# IBM Spectrum Scale Strategy Days 2021

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## ESS update

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GNR/ESS Test

IBM

# IBM Elastic Storage System (ESS)
Integrated scale-out data management for file and object data

Optimal building block for high-performance, scalable,
reliable enterprise Spectrum Scale storage
- Faster data access with choice to scale-up or scale-out
- Easy to deploy clusters with unified system GUI
- Simplified storage administration with IBM Spectrum Control integration

One solution for all your Spectrum Scale data needs
- Single repository of data with unified file and object support
- Anywhere access with multi-protocol support using
  protocol nodes - NFS, SMB, Object and HDFS
- Ideal for Big Data analytics including full Hadoop transparency

Ready for business-critical data
- Disaster recovery with synchronous or asynchronous replication
- Ensure reliability and fast rebuild times using Spectrum Scale RAID's
  dispersed data and erasure code
- Five 9s (99.999%) of availability and online scalability and upgrades
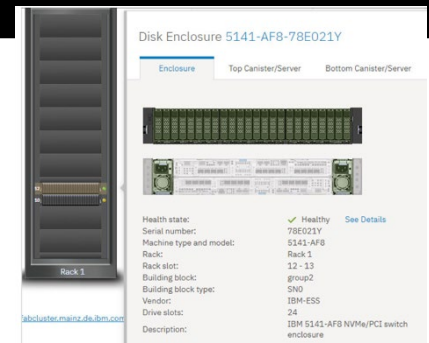
Simple GUI and easy wizards

Single
ESS 3000

ESS 3000
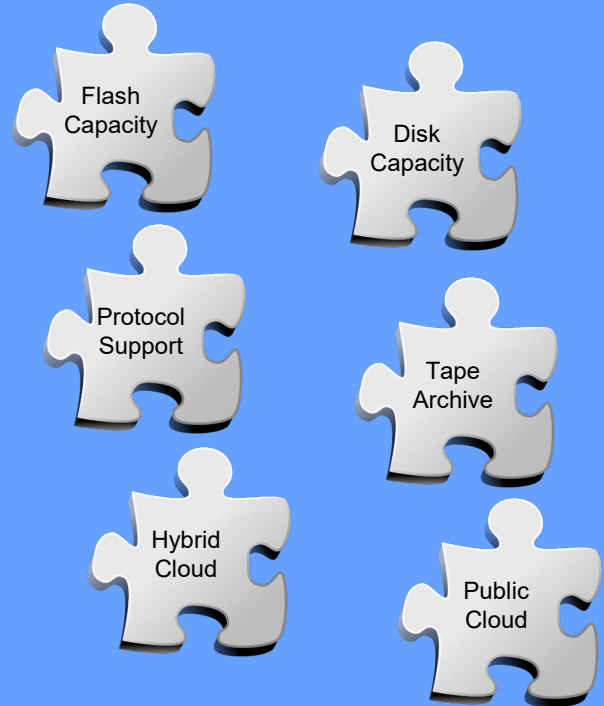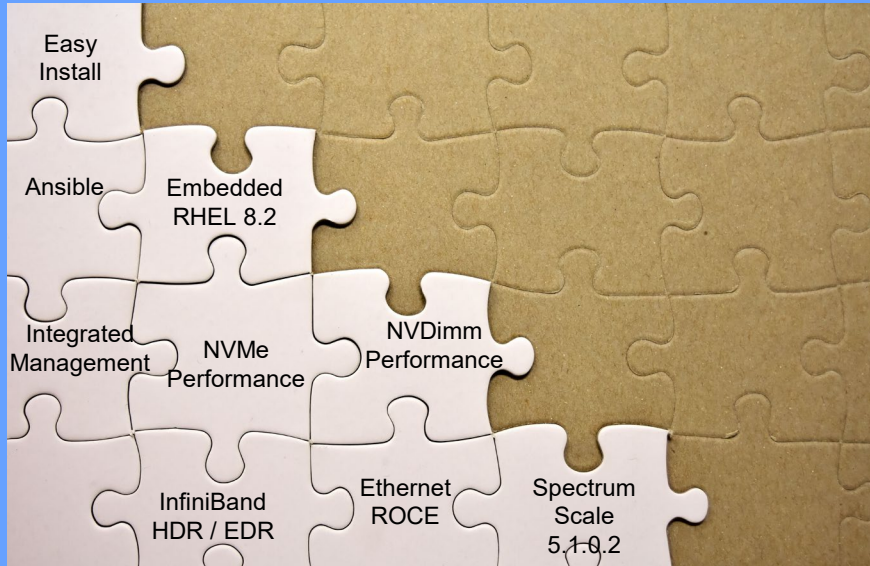cluster

ESS 5000 SC

ESS 5000 SL

# ESS Ecosystem

Powerful Integrated Solution Validated by IBM
Start Small and Grow as needed
Performance, Capacity, Protocol and Archive available options

ESS Integrated EcoSystem

Easy Install

Ansible

Embedded RHEL 8.2

Integrated Management

NVMe Performance

NVDimm Performance

InfiniBand HDR / EDR

Ethernet ROCE

Spectrum Scale 5.1.0.2

Flash Capacity

Disk Capacity

Protocol Support

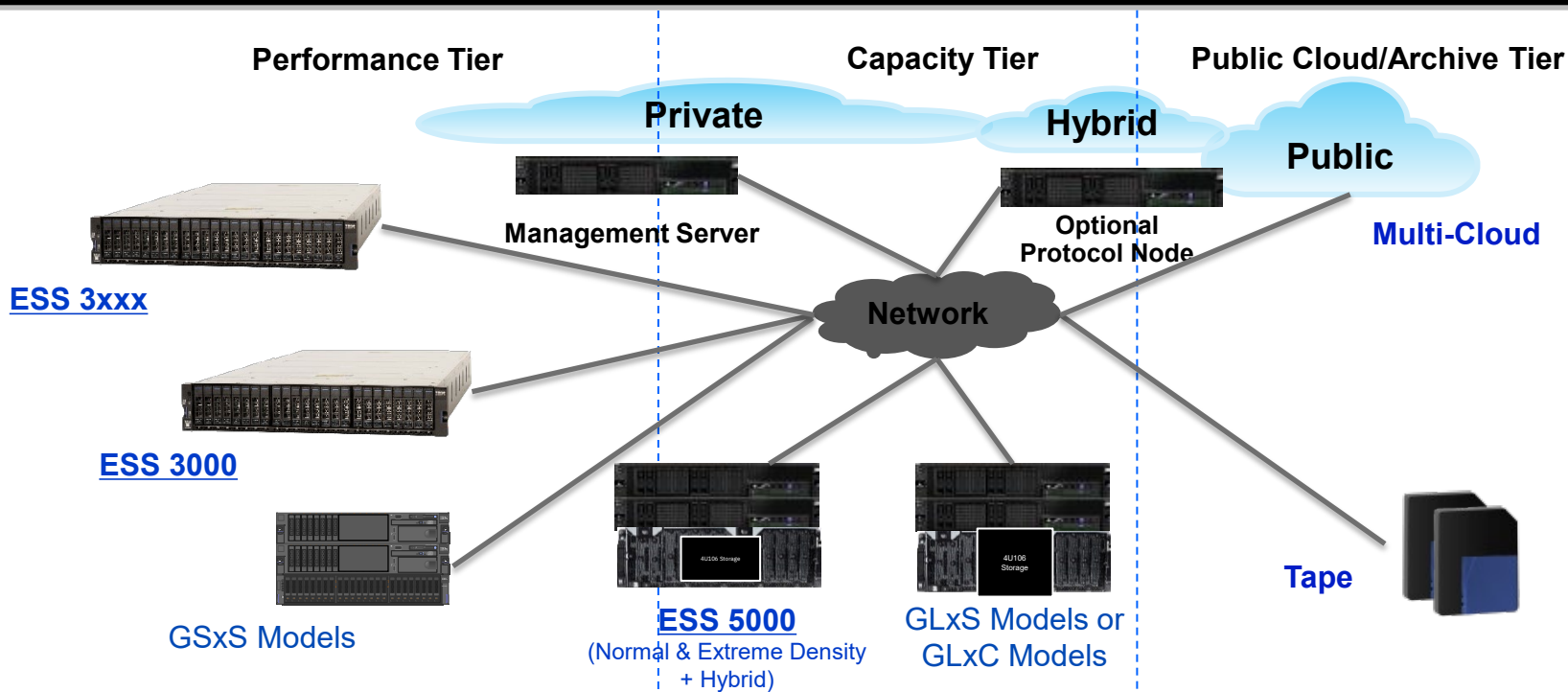Tape Archive

Hybrid Cloud

Public Cloud

# ESS Ecosystem

Start Small and Grow as Needed
One Management Server required per Spectrum Scale Cluster
Optional Protocol Nodes sized per customer needs



**Performance Tier**

**Capacity Tier**

**Public Cloud/Archive Tier**

**Private**

**Hybrid**

**Public**

**Management Server**

**Optional Protocol Node**

**Multi-Cloud**

**ESS 3xxx**

**ESS 3000**

**Network**

GSxS Models

**ESS 5000**
(Normal & Extreme Density + Hybrid)

GLxS Models or GLxC Models

**Tape**

# Artificial Intelligence

**Artificial Intelligence and Machine Learning is growing in every Industry.**

ESS is positioned for AI:
- There is no AI without IA (Intelligent Architecture)
- ESS Leadership in HPC storage creates a strong AI Storage infrastructure
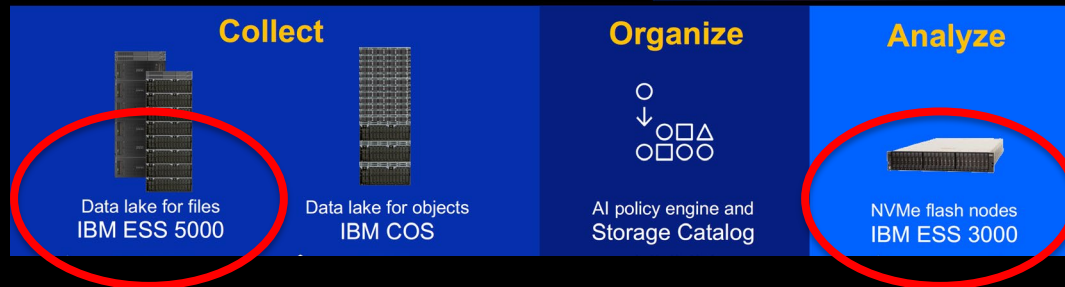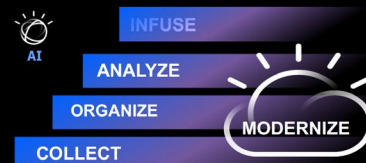
IBM's AI Storage Architecture
AI Collect
- ESS 5000 provides super fast scalable storage

AI Organize
- Integration of Spectrum Discover and Spectrum Scale provides robust meta data enrichment

AI Analyze
- ESS 3000 Flash storage is the preferred solution to keep compute GPUs nearly 100% utilized

↓ Complexity
↓ Costs
↑ Integration

AI

INFUSE
ANALYZE
ORGANIZE
MODERNIZE
COLLECT

**Collect**

Data lake for files
IBM ESS 5000

Data lake for objects
IBM COS

**Organize**

AI policy engine and
Storage Catalog

**Analyze**

NVMe flash nodes
IBM ESS 3000

# ESS 5000 highlights

**Third-generation, capacity-oriented Elastic Storage System:**

**New throughput-optimized <u>Power9</u> Data Servers:**

- 9 PCIe slots, up to 3 Network Adapters per Data Server

- Substantial improvement in performance, 55 GB/s Throughput

- Can support up to 9 enclosures in single building block.

- Logtip on NVDIMM, improvement in small write performance

**2 HDD models for maximum flexibility:**

- **SCx** : same 4U106 HDD enclosure as Gen.2 GLxC models

- **SLx** : new 5U92 enclosure, up to 25% denser than Gen.2 GLxS

# ESS 5000 SC Series

- Highest Capacity ESS model family, Uses the same 4U106 enclosure as "CORAL"
- Up to 6 Network Adapters per ESS
  - 25G Ethernet, 100G Ethernet, 100G InfiniBand
  - New CX6 HDR-100G Adapter
  - RoCE support (RPQ)
- Three HDD options: 10TB, 14TB, 16TB
- LBS services to upgrade GLxC Power8 servers to Power9

15.23 PB raw storage capacity

*Model SC9*
40U
952 NL-SAS,
2 SSD

*Model SC8*
36U
846 NL-SAS,
2 SSD

*Model SC7*
32U
740 NL-SAS,
2 SSD

*Model SC6*
28U
634 NL-SAS,
2 SSD

*Model SC5*
24U
528 NL-SAS,
2 SSD

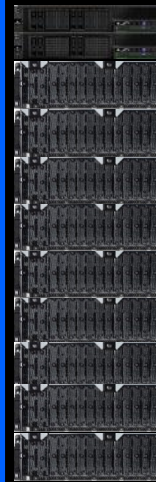*Model SC4*
20U
422 NL-SAS,
2 SSD

*Model SC3*
16U
316 NL-SAS,
2 SSD

*Model SC2:*
12U
210 NL-SAS,
2 SSD

*Model SC1:*
8U
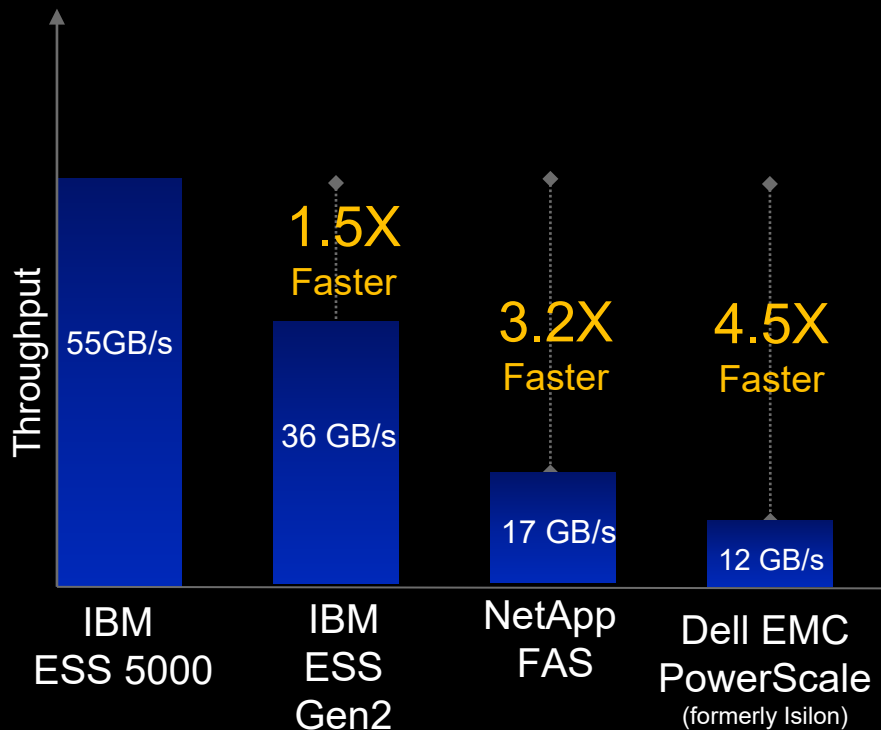104 NL-SAS,
2 SSD

Online MES upgrade

# ESS 5000 SL Series

- Proven 5U92 enclosure – Standard Rack Depth
- Ability to grow (capacity and performance)
- Up to 6 Network Adapters per ESS
  - 25G Ethernet, 100G Ethernet, 100G InfiniBand
  - New CX6 HDR-100G Adapter
  - RoCE support (RPQ)
- Four HDD options: 6TB, 10TB, 14TB, 16TB

**Model SL7:**
7 Enclosures, 39U
642 NL-SAS, 2 SSD

**Model SL6:**
6 Enclosures, 34U
550 NL-SAS, 2 SSD

**Model SL5:**
5 Enclosures, 29U
458NL-SAS, 2 SSD

**Model SL4:**
4 Enclosures, 24U
366 NL-SAS, 2 SSD

**Model SL3:**
3 Enclosures, 19U
274 NL-SAS, 2 SSD

**Model SL2:**
2 Enclosures, 14U
182 NL-SAS, 2 SSD

**Model SL1:**
1 Enclosures, 9U
90 NL-SAS, 2 SSD

Online MES upgrade

8

# IBM ESS 5000 performance

Throughput

- IBM ESS 5000 — 55GB/s
- IBM ESS Gen2 — 36 GB/s — **1.5X** Faster
- NetApp FAS — 17 GB/s — **3.2X** Faster
- Dell EMC PowerScale (formerly Isilon) — 12 GB/s — **4.5X** Faster

# IBM ESS 5000 density

**60%** Better density

- IBM ESS 5000 — 1 node — 370TB/u — 36u
- Netapp FAS6000 +DS460C — 1 node — 94TB/u — 144u

**40%** Better density

- IBM ESS 5000 — 1 node — 370TB/u — 36u
- Dell EMC PowerScale (formerly Isilon) A2000 — 60 nodes — 225TB/u — 60u