

ADVANCED TECHNOLOGY GROUP (ATG)



Accelerate with ATG Webinar: Storage Virtualize 9.1.0 Technical Update

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Offerings

Client Technical Workshops

- **IBM Storage Scale & Storage Scale Functions: August 20-21 (San Jose, CA)**
- **IBM DS8000 G10 Advanced Functions: August 26-27 (Chicago, IL)**
- **IBM FlashSystem Deep Dive & Advanced Functions: September 10-11 (Durham, NC)**
- **Cyber Resilience with IBM Storage Defender**
- **IBM Fusion & Ceph**

TechZone Test Drive / Demo's

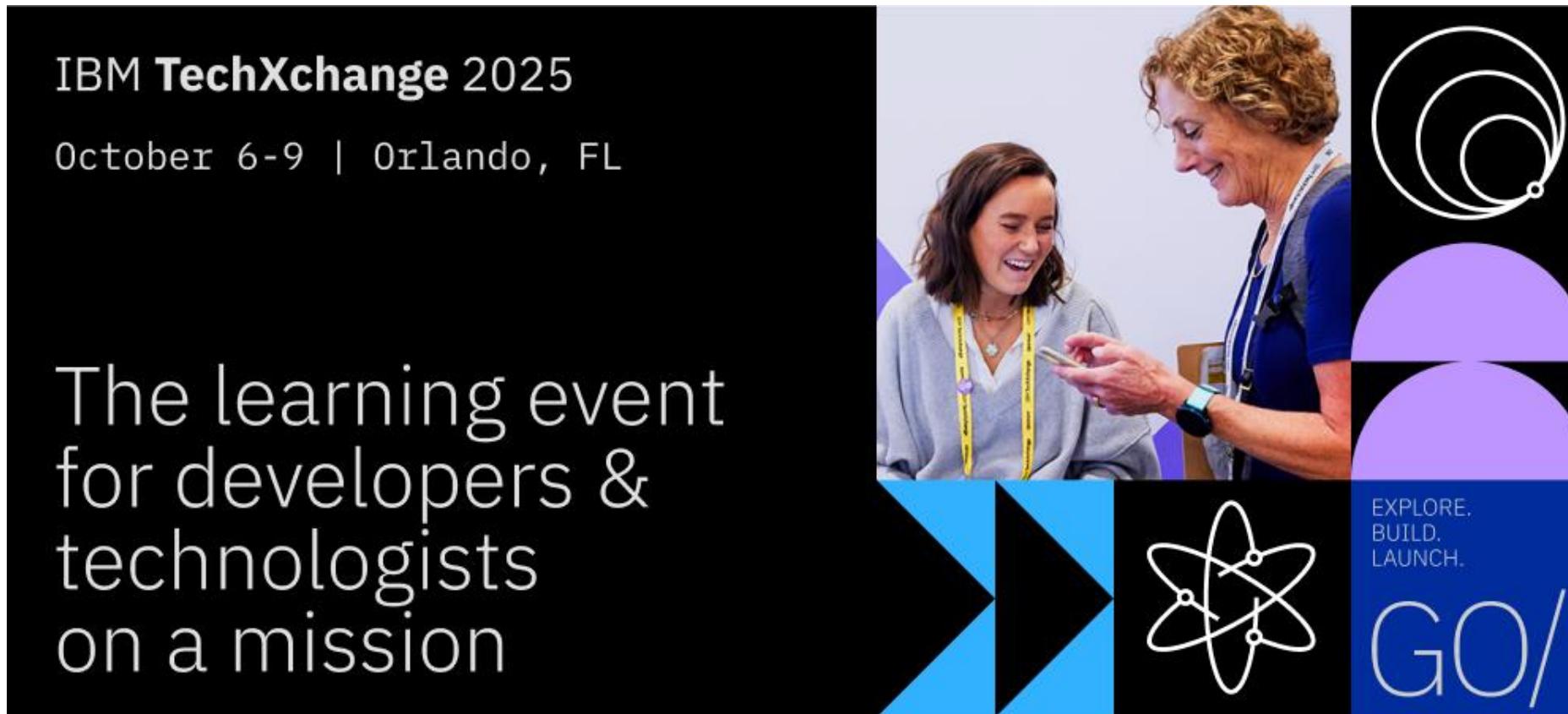
- IBM Cloud Object Storage Test Drive - (VMware based)
- IBM DS8900F Safeguarded Copy (SGC) Test Drive
- IBM DS8900F Storage Management Test Drive
- IBM Storage Scale and Storage Scale System GUI
- IBM Storage Virtualize Test Drive
- IBM Storage Ceph Test Drive
- IBM Storage Ceph Test Drive - (VMware based)
- IBM Storage Protect Live Test Drive
- Managing Copy Services on the DS8000 Using IBM Copy Services Manager Test Drive

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0447 or

Direct link <https://www.menti.com/alhsf3bgvxu6>
Or

QR Code



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Meet the Speakers



Byron Grossnickle is an IBM Storage Technical Specialist concentrating on Storage Virtualize software. This includes FlashSystem, SVC, and Storage Virtualize for Public Cloud. Byron has been with IBM 19 years exclusively in storage. Prior to working for IBM, Byron spent 6 years engineering storage in the Telcom Industry. Prior to that he worked 8 years in healthcare IT. Byron lives in the Kansas City area and is available to travel to customer engagements.

IBM Storage Virtualize 9.1.0 Agenda



- Release Schedule
- Storage Partition Enhancements
- Replication Enhancements
- VMware Enhancements
 - VASA 5
 - Multiple vCenters
 - VMFS HA Partition
- Security Enhancements
 - SFTP
 - Ransomware Threat Detection on Snapshots
- GUI Enhancements
- Misc Enhancements

Release Schedule

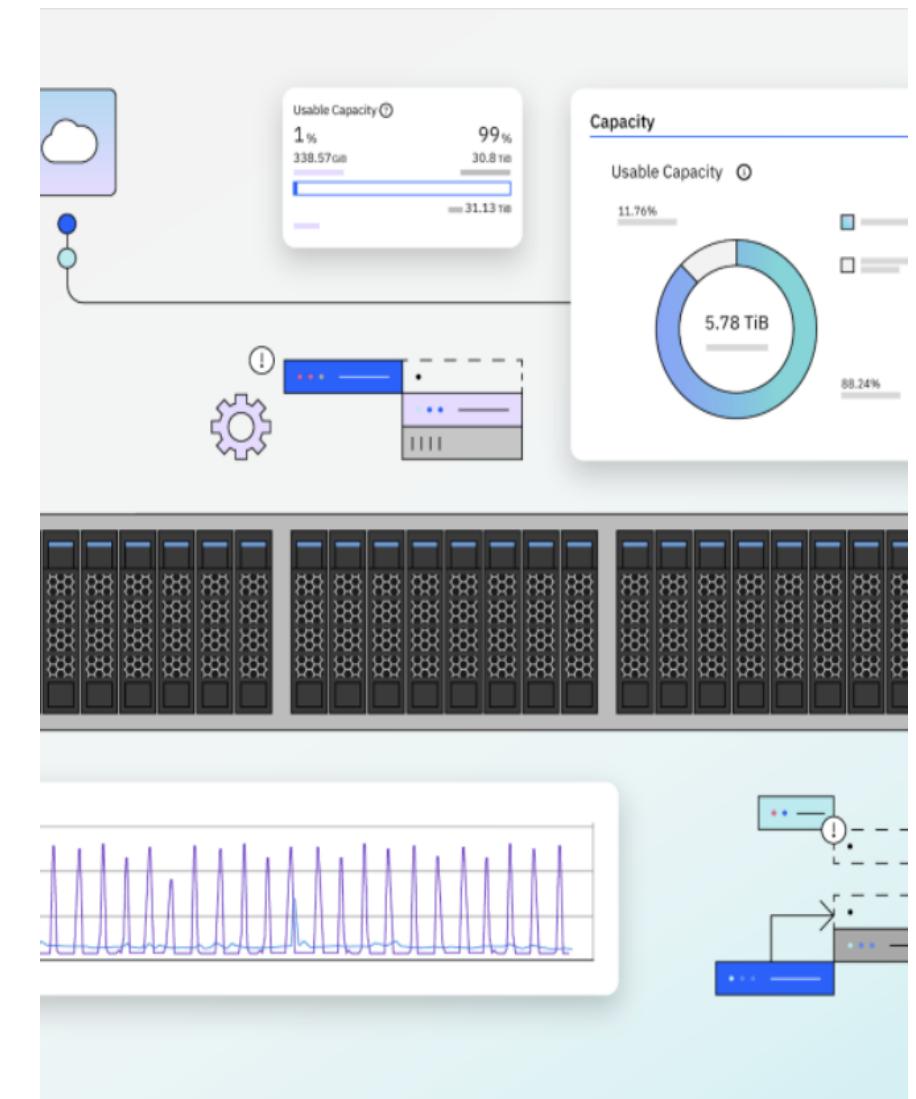
- Marketing/RFA Announce – 9.1.0 – July 8, 2025
- eGA – 9.1.0 – July 25, 2025
- Why the jump to 9.1.0 instead of 8.8?

9.1.0 is a LTS (Long Term Support) Release. LTS releases are kept long term and patch levels are released against them. Non-LTS releases normally do not get any patches and are not be maintained long term. Those patches will be available in the next Non-LTS or LTS release.

- [Release FAQ](#)



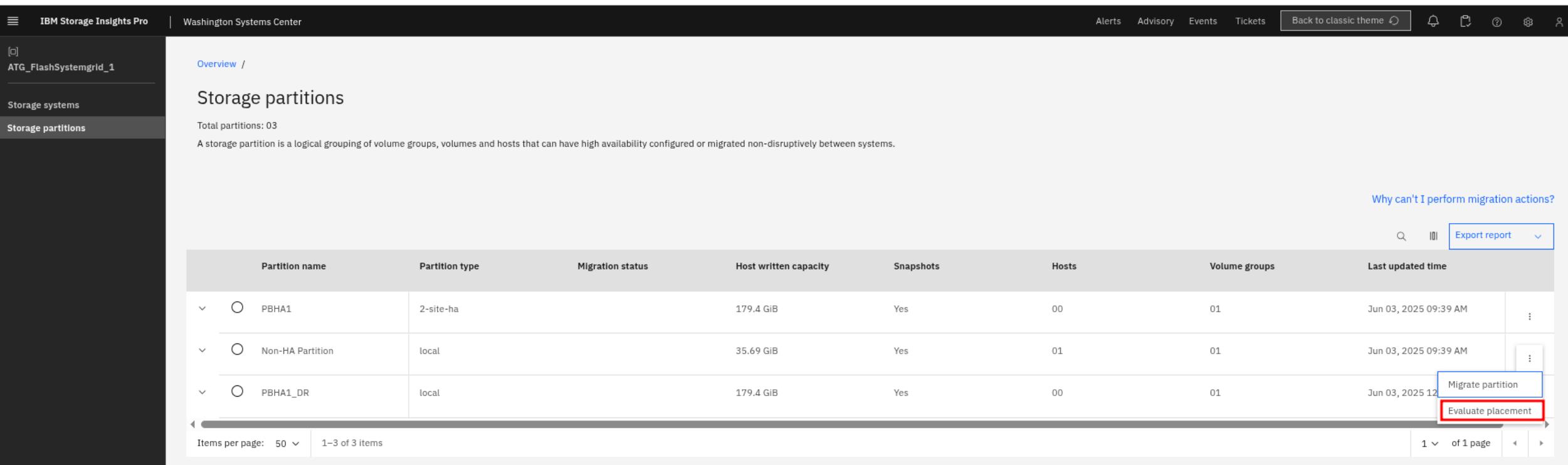
Storage Partition Enhancements



Number of Partitions/Grid Members

- Storage Virtualize 9.1.0 supports
 - 32 Partitions per FlashSystem
 - 5045 retains 4 partitions
 - 32 FlashSystem grid members

AI Driven Storage Insights Partition Placement Recommendations



IBM Storage Insights Pro | Washington Systems Center

ATG_FlashSystemgrid_1

Storage systems

Storage partitions

Overview /

Total partitions: 03

A storage partition is a logical grouping of volume groups, volumes and hosts that can have high availability configured or migrated non-disruptively between systems.

Why can't I perform migration actions?

Export report

Partition name	Partition type	Migration status	Host written capacity	Snapshots	Hosts	Volume groups	Last updated time
PBHA1	2-site-ha		179.4 GiB	Yes	00	01	Jun 03, 2025 09:39 AM
Non-HA Partition	local		35.69 GiB	Yes	01	01	Jun 03, 2025 09:39 AM
PBHA1_DR	local		179.4 GiB	Yes	00	01	Jun 03, 2025 12:00 PM

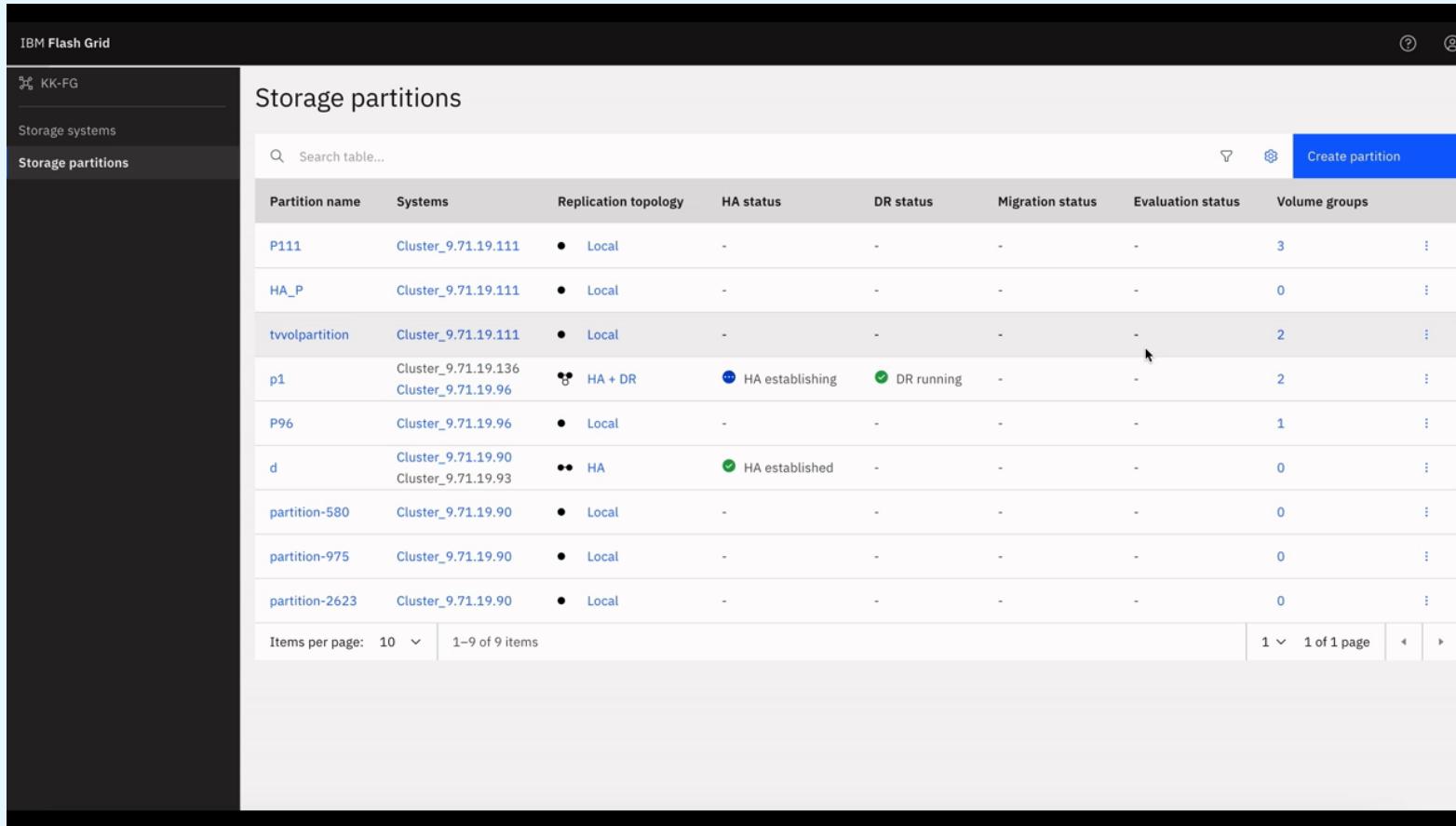
Items per page: 50 | 1-3 of 3 items

1 of 1 page

Migrate partition

Evaluate placement

In 9.1.0 Available from the GUI



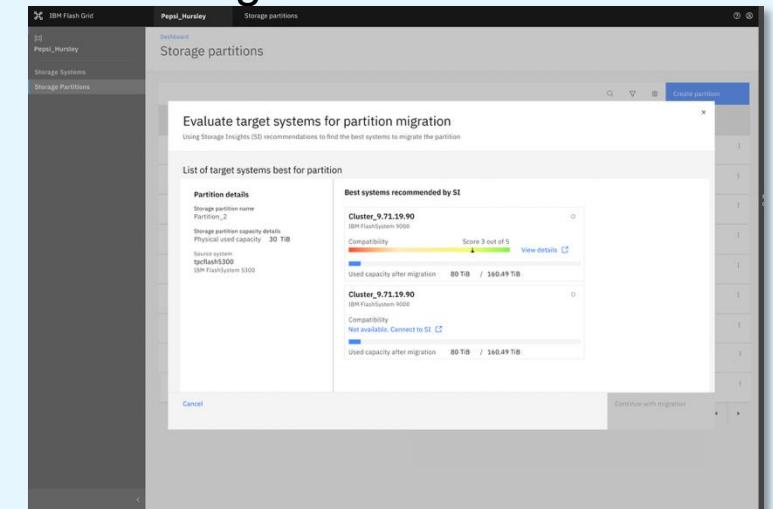
The screenshot shows the 'Storage partitions' table in the IBM Flash Grid GUI. The table has columns for Partition name, Systems, Replication topology, HA status, DR status, Migration status, Evaluation status, and Volume groups. There are 9 items listed:

Partition name	Systems	Replication topology	HA status	DR status	Migration status	Evaluation status	Volume groups
P111	Cluster_9.71.19.111	● Local	-	-	-	-	3
HA_P	Cluster_9.71.19.111	● Local	-	-	-	-	0
tvvolpartition	Cluster_9.71.19.111	● Local	-	-	-	-	2
p1	Cluster_9.71.19.136 Cluster_9.71.19.96	● HA + DR	HA establishing	DR running	-	-	2
P96	Cluster_9.71.19.96	● Local	-	-	-	-	1
d	Cluster_9.71.19.90 Cluster_9.71.19.93	● HA	HA established	-	-	-	0
partition-580	Cluster_9.71.19.90	● Local	-	-	-	-	0
partition-975	Cluster_9.71.19.90	● Local	-	-	-	-	0
partition-2623	Cluster_9.71.19.90	● Local	-	-	-	-	0

Items per page: 10 | 1-9 of 9 items | 1 | 1 of 1 page | < >

Added capability to get partition advisory/recommendation from Storage Insights

- Add/Update SI API key
- Integrate recommended target system list from SI and allow partition migration



The screenshot shows a dialog box titled 'Evaluate target systems for partition migration'. It lists 'Best systems recommended by SI' for a partition named 'Partition_2'. The dialog includes a table with columns for Partition details, Storage system name, Storage partition capacity details, and Used capacity after migration.

Partition details	Storage system name	Storage partition capacity details	Used capacity after migration
Partition_2	Cluster_9.71.19.90 IBM FlashSystem 1000	Physical used capacity: 30 TiB	80 TiB / 160.49 TiB
	Cluster_9.71.19.90 IBM FlashSystem 1000	Physical used capacity: 30 TiB	80 TiB / 160.49 TiB

FlashSystem/SI Pro Logistics

- The FlashSystem must be tied to the SI Pro RESTful API

How?

- Storage administrator generates an API key within the Storage Insights tenant UI and adds it into the storage system as part of storage partition migration workflow
- The API key is stored encrypted and with proper access control
- This API key is used by GUI to communicate with Storage Insights to fetch migration advisories
- When an admin initiates a partition migration a list of potential target systems is displayed in GUI, sorted by a compatibility score (1-5 with 5 being most compatible)
- The compatibility score depends on multiple factors such as capacity, usage patterns, performance trends, and other metrics decided by Storage Insights

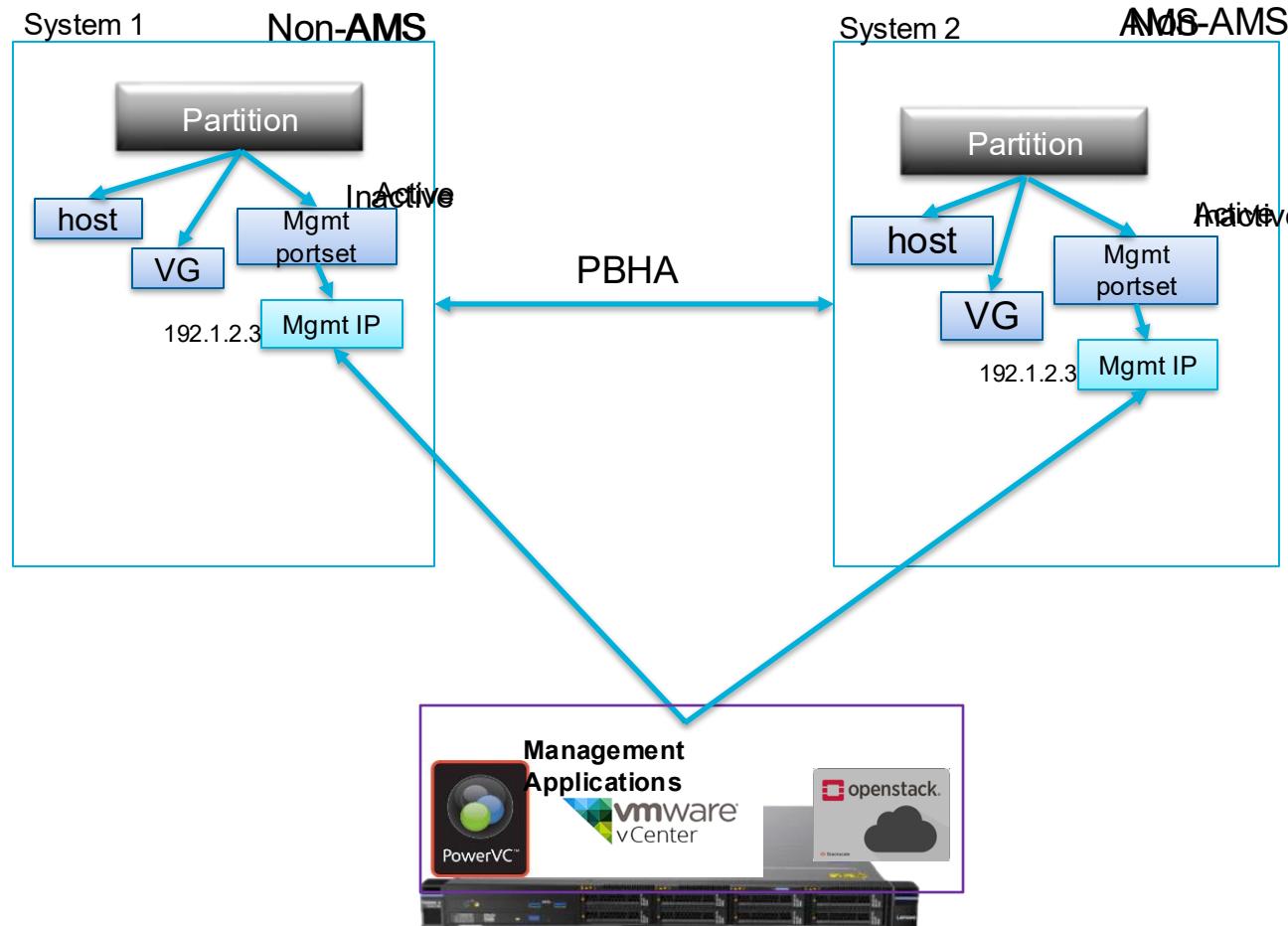
Requirements:

- This feature is available only through the FlashSystemgrid GUI
 - The system must be part of a FlashSystem grid
 - The storage needs to be connected with Storage Insights

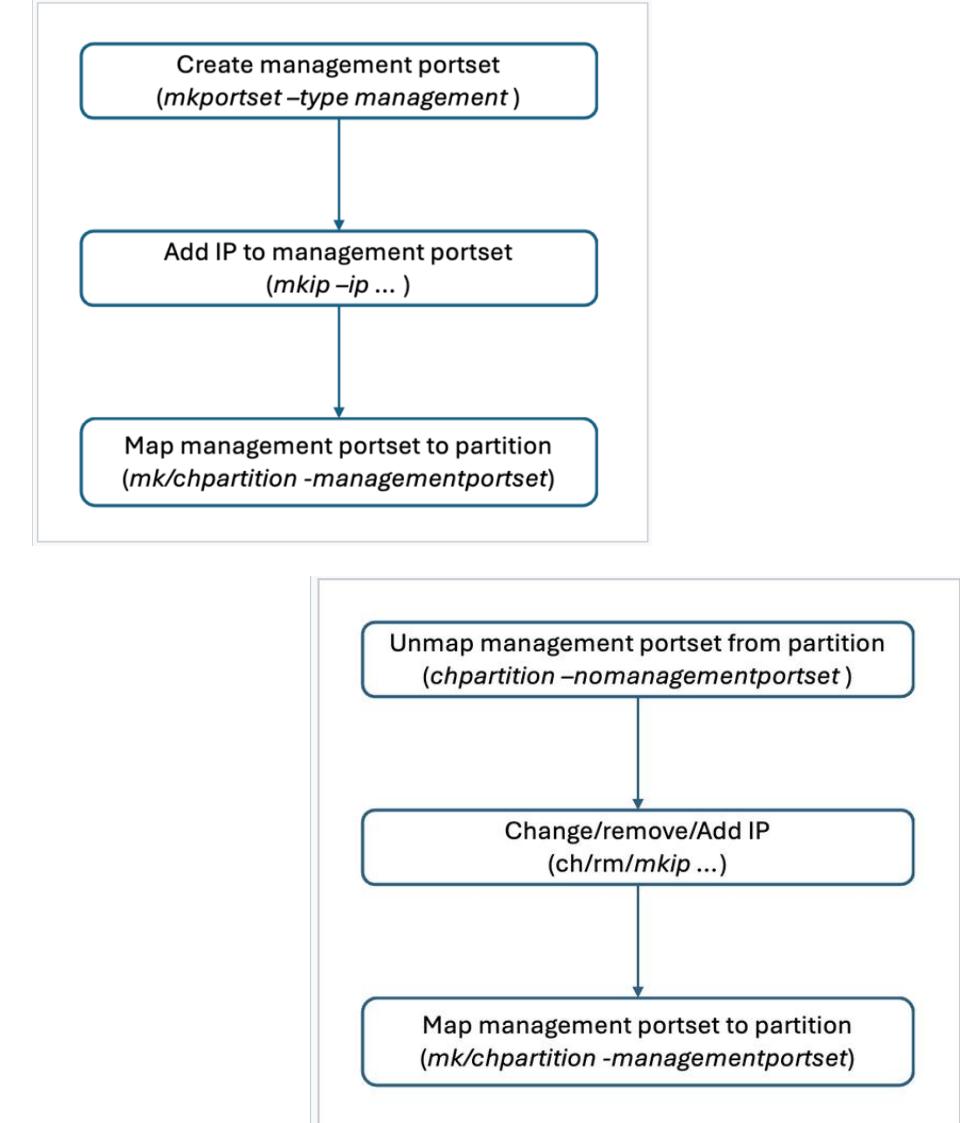
Partition Management IP

- An IP address (IPv4 **or** IPv6) can be added to a partition
- This is helpful for automation applications (VASA, OpenStack, Homegrown) that need to have a constant management point when a partition fails over in an HA scenario, or a partition is migrated
- Restrictions
 - One management IP (either IPv4 or IPv6) per management portset (per storage partition)
 - **Once a management portset is mapped to a partition, the management IP can not be removed or changed directly**
 - The management portset needs to be removed from the partition first and then the ip can be change/removed, then added to the partition again
 - **The GUI masks this complexity** and changing/removing can be done directly from the partition in the GUI

Implementation and Configuration



AMS – Active Management System

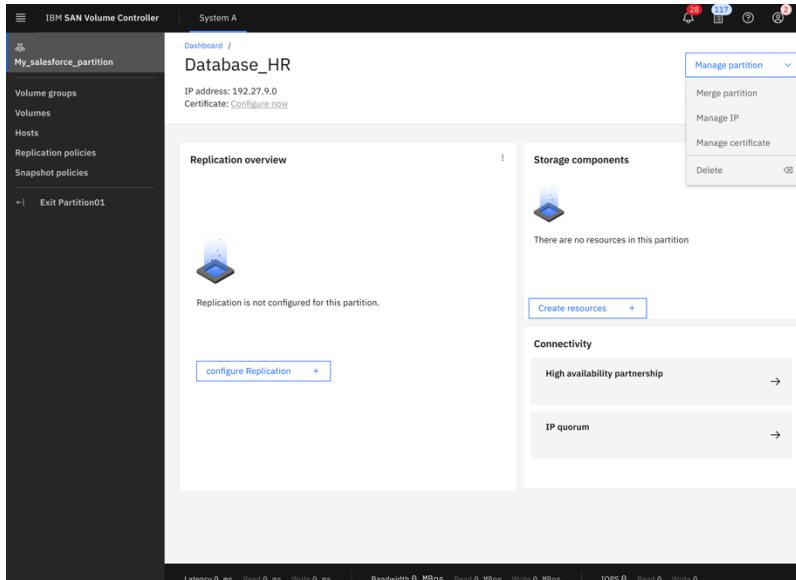


Adding management IP to partition

The image consists of three screenshots of the IBM SAN Volume Controller interface, illustrating the steps to add a management IP address to a partition.

- Screenshot 1: Initial Partition Overview**
The interface shows a partition named "My_salesforce_partition" under "System A". The "Manage partition" dropdown is open, with "Manage IP" highlighted. The partition status is shown as "IP address: Assign".
- Screenshot 2: Assign IP Address Dialog**
A modal dialog titled "Assign a IP address" is displayed. It contains fields for "IP" (radio buttons for "IPv4" and "IPv6", with "IPv4" selected), "Enter IP address" (text input), "Port number" (dropdown menu showing "1"), "Subnet mask" (text input), "VLAN Id (optional)" (text input), "Enter subnet address" (text input), "Enter VLAN Id" (text input), and "Gateway" (text input). Buttons for "Cancel" and "Save" are at the bottom.
- Screenshot 3: Final Partition Overview**
The partition status is now shown as "IP address: 192.27.9.0". The "Manage partition" dropdown is open, with "Manage IP" highlighted. The partition status is now shown as "IP address: 192.27.9.0".

Removing/modifying management IP



IBM SAN Volume Controller

System A

Database_HR

IP address: 192.27.9.0

Certificate: Configure now

Replication overview

Storage components

There are no resources in this partition

Create resources +

Replication is not configured for this partition.

configure Replication +

Connectivity

High availability partnership →

IP quorum →

Latency 0 ms Read 0 ms Write 0 ms

Bandwidth 0 MBps Read 0 MBps Write 0 MBps

IOPS 0 Read 0 Write 0

My_salesforce_partition

Volume groups

Volumes

Hosts

Replication policies

Snapshot policies

Exit Partition01

Manage partition

Merge partition

Manage IP

Manage certificate

Delete

Replic: Database_HR

Partition IP address

Remove IP

Removing IP may impact replication. Once removed, you may be required to re-assign the IP again. Are you sure you want to remove the IP address mapped to the partition?

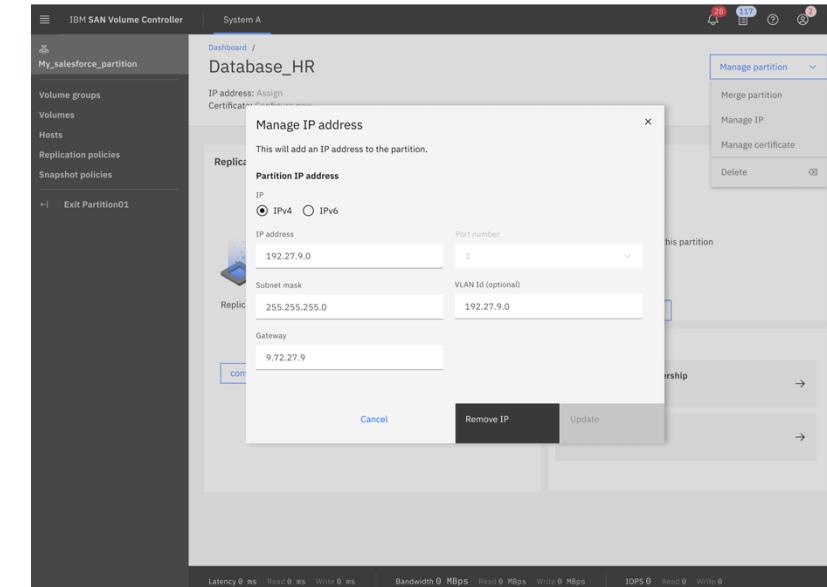
9.72.27.9

Cancel Remove IP Update

Latency 0 ms Read 0 ms Write 0 ms

Bandwidth 0 MBps Read 0 MBps Write 0 MBps

IOPS 0 Read 0 Write 0



IBM SAN Volume Controller

System A

Database_HR

IP address: Assign

Certificate: Configure now

Manage IP address

This will add an IP address to the partition.

Replic: Database_HR

Partition IP address

IP: IPv4

IP address: 192.27.9.0

Port number: 1

Subnet mask: 255.255.255.0

VLAN Id (optional): 192.27.9.0

Gateway: 9.72.27.9

Cancel Remove IP Update

Latency 0 ms Read 0 ms Write 0 ms

Bandwidth 0 MBps Read 0 MBps Write 0 MBps

IOPS 0 Read 0 Write 0

Manage partition

Merge partition

Manage IP

Manage certificate

Delete

Modify partition IP

Modifying the partition IP may impact replication. And some management applications like Cinder, Vasa etc. along with the certificate which will require an update. Are you sure you want to modify the IP address mapped to the partition?



No

Modify

Use Case Specific Certificates

- Prior to 9.1.0 all functions of the system used the system certificate
- From 9.1 onward, the system certificate can be used, or function specific certificates can be used
 - Why? Increase system security and flexibility
 - Some functions require different flags to be set on certificates
 - Updating a certificate for an individual function will not affect all other functions on the storage array
 - Different certificate authorities can be used for different functions
 - If a particular certificate gets compromised, it will not affect all functions on the storage array

Implementation and Configuration

- New system installs or upgrading to 9.1.0 will use the main system certificate (default) for all use-cases until use-case specific separate certificate is configured.
- Separate certificates can be configured for following use cases in Release 1:
 - Key Server specific separate certificate
 - Internal system-to-system communication certificate (FlashSystem grid and replication/HA)
- Use-case specific separate certificate can be created, managed and viewed using the GUI or new CLIs
 - ***mksystemcertstore, chsystemcertstore, rmsystemcertstore*** and ***lssystemcertstore*** CLIs.
- The main system certificate (default) can continue to managed and viewed using legacy ***chsystemcert / lssystemcert*** CLIs.
- Use-case specific separate certificate persist across upgrades once it is created
- Use case would continue to use Main system certificate on removal of use case specific separate certificate.
- Configuring separate certificate per use cases is supported on all products.

Certificates Screen

IBM Storage FlashSystem 5300 blastoise Security

2

Certificates

Manage certificates that are used to secure connections between systems or applications across a public network.

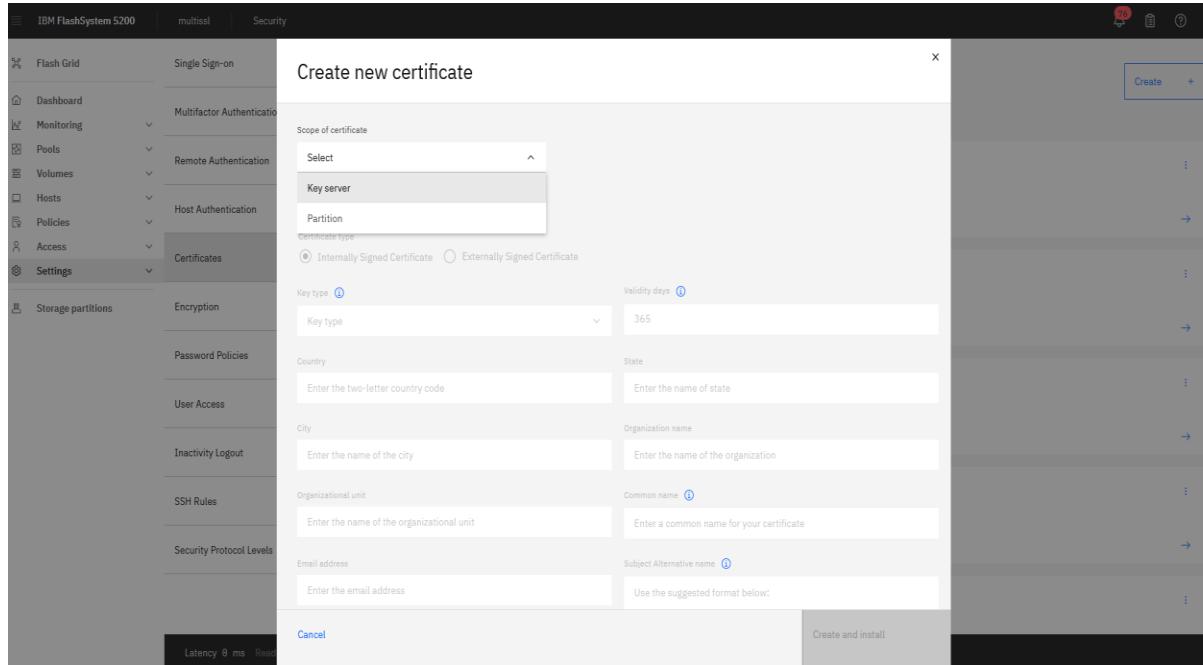
Main system certificate

Certificate status	Certificate type	Organization	Organization unit	Common name
Valid ✓	Externally signed	ibm.com	SYS	blastoise.tuc.stglabs.ibm.com

Create +

Latency 611 µs Read 916 µs Write 256 µs | Bandwidth 1177 MBps Read 813 MBps Write 363 MBps | IOPS 17274 Read 9274 Write 8000

Key Server Specific Certificate - Create



Create new certificate

Certificate type

Internally Signed Certificate Externally Signed Certificate

Key type **Validity days**

Country US	State Kansas
City OverlandPark	Organization name IBM
Organizational unit BMG	Common name <input type="button" value="BMGCert"/>
Email address byrongo@us.ibm.com	Subject Alternative name <input type="button" value="http://blastoise.tuc.stglabs.ibm.com"/>

Create and install

Key Server Cert

IBM Storage FlashSystem 5300 | blastoise | Security

Dashboard Single Sign-on

Monitoring Multifactor Authentication

Pools

Volumes

Hosts Remote Authentication

Policies

Access Host Authentication

Settings Certificates

Storage partitions

Password Policies

User Access

Inactivity Logout

SSH Rules

Security Protocol Levels

Certificates

Manage certificates that are used to secure connections between systems or applications across a public network.

Main system certificate

Certificate status	Certificate type	Organization	Organization unit	Common name
Valid ✓	Externally signed	ibm.com	SYS	blastoise.tuc.stglabs.ibm.com

Key server

Certificate status	Certificate type	Organization	Organization unit	Common name	Auto renewal
Valid ✓	System signed	IBM	BMG	BMGCert	<input checked="" type="checkbox"/> On

Latency 0.756 ms Read 1.152 ms Write 0.268 ms | Bandwidth 1255 MBps Read 892 MBps Write 363 MBps | IOPS 17948 Read 9913 Write 8036

Partition Host Cluster Support

- Host Clusters are now supported in partitions

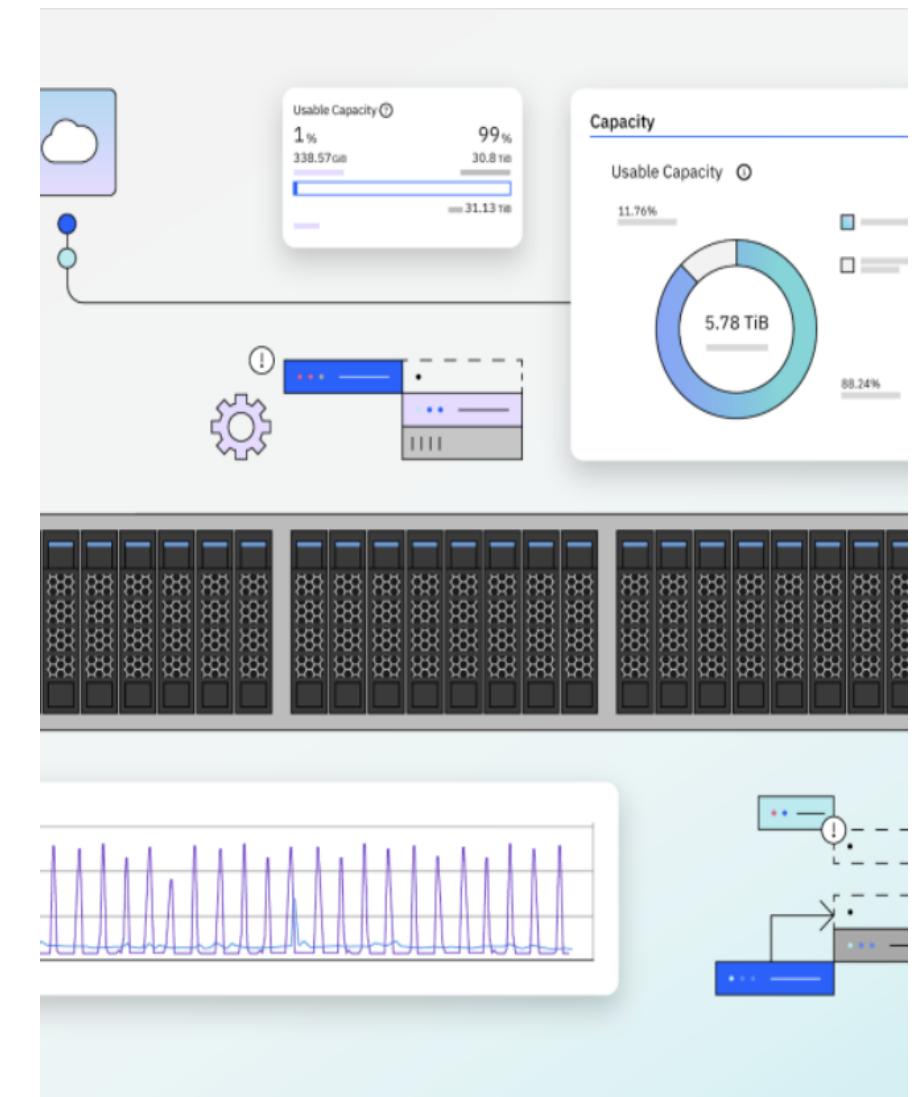
- Actions Supported

- Create/Remove host cluster
- Add/Delete hosts from host cluster
- Create/Remove shared mappings
- Import host clusters using draft partition
- Rename host cluster
- Non-uniform host access support

Replication Enhancements

- More Partitions (4 -> 32) and Replication Policies (32 -> 132)
 - All PBR/PBHA supported platforms except FS5045 (which remains at 4)
 - All partitions can be used for PBHA & PBR if remote system(s) also support increased limit
- PBR recovery volumes are now online/read-only for better host interop
 - Only for partition-based DR (introduced 8.7.1)
 - Volumes become online/read-write when made independent or DR Test is started
- Support for thin-provisioning warning and buffer size settings in a provisioning policy
- Can now move volumes between volume groups within the same partition
 - No impact to HA
 - DR volumes must be moved via an unreplicated volume group and require a full resync of the volume
- Replicated volumes, volume groups, hosts, host clusters & partitions can now be renamed
 - Rename is propagated to remote systems
 - No impact to HA or DR
- Replicated volumes can now be expanded
 - No impact to HA, minimal impact to DR recovery point

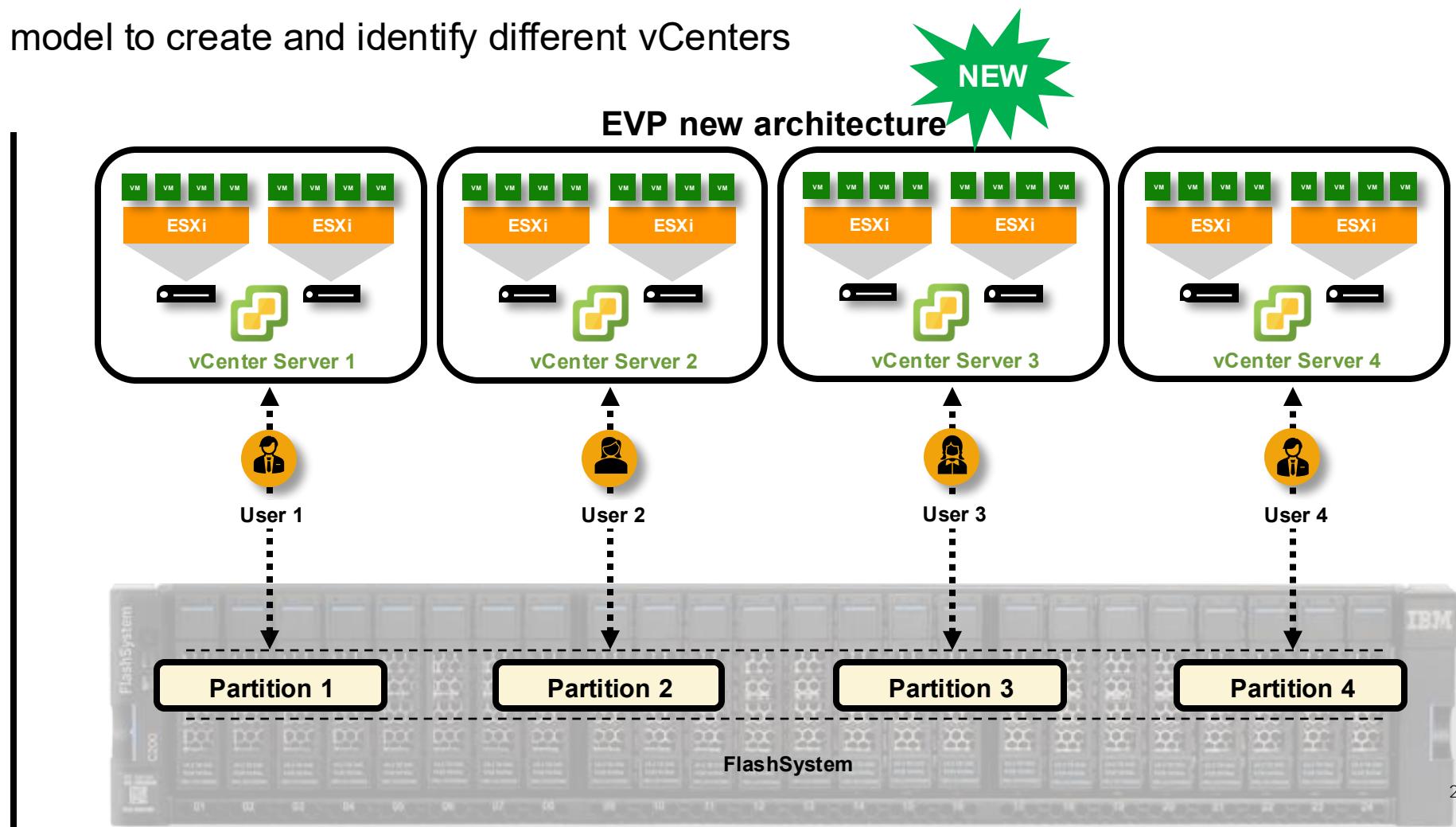
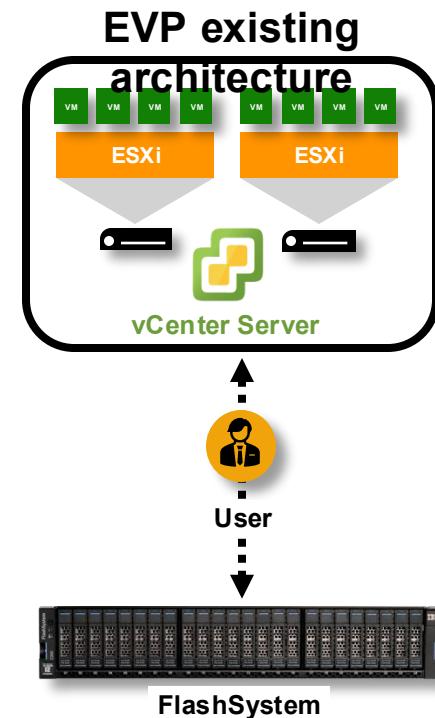
VMware Enhancements



VASA5 support in Storage Virtualize 9.1.0

- VASA5 supports multi-tenancy
- VASA5 allows multiple vCenter servers to register with the same storage array
- VASA5 has a new object model to create and identify different vCenters

[Deprecation of vVols](#)



EVP = ESX VASA Provider

Development Goals Surrounding VASA5

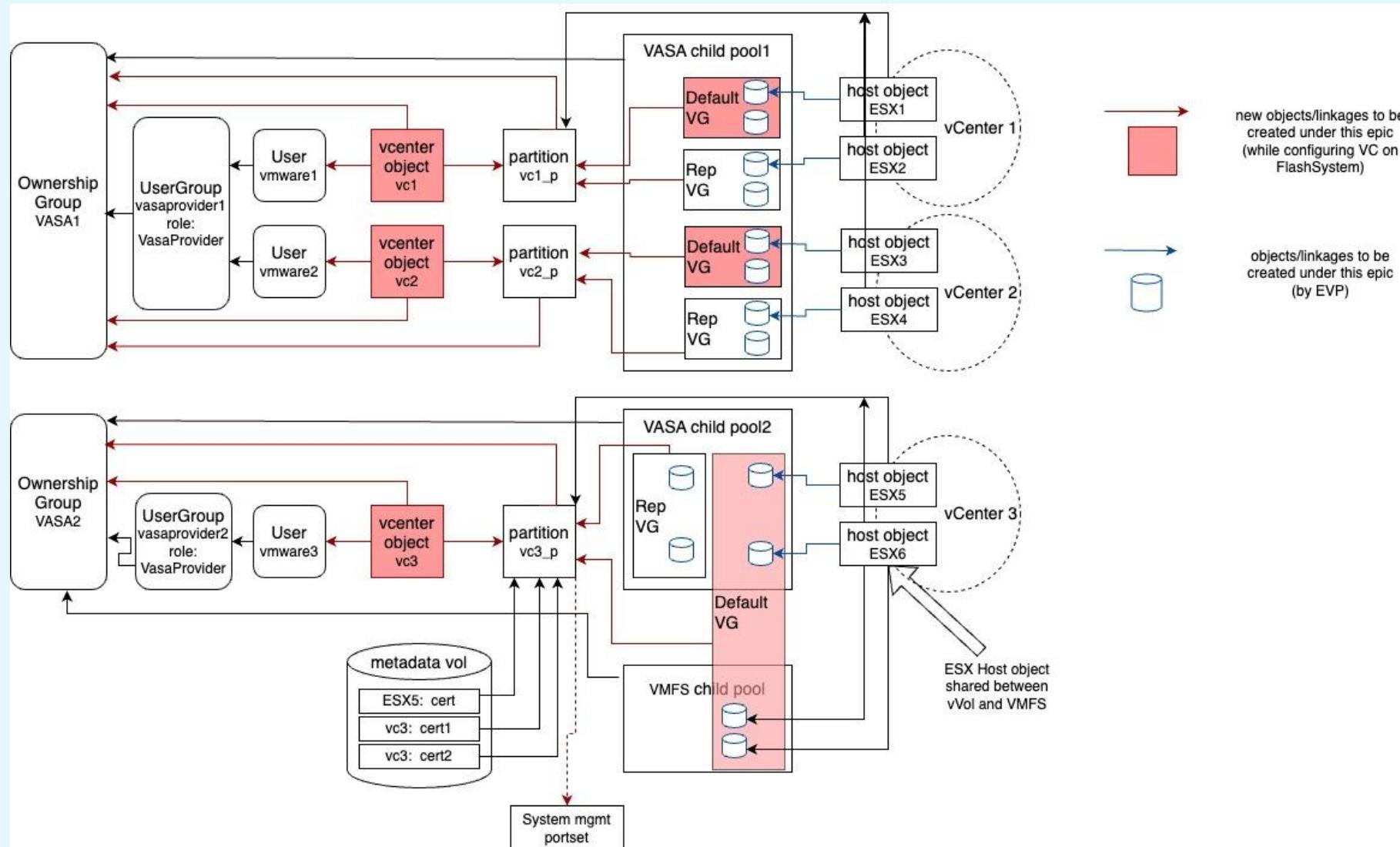
- Feature Goals

- Support for multiple vCenter servers on a Storage Virtualize system
- One or multiple VMware VMFS partitions
- Certificate management
- Server Name Indication (SNI) configuration

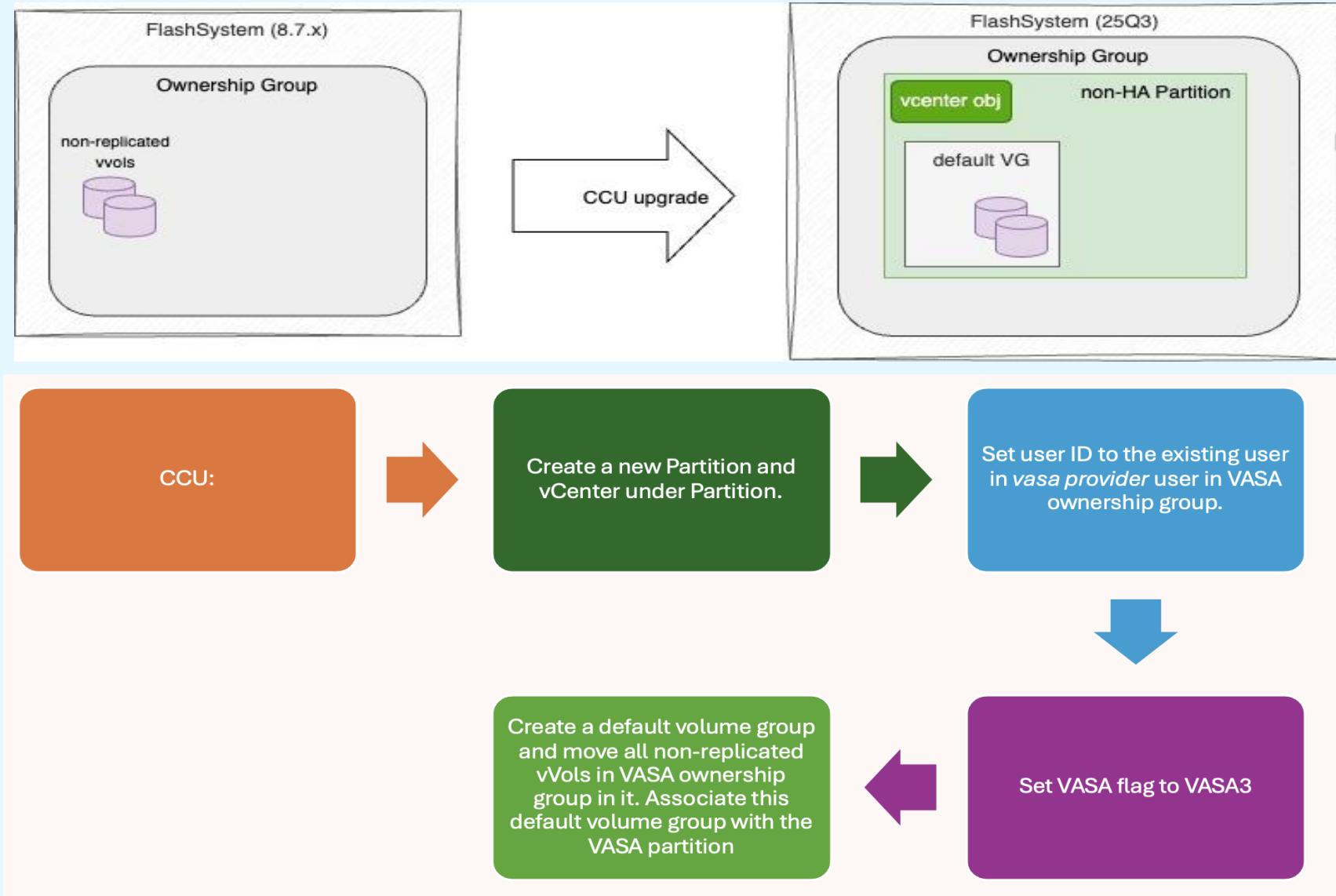
- Framework Goals

- Deliver a new vCenter object model within Storage Virtualize
- Establish a foundational framework for provisioning resources across multiple vCenters
- Enable better scalability, isolation, and reliability in managing virtual infrastructure

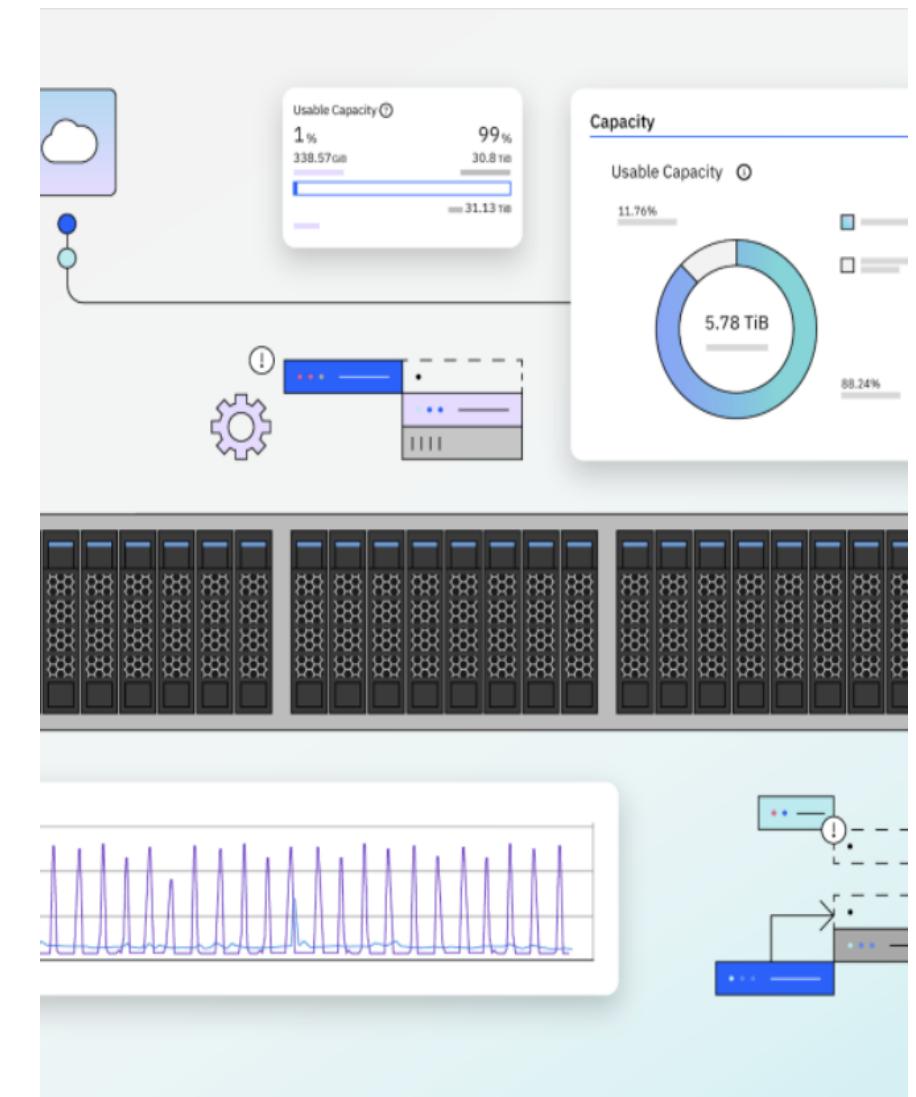
Object Model Overview



Upgrade from pre-9.1.0 builds with vVols



Security Enhancements



SFTP Support

- Adding SFTP, native SCP is now deprecated
- SCP command line still supported, uses SFTP “under the covers”
- Applies to port 22 for admin users
- Current usage of SCP from a host that supports SFTP
 - `scp -O -P22 tempfile adminuser@system:/upgrade`
- Because 9.1.0 supports SFTP, SCP no longer needs the **-O**, but you can still use it
 - **`scp -P22 tempfile adminuser@system:/upgrade`**
- Can use SFTP in interactive mode with
 - `sftp -P22 adminuser@system`
- Can use sftp clients

RTD (Ransomware Threat Detection) status CLI

New CLI:

```
# lsanomalydetection -delim :  
inferencer_version:0.1.7.1  
model_version:0.3.24.0  
volume_group_support:yes  
active_array_count:1
```

Note: Volume group support was introduced in 8.7.2 and requires all FCM 4 drives to be running at least 4.2 firmware; this CLI will show if that criteria is met.

RTD status GUI



- Note: SI Pro license is required to have anomaly alerts raised within SV; SI will notify SV whether this is licensed.

Adding to lsarray

Updated CLI:

```
# lsarray 0
...
anomaly_detection_active yes
...
```

Note: this field will show 'yes' if the array has provided anomaly statistics recently, 'no' if it has not, and 'partial' if any member drive has not contributed to a recent collection.

Mark snapshots with anomaly seq number

A new field '[anomaly_sequence_number](#)' is available in the detailed **lsvolumegroupsnapshot** view.

This is populated if an anomaly was present on the volumegroup when the snapshot was triggered.

This allows customers to understand which snapshots are potentially compromised, and which are best to restore from.

Note: By marking the sequence number fixed, it will be removed from all snapshots. Subsequent snapshots will not contain the sequence number.

```
# lsvolumegroupsnapshot -delim : x
...:anomaly_sequence_number
...:117
```

Mark snapshots with anomaly events GUI

Volume groups / volumegroup0

volumegroup0

3.00 TiB Total Group Capacity

Volumes (new) (3) Volumes (3) Policies (0) **Snapshots (6)** Cloud Snapshots

Capacity for Snapshots									Hide details ^
Written Capacity		Available Capacity							9.00 MiB / 18.00 TiB (0.00%)
<hr/>									
Snapshot name	State	Safeguarded	Time Created	>Last restore time	Expiration Time	HA status	Threat detection event	Actions	
snapshot-DA880DC6-FC8F-54AA-B25E-37FDAE24D121	Active	No	4/7/2025 12:46 PM	-	4/8/2025 12:46 PM	Local	Yes	⋮	
snapshot-C2F9E9C2-1E76-555A-B37B-37ED38B0695E	Active	No	4/7/2025 12:46 PM	-	4/14/2025 12:46 PM	Local	No	⋮	
snapshot-0DE40226-F760-52DD-81F5-BD144D38C79B	Active	No	4/7/2025 12:46 PM	-	4/8/2025 12:46 PM	Local	No	⋮	

Extend Snapshot Expiration Time

When an anomaly is logged against a volume group with earlier snapshots, the latest snapshot before the anomaly is recognized

If there is an expiration time for that snapshot, it will be extended to at least 7 days later than the anomaly.

Note: This has not been integrated with HA snapshots yet

Debug collection using Time Series Aggregations

- Since 8.7.3, RTD aggregation data has been written back to the FCMs in a reserved area.
- That is used to provide SI weekly with a contiguous set of aggregated data
- With 9.1.0, that data can be collected manually using the snap **anomalystats** (or **t**) parameter
- This collects up to 900 aggregations, representing the last 30 minutes
- This is useful when testing with benign or anomalous workloads, in order to train new models

DRAID1 Support

Prior to 9.1.0, DRAID6 was supported for Ransomware Threat Detection.

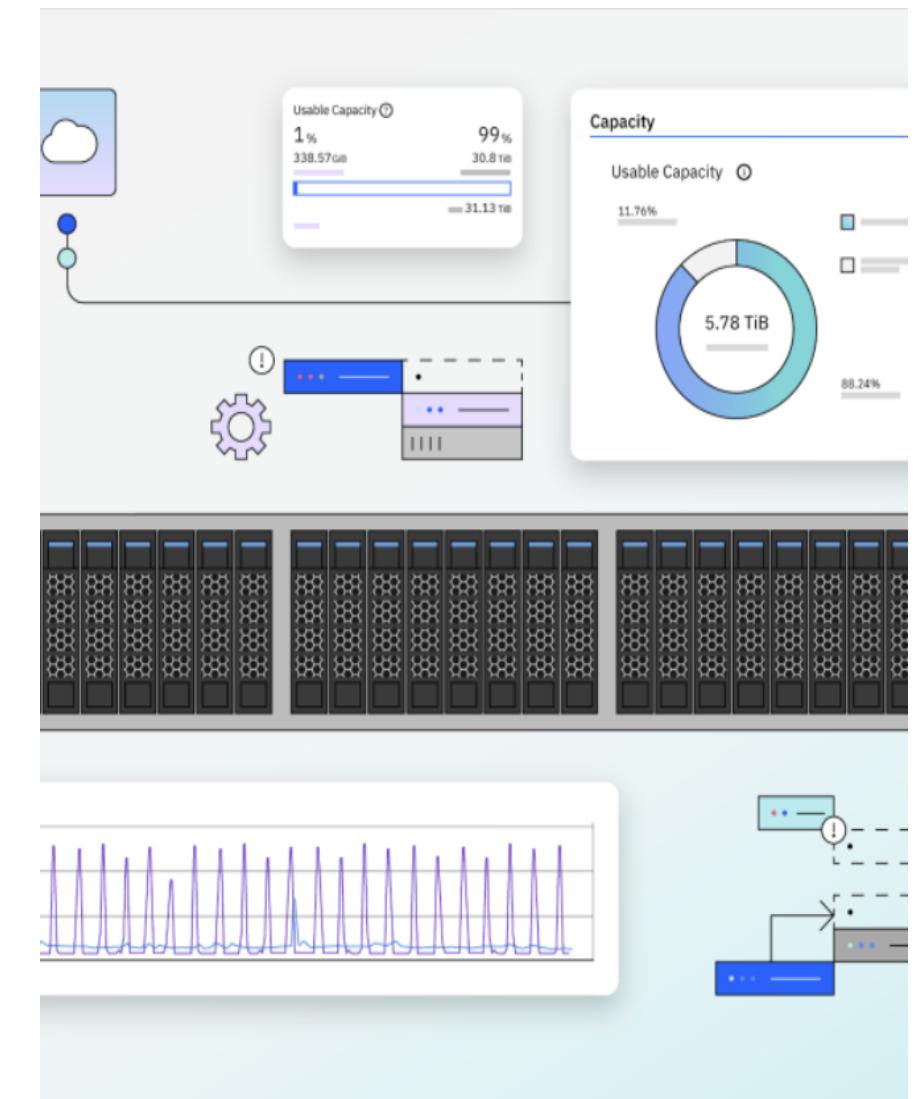
Now, DRAID1 is also supported, allowing for systems with fewer drives to benefit from the feature. This involves an updated T10DIF format and so is only applied to new arrays.

Note: Arrays created prior to 9.1.0 will not benefit from RTD support until the array is recreated.

New Inference Engine Model

Ransomware threat detection models are evolving. Each release of SV code is likely to get an improved model. Improvements reduce the false positive rate (FPR) while maintaining a high confidence in the true positives. 8.7.3 included model 0.3.23.0, which will be available as a patch to install on the LTS 8.7.0.x stream; this patch delivery mechanism will continue with the new model being made available to LTS streams after GA.

GUI Enhancements



Volume Screen Carbonization

This screenshot shows the 'Volumes' list in the IBM SAN Volume Controller interface. A context menu is open over a selected volume, listing actions such as 'Map to host or host cluster', 'Move to volume group', 'More actions', 'Delete', and 'Migrate to another pool'. The list includes columns for Name, State, Capacity, Pool, Volume group, Host mapping, and Protocol type. The interface also displays performance metrics at the bottom.

This screenshot shows the detailed properties of Volume2. It includes sections for 'Volume properties' (Reprovisioned capacity, Volume group, Mirror sync rate, Throttles bandwidth limit, IOPS limit), 'Host Mappings' (2), and 'Snapshots' (2). A 'Copy 0' and 'Copy 1' section is also visible, showing details like Pool, Encrypted, Auto expand, Additional capacity savings, Thin provisioned, and Synchronized status.

This screenshot shows a list of volumes with a context menu open over Volume4. The menu options are: Create mappings, Modify capacity, Rename, Take snapshot, Migrate to another pool, and Delete. The table lists Volume1 through Volume7, showing details like State, Capacity, Pool, Volume group, Host mapping, and Protocol type.

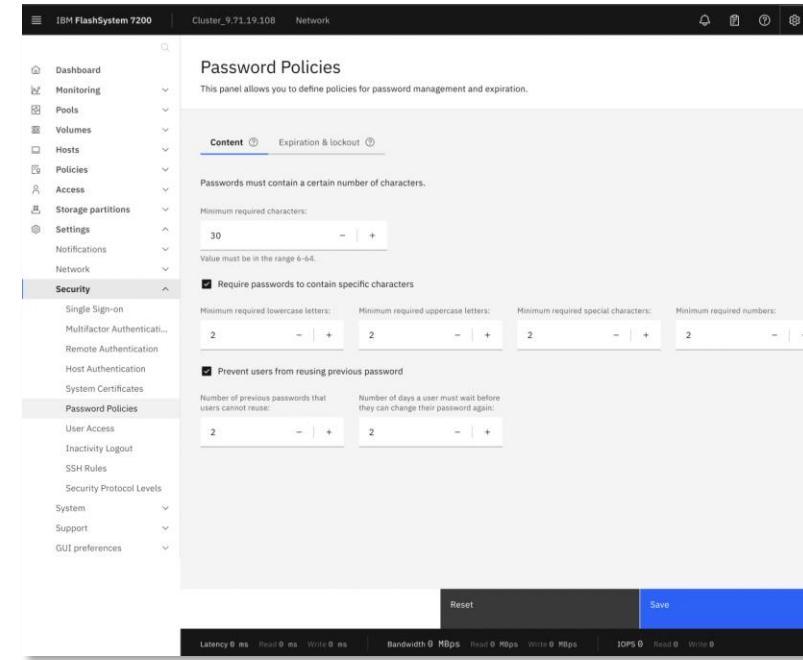
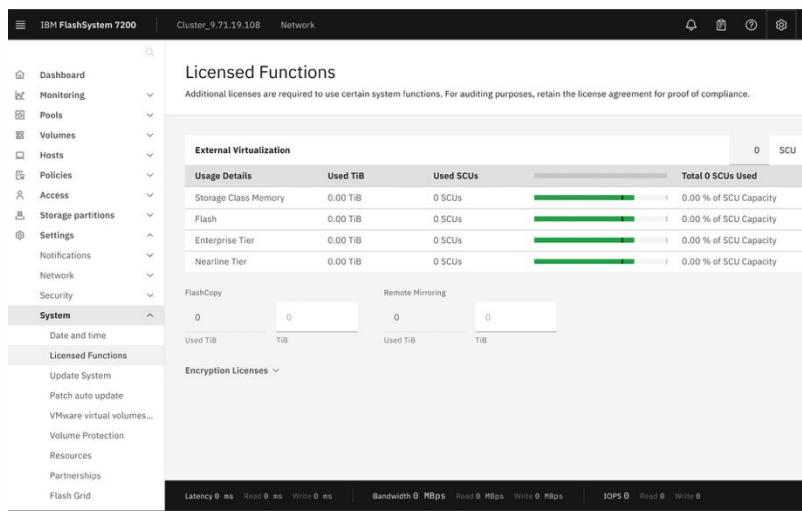
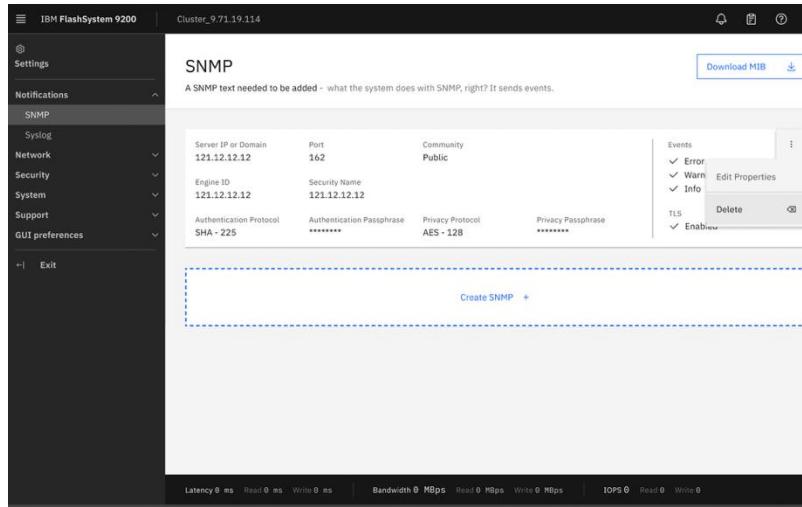
Volume1	Online	1.00 GiB	Pool3	-	No
Volume2	Online	1.00 GiB	Pool3	vgr1	No
Volume3	Online	1.00 GiB	Pool3	vgr1	No
Volume4	Online	1.00 GiB	Pool3	vgr1	Yes
Volume5	Online	1.00 GiB	Pool3	vgr1	No
Volume6	Online	1.00 GiB	Pool3	vgr2	No
Volume7	Online	1.00 GiB	Pool3	-	No

- Converted from existing dojo table to new data table
- Improved UX & usability
- Allowed expansion for HA & replicated volumes
- Volume Details:

- Overview
- Host Mappings
- Snapshots

- Single volume actions
- Bulk volume actions
- All actions carbonized

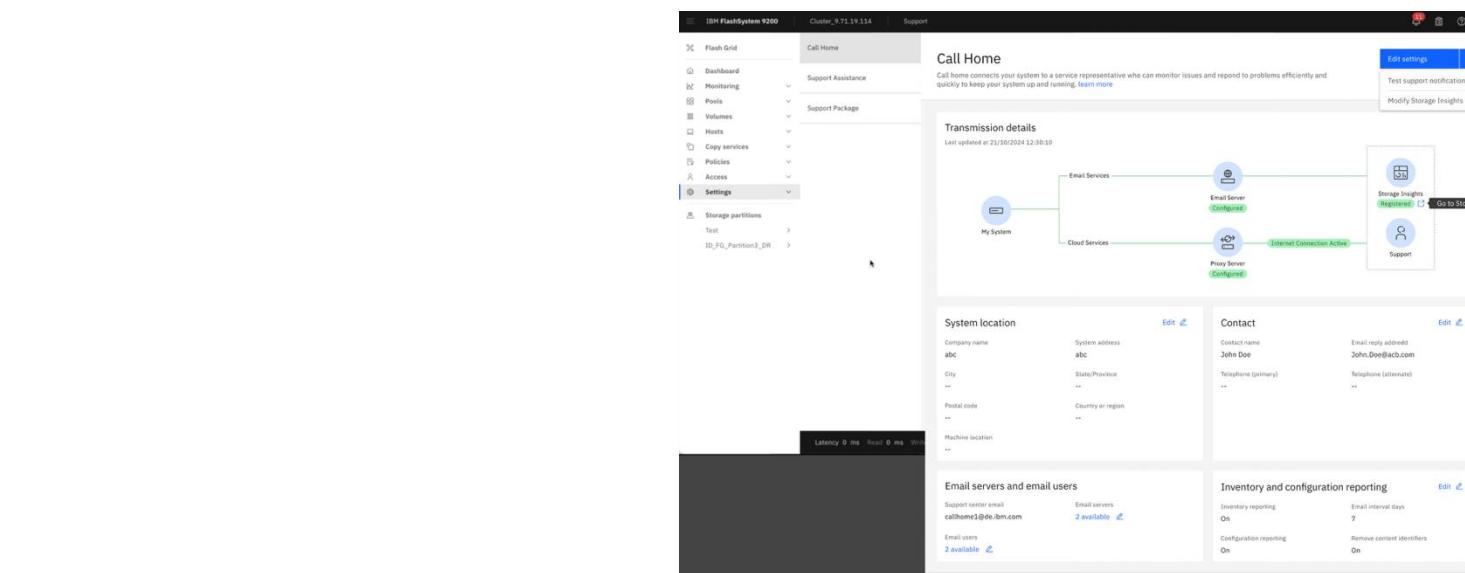
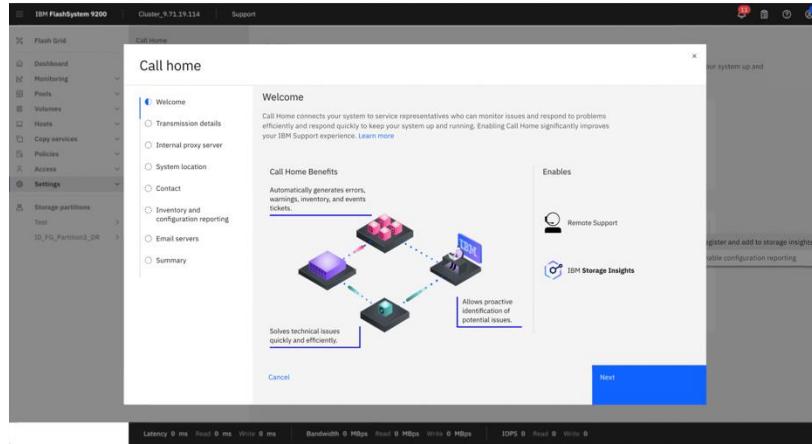
Settings Panel Carbonization



Carbonized all the panels under settings tab:

- SNMP/syslog server
- Password policy
- Licensed function
- iSCSI settings

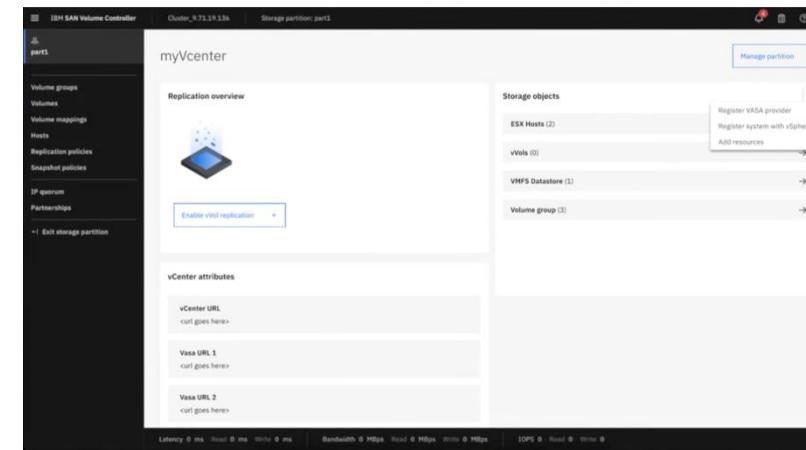
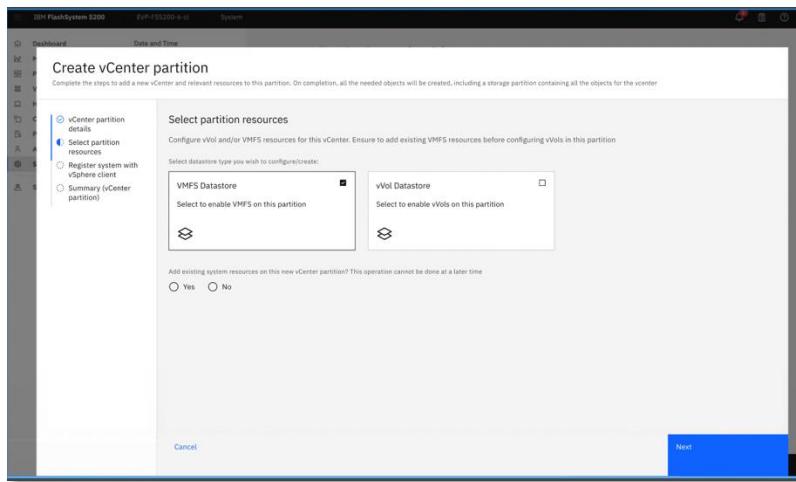
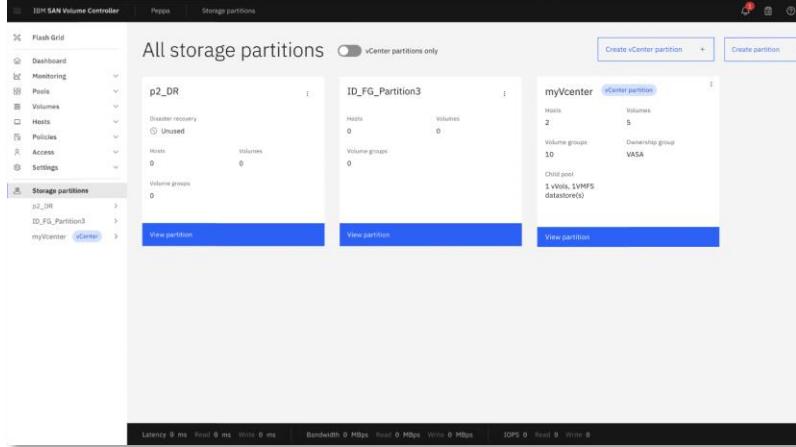
Call Home Carbonization



Carbonized call home panels, include:

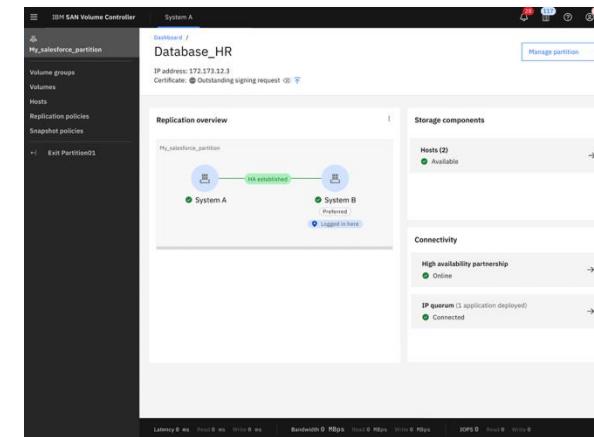
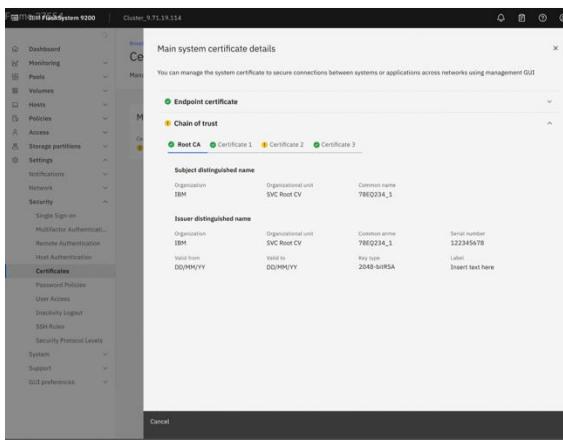
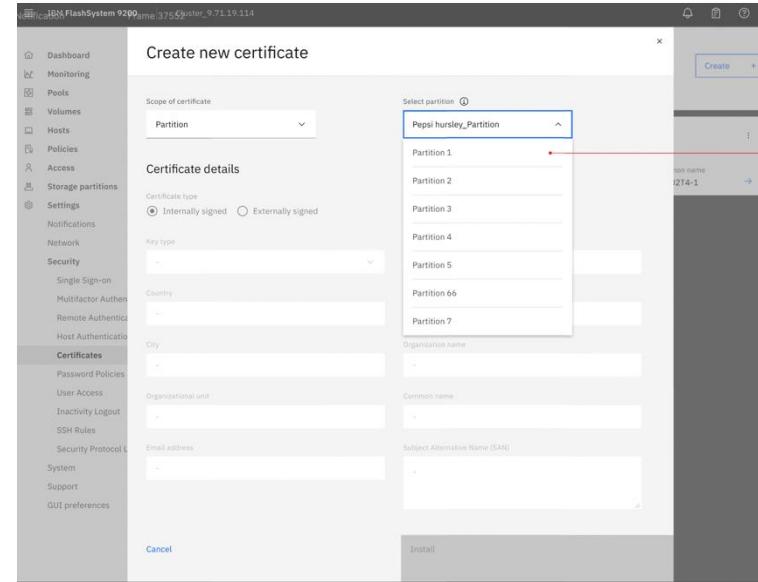
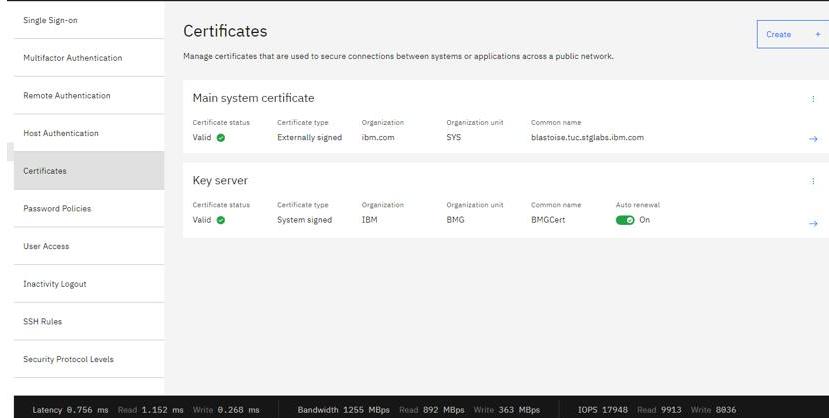
- Settings/Support – Cloud Call Home
- Email Call Home
- Edit specific section individually

GUI support multiple vCenters, VMFS and vVols



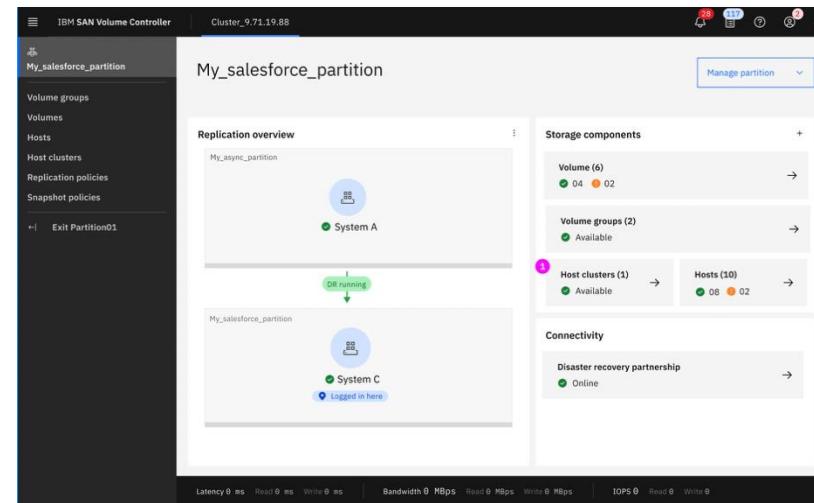
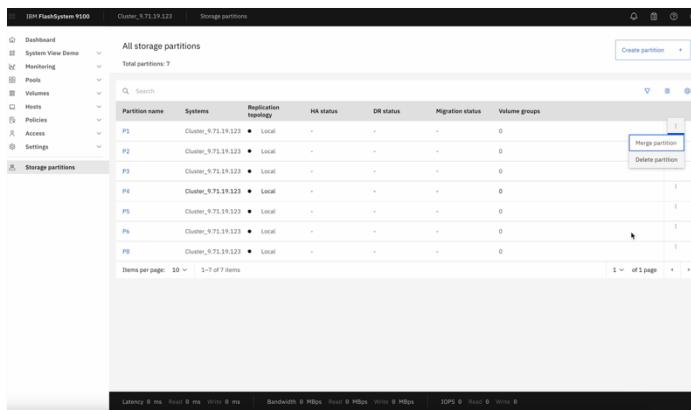
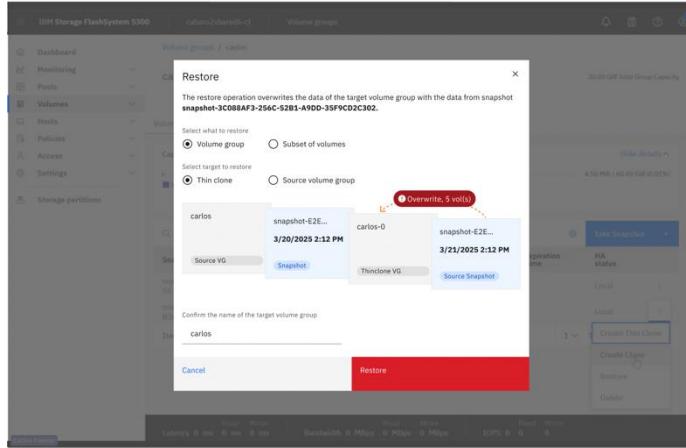
- Ability to create vCenter partition
- Partition Listing show vCenter partition
- Partition world changes:
 - Register VASA provider
 - Register system with vSphere
 - vCenter attributes

Support for Multiple SSL Certificates & Partition IP



- Certificates menu under settings->security
- Ability to create scope specific certificates
- Assign partition level certificate
- Support to assign Partition IP

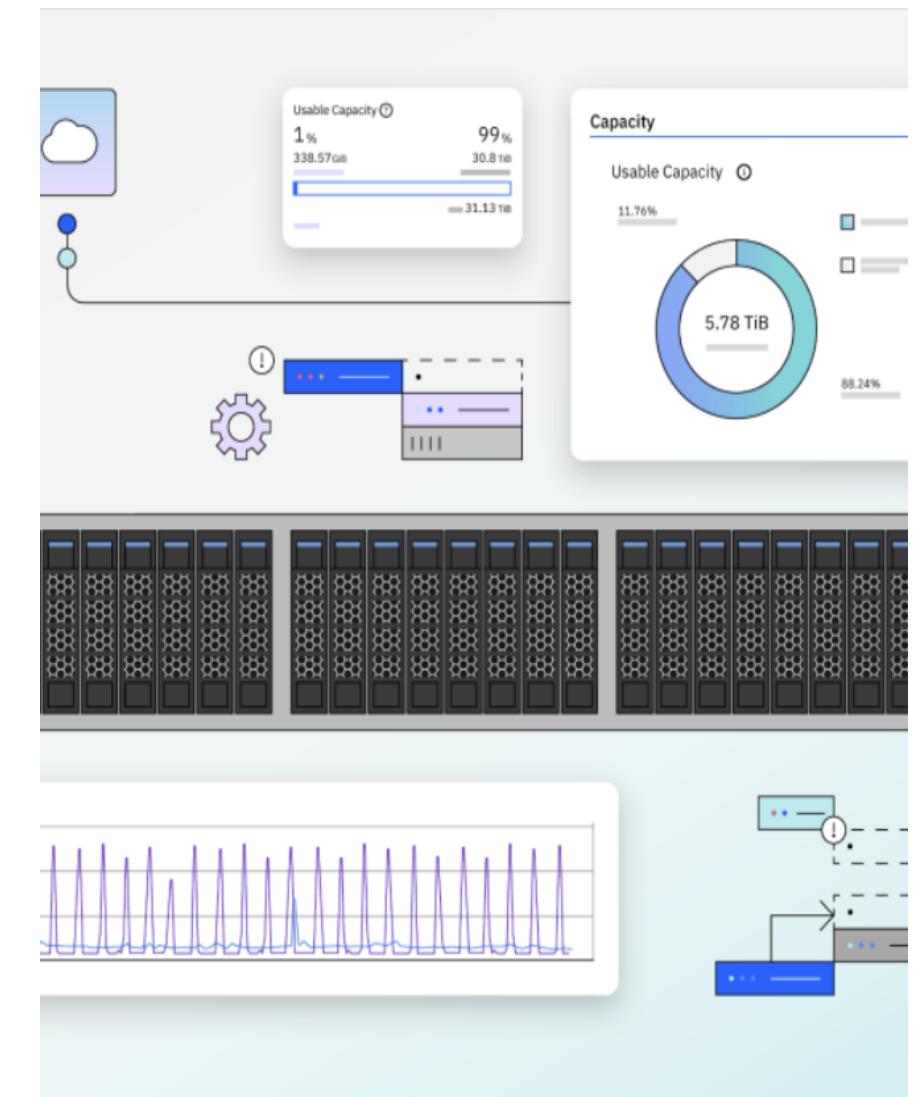
Multiple GUI Work for Feature Supports



- GUI supports drive upgrades during CCU
- Moving volumes between the volume groups within the same partition
- Editing warning and buffer size attributes in a provisioning policy
- GUI supports encryption enabled by default capabilities

- Restore from snapshot of thin clone to source of thin clone
- Create clone from subset of volumes in the snapshot
- Support for host clusters in storage partitions
- Changes related to ransomware threat detection
- Support for increased number of storage partitions
- Support for renaming replicated objects(volumes, hosts & volume groups)
- Support for renaming partition

Misc. Enhancements



Addressing volumes by UUID

- Using the CLI or API, volumes can be addressed using the UUID.
- E.g.,
- `lsvdisk <uuid>`
- `mkvdiskhostmap -host <ID/name> <uuid>`
- `rmvolume <uuid>`
- Note that the volume UUID changes to the NVMe NGUID format if mapped to an NVMe host, and when it is unmapped from all NVMe hosts it will revert to the SCSI NAA format.

Multiple I/O group support for SVC

- The Storage Virtualize strategy is that SVC will support multiple I/O groups on LTS releases only.
- 9.1.0 is an LTS release, therefore will support SVC using multiple I/O groups.
- FlashSystem does not support multiple I/O groups from 8.7.1 onwards, and there is no plan to re-enable support.
- Upgrading an SVC system using multiple I/O groups is permitted from 8.7.0 to 9.1.0.
- Upgrading an SVC system using multiple I/O groups to 9.1.1 and later non-LTS releases is not permitted.

Automatic Drive Upgrade

- After a system upgrade completes, FCM drives in the system will automatically start upgrading.
- The FCM firmware package is included in the install package.
- Both member and candidate drives are upgraded.
- Ensures that FCMs are upgraded to the recommended firmware version as part of regular software upgrade.

Support for Day-to-day Tasks During Upgrade

- Currently very few configuration changes are supported during software upgrades, although (almost all) views are.

- The product documentation highlights which commands are available during upgrade with a notification:

 **Note:** This command is available during the upgrade process.

- Commands are available when upgrading from this version.

- Commands are not permitted around the committing phase of upgrade (~ 5 minutes)

- Supported tasks include:
 - Create/remove/modify volume
 - Create/remove/modify host
 - Create/remove/modify volume group
 - Create/remove/modify host cluster
 - Create/remove/modify partition
 - Create/remove host/host cluster mappings
 - Add/remove/restore snapshot

iSCSI Direct Attach Support

- iSCSI host attach over direct attach connectivity was supported only via SCORE.
- There are many customers who are already using iSCSI protocol for connecting their hosts with direct attach configuration. As it does not need switch it's a more cost-effective solution for low end platforms using iSCSI for host attach.
- General support for these configurations is now available on 8.7.0 and later.

Requirements:

- Different subnets are required for the host interfaces for each connection, i.e. two interfaces for the same host must be on different subnets.
- Note: Assigning IP addresses from same subnet to multiple interfaces of same host causes IP routing issues and target is unreachable. This is not related to direct attach configuration, however its general host behavior with Ethernet.

Limitations:

- Ethernet iSCSI Direct attach is not supported with AIX.
- iSCSI direct attach with PBHA will still require SCORE approval.

What is New in FlashSystem grid?

- Support 32 systems in an IBM FlashSystem grid compared to 8 systems in earlier versions
- Rename all FlashSystem grid CLIs to adhere to the formal name
 - Old command names will still work, however not be advertised. They may require a satask or sainfo prefix

```
IBM_FlashSystem:Cluster_9.71.254.51:superuser>svcinfo lsgrid
grid_name aiops_Test
grid_uuid CBBDD554-EF9C-5BF3-A210-32FE82ABE7E3
grid_owner_uuid A48778C7-2E12-5675-B72B-5E5FFA01F5AF
grid_ip_address 9.71.254.51
last_contact_time
number_of_storage_partitions 2
number_of_storage_partition_copies 3
total_physical_capacity 115.64TB
used_physical_capacity 440.06GB
warning_exceeded no
total_logical_capacity
total_allocated
total_written
total_written_snapshots
total_provisioned_host
total_reserved_host_volume
total_reserved_contingency
total_reserved_childpools
number_of_systems 32
number_of_reachable_systems 32
number_of_systems_reported 32
IBM_FlashSystem:Cluster_9.71.254.51:superuser>
```

	id	system_uuid	member_address	truststore_id	role
0	A48778C7-2E12-5675-B72B-5E5FFA01F5AF				coordinator
1	E8B9EAB0-00F8-54D1-8160-AE78E054D459	9.71.254.48	2		member
2	843CD800-9C1A-514C-A39D-0442AF1DA495	9.71.254.39	3		member
3	5701AFDB-7797-5338-AE66-463D78F8AE3A	9.71.254.36	4		member
4	866981EE-C0B4-5759-8488-92EA7FF1594A	9.71.254.42	5		member
5	32D3F7C2-51A1-53DA-A97F-46BFCA80374A	9.71.254.29	6		member
6	324C9D1D-44A0-50B5-99AD-293EA785CB9B	9.71.254.45	7		member
7	7A011FDB-EF50-5C83-87E6-B37547992902	9.71.254.54	8		member
8	75A5DB38-7ADC-59E1-A55E-F875B315F49F	9.71.254.62	9		member
9	98F53A6E-D653-506E-8B04-69C2941AC19D	9.71.254.61	10		member
10	FDDDA47FD-50E5-555A-992A-B7C426CB8B93	9.71.254.103	11		member
11	2F98F7DB-23EC-5CD2-8348-82C8B45C89F1	9.71.254.105	12		member
12	592BC820-EECD-534C-A881-5C35A8207186	9.71.254.106	13		member
13	704F1771-6732-5192-A4DA-3334B4490752	9.71.254.108	14		member
14	334CFCE5-A13D-518A-9471-E06737711EBC	9.71.254.115	15		member
15	186B755F-E68C-5851-84A7-BBB79947B298	9.71.254.116	16		member
16	21FC5BB9-49F0-5D66-9474-22DBF6461F8C	9.71.254.127	17		member
17	C4E76871-38E4-528E-9D25-4A200A2CBC31	9.71.254.128	18		member
18	F50176BB-178D-57EE-9EBE-B49A841A9D34	9.71.254.168	19		member
19	1BB9BDF2-E032-5E68-AF73-E34F84F2CDEB	9.71.254.174	20		member
20	DA0DA223-C9BC-54AC-AA43-0C92111BA15D	9.71.254.185	21		member
21	3AA06575-436F-569E-9495-C75098C27ECF	9.71.254.187	22		member
22	CDA4BCA7-E91D-5A54-B9F2-BC327251AD3F	9.71.254.118	23		member
23	FEDDD316-555D-5987-BDFB-4F6159D7A351	9.71.254.119	24		member
24	501A8FF2-1325-5E26-BC39-8635B850ABB5	9.71.254.109	25		member
25	1F823AF6-8DA3-5C7E-85B7-31024713AE68	9.71.254.110	26		member
26	337FB288-781D-55DD-A4B0-14B6A1030D20	9.71.254.112	27		member
27	2F6BBC86-2C8E-561F-96BF-8E5E58605171	9.71.254.113	28		member
28	ACCF30BE-63B9-52E3-998E-1812267FE653	9.71.254.130	29		member
29	4277F064-0131-571F-B6E6-59076ED2364E	9.71.254.166	30		member
30	9B6F64A0-D143-5E25-B39A-76CDE1A10134	9.71.254.124	31		member
31	CE55D0C2-723C-5B3D-B6D5-9E78DFA7AA04	9.71.254.125	32		member

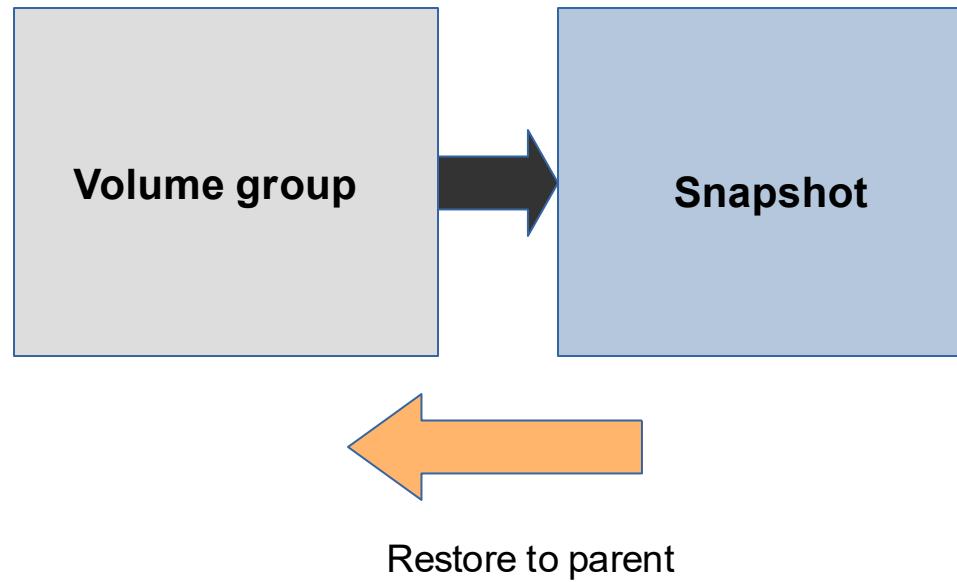
```
IBM_FlashSystem:Cluster_9.71.254.51:superuser>svcinfo lsgridsystem |more
id name          system_id      ip_address  grid_system_uuid          partition_count total_physical_capacity used_physical_capacity last_contact_time code_level
product_name      upgrade_status hardware_health connectivity_health warning_exceeded total_logical_capacity allocated written written_snapshots provision
ed_host reserved_host_volume reserved_contingency reserved_childpools error_data
0 Cluster_9.71.254.51      00000204B6800262 9.71.254.51  A4878C7-2E12-5675-B72B-5E5FFA01F5AF 1          25.56TB      0.00MB          9.1.0.0 (b
uild 187.19.2505091500200) IBM FlashSystem 5200      success      unhealthy      unhealthy      no          77.57TB      1.23TB      0.00MB  0.00MB      200.00GB
1.22TB      7.81GB      0.00MB
1 Cluster_9.71.254.48      00000204ACC03978 9.71.254.48  E8B9EAB0-00F8-54D1-8160-AE78E054D459 1          1.81TB      220.00GB          9.1.0.0 (b
uild 187.19.2505091500000) IBM FlashSystem 5200      success      healthy      unhealthy      no
```

```
IBM_FlashSystem:Cluster_9.71.254.51:superuser>svcinfo lsgridpartition
system_index id name          preferred_management_system_name active_management_system_name replication_policy_id replication_policy_name location1_system_name location1_status location2_s
ystem_name location2_status host_count volume_group_count default_volume_group_id default_volume_group_name ha_status  link_status desired_location_system_name migration_status draft draf
volume_group_count draft_host_count ownership_group_id ownership_group_name management_portset_id management_portset_name host_cluster_count draft_host_cluster_count
0 Finance_WL      Cluster_9.71.254.51      Cluster_9.71.254.51      0          ha-policy-0          Cluster_9.71.254.51      healthy      Cluster_9.7
..254.48 healthy      1      1          established synchronized          0          0          no      0
0
0 Finance_WL      Cluster_9.71.254.51      Cluster_9.71.254.51      0          ha-policy-0          Cluster_9.71.254.51      healthy      Cluster_9.7
..254.48 healthy      1      1          established synchronized          0          0          no      0
0
0 Finance_WL_DR
0          1          0          0          0          0          0          0          0
0
IBM_FlashSystem:Cluster_9.71.254.51:superuser>
```

Thin Clone Restore

Current functionality:

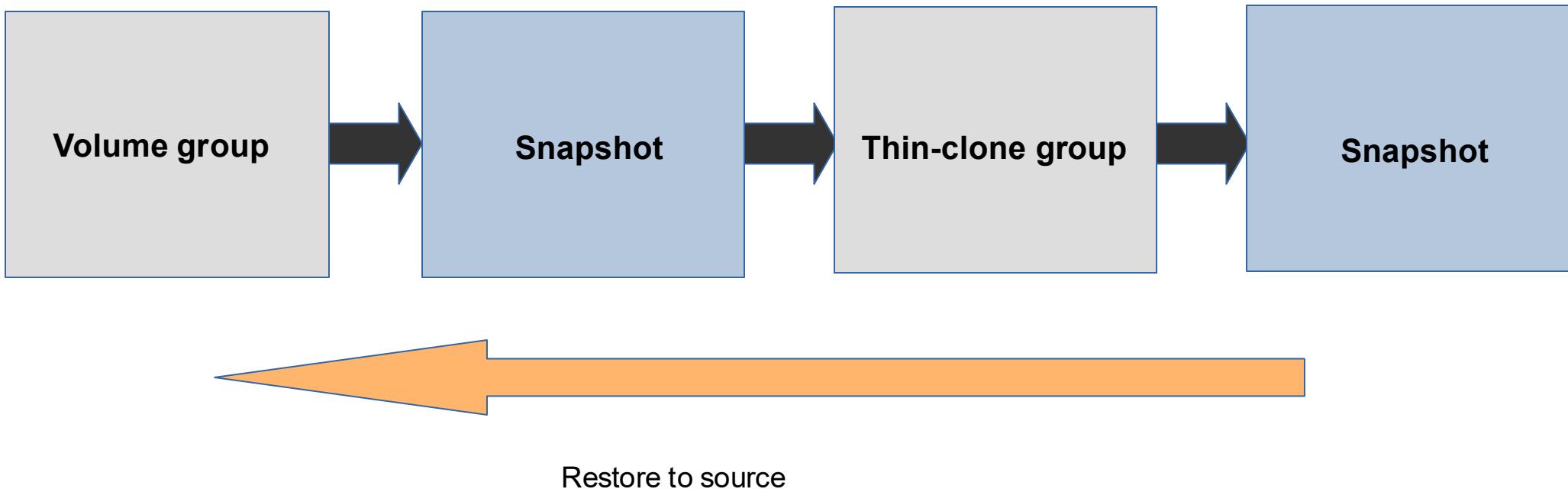
Snapshots can only be restored to the parent volumes from which they were taken



Thin Clone Restore

New functionality:

Snapshots can be restored to the source volume group of thin-clones



Thin Clone Restore

Volume groups / thinCloneGroup

thinCloneGroup

3.00 GiB Total Group Capacity

View properties

Restore

The restore operation overwrites the data of the target volume group with the data from snapshot **snapshot-20AF91E7-4DD8-5A35-8EFC-0105698C138B**.

Select what to restore [\(i\)](#)

Volume group Subset of Volumes

Select target to restore

Thin clone Source volume group

volumegroup0 **snapshot-D32BC80C...** **thinCloneGroup**

13/5/2025 08:03 **13/5/2025 08:04**

Source volume group **Source snapshot** Thin-clone volume group **Snapshot**

! Overwrite, 3 volumes

Confirm the name of the target volume group, **volumegroup0**, that will be restored [\(i\)](#)

volumegroup0

Cancel **Restore**

Latency 0 ms Read 0 ms Write 0 ms

Bandwidth 0 MBps Read 0 MBps Write 0 MBps

IOPS 0 Read 0 Write 0

2.25 MiB / 3.00 GiB (0.07%)

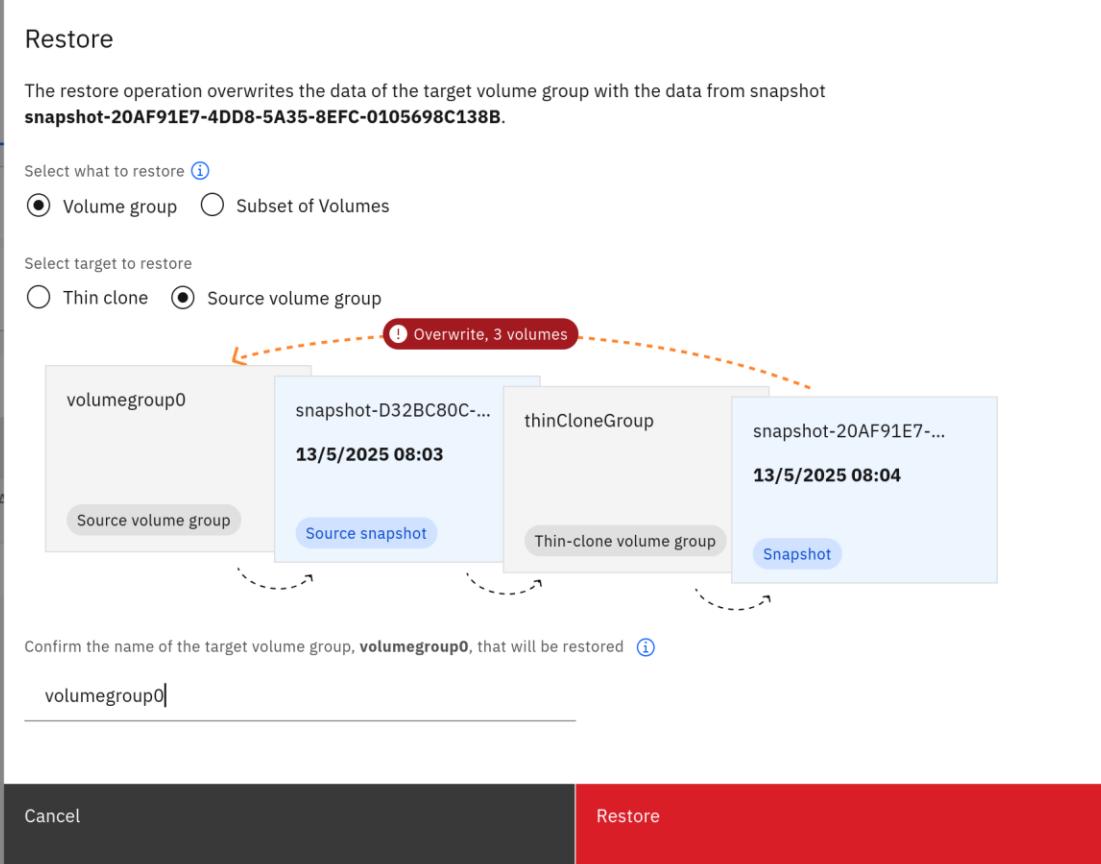
Hide details [\(i\)](#)

Threat detection event Written Capacity

No 2.25 MiB

Take Snapshot [\(i\)](#)

1 1 of 1 page



Accelerate with ATG Survey

Please take a moment to share your feedback with our team!

You can access this 6-question survey via Menti.com with code 5151
0447 or

Direct link <https://www.menti.com/alhsf3bgvxu6>
Or

QR Code



Thank you!