

# vSphere 6.7 – What's New

David Stamen | Nigel Hickey

Technical Marketing Engineers, vSphere

Twitter: @davidstamen | @vCenterNerd

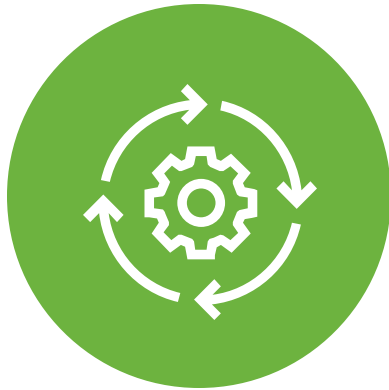
# Disclaimer

- This presentation may contain product features or functionality that are currently under development.
- This overview of new technology represents no commitment from VMware to deliver these features in any generally available product.
- Features are subject to change, and must not be included in contracts, purchase orders, or sales agreements of any kind.
- Technical feasibility and market demand will affect final delivery.
- Pricing and packaging for any new features/functionality/technology discussed or presented, have not been determined.
- This information is confidential.

The information in this presentation is for informational purposes only and may not be incorporated into any contract. There is no commitment or obligation to deliver any items presented herein.

# vSphere 6.7

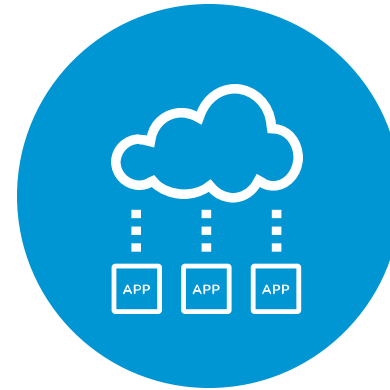
Efficient and Secure Platform for your Hybrid Cloud



Simple  
management at  
scale



Comprehensive  
built-in security

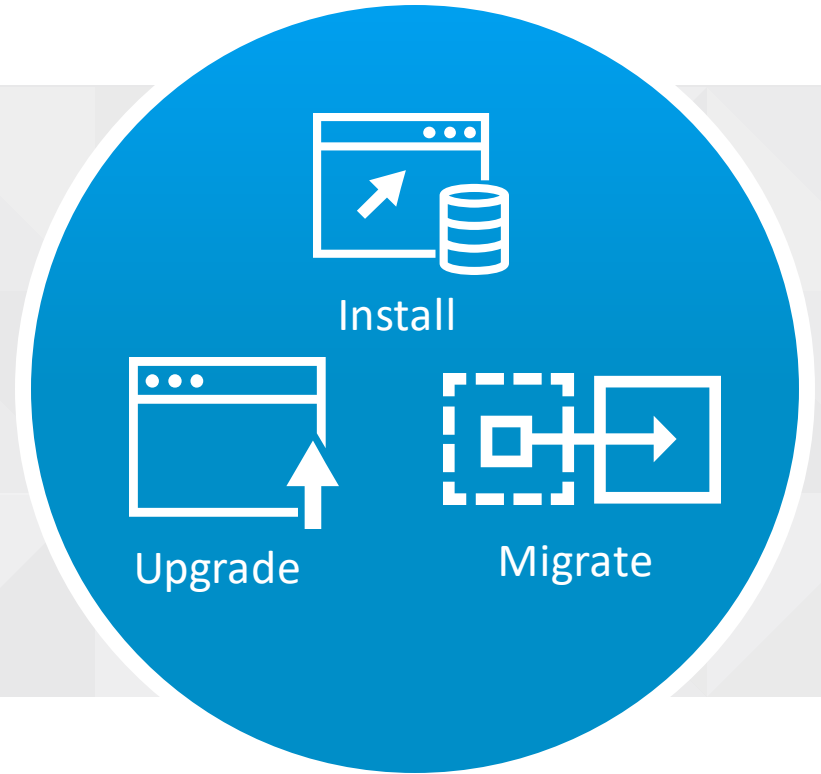


Universal  
application  
platform



Seamless hybrid  
cloud experience

# vCenter Server Appliance Lifecycle



# vCenter Server Appliance Overview

Quick provisioning

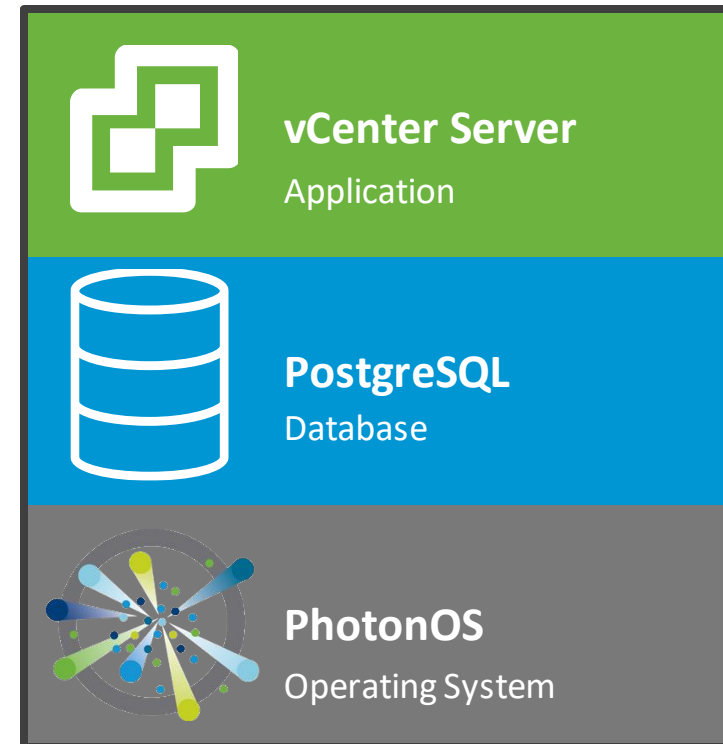
No operating system / database licenses

Unified patching / updating

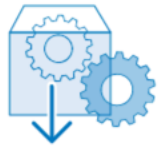
Single point of support

Pre-tuned database

## virtual machine



vm - Stage 1: Deploy appliance English



### Install

Install a new vCenter Server Appliance or Platform Services Controller



### Upgrade

Upgrade an existing vCenter Server Appliance or Platform Services Controller Appliance



### Migrate

Migrate from an existing vCenter Server or Platform Services Controller or Single Sign-On server for Windows to Appliance



### Restore

Restore from a previously created vCenter Server Appliance or Platform Services Controller Appliance backup

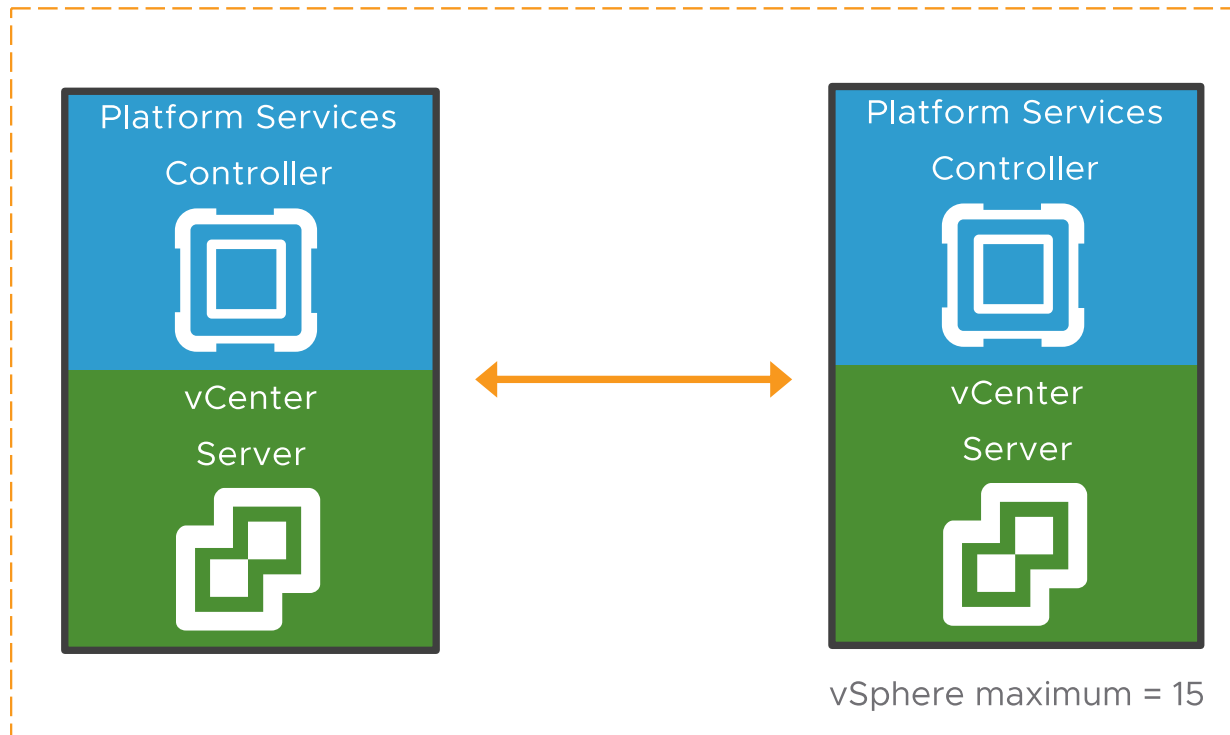
- Updated Clarity UI
- Removal of SSO "Site" for embedded deployments
- Embedded Linked Mode support
- Batch CLI available



# vCenter Server with Embedded PSC and ELM

## Simplified Architecture

vSphere SSO domain w/ Enhanced Linked Mode



\*vCenter Server Appliance Only\*

Enhanced Linked Mode

Greenfield deployments

Supports maximums scale

No load balancer

VCHA supported

Site boundary removed

# vSphere 6.7 Upgrade / Migration Paths

Source	Destination	Upgrade Path
vSphere 5.5 (any)	vSphere 6.7	Not Supported
vSphere 6.0 (any)	vSphere 6.7	Supported
vSphere 6.5 – 6.5 U1	vSphere 6.7	Supported
vSphere 6.5 U2	vSphere 6.7	Not Supported



**vm** Migrate - Stage 2: vCenter Server Appliance

- 1 Introduction
- 2 Connect to source vCenter Se...
- 3 Join AD Domain
- 4 **Select migration data**
- 5 Ready to complete

### Select migration data

Select the data that you want to copy from the source vCenter Server for Windows.

The data sizes shown below represent only the data that will be copied to the target server. It does not correspond to the actual size of your data on the source server. The identity of the server will also be copied and the source server will remain unchanged.

- Configuration (2.67 GB) Estimated downtime: 33 minutes
- Configuration and historical data (events and tasks) (2.77 GB)
- Configuration and historical data (events, tasks and performance metrics) (2.77 GB)
  - Import historical data in the background. Estimated downtime: 34 minutes**  
vCenter Server Appliance will start once the configuration data has been imported. The historical data will be imported in the background. During this time, the performance of vCenter Server Appliance might not be optimal.
  - Import all data now. Estimated downtime: 37 minutes**  
vCenter Server Appliance won't start until all data has been imported from vCenter Server.

[CANCEL](#) [BACK](#) [NEXT](#)

## Selective data import

- Deploy & import all data
- Deploy & import data in the background

## Estimated downtime

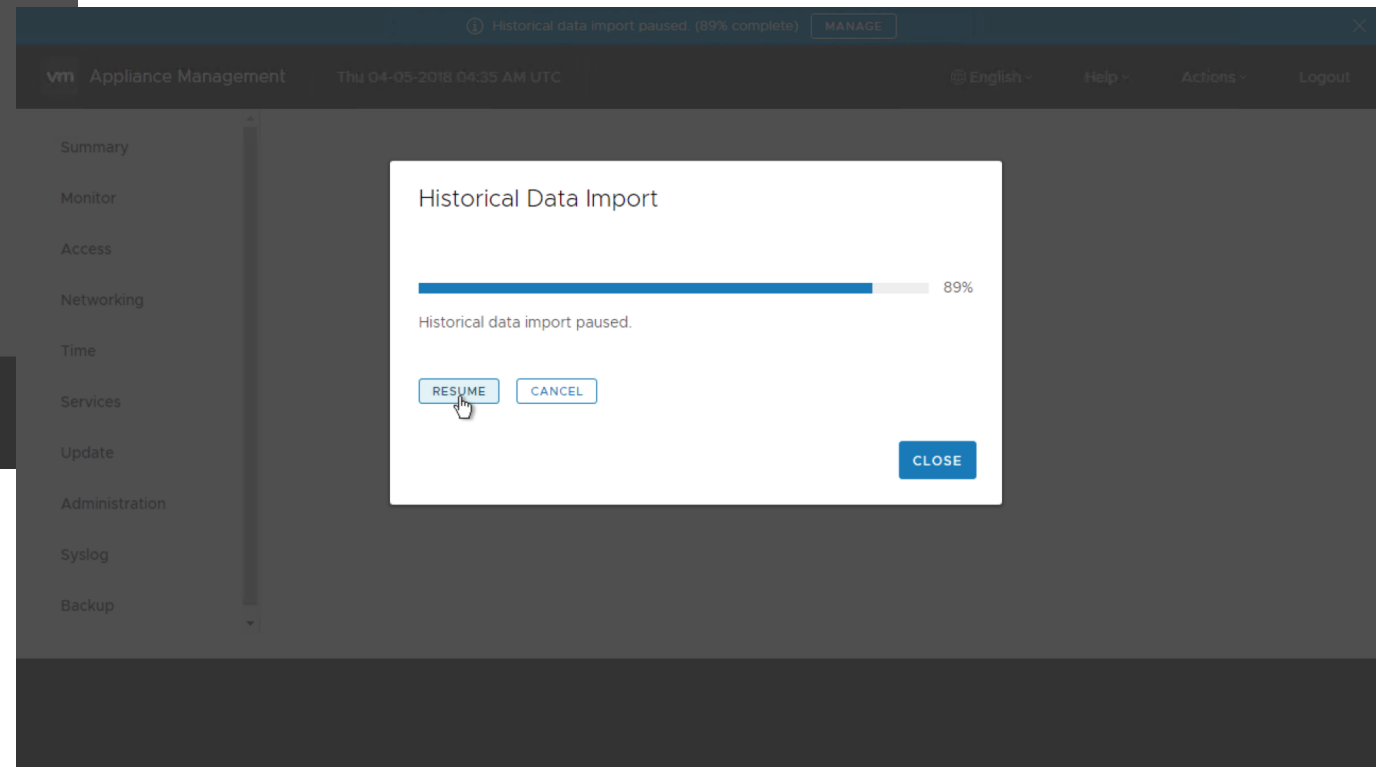
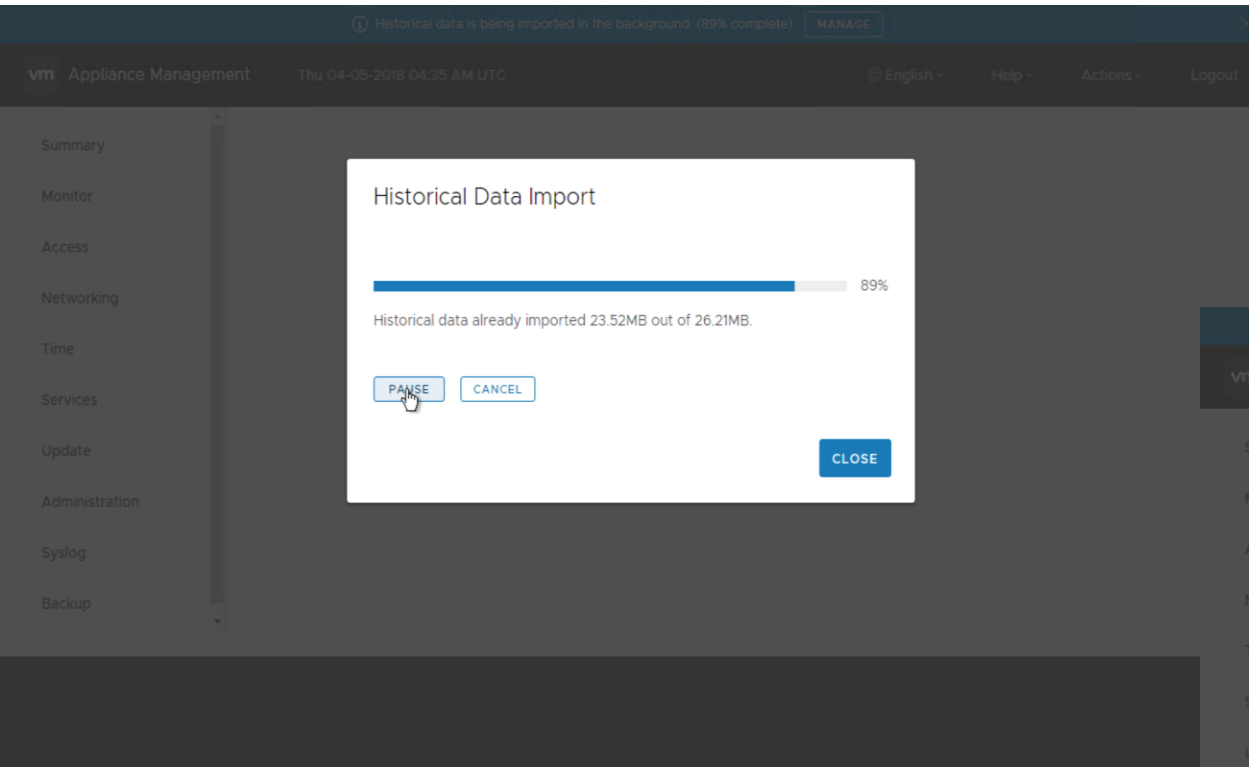
Resume and pause data import from the VAMI

Support for custom ports

Automation from the CLI

# Migration – Data Import Pause / Resume

## vSphere Appliance Management Interface



# vCenter Server Appliance Monitoring & Management



# Streamlined Monitoring

vSphere Appliance Monitoring

<https://fqdn or ip of VCSA:5480>

MANAGEMENT

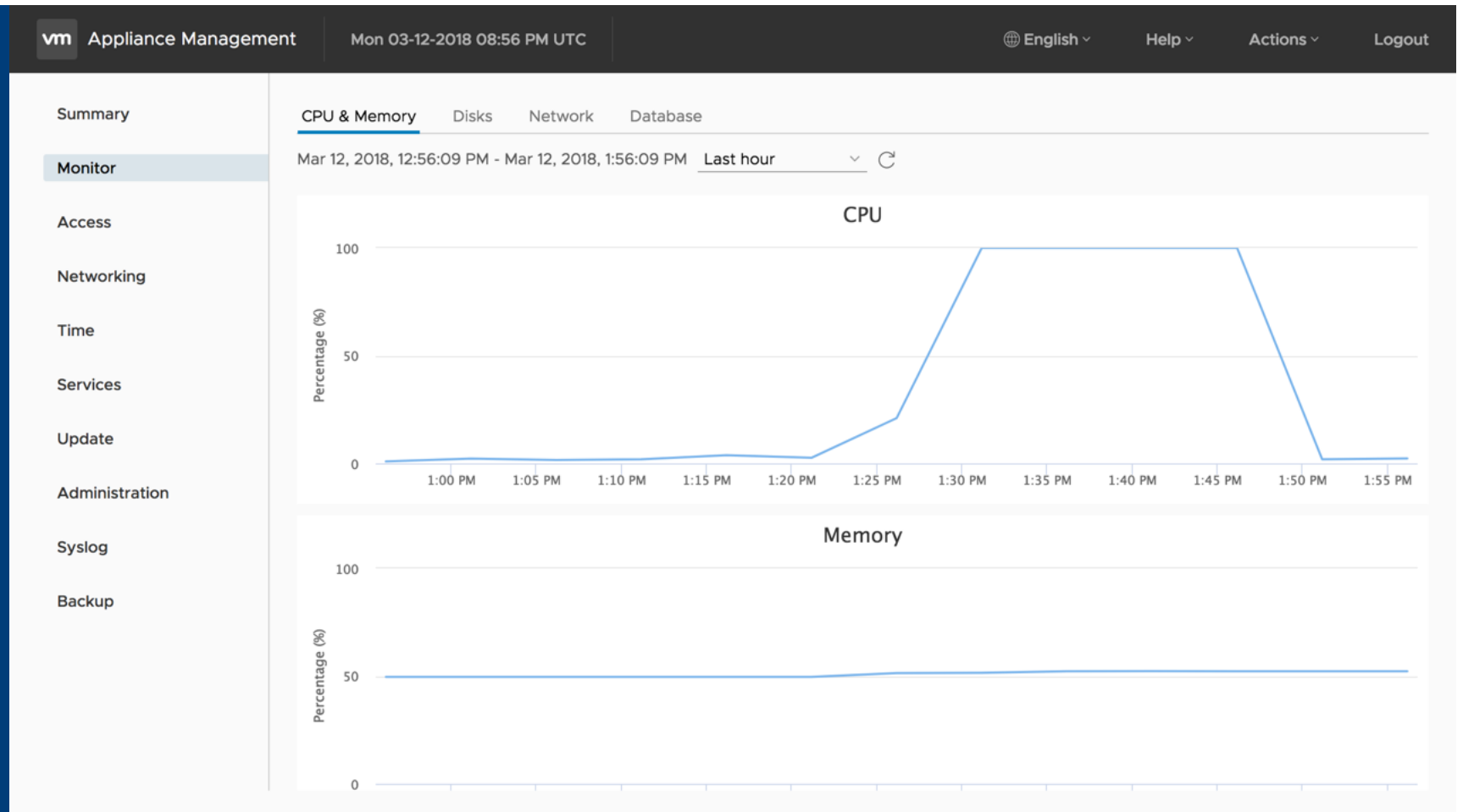
Built in monitoring:

- CPU
- Memory
- Network
- Disks

All monitoring under one tab

VCSA Services included

Syslog forwarding now supports up to 3 remote syslog servers



# Streamlined Monitoring

vSphere Appliance Monitoring

<https://fqdn or ip of VCSA:5480>

## Built in monitoring:

- CPU
- Memory
- Network
- **Disks**

All monitoring under one tab

VCSA Services included

Syslog forwarding now supports up to 3 remote syslog servers

vm Appliance Management Tue 03-13-2018 08:58 PM PDT English Help Actions Logout

Summary CPU & Memory **Disks** Network Database

Disk	Partition	Utilization
Hard disk 1	root	51.4% of 10.6 GB
Hard disk 2	none	Not available
Hard disk 3	swap	Used Space - 9.7 GB Available Space - 25.1 MB Total Space - 9.7 GB 1.4% of 26.0 GB
Hard disk 4	core	0.1% of 49.1 GB
Hard disk 5	log	99.7% of 9.7 GB
Hard disk 6	db	0.9% of 9.7 GB
Hard disk 7	dblog	0.6% of 14.6 GB
Hard disk 8	seat	0.3% of 24.5 GB
Hard disk 9	netdump	0.1% of 984.0 MB
Hard disk 10	autodeploy	0.2% of 9.7 GB
Hard disk 11	imagebuilder	0.2% of 9.7 GB
Hard disk 12	updatemgr	0.1% of 98.3 GB
Hard disk 13	archive	0.3% of 49.1 GB

# Streamlined Monitoring

vSphere Appliance Monitoring

<https://fqdn or ip of VCSA:5480>

Built in monitoring:

- CPU
- Memory
- Network
- Disks

All monitoring under one tab

VCSA **Services** included

Syslog forwarding now supports up to 3 remote syslog servers

The screenshot shows the vSphere Appliance Management web interface. The top navigation bar includes the VMware logo, 'Appliance Management', the date and time 'Mon 03-12-2018 08:46 PM UTC', and user options for 'English', 'Help', 'Actions', and 'Logout'. A left-hand sidebar contains a menu with categories: Summary, Monitor, Access, Networking, Time, Services (highlighted), Update, Administration, Syslog, and Backup. The main content area features three buttons: 'RESTART', 'START', and 'STOP'. Below these is a table of services with columns for Name, Startup Type, Health, and State. The 'VMware vSphere Web Client' service is selected and highlighted.

	Name	Startup Type	Health	State
<input type="radio"/>	VMware Performance Charts Service	Automatic	Healthy	Started
<input type="radio"/>	VMware PSC Health	Automatic	Healthy	Started
<input type="radio"/>	VMware Postgres	Automatic	Healthy	Started
<input type="radio"/>	Appliance Management Service	Automatic	Healthy	Started
<input type="radio"/>	VMware HTTP Reverse Proxy	Automatic	Healthy	Started
<input type="radio"/>	vSAN health Service	Automatic	Healthy	Started
<input checked="" type="radio"/>	VMware vSphere Web Client	Automatic	Healthy	Started
<input type="radio"/>	ImageBuilder Service	Manual		Stopped
<input type="radio"/>	License Service	Automatic	Healthy	Started
<input type="radio"/>	VMware vCenter-Services	Automatic	Healthy	Started
<input type="radio"/>	Content Library Service	Automatic	Healthy	Started
<input type="radio"/>	VMware vSphere Profile-Driven Storage Service	Automatic	Healthy	Started
<input type="radio"/>	VMware vSphere ESXi Dump Collector	Manual		Stopped
<input type="radio"/>	VMware Analytics Service	Automatic	Healthy	Started
<input type="radio"/>	VMware Postgres Archiver	Automatic	Healthy	Started

# Improved Alerting

There are vCenter Server systems with expired or expiring licenses in your inventory. [MANAGE YOUR LICENSES](#) [DETAILS](#)

vm vSphere Client Menu Search Administrator@VSPHERE.LOCAL

vcsa-sfo-01.cpbu.lab ACTIONS

Summary Monitor Configure Permissions Datacenters Hosts & Clusters VMs Datastores Networks Linked vCe

Issues and Alarms  
All Issues  
Triggered Alarms  
Tasks and Events  
Tasks  
Events  
Sessions  
Security  
Health

ACKNOWLEDGE RESET TO GREEN

Alarm Name	Object	Object type	Severity
Log Disk Exhaustion on vcsa-sfo-01	vcsa-sfo-01.cpbu.lab	Folder	CRITICAL

Memory  
Warning 85%  
Critical 95%

Disk  
Warning 75%  
Critical 85%

CPU  
Warning 75%  
Critical 90%

Recent Tasks Alarms

vm Appliance Management Mon 03-12-2018 10:51 PM UTC English Help Actions Logout

Summary Monitor Access Networking Time Services Update Administration Syslog Backup

**Forwarding Configuration**

ⓘ Prior to setting up the forwarding configuration, remote syslog server(s) must be configured and a network connection must exist between the appliance and syslog server(s) to enable log streaming.

### Create Forwarding Configuration

Specify forwarding configuration for remote syslog servers (no more than three).

Server Address	Protocol	Port	
10.158.137.12	TLS	6514	⊗
10.158.137.13	TCP	601	⊗
10.158.137.14	UDP	514	⊗

CANCEL SAVE



# Robust Backup

## Native vCenter Server Appliance Backup

### Backup Management

- Scheduled Backup
- Retention option
- Backup activity

### Verifies VCSA state

Supports VCSA & PSC appliances - embedded & external deployments

### Supported Protocols include:

- HTTP/S
- SCP
- FTP/S

The screenshot displays the vCenter Appliance Management console. At the top, the header shows 'vm Appliance Management', the date and time 'Mon 03-12-2018 10:41 PM UTC', and navigation options for 'English', 'Help', 'Actions', and 'Logout'. A left-hand navigation menu includes 'Summary', 'Monitor', 'Access', 'Networking', 'Time', 'Services', 'Update', 'Administration', 'Syslog', and 'Backup' (which is currently selected). The main content area features an information box stating: 'Before taking a backup, a backup server must be set up and configured such that the appliance has access to it. The protocols supported for backup are FTPS, HTTPS, SCP, FTP and HTTP.' Below this is the 'Backup Schedule' section, which is 'Enabled' and includes settings for 'Schedule' (Daily, 10:40 P.M. Etc/UTC), 'Backup Location' (ftp://10.159.13.53/backup/aus), 'Backup data' (Stats, Events, and Tasks; Inventory and configuration), and 'Number of backups to retain' (Retain all backups). The 'Activity' section has a 'BACKUP NOW' button and a table of recent backup operations.

	Backup Location	Type	Status	Data Transferred	Duration	End Time
>	ftp://10.159.13.53/backup/a...	Scheduled	Complete	199.95 MB	00:00:14	Mar 12, 2018, 3:23:18 PM
>	ftp://10.159.13.53/backup/a...	Manual	Complete	199.94 MB	00:00:14	Mar 12, 2018, 3:19:39 PM
>	ftp://10.159.13.53/backup/a...	Scheduled	Complete	199.98 MB	00:00:18	Mar 12, 2018, 3:30:22 PM
>	ftp://10.159.13.53/backup/a...	Scheduled	Complete	200.02 MB	00:00:14	Mar 12, 2018, 3:40:18 PM
>	ftp://10.159.13.53/backup/a...	Manual	Complete	199.97 MB	00:00:16	Mar 12, 2018, 3:16:59 PM

# Simple Restore

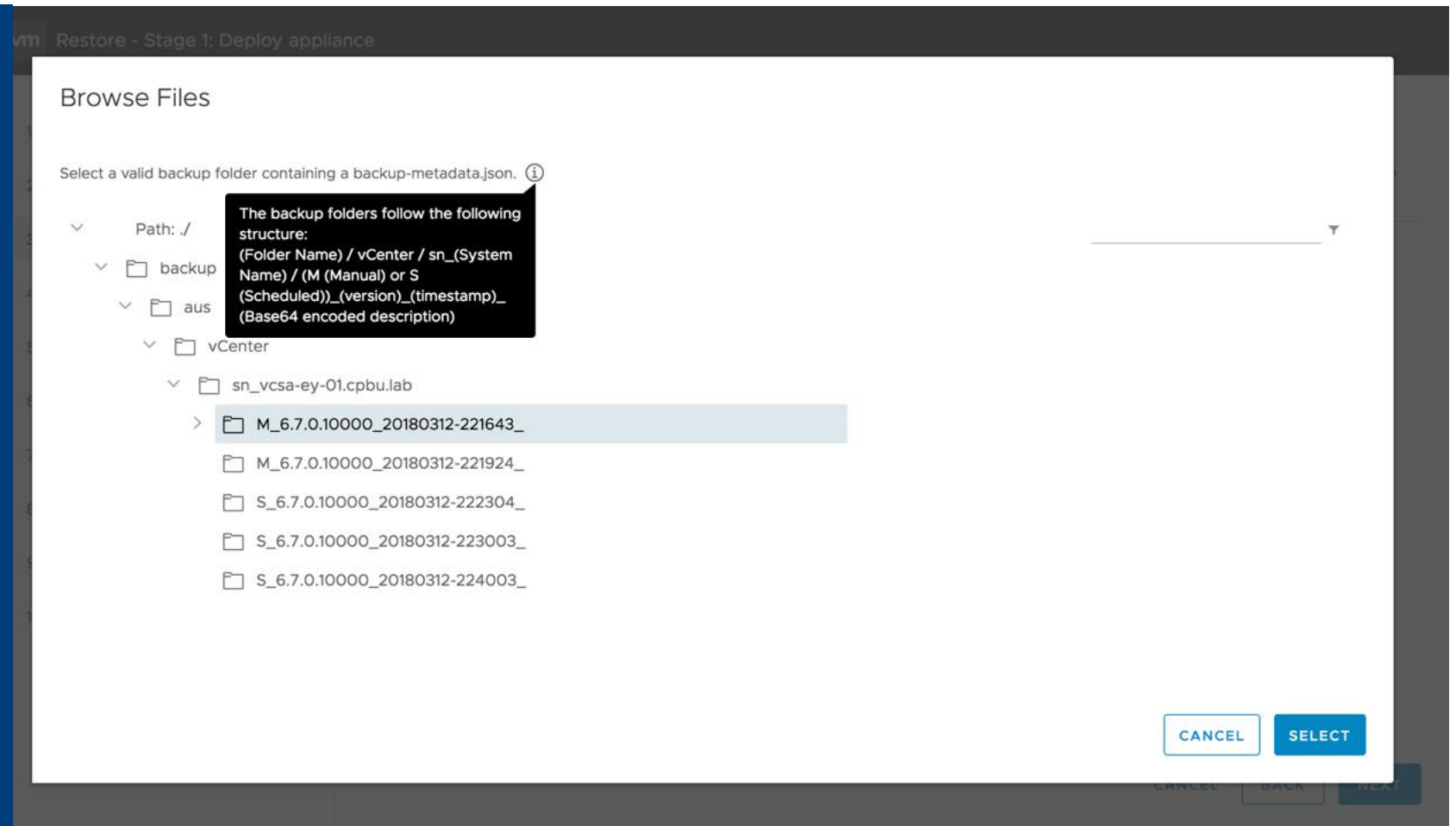
Restore directly from VCSA ISO

Browse Restore Files

External PSC restore not supported when replication partners are available

Embedded Linked Mode Supported with reconciliation

Retains VCSA identity



# Flexible Patching & Update

vm Appliance Management Thu 03-29-2018 08:35 PM UTC English Help Actions Logout

Summary  
Monitor  
Access  
Networking  
Time  
Services  
**Update**  
Administration  
Syslog  
Backup

Current version details SETTINGS CHECK UPDATES

Appliance Type vCenter Server with an embedded Platform Services Controller

Version 6.7.0.10000

Available updates (Last Checked Mar 29, 2018, 12:00:00 PM)

Updates and patches are cumulative. The most recent update or patch in the table below will contain all previous patches.

STAGE ONLY STAGE AND INSTALL

	Version	Type	Release Date	Reboot Required	Severity
<input checked="" type="radio"/>	> 6.7.0.10000	Upgrade	2018-03-29	No	Critical
<input type="radio"/>	> 6.7.0.10000	Fix	2018-03-29	No	Moderate
<input type="radio"/>	> 6.7.0.10000	Fix	2018-03-29	Yes	Important
<input type="radio"/>	> 6.7.0.10000	Fix	2018-03-29	Yes	Critical

4 Items

## Staging options

- Stage only
- Stage & Install

## Selectable Updates

## Monthly Patches

## Updates Options

- CDROM
- CDROM + URL

# vCenter Server Appliance CLI Tools



# PSC Reprint

vSphere SSO Domain

Reconfigure from an embedded to external deployment

Repoint vCenter Server to a PSC inter-site and **across sites**

External Deployments

Decommission

cmsso-util

```
Terminal — ssh root@vcsa-hou-01
Command> cmsso-util --help
usage: cmsso-util [-h] {unregister,reconfigure,repoint} ...

Tool for orchestrating unregister of a node from LS, reconfiguring a vCenter
Server with embedded PSC and repointing a vCenter Server to an external PSC in
same as well as different domain.

positional arguments:
  {unregister,reconfigure,repoint}
  unregister            Unregister node. Passing --node-pnid will unregister
                        solution users, computer account and service
                        endpoints. Passing --hostId will unregister only
                        service endpoints and solution users.
  reconfigure           Reconfigure a vCenter with an embedded Platform
                        Services Controller(PSC) to a vCenter Server. Then it
                        repoints to the provided external PSC node.
  reprint              Repoints a vCenter with an external Platform Services
                        Controller(PSC) to the provided external PSC node.

optional arguments:
  -h, --help           show this help message and exit
```

# Domain Repoint

## Move vCenter Server Across Domains

Consolidate vSphere SSO Domains

Migrates Tags, Licenses, Categories,  
Global Permissions

Pre-check option

External Deployments

cmsso-util domain-repoint

```
Terminal — ssh root@vcsa-sfo-01.cpbu.lab
root@vcsa-sfo-01 [ ~ ]# cmsso-util
usage: cmsso-util [-h] {unregister,reconfigure,repoint,domain-repoint} ...

Tool for orchestrating unregister of a node from LS, reconfiguring a vCenter
Server with embedded PSC and repointing a vCenter Server to an external PSC in
same as well as different domain.

positional arguments:
  {unregister,reconfigure,repoint,domain-repoint}
  unregister           Unregister node. Passing --node-pnid will unregister
                        solution users, computer account and service
                        endpoints. Passing --hostId will unregister only
                        service endpoints and solution users.
  reconfigure          Reconfigure a vCenter with an embedded Platform
                        Services Controller(PSC) to a vCenter Server. Then it
                        repoints to the provided external PSC node.
  repoint              Repoints a vCenter with an external Platform Services
                        Controller(PSC) to the provided external PSC node.
  domain-repoint       Repoint vCenter Server from one Platform Services
                        Controller to another Platform Services Controller in
                        a different domain. The repointing operation will
                        migrate Tags, Authorization, License data to another
                        Platform Services Controller.

optional arguments:
  -h, --help           show this help message and exit
```



# Domain Repoint Pre-Check

## Pre-check JSON

Resolve conflicts prior to domain repoint

Conflict\*.json

All\_Privileges.json

All\_Roles.json

All\_TagCategories.json

All\_Tags.json

```
Terminal — ssh root@vcsa-sfo-01.cpbu.lab
The repoint service migrates License, Tags, Authorization data from one
Platform Services Controller to another.

WARNING: Global Permissions for the source vCenter Server system will be lost. The
administrator for the target domain must add global permissions manually.
Source domain users and groups will be lost after the Repoint operation.
User 'administrator@vsphere.local' will be assigned administrator role on the
source vCenter Server system.

The default resolution mode for Tags and Authorization conflicts is Copy,
unless overridden in the conflict files generated during pre-check.

Solutions and plugins registered with vCenter Server must be re-registered.

vCenter Server details in target Platform Services Controller are not provided.
Tags/Authorization conflicts will not be checked.

Before running the Repoint operation, you should back up or take snapshots
of all nodes including external databases. You can use backups and
snapshots to revert the changes in case of failure. By using the Repoint tool
you agree to take the responsibility for creating backups or taking
snapshots, otherwise you should cancel this operation.

Repoint Node Information
Source Platform Services Controller: psc-sfo-01.cpbu.lab
Target Platform Services Controller: psc-nyc-01.cpbu.lab

Starting License pre-check           ... Done
Starting Tagging Data export         ... Done
Starting Authz Data export           ... Done
Conflict data, if any, can be found under /storage/domain-data/Conflict*.json
Pre-checks successful.
```

# CLI Batch Operations

Supports vCenter Server lifecycle

- Install
- Upgrade
- Migrate

Deploy multiple single instances or in sequence

Point to a single directory containing json files

Example json scripts included in VCSA ISO

```
Terminal --bash
eyounis-mac-01:mac eyounis$ ./vcsa-deploy install --accept-eula --no-ssl-certificate-verification
/Users/eyounis/Documents/BatchDeploy
Run the installer with "-v" or "--verbose" to log detailed information
Updating log file location, copying '/var/folders/gz/47f6n_w16_1_klyc7pq8ddy80000gn/T/vcsaCliInst
aller-2018-03-13-23-52-yewi6eaz/vcsa-cli-installer.log' to desired location as a backup: '/var/fo
lders/gz/47f6n_w16_1_klyc7pq8ddy80000gn/T/vcsaCliInstaller-2018-03-13-23-52-yewi6eaz/workflow_152
0985166398/vcsa-cli-installer.log.bak'
Workflow log-dir
/var/folders/gz/47f6n_w16_1_klyc7pq8ddy80000gn/T/vcsaCliInstaller-2018-03-13-23-52-yewi6eaz/workf
low_1520985166398
===== [START] Start executing Task: To validate CLI options at 23:52:46 =====
=====
Command line arguments verified.
[SUCCEEDED] Successfully executed Task 'CLIOptionsValidationTask: Executing CLI optionsValidatio
n task' in
TaskFlow 'template_validation' at 23:52:46
===== [START] Start executing Task: To validate the syntax of the template. at 23:52:4
6 =====
Template syntax validation for template '/Users/eyounis/Documents/BatchDeploy/ELM-01.json' succee
ded.
```



# vSphere Client (HTML5)



# vSphere Client Feature Parity

Now 95% feature parity

MANAGEMENT

vSphere Update Manager

Content Library

vSAN

vRealize Operations

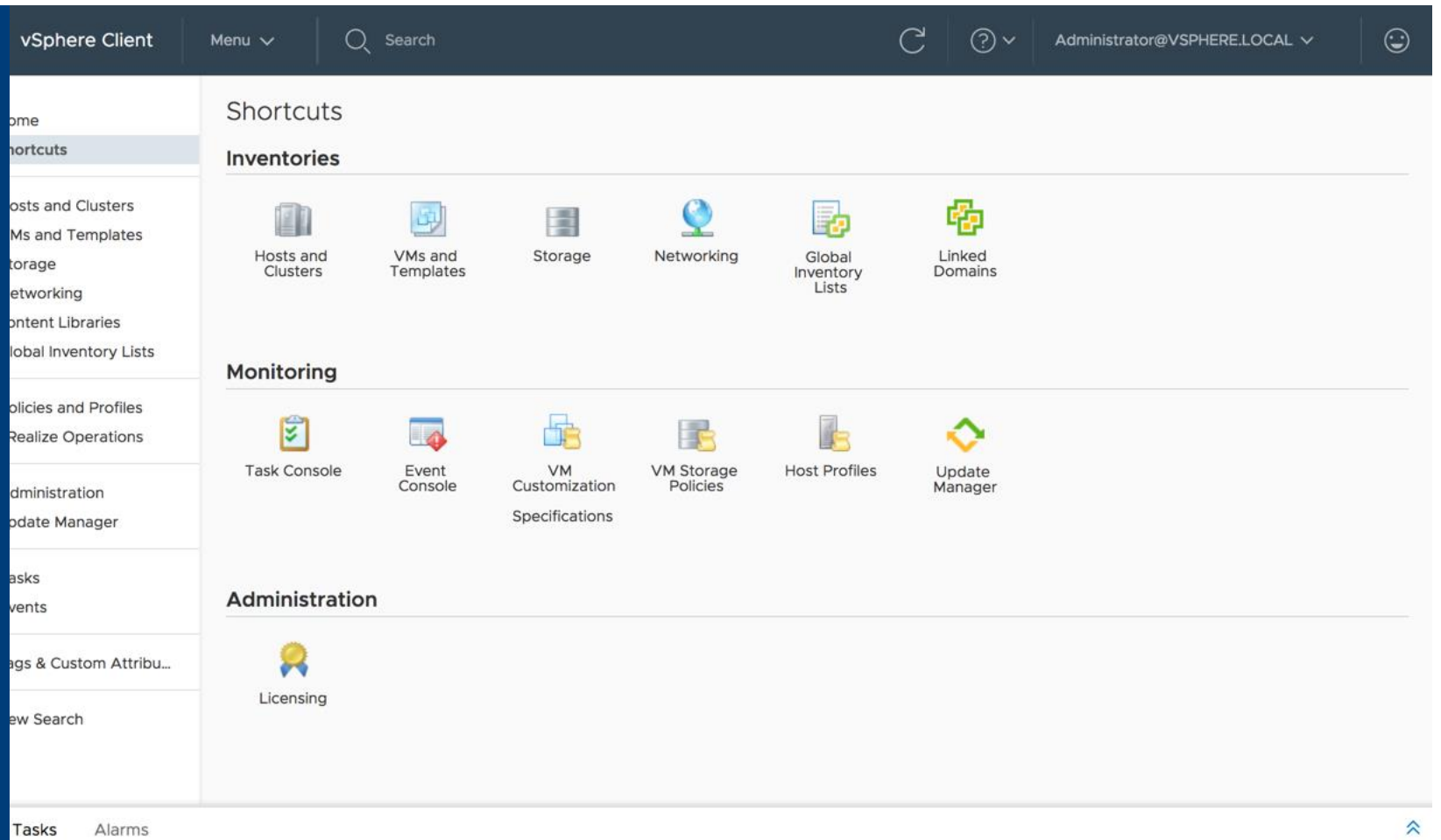
Storage Policies

Host Profiles

vDS Topology Diagram

Licensing

More....



# Platform Services Controller

## vSphere Client

MANAGEMENT

PSC UI now included in vSphere Client

Configuration Tab

- Identity Sources
- Active Directory Domain
- Policies
- Login Banner
- Smart Card Configuration

Certificate Management

The screenshot displays the vSphere Client interface for the Platform Services Controller (PSC). The top navigation bar includes the vSphere Client logo, a menu, a search bar, and the user's identity (Administrator@VSPHERE.LOCAL). The left sidebar shows the 'Administration' section with a tree view where 'Configuration' is selected. The main content area is titled 'Policies' and contains tabs for 'PASSWORD POLICY', 'LOCKOUT POLICY', and 'TOKEN POLICY'. The 'PASSWORD POLICY' tab is active, showing a description: 'A set of rules and restrictions on the format and expiration of Single Sign-On user passwords'. Below this is a table for the 'Password Policy' configuration.

Description	
Maximum lifetime	Password must be changed every 90 days
Restrict reuse	Users cannot reuse any previous 5 passwords
Maximum length	20
Minimum length	8
Character requirements	At least 1 special characters At least 2 alphabetic characters At least 1 uppercase characters At least 1 lowercase characters At least 1 numeric character Identical adjacent characters: 3

**vm vSphere Client** Menu Search Administrator@VSPHERE.LOCAL

Home Shortcuts

Hosts and Clusters  
VMs and Templates  
Storage  
Networking  
Content Libraries  
Global Inventory Lists

Policies and Profiles  
**vRealize Operations**

Administration  
Update Manager

Tasks  
Events

Tags & Custom Attribu...

New Search

## vRealize Operations is not present!

It looks like vRealize Operations is not configured to work with this vCenter.

### Why do I need vRealize Operations?

**Application-aware monitoring across SDDC and multiple clouds**

Centralize IT operations management of SDDC and multi-cloud environment, accelerate time to value and troubleshoot smarter with native integrations, unified visibility from applications to infrastructure health and actionable insights combining metrics and logs

**Cloud Planning, capacity optimization and compliance**

Correlate operational and cost insights to accelerate cloud planning decisions, control costs and reduce risk. Optimize cost and resource usage through capacity management, reclamation and right sizing, improve planning and forecasting and enforce IT and configuration standards.

**Automated and proactive workloads management**

Simplify and streamline IT operations with fully automated management of infrastructure and applications performance, while retaining full control. Automatically balance workloads, avoid contention and enable proactive detection and automatic remediation of issues and anomalies before end users are impacted.

and many more!

[VIEW ALL USE CASES](#)

**INSTALL** CONFIGURE EXISTING INSTANCE

Recent Tasks Alarms

# vSphere Lifecycle



# Update Manager Web Client Interface (HTML5)

Critical milestone achieved for vSphere Client

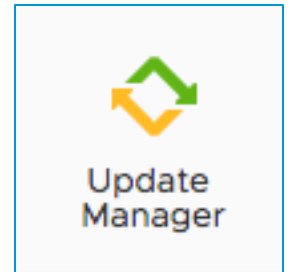
vSphere 6.7 marks the first release of the Update Manager HTML5 interface

The new interface exhibits a clean design and an optimized workflows

vSphere Web Client is still available and required for the following:

- Update Manager configuration changes
- VMware Tools & VM Hardware updates
- Viewing Events and Notifications from the Update Manager interface
- Indicating which hosts are Quick Boot capable or disabling Quick Boot
  - Quick Boot will still be used when updating compatible hosts

MANAGEMENT



# Update Manager – Main Interface

Create baselines, upload patches, extensions, and ESXi images

The screenshot displays the vSphere Client interface for the Update Manager. The top navigation bar includes the VMware logo, 'vSphere Client', a menu, a search bar, a refresh icon, a help icon, and the user email 'Administrator@VCRITICAL.COM'. The left sidebar contains navigation options: Home, Shortcuts, Hosts and Clusters, VMs and Templates, Storage, Networking, Content Libraries, Global Inventory Lists, Policies and Profiles, vRealize Operations, Administration, Update Manager (highlighted), Tasks, Events, Tags & Custom Attributes, and New Search.

The main content area is titled 'Update Manager' and has tabs for Home, Baselines (selected), Updates, and ESXi images. Below the tabs are action buttons: NEW (with a dropdown arrow), EDIT, DELETE, and DUPLICATE. A table lists the baselines and baseline groups:

	Baselines and Baseline Groups	Content	Type	Last Modified
<input type="radio"/>	Upgrade to 6.7 7797198	Upgrade	Custom	3 weeks ago
<input type="radio"/>	Install EMC NAS	Extension	Custom	3 weeks ago
<input type="radio"/>	Non-Critical Host Patches (Predefined)	Patch	Predefined	3 weeks ago
<input type="radio"/>	Critical Host Patches (Predefined)	Patch	Predefined	3 weeks ago
<input type="radio"/>	Cisco UCS Group	Group	Custom	3 weeks ago

At the bottom right of the table, it indicates '5 Baselines and Baseline Groups'.

# Update Manager – Updates Tab

Check status or remediate hosts and clusters

The screenshot shows the vSphere Client interface with the Update Manager tab selected. The left sidebar shows a tree view of the environment: vcsa22.vcritical.com > WEST > AppServices > Development. The main content area has tabs for Summary, Monitor, Configure, Permissions, Hosts, VMs, Datastores, Networks, and Updates (selected). Three summary cards are displayed: '8 Hosts' (8 with 6.7.0), 'All Hosts Compliant' (with a 'CHECK COMPLIANCE' button, last check 22 hours ago), and 'All Hosts Can Remediate' (with 'NO failed check(s) on any host' and 'NO failed check(s) on the cluster', and a 'PRE-CHECK REMEDIATION' button, last check 2 days ago). Below these cards are buttons for ATTACH, DETACH, STAGE, and REMEDIATE, and a 'GO TO UPDATE MANAGER HOME' link. A table at the bottom lists attached baselines:

	Attached Baselines	Compliance	Content	Type	Last Modified
<input type="radio"/>	Install EMC NAS	Compliant	Extension	Custom	3 weeks ago
<input type="radio"/>	Upgrade to 6.7 7797198	Compliant	Upgrade	Custom	3 weeks ago



# Update Manager Workflow Micro Demo

See the new VUM interface in action during a cluster upgrade

A cluster of ESXi 6.5 hosts will be upgraded to ESXi 6.7

- Attach baseline, check, remediate

## Observations

- Status of hosts in the cluster is clearly displayed
- The pre-check is now a separate operation
- The remediation wizard is simplified and requires minimal user interaction
- Settings are visible but cannot be edited during remediation

## Takeaway

- vSphere administrators will be more efficient when updating hosts

# Update Manager Workflow Micro Demo

## Cluster Upgrade

The screenshot displays the vSphere Client interface for a cluster named 'AppServices'. The top navigation bar includes the VMware logo, 'vSphere Client', a search bar, and the user 'Administrator@VCRITICAL.COM'. The left sidebar shows a tree view of the cluster hierarchy, including hosts (r0911.vcritical.com to r0914.vcritical.com) and processes (process101 to process119). The main content area is divided into several sections:

- Summary:** Shows 'Total Processors: 112' and 'Total vMotion Migrations: 261'. It also includes resource usage bars for CPU (Used: 37.92 GHz, Free: 207.83 GHz, Capacity: 245.76 GHz), Memory (Used: 291.4 GB, Free: 471.25 GB, Capacity: 782.85 GB), and Storage (Used: 143.84 GB, Free: 2.67 TB, Capacity: 2.81 TB).
- vSphere DRS:** The status is 'Balanced'. Migration automation level is 'Fully Automated'. Migration threshold is 'Apply priority 1, priority 2, priority 3, priority 4, and priority 5 recommendations'. Power management automation level is 'Off'. DRS recommendations and DRS faults are both 0.
- Update Manager:** Compliance is shown as a progress indicator. Precheck Remediation status is 'Some Hosts May Not Remediate (last check just now)'. Buttons for 'CHECK COMPLIANCE' and 'PRE-CHECK REMEDIATION' are visible.
- Tags:** A table with columns for 'Assigned Tag', 'Category', and 'Description' is shown, currently empty.

# Rebooting VMware ESXi Hosts

## What's the big deal?

Modern datacenter servers take significant time to reboot

- Self tests, device initialization, physical memory testing, etc.

Host updates typically require at least one reboot



- Major version upgrades have required pre- and post-upgrade reboots

Update Manager is used to patch or upgrade clusters

- Zero downtime for applications, when DRS is enabled
- Start-to-finish cluster update time still lengthy

Customers may choose to restrict host updates to defined maintenance windows

- Change control, policy compliance, or other non-technical requirements

Task Name	Target	Status
Initiate host reboot	 r0911.vcritical.com	 Completed

# VMware vSphere 6.7 Optimizes Host Reboots

Two different ways to reduce host downtime during updates

## Single Reboot Upgrade

- Applies to ESXi 6.5 hosts
- Faster upgrades to ESXi 6.7

Helps customers get to  
vSphere 6.7 faster

## Quick Boot

- Applies to ESXi 6.7 hosts
- Faster patching of ESXi 6.7 hosts

Minimize maintenance time  
when patching vSphere 6.7

# Single Reboot for Major Version Upgrades

Eliminate multiple reboots when upgrading hosts from ESXi 6.5 to 6.7

Update Manager upgrades hosts to the latest major version of ESXi

- The destination version must be the current vSphere version, not an older release

Major version upgrade workflow

- Upload an ISO image and create an upgrade baseline
- Attach the baseline to a vSphere cluster, scan, and remediate

In VMware vSphere 6.5 and earlier, hosts are rebooted before and after the upgrade

- Two reboots per host

VMware vSphere 6.7 is optimized for faster upgrades, and eliminates the first reboot

- Applicable to 6.5 → 6.7 upgrades only
- 6.0 hosts still reboot twice

Nothing to configure, single reboot is used automatically

# Single Reboot Micro Demo Introduction

Featuring the new HTML 5 Update Manager interface

Two 8-node clusters undergoing upgrades to VMware ESXi 6.7

- WebApps: VMware ESXi 6.0
- Development: VMware ESXi 6.5

## Observations

- The 6.5 cluster finishes upgrading all 8 hosts in just over half an hour
  - The 6.0 cluster is still upgrading the third host
- The 6.0 cluster completes the 8 host upgrade after almost two hours

## Takeaway

- Major version upgrades are up to 4x faster

# Single Reboot Micro Demo

The screenshot shows the VMware vSphere Client interface for a cluster named 'Development'. The 'Updates' tab is active, displaying the following information:

- 8 Hosts** with version 6.7.0.
- All Hosts Compliant** (last check 58 minutes ago).
- All Hosts Can Remediate** (last check 38 minutes ago).

Below the summary cards, there are buttons for **ATTACH**, **DETACH**, **STAGE**, and **REMEDiate**, along with a link to **GO TO UPDATE MANAGER HOME**.

Attached Baselines	Compliance	Content	Type	Last Modified
<input type="radio"/> Upgrade to 6.7 7797198	<span>Compliant</span>	Upgrade	Custom	2 weeks ago

# Quick Boot

Restart the VMware ESXi hypervisor without rebooting the physical hardware

Quick Boot can make a big impact on datacenter operations!

- When a reboot is necessary, devices are shut down and the hypervisor restarts
- Hardware initialization and memory tests are not performed
- Improves host availability and shortens maintenance windows

## Requirements

- Supported server hardware (current: short list of Dell and HPE systems)
- Native device drivers only – no vmklinux driver support
- Secure boot not supported

### Host Settings

Allow Quick Boot	Yes
VM Power state	-
Disable removable media devices that might prevent a host from entering maintenance mode	No
Retry entering maintenance mode in case of failure	Yes



# Quick Boot Micro Demo Introduction

Faster host reboot after installation of the EMC NAS VAAI extension

Two HPE hosts running VMware ESXi 6.7

- One is using default configuration with Quick Boot enabled
- One has Quick Boot manually disabled
- VUM initiated installation of an extension that requires a reboot

Observations

- The Quick Boot host unloads drivers and restarts VMware ESXi
- The traditional server reboot includes hardware initialization
- Quick Boot host is ready for use while the other is still loading ESXi from disk

Takeaway

- When hosts need to reboot, Quick Boot reduces the maintenance window requirement

# Quick Boot Demo

VMware ESXi 6.7.0 (VMKernel Release Build 816992Z)  
Dell Inc. PowerEdge R740  
2 x Intel(R) Xeon(R) Gold 5120 CPU @ 2.20GHz  
302.7 GiB Memory

Shutting down device drivers ...

VMware ESXi 6.7.0 (VMKernel Release Build 816992Z)  
Dell Inc. PowerEdge R740  
2 x Intel(R) Xeon(R) Gold 5120 CPU @ 2.20GHz  
302.7 GiB Memory

Shutting down APs ... This system has been halted.

It is safe to use the reset or power button to reboot.

crmsvc101 minutes ago

Recent Tasks Alarms

Task Name	Target	Status	Initiator	Start Time	Completion Time
Initiate host reboot	s0712.vcritical.com	✓ Completed	com.vmware.vcIntegrity	04/27/2018, 4:12:13 PM	04/27/2018, 4:12:13 PM
Initiate host reboot	s0713.vcritical.com	✓ Completed	com.vmware.vcIntegrity	04/27/2018, 4:12:13 PM	04/27/2018, 4:12:13 PM
Enter maintenance mode	s0712.vcritical.com	✓ Completed	com.vmware.vcIntegrity	04/27/2018, 4:12:13 PM	04/27/2018, 4:12:13 PM
Enter maintenance mode	s0713.vcritical.com	✓ Completed	com.vmware.vcIntegrity	04/27/2018, 4:12:13 PM	04/27/2018, 4:12:13 PM

All More Tasks

# Host Profiles Web Client Interface (HTML5)

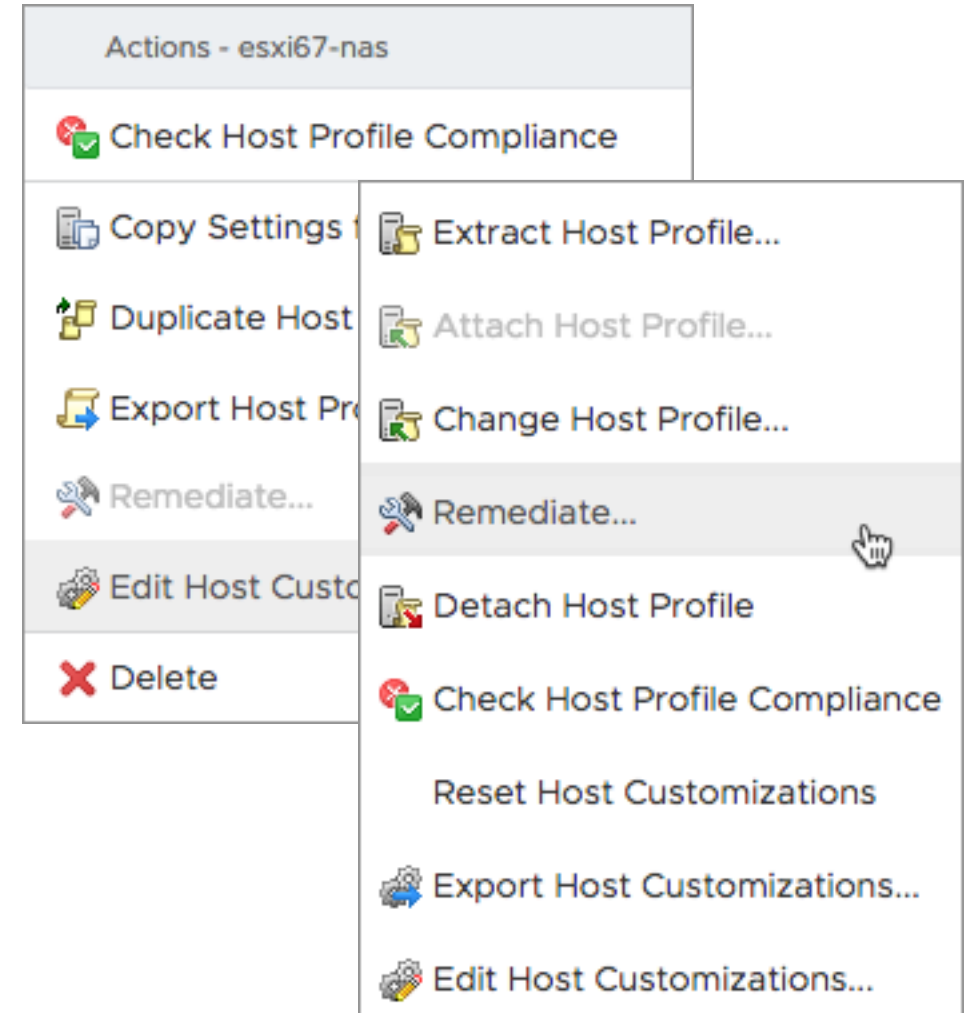
Initial release of Host Profiles UI offers basic capabilities

## Minimum Viable Product (MVP) for Host Profiles

- Focused around base operational tasks

## Primary capabilities in this release

- Create/update profiles from a host
- Edit host customizations
- Check compliance
- Remediate



# Virtual Hardware Compatibility Level

## VM Hardware

vSphere 6.7 brings forth VM hardware version 14

Primarily HW 14 adds support for security and application technologies:

- VBS, vTPM, vIOMMU
- vPMEM, updates to vRDMA and vNVMe,
- per-VM EVC

Most resource maximums, such as vRAM and vCPUs stay the same

- Maximum virtual disks increased
  - 60 → 256
- New CPU enablement

Select a default virtual machine compatibility:

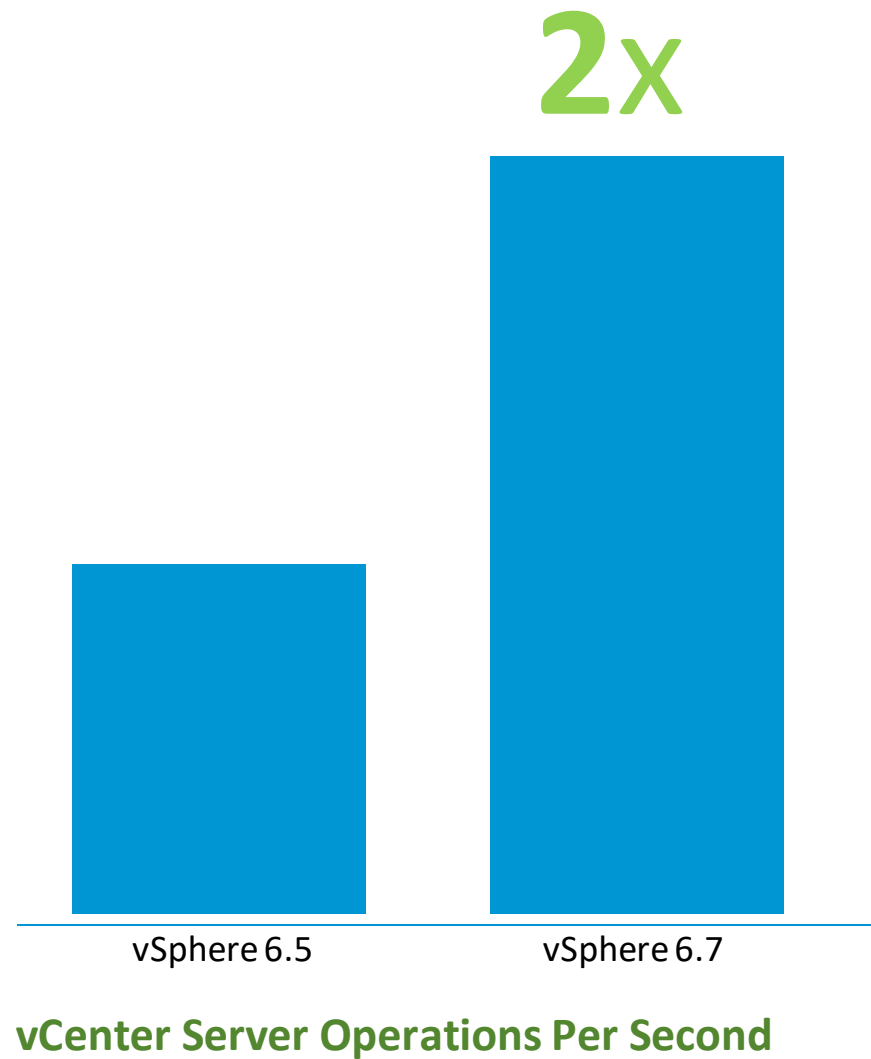
Compatible with:  ⓘ

Virtual machines using hardware version 14 provide the best performance and latest features available in ESXi 6.7.

# Distributed Resource Scheduler



# Superior Performance: vSphere 6.7 versus 6.5



**3x** Reduction in memory usage

**3x** Faster DRS-related operations (e.g. Power-On VM latency)

(All metrics compared at cluster scale limits)

# Initial Placement Engine revamped

DRS in vSphere 6.7 introduces new initial placement engine

VMs are placed faster and more evenly distributed across hosts in cluster

Hosts in Cluster	6.0 algorithm	6.7 Algorithm
Host 1	64 VMs	16
Host 2	0 VMs	16
Host 3	0 VMs	16
Host 4	0 VMs	16

# Resource Distribution Enhancements

More frequent resource settings updates which allows DRS to react to resource changes faster.

Resource targets calculations are separated from load-balancing operations and run every minute

Resource pools aggressively distributes reserved memory amongst child-objects to act as buffer for resource demand spikes

Resource pool resource demand calculation includes consumed memory in 6.7. memory entitlement in previous versions is based on active memory. This aligns better vSphere DRS additional load-balancing options “Memory Metric for load-balancing” that includes consumed memory for load-balancing operations.



# vSphere with Operations Management 6.7



# vRealize Operations Manager Plugin for vSphere Client

Available Out of the Box!

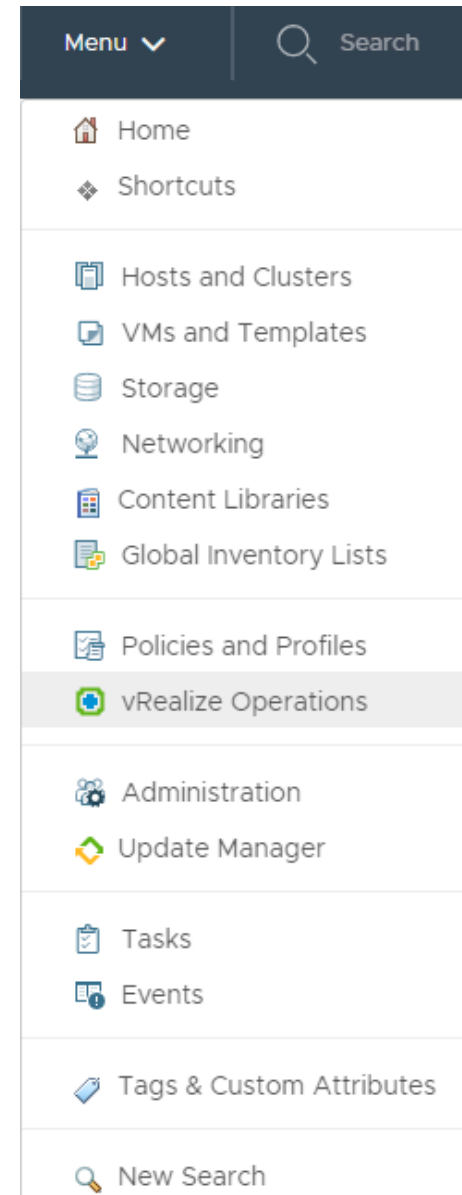
Integrates with vROps 6.7 Instances Automatically

Allows Users to Trial vROps Directly from vSphere Client

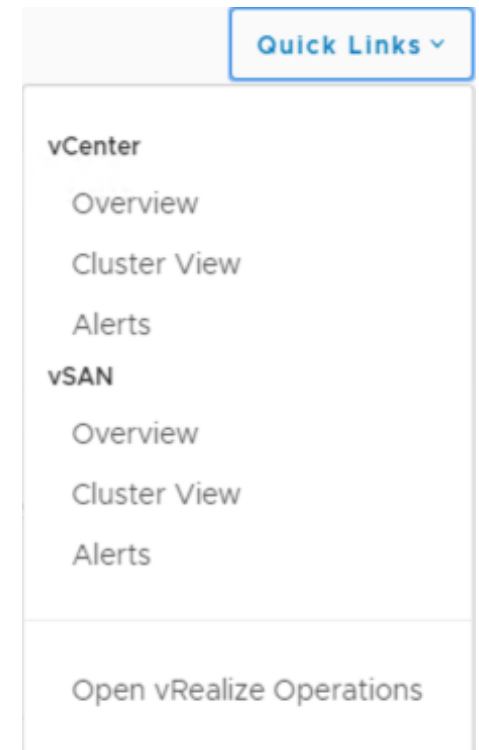
Six Dashboards Available

- vCenter Overview
- vCenter Cluster View
- vCenter Alerts
- vSAN Overview
- vSAN Cluster View
- vSAN Alerts

Offers a Direct Link to the vROps Instance



## MANAGEMENT



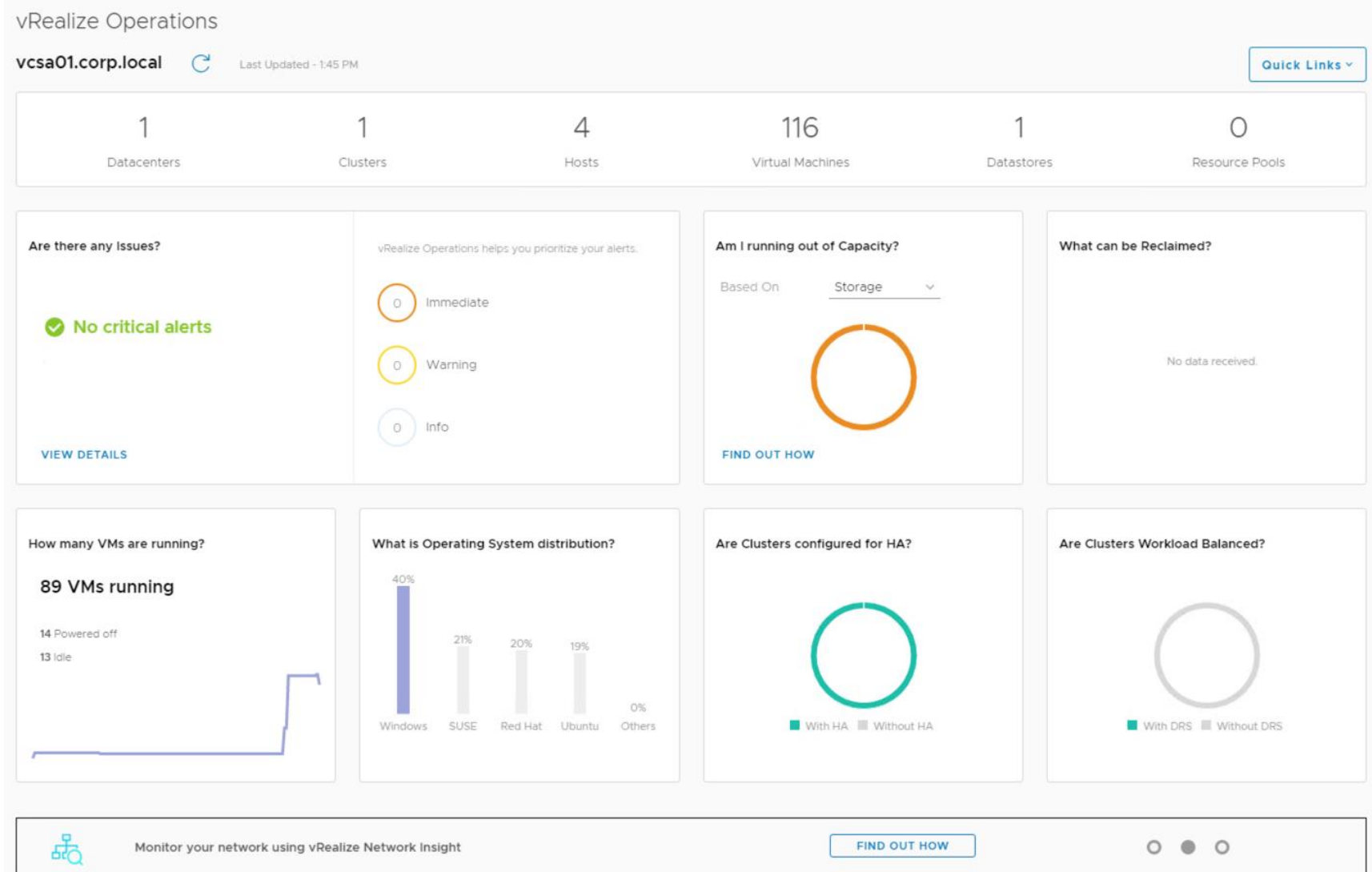
# vCenter Server Overview Dashboard

An overview dashboard available within the vSphere Client

MANAGEMENT

## Easily Access:

- vCenter Overview
- Issues
- Alerts
- Capacity Constraints
- Reclaimable Resources
- VMs Running
- OS Distribution
- Cluster Configuration
  - HA
  - DRS



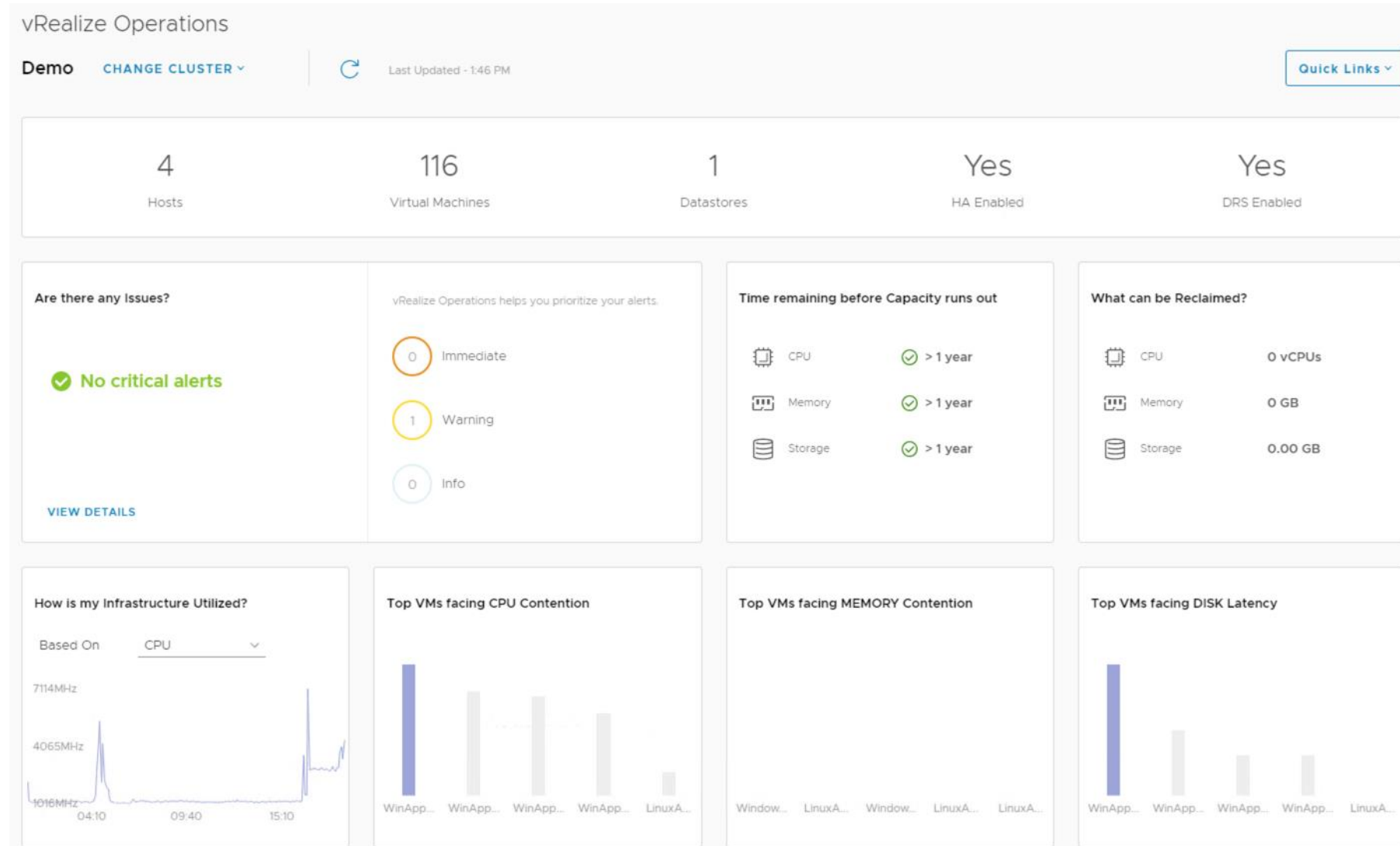
# vCenter Server Cluster View Dashboard

An overview dashboard available within the vSphere Client

MANAGEMENT

## Easily Access:

- High Level Cluster Information
- Alerts
- Issues
- Capacity Remaining
- Reclaimable Resources
- Utilization Graph
- Top N VMs for:
  - CPU Contention
  - Memory Contention
  - Disk Latency



# vCenter Server Alerts Dashboard

An overview dashboard available within the vSphere Client

## Easily Access:

- Alert Counts
- Alerts by Severity
- Alert Information
- Link to Manage vROps Sourced Alerts

vRealize Operations

Alert Lists Last Updated - 1:47 PM [Quick Links](#)

Following are vRealize Operations Alerts. Click [HERE](#) to manage alerts inside vRealize Operations.

Are there any Issues?

- 0 CRITICAL  
Highest level
- 0 IMMEDIATE  
Medium level
- 0 WARNING  
Lowest level
- 0 INFO  
Informational purposes only

Criticality	Alert Description	Triggered On	Created On	Alert Type	Alert Sub Type	
	Cluster has unbalanced workload	Demo	Mar 8, 2018	Virtualization/Hypervisor Alerts	Performance	

1 - 1 of 1 alerts

# Introducing vRealize Operations Manager 6.7



# Refreshed Quick Start Guide

Fast Access to the Things You Need

**vm vRealize Operations Manager** Home Dashboards Alerts Environment Administration

BACK Quick Start

- Quick Start
- Operations Overview
- Optimize Performance
  - Overview
  - Recommended Actions
- Optimize Capacity
  - Overview
  - Reclaim
  - Workload Optimization
  - What-If Analysis
- Troubleshoot
  - Virtual Machine
  - vSAN
  - Using Logs
  - vSphere Compliance
- Application Monitoring (Wavefront)

### Optimize Performance

0 DATACENTERS REQUIRING OPTIMIZATION

- Workload Optimization**  
Run workload optimization to ensure consistent performance in your datacenters.
- Recommendations**  
View and take recommendations to improve overall system performance.
- Optimization History**  
See completed optimization actions.

### Optimize Capacity

0 TOTAL SAVINGS OPPORTUNITY

- Assess Capacity**  
Determine if there is sufficient capacity in your environment.
- Reclaim**  
Reduce waste by reclaiming unused resources.
- Plan**  
Run scenarios to plan for future projects and changes.
- Assess Cost**  
Analyze the costs of running your environment.

### Troubleshoot

ISSUES USING ALERTS, LOGS AND DASHBOARDS

- Alerts**  
Troubleshoot by reviewing active alerts in the system.
- Logs**  
Troubleshoot by examining and analyzing logs.
- Troubleshoot**  
Troubleshoot by object type, using metrics to detect anomalies:
  - Virtual Machine
  - Host
  - Cluster
  - Datastore
  - vSAN

### Manage Configuration

- vSphere Compliance**  
Assess and Manage Compliance.
- Configuration**  
Manage and assess configuration by object type:
  - Virtual Machine
  - Host
  - Cluster
  - Distributed Switch

VIEW MORE +

# New Capacity Overview Dashboard

## New Look and Actionable Recommendations

Overview ⚙️ 🔍 Search by name

**⚠️ Denver-RD-DC**  
10 Weeks Remaining until 1 cluster exceeds capacity

**⚠️ Denver-Prod**  
14 Weeks Remaining until 1 cluster exceeds capacity

**⚠️ PaloAlto-DC**  
8 Weeks Remaining until 2 clusters exceed capacity

**⚠️ Denver-Test-DC**  
10 Weeks Remaining until 2 clusters exceed capacity

**⚠️ Bangalore-Test-D**  
14 Weeks Remaining until 2 clusters exceed capacity

[EXPAND](#)

---

Denver-RD-DC [EXPORT](#) 🏷️ vc-hasaverylongandextendedname

**Time Remaining**

⚠️ 1 cluster at the critical level

⚠️ 2 clusters at the warning level

📄 Your datacenter also contains 15 hosts that do not belong to a cluster. ⓘ

**Reclaimable Capacity**

**\$22,789 /mo.** **480 VMs**

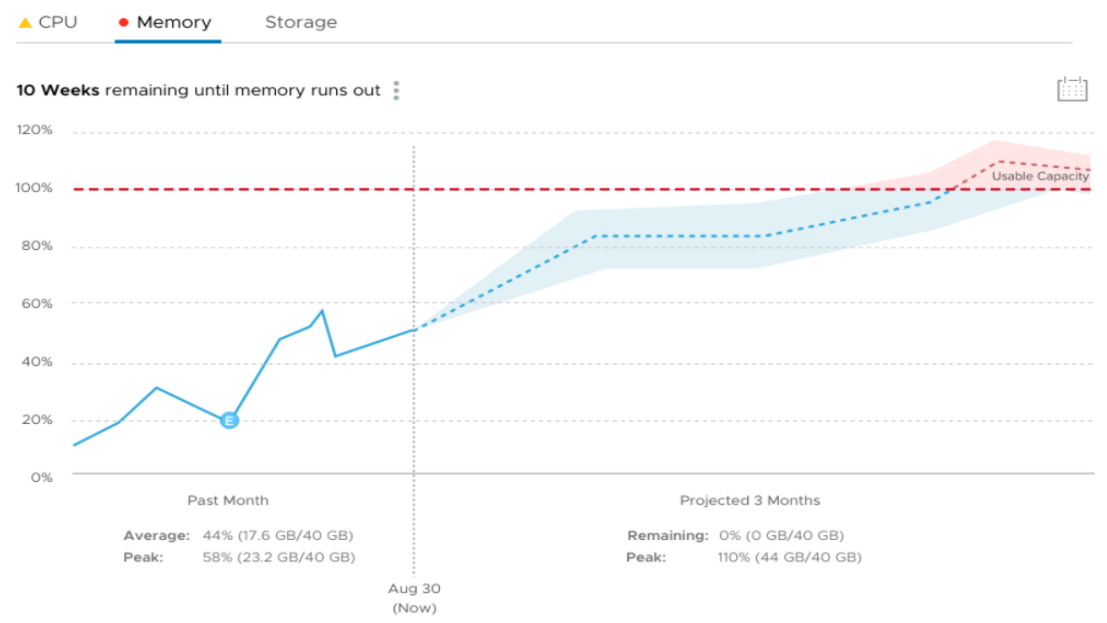
Potential Savings With Reclaimable Resources

[VIEW RECLAIMABLE VMs](#)

**Consolidation**

The available capacity across your clusters is the equivalent of

📄 8 hosts ⓘ



### Recommendations

#### Option 1

##### Reclaim Resources

You can increase your time remaining to **14 weeks** by reclaiming resources:

CPU: **400 GHz**  
Memory: **56 GB**  
Storage: **78 GB**

[RECLAIM RESOURCES](#)

OR

#### Option 2

##### Add Capacity

You can increase your time remaining to **14 weeks** by purchasing hardware:


Server: **Dell PowerEdge T330**  
Quantity: **2**  
Cost/month: **\$1750**


[RUN SCENARIO](#)



# New Reclaimable Capacity Dashboard

## Quickly Realize Reclaimable Resources



Reclaim  Filter

 **DemoDC**  
> 1 Year Remaining


0 Cost Savings Optimized


ALL DATACENTERS

---




 DemoDC  vcsa01

How much you can potentially save.

  
**0/mo.**  
Cost Savings

  
**68 VMs**  
With Reclaimable Resources



Total Reclaimable Capacity

Resource	Reclaimable Capacity	% Reclaimable
 CPU	0 vCPUs	<div style="width: 0%; height: 10px; background-color: #ccc;"></div>
 Memory	134 GB	<div style="width: 100%; height: 10px; background-color: #9933cc;"></div>
 Disk Space	45.54 KB	<div style="width: 10%; height: 10px; background-color: #ccc;"></div>

Duration older than:  x Filter

Powered Off VMs 0/mo.Idle VMs 0/mo.Snapshots 0/mo.Oversized VMs

DELETE SNAPSHOT(S)EXCLUDE VM(S)

▼  Demo	0/mo.	 45.54 KB	
<input checked="" type="checkbox"/> VM Name	Cost Savings / mo ↓	Reclaimable Storage	Age
<input checked="" type="checkbox"/> 6960d0b5-5de0-4b1f-a31a-d595a7a90cb9	?/mo.	45.54 KB	119 Days

1 - 1 of 1 items

SHOW EXCLUDED VMS

# Updated Workload Optimization Dashboard

Clean Interface to Make Sure Workloads are Happy

Workload Optimization Filter


**DemoDC**  
> 1 Year Remaining  
0 Cost Savings Optimized


ALL DATACENTERS

DemoDC vcsa01

**Optimization Recommendation**

Status: Optimized




 Your workloads are optimized according to your settings.

OPTIMIZE NOW SCHEDULE

**Placement Settings** 0 Tag Applied

Utilization Objective: Moderate

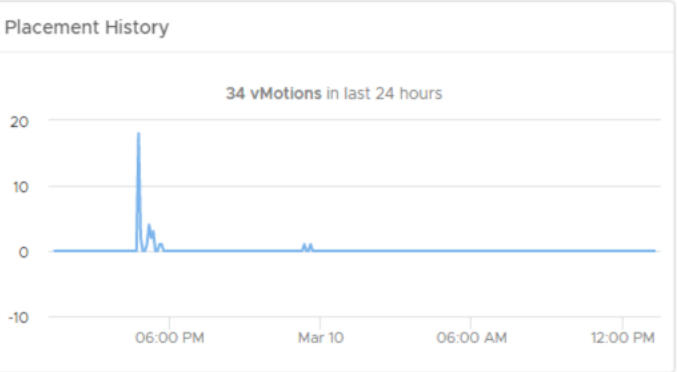


- ✓ Avoid Performance Issues
- ✓ As Few Moves as Possible

EDIT SETTINGS

**Placement History**



34 vMotions in last 24 hours



06:00 PM Mar 10 06:00 AM 12:00 PM

Are your clusters meeting your utilization objective?

VIEW DRS SUMMARY SET DRS AUTOMATION Filter

Name	CPU Workload %	Memory Workload %	DRS Settings	Migration Threshold
Demo	 55%	 73%	Fully Automated	Default

1 - 1 of 1 items

# Workload Optimization Now Supports Tags

## Control How Workload is Spread With vCenter Tags

### Workload Automation Policy Settings

Affected Policy: vSphere Solution's Default Policy (May 26, 2017 1:58:09 PM)

#### Workload Optimization

Balance  Consolidate

Balance will spread workloads evenly over the available resources, but may move workloads more often. This is good for more stable populations.

Relieve stress will minimize workload contention, but will not attempt to move workloads to achieve better balance or consolidation.

Consolidate will place workloads into as few clusters as possible, but allows for less responsive capacity. This is good for populations with steady demand - and may reduce licensing and power costs.

Cluster Headroom

0%  50%

Headroom provides a buffer of space for the cluster, which may cause a rebalance to occur earlier than it would otherwise.

#### Tag Based VM Placement

Select the criteria you would like to use for tag based placement of VMs. This policy will only move VMs to cluster with matching tags.

Move Status  Move Me   Enable Prioritization

Non-Prioritized Tags

Prioritized Tags

- Move Status  Do Not Move Me
- Move Status  Move Me

Warning: Changes to this policy will affect other containers.

# New DRS Summary View

## High Level DRS Overview and Detailed vMotion History

Workload Optimization > DRS Summary Filter

### DRS Settings

Cluster Name	Demo
Automation Level	Fully Automated
Migration Threshold	Default
Active Memory Used	False

### Cluster Balance History

Time	Total Imbalance	Tolerable Threshold
04:30 PM	310	150
04:45 PM	50	150
05:00 PM	40	150
05:15 PM	30	150
05:30 PM	40	150
05:45 PM	20	150
06:00 PM	30	150
06:15 PM	20	150

### Recent vMotions

Time	DRS Initiated	User Initiated
04:30 PM	0	0
04:45 PM	2	15
05:00 PM	1	0
05:15 PM	4	0
05:30 PM	3	0
05:45 PM	1	0
06:00 PM	1	0

### DRS vMotion Details

Date	VM	Source	Destination	Type
5:17:28 PM	WinApplication02	esx01.corp.local	esx02.corp.local	DRS
5:17:28 PM	WinApplications3	esx01.corp.local	esx02.corp.local	DRS
5:17:28 PM	LinuxApp51	esx04.corp.local	esx02.corp.local	DRS

1 - 3 of 3 items

# New Workload Analysis and Projection Workflow

Accurately Analyze Potential Future Workloads

The screenshot displays the vRealize Operations Manager interface for 'What-If Analysis'. The top navigation bar includes 'vm vRealize Operations Manager', 'Home', 'Dashboards', 'Alerts', 'Environment', and 'Administration', along with search, refresh, and user icons. The main content area is titled 'What-If Analysis' and contains two sections:

- New Scenario:** A card titled 'Add Workload' with a blue and green icon. Below the icon, it reads: 'Use this scenario for expanding or adding an application. Determine if the new VMs will fit into your environment.' A 'SELECT' button is located at the bottom of the card.
- Saved Scenarios:** A table with columns for 'Scenario Name', 'Date Created', and 'Scenario Start & End Date'. Above the table are buttons for 'RUN SCENARIO', 'EDIT', and 'DELETE', and a 'Filter' dropdown. The table contains one entry: 'Adding Q4 Workload' created on 'Mar 08, 2018' with a start and end date of 'Aug 31, 2018 - Mar 01, 2019'. A '1 - 1 of 1 items' indicator is at the bottom right of the table.

# Walking Through Adding New Workloads – Part 1

## Workloads Modeled After Existing VMs or Specific CPU/RAM/Disk Usage

The screenshot shows the 'Add Workload' configuration page in vRealize Operations Manager. The page is divided into several sections:

- SCENARIO NAME:** A text input field containing 'Adding Q4 Workload'.
- LOCATION:** A section titled 'WHERE WOULD YOU LIKE TO ADD YOUR WORKLOAD?' with two dropdown menus. The first is 'DemoDC (vcasa01)' and the second is 'Demo'.
- APPLICATION PROFILE:** Two radio buttons: 'Configure' (unselected) and 'Import from existing VM' (selected).
- FIND EXISTING VMS AND USE THEIR UTILIZATION BEHAVIOR TO MAKE SCENARIO PROJECTIONS:** A 'SELECT VMS' button.
- SELECTED VMS:** A table with the following data:

VM Name	Peak CPU	Peak Memory	Peak Storage	Quantity	
WinApplication01	242.67 MHz	923.86 MB	13.69 GB	20	
- DATE:** Two date pickers. 'START DATE' is '8/31/18' and 'END DATE\*' is '3/01/19'. A note below reads: '\*Our engine is able to make projections up to a maximum of one year from the current date.'
- Buttons:** 'RUN SCENARIO' (blue), 'SAVE', and 'CANCEL' (white with blue border).

# Walking Through Adding New Workloads – Part 2

## Analyze Current On-Premises Resources and Cloud Based Costs


Add Workload


Adding Q4 Workload EDIT | SAVE | X

<b>Scenario</b>	Add VMs	<b>Total to be Added</b>	20 VMs				
<b>Date</b>	Aug 31, 2018 to Mar 01, 2019	<b>CPU</b>	4.54 GHz	<b>Memory</b>	6.11 GB	<b>Storage</b>	273.79 GB



Add VMs to DemoDC (vcsa01) ▶ Demo RUN SCENARIO

Private Cloud

 The workload does not fit in Demo within your selected timeframe and would decrease your time remaining from > 1 Year to 174 days.

 Demo	<b>Peak CPU</b> 17.22 GHz	<b>Memory Deficit</b> 12.52 GB	<b>Storage Deficit</b> 199.16 GB
--	------------------------------	-----------------------------------	-------------------------------------

Public Cloud

 <b>HYBRID CLOUD</b> <b>VMware Cloud</b> COST <b>\$93/month</b> <a href="#">LEARN MORE</a>	 <b>PUBLIC CLOUD</b> <b>AWS</b> COST <b>\$2,235/month</b> <a href="#">LEARN MORE</a>
---	---

# vSphere 6.7 RESTful APIs





# vSphere RESTful APIs

## Newly Added APIs

- Appliance API
  - Backup Job Scheduling
  - Restore Job Creation
  - Granular Service Control
  - New Update Workflows
    - Policy Handling
    - Staging
    - Installation
  - Service Management
  - Local Account Configuration
- vCenter
  - New Deployment Methods
  - Compute Policies and Capabilities
  - Storage Policies
  - VM Cloning Tasks
  - vMotion Support
  - List Guest Customization Specifications
  - VM Tools Management
  - Improved Tag Handling
- CIS
  - Batch Activity Support
  - Task Management
- Content Library
  - Configuration Tasks
  - Item Lifecycle Management

# vSphere 6.7 Command Line Interfaces



# VMware PowerCLI 10

The PowerCLI You Know and Love, Now Available Everywhere

Installable from the PowerShell Gallery

Now Supports PowerShell Core 6.0.1

- MacOS
- Linux

Deprecated Cmdlets

- Get/Set-VMGuestNetworkInterface
- Get/New/Remove-VMGuestRoute

Community Sourced Corrections

Default certificate behavior is to DENY

- Install Trusted Certificates
- Set-PowerCLIConfiguration -InvalidCertificateAction Ignore

```
kruddy-m01:~ kruddy$ pwsh
PowerShell v6.0.1
Copyright (c) Microsoft Corporation. All rights reserved.

https://aka.ms/pscore6-docs
Type 'help' to get help.

[PS /Users/kruddy> Install-Module -Name VMware.PowerCLI -Scope CurrentUser
[PS /Users/kruddy> Get-Module VMware.* -ListAvailable

Directory: /Users/kruddy/.local/share/powershell/Modules

ModuleType Version Name ExportedCommands
-----
Script 6.5.2.7... VMware.DeployAutomation {Add-DeployRule, Add-
Script 6.5.2.7... VMware.ImageBuilder {Add-EsxSoftwareDepot
Manifest 10.0.0... VMware.PowerCLI
Script 10.0.0... VMware.VimAutomation.Cis.Core {Connect-CisServer, D
Script 10.0.0... VMware.VimAutomation.Cloud {Add-CIDatastore, Con
Script 10.0.0... VMware.VimAutomation.Common
Script 10.0.0... VMware.VimAutomation.Core {Add-PassthroughDevice
Script 6.5.4.7... VMware.VimAutomation.HA Get-DrmInfo
```

# VMware Datacenter CLI (DCLI)

## Automation of vSphere and VMware Cloud on AWS

### Accessible via:

- Windows, Linux, Mac OS
- VCSA shell
- Windows vCenter Server Cmd Prompt

### Interactive Shell Mode

- Supports Tab Completion
- Saves History Across Sessions

### Supported Output Formats

- Simple
- Table
- JSON
- XML
- HTML

```
root@photon-FgMoCqkY2 [ ~/vmware-dcli ]# ./dcli.sh
Welcome to VMware Datacenter CLI (DCLI)

usage: <namespaces> <command>

To auto-complete and browse DCLI namespaces:    <TAB>
If you need more help for a command:            vcenter vm get --help
If you need more help for a namespace:         vcenter vm --help
For detailed information on DCLI usage visit:   http://vmware.com/go/dcli
dcli> vm list
|-----|-----|-----|-----|-----|
|Vm      |Name                |PowerState |CpuCount|MemorySizeMiB|
|-----|-----|-----|-----|-----|
|vm-117|photon01            |POWERED_OFF|1       |2048          |
|vm-119|AppVM                |POWERED_OFF|1       |1024          |
|vm-120|DBVM                 |POWERED_OFF|1       |16            |
|vm-123|f3680d62-b912-4909-b80e-c0e9b71545c6|POWERED_OFF|1       |1024          |
|-----|-----|-----|-----|-----|
dcli> system time get
          version
          storage
          uptime
          time
          update
          lastcheck
          get
```

# vSphere 6.7 Software Development Kits



# vSphere Automation SDKs

Open-Sourced SDKs Available on GitHub

MANAGEMENT

VMware maintained

Get up & running in less than 5 minutes!

SDKs for managing vSphere REST API  
and VMware Cloud on AWS

Available in languages such as:

- REST
- Python
- Java
- Perl
- .NET
- Ruby

Full of Samples

Community Contributions Welcome

The screenshot shows the VMware Open Source Program Office page for vSphere Automation SDKs. The page has a dark blue header with the VMware logo and 'Open Source Program Office'. A left sidebar contains navigation links: Overview, Getting the SDKs, Support, Contributors, Contributing, and Licenses. The main content area features the vSphere Automation SDKs logo and the text 'Software Development Kits for accessing vSphere's Automation endpoint APIs'. Below this, there is a 'Fork vSphere Automation SDKs in:' section with buttons for REST, PYTHON, JAVA, PERL, .NET, and RUBY. The 'Overview' section explains that the SDKs bundle client libraries, documentation, and sample code for accessing the vSphere Automation endpoint. It lists supported services: vCenter Server Appliance (VCSA) features, Virtual Machine Management, Content Library, and Tagging. The 'Getting the SDKs' section states that the SDKs are available from VMware's GitHub source repositories and provides instructions to clone the repo and follow the README.md. A link to the vSphere Automation SDK Overview is provided for more information.

# Comprehensive Built-in Security



# Feature List

Support for Trusted Platform Module (TPM) 2.0 for use by ESXi

Support for Windows 10 and Windows Server 2016 Security Features

- Virtualization Based Security (VBS)
- Credential Guard

Support for Virtual TPM 2.0

- Secured with VM Encryption

New VM Encryption UI enhancements in the HTML5 Web Client

FIPS 140-2 enablement

TLS 1.2 by default

New alarms



# Secure Infrastructure

- Secure Boot
- Various m
- vCenter va  
host even  
as atteste
- Secure Bo  
remaining

The screenshot shows the VMware vCenter Security dashboard. The left sidebar has a menu with 'Security' highlighted. The main area displays a table of ESXi host attestation results.

Name	Attestation	Last verified	TPM version	Message
10.19.89.75	Passed	2/4/2017, 4:23 AM	2.0	
10.20.132.151	Passed	1/31/2016, 9:14 PM	2.0	
10.20.232.212	N/A	N/A	1.2	
10.20.233.175	N/A	N/A	1.2	
10.20.235.198	Failed	3/28/2017, 3:46 AM	2.0	Attestation failed
10.20.235.199	Passed	12/23/2016, 6:56 PM	2.0	
10.20.235.200	N/A	N/A	N/A	
10.21.235.200	N/A	N/A	N/A	

ESXi Host

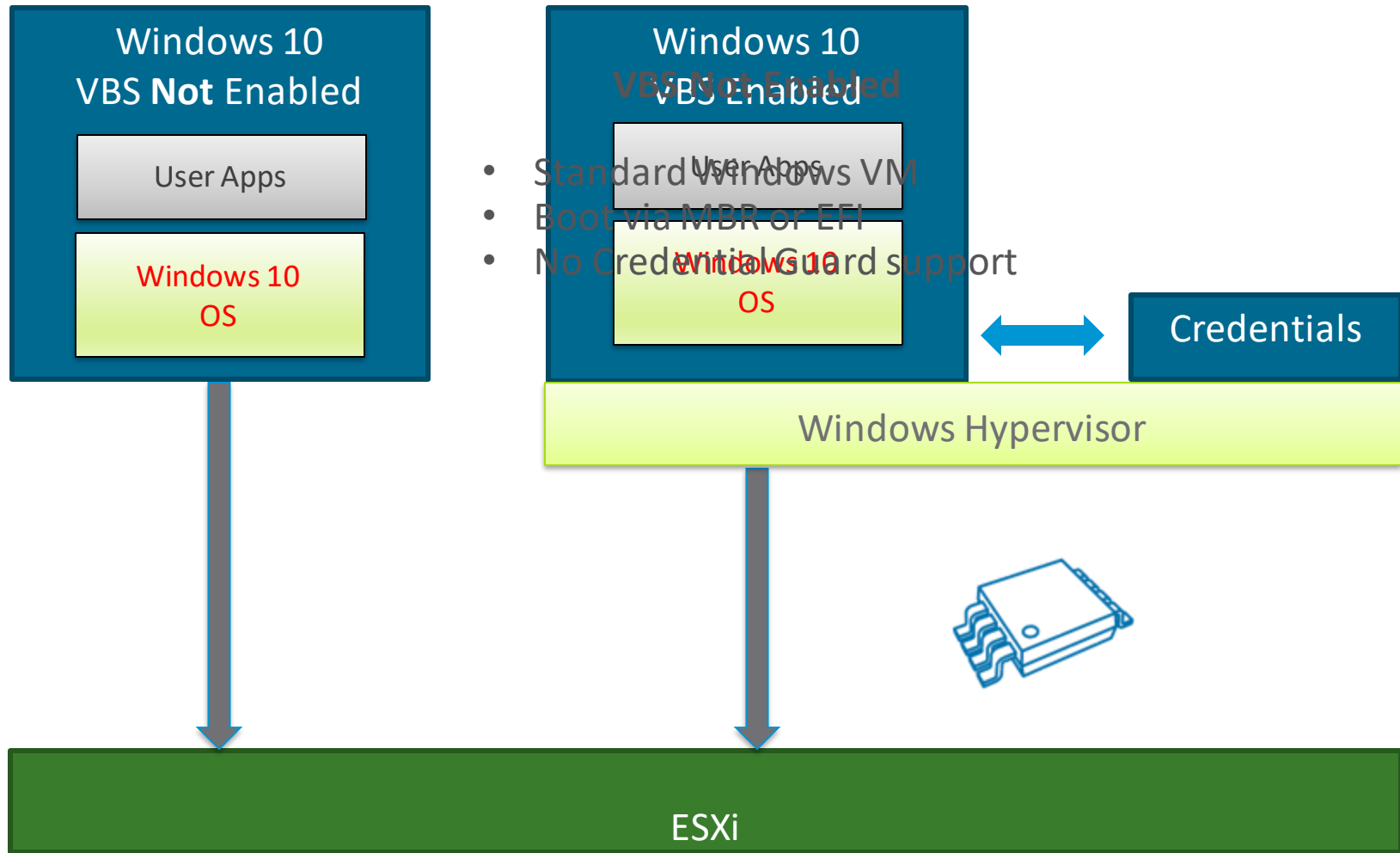
Comprehensive security dashboard



# Windows 10 & 2016 Security Features Support



# VBS Explained



## VBS Enabled

- Automatically enabled:
  - Hardware Virtualization
  - IOMMU
  - EFI firmware
  - Secure Boot
- Credential Guard Ready
  - Enable via Windows

## New Hardware available

- Virtual Trusted Platform Module (vTPM 2.0)
- TPM data secured with VM Encryption

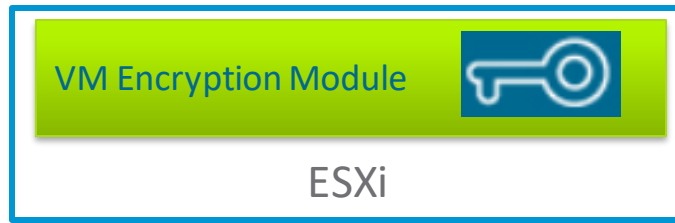
# Securing Virtual TPM Data



Windows 2016



TPM data is securely stored in a virtual Certificate Authority (CA) certificate file, encrypted using Virtual Encryption Trusted Platform Module 2.0



ESXi



Hardware

Name ↑
vmware-0.log
vmware-1.log
vmware.log
vmx-Windows2016-bf697ed89a2ec2
Windows2016-0288a296.hlog
Windows2016-07aab2d8.vswp
<b>Windows2016.nvram</b>
Windows2016.vmdk
Windows2016.vmsd
Windows2016.vmx
Windows2016.vmx.lck
Windows2016.vmx.f

# vTPM Summary

Windows2016 | ACTIONS

Summary | Monitor | Configure | Permissions | Datastores | Networks

Powered Off

Guest OS: Microsoft Windows Server 2016 (64-bit) - VBS true  
Compatibility: ESXi 2016p6 and later (VM version 14)  
VMware Tools: Not running, version:10287 (Current) [More info](#)

DNS Name:  
IP Addresses:  
Host: esxi-vsan-40.lab1.local

Launch Web Console  
Launch Remote Console

VM Hardware

Encryption	VM configuration files are encrypted. No hard disks are encrypted.
> CPU	2 CPU(s)
> Memory	4 GB, 0 GB memory active
> Hard disk 1	40 GB
> Network adapter 1	VM Network (disconnected)
CD/DVD drive 1	Disconnected
Floppy drive 1	Disconnected
> Video card	8 MB
Virtual Trusted Platform Module	Present
SHA256withRSA-RSA	2.23.133.2.3=#0c0b69643a3030303230303635,2.23.133.2.2=#0c0b564d776172652054504d32,2.23.133.2.1=#0c0b69643a3536344435373030
SHA256withECDSA-EC	2.23.133.2.3=#0c0b69643a3030303230303635,2.23.133.2.2=#0c0b564d776172652054504d32,2.23.133.2.1=#0c0b69643a3536344435373030
	<a href="#">Manage Certificates</a>

# vTPM Storage Root & Endorsement Key Certificates

Windows2016 | ACTIONS ▾

Summary Monitor **Configure** Permissions Datastores Networks

TPM

- Certificates
- Signing Requests
- More
  - Alarm Definitions
  - Scheduled Tasks
- VMware EVC
- VM Hardware
- Policies

Export

Type	Algorithm	Signing Authority
SHA256withRSA	RSA	CA
SHA256withRSA	EC	CA

Certificate Info

Issuer	OU=VMware Engineering,O=mgt-vc-e-01.lab1.local,ST=California,C=US,DC=local,DC=vsphere,CN=CA
Version	3
Kind	X.509
Valid From	01/09/2018, 12:07:17 PM
Valid To	12/31/2027, 2:14:06 PM
Algorithm	SHA256withRSA
Public Key algorithm	EC

# Virtual TPM takeaways

Does not require or map to a hardware TPM

Virtual machines are provided with trusted VIRTUAL hardware

Trusted virtual hardware is presented to VM's by a host

The ESXi host has a root of trust to PHYSICAL hardware

vTPM “uniqueness” is established by certificates from either VMCA or another certificate authority

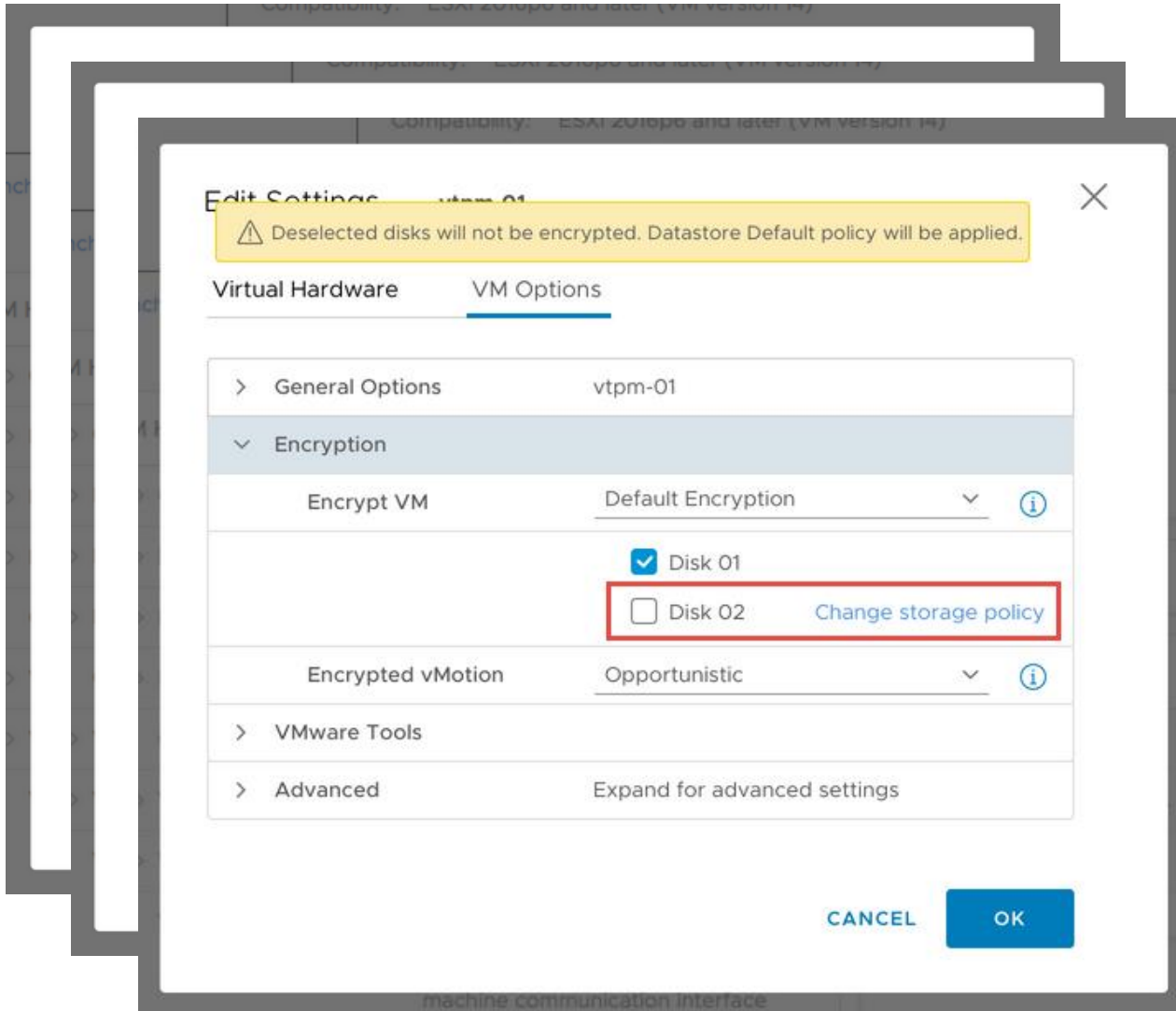
# VM Encryption in HTML5 UI





# VM Encryption

## Easy to Manage Security



- Easy button to enable encryption with a single click
- Granular reporting of the “Encryption State” of the VM
- Allows to do further customizations easily

## Additional vSphere 6.7 Features



## Current status:

- Kernel crypto module and OpenSSL module have got through FIPS evaluation today
  - VMkernel
  - OpenSSL

## V.Next status:

- FIPS
  - VMkernel
  - OpenSSL
  - Java (VMCA only)
  - SSH
- **Enabled by default!**



# Secure By Default: TLS 1.2 only for v.Next

## TLS 1.2 by default

- You can “downgrade”.
- Only Key Managers that support TLS 1.2 will be supported

TLS 1.2



# New Alarms

Virtual Machine Locked Alarm

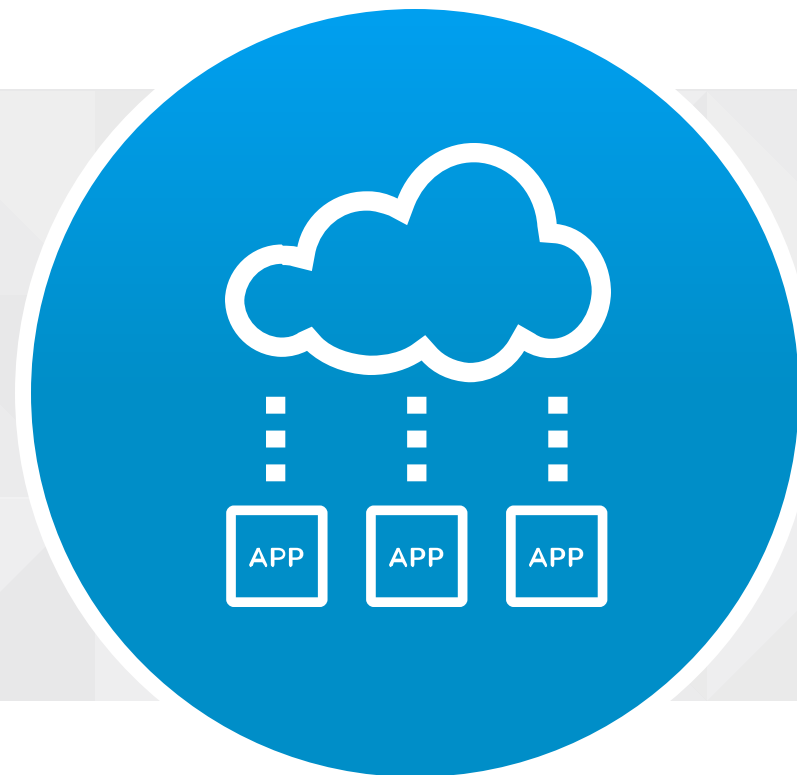
Host Requires Encryption Mode Enabled Alarm

KMS Client and server Certificate Status Alarm

ADD ENABLE/DISABLE DELETE

	Alarm Name	Object type	Defined In	Enabled	Last modified
<input type="checkbox"/>	<input checked="" type="checkbox"/> KMS Server Certificate Status	vCenter Server	This Object	Enabled	03/15/2018, 11:29:30 AM
	Name	KMS Server Certificate Status			
	Description	This alarm indicates that the KMS server certificate is getting close to its expiration date.			
	Targets	vCenter Server			
	Alarm Rules	IF KMS Server Certificate will expire soon. THEN trigger the alarm as  critical			
	Last modified	03/15/2018, 11:29:30 AM			
<input type="checkbox"/>	<input checked="" type="checkbox"/> Virtual Machine Locked Alarm	Virtual Machine	This Object	Enabled	03/15/2018, 11:29:30 AM
	Name	Virtual Machine Locked Alarm			
	Description	Alarm to indicate that the virtual machine is locked.			
	Targets	All virtual machines in vCenter server mgt-vc-e-01.lab1.local			
	Alarm Rules	IF Virtual machine is locked because keys are missing on host. OR Virtual machine is locked because keys are missing on KMS cluster. OR Virtual machine is locked because of a KMS cluster error. THEN trigger the alarm as  critical  OR IF Virtual machine is unlocked. THEN trigger the alarm as  normal			
	Last modified	03/15/2018, 11:29:30 AM			
<input type="checkbox"/>	<input checked="" type="checkbox"/> Host Requires Encryption Mode Enable...	Host	This Object	Enabled	03/15/2018, 11:29:30 AM
	Name	Host Requires Encryption Mode Enabled Alarm			
	Description	Alarm to indicate that the host requires encryption mode enabled.			
	Targets	All hosts in vCenter server mgt-vc-e-01.lab1.local			
	Alarm Rules	IF Host requires encryption mode enabled and the key is not available on the KMS cluster. OR Host requires encryption mode enabled and the KMS cluster is not available. THEN trigger the alarm as  critical  OR IF com.vmware.vc.crypto.HostKeyUpdatedEvent OR Host is on encryption mode.			

# Universal Application Platform



# Universal Application Platform

The platform for mission critical workloads

Support for more business critical applications through:

- Broader hardware ecosystem
  - Native 4K drives
  - Intel VMD for NVMe
- Software enhancements
  - RoCE v2
  - 256 disks per VM
  - Automatic UNMAP for SE sparse disks
- Performance optimizations
  - NBD/SSL throughput for backups
  - Configurable UNMAP rate
  - 1 GB pages

# Universal Application Platform

Expanding the envelope for new workloads

ENTERPRISE APPS

## New vSphere 6.7 Features

### Enhancements for NVIDIA GRID vGPUs

- Improves host lifecycle management

### vSphere Persistent Memory

- Significantly enhances performance

### RDMA

- Connectivity to low-latency storage fabrics

### Instant Clone

- Reduces provisioning times

## Target Workloads

3D graphics

Big Data

HPC

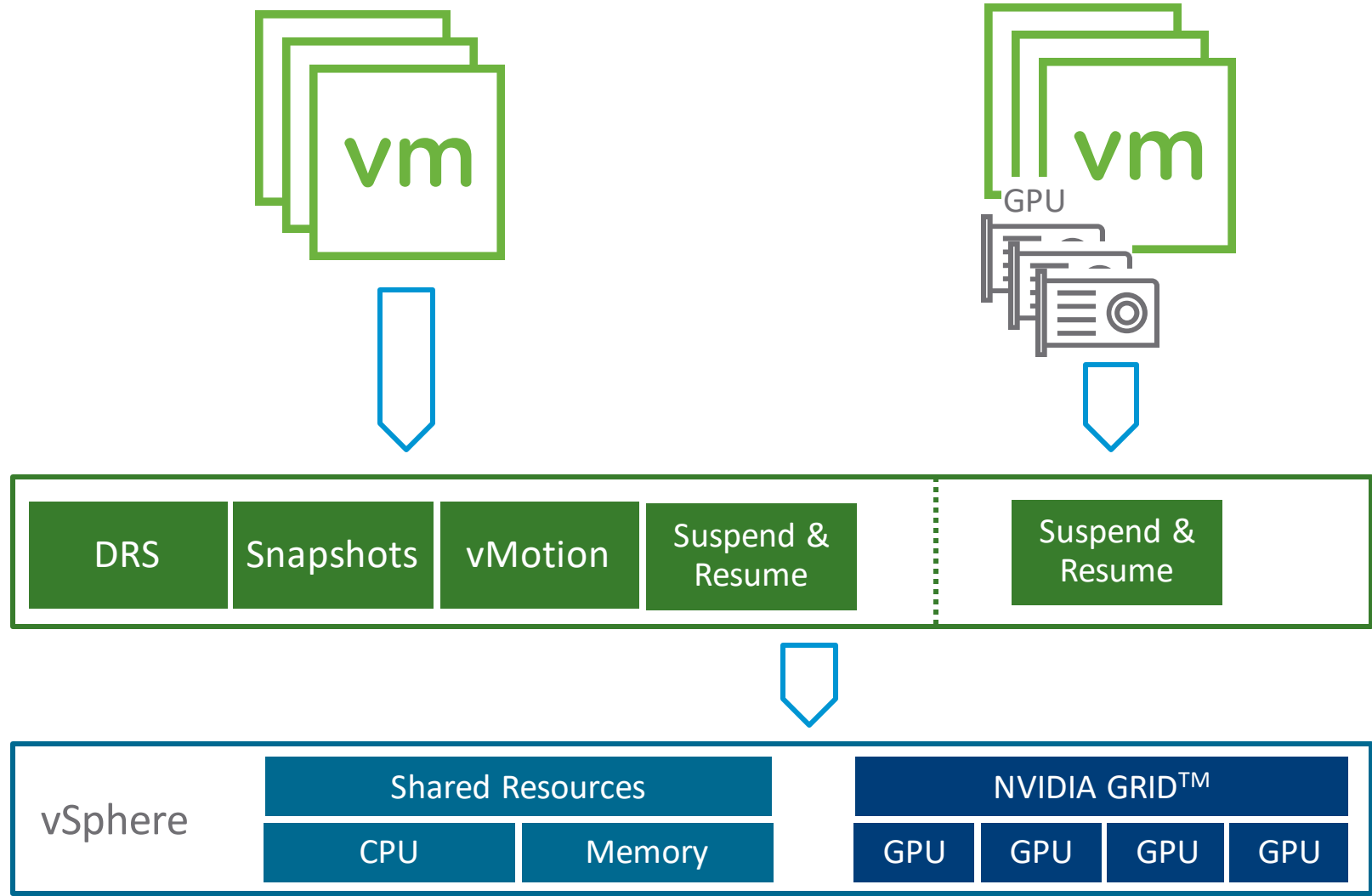
Machine Learning

In-Memory



# Enhancing Operations for NVIDIA GRID™ vGPU

Using Suspend & Resume to add vGPU mobility



# Persistent Memory (PMEM)

## Convergence of Memory and Storage

New tier of storage aimed at **Enterprise Applications**

**Lower cost** than DRAM / **Higher performance** than SSD

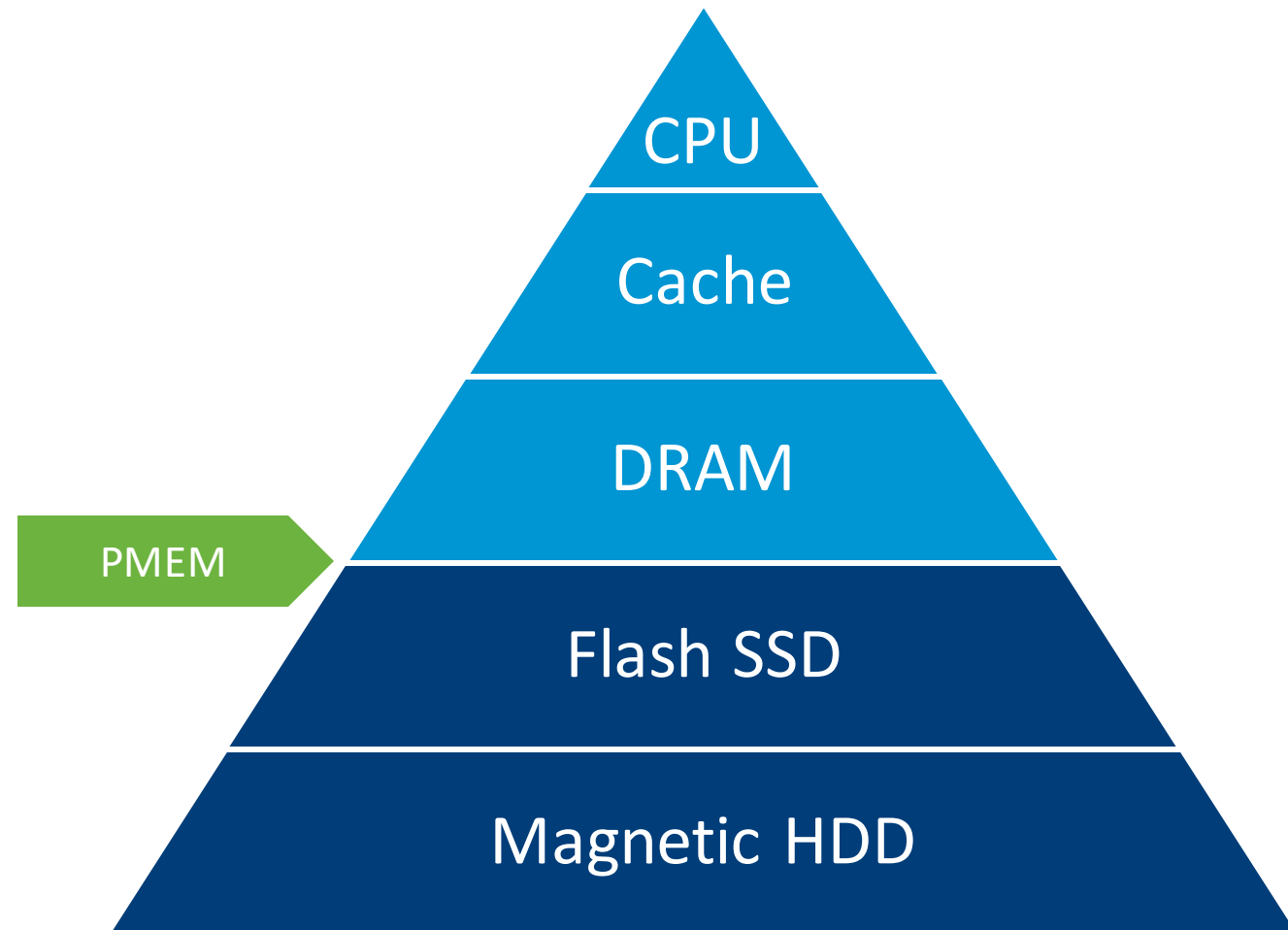
Byte Addressable

Average latency of less than 0.5 microseconds

High durability

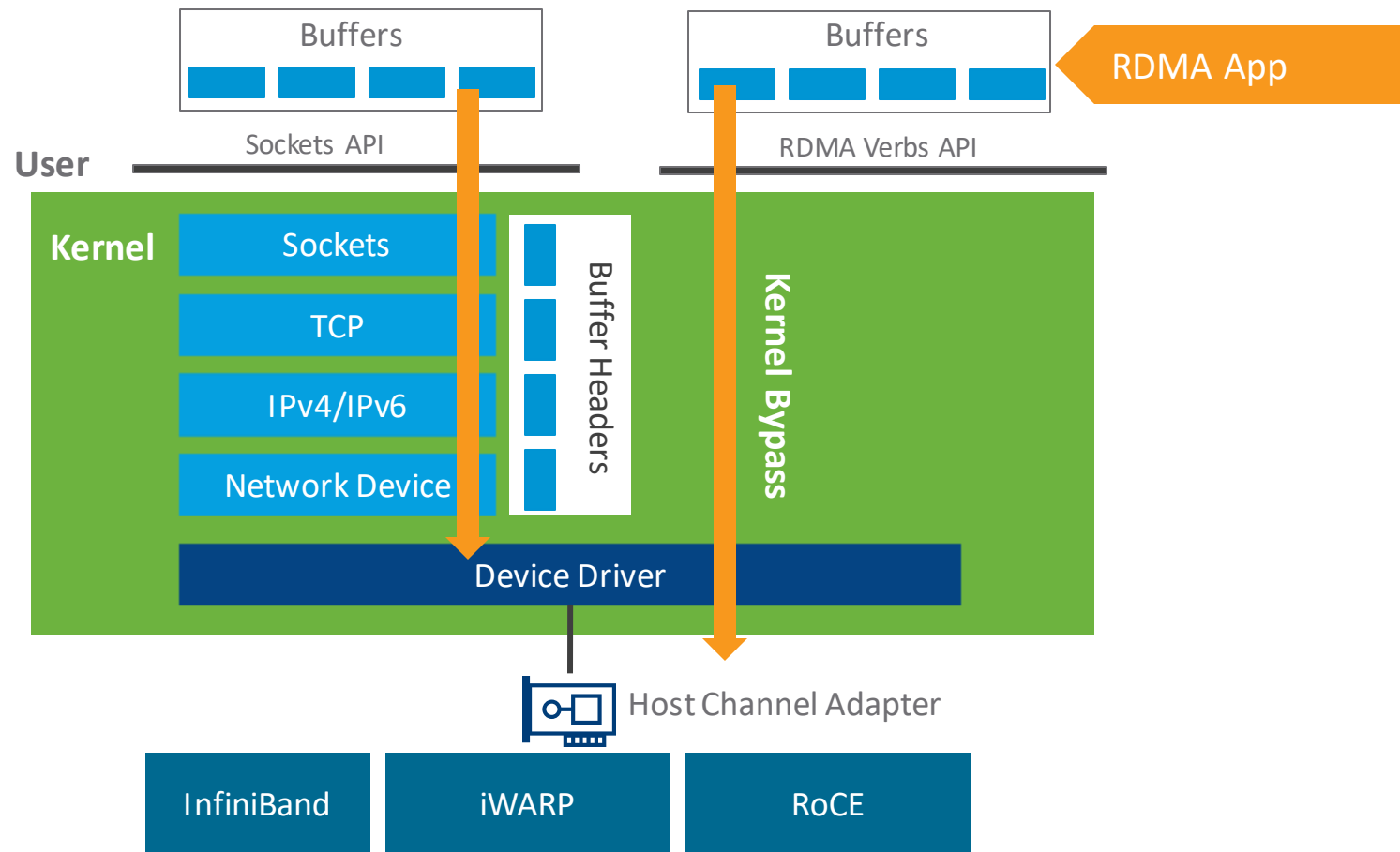
Lower power consumption than DRAM

ENTERPRISE APPS



# RDMA Overview

## Traditional Data Path vs RDMA



ENTERPRISE APPS

Remote Direct  
Memory Access

OS bypass

Zero-copy

Low latency, high  
bandwidth

Used in distributed  
databases, financial,  
file systems, Big Data

# RDMA Overview

## Motivation

### RDMA in VMs with pass-thru

- Tied to a physical host – no vMotion!
- Need an HCA

### Customers want vMotion

- For a small performance penalty
- IBM: okay with 5us latency

### PVRDMA aims to solve this

- Virtualize just enough
- HCA for performance, but work without it
- Meet latency requirement

# RDMA Overview

## Architecture

Paravirtual RDMA (PVRDMA) is a new virtual NIC in hardware version 13

Provides verbs-level emulation

- Guest kernel driver
- User level library

Plugs into the industry standard OFED stack in the VM

Device emulated in ESXi hypervisor

- Translates verbs from guest to ESXi RDMA Stack

# Instant Clone

- Single API call
- Clone independent of the source VM
- vMotion/HA/DRS support



## Rebootless

Instant Clone helps deploy hundreds of VMs instantly without needing to reboot while preserving the VM state

30x

Instant Clone

## Performance

Helps move to a new paradigm of “Just-in-time” provisioning with 30x improvement for time taken to fork a clone



## Flings

Customers are already using Instant Clone fling today to deploy 700+ VMs daily in their production CI-CD environment to achieve their DevOps goals

# Seamless Hybrid Cloud Experience



# Hybrid Linked Mode

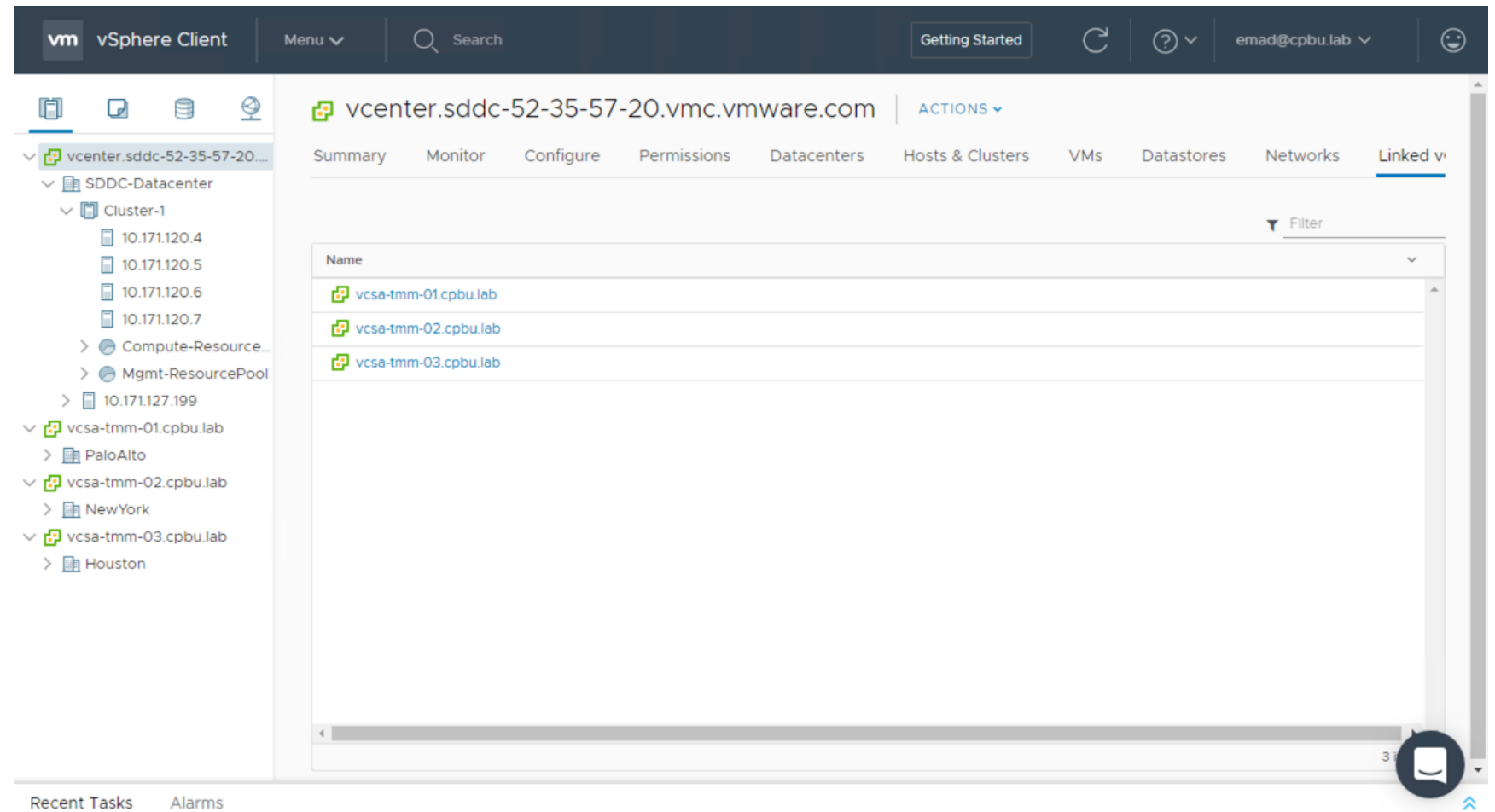
## Single Management View

Single management view across VMware Cloud on AWS and on-premises datacenter

Supports both embedded or external deployments on-premises

Maintains separate permissions between Cloud SDDC and on-premises datacenter

Enable and disable linking





# Workload Mobility

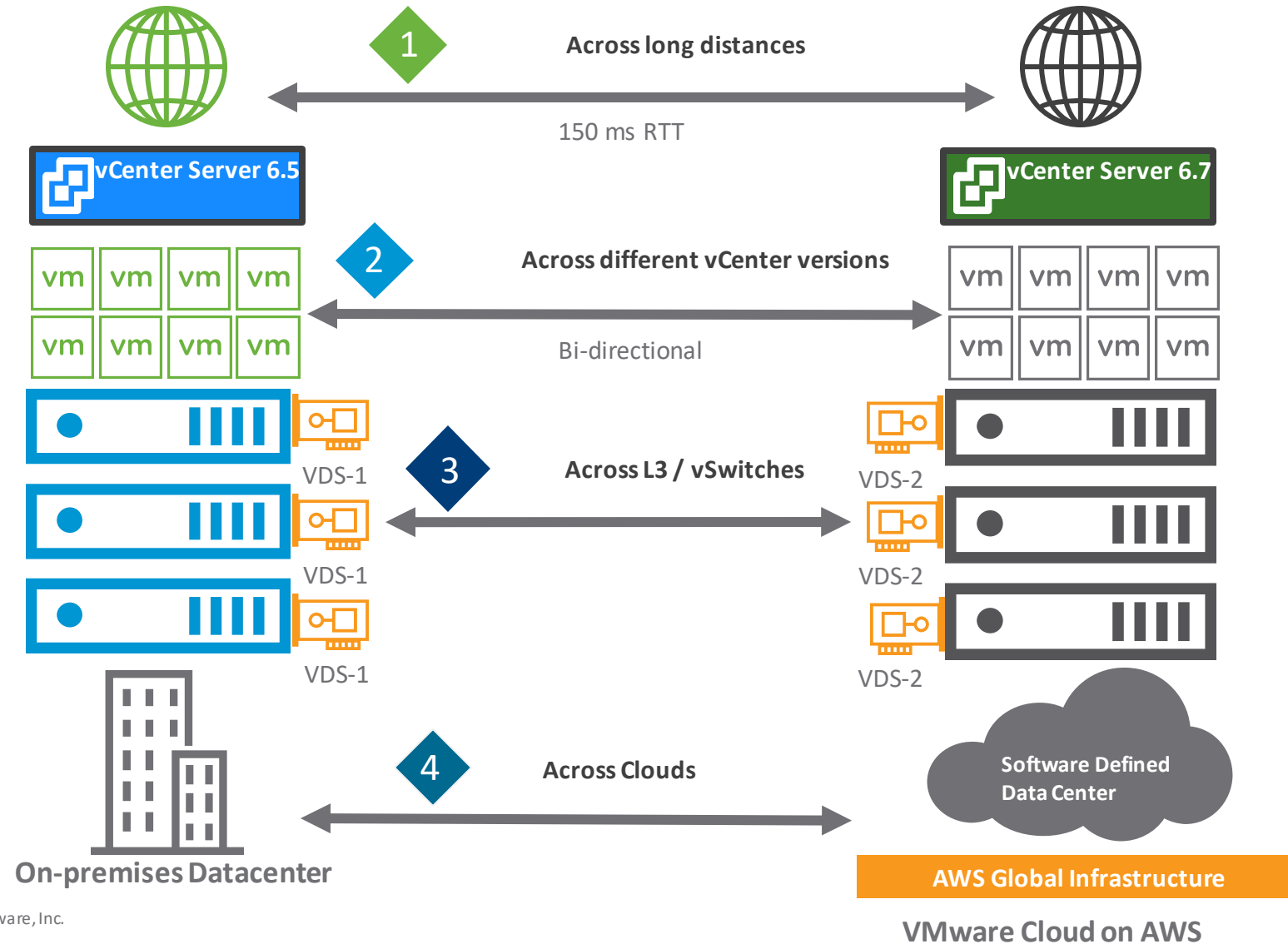
## Cross-vCenter Mixed Version Provisioning

### Requirements

- 150 ms RTT
- 250 Mbps
- VM Compatibility v9



Transit vMotion data is encrypted



# Per-VM Enhanced vMotion Compatibility

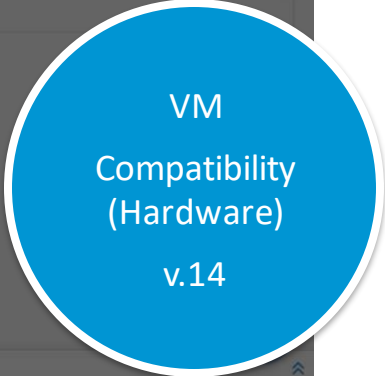
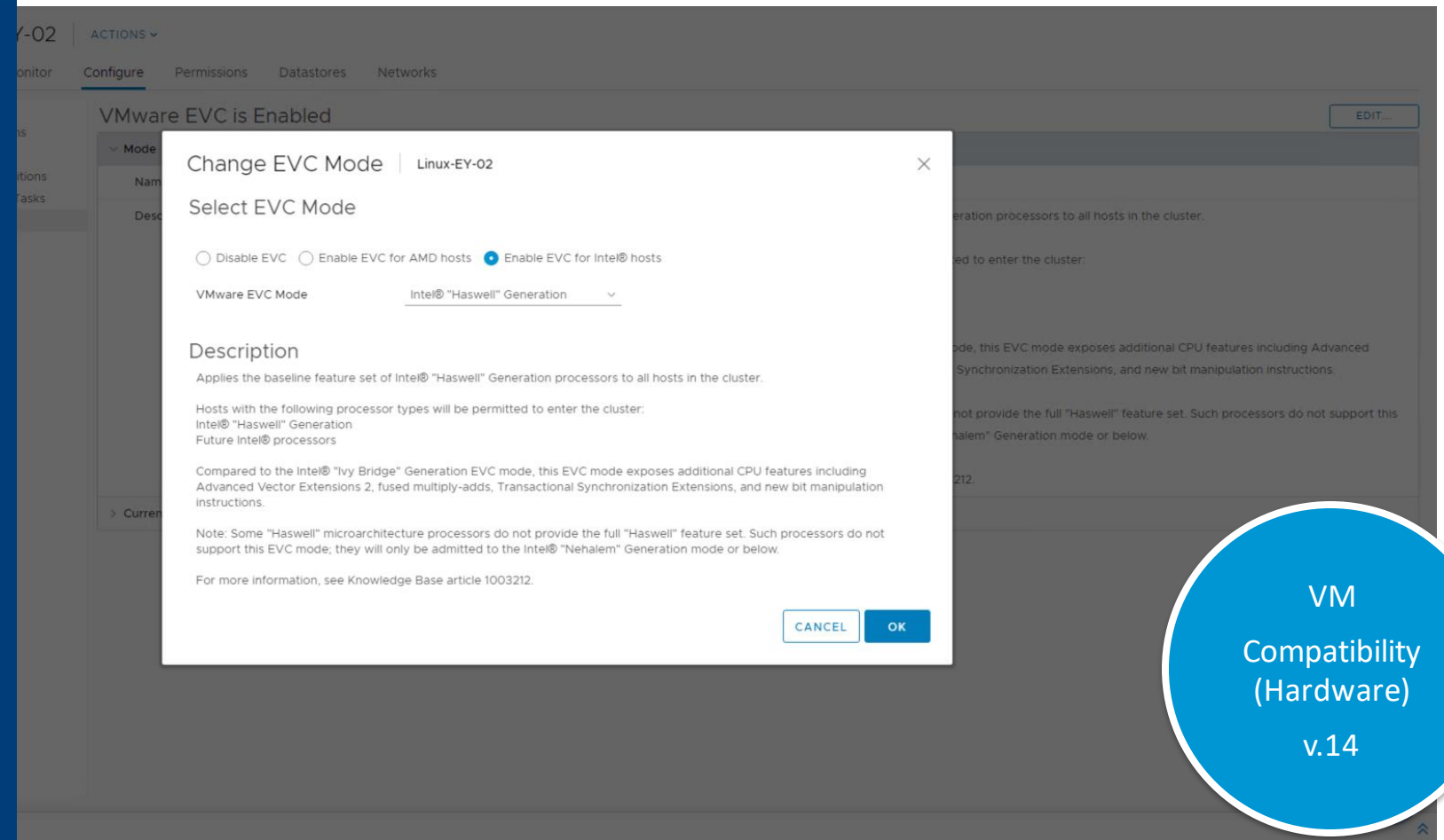
Allows granularity of enabling EVC for particular VMs rather than a cluster of hosts

Improving the mobility of a VM beyond a cluster including to VMware Cloud on AWS.

Persisting EVC mode across:

- Cluster
- Data Center
- vCenter Server

Persists through a power cycle





# Thank You!