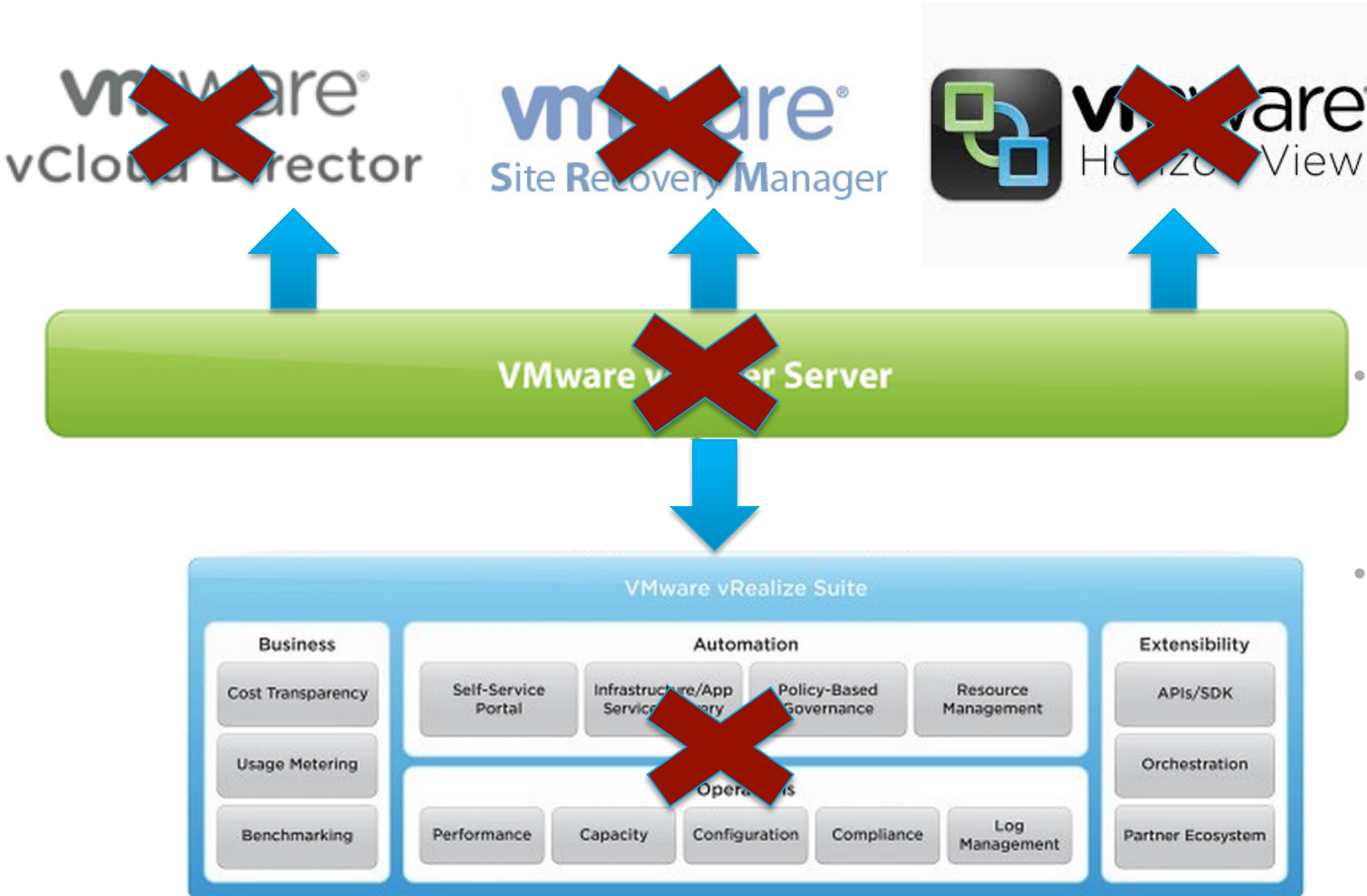


vCenter Server 6 Availability

Agenda

- Importance of vCenter Server Availability
- vCenter Server 6 components
- Availability characteristics of vCenter Server node
- PSC availability characteristics
- vCenter Server node availability solutions
- PSC availability Solutions
- Deployment Modes
- Planned improvements in 2016

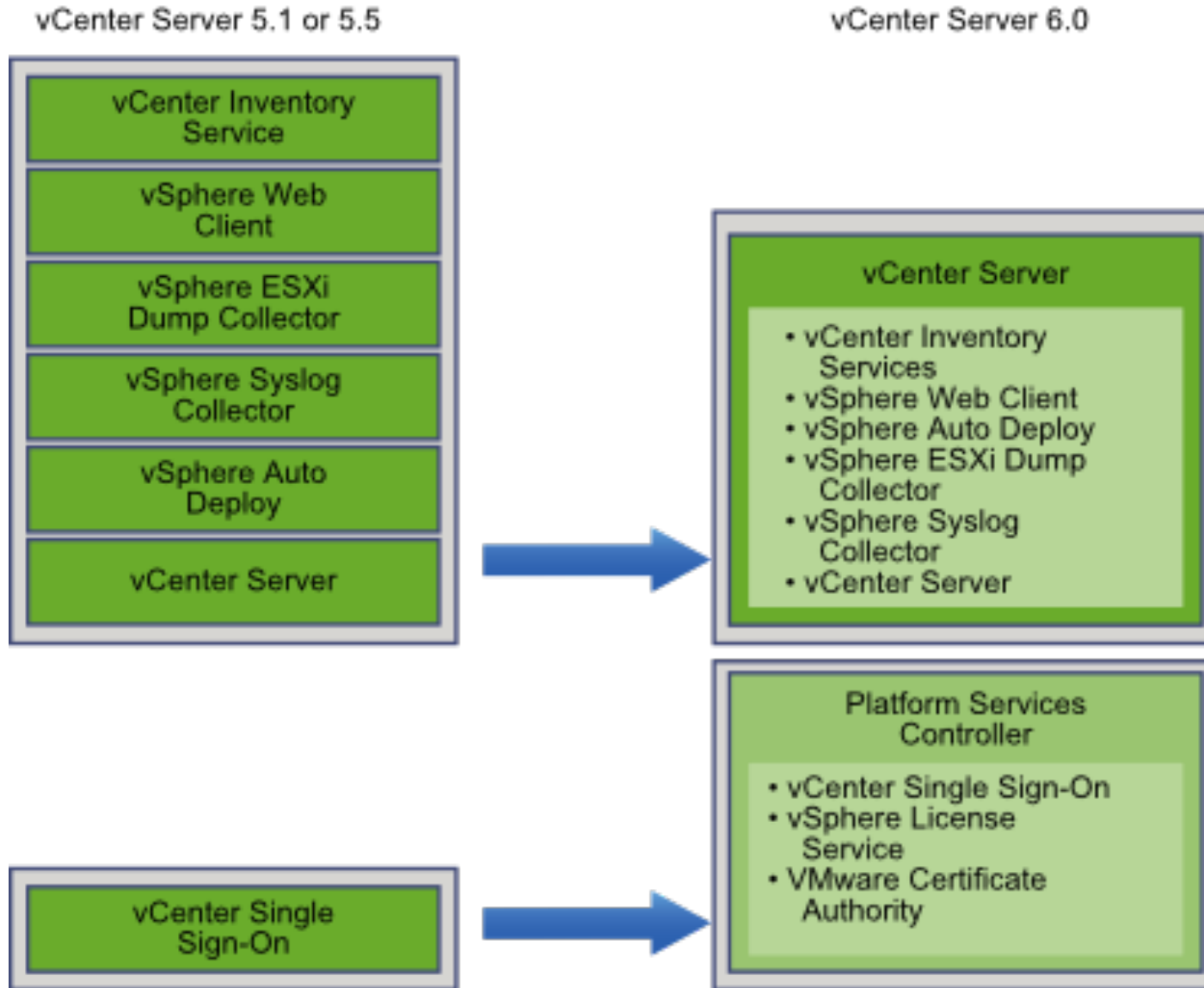
Why vCenter Server 6 Availability is important?



vCenter Server is mission critical
vCenter Server can be a single point of failure

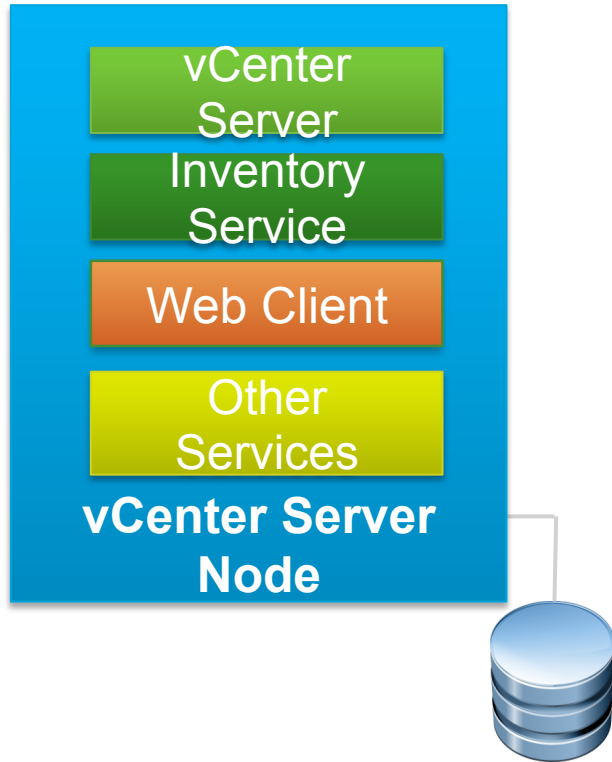
- Multiple Solutions rely on vCenter
 - Horizon® Suite
 - vRealize Automation & Operations
- Loss of vCenter curtails the ability of these solutions to perform many critical functions

vCenter Server 6 Components



- vCenter Server 6 has been consolidated into two components
 - vCenter Server Node
 - Platform Services Controller
- Single sign-on has evolved into PSC
- All other components consolidated in vCenter Server

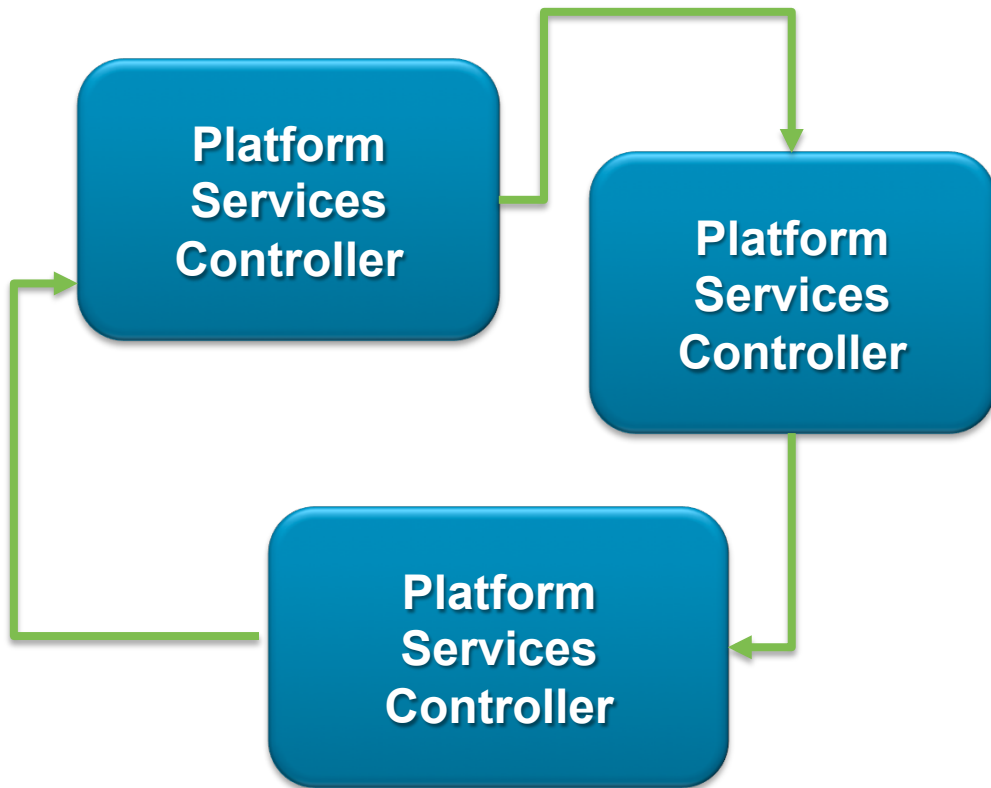
vCenter Server Node



Many of the traditional services have been consolidated

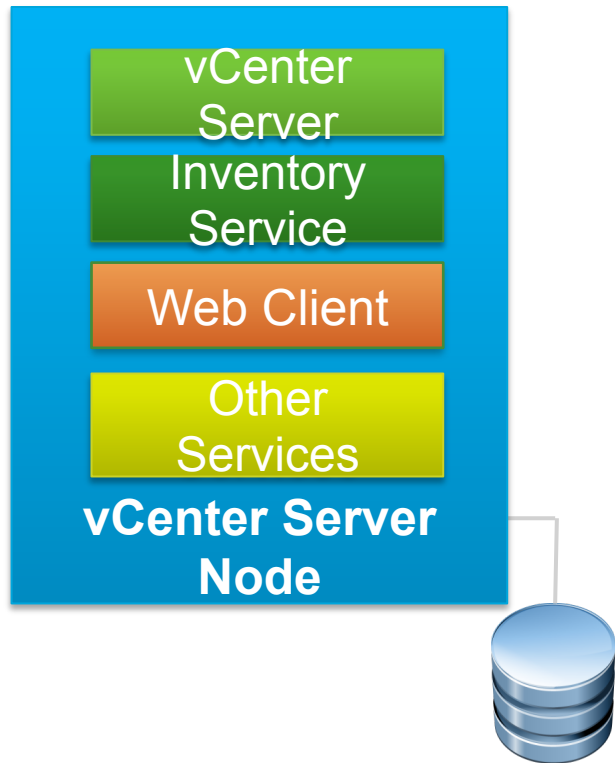
- VMware vCenter core components
- VMware vSphere Web Client
- VMware vCenter Inventory Service
- VMware vSphere Profile Driven Storage
- VMware vSphere Auto Deploy
- VMware vSphere Syslog Collector
- VMware vSphere ESXi Network Dump Collector

VMware Platform Services Controller (PSC)



- No longer just Single Sign-On
 - We're adding additional services
- Platform Services Controller includes a set of common infrastructure services that are used by the vCloud Suite (vCenter, vCAC, vCOPS, etc)
 - Single Sign-On (SSO)
 - Licensing
 - Certificate Authority
 - Certificate Store
 - Service (Product) Registration
 - Tagging and categories
 - Global Permissions
- Platform Services Controller supports data replication

vCenter Server Node Availability Characteristics



- **vCenter Server Node:**
 - Encompasses many individual components
 - Failure causes loss of vCenter Services
 - One to one relationship with managed objects
 - vCenter Server node is a single point of failure

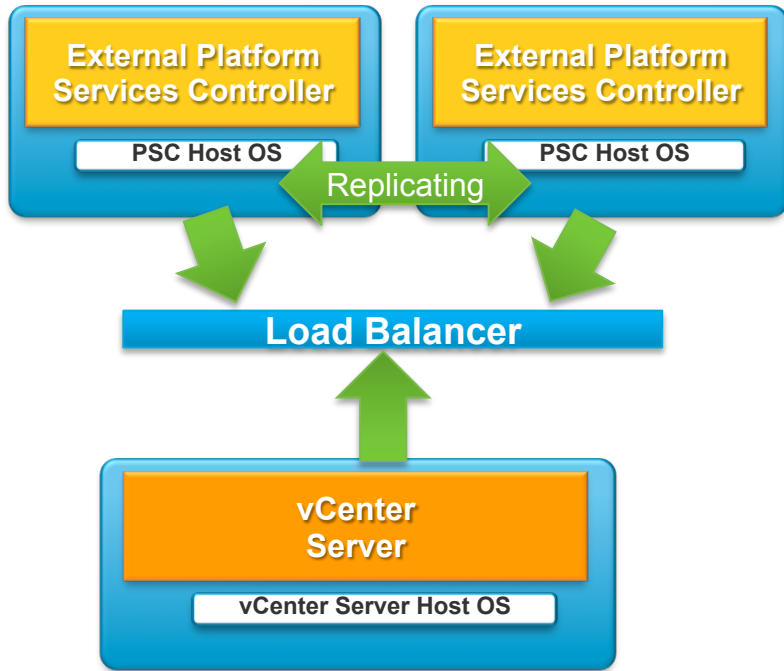
vCenter Server Database Availability Characteristics



vCenter Server DB

- **Database Services:**
 - vCenter Server data is stored in a database server
 - Can be Internal or external to vCenter Server
 - Primary repository for vCenter server related information
 - Failure of database will bring down vCenter Server services
 - The Database is a single point of failure

PSC Availability Characteristics



- **Platform Services Controller:**

- Multiple instances can exist in parallel
- Can be front ended with a load balancer
- Failure of one PSC does not bring down services
- Not a single point of failure



vCenter Server Node Availability

High Availability Solutions for protecting vCenter Server Node

99.999 %

99.99 %

99 %

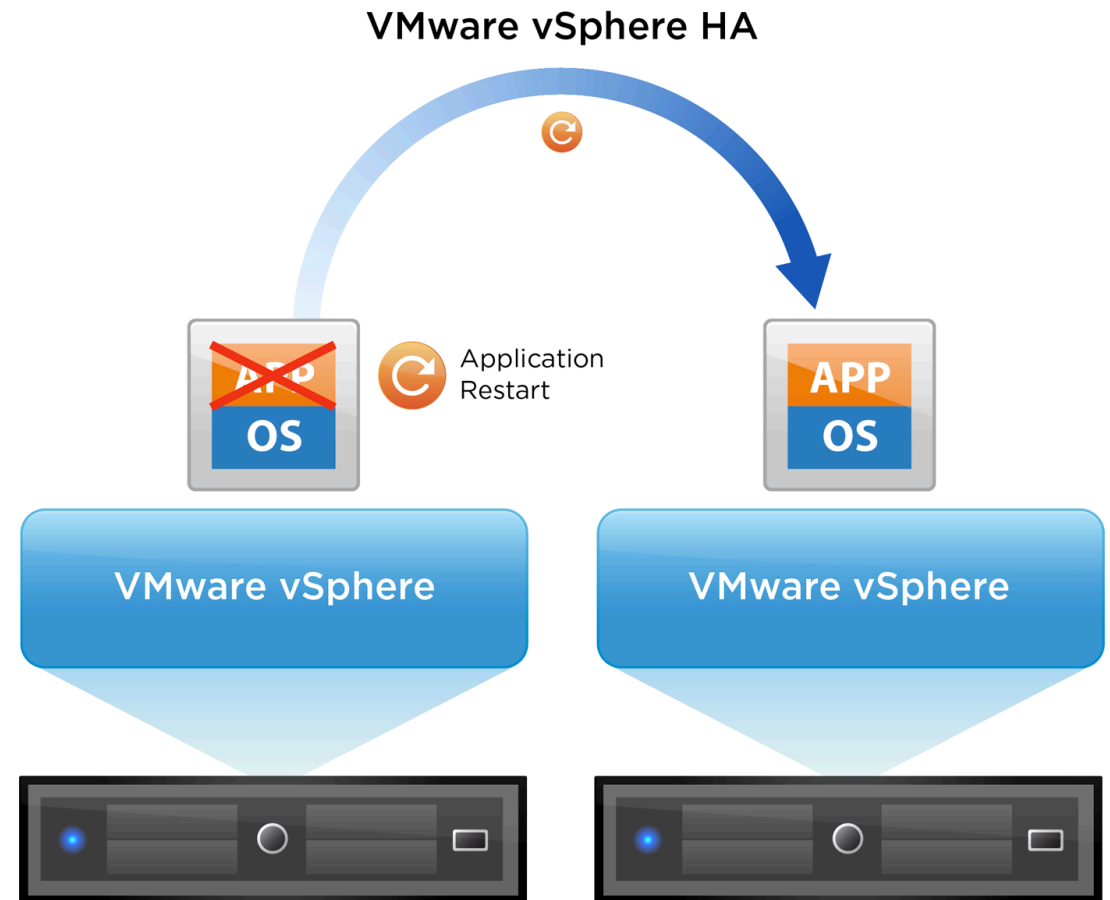
99.9 %

99.9999 %

- Multiple HA options
- Solution dependent upon availability requirements
- Solutions available include:
 - vSphere HA
 - vSphere Fault Tolerance
 - vCenter Watchdog
 - Guest OS Clustering
 - Third Party Solutions

vSphere HA

- Time tested solution
- Protect against hardware failures.
- Some downtime for failover
- Easy to set up and manage
- DRS rules can be leveraged
- High restart priority for vCenter components



vSphere Fault Tolerance (FT)

- Instantaneous protection for HW failures
- vCenter Server should use less than 4 vCPU
- Continuous availability with zero downtime and data loss
- Does not protect against application failures and downtime during patching



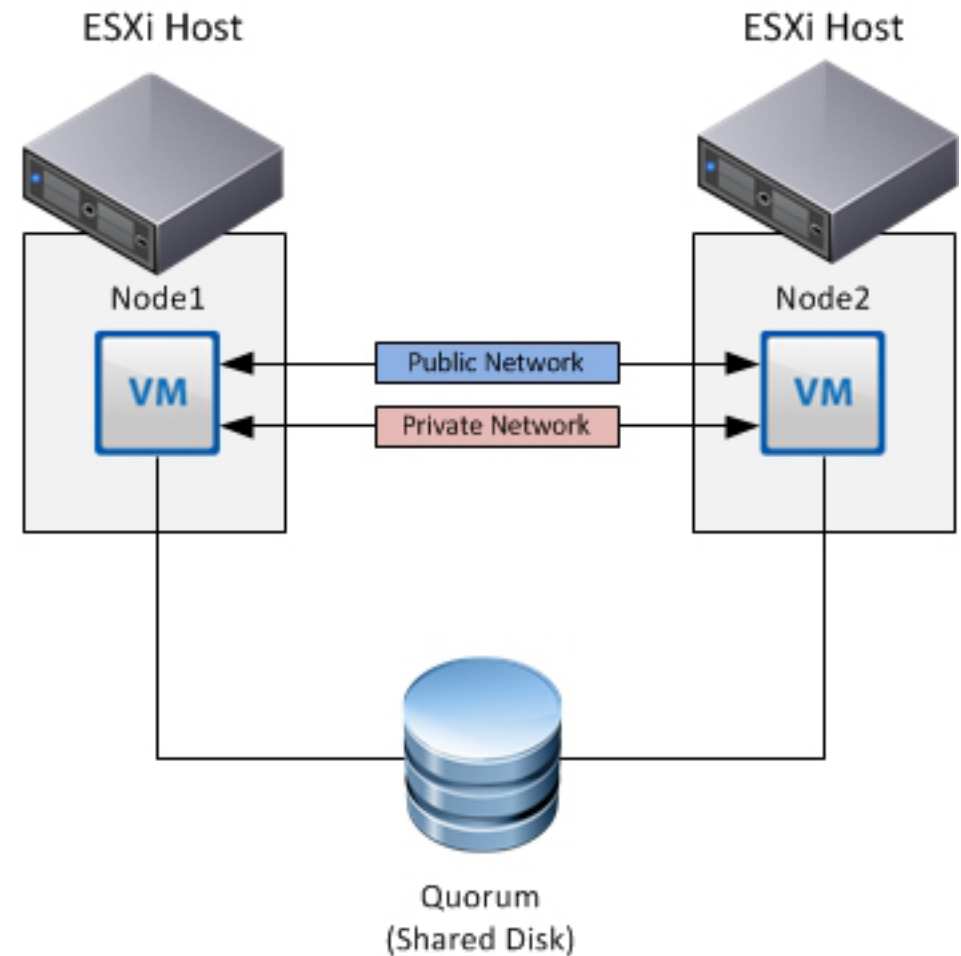
vCenter Server Watchdog



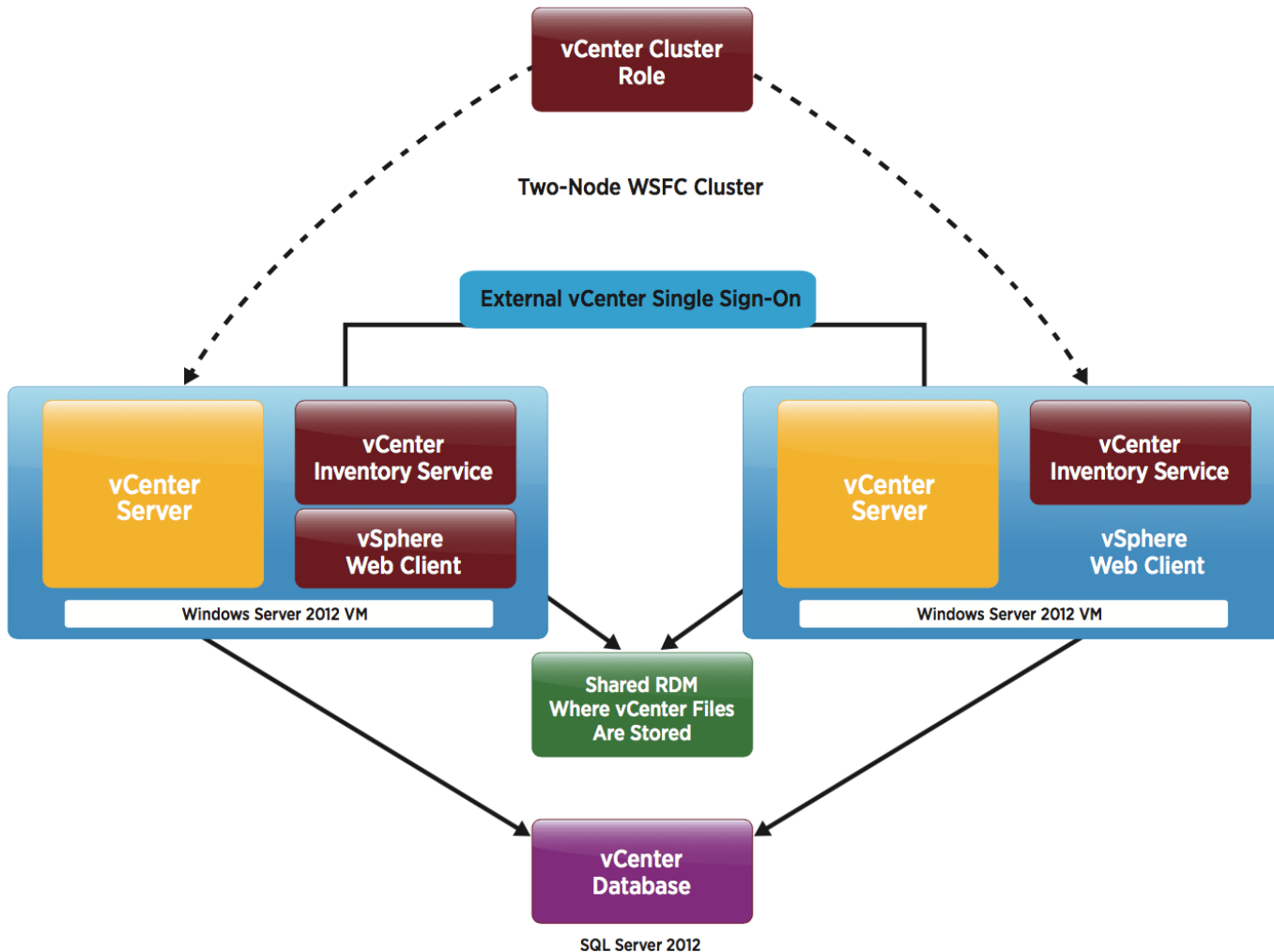
- Watchdog monitors and protects vCenter Application.
- Automatically enabled on install
- Available on VCSA and Windows vCenter
- On Failure,
 - Watchdog attempts to restart process.
 - If restart fails VM is restarted.
- Separate Watchdog per vCenter Server component
- Ensures application level availability

Virtual Machine Guest OS clustering Solutions

- Provides protection against OS level and application downtime
- Provides protection for Database
- Some downtime during failure
- Clustering on Clustering makes it complex
- Reduces downtime during OS patching

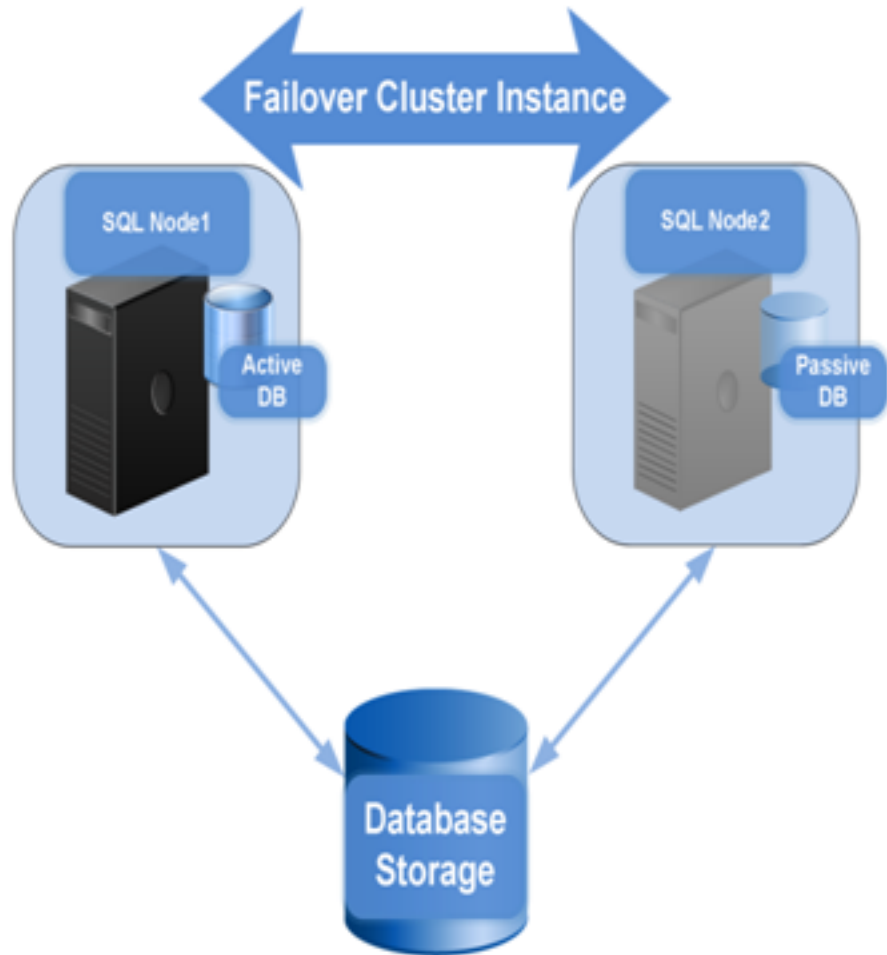


vCenter Server Node protection with Windows Server Failover Clustering



- Protects vCenter Server node in the event of application level failures
- Requires two Windows virtual machines with shared RDM between them
- Helps reduce downtime for Patching and application maintenance activity
- Should not be combined with Database Clustering

vCenter Database protection with Windows Server Failover Clustering



- Protects SQL Server Database from failures
- Requires two Windows virtual machines with shared RDMs for quorum and data disks
- Helps reduce downtime for Patching and other maintenance activity
- SQL Always on Availability Groups (AAG) is not certified to protect vCenter Databases

Comparison of availability Solutions for vCenter Server 6

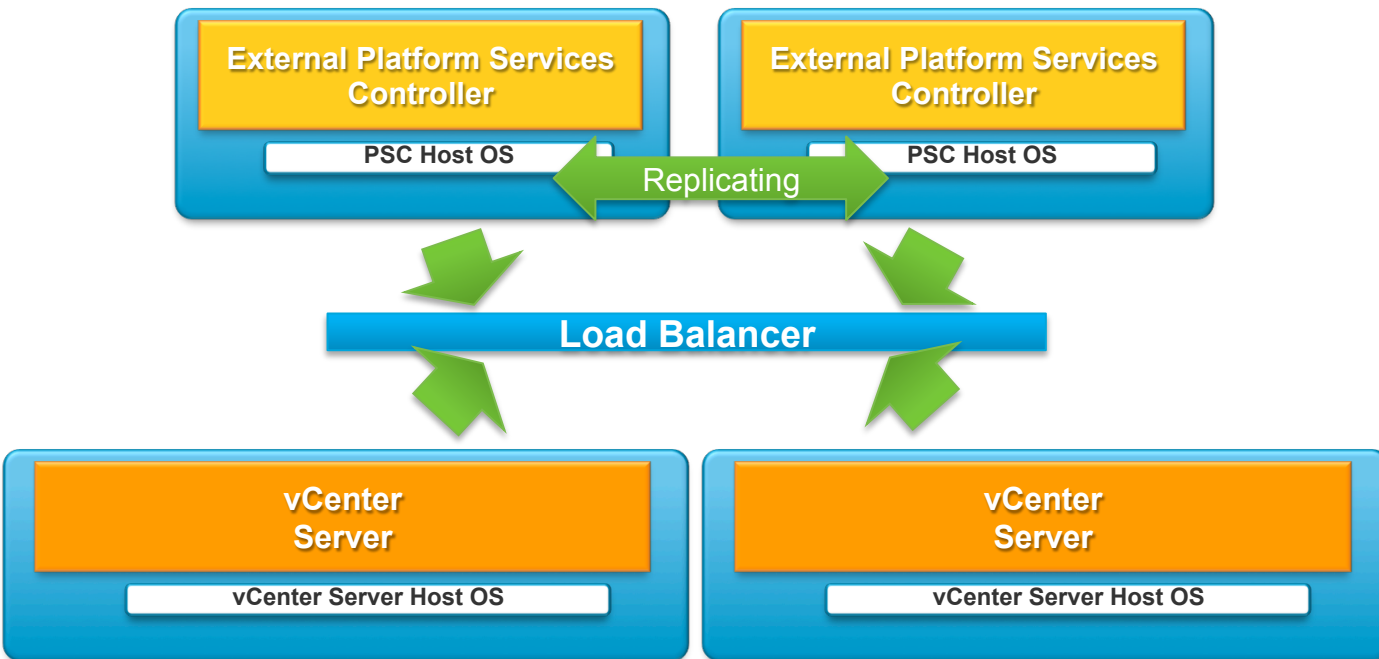
HA Solution	VM Restarting	Application Monitoring	Failover Time	Hardware Maintenance Downtime	OS Maintenance Downtime	Cost and Complexity
vSphere HA + Watchdog (WD)	YES	YES	MED	NONE	HIGH	LOW
vSphere HA + WD + Fault Tolerance	YES	YES	NONE	NONE	HIGH	MED
Guest Failover Cluster	NO	YES	LOW	MED	LOW	HIGH
vSphere HA + Guest Failover Cluster	YES	YES	LOW	NONE	LOW	HIGH

Which HA Solution should I use for my environment?

HA Solution	When should I use?
vSphere HA + Watchdog (WD)	<ol style="list-style-type: none">1. Most prevalent solution.2. Meets requirements for majority of customer environments3. Provides recovery within minutes of any hardware failure4. Watchdog recovers from most application level failures5. Easy to manage
vSphere HA + WD + Fault Tolerance	<ol style="list-style-type: none">1. Provides instantaneous recovery for any hardware failure2. Fault Tolerance limitations and requirements reduce its applicability for vCenter Server protection3. Uses double the compute and storage resources.
Guest Failover Cluster	<ol style="list-style-type: none">1. Used to provide availability for vCenter Server running on physical machines2. Reduced downtime during OS patching activities
vSphere HA + Watchdog + Guest Failover Cluster	<ol style="list-style-type: none">1. Provides best of both worlds2. Most complex to setup and manage3. Provides maximum availability as it helps reduce impact from HW, application and patch downtime.

PSC Availability

PSC High Availability with Load Balancer



Features:

- Multiple PSC nodes locally
- vCenter interacts with the PSCs via load balancer
- PSCs replicate state information between them

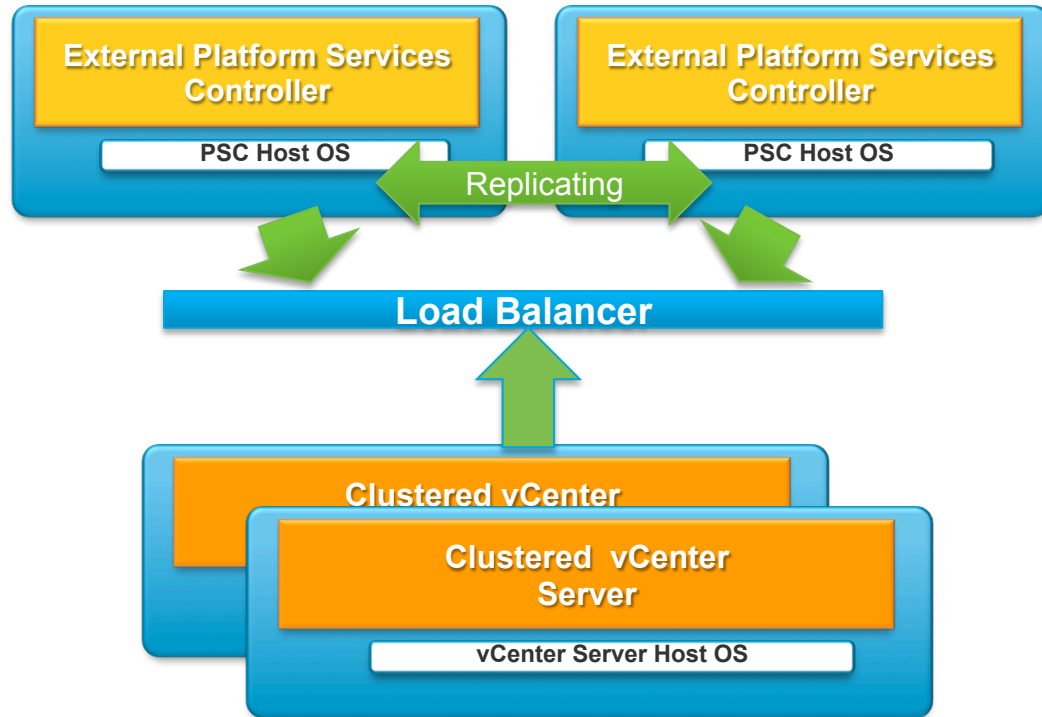
When to use Load Balancers:

- Many vCenter Servers and other solutions use the PSC locally
- Load balancers currently in use for other applications.
- Might not add to availability if only a few VMware solutions use the PSC



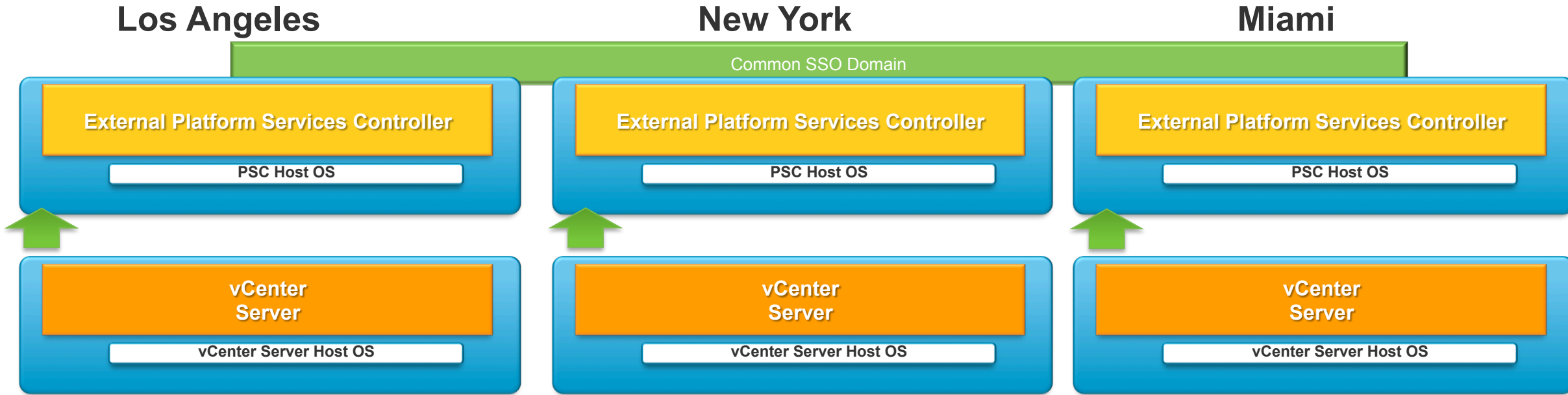
Deployment Modes

Local Site HA: PSC with Load Balancer & vCenter Server with Clustering



- Multiple PSC nodes locally
- vCenter Server interacts with the PSCs via load balancer
 - Load balancer hides any PSC failures to the vCenter
- vCenter instances are clustered
 - Reduced downtime for patching
 - Improved application availability

External Deployment Model: Multiple Site Consolidated Model



By Default

- Each site is independent
- PSC automated replication
- Site awareness

Enhanced Linked Mode

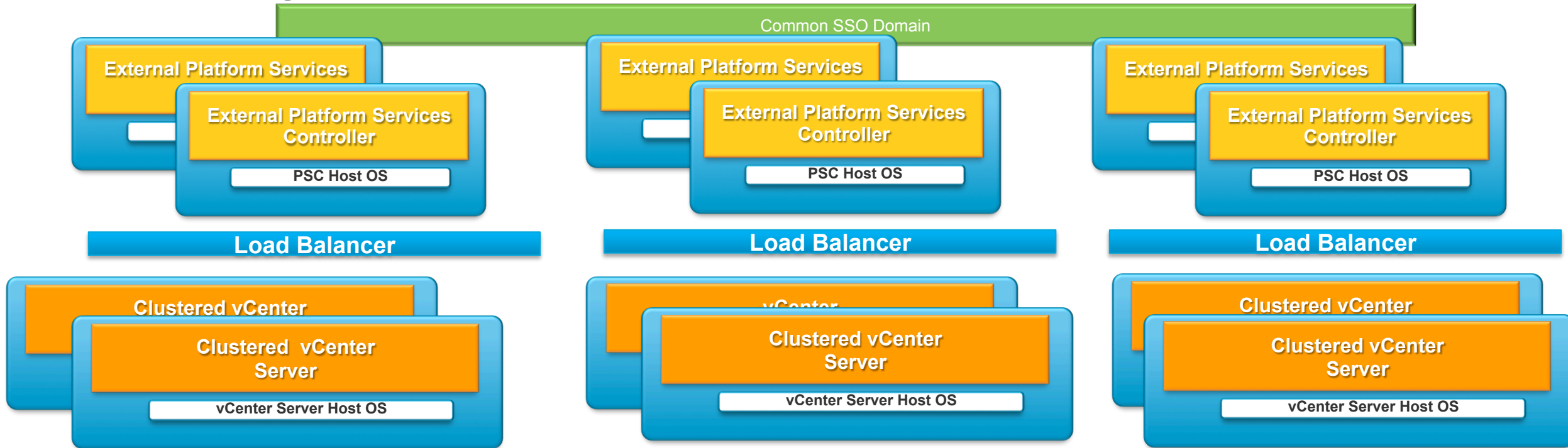
- Facilitated via Platform Services Controller
- Maintains single management point
- Works in Windows and VCVA
- Replicates Licenses, permissions, tags and roles

External Deployment Model: Multiple Site consolidated model with High Availability

Los Angeles

New York

Miami



Setup

- Each site configured then populated with at least two PSCs
- vCenter Servers are clustered with guest OS clustering for availability
- Load balancer is required at each site to provide PSC high availability

Upcoming improvements to vCenter Server Availability in 2016

Conclusion



- Multiple options for vCenter Server HA
- vSphere HA, FT, and watchdog can protect vCenter Server Node
- PSC with load balancer for HA
- In Guest Clustering can protect vCenter Server and Database services
- Multiple deployment modes to meet availability requirements

Resources

- vCenter Server 6 Availability Paper
- <https://www.vmware.com/files/pdf/techpaper/VMware-vCenter-Server-6-0-Availability-Guide.pdf>
- Creating a Windows Server Cluster <https://technet.microsoft.com/en-us/library/cc730647.aspx>
- Estimating Application Availability in ESXi Clusters
<http://blogs.vmware.com/apps/2013/07/estimating-availability-of-sap-on-esxi-clusters-examples-2.html>
- Windows Clustering in VMware environments
<http://pubs.vmware.com/vsphere-55/topic/com.vmware.ICbase/PDF/vsphere-esxi-vcenter-server-55-setup-mscs.pdf>
- Supported vCenter High Availability Options <http://kb.vmware.com/1024051>