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**Welcome to Lyon, France
and the 2026 Common Europe Congress**

**Bienvenue à Lyon, en France,
et au Congrès de Common Europe 2026**



Enhancing IBM i Operational Resilience with IBM FlashSystem Technology

Infrastructure | Technical Enablement Session



Meet Ed Yeates

Technical Architect for Celerity in the UK

- *Previously at IBM*
- *Previously at Precisely*

My core focus areas include:

- *System Availability*
- *Recovery Time Objectives (RTO)*
- *Recovery Point Objectives (RPO)*
- *Migration Strategies*





What we'll cover

- What FlashSystem does for IBM i availability — without the marketing gloss
- How RPO and RTO change when you move from traditional DR to a cyber-attack scenario
- Five areas in detail: policy-based replication, snapshots, immutable backups, Power Cyber Vault, Storage Insights anomaly detection
- Where the answers differ for small, mid-sized and large estates



Quick Recap of terms, new and old

- **Policy Based Replication** – this improves on and replaces:
 - Global Mirror (async replication)
 - Global Mirror with Change Volumes (cycle mode async replication)
 - Metro Mirror (synchronous replication)
- **Policy Based High Availability (PBHA)** – this improves on and replaces:
 - Hyperswap (active-active synchronous replication)
- **Snapshot** – this improves on and replaces:
 - Flashcopy
- **Safeguarded Copy** (immutable snapshots)
 - New technology
 - Available on FS5200 and later FS5x00; FS7200 and later FS7x00
- **Storage Insights** (cloud based enhanced support)
 - Required for real-time anomaly detection



FlashSystem Storage Partitions for IBM i



Physical or Virtual FC Adapters

Consistent Data point across Volumes



<<< IBM i single-level storage >>>

FlashSystem Storage Partition

FlashSystem Hosts

FlashSystem Volume Group

FlashSystem Volumes



Introducing Storage Partitions – one stop shop for configuring FlashSystem replication

- A Storage partition contains a set of hosts, volume groups, and volumes.
- Storage partitions can be configured to be highly available, automatically configuring every host and volume within them to be highly available.
- The management of hosts, volume groups, and volumes automatically swaps between systems to provide highly available management access.
- Equivalent to Hyperswap but easier to configure !



Introducing Storage Partitions – one stop shop for configuring FlashSystem replication

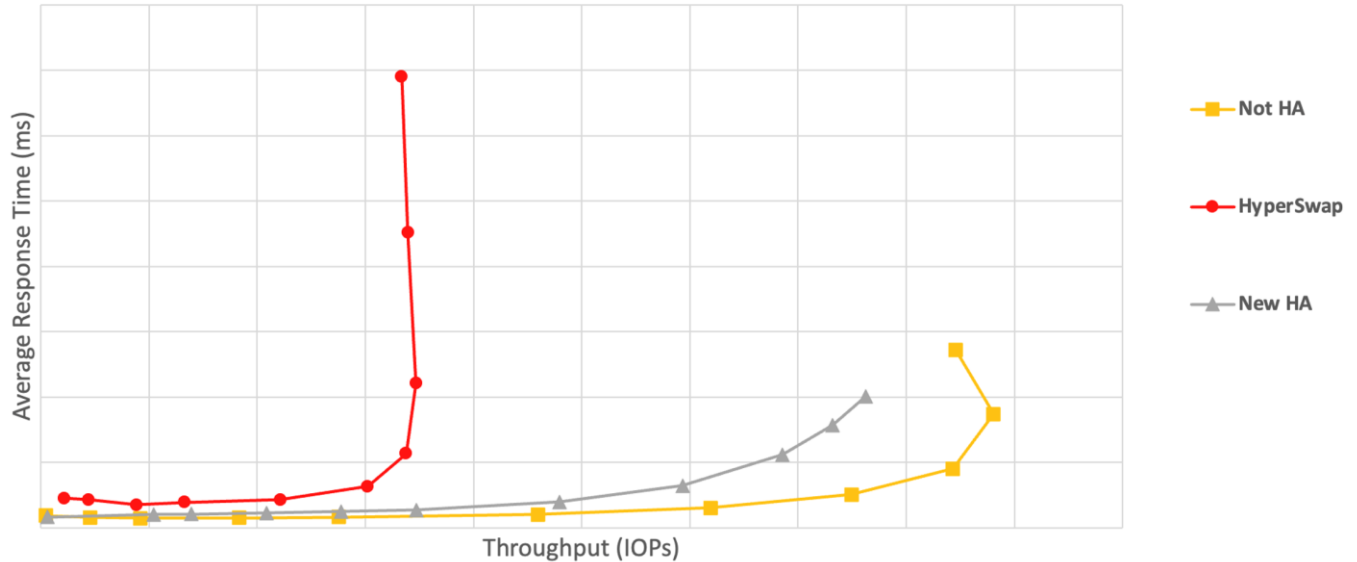
1. Configure your Storage Partition on your preferred management system
 2. Decide on the replication policy e.g. HA or replication
 3. Add your Volume Groups and Hosts to the Storage Partition
 4. Data is synchronised / Hosts are created – **all done !**
- SAN Fabric Zoning and Comms round-trip rules the same as with Hyperswap



PBHA – “Next Gen” Active-Active replication

- Two FS9x00s, connected using Fibre Channel
- Typical OLTP workload
- Greater than 2x throughput versus HyperSwap with improved response time

Performance Comparison: 16KB 703050





PBHA – “Next Gen” Active-Active replication

The screenshot displays the IBM SAN Volume Controller interface for Partition01. The main content area is titled "Partition01 Overview" and is divided into three main sections:

- Replication Policy:** Shows a policy named "RepPol_01" with a topology of "2 Site High Availability". Below this is a "High Availability Status" section with a diagram showing two "bath" production systems connected by a green line, indicating active-active replication.
- Connectivity:** Lists two connected components: "Partnership (Partnership01)" and "IP Quorum (1 application deployed)".
- Storage Entities:** Lists "Hosts (05)" (Online), "Volume Groups (04)" (Online), and "Volumes (50)".

The bottom status bar shows performance metrics: Latency 0 ms, Read 0 ms, Write 0 ms, Bandwidth 0 ms, Read 0 ms, Write 0 ms, IOPS 0 ms, Read 0 ms, Write 0 ms.

- ✓ Partnership
- ✓ IP Quorum “split-brain”
- ✓ Hosts / IBM I Lpars
- ✓ Volume Groups



FlashSystem Storage Partitions for IBM i



Physical or Virtual FC Adapters

Consistent Data point across Volumes



<<< IBM i single-level storage >>>



Physical or Virtual FC Adapters

Consistent Data point across Volumes

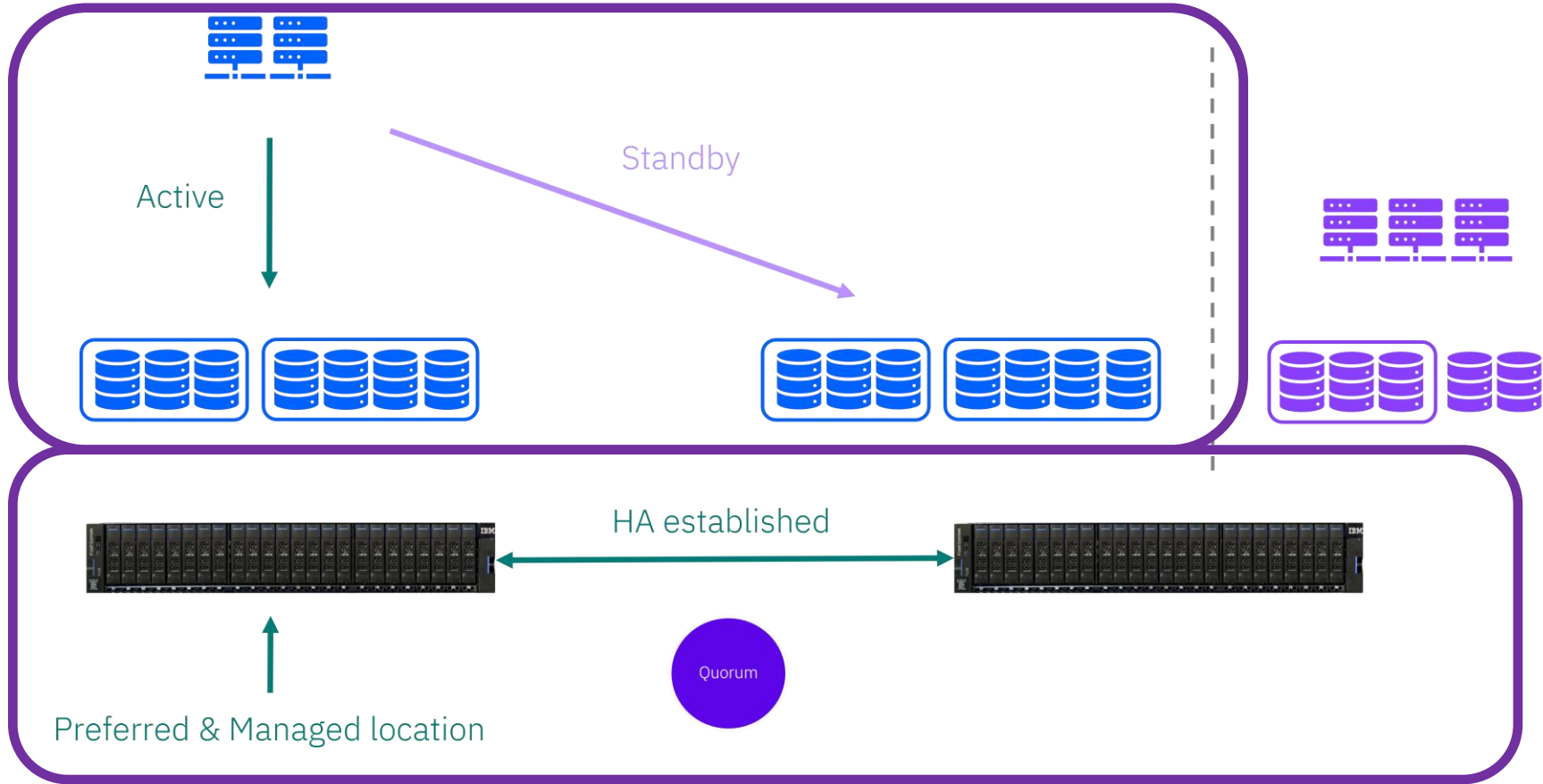


<<< IBM i single-level storage >>>

Storage Partition in a PBHA set up



PBHA – Preferred Management Site





01

Why IBM i resilience is harder now

The threat picture has changed; IBM FlashSystem helps you keep up



What you're defending against



1 in 10 Million versus **1 in 100**





What you're defending against

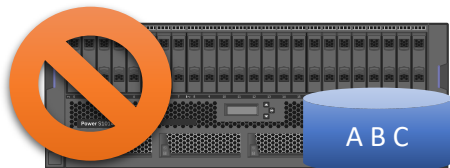
Traditional DR

- Hardware failures and site-level events still happen
- Hardware and Software replication solutions still valid
- Test your DR procedures to know your RPO and RTO
- Have you tested 'Unplanned' invocations and not just 'Planned' ?

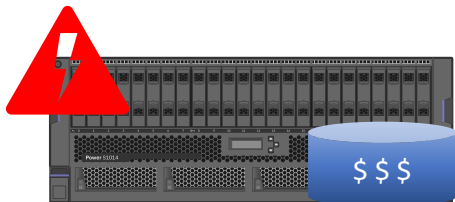
Cyber attack

- Malware now targets IBM i and Power directly, not just x86
- Encryption can start within a minute of compromise
- Internal 'bad actor' may corrupt data when legitimately logged in
- You need a restore point you can prove is clean

What you're defending against – Recovery Scenarios

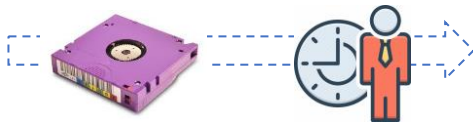
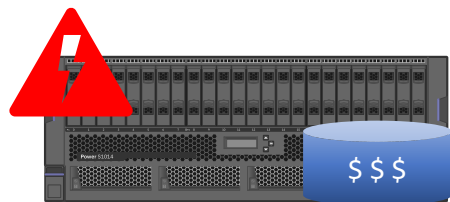


*Traditional DR –
Data mirrored*



*Data corruption
– mirrored*

Traditional DR does not protect against cyber attack / data corruption



*Data corruption
– recover from
tape backup*

IBM FlashSystem snapshots help here



FlashSystem resilience in three numbers

<1 min

Anomaly detection from
FlashCore Module NVME
drives

100%

Six nines of availability,
enhanced with PBHA multi-
site active-active operation

Zero

Downtime for non-disruptive
data movement under Storage
Assurance



02

Policy-based replication and RPO

Replication that follows the policy, not the operator



Policy Based Replication – IBM i Considerations

Features & Advantages

- Automatically tries to achieve best RPO
 - Improvement on GMCV
- Easy to configure and synchronize
- No decisions relating to in/out of replication
- Can be used in combination with software replication

Considerations

- Disk-based replication includes OS and temporary storage
- Cannot use to upgrade OS or apply PTFs
- Abnormal IPL to switch, so unknown RTO
- You need a separate tool if you want DR site backups
- **Ed's Tip:** Use Snapshots to plan for RTO at different times of the day.



How policy-based replication works

- Replication policies are set per volume or volume group. No manual scheduling.
- Policy frequency maps directly to your RPO target
- Storage Virtualize handles replication across the 5600, 7600 and 9600
- If the link drops, replication picks up automatically when it returns



03

Policy-based snapshots and sizing

Point-in-time copies that don't blow out your capacity plan



Snapshots: what they do and how to size them

- They are a point-in-time copies instantly, with no performance hit during creation
- Snapshot policies cover frequency, retention and expiry; no manual housekeeping
- Space-efficient snapshots are copy-on-write, so only changed blocks consume capacity
- Sizing rule of thumb for IBM i: 15-25% of production capacity per day, typical OLTP
- High-transaction workloads (large ERP, order processing) need closer to 30-40% per 24 hours
- Don't guess. Pull capacity trending from Storage Insights and refine over time.
- **Ed's Tip:** Start with 3-4 snapshots per day then slowly increase frequency and retention



Snapshots – Create Policy #1

IBM Storage FlashSystem 5300 | JT_FSS300 | Snapshot policies

Dashboard

Create snapshot policy

- ✓ Name policy
- Define schedule**
- Assign policy
Optional

Define schedule

Specify the frequency, time, day of the week, day of the month and retention period for snapshots.

Frequency: Hourly

Hourly interval: 2

Retention interval (days): 2

Base time: 06:55 AM

The snapshot is taken at the specified hourly interval from the base time.

[Cancel](#) [Back](#) [Create policy](#)

Summary

Name: JT_2H

Snapshots schedule: Every 2 hours, initially starting at 06:55 AM, and retained for 2 days



Snapshots – Create Policy #2

IBM Storage FlashSystem 5300 | JT_FS5300 | Snapshot policies

Dashboard | Monitoring | Pools | Volumes | Hosts | Copy services | **Policies** | Provisioning policies | Replication policies | **Snapshot policies** | Access | Settings | Storage partitions

Snapshot Policies

Create policies and assign them to volume groups to automate the creation and retention of your snapshots.

Search table... Filter Settings [Create snapshot policy](#)

Name	Target	Frequency	Retention	Volume group count	
JT_1H	Local	Every hour	1 Days	1	⋮
JT_2H	Local	Every 2 hours	2 Days	0	⋮
predefinedsspolicy0	Local	Every 6 hours	7 Days	0	⋮
predefinedsspolicy1	Local	Every week on Sunday at 01:00 AM	30 Days	0	⋮
predefinedsspolicy2	Local	Every month on the 3rd at 01:00 AM	365 Days	0	⋮
predefinedsspolicy38	Cloud	Every day at 01:00 AM	30 Days	0	⋮

Items per page: 10 | 1-7 of 7 items | 1 | 1 of 1 page

Assign to Volume Group



Snapshots – Create Policy #3

IBM Storage FlashSystem 5300 | JT_FS5300 | Volume groups

Volume groups / JTIBMI

JTIBMI 2.46 TiB Total Group Capacity

Safeguarded Snapshot Policy

Volumes (12) Policies (1) **Local snapshots (29)** Cloud Snapshots

Capacity for Snapshots Hide details ^
1.67 TiB / 71.37 TiB (2.34%)
Written Capacity

Search Take Snapshot +

Snapshot name	State	Safeguarded	Time Created	Last restore time	Expiration Time
snapshot17	Active	Yes	31/3/2026 09:44	-	1/4/2026 09:44
snapshot16	Active	Yes	31/3/2026 08:44	-	1/4/2026 08:44

Items per page: 25 | 1–25 of 29 items | 1 of 2 pages

Latency 63 µs | Read 63 µs | Write 71 µs | Bandwidth 13 MBps | Read 13 MBps | Write 0 MBps | IOPS 2417 | Read 2347 | Write 70



04

Immutable backups

Restore points you can trust after an attack



Immutable backups, the IBM i angle

How immutability is enforced

- Snapshots are logically isolated from production. No write access after creation.
- Only authorised admins can touch them, via role-based controls
- During retention, copies can't be changed, deleted or replicated. WORM-equivalent in practice.
- Useful evidence for DORA, NIS2 and ISO 22301 compliance

IBM i specifics

- Data in memory may not be included in the Snapshot
- Quiesce / Pause the application and Flush memory for improved data integrity
- Abnormal IPL to boot a snapshot
- Test recovery of immutable backups regularly. **Don't trust a snapshot until you've validated that you can recover to it.**



Why should you validate your snapshots?

- It provides you with a known **Recovery Point ...**
- It provides you with a known **Recovery Time ...**
 - ... for a Cyber Attack
 - ... for a DR invocation of FlashSystem replication



How to Test and Validate an Immutable Snapshot

The screenshot displays the IBM Storage FlashSystem 5300 management interface. The top navigation bar shows 'IBM Storage FlashSystem 5300', 'JT_FS5300', and 'Volume groups'. The main content area is titled 'Volume groups / JTIBMI' and shows a 'Safeguarded Snapshot Policy' for the 'JTIBMI' volume group, which has a '2.46 TiB Total Group Capacity'. Below this, there are tabs for 'Volumes (12)', 'Policies (1)', 'Local snapshots (31)', and 'Cloud Snapshots'. A summary card indicates 'Capacity for Snapshots' at '1.49 TiB / 76.29 TiB (1.96%)'. A table lists snapshots with columns for 'Snapshot name', 'State', 'Safeguarded', 'Time Created', 'Last restore time', and 'Expiration Time'. A 'Take Snapshot' button is visible, and a context menu is open over the first row, showing options: 'Create Thin Clone', 'Create Clone', 'Restore', and 'Delete'. The bottom status bar shows performance metrics: Latency 80 µs, Read 127 µs, Write 73 µs, Bandwidth 4 MBps, Read 1 MBps, Write 2 MBps, IOPS 744, Read 97, Write 647.

Snapshot name	State	Safeguarded	Time Created	Last restore time	Expiration Time
snapshot13	Active	Yes	15/6/2026 08:44	-	16/6/2026 08:44
snapshot12	Active	Yes	15/6/2026 07:44	-	16/6/2026 07:44
snapshot11	Active	Yes	15/6/2026 06:44	-	16/6/2026 06:44

Thin-Clone Snapshots are created from a source Volume Group snapshot – these are no longer immutable and so can be mounted to the Clean Room and refreshed from a subsequent immutable snapshot.



Create a Thin-Clone Volume Group from a Snapshot

The screenshot shows the IBM Storage FlashSystem 5300 management console. The left sidebar contains navigation options: Dashboard, Monitoring, Pools, Volumes, Hosts, Copy services, Policies, Access, Settings, and Storage partitions. The main area displays the 'Volume groups' page. A modal dialog titled 'Create Volume Group' is open, with a close button (X) in the top right corner. The dialog contains the following text and form elements:

Select how to assign volumes to a new volume group. You can specify from existing volumes or select a snapshot of volumes in another volume group.

Enter name (optional)
SAFEGUARDED_TEST

Ownership group (optional)
celernity

Assign volumes (optional)

Choose existing volumes

Choose an existing snapshot from a volume group

At the bottom of the dialog are two buttons: 'Cancel' and 'Next'. The background interface shows a table of volume groups with a 'Create Volume Group +' button and a '1 of 1 page' indicator.



Attributes of a Thin-Clone Volume Group

IBM Storage FlashSystem 5300 | JT_FS5300 | Volume groups

Dashboard
Monitoring
Pools
Volumes
Hosts
Copy services
Policies
Access
Settings
Storage partitions

Volume Groups

Search table... Filter Settings Create Volume Group +

Name	Volume Count	Snapshot Policy	Snapshot Count	Safeguarded
JTIBMI	12	JT_1H	31	Yes
↳ SNAPSHOT_CopyAssure	12	-	0	No
↳ SNAPSHOT_TAPE	12	-	0	No

Source details

Source volume group name	JTIBMI	Source Snapshot	FC_BACKUP	Time created/refreshed	Jun 15, 01:39 AM
--------------------------	--------	-----------------	-----------	------------------------	------------------

Items per page: 10 | 1-3 of 3 items | 1 | 1 of 1 page

Latency 127 µs | Read 146 µs | Write 81 µs | Bandwidth 47 MBps | Read 28 MBps | Write 19 MBps | IOPS 4604 | Read 3251 | Write 1353



Thin-Clone Volume Group – Mapped to Host

IBM Storage FlashSystem 5300 | JT_FS5300 | Volume groups

Volume groups / SNAPSHOT_TAPE

SNAPSHOT_TAPE

Volumes (12) | Policies (0) | Local snapshots (0) | Cloud Snapshots

Actions | All Volumes

Name	State	Pool	Host Mappings
snapshot-JTIBMi_01	✓ Online	JTIBMi	Yes
snapshot-JTIBMi_02	✓ Online	JTIBMi	Yes
snapshot-JTIBMi_03	✓ Online	JTIBMi	Yes
snapshot-JTIBMi_04	✓ Online	JTIBMi	Yes
snapshot-JTIBMi_05	✓ Online	JTIBMi	Yes
snapshot-JTIBMi_06	✓ Online	JTIBMi	Yes

Showing 12 volumes | Selecting 0 volumes



Refresh the Thin-Clone Volume Group

IBM Storage FlashSystem 5300 | JT_FS5300 | Volume groups

Dashboard | Monitoring | Pools | **Volumes** | Hosts | Copy services | Policies | Access | Settings | Storage partitions

Volume Groups

Search table... Filter Settings Create Volume Group +

Name	Volume Count	Snapshot Policy	Snapshot Count	Safeguarded
JTIBMI	12	JT_1H	31	Yes
↳ SNAPSHOT_CopyAssure	12	-	0	No
↳ SNAPSHOT_TAPE	12	-	0	No

Source details

Source volume group name: JTIBMI | Source Snapshot: FC_BACKUP | Time created/refreshed: Jun 15, 01:39 AM

Items per page: 10 | 1-3 of 3 items

Latency 114 µs | Read 116 µs | Write 68 µs | Bandwidth 25 MBps | Read 24 MBps | Write 0 MBps | IOPS 5817 | Read 5636 | Write 182

- View details
- Rename
- Edit ownership group
- Delete
- Refresh from snapshot**
- Convert thin clone to clone



05

IBM Power Cyber Vault

Clean room recovery for IBM i



Power Cyber Vault: what the IBM i story looks like

- Power Cyber Vault is FlashSystem plus Power11 plus IBM services, sold and supported as a single offering
- It's an air-gapped or logically isolated environment used for recovery testing and forensics
- IBM i workloads recover into the clean room from immutable snapshots; production carries on untouched
- Ransomware detection scans the recovered volumes before anything goes back to production
- Clean room validation checks data integrity, application start-up and journal consistency
- RTOs drop from hours to minutes for mission-critical IBM i
- Sizing scales from dedicated single-client vaults up to shared multi-tenant designs for mid-market

Power Cyber Vault: Customer story

Assure use case



Very short shelf-life products.

Absolutely 100% availability required, backups take 8 hours.

They asked me a question.....



How can we reduce RPO and RTO in all scenarios?

Power Cyber Vault: Customer Solution

Assure use case



How can we reduce RPO and RTO in all scenarios?

Proactive Threat Detection

- ✓ Flash Core Module drives (FCM5) with anomaly detection
- ✓ IBM Storage Insights & Stay up to date with Firmware

Traditional DR

- ✓ Replication: mitigate against system failure / Data Centre disaster
- ✓ PB-HA & MIMIX

Reduce Planned Downtime

- ✓ FlashCopy Backups: zero downtime for backup

Mitigate Against **Cyber Attack / Data Corruption**

- ✓ Safeguarded Copy / Immutable snapshots
- ✓ Clean Room Lpar
- ✓ Automation in place to **validate** the immutable snapshots



Best Practice



DR

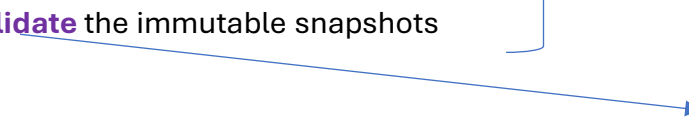
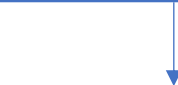


Backups

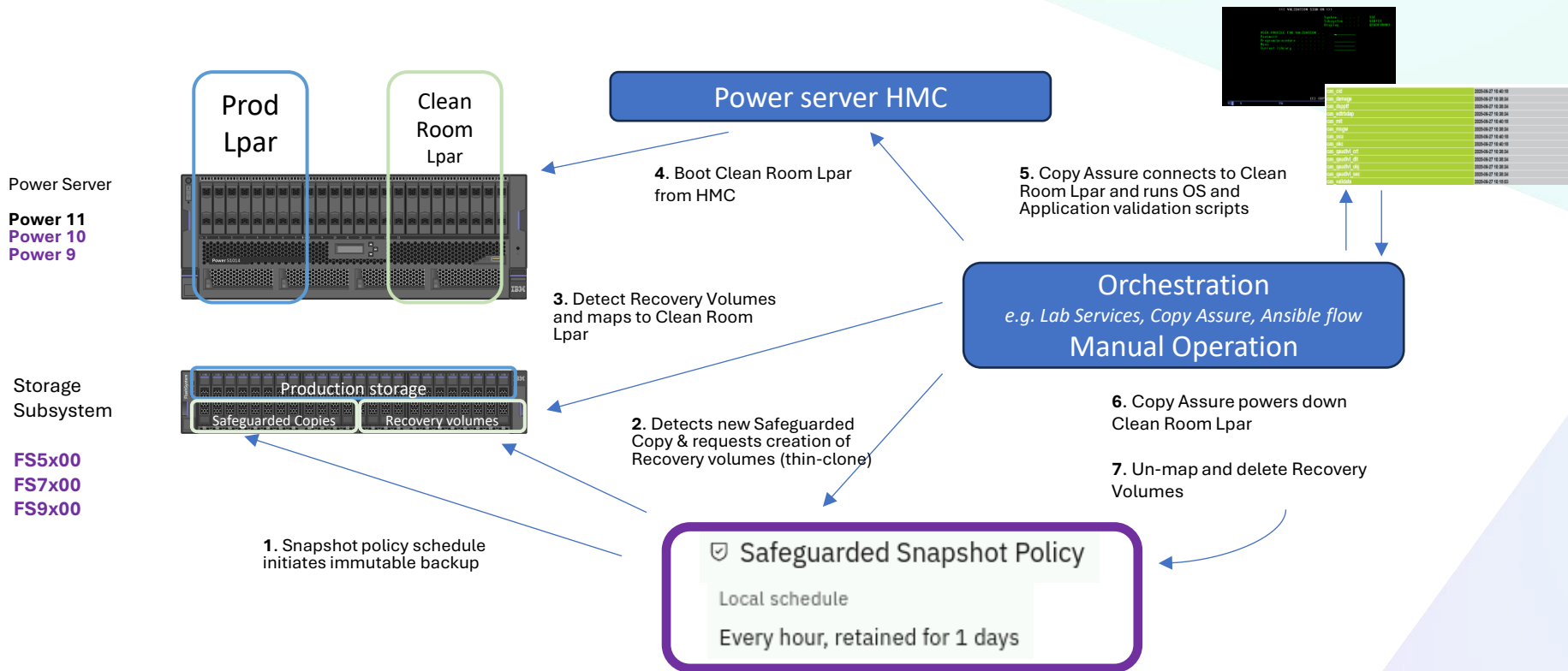


Power Cyber Vault

Celerity Copy Assure



Cyber Vault validation flow chart





06

Anomaly detection with Storage Insights

Catch the attack at the I/O layer, before it spreads



Storage Insights for anomaly detection and visibility

Anomaly detection

- Every FlashCore Module monitors each I/O operation using embedded ML
- Ransomware encryption patterns surface in under a minute. Earlier than host-based detection.
- Alerts land in the Storage Insights dashboard with the storage telemetry attached
- Optionally auto-trigger an immutable snapshot the moment an anomaly is flagged

Operational visibility

- One dashboard for health, capacity and performance across the FlashSystem estate
- AI recommendations flag capacity risks before they breach SLA
- Alerts plug into IBM i monitoring tools your clients already run (e.g. Grafana)
- Capacity trends give you something to point at when planning snapshot and replication growth



Thank you

Questions & discussion

Ed's [LinkedIn](#)