



Building Enterprise Class HA/DR Solutions for Hyper-V and VMware

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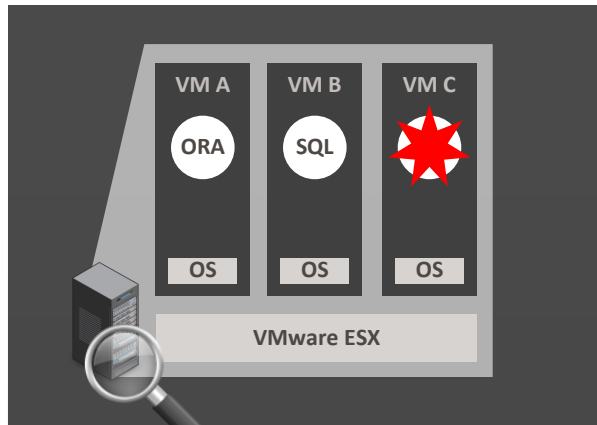
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Application Resilience for vSphere with Symantec Cluster Server (VCS)

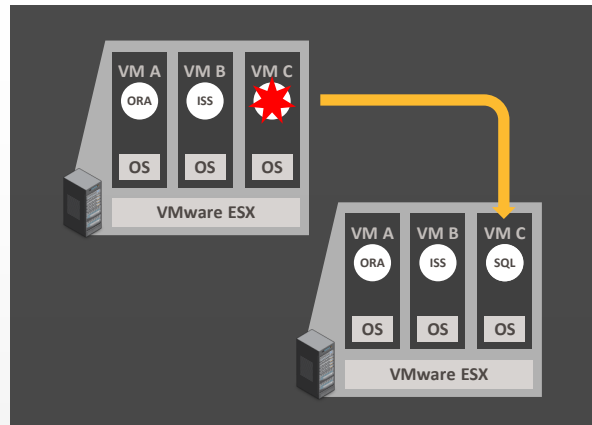
Virtualization brings challenges for visibility and availability of applications

Application Control & Visibility



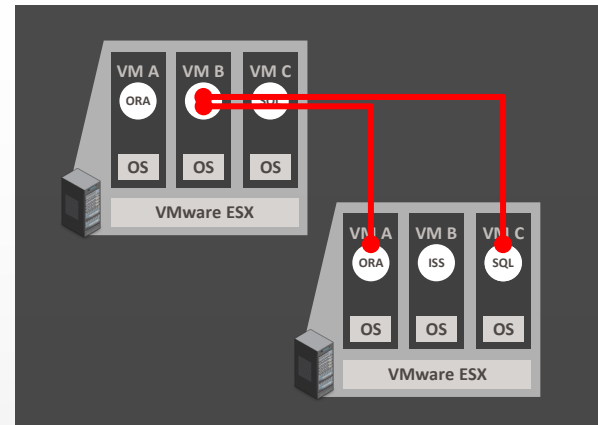
- Application view and health status from vCenter
- OS and application recovery

Application Recovery



- Reduce planned and unplanned downtime
- Reduce outage during OS & application patching

Multi-tier Application Management



- Application relationship management
- Physical and virtual environment

Monitoring tools providing information only!

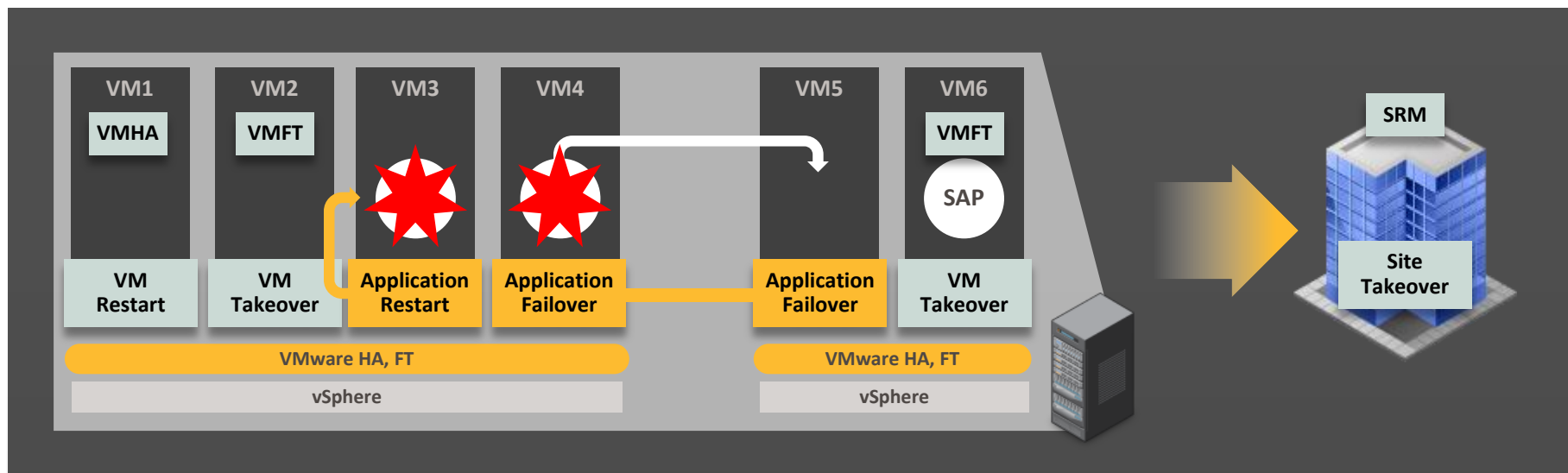
Siloed approach for physical and virtual

Rigid Storage compatibility for clusters!

Shared SCSI bus RDM limits vMotion!

Database down what about other apps?

VM & application availability requirements



VM Restart / Takeover

- Protection from unplanned VM downtime
- Recovery from ESX Host and VM OS failures
- Integrated with VMware tools
- VM Zero downtime and zero data loss through FT

Application Restart

- Recover from application faults
- OS & Application level recovery
- Application relationship management

Application Failover

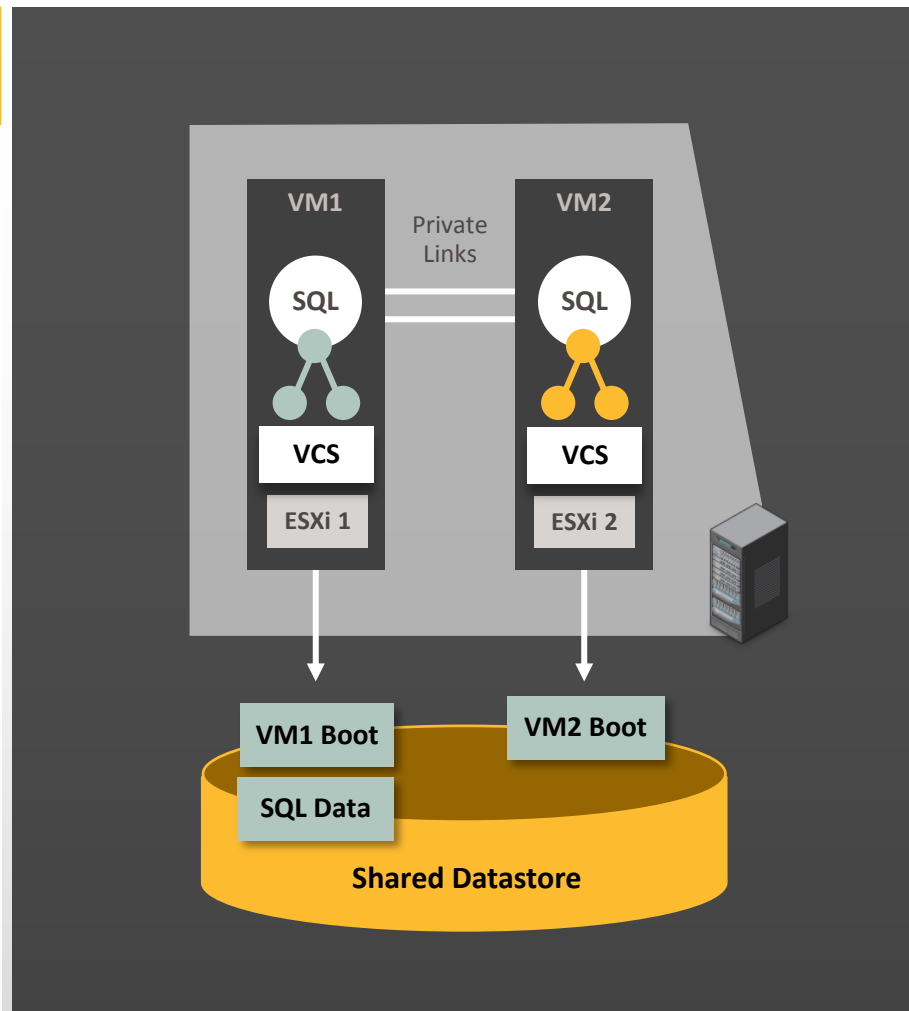
- Reduce planned downtime during OS patching
- Reduce unplanned downtime from OS corruption
- Quicker recovery (faster failover)

Recover from VM corruption & logical failures with [Symantec Cluster Server](#) + VMware HA

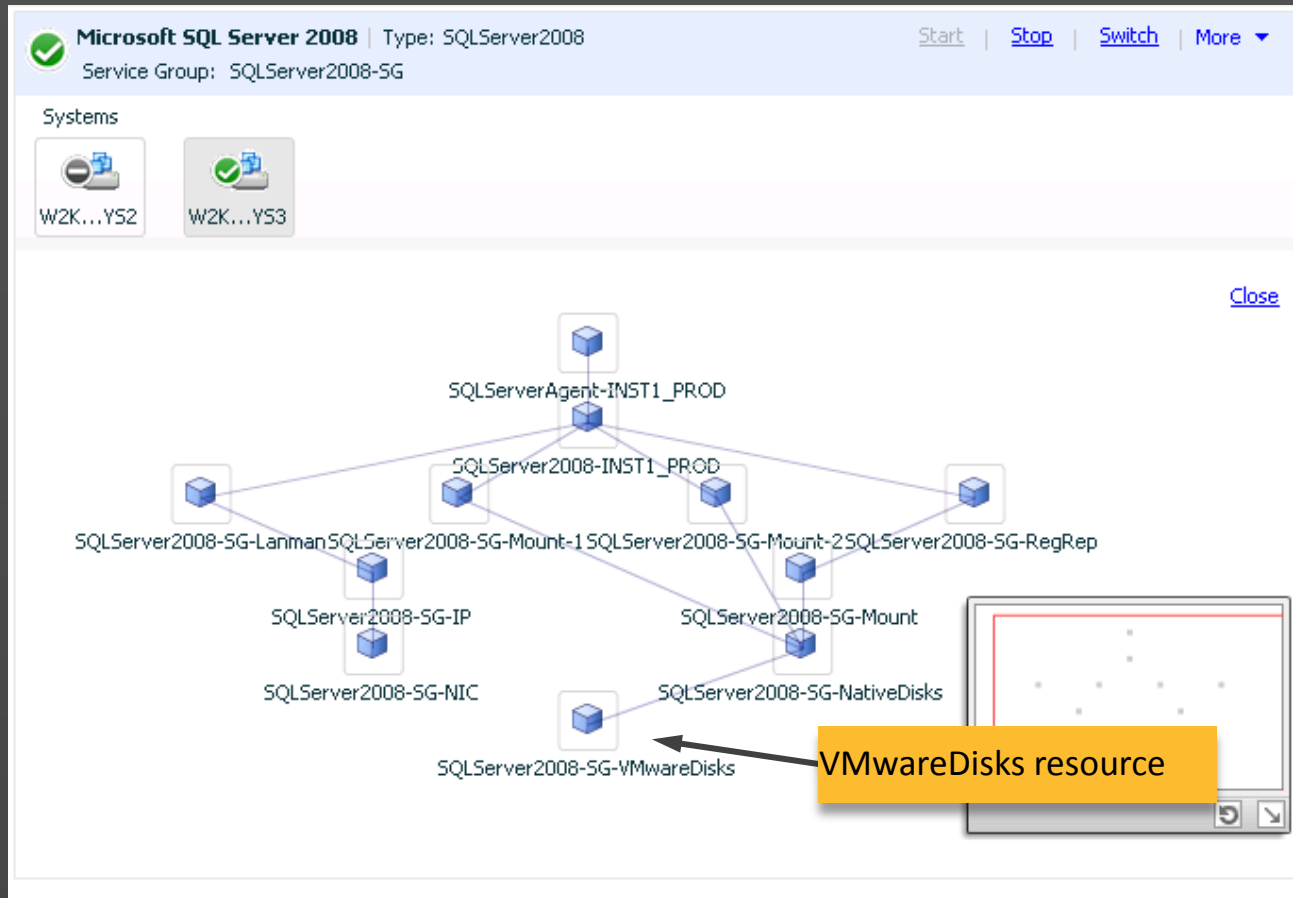
Using the VMware Hot Plug API & Veritas Cluster Server to control VM access to storage

Controlled VM access via Veritas Cluster Server

- Enable vMotion, HA & DRS etc..
- Utilize Hot Disk API for attaching disks
- Wider support of disk types available incl RDM
- Cluster controls access and has better guard against splitbrain.
- Easy transfer of operational knowledge to virtual environments.



Using the VMware Hot Plug API & Veritas Cluster Server to control VM access to storage

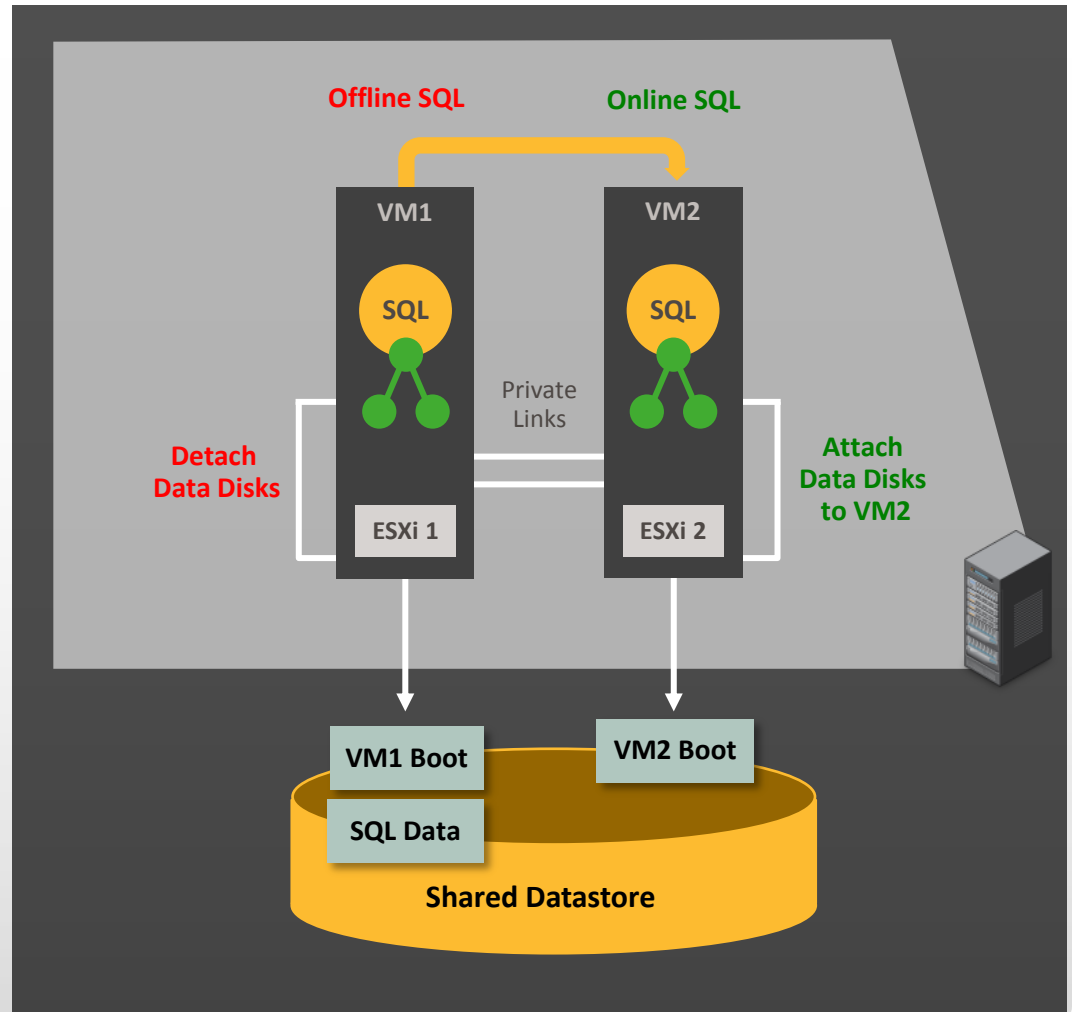


VMware Disk resource controls access to data storage from the VM

Using the power of VCS to control VM access to storage

Graceful Switchover:

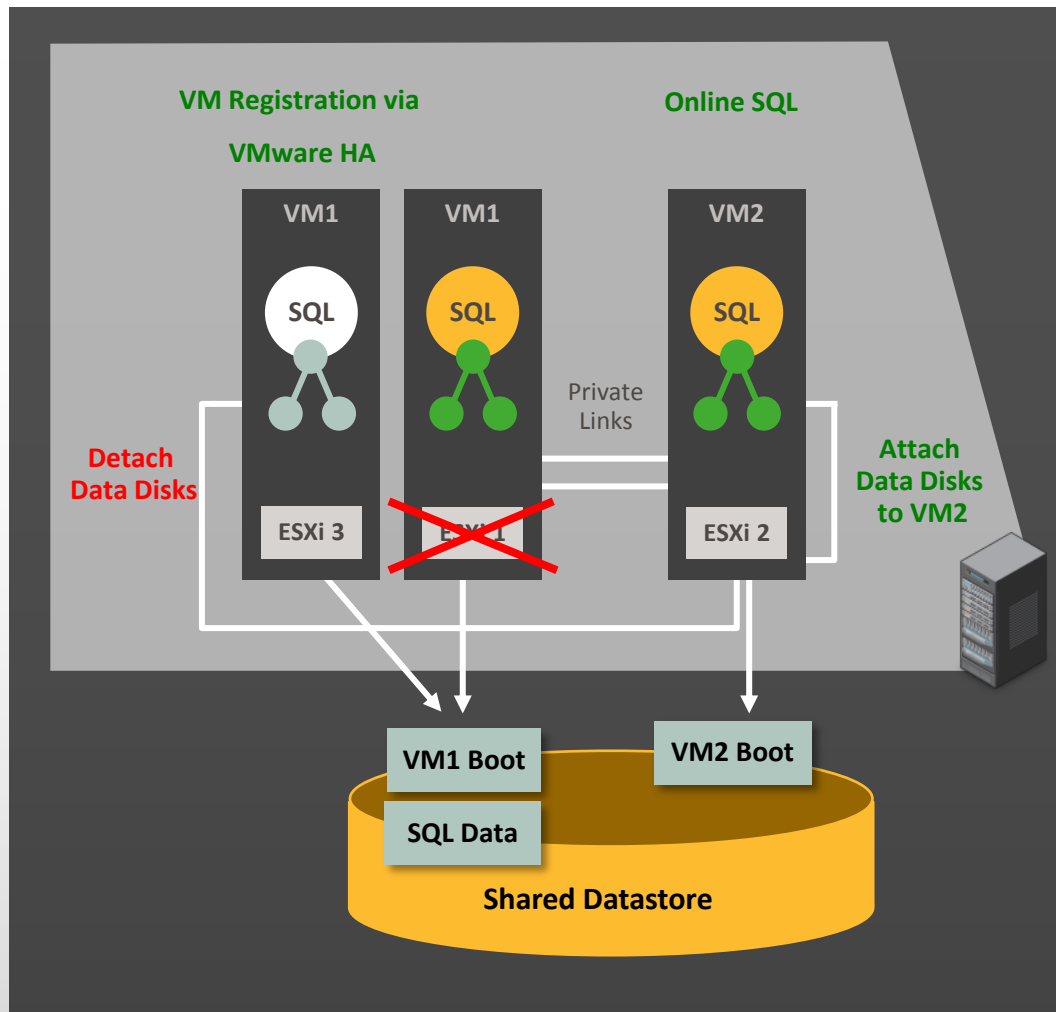
- When the application SG is switched from VM1 to VM2
 - The offline routine of VMwareDisks detaches the disks from VM1
 - The online routine on the failover target node then attaches the disks to VM2.



Operational scenarios : ESX fault (with VMHA enabled)

ESX Fault: (with VMHA enabled)

- ESX crash – SG begins to online on failover target node
- Simultaneously VMware HA registers the faulted VM to another ESXi host
- VMwareDisks online routine is VMware HA aware and waits till the faulted VM is registered.
- VMwareDisks agent fires detach disk operation against faulted VM on the new ESXi host
- The agent proceeds with online (attach disks) operation on the failover target node
- SG failover complete!



Visualize and control apps from vSphere client – screenshot

The screenshot displays the vSphere Client interface with the following components highlighted:

- VM Selected:** The left-hand inventory tree shows the VM 'W2K8-SQL-SYS2' selected and highlighted with a red box.
- Cluster Status:** The 'Cluster_18913' summary bar at the top shows '2 Applications: 1 Online | 0 Offline | 0 Partial | 0 Faulted', highlighted with a red box.
- Application Status:** The main pane shows the 'Microsoft SQL Server 2008' application status, including 'Service Group: SQLServer2008-SG' and 'Systems: W2K...YS2, W2K...YS3', highlighted with a red box.
- Component Dependency:** A dependency graph is displayed, showing the relationship between various SQL Server components like 'SQLServerAgent-INST_PROD', 'SQLServer2000-INST_PROD', and 'SQLServer2008-SG-IP', highlighted with a red box.
- Application Operation:** The 'Start | Stop | Switch | More' control buttons are highlighted with a red box.

Yellow lines connect these red boxes to five yellow callout boxes at the bottom of the screenshot, which are labeled: 'VM Selected', 'Cluster Status', 'Application Status', 'Component Dependency', and 'Application Operation'.

Dashboard for visualizing application status and controlling applications

WINVCS.window.local - vSphere Client

SYMC-PROD-CLUS

Symantec High Availability Dashboard

ESX Clusters: 1 | Applications: 3 | Faulted: 0 | Partial: 0 | Online: 3 | Offline: 0

Configured Application from: SYMC-PROD-CLUS

Application	Service Groups	Status	Systems	Alerts and Description
Application A Console	ApplicationHA_Console	Online	1	...
Custom Application	GeneralApplication_SG	Offline	2	...
Microsoft SQL Server 2008	SQLServer2008-SG	Online	2	...
VMware vCenter Server	vCenterServer_SG	Online	1	...

Data Center Level

Batch Operations

Aggregated Statistics

Node Membership

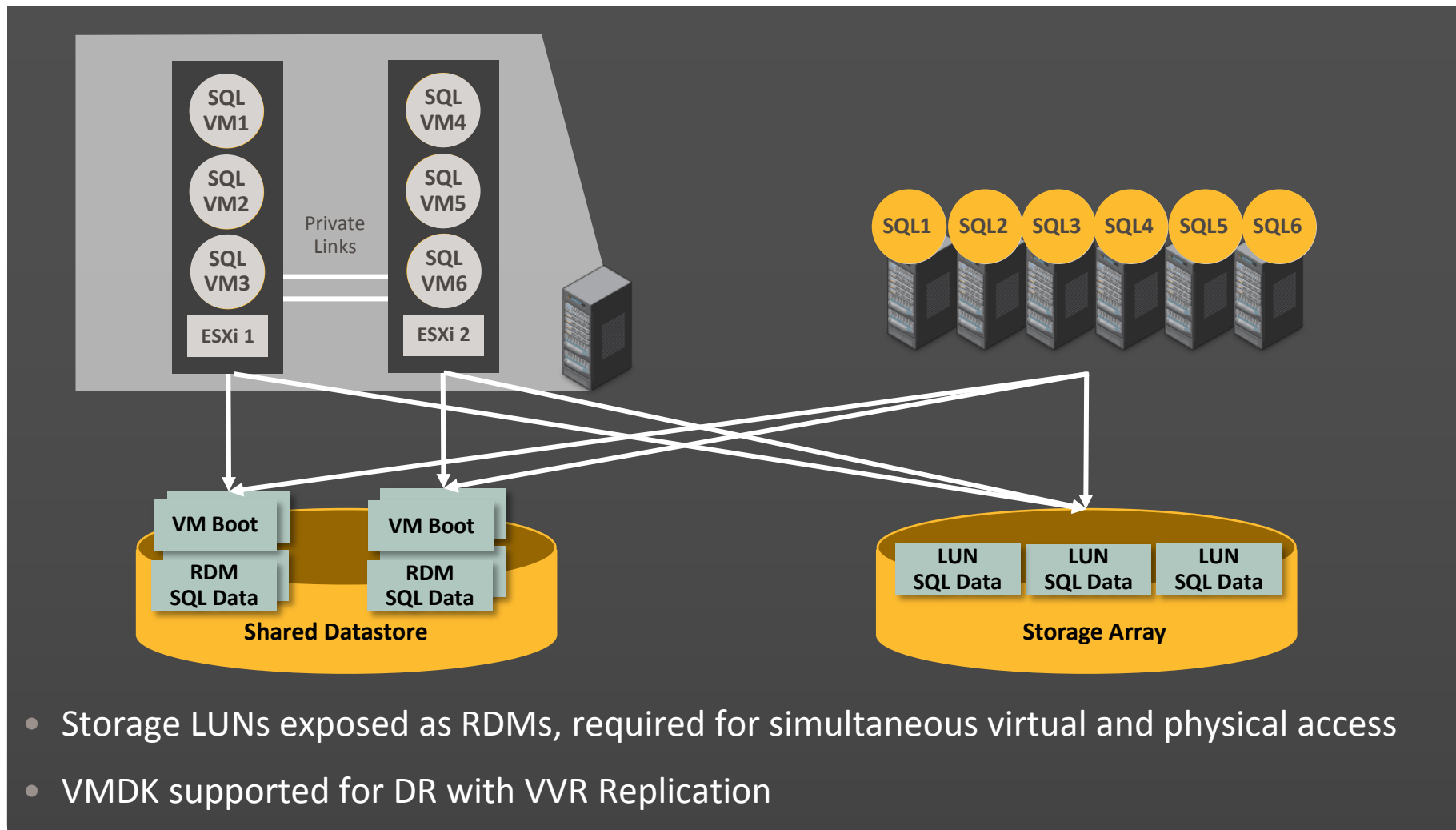
Dashboard also available on cluster level.

Disaster Recovery from server hardware & app failures

with [Symantec Cluster Server](#) + Replication

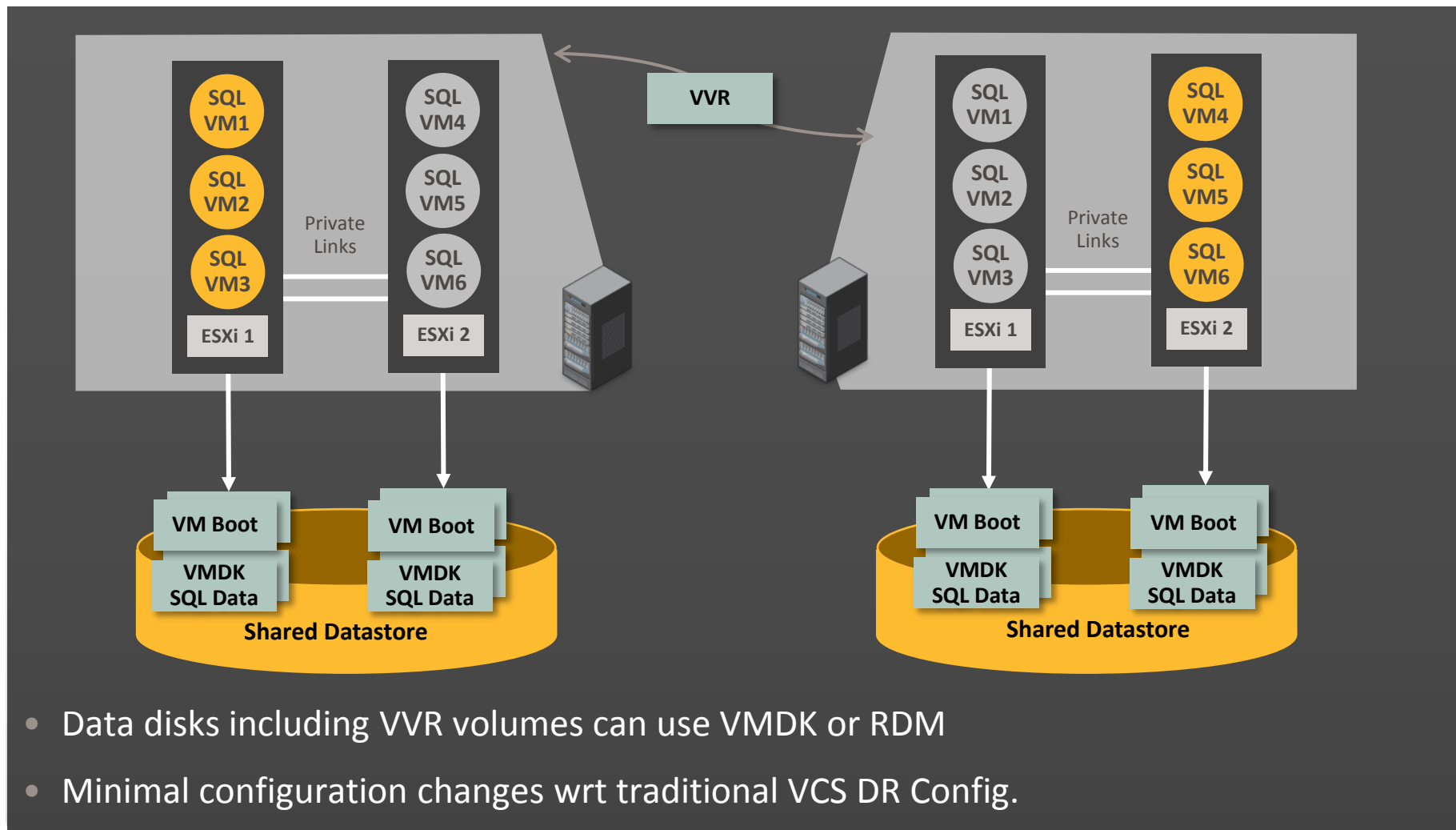
Advanced configurations

Physical to virtual clusters - campus or DR



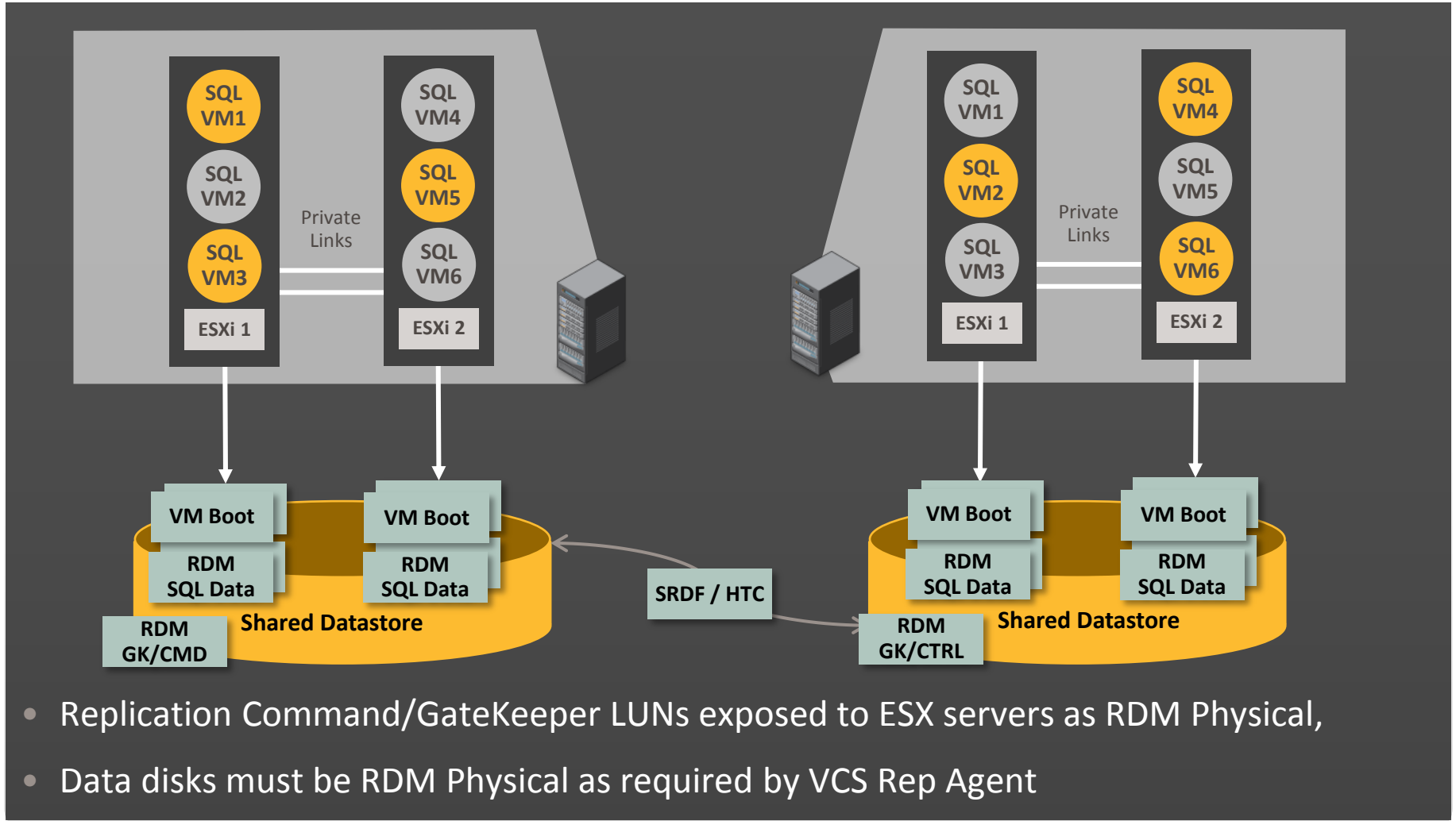
Advanced configurations

DR clusters with VVR replication



Advanced configurations

DR clusters with hardware replication (HTC/SRDF)



- Replication Command/GateKeeper LUNs exposed to ESX servers as RDM Physical,
- Data disks must be RDM Physical as required by VCS Rep Agent

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Enabling Enterprise HA/DR with Microsoft Hyper-V

Is VMware really losing market share to the growing competition?



Growing competition for VMware in the virtualization market space



Hypervisor War

Microsoft continues Hyper-V growth, catching up to VMware

Virtualization Wars: VMware vs. Hyper-V: Which is Right For Your Virtual Environment?



Windows Server
Hyper-V

Native Technology

SMB 3.0 brings enterprise-class storage to Hyper-V deployments

Windows Storage Spaces and ReFS: Is it time to ditch RAID for good?



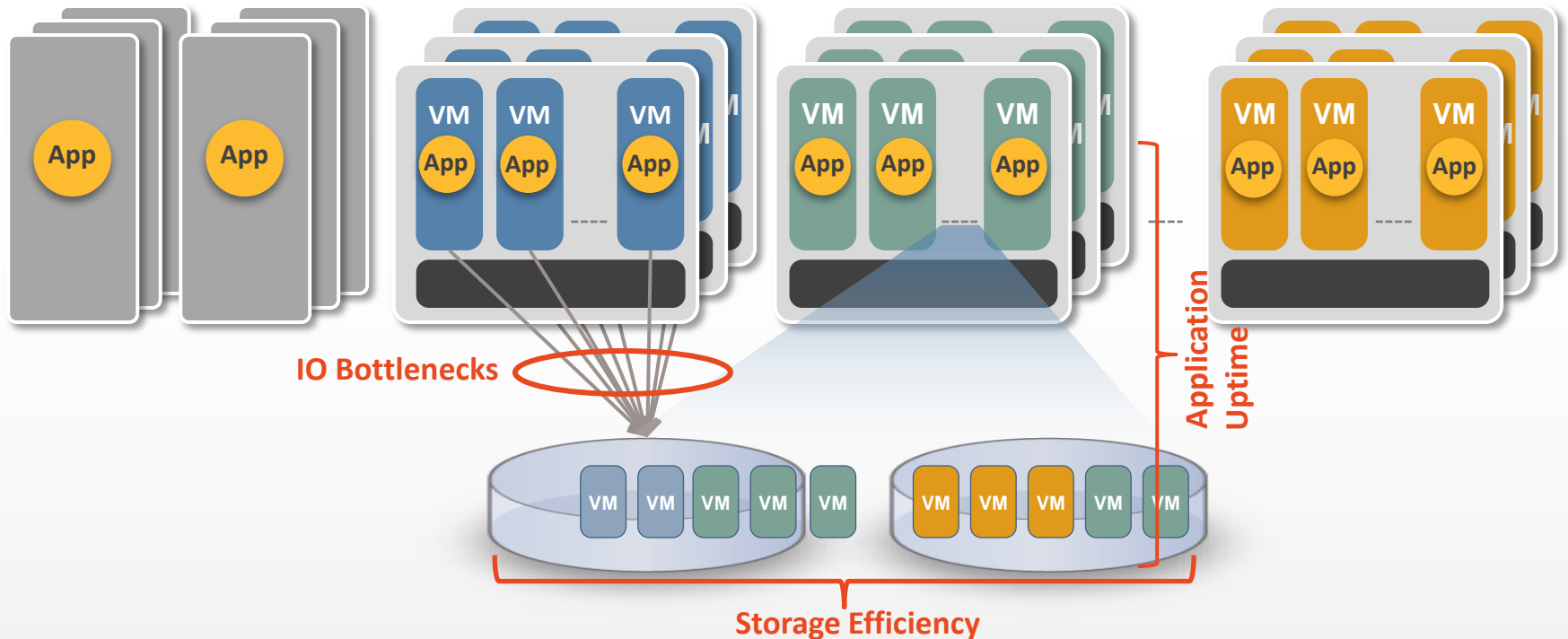
Incumbents & Startups

EMC XtremeSF: Delivering Next Generation Storage Performance for SQL Server

Running SQL Server on all-flash crushes storage latency, enabling 3-5x better transactional throughput and dramatically simplifies operations

PureStorage

Challenges in Windows Hyper-V Environments



- Increasing VM (& app) consolidation ratio
- Storage growth, Increasing LUN sizes
- Create, delete, migrate of VMs & storage
- Maximize Application Availability

Storage Pooling

Cost-effective VM/application centric storage management

I/O Performance

Leverage Flash and improve latency and throughput in physical/virtual

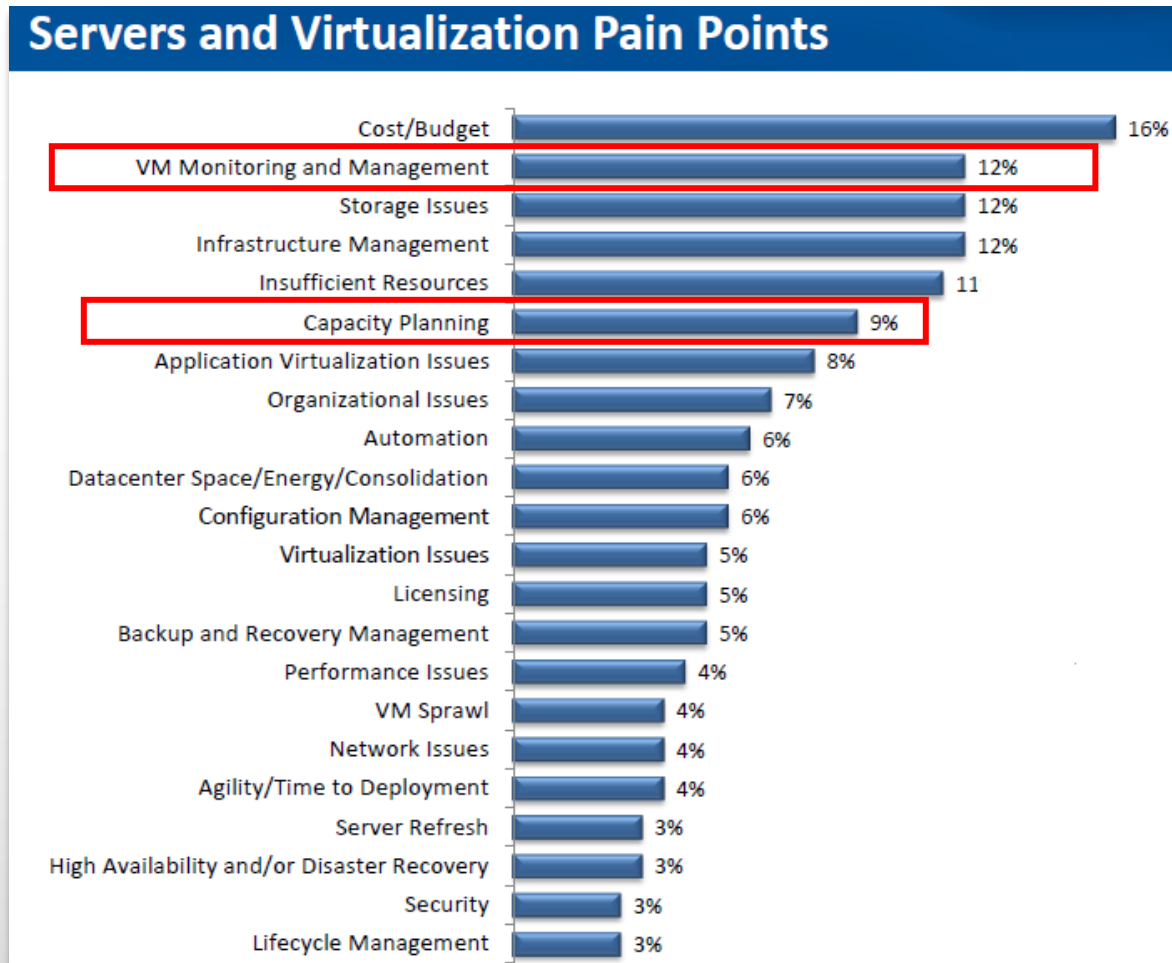
Application uptime

Maximize Application uptime

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Enterprise Availability for Hyper-V with Symantec

Application availability a key requirement for virtualization of critical apps



451 Research TheInfoPro – Servers and Virtualization Wave 13, October 2013

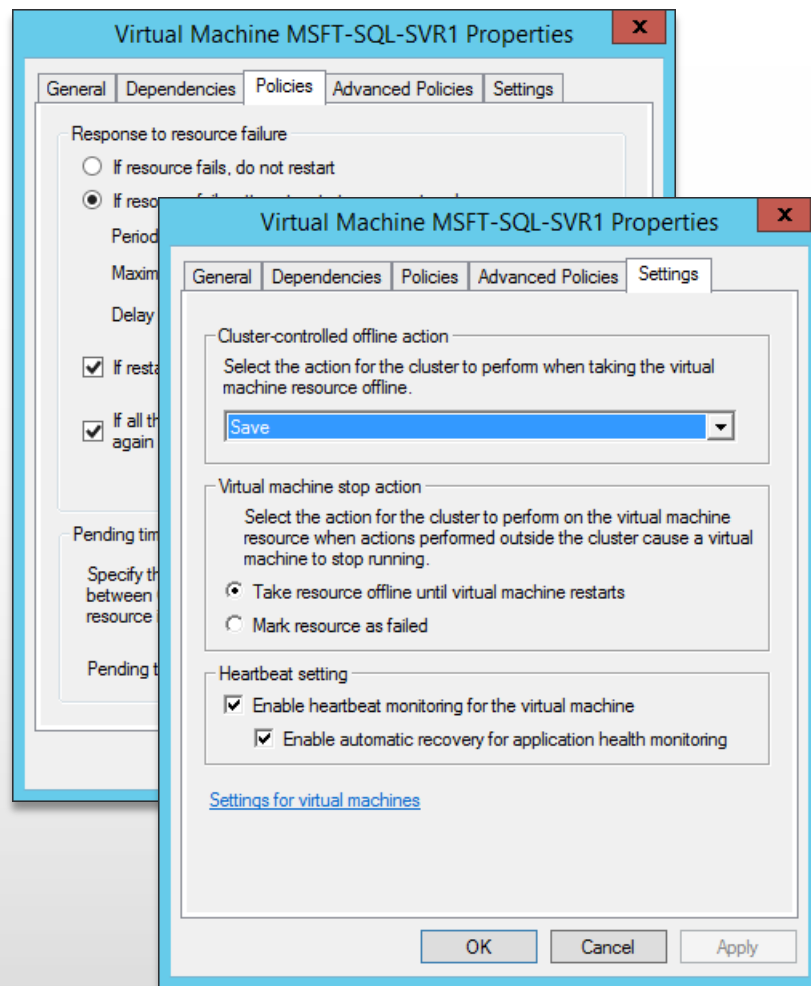
VM Monitoring in Windows Server 2012

Overview

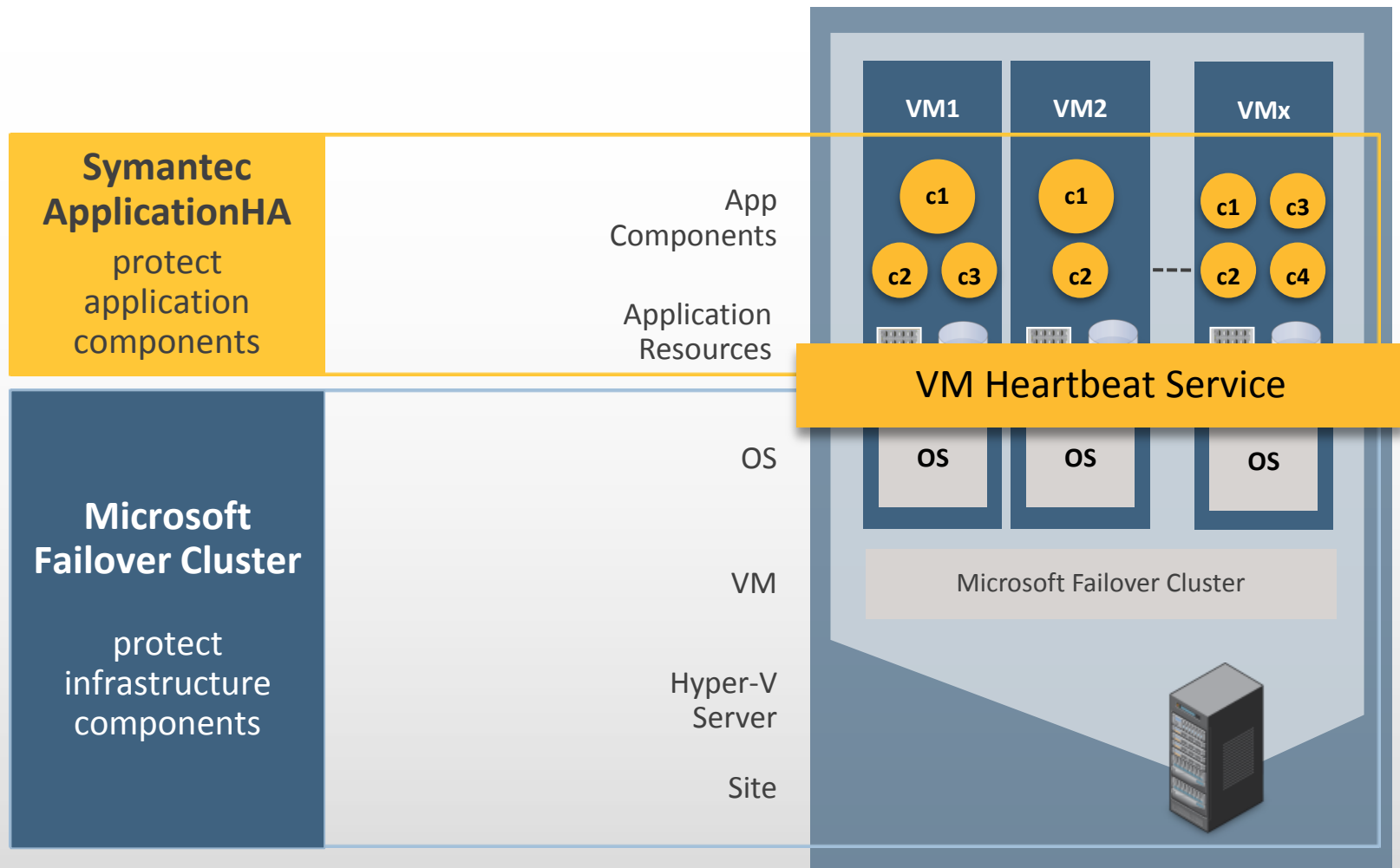
- *Application Health detection inside virtual machine*
- *Cluster service in host takes remedial action*
- *Independent of Guest Clustering*
 - No need for clustering in guest
- *Windows Server 2012 Required*
 - As both host and guest OS
 - Windows Server 2012 Hyper-V integration services on guest
 - Installed by default

Coordinated recovery with Hyper-V Role and Microsoft Failover Cluster – details

- *Coordinated handoff to Failover Cluster Resource Policies*
 - VM level recovery and failover for resource faults.
 - Granular level settings per VM
- *Utilizing Microsoft Heartbeat service within Failover Cluster*
 - Leverage heartbeat service for communication of faulted applications.
 - Can be enabled and disabled from within ApplicationHA for maintenance of application.

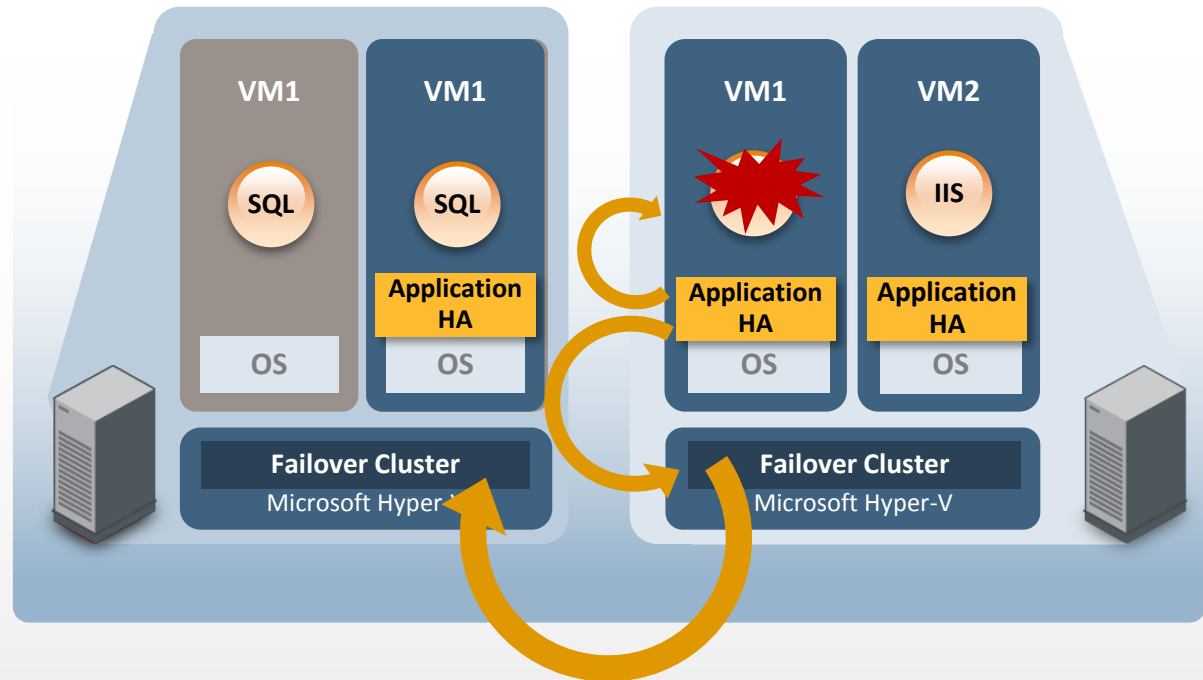


Providing application resilience with Microsoft FOC and Symantec ApplicationHA



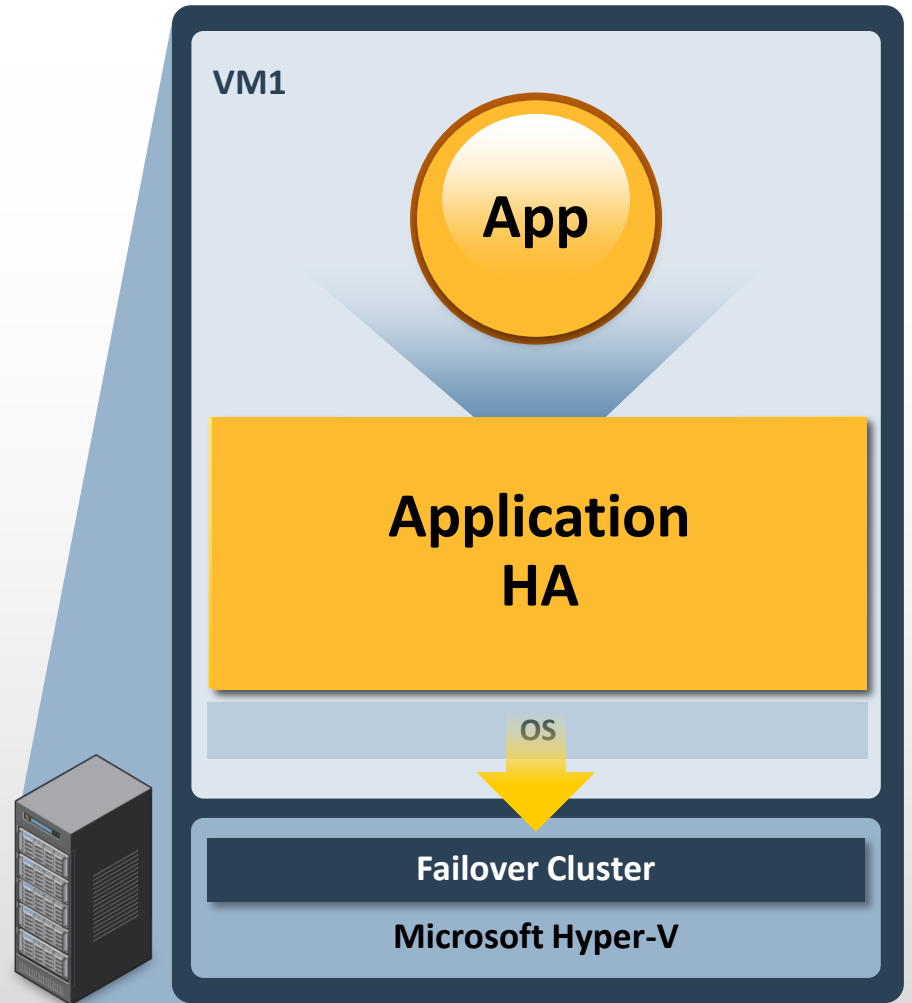
Coordinated recovery between ApplicationHA and Microsoft Failover Cluster

- App monitoring
 - Show health status
 - Detect app failures
- Coordinated recovery
 - Restart applications
 - Trigger Failover Cluster for further recovery
 - Integration via VM Heartbeat Service
- Protects against wide range of failures
 - Infrastructure failures
 - VM is up but app is down
 - VM recovers after a server failure but app doesn't
 - App is up but not functional



Coordinated recovery between ApplicationHA and Failover Cluster – details

- Deep understanding of the apps
 - App specific modules start, stop, recover apps
 - Eg: SQL DB instances, FileStream, Analysis, Storage mount points, dependencies
 - Functional testing based on SQL queries
- Customizable recovery behavior
 - App or VM restart limit
 - In-guest remediation only - Enable/Disable App Heartbeat
 - Turn off remediation during planned maintenance - Enter/Exit Maintenance mode



Coordinated recovery between ApplicationHA and Microsoft Failover Cluster – details

- Simple Application Configuration Wizards
 - Deployed from web browser or from Veritas Operations Manager

The screenshot displays the Symantec ApplicationHA Configuration Wizard in Google Chrome, showing four sequential steps:

- Welcome:** Introduction to the wizard and prerequisites.
- Application Selection:** A search bar and a list of supported applications. "Microsoft SQL Server 2012" is selected.
- SQL Instance Selection:** A table with a checked checkbox and "MSSQLSERVER" selected.
- Application Monitoring Configuration:** A table showing completed tasks.

Task	Status
Initialize application monitoring configur	Completed
Configure application monitoring	Completed
Enable application heartbeat	Completed

Navigation buttons: "View Logs" and "Next >" are visible at the bottom of each step.

Visualize and control apps from web browser - Screenshot

The screenshot displays the Application Health web interface for Microsoft SQL Server 2012. The browser address bar shows the URL `https://localhost:5634/vcs/admin/application_health.html?priv=ADMIN`. The page title is "Applications: Microsoft SQL Server 2012" and the status is "Online". A refresh rate of 60 seconds is indicated. The interface includes a "Component List" tab with the following items:

- ✓ The [SQLSERVERAGENT] service is running.
- ✓ The [MSSQLServerOLAPService] service is running.
- ✓ Microsoft SQL Server 2012 instance [MSSQLSERVER] is running.
- ✓ The mount [C:] is accessible.

Four callout boxes highlight key features:

- Application Status:** Points to the application name and status.
- Application Operation:** Points to the list of control actions such as "Configure Application Monitoring", "Unconfigure Application Monitoring", "Enable Application Heartbeat", "Disable Application Heartbeat", "Start Application", "Stop Application", "Enter Maintenance Mode", and "Exit Maintenance Mode".
- Detailed Monitoring:** Points to the "Component List" and "Component Dependency" tabs.
- Application Settings:** Points to the "Refresh", "Settings", and "Licenses" links.

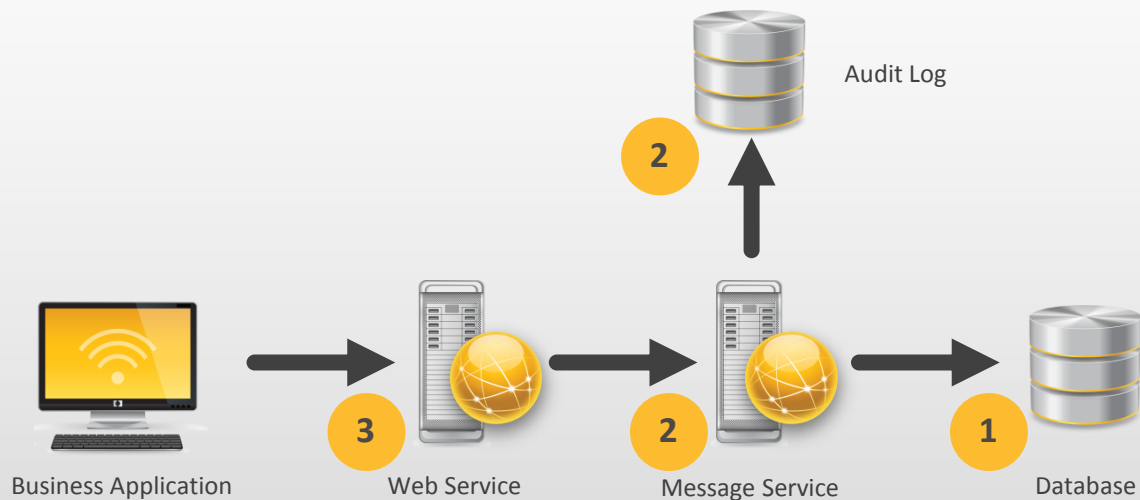
At the bottom of the interface, the version "ApplicationHA (Version 6.1.00000.283)" and the Symantec logo are visible, along with a "View log" link.

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Orchestrating application resilience for vSphere & Hyper-V with Symantec Virtual Business Service

Applications working together drives your business!

- Coordination between application tiers drives the business service for its organizations and for its customers
 - Reduce operational headaches
 - Orchestrated start/stop order.
 - Auto Fault remediation to reduce siloed management headaches.



Should it take hours to recover from a failed service?

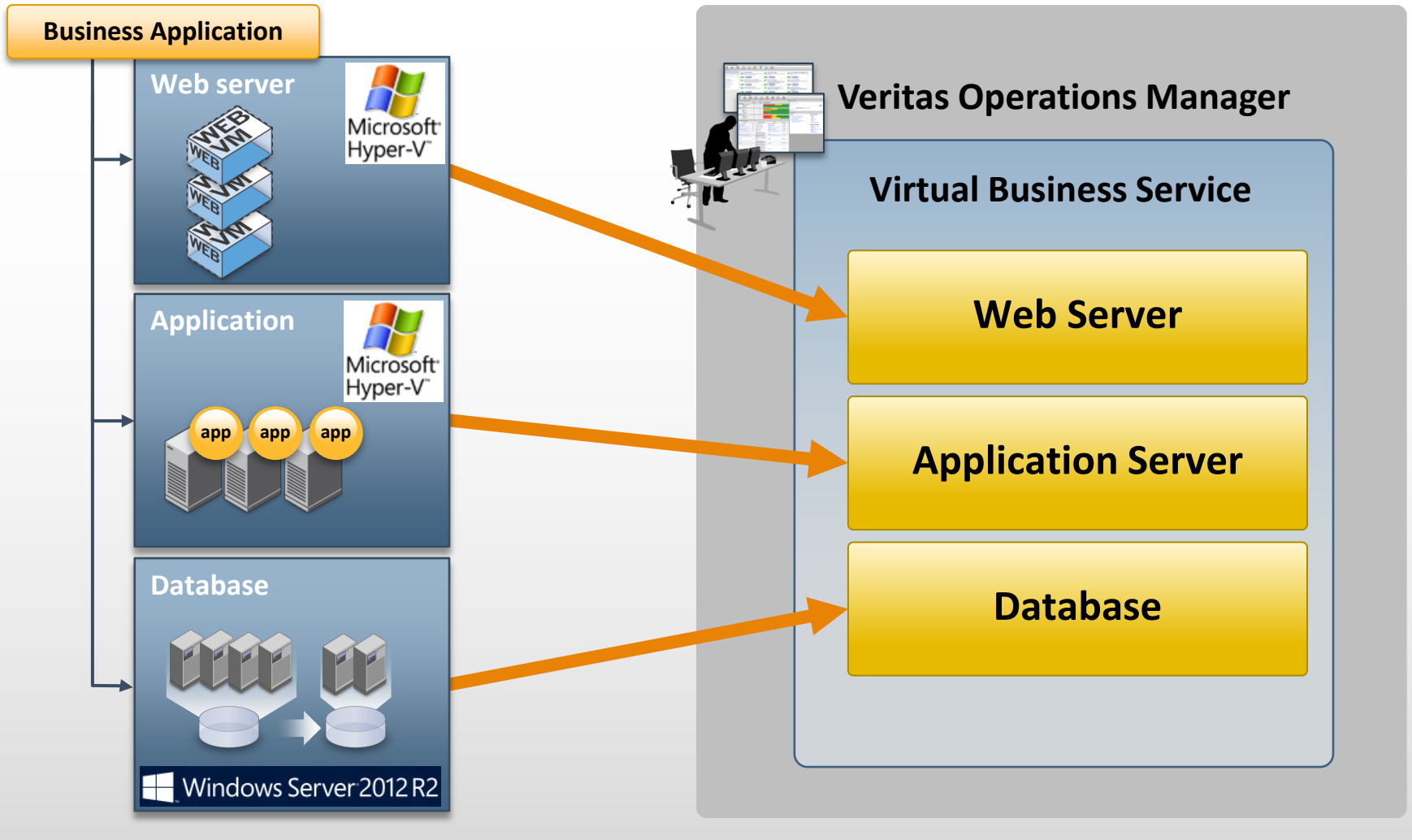
Limited automation with different protection tools for each tier

```
00:00 Database faces an outage, automatically recovered on standby node
00:01 Service fails, customers lose access to balance enquiry website
00:05 Monitoring software detects outage, creates ticket
00:10 Help desk starts processing ticket, finds service owner
00:20 Service owner starts troubleshooting: are web servers OK?
00:30 Locate the virtualization admin: troubleshoot VM layer
00:45 Virtualization admin: Web Servers OK, not my problem, check DB
00:50 Look up dependencies, service is using CustomerInfo database
01:00 Pull up the DBA: Is the database working OK?
01:15 DBA: DB all clear, my databases are all well protected!
01:30 Continue troubleshooting: DB OK, Web OK, is BusinessLogic App OK?
01:40 BusinessLogic Application not touched in ages, what's the password?
02:00 Oh no, the Application is pointing to the failed DB server ...
02:10 Reset the Application to point to the active DB server
02:15 Check if website is accessible ... Yes? You're sure? PHEW!
```

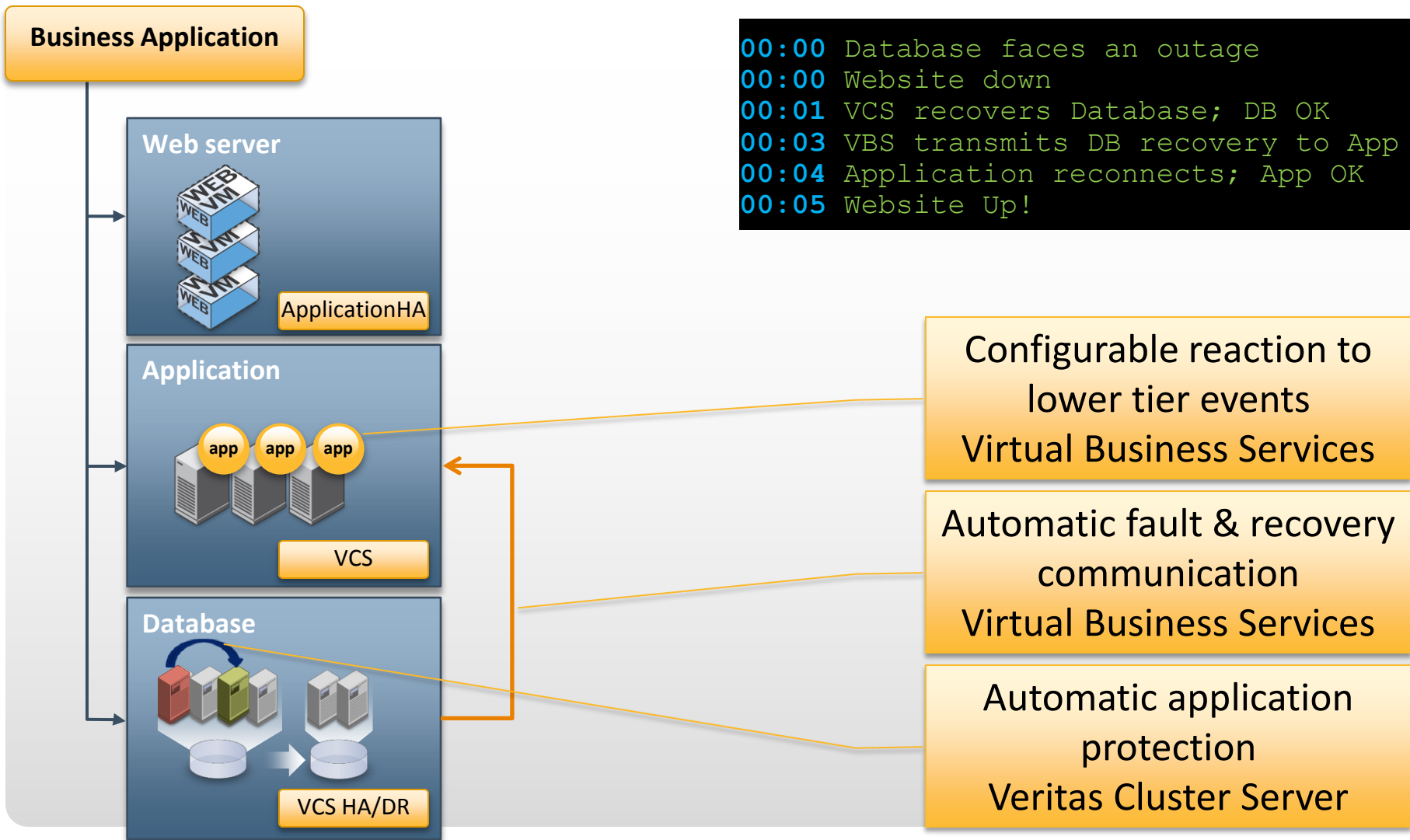


Virtual Business Service

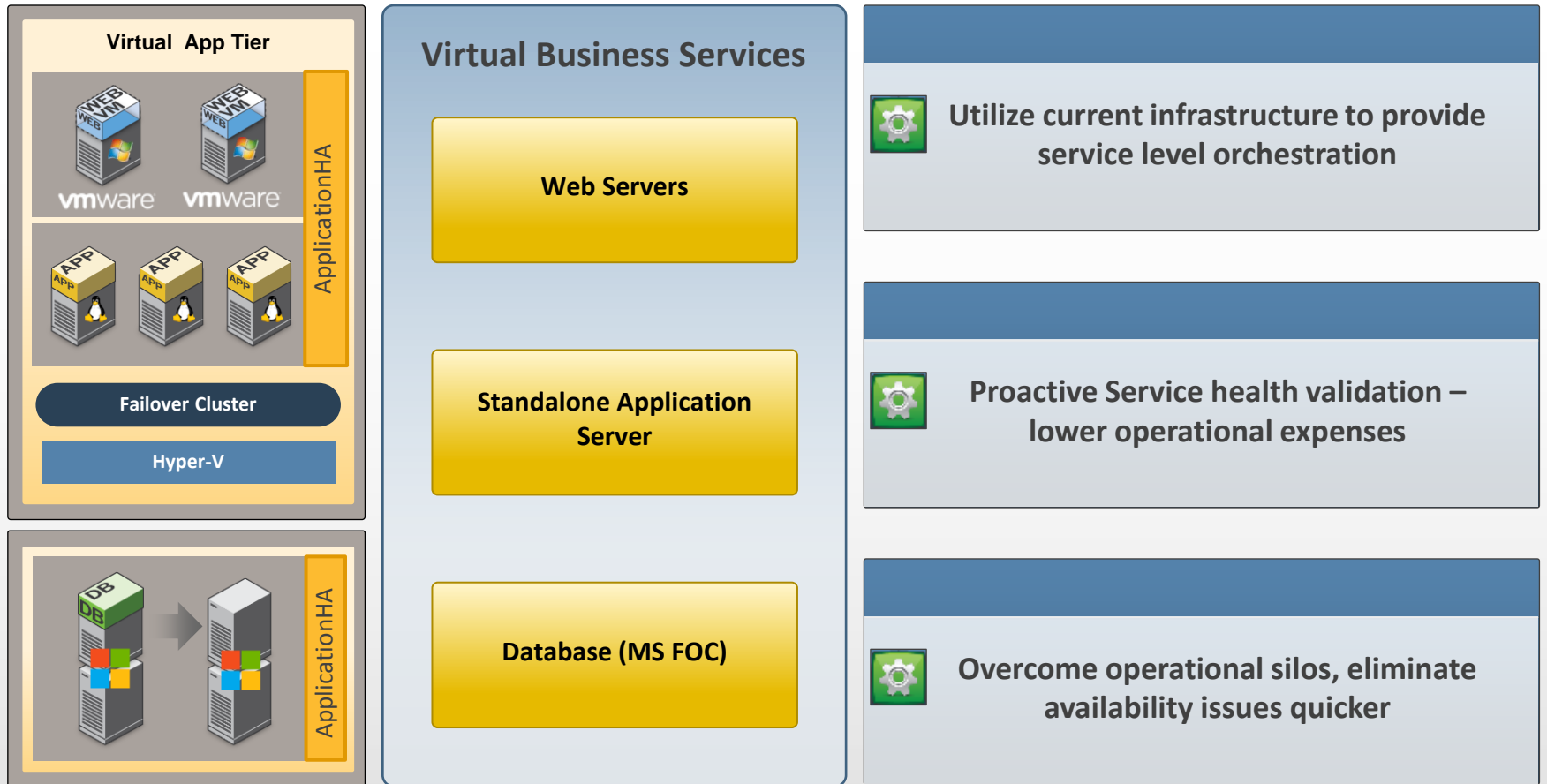
Single logical entity for the multi-tier application



Always-on automatic multi-tier protection with Virtual Business Services



Introducing Virtual Business Services for Microsoft Failover Cluster



VBS 3-party support is licensed via ApplicationHA. The feature is installed from the VBS 3-party support package, which is available on the ApplicationHA media.

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Making Hyper-V Enterprise Ready with Symantec

Building Enterprise Class Hyper-V Solutions with Symantec Storage Foundation High Availability for Windows 6.1 :

Accelerated Critical App Virtualization for VMware

Symantec Cluster Server for VMware

- Reduces recovery times by eliminating VM reboots
- Enables physical to virtual failover
- Reduces planned downtime for OS patches
- Fast configuration and can be managed with vCenter

Enterprise Availability for Hyper-V

ApplicationHA for Hyper-V

- App Health status
- Auto-discovery of application configuration.
- Application fault remediation
- Custom application support
- Simplified application configuration and management.

Ensure Business Availability Orchestration

Virtual Business Service for Virtual & Physical

- Eliminate availability issues quicker
- Proactive health validation
- Utilize infrastructure to provide service level orchestration
- Overcome operational silos

Total Customer Experience (TCE) & Manageability

Seamless Integration into the Ecosystems

VMware

- Leverage VMwareHA, DRS, vMotion & SRM
- Flexible storage choices wrt clustering applications

Hyper-V

- Failover Cluster aware storage pooling
- Integrated with native management workflows (FoC Mgr, SCVMM, Hyper-v Mgr, Server Mgr)

- Supporting all native Hyper-V VM capabilities (e.g. Live/Quick Migration)

Windows Server 2012 & R2 Support

- Co-existence across Symantec storage management, HA/DR
- Hyper-V Virtual Fibre Channel support

What questions do you have?



Technical: Business Critical Virtualization



Thank you!

Please take a few minutes to fill out the short session survey available on the mobile app—the survey will be available in the mobile app shortly after the session ends. And then watch for and complete the more extensive post-event survey that will arrive via email a few days after the conference.

To download the app, go to <https://vision2014.quickmobile.com> or search for Vision 2014 in the iTunes or Android stores.