



ADVANCED TECHNOLOGY GROUP (ATG)



Accelerate with ATG Webinar: Unleash the Power of the IBM FlashSystem 5300

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Accelerate with ATG Technical Webinar Series

Advanced Technology Group experts cover a variety of technical topics.

Audience: Clients who have or are considering acquiring IBM Storage solutions. Business Partners and IBMers are also welcome.

To automatically receive announcements of upcoming Accelerate with IBM Storage webinars, Clients, Business Partners and IBMers are welcome to send an email request to accelerate-join@hursley.ibm.com.



2024 Upcoming Webinars – Register Here!

[Take Your CSM to the Next Level: What's New in IBM Copy Services Manager 6.3.10 & 6.3.11](#) - July 9th, 2024

[Get Up To Speed on IBM Storage Virtualize 8.6.3 & 8.7 - Latest Features and Enhancements](#) - July 16th, 2024

[IBM C-Type SAN Analytics: Real-time and Always-on SAN Performance visibility at Scale](#) – July 23rd, 2024

Important Links to bookmark:



ATG Accelerate Site: <https://ibm.biz/BdSUFN>

ATG MediaCenter Channel: <https://ibm.biz/BdfEgQ>

Offerings

Client Technical Workshops

- **IBM Cyber Resiliency with IBM Storage Defender: July 17th - 18th - VIRTUAL**
- **IBM Storage Scale System & Storage Scale Workshop: August 8th in San Jose, CA**
- **IBM Fusion & Ceph: A Deep Dive into Next Gen Storage: August 21st – 22nd in Atlanta, GA**
- **IBM FlashSystem Deep Dive & Advanced Functions: September 18th – 19th in Paramus, NJ**
- IBM DS8900F Advanced Functions

TechZone Test Drive / Demo's

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

Please reach out to your IBM Representative or Business Partner for more information.

IMPORTANT The ATG team serves clients and Business Partners in the Americas, concentrating on North America.

Registration Open!

Storage @ IBM TechXchange Conference 2024

October 21-24, 2024
Mandalay Bay | Las Vegas
#IBMTechXchange

Key Learnings

- Practical how-to advice
- Patterns and best practices
- Success stories, IBM PoV, proven techniques

Featured Products

- IBM Storage Defender
- IBM Storage Fusion
- IBM Storage Scale + IBM Storage Ceph
- IBM Tape + IBM SAN
- IBM Storage FlashSystem + IBM Storage DS8000

Collaborate. Learn. Play.

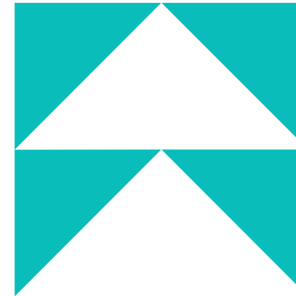
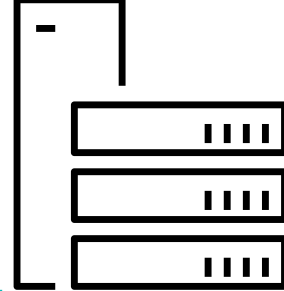
Community

- IBM Champions
- User Groups
- Tech Peers
- Business Partners



Sandbox

- Network
- Learn
- Collaborate
- Play

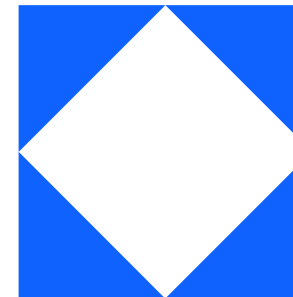


Accelerate your Career

- Labs (Instructor-Led, Self-paced)
- IBM Certification Testing
- Earn up to 25 hours in CPE credits

Breakout Sessions

- Trends and Directions
- User Groups
- Product Deep Dives
- Meet the Expert
- Professional Development
- Show the Code
- Birds of a Feather
- Academic/Research



Roadmaps

Go deep with people in the know and set the stage for where IBM is going in the future



<https://www.ibm.com/community/ibm-techxchange-conference/>

Game On!



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](https://www.menti.com) with code 1708 6924 or

Direct link <https://www.menti.com/alwhyze7z1gz>

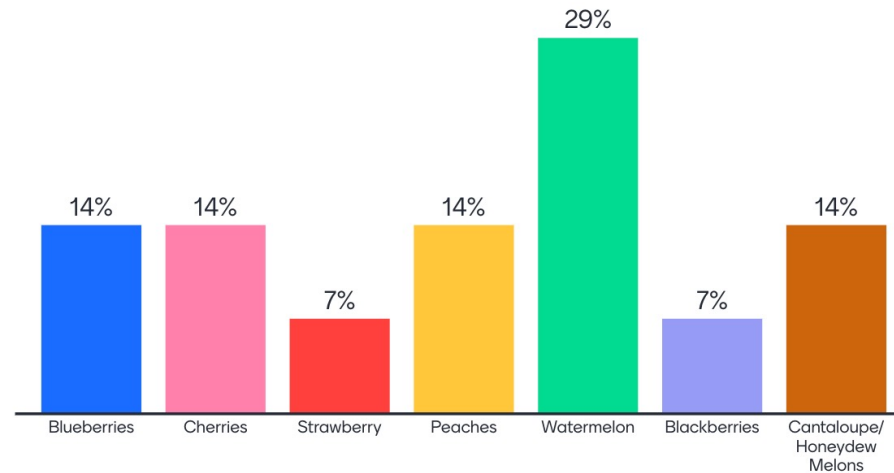
Or

QR Code



Join at menti.com | use code 1708 6924

What is your favorite summer fruit?





ADVANCED TECHNOLOGY GROUP (ATG)



Accelerate with ATG Webinar: Unleash the Power of the IBM FlashSystem 5300

Byron Grossnickle

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byrongro@us.ibm.com



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.

FS5300 Agenda



- Hardware
- Software Integration/Changes
- Storage Assurance Program - Perpetual

IBM FlashSystem 5300 Hardware



FlashSystem Family



FlashSystem 5015 & 5045

SAS based entry to the world of IBM Storage Virtualize and FlashSystem.

FS5015: 80k* IOPs, 7GB/s
FS5045: 200k* IOPs, 12GB/s

May '24



FlashSystem 5300

Next-gen of Award-winning efficiency leader. Densest 1U system unlocks the FCM value proposition to everyone

400k* IOPs, over 28GB/s and 1PB effective** per controller.



FlashSystem 7300

The 5th generation of the award winning 7000 series, striking the right performance, scaling and value balance

530k* IOPs, over 45GB/s and 2.1PB effective** per controller.



FlashSystem 9500

Extreme performance for large, mixed and consolidated workloads

1.4M* IOPs, over 100GB/s and 4.4PB effective** per controller.

Powered by IBM Storage Virtualize

Storage Virtualize for Public Cloud

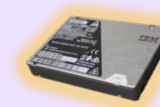
Hybrid Cloud integration with all FlashSystem products allows seamless data migration from on premise to your chosen cloud provider.

* IOPs quoted are real life 16KB blocks with a 70/30/50 R/W ratio (from media!) compression
** Based on 3:1 ratio



SAN Volume Controller (SVC)
SV3 Storage Engine

Celebrating 20 years in market, SVC supports more than 500 models of storage controller with seamless SVC and storage replacement.



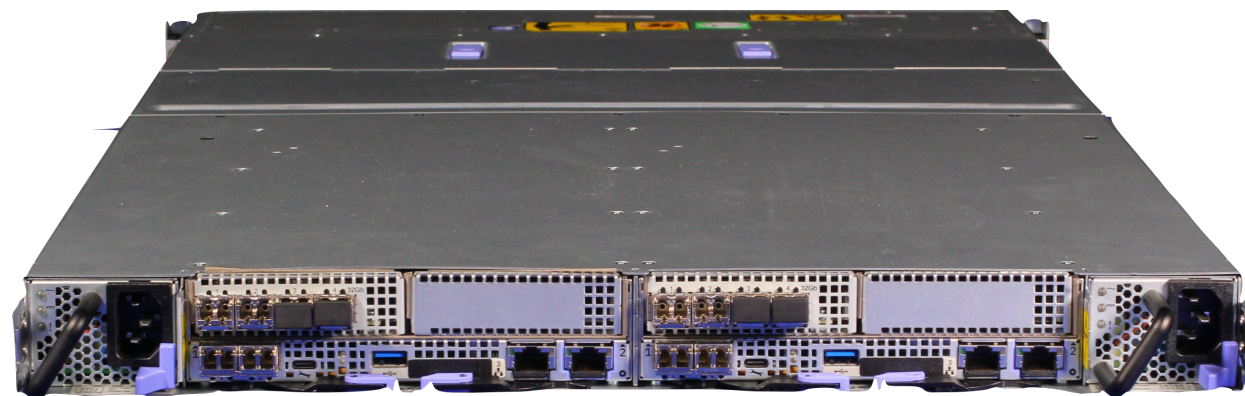
IBM FlashCore Modules

The 4th generation of one of FlashSystem key value propositions with:

- AI-enabled Ransomware Threat Detection
- Data Reduction HW-offload
- Densest Tier-0 flash drive

What is the FlashSystem 5300

- Follow on for the FlashSystem 5200
- With More Performance
 - Intel Icelake D
 - PCIeG4 for double the 32G Ports
 - 45% increase in 16K 70/30/50
 - 50% increase in large block write
- More Security
 - Measure/Trusted and Secure boot
 - Quantum Safe Cryptography (with FCM4)
 - FCM4 Ransomware Threat detection
 - Separated management and IO ports
 - More bitmap capacity for SGC – 10 PB Target
- More on board options



FlashSystem 5300

- **MTM: 4662-7H2**
- 1U - 19" Rack mount, 29" depth Enclosure
 - ~1kW power requirement, Auto Switch PSU support
 - Field upgradable with replacements canisters

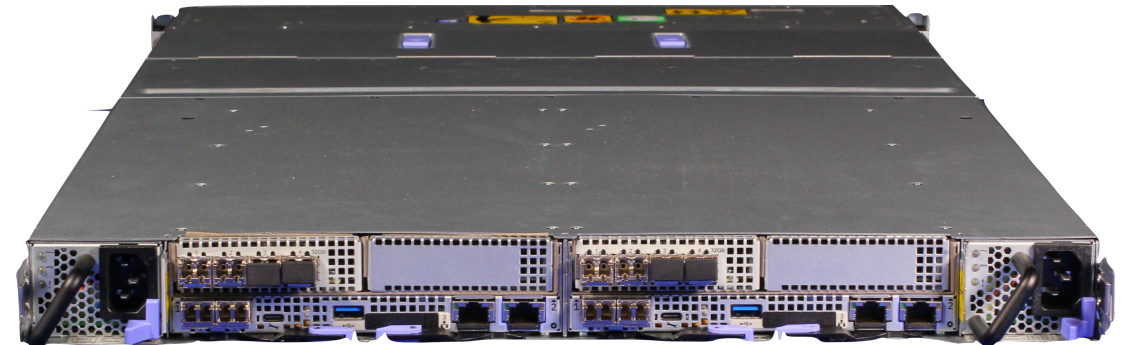
Supports Up To 12 NVMe Drives

- Additional drives supported with expansion enclosures

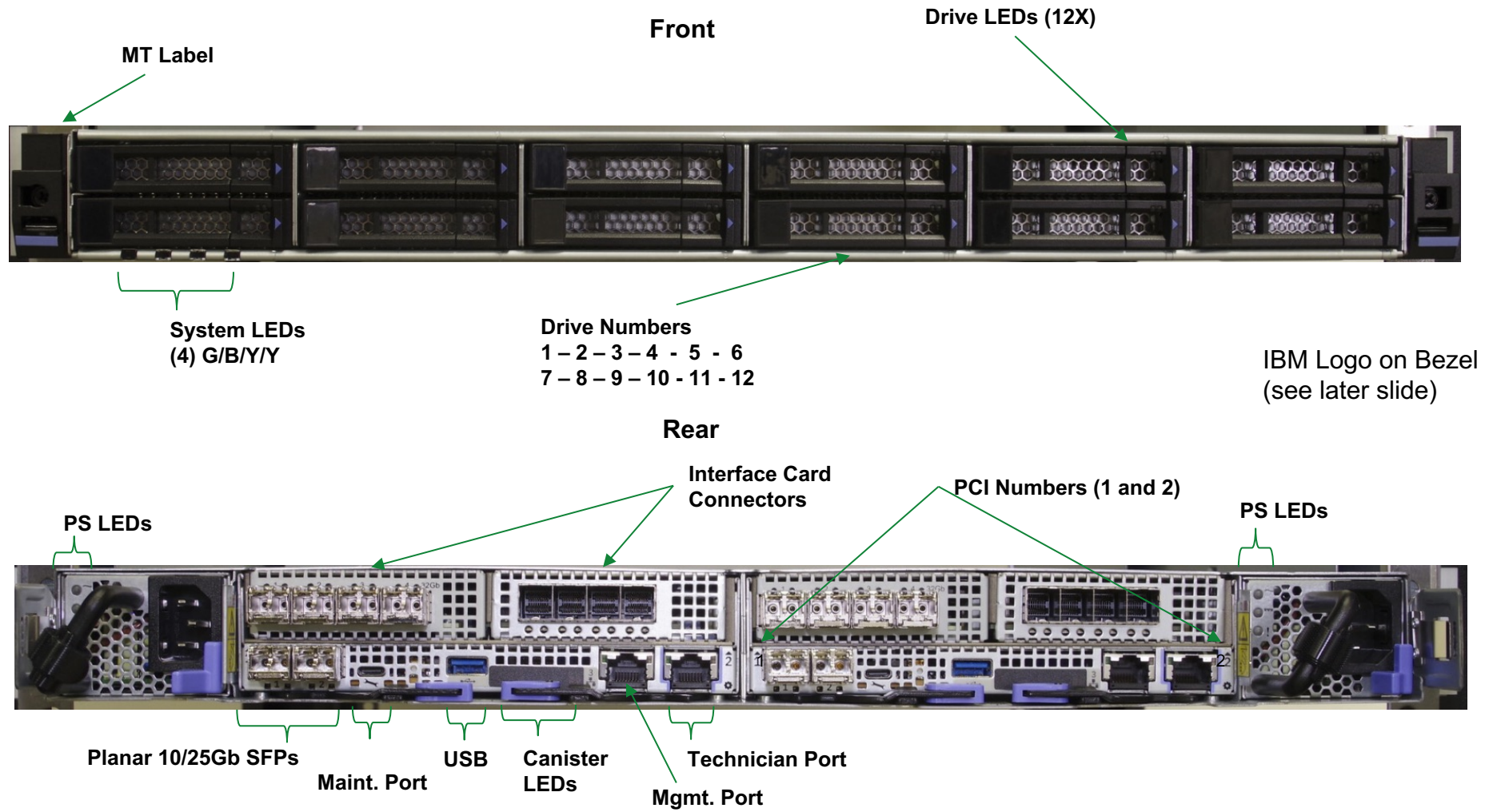
Two IO Adapters per Canister (4 per enclosure)

High Availability RAS

- Drives
- Dual Canister
- Dual PSU
- Independently replaceable enclosure fans



Connectors/Labeling



Front Bezel

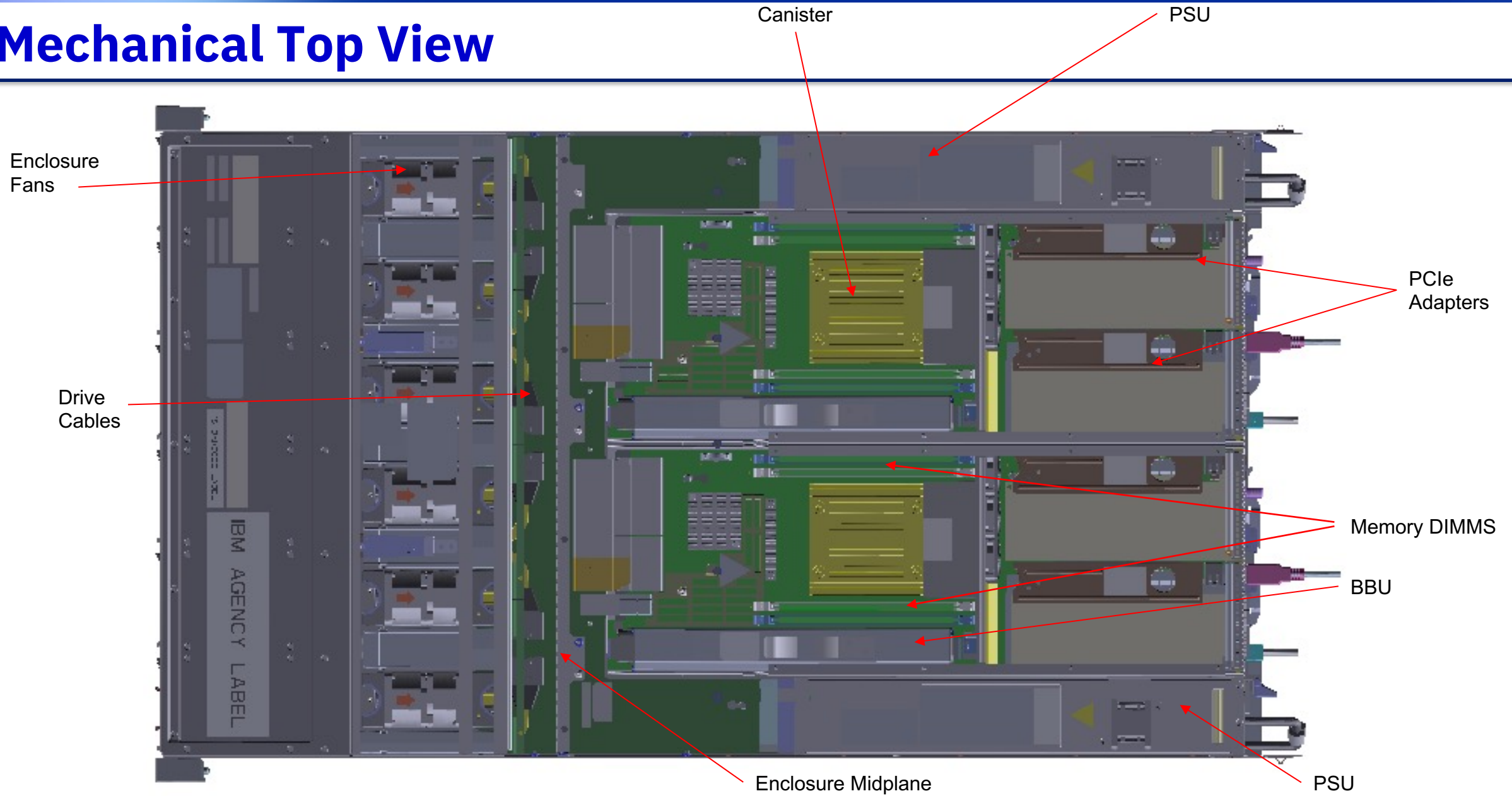
Passive front bezel included with each system.

Kensington Security Slot for optional locking



- Note: The bezel is primarily for aesthetics and to provide physical locking of drives
- Bezel is not available for field upgrades from the FS5200

Mechanical Top View



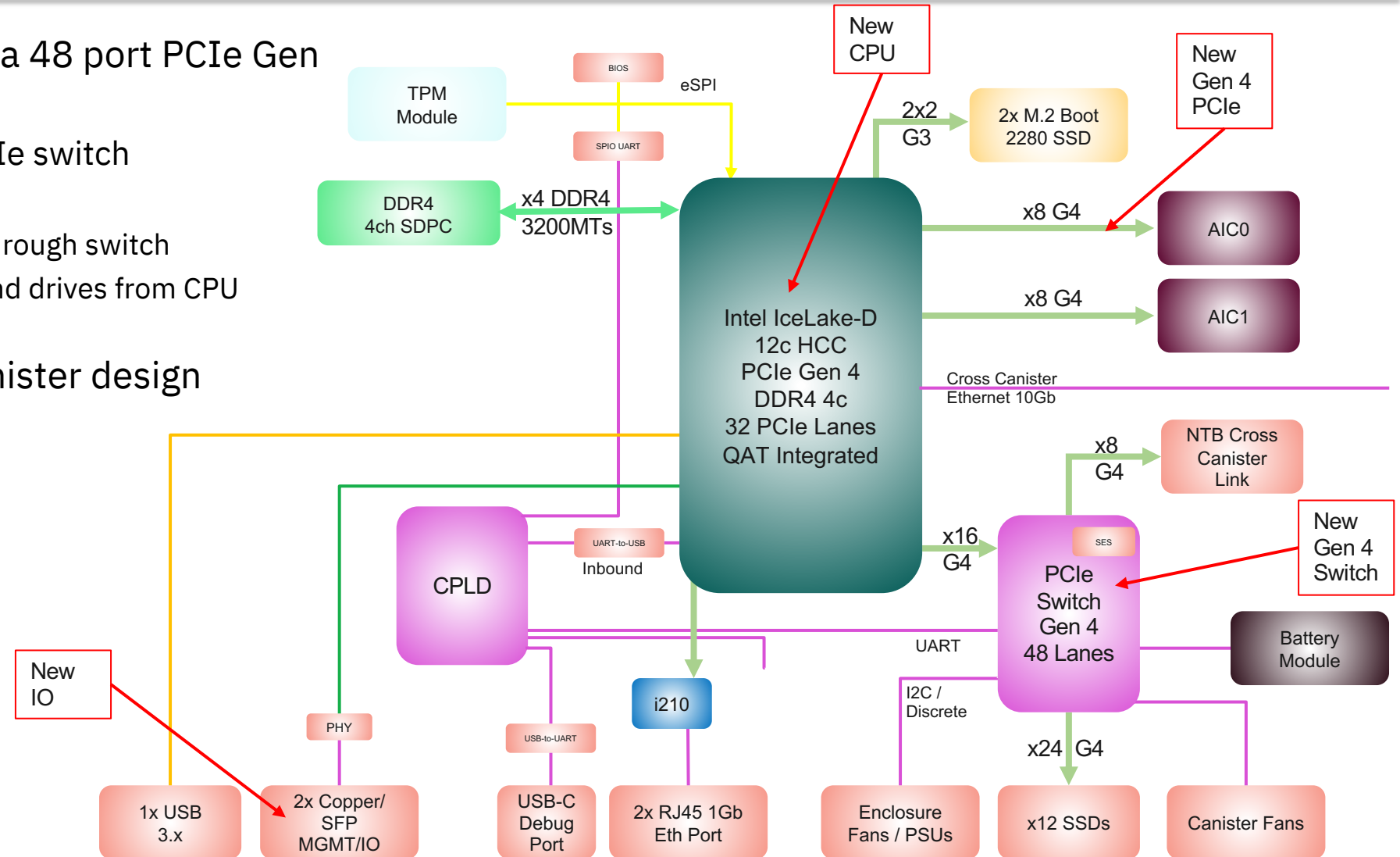
Hardware Comparison vs 5200

	5200	5300
CPU	8 core Intel SkyLake-D 2146NT (2.30GHz)	12 core Intel Icelake-D 2753NT (2.00GHz)
IO adapter slots	2 x8 PCIe gen3	2 x8 PCIe gen4
Onboard IO ports	2x 10G iSCSI IO/management Technician Port	2x 10/25G Flexible IO Ports, 1x 1G dedicated management Technician Port

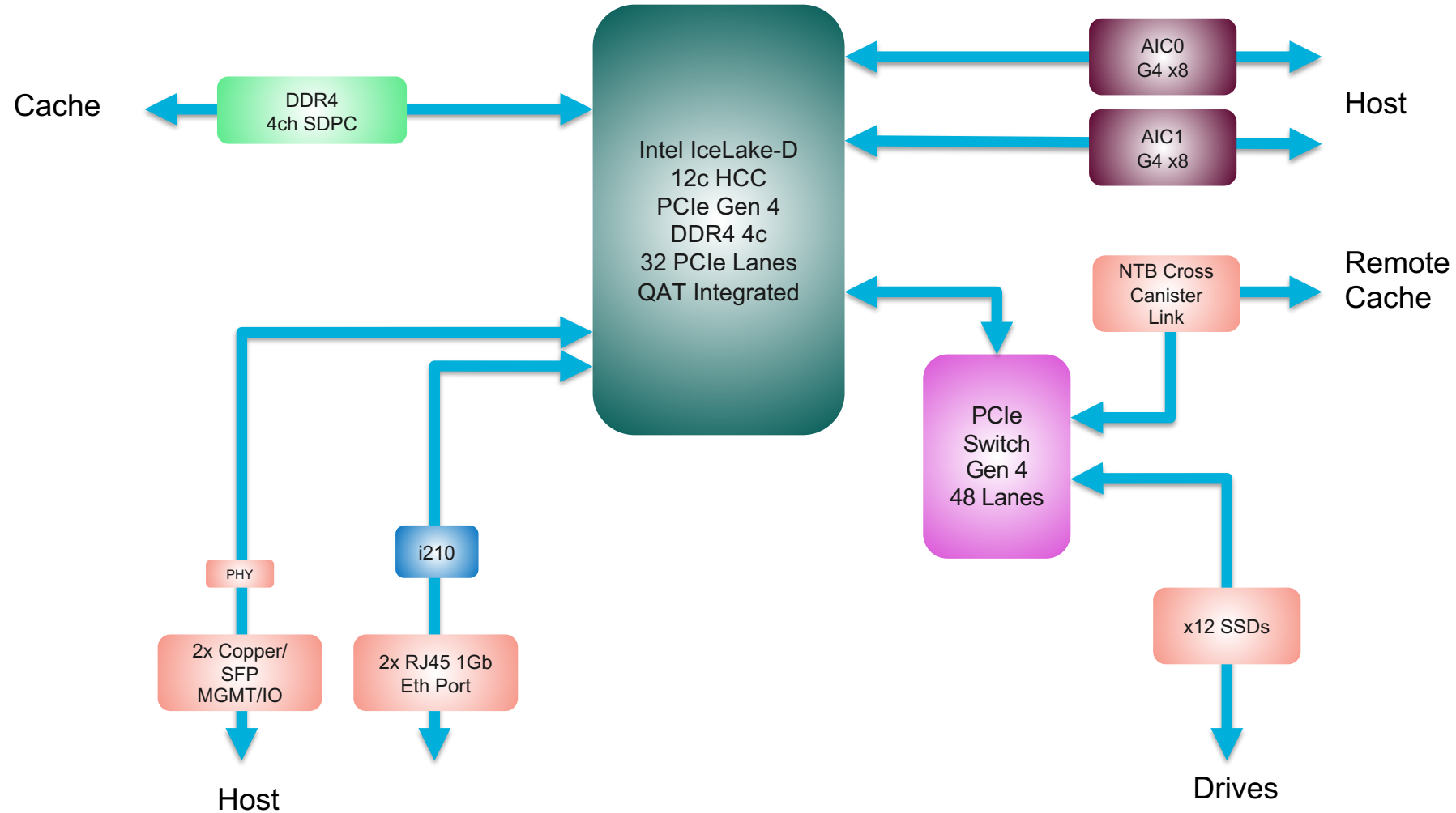
– Unlike the 5200, the 5300 has a dedicated Linux core that won't interfere with production data path

Block Diagram

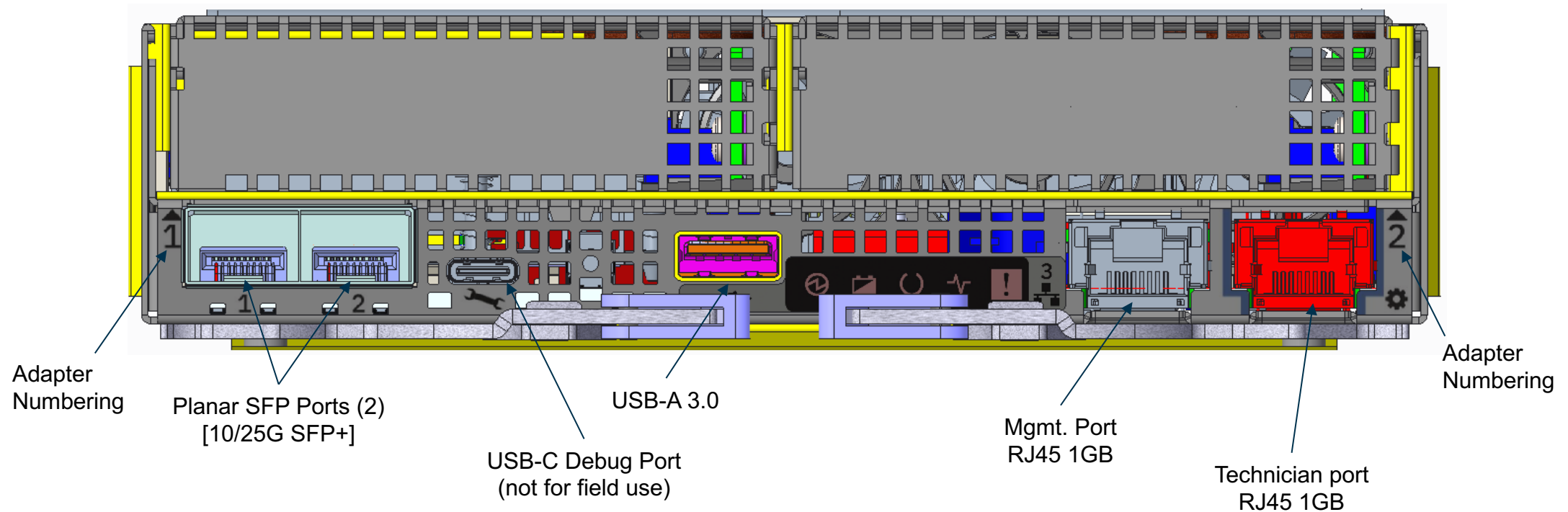
- Canister design integrates a 48 port PCIe Gen 4 switch
- NTB connected through PCIe switch
 - NTB is x8 Gen 4
 - Drives connection to CPU through switch
 - Over subscription to NTB and drives from CPU
 - x16 from CPU to switch
- Battery integrated into Canister design



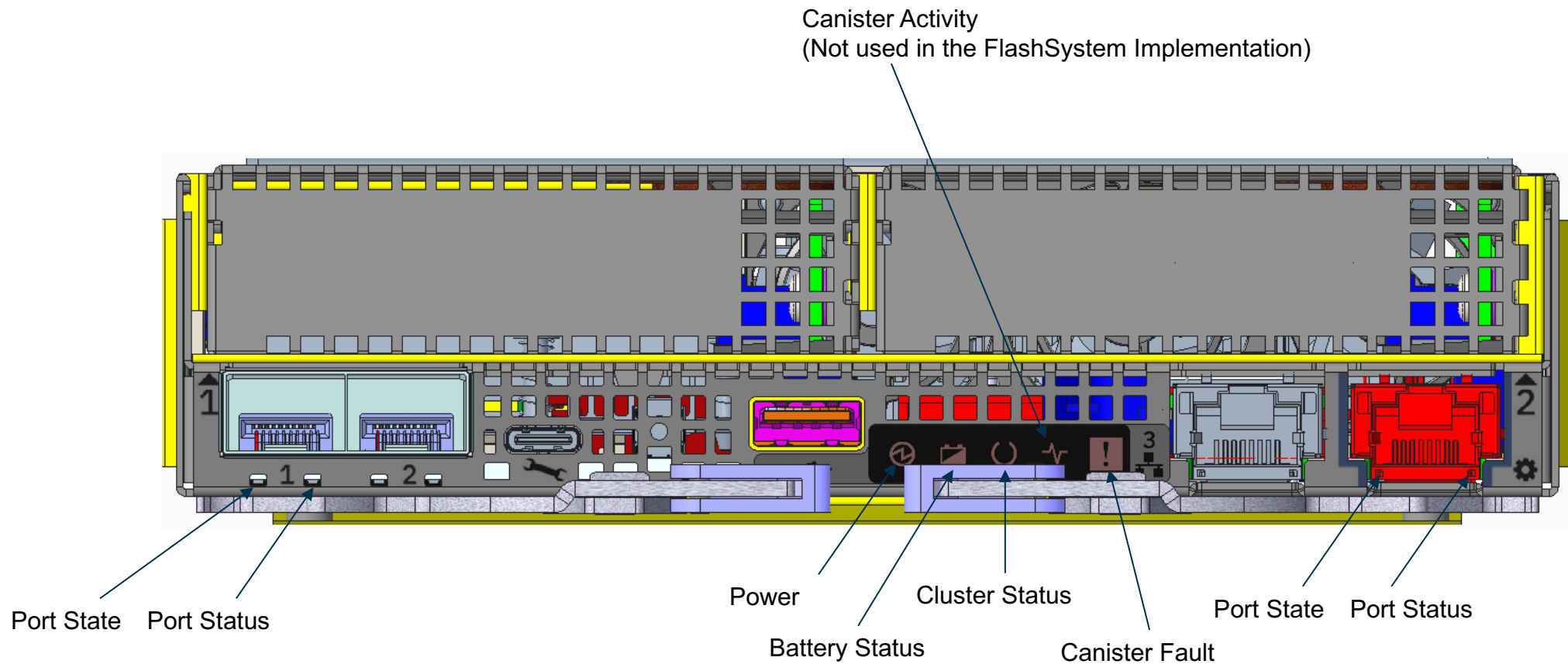
IO Data Path Flow



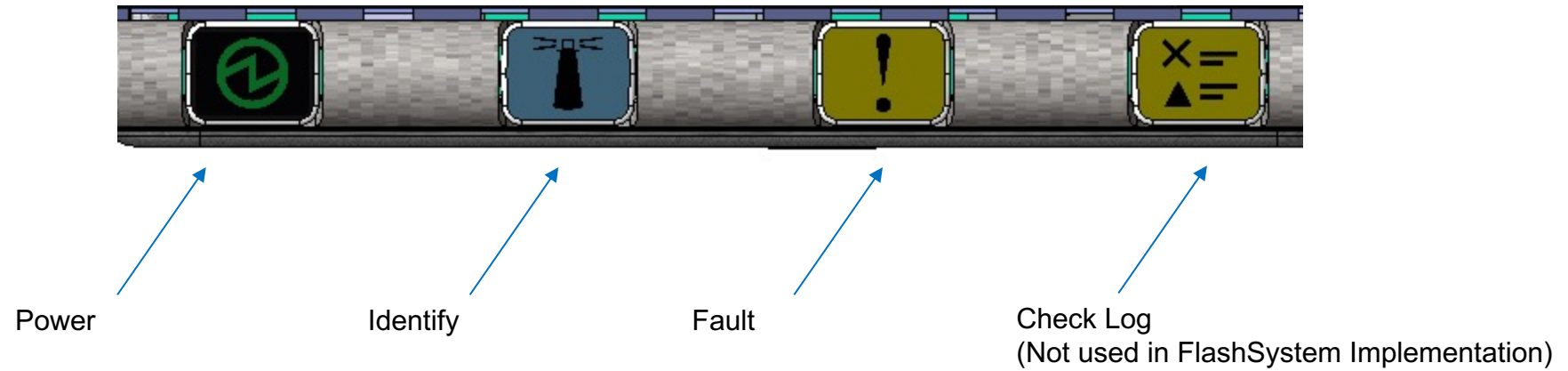
Canister Connector/Labels



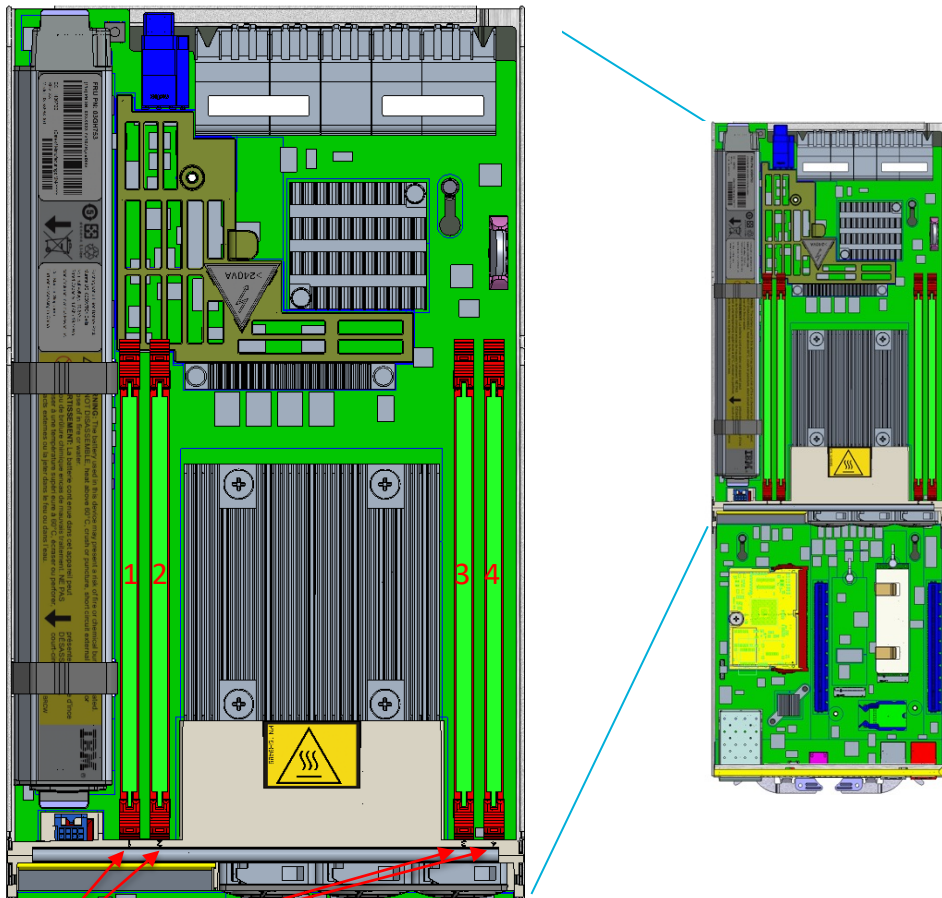
Canister LEDs



Enclosure LEDs



Canister DIMM Slot Configuration



DIMM slot labels are located on the Canister Fan Assembly

Memory Kit Installation – Feature ALG2, ALG3, ALGE

Feature	Description	Maximum per Enclosure
ALG2	64GiB Base Cache (two 32GiB DIMMs)	1
ALG3	256GiB Base Cache (four 64GiB DIMMs)	1
ALGE	256GiB Cache Upgrade (four additional 64GiB DIMMs)	1
ALG3 + ALGE	512GiB Base Cache (eight 64GiB DIMMs)	1

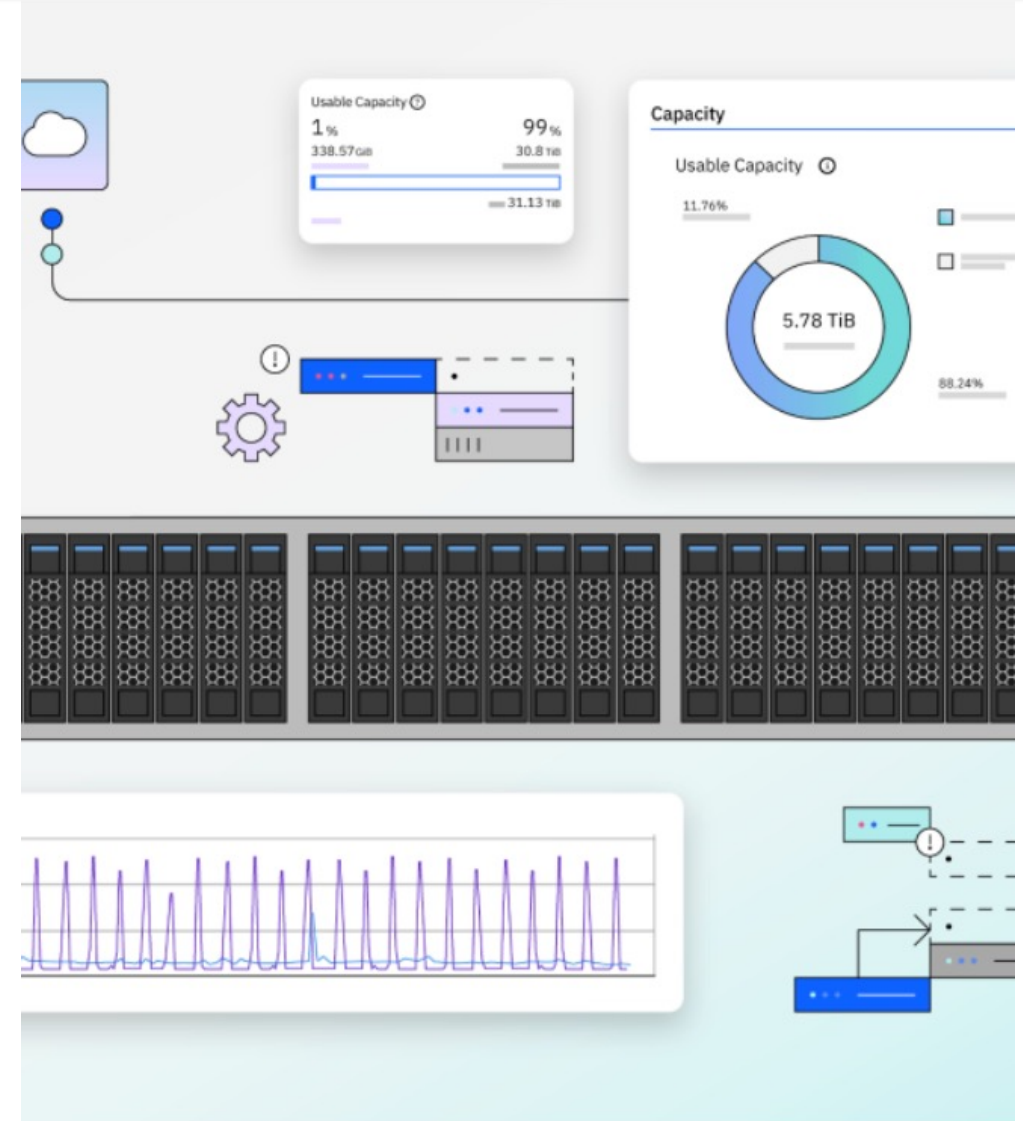
FlashSystem 5300 supports three memory configurations, Small, Medium and Large.

- Small – ALG2
- Medium – ALG3
- Large – ALG3 + ALGE

Feature	Slot 4	Slot 3	Slot 2	Slot 1
ALG2	Empty	32GiB	Empty	Empty
ALG3	Empty	64GiB	64GiB	Empty
ALG3 + ALGE	64GiB	64GiB	64GiB	64GiB

FS5300

Software Integration/Changes



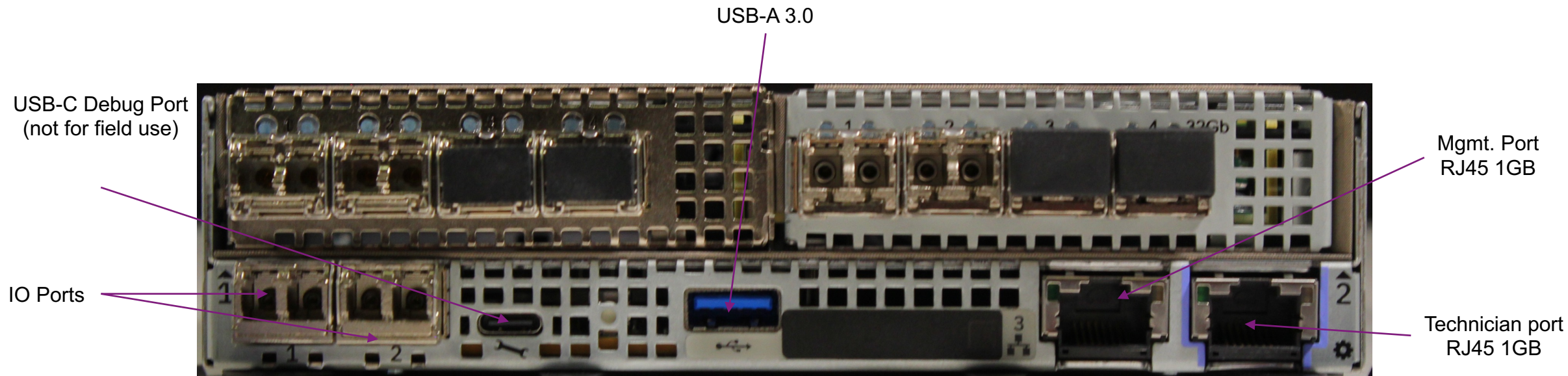
Adapter & Protocol Support

Adapter	Protocol	Connectors	Cable
4-Port 32GFC	FC-SCSI, FC-NVMe	SFP+	OM3 LC
2-Port 64G FC	FC-SCSI, FC-NVMe – August 2024	SFP+	OM3 LC
4-port 10GbE	iSCSI, NVMe/TCP, IP Rep with iWARP RDMA, IP Rep, Clustering/Hyperswap with iWARP RDMA	SFP+, RJ45	OM3 LC, Cat5/Cat6
2-Port SAS*	SAS Expansion	Mini SAS-HD	SAS
On-Board 10/25GbE	iSCSI, NVMe/TCP, IP Replication NO RDMA	SFP+, SFP28, RJ45	OM3 LC, Cat5/Cat6, DAC
1GbE Management	Management Only	RJ45	Cat5/6

* SAS adapter has 4 ports, only 2 are active



Onboard IO Ports



Physical Port	1	2	3	T
Logical Port	2	3	1	-
Purpose	IO* IP Rep	IO* IP Rep	Management	System Setup
Connectivity	Optical 10GbE SFP+ Optical 25GbE SFP28 DAC 25Gb (up to 3m) RJ45	Optical 10GbE SFP+ Optical 25GbE SFP28 DAC 25Gb (up to 3m) RJ45	RJ45 1G	RJ45 1G

*From 8.7.0, these ports can also be used for management

Memory Options

Name	Per Node	Per Enclosure	DIMMs Per Node
Base 1	32G	64G	1x32G
Base 2	128G	256G	2x64G
Option 1	256G	512G	4x64G

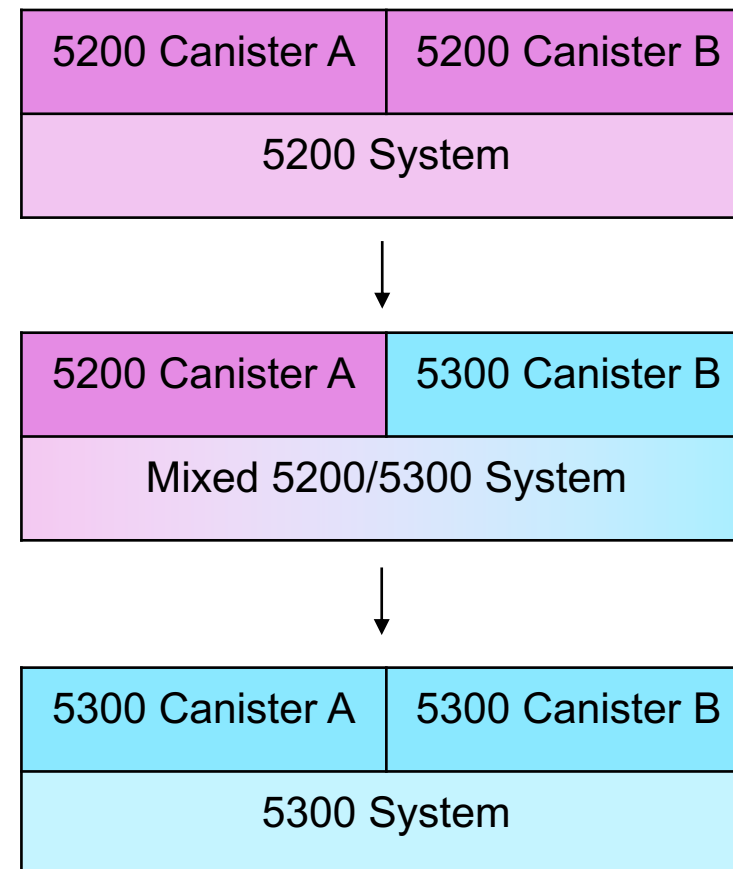
Support for these features requires at least 128G (Base 2) of memory per node:

- Policy-based replication and PB-HA
- Data de-duplication
- Embedded VASA provider and vVols replication
- Storage Insights integration

Development recommend 128G (Base 2) for deployments that require advanced IO Features

Non-disruptive Hardware Upgrade

- 5200 clusters can be upgraded to use 5300 node canisters with no disruption to host IO
- No performance impact to using 5200 midplane at PCIe gen4
- All drives supported on 5200 remain supported on 5300
- Only the 10Gb Ethernet HBA card is supported on the 5300. On board ports run 10/25Gb



Hardware Upgrade Considerations

- Cluster code level must be at least 8.6.3.0+
- Supported on single IO group clusters
- Not all 5200 IO adapter options supported on 5300
- 5300 supports different DIMMs from 5200, so MES kits will ship with new DIMMs that must be fitted
- GM (Global Mirror) is replaced with PBR (Policy Based Replication). 8.6.3 does NOT support GM/GMCMV. Those clients needing to upgrade an FS5200 running GM/GMCMV either need to convert to PBR OR wait for 8.7 code and run it in compatibility mode on the FS5200 before upgrading.

Software Highlights

Key Features

- Ransomware Threat Detection with FCM 4.1 and Safeguarded Copy
- Embedded VASA provider
- Secure Boot/Measured Boot and Secure Firmware
- Policy Based Replication and HA

Improved Features

- Snapshot increased to **10PiB** of target capacity (compared to 4PiB on the 5200)
- More Ethernet I/O Ports
- Management Simplification
- Performance

Scale Out Design Differences

- 5300 is designed to use Policy Based Replication and PB-HA for scale out instead of forming multi-IO group clusters
- Clusters of two IO groups are supported for very specific HyperSwap use cases, but PBR and PB-HA should be considered the 'default' config
- **5300 will not be able to cluster directly with 5200 systems** – but hardware upgrade is supported use case for single io group systems
- Maximum SAS chain weight of 12U brings 5300 into line with our other products

Feature Guide: Secure Boot

- 5300 is our most secure product to date
- All secure boot features from the 9500 are included
- Additional security is provided by enabling secure boot capabilities of the PCIe switch

BIOS

Password protected to prevent tampering or force booting from untrusted devices

Checks bootloader signature and only boots if signed with our private key

Boot Drive

All filesystems with execute permissions are encrypted to prevent tampering

TPM

Measures boot process and allows decryption of the boot device only if BIOS, bootloader and kernel signatures are trusted

PCIe Switch (New)

Verifies firmware signatures and only boots if they match key provided at manufacture time

Performance Summary

- FS5300 not only demonstrates significant throughput and bandwidth improvement over its predecessor FS5200 (About 1.5x), but also showcases significantly lower latency than the FS5200.

FlashSystem 5000 - Key differences



FlashSystem 5015

2U height, AC or DC power
 SAS back-end → 24x SAS SSD / 10k RPM HDD
 or
 SAS back-end → 12x NL-SAS HDD
 2-core Broadwell DE CPUs
 64GB cache max
 4x 1GbE on-board ports
 8x host ports max – 16Gb FC / 10GbE* / 12Gb SAS
 2,048 volumes
 2,048 FlashCopy mappings
 4PiB FlashCopy capacity
 Inline threat detection – controller only



FlashSystem 5045

2U height, AC or DC power
 SAS back-end → 24x SAS SSD / 10k RPM HDD
 or
 SAS back-end → 12x NL-SAS HDD
 6-core Broadwell DE CPUs
 64GB cache max
 4x 10GbE on-board ports
 8 host ports max – 16Gb FC / 10GbE* / 12Gb SAS
 8,192 volumes
 8,191 Snapshots
 4PiB Snapshot capacity
 Inline threat detection – controller only
 Encryption
 Volume Group Snapshots - Safeguarded copy,
 Internal Scheduler
 HyperSwap + PBHA
 PBR



FlashSystem 5300

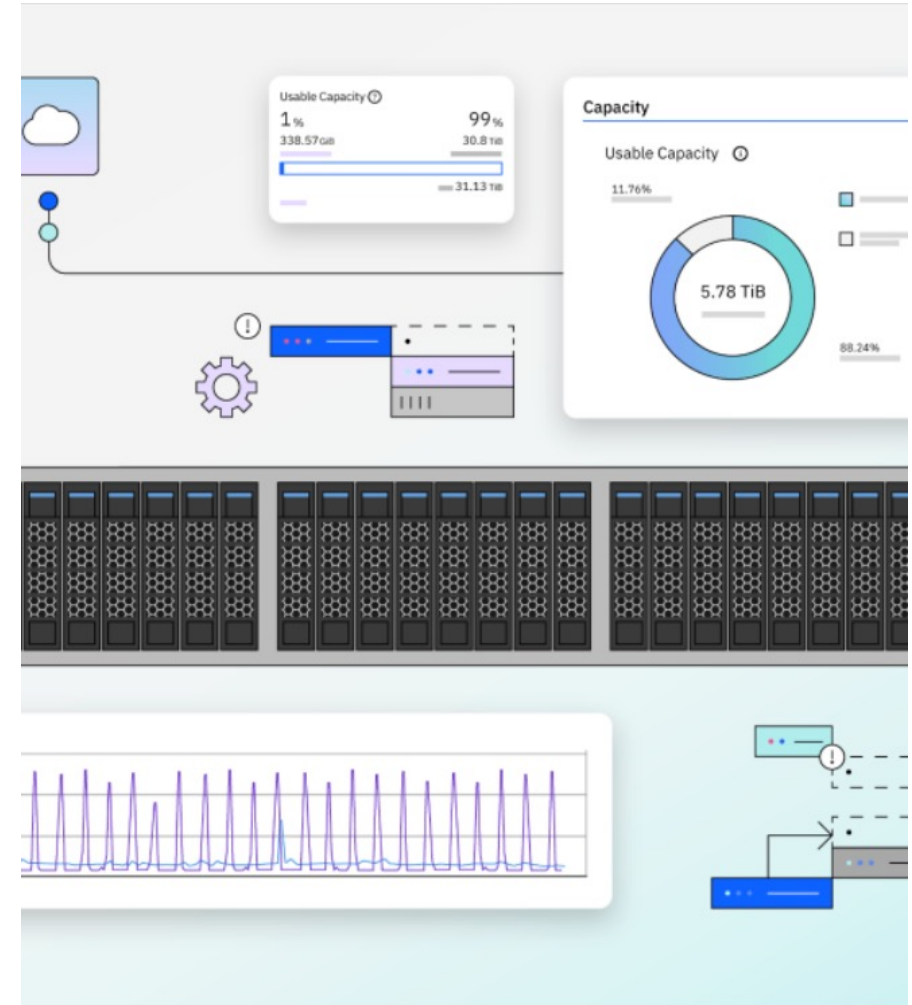
1U height, AC power
 NVMe back-end → 12x NVMe FCM / SSD / SCM
 Inline compression with FCM
 12-core Ice Lake CPUs with QAT
 512GB cache max
 4x 25/10GbE flexible on-board ports with options:
 - SFP28, SFP+, RJ45
 16x host ports max – 32Gb FC / 10GbE or 8x 64GbFC
 8,192 volumes
 15,863 Snapshots
 10PiB Snapshot capacity
 Inline threat detection + RTD – Controller and FCM4
 Encryption + Secure Boot
 Volume Group Snapshots - Safeguarded copy, Internal Scheduler
 HyperSwap + PBHA
 PBR
 Storage Insights Integration
 Embedded VASA Provider
 Vvols replication
 NVMe over FC or TCP
 TCT

*25GbE will be WFM April 24th on FS5015/FS5045 due to supply constraints

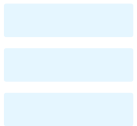
IBM FlashSystems

IBM Storage Assurance

Perpetual



Root Cause: Legacy Storage Lifecycle



Purchase New Storage



Get maintenance on broken parts



Buy new hardware and replace old hardware with full system tech refresh

Can't upgrade to latest SW upgrades on "old" HW

Long budget approval and procurement process for new HW

Disruptive data migration from old → new system

Can't buy more capacity because vendor ran out of supply.

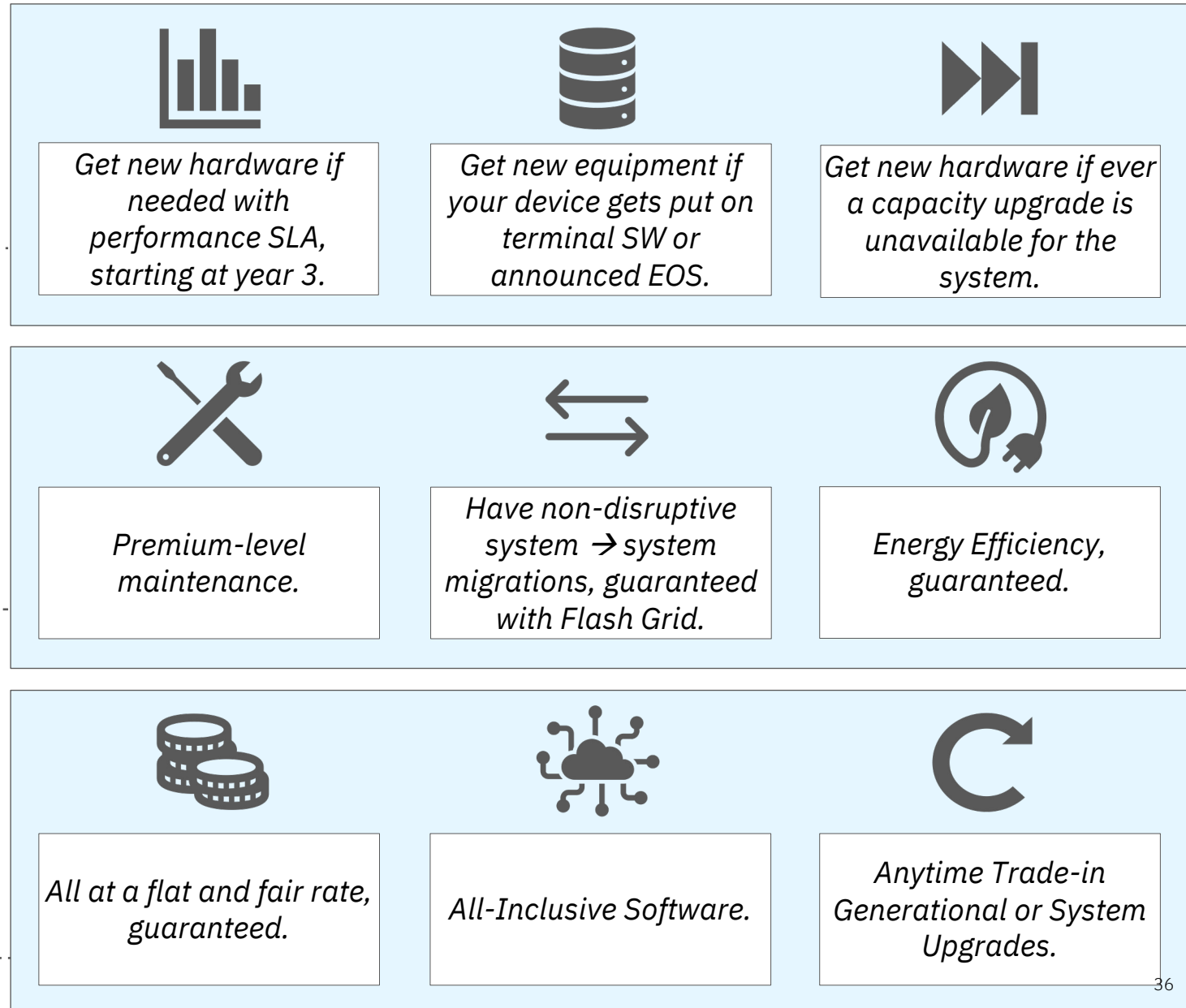
Price raise on maintenance contract extension. Maintenance contract expires in 2 years when HW goes EOS.



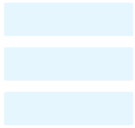
IBM Storage Assurance with FlashSystem is **IT for Life**

Stay modern forever with flat, regular and transparent pricing.

- Constantly stay modern with **automatic refreshes around SLAs**.
- **Rest assured** that your storage will meet your needs with the risk being on IBM.
- Avoid lock-in with **flexibility to upgrade and trade-in** your systems at any point.



What Storage Lifecycle can be...



Purchase New Storage



Get maintenance on broken parts



Buy new hardware and replace old hardware with full system tech refresh

- ✓ Always get the latest SW upgrades on your existing HW.
- ✓ Get performance upgrades if needed

- ✓ Never go through procurement / budget approval process again

- ✓ Non-disruptive migration guaranteed.
- ✓ Don't build a Franken-system

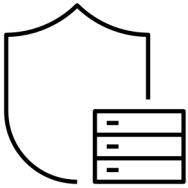
Add capacity flexibly at any point. If not available, get a new system ✓

✓ Flat and fair rate guaranteed – no contract increases save MES upgrades

✓ Get new system if your system is ever EOS

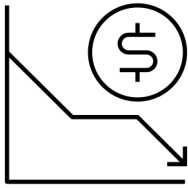


All with industry-leading, innovative technology



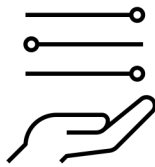
Data Resilience

Defend, protect and recover your “minimum viable company” from cyber attacks



Efficiency & Sustainability

Reduce cost and energy consumption to free up money for strategic projects



Modernization

Simplify storage management and consumption for autonomous and human use

Common software platform for hybrid-cloud integrations and automation



IBM Storage Insights



IBM Storage Virtualize

Fleet-wide monitoring, analytics and AI assistance

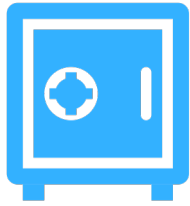
AI-enabled computational storage for efficient data processing and ransomware threat detection



Scalable systems for every capacity and performance point

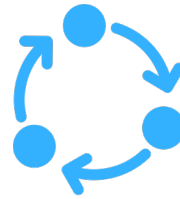
IBM Storage Assurance

Consume storage however is best to assure...



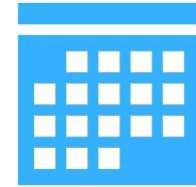
Financial Optimization

Assure financial agility with budget predictability.



Innovation Adoption

Assure modernization throughout the storage lifecycle with non-disruptive upgrades*.



Operational Efficiency

Assure lifecycle efficiency by receiving automatic upgrade options forever.

Achieve Assurance with Options.

Perpetual

Subscribe to perpetual automatic HW and SW upgrades on client-owned infrastructure around lifecycle SLAs.

Utility

Pay for storage as you go. On a client-owned device, pay a base fee quarterly and a monitored additional fee based on usage.

As-a-Service

Flexibly pay for storage by tier on IBM-owned infrastructure. Only pay for what is used and save money on any data reduction experienced.

Where to Get More Information

A link for IBM Storage Assurance Perpetual

[IBM Storage Assurance Perpetual](#)

Thank you!

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](https://www.menti.com/join/17086924) with code 1708 6924 or

Direct link <https://www.menti.com/alwhyze7z1gz>

Or

QR Code

