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SuperStorage

Computex 2018



Green Computing

We Keep IT Green™



X11 General Purpose Storage Servers

Double-sided Storage



Front



Back

SSG-6049P-E1CR36 H/L

- 4U 36x Hot-Swap 3.5" 12Gb/s SAS3/SATA3 bays
- 4x Optional Hybrid NVMe bays
- 16x DIMM Slots (DDR4)
- 2x Rear Hot-Swap 2.5" HDD (H/L)



SSG-2029P-E1CR24 H/L SSG-2029P-ACR24 H/L

- 2U 24x Hot-Swap 2.5" 12Gb/s SAS3/SATA3 bays
- 4x Optional Hybrid NVMe bays
- 16x DIMM Slots (DDR4)
- 2x Rear Hot-Swap 2.5" HDD (H/L)



SSG-6029P-E1CR12 H/L/T

- 2U 12x Hot-Swap 3.5" 12Gb/s SAS3/SATA3 bays
- 4x Optional Hybrid NVMe bays
- 16x DIMM Slots (DDR4)
- 2x Rear Hot-Swap 2.5" HDD (H/L)



SSG-6049P-E1CR24 H/L

- 4U 24x Hot-Swap 3.5" 12Gb/s SAS3/SATA3 bays
- IT mode LSI 3008 (L-series) / 3108 HW RAID (N-series)
- 16x DIMM Slots (DDR4)



SSG-6039P-E1CR16 H/L

- 3U 16x Hot-Swap 3.5" 12Gb/s SAS3/SATA3 bays
- 16 x DIMM Slots (DDR4)
- 2x Rear Hot-Swap 2.5" HDD
- Optional DVD bay

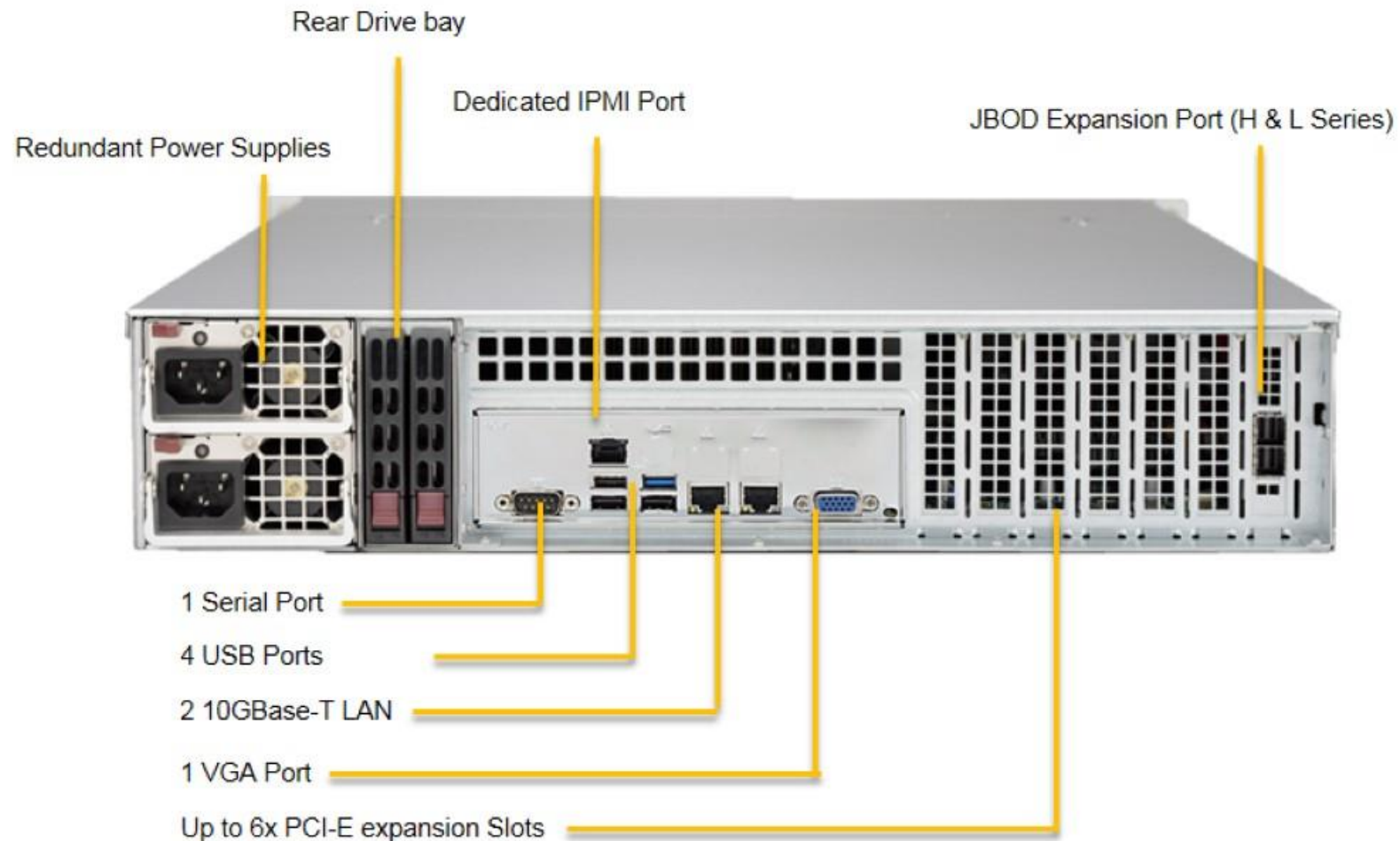


nvm
EXPRESS

Optional Hybrid Bays



Flexible Features for Today's Enterprise



4x Optional NVMe - Hybrid Bays

Introducing Red Hat Storage One

by Supermicro



Growth

- ✓ Scale-out architecture that grows linearly to accommodate massive data growth
- ✓ 4-24 nodes initial deployment, scales to multiple PBs

Availability

- ✓ No single point of failure
- ✓ Zero data loss

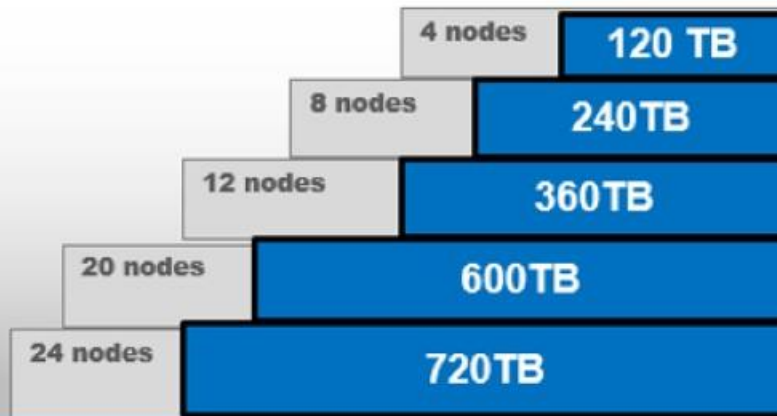
Cost

- ✓ Very cost effective compared to proprietary NAS appliances
- ✓ Simple pricing model with all software features/functionality included

Built to address today's Storage challenges



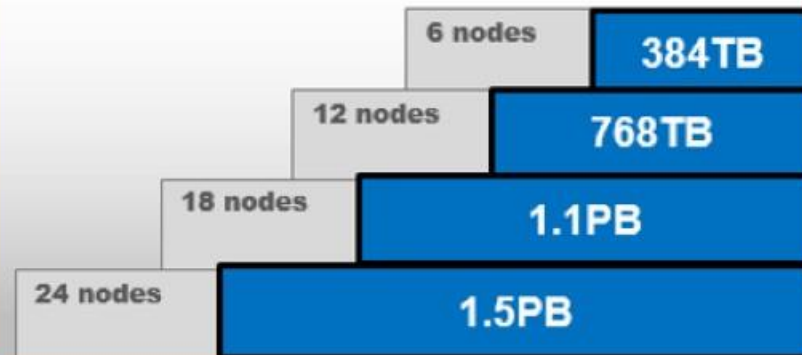
Scale-out NAS



Usable Capacity Options for the General Purpose NAS



Content Repo



Usable Capacity Options for Content Repository





X11 Dense and Ultra-Dense Storage Servers

Top-Loading

Simply Double



SSG-6049P-E1CR45 L/H SSG-5049P-E1CR45 L/H (UP) SSG-6049P-E1CR60 L/H

- 4U 45 and 60x Hot-Swap 3.5" SAS3/SATA3 bays (12Gb/sec)
- Up to 6x optional 2.5" NVMe bays
- IT mode LSI 3008 (L-series) / 3108 HW RAID (H-series)
- Up to 24x DIMM Slots (DDR4)
- Front 3.5" LCD panel



Optional NVMe Bays



SSG-6048R-E1CR90L

- 4U 90x Hot-Swap 3.5" 12Gb/s SAS3/SATA3 bays
- X10 version currently shipping

SSG-2029P-NR48L

- All Flash Storage Server
- 2U 48x Hot-Swap 2.5" NVMe bays
- 24x DIMM Slots (DDR4)
- SIOM for flexible networking options

SSG-6029P-E1CR16T

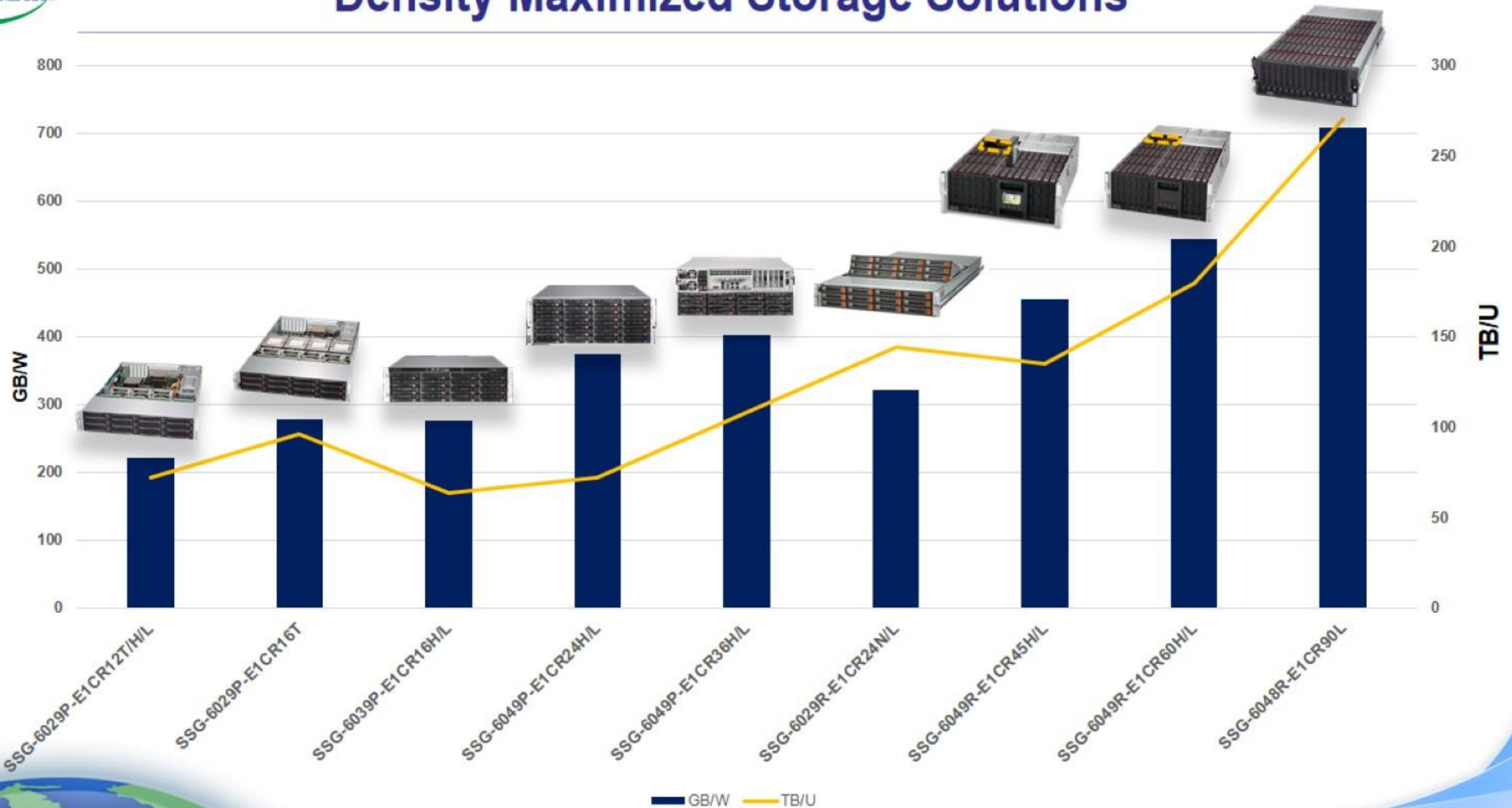
- 2U 16x Hot-Swap 3.5" SAS3/SATA3 bays (12Gb/sec)
- 16x DIMM Slots (DDR4)
- Cable-arm for hot-swap access of second row

SSG-6029P-E1CR24 L/H SSG-2029P-E1CR48 L/H

- 2U 48x Hot-Swap 2.5" SAS3/SATA3 bays (12Gb/sec) or 2U 24x Hot-Swap 3.5" SAS3/SATA3 bays (12Gb/sec)
- 4x Optional Hybrid NVMe bays
- 24x DIMM Slots (DDR4)
- Cable-arm for hot-swap access of second row



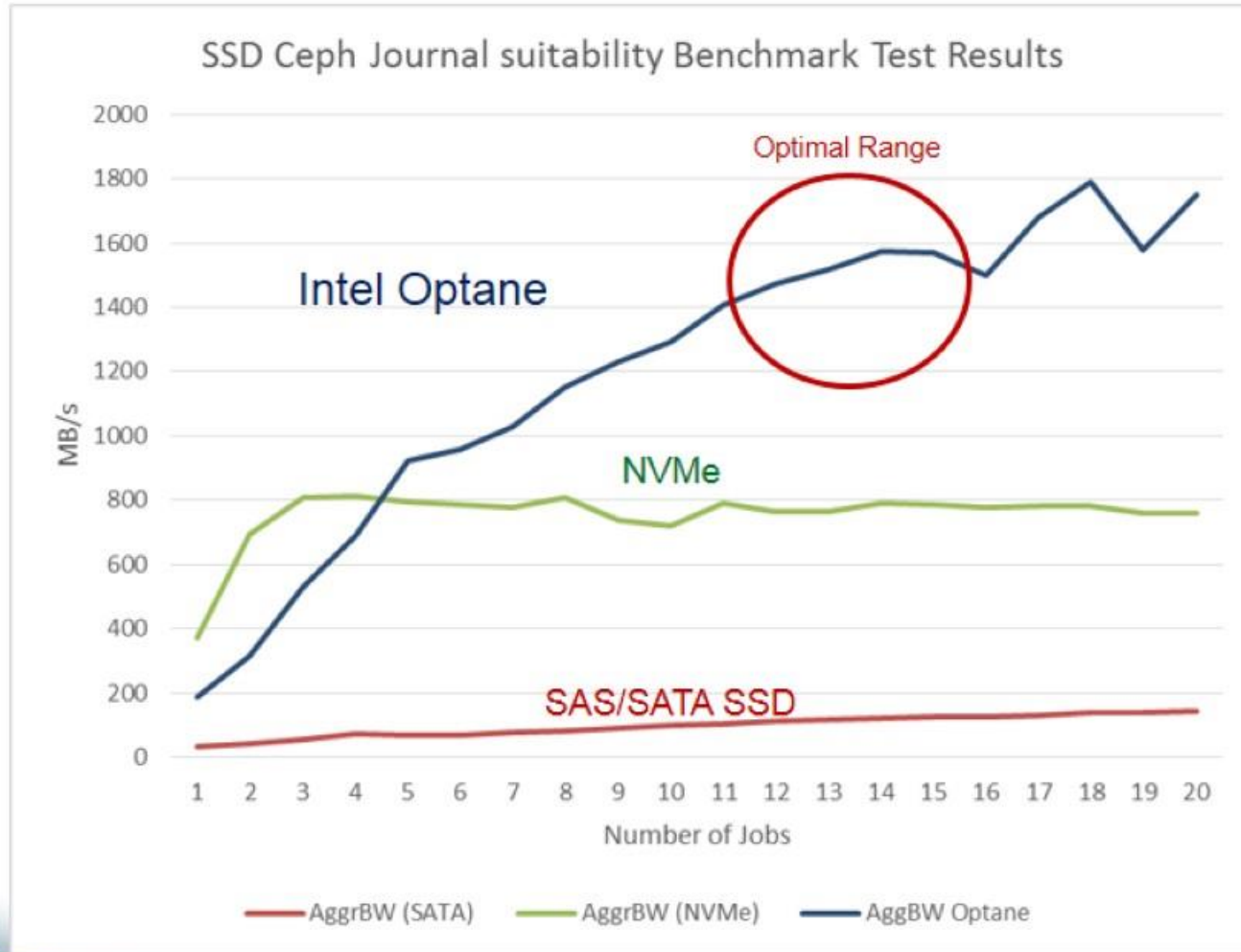
Density Maximized Storage Solutions





Optane for Ceph Journal (cache)

Ratio of HDD to flash device



4x U.2 NVMe (15:1)



3x U.2 NVMe (15:1)



2x AIC NVMe (12:1)



1x AIC NVMe (12:1)



Storage Bridge Bay (SBB)

SAS & Hybrid Architecture

SSG-6048R-DE2CR24L
SSG-6038R-DE2CR16L
SSG-2028R-DE2CR24L

- 4U/24, 3U/16, 2U/24 Bay
- Dual Intel Xeon
- 8x DIMM (DDR4)
- Dedicated B2B using x8 PCI-E
- Fully redundant x8 SAS Architecture with built-in JBOD expansion
- 3 PCI-E 3.0 x8 expansion slots per node



Side-by-side

nvm
EXPRESS

Optional NVMe Bays

Green Computing



All NVMe Flash Architecture

SSG-2029P-DN2CR48L
SSG-2029P-DN2CR24L

- 2U/48 Bay & 2U/24 Bay
- Dual Intel Xeon
- 16x DIMM (DDR4)
- Dedicated B2B (Ethernet)
- SIOM Support
- 2 PCI-E 3.0 x8 + x16 expansion slots per node



Top-and-bottom

Fully Redundant Hot-Swap Design

- Redundant Host-swap appliance nodes
- Redundant Hot-swap fans and power supplies

Unified File and Block Connectivity

- Unified File (NFS and SMB) and Block (FC and iSCSI) services
- Full suite of enterprise data services
- Inline data reduction

3-Year Service Included

- ✓ 3-Year Next Business Day Onsite*
- ✓ Remote installation service
- ✓ Optional Service upgrades available for 4-hour response and Up to 5 years of coverage*

All-Flash



Hybrid & All-Disk



*Response time SLA dependent on location of equipment, best effort may be used if outside the SMCI service area





Unified NAS Storage - Nexenta

	All Flash		Hybrid		Archive
					
Available Models	SSG-2028R-NEX2010 SSG-2028R-NEX2020	SSG-2028R-NEX2030 SSG-2028R-NEX2040	SSG-6048R-NEX4010	SSG-6048R-NEX4020	SSG-6048R-NEX4030
Max BW (100% Read)	8 GB/s	8 GB/s	2 GB/ s	1.8 GB/s	1.4 GB/s
Max 8KB IOPS (Mix R:W)	180,000	180,000	70,000	40,000	25,000
Storage Media	1.9TB SAS SSD	3.8TB SAS SSD	2TB SAS 7k RPM	4TB SAS 7k RPM	8TB SAS 7k RPM
Pool Configuration	All-Flash, Dual Parity		Hybrid, Mirrors 3 Hot Spares	Hybrid, Dual Parity 3 Hot Spares	All-Disk, Triple Parity
Raw Capacity (TB)	23 to 92	46 to 276	42 to 218	84 to 420	176 to 880
Usable Capacity (TB)	15 to 61	30 to 184	20 to 106	48 / 272	128 to 640
Usable Capacity (TiB)	15 to 55	92 to 167	18 to 96	44 / 247	154 to 582
Effective Capacity (TiB)	41 to 166	82 to 502	27 to 145	65 to 371	140 to 698
Expansion Chassis	Up to 2x 2U/24 bay - all flash JBODs supported (72 bays total)		Up to 2x 4U/44-bay JBODs supported (112 bays total)		

SuperStorage

Next Generation 1U & 2U All Flash Storage Servers



1U/2U All Flash & Scale-out Optimized

Next Generation Flash



SSG-1029P-NMR36 L/LR

- Up to 36 NGSFF devices (1/2 PB)
- Up to 3TB Memory (24 DIMM)
- RDMA optimized Configuration for low latency
- Redundant Power Supplies

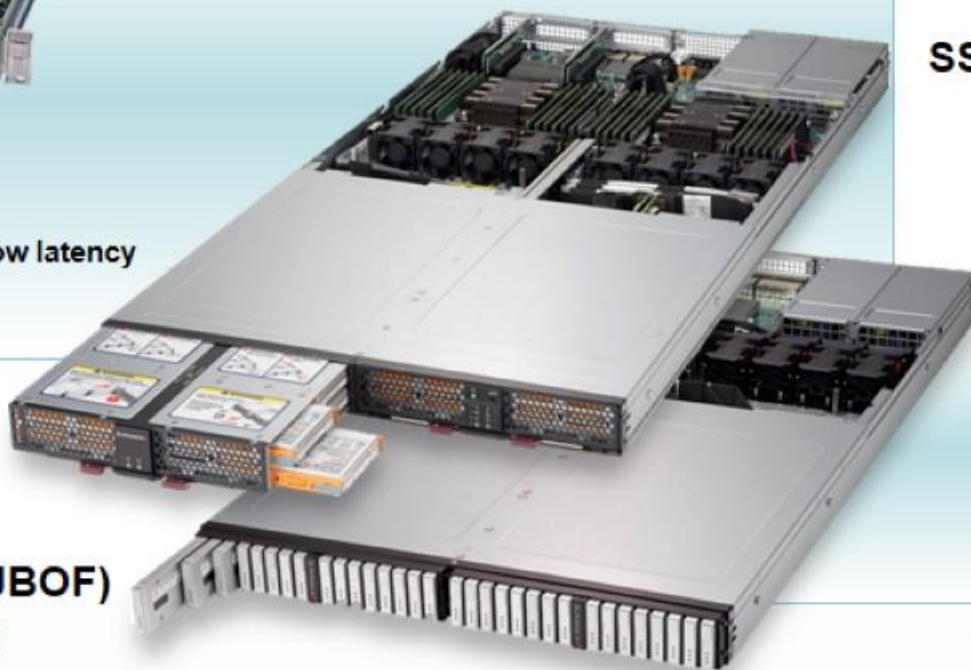
SYS-1029P-N32R (U.2)

SSG-136R-N32JBF (JBOF)

SYS-1029P-NR32R (RSSD)

SSG-136R-NR32JBF (RSSD JBOF)

- Up to 32 U.2 or RSSD devices (1 PB)
- Up to 3TB Memory (24 DIMM)
- RDMA optimized Configuration for low latency
- Redundant Power Supplies



1U Server or JBOF



SSG-6019P-ACR12L

- Dual Intel Xeon Skylake (Socket P) Server (Up to 165W)
- 12x DIMM Slots (DDR4)
- 12x Hot-Swap 3.5" SAS3/SATA3 bays (12Gb/sec)
- 4x Hybrid Hot-Swap NVMe/SSD bays



SSG-2029P-DN2RR32L

- Up to 32 RSSD devices (1 PB)
- 12x DIMM Slots (DDR4)
- RDMA optimized Configuration for low latency

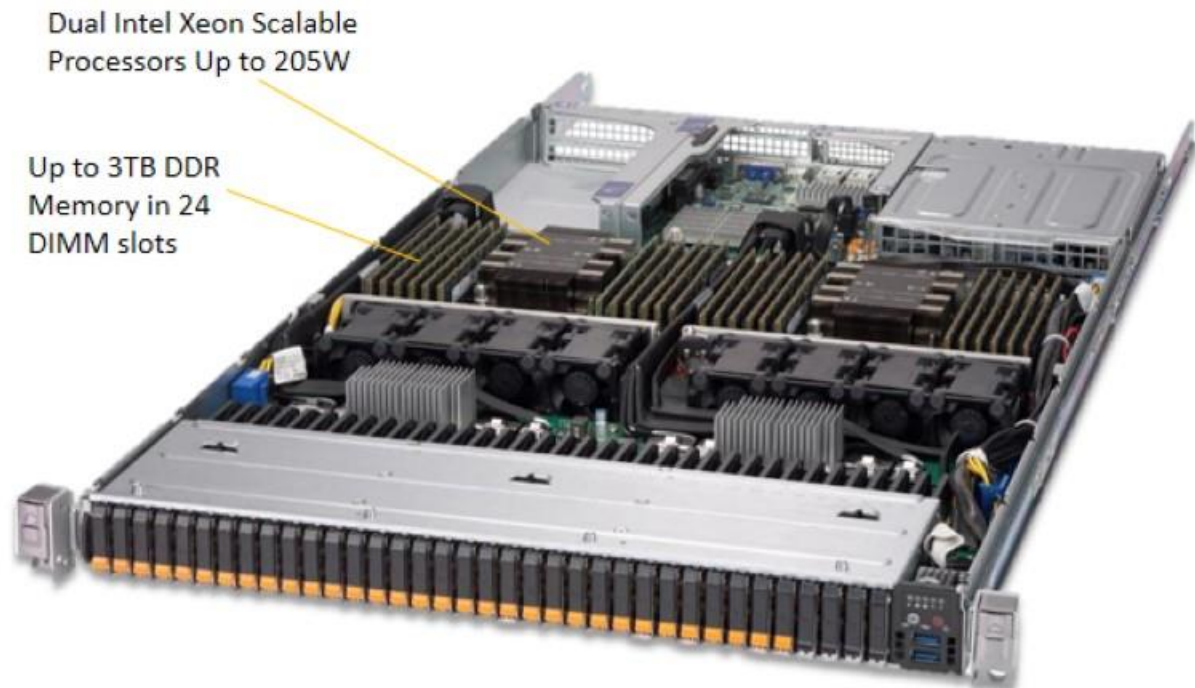


NF1 NVMe

The New Generation All-Flash Leader!

● SSG-1029P-NMR36L

- ❖ 36 hot-swap NF1 NVMe
- ❖ Up to 10 million IOPS in 1U
- ❖ NVMe over Fabric (option)
- ❖ M.2 NVMe support
- ❖ Optimal thermal and power efficiency
- ❖ Hot Plug and Power Loss Protection
- ❖ NF1 SSD Capacity : 4TB -16TB
- ❖ 0.5 Petabyte in 1U!



Supermicro/Samsung NF1 NVMe



JBOF Product Highlights

High Density & High Capacity Disks:

- ❖ 1U 32 hot-swap NVMe drives x 32TB = 1 PB
- ❖ **Just a Bunch of Flash!**

Serviceability:

- ❖ Hot-swap fan modules and power supplies
- ❖ Hot-swap SSDs & Tool-Less Drive Trays

Accessibility:

- ❖ Remote system on/off and system management
- ❖ Remote power cycling for each Individual SSD

Redundancy:

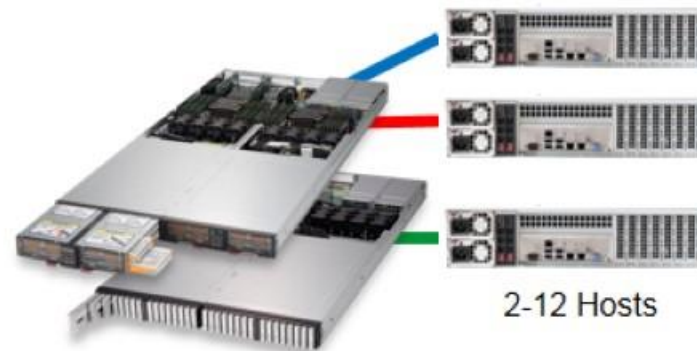
- ❖ Redundant Power Supplies and Fans

Performance:

- ❖ Flexible to configure Direct or optional Fabric Connectivity
- ❖ High throughput up to 64 GB/s data transfer rate

Deployment Methods

PCI-E Connected



2-12 Hosts

Fabric Connected

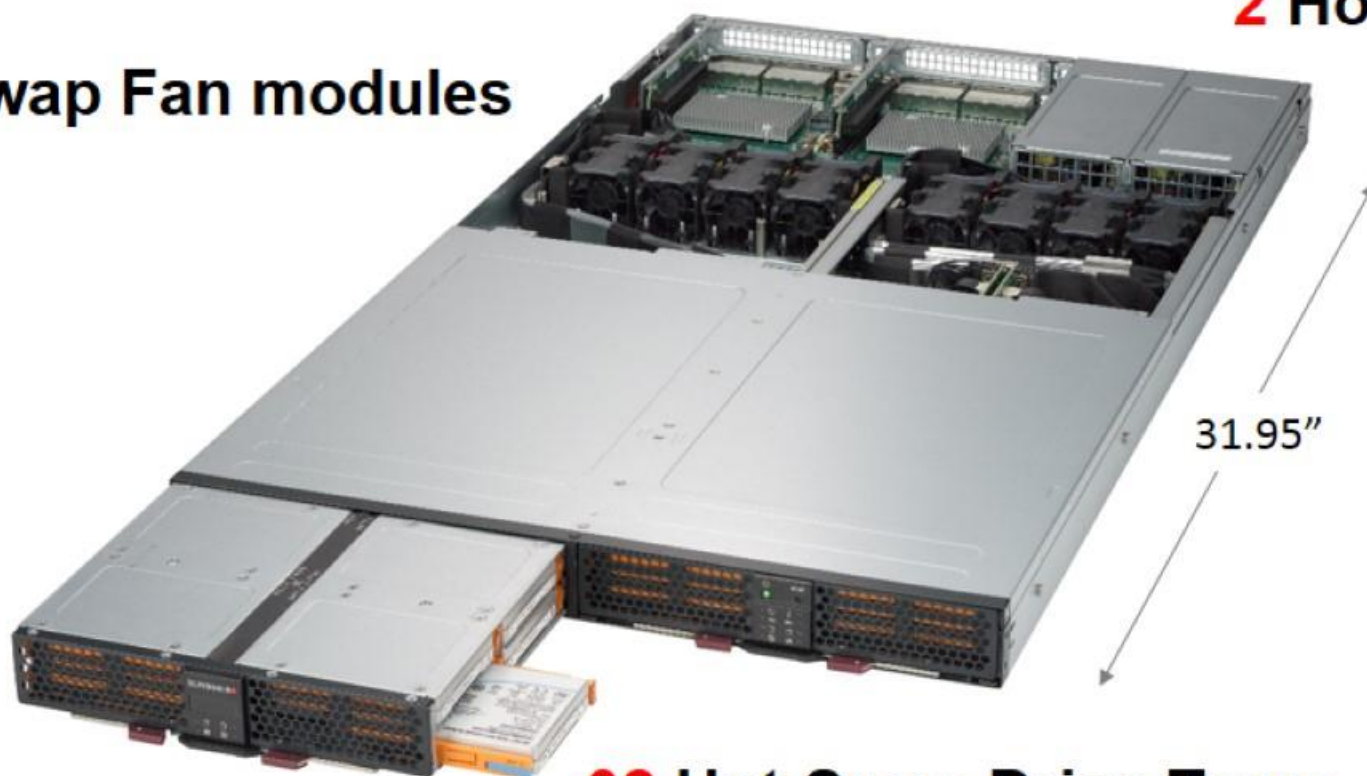


100's of Hosts

Hot-Swap Modular Design

8 Hot-Swap Fan modules

2 Hot-Swap Redundant Power Supplies



31.95"

32 Hot-Swap Drive Trays

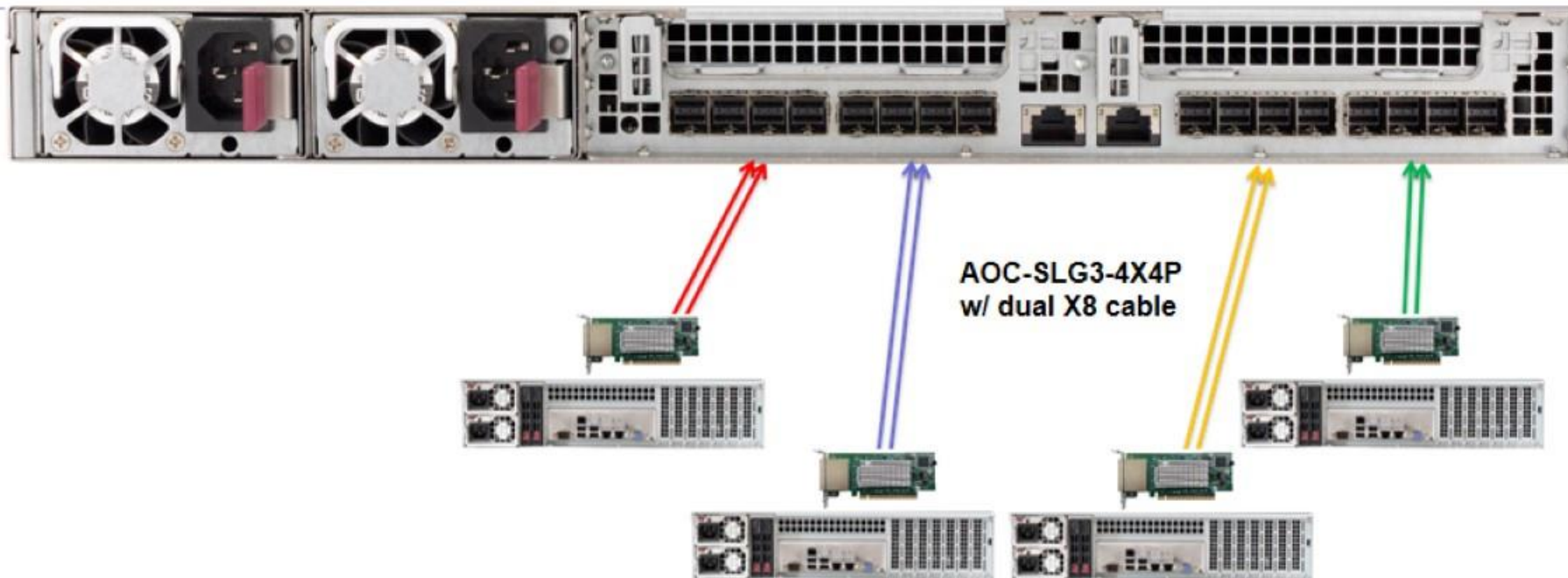


Tool-less Tray





Rear view - JBOF with 4 Hosts



AOC-SLG3-4X4P

Low profile standard Gen 3.0 PCIe x16 for JBOF (PLX PEX9733)

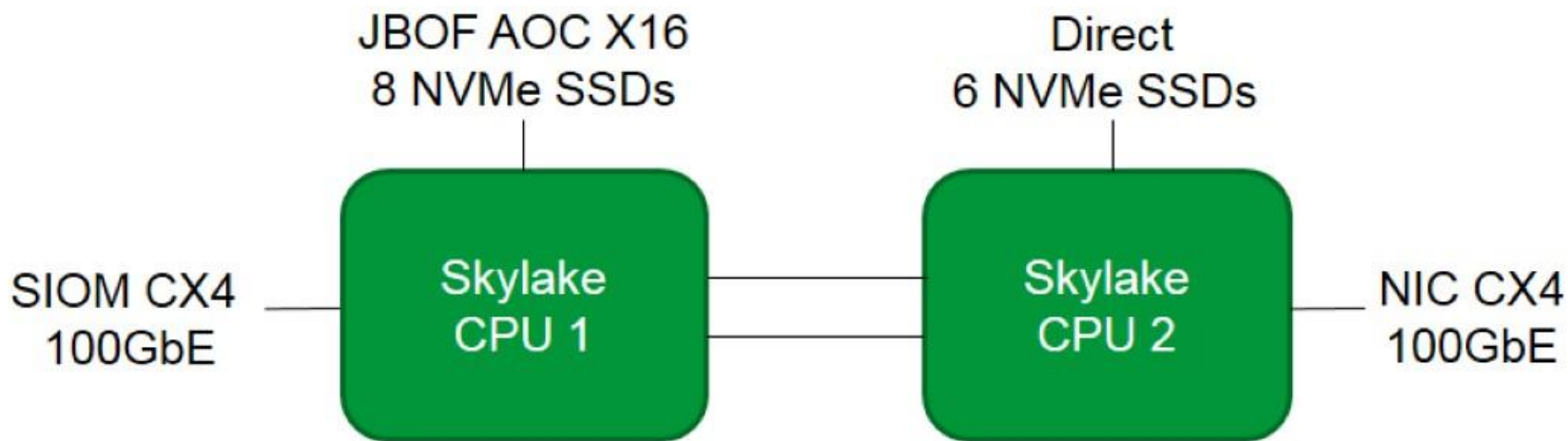


Part Number	Length	Vendor
<u>CBL-SAST-1035-1</u>	1 meter	Amphenol
<u>CBL-SAST-1035-2</u>	1 meter	Molex
<u>CBL-SAST-1036-1</u>	2 meter	Amphenol
<u>CBL-SAST-1036-2</u>	2 meter	Molex
<u>CBL-SAST-1037-1</u>	3 meter	Amphenol
<u>CBL-SAST-1037-2</u>	3 meter	Molex



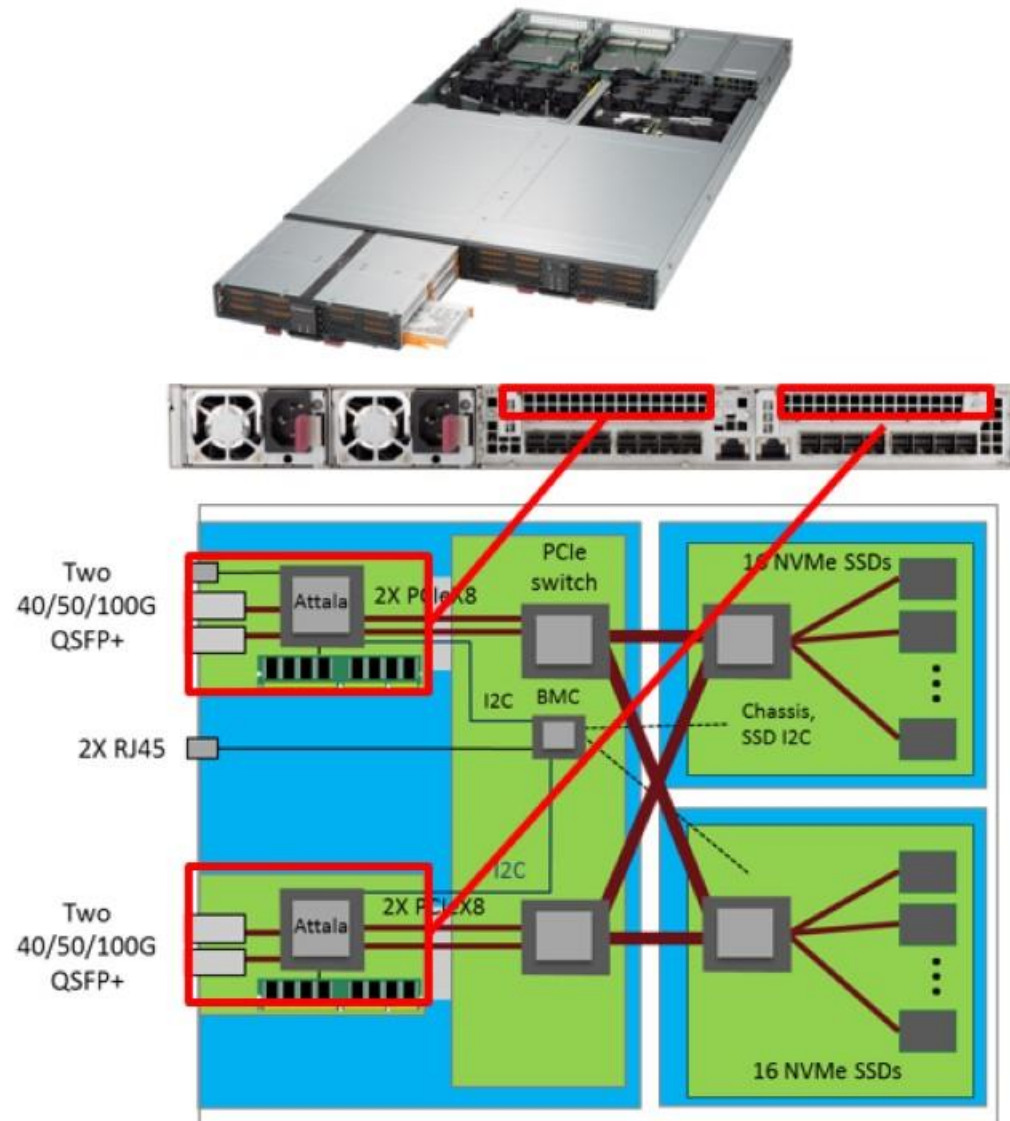
Recommended Configuration with 4 Hosts

- X11 2U BigTwin 4 Node with 24 NVMe SSDs + 1U JBOF with 32 NVMe SSDs
- In only 3U, you will have:
 - ❖ 56 NVMe SSDs
 - ❖ 8 Skylake Processors
 - ❖ 800GbE Network



Attala AOC features:

- **100% Standards-based Networking**
 - ❖ RoCEv2, NVMe-oF, Redfish, Swordfish
- **Performance & QoS**
 - ❖ Only add'l 5 μ sec; 400-500Gb/s, 9-11M IOPS; per-namespace IOPS/throughput QoS controls; future NV-DIMM namespaces
- **Enterprise features**
 - ❖ Export full and sub-SSDs; tenant policy filter; multi—host sharing & reservations; admin SMART diagnostics.
 - ❖ Data protection with HW-based mirroring
- **Full link redundancy**
 - ❖ Attala FPGAs create multi-paths on any network port to same SSD to support host-based MPIO
- **Full management solution**
 - ❖ NSC card is mgmt front-end of entire data node: hardware management, orchestration of resources
 - ❖ Real-time telemetry of health & performance monitoring
- **Single-port SSD support**



Using NVMe-oF for Small File Workload

32 bay JBOF
with 2 Attala NSC40 installed



NVMe Fabric

Metadata Servers
Data On Metadata
Distributed Namespace



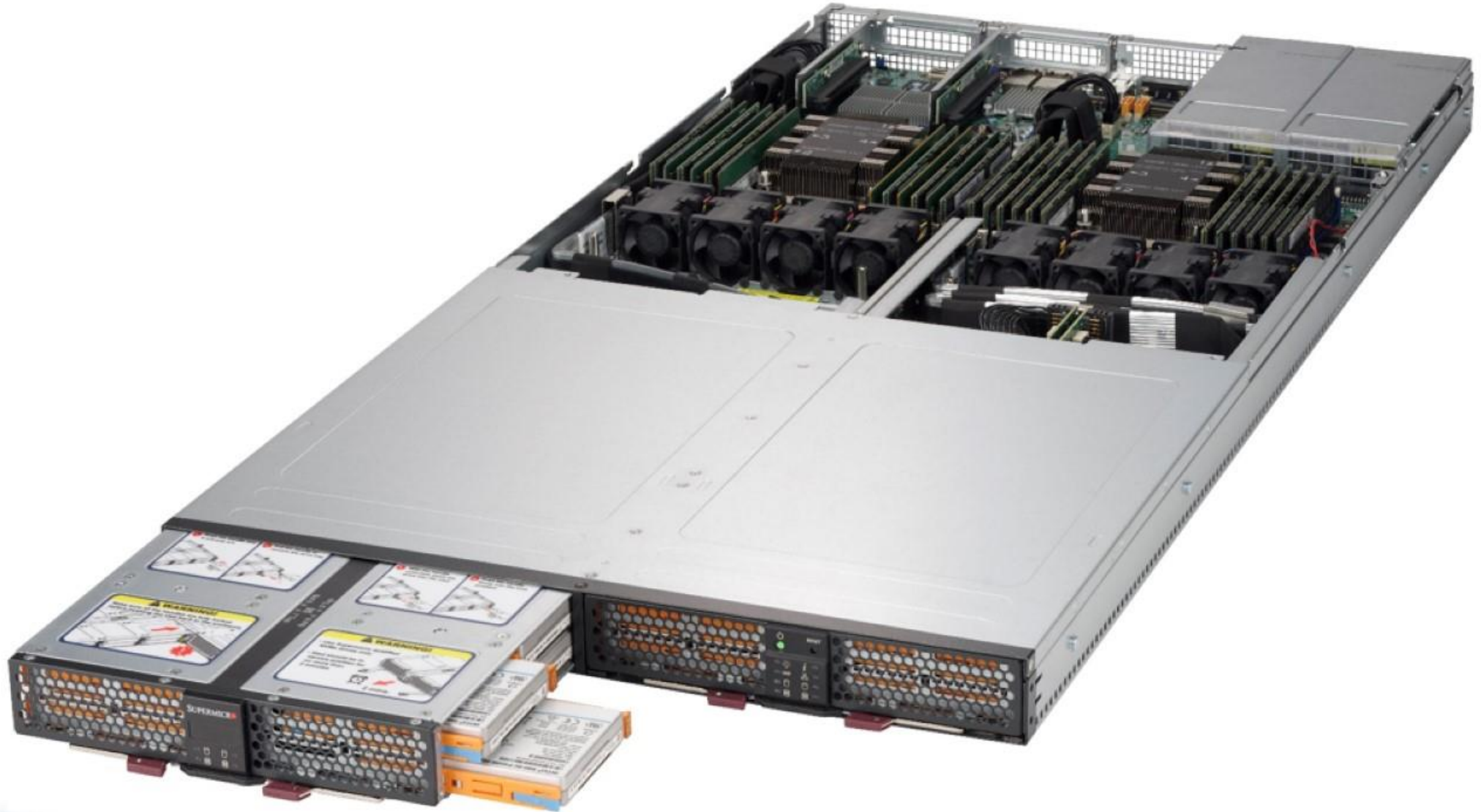
Lustre Network

Object Storage Servers



90 Bay JBOD

Dual Processor 1U 32 NVMe



3.0



Ruler JBOF and Server



Why Ruler SSD?

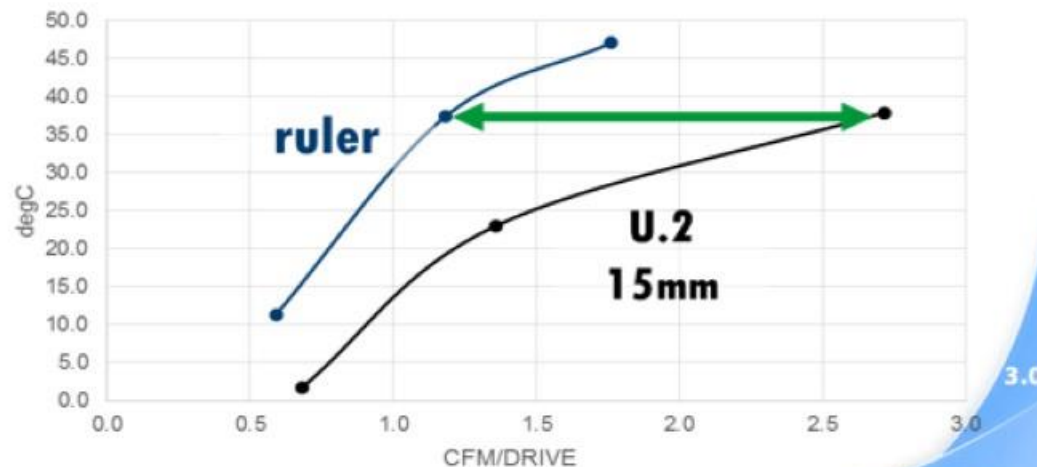
- Fully front Serviceable - Fits into 1U
- Maximize drive capacity
- Maximize capacity per 1U
- Optimize thermal efficiency
- Drive down TCO

● SSG-136R-NR32R

- ❖ 1U 32 Ruler JBOF
- ❖ Up to 8 host connections
- ❖ Up to 1 Petabyte in 1U
- ❖ Optional NVMe over Fabric
- ❖ HPC / Data Analytics

● SYS-1029P-NR32R

- ❖ 1U 32 Ruler Server
- ❖ DP w/ 24DIMM
- ❖ High Throughput Ingest
- ❖ HPC / Data Analytics
- ❖ Content Delivery Network
- ❖ Top of Rack Storage



Thermal Efficiency: **Up to 55% Better Airflow** vs. U.2 15mm

NF1 – 1U/36 All-Flash Server

Next Generation All-Flash Leader!

Optimized for Big Data and Object Storage

SSG-6019P-ACR12L

- Density Optimized 3.5" Storage Server
- Pull-out Storage Drawer for Easy Drive maintenance
- Directly connected drive bays to minimize latency
- 4 Front loading 7mm Hybrid NVMe/SATA bays for cache applications
- Dual CPU with 12 DIMM for cost optimal compute performance



Pull-out Hot-swap SAS/SATA Drawer



4 Front loading 7mm Hybrid NVMe/SATA bays





Key Feature – Easy hot-swap serviceability



12x 3.5" Hot-swap storage drawer
With internal rail and cable management

FRONT

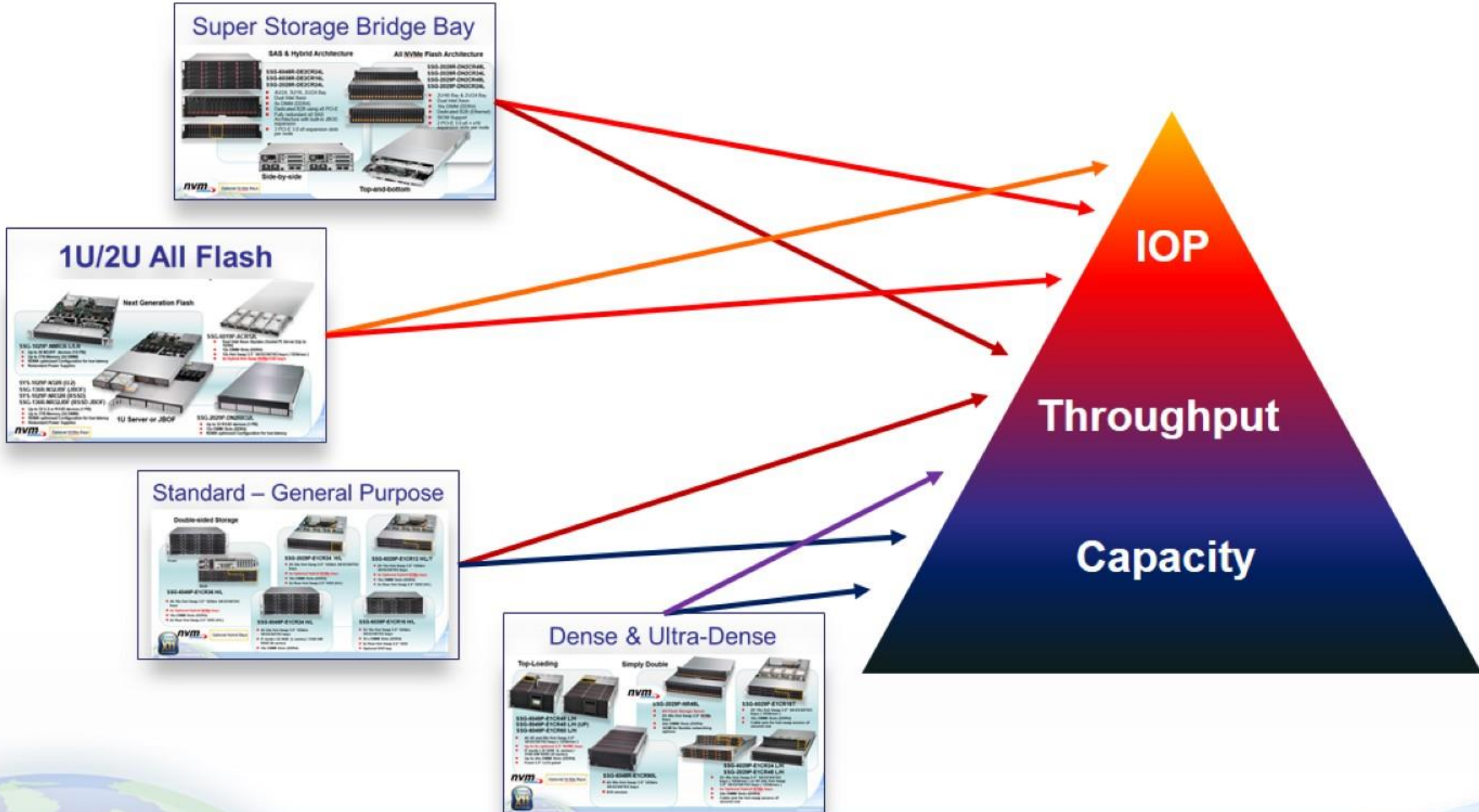
Chassis remains stationery in rack



1U rear I/O : Standard rack cabling
and serviceability

Back

Enterprise Proven Hardware – Software Defined Solutions





Thank You

<https://www.supermicro.com/products/nfo/storage.cfm>

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