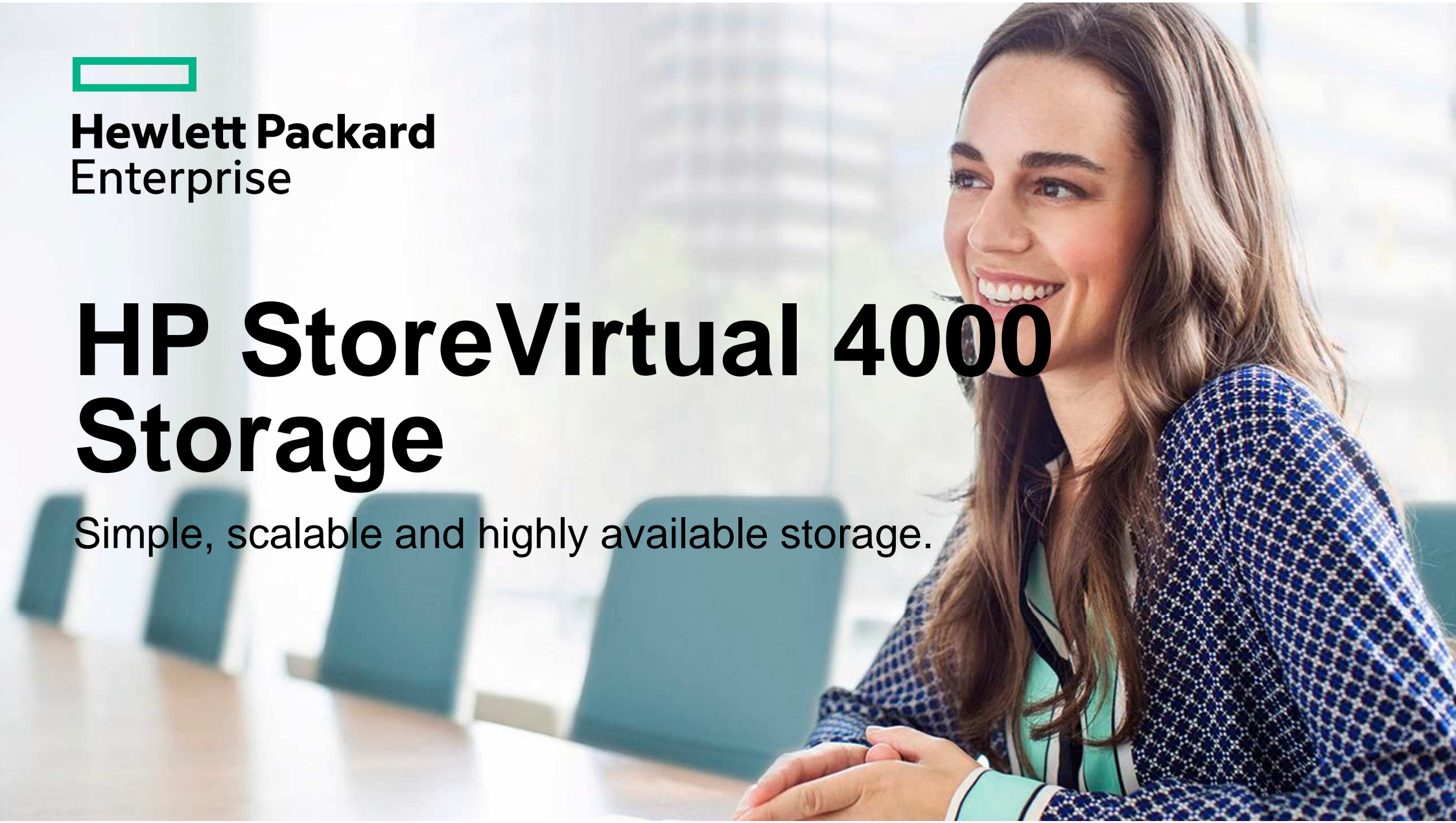




**Hewlett Packard
Enterprise**

HP StoreVirtual 4000 Storage

Simple, scalable and highly available storage.



HP StoreVirtual Portfolio

Software-defined with your workload in mind

When Value Matters

Cost optimized

Performance for SMB and ROBO



StoreVirtual 4330

When Performance Matters

SSD performance at a lower cost

Efficient use of SSD for SMB



StoreVirtual 4335 Hybrid

When Scale Matters

Up to 1.6 PB storage

Consolidate storage performance and capacity



StoreVirtual 4530, 4730

When Convergence Matters

Optimize virtualized deployment

Hyper-converged appliance



CS 2xx-HC StoreVirtual

Common Management

Simple | Scalable | Highly Available

Common Data Services

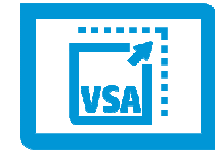


Choose your hardware

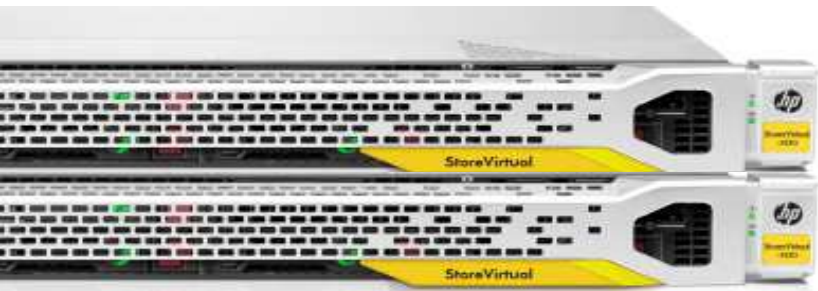
When Flexibility Matters

Unlock server storage

Choose your hypervisor



StoreVirtual VSA Software



Built for virtualization

HP StoreVirtual Technology

Simple

- Simple management for virtualized environments
- All-inclusive licensing with enterprise-class storage features
- Virtualization platform integration for increased functionality and ease of use

Scalable

- **Scale performance and capacity non-disruptively**
- Single storage pool with iSCSI and Fibre Channel connectivity

Highly Available

- **Proven Five 9's high availability and reliability**
- Multi-site availability with transparent failover
- Online data migration across systems, locations, and technology changes

HP StoreVirtual – All-inclusive enterprise features



Network RAID synchronous replication



Multi-site stretch cluster



Federated scale-out storage



Integrated disaster recovery



Peer Motion data mobility



Application integration



Automated sub-volume tiering



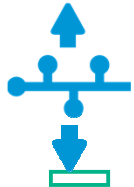
Linear scaling performance and capacity



Unconditional thin provisioning



High availability



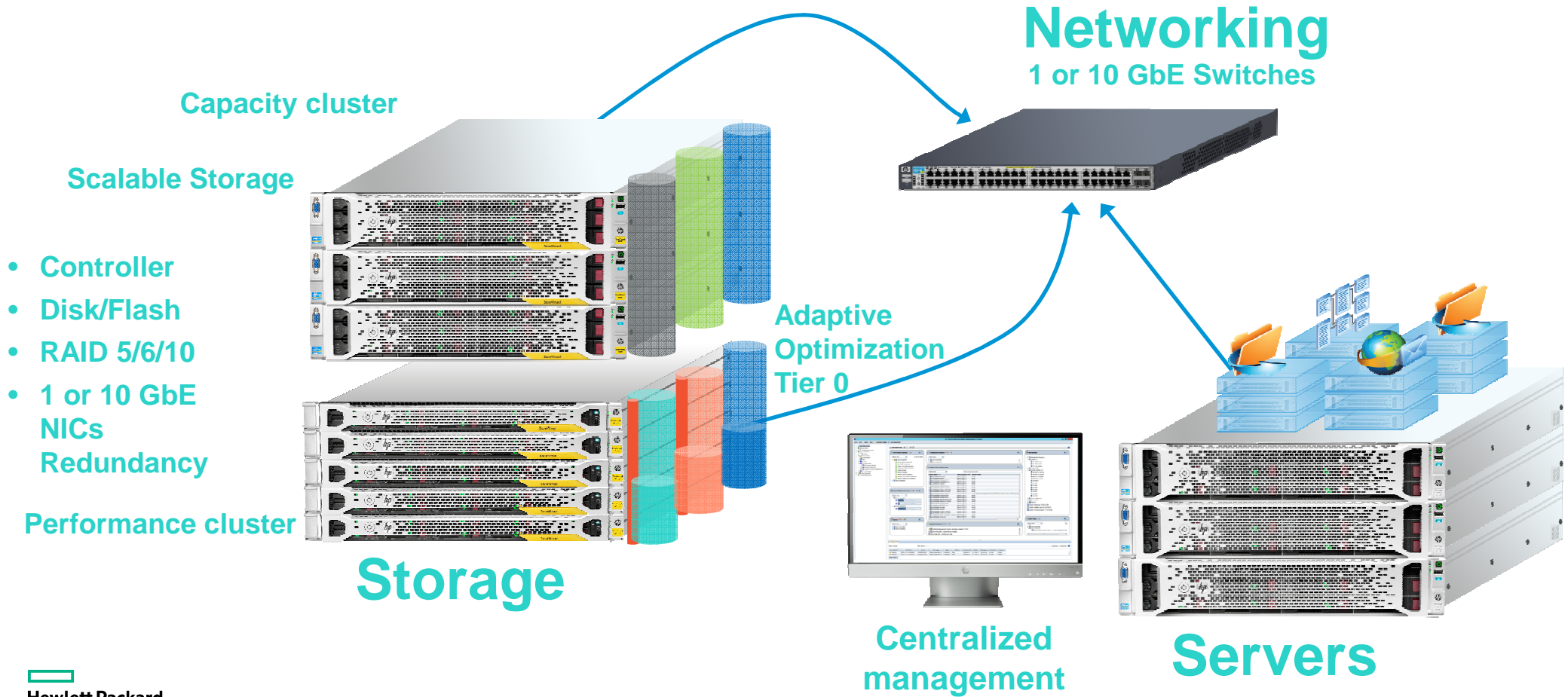
Multi-pathing



Space Reclamation

Clustered Storage Architecture

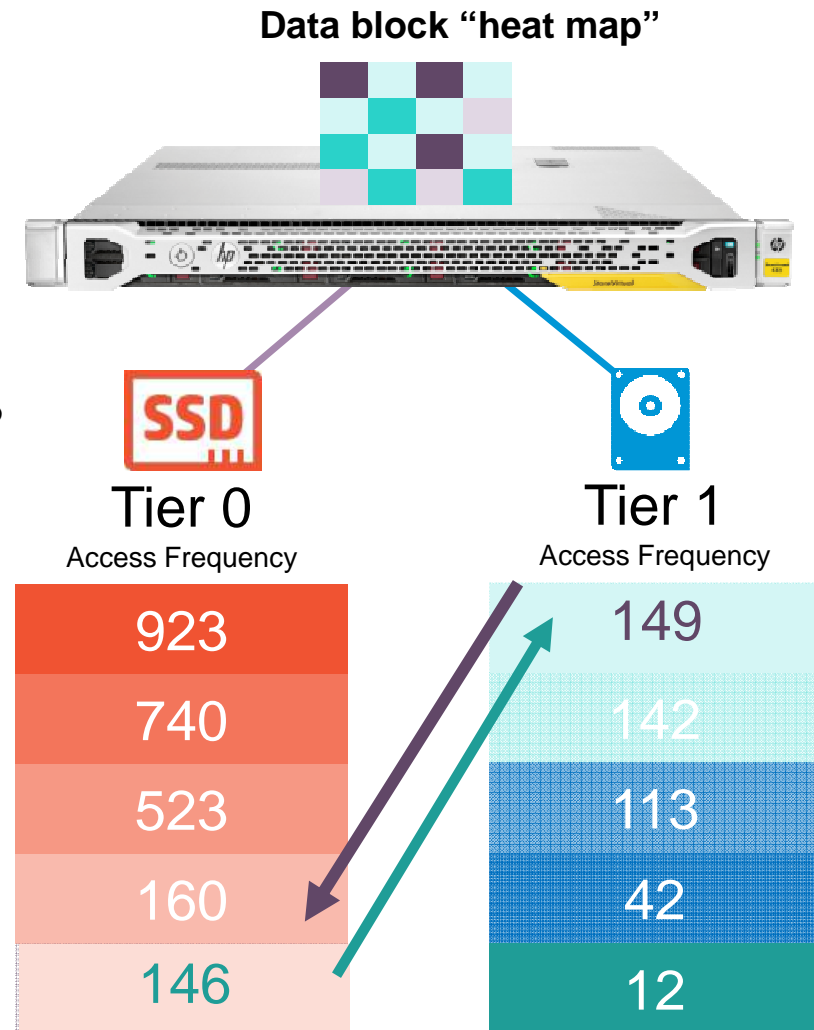
Buy for today, and then scale with demand



Performance at the right cost

For changing and unpredictable workloads

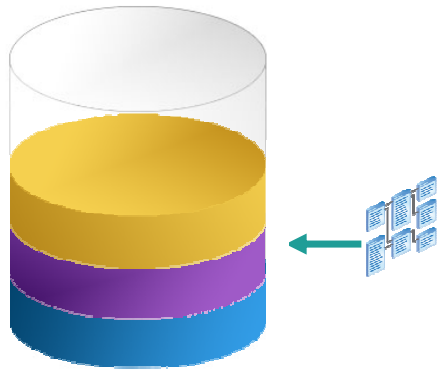
- Balancing cost and performance
- Dynamic movement between two storage tiers for optimized utilization
- Granular and efficient movement of data at 256KB
- Maintains “heat map” for blocks on all AO-permitted volumes
 - Frequently accessed blocks are promoted to Tier 0 (faster tier)
 - Less frequently accessed blocks are moved down to Tier 1 (slower tier)
 - Intelligently avoids contention between application IO and internal data movement



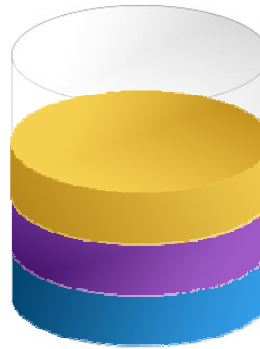
Maximize storage capacity

Space Reclamation- conserve and recover already allocated capacity to volumes

With automatic space reclamation integration for both VMware and Microsoft, you can reclaim space on both full and thinly provisioned volumes.

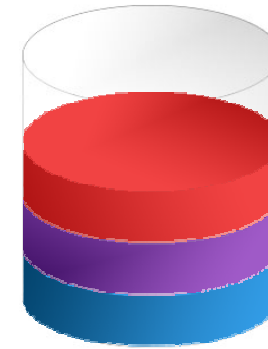


Write Data



Delete Data

After deleting data, the space doesn't automatically get returned to the usable capacity pool

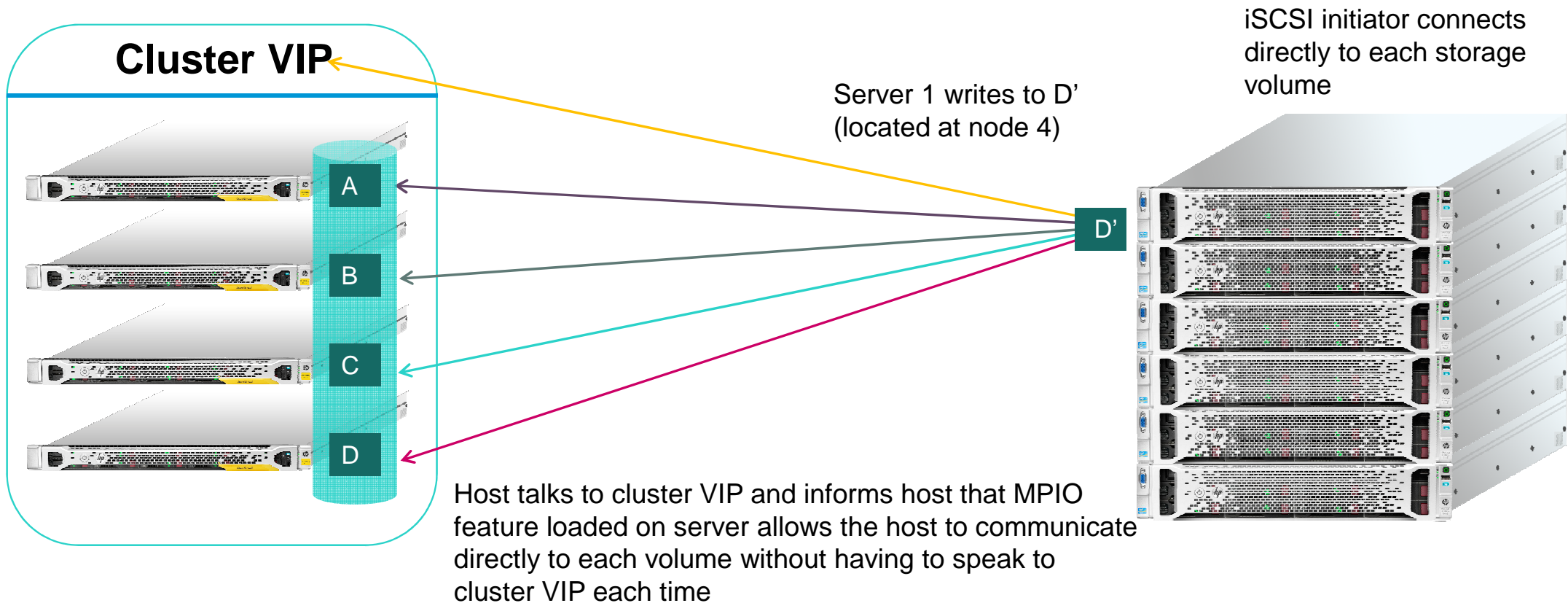


Space Reclamation

Reclaim unused storage from volumes. Space returns to the storage pool to maximize your data storage

Intelligently directing data

Increase the efficiency of your workloads by directly connecting with volumes



Real-time protection from site failure – Multi-site HA

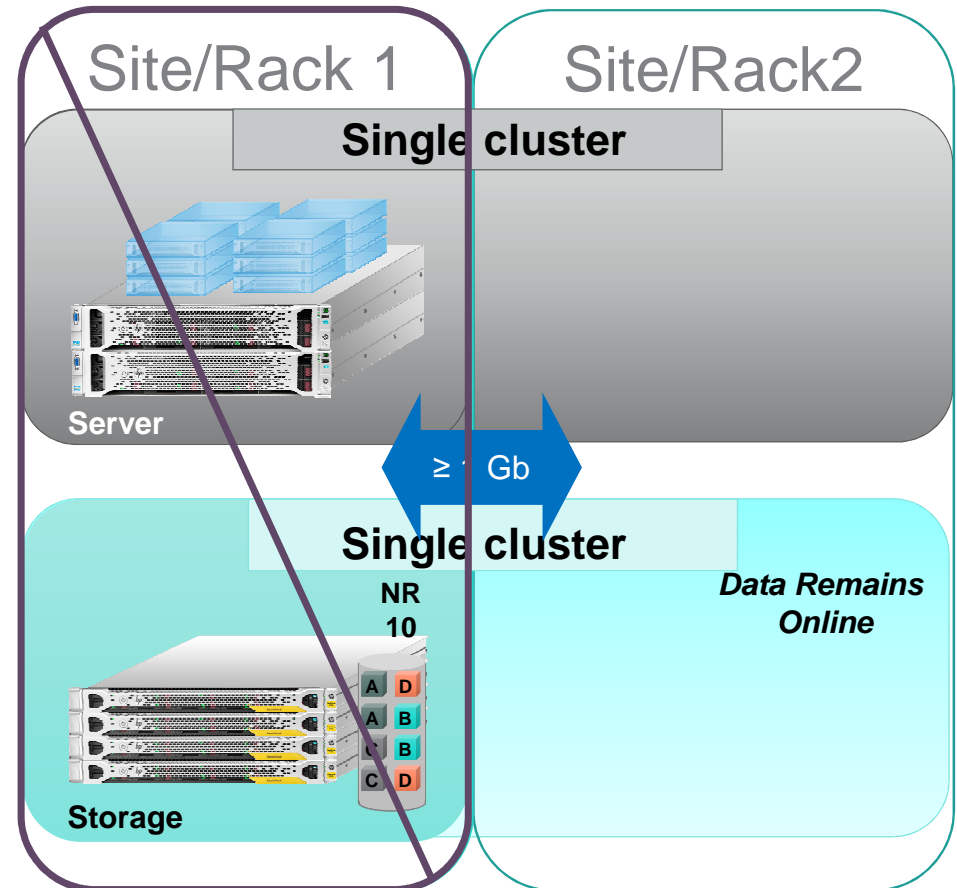
First iSCSI portfolio & Only VSA product with VMware vMSC certification

–Physical separation from:

- Component failure
- Node failure
- Failure in rack
- Failure of building
- Site or Data Center failure

–The next level of HA for virtualized environments with 99.999% availability

- All Network RAID 10 volumes are online and accessible simultaneously at both sites
- Volumes and VMs remain online in the event of a site failure
- Volumes automatically re-sync after failed site comes back online



HP StoreVirtual VSA – Software Defined Storage

- Pools your server based storage to create highly available scale out storage
 - **Open and extensible to any environment** – Any x86 server, multiple hypervisors
 - **Increased agility** – seamless data mobility across infrastructure and sites, both HW and SW defined
 - **Resiliency and risk reduction** – Built-in backup and disaster recovery



What's New for StoreVirtual VSA?

- **New capacity-based licenses** – 4TB, 10TB or 50TB; upgrade capacity licenses as well
- **Flexible licensing options** – 3 and 5 year license options available
- **New features** – Adaptive Optimization, SMI-S support for Microsoft System Center Virtual Machine Manager (SCVMM), REST API
- **Enhanced features** – Online Upgrades, Scriptable Installation, Application-managed snapshots

Software Defined Convergence – HP StoreVirtual VSA

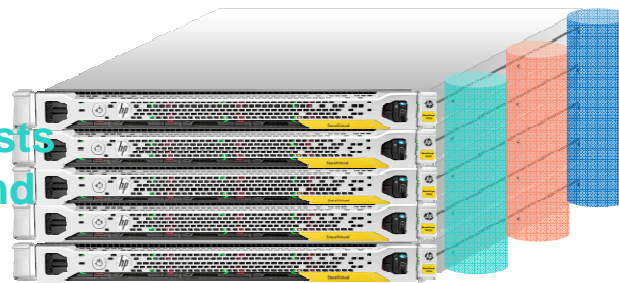
Buy for today, and then scale with demand

Turn servers into fully featured,
highly available arrays

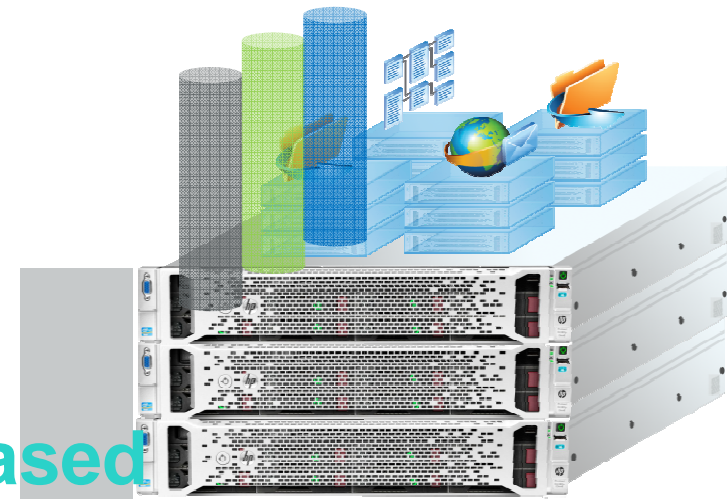
- Support any server certified for VMware vSphere or qualified Microsoft Hyper-V
- Convert existing direct-attached storage into StoreVirtual Storage

Keep storage acquisition costs
low by combining servers and
storage

- Reduce storage costs
- Reuse existing hardware
- Recycle existing infrastructure



Storage



based

Server

Where to use HP StoreVirtual VSA

Start small then grow

- Fully featured shared storage for virtualization
- Upgrade to StoreVirtual appliances online

Remote and branch offices

- HA storage for smaller VM environments
- Affordable disaster recovery

Testing sandbox

- Repurpose existing DAS or SAN
- Migrate to production StoreVirtual arrays online

Additional storage tier

- Create SSD tiers for high performance
- Build from blade or server disks

Cloud service providers

- Utilize capacity of existing infrastructure
- Easily adapt to changing customer demands

Simple management

Centralized Management Console – your single pane of glass for everything

Manage all systems

- From all locations
- For all models and generations
- Manage HW and SW defined together

SAN Status Page

- Single view of key data for all systems
- Best practice summary, available updates, alarms and events

Flexible options

- Wizard driven
- REST API

The screenshot displays the HP StoreVirtual Centralized Management Console interface. The main window is divided into several panels:

- SAN Status Page:** Shows a Best Practice Summary for StoreVirtual-MG1, including Disk Protection Using RAID, Disk RAID Consistency, Cluster-Level Data Protection, Volume-Level Data Protection, Volume Access, Network Bonding, Network Bond Consistency, Network Flow Control Consistency, and Network Frame Size Consistency.
- Configuration Summary:** Provides a summary of configuration for StoreVirtual-MG1 and StoreVirtual-MG2.
- Volume Data Protection Level:** A table listing various volumes and their protection levels. The table has columns for Volume Name, Data Protection Level, and Volume Status.
- Cluster Utilization Summary:** Shows utilization for StoreVirtual-MG1 (24% SV-4630-cluster) and StoreVirtual-MG2 (8% SV-4730-cluster, 33% SV-VSA-Cluster).
- Alarms:** Displays a list of alarms with columns for Severity, Date/Time, Event, Message, Type, Name, Component, Cluster, Management, Hostname, and Source.
- Upgrades Summary:** Shows upgrade information for the Centralized Management Console and StoreVirtual-MG1.
- Active Tasks:** Lists active tasks, such as 'Creating Application Man...'

Severity	Date/Time	Event	Message	Type	Name	Component	Cluster	Management	Hostname	Source
Warning	4/30/14 3:12:42 PM GMT	E0200002:ED...	Email Configuration S...	Configurat...	Email	Storage Sy...	SV-VSA-Cl...	StoreVirtual...	sv-vs1	System
Warning	4/30/14 3:12:45 PM GMT	E0200002:ED...	Email Configuration S...	Configurat...	Email	Storage Sy...	SV-VSA-Cl...	StoreVirtual...	sv-vs3	System

Easily identify how to optimize your system

Best Practice Analyzer provides:

- Status updates on your storage pool configuration
- Recommendations for actions to improve your storage pool reliability and performance

The screenshot shows the HP StoreVirtual Centralized Management Console interface. The main window displays a 'Summary' section with a table of configuration metrics. The table has columns for 'Name' and 'Summary'. The data includes metrics for 'Volumes & Snapshots', 'sum of iSCSI sessions and FC active paths', 'Storage Systems in Management Group', and 'Storage Systems in Cluster' for two different clusters: 'SV-4630-cluster' and 'SV-4730-cluster'. Below the summary, there is a 'Best Practice Summary' section with a table listing various best practices and their status.

Name	Summary
Volumes & Snapshots	4.0
sum of iSCSI sessions and FC active paths	113
Storage Systems in Management Group	4
Storage Systems in Cluster 'SV-4630-cluster'	2
Storage Systems in Cluster 'SV-4730-cluster'	2
Volumes & Snapshots	6
sum of iSCSI sessions and FC active paths	9
Storage Systems in Management Group	4
Storage Systems in Cluster 'SV-VSA-Cluster'	4
VSA2014Benchmark	

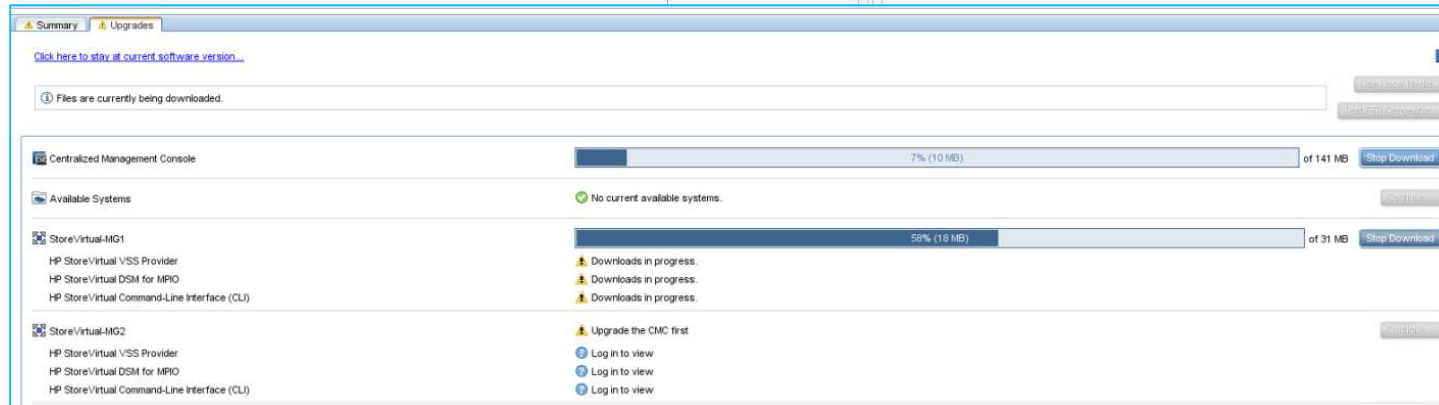
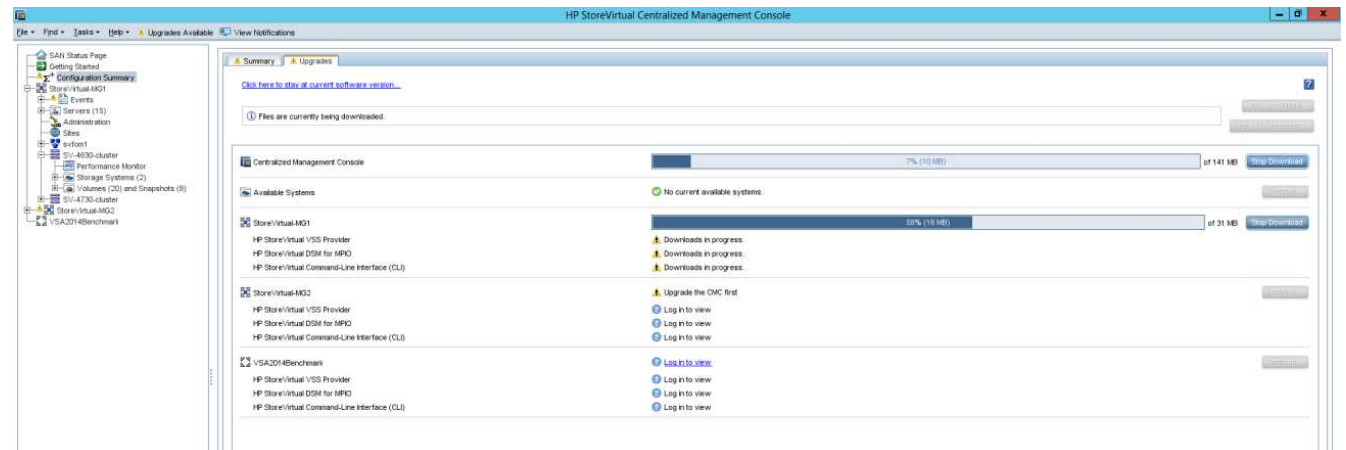
Best Practice Summary:
The Best Practice summary provides information about SAN configurations that can increase the reliability or performance of the SAN. This summary highlights specific best practices that apply to this SAN. Click the Help button to learn more about each best practice and how to take corrective action.

Name	Status	Summary	Help
StoreVirtual-MG1	⚠️		?
Disk Protection Using RAID	⚠️		?
Disk RAID Consistency	✅		?
Cluster-Level Data Protection	✅		?
Volume-Level Data Protection	✅		?
Volume Access	✅		?
Network Bonding	✅		?
Network Bond Consistency	✅		?
Network Flow Control Consistency	⚠️	(1) - SV-4730-cluster	?
Network Frame Size Consistency	✅		?
StoreVirtual-MG2	✅		?
VSA2014Benchmark	🔗		?

Online upgrades made easy

One click upgrades

- Checks upgrades automatically
- No disruption to applications
- Automatically enforces upgrade best practices

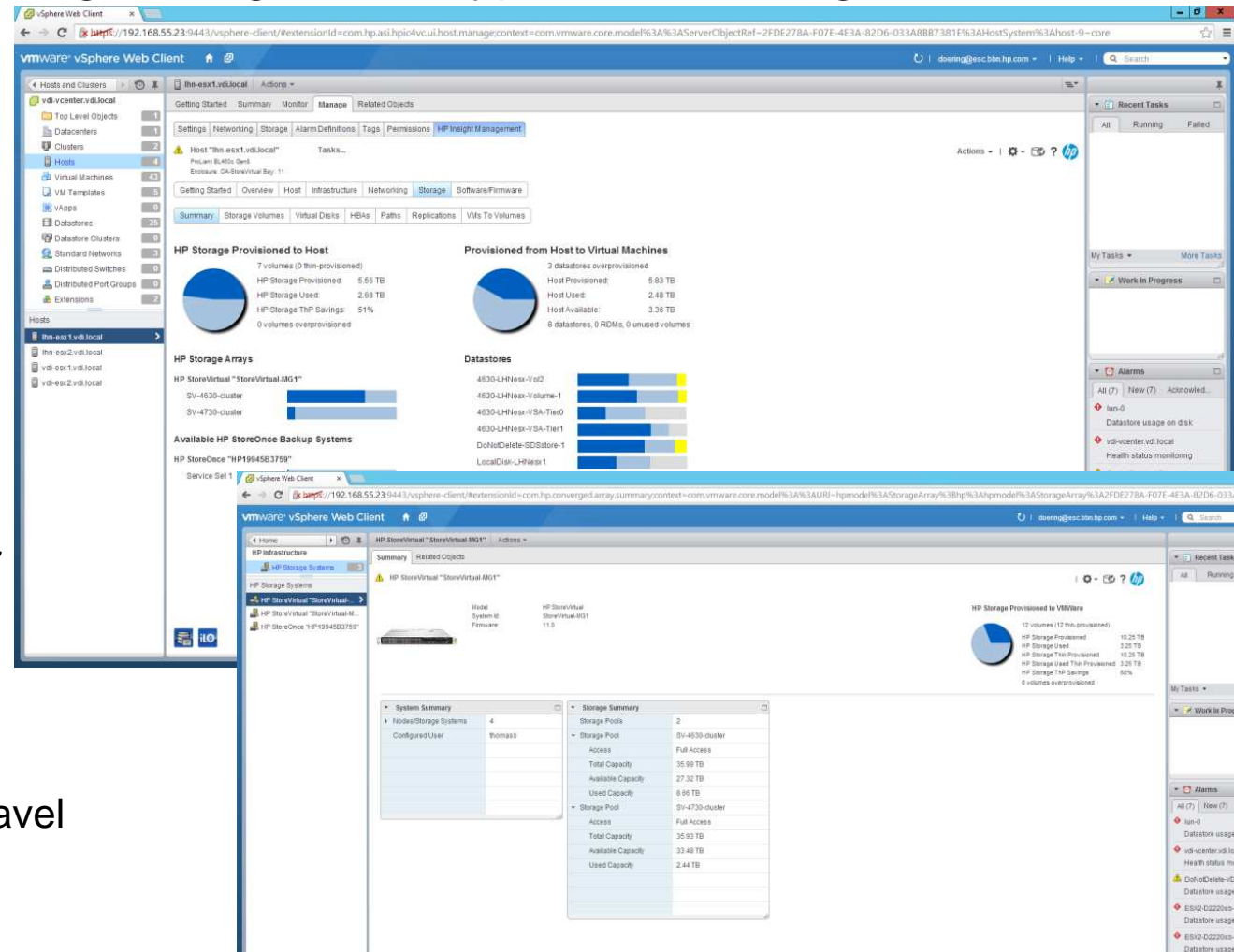


HP OneView for vCenter Server 7.8

Easily monitor and control your storage using native hypervisor management

Integrated monitoring and storage provisioning

- Provision storage for vSphere via OneView for vCenter Server
- Provision storage for Hyper-V in Microsoft System Center Virtual Machine Manager and monitor the hardware in System Center Operations Manager
- Manage your StoreVirtual from anywhere
 - Reduce system admin expenses and travel



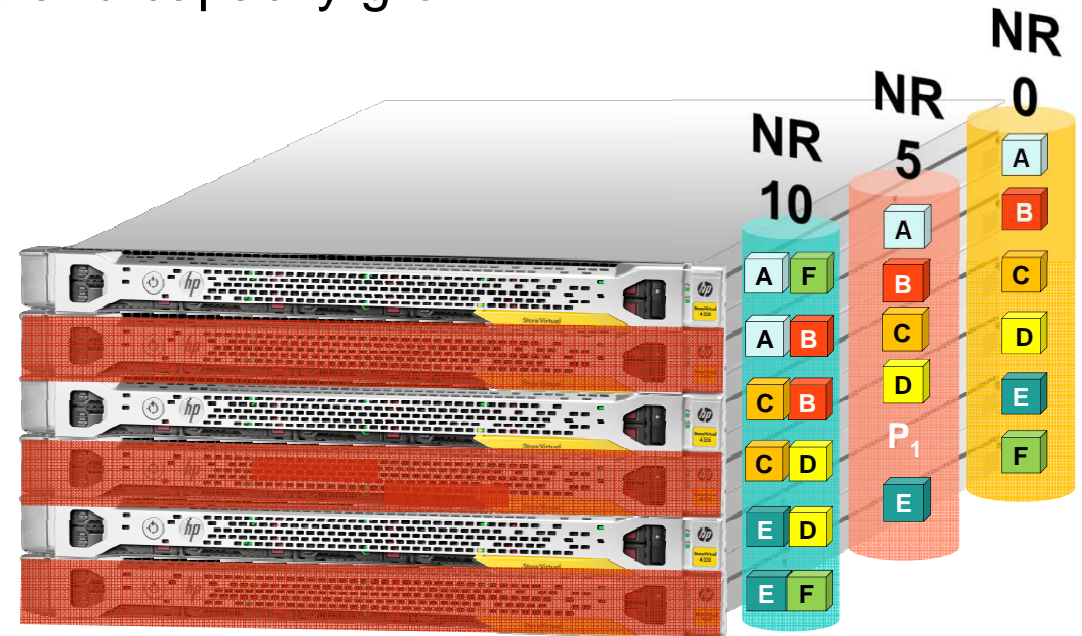
Costs with remote management
Hewlett Packard Enterprise

Highly available to business demands

Add predictable application performance and capacity growth

–Proven Five 9's (99.999%) high availability and reliability

- Multi-site availability with transparent failover
- Online data migration across systems, locations, and technology changes



Seamless and non-disruptive data mobility

Investment protection without disruption

StoreVirtual Peer Motion

With six clicks move volumes seamlessly between

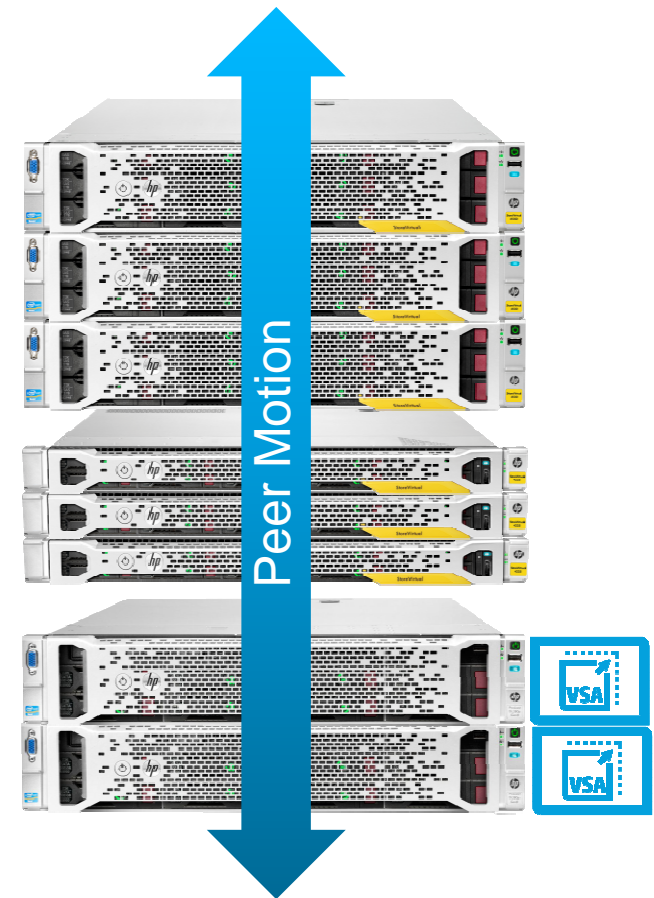
- Storage systems
- Clusters
- Locations
- Disk types
- Form factors
- Different generations
- Physical and virtual platforms

In a matter of minutes swap out/in entire clusters for non-disruptive technology upgrade

All data remains online and available

Demo:

<https://www.youtube.com/watch?v=2hmyQQlvH4o&feature=youtu.be>



Thank you

