SDC 21
BY Developers FOR Developers

Birds of Feather: E-SSD/E-BoF

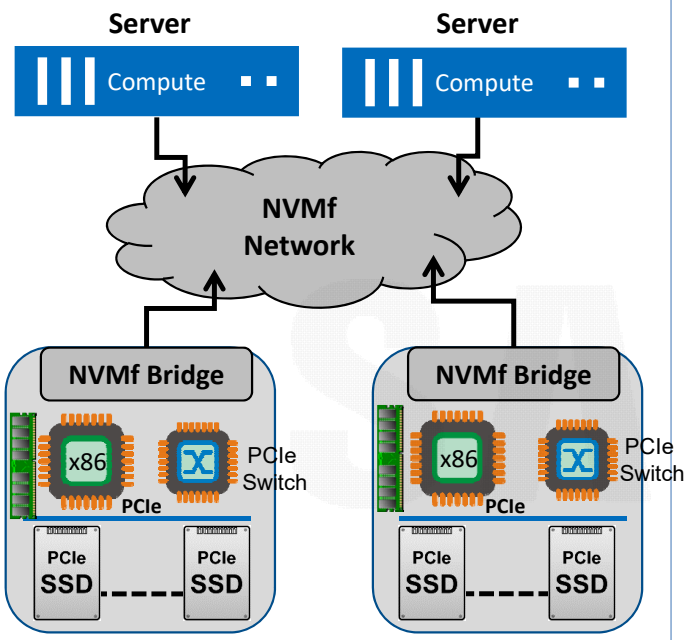
Virtual Session

Sep 28, 2021

5:00 pm PT / 8:00 pm ET

NVMe Over Fabrics Architectures for Disaggregated Storage

JBOF with x86

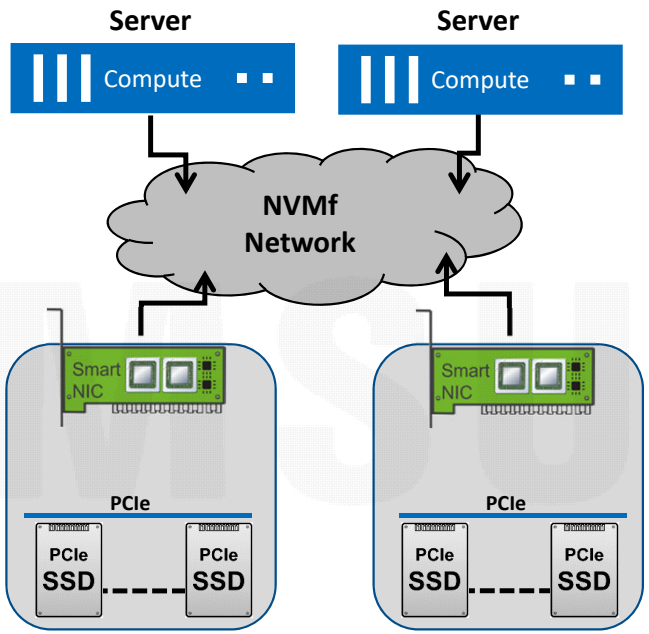


Pros
- Current production
- Established Ecosystem
- PCIe SSDs in production

Cons
- BW bottleneck
- Added PCIe latency
- High power

Production

JBOF with SmartNIC

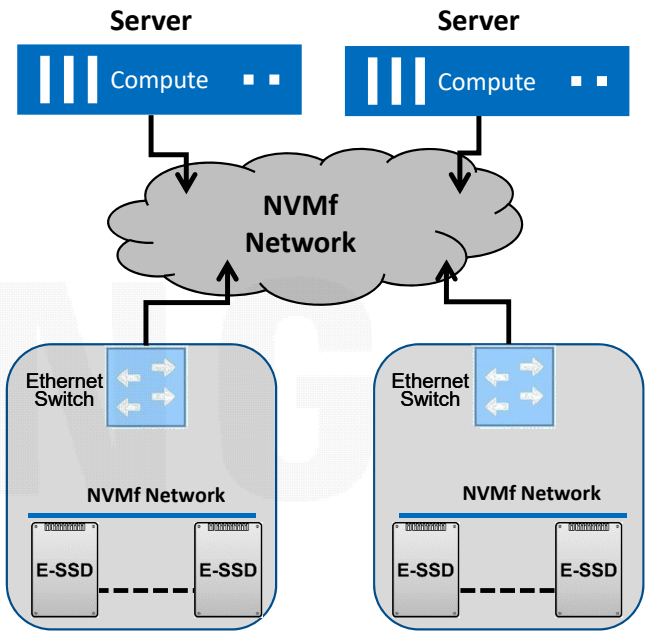


Pros
- Finding some use cases
- Emerging Ecosystem
- PCIe SSDs in production
- Lower Power

Cons
- Added PCIe latency
- Needs SmartNIC on both sides

Engage-Short Term

E-BOF



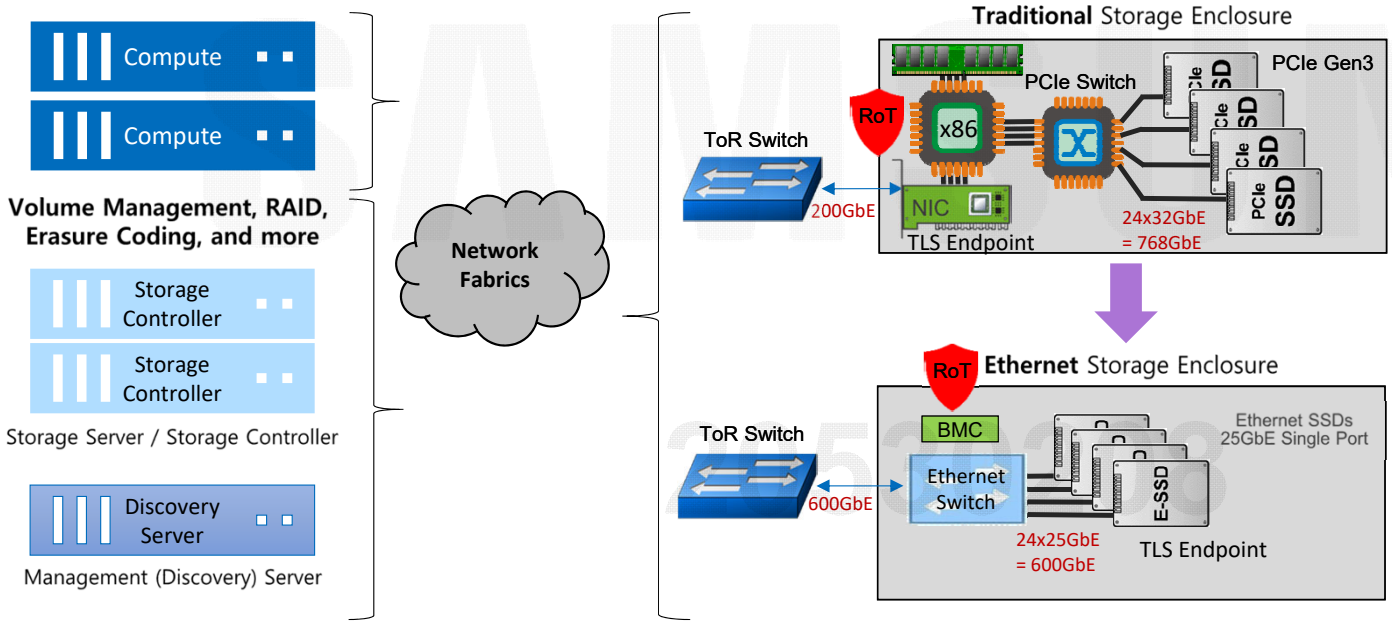
Pros
- BOM cost savings
- Lower latency/power
- True disaggregation possible

Cons
- No Ecosystem yet
- E-SSDs are in PoC

Engage-Long Term

Disaggregated Architecture

- **NIC card's essential features are offloaded to E-SSD.**
- **Storage controller can communicate with multiple E-BOFs as it is done with JBOFs.**
  - Connection and discovery are added to maintain connection in NVMe-oF specification.
  - NVMe I/O command processing is equal as PCIe based NVMe SSD for E-SSD.
  - Additional target configuration may not be needed, since configured information are saved in E-SSD.
- **SW modification**
  - Schema of JBOF for Redfish can be changed.



NIC + CPU
- IP address configuration
- Manage Connections
- Network Management

PCIe SSD
- NVMe I/O Processing

BMC (Expected)
- E-SSD IP address configuration

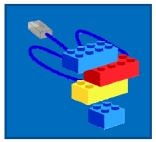
E-SSD (offloaded)
- IP address configuration (manual)
- Manage Connections
- Network Management
- NVMe I/O Processing

E-BoF Value and Applications

- Value

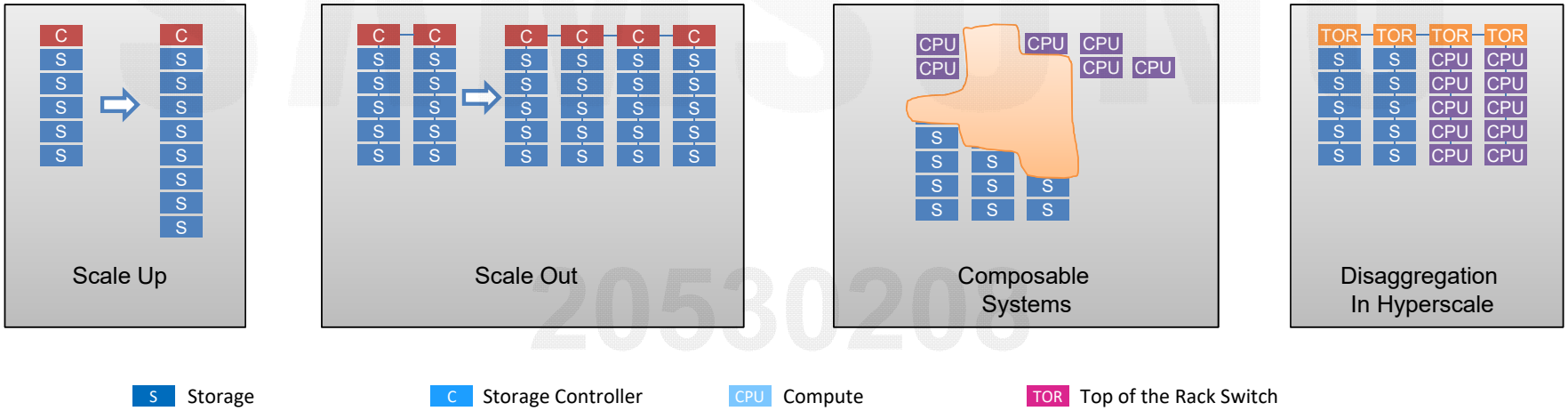
Unlocks all of
SSD performance

Reduces
System level
TCO



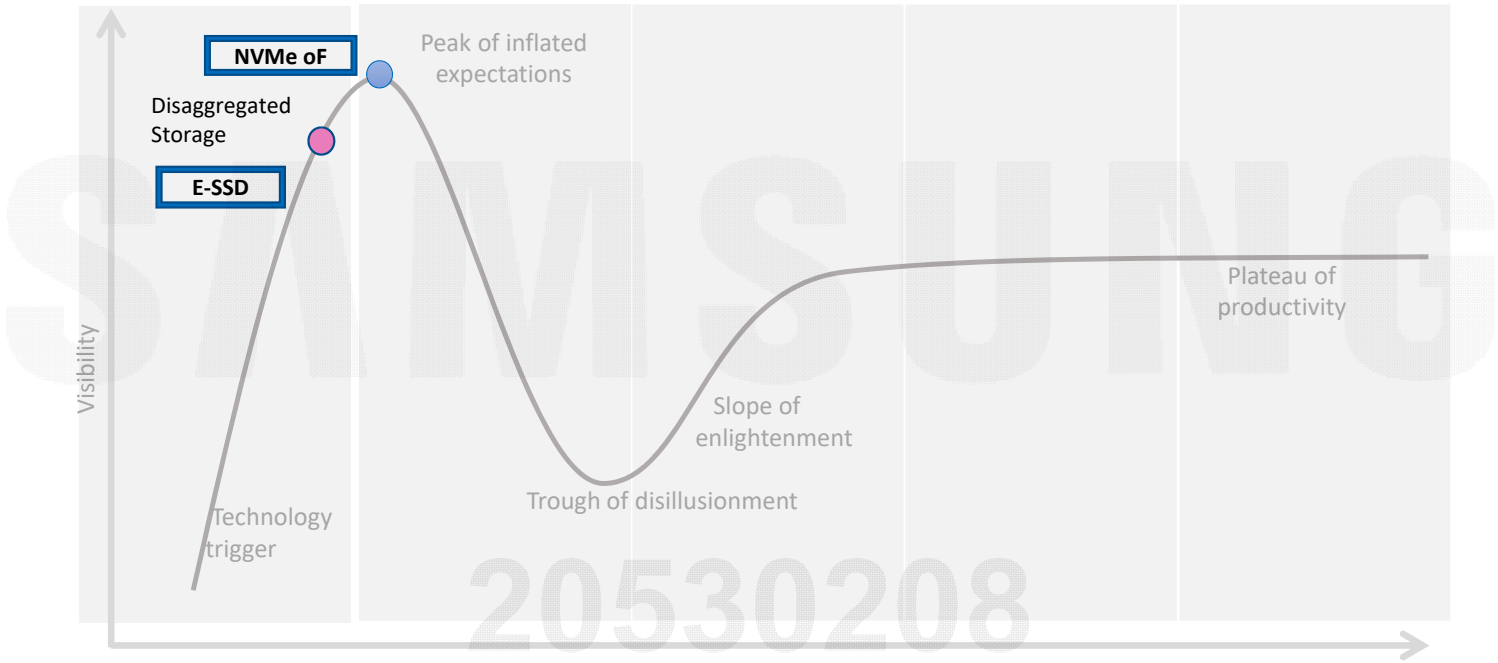
Ethernet connectivity
Inherently disaggregated

- Applications



E-SSD and the Hype Cycle

E-SSD is in the early phase of the hype cycle.



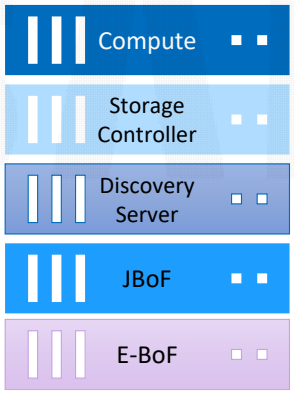
Vendors

E-SSD

- Samsung
- Marvell/Toshiba
- Kazan/Western Digital?
- Marvell/Hynix

E-BoF

- Foxconn – Irene
  - Marvell Switch
- Foxconn – Newell
  - Nvidia Switch



Questions