Leverage Software Defined Storage to enable and enhance your hybrid cloud deployment

BCNET 2018 March 2018

NetApp

Define “Software Defined Storage”

Define “Software Defined Storage”

- Software Only?
- Virtualized?
- Abstraction Layer?

Software-defined storage (SDS) is a computer program that manages data storageresources and functionality and has no dependencies on the underlying physical storage hardware.
https://searchstorage.techtarget.com/definition/software-defined-storage

Software defined storage (SDS) creates a virtualized network of storage resources by separating the control and management software from the underlying hardware infrastructure. https://www.sdxcentral.com/cloud/definitions/what-is-software-defined-storage/

NetApp

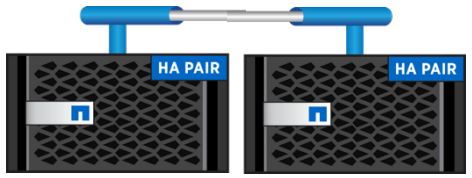
Storage Networking Industry Association (SNIA) Definition

- **SNIA defines SDS as:** Virtualized storage with a service management interface. SDS includes pools of storage with data service characteristics that may be applied to meet the requirements specified through the service management interface. **View more SNIA SDS educational resources.**
- **SDS is more than storage virtualization in the following ways:**
- Storage Virtualization provides a capacity pool that can be structured into tiers and presented over an appropriate medium and protocol.
- Software Defined Storage (SDS) must include:
  - **Automation**– Simplified management that reduces the cost of maintaining the storage infrastructure
  - **Standard Interfaces** – APIs for the management, provisioning and maintenance of storage devices and services
  - **Virtualized Data Path** – Block, File and/or Object interfaces that support applications written to these interfaces
  - **Scalability**– Seamless ability to scale the storage infrastructure without disruption to the specified availability or performance
  - **Transparency** – The ability for storage consumers to monitor and manage their own storage consumption against available resources and costs

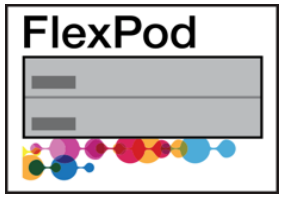
Evolution of ONTAP

Engineered Systems

Evolution of ONTAP

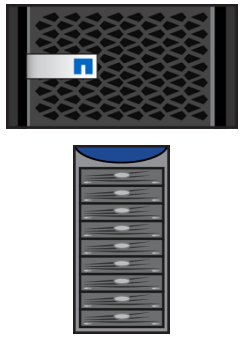


Engineered Systems



Converged Infrastructure

Storage Virtualization



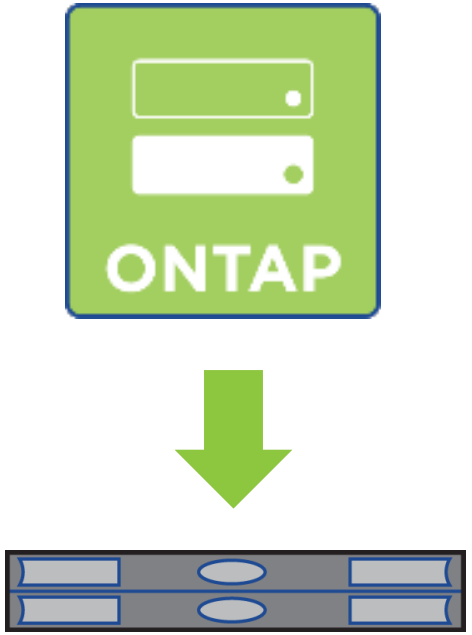
Traditional storage deployment challenges

IT deployment requirements have evolved

- Purchase-to-deployment cycles are long
- Pre-purchasing capacity is required for hard-to-forecast workloads
- Adding capacity requires incremental hardware
- Capital purchases often require approval from central IT

NetApp Software based ONTAP

Enterprise data services: software defined



- What is NetApp® ONTAP® Select?
  - Software-defined storage (SDS) for commodity servers
    - Deploys in data center, remote office, and infrastructure-as-a-service (IaaS) environments
    - Includes a flexible, capacity-based license
    - Offers a choice of configurations, including all-flash systems
- What is NetApp® ONTAP® Cloud?
  - Software-defined storage (SDS) for cloud infrastructure
    - Deploys in AWS or Azure
    - Includes a flexible, capacity-based license
    - Offers a choice of configurations, including Cloud Tiering

NetApp

Why Software Based ONTAP?

Tier 2 and 3 storage

Enterprise class

- Support for NAS and iSCSI access

Availability

- Single and multimode HA configurations

ROBO/ secondary storage

Total cost of ownership (TCO)

- Efficient and cost-effective storage for remote site deployment

Flexibility

Leverage existing server infrastructure for new project deployment

Management

Consistency

- Manage multiple sites, physical or virtual the same way
- Automation

Flexibility

- Leverage existing server infrastructure for new project deployment

Data Protection

Snapshots

- Industry leading snapshot technology
- Application Integration

Common Replication Framework

- Storage efficient Replication
- SafeNet offering

NetApp

Deployments for ONTAP Select for BCNet

- **Form Factor**

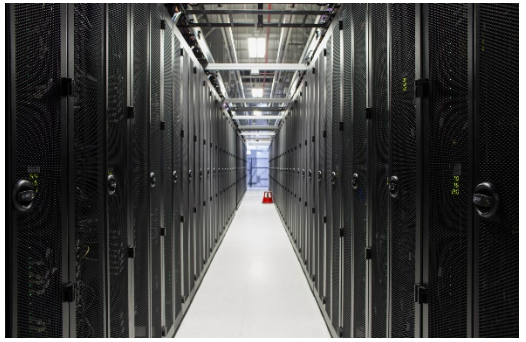
  Satisfy unique space constraints while maintaining full functionality

- **Remote Locations**

  Manage remote locations and data centers consistently with a cost-effective, easy-to-deploy SDS solution

- **Data Center**

  Deploy software-defined storage as part of core infrastructure or for departmental storage



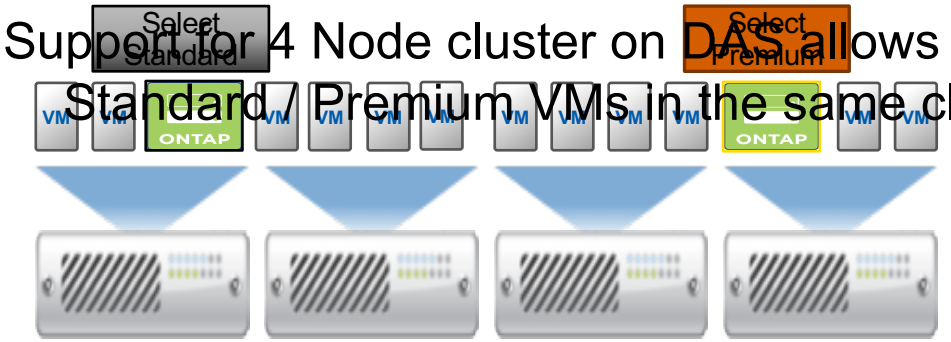
- **Cloud IaaS**

  Deliver enterprise data services on infrastructure as a service

ONTAP Deploy

Deployment models

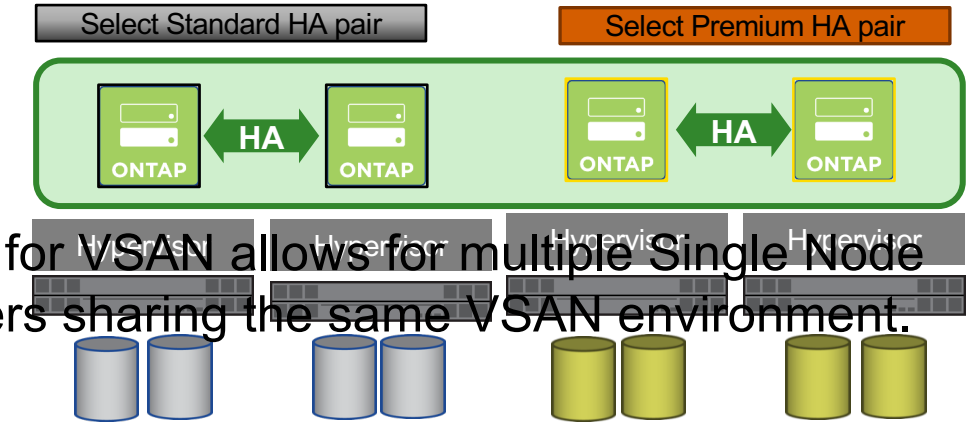
Support for 4 Node cluster on DAS allows for mixed Standard / Premium VMs in the same cluster.



Multiple Single Node clusters sharing a VSAN

ONTAP DEPLOY

Support for VSAN allows for multiple Single Node clusters sharing the same VSAN environment.

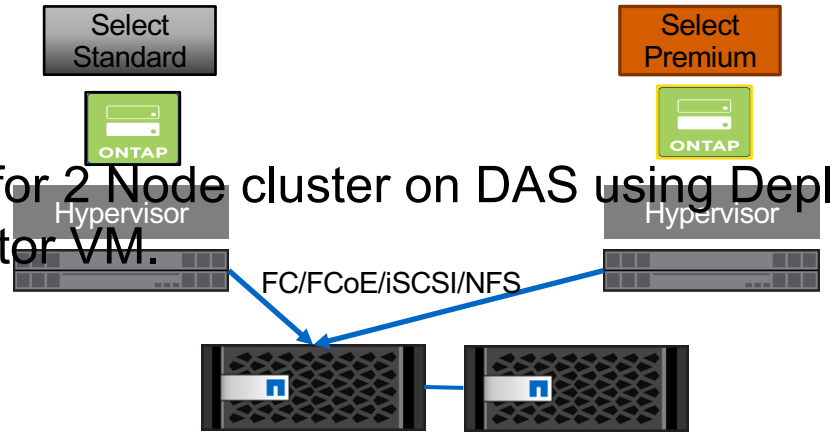


Four-node cluster with DAS (SAS / SSD)

NEW: 6 and 8 node clusters are supported with ONTAP Deploy 2.7 and ONTAP Select 9.3

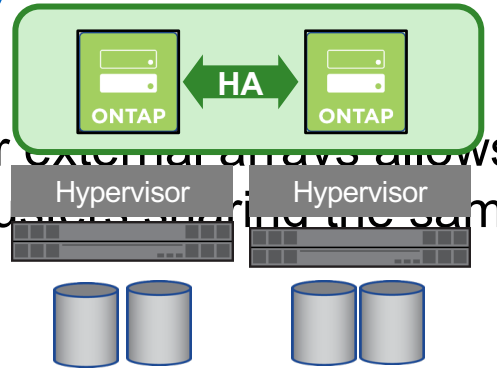
Latency:
500 ms RTT
Bandwidth:
5Mb/s

Support for 2 Node cluster on DAS using Deploy Mediator VM.



Multiple Single Node clusters sharing an external array datastore

Support for external arrays allows for multiple Single Node clusters sharing the same storage array.



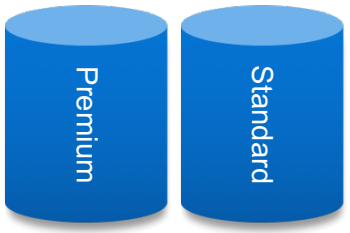
Two-node cluster with DAS (SAS / SSD)

NetApp

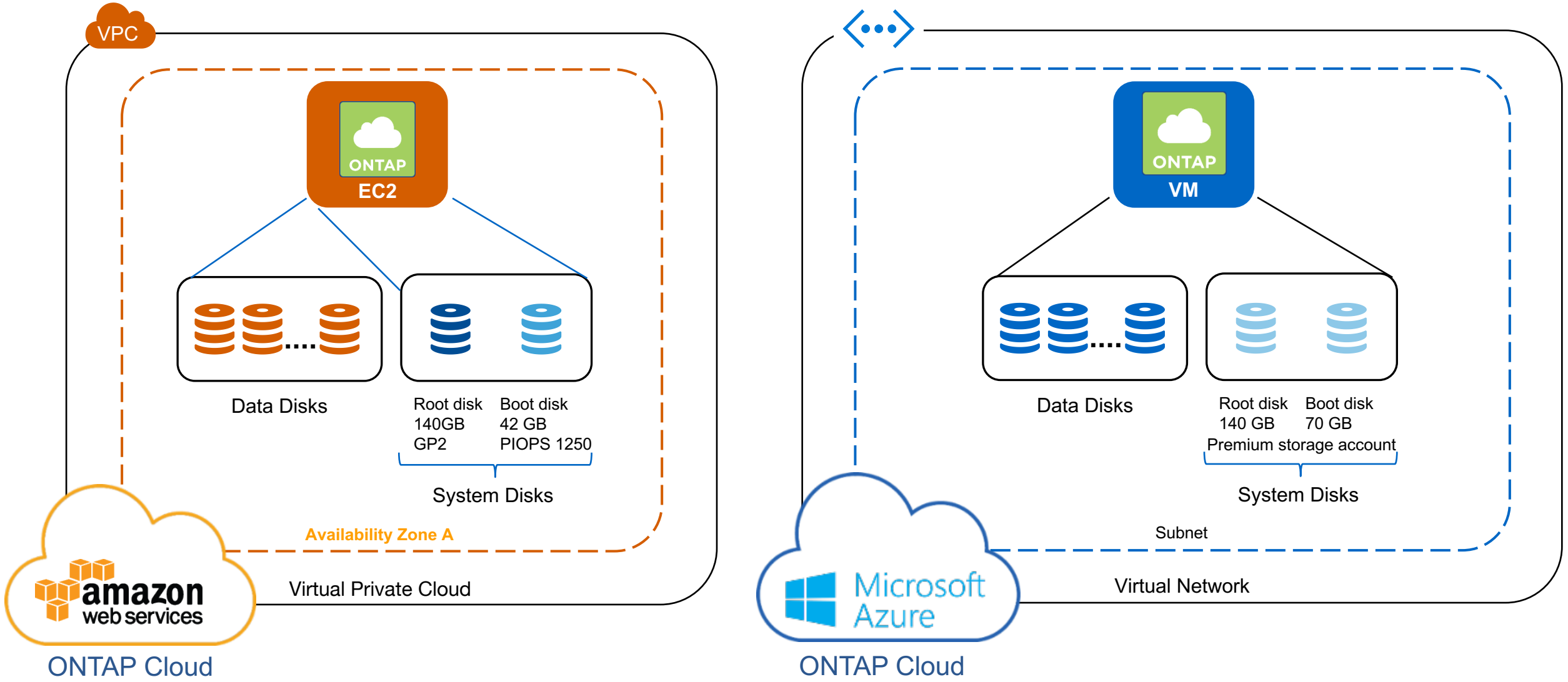
ONTAP Cloud

What is it?

- ONTAP Cloud is a fully fledged version of ONTAP running natively in AWS or Azure
- It consumes native cloud storage
- It allows a cloud first strategy

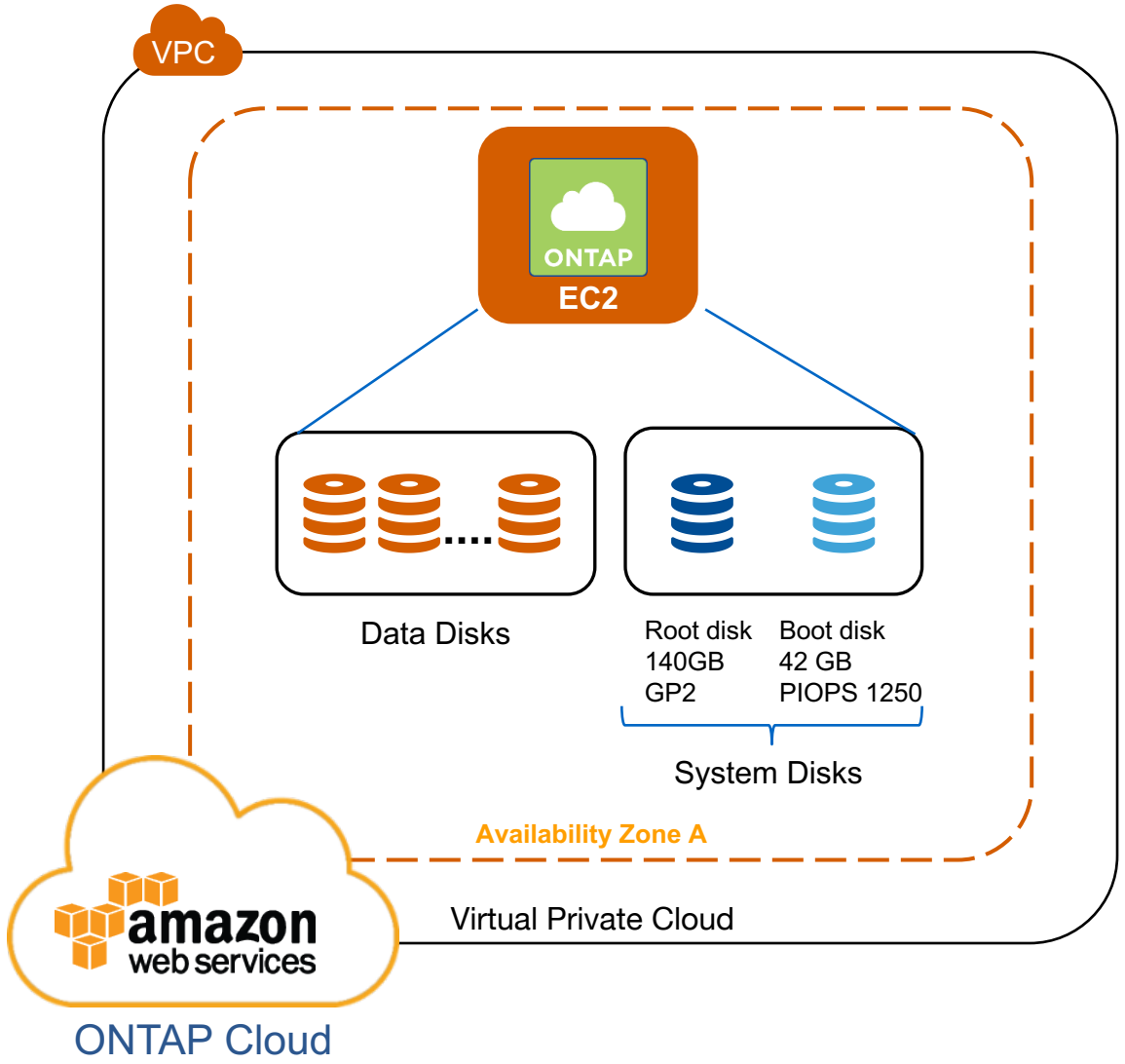


ONTAP Cloud Architecture



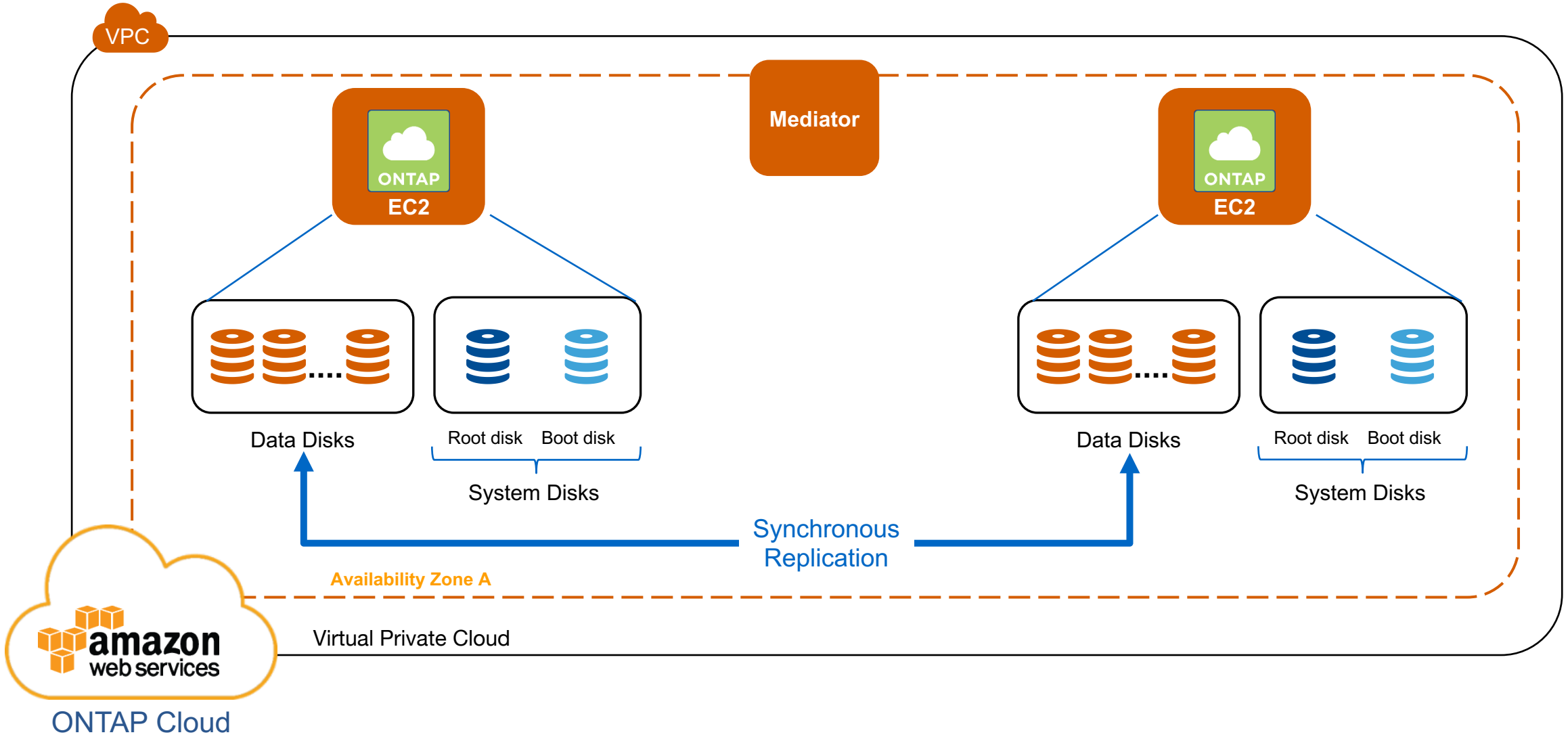
NetApp

ONTAP Cloud Architecture



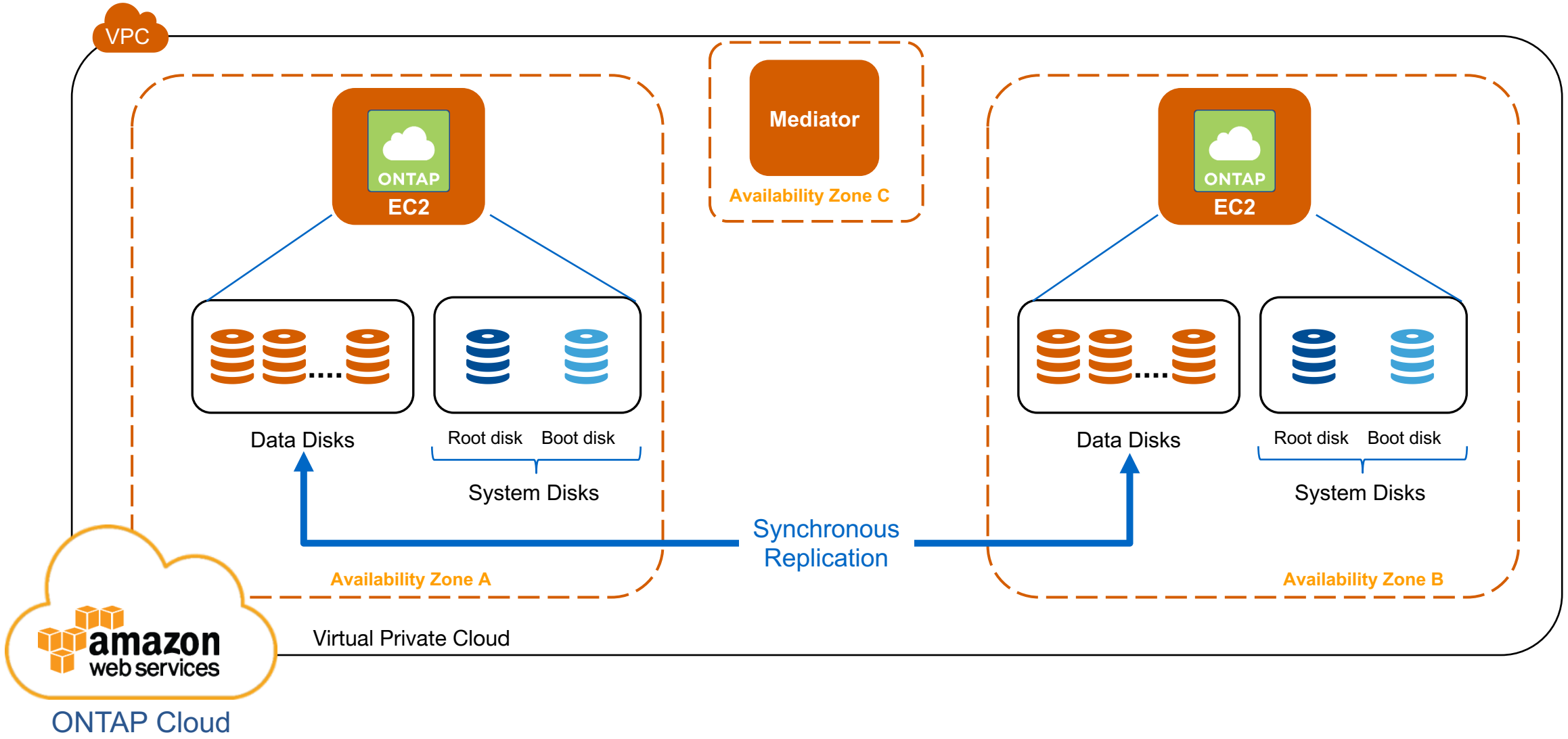
NetApp

ONTAP Cloud Architecture: HA in Single Availability Zone



NetApp

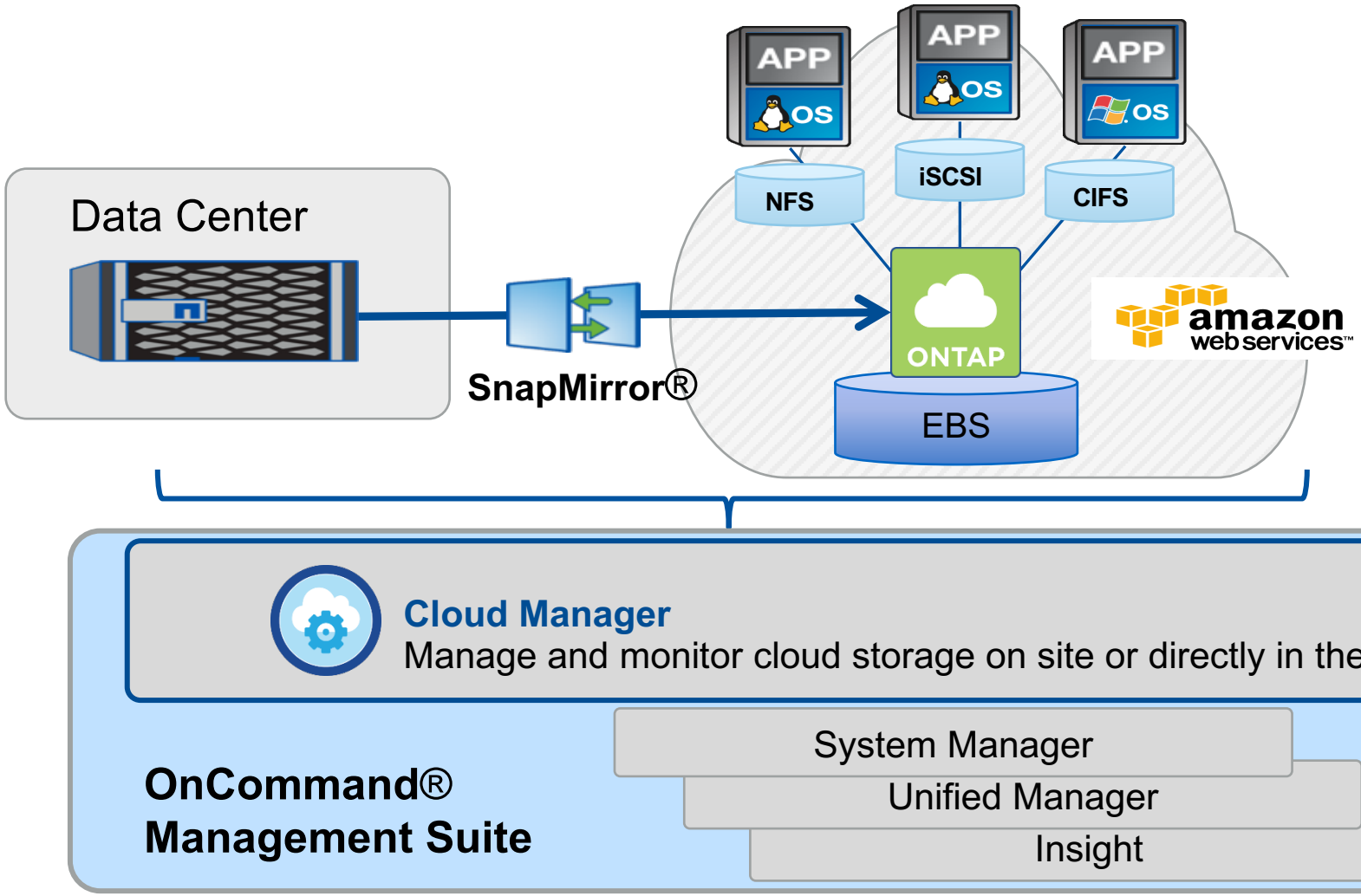
ONTAP Cloud Architecture: HA in Multi-Availability Zone



NetApp

NetApp ONTAP Cloud

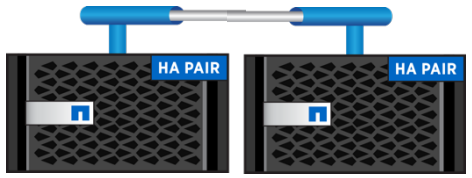
Expand your storage options in the cloud



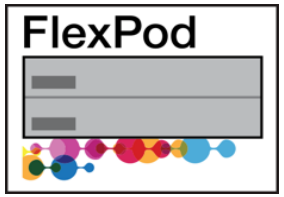
- **Snapshot® copies**
- **Deduplication**
- **Compression**
- **Encryption**
- **SnapMirror and SnapVault®**
- **FlexClone® volumes**
- **NFS/CIFS/iSCSI**

NetApp

Enterprise data management for the Data Fabric

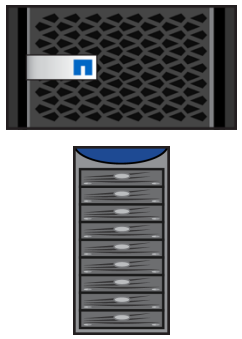


Engineered Systems



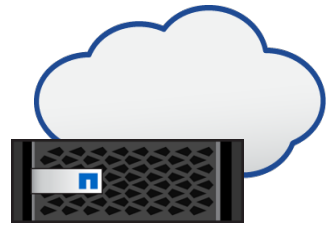
Converged Infrastructure

Storage Virtualization



Software-Defined Storage

Cloud Based Software-Defined Storage



Storage as a Service/ Colocation

NetApp

NetApp ONTAP Select technical specifications*

		Standard License	Premium License
Core Features	Host protocols	▪ NFS, SMB/CIFS, iSCSI	▪ NFS, SMB/CIFS, iSCSI
	Deployment options	▪ Single node ▪ 2-node cluster (HA Pair) ▪ 4-, 6- or 8-node cluster	▪ Single node ▪ 2-node cluster (HA Pair) ▪ 4-, 6- or 8-node cluster
	Supported capacity (per node)	▪ Up to 400TB (ESX), 100TB (KVM) raw	▪ Up to 400TB (ESX), 100TB (KVM) raw
Hardware Requirements	CPU family	▪ Intel Xeon E5-26xx v3 (Haswell) or later	▪ Intel Xeon E5-26xx v3 (Haswell) or later
	CPU cores (NetApp® ONTAP® Select)	▪ 4 virtual CPUs	▪ 4 or 8 virtual CPUs
	Memory (ONTAP Select)	▪ 16GB RAM	▪ 16GB or 64GB RAM
	Network (per node)	▪ Min. 2 x 1GbE ports (single node) ▪ Min. 4 x 1GbE ports (2-node) ▪ Min. 2 x 10GbE ports (4-, 6-, 8-nodes)	▪ Min. 2 x 1GbE ports (single node) ▪ Min. 4 x 1GbE ports (2-node) ▪ Min. 2 x 10GbE ports (4-, 6-, 8-nodes)
Storage Types	Local DAS with RAID controller	▪ Hardware RAID controller with 12Gbps throughput and 512MB internal battery-backed or flash (supercapacitor) cache	
	Disk type: SSD	▪ N/A	▪ 4–24 disks
	Disk type: SAS, NL-SAS, SATA	▪ 8–24 disks (Up to 60 drives on external arrays)	▪ 8–24 disks (Up to 60 drives on external arrays)
	Hyper converged infrastructure	▪ NetApp HCI; VMware vSAN 6.0, 6.1, 6.2	▪ NetApp HCI; VMware vSAN 6.0, 6.1, 6.2
	External arrays**	▪ FC, FCoE, iSCSI, NFS (ESX only)	▪ FC, FCoE, iSCSI, NFS (ESX only)
Software	Hypervisor support (bare metal)	▪ VMware vSphere 5.5, 6.0, 6.5 (all licenses) ▪ KVM – Red Hat Enterprise Linux 7.2/7.3 ▪ CentOS 7.2/7.3	▪ VMware vSphere 5.5, 6.0, 6.5 (all licenses) ▪ KVM – Red Hat Enterprise Linux 7.2/7.3 ▪ CentOS 7.2/7.3
	Management software	▪ NetApp OnCommand® management suite ▪ ONTAP Select Deploy utility ▪ NetApp SnapCenter® software (optional)	▪ NetApp OnCommand management suite ▪ ONTAP Select Deploy utility ▪ SnapCenter (optional)

*For detailed system requirements, consult the NetApp Interoperability Matrix Tool and the release notes.

**External array protocol support reflects networked storage connectivity.

NetApp