

READY FOR ANY vForum2015

9 December 2015 | Taipei, Taiwan

掌握高效雲端儲存 創新 IT 管理優勢

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NetApp 資深技術顧問

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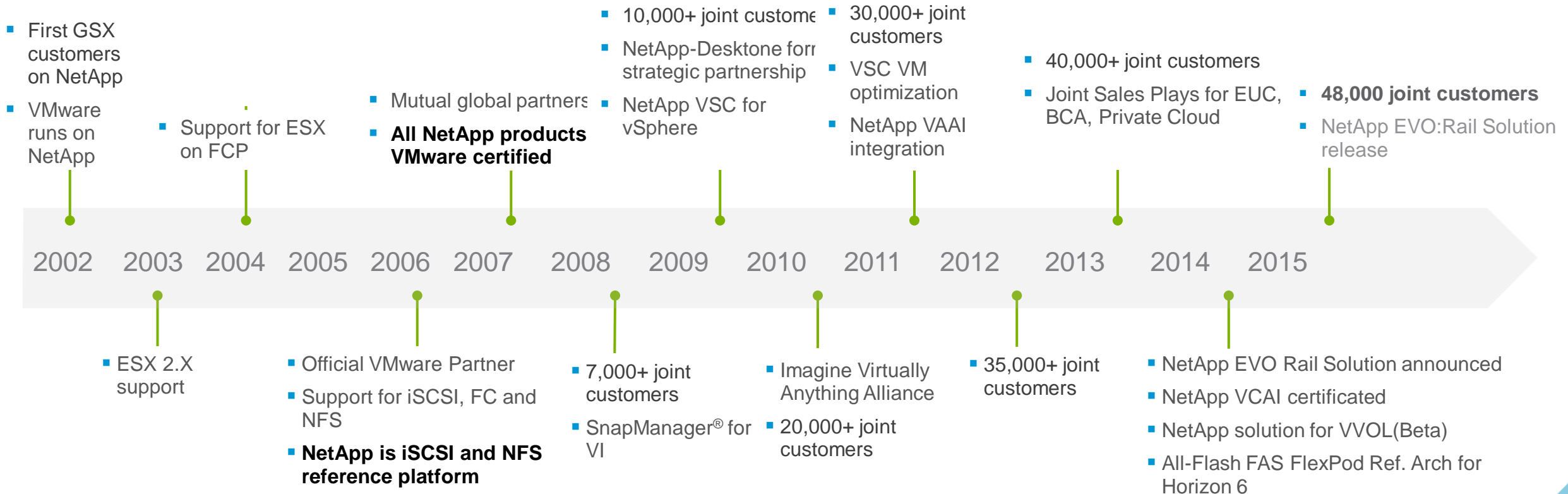
Agenda

- VMware Ecosystems Integration
- VMware deeply integration
- Business Continuity and Disaster Recovery (AltaVault, NPS, Cloud ONTAP)
- High performance scale vertically or horizontally (All Flash, FlexPod)
- The best storage for virtualization (Cluster data ONTAP)
- Never challenge in Storage/Virtualization Management (OnCommand Insight)
- NetApp product portfolio and vision (Data Fabric)

VMware Ecosystems Integration

NetApp and VMware Long-term Partnership

Delivering joint innovations



NetApp: Our special sauce is in the software.

Comprehensive VMware Integration

Horizon

- View VCAI provisioning
- Horizon DaaS

vROps and vR Log Insight

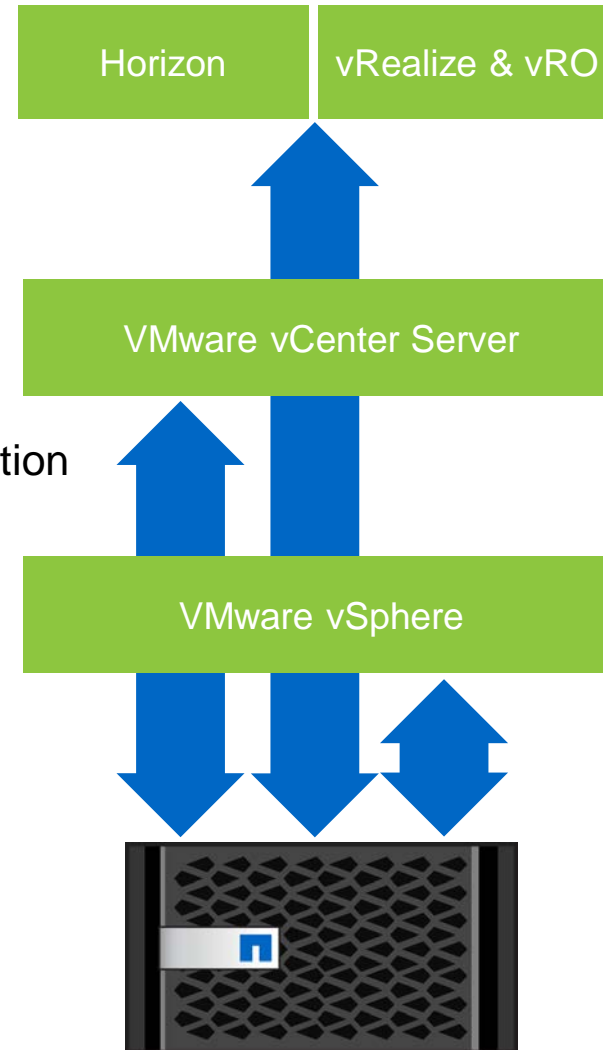
- vROps adapter
- vR Log Insight Content Pack

vCenter Plug-ins

- VSC
 - Monitoring and host configuration
 - Provisioning and cloning
 - Backup and recovery
 - Optimization
- DR failover/failback with SRM

VASA Provider

- Policy-based management (aka Software-defined Storage)
- Events and alarms
- VVol management



vRealize & VRO

- vCloud backup and recovery
- DataStore provisioning
- vApp VAAI provisioning

VAAI for SAN

- Full copy
- Block zero
- HW assist locking
- Space reclamation
- Thin provisioning suspend

VAAI for NFS

- Full copy / clone
- Space reservation

vSphere I/O

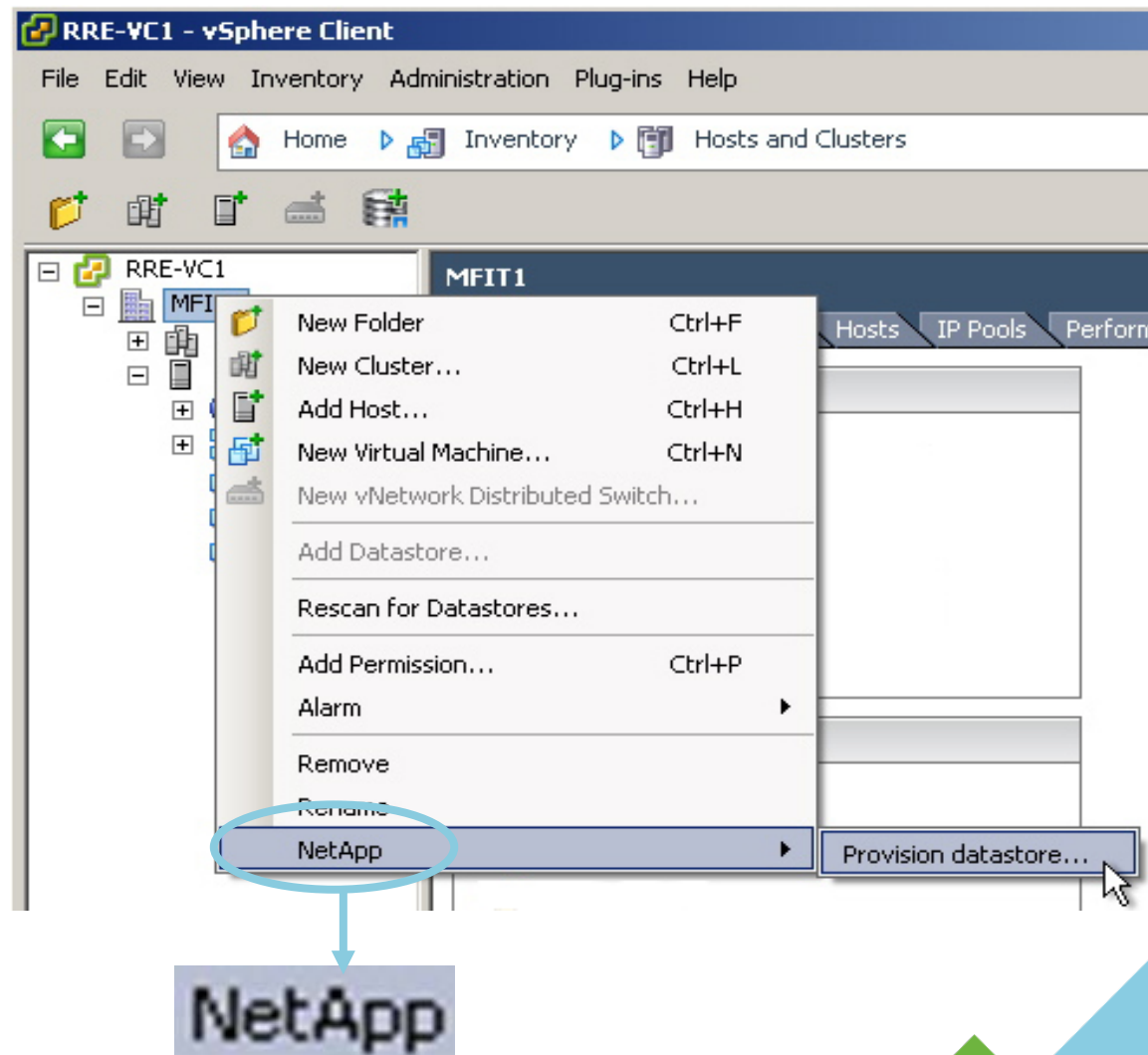
- Storage I/O Control (SIOC)
- Multipathing (ALUA)

VMware deeply integration

VMware Plug-In 新增 Datastores

- 部署 datastores
 - 無須儲存管理者的介入
- 支援在不同的等級快速部署 datastores
 - Data Center
 - Cluster
 - Host

SAN + NAS + iSCSI + FCoE



VMware Plug-In

放大 / 縮小 / 刪除 / 重複資料刪除 Datastores

- 管理儲存設備的選項及設定
 - 啟用重複資料刪除功能
 - 啟用精簡配置功能
- 調整 datastores 的容量大小
 - 放大
 - 縮小 (NFS)
 - 設定自動增長 (NFS)

SAN + NAS + iSCSI + FCoE

The screenshot displays the VMware vSphere interface. At the top, a blue banner reads "SAN + NAS + iSCSI + FCoE". Below it, a table lists datastores with columns for Name, Status, Capacity, and Used Space. A context menu is open over the "datastore2" entry, showing options like "Browse Datastore...", "Alarm", "Rename", "Delete", "Refresh", "Properties...", "NetApp", "Copy to Clipboard", "Ctrl+C", "Deduplication management...", "Resize...", and "Destroy...". The "NetApp" option is circled in blue, and a blue arrow points from it to the "NetApp" logo. Below the logo, the "Datastore deduplication management" dialog is open, showing the "Deduplication status" and "Deduplication settings" for the datastore "TR3749". The "Deduplication state" is "Enabled", and the "Deduplication status" is "idle". The "Deduplication settings" section includes checkboxes for "Disable deduplication?", "Start deduplication?", and "Rescan?".

Name	Status	Capacity	Used Space
datastore2	Normal	68.00 GB	67.4
TR3749	Normal	50.00 GB	39.8
		200.00 GB	199.4
		50.00 GB	39.2

Deduplication status

Datastore name:	TR3749
Volume name:	TR
Deduplication state:	Enabled
Deduplication status:	idle
Space saved (GB):	5.73
Percent saved:	58
Last deduplication start:	Mon Dec 21 04:21:18 GMT 2009
Last deduplication end:	Mon Dec 21 04:27:47 GMT 2009

Deduplication settings

Disable deduplication?	<input type="checkbox"/>
Start deduplication?	<input type="checkbox"/>
Rescan?	<input type="checkbox"/>

VMware Plug-In 顯示儲存設備空間使用率 / 空間節省率

- 提供 VM 管理者儲存使用率報告
- 完全透通於儲存層級：
 - Datastore
 - LUN
 - FlexVol
 - Aggregate (實體硬碟)

SAN + NAS + iSCSI + FCoE

10.61.167.152 VMware ESXi, 4.0.0, 171294

Summary Virtual Machines Resource Allocation Performance Configuration Tasks & Events Alarms Permissions Maps Storage Views **NetApp**

NetApp Storage Management << Virtual Storage Console

Overview
Storage Details - SAN
Storage Details - NAS
Data Collection
Tools
About

SAN Storage Controllers

Datastore	Datastore Capacity	LUN Pathname	S...	Storage Status
Controller: Imahara-2 (6 LUNs)				
nonLocal	1.00GB	Avol/unitTestLuns/nonLocal	1...	Online
useCase3Vmfs2MultiFcp000	200.00GB	Avol/unitTestLuns/useCase3Vmf... 2...	2...	Online
useCase3Vmfs2MultiFcp001	200.00GB	Avol/unitTestLuns/useCase3Vmf... 2...	2...	Online
useCase3Vmfs2Multiscsi002	200.00GB	Avol/unitTestLuns/useCase3Vmf... 2...	2...	Online
useCase3Vmfs2Multiscsi003	200.00GB	Avol/unitTestLuns/useCase3Vmf... 2...	2...	Online
TR3749	50.00GB	Avol/TR/TR3749	5...	Online

Details
Storage Controller: **Imahara-2** Partner: **Imahara-1**

LUN
Name: **naa.60a98000486e59344a5a546e48734d43**
LUN Pathname: **Avol/TR/TR3749**
Serial Number: **HnY4JZTnHsMC**
Status: **Online**
Space Reservation: **Disabled**
LUN Type: **vmware**
Protocol: **fcp**
IGroup: **rcu_generated_alua : 2 (Type: vmware)**
Portset:
ALUA Capable: **Enabled**

Capacity

Datastore Usage (20%)
LUN Usage (20%)
Volume Usage (21%)
Aggregate Usage (79%)

Volume
Name: **TR**
Status: **online**
Type: **flex**
Guarantee: **volume**
Aggregate: **aggr1**
Snapshot Reserve: **0%**
Autogrow Increment: **10.00GB**
Autogrow Max Size: **60.00GB**

Deduplication (Advanced Single Instance Storage)
State: **enabled**
Status: **idle**
Space Savings: **58%**

License Period: 152 days remaining Administrator

VMware Plug-In VM快速複製 Rapid Cloning

- 即時快速複製 VMs
 - 虛擬伺服器
 - 虛擬桌面
- 原生的儲存高效率
 - I/O offload
 - 預先重複資料刪除的複本

SAN + NAS + iSCSI + FCoE

Power
Guest
Snapshot
Open Console
Edit Settings...
Migrate...
Clone...
Template
Fault Tolerance
Add Permission...
Alarm
Report Performance
Rename
Remove from Inventory
Delete from Disk
NetApp

Storage Controller details
Clone source
Clone destination
Virtual machine folder
Disk format
Virtual machine details
Datastore creation
Datastore selection
Connection broker
Summary

Number of clones: 1
Clone name: newClone
Starting clone number: 1
Clone number increment: 1
Apply customization specification?
Customization specification: Accounting
Power on?
Import into connection broker?
Connection broker: loadgen
Create new datastore(s)?

Sample clone names
newClone

*Note: The success of the creation of 2000 or more VMs will be determined by the size and performance of the vCenter server.
*Note: The selected virtual machine/template has a snapshot. This will cause a native clone operation for the first of the requested clones.

< Back Next > Cancel

Create rapid clones...

NetApp

Virtual Storage Console Role-Based的全面權限安全控管

Comprehensive Role-Based Access Control

Welcome to the RBAC User Creator for Data ONTAP® v2.0

Storage System
Enter the storage system hostname/IP address, and the root/admin credentials.

Storage system :

Port : 443 use SSL

User name :

Password : Login

Product Selection
Select the product to create the user for

Select product

Select product version

Select the Data ONTAP® privilege role :

All

Preview

Cancel Submit

NetApp
Storage

VMware
vCenter

Edit Role

Edit the role name or make changes to the effective privileges allowed in this role by enabling or disabling the check boxes.

Name: VSC Administrator

Privileges

- NetApp Virtual Storage Console
 - Monitoring and Host Configuration
 - Configure Storage Systems
 - Add, Modify, and Skip storage systems
 - Remove storage systems
 - Host Management
 - Apply recommended settings
 - Deploy VAAI for NFS Plug-in
 - Optimization and Migration
 - Configure
 - Initiate scan
 - Migrate virtual machines
 - Provisioning and Cloning
 - Create Rapid Clones
 - Datastore
 - Manage datastores
 - Provision
 - Distribute Templates
 - Reclaim Space
 - Redeploy clones

Description: Provision NetApp storage and create datastores using the Provisioning and Cloning capability.

Help OK Cancel

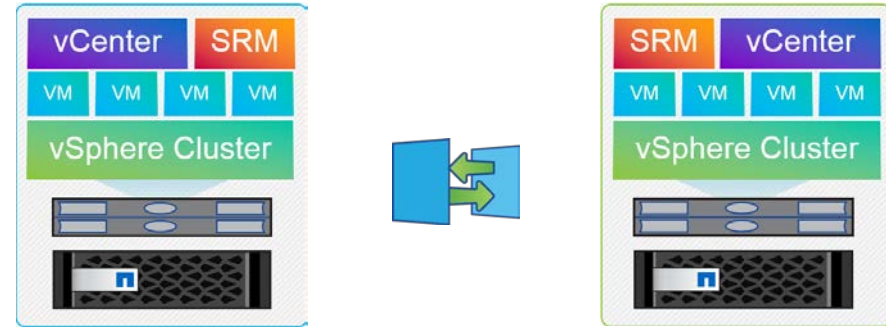
Business Continuity and Disaster Recovery

Cloud solutions for VMware vSphere (AltaVault, NPS, Cloud ONTAP)



Disaster Recovery Scenarios

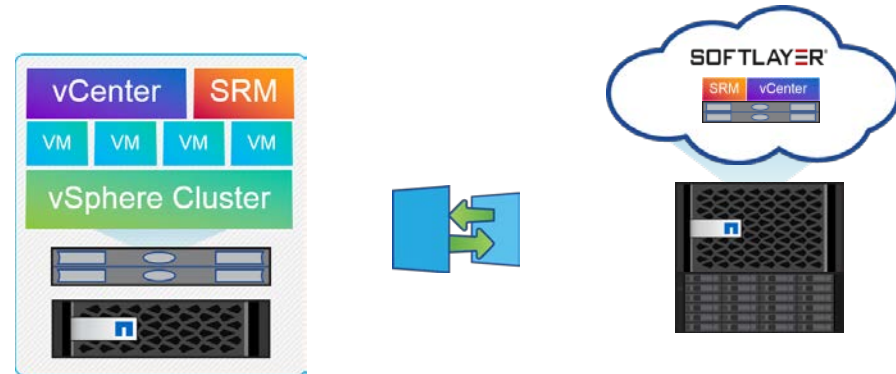
Private Cloud
Site-to-Site



Public Cloud

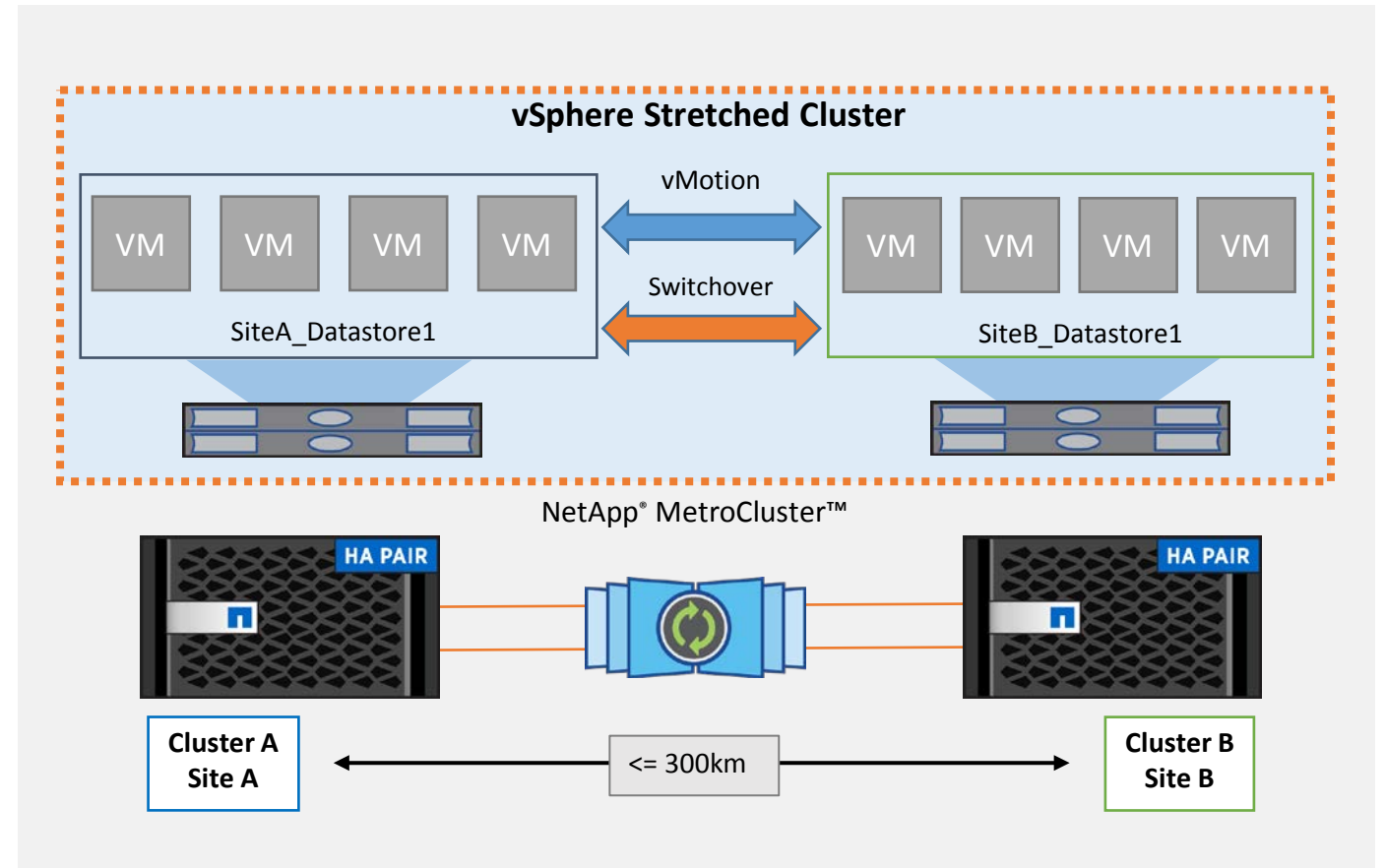


Hybrid Cloud
with SoftLayer and NPS



vSphere Metro Storage Cluster (vMSC)

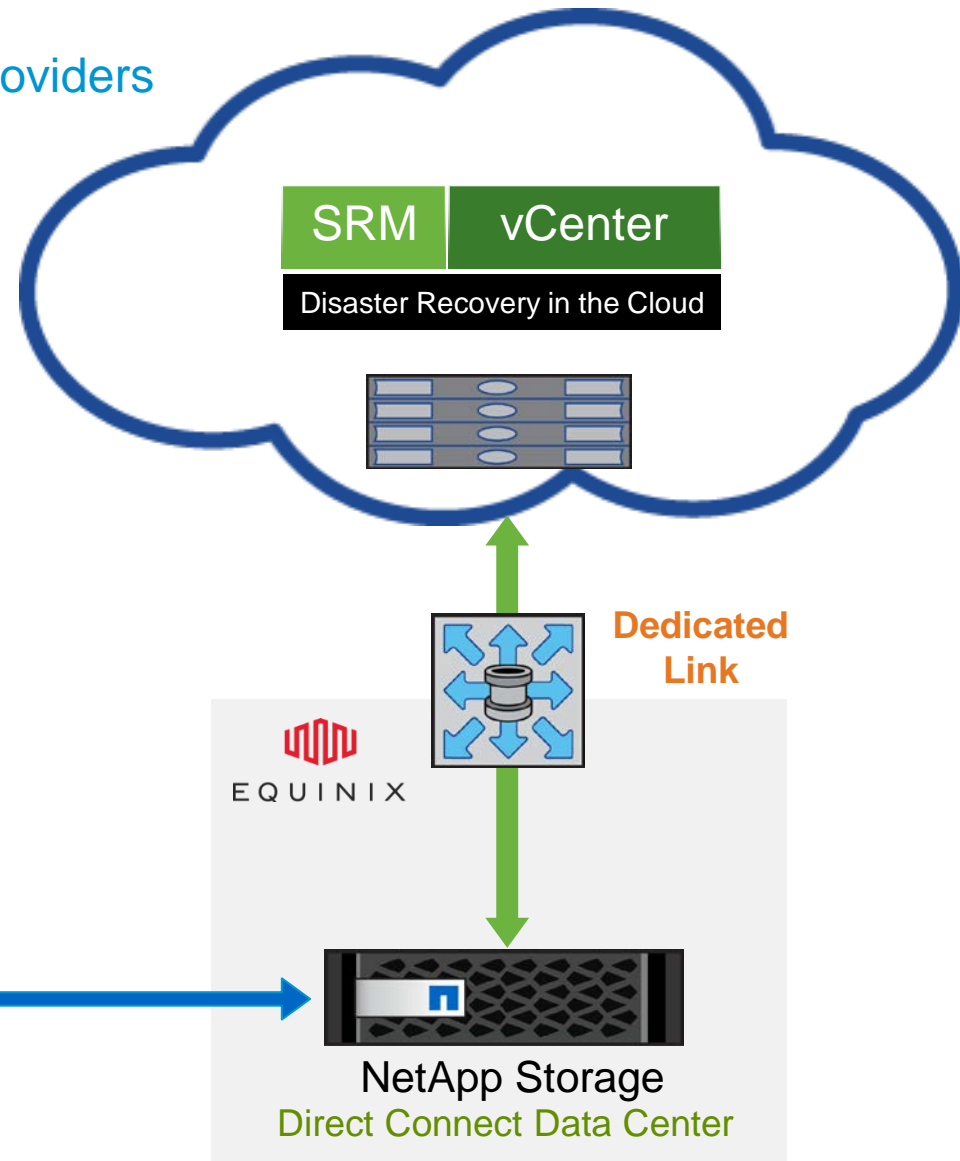
- **What is vMSC?**
- **VMware certified** solution for HA storage architectures.
- Storage availability for two sites up to 300km.
- **What are the benefits?**
- Extend vSphere HA across **synchronous replication sites** for **automated recovery of host failures**.



Disaster Recovery to the Cloud

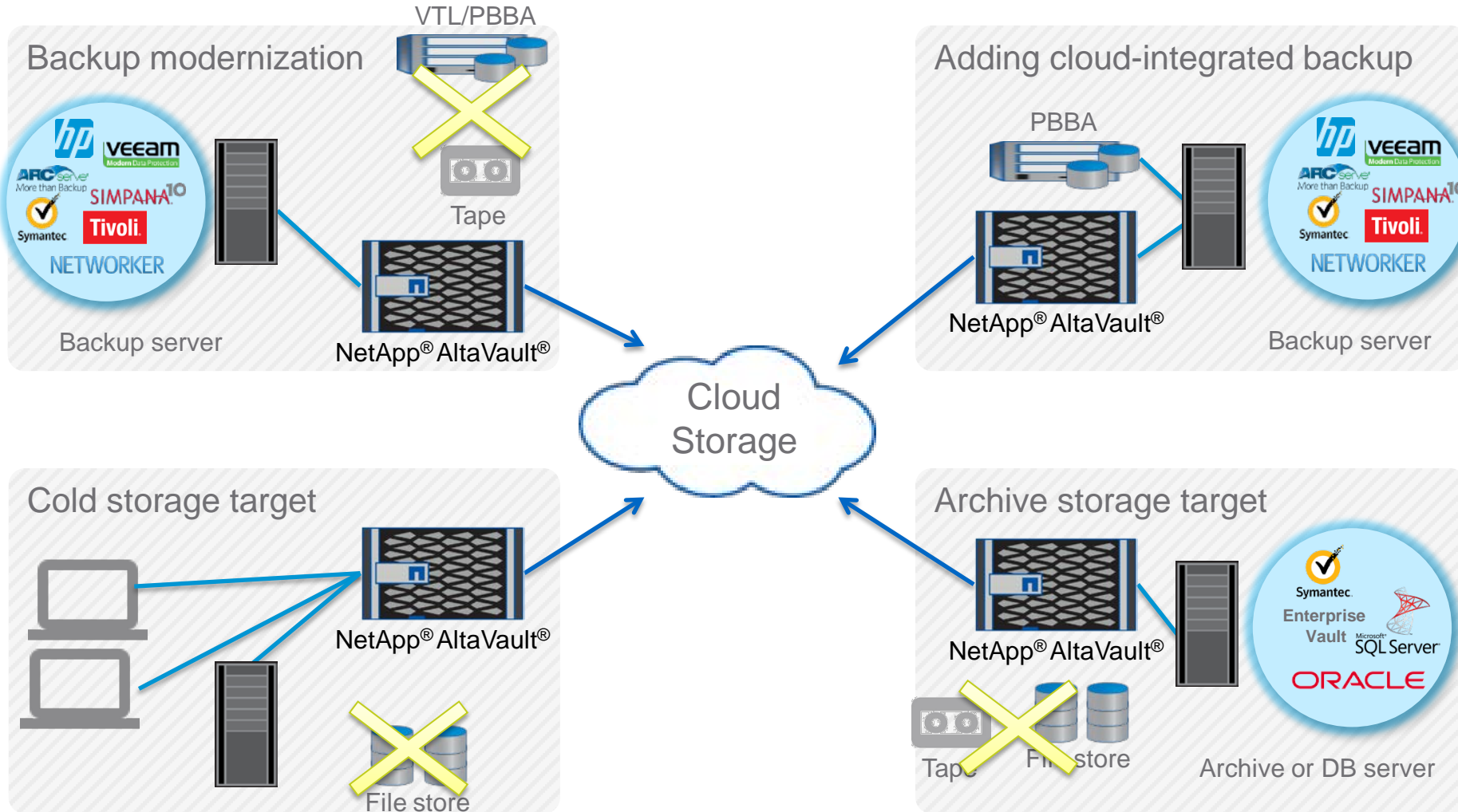
SRM on NPS (NetApp Private Storage) for public cloud providers

- Secure, high-performance connections between NetApp and public cloud
- Full NetApp clustered Data ONTAP value
- Seamless data mobility between premises and NPS for public cloud



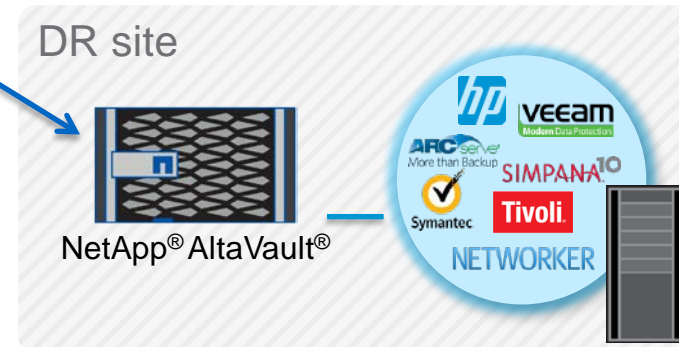
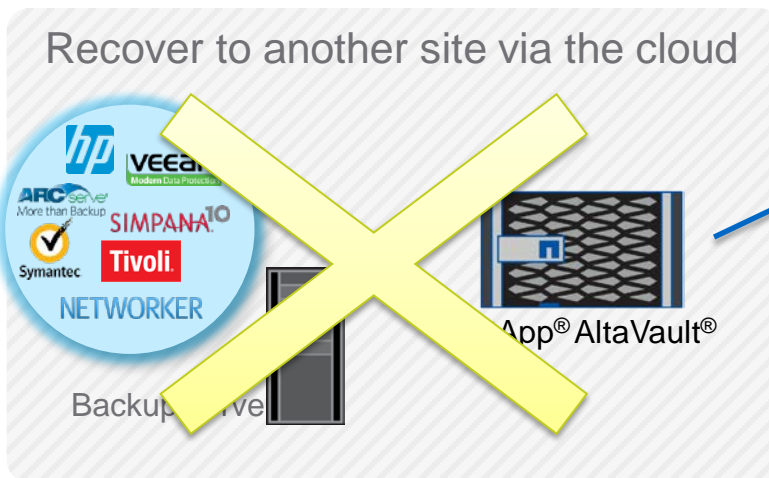
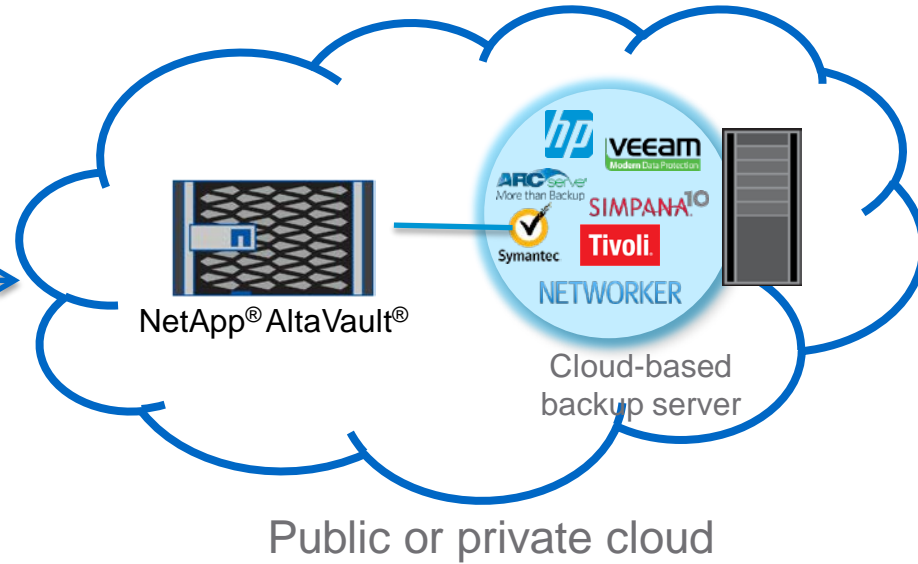
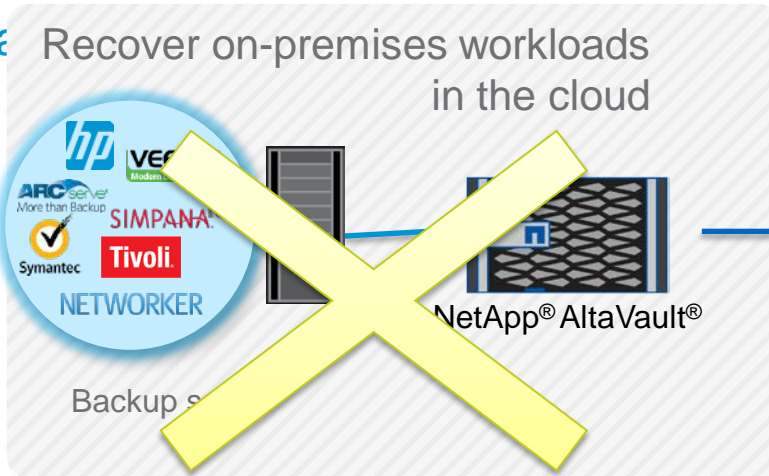
Cloud backup and archive use cases

NetApp AltaVault



Disaster recovery options

NetApp AltaVault



High performance scale vertically or horizontally

Scale out with standard and proven configurations (**All Flash, FlexPod**)

NetApp 3x performance guarantee

Guaranteed performance for enterprise applications when comparing NetApp® flash to disk-based systems

- **Systems:** NetApp AFF8080 and EF560
- **Performance:** At least 3x more IOPS at 1-millisecond latency than with disk
- **Workloads:** SQL Server and Oracle Database
- **Offer period:** October 20, 2015, through April 29, 2016
- **Implementation:** NetApp or NetApp authorized partner

If the system does not meet the guarantee, **NetApp will provide up to two days of Professional Services to optimize the system** or to assess performance bottlenecks



**Switch to NetApp and get
3x the performance.
Guaranteed.**

www.netapp.com/3xguarantee

Optimize for Any Workload

FlexPod NetApp (Cisco) for VMware, Hyper-V, Oracle, SAP, Citrix, Red Hat, OpenStack, Hadoop, Oracle(RAC)

Production-Balanced Infrastructure



VDI



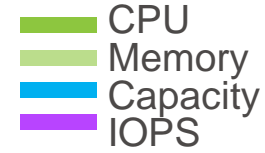
Higher-performance blades and more input/output operations per second (IOPS)



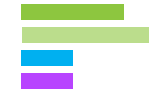
Entry-Level



Deploy entry-level system, then scale up



Develop and Test



More computing and less storage



Data Protection and Backup



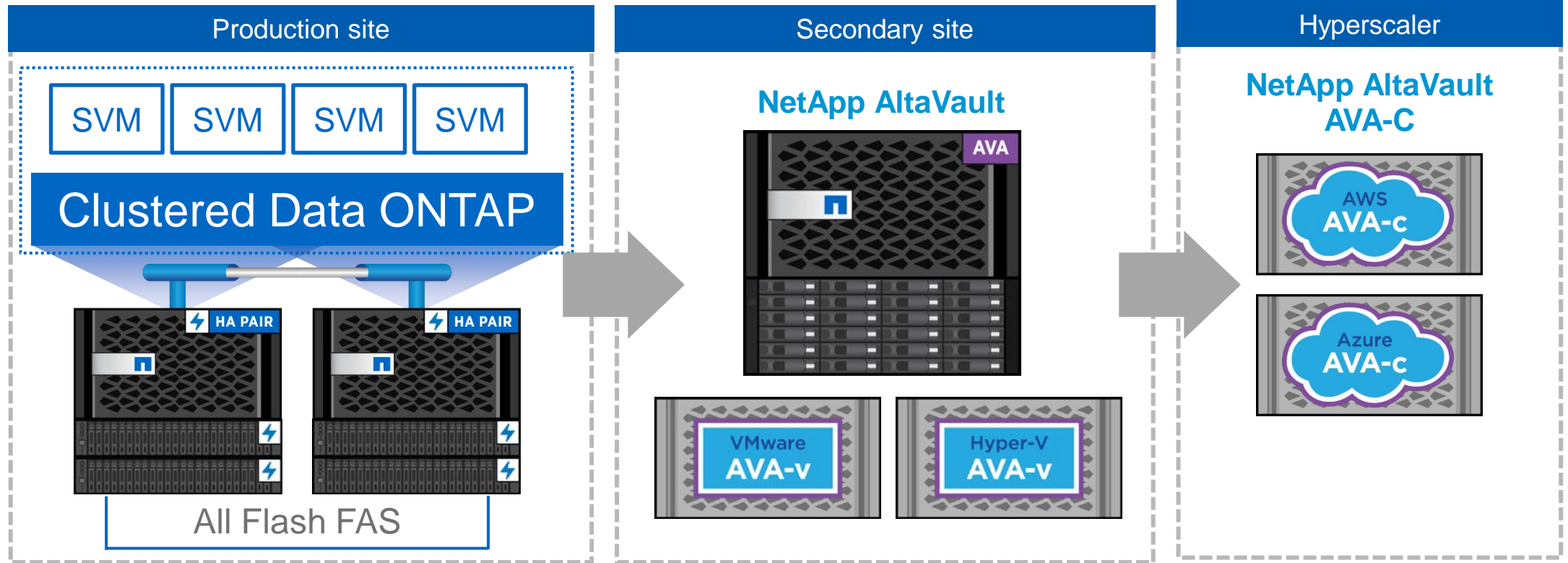
Less computing and more storage



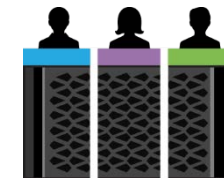
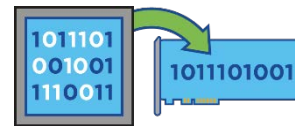
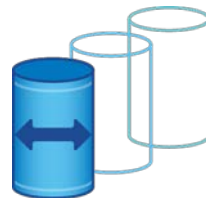
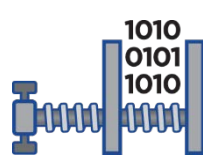
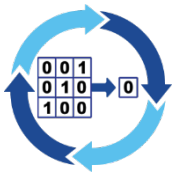
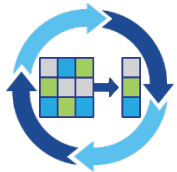
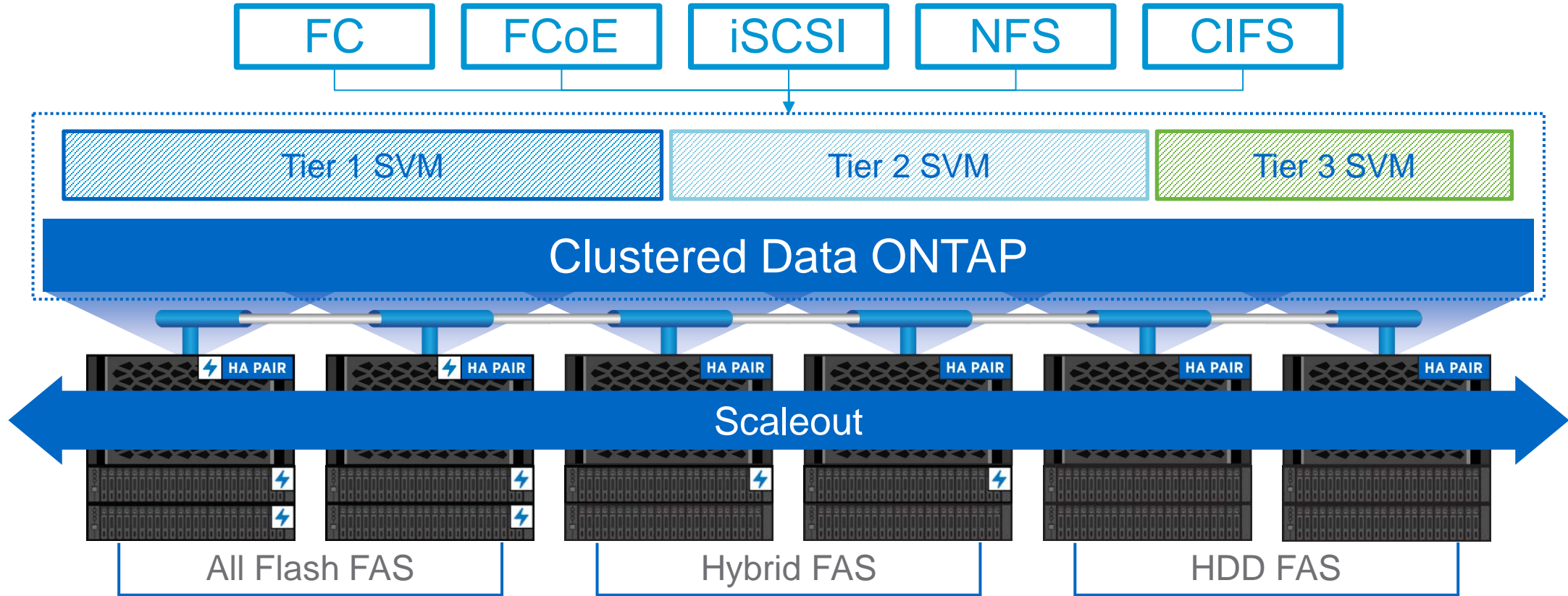
The best storage for virtualization

Non-disruptively (Cluster data ONTAP)

Backup and Recovery Architecture with AltaVault



Enterprise Capabilities



Never challenge in Storage/Virtualization Management

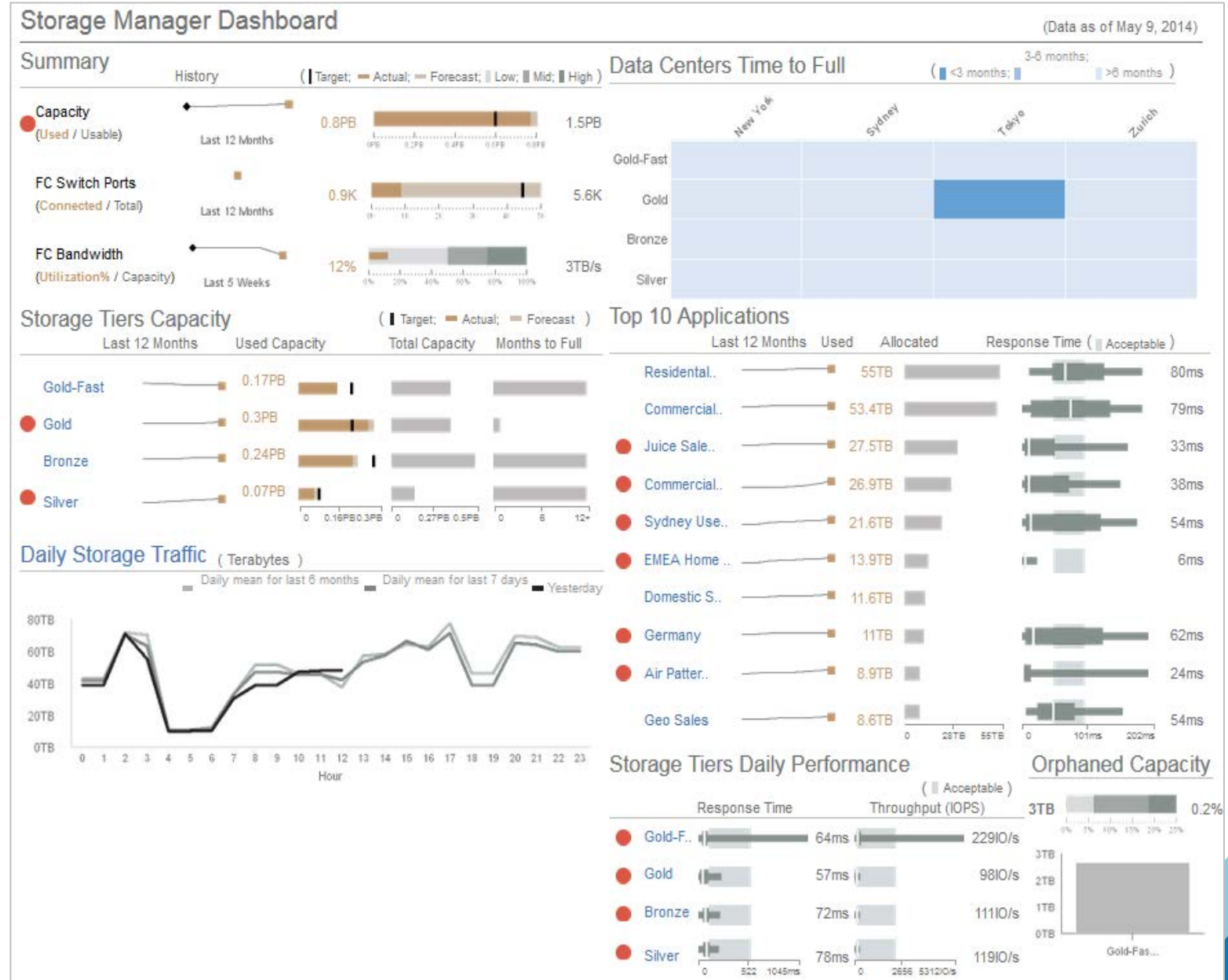
Simplify troubleshooting and analysis (**OnCommand Insight**)

OnCommand Insight

Broker and monitor storage across the cloud

- Operations
 - Determine where to put workloads
 - Monitor and troubleshoot performance issues
- Service quality
 - Reduce risk
 - Assure service levels
- Cost management
 - Measuring cloud elasticity
 - Determine whether services are aligned and optimized
 - Implement cost accountability (showback, chargeback)
 - Rationalize and optimize costs

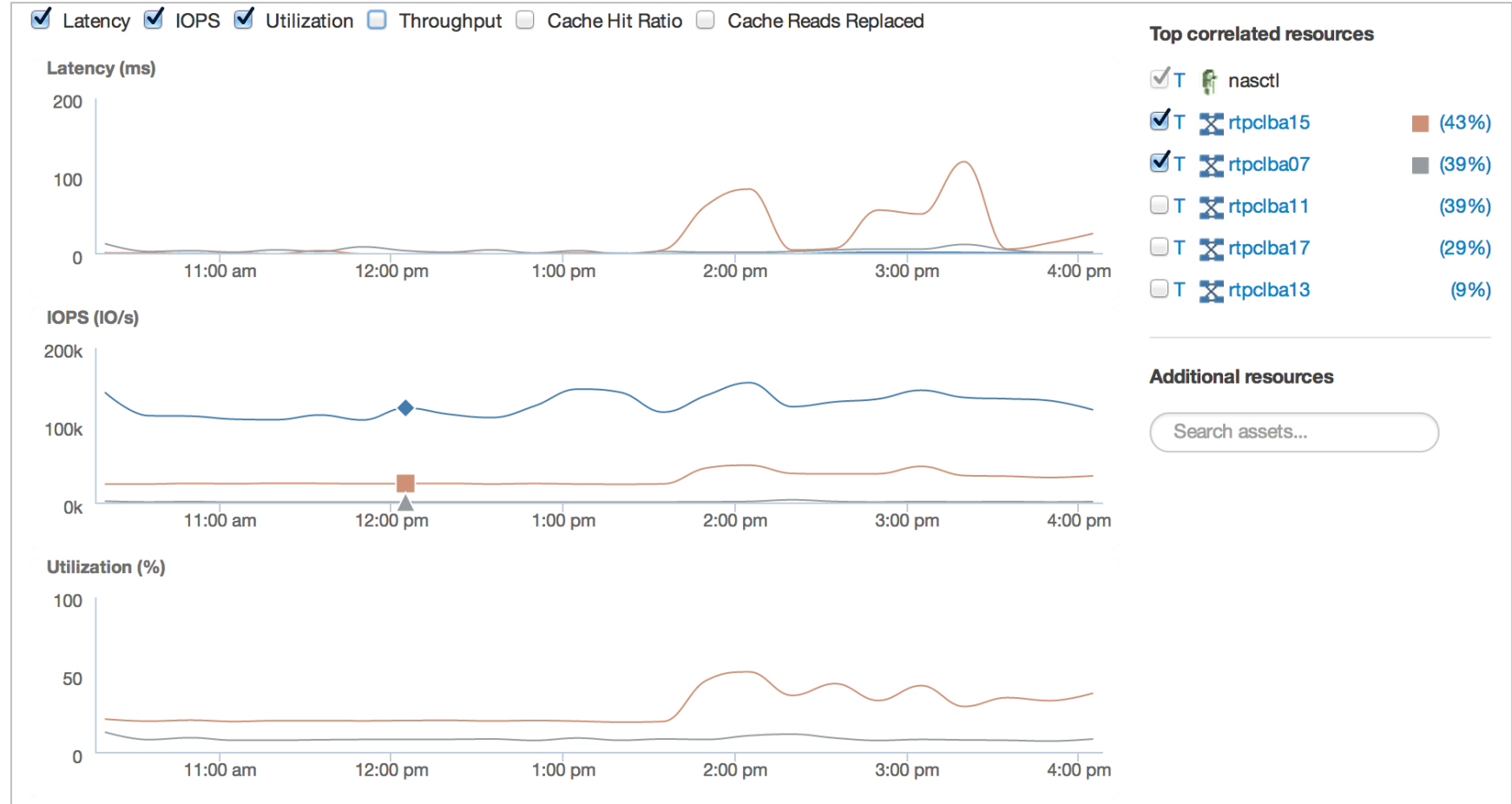
Manage capacity



Operational Troubleshooting

Advanced Analytics


- Analyze and audit configuration to understand the impact on performance
- Identify infrastructure downtime risks
- Ensure compliance with architecture and best practices
- Analyze the impact of servers' workloads on storage



Multivendor infrastructure

- Operations, service

Cloud



openstack Cloud ONTAP amazon web services™

Multi-protocol Storage




NetApp EMC² HITACHI FUJITSU Violin MEMORY DELL Compellent hp IBM.

Server Virtualization



vmware Windows Server Hyper-V IBM.

Fiber Channel Switches



BROCADE CISCO QLOGIC

Access Gateway / NPV



BROCADE CISCO



Only NetApp® OnCommand® Insight has advanced analytics for intelligence across the **multivendor infrastructure**



Industry Leading Multivendor Multi Platform Support

Storage Support

NetApp

NetApp FAS Series 7-Mode/cDOT
NetApp Data ONTAP Edge
NetApp E-series
SnapVault (7-Mode) *-new*

EMC

EMC Atmos
EMC Celerra NAS
EMC Clariion
EMC Data Domain
EMC Isilon
EMC Solution Enabler
EMC StorageScope
EMC Symmetrix /VMAX
EMC VNX
EMC VMAX3 *-new*
EMC XtremIO *-new*

Dell

Dell Compellent *-new*



Fujitsu

Fujitsu Eternus

HP

HP CommandView AE/AE Lite
HP 3PAR
HP EVA
HP XP

Hitachi (HDS)

HDS 95x/99x, SA800, AMS, HM700, HUS 1xx, HUS VM, NSC, USP/USPv, SMS, VSP, WMS

IBM

IBM DS, DS6000/DS8000
IBM ESS Shark
IBM TotalStorage DS4000
IBM N-series
IBM XIV

Violin

Violin 6000 Series

Storage Virtualization

NetApp v-Series
EMC Vplex
IBM SVC

Fibre Channel Switches

Brocade (McData) Sphereon/Intrepid
Brocade (McData) EFCM
Brocade Multi-Protocol Router
Cisco MDS/Nexus
QLogic SANSurfer

Access Gateway / NPV

Brocade Access Gateway
Cisco NPV

Server Virtualization

VMware Virtual Center
VMware vSphere
IBM PowerVM
MicroS Hyper-V



BROCADE



New in OCI 7.1

EMC VMAX3
EMC XtremIO (beta)
Dell Compellent
SnapVault 7 Mode (beta)



NetApp Compellent

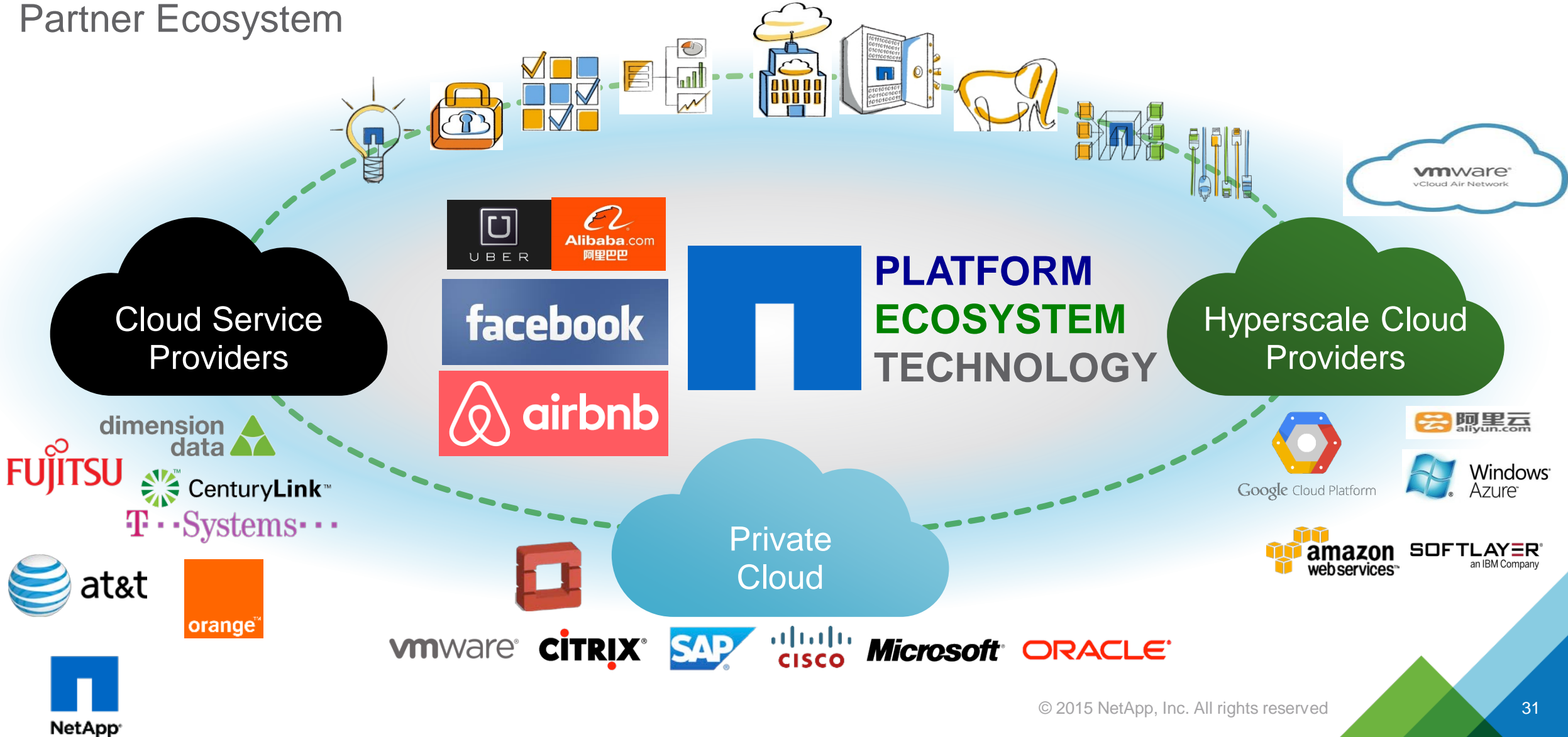
NetApp product portfolio and vision

Overall storage and virtualization solution provider (**Data Fabric**)

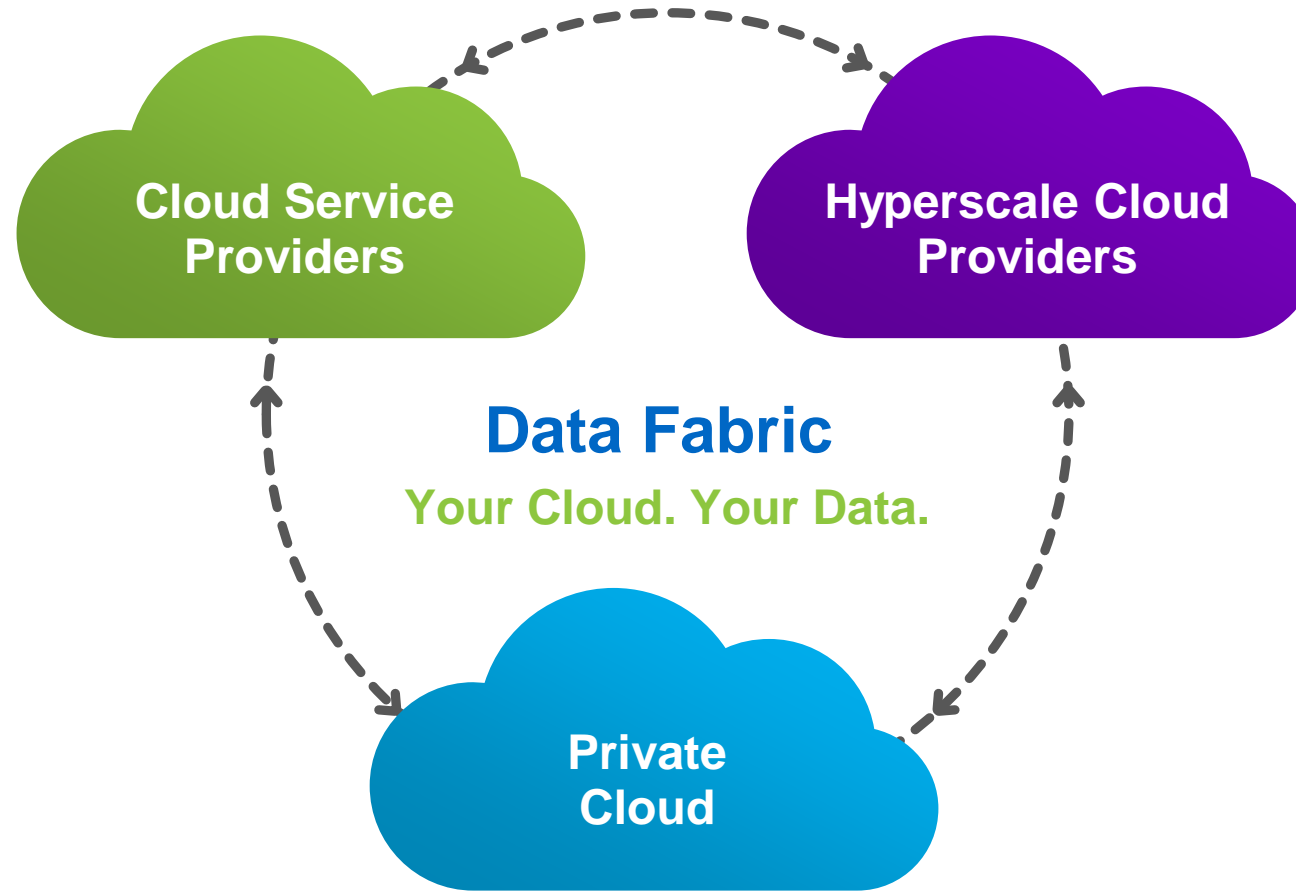


NetApp Data Fabric

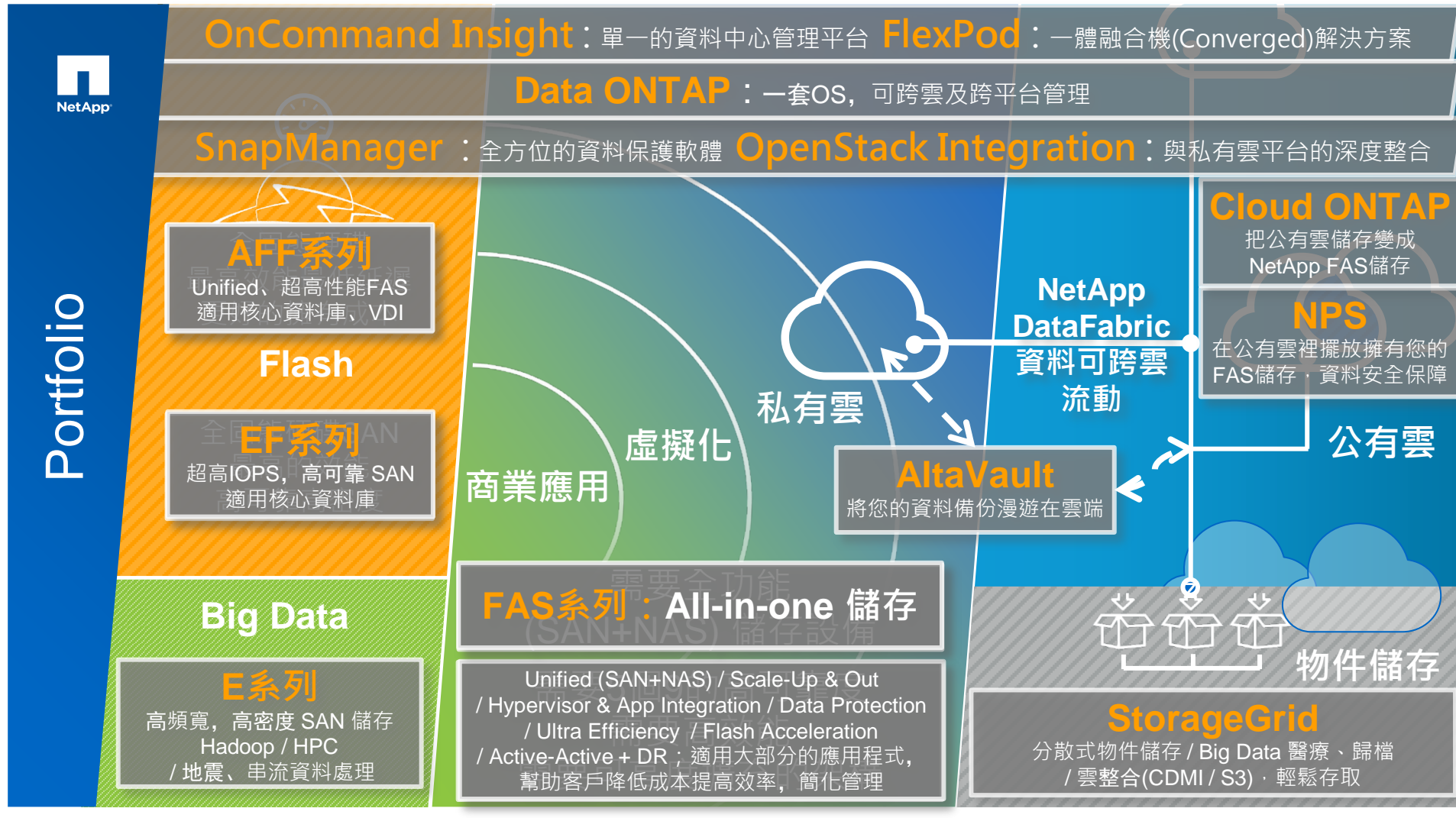
Partner Ecosystem



Vision: Connecting all “your clouds” with NetApp



NetApp product portfolio



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