



Protecting your vCenter Server with vCenter Server Heartbeat

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Agenda

- Why protect vCenter Server? (Use-cases)
- How does vCenter Server Heartbeat work?
- Compatibility considerations with other VMware solutions
- Deployment scenarios

Why protect vCenter Server? (common customer use-cases)

Common customer use-cases:

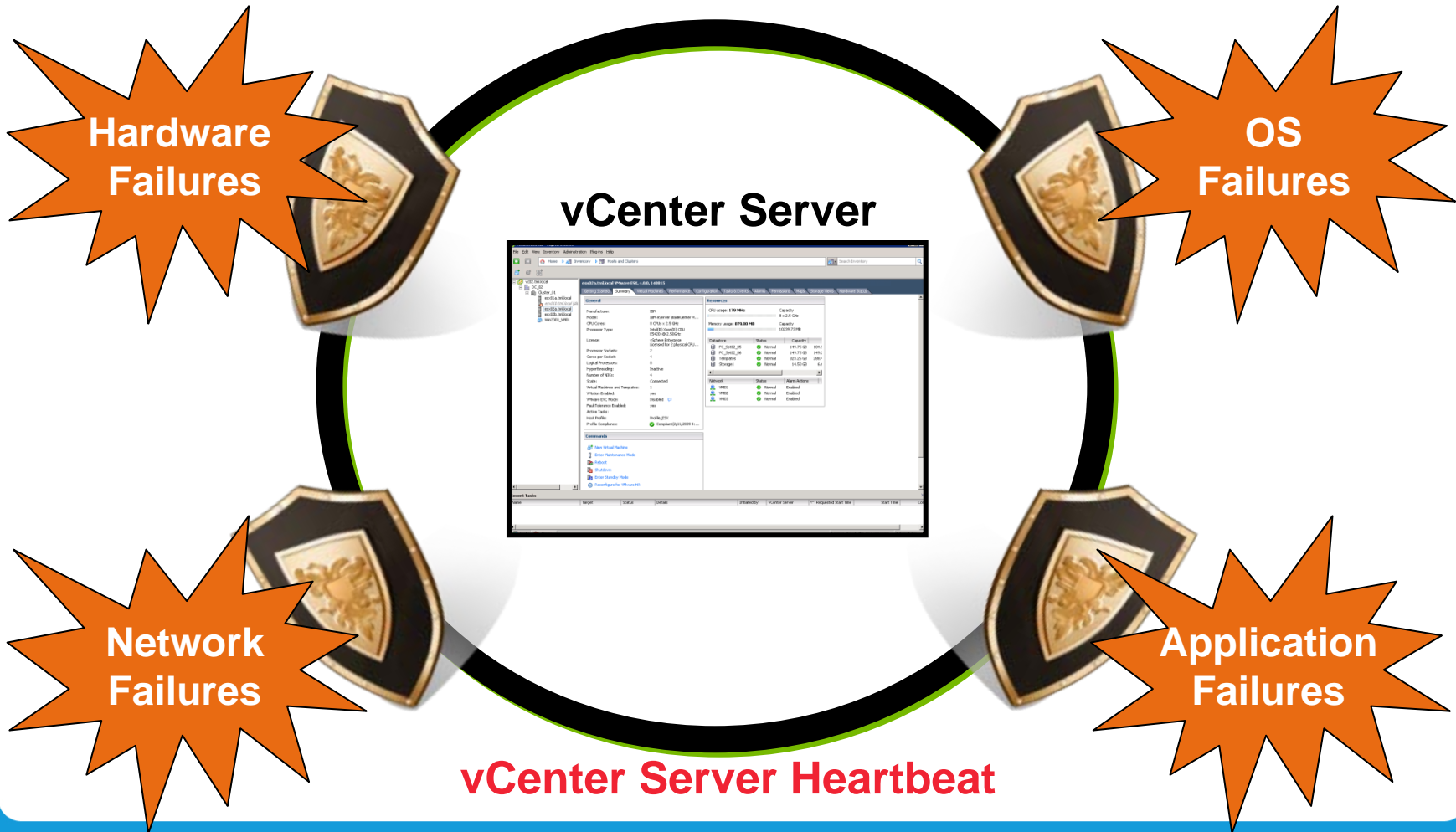
- Have specific SLA for vCenter Server from business units in order to manage their higher tier workloads
- vCenter Server manages a large portion of the datacenter such that itself becomes a tier 1 application
- Need protection for DRS to keep performance SLAs for workloads
- Want to do hardware maintenance without taking down vCenter Server
- Need to protect license server or SQL database
- And many more ...

Why protect vCenter Server? (not good reasons)

No need to protect vCenter Server for the following:

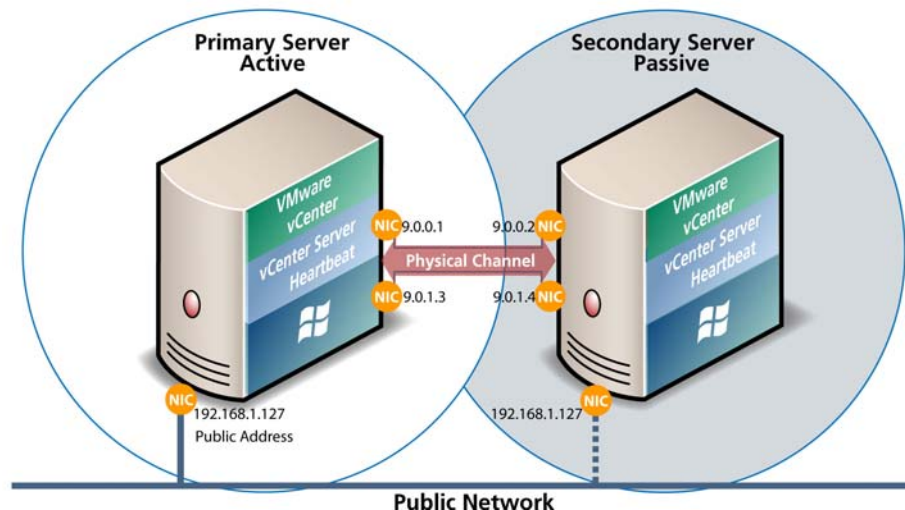
- Ensure that VMware HA works (HA failover doesn't require vCenter Server)
- Ensure VMs still run in case of vCenter Server failure (VMs will continue to run on ESX without vCenter Server)

How does vCenter Server Heartbeat work? (What failure scenarios are protected)



How does vCenter Server Heartbeat work? (high level architecture: active-passive)

- Secondary is a clone of Primary through P2V, VM clone, or Windows Backup/Restore
- Disk transactions of protected files, folders and registries from Primary are replicated to Secondary through dedicated private network channel (can be redundant)
- IP packet filter hides Secondary from public network



How does vCenter Server Heartbeat work? (how does it monitor and protect)

Hardware & OS Failures

Detected through heartbeat message monitoring between Primary and Secondary

Network Failures

Detected through polling default gateway, the primary DNS server, and the Global Catalog server at regular intervals

Application Failures

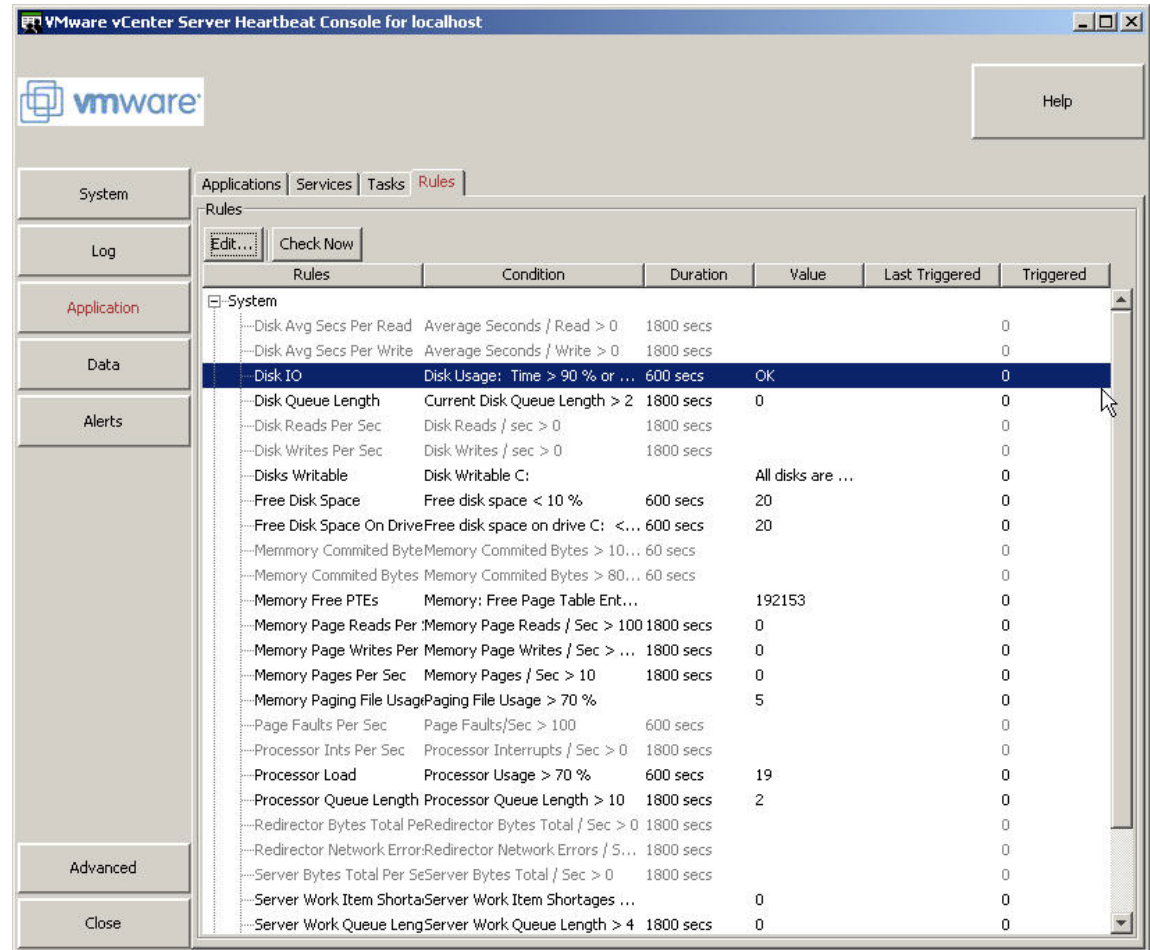
Detected through Windows Service monitoring for vCenter Server, SQL Server, Update Manager, and License Server

Application Performance Degradation

Detected if a set of performance metrics is outside of expected threshold

How does vCenter Server Heartbeat work? (Application performance monitoring)

Critical performance metrics important for the health of vCenter Server, License Server, Update Manager, and SQL Server are monitored and can cause switchovers

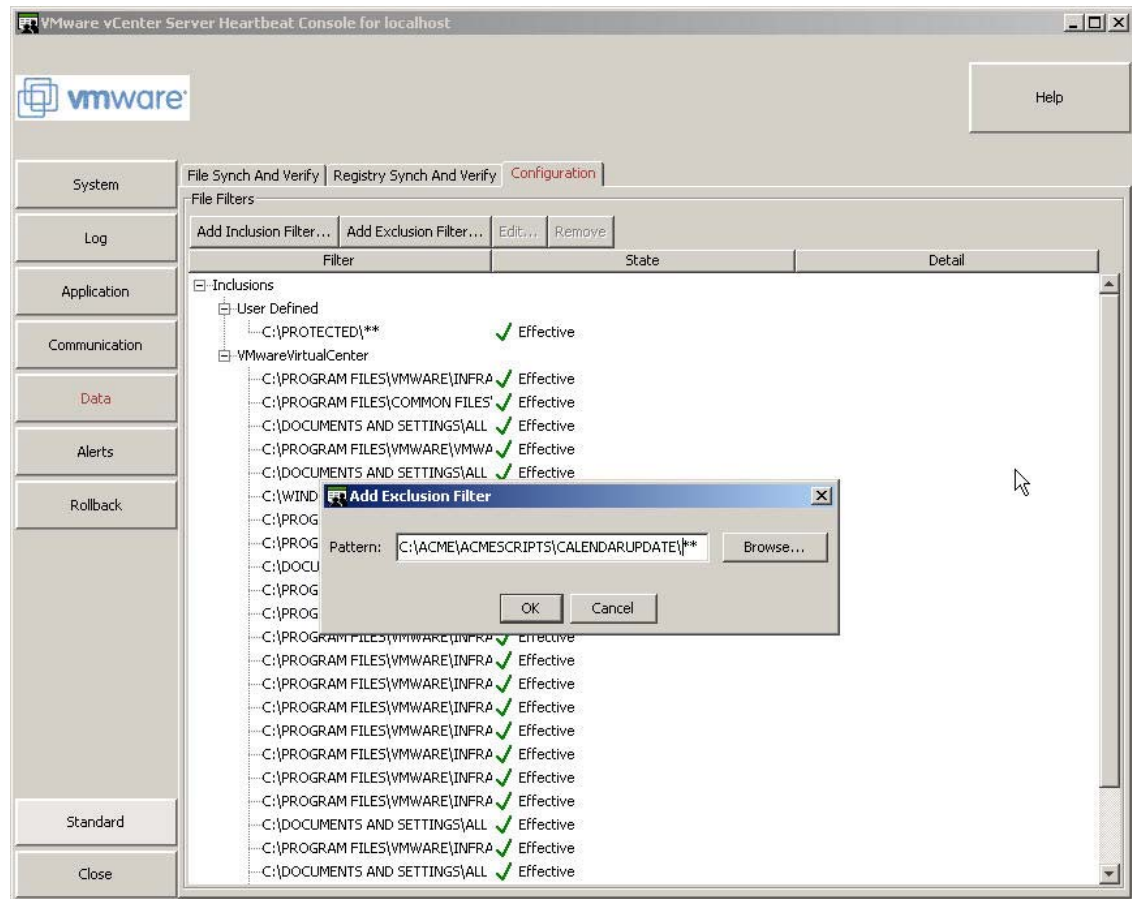


The screenshot shows the VMware vCenter Server Heartbeat Console for localhost. The interface includes a VMware logo, a Help button, and a navigation pane on the left with buttons for System, Log, Application, Data, Alerts, Advanced, and Close. The main area displays a list of rules under the 'Rules' tab, with columns for Rules, Condition, Duration, Value, Last Triggered, and Triggered. The 'Disk IO' rule is highlighted.

Rules	Condition	Duration	Value	Last Triggered	Triggered
System					
-Disk Avg Secs Per Read	Average Seconds / Read > 0	1800 secs			0
-Disk Avg Secs Per Write	Average Seconds / Write > 0	1800 secs			0
Disk IO	Disk Usage: Time > 90 % or ...	600 secs	OK		0
-Disk Queue Length	Current Disk Queue Length > 2	1800 secs	0		0
-Disk Reads Per Sec	Disk Reads / sec > 0	1800 secs			0
-Disk Writes Per Sec	Disk Writes / sec > 0	1800 secs			0
-Disks Writable	Disk Writable C:		All disks are ...		0
-Free Disk Space	Free disk space < 10 %	600 secs	20		0
-Free Disk Space On Drive	Free disk space on drive C: < ...	600 secs	20		0
-Memory Committed Byte	Memory Committed Bytes > 10 ...	60 secs			0
-Memory Committed Bytes	Memory Committed Bytes > 80 ...	60 secs			0
-Memory Free PTEs	Memory: Free Page Table Ent...		192153		0
-Memory Page Reads Per	Memory Page Reads / Sec > 100	1800 secs	0		0
-Memory Page Writes Per	Memory Page Writes / Sec > ...	1800 secs	0		0
-Memory Pages Per Sec	Memory Pages / Sec > 10	1800 secs	0		0
-Memory Paging File Usage	Paging File Usage > 70 %		5		0
-Page Faults Per Sec	Page Faults/Sec > 100	600 secs			0
-Processor Ints Per Sec	Processor Interrupts / Sec > 0	1800 secs			0
-Processor Load	Processor Usage > 70 %	600 secs	19		0
-Processor Queue Length	Processor Queue Length > 10	1800 secs	2		0
-Redirector Bytes Total Pe	Redirector Bytes Total / Sec > 0	1800 secs			0
-Redirector Network Error	Redirector Network Errors / S...	1800 secs			0
-Server Bytes Total Per Se	Server Bytes Total / Sec > 0	1800 secs			0
-Server Work Item Shorta	Server Work Item Shortages ...		0		0
-Server Work Queue Leng	Server Work Queue Length > 4	1800 secs	0		0

How does vCenter Server Heartbeat work? (Users can tweak what's being protected)

Though vCenter Server Heartbeat automatically detects and protects all critical data, users can also tweak the specific files, folders, and registry items to be protected



How does vCenter Server Heartbeat work? (switchover scenarios)

Manual Switchover

Manually switch between Primary and Secondary

- Useful for performing maintenance work on Primary

Auto Switchover

User customizable action caused by:

- Network failures
- Application failures
- Performance degradations

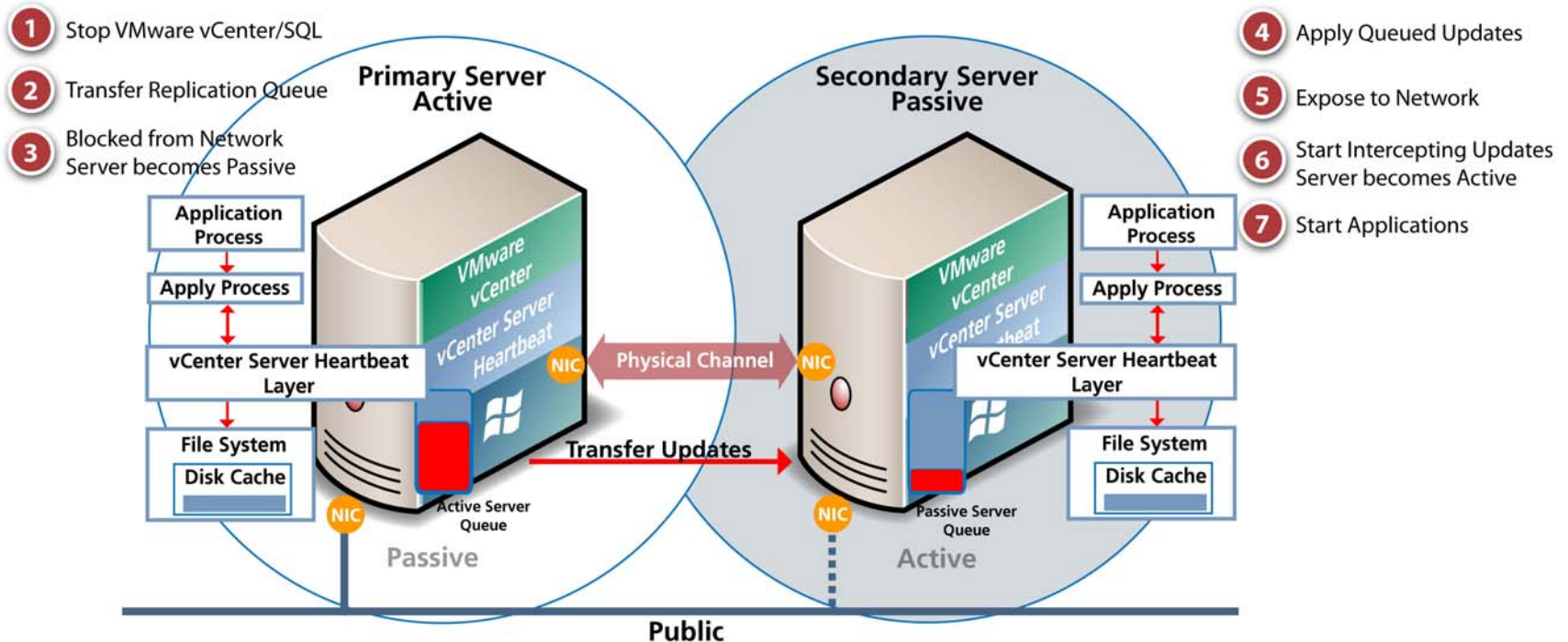
Failover

When heartbeat through private network channel is missing due to:

- Server hardware failures, including private network channel failures
- Windows OS crashes

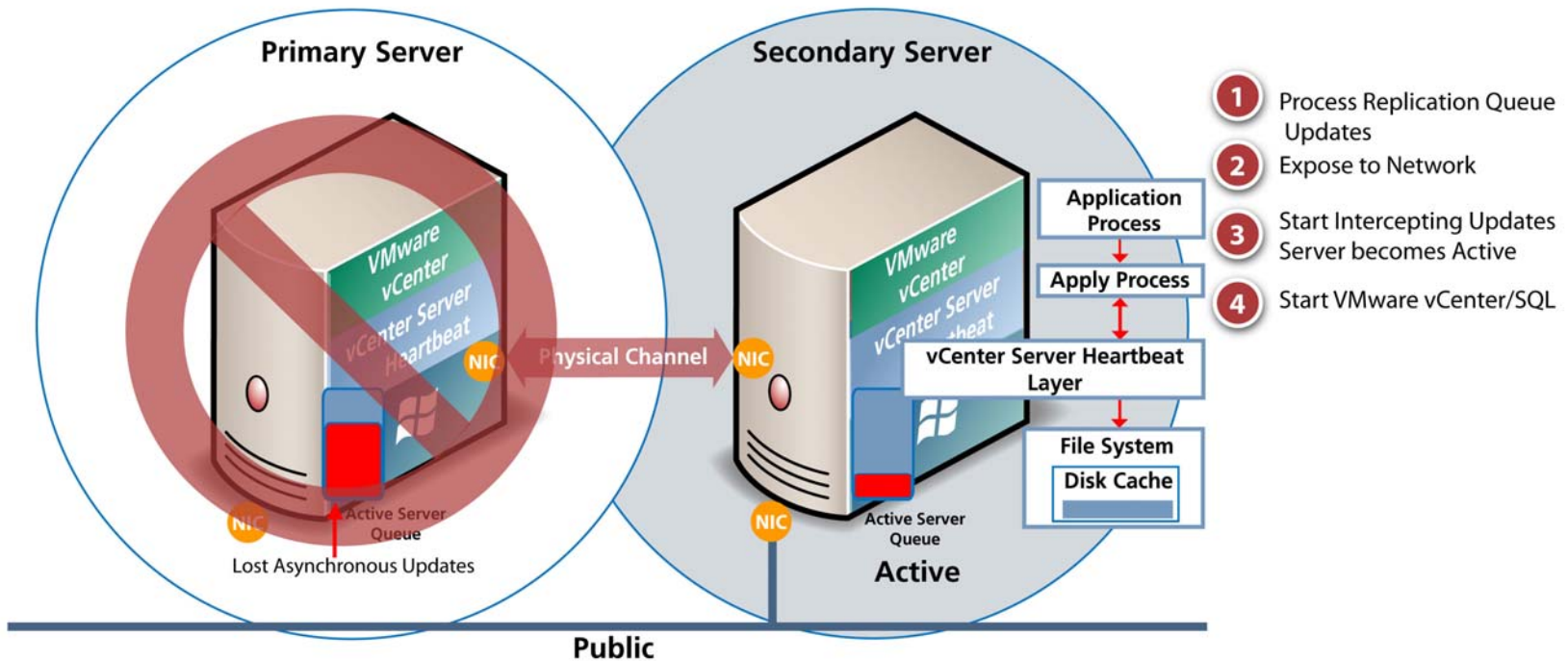
How does vCenter Server Heartbeat work? (Manual or Auto Switchover)

■ Graceful switch of vCenter Server load to Secondary



How does vCenter Server Heartbeat Work? (Failover steps)

- Failure scenario impact is similar to an abrupt vCenter Server service restart



VMware Management Solutions implications

- The following solutions are supported only for non-WAN configurations, they will treat the switchover/failover process similar to a vCenter Server restart
 - vCenter Update Manager
 - vCenter Site Recovery Manager
 - vCenter Lifecycle Manager
 - vCenter Lab Manager
 - vCenter Stage Manager
- Currently vCenter Server Heartbeat does not specifically protect management solutions mentioned above (except vCenter Update Manager if it's on the same host as vCenter Server)

Deployment Scenarios (Server choices and implications)

- Server Choices for Primary and Secondary vCenter Server
 - Physical Primary, Virtual Secondary (P-V) (**Recommended**)
 - Virtual Primary, Virtual Secondary (V-V) (**Recommended**)
 - Physical Primary, Physical Secondary (P-P) (Supported)
 - Virtual Primary, Physical Secondary (V-P) (Not Supported)
- Cloning techniques to create Secondary Server
 - For P-V configuration (Using P2V tool like VMware Converter **recommended**)
 - For V-V configuration (Cloning the Primary VM **recommended**)
 - For P-P configuration (Using Windows Backup/Restore **recommended**)

Deployment Scenarios (Protected vCenter Server components)

- Location of vCenter Server Database
 - On the same server as vCenter (Supported for small environments)
 - On separate server from vCenter Server (P-V, V-V, P-P configurations supported)
- vCenter Server components are protected if they are on same host as vCenter Server
 - License Server
 - VMware Update Manager
 - Integrated Capacity Planner
 - Integrated VMware Converter Enterprise


Deployment Scenarios (Secondary across WAN)

- Use-case: Need DR coverage for vCenter Server on recovery site
- Some Implications:
 - Separate IP addresses likely required for Primary and Secondary
 - Measurement of WAN bandwidth and application load required prior to installation (testing utility included), T1 with at least 1 Mbps spare bandwidth required
 - DNS entry registration required during switchover or failover process
 - Private network channel must be configured using static routes over switches and routers to maintain isolated communications over corporate or public traffic
 - Special network configuration required for split-brain avoidance

Summary

vCenter Server Heartbeat:

- Provides a robust way to protect vCenter Server against common failure scenarios
 - Hardware, OS, Network, Application, Performance
- Provides comprehensive protection for commonly deployed vCenter components: Database, License Server, Update Manager, Integrated Capacity Planner, Integrated Converter
- Can protect across the WAN in DR scenario
- Leverages virtualization technology (P2V, Cloning, VMs as Primary or Secondary) to simplify the complexity and lower your cost providing high availability



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 indirectly applicable to my job
 personally interesting, but not applicable to my job

2. Did this session provide information that can help you do your job better?
 Yes
 Slightly
 No

3. This session was... (pick one)
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 Just right
 Not technical enough

4. What is your technical experience level?
 Not technical
 Novice
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5. Based on what you learned in this session, what is your likelihood to...
 implement what you heard in your environment
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