The Benefits of Hyper Converged Systems for Your Organization

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Chief Technology Officer

Daly

Today's enterprise requires infrastructure that is as agile as the business needs
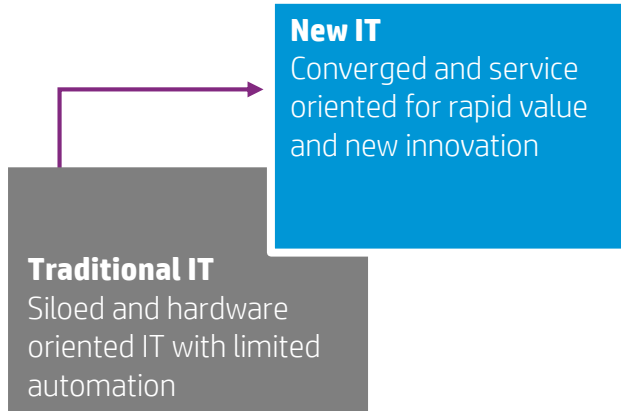
Business value

Hybrid infrastructure is fast, agile, simple and efficient in service delivery

Delivered as general-purpose, dedicated, physical infrastructure

Technology centric

Manual

Silo'ed

Converged

Hybrid

Software-defined

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hp
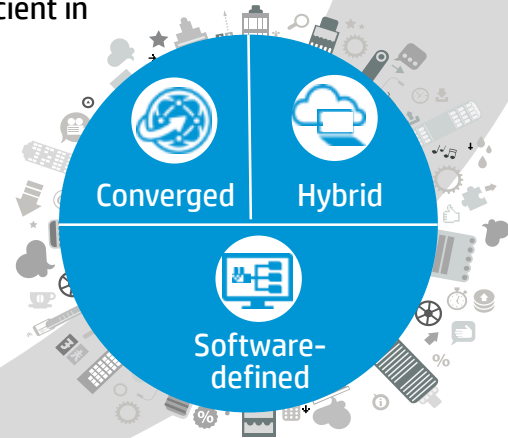
Organizations are transforming and IT requirements continue to shift

Hyper-converged is an example of the New IT

New IT
Converged and service oriented for rapid value and new innovation

**Traditional IT**
Siloed and hardware oriented IT with limited automation

Hyper-converged can accelerate transformation

- Virtualization
- Small ITaaS Projects
- Virtual Desktops
- Remote Office IT

Transform
to a hybrid infrastructure

Enable
workplace productivity

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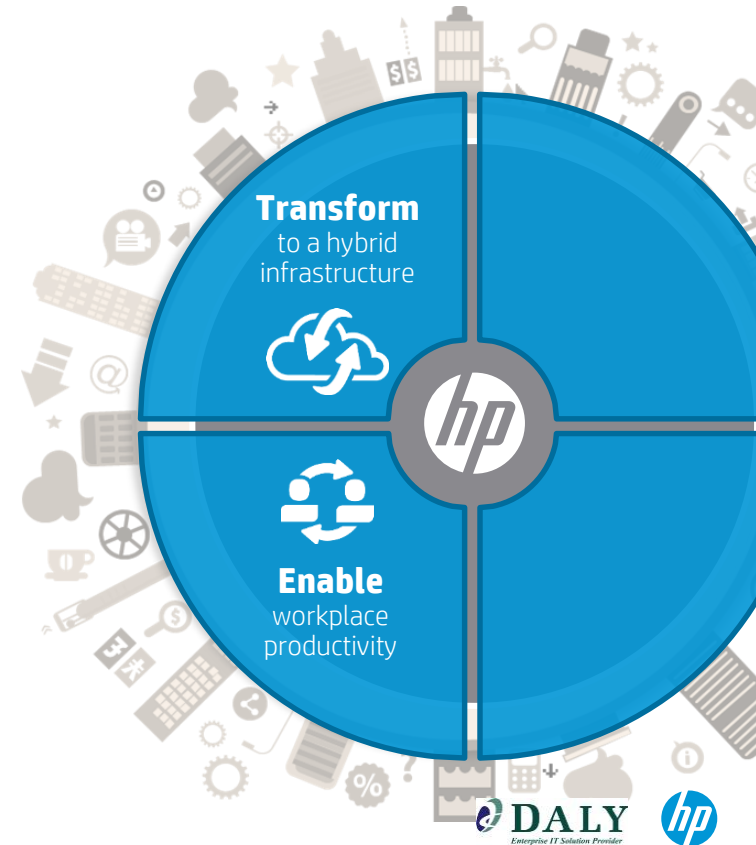
Hyper-convergence to support new business requirements

Simplify operations. Align costs. Gain rapid time-to-value.
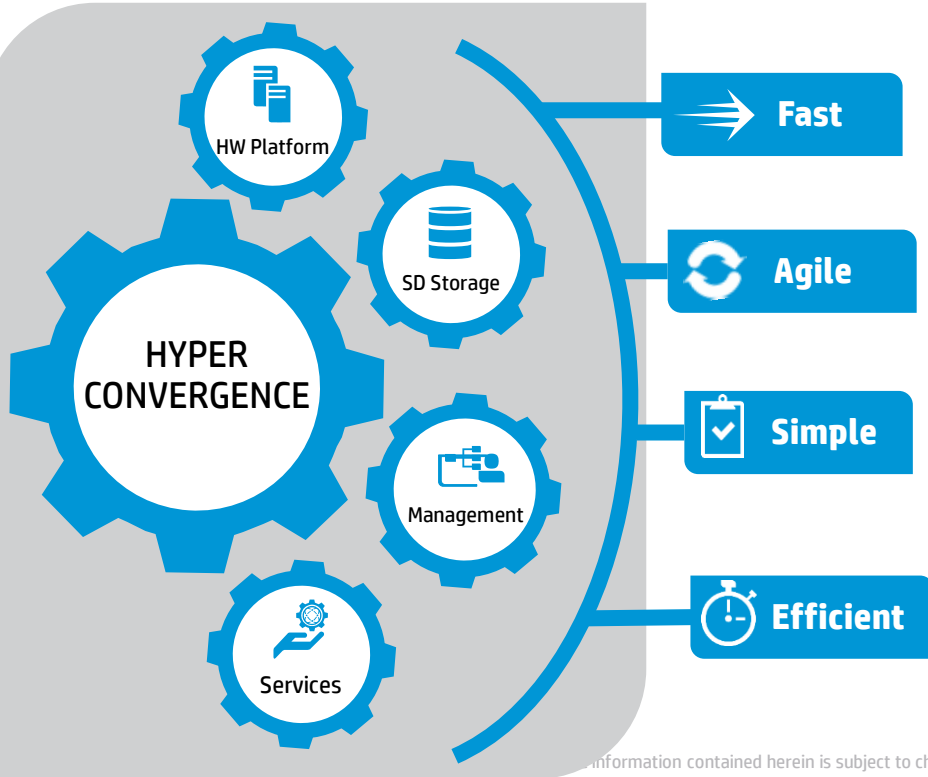
Fast
Rapidly develop and deliver new services and growth

Agile
Flexibly address new & existing services opportunities

Simple
Eliminate management complexity & reduce project risk

Efficient
Increase IT operation efficiency

Target environments

Hyper-convergence accelerates and simplifies IT deployments for IT generalists

Medium-sized businesses
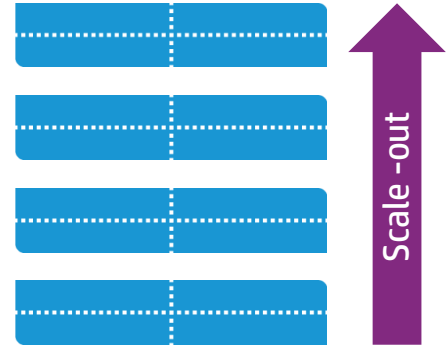Start small, scale compute and storage as you go

Enterprise ROBO
Centrally managed, formulaic IT deployment

Line of Business
Enterprise-ready solution as infrastructure for a specific application

Simple scale-out, up to **4 appliances** in less than 15 minutes

Scale -out

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Deploy Applications - Not Infrastructure

Applications with high compute requirements and high I/O density benefit from hyper-convergence

Medium-sized business

Infrastructure services, manufacturing systems,
back office applications, dedicated virtual desktops

Enterprise ROBO

Infrastructure services, directory services, print services,
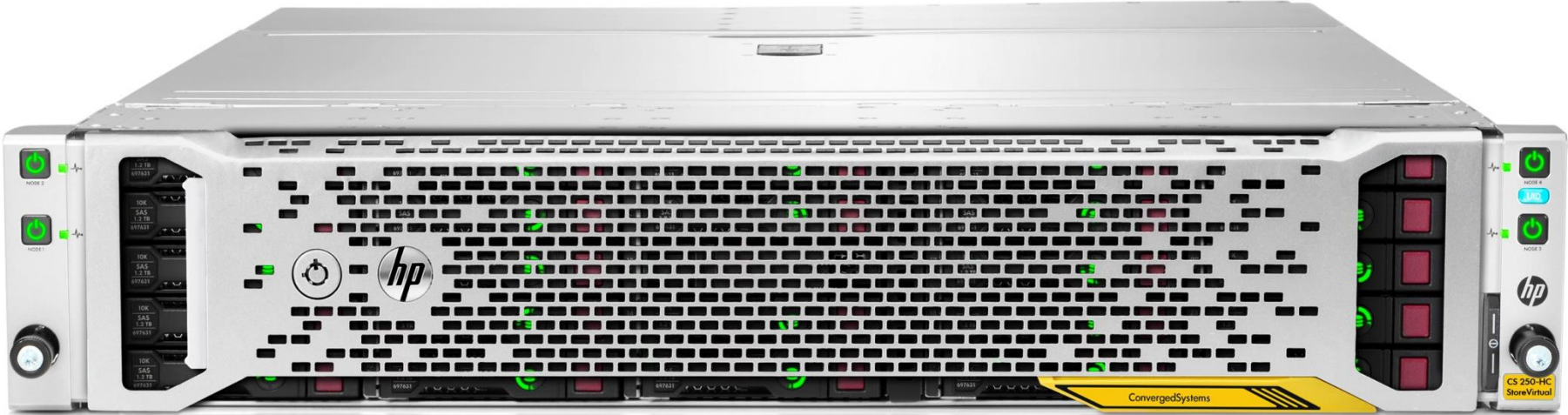small virtualized file services, point-of-sale applications

Line of Business

Virtual desktops for task workers, virtualized database and
web servers, development and test environments
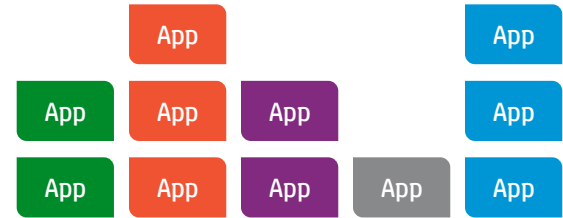
Simple building block for the
software-defined datacenter

The newest member of the ConvergedSystem 200-HC StoreVirtual family is here

The all-new HP ConvergedSystem 250-HC StoreVirtual

Faster time to value

Fast

Deploy in minutes

- **HP OneView InstantOn** startup and expansion wizard
  - 5 minutes on keyboard, 15 minutes total deployment time
  - Includes IP addressing, server and storage clustering and system startup

Turnkey system

- **Factory integrated** appliance with compute, storage, networking built on trusted HP and VMware technology
- More performance with powerful **ProLiant Gen9** servers
- No SAN required with **HP StoreVirtual VSA**

Easy expansion

- **Simplified expansion** experience through HP OneView InstantOn
- **Linear scaling** architecture accommodates changing workloads
- Scale-out to eight appliances in same management zone*

* Multiple clusters is an advanced setup, available through HP StoreVirtual Centralized Management Console.

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Simplicity as a core tenet

Simple

Managed by IT generalists

- Reduce IT costs and resources
- Accelerate response to changes in business
- Customer-installable, -expandable, -serviceable

Familiar management experience

- VMware vSphere and vRealize Operations integration avoids management silos
- Flexible VMware licensing model
- Appliance component integration into vCenter console

Global support

- Worldwide support for all hardware and software by HP and Partners
- Use HP Installation and startup service for remote locations

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9

Reduced cost and risk

Efficient

Purpose-built appliance

- Delivers 4x the compute in 75 percent less space than traditional rack servers
- Power and cooling savings with smaller footprint
- Predictable performance and costs as you scale

Optimized for business continuity

- 99.999 percent high availability with Network RAID10
- Investment protection without disruption with StoreVirtual Peer Motion
- VMware Metro Storage Cluster (vMSC) certified for disaster recovery

Flexible expansion

- Connect internal compute to existing external storage resources
- Provision additional capacity from StoreVirtual-based systems
- Open and extensible to heterogeneous environments

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Virtualization. Optimized. Delivered.

## Purpose-built virtualization appliance

Infrastructure building blocks: optimized compute
with software-defined storage, simple to deploy and manage.

Simple, straight-forward out of box experience

- 15 minutes of installation time for VMware vSphere environment
- Same experience regardless whether first or fourth appliance
- Easy configuration of all components: vSphere, StoreVirtual

Powerful compute and storage

- Scale out to up to eight appliances* in one management zone
- Linear scalability by adding more appliances
- Full vMSC support for stretched vSphere and StoreVirtual clusters
- Customer-installable, -expandable, -serviceable
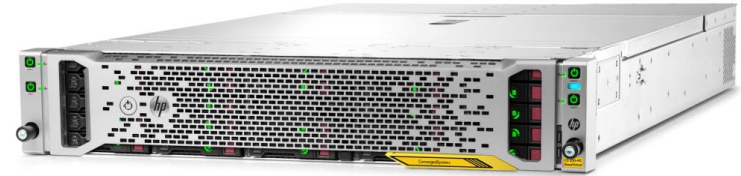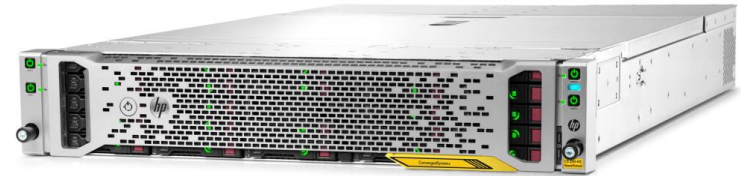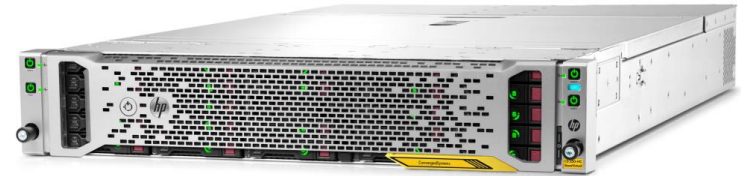
Scale-out

Fastest time to value

Simple start-up and VMware integrated management

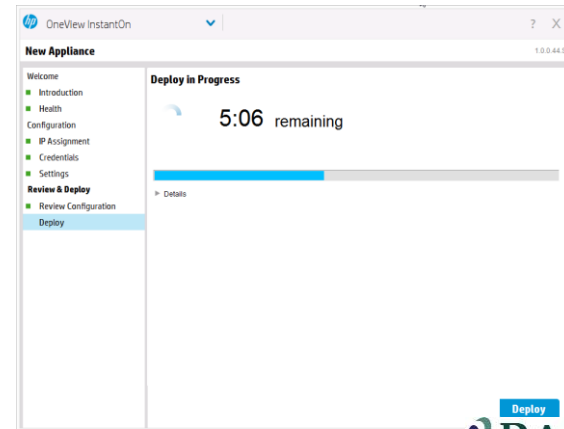### Initial installation with HP OneView InstantOn

- First and only step of the easy configuration of hypervisor and StoreVirtual components
- After installation/expansion highly available hypervisor and StoreVirtual clusters
- About 5 minutes of keyboard-time*, 15 minute total deployment time
- Get past infrastructure deployment quickly

Day-to-day management with HP OneView for vCenter

- System monitoring, VM and storage statistics
- Storage provisioning for new and expanding data stores
- Deploy, clone and instantiate VMs from templates

HP OneView for vCenter Server
for day-to-day management operations
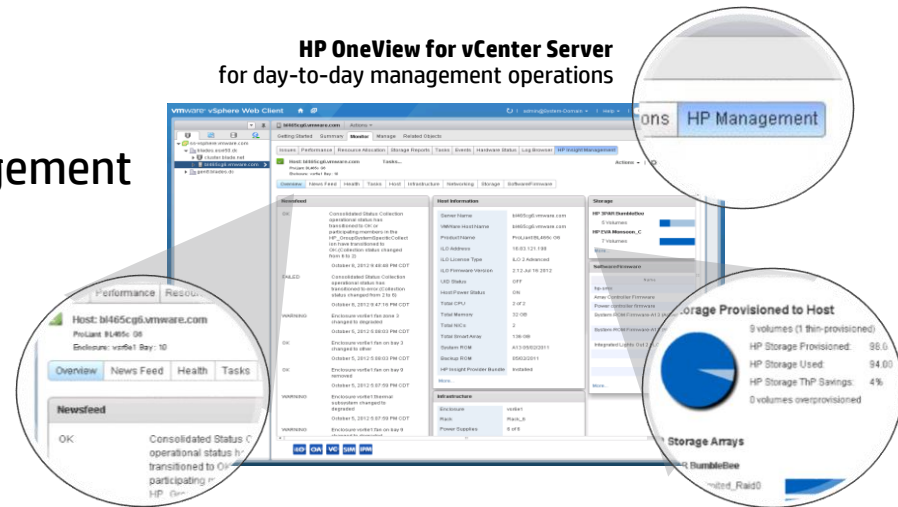
HP OneView InstantOn for initial configuration and expanding existing installations of CS 250-HC StoreVirtual

* Based on HP internal testing

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StoreVirtual Availability means Always Online

vSphere for best-in-class virtualization paired with StoreVirtual Availability

Proven track record for high availability

- Based on 8 years experience in software-defined storage
- StoreVirtual technology demonstrates consistent Five 9s of storage availability
- Network RAID replicates data synchronously across nodes and appliances, never skips a beat
- Storage for virtual machines remains online, can be paired with VMware High Availability or Fault Tolerance
- Stretched clusters* can be configured fluidly and span Availability Zones (appliances, racks or data centers)

Virtual machines can remain online in a transparent failover

Unavailable

Single zone cluster

Zone 2

Stretched cluster across Availability Zones
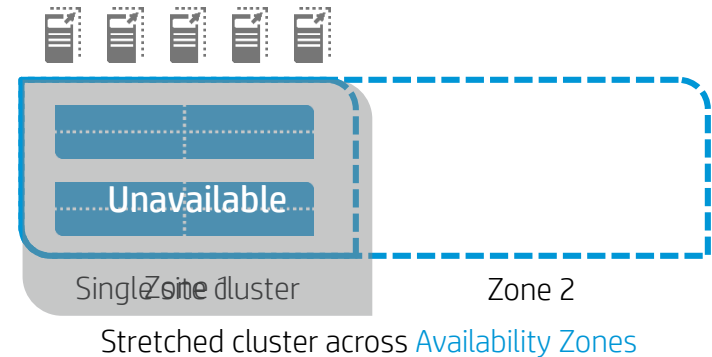
Configuration is **vSphere Metro Storage Cluster** certified

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Predictable scalability for compute and storage

Linear scalability is in StoreVirtual's DNA

	1	2	3	4
Server VMs	144	288	432	576
Desktops	640	1280	1920	2560
OLTP IOPS	16900	33800	50700	67600

# of CS 242-HC StoreVirtual Appliances
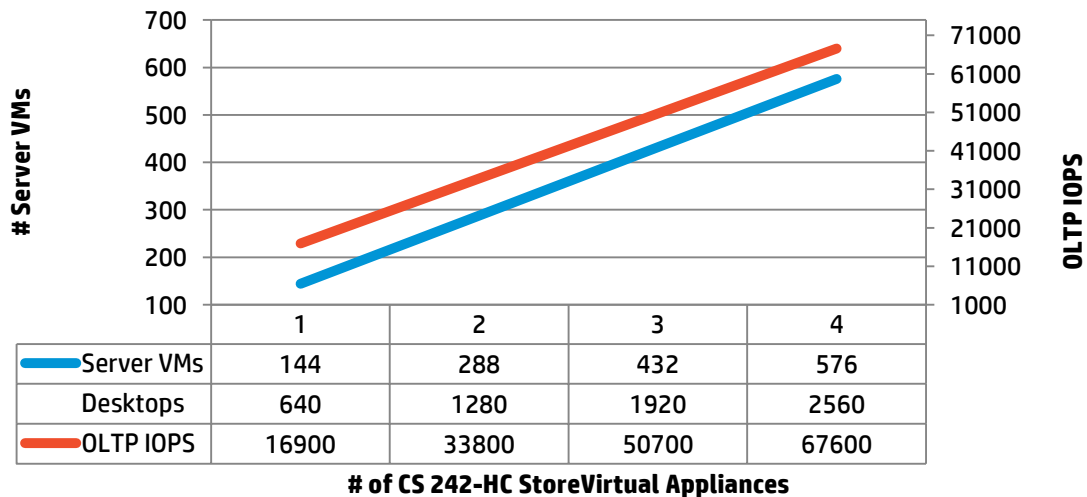
Server VMs   Desktops   OLTP IOPS

Final CS 250-HC StoreVirtual performance data not available; based on four node CS 242-HC StoreVirtual testing. Number of server VMs with 2 vCPU, 4 GB vRAM and 70 IOPS per VM, OLTP performance on SSD tier for 8k, random, 60% read. Test results apply to synthetic test workloads, depend on environmental variables, actual results will vary.

What's New - HP CS 250-HC StoreVirtual

Freedom to customize with new configure-to-order model

Increased capability
- Greater performance with new HP Apollo 2000 Gen9 servers

Improved flexibility
- CTO model facilitates more diverse workload requirements
- Support for both VMware vSphere 5.5 and 6.0

Lower entry cost
- 3-node configuration enables better fit for ROBO and medium-sized businesses

Improved integration
- Centralized vCenter simplifies the management of multiple deployments

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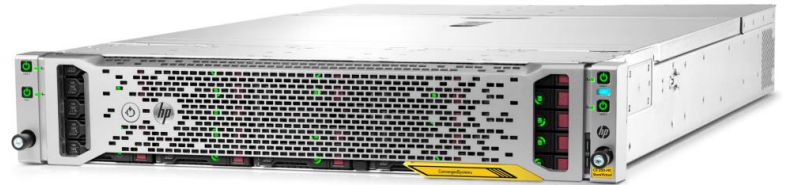
Compact, powerful server platform

HP ConvergedSystem 250-HC StoreVirtual

- Compact 2U platform with up to 4 compute/storage nodes based on latest HP Apollo Gen9 technology

- **3 or 4 identically configured nodes** with
  - (2) Intel Xeon E5-2640v3 or E5-2680v3 processors
  - 128GB, 256GB or 512GB memory
  - (2) 10GbE SFP+ network connectivity
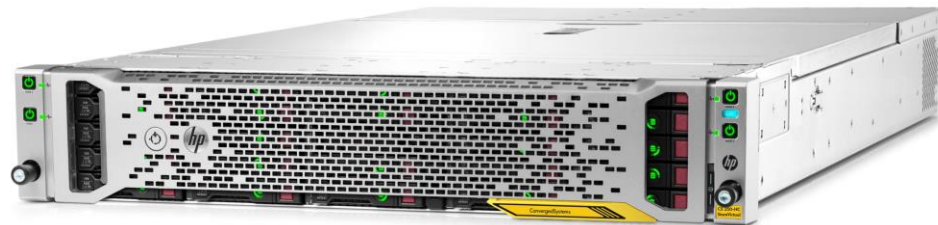
Hybrid Storage Configuration	Capacity Configuration
4x 1.2TB SAS SFF + 2x 400GB SFF SSDs ~ 7.5TB HA storage for 4-node systems ~ 5.5TB HA storage for 3-node systems	6x 1.2TB SAS SFF ~ 11.5TB HA storage for 4-node systems ~ 8.5TB HA storage for 3-node systems

- 1-year 9x5 NBD on-site warranty, 1-year 9x5 software support*

- 4- and 3-node ConvergedSystem 250-HC StoreVirtual come with redundant fans and require 200-240V power supply (included)

- Co-existence with current ConvergedSystem 200-HC StoreVirtual (ConvergedSystem 240-HC and 242-HC StoreVirtual models)

Plug and play – 8x network, 2x power, go!

2x 1400W
Power Supplies

2x 10GbE for
primary network connectivty
(SFP+ ports)

HP SmartArray P440
(with 4GB cache)

4

2

3

1

Serial/USB/Video
(fits HP 36-pin Dongle)

USB 3.0 connector
(for USB-based Factory Reset)

2x 1GbE
RJ 45 ports
(not used)

Dedicated
iLO4 port

1GbE for initial installation
of first appliance
(RJ 45 port)
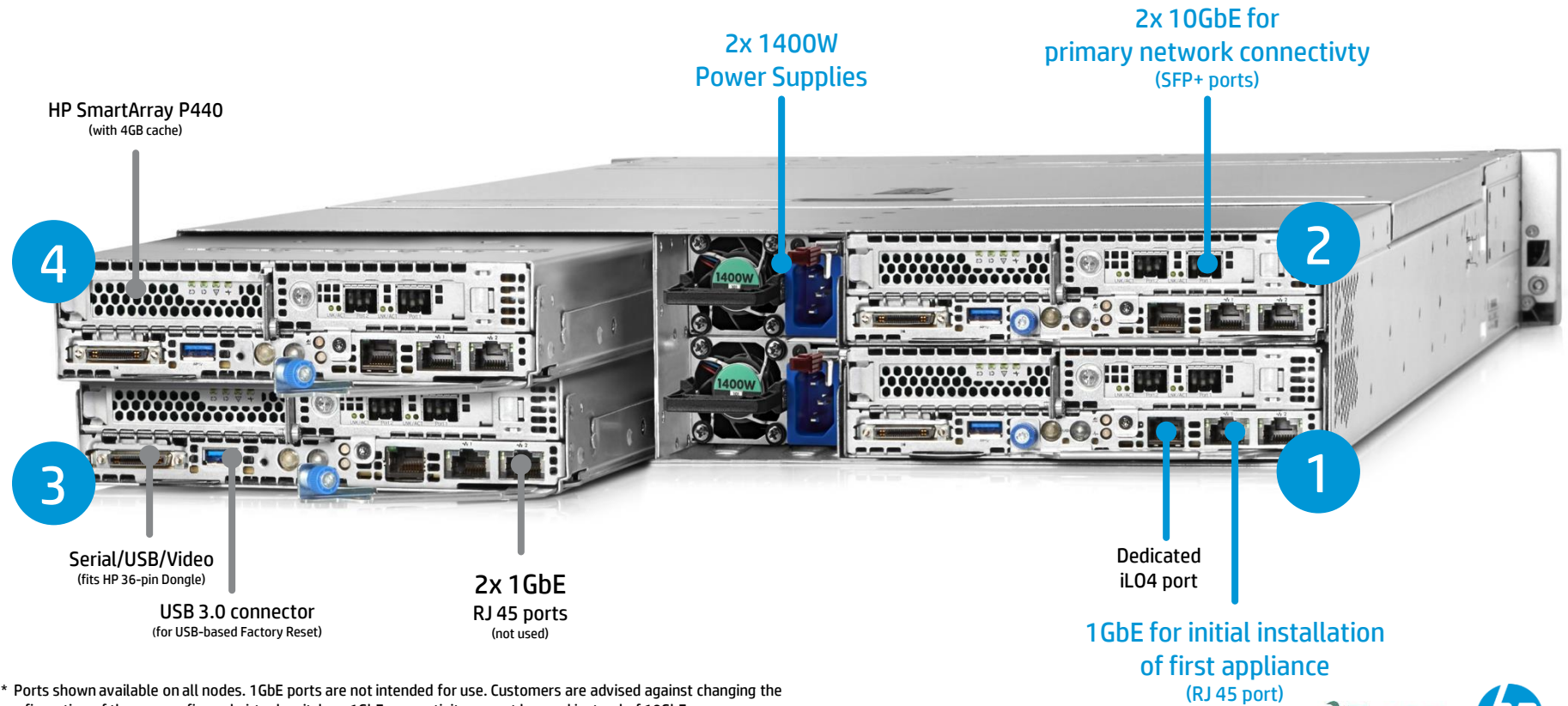
* Ports shown available on all nodes. 1GbE ports are not intended for use. Customers are advised against changing the configuration of the pre-configured virtual switches. 1GbE connectivity cannot be used instead of 10GbE.

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Drive Assignment

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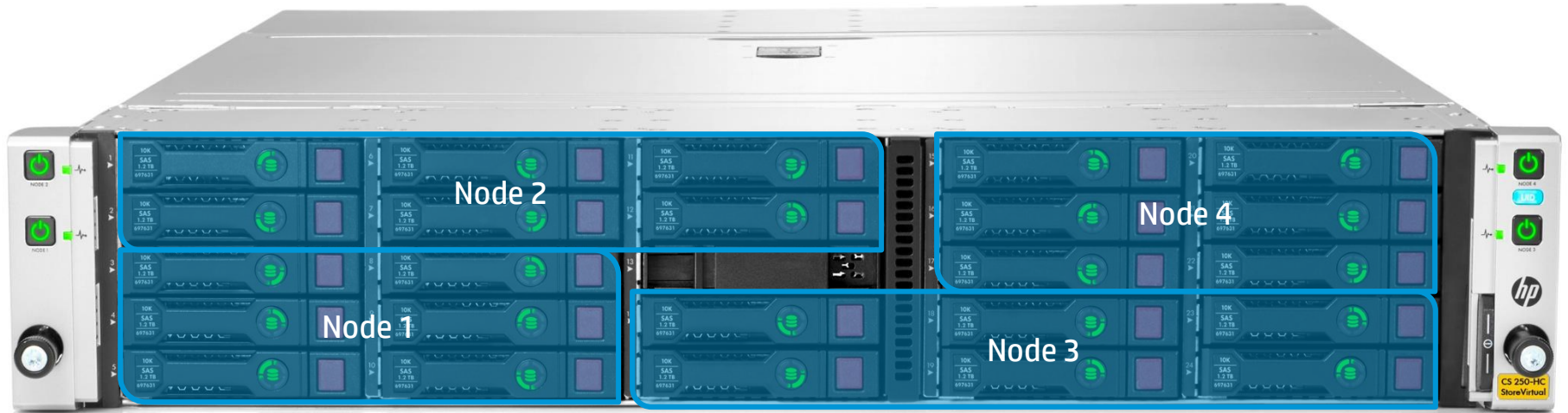
Scalability in single Availability Zone

Easy, linear scalability by appliance

Up to four appliances

- OneView InstantOn automates the expansion to up to four appliances in one management zone in one Availability Zone

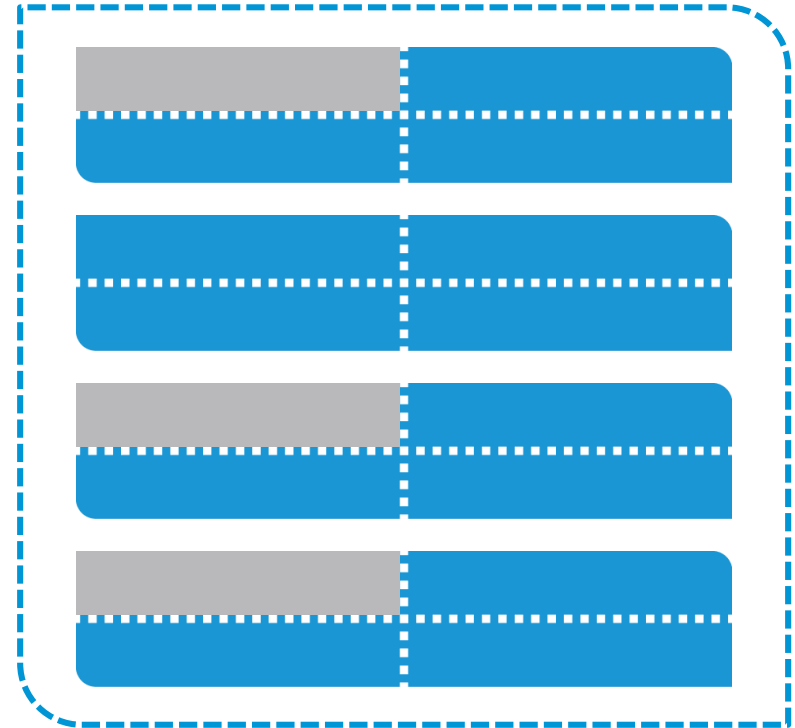- Starting configuration:
  1 appliance (M0T03A) with
  3 or 4 nodes (M0T04A and options)

- Incremental configuration:
  1 appliance (M0T03A) with
  3 or 4 nodes (M0T04A and options)

Software ready-to-go for true 'plug-and-play'

All software pre-installed, "no assembly required"

Hyper-converged systems from HP provides virtualized compute and HA storage with rich data services.

Pre-integrated software components

- VMware vSphere 5.5 or 6.0*
  (upgradable, mix not supported)
- HP StoreVirtual VSA with LeftHand OS 12.0
  for clustered, highly available storage
- HP OneView InstantOn 1.2
- HP OneView for vCenter 7.7

3–4 nodes

| Mgmt VM | App | App | App | App |

| VSA | StoreVirtual |

| VMware vSphere |

| HP ConvergedSystem 250-HC node |

SSD SSD

* **vSphere and vCenter licenses must be purchased for the CS 200-HC StoreVirtual**. Valid software license required for pre-installed software. Customer with ELA and vCloud Air Partner can reuse their licenses on this platform. When including VMware Horizon licenses on the same quote, Horizon components are not pre-installed on the system.

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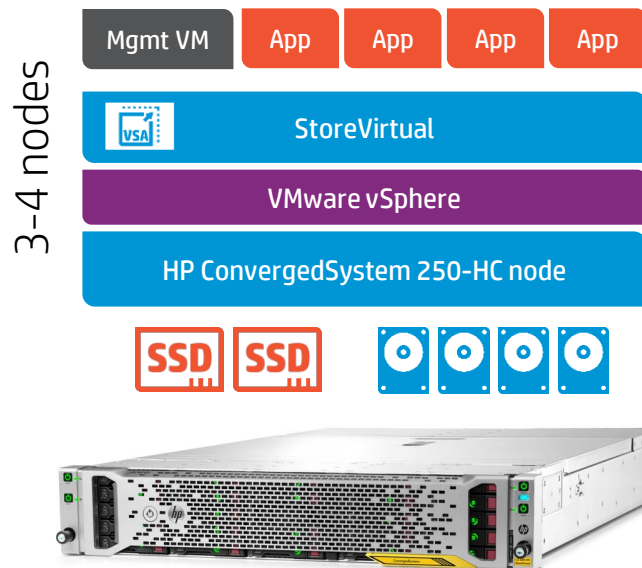
Centralized management with OneView for vCenter

Management for multi management zone and remote site deployments

Simplify larger deployments

- Integration with centralized instance of VMware vCenter
- New option in OneView InstantOn during initial deployment to use "Remote vCenter" (instead of built-in instance)
- Centralized virtual machine management, incl. virtual machine and storage provisioning
- Monitoring of multiple management zone
- Advanced storage features will require HP StoreVirtual Centralized Management Console on management system
- Works in the context of best practices and configuration limits for remote management for vSphere

VMware vCenter with **OneView for vCenter**

Administrator sets up new appliances or expands installations with 'Remote' vCenter in **OneView InstantOn**
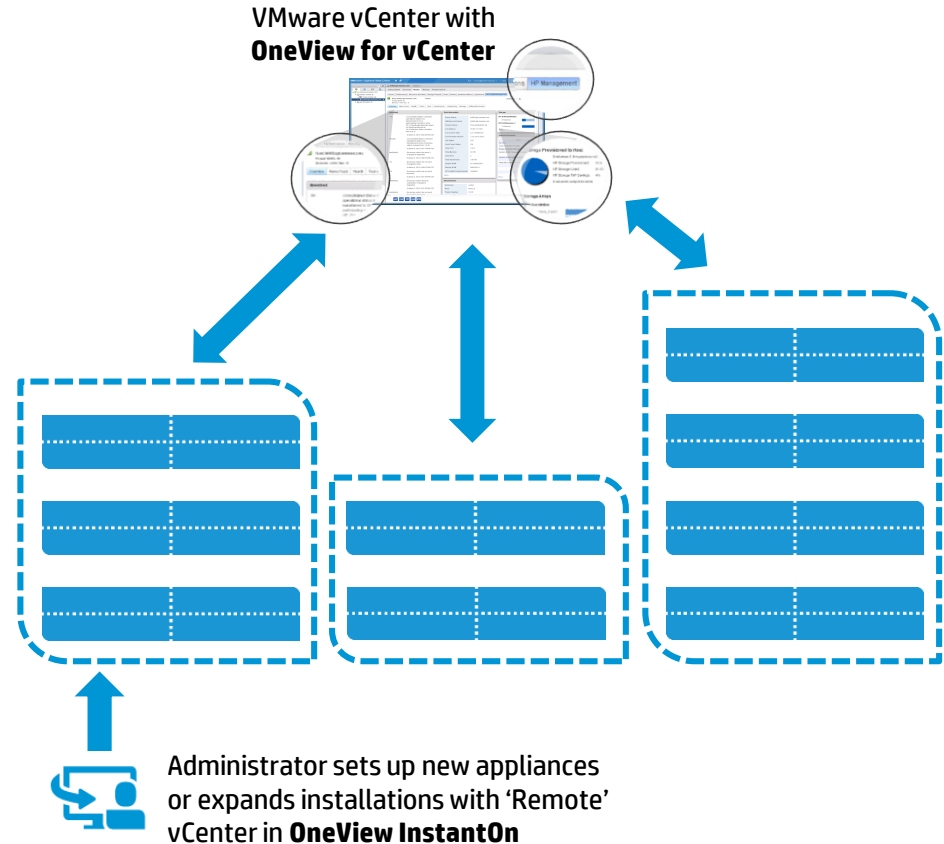
Ready, ~~Set~~, Go for Disaster Recovery

Business Continuity across the globe

Easy-to-setup replication

- Remote Copy replicates snapshots to any StoreVirtual-based storage
  - Disaster Recovery to a stand-by data center
  - Remote Office/Branch Offices with need for replication

- Replication via **space-efficient snapshots**

- **At your pace:** Manually triggered, scripted or scheduled*

- Meets flexible RTO as low as **30 minutes**

- **Automated failover** by VMware Site Recovery Manager and HP StoreVirtual Site Recovery Adapter

Virtual machines can be brought online from replicated volumes

Unavailable

Remote Copy

Data center with CS 250-HC StoreVirtual

DR site with HP ProLiant running VMware vSphere and HP StoreVirtual VSA

Your workloads. Protected.

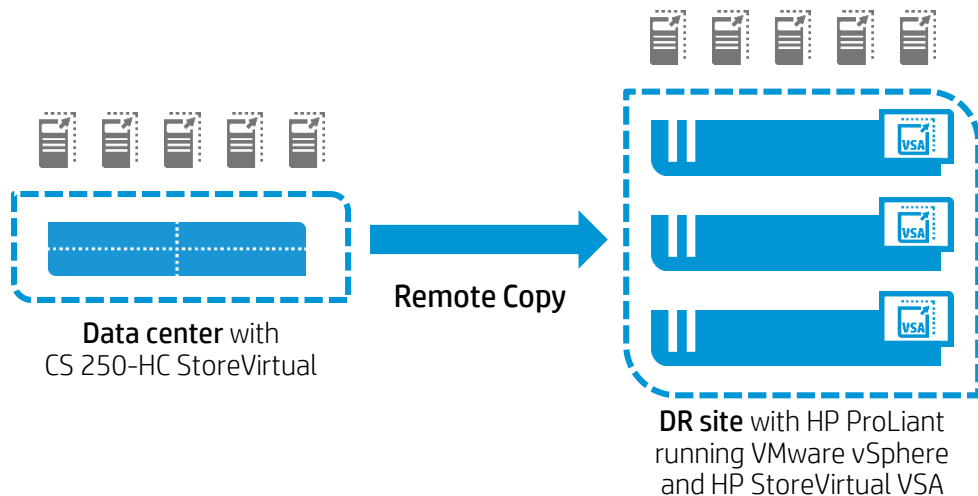## StoreVirtual VSA Data Protection Shield

Exclusive offer for CS 250-HC customers

Save ~50%* compared to a 3-pack of StoreVirtual VSA 4TB licenses

- Easy to setup replication: Leverage Remote Copy from CS 250-HC StoreVirtual to any StoreVirtual-based solution**

- StoreVirtual VSA Data Protection Shield includes three StoreVirtual VSA licenses each with 4TB

- Three year license - includes three years of software support***

Virtual machines can be brought online from replicated volumes

Data center with CS 250-HC StoreVirtual

Remote Copy

DR site with HP ProLiant running VMware vSphere and HP StoreVirtual VSA

* Pricing subject to finalization
** Advanced setting, available through HP StoreVirtual Centralized Management Console
*** Software support during business hours (9x5); can be upgraded with Foundation Care and Proactive Care

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Solution compares*   Leverage existing servers

HP solution Replicate to any StoreVirtual-based system	**HP CS 250-HC StoreVirtual**	**HP ProLiant with StoreVirtual VSA**
	• 3-node CS 250-HC StoreVirtual (E5-2640v3, 128GB, 4x 1.2TB HDD, 2x 400GB)	• 3x existing virtualized servers
	• StoreVirtual technology	• StoreVirtual VSA Data Protection Shield
	• VMware vSphere Enterprise and Proactive Care	• VMware vSphere
Solution price **$130,914**	**$129,664**	**$1,250****

Nutanix solution Replicate to a 2nd and equal system	**Nutanix NX-3360-G4**	**Nutanix NX-3360-G4**
	• Nutanix NX-3360-G4 (E5-2630v3, 128GB, 4x 1TB HDD, 2x 480GB SSD)	• Nutanix NX-3360-G4 (E5-2630v3, 128GB, 4x 1TB HDD, 2x 480GB SSD)
	• VMware vSphere Enterprise and Platinum Plus Support	• VMware vSphere Enterprise and Platinum Plus Support
Solution price **$348,296**	**$174,148**	**$174,148**

Solution compares*

HP solution Replicate to any StoreVirtual-based system	**HP CS 250-HC StoreVirtual**	**HP ProLiant with StoreVirtual VSA**
	• 3-node CS 250-HC StoreVirtual (E5-2640v3, 128GB, 4x 1.2TB HDD, 2x 400GB)	• 3x HP ProLiant DL360 Gen9 (E5-2630v3, 128GB RAM, 4x 1.2TB SAS)
	• StoreVirtual technology	• StoreVirtual VSA Data Protection Shield
	• VMware vSphere Enterprise and Proactive Care	• VMware vSphere Enterprise and Proactive Care
Solution price **$211,664**	**$129,664**	**$82,000**
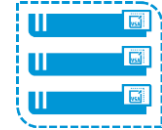
Nutanix solution Replicate to a 2nd and equal system	**Nutanix NX-3360-G4**	**Nutanix NX-3360-G4**
	• Nutanix NX-3360-G4 (E5-2630v3, 128GB, 4x 1TB HDD, 2x 480GB SSD)	• Nutanix NX-3360-G4 (E5-2630v3, 128GB, 4x 1TB HDD, 2x 480GB SSD)
	• VMware vSphere Enterprise and Platinum Plus Support	• VMware vSphere Enterprise and Platinum Plus Support
Solution price **$348,296**	**$174,148**	**$174,148**

*According to a list price of the CS 250 and the IDC price book list price of Nutanix 3360 G4

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Scaling the environment for growth

StoreVirtual VSA Data Protection Shield for CS 250-HC StoreVirtual customers

To start:

StoreVirtual VSA Data Protection Shield includes three StoreVirtual VSA licenses with 4TB capacity each

- Leverage Remote Copy feature to replicate to StoreVirtual-based solution
  - Choose how many workloads need to be protected
  - Setup as manually triggered, scripted or scheduled

To Grow:

- Grow seamlessly
  - Add more storage later by adding more drives or StoreVirtual VSAs

- 4TB VSA licenses are upgrade eligible to 10TB and 50TB licenses
  - Purchase a 4TB to 10TB upgrade license and apply at any time
  - Save 10% when upgrading to three 10TB licenses later

Appliance simplicity with server flexibility

1-2-easy – Ordering the next-generation hyper-converged solution

- Discrete options for simple yet customizable configuration
- Choices apply to all four nodes in the system for optimally balanced configurations
- CS 240-HC StoreVirtual and CS 242-HC StoreVirtual equivalent configurations for compatibility

HP ConvergedSystem 250-HC StoreVirtual System

Base system

Quote licenses:
[ ] VMware vSphere Enterprise
[ ] VMware vSphere Enterprise Plus
[ ] VMware vSphere for Desktop
[ ] VMware Horizon* (View, Adv, Ent)

Nodes in the System:
( ) 3 nodes
( ) 4 nodes

Node options

Hypervisor pre-integrated:
( ) VMware vSphere 5.5
( ) VMware vSphere 6.0

CPUs per node:
( ) 2x Intel E5-2640v3 / 8-core @ 2.6GHz
( ) 2x Intel E5-2680v3 / 12-core @ 2.5GHz

Primary network connectivity per node:
( ) 2P 10GbE SFP+

Amount of memory per node:
( ) 128GB
( ) 256GB
( ) 512GB

Drive configuration per node:
( ) 6x 1.2TB SAS
( ) 4x 1.2TB SAS + 2x 400GB SSD

Selection applies to all nodes in the system

* When including VMware Horizon licenses on the same quote, Horizon-specific components are not pre-installed on the system.

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Additional storage for hyper-converged environments

Add StoreVirtual storage-only resources that can also be provisioned from HP OneView for vCenter for

Increased storage capacity on a separate tier

Different storage performance characteristics

Shared storage for legacy applications

How to connect compute resources in the ConvergedSystem 200-HC StoreVirtual to external StoreVirtual resources?

1. StoreVirtual Centralized Management Console on the Management VM to setup new storage pool*

2. Add new StoreVirtual pool to OneView for vCenter

HP recommends StoreVirtual 4335 or StoreVirtual VSA

CS 242-HC StoreVirtual

StoreVirtual 4335

* New management group recommended; HP Peer Motion on StoreVirtual not available across management group boundaries.
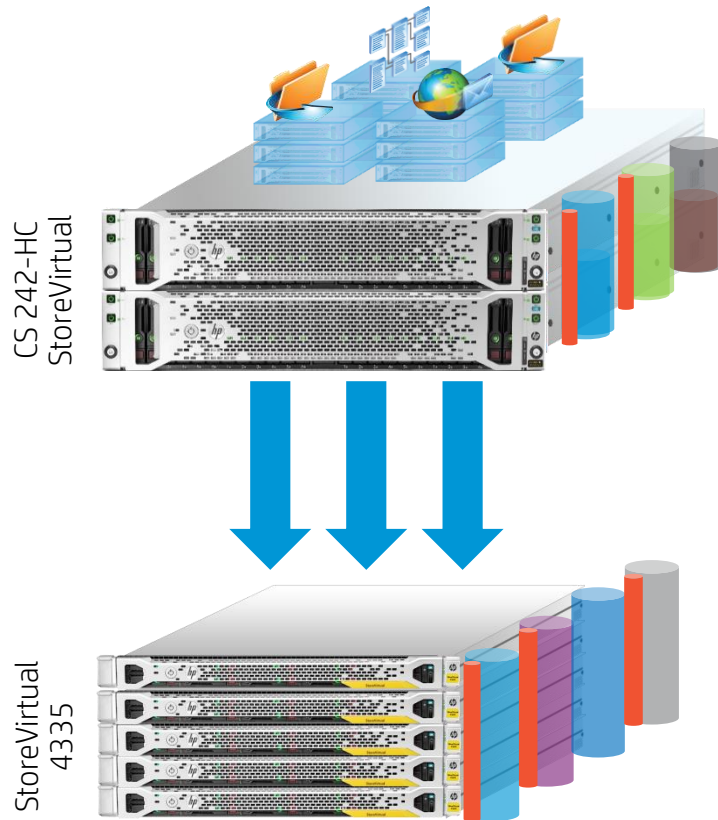
**Applications
running on VMware vSphere**

All virtualized workloads running
on same appliance utilizing a
powerful server platform

All-inclusive Data Services

Scalability, High Availability,
Thin Provisioning powered by
HP StoreVirtual technology

Converged
System
250-HC
StoreVirtual

HP OneView Management

Bring-up with HP OneView InstantOn
Day-to-day operations with HP OneView for vCenter

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Thank you