`

```
cat reconfig_management_server.sh.bak | sed 's|\. nim_include.script|. /nim_include.script|' > reconfig_management_server.sh
```

- c. Command: Verify the update.

```
grep nim_include.script reconfig_management_server.sh
```

Example Output:

```
$ grep nim_include.script reconfig_management_server.sh
if [ -f nim_include.script ]
. ./nim_include.script
log "Unable to load the nim_include.script."
```

2. Command: In the `fprun` screen session. Restore management Server NIM Configuration, sendmail configuration, and ha tools logs

```
./reconfig_management_server.sh
```

Example Output:

Click the link or open the included file

[reconfig_management_server.sh reverseflash01_20220829_165223.log](#) for full example output. Look for a successful return code, `rc=0`.

```
20220608_144603 (reverseflash01:reconfig_management_server.sh): The NIM command is running without errors and all non managmeent LPARs are registered.
20220608_144603 (reverseflash01:reconfig_management_server.sh): All operations completed successfully.
20220608_144603 (reverseflash01:reconfig_management_server.sh): Script './reconfig_management_server.sh' with arguments '' ended with rc='0'. Start: Wed Jun 8 14:43:10 EDT 2022 End: Wed Jun 8 14:46:03 EDT 2022. Elapsed Time (Seconds): 173.
```

Example Output: (An error occurs due to a script issue. Use the commands it the first item to fix the file.)

```
$ ./reconfig_management_server.sh
./reconfig_management_server.sh[28]: nim_include.script: not found.
```

3. Command: Update the management NIM Server to prepare for migration of the rest of the hosts. This command registers the AIX 7.2 TL5 SP2 `lpp_source`, updates that `lpp_source` to AIX 7.2 TL5 SP3, applies the OpenSSL, OpenSSH and Java fileset updates, creates an `efix` bundle in the `lpp_source`, and generates the SPOT resource which will be used to migrate the management standby in stage 6 and the rest of the core nodes in stage 7.

```
./deploy_nim_server.sh ent11 NA
```

Example Output:

Click the link or open the included file [deploy_nim_server.sh reverseflash01_20220829_165911.log](#) for full output. Look for a successful return code, `rc=0`.

STAGE 2 - Updating Pflayer

```
20220608_153412 (reverseflash01:deploy_nim_server.sh): All operations completed successfully.
20220608_153412 (reverseflash01:deploy_nim_server.sh): Script './deploy_nim_server.sh' with arguments 'ent11 NA' ended with rc='0'. Start: Wed Jun 8 14:56:42 EDT 2022 End: Wed Jun 8 15:34:12 EDT 2022. Elapsed Time (Seconds): 2250.
```

4. Verify the NIM Configuration

a. Command: Verify the lpp_source '7200-05-02-2113'.

```
lsnim -l 7200-05-02-2113
```

Example Output:

```
$ lsnm -l 7200-05-02-2113
7200-05-02-2113:
  class      = resources
  type       = lpp_source
  arch       = power
  Rstate      = ready for use
  prev_state  = unavailable for use
  location    = /pdoa_nimrestore/lpp_source/AIX_v7.2_Install_7200-05-02-2113
  simages     = yes
  alloc_count = 0
  server      = master
```

b. Command: Verify the installp_bundle '7200-05-02-2113_ifixes_bnd'

```
lsnm -l 7200-05-02-2113_ifixes_bnd
```

Example Output:

```
$ lsnm -l 7200-05-02-2113_ifixes_bnd
7200-05-02-2113_ifixes_bnd:
  class      = resources
  type       = installp_bundle
  Rstate      = ready for use
  prev_state  = unavailable for use
  location    = /pdoa_nimrestore/installp_bundle/7200-05-02-2113_ifixes.bnd
  alloc_count = 0
  server      = master
```

c. Command: Verify the SPOT 'SPOT-7200-05-02-2113'.

```
lsnm -l SPOT-7200-05-02-2113
```

Example Output:

```
$ lsnm -l SPOT-7200-05-02-2113
SPOT-7200-05-02-2113:
  class      = resources
  type       = spot
  plat_defined = chrp
  arch       = power
  bos_license = yes
  Rstate      = ready for use
  prev_state  = verification is being performed
  location    = /pdoa_nimrestore/spot/7200-05-02-2113/SPOT-7200-05-02-2113/usr
  version     = 7
  release     = 2
  mod         = 5
  oslevel_r   = 7200-05
  oslevel_s   = 7200-05-03-2148
  alloc_count = 0
  server      = master
  if_supported = chrp.64 ent
  Rstate_result = success
```

STAGE 2 - Updating Pflayer

Phase 3: Step 7: Restore management standby and clone rootvg.

1. Command: Restore management standby and clone rootvg. Rootvg will be cloned to hedge against a disk failure between Stage 2 and Stage 6 when the management standby will be migrated.

```
./reconfig_managementstandby_server.sh
```

Example Output:

Click the link or open the included file

[PDOA FP9 FP5 Readme References\reconfig_managementstandby_server.sh reverseflash01 20220608 160315.log](#) for full output. Look for a successful return code, rc=0.

```
20220608_162335 (reverseflash01:reconfig_managementstandby_server.sh): Management standby node has been rebooted, bootstrap clone has been removed and rootvg has been cloned.
20220608_162335 (reverseflash01:reconfig_managementstandby_server.sh): All operations completed successfully.
20220608_162335 (reverseflash01:reconfig_managementstandby_server.sh): Script './reconfig_managementstandby_server.sh' with arguments '' ended with rc='0'. Start: Wed Jun  8 16:03:15 EDT 2022 End: Wed Jun  8 16:23:35 EDT 2022. Elapsed Time (Seconds): 1220.
```

2. Command: Verify the management standby node oslevel is again 7.1 and that rootvg is cloned (altinst_rootvg exists).

```
ssh ${BCUMGMTSTDBY} 'oslevel -s;lsvg | grep rootvg'
```

Example Output:

```
$ ssh ${BCUMGMTSTDBY} 'oslevel -s;lsvg | grep rootvg'
7100-05-07-2038
rootvg
altinst_rootvg
```

STAGE 2 - Updating Pflayer

Phase 3: Step 8: Update AIX on management host.

This step is not required as the AIX 7.2 migration step will have updated AIX to the V1.1 FP5 validated stack level. Contact IBM Support if new AIX fixpacks, installp filesets, or efixes need to be installed as part of this fixpack beyond the validated stack level.

1. Command: Verify level and successful installation from install_all_updates.log. V1.1 FP2->FP4 customers will see 7100-05-04 and will need to repeat the steps starting at Phase 3 Step 1 Item 4 (quiesce) .

```
oslevel -s
```

Example Output:

```
$ oslevel -s  
7200-05-04-2220
```


STAGE 2 - Updating Pflayer

Phase 3: Step 9: Restart domain on management node if using DPM.

This step is only required if DPM is currently being used. If DPM is not used, then skip to the next Step.

1. Login to the management host as the root user.
2. If using screen then enter the screen session using `'screen -r fprun'`.
3. Command: Ensure that the current working directory is correct.

```
cd /BCU_share/FP9_FP5/fixpack_tools/application
```

4. Command: If using OPM check domain status:

```
hals -mgmt
```

Example Output:

```
$ hals -mgmt
MANAGEMENT DOMAIN
=====+=====+=====+=====+=====+=====+=====+
| COMPONENT | PRIMARY | STANDBY | CURRENT | OPSTATE | HA STATUS | RG REQUESTS |
=====+=====+=====+=====+=====+=====+=====+
| DPM       | flashdancehostname01 | flashdancehostname03 | flashdancehostname03 | Online | Standby Offline | - |
| DB2DPM    | flashdancehostname01 | flashdancehostname03 | flashdancehostname03 | Online | Standby Offline | - |
=====+=====+=====+=====+=====+=====+=====+
```

5. Command: If the error 'Error: Unable to determine an online host in domain 'mgmtdomain'.' appears then run 'hadomain -mgmt start' to start the domain.

```
hadomain -mgmt start
```

6. Command: Start domains on management:

```
./unquiesce_node.sh
```

Example Output:

```
$ ./unquiesce_node.sh
20201203_095534 (flashdancehostname01:unquiesce_node.sh): Starting date: Thu Dec 3 09:55:34 IST 2020.
20201203_095534 (flashdancehostname01:unquiesce_node.sh): Attempting to unquiesce host flashdancehostname01.
20201203_095659 (flashdancehostname01:unquiesce_node.sh): Successfully unquiesced host.
20201203_095659 (flashdancehostname01:unquiesce_node.sh): Starting date: Thu Dec 3 09:55:34 IST 2020 Ending Date: Thu Dec 3 09:56:59 IST 2020.
```

7. Command: Check the domain status:

```
hals -mgmt
```

Example Output:

```
$ hals -mgmt
MANAGEMENT DOMAIN
=====+=====+=====+=====+=====+=====+=====+
| COMPONENT | PRIMARY | STANDBY | CURRENT | OPSTATE | HA STATUS | RG REQUESTS |
=====+=====+=====+=====+=====+=====+=====+
| DPM       | flashdancehostname01 | flashdancehostname03 | flashdancehostname03 | Online | Normal | - |
| DB2DPM    | flashdancehostname01 | flashdancehostname03 | flashdancehostname03 | Online | Normal | - |
=====+=====+=====+=====+=====+=====+=====+
```

8. Command: Failback DPM. Requires DPM Outage. Replace *hostname* with hostname of standby management host. hafailover command frequently times out before DPM successfully fails over. Check with hals -mgmt.

```
hafailover hostname DPM
```

Example Output:

```
$ hafailover flashdancehostname03 DPM
Moving resources from flashdancehostname03 to flashdancehostname01
.....Failed to start all resources. Check state with hals
```

STAGE 2 - Updating Pflayer

9. Command: Verify DPM failed over.

```
hals -mgmt
```

Example Output:

```
$ hals -mgmt
MANAGEMENT DOMAIN
```

COMPONENT	PRIMARY	STANDBY	CURRENT	OPSTATE	HA STATUS	RG REQUESTS
DPM	flashdancehostname01	flashdancehostname03	flashdancehostname01	Online	Normal	-
DB2DPM	flashdancehostname01	flashdancehostname03	flashdancehostname01	Online	Normal	-

STAGE 2 - Updating Pflayer

Phase 3: Step 10: Verify platform layer after AIX 7.2 migration.

1. Command: Attempt to use platform layer command `appl_ls_cat`. For environments that started on V1.1 FP3, this is expected to fail and will be fixed in Phase 4. This is due to the perl update that was part of AIX 7.1 TL5 SP7 in V1.1 FP4. Customers on V1.1 FP4 will not see an error.

```
appl_ls_cat
```

Example Output: (FP4->FP5)

```
$ appl_ls_cat
NAME          VERSION      STATUS      DESCRIPTION
bwr0          4.0.4.2      Committed   Updates for IBM_PureData_System_for_Operational_Analytics
bwr1          4.0.5.0      Committed   Updates for IBM_PureData_System_for_Operational_Analytics_DB2105
bwr2          4.0.6.0      Committed   Updates for IBM_PureData_System_for_Operational_Analytics
bwr3          4.0.8.0      Committed   Updates for IBM_PureData_System_for_Operational_Analytics
```

Example Output: (FP3->FP5, FP2->FP5, FP1->FP5: Failure due to V1.1 FP3 version of platform layer.)

```
$ appl_ls_cat
Can't locate Log/Log4perl.pm in @INC (you may need to install the Log::Log4perl module) (@INC contains:
/opt/ibm/aixappl/pflayer/lib /opt/ibm/smart/pfmgmt/lib /usr/opt/perl5/lib/site_perl/5.28.1/aix-thread-multi
/usr/opt/perl5/lib/site_perl/5.28.1 /usr/opt/perl5/lib/5.28.1/aix-thread-multi /usr/opt/perl5/lib/5.28.1) at
/opt/ibm/aixappl/pflayer/lib/ISAS/Logger.pm line 12.
BEGIN failed--compilation aborted at /opt/ibm/aixappl/pflayer/lib/ISAS/Logger.pm line 12.
Compilation failed in require at /opt/ibm/aixappl/pflayer/lib/ExecWrapper.pm line 21.
BEGIN failed--compilation aborted at /opt/ibm/aixappl/pflayer/lib/ExecWrapper.pm line 21.
Compilation failed in require at /opt/ibm/aixappl/pflayer/lib/ExecWrapper/Exec.pm line 23.
BEGIN failed--compilation aborted at /opt/ibm/aixappl/pflayer/lib/ExecWrapper/Exec.pm line 23.
Compilation failed in require at /opt/ibm/aixappl/pflayer/lib/ODM.pm line 13.
BEGIN failed--compilation aborted at /opt/ibm/aixappl/pflayer/lib/ODM.pm line 13.
Compilation failed in require at /opt/ibm/aixappl/pflayer/bin/appl_ls_cat line 16.
BEGIN failed--compilation aborted at /opt/ibm/aixappl/pflayer/bin/appl_ls_cat line 16.
```

Phase 4: pflayer update

1. Command: Update Pflayer. Installation time is approximately 4 to 5 mins.

```
./stage02_phase03_pflayer.sh
```

[Example Output: See](#)

[PDOA_FP9_FP5_Readme_References\stage02_phase03_pflayer.sh_reverseflash01_20220727_154059.log](#) for full output. The following output shows a successful installation.

```
20220727_154422 (reverseflash01:stage02_phase03_pflayer.sh): Exited with rc=0.
20220727_154422 (reverseflash01:stage02_phase03_pflayer.sh): Installation completed. Verifying versions.
20220727_154422 (reverseflash01:stage02_phase03_pflayer.sh): pflayer current version is 4.0.9.1.
20220727_154422 (reverseflash01:stage02_phase03_pflayer.sh): pflayer fp version is 4.0.9.1.
20220727_154422 (reverseflash01:stage02_phase03_pflayer.sh): Comparing 0: 4 to 4.
20220727_154422 (reverseflash01:stage02_phase03_pflayer.sh): Comparing 1: 0 to 0.
20220727_154422 (reverseflash01:stage02_phase03_pflayer.sh): Comparing 2: 9 to 9.
20220727_154422 (reverseflash01:stage02_phase03_pflayer.sh): Comparing 3: 1 to 1.
20220727_154422 (reverseflash01:stage02_phase03_pflayer.sh): Successfully verified the platform layer is installed.
```

STAGE 2 - Updating Pflayer

2. Command: Verify pflayer function: appl_ls_cat

appl_ls_cat

Example Output: (FP4->FP5)

```
$ appl_ls_cat
NAME          VERSION          STATUS          DESCRIPTION
bwr0          4.0.4.0          Committed       Updates for IBM_PureData_System_for_Operational_Analytics
bwr1          4.0.5.0          Committed       Updates for IBM_PureData_System_for_Operational_Analytics_DB2105
bwr2          4.0.7.0          Committed       Updates for IBM_PureData_System_for_Operational_Analytics
bwr3          4.0.8.0          Committed       Updates for IBM_PureData_System_for_Operational_Analytics
```

Phase 5: Backup SAN Configuration

1. Command: As root on management. Create the backup directory.

```
mkdir /BCU_share/san_switch_backup
```

2. Command: Collect the ip addresses for the SAN Switches.

```
appl_ls_hw -r san -A M_IP_address
```

Example Output:

```
$ appl_ls_hw -r san -A M_IP_address
"172.23.1.161"
"172.23.1.162"
"172.23.1.163"
"172.23.1.164"
```

3. Command: Assign the IAN management ip to the mgmtip shell variable.

```
mgmtip=$(lsattr -a netaddr -E0l en11 | grep -v "#");echo $mgmtip
```

Example Output:

```
$ mgmtip=$(lsattr -a netaddr -E0l en11 | grep -v "#");echo $mgmtip
172.23.1.1
```

4. Command: Generate the configupload commands for each of the SAN switches. These will be used to cut and paste into the appropriate san switch session. Copy from the two lines below from 'd=' to 'done'.

```
d=$(date +%Y%m%d%H%M%S);for ip in $(appl_ls_hw -r san -A M_IP_address | sed 's|'|g');do echo "configupload -all -p scp \${mgmtip}\",\"root\", \"/BCU_share/san_switch_backup/\${ip}_\${d}_prefp5.cfg\"";done
```

Example Output:

```
$ d=$(date +%Y%m%d%H%M%S);for ip in $(appl_ls_hw -r san -A M_IP_address | sed 's|'|g');do echo "configupload -all -p scp \${mgmtip}\",\"root\", \"/BCU_share/san_switch_backup/\${ip}_\${d}_prefp5.cfg\"";done

configupload -all -p scp "172.23.1.1","root","/BCU_share/san_switch_backup/172.23.1.161_20210222153517_prefp4.cfg"
configupload -all -p scp "172.23.1.1","root","/BCU_share/san_switch_backup/172.23.1.162_20210222153517_prefp4.cfg"
configupload -all -p scp "172.23.1.1","root","/BCU_share/san_switch_backup/172.23.1.163_20210222153517_prefp4.cfg"
configupload -all -p scp "172.23.1.1","root","/BCU_share/san_switch_backup/172.23.1.164_20210222153517_prefp4.cfg"
```

STAGE 2 - Updating Pflayer

5. For each ip address login to the switch and cut/paste the appropriate backup commands for that ip address. Root on management has key based access to the admin user on all SAN switches, however you will need the root password to allow the SAN to upload its configuration to the management host.

- a. Command: Establish an ssh session from root on management to the admin account on the san switch.

```
$ ssh admin@172.23.1.161
```

- b. Command: At the SAN switch prompt copy the corresponding configupload generate command. You will need the root password from the management host to respond to the password prompt.

```
F-SAN1:FID128:admin> configupload -all -p scp
"172.23.1.1","root","/BCU_share/san_switch_backup/172.23.1.161_20210222153517_prefp4.cfg"
root@172.23.1.1's password:
root@172.23.1.1's password:

configUpload complete: All selected config parameters are uploaded
```

- c. If there is an error like 'scp failed'. Then skip to item 6 to manually run configupload on each SAN.
 - d. Command: exit the session.

```
F-SAN1:FID128:admin> exit
logout
Connection to 172.23.1.161 closed.
```

- e. Repeat these steps for all SAN switches in the environment.

6. If item 5 fails do the following for each SAN switch. You will need to enable FTP that is part of Stage 5 to use FTP as the configupload option.

- a. Command: Login to the SAN switch from the management host as root. This example will show 172.23.1.161.

```
$ ssh admin@172.23.1.161
```

- b. Command: Run configupload at the SAN prompt. Follow the prompts. Your server ip address is the internal network address. Also replace the target file using the generated filename for that ip address.

```
san01:FID128:admin> configupload
Protocol (scp, ftp, sftp, local) [ftp]: ftp
Server Name or IP Address [host]: 172.23.1.1
User Name [user]: root
Path/Filename [<home dir>/config.txt]: /BCU_share/san_switch_backup/172.23.1.161_20210504213516_prefp4.cfg
Section (all|chassis|FID# [all]): all
Password:

configUpload complete: All selected config parameters are uploaded
san01:FID128:admin> exit
```

- c. Repeat for all of the SAN Switches.

7. Command: Verify that all SAN switch configurations are backed up.

```
ls -l /BCU_share/san_switch_backup/
```

Example output:

```
$ ls -l /BCU_share/san_switch_backup/

total 272
-rw-r--r-- 1 root system 28409 Feb 22 15:37 172.23.1.161_20210222153517_prefp4.cfg
-rw-r--r-- 1 root system 28411 Feb 22 15:38 172.23.1.162_20210222153517_prefp4.cfg
-rw-r--r-- 1 root system 39931 Feb 22 15:38 172.23.1.163_20210222153517_prefp4.cfg
-rw-r--r-- 1 root system 39931 Feb 22 15:39 172.23.1.164_20210222153517_prefp4.cfg
```

STAGE 2 - Updating Pflayer

8. Command: Verify no mistakes in cut and paste. Filename ip address should match the “boot.ipa” field. In the FP4 readme, the ‘lookupName’ field was used, however that was found to be inconsistently populated leading to confusion.

```
grep 'boot.ipa' /BCU_share/san_switch_backup/*prefp5.cfg
```

Example Output:

```
$ grep 'boot.ipa' /BCU_share/san_switch_backup/*prefp5.cfg
/BCU_share/san_switch_backup/172.23.1.161_20221005210457_prefp5.cfg:boot.ipa:172.23.1.161
/BCU_share/san_switch_backup/172.23.1.162_20221005210457_prefp5.cfg:boot.ipa:172.23.1.162
/BCU_share/san_switch_backup/172.23.1.163_20221005210457_prefp5.cfg:boot.ipa:172.23.1.163
/BCU_share/san_switch_backup/172.23.1.164_20221005210457_prefp5.cfg:boot.ipa:172.23.1.164
```


STAGE 3 - Updating HMC

Stage 3 Description

Every environment has two redundant HMCs to manage the Power servers. The two HMC components are updated one at a time. During the update one HMC may be unavailable until the update completes. Once the first HMC update completes, the second HMC will not be able to manage the Power servers until it is updated.

Phases/Steps

- Phase 1: Preparation
- Phase 2: Update HMC1
 - FP3->FP5: Apply HMC updates from V1.1 FP4 prior to V1.1 FP5.
 - FP2->FP5: Apply HMC updates from V1.1 FP3 + V1.1 FP4 prior to V1.1 FP5.
- Phase 3: Update HMC2
 - FP3->FP5: Apply HMC updates from V1.1 FP4 prior to V1.1 FP5.
- FP2->FP5: Apply HMC updates from V1.1 FP3 + V1.1 FP4 prior to V1.1 FP5
- Phase 4: Verification

Outage Requirements

- No outage requirements for this stage.

Time Per Step

- Phase 1: 10 to 15 minutes
- Phase 2: Approximately 1 Hour
 - FP3->FP5 Customers add an extra 2 hours to apply V1.1 FP4's HMC FW here.
 - FP2->FP5 Customers add an extra hour to apply V1.1 FP3's HMC FW here.
 - FP1->FP5 Customers add an extra 2.5 hours to apply V1.1 FP2's HMC FW here.
- Phase 3: Approximately 1 Hour
 - FP3->FP5 Customers add an extra 2 hours to apply V1.1 FP4's HMC FW here.
 - FP2->FP5 Customers add an extra hour to apply V1.1 FP3's HMC FW here.
 - FP1->FP5 Customers add an extra 2.5 hours to apply V1.1 FP2's HMC FW here.
- Phase 4: Less than a minute.

Risk Mitigation

- There is at least one HMC active throughout the update process.

Backout Options

- With help from IBM Support it is possible to reinstall HMCs to prior firmware levels if required.

STAGE 3 - Updating HMC

V1.1 FP3 to V1.1 FP5 Scenario:

- You must apply the V1.1 FP4 HMC updates prior to applying the V1.1 FP5 updates..

V1.1 FP2 to V1.1 FP5 Scenario:

- If you are upgrading from V1.1 FP2 then you must apply the V1.1 FP3 updates first and then the V1.1 FP4 updates second and the V1.1 FP5 updates third.

V1.1 FP1 to V1.1 FP5 Scenario:

- If you are updating from FP5_FP1 then you must apply the FP6_FP2 HMC updates first as they are required. The steps for this are not included in this readme. Please contact IBM for more information about the steps needed in this scenario.

Phase 1: Preparation

1. Login to the management host as the root user.
2. If you are using screen, then enter the screen session used for log tracking using 'screen -r sessionname'. In the lab we use 'pflayerlog' for this screen session.
3. Command: In the logging session, whether screen or a separate session, initiate a tail of the platform layer log file. Note that the log file will wrap so it may be necessary to <ctrl>-c the tail and then run the command again to read from the new log file.

```
tail -f /BCU_share/aixappl/pflayer/log/platform_layer.log
```

4. Login to the management node as the root user in a new session, or exit the above session using <ctrl>-a d to get back to non-screen based session.
5. If using screen, in the new or existing session, enter the session used to run the fixpack commands using screen -r sessionname. In the lab we use fprun.
6. Ensure the current working directory is correct. FP4 to FP5 scenario customers must use the FP9_FP5 directory below.

```
$ cd /BCU_share/FP9_FP5/fixpack_tools/application
```

FP3->FP5 customers need to apply the FP4 HMC updates first before applying the V1.1 FP5 update. Once the FP3->FP4 HMC updates are complete, repeat the process using the FP9_FP5 directory for the next round of updates.

```
$ cd /BCU_share/FP8_FP4/fixpack_tools/application
```

FP2->FP5 customers need to apply the FP3 HMC updates first, then FP4 updates after and must use the following directory as the working directory. Once the FP2->FP3 HMC updates are complete, repeat the process using the FP8_FP4 directory for the next round of updates.

```
$ cd /BCU_share/FP7_FP3/fixpack_tools/application
```

7. Command: Run the following to validate the HMC updates. There is one .iso file MH01898_91942_1.iso to be applied in this update. FP3->FP5: There are 4 updates available for each HMC listed as _2.iso to _5.iso. The example output below does not show the _5.iso. FP2->FP5: There are two .iso files to be applied. The return code should be '0' for each HMC. The most common error in validation is due to available disk space. For this fixpack the validation looks for 1.5 times the size of the ISO update file free on '/' to pass validation.

```
./stage03_hmc_update.sh validate
```

Example Output:

```
$ ./stage03_hmc_update.sh validate
20220913_165903 (reverseflash01:stage03_hmc_update.sh): Starting date: Tue Sep 13 16:59:03 EDT 2022.
20220913_165905 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pflayer/bin/icmids/appl_ctrl_hmc update -validate
-l hmc0 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports.
20220913_165905 (reverseflash01:stage03_hmc_update.sh): -----
20220913_165912 (reverseflash01:stage03_hmc_update.sh): -----
```

STAGE 3 - Updating HMC

```
20220913_165912 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate
-l hmc0 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports returned '0'.
[13 Sep 2022 16:59:12,066] <2556868 CTRL DEBUG reverseflash01>
/BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports/MH01898_91942_1.iso is applicable
20220913_165912 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate
-l hmc1 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports.
20220913_165912 (reverseflash01:stage03_hmc_update.sh): -----
20220913_165918 (reverseflash01:stage03_hmc_update.sh): -----
20220913_165918 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate
-l hmc1 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports returned '0'.
[13 Sep 2022 16:59:18,626] <2819110 CTRL DEBUG reverseflash01>
/BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports/MH01898_91942_1.iso is applicable
20220913_165918 (reverseflash01:stage03_hmc_update.sh): Script './stage03_hmc_update.sh' with arguments 'validate' ended with
rc='0'. Start: Tue Sep 13 16:59:03 EDT 2022 End: Tue Sep 13 16:59:18 EDT 2022. Elapsed Time (Seconds): 15 (H:M:S):(00:00:15).
20220913_165918 (reverseflash01:stage03_hmc_update.sh): Normalizing management hostname.
20220913_165919 (reverseflash01:stage03_hmc_update.sh): Management hostname is 'reverseflash01'.
20220913_165919 (reverseflash01:stage03_hmc_update.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from
script './stage03_hmc_update.sh'.' to 'user@customer.com' '-c root@localhost'.
20220913_165919 (reverseflash01:stage03_hmc_update.sh): Notification sent.
20220913_165919 (reverseflash01:stage03_hmc_update.sh): Writing output to
/BCU_share/support/FP9_FP5/log/stage03_hmc_update.sh_reverseflash01_20220913_165903.log.rc.
20220913_165919 (reverseflash01:stage03_hmc_update.sh): Completed.

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

Example Output: (FP3->FP4)

```
$ ./stage03_hmc_update.sh validate
20201125_040051 (flashdancehostname01:stage03_hmc_update.sh): Starting date: Wed Nov 25 04:00:51 IST 2020.
20201125_040052 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -
validate -l hmc0 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports.
20201125_040052 (flashdancehostname01:stage03_hmc_update.sh): -----
20201125_040057 (flashdancehostname01:stage03_hmc_update.sh): -----
20201125_040057 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -
validate -l hmc0 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports returned '0'.
[25 Nov 2020 04:00:57,889] <5898962 CTRL DEBUG flashdancehostname01>
/BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports/HMC_Update_V9R1_SP931_2.iso is applicable
[25 Nov 2020 04:00:57,890] <5898962 CTRL DEBUG flashdancehostname01>
/BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports/HMC_Update_V9R1_SP941_3.iso is applicable
[25 Nov 2020 04:00:57,890] <5898962 CTRL DEBUG flashdancehostname01>
/BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports/MH01853_91931_4.iso is applicable
20201125_040057 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -
validate -l hmc1 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports.
20201125_040057 (flashdancehostname01:stage03_hmc_update.sh): -----
20201125_040103 (flashdancehostname01:stage03_hmc_update.sh): -----
20201125_040103 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -
validate -l hmc1 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports returned '0'.
[25 Nov 2020 04:01:03,902] <4980840 CTRL DEBUG flashdancehostname01>
/BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports/HMC_Update_V9R1_SP931_2.iso is applicable
[25 Nov 2020 04:01:03,902] <4980840 CTRL DEBUG flashdancehostname01>
/BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports/HMC_Update_V9R1_SP941_3.iso is applicable
[25 Nov 2020 04:01:03,902] <4980840 CTRL DEBUG flashdancehostname01>
/BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports/MH01853_91931_4.iso is applicable
20201125_040103 (flashdancehostname01:stage03_hmc_update.sh): Starting date: Wed Nov 25 04:00:51 IST 2020 Ending Date: Wed Nov
25 04:01:03 IST 2020.
```

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application

Example Output: (FP2->FP5 customers applying FP3 HMC levels)

```
$ ./stage03_hmc_update.sh validate
20210513_120252 (reverseflash01:stage03_hmc_update.sh): Starting date: Thu May 13 12:02:52 EDT 2021.
20210513_120253 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate
-l hmc0 -f /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports.
20210513_120253 (reverseflash01:stage03_hmc_update.sh): -----
Recovery upgrade package is incorrect and invalid.->/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports/HMC_Recovery_V9R191_1
The image files are incorrect and invalid.->/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports/HMC_Update_V9R193_SP0_2.iso
20210513_120257 (reverseflash01:stage03_hmc_update.sh): -----
20210513_120257 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate
-l hmc0 -f /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports returned '1'.
20210513_120257 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate
-l hmc1 -f /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports.
20210513_120258 (reverseflash01:stage03_hmc_update.sh): -----
Recovery upgrade package is incorrect and invalid.->/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports/HMC_Recovery_V9R191_1
The image files are incorrect and invalid.->/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports/HMC_Update_V9R193_SP0_2.iso
20210513_120302 (reverseflash01:stage03_hmc_update.sh): -----
20210513_120302 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate
-l hmc1 -f /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports returned '1'.
20210513_120302 (reverseflash01:stage03_hmc_update.sh): Starting date: Thu May 13 12:02:52 EDT 2021 Ending Date: Thu May 13
12:03:02 EDT 2021.
```

Phase 2: Update HMC1

1. Command: Prepare: In the same directory and session run the following to prepare hmc0. This will re-run the validation and then will reboot the HMC. If the HMC does not boot in an hour contact IBM support as it will be necessary to have a CE/SSR physically access the system through a support ticket. If you are using a vtmenu session to run this command then verify it is run through the hmc associated with hmc1 as the prepare command and the later installation commands will also reboot the hmc as part of the updates.

```
./stage03_hmc_update.sh prepare hmc0
```

Example Output:

```
(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
$ ./stage03_hmc_update.sh prepare hmc0
20220913_170203 (reverseflash01:stage03_hmc_update.sh): Starting date: Tue Sep 13 17:02:03 EDT 2022.
20220913_170204 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmnds/appl_ctrl_hmc update -validate
-l hmc0 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports.
20220913_170204 (reverseflash01:stage03_hmc_update.sh): -----
20220913_170210 (reverseflash01:stage03_hmc_update.sh): -----
20220913_170210 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmnds/appl_ctrl_hmc update -validate
-l hmc0 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports returned '0'.
[13 Sep 2022 17:02:10,240] <2753256 CTRL DEBUG reverseflash01>
/BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports/MH01898_91942_1.iso is applicable
20220913_170210 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmnds/appl_ctrl_hmc update -prepare
-l hmc0 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports.
20220913_170210 (reverseflash01:stage03_hmc_update.sh): -----
Prepare succeeded for HMC 172.23.1.245
20220913_171354 (reverseflash01:stage03_hmc_update.sh): -----
20220913_171354 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmnds/appl_ctrl_hmc update -prepare
-l hmc0 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports returned '0'.
20220913_171354 (reverseflash01:stage03_hmc_update.sh): Script './stage03_hmc_update.sh' with arguments 'prepare hmc0' ended with
rc='0'. Start: Tue Sep 13 17:02:03 EDT 2022 End: Tue Sep 13 17:13:54 EDT 2022. Elapsed Time (Seconds): 711 (H:M:S):(00:11:51).
20220913_171354 (reverseflash01:stage03_hmc_update.sh): Normalizing management hostname.
20220913_171354 (reverseflash01:stage03_hmc_update.sh): Management hostname is 'reverseflash01'.
20220913_171354 (reverseflash01:stage03_hmc_update.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from
script './stage03_hmc_update.sh'.' to 'user@customer.com' '-c root@localhost'.
20220913_171354 (reverseflash01:stage03_hmc_update.sh): Notification sent.
20220913_171354 (reverseflash01:stage03_hmc_update.sh): Writing output to
/BCU_share/support/FP9_FP5/log/stage03_hmc_update.sh_reverseflash01_20220913_170203.log.rc.
20220913_171354 (reverseflash01:stage03_hmc_update.sh): Completed.
You have mail in /usr/spool/mail/root

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

Example Output: (FP3->FP5: FP3 Customers applying FP4 HMC levels)

```
$ ./stage03_hmc_update.sh prepare hmc0
20201125_041013 (flashdancehostname01:stage03_hmc_update.sh): Starting date: Wed Nov 25 04:10:13 IST 2020.
20201125_041014 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmnds/appl_ctrl_hmc update -
validate -l hmc0 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports.
20201125_041014 (flashdancehostname01:stage03_hmc_update.sh): -----
20201125_041020 (flashdancehostname01:stage03_hmc_update.sh): -----
20201125_041020 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmnds/appl_ctrl_hmc update -
validate -l hmc0 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports returned '0'.
[25 Nov 2020 04:10:19,927] <3801426 CTRL DEBUG flashdancehostname01>
/BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports/HMC_Update_V9R1_SP931_2.iso is applicable
[25 Nov 2020 04:10:19,928] <3801426 CTRL DEBUG flashdancehostname01>
/BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports/HMC_Update_V9R1_SP941_3.iso is applicable
[25 Nov 2020 04:10:19,928] <3801426 CTRL DEBUG flashdancehostname01>
/BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports/MH01853_91931_4.iso is applicable
20201125_041020 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmnds/appl_ctrl_hmc update -
prepare -l hmc0 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports.
20201125_041020 (flashdancehostname01:stage03_hmc_update.sh): -----
Prepare succeeded for HMC 172.23.1.245
20201125_041924 (flashdancehostname01:stage03_hmc_update.sh): -----
20201125_041924 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmnds/appl_ctrl_hmc update -
prepare -l hmc0 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports returned '0'.
20201125_041924 (flashdancehostname01:stage03_hmc_update.sh): Starting date: Wed Nov 25 04:10:13 IST 2020 Ending Date: Wed Nov
25 04:19:24 IST 2020.

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

STAGE 3 - Updating HMC

Example Output: (FP2->FP5: FP2 Customers applying FP3 HMC levels)

```
$ ./stage03_hmc_update.sh prepare hmc0
20210514_085645 (reverseflash01:stage03_hmc_update.sh): Starting date: Fri May 14 08:56:45 EDT 2021.
20210514_085646 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmnds/appl_ctrl_hmc update -validate
-1 hmc0 -f /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports.
20210514_085646 (reverseflash01:stage03_hmc_update.sh): -----
20210514_085652 (reverseflash01:stage03_hmc_update.sh): -----
20210514_085652 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmnds/appl_ctrl_hmc update -validate
-1 hmc0 -f /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports returned '0'.
[14 May 2021 08:56:52,009] <6422658 CTRL DEBUG reverseflash01>
/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports/HMC_Recovery_V9R19l_1 is applicable
[14 May 2021 08:56:52,009] <6422658 CTRL DEBUG reverseflash01>
/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports/HMC_Update_V9R1_SP930_2.iso is applicable
20210514_085652 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmnds/appl_ctrl_hmc update -prepare
-1 hmc0 -f /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports.
20210514_085652 (reverseflash01:stage03_hmc_update.sh): -----
Prepare succeeded for HMC 172.23.1.245
20210514_090602 (reverseflash01:stage03_hmc_update.sh): -----
20210514_090602 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmnds/appl_ctrl_hmc update -prepare
-1 hmc0 -f /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports returned '0'.
20210514_090602 (reverseflash01:stage03_hmc_update.sh): Starting date: Fri May 14 08:56:45 EDT 2021 Ending Date: Fri May 14
09:06:02 EDT 2021.
```

2. Command: Update. Update. FP4->FP5: Applies one iso update which takes approximately 40 minutes to an hour. FP3->FP5: Apply FP4 HMC levels first. FP4 has 5 HMC updates and takes between 60 and 90 minutes to complete with an HMC reboot between each update. May require running the update command multiple times if all updates are not applied. FP2->FP5: Apply FP3 HMCs levels before FP4 and FP5 updates. Includes two HMC updates.

```
./stage03_hmc_update.sh install hmc0
```

Example Output:

```
$ ./stage03_hmc_update.sh install hmc0
20220913_174345 (reverseflash01:stage03_hmc_update.sh): Starting date: Tue Sep 13 17:43:45 EDT 2022.
20220913_174346 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmnds/appl_ctrl_hmc update -validate
-1 hmc0 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports.
20220913_174346 (reverseflash01:stage03_hmc_update.sh): -----
20220913_174353 (reverseflash01:stage03_hmc_update.sh): -----
20220913_174353 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmnds/appl_ctrl_hmc update -validate
-1 hmc0 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports returned '0'.
[13 Sep 2022 17:43:53,397] <3146150 CTRL DEBUG reverseflash01>
/BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports/MH01898_91942_1.iso is applicable
20220913_174353 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmnds/appl_ctrl_hmc update -install
-1 hmc0 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports.
20220913_174353 (reverseflash01:stage03_hmc_update.sh): -----
SNMP string exist on HMC: 172.23.1.245
20220913_181458 (reverseflash01:stage03_hmc_update.sh): -----
20220913_181458 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmnds/appl_ctrl_hmc update -install
-1 hmc0 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports returned '0'.
20220913_181458 (reverseflash01:stage03_hmc_update.sh): Script './stage03_hmc_update.sh' with arguments 'install hmc0' ended with
rc='0'. Start: Tue Sep 13 17:43:45 EDT 2022 End: Tue Sep 13 18:14:58 EDT 2022. Elapsed Time (Seconds): 1873 (H:M:S):(00:31:13).
20220913_181458 (reverseflash01:stage03_hmc_update.sh): Normalizing management hostname.
20220913_181458 (reverseflash01:stage03_hmc_update.sh): Management hostname is 'reverseflash01'.
20220913_181458 (reverseflash01:stage03_hmc_update.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from
script './stage03_hmc_update.sh'.' to 'user@customer.com' '-c root@localhost'.
20220913_181459 (reverseflash01:stage03_hmc_update.sh): Notification sent.
20220913_181459 (reverseflash01:stage03_hmc_update.sh): Writing output to
/BCU_share/support/FP9_FP5/log/stage03_hmc_update.sh_reverseflash01_20220913_174345.log.rc.
20220913_181459 (reverseflash01:stage03_hmc_update.sh): Completed.
You have mail in /usr/spool/mail/root

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

Example Output: (FP3->FP5: FP3 customers applying FP4 levels)

```
$ ./stage03_hmc_update.sh install hmc0
20201125_042332 (flashdancehostname01:stage03_hmc_update.sh): Starting date: Wed Nov 25 04:23:32 IST 2020.
20201125_042333 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmnds/appl_ctrl_hmc update -
validate -1 hmc0 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports.
20201125_042333 (flashdancehostname01:stage03_hmc_update.sh): -----
```

STAGE 3 - Updating HMC

```
20201125_042339 (flashdancehostname01:stage03_hmc_update.sh): -----
20201125_042339 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -
validate -l hmc0 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports returned '0'.
[25 Nov 2020 04:23:39,072] <4128942 CTRL DEBUG flashdancehostname01>
/BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports/HMC_Update_V9R1_SP931_2.iso is applicable
[25 Nov 2020 04:23:39,072] <4128942 CTRL DEBUG flashdancehostname01>
/BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports/HMC_Update_V9R1_SP941_3.iso is applicable
[25 Nov 2020 04:23:39,072] <4128942 CTRL DEBUG flashdancehostname01>
/BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports/MH01853_91931_4.iso is applicable
20201125_042339 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -
install -l hmc0 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports.
20201125_042339 (flashdancehostname01:stage03_hmc_update.sh): -----
SNMP string exist on HMC: 172.23.1.245
20201125_050149 (flashdancehostname01:stage03_hmc_update.sh): -----
20201125_050149 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -
install -l hmc0 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports returned '0'.
20201125_050149 (flashdancehostname01:stage03_hmc_update.sh): Starting date: Wed Nov 25 04:23:32 IST 2020 Ending Date: Wed Nov
25 05:01:49 IST 2020.
```

Example Output: (FP2 customers applying FP3 levels)

```
$ ./stage03_hmc_update.sh install hmc0
20210514_221738 (reverseflash01:stage03_hmc_update.sh): Starting date: Fri May 14 22:17:38 EDT 2021.
20210514_221739 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate
-l hmc0 -f /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports.
20210514_221739 (reverseflash01:stage03_hmc_update.sh): -----
20210514_221745 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate
-l hmc0 -f /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports returned '0'.
[14 May 2021 22:17:45,858] <5899098 CTRL DEBUG reverseflash01>
/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports/HMC_Recovery_V9R191_1 is applicable
[14 May 2021 22:17:45,859] <5899098 CTRL DEBUG reverseflash01>
/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports/HMC_Update_V9R1_SP930_2.iso is applicable
20210514_221745 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -install
-l hmc0 -f /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports.
20210514_221745 (reverseflash01:stage03_hmc_update.sh): -----
SNMP string exist on HMC: 172.23.1.245
20210514_230301 (reverseflash01:stage03_hmc_update.sh): -----
20210514_230301 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -install
-l hmc0 -f /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports returned '0'.
20210514_230301 (reverseflash01:stage03_hmc_update.sh): Starting date: Fri May 14 22:17:38 EDT 2021 Ending Date: Fri May 14
23:03:01 EDT 2021.

(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP7_FP3/fixpack_tools/application
```

NOTE: The return code of the outer script is not reliable, so be sure to look at the log entry for the result: *Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -install -l hmc0 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports returned '0'.*

3. Command: Check the version on hmc0.

```
appl_ls_hw -l hmc0 -A M_IP_address | sed 's'|'g' | while read ip;do ssh -n hscroot@$ip 'lshmc -V';done
```

Example Output:

```
$ appl_ls_hw -l hmc0 -A M_IP_address | sed 's'|'g' | while read ip;do ssh -n hscroot@$ip 'lshmc -V';done
"version= Version: 9
Release: 1
Service Pack: 942
HMC Build level 2109060506
MH01810 - HMC V9R1 M930
MH01831 - HMC V9R1 M931
MH01853 - Required fix for HMC V9R1 M910+ to install M940
MH01859 - HMC V9R1 M941
MH01876 - HMC V9R1 M942
MH01898 - iFix for HMC V9R1 M942
", "base_version=V9R1
"
```

STAGE 3 - Updating HMC

Example Output: (FP3->FP5: Customers applying FP4 levels)

```
$ appl_ls_hw -l hmc0 -A M_IP_address | sed 's|'|g' | while read ip;do ssh -n hscroot@$ip 'lshmc -V';done
"version= Version: 9
Release: 1
Service Pack: 942
HMC Build level 2011270432
MH01810 - HMC V9R1 M930
MH01831 - HMC V9R1 M931
MH01853 - Required fix for HMC V9R1 M910+ to install M940
MH01859 - HMC V9R1 M941
MH01876 - HMC V9R1 M942
", "base_version=V9R1
"
```

Example Output: (FP2->FP5: FP2 customers applying FP3 levels)

```
$ appl_ls_hw -l hmc0 -A M_IP_address | sed 's|'|g' | while read ip;do ssh -n hscroot@$ip 'lshmc -V';done
"version= Version: 9
Release: 1
Service Pack: 930
HMC Build level 1904220700
MH01810 - HMC V9R1 M930
", "base_version=V9R1
"
```

4. Check the HMC level and proceed to the next step as indicated.
 - a. If the HMC level is V9 R1 942 MH01898 then proceed to the phase 3 to update hmc1.
 - b. If the HMC level is V9 R1 942 MH01876 then proceed to phase 3 to update hmc1 to the V1.1 FP4 HMC level.
 - c. If the HMC level is V9R1_M930 and this is a FP2->FP4 scenario. Continue to phase 3 to update hmc1 to the V1.1 FP3 HMC level. Otherwise check the log for errors.
 - d. If the HMC level is V9 R1 940 and there are no errors, then proceed to the next item to finish installing the update. There is a timing issue in the V1.1 FP4 that can prevent the platform layer from applying all of the updates in one command.
5. Command: Run the update again to finish applying the rest of the updates if necessary. This scenario has only occurred during internal testing.

```
./stage03_hmc_update.sh install hmc0
```

Example Output:

```
$ ./stage03_hmc_update.sh install hmc0
20201125_081438 (flashdancehostname01:stage03_hmc_update.sh): Starting date: Wed Nov 25 08:14:38 IST 2020.
20201125_081439 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -
validate -l hmc0 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports.
20201125_081439 (flashdancehostname01:stage03_hmc_update.sh): -----
20201125_081445 (flashdancehostname01:stage03_hmc_update.sh): -----
20201125_081445 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -
validate -l hmc0 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports returned '0'.
[25 Nov 2020 08:14:44,992] <3801608 CTRL DEBUG flashdancehostname01>
/BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports/HMC Update_V9R1_SP941_4.iso is applicable
20201125_081445 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -
install -l hmc0 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports.
20201125_081445 (flashdancehostname01:stage03_hmc_update.sh): -----
SNMP string exist on HMC: 172.23.1.245
20201125_084220 (flashdancehostname01:stage03_hmc_update.sh): -----
20201125_084220 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -
install -l hmc0 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports returned '0'.
20201125_084220 (flashdancehostname01:stage03_hmc_update.sh): Starting date: Wed Nov 25 08:14:38 IST 2020 Ending Date: Wed Nov 25 08:42:20 IST 2020.
```


Phase 3: Update HMC2

1. Command: Perform steps 2 and 3 (preparation and installation) on the secondary HMC which should have the logical name hmc1 to complete the update operation. This will reboot this hmc and should take about 15 minutes. If you are using a vtmenu session to run this command then verify it is run through the hmc associated with hmc0 as the prepare command and the later installation commands will also reboot the hmc as part of the updates.

```
./stage03_hmc_update.sh prepare hmc1
```

Example Output:

```
$ ./stage03_hmc_update.sh prepare hmc1
20220913_182937 (reverseflash01:stage03_hmc_update.sh): Starting date: Tue Sep 13 18:29:37 EDT 2022.
20220913_182938 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate
-l hmc1 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports.
20220913_182938 (reverseflash01:stage03_hmc_update.sh): -----
20220913_182944 (reverseflash01:stage03_hmc_update.sh): -----
20220913_182944 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate
-l hmc1 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports returned '0'.
[13 Sep 2022 18:29:44,117] <2490792 CTRL DEBUG reverseflash01>
/BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports/MH01898_91942_1.iso is applicable
20220913_182944 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -prepare
-l hmc1 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports.
20220913_182944 (reverseflash01:stage03_hmc_update.sh): -----
Prepare succeeded for HMC 172.23.1.246
20220913_184022 (reverseflash01:stage03_hmc_update.sh): -----
20220913_184022 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -prepare
-l hmc1 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports returned '0'.
20220913_184022 (reverseflash01:stage03_hmc_update.sh): Script './stage03_hmc_update.sh' with arguments 'prepare hmc1' ended with
rc='0'. Start: Tue Sep 13 18:29:37 EDT 2022 End: Tue Sep 13 18:40:22 EDT 2022. Elapsed Time (Seconds): 645 (H:M:S):(00:10:45).
20220913_184022 (reverseflash01:stage03_hmc_update.sh): Normalizing management hostname.
20220913_184022 (reverseflash01:stage03_hmc_update.sh): Management hostname is 'reverseflash01'.
20220913_184022 (reverseflash01:stage03_hmc_update.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from
script './stage03_hmc_update.sh'.' to 'user@customer.com' '-c root@localhost'.
20220913_184023 (reverseflash01:stage03_hmc_update.sh): Notification sent.
20220913_184023 (reverseflash01:stage03_hmc_update.sh): Writing output to
/BCU_share/support/FP9_FP5/log/stage03_hmc_update.sh_reverseflash01_20220913_182937.log.rc.
20220913_184023 (reverseflash01:stage03_hmc_update.sh): Completed.

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

Example Output: (FP3->FP5: Customer applying FP4 HMC Levels)

```
$ ./stage03_hmc_update.sh prepare hmc1
20201125_090522 (flashdancehostname01:stage03_hmc_update.sh): Starting date: Wed Nov 25 09:05:22 IST 2020.
20201125_090523 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -
validate -l hmc1 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports.
20201125_090523 (flashdancehostname01:stage03_hmc_update.sh): -----
20201125_090529 (flashdancehostname01:stage03_hmc_update.sh): -----
20201125_090529 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -
validate -l hmc1 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports returned '0'.
[25 Nov 2020 09:05:29,421] <6553608 CTRL DEBUG flashdancehostname01>
/BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports/HMC_Update_V9R1_SP931_2.iso is applicable
[25 Nov 2020 09:05:29,422] <6553608 CTRL DEBUG flashdancehostname01>
/BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports/MH01853_91931_3.iso is applicable
[25 Nov 2020 09:05:29,422] <6553608 CTRL DEBUG flashdancehostname01>
/BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports/HMC_Update_V9R1_SP941_4.iso is applicable
20201125_090529 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -
prepare -l hmc1 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports.
20201125_090529 (flashdancehostname01:stage03_hmc_update.sh): -----
Prepare succeeded for HMC 172.23.1.246
20201125_091553 (flashdancehostname01:stage03_hmc_update.sh): -----
20201125_091553 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -
prepare -l hmc1 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports returned '0'.
20201125_091553 (flashdancehostname01:stage03_hmc_update.sh): Starting date: Wed Nov 25 09:05:22 IST 2020 Ending Date: Wed Nov
25 09:15:53 IST 2020.

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

Example Output: (FP2->FP5: FP2 customers applying FP3 HMC levels)

STAGE 3 - Updating HMC

```
$ ./stage03_hmc_update.sh prepare hmc1
20210514_232321 (reverseflash01:stage03_hmc_update.sh): Starting date: Fri May 14 23:23:21 EDT 2021.
20210514_232322 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate
-l hmc1 -f /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports.
20210514_232322 (reverseflash01:stage03_hmc_update.sh): -----
20210514_232328 (reverseflash01:stage03_hmc_update.sh): -----
20210514_232328 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate
-l hmc1 -f /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports returned '0'.
[14 May 2021 23:23:28,600] <3408206 CTRL DEBUG reverseflash01>
/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports/HMC_Recovery_V9R19l_1 is applicable
[14 May 2021 23:23:28,600] <3408206 CTRL DEBUG reverseflash01>
/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports/HMC_Update_V9R1_SP930_2.iso is applicable
20210514_232328 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -prepare
-l hmc1 -f /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports.
20210514_232328 (reverseflash01:stage03_hmc_update.sh): -----
Prepare succeeded for HMC 172.23.1.246
20210514_232329 (reverseflash01:stage03_hmc_update.sh): -----
20210514_232329 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -prepare
-l hmc1 -f /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports returned '0'.
20210514_232329 (reverseflash01:stage03_hmc_update.sh): Starting date: Fri May 14 23:23:21 EDT 2021 Ending Date: Fri May 14
23:32:39 EDT 2021.

(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP7_FP3/fixpack_tools/application
```

2. Command: Update. FP4->FP5: Applies one iso update which takes approximately 40 minutes to an hour. FP3->FP5: Apply FP4 HMC levels first. FP4 has 5 HMC updates and takes between 60 and 90 minutes to complete with an HMC reboot between each update. May require running the update command multiple times if all updates are not applied. FP2->FP5: Apply FP3 HMCs levels before FP4 and FP5 updates. Includes two HMC updates.

```
./stage03_hmc_update.sh install hmc1
```

Example Output:

```
$ ./stage03_hmc_update.sh install hmc1
20220913_185306 (reverseflash01:stage03_hmc_update.sh): Starting date: Tue Sep 13 18:53:06 EDT 2022.
20220913_185307 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate
-l hmc1 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports.
20220913_185307 (reverseflash01:stage03_hmc_update.sh): -----
20220913_185313 (reverseflash01:stage03_hmc_update.sh): -----
20220913_185313 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate
-l hmc1 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports returned '0'.
[13 Sep 2022 18:53:13,027] <2360452 CTRL DEBUG reverseflash01>
/BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports/MH01898_91942_1.iso is applicable
20220913_185313 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -install
-l hmc1 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports.
20220913_185313 (reverseflash01:stage03_hmc_update.sh): -----
SNMP string exist on HMC: 172.23.1.246
20220913_192326 (reverseflash01:stage03_hmc_update.sh): -----
20220913_192326 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -install
-l hmc1 -f /BCU_share/FP9_FP5/firmware/hmc/CR8/image/imports returned '0'.
20220913_192326 (reverseflash01:stage03_hmc_update.sh): Script './stage03_hmc_update.sh' with arguments 'install hmc1' ended with
rc='0'. Start: Tue Sep 13 18:53:06 EDT 2022 End: Tue Sep 13 19:23:26 EDT 2022. Elapsed Time (Seconds): 1820 (H:M:S):(00:30:20).
20220913_192326 (reverseflash01:stage03_hmc_update.sh): Normalizing management hostname.
20220913_192327 (reverseflash01:stage03_hmc_update.sh): Management hostname is 'reverseflash01'.
20220913_192327 (reverseflash01:stage03_hmc_update.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from
script './stage03_hmc_update.sh'.' to 'user@customer.com' '-c root@localhost'.
20220913_192327 (reverseflash01:stage03_hmc_update.sh): Notification sent.
20220913_192327 (reverseflash01:stage03_hmc_update.sh): Writing output to
/BCU_share/support/FP9_FP5/log/stage03_hmc_update.sh_reverseflash01_20220913_185306.log.rc.
20220913_192327 (reverseflash01:stage03_hmc_update.sh): Completed.
You have mail in /usr/spool/mail/root

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

Example Output: (FP3->FP5: FP3 Customers applying FP4 levels)

```
$ ./stage03_hmc_update.sh install hmc1
20201125_091927 (flashdancehostname01:stage03_hmc_update.sh): Starting date: Wed Nov 25 09:19:27 IST 2020.
20201125_091928 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -
validate -l hmc1 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports.
20201125_091928 (flashdancehostname01:stage03_hmc_update.sh): -----
20201125_091934 (flashdancehostname01:stage03_hmc_update.sh): -----
20201125_091934 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -
validate -l hmc1 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports returned '0'.
```

STAGE 3 - Updating HMC

```
[25 Nov 2020 09:19:34,177] <3867330 CTRL DEBUG flashdancehostname01>
/BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports/HMC_Update_V9R1_SP931_2.iso is applicable
[25 Nov 2020 09:19:34,177] <3867330 CTRL DEBUG flashdancehostname01>
/BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports/MH01853_91931_3.iso is applicable
[25 Nov 2020 09:19:34,178] <3867330 CTRL DEBUG flashdancehostname01>
/BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports/HMC_Update_V9R1_SP941_4.iso is applicable
20201125_091934 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -
install -l hmc1 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports.
20201125_091934 (flashdancehostname01:stage03_hmc_update.sh): -----
SNMP string exist on HMC: 172.23.1.246
20201125_103056 (flashdancehostname01:stage03_hmc_update.sh): -----
20201125_103056 (flashdancehostname01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -
install -l hmc1 -f /BCU_share/FP8_FP4/firmware/hmc/CR8/image/imports returned '0'.
20201125_103056 (flashdancehostname01:stage03_hmc_update.sh): Starting date: Wed Nov 25 09:19:27 IST 2020 Ending Date: Wed Nov
25 10:30:56 IST 2020.

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

Example Output: (FP2->FP5: FP2 customers applying FP3 levels)

```
$ ./stage03_hmc_update.sh install hmc1
20210515_000252 (reverseflash01:stage03_hmc_update.sh): Starting date: Sat May 15 00:02:52 EDT 2021.
20210515_000253 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate
-l hmc1 -f /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports.
20210515_000253 (reverseflash01:stage03_hmc_update.sh): -----
20210515_000259 (reverseflash01:stage03_hmc_update.sh): -----
20210515_000259 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate
-l hmc1 -f /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports returned '0'.
[15 May 2021 00:02:59,949] <3932556 CTRL DEBUG reverseflash01>
/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports/HMC_Recovery_V9R191_1 is applicable
[15 May 2021 00:02:59,949] <3932556 CTRL DEBUG reverseflash01>
/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports/HMC_Update_V9R1_SP930_2.iso is applicable
20210515_000300 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -install
-l hmc1 -f /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports.
20210515_000300 (reverseflash01:stage03_hmc_update.sh): -----
SNMP string exist on HMC: 172.23.1.246
20210515_004858 (reverseflash01:stage03_hmc_update.sh): -----
20210515_004858 (reverseflash01:stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -install
-l hmc1 -f /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports returned '0'.
20210515_004858 (reverseflash01:stage03_hmc_update.sh): Starting date: Sat May 15 00:02:52 EDT 2021 Ending Date: Sat May 15
00:48:58 EDT 2021.

(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP7_FP3/fixpack_tools/application
```

If no error repeat the command to apply the rest of the updates.

3. Command: Verify the second hmc, labeled hmc1, is updated.

```
appl_ls_hw -l hmc1 -A M_IP_address | sed 's|'|g' | while read ip;do ssh -n hscroot@$ip 'lshmc -V';done
```

Example Output:

```
$ appl_ls_hw -l hmc1 -A M_IP_address | sed 's|'|g' | while read ip;do ssh -n hscroot@$ip 'lshmc -V';done
"version= Version: 9
Release: 1
Service Pack: 942
HMC Build level 2109060506
MH01810 - HMC V9R1 M930
MH01831 - HMC V9R1 M931
MH01853 - Required fix for HMC V9R1 M910+ to install M940
MH01859 - HMC V9R1 M941
MH01876 - HMC V9R1 M942
MH01898 - iFix for HMC V9R1 M942
", "base_version=V9R1
"
```

Example Output: (FP3->FP5: FP3 customers applying FP4 HMC levels)

```
$ appl_ls_hw -l hmc1 -A M_IP_address | sed 's|'|g' | while read ip;do ssh -n hscroot@$ip 'lshmc -V';done
"version= Version: 9
Release: 1
Service Pack: 942
HMC Build level 2011270432
MH01810 - HMC V9R1 M930
```

STAGE 3 - Updating HMC

```
MH01831 - HMC V9R1 M931
MH01853 - Required fix for HMC V9R1 M910+ to install M940
MH01859 - HMC V9R1 M941
MH01876 - HMC V9R1 M942
", "base_version=V9R1
"
```

Example Output: (FP2->FP5: FP2 customers applying FP3 HMC levels)

```
$ appl_ls_hw -l hmc1 -A M_IP_address | sed 's|'|g' | while read ip;do ssh -n hscroot@$ip 'lshmc -V';done
"version= Version: 9
  Release: 1
  Service Pack: 930
HMC Build level 1904220700
MH01810 - HMC V9R1 M930
", "base_version=V9R1
"
```

4. Check the HMC level and proceed to the next step as indicated.
 - a. If the HMC level is V9 R1 942 then proceed to the phase 4 to validate the updates.
 - b. If the HMC level is V9R1_M930 and this is a FP2->FP4 scenario then proceed to phase 4 to validate the V1.1 FP3 HMC level updates.
 - c. If the HMC level is V9 R1 940 and there are no errors, then proceed to the next item to finish installing the update. There is a timing issue in the V1.1 FP4 that can prevent the platform layer from applying all of the updates in one command.
5. Command: Run the update again to apply the rest of the updates. This scenario has only occurred during internal testing and is only needed if the fixpack did not apply all of the updates available.

```
./stage03_hmc_update.sh install hmc1
```

Example Output:

```
$ ./stage03_hmc_update.sh install hmc1
20201014_212617 (stage03_hmc_update.sh): Starting date: Wed Oct 14 21:26:17 EDT 2020.
20201014_212618 (stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate -l hmc0 -f
/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports.
20201014_212618 (stage03_hmc_update.sh): -----
20201014_212623 (stage03_hmc_update.sh): -----
20201014_212623 (stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate -l hmc0 -f
/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports returned '1'.
20201014_212623 (stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate -l hmc1 -f
/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports.
20201014_212623 (stage03_hmc_update.sh): -----
20201014_212630 (stage03_hmc_update.sh): -----
20201014_212630 (stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -validate -l hmc1 -f
/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports returned '0'.
[14 Oct 2020 21:26:30,336] <4326262 CTRL DEBUG b30i01> /BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports/HMC_Recovery_V9R191_1
is applicable
[14 Oct 2020 21:26:30,336] <4326262 CTRL DEBUG b30i01>
/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports/HMC_Update_V9R193_SP0_2.iso is applicable
20201014_212630 (stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -install -l hmc1 -f
/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports.
20201014_212630 (stage03_hmc_update.sh): -----
Use of uninitialized value in concatenation (.) or string at /opt/ibm/aixappl/pfplayer/lib/Ctrl/Updates/HMC.pm line 504.
SNMP string exist on HMC: 172.24.1.246
20201014_221420 (stage03_hmc_update.sh): -----
20201014_221420 (stage03_hmc_update.sh): Running /opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_hmc update -install -l hmc1 -f
/BCU_share/FP7_FP3/firmware/hmc/CR8/image/imports returned '0'.
20201014_221420 (stage03_hmc_update.sh): Starting date: Wed Oct 14 21:26:17 EDT 2020 Ending Date: Wed Oct 14 22:14:20 EDT 2020.
```

Phase 4: Verification of the update.

1. Command: Verify HMC firmware levels in the lines with `FWLevel` using query command below:

```
appl_ls_hw -r hmc -A Logical_name | xargs -n 1 ${PL_ROOT}/bin/icmds/appl_ctrl_hmc query -l
```

Example Output: (for CR8 to CR9 Models)

```
$ appl_ls_hw -r hmc -A Logical_name | xargs -n 1 ${PL_ROOT}/bin/icmds/appl_ctrl_hmc query -l
Details:
  PLLogicalName: hmc0
  MachineType: 7042
  FWLevel: 9.1.942
  TotalManagedSystems: 4
  AccessState: Unlocked
  Manufacturer: IBM
  HostName: reverseflashhmc1
  Status: Online
  Description: Hardware Management Console
  Architecture: x86_64
  SerialNumber: 2133EED
  Model: CR8
  ArchitectureManaged: ppc
  IPv4Address: ["172.23.1.245","172.16.0.1","9.42.136.251"]
  EficesApplied: ["MH01810 - HMC V9R1 M930
", "MH01831 - HMC V9R1 M931
", "MH01853 - Required fix for HMC V9R1 M910+ to install M940
", "MH01859 - HMC V9R1 M941
", "MH01876 - HMC V9R1 M942
", "MH01898 - iFix for HMC V9R1 M942
"]
  Corporate_IP: 9.42.136.251
  ManagedSystems: ["Server-8286-42A-SN21574DW","Server-8284-22A-SN21557DW","Server-8284-22A-SN21557EW","Server-8286-42A-SN21574EW"]
Details:
  Architecture: x86_64
  Model: CR8
  TotalManagedSystems: 4
  FWLevel: 9.1.942
  IPv4Address: ["172.23.1.246","172.17.0.2","9.42.136.252"]
  AccessState: Unlocked
  MachineType: 7042
  HostName: reverseflashhmc2
  Corporate_IP: 9.42.136.252
  ArchitectureManaged: ppc
  ManagedSystems: ["Server-8284-22A-SN21557EW","Server-8286-42A-SN21574DW","Server-8286-42A-SN21574EW","Server-8284-22A-SN21557DW"]
  EficesApplied: ["MH01810 - HMC V9R1 M930
", "MH01831 - HMC V9R1 M931
", "MH01853 - Required fix for HMC V9R1 M910+ to install M940
", "MH01859 - HMC V9R1 M941
", "MH01876 - HMC V9R1 M942
", "MH01898 - iFix for HMC V9R1 M942
"]
  SerialNumber: 2133EDD
  PLLogicalName: hmc1
  Description: Hardware Management Console
  Status: Online
  Manufacturer: IBM
```

2. Check the HMC level and proceed to the next step as indicated.
 - a. If the HMC levels are V9 R1 942 MH01898 then proceed Stage 4.
 - b. If the HMC levels are V9 R1 942 MH01876 then proceed to phase 1 to apply the V1.1 FP5 HMC levels.
 - c. If the HMC level is V9R1_M930 and this is a FP2->FP4 scenario then proceed to phase 1 to apply the V1.1 FP4 HMC levels.
 - d. If the HMC level is V9 R1 940 and there are no errors, then proceed to the Phase 2 and / or Phase 3 to complete the V1.1 FP4 application for the HMCs at this level. There is a timing issue in the platform layer that sometimes does not apply all of the eligible updates in one pass.

STAGE 4 - Storage firmware update for both V7000 and FlashSystem

Stage 4 Description

New in V1.1 FP4 are tools to help manage the update risks related to updating storage enclosures. The script './stage04_storage_update.sh' replaces the complexities related to managing storage updates.

The following will illustrate the storage enclosure update strategy using a 12.5 DN V1.1 system. Note that the order of the storage ids will not necessarily be guaranteed to match the order within the racks.

1. The following command shows a listing of V1.1 Storage Enclosures. Using a 12.5 DN example here helps illustrate the strategy. V1.0 customers can have up to 18.5 DN and V1.1 customers may have up to 24.5 DN which both represent 7 racks or frames worth of equipment.

```
$ appl_ls_hw -r storage -M
```

NAME	HOSTNAME	IP	MODULE	STATUS	DESCRIPTION
storage0	pdoaV7_00	172.23.1.181		Online	IBM Storwize V7000 FAB-1 Storage
storage1	pdoaFlash_00	172.23.1.182		Online	IBM FlashSystem 900 Storage
storage2	pdoaV7_01	172.23.1.183		Online	IBM Storwize V7000 FAB-1 Storage
storage3	pdoaFlash_01	172.23.1.184		Online	IBM FlashSystem 900 Storage
storage4	pdoaV7_02	172.23.1.185		Online	IBM Storwize V7000 FAB-1 Storage
storage5	pdoaFlash_02	172.23.1.186		Online	IBM FlashSystem 900 Storage
storage6	pdoaV7_03	172.23.1.187		Online	IBM Storwize V7000 FAB-1 Storage
storage7	pdoaFlash_03	172.23.1.188		Online	IBM FlashSystem 900 Storage
storage8	pdoaV7_04	172.23.1.189		Online	IBM Storwize V7000 FAB-1 Storage
storage9	pdoaFlash_04	172.23.1.190		Online	IBM FlashSystem 900 Storage
storage10	pdoaV7_05	172.23.1.191		Online	IBM Storwize V7000 FAB-1 Storage
storage11	pdoaFlash_05	172.23.1.192		Online	IBM FlashSystem 900 Storage
storage12	pdoaV7_06	172.23.1.193		Online	IBM Storwize V7000 FAB-1 Storage
storage13	pdoaFlash_06	172.23.1.194		Online	IBM FlashSystem 900 Storage
storage14	pdoaV7_07	172.23.1.195		Online	IBM Storwize V7000 FAB-1 Storage
storage15	pdoaFlash_07	172.23.1.196		Online	IBM FlashSystem 900 Storage
storage16	pdoaV7_08	172.23.1.197		Online	IBM Storwize V7000 FAB-1 Storage
storage17	pdoaFlash_08	172.23.1.198		Online	IBM FlashSystem 900 Storage
storage18	pdoaV7_09	172.23.1.199		Online	IBM Storwize V7000 FAB-1 Storage
storage19	pdoaFlash_09	172.23.1.200		Online	IBM FlashSystem 900 Storage
storage20	pdoaV7_10	172.23.1.201		Online	IBM Storwize V7000 FAB-1 Storage
storage21	pdoaFlash_10	172.23.1.202		Online	IBM FlashSystem 900 Storage
storage22	pdoaV7_11	172.23.1.203		Online	IBM Storwize V7000 FAB-1 Storage
storage23	pdoaFlash_11	172.23.1.204		Online	IBM FlashSystem 900 Storage
storage24	pdoaV7_12	172.23.1.205		Online	IBM Storwize V7000 FAB-1 Storage
storage25	pdoaFlash_12	172.23.1.206		Online	IBM FlashSystem 900 Storage

2. The platform layer can update all storage enclosures of the same type in parallel. However, to reduce the risks of having to replace canisters during the update there is a goal to limit the number of enclosures updated at any single time. A good rule of thumb is to update only 3 or 4 enclosures at a time. A further strategy to reduce the impact of errors that could hit in the field is to run a test run on the Foundation Enclosures first.
3. Note that the enclosures used for the single test and those assigned to the groups are more or less arbitrary. The ratio of enclosures to update is picked assuming that at any one time it is possible for 1 of 3 or 1 of 4 enclosure may experience a problem that could require support to intervene or canister replacements. Customers who are less risk adverse may decide to increase the # of enclosures per parallel cycle to help reduce the time. For the model below, expect to take about an hour for each update expect to take 8 hours for the example below.

STAGE 4 - Storage firmware update for both V7000 and FlashSystem

4. From a planning perspective it is possible to run the updates while the system is running with low I/O requirements and then put the system back into full production when that update completes. It is not necessary to update all enclosures between full production usage.
 - a. Foundation Updates V7000/Flash900 update test.
 - i. Update 1: storage0
 - ii. Update 2: storage1 [V1.1 customers only]
 - b. First round of core updates are dedicated for the V7000 enclosures. The model simply takes the first N enclosures that have not yet been updated. For V1.0 we use N=3 and for V1.1 we use N=4. Below we see N=4 or 4 enclosures per update.
 - i. Update 3: storage2,storage4,storage6,storage8
 - ii. Update 4: storage10,storage12,storage14,storage16
 - iii. Update 5: storage18,storage20,storage22,storage24
 - c. Second round of core updates take care of Flash900 enclosures. V1.1 customers only. This strategy updates 4 enclosures per update.s
 - i. Update 6: storage3,storage5,storage7,storage9
 - ii. Update 7: storage11,storage13,storage15,storage17
 - iii. Update 8: storage19,storage21,storage23,storage25

STAGE 4 - Storage firmware update for both V7000 and FlashSystem

Phases/Steps

- Stage 4 Phase 1: Preparation
- Stage 4 Phase 2: V7000 and Flash900 Updates
- Stage 4 Phase 3: Validation

Outage Requirements

- No outage requirements for this stage, however an outage could be taken. Storage firmware upgrades can be done when there is minimal workload on the system. System can be up and running.
- During the update however, the I/O capacity of the appliance will be reduced while storage canisters are rebooted to apply updated firmware.

Time Per Phase/Step

- Phase 1: The commands take a few minutes to run per enclosure. If there are any issues with the storage allow time to address any issues that appear in the eventlog.
- Phase 2:
 - Using Default Risk Option
 - V1.1 Foundation V7000 90 Mins
 - V1.1 Data V7000 (sets of 3) 90 Min / set.
 - V1.1 Foundation Flash900 90 Mins
 - V1.1 Data Flash900 (sets of 3) 90 Min /set.
 - FP3->FP5 Customers
 - Add an additional 90 minutes to update the V1.1 Foundation V7000 to V1.1 FP3 V7000 levels.
 - Add an additional 90 minutes for each set of V1.1 Data V7000s to update to V1.1 FP3 V7000 levels.
 - May be necessary to add additional time to apply Flash900 Foundation and Data updates to V1.1 FP4 levels.
 - FP2->FP5 Customers
 - Add an additional 90 minutes to update the V1.1 Foundation V7000 to V1.1 FP3 V7000 levels.
 - Add an additional 90 minutes for each set of V1.1 Data V7000s to update to V1.1 FP3 V7000 levels.
- Phase 3: 10 Minutes.

Risk Mitigation

- V7000 gen1, gen2 and Flash900 storage enclosures support concurrent updates however the I/O workload needs to be low to minimal.

STAGE 4 - Storage firmware update for both V7000 and FlashSystem

- With a default risk profile. Only some of the storage will be updated at any point in time. This reduces the risk of hitting issues in the field impacting large number of enclosure canisters which could require canister replacements.

Backout Options

- Firmware downgrades are not recommended and may not be possible with Storage Enclosures. Once the firmware is updated on the storage enclosures there will be no reasonable way to return to older firmware.

Phase 1: Preparation

1. Login to a screen or vtmenu console session as root on the management host.
2. Command: Change the working directory.

```
cd /BCU_share/FP9_FP5/fixpack_tools/application
```

FP3->FP5 customers will need to apply V1.1. FP4 V7000 levels first. Use the following to set the CWD to the FP8_FP4 path. At the time of this writing it is not known if it is necessary to apply the FP4 Flash900 levels prior to applying FP5 levels. V1.1 FP3 to V1.1 FP5 testing is planned after the fixpack is released.

```
cd /BCU_share/FP8_FP4/fixpack_tools/application
```

FP2->FP5 customers need to apply V1.1 FP3 V7000 levels first. Use the following to set the CWD to the FP7_FP3 path. V1.1 FP3 customers. As of this writing it is not yet known or tested to update from V1.1 FP3 directory to V1.1 FP5 for V7000 or Flash900 enclosures. Any issues with the updates will be determined during the validation steps.

```
$ cd /BCU share/FP7_FP3/fixpack tools/application
```

3. Command: Determine the serial numbers for the V7000s. One will be needed to download the latest update test utility from IBM FixCentral. Due to a recent update the testers are now valid only for 60 days form their release date and will not beyond that date.

```
appliance ls hw -r storage -A Machine type,Model,FW level,Serial number | grep 2076
```

Example Output:

```
$ appl_ls_hw -r storage -A Machine_type,Model,FW_level,Serial_number | grep 2076
"2076","524","8.2.1.11","#####"
```

4. Command: Create the override directory in the /BCU_share/FP9_FP5 folder.

```
mkdir /BCU share/FP9 FP5/firmware/storage/2076/image/imports/override/
```

5. Download the latest V7000 test utility from IBM Fix Central
 - a. Login to the IBM FixCentral
 - b. Find fixes releated to V7000 (2076)
 - c. Click on Product Software Link
 - d. Find the latest "Spectrum Virtual Software Upgrade Test Utility".
 - e. Click the link and attempt to download. It will prompt for a MT / SN. The MT is 2076 and then use the serial number from the first enclosure found above. (If this does not work contact IBM Support).
 - f. Download the "IBM_INSTALL_FROM_8.4_AND_EARLIER_upgradetest_." and upload to /BCU_share/FP9_FP5/firmware/storage/2076/image/imports/override/
6. Command: Replace the tester included with the fixpack, with the newly downloaded tester. This is one long command.

```
if find /BCU_share/FP9_FP5/firmware/storage/2076/image/imports/override/ -name "IBM_INSTALL_FROM 8.4_AND_EARLIER_upgradetest*";
then mv /BCU_share/FP9_FP5/firmware/storage/2076/image/imports/testupdate /BCU_share/FP9_FP5/firmware/storage/2076/image/imports
/testupdate_fp5ga;ln -s /BCU_share/FP9_FP5/firmware/storage/2076/image/imports/override
/BCU_share/FP9_FP5/firmware/storage/2076/image/imports/testupdate :fi
```

7. Command: Verify the new tester is linked.

```
ls -la /BCU share/FP9 FP5/firmware/storage/2076/image/imports
```

STAGE 4 - Storage firmware update for both V7000 and FlashSystem

Example Output:

```
$ ls -la /BCU_share/FP9_FP5/firmware/storage/2076/image/imports
total 16
drwxr-xr-x 6 root system 256 Oct 06 01:11 .
drwxr-xr-x 3 root system 256 Jul 24 2021 ..
-rwxr--r-- 1 root system 893 Feb 03 2022 collectdiskfw.sh
drwxr-xr-x 2 root system 256 Apr 21 22:39 controller
drwxr-xr-x 2 root system 256 Jul 19 01:56 drives
drwxr-xr-x 2 root system 256 Oct 06 01:07 override
-rw-r--r-- 1 root system 2659 Jul 19 03:43 target_level_drives_524.cfg
lrwxrwxrwx 1 root system 63 Oct 06 01:11 testupdate -> /BCU_share/FP9_FP5/firmware/storage/2076/image/imports/override
drwxr-xr-x 2 root system 256 Jul 19 01:56 testupdate_fp5ga
```

8. Command: Verify only one update test utility is found in the override directory. In the example below, this is version 37.2, but yours will likely be higher.

```
ls /BCU_share/FP9_FP5/firmware/storage/2076/image/imports/testupdate/
```

Example Output:

```
$ ls /BCU_share/FP9_FP5/firmware/storage/2076/image/imports/testupdate/
IBM_INSTALL_FROM_8.4_AND_EARLIER_upgradetest_37.2
```

9. Command: Run the following to check the eventlog status. Contact IBM support to help resolve errors. This step is a repeat of steps taken in Stage 1.

```
./check_storage.sh
```

Example Output:

```
$ ./check_storage.sh
20201204_225608 (flashdancehostname01:check_storage.sh): Checking the storage status.
**** 172.23.1.181 ****
**** 172.23.1.182 ****
sequence_number last_timestamp object_type object_id object_name copy_id status fixed event_id error_code description
secondary_object_type secondary_object_id
134 200214060932 internal 0 alert no 085153 3087 Quorum device error
**** 172.23.1.183 ****
sequence_number last_timestamp object_type object_id object_name copy_id status fixed event_id error_code description
934 201204224810 io_grp 0 io_grp0 alert no 072901 1052 Inter-canister PCIe
link degraded
**** 172.23.1.184 ****
**** 172.23.1.185 ****
sequence_number last_timestamp object_type object_id object_name copy_id status fixed event_id error_code description
847 200214072150 enclosure 1 alert no 045102 1260 SAS cable fault type 2
**** 172.23.1.186 ****

(1) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

10. Command: Use the following command to check to see if there are any battery charging cycles running or End of Life warnings. If any batteries show 'yes' for the end_of_life_warning open a PMR to have the battery replaced. Battery replacements will add a day to replace the battery and for the battery to be recognized, charged and for the firmware to normalize.

```
./check_storage_battery.sh
```

Example Output:

```
$ ./check_storage_battery.sh
20201204_230314 (flashdancehostname01:check_storage_battery.sh): Checking the storage status.
**** 172.23.1.181 ****
enclosure_id battery_id status charging_status recondition_needed percent_charged end_of_life_warning
2 1 online idle no 100 no
2 2 online idle no 100 no
**** 172.23.1.182 ****
enclosure_id battery_id status charging_status recondition_needed percent_charged end_of_life_warning
1 1 online idle no 96 no
1 2 online idle no 91 no
**** 172.23.1.183 ****
```

STAGE 4 - Storage firmware update for both V7000 and FlashSystem

```
enclosure_id battery_id status charging_status recondition_needed percent_charged end_of_life_warning
1 1 online idle no 100 no
1 2 online idle no 100 no
**** 172.23.1.184 ****
enclosure_id battery_id status charging_status recondition_needed percent_charged end_of_life_warning
1 1 online idle no 100 no
1 2 online idle no 91 no
**** 172.23.1.185 ****
enclosure_id battery_id status charging_status recondition_needed percent_charged end_of_life_warning
2 1 online idle no 100 no
2 2 online idle no 100 no
**** 172.23.1.186 ****
enclosure_id battery_id status charging_status recondition_needed percent_charged end_of_life_warning
1 1 online idle no 100 no
1 2 online idle no 95 no

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

11. Command: FP2->FP5 customers who need to apply V1.1 FP3 levels. FP3->FP5 customers likely need to apply V1.1 FP4 levels. Customers already on V1.1 FP4 can skip this step. Use the following command to determine all of the V7000 enclosures in your system. The example output shows 'storage0' and 'storage2'. These will need to be added to the command line in the prepare and update steps to only target the V7000s for the V1.1 FP3 update steps.

```
appl_ls_hw -r storage | grep V7000
```

Example Output: (PDOA 1.1 1.5 DN system)

```
$ appl_ls_hw -r storage | grep V7000
storage0 - - Online IBM Storwize V7000 FAB-1 Storage
storage2 - - Online IBM Storwize V7000 FAB-1 Storage
```

12. Command: Run the following validation steps on all storage enclosures. Enclosures that are already updated will not appear in the list. Enclosures that fail the storage test update procedure will have non-zero return codes.

```
./stage04_storage_update.sh validate
```

FP2->FP5 and FP3->FP5 Customers: replace 'storage0,storage2' with your comma separated list of V7000 platform layer enclosure names. This was found in item 5 above. This command must be run using the appropriate /BCU_share/FP7_FP3 or /BCU_share/FP8_FP4 working directory in order to find the V1.1 FP3 or V1.1 FP4 V7000 updates.

```
./stage04_storage_update.sh validate storage0,storage2
```

Example output: (V1.1 FP4 to V1.1 FP5 scenario)

```
$ ./stage04_storage_update.sh validate
20220727_192539 (reverseflash01:stage04_storage_update.sh): Starting date: Wed Jul 27 19:25:39 EDT 2022.
20220727_192546 (reverseflash01:stage04_storage_update.sh): Running command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -validate -l storage0,storage2 -f /BCU_share/FP9_FP5/firmware/storage/2076/image -t 8.2.1.15'
STORAGE:storage0:172.23.1.181:0:
STORAGE:storage2:172.23.1.183:0:
20220727_192741 (reverseflash01:stage04_storage_update.sh): Ran command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -validate -l storage0,storage2 -f /BCU_share/FP9_FP5/firmware/storage/2076/image -t 8.2.1.15' with rc='0'.
20220727_192741 (reverseflash01:stage04_storage_update.sh): Running command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -validate -l storage1,storage3 -f /BCU_share/FP9_FP5/firmware/storage/AE2/image -t 1.5.2.10'
STORAGE:storage3:172.23.1.184:0:
STORAGE:storage1:172.23.1.182:0:
20220727_192915 (reverseflash01:stage04_storage_update.sh): Ran command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -validate -l storage1,storage3 -f /BCU_share/FP9_FP5/firmware/storage/AE2/image -t 1.5.2.10' with rc='0'.
20220727_192915 (reverseflash01:stage04_storage_update.sh): Storage Status Lines:
0 0 0 0
20220727_192915 (reverseflash01:stage04_storage_update.sh): Script './stage04_storage_update.sh' with arguments 'validate' ended
with rc='0'. Start: Wed Jul 27 19:25:39 EDT 2022 End: Wed Jul 27 19:29:15 EDT 2022. Elapsed Time (Seconds): 216
(H:M:S):(00:03:36).
20220727_192915 (reverseflash01:stage04_storage_update.sh): Normalizing management hostname.
```

STAGE 4 - Storage firmware update for both V7000 and FlashSystem

```
20220727_192916 (reverseflash01:stage04_storage_update.sh): Management hostname is 'reverseflash01'.
20220727_192916 (reverseflash01:stage04_storage_update.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01'
from script './stage04_storage_update.sh' to 'user@company.com' '-c root@localhost,n9a5h5n8v2f5q0u9@ibm-analytics.slack.com'.
20220727_192916 (reverseflash01:stage04_storage_update.sh): Notification sent.
```

```
(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

Example Output: (FP3->FP5: FP3 customers who need to apply V1.1 FP4 first, but started in FP8_FP4's directory)

```
(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
$ ./stage04_storage_update.sh validate
20210517_083512 (reverseflash01:stage04_storage_update.sh): Starting date: Mon May 17 08:35:12 EDT 2021.
20210517_083519 (reverseflash01:stage04_storage_update.sh): Running command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -validate -l storage0,storage2 -f /BCU_share/FP8_FP4/firmware/storage/2076/image -t 8.2.1.11'
STORAGE:storage0:172.23.1.181:1:Error: The update operation on the system cannot be performed.
STORAGE:storage2:172.23.1.183:1:Error: The update operation on the system cannot be performed.
20210517_083657 (reverseflash01:stage04_storage_update.sh): Ran command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -validate -l storage0,storage2 -f /BCU_share/FP8_FP4/firmware/storage/2076/image -t 8.2.1.11' with rc='1'.
20210517_083657 (reverseflash01:stage04_storage_update.sh): Running command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -validate -l storage1,storage3 -f /BCU_share/FP8_FP4/firmware/storage/AE2/image -t 1.5.2.7'
STORAGE:storage3:172.23.1.184:0:
STORAGE:storage1:172.23.1.182:0:
20210517_083817 (reverseflash01:stage04_storage_update.sh): Ran command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -validate -l storage1,storage3 -f /BCU_share/FP8_FP4/firmware/storage/AE2/image -t 1.5.2.7' with rc='0'.
20210517_083817 (reverseflash01:stage04_storage_update.sh): Storage Status Lines:
1 0 1 0
20210517_083817 (reverseflash01:stage04_storage_update.sh): Starting date: Mon May 17 08:35:12 EDT 2021   Ending Date: Mon May 17
08:38:17 EDT 2021.

(1) root @ reverseflash01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
$
```

Example Output: (FP2->FP5: FP2 customers who need to apply V1.1 FP3 first.)

```
$ ./stage04_storage_update.sh validate storage0,storage2
20210517_115459 (reverseflash01:stage04_storage_update.sh): Starting date: Mon May 17 11:54:59 EDT 2021.
20210517_115506 (reverseflash01:stage04_storage_update.sh): Running command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -validate -l storage0,storage2 -f /BCU_share/FP7_FP3/firmware/storage/2076/image -t 7.8.1.10'
STORAGE:storage2:172.23.1.183:0:
STORAGE:storage0:172.23.1.181:0:
20210517_115658 (reverseflash01:stage04_storage_update.sh): Ran command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -validate -l storage0,storage2 -f /BCU_share/FP7_FP3/firmware/storage/2076/image -t 7.8.1.10' with rc='0'.
20210517_115658 (reverseflash01:stage04_storage_update.sh): Storage Status Lines:
0 0
20210517_115658 (reverseflash01:stage04_storage_update.sh): Starting date: Mon May 17 11:54:59 EDT 2021
```

- If there is an error use the following to collect and compress the pfplayer logs in /BCU_share/support/FP8_FP4/log/pfplayer and provide this tgz file to support. Note: For FP2 customers if running this command from the /BCU_share/FP7_FP3 fixpack directory the output will found in /BCU_share/support/FP7_FP3/log/pfplayer.

```
./getFPLogs.sh Stage04_Validate
```

Example output:

```
$ ./getFPLogs.sh Stage04_Validate
20201204_231427 (flashdancehostname01:getFPLogs.sh): Starting date: Fri Dec 4 23:14:27 IST 2020.
20201204_231427 (flashdancehostname01:getFPLogs.sh): Creating compressed file
/BCU_share/support/FP8_FP4/log/pfplayer/20201204_231427_Stage04_Validate_BCU_share_aixappl.tgz...
```

STAGE 4 - Storage firmware update for both V7000 and FlashSystem

13. Command: If there are no errors, run the prepare steps on all enclosures. `./stage04_storage_update.sh prepare`. This step will re-run the validation and will fail on any validation errors.

```
./stage04_storage_update.sh prepare
```

V1.1 FP2->FP5 customers who need to apply V1.1 FP3 or FP3->FP5 customers who need to apply V1.1 FP4 levels should use the following modified command and run from the V1.1 FP3 or V1.1 FP4 fixpack directory.

```
./stage04_storage_update.sh prepare storage0,storage2
```

Example output:

```
$ ./stage04_storage_update.sh prepare
20220727_193033 (reverseflash01:stage04_storage_update.sh): Starting date: Wed Jul 27 19:30:33 EDT 2022.
20220727_193040 (reverseflash01:stage04_storage_update.sh): Running command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -validate -l storage0,storage2 -f /BCU_share/FP9_FP5/firmware/storage/2076/image -t 8.2.1.15'
STORAGE:storage2:172.23.1.183:0:
STORAGE:storage0:172.23.1.181:0:
20220727_193234 (reverseflash01:stage04_storage_update.sh): Ran command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -validate -l storage0,storage2 -f /BCU_share/FP9_FP5/firmware/storage/2076/image -t 8.2.1.15' with rc='0'.
20220727_193234 (reverseflash01:stage04_storage_update.sh): Running command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -validate -l storage1,storage3 -f /BCU_share/FP9_FP5/firmware/storage/AE2/image -t 1.5.2.10'
STORAGE:storage3:172.23.1.184:0:
STORAGE:storage1:172.23.1.182:0:
20220727_193411 (reverseflash01:stage04_storage_update.sh): Ran command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -validate -l storage1,storage3 -f /BCU_share/FP9_FP5/firmware/storage/AE2/image -t 1.5.2.10' with rc='0'.
20220727_193411 (reverseflash01:stage04_storage_update.sh): Running command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -prepare -l storage0,storage2 -f /BCU_share/FP9_FP5/firmware/storage/2076/image'
STORAGE:storage0:172.23.1.181:0:
STORAGE:storage2:172.23.1.183:0:
20220727_193436 (reverseflash01:stage04_storage_update.sh): Running command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -prepare -l storage1,storage3 -f /BCU_share/FP9_FP5/firmware/storage/AE2/image'
STORAGE:storage1:172.23.1.182:0:
STORAGE:storage3:172.23.1.184:0:
20220727_193537 (reverseflash01:stage04_storage_update.sh): Storage Status Lines:
0 0 0 0
20220727_193537 (reverseflash01:stage04_storage_update.sh): Script './stage04_storage_update.sh' with arguments 'prepare' ended
with rc='0'. Start: Wed Jul 27 19:30:33 EDT 2022 End: Wed Jul 27 19:35:37 EDT 2022. Elapsed Time (Seconds): 304
(H:M:S): (00:05:04).
20220727_193537 (reverseflash01:stage04_storage_update.sh): Normalizing management hostname.
20220727_193538 (reverseflash01:stage04_storage_update.sh): Management hostname is 'reverseflash01'.
20220727_193538 (reverseflash01:stage04_storage_update.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01'
from script './stage04_storage_update.sh'.' to 'user@us.ibm.com' '-c root@localhost'.
20220727_193538 (reverseflash01:stage04_storage_update.sh): Notification sent.
You have mail in /usr/spool/mail/root
```

- If there is an error use `./getFPLogs.sh Stage04_Prepare` to collect and compress the pfplayer logs in `/BCU_share/support/FP8_FP4/log/pfplayer` and provide this tgz file to support.
- Otherwise proceed to the update Phase.

Phase 2: Update V7000 and Flash900 Firmware

In this fixpack the `./stage04_storage_update.sh` script has multiple options for the update. It will run steps in order. Any error between processes will stop the update. The update can be resumed and will skip enclosures that have updated already. The recommended method is to follow the default model which reduces the number of enclosures at risk at any point in time.

- default
 - Validate All
 - Prepare All
 - Update Foundation V7000.
 - Enclosure and/or disks.
 - Update Data V7000s (3 at a time until all V7Ks are updated)
 - Enclosure and/or disks.
 - Update Foundation Flash
 - Update Data Flash (3 at a time until all V7Ks are updated.)
- doall
 - Validate All
 - Prepare All
 - Update All V7000s in parallel.
 - Enclosure and/or disks.
 - Update All Flash900s in parallel.
- storageN
 - Validate storageN
 - Prepare storageN
 - Update storageN.
 - May need to use `PDOA_OVERRIDE=Y` if validation fails on that enclosure.
 - If V7000 will update enclosure and/or disks.
 - Does not allow specifying multiple devices at the same time.

STAGE 4 - Storage firmware update for both V7000 and FlashSystem

1. Command: The following command will update all storage enclosures using the default risk model.

```
./stage04_storage_update.sh default install
```

FP2->FP5 Customers who need to apply FP3 V7000 levels or FP3->FP5 customers who need to apply FP4 V7000 levels should use the following modified command. Replacing the 'storage0,storage2' platform layer labels to match the v7000 labels determined earlier.

```
./stage04_storage_update.sh default install storage0,storage2
```

Example Output: [\(See file](#)

[PDOA FP9 FP5 Readme References\stage04_storage_update.sh reverseflash01 20220727 193917.10g for full example output.\)](#) Otherwise look for the 'Storage Status Lines:' section which should have all '0's and rc=0.

```
$ ./stage04_storage_update.sh default install
20220728_013322 (reverseflash01:stage04_storage_update.sh): Storage Status Lines:
0 0 0 0
20220728_013322 (reverseflash01:stage04_storage_update.sh): Script './stage04_storage_update.sh' with arguments 'default install'
ended with rc='1'. Start: Wed Jul 27 19:39:17 EDT 2022 End: Thu Jul 28 01:33:22 EDT 2022. Elapsed Time (Seconds): 21245
(H:M:S): (05:54:05).
20220728_013322 (reverseflash01:stage04_storage_update.sh): Normalizing management hostname.
20220728_013323 (reverseflash01:stage04_storage_update.sh): Management hostname is 'reverseflash01'.
20220728_013323 (reverseflash01:stage04_storage_update.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01'
from script './stage04_storage_update.sh' to 'user@company.com' '-c root@localhost'.
20220728_013323 (reverseflash01:stage04_storage_update.sh): Notification sent.
```

Example Output: (FP2->FP5 customers applying FP3 V7000 levels)

```
$ ./stage04_storage_update.sh default install storage0,storage2
20210517_140458 (reverseflash01:stage04_storage_update.sh): Starting date: Mon May 17 14:04:58 EDT 2021.
20210517_140505 (reverseflash01:stage04_storage_update.sh): Running command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -validate -l storage0,storage2 -f /BCU_share/FP7_FP3/firmware/storage/2076/image -t 7.8.1.10'
STORAGE:storage0:172.23.1.181:0:
STORAGE:storage2:172.23.1.183:0:
20210517_140655 (reverseflash01:stage04_storage_update.sh): Ran command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -validate -l storage0,storage2 -f /BCU_share/FP7_FP3/firmware/storage/2076/image -t 7.8.1.10' with rc='0'.
20210517_140655 (reverseflash01:stage04_storage_update.sh): Running command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -prepare -l storage0,storage2 -f /BCU_share/FP7_FP3/firmware/storage/2076/image'
STORAGE:storage2:172.23.1.183:0:
STORAGE:storage0:172.23.1.181:0:
20210517_140715 (reverseflash01:stage04_storage_update.sh): Running V7000 update to '7.8.1.10' for 'storage0'.
20210517_140715 (reverseflash01:stage04_storage_update.sh): Running command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -install -l storage0 -f /BCU_share/FP7_FP3/firmware/storage/2076/image -t 7.8.1.10'
Details:
  PLLogicalName: storage0
  FWLevel: 7.8.1.10
  MachineType: 2076
  Status: Online
  FWBuild: 135.9.1905291321000
  Description: IBM Storwize V7000 FAB-1 Storage
  HostName: reverseflashV7_00
  Model: 524
  Manufacturer: IBM
  IPv4Address: ["172.23.1.181"]
  SerialNumber: 7821CKY
  AccessState: Unlocked
STORAGE:storage0:172.23.1.181:0:
Details:
  HostName: reverseflashV7_00
  Model: 524
  FWBuild: 135.9.1905291321000
  Description: IBM Storwize V7000 FAB-1 Storage
  IPv4Address: ["172.23.1.181"]
  AccessState: Unlocked
  SerialNumber: 7821CKY
  Manufacturer: IBM
  MachineType: 2076
  FWLevel: 7.8.1.10
  PLLogicalName: storage0
  Status: Online
STORAGE:storage0:172.23.1.181:0:Storage firmware update is successful.
20210517_151413 (reverseflash01:stage04_storage_update.sh): Ran V7000 update for '7.8.1.10'. Returned rc='0'.
20210517_151413 (reverseflash01:stage04_storage_update.sh): Running V7000 update to '7.8.1.10' for 'storage2'.
```


STAGE 4 - Storage firmware update for both V7000 and FlashSystem

```
20210517_151413 (reverseflash01:stage04_storage_update.sh): Running command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_storage
update -install -l storage2 -f /BCU_share/FP7_FP3/firmware/storage/2076/image -t 7.8.1.10'
Details:
Manufacturer: IBM
FWLevel: 7.8.1.10
Status: Online
IPv4Address: ["172.23.1.183"]
Model: 524
SerialNumber: 7821FEZ
HostName: reverseflashV7_01
Description: IBM Storwize V7000 FAB-1 Storage
PLLogicalName: storage2
FWBuild: 135.9.1905291321000
MachineType: 2076
AccessState: Unlocked
STORAGE:storage2:172.23.1.183:0:
Details:
FWLevel: 7.8.1.10
Manufacturer: IBM
Status: Online
IPv4Address: ["172.23.1.183"]
SerialNumber: 7821FEZ
Model: 524
HostName: reverseflashV7_01
FWBuild: 135.9.1905291321000
Description: IBM Storwize V7000 FAB-1 Storage
PLLogicalName: storage2
MachineType: 2076
AccessState: Unlocked
STORAGE:storage2:172.23.1.183:0:Storage firmware update is successful.
20210517_162610 (reverseflash01:stage04_storage_update.sh): Ran V7000 update for '7.8.1.10'. Returned rc='0'.
20210517_162610 (reverseflash01:stage04_storage_update.sh): Storage Status Lines:
0 0
20210517_162610 (reverseflash01:stage04_storage_update.sh): Starting date: Mon May 17 14:04:58 EDT 2021 Ending Date: Mon May 17
16:26:10 EDT 2021.
```

Examine the line after *Storage Status Lines*: which contains a string of 0's and/or 1's. If a '1' appears there is a failure and there should be a line that says '*update failed*' earlier in the log. During testing it was revealed that the return code for the overall script does not reliably return a 0 or 1.

If there is no failure proceed to the next step.

If a failure occurs, capture the logs and contact IBM support.

- a. Command: To collect platform layer logs run the following command.

```
./getFPLogs.sh Stage04_apply_failed_185
```

Example output:

```
20201205_181001 (flashdancehostname01:getFPLogs.sh): Starting date: Sat Dec 5 18:10:01 IST 2020.
20201205_181001 (flashdancehostname01:getFPLogs.sh): Creating compressed file
/BCU_share/support/FP8_FP4/log/pfplayer/20201205_181001_Stage04_Apply_Flash_Succeeded_BCU_share_aixappl.tgz.
```

- b. Upload the contents of the of the /BCU_share/support/FP8_FP4/log directory to IBM Support.

STAGE 4 - Storage firmware update for both V7000 and FlashSystem

- c. Command: Once resolved, re-run the same command to resume the update.

```
./stage04_storage_update.sh default install
```

Example Output:

```
$ ./stage04_storage_update.sh default install
20201205_055340 (flashdancehostname01:stage04_storage_update.sh): Starting date: Sat Dec 5 05:53:40 IST 2020.
20201205_055349 (flashdancehostname01:stage04_storage_update.sh): Running command
'/opt/ibm/aixappl/pfplayer/bin/icmcs/appl_ctrl_storage update -validate -l storage1,storage3,storage5 -f
/BCU_share/FP8_FP4/firmware/storage/AE2/image -t 1.5.2.7'
STORAGE:storage3:172.23.1.184:0:
STORAGE:storage1:172.23.1.182:0:
STORAGE:storage5:172.23.1.186:0:
20201205_055610 (flashdancehostname01:stage04_storage_update.sh): Ran command
'/opt/ibm/aixappl/pfplayer/bin/icmcs/appl_ctrl_storage update -validate -l storage1,storage3,storage5 -f
/BCU_share/FP8_FP4/firmware/storage/AE2/image -t 1.5.2.7' with rc='0'.
20201205_055610 (flashdancehostname01:stage04_storage_update.sh): Running command
'/opt/ibm/aixappl/pfplayer/bin/icmcs/appl_ctrl_storage update -prepare -l storage1,storage3,storage5 -f
/BCU_share/FP8_FP4/firmware/storage/AE2/image'
STORAGE:storage3:172.23.1.184:0:
STORAGE:storage5:172.23.1.186:0:
STORAGE:storage1:172.23.1.182:0:
20201205_055735 (flashdancehostname01:stage04_storage_update.sh): Running Flash update to '1.5.2.7' for 'storage1'.
20201205_055735 (flashdancehostname01:stage04_storage_update.sh): Running command
'/opt/ibm/aixappl/pfplayer/bin/icmcs/appl_ctrl_storage update -install -l storage1 -f
/BCU_share/FP8_FP4/firmware/storage/AE2/image -t 1.5.2.7'
Details:
  PLLogicalName: storage1
  IPv4Address: ["172.23.1.182"]
  Manufacturer: IBM
  FWBuild: 126.1.2002191825000.468.195
  Description: IBM FlashSystem 900 Storage
  HostName: flashdancehostnameFlash_00
  FWLevel: 1.5.2.7
  AccessState: Unlocked
  Status: Online
  Model: AE2
  MachineType: 9840
  SerialNumber: 1351359
STORAGE:storage1:172.23.1.182:0:
Details:
  Description: IBM FlashSystem 900 Storage
  FWBuild: 126.1.2002191825000.468.195
  Manufacturer: IBM
  FWLevel: 1.5.2.7
  HostName: flashdancehostnameFlash_00
  PLLogicalName: storage1
  IPv4Address: ["172.23.1.182"]
  Status: Online
  MachineType: 9840
  SerialNumber: 1351359
  Model: AE2
  AccessState: Unlocked
STORAGE:storage1:172.23.1.182:0:Storage firmware update is successful.
20201205_072735 (flashdancehostname01:stage04_storage_update.sh): Ran Flash update for '1.5.2.7'. Returned rc='0'.
20201205_072735 (flashdancehostname01:stage04_storage_update.sh): Running Flash update to '1.5.2.7' for 'storage3,storage5'.
20201205_072735 (flashdancehostname01:stage04_storage_update.sh): Running command
'/opt/ibm/aixappl/pfplayer/bin/icmcs/appl_ctrl_storage update -install -l storage3,storage5 -f
/BCU_share/FP8_FP4/firmware/storage/AE2/image -t 1.5.2.7'
Details:
  Status: Online
  Manufacturer: IBM
  SerialNumber: 1351350
  Model: AE2
  FWLevel: 1.5.2.7
  FWBuild: 126.1.2002191825000.468.195
  Description: IBM FlashSystem 900 Storage
  HostName: flashdancehostnameFlash_01
  MachineType: 9840
  PLLogicalName: storage3
  AccessState: Unlocked
  IPv4Address: ["172.23.1.184"]
Details:
  SerialNumber: 1351360
  Manufacturer: IBM
  Status: Online
  FWLevel: 1.5.2.7
  Model: AE2
  HostName: flashdancehostnameFlash_02
  MachineType: 9840
  Description: IBM FlashSystem 900 Storage
  FWBuild: 126.1.2002191825000.468.195
  IPv4Address: ["172.23.1.186"]
  AccessState: Unlocked
  PLLogicalName: storage5
```

STAGE 4 - Storage firmware update for both V7000 and FlashSystem

```
STORAGE:storage3:172.23.1.184:0:
STORAGE:storage5:172.23.1.186:0:
Details:
  PLLogicalName: storage3
  AccessState: Unlocked
  IPv4Address: ["172.23.1.184"]
  FWBuild: 126.1.2002191825000.468.195
  Description: IBM FlashSystem 900 Storage
  HostName: flashdancehostnameFlash_01
  MachineType: 9840
  FWLevel: 1.5.2.7
  Model: AE2
  Status: Online
  SerialNumber: 1351350
  Manufacturer: IBM
Details:
  HostName: flashdancehostnameFlash_02
  MachineType: 9840
  FWBuild: 126.1.2002191825000.468.195
  Description: IBM FlashSystem 900 Storage
  AccessState: Unlocked
  IPv4Address: ["172.23.1.186"]
  PLLogicalName: storage5
  Status: Online
  Manufacturer: IBM
  SerialNumber: 1351360
  Model: AE2
  FWLevel: 1.5.2.7
STORAGE:storage3:172.23.1.184:0:
STORAGE:storage5:172.23.1.186:0:
Details:
  Manufacturer: IBM
  SerialNumber: 1351350
  Status: Online
  Model: AE2
  FWLevel: 1.5.2.7
  Description: IBM FlashSystem 900 Storage
  FWBuild: 126.1.2002191825000.468.195
  HostName: flashdancehostnameFlash_01
  MachineType: 9840
  PLLogicalName: storage3
  IPv4Address: ["172.23.1.184"]
  AccessState: Unlocked
Details:
  FWLevel: 1.5.2.7
  Model: AE2
  Status: Online
  SerialNumber: 1351360
  Manufacturer: IBM
  AccessState: Unlocked
  IPv4Address: ["172.23.1.186"]
  PLLogicalName: storage5
  HostName: flashdancehostnameFlash_02
  MachineType: 9840
  FWBuild: 126.1.2002191825000.468.195
  Description: IBM FlashSystem 900 Storage
STORAGE:storage3:172.23.1.184:0:Storage firmware update is successful.
STORAGE:storage5:172.23.1.186:0:Storage firmware update is successful.
20201205_090304 (flashdancehostname01:stage04_storage_update.sh): Ran Flash update for '1.5.2.7'. Returned rc='0'.
20201205_090304 (flashdancehostname01:stage04_storage_update.sh): Storage Status Lines:
0 0 0 0 0
20201205_090304 (flashdancehostname01:stage04_storage_update.sh): Starting date: Sat Dec 5 05:53:40 IST 2020 Ending Date:
Sat Dec 5 09:03:04 IST 2020.
You have mail in /usr/spool/mail/root

(1) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

STAGE 4 - Storage firmware update for both V7000 and FlashSystem

2. FP2 Customers please skip this step until you have applied V1.1 FP4 levels. Continue to Phase 3 to validate the V1.1 FP3 levels are applied.
3. FP2->FP5 and FP3->FP5 Customers. After the V1.1 FP4 update is complete, a new feature on the V7000s is enabled called "Cloud Call Home". The architecture of PDOA is not designed to work with this feature and all the V7000s will show an error indicating a failure to connect to cloud call home servers. This feature needs to be disabled. PDOA will continue to use the e-mail based call home options for V7000 and Flash900 storage enclosures.
 - a. Command: Verify the Cloud Call Home feature is enabled.

```
appl_ls_hw -r storage -A M_IP_address,Machine_type < /dev/null | grep "2076" | sed 's|'|g' | cut -d, -f1 | while read ip;do  
echo " *** ${ip} ***";ssh -n superuser@${ip} 'lscloudcallhome';done
```

Example Output:

```
$ appl_ls_hw -r storage -A M_IP_address,Machine_type < /dev/null | grep "2076" | sed 's|'|g' | cut -d, -f1 | while read  
ip;do echo " *** ${ip} ***";ssh -n superuser@${ip} 'lscloudcallhome';done  
*** 172.23.1.181 ***  
status enabled  
connection error  
error_sequence_number 1261  
last_success  
last_failure 210212212923  
*** 172.23.1.183 ***  
status enabled  
connection error  
error_sequence_number 1571  
last_success  
last_failure 210212213129  
*** 172.23.1.185 ***  
status enabled  
connection error  
error_sequence_number 1545  
last_success  
last_failure 210212213426
```

STAGE 4 - Storage firmware update for both V7000 and FlashSystem

b. Command: Disable the Cloud Call Home Feature.

```
appl_ls_hw -r storage -A M_IP_address,Machine_type < /dev/null | grep "2076" | sed 's|'||g' | cut -d, -f1 | while read ip;do  
echo " *** ${ip} ***";ssh -n superuser@${ip} 'chcloudcallhome -disable';done
```

Example Output:

```
$ appl_ls_hw -r storage -A M_IP_address,Machine_type < /dev/null | grep "2076" | sed 's|'||g' | cut -d, -f1 | while read  
ip;do echo " *** ${ip} ***";ssh -n superuser@${ip} 'chcloudcallhome -disable';done  
  
*** 172.23.1.181 ***  
*** 172.23.1.183 ***  
*** 172.23.1.185 ***
```

c. Verify the Cloud Call Home Features are now disabled.

```
appl_ls_hw -r storage -A M_IP_address,Machine_type < /dev/null | grep "2076" | sed 's|'||g' | cut -d, -f1 | while read ip;do  
echo " *** ${ip} ***";ssh -n superuser@${ip} 'lscloudcallhome';done
```

Example Output:

```
$ appl_ls_hw -r storage -A M_IP_address,Machine_type < /dev/null | grep "2076" | sed 's|'||g' | cut -d, -f1 | while read  
ip;do echo " *** ${ip} ***";ssh -n superuser@${ip} 'lscloudcallhome';done  
*** 172.23.1.181 ***  
status disabled  
connection  
error_sequence_number  
last_success  
last_failure 210212212923  
*** 172.23.1.183 ***  
status disabled  
connection  
error_sequence_number  
last_success  
last_failure 210212213129  
*** 172.23.1.185 ***  
status disabled  
connection  
error_sequence_number  
last_success  
last_failure 210212213426  
  
(0) root @ flashdancehostname01: 7.1.0.0: /
```

Phase 3: Validation

1. Command: Check the version status. V7000 levels should show 8.2.1.11 and Flash900 should show 1.5.2.7. V1.1 FP2->FP4 customers who have applied V1.1 FP3 will only see the V7000 levels at 7.8.1.10 and the Flash900 levels should be 1.4.7.1. FP2->FP4 customers will repeat the steps starting from Phase 1 preparation and using the FP8_FP4 fixpack path.

```
appl_ls_hw -r storage -A Logical_name,M_IP_address,FW_level,Description
```

Example Output:

```
$ appl_ls_hw -r storage -A Logical_name,M_IP_address,FW_level,Description
"storage0","172.23.1.181","8.2.1.15","IBM Storwize V7000 FAB-1 Storage"
"storage1","172.23.1.182","1.5.2.10","IBM FlashSystem 900 Storage"
"storage2","172.23.1.183","8.2.1.15","IBM Storwize V7000 FAB-1 Storage"
"storage3","172.23.1.184","1.5.2.10","IBM FlashSystem 900 Storage"
```

Example Output: (FP3->FP5: FP3 customers who applied V1.1 FP4 V7000 Levels)

```
$ appl_ls_hw -r storage -A Logical_name,M_IP_address,FW_level,Description
"storage0","172.23.1.181","8.2.1.11","IBM Storwize V7000 FAB-1 Storage"
"storage1","172.23.1.182","1.5.2.5","IBM FlashSystem 900 Storage"
"storage2","172.23.1.183","8.2.1.11","IBM Storwize V7000 FAB-1 Storage"
"storage3","172.23.1.184","1.5.2.5","IBM FlashSystem 900 Storage"
"storage4","172.23.1.185","8.2.1.11","IBM Storwize V7000 FAB-1 Storage"
"storage5","172.23.1.186","1.5.2.5","IBM FlashSystem 900 Storage"
```

Example Output: (FP2->FP5: FP2 customers who applied V1.1 FP3 V7000 levels.)

```
$ appl_ls_hw -r storage -A Logical_name,M_IP_address,FW_level,Description
"storage0","172.23.1.181","7.8.1.10","IBM Storwize V7000 FAB-1 Storage"
"storage1","172.23.1.182","1.4.7.1","IBM FlashSystem 900 Storage"
"storage2","172.23.1.183","7.8.1.10","IBM Storwize V7000 FAB-1 Storage"
"storage3","172.23.1.184","1.4.7.1","IBM FlashSystem 900 Storage"
```

2. Command: Check storage status.

```
./check_storage.sh
```

Example Output:

```
$ ./check_storage.sh
20201205_181914 (flashdancehostname01:check_storage.sh): Checking the storage status.
**** 172.23.1.181 ****
sequence_number last_timestamp object_type object_id object_name copy_id status fixed event_id error_code description
1261 201205035431 cluster flashdancehostnameV7_00 alert no 989007 3201 Unable to
send to the cloud callhome servers
**** 172.23.1.182 ****
sequence_number last_timestamp object_type object_id object_name copy_id status fixed event_id error_code description
secondary_object_type secondary_object_id
134 200214060932 internal 0 alert no 085153 3087 Quorum device error
**** 172.23.1.183 ****
sequence_number last_timestamp object_type object_id object_name copy_id status fixed event_id error_code description
1571 201205051121 cluster flashdancehostnameV7_01 alert no 989007 3201 Unable to
send to the cloud callhome servers
1596 201205180454 io_grp 0 io_grp0 alert no 072901 1052 Inter-
canister PCIe link degraded
**** 172.23.1.184 ****
**** 172.23.1.185 ****
sequence_number last_timestamp object_type object_id object_name copy_id status fixed event_id error_code description
1530 201205042358 enclosure 1 alert no 045102 1260 SAS cable
fault type 2
1545 201205051349 cluster flashdancehostnameV7_02 alert no 989007 3201 Unable to
send to the cloud callhome servers
```

STAGE 4 - Storage firmware update for both V7000 and FlashSystem

***** 172.23.1.186 *****

STAGE 4 - Storage firmware update for both V7000 and FlashSystem

3. Check Fiber Channel Path Status.

```
./check_fcpaths.sh
```

Example Output:

```
$ ./check_fcpaths.sh
20201205_182125 (flashdancehostname01:check_fcpaths.sh): Starting date: Sat Dec 5 18:21:25 IST 2020.
20201205_182125 (flashdancehostname01:check_fcpaths.sh): Collecting current histogram.
HOSTS -----
flashdancehostname01
-----
14 fscsi0:Enabled
14 fscsi2:Enabled
14 fscsi4:Enabled
14 fscsi6:Enabled

HOSTS -----
flashdancehostname03
-----
10 fscsi0:Enabled
10 fscsi2:Enabled
10 fscsi4:Enabled
10 fscsi6:Enabled

HOSTS -----
flashdancehostname02, flashdancehostname04
-----
42 fscsi10:Enabled
42 fscsi11:Enabled
42 fscsi12:Enabled
42 fscsi13:Enabled
42 fscsi14:Enabled
42 fscsi15:Enabled
42 fscsi8:Enabled
42 fscsi9:Enabled

HOSTS -----
flashdancehostname05, flashdancehostname06, flashdancehostname07
-----
160 fscsi0:Enabled
160 fscsi12:Enabled
160 fscsi13:Enabled
160 fscsi14:Enabled
160 fscsi15:Enabled
160 fscsi1:Enabled
160 fscsi2:Enabled
160 fscsi3:Enabled
160 fscsi4:Enabled
160 fscsi8:Enabled
20201205_182126 (flashdancehostname01:check_fcpaths.sh): Checking for missing paths.
flashdancehostname01: 0
flashdancehostname03: 0
flashdancehostname06: 0
flashdancehostname02: 0
flashdancehostname04: 0
flashdancehostname07: 0
flashdancehostname05: 0
20201205_182127 (flashdancehostname01:check_fcpaths.sh): Starting date: Sat Dec 5 18:21:25 IST 2020 Ending Date: Sat Dec 5
18:21:27 IST 2020.

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```


STAGE 5 - SAN switch firmware update

Stage 5 Description

Steps

- Stage 5 Phase 1: Enable FTP
- Stage 5 Phase 2: Switch Validation
- Stage 5 Phase 3: Update the SAN switches.
- Stage 5 Phase 4: Verify the SAN Switch Updates.
- Stage 5 Phase 5: Disable FTP

Outage Requirements

- FP4->FP5 customers will not apply a SAN switch update. Only FP1->FP5, FP2->FP5, FP3->FP5 customers will apply SAN switch updates.
- No outage requirements for this stage. One SAN switch for each rack of servers will always be up during the SAN updates.
- During the update however the I/O capacity of the appliance will be reduced while while SAN switches are updated and rebooted to apply updated firmware.

Time Per Step

- Stage 5 Phase 1: 10 Minutes
- Stage 5 Phase 2: 10 Minutes
- Stage 5 Phase 3: 120 Minutes (2 hours)
- Stage 5 Phase 4: 10 Minutes
- Stage 5 Phase 5: 10 Minutes

Risk Mitigation

- SAN Switch failures are quite uncommon during firmware updates in our experience.
- All PDOA hosts are connected to the storage via two SAN switches with 4 or 5 connections to each SAN switch.

Backout Options

- Firmware downgrades are not recommended for SAN switches.

Phase 1: Enable FTP On Management

SAN switch updates should be done in 2 sets. All even numbered first and then the odd numbered.

1. Login to the management node as a root user. If using screen attach to the fprun or the screen session used to run fixpack commands.
2. Command: Ensure the working directory is correct.

```
cd /BCU_share/FP8_FP4/fixpack_tools/application
```

3. Command: Enable FTP on the management node:

Due to the changes with the sshd update on the management host it is necessary to use the FTP option to upload the SAN switch firmware image. This will be disabled once the SAN switch update is complete.

```
$ lssrc -t ftp
Service      Command      Description      Status
ftp                                     inoperative

$ startsrc -t ftp
0513-124 The ftp subserver has been started.

$ lssrc -t ftp
Service      Command      Description      Status
ftp          /usr/sbin/ftpd  ftpd             active
```

4. Command: Verify the root user is not in /etc/ftpusers. The root entry must be removed from this file if it exists.

```
grep -i root /etc/ftpusers
```

Example Output:

```
$ grep -i root /etc/ftpusers
grep: 0652-033 Cannot open /etc/ftpusers.
```

5. Command: Run FTP validation script. The return code should be 0.

```
./check_ftpserver.sh
```

Example Output:

```
$ ./check_ftpserver.sh
20201212_014631 (flashdancehostname01:check_ftpserver.sh): Starting date: Sat Dec 12 01:46:31 IST 2020.
20201212_014631 (flashdancehostname01:check_ftpserver.sh): Checking for ftp service in /etc/inetd.conf.
ftp      stream  tcp6      nowait   root     /usr/sbin/ftpd  ftpd
20201212_014631 (flashdancehostname01:check_ftpserver.sh): Checking to see if ftp service is listed as active.
ftp      /usr/sbin/ftpd  ftpd      active
20201212_014631 (flashdancehostname01:check_ftpserver.sh): FTP Service is active and enabled for root.
20201212_014631 (flashdancehostname01:check_ftpserver.sh): Starting date: Sat Dec 12 01:46:31 IST 2020   Ending Date: Sat Dec 12 01:46:31 IST 2020.

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

Phase 2: Switch Validation

1. Command: Run the validation check. This will check all of the san switches in the environment.

```
./stage05_san_update.sh validate
```

Example Output:

```
$ ./stage05_san_update.sh validate
20201212_014825 (flashdancehostname01:stage05_san_update.sh): Starting date: Sat Dec 12 01:48:25 IST 2020.
20201212_014827 (flashdancehostname01:stage05_san_update.sh): Running validate command
'/opt/ibm/aixappl/pfplayer/bin/icmids/appl_ctrl_san update -validate -l san0,san1,san2,san3 -f /BCU_share/FP8_FP4/firmware/san/40-1000569-11/image/v7.4.2e'.
SAN:san1:172.23.1.162:0:Validation of switch with IP 172.23.1.162 Successful
SAN:san3:172.23.1.164:0:Validation of switch with IP 172.23.1.164 Successful
SAN:san0:172.23.1.161:0:Validation of switch with IP 172.23.1.161 Successful
SAN:san2:172.23.1.163:0:Validation of switch with IP 172.23.1.163 Successful
20201212_014845 (flashdancehostname01:stage05_san_update.sh): Ran validate command
'/opt/ibm/aixappl/pfplayer/bin/icmids/appl_ctrl_san update -validate -l san0,san1,san2,san3 -f /BCU_share/FP8_FP4/firmware/san/40-1000569-11/image/v7.4.2e' with r
return code '0'.
20201212_014846 (flashdancehostname01:check_fcpaths.sh): Starting date: Sat Dec 12 01:48:46 IST 2020.
20201212_014846 (flashdancehostname01:check_fcpaths.sh): Collecting current histogram.
HOSTS -----
flashdancehostname01
-----
14 fscsi0:Enabled
14 fscsi2:Enabled
14 fscsi4:Enabled
14 fscsi6:Enabled

HOSTS -----
flashdancehostname03
-----
10 fscsi0:Enabled
10 fscsi2:Enabled
10 fscsi4:Enabled
10 fscsi6:Enabled

HOSTS -----
flashdancehostname02, flashdancehostname04
-----
42 fscsi10:Enabled
42 fscsi11:Enabled
42 fscsi12:Enabled
42 fscsi13:Enabled
42 fscsi14:Enabled
42 fscsi15:Enabled
42 fscsi8:Enabled
42 fscsi9:Enabled

HOSTS -----
flashdancehostname05, flashdancehostname06, flashdancehostname07
-----
160 fscsi0:Enabled
160 fscsi12:Enabled
160 fscsi13:Enabled
160 fscsi14:Enabled
160 fscsi15:Enabled
160 fscsi1:Enabled
160 fscsi2:Enabled
160 fscsi3:Enabled
160 fscsi4:Enabled
160 fscsi8:Enabled
20201212_014847 (flashdancehostname01:check_fcpaths.sh): Checking for missing paths.
flashdancehostname01: 0
flashdancehostname03: 0
flashdancehostname02: 0
flashdancehostname04: 0
flashdancehostname06: 0
flashdancehostname07: 0
flashdancehostname05: 0
20201212_014848 (flashdancehostname01:check_fcpaths.sh): Starting date: Sat Dec 12 01:48:46 IST 2020 Ending Date: Sat Dec 12 01:48:48 IST 2020.
20201212_014848 (flashdancehostname01:check_ftpserver.sh): Starting date: Sat Dec 12 01:48:48 IST 2020.
20201212_014848 (flashdancehostname01:check_ftpserver.sh): Checking for ftp service in /etc/inetd.conf.
ftp stream tcp6 nowait root /usr/sbin/ftpd ftpd
20201212_014848 (flashdancehostname01:check_ftpserver.sh): Checking to see if ftp service is listed as active.
ftp /usr/sbin/ftpd ftpd active
20201212_014848 (flashdancehostname01:check_ftpserver.sh): FTP Service is active and enabled for root.
20201212_014848 (flashdancehostname01:check_ftpserver.sh): Starting date: Sat Dec 12 01:48:48 IST 2020 Ending Date: Sat Dec 12 01:48:48 IST 2020.
```

STAGE 5 - SAN switch firmware update

20201212_014848 (flashdancehostname01:stage05_san_update.sh): Starting date: Sat Dec 12 01:48:25 IST 2020 Ending Date: Sat Dec 12 01:48:48 IST 2020.

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application

Phase 3: Update the SAN Switches

The stage05_san_update.sh script will run the validation and install steps for the san switches in parallel where only one SAN switch per environment is updated at a time. It takes about 2 hours to complete if there are no issues. If there is an error, once the error is addressed the command can be re-run to update the switches that are not yet updated. It is also possible to specify the exact SAN (san#) to update on the command line if necessary.

1. Command: Run the following command to to update the SAN switches.

```
./stage05_san_update.sh install
```

Example Output:

```
$ ./stage05_san_update.sh install
20201212_015543 (flashdancehostname01:stage05_san_update.sh): Starting date: Sat Dec 12 01:55:43 IST 2020.
20201212_015544 (flashdancehostname01:stage05_san_update.sh): Running validate command
'/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_san update -validate -l san0,san1,san2,san3 -f /BCU_share/FP8_FP4/firmware/san/40-1000569-11/image/v7.4.2e'.
SAN:san3:172.23.1.164:0:Validation of switch with IP 172.23.1.164 Successful
SAN:san1:172.23.1.162:0:Validation of switch with IP 172.23.1.162 Successful
SAN:san2:172.23.1.163:0:Validation of switch with IP 172.23.1.163 Successful
SAN:san0:172.23.1.161:0:Validation of switch with IP 172.23.1.161 Successful
20201212_015604 (flashdancehostname01:stage05_san_update.sh): Ran validate command
'/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_san update -validate -l san0,san1,san2,san3 -f /BCU_share/FP8_FP4/firmware/san/40-1000569-11/image/v7.4.2e' with return code '0'.
20201212_015604 (flashdancehostname01:check_fcpaths.sh): Starting date: Sat Dec 12 01:56:04 IST 2020.
20201212_015604 (flashdancehostname01:check_fcpaths.sh): Collecting current histogram.
HOSTS -----
flashdancehostname01
-----
14 fscsi0:Enabled
14 fscsi2:Enabled
14 fscsi4:Enabled
14 fscsi6:Enabled

HOSTS -----
flashdancehostname03
-----
10 fscsi0:Enabled
10 fscsi2:Enabled
10 fscsi4:Enabled
10 fscsi6:Enabled

HOSTS -----
flashdancehostname02, flashdancehostname04
-----
42 fscsi10:Enabled
42 fscsi11:Enabled
42 fscsi12:Enabled
42 fscsi13:Enabled
42 fscsi14:Enabled
42 fscsi15:Enabled
42 fscsi8:Enabled
42 fscsi9:Enabled

HOSTS -----
flashdancehostname05, flashdancehostname06, flashdancehostname07
-----
160 fscsi0:Enabled
160 fscsi12:Enabled
160 fscsi13:Enabled
160 fscsi14:Enabled
160 fscsi15:Enabled
160 fscsi1:Enabled
160 fscsi2:Enabled
160 fscsi3:Enabled
160 fscsi4:Enabled
160 fscsi8:Enabled
20201212_015605 (flashdancehostname01:check_fcpaths.sh): Checking for missing paths.
flashdancehostname01: 0
flashdancehostname03: 0
flashdancehostname06: 0
flashdancehostname02: 0
flashdancehostname04: 0
flashdancehostname07: 0
flashdancehostname05: 0
```

STAGE 5 - SAN switch firmware update

```
20201212_015606 (flashdancehostname01:check_fcpaths.sh): Starting date: Sat Dec 12 01:56:04 IST 2020   Ending Date: Sat Dec 12 01:56:06 IST 2020.
20201212_015606 (flashdancehostname01:check_ftpserver.sh): Starting date: Sat Dec 12 01:56:06 IST 2020.
20201212_015606 (flashdancehostname01:check_ftpserver.sh): Checking for ftp service in /etc/inetd.conf.
ftp      stream tcp6     nowait  root    /usr/sbin/ftpd      ftpd
20201212_015606 (flashdancehostname01:check_ftpserver.sh): Checking to see if ftp service is listed as active.
ftp      /usr/sbin/ftpd      ftpd      active
20201212_015606 (flashdancehostname01:check_ftpserver.sh): FTP Service is active and enabled for root.
20201212_015606 (flashdancehostname01:check_ftpserver.sh): Starting date: Sat Dec 12 01:56:06 IST 2020   Ending Date: Sat Dec 12 01:56:06 IST 2020.
20201212_015606 (flashdancehostname01:stage05_san_update.sh): Risk tolerance default specified. Performing update on eligible even numbered sans and then odd numbered sans in parallel.
20201212_015606 (flashdancehostname01:check_fcpaths.sh): Starting date: Sat Dec 12 01:56:06 IST 2020.
20201212_015606 (flashdancehostname01:check_fcpaths.sh): Collecting current histogram.
HOSTS -----
flashdancehostname01
-----
14 fscsi0:Enabled
14 fscsi2:Enabled
14 fscsi4:Enabled
14 fscsi6:Enabled

HOSTS -----
flashdancehostname03
-----
10 fscsi0:Enabled
10 fscsi2:Enabled
10 fscsi4:Enabled
10 fscsi6:Enabled

HOSTS -----
flashdancehostname05, flashdancehostname06, flashdancehostname07
-----
160 fscsi0:Enabled
160 fscsi12:Enabled
160 fscsi13:Enabled
160 fscsi14:Enabled
160 fscsi15:Enabled
160 fscsi1:Enabled
160 fscsi2:Enabled
160 fscsi3:Enabled
160 fscsi4:Enabled
160 fscsi8:Enabled

HOSTS -----
flashdancehostname02, flashdancehostname04
-----
42 fscsi10:Enabled
42 fscsi11:Enabled
42 fscsi12:Enabled
42 fscsi13:Enabled
42 fscsi14:Enabled
42 fscsi15:Enabled
42 fscsi8:Enabled
42 fscsi9:Enabled
20201212_015608 (flashdancehostname01:check_fcpaths.sh): Checking for missing paths.
flashdancehostname01: 0
flashdancehostname03: 0
flashdancehostname06: 0
flashdancehostname02: 0
flashdancehostname04: 0
flashdancehostname07: 0
flashdancehostname05: 0
20201212_015609 (flashdancehostname01:check_fcpaths.sh): Starting date: Sat Dec 12 01:56:06 IST 2020   Ending Date: Sat Dec 12 01:56:09 IST 2020.
20201212_015609 (flashdancehostname01:stage05_san_update.sh): Running update command
'/opt/ibm/aixappl/pflayer/bin/icmds/appl_ctrl_san update -install -l san0,san2 -f /BCU_share/FP8_FP4/firmware/san/40-1000569-11/image/v7.4.2e'
SNMP string exist on SAN: 172.23.1.161
SNMP string exist on SAN: 172.23.1.163
The switch update is successful for IP 172.23.1.161.
The switch update is successful for IP 172.23.1.163.
SAN:san0:172.23.1.161:0:update of switch with IP 172.23.1.161 Successful
SAN:san2:172.23.1.163:0:update of switch with IP 172.23.1.163 Successful
20201212_024722 (flashdancehostname01:stage05_san_update.sh): Ran update command
'/opt/ibm/aixappl/pflayer/bin/icmds/appl_ctrl_san update -install -l san0,san2 -f /BCU_share/FP8_FP4/firmware/san/40-1000569-11/image/v7.4.2e' with return code '0'.
20201212_024722 (flashdancehostname01:check_fcpaths.sh): Starting date: Sat Dec 12 02:47:22 IST 2020.
20201212_024722 (flashdancehostname01:check_fcpaths.sh): Collecting current histogram.
HOSTS -----
flashdancehostname01
-----
14 fscsi0:Enabled
14 fscsi2:Enabled
14 fscsi4:Enabled
14 fscsi6:Enabled

HOSTS -----
```

STAGE 5 - SAN switch firmware update

```
flashdancehostname03
-----
10 fscsi0:Enabled
10 fscsi2:Enabled
10 fscsi4:Enabled
10 fscsi6:Enabled

HOSTS -----
flashdancehostname02, flashdancehostname04
-----
42 fscsi10:Enabled
42 fscsi11:Enabled
42 fscsi12:Enabled
42 fscsi13:Enabled
42 fscsi14:Enabled
42 fscsi15:Enabled
42 fscsi8:Enabled
42 fscsi9:Enabled

HOSTS -----
flashdancehostname05, flashdancehostname06, flashdancehostname07
-----
160 fscsi0:Enabled
160 fscsi12:Enabled
160 fscsi13:Enabled
160 fscsi14:Enabled
160 fscsi15:Enabled
160 fscsi1:Enabled
160 fscsi2:Enabled
160 fscsi3:Enabled
160 fscsi4:Enabled
160 fscsi8:Enabled
20201212_024724 (flashdancehostname01:check_fcpaths.sh): Checking for missing paths.
flashdancehostname01: 0
flashdancehostname03: 0
flashdancehostname07: 0
flashdancehostname02: 0
flashdancehostname04: 0
flashdancehostname06: 0
flashdancehostname05: 0
20201212_024725 (flashdancehostname01:check_fcpaths.sh): Starting date: Sat Dec 12 02:47:22 IST 2020   Ending Date: Sat Dec 12 02:47:25 IST 2020.
20201212_024725 (flashdancehostname01:stage05_san_update.sh): Running update command
'/opt/ibm/aixappl/pflayer/bin/icmids/appl_ctrl_san update -install -l san1,san3 -f /BCU_share/FP8_FP4/firmware/san/40-1000569-11/image/v7.4.2e'.
SNMP string exist on SAN: 172.23.1.164
SNMP string exist on SAN: 172.23.1.162
The switch update is successful for IP 172.23.1.164.
The switch update is successful for IP 172.23.1.162.
SAN:san3:172.23.1.164:0:update of switch with IP 172.23.1.164 Successful
SAN:san1:172.23.1.162:0:update of switch with IP 172.23.1.162 Successful
20201212_033838 (flashdancehostname01:stage05_san_update.sh): Ran update command
'/opt/ibm/aixappl/pflayer/bin/icmids/appl_ctrl_san update -install -l san1,san3 -f /BCU_share/FP8_FP4/firmware/san/40-1000569-11/image/v7.4.2e' with return code '0'.
20201212_033838 (flashdancehostname01:stage05_san_update.sh): Starting date: Sat Dec 12 01:55:43 IST 2020   Ending Date: Sat Dec 12 03:38:38 IST 2020.

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

Phase 4: Verify the SAN Switch Updates

The updated level should reflect v7.4.2e on all SANs as shown below. The number of SANs varies depending on the size of the environment.

1. Run the following command to verify the SAN Switch levels.

```
appl_ls_hw -r san -A Logical_name | xargs -n 1 ${PL_ROOT}/bin/icmds/appl_ctrl_san query -L
```

Example Output:

```
$ appl_ls_hw -r san -A Logical_name | xargs -n 1 ${PL_ROOT}/bin/icmds/appl_ctrl_san query -L
Details:
MachineType: -
Description: IBM System Storage Switch
Manufacturer: Brocade
IPv4Address: ["172.23.1.161"]
DeviceName: SAN01
AccessState: Unlocked
Model: 40-1000569-13
PLLogicalName: san0
FWLevel: v7.4.2e
SerialNumber: BRW2527K01G
Status: Online
Details:
Manufacturer: Brocade
Status: Online
DeviceName: SAN02
Model: 40-1000569-13
PLLogicalName: san1
AccessState: Unlocked
MachineType: -
SerialNumber: BRW2527K01F
FWLevel: v7.4.2e
IPv4Address: ["172.23.1.162"]
Description: IBM System Storage Switch
Details:
DeviceName: SAN03
AccessState: Unlocked
IPv4Address: ["172.23.1.163"]
Description: IBM System Storage Switch
Model: 40-1000569-13
Manufacturer: Brocade
Status: Online
FWLevel: v7.4.2e
SerialNumber: BRW2526K052
PLLogicalName: san2
MachineType: -
Details:
PLLogicalName: san3
MachineType: -
Description: IBM System Storage Switch
Status: Online
Manufacturer: Brocade
Model: 40-1000569-13
AccessState: Unlocked
DeviceName: SAN_SWITCH_4
SerialNumber: BRW2527K01D
FWLevel: v7.4.2e
IPv4Address: ["172.23.1.164"]

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```


Phase 5: Disable FTP

1. Command: Undo changes done for enabling FTP on the management node as shown in the 3 commands below below:

```
$ lssrc -t ftp
Service      Command      Description      Status
ftp          /usr/sbin/ftpd  ftpd             active

$ stopsrc -t ftp
0513-127 The ftp subserver was stopped successfully.

$ lssrc -t ftp
Service      Command      Description      Status
ftp          /usr/sbin/ftpd  ftpd             inoperative
```

STAGE 6 - Management stack upgrade

Stage 6 Description

Steps

- Stage 6 Phase 1: Quiesce Management
- Stage 6 Phase 2: Migrate AIX on management standby.
- Stage 6 Phase 3: Update Fiber Channel, NIC and SSIAS adapter firmware.
- Stage 6 Phase 4: Update GPFS, TSA and DB2 on management hosts
- Stage 6 Phase 5: Restore Management To Service
- Stage 6 Phase 6: Prepare and Update Db2 on the management hosts.

Outage Requirements

- No core outage requirements during this stage.
- Warehouse Tools will be offline during the update.
- DPM will be offline during the update.
- The management domain will be offline during the update.
- GPFS filesystems will be offline during the update.

Time Per Step

- Stage 6 Phase 1: 10 to 15 minutes.
- Stage 6 Phase 2: 2 hours
 - V1.1 FP3->FP5 (Not tested, may require applying V1.1 FP4 AIX levels prior to migration which adds 50 minutes).
 - V1.1 FP2->FP5 (requires applying V1.1 FP3 AIX levels prior to migration which add 50 minutes) See previous FP3->FP5 bullet for FP3->FP5 requirements.
- Stage 6 Phase 3: 30 minutes
 - V1.1 FP2->FP4 add 20 minutes
- Stage 6 Phase 4: 10 minutes for GPFS.
 - FP3->FP5 add 10 minutes to apply FP4 GPFS levels.
 - FP2->FP4 add 5 minutes to apply FP3 GPFS levels.
- Stage 6 Phase 5: 15 minutes for TSA
 - Add 10 minutes if DPM was not removed as part of V1.1 FP4.
- Stage 6 Phase 6: 20 Minutes for DB2
 - Only required if OPM was not removed in V1.1 FP4 Stage 9 and the intent is to continue to use OPM after V1.1 FP5 is applied.
- Stage 6 Phase 7: 40 to 60 Mins for mksysb backups.

Risk Mitigation

- alt_disk_install_recovery can boot off previous level.
- mksysb recovery

STAGE 6 - Management stack upgrade

Backout Options

- Management host backout options will not be possible after GPFS has been committed.

During the management stack upgrade the warehouse will still be up and running. OPM and warehouse tools will be stopped and the management hosts will be rebooted.

Phase 1: Quiesce Management Services

Note: In V1.1 FP4 the management services for OPM were removed. This included removing the TSA domain. If OPM and the management domain are removed, then skip this phase and proceed to phase 2.

1. Command: Verify the state of the Management domain using:

```
hals -mgmt
```

Example Output when DPM is Online. If Online go to step 2.

```
$ hals -mgmt
MANAGEMENT DOMAIN
```

COMPONENT	PRIMARY	STANDBY	CURRENT	OPSTATE	HA STATUS	RG REQUESTS
DPM	flashdancehostname01	flashdancehostname03	flashdancehostname01	Online	Normal	-
DB2DPM	flashdancehostname01	flashdancehostname03	flashdancehostname01	Online	Normal	-

Example output when DPM is Offline but the management domain is still online. Go to step 3.

```
$ hals -mgmt
MANAGEMENT DOMAIN
```

COMPONENT	PRIMARY	STANDBY	CURRENT	OPSTATE	HA STATUS	RG REQUESTS
DPM	flashdancehostname01	N/A	N/A	Offline	Offline	-
DB2DPM	flashdancehostname01	N/A	N/A	Offline	Offline	-

Example output when the management domain is offline. Go to step 4.

```
$ hals -mgmt
none are available... returning
```

2. Command: Stop the DPM Services.

```
hastopdpm
```

Example Output:

```
$ hastopdpm
Stopping DPM and DB2 instance.....Resources offline
MANAGEMENT DOMAIN
```

COMPONENT	PRIMARY	STANDBY	CURRENT	OPSTATE	HA STATUS	RG REQUESTS
DPM	flashdancehostname01	N/A	N/A	Offline	Offline	-
DB2DPM	flashdancehostname01	N/A	N/A	Offline	Offline	-

3. Command: Stop the management Domain. There is no output for this command.

```
hadomain -mgmt stop
```

Example Output:

```
$ hadomain -mgmt stop
```

4. Command: Verify the domain is offline.

```
hals -mgmt
```

Example Output:

```
$ hals -mgmt
```

STAGE 6 - Management stack upgrade

none are available... returning

Phase 2: Migrate and Update AIX on the management standby host

1. Login to the management host and use or initiate a screen session. This is a root session. In the lab we use a screen session labelled *fprun* which is started by root on the management host.

2. Command: Change the directory if not already to /BCU_share/FP9_FP5/fixpack_tools/application.

```
cd /BCU_share/FP9_FP5/fixpack_tools/application
```

3. Ensure /BCU_share is mounted using the ./enable_bcushare.sh script.

```
./enable_bcushare.sh
```

Example Output:

```
$ ./enable_bcushare.sh
20201215_225746 (flashdancehostname01:enable_bcushare.sh): Checking for /BCU_share on all hosts.
20201215_225747 (flashdancehostname01:enable_bcushare.sh): Success: /BCU_share is mounted on all hosts.
20201215_225747 (flashdancehostname01:enable_bcushare.sh): enable_bcushare.sh completed with rc=0.
```

4. Command: Before removing the clone, double check that the standby node is using AIX 7.1 and not AIX 7.2. The fixpack tools scripting should have verified this already, but just to be sure. NOTE: At the time of this writing the AIX 7.2 migration procedure has only been tested when AIX is 7.1 TL5 SP7 (V1.1 FP4). FP1->FP5, FP2->FP5 FP3->FP5 customers should contact IBM prior to continuing for guidance.

```
dsh -n ${BCUMGMTSTDBY} oslevel -s
```

Example Output:

```
$ dsh -n ${BCUMGMTSTDBY} oslevel -s
reverseflash03: 7100-05-07-2038
```

5. Command: Remove the rootvg clone (altinst_rootvg) taken during Stage 2.

```
dsh -n ${BCUMGMTSTDBY} -s 'cd /BCU_share/FP9_FP5/fixpack_tools/application;./mirror_utility.sh -action unclone'
```

Example Output:

```
$ dsh -n ${BCUMGMTSTDBY} -s 'cd /BCU_share/FP9_FP5/fixpack_tools/application;./mirror_utility.sh -action unclone'
reverseflash03: 20220502_125108 (reverseflash03:mirror_utility.sh): Attempting to source /.profile to define BCU* variables.
reverseflash03: 20220502_125108 (reverseflash03:mirror_utility.sh): Starting date: Mon May 2 12:51:08 EDT 2022.
reverseflash03: 20220502125108: (mirror_utility.pl) Retrieving the current boot disk.
reverseflash03: 20220502125108: (mirror_utility.pl) Running command 'getconf -a | grep "^BOOT_DEVICE" | cut -d: -f2'.
reverseflash03: 20220502125108: (mirror_utility.pl) Found boot disk is hdisk0.
reverseflash03: 20220502125108: (mirror_utility.pl) Retrieving disk statistics for volume groups.
reverseflash03: 20220502125108: (mirror_utility.pl) Retrieving Internal Disks.
reverseflash03: 20220502125108: (mirror_utility.pl) Retrieving Free Disks.
reverseflash03: 20220502125109: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk0 -g menu.
reverseflash03: 20220502125109: (mirror_utility.pl) Running cmd lspv -l hdisk0.
reverseflash03: 20220502125109: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk1 -g menu.
reverseflash03: 20220502125109: (mirror_utility.pl) Running cmd lspv -l hdisk1.
reverseflash03: 20220502125109: (mirror_utility.pl) Retrieving lv stats for rootvg.
reverseflash03: 20220502125109: (mirror_utility.pl) Running command lsvg -l rootvg with paging filter.
reverseflash03: 20220502125109: (mirror_utility.pl) Determining rootvg status.
reverseflash03: 20220502125109: (mirror_utility.pl) Running command 'alt_disk_install -X altinst_rootvg'.
reverseflash03: 20220502125111: (mirror_utility.pl) Running command 'bosboot -a'.
reverseflash03: 20220502125127: (mirror_utility.pl) Running command 'bootlist -m normal hdisk0'.
reverseflash03: 20220502125127: (mirror_utility.pl) Retrieving the current boot disk.
reverseflash03: 20220502125127: (mirror_utility.pl) Running command 'getconf -a | grep "^BOOT_DEVICE" | cut -d: -f2'.
```

STAGE 6 - Management stack upgrade

```
reverseflash03: 20220502125127: (mirror_utility.pl) Found boot disk is hdisk0.
reverseflash03: 20220502125127: (mirror_utility.pl) Retrieving disk statistics for volume groups.
reverseflash03: 20220502125128: (mirror_utility.pl) Retrieving Internal Disks.
reverseflash03: 20220502125128: (mirror_utility.pl) Retrieving Free Disks.
reverseflash03: 20220502125128: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk0 -g menu.
reverseflash03: 20220502125128: (mirror_utility.pl) Running cmd lspv -l hdisk0.
reverseflash03: 20220502125128: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk1 -g menu.
reverseflash03: 20220502125128: (mirror_utility.pl) Running cmd lspv -l hdisk1.
reverseflash03: 20220502125128: (mirror_utility.pl) Retrieving lv stats for rootvg.
reverseflash03: 20220502125128: (mirror_utility.pl) Running command lsvg -l rootvg with paging filter.
reverseflash03: 20220502125128: (mirror_utility.pl) Determining rootvg status.
reverseflash03: 20220502_125129 (reverseflash03:mirror_utility.sh): Script './mirror_utility.sh' with arguments '-action unclone'
ended with rc='0'. Start: Mon May 2 12:51:08 EDT 2022 End: Mon May 2 12:51:29 EDT 2022. Elapsed Time (Seconds): 21.
reverseflash03: 20220502_125131 (reverseflash03:mirror_utility.sh): Normalizing management hostname.
reverseflash03: 20220502_125131 (reverseflash03:mirror_utility.sh): Management hostname is 'reverseflash01'.
reverseflash03: 20220502_125131 (reverseflash03:mirror_utility.sh): Sending notification 'Message from PDOA fixpack on
'reverseflash03' from script './mirror_utility.sh' to 'user@us.ibm.com' '-c root@localhost' via reverseflash01.
reverseflash03: 20220502_125132 (reverseflash03:mirror_utility.sh): Notification sent.
reverseflash03: 20220502_125132 (reverseflash03:mirror_utility.sh): mirror_utility.sh completed with rc=0.
```

6. Configure the management standby host for rsh.

- a. Command: Verify rsh is disabled on the management standby. If enabled then proceed to item 7.

```
rsh ${BCUMGMTSTDBY} echo "${BCUMGMTSTDBY} ready for migration."
```

Example Output: (Disabled.)

```
$ rsh ${BCUMGMTSTDBY} echo "${BCUMGMTSTDBY} ready for migration."
flashdancehostname03: A remote host refused an attempted connect operation.
```

Example Output: (Enabled)

```
$ rsh ${BCUMGMTSTDBY} echo "${BCUMGMTSTDBY} ready for migration."
flashdancehostname03mgt ready for migration.
```

- b. Command: Verify the .rhosts file on the management standby exists, and lists the management host with the user root. If Configured, proceed to 6d, otherwise proceed to 6c to create the file.

```
ssh -n ${BCUMGMTSTDBY} cat /.rhosts
```

Example Output: (Configured)

```
$ ssh -n ${BCUMGMTSTDBY} cat /.rhosts
flashdancehostname01 root
```

- c. Command: Create the .rhosts file on the management standby.

```
ssh -n ${BCUMGMTSTDBY} "if [ ! -f /.rhosts ];then echo Creating .rhosts file.;echo $(hostname) root > /.rhosts;chmod 400
/.rhosts;fi"
```

Example Output: (If .rhosts is created.)

```
$ ssh -n ${BCUMGMTSTDBY} "if [ ! -f /.rhosts ];then echo Creating .rhosts file.;echo $(hostname) root > /.rhosts;chmod 400
/.rhosts;fi"
Creating .rhosts file.
```

- d. Command: Start the rsh shell.

```
ssh -n ${BCUMGMTSTDBY} "startsrc -t shell"
```

Example Output:

```
$ ssh -n ${BCUMGMTSTDBY} "startsrc -t shell"
0513-124 The shell subserver has been started.
```

- e. Command: Verify the rsh shell is working from management to management standby.

```
rsh ${BCUMGMTSTDBY} echo "${BCUMGMTSTDBY} ready for migration."
```

Example Output:

STAGE 6 - Management stack upgrade

```
$ rsh ${BCUMGMTSTDBY} echo "${BCUMGMTSTDBY} ready for migration."
flashdancehostname03mgt ready for migration.
```

7. Command: Migrate the management standby host to AIX 7.2. See Appendix – Troubleshooting AIX 7.2 Migration Failures if an error is encountered.

```
./migrate_aix72.sh -migrate -server ${BCUMGMTSTDBY} -nimserver ${BCUMGMT}
```

[Example Output: See the file PDOA_FP9_FP5_Readme_References\migrate_aix72.sh_reverseflash01_20220803_230205.log for full log output. The following excerpt shows a successful migration.](#)

```
20220804_001635 (reverseflash01:migrate_aix72.sh): Checking 'reverseflash03mgt' for indications of a successful alt_disk_mksysb application with target level '7.2.0.0'.
20220804_001638 (reverseflash01:migrate_aix72.sh): Discovered alternate install variables as: OSVERSION='7.2.0.0' ALTVG='altinst_rootvg' BOOTABLE='YES'
20220804_001638 (reverseflash01:migrate_aix72.sh): Discovered 'altinst_rootvg' volume group with version '7.2.0.0' that matches '7.2.0.0'.
20220804_001638 (reverseflash01:migrate_aix72.sh): Install validation succeeded.
20220804_001638 (reverseflash01:migrate_aix72.sh): Successfully completed.
20220804_001638 (reverseflash01:migrate_aix72.sh): Script './migrate_aix72.sh' with arguments '-migrate -server reverseflash03mgt -nimserver reverseflash01mgt' ended with rc='0'. Start: Wed Aug 3 23:02:05 EDT 2022 End: Thu Aug 4 00:16:38 EDT 2022. Elapsed Time (Seconds): 4473 (H:M:S): (01:14:33).
```

8. Command: Reboot the management standby host. This command also verifies the update, restores the sendmail configuration and restores ha tools logs on the local host after the system reboots.

```
./migrate_aix72.sh -reboot NOFORCE -server ${BCUMGMTSTDBY} -nimserver ${BCUMGMT}
```

Example Output: [\(see the file](#)

[PDOA_FP9_FP5_Readme_References\migrate_aix72.sh_reverseflash01_20220804_123525.log\)](#) The following messages indicate success in the log.

```
20220804_124714 (reverseflash01:migrate_aix72.sh): Reboot into AIX 7.2 is validated '7.2.0.0'.
...
20220804_124824 (reverseflash01:migrate_aix72.sh): GPFS and '/stage' have been verified.
...
20220804_124830 (reverseflash01:migrate_aix72.sh): Command returned rc='0'.
20220804_124830 (reverseflash01:migrate_aix72.sh): Successfully completed.
20220804_124830 (reverseflash01:migrate_aix72.sh): Script './migrate_aix72.sh' with arguments '-reboot -server reverseflash03mgt -nimserver reverseflash01mgt' ended with rc='0'. Start: Thu Aug 4 12:35:25 EDT 2022 End: Thu Aug 4 12:48:30 EDT 2022. Elapsed Time (Seconds): 785 (H:M:S):(00:13:05).
```

STAGE 6 - Management stack upgrade

9. Command: Verify level and successful installation from install_all_updates.log. Both management nodes should now be updated to AIX 7.2 TL5 SP4. V1.1 FP2 customers will need at least one additional pass to one to apply V1.1 FP3's AIX level. It is not known at this time if FP3's customers will also need an additional pass to apply FP4's level before migrating.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'oslevel -s'
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'oslevel -s'
reverseflash01: 7200-05-04-2220
reverseflash03: 7200-05-04-2220
```

10. Command: Verify the management standby efices. If IJ29552s7b is present (3 efices appear) then see Appendix – Safely removing IJ29552s7b efix after migration. FP2->FP5, FP3->FP5 customers may see other efices than then ones shown below, contact IBM Support before proceeding if that is the case.

```
ssh ${BCUMGMTSTDBY} 'emgr -l'
```

Example Output:

```
$ ssh ${BCUMGMTSTDBY} 'emgr -l'
```

ID	STATE	LABEL	INSTALL TIME	UPDATED BY	ABSTRACT
1	S	IJ40615m4b	09/13/22 20:46:16	IJ40615	for AIX 7.2 TL5 SP2 SP4
2	S	IJ39876s3a	09/13/22 20:46:28	IJ39876	POTENTIAL SECURITY ISSUE

STATE codes:

```
S = STABLE
M = MOUNTED
U = UNMOUNTED
Q = REBOOT REQUIRED
B = BROKEN
I = INSTALLING
R = REMOVING
T = TESTED
P = PATCHED
N = NOT PATCHED
SP = STABLE + PATCHED
SN = STABLE + NOT PATCHED
QP = BOOT IMAGE MODIFIED + PATCHED
QN = BOOT IMAGE MODIFIED + NOT PATCHED
RQ = REMOVING + REBOOT REQUIRED
```


STAGE 6 - Management stack upgrade

11. Command: Disable rsh on the management standby after migration.

```
ssh -n ${BCUMGMTSTDBY} "stopsrc -t shell"
```

12. Command: Remount /BCU_share using the utility script.

```
./enable_bcushare.sh
```

Example Output:

```
(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
$ ./enable_bcushare.sh
20201215_235055 (flashdancehostname01:enable_bcushare.sh): Checking for /BCU_share on all hosts.
20201215_235056 (flashdancehostname01:enable_bcushare.sh): Warning: The following hosts are missing /BCU_share mounts.
flashdancehostname03: Warning: Missing /BCU_share mount.
20201215_235056 (flashdancehostname01:enable_bcushare.sh): Attempting to mount /BCU_share on all hosts.
20201215_235057 (flashdancehostname01:enable_bcushare.sh): Checking for /BCU_share on all hosts.
20201215_235058 (flashdancehostname01:enable_bcushare.sh): Success: /BCU_share is mounted on all hosts.
20201215_235058 (flashdancehostname01:enable_bcushare.sh): enable_bcushare.sh completed with rc=0.

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

Phase 3: Update FC Adapter, Card Adapter and Network Adapter

Note: V1.1 FP4->FP5 customers will only have RAID (sisas) adapter updates, please skip to Step 2: RAID (sisas) Adapter.

Note: V1.1 FP3->FP5 customers also have Fibre Channel updates on the data nodes (non-mgmt / non-admin). V1.1 FP2->FP5 customers will need to update all adapters. Please ensure that the V1.1 FP3 and V1.1 F4 fix packs have been downloaded and registered before starting Step 1 for these scenarios.

Step 1: Update Fibre Channel and Network Card Adapters

1. Command: The management nodes will not have FC Adapter nor Network Adapter Updates. The following command will list all adapters that require updates. This list should only include FC adapters from Data Nodes. This command will be used again as part of Stage 7 to update FC adapters on all quiesced hosts. Note: V1.1 FP2->FP4 customers will see network adapters on all hosts as well as FC adapters on the foundation hosts. See the FP2 customer example output.

```
./update_adapters.sh validate
```

Example Output: (FP3->FP4 output)

```
$ ./update_adapters.sh validate
20201216_022908 (flashdancehostname01:update_adapters.sh): Starting date: Wed Dec 16 02:29:08 IST 2020.
20201216_022908 (flashdancehostname01:update_adapters.sh): Checking for available updates.
20201216_022908 (flashdancehostname01:update_adapters.sh): Checking for Quiesced hosts.
20201216_022915 (flashdancehostname01:update_adapters.sh): Checking for adapters that are eligible for updates.
20201216_022942 (flashdancehostname01:update_adapters.sh): The following is a list of all adapters requiring updates. Only
adapters on quiesced hosts will be updated.
20201216_022942 (flashdancehostname01:update_adapters.sh):

server2 flashdancehostname05 172.23.1.5 fc_adapter6 server2 7710322514101e04 0320080270
server2 flashdancehostname05 172.23.1.5 fc_adapter7 server2 7710322514101e04 0320080270
server2 flashdancehostname05 172.23.1.5 fc_adapter8 server2 7710322514101e04 0320080270
server2 flashdancehostname05 172.23.1.5 fc_adapter9 server2 7710322514101e04 0320080270
server0 flashdancehostname06 172.23.1.6 fc_adapter0 server0 7710322514101e04 0320080270
server0 flashdancehostname06 172.23.1.6 fc_adapter1 server0 7710322514101e04 0320080270
server0 flashdancehostname06 172.23.1.6 fc_adapter2 server0 7710322514101e04 0320080270
server0 flashdancehostname06 172.23.1.6 fc_adapter3 server0 7710322514101e04 0320080270
server5 flashdancehostname07 172.23.1.7 fc_adapter18 server5 7710322514101e04 0320080270
server5 flashdancehostname07 172.23.1.7 fc_adapter19 server5 7710322514101e04 0320080270
server5 flashdancehostname07 172.23.1.7 fc_adapter20 server5 7710322514101e04 0320080270
server5 flashdancehostname07 172.23.1.7 fc_adapter21 server5 7710322514101e04 0320080270

20201216_022942 (flashdancehostname01:update_adapters.sh): Starting date: Wed Dec 16 02:29:08 IST 2020 Ending Date: Wed Dec 16
02:29:42 IST 2020.

(1) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

Example Output: (FP2->FP4 customers)

```
$ ./update_adapters.sh validate
20210521_142758 (reverseflash01:update_adapters.sh): Starting date: Fri May 21 14:27:58 EDT 2021.
20210521_142758 (reverseflash01:update_adapters.sh): Checking for available updates.
20210521_142758 (reverseflash01:update_adapters.sh): Checking for Quiesced hosts.
20210521_142804 (reverseflash01:update_adapters.sh): Checking for adapters that are eligible for updates.
20210521_142827 (reverseflash01:update_adapters.sh): The following is a list of all adapters requiring updates. Only adapters on
quiesced hosts will be updated.
20210521_142827 (reverseflash01:update_adapters.sh):

server5 reverseflash01 172.23.1.1 net_adapter10 server5 e4148a1614109304 30100150
server5 reverseflash01 172.23.1.1 net_adapter11 server5 e4148a1614109304 30100150
server3 reverseflash02 172.23.1.2 net_adapter6 server3 e4148a1614109304 30100150
server3 reverseflash02 172.23.1.2 net_adapter7 server3 e4148a1614109304 30100150
```

STAGE 6 - Management stack upgrade

```
server1 reverseflash03 172.23.1.3 net_adapter2 server1 e4148a1614109304 30100150
server1 reverseflash03 172.23.1.3 net_adapter3 server1 e4148a1614109304 30100150
server4 reverseflash04 172.23.1.4 net_adapter8 server4 e4148a1614109304 30100150
server4 reverseflash04 172.23.1.4 net_adapter9 server4 e4148a1614109304 30100150
server2 reverseflash05 172.23.1.5 net_adapter4 server2 e4148a1614109304 30100150
server2 reverseflash05 172.23.1.5 net_adapter5 server2 e4148a1614109304 30100150
server0 reverseflash06 172.23.1.6 net_adapter0 server0 e4148a1614109304 30100150
server0 reverseflash06 172.23.1.6 net_adapter1 server0 e4148a1614109304 30100150
server5 reverseflash01 172.23.1.1 fc_adapter18 server5 df1000f114100104 203305
server5 reverseflash01 172.23.1.1 fc_adapter19 server5 df1000f114100104 203305
server3 reverseflash02 172.23.1.2 fc_adapter10 server3 df1000f114100104 203305
server3 reverseflash02 172.23.1.2 fc_adapter11 server3 df1000f114100104 203305
server3 reverseflash02 172.23.1.2 fc_adapter12 server3 df1000f114100104 203305
server3 reverseflash02 172.23.1.2 fc_adapter13 server3 df1000f114100104 203305
server1 reverseflash03 172.23.1.3 fc_adapter4 server1 df1000f114100104 203305
server1 reverseflash03 172.23.1.3 fc_adapter5 server1 df1000f114100104 203305
server4 reverseflash04 172.23.1.4 fc_adapter14 server4 df1000f114100104 203305
server4 reverseflash04 172.23.1.4 fc_adapter15 server4 df1000f114100104 203305
server4 reverseflash04 172.23.1.4 fc_adapter16 server4 df1000f114100104 203305
server4 reverseflash04 172.23.1.4 fc_adapter17 server4 df1000f114100104 203305
server2 reverseflash05 172.23.1.5 fc_adapter6 server2 7710322514101e04 0320080200
server2 reverseflash05 172.23.1.5 fc_adapter7 server2 7710322514101e04 0320080200
server2 reverseflash05 172.23.1.5 fc_adapter8 server2 7710322514101e04 0320080200
server2 reverseflash05 172.23.1.5 fc_adapter9 server2 7710322514101e04 0320080200
server0 reverseflash06 172.23.1.6 fc_adapter0 server0 7710322514101e04 0320080200
server0 reverseflash06 172.23.1.6 fc_adapter1 server0 7710322514101e04 0320080200
server0 reverseflash06 172.23.1.6 fc_adapter2 server0 7710322514101e04 0320080200
server0 reverseflash06 172.23.1.6 fc_adapter3 server0 7710322514101e04 0320080200

20210521_142827 (reverseflash01:update_adapters.sh): The following adapters are eligible for updates. '
e4148a1614109304:net_adapter10,net_adapter11,net_adapter2,net_adapter3
df1000f114100104:fc_adapter18,fc_adapter19,fc_adapter4,fc_adapter5'.
20210521_142827 (reverseflash01:update_adapters.sh): Running the command
'/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_net_adapter update -validate -l
net_adapter10,net_adapter11,net_adapter2,net_adapter3 -f /BCU_share/FP7_FP3/firmware/net_adapter/e4148a1614109304/image' to
validate devices.
Validation passed for net_adapter10
Validation passed for net_adapter11
Validation passed for net_adapter2
Validation passed for net_adapter3
20210521_142905 (reverseflash01:update_adapters.sh): Running the command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_fc_adapter
update -validate -l fc_adapter18,fc_adapter19,fc_adapter4,fc_adapter5 -f
/BCU_share/FP7_FP3/firmware/fc_adapter/df1000f114100104/image' to validate devices.
Validation passed for fc_adapter18
Validation passed for fc_adapter19
Validation passed for fc_adapter4
Validation passed for fc_adapter5
20210521_142935 (reverseflash01:update_adapters.sh): Starting date: Fri May 21 14:27:58 EDT 2021 Ending Date: Fri May 21
14:29:35 EDT 2021.

(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

2. Command: FP2->FP4 customers will need to run the following to update their FC and NIC cards to V1.1 FP3 levels.

```
./update_adapters.sh update
```

Example Output: (FP2->FP4)

```
$ ./update_adapters.sh update
20210521_143524 (reverseflash01:update_adapters.sh): Starting date: Fri May 21 14:35:24 EDT 2021.
20210521_143524 (reverseflash01:update_adapters.sh): Checking for available updates.
20210521_143524 (reverseflash01:update_adapters.sh): Checking for Quiesced hosts.
20210521_143530 (reverseflash01:update_adapters.sh): Checking for adapters that are eligible for updates.
20210521_143553 (reverseflash01:update_adapters.sh): The following is a list of all adapters requiring updates. Only adapters on
quiesced hosts will be updated.
20210521_143553 (reverseflash01:update_adapters.sh):

server5 reverseflash01 172.23.1.1 net_adapter10 server5 e4148a1614109304 30100150
server5 reverseflash01 172.23.1.1 net_adapter11 server5 e4148a1614109304 30100150
server3 reverseflash02 172.23.1.2 net_adapter6 server3 e4148a1614109304 30100150
server3 reverseflash02 172.23.1.2 net_adapter7 server3 e4148a1614109304 30100150
server1 reverseflash03 172.23.1.3 net_adapter2 server1 e4148a1614109304 30100150
server1 reverseflash03 172.23.1.3 net_adapter3 server1 e4148a1614109304 30100150
server4 reverseflash04 172.23.1.4 net_adapter8 server4 e4148a1614109304 30100150
server4 reverseflash04 172.23.1.4 net_adapter9 server4 e4148a1614109304 30100150
server2 reverseflash05 172.23.1.5 net_adapter4 server2 e4148a1614109304 30100150
server2 reverseflash05 172.23.1.5 net_adapter5 server2 e4148a1614109304 30100150
server0 reverseflash06 172.23.1.6 net_adapter0 server0 e4148a1614109304 30100150
server0 reverseflash06 172.23.1.6 net_adapter1 server0 e4148a1614109304 30100150
server5 reverseflash01 172.23.1.1 fc_adapter18 server5 df1000f114100104 203305
server5 reverseflash01 172.23.1.1 fc_adapter19 server5 df1000f114100104 203305
server3 reverseflash02 172.23.1.2 fc_adapter10 server3 df1000f114100104 203305
server3 reverseflash02 172.23.1.2 fc_adapter11 server3 df1000f114100104 203305
server3 reverseflash02 172.23.1.2 fc_adapter12 server3 df1000f114100104 203305
```

```

server3 reverseflash02 172.23.1.2 fc_adapter13 server3 df1000f114100104 203305
server1 reverseflash03 172.23.1.3 fc_adapter4 server1 df1000f114100104 203305
server1 reverseflash03 172.23.1.3 fc_adapter5 server1 df1000f114100104 203305
server4 reverseflash04 172.23.1.4 fc_adapter14 server4 df1000f114100104 203305
server4 reverseflash04 172.23.1.4 fc_adapter15 server4 df1000f114100104 203305
server4 reverseflash04 172.23.1.4 fc_adapter16 server4 df1000f114100104 203305
server4 reverseflash04 172.23.1.4 fc_adapter17 server4 df1000f114100104 203305
server2 reverseflash05 172.23.1.5 fc_adapter6 server2 7710322514101e04 0320080200
server2 reverseflash05 172.23.1.5 fc_adapter7 server2 7710322514101e04 0320080200
server2 reverseflash05 172.23.1.5 fc_adapter8 server2 7710322514101e04 0320080200
server2 reverseflash05 172.23.1.5 fc_adapter9 server2 7710322514101e04 0320080200
server0 reverseflash06 172.23.1.6 fc_adapter0 server0 7710322514101e04 0320080200
server0 reverseflash06 172.23.1.6 fc_adapter1 server0 7710322514101e04 0320080200
server0 reverseflash06 172.23.1.6 fc_adapter2 server0 7710322514101e04 0320080200
server0 reverseflash06 172.23.1.6 fc_adapter3 server0 7710322514101e04 0320080200

20210521_143553 (reverseflash01:update_adapters.sh): The following adapters are eligible for updates. '
e4148a1614109304:net_adapter10,net_adapter11,net_adapter2,net_adapter3
df1000f114100104:fc_adapter18,fc_adapter19,fc_adapter4,fc_adapter5'.
20210521_143553 (reverseflash01:update_adapters.sh): Running the command
'/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_net_adapter update -validate -l
net_adapter10,net_adapter11,net_adapter2,net_adapter3 -f /BCU_share/FP7_FP3/firmware/net_adapter/e4148a1614109304/image' to
validate devices.
Validation passed for net_adapter10
Validation passed for net_adapter11
Validation passed for net_adapter2
Validation passed for net_adapter3
20210521_143630 (reverseflash01:update_adapters.sh): Running the command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_fc_adapter
update -validate -l fc_adapter18,fc_adapter19,fc_adapter4,fc_adapter5 -f
/BCU_share/FP7_FP3/firmware/fc_adapter/df1000f114100104/image' to validate devices.
Validation passed for fc_adapter18
Validation passed for fc_adapter19
Validation passed for fc_adapter4
Validation passed for fc_adapter5
20210521_143701 (reverseflash01:update_adapters.sh): The following adapters are eligible for updates. '
e4148a1614109304:net_adapter10,net_adapter11,net_adapter2,net_adapter3
df1000f114100104:fc_adapter18,fc_adapter19,fc_adapter4,fc_adapter5'.
20210521_143701 (reverseflash01:update_adapters.sh): Running the command
'/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_net_adapter update -install -l
net_adapter10,net_adapter11,net_adapter2,net_adapter3 -f /BCU_share/FP7_FP3/firmware/net_adapter/e4148a1614109304/image' to
update devices.
Successfully Completed adapter update for net_adapter10
Successfully Completed adapter update for net_adapter2
Successfully Completed adapter update for net_adapter3
Successfully Completed adapter update for net_adapter11
20210521_144421 (reverseflash01:update_adapters.sh): Running the command '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_fc_adapter
update -install -l fc_adapter18,fc_adapter19,fc_adapter4,fc_adapter5 -f
/BCU_share/FP7_FP3/firmware/fc_adapter/df1000f114100104/image' to update devices.
Successfully Completed adapter update for fc_adapter18
Successfully Completed adapter update for fc_adapter4
Successfully Completed adapter update for fc_adapter19
Successfully Completed adapter update for fc_adapter5
20210521_145238 (reverseflash01:update_adapters.sh): Starting date: Fri May 21 14:35:24 EDT 2021 Ending Date: Fri May 21
14:52:38 EDT 2021.

```

```

/BCU_share/FP9_FP5/fixpack_tools/status/adapter_status.sh | egrep "$(echo ${BCUMGMT} \||${BCUMGMTSTDBY}\ | sed 's|mgt||g')"
```

Example Output:

```

$ /BCU_share/FP9_FP5/fixpack_tools/status/adapter_status.sh | egrep "$(echo ${BCUMGMT} \||${BCUMGMTSTDBY}\ | sed 's|mgt||g')"
```

server5	reverseflash01	172.23.1.1	net_adapter10	server5	e4148a1614109304	30100310
server5	reverseflash01	172.23.1.1	net_adapter11	server5	e4148a1614109304	30100310
server1	reverseflash03	172.23.1.3	net_adapter2	server1	e4148a1614109304	30100310
server1	reverseflash03	172.23.1.3	net_adapter3	server1	e4148a1614109304	30100310
server5	reverseflash01	172.23.1.1	fc_adapter18	server5	df1000f114100104	210313
server5	reverseflash01	172.23.1.1	fc_adapter19	server5	df1000f114100104	210313
server1	reverseflash03	172.23.1.3	fc_adapter4	server1	df1000f114100104	210313
server1	reverseflash03	172.23.1.3	fc_adapter5	server1	df1000f114100104	210313

```

(0) root @ reverseflash01: 7.1.1.0.0: /BCU share/FP8 FP4/fixpack tools/application
```

STAGE 6 - Management stack upgrade

Step 2: Update RAID (sissas) Adapter

1. Command: Validate the sissas adapters on the management hosts. This will list all adapters that should be updated and all adapters that would be updated on quiesced hosts. V1.1 FP2->FP4 customers: Please verify that the level is 19512300 or higher. If this level is lower, please refer to this note <https://www.ibm.com/support/pages/node/1088866>. The sissas helper scripts below will not recognize the error condition that occurs in the technote scenario and will not allow a second attempt. It will still apply the firmware the first time.

```
./update_sissas.sh validate
```

Example Output:

```
$ ./update_sissas.sh validate
20220804_144406 (reverseflash01:update_sissas.sh): Starting date: Thu Aug 4 14:44:06 EDT 2022.
20220804_144406 (reverseflash01:update_sissas.sh): Checking for available updates.
20220804_144406 (reverseflash01:update_sissas.sh): Checking for Quiesced hosts.
20220804_144414 (reverseflash01:update_sissas.sh): Checking for adapters that are eligible for updates.
20220804_144418 (reverseflash01:update_sissas.sh): The following is a list of all adapters requiring updates. Only adapters on
quiesced hosts will be updated.
20220804_144418 (reverseflash01:update_sissas.sh):

reverseflash06:172.23.1.6:sissas0:19512b00
reverseflash03:172.23.1.3:sissas0:19512b00
reverseflash05:172.23.1.5:sissas0:19512b00
reverseflash02:172.23.1.2:sissas0:19512b00
reverseflash04:172.23.1.4:sissas0:19512b00
reverseflash01:172.23.1.1:sissas0:19512b00

20220804_144418 (reverseflash01:update_sissas.sh): The following adapters are eligible for updates. '
reverseflash03:172.23.1.3:sissas0:19512b00
reverseflash01:172.23.1.1:sissas0:19512b00'.
20220804_144418 (reverseflash01:update_sissas.sh): Running the command '/opt/ibm/aixappl/pfplayer/bin/icmds/adapterfw -validate -i
172.23.1.3 -d sissas0 -f /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm' to
validate devices.
The adapter validation is successful for the adapter firmware image /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-
57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm on sissas0(172.23.1.3)'.
20220804_144420 (reverseflash01:update_sissas.sh): Running the command '/opt/ibm/aixappl/pfplayer/bin/icmds/adapterfw -validate -i
172.23.1.1 -d sissas0 -f /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm' to
validate devices.
The adapter validation is successful for the adapter firmware image /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-
57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm on sissas0(172.23.1.1)'.
20220804_144422 (reverseflash01:update_sissas.sh): Script './update_sissas.sh' with arguments 'validate' ended with rc='0'.
Start: Thu Aug 4 14:44:06 EDT 2022 End: Thu Aug 4 14:44:22 EDT 2022. Elapsed Time (Seconds): 16 (H:M:S):(00:00:16).
20220804_144422 (reverseflash01:update_sissas.sh): Normalizing management hostname.
20220804_144423 (reverseflash01:update_sissas.sh): Management hostname is 'reverseflash01'.
20220804_144423 (reverseflash01:update_sissas.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from
script './update_sissas.sh'.' to 'user@customer.com' '-c root@localhost'.
20220804_144423 (reverseflash01:update_sissas.sh): Notification sent.
```

2. Command: Update the management node adapters.

```
./update_sissas.sh update
```

Example Output:

```
$ ./update_sissas.sh update
20220804_144544 (reverseflash01:update_sissas.sh): Starting date: Thu Aug 4 14:45:44 EDT 2022.
20220804_144544 (reverseflash01:update_sissas.sh): Checking for available updates.
20220804_144544 (reverseflash01:update_sissas.sh): Checking for Quiesced hosts.
20220804_144552 (reverseflash01:update_sissas.sh): Checking for adapters that are eligible for updates.
20220804_144556 (reverseflash01:update_sissas.sh): The following is a list of all adapters requiring updates. Only adapters on
quiesced hosts will be updated.
20220804_144556 (reverseflash01:update_sissas.sh):

reverseflash06:172.23.1.6:sissas0:19512b00
reverseflash03:172.23.1.3:sissas0:19512b00
reverseflash05:172.23.1.5:sissas0:19512b00
reverseflash02:172.23.1.2:sissas0:19512b00
reverseflash04:172.23.1.4:sissas0:19512b00
reverseflash01:172.23.1.1:sissas0:19512b00

20220804_144556 (reverseflash01:update_sissas.sh): The following adapters are eligible for updates. '
reverseflash03:172.23.1.3:sissas0:19512b00
```

STAGE 6 - Management stack upgrade

```
reverseflash01:172.23.1.1:sissas0:19512b00'.
20220804_144556 (reverseflash01:update_sissas.sh): Running the command '/opt/ibm/aixappl/pflayer/bin/icmds/adapterfw -validate -i
172.23.1.3 -d sissas0 -f /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm' to
validate devices.
The adapter validation is successful for the adapter firmware image /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-
57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm on sissas0(172.23.1.3).
20220804_144558 (reverseflash01:update_sissas.sh): Running the command '/opt/ibm/aixappl/pflayer/bin/icmds/adapterfw -validate -i
172.23.1.1 -d sissas0 -f /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm' to
validate devices.
The adapter validation is successful for the adapter firmware image /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-
57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm on sissas0(172.23.1.1).
20220804_144600 (reverseflash01:update_sissas.sh): The following adapters are eligible for updates. '
reverseflash03:172.23.1.3:sissas0:19512b00
reverseflash01:172.23.1.1:sissas0:19512b00'.
20220804_144600 (reverseflash01:update_sissas.sh): Running the command '/opt/ibm/aixappl/pflayer/bin/icmds/adapterfw -update -i
172.23.1.3 -d sissas0 -f /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm' to
validate devices.
The adapter update is successful for the adapter firmware image /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-
57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm on sissas0(172.23.1.3).
20220804_144743 (reverseflash01:update_sissas.sh): Running the command '/opt/ibm/aixappl/pflayer/bin/icmds/adapterfw -update -i
172.23.1.1 -d sissas0 -f /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm' to
validate devices.
The adapter update is successful for the adapter firmware image /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-
57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm on sissas0(172.23.1.1).
20220804_144924 (reverseflash01:update_sissas.sh): Script './update_sissas.sh' with arguments 'update' ended with rc='0'. Start:
Thu Aug 4 14:45:44 EDT 2022 End: Thu Aug 4 14:49:23 EDT 2022. Elapsed Time (Seconds): 220 (H:M:S):(00:03:40).
20220804_144924 (reverseflash01:update_sissas.sh): Normalizing management hostname.
20220804_144924 (reverseflash01:update_sissas.sh): Management hostname is 'reverseflash01'.
20220804_144924 (reverseflash01:update_sissas.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from
script './update_sissas.sh'.' to 'user@company.com' '-c root@localhost'.
20220804_144924 (reverseflash01:update_sissas.sh): Notification sent.
```

(0) root @ reverseflash01: 7.2.0.0:/BCU_share/FP9_FP5/fixpack_tools/application

3. Command: Verify the adapter versions. The management nodes should be at 19512c00.

```
/BCU_share/FP9_FP5/fixpack_tools/status/adapter_status.sh | grep sissas
```

Example Output:

```
$ /BCU_share/FP9_FP5/fixpack_tools/status/adapter_status.sh | grep sissas
reverseflash01: 172.23.1.1:sissas0: 53495351.19512c00: Customer Card ID Number.....57D7
reverseflash02: 172.23.1.2:sissas0: 53495351.19512b00: Customer Card ID Number.....57D7
reverseflash03: 172.23.1.3:sissas0: 53495351.19512c00: Customer Card ID Number.....57D7
reverseflash04: 172.23.1.4:sissas0: 53495351.19512b00: Customer Card ID Number.....57D7
reverseflash05: 172.23.1.5:sissas0: 53495351.19512b00: Customer Card ID Number.....57D7
reverseflash06: 172.23.1.6:sissas0: 53495351.19512b00: Customer Card ID Number.....57D7
```

Phase 4: Update GPFS on the management hosts

Spectrum Scale (GPFS) will be migrated and updated on the management hosts in this phase. The following instructions provide the migration (5.0.5.4 to 5.1.1.0) and update (5.1.1.0 to 5.1.1.4) steps that represents what happens in a PDOA V1.1 FP4 to PDOA V1.1 FP5 scenario. At this time other scenarios have not been tested.

1. Ensure DPM services are offline.
2. Command: Quiesce the management hosts. A quiesced host has all services shutdown, the TSA domain is offline on that host, all GPFS filesystems are cleanly unmounted, and the GPFS cluster is shutdown on that host. This step will effectively shutdown the management domain (if it still exists) and the MANAGEMENT.gpfs cluster.

```
dsh -s -n ${BCUMGMT},${BCUMGMTSTDBY} '/BCU_share/FP9_FP5/fixpack_tools/application/quiesce_node.sh'
```

Example Output: (For full example output see:

[PDOA FP9 FP5 Readme References\quiesce_node.sh reverseflash01 20220804 151442.log](#) and [PDOA FP9 FP5 Readme References\quiesce_node.sh reverseflash03 20220804 151443.log](#))

Successful output will show GPFS is shutdown for both hosts as well as rc=0 codes as shown in the following except.

```
$ dsh -s -n ${BCUMGMT},${BCUMGMTSTDBY} '/BCU_share/FP9_FP5/fixpack_tools/application/quiesce_node.sh'
...
reverseflash01: Thu Aug  4 15:15:04 EDT 2022: 6027-1345 mmshutdown: Finished
reverseflash01: 20220804_151504 (reverseflash01:quiesce_node.sh): Script
'/BCU_share/FP9_FP5/fixpack_tools/application/quiesce_node.sh' with arguments '' ended with rc='0'. Start: Thu Aug  4 15:14:42
EDT 2022 End: Thu Aug  4 15:15:04 EDT 2022. Elapsed Time (Seconds): 22 (H:M:S):(00:00:22).
...
reverseflash03: Thu Aug  4 15:15:06 EDT 2022: 6027-1345 mmshutdown: Finished
reverseflash03: 20220804_151506 (reverseflash03:quiesce_node.sh): Script
'/BCU_share/FP9_FP5/fixpack_tools/application/quiesce_node.sh' with arguments '' ended with rc='0'. Start: Thu Aug  4 15:14:43
EDT 2022 End: Thu Aug  4 15:15:06 EDT 2022. Elapsed Time (Seconds): 23 (H:M:S):(00:00:23).
...
```

3. Command: Validate GPFS updates on the management hosts. The V1.1 FP4->FP5 scenario output will show the current versions at 5.0.5.4. The V1.1 FP3->FP5 scenario will show the current version at 4.2.3.17. The V1.1 FP2->FP5 scenario will show 4.2.3.7 as the current version. The available versions will depend on which fixpacks have been registered on the system. The script will detect all available versions from V1.1 FP2 to V1.1 FP5 as long as the fixpack packages have been unpacked. The script will also enforce the update order based on internal testing. At present the supported update order is: 4.2.3.x->5.0.5.0->5.0.5.4->5.1.1.0->5.1.1.4. The script can be run multiple times with the same arguments to update to the next supported level until reaching the expected level. The return code for the dsh command should be '0'.

```
dsh -f 1 -n ${BCUMGMT},${BCUMGMTSTDBY} '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh validate' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -f 1 -n ${BCUMGMT},${BCUMGMTSTDBY} '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh validate' 2>&1 | dshbak -c
HOSTS -----
reverseflash01
-----
20220804_152941 (reverseflash01:gpfs_utility.sh): Starting date: Thu Aug  4 15:29:41 EDT 2022.
20220804_152941 (reverseflash01:gpfs_utility.sh): Checking current gpfs version.
20220804_152941 (reverseflash01:gpfs_utility.sh): My GPFS version is '5.0.5.4'.
20220804_152941 (reverseflash01:gpfs_utility.sh): Checking for available gpfs updates.
20220804_152941 (reverseflash01:gpfs_utility.sh): Found GPFS version '4.2.3.0'.
20220804_152941 (reverseflash01:gpfs_utility.sh): Found GPFS version '4.2.3.7'.
20220804_152941 (reverseflash01:gpfs_utility.sh): Found GPFS version '4.2.3.17'.
20220804_152941 (reverseflash01:gpfs_utility.sh): Found GPFS version '5.0.5.0'.
20220804_152941 (reverseflash01:gpfs_utility.sh): Found GPFS version '5.0.5.4'.
```

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```
20220804_152941 (reverseflash01:gpfs_utility.sh): Found GPFS version '5.1.1.0'.
20220804_152941 (reverseflash01:gpfs_utility.sh): Found GPFS version '5.1.1.4'.
20220804_152941 (reverseflash01:gpfs_utility.sh): There are no updates available for this system.
20220804_152941 (reverseflash01:gpfs_utility.sh): There is no available update for this host.
20220804_152941 (reverseflash01:gpfs_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh' with
arguments 'validate' ended with rc='1'. Start: Thu Aug 4 15:29:41 EDT 2022 End: Thu Aug 4 15:29:41 EDT 2022. Elapsed Time
(Seconds): 0 (H:M:S):(00:00:00).
20220804_152941 (reverseflash01:gpfs_utility.sh): Normalizing management hostname.
20220804_152942 (reverseflash01:gpfs_utility.sh): Management hostname is 'reverseflash01'.
20220804_152942 (reverseflash01:gpfs_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh'.' to 'user@company.com' '-c root@localhost'.
20220804_152942 (reverseflash01:gpfs_utility.sh): Notification sent.

HOSTS -----
reverseflash03
-----
20220804_152942 (reverseflash03:gpfs_utility.sh): Starting date: Thu Aug 4 15:29:42 EDT 2022.
20220804_152942 (reverseflash03:gpfs_utility.sh): Checking current gpfs version.
20220804_152942 (reverseflash03:gpfs_utility.sh): My GPFS version is '5.0.5.4'.
20220804_152942 (reverseflash03:gpfs_utility.sh): Checking for available gpfs updates.
20220804_152942 (reverseflash03:gpfs_utility.sh): Found GPFS version '4.2.3.0'.
20220804_152942 (reverseflash03:gpfs_utility.sh): Found GPFS version '4.2.3.7'.
20220804_152942 (reverseflash03:gpfs_utility.sh): Found GPFS version '4.2.3.17'.
20220804_152942 (reverseflash03:gpfs_utility.sh): Found GPFS version '5.0.5.0'.
20220804_152942 (reverseflash03:gpfs_utility.sh): Found GPFS version '5.0.5.4'.
20220804_152942 (reverseflash03:gpfs_utility.sh): Found GPFS version '5.1.1.0'.
20220804_152942 (reverseflash03:gpfs_utility.sh): Found GPFS version '5.1.1.4'.
20220804_152942 (reverseflash03:gpfs_utility.sh): There are no updates available for this system.
20220804_152942 (reverseflash03:gpfs_utility.sh): There is no available update for this host.
20220804_152942 (reverseflash03:gpfs_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh' with
arguments 'validate' ended with rc='1'. Start: Thu Aug 4 15:29:42 EDT 2022 End: Thu Aug 4 15:29:42 EDT 2022. Elapsed Time
(Seconds): 0 (H:M:S):(00:00:00).
20220804_152944 (reverseflash03:gpfs_utility.sh): Normalizing management hostname.
20220804_152945 (reverseflash03:gpfs_utility.sh): Management hostname is 'reverseflash01'.
20220804_152945 (reverseflash03:gpfs_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash03' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220804_152945 (reverseflash03:gpfs_utility.sh): Notification sent.You have mail in /usr/spool/mail/root

(0) root @ reverseflash01: 7.2.0.0: /
```

4. Command: Update GPFS on the management hosts to 5.1.1.0

```
dsh -s -n ${BCUMGMT},${BCUMGMTSTDBY} '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh update' 2>&1
```

Example Output: (See the log files for what will appear on the screen:

[PDOA FP9 FP5 Readme References\gpfs_utility.sh reverseflash01 20220804 155150.log](#) and

[PDOA FP9 FP5 Readme References\gpfs_utility.sh reverseflash03 20220804 155150.log](#), and the

installp log files for what will appear in the installp logs

[PDOA FP9 FP5 Readme References\gpfs_utility.sh reverseflash01 20220804 155150.log.installp.log](#)

and

[PDOA FP9 FP5 Readme References\gpfs_utility.sh reverseflash03 20220804 155150.log.installp.log](#))

Successfull output will show the installp command was run on both hosts with an return code of '0'.

```
reverseflash01: 20220804_155205 (reverseflash01:gpfs_utility.sh): Running cmd 'installp -agXYd
/BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.0-ppc64-AIX-install.tgz_extract gpfs' to update gpfs to
version '5.1.1.0'.
reverseflash01: 20220804_155323 (reverseflash01:gpfs_utility.sh): The command 'installp -agXYd
/BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.0-ppc64-AIX-install.tgz_extract gpfs' returned '0'.
```

5. Command: Validate GPFS on the management hosts to 5.1.1.4. This will also extract the 5.1.1.4 version of GPFS.

```
dsh -f 1 -n ${BCUMGMT},${BCUMGMTSTDBY} '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh validate' 2>&1 | dshbak -c
```

Example Output: (Output will be similar to that in item 3)

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6. Command: Update GPFS to 5.1.1.4 on the management hosts.

```
dsh -s -n ${BCUMGMT},${BCUMGMTSTDBY} '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh update' 2>&1
```

Example Output: (Look for the following two lines for each host with returned '0' for each installp command.)

```
reverseflash03: 20220804_161655 (reverseflash03:gpfs_utility.sh): Running cmd 'installp -agXYd /BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.4-ppc64-AIX-update.tgz_extract gpfs' to update gpfs to version '5.1.1.4'.
reverseflash03: 20220804_161844 (reverseflash03:gpfs_utility.sh): The command 'installp -agXYd /BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.4-ppc64-AIX-update.tgz_extract gpfs' returned '0'.
reverseflash03: 20220804_161844 (reverseflash03:gpfs_utility.sh): update completed on this host.
```

7. Command: Verify GPFS Levels. Customers starting at V1.1 FP2, V1.1 FP3 or V1.1 FP4 who have contacted IBM Support to verify the scenario is supported will need to repeat Phase 4 items 3 & 4 multiple times until the levels below are shown for the management and management standby hosts.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'lspp -l "gpfs*" | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'lspp -l "gpfs*" | dshbak -c
HOSTS -----
reverseflash01, reverseflash03
-----
Fileset                                Level  State      Description
-----
Path: /usr/lib/objrepos
gpfs.base                             5.1.1.4  APPLIED    GPFS File Manager
gpfs.compression                       5.1.1.0  COMMITTED  GPFS Compression Libraries
gpfs.gskit                             8.0.55.19 COMMITTED  GPFS GSKit Cryptography
                                         Runtime
gpfs.license.std                      5.1.1.0  COMMITTED  IBM Spectrum Scale Standard
                                         Edition License
gpfs.msg.en_US                        5.1.1.3  APPLIED    GPFS Server Messages - U.S.
                                         English

Path: /etc/objrepos
gpfs.base                             5.1.1.4  APPLIED    GPFS File Manager

Path: /usr/share/lib/objrepos
gpfs.docs.data                        5.1.1.3  APPLIED    GPFS Server Manpages and
                                         Documentation
```

8. Command: Start GPFS on the management hosts. Repeat the command until all management hosts are Active.

```
/usr/lpp/mmfs/bin/mmstartup -a
```

Example Output:

```
$ /usr/lpp/mmfs/bin/mmstartup -a
Wed Dec 16 02:14:51 IST 2020: 6027-1642 mmstartup: Starting GPFS ...

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
$ /usr/lpp/mmfs/bin/mmgetstate -a

Node number  Node name          GPFS state
-----
1            flashdancehostname01 arbitrating
2            flashdancehostname03 arbitrating

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
$ /usr/lpp/mmfs/bin/mmgetstate -a

Node number  Node name          GPFS state
-----
1            flashdancehostname01 active
2            flashdancehostname03 active
```

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9. Command: Verify Minimum Release Level.

```
date;time dsh -n ${BCUMGMT},${BCUMGMTSTDBY} '/usr/lpp/mmfs/bin/mmlsconfig minReleaseLevel'
```

Example Output: (FP4->FP5)

```
$ date;time dsh -n ${BCUMGMT},${BCUMGMTSTDBY} '/usr/lpp/mmfs/bin/mmlsconfig minReleaseLevel'
Tue Aug  9 11:13:55 EDT 2022
reverseflash01: minReleaseLevel 5.0.5.1
reverseflash03: minReleaseLevel 5.0.5.1

real    0m1.99s
user    0m0.51s
sys     0m0.17s
```

Example Output: (FP3->FP5: This scenario has not yet been tested.)

```
$ date;time dsh -n ${BCUMGMT},${BCUMGMTSTDBY} '/usr/lpp/mmfs/bin/mmlsconfig minReleaseLevel'
Wed Dec 16 02:16:34 IST 2020
flashdancehostname01: minReleaseLevel 4.2.3.9
flashdancehostname03: minReleaseLevel 4.2.3.9

real    0m1.94s
user    0m0.48s
sys     0m0.16s

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

Example Output: (FP2->FP5: This scenario will not be tested.)

```
(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
$ date;time dsh -n ${BCUMGMT},${BCUMGMTSTDBY} '/usr/lpp/mmfs/bin/mmlsconfig minReleaseLevel'
Fri May 21 16:32:17 EDT 2021
reverseflash01: minReleaseLevel 4.2.3.0
reverseflash03: minReleaseLevel 4.2.3.0

real    0m2.13s
user    0m0.51s
sys     0m0.16s

(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

STAGE 6 - Management stack upgrade

10. Verify Filesystem Mounts

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'mount | grep -i mmfs' | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'mount | grep -i mmfs' | dshbak -c
HOSTS -----
flashdancehostname01
-----
      /dev/opm      /opmfs      mmfs  Dec 16 02:15 rw,mtime,atime,dev=opm
      /dev/db2home  /db2home    mmfs  Dec 16 02:15 rw,dev=FOUNDATION.GPFS:db2home,ldev=db2home
      /dev/dwhome   /dwhome     mmfs  Dec 16 02:15 rw,dev=FOUNDATION.GPFS:dwhome,ldev=dwhome
      /dev/stage    /stage      mmfs  Dec 16 02:15 rw,dev=FOUNDATION.GPFS:stage,ldev=stage
      /dev/appsvr   /usr/IBM/dwe/appserver_001 mmfs  Dec 16 02:15 rw,mtime,atime,dev=appsvr

HOSTS -----
flashdancehostname03
-----
      /dev/appsvr   /usr/IBM/dwe/appserver_001 mmfs  Dec 16 02:15 rw,mtime,atime,dev=appsvr
      /dev/opm      /opmfs      mmfs  Dec 16 02:15 rw,mtime,atime,dev=opm
      /dev/db2home  /db2home    mmfs  Dec 16 02:15 rw,dev=FOUNDATION.GPFS:db2home,ldev=db2home
      /dev/dwhome   /dwhome     mmfs  Dec 16 02:15 rw,dev=FOUNDATION.GPFS:dwhome,ldev=dwhome
      /dev/stage    /stage      mmfs  Dec 16 02:15 rw,dev=FOUNDATION.GPFS:stage,ldev=stage

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

Phase 5: Update TSA on the management hosts.

While DPM (or OPM) will be removed at the end of the fixpack process, we will still update TSA on the management hosts and ensure it is working properly.

This step assumes that host is quiesced in terms of running services and the domains and that GPFS is started and GPFS filesystems are mounted.

Step 1: Update TSA and RSCT

1. Command: As root running in a terminal or screen session on the management node, run the TSA validation. This command will unpack the appropriate TSA Fixpack (on first host only), will run prereqSAM to verify the fixpack is ready to be applied.

dsh -f 1 -n \${BCUMGMT},\${BCUMGMTSTDBY} '/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh validate' 2>&1 | dshbak -c
Example Output:

```
$ dsh -f 1 -n ${BCUMGMT},${BCUMGMTSTDBY} '/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh validate' 2>&1 | dshbak -c
HOSTS -----
reverseflash01
-----
20220804_162541 (reverseflash01:tsa_utility.sh): Starting date: Thu Aug  4 16:25:41 EDT 2022.
20220804_162541 (reverseflash01:tsa_utility.sh): Checking current TSA version.
20220804_162541 (reverseflash01:tsa_utility.sh): My TSA version is '4.1.0.6'.
20220804_162541 (reverseflash01:tsa_utility.sh): Checking for available TSA updates.
20220804_162541 (reverseflash01:tsa_utility.sh): Found TSA version '4.1.0.0004'.
20220804_162542 (reverseflash01:tsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220804_162542 (reverseflash01:tsa_utility.sh): Found TSA version '4.1.0.0005'.
20220804_162542 (reverseflash01:tsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220804_162542 (reverseflash01:tsa_utility.sh): Found TSA version '4.1.0.0006'.
20220804_162542 (reverseflash01:tsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220804_162542 (reverseflash01:tsa_utility.sh): Found TSA version '4.1.0.0007'.
20220804_162542 (reverseflash01:tsa_utility.sh): Next Version      : 4.1.0.0007.
20220804_162542 (reverseflash01:tsa_utility.sh): Version Location   : /BCU_share/FP9_FP5/software/TSA/4.1.0.0007.
20220804_162542 (reverseflash01:tsa_utility.sh): Unpacking TSA update.
20220804_162548 (reverseflash01:tsa_utility.sh): Running Update Validation
'/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/prereqSAM'.
prereqSAM: All prerequisites for the ITSAMP installation are met on operating system: AIX 7200-05
20220804_162555 (reverseflash01:tsa_utility.sh): There is an available update for this host.
20220804_162555 (reverseflash01:tsa_utility.sh): Starting date: Thu Aug  4 16:25:41 EDT 2022   Ending Date: Thu Aug  4 16:25:55
EDT 2022.

HOSTS -----
reverseflash03
-----
20220804_162555 (reverseflash03:tsa_utility.sh): Attempting to source /.profile to define BCU* variables.
20220804_162556 (reverseflash03:tsa_utility.sh): Starting date: Thu Aug  4 16:25:56 EDT 2022.
20220804_162556 (reverseflash03:tsa_utility.sh): Checking current TSA version.
20220804_162556 (reverseflash03:tsa_utility.sh): My TSA version is '4.1.0.6'.
20220804_162556 (reverseflash03:tsa_utility.sh): Checking for available TSA updates.
20220804_162556 (reverseflash03:tsa_utility.sh): Found TSA version '4.1.0.0004'.
20220804_162556 (reverseflash03:tsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220804_162556 (reverseflash03:tsa_utility.sh): Found TSA version '4.1.0.0005'.
20220804_162556 (reverseflash03:tsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220804_162556 (reverseflash03:tsa_utility.sh): Found TSA version '4.1.0.0006'.
20220804_162556 (reverseflash03:tsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220804_162556 (reverseflash03:tsa_utility.sh): Found TSA version '4.1.0.0007'.
20220804_162556 (reverseflash03:tsa_utility.sh): Next Version      : 4.1.0.0007.
20220804_162556 (reverseflash03:tsa_utility.sh): Version Location   : /BCU_share/FP9_FP5/software/TSA/4.1.0.0007.
20220804_162556 (reverseflash03:tsa_utility.sh): Running Update Validation
'/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/prereqSAM'.
prereqSAM: All prerequisites for the ITSAMP installation are met on operating system: AIX 7200-05
20220804_162604 (reverseflash03:tsa_utility.sh): There is an available update for this host.
20220804_162604 (reverseflash03:tsa_utility.sh): Starting date: Thu Aug  4 16:25:56 EDT 2022   Ending Date: Thu Aug  4 16:26:04
EDT 2022.
You have mail in /usr/spool/mail/root
```


STAGE 6 - Management stack upgrade

2. Command: Run the following command to update TSA on the management hosts.

```
dsh -s -n ${BCUMGMT},${BCUMGMTSTDBY} '/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh update' 2>&1
```

Example Output:

```
$ dsh -s -n ${BCUMGMT},${BCUMGMTSTDBY} '/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh update' 2>&1
reverseflash01: 20220804_163606 (reverseflash01:tsa_utility.sh): Starting date: Thu Aug 4 16:36:06 EDT 2022.
reverseflash01: 20220804_163606 (reverseflash01:tsa_utility.sh): Checking current TSA version.
reverseflash01: 20220804_163606 (reverseflash01:tsa_utility.sh): My TSA version is '4.1.0.6'.
reverseflash01: 20220804_163606 (reverseflash01:tsa_utility.sh): Checking for available TSA updates.
reverseflash01: 20220804_163606 (reverseflash01:tsa_utility.sh): Found TSA version '4.1.0.0004'.
reverseflash01: 20220804_163606 (reverseflash01:tsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version
'4.1.0.6'. Skipping to next available version.
reverseflash01: 20220804_163606 (reverseflash01:tsa_utility.sh): Found TSA version '4.1.0.0005'.
reverseflash01: 20220804_163606 (reverseflash01:tsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version
'4.1.0.6'. Skipping to next available version.
reverseflash01: 20220804_163606 (reverseflash01:tsa_utility.sh): Found TSA version '4.1.0.0006'.
reverseflash01: 20220804_163606 (reverseflash01:tsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version
'4.1.0.6'. Skipping to next available version.
reverseflash01: 20220804_163606 (reverseflash01:tsa_utility.sh): Found TSA version '4.1.0.0007'.
reverseflash01: 20220804_163606 (reverseflash01:tsa_utility.sh): Next Version : 4.1.0.0007.
reverseflash01: 20220804_163606 (reverseflash01:tsa_utility.sh): Version Location :
/BCU_share/FP9_FP5/software/TSA/4.1.0.0007.
reverseflash01: 20220804_163606 (reverseflash01:tsa_utility.sh): Running Update Validation
'/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/prereqSAM'.
reverseflash03: 20220804_163606 (reverseflash03:tsa_utility.sh): Attempting to source /.profile to define BCU* variables.
reverseflash03: 20220804_163607 (reverseflash03:tsa_utility.sh): Starting date: Thu Aug 4 16:36:07 EDT 2022.
reverseflash03: 20220804_163607 (reverseflash03:tsa_utility.sh): Checking current TSA version.
reverseflash03: 20220804_163607 (reverseflash03:tsa_utility.sh): My TSA version is '4.1.0.6'.
reverseflash03: 20220804_163607 (reverseflash03:tsa_utility.sh): Checking for available TSA updates.
reverseflash03: 20220804_163607 (reverseflash03:tsa_utility.sh): Found TSA version '4.1.0.0004'.
reverseflash03: 20220804_163607 (reverseflash03:tsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version
'4.1.0.6'. Skipping to next available version.
reverseflash03: 20220804_163607 (reverseflash03:tsa_utility.sh): Found TSA version '4.1.0.0005'.
reverseflash03: 20220804_163607 (reverseflash03:tsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version
'4.1.0.6'. Skipping to next available version.
reverseflash03: 20220804_163607 (reverseflash03:tsa_utility.sh): Found TSA version '4.1.0.0006'.
reverseflash03: 20220804_163607 (reverseflash03:tsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version
'4.1.0.6'. Skipping to next available version.
reverseflash03: 20220804_163607 (reverseflash03:tsa_utility.sh): Found TSA version '4.1.0.0007'.
reverseflash03: 20220804_163607 (reverseflash03:tsa_utility.sh): Next Version : 4.1.0.0007.
reverseflash03: 20220804_163607 (reverseflash03:tsa_utility.sh): Version Location :
/BCU_share/FP9_FP5/software/TSA/4.1.0.0007.
reverseflash03: 20220804_163607 (reverseflash03:tsa_utility.sh): Running Update Validation
'/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/prereqSAM'.
reverseflash01: 20220804_163608 (reverseflash01:tsa_utility.sh): All prerequisites for the ITSAMP installation are met on operating system: AIX 7200-05
reverseflash01: 20220804_163608 (reverseflash01:tsa_utility.sh): There is an available update for this host.
reverseflash01: 20220804_163608 (reverseflash01:tsa_utility.sh): Verifying this host is ready to update. Domain must be offline
on this node.
reverseflash01: 20220804_163608 (reverseflash01:check_server_state.sh): Starting date: Thu Aug 4 16:36:08 EDT 2022.
reverseflash01: 20220804_163608 (reverseflash01:check_server_state.sh): Domain state: ''.
reverseflash01: 20220804_163608 (reverseflash01:check_server_state.sh): Starting date: Thu Aug 4 16:36:08 EDT 2022 Ending
Date: Thu Aug 4 16:36:08 EDT 2022.
reverseflash01: 20220804_163608 (reverseflash01:tsa_utility.sh): Updating TSA.
reverseflash01: 20220804_163608 (reverseflash01:tsa_utility.sh): Running update command
'/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/installSAM'.
reverseflash03: 20220804_163610 (reverseflash03:tsa_utility.sh): All prerequisites for the ITSAMP installation are met on operating system: AIX 7200-05
reverseflash03: 20220804_163610 (reverseflash03:tsa_utility.sh): There is an available update for this host.
reverseflash03: 20220804_163610 (reverseflash03:tsa_utility.sh): Verifying this host is ready to update. Domain must be offline
on this node.
reverseflash03: 20220804_163610 (reverseflash03:check_server_state.sh): Starting date: Thu Aug 4 16:36:10 EDT 2022.
reverseflash03: 20220804_163610 (reverseflash03:check_server_state.sh): Domain state: ''.
reverseflash03: 20220804_163610 (reverseflash03:check_server_state.sh): Starting date: Thu Aug 4 16:36:10 EDT 2022 Ending
Date: Thu Aug 4 16:36:10 EDT 2022.
reverseflash03: 20220804_163610 (reverseflash03:tsa_utility.sh): Updating TSA.
reverseflash03: 20220804_163610 (reverseflash03:tsa_utility.sh): Running update command
'/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/installSAM'.
reverseflash01: 20220804_163755 (reverseflash01:tsa_utility.sh): The command
'/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/installSAM' returned '0'.
reverseflash01: 20220804_163755 (reverseflash01:tsa_utility.sh): Update completed. Checking TSA version.
reverseflash01: 20220804_163755 (reverseflash01:tsa_utility.sh): My TSA version is '4.1.0.7'.
reverseflash01: 20220804_163755 (reverseflash01:tsa_utility.sh): Version verified.
reverseflash01: 20220804_163755 (reverseflash01:tsa_utility.sh): Script
'/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh' with arguments 'update' ended with rc='0'. Start: Thu Aug 4
16:36:06 EDT 2022 End: Thu Aug 4 16:37:55 EDT 2022. Elapsed Time (Seconds): 109 (H:M:S):(00:01:49).
reverseflash01: 20220804_163755 (reverseflash01:tsa_utility.sh): Normalizing management hostname.
reverseflash01: 20220804_163755 (reverseflash01:tsa_utility.sh): Management hostname is 'reverseflash01'.
reverseflash01: 20220804_163755 (reverseflash01:tsa_utility.sh): Sending notification 'Message from PDOA fixpack on
'reverseflash01' from script '/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh' to 'user@customer.com' '-c
root@localhost'.
reverseflash01: 20220804_163755 (reverseflash01:tsa_utility.sh): Notification sent.
reverseflash03: 20220804_163758 (reverseflash03:tsa_utility.sh): The command
'/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/installSAM' returned '0'.
```

STAGE 6 - Management stack upgrade

```
reverseflash03: 20220804_163758 (reverseflash03:tlsa_utility.sh): Update completed. Checking TSA version.
reverseflash03: 20220804_163758 (reverseflash03:tlsa_utility.sh): My TSA version is '4.1.0.7'.
reverseflash03: 20220804_163758 (reverseflash03:tlsa_utility.sh): Version verified.
reverseflash03: 20220804_163758 (reverseflash03:tlsa_utility.sh): Script
'/BCU_share/FP9_FP5/fixpack_tools/application/tlsa_utility.sh' with arguments 'update' ended with rc='0'. Start: Thu Aug 4
16:36:07 EDT 2022 End: Thu Aug 4 16:37:58 EDT 2022. Elapsed Time (Seconds): 112 (H:M:S):(00:01:52).
reverseflash03: 20220804_163800 (reverseflash03:tlsa_utility.sh): Normalizing management hostname.
reverseflash03: 20220804_163800 (reverseflash03:tlsa_utility.sh): Management hostname is 'reverseflash01'.
reverseflash03: 20220804_163800 (reverseflash03:tlsa_utility.sh): Sending notification 'Message from PDOA fixpack on
'reverseflash03' from script '/BCU_share/FP9_FP5/fixpack_tools/application/tlsa_utility.sh' to 'user@customer.com' '-c
root@localhost' via reverseflash01.
reverseflash03: 20220804_163801 (reverseflash03:tlsa_utility.sh): Notification sent.

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

STAGE 6 - Management stack upgrade

3. Command: Verify the rsct level on the management hosts.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'ctversion' | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'ctversion' | dshbak -c
HOSTS -----
reverseflash01, reverseflash03
-----
radys004a 3.2.6.4 power
```

4. Command: Verify the Tivoli System Automation level on the management hosts.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'samversion' | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'samversion' | dshbak -c
HOSTS -----
reverseflash01, reverseflash03
-----
rsa41laris007a 4.1.0.7 Aug 24 2021 13:55:33
```

5. Command: Check if there is a management domain. If the output is blank, then skip to item 11. If the output shows mgmt domain, then continue to start the domain and perform the necessary steps to commit the RSCT and TSA levels for that domain.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'lsrpdomain'
```


STAGE 6 - Management stack upgrade

Step 2: Migrate RSCT and TSA on the Management Host

This step is only needed if DPM (OPM) is still in use and was not removed as part of Stage 9 in V1.1 FP4. If DPM was removed proceed to Stage 6, Phase 7.

1. Command: Start the TSA domain on the management host. There is no output unless there is an error.

```
hadomain -mgmt start
```

2. Command: Verify the domain is started.

```
hals -mgmt
```

Example Output:

```
$ hals -mgmt
MANAGEMENT DOMAIN
=====+=====+=====+=====+=====+=====+=====+
| COMPONENT | PRIMARY          | STANDBY          | CURRENT          | OPSTATE          | HA STATUS        | RG REQUESTS      |
|-----+-----+-----+-----+-----+-----+-----+
| DPM        | flashdancehostname01 | N/A              | N/A              | Offline          | Offline          | -                |
| DB2DPM     | flashdancehostname01 | N/A              | N/A              | Offline          | Offline          | -                |
=====+=====+=====+=====+=====+=====+=====+
```

3. Command: Verify the domain is in mixed mode and is still running the old RSCT level (3.2.4.3). Mixed Versions indicates that RSCT has not been migrated after being updated. Note: FP2->FP4 customers will see version 3.2.3.2.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'lsrpdomain' | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'lsrpdomain' | dshbak -c
HOSTS -----
flashdancehostname01, flashdancehostname03
-----
Name      OpState RSCTActiveVersion MixedVersions TSPort GSPort
mgmtdomain Online  3.2.4.3           Yes          12347  12348
```

4. Command: Verify that TSA is not yet migrated and shows the AVN is 4.1.0.5 and the IVN is 4.1.0.6. Note: FP2->FP4 customers will see AVN as 4.1.0.4.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "lssrc -ls IBM.RecoveryRM | egrep 'IVN|AVN'" | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "lssrc -ls IBM.RecoveryRM | egrep 'IVN|AVN'" | dshbak -c
HOSTS -----
flashdancehostname01, flashdancehostname03
-----
Our IVN      : 4.1.0.6
Our AVN      : 4.1.0.5
```

5. Command: Migrate RSCT and TSA using the following command. This command will only run the migration on the current domain leader. It will first run the RSCT migration and then the TSA migration if that is successful.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} '/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh commit' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} '/BCU_share/FP8_FP4/fixpack_tools/application/tsa_utility.sh commit' 2>&1 | dshbak -c
```

STAGE 6 - Management stack upgrade

```
HOSTS -----
flashdancehostname03
-----
20201217_003534 (flashdancehostname03:tlsa_utility.sh): Starting date: Thu Dec 17 00:35:34 IST 2020.
20201217_003534 (flashdancehostname03:tlsa_utility.sh): Checking current TSA version.
20201217_003534 (flashdancehostname03:tlsa_utility.sh): My TSA version is '4.1.0.6'.
20201217_003535 (flashdancehostname03:tlsa_utility.sh): Checking for available TSA updates.
20201217_003535 (flashdancehostname03:tlsa_utility.sh): Found TSA version '4.1.0.0004'.
20201217_003535 (flashdancehostname03:tlsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
20201217_003535 (flashdancehostname03:tlsa_utility.sh): Found TSA version '4.1.0.0005'.
20201217_003535 (flashdancehostname03:tlsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
20201217_003535 (flashdancehostname03:tlsa_utility.sh): Found TSA version '4.1.0.0006'.
20201217_003535 (flashdancehostname03:tlsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
20201217_003535 (flashdancehostname03:tlsa_utility.sh): There is no available update for this host.
20201217_003535 (flashdancehostname03:tlsa_utility.sh): Collecting domain details.
20201217_003535 (flashdancehostname03:tlsa_utility.sh): Domain is online.
20201217_003535 (flashdancehostname03:tlsa_utility.sh): Domain RSCT is in mixed mode.
20201217_003535 (flashdancehostname03:tlsa_utility.sh): All nodes are online.
20201217_003535 (flashdancehostname03:tlsa_utility.sh): Will not run RSCT migration on this host as it is not the leader.
20201217_003535 (flashdancehostname03:tlsa_utility.sh): Starting date: Thu Dec 17 00:35:34 IST 2020   Ending Date: Thu Dec 17
00:35:35 IST 2020.

HOSTS -----
flashdancehostname01
-----
20201217_003534 (flashdancehostname01:tlsa_utility.sh): Starting date: Thu Dec 17 00:35:34 IST 2020.
20201217_003534 (flashdancehostname01:tlsa_utility.sh): Checking current TSA version.
20201217_003534 (flashdancehostname01:tlsa_utility.sh): My TSA version is '4.1.0.6'.
20201217_003534 (flashdancehostname01:tlsa_utility.sh): Checking for available TSA updates.
20201217_003534 (flashdancehostname01:tlsa_utility.sh): Found TSA version '4.1.0.0004'.
20201217_003534 (flashdancehostname01:tlsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
20201217_003534 (flashdancehostname01:tlsa_utility.sh): Found TSA version '4.1.0.0005'.
20201217_003534 (flashdancehostname01:tlsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
20201217_003534 (flashdancehostname01:tlsa_utility.sh): Found TSA version '4.1.0.0006'.
20201217_003534 (flashdancehostname01:tlsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
20201217_003534 (flashdancehostname01:tlsa_utility.sh): There is no available update for this host.
20201217_003534 (flashdancehostname01:tlsa_utility.sh): Collecting domain details.
20201217_003535 (flashdancehostname01:tlsa_utility.sh): Domain is online.
20201217_003535 (flashdancehostname01:tlsa_utility.sh): Domain RSCT is in mixed mode.
20201217_003535 (flashdancehostname01:tlsa_utility.sh): All nodes are online.
20201217_003535 (flashdancehostname01:tlsa_utility.sh): Running rsct migration 'runact -c IBM.PeerDomain CompleteMigration
Options=0' on this host as it is the leader.
Resource Class Action Response for CompleteMigration
20201217_003537 (flashdancehostname01:tlsa_utility.sh): Collecting domain details.
20201217_003537 (flashdancehostname01:tlsa_utility.sh): Domain is online.
20201217_003537 (flashdancehostname01:tlsa_utility.sh): Domain is not in mixed mode.
20201217_003538 (flashdancehostname01:tlsa_utility.sh): TSA migration is required.
20201217_003538 (flashdancehostname01:tlsa_utility.sh): This host is the domain leader.
20201217_003538 (flashdancehostname01:tlsa_utility.sh): Running 'echo Y | samctrl -m' to migrate TSA domain.
The cluster mgmt domain is ready to be migrated from "4.1.0.5" to a new level. Type Y to perform migration [Y|N]:

Active version successfully migrated to new version "4.1.0.6"!
20201217_003543 (flashdancehostname01:tlsa_utility.sh): Collecting domain details.
20201217_003543 (flashdancehostname01:tlsa_utility.sh): Domain is online.
20201217_003543 (flashdancehostname01:tlsa_utility.sh): Domain is not in mixed mode.
20201217_003544 (flashdancehostname01:tlsa_utility.sh): AVN: '4.1.0.6' is equal to IVN: '4.1.0.6'. TSA Migration is not required.
20201217_003544 (flashdancehostname01:tlsa_utility.sh): RSCT and TSA Migration were successful.
20201217_003544 (flashdancehostname01:tlsa_utility.sh): Starting date: Thu Dec 17 00:35:34 IST 2020   Ending Date: Thu Dec 17
00:35:44 IST 2020.
```

6. Command: Verify the domain is no longer in mixed mode.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'lsrpdomain' | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'lsrpdomain' | dshbak -c
HOSTS -----
flashdancehostname01, flashdancehostname03
-----
Name      OpState RSCTActiveVersion MixedVersions TSPort GSPort
mgmt domain Online  3.2.5.2      No           12347  12348
```

7. Command: Verify that TSA is migrated and shows the AVN is 4.1.0.6 and the IVN is 4.1.0.6.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "lssrc -ls IBM.RecoveryRM | egrep 'IVN|AVN'" | dshbak -c
```

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Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "lssrc -ls IBM.RecoveryRM | egrep 'IVN|AVN'" | dshbak -c
HOSTS -----
flashdancehostname01, flashdancehostname03
-----
Our IVN           : 4.1.0.6
Our AVN           : 4.1.0.6
```

STAGE 6 - Management stack upgrade

Step 3: Verify and Commit RSCT installp packages.

1. Command: Check for rsct filesets in the Applied state on the management hosts. If starting from V1.1 FP4, this step will likely be unnecessary.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'installp -s rsct*' 2>&1 | dshbak -c
```

Example Output: (No installp commit is necessary. Proceed to Phase 6.)

```
HOSTS -----
reverseflash01, reverseflash03
-----
0503-459 installp: No filesets were found in the Software
Vital Product Database in the APPLIED state.
```

Example Output: (Example is from V1.1 FP3 to V1.1 FP4 scenario)

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'installp -s rsct*' 2>&1 | dshbak -c
HOSTS -----
kf5hostname01, kf5hostname03
-----
rsct.basic.rte          ROOT    3.2.5.2      APPLIED
rsct.basic.rte          USR     3.2.5.2      APPLIED
rsct.basic.rte          USR     3.2.5.3      APPLIED
rsct.basic.rte          ROOT    3.2.5.3      APPLIED
rsct.core.errm          USR     3.2.5.1      APPLIED
rsct.core.errm          ROOT    3.2.5.1      APPLIED
rsct.core.hostrm        USR     3.2.5.2      APPLIED
rsct.core.hostrm        ROOT    3.2.5.2      APPLIED
rsct.core.hostrm        USR     3.2.5.3      APPLIED
rsct.core.hostrm        ROOT    3.2.5.3      APPLIED
rsct.core.rmc           USR     3.2.5.2      APPLIED
rsct.core.rmc           ROOT    3.2.5.2      APPLIED
rsct.core.rmc           USR     3.2.5.3      APPLIED
rsct.core.rmc           ROOT    3.2.5.3      APPLIED
rsct.core.rmc           USR     3.2.5.3      APPLIED
rsct.core.rmc           ROOT    3.2.5.3      APPLIED
rsct.core.utils         USR     3.2.5.2      APPLIED
rsct.core.utils         ROOT    3.2.5.2      APPLIED
rsct.core.utils         ROOT    3.2.5.3      APPLIED
rsct.core.utils         USR     3.2.5.3      APPLIED
Installp Status
-----
Name                    Part      Level        State
-----
```

2. Command: Commit the rsct filesets on the management hosts.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'installp -cgX rsct*' 2>&1 | dshbak -c
```

Example Output: (Output may be in multiple stanzas. The example output only shows output from one host.)

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'installp -cgX rsct*' 2>&1 | dshbak -c
HOSTS -----
kf5hostname01
-----
SUCCESES
-----
Filesets listed in this section passed pre-commit verification
and will be committed.

Selected Filesets
-----
rsct.basic.rte 3.2.5.2      # RSCT Basic Function
rsct.basic.rte 3.2.5.3      # RSCT Basic Function
rsct.core.errm 3.2.5.1      # RSCT Event Response Resource...
rsct.core.hostrm 3.2.5.2    # RSCT Host Resource Manager
rsct.core.hostrm 3.2.5.3    # RSCT Host Resource Manager
rsct.core.rmc 3.2.5.2      # RSCT Resource Monitoring and...
rsct.core.rmc 3.2.5.3      # RSCT Resource Monitoring and...
rsct.core.utils 3.2.5.2    # RSCT Utilities
rsct.core.utils 3.2.5.3    # RSCT Utilities
```

STAGE 6 - Management stack upgrade

```
<< End of Success Section >>

+-----+
+-----+ Pre-commit Verification... +-----+
+-----+
Verifying selections...done
Verifying requisites...done
Results...

FILESET STATISTICS
-----
    9  Selected to be committed, of which:
        9  Passed pre-installation verification
    ----
    9  Total to be committed
+-----+
+-----+ Committing Software... +-----+
+-----+

installp: COMMITTING software for:
         rsct.core.utils 3.2.5.2

Filesets processed:  1 of 9  (Total time:  1 secs).

installp: COMMITTING software for:
         rsct.core.utils 3.2.5.3

Filesets processed:  2 of 9  (Total time:  1 secs).

installp: COMMITTING software for:
         rsct.core.rmc 3.2.5.2

Filesets processed:  3 of 9  (Total time:  1 secs).

installp: COMMITTING software for:
         rsct.basic.rte 3.2.5.2

Filesets processed:  4 of 9  (Total time:  2 secs).

installp: COMMITTING software for:
         rsct.core.errm 3.2.5.1

Filesets processed:  5 of 9  (Total time:  2 secs).

installp: COMMITTING software for:
         rsct.core.hostrm 3.2.5.2

Filesets processed:  6 of 9  (Total time:  2 secs).

installp: COMMITTING software for:
         rsct.core.rmc 3.2.5.3

Filesets processed:  7 of 9  (Total time:  2 secs).

installp: COMMITTING software for:
         rsct.basic.rte 3.2.5.3

Filesets processed:  8 of 9  (Total time:  3 secs).

installp: COMMITTING software for:
         rsct.core.hostrm 3.2.5.3

Finished processing all filesets.  (Total time:  3 secs).
+-----+
+-----+ Summaries: +-----+
+-----+

Installation Summary
-----
Name                               Level      Part      Event      Result
-----
rsct.core.utils                    3.2.5.2    USR        COMMIT      SUCCESS
rsct.core.utils                    3.2.5.2    ROOT       COMMIT      SUCCESS
rsct.core.utils                    3.2.5.3    USR        COMMIT      SUCCESS
rsct.core.utils                    3.2.5.3    ROOT       COMMIT      SUCCESS
rsct.core.rmc                      3.2.5.2    USR        COMMIT      SUCCESS
rsct.core.rmc                      3.2.5.2    ROOT       COMMIT      SUCCESS
rsct.basic.rte                    3.2.5.2    USR        COMMIT      SUCCESS
rsct.basic.rte                    3.2.5.2    ROOT       COMMIT      SUCCESS
rsct.core.errm                    3.2.5.1    USR        COMMIT      SUCCESS
rsct.core.errm                    3.2.5.1    ROOT       COMMIT      SUCCESS
rsct.core.hostrm                  3.2.5.2    USR        COMMIT      SUCCESS
rsct.core.hostrm                  3.2.5.2    ROOT       COMMIT      SUCCESS
rsct.core.rmc                      3.2.5.3    USR        COMMIT      SUCCESS
rsct.core.rmc                      3.2.5.3    ROOT       COMMIT      SUCCESS
rsct.basic.rte                    3.2.5.3    USR        COMMIT      SUCCESS
rsct.basic.rte                    3.2.5.3    ROOT       COMMIT      SUCCESS
rsct.core.hostrm                  3.2.5.3    USR        COMMIT      SUCCESS
```

STAGE 6 - Management stack upgrade

rsct.core.hostrm	3.2.5.3	ROOT	COMMIT	SUCCESS
------------------	---------	------	--------	---------

STAGE 6 - Management stack upgrade

3. Command: Verify rsct filesets are no longer in the Applied state.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'installp -s rsct* 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'installp -s rsct*' 2>&1 | dshbak -c
HOSTS -----
kf5hostname01, kf5hostname03
-----
0503-459 installp: No filesets were found in the Software
Vital Product Database in the APPLIED state.
```

Phase 6: Prepare and Update Db2 on the management hosts.

This phase is only required if OPM was not removed in V1.1 FP4 Stage 9 and there is an intent to continue to use OPM after V1.1 FP5 has concluded. If OPM has been removed already or will be removed during this fix pack, then proceed to Proceed to Stage 7.

If Db2 will be updated on the management host continue with Phase 6. Unlike in Stage 8, Db2 on the management hosts is applied over the existing Db2 copies. This is a requirement for OPM which does not support migrating its instances to new Db2 copies during upgrades. In addition, OPM does not support Db2 11.1 instances for its performance database, so you must continue to use Db2 10.5 fix packs.

While not directly supported, some customers may have created new Db2 instances on the management host, or created new Db2 copies to support non-appliance functions. These instructions and tools do not take these into account and it may be necessary to use a different procedure to update Db2 on the management nodes.

The instructions below were taken from V1.1 FP4's readme for Stage 6 and were not updated or tested. Therefore the output will be different, however the behavior of the Db2 fix pack process is expected to work the same with updated Db2 10.5 fix packs against V1.1 FP4's Db2 copies on the management hosts.

Note that the Db2 images and helper scripts were generated in Stage 1 Phase 2. If helper scripts are not present the verify Stage 1 Phase 2 has successfully completed.

If installing a special build that is not shipped with this fixpack, it should be possible to copy that special build (universal fixpack) tgz image to the /BCU_share/FP9_FP5/software/DB2 before running the commands to unpack that image. The prepare command will attempt to unpack the directory and will create appropriate links to identify the db2 level of that special build.

1. If OPM and Db2 are being removed, then then the items left in this Stage can be skipped and users can move to the last item in this stage to determine if mksysb's should be taken. The next set of step requires all associated instances to be stopped. If coming from Phase 5 this should be the case. We can use the following to verify the state. The domain is online and DPM is offline.

```
hals -mgmt
```

Example Output:

```
$ hals -mgmt
MANAGEMENT DOMAIN
=====
```

COMPONENT	PRIMARY	STANDBY	CURRENT	OPSTATE	HA STATUS	RG REQUESTS
DPM	flashdancehostname01	N/A	N/A	Offline	Offline	-
DB2DPM	flashdancehostname01	N/A	N/A	Offline	Offline	-

```
=====
```


STAGE 6 - Management stack upgrade

2. Command: Verify the mgmtfixpack.sh command is available to both management hosts and is executable for root.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "ls -la /BCU_share/FP9_FP5/software/DB2/mgmtfixpack.sh" | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} "ls -la /BCU_share/FP9_FP5/software/DB2/mgmtfixpack.sh" | dshbak -c
HOSTS -----
flashdancehostname01, flashdancehostname03
-----
-rwxr--r--  1 root      system          268 Dec 18 03:11 /BCU_share/FP9_FP5/software/DB2/mgmtfixpack.sh
```

3. Command: In a screen session or vtmenu console session which will not be impacted by a networking issue between the terminal, run the following command to update the Db2 10.5 copy on the management host. This will copy the script specified in the -e argument on all target hosts to /tmp and execute it. It will also log stdout and stderr to the folder specified in the -F argument for each host. This runs the command in parallel on both hosts.

```
time dsh -n ${BCUMGMT},${BCUMGMTSTDBY} -F /BCU_share/support/FP9_FP5/log/db2install -e /BCU_share/FP8_FP4/software/DB2/mgmtfixpack.sh
```

Example Output:

```
$ time dsh -n ${BCUMGMT},${BCUMGMTSTDBY} -F /BCU_share/FP9_FP5/software/DB2/log/db2install -e /BCU_share/FP8_FP4/software/DB2/mgmtfixpack.sh
flashdancehostname01: DBI1017I  installFixPack is updating the DB2 product(s) installed in
flashdancehostname01:           location /usr/IBM/dwe/mgmt_db2/V10.5.
flashdancehostname01:
flashdancehostname01: A minor error occurred during the execution.
flashdancehostname01:
flashdancehostname01: For more information see the DB2 installation log at
flashdancehostname01: "/tmp/installFixPack.log.5112480".
flashdancehostname01: 0516-010 : Volume group must be varied on; use varyonvg command.
flashdancehostname03: DBI1017I  installFixPack is updating the DB2 product(s) installed in
flashdancehostname03:           location /usr/IBM/dwe/mgmt_db2/V10.5.
flashdancehostname03:
flashdancehostname03: The execution completed successfully.
flashdancehostname03:
flashdancehostname03: For more information see the DB2 installation log at
flashdancehostname03: "/tmp/installFixPack.log.2949686".
flashdancehostname03: 0516-010 : Volume group must be varied on; use varyonvg command.

real    13m43.06s
user    0m37.97s
sys     1m1.41s
```

Output Notes:

- 0516-010 : Volume group must be varied on; use varyonvg command
 - This can be ignored and does not impact the update.
- A minor error occurred during the execution.
 - Occurred on the management host.
 - Examine Log. In this case on the management host it is "/tmp/installFixPack.log.5112480"

```
WARNING: The install is unable to update the instance "db2opm" because it is
currently in use. Ensure the instance is not active and update the instance
post install using the command "db2iupdt".
```

```
WARNING: One or more errors occurred while updating the instances on the
system. This usually occurs because some instances are currently active.
```

```
An error occurred while updating the instances. The following instances were
not updated successfully: db2opm  You must update the instances manually. If
you are performing a root installation, use the db2iupdt command. If you are
performing a non-root installation, use the db2nrupdt command. If the manual
instance update also failed, contact DB2 Customer Service.
```

STAGE 6 - Management stack upgrade

Updating existing DB2 instances :.....Failure

- In this case DPM was running.

```
$ hals -mgmt
MANAGEMENT DOMAIN
=====
| COMPONENT | PRIMARY | STANDBY | CURRENT | OPSTATE | HA STATUS | RG REQUESTS |
=====
| DPM       | flashdancehostname01 | flashdancehostname03 | flashdancehostname01 | Online  | Normal    | -            |
| DB2DPM    | flashdancehostname01 | flashdancehostname03 | flashdancehostname01 | Online  | Normal    | -            |
=====
```

- Stop DPM and rerun the install on the management host.

```
$ hastopdpm
Stopping DPM and DB2 instance.....Resources offline
MANAGEMENT DOMAIN
=====
| COMPONENT | PRIMARY | STANDBY | CURRENT | OPSTATE | HA STATUS | RG REQUESTS |
=====
| DPM       | flashdancehostname01 | N/A      | N/A      | Offline | Offline   | -            |
| DB2DPM    | flashdancehostname01 | N/A      | N/A      | Offline | Offline   | -            |
=====
```

```
(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/software/DB2
```

- Rerun the installation again on the management host.

```
time dsh -n ${BCUMGMT} -F /BCU_share/FP9_FP5/software/DB2/log/db2install -e
/BCU_share/FP9_FP5/software/DB2/mgmtfixpack.sh
```

Example Output:

```
$ time dsh -n ${BCUMGMT} -F /BCU_share/FP9_FP5/software/DB2/log/db2install -e
/BCU_share/FP9_FP5/software/DB2/mgmtfixpack.sh
flashdancehostname01: DBI1017I  installFixPack is updating the DB2 product(s) installed in
flashdancehostname01: location /usr/IBM/dwe/mgmt_db2/V10.5.
flashdancehostname01:
flashdancehostname01: The execution completed successfully.
flashdancehostname01:
flashdancehostname01: For more information see the DB2 installation log at
flashdancehostname01: "/tmp/installFixPack.log.5308764".
flashdancehostname01: 0516-010 : Volume group must be varied on; use varyonvg command.

real    9m23.11s
user    0m38.96s
sys     0m51.05s

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/software/DB2
```

STAGE 6 - Management stack upgrade

4. Command: Verify the level of Db2 on the management and management standby hosts. Below shows 10.5.0.11..2 which is the expected level as shipped with this fixpack. Note: FP2->FP4 customers may see the 'dweadmin' instance owner appear on the standby management host. This may be due to an incomplete removal of the Warehouse Tools components when V1.1 FP2 was applied.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} -e /BCU_share/FP9_FP5/software/DB2/scripts/get_db2_data.sh 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} -e /BCU_share/FP9_FP5/software/DB2/scripts/get_db2_data.sh 2>&1 | dshbak -c
HOSTS -----
flashdancehostname01, flashdancehostname03
-----
/usr/IBM/dwe/mgmt_db2/V10.5|10.5|10.5.0.11|10.5.0.11..2|db2opm|db2opm| |
```

Example Output: (FP2 customers)

```
(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP8_FP4/software/DB2
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} -e /BCU_share/FP9_FP5/software/DB2/scripts/get_db2_data.sh 2>&1 | dshbak -c
HOSTS -----
reverseflash01
-----
/usr/IBM/dwe/mgmt_db2/V10.5|10.5|10.5.0.11|10.5.0.11..2|db2opm|db2opm| |

HOSTS -----
reverseflash03
-----
/usr/IBM/dwe/mgmt_db2/V10.5|10.5|10.5.0.11|10.5.0.11..2|db2opm,dweadmin|db2opm,dweadmin| |

(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP8_FP4/software/DB2
```

5. Command: If using DPM then restart DPM. If not using DPM then skip this step. In Stage 09 DPM will be removed for customers who no longer need DPM installed.

```
hastartdpm
```

Example Output:

```
$ hastartdpm
Starting DPM and DB2 instance.....Resources online
MANAGEMENT DOMAIN
=====+=====+=====+=====+=====+=====+=====+
| COMPONENT | PRIMARY          | STANDBY          | CURRENT          | OPSTATE          | HA STATUS        | RG REQUESTS      |
|-----+-----+-----+-----+-----+-----+-----+
| DPM       | flashdancehostname01 | flashdancehostname03 | flashdancehostname01 | Online           | Normal           | -                 |
| DB2DPM    | flashdancehostname01 | flashdancehostname03 | flashdancehostname01 | Online           | Normal           | -                 |
|-----+-----+-----+-----+-----+-----+=====+

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/software/DB2
```

Phase 7: Backup Management Hosts

After Stage 6 is complete the management nodes are fully updated. This is a good time to consider running another mksysb for those two hosts. This is to hedge against a hard disk error on hdisk0, or the current boot disk. It is not recommended to restore the mirrors before taking a mksysb.

1. Command: Create new mksysb images of the management hosts. This command will create new mksysb images on the /stage filesystem. The BACKUPIFNEEDED will verify that a recent (90 days) backup at the same OSLEVEL exists, and if not, the command will take a new one. To modify the timeframe searched add "PDOAHISTORYDAYS=<#> " to the beginning of the command line.

```
./stage02_phase01_mksysb.sh ${BCUMGMT},${BCUMGMTSTDBY} BACKUPIFNEEDED
```

Example Output: (Excerpted)

```
20220811_145234 (reverseflash01:stage02_phase01_mksysb.sh): Validating backup for 'reverseflash01mgt'.
20220811_145237 (reverseflash01:stage02_phase01_mksysb.sh): Looking for mksysb backups in
'/stage/backups/FP9_FP5/20220811_144805' for host 'reverseflash01' as recent as '129600' minutes ago.
20220811_145237 (reverseflash01:stage02_phase01_mksysb.sh): Running 'lsmksysb -l -c -f
/stage/backups/FP9_FP5/20220811_144805/reverseflash01/reverseflash01.mksysb' to determine backup information.
20220811_145238 (reverseflash01:stage02_phase01_mksysb.sh): Found oslevel in mksysb was '7200-05-04-2220'.
20220811_145238 (reverseflash01:stage02_phase01_mksysb.sh): Found oslevel in mksysb matches current oslevel '7200-05-04-2220'.
20220811_145238 (reverseflash01:stage02_phase01_mksysb.sh): Validation returned '0'.
20220811_145238 (reverseflash01:stage02_phase01_mksysb.sh): Validating backup for 'reverseflash03mgt'.
20220811_145240 (reverseflash01:stage02_phase01_mksysb.sh): Looking for mksysb backups in
'/stage/backups/FP9_FP5/20220811_144805' for host 'reverseflash03' as recent as '129600' minutes ago.
20220811_145240 (reverseflash01:stage02_phase01_mksysb.sh): Running 'lsmksysb -l -c -f
/stage/backups/FP9_FP5/20220811_144805/reverseflash03/reverseflash03.mksysb' to determine backup information.
20220811_145240 (reverseflash01:stage02_phase01_mksysb.sh): Found oslevel in mksysb was '7200-05-04-2220'.
20220811_145240 (reverseflash01:stage02_phase01_mksysb.sh): Found oslevel in mksysb matches current oslevel '7200-05-04-2220'.
20220811_145240 (reverseflash01:stage02_phase01_mksysb.sh): Validation returned '0'.
```

The output above is like the output in Stage 2, Phase 1.

STAGE 7 - Standby nodes update

Stage 7 Description

Steps

- Stage 7 Phase 1: Identify hosts to be updated this cycle.
- Stage 7 Phase 2: Migrate Standby hosts.
- Stage 7 Phase 3: Quiesce hosts.
- Stage 7 Phase 4: Update firmware on standby hosts.
- Stage 7 Phase 5: Returning hosts to service.
- Stage 7 Phase 6: Prepare for next cycle.

Outage Requirements

- Updates are performed in passes. Each pass updates the current standby hosts that have not yet been updated.
- Most updates are done in parallel across all standby hosts within a pass, however, this is not true for Power Firmware (PFW) updates nor SISSAS adapter updates, both of which are performed serially. For serial updates the time needed is per rack, where each rack contains one standby. Note that after Pass 2 all LPARs in the first rack will be updated.
- First update pass should not require any outage, however standby nodes will be brought out of service during the update. This will mean that it will not be possible to failover in affected ha groups until the update is complete and the host is back in service.
- Subsequent update passes will require one or more 'failovers' depending on the number of racks or size of the appliance. A failover will result in a disruption of service. The maximum number of failovers between updates should be 7 or 1 failover per rack. Failovers can only be performed sequentially.

Time Per Step

- Stage 7 Phase 1: 5 Minutes.
- Stage 7 Phase 2: ~3 Hours / Pass (Min two passes add one additional pass for each DN above 1.5 DNs up to 4.5 DNs).
- Stage 7 Phase 3: 20 to 40 Minutes
- Stage 7 Phase 4:
 - 5 Minutes per rack for SISSAS adapter updates per pass.
 - 40 Minutes per rack for PFW updates per pass.
 - V1.1 FP3->FP5 customers add 60 minutes per pass to apply V1.1 FP4 levels of FC/NIC Firmware, run in parallel on standby hosts.
 - V1.1 FP2->FP5 customers add 60 minutes per pass to apply V1.1 FP3 or FP4 levels of FC/NIC firmware, run in parallel on standby hosts.
- Stage 7 Phase 5: 10 Minutes.
- Stage 7 Phase 6: 5 Minutes per failover per rack. Up to 35 minutes for a 7 rack environment

STAGE 7 - Standby nodes update

Risk Mitigation

- In order to follow these steps where the system is online during updates, it will be necessary to perform failovers. Some customers who have updated DB2 in the past without following PDOA guidelines may experience problems when attempting to failover. The most common issues are forgetting to update DB2 on standby hosts, forgetting to apply licenses to new DB2 copies, or forgetting to update the db2 global registry on standby hosts.
- During the update only standby hosts are removed from service. This can allow service to perform problem determination outside of outage windows.

Backout Options

- mksysb
- alt_disk_install

STAGE 7 - Standby nodes update

Update Strategy

The update strategy here is to take advantage of the HA features of the appliance. During the updates the standby hosts will be quiesced from the environments to allow them to be updated while ensuring the core warehouse is still operational. Once the nodes are updated and validated, they will be unquiesced and allowed back into the appliance at their standby roles.

When a host is quiesced, it is removed from participating in its parent TSA Domain and GPFS cluster. Any duties that host may have had within those parents is transferred to other hosts within that domain or cluster. In GPFS clusters this included configuration management (admin or admin standby, or first two LPARs in racks 3-7 if they exist), NSD management (admin or admin standby for /db2home, /dwhome and /stage), or filesystem management (any host). During this GPFS role transfers there will be a small delay for all I/O against those filesystems until the role transfers are completed.

Another update strategy, and one that is less complicated, is to stop the database on all hosts and take a full outage and combine stage 7 and stage 8. If taking a full outage, it is necessary to stop the database with hastopdb2 prior to proceeding with Stage 7 steps. Note that the migrate command in Phase 2 requires GPFS to be online in order to facilitate automatic mksysb backups, hatool log backups and sendmail backups as part of the update. Also note that during an "all node" migration that GPFS filesystems like /db2home, /stage/, and /dwhome will be down while the admin nodes are rebooting. Finally, only 4 LPARs are migrated at a time, so larger systems will incur significant downtime (2 to 3 hours per set) just for the migration. It is possible to do more servers in parallel however the limit has not been tested.

A good method to explain this strategy is to look at a larger example than our instructions will show. The following command shows a 12.5 DN PDOA V1.1 environment. FP4->FP5 customers will not see the Management Domain which was removed in V1.1 FP4.

```
$ hals
MANAGEMENT DOMAIN
+=====+=====+=====+=====+=====+=====+=====+
| COMPONENT | PRIMARY | STANDBY | CURRENT | OPSTATE | HA STATUS | RG REQUESTS |
+=====+=====+=====+=====+=====+=====+=====+
| DPM        | host01  | host03  | host01  | Online  | Normal    | -            |
| DB2DPM     | host01  | host03  | host01  | Online  | Normal    | -            |
+=====+=====+=====+=====+=====+=====+=====+

CORE DOMAIN
+=====+=====+=====+=====+=====+=====+=====+
| PARTITIONS | CURRENT | STANDBY | DOMAIN   | OPSTATE | HA STATUS | RG REQUESTS |
+=====+=====+=====+=====+=====+=====+=====+
| 0-5        | host04  | host02  | bcudomain01 | Online  | Normal    | -            |
| 6-15       | host06  | host08  | bcudomain02 | Online  | Normal    | -            |
| 16-25      | host07  | host08  | bcudomain02 | Online  | Normal    | -            |
| 26-35      | host05  | host08  | bcudomain02 | Online  | Normal    | -            |
| 36-45      | host09  | host08  | bcudomain02 | Online  | Normal    | -            |
| 46-55      | host13  | host14  | bcudomain03 | Online  | Normal    | -            |
| 56-65      | host12  | host14  | bcudomain03 | Online  | Normal    | -            |
| 66-75      | host10  | host14  | bcudomain03 | Online  | Normal    | -            |
| 76-85      | host11  | host14  | bcudomain03 | Online  | Normal    | -            |
| 86-95      | host18  | host15  | bcudomain04 | Online  | Normal    | -            |
| 96-105     | host17  | host15  | bcudomain04 | Online  | Normal    | -            |
| 106-115    | host16  | host15  | bcudomain04 | Online  | Normal    | -            |
| 116-125    | host19  | host15  | bcudomain04 | Online  | Normal    | -            |
+=====+=====+=====+=====+=====+=====+=====+
```


STAGE 7 - Standby nodes update

This environment has 1 management domain and 4 core domains. The update strategy for the above list would be as follows.

- a. FP1->FP5, FP2->FP5, FP3->FP5 only. Normalize the management domain and bcudomain01 so that both standby hosts are assigned to the same CEC. In this case failover DPM resources to host03 as host01 and host02 are the same server and host03 and host04 are the same server. Take the interruption on the management hosts. Note that by this time the management hosts in stage 6 have gone through some updates for OS, adapter firmware and software stack. However, they must be quiesced as the power firmware update will reboot the LPARs and the restart the CEC. It is not necessary to Normalize for V1.1 FP4->FP5 customers as the management domain should be have been removed.
- b. Update #1: update the current set of standby hosts (host01, host02,host08,host14,host15).
- c. Failover #1: At a time when interruptions could be handled, initiate failovers. After the failovers are completed it is possible to return to production
 - a. Failover host03 to host01 in mgmt. domain.
 - b. Failover host04 to host02 in bcudomain01.
 - c. Failover host05 to host08 in bcudomain02. [U: host 08 TBD: host 05,06,07,09]
 - d. Failover host10 to host14 in bcudomain03. [U: host 14 TBD: host 10,11,12,13]
 - e. Failover host16 to host15 in bcudomain04. [U: host 15 TBD: host 16,17,18,19]
- d. Update #2: update the current set of standby hosts. (host03, host04, host05,host10,host14).
- e. Failover #2: At a time when interruptions could be handled, initiate failovers. After the failovers are completed it is possible to return to production after failover are completed.
 - a. Management Domain is fully updated, no further updates required in this stage.
 - b. bcudomain01 is fully updated, no further updates required in this stage.
 - c. Failover host06 to host05 in bcudomain02. [U: host 05,08 TBD: host 06, 07,09]
 - d. Failover host11 to host10 in bcudomain03. [U: host 10,14 TBD: host 11,12,13]
 - e. Failover host17 to host16 in bcudomain04. [U: host 15,16 TBD: host 17,18,19]
- f. Update #3: update the current set of standby hosts. (host06,host11,host17)
- g. Failover #3: At a time when interruptions could be handled, initiate failovers. After the failovers are completed it is possible to return to production after failover are completed.
 - a. Management Domain is fully updated, no further updates required in this stage.
 - b. bcudomain01 is fully updated, no further updates required in this stage.
 - c. Failover host07 to host06 in bcudomain02. [U: host 05,06,08 TBD: host 07,09]
 - d. Failover host12 to host11 in bcudomain03. [U: host 10,11,14 TBD: host 12,13]
 - e. Failover host18 to host17 in bcudomain04. [U: host 15,16,17 TBD: host 18,19]
- h. Update #4: update the current set of standby hosts. (host07,host12,host18)
- i. Failover #4: At a time when interruptions could be handled, initiate failovers. After the failovers are completed it is possible to return to production after failover are completed.
 - a. Management Domain is fully updated, no further updates required in this stage.
 - b. bcudomain01 is fully updated, no further updates required in this stage.
 - c. Failover host09 to host07 in bcudomain02. [U: host 05,06,07,08 TBD: host 09]
 - d. Failover host13 to host12 in bcudomain03. [U: host 10,11,12,14 TBD: host 13]
 - e. Failover host19 to host18 in bcudomain04. [U: host 15,16,17,18 TBD: host 19]

STAGE 7 - Standby nodes update

- j. Update #5: update the current set of standby hosts. (host09,host13,host18)

This method allows for the updates to be spread out over time with small interruptions to handle the failovers. The failover time in between updates will vary based on the # of domains in the appliance. The number of updates depends on the size or number of hosts in the largest data rack in the appliance which can vary from 1 to 4 hosts in V1.0 and 1 to 5 hosts in V1.1.

Phase 1: Identify Hosts and Servers requiring updates.

Step 1: Identify the hosts to be updated.

1. Command: Use 'hals' to identify the current active and standby hosts in the environment. When looking at the MANAGEMENT DOMAIN output, pay attention to the fourth column (CURRENT) which shows the current active host. When looking at the CORE DOMAIN, the CURRENT column is the second column.
NOTE: In V1.1 FP4 Stage 9 the management domain was removed.

hals

Example Output:

```
$ hals
MANAGEMENT DOMAIN
=====+=====+=====+=====+=====+=====+=====+
| COMPONENT | PRIMARY | STANDBY | CURRENT | OPSTATE | HA STATUS | RG REQUESTS |
| DPM       | flashdancehostname01 | flashdancehostname03 | flashdancehostname01 | Online | Normal | - |
| DB2DPM    | flashdancehostname01 | flashdancehostname03 | flashdancehostname01 | Online | Normal | - |
CORE DOMAIN
=====+=====+=====+=====+=====+=====+=====+
| PARTITIONS | CURRENT | STANDBY | DOMAIN | OPSTATE | HA STATUS | RG REQUESTS |
| 0-5        | flashdancehostname02 | flashdancehostname04 | bcudomain01 | Online | Normal | - |
| 6-15       | flashdancehostname07 | flashdancehostname05 | bcudomain02 | Online | Normal | - |
| 16-25      | flashdancehostname06 | flashdancehostname05 | bcudomain02 | Online | Normal | - |
```

2. Command: Verify the hostname to server or CEC assignments. This is important during foundation host updates.

```
dsh -n ${ALL} 'lsconf | grep "Machine Serial Number"' | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} 'lsconf | grep "Machine Serial Number"' | dshbak -c
HOSTS -----
flashdancehostname03, flashdancehostname04
-----
Machine Serial Number: 2168C1V

HOSTS -----
flashdancehostname01, flashdancehostname02
-----
Machine Serial Number: 2168BFV

HOSTS -----
flashdancehostname06
-----
Machine Serial Number: 216B47V

HOSTS -----
flashdancehostname07
-----
Machine Serial Number: 216B44V

HOSTS -----
flashdancehostname05
-----
Machine Serial Number: 216B42V
```

In the above case flashdancehostname01 and flashdancehostname 02 are LPARs on the same CEC and flashdancehostname03 and flashdancehostname04 are LPARs on the same CEC. The PDOA naming convention will always associate hosts 01 and 02 together and hosts 03 and 04 together.

STAGE 7 - Standby nodes update

3. Command: Verify the hosts and servers that require updates. The stageSeven_status.sh command checks the OS level, Power Firmware Level, Network Adapter, Fiber Channel Adapter and Internal Adapter levels. The sample below shows that '01' and '03' are waiting for a Power Firmware update. '02', '04', '05' and '06' are waiting for a Power Firmware update, AIX update and SISASS adapter update. If there is no output then Stage 07 is completed.

```
dsh -n ${ALL} '/BCU_share/FP9_FP5/fixpack_tools/status/stageSeven_status.sh' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} '/BCU_share/FP9_FP5/fixpack_tools/status/stageSeven_status.sh' 2>&1 | dshbak -c
HOSTS -----
reverseflash01, reverseflash03
-----
Firmware Version: IBM,FW860.90 (SV860_226)

HOSTS -----
reverseflash02, reverseflash04, reverseflash05, reverseflash06
-----
Firmware Version: IBM,FW860.90 (SV860_226)
7100-05-07-2038
sisas:53495351.19512b00
```

4. Potential Service Interruption. Determine if the current standby hosts for each domain (management, bcudomain01, bcudomain02,...) should be updated during this pass. Look at bcudomain01 in the core nodes list. This is important as the Power Firmware update will power off the entire CEC as part of the update.
 - a. If the current admin host is '02', then '04' can be quiesced and updated. To update '04' it is necessary to ensure that '03' can also be quiesced.
 - b. If the current admin host is '04', then '02' can be quiesced. To update '02' it is necessary to ensure that '01' can also be quiesced.
 - c. **Service Interruption.** If the current admin host is '02' and standby host is '04' and only '02' requires an update, then this cycle will require failing over '02' to '04'. This is normally the case for the second pass for stage07 updates.

```
$ hafailover flashdancehostname02
Moving resources from flashdancehostname02 to flashdancehostname04
.....Done
CORE DOMAIN
+-----+-----+-----+-----+-----+-----+-----+
| PARTITIONS | CURRENT | STANDBY | DOMAIN | OPSTATE | HA STATUS | RG REQUESTS |
+-----+-----+-----+-----+-----+-----+-----+
| 0-5 | flashdancehostname04 | flashdancehostname02 | bcudomain01 | Online | Normal | - |
| 6-15 | flashdancehostname07 | flashdancehostname05 | bcudomain02 | Online | Normal | - |
| 16-25 | flashdancehostname06 | flashdancehostname05 | bcudomain02 | Online | Normal | - |
+-----+-----+-----+-----+-----+-----+-----+
```

STAGE 7 - Standby nodes update

- d. **Service Interruption.** If this is the second or higher pass then failover a data node in each of the domains. In the first pass of this example '05' from bcudomain02 was updated. The bcudomain02 domain has '06' and '07' so failover '06' to '05'. For larger systems do this check for each domain and perform the necessary failovers. Failovers can only be done one at a time.

```
$ hafaillver flashdancehostname06
Moving resources from flashdancehostname06 to flashdancehostname05
.....Done
CORE DOMAIN
=====+=====+=====+=====+=====+=====+=====+=====+
| PARTITIONS | CURRENT          | STANDBY          | DOMAIN          | OPSTATE          | HA STATUS        | RG REQUESTS      |
|-----+-----+-----+-----+-----+-----+-----+-----+
| 0-5        | flashdancehostname04 | flashdancehostname02 | bcudomain01     | Online           | Normal           | -                |
| 6-15       | flashdancehostname07 | flashdancehostname06 | bcudomain02     | Online           | Normal           | -                |
| 16-25      | flashdancehostname05 | flashdancehostname06 | bcudomain02     | Online           | Normal           | -                |
=====+=====+=====+=====+=====+=====+=====+=====+
```

- e. **Command:** If DPM is not needed, then stop DPM and then stop the management domain. This will avoid having to failover DPM. DPM should have been removed in V1.1 FP4.

```
hastopdpm
```

```
hadomain -mgmt stop
```

Example Output:

```
$ hastopdpm
Stopping DPM and DB2 instance.....Resources offline
MANAGEMENT DOMAIN
=====+=====+=====+=====+=====+=====+=====+=====+
| COMPONENT | PRIMARY          | STANDBY          | CURRENT          | OPSTATE          | HA STATUS        | RG REQUESTS      |
|-----+-----+-----+-----+-----+-----+-----+-----+
| DPM       | flashdancehostname01 | N/A              | N/A              | Offline          | Offline          | -                |
| DB2DPM    | flashdancehostname01 | N/A              | N/A              | Offline          | Offline          | -                |
=====+=====+=====+=====+=====+=====+=====+=====+
$ hadomain -mgmt stop

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

- f. If DPM is needed, ensure that it is not running on the same CEC as the current active admin node. If so, then failover DPM. The example below shows DPM is running on '03'.

- i. **Command:** Determine the state

```
hals -mgmt
```

Example Output:

```
$ hals -mgmt
MANAGEMENT DOMAIN
=====+=====+=====+=====+=====+=====+=====+=====+
| COMPONENT | PRIMARY          | STANDBY          | CURRENT          | OPSTATE          | HA STATUS        | RG REQUESTS      |
|-----+-----+-----+-----+-----+-----+-----+-----+
| DPM       | flashdancehostname01 | flashdancehostname03 | flashdancehostname03 | Online           | Normal           | -                |
| DB2DPM    | flashdancehostname01 | flashdancehostname03 | flashdancehostname03 | Online           | Normal           | -                |
=====+=====+=====+=====+=====+=====+=====+=====+
```

- ii. **Command:** As '03' is the same CEC as '04', use hafaillver to move DPM from '03' to '01'. This will ensure that '03' and '04' are both ready to be quiesced and rebooted during the power firmware update. If needed, replace the *flashdancehostname03* with the appropriate hostname.

```
hafaillver flashdancehostname03 DPM
```

Example Output:

```
$ hafaillver flashdancehostname03 DPM
Moving resources from flashdancehostname03 to flashdancehostname01
.....Done
MANAGEMENT DOMAIN
=====+=====+=====+=====+=====+=====+=====+=====+
| COMPONENT | PRIMARY          | STANDBY          | CURRENT          | OPSTATE          | HA STATUS        | RG REQUESTS      |
|-----+-----+-----+-----+-----+-----+-----+-----+
| DPM       | flashdancehostname01 | flashdancehostname03 | flashdancehostname01 | Online           | Normal           | -                |
=====+=====+=====+=====+=====+=====+=====+=====+
```

STAGE 7 - Standby nodes update

```
| DB2DPM | flashdancehostname01 | flashdancehostname03 | flashdancehostname01 | Online | Normal | - |
|-----|-----|-----|-----|-----|-----|-----|
(0) root @ flashdancehostname01: 7.1.0.0: /
```

5. **Command:** Verify hosts are eligible to be quiesced. This command checks the hosts individually to verify that no resources are online on the host. Here we see that '01', '03', '04' and '05' are eligible to quiesce and have pending updates. Eligible to quiesce is determined when there are no services (DPM, Db2) running on that host. If this were the second pass, our example should show that '01', '02' and '06' are eligible to quiesce. If the environment has had a planar replaced in a CEC, it is possible that the FW level will be older than 860.70 as shown below. If this is the case, it is possible that the power firmware update will be longer and will also reboot that server.

```
dsh -n ${ALL} 'cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 && echo "Eligible to quiesce.";status/stageSeven_status.sh' 2>&1 | dshbak -c
```

Example Output: (First Pass)

```
$ dsh -n ${ALL} 'cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 && echo "Eligible to quiesce.";status/stageSeven_status.sh' 2>&1 | dshbak -c
HOSTS -----
reverseflash01, reverseflash03
-----
Eligible to quiesce.
Firmware Version: IBM,FW860.90 (SV860_226)

HOSTS -----
reverseflash02, reverseflash06
-----
Firmware Version: IBM,FW860.90 (SV860_226)
7100-05-07-2038
sisas:53495351.19512b00

HOSTS -----
reverseflash04, reverseflash05
-----
Eligible to quiesce.
Firmware Version: IBM,FW860.90 (SV860_226)
7100-05-07-2038
sisas:53495351.19512b00

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/support/FP9_FP5/log
```

Example Output: (Second Pass) Notice '03', '04', and '05' which no longer need updates do not appear in the output and '01', '02', and '06' require updates and are eligible to quiesce.

```
$ dsh -n ${ALL} 'cd /BCU_share/FP8_FP4/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 && echo "Eligible to quiesce.";status/stageSeven_status.sh' 2>&1 | dshbak -c
HOSTS -----
flashdancehostname01
-----
Eligible to quiesce.
Firmware Version: IBM,FW860.70 (SV860_205)

HOSTS -----
flashdancehostname02
-----
Eligible to quiesce.
Firmware Version: IBM,FW860.70 (SV860_205)
7100-05-04-1914
sisas:53495351.19512300

HOSTS -----
flashdancehostname06
-----
Eligible to quiesce.
Firmware Version: IBM,FW860.70 (SV860_205)
7100-05-04-1914
fcs:7710322514101e04.0320080270
sisas:53495351.19512300

HOSTS -----
flashdancehostname07
-----
```

STAGE 7 - Standby nodes update

```
Firmware Version: IBM,FW860.70 (SV860_205)
7100-05-04-1914
fcs:7710322514101e04.0320080270
sisas:53495351.19512300
```

```
(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

6. Command: Verify nodes to be migrated are able to migrate and 'rsh' is enabled.

```
dsh -n ${BCUDB2ALL} "cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 &&
status/stageSeven_status.sh" | grep 7100 | cut -d: -f1 | while read tgthost;do rsh ${tgthost} echo "${tgthost} ready for
migration." < /dev/null;done
```

Example Output: (Shows two hosts are ready for migration. Will vary by size of system and which pass is being performed)

```
$ dsh -n ${BCUDB2ALL} "cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 &&
status/stageSeven_status.sh" | grep 7100 | cut -d: -f1 | while read tgthost;do rsh ${tgthost} echo "${tgthost} ready for
migration." < /dev/null;done
flashdancehostname02 ready for migration.
flashdancehostname06 ready for migration.
```

Example Output: (Both hosts refuse connections and need rsh to be enabled.)

```
$ dsh -n ${BCUDB2ALL} "cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 &&
status/stageSeven_status.sh" | grep 7100 | cut -d: -f1 | while read tgthost;do rsh ${tgthost} echo "${tgthost} ready for
migration." < /dev/null;done
flashdancehostname02: A remote host refused an attempted connect operation.
flashdancehostname06: A remote host refused an attempted connect operation.
```

7. Command: Verify that the .rhosts file exists on all hosts to be migrated. In PDOA, /.rhosts was populated as part of the deployment, however if /.rhosts was removed it will need to exist for the migration to work.

```
dsh -n ${BCUDB2ALL} "cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 &&
status/stageSeven_status.sh" | grep 7100 | cut -d: -f1 | while read tgthost;do echo "**** ${tgthost}****";ssh -n ${tgthost} cat
/.rhosts;done
```

Example Output: (Shows '<management host> root' in each file.

```
$ dsh -n ${BCUDB2ALL} "cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 &&
status/stageSeven_status.sh" | grep 7100 | cut -d: -f1 | while read tgthost;do echo "**** ${tgthost}****";ssh -n ${tgthost} cat
/.rhosts;done
*** flashdancehostname02***
flashdancehostname01 root
*** flashdancehostname06***
flashdancehostname01 root
```

Example Output: (Show one host that does not have .rhosts file.

```
$ dsh -n ${BCUDB2ALL} "cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 &&
status/stageSeven_status.sh" | grep 7100 | cut -d: -f1 | while read tgthost;do echo "**** ${tgthost}****";ssh -n ${tgthost} cat
/.rhosts;done
*** flashdancehostname02***
cat: 0652-050 Cannot open /.rhosts.
*** flashdancehostname06***
flashdancehostname01 root
```

8. Command: Create the .rhosts file on hosts that are missing that file.

```
dsh -n ${BCUDB2ALL} "cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 &&
status/stageSeven_status.sh" | grep 7100 | cut -d: -f1 | while read tgthost;do echo "**** ${tgthost}****";ssh -n ${tgthost} "if [ !
-f /.rhosts ];then echo Creating .rhosts file.;echo $(hostname) root > /.rhosts;chmod 400 /.rhosts;fi";done
```

Example Output:

```
dsh -n ${BCUDB2ALL} "cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 &&
status/stageSeven_status.sh" | grep 7100 | cut -d: -f1 | while read tgthost;do echo "**** ${tgthost}****";ssh -n ${tgthost} "if [ !
-f /.rhosts ];then echo Creating .rhosts file.;echo $(hostname) root > /.rhosts;chmod 400 /.rhosts;fi";done
*** flashdancehostname02***
Creating .rhosts file.
*** flashdancehostname06***
```

```
(0) root @ flashdancehostname01: 7.2.0.0: /
```

STAGE 7 - Standby nodes update

9. Command: Insert entry into `/.rhosts` on hosts that have `/.rhosts` but are missing the management node with root entry.

```
dsh -n ${BCUDB2ALL} "cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 &&
status/stageSeven_status.sh" | grep 7100 | cut -d: -f1 | while read tgthost;do echo "**** ${tgthost}****";ssh -n ${tgthost} "if
grep $(hostname) /.rhosts;then echo No Edit required;else echo Adding.rhosts file.;echo $(hostname) root >> /.rhosts;fi";done
```

Example Output:

```
$ dsh -n ${BCUDB2ALL} "cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 &&
status/stageSeven_status.sh" | grep 7100 | cut -d: -f1 | while read tgthost;do echo "**** ${tgthost}****";ssh -n ${tgthost} "if
grep $(hostname) /.rhosts;then echo No Edit required;else echo Adding.rhosts file.;echo $(hostname) root >> /.rhosts;fi";done
*** flashdancehostname04***
flashdancehostname01 root
No Edit required
*** flashdancehostname05***
Adding.rhosts file.
```

10. Command: For hosts that say denied, run the following to start the rsh daemon.

```
dsh -n ${BCUDB2ALL} "cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 && echo
Eligible to quiesce. && status/stageSeven_status.sh | grep 7100 && startsrc -t shell" 2>&1 | dshbak -c
```

Example Output: (Note: Only eligible to migrate hosts are enabled to limit exposure)

```
$ dsh -n ${BCUDB2ALL} "cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 &&
status/stageSeven_status.sh" | grep 7100 | cut -d: -f1 | while read tgthost;do ssh -n ${tgthost} startsrc -t shell;done
0513-124 The shell subserver has been started.
0513-124 The shell subserver has been started.
```

11. Command: Recheck to verify that targeted hosts are ready to be migrated.

```
dsh -n ${BCUDB2ALL} "cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 &&
status/stageSeven_status.sh" | grep 7100 | cut -d: -f1 | while read tgthost;do rsh ${tgthost} echo "${tgthost} ready for
migration." < /dev/null;done
```

Example Output:

```
dsh -n ${BCUDB2ALL} "cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 &&
status/stageSeven_status.sh" | grep 7100 | cut -d: -f1 | while read tgthost;do rsh ${tgthost} echo "${tgthost} ready for
migration." < /dev/null;done
flashdancehostname02 ready for migration.
flashdancehostname06 ready for migration.

(0) root @ flashdancehostname01: 7.2.0.0: /
```


Phase 2: Migrate Standby Hosts to AIX 7.2.

In this step the eligible core hosts (non-management) are quiesced at the domain level, backed up using mksysb to /stage, rootvg cloned, migrated, quiesced at the GPFS level, rebooted, and restoration of the hatools logs and sendmail configuration after reboot. For customers on V1.1 FP2 or V1.1 FP3 it may be necessary to update to the AIX level on V1.1 FP4, prior to migrating to AIX 7.2.

The following table illustrates log files associated with the migration.

Server	Role	File
Nim Server (Management)	nimadm migration log files	/var/adm/ras/alt_mig/<lparname>_ alt_mig.log
Nim Target	Emgr log file.	/var/adm/ras/emgr.log
Management Server	FP Tools Core Node Migration	/BCU_share/support/FP9_FP5/log/migrate_core_nodes_aix72.sh_<timestamp>.log (.stderr)
Management Server	FP Tools Per Host AIX Migration. Stderr file includes expanded nimadm command logging.	/BCU_share/support/FP9_FP5/log/migrate_aix72.sh_<mgmthostname>_<timestamp>.log [.stderr]

STAGE 7 - Standby nodes update

The `migrate_core_nodes_aix72.sh` script will attempt to do the following. All eligible host must pass each step before it proceeds to the next step.

- Identify all core hosts that are hosting services or are not hosting services.
- For each host that needs to go through part of the migration process the script will determine:
 - Check for a recent `mksysb` for that host.
 - Check for a recent `/etc/mail` backup to ensure the sendmail configuration survives the migration.
 - Check for a recent `/tmp/halog` backup. This is to preserve historical HA data across the migration for support purposes.
 - Check the OS Level
 - Check the OS Level of a clone if it exists.
- Steps:
 - Quiesce the domain all hosts that have migration steps left.
 - Create `mksysb` for all hosts that need recent `mksysbs`.
 - Requires GPFS to be online at this point.
 - Unmirror rootvg on hosts that need to be migrated.
 - Migrate (`MAXPARALLELMIGRATION=4` hosts in parallel per migration)
 - Quiesce GPFS on all hosts that need migration.
 - Reboot all hosts that were migrated but not yet rebooted.
 - Verifies OS Level is AIX 7.2
 - Restores `/etc/mail` and `/tmp/halog` from backups to `/stage`.

STAGE 7 - Standby nodes update

1. Command: Migrate the standby hosts. This command takes about 2 to 3 hours per set of four servers if there are no issues encountered. Migration progress can be tracked in the *fplog* screen session by tailing any of the migrate node log.stderr files, there is one such file for each host being migrated. If errors are encountered proceed examine the log files and refer to Appendix – Troubleshooting AIX 7.2 Migration Failures at the end of this document. For all other issues contact IBM Support.

```
./migrate_core_nodes_aix72.sh -migrate
```

Example Output: (Excepted. Look for a rc=0 as well as hosts in the line ‘The following hosts have been migrated and rebooted:’. The example shows two hosts are migrated, and two hosts are yet to be migrated.)

```
20220823_173222 (reverseflash01:migrate_core_nodes_aix72.sh): (nodeeligibility) Validating list of nodes
'reverseflash02mgt,reverseflash06mgt,reverseflash04mgt,reverseflash05mgt' for update eligibility.
20220823_173600 (reverseflash01:migrate_core_nodes_aix72.sh): (validate_alt_oslevel) No hosts are eligible to be
migrated or are migrated and need to be rebooted.
20220823_173600 (reverseflash01:migrate_core_nodes_aix72.sh): (validate_alt_oslevel) The following hosts '' are
eligible for migration.
20220823_173600 (reverseflash01:migrate_core_nodes_aix72.sh): (validate_alt_oslevel) The following hosts have been
migrated and rebooted: ' reverseflash04mgt reverseflash05mgt'.
20220823_173600 (reverseflash01:migrate_core_nodes_aix72.sh): (validate_alt_oslevel) The following hosts cannot be
migrated due to hosting services, but need to be migrated. ' reverseflash02mgt reverseflash06mgt'
20220823_173600 (reverseflash01:migrate_core_nodes_aix72.sh): (validate_alt_oslevel) The following hosts have been
migrated but not rebooted: ''.
20220823_173600 (reverseflash01:migrate_core_nodes_aix72.sh): (validate_alt_oslevel) The following hosts have errors:
''.
20220823_173600 (reverseflash01:migrate_core_nodes_aix72.sh): (validate_alt_oslevel) No nodes determined to be eligible
for migration at this time.
20220823_173600 (reverseflash01:migrate_core_nodes_aix72.sh): Successfully migrated hosts ''.
20220823_173600 (reverseflash01:migrate_core_nodes_aix72.sh): Successfully completed.
20220823_173600 (reverseflash01:migrate_core_nodes_aix72.sh): Script './migrate_core_nodes_aix72.sh' with arguments '-
migrate' ended with rc='0'. Start: Tue Aug 23 15:34:18 EDT 2022 End: Tue Aug 23 17:36:00 EDT 2022. Elapsed Time
(Seconds): 7302 (H:M:S):(02:01:42).
20220823_173600 (reverseflash01:migrate_core_nodes_aix72.sh): Normalizing management hostname.
20220823_173601 (reverseflash01:migrate_core_nodes_aix72.sh): Management hostname is 'reverseflash01'.
20220823_173601 (reverseflash01:migrate_core_nodes_aix72.sh): Sending notification 'Message from PDOA fixpack on
'reverseflash01' from script './migrate_core_nodes_aix72.sh'.' to 'user@company.com' '-c root@localhost'.
20220823_173601 (reverseflash01:migrate_core_nodes_aix72.sh): Notification sent.
You have mail in /usr/spool/mail/root
```

Example Output: (Error encountered)

```
20220901_111133 (reverseflash01:migrate_core_nodes_aix72.sh): (validate_alt_oslevel) The following hosts '' are
eligible for migration.
20220901_111133 (reverseflash01:migrate_core_nodes_aix72.sh): (validate_alt_oslevel) The following hosts have been
migrated and rebooted: 'reverseflash04mgt,reverseflash05mgt'.
20220901_111133 (reverseflash01:migrate_core_nodes_aix72.sh): (validate_alt_oslevel) The following hosts cannot be
migrated due to hosting services, but need to be migrated. ''
20220901_111133 (reverseflash01:migrate_core_nodes_aix72.sh): (validate_alt_oslevel) The following hosts have been
migrated but not rebooted: 'reverseflash02mgt,reverseflash06mgt'.
20220901_111133 (reverseflash01:migrate_core_nodes_aix72.sh): (validate_alt_oslevel) The following hosts have errors:
''.
20220901_111133 (reverseflash01:migrate_core_nodes_aix72.sh): (validate_alt_oslevel) Validation completed.
20220901_111133 (reverseflash01:migrate_core_nodes_aix72.sh): Error: the following hosts were not migrated '' and the
following hosts that were migrated were not rebooted 'reverseflash02mgt,reverseflash06mgt'.
20220901_111133 (reverseflash01:migrate_core_nodes_aix72.sh): An error occurred.
20220901_111133 (reverseflash01:migrate_core_nodes_aix72.sh): Script './migrate_core_nodes_aix72.sh' with arguments '-
migrate' ended with rc='2'. Start: Thu Sep 1 10:33:36 EDT 2022 End: Thu Sep 1 11:11:33 EDT 2022. Elapsed Time
(Seconds): 2277 (H:M:S):(00:37:57).
```

STAGE 7 - Standby nodes update

2. Command: Verify the state of the system. All standby hosts should be offline and services should remain online.

```
$ hals
none are available... returning
CORE DOMAIN
```

PARTITIONS	CURRENT	STANDBY	DOMAIN	OPSTATE	HA STATUS	RG REQUESTS
0-5	reverseflash02	reverseflash04	bcudomain01	Online	Standby Offline	-
6-15	reverseflash06	reverseflash05	bcudomain02	Online	Standby Offline	-

3. Command: Verify the OS level on the new hosts.

```
dsh -n ${ALL} 'oslevel -s' | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} 'oslevel -s' | dshbak -c
HOSTS -----
reverseflash01, reverseflash03, reverseflash04, reverseflash05
-----
7200-05-04-2220

HOSTS -----
reverseflash02, reverseflash06
-----
7100-05-07-2038
```

4. Command: Verify efices. Migrated hosts should only have two efices, hosts that are yet to be migrated should have one efex (V1.1 FP4). For any migrated host that is missing efices, see Appendix – Apply efices if missing on a node. For any migrated host that still contains IJ29552s7b (will show 3 efices) see Appendix – Safely removing IJ29552s7b efex after migration. Do not attempt to remove the extra e-fix without following the instructions in the appendix.

```
dsh -n ${ALL} 'echo "emgr -l: ";emgr -l 2>&1 | grep -p "^ID"' | dshbak -c
```

Example Output: (One node, reverseflash04, is missing its efices.)

```
$ dsh -n ${ALL} 'echo "emgr -l: ";emgr -l 2>&1 | grep -p "^ID"' | dshbak -c
HOSTS -----
reverseflash01
-----
emgr -l:
ID STATE LABEL          INSTALL TIME      UPDATED BY ABSTRACT
=== =====
1  S   IJ40615m4b 08/16/22 09:31:39      IJ40615 for AIX 7.2 TL5 SP2 SP4
2  S   IJ39876s3a 08/16/22 09:31:52      IJ39876 POTENTIAL SECURITY ISSUE

HOSTS -----
reverseflash02
-----
emgr -l:
ID STATE LABEL          INSTALL TIME      UPDATED BY ABSTRACT
=== =====
1  S   IJ29552s7b 05/24/21 14:53:05      IJ29552 LOAD MODULE AUTH ISSUES

HOSTS -----
reverseflash06
-----
emgr -l:
ID STATE LABEL          INSTALL TIME      UPDATED BY ABSTRACT
=== =====
1  S   IJ29552s7b 05/24/21 14:53:08      IJ29552 LOAD MODULE AUTH ISSUES

HOSTS -----
```

STAGE 7 - Standby nodes update

```
reverseflash04
-----
emgr -l:

HOSTS -----
reverseflash03
-----
emgr -l:
ID  STATE LABEL          INSTALL TIME      UPDATED BY ABSTRACT
===  =====
1   S    IJ40615m4b 08/16/22 16:29:59      IJ40615 for AIX 7.2 TL5 SP2 SP4
2   S    IJ39876s3a 08/16/22 16:30:11      IJ39876 POTENTIAL SECURITY ISSUE

HOSTS -----
reverseflash05
-----
emgr -l:
ID  STATE LABEL          INSTALL TIME      UPDATED BY ABSTRACT
===  =====
1   S    IJ40615m4b 08/23/22 16:53:29      IJ40615 for AIX 7.2 TL5 SP2 SP4
2   S    IJ39876s3a 08/23/22 16:53:43      IJ39876 POTENTIAL SECURITY ISSUE
```

Example Output: (Shows 'reverseflash06' did not have its efix removed.)

```
$ dsh -n ${BCUALL} 'emgr -l' | dshbak -c
HOSTS -----
reverseflash04
-----

ID  STATE LABEL          INSTALL TIME      UPDATED BY ABSTRACT
===  =====
1   S    IJ40615m4b 09/19/22 20:35:21      IJ40615 for AIX 7.2 TL5 SP2 SP4
2   S    IJ39876s3a 09/19/22 20:35:34      IJ39876 POTENTIAL SECURITY ISSUE

STATE codes:
S = STABLE
M = MOUNTED
U = UNMOUNTED
Q = REBOOT REQUIRED
B = BROKEN
I = INSTALLING
R = REMOVING
T = TESTED
P = PATCHED
N = NOT PATCHED
SP = STABLE + PATCHED
SN = STABLE + NOT PATCHED
QP = BOOT IMAGE MODIFIED + PATCHED
QN = BOOT IMAGE MODIFIED + NOT PATCHED
RQ = REMOVING + REBOOT REQUIRED

HOSTS -----
reverseflash02
-----

ID  STATE LABEL          INSTALL TIME      UPDATED BY ABSTRACT
===  =====
1   S    IJ40615m4b 09/14/22 13:47:00      IJ40615 for AIX 7.2 TL5 SP2 SP4
2   S    IJ39876s3a 09/14/22 13:47:14      IJ39876 POTENTIAL SECURITY ISSUE

STATE codes:
S = STABLE
M = MOUNTED
U = UNMOUNTED
Q = REBOOT REQUIRED
B = BROKEN
I = INSTALLING
R = REMOVING
T = TESTED
P = PATCHED
N = NOT PATCHED
SP = STABLE + PATCHED
SN = STABLE + NOT PATCHED
QP = BOOT IMAGE MODIFIED + PATCHED
QN = BOOT IMAGE MODIFIED + NOT PATCHED
RQ = REMOVING + REBOOT REQUIRED

HOSTS -----
reverseflash05
-----

ID  STATE LABEL          INSTALL TIME      UPDATED BY ABSTRACT
===  =====
```

STAGE 7 - Standby nodes update

```
1 S IJ40615m4b 09/14/22 13:49:43 IJ40615 for AIX 7.2 TL5 SP2 SP4
2 S IJ39876s3a 09/14/22 13:49:56 IJ39876 POTENTIAL SECURITY ISSUE
```

```
STATE codes:
S = STABLE
M = MOUNTED
U = UNMOUNTED
Q = REBOOT REQUIRED
B = BROKEN
I = INSTALLING
R = REMOVING
T = TESTED
P = PATCHED
N = NOT PATCHED
SP = STABLE + PATCHED
SN = STABLE + NOT PATCHED
QP = BOOT IMAGE MODIFIED + PATCHED
QN = BOOT IMAGE MODIFIED + NOT PATCHED
RQ = REMOVING + REBOOT REQUIRED
```

```
HOSTS -----
reverseflash06
-----
```

ID	STATE	LABEL	INSTALL TIME	UPDATED BY	ABSTRACT
1	S	IJ29552s7b	05/24/21 14:53:08	IJ29552	LOAD MODULE AUTH ISSUES
2	S	IJ40615m4b	09/19/22 19:46:34	IJ40615	for AIX 7.2 TL5 SP2 SP4
3	S	IJ39876s3a	09/19/22 19:46:49	IJ39876	POTENTIAL SECURITY ISSUE

```
STATE codes:
S = STABLE
M = MOUNTED
U = UNMOUNTED
Q = REBOOT REQUIRED
B = BROKEN
I = INSTALLING
R = REMOVING
T = TESTED
P = PATCHED
N = NOT PATCHED
SP = STABLE + PATCHED
SN = STABLE + NOT PATCHED
QP = BOOT IMAGE MODIFIED + PATCHED
QN = BOOT IMAGE MODIFIED + NOT PATCHED
RQ = REMOVING + REBOOT REQUIRED
```

5. Command: Disable the 'shell' or 'rsh' daemon on migrated hosts. This will disable this daemon on any AIX host in the environment that is booted into AIX 7.2 and has the daemon active.

```
dsh -n ${BCUDB2ALL} "oslevel -s | grep 7200 && lssrc -t shell | grep -i active && stopsrc -t shell && lssrc -t shell"
```

Example Output:

```
$ dsh -n ${BCUDB2ALL} "oslevel -s | grep 7200 && lssrc -t shell | grep -i active && stopsrc -t shell && lssrc -t shell"
flashdancehostname02: 7200-05-04-2220
flashdancehostname02: shell /usr/sbin/rshd rshd active
flashdancehostname02: 0513-127 The shell subserver was stopped successfully.
flashdancehostname02: Service Command Description Status
flashdancehostname02: shell inoperative
flashdancehostname06: 7200-05-04-2220
flashdancehostname06: shell /usr/sbin/rshd rshd active
flashdancehostname06: 0513-127 The shell subserver was stopped successfully.
flashdancehostname06: Service Command Description Status
flashdancehostname06: shell inoperative
```

Phase 3: Quiesce Updated Hosts to prepare for firmware updates.

This step will quiesce the newly updated hosts. Upon reboot those hosts will automatically rejoin their respective GPFS clusters and mount filesystems. This step will quiesce those hosts to help reduce the risk of an issue with a firmware update causing an issue with those clusters. The quiesce command will not quiesce a host this has active database partitions. If this is the third pass for stage 7 please note that the admin node standby will be quiesced again even though it has already been updated. The most common reason for a host to fail to quiesce is due to sessions on /db2home or defunct instance owner processes on standby hosts. Have users exit unnecessary sessions or kill off those sessions and then re-attempt to quiesce the hosts.

1. Command: Quiesce the migrated servers. This command verifies the power firmware needs to be updated and that the host is not online in its domain before completing the quiesce step.

```
dsh -n $(BCUALL) 'cd /BCU_share/FP9_FP5/fixpack_tools/status/stageSeven_status.sh | grep "Firmware Version" > /dev/null 2>&1 && application/check_server_state.sh domain > /dev/null 2>&1 && application/quiesce_node.sh'
```

Example Output: (Hosts that cannot be quiesced – expected for hosts with running partitions.)

```
reverseflash04: 20220909_141127 (reverseflash04:check_server_state.sh): Service States (Number of db2sysc processes running): 6.
reverseflash04: 20220909_141127 (reverseflash04:quiesce_node.sh): Error: Cannot quiesce this host due to existing services.
Please failover any services running on this host.
reverseflash04: 20220909_141127 (reverseflash04:quiesce_node.sh): Script
'/BCU_share/FP9_FP5/fixpack_tools/application/quiesce_node.sh' with arguments '' ended with rc='1'. Start: Fri Sep 9 14:11:27
EDT 2022 End: Fri Sep 9 14:11:27 EDT 2022. Elapsed Time (Seconds): 0 (H:M:S):(00:00:00).
```

Example Output: (Hosts that are being quiesced successfully)

```
reverseflash02: 20220909_141127 (reverseflash02:check_server_state.sh): Service States:
reverseflash02:
reverseflash02:
reverseflash02: 20220909_141127 (reverseflash02:check_server_state.sh): Service States (Number of db2sysc processes running): 0.
reverseflash02: 20220909_141127 (reverseflash02:check_server_state.sh): Domain state: 'Offline'.
reverseflash02: 20220909_141132 (reverseflash02:quiesce_node.sh): Unmounting all GPFS Filesystems on this host.
reverseflash02: Fri Sep 9 14:11:32 EDT 2022: 6027-1674 mmumount: Unmounting file systems ...
reverseflash02: 20220909_141151 (reverseflash02:quiesce_node.sh): Stopping GPFS on this host.
reverseflash02: Fri Sep 9 14:11:51 EDT 2022: 6027-1341 mmshutdown: Starting force unmount of GPFS file systems
reverseflash02: Fri Sep 9 14:11:57 EDT 2022: 6027-1344 mmshutdown: Shutting down GPFS daemons
reverseflash02: Shutting down!
reverseflash02: 'shutdown' command about to kill process 3605504
reverseflash02: Master did not clean up; attempting cleanup now
reverseflash02: 2022-09-09_14:12:57.473-0400: GPFS: 6027-311 [N] mmfsd is shutting down.
reverseflash02: 2022-09-09_14:12:57.473-0400: [N] Reason for shutdown: mmfsadm shutdown command timed out
reverseflash02: Fri Sep 9 14:12:57 EDT 2022: mmcommon mmfsd down invoked. Subsystem: mmfs Status: down
reverseflash02: Fri Sep 9 14:12:57 EDT 2022: 6027-1674 mmcommon: Unmounting file systems ...
reverseflash02: Fri Sep 9 14:13:05 EDT 2022: 6027-1345 mmshutdown: Finished
reverseflash02: 20220909_141306 (reverseflash02:quiesce_node.sh): Script
'/BCU_share/FP9_FP5/fixpack_tools/application/quiesce_node.sh' with arguments '' ended with rc='0'. Start: Fri Sep 9 14:11:27
EDT 2022 End: Fri Sep 9 14:13:06 EDT 2022. Elapsed Time (Seconds): 100 (H:M:S):(00:01:40).
```

Example Output: (Hosts that should be quiesced, but cannot due to GPFS busy mounts)

```
reverseflash02: 20220909_140942 (reverseflash02:check_server_state.sh): GPFS State: 'active'.
reverseflash02: 20220909_140944 (reverseflash02:quiesce_node.sh): Unmounting all GPFS Filesystems on this host.
reverseflash02: Fri Sep 9 14:09:44 EDT 2022: 6027-1674 mmumount: Unmounting file systems ...
reverseflash02: GPFS: 6027-511 Cannot unmount /dev/db2home: The requested resource is busy.
reverseflash02: 20220909_140945 (reverseflash02:quiesce_node.sh): Error: Unable to unmount filesystems on this host.
reverseflash02: 20220909_140945 (reverseflash02:quiesce_node.sh): Script
'/BCU_share/FP9_FP5/fixpack_tools/application/quiesce_node.sh' with arguments '' ended with rc='2'. Start: Fri Sep 9 14:09:39
EDT 2022 End: Fri Sep 9 14:09:45 EDT 2022. Elapsed Time (Seconds): 7 (H:M:S):(00:00:07).
```

STAGE 7 - Standby nodes update

2. Command: Verify that all standby hosts are quiesced. Only the hosts listed below will be updated in Phase 4.

```
dsh -s -n ${ALL} 'cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh > /dev/null 2>&1 && echo "Host is quiesced."'
```

Example Output:

```
$ dsh -s -n ${ALL} 'cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh > /dev/null 2>&1 && echo "Host is quiesced."'
reverseflash02: Host is quiesced.
reverseflash05: Host is quiesced.
```


Phase 4: Update firmware on the standby hosts.

Phase 4 Description

For the set of hosts and servers that are quiesced, the following steps will be taken.

- Quiesce Migrated Hosts
- Update RAID Adapter Firmware
 - This step is done one sissas adapter at a time and does not work in parallel.
- Update Power Firmware
 - Foundation Servers are to be done first if a Foundation server is listed.
 - Data Servers can be done in parallel.
 - 2020-05-12 Update: Due to a firmware change in the HMC 9.x level it is not possible to update multiple power server firmware at the same time using the hmc command line (which is what is used by the pflayer automation). If not taking an outage this extra time was minimal as the servers impacted were already quiesced, however if taking a full outage this can add a significant amount of time to perform the update. It may be possible to manually apply the firmware update to all hosts via the HMC GUI. This method has not been tested in the lab nor is it documented.
 - This step will reboot the server and all LPARs on that server as part of the update.
- Update FC Adapters
 - This step can be done in parallel across all quiesced hosts. On each quiesced host however the FC adapters are done serially.
- Update NIC Adapters
 - This step can be done in parallel across all quiesced hosts. On each quiesced host the NIC adapters are updated serially to preserve the etherchannel connection during the update.

STAGE 7 - Standby nodes update

Step 1: Mount /BCU_share. This command safe to run multiple times and can be rerun to verify all hosts have /BCU_share mounted.

1. Command: This command safe to run multiple times and can be rerun to verify all hosts have /BCU_share mounted.

```
./enable_bcushare.sh
```

Example Output:

```
$ ./enable_bcushare.sh
20201218_195610 (flashdancehostname01:enable_bcushare.sh): Checking for /BCU_share on all hosts.
20201218_195611 (flashdancehostname01:enable_bcushare.sh): Success: /BCU_share is mounted on all hosts.
20201218_195611 (flashdancehostname01:enable_bcushare.sh): enable_bcushare.sh completed with rc=0.
```

STAGE 7 - Standby nodes update

Step 2: Update AIX On the quiesced hosts.

NOTE: These steps are provided if a customer needs to apply an AIX SP upgrade beyond that provided in this fixpack. The commands within this step have not been tested and only illustrate the potential output if a new AIX SP were to be applied by the fixpack tools. Proceed to Stage 7, Phase 4, Step 3 if you are not applying an AIX SP above that provided in V1.1 FP5.

1. Command: The following command will check to see if the host is quiesced, and if so, will run the AIX check against that host. In the example output '04' and '05' are ready to be updated, while '03' has already been updated and shows that no updates are available for that host. Only quiesced hosts will have output. Note: V1.1 FP2->FP4 customers should verify that if the current AIX level is AIX 7.1 TL5 SP1 that the next level is AIX 7.1 TL5 SP4 for the first pass. V1.1 FP4 to V1.1 FP5 customers can skip the AIX update as AIX was migrated in Phase 2.

```
dsh -n ${ALL} 'cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh > /dev/null 2>&1 && application/update_aix.sh check' 2>&1 | dshbak -c
```

Example Output:

```
$
dsh -n ${ALL} 'cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh > /dev/null 2>&1 && application/update_aix.sh check' 2>&1 | dshbak -c

HOSTS -----
flashdancehostname04
-----
20201218_200021 (flashdancehostname04:update_aix.sh): Starting date: Fri Dec 18 20:00:21 IST 2020.
20201218_200021 (flashdancehostname04:update_aix.sh): Collecting the available aix details.
20201218_200021 (flashdancehostname04:update_aix.sh): Discovered aix update '/BCU_share/FP6_FP2/software/AIX/71_TL5_SP1'.
20201218_200021 (flashdancehostname04:update_aix.sh): Version is '7100.5.1'.
20201218_200021 (flashdancehostname04:update_aix.sh): Compared my version '7100.05.04.1914' to '7100.5.1' and received '2'.
20201218_200021 (flashdancehostname04:update_aix.sh): Discovered aix update '/BCU_share/FP7_FP3/software/AIX/71_TL5_SP4'.
20201218_200021 (flashdancehostname04:update_aix.sh): Version is '7100.5.4'.
20201218_200021 (flashdancehostname04:update_aix.sh): Compared my version '7100.05.04.1914' to '7100.5.4' and received '1'.
20201218_200021 (flashdancehostname04:update_aix.sh): Discovered aix update '/BCU_share/FP8_FP4/software/AIX/71_TL5_SP7'.
20201218_200021 (flashdancehostname04:update_aix.sh): Version is '7100.5.7'.
20201218_200021 (flashdancehostname04:update_aix.sh): Compared my version '7100.05.04.1914' to '7100.5.7' and received '0'.
20201218_200021 (flashdancehostname04:update_aix.sh): There is an available update.
20201218_200021 (flashdancehostname04:update_aix.sh): This is the first version checked.
20201218_200021 (flashdancehostname04:update_aix.sh): The next update is version '7100.5.7' in directory
'/BCU_share/FP8_FP4/software/AIX/71_TL5_SP7'.
20201218_200021 (flashdancehostname04:update_aix.sh): Checking to see if 'flashdancehostname04' is eligible to update.
20201218_200023 (flashdancehostname04:update_aix.sh): Success: This host 'flashdancehostname04' is quiesced.
20201218_200023 (flashdancehostname04:update_aix.sh): Success: This host 'flashdancehostname04' has rootvg cloned .
20201218_200023 (flashdancehostname04:update_aix.sh): Success: This host 'flashdancehostname04' has available updates .
20201218_200023 (flashdancehostname04:update_aix.sh): Verifying rpm repository health.
20201218_200023 (flashdancehostname04:update_aix.sh): Success: This host 'flashdancehostname04' has a consistent rpm repository.
20201218_200023 (flashdancehostname04:update_aix.sh): Starting date: Fri Dec 18 20:00:21 IST 2020   Ending Date: Fri Dec 18
20:00:23 IST 2020.

HOSTS -----
flashdancehostname03
-----
20201218_200021 (flashdancehostname03:update_aix.sh): Starting date: Fri Dec 18 20:00:21 IST 2020.
20201218_200021 (flashdancehostname03:update_aix.sh): Collecting the available aix details.
20201218_200021 (flashdancehostname03:update_aix.sh): Discovered aix update '/BCU_share/FP6_FP2/software/AIX/71_TL5_SP1'.
20201218_200021 (flashdancehostname03:update_aix.sh): Version is '7100.5.1'.
20201218_200022 (flashdancehostname03:update_aix.sh): Compared my version '7100.05.07.2038' to '7100.5.1' and received '2'.
20201218_200022 (flashdancehostname03:update_aix.sh): Discovered aix update '/BCU_share/FP7_FP3/software/AIX/71_TL5_SP4'.
20201218_200022 (flashdancehostname03:update_aix.sh): Version is '7100.5.4'.
20201218_200022 (flashdancehostname03:update_aix.sh): Compared my version '7100.05.07.2038' to '7100.5.4' and received '2'.
20201218_200022 (flashdancehostname03:update_aix.sh): Discovered aix update '/BCU_share/FP8_FP4/software/AIX/71_TL5_SP7'.
20201218_200022 (flashdancehostname03:update_aix.sh): Version is '7100.5.7'.
20201218_200022 (flashdancehostname03:update_aix.sh): Compared my version '7100.05.07.2038' to '7100.5.7' and received '1'.
20201218_200022 (flashdancehostname03:update_aix.sh): The next update is version '' in directory ''.
20201218_200022 (flashdancehostname03:update_aix.sh): Checking to see if 'flashdancehostname03' is eligible to update.
20201218_200023 (flashdancehostname03:update_aix.sh): Success: This host 'flashdancehostname03' is quiesced.
20201218_200023 (flashdancehostname03:update_aix.sh): Success: This host 'flashdancehostname03' has rootvg cloned .
20201218_200023 (flashdancehostname03:update_aix.sh): Error: this host 'flashdancehostname03' has no available AIX updates.
20201218_200023 (flashdancehostname03:update_aix.sh): No updates are available for this host.
```

STAGE 7 - Standby nodes update

```
20201218_200023 (flashdancehostname03:update_aix.sh): This host is not available for updates as it is not cloned and/or is not
quiesced.
20201218_200023 (flashdancehostname03:update_aix.sh): Verifying rpm repository health.
20201218_200024 (flashdancehostname03:update_aix.sh): Success: This host 'flashdancehostname03' has a consistent rpm repository.
20201218_200024 (flashdancehostname03:update_aix.sh): Starting date: Fri Dec 18 20:00:21 IST 2020    Ending Date: Fri Dec 18
20:00:24 IST 2020.
HOSTS -----
flashdancehostname05
-----
20201218_200023 (flashdancehostname05:update_aix.sh): Starting date: Fri Dec 18 20:00:23 IST 2020.
20201218_200023 (flashdancehostname05:update_aix.sh): Collecting the available aix details.
20201218_200023 (flashdancehostname05:update_aix.sh): Discovered aix update '/BCU_share/FP6_FP2/software/AIX/71_TL5_SP1'.
20201218_200023 (flashdancehostname05:update_aix.sh): Version is '7100.5.1'.
20201218_200023 (flashdancehostname05:update_aix.sh): Compared my version '7100.05.04.1914' to '7100.5.1' and received '2'.
20201218_200023 (flashdancehostname05:update_aix.sh): Discovered aix update '/BCU_share/FP7_FP3/software/AIX/71_TL5_SP4'.
20201218_200023 (flashdancehostname05:update_aix.sh): Version is '7100.5.4'.
20201218_200023 (flashdancehostname05:update_aix.sh): Compared my version '7100.05.04.1914' to '7100.5.4' and received '1'.
20201218_200023 (flashdancehostname05:update_aix.sh): Discovered aix update '/BCU_share/FP8_FP4/software/AIX/71_TL5_SP7'.
20201218_200023 (flashdancehostname05:update_aix.sh): Version is '7100.5.7'.
20201218_200023 (flashdancehostname05:update_aix.sh): Compared my version '7100.05.04.1914' to '7100.5.7' and received '0'.
20201218_200023 (flashdancehostname05:update_aix.sh): There is an available update.
20201218_200023 (flashdancehostname05:update_aix.sh): This is the first version checked.
20201218_200023 (flashdancehostname05:update_aix.sh): The next update is version '7100.5.7' in directory
'/BCU_share/FP8_FP4/software/AIX/71_TL5_SP7'.
20201218_200023 (flashdancehostname05:update_aix.sh): Checking to see if 'flashdancehostname05' is eligible to update.
20201218_200026 (flashdancehostname05:update_aix.sh): Success: This host 'flashdancehostname05' is quiesced.
20201218_200026 (flashdancehostname05:update_aix.sh): Success: This host 'flashdancehostname05' has rootvg cloned .
20201218_200026 (flashdancehostname05:update_aix.sh): Success: This host 'flashdancehostname05' has available updates .
20201218_200026 (flashdancehostname05:update_aix.sh): Verifying rpm repository health.
20201218_200027 (flashdancehostname05:update_aix.sh): Success: This host 'flashdancehostname05' has a consistent rpm repository.
20201218_200027 (flashdancehostname05:update_aix.sh): Starting date: Fri Dec 18 20:00:23 IST 2020    Ending Date: Fri Dec 18
20:00:27 IST 2020.

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

2. Command: Run the following command to update AIX on the quiesced hosts with eligible updates. This command will apply the AIX update and reboot the servers if the update completes successfully. This command should be run in a screen session or vtmenu console session. Output can be tracked in /BCU_share/support/FP8_FP4/log for each server. The update takes about 15 minutes and then another 5 to 10 minutes to reboot the servers. Note: V1.1 FP2->FP4 customers: Similar to Stage 2 and Stage 6 it is required to apply V7.1 TL5 SP4 from the V1.1 FP3 fixpack.

```
dsh -n $(ALL) 'cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh > /dev/null 2>&1 &&
application/update_aix.sh update' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n $(ALL) 'cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh > /dev/null 2>&1 &&
application/update_aix.sh update' 2>&1 | dshbak -c
.
HOSTS -----
flashdancehostname03
-----
20201218_200834 (flashdancehostname03:update_aix.sh): Starting date: Fri Dec 18 20:08:34 IST 2020.
20201218_200834 (flashdancehostname03:update_aix.sh): Collecting the available aix details.
20201218_200834 (flashdancehostname03:update_aix.sh): Discovered aix update '/BCU_share/FP6_FP2/software/AIX/71_TL5_SP1'.
20201218_200834 (flashdancehostname03:update_aix.sh): Version is '7100.5.1'.
20201218_200834 (flashdancehostname03:update_aix.sh): Compared my version '7100.05.07.2038' to '7100.5.1' and received '2'.
20201218_200834 (flashdancehostname03:update_aix.sh): Discovered aix update '/BCU_share/FP7_FP3/software/AIX/71_TL5_SP4'.
20201218_200834 (flashdancehostname03:update_aix.sh): Version is '7100.5.4'.
20201218_200835 (flashdancehostname03:update_aix.sh): Compared my version '7100.05.07.2038' to '7100.5.4' and received '2'.
20201218_200835 (flashdancehostname03:update_aix.sh): Discovered aix update '/BCU_share/FP8_FP4/software/AIX/71_TL5_SP7'.
20201218_200835 (flashdancehostname03:update_aix.sh): Version is '7100.5.7'.
20201218_200835 (flashdancehostname03:update_aix.sh): Compared my version '7100.05.07.2038' to '7100.5.7' and received '1'.
20201218_200835 (flashdancehostname03:update_aix.sh): The next update is version '' in directory ''.
20201218_200835 (flashdancehostname03:update_aix.sh): Checking to see if 'flashdancehostname03' is eligible to update.
20201218_200836 (flashdancehostname03:update_aix.sh): Success: This host 'flashdancehostname03' is quiesced.
20201218_200836 (flashdancehostname03:update_aix.sh): Success: This host 'flashdancehostname03' has rootvg cloned .
20201218_200836 (flashdancehostname03:update_aix.sh): Error: this host 'flashdancehostname03' has no available AIX updates.
20201218_200836 (flashdancehostname03:update_aix.sh): No updates are available for this host.
20201218_200836 (flashdancehostname03:update_aix.sh): This host is not available for updates as it is not cloned and/or is not
quiesced.
20201218_200836 (flashdancehostname03:update_aix.sh): Verifying rpm repository health.
20201218_200837 (flashdancehostname03:update_aix.sh): Success: This host 'flashdancehostname03' has a consistent rpm repository.
20201218_200837 (flashdancehostname03:update_aix.sh): Starting date: Fri Dec 18 20:08:34 IST 2020    Ending Date: Fri Dec 18
20:08:37 IST 2020.
HOSTS -----
flashdancehostname04
-----
20201218_200834 (flashdancehostname04:update_aix.sh): Starting date: Fri Dec 18 20:08:34 IST 2020.
```

STAGE 7 - Standby nodes update

```
20201218_200834 (flashdancehostname04:update_aix.sh): Collecting the available aix details.
20201218_200834 (flashdancehostname04:update_aix.sh): Discovered aix update '/BCU_share/FP6_FP2/software/AIX/71_TL5_SP1'.
20201218_200834 (flashdancehostname04:update_aix.sh): Version is '7100.5.1'.
20201218_200834 (flashdancehostname04:update_aix.sh): Compared my version '7100.05.04.1914' to '7100.5.1' and received '2'.
20201218_200834 (flashdancehostname04:update_aix.sh): Discovered aix update '/BCU_share/FP7_FP3/software/AIX/71_TL5_SP4'.
20201218_200834 (flashdancehostname04:update_aix.sh): Version is '7100.5.4'.
20201218_200834 (flashdancehostname04:update_aix.sh): Compared my version '7100.05.04.1914' to '7100.5.4' and received '1'.
20201218_200834 (flashdancehostname04:update_aix.sh): Discovered aix update '/BCU_share/FP8_FP4/software/AIX/71_TL5_SP7'.
20201218_200834 (flashdancehostname04:update_aix.sh): Version is '7100.5.7'.
20201218_200834 (flashdancehostname04:update_aix.sh): Compared my version '7100.05.04.1914' to '7100.5.7' and received '0'.
20201218_200834 (flashdancehostname04:update_aix.sh): There is an available update.
20201218_200834 (flashdancehostname04:update_aix.sh): This is the first version checked.
20201218_200834 (flashdancehostname04:update_aix.sh): The next update is version '7100.5.7' in directory
'/BCU_share/FP8_FP4/software/AIX/71_TL5_SP7'.
20201218_200834 (flashdancehostname04:update_aix.sh): Checking to see if 'flashdancehostname04' is eligible to update.
20201218_200836 (flashdancehostname04:update_aix.sh): Success: This host 'flashdancehostname04' is quiesced.
20201218_200836 (flashdancehostname04:update_aix.sh): Success: This host 'flashdancehostname04' has rootvg cloned .
20201218_200836 (flashdancehostname04:update_aix.sh): Success: This host 'flashdancehostname04' has available updates .
20201218_200836 (flashdancehostname04:update_aix.sh): Verifying rpm repository health.
20201218_200836 (flashdancehostname04:update_aix.sh): Success: This host 'flashdancehostname04' has a consistent rpm repository.
20201218_200836 (flashdancehostname04:update_aix.sh): Running 'update_all -pd /BCU_share/FP8_FP4/software/AIX/71_TL5_SP7' to
preview the aix update.
20201218_200847 (flashdancehostname04:update_aix.sh): Success: Preview completed successfully.
20201218_200847 (flashdancehostname04:update_aix.sh): Running 'update_all -cYd /BCU_share/FP8_FP4/software/AIX/71_TL5_SP7' to
execute the aix update.
20201218_200847 (flashdancehostname04:update_aix.sh): PID for 'update_all -cYd /BCU_share/FP8_FP4/software/AIX/71_TL5_SP7' is
'11403606'.
20201218_200847 (flashdancehostname04:update_aix.sh): Waiting on '11403606' to complete. For current status check
'/var/adm/ras/install_all_updates.log' on host 'flashdancehostname04'.
(0:300): Update not found. Sleeping for 5 seconds before next check.
(5:300): Update not found. Sleeping for 5 seconds before next check.
(10:300): Update not found. Sleeping for 5 seconds before next check.
(15:300): Update not found. Sleeping for 5 seconds before next check.
Found pid '11403606'.
    PID      TTY  TIME CMD
    11403606  -   0:00 ksh
Fri Dec 18 20:09:07 IST 2020: flashdancehostname04 update status duration (0 seconds).
installp: APPLYING software for:
Filesets processed: 1 of 2 (Total time: 12 secs).
installp: APPLYING software for:
Finished processing all filesets. (Total time: 29 secs).
install_all_updates: Result = SUCCESS
install_all_updates: Result = SUCCESS
installp: APPLYING software for:
Finished processing all filesets. (Total time: 15 secs).
installp: COMMITTING software for:
Finished processing all filesets. (Total time: 16 secs).
    PID      TTY  TIME CMD
    11403606  -   0:00 ksh
...
11403606      -   0:00 ksh
Fri Dec 18 20:41:14 IST 2020: flashdancehostname04 update status duration (1927 seconds).
Filesets processed: 198 of 201 (Total time: 31 mins 30 secs).
installp: COMMITTING software for:
Filesets processed: 199 of 201 (Total time: 31 mins 30 secs).
installp: COMMITTING software for:
Filesets processed: 200 of 201 (Total time: 31 mins 31 secs).
installp: COMMITTING software for:
Finished processing all filesets. (Total time: 31 mins 31 secs).
installp: bosboot verification completed.
installp: bosboot process completed.
installp: * * * A T T E N T I O N ! ! !
20201218_204127 (flashdancehostname04:update_aix.sh): PID '11403606' completed with rc='0'. For more information consult the
update log '/var/adm/ras/install_all_updates.log'.
20201218_204127 (flashdancehostname04:update_aix.sh): AIX update completed. Issuing shutdown instructions after 1 minute.
    PID      TTY  TIME CMD
Update process completed.
Fri Dec 18 20:42:14 IST 2020: flashdancehostname04 update status duration (1987 seconds).
installp: COMMITTING software for:
Filesets processed: 199 of 201 (Total time: 31 mins 30 secs).
installp: COMMITTING software for:
Filesets processed: 200 of 201 (Total time: 31 mins 31 secs).
installp: COMMITTING software for:
Finished processing all filesets. (Total time: 31 mins 31 secs).
installp: bosboot verification completed.
installp: bosboot process completed.
installp: * * * A T T E N T I O N ! ! !
install_all_updates: Result = SUCCESS
application/update_aix.sh[267]: 9896214 Terminated
cat: 0652-050 Cannot open /BCU_share/support/FP8_FP4/log/update_aix.sh_flashdancehostname04_20201218_200832.log.rc.
rm: /BCU_share/support/FP8_FP4/log/update_aix.sh_flashdancehostname04_20201218_200832.log.rc: A file or directory in the path
name does not exist.
HOSTS -----
flashdancehostname05
-----
20201218_200836 (flashdancehostname05:update_aix.sh): Starting date: Fri Dec 18 20:08:36 IST 2020.
20201218_200836 (flashdancehostname05:update_aix.sh): Collecting the available aix details.
20201218_200836 (flashdancehostname05:update_aix.sh): Discovered aix update '/BCU_share/FP6_FP2/software/AIX/71_TL5_SP1'.
```

STAGE 7 - Standby nodes update

```
20201218_200836 (flashdancehostname05:update_aix.sh): Version is '7100.5.1'.
20201218_200836 (flashdancehostname05:update_aix.sh): Compared my version '7100.05.04.1914' to '7100.5.1' and received '2'.
20201218_200836 (flashdancehostname05:update_aix.sh): Discovered aix update '/BCU_share/FP7_FP3/software/AIX/71_TL5_SP4'.
20201218_200836 (flashdancehostname05:update_aix.sh): Version is '7100.5.4'.
20201218_200836 (flashdancehostname05:update_aix.sh): Compared my version '7100.05.04.1914' to '7100.5.4' and received '1'.
20201218_200837 (flashdancehostname05:update_aix.sh): Discovered aix update '/BCU_share/FP8_FP4/software/AIX/71_TL5_SP7'.
20201218_200837 (flashdancehostname05:update_aix.sh): Version is '7100.5.7'.
20201218_200837 (flashdancehostname05:update_aix.sh): Compared my version '7100.05.04.1914' to '7100.5.7' and received '0'.
20201218_200837 (flashdancehostname05:update_aix.sh): There is an available update.
20201218_200837 (flashdancehostname05:update_aix.sh): This is the first version checked.
20201218_200837 (flashdancehostname05:update_aix.sh): The next update is version '7100.5.7' in directory
'/BCU_share/FP8_FP4/software/AIX/71_TL5_SP7'.
20201218_200837 (flashdancehostname05:update_aix.sh): Checking to see if 'flashdancehostname05' is eligible to update.
20201218_200840 (flashdancehostname05:update_aix.sh): Success: This host 'flashdancehostname05' is quiesced.
20201218_200840 (flashdancehostname05:update_aix.sh): Success: This host 'flashdancehostname05' has rootvg cloned .
20201218_200840 (flashdancehostname05:update_aix.sh): Success: This host 'flashdancehostname05' has available updates .
20201218_200840 (flashdancehostname05:update_aix.sh): Verifying rpm repository health.
20201218_200840 (flashdancehostname05:update_aix.sh): Success: This host 'flashdancehostname05' has a consistent rpm repository.
20201218_200840 (flashdancehostname05:update_aix.sh): Running 'update_all -pd /BCU_share/FP8_FP4/software/AIX/71_TL5_SP7' to
preview the aix update.
20201218_200900 (flashdancehostname05:update_aix.sh): Success: Preview completed successfully.
20201218_200900 (flashdancehostname05:update_aix.sh): Running 'update_all -cYd /BCU_share/FP8_FP4/software/AIX/71_TL5_SP7' to
execute the aix update.
20201218_200900 (flashdancehostname05:update_aix.sh): PID for 'update_all -cYd /BCU_share/FP8_FP4/software/AIX/71_TL5_SP7' is
'4784390'.
20201218_200900 (flashdancehostname05:update_aix.sh): Waiting on '4784390' to complete. For current status check
'/var/adm/ras/install_all_updates.log' on host 'flashdancehostname05'.
(0:300): Update not found. Sleeping for 5 seconds before next check.
(5:300): Update not found. Sleeping for 5 seconds before next check.
(10:300): Update not found. Sleeping for 5 seconds before next check.
(15:300): Update not found. Sleeping for 5 seconds before next check.
(20:300): Update not found. Sleeping for 5 seconds before next check.
(25:300): Update not found. Sleeping for 5 seconds before next check.
Found pid '4784390'.
    PID      TTY    TIME CMD
    4784390  -    0:00 ksh
Fri Dec 18 20:09:30 IST 2020: flashdancehostname05 update status duration (0 seconds).
installp: APPLYING software for:
Filesets processed: 1 of 2 (Total time: 12 secs).
installp: APPLYING software for:
Finished processing all filesets. (Total time: 29 secs).
install_all_updates: Result = SUCCESS
install_all_updates: Result = SUCCESS
installp: APPLYING software for:
Finished processing all filesets. (Total time: 22 secs).
installp: COMMITTING software for:
Finished processing all filesets. (Total time: 23 secs).
    PID      TTY    TIME CMD
    4784390  -    0:00 ksh
...
Fri Dec 18 20:48:45 IST 2020: flashdancehostname05 update status duration (2355 seconds).
Filesets processed: 199 of 202 (Total time: 38 mins 17 secs).
installp: COMMITTING software for:
Filesets processed: 200 of 202 (Total time: 38 mins 17 secs).
installp: COMMITTING software for:
Filesets processed: 201 of 202 (Total time: 38 mins 17 secs).
installp: COMMITTING software for:
Finished processing all filesets. (Total time: 38 mins 18 secs).
installp: bosboot verification completed.
installp: bosboot process completed.
installp: * * * A T T E N T I O N ! ! !
20201218_204905 (flashdancehostname05:update_aix.sh): PID '4784390' completed with rc='0'. For more information consult the
update log '/var/adm/ras/install_all_updates.log'.
20201218_204905 (flashdancehostname05:update_aix.sh): AIX update completed. Issuing shutdown instructions after 1 minute.
    PID      TTY    TIME CMD
Update process completed.
Fri Dec 18 20:49:46 IST 2020: flashdancehostname05 update status duration (2416 seconds).
installp: COMMITTING software for:
Filesets processed: 200 of 202 (Total time: 38 mins 17 secs).
installp: COMMITTING software for:
Filesets processed: 201 of 202 (Total time: 38 mins 17 secs).
installp: COMMITTING software for:
Finished processing all filesets. (Total time: 38 mins 18 secs).
installp: bosboot verification completed.
installp: bosboot process completed.
installp: * * * A T T E N T I O N ! ! !
install_all_updates: Result = SUCCESS
application/update_aix.sh[267]: 4916216 Terminated
cat: 0652-050 Cannot open /BCU_share/support/FP8_FP4/log/update_aix.sh_flashdancehostname05_20201218_200833.log.rc.
rm: /BCU_share/support/FP8_FP4/log/update_aix.sh_flashdancehostname05_20201218_200833.log.rc: A file or directory in the path
name does not exist.

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

a. Notes on output.

STAGE 7 - Standby nodes update

- i. This message 'cat: 0652-050 Cannot open /BCU_share/support/FP8_FP4/log/update_aix.sh_flashdancehostname05_20201218_200833.log.rc' can be ignored. This is a timing issue between the reboot operation and the script finishing.
- ii. Since '03' was already updated, the update command completed quickly. The goal of this script is to be safe. It checks to see if the host is cloned and is quiesced and has an available update.

3. Command: Ensure /BCU_share is mounted on the updated and rebooted hosts.

```
./enable_bcushare.sh
```

Example Output:

```
$ ./enable_bcushare.sh
20201218_195610 (flashdancehostname01:enable_bcushare.sh): Checking for /BCU_share on all hosts.
20201218_195611 (flashdancehostname01:enable_bcushare.sh): Success: /BCU_share is mounted on all hosts.
20201218_195611 (flashdancehostname01:enable_bcushare.sh): enable_bcushare.sh completed with rc=0.
```

4. Command: Quiesce the just updated and rebooted hosts.

```
dsh -n ${BCUALL} '/BCU_share/FP9_FP5/fixpack_tools/application/quiesce_node.sh' 2>&1 | dshbak -c
```

5. Command: Verify the hosts are up and oslevel shows as updated. In this example, '01', '03' were already updated and '04' and '05' were updated as part of the previous step. Only the active servers '02', '06' and '07' are not updated in the example. If a host returns remote shell had exit code 255 then retry.

```
dsh -n ${ALL} 'oslevel -s' | dshbak -c
```

Example Output: (FP5 customers with all servers migrated)

```
$ dsh -n ${ALL} 'oslevel -s' | dshbak -c
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
7200-05-04-2220
```

Example Output: (Some hosts at V1.1 FP3 and some at V1.1 FP4)

```
$ dsh -n ${ALL} 'oslevel -s' | dshbak -c
HOSTS -----
flashdancehostname01, flashdancehostname03, flashdancehostname04, flashdancehostname05
-----
7100-05-07-2038

HOSTS -----
flashdancehostname02, flashdancehostname06, flashdancehostname07
-----
7100-05-04-1914
```

Example Output: (V1.1 FP2->FP4 customers first AIX update within the first pass).

```
$ dsh -n ${ALL} 'oslevel -s' | dshbak -c
HOSTS -----
reverseflash04, reverseflash05
-----
7100-05-01-1731

HOSTS -----
reverseflash01, reverseflash03
-----
7100-05-07-2038

HOSTS -----
reverseflash02, reverseflash06
-----
```


STAGE 7 - Standby nodes update

7100-05-04-1914

Example output: (V1.1 FP2->FP4 customers second update within the first pass.)

```
(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
$ dsh -n ${ALL} 'oslevel -s' | dshbak -c
HOSTS -----
reverseflash04, reverseflash05
-----
7100-05-01-1731

HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash06
-----
7100-05-07-2038

(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

- a. Verify the targeted nodes were updated to AIX 7.1 TL5 SP7 and proceed to the next item to apply the e-fix.
- b. If the original PDOA fixpack level is V1.1 FP2 and the targeted nodes show AIX 7.1 TL5 SP4 then repeat Stage 7 Phase 4 to apply AIX 7.1 TL5 SP7 to the currently quiesced hosts. Do not apply the efix yet.

STAGE 7 - Standby nodes update

Step 3: Update the Internal RAID adapters on the quiesced hosts.

1. Command: Remount BCU_share on the updated hosts. The output in the example shows '04' and '05' were missing the mount. This is consistent as '04' and '05' were updated and rebooted.

```
./enable_bcushare.sh
```

Example Output:

```
$ ./enable_bcushare.sh
20201218_212123 (flashdancehostname01:enable_bcushare.sh): Checking for /BCU_share on all hosts.
20201218_212125 (flashdancehostname01:enable_bcushare.sh): Warning: The following hosts are missing /BCU_share mounts.
flashdancehostname04: Warning: Missing /BCU_share mount.
flashdancehostname05: Warning: Missing /BCU_share mount.
20201218_212125 (flashdancehostname01:enable_bcushare.sh): Attempting to mount /BCU_share on all hosts.
20201218_212126 (flashdancehostname01:enable_bcushare.sh): Checking for /BCU_share on all hosts.
20201218_212127 (flashdancehostname01:enable_bcushare.sh): Success: /BCU_share is mounted on all hosts.
20201218_212127 (flashdancehostname01:enable_bcushare.sh): enable_bcushare.sh completed with rc=0.

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

2. Command: Run the validation to check for eligible RAID adapters. The output should only show '04' and '05' in this example as '01' and '03' were updated in Stage 6, '02', '06' and '07' are active hosts and not eligible. The output also shows the pflayer validation was successful on those adapters. V1.1 FP2->FP5 customers: Please verify that the level is 19512300 or higher. If this level is lower, please refer to this note <https://www.ibm.com/support/pages/node/1088866>. The sissas helper scripts below will not recognize the error condition that occurs in the technote scenario and will not allow a second attempt. Note if a SAS adapter was replaced after applying the above technote or V1.1 FP3 then if its level was not updated it may have a lower level. Update that adapter first according to the technote before updating the rest of the adapters. Add an additional 5 minutes for each adapter that needs this extra set of updates.

```
./update_sissas.sh validate
```

Example Output:

```
$ ./update_sissas.sh validate
20220909_144205 (reverseflash01:update_sissas.sh): Starting date: Fri Sep 9 14:42:05 EDT 2022.
20220909_144205 (reverseflash01:update_sissas.sh): Checking for available updates.
20220909_144205 (reverseflash01:update_sissas.sh): Checking for Quiesced hosts.
20220909_144215 (reverseflash01:update_sissas.sh): Checking for adapters that are eligible for updates.
20220909_144221 (reverseflash01:update_sissas.sh): The following is a list of all adapters requiring updates. Only adapters on quiesced hosts will be updated.
20220909_144221 (reverseflash01:update_sissas.sh):

reverseflash06:172.23.1.6:sissas0:19512b00
reverseflash05:172.23.1.5:sissas0:19512b00
reverseflash02:172.23.1.2:sissas0:19512b00
reverseflash04:172.23.1.4:sissas0:19512b00

20220909_144221 (reverseflash01:update_sissas.sh): The following adapters are eligible for updates. '
reverseflash05:172.23.1.5:sissas0:19512b00
reverseflash02:172.23.1.2:sissas0:19512b00'.
20220909_144221 (reverseflash01:update_sissas.sh): Running the command '/opt/ibm/aixappl/pflayer/bin/icmds/adapterfw -validate -i 172.23.1.5 -d sissas0 -f /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm' to validate devices.
The adapter validation is successful for the adapter firmware image /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm on sissas0(172.23.1.5) .
20220909_144225 (reverseflash01:update_sissas.sh): Running the command '/opt/ibm/aixappl/pflayer/bin/icmds/adapterfw -validate -i 172.23.1.2 -d sissas0 -f /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm' to validate devices.
The adapter validation is successful for the adapter firmware image /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm on sissas0(172.23.1.2) .
20220909_144229 (reverseflash01:update_sissas.sh): Script './update_sissas.sh' with arguments 'validate' ended with rc='0'.
Start: Fri Sep 9 14:42:05 EDT 2022 End: Fri Sep 9 14:42:29 EDT 2022. Elapsed Time (Seconds): 24 (H:M:S):(00:00:24).
```

STAGE 7 - Standby nodes update

3. Command: Run the update command to update the adapters. The command should be run in a screen session or vtmenu console session. The example output shows successful results for the eligible adapters. This takes about 2 minutes per adapter per server and is done serially.

```
./update_sissas.sh update
```

Example Output:

```
20220914_150455 (reverseflash01:update_sissas.sh): Starting date: Wed Sep 14 15:04:55 EDT 2022.
20220914_150455 (reverseflash01:update_sissas.sh): Checking for available updates.
20220914_150455 (reverseflash01:update_sissas.sh): Checking for Quiesced hosts.
20220914_150503 (reverseflash01:update_sissas.sh): Checking for adapters that are eligible for updates.
20220914_150507 (reverseflash01:update_sissas.sh): The following is a list of all adapters requiring updates. Only adapters on
quiesced hosts will be updated.
20220914_150507 (reverseflash01:update_sissas.sh):

reverseflash06:172.23.1.6:sissas0:19512b00
reverseflash05:172.23.1.5:sissas0:19512b00
reverseflash02:172.23.1.2:sissas0:19512b00
reverseflash04:172.23.1.4:sissas0:19512b00

20220914_150507 (reverseflash01:update_sissas.sh): The following adapters are eligible for updates. '
reverseflash05:172.23.1.5:sissas0:19512b00
reverseflash02:172.23.1.2:sissas0:19512b00'.
20220914_150507 (reverseflash01:update_sissas.sh): Running the command '/opt/ibm/aixappl/pflayer/bin/icmds/adapterfw -validate -i
172.23.1.5 -d sissas0 -f /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm' to
validate devices.
The adapter validation is successful for the adapter firmware image /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-
57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm on sissas0(172.23.1.5) .
20220914_150509 (reverseflash01:update_sissas.sh): Running the command '/opt/ibm/aixappl/pflayer/bin/icmds/adapterfw -validate -i
172.23.1.2 -d sissas0 -f /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm' to
validate devices.
The adapter validation is successful for the adapter firmware image /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-
57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm on sissas0(172.23.1.2) .
20220914_150511 (reverseflash01:update_sissas.sh): The following adapters are eligible for updates. '
reverseflash05:172.23.1.5:sissas0:19512b00
reverseflash02:172.23.1.2:sissas0:19512b00'.
20220914_150511 (reverseflash01:update_sissas.sh): Running the command '/opt/ibm/aixappl/pflayer/bin/icmds/adapterfw -update -i
172.23.1.5 -d sissas0 -f /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm' to
validate devices.
The adapter update is successful for the adapter firmware image /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-
57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm on sissas0(172.23.1.5) .
20220914_150655 (reverseflash01:update_sissas.sh): Running the command '/opt/ibm/aixappl/pflayer/bin/icmds/adapterfw -update -i
172.23.1.2 -d sissas0 -f /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm' to
validate devices.
The adapter update is successful for the adapter firmware image /BCU_share/FP9_FP5/firmware/CCIN_adapter/CCIN-
57D7/pci.1014034a.51-19512c00-1.aix6.1.noarch.rpm on sissas0(172.23.1.2) .
20220914_150751 (reverseflash01:update_sissas.sh): Script './update_sissas.sh' with arguments 'update' ended with rc='0'. Start:
Wed Sep 14 15:04:55 EDT 2022 End: Wed Sep 14 15:07:51 EDT 2022. Elapsed Time (Seconds): 176 (H:M:S):(00:02:56) .
20220914_150751 (reverseflash01:update_sissas.sh): Normalizing management hostname.
20220914_150752 (reverseflash01:update_sissas.sh): Management hostname is 'reverseflash01'.
20220914_150752 (reverseflash01:update_sissas.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from
script './update_sissas.sh'.' to 'user@customer.com' '-c root@localhost'.
20220914_150752 (reverseflash01:update_sissas.sh): Notification sent.
```

STAGE 7 - Standby nodes update

4. Command: Rerunning the validate command shows only the active hosts adapters need to be updated.

```
./update_sissas.sh validate
```

Example Output:

```
20220914_151027 (reverseflash01:update_sissas.sh): Starting date: Wed Sep 14 15:10:27 EDT 2022.
20220914_151027 (reverseflash01:update_sissas.sh): Checking for available updates.
20220914_151027 (reverseflash01:update_sissas.sh): Checking for Quiesced hosts.
20220914_151034 (reverseflash01:update_sissas.sh): Checking for adapters that are eligible for updates.
20220914_151039 (reverseflash01:update_sissas.sh): The following is a list of all adapters requiring updates. Only adapters on
quiesced hosts will be updated.
20220914_151039 (reverseflash01:update_sissas.sh):

reverseflash06:172.23.1.6:sissas0:19512b00
reverseflash04:172.23.1.4:sissas0:19512b00

20220914_151039 (reverseflash01:update_sissas.sh): Script './update_sissas.sh' with arguments 'validate' ended with rc='1'.
Start: Wed Sep 14 15:10:27 EDT 2022 End: Wed Sep 14 15:10:39 EDT 2022. Elapsed Time (Seconds): 12 (H:M:S):(00:00:12).
20220914_151039 (reverseflash01:update_sissas.sh): Normalizing management hostname.
20220914_151040 (reverseflash01:update_sissas.sh): Management hostname is 'reverseflash01'.
20220914_151040 (reverseflash01:update_sissas.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from
script './update_sissas.sh'.' to 'user@customer.com' '-c root@localhost'.
20220914_151040 (reverseflash01:update_sissas.sh): Notification sent.
```

STAGE 7 - Standby nodes update

Step 4: Update the FC and Network Adapters.

In PDOA V1.1 FP4->FP5 scenarios there are no NIC or FC firmware updates available. Running the validate and update options from update_adapter will simply find no updates that need to be applied. However, run item 1 to verify as it is possible if an adapter was replaced that the firmware was not updated as part of the replacement action.

In PDOA V1.1 FP3->FP5 scenarios there are no available updates for the network adapters and only the FC adapters on the data nodes are updated.

During testing it is possible to see failed FC paths after updating the FC firmware.

During testing it is possible to see performance degradation on updated data hosts after the FC update and before the power firmware (PFW) update on the same server. It is therefore recommended to update both the FC and PFW and rebooting the host before returning the updated node to service.

1. Command: Run the validation to check for eligible adapters and to run the platform layer validate command against those eligible adapters. The example output shows that all of the data nodes have adapters that need to be updated, but only '05' is quiesced and eligible. Note '01'-'04' hosts, the foundation hosts, use different FC cards which do not have available updates in V1.1 FP4, however they do have updates in V1.1 FP3 which will be applied for V1.1 FP2->FP4 customers.

```
./update_adapters.sh validate
```

Example Output:

```
$ ./update_adapters.sh validate
20201218_214000 (flashdancehostname01:update_adapters.sh): Starting date: Fri Dec 18 21:40:00 IST 2020.
20201218_214000 (flashdancehostname01:update_adapters.sh): Checking for available updates.
20201218_214000 (flashdancehostname01:update_adapters.sh): Checking for Quiesced hosts.
20201218_214007 (flashdancehostname01:update_adapters.sh): Checking for adapters that are eligible for updates.
20201218_214035 (flashdancehostname01:update_adapters.sh): The following is a list of all adapters requiring updates. Only
adapters on quiesced hosts will be updated.
20201218_214035 (flashdancehostname01:update_adapters.sh):

server2 flashdancehostname05 172.23.1.5 fc_adapter6 server2 7710322514101e04 0320080270
server2 flashdancehostname05 172.23.1.5 fc_adapter7 server2 7710322514101e04 0320080270
server2 flashdancehostname05 172.23.1.5 fc_adapter8 server2 7710322514101e04 0320080270
server2 flashdancehostname05 172.23.1.5 fc_adapter9 server2 7710322514101e04 0320080270
server0 flashdancehostname06 172.23.1.6 fc_adapter0 server0 7710322514101e04 0320080270
server0 flashdancehostname06 172.23.1.6 fc_adapter1 server0 7710322514101e04 0320080270
server0 flashdancehostname06 172.23.1.6 fc_adapter2 server0 7710322514101e04 0320080270
server0 flashdancehostname06 172.23.1.6 fc_adapter3 server0 7710322514101e04 0320080270
server5 flashdancehostname07 172.23.1.7 fc_adapter18 server5 7710322514101e04 0320080270
server5 flashdancehostname07 172.23.1.7 fc_adapter19 server5 7710322514101e04 0320080270
server5 flashdancehostname07 172.23.1.7 fc_adapter20 server5 7710322514101e04 0320080270
server5 flashdancehostname07 172.23.1.7 fc_adapter21 server5 7710322514101e04 0320080270

20201218_214035 (flashdancehostname01:update_adapters.sh): The following adapters are eligible for updates. '
7710322514101e04:fc_adapter6,fc_adapter7,fc_adapter8,fc_adapter9'.
20201218_214035 (flashdancehostname01:update_adapters.sh): Running the command
'/opt/ibm/aixappl/pflayer/bin/icmds/appl_ctrl_fc_adapter update -validate -l fc_adapter6,fc_adapter7,fc_adapter8,fc_adapter9 -f
/BCU_share/FP8_FP4/firmware/fc_adapter/7710322514101e04/image' to validate devices.
Validation passed for fc_adapter6
Validation passed for fc_adapter7
Validation passed for fc_adapter8
Validation passed for fc_adapter9
20201218_214107 (flashdancehostname01:update_adapters.sh): Starting date: Fri Dec 18 21:40:00 IST 2020 Ending Date: Fri Dec 18
21:41:07 IST 2020.
```

STAGE 7 - Standby nodes update

2. Command: Run the update to update the FC on the standby hosts. This command should be run in a screen session or vtmenu console session. The example output shows success for the 4 adapters in this update. This command takes ~15 minutes per server. Updates are done in parallel on all quiesced servers.

```
./update_adapters.sh update
```

Example Output:

```
$ ./update_adapters.sh update
20201218_214529 (flashdancehostname01:update_adapters.sh): Starting date: Fri Dec 18 21:45:29 IST 2020.
20201218_214529 (flashdancehostname01:update_adapters.sh): Checking for available updates.
20201218_214529 (flashdancehostname01:update_adapters.sh): Checking for Quiesced hosts.
20201218_214536 (flashdancehostname01:update_adapters.sh): Checking for adapters that are eligible for updates.
20201218_214604 (flashdancehostname01:update_adapters.sh): The following is a list of all adapters requiring updates. Only
adapters on quiesced hosts will be updated.
20201218_214604 (flashdancehostname01:update_adapters.sh):

server2 flashdancehostname05 172.23.1.5 fc_adapter6 server2 7710322514101e04 0320080270
server2 flashdancehostname05 172.23.1.5 fc_adapter7 server2 7710322514101e04 0320080270
server2 flashdancehostname05 172.23.1.5 fc_adapter8 server2 7710322514101e04 0320080270
server2 flashdancehostname05 172.23.1.5 fc_adapter9 server2 7710322514101e04 0320080270
server0 flashdancehostname06 172.23.1.6 fc_adapter0 server0 7710322514101e04 0320080270
server0 flashdancehostname06 172.23.1.6 fc_adapter1 server0 7710322514101e04 0320080270
server0 flashdancehostname06 172.23.1.6 fc_adapter2 server0 7710322514101e04 0320080270
server0 flashdancehostname06 172.23.1.6 fc_adapter3 server0 7710322514101e04 0320080270
server5 flashdancehostname07 172.23.1.7 fc_adapter18 server5 7710322514101e04 0320080270
server5 flashdancehostname07 172.23.1.7 fc_adapter19 server5 7710322514101e04 0320080270
server5 flashdancehostname07 172.23.1.7 fc_adapter20 server5 7710322514101e04 0320080270
server5 flashdancehostname07 172.23.1.7 fc_adapter21 server5 7710322514101e04 0320080270

20201218_214604 (flashdancehostname01:update_adapters.sh): The following adapters are eligible for updates. '
7710322514101e04:fc_adapter6,fc_adapter7,fc_adapter8,fc_adapter9'.
20201218_214604 (flashdancehostname01:update_adapters.sh): Running the command
'/opt/ibm/aixappl/pfplayer/bin/icmids/appl_ctrl_fc_adapter update -validate -l fc_adapter6,fc_adapter7,fc_adapter8,fc_adapter9 -f
/BCU_share/FP8_FP4/firmware/fc_adapter/7710322514101e04/image' to validate devices.
Validation passed for fc_adapter6
Validation passed for fc_adapter7
Validation passed for fc_adapter8
Validation passed for fc_adapter9
20201218_214635 (flashdancehostname01:update_adapters.sh): The following adapters are eligible for updates. '
7710322514101e04:fc_adapter6,fc_adapter7,fc_adapter8,fc_adapter9'.
20201218_214636 (flashdancehostname01:update_adapters.sh): Running the command
'/opt/ibm/aixappl/pfplayer/bin/icmids/appl_ctrl_fc_adapter update -install -l fc_adapter6,fc_adapter7,fc_adapter8,fc_adapter9 -f
/BCU_share/FP8_FP4/firmware/fc_adapter/7710322514101e04/image' to update devices.
Successfully Completed adapter update for fc_adapter6
Successfully Completed adapter update for fc_adapter7
Successfully Completed adapter update for fc_adapter8
Successfully Completed adapter update for fc_adapter9
20201218_215126 (flashdancehostname01:update_adapters.sh): Starting date: Fri Dec 18 21:45:29 IST 2020 Ending Date: Fri Dec 18
21:51:26 IST 2020.
```

3. Command: Rerun the validate step to verify the adapters no longer appear as needing to be updated. From the example output the adapters on '05' no longer show as needing an update.

```
./update_adapters.sh validate
```

Example Output:

```
$ ./update_adapters.sh validate
20201218_220758 (flashdancehostname01:update_adapters.sh): Starting date: Fri Dec 18 22:07:58 IST 2020.
20201218_220758 (flashdancehostname01:update_adapters.sh): Checking for available updates.
20201218_220758 (flashdancehostname01:update_adapters.sh): Checking for Quiesced hosts.
20201218_220805 (flashdancehostname01:update_adapters.sh): Checking for adapters that are eligible for updates.
20201218_220833 (flashdancehostname01:update_adapters.sh): The following is a list of all adapters requiring updates. Only
adapters on quiesced hosts will be updated.
20201218_220833 (flashdancehostname01:update_adapters.sh):

server0 flashdancehostname06 172.23.1.6 fc_adapter0 server0 7710322514101e04 0320080270
server0 flashdancehostname06 172.23.1.6 fc_adapter1 server0 7710322514101e04 0320080270
server0 flashdancehostname06 172.23.1.6 fc_adapter2 server0 7710322514101e04 0320080270
server0 flashdancehostname06 172.23.1.6 fc_adapter3 server0 7710322514101e04 0320080270
server5 flashdancehostname07 172.23.1.7 fc_adapter18 server5 7710322514101e04 0320080270
server5 flashdancehostname07 172.23.1.7 fc_adapter19 server5 7710322514101e04 0320080270
```

STAGE 7 - Standby nodes update

```
server5 flashdancehostname07 172.23.1.7 fc_adapter20 server5 7710322514101e04 0320080270
server5 flashdancehostname07 172.23.1.7 fc_adapter21 server5 7710322514101e04 0320080270

20201218_220833 (flashdancehostname01:update_adapters.sh): Starting date: Fri Dec 18 22:07:58 IST 2020 Ending Date: Fri Dec 18
22:08:33 IST 2020.

(1) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

4. Command: Verify the Fiber Channel Path Status. All paths should be enabled. In testing some hosts had failed paths, as shown by the second example output.

`./check_fcpaths.sh`

Example Output:

```
$ ./check_fcpaths.sh
20201218_221321 (flashdancehostname01:check_fcpaths.sh): Starting date: Fri Dec 18 22:13:21 IST 2020.
20201218_221321 (flashdancehostname01:check_fcpaths.sh): Collecting current histogram.
HOSTS -----
flashdancehostname01
-----
14 fscsi0:Enabled
14 fscsi2:Enabled
14 fscsi4:Enabled
14 fscsi6:Enabled

HOSTS -----
flashdancehostname03
-----
10 fscsi0:Enabled
10 fscsi2:Enabled
10 fscsi4:Enabled
10 fscsi6:Enabled

HOSTS -----
flashdancehostname02, flashdancehostname04
-----
42 fscsi10:Enabled
42 fscsi11:Enabled
42 fscsi12:Enabled
42 fscsi13:Enabled
42 fscsi14:Enabled
42 fscsi15:Enabled
42 fscsi8:Enabled
42 fscsi9:Enabled

HOSTS -----
flashdancehostname05, flashdancehostname06, flashdancehostname07
-----
160 fscsi0:Enabled
160 fscsi12:Enabled
160 fscsi13:Enabled
160 fscsi14:Enabled
160 fscsi15:Enabled
160 fscsi1:Enabled
160 fscsi2:Enabled
160 fscsi3:Enabled
160 fscsi4:Enabled
160 fscsi8:Enabled
20201218_221323 (flashdancehostname01:check_fcpaths.sh): Checking for missing paths.
flashdancehostname01: 0
flashdancehostname03: 0
flashdancehostname04: 0
flashdancehostname02: 0
flashdancehostname07: 0
flashdancehostname06: 0
flashdancehostname05: 0
20201218_221324 (flashdancehostname01:check_fcpaths.sh): Starting date: Fri Dec 18 22:13:21 IST 2020 Ending Date: Fri Dec 18
22:13:24 IST 2020.
```

Example Output W/ errors:

```
$ ./check_fcpaths.sh
20201231_085404 (flashdancehostname01:check_fcpaths.sh): Starting date: Thu Dec 31 08:54:04 IST 2020.
20201231_085404 (flashdancehostname01:check_fcpaths.sh): Collecting current histogram.
HOSTS -----
flashdancehostname01
-----
14 fscsi0:Enabled
14 fscsi2:Enabled
14 fscsi4:Enabled
14 fscsi6:Enabled
```

STAGE 7 - Standby nodes update

```
HOSTS -----
flashdancehostname02, flashdancehostname04
-----
42 fscsi10:Enabled
42 fscsi11:Enabled
42 fscsi12:Enabled
42 fscsi13:Enabled
42 fscsi14:Enabled
42 fscsi15:Enabled
42 fscsi8:Enabled
42 fscsi9:Enabled

HOSTS -----
flashdancehostname03
-----
10 fscsi0:Enabled
10 fscsi2:Enabled
10 fscsi4:Enabled
10 fscsi6:Enabled

HOSTS -----
flashdancehostname05, flashdancehostname07
-----
160 fscsi0:Enabled
160 fscsi12:Enabled
160 fscsi13:Enabled
160 fscsi14:Enabled
160 fscsi15:Enabled
160 fscsi1:Enabled
160 fscsi2:Enabled
160 fscsi3:Enabled
160 fscsi4:Enabled
160 fscsi8:Enabled

HOSTS -----
flashdancehostname06
-----
160 fscsi0:Enabled
160 fscsi12:Enabled
80 fscsi13:Enabled
80 fscsi13:Failed
160 fscsi14:Enabled
80 fscsi15:Enabled
80 fscsi15:Failed
80 fscsi1:Enabled
80 fscsi1:Failed
160 fscsi2:Enabled
80 fscsi3:Enabled
80 fscsi3:Failed
160 fscsi4:Enabled
160 fscsi8:Enabled
20201231_085405 (flashdancehostname01:check_fcpaths.sh): Checking for missing paths.
flashdancehostname01: 0
flashdancehostname03: 0
flashdancehostname02: 0
flashdancehostname04: 0
flashdancehostname05: 0
flashdancehostname07: 0
20201231_085406 (flashdancehostname01:check_fcpaths.sh): Warning: Found fiber channel paths missing on one of the hosts.
20201231_085406 (flashdancehostname01:check_fcpaths.sh): Starting date: Thu Dec 31 08:54:04 IST 2020   Ending Date: Thu Dec 31
08:54:06 IST 2020.
```


STAGE 7 - Standby nodes update

Step 5: Updating Power firmware on the standby CECs

1. If using the pflayer to update the PFW, then the updates are done serially due to limitations within the HMCs. The commands below will only update quiesced servers so provide a safer mechanism, however it takes longer to run the updates. If using this method proceed to step 2. If using the HMC GUI method proceed to step (todo) which allows to run the update in parallel. If the management LPAR is running on the CEC then it will be necessary to re-create all screen sessions if using screens and to restart the update to complete any other servers that need to be updated.
2. Command: Rerun the quiesce command to stop GPFS after the AIX update completed.

```
dsh -n ${ALL} 'cd /BCU_share/FP9_FP5/fixpack_tools;status/stageSeven_status.sh | grep "Firmware Version" > /dev/null 2>&1 && application/check_server_state.sh domain > /dev/null 2>&1 && application/quiesce_node.sh'
```

Example Output:

```
$ dsh -n ${ALL} 'cd /BCU_share/FP9_FP5/fixpack_tools;status/stageSeven_status.sh | grep "Firmware Version" > /dev/null 2>&1 && application/check_server_state.sh domain > /dev/null 2>&1 && application/quiesce_node.sh'
reverseflash02: 20220915_151350 (reverseflash02:quiesce_node.sh): Attempting to source /.profile to define BCU* variables.
reverseflash02: 20220915_151350 (reverseflash02:quiesce_node.sh): Starting date: Thu Sep 15 15:13:50 EDT 2022.
reverseflash02: 20220915_151350 (reverseflash02:quiesce_node.sh): Attempting to quiesce host reverseflash02.
reverseflash02: 20220915_151350 (reverseflash02:check_server_state.sh): Starting date: Thu Sep 15 15:13:50 EDT 2022.
reverseflash02: 20220915_151350 (reverseflash02:check_server_state.sh): Service States:
reverseflash02:
reverseflash02:
reverseflash02: 20220915_151350 (reverseflash02:check_server_state.sh): Service States (Number of db2sysc processes running): 0.
reverseflash02: 20220915_151350 (reverseflash02:check_server_state.sh): Starting date: Thu Sep 15 15:13:50 EDT 2022 Ending
Date: Thu Sep 15 15:13:50 EDT 2022.
reverseflash02: 20220915_151350 (reverseflash02:check_server_state.sh): Starting date: Thu Sep 15 15:13:50 EDT 2022.
reverseflash02: 20220915_151350 (reverseflash02:check_server_state.sh): Domain state: 'Offline'.
reverseflash02: 20220915_151350 (reverseflash02:check_server_state.sh): Starting date: Thu Sep 15 15:13:50 EDT 2022 Ending
Date: Thu Sep 15 15:13:50 EDT 2022.
reverseflash02: 20220915_151350 (reverseflash02:check_server_state.sh): Starting date: Thu Sep 15 15:13:50 EDT 2022.
reverseflash02: 20220915_151350 (reverseflash02:check_server_state.sh): Domain state: 'Offline'.
reverseflash02: 20220915_151350 (reverseflash02:check_server_state.sh): Starting date: Thu Sep 15 15:13:50 EDT 2022 Ending
Date: Thu Sep 15 15:13:50 EDT 2022.
reverseflash02: 20220915_151350 (reverseflash02:check_server_state.sh): Starting date: Thu Sep 15 15:13:50 EDT 2022.
reverseflash02: 20220915_151353 (reverseflash02:check_server_state.sh): GPFS State: 'down'.
reverseflash02: 20220915_151353 (reverseflash02:check_server_state.sh): Starting date: Thu Sep 15 15:13:50 EDT 2022 Ending
Date: Thu Sep 15 15:13:53 EDT 2022.
reverseflash02: 20220915_151353 (reverseflash02:quiesce_node.sh): Script 'application/quiesce_node.sh' with arguments '' ended
with rc=0. Start: Thu Sep 15 15:13:50 EDT 2022 End: Thu Sep 15 15:13:53 EDT 2022. Elapsed Time (Seconds): 3 (H:M:S):(00:00:03).
reverseflash02: 20220915_151355 (reverseflash02:quiesce_node.sh): Normalizing management hostname.
reverseflash02: 20220915_151356 (reverseflash02:quiesce_node.sh): Management hostname is 'reverseflash01'.
reverseflash02: 20220915_151356 (reverseflash02:quiesce_node.sh): Sending notification 'Message from PDOA fixpack on
'reverseflash02' from script 'application/quiesce_node.sh' to 'user@customer.com' '-c root@localhost' via reverseflash01.
reverseflash02: 20220915_151357 (reverseflash02:quiesce_node.sh): Notification sent.
reverseflash05: 20220915_151354 (reverseflash05:quiesce_node.sh): Attempting to source /.profile to define BCU* variables.
reverseflash05: 20220915_151355 (reverseflash05:quiesce_node.sh): Starting date: Thu Sep 15 15:13:55 EDT 2022.
reverseflash05: 20220915_151355 (reverseflash05:quiesce_node.sh): Attempting to quiesce host reverseflash05.
reverseflash05: 20220915_151355 (reverseflash05:check_server_state.sh): Starting date: Thu Sep 15 15:13:55 EDT 2022.
reverseflash05: 20220915_151355 (reverseflash05:check_server_state.sh): Service States:
reverseflash05:
reverseflash05:
reverseflash05: 20220915_151355 (reverseflash05:check_server_state.sh): Service States (Number of db2sysc processes running): 0.
reverseflash05: 20220915_151355 (reverseflash05:check_server_state.sh): Starting date: Thu Sep 15 15:13:55 EDT 2022 Ending
Date: Thu Sep 15 15:13:55 EDT 2022.
reverseflash05: 20220915_151355 (reverseflash05:check_server_state.sh): Starting date: Thu Sep 15 15:13:55 EDT 2022.
reverseflash05: 20220915_151355 (reverseflash05:check_server_state.sh): Domain state: 'Offline'.
reverseflash05: 20220915_151355 (reverseflash05:check_server_state.sh): Starting date: Thu Sep 15 15:13:55 EDT 2022 Ending
Date: Thu Sep 15 15:13:55 EDT 2022.
reverseflash05: 20220915_151355 (reverseflash05:check_server_state.sh): Starting date: Thu Sep 15 15:13:55 EDT 2022.
reverseflash05: 20220915_151355 (reverseflash05:check_server_state.sh): Domain state: 'Offline'.
reverseflash05: 20220915_151355 (reverseflash05:check_server_state.sh): Starting date: Thu Sep 15 15:13:55 EDT 2022 Ending
Date: Thu Sep 15 15:13:55 EDT 2022.
reverseflash05: 20220915_151355 (reverseflash05:check_server_state.sh): Starting date: Thu Sep 15 15:13:55 EDT 2022.
reverseflash05: 20220915_151358 (reverseflash05:check_server_state.sh): GPFS State: 'down'.
reverseflash05: 20220915_151358 (reverseflash05:check_server_state.sh): Starting date: Thu Sep 15 15:13:55 EDT 2022 Ending
Date: Thu Sep 15 15:13:58 EDT 2022.
reverseflash05: 20220915_151358 (reverseflash05:quiesce_node.sh): Script 'application/quiesce_node.sh' with arguments '' ended
with rc=0. Start: Thu Sep 15 15:13:55 EDT 2022 End: Thu Sep 15 15:13:58 EDT 2022. Elapsed Time (Seconds): 4 (H:M:S):(00:00:04).
reverseflash05: 20220915_151400 (reverseflash05:quiesce_node.sh): Normalizing management hostname.
reverseflash05: 20220915_151401 (reverseflash05:quiesce_node.sh): Management hostname is 'reverseflash01'.
reverseflash05: 20220915_151401 (reverseflash05:quiesce_node.sh): Sending notification 'Message from PDOA fixpack on
'reverseflash05' from script 'application/quiesce_node.sh' to 'user@customer.com' '-c root@localhost' via reverseflash01.
reverseflash05: 20220915_151401 (reverseflash05:quiesce_node.sh): Notification sent.
reverseflash01: 20220915_151349 (reverseflash01:quiesce_node.sh): Starting date: Thu Sep 15 15:13:49 EDT 2022.
reverseflash01: 20220915_151349 (reverseflash01:quiesce_node.sh): Attempting to quiesce host reverseflash01.
```

STAGE 7 - Standby nodes update

```
reverseflash01: 20220915_151349 (reverseflash01:check_server_state.sh): Starting date: Thu Sep 15 15:13:49 EDT 2022.
reverseflash01: 20220915_151349 (reverseflash01:check_server_state.sh): Service States:
reverseflash01:
reverseflash01:
reverseflash01: 20220915_151349 (reverseflash01:check_server_state.sh): Service States (Number of db2sysc processes running): 0.
reverseflash01: 20220915_151349 (reverseflash01:check_server_state.sh): Starting date: Thu Sep 15 15:13:49 EDT 2022 Ending
Date: Thu Sep 15 15:13:49 EDT 2022.
reverseflash01: 20220915_151349 (reverseflash01:check_server_state.sh): Starting date: Thu Sep 15 15:13:49 EDT 2022.
reverseflash01: 20220915_151349 (reverseflash01:check_server_state.sh): Domain state: ''.
reverseflash01: 20220915_151349 (reverseflash01:check_server_state.sh): Starting date: Thu Sep 15 15:13:49 EDT 2022 Ending
Date: Thu Sep 15 15:13:49 EDT 2022.
reverseflash01: 20220915_151349 (reverseflash01:check_server_state.sh): Starting date: Thu Sep 15 15:13:49 EDT 2022.
reverseflash01: 20220915_151349 (reverseflash01:check_server_state.sh): Domain state: ''.
reverseflash01: 20220915_151349 (reverseflash01:check_server_state.sh): Starting date: Thu Sep 15 15:13:49 EDT 2022 Ending
Date: Thu Sep 15 15:13:49 EDT 2022.
reverseflash01: 20220915_151349 (reverseflash01:check_server_state.sh): Starting date: Thu Sep 15 15:13:49 EDT 2022.
reverseflash01: 20220915_151352 (reverseflash01:check_server_state.sh): GPFS State: 'active'.
reverseflash01: 20220915_151352 (reverseflash01:check_server_state.sh): Starting date: Thu Sep 15 15:13:49 EDT 2022 Ending
Date: Thu Sep 15 15:13:52 EDT 2022.
reverseflash01: 20220915_151354 (reverseflash01:quiesce_node.sh): Unmounting all GPFS Filesystems on this host.
reverseflash01: Thu Sep 15 15:13:54 EDT 2022: 6027-1674 mmumount: Unmounting file systems ...
reverseflash01: 20220915_151359 (reverseflash01:quiesce_node.sh): Stopping GPFS on this host.
reverseflash01: Thu Sep 15 15:14:00 EDT 2022: 6027-1341 mmshutdown: Starting force unmount of GPFS file systems
reverseflash01: Thu Sep 15 15:14:05 EDT 2022: 6027-1344 mmshutdown: Shutting down GPFS daemons
reverseflash01: Shutting down!
reverseflash01: 'shutdown' command about to kill process 3277644
reverseflash01: Thu Sep 15 15:14:10 EDT 2022: 6027-1345 mmshutdown: Finished
reverseflash01: 20220915_151410 (reverseflash01:quiesce_node.sh): Script 'application/quiesce_node.sh' with arguments '' ended
with rc='0'. Start: Thu Sep 15 15:13:49 EDT 2022 End: Thu Sep 15 15:14:10 EDT 2022. Elapsed Time (Seconds): 21
(H:M:S):(00:00:21).
reverseflash01: 20220915_151410 (reverseflash01:quiesce_node.sh): Normalizing management hostname.
reverseflash01: 20220915_151411 (reverseflash01:quiesce_node.sh): Management hostname is 'reverseflash01'.
reverseflash01: 20220915_151411 (reverseflash01:quiesce_node.sh): Sending notification 'Message from PDOA fixpack on
'reverseflash01' from script 'application/quiesce_node.sh'.' to 'user@customer.com' '-c root@localhost'.
reverseflash01: 20220915_151411 (reverseflash01:quiesce_node.sh): Notification sent.
reverseflash03: 20220915_151348 (reverseflash03:quiesce_node.sh): Attempting to source /.profile to define BCU* variables.
reverseflash03: 20220915_151349 (reverseflash03:quiesce_node.sh): Starting date: Thu Sep 15 15:13:49 EDT 2022.
reverseflash03: 20220915_151349 (reverseflash03:quiesce_node.sh): Attempting to quiesce host reverseflash03.
reverseflash03: 20220915_151349 (reverseflash03:check_server_state.sh): Starting date: Thu Sep 15 15:13:49 EDT 2022.
reverseflash03: 20220915_151349 (reverseflash03:check_server_state.sh): Service States:
reverseflash03:
reverseflash03:
reverseflash03: 20220915_151349 (reverseflash03:check_server_state.sh): Service States (Number of db2sysc processes running): 0.
reverseflash03: 20220915_151349 (reverseflash03:check_server_state.sh): Starting date: Thu Sep 15 15:13:49 EDT 2022 Ending
Date: Thu Sep 15 15:13:49 EDT 2022.
reverseflash03: 20220915_151349 (reverseflash03:check_server_state.sh): Starting date: Thu Sep 15 15:13:49 EDT 2022.
reverseflash03: 20220915_151349 (reverseflash03:check_server_state.sh): Domain state: ''.
reverseflash03: 20220915_151349 (reverseflash03:check_server_state.sh): Starting date: Thu Sep 15 15:13:49 EDT 2022 Ending
Date: Thu Sep 15 15:13:49 EDT 2022.
reverseflash03: 20220915_151349 (reverseflash03:check_server_state.sh): Starting date: Thu Sep 15 15:13:49 EDT 2022.
reverseflash03: 20220915_151349 (reverseflash03:check_server_state.sh): Domain state: ''.
reverseflash03: 20220915_151349 (reverseflash03:check_server_state.sh): Starting date: Thu Sep 15 15:13:49 EDT 2022 Ending
Date: Thu Sep 15 15:13:49 EDT 2022.
reverseflash03: 20220915_151349 (reverseflash03:check_server_state.sh): Starting date: Thu Sep 15 15:13:49 EDT 2022.
reverseflash03: 20220915_151352 (reverseflash03:check_server_state.sh): GPFS State: 'active'.
reverseflash03: 20220915_151352 (reverseflash03:check_server_state.sh): Starting date: Thu Sep 15 15:13:49 EDT 2022 Ending
Date: Thu Sep 15 15:13:52 EDT 2022.
reverseflash03: 20220915_151354 (reverseflash03:quiesce_node.sh): Unmounting all GPFS Filesystems on this host.
reverseflash03: Thu Sep 15 15:13:54 EDT 2022: 6027-1674 mmumount: Unmounting file systems ...
reverseflash03: 20220915_151359 (reverseflash03:quiesce_node.sh): Stopping GPFS on this host.
reverseflash03: Thu Sep 15 15:13:59 EDT 2022: 6027-1341 mmshutdown: Starting force unmount of GPFS file systems
reverseflash03: Thu Sep 15 15:14:04 EDT 2022: 6027-1344 mmshutdown: Shutting down GPFS daemons
reverseflash03: Shutting down!
reverseflash03: 'shutdown' command about to kill process 2294346
reverseflash03: Master did not clean up; attempting cleanup now
reverseflash03: 2022-09-15_15:15:05.076-0400: GPFS: 6027-311 [N] mmfsd is shutting down.
reverseflash03: 2022-09-15_15:15:05.077-0400: [N] Reason for shutdown: mmfsadm shutdown command timed out
reverseflash03: Thu Sep 15 15:15:05 EDT 2022: mmcommon mmfsd down invoked. Subsystem: mmfs Status: down
reverseflash03: Thu Sep 15 15:15:05 EDT 2022: 6027-1674 mmcommon: Unmounting file systems ...
reverseflash03: 2022-09-15_15:15:06.128-0400: [D] consflush: fsync stderr: errno 22 (A system call received a parameter that is
not valid.)
reverseflash03: 2022-09-15_15:15:06.128-0400: [D] consflush: fsync stdout: errno 22 (A system call received a parameter that is
not valid.)
reverseflash03: Thu Sep 15 15:15:10 EDT 2022: 6027-1345 mmshutdown: Finished
reverseflash03: 20220915_151510 (reverseflash03:quiesce_node.sh): Script 'application/quiesce_node.sh' with arguments '' ended
with rc='0'. Start: Thu Sep 15 15:13:49 EDT 2022 End: Thu Sep 15 15:15:10 EDT 2022. Elapsed Time (Seconds): 82
(H:M:S):(00:01:22).
reverseflash03: 20220915_151512 (reverseflash03:quiesce_node.sh): Normalizing management hostname.
reverseflash03: 20220915_151512 (reverseflash03:quiesce_node.sh): Management hostname is 'reverseflash01'.
reverseflash03: 20220915_151512 (reverseflash03:quiesce_node.sh): Sending notification 'Message from PDOA fixpack on
'reverseflash03' from script 'application/quiesce_node.sh'.' to 'user@customer.com' '-c root@localhost' via reverseflash01.
reverseflash03: 20220915_151512 (reverseflash03:quiesce_node.sh): Notification sent.
```

STAGE 7 - Standby nodes update

3. Command: Run the following command to verify the platform layer registered hostnames are properly setup in known_hosts. Reply 'yes' for each host. Repeat the command to verify the prompting no longer appears.

```
appl_ls_hw -r server_os -A Parent,M_Hostname < /dev/null | sed 's|'|g' | cut -d, -f2 | while read h;do ssh -n $h hostname;done
```

Example Output: (First pass)

```
$ appl_ls_hw -r server_os -A Parent,M_Hostname < /dev/null | sed 's|'|g' | cut -d, -f2 | while read h;do ssh -n $h hostname;done
kf5hostname05
The authenticity of host 'kf5hostname03mgt (172.23.1.3)' can't be established.
RSA key fingerprint is SHA256:5WXl4skviwv85Skdevag2R9L8RGszwq0LwJ4Qly3cU.
Are you sure you want to continue connecting (yes/no/[fingerprint])?
(130) root @ kf5hostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
$ appl_ls_hw -r server_os -A Parent,M_Hostname < /dev/null | sed 's|'|g' | cut -d, -f2 | while read h;do ssh -n $h hostname;done
kf5hostname05
The authenticity of host 'kf5hostname03mgt (172.23.1.3)' can't be established.
RSA key fingerprint is SHA256:5WXl4skviwv85Skdevag2R9L8RGszwq0LwJ4Qly3cU.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'kf5hostname03mgt' (RSA) to the list of known hosts.
kf5hostname03
The authenticity of host 'kf5hostname07mgt (172.23.1.7)' can't be established.
RSA key fingerprint is SHA256:ddIuez9oBpuNzgaDPOs/CXan+zlZrPO8B4fq5LNImII.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'kf5hostname07mgt' (RSA) to the list of known hosts.
kf5hostname07
The authenticity of host 'kf5hostname02mgt (172.23.1.2)' can't be established.
RSA key fingerprint is SHA256:7B1hS2H+g91kA8Uf2pEFcwJxWfW9vZbEalE+JMwU6FM.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'kf5hostname02mgt' (RSA) to the list of known hosts.
kf5hostname02
The authenticity of host 'kf5hostname04mgt (172.23.1.4)' can't be established.
RSA key fingerprint is SHA256:7B1hS2H+g91kA8Uf2pEFcwJxWfW9vZbEalE+JMwU6FM.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'kf5hostname04mgt' (RSA) to the list of known hosts.
kf5hostname04
The authenticity of host 'kf5hostname06mgt (172.23.1.6)' can't be established.
RSA key fingerprint is SHA256:NBNGjRt/ny5Xb9Sx4kUg2jrFTSIIZJTIThCB5E9ZqI8.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'kf5hostname06mgt' (RSA) to the list of known hosts.
kf5hostname06
The authenticity of host 'kf5hostname01mgt (172.23.1.1)' can't be established.
RSA key fingerprint is SHA256:7zgxP7oByhTRaBVtrtMKqZ64EjIA55F0m+PsnF6+JAg.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'kf5hostname01mgt' (RSA) to the list of known hosts.
kf5hostname01
```

Example Output: The command should return without prompting as shown below in this second pass.

```
$ appl_ls_hw -r server_os -A Parent,M_Hostname < /dev/null | sed 's|'|g' | cut -d, -f2 | while read h;do ssh -n $h hostname;done
kf5hostname05
kf5hostname03
kf5hostname07
kf5hostname02
kf5hostname04
kf5hostname06
kf5hostname01
```

4. Command: Run the following command to check for servers that need to be updated and for servers that are eligible to be updated. This shows that 'server_fsp2' and 'server_fsp1' need updates and are eligible to be updated. In order to update all lpars on the server must be quiesced and it must require an update.

```
./update_pfw.sh validate
```

Example Output:

```
$ ./update_pfw.sh validate
20220915_151758 (reverseflash01:update_pfw.sh): Starting date: Thu Sep 15 15:17:58 EDT 2022.
20220915_151758 (reverseflash01:update_pfw.sh): Normalizing management hostname.
20220915_151759 (reverseflash01:update_pfw.sh): Management hostname is 'reverseflash01'.
20220915_151759 (reverseflash01:update_pfw.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from script
'./update_pfw.sh.' to 'user@company.com' '-c root@localhost'.
```

STAGE 7 - Standby nodes update

```
20220915_151759 (reverseflash01:update_pfw.sh): Notification sent.
20220915_151759 (reverseflash01:update_pfw.sh): Running validation.
20220915_151759 (reverseflash01:update_pfw.sh): Collecting servers types.
20220915_151800 (reverseflash01:update_pfw.sh): Loading available updates.
20220915_151800 (reverseflash01:update_pfw.sh): Found server 'server_fsp2' which requires an update.
20220915_151801 (reverseflash01:update_pfw.sh): Checking server LPARs/Hosts 'reverseflash05mgt' to verify that they are quiesced
and eligible for updates.
20220915_151805 (reverseflash01:update_pfw.sh): Host 'reverseflash05mgt' is quiesced.
20220915_151806 (reverseflash01:update_pfw.sh): Found server 'server_fsp3' which requires an update.
20220915_151807 (reverseflash01:update_pfw.sh): Checking server LPARs/Hosts 'reverseflash06mgt' to verify that they are quiesced
and eligible for updates.
20220915_151810 (reverseflash01:update_pfw.sh): Host 'reverseflash06mgt' is not quiesced with rc='3'.
20220915_151811 (reverseflash01:update_pfw.sh): Found server 'server_fsp0' which requires an update.
20220915_151812 (reverseflash01:update_pfw.sh): Checking server LPARs/Hosts 'reverseflash02mgt
reverseflash01mgt' to verify that they are quiesced and eligible for updates.
20220915_151816 (reverseflash01:update_pfw.sh): Host 'reverseflash02mgt' is quiesced.
20220915_151819 (reverseflash01:update_pfw.sh): Host 'reverseflash01mgt' is quiesced.
20220915_151819 (reverseflash01:update_pfw.sh): Found server 'server_fsp1' which requires an update.
20220915_151820 (reverseflash01:update_pfw.sh): Checking server LPARs/Hosts 'reverseflash03mgt
reverseflash04mgt' to verify that they are quiesced and eligible for updates.
20220915_151824 (reverseflash01:update_pfw.sh): Host 'reverseflash03mgt' is quiesced.
20220915_151827 (reverseflash01:update_pfw.sh): Host 'reverseflash04mgt' is not quiesced with rc='3'.
20220915_151827 (reverseflash01:update_pfw.sh): Found the following model:target versions.
22A:860.240:/BCU_share/FP9_FP5/firmware/server_fsp/22A_42A/image/imports:server_fsp2
42A:860.240:/BCU_share/FP9_FP5/firmware/server_fsp/22A_42A/image/imports:server_fsp0.
20220915_151828 (reverseflash01:update_pfw.sh): Running '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_fsp update -validate -l
server_fsp2 -f /BCU_share/FP9_FP5/firmware/server_fsp/22A_42A/image/imports'.
Validating the PFW update.
PFW:server_fsp2:0:Validate succeeded
Validation Completed Successfully
20220915_151842 (reverseflash01:update_pfw.sh): Target Results RCs:
'22A:860.240:/BCU_share/FP9_FP5/firmware/server_fsp/22A_42A/image/imports:server_fsp2':'server_fsp2:0'.
20220915_151842 (reverseflash01:update_pfw.sh): Running '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_fsp update -validate -l
server_fsp0 -f /BCU_share/FP9_FP5/firmware/server_fsp/22A_42A/image/imports'.
Validating the PFW update.
PFW:server_fsp0:0:Validate succeeded
Validation Completed Successfully
20220915_151858 (reverseflash01:update_pfw.sh): Target Results RCs:
'42A:860.240:/BCU_share/FP9_FP5/firmware/server_fsp/22A_42A/image/imports:server_fsp0':'server_fsp0:0'.
20220915_151858 (reverseflash01:update_pfw.sh): Script './update_pfw.sh' with arguments 'validate' ended with rc='0'. Start: Thu
Sep 15 15:17:58 EDT 2022 End: Thu Sep 15 15:18:58 EDT 2022. Elapsed Time (Seconds): 60 (H:M:S):(00:01:00).
20220915_151859 (reverseflash01:update_pfw.sh): Normalizing management hostname.
20220915_151859 (reverseflash01:update_pfw.sh): Management hostname is 'reverseflash01'.
20220915_151859 (reverseflash01:update_pfw.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from script
'./update_pfw.sh'.' to 'user@company.com' '-c root@localhost'.
20220915_151859 (reverseflash01:update_pfw.sh): Notification sent.

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

STAGE 7 - Standby nodes update

5. Command: Run the following command to update the quiesced and eligible CECs. If one of the CECs contains the management and management standby you will need to rerun the command after that CEC is updated. This command should be run via a screen session or vtmenu console session to the management host. This will take approximately 20 minutes per server and the updates are done serially due to limitations in the HMC CLI used by the PDOA platform layer automation. Note: PDOA V1.1 FP2->FP4 customers will experience a CEC reboot as part of this step due to the version upgrade. Since the CEC update order is not deterministic it may be necessary to repeat this step if the Foundation CEC is updated in this pass, and it is the first CEC to be selected to update. Be sure to use the commands in a) and b) to periodically check the state of the CECs and LPARs that are being updated.

```
./update_pfw.sh update
```

Example Output:

```
$ ./update_pfw.sh update
20220915_152032 (reverseflash01:update_pfw.sh): Starting date: Thu Sep 15 15:20:32 EDT 2022.
20220915_152032 (reverseflash01:update_pfw.sh): Normalizing management hostname.
20220915_152033 (reverseflash01:update_pfw.sh): Management hostname is 'reverseflash01'.
20220915_152033 (reverseflash01:update_pfw.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from script
'./update_pfw.sh',' to 'user@company.com' '-c root@localhost'.
20220915_152033 (reverseflash01:update_pfw.sh): Notification sent.
20220915_152033 (reverseflash01:update_pfw.sh): Running update.
20220915_152033 (reverseflash01:update_pfw.sh): Running validation.
20220915_152033 (reverseflash01:update_pfw.sh): Collecting servers types.
20220915_152034 (reverseflash01:update_pfw.sh): Loading available updates.
20220915_152034 (reverseflash01:update_pfw.sh): Found server 'server_fsp2' which requires an update.
20220915_152035 (reverseflash01:update_pfw.sh): Checking server LPARs/Hosts 'reverseflash05mgt' to verify that they are quiesced
and eligible for updates.
20220915_152040 (reverseflash01:update_pfw.sh): Host 'reverseflash05mgt' is quiesced.
20220915_152040 (reverseflash01:update_pfw.sh): Found server 'server_fsp3' which requires an update.
20220915_152041 (reverseflash01:update_pfw.sh): Checking server LPARs/Hosts 'reverseflash06mgt' to verify that they are quiesced
and eligible for updates.
20220915_152045 (reverseflash01:update_pfw.sh): Host 'reverseflash06mgt' is not quiesced with rc='3'.
20220915_152045 (reverseflash01:update_pfw.sh): Found server 'server_fsp0' which requires an update.
20220915_152046 (reverseflash01:update_pfw.sh): Checking server LPARs/Hosts 'reverseflash02mgt
reverseflash01mgt' to verify that they are quiesced and eligible for updates.
20220915_152050 (reverseflash01:update_pfw.sh): Host 'reverseflash02mgt' is quiesced.
20220915_152053 (reverseflash01:update_pfw.sh): Host 'reverseflash01mgt' is quiesced.
20220915_152053 (reverseflash01:update_pfw.sh): Found server 'server_fsp1' which requires an update.
20220915_152054 (reverseflash01:update_pfw.sh): Checking server LPARs/Hosts 'reverseflash03mgt
reverseflash04mgt' to verify that they are quiesced and eligible for updates.
20220915_152058 (reverseflash01:update_pfw.sh): Host 'reverseflash03mgt' is quiesced.
20220915_152101 (reverseflash01:update_pfw.sh): Host 'reverseflash04mgt' is not quiesced with rc='3'.
20220915_152101 (reverseflash01:update_pfw.sh): Found the following model:target versions.
22A:860.240:/BCU_share/FP9_FP5/firmware/server_fsp/22A_42A/image/imports:server_fsp2
42A:860.240:/BCU_share/FP9_FP5/firmware/server_fsp/22A_42A/image/imports:server_fsp0.
20220915_152101 (reverseflash01:update_pfw.sh): Running '/opt/ibm/aixappl/pflayer/bin/icmds/appl_ctrl_fsp update -validate -l
server_fsp2 -f /BCU_share/FP9_FP5/firmware/server_fsp/22A_42A/image/imports'.
Validating the PFW update.
PFW:server_fsp2:0:Validate succeeded
Validation Completed Successfully
20220915_152116 (reverseflash01:update_pfw.sh): Target Results RCs:
'22A:860.240:/BCU_share/FP9_FP5/firmware/server_fsp/22A_42A/image/imports:server_fsp2':'server_fsp2:0'.
20220915_152116 (reverseflash01:update_pfw.sh): Running '/opt/ibm/aixappl/pflayer/bin/icmds/appl_ctrl_fsp update -validate -l
server_fsp0 -f /BCU_share/FP9_FP5/firmware/server_fsp/22A_42A/image/imports'.
Validating the PFW update.
PFW:server_fsp0:0:Validate succeeded
Validation Completed Successfully
20220915_152131 (reverseflash01:update_pfw.sh): Target Results RCs:
'42A:860.240:/BCU_share/FP9_FP5/firmware/server_fsp/22A_42A/image/imports:server_fsp0':'server_fsp0:0'.
20220915_152131 (reverseflash01:update_pfw.sh): Running '/opt/ibm/aixappl/pflayer/bin/icmds/appl_ctrl_fsp update -install -l
server_fsp2 -f /BCU_share/FP9_FP5/firmware/server_fsp/22A_42A/image/imports'.
PFW:server_fsp2:0:Successfully updated
CEC updates were successful
20220915_154029 (reverseflash01:update_pfw.sh): Running '/opt/ibm/aixappl/pflayer/bin/icmds/appl_ctrl_fsp update -install -l
server_fsp0 -f /BCU_share/FP9_FP5/firmware/server_fsp/22A_42A/image/imports'.
PFW:server_fsp0:0:Successfully updated
CEC updates were successful
20220915_155625 (reverseflash01:update_pfw.sh): Script './update_pfw.sh' with arguments 'update' ended with rc='0'. Start: Thu
Sep 15 15:20:32 EDT 2022 End: Thu Sep 15 15:56:25 EDT 2022. Elapsed Time (Seconds): 2153 (H:M:S):(00:35:53).
20220915_155625 (reverseflash01:update_pfw.sh): Normalizing management hostname.
20220915_155626 (reverseflash01:update_pfw.sh): Management hostname is 'reverseflash01'.
20220915_155626 (reverseflash01:update_pfw.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from script
'./update_pfw.sh',' to 'user@company.com' '-c root@localhost'.
20220915_155626 (reverseflash01:update_pfw.sh): Notification sent.
```

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You have mail in /usr/spool/mail/root

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application

- a. FP3->FP5, FP4->FP5: There is no reboot required in these scenarios, proceed to item 6.
FP2->FP5: Note: In a separate ssh window to the HMC, use the following command line to track the CEC status. All updated CECs will cycle through the states shown in the example below during the update. You can also view the state of the servers from the HMC web interface.

```
~> while sleep 60;do date;lssyscfg -r sys -F name state | sort;done
Mon May 24 18:40:50 EDT 2021
Server-8284-22A-SN21557DW Operating
Server-8284-22A-SN21557EW Operating
Server-8286-42A-SN21574DW "Power Off In Progress"
Server-8286-42A-SN21574EW Operating
...
Mon May 24 18:54:51 EDT 2021
Server-8284-22A-SN21557DW Operating
Server-8284-22A-SN21557EW Operating
Server-8286-42A-SN21574DW "No Connection"
Server-8286-42A-SN21574EW Operating
Mon May 24 18:55:51 EDT 2021
Server-8284-22A-SN21557DW Operating
Server-8284-22A-SN21557EW Operating
Server-8286-42A-SN21574DW "Power Off"
Server-8286-42A-SN21574EW Operating
Mon May 24 18:56:51 EDT 2021
Server-8284-22A-SN21557DW Operating
Server-8284-22A-SN21557EW Operating
Server-8286-42A-SN21574DW "Power Off"
Server-8286-42A-SN21574EW Operating
Mon May 24 18:57:51 EDT 2021
Server-8284-22A-SN21557DW Operating
Server-8284-22A-SN21557EW Operating
Server-8286-42A-SN21574DW Initializing
Server-8286-42A-SN21574EW Operating
...
Mon May 24 19:03:51 EDT 2021
Server-8284-22A-SN21557DW Operating
Server-8284-22A-SN21557EW Operating
Server-8286-42A-SN21574DW Operating
Server-8286-42A-SN21574EW Operating
```

- b. Once the CEC is operating, check the status of all LPARs. If any of the CECs are 'Not Activated', then activate them using the HMC GUI or the HMC command line.

```
~> while sleep 60;do date;lssyscfg -r sys -F name state | sort | while read m s;do echo "*** $m : $s ***";lssyscfg -r lpar -F name state -m $m;done;done
Mon May 24 19:20:06 EDT 2021
*** Server-8284-22A-SN21557DW : Operating ***
datanode_6 Running
*** Server-8284-22A-SN21557EW : Operating ***
stdbnode_5 Running
*** Server-8286-42A-SN21574DW : Operating ***
adminnode_2 "Not Activated"
sysNode "Not Activated"
*** Server-8286-42A-SN21574EW : Operating ***
stdbnode_4 Running
stdbnode_3 Running
```

- i. Command: To restart the LPARs given the servername *Server-8286-42A-SN21574DW* and the Foundation LPARs *adminnode_2*, *sysNode* use the following as hscroot. Replace the server name with the server name listed from the above command. If starting another LPAR use the associated LPAR name. Then re-run the while command to check to see tha the LPAR starts. Once the LPAR is started, try to ssh to the management host.

```
chsysstate -r lpar -m Server-8286-42A-SN21574DW -o on -n adminnode_2,sysNode
```

- c. Note: When tracking the foundation CEC, use ping on the HMC to wait for the management host to start. In almost all cases the management IAN ip address is 172.23.1.1 which is pingable from the HMC, or any other PDOA LPAR that is online.

```
ping 172.23.1.1
```

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- d. If the management lpar was rebooted, login to the management host and restart any screen sessions.

- i. Login to the management host as root.
- ii. Command: Check screen sessions: `screen -ls`

```
$ screen -ls
There is a screen on:
      3276858.fprun      (Dead ???)
Remove dead screens with 'screen -wipe'.
1 Socket in /tmp/screens/S-root.
```

- iii. Command: Remove dead screens: `screen -wipe`

```
$ screen -wipe
There is a screen on:
      3276858.fprun      (Removed)
1 socket wiped out.
No Sockets found in /tmp/screens/S-root.
```

- iv. Command: Recreate the screen sessions.

```
/BCU_share/FP9_FP5/fixpack_tools/application/enable_screensessions.sh
```

- v. Command: Enter the 'fprun' screen session.

```
screen -r fprun
```

- vi. Command: Remount /BCU_share on all of the hosts.

```
./enable_bcushare.sh
```

6. Command: Reboot all updated core lpar in this pass if necessary. In this V1.1 FP3->V1.1 FP5 or V1.1 FP4->V1.1 FP5 update the Power Firmware (PFW) update does not power down the CEC as part of the update. During testing for V1.1 FP1 through V1.1 FP3, the fiber channel updates sometimes lead to failed paths for which a reboot is the easiest solution. As the servers are quiesced and updated, this is a good time to perform those reboots. To reboot all standby core hosts run the following. Note: V1.1 FP2->FP4 customers. This step is not necessary as the CEC will have rebooted as part of the PFW update.

```
dsh -n ${BCUDB2ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/check_server_state.sh && (nohup shutdown +0 -r </dev/null >/dev/null 2>&1 &) ' | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUDB2ALL} '/BCU_share/FP8_FP4/fixpack_tools/application/check_server_state.sh && (nohup shutdown +0 -r </dev/null >/dev/null 2>&1 &) ' | dshbak -c
HOSTS -----
flashdancehostname02
-----
20210101_113547 (flashdancehostname02:check_server_state.sh): Starting date: Fri Jan  1 11:35:47 IST 2021.
20210101_113549 (flashdancehostname02:check_server_state.sh): GPFS State: 'down'.
20210101_113549 (flashdancehostname02:check_server_state.sh): Domain state: 'Offline'.
20210101_113549 (flashdancehostname02:check_server_state.sh): Service States:

20210101_113549 (flashdancehostname02:check_server_state.sh): Starting date: Fri Jan  1 11:35:47 IST 2021    Ending Date: Fri Jan
1 11:35:49 IST 2021.

HOSTS -----
flashdancehostname04
-----
20210101_113547 (flashdancehostname04:check_server_state.sh): Starting date: Fri Jan  1 11:35:47 IST 2021.
20210101_113549 (flashdancehostname04:check_server_state.sh): GPFS State: 'active'.
20210101_113549 (flashdancehostname04:check_server_state.sh): Domain state: 'Online'.
20210101_113549 (flashdancehostname04:check_server_state.sh): Service States:
Online
```

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```
20210101_113549 (flashdancehostname04:check_server_state.sh): Starting date: Fri Jan 1 11:35:47 IST 2021 Ending Date: Fri Jan 1 11:35:49 IST 2021.

HOSTS -----
flashdancehostname07
-----
20210101_113547 (flashdancehostname07:check_server_state.sh): Starting date: Fri Jan 1 11:35:47 IST 2021.
20210101_113549 (flashdancehostname07:check_server_state.sh): GPFS State: 'active'.
20210101_113549 (flashdancehostname07:check_server_state.sh): Domain state: 'Online'.
20210101_113549 (flashdancehostname07:check_server_state.sh): Service States:
Online

20210101_113549 (flashdancehostname07:check_server_state.sh): Starting date: Fri Jan 1 11:35:47 IST 2021 Ending Date: Fri Jan 1 11:35:49 IST 2021.

HOSTS -----
flashdancehostname05
-----
20210101_113547 (flashdancehostname05:check_server_state.sh): Starting date: Fri Jan 1 11:35:47 IST 2021.
20210101_113549 (flashdancehostname05:check_server_state.sh): GPFS State: 'active'.
20210101_113550 (flashdancehostname05:check_server_state.sh): Domain state: 'Online'.
20210101_113550 (flashdancehostname05:check_server_state.sh): Service States:
Online

20210101_113550 (flashdancehostname05:check_server_state.sh): Starting date: Fri Jan 1 11:35:47 IST 2021 Ending Date: Fri Jan 1 11:35:50 IST 2021.

HOSTS -----
flashdancehostname06
-----
20210101_113547 (flashdancehostname06:check_server_state.sh): Starting date: Fri Jan 1 11:35:47 IST 2021.
20210101_113549 (flashdancehostname06:check_server_state.sh): GPFS State: 'down'.
20210101_113550 (flashdancehostname06:check_server_state.sh): Domain state: 'Offline'.
20210101_113550 (flashdancehostname06:check_server_state.sh): Service States:

20210101_113550 (flashdancehostname06:check_server_state.sh): Starting date: Fri Jan 1 11:35:47 IST 2021 Ending Date: Fri Jan 1 11:35:50 IST 2021.
```

7. Command: Use the following to track when the hosts are offline and then online.

```
while sleep 30;do date;dping ${ALL};done
```

Example Output:

```
$ while sleep 30;do date;dping ${ALL};done
Fri Jan 1 11:42:28 IST 2021
flashdancehostname02: ping (alive)
flashdancehostname07: ping (alive)
flashdancehostname03: ping (alive)
flashdancehostname04: ping (alive)
flashdancehostname01: ping (alive)
flashdancehostname05: ping (alive)
flashdancehostname06: noping (unreachable)
Fri Jan 1 11:42:58 IST 2021
flashdancehostname07: ping (alive)
flashdancehostname01: ping (alive)
flashdancehostname02: ping (alive)
flashdancehostname04: ping (alive)
flashdancehostname05: ping (alive)
flashdancehostname06: ping (alive)
flashdancehostname03: ping (alive)
```

8. Command: Verify the hosts are online and check the uptime. The example output shows '02' and '06' were recently rebooted.

```
dsh -n ${ALL} uptime | sort
```

Example Output:

```
$ dsh -n ${ALL} uptime | sort
flashdancehostname01: 11:43AM up 29 days, 4:51, 1 user, load average: 0.08, 0.16, 0.12
flashdancehostname02: 11:43AM up 4 mins, 0 users, load average: 0.10, 0.17, 0.09
flashdancehostname03: 11:43AM up 16 days, 11:59, 0 users, load average: 0.41, 0.25, 0.23
flashdancehostname04: 11:43AM up 7 days, 11:24, 1 user, load average: 0.12, 0.13, 0.19
flashdancehostname05: 11:43AM up 8 days, 1:32, 0 users, load average: 0.25, 0.39, 0.44
flashdancehostname06: 11:43AM up 2 mins, 0 users, load average: 0.50, 0.26, 0.12
```


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```
flashdancehostname07: 11:43AM up 45 days, 13:06, 0 users, load average: 0.61, 0.63, 0.59
```

9. Command: After reboot, enable BCU_share.

```
./enable_bcushare.sh
```

Example Output:

```
$ ./enable_bcushare.sh
20210103_211957 (flashdancehostname01:enable_bcushare.sh): Checking for /BCU_share on all hosts.
20210103_211958 (flashdancehostname01:enable_bcushare.sh): Warning: The following hosts are missing /BCU_share mounts.
flashdancehostname07: Warning: Missing /BCU_share mount.
20210103_211958 (flashdancehostname01:enable_bcushare.sh): Attempting to mount /BCU_share on all hosts.
20210103_211959 (flashdancehostname01:enable_bcushare.sh): Checking for /BCU_share on all hosts.
20210103_212000 (flashdancehostname01:enable_bcushare.sh): Success: /BCU_share is mounted on all hosts.
20210103_212000 (flashdancehostname01:enable_bcushare.sh): enable_bcushare.sh completed with rc=0.
```

10. Continue to Phase 5 to return the updated hosts to service.

Phase 5: Returning Quiesced Nodes To Service

1. Command: Run the following to enable /BCU_share on updated hosts. From V1.1 FP3 to V1.1 FP4 the PFW update is concurrent and does lead to a reboot of the LPARs.

```
./enable_bcushare.sh
```

Example Output:

```
$ ./enable_bcushare.sh
20201229_064443 (flashdancehostname01:enable_bcushare.sh): Checking for /BCU_share on all hosts.
20201229_064444 (flashdancehostname01:enable_bcushare.sh): Success: /BCU_share is mounted on all hosts.
20201229_064444 (flashdancehostname01:enable_bcushare.sh): enable_bcushare.sh completed with rc=0.
```

2. Command: Run the following command to check the uptime.

```
dsh -n ${ALL} 'uptime'
```

Example Output:

```
$ dsh -n ${ALL} 'uptime'
flashdancehostname01: 06:45AM up 25 days, 23:53, 2 users, load average: 0.29, 0.20, 0.22
flashdancehostname04: 06:45AM up 4 days, 6:26, 0 users, load average: 0.13, 0.15, 0.09
flashdancehostname02: 06:45AM up 119 days, 1:11, 2 users, load average: 1.38, 1.56, 1.67
flashdancehostname06: 06:45AM up 79 days, 22:53, 0 users, load average: 1.93, 1.48, 1.85
flashdancehostname07: 06:45AM up 42 days, 8:07, 0 users, load average: 1.84, 1.92, 2.21
flashdancehostname03: 06:45AM up 13 days, 7 hrs, 0 users, load average: 0.04, 0.06, 0.06
flashdancehostname05: 06:45AM up 4 days, 20:34, 0 users, load average: 1.05, 1.05, 0.88
```

3. Command: Run the following to verify that the standby nodes updates are completed. The updated hosts will not appear in the output.

```
dsh -n ${ALL} -e /BCU_share/FP9_FP5/fixpack_tools/status/stageSeven_status.sh | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} -e /BCU_share/FP9_FP5/fixpack_tools/status/stageSeven_status.sh | dshbak -c
HOSTS -----
reverseflash03
-----
Firmware Version: IBM,FW860.90 (SV860_226)

HOSTS -----
reverseflash04, reverseflash06
-----
Firmware Version: IBM,FW860.90 (SV860_226)
7100-05-07-2038
sissas:53495351.19512b00

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

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4. Command: Restore the standby hosts to operational status. This command will attempt to start GPFS, mount GPFS filesystems and add quiesced hosts in their respective domains. The example output shows the result of the first completed pass. Management hosts will display the errors: “Error: Could not determine domain for this host.” and “Error: Unable to unquiesce host.”. As long as those hosts show “Starting GPFS” this is okay. This is expected as the domains were removed in V1.1 FP4 Stage 9.

```
dsh -n ${ALL} "/BCU_share/FP9_FP5/fixpack_tools/application/unquiesce_node.sh" | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} "/BCU_share/FP9_FP5/fixpack_tools/application/unquiesce_node.sh" | dshbak -c
HOSTS -----
flashdancehostname01
-----
20201229_071142 (flashdancehostname01:unquiesce_node.sh): Starting date: Tue Dec 29 07:11:41 IST 2020.
20201229_071142 (flashdancehostname01:unquiesce_node.sh): Attempting to unquiesce host flashdancehostname01.
20201229_071203 (flashdancehostname01:unquiesce_node.sh): Successfully unquiesced host.
20201229_071203 (flashdancehostname01:unquiesce_node.sh): Starting date: Tue Dec 29 07:11:41 IST 2020    Ending Date: Tue Dec 29 07:12:03 IST 2020.
HOSTS -----
flashdancehostname02
-----
20201229_071142 (flashdancehostname02:unquiesce_node.sh): Starting date: Tue Dec 29 07:11:42 IST 2020.
20201229_071142 (flashdancehostname02:unquiesce_node.sh): Attempting to unquiesce host flashdancehostname02.
20201229_071304 (flashdancehostname02:unquiesce_node.sh): Successfully unquiesced host.
20201229_071304 (flashdancehostname02:unquiesce_node.sh): Starting date: Tue Dec 29 07:11:42 IST 2020    Ending Date: Tue Dec 29 07:13:04 IST 2020.
HOSTS -----
flashdancehostname03
-----
20201229_071142 (flashdancehostname03:unquiesce_node.sh): Starting date: Tue Dec 29 07:11:42 IST 2020.
20201229_071142 (flashdancehostname03:unquiesce_node.sh): Attempting to unquiesce host flashdancehostname03.
Tue Dec 29 07:11:49 IST 2020: 6027-1642 mmstartup: Starting GPFS ...
Tue Dec 29 07:12:06 IST 2020: 6027-1623 mmmount: Mounting file systems ...
Tue Dec 29 07:12:13 IST 2020: 6027-1623 mmmount: Mounting file systems ...
20201229_071346 (flashdancehostname03:unquiesce_node.sh): Successfully unquiesced host.
20201229_071346 (flashdancehostname03:unquiesce_node.sh): Starting date: Tue Dec 29 07:11:42 IST 2020    Ending Date: Tue Dec 29 07:13:46 IST 2020.
HOSTS -----
flashdancehostname04
-----
20201229_071142 (flashdancehostname04:unquiesce_node.sh): Starting date: Tue Dec 29 07:11:42 IST 2020.
20201229_071142 (flashdancehostname04:unquiesce_node.sh): Attempting to unquiesce host flashdancehostname04.
Tue Dec 29 07:11:50 IST 2020: 6027-1642 mmstartup: Starting GPFS ...
20201229_071413 (flashdancehostname04:unquiesce_node.sh): Successfully unquiesced host.
20201229_071413 (flashdancehostname04:unquiesce_node.sh): Starting date: Tue Dec 29 07:11:42 IST 2020    Ending Date: Tue Dec 29 07:14:13 IST 2020.
HOSTS -----
flashdancehostname06
-----
20201229_071142 (flashdancehostname06:unquiesce_node.sh): Starting date: Tue Dec 29 07:11:42 IST 2020.
20201229_071142 (flashdancehostname06:unquiesce_node.sh): Attempting to unquiesce host flashdancehostname06.
20201229_071455 (flashdancehostname06:unquiesce_node.sh): Successfully unquiesced host.
20201229_071455 (flashdancehostname06:unquiesce_node.sh): Starting date: Tue Dec 29 07:11:42 IST 2020    Ending Date: Tue Dec 29 07:14:55 IST 2020.
HOSTS -----
flashdancehostname07
-----
20201229_071142 (flashdancehostname07:unquiesce_node.sh): Starting date: Tue Dec 29 07:11:42 IST 2020.
20201229_071142 (flashdancehostname07:unquiesce_node.sh): Attempting to unquiesce host flashdancehostname07.
20201229_071457 (flashdancehostname07:unquiesce_node.sh): Successfully unquiesced host.
20201229_071457 (flashdancehostname07:unquiesce_node.sh): Starting date: Tue Dec 29 07:11:42 IST 2020    Ending Date: Tue Dec 29 07:14:57 IST 2020.
HOSTS -----
flashdancehostname05
-----
20201229_071142 (flashdancehostname05:unquiesce_node.sh): Starting date: Tue Dec 29 07:11:42 IST 2020.
20201229_071142 (flashdancehostname05:unquiesce_node.sh): Attempting to unquiesce host flashdancehostname05.
Tue Dec 29 07:11:50 IST 2020: 6027-1642 mmstartup: Starting GPFS ...
Tue Dec 29 07:12:31 IST 2020: 6027-1623 mmmount: Mounting file systems ...
20201229_071932 (flashdancehostname05:unquiesce_node.sh): Successfully unquiesced host.
20201229_071932 (flashdancehostname05:unquiesce_node.sh): Starting date: Tue Dec 29 07:11:42 IST 2020    Ending Date: Tue Dec 29 07:19:32 IST 2020.
```

5. Command: Verify the Fiber Channel Paths are all Enabled.

```
./check_fcpaths.sh
```

Example Output:

```
$ ./check_fcpaths.sh
20220919_163456 (reverseflash01:check_fcpaths.sh): Starting date: Mon Sep 19 16:34:56 EDT 2022.
20220919_163456 (reverseflash01:check_fcpaths.sh): Collecting current histogram.
HOSTS -----
reverseflash01
-----
16 fscsi0:Enabled
16 fscsi2:Enabled
```

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```
16 fscsi4:Enabled
16 fscsi6:Enabled

HOSTS -----
reverseflash03
-----
12 fscsi0:Enabled
12 fscsi2:Enabled
12 fscsi4:Enabled
12 fscsi6:Enabled

HOSTS -----
reverseflash02, reverseflash04
-----
42 fscsi10:Enabled
42 fscsi11:Enabled
42 fscsi12:Enabled
42 fscsi13:Enabled
42 fscsi14:Enabled
42 fscsi15:Enabled
42 fscsi8:Enabled
42 fscsi9:Enabled

HOSTS -----
reverseflash05, reverseflash06
-----
80 fscsi0:Enabled
80 fscsi12:Enabled
80 fscsi13:Enabled
80 fscsi14:Enabled
80 fscsi15:Enabled
80 fscsi1:Enabled
80 fscsi2:Enabled
80 fscsi3:Enabled
80 fscsi4:Enabled
80 fscsi8:Enabled

20220919_163458 (reverseflash01:check_fcpaths.sh): Checking for missing paths.
reverseflash01: 0
reverseflash02: 0
reverseflash05: 0
reverseflash03: 0
reverseflash04: 0
reverseflash06: 0
20220919_163500 (reverseflash01:check_fcpaths.sh): Starting date: Mon Sep 19 16:34:56 EDT 2022   Ending Date: Mon Sep 19 16:35:00
EDT 2022.
```

Example Output: (Error: One node has path issues)

```
$ ./check_fcpaths.sh
20220919_163456 (reverseflash01:check_fcpaths.sh): Starting date: Mon Sep 19 16:34:56 EDT 2022.
20220919_163456 (reverseflash01:check_fcpaths.sh): Collecting current histogram.
HOSTS -----
reverseflash01
-----
16 fscsi0:Enabled
16 fscsi2:Enabled
16 fscsi4:Enabled
16 fscsi6:Enabled

HOSTS -----
reverseflash03
-----
12 fscsi0:Enabled
12 fscsi2:Enabled
12 fscsi4:Enabled
12 fscsi6:Enabled

HOSTS -----
reverseflash04
-----
42 fscsi10:Enabled
42 fscsi11:Enabled
42 fscsi12:Enabled
42 fscsi13:Enabled
42 fscsi14:Enabled
42 fscsi15:Enabled
42 fscsi8:Enabled
42 fscsi9:Enabled

HOSTS -----
reverseflash05, reverseflash06
-----
80 fscsi0:Enabled
```

STAGE 7 - Standby nodes update

```
80 fscsi12:Enabled
80 fscsi13:Enabled
80 fscsi14:Enabled
80 fscsi15:Enabled
80 fscsi1:Enabled
80 fscsi2:Enabled
80 fscsi3:Enabled
80 fscsi4:Enabled
80 fscsi8:Enabled

HOSTS -----
reverseflash02
-----
42 fscsi10:Enabled
42 fscsi11:Enabled
42 fscsi12:Enabled
42 fscsi13:Failed
42 fscsi14:Enabled
42 fscsi15:Enabled
42 fscsi8:Enabled
42 fscsi9:Enabled
20220919_163458 (reverseflash01:check_fcpaths.sh): Checking for missing paths.
reverseflash01: 0
reverseflash05: 0
reverseflash03: 0
reverseflash04: 0
reverseflash06: 0
20220919_163500 (reverseflash01:check_fcpaths.sh): Warning: Found fiber channel paths missing on one of the hosts.
20220919_163500 (reverseflash01:check_fcpaths.sh): Starting date: Mon Sep 19 16:34:56 EDT 2022   Ending Date: Mon Sep 19 16:35:00
EDT 2022.
```

6. Command: Verify the filesystems are mounted on the the updated hosts.

```
dsh -n ${ALL} 'mount | grep -c mmfs' | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} 'mount | grep -c mmfs' | dshbak -c
HOSTS -----
flashdancehostname01, flashdancehostname03
-----
5

HOSTS -----
flashdancehostname02, flashdancehostname04
-----
21

HOSTS -----
flashdancehostname05, flashdancehostname06, flashdancehostname07
-----
63
```

7. Command: Verify the standby nodes are online again in the domain. The HA STATUS should show Normal. FP4->FP5 customers will not see the Management Domain as it was removed in V1.1 FP4.

```
hals
```

Example Output:

```
$ hals
MANAGEMENT DOMAIN
+-----+-----+-----+-----+-----+-----+
| COMPONENT | PRIMARY | STANDBY | CURRENT | OPSTATE | HA STATUS | RG REQUESTS |
+-----+-----+-----+-----+-----+-----+
| DPM       | flashdancehostname01 | flashdancehostname03 | flashdancehostname01 | Online | Normal | - |
| DB2DPM    | flashdancehostname01 | flashdancehostname03 | flashdancehostname01 | Online | Normal | - |
+-----+-----+-----+-----+-----+-----+

CORE DOMAIN
+-----+-----+-----+-----+-----+-----+
| PARTITIONS | CURRENT | STANDBY | DOMAIN | OPSTATE | HA STATUS | RG REQUESTS |
+-----+-----+-----+-----+-----+-----+
| 0-5        | flashdancehostname02 | flashdancehostname04 | bcudomain01 | Online | Normal | - |
| 6-15       | flashdancehostname07 | flashdancehostname05 | bcudomain02 | Online | Normal | - |
| 16-25      | flashdancehostname06 | flashdancehostname05 | bcudomain02 | Online | Normal | - |
+-----+-----+-----+-----+-----+-----+
```

Phase 6: Prepare for the next cycle.

1. Command: Run the stage07 check utility to check the status of all nodes. The output below does not contain the hosts '01', '02', and '05' indicating that those host have completed their stage 07 updates.

```
dsh -n ${ALL} -e /BCU_share/FP9_FP5/fixpack_tools/status/stageSeven_status.sh | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} -e /BCU_share/FP9_FP5/fixpack_tools/status/stageSeven_status.sh | dshbak -c
HOSTS -----
reverseflash03
-----
Firmware Version: IBM,FW860.90 (SV860_226)

HOSTS -----
reverseflash04, reverseflash06
-----
Firmware Version: IBM,FW860.90 (SV860_226)
7100-05-07-2038
sissas:53495351.19512b00
```

2. Command: Run hals to see the current HA Status and node assignments. Note: FP4->FP5 customers should not see a management domain.

```
hals
```

Example Output:

```
$ hals
MANAGEMENT DOMAIN
+-----+-----+-----+-----+-----+-----+
| COMPONENT | PRIMARY | STANDBY | CURRENT | OPSTATE | HA STATUS | RG REQUESTS |
+-----+-----+-----+-----+-----+-----+
| DPM       | flashdancehostname01 | flashdancehostname03 | flashdancehostname01 | Online | Normal | - |
| DB2DPM    | flashdancehostname01 | flashdancehostname03 | flashdancehostname01 | Online | Normal | - |
+-----+-----+-----+-----+-----+-----+

CORE DOMAIN
+-----+-----+-----+-----+-----+-----+
| PARTITIONS | CURRENT | STANDBY | DOMAIN | OPSTATE | HA STATUS | RG REQUESTS |
+-----+-----+-----+-----+-----+-----+
| 0-5       | flashdancehostname02 | flashdancehostname04 | bcudomain01 | Online | Normal | - |
| 6-15     | flashdancehostname07 | flashdancehostname05 | bcudomain02 | Online | Normal | - |
| 16-25    | flashdancehostname06 | flashdancehostname05 | bcudomain02 | Online | Normal | - |
+-----+-----+-----+-----+-----+-----+
```

3. Using the output from 1 and 2, identify if stage 07 is complete or the next set of hosts to update. In the example output '01', '02', '06' and '07' require updates. Return the Phase 1 if any hosts require updates.

STAGE 8 - CORE NODES update in DOWNTIME window

Stage 8 Description

Stage 8 represents the outage phase, which is like the previous PDOA fixpack core apply phases. Where it is not similar is that it uses a phased approach that can be interrupted to bring the system back into production if needed.

Steps

- Stage 8 Phase 1: Quiesce the appliance.
- Stage 8 Phase 2: BNT Firmware Updates.
- Stage 8 Phase 3: Core GPFS Updates
- Stage 8 Phase 4: Core TSA Domain Updates
- Stage 8 Phase 5: Update HA Tools
- Stage 8 Phase 6: Core DB2 Updates.
- Stage 8 Phase 7: mksysb
- Stage 8 Phase 8: Committing GPFS/Spectrum Scale and Db2
- Stage 8 Phase 9: Committing Power Firmware Updates
- Stage 8 Phase 10: Remirror rootvg on all hosts.

Outage Requirements

- All services will be offline in the appliance during the update.

Time Per Step

- Stage 8 Phase 1: ~30 Minutes. [Outage]
- Stage 8 Phase 2: 30 to 40 Minutes. [Outage]
- Stage 8 Phase 3: 30 minutes for GPFS [Outage]
- Stage 8 Phase 4: 25 minutes for TSA updates. [Outage]
- Stage 8 Phase 5: 30 to 60 minutes (larger appliances will take longer). [Outage]
- Stage 8 Phase 6: 45 minutes Core DB2 Updates. [Outage]
- Stage 8 Phase 7: 1 hour and run in parallel on all hosts. [No Outage]
- Stage 8 Phase 8: 30 to 60 Minutes (larger appliance will take longer). [No Outage]
- Stage 8 Phase 9: 4 Minutes per server, run serially. [No Outage]
- Stage 8 Phase 10: 3 hours and run in parallel. [No Outage | rootvg hdisks 100% active for mirror rebuild]

Risk Mitigation

- System can be put back into production between completed phases.
- mksysb and alt_disk_install methods to recover host in some cases
- TSA domain backups.
- DB2 installed in multiple copies.

STAGE 8 - CORE NODES update in DOWNTIME window

- Customer should backup their database as per their normal processes.

Backout Options

- mksysb [not available after GPFS commit]
- alt_disk_install [not available after GPFS commit]
- Revert to previous DB2 copies [may require database restore]

Phase 1: Quiesce The Appliance

1. Login as root in a screen or vtmenu console session on the management host.
2. Command: Change the directory if not already to /BCU_share/FP8_FP4/fixpack_tools/application

```
cd /BCU_share/FP9_FP5/fixpack_tools/application
```

3. In Stage 07 hosts, LPARs and CECs were quiesced to allow for partial updates. In Stage 08 all services, TSA domains, GPFS clusters will be quiesced on the whole appliance. This can also be performed at any stage depending on the risk tolerance of the customer.
4. Command: Determine if the services that are running. This is run as root on the management host. Preferably in a screen or vtmenu session. The following command shows that DPM, and the core database services are online. The expectation is that all services are online when starting this stage, however many customers are not using DPM so DPM may be Offline as well as the management domain. FP4->FP5 customers will not see a management domain.

```
hals
```

Example Output:

```
$ hals
MANAGEMENT DOMAIN
=====+=====+=====+=====+=====+=====+=====+
| COMPONENT | PRIMARY | STANDBY | CURRENT | OPSTATE | HA STATUS | RG REQUESTS |
|-----+-----+-----+-----+-----+-----+-----+
| DPM       | flashdancehostname01 | flashdancehostname03 | flashdancehostname03 | Online | Normal | - |
| DB2DPM    | flashdancehostname01 | flashdancehostname03 | flashdancehostname03 | Online | Normal | - |
|-----+-----+-----+-----+-----+-----+-----+

CORE DOMAIN
=====+=====+=====+=====+=====+=====+=====+
| PARTITIONS | CURRENT | STANDBY | DOMAIN | OPSTATE | HA STATUS | RG REQUESTS |
|-----+-----+-----+-----+-----+-----+-----+
| 0-5        | flashdancehostname02 | flashdancehostname04 | bcudomain01 | Online | Normal | - |
| 6-15       | flashdancehostname07 | flashdancehostname06 | bcudomain02 | Online | Normal | - |
| 16-25      | flashdancehostname05 | flashdancehostname06 | bcudomain02 | Online | Normal | - |
|-----+-----+-----+-----+-----+-----+-----+
```

5. Command: If DPM is started, the stop DPM.

```
hastopdpm
```

Example Output: (FP4 with OPM removed)

```
$ hastopdpm
none are available... returning
Can't connect to any nodes in the cluster or all nodes are offline in domain. Exiting
```

Example Output: (FP3 and earlier)

```
$ hastopdpm
Stopping DPM and DB2 instance.....Resources offline
MANAGEMENT DOMAIN
=====+=====+=====+=====+=====+=====+=====+
| COMPONENT | PRIMARY | STANDBY | CURRENT | OPSTATE | HA STATUS | RG REQUESTS |
|-----+-----+-----+-----+-----+-----+-----+
| DPM       | flashdancehostname01 | N/A | N/A | Offline | Offline | - |
| DB2DPM    | flashdancehostname01 | N/A | N/A | Offline | Offline | - |
|-----+-----+-----+-----+-----+-----+-----+
```

6. Command: If the core partitions are Online then stop the core partitions.

```
hastopdb2
```

STAGE 8 - CORE NODES update in DOWNTIME window

Example Output:

```
(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
$ hastopdb2
Stopping DB2.....DB2 Resources offline
CORE DOMAIN
```

PARTITIONS	CURRENT	STANDBY	DOMAIN	OPSTATE	HA STATUS	RG REQUESTS
0-5	N/A	N/A	bcudomain01	Offline	Offline	-
6-15	N/A	N/A	bcudomain02	Offline	Offline	-
16-25	N/A	N/A	bcudomain02	Offline	Offline	-

7. Command: At this point all PDOA services (DPM, Db2 Partitions or MLNs) should be stopped. Stop the core domain.

```
hadomain -core stop
```

Example Output:

```
$ hadomain -core stop
```

8. Command: Verify the core domain is stopped or listed as DOMAIN OFFLINE. FP4->FP5 customers will not see a management domain.

```
hals
```

Example Output:

```
$ hals
MANAGEMENT DOMAIN
```

COMPONENT	PRIMARY	STANDBY	CURRENT	OPSTATE	HA STATUS	RG REQUESTS
DPM	flashdancehostname01	N/A	N/A	Offline	Offline	-
DB2DPM	flashdancehostname01	N/A	N/A	Offline	Offline	-

```
CORE DOMAIN
```

PARTITIONS	CURRENT	STANDBY	DOMAIN	OPSTATE	HA STATUS	RG REQUESTS
N/A	N/A	N/A	bcudomain01	DOMAIN OFFLINE	N/A	N/A
N/A	N/A	N/A	bcudomain02	DOMAIN OFFLINE	N/A	N/A

9. Command: Stop the Management domain. Only if upgrading from V1.1 FP3 or lower. Management domain was removed in V1.1 FP4 Stage 9.

```
hadomain -mgmt stop
```

Example Output: (FP4 with OPM removed)

```
$ hadomain -mgmt stop
stoprpdomain: 2602-141 The peer domain "mgmtdomain" was not found and cannot be stopped.
Error stopping domain. rc=5
```

Example Output: (FP3 and earlier)

```
$ hadomain -mgmt stop
```

10. Command: Verify the domains are stopped. There are three commands to check the status.

```
hals
```

Example Output:

```
$ hals
none are available... returning
```

STAGE 8 - CORE NODES update in DOWNTIME window

CORE DOMAIN						
PARTITIONS	CURRENT	STANDBY	DOMAIN	OPSTATE	HA STATUS	RG REQUESTS
N/A	N/A	N/A	bcudomain01	DOMAIN OFFLINE	N/A	N/A
N/A	N/A	N/A	bcudomain02	DOMAIN OFFLINE	N/A	N/A

11. Command: Check the status of the management domain.

```
hadomain -mgmt status
```

Example Output: (FP4 with OPM Removed)

```
$ hadomain -mgmt status
lsrpdomain: 2602-101 The peer domain "mgmtdomain" was not found.
Error checking domain. rc=6
```

Example Output: (FP3 and earlier)

```
$ hadomain -mgmt status
mgmtdomain Offline 3.2.5.2          No          12347  12348
```

12. Command: Check the status of the core domains.

```
hadomain -core status
```

Example Output: (Shows FP4 RSCT Levels)

```
$ hadomain -core status
bcudomain01 Offline 3.2.5.2          Yes          12347  12348
bcudomain02 Offline 3.2.5.2          Yes          12347  12348
```

13. Command: Stop the filesystems on all hosts. This step will attempt to unmount all GPFS filesystems on all AIX servers in the appliance. This includes the '/stage', '/dwhome', and '/db2home' filesystems which are often used for user logins. If your environment has applications running that access these filesystems then it will be necessary to quiesce or stop those applications prior to running this step. Any server that has filesystems that cannot be unmounted must be rebooted if the applications or sessions using those filesystems cannot be determined or killed. Please note that rebooting a host will automatically start and mount GPFS filesystems, so this step will need be repeated until all hosts do not have any GPFS filesystems mounted.

```
dsh -n ${ALL} '/usr/lpp/mmfs/bin/mmumount all'
```

Example Output:

```
$ dsh -n ${ALL} '/usr/lpp/mmfs/bin/mmumount all'
flashdancehostname01: Tue Jan 5 02:52:13 IST 2021: 6027-1674 mmumount: Unmounting file systems ...
flashdancehostname03: Tue Jan 5 02:52:14 IST 2021: 6027-1674 mmumount: Unmounting file systems ...
flashdancehostname02: Tue Jan 5 02:52:14 IST 2021: 6027-1674 mmumount: Unmounting file systems ...
flashdancehostname04: Tue Jan 5 02:52:14 IST 2021: 6027-1674 mmumount: Unmounting file systems ...
flashdancehostname07: Tue Jan 5 02:52:14 IST 2021: 6027-1674 mmumount: Unmounting file systems ...
flashdancehostname06: Tue Jan 5 02:52:14 IST 2021: 6027-1674 mmumount: Unmounting file systems ...
flashdancehostname05: Tue Jan 5 02:52:14 IST 2021: 6027-1674 mmumount: Unmounting file systems ...
```

14. Command: Verify that there are no GPFS filesystems mounted. Do not proceed past this step if any host has GPFS filesystems mounted.

```
dsh -n ${ALL} 'mount | grep -c mmfs' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} 'mount | grep -c mmfs' 2>&1 | dshbak -c
HOSTS -----
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
flashdancehostname01, flashdancehostname02, flashdancehostname03, flashdancehostname04, flashdancehostname05,  
flashdancehostname06, flashdancehostname07  
-----  
0
```

15. Command: Shutdown GPFS on all hosts.

```
dsh -n ${ALL} '/usr/lpp/mmfs/bin/mmshutdown' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} '/usr/lpp/mmfs/bin/mmshutdown' 2>&1 | dshbak -c  
HOSTS -----  
flashdancehostname01  
-----  
Tue Jan 5 02:56:53 IST 2021: 6027-1341 mmshutdown: Starting force unmount of GPFS file systems  
Tue Jan 5 02:56:58 IST 2021: 6027-1344 mmshutdown: Shutting down GPFS daemons  
Shutting down!  
'shutdown' command about to kill process 4457002  
Tue Jan 5 02:57:04 IST 2021: 6027-1345 mmshutdown: Finished  
  
HOSTS -----  
flashdancehostname07  
-----  
Tue Jan 5 02:56:54 IST 2021: 6027-1341 mmshutdown: Starting force unmount of GPFS file systems  
Tue Jan 5 02:56:59 IST 2021: 6027-1344 mmshutdown: Shutting down GPFS daemons  
Shutting down!  
'shutdown' command about to kill process 2163214  
Tue Jan 5 02:57:05 IST 2021: 6027-1345 mmshutdown: Finished  
  
HOSTS -----  
flashdancehostname04  
-----  
Tue Jan 5 02:56:54 IST 2021: 6027-1341 mmshutdown: Starting force unmount of GPFS file systems  
Tue Jan 5 02:56:59 IST 2021: 6027-1344 mmshutdown: Shutting down GPFS daemons  
Shutting down!  
'shutdown' command about to kill process 8192402  
Tue Jan 5 02:57:15 IST 2021: 6027-1345 mmshutdown: Finished  
  
HOSTS -----  
flashdancehostname05  
-----  
Tue Jan 5 02:56:54 IST 2021: 6027-1341 mmshutdown: Starting force unmount of GPFS file systems  
Tue Jan 5 02:56:59 IST 2021: 6027-1344 mmshutdown: Shutting down GPFS daemons  
Shutting down!  
'shutdown' command about to kill process 5243622  
Tue Jan 5 02:57:15 IST 2021: 6027-1345 mmshutdown: Finished  
  
HOSTS -----  
flashdancehostname06  
-----  
Tue Jan 5 02:56:54 IST 2021: 6027-1341 mmshutdown: Starting force unmount of GPFS file systems  
Tue Jan 5 02:56:59 IST 2021: 6027-1344 mmshutdown: Shutting down GPFS daemons  
Shutting down!  
'shutdown' command about to kill process 3539252  
Tue Jan 5 02:57:17 IST 2021: 6027-1345 mmshutdown: Finished  
  
HOSTS -----  
flashdancehostname02  
-----  
Tue Jan 5 02:56:54 IST 2021: 6027-1341 mmshutdown: Starting force unmount of GPFS file systems  
Tue Jan 5 02:56:59 IST 2021: 6027-1344 mmshutdown: Shutting down GPFS daemons  
Shutting down!  
'shutdown' command about to kill process 3473822  
Master did not clean up; attempting cleanup now  
2021-01-05_02:57:59.493+0530: GPFS: 6027-311 [N] mmfsd is shutting down.  
2021-01-05_02:57:59.494+0530: [N] Reason for shutdown: mmfsadm shutdown command timed out  
Tue Jan 5 02:57:59 IST 2021: mmcommon mmfsdown invoked. Subsystem: mmfs Status: down  
Tue Jan 5 02:57:59 IST 2021: 6027-1674 mmcommon: Unmounting file systems ...  
Tue Jan 5 02:58:04 IST 2021: 6027-1345 mmshutdown: Finished
```

16. Command: Verify that all hosts are shutdown. All hosts should report 'down' in the output.

```
dsh -n ${ALL} '/usr/lpp/mmfs/bin/mmgetstate'
```

Example Output:

```
$ dsh -n ${ALL} '/usr/lpp/mmfs/bin/mmgetstate'  
flashdancehostname01:  
flashdancehostname01: Node number Node name GPFS state  
flashdancehostname01: -----
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
flashdancehostname01:      1      flashdancehostname01 down
flashdancehostname02:
flashdancehostname02: Node number Node name      GPFS state
flashdancehostname02: -----
flashdancehostname02:      1      flashdancehostname02 down
flashdancehostname04:
flashdancehostname04: Node number Node name      GPFS state
flashdancehostname04: -----
flashdancehostname04:      2      flashdancehostname04 down
flashdancehostname07:
flashdancehostname07: Node number Node name      GPFS state
flashdancehostname07: -----
flashdancehostname07:      5      flashdancehostname07 down
flashdancehostname05:
flashdancehostname05: Node number Node name      GPFS state
flashdancehostname05: -----
flashdancehostname05:      3      flashdancehostname05 down
flashdancehostname03:
flashdancehostname03: Node number Node name      GPFS state
flashdancehostname03: -----
flashdancehostname03:      2      flashdancehostname03 down
flashdancehostname06:
flashdancehostname06: Node number Node name      GPFS state
flashdancehostname06: -----
flashdancehostname06:      4      flashdancehostname06 down
```

17. Command: Unload GPFS from the environment on each host. If any host fails to unload, then reboot that host and return to step 9 as the GPFS daemons will be restarted on that host. If that host is a primary or secondary configuration host it will be able to start GPFS cluster and mount filesystems and those will have to unmounted, GPFS on that host will need to be stopped and the GPFS will need to be removed form the environment.

```
dsh -n ${ALL} '/usr/lpp/mmfs/bin/mmfsenv -u' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} '/usr/lpp/mmfs/bin/mmfsenv -u' 2>&1 | dshbak -c
HOSTS -----
flashdancehostname01, flashdancehostname02, flashdancehostname03, flashdancehostname04, flashdancehostname05,
flashdancehostname06, flashdancehostname07
-----
GPFS: 6027-501 /usr/lpp/mmfs/bin/mmfskxunload: module /usr/lpp/mmfs/bin/mmfs unloaded.

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

18. Command: Verify that GPFS is unloaded from the environment.

```
dsh -n ${ALL} '/usr/lpp/mmfs/bin/mmfsenv -u' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} '/usr/lpp/mmfs/bin/mmfsenv -u' 2>&1 | dshbak -c
HOSTS -----
flashdancehostname01, flashdancehostname02, flashdancehostname03, flashdancehostname04, flashdancehostname05,
flashdancehostname06, flashdancehostname07
-----
GPFS: 6027-507 /usr/lpp/mmfs/bin/mmfskxload: /usr/lpp/mmfs/bin/mmfs is not loaded.

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

Phase 2: Update the network switches.

Apply BNT firmware update on all the network switches. This step will result in full network outage for the update duration as the switches reboot. The following commands should be run through a screen session or vtmenu session on the management host as the root user. Platform layer commands are logged to `/BCU_share/aixappl/pflayer/log/platform_layer.log` and `/BCU_share/aixappl/pflayer/log/platform_layer.trace`.

1. Command: Validate the BNT updates. This command will check to see if there are available updates and if the network switches need to be updated and will run the platform layer validation tests.

```
./update_bnt.sh validate
```

Example Output:

```
$ ./update_bnt.sh validate
20220921_124440 (reverseflash01:update_bnt.sh): Starting date: Wed Sep 21 12:44:40 EDT 2022.
20220921_124440 (reverseflash01:update_bnt.sh): Running validation.
20220921_124440 (reverseflash01:update_bnt.sh): Collecting switch types.
20220921_124441 (reverseflash01:update_bnt.sh): Loading available updates.
20220921_124442 (reverseflash01:update_bnt.sh): Found server 'net0' which requires an update.
20220921_124442 (reverseflash01:update_bnt.sh): Found server 'net1' which requires an update.
20220921_124442 (reverseflash01:update_bnt.sh): Found server 'net2' which requires an update.
20220921_124442 (reverseflash01:update_bnt.sh): Found server 'net3' which requires an update.
20220921_124442 (reverseflash01:update_bnt.sh): Found the following model:target versions.
7.11.24.0:/BCU_share/FP9_FP5/firmware/net/:G8052:net0,net1 7.11.24.0:/BCU_share/FP9_FP5/firmware/net/:G8264:net2,net3.
20220921_124442 (reverseflash01:update_bnt.sh): Running '/opt/ibm/aixappl/pflayer/bin/icmnds/appl_ctrl_net update -validate -l
net0,net1,net2,net3 -f /BCU_share/FP9_FP5/firmware/net/'.
BNT:net3:172.23.1.251:0:Validation process completed:Configuration backup process success for 172.23.1.251.
BNT:net1:172.23.1.253:0:Validation process completed:Configuration backup process success for 172.23.1.253.
BNT:net0:172.23.1.254:0:Validation process completed:Configuration backup process success for 172.23.1.254.
BNT:net2:172.23.1.252:0:Validation process completed:Configuration backup process success for 172.23.1.252.
20220921_124517 (reverseflash01:update_bnt.sh): Verifying all nodes are quiesced.
reverseflash01: Host is quiesced.
reverseflash02: Host is quiesced.
reverseflash03: Host is quiesced.
reverseflash05: Host is quiesced.
reverseflash04: Host is quiesced.
reverseflash06: Host is quiesced.
20220921_124522 (reverseflash01:update_bnt.sh): Script './update_bnt.sh' with arguments 'validate' ended with rc='0'. Start: Wed
Sep 21 12:44:40 EDT 2022 End: Wed Sep 21 12:45:22 EDT 2022. Elapsed Time (Seconds): 42 (H:M:S):(00:00:42).
20220921_124522 (reverseflash01:update_bnt.sh): Normalizing management hostname.
20220921_124522 (reverseflash01:update_bnt.sh): Management hostname is 'reverseflash01'.
20220921_124522 (reverseflash01:update_bnt.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from script
'./update_bnt.sh'.' to 'user@company.com' '-c root@localhost'.
20220921_124522 (reverseflash01:update_bnt.sh): Notification sent.

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

2. Command: Update the BNT network switches. This may or may not result in a loss of access to the session. This command will rerun the validate step which checks that all hosts are quiesced. The platform layer will attempt to copy the OS and boot images to each switch. If this fails on any switch the platform layer will stop. The 1Gb switches will reboot faster than the 10Gb switches. If not running in a vtmenu or screen session there will be no output after the `app_ctrl_net` update command however all switches should reboot and complete their update.

```
./update_bnt.sh update
```

Example Output:

```
$ ./update_bnt.sh update
20220921_124547 (reverseflash01:update_bnt.sh): Starting date: Wed Sep 21 12:45:47 EDT 2022.
20220921_124547 (reverseflash01:update_bnt.sh): Running update.
20220921_124547 (reverseflash01:update_bnt.sh): Running validation.
20220921_124547 (reverseflash01:update_bnt.sh): Collecting switch types.
20220921_124548 (reverseflash01:update_bnt.sh): Loading available updates.
20220921_124548 (reverseflash01:update_bnt.sh): Found server 'net0' which requires an update.
20220921_124548 (reverseflash01:update_bnt.sh): Found server 'net1' which requires an update.
20220921_124549 (reverseflash01:update_bnt.sh): Found server 'net2' which requires an update.
20220921_124549 (reverseflash01:update_bnt.sh): Found server 'net3' which requires an update.
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
20220921_124549 (reverseflash01:update_bnt.sh): Found the following model:target versions.
7.11.24.0:/BCU_share/FP9_FP5/firmware/net/:G8052:net0,net1 7.11.24.0:/BCU_share/FP9_FP5/firmware/net/:G8264:net2,net3.
20220921_124549 (reverseflash01:update_bnt.sh): Running '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_net update -validate -l
net0,net1,net2,net3 -f /BCU_share/FP9_FP5/firmware/net/'.
BNT:net1:172.23.1.253:0:Validation process completed:Configuration backup process success for 172.23.1.253.
BNT:net3:172.23.1.251:0:Validation process completed:Configuration backup process success for 172.23.1.251.
BNT:net0:172.23.1.254:0:Validation process completed:Configuration backup process success for 172.23.1.254.
BNT:net2:172.23.1.252:0:Validation process completed:Configuration backup process success for 172.23.1.252.
20220921_124619 (reverseflash01:update_bnt.sh): Verifying all nodes are quiesced.
reverseflash01: Host is quiesced.
reverseflash02: Host is quiesced.
reverseflash04: Host is quiesced.
reverseflash05: Host is quiesced.
reverseflash03: Host is quiesced.
reverseflash06: Host is quiesced.
20220921_124625 (reverseflash01:update_bnt.sh): Running '/opt/ibm/aixappl/pfplayer/bin/icmds/appl_ctrl_net update -install -l
net0,net1,net2,net3 -f /BCU_share/FP9_FP5/firmware/net/'.
BNT:net2:172.23.1.252:0:Ping success for Switch: 172.23.1.252.
BNT:net0:172.23.1.254:0:Ping success for Switch: 172.23.1.254.
BNT:net1:172.23.1.253:0:Ping success for Switch: 172.23.1.253.
BNT:net3:172.23.1.251:0:Ping success for Switch: 172.23.1.251.
20220921_130939 (reverseflash01:update_bnt.sh): Script './update_bnt.sh' with arguments 'update' ended with rc='0'. Start: Wed
Sep 21 12:45:47 EDT 2022 End: Wed Sep 21 13:09:39 EDT 2022. Elapsed Time (Seconds): 1432 (H:M:S):(00:23:52).
20220921_130939 (reverseflash01:update_bnt.sh): Normalizing management hostname.
20220921_130940 (reverseflash01:update_bnt.sh): Management hostname is 'reverseflash01'.
20220921_130940 (reverseflash01:update_bnt.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from script
'./update_bnt.sh'.' to 'user@company.com' '-c root@localhost'.
20220921_130940 (reverseflash01:update_bnt.sh): Notification sent.
You have mail in /usr/spool/mail/root

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

3. Command: Verify the update. The FWLevel should be 7.11.24.0 for all switches. In practice the 1Gb switches failed Host Key verification. Proceed to 4 if any switches show the WARNING.

```
appl_ls_hw -r net -A Logical_name | sed 's'|lg' | while read x;do $PL_ROOT/bin/icmds/appl_ctrl_net query -l ${x};done
```

Example Output:

```
$ appl_ls_hw -r net -A Logical_name | sed 's'|lg' | while read x;do $PL_ROOT/bin/icmds/appl_ctrl_net query -l ${x};done
password :
spawn ssh 172.23.1.254 -l admin
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
@   WARNING: REMOTE HOST IDENTIFICATION HAS CHANGED!   @
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
IT IS POSSIBLE THAT SOMEONE IS DOING SOMETHING NASTY!
Someone could be eavesdropping on you right now (man-in-the-middle attack)!
It is also possible that a host key has just been changed.
The fingerprint for the RSA key sent by the remote host is
SHA256:30zLvTH8JtRF2kNHqV+JPFM6Jzft6Ncgd5bBPn1UUm0.
Please contact your system administrator.
Add correct host key in /.ssh/known_hosts to get rid of this message.
Offending DSA key in /.ssh/known_hosts:15
RSA host key for 172.23.1.254 has changed and you have requested strict checking.
Host key verification failed.
Details:
  Status: Online
  Manufacturer: -
  AccessState: Locked
  Model: -
  SerialNumber: -
  FWLevel: -
  Description: -
  IPv4Address: ["172.23.1.254"]
  MachineType: -
  PLLocalName: net0
password :
spawn ssh 172.23.1.253 -l admin
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
@   WARNING: REMOTE HOST IDENTIFICATION HAS CHANGED!   @
@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@@
IT IS POSSIBLE THAT SOMEONE IS DOING SOMETHING NASTY!
Someone could be eavesdropping on you right now (man-in-the-middle attack)!
It is also possible that a host key has just been changed.
The fingerprint for the RSA key sent by the remote host is
SHA256:iVxZinznW5RsTX6iDsSSJTxpGIMvFTUppb+8kKP0lks.
Please contact your system administrator.
Add correct host key in /.ssh/known_hosts to get rid of this message.
Offending DSA key in /.ssh/known_hosts:12
RSA host key for 172.23.1.253 has changed and you have requested strict checking.
Host key verification failed.
Details:
  Model: -
```


STAGE 8 - CORE NODES update in DOWNTIME window

```
FWLevel: -
AccessState: Locked
IPv4Address: ["172.23.1.253"]
MachineType: -
Manufacturer: -
PLLogicalName: net1
Status: Online
SerialNumber: -
Description: -
Details:
AccessState: Unlocked
MachineType: -
PLLogicalName: net2
IPv4Address: ["172.23.1.252"]
Description: BNT
Status: Online
SerialNumber: YL11CM4BJ033
Manufacturer: IBM
FWLevel: 7.11.24.0
Model: G8264
Details:
IPv4Address: ["172.23.1.251"]
Manufacturer: IBM
Model: G8264
Description: BNT
FWLevel: 7.11.24.0
AccessState: Unlocked
SerialNumber: YL11CM53L012
PLLogicalName: net3
MachineType: -
Status: Online

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

STAGE 8 - CORE NODES update in DOWNTIME window

4. Command: Reset the SSH host keys from the BNT switches in root's `/.ssh/known_hosts` file. Proceed to 5 after the rest to verify the BNT levels.

```
appl_ls_hw -r net -A M_IP_address < /dev/null | sed 's|\"|g' | while read ip;do echo "Removing '${ip}' from known_hosts.";ssh-keygen -R ${ip};ssh-keyscan ${ip} >> /.ssh/known_hosts;diff /.ssh/known_hosts /.ssh/known_hosts.old;sleep 1;done
```

Example Output:

```
$ appl_ls_hw -r net -A M_IP_address < /dev/null | sed 's|\"|g' | while read ip;do echo "Removing '${ip}' from known_hosts.";ssh-keygen -R ${ip};ssh-keyscan ${ip} >> /.ssh/known_hosts;diff /.ssh/known_hosts /.ssh/known_hosts.old;sleep 1;done
Removing '172.23.1.254' from known_hosts.
# Host 172.23.1.254 found: line 43
/.ssh/known_hosts updated.
Original contents retained as /.ssh/known_hosts.old
# 172.23.1.254:22 SSH-2.0-IBM
# 172.23.1.254:22 SSH-2.0-IBM
# 172.23.1.254:22 SSH-2.0-IBM
42a43
> 172.23.1.254 ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQCSVs0E471a+3W4TbG9YGwuZVvJvJk4tPZAiBOHjK82yWbClz+oMgaU3/p9sUyA+T4Tqgx51eJ4Hmn5HmOCEOmPe5gMz65ZE8T5f
8SmJPkrcJw/kK498/b0369nttvqtnSpkSGScTyK3TejuG8pqsNY/5E2ZvR2UmFptsMEPViRE5BqrlzpTPymeYBaBI2eA2ZyqTh63OX61puIEgNjE62mIaTAjiucXquMpS
L4ujtRR4XH8cLKg+cEcF2WJrcoYf6nkmMKk2dqSmi1/C7MzEyKHxQsdbznfCV0rDw+S2X9n4CvaR+XMDI/tT2HtYZv0zzgf2azL4HyUYTGxEYeaB
46d46
< 172.23.1.254 ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQCSVs0E471a+3W4TbG9YGwuZVvJvJk4tPZAiBOHjK82yWbClz+oMgaU3/p9sUyA+T4Tqgx51eJ4Hmn5HmOCEOmPe5gMz65ZE8T5f
8SmJPkrcJw/kK498/b0369nttvqtnSpkSGScTyK3TejuG8pqsNY/5E2ZvR2UmFptsMEPViRE5BqrlzpTPymeYBaBI2eA2ZyqTh63OX61puIEgNjE62mIaTAjiucXquMpS
L4ujtRR4XH8cLKg+cEcF2WJrcoYf6nkmMKk2dqSmi1/C7MzEyKHxQsdbznfCV0rDw+S2X9n4CvaR+XMDI/tT2HtYZv0zzgf2azL4HyUYTGxEYeaB
Removing '172.23.1.253' from known_hosts.
# Host 172.23.1.253 found: line 43
/.ssh/known_hosts updated.
Original contents retained as /.ssh/known_hosts.old
# 172.23.1.253:22 SSH-2.0-IBM
# 172.23.1.253:22 SSH-2.0-IBM
# 172.23.1.253:22 SSH-2.0-IBM
42a43
> 172.23.1.253 ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQCSVs0E471a+3W4TbG9YGwuZVvJvJk4tPZAiBOHjK82yWbClz+oMgaU3/p9sUyA+T4Tqgx51eJ4Hmn5HmOCEOmPe5gMz65ZE8T5f
8SmJPkrcJw/kK498/b0369nttvqtnSpkSGScTyK3TejuG8pqsNY/5E2ZvR2UmFptsMEPViRE5BqrlzpTPymeYBaBI2eA2ZyqTh63OX61puIEgNjE62mIaTAjiucXquMpS
L4ujtRR4XH8cLKg+cEcF2WJrcoYf6nkmMKk2dqSmi1/C7MzEyKHxQsdbznfCV0rDw+S2X9n4CvaR+XMDI/tT2HtYZv0zzgf2azL4HyUYTGxEYeaB
j76rnZA2kE1MuA+Q5m7SyCYia2W1EIs+AvtV61DS5cSRPNuShP+/aBSUpXwx4Q+f6BLVek2Jmgs05R6+xlDtGbBm2vqP5g3XNZyy33JkRB9+op+uB7
46d46
< 172.23.1.253 ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQCSVs0E471a+3W4TbG9YGwuZVvJvJk4tPZAiBOHjK82yWbClz+oMgaU3/p9sUyA+T4Tqgx51eJ4Hmn5HmOCEOmPe5gMz65ZE8T5f
8SmJPkrcJw/kK498/b0369nttvqtnSpkSGScTyK3TejuG8pqsNY/5E2ZvR2UmFptsMEPViRE5BqrlzpTPymeYBaBI2eA2ZyqTh63OX61puIEgNjE62mIaTAjiucXquMpS
L4ujtRR4XH8cLKg+cEcF2WJrcoYf6nkmMKk2dqSmi1/C7MzEyKHxQsdbznfCV0rDw+S2X9n4CvaR+XMDI/tT2HtYZv0zzgf2azL4HyUYTGxEYeaB
j76rnZA2kE1MuA+Q5m7SyCYia2W1EIs+AvtV61DS5cSRPNuShP+/aBSUpXwx4Q+f6BLVek2Jmgs05R6+xlDtGbBm2vqP5g3XNZyy33JkRB9+op+uB7
Removing '172.23.1.252' from known_hosts.
# Host 172.23.1.252 found: line 43
/.ssh/known_hosts updated.
Original contents retained as /.ssh/known_hosts.old
# 172.23.1.252:22 SSH-2.0-IBM
# 172.23.1.252:22 SSH-2.0-IBM
# 172.23.1.252:22 SSH-2.0-IBM
42a43
> 172.23.1.252 ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQCSVs0E471a+3W4TbG9YGwuZVvJvJk4tPZAiBOHjK82yWbClz+oMgaU3/p9sUyA+T4Tqgx51eJ4Hmn5HmOCEOmPe5gMz65ZE8T5f
8SmJPkrcJw/kK498/b0369nttvqtnSpkSGScTyK3TejuG8pqsNY/5E2ZvR2UmFptsMEPViRE5BqrlzpTPymeYBaBI2eA2ZyqTh63OX61puIEgNjE62mIaTAjiucXquMpS
L4ujtRR4XH8cLKg+cEcF2WJrcoYf6nkmMKk2dqSmi1/C7MzEyKHxQsdbznfCV0rDw+S2X9n4CvaR+XMDI/tT2HtYZv0zzgf2azL4HyUYTGxEYeaB
j76rnZA2kE1MuA+Q5m7SyCYia2W1EIs+AvtV61DS5cSRPNuShP+/aBSUpXwx4Q+f6BLVek2Jmgs05R6+xlDtGbBm2vqP5g3XNZyy33JkRB9+op+uB7
RpmHj2h7LthIfGTyIhGLzgaU0rUgeW7IXMV4kLAhrblPcr875NbyigjR0INsgRsXq0mF8kgDQ==
46d46
< 172.23.1.252 ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQCSVs0E471a+3W4TbG9YGwuZVvJvJk4tPZAiBOHjK82yWbClz+oMgaU3/p9sUyA+T4Tqgx51eJ4Hmn5HmOCEOmPe5gMz65ZE8T5f
8SmJPkrcJw/kK498/b0369nttvqtnSpkSGScTyK3TejuG8pqsNY/5E2ZvR2UmFptsMEPViRE5BqrlzpTPymeYBaBI2eA2ZyqTh63OX61puIEgNjE62mIaTAjiucXquMpS
L4ujtRR4XH8cLKg+cEcF2WJrcoYf6nkmMKk2dqSmi1/C7MzEyKHxQsdbznfCV0rDw+S2X9n4CvaR+XMDI/tT2HtYZv0zzgf2azL4HyUYTGxEYeaB
j76rnZA2kE1MuA+Q5m7SyCYia2W1EIs+AvtV61DS5cSRPNuShP+/aBSUpXwx4Q+f6BLVek2Jmgs05R6+xlDtGbBm2vqP5g3XNZyy33JkRB9+op+uB7
RpmHj2h7LthIfGTyIhGLzgaU0rUgeW7IXMV4kLAhrblPcr875NbyigjR0INsgRsXq0mF8kgDQ==
Removing '172.23.1.251' from known_hosts.
# Host 172.23.1.251 found: line 43
/.ssh/known_hosts updated.
Original contents retained as /.ssh/known_hosts.old
# 172.23.1.251:22 SSH-2.0-IBM
# 172.23.1.251:22 SSH-2.0-IBM
# 172.23.1.251:22 SSH-2.0-IBM
42a43
> 172.23.1.251 ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQCSVs0E471a+3W4TbG9YGwuZVvJvJk4tPZAiBOHjK82yWbClz+oMgaU3/p9sUyA+T4Tqgx51eJ4Hmn5HmOCEOmPe5gMz65ZE8T5f
8SmJPkrcJw/kK498/b0369nttvqtnSpkSGScTyK3TejuG8pqsNY/5E2ZvR2UmFptsMEPViRE5BqrlzpTPymeYBaBI2eA2ZyqTh63OX61puIEgNjE62mIaTAjiucXquMpS
L4ujtRR4XH8cLKg+cEcF2WJrcoYf6nkmMKk2dqSmi1/C7MzEyKHxQsdbznfCV0rDw+S2X9n4CvaR+XMDI/tT2HtYZv0zzgf2azL4HyUYTGxEYeaB
j76rnZA2kE1MuA+Q5m7SyCYia2W1EIs+AvtV61DS5cSRPNuShP+/aBSUpXwx4Q+f6BLVek2Jmgs05R6+xlDtGbBm2vqP5g3XNZyy33JkRB9+op+uB7
RpmHj2h7LthIfGTyIhGLzgaU0rUgeW7IXMV4kLAhrblPcr875NbyigjR0INsgRsXq0mF8kgDQ==
MspmGG2PN1ORS7xD8wKgRvgyEUR4X6xfpR0opWfg82CeinMaVjVIEd/eFhbE7Z6pr0Xbnxw==
46d46
< 172.23.1.251 ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAQCSVs0E471a+3W4TbG9YGwuZVvJvJk4tPZAiBOHjK82yWbClz+oMgaU3/p9sUyA+T4Tqgx51eJ4Hmn5HmOCEOmPe5gMz65ZE8T5f
8SmJPkrcJw/kK498/b0369nttvqtnSpkSGScTyK3TejuG8pqsNY/5E2ZvR2UmFptsMEPViRE5BqrlzpTPymeYBaBI2eA2ZyqTh63OX61puIEgNjE62mIaTAjiucXquMpS
L4ujtRR4XH8cLKg+cEcF2WJrcoYf6nkmMKk2dqSmi1/C7MzEyKHxQsdbznfCV0rDw+S2X9n4CvaR+XMDI/tT2HtYZv0zzgf2azL4HyUYTGxEYeaB
j76rnZA2kE1MuA+Q5m7SyCYia2W1EIs+AvtV61DS5cSRPNuShP+/aBSUpXwx4Q+f6BLVek2Jmgs05R6+xlDtGbBm2vqP5g3XNZyy33JkRB9+op+uB7
RpmHj2h7LthIfGTyIhGLzgaU0rUgeW7IXMV4kLAhrblPcr875NbyigjR0INsgRsXq0mF8kgDQ==
MspmGG2PN1ORS7xD8wKgRvgyEUR4X6xfpR0opWfg82CeinMaVjVIEd/eFhbE7Z6pr0Xbnxw==
```

```
(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

STAGE 8 - CORE NODES update in DOWNTIME window

5. Command: Rerun the level check. BNT FWLevel should all be 7.11.24.0.

```
appl_ls_hw -r net -A Logical_name | sed 's|'|g' | while read x;do $PL_ROOT/bin/icmds/appl_ctrl_net query -l ${x};done
```

Example Output:

```
$ appl_ls_hw -r net -A Logical_name | sed 's|'|g' | while read x;do $PL_ROOT/bin/icmds/appl_ctrl_net query -l ${x};done
Details:
Description: BNT
PLLogicalName: net0
IPv4Address: ["172.23.1.254"]
Model: G8052
AccessState: Unlocked
FWLevel: 7.11.24.0
MachineType: -
Manufacturer: IBM
SerialNumber: Y014CM53F482
Status: Online
Details:
Description: BNT
AccessState: Unlocked
Model: G8052
MachineType: -
SerialNumber: Y014CM4C3028
PLLogicalName: net1
Status: Online
FWLevel: 7.11.24.0
IPv4Address: ["172.23.1.253"]
Manufacturer: IBM
Details:
IPv4Address: ["172.23.1.252"]
MachineType: -
Status: Online
Model: G8264
PLLogicalName: net2
SerialNumber: YL11CM4BJ033
Manufacturer: IBM
AccessState: Unlocked
Description: BNT
FWLevel: 7.11.24.0
Details:
IPv4Address: ["172.23.1.251"]
AccessState: Unlocked
Description: BNT
SerialNumber: YL11CM53L012
FWLevel: 7.11.24.0
Status: Online
Manufacturer: IBM
PLLogicalName: net3
MachineType: -
Model: G8264
```

6. Command: Verify all AIX LPARs have fully SYNC etherchannel adapters. Management LPARs have 2 adapters and core LPARs have 4 adapters.

```
dsh -n ${ALL} 'entstat -d ent11 | egrep "Number of adapters|Aggregation:|Synchronization" | sort | uniq -c' | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} 'entstat -d ent11 | egrep "Number of adapters|Aggregation:|Synchronization" | sort | uniq -c' | dshbak -c
HOSTS -----
flashdancehostname01, flashdancehostname03
-----
 4          Aggregation: Aggregatable
 4          Synchronization: IN_SYNC
 1 Number of adapters: 2
 2 Receive TCP Segment Aggregation: Enabled
 1 Statistics for every adapter in the IEEE 802.3ad Link Aggregation:

HOSTS -----
flashdancehostname02, flashdancehostname04, flashdancehostname05, flashdancehostname06, flashdancehostname07
-----
 8          Aggregation: Aggregatable
 8          Synchronization: IN_SYNC
 1 Number of adapters: 4
 4 Receive TCP Segment Aggregation: Enabled
 1 Statistics for every adapter in the IEEE 802.3ad Link Aggregation:

(0) root @ flashdancehostname01: 7.1.0.0: /
```

STAGE 8 - CORE NODES update in DOWNTIME window

Phase 3: Update GPFS on the core hosts.

1. Command: Run the GPFS validation script on the core hosts. This will show that the current version is 4.2.3.17 with 2 updates available, 5.1.1.0 and 5.1.1.4. . Note: FP4 customers will show 5.0.5.4. FP3 customers will show 4.2.3.17. FP2->FP4 customers will start at 4.2.3.7.

```
dsh -f 1 -n ${BCUDB2ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh validate' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -f 1 -n ${BCUDB2ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh validate' 2>&1 | dshbak -c
HOSTS -----
reverseflash02
-----
20220921_133703 (reverseflash02:gpfs_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_133703 (reverseflash02:gpfs_utility.sh): Starting date: Wed Sep 21 13:37:03 EDT 2022.
20220921_133703 (reverseflash02:gpfs_utility.sh): Checking current gpfs version.
20220921_133703 (reverseflash02:gpfs_utility.sh): My GPFS version is '5.0.5.4'.
20220921_133703 (reverseflash02:gpfs_utility.sh): Checking for available gpfs updates.
20220921_133703 (reverseflash02:gpfs_utility.sh): Found GPFS version '4.2.3.0'.
20220921_133703 (reverseflash02:gpfs_utility.sh): Found GPFS version '4.2.3.7'.
20220921_133703 (reverseflash02:gpfs_utility.sh): Found GPFS version '4.2.3.17'.
20220921_133703 (reverseflash02:gpfs_utility.sh): Found GPFS version '5.0.5.0'.
20220921_133703 (reverseflash02:gpfs_utility.sh): Found GPFS version '5.0.5.4'.
20220921_133703 (reverseflash02:gpfs_utility.sh): Found GPFS version '5.1.1.0'.
20220921_133703 (reverseflash02:gpfs_utility.sh): Found GPFS version '5.1.1.4'.
20220921_133703 (reverseflash02:gpfs_utility.sh): There is an available update for this host.
20220921_133705 (reverseflash02:gpfs_utility.sh): validate completed on this host.
20220921_133705 (reverseflash02:gpfs_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh' with
arguments 'validate' ended with rc='0'. Start: Wed Sep 21 13:37:03 EDT 2022 End: Wed Sep 21 13:37:05 EDT 2022. Elapsed Time
(Seconds): 2 (H:M:S):(00:00:02).
20220921_133707 (reverseflash02:gpfs_utility.sh): Normalizing management hostname.
20220921_133708 (reverseflash02:gpfs_utility.sh): Management hostname is 'reverseflash01'.
20220921_133708 (reverseflash02:gpfs_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash02' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_133709 (reverseflash02:gpfs_utility.sh): Notification sent.

HOSTS -----
reverseflash04
-----
20220921_133709 (reverseflash04:gpfs_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_133709 (reverseflash04:gpfs_utility.sh): Starting date: Wed Sep 21 13:37:09 EDT 2022.
20220921_133709 (reverseflash04:gpfs_utility.sh): Checking current gpfs version.
20220921_133709 (reverseflash04:gpfs_utility.sh): My GPFS version is '5.0.5.4'.
20220921_133709 (reverseflash04:gpfs_utility.sh): Checking for available gpfs updates.
20220921_133709 (reverseflash04:gpfs_utility.sh): Found GPFS version '4.2.3.0'.
20220921_133709 (reverseflash04:gpfs_utility.sh): Found GPFS version '4.2.3.7'.
20220921_133709 (reverseflash04:gpfs_utility.sh): Found GPFS version '4.2.3.17'.
20220921_133710 (reverseflash04:gpfs_utility.sh): Found GPFS version '5.0.5.0'.
20220921_133710 (reverseflash04:gpfs_utility.sh): Found GPFS version '5.0.5.4'.
20220921_133710 (reverseflash04:gpfs_utility.sh): Found GPFS version '5.1.1.0'.
20220921_133710 (reverseflash04:gpfs_utility.sh): Found GPFS version '5.1.1.4'.
20220921_133710 (reverseflash04:gpfs_utility.sh): There is an available update for this host.
20220921_133710 (reverseflash04:gpfs_utility.sh): validate completed on this host.
20220921_133710 (reverseflash04:gpfs_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh' with
arguments 'validate' ended with rc='0'. Start: Wed Sep 21 13:37:09 EDT 2022 End: Wed Sep 21 13:37:10 EDT 2022. Elapsed Time
(Seconds): 1 (H:M:S):(00:00:01).
20220921_133712 (reverseflash04:gpfs_utility.sh): Normalizing management hostname.
20220921_133712 (reverseflash04:gpfs_utility.sh): Management hostname is 'reverseflash01'.
20220921_133712 (reverseflash04:gpfs_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash04' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_133713 (reverseflash04:gpfs_utility.sh): Notification sent.

HOSTS -----
reverseflash05
-----
20220921_133713 (reverseflash05:gpfs_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_133714 (reverseflash05:gpfs_utility.sh): Starting date: Wed Sep 21 13:37:14 EDT 2022.
20220921_133714 (reverseflash05:gpfs_utility.sh): Checking current gpfs version.
20220921_133714 (reverseflash05:gpfs_utility.sh): My GPFS version is '5.0.5.4'.
20220921_133714 (reverseflash05:gpfs_utility.sh): Checking for available gpfs updates.
20220921_133714 (reverseflash05:gpfs_utility.sh): Found GPFS version '4.2.3.0'.
20220921_133714 (reverseflash05:gpfs_utility.sh): Found GPFS version '4.2.3.7'.
20220921_133714 (reverseflash05:gpfs_utility.sh): Found GPFS version '4.2.3.17'.
20220921_133714 (reverseflash05:gpfs_utility.sh): Found GPFS version '5.0.5.0'.
20220921_133714 (reverseflash05:gpfs_utility.sh): Found GPFS version '5.0.5.4'.
20220921_133714 (reverseflash05:gpfs_utility.sh): Found GPFS version '5.1.1.0'.
20220921_133714 (reverseflash05:gpfs_utility.sh): Found GPFS version '5.1.1.4'.
20220921_133714 (reverseflash05:gpfs_utility.sh): There is an available update for this host.
20220921_133714 (reverseflash05:gpfs_utility.sh): validate completed on this host.
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
20220921_133714 (reverseflash05:gpfs_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh' with arguments 'validate' ended with rc='0'. Start: Wed Sep 21 13:37:14 EDT 2022 End: Wed Sep 21 13:37:14 EDT 2022. Elapsed Time (Seconds): 1 (H:M:S): (00:00:01).
20220921_133716 (reverseflash05:gpfs_utility.sh): Normalizing management hostname.
20220921_133717 (reverseflash05:gpfs_utility.sh): Management hostname is 'reverseflash01'.
20220921_133717 (reverseflash05:gpfs_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash05' from script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_133717 (reverseflash05:gpfs_utility.sh): Notification sent.
```

```
HOSTS -----
reverseflash06
-----
20220921_133718 (reverseflash06:gpfs_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_133718 (reverseflash06:gpfs_utility.sh): Starting date: Wed Sep 21 13:37:18 EDT 2022.
20220921_133718 (reverseflash06:gpfs_utility.sh): Checking current gpfs version.
20220921_133718 (reverseflash06:gpfs_utility.sh): My GPFS version is '5.0.5.4'.
20220921_133718 (reverseflash06:gpfs_utility.sh): Checking for available gpfs updates.
20220921_133718 (reverseflash06:gpfs_utility.sh): Found GPFS version '4.2.3.0'.
20220921_133718 (reverseflash06:gpfs_utility.sh): Found GPFS version '4.2.3.7'.
20220921_133719 (reverseflash06:gpfs_utility.sh): Found GPFS version '4.2.3.17'.
20220921_133719 (reverseflash06:gpfs_utility.sh): Found GPFS version '5.0.5.0'.
20220921_133719 (reverseflash06:gpfs_utility.sh): Found GPFS version '5.0.5.4'.
20220921_133719 (reverseflash06:gpfs_utility.sh): Found GPFS version '5.1.1.0'.
20220921_133719 (reverseflash06:gpfs_utility.sh): Found GPFS version '5.1.1.4'.
20220921_133719 (reverseflash06:gpfs_utility.sh): There is an available update for this host.
20220921_133719 (reverseflash06:gpfs_utility.sh): validate completed on this host.
20220921_133719 (reverseflash06:gpfs_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh' with arguments 'validate' ended with rc='0'. Start: Wed Sep 21 13:37:18 EDT 2022 End: Wed Sep 21 13:37:19 EDT 2022. Elapsed Time (Seconds): 1 (H:M:S): (00:00:01).
20220921_133721 (reverseflash06:gpfs_utility.sh): Normalizing management hostname.
20220921_133722 (reverseflash06:gpfs_utility.sh): Management hostname is 'reverseflash01'.
20220921_133722 (reverseflash06:gpfs_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash06' from script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_133722 (reverseflash06:gpfs_utility.sh): Notification sent.
```

(0) root @ reverseflash01: 7.2.0.0:/BCU_share/FP9_FP5/fixpack_tools/application

2. Command: Update GPFS to 5.0.5.0. This is the first of two updates, similar to what happened in Stage06 with the management hosts.

```
dsh -n ${BCUDB2ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh update' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUDB2ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh update' 2>&1 | dshbak -c
HOSTS -----
reverseflash02
-----
20220921_133849 (reverseflash02:gpfs_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_133849 (reverseflash02:gpfs_utility.sh): Starting date: Wed Sep 21 13:38:49 EDT 2022.
20220921_133849 (reverseflash02:gpfs_utility.sh): Checking current gpfs version.
20220921_133849 (reverseflash02:gpfs_utility.sh): My GPFS version is '5.0.5.4'.
20220921_133849 (reverseflash02:gpfs_utility.sh): Checking for available gpfs updates.
20220921_133849 (reverseflash02:gpfs_utility.sh): Found GPFS version '4.2.3.0'.
20220921_133849 (reverseflash02:gpfs_utility.sh): Found GPFS version '4.2.3.7'.
20220921_133849 (reverseflash02:gpfs_utility.sh): Found GPFS version '4.2.3.17'.
20220921_133849 (reverseflash02:gpfs_utility.sh): Found GPFS version '5.0.5.0'.
20220921_133849 (reverseflash02:gpfs_utility.sh): Found GPFS version '5.0.5.4'.
20220921_133849 (reverseflash02:gpfs_utility.sh): Found GPFS version '5.1.1.0'.
20220921_133849 (reverseflash02:gpfs_utility.sh): Found GPFS version '5.1.1.4'.
20220921_133849 (reverseflash02:gpfs_utility.sh): There is an available update for this host.
20220921_133849 (reverseflash02:gpfs_utility.sh): Verifying this host is ready to update.
20220921_133849 (reverseflash02:check_server_state.sh): Starting date: Wed Sep 21 13:38:49 EDT 2022.
20220921_133849 (reverseflash02:check_server_state.sh): Running command '/usr/lpp/mmfs/bin/mmfsenv -u'.
20220921_133850 (reverseflash02:check_server_state.sh): Ran command '/usr/lpp/mmfs/bin/mmfsenv -u' with rc='0'.
20220921_133852 (reverseflash02:check_server_state.sh): GPFS State: 'down'.
20220921_133852 (reverseflash02:check_server_state.sh): Starting date: Wed Sep 21 13:38:49 EDT 2022 Ending Date: Wed Sep 21 13:38:52 EDT 2022.
20220921_133852 (reverseflash02:gpfs_utility.sh): Updating GPFS.
20220921_133852 (reverseflash02:gpfs_utility.sh): Running cmd 'installp -agXYd /BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.0-ppc64-AIX-install.tgz_extract gpfs' to update gpfs to version '5.1.1.0'.
20220921_134020 (reverseflash02:gpfs_utility.sh): The command 'installp -agXYd /BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.0-ppc64-AIX-install.tgz_extract gpfs' returned '0'.
20220921_134020 (reverseflash02:gpfs_utility.sh): update completed on this host.
20220921_134020 (reverseflash02:gpfs_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh' with arguments 'update' ended with rc='0'. Start: Wed Sep 21 13:38:49 EDT 2022 End: Wed Sep 21 13:40:20 EDT 2022. Elapsed Time (Seconds): 91 (H:M:S): (00:01:31).
20220921_134022 (reverseflash02:gpfs_utility.sh): Normalizing management hostname.
20220921_134022 (reverseflash02:gpfs_utility.sh): Management hostname is 'reverseflash01'.
20220921_134022 (reverseflash02:gpfs_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash02' from script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_134023 (reverseflash02:gpfs_utility.sh): Notification sent.
```

HOSTS -----

STAGE 8 - CORE NODES update in DOWNTIME window

```
reverseflash05
-----
20220921_133849 (reverseflash05:gpfs_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_133849 (reverseflash05:gpfs_utility.sh): Starting date: Wed Sep 21 13:38:49 EDT 2022.
20220921_133849 (reverseflash05:gpfs_utility.sh): Checking current gpfs version.
20220921_133849 (reverseflash05:gpfs_utility.sh): My GPFS version is '5.0.5.4'.
20220921_133849 (reverseflash05:gpfs_utility.sh): Checking for available gpfs updates.
20220921_133849 (reverseflash05:gpfs_utility.sh): Found GPFS version '4.2.3.0'.
20220921_133849 (reverseflash05:gpfs_utility.sh): Found GPFS version '4.2.3.7'.
20220921_133850 (reverseflash05:gpfs_utility.sh): Found GPFS version '4.2.3.17'.
20220921_133850 (reverseflash05:gpfs_utility.sh): Found GPFS version '5.0.5.0'.
20220921_133850 (reverseflash05:gpfs_utility.sh): Found GPFS version '5.0.5.4'.
20220921_133850 (reverseflash05:gpfs_utility.sh): Found GPFS version '5.1.1.0'.
20220921_133850 (reverseflash05:gpfs_utility.sh): Found GPFS version '5.1.1.4'.
20220921_133850 (reverseflash05:gpfs_utility.sh): There is an available update for this host.
20220921_133850 (reverseflash05:gpfs_utility.sh): Verifying this host is ready to update.
20220921_133850 (reverseflash05:check_server_state.sh): Starting date: Wed Sep 21 13:38:50 EDT 2022.
20220921_133850 (reverseflash05:check_server_state.sh): Running command '/usr/lpp/mmfs/bin/mmfsenv -u'.
20220921_133851 (reverseflash05:check_server_state.sh): Ran command '/usr/lpp/mmfs/bin/mmfsenv -u' with rc='0'.
20220921_133854 (reverseflash05:check_server_state.sh): GPFS State: 'down'.
20220921_133854 (reverseflash05:check_server_state.sh): Starting date: Wed Sep 21 13:38:50 EDT 2022   Ending Date: Wed Sep 21
13:38:54 EDT 2022.
20220921_133854 (reverseflash05:gpfs_utility.sh): Updating GPFS.
20220921_133854 (reverseflash05:gpfs_utility.sh): Running cmd 'installp -agXYd
/BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.0-ppc64-AIX-install.tgz_extract gpfs' to update gpfs to
version '5.1.1.0'.
20220921_134022 (reverseflash05:gpfs_utility.sh): The command 'installp -agXYd
/BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.0-ppc64-AIX-install.tgz_extract gpfs' returned '0'.
20220921_134022 (reverseflash05:gpfs_utility.sh): update completed on this host.
20220921_134022 (reverseflash05:gpfs_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh' with
arguments 'update' ended with rc='0'. Start: Wed Sep 21 13:38:49 EDT 2022 End: Wed Sep 21 13:40:22 EDT 2022. Elapsed Time
(Seconds): 93 (H:M:S):(00:01:33).
20220921_134024 (reverseflash05:gpfs_utility.sh): Normalizing management hostname.
20220921_134025 (reverseflash05:gpfs_utility.sh): Management hostname is 'reverseflash01'.
20220921_134025 (reverseflash05:gpfs_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash05' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_134025 (reverseflash05:gpfs_utility.sh): Notification sent.

HOSTS -----
reverseflash06
-----
20220921_133849 (reverseflash06:gpfs_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_133849 (reverseflash06:gpfs_utility.sh): Starting date: Wed Sep 21 13:38:49 EDT 2022.
20220921_133849 (reverseflash06:gpfs_utility.sh): Checking current gpfs version.
20220921_133849 (reverseflash06:gpfs_utility.sh): My GPFS version is '5.0.5.4'.
20220921_133849 (reverseflash06:gpfs_utility.sh): Checking for available gpfs updates.
20220921_133849 (reverseflash06:gpfs_utility.sh): Found GPFS version '4.2.3.0'.
20220921_133849 (reverseflash06:gpfs_utility.sh): Found GPFS version '4.2.3.7'.
20220921_133850 (reverseflash06:gpfs_utility.sh): Found GPFS version '4.2.3.17'.
20220921_133850 (reverseflash06:gpfs_utility.sh): Found GPFS version '5.0.5.0'.
20220921_133850 (reverseflash06:gpfs_utility.sh): Found GPFS version '5.0.5.4'.
20220921_133850 (reverseflash06:gpfs_utility.sh): Found GPFS version '5.1.1.0'.
20220921_133850 (reverseflash06:gpfs_utility.sh): Found GPFS version '5.1.1.4'.
20220921_133850 (reverseflash06:gpfs_utility.sh): There is an available update for this host.
20220921_133850 (reverseflash06:gpfs_utility.sh): Verifying this host is ready to update.
20220921_133850 (reverseflash06:check_server_state.sh): Starting date: Wed Sep 21 13:38:50 EDT 2022.
20220921_133850 (reverseflash06:check_server_state.sh): Running command '/usr/lpp/mmfs/bin/mmfsenv -u'.
20220921_133851 (reverseflash06:check_server_state.sh): Ran command '/usr/lpp/mmfs/bin/mmfsenv -u' with rc='0'.
20220921_133854 (reverseflash06:check_server_state.sh): GPFS State: 'down'.
20220921_133854 (reverseflash06:check_server_state.sh): Starting date: Wed Sep 21 13:38:50 EDT 2022   Ending Date: Wed Sep 21
13:38:54 EDT 2022.
20220921_133854 (reverseflash06:gpfs_utility.sh): Updating GPFS.
20220921_133854 (reverseflash06:gpfs_utility.sh): Running cmd 'installp -agXYd
/BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.0-ppc64-AIX-install.tgz_extract gpfs' to update gpfs to
version '5.1.1.0'.
20220921_134025 (reverseflash06:gpfs_utility.sh): The command 'installp -agXYd
/BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.0-ppc64-AIX-install.tgz_extract gpfs' returned '0'.
20220921_134025 (reverseflash06:gpfs_utility.sh): update completed on this host.
20220921_134025 (reverseflash06:gpfs_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh' with
arguments 'update' ended with rc='0'. Start: Wed Sep 21 13:38:49 EDT 2022 End: Wed Sep 21 13:40:25 EDT 2022. Elapsed Time
(Seconds): 96 (H:M:S):(00:01:36).
20220921_134027 (reverseflash06:gpfs_utility.sh): Normalizing management hostname.
20220921_134028 (reverseflash06:gpfs_utility.sh): Management hostname is 'reverseflash01'.
20220921_134028 (reverseflash06:gpfs_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash06' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_134029 (reverseflash06:gpfs_utility.sh): Notification sent.

HOSTS -----
reverseflash04
-----
20220921_133849 (reverseflash04:gpfs_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_133849 (reverseflash04:gpfs_utility.sh): Starting date: Wed Sep 21 13:38:49 EDT 2022.
20220921_133849 (reverseflash04:gpfs_utility.sh): Checking current gpfs version.
20220921_133849 (reverseflash04:gpfs_utility.sh): My GPFS version is '5.0.5.4'.
20220921_133849 (reverseflash04:gpfs_utility.sh): Checking for available gpfs updates.
20220921_133849 (reverseflash04:gpfs_utility.sh): Found GPFS version '4.2.3.0'.
20220921_133849 (reverseflash04:gpfs_utility.sh): Found GPFS version '4.2.3.7'.
20220921_133850 (reverseflash04:gpfs_utility.sh): Found GPFS version '4.2.3.17'.
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
20220921_133850 (reverseflash04:gpfs_utility.sh): Found GPFS version '5.0.5.0'.
20220921_133850 (reverseflash04:gpfs_utility.sh): Found GPFS version '5.0.5.4'.
20220921_133850 (reverseflash04:gpfs_utility.sh): Found GPFS version '5.1.1.0'.
20220921_133850 (reverseflash04:gpfs_utility.sh): Found GPFS version '5.1.1.4'.
20220921_133850 (reverseflash04:gpfs_utility.sh): There is an available update for this host.
20220921_133850 (reverseflash04:gpfs_utility.sh): Verifying this host is ready to update.
20220921_133850 (reverseflash04:check_server_state.sh): Starting date: Wed Sep 21 13:38:50 EDT 2022.
20220921_133850 (reverseflash04:check_server_state.sh): Running command '/usr/lpp/mmfs/bin/mmfsenv -u'.
20220921_133851 (reverseflash04:check_server_state.sh): Ran command '/usr/lpp/mmfs/bin/mmfsenv -u' with rc='0'.
20220921_133854 (reverseflash04:check_server_state.sh): GPFS State: 'down'.
20220921_133854 (reverseflash04:check_server_state.sh): Starting date: Wed Sep 21 13:38:50 EDT 2022   Ending Date: Wed Sep 21
13:38:54 EDT 2022.
20220921_133854 (reverseflash04:gpfs_utility.sh): Updating GPFS.
20220921_133854 (reverseflash04:gpfs_utility.sh): Running cmd 'installp -agXYd
/BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.0-ppc64-AIX-install.tgz_extract gpfs' to update gpfs to
version '5.1.1.0'.
20220921_134026 (reverseflash04:gpfs_utility.sh): The command 'installp -agXYd
/BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.0-ppc64-AIX-install.tgz_extract gpfs' returned '0'.
20220921_134026 (reverseflash04:gpfs_utility.sh): update completed on this host.
20220921_134026 (reverseflash04:gpfs_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh' with
arguments 'update' ended with rc='0'. Start: Wed Sep 21 13:38:49 EDT 2022 End: Wed Sep 21 13:40:26 EDT 2022. Elapsed Time
(Seconds): 97 (H:M:S):(00:01:37).
20220921_134028 (reverseflash04:gpfs_utility.sh): Normalizing management hostname.
20220921_134028 (reverseflash04:gpfs_utility.sh): Management hostname is 'reverseflash01'.
20220921_134028 (reverseflash04:gpfs_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash04' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_134029 (reverseflash04:gpfs_utility.sh): Notification sent.
```

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application

3. Command: If all hosts are successful, rerun the validation to prepare for the 5.1.1.4 level. All hosts should show their GPFS version is 5.1.1.0 and that there is an update available.

```
dsh -f 1 -n ${BCUDB2ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh validate' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -f 1 -n ${BCUDB2ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh validate' 2>&1 | dshbak -c
HOSTS -----
reverseflash02
-----
20220921_134506 (reverseflash02:gpfs_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_134507 (reverseflash02:gpfs_utility.sh): Starting date: Wed Sep 21 13:45:07 EDT 2022.
20220921_134507 (reverseflash02:gpfs_utility.sh): Checking current gpfs version.
20220921_134507 (reverseflash02:gpfs_utility.sh): My GPFS version is '5.1.1.0'.
20220921_134507 (reverseflash02:gpfs_utility.sh): Checking for available gpfs updates.
20220921_134507 (reverseflash02:gpfs_utility.sh): Found GPFS version '4.2.3.0'.
20220921_134507 (reverseflash02:gpfs_utility.sh): Found GPFS version '4.2.3.7'.
20220921_134507 (reverseflash02:gpfs_utility.sh): Found GPFS version '4.2.3.17'.
20220921_134507 (reverseflash02:gpfs_utility.sh): Found GPFS version '5.0.5.0'.
20220921_134507 (reverseflash02:gpfs_utility.sh): Found GPFS version '5.0.5.4'.
20220921_134507 (reverseflash02:gpfs_utility.sh): Found GPFS version '5.1.1.0'.
20220921_134507 (reverseflash02:gpfs_utility.sh): Found GPFS version '5.1.1.4'.
20220921_134510 (reverseflash02:gpfs_utility.sh): There is an available update for this host.
20220921_134510 (reverseflash02:gpfs_utility.sh): validate completed on this host.
20220921_134510 (reverseflash02:gpfs_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh' with
arguments 'validate' ended with rc='0'. Start: Wed Sep 21 13:45:07 EDT 2022 End: Wed Sep 21 13:45:10 EDT 2022. Elapsed Time
(Seconds): 4 (H:M:S):(00:00:04).
20220921_134512 (reverseflash02:gpfs_utility.sh): Normalizing management hostname.
20220921_134513 (reverseflash02:gpfs_utility.sh): Management hostname is 'reverseflash01'.
20220921_134513 (reverseflash02:gpfs_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash02' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_134514 (reverseflash02:gpfs_utility.sh): Notification sent.

HOSTS -----
reverseflash04
-----
20220921_134514 (reverseflash04:gpfs_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_134515 (reverseflash04:gpfs_utility.sh): Starting date: Wed Sep 21 13:45:15 EDT 2022.
20220921_134515 (reverseflash04:gpfs_utility.sh): Checking current gpfs version.
20220921_134515 (reverseflash04:gpfs_utility.sh): My GPFS version is '5.1.1.0'.
20220921_134515 (reverseflash04:gpfs_utility.sh): Checking for available gpfs updates.
20220921_134515 (reverseflash04:gpfs_utility.sh): Found GPFS version '4.2.3.0'.
20220921_134515 (reverseflash04:gpfs_utility.sh): Found GPFS version '4.2.3.7'.
20220921_134515 (reverseflash04:gpfs_utility.sh): Found GPFS version '4.2.3.17'.
20220921_134515 (reverseflash04:gpfs_utility.sh): Found GPFS version '5.0.5.0'.
20220921_134515 (reverseflash04:gpfs_utility.sh): Found GPFS version '5.0.5.4'.
20220921_134515 (reverseflash04:gpfs_utility.sh): Found GPFS version '5.1.1.0'.
20220921_134515 (reverseflash04:gpfs_utility.sh): Found GPFS version '5.1.1.4'.
20220921_134515 (reverseflash04:gpfs_utility.sh): There is an available update for this host.
20220921_134515 (reverseflash04:gpfs_utility.sh): validate completed on this host.
20220921_134515 (reverseflash04:gpfs_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh' with
arguments 'validate' ended with rc='0'. Start: Wed Sep 21 13:45:15 EDT 2022 End: Wed Sep 21 13:45:15 EDT 2022. Elapsed Time
(Seconds): 1 (H:M:S):(00:00:01).
```


STAGE 8 - CORE NODES update in DOWNTIME window

```
20220921_134517 (reverseflash04:gpfs_utility.sh): Normalizing management hostname.
20220921_134518 (reverseflash04:gpfs_utility.sh): Management hostname is 'reverseflash01'.
20220921_134518 (reverseflash04:gpfs_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash04' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_134518 (reverseflash04:gpfs_utility.sh): Notification sent.
```

```
HOSTS -----
reverseflash05
```

```
20220921_134519 (reverseflash05:gpfs_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_134519 (reverseflash05:gpfs_utility.sh): Starting date: Wed Sep 21 13:45:19 EDT 2022.
20220921_134519 (reverseflash05:gpfs_utility.sh): Checking current gpfs version.
20220921_134519 (reverseflash05:gpfs_utility.sh): My GPFS version is '5.1.1.0'.
20220921_134519 (reverseflash05:gpfs_utility.sh): Checking for available gpfs updates.
20220921_134519 (reverseflash05:gpfs_utility.sh): Found GPFS version '4.2.3.0'.
20220921_134519 (reverseflash05:gpfs_utility.sh): Found GPFS version '4.2.3.7'.
20220921_134519 (reverseflash05:gpfs_utility.sh): Found GPFS version '4.2.3.17'.
20220921_134520 (reverseflash05:gpfs_utility.sh): Found GPFS version '5.0.5.0'.
20220921_134520 (reverseflash05:gpfs_utility.sh): Found GPFS version '5.0.5.4'.
20220921_134520 (reverseflash05:gpfs_utility.sh): Found GPFS version '5.1.1.0'.
20220921_134520 (reverseflash05:gpfs_utility.sh): Found GPFS version '5.1.1.4'.
20220921_134520 (reverseflash05:gpfs_utility.sh): There is an available update for this host.
20220921_134520 (reverseflash05:gpfs_utility.sh): validate completed on this host.
20220921_134520 (reverseflash05:gpfs_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh' with
arguments 'validate' ended with rc='0'. Start: Wed Sep 21 13:45:19 EDT 2022 End: Wed Sep 21 13:45:20 EDT 2022. Elapsed Time
(Seconds): 1 (H:M:S):(00:00:01).
20220921_134522 (reverseflash05:gpfs_utility.sh): Normalizing management hostname.
20220921_134522 (reverseflash05:gpfs_utility.sh): Management hostname is 'reverseflash01'.
20220921_134522 (reverseflash05:gpfs_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash05' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_134523 (reverseflash05:gpfs_utility.sh): Notification sent.
```

```
HOSTS -----
reverseflash06
```

```
20220921_134523 (reverseflash06:gpfs_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_134524 (reverseflash06:gpfs_utility.sh): Starting date: Wed Sep 21 13:45:24 EDT 2022.
20220921_134524 (reverseflash06:gpfs_utility.sh): Checking current gpfs version.
20220921_134524 (reverseflash06:gpfs_utility.sh): My GPFS version is '5.1.1.0'.
20220921_134524 (reverseflash06:gpfs_utility.sh): Checking for available gpfs updates.
20220921_134524 (reverseflash06:gpfs_utility.sh): Found GPFS version '4.2.3.0'.
20220921_134524 (reverseflash06:gpfs_utility.sh): Found GPFS version '4.2.3.7'.
20220921_134524 (reverseflash06:gpfs_utility.sh): Found GPFS version '4.2.3.17'.
20220921_134524 (reverseflash06:gpfs_utility.sh): Found GPFS version '5.0.5.0'.
20220921_134524 (reverseflash06:gpfs_utility.sh): Found GPFS version '5.0.5.4'.
20220921_134524 (reverseflash06:gpfs_utility.sh): Found GPFS version '5.1.1.0'.
20220921_134524 (reverseflash06:gpfs_utility.sh): Found GPFS version '5.1.1.4'.
20220921_134524 (reverseflash06:gpfs_utility.sh): There is an available update for this host.
20220921_134524 (reverseflash06:gpfs_utility.sh): validate completed on this host.
20220921_134524 (reverseflash06:gpfs_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh' with
arguments 'validate' ended with rc='0'. Start: Wed Sep 21 13:45:24 EDT 2022 End: Wed Sep 21 13:45:24 EDT 2022. Elapsed Time
(Seconds): 1 (H:M:S):(00:00:01).
20220921_134527 (reverseflash06:gpfs_utility.sh): Normalizing management hostname.
20220921_134527 (reverseflash06:gpfs_utility.sh): Management hostname is 'reverseflash01'.
20220921_134527 (reverseflash06:gpfs_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash06' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_134528 (reverseflash06:gpfs_utility.sh): Notification sent.
You have mail in /usr/spool/mail/root
```

```
(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

4. Command: Run the command to update GPFS on the core hosts to 5.1.1.4.

```
dsh -n ${BCUDB2ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh update' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUDB2ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh update' 2>&1 | dshbak -c
HOSTS -----
reverseflash04
-----
20220921_134657 (reverseflash04:gpfs_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_134657 (reverseflash04:gpfs_utility.sh): Starting date: Wed Sep 21 13:46:57 EDT 2022.
20220921_134657 (reverseflash04:gpfs_utility.sh): Checking current gpfs version.
20220921_134657 (reverseflash04:gpfs_utility.sh): My GPFS version is '5.1.1.0'.
20220921_134657 (reverseflash04:gpfs_utility.sh): Checking for available gpfs updates.
20220921_134657 (reverseflash04:gpfs_utility.sh): Found GPFS version '4.2.3.0'.
20220921_134658 (reverseflash04:gpfs_utility.sh): Found GPFS version '4.2.3.7'.
20220921_134658 (reverseflash04:gpfs_utility.sh): Found GPFS version '4.2.3.17'.
20220921_134658 (reverseflash04:gpfs_utility.sh): Found GPFS version '5.0.5.0'.
20220921_134658 (reverseflash04:gpfs_utility.sh): Found GPFS version '5.0.5.4'.
20220921_134658 (reverseflash04:gpfs_utility.sh): Found GPFS version '5.1.1.0'.
20220921_134658 (reverseflash04:gpfs_utility.sh): Found GPFS version '5.1.1.4'.
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
20220921_134658 (reverseflash04:gpfs_utility.sh): There is an available update for this host.
20220921_134658 (reverseflash04:gpfs_utility.sh): Verifying this host is ready to update.
20220921_134658 (reverseflash04:check_server_state.sh): Starting date: Wed Sep 21 13:46:58 EDT 2022.
20220921_134658 (reverseflash04:check_server_state.sh): Running command '/usr/lpp/mmfs/bin/mmfsenv -u'.
20220921_134659 (reverseflash04:check_server_state.sh): Ran command '/usr/lpp/mmfs/bin/mmfsenv -u' with rc='0'.
20220921_134702 (reverseflash04:check_server_state.sh): GPFS State: 'down'.
20220921_134702 (reverseflash04:check_server_state.sh): Starting date: Wed Sep 21 13:46:58 EDT 2022   Ending Date: Wed Sep 21
13:47:02 EDT 2022.
20220921_134702 (reverseflash04:gpfs_utility.sh): Updating GPFS.
20220921_134702 (reverseflash04:gpfs_utility.sh): Running cmd 'installp -agXYd
/BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.4-ppc64-AIX-update.tgz_extract gpfs' to update gpfs to
version '5.1.1.4'.
20220921_134859 (reverseflash04:gpfs_utility.sh): The command 'installp -agXYd
/BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.4-ppc64-AIX-update.tgz_extract gpfs' returned '0'.
20220921_134859 (reverseflash04:gpfs_utility.sh): update completed on this host.
20220921_134859 (reverseflash04:gpfs_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh' with
arguments 'update' ended with rc='0'. Start: Wed Sep 21 13:46:57 EDT 2022 End: Wed Sep 21 13:48:59 EDT 2022. Elapsed Time
(Seconds): 122 (H:M:S): (00:02:02).
20220921_134901 (reverseflash04:gpfs_utility.sh): Normalizing management hostname.
20220921_134901 (reverseflash04:gpfs_utility.sh): Management hostname is 'reverseflash01'.
20220921_134901 (reverseflash04:gpfs_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash04' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_134902 (reverseflash04:gpfs_utility.sh): Notification sent.
```

```
HOSTS -----
reverseflash05
```

```
20220921_134657 (reverseflash05:gpfs_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_134657 (reverseflash05:gpfs_utility.sh): Starting date: Wed Sep 21 13:46:57 EDT 2022.
20220921_134657 (reverseflash05:gpfs_utility.sh): Checking current gpfs version.
20220921_134657 (reverseflash05:gpfs_utility.sh): My GPFS version is '5.1.1.0'.
20220921_134657 (reverseflash05:gpfs_utility.sh): Checking for available gpfs updates.
20220921_134657 (reverseflash05:gpfs_utility.sh): Found GPFS version '4.2.3.0'.
20220921_134658 (reverseflash05:gpfs_utility.sh): Found GPFS version '4.2.3.7'.
20220921_134658 (reverseflash05:gpfs_utility.sh): Found GPFS version '4.2.3.17'.
20220921_134658 (reverseflash05:gpfs_utility.sh): Found GPFS version '5.0.5.0'.
20220921_134658 (reverseflash05:gpfs_utility.sh): Found GPFS version '5.0.5.4'.
20220921_134658 (reverseflash05:gpfs_utility.sh): Found GPFS version '5.1.1.0'.
20220921_134658 (reverseflash05:gpfs_utility.sh): Found GPFS version '5.1.1.4'.
20220921_134658 (reverseflash05:gpfs_utility.sh): There is an available update for this host.
20220921_134658 (reverseflash05:gpfs_utility.sh): Verifying this host is ready to update.
20220921_134658 (reverseflash05:check_server_state.sh): Starting date: Wed Sep 21 13:46:58 EDT 2022.
20220921_134658 (reverseflash05:check_server_state.sh): Running command '/usr/lpp/mmfs/bin/mmfsenv -u'.
20220921_134659 (reverseflash05:check_server_state.sh): Ran command '/usr/lpp/mmfs/bin/mmfsenv -u' with rc='0'.
20220921_134702 (reverseflash05:check_server_state.sh): GPFS State: 'down'.
20220921_134702 (reverseflash05:check_server_state.sh): Starting date: Wed Sep 21 13:46:58 EDT 2022   Ending Date: Wed Sep 21
13:47:02 EDT 2022.
20220921_134702 (reverseflash05:gpfs_utility.sh): Updating GPFS.
20220921_134702 (reverseflash05:gpfs_utility.sh): Running cmd 'installp -agXYd
/BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.4-ppc64-AIX-update.tgz_extract gpfs' to update gpfs to
version '5.1.1.4'.
20220921_134901 (reverseflash05:gpfs_utility.sh): The command 'installp -agXYd
/BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.4-ppc64-AIX-update.tgz_extract gpfs' returned '0'.
20220921_134901 (reverseflash05:gpfs_utility.sh): update completed on this host.
20220921_134901 (reverseflash05:gpfs_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh' with
arguments 'update' ended with rc='0'. Start: Wed Sep 21 13:46:57 EDT 2022 End: Wed Sep 21 13:49:01 EDT 2022. Elapsed Time
(Seconds): 124 (H:M:S): (00:02:04).
20220921_134903 (reverseflash05:gpfs_utility.sh): Normalizing management hostname.
20220921_134904 (reverseflash05:gpfs_utility.sh): Management hostname is 'reverseflash01'.
20220921_134904 (reverseflash05:gpfs_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash05' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_134904 (reverseflash05:gpfs_utility.sh): Notification sent.
```

```
HOSTS -----
reverseflash02
```

```
20220921_134657 (reverseflash02:gpfs_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_134657 (reverseflash02:gpfs_utility.sh): Starting date: Wed Sep 21 13:46:57 EDT 2022.
20220921_134657 (reverseflash02:gpfs_utility.sh): Checking current gpfs version.
20220921_134657 (reverseflash02:gpfs_utility.sh): My GPFS version is '5.1.1.0'.
20220921_134657 (reverseflash02:gpfs_utility.sh): Checking for available gpfs updates.
20220921_134657 (reverseflash02:gpfs_utility.sh): Found GPFS version '4.2.3.0'.
20220921_134657 (reverseflash02:gpfs_utility.sh): Found GPFS version '4.2.3.7'.
20220921_134657 (reverseflash02:gpfs_utility.sh): Found GPFS version '4.2.3.17'.
20220921_134657 (reverseflash02:gpfs_utility.sh): Found GPFS version '5.0.5.0'.
20220921_134657 (reverseflash02:gpfs_utility.sh): Found GPFS version '5.0.5.4'.
20220921_134658 (reverseflash02:gpfs_utility.sh): Found GPFS version '5.1.1.0'.
20220921_134658 (reverseflash02:gpfs_utility.sh): Found GPFS version '5.1.1.4'.
20220921_134658 (reverseflash02:gpfs_utility.sh): There is an available update for this host.
20220921_134658 (reverseflash02:gpfs_utility.sh): Verifying this host is ready to update.
20220921_134658 (reverseflash02:check_server_state.sh): Starting date: Wed Sep 21 13:46:58 EDT 2022.
20220921_134658 (reverseflash02:check_server_state.sh): Running command '/usr/lpp/mmfs/bin/mmfsenv -u'.
20220921_134658 (reverseflash02:check_server_state.sh): Ran command '/usr/lpp/mmfs/bin/mmfsenv -u' with rc='0'.
20220921_134700 (reverseflash02:check_server_state.sh): GPFS State: 'down'.
20220921_134700 (reverseflash02:check_server_state.sh): Starting date: Wed Sep 21 13:46:58 EDT 2022   Ending Date: Wed Sep 21
13:47:00 EDT 2022.
20220921_134700 (reverseflash02:gpfs_utility.sh): Updating GPFS.
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
20220921_134700 (reverseflash02:gpfs_utility.sh): Running cmd 'installp -agXYd
/BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.4-ppc64-AIX-update.tgz_extract gpfs' to update gpfs to
version '5.1.1.4'.
20220921_134901 (reverseflash02:gpfs_utility.sh): The command 'installp -agXYd
/BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.4-ppc64-AIX-update.tgz_extract gpfs' returned '0'.
20220921_134901 (reverseflash02:gpfs_utility.sh): update completed on this host.
20220921_134901 (reverseflash02:gpfs_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh' with
arguments 'update' ended with rc='0'. Start: Wed Sep 21 13:46:57 EDT 2022 End: Wed Sep 21 13:49:01 EDT 2022. Elapsed Time
(Seconds): 124 (H:M:S):(00:02:04).
20220921_134903 (reverseflash02:gpfs_utility.sh): Normalizing management hostname.
20220921_134904 (reverseflash02:gpfs_utility.sh): Management hostname is 'reverseflash01'.
20220921_134904 (reverseflash02:gpfs_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash02' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_134904 (reverseflash02:gpfs_utility.sh): Notification sent.

HOSTS -----
reverseflash06
-----
20220921_134657 (reverseflash06:gpfs_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_134658 (reverseflash06:gpfs_utility.sh): Starting date: Wed Sep 21 13:46:58 EDT 2022.
20220921_134658 (reverseflash06:gpfs_utility.sh): Checking current gpfs version.
20220921_134658 (reverseflash06:gpfs_utility.sh): My GPFS version is '5.1.1.0'.
20220921_134658 (reverseflash06:gpfs_utility.sh): Checking for available gpfs updates.
20220921_134658 (reverseflash06:gpfs_utility.sh): Found GPFS version '4.2.3.0'.
20220921_134658 (reverseflash06:gpfs_utility.sh): Found GPFS version '4.2.3.7'.
20220921_134658 (reverseflash06:gpfs_utility.sh): Found GPFS version '4.2.3.17'.
20220921_134658 (reverseflash06:gpfs_utility.sh): Found GPFS version '5.0.5.0'.
20220921_134658 (reverseflash06:gpfs_utility.sh): Found GPFS version '5.0.5.4'.
20220921_134658 (reverseflash06:gpfs_utility.sh): Found GPFS version '5.1.1.0'.
20220921_134658 (reverseflash06:gpfs_utility.sh): Found GPFS version '5.1.1.4'.
20220921_134658 (reverseflash06:gpfs_utility.sh): There is an available update for this host.
20220921_134658 (reverseflash06:gpfs_utility.sh): Verifying this host is ready to update.
20220921_134658 (reverseflash06:check_server_state.sh): Starting date: Wed Sep 21 13:46:58 EDT 2022.
20220921_134658 (reverseflash06:check_server_state.sh): Running command '/usr/lpp/mmfs/bin/mmfsenv -u'.
20220921_134659 (reverseflash06:check_server_state.sh): Ran command '/usr/lpp/mmfs/bin/mmfsenv -u' with rc='0'.
20220921_134702 (reverseflash06:check_server_state.sh): GPFS State: 'down'.
20220921_134702 (reverseflash06:check_server_state.sh): Starting date: Wed Sep 21 13:46:58 EDT 2022 Ending Date: Wed Sep 21
13:47:02 EDT 2022.
20220921_134702 (reverseflash06:gpfs_utility.sh): Updating GPFS.
20220921_134702 (reverseflash06:gpfs_utility.sh): Running cmd 'installp -agXYd
/BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.4-ppc64-AIX-update.tgz_extract gpfs' to update gpfs to
version '5.1.1.4'.
20220921_134901 (reverseflash06:gpfs_utility.sh): The command 'installp -agXYd
/BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.4-ppc64-AIX-update.tgz_extract gpfs' returned '0'.
20220921_134901 (reverseflash06:gpfs_utility.sh): update completed on this host.
20220921_134901 (reverseflash06:gpfs_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh' with
arguments 'update' ended with rc='0'. Start: Wed Sep 21 13:46:58 EDT 2022 End: Wed Sep 21 13:49:01 EDT 2022. Elapsed Time
(Seconds): 124 (H:M:S):(00:02:04).
20220921_134903 (reverseflash06:gpfs_utility.sh): Normalizing management hostname.
20220921_134904 (reverseflash06:gpfs_utility.sh): Management hostname is 'reverseflash01'.
20220921_134904 (reverseflash06:gpfs_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash06' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/gpfs_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_134904 (reverseflash06:gpfs_utility.sh): Notification sent.

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

5. Command: Verify the GPFS levels on the core nodes.

```
dsh -n ${BCUDB2ALL} 'ls1pp -l "gpfs*" | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUDB2ALL} 'ls1pp -l "gpfs*" | dshbak -c
HOSTS -----
reverseflash02, reverseflash04, reverseflash05, reverseflash06
-----
      Fileset              Level  State      Description
-----
Path: /usr/lib/objrepos
  gpfs.base                5.1.1.4  APPLIED    GPFS File Manager
  gpfs.compression          5.1.1.0  COMMITTED  GPFS Compression Libraries
  gpfs.gskit                8.0.55.19 COMMITTED  GPFS GSKit Cryptography
                        Runtime
  gpfs.license.std          5.1.1.0  COMMITTED  IBM Spectrum Scale Standard
                        Edition License
  gpfs.msg.en_US            5.1.1.3  APPLIED    GPFS Server Messages - U.S.
                        English

Path: /etc/objrepos
  gpfs.base                5.1.1.4  APPLIED    GPFS File Manager

Path: /usr/share/lib/objrepos
  gpfs.docs.data           5.1.1.3  APPLIED    GPFS Server Manpages and
                        Documentation
```

STAGE 8 - CORE NODES update in DOWNTIME window

6. Command: Start GPFS on all hosts. This command is different from the one used in Stage 06 as it uses dsh and starts GPFS individually on all hosts.

```
dsh -n ${ALL} '/usr/lpp/mmfs/bin/mmstartup' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} '/usr/lpp/mmfs/bin/mmstartup' 2>&1 | dshbak -c
HOSTS -----
flashdancehostname01
-----
Tue Jan  5 08:56:11 IST 2021: 6027-1642 mmstartup: Starting GPFS ...

HOSTS -----
flashdancehostname02, flashdancehostname03, flashdancehostname04, flashdancehostname05, flashdancehostname06,
flashdancehostname07
-----
Tue Jan  5 08:56:12 IST 2021: 6027-1642 mmstartup: Starting GPFS ...

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

7. Command: Verify GPFS is started. Rerun this command until all hosts are no longer arbitrating.

```
dsh -n ${ALL} '/usr/lpp/mmfs/bin/mmgetstate -a' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} '/usr/lpp/mmfs/bin/mmgetstate -a' 2>&1 | dshbak -c
HOSTS -----
flashdancehostname01, flashdancehostname03
-----

Node number  Node name      GPFS state
-----
1            flashdancehostname01 active
2            flashdancehostname03 active

HOSTS -----
flashdancehostname02, flashdancehostname04, flashdancehostname05, flashdancehostname06, flashdancehostname07
-----

Node number  Node name      GPFS state
-----
1            flashdancehostname02 active
2            flashdancehostname04 active
3            flashdancehostname05 active
4            flashdancehostname06 active
5            flashdancehostname07 active

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

8. Verify that all filesystems are mounted. This may take several minutes before all filesystems are mounted.

```
dsh -n ${ALL} 'mount | grep -c mmfs' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} 'mount | grep -c mmfs' 2>&1 | dshbak -c
HOSTS -----
flashdancehostname01, flashdancehostname03
-----
5

HOSTS -----
flashdancehostname02, flashdancehostname04
-----
21

HOSTS -----
flashdancehostname05, flashdancehostname06, flashdancehostname07
-----
63
```

Phase 4: Update TSA on the core hosts.

This phase requires all services to be stopped, all domains to be stopped, and GPFS to be started with all filesystems mounted. This is that state after State 8, Phase 3 is completed.

1. Command: As root running in a terminal or screen session on the management node, run the TSA validation. This command will unpack the appropriate TSA Fixpack (on first host only), will run prereqSAM to verify the fixpack is ready to be applied.

```
dsh -f 1 -n ${BCUDB2ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh validate' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -f 1 -n ${BCUDB2ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh validate' 2>&1 | dshbak -c
HOSTS -----
reverseflash02
-----
20220921_135418 (reverseflash02:tsa_utility.sh): Attempting to source ./profile to define BCU* variables.
20220921_135418 (reverseflash02:tsa_utility.sh): Starting date: Wed Sep 21 13:54:18 EDT 2022.
20220921_135418 (reverseflash02:tsa_utility.sh): Checking current TSA version.
20220921_135418 (reverseflash02:tsa_utility.sh): My TSA version is '4.1.0.6'.
20220921_135418 (reverseflash02:tsa_utility.sh): Checking for available TSA updates.
20220921_135418 (reverseflash02:tsa_utility.sh): Found TSA version '4.1.0.0004'.
20220921_135418 (reverseflash02:tsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135418 (reverseflash02:tsa_utility.sh): Found TSA version '4.1.0.0005'.
20220921_135418 (reverseflash02:tsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135418 (reverseflash02:tsa_utility.sh): Found TSA version '4.1.0.0006'.
20220921_135418 (reverseflash02:tsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135418 (reverseflash02:tsa_utility.sh): Found TSA version '4.1.0.0007'.
20220921_135418 (reverseflash02:tsa_utility.sh): Next Version      : 4.1.0.0007.
20220921_135418 (reverseflash02:tsa_utility.sh): Version Location   : /BCU_share/FP9_FP5/software/TSA/4.1.0.0007.

20220921_135425 (reverseflash02:tsa_utility.sh): Running Update Validation
'/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/prereqSAM'.
prereqSAM: All prerequisites for the ITSAMP installation are met on operating system: AIX 7200-05
20220921_135431 (reverseflash02:tsa_utility.sh): There is an available update for this host.
20220921_135431 (reverseflash02:tsa_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh' with
arguments 'validate' ended with rc='0'. Start: Wed Sep 21 13:54:18 EDT 2022 End: Wed Sep 21 13:54:31 EDT 2022. Elapsed Time
(Seconds): 13 (H:M:S): (00:00:13).
20220921_135433 (reverseflash02:tsa_utility.sh): Normalizing management hostname.
20220921_135434 (reverseflash02:tsa_utility.sh): Management hostname is 'reverseflash01'.
20220921_135434 (reverseflash02:tsa_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash02' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_135434 (reverseflash02:tsa_utility.sh): Notification sent.

HOSTS -----
reverseflash04
-----
20220921_135435 (reverseflash04:tsa_utility.sh): Attempting to source ./profile to define BCU* variables.
20220921_135435 (reverseflash04:tsa_utility.sh): Starting date: Wed Sep 21 13:54:35 EDT 2022.
20220921_135435 (reverseflash04:tsa_utility.sh): Checking current TSA version.
20220921_135435 (reverseflash04:tsa_utility.sh): My TSA version is '4.1.0.6'.
20220921_135435 (reverseflash04:tsa_utility.sh): Checking for available TSA updates.
20220921_135435 (reverseflash04:tsa_utility.sh): Found TSA version '4.1.0.0004'.
20220921_135435 (reverseflash04:tsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135435 (reverseflash04:tsa_utility.sh): Found TSA version '4.1.0.0005'.
20220921_135435 (reverseflash04:tsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135435 (reverseflash04:tsa_utility.sh): Found TSA version '4.1.0.0006'.
20220921_135435 (reverseflash04:tsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135435 (reverseflash04:tsa_utility.sh): Found TSA version '4.1.0.0007'.
20220921_135435 (reverseflash04:tsa_utility.sh): Next Version      : 4.1.0.0007.
20220921_135435 (reverseflash04:tsa_utility.sh): Version Location   : /BCU_share/FP9_FP5/software/TSA/4.1.0.0007.
20220921_135435 (reverseflash04:tsa_utility.sh): Running Update Validation
'/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/prereqSAM'.
prereqSAM: All prerequisites for the ITSAMP installation are met on operating system: AIX 7200-05
20220921_135441 (reverseflash04:tsa_utility.sh): There is an available update for this host.
20220921_135441 (reverseflash04:tsa_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh' with
arguments 'validate' ended with rc='0'. Start: Wed Sep 21 13:54:35 EDT 2022 End: Wed Sep 21 13:54:41 EDT 2022. Elapsed Time
(Seconds): 6 (H:M:S): (00:00:06).
20220921_135443 (reverseflash04:tsa_utility.sh): Normalizing management hostname.
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
20220921_135444 (reverseflash04:tlsa_utility.sh): Management hostname is 'reverseflash01'.
20220921_135444 (reverseflash04:tlsa_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash04' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/tlsa_utility.sh.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_135445 (reverseflash04:tlsa_utility.sh): Notification sent.
```

```
HOSTS -----
reverseflash05
```

```
20220921_135445 (reverseflash05:tlsa_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_135445 (reverseflash05:tlsa_utility.sh): Starting date: Wed Sep 21 13:54:45 EDT 2022.
20220921_135445 (reverseflash05:tlsa_utility.sh): Checking current TSA version.
20220921_135445 (reverseflash05:tlsa_utility.sh): My TSA version is '4.1.0.6'.
20220921_135445 (reverseflash05:tlsa_utility.sh): Checking for available TSA updates.
20220921_135445 (reverseflash05:tlsa_utility.sh): Found TSA version '4.1.0.0004'.
20220921_135445 (reverseflash05:tlsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135445 (reverseflash05:tlsa_utility.sh): Found TSA version '4.1.0.0005'.
20220921_135445 (reverseflash05:tlsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135446 (reverseflash05:tlsa_utility.sh): Found TSA version '4.1.0.0006'.
20220921_135446 (reverseflash05:tlsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135446 (reverseflash05:tlsa_utility.sh): Found TSA version '4.1.0.0007'.
20220921_135446 (reverseflash05:tlsa_utility.sh): Next Version      : 4.1.0.0007.
20220921_135446 (reverseflash05:tlsa_utility.sh): Version Location   : /BCU_share/FP9_FP5/software/TSA/4.1.0.0007.
20220921_135446 (reverseflash05:tlsa_utility.sh): Running Update Validation
'/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/prereqSAM'.
prereqSAM: All prerequisites for the ITSAMP installation are met on operating system: AIX 7200-05
20220921_135452 (reverseflash05:tlsa_utility.sh): There is an available update for this host.
20220921_135452 (reverseflash05:tlsa_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/tlsa_utility.sh' with
arguments 'validate' ended with rc='0'. Start: Wed Sep 21 13:54:45 EDT 2022 End: Wed Sep 21 13:54:52 EDT 2022. Elapsed Time
(Seconds): 7 (H:M:S):(00:00:07).
20220921_135454 (reverseflash05:tlsa_utility.sh): Normalizing management hostname.
20220921_135455 (reverseflash05:tlsa_utility.sh): Management hostname is 'reverseflash01'.
20220921_135455 (reverseflash05:tlsa_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash05' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/tlsa_utility.sh.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_135455 (reverseflash05:tlsa_utility.sh): Notification sent.
```

```
HOSTS -----
reverseflash06
```

```
20220921_135456 (reverseflash06:tlsa_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_135456 (reverseflash06:tlsa_utility.sh): Starting date: Wed Sep 21 13:54:56 EDT 2022.
20220921_135456 (reverseflash06:tlsa_utility.sh): Checking current TSA version.
20220921_135456 (reverseflash06:tlsa_utility.sh): My TSA version is '4.1.0.6'.
20220921_135456 (reverseflash06:tlsa_utility.sh): Checking for available TSA updates.
20220921_135456 (reverseflash06:tlsa_utility.sh): Found TSA version '4.1.0.0004'.
20220921_135456 (reverseflash06:tlsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135456 (reverseflash06:tlsa_utility.sh): Found TSA version '4.1.0.0005'.
20220921_135456 (reverseflash06:tlsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135456 (reverseflash06:tlsa_utility.sh): Found TSA version '4.1.0.0006'.
20220921_135456 (reverseflash06:tlsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135456 (reverseflash06:tlsa_utility.sh): Found TSA version '4.1.0.0007'.
20220921_135456 (reverseflash06:tlsa_utility.sh): Next Version      : 4.1.0.0007.
20220921_135456 (reverseflash06:tlsa_utility.sh): Version Location   : /BCU_share/FP9_FP5/software/TSA/4.1.0.0007.
20220921_135456 (reverseflash06:tlsa_utility.sh): Running Update Validation
'/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/prereqSAM'.
prereqSAM: All prerequisites for the ITSAMP installation are met on operating system: AIX 7200-05
20220921_135503 (reverseflash06:tlsa_utility.sh): There is an available update for this host.
20220921_135503 (reverseflash06:tlsa_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/tlsa_utility.sh' with
arguments 'validate' ended with rc='0'. Start: Wed Sep 21 13:54:56 EDT 2022 End: Wed Sep 21 13:55:03 EDT 2022. Elapsed Time
(Seconds): 7 (H:M:S):(00:00:07).
20220921_135505 (reverseflash06:tlsa_utility.sh): Normalizing management hostname.
20220921_135506 (reverseflash06:tlsa_utility.sh): Management hostname is 'reverseflash01'.
20220921_135506 (reverseflash06:tlsa_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash06' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/tlsa_utility.sh.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_135506 (reverseflash06:tlsa_utility.sh): Notification sent.
```

```
(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

2. Command: Run the following command to update TSA on the core hosts.

```
dsh -n ${BCUDB2ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/tlsa_utility.sh update' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUDB2ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/tlsa_utility.sh update' 2>&1 | dshbak -c
HOSTS -----
reverseflash02
20220921_135841 (reverseflash02:tlsa_utility.sh): Attempting to source /.profile to define BCU* variables.
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
20220921_135841 (reverseflash02:tlsa_utility.sh): Starting date: Wed Sep 21 13:58:41 EDT 2022.
20220921_135841 (reverseflash02:tlsa_utility.sh): Checking current TSA version.
20220921_135841 (reverseflash02:tlsa_utility.sh): My TSA version is '4.1.0.6'.
20220921_135841 (reverseflash02:tlsa_utility.sh): Checking for available TSA updates.
20220921_135841 (reverseflash02:tlsa_utility.sh): Found TSA version '4.1.0.0004'.
20220921_135841 (reverseflash02:tlsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135841 (reverseflash02:tlsa_utility.sh): Found TSA version '4.1.0.0005'.
20220921_135841 (reverseflash02:tlsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135841 (reverseflash02:tlsa_utility.sh): Found TSA version '4.1.0.0006'.
20220921_135841 (reverseflash02:tlsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135841 (reverseflash02:tlsa_utility.sh): Found TSA version '4.1.0.0007'.
20220921_135841 (reverseflash02:tlsa_utility.sh): Next Version      : 4.1.0.0007.
20220921_135841 (reverseflash02:tlsa_utility.sh): Version Location   : /BCU_share/FP9_FP5/software/TSA/4.1.0.0007.
20220921_135841 (reverseflash02:tlsa_utility.sh): Running Update Validation
'/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/prereqSAM'.
prereqSAM: All prerequisites for the ITSAMP installation are met on operating system: AIX 7200-05
20220921_135843 (reverseflash02:tlsa_utility.sh): There is an available update for this host.
20220921_135843 (reverseflash02:tlsa_utility.sh): Verifying this host is ready to update. Domain must be offline on this node.
20220921_135843 (reverseflash02:check_server_state.sh): Starting date: Wed Sep 21 13:58:43 EDT 2022.
20220921_135843 (reverseflash02:check_server_state.sh): Domain state: 'Offline'.
20220921_135843 (reverseflash02:check_server_state.sh): Starting date: Wed Sep 21 13:58:43 EDT 2022   Ending Date: Wed Sep 21
13:58:43 EDT 2022.
20220921_135843 (reverseflash02:tlsa_utility.sh): Updating TSA.
20220921_135843 (reverseflash02:tlsa_utility.sh): Running update command
'/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/installSAM'.
20220921_140024 (reverseflash02:tlsa_utility.sh): The command '/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/installSAM'
returned '0'.
20220921_140024 (reverseflash02:tlsa_utility.sh): Update completed. Checking TSA version.
20220921_140024 (reverseflash02:tlsa_utility.sh): My TSA version is '4.1.0.7'.
20220921_140024 (reverseflash02:tlsa_utility.sh): Version verified.
20220921_140024 (reverseflash02:tlsa_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/tlsa_utility.sh' with
arguments 'update' ended with rc='0'. Start: Wed Sep 21 13:58:41 EDT 2022 End: Wed Sep 21 14:00:24 EDT 2022. Elapsed Time
(Seconds): 103 (H:M:S): (00:01:43).
20220921_140026 (reverseflash02:tlsa_utility.sh): Normalizing management hostname.
20220921_140026 (reverseflash02:tlsa_utility.sh): Management hostname is 'reverseflash01'.
20220921_140027 (reverseflash02:tlsa_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash02' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/tlsa_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_140027 (reverseflash02:tlsa_utility.sh): Notification sent.

HOSTS -----
reverseflash04
-----
20220921_135841 (reverseflash04:tlsa_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_135841 (reverseflash04:tlsa_utility.sh): Starting date: Wed Sep 21 13:58:41 EDT 2022.
20220921_135841 (reverseflash04:tlsa_utility.sh): Checking current TSA version.
20220921_135841 (reverseflash04:tlsa_utility.sh): My TSA version is '4.1.0.6'.
20220921_135841 (reverseflash04:tlsa_utility.sh): Checking for available TSA updates.
20220921_135841 (reverseflash04:tlsa_utility.sh): Found TSA version '4.1.0.0004'.
20220921_135841 (reverseflash04:tlsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135841 (reverseflash04:tlsa_utility.sh): Found TSA version '4.1.0.0005'.
20220921_135841 (reverseflash04:tlsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135841 (reverseflash04:tlsa_utility.sh): Found TSA version '4.1.0.0006'.
20220921_135841 (reverseflash04:tlsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135841 (reverseflash04:tlsa_utility.sh): Found TSA version '4.1.0.0007'.
20220921_135841 (reverseflash04:tlsa_utility.sh): Next Version      : 4.1.0.0007.
20220921_135841 (reverseflash04:tlsa_utility.sh): Version Location   : /BCU_share/FP9_FP5/software/TSA/4.1.0.0007.
20220921_135841 (reverseflash04:tlsa_utility.sh): Running Update Validation
'/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/prereqSAM'.
prereqSAM: All prerequisites for the ITSAMP installation are met on operating system: AIX 7200-05
20220921_135843 (reverseflash04:tlsa_utility.sh): There is an available update for this host.
20220921_135843 (reverseflash04:tlsa_utility.sh): Verifying this host is ready to update. Domain must be offline on this node.
20220921_135843 (reverseflash04:check_server_state.sh): Starting date: Wed Sep 21 13:58:43 EDT 2022.
20220921_135843 (reverseflash04:check_server_state.sh): Domain state: 'Offline'.
20220921_135843 (reverseflash04:check_server_state.sh): Starting date: Wed Sep 21 13:58:43 EDT 2022   Ending Date: Wed Sep 21
13:58:43 EDT 2022.
20220921_135843 (reverseflash04:tlsa_utility.sh): Updating TSA.
20220921_135843 (reverseflash04:tlsa_utility.sh): Running update command
'/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/installSAM'.
20220921_140025 (reverseflash04:tlsa_utility.sh): The command '/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/installSAM'
returned '0'.
20220921_140025 (reverseflash04:tlsa_utility.sh): Update completed. Checking TSA version.
20220921_140025 (reverseflash04:tlsa_utility.sh): My TSA version is '4.1.0.7'.
20220921_140025 (reverseflash04:tlsa_utility.sh): Version verified.
20220921_140025 (reverseflash04:tlsa_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/tlsa_utility.sh' with
arguments 'update' ended with rc='0'. Start: Wed Sep 21 13:58:41 EDT 2022 End: Wed Sep 21 14:00:25 EDT 2022. Elapsed Time
(Seconds): 104 (H:M:S): (00:01:44).
20220921_140027 (reverseflash04:tlsa_utility.sh): Normalizing management hostname.
20220921_140028 (reverseflash04:tlsa_utility.sh): Management hostname is 'reverseflash01'.
20220921_140028 (reverseflash04:tlsa_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash04' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/tlsa_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_140029 (reverseflash04:tlsa_utility.sh): Notification sent.
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
HOSTS -----
reverseflash06
-----
20220921_135841 (reverseflash06:tsa_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_135841 (reverseflash06:tsa_utility.sh): Starting date: Wed Sep 21 13:58:41 EDT 2022.
20220921_135841 (reverseflash06:tsa_utility.sh): Checking current TSA version.
20220921_135841 (reverseflash06:tsa_utility.sh): My TSA version is '4.1.0.6'.
20220921_135841 (reverseflash06:tsa_utility.sh): Checking for available TSA updates.
20220921_135841 (reverseflash06:tsa_utility.sh): Found TSA version '4.1.0.0004'.
20220921_135841 (reverseflash06:tsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135841 (reverseflash06:tsa_utility.sh): Found TSA version '4.1.0.0005'.
20220921_135841 (reverseflash06:tsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135841 (reverseflash06:tsa_utility.sh): Found TSA version '4.1.0.0006'.
20220921_135841 (reverseflash06:tsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135841 (reverseflash06:tsa_utility.sh): Found TSA version '4.1.0.0007'.
20220921_135841 (reverseflash06:tsa_utility.sh): Next Version      : 4.1.0.0007.
20220921_135841 (reverseflash06:tsa_utility.sh): Version Location   : /BCU_share/FP9_FP5/software/TSA/4.1.0.0007.
20220921_135841 (reverseflash06:tsa_utility.sh): Running Update Validation
'/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/prereqSAM'.
prereqSAM: All prerequisites for the ITSAMP installation are met on operating system: AIX 7200-05
20220921_135843 (reverseflash06:tsa_utility.sh): There is an available update for this host.
20220921_135843 (reverseflash06:tsa_utility.sh): Verifying this host is ready to update. Domain must be offline on this node.
20220921_135843 (reverseflash06:check_server_state.sh): Starting date: Wed Sep 21 13:58:43 EDT 2022.
20220921_135843 (reverseflash06:check_server_state.sh): Domain state: 'Offline'.
20220921_135843 (reverseflash06:check_server_state.sh): Starting date: Wed Sep 21 13:58:43 EDT 2022   Ending Date: Wed Sep 21
13:58:43 EDT 2022.
20220921_135843 (reverseflash06:tsa_utility.sh): Updating TSA.
20220921_135843 (reverseflash06:tsa_utility.sh): Running update command
'/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/installSAM'.
20220921_140028 (reverseflash06:tsa_utility.sh): The command '/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/installSAM'
returned '0'.
20220921_140028 (reverseflash06:tsa_utility.sh): Update completed. Checking TSA version.
20220921_140028 (reverseflash06:tsa_utility.sh): My TSA version is '4.1.0.7'.
20220921_140028 (reverseflash06:tsa_utility.sh): Version verified.
20220921_140028 (reverseflash06:tsa_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh' with
arguments 'update' ended with rc='0'. Start: Wed Sep 21 13:58:41 EDT 2022 End: Wed Sep 21 14:00:28 EDT 2022. Elapsed Time
(Seconds): 107 (H:M:S): (00:01:47).
20220921_140030 (reverseflash06:tsa_utility.sh): Normalizing management hostname.
20220921_140031 (reverseflash06:tsa_utility.sh): Management hostname is 'reverseflash01'.
20220921_140031 (reverseflash06:tsa_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash06' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_140031 (reverseflash06:tsa_utility.sh): Notification sent.

HOSTS -----
reverseflash05
-----
20220921_135841 (reverseflash05:tsa_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_135841 (reverseflash05:tsa_utility.sh): Starting date: Wed Sep 21 13:58:41 EDT 2022.
20220921_135841 (reverseflash05:tsa_utility.sh): Checking current TSA version.
20220921_135841 (reverseflash05:tsa_utility.sh): My TSA version is '4.1.0.6'.
20220921_135841 (reverseflash05:tsa_utility.sh): Checking for available TSA updates.
20220921_135841 (reverseflash05:tsa_utility.sh): Found TSA version '4.1.0.0004'.
20220921_135841 (reverseflash05:tsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135841 (reverseflash05:tsa_utility.sh): Found TSA version '4.1.0.0005'.
20220921_135841 (reverseflash05:tsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135842 (reverseflash05:tsa_utility.sh): Found TSA version '4.1.0.0006'.
20220921_135842 (reverseflash05:tsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.6'. Skipping to
next available version.
20220921_135842 (reverseflash05:tsa_utility.sh): Found TSA version '4.1.0.0007'.
20220921_135842 (reverseflash05:tsa_utility.sh): Next Version      : 4.1.0.0007.
20220921_135842 (reverseflash05:tsa_utility.sh): Version Location   : /BCU_share/FP9_FP5/software/TSA/4.1.0.0007.
20220921_135842 (reverseflash05:tsa_utility.sh): Running Update Validation
'/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/prereqSAM'.
prereqSAM: All prerequisites for the ITSAMP installation are met on operating system: AIX 7200-05
20220921_135843 (reverseflash05:tsa_utility.sh): There is an available update for this host.
20220921_135843 (reverseflash05:tsa_utility.sh): Verifying this host is ready to update. Domain must be offline on this node.
20220921_135843 (reverseflash05:check_server_state.sh): Starting date: Wed Sep 21 13:58:43 EDT 2022.
20220921_135843 (reverseflash05:check_server_state.sh): Domain state: 'Offline'.
20220921_135843 (reverseflash05:check_server_state.sh): Starting date: Wed Sep 21 13:58:43 EDT 2022   Ending Date: Wed Sep 21
13:58:43 EDT 2022.
20220921_135843 (reverseflash05:tsa_utility.sh): Updating TSA.
20220921_135843 (reverseflash05:tsa_utility.sh): Running update command
'/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/installSAM'.
20220921_140029 (reverseflash05:tsa_utility.sh): The command '/BCU_share/FP9_FP5/software/TSA/4.1.0.0007/SAM4107MPAIX/installSAM'
returned '0'.
20220921_140029 (reverseflash05:tsa_utility.sh): Update completed. Checking TSA version.
20220921_140029 (reverseflash05:tsa_utility.sh): My TSA version is '4.1.0.7'.
20220921_140029 (reverseflash05:tsa_utility.sh): Version verified.
20220921_140029 (reverseflash05:tsa_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh' with
arguments 'update' ended with rc='0'. Start: Wed Sep 21 13:58:41 EDT 2022 End: Wed Sep 21 14:00:29 EDT 2022. Elapsed Time
(Seconds): 108 (H:M:S): (00:01:48).
20220921_140031 (reverseflash05:tsa_utility.sh): Normalizing management hostname.
20220921_140031 (reverseflash05:tsa_utility.sh): Management hostname is 'reverseflash01'.
```


STAGE 8 - CORE NODES update in DOWNTIME window

```
20220921_140031 (reverseflash05:tso_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash05' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/tso_utility.sh'.' to 'user@company.com' '-c root@localhost' via reverseflash01.
20220921_140032 (reverseflash05:tso_utility.sh): Notification sent.
You have mail in /usr/spool/mail/root

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
$
```

3. Command: If there are no errors, start the core domain.

```
$ hadomain -core start
```

STAGE 8 - CORE NODES update in DOWNTIME window

4. Command: Check the state of the core domain.

```
hals -core
```

Example Output:

```
$ hals -core
CORE DOMAIN
=====+=====+=====+=====+=====+=====+=====+
| PARTITIONS | CURRENT | STANDBY | DOMAIN | OPSTATE | HA STATUS | RG REQUESTS |
=====+=====+=====+=====+=====+=====+=====+
| 0-5        | N/A     | N/A     | bcudomain01 | Offline | Offline | - |
| 6-15       | N/A     | N/A     | bcudomain02 | Offline | Offline | - |
| 16-25      | N/A     | N/A     | bcudomain02 | Offline | Offline | - |
=====+=====+=====+=====+=====+=====+=====+
```

5. Command: Verify the domain is in mixed mode and is still running the old RSCT level (3.2.5.2). Mixed Versions indicates that RSCT has not been migrated after being updated. PDOA V1.1 FP2->FP5 customers will see 3.2.3.2 in the output and FP3->FP5 customers will see 3.2.4.3

```
dsh -n ${BCUDB2ALL} 'lsrpdomain' | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUDB2ALL} 'lsrpdomain' | dshbak -c
HOSTS -----
reverseflash02, reverseflash04
-----
Name      OpState RSCTActiveVersion MixedVersions TSPort GSPort
bcudomain01 Online  3.2.5.2          Yes          12347  12348

HOSTS -----
reverseflash05, reverseflash06
-----
Name      OpState RSCTActiveVersion MixedVersions TSPort GSPort
bcudomain02 Online  3.2.5.2          Yes          12347  12348

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
$
```

6. Command: Verify that TSA is not yet migrated and shows the AVN is 4.1.0.6 and the IVN is 4.1.0.7. PDOA V1.1 FP2->FP5 customers will see 4.1.0.4 in the AVN output, FP3->FP5 customers will see 4.1.0.5 in the AVN output..

```
dsh -n ${BCUDB2ALL} "lssrc -ls IBM.RecoveryRM | egrep 'IVN|AVN'" | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUDB2ALL} "lssrc -ls IBM.RecoveryRM | egrep 'IVN|AVN'" | dshbak -c
HOSTS -----
reverseflash02, reverseflash04, reverseflash05, reverseflash06
-----
Our IVN      : 4.1.0.7
Our AVN      : 4.1.0.6

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

7. Command: Migrate RSCT and TSA using the following command. This command will only run the migration on the current domain leader. It will first run the RSCT migration and then the TSA migration if that is successful.

```
dsh -n ${BCUDB2ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh commit' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUDB2ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh commit' 2>&1 | dshbak -c
HOSTS -----
reverseflash02
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
-----
20220921_140841 (reverseflash02:tlsa_utility.sh): Attempting to source ./profile to define BCU* variables.
20220921_140841 (reverseflash02:tlsa_utility.sh): Starting date: Wed Sep 21 14:08:41 EDT 2022.
20220921_140841 (reverseflash02:tlsa_utility.sh): Checking current TSA version.
20220921_140841 (reverseflash02:tlsa_utility.sh): My TSA version is '4.1.0.7'.
20220921_140841 (reverseflash02:tlsa_utility.sh): Checking for available TSA updates.
20220921_140841 (reverseflash02:tlsa_utility.sh): Found TSA version '4.1.0.0004'.
20220921_140841 (reverseflash02:tlsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.7'. Skipping to
next available version.
20220921_140841 (reverseflash02:tlsa_utility.sh): Found TSA version '4.1.0.0005'.
20220921_140841 (reverseflash02:tlsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.7'. Skipping to
next available version.
20220921_140841 (reverseflash02:tlsa_utility.sh): Found TSA version '4.1.0.0006'.
20220921_140841 (reverseflash02:tlsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.7'. Skipping to
next available version.
20220921_140841 (reverseflash02:tlsa_utility.sh): Found TSA version '4.1.0.0007'.
20220921_140841 (reverseflash02:tlsa_utility.sh): TSA version '4.1.0.0007' at at or below my TSA version '4.1.0.7'. Skipping to
next available version.
20220921_140841 (reverseflash02:tlsa_utility.sh): There is no available update for this host.
20220921_140841 (reverseflash02:tlsa_utility.sh): Collecting domain details.
20220921_140842 (reverseflash02:tlsa_utility.sh): Domain is online.
20220921_140842 (reverseflash02:tlsa_utility.sh): Domain RSCT is in mixed mode.
20220921_140842 (reverseflash02:tlsa_utility.sh): All nodes are online.
20220921_140842 (reverseflash02:tlsa_utility.sh): Will not run RSCT migration on this host as it is not the leader.
20220921_140842 (reverseflash02:tlsa_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh' with
arguments 'commit' ended with rc='0'. Start: Wed Sep 21 14:08:41 EDT 2022 End: Wed Sep 21 14:08:42 EDT 2022. Elapsed Time
(Seconds): 1 (H:M:S):(00:00:01).
20220921_140844 (reverseflash02:tlsa_utility.sh): Normalizing management hostname.
20220921_140844 (reverseflash02:tlsa_utility.sh): Management hostname is 'reverseflash01'.
20220921_140844 (reverseflash02:tlsa_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash02' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh'.' to 'user@customer.com' '-c root@localhost' via reverseflash01.
20220921_140845 (reverseflash02:tlsa_utility.sh): Notification sent.

HOSTS -----
reverseflash05
-----
20220921_140841 (reverseflash05:tlsa_utility.sh): Attempting to source ./profile to define BCU* variables.
20220921_140841 (reverseflash05:tlsa_utility.sh): Starting date: Wed Sep 21 14:08:41 EDT 2022.
20220921_140841 (reverseflash05:tlsa_utility.sh): Checking current TSA version.
20220921_140841 (reverseflash05:tlsa_utility.sh): My TSA version is '4.1.0.7'.
20220921_140841 (reverseflash05:tlsa_utility.sh): Checking for available TSA updates.
20220921_140841 (reverseflash05:tlsa_utility.sh): Found TSA version '4.1.0.0004'.
20220921_140841 (reverseflash05:tlsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.7'. Skipping to
next available version.
20220921_140841 (reverseflash05:tlsa_utility.sh): Found TSA version '4.1.0.0005'.
20220921_140841 (reverseflash05:tlsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.7'. Skipping to
next available version.
20220921_140841 (reverseflash05:tlsa_utility.sh): Found TSA version '4.1.0.0006'.
20220921_140841 (reverseflash05:tlsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.7'. Skipping to
next available version.
20220921_140841 (reverseflash05:tlsa_utility.sh): Found TSA version '4.1.0.0007'.
20220921_140841 (reverseflash05:tlsa_utility.sh): TSA version '4.1.0.0007' at at or below my TSA version '4.1.0.7'. Skipping to
next available version.
20220921_140841 (reverseflash05:tlsa_utility.sh): There is no available update for this host.
20220921_140841 (reverseflash05:tlsa_utility.sh): Collecting domain details.
20220921_140842 (reverseflash05:tlsa_utility.sh): Domain is online.
20220921_140842 (reverseflash05:tlsa_utility.sh): Domain RSCT is in mixed mode.
20220921_140842 (reverseflash05:tlsa_utility.sh): All nodes are online.
20220921_140842 (reverseflash05:tlsa_utility.sh): Will not run RSCT migration on this host as it is not the leader.
20220921_140842 (reverseflash05:tlsa_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh' with
arguments 'commit' ended with rc='0'. Start: Wed Sep 21 14:08:41 EDT 2022 End: Wed Sep 21 14:08:42 EDT 2022. Elapsed Time
(Seconds): 1 (H:M:S):(00:00:01).
20220921_140844 (reverseflash05:tlsa_utility.sh): Normalizing management hostname.
20220921_140845 (reverseflash05:tlsa_utility.sh): Management hostname is 'reverseflash01'.
20220921_140845 (reverseflash05:tlsa_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash05' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/tsa_utility.sh'.' to 'user@customer.com' '-c root@localhost' via reverseflash01.
20220921_140845 (reverseflash05:tlsa_utility.sh): Notification sent.

HOSTS -----
reverseflash04
-----
20220921_140841 (reverseflash04:tlsa_utility.sh): Attempting to source ./profile to define BCU* variables.
20220921_140841 (reverseflash04:tlsa_utility.sh): Starting date: Wed Sep 21 14:08:41 EDT 2022.
20220921_140841 (reverseflash04:tlsa_utility.sh): Checking current TSA version.
20220921_140841 (reverseflash04:tlsa_utility.sh): My TSA version is '4.1.0.7'.
20220921_140841 (reverseflash04:tlsa_utility.sh): Checking for available TSA updates.
20220921_140841 (reverseflash04:tlsa_utility.sh): Found TSA version '4.1.0.0004'.
20220921_140841 (reverseflash04:tlsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.7'. Skipping to
next available version.
20220921_140841 (reverseflash04:tlsa_utility.sh): Found TSA version '4.1.0.0005'.
20220921_140841 (reverseflash04:tlsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.7'. Skipping to
next available version.
20220921_140841 (reverseflash04:tlsa_utility.sh): Found TSA version '4.1.0.0006'.
20220921_140841 (reverseflash04:tlsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.7'. Skipping to
next available version.
20220921_140841 (reverseflash04:tlsa_utility.sh): Found TSA version '4.1.0.0007'.
20220921_140841 (reverseflash04:tlsa_utility.sh): TSA version '4.1.0.0007' at at or below my TSA version '4.1.0.7'. Skipping to
next available version.
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
20220921_140841 (reverseflash04:tlsa_utility.sh): There is no available update for this host.
20220921_140841 (reverseflash04:tlsa_utility.sh): Collecting domain details.
20220921_140842 (reverseflash04:tlsa_utility.sh): Domain is online.
20220921_140842 (reverseflash04:tlsa_utility.sh): Domain RSCT is in mixed mode.
20220921_140842 (reverseflash04:tlsa_utility.sh): All nodes are online.
20220921_140842 (reverseflash04:tlsa_utility.sh): Running rsct migration 'runact -c IBM.PeerDomain CompleteMigration Options=0' on
this host as it is the leader.
Resource Class Action Response for CompleteMigration
20220921_140844 (reverseflash04:tlsa_utility.sh): Collecting domain details.
20220921_140844 (reverseflash04:tlsa_utility.sh): Domain is online.
20220921_140844 (reverseflash04:tlsa_utility.sh): Domain is not in mixed mode.
20220921_140845 (reverseflash04:tlsa_utility.sh): TSA migration is required.
20220921_140845 (reverseflash04:tlsa_utility.sh): This host is the domain leader.
20220921_140845 (reverseflash04:tlsa_utility.sh): Running 'echo Y | samctrl -m' to migrate TSA domain.
The cluster bcudomain01 is ready to be migrated from "4.1.0.6" to a new level. Type Y to perform migration [Y|N]:

Active version successfully migrated to new version "4.1.0.7"!
20220921_140849 (reverseflash04:tlsa_utility.sh): Collecting domain details.
20220921_140850 (reverseflash04:tlsa_utility.sh): Domain is online.
20220921_140850 (reverseflash04:tlsa_utility.sh): Domain is not in mixed mode.
20220921_140850 (reverseflash04:tlsa_utility.sh): AVN: '4.1.0.7' is equal to IVN: '4.1.0.7'. TSA Migration is not required.
20220921_140850 (reverseflash04:tlsa_utility.sh): RSCT and TSA Migration were successful.
20220921_140850 (reverseflash04:tlsa_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/tlsa_utility.sh' with
arguments 'commit' ended with rc=0'. Start: Wed Sep 21 14:08:41 EDT 2022 End: Wed Sep 21 14:08:50 EDT 2022. Elapsed Time
(Seconds): 9 (H:M:S):(00:00:09).
20220921_140852 (reverseflash04:tlsa_utility.sh): Normalizing management hostname.
20220921_140853 (reverseflash04:tlsa_utility.sh): Management hostname is 'reverseflash01'.
20220921_140853 (reverseflash04:tlsa_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash04' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/tlsa_utility.sh'.' to 'user@customer.com' '-c root@localhost' via reverseflash01.
20220921_140854 (reverseflash04:tlsa_utility.sh): Notification sent.

HOSTS -----
reverseflash06
-----
20220921_140841 (reverseflash06:tlsa_utility.sh): Attempting to source /.profile to define BCU* variables.
20220921_140841 (reverseflash06:tlsa_utility.sh): Starting date: Wed Sep 21 14:08:41 EDT 2022.
20220921_140841 (reverseflash06:tlsa_utility.sh): Checking current TSA version.
20220921_140841 (reverseflash06:tlsa_utility.sh): My TSA version is '4.1.0.7'.
20220921_140841 (reverseflash06:tlsa_utility.sh): Checking for available TSA updates.
20220921_140841 (reverseflash06:tlsa_utility.sh): Found TSA version '4.1.0.0004'.
20220921_140841 (reverseflash06:tlsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.7'. Skipping to
next available version.
20220921_140841 (reverseflash06:tlsa_utility.sh): Found TSA version '4.1.0.0005'.
20220921_140841 (reverseflash06:tlsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.7'. Skipping to
next available version.
20220921_140841 (reverseflash06:tlsa_utility.sh): Found TSA version '4.1.0.0006'.
20220921_140841 (reverseflash06:tlsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.7'. Skipping to
next available version.
20220921_140841 (reverseflash06:tlsa_utility.sh): Found TSA version '4.1.0.0007'.
20220921_140841 (reverseflash06:tlsa_utility.sh): TSA version '4.1.0.0007' at at or below my TSA version '4.1.0.7'. Skipping to
next available version.
20220921_140841 (reverseflash06:tlsa_utility.sh): There is no available update for this host.
20220921_140841 (reverseflash06:tlsa_utility.sh): Collecting domain details.
20220921_140842 (reverseflash06:tlsa_utility.sh): Domain is online.
20220921_140842 (reverseflash06:tlsa_utility.sh): Domain RSCT is in mixed mode.
20220921_140842 (reverseflash06:tlsa_utility.sh): All nodes are online.
20220921_140842 (reverseflash06:tlsa_utility.sh): Running rsct migration 'runact -c IBM.PeerDomain CompleteMigration Options=0' on
this host as it is the leader.
Resource Class Action Response for CompleteMigration
20220921_140844 (reverseflash06:tlsa_utility.sh): Collecting domain details.
20220921_140844 (reverseflash06:tlsa_utility.sh): Domain is online.
20220921_140844 (reverseflash06:tlsa_utility.sh): Domain is not in mixed mode.
20220921_140845 (reverseflash06:tlsa_utility.sh): TSA migration is required.
20220921_140845 (reverseflash06:tlsa_utility.sh): This host is the domain leader.
20220921_140845 (reverseflash06:tlsa_utility.sh): Running 'echo Y | samctrl -m' to migrate TSA domain.
The cluster bcudomain02 is ready to be migrated from "4.1.0.6" to a new level. Type Y to perform migration [Y|N]:

Active version successfully migrated to new version "4.1.0.7"!
20220921_140850 (reverseflash06:tlsa_utility.sh): Collecting domain details.
20220921_140850 (reverseflash06:tlsa_utility.sh): Domain is online.
20220921_140850 (reverseflash06:tlsa_utility.sh): Domain is not in mixed mode.
20220921_140851 (reverseflash06:tlsa_utility.sh): AVN: '4.1.0.7' is equal to IVN: '4.1.0.7'. TSA Migration is not required.
20220921_140851 (reverseflash06:tlsa_utility.sh): RSCT and TSA Migration were successful.
20220921_140851 (reverseflash06:tlsa_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/tlsa_utility.sh' with
arguments 'commit' ended with rc=0'. Start: Wed Sep 21 14:08:41 EDT 2022 End: Wed Sep 21 14:08:51 EDT 2022. Elapsed Time
(Seconds): 10 (H:M:S):(00:00:10).
20220921_140853 (reverseflash06:tlsa_utility.sh): Normalizing management hostname.
20220921_140854 (reverseflash06:tlsa_utility.sh): Management hostname is 'reverseflash01'.
20220921_140854 (reverseflash06:tlsa_utility.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash06' from script
'/BCU_share/FP9_FP5/fixpack_tools/application/tlsa_utility.sh'.' to 'user@customer.com' '-c root@localhost' via reverseflash01.
20220921_140854 (reverseflash06:tlsa_utility.sh): Notification sent.

(0) root @ reverseflash01: 7.2.0.0:/BCU_share/FP9_FP5/fixpack_tools/application
```

Example Output: (With an error on flashdancehostname06 – bcudomain02)

STAGE 8 - CORE NODES update in DOWNTIME window

```
$ dsh -n ${BCUDB2ALL} '/BCU_share/FP8_FP4/fixpack_tools/application/tsa_utility.sh commit' 2>&1 | dshbak -c
HOSTS -----
flashdancehostname02
-----
20210111_221711 (flashdancehostname02:tsa_utility.sh): Starting date: Mon Jan 11 22:17:11 IST 2021.
20210111_221711 (flashdancehostname02:tsa_utility.sh): Checking current TSA version.
20210111_221711 (flashdancehostname02:tsa_utility.sh): My TSA version is '4.1.0.6'.
20210111_221711 (flashdancehostname02:tsa_utility.sh): Checking for available TSA updates.
20210111_221712 (flashdancehostname02:tsa_utility.sh): Found TSA version '4.1.0.0004'.
20210111_221712 (flashdancehostname02:tsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
20210111_221712 (flashdancehostname02:tsa_utility.sh): Found TSA version '4.1.0.0005'.
20210111_221712 (flashdancehostname02:tsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
20210111_221712 (flashdancehostname02:tsa_utility.sh): Found TSA version '4.1.0.0006'.
20210111_221712 (flashdancehostname02:tsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
20210111_221712 (flashdancehostname02:tsa_utility.sh): There is no available update for this host.
20210111_221712 (flashdancehostname02:tsa_utility.sh): Collecting domain details.
20210111_221712 (flashdancehostname02:tsa_utility.sh): Domain is online.
20210111_221712 (flashdancehostname02:tsa_utility.sh): Domain RSCT is in mixed mode.
20210111_221712 (flashdancehostname02:tsa_utility.sh): All nodes are online.
20210111_221712 (flashdancehostname02:tsa_utility.sh): Will not run RSCT migration on this host as it is not the leader.
20210111_221712 (flashdancehostname02:tsa_utility.sh): Starting date: Mon Jan 11 22:17:11 IST 2021   Ending Date: Mon Jan 11
22:17:12 IST 2021.

HOSTS -----
flashdancehostname05
-----
20210111_221712 (flashdancehostname05:tsa_utility.sh): Starting date: Mon Jan 11 22:17:12 IST 2021.
20210111_221712 (flashdancehostname05:tsa_utility.sh): Checking current TSA version.
20210111_221712 (flashdancehostname05:tsa_utility.sh): My TSA version is '4.1.0.6'.
20210111_221712 (flashdancehostname05:tsa_utility.sh): Checking for available TSA updates.
20210111_221712 (flashdancehostname05:tsa_utility.sh): Found TSA version '4.1.0.0004'.
20210111_221712 (flashdancehostname05:tsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
20210111_221712 (flashdancehostname05:tsa_utility.sh): Found TSA version '4.1.0.0005'.
20210111_221712 (flashdancehostname05:tsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
20210111_221712 (flashdancehostname05:tsa_utility.sh): Found TSA version '4.1.0.0006'.
20210111_221712 (flashdancehostname05:tsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
20210111_221712 (flashdancehostname05:tsa_utility.sh): There is no available update for this host.
20210111_221712 (flashdancehostname05:tsa_utility.sh): Collecting domain details.
20210111_221713 (flashdancehostname05:tsa_utility.sh): Domain is online.
20210111_221713 (flashdancehostname05:tsa_utility.sh): Domain RSCT is in mixed mode.
20210111_221713 (flashdancehostname05:tsa_utility.sh): All nodes are online.
20210111_221713 (flashdancehostname05:tsa_utility.sh): Will not run RSCT migration on this host as it is not the leader.
20210111_221713 (flashdancehostname05:tsa_utility.sh): Starting date: Mon Jan 11 22:17:12 IST 2021   Ending Date: Mon Jan 11
22:17:13 IST 2021.

HOSTS -----
flashdancehostname07
-----
20210111_221712 (flashdancehostname07:tsa_utility.sh): Starting date: Mon Jan 11 22:17:12 IST 2021.
20210111_221712 (flashdancehostname07:tsa_utility.sh): Checking current TSA version.
20210111_221712 (flashdancehostname07:tsa_utility.sh): My TSA version is '4.1.0.6'.
20210111_221712 (flashdancehostname07:tsa_utility.sh): Checking for available TSA updates.
20210111_221712 (flashdancehostname07:tsa_utility.sh): Found TSA version '4.1.0.0004'.
20210111_221712 (flashdancehostname07:tsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
20210111_221712 (flashdancehostname07:tsa_utility.sh): Found TSA version '4.1.0.0005'.
20210111_221712 (flashdancehostname07:tsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
20210111_221712 (flashdancehostname07:tsa_utility.sh): Found TSA version '4.1.0.0006'.
20210111_221712 (flashdancehostname07:tsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
20210111_221712 (flashdancehostname07:tsa_utility.sh): There is no available update for this host.
20210111_221712 (flashdancehostname07:tsa_utility.sh): Collecting domain details.
20210111_221713 (flashdancehostname07:tsa_utility.sh): Domain is online.
20210111_221713 (flashdancehostname07:tsa_utility.sh): Domain RSCT is in mixed mode.
20210111_221713 (flashdancehostname07:tsa_utility.sh): All nodes are online.
20210111_221713 (flashdancehostname07:tsa_utility.sh): Will not run RSCT migration on this host as it is not the leader.
20210111_221713 (flashdancehostname07:tsa_utility.sh): Starting date: Mon Jan 11 22:17:12 IST 2021   Ending Date: Mon Jan 11
22:17:13 IST 2021.

HOSTS -----
flashdancehostname06
-----
20210111_221712 (flashdancehostname06:tsa_utility.sh): Starting date: Mon Jan 11 22:17:12 IST 2021.
20210111_221712 (flashdancehostname06:tsa_utility.sh): Checking current TSA version.
20210111_221712 (flashdancehostname06:tsa_utility.sh): My TSA version is '4.1.0.6'.
20210111_221712 (flashdancehostname06:tsa_utility.sh): Checking for available TSA updates.
20210111_221712 (flashdancehostname06:tsa_utility.sh): Found TSA version '4.1.0.0004'.
20210111_221712 (flashdancehostname06:tsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
20210111_221712 (flashdancehostname06:tsa_utility.sh): Found TSA version '4.1.0.0005'.
20210111_221712 (flashdancehostname06:tsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
20210111_221712 (flashdancehostname06:tsa_utility.sh): Found TSA version '4.1.0.0006'.
20210111_221712 (flashdancehostname06:tsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
20210111_221712 (flashdancehostname06:tsa_utility.sh): There is no available update for this host.
20210111_221712 (flashdancehostname06:tsa_utility.sh): Collecting domain details.
20210111_221713 (flashdancehostname06:tsa_utility.sh): Domain is online.
20210111_221713 (flashdancehostname06:tsa_utility.sh): Domain RSCT is in mixed mode.
20210111_221713 (flashdancehostname06:tsa_utility.sh): All nodes are online.
20210111_221713 (flashdancehostname06:tsa_utility.sh): Running rsct migration 'runact -c IBM.PeerDomain CompleteMigration
Options=0' on this host as it is the leader.
Resource Class Action Response for CompleteMigration
20210111_221713 (flashdancehostname06:tsa_utility.sh): Error: RSCT migration failed.
20210111_221713 (flashdancehostname06:tsa_utility.sh): Starting date: Mon Jan 11 22:17:12 IST 2021    Ending Date: Mon Jan 11
22:17:13 IST 2021.

HOSTS -----
flashdancehostname04
-----
20210111_221712 (flashdancehostname04:tsa_utility.sh): Starting date: Mon Jan 11 22:17:12 IST 2021.
20210111_221712 (flashdancehostname04:tsa_utility.sh): Checking current TSA version.
20210111_221712 (flashdancehostname04:tsa_utility.sh): My TSA version is '4.1.0.6'.
20210111_221712 (flashdancehostname04:tsa_utility.sh): Checking for available TSA updates.
20210111_221712 (flashdancehostname04:tsa_utility.sh): Found TSA version '4.1.0.0004'.
20210111_221712 (flashdancehostname04:tsa_utility.sh): TSA version '4.1.0.0004' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
20210111_221712 (flashdancehostname04:tsa_utility.sh): Found TSA version '4.1.0.0005'.
20210111_221712 (flashdancehostname04:tsa_utility.sh): TSA version '4.1.0.0005' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
20210111_221712 (flashdancehostname04:tsa_utility.sh): Found TSA version '4.1.0.0006'.
20210111_221712 (flashdancehostname04:tsa_utility.sh): TSA version '4.1.0.0006' at at or below my TSA version '4.1.0.6'. Skipping
to next available version.
20210111_221712 (flashdancehostname04:tsa_utility.sh): There is no available update for this host.
20210111_221712 (flashdancehostname04:tsa_utility.sh): Collecting domain details.
20210111_221712 (flashdancehostname04:tsa_utility.sh): Domain is online.
20210111_221712 (flashdancehostname04:tsa_utility.sh): Domain RSCT is in mixed mode.
20210111_221712 (flashdancehostname04:tsa_utility.sh): All nodes are online.
20210111_221712 (flashdancehostname04:tsa_utility.sh): Running rsct migration 'runact -c IBM.PeerDomain CompleteMigration
Options=0' on this host as it is the leader.
Resource Class Action Response for CompleteMigration
20210111_221714 (flashdancehostname04:tsa_utility.sh): Collecting domain details.
20210111_221715 (flashdancehostname04:tsa_utility.sh): Domain is online.
20210111_221715 (flashdancehostname04:tsa_utility.sh): Domain is not in mixed mode.
20210111_221715 (flashdancehostname04:tsa_utility.sh): TSA migration is required.
20210111_221716 (flashdancehostname04:tsa_utility.sh): This host is the domain leader.
20210111_221716 (flashdancehostname04:tsa_utility.sh): Running 'echo Y | samctrl -m' to migrate TSA domain.
The cluster bcudomain01 is ready to be migrated from "4.1.0.5" to a new level. Type Y to perform migration [Y|N]:

Active version successfully migrated to new version "4.1.0.6"!
20210111_221720 (flashdancehostname04:tsa_utility.sh): Collecting domain details.
20210111_221720 (flashdancehostname04:tsa_utility.sh): Domain is online.
20210111_221720 (flashdancehostname04:tsa_utility.sh): Domain is not in mixed mode.
20210111_221721 (flashdancehostname04:tsa_utility.sh): AVN: '4.1.0.6' is equal to IVN: '4.1.0.6'. TSA Migration is not required.
20210111_221721 (flashdancehostname04:tsa_utility.sh): RSCT and TSA Migration were successful.
20210111_221721 (flashdancehostname04:tsa_utility.sh): Starting date: Mon Jan 11 22:17:12 IST 2021    Ending Date: Mon Jan 11
22:17:21 IST 2021.

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

8. Command: Verify the domain is no longer in mixed mode.

```
dsh -n ${BCUDB2ALL} 'lsrpdomain' | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUDB2ALL} 'lsrpdomain' | dshbak -c
HOSTS -----
reverseflash02, reverseflash04
-----
Name      OpState RSCTActiveVersion MixedVersions TSPort GSPort
bcudomain01 Online  3.2.6.4          No           12347  12348

HOSTS -----
reverseflash05, reverseflash06
-----
Name      OpState RSCTActiveVersion MixedVersions TSPort GSPort
bcudomain02 Online  3.2.6.4          No           12347  12348
```

9. Command: Verify that TSA is migrated and shows the AVN is 4.1.0.7 and the IVN is 4.1.0.7.

```
dsh -n ${BCUDB2ALL} "lssrc -ls IBM.RecoveryRM | egrep 'IVN|AVN'" | dshbak -c
```

STAGE 8 - CORE NODES update in DOWNTIME window

Example Output:

```
$ dsh -n ${BCUDB2ALL} "lssrc -ls IBM.RecoveryRM | egrep 'IVN|AVN'" | dshbak -c
HOSTS -----
reverseflash02, reverseflash04, reverseflash05, reverseflash06
-----
Our IVN          : 4.1.0.7
Our AVN          : 4.1.0.7
(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

10. Command: Check that RSCT filesets are still in the Applied state. In FP4 to FP5 scenarios we do not see RSCT in the apply state.

```
dsh -n ${BCUDB2ALL} 'installp -s rsct*' 2>&1 | dshbak -c
```

Example Output: (If starting from FP4)

```
$ dsh -n ${BCUDB2ALL} 'installp -s rsct*' 2>&1 | dshbak -c
HOSTS -----
reverseflash02, reverseflash04, reverseflash05, reverseflash06
-----
0503-459 installp: No filesets were found in the Software
                  Vital Product Database in the APPLIED state.
```

Example Output:

```
$ dsh -n ${BCUDB2ALL} 'installp -s rsct*' 2>&1 | dshbak -c
HOSTS -----
kf5hostname02, kf5hostname04, kf5hostname05, kf5hostname06, kf5hostname07
-----
rsct.basic.rte      ROOT    3.2.5.2      APPLIED
rsct.basic.rte      USR     3.2.5.2      APPLIED
rsct.basic.rte      USR     3.2.5.3      APPLIED
rsct.basic.rte      ROOT    3.2.5.3      APPLIED
rsct.core.errm      USR     3.2.5.1      APPLIED
rsct.core.errm      ROOT    3.2.5.1      APPLIED
rsct.core.hostrm    USR     3.2.5.2      APPLIED
rsct.core.hostrm    ROOT    3.2.5.2      APPLIED
rsct.core.hostrm    USR     3.2.5.3      APPLIED
rsct.core.hostrm    ROOT    3.2.5.3      APPLIED
rsct.core.rmc       USR     3.2.5.2      APPLIED
rsct.core.rmc       ROOT    3.2.5.2      APPLIED
rsct.core.rmc       USR     3.2.5.3      APPLIED
rsct.core.rmc       ROOT    3.2.5.3      APPLIED
rsct.core.rmc       USR     3.2.5.2      APPLIED
rsct.core.rmc       ROOT    3.2.5.2      APPLIED
rsct.core.rmc       USR     3.2.5.3      APPLIED
rsct.core.rmc       ROOT    3.2.5.3      APPLIED
rsct.core.utils     USR     3.2.5.2      APPLIED
rsct.core.utils     ROOT    3.2.5.2      APPLIED
rsct.core.utils     ROOT    3.2.5.3      APPLIED
rsct.core.utils     USR     3.2.5.3      APPLIED
Installp Status
-----
Name                Part      Level      State
-----
```

11. Command: If needed, commit the rsct filesets.

```
dsh -n ${BCUDB2ALL} 'installp -cgX rsct*' 2>&1 | dshbak -c
```

Example Output: (May show in multiple stanzas, only one stanza shown)

```
$ dsh -n ${BCUDB2ALL} 'installp -cgX rsct*' 2>&1 | dshbak -c
HOSTS -----
kf5hostname04, kf5hostname05
-----
SUCCESES
-----
Filesets listed in this section passed pre-commit verification
and will be committed.

Selected Filesets
-----
rsct.basic.rte 3.2.5.2      # RSCT Basic Function
rsct.basic.rte 3.2.5.3      # RSCT Basic Function
rsct.core.errm 3.2.5.1      # RSCT Event Response Resource...
rsct.core.hostrm 3.2.5.2    # RSCT Host Resource Manager
rsct.core.hostrm 3.2.5.3    # RSCT Host Resource Manager
rsct.core.rmc 3.2.5.2      # RSCT Resource Monitoring and...
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
rsct.core.rmc 3.2.5.3          # RSCT Resource Monitoring and...
rsct.core.utils 3.2.5.2        # RSCT Utilities
rsct.core.utils 3.2.5.3        # RSCT Utilities

<< End of Success Section >>
+-----+
+-----+ Pre-commit Verification... +-----+
+-----+
Verifying selections...done
Verifying requisites...done
Results...

FILESET STATISTICS
-----
    9 Selected to be committed, of which:
      9 Passed pre-installation verification
    ---
    9 Total to be committed
+-----+
+-----+ Committing Software... +-----+
+-----+

installp: COMMITTING software for:
          rsct.core.utils 3.2.5.2

Filesets processed:  1 of 9  (Total time:  0 secs).

installp: COMMITTING software for:
          rsct.core.utils 3.2.5.3

Filesets processed:  2 of 9  (Total time:  1 secs).

installp: COMMITTING software for:
          rsct.core.rmc 3.2.5.2

Filesets processed:  3 of 9  (Total time:  1 secs).

installp: COMMITTING software for:
          rsct.basic.rte 3.2.5.2

Filesets processed:  4 of 9  (Total time:  1 secs).

installp: COMMITTING software for:
          rsct.core.errm 3.2.5.1

Filesets processed:  5 of 9  (Total time:  1 secs).

installp: COMMITTING software for:
          rsct.core.hostrm 3.2.5.2

Filesets processed:  6 of 9  (Total time:  2 secs).

installp: COMMITTING software for:
          rsct.core.rmc 3.2.5.3

Filesets processed:  7 of 9  (Total time:  2 secs).

installp: COMMITTING software for:
          rsct.basic.rte 3.2.5.3

Filesets processed:  8 of 9  (Total time:  2 secs).

installp: COMMITTING software for:
          rsct.core.hostrm 3.2.5.3

Finished processing all filesets.  (Total time:  2 secs).
+-----+
+-----+ Summaries: +-----+
+-----+

Installation Summary
-----
Name                      Level      Part      Event      Result
-----
rsct.core.utils            3.2.5.2    USR       COMMIT     SUCCESS
rsct.core.utils            3.2.5.2    ROOT     COMMIT     SUCCESS
rsct.core.utils            3.2.5.3    USR       COMMIT     SUCCESS
rsct.core.utils            3.2.5.3    ROOT     COMMIT     SUCCESS
rsct.core.rmc              3.2.5.2    USR       COMMIT     SUCCESS
rsct.core.rmc              3.2.5.2    ROOT     COMMIT     SUCCESS
rsct.basic.rte             3.2.5.2    USR       COMMIT     SUCCESS
rsct.basic.rte             3.2.5.2    ROOT     COMMIT     SUCCESS
rsct.core.errm             3.2.5.1    USR       COMMIT     SUCCESS
rsct.core.errm             3.2.5.1    ROOT     COMMIT     SUCCESS
rsct.core.hostrm           3.2.5.2    USR       COMMIT     SUCCESS
rsct.core.hostrm           3.2.5.2    ROOT     COMMIT     SUCCESS
rsct.core.rmc              3.2.5.3    USR       COMMIT     SUCCESS
rsct.core.rmc              3.2.5.3    ROOT     COMMIT     SUCCESS
```


STAGE 8 - CORE NODES update in DOWNTIME window

rsct.basic.rte	3.2.5.3	USR	COMMIT	SUCCESS
rsct.basic.rte	3.2.5.3	ROOT	COMMIT	SUCCESS
rsct.core.hostrm	3.2.5.3	USR	COMMIT	SUCCESS
rsct.core.hostrm	3.2.5.3	ROOT	COMMIT	SUCCESS

12. Command: Verify that there are no more Applied rsct filesets.

```
dsh -n ${BCUDB2ALL} 'installp -s rsct*' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUDB2ALL} 'installp -s rsct*' 2>&1 | dshbak -c
HOSTS -----
kf5hostname02, kf5hostname04, kf5hostname05, kf5hostname06, kf5hostname07
-----
0503-459 installp: No filesets were found in the Software
Vital Product Database in the APPLIED state.
```

Phase 5: Update HA Tools.

During the testing for 2.0.8.0 there were several defects discovered that could not be shipped with 2.0.8.0 that are included in 2.0.8.1. HA Tools 2.0.9.0 includes all the fixes in 2.0.8.0 and 2.0.8.1. This step is done with domains online, but with all services quiesced.

1. In very early PDOA V1.1 installations there is an inconsistent in the naming convention for relationships between db2 partition resources and network equivalencies during the corporate network setup tasks. This creates a problem with the ha tool's commands *hareset* and *hachkconfig*. This step will check for issues and correct them. FP4->FP5 customers should have corrected this with the installation of 2.0.8.1, however, rerun the check commands to verify.

- a. Command: Find the relationships that are improperly named. If this is blank then skip items 1b and 1c as this system does not need to be corrected.

```
dsh -n ${BCUDB2ALL} "lsrel -D@ -s 'Name like \"%network\"" Name | grep network | cut -d@ -f1" 2> /dev/null | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUDB2ALL} "lsrel -D@ -s 'Name like \"%network\"" Name | grep network | cut -d@ -f1" 2> /dev/null | dshbak -c
HOSTS -----
b30i02, b30i04
-----
db2_bcuaix_0_1_2_3_4_5-rs_Dependson_db2_VLAN501_network
HOSTS -----
b30i05, b30i06, b30i07
-----
db2_bcuaix_16_17_18_19_20_21_22_23_24_25-rs_Dependson_db2_VLAN501_network
db2_bcuaix_6_7_8_9_10_11_12_13_14_15-rs_Dependson_db2_VLAN501_network
```

- b. Command: Use the following command to rename all relationships that are incorrect.

```
dsh -f 1 -n ${BCUDB2ALL} "sleep 1;lsrel -D@ -s 'Name like \"%network\"" Name 2> /dev/null | grep network | cut -d@ -f1 |
while read f;do echo \${f};chrel -c \${f}-rel \${f};done" | dshbak -c
```

Example Output:

```
$ dsh -f 1 -n ${BCUDB2ALL} "sleep 1;lsrel -D@ -s 'Name like \"%network\"" Name 2> /dev/null | grep network | cut -d@ -f1 |
while read f;do echo \${f};chrel -c \${f}-rel \${f};done" | dshbak -c
HOSTS -----
b30i02
-----
db2_bcuaix_0_1_2_3_4_5-rs_Dependson_db2_VLAN501_network
HOSTS -----
b30i05
-----
db2_bcuaix_16_17_18_19_20_21_22_23_24_25-rs_Dependson_db2_VLAN501_network
db2_bcuaix_6_7_8_9_10_11_12_13_14_15-rs_Dependson_db2_VLAN501_network
```

- c. Command: Verify that the the relationships are renamed. The following should return blank.

```
dsh -n ${BCUDB2ALL} "lsrel -D@ -s 'Name like \"%network\"" Name | grep network | cut -d@ -f1" 2> /dev/null | dshbak -c
```

2. Command: Backup the current hatools directory on the management host. In case of an odd error this will prevent the need to restore via mksysb.

```
cp -r /usr/IBM/analytics/ha_tools /usr/IBM/analytics/ha_tools. $(date +%s)
```

STAGE 8 - CORE NODES update in DOWNTIME window

3. Command: Verify the backup is available.

```
ls -drt /usr/IBM/analytics/ha_tools.*
```

Example Output:

```
$ ls -drt /usr/IBM/analytics/ha_tools.*
/usr/IBM/analytics/ha_tools.1610398833
```

4. Command: Verify that the HA Tools compressed file is available on all hosts.

```
dsh -n ${ALL} 'ls /BCU_share/FP9_FP5/software/HA_DB2/hatools*tgz' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} 'ls /BCU_share/FP9_FP5/software/HA_DB2/hatools*tgz' 2>&1 | dshbak -c
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
/BCU_share/FP9_FP5/software/HA_DB2/hatools_2.0.9.0_20220803.184708.tgz
```

5. Command: Unpack hatools on all hosts. There is no output unless there is an error.

```
dsh -n ${ALL} 'gzip -d < $(ls -t /BCU_share/FP9_FP5/software/HA_DB2/hatools*tgz | head -1) | tar -xf - -C /usr/IBM/analytics' | dshbak -c
```

6. Command: Verify the cksums on all hosts. Note that hatools.conf is not included in this update so will appear as different.

```
dsh -n ${ALL} '(cd /usr/IBM/analytics;cksum $(find ha_tools -type f | sort)) | diff $(ls -t /BCU_share/FP9_FP5/software/HA_DB2/hatools*cksum* | head -1) -' 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} '(cd /usr/IBM/analytics;cksum $(find ha_tools -type f | sort)) | diff $(ls -t /BCU_share/FP9_FP5/software/HA_DB2/hatools*cksum* | head -1) -' 2>&1 | dshbak -c
HOSTS -----
reverseflash01
-----
34a35
> 2225558768 1317 ha_tools/hatools.conf

HOSTS -----
reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
34a35
> 1644589196 1400 ha_tools/hatools.conf
```

7. Command: Verify the .buildinfo matches.

```
dsh -n ${ALL} 'cd /usr/IBM/analytics/ha_tools/;cat .buildinfo' | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} 'cd /usr/IBM/analytics/ha_tools/;cat .buildinfo' | dshbak -c
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
hatools_2.0.9.0_20220803.184708
```

STAGE 8 - CORE NODES update in DOWNTIME window

8. Command: Verify the version.txt file contains 2.0.9.0.

```
dsh -n ${ALL} 'cd /usr/IBM/analytics/ha_tools/:cat version.txt' | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} 'cd /usr/IBM/analytics/ha_tools/:cat version.txt' | dshbak -c
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
2.0.9.0
```

9. Command: Backup the domain.

```
haretset -backup
```

Example Output:

```
$ haretset -backup
```

It is recommended that the HA configuration is verified using the 'hachkconfig' tool before creating a backup.

Type 'yes' to continue or any other key to quit
yes

```
Backed up host: flashdancehostname07
Backed up host: flashdancehostname06
Backed up host: flashdancehostname05
Backed up host: flashdancehostname04
Backed up host: flashdancehostname02
```

```
(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/software/HA_DB2
```

10. Command: Run hachkconfig without any arguments. This should highlight policy missing or mismatch errors. Customers starting from V1.1 FP4 should not see any issues. Customers starting from V1.1 FP3 or earlier; this is expected as the TSA/HA Tools integration scripts have not been copied. The output below shows only the policy error output.

```
hachkconfig
```

Example Output: (Starting from FP3 or earlier.)

```
$ hachkconfig
```

Inspecting CORE resource model

Logging to /tmp/halog/hachkconfig.2021.01.12-02.48.31.*.out

```
Inspecting Policies: HA Group 1
** Problem with Policy: Policy missing or mismatch: flashdancehostname04:/usr/sbin/rsct/sapolicies/db2/crISAS_rsrc.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname04:/usr/sbin/rsct/sapolicies/db2/db2ISAS_monitor.ksh
** Problem with Policy: Policy missing or mismatch:
flashdancehostname04:/usr/sbin/rsct/sapolicies/db2/db2ISAS_monitor_pdoa_trouble.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname04:/usr/sbin/rsct/sapolicies/db2/db2ISAS_start.ksh
** Problem with Policy: Policy missing or mismatch:
flashdancehostname04:/usr/sbin/rsct/sapolicies/db2/db2ISAS_start_pdoa_trouble.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname04:/usr/sbin/rsct/sapolicies/db2/db2ISAS_stop.ksh
** Problem with Policy: Policy missing or mismatch:
flashdancehostname04:/usr/sbin/rsct/sapolicies/db2/mountISAS_monitor_pdoa_trouble.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname02:/usr/sbin/rsct/sapolicies/db2/crISAS_rsrc.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname02:/usr/sbin/rsct/sapolicies/db2/db2ISAS_monitor.ksh
** Problem with Policy: Policy missing or mismatch:
flashdancehostname02:/usr/sbin/rsct/sapolicies/db2/db2ISAS_monitor_pdoa_trouble.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname02:/usr/sbin/rsct/sapolicies/db2/db2ISAS_start.ksh
** Problem with Policy: Policy missing or mismatch:
flashdancehostname02:/usr/sbin/rsct/sapolicies/db2/db2ISAS_start_pdoa_trouble.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname02:/usr/sbin/rsct/sapolicies/db2/db2ISAS_stop.ksh
** Problem with Policy: Policy missing or mismatch:
flashdancehostname02:/usr/sbin/rsct/sapolicies/db2/mountISAS_monitor_pdoa_trouble.ksh
Inspecting Policies: HA Group 2
```

STAGE 8 - CORE NODES update in DOWNTIME window

```

** Problem with Policy: Policy missing or mismatch: flashdancehostname05:/usr/sbin/rsct/sapolicies/db2/crISAS_rsrc.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname05:/usr/sbin/rsct/sapolicies/db2/db2ISAS_monitor.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname05:/usr/sbin/rsct/sapolicies/db2/db2ISAS_monitor_pdoa_trouble.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname05:/usr/sbin/rsct/sapolicies/db2/db2ISAS_start.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname05:/usr/sbin/rsct/sapolicies/db2/db2ISAS_start_pdoa_trouble.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname05:/usr/sbin/rsct/sapolicies/db2/db2ISAS_stop.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname05:/usr/sbin/rsct/sapolicies/db2/mountISAS_monitor_pdoa_trouble.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname07:/usr/sbin/rsct/sapolicies/db2/crISAS_rsrc.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname07:/usr/sbin/rsct/sapolicies/db2/db2ISAS_monitor.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname07:/usr/sbin/rsct/sapolicies/db2/db2ISAS_monitor_pdoa_trouble.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname07:/usr/sbin/rsct/sapolicies/db2/db2ISAS_start.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname07:/usr/sbin/rsct/sapolicies/db2/db2ISAS_start_pdoa_trouble.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname07:/usr/sbin/rsct/sapolicies/db2/db2ISAS_stop.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname07:/usr/sbin/rsct/sapolicies/db2/mountISAS_monitor_pdoa_trouble.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname06:/usr/sbin/rsct/sapolicies/db2/crISAS_rsrc.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname06:/usr/sbin/rsct/sapolicies/db2/db2ISAS_monitor.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname06:/usr/sbin/rsct/sapolicies/db2/db2ISAS_monitor_pdoa_trouble.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname06:/usr/sbin/rsct/sapolicies/db2/db2ISAS_start.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname06:/usr/sbin/rsct/sapolicies/db2/db2ISAS_start_pdoa_trouble.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname06:/usr/sbin/rsct/sapolicies/db2/db2ISAS_stop.ksh
** Problem with Policy: Policy missing or mismatch: flashdancehostname06:/usr/sbin/rsct/sapolicies/db2/mountISAS_monitor_pdoa_trouble.ksh
Checking host roles: HA Group 1
Checking host roles: HA Group 2

...

** 35 problem(s) found

```

11. Command: If there are issues, run `hachkconfig -repair` to copy the policy scripts. The output will vary depending on the size of the PDOA environment.

hachkconfig -repair

Example Output:

```
$ hachkconfig -repair
Inspecting and repairing CORE resource model
```

```
Logging to /tmp/halog/hachkconfig.2021.01.12-02.54.58.*.out
```

[illegible]

STAGE 8 - CORE NODES update in DOWNTIME window

```
Copy /usr/IBM/analytics/ha_tools/HAscripts/crISAS_rsrc.ksh to flashdancehostname06:/usr/sbin/rsct/sapolicies/db2
** Problem with Policy: Policy missing or mismatch: flashdancehostname06:/usr/sbin/rsct/sapolicies/db2/db2ISAS_monitor.ksh
Copy /usr/IBM/analytics/ha_tools/HAscripts/db2ISAS_monitor.ksh to flashdancehostname06:/usr/sbin/rsct/sapolicies/db2
** Problem with Policy: Policy missing or mismatch: flashdancehostname06:/usr/sbin/rsct/sapolicies/db2/db2ISAS_start.ksh
Copy /usr/IBM/analytics/ha_tools/HAscripts/db2ISAS_start.ksh to flashdancehostname06:/usr/sbin/rsct/sapolicies/db2
** Problem with Policy: Policy missing or mismatch: flashdancehostname06:/usr/sbin/rsct/sapolicies/db2/db2ISAS_stop.ksh
Copy /usr/IBM/analytics/ha_tools/HAscripts/db2ISAS_stop.ksh to flashdancehostname06:/usr/sbin/rsct/sapolicies/db2

Checking host roles: HA Group 1
Checking host roles: HA Group 2
...

** 20 problem(s) found
** All problems fixed
```

12. Command: Run the hachkconfig again to verify no more problems are detected.

hachkconfig

Example Output:

```
$ hachkconfig
Inspecting CORE resource model

Logging to /tmp/halog/hachkconfig.2021.01.12-03.09.01*.out

Inspecting Policies: HA Group 1
Verified Policies
Inspecting Policies: HA Group 2
Verified Policies

Checking host roles: HA Group 1
Checking host roles: HA Group 2
...

** No issues found

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/software/HA_DB2
```

Phase 6 : Update DB2 on the core hosts.

In Stage 6, Phase 6 Db2 was updated on the management hosts. In these steps Db2 copies were extracted and several scripts were generated. If this phase was skipped, then return to those steps to unpack and prepare the db2 files.

Phase 6: Step 1 Installing the Db2 Update

1. Command: Run the following to verify the Db2 versions on your environment. PDOA supports Db2 10.5 only on the management hosts and Db2 10.5 or 11.1 on the core nodes. Over time it is possible to have multiple copies of Db2 on the core nodes. It may be necessary to uninstall older Db2 versions that are no longer in use and will no longer be needed for reversion in order to free up space on the /usr filesystem. The commands below show one copy of Db2 10.5 and 3 copies of Db2 11.1 on the core nodes. The latest level V11.1.4.5..0 is the level that is being used for the instance owner *bcuaix*. Experience shows that PDOA can usually have 3 to 4 Db2 copies at the same time without having to expand the /usr filesystem.

```
dsh -n ${ALL} -e /BCU_share/FP9_FP5/software/DB2/scripts/get_db2_data.sh 2> /dev/null | dshbak -c
```

Example Output: (V1.1 FP4 will not have Db2 on management hosts.)

```
$ dsh -n ${ALL} -e /BCU_share/FP9_FP5/software/DB2/scripts/get_db2_data.sh 2> /dev/null | dshbak -c
HOSTS -----
reverseflash02
-----
/usr/IBM/dwe/db2/V10.5.0.10..6|10.5|10.5.0.10|10.5.0.10..6|||
/usr/IBM/dwe/db2/V10.5.0.11..2|10.5|10.5.0.11|10.5.0.11..2|bcuaix|bcuaix||

HOSTS -----
reverseflash04, reverseflash05, reverseflash06
-----
/usr/IBM/dwe/db2/V10.5.0.10..6|10.5|10.5.0.10|10.5.0.10..6|||
/usr/IBM/dwe/db2/V10.5.0.11..2|10.5|10.5.0.11|10.5.0.11..2|bcuaix|bcuaix||
/usr/IBM/dwe/db2/V11.1.4.4.a.2|11.1|11.1.4.4|11.1.4.4.a.2|||
/usr/IBM/dwe/db2/V11.1.4.5..0|11.1|11.1.4.5|11.1.4.5..0|||
```

Example Output: (V1.1 FP3 or earlier will have Db2 on management hosts.)

```
$ dsh -n ${ALL} -e /BCU_share/FP8_FP4/software/DB2/scripts/get_db2_data.sh 2> /dev/null | dshbak -c
HOSTS -----
flashdancehostname01, flashdancehostname03
-----
/usr/IBM/dwe/mgmt_db2/V10.5|10.5|10.5.0.11|10.5.0.11..2|db2opm|db2opm||

HOSTS -----
flashdancehostname02, flashdancehostname04, flashdancehostname05, flashdancehostname06, flashdancehostname07
-----
/usr/IBM/dwe/db2/V10.5.0.5..1|10.5|10.5.0.5|10.5.0.5..5|||
/usr/IBM/dwe/db2/V11.1|11.1|11.1.0.0|11.1.0.0..0|||
/usr/IBM/dwe/db2/V11.1.4.4.a.2|11.1|11.1.4.4|11.1.4.4.a.2|||
/usr/IBM/dwe/db2/V11.1.4.5..0|11.1|11.1.4.5|11.1.4.5..0|bcuaix|bcuaix||
```

2. Command: Uninstall any Db2 copies on the core that are no longer needed to free space, if needed, on '/usr'. The following example will show an uninstall V11.1 GA. The expectation and standard is that all data nodes are treated the same which allows the use of dsh commands. Replace the path '/usr/IBM/dwe/db2/V11.1' list below with the path listed above. If you have non-uniform db2 installations then you may need to run that command on a more limited set of nodes.

```
dsh -n ${BCUDB2ALL} '/usr/IBM/dwe/db2/V11.1/install/db2_deinstall -a' 2>&1 | dshbak -c
```

Example Output:

STAGE 8 - CORE NODES update in DOWNTIME window

```
$ dsh -n ${BCUDB2ALL} ' /usr/IBM/dwe/db2/V11.1/install/db2_deinstall -a' 2>&1 | dshbak -c
HOSTS -----
flashdancehostname06
-----
DBI1016I  Program db2_deinstall is performing uninstallation. Please
wait.

The execution completed successfully.

For more information see the DB2 uninstallation log at
"/tmp/db2_deinstall.log.4653064".

HOSTS -----
flashdancehostname07
-----
DBI1016I  Program db2_deinstall is performing uninstallation. Please
wait.

The execution completed successfully.

For more information see the DB2 uninstallation log at
"/tmp/db2_deinstall.log.14352586".

HOSTS -----
flashdancehostname05
-----
DBI1016I  Program db2_deinstall is performing uninstallation. Please
wait.

The execution completed successfully.

For more information see the DB2 uninstallation log at
"/tmp/db2_deinstall.log.14156004".

HOSTS -----
flashdancehostname04
-----
DBI1016I  Program db2_deinstall is performing uninstallation. Please
wait.

The execution completed successfully.

For more information see the DB2 uninstallation log at
"/tmp/db2_deinstall.log.8192222".

HOSTS -----
flashdancehostname02
-----
DBI1016I  Program db2_deinstall is performing uninstallation. Please
wait.

The execution completed successfully.

For more information see the DB2 uninstallation log at
"/tmp/db2_deinstall.log.7733864".
```

3. Check for the generated scripts for the core nodes. The following examples show the installation, instance update, and registry fixes for Db2 version 11.1.4.5..4 updating from 11.1.4.5..0. Your system may have a different db2 source copy, or you may decide not to update Db2 at this time.

- a. Command: Change the working directory to /BCU_share/FP8_FP4/software/DB2

```
cd /BCU_share/FP9_FP5/software/DB2
```

- b. Command: Verify the contents of the generated corefixpack.sh file. If you see '-f update' instead of '-f ha_standby_ignore' then update the script or see the item Stage 1, Phase 2, 5b for instructions on how to modify the file.

```
cat corefixpack.sh
```

Example Output:

```
$ cat corefixpack.sh
/BCU_share/FP9_FP5/software/DB2/unpack_11.1.4.7..0/universal/installFixPack -n -b /usr/IBM/dwe/db2/V11.1.4.5..4 -p
/usr/IBM/dwe/db2/V11.1.4.7..0 -f NOTSAMP -f ha_standby_ignore -t /tmp/${hostname}_db2_11.1.4.7..0_${date}
+%Y%m%d_%H%M%S).trc -n
```

Example Output: (Generated file w/o the -f ha_standby_ignore modification.)

STAGE 8 - CORE NODES update in DOWNTIME window

```
$ cat corefixpack.sh
/BCU_share/FP9_FP5/software/DB2/unpack_10.5.0.11..10/universal/installFixPack -n -b /usr/IBM/dwe/db2/V10.5.0.11..2 -p
/usr/IBM/dwe/db2/V10.5.0.11..2 -c /BCU_share/FP9_FP5/software/DB2/unpack_nlpack_10.5.0.11..0/nlpack -f NOTSAMP -f update -t
/tmp/${hostname}_db2_10.5.0.11..10_${date +%Y%m%d_%H%M%S}.trc -n
```

- c. Command: Verify the contents of the generate instance_update_<instance>.sh file.

```
cat instance_update_bcuaix.sh
```

Example Output:

```
$ cat instance_update_bcuaix.sh
/usr/IBM/dwe/db2/V11.1.4.5..4/instance/db2iupdt bcuaix
```

- d. Command: Verify the contents of the db2greg_update_<instance>.sh file.

```
cat db2greg_update_bcuaix.sh
```

Example Output:

```
$ cat db2greg_update_bcuaix.sh
pdir=$(/usr/IBM/dwe/db2/V11.1.4.5..4/bin/db2greg -dump | grep '^I,DB2' | cut -d, -f 4,9 | grep bcuaix, | cut -d, -f2)
if [ ! "${pdir}" == "/usr/IBM/dwe/db2/V11.1.4.5..4" ];then echo "Updating registry for instance bcuaix on
${hostname}";/usr/IBM/dwe/db2/V11.1.4.5..4/bin/db2greg -delinstrec
instancename=bcuaix,installpath=${pdir};/usr/IBM/dwe/db2/V11.1.4.5..4/instance/db2iset -a bcuaix;else echo "Instance is
correctly assigned.";fi
```

4. Command: If proceeding with the Db2 update, run the following command to install Db2 on all core hosts.

```
time dsh -n ${BCUDB2ALL} -F /BCU_share/support/FP9_FP5/log/db2install -e /BCU_share/FP9_FP5/software/DB2/corefixpack.sh
```

Example Output: (FP4, DB2 10.5)

```
$ time dsh -n ${BCUDB2ALL} -F /BCU_share/support/FP9_FP5/log/db2install -e /BCU_share/FP9_FP5/software/DB2/corefixpack.sh
reverseflash06: DBI1017I installFixPack is updating the DB2 product(s) installed in
reverseflash06: location /usr/IBM/dwe/db2/V10.5.0.11..2.
reverseflash06: The execution completed successfully.
reverseflash06: For more information see the DB2 installation log at
reverseflash06: "/tmp/installFixPack.log.5177972".
reverseflash06: 0516-010 : Volume group must be varied on; use varyonvg command.
reverseflash05: DBI1017I installFixPack is updating the DB2 product(s) installed in
reverseflash05: location /usr/IBM/dwe/db2/V10.5.0.11..2.
reverseflash05: The execution completed successfully.
reverseflash05: For more information see the DB2 installation log at
reverseflash05: "/tmp/installFixPack.log.13370234".
reverseflash05: 0516-010 : Volume group must be varied on; use varyonvg command.
reverseflash04: DBI1017I installFixPack is updating the DB2 product(s) installed in
reverseflash04: location /usr/IBM/dwe/db2/V10.5.0.11..2.
reverseflash04: The execution completed successfully.
reverseflash04: For more information see the DB2 installation log at
reverseflash04: "/tmp/installFixPack.log.3146572".
reverseflash04: 0516-010 : Volume group must be varied on; use varyonvg command.
reverseflash02: DBI1017I installFixPack is updating the DB2 product(s) installed in
reverseflash02: location /usr/IBM/dwe/db2/V10.5.0.11..2.
reverseflash02: The execution completed successfully.
reverseflash02: For more information see the DB2 installation log at
reverseflash02: "/tmp/installFixPack.log.3671198".
reverseflash02: 0516-010 : Volume group must be varied on; use varyonvg command.

real 15m6.42s
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
user    0m0.55s
sys     0m0.09s
```

Example Output: (V1.1 FP4 Db2 11.1)

```
$ time dsh -n ${BCUDB2ALL} -F /BCU_share/support/FP8_FP4/log/db2install -e /BCU_share/FP8_FP4/software/DB2/corefixpack.sh
flashdancehostname02: DBI1017I  installFixPack is updating the database products installed in
flashdancehostname02:          location /usr/IBM/dwe/db2/V11.1.4.5..0.
flashdancehostname02:
flashdancehostname02: The execution completed successfully.
flashdancehostname02:
flashdancehostname02: For more information see the DB2 installation log at
flashdancehostname02: "/tmp/installFixPack.log.7930446".
flashdancehostname02: 0516-010 : Volume group must be varied on; use varyonvg command.
flashdancehostname04: DBI1017I  installFixPack is updating the database products installed in
flashdancehostname04:          location /usr/IBM/dwe/db2/V11.1.4.5..0.
flashdancehostname04:
flashdancehostname04: The execution completed successfully.
flashdancehostname04:
flashdancehostname04: For more information see the DB2 installation log at
flashdancehostname04: "/tmp/installFixPack.log.5833570".
flashdancehostname04: 0516-010 : Volume group must be varied on; use varyonvg command.
flashdancehostname07: DBI1017I  installFixPack is updating the database products installed in
flashdancehostname07:          location /usr/IBM/dwe/db2/V11.1.4.5..0.
flashdancehostname07:
flashdancehostname07: DBI1165E  Instance bcuaix is not accessible on the following
flashdancehostname07:          database partitions: flashdancehostname04
flashdancehostname07: Explanation:
flashdancehostname07: Your db2nodes.cfg file is referring to nodes that cannot be accessed
flashdancehostname07: from this node. Furthermore, the remote node might also not be sharing
flashdancehostname07: the sqllib with this node. With DPF, all nodes must have the same sqllib
flashdancehostname07: mounted.
flashdancehostname07: User response:
flashdancehostname07:
flashdancehostname07: You must either fix your db2nodes.cfg file or ensure that the same
flashdancehostname07: sqllib is mounted on all nodes, or both.
flashdancehostname07:
flashdancehostname07: The execution completed successfully.
flashdancehostname07:
flashdancehostname07: For more information see the DB2 installation log at
flashdancehostname07: "/tmp/installFixPack.log.14680694".
flashdancehostname07: 0516-010 : Volume group must be varied on; use varyonvg command.
flashdancehostname05: DBI1017I  installFixPack is updating the database products installed in
flashdancehostname05:          location /usr/IBM/dwe/db2/V11.1.4.5..0.
flashdancehostname05:
flashdancehostname05: The execution completed successfully.
flashdancehostname05:
flashdancehostname05: For more information see the DB2 installation log at
flashdancehostname05: "/tmp/installFixPack.log.6750746".
flashdancehostname05: 0516-010 : Volume group must be varied on; use varyonvg command.
flashdancehostname06: DBI1017I  installFixPack is updating the database products installed in
flashdancehostname06:          location /usr/IBM/dwe/db2/V11.1.4.5..0.
flashdancehostname06:
flashdancehostname06: The execution completed successfully.
flashdancehostname06:
flashdancehostname06: For more information see the DB2 installation log at
flashdancehostname06: "/tmp/installFixPack.log.11468914".
flashdancehostname06: 0516-010 : Volume group must be varied on; use varyonvg command.

real    8m18.67s
user    0m0.62s
sys     0m0.11s

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/software/DB2
```

STAGE 8 - CORE NODES update in DOWNTIME window

5. Command: Verify the new copy was installed on all hosts.

```
dsh -n ${ALL} -e /BCU_share/FP9_FP5/software/DB2/scripts/get_db2_data.sh 2> /dev/null | dshbak -c
```

Example Output: (Db2 11.1)

```
$ dsh -n ${ALL} -e /BCU_share/FP9_FP5/software/DB2/scripts/get_db2_data.sh 2> /dev/null | dshbak -c
HOSTS -----
flashdancehostname02, flashdancehostname04, flashdancehostname05, flashdancehostname06, flashdancehostname07
-----
/usr/IBM/dwe/db2/V10.5.0.5.1|10.5|10.5.0.5|10.5.0.5.5|||
/usr/IBM/dwe/db2/V11.1.4.5.0|11.1|11.1.4.5|11.1.4.5.0|||
/usr/IBM/dwe/db2/V11.1.4.5.4|11.1|11.1.4.5|11.1.4.5.4|bcuaix|bcuaix|
/usr/IBM/dwe/db2/V11.1.4.7.0|11.1|11.1.4.7|11.1.4.7.0|||
```

Example Output: (Db2 10.5 and corefixpack used '-f update' instead of '-f ha_standby_ignore'. Instance migrated as part of install.)

```
$ dsh -n ${ALL} -e /BCU_share/FP9_FP5/software/DB2/scripts/get_db2_data.sh 2> /dev/null | dshbak -c
HOSTS -----
reverseflash02
-----
/usr/IBM/dwe/db2/V10.5.0.10.6|10.5|10.5.0.10|10.5.0.10.6|||
/usr/IBM/dwe/db2/V10.5.0.11.2|10.5|10.5.0.11|10.5.0.11.10|bcuaix|bcuaix|

HOSTS -----
reverseflash04, reverseflash05, reverseflash06
-----
/usr/IBM/dwe/db2/V10.5.0.10.6|10.5|10.5.0.10|10.5.0.10.6|||
/usr/IBM/dwe/db2/V10.5.0.11.2|10.5|10.5.0.11|10.5.0.11.10|bcuaix|bcuaix|
/usr/IBM/dwe/db2/V11.1.4.4.a.2|11.1|11.1.4.4|11.1.4.4.a.2|||
/usr/IBM/dwe/db2/V11.1.4.5.0|11.1|11.1.4.5|11.1.4.5.0|||
```

6. Command: Verify the licenses are consistent. Expiry Date should show Permanent and Product Identifier should show db2aese for all Db2 V10.5 and 11.1 versions.

```
dsh -n ${ALL} '/usr/local/bin/db2ls -c | cut -d: -f 1 | grep -v "#" | while read dcopy;do echo " ** ${dcopy} **";${dcopy}/adm/db2licm -l;done' | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} '/usr/local/bin/db2ls -c | cut -d: -f 1 | grep -v "#" | while read dcopy;do echo " ** ${dcopy} **";${dcopy}/adm/db2licm -l;done' | dshbak -c
HOSTS -----
flashdancehostname01, flashdancehostname03
-----
** /usr/IBM/dwe/mgmt_db2/V10.5 **
Product name:          "DB2 Advanced Enterprise Server Edition"
License type:          "CPU Option"
Expiry date:           "Permanent"
Product identifier:    "db2aese"
Version information:   "10.5"
Enforcement policy:    "Soft Stop"

HOSTS -----
flashdancehostname02, flashdancehostname04, flashdancehostname05, flashdancehostname06, flashdancehostname07
-----
** /usr/IBM/dwe/db2/V10.5.0.5.1 **
Product name:          "DB2 Advanced Enterprise Server Edition"
License type:          "CPU Option"
Expiry date:           "Permanent"
Product identifier:    "db2aese"
Version information:   "10.5"
Enforcement policy:    "Soft Stop"

** /usr/IBM/dwe/db2/V11.1.4.4.a.2 **
Product name:          "DB2 Advanced Enterprise Server Edition"
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
License type:           "CPU Option"
Expiry date:           "Permanent"
Product identifier:     "db2aese"
Version information:    "11.1"
Enforcement policy:     "Soft Stop"
Features:
IBM DB2 Performance Management Offering:      "Not licensed"

** /usr/IBM/dwe/db2/V11.1.4.5..0 **
Product name:           "DB2 Advanced Enterprise Server Edition"
License type:           "CPU Option"
Expiry date:           "Permanent"
Product identifier:     "db2aese"
Version information:    "11.1"
Enforcement policy:     "Soft Stop"
Features:
IBM DB2 Performance Management Offering:      "Not licensed"

** /usr/IBM/dwe/db2/V11.1.4.5..4 **
Product name:           "DB2 Advanced Enterprise Server Edition"
License type:           "CPU Option"
Expiry date:           "Permanent"
Product identifier:     "db2aese"
Version information:    "11.1"
Enforcement policy:     "Soft Stop"
Features:
IBM DB2 Performance Management Offering:      "Not licensed"

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/software/DB2
```

STAGE 8 - CORE NODES update in DOWNTIME window

Phase 6: Step 2 Migrating the Db2 Instance

1. Before migrating the instance, consider the following points.
 - a. Preparing to migrate the instance. The following steps come from the [DB2 Post Fixpack Link in the DB2 Knowledge Center](#).
 - b. If you are using Federation, please refer to Procedure 1 in the link above for instructions on what to do prior to migrating the instance.
 - c. Verify there are no intentional changes made to the file' `~bcuaix/sqllib/db2profile`'. Replace *bcuaix* with your instance owner's username. This file is not modified as shipped, but customers may have modified it for other DB2 purposes. Any updates to this file should preferably be placed in the `~bcuaix/sqllib/userprofile` file which is not modified by db2iupdt.
If in doubt, backup the db2profile file.
 - d. Verify that your instance owner's '.profile' to ensure it is not running bash. This will need to be removed as it can cause the db2iupdt command to hang.

2. Command: Ensure db2home is mounted on the management host.

```
mount /db2home
```

3. Command: Identify the current host owner for partition 0 and assign that to the variable \$h and the instance owner to variable i. This command only works if the core domains are Online.

```
i=$(grep INSTANCE /usr/IBM/analytcs/ha_tools/hatools.conf | cut -d= -f2);h=$(grep "^0" ~${i}/sqllib/db2nodes.cfg | awk '{print $2}');echo "i=${i};h=${h}"
```

Example Output:

```
$ i=$(grep INSTANCE /usr/IBM/analytcs/ha_tools/hatools.conf | cut -d= -f2);h=$(grep "^0" ~${i}/sqllib/db2nodes.cfg | awk '{print $2}');echo "i=${i};h=${h}"
```

```
i=bcuaix;h=flashdancehostname04
```

4. Command: Run the migration script.

```
time ssh ${h} "/BCU_share/FP9_FP5/software/DB2/instance_update_${i}.sh" 2>&1 | tee -a /BCU_share/support/FP9_FP5/log/instance_update_${i}.log
```

Example Output:

```
$ time ssh ${h} "/BCU_share/FP8_FP4/software/DB2/instance_update_${i}.sh" 2>&1 | tee -a /BCU_share/support/FP8_FP4/log/instance_update_${i}.log
```

```
DB2 installation is being initialized.
```

```
Total number of tasks to be performed: 4  
Total estimated time for all tasks to be performed: 309 second(s)
```

```
Task #1 start  
Description: Setting default global profile registry variables  
Estimated time 1 second(s)  
Task #1 end
```

```
Task #2 start  
Description: Initializing instance list  
Estimated time 5 second(s)  
Task #2 end
```

```
Task #3 start  
Description: Configuring DB2 instances  
Estimated time 300 second(s)  
Task #3 end
```

```
Task #4 start  
Description: Updating global profile registry
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
Estimated time 3 second(s)
Task #4 end

The execution completed successfully.

For more information see the DB2 installation log at
"/tmp/db2iupdt.log.5243052".
DBI1446I The db2iupdt command is running.

DBI1070I Program db2iupdt completed successfully.

real    0m36.98s
user    0m0.05s
sys     0m0.00s

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/software/DB2
```

5. Command: Verify that the instance is updated on all hosts. It will only be updated and present on the hosts listed in the ~/sqlib/db2nodes.cfg file. This is expected as shown below. The standby nodes are not updated. In example output case the standby nodes are '02' and '05'.

```
dsh -n ${ALL} -e /BCU_share/FP9_FP5/software/DB2/scripts/get_db2_data.sh 2> /dev/null | dshbak -c
```

Example Output: (Db2 10.5, when -f update is used no change is expected as all nodes migrated)

```
$ dsh -n ${ALL} -e /BCU_share/FP9_FP5/software/DB2/scripts/get_db2_data.sh 2> /dev/null | dshbak -c
HOSTS -----
reverseflash02
-----
/usr/IBM/dwe/db2/V10.5.0.10..6|10.5|10.5.0.10|10.5.0.10..6|||
/usr/IBM/dwe/db2/V10.5.0.11..2|10.5|10.5.0.11|10.5.0.11..10|bcuaix|bcuaix||

HOSTS -----
reverseflash04, reverseflash05, reverseflash06
-----
/usr/IBM/dwe/db2/V10.5.0.10..6|10.5|10.5.0.10|10.5.0.10..6|||
/usr/IBM/dwe/db2/V10.5.0.11..2|10.5|10.5.0.11|10.5.0.11..10|bcuaix|bcuaix||
/usr/IBM/dwe/db2/V11.1.4.4.a.2|11.1|11.1.4.4|11.1.4.4.a.2|||
/usr/IBM/dwe/db2/V11.1.4.5..0|11.1|11.1.4.5|11.1.4.5..0|||
```

Example Output: (Db2 11.1, when -f ha_standby_ignore is used)

```
$ dsh -n ${ALL} -e /BCU_share/FP9_FP5/software/DB2/scripts/get_db2_data.sh 2> /dev/null | dshbak -c
HOSTS -----
flashdancehostname02, flashdancehostname06
-----
/usr/IBM/dwe/db2/V10.5.0.5..1|10.5|10.5.0.5|10.5.0.5..5|||
/usr/IBM/dwe/db2/V11.1.4.5..0|11.1|11.1.4.5|11.1.4.5..0|||
/usr/IBM/dwe/db2/V11.1.4.5..4|11.1|11.1.4.5|11.1.4.5..4|bcuaix|bcuaix||
/usr/IBM/dwe/db2/V11.1.4.7..0|11.1|11.1.4.7|11.1.4.7..0|||

HOSTS -----
flashdancehostname04, flashdancehostname05, flashdancehostname07
-----
/usr/IBM/dwe/db2/V10.5.0.5..1|10.5|10.5.0.5|10.5.0.5..5|||
/usr/IBM/dwe/db2/V11.1.4.5..0|11.1|11.1.4.5|11.1.4.5..0|||
/usr/IBM/dwe/db2/V11.1.4.5..4|11.1|11.1.4.5|11.1.4.5..4|||
/usr/IBM/dwe/db2/V11.1.4.7..0|11.1|11.1.4.7|11.1.4.7..0|bcuaix|bcuaix||
```

6. Command: To update the registry entries on the core standby nodes, run the following.

```
dsh -n ${BCUDB2ALL} -e /BCU_share/FP9_FP5/software/DB2/db2greg_update_${i}.sh 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUDB2ALL} -e /BCU_share/FP8_FP4/software/DB2/db2greg_update_${i}.sh 2>&1 | dshbak -c
HOSTS -----
flashdancehostname02
-----
```

STAGE 8 - CORE NODES update in DOWNTIME window

Updating registry for instance bcuaix on flashdancehostname02

```
HOSTS -----  
flashdancehostname04, flashdancehostname06, flashdancehostname07  
-----  
Instance is correctly assigned.
```

```
HOSTS -----  
flashdancehostname05  
-----  
Updating registry for instance bcuaix on flashdancehostname05
```

STAGE 8 - CORE NODES update in DOWNTIME window

7. Command: Rerun the command again to verify that no more changes are needed.

```
dsh -n ${BCUDB2ALL} -e /BCU_share/FP9_FP5/software/DB2/db2greg_update_${i}.sh 2>&1 | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUDB2ALL} -e /BCU_share/FP8_FP4/software/DB2/db2greg_update_${i}.sh 2>&1 | dshbak -c

HOSTS -----
flashdancehostname02, flashdancehostname04, flashdancehostname05, flashdancehostname06, flashdancehostname07
-----
Instance is correctly assigned.

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/software/DB2
```

8. Command: Run the get_db2_data.sh command to verify all core nodes are consistent.

```
dsh -n ${ALL} -e /BCU_share/FP9_FP5/software/DB2/scripts/get_db2_data.sh 2> /dev/null | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} -e /BCU_share/FP8_FP4/software/DB2/scripts/get_db2_data.sh 2> /dev/null | dshbak -c

HOSTS -----
flashdancehostname01, flashdancehostname03
-----
/usr/IBM/dwe/mgmt_db2/V10.5|10.5|10.5.0.11|10.5.0.11..2|db2opm|db2opm||

HOSTS -----
flashdancehostname02, flashdancehostname04, flashdancehostname05, flashdancehostname06, flashdancehostname07
-----
/usr/IBM/dwe/db2/V10.5.0.5..1|10.5|10.5.0.5|10.5.0.5..5||||
/usr/IBM/dwe/db2/V11.1.4.4.a.2|11.1|11.1.4.4|11.1.4.4.a.2||||
/usr/IBM/dwe/db2/V11.1.4.5..0|11.1|11.1.4.5|11.1.4.5..0||||
/usr/IBM/dwe/db2/V11.1.4.5..4|11.1|11.1.4.5|11.1.4.5..4|bcuaix|bcuaix||
```

9. Command: Start the database.

```
time hastartdb2
```

Example Output:

```
(5) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/software/DB2
$ time hastartdb2
Starting DB2.....DB2 resources online
Activating DB BCUDB
DB20000I The ACTIVATE DATABASE command completed successfully.
CORE DOMAIN
=====+=====+=====+=====+=====+=====+=====+=====+
| PARTITIONS | CURRENT          | STANDBY          | DOMAIN          | OPSTATE         | HA STATUS       | RG REQUESTS    |
=====+=====+=====+=====+=====+=====+=====+=====+
| 0-5        | flashdancehostname04 | flashdancehostname02 | bcudomain01    | Online          | Normal         | -              |
| 6-15       | flashdancehostname06 | flashdancehostname05 | bcudomain02    | Online          | Normal         | -              |
| 16-25      | flashdancehostname07 | flashdancehostname05 | bcudomain02    | Online          | Normal         | -              |
=====+=====+=====+=====+=====+=====+=====+=====+

real    0m55.10s
user    0m1.67s
sys      0m0.34s

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/software/DB2
```

10. If migrating the database proceed to stage 6 phase 3. If not migrating yet, proceed to stage 6 phase 4 to start rebinding the database.

STAGE 8 - CORE NODES update in DOWNTIME window

Phase 6: Step 3 Migrating the database.

[Optional]: Migrate the database. This will update the database to use some new features. Once you run this to revert to an older db2 copy you must restore the database. In this example the update took a small amount of time. Where *flashdancehostname04* is the admin host, *bcuaix* is the instance owner, *bcudb* is the database. This step can be done at a later time if desired.

1. The following command will determine the admin host and which version of db2 is used between 10.1, 10.5 and 11.1 and will run that upgrade command if it exists for the database bcudb for the user bcuaix. You can use the simpler DB2 V.R commands below as well and skip this more complicated command.

- a. Command: Set the \$i and \$h variables.

```
i=$(grep INSTANCE /usr/IBM/analytics/ha_tools/hatools.conf | cut -d= -f2);h=$(grep "^0" ~${i}/sqllib/db2nodes.cfg | awk '{print $2}');echo "i=${i};h=${h}"
```

Example Output:

```
$ i=$(grep INSTANCE /usr/IBM/analytics/ha_tools/hatools.conf | cut -d= -f2);h=$(grep "^0" ~${i}/sqllib/db2nodes.cfg | awk '{print $2}');echo "i=${i};h=${h}"
```

```
i=bcuaix;h=flashdancehostname04
```

- b. Command: Set the \$db variable.

```
db=$(grep DB /usr/IBM/analytics/ha_tools/hatools.conf | cut -d= -f2);echo ${db}
```

Example Output:

```
$ db=$(grep DB /usr/IBM/analytics/ha_tools/hatools.conf | cut -d= -f2);echo ${db}
```

```
BCUDB
```

- c. Command: Run the following as the root user in the same session as above. Alternatively simply login to the admin host as the instance owner and run the appropriate db2updv## command.

```
dsh -n ${h} "su - ${i} -c 'for c in db2updv10 db2updv105 db2updv111;do which ${c} 2>/dev/null && ${c} -d ${db};done'"
```

Example Output:

```
$ dsh -n ${h} "su - ${i} -c 'for c in db2updv10 db2updv105 db2updv111;do which ${c} 2>/dev/null && ${c} -d ${db};done'"
```

```
flashdancehostname04: /db2home/bcuaix/sqllib/bin/db2updv111
flashdancehostname04: db2updv111 completed successfully for database 'BCUDB'.
flashdancehostname04:
flashdancehostname04: _____
flashdancehostname04:                      DB2 Service Tools                      _____
flashdancehostname04:
flashdancehostname04:                      I      B      M
flashdancehostname04:
flashdancehostname04:                      db2updv111
flashdancehostname04:
flashdancehostname04: This tool is a service utility designed to update a DB2 Version 11.1
flashdancehostname04: database to the current fix pack level.
flashdancehostname04: _____
flashdancehostname04:
flashdancehostname04: DB2 Universal Database Version 11.1, 5622-044 (c) Copyright IBM Corp. 2017
flashdancehostname04: Licensed Material - Program Property of IBM
flashdancehostname04: IBM DATABASE 2 Database update to current fix pack tool
flashdancehostname04:
```

```
(0) root @ flashdancehostname01: 7.1.0.0: /
```

STAGE 8 - CORE NODES update in DOWNTIME window

Phase 6: Step 4 Rebinding the database.

Rebinding should occur automatically however some applications can experience odd behavior after a db2 fixpack is applied. Performing these rebind steps right after the update can avoid some of these issues.

1. Check the following DB2 Knowledge Center links for other rebind instructions if using DB2 Spatial or DB2 Federation rebind steps.

DB2 V10.1	https://www.ibm.com/support/knowledgecenter/en/SSEPGG_10.1.0/com.ibm.db2.luw.qb.server.doc/doc/t0024970.html
DB2 V10.5	https://www.ibm.com/support/knowledgecenter/en/SSEPGG_10.5.0/com.ibm.db2.luw.qb.server.doc/doc/t0024970.html
DB2 V11.1	https://www.ibm.com/support/knowledgecenter/en/SSEPGG_11.1.0/com.ibm.db2.luw.qb.server.doc/doc/t0024970.html

2. Command: Determine the current host for partiitons 0 through 5.

```
hals
```

Example Output:

```
$ hals
none are available... returning
CORE DOMAIN
=====+=====+=====+=====+=====+=====+=====+
| PARTITIONS | CURRENT          | STANDBY          | DOMAIN          | OPSTATE          | HA STATUS        | RG REQUESTS |
|-----+-----+-----+-----+-----+-----+-----+
| 0-5        | kf5hostname04    | kf5hostname02    | bcudomain01    | Online           | Normal           | -           |
| 6-15       | kf5hostname06    | kf5hostname07    | bcudomain02    | Online           | Normal           | -           |
| 16-25      | kf5hostname05    | kf5hostname07    | bcudomain02    | Online           | Normal           | -           |
|-----+-----+-----+-----+-----+-----+=====+
```

3. Command: Using ssh, login to the current host. Repace *kf5hostname* with the hostname shown in the CURRENT column for partitions 0-5.

```
ssh kf5hostname04
```

Example Output:

```
$ ssh kf5hostname04
Last unsuccessful login: Fri Oct  4 20:32:39 -03 2019 on ssh from 172.23.1.245
Last login: Wed Mar  3 20:06:36 -03 2021 on ssh from 172.23.1.1
*****
*
* Welcome to AIX Version 7.1!
*
*
* Please see the README file in /usr/lpp/bos for information pertinent to
* this release of the AIX Operating System.
*
*
*****
```

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4. Command: Determine the instance owner. In general PDOA only allows one instance owner, however in some cases there may be multiple instances. The default instance owner is *bcuaix* as shown below. This command selects that last Db2 copy installed and runs its db2greg dump command to list all registered instances on this system.

```
$(/usr/local/bin/db2ls -c | cut -d: -f1 | tail -1)/bin/db2greg -dump | grep "^I"
```

Example Output:

```
$ $(/usr/local/bin/db2ls -c | cut -d: -f1 | tail -1)/bin/db2greg -dump | grep "^I"
I,DB2,11.1.4.5,bcuaix,/db2home/bcuaix/sqlib,,1,0,/usr/IBM/dwe/db2/V11.1.4.5..4,,
(0) root @ kf5hostname04: 7.1.0.0: /
```

5. Command: Using the su command switch the user to the instance owner. This is listed in the 4th column of the output above.

```
su - bcuaix
```

6. Command: List all of the database. PDOA generally only supports one database in production environments, however some customers have multiple databases. This command will only show the indirect or non-Alias names.

```
db2 list database directory | grep -p Indirect
```

Example Output:

```
$ db2 list database directory | grep -p Indirect
Database alias           = BCUDB
Database name            = BCUDB
Local database directory = /db2home/bcuaix
Database release level   = 14.00
Comment                  =
Directory entry type     = Indirect
Catalog database partition number = 0
Alternate server hostname =
Alternate server port number =
```

7. Command: Connect to the database.

```
db2 connect to bcudb
```

Example Output:

```
$ db2 connect to bcudb
connect to bcudb

Database Connection Information

Database server          = DB2/AIX64 11.1.4.5
SQL authorization ID     = BCUAIX
Local database alias     = BCUDB
```

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8. Rebinding.

- Command: Run the three rebind commands below. The second command may have errors which are expected.

```
time db2 BIND ~/sqllib/bnd/db2schema.bnd BLOCKING ALL GRANT PUBLIC SQLERROR CONTINUE
```

```
time db2 BIND ~/sqllib/bnd/@db2ubind.lst BLOCKING ALL GRANT PUBLIC ACTION ADD
```

```
time db2 BIND ~/sqllib/bnd/@db2cli.lst BLOCKING ALL GRANT PUBLIC ACTION ADD
```

Example Output:

```
$ time db2 BIND ~/sqllib/bnd/db2schema.bnd BLOCKING ALL GRANT PUBLIC SQLERROR CONTINUE
BIND /db2home/bcuaix/sqllib/bnd/db2schema.bnd BLOCKING ALL GRANT PUBLIC SQLERROR CONTINUE
```

```
LINE      MESSAGES FOR db2schema.bnd
-----
SQL0061W  The binder is in progress.
SQL0091N  Binding was ended with "0" errors and "0" warnings.
```

```
real      0m9.30s
user      0m0.02s
sys       0m0.01s
$
```

```
$ time db2 BIND ~/sqllib/bnd/@db2ubind.lst BLOCKING ALL GRANT PUBLIC ACTION ADD
BIND /db2home/bcuaix/sqllib/bnd/@db2ubind.lst BLOCKING ALL GRANT PUBLIC ACTION ADD
```

```
LINE      MESSAGES FOR db2ubind.lst
-----
SQL0061W  The binder is in progress.
```

```
LINE      MESSAGES FOR db2ajgrt.bnd
-----
SQL0719N  Bind error for user "BCUAIX ". Package
          "NULLID.SQLABO02" already exists.  SQLSTATE=42710
```

```
LINE      MESSAGES FOR db2ueiwi.bnd
-----
SQL0719N  Bind error for user "BCUAIX ". Package
          "NULLID.SQLUAO20" already exists.  SQLSTATE=42710
```

```
LINE      MESSAGES FOR db2uigsi.bnd
-----
SQL0719N  Bind error for user "BCUAIX ". Package
          "NULLID.SQLUCO09" already exists.  SQLSTATE=42710
```

```
LINE      MESSAGES FOR db2ucktb.bnd
-----
SQL0719N  Bind error for user "BCUAIX ". Package
          "NULLID.SQLUJO0H" already exists.  SQLSTATE=42710
```

```
LINE      MESSAGES FOR db2uici.bnd
-----
SQL0719N  Bind error for user "BCUAIX ". Package
          "NULLID.SQLUD002" already exists.  SQLSTATE=42710
```

```
LINE      MESSAGES FOR db2uiict.bnd
-----
SQL0719N  Bind error for user "BCUAIX ". Package
          "NULLID.SQLUEO01" already exists.  SQLSTATE=42710
```

```
LINE      MESSAGES FOR db2uexpm.bnd
-----
SQL0719N  Bind error for user "BCUAIX ". Package
          "NULLID.SQLUBO05" already exists.  SQLSTATE=42710
```

```
LINE      MESSAGES FOR db2uimp.bnd
-----
SQL0719N  Bind error for user "BCUAIX ". Package
          "NULLID.SQLUFO17" already exists.  SQLSTATE=42710
```

```
LINE      MESSAGES FOR db2uImpInsUpdate.bnd
-----
SQL0719N  Bind error for user "BCUAIX ". Package
          "NULLID.SQLUP003" already exists.  SQLSTATE=42710
```

```
LINE      MESSAGES FOR db2uiDescribe.bnd
-----
SQL0719N  Bind error for user "BCUAIX ". Package
          "NULLID.SQLUP000" already exists.  SQLSTATE=42710
```

```
LINE      MESSAGES FOR db2ugtpi.bnd
```

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```
-----
SQL0719N  Bind error for user "BCUAIX  ". Package
          "NULLID.SQLUH00B" already exists.  SQLSTATE=42710
LINE      MESSAGES FOR db2pctsp.bnd
-----
SQL0719N  Bind error for user "BCUAIX  ". Package
          "NULLID.SQLP1002" already exists.  SQLSTATE=42710
LINE      MESSAGES FOR db2uredp.bnd
-----
SQL0719N  Bind error for user "BCUAIX  ". Package
          "NULLID.SQULI000" already exists.  SQLSTATE=42710
LINE      MESSAGES FOR db2clpcs.bnd
-----
SQL0719N  Bind error for user "BCUAIX  ". Package
          "NULLID.SQLC2029" already exists.  SQLSTATE=42710
LINE      MESSAGES FOR db2clprp.bnd
-----
SQL0719N  Bind error for user "BCUAIX  ". Package
          "NULLID.SQLC3028" already exists.  SQLSTATE=42710
LINE      MESSAGES FOR db2clpur.bnd
-----
SQL0719N  Bind error for user "BCUAIX  ". Package
          "NULLID.SQLC4028" already exists.  SQLSTATE=42710
LINE      MESSAGES FOR db2clprs.bnd
-----
SQL0719N  Bind error for user "BCUAIX  ". Package
          "NULLID.SQLC5028" already exists.  SQLSTATE=42710
LINE      MESSAGES FOR db2clpnc.bnd
-----
SQL0719N  Bind error for user "BCUAIX  ". Package
          "NULLID.SQLC6028" already exists.  SQLSTATE=42710
LINE      MESSAGES FOR db2arxcs.bnd
-----
SQL0719N  Bind error for user "BCUAIX  ". Package
          "NULLID.SQLA1000" already exists.  SQLSTATE=42710
LINE      MESSAGES FOR db2arxrr.bnd
-----
SQL0719N  Bind error for user "BCUAIX  ". Package
          "NULLID.SQLA2000" already exists.  SQLSTATE=42710
LINE      MESSAGES FOR db2arxrs.bnd
-----
SQL0719N  Bind error for user "BCUAIX  ". Package
          "NULLID.SQLA4000" already exists.  SQLSTATE=42710
LINE      MESSAGES FOR db2arxnc.bnd
-----
SQL0719N  Bind error for user "BCUAIX  ". Package
          "NULLID.SQLA5000" already exists.  SQLSTATE=42710
LINE      MESSAGES FOR db2arxur.bnd
-----
SQL0719N  Bind error for user "BCUAIX  ". Package
          "NULLID.SQLA3000" already exists.  SQLSTATE=42710
LINE      MESSAGES FOR db2dropv.bnd
-----
SQL0719N  Bind error for user "BCUAIX  ". Package
          "NULLID.SQLE3002" already exists.  SQLSTATE=42710
LINE      MESSAGES FOR db2uimtb.bnd
-----
SQL0719N  Bind error for user "BCUAIX  ". Package
          "NULLID.SQLUK00C" already exists.  SQLSTATE=42710
LINE      MESSAGES FOR db2uqtpd.bnd
-----
SQL0719N  Bind error for user "BCUAIX  ". Package
          "NULLID.SQLUM000" already exists.  SQLSTATE=42710
LINE      MESSAGES FOR db2uqtnm.bnd
-----
SQL0719N  Bind error for user "BCUAIX  ". Package
          "NULLID.SQUL000" already exists.  SQLSTATE=42710
LINE      MESSAGES FOR db2ulxld.bnd
-----
SQL0719N  Bind error for user "BCUAIX  ". Package
          "NULLID.SQLUN001" already exists.  SQLSTATE=42710
```

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```
LINE      MESSAGES FOR db2uiXmlparse.bnd
-----
SQL0719N  Bind error for user "BCUAIX ". Package
          "NULLID.SQLUZO00" already exists.  SQLSTATE=42710

LINE      MESSAGES FOR db2uipkg.bnd
-----
SQL0719N  Bind error for user "BCUAIX ". Package
          "NULLID.SQLUO001" already exists.  SQLSTATE=42710

LINE      MESSAGES FOR db2_adminotm.bnd
-----
SQL0719N  Bind error for user "BCUAIX ". Package
          "NULLID.AOTMO05" already exists.  SQLSTATE=42710
SQL0082C  An error has occurred which has terminated
          processing.
SQL0092N  No package was created because of previous errors.
SQL0091N  Binding was ended with "33" errors and "0"
          warnings.

real      0m0.20s
user      0m0.01s
sys       0m0.01s
$

$ time db2 BIND ~/sqllib/bnd/@db2cli.lst BLOCKING ALL GRANT PUBLIC ACTION ADD
BIND /db2home/bcuaix/sqllib/bnd/@db2cli.lst BLOCKING ALL GRANT PUBLIC ACTION ADD

LINE      MESSAGES FOR db2cli.lst
-----
SQL0061W  The binder is in progress.
SQL0091N  Binding was ended with "0" errors and "0" warnings.

real      0m0.20s
user      0m0.02s
sys       0m0.01s
$
```

- b. Command: Update Invalid Packages. This command typically has errors. Proceed to c) if errors detected. Otherwise skip to g).

```
db2rbind bcudb -l ~/db2rbind.$(date +%s).log all
```

Example Output:

```
$ db2rbind bcudb -l ~/db2rbind.$(date +%s).log all

Errors detected !!

Check log file '/db2home/bcuaix/db2rbind.1614817431.log' for details
$
```

- c. Command: Determine the error. SQL2453N is documented here: <http://www-01.ibm.com/support/docview.wss?uid=swg21679552>

```
grep -v -i succeed $(ls -rt ~/db2rbind.*.log | tail -1)
```

Example Output:

```
$ grep -v -i succeed $(ls -rt ~/db2rbind.*.log | tail -1)

Starting time .... Wed Mar  3 21:24:04 2021

      sqlcode = -2453; sqlerrmc = SYSIBMAD; sqlrrp = SQLRA151SYSIBMAD
      SQL2453N  Rebinding the package failed because the SQL object that generated the package
needs to be revalidated.  SQL object name: "SYSIBMADM.DBMS_RANDOM_INITIALIZE". SQL object
type: "ROUTINE".  SQLSTATE=560D6

Failed to rebind                                = 1 (or more)

Ending time .... Wed Mar  3 21:24:50 2021
```

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\$

- d. Command: Revalidate Objects. This should return without an error.

```
db2 "CALL SYSPROC.ADMIN_REVALIDATE_DB_OBJECTS(NULL, 'SYSIBMADM', NULL) "
```

Example Output:

```
$ db2 "CALL SYSPROC.ADMIN_REVALIDATE_DB_OBJECTS(NULL, 'SYSIBMADM', NULL) "
CALL SYSPROC.ADMIN_REVALIDATE_DB_OBJECTS(NULL, 'SYSIBMADM', NULL)
```

Return Status = 0

- e. Command: Rerun the db2rbind command again. If it hangs, check 'db2top -d bcudb' for applications in 'Lock Waiting.' state. Force the rbind connection, issue a commit to remove the plan lock from the current session and retry. If that fails terminate all connections and retry.

```
db2rbind bcudb -l ~/db2rbind. $(date +%s).log all
```

Example Output:

```
$ db2rbind bcudb -l ~/db2rbind. $(date +%s).log all
```

<CTRL-C> to cancel.

```
$ db2 list applications show detail | grep "Lock-wait"
```

```
BCUAIX
db2rbind          435          *N0.bcuaix.210304003143          00002 1          0
16769          Lock-wait          Not Collected          BCUDB
/db2home/bcuaix/bcuaix/NODE0000/SQL00001/MEMBER0000/
$
```

```
$ db2 list applications
list applications
```

Auth Id	Application Name	Appl. Handle	Application Id	DB Name	# of Agents
BCUAIX	db2bp	386	*N0.bcuaix.210304001604	BCUDB	1
BCUAIX	db2rbind	435	*N0.bcuaix.210304003143	BCUDB	1

```
$ db2 "force applications (435)"
```

```
force applications (435)
```

```
DB20000I The FORCE APPLICATION command completed successfully.
```

```
DB21024I This command is asynchronous and may not be effective immediately.
```

```
$ db2pd -db bcudb -locks
```

```
Database Member 0 -- Database BCUDB -- Active -- Up 0 days 00:26:54 -- Date 2021-03-03-21.42.58.220312
```

Locks:

Address	TranHdl	Lockname	Type	Mode	Sts	Owner	Dur	HoldCount	Att
ReleaseFlg rriID									
0x0A000300018F6700	3	4141414141634A62AB2D1F36C1	PlanLock	..S	G	3	1	0	0x00000000
0x40000000 0									
0x0A000300018B2C00	3	000000010000000100015700D6	VarLock	..X	G	3	1	0	0x00000000
0x40000000 0									
0x0A000300018B2A00	3	0000009F000000000000000054	TableLock	.IX	G	3	21	0	0x00203000
0xC0000000 0									

```
$ db2 list applications
list applications
```

Auth Id	Application Name	Appl. Handle	Application Id	DB Name	# of Agents
BCUAIX	db2bp	386	*N0.bcuaix.210304001604	BCUDB	1

```
$ db2 commit
```

```
commit
```

```
DB20000I The SQL command completed successfully.
```

```
$ db2pd -db bcudb -locks
```

```
Database Member 0 -- Database BCUDB -- Active -- Up 0 days 00:27:07 -- Date 2021-03-03-21.43.11.011671
```

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```
Locks:
Address      TranHdl   Lockname      Type      Mode Sts Owner      Dur HoldCount Att
ReleaseFlg rrIID
$

$ db2rbind bcudb -l ~/db2rbind.$(date +%s).log all

Rebind done successfully for database 'BCUDB'.

$
```

- f. Command: Check the rbind log for any other errors. The Failed to rebind count should be 0.

```
grep -v -i succeed $(ls -rt ~/db2rbind.*.log | tail -1)
```

Example Output:

```
$ grep -v -i succeed $(ls -rt ~/db2rbind.*.log | tail -1)

Starting time .... Wed Mar  3 21:45:53 2021

Failed to rebind                                =  0 (or more)

Ending time .... Wed Mar  3 21:46:41 2021

$
```

- g. Contact your DBAs to begin validation tests.
- h. Exit the instance owner's shell and then exit the admin host ssh session. This should return the session to the management host inside the *fprun* screen. Verify with 'echo \$STY'. The working directory will be modified in the next phase.

```
$ echo $STY
3408260.fprun
```


Phase 7: mkysyb

At this point in the update all major changes to the local OS and rootvg are completed. However, before attempting to re-mirror rootvg it is a good idea to take another mkysyb backup. This backup can help restore a host to the post-updated version of rootvg in the event of a disk failure during the re-mirror process. This can save a significant amount of time as it will avoid the need to re-apply the AIX, GPFS, TSA, HA Tools and Db2 updates on the pre-update mkysybs from phase 2. This Phase uses a script, /BCU_share, and /stage to perform the mkysyb. If you have a mkysyb process of your own then follow your instructions for collecting mkysybs for all hosts. The script 'stage02_phase01_mkysyb.sh' was used in stage 02, backs up all hosts in parallel to '/stage/backups/FP9_FP5/<timestamp>/<hostname>'. The script also ensures it also copies the 'image.data' and 'bosinst.data' for those hosts as well.

1. Command: In a root login over a vtmenu or screen session ensure the session current working directory is correct.

```
cd /BCU_share/FP9_FP5/fixpack_tools/application
```

2. Command: Verify that the /BCU_share filesystem is mounted on all hosts.

```
./enable_bcushare.sh
```

Example Output:

```
$ ./enable_bcushare.sh
20210115_010049 (flashdancehostname01:enable_bcushare.sh): Checking for /BCU_share on all hosts.
20210115_010050 (flashdancehostname01:enable_bcushare.sh): Success: /BCU_share is mounted on all hosts.
20210115_010050 (flashdancehostname01:enable_bcushare.sh): enable_bcushare.sh completed with rc=0.
```

```
(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

3. Command: Verify the /stage filesystem is mounted on all hosts.

```
./enable_stage.sh
```

Example Output:

```
$ ./enable_stage.sh
20210115_010243 (flashdancehostname01:enable_stage.sh): Checking for /stage on all hosts.
20210115_010244 (flashdancehostname01:enable_stage.sh): Success: The /stage filesystem is mounted on all hosts.
20210115_010244 (flashdancehostname01:enable_stage.sh): enable_stage.sh completed with rc=0.
```

```
(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

4. Command: Run the mkysyb utility script.

```
./stage02_phase01_mkysyb.sh
```

Example Output:

```
$ ./stage02_phase01_mkysyb.sh
20210115_010402 (flashdancehostname01:stage02_phase01_mkysyb.sh): Starting date: Fri Jan 15 01:04:02 IST 2021.
20210115_010402 (flashdancehostname01:stage02_phase01_mkysyb.sh): Verifying /stage is mounted on all nodes.
20210115_010402 (flashdancehostname01:enable_stage.sh): Checking for /stage on all hosts.
20210115_010403 (flashdancehostname01:enable_stage.sh): Success: The /stage filesystem is mounted on all hosts.
20210115_010403 (flashdancehostname01:enable_stage.sh): enable_stage.sh completed with rc=0.
20210115_010403 (flashdancehostname01:stage02_phase01_mkysyb.sh): Looking for mkssyb backups in /stage/backups/FP8_FP4/.
/stage/backups/FP8_FP4/20210109_132026/flashdancehostname06/flashdancehostname06.mkysyb
/stage/backups/FP8_FP4/20210109_132026/flashdancehostname06/image.data
/stage/backups/FP8_FP4/20210109_132026/flashdancehostname06/bosinst.data
/stage/backups/FP8_FP4/20210109_132026/flashdancehostname05/flashdancehostname05.mkysyb
/stage/backups/FP8_FP4/20210109_132026/flashdancehostname05/image.data
/stage/backups/FP8_FP4/20210109_132026/flashdancehostname05/bosinst.data
/stage/backups/FP8_FP4/20210109_132026/flashdancehostname02/image.data
/stage/backups/FP8_FP4/20210109_132026/flashdancehostname02/bosinst.data
/stage/backups/FP8_FP4/20210109_132026/flashdancehostname04/image.data
/stage/backups/FP8_FP4/20210109_132026/flashdancehostname04/flashdancehostname04.mkysyb
```

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```
/stage/backups/FP8_FP4/20210109_132026/flashdancehostname04/bosinst.data
/stage/backups/FP8_FP4/20210109_132026/flashdancehostname07/image.data
/stage/backups/FP8_FP4/20210109_132026/flashdancehostname07/flashdancehostname07.mksysb
/stage/backups/FP8_FP4/20210109_132026/flashdancehostname07/bosinst.data
/stage/backups/FP8_FP4/20210109_132026/flashdancehostname01/image.data
/stage/backups/FP8_FP4/20210109_132026/flashdancehostname01/bosinst.data
/stage/backups/FP8_FP4/20210109_132026/flashdancehostname01/flashdancehostname01.mksysb
/stage/backups/FP8_FP4/20210109_132026/flashdancehostname03/image.data
/stage/backups/FP8_FP4/20210109_132026/flashdancehostname03/flashdancehostname03.mksysb
/stage/backups/FP8_FP4/20210109_132026/flashdancehostname03/bosinst.data
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname06/flashdancehostname06.mksysb
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname06/image.data
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname06/bosinst.data
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname05/flashdancehostname05.mksysb
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname05/image.data
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname05/bosinst.data
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname02/image.data
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname02/bosinst.data
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname02/flashdancehostname02.mksysb
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname04/image.data
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname04/flashdancehostname04.mksysb
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname04/bosinst.data
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname07/image.data
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname07/flashdancehostname07.mksysb
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname07/bosinst.data
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname01/image.data
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname01/bosinst.data
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname01/flashdancehostname01.mksysb
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname03/image.data
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname03/flashdancehostname03.mksysb
/stage/backups/FP8_FP4/20201117_080027/flashdancehostname03/bosinst.data
20210115_010404 (flashdancehostname01:stage02_phase01_mksysb.sh): Running mksysb on all hosts to
/stage/backups/FP8_FP4/20210115_010404.
20210115_010404 (flashdancehostname01:stage02_phase01_mksysb.sh): Running mksysb on all hosts to
/stage/backups/FP8_FP4/20210115_010404.
flashdancehostname07:
flashdancehostname07: Creating information file (/image.data) for rootvg.
flashdancehostname07:
flashdancehostname07: Creating list of files to back up.
flashdancehostname07: .
flashdancehostname07: Backing up 189681 files.....
flashdancehostname07: 168147 of 189681 files (88%)
flashdancehostname07:
flashdancehostname07: 189681 of 189681 files (100%)
flashdancehostname07: 0512-038 mksysb: Backup Completed Successfully.
flashdancehostname03:
flashdancehostname03: Creating information file (/image.data) for rootvg.
flashdancehostname03:
flashdancehostname03: Creating list of files to back up.
flashdancehostname03:
flashdancehostname03: Backing up 140623 files.....
flashdancehostname03: 43535 of 140623 files (30%).....
flashdancehostname03:
flashdancehostname03: 140623 of 140623 files (100%)
flashdancehostname03: 0512-038 mksysb: Backup Completed Successfully.
flashdancehostname04:
flashdancehostname04: Creating information file (/image.data) for rootvg.
flashdancehostname04:
flashdancehostname04: Creating list of files to back up.
flashdancehostname04: .
flashdancehostname04: Backing up 194203 files.....
flashdancehostname04: 30530 of 194203 files (15%).....
flashdancehostname04:
flashdancehostname04: 194203 of 194203 files (100%)
flashdancehostname04: 0512-038 mksysb: Backup Completed Successfully.
flashdancehostname05:
flashdancehostname05: Creating information file (/image.data) for rootvg.
flashdancehostname05:
flashdancehostname05: Creating list of files to back up.
flashdancehostname05: .
flashdancehostname05: Backing up 194516 files.....
flashdancehostname05:
flashdancehostname05: 194516 of 194516 files (100%)
flashdancehostname05: 0512-038 mksysb: Backup Completed Successfully.
flashdancehostname06:
flashdancehostname06: Creating information file (/image.data) for rootvg.
flashdancehostname06:
flashdancehostname06: Creating list of files to back up.
flashdancehostname06: .
flashdancehostname06: Backing up 187465 files.....
flashdancehostname06: 63211 of 187465 files (33%).....
flashdancehostname06:
flashdancehostname06: 187465 of 187465 files (100%)
flashdancehostname06: 0512-038 mksysb: Backup Completed Successfully.
flashdancehostname02:
flashdancehostname02: Creating information file (/image.data) for rootvg.
flashdancehostname02:
flashdancehostname02: Creating list of files to back up.
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
flashdancehostname02: ...
flashdancehostname02: Backing up 190655 files.....
flashdancehostname02: 52112 of 190655 files (27%).....
flashdancehostname02: 130906 of 190655 files (68%).....
flashdancehostname02:
flashdancehostname02: 190655 of 190655 files (100%)
flashdancehostname02: 0512-038 mksysb: Backup Completed Successfully.
flashdancehostname01:
flashdancehostname01: Creating information file (/image.data) for rootvg.
flashdancehostname01:
flashdancehostname01: Creating list of files to back up.
flashdancehostname01: .
flashdancehostname01: Backing up 202455 files.....
flashdancehostname01: 21345 of 202455 files (10%).....
flashdancehostname01: 176695 of 202455 files (87%).....
flashdancehostname01: 176703 of 202455 files (87%).....
flashdancehostname01: 176711 of 202455 files (87%).....
flashdancehostname01:
flashdancehostname01: 202455 of 202455 files (100%)
flashdancehostname01: 0512-038 mksysb: Backup Completed Successfully.

real    24m51.17s
user    1m20.99s
sys      2m39.17s
20210115_012855 (flashdancehostname01:stage02_phase01_mksysb.sh): Looking for new mksysb backups in
/stage/backups/FP8_FP4/20210115_010404/20210115_010404
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname06/flashdancehostname06.mksysb
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname06/image.data
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname06/bosinst.data
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname05/flashdancehostname05.mksysb
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname05/image.data
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname05/bosinst.data
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname02/image.data
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname02/bosinst.data
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname02/flashdancehostname02.mksysb
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname04/image.data
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname04/flashdancehostname04.mksysb
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname04/bosinst.data
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname07/image.data
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname07/flashdancehostname07.mksysb
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname07/bosinst.data
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname01/image.data
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname01/bosinst.data
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname01/flashdancehostname01.mksysb
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname03/image.data
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname03/flashdancehostname03.mksysb
/stage/backups/FP8_FP4/20210115_010404/flashdancehostname03/bosinst.data
20210115_012855 (flashdancehostname01:stage02_phase01_mksysb.sh): Starting date: Fri Jan 15 01:04:02 IST 2021   Ending Date: Fri
Jan 15 01:28:55 IST 2021.

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

5. Command: Verify that all hosts backed up successfully. Each host should have the mksysb file, image.data file, and bosinst.data file associated with the backup. Using the command below list the last mksysb file and look for the 'Backup Completed Successfully' message for each host.

```
ls -rt /BCU_share/support/FP9_FP5/log/*mksysb* | tail -1 | xargs grep '038 mksysb: Backup Completed Successfully' | sort
```

Example Output:

```
$ ls -rt /BCU_share/support/FP8_FP4/log/*mksysb* | tail -1 | xargs grep '038 mksysb: Backup Completed Successfully' | sort
flashdancehostname01: 0512-038 mksysb: Backup Completed Successfully.
flashdancehostname02: 0512-038 mksysb: Backup Completed Successfully.
flashdancehostname03: 0512-038 mksysb: Backup Completed Successfully.
flashdancehostname04: 0512-038 mksysb: Backup Completed Successfully.
flashdancehostname05: 0512-038 mksysb: Backup Completed Successfully.
flashdancehostname06: 0512-038 mksysb: Backup Completed Successfully.
flashdancehostname07: 0512-038 mksysb: Backup Completed Successfully.
```

6. Optional: Copy the mksysb images to an offsystem location.

Phase 8: Committing GPFS/Spectrum Scale and Db2.

Committing both GPFS/Spectrum Scale and Db2 will have a big impact in risk planning if there is a possibility or wanting to roll back. In general, the PDOA goal is to do thorough testing to provide some confidence that it will not be necessary to roll back changes, which in an appliance is a very complicated endeavor.

GPFS/Spectrum Scale is committed in two parts. The first part updates the minimum GPFS/Spectrum Scale code level. This does not change the filesystem structures, so reversion to an older GPFS level can be done by re-installing GPFS at a lower level, or restoring via mksysb. The second part is at each filesystem level, once each filesystem is updated then the only way to revert GPFS to an earlier level is to restore from mksysb or re-install GPFS and then to recreate all the filesystems and restore the filesystem contents. The PDOA GPFS filesystems 'db2home', 'stage', and 'dwhome' are not part of the database backup this type of restore is prohibitively expensive. Each partition also has an associated bkpf##### filesystem, depending on how it is used the contents of this filesystem are also not backed up as part of a Db2 backup. For more information about GPFS filesystems and backups refer to Backups.

For Db2, the commit depends on the differences between the original and updated fixpacks. For most fixpack updates committing (or migrating the database) updates the catalog tables to take advantage of new features. If the catalog tables are updated then the only way to revert to an earlier level is to migrate the instance back to a previous copy and restore the database.

The PDOA recommendation is to migrate GPFS as soon as possible. For Db2 many of our customers are strong DBAs so they can decide whether they want to migrate their database, but in general the recommendation would be to migrate the database as well.

STAGE 8 - CORE NODES update in DOWNTIME window

1. Command: Checking the state of the GPFS installp filesets, GPFS minimum release levels, and GPFS filesystem versions. The original filesystem level will be 4.1.0.4. If updated from v1.1 FP4, the minReleaseLevel will be 5.0.5.1 and the current filesystem level will be 5.0.5.0. If updated from V1.1 FP3 the minReleaseLevel will be 4.2.3.9 and the current filesystem level will be 4.2.3.9. V1.1 FP2->FP4 customers will see a minReleaseLevel and current filesystem level of 4.2.3.0.

```
./gpfs_commit.sh
```

Example Output:

```
$ ./gpfs_commit.sh
20220922_094741 (reverseflash01:gpfs_commit.sh): Starting date: Thu Sep 22 09:47:41 EDT 2022.
20220922_094741 (reverseflash01:gpfs_commit.sh): Checking current gpfs version.
20220922_094741 (reverseflash01:gpfs_commit.sh): Checking GPFS Uncommitted installp packages.
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
gpfs.base                USR      5.1.1.4      APPLIED
gpfs.base                ROOT     5.1.1.4      APPLIED
gpfs.docs.data           SHARE   5.1.1.3      APPLIED
gpfs.msg.en_US           USR      5.1.1.3      APPLIED
Installp Status
-----
Name                      Part      Level              State
-----
20220922_094742 (reverseflash01:gpfs_commit.sh): Checking GPFS release level for all hosts.
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
minReleaseLevel 5.0.5.1
20220922_094744 (reverseflash01:gpfs_commit.sh): Checking Filesystem Levels for all hosts.
HOSTS -----
reverseflash01, reverseflash03
-----
   5                      14.10 (4.1.0.4)      Original file system version
   5 -v                  23.00 (5.0.5.0)      Current file system version

HOSTS -----
reverseflash02, reverseflash04
-----
  21                      14.10 (4.1.0.4)      Original file system version
  21 -v                  23.00 (5.0.5.0)      Current file system version

HOSTS -----
reverseflash05, reverseflash06
-----
  33                      14.10 (4.1.0.4)      Original file system version
  33 -v                  23.00 (5.0.5.0)      Current file system version
20220922_094830 (reverseflash01:gpfs_commit.sh): Script './gpfs_commit.sh' with arguments '' ended with rc='0'. Start: Thu Sep 22
09:47:41 EDT 2022 End: Thu Sep 22 09:48:30 EDT 2022. Elapsed Time (Seconds): 49 (H:M:S):(00:00:49).
20220922_094830 (reverseflash01:gpfs_commit.sh): Normalizing management hostname.
20220922_094830 (reverseflash01:gpfs_commit.sh): Management hostname is 'reverseflash01'.
20220922_094830 (reverseflash01:gpfs_commit.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from script
'./gpfs_commit.sh'.' to 'user@customer.com' '-c root@localhost'.
20220922_094830 (reverseflash01:gpfs_commit.sh): Notification sent.

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

2. Command: Update the minimum release level for all PDOA GPFS clusters. If PDOA GPFS clusters are connected to remote (external) GPFS clusters those clusters must be updated before this step as they will lose access to shared filesystems. The updated release level will be 5.1.1.0. After this GPFS can be only be reverted using the mksysb taken in phase 7 or by re-installing GPFS.

```
./gpfs_commit.sh commitversion
```

Example Output:

```
$ ./gpfs_commit.sh commitversion
20220922_101743 (reverseflash01:gpfs_commit.sh): Starting date: Thu Sep 22 10:17:43 EDT 2022.
20220922_101743 (reverseflash01:gpfs_commit.sh): Checking current gpfs version.
20220922_101743 (reverseflash01:gpfs_commit.sh): Checking GPFS Uncommitted installp packages.
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
gpfs.base                USR      5.1.1.4      APPLIED
gpfs.base                ROOT     5.1.1.4      APPLIED
gpfs.docs.data           SHARE   5.1.1.3      APPLIED
```

STAGE 8 - CORE NODES update in DOWNTIME window

```

gpfs.msg.en_US          USR      5.1.1.3          APPLIED
Installp Status
-----
Name                    Part      Level                      State
-----
20220922_101744 (reverseflash01:gpfs_commit.sh): Checking GPFS release level for all hosts.
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
minReleaseLevel 5.0.5.1
20220922_101747 (reverseflash01:gpfs_commit.sh): Checking Filesystem Levels for all hosts.
HOSTS -----
reverseflash01, reverseflash03
-----
      5                    14.10 (4.1.0.4)          Original file system version
      5 -V                 23.00 (5.0.5.0)          Current file system version

HOSTS -----
reverseflash02, reverseflash04
-----
      21                   14.10 (4.1.0.4)          Original file system version
      21 -V                23.00 (5.0.5.0)          Current file system version

HOSTS -----
reverseflash05, reverseflash06
-----
      33                   14.10 (4.1.0.4)          Original file system version
      33 -V                23.00 (5.0.5.0)          Current file system version
20220922_101831 (reverseflash01:gpfs_commit.sh): Running op commitversion.
20220922_101831 (reverseflash01:gpfs_commit.sh): Committing GPFS by updating release to LATEST.
reverseflash01: Update GPFS Cluster.
reverseflash01: Verifying that all nodes in the cluster are up-to-date ...
reverseflash02: Update GPFS Cluster.
reverseflash02: Verifying that all nodes in the cluster are up-to-date ...
20220922_101932 (reverseflash01:gpfs_commit.sh): Rechecking version.
20220922_101932 (reverseflash01:gpfs_commit.sh): Checking GPFS Uncommitted installp packages.
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
gpfs.base              USR      5.1.1.4          APPLIED
gpfs.base              ROOT   5.1.1.4          APPLIED
gpfs.docs.data         SHARE  5.1.1.3          APPLIED
gpfs.msg.en_US         USR      5.1.1.3          APPLIED
Installp Status
-----
Name                    Part      Level                      State
-----
20220922_101933 (reverseflash01:gpfs_commit.sh): Checking GPFS release level for all hosts.
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
minReleaseLevel 5.1.1.0
20220922_101935 (reverseflash01:gpfs_commit.sh): Checking Filesystem Levels for all hosts.
HOSTS -----
reverseflash01, reverseflash03
-----
      5                    14.10 (4.1.0.4)          Original file system version
      5 -V                 23.00 (5.0.5.0)          Current file system version

HOSTS -----
reverseflash02, reverseflash04
-----
      21                   14.10 (4.1.0.4)          Original file system version
      21 -V                23.00 (5.0.5.0)          Current file system version

HOSTS -----
reverseflash05, reverseflash06
-----
      33                   14.10 (4.1.0.4)          Original file system version
      33 -V                23.00 (5.0.5.0)          Current file system version
20220922_102019 (reverseflash01:gpfs_commit.sh): Script './gpfs_commit.sh' with arguments 'commitversion' ended with rc='0'.
Start: Thu Sep 22 10:17:43 EDT 2022 End: Thu Sep 22 10:20:19 EDT 2022. Elapsed Time (Seconds): 156 (H:M:S):(00:02:36).
20220922_102019 (reverseflash01:gpfs_commit.sh): Normalizing management hostname.
20220922_102020 (reverseflash01:gpfs_commit.sh): Management hostname is 'reverseflash01'.
20220922_102020 (reverseflash01:gpfs_commit.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from script
'./gpfs_commit.sh' to 'user@company.com' '-c root@localhost'.
20220922_102020 (reverseflash01:gpfs_commit.sh): Notification sent.
You have mail in /usr/spool/mail/root

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application

```

3. Command: Update the minimum levels for all GPFS filesystems. The new filesystem level will be 5.1.1.0. Note that after this the only way to revert to the older GPFS version is to recreate all filesystems and

STAGE 8 - CORE NODES update in DOWNTIME window

restore from backups. Filesystem updates are done one at a time. Output size and time will depend on the size of the PDOA environment. Example output is truncated so that only a few filesystem examples are displayed.

```
./gpfs_commit.sh commitfilesystems
```

Example Output:

```
(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
$ ./gpfs_commit.sh commitfilesystems
20220922_104450 (reverseflash01:gpfs_commit.sh): Starting date: Thu Sep 22 10:44:50 EDT 2022.
20220922_104450 (reverseflash01:gpfs_commit.sh): Checking current gpfs version.
20220922_104450 (reverseflash01:gpfs_commit.sh): Checking GPFS Uncommitted installp packages.
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
gpfs.base          USR      5.1.1.4      APPLIED
gpfs.base          ROOT     5.1.1.4      APPLIED
gpfs.docs.data     SHARE   5.1.1.3      APPLIED
gpfs.msg.en_US     USR      5.1.1.3      APPLIED
Installp Status
-----
Name               Part      Level        State
-----
20220922_104452 (reverseflash01:gpfs_commit.sh): Checking GPFS release level for all hosts.
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
minReleaseLevel 5.1.1.0
20220922_104454 (reverseflash01:gpfs_commit.sh): Checking Filesystem Levels for all hosts.
HOSTS -----
reverseflash01, reverseflash03
-----
      5              14.10 (4.1.0.4)      Original file system version
      5 -v           23.00 (5.0.5.0)      Current file system version

HOSTS -----
reverseflash02, reverseflash04
-----
     21              14.10 (4.1.0.4)      Original file system version
     21 -v           23.00 (5.0.5.0)      Current file system version

HOSTS -----
reverseflash05, reverseflash06
-----
     33              14.10 (4.1.0.4)      Original file system version
     33 -v           23.00 (5.0.5.0)      Current file system version
20220922_104539 (reverseflash01:gpfs_commit.sh): Running op commitfilesystems.
20220922_104539 (reverseflash01:gpfs_commit.sh): Committing GPFS filesystems by updating filesystem levels to latest level.
reverseflash01: Updating appsvr on reverseflash01...
reverseflash01: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash01: Updating opm on reverseflash01...
reverseflash01: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating bkpf0 on reverseflash02...
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating bkpf1 on reverseflash02...
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating bkpf2 on reverseflash02...
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating bkpf3 on reverseflash02...
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating bkpf4 on reverseflash02...
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating bkpf5 on reverseflash02...
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating db2fs0 on reverseflash02...
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating db2fs1 on reverseflash02...
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating db2fs2 on reverseflash02...
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating db2fs3 on reverseflash02...
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating db2fs4 on reverseflash02...
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating db2fs5 on reverseflash02...
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating db2home on reverseflash02...
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating db2path0 on reverseflash02...
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating db2path1 on reverseflash02...
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating db2path2 on reverseflash02...
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating db2path3 on reverseflash02...
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating db2path4 on reverseflash02...
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating db2path5 on reverseflash02...
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating dwhome on reverseflash02...
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash02: Updating stage on reverseflash02...
reverseflash02: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating bkpfsl0 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating bkpfsl1 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating bkpfsl2 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating bkpfsl3 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating bkpfsl4 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating bkpfsl5 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating bkpfsl6 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating bkpfsl7 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating bkpfsl8 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating bkpfsl9 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating db2fs10 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating db2fs11 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating db2fs12 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating db2fs13 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating db2fs14 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating db2fs15 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating db2fs6 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating db2fs7 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating db2fs8 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating db2fs9 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating db2path10 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating db2path11 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating db2path12 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating db2path13 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating db2path14 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating db2path15 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating db2path6 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating db2path7 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating db2path8 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
reverseflash05: Updating db2path9 on reverseflash05...
reverseflash05: Successfully upgraded file system format version to 25.00 (5.1.1.0).
20220922_104728 (reverseflash01:gpfs_commit.sh): Rechecking version.
20220922_104728 (reverseflash01:gpfs_commit.sh): Checking GPFS Uncommitted installp packages.
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
gpfs.base          USR      5.1.1.4      APPLIED
gpfs.base          ROOT    5.1.1.4      APPLIED
gpfs.docs.data     SHARE   5.1.1.3      APPLIED
gpfs.msg.en_US     USR      5.1.1.3      APPLIED
Installp Status
-----
Name              Part    Level      State
-----
20220922_104729 (reverseflash01:gpfs_commit.sh): Checking GPFS release level for all hosts.
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
```


STAGE 8 - CORE NODES update in DOWNTIME window

```
minReleaseLevel 5.1.1.0
20220922_104731 (reverseflash01:gpfs_commit.sh): Checking Filesystem Levels for all hosts.
HOSTS -----
reverseflash01, reverseflash03
-----
      5                      14.10 (4.1.0.4)      Original file system version
      5 -V                   25.00 (5.1.1.0)      Current file system version

HOSTS -----
reverseflash02, reverseflash04
-----
      21                     14.10 (4.1.0.4)      Original file system version
      21 -V                  25.00 (5.1.1.0)      Current file system version

HOSTS -----
reverseflash05, reverseflash06
-----
      33                      14.10 (4.1.0.4)      Original file system version
      33 -V                   25.00 (5.1.1.0)      Current file system version
20220922_104815 (reverseflash01:gpfs_commit.sh): Script './gpfs_commit.sh' with arguments 'commitfilesystems' ended with rc='0'.
Start: Thu Sep 22 10:44:50 EDT 2022 End: Thu Sep 22 10:48:15 EDT 2022. Elapsed Time (Seconds): 205 (H:M:S):(00:03:25).
20220922_104815 (reverseflash01:gpfs_commit.sh): Normalizing management hostname.
20220922_104816 (reverseflash01:gpfs_commit.sh): Management hostname is 'reverseflash01'.
20220922_104816 (reverseflash01:gpfs_commit.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from script
'./gpfs_commit.sh'.' to 'user@customer.com' '-c root@localhost'.
20220922_104816 (reverseflash01:gpfs_commit.sh): Notification sent.
You have mail in /usr/spool/mail/root
```

4. (0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application Command: Run the following to commit all GPFS installp filesets. Output size will vary depending on the size of the PDOA system. Example output is truncated to only show one hosts output for the commit command.

```
./gpfs_commit.sh commitinstallp
```

Example Output:

```
$ ./gpfs_commit.sh commitinstallp
20220922_105240 (reverseflash01:gpfs_commit.sh): Starting date: Thu Sep 22 10:52:40 EDT 2022.
20220922_105240 (reverseflash01:gpfs_commit.sh): Checking current gpfs version.
20220922_105240 (reverseflash01:gpfs_commit.sh): Checking GPFS Uncommitted installp packages.
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
gpfs.base          USR      5.1.1.4      APPLIED
gpfs.base          ROOT    5.1.1.4      APPLIED
gpfs.docs.data     SHARE  5.1.1.3      APPLIED
gpfs.msg.en_US     USR    5.1.1.3      APPLIED
Installp Status
-----
Name               Part    Level      State
-----
20220922_105242 (reverseflash01:gpfs_commit.sh): Checking GPFS release level for all hosts.
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
minReleaseLevel 5.1.1.0
20220922_105245 (reverseflash01:gpfs_commit.sh): Checking Filesystem Levels for all hosts.
HOSTS -----
reverseflash01, reverseflash03
-----
      5                      14.10 (4.1.0.4)      Original file system version
      5 -V                   25.00 (5.1.1.0)      Current file system version

HOSTS -----
reverseflash02, reverseflash04
-----
      21                     14.10 (4.1.0.4)      Original file system version
      21 -V                  25.00 (5.1.1.0)      Current file system version

HOSTS -----
reverseflash05, reverseflash06
-----
      33                      14.10 (4.1.0.4)      Original file system version
      33 -V                   25.00 (5.1.1.0)      Current file system version
20220922_105329 (reverseflash01:gpfs_commit.sh): Running op commitinstallp.
20220922_105329 (reverseflash01:gpfs_commit.sh): Committing GPFS installp packages.
reverseflash01: SUCCESSES
reverseflash01: -----
reverseflash01: Filesets listed in this section passed pre-commit verification
reverseflash01: and will be committed.
reverseflash01:
reverseflash01: Selected Filesets
reverseflash01: -----
reverseflash01: gpfs.base 5.1.1.4                                # GPFS File Manager
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
reverseflash01: gpfs.docs.data 5.1.1.3          # GPFS Server Manpages and Doc...
reverseflash01: gpfs.msg.en_US 5.1.1.3          # GPFS Server Messages - U.S. ...
reverseflash01: << End of Success Section >>
reverseflash01:
reverseflash05: SUCCESSES
reverseflash05: -----
reverseflash05: Filesets listed in this section passed pre-commit verification
reverseflash05: and will be committed.
reverseflash05:
reverseflash05: Selected Filesets
reverseflash05: -----
reverseflash05: gpfs.base 5.1.1.4          # GPFS File Manager
reverseflash05: gpfs.docs.data 5.1.1.3    # GPFS Server Manpages and Doc...
reverseflash05: gpfs.msg.en_US 5.1.1.3    # GPFS Server Messages - U.S. ...
reverseflash05: << End of Success Section >>
reverseflash05:
reverseflash04: SUCCESSES
reverseflash04: -----
reverseflash04: Filesets listed in this section passed pre-commit verification
reverseflash04: and will be committed.
reverseflash04:
reverseflash04: Selected Filesets
reverseflash04: -----
reverseflash04: gpfs.base 5.1.1.4          # GPFS File Manager
reverseflash04: gpfs.docs.data 5.1.1.3    # GPFS Server Manpages and Doc...
reverseflash04: gpfs.msg.en_US 5.1.1.3    # GPFS Server Messages - U.S. ...
reverseflash04: << End of Success Section >>
reverseflash04:
reverseflash03: SUCCESSES
reverseflash03: -----
reverseflash03: Filesets listed in this section passed pre-commit verification
reverseflash03: and will be committed.
reverseflash03:
reverseflash03: Selected Filesets
reverseflash03: -----
reverseflash03: gpfs.base 5.1.1.4          # GPFS File Manager
reverseflash03: gpfs.docs.data 5.1.1.3    # GPFS Server Manpages and Doc...
reverseflash03: gpfs.msg.en_US 5.1.1.3    # GPFS Server Messages - U.S. ...
reverseflash03: << End of Success Section >>
reverseflash03:
reverseflash02: SUCCESSES
reverseflash02: -----
reverseflash02: Filesets listed in this section passed pre-commit verification
reverseflash02: and will be committed.
reverseflash02:
reverseflash02: Selected Filesets
reverseflash02: -----
reverseflash02: gpfs.base 5.1.1.4          # GPFS File Manager
reverseflash02: gpfs.docs.data 5.1.1.3    # GPFS Server Manpages and Doc...
reverseflash02: gpfs.msg.en_US 5.1.1.3    # GPFS Server Messages - U.S. ...
reverseflash02: << End of Success Section >>
reverseflash02:
reverseflash06: SUCCESSES
reverseflash06: -----
reverseflash06: Filesets listed in this section passed pre-commit verification
reverseflash06: and will be committed.
reverseflash06:
reverseflash06: Selected Filesets
reverseflash06: -----
reverseflash06: gpfs.base 5.1.1.4          # GPFS File Manager
reverseflash06: gpfs.docs.data 5.1.1.3    # GPFS Server Manpages and Doc...
reverseflash06: gpfs.msg.en_US 5.1.1.3    # GPFS Server Messages - U.S. ...
reverseflash06: << End of Success Section >>
reverseflash06:
20220922_105337 (reverseflash01:gpfs_commit.sh): Rechecking version.
20220922_105337 (reverseflash01:gpfs_commit.sh): Checking GPFS Uncommitted installp packages.
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
0503-459 installp: No filesets were found in the Software
Vital Product Database in the APPLIED state.
20220922_105338 (reverseflash01:gpfs_commit.sh): Checking GPFS release level for all hosts.
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
minReleaseLevel 5.1.1.0
20220922_105341 (reverseflash01:gpfs_commit.sh): Checking Filesystem Levels for all hosts.
HOSTS -----
reverseflash01, reverseflash03
-----
5          14.10 (4.1.0.4)          Original file system version
5 -v       25.00 (5.1.1.0)          Current file system version
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
HOSTS -----
reverseflash02, reverseflash04
-----
21                14.10 (4.1.0.4)      Original file system version
21 -v             25.00 (5.1.1.0)      Current file system version

HOSTS -----
reverseflash05, reverseflash06
-----
33                14.10 (4.1.0.4)      Original file system version
33 -v             25.00 (5.1.1.0)      Current file system version
20220922_105427 (reverseflash01:gpfs_commit.sh): Script './gpfs_commit.sh' with arguments 'commitinstallp' ended with rc='0'.
Start: Thu Sep 22 10:52:40 EDT 2022 End: Thu Sep 22 10:54:26 EDT 2022. Elapsed Time (Seconds): 107 (H:M:S):(00:01:47).
20220922_105427 (reverseflash01:gpfs_commit.sh): Normalizing management hostname.
20220922_105427 (reverseflash01:gpfs_commit.sh): Management hostname is 'reverseflash01'.
20220922_105427 (reverseflash01:gpfs_commit.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from script
'./gpfs_commit.sh'.' to 'user@customer.com' '-c root@localhost'.
20220922_105427 (reverseflash01:gpfs_commit.sh): Notification sent.

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

5. Run the following to verify all commit steps have completed.

```
./gpfs_commit.sh
```

Example Output:

```
$ ./gpfs_commit.sh
20220922_110159 (reverseflash01:gpfs_commit.sh): Starting date: Thu Sep 22 11:01:59 EDT 2022.
20220922_110159 (reverseflash01:gpfs_commit.sh): Checking current gpfs version.
20220922_110159 (reverseflash01:gpfs_commit.sh): Checking GPFS Uncommitted installp packages.
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
0503-459 installp: No filesets were found in the Software
Vital Product Database in the APPLIED state.
20220922_110200 (reverseflash01:gpfs_commit.sh): Checking GPFS release level for all hosts.
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
minReleaseLevel 5.1.1.0
20220922_110203 (reverseflash01:gpfs_commit.sh): Checking Filesystem Levels for all hosts.
HOSTS -----
reverseflash01, reverseflash03
-----
5                14.10 (4.1.0.4)      Original file system version
5 -v             25.00 (5.1.1.0)      Current file system version

HOSTS -----
reverseflash02, reverseflash04
-----
21                14.10 (4.1.0.4)      Original file system version
21 -v             25.00 (5.1.1.0)      Current file system version

HOSTS -----
reverseflash05, reverseflash06
-----
33                14.10 (4.1.0.4)      Original file system version
33 -v             25.00 (5.1.1.0)      Current file system version
20220922_110248 (reverseflash01:gpfs_commit.sh): Script './gpfs_commit.sh' with arguments '' ended with rc='0'. Start: Thu Sep 22
11:01:59 EDT 2022 End: Thu Sep 22 11:02:48 EDT 2022. Elapsed Time (Seconds): 49 (H:M:S):(00:00:49).
20220922_110248 (reverseflash01:gpfs_commit.sh): Normalizing management hostname.
20220922_110249 (reverseflash01:gpfs_commit.sh): Management hostname is 'reverseflash01'.
20220922_110249 (reverseflash01:gpfs_commit.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from script
'./gpfs_commit.sh'.' to 'user@customer.com' '-c root@localhost'.
20220922_110249 (reverseflash01:gpfs_commit.sh): Notification sent.
You have mail in /usr/spool/mail/root

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

Phase 9: Committing Power Firmware Updates

This Phase commits the Power Firmware updates on the servers.

1. Command: Check the Power Firmware updates. This is run on the management host as root in a vtmenu or screen session. The below shows that the PFW levels are not committed on any of the servers.

```
./commit_pfw.sh
```

Example Output:

```
$ ./commit_pfw.sh
20220922_110503 (reverseflash01:commit_pfw.sh): Starting date: Thu Sep 22 11:05:03 EDT 2022.
20220922_110503 (reverseflash01:commit_pfw.sh): Collecting hmc ip address.
20220922_110504 (reverseflash01:commit_pfw.sh): Collecting servers.
20220922_110504 (reverseflash01:commit_pfw.sh): Checking server 'Server-8284-22A-SN21557DW' licensed code.
20220922_110505 (reverseflash01:commit_pfw.sh): Installed version: 01SV860,240.
20220922_110505 (reverseflash01:commit_pfw.sh): Active version: 01SV860,226.
20220922_110505 (reverseflash01:commit_pfw.sh): PFW is not committed.
20220922_110505 (reverseflash01:commit_pfw.sh): Checking server 'Server-8284-22A-SN21557EW' licensed code.
20220922_110506 (reverseflash01:commit_pfw.sh): Installed version: 01SV860,240.
20220922_110506 (reverseflash01:commit_pfw.sh): Active version: 01SV860,226.
20220922_110506 (reverseflash01:commit_pfw.sh): PFW is not committed.
20220922_110506 (reverseflash01:commit_pfw.sh): Checking server 'Server-8286-42A-SN21574DW' licensed code.
20220922_110507 (reverseflash01:commit_pfw.sh): Installed version: 01SV860,240.
20220922_110507 (reverseflash01:commit_pfw.sh): Active version: 01SV860,226.
20220922_110507 (reverseflash01:commit_pfw.sh): PFW is not committed.
20220922_110507 (reverseflash01:commit_pfw.sh): Checking server 'Server-8286-42A-SN21574EW' licensed code.
20220922_110508 (reverseflash01:commit_pfw.sh): Installed version: 01SV860,240.
20220922_110508 (reverseflash01:commit_pfw.sh): Active version: 01SV860,226.
20220922_110508 (reverseflash01:commit_pfw.sh): PFW is not committed.
20220922_110508 (reverseflash01:commit_pfw.sh): Script './commit_pfw.sh' with arguments '' ended with rc='1'. Start: Thu Sep 22 11:05:03 EDT 2022 End: Thu Sep 22 11:05:08 EDT 2022. Elapsed Time (Seconds): 5 (H:M:S):(00:00:05).
20220922_110508 (reverseflash01:commit_pfw.sh): Normalizing management hostname.
20220922_110509 (reverseflash01:commit_pfw.sh): Management hostname is 'reverseflash01'.
20220922_110509 (reverseflash01:commit_pfw.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from script './commit_pfw.sh'.' to 'user@customer.com' '-c root@localhost'.
20220922_110509 (reverseflash01:commit_pfw.sh): Notification sent.
```

2. Command: Commit the power firmware on the servers. This is run serially on each server. The command will check each server, if needed apply the commit, and then check each server again to verify.

```
./commit_pfw.sh commit
```

Example Output:

```
$ ./commit_pfw.sh commit
20220922_113640 (reverseflash01:commit_pfw.sh): Starting date: Thu Sep 22 11:36:40 EDT 2022.
20220922_113640 (reverseflash01:commit_pfw.sh): Collecting hmc ip address.
20220922_113640 (reverseflash01:commit_pfw.sh): Collecting servers.
20220922_113641 (reverseflash01:commit_pfw.sh): Checking server 'Server-8284-22A-SN21557DW' licensed code.
20220922_113642 (reverseflash01:commit_pfw.sh): Installed version: 01SV860,240.
20220922_113642 (reverseflash01:commit_pfw.sh): Active version: 01SV860,226.
20220922_113642 (reverseflash01:commit_pfw.sh): PFW is not committed.
20220922_113642 (reverseflash01:commit_pfw.sh): Committing Power Firmware on server 'Server-8284-22A-SN21557DW'.
20220922_113921 (reverseflash01:commit_pfw.sh): Checking server 'Server-8284-22A-SN21557DW' licensed code.
20220922_113922 (reverseflash01:commit_pfw.sh): Installed version: 01SV860,240.
20220922_113922 (reverseflash01:commit_pfw.sh): Active version: 01SV860,240.
20220922_113922 (reverseflash01:commit_pfw.sh): PFW is committed.
20220922_113922 (reverseflash01:commit_pfw.sh): Checking server 'Server-8284-22A-SN21557EW' licensed code.
20220922_113923 (reverseflash01:commit_pfw.sh): Installed version: 01SV860,240.
20220922_113923 (reverseflash01:commit_pfw.sh): Active version: 01SV860,226.
20220922_113923 (reverseflash01:commit_pfw.sh): PFW is not committed.
20220922_113923 (reverseflash01:commit_pfw.sh): Committing Power Firmware on server 'Server-8284-22A-SN21557EW'.
20220922_114347 (reverseflash01:commit_pfw.sh): Checking server 'Server-8284-22A-SN21557EW' licensed code.
20220922_114348 (reverseflash01:commit_pfw.sh): Installed version: 01SV860,240.
20220922_114348 (reverseflash01:commit_pfw.sh): Active version: 01SV860,240.
20220922_114348 (reverseflash01:commit_pfw.sh): PFW is committed.
20220922_114348 (reverseflash01:commit_pfw.sh): Checking server 'Server-8286-42A-SN21574DW' licensed code.
20220922_114349 (reverseflash01:commit_pfw.sh): Installed version: 01SV860,240.
20220922_114349 (reverseflash01:commit_pfw.sh): Active version: 01SV860,226.
20220922_114349 (reverseflash01:commit_pfw.sh): PFW is not committed.
20220922_114349 (reverseflash01:commit_pfw.sh): Committing Power Firmware on server 'Server-8286-42A-SN21574DW'.
20220922_114628 (reverseflash01:commit_pfw.sh): Checking server 'Server-8286-42A-SN21574DW' licensed code.
20220922_114629 (reverseflash01:commit_pfw.sh): Installed version: 01SV860,240.
20220922_114629 (reverseflash01:commit_pfw.sh): Active version: 01SV860,240.
20220922_114629 (reverseflash01:commit_pfw.sh): PFW is committed.
```

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```
20220922_114629 (reverseflash01:commit_pfw.sh): Checking server 'Server-8286-42A-SN21574EW' licensed code.
20220922_114630 (reverseflash01:commit_pfw.sh): Installed version: 01SV860,240.
20220922_114630 (reverseflash01:commit_pfw.sh): Active version: 01SV860,226.
20220922_114630 (reverseflash01:commit_pfw.sh): PFW is not committed.
20220922_114630 (reverseflash01:commit_pfw.sh): Committing Power Firmware on server 'Server-8286-42A-SN21574EW'.
20220922_114916 (reverseflash01:commit_pfw.sh): Checking server 'Server-8286-42A-SN21574EW' licensed code.
20220922_114917 (reverseflash01:commit_pfw.sh): Installed version: 01SV860,240.
20220922_114917 (reverseflash01:commit_pfw.sh): Active version: 01SV860,240.
20220922_114917 (reverseflash01:commit_pfw.sh): PFW is committed.
20220922_114917 (reverseflash01:commit_pfw.sh): Script './commit_pfw.sh' with arguments 'commit' ended with rc='0'. Start: Thu
Sep 22 11:36:40 EDT 2022 End: Thu Sep 22 11:49:17 EDT 2022. Elapsed Time (Seconds): 758 (H:M:S):(00:12:38).
20220922_114917 (reverseflash01:commit_pfw.sh): Normalizing management hostname.
20220922_114917 (reverseflash01:commit_pfw.sh): Management hostname is 'reverseflash01'.
20220922_114917 (reverseflash01:commit_pfw.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from script
'./commit_pfw.sh'.' to 'user@customer.com' '-c root@localhost'.
20220922_114917 (reverseflash01:commit_pfw.sh): Notification sent.
You have mail in /usr/spool/mail/root
```

```
(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

3. Command: Rerun the command from item 1 to verify all are committed.

```
./commit_pfw.sh
```

Example Output:

```
$ ./commit_pfw.sh
20220922_115243 (reverseflash01:commit_pfw.sh): Starting date: Thu Sep 22 11:52:43 EDT 2022.
20220922_115243 (reverseflash01:commit_pfw.sh): Collecting hmc ip address.
20220922_115244 (reverseflash01:commit_pfw.sh): Collecting servers.
20220922_115244 (reverseflash01:commit_pfw.sh): Checking server 'Server-8284-22A-SN21557DW' licensed code.
20220922_115245 (reverseflash01:commit_pfw.sh): Installed version: 01SV860,240.
20220922_115245 (reverseflash01:commit_pfw.sh): Active version: 01SV860,240.
20220922_115245 (reverseflash01:commit_pfw.sh): PFW is committed.
20220922_115245 (reverseflash01:commit_pfw.sh): Checking server 'Server-8284-22A-SN21557EW' licensed code.
20220922_115246 (reverseflash01:commit_pfw.sh): Installed version: 01SV860,240.
20220922_115246 (reverseflash01:commit_pfw.sh): Active version: 01SV860,240.
20220922_115246 (reverseflash01:commit_pfw.sh): PFW is committed.
20220922_115246 (reverseflash01:commit_pfw.sh): Checking server 'Server-8286-42A-SN21574DW' licensed code.
20220922_115247 (reverseflash01:commit_pfw.sh): Installed version: 01SV860,240.
20220922_115247 (reverseflash01:commit_pfw.sh): Active version: 01SV860,240.
20220922_115247 (reverseflash01:commit_pfw.sh): PFW is committed.
20220922_115247 (reverseflash01:commit_pfw.sh): Checking server 'Server-8286-42A-SN21574EW' licensed code.
20220922_115248 (reverseflash01:commit_pfw.sh): Installed version: 01SV860,240.
20220922_115248 (reverseflash01:commit_pfw.sh): Active version: 01SV860,240.
20220922_115248 (reverseflash01:commit_pfw.sh): PFW is committed.
20220922_115248 (reverseflash01:commit_pfw.sh): Script './commit_pfw.sh' with arguments '' ended with rc='0'. Start: Thu Sep 22
11:52:43 EDT 2022 End: Thu Sep 22 11:52:48 EDT 2022. Elapsed Time (Seconds): 5 (H:M:S):(00:00:05).
20220922_115248 (reverseflash01:commit_pfw.sh): Normalizing management hostname.
20220922_115249 (reverseflash01:commit_pfw.sh): Management hostname is 'reverseflash01'.
20220922_115249 (reverseflash01:commit_pfw.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from script
'./commit_pfw.sh'.' to 'user@customer.com' '-c root@localhost'.
20220922_115249 (reverseflash01:commit_pfw.sh): Notification sent.
```

Phase 10: Remirror the rootvg volume group after the update is successful

This step uses a new utility in V1.1 FP4 to perform the re-mirror operation. This utility was used in Phase 6 and Phase 7 to clone rootvg and is now used to remove the clone and perform the re-mirror operations. This utility runs in parallel on all hosts. After the utility completes it is necessary to redo the paging and system dump settings according to updated best practices.

1. Command: In a root login over a vtmenu or screen session ensure the session current working directory is correct.

```
cd /BCU_share/FP9_FP5/fixpack_tools/application
```

2. Command: Verify that the /BCU_share filesystems are mounted on all hosts. Both commands will attempt to mount those filesystems on any host that does not have it mounted yet.

```
./enable_bcushare.sh
```

Example Output:

```
$ ./enable_bcushare.sh
20210115_014124 (flashdancehostname01:enable_bcushare.sh): Checking for /BCU_share on all hosts.
20210115_014125 (flashdancehostname01:enable_bcushare.sh): Success: /BCU_share is mounted on all hosts.
20210115_014125 (flashdancehostname01:enable_bcushare.sh): enable_bcushare.sh completed with rc=0.
```

3. Command: Verify that all PDOA have old_rootvg clones

```
dsh -n ${ALL} 'lspv | grep old_rootvg || echo "No Clone"' | sort
```

Example Output:

```
$ dsh -n ${ALL} 'lspv | grep old_rootvg || echo "No Clone"' | sort
reverseflash01: hdisk1      00fa574d471862e3      old_rootvg
reverseflash02: hdisk0      00fa574d3e1b2250      old_rootvg
reverseflash03: hdisk0      00fa574e43949559      old_rootvg
reverseflash04: hdisk0      00fa574e3e3a3a92      old_rootvg
reverseflash05: hdisk0      00fa557e3e4a5d82      old_rootvg
reverseflash06: hdisk0      00fa557d3e2b73f1      old_rootvg
```

4. Command: Verify that all PDOA hosts are at the update oslevel.

```
dsh -n ${ALL} 'oslevel -s'
```

Example Output:

```
$ dsh -n ${ALL} 'oslevel -s'
reverseflash02: 7200-05-04-2220
reverseflash05: 7200-05-04-2220
reverseflash01: 7200-05-04-2220
reverseflash04: 7200-05-04-2220
reverseflash03: 7200-05-04-2220
reverseflash06: 7200-05-04-2220
```

5. Command: Remove the old_rootvg clones. This step removes the clone and the ability to quickly boot into the pre-FP5 LPAR images. Note the new messages for the alt_disk_install command.

```
dsh -n ${ALL} 'lspv | grep old_rootvg && alt_disk_install -X old_rootvg'
```

Example Output:

```
$ dsh -n ${ALL} 'lspv | grep old_rootvg && alt_disk_install -X old_rootvg'
reverseflash01: hdisk1      00fa574d471862e3      old_rootvg
```

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```
reverseflash01: +-----+
reverseflash01: ATTENTION: calling new module /usr/sbin/alt_rootvg_op. Please see the alt_rootvg_op man page
reverseflash01: and documentation for more details.
reverseflash01: Executing command: (/usr/sbin/alt_rootvg_op -X old_rootvg)
reverseflash01: +-----+
reverseflash03: hdisk0          00fa574e43949559          old_rootvg
reverseflash03: +-----+
reverseflash03: ATTENTION: calling new module /usr/sbin/alt_rootvg_op. Please see the alt_rootvg_op man page
reverseflash03: and documentation for more details.
reverseflash03: Executing command: (/usr/sbin/alt_rootvg_op -X old_rootvg)
reverseflash03: +-----+
reverseflash02: hdisk0          00fa574d3e1b2250          old_rootvg
reverseflash02: +-----+
reverseflash02: ATTENTION: calling new module /usr/sbin/alt_rootvg_op. Please see the alt_rootvg_op man page
reverseflash02: and documentation for more details.
reverseflash02: Executing command: (/usr/sbin/alt_rootvg_op -X old_rootvg)
reverseflash02: +-----+
reverseflash04: hdisk0          00fa574e3e3a3a92          old_rootvg
reverseflash04: +-----+
reverseflash04: ATTENTION: calling new module /usr/sbin/alt_rootvg_op. Please see the alt_rootvg_op man page
reverseflash04: and documentation for more details.
reverseflash04: Executing command: (/usr/sbin/alt_rootvg_op -X old_rootvg)
reverseflash04: +-----+
reverseflash06: hdisk0          00fa557d3e2b73f1          old_rootvg
reverseflash06: +-----+
reverseflash06: ATTENTION: calling new module /usr/sbin/alt_rootvg_op. Please see the alt_rootvg_op man page
reverseflash06: and documentation for more details.
reverseflash06: Executing command: (/usr/sbin/alt_rootvg_op -X old_rootvg)
reverseflash06: +-----+
reverseflash05: hdisk0          00fa557e3e4a5d82          old_rootvg
reverseflash05: +-----+
reverseflash05: ATTENTION: calling new module /usr/sbin/alt_rootvg_op. Please see the alt_rootvg_op man page
reverseflash05: and documentation for more details.
reverseflash05: Executing command: (/usr/sbin/alt_rootvg_op -X old_rootvg)
reverseflash05: +-----+
You have mail in /usr/spool/mail/root
```

6. Command: Verify there are no more clones.

```
dsh -n ${ALL} 'lspv | grep old_rootvg || echo "No Clone"' | sort
```

Example Output:

```
$ dsh -n ${ALL} 'lspv | grep old_rootvg || echo "No Clone"' | sort
reverseflash01: No Clone
reverseflash02: No Clone
reverseflash03: No Clone
reverseflash04: No Clone
reverseflash05: No Clone
reverseflash06: No Clone
```

7. Command: Verify the rootvg and bootlist are consistent.

```
dsh -n ${ALL} 'printf "Bootlist: $(bootlist -m normal -o) rootvg: $(lspv | grep rootvg)'"
```

Example Output:

```
$ dsh -n ${ALL} 'printf "Bootlist: $(bootlist -m normal -o) rootvg: $(lspv | grep rootvg)'"
reverseflash01: Bootlist: hdisk0 blv=hd5 pathid=0 rootvg: hdisk0 00fa574d3debf33a rootvg active
reverseflash03: Bootlist: hdisk1 blv=hd5 pathid=0 rootvg: hdisk1 00fa574e4718478b rootvg active
reverseflash04: Bootlist: hdisk1 blv=hd5 pathid=0 rootvg: hdisk1 00fa574e47184d73 rootvg active
reverseflash06: Bootlist: hdisk1 blv=hd5 pathid=0 rootvg: hdisk1 00fa557d47183ef4 rootvg active
reverseflash05: Bootlist: hdisk1 blv=hd5 pathid=0 rootvg: hdisk1 00fa557e471855f8 rootvg active
reverseflash02: Bootlist: hdisk1 blv=hd5 pathid=0 rootvg: hdisk1 00fa574d47183725 rootvg active
```

8. Command: Run the following command to remirror rootvg. This command will not return output until it is finished on each host. This command should be run within a vtmenu session or screen session. It is a long running command (about 3 hours for most PDOA servers).

```
dsh -s -n ${ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/mirror_utility.sh -action mirror'
```

Note: To track the status of the mirroring, periodically run the following command in a separate window. This tracks the count of stale logical volumes (lvs) which reduces as the mirroring

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progresses. The '-L' argument prevents the command from hanging while waiting on the mirrorvg command to release its lock. If e-mail alerting is configured, each host will also send an e-mail alert when completed.

```
dsh -n ${ALL} 'lsvg -L -l rootvg | grep -i -c stale' | sort
```

Example Output:

```
$ dsh -n ${ALL} 'lsvg -L -l rootvg | grep -i -c stale' | sort
reverseflash01: 3
reverseflash02: 0
reverseflash03: 0
reverseflash04: 0
reverseflash05: 0
reverseflash06: 0
```

Example Output: (Only one host's output is shown.)

```
$ dsh -n ${ALL} '/BCU_share/FP8_FP4/fixpack_tools/application/mirror_utility.sh -action mirror'
flashdancehostname06: 20210120_063441 (flashdancehostname06:mirror_utility.sh): Starting date: Wed Jan 20 06:34:41 IST 2021.
flashdancehostname06: 20210120063441: (mirror_utility.pl) Retrieving the current boot disk.
flashdancehostname06: 20210120063441: (mirror_utility.pl) Running command 'getconf -a | grep "^BOOT_DEVICE" | cut -d: -f2'.
flashdancehostname06: 20210120063442: (mirror_utility.pl) Found boot disk is hdisk0.
flashdancehostname06: 20210120063442: (mirror_utility.pl) Retrieving disk statistics for volume groups.
flashdancehostname06: 20210120063442: (mirror_utility.pl) Retrieving Internal Disks.
flashdancehostname06: 20210120063442: (mirror_utility.pl) Retrieving Free Disks.
flashdancehostname06: 20210120063443: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk0 -g menu.
flashdancehostname06: 20210120063443: (mirror_utility.pl) Running cmd lsvg -l hdisk0.
flashdancehostname06: 20210120063443: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk1 -g menu.
flashdancehostname06: 20210120063443: (mirror_utility.pl) Running cmd lsvg -l hdisk1.
flashdancehostname06: 20210120063443: (mirror_utility.pl) Retrieving lv stats for rootvg.
flashdancehostname06: 20210120063443: (mirror_utility.pl) Running command lsvg -l rootvg with paging filter.
flashdancehostname06: 20210120063443: (mirror_utility.pl) Determining rootvg status.
flashdancehostname06: 20210120063443: (mirror_utility.pl) Attempting to restore rootvg mirror.
flashdancehostname06: 20210120063443: (mirror_utility.pl) Running command 'alt_disk_install -X altinst_rootvg'.
flashdancehostname06: 20210120063446: (mirror_utility.pl) Running command 'bosboot -a'.
flashdancehostname06: 20210120063502: (mirror_utility.pl) Running command 'bootlist -m normal hdisk0'.
flashdancehostname06: 20210120063502: (mirror_utility.pl) Retrieving the current boot disk.
flashdancehostname06: 20210120063502: (mirror_utility.pl) Running command 'getconf -a | grep "^BOOT_DEVICE" | cut -d: -f2'.
flashdancehostname06: 20210120063502: (mirror_utility.pl) Found boot disk is hdisk0.
flashdancehostname06: 20210120063502: (mirror_utility.pl) Retrieving disk statistics for volume groups.
flashdancehostname06: 20210120063503: (mirror_utility.pl) Retrieving Internal Disks.
flashdancehostname06: 20210120063503: (mirror_utility.pl) Retrieving Free Disks.
flashdancehostname06: 20210120063503: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk0 -g menu.
flashdancehostname06: 20210120063503: (mirror_utility.pl) Running cmd lsvg -l hdisk0.
flashdancehostname06: 20210120063503: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk1 -g menu.
flashdancehostname06: 20210120063503: (mirror_utility.pl) Running cmd lsvg -l hdisk1.
flashdancehostname06: 20210120063503: (mirror_utility.pl) Retrieving lv stats for rootvg.
flashdancehostname06: 20210120063503: (mirror_utility.pl) Running command lsvg -l rootvg with paging filter.
flashdancehostname06: 20210120063504: (mirror_utility.pl) Determining rootvg status.
flashdancehostname06: 20210120063504: (mirror_utility.pl) Running command 'extendvg -f rootvg hdisk1'.
flashdancehostname06: 20210120063504: (mirror_utility.pl) Retrieving the current boot disk.
flashdancehostname06: 20210120063504: (mirror_utility.pl) Running command 'getconf -a | grep "^BOOT_DEVICE" | cut -d: -f2'.
flashdancehostname06: 20210120063505: (mirror_utility.pl) Found boot disk is hdisk0.
flashdancehostname06: 20210120063505: (mirror_utility.pl) Retrieving disk statistics for volume groups.
flashdancehostname06: 20210120063505: (mirror_utility.pl) Retrieving Internal Disks.
flashdancehostname06: 20210120063505: (mirror_utility.pl) Retrieving Free Disks.
flashdancehostname06: 20210120063505: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk0 -g menu.
flashdancehostname06: 20210120063505: (mirror_utility.pl) Running cmd lsvg -l hdisk0.
flashdancehostname06: 20210120063506: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk1 -g menu.
flashdancehostname06: 20210120063506: (mirror_utility.pl) Running cmd lsvg -l hdisk1.
flashdancehostname06: 20210120063506: (mirror_utility.pl) Retrieving lv stats for rootvg.
flashdancehostname06: 20210120063506: (mirror_utility.pl) Running command lsvg -l rootvg with paging filter.
flashdancehostname06: 20210120063506: (mirror_utility.pl) Determining rootvg status.
flashdancehostname06: 20210120063506: (mirror_utility.pl) Running command 'mirrorvg rootvg hdisk1'.
flashdancehostname06: 20210120093155: (mirror_utility.pl) Retrieving the current boot disk.
flashdancehostname06: 20210120093155: (mirror_utility.pl) Running command 'getconf -a | grep "^BOOT_DEVICE" | cut -d: -f2'.
flashdancehostname06: 20210120093155: (mirror_utility.pl) Found boot disk is hdisk0.
flashdancehostname06: 20210120093155: (mirror_utility.pl) Retrieving disk statistics for volume groups.
flashdancehostname06: 20210120093155: (mirror_utility.pl) Retrieving Internal Disks.
flashdancehostname06: 20210120093156: (mirror_utility.pl) Retrieving Free Disks.
flashdancehostname06: 20210120093156: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk0 -g menu.
flashdancehostname06: 20210120093156: (mirror_utility.pl) Running cmd lsvg -l hdisk0.
flashdancehostname06: 20210120093156: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk1 -g menu.
flashdancehostname06: 20210120093156: (mirror_utility.pl) Running cmd lsvg -l hdisk1.
flashdancehostname06: 20210120093156: (mirror_utility.pl) Retrieving lv stats for rootvg.
flashdancehostname06: 20210120093156: (mirror_utility.pl) Running command lsvg -l rootvg with paging filter.
flashdancehostname06: 20210120093156: (mirror_utility.pl) Determining rootvg status.
flashdancehostname06: 20210120093157: (mirror_utility.pl) Running command 'bosboot -a'.
flashdancehostname06: 20210120093215: (mirror_utility.pl) Running command 'bootlist -m normal hdisk0 hdisk1'.
flashdancehostname06: 20210120093215: (mirror_utility.pl) Retrieving the current boot disk.
flashdancehostname06: 20210120093215: (mirror_utility.pl) Running command 'getconf -a | grep "^BOOT_DEVICE" | cut -d: -f2'.
```


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```
flashdancehostname06: 20210120093215: (mirror_utility.pl) Found boot disk is hdisk0.
flashdancehostname06: 20210120093216: (mirror_utility.pl) Retrieving disk statistics for volume groups.
flashdancehostname06: 20210120093216: (mirror_utility.pl) Retrieving Internal Disks.
flashdancehostname06: 20210120093216: (mirror_utility.pl) Retrieving Free Disks.
flashdancehostname06: 20210120093216: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk0 -g menu.
flashdancehostname06: 20210120093216: (mirror_utility.pl) Running cmd lsvg -l hdisk0.
flashdancehostname06: 20210120093217: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk1 -g menu.
flashdancehostname06: 20210120093217: (mirror_utility.pl) Running cmd lsvg -l hdisk1.
flashdancehostname06: 20210120093217: (mirror_utility.pl) Retrieving lv stats for rootvg.
flashdancehostname06: 20210120093217: (mirror_utility.pl) Running command lsvg -l rootvg with paging filter.
flashdancehostname06: 20210120093217: (mirror_utility.pl) Determining rootvg status.
flashdancehostname06: 20210120093217: (mirror_utility.pl) Retrieving the current boot disk.
flashdancehostname06: 20210120093217: (mirror_utility.pl) Running command 'getconf -a | grep "^BOOT_DEVICE" | cut -d: -f2'.
flashdancehostname06: 20210120093217: (mirror_utility.pl) Found boot disk is hdisk0.
flashdancehostname06: 20210120093217: (mirror_utility.pl) Retrieving disk statistics for volume groups.
flashdancehostname06: 20210120093217: (mirror_utility.pl) Retrieving Internal Disks.
flashdancehostname06: 20210120093218: (mirror_utility.pl) Retrieving Free Disks.
flashdancehostname06: 20210120093218: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk0 -g menu.
flashdancehostname06: 20210120093218: (mirror_utility.pl) Running cmd lsvg -l hdisk0.
flashdancehostname06: 20210120093218: (mirror_utility.pl) Running cmd /usr/lpp/bosinst/blvset -d /dev/hdisk1 -g menu.
flashdancehostname06: 20210120093218: (mirror_utility.pl) Running cmd lsvg -l hdisk1.
flashdancehostname06: 20210120093218: (mirror_utility.pl) Retrieving lv stats for rootvg.
flashdancehostname06: 20210120093218: (mirror_utility.pl) Running command lsvg -l rootvg with paging filter.
flashdancehostname06: 20210120093218: (mirror_utility.pl) Determining rootvg status.
flashdancehostname06: 20210120_093218 (flashdancehostname06:mirror_utility.sh): Starting date: Wed Jan 20 06:34:41 IST 2021
Ending Date: Wed Jan 20 09:32:18 IST 2021.
flashdancehostname06: 20210120_093219 (flashdancehostname06:mirror_utility.sh): mirror_utility.sh completed with rc=0.
...
```

9. Command: Verify the status of rootvg on all the hosts.

```
dsh -n ${ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/mirror_utility.sh -action query -statustype rootvg_mirrored | grep -i Value' | sort
```

Example Output:

```
$ dsh -n ${ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/mirror_utility.sh -action query -statustype rootvg_mirrored | grep -i Value' | sort
reverseflash01: 20220922164033: (mirror_utility.pl) Value: True
reverseflash02: 20220922164034: (mirror_utility.pl) Value: True
reverseflash03: 20220922164035: (mirror_utility.pl) Value: True
reverseflash04: 20220922164035: (mirror_utility.pl) Value: True
reverseflash05: 20220922164034: (mirror_utility.pl) Value: True
reverseflash06: 20220922164034: (mirror_utility.pl) Value: True
```

10. Command: Checking stdout output is a challenge. Each host will have a separate set of stdout and stderr logfiles in /BCU_share/support/FP9_FP5/log. The following command will check for any log file for the mirror utility from the last 3 hours and print out its completion status.

```
find /BCU_share/support/FP9_FP5/log -name mirror_utility.sh_*.log -cmin -180 | xargs egrep -h "ended with" | grep 'action mirror'
```

Example Output:

```
$ find /BCU_share/support/FP9_FP5/log -name mirror_utility.sh_*.log -cmin -180 | xargs egrep -h "ended with" | grep 'action mirror'
20220922_151516 (reverseflash02:mirror_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/mirror_utility.sh' with arguments '-action mirror' ended with rc='0'. Start: Thu Sep 22 12:23:57 EDT 2022 End: Thu Sep 22 15:15:16 EDT 2022. Elapsed Time (Seconds): 10279 (H:M:S):(02:51:19).
20220922_151131 (reverseflash03:mirror_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/mirror_utility.sh' with arguments '-action mirror' ended with rc='0'. Start: Thu Sep 22 12:23:57 EDT 2022 End: Thu Sep 22 15:11:31 EDT 2022. Elapsed Time (Seconds): 10054 (H:M:S):(02:47:34).
20220922_151817 (reverseflash04:mirror_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/mirror_utility.sh' with arguments '-action mirror' ended with rc='0'. Start: Thu Sep 22 12:23:57 EDT 2022 End: Thu Sep 22 15:18:17 EDT 2022. Elapsed Time (Seconds): 10460 (H:M:S):(02:54:20).
20220922_151843 (reverseflash05:mirror_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/mirror_utility.sh' with arguments '-action mirror' ended with rc='0'. Start: Thu Sep 22 12:23:57 EDT 2022 End: Thu Sep 22 15:18:43 EDT 2022. Elapsed Time (Seconds): 10486 (H:M:S):(02:54:46).
20220922_151819 (reverseflash06:mirror_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/mirror_utility.sh' with arguments '-action mirror' ended with rc='0'. Start: Thu Sep 22 12:23:57 EDT 2022 End: Thu Sep 22 15:18:19 EDT 2022. Elapsed Time (Seconds): 10462 (H:M:S):(02:54:22).
20220922_161608 (reverseflash01:mirror_utility.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/mirror_utility.sh' with arguments '-action mirror' ended with rc='0'. Start: Thu Sep 22 12:23:56 EDT 2022 End: Thu Sep 22 16:16:08 EDT 2022. Elapsed Time (Seconds): 13932 (H:M:S):(03:52:12).
```

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11. Command: Check the status of the Paging Space and System Dump logical volumes. The status depends on multiple factors and the outcome can vary based on those factors. The goal is to have two paging spaces (hd6 and paging00) that are mirrored, and two dump devices (hd7 and lg_dumplv), one per rootvg hdisk member and both active. The output below shows 'flashdancehostname01' has two paging spaces that are both mirrored, 2 sysdump devices, one is mirrored and one is not, and only one is active. It also shows the other hosts have the same set of mirrored paging spaces, two unmirrored dump devices that are both active. What we can't see from this picture is whether the non-mirrored logical volumes are on separate disks. During re-mirror operations active sysdump devices are not mirrored so it is likely that both are on the same disk.

```
dsh -n ${ALL} 'lsvg -l rootvg | egrep -i "paging|sysdump"' | dshbak -c
```

Example Output(FP4->FP5:)

```
$ dsh -n ${ALL} 'lsvg -l rootvg | egrep -i "paging|sysdump"' | dshbak -c
HOSTS -----
reverseflash01
-----
hd6          paging      64      128      2      open/syncd    N/A
lg_dumplv    sysdump      7        7        1      open/syncd    N/A
hd7          sysdump      7        7        1      open/syncd    N/A
paging00     paging      64      128      2      open/syncd    N/A
-----
HOSTS -----
reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
hd6          paging      64      128      2      open/syncd    N/A
paging00     paging      64      128      2      open/syncd    N/A
lg_dumplv    sysdump      7        7        1      open/syncd    N/A
hd7          sysdump      7        7        1      open/syncd    N/A
-----
(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

Example Output: (FP3->FP5: hd7 shows undersized)

```
$ dsh -n ${ALL} 'lsvg -l rootvg | egrep -i "paging|sysdump"' | dshbak -c
HOSTS -----
flashdancehostname01
-----
hd6          paging      64      128      2      open/syncd    N/A
lg_dumplv    sysdump      7        7        1      open/syncd    N/A
hd7          sysdump      3        6        2      closed/syncd  N/A
paging00     paging      64      128      2      open/syncd    N/A
-----
HOSTS -----
flashdancehostname02, flashdancehostname03, flashdancehostname04, flashdancehostname05, flashdancehostname06,
flashdancehostname07
-----
hd6          paging      64      128      2      open/syncd    N/A
paging00     paging      64      128      2      open/syncd    N/A
lg_dumplv    sysdump      7        7        1      open/syncd    N/A
hd7          sysdump      3        3        1      open/syncd    N/A
-----
```

Example Output: (V1.1 FP2->FP5 customers, shows hd7 is not used and is undersized)

```
$ dsh -n ${ALL} 'lsvg -l rootvg | egrep -i "paging|sysdump"' | dshbak -c
HOSTS -----
reverseflash01
-----
hd6          paging      64      128      2      open/syncd    N/A
lg_dumplv    sysdump      7        7        1      open/syncd    N/A
hd7          sysdump      3        6        2      closed/syncd  N/A
paging00     paging      64      128      2      open/syncd    N/A
-----
HOSTS -----
```

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```
reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
hd6          paging      64      128      2      open/syncd      N/A
paging00     paging      64      128      2      open/syncd      N/A
lg_dump1v    sysdump     7        7        1      open/syncd      N/A
hd7          sysdump     3        6        2      closed/syncd    N/A

(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

12. V1.1 FP2->FP5 customers will notice hd7 is closed versus open and have 2 copies instead of just 1 copy. Other scenarios may also see issues if these steps were skipped when applying previous fixpacks. Run the following commands to remove the second copy if it exists.
- a. Command: Remove one of the copies for hd7 and add it as a secondary dump device.

```
dsh -n ${ALL} 'm="";i=1;d1="";d2="";lvds=$(ls1v -l hd7 | grep hdisk | while read a;b;do echo $a;done);bootlist -m normal -o | while read hd rest;do eval "d${i}=${hd}";((i=i+1));done;echo "${lvds}" | grep ${d1} && rmlvcopy hd7 1 ${d1}'
```

Example Output:

```
dsh -n ${ALL} 'm="";i=1;d1="";d2="";lvds=$(ls1v -l hd7 | grep hdisk | while read a;b;do echo $a;done);bootlist -m normal -o | while read hd rest;do eval "d${i}=${hd}";((i=i+1));done;echo "${lvds}" | grep ${d1} && rmlvcopy hd7 1 ${d1}'
reverseflash01: hdisk9
reverseflash03: hdisk0
reverseflash04: hdisk0
reverseflash02: hdisk0
reverseflash05: hdisk0
reverseflash06: hdisk0
```

Example Output: (If run accidentally when not needed, no harm done)

```
$ dsh -n ${ALL} 'm="";i=1;d1="";d2="";lvds=$(ls1v -l hd7 | grep hdisk | while read a;b;do echo $a;done);bootlist -m normal -o | while read hd rest;do eval "d${i}=${hd}";((i=i+1));done;echo "${lvds}" | grep ${d1} && rmlvcopy hd7 1 ${d1}'
reverseflash01: hdisk0
reverseflash01: 0516-921 rmlvcopy: All logical partitions have less than or
reverseflash01: equal to 1 number of copies.
reverseflash02: hdisk1
reverseflash02: 0516-921 rmlvcopy: All logical partitions have less than or
reverseflash02: equal to 1 number of copies.
reverseflash05: hdisk1
reverseflash05: 0516-921 rmlvcopy: All logical partitions have less than or
reverseflash05: equal to 1 number of copies.
reverseflash03: hdisk1
reverseflash03: 0516-921 rmlvcopy: All logical partitions have less than or
reverseflash03: equal to 1 number of copies.
reverseflash04: hdisk1
reverseflash04: 0516-921 rmlvcopy: All logical partitions have less than or
reverseflash04: equal to 1 number of copies.
reverseflash06: hdisk1
reverseflash06: 0516-921 rmlvcopy: All logical partitions have less than or
reverseflash06: equal to 1 number of copies.

(6) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

- b. Command: Verify that hd7 has only 1 copy, and is on a separate disk from lg_dump1v. Note: Some entries will not show 100% IN BAND values. This is expected and is not an error.

```
dsh -n ${ALL} 'ls1v -l lg_dump1v;ls1v -l hd7' | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} 'ls1v -l lg_dump1v;ls1v -l hd7' | dshbak -c
HOSTS -----
reverseflash01
-----
lg_dump1v:N/A
PV          COPIES      IN BAND      DISTRIBUTION
hdisk9      007:000:000    100%         000:007:000:000:000
hd7:N/A
PV          COPIES      IN BAND      DISTRIBUTION
hdisk1      003:000:000    100%         000:003:000:000:000

HOSTS -----
reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
```

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```
lg_dump1v:N/A
PV          COPIES      IN BAND      DISTRIBUTION
hdisk0      007:000:000  100%        000:007:000:000:000
hd7:N/A
PV          COPIES      IN BAND      DISTRIBUTION
hdisk1      003:000:000  100%        000:003:000:000:000
```

13. Command: Add hd7 as a secondary dump device. Verify the second secondary line says /dev/hd7. If the output is blank then no modifications were necessary. This command is safe to use even if hd7 is already defined as a secondary device. While this was addressed in FP3 it is possible the instruction was skipped. If no changes are made to a host there will be no output for that host.

```
dsh -n ${ALL} 'sysdumpdev -l | grep secondary | grep null && sysdumpdev -Ps /dev/hd7' | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} 'sysdumpdev -l | grep secondary | grep null && sysdumpdev -Ps /dev/hd7' | dshbak -c
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
secondary      /dev/sysdumpnull
primary         /dev/lg_dump1v
secondary       /dev/hd7
copy directory  /var/adm/ras
forced copy flag TRUE
always allow dump FALSE
dump compression ON
type of dump    fw-assisted
full memory dump disallow

(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

14. Command: Verify hd7 is now Open/Sync'd with only 1 copy. FP3->FP5, FP4->FP5 customers should see hd7 with 7 PPs, but may see 3 PPs if the steps were inadvertently skipped while applying FP3 or FP4. The size will be correctly in the following item.

```
dsh -n ${ALL} 'lsvg -l rootvg | egrep -i "paging|sysdump"' | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} 'lsvg -l rootvg | egrep -i "paging|sysdump"' | dshbak -c
HOSTS -----
reverseflash01
-----
hd6          paging      64      128      2      open/syncd  N/A
lg_dump1v    sysdump     7        7        1      open/syncd  N/A
hd7          sysdump     3        3        1      open/syncd  N/A
paging00     paging      64      128      2      open/syncd  N/A

HOSTS -----
reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
hd6          paging      64      128      2      open/syncd  N/A
paging00     paging      64      128      2      open/syncd  N/A
lg_dump1v    sysdump     7        7        1      open/syncd  N/A
hd7          sysdump     3        3        1      open/syncd  N/A

(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

15. Correct the hdisk assignment with the secondary dump device hd7. This is expected for all scenarios.
- Command: Check the status of hd7 and lg_dump1v. lg_dump1v should be assigned to the first hdisk, normally hdisk1 (after migration), and hd7 should be assigned to the second hdisk, normally hdisk0 (after migration). After re-mirror the expectation is that both will be assigned to hdisk1 (or the hdisk that was used for migration). If a secondary disk is not specified, then hd7 will be mirrored. If hd7 has two copies, return to item 12 to remove one of the copies.

```
dsh -n ${ALL} 'lslv -l lg_dump1v;lslv -l hd7' | dshbak -c
```

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Example Output: (One host has hd7 mirrored, return to item 12 to address)

```
$ dsh -n ${ALL} 'lslv -l lg_dumplv;lslv -l hd7' | dshbak -c
HOSTS -----
flashdancehostname01
-----
lg_dumplv:N/A
PV          COPIES      IN BAND    DISTRIBUTION
hdisk0      007:000:000    100%       000:007:000:000:000
hd7:N/A
PV          COPIES      IN BAND    DISTRIBUTION
hdisk0      003:000:000    100%       000:003:000:000:000
hdisk1      003:000:000    100%       000:003:000:000:000

HOSTS -----
flashdancehostname02, flashdancehostname03, flashdancehostname04, flashdancehostname05, flashdancehostname06,
flashdancehostname07
-----
lg_dumplv:N/A
PV          COPIES      IN BAND    DISTRIBUTION
hdisk0      007:000:000    100%       000:007:000:000:000
hd7:N/A
PV          COPIES      IN BAND    DISTRIBUTION
hdisk0      003:000:000    100%       000:003:000:000:000
```

Example Output: (reverseflash01 is different from the rest of the hosts)

```
$ dsh -n ${ALL} 'lslv -l lg_dumplv;lslv -l hd7' | dshbak -c
HOSTS -----
reverseflash01
-----
lg_dumplv:N/A
PV          COPIES      IN BAND    DISTRIBUTION
hdisk0      007:000:000    100%       000:007:000:000:000
hd7:N/A
PV          COPIES      IN BAND    DISTRIBUTION
hdisk0      007:000:000    100%       000:007:000:000:000

HOSTS -----
reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
lg_dumplv:N/A
PV          COPIES      IN BAND    DISTRIBUTION
hdisk1      007:000:000    100%       000:007:000:000:000
hd7:N/A
PV          COPIES      IN BAND    DISTRIBUTION
hdisk1      007:000:000    100%       000:007:000:000:000

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

- b. Command: If a host has hd7 on hdisk0 only, then move hd7 to the other hdisk in the rootvg mirror. The following command will determine the first and second hdisks for rootvg. It will then check to see if hd7 is located on the first disk in bootlist, and if so, will run the migratepv command to move hd7 to the second disk. This command is safe to use even if hd7 is assigned to the correct hdisk.

```
dsh -n ${ALL} 'm="";i=1;d1="";d2="";lvds=$(lslv -l hd7 | grep hdisk | while read a b;do echo $a;done);bootlist -m normal -o
| while read hd rest;do eval "d${i}=${hd}";((i=i+1));done;echo "${lvds}" | grep ${d1} && time migratepv -l hd7 ${d1} ${d2}'
```

Example Output:

```
$ dsh -n ${ALL} 'm="";i=1;d1="";d2="";lvds=$(lslv -l hd7 | grep hdisk | while read a b;do echo $a;done);bootlist -m normal -
o | while read hd rest;do eval "d${i}=${hd}";((i=i+1));done;echo "${lvds}" | grep ${d1} && time migratepv -l hd7 ${d1}
${d2}'
reverseflash03: hdisk1
reverseflash03:
reverseflash03: real      6m34.61s
reverseflash03: user      0m0.29s
reverseflash03: sys       0m0.81s
reverseflash01: hdisk0
reverseflash01:
reverseflash01: real      6m35.26s
reverseflash01: user      0m0.31s
reverseflash01: sys       0m0.84s
reverseflash04: hdisk1
reverseflash04:
reverseflash04: real      6m49.87s
reverseflash04: user      0m0.32s
reverseflash04: sys       0m0.86s
```

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```
reverseflash06: hdisk1
reverseflash06:
reverseflash06: real    6m51.15s
reverseflash06: user    0m0.33s
reverseflash06: sys     0m0.89s
reverseflash02: hdisk1
reverseflash02:
reverseflash02: real    6m53.90s
reverseflash02: user    0m0.32s
reverseflash02: sys     0m0.90s
reverseflash05: hdisk1
reverseflash05:
reverseflash05: real    6m55.47s
reverseflash05: user    0m0.35s
reverseflash05: sys     0m0.98s
```

- c. Command: Recheck the logical volume assignments.

```
dsh -n ${ALL} 'lslv -l lg_dumplv;lslv -l hd7' | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} 'lslv -l lg_dumplv;lslv -l hd7' | dshbak -c
HOSTS -----
reverseflash01
-----
lg_dumplv:N/A
PV          COPIES      IN BAND      DISTRIBUTION
hdisk0      007:000:000    100%         000:007:000:000:000
hd7:N/A
PV          COPIES      IN BAND      DISTRIBUTION
hdisk1      007:000:000    100%         000:007:000:000:000

HOSTS -----
reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
lg_dumplv:N/A
PV          COPIES      IN BAND      DISTRIBUTION
hdisk1      007:000:000    100%         000:007:000:000:000
hd7:N/A
PV          COPIES      IN BAND      DISTRIBUTION
hdisk0      007:000:000    100%         000:007:000:000:000

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

16. As shipped, lg_dumplv and hd7 are not the same size. Update hd7 to 7 PPs. This was first addressed in V1.1 FP4 in Stage 8 and V1.1 FP4 to V1.1 FP5 customers should not need to modify the size. However, there is no harm in running the following commands even if a correction is not needed.

- a. Command: Update hd7 to include 7 PPs.

```
dsh -n ${ALL} 's=$(lsattr -a size -E01 hd7 | grep -v "#");echo $s;if [ "$s" -eq 3 ];then extendlv hd7 4;fi' | dshbak -c
```

Example Output: (If a correction was needed)

```
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
3
```

Example Output: (If no correction was needed).

```
$ dsh -n ${ALL} 's=$(lsattr -a size -E01 hd7 | grep -v "#");echo $s;if [ "$s" -eq 3 ];then extendlv hd7 4;fi' | dshbak -c
HOSTS -----
reverseflash01, reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
7
```

- b. Command: Verify hd7 has 7 PPs on a single disk.

```
dsh -n ${ALL} 'lslv -l lg_dumplv;lslv -l hd7' | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} 'lslv -l lg_dumplv;lslv -l hd7' | dshbak -c
HOSTS -----
```

STAGE 8 - CORE NODES update in DOWNTIME window

```
reverseflash01
-----
lg_dump|v:N/A
PV          COPIES      IN BAND      DISTRIBUTION
hdisk9      007:000:000  100%      000:007:000:000:000
hd7:N/A
PV          COPIES      IN BAND      DISTRIBUTION
hdisk1      007:000:000  100%      000:007:000:000:000

HOSTS -----
reverseflash02, reverseflash03, reverseflash04, reverseflash05, reverseflash06
-----
lg_dump|v:N/A
PV          COPIES      IN BAND      DISTRIBUTION
hdisk0      007:000:000  100%      000:007:000:000:000
hd7:N/A
PV          COPIES      IN BAND      DISTRIBUTION
hdisk1      007:000:000  100%      000:007:000:000:000

(0) root @ reverseflash01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

17. Check the status of the dump devices.

- Command: Rerun sysdumpdev on all hosts. In the scenario only flashdancehostname01 does not have a secondary device.

```
dsh -n ${ALL} ' sysdumpdev -l' | dshbak -c
```

Example Output:

```
(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
$ dsh -n ${ALL} ' sysdumpdev -l' | dshbak -c
HOSTS -----
flashdancehostname01
-----
primary      /dev/lg_dump|v
secondary    /dev/sysdumpnull
copy directory /var/adm/ras
forced copy flag TRUE
always allow dump FALSE
dump compression ON
type of dump fw-assisted
full memory dump disallow

HOSTS -----
flashdancehostname02, flashdancehostname03, flashdancehostname04, flashdancehostname05, flashdancehostname06,
flashdancehostname07
-----
primary      /dev/lg_dump|v
secondary    /dev/hd7
copy directory /var/adm/ras
forced copy flag TRUE
always allow dump FALSE
dump compression ON
type of dump fw-assisted
full memory dump disallow
```

- Command: Run the following command to update the secondary device on hosts where it is no longer set. On hosts where it is set it will show a 'secondary' line, if it is not yet set it will show the output of the sysdumpdev command.

```
dsh -n ${ALL} ' sysdumpdev -l | grep secondary | grep hd7 || sysdumpdev -Ps /dev/hd7' | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} ' sysdumpdev -l | grep secondary | grep hd7 || sysdumpdev -Ps /dev/hd7' | dshbak -c
HOSTS -----
flashdancehostname02, flashdancehostname03, flashdancehostname04, flashdancehostname05, flashdancehostname06,
flashdancehostname07
-----
secondary      /dev/hd7

HOSTS -----
flashdancehostname01
-----
primary      /dev/lg_dump|v
secondary    /dev/hd7
copy directory /var/adm/ras
```

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```
forced copy flag      TRUE
always allow dump     FALSE
dump compression      ON
type of dump          fw-assisted
full memory dump      disallow
```

- c. Command: Recheck the dump devices.

```
dsh -n ${ALL} ' sysdumpdev -l' | dshbak -c
```

Example Output:

```
$ dsh -n ${ALL} ' sysdumpdev -l' | dshbak -c
HOSTS -----
flashdancehostname01, flashdancehostname02, flashdancehostname03, flashdancehostname04, flashdancehostname05,
flashdancehostname06, flashdancehostname07
-----
primary          /dev/lg_dumplv
secondary        /dev/hd7
copy directory    /var/adm/ras
forced copy flag  TRUE
always allow dump FALSE
dump compression  ON
type of dump      fw-assisted
full memory dump  disallow
```


STAGE 9: Completing the fixpack

Steps/Phases

- Phase 1: Updating the appliance catalog.
- Phase 2: Remove Obsolete Java Levels [FP3->FP5, FP2->FP5, FP1->FP5 only]
- Phase 3: Remove DPM [FP3->FP5, FP2->FP5, FP1->FP5 only]
- Phase 4: Remove Db2 on the management hosts. [FP3->FP5, FP2->FP5, FP1->FP5 only]
- Phase 5: Verifying the Fixpack
- Phase 6: Cleanup

Outage Requirements

- There are no outage requirements for this stage.

Time Per Step

- Phase 1: 10 Minutes
- Phase 2: 20 Minutes
- Phase 3: 20 Minutes
- Phase 4: 20 Minutes
- Phase 5: 20 Minutes
- Phase 6: 30 Minutes

Risk Mitigation

- No risk mitigation needed.

Backout Options

- No backout option available.

Phase 1: Update the appliance catalog

While the appliance console is removed and the fixpack was not registered as in previous fixpacks, it is possible and necessary to update the appliance catalog. After the system is updated the following commands will show the compliance status of the fixpack.

1. Command: Verify the catalog command shows no updates.

```
appl_ls_cat
```

Example Output: (FP4->FP5)

```
$ appl_ls_cat
```

NAME	VERSION	STATUS	DESCRIPTION
bwr0	4.0.4.0	Committed	Updates for IBM_PureData_System_for_Operational_Analytics
bwr1	4.0.5.0	Committed	Updates for IBM_PureData_System_for_Operational_Analytics_DB2105
bwr2	4.0.7.0	Committed	Updates for IBM_PureData_System_for_Operational_Analytics
bwr3	4.0.8.0	Committed	Updates for IBM_PureData_System_for_Operational_Analytics

```
(0) root @ flashdancehostname01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

Example Output: (FP3->FP5)

```
$ appl_ls_cat
```

NAME	VERSION	STATUS	DESCRIPTION
bwr0	4.0.4.0	Committed	Updates for IBM_PureData_System_for_Operational_Analytics
bwr1	4.0.5.0	Committed	Updates for IBM_PureData_System_for_Operational_Analytics_DB2105
bwr2	4.0.7.0	Committed	Updates for IBM_PureData_System_for_Operational_Analytics

2. Command: Find the catalog directory.

```
cd /BCU_share/FP9_FP5/fixpack_tools/catalog
```

3. Command: Generate the FP9_FP5_odm.add file.

```
./apply_catalog.sh > apply_catalog.$(date +%s).out 2>&1
```

4. Command: Check that the odm records are generated.

```
egrep "_Record" FP9_FP5_odm.add | sort | uniq -c | sort -n
```

Example Output:

```
$ egrep "_Record" FP9_FP5_odm.add | sort | uniq -c | sort -n
  1 Solution_Record:
  8 Module_Record:
 11 Product_Record:
```

5. Command: Apply the records.

```
./odm_add.sh
```

6. Command: Check the catalog again. Version 4.0.9.0 should appear in the output. Note: Gaps in versions are expected when scenarios involving FP1->FP3, FP2->FP4, FP3->FP5 have occurred. In cases where multiple fixpacks are applied at the same time, only the last fixpack information should be added to the catalog.

```
appl_ls_cat
```

Example Output:

```
$ appl_ls_cat
```

NAME	VERSION	STATUS	DESCRIPTION
------	---------	--------	-------------

STAGE 9: Completing the fixpack

bwr0	4.0.4.2	Committed	Updates for IBM_PureData_System_for_Operational_Analytics
bwr1	4.0.5.0	Committed	Updates for IBM_PureData_System_for_Operational_Analytics_DB2105
bwr2	4.0.6.0	Committed	Updates for IBM_PureData_System_for_Operational_Analytics
bwr3	4.0.8.0	Committed	Updates for IBM_PureData_System_for_Operational_Analytics
bwr4	4.0.9.0	Committed	Updates for IBM_PureData_System_for_Operational_Analytics

7. Command: Check the catalog for version 4.0.9.0.

```
appl_ls_cat -i | grep bwr | while read label rest;do echo "${label}:";appl_ls_cat -l $label;done
```

Example Output:

```
$ appl_ls_cat -i | grep bwr | while read label rest;do echo "${label}:";appl_ls_cat -l $label;done
bwr4:
NAME                VERSION                STATUS                OPERATION            DESCRIPTION
pplayer4            4.0.9.1                Committed            manage               IBM_Smart_Analytics_Platform_Layer
db27                10.5.0.11..10         Committed            manage               DB2_Enterprise_Edition
db28                11.1.4.7..0           Committed            manage               DB2_Enterprise_Edition
tsa4                4.1.0.7                Committed            manage
Tivoli_Systems_Automation_for_Multi-Platforms_Update_4.1.0.7
aix4                7200-05-04-2020        Committed            manage               AIX Update
pfw8                SV860_240              Committed            manage               PFW Update
gpfs4              5.1.1.4                Committed            manage               GPFS
storagefw8          8.2.1.15               Committed            manage               StorageFW Update
storagefw9          1.5.2.10               Committed            manage               StorageFW Update
netfw5              7.11.24.0              Committed            manage               NetFW Update
ha_db23             2.0.9.0                Committed            manage               IBM_Smart_Analytics_HA_toolkit
```

Phase 2: Remove Obsolete Java Levels

NOTE: This step should have been performed as part of V1.1 FP4 Stage 9 activities. This phase may be skipped if it was already performed.

1. Command: Determine if any java programs are currently running on the system using system installed java levels.

```
dsh -n ${ALL} 'ps -ef | grep "/usr/java" | grep -v grep'
```

2. Command: Determine if any third party components are using java. This step may require some investigation to determine if any additional tools require Java5 or Java6 levels.

Determine which java levels are defined in the environment as the default java version.

```
dsh -n ${ALL} 'grep java /etc/environment'
```

Example Output:

```
$ dsh -n ${ALL} 'grep java /etc/environment'
flashdancehostname01:
PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:/usr/java5/jre/bin:/usr/java5/bin:/usr/lpp/htx/etc/scripts:/test/tools:/usr/lpp/htx/test/tools:/home/monitor/test/tools:/nim/build_net/tools:/usr/lpp/htx/etc/scripts:/opt/ibm/director/bin
flashdancehostname02:
PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:/usr/java5/jre/bin:/usr/java5/bin:/usr/lpp/htx/etc/scripts:/test/tools:/usr/lpp/htx/test/tools:/home/monitor/test/tools:/nim/build_net/tools:/usr/lpp/htx/etc/scripts
flashdancehostname03:
PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:/usr/java5/jre/bin:/usr/java5/bin:/usr/lpp/htx/etc/scripts:/test/tools:/usr/lpp/htx/test/tools:/home/monitor/test/tools:/nim/build_net/tools:/usr/lpp/htx/etc/scripts
flashdancehostname05:
PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:/usr/java5/jre/bin:/usr/java5/bin:/usr/lpp/htx/etc/scripts:/test/tools:/usr/lpp/htx/test/tools:/home/monitor/test/tools:/nim/build_net/tools:/usr/lpp/htx/etc/scripts
flashdancehostname06:
PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:/usr/java5/jre/bin:/usr/java5/bin:/usr/lpp/htx/etc/scripts:/test/tools:/usr/lpp/htx/test/tools:/home/monitor/test/tools:/nim/build_net/tools:/usr/lpp/htx/etc/scripts
flashdancehostname07:
PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:/usr/java5/jre/bin:/usr/java5/bin:/usr/lpp/htx/etc/scripts:/test/tools:/usr/lpp/htx/test/tools:/home/monitor/test/tools:/nim/build_net/tools:/usr/lpp/htx/etc/scripts
flashdancehostname04:
PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:/usr/java5/jre/bin:/usr/java5/bin:/usr/lpp/htx/etc/scripts:/test/tools:/usr/lpp/htx/test/tools:/home/monitor/test/tools:/nim/build_net/tools:/usr/lpp/htx/etc/scripts
```

The above shows that /usr/java5/jre/bin and /usr/java5/bin are the default java levels for the system. Note that users may override this PATH statement.

Note the paths /usr/lpp/htx/etc/scripts, /test/tools, /home/monitor/test/tools and /nim/build_net/tools were incorrectly included as part of the original PDOA build outs and are not needed.

3. Command: Determine the default java version for root. PDOA was shipped with java5 32 bit as the default system java.

```
dsh -n ${ALL} 'which java'
```

Example Output: (FP4->FP5 Incomplete java removal show PATH is not pointing to Java7 or Java8)

```
$ dsh -n ${ALL} 'which java'
flashdancehostname01: which: 0652-141 There is no java in /opt/ibm/aiwappl/pfmgmt/bin /opt/ibm/director/bin /opt/ibm/aiwappl/pfplayer/bin /opt/lsi/pegasus/bin /opt/ibm/aiwappl/pfmgmt/bin /usr/bin /etc /usr/sbin /usr/ucb /usr/bin/X11 /sbin /usr/java5/jre/bin /usr/java5/bin /usr/lpp/htx/etc/scripts /test/tools /usr/lpp/htx/test/tools /home/monitor/test/tools /nim/build_net/tools /usr/lpp/htx/etc/scripts /opt/ibm/director/bin /usr/IBM/analytics/ha_tools /opt/ibm/aiwappl/pfplayer/bin /opt/IBM/mi/bin /opt/IBM/mibe/bin /opt/ibm/aiwappl/pfplayer/bin /opt/ibm/aiwappl/pfplayer/bin /opt/IBM/mi/bin /opt/IBM/mibe/bin.
```

STAGE 9: Completing the fixpack

```
flashdancehostname02: which: 0652-141 There is no java in /usr/bin /etc /usr/sbin /usr/ucb /usr/bin/X11 /sbin /usr/java5/jre/bin
/usr/java5/bin /usr/lpp/htx/etc/scripts /test/tools /usr/lpp/htx/test/tools /home/monitor/test/tools /nim/build_net/tools
/usr/lpp/htx/etc/scripts.
flashdancehostname04: which: 0652-141 There is no java in /usr/bin /etc /usr/sbin /usr/ucb /usr/bin/X11 /sbin /usr/java5/jre/bin
/usr/java5/bin /usr/lpp/htx/etc/scripts /test/tools /usr/lpp/htx/test/tools /home/monitor/test/tools /nim/build_net/tools
/usr/lpp/htx/etc/scripts.
flashdancehostname03: which: 0652-141 There is no java in /usr/bin /etc /usr/sbin /usr/ucb /usr/bin/X11 /sbin /usr/java5/jre/bin
/usr/java5/bin /usr/lpp/htx/etc/scripts /test/tools /usr/lpp/htx/test/tools /home/monitor/test/tools /nim/build_net/tools
/usr/lpp/htx/etc/scripts.
flashdancehostname05: which: 0652-141 There is no java in /usr/bin /etc /usr/sbin /usr/ucb /usr/bin/X11 /sbin /usr/java5/jre/bin
/usr/java5/bin /usr/lpp/htx/etc/scripts /test/tools /usr/lpp/htx/test/tools /home/monitor/test/tools /nim/build_net/tools
/usr/lpp/htx/etc/scripts.
flashdancehostname06: which: 0652-141 There is no java in /usr/bin /etc /usr/sbin /usr/ucb /usr/bin/X11 /sbin /usr/java5/jre/bin
/usr/java5/bin /usr/lpp/htx/etc/scripts /test/tools /usr/lpp/htx/test/tools /home/monitor/test/tools /nim/build_net/tools
/usr/lpp/htx/etc/scripts.
```

(7) root @ flashdancehostname01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/catalog

Example Output: (FP2->FP5, FP3->FP5)

```
$ dsh -n ${ALL} 'which java'
flashdancehostname01: /usr/java5/jre/bin/java
flashdancehostname03: /usr/java5/jre/bin/java
flashdancehostname04: /usr/java5/jre/bin/java
flashdancehostname06: /usr/java5/jre/bin/java
flashdancehostname05: /usr/java5/jre/bin/java
flashdancehostname07: /usr/java5/jre/bin/java
flashdancehostname02: /usr/java5/jre/bin/java
```

4. Command: Check user profiles for indication of java levels. This may or may not work in all scenarios and only checks well known shell init scripts.

```
dsh -n ${ALL} 'lsuser -a home ALL | sed "s|.*home=||" | sort | uniq | while read x;do for i in .profile .bashrc .cshrc;do [ -f
${x}/${i} ] && grep java /dev/null ${x}/${i};done;done'
```

Example Output:

```
$ dsh -n ${ALL} 'lsuser -a home ALL | sed "s|.*home=||" | sort | uniq | while read x;do for i in .profile .bashrc .cshrc;do [ -f
${x}/${i} ] && grep java /dev/null ${x}/${i};done;done'
flashdancehostname01: //.profile:export JAVA_HOME=/usr/java6_64
flashdancehostname01: //.profile:#export JAVA_HOME=/usr/java8_64
```

5. Command: Check for the all system Java levels. There are 8 System level Java packages installed, 4 versions each with a 32 and 64 bit version.

```
dsh -n ${ALL} 'lsipp -l "Java*.sdk" | dshbak -c
```

Example Output: (FP4->FP5)

```
$ dsh -n ${ALL} 'lsipp -l "Java*.sdk" | dshbak -c
HOSTS -----
flashdancehostname01, flashdancehostname02, flashdancehostname03, flashdancehostname04, flashdancehostname05,
flashdancehostname06, flashdancehostname07
-----
Fileset          Level  State   Description
-----
Path: /usr/lib/objrepos
Java7.sdk         7.0.0.710 COMMITTED Java SDK 32-bit Development
Kit
Java7_64.sdk      7.0.0.710 COMMITTED Java SDK 64-bit Development
Kit
Java8.sdk         8.0.0.710 COMMITTED Java SDK 32-bit Development
Kit
Java8_64.sdk      8.0.0.710 COMMITTED Java SDK 64-bit Development
Kit
```

Example Output: (FP2->FP5, FP3->FP5)

```
$ dsh -n ${ALL} 'lsipp -l "Java*.sdk" | dshbak -c
HOSTS -----
flashdancehostname01, flashdancehostname02, flashdancehostname03, flashdancehostname04, flashdancehostname05,
flashdancehostname06, flashdancehostname07
```

STAGE 9: Completing the fixpack

Fileset	Level	State	Description
Path: /usr/lib/objrepos			
Java5.sdk	5.0.0.620	COMMITTED	Java SDK 32-bit
Java5_64.sdk	5.0.0.620	COMMITTED	Java SDK 64-bit
Java6.sdk	6.0.0.655	COMMITTED	Java SDK 32-bit
Java6_64.sdk	6.0.0.655	COMMITTED	Java SDK 64-bit
Java7.sdk	7.0.0.665	COMMITTED	Java SDK 32-bit Development Kit
Java7_64.sdk	7.0.0.665	COMMITTED	Java SDK 64-bit Development Kit
Java8.sdk	8.0.0.610	COMMITTED	Java SDK 32-bit Development Kit
Java8_64.sdk	8.0.0.610	COMMITTED	Java SDK 64-bit Development Kit
Path: /etc/objrepos			
Java5.sdk	5.0.0.620	COMMITTED	Java SDK 32-bit
Java5_64.sdk	5.0.0.620	COMMITTED	Java SDK 64-bit
Java6.sdk	6.0.0.655	COMMITTED	Java SDK 32-bit
Java6_64.sdk	6.0.0.655	COMMITTED	Java SDK 64-bit

6. Command: Verify the dependent packages. There should be no dependent packages outside of the Java6_64 packages.

```
dsh -n ${ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/remove_java56.sh' | dshbak -c
```

Example Output: (FP4->FP5: No removals required)

```
$ dsh -n ${ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/remove_java56.sh' | dshbak -c
HOSTS -----
flashdancehostname01
-----
20221019_220052 (flashdancehostname01:remove_java56.sh): Starting date: Wed Oct 19 22:00:52 IST 2022.
WARNINGS
-----
Problems described in this section are not likely to be the source of any
immediate or serious failures, but further actions may be necessary or
desired.

Not Installed
-----
No software could be found on the system that could be deinstalled for the
following requests:

(The fileset may not be currently installed, or you may have made a
typographical error.)
<< End of Warning Section >>

WARNINGS
-----
Problems described in this section are not likely to be the source of any
immediate or serious failures, but further actions may be necessary or
desired.

Not Installed
-----
No software could be found on the system that could be deinstalled for the
following requests:

(The fileset may not be currently installed, or you may have made a
typographical error.)
<< End of Warning Section >>

WARNINGS
-----
Problems described in this section are not likely to be the source of any
immediate or serious failures, but further actions may be necessary or
desired.

Not Installed
-----
No software could be found on the system that could be deinstalled for the
following requests:

(The fileset may not be currently installed, or you may have made a
typographical error.)
<< End of Warning Section >>
```

STAGE 9: Completing the fixpack

WARNINGS

```
-----
Problems described in this section are not likely to be the source of any
immediate or serious failures, but further actions may be necessary or
desired.

Not Installed
-----
No software could be found on the system that could be deinstalled for the
following requests:

(The fileset may not be currently installed, or you may have made a
typographical error.)
<< End of Warning Section >>

20221019_220052 (flashdancehostname01:remove_java56.sh): Starting date: Wed Oct 19 22:00:52 IST 2022   Ending Date: Wed Oct 19
22:00:52 IST 2022.
```

Example Output: (FP2->FP5, FP3->FP5, removal required)

```
$ dsh -n ${ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/remove_java56.sh' | dshbak -c

HOSTS -----
flashdancehostname06
-----
20210121_090235 (flashdancehostname06:remove_java56.sh): Starting date: Thu Jan 21 09:02:35 IST 2021.
SUCCESES
-----
Filesets listed in this section passed pre-deinstall verification
and will be removed.

Selected Filesets
-----
Java5.sdk 5.0.0.570                # Java SDK 32-bit

Dependents
-----
Filesets listed in this section depend on one or more of the selected
filesets (listed above) and, therefore, must also be removed.
Java5.msg.Ja_JP 5.0.0.175          # Java SDK 32-bit Locale/Messa...
Java5.msg.ja_JP 5.0.0.175          # Java SDK 32-bit Locale/Messa...

<< End of Success Section >>

SUCCESES
-----
Filesets listed in this section passed pre-deinstall verification
and will be removed.

Selected Filesets
-----
Java6.sdk 6.0.0.445                # Java SDK 32-bit

<< End of Success Section >>

SUCCESES
-----
Filesets listed in this section passed pre-deinstall verification
and will be removed.

Selected Filesets
-----
Java5_64.sdk 5.0.0.570             # Java SDK 64-bit

<< End of Success Section >>

SUCCESES
-----
Filesets listed in this section passed pre-deinstall verification
and will be removed.

Selected Filesets
-----
Java6_64.sdk 6.0.0.445             # Java SDK 64-bit

Dependents
-----
Filesets listed in this section depend on one or more of the selected
```

STAGE 9: Completing the fixpack

```
filesets (listed above) and, therefore, must also be removed.
Java6_64.msg.Ja_JP 6.0.0.1          # Java SDK 64-bit Locale/Messa...
Java6_64.msg.ja_JP 6.0.0.1          # Java SDK 64-bit Locale/Messa...
Java6_64.msg.ko_KR 6.0.0.1          # Java SDK 64-bit Locale/Messa...
Java6_64.msg.zh_CN 6.0.0.1          # Java SDK 64-bit Locale/Messa...
Java6_64.msg.zh_TW 6.0.0.1          # Java SDK 64-bit Locale/Messa...

<< End of Success Section >>

20210121_090236 (flashdancehostname06:remove_java56.sh): Starting date: Thu Jan 21 09:02:35 IST 2021   Ending Date: Thu Jan 21
09:02:36 IST 2021.

(0) root @ flashdancehostname01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/application
```

The output above is truncated to show only one host. Java6_64 has dependencies which are only from the same package.

7. Command: Uninstall Java5/Java6 32 and 64 bit versions. If there are no dependencies, then uninstall these 4 Java versions.

```
dsh -n ${ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/remove_java56.sh remove' | dshbak
```

Example Output: (FP4->FP5: No removal required)

```
(0) root @ flashdancehostname01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/catalog
$ dsh -n ${ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/remove_java56.sh remove' | dshbak
HOST: flashdancehostname01
-----
20221019_220252 (flashdancehostname01:remove_java56.sh): Starting date: Wed Oct 19 22:02:52 IST 2022.
WARNINGS
-----
Problems described in this section are not likely to be the source of any
immediate or serious failures, but further actions may be necessary or
desired.

Not Installed
-----
No software could be found on the system that could be deinstalled for the
following requests:

(The fileset may not be currently installed, or you may have made a
typographical error.)
<< End of Warning Section >>

WARNINGS
-----
Problems described in this section are not likely to be the source of any
immediate or serious failures, but further actions may be necessary or
desired.

Not Installed
-----
No software could be found on the system that could be deinstalled for the
following requests:

(The fileset may not be currently installed, or you may have made a
typographical error.)
<< End of Warning Section >>

WARNINGS
-----
Problems described in this section are not likely to be the source of any
immediate or serious failures, but further actions may be necessary or
desired.

Not Installed
-----
No software could be found on the system that could be deinstalled for the
following requests:

(The fileset may not be currently installed, or you may have made a
typographical error.)
```


STAGE 9: Completing the fixpack

```
<< End of Warning Section >>

WARNINGS
-----
Problems described in this section are not likely to be the source of any
immediate or serious failures, but further actions may be necessary or
desired.

Not Installed
-----
No software could be found on the system that could be deinstalled for the
following requests:

(The filesset may not be currently installed, or you may have made a
typographical error.)
<< End of Warning Section >>

WARNINGS
-----
Problems described in this section are not likely to be the source of any
immediate or serious failures, but further actions may be necessary or
desired.

Not Installed
-----
No software could be found on the system that could be deinstalled for the
following requests:

(The filesset may not be currently installed, or you may have made a
typographical error.)
<< End of Warning Section >>

WARNINGS
-----
Problems described in this section are not likely to be the source of any
immediate or serious failures, but further actions may be necessary or
desired.

Not Installed
-----
No software could be found on the system that could be deinstalled for the
following requests:

(The filesset may not be currently installed, or you may have made a
typographical error.)
<< End of Warning Section >>

WARNINGS
-----
Problems described in this section are not likely to be the source of any
immediate or serious failures, but further actions may be necessary or
desired.

Not Installed
-----
No software could be found on the system that could be deinstalled for the
following requests:

(The filesset may not be currently installed, or you may have made a
typographical error.)
<< End of Warning Section >>

WARNINGS
-----
Problems described in this section are not likely to be the source of any
immediate or serious failures, but further actions may be necessary or
desired.

Not Installed
-----
No software could be found on the system that could be deinstalled for the
following requests:

(The filesset may not be currently installed, or you may have made a
typographical error.)
<< End of Warning Section >>

20221019_220253 (flashdancehostname01:remove_java56.sh): Starting date: Wed Oct 19 22:02:52 IST 2022   Ending Date: Wed Oct 19
22:02:53 IST 2022.
```

Example Output: (FP2->FP5, FP3->FP5: Removal required)

```
$ dsh -n ${ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/remove_java56.sh remove' | dshbak
```

STAGE 9: Completing the fixpack

```
HOSTS -----
flashdancehostname01
-----
20210121_090708 (flashdancehostname01:remove_java56.sh): Starting date: Thu Jan 21 09:07:08 IST 2021.
SUCSESSES
-----
Filesets listed in this section passed pre-deinstall verification
and will be removed.

Selected Filesets
-----
Java5.sdk 5.0.0.570                # Java SDK 32-bit

Dependents
-----
Filesets listed in this section depend on one or more of the selected
filesets (listed above) and, therefore, must also be removed.
Java5.msg.Ja_JP 5.0.0.175          # Java SDK 32-bit Locale/Messa...
Java5.msg.ja_JP 5.0.0.175          # Java SDK 32-bit Locale/Messa...

<< End of Success Section >>

SUCSESSES
-----
Filesets listed in this section passed pre-deinstall verification
and will be removed.

Selected Filesets
-----
Java6.sdk 6.0.0.445                # Java SDK 32-bit

<< End of Success Section >>

SUCSESSES
-----
Filesets listed in this section passed pre-deinstall verification
and will be removed.

Selected Filesets
-----
Java5_64.sdk 5.0.0.570             # Java SDK 64-bit

<< End of Success Section >>

SUCSESSES
-----
Filesets listed in this section passed pre-deinstall verification
and will be removed.

Selected Filesets
-----
Java6_64.sdk 6.0.0.535             # Java SDK 64-bit

Dependents
-----
Filesets listed in this section depend on one or more of the selected
filesets (listed above) and, therefore, must also be removed.
Java6_64.ext.commapi 6.0.0.1       # Java SDK 64-bit Comm API Ext...
Java6_64.msg.Ja_JP 6.0.0.1         # Java SDK 64-bit Locale/Messa...
Java6_64.msg.Zh_CN 6.0.0.1         # Java SDK 64-bit Locale/Messa...
Java6_64.msg.Zh_TW 6.0.0.1         # Java SDK 64-bit Locale/Messa...
Java6_64.msg.ja_JP 6.0.0.1         # Java SDK 64-bit Locale/Messa...
Java6_64.msg.ko_KR 6.0.0.1         # Java SDK 64-bit Locale/Messa...
Java6_64.msg.zh_CN 6.0.0.1         # Java SDK 64-bit Locale/Messa...
Java6_64.msg.zh_TW 6.0.0.1         # Java SDK 64-bit Locale/Messa...
Java6_64.samples.demo 6.0.0.535    # Java SDK 64-bit Demo Samples
Java6_64.samples.jnlp 6.0.0.535    # Java SDK 64-bit jnlp Samples
Java6_64.source 6.0.0.535          # Java SDK 64-bit Source

<< End of Success Section >>

SUCSESSES
-----
Filesets listed in this section passed pre-deinstall verification
and will be removed.

Selected Filesets
-----
Java5.sdk 5.0.0.570                # Java SDK 32-bit

Dependents
-----
Filesets listed in this section depend on one or more of the selected
filesets (listed above) and, therefore, must also be removed.
Java5.msg.Ja_JP 5.0.0.175          # Java SDK 32-bit Locale/Messa...
Java5.msg.ja_JP 5.0.0.175          # Java SDK 32-bit Locale/Messa...

<< End of Success Section >>
```

STAGE 9: Completing the fixpack

```
SUCCESES
-----
Filesets listed in this section passed pre-deinstall verification
and will be removed.

Selected Filesets
-----
Java6.sdk 6.0.0.445                                # Java SDK 32-bit

<< End of Success Section >>

SUCCESES
-----
Filesets listed in this section passed pre-deinstall verification
and will be removed.

Selected Filesets
-----
Java5_64.sdk 5.0.0.570                              # Java SDK 64-bit

<< End of Success Section >>

SUCCESES
-----
Filesets listed in this section passed pre-deinstall verification
and will be removed.

Selected Filesets
-----
Java6_64.sdk 6.0.0.535                              # Java SDK 64-bit
Dependents
-----
Filesets listed in this section depend on one or more of the selected
filesets (listed above) and, therefore, must also be removed.
Java6_64.ext.commmapi 6.0.0.1                        # Java SDK 64-bit Comm API Ext...
Java6_64.msg.Ja_JP 6.0.0.1                          # Java SDK 64-bit Locale/Messa...
Java6_64.msg.Zh_CN 6.0.0.1                          # Java SDK 64-bit Locale/Messa...
Java6_64.msg.Zh_TW 6.0.0.1                          # Java SDK 64-bit Locale/Messa...
Java6_64.msg.ja_JP 6.0.0.1                          # Java SDK 64-bit Locale/Messa...
Java6_64.msg.ko_KR 6.0.0.1                          # Java SDK 64-bit Locale/Messa...
Java6_64.msg.zh_CN 6.0.0.1                          # Java SDK 64-bit Locale/Messa...
Java6_64.msg.zh_TW 6.0.0.1                          # Java SDK 64-bit Locale/Messa...
Java6_64.samples.demo 6.0.0.535                     # Java SDK 64-bit Demo Samples
Java6_64.samples.jnlp 6.0.0.535                     # Java SDK 64-bit jnlp Samples
Java6_64.source 6.0.0.535                           # Java SDK 64-bit Source

<< End of Success Section >>

20210121_090844 (flashdancehostname01:remove_java56.sh): Starting date: Thu Jan 21 09:07:08 IST 2021   Ending Date: Thu Jan 21
09:08:44 IST 2021.
```

8. Command: Recheck the list of packages. Only Java7 and Java8 should exit.

```
dsh -n ${ALL} 'lsipp -l "Java*.sdk"' | dshbak -c
```

Example Output:

```
(0) root @ flashdancehostname01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/catalog
$ dsh -n ${ALL} 'lsipp -l "Java*.sdk"' | dshbak -c
HOSTS -----
flashdancehostname01, flashdancehostname02, flashdancehostname03, flashdancehostname04, flashdancehostname05,
flashdancehostname06, flashdancehostname07
-----
Fileset              Level State      Description
-----
Path: /usr/lib/objrepos
Java7.sdk            7.0.0.710 COMMITTED  Java SDK 32-bit Development
Kit
Java7_64.sdk         7.0.0.710 COMMITTED  Java SDK 64-bit Development
Kit
Java8.sdk            8.0.0.710 COMMITTED  Java SDK 32-bit Development
Kit
Java8_64.sdk         8.0.0.710 COMMITTED  Java SDK 64-bit Development
Kit

(0) root @ flashdancehostname01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/catalog
$
```

9. Update /etc/environment on all hosts to reflect a new path to a system level java if desired. Do this one host at a time. Note also cleanup unneeded PDOA deployment paths that do not exist on the system.

STAGE 9: Completing the fixpack

(Also note that any existing sessions (or applications launched from those sessions) will not reflect the new environment path (if used) until they are restarted. Diff the edited file with the backup.

- a. Command: Check `/etc/environment` for invalid paths from deployment and java5 references.

```
dsh -n ${ALL} 'egrep
"java5|java6|usr/lpp/htx/etc/scripts|/test/tools|usr/lpp/htx/test/tools|/home/monitor/test/tools|nim/build_net/tools|usr
/lpp/htx/etc/scripts|opt/ibm/director/bin" /etc/environment'
```

Example Output: (FP4->FP5) (No output expected if issue was fixed when V1.1 FP4 was applied)

Example Output: (FP2->FP5, FP3->FP5)

```
$ dsh -n ${ALL} 'egrep
"java5|java6|usr/lpp/htx/etc/scripts|/test/tools|usr/lpp/htx/test/tools|/home/monitor/test/tools|nim/build_net/tools|usr
/lpp/htx/etc/scripts|opt/ibm/director/bin" /etc/environment'
flashdancehostname02:
PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:/usr/java5/jre/bin:/usr/java5/bin:/usr/lpp/htx/etc/scripts:/test/to
ols:/usr/lpp/htx/test/tools:/home/monitor/test/tools:/nim/build_net/tools:/usr/lpp/htx/etc/scripts
flashdancehostname03:
PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:/usr/java5/jre/bin:/usr/java5/bin:/usr/lpp/htx/etc/scripts:/test/to
ols:/usr/lpp/htx/test/tools:/home/monitor/test/tools:/nim/build_net/tools:/usr/lpp/htx/etc/scripts
flashdancehostname04:
PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:/usr/java5/jre/bin:/usr/java5/bin:/usr/lpp/htx/etc/scripts:/test/to
ols:/usr/lpp/htx/test/tools:/home/monitor/test/tools:/nim/build_net/tools:/usr/lpp/htx/etc/scripts
flashdancehostname05:
PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:/usr/java5/jre/bin:/usr/java5/bin:/usr/lpp/htx/etc/scripts:/test/to
ols:/usr/lpp/htx/test/tools:/home/monitor/test/tools:/nim/build_net/tools:/usr/lpp/htx/etc/scripts
flashdancehostname07:
PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:/usr/java5/jre/bin:/usr/java5/bin:/usr/lpp/htx/etc/scripts:/test/to
ols:/usr/lpp/htx/test/tools:/home/monitor/test/tools:/nim/build_net/tools:/usr/lpp/htx/etc/scripts
flashdancehostname06:
PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:/usr/java5/jre/bin:/usr/java5/bin:/usr/lpp/htx/etc/scripts:/test/to
ols:/usr/lpp/htx/test/tools:/home/monitor/test/tools:/nim/build_net/tools:/usr/lpp/htx/etc/scripts
```

- b. Command: Backup `/etc/environment`.

```
cp /etc/environment /etc/environment.FP9_FP5_$(date +%Y%m%d_%H%M%S).bak
```

- c. Command: Use `cat` and a series of `sed` commands to remove unneeded paths created by the PDOA build and update the Java path from java5 to java8. This will also remove the system director path that was not removed after V1.1 FP1 was applied.

```
cat /etc/environment | sed "s|java5|java8|g" | sed "s|usr/lpp/htx/etc/scripts||" | sed "s|/test/tools||" | sed
"s|usr/lpp/htx/test/tools||" | sed "s|/home/monitor/test/tools||" | sed "s|nim/build_net/tools||" | sed
"s|usr/lpp/htx/etc/scripts||" | sed "s|opt/ibm/director/bin||" | sed "s|::*:|:|g" > /etc/environment
```

- d. Command: Verify that the new environment file only changed the PATH variable.

```
diff /etc/environment $(ls -rt /etc/environment.FP9_FP5*.bak | tail -1)
```

Example Output:

```
$ diff /etc/environment $(ls -rt /etc/environment.FP9_FP5*.bak | tail -1)
56c56
< PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:/usr/java8/jre/bin:/usr/java8/bin:
---
>
PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:/usr/java5/jre/bin:/usr/java5/bin:/usr/lpp/htx/etc/scripts:/test/to
ols:/usr/lpp/htx/test/tools:/home/monitor/test/tools:/nim/build_net/tools:/usr/lpp/htx/etc/scripts:/opt/ibm/director/bin
```

- e. Command: Verify the java path is set as expected for ssh.

```
ssh $(hostname) 'hostname;which java'

$ ssh $(hostname) 'hostname;which java'
reverseflash01
```

STAGE 9: Completing the fixpack

```
/usr/java8/jre/bin/java
```

10. Update the /etc/profile file to reflect the new java path and to remove extra PDOA directories. Do this one host at a time.

- a. Command: Check the PATHS in /etc/profile for obsolete or invalid paths. Pick a host and proceed to item 10 b. If all hosts are updated, then proceed to the next phase.

```
dsh -n ${ALL} 'egrep
"java5|java6|/usr/lpp/htx/etc/scripts|/test/tools|/usr/lpp/htx/test/tools|/home/monitor/test/tools|/nim/build_net/tools|/usr
/lpp/htx/etc/scripts|/opt/ibm/director/bin" /etc/profile'
```

Example Output: (FP2->FP5, FP3->FP5) Or FP4->FP5 if skipped during V1.1 FP4 application.

```
$ dsh -n ${ALL} 'egrep
"java5|java6|/usr/lpp/htx/etc/scripts|/test/tools|/usr/lpp/htx/test/tools|/home/monitor/test/tools|/nim/build_net/tools|/usr
/lpp/htx/etc/scripts|/opt/ibm/director/bin" /etc/profile'
flashdancehostname01: export
PATH="/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:/usr/java5/jre/bin:/usr/java5/bin:/usr/lpp/htx/etc/scripts:/test/to
ols:/usr/lpp/htx/test/tools:/home/monitor/test/tools:/nim/build_net/tools:/usr/lpp/htx/etc/scripts:/opt/ibm/director/bin:/u
sr/IBM/analytics/ha_tools:/opt/ibm/aixappl/pfplayer/bin:/opt/IBM/mi/bin:/opt/IBM/mibe/bin"
flashdancehostname01: export PATH=/opt/ibm/director/bin:$PATH
flashdancehostname02: export PATH=/opt/ibm/director/bin:$PATH
flashdancehostname04: export PATH=/opt/ibm/director/bin:$PATH
flashdancehostname05: export PATH=/opt/ibm/director/bin:$PATH
flashdancehostname06: export PATH=/opt/ibm/director/bin:$PATH
flashdancehostname07: export PATH=/opt/ibm/director/bin:$PATH
flashdancehostname03: export
PATH=/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:/usr/java5/jre/bin:/usr/java5/bin:/usr/lpp/htx/etc/scripts:/test/to
ols:/usr/lpp/htx/test/tools:/home/monitor/test/tools:/nim/build_net/tools:/usr/lpp/htx/etc/scripts:/usr/IBM/analytics/ha_too
ls
flashdancehostname03: export PATH=/opt/ibm/director/bin:$PATH
```

- b. Command: On each target host. Backup /etc/profile

```
cp /etc/profile /etc/profile.FP9_FP5_$(date +%Y%m%d_%H%M%S).bak
```

- c. Command: On each target host. Use cat/set to update /etc/profile to use the new java8 and remove extra PDOA paths no longer needed.

```
cat /etc/profile | grep -v 'PATH=/opt/ibm/director/bin:$PATH' | sed "s|java5|java8|g" | sed "s|/usr/lpp/htx/etc/scripts||" |
sed "s|/test/tools||" | sed "s|/usr/lpp/htx/test/tools||" | sed "s|/home/monitor/test/tools||" | sed
"s|/nim/build_net/tools||" | sed "s|/usr/lpp/htx/etc/scripts||" | sed "s|/opt/ibm/director/bin||" | sed "s|::*:|g" >
/etc/profile
```

- d. Command: On each target host. Diff the new and backup /etc/profile files. Carefully check the differences in the file. If there is any question in the validity of the change restore the backup profile.

```
diff /etc/profile $(ls -rt /etc/profile.FP9_FP5*.bak | tail -1)
```

Example Output: (Core Nodes: Admin or Data or Admin/Data Standby)

```
$ diff /etc/profile $(ls -rt /etc/profile.FP9_FP5*.bak | tail -1)
73a74
> export PATH=/opt/ibm/director/bin:$PATH

(1) root @ flashdancehostname02: 7.2.0.0: /
```

Example Output: (Management or Management Standby)

```
$ diff /etc/profile $(ls -rt /etc/profile.FP9_FP5*.bak | tail -1)
65c65
< export
PATH="/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:/usr/java8/jre/bin:/usr/java8/bin:/usr/IBM/analytics/ha_tools:/opt
/ibm/aixappl/pfplayer/bin:/opt/IBM/mi/bin:/opt/IBM/mibe/bin"
```

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```
---
> export
PATH="/usr/bin:/etc:/usr/sbin:/usr/ucb:/usr/bin/X11:/sbin:/usr/java5/jre/bin:/usr/java5/bin:/usr/lpp/htx/etc/scripts:/test/tools:/usr/lpp/htx/test/tools:/home/monitor/test/tools:/nim/build_net/tools:/usr/lpp/htx/etc/scripts:/opt/ibm/director/bin:/usr/IBM/analytics/ha_tools:/opt/ibm/aixappl/pflayer/bin:/opt/IBM/mi/bin:/opt/IBM/mibe/bin"
80a81
> export PATH=/opt/ibm/director/bin:$PATH

(1) root @ reverseflash01: 7.1.0.0: /BCU_share/FP8_FP4/fixpack_tools/catalog
```

- e. **Command:** Verify the path is set correctly for the host being updated.. Repeat item a) to show all hosts that have not yet been updated.

```
ssh -n $(hostname) '. /etc/environment;. .profile;which java'
```

Example Output:

```
$ ssh -n $(hostname) '. /etc/environment;. .profile;which java'
/usr/java8/jre/bin/java
```

Phase 3 Remove DPM

Note: This phase should have been performed in V1.1 FP4 Stage 9.

DPM is no longer supported and has been deprecated since V1.1 FP1. Adobe Flash, a required component to access the DPM web interface, is no longer supported and will fail as of the start of 2021.

This section will help remove DPM. There is no official replacement that can be installed on the PDOA environment; however, you may wish to obtain the IBM Db2 Data Management Console (see <https://www.ibm.com/products/db2-data-management-console>) and install it on an outside server which provides similar functionality. This product cannot be installed on any server in PDOA as it does not support AIX 7.1.

DPM, as well as its database, and home directory is installed on the GPFS filesystem /opmfs and is not protected by mksysb or cloned rootvg. If there is any doubt about the need for DPM, please contact IBM Support for guidance.

These instructions are based on those found in the opm installation guide, page 40 in the English version readme, in this link: <https://www.ibm.com/support/pages/installation-guide-optim-performance-manager-version-41>

1. Ensure you are using a root session via vtmenu or screen on the management host.
2. Command: Check to verify that there is a management domain. If there is no domain, then skip all domain commands. If domain exists the proceed to 4.

```
lsrpdomain
```

3. Command: Check to verify that OPM Is still installed. If the directory doesn't exist, then skip OPM uninstall commands. If domain doesn't exist, but OPM exists, contact IBM support as these instructions are not complete for that scenario.

```
ls /opmfs/IBM/OPM/uninstall
```

4. Command: Verify whether DPM is running. If WAS and WASAPP appear in the hals output below stop and contact IBM for help to remove Warehouse Tools.

```
hals -mgmt
```

Example Output: if the domain is online and DPM and DB2DPM are running. Goto 5 to stop DPM.

```
$ hals -mgmt
MANAGEMENT DOMAIN
=====+=====+=====+=====+=====+=====+=====+=====+
| COMPONENT | PRIMARY          | STANDBY          | CURRENT          | OPSTATE          | HA STATUS        | RG REQUESTS |
|-----+-----+-----+-----+-----+-----+-----+
| DPM       | flashdancehostname01 | flashdancehostname03 | flashdancehostname01 | Online           | Normal           | -           |
| DB2DPM    | flashdancehostname01 | flashdancehostname03 | flashdancehostname01 | Online           | Normal           | -           |
=====+=====+=====+=====+=====+=====+=====+=====+
```

Example Output: if the domain is online but DPM and DB2DPM is not running. Goto 4 to start DB2DPM.

```
$ hals -mgmt
MANAGEMENT DOMAIN
=====+=====+=====+=====+=====+=====+=====+=====+
```

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COMPONENT	PRIMARY	STANDBY	CURRENT	OPSTATE	HA STATUS	RG REQUESTS
DPM	kf5hostname01	N/A	N/A	Offline	Offline	-
DB2DPM	kf5hostname01	N/A	N/A	Offline	Offline	-

Example Output: if the management domain is not running. Goto 3 to start the domain.

```
$ hals -mgmt
none are available... returning
```

- If 'none are available ... returning' then start the management domain and check the status. Then goto 4 to start DB2DPM.

- Command: Start the management domain.

```
$ hadomain -mgmt start
```

- Command: Verify the domain is online.

```
hals -mgmt
```

Example Output:

```
$ hals -mgmt
MANAGEMENT DOMAIN
```

COMPONENT	PRIMARY	STANDBY	CURRENT	OPSTATE	HA STATUS	RG REQUESTS
DPM	kf5hostname01	N/A	N/A	Offline	Offline	-
DB2DPM	kf5hostname01	N/A	N/A	Offline	Offline	-

- Command: Start DB2DPM if it is not running. Goto 6.

```
hastartdpm -db2only
```

Example Output:

```
$ hastartdpm -db2only
Starting DB2 instance.....Resources online
MANAGEMENT DOMAIN
```

COMPONENT	PRIMARY	STANDBY	CURRENT	OPSTATE	HA STATUS	RG REQUESTS
DPM	kf5hostname01	N/A	N/A	Offline	Offline	-
DB2DPM	kf5hostname01	kf5hostname03	kf5hostname01	Online	Normal	-

- Command: Stop DPM if it is running. This will only stop the DPM applications and will leave the db2opm instance running.

```
hastopdpm -dpmonly
```

Example Output:

```
$ hastopdpm -dpmonly
Stopping DPM.....Resources offline
MANAGEMENT DOMAIN
```

COMPONENT	PRIMARY	STANDBY	CURRENT	OPSTATE	HA STATUS	RG REQUESTS
DPM	flashdancehostname01	N/A	N/A	Offline	Offline	-
DB2DPM	flashdancehostname01	flashdancehostname03	flashdancehostname01	Online	Normal	-

- Change the current directory to /opmfs/IBM/OPM/uninstall

```
cd /opmfs/IBM/OPM/uninstall
```

- Command: Remove the DPM application installation. This will leave the Db2 instance and database running. This is the last chance to keep DPM and its database. If there is any doubt, skip this step and

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contact IBM Support. This command is interactive. Hit <ENTER> to continue, 'Y' to unconfigure, and then '2' to proceed to the uninstall. This takes approximately 3 minutes.

```
./UninstallOptimPerformanceManager -i console
```

Example Output:

```

=====./UninstallOptimPerformanceManager -i console
IBM InfoSphere Optim Performance Manager (created with InstallAnywhere)
=====

Preparing CONSOLE Mode Uninstallation...

=====
Uninstall IBM InfoSphere Optim Performance Manager
=====

About to uninstall...

IBM InfoSphere Optim Performance Manager

This will remove features installed by InstallAnywhere. It will not remove
files and directories created after the installation.

PRESS <ENTER> TO CONTINUE:

=====
Unconfigure IBM InfoSphere Optim Performance Manager
=====

Do you want to unconfigure InfoSphere Optim Performance Manager? If you
unconfigure InfoSphere Optim Performance Manager, the repository database and
all of the catalog entries for the monitored databases will be dropped.
Unconfigure InfoSphere Optim Performance Manager (Y/N): Y

=====
IBM InfoSphere Optim Performance Manager
=====

Are you sure that you want to proceed with the uninstallation?

->1- No
   2- Yes

ENTER THE NUMBER OF THE DESIRED CHOICE, OR PRESS <ENTER> TO ACCEPT THE
DEFAULT: 2
Unconfiguring IBM InfoSphere Optim Performance Manager...
=====|=====|=====|

=====
Uninstalling...
=====

...*
*
*****
*****
*****
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...*
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...*
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*****

```

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```
*****
*****
*****
...*
*
*****
*****
*****
*****
...*
*
*****
*****
*****
*****

=====
Uninstall Complete
-----

Some items could not be removed.

(0) root @ flashdancehostname01: 7.1.0.0: /opmfs/IBM/OPM/uninstall
$
```

10. Verify the DPM Install directory is removed.

```
cd /opmfs
ls -la
```

Example Output:

```
$ ls -la
total 532
drwxr-xr-x  5 root    system    262144 Jan 22 01:45 .
drwxr-xr-x 53 root    system      8192 Jan 22 00:57 ..
drwxr-xr-x  2 root    system    4096 Jan 22 01:46 .flashdancehostname01
drwxr-xr-x  2 root    system    4096 Jan 22 01:46 .flashdancehostname03
-rw-r--r--  1 root    system      0 Jan 09 11:36 .mp_monitor
dr-xr-xr-x  2 root    system    8192 Jan 01 1970 .snapshots
drwxr-xr-x  4 root    system    4096 Jan 17 2020 home
```

11. Command: Verify that the DPM database still exists. This may show 'OPMDB' or 'PERFDB'.

```
su - db2opm -c 'db2 list database directory'
```

Example Output:

```
$ su - db2opm -c 'db2 list database directory'

System Database Directory

Number of entries in the directory = 1

Database 1 entry:

Database alias           = PERFDB
Database name            = PERFDB
Local database directory = /opmfs/home/db2opm
Database release level   = 10.00
Comment                  = IBM Optim Performance Manager
Directory entry type     = Indirect
Catalog database partition number = 0
Alternate server hostname =
Alternate server port number =
```

12. Drop the database. If you receive a SQL1035N error then deactivate the database and try again.

a. If the database name is PERFDB.

i. Command: Drop the database:

```
su - db2opm -c 'db2 drop database perfdb'
```

Example Output:

```
$ su - db2opm -c 'db2 drop database perfdb'
SQL1035N The operation failed because the specified database cannot be
connected to in the mode requested.  SQLSTATE=57019
```

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ii. Command: Deactivate the database.

```
su - db2opm -c 'db2 deactivate database perfdb'
```

Example Output:

```
$ su - db2opm -c 'db2 deactivate database perfdb'
DB20000I The DEACTIVATE DATABASE command completed successfully.
```

iii. Command: Drop the database.

```
su - db2opm -c 'db2 drop database perfdb'
```

Example Output:

```
(0) root @ flashdancehostname01: 7.1.0.0: /opmfs
$ su - db2opm -c 'db2 drop database perfdb'
DB20000I The DROP DATABASE command completed successfully.
```

b. If the database name is OPMDB.

i. Command: Drop the database:

```
su - db2opm -c 'db2 drop database opmdb'
```

Example Output:

```
$ su - db2opm -c 'db2 drop database opmdb'
SQL1035N The operation failed because the specified database cannot be
connected to in the mode requested.  SQLSTATE=57019
```

ii. Command: Deactivate the database.

```
su - db2opm -c 'db2 deactivate database opmdb'
```

Example Output:

```
(4) root @ kf5hostname01: 7.1.0.0: /opmfs/IBM/OPM/uninstall
$ su - db2opm -c 'db2 deactivate database opmdb'
DB20000I The DEACTIVATE DATABASE command completed successfully.
```

iii. Command: Drop the database.

```
su - db2opm -c 'db2 drop database opmdb'
```

Example Output:

```
(0) root @ kf5hostname01: 7.1.0.0: /opmfs/IBM/OPM/uninstall
$ su - db2opm -c 'db2 drop database opmdb'
DB20000I The DROP DATABASE command completed successfully.
```

13. Command: Stop the DPM Instance using hatools.

```
hastopdpm
```

Example Output:

```
$ hastopdpm
Stopping DPM and DB2 instance....Resources offline
MANAGEMENT DOMAIN
+-----+-----+-----+-----+-----+-----+-----+
| COMPONENT | PRIMARY | STANDBY | CURRENT | OPSTATE | HA STATUS | RG REQUESTS |
+-----+-----+-----+-----+-----+-----+-----+
| DPM       | flashdancehostname01 | N/A     | N/A     | Offline | Offline   | -           |
| DB2DPM    | flashdancehostname01 | N/A     | N/A     | Offline | Offline   | -           |
+-----+-----+-----+-----+-----+-----+-----+
```

14. Command: Drop the management domain.

```
rmrpdomain -f mgmtdomain
```

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15. Command: Verify the domains are dropped. If domain appears Offline then repeat command until it no longer appears in the output.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} lsrpdomain
```

16. Command: Remove the db2opm instance.

```
/usr/IBM/dwe/mgmt_db2/V10.5/instance/db2idrop db2opm
```

Example Output:

```
$ /usr/IBM/dwe/mgmt_db2/V10.5/instance/db2idrop db2opm
DBI1446I The db2idrop command is running.

DB2 installation is being initialized.

Total number of tasks to be performed: 2
Total estimated time for all tasks to be performed: 305 second(s)

Task #1 start
Description: Initializing instance list
Estimated time 5 second(s)
Task #1 end

Task #2 start
Description: Configuring DB2 instances
Estimated time 300 second(s)
Task #2 end

The execution completed successfully.

For more information see the DB2 installation log at
"/tmp/db2idrop.log.5702650".
DBI1070I Program db2idrop completed successfully.
```

17. Command: Check the Db2 global registry on the management hosts. There will be one 'I' or Instance record on the management standby for db2opm.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} '/usr/IBM/dwe/mgmt_db2/V10.5/bin/db2greg -dump' | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} '/usr/IBM/dwe/mgmt_db2/V10.5/bin/db2greg -dump' | dshbak -c
HOSTS -----
flashdancehostname01
-----
S,DB2,9.7.0.4,/opt/ibm/director/db2,,,4,0,,1415885749,0
V,DB2GPRF,DB2SYSTEM,flashdancehostname01,/opt/ibm/director/db2,
V,DB2GPRF,DB2FCMCOMM,TCPIP4,/opt/ibm/director/db2,
V,DB2GPRF,DB2SYSTEM,flashdancehostname01,/usr/IBM/dwe/mgmt_db2/V10.5,
S,GPFS,4.2.3.19,/usr/lpp/mmfs,DG_NOT_ALLOWED,DB2_INSTALLED,0,0,-,1608247634,0
S,TSA,4.1.0.5,/opt/IBM/tsamp,DG_NOT_ALLOWED,DB2_INSTALLED,0,0,-,1608247634,0
S,RSCT,3.2.4.3,/usr/sbin/rsct,DG_NOT_ALLOWED,DB2_INSTALLED,0,0,-,1608247634,0
S,DB2,10.5.0.11,/usr/IBM/dwe/mgmt_db2/V10.5,,,11,0,,1608247928,2

HOSTS -----
flashdancehostname03
-----
V,DB2GPRF,DB2SYSTEM,flashdancehostname03,/usr/IBM/dwe/mgmt_db2/V10.5,
V,DB2GPRF,DB2INSTDEF,dweadmin,/usr/IBM/dwe/db2/V11.1,
I,DB2,10.5.0.11,db2opm,/opmfs/home/db2opm/sqlllib,,1,0,/usr/IBM/dwe/mgmt_db2/V10.5,,
V,DB2GPRF,DB2INSTDEF,db2opm,/usr/IBM/dwe/mgmt_db2/V10.5,
S,GPFS,4.2.3.19,/usr/lpp/mmfs,DG_NOT_ALLOWED,DB2_INSTALLED,0,0,-,1608243969,0
S,TSA,4.1.0.5,/opt/IBM/tsamp,DG_NOT_ALLOWED,DB2_INSTALLED,0,0,-,1608243969,0
S,RSCT,3.2.4.3,/usr/sbin/rsct,DG_NOT_ALLOWED,DB2_INSTALLED,0,0,-,1608243969,0
S,DB2,10.5.0.11,/usr/IBM/dwe/mgmt_db2/V10.5,,,11,0,,1608244324,2
```

18. Command: Remove the 'I' record for db2opm on the management standby host. This command will return an error on the management host and will remove the record on the management standby host. If re-run it will return an error on both hosts.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} '/usr/IBM/dwe/mgmt_db2/V10.5/instance/db2iset -d db2opm'
```

Example Output:

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```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} '/usr/IBM/dwe/mgmt_db2/V10.5/instance/db2iset -d db2opm'
flashdancehostname01: db2set MsgRC=1306, P1='', P2=''
```

19. Command: Remove dweadmin instance records if still exist.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} '/usr/IBM/dwe/mgmt_db2/V10.5/instance/db2iset -d dweadmin'
```

Example Output:

```
(0) root @ reverseflash01: 7.1.0.0: /opmfs
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} '/usr/IBM/dwe/mgmt_db2/V10.5/instance/db2iset -d dweadmin'
reverseflash01: db2set MsgRC=1306, P1='', P2=''

(1) root @ reverseflash01: 7.1.0.0: /opmfs
```

20. Command: Verify that all 'I' records are removed.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} '/usr/IBM/dwe/mgmt_db2/V10.5/bin/db2greg -dump' | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} '/usr/IBM/dwe/mgmt_db2/V10.5/bin/db2greg -dump' | dshbak -c
HOSTS -----
flashdancehostname01
-----
S,DB2,9.7.0.4,/opt/ibm/director/db2,,,4,0,,1415885749,0
V,DB2GPRF,DB2SYSTEM,flashdancehostname01,/opt/ibm/director/db2,
V,DB2GPRF,DB2FCMCOMM,TCPIP4,/opt/ibm/director/db2,
V,DB2GPRF,DB2SYSTEM,flashdancehostname01,/usr/IBM/dwe/mgmt_db2/V10.5,
S,GPFS,4.2.3.19,/usr/lpp/mmfs,DG_NOT_ALLOWED,DB2_INSTALLED,0,0,-,1608247634,0
S,TSA,4.1.0.5,/opt/IBM/tsamp,DG_NOT_ALLOWED,DB2_INSTALLED,0,0,-,1608247634,0
S,RSCT,3.2.4.3,/usr/sbin/rsct,DG_NOT_ALLOWED,DB2_INSTALLED,0,0,-,1608247634,0
S,DB2,10.5.0.11,/usr/IBM/dwe/mgmt_db2/V10.5,,,11,0,,1608247928,2

HOSTS -----
flashdancehostname03
-----
V,DB2GPRF,DB2SYSTEM,flashdancehostname03,/usr/IBM/dwe/mgmt_db2/V10.5,
V,DB2GPRF,DB2INSTDEF,dweadmin,/usr/IBM/dwe/db2/V11.1,
S,GPFS,4.2.3.19,/usr/lpp/mmfs,DG_NOT_ALLOWED,DB2_INSTALLED,0,0,-,1608243969,0
S,TSA,4.1.0.5,/opt/IBM/tsamp,DG_NOT_ALLOWED,DB2_INSTALLED,0,0,-,1608243969,0
S,RSCT,3.2.4.3,/usr/sbin/rsct,DG_NOT_ALLOWED,DB2_INSTALLED,0,0,-,1608243969,0
S,DB2,10.5.0.11,/usr/IBM/dwe/mgmt_db2/V10.5,,,11,0,,1608244324,2
```

Phase 4 Remove Db2 on the management hosts.

Db2 is no longer needed for PDOA services on the management host. All instances (db2opm, dweadmin, db2psc) have been removed. If in the future a database is required, the installation and configuration details will be provided. It is important to remove obsolete and unused software as it can lead to additional security vectors and more management.

1. Verify that there are no instance records on the management and management standby hosts. During testing the *dweadmin* instance may appear on the standby management host where it is easy to skip its removal as part of the V1.1 FP2 readme instructions.

- a. Command: The following command will show only the instance records in the db2 global registries on the admin and admin standby nodes.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} '/usr/IBM/dwe/mgmt_db2/V10.5/bin/db2greg -dump | grep "^I" | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} '/usr/IBM/dwe/mgmt_db2/V10.5/bin/db2greg -dump | grep "^I" | dshbak -c
HOSTS -----
kf5hostname03
-----
I,DB2,10.5.0.10,dweadmin,/usr/IBM/dwe/appserver_001/home/dweadmin/sqlllib,,1,0,/usr/IBM/dwe/mgmt_db2/V10.5,,
```

- b. Command: If the *dweadmin* instance exists remove it using the following command. The command should return no output.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} '/usr/IBM/dwe/mgmt_db2/V10.5/instance/db2iset -dr -i dweadmin' | dshbak -c
```

- c. Command: Verify there are no instance records. The command should return no output.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} '/usr/IBM/dwe/mgmt_db2/V10.5/bin/db2greg -dump | grep "^I" | dshbak -c
```

2. Command: Uninstall Db2 10.5 on the management hosts. Run as root on management in a screen or vtmenu session. This will take approximately 5 minutes.

```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} '/usr/IBM/dwe/mgmt_db2/V10.5/install/db2_deinstall -a' | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} '/usr/IBM/dwe/mgmt_db2/V10.5/install/db2_deinstall -a' | dshbak -c
HOSTS -----
flashdancehostname01
-----
DBI1016I Program db2_deinstall is performing uninstallation. Please
wait.

The execution completed successfully.

For more information see the DB2 uninstallation log at
"/tmp/db2_deinstall.log.7406076".

HOSTS -----
flashdancehostname03
-----
DBI1016I Program db2_deinstall is performing uninstallation. Please
wait.

The execution completed successfully.

For more information see the DB2 uninstallation log at
"/tmp/db2_deinstall.log.3933100".
```

3. Command: Verify Db2 is uninstalled.

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```
dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'ls -la /usr/IBM/dwe/mgmt_db2/' | dshbak -c
```

Example Output:

```
$ dsh -n ${BCUMGMT},${BCUMGMTSTDBY} 'ls -la /usr/IBM/dwe/mgmt_db2/' | dshbak -c
HOSTS -----
flashdancehostname01
-----
total 0
drwxr-xr-x  2 root    system    256 Jan 22 02:16 .
drwxr-xr-x  5 bin     bin       256 Oct 19 2016 ..
-----
HOSTS -----
flashdancehostname03
-----
total 0
drwxr-xr-x  2 root    system    256 Jan 22 02:16 .
drwxr-xr-x  5 root    system    256 Oct 19 2016 ..
-----
(0) root @ flashdancehostname01: 7.1.0.0: /opmfs
```

Phase 5 Verifying the Fixpack

1. Command: Run the version display tool. Compare the versions.

```
/BCU_share/FP9_FP5/fixpack_tools/status/getVersionStatus.sh
```

Example Output

```
$ /BCU_share/FP9_FP5/fixpack_tools/status/getVersionStatus.sh
```

Stages	Name	IP	Hostname	Type	Model	Level
13	hmc0	172.23.1.245	reverseflashhmc1	7042	CR8	9.1.942
13	hmc1	172.23.1.246	reverseflashhmc2	7042	CR8	9.1.942
4	storage0	172.23.1.181	reverseflashV7_00	2076	524	8.2.1.15
4	storage1	172.23.1.182	reverseflashFlash_00	9840	AE2	1.5.2.10
4	storage2	172.23.1.183	reverseflashV7_01	2076	524	8.2.1.15
4	storage3	172.23.1.184	reverseflashFlash_01	9840	AE2	1.5.2.10
5	san0	172.23.1.161	san_switch1		40-1000569-12	v7.4.2e
5	san1	172.23.1.162	san_switch2		40-1000569-13	v7.4.2e
5	san2	172.23.1.163	san_switch3		40-1000569-13	v7.4.2e
5	san3	172.23.1.164	san_switch4		40-1000569-13	v7.4.2e
6,7	server5	172.23.1.1	reverseflash01	8286	42A	server_fsp0
6,7	aix					7200-05-04-2220
6,7	gpfs					5.1.1.4
6,7	rsct					3.2.6.4
6,7	tsa					4.1.0.7
6,7	sisssas0				53495351	19512c00
6,7	net_adapter10				e4148a1614109304	30100310
6,7	net_adapter11				e4148a1614109304	30100310
6,7	fc_adapter18				df1000f114100104	210313
6,7	fc_adapter19				df1000f114100104	210313
6,7	server3	172.23.1.2	reverseflash02	8286	42A	server_fsp0
6,7	aix					7200-05-04-2220
6,7	gpfs					5.1.1.4
6,7	rsct					3.2.6.4
6,7	tsa					4.1.0.7
6,7	sisssas0				53495351	19512c00
6,7	db2					10.5.0.10..6
6,7	db2				bcuaix	10.5.0.11..10
6,7	net_adapter6				e4148a1614109304	30100310
6,7	net_adapter7				e4148a1614109304	30100310
6,7	fc_adapter10				df1000f114100104	210313
6,7	fc_adapter11				df1000f114100104	210313
6,7	fc_adapter12				df1000f114100104	210313
6,7	fc_adapter13				df1000f114100104	210313
6,7	server1	172.23.1.3	reverseflash03	8286	42A	server_fsp1
6,7	aix					7200-05-04-2220
6,7	gpfs					5.1.1.4
6,7	rsct					3.2.6.4
6,7	tsa					4.1.0.7
6,7	sisssas0				53495351	19512c00
6,7	net_adapter2				e4148a1614109304	30100310
6,7	net_adapter3				e4148a1614109304	30100310
6,7	fc_adapter4				df1000f114100104	210313
6,7	fc_adapter5				df1000f114100104	210313
6,7	server4	172.23.1.4	reverseflash04	8286	42A	server_fsp1
6,7	aix					7200-05-04-2220
6,7	gpfs					5.1.1.4
6,7	rsct					3.2.6.4
6,7	tsa					4.1.0.7
6,7	sisssas0				53495351	19512c00
6,7	db2					10.5.0.10..6
6,7	db2				bcuaix	10.5.0.11..10
6,7	db2					11.1.4.4.a.2
6,7	db2					11.1.4.5..0
6,7	net_adapter8				e4148a1614109304	30100310
6,7	net_adapter9				e4148a1614109304	30100310
6,7	fc_adapter14				df1000f114100104	210313
6,7	fc_adapter15				df1000f114100104	210313
6,7	fc_adapter16				df1000f114100104	210313
6,7	fc_adapter17				df1000f114100104	210313
6,7	server2	172.23.1.5	reverseflash05	8284	22A	server_fsp2
6,7	aix					7200-05-04-2220
6,7	gpfs					5.1.1.4
6,7	rsct					3.2.6.4
6,7	tsa					4.1.0.7
6,7	sisssas0				53495351	19512c00
6,7	db2					10.5.0.10..6
6,7	db2				bcuaix	10.5.0.11..10
6,7	db2					11.1.4.4.a.2
6,7	db2					11.1.4.5..0
6,7	net_adapter4				e4148a1614109304	30100310

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6,7	net_adapter5				e4148a1614109304	30100310
6,7	fc_adapter6				7710322514101e04	0325080271
6,7	fc_adapter7				7710322514101e04	0325080271
6,7	fc_adapter8				7710322514101e04	0325080271
6,7	fc_adapter9				7710322514101e04	0325080271

6,7	server0	172.23.1.6	reverseflash06	8284	22A	server_fsp3
6,7	aix					7200-05-04-2220
6,7	gpfs					5.1.1.4
6,7	rsct					3.2.6.4
6,7	tss					4.1.0.7
6,7	sissas0				53495351	19512c00
6,7	db2					10.5.0.10..6
6,7	db2				bcuaix	10.5.0.11..10
6,7	db2					11.1.4.4.a.2
6,7	db2					11.1.4.5..0
6,7	net_adapter0				e4148a1614109304	30100310
6,7	net_adapter1				e4148a1614109304	30100310
6,7	fc_adapter0				7710322514101e04	0325080271
6,7	fc_adapter1				7710322514101e04	0325080271
6,7	fc_adapter2				7710322514101e04	0325080271
6,7	fc_adapter3				7710322514101e04	0325080271

7	server_fsp0	Unsupported	Unsupported	8286	42A	SV860_240

7	server_fsp1	Unsupported	Unsupported	8286	42A	SV860_240

7	server_fsp2	Unsupported	Unsupported	8284	22A	SV860_240

7	server_fsp3	Unsupported	Unsupported	8284	22A	SV860_240

8	net3	172.23.1.251	fcm_switch2		G8264	7.11.24.0

8	net2	172.23.1.252	fcm_switch1		G8264	7.11.24.0

8	net1	172.23.1.253	mgt_switch2		G8052	7.11.24.0

8	net0	172.23.1.254	mgt_switch1		G8052	7.11.24.0

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/catalog

- If a server shows something other than SV860_240, it is likely an issue with the platform layer database. For V1.1 FP2->FP5 customers this can happen on the foundation server which is running the pflayer at the time it reboots, missing the chance to update the pflayer database.
- Command: Update the pflayer database if needed for server_fsp0. Then re-run the check above.

```
/opt/ibm/aixappl/pflayer/bin/icmds/appl_ctrl_fsp query -l server_fsp0
```

Example Output:

```
$ /opt/ibm/aixappl/pflayer/bin/icmds/appl_ctrl_fsp query -l server_fsp0
Details:
AccessState: -
Description: IBM Power 810 Express CEC
DisplayName: Server-8286-42A-SN21574DW
Status: Online
Manufacturer: IBM
Model: 42A
CTRL_HMC_IP: 172.23.1.245
LPARS: ["adminnode_2","sysNode"]
SerialNumber: #####
State: Operating
LparPowerOnPolicy: autostart
LPARS_IP_LIST: ["172.23.1.2","172.23.1.1"]
PLLogicalName: server_fsp0
IPv4Address: 172.16.222.49
PendLparPowerOnPolicy: autostart
FWLevel: SV860_240
MachineType: 8286
```

- Command: Create an html fixpack report. This can be copied to a client and viewed with a browser or easily viewed via a vi, more or pg.

```
cd /BCU_share/FP9_FP5/fixpack_tools/fp_report;./makerpt.sh
```

Example Output:

```
$ cd /BCU_share/FP9_FP5/fixpack_tools/fp_report;./makerpt.sh
Creating report /BCU_share/support/html/pdoa_fixpack_report_reverseflash01_20220922194415.html.
Running 'Appliance Catalog Summary' report.
Running 'Appliance Catalog Latest Level' report.
Running 'Appliance Catalog Detail' report.
Running 'Appliance Version Status' report.
Running 'Appliance Servers' report.
Running 'HMC Commands' report.
```

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```
Running 'DB2 License Report' report.  
Running 'Disk Space and Inode Status Histogram using df.' report.  
Running 'Fiber Channel Path Status Histogram.' report.  
Running 'ENT Adapters.' report.  
Running 'Storage Enclosure Events' report.  
Running 'OS errpt counts' report.  
Running 'OS errpt as of today.' report.  
Running 'OS errpt YTD.' report.  
Running 'SAN SwitchShow.' report.  
Running 'BNT Config.' report.  
Running 'AIX Installed Software' report.  
Running 'HDISK Settings' report.  
Running 'FSCSI Interface Settings' report.  
Running 'FSCSI Adapter Settings' report.  
Completed.
```

```
(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/fp_report
```

Phase 6: Cleanup

PDOA fixpacks are large and consume a lot of space on the /BCU_share filesystem. This document describes what can be removed after the fixpack is complete. For the most part the /BCU_share filesystem should be able to accommodate PDOA fixpacks through the end of support dates and should only be used for PDOA appliance files. However, it may be necessary to free up space and this is to provide some guidance on what can be cleaned up.

1. The PDOA Fixpack files from IBM Fixcentral. These files do not need to reside on the system after they are unpacked. They should also be retrievable from IBM FixCentral if entitlement is kept up to date and V1.1 is still within its support timeframe. This should be true of all fixpack packages.

- 1.1.0.5-IM-PureData_System_for_OpAnalytics-fp005*.tgz
- 1.1.0.5-IM-PureData_System_for_OpAnalytics-fp005*.tgz.cksum
- 1.1.0.5-IM-PureData_System_for_OpAnalytics-fp005*.tgz.files
-

2. /BCU_share/FP9_FP5

- a. While it is possible to remove the entire unpacked directory to free up space, there are reasons to keep this around for future use. See the next items for more information.

3. Firmware Directory.

- a. /BCU_share/FP9_FP5/firmware

- i. It is not recommended to remove the firmware directories from any of the fixpack unpack sites as they may be needed as part of a hardware repair action to update replacement hardware.

4. Software Unpacked Directories. The software directory increases in size after Db2, Spectrum Scale and TSA components are unpacked. Space can be reclaimed by removing the unpacked images.

- a. Db2 unpack directories can be listed with ls.

```
$ ls -ld /BCU_share/FP9_FP5/software/DB2/*_unpack
drwxr-xr-x  3 root  system      256 Sep 19 18:10
/BCU_share/FP9_FP5/software/DB2/special_41072_aix64_universal_fixpack.tar.gz_unpack
drwxr-xr-x  3 root  system      256 Sep 19 18:10
/BCU_share/FP9_FP5/software/DB2/v10.5fp11_aix64_nlpack.tar.gz_unpack
drwxr-xr-x  3 root  system      256 Sep 19 18:10
/BCU_share/FP9_FP5/software/DB2/v11.1.4fp7_aix64_universal_fixpack.tar.gz_unpack
```

- b. GPFS unpack directories.

```
$ ls -ld /BCU_share/FP9_FP5/software/Spectrum_Scale/*extract
drwxr-xr-x  2 root  system      256 Sep 21 13:37
/BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.0-ppc64-AIX-install.tgz_extract
drwxr-xr-x  2 root  system      256 Sep 21 13:45
/BCU_share/FP9_FP5/software/Spectrum_Scale/Spectrum_Scale_Standard-5.1.1.4-ppc64-AIX-update.tgz_extract
```

- c. TSA unpack directories.

```
$ ls -ld /BCU_share/FP9_FP5/software/TSA/4.1.0.0007
drwxr-xr-x  3 root  system      256 Sep 21 13:54 /BCU_share/FP9_FP5/software/TSA/4.1.0.0007
```

STAGE 9: Completing the fixpack

5. Software Directores. This contains the software components of the update. Generally these are only used during the fixpack, but in some cases it may be useful to keep them around. Also, some customers may want to continue to use some of the fixpack tooling after the fixpack process is over and some directories are needed for that tooling.
 - a. /BCU_share/FP9_FP5/software
 - i. Useful directories to keep.
 1. /BCU_share/FP9_FP5/software/DB2/
 - a. The following directories include some logging info during the fixpack run and also are used by fixpack status tooling.
 - i. log
 - ii. logs
 - b. The following links are used by some of the fixpack status tooling to retrieve Db2 levels.
 - i. rspfiles-> link to /BCU_share/FP9_FP5/fixpack_tools/
 - ii. scripts -> link to /BCU_share/FP9_FP5/fixpack_tools/
 - ii. Useful directories that can be re-extracted from the fixpack tgz file.
 1. /BCU_share/FP9_FP5/software/AIX/NIM
 - a. This directory includes the base images needed to install a NIM server. While PDOA does not formally setup the management standby as a NIM server, it can be used for that purpose.
 2. /BCU_share/FP9_FP5/software/activationCDs
 - a. This directory includes PDOA Db2 activation CDs. Possibility useful if there are issues with Db2 installs in the future where Db2 on PDOA licenses are lost.
 6. Fixpack Tooling. Fixpack tooling is provided as an aid to apply the fixpack. Some of the tools may have value beyond that process. Note that some functions of the fixpack_tools directory require the directories and links listed above in the software/DB2 directory. Always use the fixpack tools from the latest /BCU_share/FP*_FP* directory.
 - a. /BCU_share/FP9_FP5/fixpack_tools.
 7. Fixpack logging.
 - a. V1.1 FP4 is the first fixpack to extensive log activity to /BCU_share/support/FP8_FP4. V1.1 FP5 logs to /BCU_share/support/FP9_FP5. It is recommended to keep this around as it is small and contains a lot of useful information generated during the fixpack.
 - b. V1.1 FP3 and V1.1 FP2 logged directly to their /BCU_share/FP*_FP* directory structure when logging was used, but was not as extensive as the script based logging in FP4.

Fixpack Completed

Fixpack Completed

Once all 9 stages are completed successfully, V1.1 FP5 is successfully completed.

Appendix – I’m Lost

This fixpack is long and it is easy to lose track of where you are. If you ever get lost you can contact IBM Support for help. You can also review the following status commands which can help determine where you are.

1. First step is to login to the management host as the root user.
2. Check to see if there are screen sessions running with screen -ls.

```
$ screen -ls
There are screens on:
 1901400.fppackaging      (Detached)
 2949274.fprun            (Detached)
 3670250.fplug           (Detached)
3 Sockets in /tmp/screens/S-root.
```

3. Access the screen session fprun or whatever you were using to run the fixpack. If using a vtmenu over the console check the console to see if there are clues.
4. Check the screen sessions to see what commands were run. You can engage the scrollback buffer using `<ctrl>-a [` or `<ctrl>-a <esc>`.
5. Check the fplug or whatever you are using to track the log files. See if you were tailing a log or the last log that was checked.
6. Also look at the log directory. You may be able to match the commands listed in the log with the commands in the readme. You can certainly look at more of the logs to see what was done and where you’ve been. The `-lrt` option to `ls` will sort from the earliest to the latest.

```
$ ls -lrt /BCU_share/support/FP9_FP5/log | tail -10
-rw-r--r-- 1 root system 412 Mar 03 20:04 unquiesce_node.sh_kf5hostname06_20210303_200151.log
-rw-r--r-- 1 root system 323 Mar 03 20:04 check_server_state.sh_kf5hostname06_20210303_200455.log
-rw-r--r-- 1 root system 0 Mar 03 20:05 check_server_state.sh_kf5hostname07_20210303_200526.log.stderr
-rw-r--r-- 1 root system 323 Mar 03 20:05 check_server_state.sh_kf5hostname07_20210303_200526.log
-rw-r--r-- 1 root system 0 Mar 03 20:05 check_server_state.sh_kf5hostname07_20210303_200556.log.stderr
-rw-r--r-- 1 root system 17809 Mar 03 20:05 unquiesce_node.sh_kf5hostname07_20210303_200152.log.stderr
-rw-r--r-- 1 root system 412 Mar 03 20:05 unquiesce_node.sh_kf5hostname07_20210303_200152.log
-rw-r--r-- 1 root system 323 Mar 03 20:05 check_server_state.sh_kf5hostname07_20210303_200556.log
-rw-r--r-- 1 root system 0 Mar 04 12:36 check_pflayer_registry.sh_kf5hostname01_20210304_123617.log.stderr
-rw-r--r-- 1 root system 225 Mar 04 12:36 check_pflayer_registry.sh_kf5hostname01_20210304_123617.log
```

7. Check the status of the system with ‘hals’.
8. Check the version status of the system with the following command. Compare the versions with the validated stack to see what is not yet updated.

```
/BCU_share/FP9_FP5/fixpack_tools/status/getVersionStatus.sh
```

9. Check the Stage 7 status. This is a good place to get lost. Stage 7, Phase 6 details how to determine what to do next.

Appendix – Safely removing IJ29552s7b efix after migration.

Description

In some rare cases after migration, the efix IJ29552s7b which was installed in V1.1 FP4 may not be removed during the migration step. If this happens, it is important to avoid attempting to remove the efix without the force option. Doing so will break the AIX installation requiring a restore, see Step 2, item 2 for examples of errors if the force option is not used.

Steps

Step 1: Verifying the efix is invalid.

- 1. Command: View the efix information.

```
emgr -l
```

Example Output: (Shows V1.1 FP4 and V1.1 FP5 efices)

```
$ emgr -l
```

ID	STATE	LABEL	INSTALL TIME	UPDATED BY	ABSTRACT
1	S	IJ29552s7b	05/24/21 14:53:08	IJ29552	LOAD MODULE AUTH ISSUES
2	S	IJ40615m4b	09/19/22 19:46:34	IJ40615	for AIX 7.2 TL5 SP2 SP4
3	S	IJ39876s3a	09/19/22 19:46:49	IJ39876	POTENTIAL SECURITY ISSUE

- 2. Command: Verify the efix is invalid. If the efix is valid then verify the oslevel for the host.

```
emgr -c -L IJ29552s7b
```

Example Output:

```
$ emgr -c -L IJ29552s7b
+-----+
Efix Manager Initialization
+-----+
Initializing log /var/adm/ras/emgr.log ...
Initializing check operation ...

+-----+
EFIX ID: 1
EFIX LABEL: IJ29552s7b
+-----+
Check level is 1.
Accessing efix metadata ...
Checking file number 1: /usr/ccs/lib/libc.a ...
emgr: 0645-022 Checksum mismatch for file /usr/ccs/lib/libc.a.
Expected sum=39000, Actual sum=55377.

emgr: 0645-086 Error checking efix with label "IJ29552s7b"

+-----+
Operation Summary
+-----+
Log file is /var/adm/ras/emgr.log

EFIX NUMBER      LABEL              OPERATION          RESULT
=====
1                IJ29552s7b        CHECK              FAILURE
```

Appendix – Safely removing IJ29552s7b efix after migration.

Return Status: FAILURE

Step 2: Removing the efix.

1. Command: Verify the cksum of the target file for the efix.

```
cksum /usr/ccs/lib/libc.a
```

Example Output:

```
$ cksum /usr/ccs/lib/libc.a
3802005552 13473436 /usr/ccs/lib/libc.a
```

2. Command: Force remove the efix.

```
emgr -F -R IJ29552s7b
```

Example Output:

```
$ emgr -F -R IJ29552s7b
+-----+
Efix Manager Initialization
+-----+
Initializing log /var/adm/ras/emgr.log ...

+-----+
Efix Force Removal
+-----+
emgr: 0645-148 ATTENTION: efix label "IJ29552s7b" is selected for force removal.
The recommended method for removing an installed efix is to use the standard
removal process (-r flag). The force remove option will not delete any of the
efix files, saved data, or execute remove scripts. This option should only
be used if the standard remove process cannot be accomplished.

Force removing efix with label "IJ29552s7b"...

+-----+
Package Locking
+-----+
Processing package unlocking for all files.
File 1: installp fileset bos.rte.libc is already unlocked.

All package locks processed successfully.

+-----+
Operation Summary
+-----+
emgr: 0645-140 ATTENTION: emgr has issued 1 attention notice(s).
Such notices may not indicate an immediate failure, but may require
further attention. Please see the output above or the log for more details.

Log file is /var/adm/ras/emgr.log

EFIX NUMBER      LABEL              OPERATION          RESULT
=====
1                IJ29552s7b        FORCE REMOVE       SUCCESS

Return Status = SUCCESS
```

Example Output: (Shows output if the -F -R options are not used and results in an error)

```
$ emgr -r -L IJ29552s7b
+-----+
Efix Manager Initialization
+-----+
Initializing log /var/adm/ras/emgr.log ...
Accessing efix metadata ...
Processing efix label "IJ29552s7b" ...

+-----+
Efix Attributes
+-----+
LABEL:           IJ29552s7b
INSTALL DATE:    05/24/21 14:53:08
STATE:           STABLE
ABSTRACT:        IJ29552 LOAD MODULE AUTH ISSUES
PACKAGER VERSION: 7
VUID:            00F7CD554C00120915123120
REBOOT REQUIRED:  yes
```


Appendix – Safely removing IJ29552s7b efix after migration.

```
BUILD BOOT IMAGE: yes
LU CAPABLE:      no
PRE-REQUISITES:  yes
SUPERSEDE:      no
PACKAGE LOCKS:   no
EZE PREREQS:     no
FIX TESTED:      no
ALTERNATE PATH:  None
EFIX FILES:      1

Install Scripts:
  PRE_INSTALL:    no
  POST_INSTALL:   no
  PRE_REMOVE:     no
  POST_REMOVE:    no

File Number:     1
LOCATION:          /usr/ccs/lib/libc.a
FILE TYPE:       Standard (file or executable)
INSTALLER:       installp
SIZE:            25264
ACL:             DEFAULT
CKSUM:           39000
PACKAGE:         bos.rte.libc
MOUNT INST:      no

+-----+
Efix Description
+-----+
IJ29552 - some lam module logins break at latest service packs

+-----+
Space Requirements
+-----+
Checking space requirements ...

Space statistics (in 512 byte-blocks):
File system: /usr, Free: 13775280, Required: 30516, Deficit: 0.
File system: /tmp, Free: 10067928, Required: 66901, Deficit: 0.

+-----+
Efix State
+-----+
Setting efix state to: REMOVING

+-----+
Package Locking
+-----+
Processing package unlocking for all files.
File 1: installp fileset bos.rte.libc is already unlocked.

All package locks processed successfully.

+-----+
Efix File Removal
+-----+
Setting up for removal of efix files ...
Removing all efix files (in reverse order of installation):
Removing efix file #1 (File: /usr/ccs/lib/libc.a) ...
Successfully updated the Kernel Authorization Table.
Successfully updated the Kernel Role Table.
Successfully updated the Kernel Command Table.
Successfully updated the Kernel Device Table.
Successfully updated the Kernel Object Domain Table.
Successfully updated the Kernel Domains Table.
Successfully updated the Kernel RBAC log level.
/usr/sbin/emgr[321]: 0509-036: 0403-012 A test command parameter is not valid.
Could not load program /usr/bin/df:
Symbol resolution failed for df because:
    Symbol liveupdate_operations (number 11) is not exported from dependent
    module /usr/lib/libc.a(shr.o).
Examine .loader section symbols with the 'dump -Tv' command.
emgr: 0645-007 ATTENTION: whichfs() returned an unexpected result.
emgr: 0645-007 ATTENTION: check fdup_space() returned an unexpected result.
emgr: 0645-069 Error deleting file from efix database.
Label="IJ29552s7b", File="1".
emgr: 0645-054 Error removing efix file number 1.
emgr: 0645-058 Removal of efix has failed.

+-----+
Efix State
+-----+
Setting efix state to: BROKEN
Could not load program /usr/bin/df:
Symbol resolution failed for df because:
    Symbol liveupdate_operations (number 11) is not exported from dependent
    module /usr/lib/libc.a(shr.o).
Examine .loader section symbols with the 'dump -Tv' command.
```

Appendix – Safely removing IJ29552s7b efex after migration.

```
emgr: 0645-007 ATTENTION: whichfs() returned an unexpected result.
emgr: 0645-007 ATTENTION: check_fdup_space() returned an unexpected result.
emgr: 0645-079 Error changing efex state.

+-----+
| Operation Summary |
+-----+
Log file is /var/adm/ras/emgr.log

EFIX NUMBER      LABEL              OPERATION          RESULT
=====
1                IJ29552s7b        REMOVE            FAILURE

Return Status: FAILURE
```

3. Command: Verify the efex is removed. Only two efexes should remain.

```
emgr -l
```

Example Output:

```
$ emgr -l

ID  STATE LABEL          INSTALL TIME          UPDATED BY ABSTRACT
=== ===
1   S    IJ40615m4b 09/19/22 19:46:34    IJ40615 for AIX 7.2 TL5 SP2 SP4
2   S    IJ39876s3a 09/19/22 19:46:49    IJ39876 POTENTIAL SECURITY ISSUE

STATE codes:
S = STABLE
M = MOUNTED
U = UNMOUNTED
Q = REBOOT REQUIRED
B = BROKEN
I = INSTALLING
R = REMOVING
T = TESTED
P = PATCHED
N = NOT PATCHED
SP = STABLE + PATCHED
SN = STABLE + NOT PATCHED
QP = BOOT IMAGE MODIFIED + PATCHED
QN = BOOT IMAGE MODIFIED + NOT PATCHED
RQ = REMOVING + REBOOT REQUIRED
```

4. Command: Verify the cksum of the target file has not changed after the efex was removed.

```
cksum /usr/ccs/lib/libc.a
```

Example Output:

```
$ cksum /usr/ccs/lib/libc.a
3802005552 13473436 /usr/ccs/lib/libc.a
```

Appendix – Apply efices if missing on a node.

Description:

During migration with AIX 7.2 TL5 SP4 images it was possible for the `nimadm` command to forget to apply the efices from the `installp` bundle. While the migration scripting is designed to address this, it is possible to manually apply the efices after a migration step is completed. This has only occurred in the lab during parallel migrations which only happens during Stage 7.

Steps:

Step 1: Checking the server

1. Command: Verify the `oslevel` of the server. The server should be migrated and show 7200-05-04-2220. Login to the server as root.

```
oslevel -s
```

Example Output:

```
$ oslevel -s
7200-05-04-2220
```

2. Command: Verify the efice is missing. This command is run from the `fprun` screen session on the management host. Replace `reverseflash04` in the command below with the hostname of the server in question. If the missing fixes are on the management host, also replace `${BCUMGMT}` with `${BCUMGMTSTDBY}`.

```
./migrate_aix72.sh -validateefices -server reverseflash04 -nimserver ${BCUMGMT}
```

Example Output: (Look for the efice is not installed for both efices.)

```
$ ./migrate_aix72.sh -validateefices -server reverseflash04 -nimserver ${BCUMGMT}
20220825_122029 (reverseflash01:migrate_aix72.sh): Starting date: Thu Aug 25 12:20:29 EDT 2022.
20220825_122029 (reverseflash01:migrate_aix72.sh): Arguments '-validateefices
20220825_122029 (reverseflash01:migrate_aix72.sh): Setting operation to 'validate_efices'.
20220825_122029 (reverseflash01:migrate_aix72.sh): Processing server.
20220825_122029 (reverseflash01:migrate_aix72.sh): Setting targetserver to 'reverseflash04'.
20220825_122029 (reverseflash01:migrate_aix72.sh): Processing nimserver.
20220825_122029 (reverseflash01:migrate_aix72.sh): Setting nimserver to 'reverseflash01mgt'.
20220825_122029 (reverseflash01:migrate_aix72.sh): Checktype '' is not 'defined' nor is it 'target'. Setting to 'target.'
20220825_122029 (reverseflash01:migrate_aix72.sh): Verifying that that the installp bundle '7200-05-02-2113_ifices_bnd'
exists on 'reverseflash01mgt'.
7200-05-02-2113_ifices_bnd:
  class      = resources
  type       = installp_bundle
  Rstate     = ready for use
  prev_state = unavailable for use
  location   = /pdoa_nimrestore/installp_bundle/7200-05-02-2113_ifices.bnd
  alloc_count = 0
  server     = master
20220825_122029 (reverseflash01:migrate_aix72.sh): 'lsnm -l 7200-05-02-2113_ifices_bnd' returned '0'.
20220825_122029 (reverseflash01:migrate_aix72.sh): The bundle '7200-05-02-2113_ifices_bnd' exists on the NIM server.
20220825_122029 (reverseflash01:migrate_aix72.sh): Loading information for '7200-05-02-2113_ifices_bnd' from
'reverseflash01mgt'.
20220825_122031 (reverseflash01:migrate_aix72.sh): Found header is
'name:class:type:Rstate:prev_state:location:alloc_count:server:'.
20220825_122031 (reverseflash01:migrate_aix72.sh): Found content is '7200-05-02-
2113_ifices_bnd:resources:installp_bundle:ready for use:unavailable for use:/pdoa_nimrestore/installp_bundle/7200-05-02-
2113_ifices_bnd:0:master:'.
20220825_122031 (reverseflash01:migrate_aix72.sh): Looking for index of 'location' from the header.
```

Appendix – Apply efixes if missing on a node.

```
20220825_122031 (reverseflash01:migrate_aix72.sh): The 'location' of the bundle on the nimserver is
'/pdoa_nimrestore/installp_bundle/7200-05-02-2113_ifixes.bnd'.
20220825_122031 (reverseflash01:migrate_aix72.sh): Found the following efixes in the bundle:
IJ40615m4b
IJ39876s3a

20220825_122031 (reverseflash01:migrate_aix72.sh): Verifying if 'IJ40615m4b' is installed in the target.
20220825_122033 (reverseflash01:migrate_aix72.sh): The efix 'IJ40615m4b' is not installed.
20220825_122033 (reverseflash01:migrate_aix72.sh): Verifying if 'IJ39876s3a' is installed in the target.
20220825_122034 (reverseflash01:migrate_aix72.sh): The efix 'IJ39876s3a' is not installed.
20220825_122034 (reverseflash01:migrate_aix72.sh): One or more efixes in the bundle were not found on the target server.
20220825_122034 (reverseflash01:migrate_aix72.sh): Successfully completed.
20220825_122034 (reverseflash01:migrate_aix72.sh): Script './migrate_aix72.sh' with arguments '-validateefixes -server
reverseflash04 -nimserver reverseflash01mgt' ended with rc='2'. Start: Thu Aug 25 12:20:29 EDT 2022 End: Thu Aug 25 12:20:34
EDT 2022. Elapsed Time (Seconds): 5 (H:M:S):(00:00:05).
20220825_122034 (reverseflash01:migrate_aix72.sh): Normalizing management hostname.
20220825_122035 (reverseflash01:migrate_aix72.sh): Management hostname is 'reverseflash01'.
20220825_122035 (reverseflash01:migrate_aix72.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from
script './migrate_aix72.sh'.' to 'user@company.com' '-c root@localhost'.
20220825_122035 (reverseflash01:migrate_aix72.sh): Notification sent.

(2) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

3. Command: Apply the efixes for the host. Replace *reverseflash04* with the target server.

```
./migrate_aix72.sh -applyefixes -server reverseflash04 -nimserver ${BCUMGMT}
```

Example Output:

```
$ chmod u+x migrate_aix72.sh;./migrate_aix72.sh -applyefixes -server reverseflash04 -nimserver ${BCUMGMT}
20220825_152227 (reverseflash01:migrate_aix72.sh): Starting date: Thu Aug 25 15:22:27 EDT 2022.
20220825_152227 (reverseflash01:migrate_aix72.sh): Arguments '-applyefixes
20220825_152227 (reverseflash01:migrate_aix72.sh): Setting operation to 'apply_efixes'.
20220825_152227 (reverseflash01:migrate_aix72.sh): Processing server.
20220825_152227 (reverseflash01:migrate_aix72.sh): Setting targetserver to 'reverseflash04'.
20220825_152227 (reverseflash01:migrate_aix72.sh): Processing nimserver.
20220825_152227 (reverseflash01:migrate_aix72.sh): Setting nimserver to 'reverseflash01mgt'.
20220825_152228 (reverseflash01:migrate_aix72.sh): Verify 'reverseflash04' is registered as a nim object in
'reverseflash01mgt'.
20220825_152228 (reverseflash01:migrate_aix72.sh): Found the following standalone servers in nim 'adminnode_2
datanode_6
stdbnode_3
stdbnode_4
stdbnode_5'.
20220825_152228 (reverseflash01:migrate_aix72.sh): Checking nim label 'adminnode_2' for 'reverseflash04' or
'reverseflash04mgt'.
adminnode_2:
  class      = machines
  type       = standalone
  comments   = 172.23.1.2 reverseflash02
  installed_image = BCUbase
  connect    = shell
  platform   = chrp
  netboot_kernel = 64
  if1        = master_net reverseflash02mgt 0 ent0
  cable_type1 = bnc
  Cstate     = ready for a NIM operation
  prev_state = not running
  Mstate     = currently running
  cpuid      = 00FA574D4C00
  Cstate_result = success
20220825_152229 (reverseflash01:migrate_aix72.sh): Checking nim label 'datanode_6' for 'reverseflash04' or
'reverseflash04mgt'.
datanode_6:
  class      = machines
  type       = standalone
  comments   = 172.23.1.6 reverseflash06
  installed_image = BCUbase
  connect    = shell
  platform   = chrp
  netboot_kernel = 64
  if1        = master_net reverseflash06mgt 0 ent0
  cable_type1 = bnc
  Cstate     = ready for a NIM operation
  prev_state = currently running
  Mstate     = not running
  cpuid      = 00FA557D4C00
  Cstate_result = success
20220825_152230 (reverseflash01:migrate_aix72.sh): Checking nim label 'stdbnode_3' for 'reverseflash04' or
'reverseflash04mgt'.
stdbnode_3:
  class      = machines
  type       = standalone
  comments   = 172.23.1.3 reverseflash03
  installed_image = BCUbase
```

Appendix – Apply efibes if missing on a node.

```
connect          = shell
platform         = chrp
netboot_kernel   = 64
if1              = master_net reverseflash03mgt 0 ent0
cable_type1      = bnc
Cstate           = ready for a NIM operation
prev_state       = not running
Mstate           = currently running
cpuid            = 00FA574E4C00
Cstate_result    = reset
20220825_152232 (reverseflash01:migrate_aix72.sh): Checking nim label 'stdbnode_4' for 'reverseflash04' or
'reverseflash04mgt'.
stdbnode_4:
class            = machines
type             = standalone
comments         = 172.23.1.4 reverseflash04
installed_image  = BCUbase
connect         = shell
platform        = chrp
netboot_kernel   = 64
if1              = master_net reverseflash04mgt 0 ent0
cable_type1      = bnc
Cstate           = ready for a NIM operation
prev_state       = not running
Mstate           = currently running
cpuid            = 00FA574E4C00
Cstate_result    = reset
20220825_152233 (reverseflash01:migrate_aix72.sh): Found 'reverseflash04' in nimlabel 'stdbnode_4'.
20220825_152233 (reverseflash01:migrate_aix72.sh): 'reverseflash04' is registered in NIM server 'reverseflash01mgt' with nim
name 'stdbnode_4'.
20220825_152233 (reverseflash01:migrate_aix72.sh): Verifying if efibes are needed.
20220825_152233 (reverseflash01:migrate_aix72.sh): Verifying that that the installp bundle '7200-05-02-2113_ifibes_bnd'
exists on 'reverseflash01mgt'.
7200-05-02-2113_ifibes_bnd:
class            = resources
type             = installp_bundle
Rstate           = ready for use
prev_state       = unavailable for use
location         = /pdoa_nimrestore/installp_bundle/7200-05-02-2113_ifibes.bnd
alloc_count      = 0
server           = master
20220825_152233 (reverseflash01:migrate_aix72.sh): 'lsnim -l 7200-05-02-2113_ifibes_bnd' returned '0'.
20220825_152234 (reverseflash01:migrate_aix72.sh): The bundle '7200-05-02-2113_ifibes_bnd' exists on the NIM server.
20220825_152234 (reverseflash01:migrate_aix72.sh): Loading information for '7200-05-02-2113_ifibes_bnd' from
'reverseflash01mgt'.
20220825_152235 (reverseflash01:migrate_aix72.sh): Found header is
'name:class:type:Rstate:prev_state:location:alloc_count:server:'.
20220825_152235 (reverseflash01:migrate_aix72.sh): Found content is '7200-05-02-
2113_ifibes_bnd:resources:installp_bundle:ready for use:unavailable for use:/pdoa_nimrestore/installp_bundle/7200-05-02-
2113_ifibes_bnd:0:master:'.
20220825_152235 (reverseflash01:migrate_aix72.sh): Looking for index of 'location' from the header.
20220825_152235 (reverseflash01:migrate_aix72.sh): The 'location' of the bundle on the nimserver is
'/pdoa_nimrestore/installp_bundle/7200-05-02-2113_ifibes.bnd'.
20220825_152235 (reverseflash01:migrate_aix72.sh): Found the following efibes in the bundle:
IJ40615m4b
IJ39876s3a

20220825_152235 (reverseflash01:migrate_aix72.sh): Verifying if 'IJ40615m4b' is installed in the target.
20220825_152237 (reverseflash01:migrate_aix72.sh): The efib 'IJ40615m4b' is not installed.
20220825_152237 (reverseflash01:migrate_aix72.sh): Verifying if 'IJ39876s3a' is installed in the target.
20220825_152238 (reverseflash01:migrate_aix72.sh): The efib 'IJ39876s3a' is not installed.
20220825_152238 (reverseflash01:migrate_aix72.sh): One or more efibes in the bundle were not found on the target server.
20220825_152238 (reverseflash01:migrate_aix72.sh): rc='2'.
20220825_152238 (reverseflash01:migrate_aix72.sh): A bundle is defined however the efibes are not applied.
20220825_152238 (reverseflash01:migrate_aix72.sh): Attempting to apply efibes using 'nim -o cust -a lpp_source=7200-05-02-
2113 -a fix_bundle=7200-05-02-2113_ifibes_bnd -a installp_flags=gXY stdbnode_4'.

Initializing log /var/adm/ras/emgr.log ...
EPKG NUMBER      LABEL                OPERATION                RESULT
=====
1                IJ40615m4b                INSTALL                SUCCESS
2                IJ39876s3a                INSTALL                SUCCESS

Return Status = SUCCESS
20220825_152317 (reverseflash01:migrate_aix72.sh): 'nim -o cust -a lpp_source=7200-05-02-2113 -a fix_bundle=7200-05-02-
2113_ifibes_bnd -a installp_flags=gXY stdbnode_4' returned rc='0'.
20220825_152317 (reverseflash01:migrate_aix72.sh): Verifying that that the installp bundle '7200-05-02-2113_ifibes_bnd'
exists on 'reverseflash01mgt'.
7200-05-02-2113_ifibes_bnd:
class            = resources
type             = installp_bundle
Rstate           = ready for use
prev_state       = unavailable for use
location         = /pdoa_nimrestore/installp_bundle/7200-05-02-2113_ifibes.bnd
alloc_count      = 0
server           = master
20220825_152318 (reverseflash01:migrate_aix72.sh): 'lsnim -l 7200-05-02-2113_ifibes_bnd' returned '0'.
20220825_152318 (reverseflash01:migrate_aix72.sh): The bundle '7200-05-02-2113_ifibes_bnd' exists on the NIM server.
```

Appendix – Apply efixes if missing on a node.

```
20220825_152318 (reverseflash01:migrate_aix72.sh): Loading information for '7200-05-02-2113_ifixes_bnd' from
'reverseflash01mgt'.
20220825_152319 (reverseflash01:migrate_aix72.sh): Found header is
'name:class:type:Rstate:prev_state:location:alloc_count:server:'.
20220825_152319 (reverseflash01:migrate_aix72.sh): Found content is '7200-05-02-
2113_ifixes_bnd:resources:installp_bundle:ready for use:unavailable for use:/pdoa_nimrestore/installp_bundle/7200-05-02-
2113_ifixes_bnd:0:master:'.
20220825_152319 (reverseflash01:migrate_aix72.sh): Looking for index of 'location' from the header.
20220825_152319 (reverseflash01:migrate_aix72.sh): The 'location' of the bundle on the nimserver is
'/pdoa_nimrestore/installp_bundle/7200-05-02-2113_ifixes_bnd'.
20220825_152320 (reverseflash01:migrate_aix72.sh): Found the following efixes in the bundle:
IJ40615m4b
IJ39876s3a

20220825_152320 (reverseflash01:migrate_aix72.sh): Verifying if 'IJ40615m4b' is installed in the target.
20220825_152321 (reverseflash01:migrate_aix72.sh): The efix 'IJ40615m4b' is installed.
20220825_152321 (reverseflash01:migrate_aix72.sh): Verifying if 'IJ39876s3a' is installed in the target.
20220825_152323 (reverseflash01:migrate_aix72.sh): The efix 'IJ39876s3a' is installed.
20220825_152323 (reverseflash01:migrate_aix72.sh): All efixes in the bundle were found on the target server.
20220825_152323 (reverseflash01:migrate_aix72.sh): Checking if a reboot is needed for efixes.
20220825_152323 (reverseflash01:migrate_aix72.sh): Checking ifix states to see if a reboot is required.
20220825_152324 (reverseflash01:migrate_aix72.sh): Found ifix states 'S
S'.
20220825_152324 (reverseflash01:migrate_aix72.sh): No reboots are required. Returning '0'.
20220825_152324 (reverseflash01:migrate_aix72.sh): Fixes are either not needed, applied, or were applied successfully. If a
reboot was needed that was also performed.
20220825_152324 (reverseflash01:migrate_aix72.sh): Successfully completed.
20220825_152324 (reverseflash01:migrate_aix72.sh): Script './migrate_aix72.sh' with arguments '-applyefixes -server
reverseflash04 -nimserver reverseflash01mgt' ended with rc=0'. Start: Thu Aug 25 15:22:27 EDT 2022 End: Thu Aug 25 15:23:24
EDT 2022. Elapsed Time (Seconds): 57 (H:M:S):(00:00:57).
20220825_152324 (reverseflash01:migrate_aix72.sh): Normalizing management hostname.
20220825_152324 (reverseflash01:migrate_aix72.sh): Management hostname is 'reverseflash01'.
20220825_152324 (reverseflash01:migrate_aix72.sh): Sending notification 'Message from PDOA fixpack on 'reverseflash01' from
script './migrate_aix72.sh'.' to 'user@customer.com' '-c root@localhost'.
20220825_152324 (reverseflash01:migrate_aix72.sh): Notification sent.
You have mail in /usr/spool/mail/root

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

4. Command: Verify that the efixes were applied on the target host. Login as root on the target host.

```
emgr -l
```

Example Output: (Should see only the two efixes)

```
$ emgr -l
```

ID	STATE	LABEL	INSTALL TIME	UPDATED BY	ABSTRACT
1	S	IJ40615m4b	09/12/22 16:32:09		IJ40615 for AIX 7.2 TL5 SP2 SP4
2	S	IJ39876s3a	09/12/22 16:32:21		IJ39876 POTENTIAL SECURITY ISSUE

STATE codes:

```
S = STABLE
M = MOUNTED
U = UNMOUNTED
Q = REBOOT REQUIRED
B = BROKEN
I = INSTALLING
R = REMOVING
T = TESTED
P = PATCHED
N = NOT PATCHED
SP = STABLE + PATCHED
SN = STABLE + NOT PATCHED
QP = BOOT IMAGE MODIFIED + PATCHED
QN = BOOT IMAGE MODIFIED + NOT PATCHED
RQ = REMOVING + REBOOT REQUIRED
```

Appendix – Quiescing PDOA

In PDOA V1.1 FP1 IF01 the concept of quiescing hosts in PDOA was introduced. This was the pre-cursor to the new fixpack model and enables a customer to create plans to help reduce the amount of downtime in outage windows by utilizing the HA and redundant features of the appliance. It is important to understand these concepts and where they are used in this fixpack.

PDOA is an appliance which has many components. One way to view this appliance is through a hierarchical structure.

- Services
 - Db2 DPF Database
 - TSA Domains
 - Spectrum Scale Clusters
 - AIX Hosts (LPARs)
 - OPM Application
 - TSA Domain
 - Spectrum Scale Clusters
 - AIX Hosts (LPARs)

During the update, there may be a need to quiesce a component. This is usually one of the following levels:

- A single AIX Host (LPAR)
- Management Hosts
- Core Hosts
- All Hosts

This fixpack provides two scripts, `quiesce.sh` and `unquiesce.sh` to help manage hosts at the host level by bringing them out of and into service as needed. These are used to prepare a standby host for an update or to restore a standby host to service. These tools are used in Stage 6 and Stage 7.

Quiescing a host.

When a host is requested to quiesce the tool will check to see if it is a current host of any services. Here is the progression of steps.

- Hosting a service.
 - Yes. Quiesce fails. User will need to stop or failover the service.
 - No. Continue to removing the node from a domain.
- Active in a TSA Domain.
 - Yes. Forces the node down using `stopprnode -f`.
 - No. Continues to Spectrum Scale quiesce.
- Active in Spectrum Scale Cluster.
 - Has mounted Spectrum Scale filesystems.
 - Yes. Attempts to unmount filesystems. If unsuccessful quiesce fails. If successful, proceeds to remove host from Cluster.

Appendix – Quiescing PDOA

- No. Proceed to remove host from Cluster.
- Removes node from cluster.
 - Spectrum Scale will reassign cluster cfg duties, NSD service and filesystem management to another node.

When these steps are completed the host is considered quiesced and ready for updates.

Unquiescing a host.

When a host is unquiesced, the process is reversed.

- Is it part of a spectrum scale cluster?
 - Yes. Continue to filesystem mounts.
 - No. Start with mmstartup. If starts successfully proceed to filesystems mounts.
- Verify all filesystems defined are mounted.
 - Yes. Proceed to domain unquiesce steps.
 - No. Issue mmmount all. Check until all expected filesystems are mounted. If not, then fail else proceed to domain unquiesce.
- Is online in domain?
 - Yes. Return success.
 - No. Contact another online node in the domain and attempt to start. If no other nodes are online the fail. If start succeeds, return success.

Quiescing an appliance or management or core nodes. See Stage 8 Phase 1 for details.

When the appliance is quiesced, the steps are like the host level steps, however they are done at the appliance level. This is typically done as part of Stage 8 or a part of a full system outage.

- Stop all services, hastopapp (V1.1 FP1), hastopdpm, hastopdb2.
- Stop all domains at the scope (appliance, management or core). 'hdomain -core stop', 'hdomain -mgmt stop'
- Unmount all filesystems on all hosts within the scope.
 - Note that /stage, /db2home and /dwhome are hosted bcudomain01 and shared with all other domains including the management domain. Therefore the management domain is normally quiesced along with the core domains. It is possible to just unmount /stage, /db2home and /dwhome on the management hosts before quiescing the core domain, however this is usually not necessary as the management domains are only useful when the core domains are online.
- Shutdown GPFS on all hosts.

At this the point the appliance is quiesced. All hosts are accessible but updates or appliance wide service can be engaged. The only host at this point access the SANs and the Foundation V7000 is the management host. This is to access '/BCU_share, /BCU_share/securefs, and /pscfs'.

Unquiescing the appliance.

When unquiescing the appliance it is important to follow the steps.

- Start GPFS on all hosts.
 - If a host is rebooted, GPFS is started automatically on that host and will either start the cluster if it is a configuration host and the cluster is not started or attempt to join a cluster.
- Mount GPFS filesystems on all hosts. Ensure all filesystems are mounted before starting the TSA domains.
- Start the TSA domains.
 - If a node is shutdown and the TSA domain was online at the time, then TSA will start when the node starts. This can create churn with GPFS if all hosts in a domain are rebooted at the same time in this state. This churn can lead to long delays to mount all the storage or even lead to failures that may not be resolved without intervention.
- Start the services.

Appendix – Backup rootvg volume group

Backup steps for OS root volume group using alt_disk_install mechanism

This fixpack includes a script to help manage rootvg in PDOA environments. However, if there is a need to manually clone rootvg these instructions were used in previous fixpacks to do the cloning and are provided here for reference

This procedure creates a copy of the rootvg volume group prior to the OS update. The primary purpose of this procedure is to provide a quick way to recover the host if there are issues or failures during the AIX update. Please note that this step will remove the redundancy protection for rootvg so it is highly encouraged to take a mksysb prior to this step.

Backup activities can be performed without any disruption to the Datawarehouse activities. It can be performed on all the servers in parallel too.

Ideal case hdisk0 and hdisk1 will be part of the root volume group. Please note that it is possible that the hdisk numbering may not match what is seen in the example nor the hdisk roles, therefore it is important to check this for every host in the environment. In case hdisk0 is the boot device then rootvg mirroring would have been done on hdisk1. Backup mechanism involves unmirroring the rootvg volume group, removing the secondary disk from rootvg volume group and then cloning the existing rootvg on the secondary disk. Steps involved are below.

a. Identify the boot device and secondary disk

```
$ getconf -a |grep BOOT_DEVICE
BOOT_DEVICE: hdisk0
```

```
$ lspv|grep rootvg
hdisk0 00fa574d3debf33a rootvg active
hdisk1 00fa574d471862e3 rootvg active
```

Here in the above case bootdevice is hdisk0 and secondary disk is hdisk1

b. Unmirror the rootvg volume group. Unmirrorvg would take around 30 seconds for completion.

```
$ unmirrorvg rootvg hdisk1
0516-1246 rmlvcopy: If hd5 is the boot logical volume, please run 'chpv -c <diskname>'
as root user to clear the boot record and avoid a potential boot
off an old boot image that may reside on the disk from which this
logical volume is moved/removed.
0516-1804 chvg: The quorum change takes effect immediately.
0516-1144 unmirrorvg: rootvg successfully unmirrored, user should perform
bosboot of system to reinitialize boot records. Then, user must modify
bootlist to just include: hdisk0.
```

Use the chpv command to ensure that there is no data from rootvg on the secondary disk. In this example the secondary disk identified in step 1 is hdisk1.

```
$ chpv -c hdisk1
```

Use the lspv command to verify that both the primary and secondary disks are still part of rootvg.

Migrate any other volumes that are present on the alternate disk to the boot disk using migratepv command. It takes some time if there are volumes to be moved otherwise comes out fast.

```
$ /usr/sbin/migratepv hdisk1 hdisk0
```

Appendix – Backup rootvg volume group

\$ lspv

```
hdisk0 00f9803f1ea37916 rootvg active
hdisk1 00f9803f20ae9999 rootvg active
hdisk2 00f9803f14f2c194 vgpscfs active
hdisk3 none nsdappsvr
hdisk4 00f9803f13519838 vgbcushare active
hdisk5 none gpfs
hdisk6 none gpfs
hdisk7 none nsdopm
hdisk8 none gpfs
```

c. Verify with lsvg that there are no duplicate partitions, unmirroring is completed.

\$ lsvg -M rootvg|grep hdisk1

```
hdisk1:1-532
```

d. Remove the secondary disk from rootvg volume group using reducevg

\$ reducevg rootvg hdisk1

\$ lspv

```
hdisk0 00f9803f1ea37916 rootvg active
hdisk1 00f9803f20ae9999 None
hdisk2 00f9803f14f2c194 vgpscfs active
hdisk3 none nsdappsvr
hdisk4 00f9803f13519838 vgbcushare active
hdisk5 none gpfs
hdisk6 none gpfs
hdisk7 none nsdopm
hdisk8 none gpfs
```

e. Clone the rootvg disk on the secondary disk.

Alt_disk_install command is a long running command so budget up to three hours for each host, once that is successful we can check altinst_rootvg on the secondary disk using lspv command. It takes around 30 mins for the management node, 10 mins for the management standby node.

\$ alt_disk_install -C -D hdisk1

\$ lspv

```
hdisk0 00f9803f1ea37916 rootvg active
hdisk1 00f9803f20ae9999 altinst_rootvg
hdisk2 00f9803f14f2c194 vgpscfs active
hdisk3 none nsdappsvr
hdisk4 00f9803f13519838 vgbcushare active
hdisk5 none gpfs
hdisk6 none gpfs
hdisk7 none nsdopm
hdisk8 none gpfs
```

f. Append the hdisk1 to current bootlist (hdisk0 is bootdisk and hdisk1 is alternate disk) using bootlist command

\$ bootlist -m normal hdisk0 hdisk1

\$ bootlist -m normal -o

```
hdisk0 blv=hd5 pathid=0
hdisk1 blv=hd5 pathid=0
```


Appendix – Restoring rootvg mirrors

This fixpack provides a tool to manage the rootvg mirrors. However, in case it is needed, the following steps were used in V1.1 FP3 and FP2 readmes to remirror rootvg. This is provided for reference and may not be used as part of the fixpack process.

1. Check lspv to verify the disk with altinst_rootvg:

```
$ lspv
hdisk0 00f9803f1ea37916 rootvg active
hdisk1 00f9803f20aeee99 altinst_rootvg
hdisk2 00f9803f14f2c194 vgpscfs active
hdisk3 none nsdappsvr
hdisk4 00f9803f13519838 vgbcushare active
hdisk5 none gpfs
hdisk6 none gpfs
hdisk7 none nsdopm
hdisk8 none gpfs
```

2. Execute alt_disk_install -X to remove the clone volume group (altinst_rootvg):

```
$ alt_disk_install -X altinst_rootvg
+-----+
ATTENTION: calling new module /usr/sbin/alt_rootvg_op. Please see the alt_rootvg_op man page
and documentation for more details.
Executing command: {/usr/sbin/alt_rootvg_op -X altinst_rootvg}
+-----+
Bootlist is set to the boot disk: hdisk0 blv=hd5
```

3. Verify lspv to check the disk is freed which was earlier allocated:

```
$ lspv
hdisk0 009803f1ea37916 rootvg active
hdisk1 00f9803f20aeee99 None
hdisk2 00f9803f14f2c194 vgpscfs active
hdisk3 none nsdappsvr
hdisk4 00f9803f13519838 vgbcushare active
hdisk5 none gpfs
hdisk6 none gpfs
hdisk7 none nsdopm
hdisk8 none gpfs
(0) root @ kf5hostname01: 7.1.0.0: /
```

4. Allocate the hdisk that was assigned to altinst_rootvg in (a) to rootvg. In this example the disk is hdisk1.

```
$ extendvg -f rootvg hdisk1
```

```
$ lspv
hdisk0 00f9803f1ea37916 rootvg active
hdisk1 00f9803f20aeee99 rootvg active
hdisk2 00f9803f14f2c194 vgpscfs active
hdisk3 none nsdappsvr
hdisk4 00f9803f13519838 vgbcushare active
hdisk5 none gpfs
hdisk6 none gpfs
hdisk7 none nsdopm
hdisk8 none gpfs
root @ kf5hostname01: 7.1.0.0: /
```

Appendix – Restoring rootvg mirrors

5. Mirror the rootvg volume group on the new disk: This command will take on average a few hours to run for standard PDOA systems. For systems that have allocated additional space in rootvg expect longer remirroring times. Use nohup to allow your session to close without interrupting the command

```
$ nohup mirrorvg rootvg hdisk1 &
0516-1804 chvg: The quorum change takes effect immediately
0516-1126 mirrorvg: rootvg successfully mirrored, user should perform
bosboot of system to initialize boot records. Then, user must modify
bootlist to include: hdisk1 hdisk0.
#
```

To check if mirrorvg is still running there are two commands to see the process and impact of the process. Assuming it does take one to three hours we can estimate the time by looking at column 6 in the ps output. Once the mirrorvg processes are complete, continue to the next step. These commands are run as root from any host. The second command assumes hdisk0 and hdisk1 are the internal disks for which there are edge cases where this may not be so.

```
$ dsh -n $(ALL) 'ps -ef | grep mirrorvg | grep -v grep' | sort
stgkf301: root 12779726 3998130 0 17:15:55 pts/0 0:00 /bin/ksh /usr/sbin/mirrorvg rootvg hdisk1
stgkf302: root 5308760 1 0 17:22:47 - 0:00 /bin/ksh /usr/sbin/mirrorvg rootvg hdisk1
stgkf303: root 7995436 1 0 17:30:52 - 0:00 /bin/ksh /usr/sbin/mirrorvg rootvg hdisk1
stgkf304: root 6160434 1 0 17:35:45 - 0:00 /bin/ksh /usr/sbin/mirrorvg rootvg hdisk1
stgkf305: root 5308462 1 0 17:34:25 - 0:00 /bin/ksh /usr/sbin/mirrorvg rootvg hdisk1
stgkf308: root 9306484 1 0 17:37:23 - 0:00 /bin/ksh /usr/sbin/mirrorvg rootvg hdisk1
```

```
$ dsh -n $(ALL) 'for disk in hdisk0 hdisk1;do iostat -d ${disk} 1 1 | tail -1;done'
stgkf301: hdisk0 95.0 75776.0 74.0 75776 0
stgkf301: hdisk1 95.0 79872.0 78.0 0 79872
stgkf305: hdisk0 95.0 79872.0 78.0 79872 0
stgkf305: hdisk1 88.0 76804.0 76.0 0 76804
stgkf308: hdisk0 100.0 77824.0 76.0 77824 0
stgkf308: hdisk1 100.0 77824.0 76.0 0 77824
stgkf302: hdisk0 90.0 72704.0 71.0 72704 0
stgkf302: hdisk1 80.0 76800.0 75.0 0 76800
stgkf304: hdisk0 100.0 79872.0 78.0 79872 0
stgkf304: hdisk1 100.0 79872.0 78.0 0 79872
stgkf303: hdisk0 97.0 66568.0 67.0 66560 8
stgkf303: hdisk1 85.0 77824.0 76.0 0 77824
```

6. Execute bosboot command and add to the bootlist

```
$ bosboot -a
bosboot: Boot image is 53276 512 byte blocks.
```

```
$ bootlist -m normal hdisk0 hdisk1
```

```
$ bootlist -m normal -o
hdisk0 blv=hd5 pathid=0
hdisk1blv=hd5 pathid=0
```

7. Validate that the disks are in fact remirrored. Verify that the remirror is complete. In addition to the mirrorvg command completing and the iostat showing minimal activity for hdisk0 and hdisk1, all LVs on rootvg should have two PVs except for system dump..

```
$ lsvg -l rootvg
rootvg:
LV NAME          TYPE      LPs      PPs      PVs  LV STATE      MOUNT POINT
hd5              boot      1        2        2    closed/syncd  N/A
hd6              paging    64       128      2    open/syncd    N/A
hd8              jfs2log   1        2        2    open/syncd    N/A
hd4              jfs2      5        10       2    open/syncd    /
hd2              jfs2      20       40       2    open/syncd    /usr
```

Appendix – Restoring rootvg mirrors

hd9var	jfs2	13	26	2	open/syncd	/var
hd3	jfs2	5	10	2	open/syncd	/tmp
hd1	jfs2	13	26	2	open/syncd	/home
hd10opt	jfs2	23	46	2	open/syncd	/opt
hd11admin	jfs2	1	2	2	open/syncd	/admin
lg_dumplv	sysdump	7	7	1	open/syncd	N/A
livedump	jfs2	1	2	2	open/syncd	/var/adm/ras/livedump
fslv00	jfs2	20	40	2	open/syncd	/BCU_fs
fslv01	jfs2	40	80	2	open/syncd	/BCU_share_stage2a
paging00	paging	64	128	2	open/syncd	N/A
nim_restore	jfs2	120	240	2	open/syncd	/nim_restore

Appendix – Lost rootvg.

If rootvg has been lost, it will need to be recovered. Depending on how it is lost the recovery will be different. This will provide the high level procedures while working with IBM support.

1. If rootvg is lost due to hdisk0 (current disk) failure.
 - a. hdisk 1, or the rootvg cloned disk is available.
 - i. Boot off of hdisk1.
 - ii. Replace hdisk0.
 - iii. Option a: if mksysb not available after the update.
 1. Once hdisk is added, rebuild the mirror.
 2. Boot off of hdisk0.
 3. Clone rootvg again so the hdisk1 is again the cloned rootvg image.
 4. Redo the updates since the last clone.
 - iv. Option b: if mksysb available after the update. This can save having to redo updates to that lpar.
 1. Once hdisk is added, attempt to restore the mksysb using alt_disk_mksysb from hdisk1 to hdisk0 using the latest backed up image.
 2. Boot off hdisk 0.
 3. Redo any updates done after the mksysb image was taken.
 - b. hdisk 1 is not available. This is a double failure.
 - i. Replace both hdisk0 and hdisk1.
 - ii. If the management host it may be necessary to setup the management standby host as NIM server. The NIM server images are supplied in this Fixpack.
 - iii. Work with support to configure the nim server as appropriate for the host to be restored.
 - iv. Restore the host.
 - v. Redo the updates since the last clone.

Appendix - ISD and CAS Uninstall

The following instructions were taken from the developer works article found at the link below and were provided in the V1.1 FP2 Readme. This link is no longer available.

https://www.ibm.com/developerworks/community/wikis/home?lang=en#!/wiki/W3e8d1c956c32_416f_a604_4633cd375569/page/Uninstall+IBM+Systems+Director+on+AIX

1) ISD uninstall - Regular uninstall (applicable only on management node)

To permanently uninstall the Director agent or server components and leave the filesets that might be used by other applications, run the following command:

```
/opt/ibm/director/bin/diruninstall
```

It will uninstall the following filesets:

- DirectorServer (if Director server was installed)
- DirectorCommonAgent
- DirectorPlatformAgent

Uninstall command generally takes around 30 mins for full uninstallation. If it comes out in few mins we need to treat it as a uninstall failure and proceed with below steps.

If uninstallation failed or If there is no diruninstall script, you need to manually uninstall the Director filesets using the following commands:

```
installp -C                                # Clean up possible unfinished install
installp -u DirectorServer                 # Uninstall Director server
```

Uninstall of DirectorServer is long running and it takes around 15 minutes

```
installp -u DirectorCommonAgent            # Uninstall Director subagents (aka Common Agent)
installp -u DirectorPlatformAgent          # Uninstall Director Platform agent
```

After all Director filesets are uninstalled, /opt/ibm/director and /opt/ibm/icc should be empty except of the following 3 files on AIX 6.1 which are installed with the sysmgt.pconsole.rte fileset:

```
/opt/ibm/director/classes/pConsoleLaunch.jar
/opt/ibm/director/classes/extensions/pConsole.TWGExt
/opt/ibm/director/classes/extensions/pConsole.TWGSubagent
```

When cleaning up an unsuccessful install, there might be files left over in /opt/ibm/director and /opt/ibm/icc. They can be removed.

2) To uninstall the cas agent filesets from all the servers run the following command:

```
installp -u DirectorCommonAgent (its already performed on the management node)
installp -u DirectorPlatformAgent (its already performed on the management node)
```

Appendix - ISD and CAS Uninstall

```
installp -u cas.agent # Uninstall common agent services (1)
```

Uninstall of cas.agent takes around 12-13 minutes on management node and other nodes it might take around 1 to 2 minute

```
installp -u tivoli.tivguid # Uninstall Tivoli Guid
```

Uninstall of Tivoli.tivguid takes around 2 minutes

```
installp -u sysmgt.cim.*providers* # Uninstall all CIM providers
```

Uninstall of sysmgt.cim.*providers* fileset takes around 4 minutes

```
installp -u sysmgt.cimserver.pegasus.rte # Uninstall Pegasus CIM server (2)
```

The following subagents have a dependency on cas.agent and need to be uninstalled before cas.agent can be uninstalled:

- artex.base.agent - AIX Profile Manager subagent (If you need to reinstall this fileset, you can get it from your AIX media)

To uninstall the cas.agent fileset, these dependent filesets need to be uninstalled first, or use the -g flag to uninstall cas.agent which will remove the dependent filesets together with the cas.agent fileset.

Appendix - Warehouse Tools Removal

Description:

These instructions were copied and modified from the V1.1 FP2 readme. As DPM is being removed as is the management domain there is no longer a need to remove the Warehouse Tools TSA object definitions.

The instructions below require root privileges on the management host.

The Tivoli System Automation domain 'mgmtdomain' must be online and must be healthy on the management and management standby nodes.

- a. Check the status of Warehouse Tools on the management server.

Run 'hals' as the root user on the management node.

```
$ hals
MANAGEMENT DOMAIN
=====+=====+=====+=====+=====+=====+=====+
| COMPONENT | PRIMARY | STANDBY | CURRENT | OPSTATE | HA STATUS | RG REQUESTS |
|-----+-----+-----+-----+-----+-----+-----+
| WASAPP    | reverseflash01 | reverseflash03 | reverseflash01 | Online | Normal | - |
| DB2APP    | reverseflash01 | reverseflash03 | reverseflash01 | Online | Normal | - |
| DPM       | reverseflash01 | reverseflash03 | reverseflash01 | Online | Normal | - |
| DB2DFM    | reverseflash01 | reverseflash03 | reverseflash01 | Online | Normal | - |
|-----+-----+-----+-----+-----+-----+-----+

```

- Proceed to b) if the OPSTATE of WASAPP and DB2APP are Online
- Proceed to c) if the OPSTATE of WASAPP and DB2APP are Offline
- For any other OPSTATE values or if 'hals' returns an error, please contact IBM Support for further guidance.

- b. Stop the Warehouse Tools WAS.

```
$ hastopapp -apponly
Stopping APP and APP instance.....APP resources offline
MANAGEMENT DOMAIN
=====+=====+=====+=====+=====+=====+=====+
| COMPONENT | PRIMARY | STANDBY | CURRENT | OPSTATE | HA STATUS | RG REQUESTS |
|-----+-----+-----+-----+-----+-----+-----+
| WASAPP    | reverseflash01 | N/A | N/A | Offline | Offline | - |
| DB2APP    | reverseflash01 | reverseflash03 | reverseflash01 | Online | Normal | - |
| DPM       | reverseflash01 | reverseflash03 | reverseflash01 | Online | Normal | - |
| DB2DFM    | reverseflash01 | reverseflash03 | reverseflash01 | Online | Normal | - |
|-----+-----+-----+-----+-----+-----+-----+

```

- Proceed to the next step if the OPSTATE for WASAPP is successfully 'Offline'.
- Otherwise contact IBM Support for further guidance.

- c. Check for one of the following installation paths.

The installation directory for the Warehouse Tools directory is located on the management server. There are two possible installation paths.

Which directory you have depends on the DB2 (V10.1, V10.5 or V11.1) installed on the environment.

```
V10.1: /usr/IBM/dwe/appserver_001/iswapp_10
```

Appendix - Warehouse Tools Removal

V10.5 or V11.1 /usr/IBM/dwe/appserver_001/iswapp_10.5

- d. Run the InfoSphere Warehouse uninstall utility.

V10.1:

```
$ cd /usr/IBM/dwe/appserver_001/iswapp_10/uninstall
$ ./uninstall
```

V10.5 or V11.1

```
$ cd /usr/IBM/dwe/appserver_001/iswapp_10.5/uninstall
$ ./uninstall
```

This should run to completion. It takes around 4 mins for completion

- e. Find the installation directory for WebSphere Application Server.

The installation directory for the Warehouse Tools application server directory is located on the management server. There are two possible installation paths.

Which directory you have depends on the DB2 (V10.1, V10.5 or V11.1) installed on the environment.

V10.1: /usr/IBM/dwe/appserver_001/appServer_10

V10.5 or V11.1: /usr/IBM/dwe/appserver_001/appServer_10.5

- f. Use IBM Installation Manager to uninstall WebSphere Application Server.

- i. List the installed packaged.

DB2 V10.1 Example:

```
$ /opt/IBM/InstallationManager/eclipse/tools/imcl listInstalledPackages

com.ibm.cic.agent_1.6.3001.20130528_1750
com.ibm.websphere.BASE.v80_8.0.7.20130725_2248
```

DB2 V10.5 or V11.1 Example:

```
$ /opt/IBM/InstallationManager/eclipse/tools/imcl listInstalledPackages

com.ibm.cic.agent_1.8.5000.20160506_1125
com.ibm.websphere.BASE.v85_8.5.5010.20160721_0036
```

- ii. Identify the package 'com.ibm.websphere.BASE.*'. This is the Warehouse Tools application server install package.
- iii. Use the Installation Manager to remove the package. These are one line commands.

DB2 V10.1 Example:

Appendix - Warehouse Tools Removal

```
$ /opt/IBM/InstallationManager/eclipse/tools/imcl uninstall  
com.ibm.websphere.BASE.v80_8.0.7.20130725_2248
```

DB2 V10.5 or V11.1 Example:

```
$ /opt/IBM/InstallationManager/eclipse/tools/imcl uninstall  
com.ibm.websphere.BASE.v85_8.5.5010.20160721_0036
```

g. Remove the Warehouse Tools database.

- i. On the management host as the root user become or login to the dweadmin user.

```
$ su - dweadmin
```

- ii. The database should be stopped. Verify that the db2nodes.cfg file lists the management server as the assigned host for partition 0.

```
$ grep $(hostname) ~/sqllib/db2nodes.cfg  
0 stgkf101 0
```

Note: If the command returns no value. Edit the ~/sqllib/db2nodes.cfg so that the second (and fourth if listed) column contain the management hostname.

- iii. Drop the ISWMETA database.

```
$ db2 drop database ISWMETA
```

- iv. Stop the dweadmin instance.

```
$ hastopapp  
Stopping APP and APP instance.....APP resources offline  
MANAGEMENT DOMAIN  
+-----+-----+-----+-----+-----+-----+-----+  
| COMPONENT | PRIMARY | STANDBY | CURRENT | OPSTATE | HA STATUS | RG REQUESTS |  
+-----+-----+-----+-----+-----+-----+-----+  
| WASAPP | reverseflash01 | N/A | N/A | Offline | Offline | - |  
| DB2APP | reverseflash01 | N/A | N/A | Offline | Offline | - |  
| DPM | reverseflash01 | reverseflash03 | reverseflash01 | Online | Normal | - |  
| DB2DPM | reverseflash01 | reverseflash03 | reverseflash01 | Online | Normal | - |  
+-----+-----+-----+-----+-----+-----+-----+
```

- v. Identify the DB2 copy that owns the dweadmin instance.

V10.1 Example

```
$ db2greg -dump | grep dweadmin  
I,DB2,10.1.0.3,dweadmin,/db2home/dweadmin/sqllib,,1,0,/usr/IBM/dwe/mgmt_db2/V10.1,,
```

V10.5 or V11.1 Example

```
$ db2greg -dump | grep dweadmin  
I,DB2,10.5.0.8,dweadmin,/usr/IBM/dwe/appserver_001/home/dweadmin/sqllib,,1,0,/usr/IBM/dwe/  
/mgmt_db2/V10.5,,
```

h. Remove the dweadmin instance.

The previous step identified the path (9th column) of the DB2 copy that owns the dweadmin instance. Use that path to remove the instance.

V10.1 Example:

Appendix - Warehouse Tools Removal

```
/usr/IBM/dwe/mgmt_db2/V10.1/instance/db2idrop dweadmin
```

V10.5 or V11.1 Example:

```
/usr/IBM/dwe/mgmt_db2/V10.5/instance/db2idrop dweadmin
```

i. Cleaning up.

i. Directories to clean up.

Almost all Warehouse Tools files are located in the following GPFS filesystem '/usr/IBM/dwe/appserver_001'. It may be necessary to verify that this filesystem was not used for temporary storage of customer files.

- ii. Users that are no longer needed in the environment. It may be necessary to verify that these users were not used for non appliance purposes.
 - dweadmin
 - wasadmin
- iii. Groups that are no longer needed in the environment. It may be necessary to verify that these groups were not used for non appliance purposes.
 - dweogrp
 - dwemgrp
 - dweagrp
 - wasagrp

j. IBM Installation Manager.

IBM Installation Manager was installed on the appliance management host as it was a pre-requisite component for the Warehouse Tools application server (WebSphere Application Server). Since IBM Installation Manager is a standard installation tool that is shared by other IBM components it may be necessary to verify that no other third party products were installed that still may require IBM Installation Manager.

To verify run the following check. If 'com.ibm.cic.agent*' is the only component left then it is safe to uninstall Installation Manager.

```
$ /opt/IBM/InstallationManager/eclipse/tools/imcl listInstalledPackages  
com.ibm.cic.agent_1.8.5000.20160506_1125
```

Otherwise it may be necessary to continue to maintain IBM Installation Manager.

k. Remove the Warehouse Tools Intelligent Miner artifacts from the database. This step requires the core warehouse to be up and running.

- i. Login as the instance owner on the core admin host.
- ii. Verify the idmdisable db is in the path. If it is not in the path stop.

```
$ which idmdisabledb  
/db2home/bcuaix/sqlllib/bin/idmdisabledb  
$ which idmcheckdb  
/db2home/bcuaix/sqlllib/bin/idmcheckdb
```

- iii. Run `idmcheckdb` to see if Warehouse Tools intelligent miner feature is configured. (The appliance ships this feature as enabled, however over time this component is not used and may be unconfigured).

DB2 V10.1 Example

```
$ idmcheckdb bcudb
```

```
IDM8969W: The current value of the database configuration parameter
"JAVA_HEAP_SZ" is "2048".
The recommended value is "65536".
Run the following command to correct the problem:
db2 UPDATE DB CFG FOR bcudb USING JAVA_HEAP_SZ 65536
```

The database "bcudb" is enabled for
Intelligent Miner Version 9.7.3 in "fenced" mode.

The following tables contain one or more columns with mining objects:

```
IDMMX.CLASSETTINGS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.CLASSIFMODELS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.CLASTASKS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.CLASTESTRESULTS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.CLASTESTTASKS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.CLUSSETTINGS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.CLUSTASKS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.CLUSTERMODELS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.LOGICALDATASPECS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.MININGDATA (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.REGRESSIONMODELS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.REGSETTINGS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.REGTASKS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.REGTESTRESULTS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.REGTESTTASKS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.RULEFILTERS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.RULEMODELS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.RULESETTINGS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.RULETASKS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.TIMESERIESMODELS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.TSSETTINGS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.TSTASKS (TABLESPACE DWEDEFAULTCONTROL)
```

DB2 V10.5 Example:

```
$ idmcheckdb bcudb
```

```
IDM8969W: The current value of the database configuration parameter
"JAVA_HEAP_SZ" is "2048".
The recommended value is "65536".
Run the following command to correct the problem:
db2 UPDATE DB CFG FOR bcudb USING JAVA_HEAP_SZ 65536
```

The database "bcudb" is enabled for
Intelligent Miner Version 9.7.3 in "fenced" mode.

The following tables contain one or more columns with mining objects:

```
IDMMX.CLASSETTINGS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.CLASSIFMODELS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.CLASTASKS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.CLASTESTRESULTS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.CLASTESTTASKS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.CLUSSETTINGS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.CLUSTASKS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.CLUSTERMODELS (TABLESPACE DWEDEFAULTCONTROL),
```

Appendix - Warehouse Tools Removal

```
IDMMX.LOGICALDATASPECS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.MININGDATA (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.REGRESSIONMODELS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.REGSETTINGS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.REGTASKS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.REGTESTRESULTS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.REGTESTTASKS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.RULEFILTERS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.RULEMODELS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.RULESETTINGS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.RULETASKS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.TIMESERIESMODELS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.TSSETTINGS (TABLESPACE DWEDEFAULTCONTROL),
IDMMX.TSTASKS (TABLESPACE DWEDEFAULTCONTROL)
```

DB2 V11.1 Example where warehouse tools was not migrated to the new DB2 copy from DB2 10.5.

```
$ idmcheckdb BCUDB
ksh: idmcheckdb: not found.
```

Note: *It is not recommended to attempt to remedy warehouse tools on the core hosts if this scenario is encountered.*

- iv. To unconfigure Warehouse Tools where idmcheckdb was successful.

```
idmdisabledb BCUDB
```

- v. To unconfigure Warehouse Tools where idmcheckdb was not successful.

All objects with IDMMX schema can be removed by hand or can be left in the database.

- vi. DWEDEFAULTCONTROL tablespace.

This is the default tablespace for use with Warehouse Tools. However, it is possible that DB2 users may have used (on purpose or by accident) this tablespace. From an appliance standpoint with Warehouse Tools removed this tablespace is no longer needed, however the DBA responsible for the core warehouse should review the use of this tablespace before it is modified or removed.

- I. Removing the Warehouse Tools component from the appliance core hosts.

Warehouse Tools includes a mining component that is installed as a companion to the DB2 copies installed on the core hosts.

- i. Identify the core host DB2 installation directory.

V10.1 Example:

```
$ dsh -n ${BCUDB2ALL} '/usr/local/bin/db2ls -c | cut -d: -f 1' | dshbak -c
HOSTS -----
```


Appendix - Warehouse Tools Removal

```
stgkf102, stgkf104, stgkf105, stgkf106, stgkf108
```

```
-----  
#PATH  
/usr/IBM/dwe/db2/V10.1.0.3..1
```

V10.5 Example:

```
$ dsh -n ${BCUDB2ALL} '/usr/local/bin/db2ls -c | cut -d: -f 1' | dshbak -c  
HOSTS -----  
kf5hostname02, kf5hostname04, kf5hostname05, kf5hostname06, kf5hostname07  
-----  
#PATH  
/usr/IBM/dwe/db2/V10.5.0.8..0
```

V11.1 Example:

```
$ dsh -n ${BCUDB2ALL} '/usr/local/bin/db2ls -c | cut -d: -f 1' | dshbak -c  
HOSTS -----  
b30i02, b30i04, b30i05, b30i06, b30i07  
-----  
#PATH  
/usr/IBM/dwe/db2/V11.1
```

Note: In some cases customers may have multiple db2 copies installed. This is ok, but adds more work to remove the warehouse tools copies.

- ii. Identify the locations of all Warehouse Tools copies in the environment.

V10.1 Example:

```
$ dsh -n ${BCUDB2ALL} '/usr/local/bin/db2ls -c | cut -d: -f 1 | grep -v "^#" | while read  
p;do cat ${p}/warehouse.ast;done' | dshbak -c  
HOSTS -----  
stgkf102, stgkf104, stgkf105, stgkf106, stgkf108  
-----  
# This is a key file for InfoSphere Warehouse copy  
warehouse.installLocation=/usr/IBM/dwe/warehouse_10.1.0.3..1
```

V10.5 Example:

```
$ dsh -n ${BCUDB2ALL} '/usr/local/bin/db2ls -c | cut -d: -f 1 | grep -v "^#" | while read  
p;do cat ${p}/warehouse.ast;done' | dshbak -c  
HOSTS -----  
kf5hostname02, kf5hostname04, kf5hostname05, kf5hostname06, kf5hostname07  
-----  
# This is a key file for DB2 for LUW - Warehouse copy  
warehouse.installLocation=/usr/IBM/dwe/warehouse_DB2V10.5.0.8..0
```

V11.1 Example with Extra DB2 Copies.:

```
$ dsh -n ${BCUDB2ALL} '/usr/local/bin/db2ls -c | cut -d: -f 1 | grep -v "^#" | while read  
p;do cat ${p}/warehouse.ast;done' | dshbak -c  
b30i04: cat: 0652-050 Cannot open /usr/IBM/dwe/db2/V11.1/warehouse.ast.  
b30i05: cat: 0652-050 Cannot open /usr/IBM/dwe/db2/V11.1/warehouse.ast.  
b30i07: cat: 0652-050 Cannot open /usr/IBM/dwe/db2/V11.1/warehouse.ast.  
b30i02: cat: 0652-050 Cannot open /usr/IBM/dwe/db2/V11.1/warehouse.ast.  
b30i02: cat: 0652-050 Cannot open /opt/IBM/db2/V10.5/warehouse.ast.  
b30i02: cat: 0652-050 Cannot open /opt/IBM/db2/V10.5/SB37081/warehouse.ast.  
b30i06: cat: 0652-050 Cannot open /usr/IBM/dwe/db2/V11.1/warehouse.ast.  
HOSTS -----  
b30i02, b30i04, b30i05, b30i06, b30i07  
-----  
# This is a key file for DB2 for LUW - Warehouse copy
```

Appendix - Warehouse Tools Removal

```
warehouse.installLocation=/usr/IBM/dwe/warehouse_10.5.0.5..1
```

Note: We see that the 'warehouse.ast' file is a way that Warehouse Tools identifies a corresponding copy of DB2. In the DB2 V11.1 example there are copies of DB2 that do not have corresponding Warehouse Tools copies.

Another way to find Warehouse copies is to follow the Warehouse Tools installation pattern.

V10.1 Example:

```
$ dsh -n ${BCUDB2ALL} 'ls -lad /usr/IBM/dwe/warehouse*' | dshbak -c
HOSTS -----
stgkf102, stgkf104, stgkf105, stgkf106, stgkf108
-----
drwxrwxr-x  13 root      system      4096 Jul 19 11:56
/usr/IBM/dwe/warehouse_10.1.0.3..1
```

V10.5 Example:

```
$ dsh -n ${BCUDB2ALL} 'ls -lad /usr/IBM/dwe/warehouse*' | dshbak -c
HOSTS -----
kf5hostname02, kf5hostname04, kf5hostname05, kf5hostname06, kf5hostname07
-----
drwxrwxr-x  13 root      system      4096 Mar 12 05:31
/usr/IBM/dwe/warehouse_DB2V10.5.0.8..0
```

V11.1 Example:

```
$ dsh -n ${BCUDB2ALL} 'ls -lad /usr/IBM/dwe/warehouse*' | dshbak -c
HOSTS -----
b30i02, b30i04, b30i05, b30i06, b30i07
-----
drwxrwxr-x  13 root      system      4096 Jul 24 2015
/usr/IBM/dwe/warehouse_10.5.0.5..1
```

Note: The above examples show a potentially unfinished DB2 11.1 upgrade as the Warehouse Tools directory is associated with the DB2 10.5 copy left on the system. This is of no consequence as long as the V1.1.0.1 (FP1) has been applied.

- iii. Using the directory found above, use 'dsh' to run the Warehouse Tools uninstaller.

V10.5 Example

```
$ dsh -n ${BCUDB2ALL} '/usr/IBM/dwe/warehouse_10.5.0.5..1/uninstall/uninstall'
```

Note: If the uninstall fails, it is sufficient to simply remove the installation directory using `rm -rf` for warehouse tools on the core hosts.

This completes the removal of Warehouse Tools. The rest of the domain removal will be done as part of Stage 9 Phase 3 when the management domain is removed.

Appendix – Removing the PDOA Console

These instructions were provided in V1.1 FP2. While there should not be necessary, they are provided again for reference.

a. Uninstall console.

a. Stop console:

```
$ mistop
CDTFS000059I The system console is already stopped.
```

Check if mi console is stopped:

```
$ mistatus
CDTFS000064I The system console is stopped.
```

Check if any process left to stop, if not kill the process:

```
$ ps -ef | grep isas | grep -v grep
```

b. deactivate the database.

```
$ su - db2psc -c 'db2 deactivate database PSCDB'
DB20000I The DEACTIVATE DATABASE command completed successfully.
```

c. Drop the database.

```
$ su - db2psc -c 'db2 drop database PSCDB'
DB20000I The DROP DATABASE command completed successfully.
```

d. Stop the instance:

```
$ su - db2psc -c 'db2stop'
08/31/2018 14:28:19 0 0 SQL1064N DB2STOP processing was successful.
SQL1064N DB2STOP processing was successful.
```

e. Drop the instance:

```
$ /usr/local/bin/db2ls
```

Install Path	Level	Fix Pack	Special	Install Number	Install Date
/usr/IBM/dwe/mgmt_db2/V10.5	10.5.0.10	10			Tue Aug 28 20:08:52 2018 BRT

Take the path from above command and run below command:

```
$ /usr/IBM/dwe/mgmt_db2/V10.5/instance/db2idrop db2psc
DBI1446I The db2idrop command is running.
```

```
DB2 installation is being initialized.
```

Appendix – Removing the PDOA Console

```
Total number of tasks to be performed: 2
Total estimated time for all tasks to be performed: 305 second(s)

Task #1 start
Description: Initializing instance list
Estimated time 5 second(s)
Task #1 end

Task #2 start
Description: Configuring DB2 instances
Estimated time 300 second(s)
Task #2 end

The execution completed successfully.

For more information see the DB2 installation log at
"/tmp/db2idrop.log.6750942".
DBI1070I  Program db2idrop completed successfully.
```

f. Uninstall mi.

```
installp -u miControlConsole.rte
```

```
+-----+
+-----+ Pre-deinstall Verification... +-----+
+-----+
Verifying selections...done
Verifying requisites...done
Results...

SUCSESSES
-----
Filesets listed in this section passed pre-deinstall verification
and will be removed.

Selected Filesets
-----
miControlConsole.rte 3.0.5.0          # IBM PureData System for Oper...

<< End of Success Section >>

FILESET STATISTICS
-----
1  Selected to be deinstalled, of which:
    1  Passed pre-deinstall verification
----
1  Total to be deinstalled

+-----+
+-----+ Deinstalling Software... +-----+
+-----+

installp:  DEINSTALLING software for:
          miControlConsole.rte 3.0.5.0

Running UnPost install
Finished processing all filesets.  (Total time:  1 mins 48 secs).

+-----+
+-----+ Summaries: +-----+
+-----+

Installation Summary
```

Appendix – Removing the PDOA Console

Name	Level	Part	Event	Result

miControlConsole.rte	3.0.5.0	USR	DEINSTALL	SUCCESS

g. Remove the mi related files from Platform Layer.

```
cd /opt/ibm/aixappl/pflayer/bin/  
rm mistart miresolve mistatus mistop
```

Appendix – Updating Power Firmware in Parallel using the HMC GUI

The platform layer provides an excellent command line option to update the power firmware. However, as of V1.1 FP3 the HMC command line option used by the platform layer no longer allows for parallel execution and will result in failures when attempted. This is documented in KIG00058 in the Known Issues technote. This was not recognized until after V1.1 FP3 was released. For larger PDOA environments this can severely extend the time needed to update the power firmware on the Power 8 servers, about 30 minutes to an hour per server. This is especially costly if an organization is doing the update in a full outage scenario. These instructions can help apply the power firmware in parallel.

To follow this process you will need to know your HMC id and passwords as well as how to access the HMCs using a browser. The default HMC id is hscroot and the password is customer managed using the pl_conf tool.

It is also important to determine the update strategy. If not doing a full outage, then it is important to pay attention to the starting levels and which server is associated with which LPAR. If doing a full outage, then it is important to quiesce the appliance before starting this update. Doing a full outage is easier as you can do all the updates at the same time.

A similar procedure was tested on a V1.1 FP2 -> V1.1 FP3 scenario so the HMC, the source power firmware levels and the target power firmware levels are different. The behavior of that update was also to reboot the CEC (both LPARs for 8286-42A servers). If using a V1.1 FP3->V1.1 FP4 scenario the update is not performed as part of these steps, however in Stage 7 it is recommended to go ahead and reboot the LPARs and will be handled through those instructions. These instructions require the use of the FTP server on the management host and use the root user to access. This access occurs on the internal network and not the corporate network. See Stage 05 for instructions on how to enable and disable the FTP server on the management node.

The following procedure has not yet been tested past the last visible screen at the time of this documentation.

Appendix – Updating Power Firmware in Parallel using the HMC GUI

1. Login to the management host as the root user.
2. Command: Use the platform layer `appl_ls_hw` command to list the HMCs. This will list the IAN or the PDOA internal network ip addresses for the two HMCs. The ip addresses are the default internal IP addresses and likely be the same for all V1.1 customers.

```
appl_ls_hw -r hmc -A M_IP_address | sed 's|'|g'
```

Example Output:

```
$ appl_ls_hw -r hmc -A M_IP_address | sed 's|'|g'
172.23.1.245
172.23.1.246
```

3. Command: Augment the above command to query each of the HMCs to determine the customer facing network ip addresses. The ip addresses will vary by customer.

```
appl_ls_hw -r hmc -A M_IP_address < /dev/null | sed 's|'|g' | while read ip;do ssh -n hscroot@${ip} lshmc -n -F
ip4addr_eth2;done
```

Example Output:

```
$ appl_ls_hw -r hmc -A M_IP_address < /dev/null | sed 's|'|g' | while read ip;do ssh -n hscroot@${ip} lshmc -n -F
ip4addr_eth2;done
9.42.109.139
9.42.109.140
```

4. Command: Update the Power On Policies for the all of the servers.

```
ssh hscroot@172.23.1.245 'lssyscfg -r sys -F name | while read m;do chsyscfg -r sys -m ${m} -i
"power_on_lpar_start_policy=autostart";done'
```

5. Command: Verify the power on policy for the servers.

```
ssh hscroot@172.23.1.245 'lssyscfg -r sys -F name,power_on_lpar_start_policy'
```

Example Output:

```
$ ssh hscroot@172.23.1.245 'lssyscfg -r sys -F name,power_on_lpar_start_policy'
Server-8286-42A-SN21F357V,autostart
Server-8286-42A-SN21F356V,autostart
Server-8284-22A-SN21F354V,autostart
Server-8284-22A-SN21F355V,autostart
Server-8284-22A-SN21F353V,autostart
```

6. Command: In your root session, determine the levels associated with each server. Take note of servers that are not at SV860_226 which are already updated and SV860_205 which start at V1.1 FP3's validated stack. V1.1 FP2's level is SV860_138. The reason this is important is that if starting at V1.1 FP2s level or lower the process will automatically reboot the CEC. If starting from V1.1 FP3 the process will not automatically reboot the CEC.

```
appl_ls_hw -r server_fsp -A Logical_name,Machine_type,Model,Serial_number,FW_level | sort
```

Example Output:

```
$ appl_ls_hw -r server_fsp -A Logical_name,Machine_type,Model,Serial_number,FW_level | sort
"server_fsp0","8286","42A","21F356V","SV860_205"
"server_fsp1","8286","42A","21F357V","SV860_205"
"server_fsp2","8284","22A","21F354V","SV860_205"
"server_fsp3","8284","22A","21F353V","SV860_205"
"server_fsp4","8284","22A","21F355V","SV860_205"
```

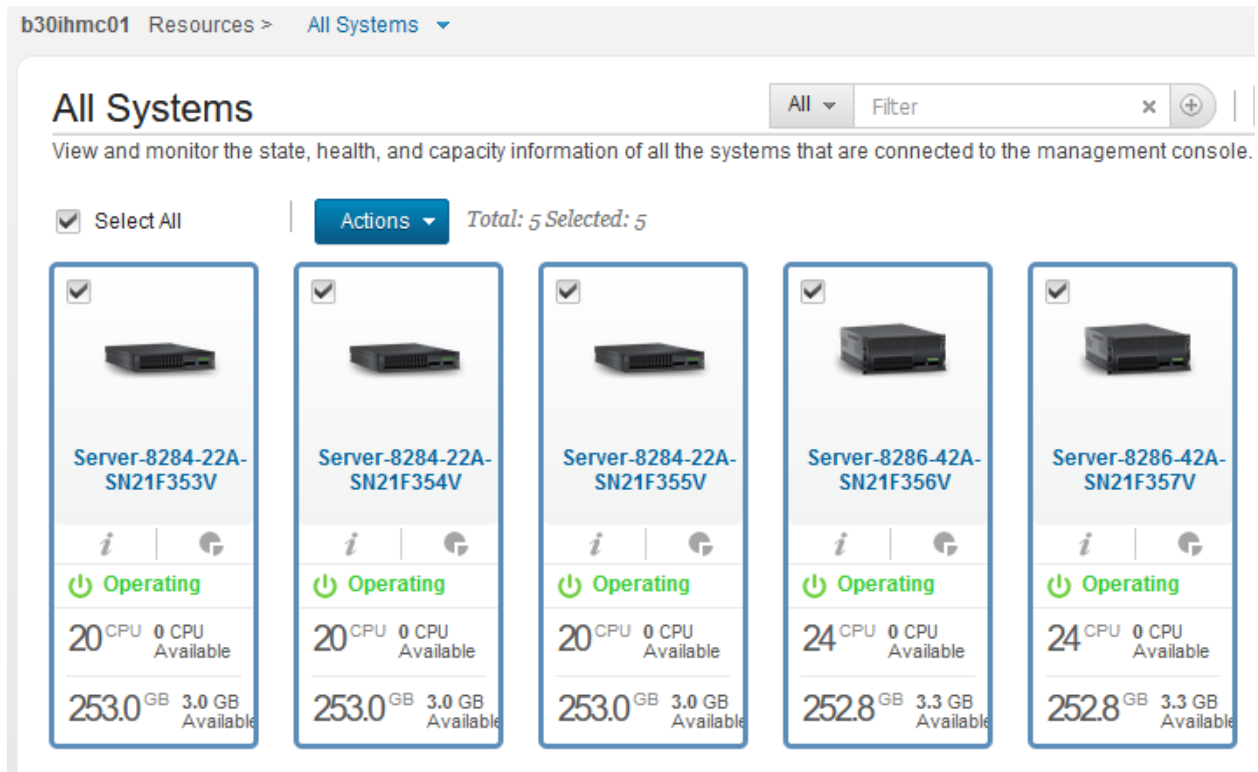
7. HMC GUI: Attempt to login to the first HMC coreporate ip using the https pattern "https://<ip>".
8. HMC GUI: You should navigate to Resources->All Systems to see all the servers.

Appendix – Updating Power Firmware in Parallel using the HMC GUI

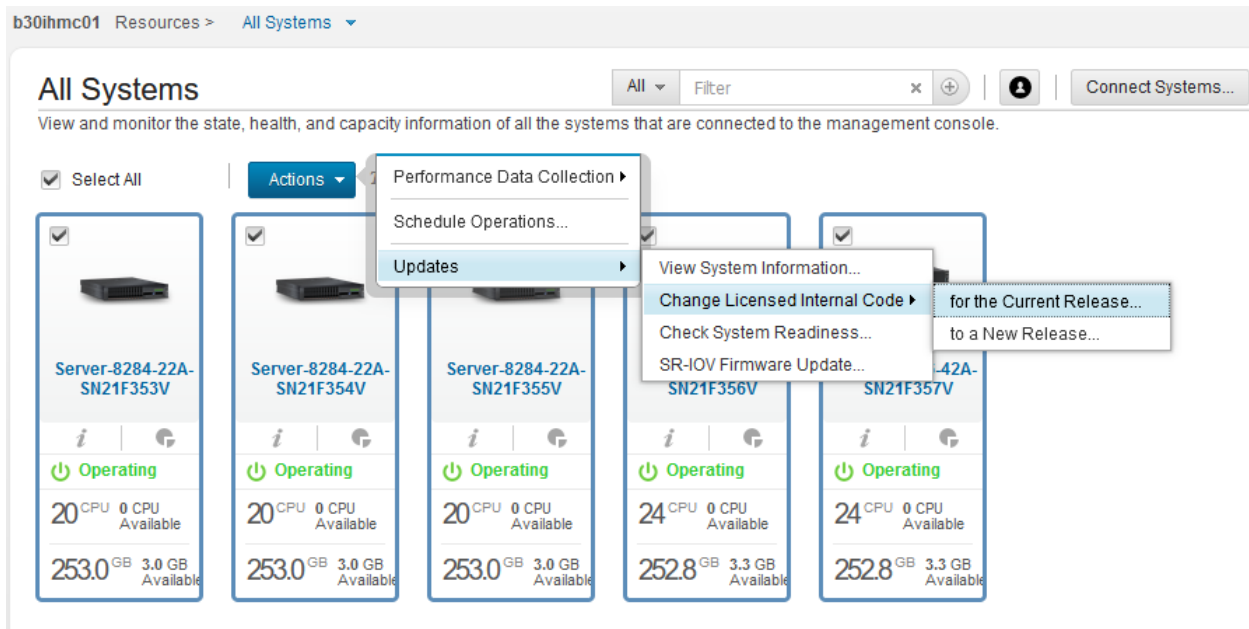
- Note the naming convention: Server-<MT>-<Model>-<SN>. Where MTM is 8286-42A or 8284-22A.
- 8286-42A are the foundation servers. Management and Admin LPARs and Manageme Standby and Admin Standby LPARs.
- 8284-22A exist on 1.5 DN and higher environments.

 Server-8284-22A-SN21F353V    Operating 20 CPU 0 CPU Available 256.0 GB 0.0 GB Available	 Server-8284-22A-SN21F354V    Operating 20 CPU 0 CPU Available 256.0 GB 0.0 GB Available	 Server-8284-22A-SN21F355V    Operating 20 CPU 0 CPU Available 253.0 GB 3.0 GB Available	 Server-8286-42A-SN21F356V    Operating 24 CPU 0 CPU Available 252.8 GB 3.3 GB Available	 Server-8286-42A-SN21F357V    Operating 24 CPU 0 CPU Available 252.8 GB 3.3 GB Available
---	---	---	---	---

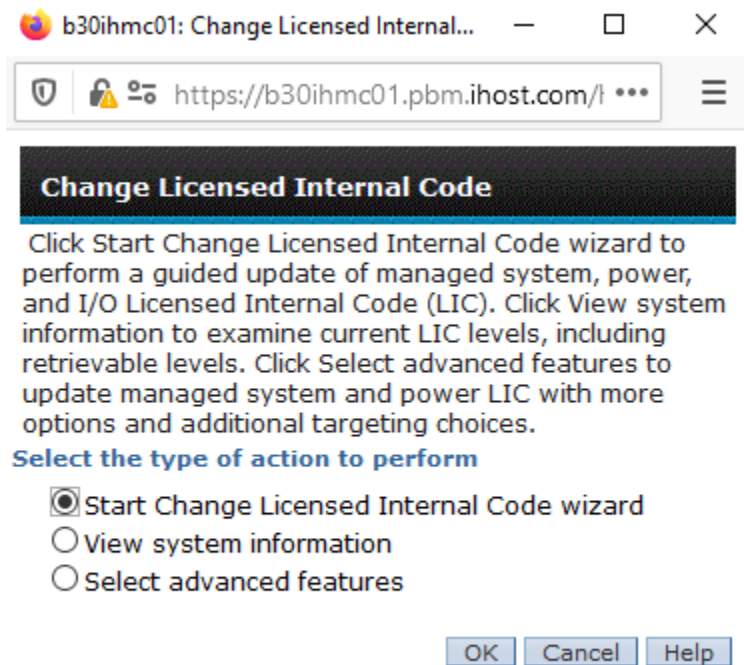
9. HMC GUI: In the HMC GUI click the check boxes for all the servers that need to be updated this pass. Then click the Actions->Updates->Check System Readiness... option.



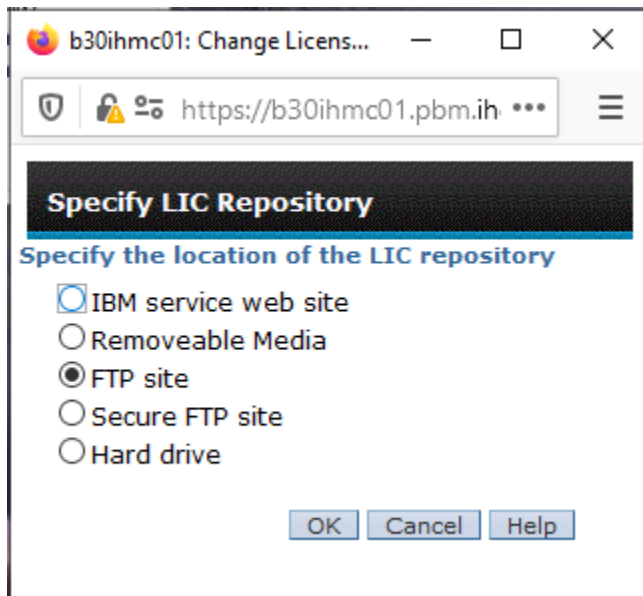
10. HMC GUI: Click the Action-Updates->Change Licensed Internal Code->to Current Release option. If updated from V1.1 FP2 these instructions may not work.



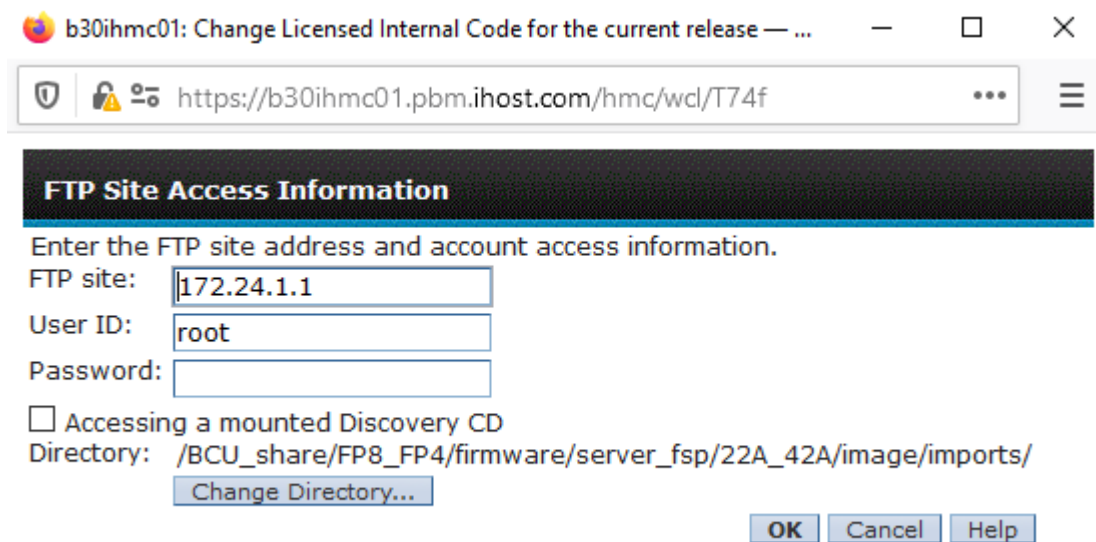
11. HMC GUI: Click Start Change Licensed Internal Code wizard.

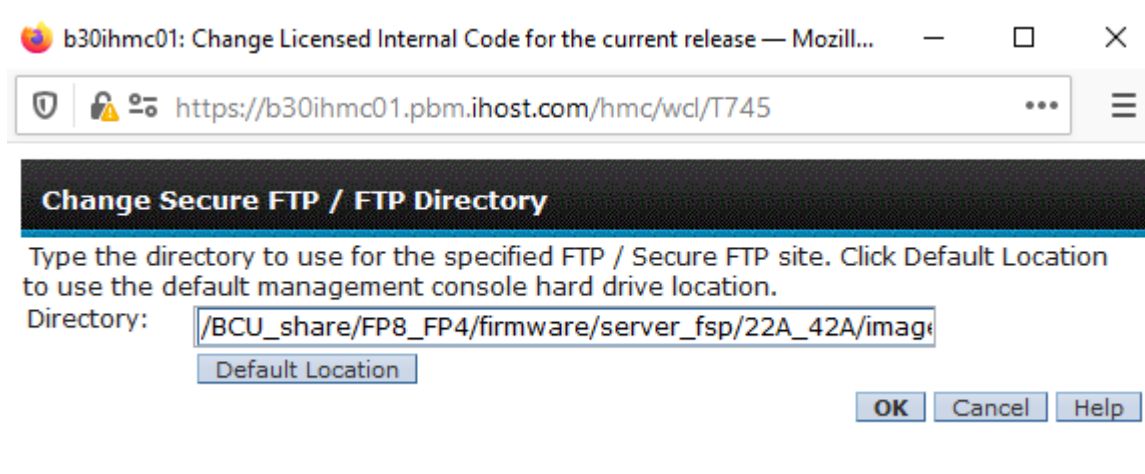


12. HMC GUI: Choose FTP site.



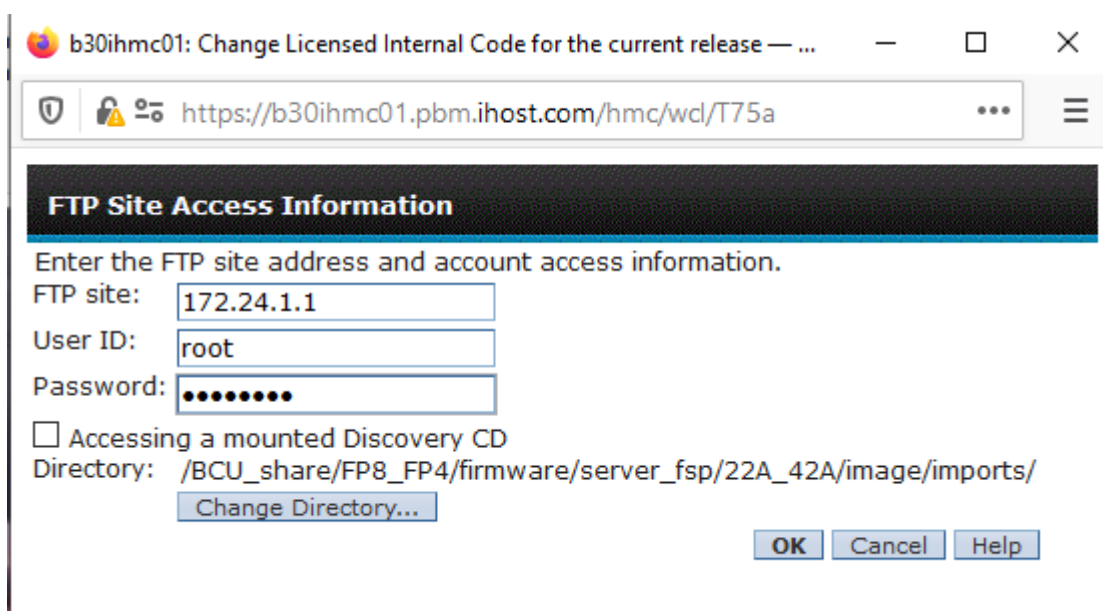
13. Enter the details for the FTP site. The likely internal ip address is 172.23.1.1 and not what is shown on below. If needed click the change directory button and set the directory to /BCU_share/FP8_FP4/firmware/server_fsp/22A_42A/image/imports/. Click Ok on the change directory dialog.





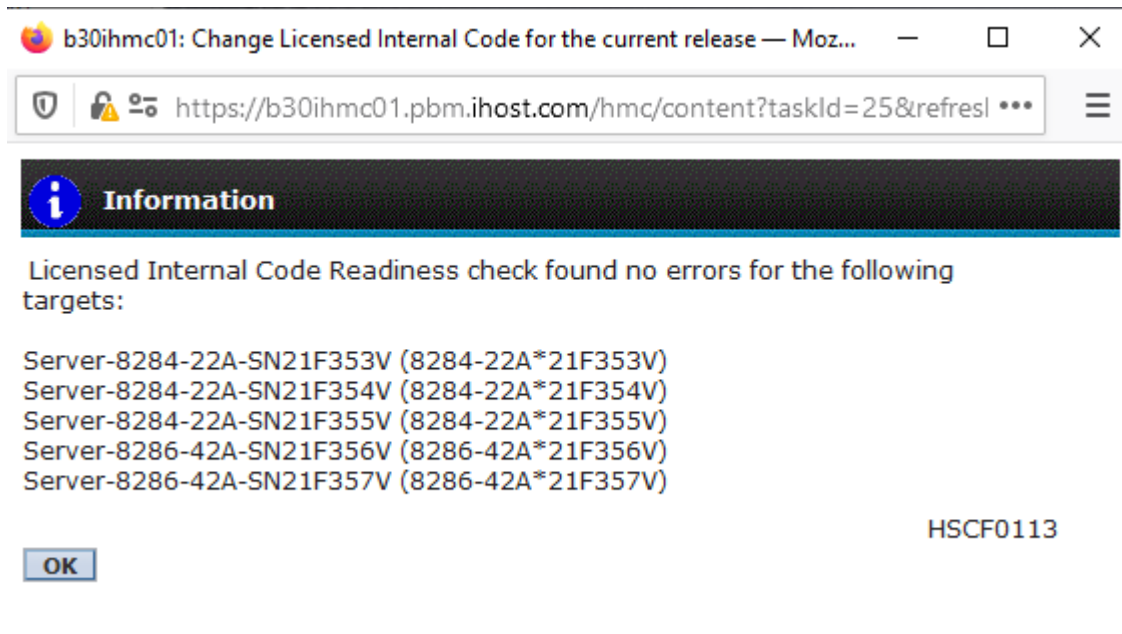
The screenshot shows a web browser window titled "b30ihmc01: Change Licensed Internal Code for the current release — Mozill...". The address bar shows the URL "https://b30ihmc01.pbm.ihost.com/hmc/wcl/T745". The main content area has a dark header with the title "Change Secure FTP / FTP Directory". Below the header, the text reads: "Type the directory to use for the specified FTP / Secure FTP site. Click Default Location to use the default management console hard drive location." There is a text input field labeled "Directory:" containing the path "/BCU_share/FP8_FP4/firmware/server_fsp/22A_42A/image". Below the input field is a button labeled "Default Location". At the bottom right are three buttons: "OK", "Cancel", and "Help".

14. Enter the root password in the dialog box. It should be possible to use a non-root user to access the update directory. Click Ok.

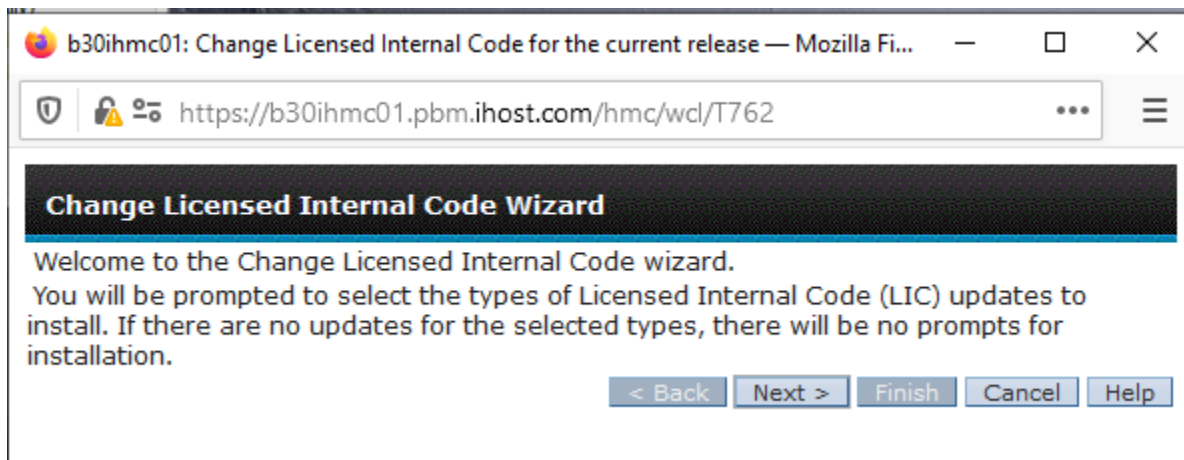


The screenshot shows a web browser window titled "b30ihmc01: Change Licensed Internal Code for the current release — ...". The address bar shows the URL "https://b30ihmc01.pbm.ihost.com/hmc/wcl/T75a". The main content area has a dark header with the title "FTP Site Access Information". Below the header, the text reads: "Enter the FTP site address and account access information." There are three text input fields: "FTP site:" containing "172.24.1.1", "User ID:" containing "root", and "Password:" containing nine dots. Below the password field is a checkbox labeled "Accessing a mounted Discovery CD". Below the checkbox is a text input field labeled "Directory:" containing the path "/BCU_share/FP8_FP4/firmware/server_fsp/22A_42A/image/imports/". Below the input field is a button labeled "Change Directory...". At the bottom right are three buttons: "OK", "Cancel", and "Help".

15. HMC GUI: The wizard runs the check readiness against the selected servers. Click Ok.



16. Continue with with Wizard and click Next.



17. The managed and System and Power LIC should be checked. Click Advanced Options to see the Advanced Options screen.

Change Licensed Internal Code Wizard

Select Managed System and Power LIC to install updates. Click Advanced to view the concurrency status of the targets, to change the selected targets, or to select a different installation type.

Current LIC repository location: FTP site

☒ Managed System and Power LIC

Concurrency status: All updates are concurrent.

Current installation type selection: Concurrent install and activate.

[Advanced Options...](#)

[< Back](#) [Next >](#) [Finish](#) [Cancel](#) [Help](#)

18. All selected servers should have All can be concurrent activated.

Managed System and Power Licensed Internal Code (LIC) Concurrency

Click a table row and click View Information to see the activated and retrievable LIC levels for that target.

Current LIC repository location: FTP site

Select	Target	Target Name	Concurrency Status
☐	☒	Server-8284-22A-SN21F353V	All can be concurrently activated.
☐	☒	Server-8284-22A-SN21F354V	All can be concurrently activated.
☐	☒	Server-8284-22A-SN21F355V	All can be concurrently activated.
☐	☒	Server-8286-42A-SN21F356V	All can be concurrently activated.
☐	☒	Server-8286-42A-SN21F357V	All can be concurrently activated.

[View Information...](#)

Select the type of installation to perform

☒ Concurrent install and activate

☐ Concurrent install only, with deferred disruptive activate

☐ Disruptive install and activate - Power off automatically, if necessary. (Shortest overall update time)

☐ Disruptive install and activate - Delay power off with confirmation. (Shortest system down time)

[OK](#) [Cancel](#) [Help](#)

19. Select a server and select 'View Information'. You should see the current levels are 205 and the retrievable levels is 226. Click close and then click OK on the previous screen.

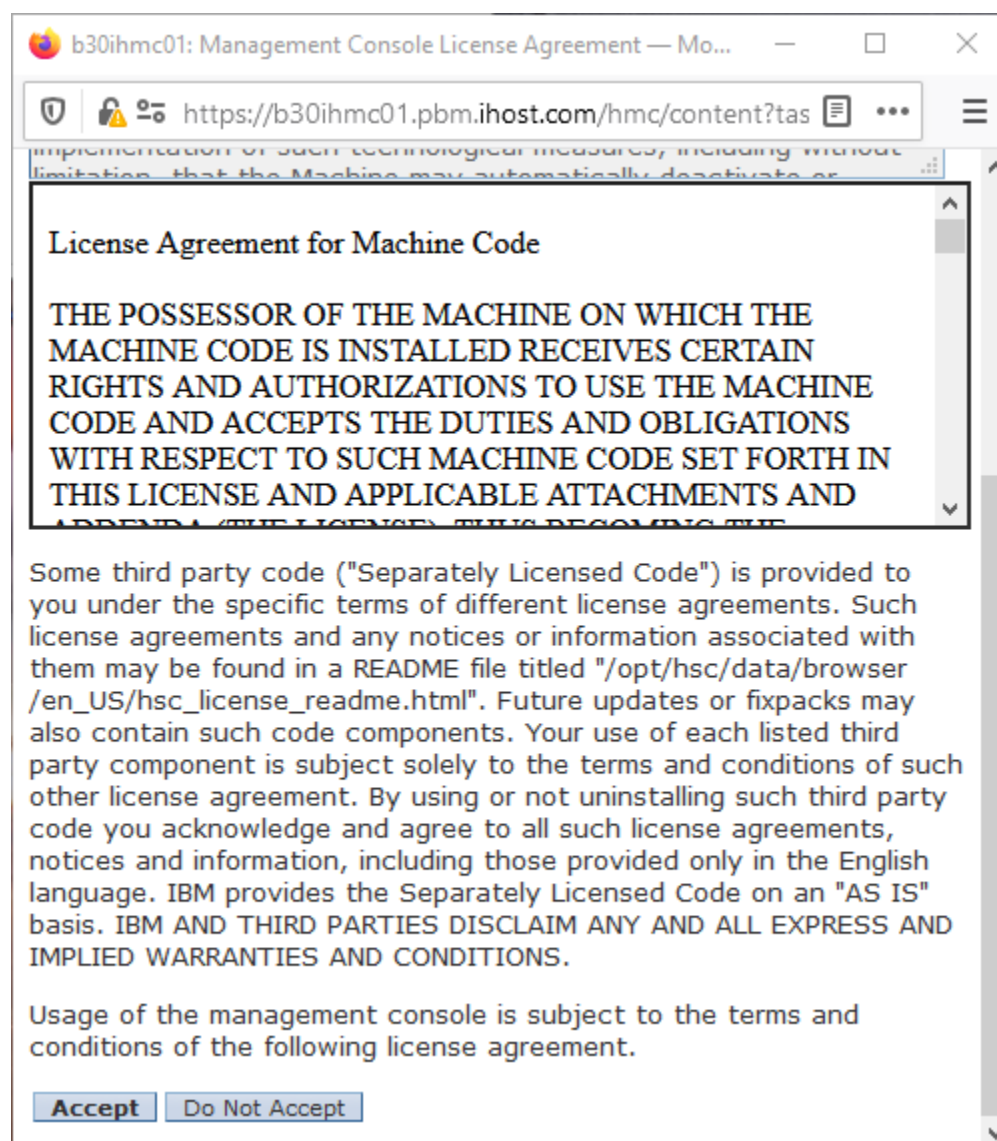
The screenshot shows a web browser window titled "b30ihmc01: Change Licensed Internal Code for the current release — Mozilla Firefox". The address bar shows the URL "https://b30ihmc01.pbm.ihost.com/hmc/wd/T7a3". The main content area has a dark header "Managed System and Power Licensed Internal Code (LIC) Level Details". Below the header, there is a text block: "Click a table row and click View Details to see additional information about the LIC levels based on the current type of installation." followed by "Target name: Server-8284-22A-SN21F353V", "Current LIC repository location: FTP site", and "Type of installation: Concurrent install and activate." Below this is a table with 7 columns: "Select", "EC Number", "LIC Type", "Machine Type/ Model/ Serial Number", "Activated Level", "Retrievable Concurrent Activate Level", and "Retrievable Disruptive Activate Level". The table contains one row with the following data: "O" in the Select column, "01SV860" in the EC Number column, "Managed System Primary" in the LIC Type column, "8284-22A*21F353V" in the Machine Type/ Model/ Serial Number column, "FW860.70 (205)" in the Activated Level column, "FW860.90 (226)" in the Retrievable Concurrent Activate Level column, and "FW860.90 (226)" in the Retrievable Disruptive Activate Level column. Below the table is a "View Details..." button. At the bottom right are "Close" and "Help" buttons.

Select	EC Number	LIC Type	Machine Type/ Model/ Serial Number	Activated Level	Retrievable Concurrent Activate Level	Retrievable Disruptive Activate Level
☐	01SV860	Managed System Primary	8284-22A*21F353V	FW860.70 (205)	FW860.90 (226)	FW860.90 (226)

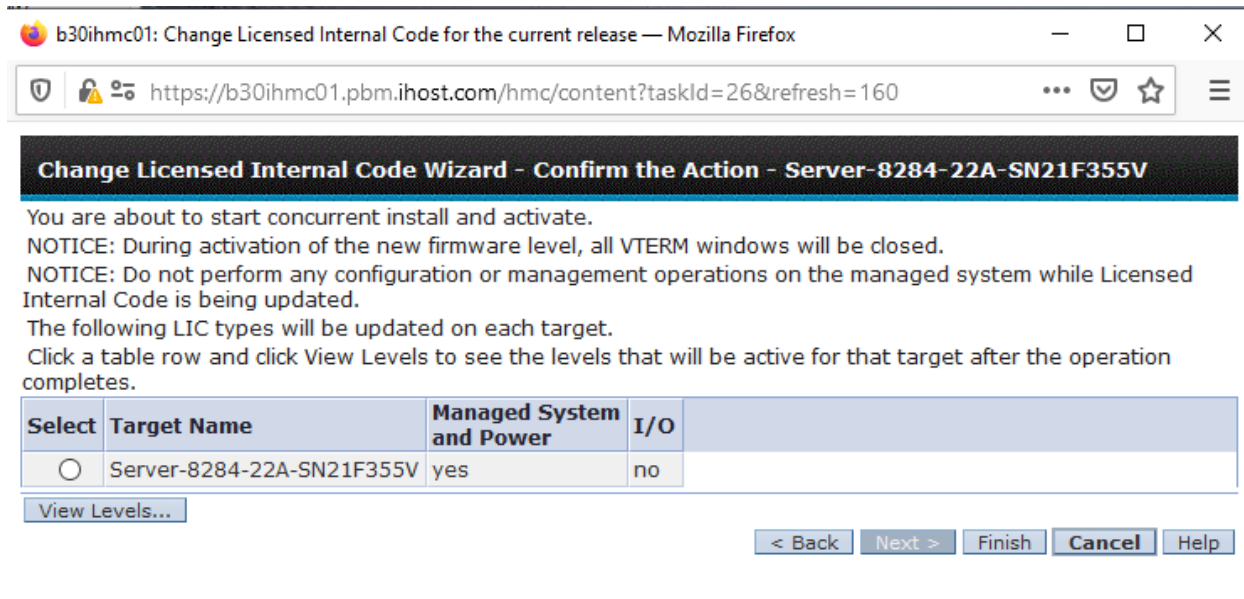
20. Click next to start the final wizard.

The screenshot shows a web browser window titled "b30ihmc01: Change Licensed Internal Code for the current release — Mozilla Firefox". The address bar shows the URL "https://b30ihmc01.pbm.ihost.com/hmc/content?taskId=25&refresh=152". The main content area has a dark header "Change Licensed Internal Code Wizard". Below the header, there is a text block: "Select Managed System and Power LIC to install updates. Click Advanced to view the concurrency status of the targets, to change the selected targets, or to select a different installation type." followed by "Current LIC repository location: FTP site". Below this is a checkbox labeled "Managed System and Power LIC" which is checked. Below the checkbox is a text block: "Concurrency status: All updates are concurrent." followed by "Current installation type selection: Concurrent install and activate." Below this is an "Advanced Options..." button. At the bottom right are buttons: "< Back", "Next >", "Finish", "Cancel", and "Help".

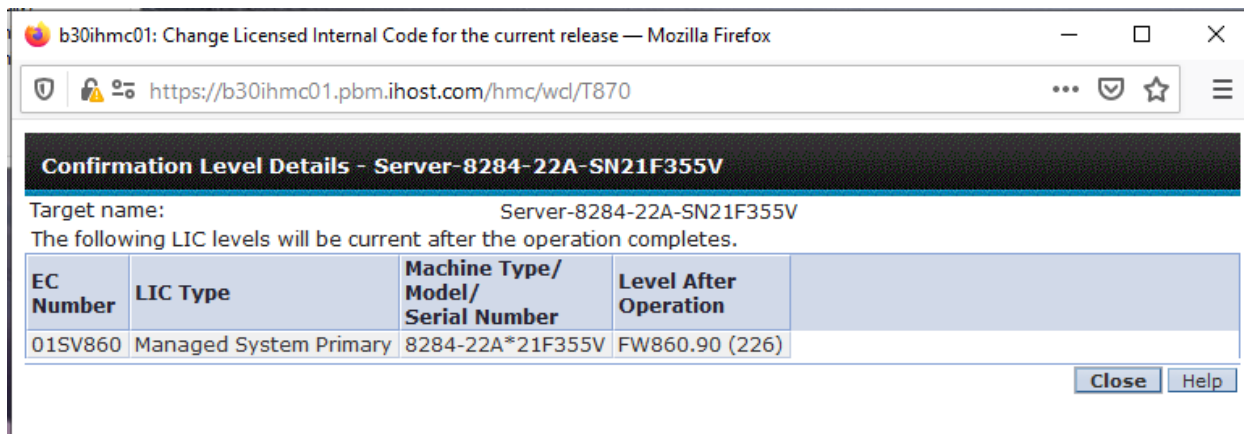
21. Accept the license agreement.



22. The confirm action page should show all servers to be updated. The picture shows just one. Click View Levels.



23. Verify the target level again and click Close.



Click 'Finish' on the previous window. Note this process has not been tested on PDOA systems, however it should apply the update in parallel.

Appendix - Registering Previous Fixpacks

The instructions in this appendix are for customers who need to download and unpack fixpack levels in between the current level and the fixpack that will be applied. This is necessary to obtain software and firmware updates that may not be included in the latest fixpack or that may be required as intermediate updates. These instructions are taken from previous readme documents. Registration is simply downloading the fixpack and unpacking that fixpack or interim fix into the proper directories.

V1.1 FP4 Registration

1. Copy the fixpack files to the /BCU_share directory on the management host.
2. Login to the management host as the root user.
3. Command: Change the working directory to /BCU_share.

```
cd /BCU_share
```

4. Command: Verify the cksum of the fixpack matches the cksum shown in the command below for the fixpack file that was downloaded. The cksum and size are the same regardless of the file downloaded.

```
cksum 1.1.0.4-IM-PureData_System_for_OpAnalytics-fp004.tgz | diff 1.1.0.4-IM-PureData_System_for_OpAnalytics-fp004.tgz.cksum -
```

Example Output:

```
$ cksum 1.1.0.4-IM-PureData_System_for_OpAnalytics-fp004.tgz | diff 1.1.0.4-IM-PureData_System_for_OpAnalytics-fp004.tgz.cksum -
1c1
< 4064731954 26129423644 1.1.0.4-IM-PureData_System_for_OpAnalytics-fp004_20210302_190606.tgz
---
> 4064731954 26129423644 1.1.0.4-IM-PureData_System_for_OpAnalytics-fp004.tgz
```

5. Command: Use the following command line to unpack the contents of the compressed tar file.

```
time gzip -d < /BCU_share/1.1.0.4-IM-PureData_System_for_OpAnalytics-fp004.tgz | tar -xof - -C /BCU_share
```

Example Output:

```
$ time gzip -d < /BCU_share/1.1.0.4-IM-PureData_System_for_OpAnalytics-fp004.tgz | tar -xof - -C /BCU_share

real    5m2.64s
user    2m46.78s
sys     1m9.56s
```

6. Command: Verify the number of files and directories in /BCU_share/FP8_FP4. This check will not work after the fixpack begins as new files will be added to the directory during the update.

```
find /BCU_share/FP8_FP4 | wc -l
```

Example Output:

```
$ find /BCU_share/FP8_FP4 | wc -l
3579
```

7. Command: Verify the file cksums. After the fixpack is applied newly extracted files and some log files will appear in the difference output.

```
time find FP8_FP4 -type f | xargs cksum | diff 1.1.0.4-IM-PureData_System_for_OpAnalytics-fp004.files.cksum -
```

Example Output:

```
$ time find FP8_FP4 -type f | xargs cksum | diff 1.1.0.4-IM-PureData_System_for_OpAnalytics-fp004.files.cksum -

real    1m44.35s
user    0m53.76s
sys     0m6.98s
```

V1.1 FP3 Registration

1. If your system is currently at V1.1 FP2, then also follow these instructions to register the V1.1 FP3 fixpack and to unpack updated V1.1 FP4 platform layer and fixpack tooling. Otherwise continue to the next section.

- a. Command: Verify the checksum for the FP3 file.

```
cksum /BCU_share/*IM-PureData_System_for_OpAnalytics-fp00[37].*tgz
```

Example Output:

```
$ cksum /BCU_share/*IM-PureData_System_for_OpAnalytics-fp00[37].*tgz
<td>
```

- b. Command: Unpack the contents of the V1.1 FP3 compressed file.

```
time gzip -d < 1.1.0.3-IM-PureData_System_for_OpAnalytics-fp003.tgz | tar -xof - -C /BCU_share
```

Example Output:

```
$ time gzip -d < 1.1.0.3-IM-PureData_System_for_OpAnalytics-fp003.tgz | tar -xof - -C /BCU_share
<td>
```

- c. Command: Verify the number of files extracted.

```
find /BCU_share/FP7_FP3 | wc -l
```

Example Output:

```
$ find /BCU_share/FP7_FP3 | wc -l
<td>
```

2. Download IF02 if using the V1.1 FP2 to V1.1 FP4 update path.

- a. Command: Verify the cksum for the 4.0.9.0 platform layer installation file.

```
cksum /BCU_share/PlatformControl-Pfplayer.4.0.9.0_20210608221232.bff
```

Example Output:

```
$ cksum /BCU_share/PlatformControl-Pfplayer.4.0.9.0_20210608221232.bff
<td>
```

- b. Command: Backup the existing 4.0.8.0 platform layer.

```
mv /BCU_share/FP8_FP4/software/Pfplayer/PlatformControl-Pfplayer.4.0.8.0_20201228213703.bff
/BCU_share/FP8_FP4/software/Pfplayer/PlatformControl-Pfplayer.4.0.8.0_20201228213703.bff.bak
```

<td>

- c. Command: Copy the 4.0.9.0 platform installation file to the FP8_FP4 installation path.

```
cp /BCU_share/PlatformControl-Pfplayer.4.0.9.0_20210608221232.bff /BCU_share/FP8_FP4/software/Pfplayer/
```

<td>

- d. Command: Verify the cksum for the updated fixpack tools package.

Appendix - Registering Previous Fixpacks

```
cksum $(ls -rt /BCU_share/atk-tools_fixpack_tools_*.tgz | tail -1)
```

Example Output:

<tbid>

- e. Command: Backup the current fixpack tools.

```
mv /BCU_share/FP8_FP4/fixpack_tools/ /BCU_share/FP8_FP4/fixpack_tools_1.1.0.4
```

- f. Command: Unpack the updated fixpack tools.

```
gzip -d < $(ls -rt /BCU_share/atk-tools_fixpack_tools_*.tgz | tail -1) | tar -xf - -C /BCU_share/FP8_FP4/
```

- g. Command: Verify the cksum of the new fixpack tools directory.

```
$ (cd /BCU_share/FP8_FP4;find fixpack_tools -type f | xargs cksum) | diff $(ls -rt /BCU_share/atk-tools_fixpack_tools_*.cksum | tail -1) -
```

Appendix – Restoring The Management Host as a NIM Server

During Stage 2 the management host's rootvg mirror is broken and the free disk is used as the target for the AIX 7.2 migration. As part of the preparation for migration, the NIM configuration is backed up, removed, and the NIM server files are uninstalled. If there are no issues during migration the NIM configuration will be restored and these instructions will not be needed, however, if there is an issue and the management node needs to be reset, it may be desired or necessary to restore the management node as a NIM server. The instructions assume that the migration occurred and the management host was restarted and is running AIX 7.2.

If the AIX 7.2 clone is removed (or doesn't exist) it will be possible to migrate the management host again in Stage 3 Phase 2.

Phase 1: Reverting the Management Host Level to AIX 7.1

Step 1: Checking the oslevel for the management host as the root user.

- Command: Checking if the oslevel is 7.1 or 7.2. If the oslevel is 7100* then the management host is already at 7.1. Proceed to the next phase.

```
oslevel -s
```

Example Output:

```
$ oslevel -s  
7100-05-07-2038
```

Step 2: Quiescing the management host.

- Command: Use the fixpack tools to stop any services (pre-FP4), unmount GPFS filesystems and stop GPFS.

```
/BCU_share/FP9_FP5/fixpack_tools/application/quiesce_node.sh
```

Step 3: Verifying the management host's cloned disk is AIX 7.1. If the output shows AIX 7.2.0.0 or is blank, contact IBM support, do not proceed.

- Command:

```
/BCU_share/FP9_FP5/fixpack_tools/application/check_alt_oslevel.sh | grep OSVERSION
```

Example Output:

```
OSVERSION=7.1.0.0
```

Step 4: Updating the bootlist to use the previous clone. After the 7.2 migration is complete and the management node has rebooted into the newly migrated rootvg image, the previous clone will be named 'old_rootvg'. The next command will display the current 'rootvg' volume groups and their associated hdisks. The hdisk assignments are determined by cfgmgr and may not match the example output. It is also possible that the clone will not be named 'old_rootvg'.

- Command: View the current hdisk to vg assignment.

```
lspv | grep rootvg
```

Example Output:

```
lspv | grep rootvg  
hdisk0      00fa574e43949559      old_rootvg  
hdisk1      00fa574e4718478b      rootvg          active
```

- Command: View the current bootlist.

Appendix – Restoring The Management Host as a NIM Server

```
bootlist -m normal -o
```

Example Output: (shows hdisk1, which matches the current rootvg hdisk)

```
$ bootlist -m normal -o
hdisk1 blv=hd5 pathid=0
```

- Command: Update the bootlist to match the hdisk associated with 'old_rootvg'.

```
bootlist -m normal hdisk0 hdisk1
```

- Command: Review the current bootdisk order. The hdisk must match the 'old_rootvg' or 'altinst_rootvg' hdisk.

```
$ bootlist -m normal -o
```

Example Output:

```
$ bootlist -m normal -o
hdisk0 blv=hd5 pathid=0
hdisk1 blv=hd5 pathid=0
```

Step 5: Rebooting the management host into AIX 7.1.

All existing sessions on the management host will be down. Access to /BCU_share on other hosts will hang while the management host reboots. Using the 'at now' method returns to the command line immediately, allowing the user to exit the session before access to the host is lost. This can prevent having to wait for the client to timeout if accessing the server from a command line ssh session.

- Command: Reboot the management host. This will schedule a reboot immediately. Wait for the reboot notice and then exit the session.

```
echo "shutdown +0 -r" | at now
```

- Command: Once the system has rebooted, verify that the oslevel is 7.1 again.

```
oslevel -s
```

Example Output:

```
$ oslevel -s
7100-05-07-2038
```

- Command: Verify that the rootvg to hdisk mappings.

```
$ lspv | grep rootvg
```

Example Output:

```
$ lspv | grep rootvg
hdisk0      00fa574e43949559      rootvg      active
hdisk1      00fa574e4718478b      altinst_rootvg
```

- Command: Verify that the rootvg clone is the 7.2 migrated clone.

```
/BCU_share/FP9_FP5/fixpack_tools/application/check_alt_oslevel.sh | grep OSVERSION
```


Appendix – Restoring The Management Host as a NIM Server

Example Output:

```
OSVERSION=7.2.0.0
```

Phase 2: Removing The NIM Restore Filesystem/LV/VG

Use this step if the intent is to remove the migrated clone due to an error discovered after migration and is provided here for future reference

During the NIM migration a new filesystem is created, /pdoa_nimrestore off a new hdisk that is carved out of the Foundation V7000. This was created prior to the management host migration and exists on both the original AIX 7.1 rootvg and the migrated AIX 7.2 rootvg. If the NIM server was deployed on the AIX 7.2 rootvg and the intent is to remove the migrated clone, then this filesystem should be cleaned and removed.

Step 1: Unmount /pdoa_nimrestore.

- Command:

```
umount /pdoa_nimrestore
```

Step 2: Remove the filesystem [NOTE: Removing /pdoa_nimrestore is enough to be able to rerun the Stage 2, Phase 3, Step 3 to recreate the LUNs/Filesystems].

- Command:

```
rmfs /pdoa_nimrestore
```

Step 3: Verify the hdisk/LUN assigned to nimvg.

- Command: nimvg hdisk relationship

```
lspv | grep nimvg
```

Example Output:

```
$ lspv | grep nimvg
hdisk10          00fa574d86969c9c          nimvg          active
```

- Command: hdisk to LUN ID, assign to *unique_id*. Replace 'hdisk10' with the hdisk identified above.

```
lsattr -EOL hdisk10 -a unique_id | grep -v unique_id
```

Example Output:

```
$ lsattr -EOL hdisk10 -a unique_id | grep -v unique_id
3321360050764008480D2C000000000000000001804214503IBMfcP
```

- Command: Verify this ID appears in the Foundation V7000 (typically 172.23.1.1 and *storage0*). Replace '3321360050764008480D2C000000000000000001804214503IBMfcP' with the id that appears in the previous command. This method only works with V7000 vdisks and not Flash900 vdisks.

```
appl_ls_hw -l storage0 -A M_IP_address < /dev/null | sed 's|'|g' | while read ip;do ssh superuser@${ip} 'lsdisk -
nohdr -delim "," | while read line;do id=$(echo $line | cut -d, -f 14);echo
"3321360050764008480D2C000000000000000001804214503IBMfcP" | grep "${id}" && echo "${line}";done';done
```

Example Output: Look for a VDISK name of
FOUNDATION_MDISKPOOL#_LUN#_600_[MGMT|MGMTSTDBY]NIM to ensure this is the correct
hdisk.

```
appl_ls_hw -l storage0 -A M_IP_address < /dev/null | sed 's|'|g' | while read ip;do ssh superuser@${ip} 'lsdisk -  
nohdr -delim "," | while read line;do id=$(echo $line | cut -d, -f 14);echo  
"3321360050764008480D2C0000000000000001804214503IBMfc" | grep "${id}" && echo "${line}";done';done  
3321360050764008480D2C0000000000000001804214503IBMfc  
10,FOUNDATION_MDISKPOOL7_LUN4_600_MGMTNIM,0,io_grp0,online,4,FOUNDATION_MDISKPOOL7,600.00GB,striped,,,,60050764008480D  
2C0000000000000018,0,1,not_empty,0,no,0,4,FOUNDATION_MDISKPOOL7,no,no,10,FOUNDATION_MDISKPOOL7_LUN4_600_MGMTNIM,,scsi
```

Step 4: varyoff nimvg.

- Command:

```
varyoffvg nimvg
```

Step 5: Export nimvg.

- Command:

```
exportvg nimvg
```

Step 6: Clearing the disk identified in Step 3.

- Command: Replace "<hdisk>" with the hdisk number associated the NIM LUN(Double and triple check that this is the correct hdisk as doing this on the wrong disk can result in data loss! This allows the hdisk to be added to volume groups without forcing the operation.

```
chpv -C <hdisk>
```

Phase 3: Restoring NIM

Use this phase to restore the management server's NIM configuration to pre-FP5 setup.

Step 1: Reinstalling the NIM Server Fileset

- Command: Install the NIM Server from the installp images provides in FP5.

```
installp -acXYgd /BCU_share/FP9_FP5/software/AIX/NIM/7100-05-04/installp/ppc bos.sysmgt.nim.master
```

- Command: Apply the update using the AIX update image in FP4.

```
installp -acXYgd /BCU_share/FP8_FP4/software/AIX/71_TL5_SP7 bos.sysmgt.nim.master
```

Step 2: Restoring the management node NIM configuration.

- Command: Determine the filename for the latest NIM Configuration backup. This was taken as part of Stage 2.

```
ls -lrt /stage/backups/FP9_FP5/$(hostname)_NIMDB_Backup*
```

Example Output:

```
$ ls -lrt /stage/backups/FP9_FP5/$(hostname)_NIMDB_Backup*
-rw-r--r-- 1 root system 40960 Oct 18 2021 /stage/backups/FP9_FP5/reverseflash01_NIMDB_Backup.20211018123905
-rw-r--r-- 1 root system 40960 Mar 04 17:11 /stage/backups/FP9_FP5/reverseflash01_NIMDB_Backup.20220304171100
-rw-r--r-- 1 root system 40960 Apr 05 09:34 /stage/backups/FP9_FP5/reverseflash01_NIMDB_Backup.20220405093400
-rw-r--r-- 1 root system 40960 Jun 07 17:11 /stage/backups/FP9_FP5/reverseflash01_NIMDB_Backup.20220607171103
-rw-r--r-- 1 root system 40960 Aug 12 16:16 /stage/backups/FP9_FP5/reverseflash01_NIMDB_Backup.20220812161625
```

- Command: Run the restore command using the latest NIM backup file.

```
/usr/lpp/bos.sysmgt/nim/methods/m_restore_db /stage/backups/FP9_FP5/reverseflash01_NIMDB_Backup.20220405093400
```

Example Output:

```
$ /usr/lpp/bos.sysmgt/nim/methods/m_restore_db /stage/backups/FP9_FP5/reverseflash01_NIMDB_Backup.20220405093400
Level check is successful.
```

```
x ./etc/objrepos/nim_attr, 12288 bytes, 24 media blocks.
x ./etc/objrepos/nim_attr.vc, 12288 bytes, 24 media blocks.
x ./etc/objrepos/nim_object, 4096 bytes, 8 media blocks.
x ./etc/objrepos/nim_object.vc, 4096 bytes, 8 media blocks.
x ./etc/NIM.level, 9 bytes, 1 media blocks.
x ./etc/niminfo, 171 bytes, 1 media blocks.
x ./etc/NIM.primary.cpuid, 13 bytes, 1 media blocks.
0513-071 The nimesis Subsystem has been added.
0513-071 The nimd Subsystem has been added.
0513-059 The nimesis Subsystem has been started. Subsystem PID is 2753320.
```

- Command: Verify the nim configuration is restored.

```
lsnim
```

Example Output:

```
$ lsnim
master          machines      master
boot            resources    boot
nim_script      resources    nim_script
```

Appendix – Restoring The Management Host as a NIM Server

master_net	networks	ent
BCUbase	resources	mksysb
BCUbosinst	resources	bosinst_data
BCUspot	resources	spot
BCUis	resources	script
BCUtune	resources	script
BCUusers	resources	script
BCUdb2inst	resources	script
BCUdb2inst_process	resources	script
BCUsysNode	resources	script
BCUmirrorvg	resources	script
BCUunmount	resources	script
BCUlicense	resources	script
BCUtimezone	resources	script
BCUsetupssh	resources	script
RefreshFCS	resources	script
bcu_resources	groups	res_group
adminnode_2	machines	standalone
primary_admin	groups	mac_group
bcu_nodes	groups	mac_group
datanode_6	machines	standalone
data_nodes	groups	mac_group
stdbnode_3	machines	standalone
standby_nodes	groups	mac_group
stdbnode_4	machines	standalone
stdbnode_5	machines	standalone

Phase 4: Removing the AIX 7.2 Clone

Warning: This step will remove the 'old_rootvg' or 'altinst_rootvg' clone if it exists. Only run this step if it is necessary to remove the AIX 7.2 clone.

- Command: Run the unclone step. This step requires both 'hdisks' to be in the bootlist.

```
/BCU_share/FP9_FP5/fixpack_tools/application/mirror_utility.sh -action unclone
```

- Command: Verify that the clone is removed.

```
lspv | grep rootvg
```

Example Output:

```
$ lspv | grep rootvg
hdisk1          00fa574d471862e3          rootvg          active
```

Appendix – Troubleshooting AIX 7.2 Migration Failures

Description

During Stage 2, Stage 6, and Stage 7 the AIX LPARs are migrated using NIM. In Stage 2, the management standby is deployed as a new NIM server and the management lpar is reconfigured as a client. After migration, the management server has its NIM server database restored to what was used during the initial deployment of the environment. While most customers have not modified the configuration, there are several reasons why this may not work. Here are some potential issues that can cause the migration step to fail.

Possible Reasons for Failure

Unable to Quiesce The Host

This occurs when a process has an open file descriptor on a Spectrum Scale filesystem preventing the 'umount' command from working. This prevents the quiesce from completing successfully and is a safety mechanism. The solution is to determine which host or hosts have one or more filesystems that cannot be safely unmounted. The following commands are run against all hosts, including the management hosts and hosts that may already be migrated.

Troubleshooting quiesce issues.

1. Command: Check that all eligible hosts are quiesced. If there are eligible hosts that are not quiesced proceed to '1c'. Otherwise proceed to item '2'.

```
dsh -n ${ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/check_server_state.sh services > /dev/null 2>&1 && echo "Eligible." && /BCU_share/FP9_FP5/fixpack_tools/application/check_server_state.sh > /dev/null 2>&1 && echo "Quiesced."' | dshbak -c
```

Example Output: (All eligible hosts are quiesced.)

```
$ dsh -n ${ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/check_server_state.sh services > /dev/null 2>&1 && echo "Eligible." && /BCU_share/FP9_FP5/fixpack_tools/application/check_server_state.sh > /dev/null 2>&1 && echo "Quiesced."' | dshbak -c
HOSTS -----
reverseflash01, reverseflash03, reverseflash04, reverseflash05
-----
Eligible.
Quiesced.

(0) root @ reverseflash01: 7.2.0.0: /
```

Example Output: (Shows some eligible hosts are not quiesced.)

Appendix – Troubleshooting AIX 7.2 Migration Failures

```
$ dsh -n ${ALL} '/BCU_share/FP9_FP5/fixpack_tools/application/check_server_state.sh services > /dev/null 2>&1 && echo
"Eligible." && /BCU_share/FP9_FP5/fixpack_tools/application/check_server_state.sh > /dev/null 2>&1 && echo "Queisced."' |
dshbak -c
HOSTS -----
reverseflash01, reverseflash03
-----
Eligible.
Queisced.

HOSTS -----
reverseflash04, reverseflash05
-----
Eligible.

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

2. Command: Check the log output for errors. This command will look for the latest quiesce log file for each host and will look for the result as well as any errors in the log. If a node should have been eligible to quiesce, and it returns an error that says 'Unable to unmount filesystem on this host.' then those hosts need further examination. The output or log file may show 'GPFS: 6027-511 Cannot unmount /dev/stage: The requested resource is busy.', which indicated that a process is holding onto the filesystem. Hosts that are not eligible to quiesce will return the error "Error: Cannot quiesce this host due to existing services."

```
dsh -n ${ALL} 'ls -rt /BCU_share/support/FP9_FP5/log/quiesce*$(hostname)*.log | tail -1 | xargs egrep "Error|ended with"' |
dshbak -c
```

Example Output: (With errors)

```
$ dsh -n ${ALL} 'ls -rt /BCU_share/support/FP9_FP5/log/quiesce*$(hostname)*.log | tail -1 | xargs egrep "Error|ended with"'
| dshbak -c
HOSTS -----
reverseflash01
-----
20220822_190326 (reverseflash01:quiesce_node.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/quiesce_node.sh' with
arguments '' ended with rc='0'. Start: Mon Aug 22 19:02:05 EDT 2022 End: Mon Aug 22 19:03:26 EDT 2022. Elapsed Time
(Seconds): 81 (H:M:S):(00:01:21).

HOSTS -----
reverseflash02
-----
20220822_190206 (reverseflash02:quiesce_node.sh): Error: Cannot quiesce this host due to existing services. Please failover
any services running on this host.
20220822_190206 (reverseflash02:quiesce_node.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/quiesce_node.sh' with
arguments '' ended with rc='1'. Start: Mon Aug 22 19:02:06 EDT 2022 End: Mon Aug 22 19:02:06 EDT 2022. Elapsed Time
(Seconds): 0 (H:M:S):(00:00:00).

HOSTS -----
reverseflash03
-----
20220822_190228 (reverseflash03:quiesce_node.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/quiesce_node.sh' with
arguments '' ended with rc='0'. Start: Mon Aug 22 19:02:06 EDT 2022 End: Mon Aug 22 19:02:28 EDT 2022. Elapsed Time
(Seconds): 22 (H:M:S):(00:00:22).

HOSTS -----
reverseflash06
-----
20220822_190206 (reverseflash06:quiesce_node.sh): Error: Cannot quiesce this host due to existing services. Please failover
any services running on this host.
20220822_190206 (reverseflash06:quiesce_node.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/quiesce_node.sh' with
arguments '' ended with rc='1'. Start: Mon Aug 22 19:02:06 EDT 2022 End: Mon Aug 22 19:02:06 EDT 2022. Elapsed Time
(Seconds): 1 (H:M:S):(00:00:01).

HOSTS -----
reverseflash04
-----
20220822_190233 (reverseflash04:quiesce_node.sh): Error: Unable to unmount filesystems on this host.
20220822_190233 (reverseflash04:quiesce_node.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/quiesce_node.sh' with
arguments '' ended with rc='2'. Start: Mon Aug 22 19:02:06 EDT 2022 End: Mon Aug 22 19:02:33 EDT 2022. Elapsed Time
(Seconds): 27 (H:M:S):(00:00:27).

HOSTS -----
reverseflash05
-----
20220822_190234 (reverseflash05:quiesce_node.sh): Error: Unable to unmount filesystems on this host.
```


Appendix – Troubleshooting AIX 7.2 Migration Failures

```
20220822_190234 (reverseflash05:quiesce_node.sh): Script '/BCU_share/FP9_FP5/fixpack_tools/application/quiesce_node.sh' with arguments '' ended with rc='2'. Start: Mon Aug 22 19:02:06 EDT 2022 End: Mon Aug 22 19:02:34 EDT 2022. Elapsed Time (Seconds): 28 (H:M:S):(00:00:28).
```

```
(0) root @ reverseflash01: 7.2.0.0: /BCU_share/support/FP9_FP5/log
```

3. Command: If there are filesystem unmount errors, use the following command to identify hosts that have mounted GPFS filesystems that could not be unmounted.

```
dsh -n ${ALL} 'cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 && mount | grep mmfs | while read dev mp rest;do echo ${mp};done'
```

Example Output: (Shows /stage is still mounted on two hosts that are eligible to quiesce).

```
$ dsh -n ${ALL} 'cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 && mount | grep mmfs | while read dev mp rest;do echo ${mp};done'
reverseflash05: /stage
reverseflash04: /stage
```

4. Command: Look for any processes that have open file descriptors on the filesystem. Login to that host and check each pid to see if it is doing something important. If not, kill that pid. Attempt to quiesce all hosts again if PIDs were killed. Otherwise move on to reboot those hosts that could not be quiesced.

```
dsh -n ${ALL} 'cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 && mount | grep mmfs | while read dev mp rest;do fuser -c ${mp};done'
```

Example Output: (Shows No Open FDs, but filesystems cannot be unmounted.)

```
$ dsh -n ${ALL} 'cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 && mount | grep mmfs | while read dev mp rest;do fuser -c ${mp};done'
reverseflash04: /stage:
reverseflash05: /stage:
```

5. Command: Reboot any host that could not be quiesced. This command will verify the host was eligible to quiesce, and still has 'GPFS' mounts mounted. Note. This command is not run against management hosts which during stage 7 should already be migrated. Also, management hosts no longer have services so the check_server_state.sh script will already return 0 for the services check.

```
dsh -n ${BCUALL} 'cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 && mount | grep mmfs && echo "Rebooting host." && echo "shutdown +0 -r" | at now'
```

Example Output: (2 hosts rebooting)

```
$ dsh -n ${ALL} 'cd /BCU_share/FP9_FP5/fixpack_tools;application/check_server_state.sh services > /dev/null 2>&1 && mount | grep mmfs && echo "Rebooting host." && echo "shutdown +0 -r" | at now'
reverseflash05: /dev/stage /stage mmfs Jun 14 19:00 rw,mtime,atime,dev=stage
reverseflash05: Rebooting host.
reverseflash05: Job root.1661211421c0.a will be run at Mon Aug 22 19:37:01 EDT 2022.
reverseflash04: /dev/stage /stage mmfs Jun 14 17:14 rw,mtime,atime,dev=stage
reverseflash04: Rebooting host.
reverseflash04: Job root.1661211421c0.a will be run at Mon Aug 22 19:37:01 EDT 2022.
```

6. Command: Use dping in a loop to wait for the hosts to restart. When all hosts are alive again, control-c and verify connectivity to those hosts.

```
while sleep 10;do date;dping ${ALL};done
```

Example Output:

Appendix – Troubleshooting AIX 7.2 Migration Failures

```
Mon Aug 22 19:40:42 EDT 2022
reverseflash06: ping (alive)
reverseflash02: ping (alive)
reverseflash01: ping (alive)
reverseflash03: ping (alive)
reverseflash05: noping (unreachable)
reverseflash04: noping (unreachable)
...
Mon Aug 22 19:43:27 EDT 2022
reverseflash02: ping (alive)
reverseflash06: ping (alive)
reverseflash01: ping (alive)
reverseflash04: ping (alive)
reverseflash03: ping (alive)
reverseflash05: ping (alive)
```

7. Command: Verify connectivity after reboots have completed. GPFS will automatically restart on the rebooted hosts. Allow 5 minutes to for the hosts to rejoin their clusters and mount the filesystems, then attempt to quiesce again.

```
dsh -n ${ALL} 'hostname' | sort
```

Example Output:

```
$ dsh -n ${ALL} 'hostname' | sort
reverseflash01: reverseflash01
reverseflash02: reverseflash02
reverseflash03: reverseflash03
reverseflash04: reverseflash04
reverseflash05: reverseflash05
reverseflash06: reverseflash06
```

8. Command: Remount /BCU_share on the rebooted hosts. Then return to the migration step to retry.

```
./enable_bcushare.sh
```

Example Output:

```
$ ./enable_bcushare.sh
20220823_095037 (reverseflash01:enable_bcushare.sh): Validated host list ''.
20220823_095037 (reverseflash01:enable_bcushare.sh): validatehostlist: validating hostlist = ''.
20220823_095037 (reverseflash01:enable_bcushare.sh): validatehostlist: updating to ALL.
20220823_095037 (reverseflash01:enable_bcushare.sh): validatehostlist: Returning
'reverseflash02mgt,reverseflash06mgt,reverseflash04mgt,reverseflash05mgt,reverseflash01mgt,reverseflash03mgt' as the list of
valid hosts.
20220823_095037 (reverseflash01:enable_bcushare.sh): echo hlist =
'reverseflash02mgt,reverseflash06mgt,reverseflash04mgt,reverseflash05mgt,reverseflash01mgt,reverseflash03mgt'.
20220823_095037 (reverseflash01:enable_bcushare.sh): Checking for /BCU_share on
'reverseflash02mgt,reverseflash06mgt,reverseflash04mgt,reverseflash05mgt,reverseflash01mgt,reverseflash03mgt'.
20220823_095038 (reverseflash01:enable_bcushare.sh): Warning: The following hosts are missing /BCU_share mounts.
reverseflash05: Warning: Missing /BCU_share mount.
reverseflash04: Warning: Missing /BCU_share mount.
20220823_095038 (reverseflash01:enable_bcushare.sh): Attempting to mount /BCU_share on
'reverseflash02mgt,reverseflash06mgt,reverseflash04mgt,reverseflash05mgt,reverseflash01mgt,reverseflash03mgt' hosts.
20220823_095039 (reverseflash01:enable_bcushare.sh): Checking for /BCU_share on
'reverseflash02mgt,reverseflash06mgt,reverseflash04mgt,reverseflash05mgt,reverseflash01mgt,reverseflash03mgt'.
20220823_095040 (reverseflash01:enable_bcushare.sh): Success: /BCU_share is mounted on all hosts.
20220823_095040 (reverseflash01:enable_bcushare.sh): enable_bcushare.sh completed with rc=0.

(0) root @ reverseflash01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

Appendix – Troubleshooting AIX 7.2 Migration Failures

Unable to 'rsh' from the NIM server to the NIM Client.

This only impacts the non-management node migrations in Stage 6 and Stage 7 as those configurations were part of the original deployment. Steps are provided in Stage 6 and Stage 7 to enable the 'rsh' daemon and to configure the '/.rhosts' file to enable rsh solely for the migration. Once migration is completed the instructions to disable the 'rsh' daemon are provided. The migrate_aix72.sh_<hostname>_<timestamp>.log.stderr file will show the nimadm message '0505-153 nimadm: Unable to execute remote client commands' as shown below. To remedy follow the instructions prior to the migration steps in Stage 6 or Stage 7 to setup 'rsh'.

```
20221007_070253 (flashdancehostname01:migrate_aix72.sh): Verifying that that the installp bundle '7200-05-02-2113_ifixes_bnd' exists on 'flashdancehostname01mgt'.
20221007_070253 (flashdancehostname01:migrate_aix72.sh): Found '7200-05-02-2113_ifixes_bnd' installp bundle. Creating -b option.
20221007_070253 (flashdancehostname01:migrate_aix72.sh): Migrating target 'datanode_6' via 'flashdancehostname01mgt' using command 'nimadm -c datanode_6 -s SPOT-7200-05-02-2113 -l 7200-05-02-2113 -Y -d hdisk1 -j nimvg -b 7200-05-02-2113_ifixes_bnd'. Output can be found in /BCU_share/support/FP9_FP5/log/migrate_aix72.sh_flashdancehostname01_20221007_070239.log.stderr.
Initializing the NIM master.
Initializing NIM client flashdancehostname06.
warning: 0042-053 m_ckmac: there is no NIM object named "certificate"
warning: warning: 0042-521 m_ckmac: The mgmt_profile attribute is not set for the datanode_6 object.

flashdancehostname06: A remote host refused an attempted connect operation.
0505-159 nimadm: WARNING, unexpected result from remote command to flashdancehostname06.
0505-153 nimadm: Unable to execute remote client commands.
Cleaning up alt_disk_migration on the NIM master.
20221007_070326 (flashdancehostname01:migrate_aix72.sh): the CMD: 'nimadm -c datanode_6 -s SPOT-7200-05-02-2113 -l 7200-05-02-2113 -Y -d hdisk1 -j nimvg -b 7200-05-02-2113_ifixes_bnd' completed with rc='2'.
20221007_070327 (flashdancehostname01:migrate_aix72.sh): Writing output to /BCU_share/support/FP9_FP5/log/migrate_aix72.sh_flashdancehostname01_20221007_070239.log.rc.
20221007_070327 (flashdancehostname01:migrate_aix72.sh): Completed.
```

Appendix – Troubleshooting AIX 7.2 Migration Failures

The Target Client is a NIM server

This error only occurs in Stage 6 or Stage 7 and likely was the result of a support related activity to either recover the management host or recover a core host when the management host was down. This requires unconfiguring the NIM server and then reconfiguring the host as a client of the management host again. The `migrate_aix72.sh_<hostname>_<timestamp>.log.stderr` file will show the nimadm message '0505-156 nimadm: Client's /etc/niminfo does not match NIM master's database' as shown in the excerpt below.

```
20221010_212945 (flashdancehostname01:migrate_aix72.sh): Verifying that that the installp bundle '7200-05-02-2113_ifixes_bnd' exists on 'flashdancehostname01mgt'.
20221010_212946 (flashdancehostname01:migrate_aix72.sh): Found '7200-05-02-2113_ifixes_bnd' installp bundle. Creating -b option.
20221010_212946 (flashdancehostname01:migrate_aix72.sh): Migrating target 'stbbynode_5' via 'flashdancehostname01mgt' using command 'nimadm -c stbbynode_5 -s SPOT-7200-05-02-2113 -l 7200-05-02-2113 -Y -d hdisk1 -j nimvg -b 7200-05-02-2113_ifixes_bnd'. Output can be found in /BCU_share/support/FP9_FP5/log/migrate_aix72.sh_flashdancehostname01_20221010_212923.log.stderr.
Initializing the NIM master.
Initializing NIM client flashdancehostname05.
warning: 0042-053 m_ckmac: there is no NIM object named "certificate"
warning: warning: 0042-521 m_ckmac: The mgmt_profile attribute is not set for the stbbynode_5 object.

0505-156 nimadm: Client's /etc/niminfo does not match NIM master's database information.
Cleaning up alt_disk_migration on the NIM master.
20221010_212950 (flashdancehostname01:migrate_aix72.sh): the CMD: 'nimadm -c stbbynode_5 -s SPOT-7200-05-02-2113 -l 7200-05-02-2113 -Y -d hdisk1 -j nimvg -b 7200-05-02-2113_ifixes_bnd' completed with rc='2'.
20221010_212950 (flashdancehostname01:migrate_aix72.sh): Writing output to /BCU_share/support/FP9_FP5/log/migrate_aix72.sh_flashdancehostname01_20221010_212923.log.rc.
20221010_212950 (flashdancehostname01:migrate_aix72.sh): Completed.
```

Reconfiguring a non-management lpar to be a NIM client of the management host.

- Command: Remove the NIM Server configuration. Replace *flashdancehostname05* with the server that failed to migrate with the message above. WARNING: Do not run this command outside of ssh on the management node!

```
$ ssh flashdancehostname05 'nim -o unconfig master'
0513-044 The nimesis Subsystem was requested to stop.
0513-004 The Subsystem or Group, nimd, is currently inoperative.
0513-004 The Subsystem or Group, nimsh, is currently inoperative.
0513-083 Subsystem has been Deleted.
0513-083 Subsystem has been Deleted.
0518-307 odmdelate: 5 objects deleted.
0518-307 odmdelate: 42 objects deleted.

(0) root @ flashdancehostname01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
```

- Command: Remove the NIM Server Fileset from the target server. WARNING: Do not run this command outside of ssh on the management host! Replace *flashdancehostname05* with the hostname of the host that failed to be migrated.

```
$ ssh flashdancehostname05 'installp -u bos.sysmgt.nim.master'
+-----+
+-----+ Pre-deinstall Verification... +-----+
+-----+
Verifying selections...done
Verifying requisites...SUCSESSES
-----
Filesets listed in this section passed pre-deinstall verification
and will be removed.

Selected Filesets
-----
bos.sysmgt.nim.master 7.1.3.47          # Network Install Manager - Ma...

<< End of Success Section >>
```

Appendix – Troubleshooting AIX 7.2 Migration Failures

```
done
Results...

FILESET STATISTICS
-----
    1 Selected to be deinstalled, of which:
      1 Passed pre-deinstall verification
----
    1 Total to be deinstalled

+-----+
+                         Deinstalling Software...
+-----+

installp: DEINSTALLING software for:
          bos.sysmgt.nim.master 7.1.3.47

Finished processing all filesets.  (Total time: 38 secs).

+-----+
+                         Summaries:
+-----+

Installation Summary
-----
Name                               Level           Part            Event            Result
-----
bos.sysmgt.nim.master              7.1.3.47        USR              DEINSTALL        SUCCESS

(0) root @ flashdancehostname01: 7.2.0.0: /BCU_share/FP9_FP5/fixpack_tools/application
$
```

- Configure the host as a NIM client. This uses 'connect=shell' to match the definition in the NIM server. RSH will be used only for a short time as part of the migration step. This command must be run as root on the management host to work correctly.

```
ssh flashdancehostname05 "lsconf | grep -i 'LPAR Info' | cut -d: -f2 | while read num lpar;do niminit -a master port=1058 -a master=$(hostname) -a name=${lpar} -a connect=shell;done"
```

- Command: Verify the `/etc/niminfo` file on the target host.

```
$ ssh flashdancehostname05 "cat /etc/niminfo"
#----- Network Install Manager -----
# warning - this file contains NIM configuration information
#         and should only be updated by NIM
# 172.23.1.5 flashdancehostname05

export NIM_NAME=stdbnode_5
export NIM_HOSTNAME=flashdancehostname05
export NIM_CONFIGURATION=standalone
export NIM_MASTER_HOSTNAME=flashdancehostname01
export NIM_MASTER_PORT=1058
export NIM_REGISTRATION_PORT=1059
export NIM_SHELL="nimsh"
export NIM_MASTERID=00F968BF4C00
export NIM_FIPS_MODE=0
export NIM_BOS_IMAGE=/SPOT/usr/sys/inst.images/installp/ppc/bos
export NIM_BOS_FORMAT=rte
export NIM_HOSTS=" 127.0.0.1:loopback:localhost 172.23.1.5:flashdancehostname05 172.23.1.1:flashdancehostname01 "
export NIM_MOUNTS=""
export ROUTES=" default:0:172.23.1.245 "
You have mail in /usr/spool/mail/root
```