

DELL TECHNOLOGIES PARTNER PROGRAM

HEROES

PowerStore

Ask the PowerStore experts



Focus Areas

- Positioning
- PowerStore Key Differentiators
- PowerStore T-Series
- PowerStore X-Series
- All Inclusive Features
- Data Protection
- Anytime Upgrade program





Storage



Servers



Data Protection



CI/HCI/NW

Winning with our Industry Leading Portfolio



Y2020 Primary Storage Portfolio

>\$250K
"High End"

PowerMax



Unmatched Performance, resiliency and cutting edge innovation for **high-value workloads**

\$25K - 250K+
"Midrange"

PowerStore



Flexibility, scalability, simplicity and performance with market-leading economics for a **wide range of legacy and next-gen apps**

< \$100K

Unity XT



<\$25K+
"Entry"

PowerVault



Simplicity for SMB

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PARTNER PROGRAM



POWERSTORE

Designed for the data era

Data-centric • Intelligent • Adaptable



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Intel
Innovation
Built-in



Data-centric

Ultimate workload flexibility



Any
Workload

- Single architecture for block, file, and vVols
- Scale-up and scale-out
- Designed for **99.9999%** availability



Performance
Optimized

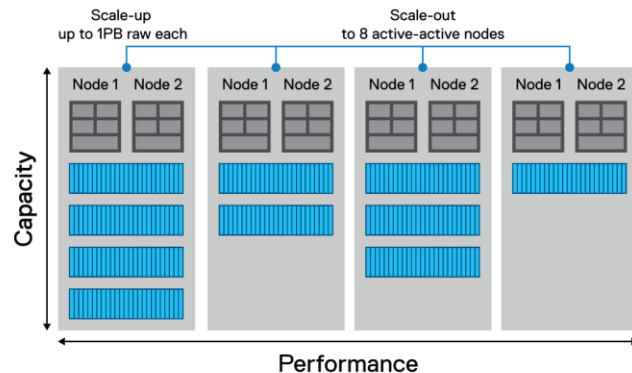
- Active-Active HA with end-to-end NVMe
- Flash or SCM
- **7x** faster and **3x** lower latency than Unity XT



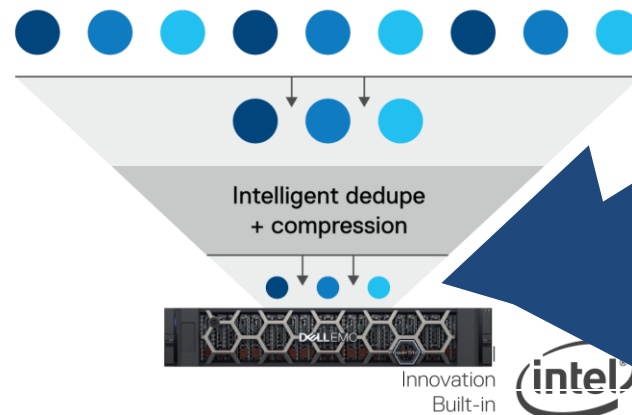
Efficiency
Without
Compromise

- Always-on inline data reduction
- Intelligent dedupe and compression
- **4:1** data reduction guaranteed

Next-gen performance, advanced clustering

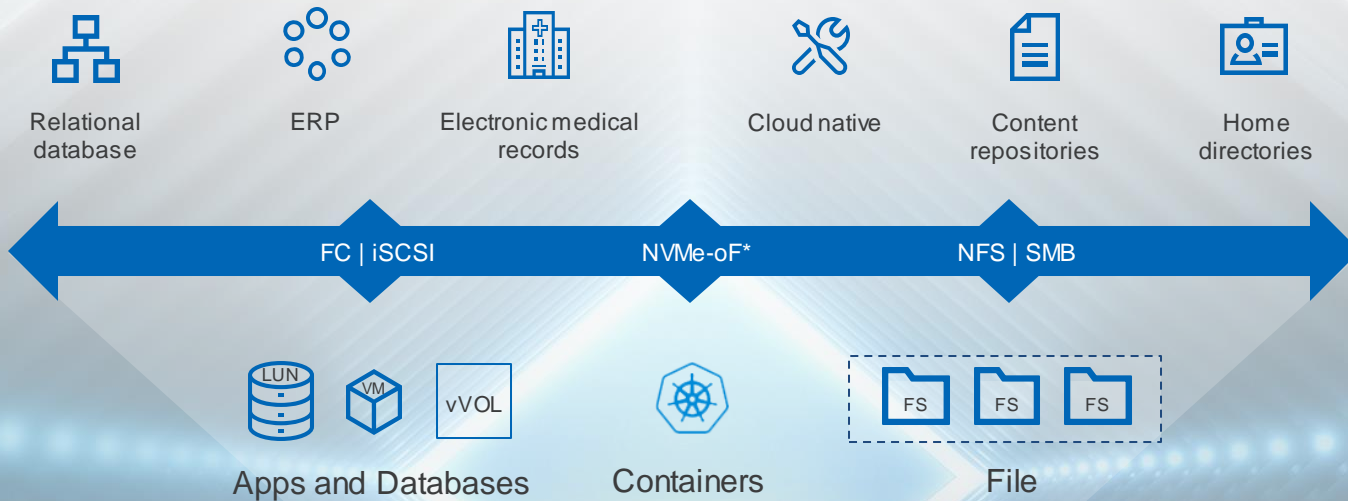


Inline, “always on” data reduction



Any Workload

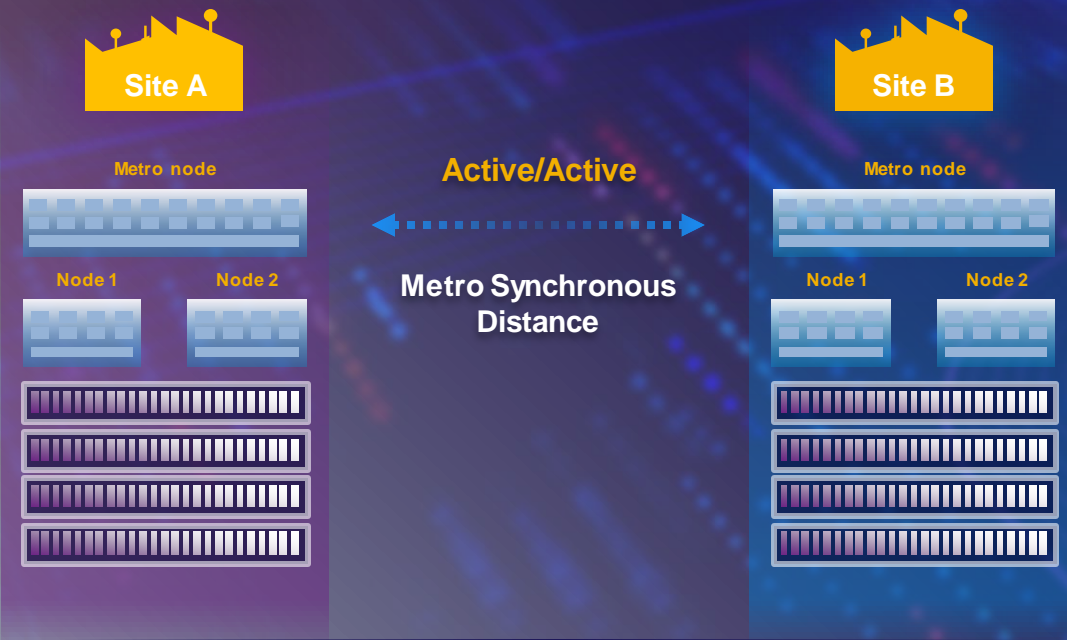
Traditional and modern workloads



Active-Active HA | NVMe | Flash or SCM



Metro Replication for Continuous Availability



> 6-9's Consistent Availability

Mirrored volumes

Delivers true RTO and RPO equal to zero with instant failover

Enables workload mobility across data centers

Zero impact to array performance

Intelligent

Autonomous, consistent operations



Programmable Infrastructure

- Automate storage provisioning processes
- Deploy new resources in **seconds** vs days
- Eliminate manual steps to reduce risk



Autonomous Appliance

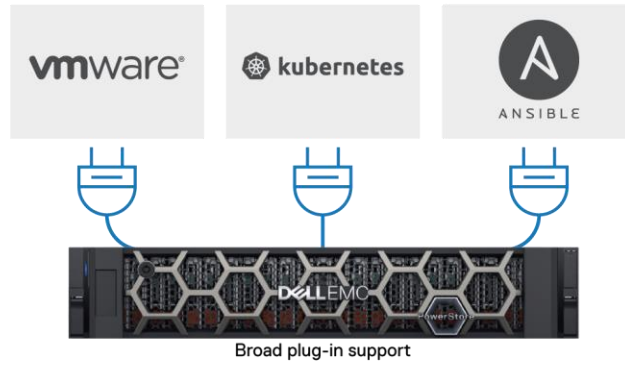
- Automatically discover new appliances
- Improved system utilization through ML
- **99% less staff time** to rebalance volumes



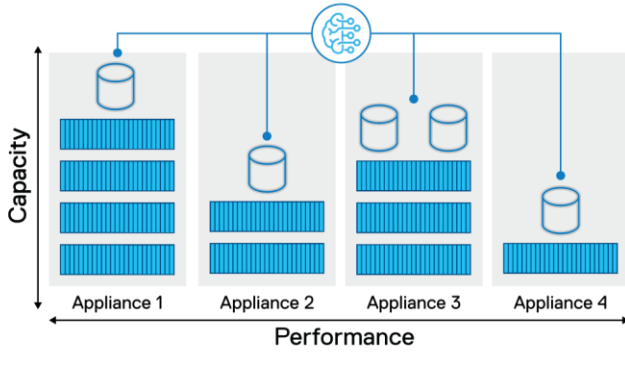
Proactive Health Analytics

- Anticipate business needs and avoid outages
- Single pane of glass view of data center
- **16X faster** to identify HA problems

Automated, end-to-end workflows



Machine learning engine



Adaptable

Continuously modern and highly adaptable

Flexible Architecture

- Container-based design for faster innovation
- Enables consistent services across platforms
- Ability to run apps locally with AppsON

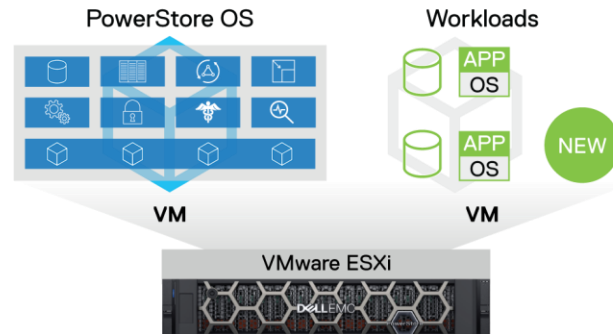
Flexible Deployment

- Small footprint, easy to deploy at the Edge
- Complements other platforms, including HCI
- Seamless application mobility with VCF
- Automated, non-disruptive data migrations

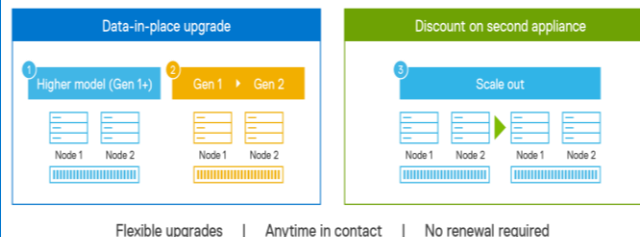
Flexible Consumption

- Flexible pay-per-use solutions with DTOD
- Backed by Dell EMC's Future Proof program
- Includes new Anytime Upgrades

Introducing AppsON: Run any workload directly on PowerStore



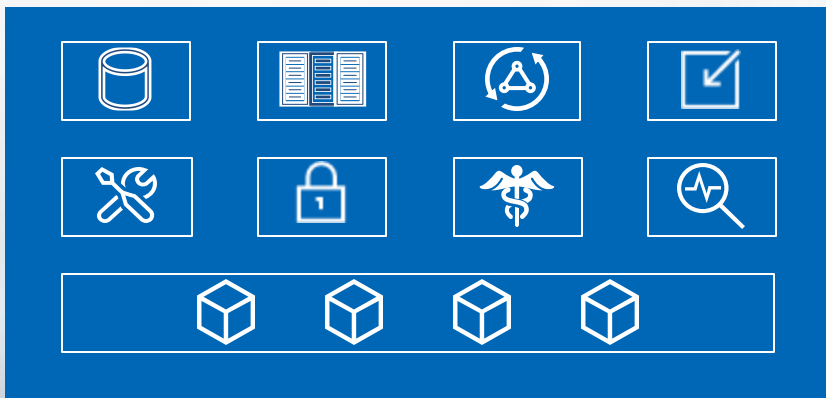
Anytime Upgrades: Continuously modern without limits



PowerStore OS

Container-based architecture

New PowerStore OS



Next-generation Dell EMC
storage stack

Modular software
architecture

Faster innovation

Consistent services
across platforms

PowerStore Family (X- and T-Series)

	PowerStore 1000	PowerStore 3000	PowerStore 5000	PowerStore 7000	PowerStore 9000
CPU per Appliance	4x 8C @ 1.8G Intel Xeon	4x 12C @ 2.1G Intel Xeon	4x 16C @ 2.1G Intel Xeon	4x 20C @ 2.4G Intel Xeon	4x 28C @ 2.1G Intel Xeon
Memory per Appliance	384GB	768GB	1152GB	1536GB	2560GB
NVRAM drives per Appliance	2		4		
Max Storage Drives per Appliance	96		96		
Supported Drives	NVMe SCM, NVMe SSD, SAS SSD				
Embedded Ports	4x 25/10/1 GbE Optical or 4x 10/1 GbE BaseT				
Support I/O Modules (2 slots per node)	4x 32/16/8 Gb FC, 4x 25/10/1 GbE Optical, 4x 10/1 GbE BaseT				
Supported Expansion Shelves	2.5" 25-Drive SAS SSD				



PowerStore Hardware

Optional IO modules
(2 per Node)

32/16/8Gb FC (4-port) – T and X
16/8/4Gb FC (4 port) – T and X
25/10GbE Optical (4-port) – T only
10/1G BaseT (4-port) – T only

SAS expansion ports
(2 per node)

Management ports
(1+1 per node)

Mandatory Mezz card
(1 per Node)

25GbE/10GbE Optical (4 port)
10/1G BaseT (4 port)

Node B

Node A



PowerStore Hardware



Full NVMe

2U 2-Node appliance

Dual Socket
Intel Xeon
CPUs
2x8C > 2x28C per
node
192GB > 1280GB
RAM per node

25x NVMe slots
NVRAM Caching
Redundant HW
components
Scale up w/expansion
enclosures

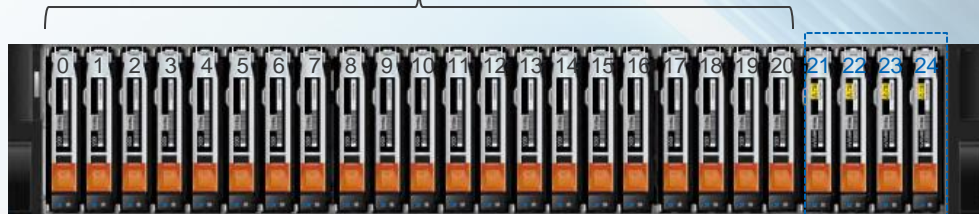
Drive Support - SEDs

NVMe SSD	SCM	SAS SSD
1.92TB	375GB	1.92TB
3.84TB	750GB	3.84TB
7.68TB		7.68TB
15.36TB		



PowerStore Hardware

Up to 21x NVMe SSD
or NVMe SCM drives



2x or 4x
NVMe NVRAM drives

Expansion Enclosure
Up to 25x SAS SSD drives



25x Drive Slots supports:

- NVMe SSD **OR** SCM
- 6 drives min

Last 4x slots reserved:

- SED 8GB NVMe NVRAM used for write caching (not FIPS certified)
- Support either 2 or 4 NVRAM drives depending on model

Base Enclosure must be completely filled before expansion enclosures can be attached

Dynamic RAID

- RAID 5 (4+1 / 8+1)
 - Automatically set on initialization
- Extent Based
- Mix Drive Capacities
- Single-Drive Granularity Scale-Up

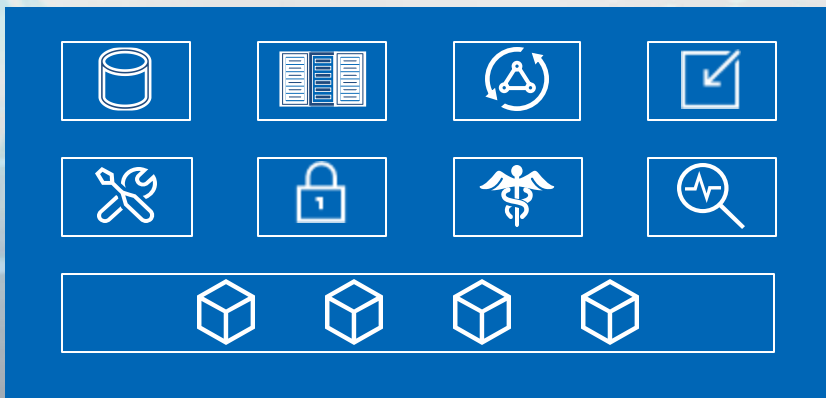
- RAID Resiliency Sets (RRS)
 - Up to 25 drives
 - May Span across enclosures

- Distributed Spare - 1 per RRS
 - Spare space is distributed across all drives
 - Shorten Rebuild Times

Initial Disk Count Requirement	Geometry	Maximum Drives
6	4+1	25
10	8+1	25

PowerStore T

PowerStore OS



PowerStore OS runs directly on purpose built hardware

- 2U2N
- All NVMe Base Enclosure
- Dual-socket Intel Xeon architecture

Capabilities

- SAN (FC/iSCSI)
- vVol (iSCSI)
- NAS (CFS/NFS/SFTP) – Optional on the first Appliance in the PowerStore-T Cluster

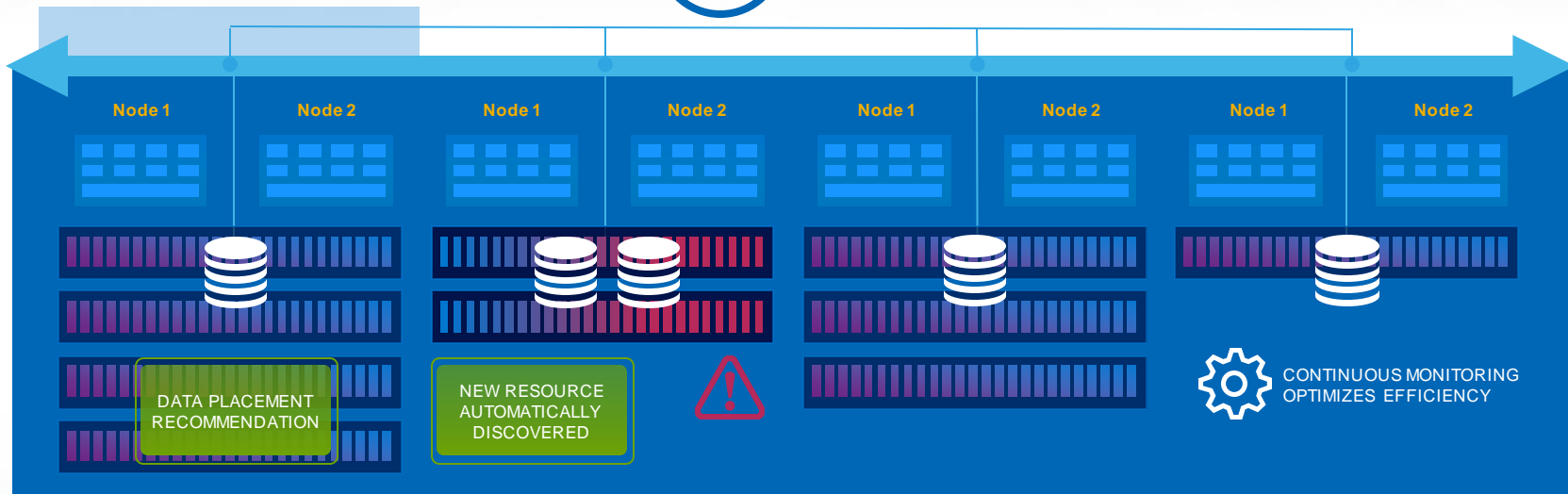
N-Way Scale Architecture



SCALE-UP
to 1PB raw

Federated SCALE-OUT
to 4 Appliances

CAPACITY

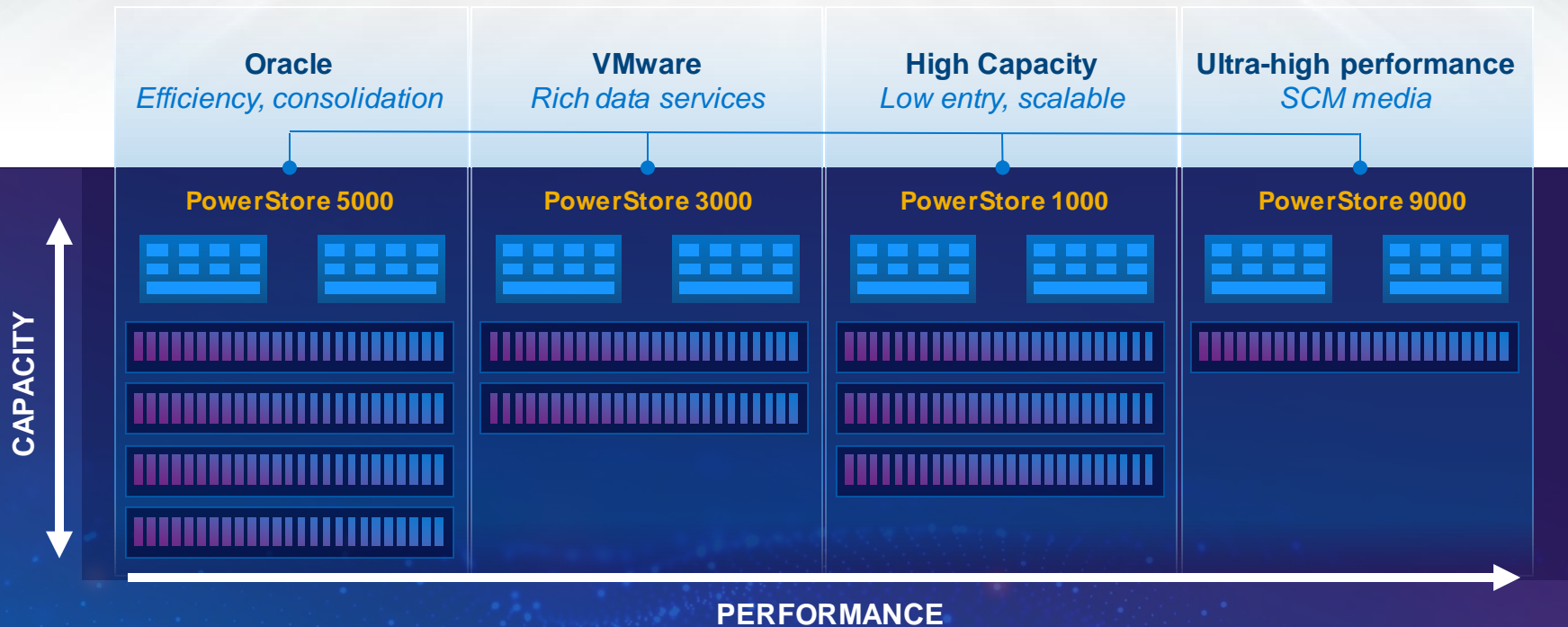


PERFORMANCE

Independently scale compute and storage
Spend less time managing the storage and workloads



Scale-up and scale-out



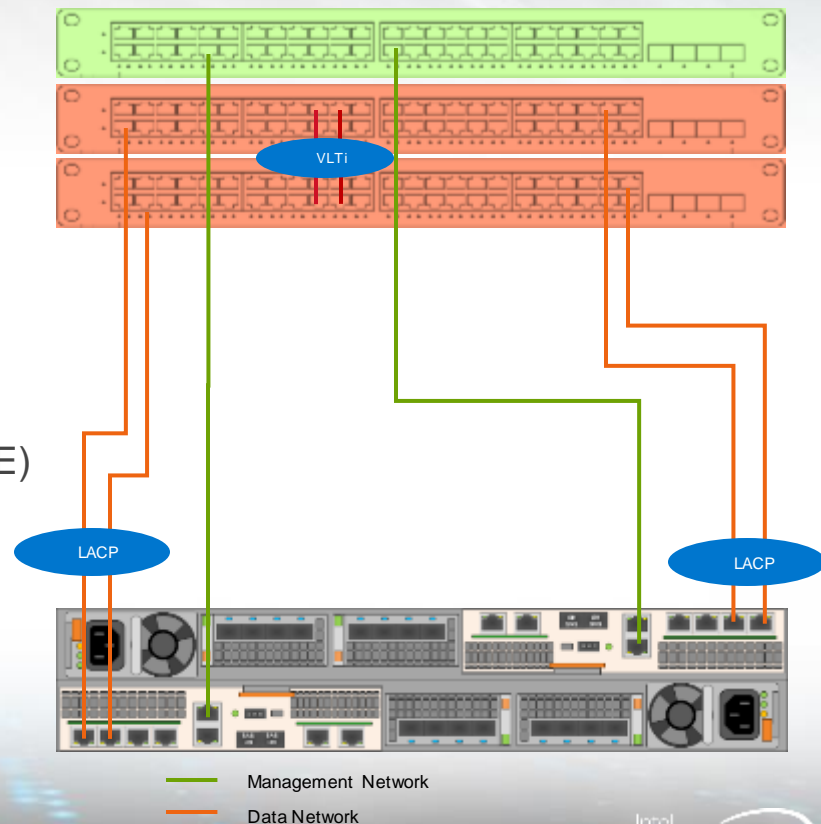
Performance and application segregation

PowerStore clusters are only supported for PowerStore T models in the initial release. Cluster support for PowerStore X models with AppSON will be available in a future release.

T Model Minimum Networking

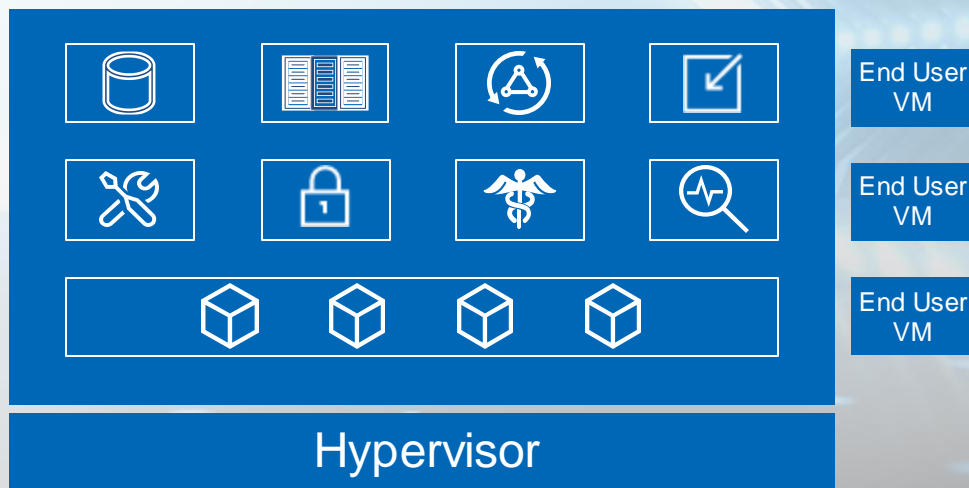
Cabling

- **Management Network**
 - 1x Out of Band (OOB) Management switch
 - 2x OOB Management is supported for HA
 - Onboard 1GbE Ports
- **Data Network**
 - 2x Top of Rack (ToR) Ethernet Switches (min 10GbE)
 - Bonded 4-Port Card Ports 0 & 1
 - Layer 2 interconnect
- **Cluster will alert on not having dual redundant switches**



PowerStore X

PowerStore OS



ESXi runs directly on purpose built hardware

- 2U2N
- All NVMe Base Enclosure
- Dual-socket Intel Xeon architecture

PowerStore OS runs in a virtual machine

- Referred to as the Controller VM

Capabilities

- SAN (FC/iSCSI)
- Vol (iSCSI)
- Embedded Applications (Virtual Machines)
- Currently, clustering of multiple X model appliances is not supported

AppsON Hypervisor Deployment – X Model

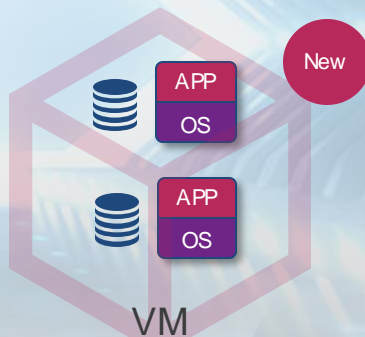
Traditional & Modern Workloads



PowerStore OS



VM



VM

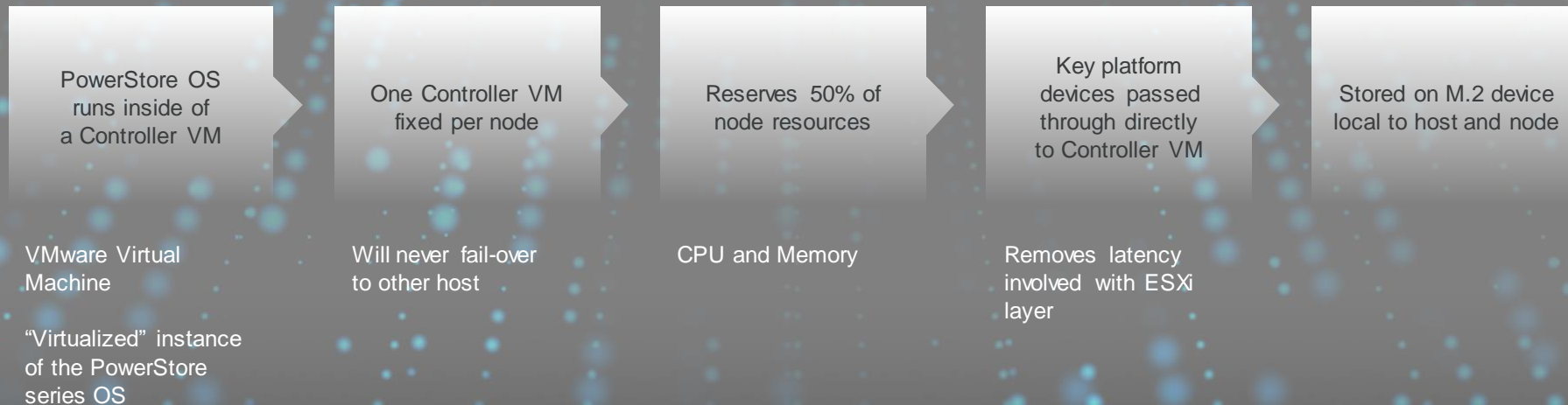
VMware ESXi



Run applications directly on the appliance

- Infrastructure apps
- Data-intensive, demanding workloads
- Still serve out storage externally
- VMware Direct Path

PowerStore X



PowerStore X



VMware ESXi 6.7 U2 installed directly onto each node

PowerStore X model appliance contains ESXi Cluster of two ESXi hosts

Requires existing vCenter and license for deployment

VMware components are automatically configured

Customer Virtual Machines will leverage PowerStore storage and data services

ESXi host per node

VMware vSphere Enterprise Plus license

Customer can purchase license or use existing

ESXi Cluster

vSphere HA

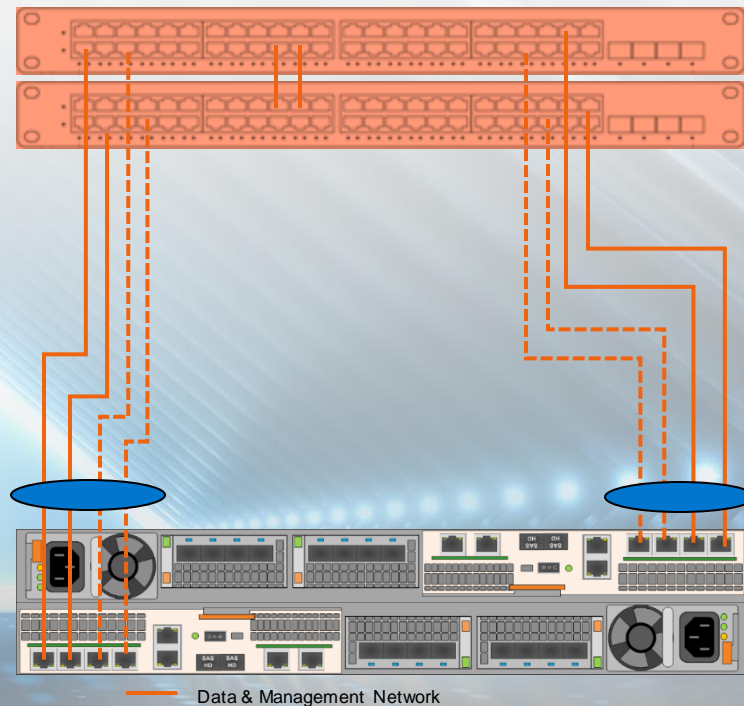
Distributed Virtual Switch



X-Model Minimum Networking

Cabling

- **In-Band Management**
- **Data Network**
 - 2x Top of Rack (ToR) Ethernet Switches
 - Bonded 4-Port Card Ports 0 & 1
 - Layer 2 interconnect
- **Cluster will alert on not having dual redundant switches**



All Inclusive Features



SNAPS/CLONES
+ APPSYNC BASIC



REPLICATION



UNIFIED INLINE
4:1 DATA REDUCTION



FEDERATED
MANAGEMENT



SEAMLESS
MIGRATION



EXPANDABLE
DYNAMIC POOLS



CLOUDIQ ANALYTICS



INHERENT FILE SHARING



CLUSTER RESOURCE
BALANCING



N-WAY SCALE



PERFORMANCE
POLICIES



DATA AT REST
ENCRYPTION



ANTI-VIRUS
ENABLER



EXTENSIBLE
INFRASTRUCTURE



BUILT-IN
INTELLIGENCE

Ultimate Deployment flexibility



PowerOne

Autonomous Infrastructure

*All Dell EMC Components
Declarative built-in automation for
VMware outcomes*

PowerStore



“PowerStore.SDS”



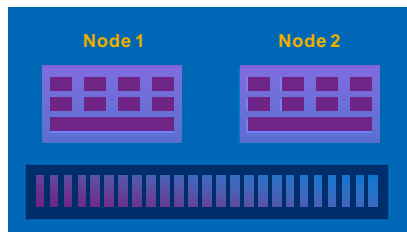
Coming in a Future Release

Anytime Upgrade program

Continuously modern without limits

Option 1

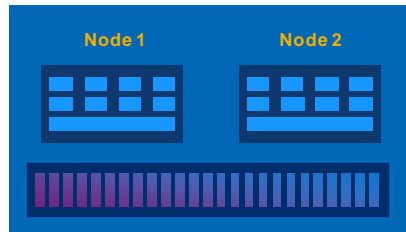
Gen1 → Gen2



DATA-IN-PLACE UPGRADE

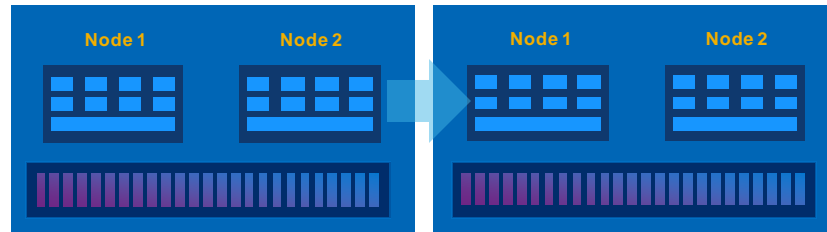
Option 2

Higher model (Gen1+)



Option 3

Scale out



CREDIT TOWARDS 2ND APPLIANCE

Flexible Upgrades | Anytime in contract | No renewal required

PowerStore Seamless migration

Xtremio*

Unity

SC Series

VNX Series

PS Series



Native tools included

Cross-platform solutions

* Road Map



Migrate without disrupting your business

Protection Policies

- A Protection Policy is a set of user defined rules used to establish local or remote data protection across storage resources
 - Users do not configure snapshot schedules or replication sessions on a storage object, but rather assign a Protection Policy to it
- A Protection Policy consists of rules which define what level of protection to apply

- Snapshot Rules:
 - Hourly snapshots
 - Daily snapshots
 - Weekly snapshots
- Replication Rules:
 - Asynchronous Replication
 - > 5 min RPO



Supported File Protocols

- NFS
 - NFSv3
 - NFSv4 - 4.1
 - Secure NFS
- SMB – Standalone or Domain Joined
 - SMB1
 - SMB2
 - SMB3 – 3.1.1
- Multiprotocol - Access using both SMB and NFS simultaneously
 - Automatically enabled when both the SMB and NFS protocols are enabled on the NAS Server
- FTP/SFTP



