# Break through data barriers and accelerate AI innovation with the **IBM Storage Scale System 6000**

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System

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# HPC Trends & Vision

## Modern Storage – Convergence of HPC and AI

Workload Expansion

- Traditional Modelling / Simulation
- Growth of AI (ML, DL) as a new paradigm in high performant workloads
  - LLM & HPC most demanding, modern AI space
- Big Data / HPDA
- Hybrid (Data Lakehouse, AI Augmented Modelling/Simulation, etc)
- Sharable Infrastructure
- Expansion Beyond the Traditional On-prem Datacenter, to the Edge, and to the Cloud
  - Data driven workflows
  - Emergence of Usage Based Consumption Models
- New Data Challenges
  - Continued Data Growth
  - Data Governance, Management, and Orchestration
  - Increased Performance (Throughput, Bandwidth, IOPS)

IBM Storage for Data and AI / © 2023 IBM Corporation



# A Global Data Platform with IBM Storage Scale System 6000



# Leadership matters



For the eighth consecutive time, IBM is recognized as a leader in the 2023 Gartner Magic Quadrant for Distributed File Systems and Object Storage

https://www.ibm.com/account/reg/us-en/signup?formid=urx-40622

Over 6,000 clients

- 9 of the top 10 auto manufactures
- 9 of the top 10 investment banks
- 18 of the top 25 banks
- 8 of the top 10 global retailers
- 4 of the top 5 insurance companies



**Proven scale:** IBM Storage Scale is the underlying file system in many of the supercomputers and AI deployments around the world, due to its proven parallel file system performance....

**Global file and object services:** IBM Storage Scale's active file and object management provides local read/write performance irrespective of the location of the data (in a data center, cloud or edge locations).

**Red Hat Ceph:** Assuming ownership of Red Hat Ceph, IBM has the potential to appeal to a broader set of customers looking for an open-source-based unified platform

## **IBM Storage Scale System 6000**

The simplest and fastest way to deploy a global data platform for AI and Hybrid Cloud workloads

Manage next generation and traditional workloads with simultaneous high-performance file and object data access services to the same data

Optimize local and remote access and simplify DR with global hybrid cloud data services

Speed access to critical data with Intelligent and automated data management services

Protect against cyber threats with Cyber-secure data services for unstructured data including end to end encryption and identification to recovery

Lower RTO times with proven data protection and data resiliency services

Scale-up to PBs and scale-out to YBs for GB/s+ performance and capacity to manage your entire data ecosystem with lower cost and enterprise security and resiliency your business requires



Scale from 1 to 1000S of systems up to 256 GB/S per system up to 7M IOPS per system 184 TB to 1.5 PB raw NVMe capacity per system

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\* Update: Chart was updated to reflect current lab read performance, as of Dec. 4/23, an improvement over what was measured as of Nov. 12/23.

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#### Scale from 1 to 1000s of system

Lab Measurements:

up to 310 GB/s seq. read\* per system (building block) - ~2.5X ESS3500 up to 155 GB/s seq. write per system (building block) - ~2.6X ESS3500 up to 13M 4KiB random read IOPS\*\* per system (building block)

\*\*13 M IOPS with 10 clients and 24 of the BB's 48 NVMe drives, using the NVMeoF protected tier capability supported via special request as described in the <u>Storage Scale System 6000 Data Sheet</u>

# **IBM Storage Scale System 6000**

#### IBM Storage for Data and Al



#### Gen 5 Dual Canister 4U-48 NVMe

- AMD Genoa, dual socket 48 cores / canister
- New x86 utility node (EMS and protocols)
- NDR/CX7 support
- 48x U.2 NVMe / FCM (PCIe Gen 4 drives)
- Up to 1.5PB of NVMe flash and 1.8PB FCM flash
- Up to 5.5PB of compressed FCM flash
- HDD JBOD expansion option (up to 18PB)

#### NVMe Supported Drives

- 3.84 TB
- 7.68 TB
- 15.36 TB
- 30.74 TB
  - \* 19.2 / 38 TB FCM 4.0 \*

#### HDD SED Supported Drives

- 12 TB SAS HDD
- 16 TB SAS HDD
- 20 TB SAS HDD
- 22 TB SAS HDD

#### **Performance and Sustainability**

- 2X+ throughput improvement
- NVMeoF support
- Hybrid performance and capacity support
- Containerized protocol support on IO nodes
- Statement of Direction: 1H24 \*

# 2U X86 Utility Node

#### IBM Storage for Data and Al

All-purpose, powerful and fully integrated utility node, supporting multiple use cases and compatible with existing building blocks



#### Replaces existing power-based EMS and Protocol node and adds support for additional storage use cases

#### System Config

- Processor: AMD EPYC (single/dual docket)
- Memory: 128GB 512GB
- 2x internal boot drives
- High-Speed Network: 1-3 CX-6 adapters
- 1Gb/10Gb network

#### Versatility and Flexibility

- Support for EMS, GUI and Callhome
- Support for Protocol node functions
- Support for AFM gateway
- Support for GKLM (orderable via AAS)
- Support for IBM Storage Protect and Discover

#### Storage Scale System 6000 – Overview Extreme Flexibility with Performance – GA 1 – 4Q 2023

#### IBM Storage for Data and Al

- 4U 19in Rack mount
- Dual Active/Active Canister, up to 48
  U.2 NVMe Performance Model (MTM 5141-F48)
- Processor per canister
  - Dual AMD EPYC Genoa 48C
- Memory per Canister
  - 24 x 32GB (768GB) default base
  - 24 x 64GB (1536GB) option
- Storage
  - 48 U.2 G4 NVMe (24 and 48 drives configuration)
  - NVMe: 3.84TB, 7.6TB, 15TB, 30TB

- 1 to 4 x16 G5 CX-7 (VPI, dual port 200Gb)
- 1 to 4 x16 G5 CX-7 (IB 400Gb Single port – no aux card)
- Management Network
  - 2 x 10GbE
- Hardware management and BMC
  - 1 x 1GbE
- Dual Boot drive (Secure boot)
  - x2 G3 NVMe E1.S (not hotswappble)
  - 960 GB SED (Micron 7450 PRO)
- Six hot swappable Fan modules (N+1), 2 Fans/module
- Four hot swappable 2400W CRPS Power supply (2+2)
- Two CMA, one for each canister



#### Front View



**Rear View** 

#### **Storage Scale System 6000 – Canister Ports and LEDs**

#### IBM Storage for Data and Al



PCIe Slot	Usage	PCIe Slot	Usage
1	SAS4 G4 (Hybrid/Capacity)	5	Nvidia CX7 Network x16 G5 (Performance)
2	SAS4 G4 (Hybrid/Capacity)	6	SAS4 G4 (Hybrid/Capacity) <i>Nvidia CX7 Network x16 G5 (Performance)</i>
3	Nvidia CX7 Network x16 G5 (Performance) SAS4 G4 (Hybrid/Capacity)	7	SAS4 G4 (Hybrid/Capacity)
4	Nvidia CX7 Network x16 G5 (Performance)	8	SAS4 G4 (Hybrid/Capacity)

- Max Config Performance model 4 x CX7 cards only GA1
- Max Config Hybrid model 3 x CX7 cards + 5 SAS 24Gb cards GA2
- Hybrid model 2 x CX7 cards + 6 SAS 24Gb cards GA2
- NVIDIA CX7 supported cards:
  - 400Gb single port (IB only) x16 Gen5
  - 200Gb VPI dual port (IB/ETH) x16 Gen5
- ESS6000 will GA with Optical cables only





#### **IBM Storage Scale 6000 Data Sheet**

https://www.ibm.com/downloads/cas/JBVQYVXB