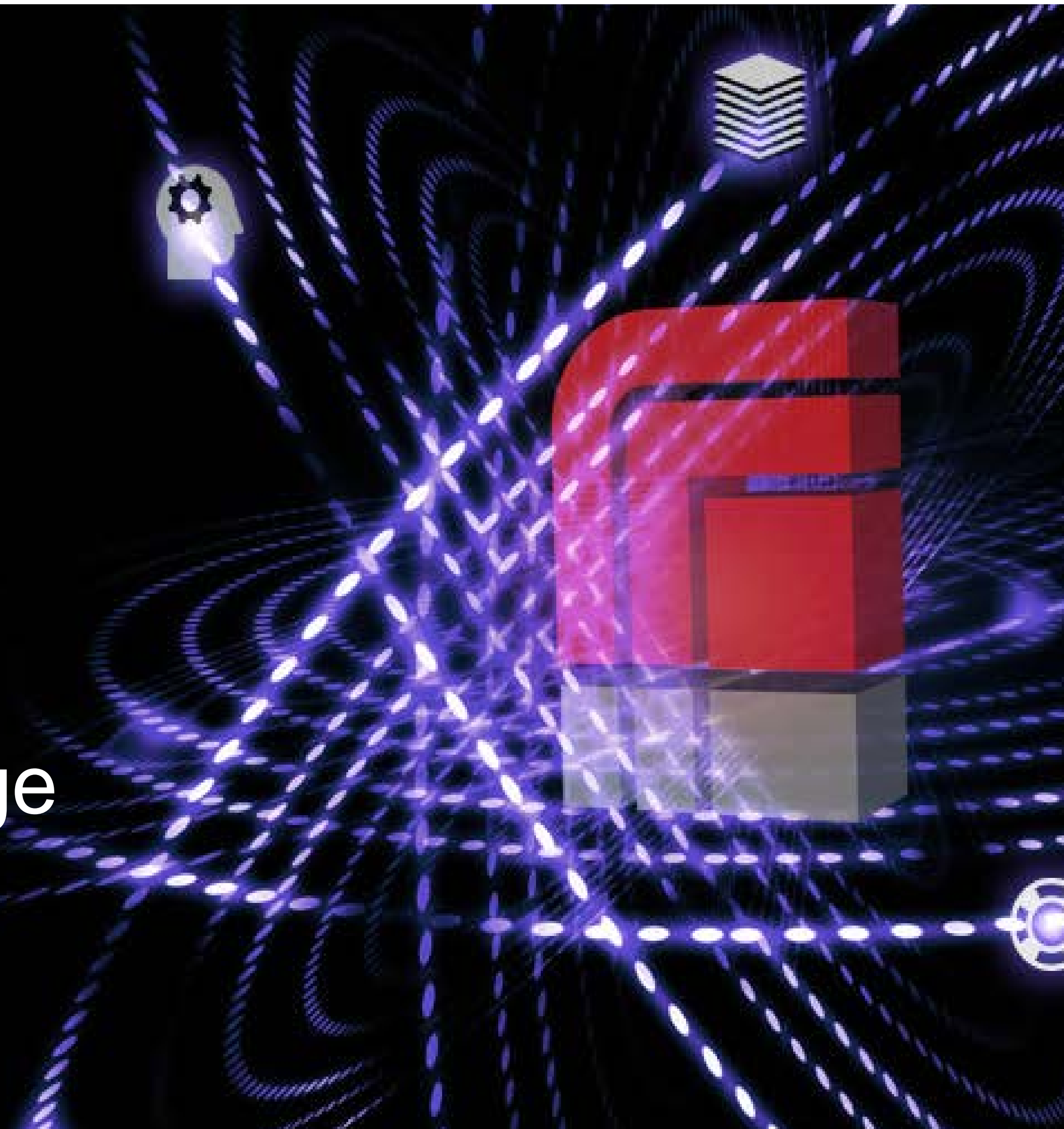
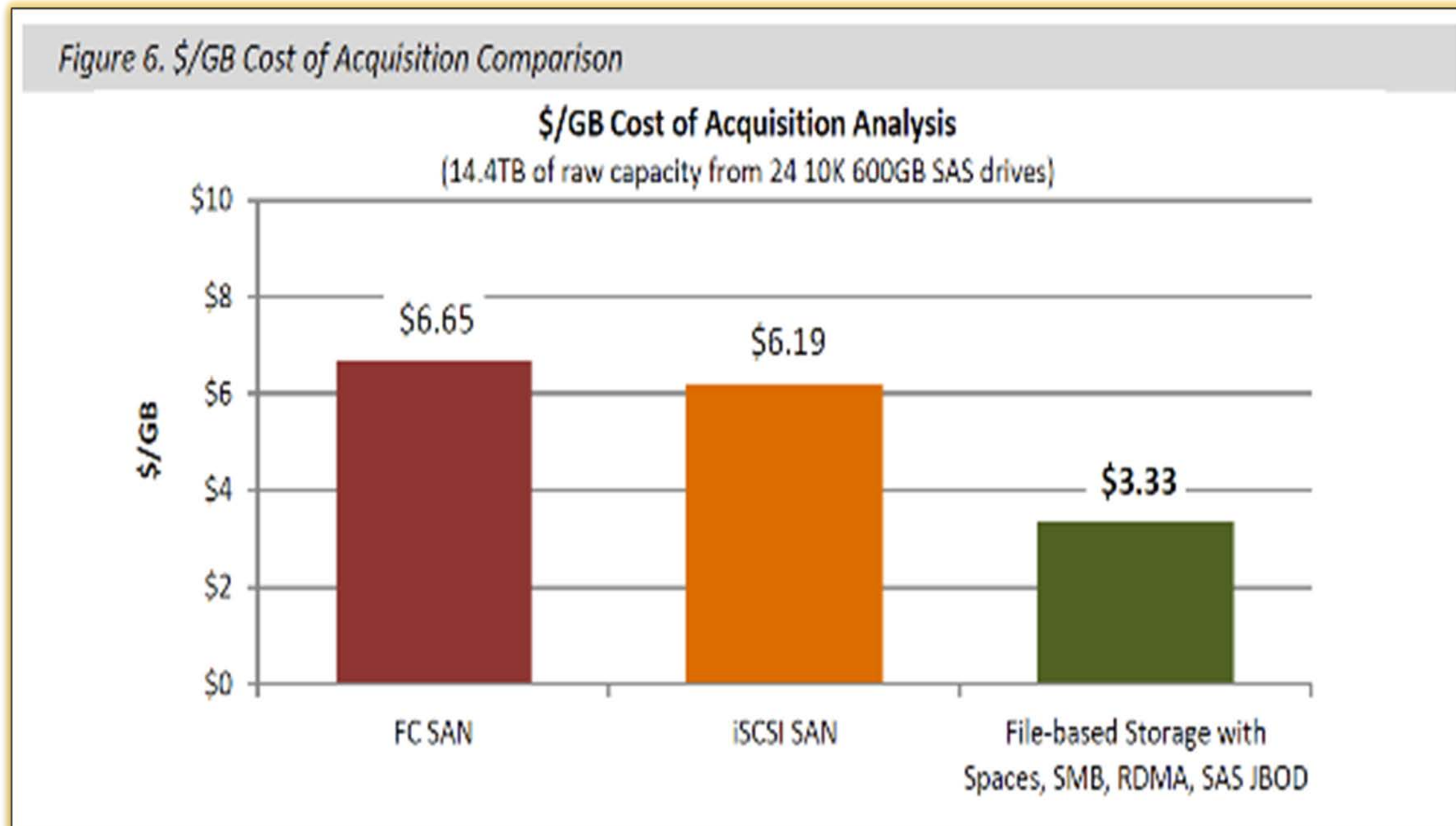


S2D or not to S2D

Microsoft Software-Defined Storage



Value of Microsoft Software Defined Storage

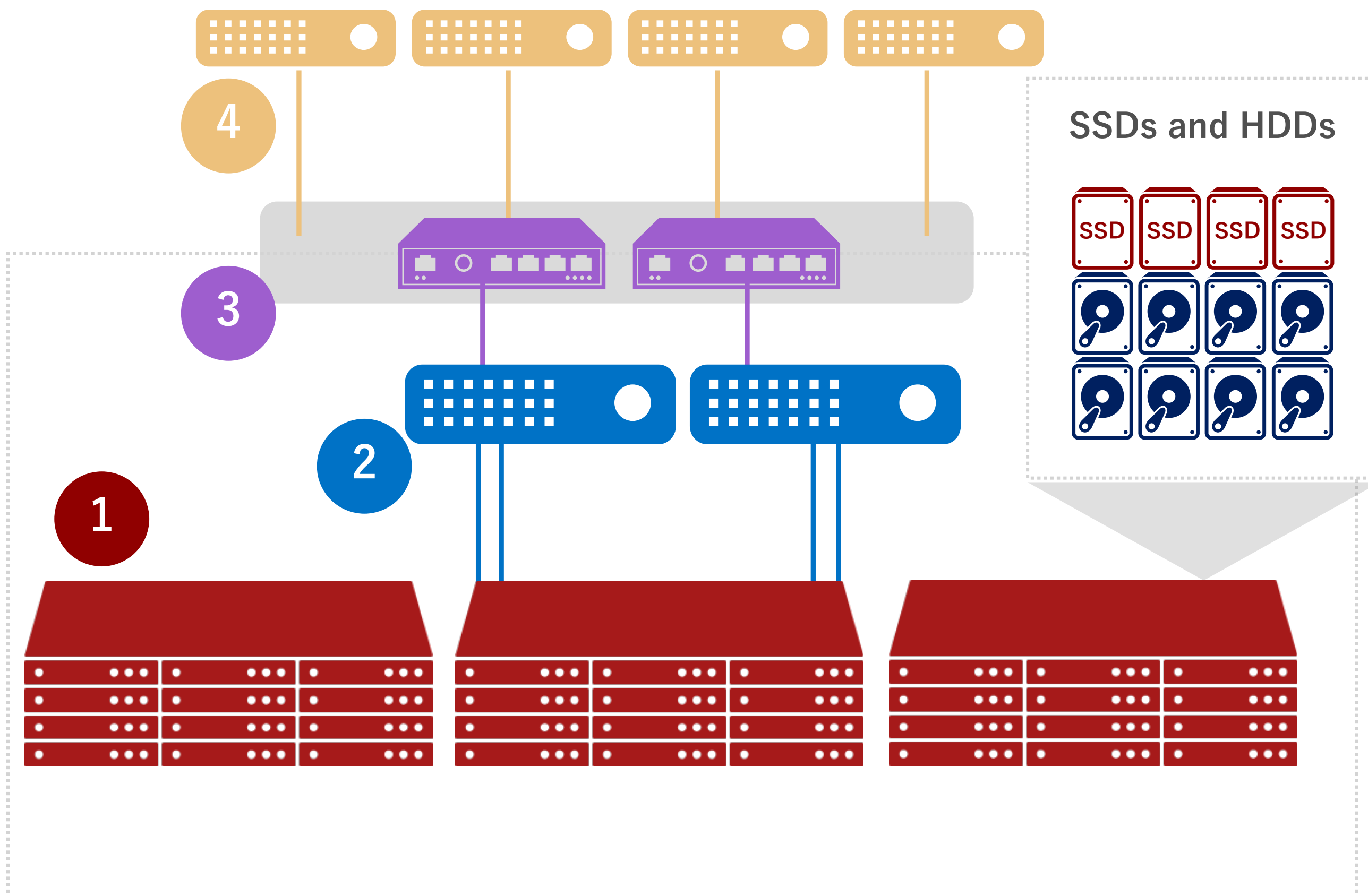


ESG findings show a savings of up to 50% in comparison to typical SAN storage

➤ Storage Spaces Features

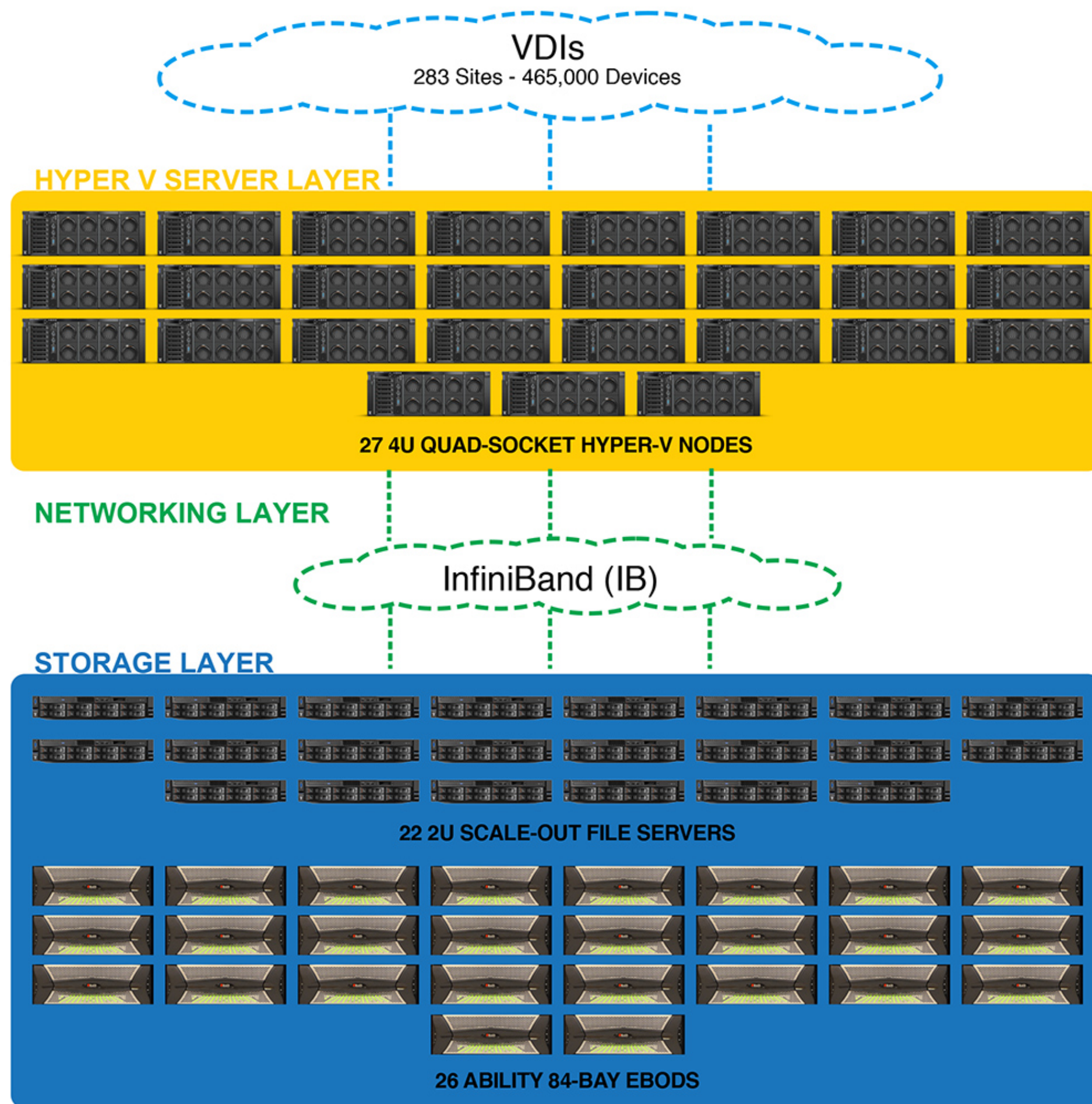
- Disaggregate Architecture
- Hot and Cold Tiered Storage
- Continuous Availability
- SMB 3.0 w/ RDMA

Storage Spaces Shared aka “Classic”



- 1 Enclosure Awareness:**
No single point of failure protection
12Gb/s SAS EBOD tiered **HDD** / **SSD**
- 2 Scale-out file server (SOFS):**
Highly available failover clustered nodes
Unified shared volume namespace
- 3 SMB Direct:**
RDMA-enabled networking
10GbE, 40GbE, 100GbE or Infiniband
- 4 Hyper-V:**
Scale to 1000's of VMs independently
High speed networking to storage layer

Dept. of Veteran's Affairs



Supporting:

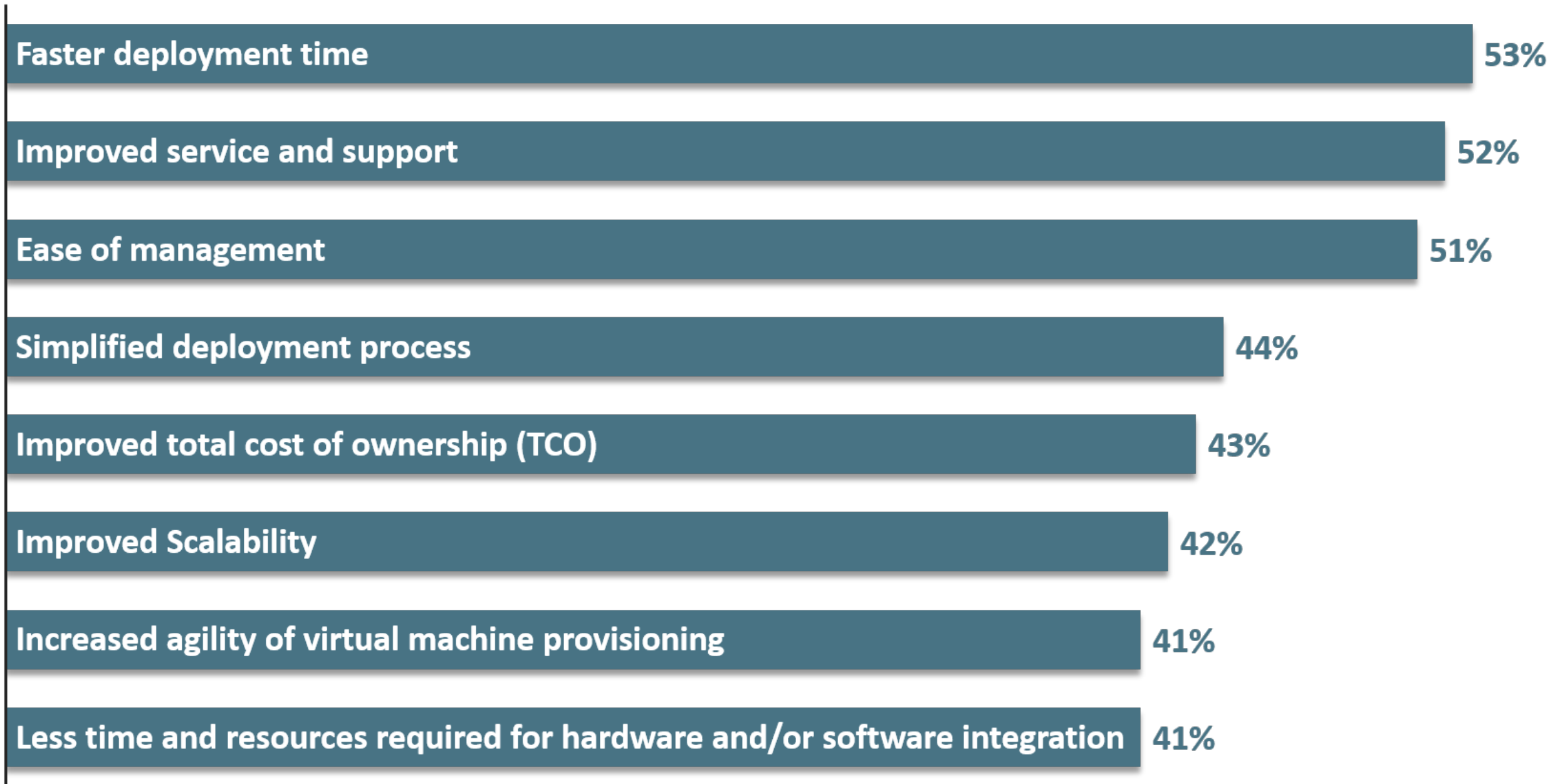
- 283 physical sites
- 465,000 VDI devices
- 27 quad-socket Lenovo Hyper-V nodes
- 22 dual-socket Lenovo file server nodes
- 26 RAID Ability EBODs
- 84-bay tiered storage (HDD / SSD)
- Microsoft Certified Architecture

5+ Petabyte Tiered Storage Solution

Value of Convergence

What benefits has your organization realized by deploying integrated computing platforms?

(Percent of respondents, N=99, multiple responses accepted)



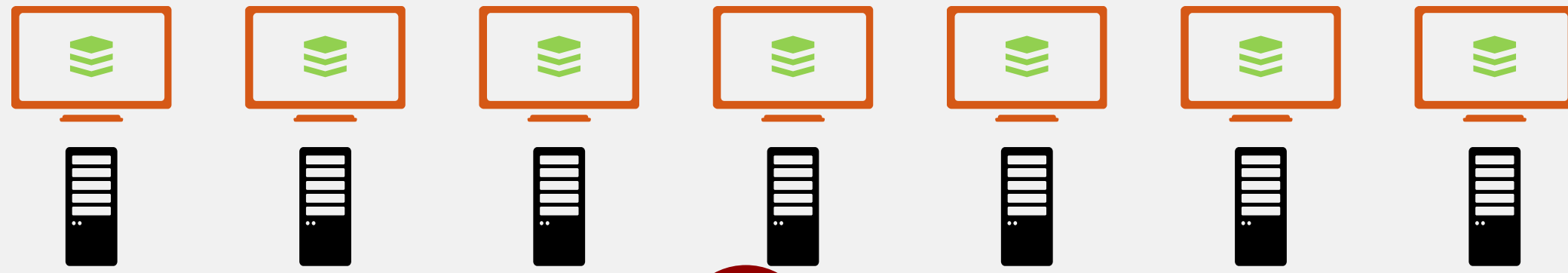
ESG findings show up to 50% of respondents plan to utilize converged solutions.

➤ Storage Spaces Direct Benefits

- Site-aware Failover Clusters
- Resilient Virtual Disks
- NVMe Cache Layer w/ SATA Support
- ReFS Real-Time Tiering

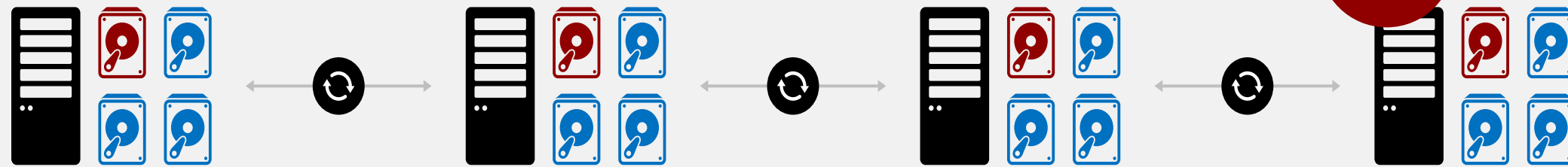
Windows Server 2016 – S2D Disaggregate

Hyper-V cluster



SMB storage fabric

Storage Spaces Direct with Scale-Out File Server



Architecture allows scaling Hyper-V (compute) and Scale-Out File Server (storage) independently

1

Industry standard Lenovo servers
Local SATA / NVMe SSD and HDD support
Servers are connected together with 10GbE.

2

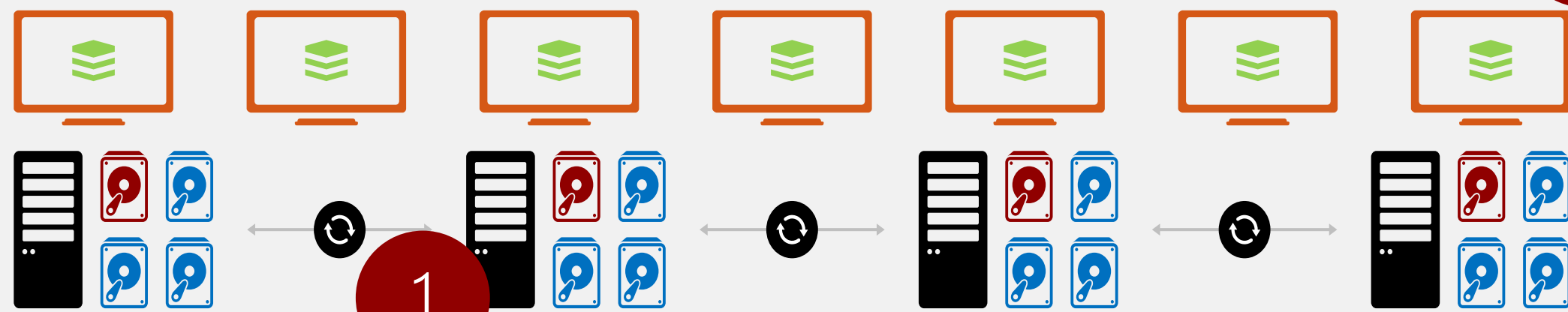
File shares provide storage for Hyper-V hosts, accessed over SMB 3.0. Highest performance delivered via SMB Direct (RDMA) and SMB Multichannel. Supports 56 Gb+ speeds.

Cloud design points and management

- Standard file servers with local storage
- Fault tolerance to disk, enclosure, node failures
- Scale pools to large number of drives
- Monitor w/SCVMM, SCOM, and manage w/ClearPointe
- Targeted granular expansion

Windows Server 2016 – S2D Hyperconverged

Combined Hyper-V & Storage Cluster
-> Hyperconverged



Architecture reduces complexity

Combines Hyper-V & Storage clusters onto fewer nodes

1

Industry standard Lenovo servers
Local SATA / NVMe SSD and HDD support
Concurrent storage and Hyper-V enabled.
Servers are connected together with 10GbE.

2

Virtual Machines run directly on converged
Hyper-V / Storage nodes

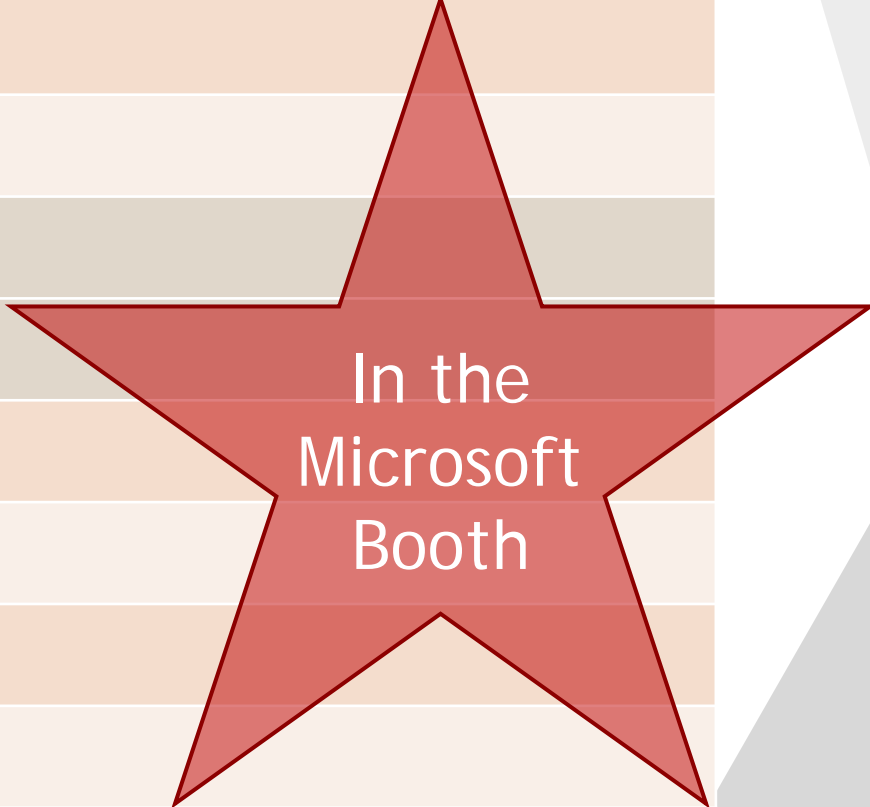
Reliability, scalability, flexibility

- All-in-one appliance design with local storage
- Fault tolerance to disk, enclosure, node failures
- Fast VM creation and efficient VM snapshots
- Monitor w/SCVMM, SCOM, and manage w/ClearPointe
- Simple snap-in expansion architecture

Ability™ HCI Series S2D200



Offer Type				
Category (Choose only one)	Hyper-Converged Premium			
Profile (Choose only one)	All-Flash			
Scale (Per your testing)	4 to 16 Nodes			
System (Per Node)				
SKU	RAID Inc. Ability™ HCI Series S2D200			
Form Factor	2U Rack Server			
CPU	Dual Intel Xeon E5-2680 v4 2.4GHz, 35M Cache, 14-Core per processor			
Memory	512GB DDR4 Registered ECC 2400MHz DIMM			
Host-Bus Adapter(s)	Avago 9300 Fury HBA (x3)			
Network Interface Adapter(s)	Chelsio T580-LP(x2)			
RDMA Capable	Yes			
TPM 2.0	Yes			
Drives (Per Node)				
Type	Count	Form Factor	Size	Description (Optional)
Cache	4	PCIe Card	1.6TB	HGST Ultrastar SN150
Capacity	24	2.5"	256GB	SanDisk CloudSpeed Eco II
Third Tier (If Applicable)				



Storage Spaces Shared or S2D

Choose Your Spaces

- Storage Spaces Shared
 - In WS2012 R2 and WS2016
- Storage Spaces Direct
 - Introduced in WS2016
- Storage Spaces with Shared SAS fully supported in WS2016
- Upgrade from WS2012 R2 to WS2016
 - Cluster OS Rolling Upgrade w/o stopping Hyper-V or Scale-Out File Server workloads

	Storage Spaces Shared	Storage Spaces Direct
Architecture	Shared Storage w/ SAS JBOD	Shared-Nothing Storage
Topology	Disaggregated	File Server Dependent
Device Types	SAS only	SATA, SAS or NVMe
Min Nodes	2	3
Max Nodes	4	16
Fault Domains	Disk, Enclosure	Server, Chassis, Rack
Max storage pool	80	240
Flash cache	Fixed Size SSD Tiering and Parity Journal	Dynamic (volume independent)
Volume Types	Mirror, Parity (archive only)	Mirror, Parity and Multi-Resilient
Tiering	Scheduled	Real-Time (ReFS)
File System	NTFS	ReFS (NTFS for backup)
CSV read cache	No	Yes
Windows Editions	Standard, Datacenter	Datacenter only

Q & A

Continue the conversation.



Stay in Touch

CLEARPointe

Lenovo



Blog

[RAIDinc.com/ignite16](https://raidinc.com/ignite16)



Phone

Toll Free (800) 330-7335

Direct (978) 683-6444



Email

sales@raidinc.com



Download the Solution Brief

[RAIDinc.com/S2D200](https://raidinc.com/S2D200)



Connect

[@RAIDinc](https://twitter.com/RAIDinc)