



OPEN
Compute Project



OCP U.S. SUMMIT 2017

Santa Clara, CA



NetApp ONTAP SELECT

Robert Ruby / Manager, Systems Engineering /
NetApp

OPEN HARDWARE.

OPEN SOFTWARE.

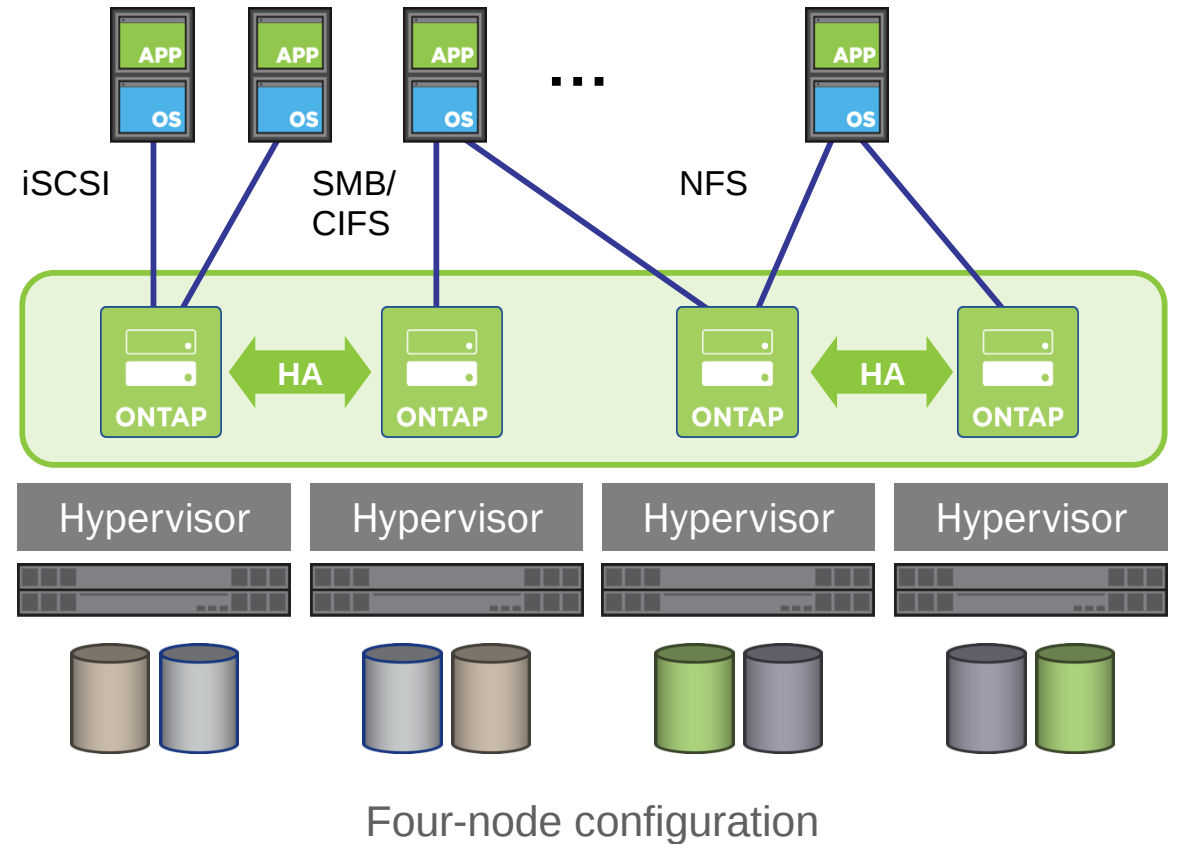
OPEN FUTURE.



ONTAP Select

Software-defined storage

- What is ONTAP Select?
 - Name for the NetApp' software-only platform for private cloud
 - ONTAP on commodity hardware
 - Enterprise data management services for DAS
- What customer problems does ONTAP Select address?
 - Flexibility
 - Simplicity
 - Scalability



ONTAP Select

Select 9.1 features and characteristics

Feature	Description
Product Versions	▪ Premium and Standard
High Availability	▪ 4-node cluster required for HA (2 HA pairs) ▪ Under 60 sec failover for planned/unplanned outages
Single-Node Support	▪ Designed for small deployments / ROBO / testing ▪ Cannot be converted to a cluster
Capacity	▪ Up to 100TB capacity per instance, 400TB per cluster (4x100TB) ▪ HA configuration creates a replica/copy of aggregate on the partner node
Manageability	▪ ONTAP Deploy (Specific tool for installing Select) ▪ OnCommand® Suite, System Manager, WFA ▪ SnapManager®/Drive and SnapCenter® 2.0 ▪ GUI, CLI and REST API supported deployment and configuration

ONTAP Select

Select 9.1 Properties

Description	ONTAP Select 9.1 / 9.0 Standard VM	ONTAP Select 9.1 Premium VM
Select CPU / Memory	4 vCPUs / 16GB RAM	8 vCPUs / 64GB RAM
Host CPU / Memory Min Requirements	Intel Xeon E5-26xx v3 (Haswell) CPU or greater • 6 cores • 24 GB RAM	Intel Xeon E5-26xx v3 (Haswell) CPU or greater • 10 cores • 72 GB RAM
License Info	You can apply a Premium or a Standard License file to the Standard Select VM	You can only apply a Premium license to a Premium VM
Hypervisor Min Requirements	vSphere 5.5 update 3a (build 3116895 or greater) and 6.0 (build 2494585 or greater)	
Disk type (DAS only)	SAS only	SAS or SSD
Number of disks	8 - 24 SAS	8 - 24 SAS OR 4 - 24 SSD
Network Min Requirements	2 x 1Gb (single node) / 2 x 10Gb (multi node)	
Hardware RAID Controller Min Requirements	12 Gb/s throughput, BBU with write back cache enabled.	
Datastore Size (Evaluation)	500 GB (single node) / 1.9 TB (multi node) up to 100 TB	
Datastore Size (Production)	1.3 TB (single node) / 2.3 TB (multi node) up to 100 TB	
ONTAP Select System boot disk	10GB	
ONTAP Select System core dump disk	120GB	
ONTAP Select Mailbox disk	556MB	
ONTAP Select Cluster root disk	68GB (single node) / 136GB (multi node)	

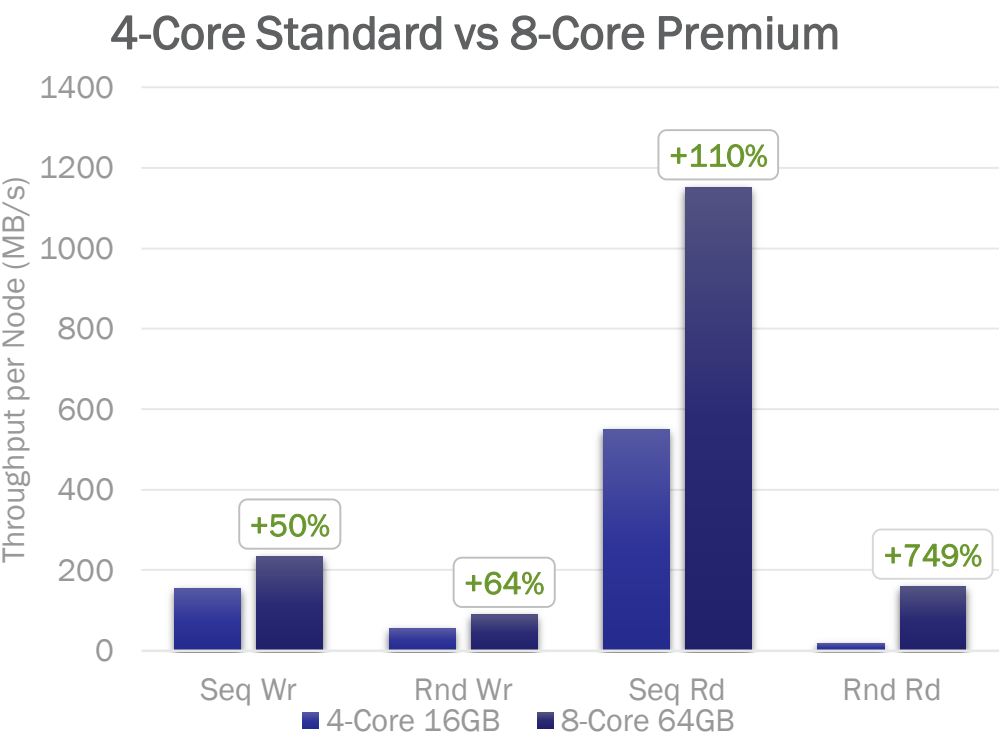
ONTAP Select

Performance Characterization

- Workload Details
 - Workloads
 - 64k Sequential write
 - 4k Random write
 - 64k Sequential read
 - 4k Random read
 - I/O generator
 - sio
 - Design
 - Workloads designed to be CPU/disk bound
 - Data set: 256G
 - Read workloads served from disk (no caching of user data at the client and ONTAP buffer cache)

ONTAP Select

Performance Characterization

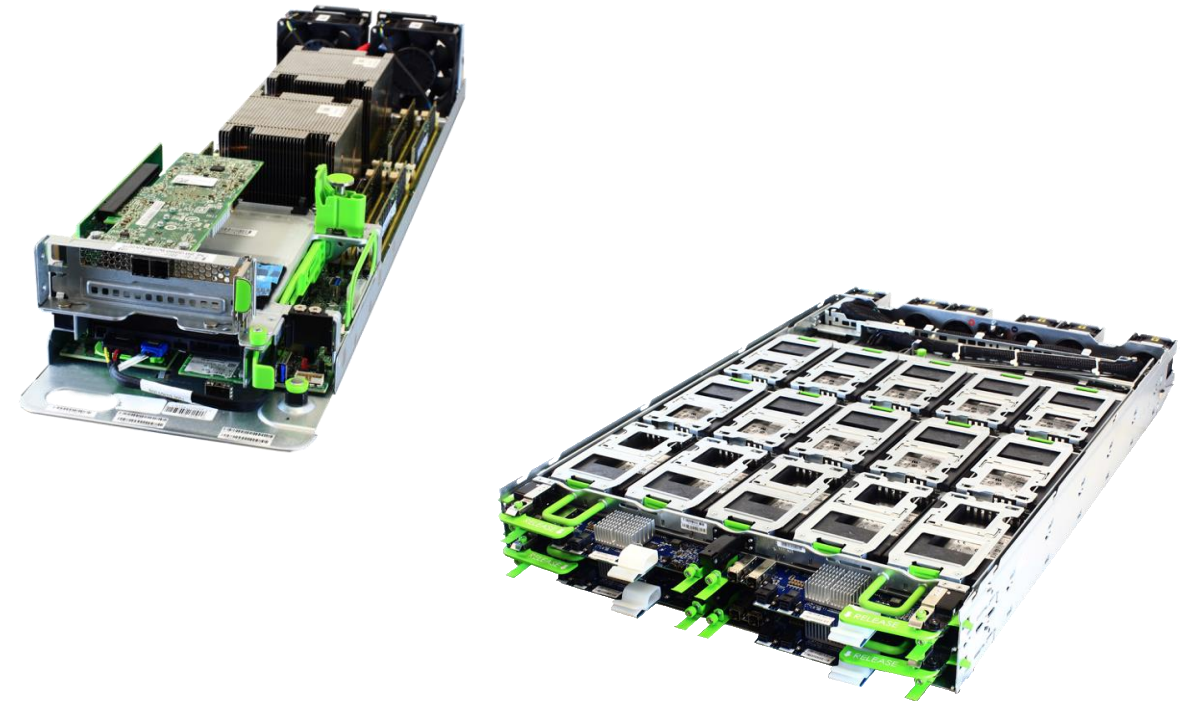


Description	Sequential Read	Sequential Write	Random Read	Random Write
ONTAP Standard (Select 9.0) SAS disks	549MBps	155MBps	19MBps	54MBps
ONTAP Premium (Select 9.1) SSD disks	1151MBps	233MBps	158MBps	89MBps

NetApp ONTAP Select on OCP

- ONTAP Select hardware (per node):
 - OCP Leopard servers (Qty 4) (4 servers per cluster)
 - 2 x 14-core 2.4GHz E5-2680 v4
 - 96GB RAM
 - 1 x 120GB SSD (boot)
 - 1 x 9286CV-8e RAID card with CacheVault
 - 2 x dual ports Intel X710 10GbE
 - OCP Knox JBODs (Qty 4) (2 trays per JBOD and 1 JBOD attached per node)
 - 7 x 1TB SSD per node per tray - (RAID5) – no spare – Cluster (28 total disks)
- Hypervisor (per node):
 - ESX 6.0u2
 - VM Size – 8 core vCPU with 64GB RAM
- NetApp ONTAP Features and functions tested:
 - NFS, CIFS, Snapshots and SnapMirror

OCP Hardware Platform





OPEN

Compute Project

