



PowerVM LPM and SRR Automation Tool

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PowerVM LPM and SRR Automation Tool

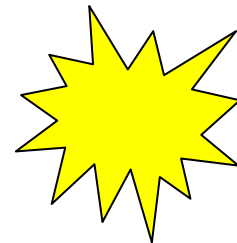
Design, Automate, Rollback

New features in Version 9.930.2

February 13, 2020

There is a new release now for the tool on ResourceLink.

There are 2 main sections to this presentation. The first section is on the V9.910 features. If you already have V9.910 you can skip this sections.



The second section is the new features on V9.930. You can go directly to this section to see the new changes to the tool if you already have V9.910.

PowerVM LPM and SRR Automation Tool

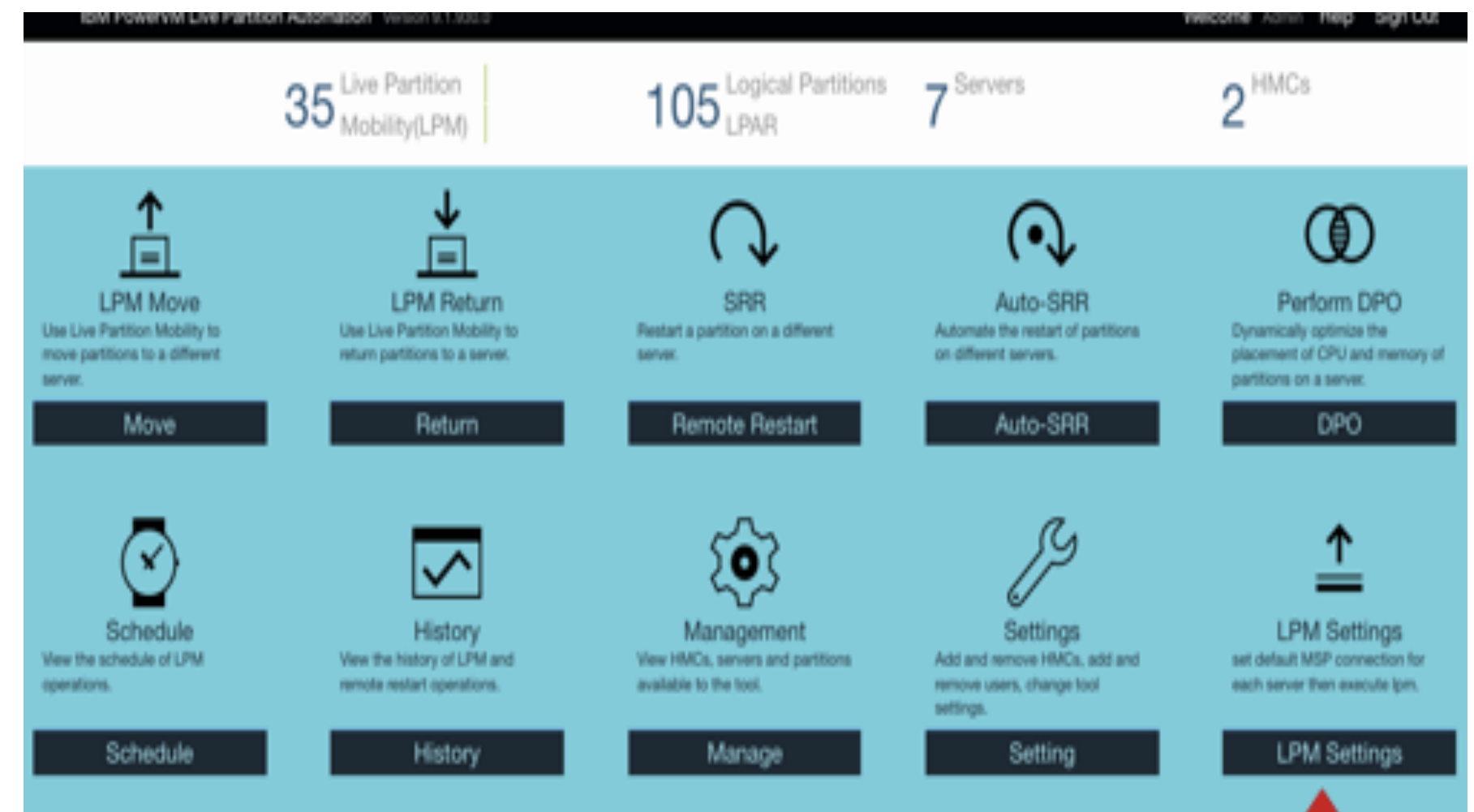
Design, Automate, Rollback

Live Partition Mobility

- **Design** for maintenance and migration
- **Automate** and accelerate mobility actions
- **Rollback** simply to original server

Simplified Remote Restart

- **Design** plan for unscheduled outages
- **Automate** recovery actions
- **Rollback** simply to original server



PowerVM LPM and SRR Automation

Design, Automate, Rollback

Live Partition Mobility (LPM)

- **Design** for maintenance and migration
 - Build a LPM plan for a maintenance window with control over VIO, HBA mappings, etc.
- **Automate** and accelerate mobility action
 - Schedule automated LPM operations or quickly move one or many partitions to another server in as few as 4 clicks with an easy-to-use GUI
- **Rollback** simply to original server
 - Return the partition/s back in a few as 4 clicks to the original server with the original HBA and Virtual slot ID mappings

Simplified Remote Restart (SRR)

- **Design** for unplanned outages
 - Build a SRR plan ready to execute in the event of an unplanned outage
- **Automate** and accelerate mobility action
 - Use a GUI to quickly SRR many or all the partitions to one or more destination servers
- **Rollback** simply to original server
 - Once the outage has been resolved / repaired, move all the partitions back to the original server with just a few clicks

Live Partition Mobility Away and Move

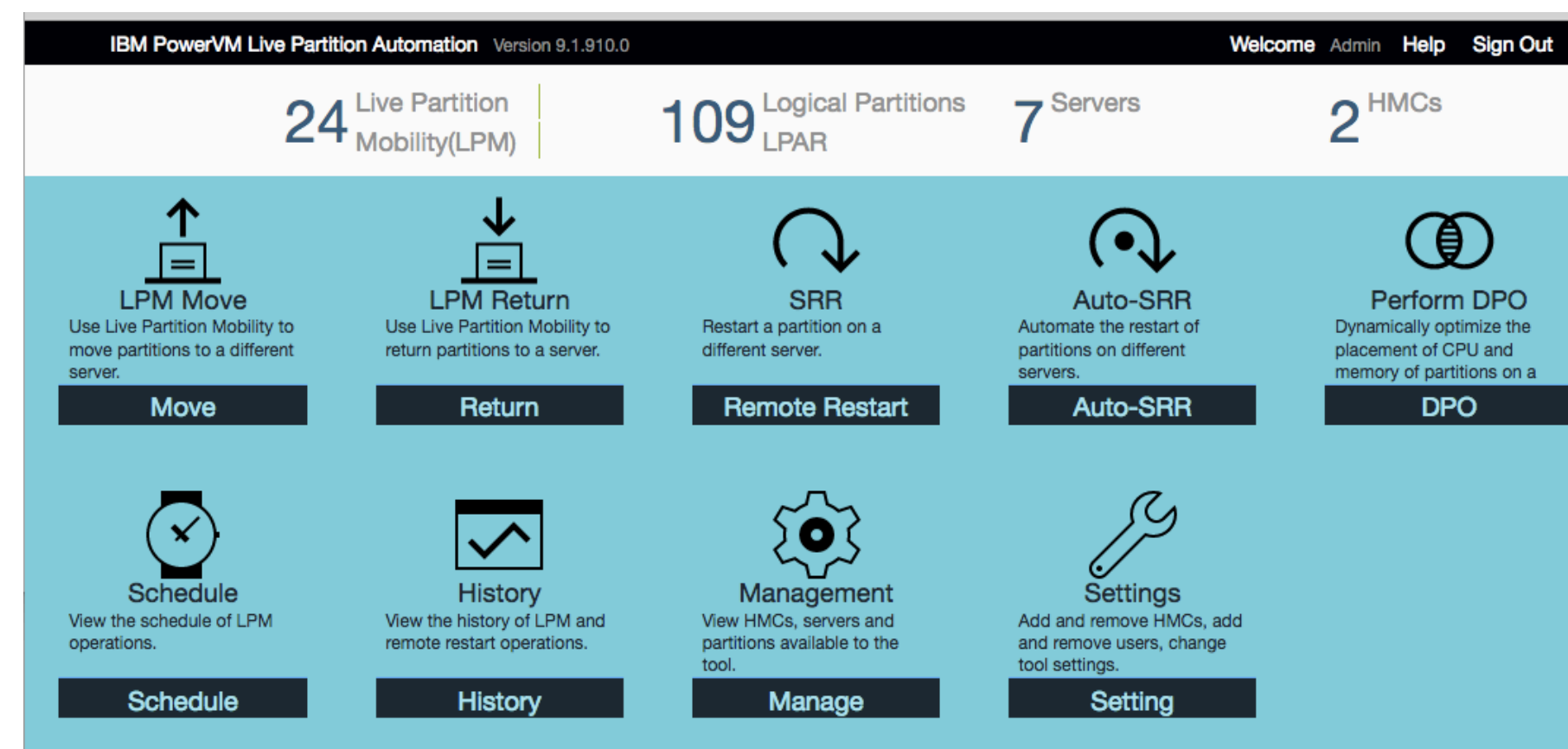
The screenshot shows the 'LPM Away' configuration page. It features a table of LPARs with columns for Name, Cores, Mem, Settings, Source Systems, and Dest Server. A summary table on the right shows the order of operations, destination servers, and remaining CPU and memory. Below this are sections for 'Partition placement policy' (Packing or Striping), 'Concurrent Count' (set to 8), and 'Other settings' (Retain virtual slots, HBA mapping, Retain processor pool mapping, Do not allow LPM return).

Order	Dest Server	Remaining CPU	Remaining MEM
1	thoradfp1	5.5	271872
2	jupe4dfp1	0.95	21504

The screenshot shows the 'LPM Move' configuration page. It includes an 'Import' section, a 'Choose partitions to be moved' section with a list of partitions (mike hmc, jupe4bfp1, MAp720, jupe4dfp1, thoradfp1, kurtkP8, Server-9117-MMC-SN105C627, bob hmc, bobfP8), and a 'Choose destination systems' section with a list of destination systems (mike hmc, jupe4bfp1, MAp720, jupe4dfp1, thoradfp1, kurtkP8, Server-9117-MMC-SN105C627, bob hmc, bobfP8). A 'Next' button is visible at the bottom right.

LPM and SRR Automation Tool Version 9.1.910

- Support for POWER9
- Support for new LPM and SRR features
- New, simplified user interface
- Ability for pre-LPM and post-LPM scripting
- Bypass VLAN issues during validation
- LDAP support
- Automatic plans creation
- Links to online help videos
- Ability to change log file sizes



SRR features in Version 9.1.910.2

- These are the new SRR features added to the tool.
 - Ability to remote restart with different CPU, Memory on target system.
 - Ability to choose a different virtual switch on the target system
 - Test option to remote restart a partition when the system is in PowerOn state
 - Ability to remote restart without powering on the partition on target system

Remote restart with different CPU, Memory on target system

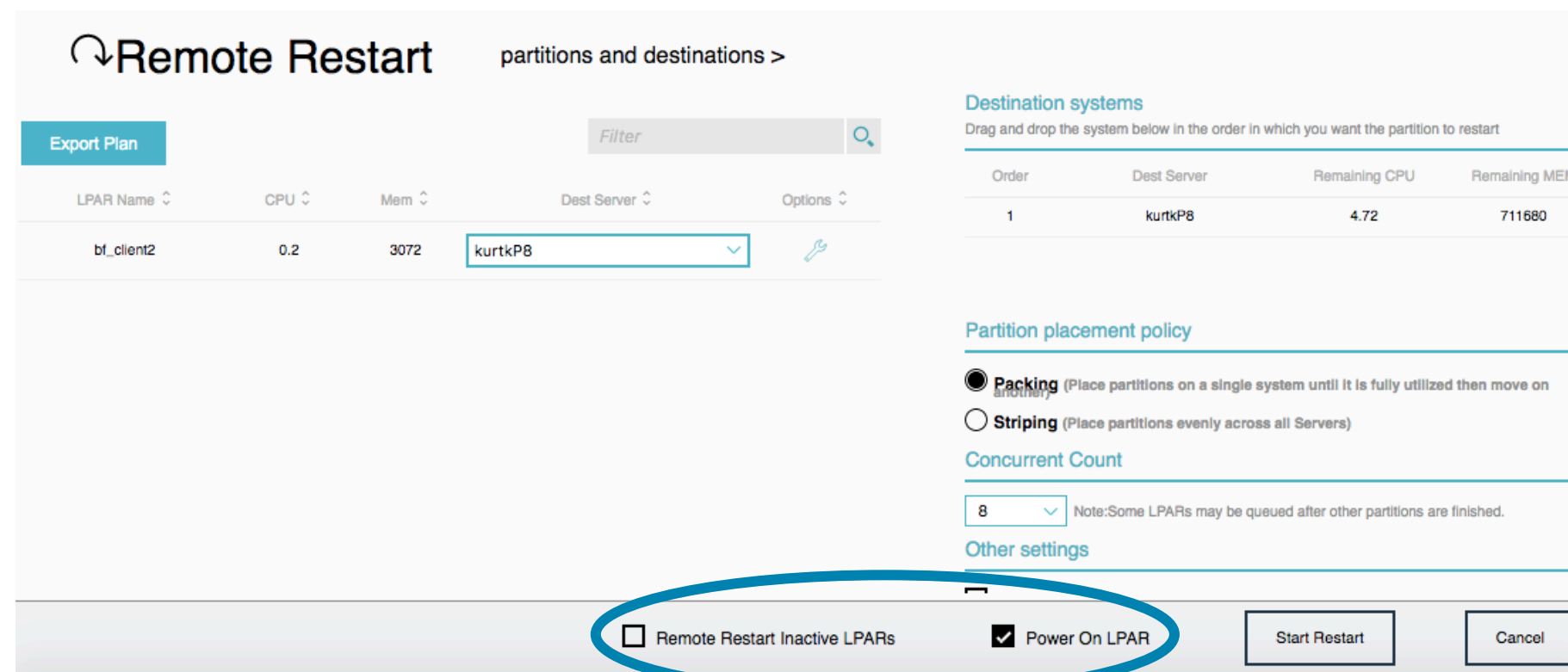
- There are now columns in the RR spreadsheet that allow the SRR to change the Desired Procs (virtual processors), Desired Proc Units and the Desired Memory.
- The values entered into the spreadsheet need to be between the min and max values set in the profile for the partition.
- The tool will set new values when the partition is restarted.
- However, when the partition is LPM'd back to its original server, the different values will be maintained.
- You can use the tool's new scripting ability to change the values during the LPM operation with DLPAR.

Remote restart with different CPU, Memory on target system

- Please see the video for a quick demonstration of this.
- ibm.biz/LPM_SRR_tool
- Look for topic
- **How to change cpu and/or memory when doing SRR**
- Look for file
- [SRR_CPU_Memory_changes.mov](#)

New Checkboxes on SRR Placement Panel

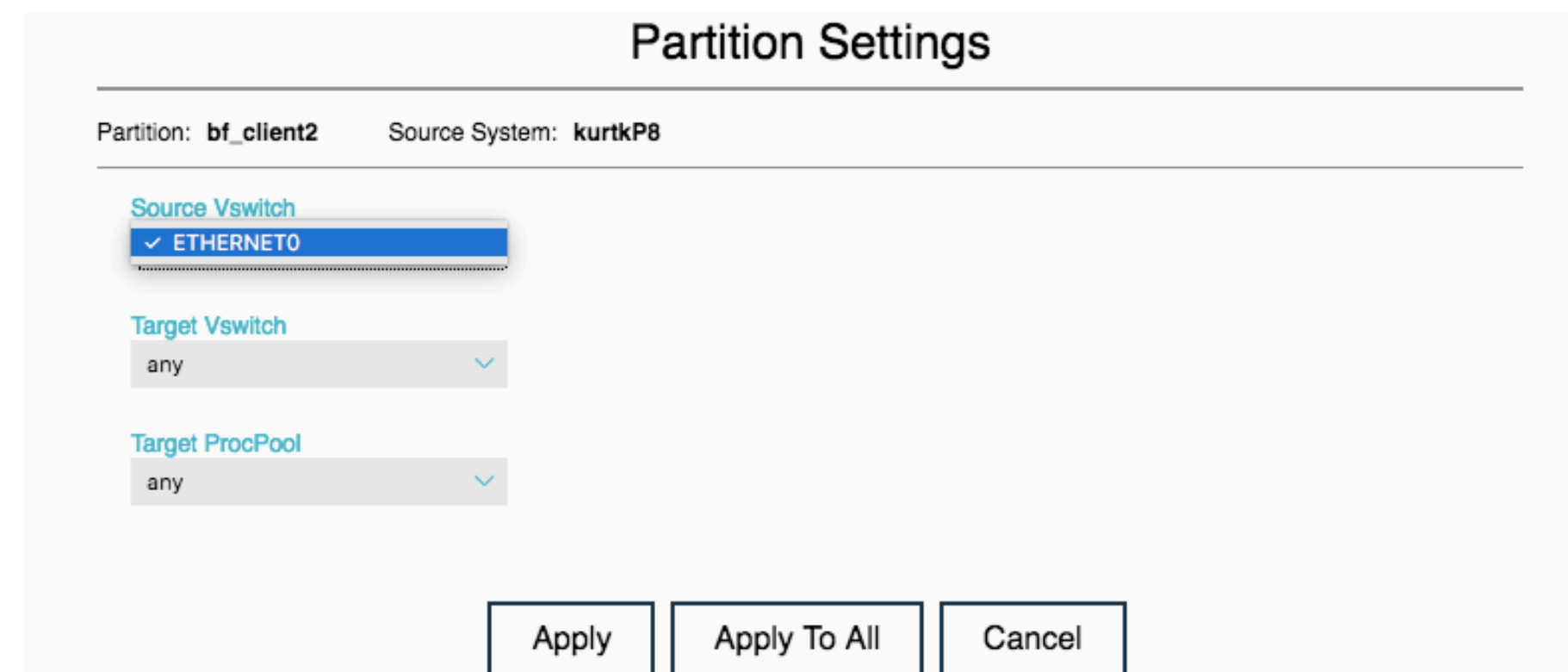
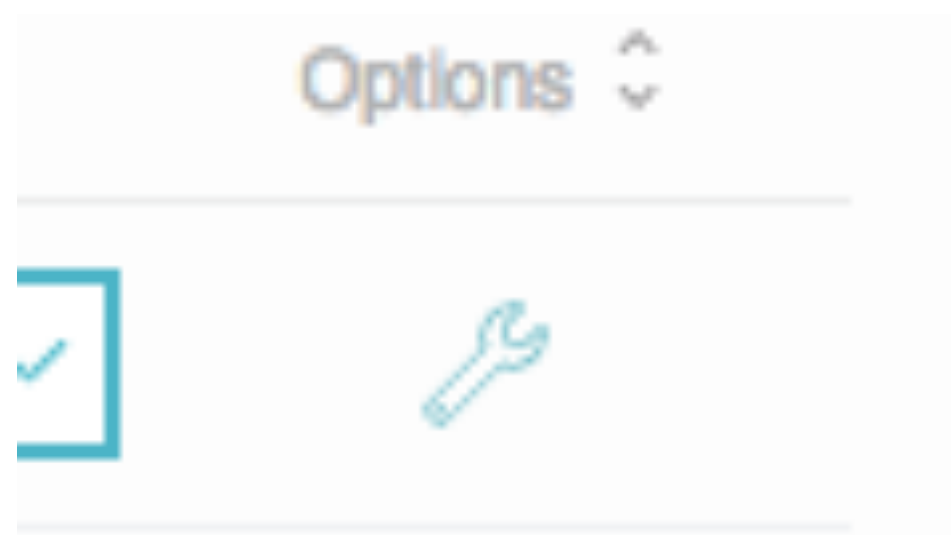
- **Remote Restart Inactive LPARs** – this is referred to as the “test” option in HMC documentation. This will actually remote restart an “inactive” partition to another server while the source server is up and running.
- **Power on LPAR** – this will activate the LPAR after remote restart. If you don’t check this box, the lpar will be moved but not started.



Options wrench pop-up on SRR Placement Panel

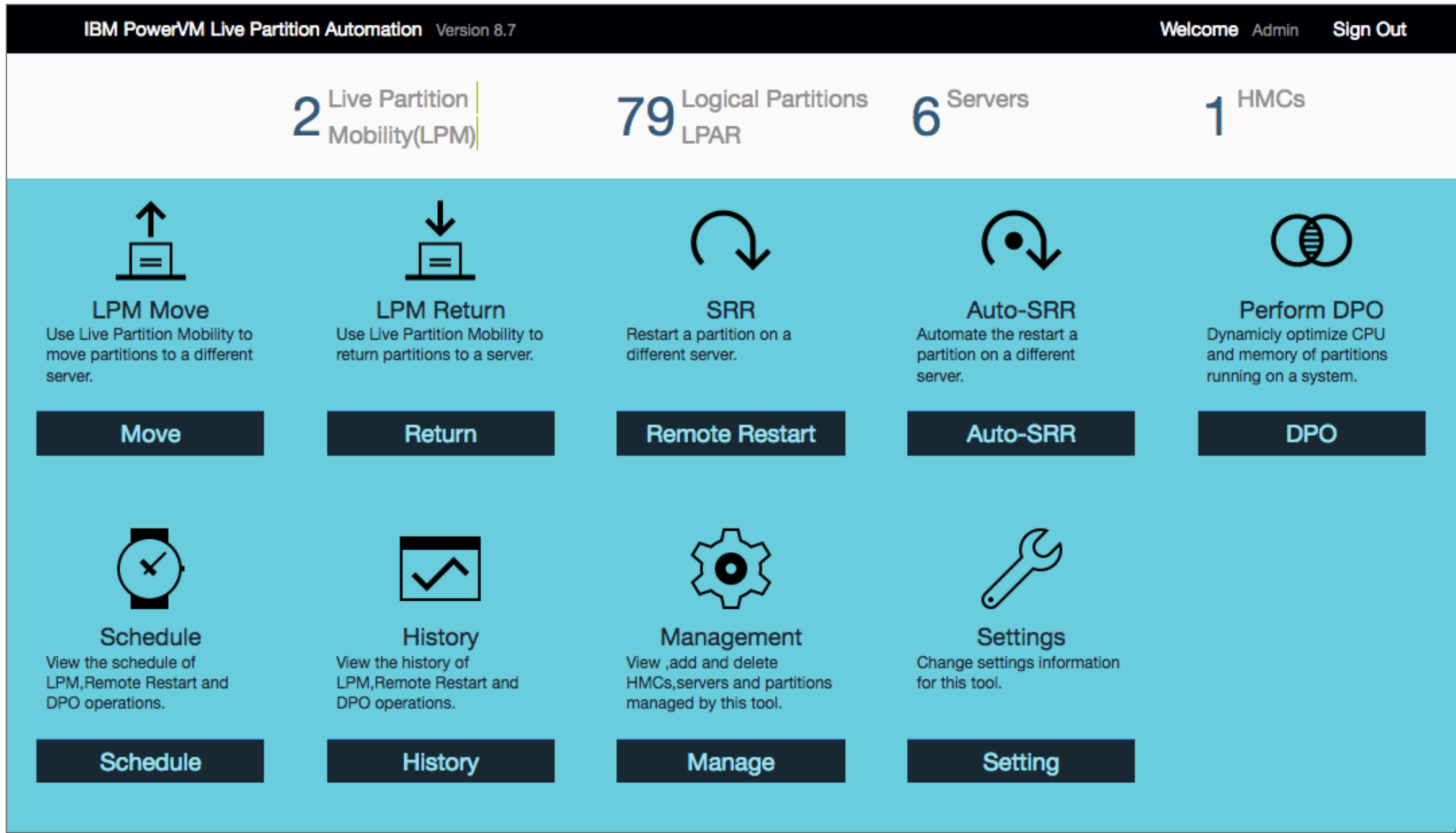
- The Options pop-up now has the ability to change the Vswitch when performing the remote restart. The Target ProcPool option was available on previous releases. To get to this panel, click on the Options wrench icon.

■



New, simplified user interface

The IBM Design team designed the new User Interface.



Ability for pre-LPM and post-LPM scripting

Customers have been asking to be able to execute their custom scripts during LPM operations. Frame names and LPAR names and LPAR ids are added as parameters by the tool. These files are in \$HOME/lpm_script subdirectory.

For AIX and Linux installations, the file names need to be <script name>.sh

For Windows installations, the file names need to be <script name>.bat

This ppt only talks about the .sh file names...but you can use .bat for Windows

Script names and the parameters

Frame Scripts

- `pre_lpm_away_frame.sh` - called once before any LPMs are started during LPM Move. The tool calls the script with multiple parameters `<source frame> <dest frame 1><dest frame 2><dest frame 3>.....`
- `post_lpm_away_frame.sh` - called once after all LPMs are completed during LPM Move. The tool calls the script with multiple parameters `<source frame> <dest frame 1><dest frame 2><dest frame 3>.....`
- `pre_lpm_return_frame.sh` - called once before any LPMs are started during LPM Return. The tool calls the script with multiple parameters `<original source frame> <current dest frame 1><current dest frame 2><current dest frame 3>.....`
- `post_lpm_return_frame.sh` - called once after all LPMs are completed during LPM Return. The tool calls the script with multiple parameters `<original source frame> <current dest frame 1><current dest frame 2><current dest frame 3>.....`
- PLEASE NOTE THAT THE DESTINATION FRAME ORDER may be different on the script invocations!

Script names and the parameters

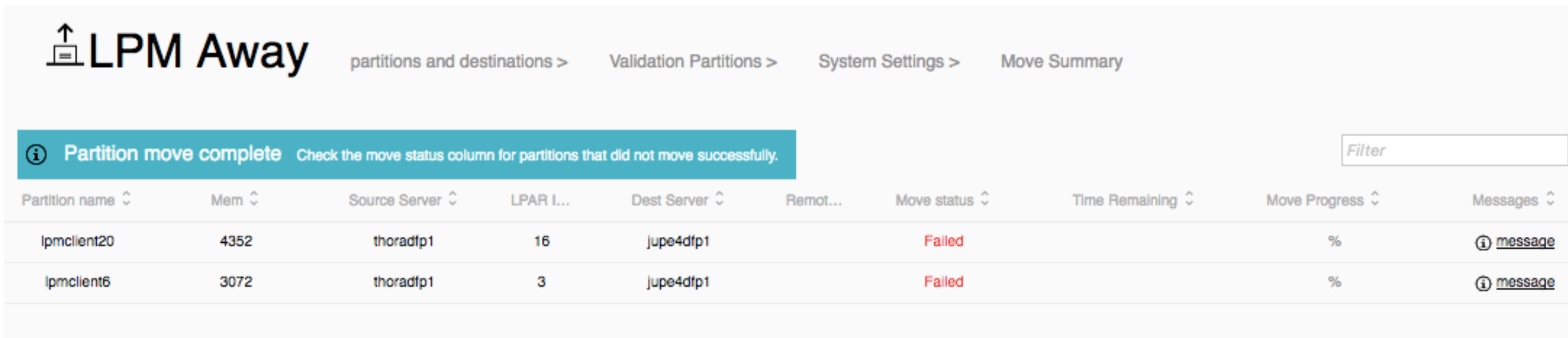
LPAR scripts

- pre_lpm_away_lpar.sh - called each time an LPM starts during LPM Move. The tool calls the script with <source frame><dest frame><lpar name>
- pre_lpm_return_lpar.sh called each time an LPM starts during LPM Return. The tool calls the script with <current dest frame><original source frame><lpar name> (PLEASE NOTE THE FRAME ORDER IS DIFFERENT THAN THE OTHER SCRIPTS)
- post_lpm_away_lpar.sh - called each time an LPM completes during LPM Move. The tool calls the script with <source frame><dest frame><lpar name><lpar id on dest frame>
- post_lpm_return_lpar.sh called each time an LPM completes during LPM Return. The tool calls the script with <current dest frame><original source frame><lpar name><lpar id on original source frame> (PLEASE NOTE THE FRAME ORDER IS DIFFERENT THAN THE OTHER SCRIPTS)

How the tool handles the scripts return codes

If a “pre” script returns a non-zero Return Code, the tool stops that sequence of LPMs.

For example, I have set the return code to 1 on the pre_lpm_away_frame.sh . When I try to LPM the lpars for that frame the tool gives a Move Status of Failed and the “message” shows the script failed.



LPM Away partitions and destinations > Validation Partitions > System Settings > Move Summary

Partition move complete Check the move status column for partitions that did not move successfully.

Partition name	Mem	Source Server	LPAR I...	Dest Server	Remot...	Move status	Time Remaining	Move Progress	Messages
lpmclient20	4352	thoradfp1	16	jupe4dfp1		Failed		%	message
lpmclient6	3072	thoradfp1	3	jupe4dfp1		Failed		%	message

i Message

```
thoradfp1:lpmclient20 --> jupe4dfp1  
Failed to execute pre_lpm_away_frame.sh
```

How the tool handles the scripts return codes

If a “post” script returns a non-zero Return Code, the tool continues its process. It does not tell the user on the Status screen that the post script failed. Since its POST, its sort of too late to stop the rest of the process.

”pre” scripts stops a step.....”post” scripts don’t.

Example of the flow of the scripts

Let's say the example is we are moving 2 partitions (lpar1 and lpar2) from our source frame named Frame880 to 2 destination frames Frame980 (lpar1 destination) and Frame 950 (lpar2 destination)

Run `pre_lpm_away_frame.sh Frame880 Frame980 Frame950`

If RC=0 #if not 0, no LPMs will occur

```
{ # for every lpar do the following
run pre_lpm_away_lpar.sh Frame880 Frame980 lpar1 <lpar1 ID on Frame980>
If RC=0 {
    start the LPM for that lpar
    run post_lpm_away_lpar.sh Frame880 Frame980 lpar1 <lpar1 ID on Frame980>
    Ignore error code on post script
}
}
```

Here is an pair of AIX example scripts you can test

So before you write your own script, we suggest you try these scripts to just get a hang of it.

Create this file with these contents....pre_lpm_away_frame.sh

```
#!/bin/ksh
echo "pre_lpm_away_frame  $1 $2 $3 $4 $5 $6 $7 $8\n" >> /tmp/pre_lpm_away_frame.out
return 0
```

Create this file with these contents....post_lpm_away_lpar.sh

```
#!/bin/ksh
echo "post_lpm_away_lpar  $1 $2 $3 $4 $5 $6 $7 $8\n" >> /tmp/post_lpm_away_lpar.out
return 0
```

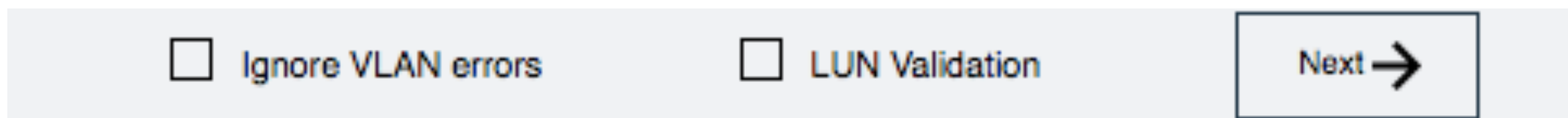
Then do an LPM and look at the contents of those files in the /tmp subdirectory

Bypass VLAN issues during validation

Multiple customers have different VLAN/Vswitch configurations especially when moving from older architectures to newer architectures (i.e. Power8 - > Power9).

LPM Validation fails if VLANs or Vswitchs don't match. Customers have been fixing this by using the config.properties file to specify "Ignore vlan issues".

The new GUI has a "Ignore VLAN errors" checkbox on the LPM Move panel.



Ignore VLAN errors LUN Validation

LDAP/AD support for user authentication

The tool can now use LDAP/AD for its user ids.

The Admin user is still a local id.

All other users will be authenticated via LDAP/AD.

Please see the document in ibm.biz/lpm_srr_tool for details on setting this up.

The document name is [LDAPconfigurationProcedure-<datecode>.doc](#)

Automatic plans creation

Many customers use plans (aka spreadsheets) for customization on how they want the LPMs to be mapped and for the ability for an advanced admin to create a plan and hand it off to a less skilled admin to execute.

Plans can also be used to do recovery actions if the tool fails.

Customers can still make their own plans, but the tool also creates a plan whether the customer wants or not to help in recovery and debug.

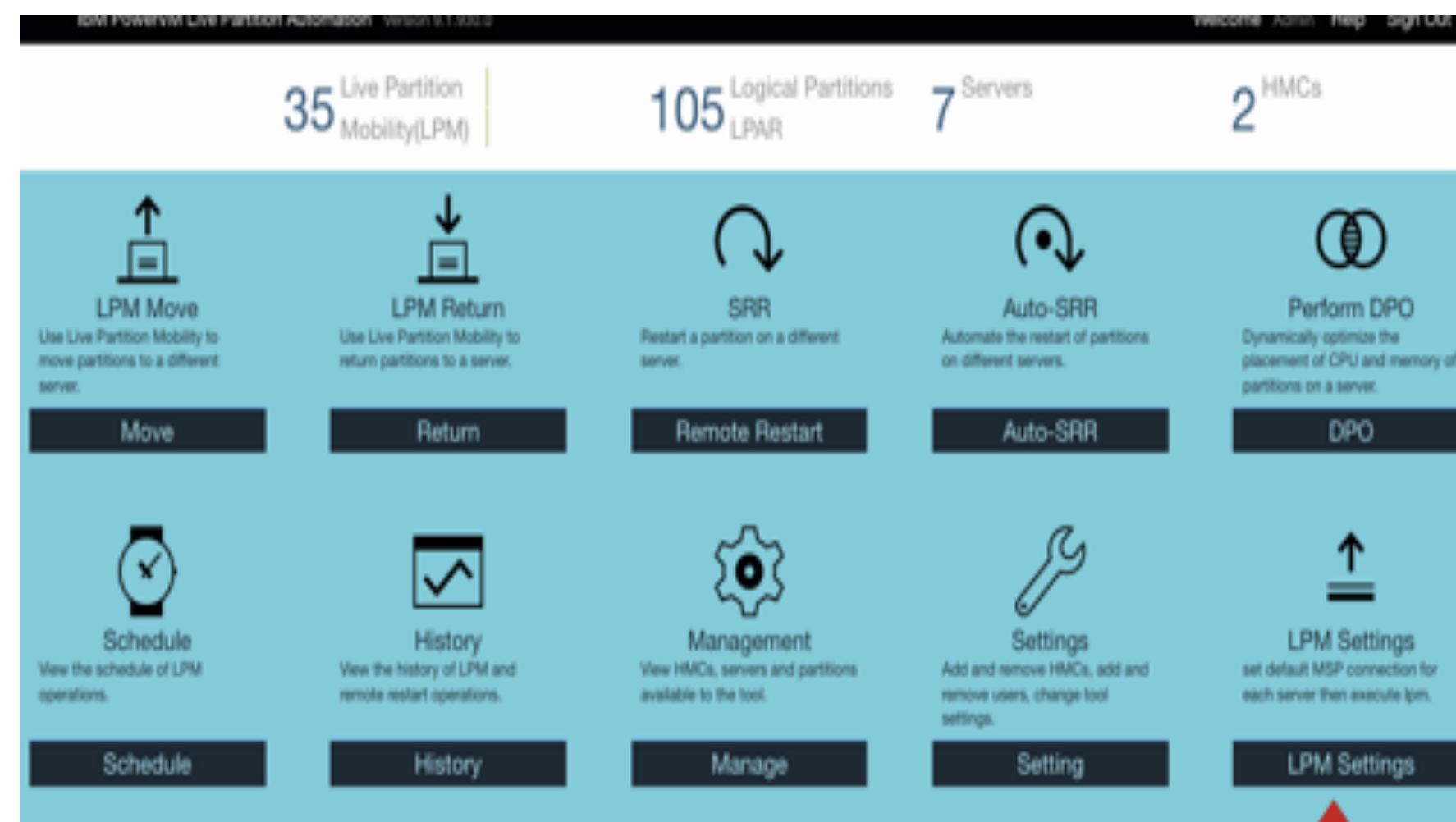
These files are in `$HOME/lpm_plan/perform_LPM` and `$HOME/lpm_plan/perform_SRR` with a timestamp in their name.

```
2018_10_02_06_35_lpm.xlsx
```

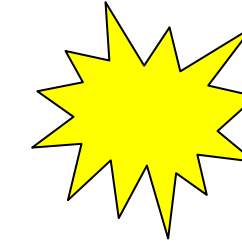
```
2018_10_02_07_21_srr.xlsx
```

LPM and SRR Automation Tool Version 9.1.930

- LPM features added
 - Support for the affinity option
 - Keep VIOS ID mappings option
 - Enhanced support for VNIC backing devices
 - Set default MSP connections
 - Additional “Ignore VLAN error” and “LUN validation” checkboxes
- SRR features added
 - New AutoSRR capability
 - SRR and AutoSRR script capability
 - AutoSRR daily validations and email capability
- Demo version of tool available
- Fixes – Vswitchs with multiple VLANs



Support for the affinity option



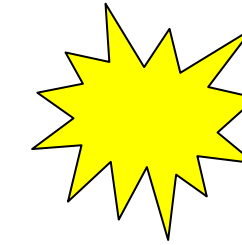
Affinity is only available when doing the actual move operation. It can not be done as part of validation.

This option means move the partition if its affinity score is the same or better than its current score. This was added for mainly for SAP Hana partitions but can be used for any partition.

Note that if the score is lower, the HMC will not move the partition and report an error.

The screenshot shows the 'LPM Move' interface. At the top, there are navigation links: 'partitions and destinations >', 'Validation Partitions >', and 'System Settings >'. Below this is a table with columns: LPAR Name, Cores, Mem, Settings, Source Systems, and Dest Server. The row for 'gb_client1' has a settings icon circled in blue. Below the table is the 'Partition Settings' section for 'gb_client1' on source system 'bobfP8'. It contains several dropdown menus for Source and Target Vswitch, VIOS, and VIOS IP, along with Target ProcPool and Concurrency Level. At the bottom, there are three checkboxes: 'Affinity' (circled in blue), 'Use Single MSP Pair', and 'Apply' (disabled), followed by 'Apply To All' and 'Cancel' buttons.

Keep VIOS ID Mappings option



Striping (Place parameters evenly across all controllers)

Concurrent Count

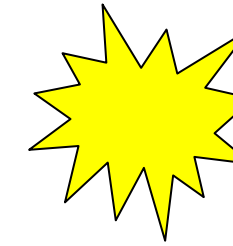
8 Note: Some LPARs may be queued after other partitions are finished.

Other settings

- Keep VIOS ID Mappings
- Keep Virtual Slots, HBA Mapping, VNIC mapping
- Retain processor pool mapping
- Do not allow LPM return

- This new option is for customer that have multiple VIOS pairs on their servers and want the VSCSI and NPIV virtual adapters to be assigned to a VIOS pair.
- This is different from the legacy “Keep Virtual Slots...” option as it won’t keep the same Virtual Fibre Channel fcs mappings.
- This can be added to the spreadsheet and edited if the VIOS pair IDs are different.

Keep VIOS ID Mappings option



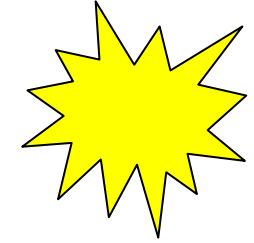
- This new option is for customers that have multiple VIOS pairs on a server and want the tool to make sure the VFC and VSCSI adapters are assigned to correct VIOS pair. After you check this, you can "Export" the plan and check the columns in the spreadsheet.

Other settings

- Keep VIOS ID Mappings
- Keep Virtual Slots, HBA Mapping, VNIC mapping
- Retain processor pool mapping

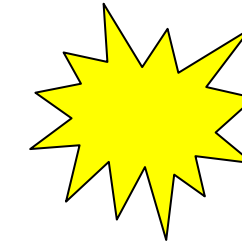
U	V	W	X	Y	Z	AA	AB	AC	AD	AE			
	HMC NAME	COMMAND	/IOC SLOT	PIV VIOS	IL/IOS	FSC N/IOS	SLOT	/IOC SLOT	PIV VIOS	IL/IOS	FSC N/IOS	SLOT	NUM2
	Mike HMC	s3/kk1vios1//172.28.10.70/bb1vios1	4	1			6	2					

Enhanced support for VNIC backing devices



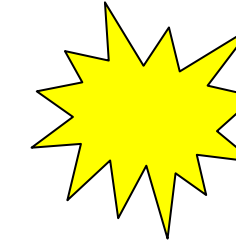
- Previous versions of the tool didn't handle multiple backing devices on the "LPM Return" of a partition.
- This version handles the "LPM Return" properly but also gives the user the ability to modify the backing devices on both the LPM Move and LPM Return spreadsheets.

VNIC columns in spreadsheet



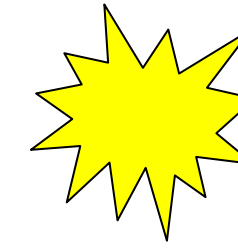
VNIC VIOC SLOT NUM1	VNIC VIOS ID1	VNIC AD ID1	VNIC PHYS ID1	VNIC CAPACITY1	VNIC LOCAL AD ID1	VNIC LOCAL PHYS ID1
5	2	2	2	20.0	2	2

Set default MSP connections



- Some customers have multiple IP addresses in their VIOS. These may be on different speed connections. The HMC doesn't automatically choose the "fastest" connection. The customer has been able to choose the "fastest" connection via the "Settings" panel.
- This option allows the customer to set the "fastest" connection on each server once and the tool will automatically use it unless its overridden on the "Settings" panel.
- When you do a "Validation", the tool will show you if the "Default MSP" is set.

Configuring default MSPs



- It may take some time for this panel to fully populate...especially if you have multiple VIOS and multiple IP addresses in your server.
- This is for customers that have multiple IP addresses in a VIOS. You can set the high speed IP connection as your MSP.

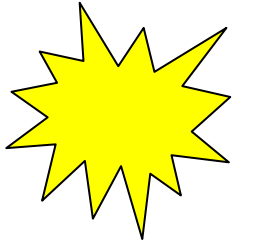
The screenshot displays the IBM PowerVM Live Partition Automation (LPA) interface. The top navigation bar includes the text "IBM PowerVM Live Partition Automation Version 9.1.930.0" and "Welcome Admin".

The main content area is divided into two panels:

- LPM Settings:** Features a "Choose a System" section with the instruction "Select one System and configure MSP pair". It lists two HMCs: "Mike HMC" and "Bob HMC". Under "Mike HMC", several VIOS instances are listed with radio buttons: "kurtkP8" (selected), "jupe4bfp1", "jupe4dfp1", "thoradfp1", "Server-9117-MMC-SN105C627", and "MAp720".
- MSP Settings:** A modal dialog for configuring the selected system. It shows "System Name: kurtkP8". It has two columns of settings:
 - VIOS NAME1:** A dropdown menu currently showing "kk1vios1".
 - VIOS IPADD1:** A dropdown menu showing "172.28.10.70" (highlighted in blue) and "9.5.110.224".
 - VIOS NAME2:** A dropdown menu currently showing "kk1vios2".
 - VIOS IPADD2:** A dropdown menu showing "172.28.10.71".At the bottom of the dialog are "Apply" and "Cancel" buttons.

A "Configure MSP" button is located at the bottom right of the LPM Settings panel.

Validation panel shows if defaults MSPs are set

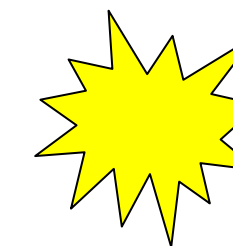


- The checkmark indicates both the source and destination server have default MSPs set and the validation is done with those MSPs.
- The exclamation mark means that one or both servers don't have defaults MSPs set.

LPAR Name ↕	Source Server ↕	Dest Server ↕	Validation State ↕	MSPs ↕	Detail ↕
bf_client1	kurtkP8	bobfP8	Success	✓	📄 message

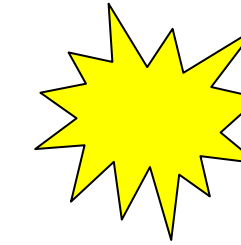
MSPs ↕
⚠

New AutoSRR capabilities



- There are multiple new capabilities on SRR.
 - Scripting for both SRR and AutoSRR.
 - “healthcheck” of the SRR status every day and email of the results.
 - plans for SRR to occur automatically when a server crashes
 - After a server is repaired, the tool can still be used to “LPM Return” the partitions that were SRR’d.

Setting up email configuration



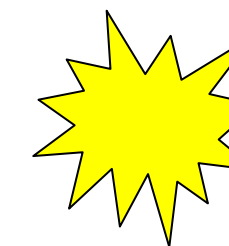
- To have the tool send email for the daily SRR healthcheck, please configure it on the "Settings" panel under "Email Config". Use the "Send test email" button to validate your email configuration.

The screenshot shows the "Settings" page for IBM PowerVM Live Partition Automation, version 9.1.930.0. The "Email Config" tab is selected. The page contains the following configuration fields:

- Email From:** (Set the email send address)
- SMTP Server:** (Set the email server)
- SMTP Server User Name:** (Set the username of SMTP server)
- Email To:** (Set the email receive address)
- SMTP Server Auth:** Yes (Set whether the SMTP Server needs authenticate)
- SMTP Server Password:** (Set the password of STMP Server)

At the bottom right, there are two buttons: "Send test email" and "Apply".

Configuring SRR Healthcheck and AutoSRR



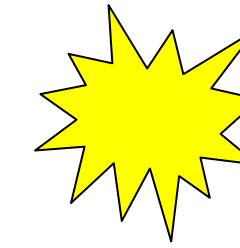
- The Remote Restart placement panel has a new “Monitor” button that will pop-up the panel explained on the next page.

The screenshot shows the 'Remote Restart' configuration interface. At the top left, there is a 'Remote Restart' header with a refresh icon and a link to 'partitions and destinations >'. Below this is a table with columns for LPAR Name, CPU, Mem, Dest Server, and Options. The first row shows 'bf_clent1' with CPU 0.2 and Mem 6144. The 'Dest Server' column has a dropdown menu with 'bobfP8' selected. To the right of the table is a 'Filter' input field and a search icon. Below the table, there are two sections: 'Destination systems' and 'Partition placement policy'. The 'Destination systems' section has a heading and a sub-heading 'Drag and drop the system below in the order in which you want the partition to restart'. It contains a table with columns 'Order', 'Dest Server', 'Remaining CPU', and 'Remaining Memory'. The first row shows '1', 'bobfP8', '1.27', and '177152'. The 'Partition placement policy' section has two radio buttons: 'Packing' (unselected) and 'Striping' (selected). Below this is the 'Concurrent Count' section with a dropdown menu set to '8' and a note: 'Note: Some LPARs may be queued after other partitions are finished.' At the bottom of the panel, there are three checkboxes: 'Remote Restart Inactive LPARs' (unchecked), 'Power On LPAR' (checked), and three buttons: 'Start Restart', 'Monitor', and 'Cancel'.

LPAR Name	CPU	Mem	Dest Server	Options
bf_clent1	0.2	6144	bobfP8	

Order	Dest Server	Remaining CPU	Remaining Memory
1	bobfP8	1.27	177152

How the AutoSRR panel works



- This panel is used for SRR healthcheck and enabling automatic SRR for the current server you are working on.
- This doesn't have to be done on all your servers.
- And these checkboxes are mutually exclusive.

Monitor

Perform validation daily

Send validation results email

I want to validate at: 1:34 PM

Hours		Minutes				
1	2	3	00	05	10	AM
4	5	6	15	20	25	
7	8	9	30	35	40	PM
10	11	12	45	50	55	

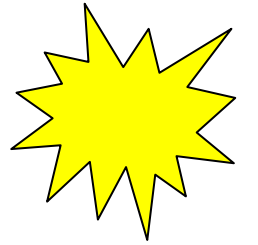
The Server Time is 01/14/2020 13:27

Automatically perform SRR when the Managed System fails

Apply Close


The daily validation will start on the next calendar day. You can see that its set by going to the “AutoSRR” main menu.


AutoSRR panel shows saved Monitor settings



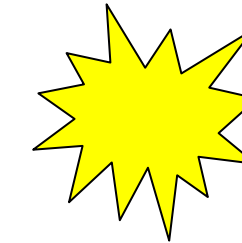
Auto SRR

View By: Batch Move

Filter 

Source System	LPAR NAME	Destination System	Auto SRR	Auto Validate	Validate Time	Remove
bobfP8	bf_client2	kurtkP8	Y	Y	2: 00	

SRR and AutoSRR script capability



Frame Scripts

- `pre_srr_frame.sh` - called once before any LPMs are started during LPM Move. The tool calls the script with multiple parameters `<source frame> <dest frame 1><dest frame 2><dest frame 3>.....`
- `post_srr_frame.sh` - called once after all LPMs are completed during LPM Move. The tool calls the script with multiple parameters `<source frame> <dest frame 1><dest frame 2><dest frame 3>.....`
- `pre_auto_srr_frame.sh` - called once before any LPMs are started during LPM Move. The tool calls the script with multiple parameters `<source frame> <dest frame 1><dest frame 2><dest frame 3>.....`
- `post_auto_srr_frame.sh` - called once after all LPMs are completed during LPM Move. The tool calls the script with multiple parameters `<source frame> <dest frame 1><dest frame 2><dest frame 3>.....`

LPAR scripts

- `pre_srr_lpar.sh` - called each time an LPM starts during LPM Move. The tool calls the script with `<source frame><dest frame><lpar name>`
- `post_srr_lpar.sh` called each time an LPM starts during LPM Return. The tool calls the script with `<current dest frame><original source frame><lpar name>` **(PLEASE NOTE THE FRAME ORDER IS DIFFERENT THAN THE OTHER SCRIPTS)**
- `pre_auto_srr_lpar.sh` - called each time an LPM starts during LPM Move. The tool calls the script with `<source frame><dest frame><lpar name>`
- `post_auto_srr_lpar.sh` called each time an LPM starts during LPM Return. The tool calls the script with `<current dest frame><original source frame><lpar name>` **(PLEASE NOTE THE FRAME ORDER IS DIFFERENT THAN THE OTHER SCRIPTS)**

Links to online help videos

The tool's help panel will now also include links to online help.

The help is available outside of the tool also at ibm.biz/LPM_SRR_tool and ibm.biz/lpm_srr_tool . These URLs are case-sensitive so we supplied both.

This is a link to [ibm developer works](#) and will have FAQs and help videos on how to use many features of the tool and the ability for customers to ask for help.

Ability to change log file sizes in bin/log subdirectory

The files sizes can be changed in {HOME}/webapps/lpm/WEB-INF/log4j.properties. Currently we save 10 copies of a log of 100MB in size for both the lpm.log and lpm_error.log. This is 2 GBytes of log files. I have had to work on some very busy customer systems where the log files have been wrapped before the data can be sent to me.

I suggest keeping 20 backups of the lpm.log to help with debug. Please change “log4j.appender.info_lpm.MaxBackupIndex=10 to log4j.appender.info_lpm.MaxBackupIndex=20 in the file and save it and restart the tool

Find the appropriate set of lines for the log you want to change...this is for lpm.log

```
log4j.appender.info_lpm.File=./log/lpm.log
log4j.appender.info_lpm.MaxFileSize=100MB
log4j.appender.info_lpm.MaxBackupIndex=10
```

This is for lpm_error.log

```
log4j.appender.error_lpm.File=./log/lpm_error.log
log4j.appender.error_lpm.MaxFileSize=100MB
log4j.appender.error_lpm.MaxBackupIndex=10
```


Upgrade to LPM and SRR Automation Tool V9

- Note that **support for POWER9** in the LPM & SRR Automation Tool will ONLY be available via the latest Version 9.
- The LPM and SRR Automation Tool V9 has a new development and support structure, with e-fixes available between release levels.
- Clients who have earlier versions of the LPM Automation Tool (V8.6.1 or earlier) and want to acquire the latest version (V9) will be required to purchase an enterprise license and maintenance agreement to access latest upgrades, fixes and enhancements.
- Clients with the LPM Automation Tool (V8.6.1 and earlier) who choose not to purchase the Version 9 will continue to receive email support until September 2019, but there will be no further updates to Version 8.

PowerVM LPM and SRR Automation Tool Offering and Contacts

- LPM and SRR Automation Tool is available WW from IBM Systems Lab Services
 - Lab Services Offering Manager: Randy Greenberg rsg@us.ibm.com
 - Lab Services NA Opportunity Manager: Stephen Brandenburg sbranden@us.ibm.com
 - Lab Services Europe Opportunity Manager: Virginie Cohen VirginieCohen@fr.ibm.com
 - Other regions: please contact your local Lab Services opportunity manager <http://ibm.biz/LabServicesOM>
 - General Lab Services enquiries ibmsls@us.ibm.com