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

**Lorenzo Galelli**
Sr. Principal Technical Product Manager
Virtualization Solutions
Symantec

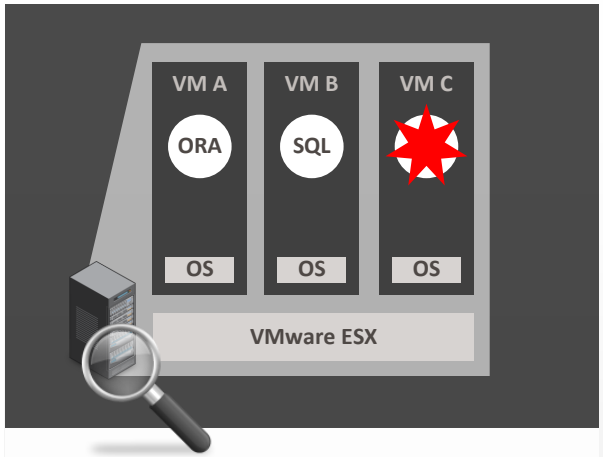
**Nick Kenny**
Principal Technical Specialist
Storage & Availability Solutions
Symantec

vision

# Application Resilience for vSphere with Symantec Cluster Server (VCS)

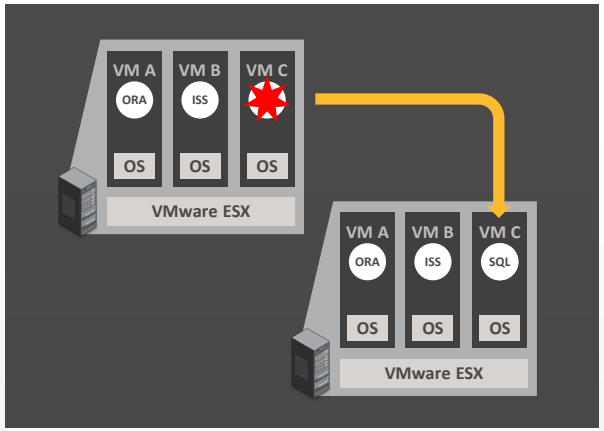
# Virtualization brings challenges for visibility and availability of applications

## Application Control & Visibility



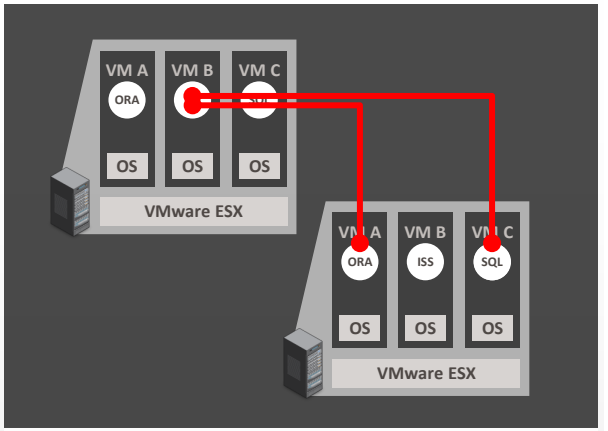

- Application view and health status from vCenter
- OS and application recovery

## Application Recovery




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

## Multi-tier Application Management




- Application relationship management
- Physical and virtual environment

**Monitoring tools providing information only!**

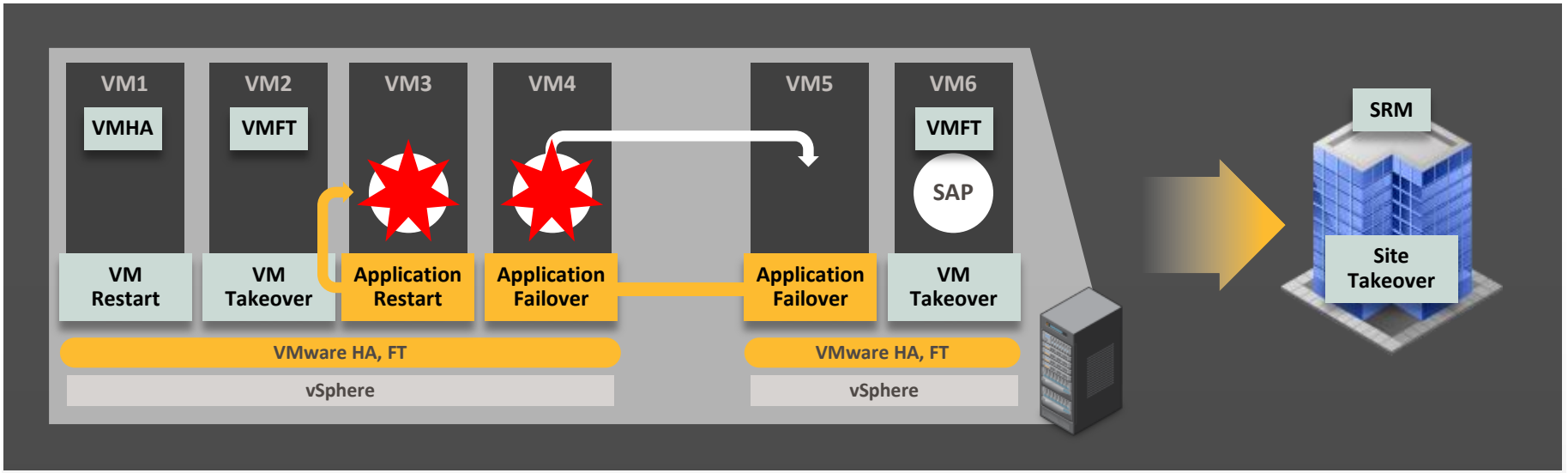
**Siloed approach for physical and virtual**

**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)

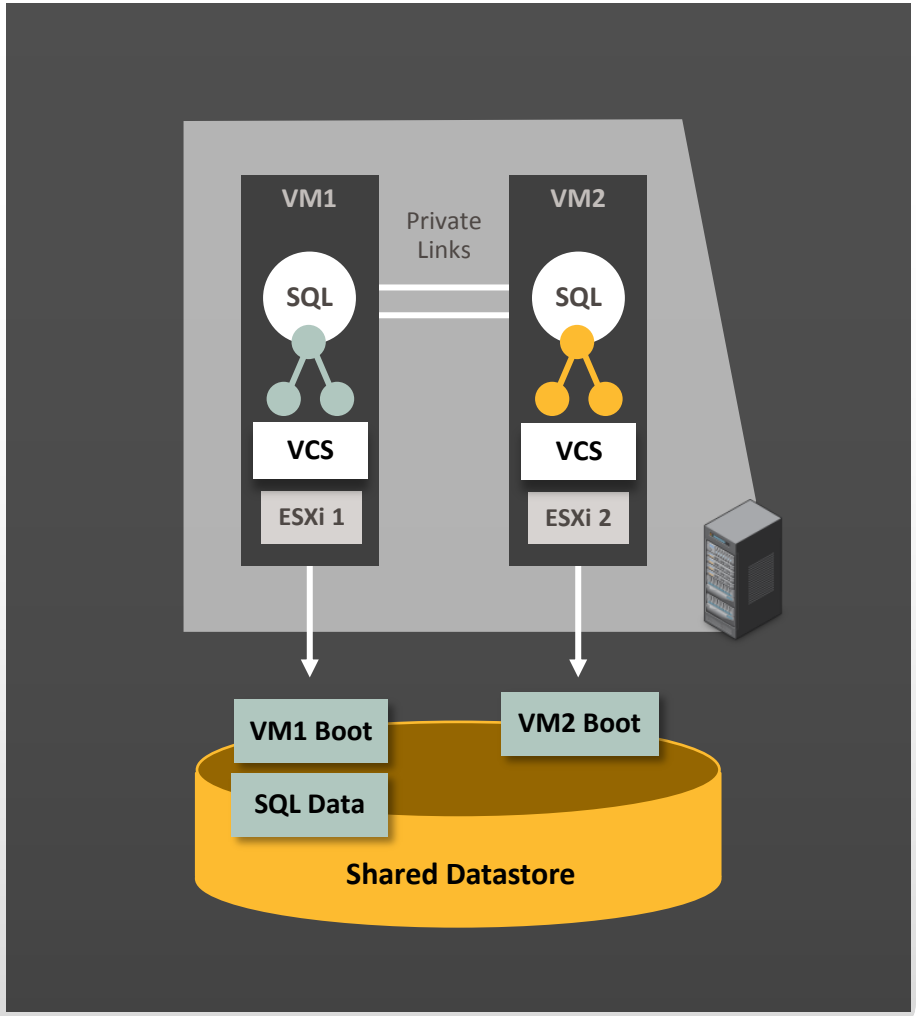
# Recover from VM corruption & logical failures

## with Symantec Cluster Server + VMware HA

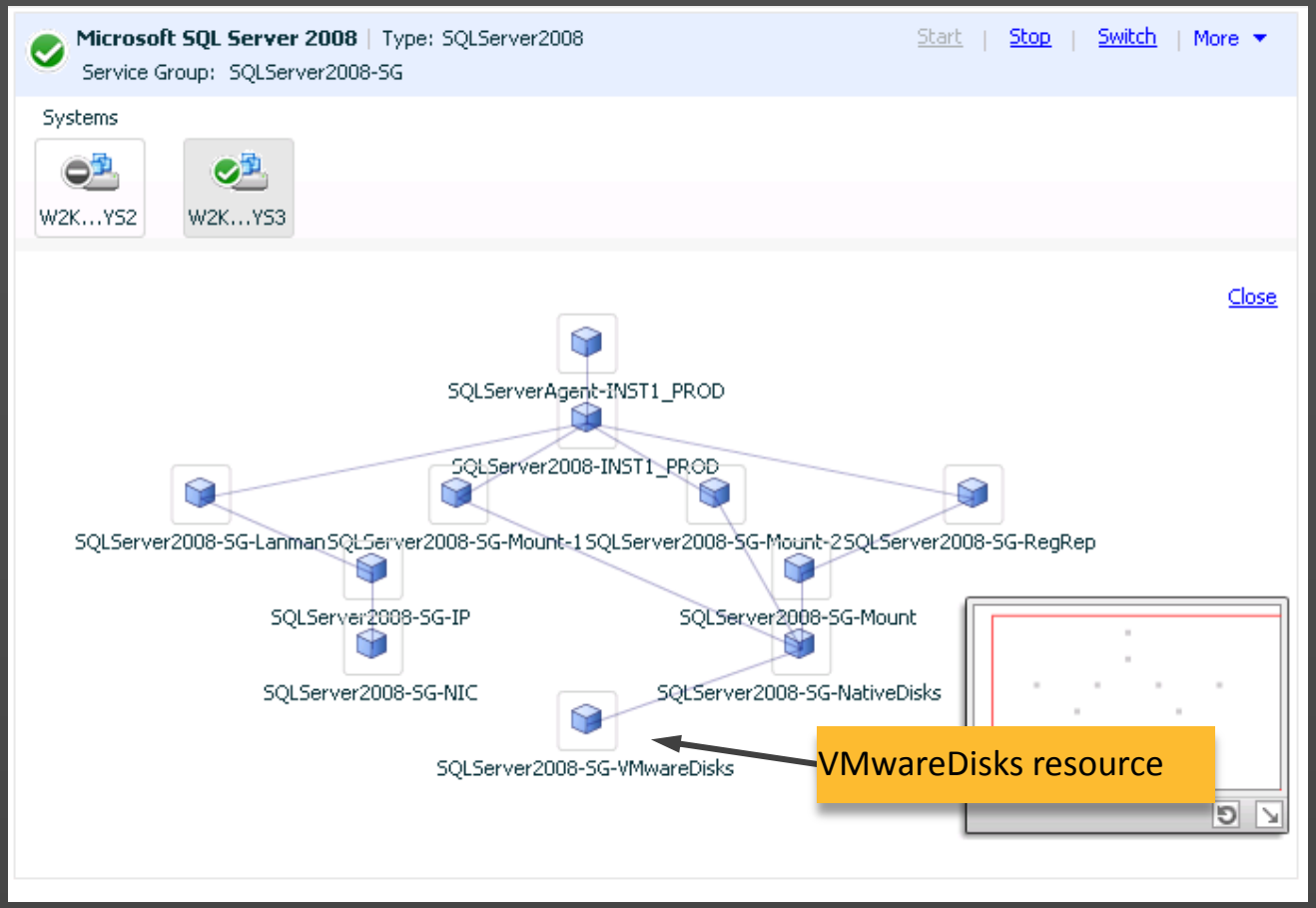
# Using the VMware Hot Plug API & Veritas Cluster Server to control VM access to storage

## 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

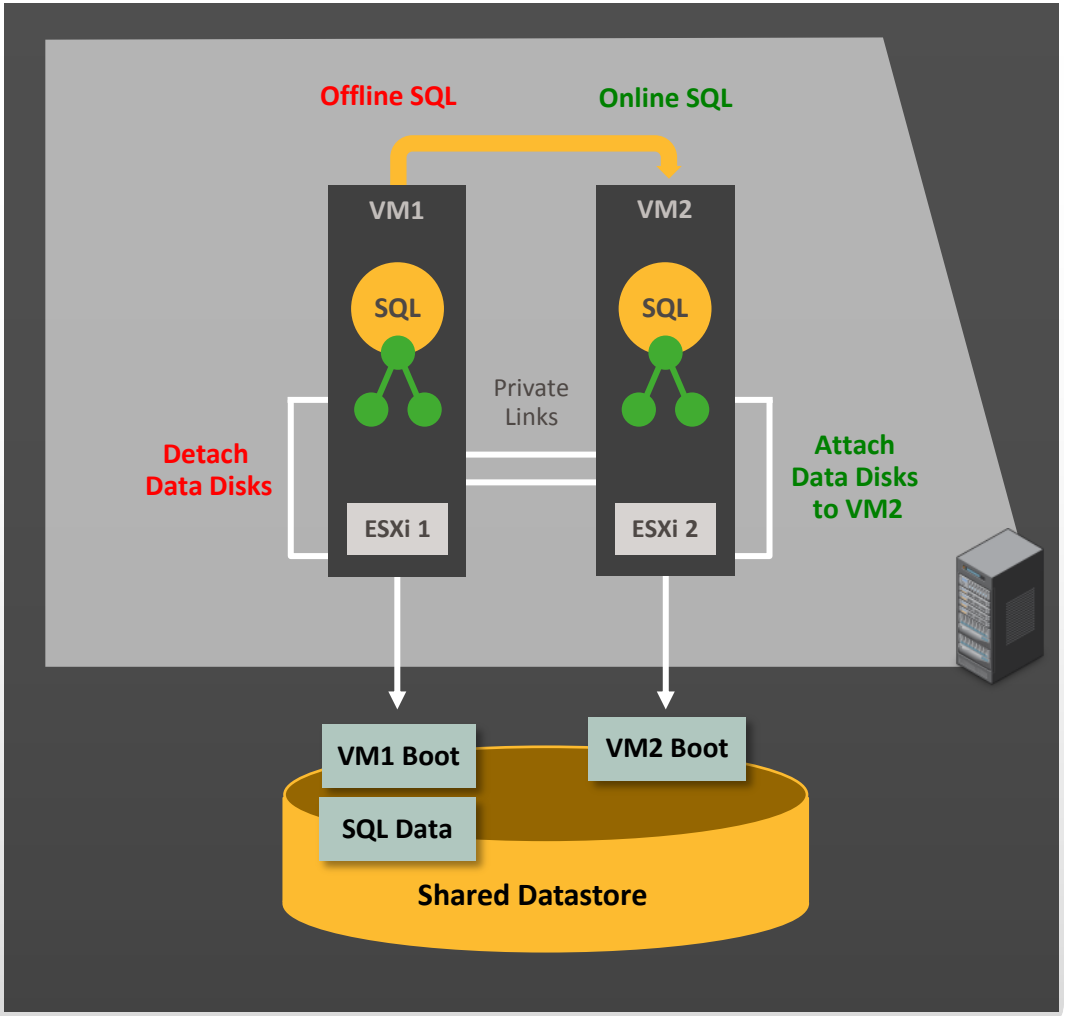



VMware Disk resource controls access to data storage from the VM

# Using the power of VCS to control VM access to storage

## Graceful Switchover:

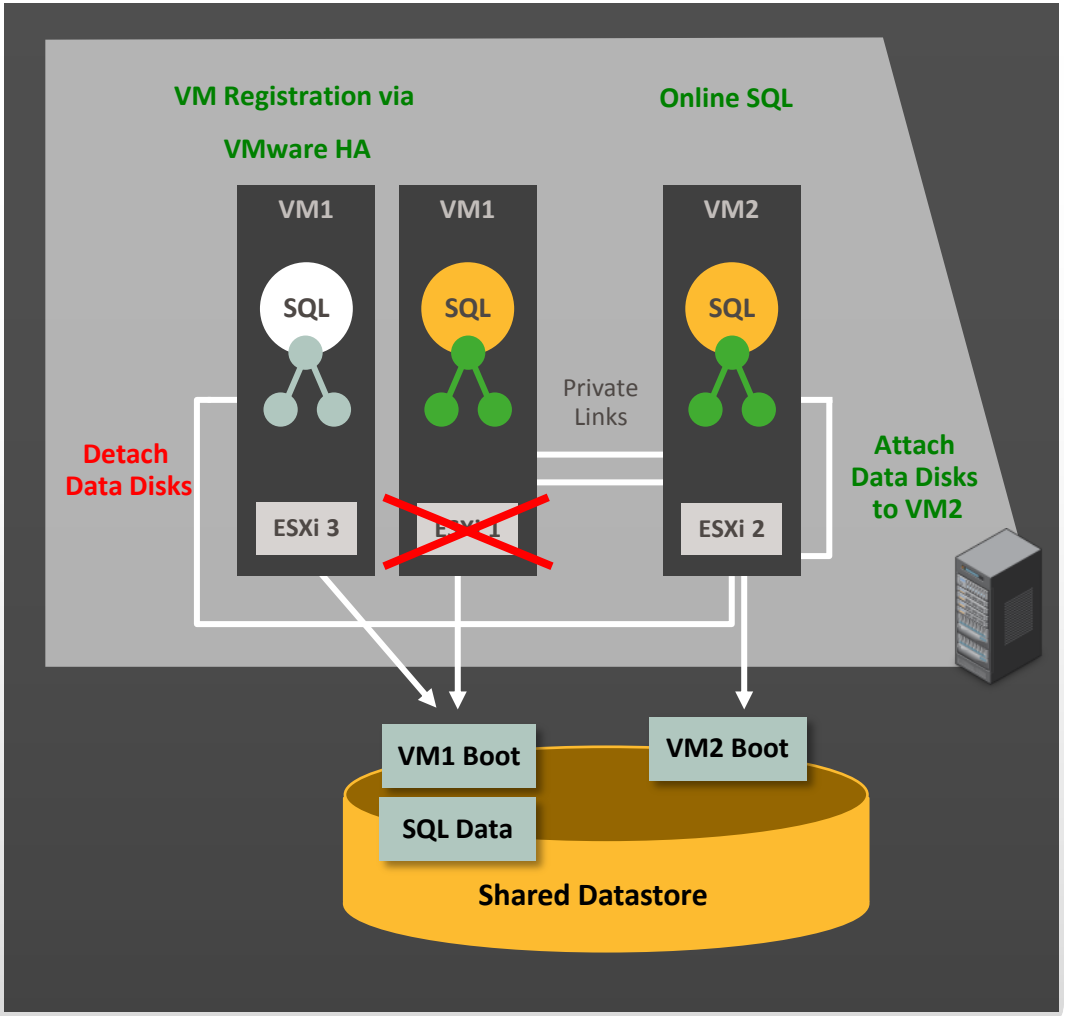
- When the application SG is switched from VM1 to VM2
  - The offline routine of VMwareDisks detaches the disks from VM1
  - The online routine on the failover target node then attaches the disks to VM2.



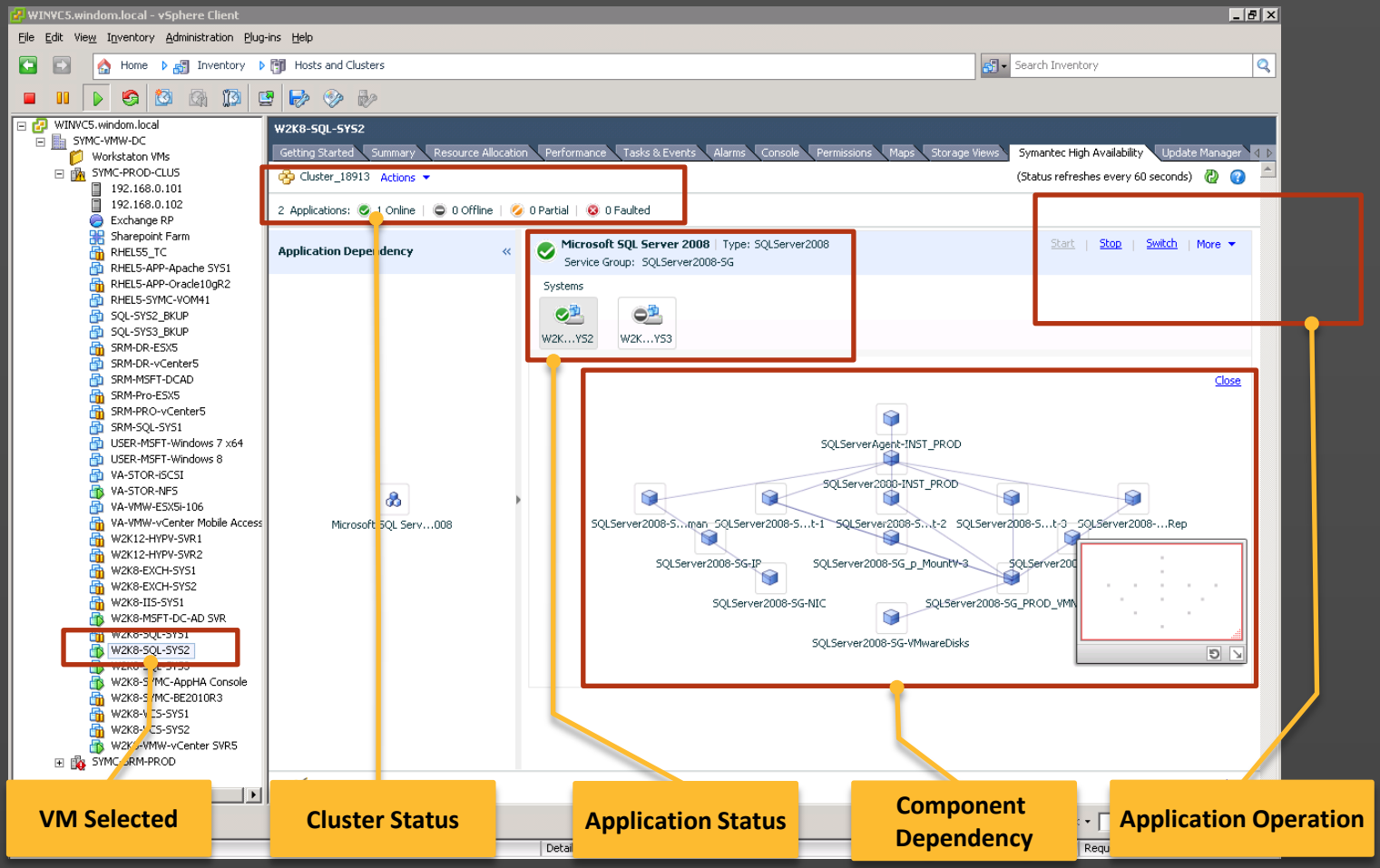
# Operational scenarios : ESX fault (with VMHA enabled)

## ESX Fault: (with VMHA enabled)

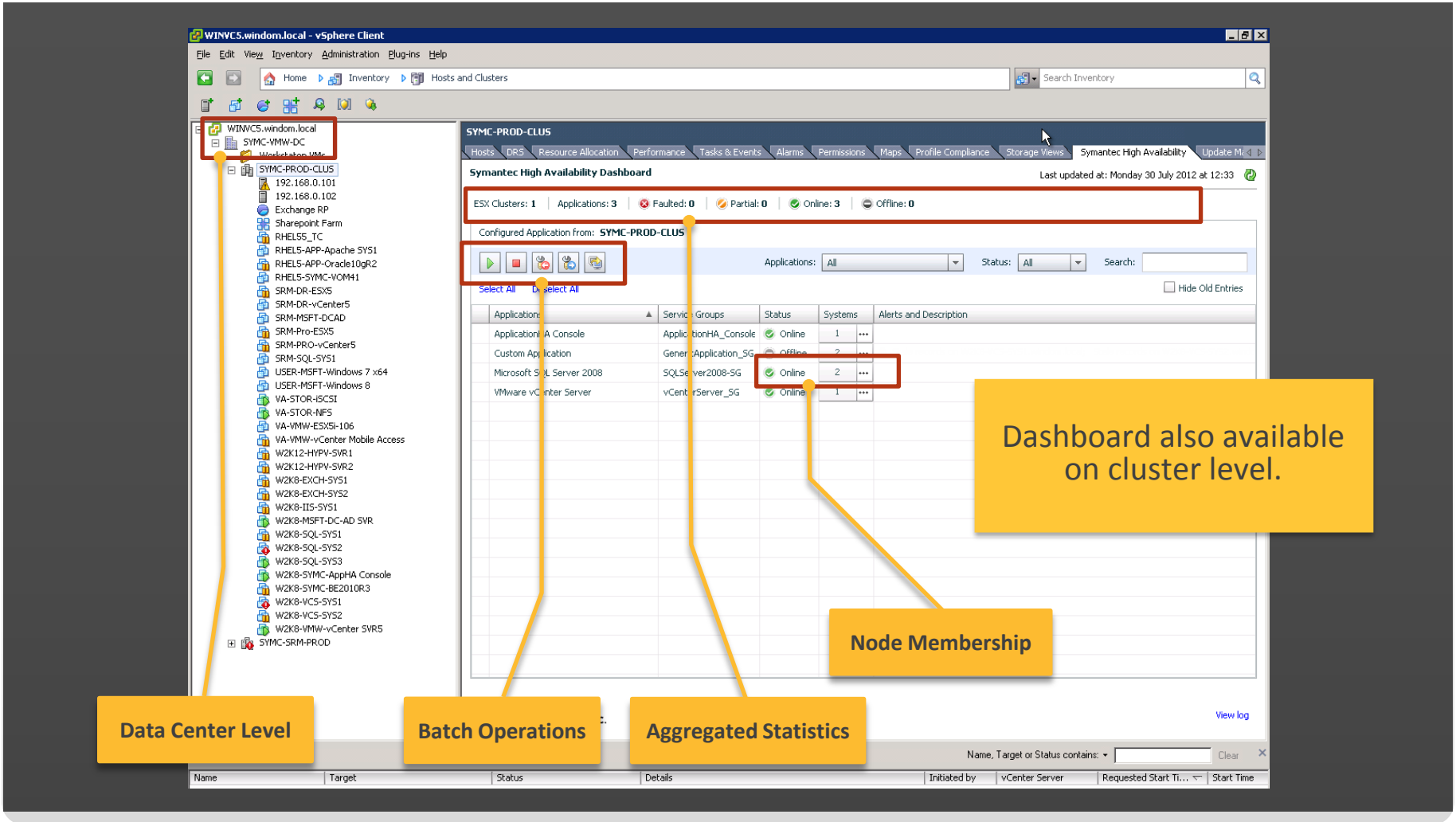
- ESX crash – SG begins to online on failover target node
- Simultaneously VMware HA registers the faulted VM to another ESXi host
- VMwareDisks online routine is VMware HA aware and waits till the faulted VM is registered.
- VMwareDisks agent fires detach disk operation against faulted VM on the new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



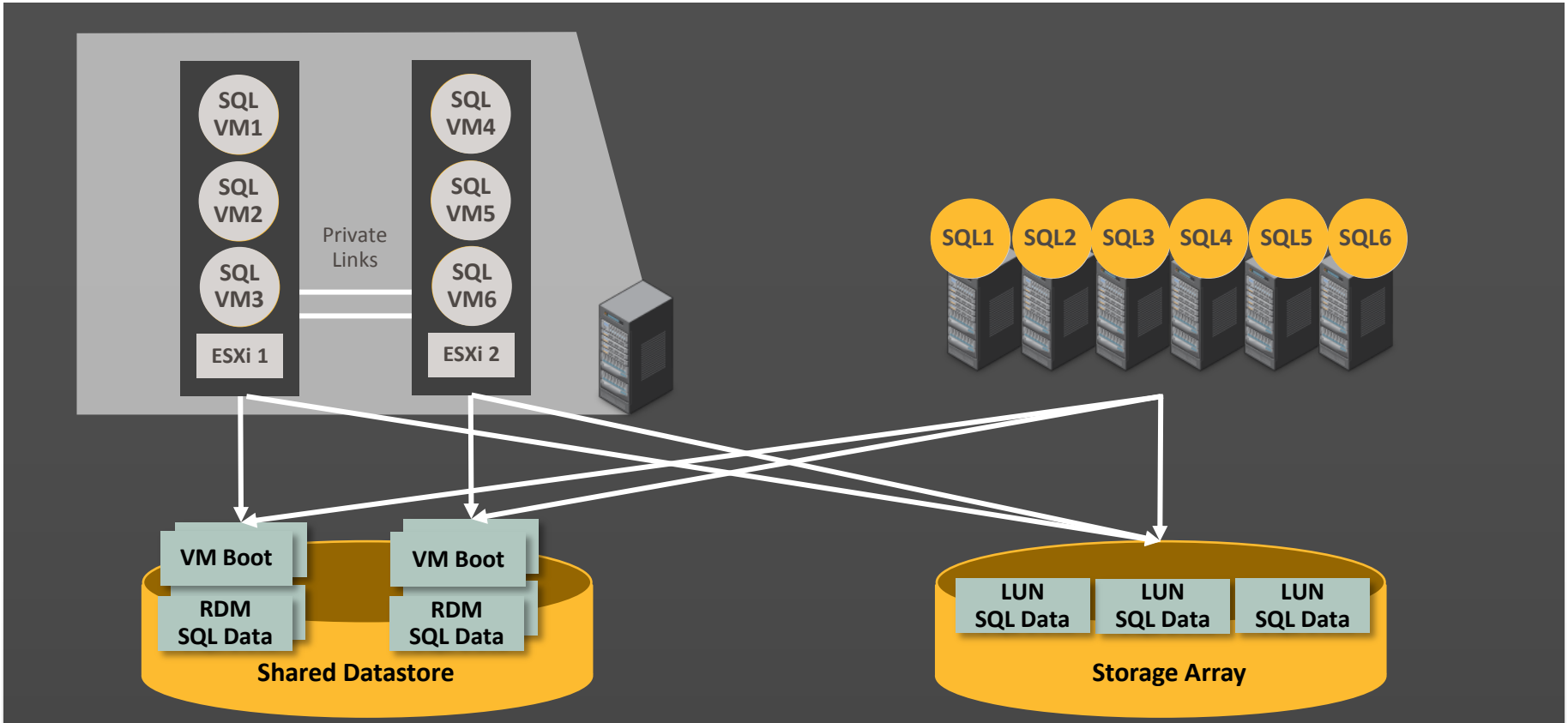
# Dashboard for visualizing application status and controlling applications



# Disaster Recovery from server hardware & app failures

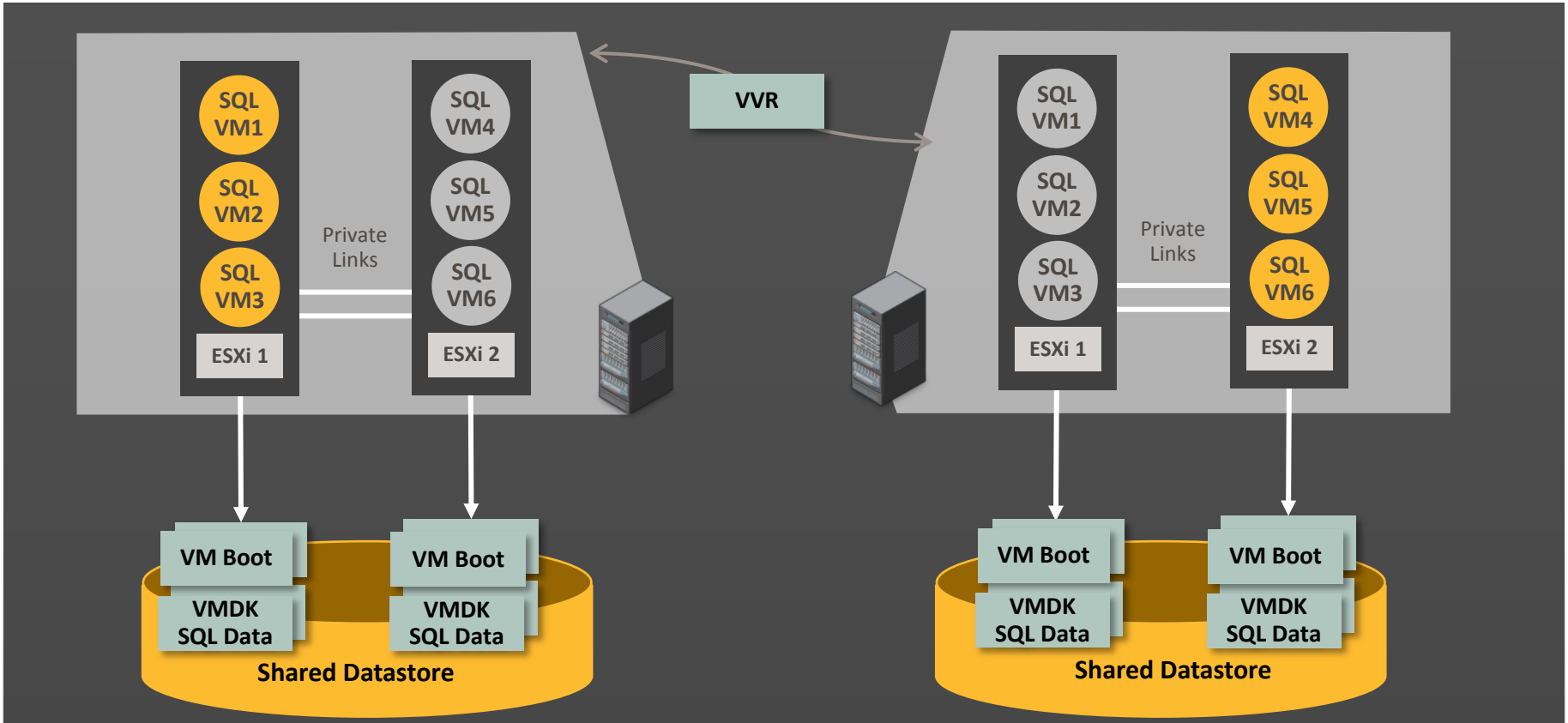
with Symantec Cluster Server + Replication

# Advanced configurations
# Physical to virtual clusters - campus or DR



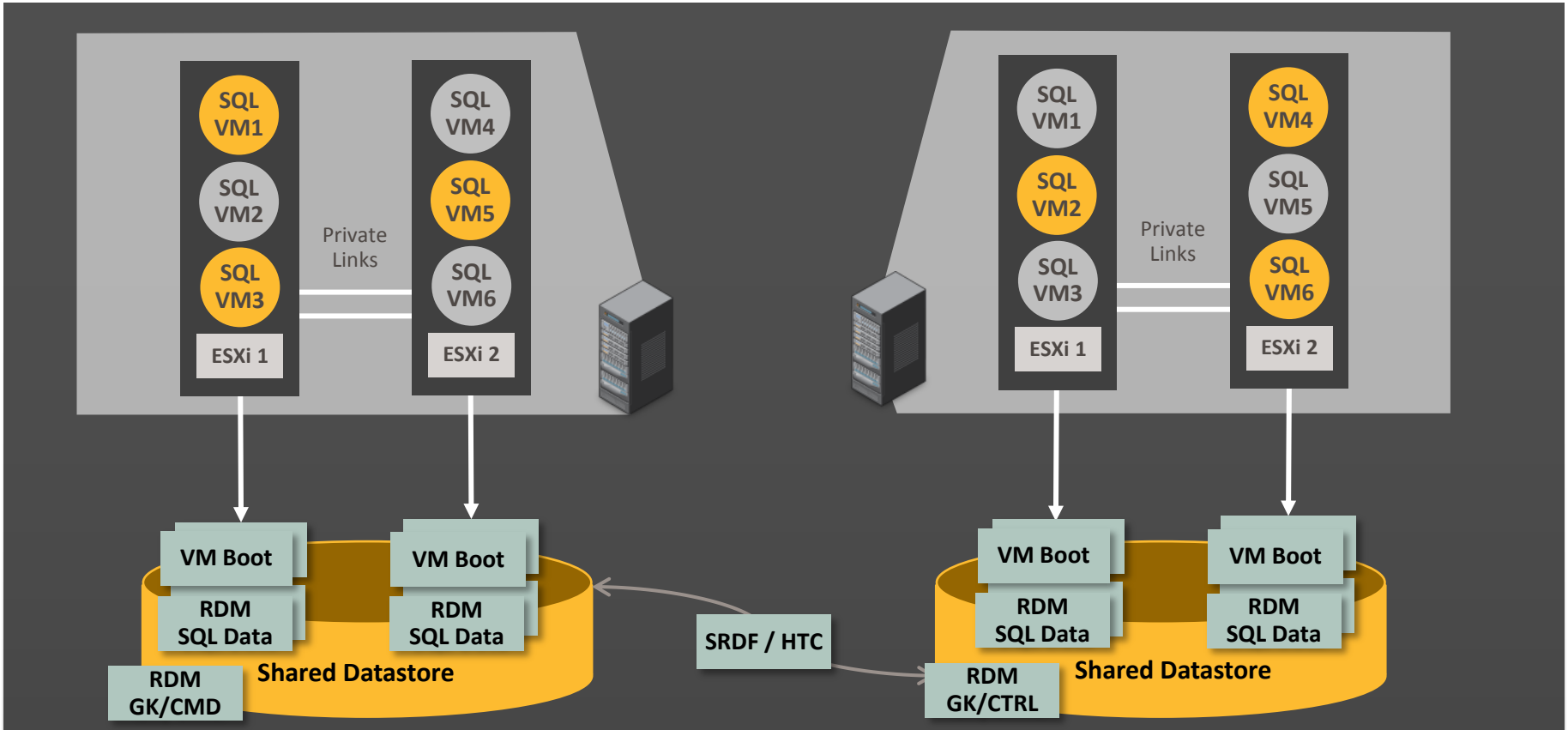

- Storage LUNs exposed as RDMs, required for simultaneous virtual and physical access
- VMDK supported for DR with VVR Replication

# Advanced configurations
# DR clusters with VVR replication




- Data disks including VVR volumes can use VMDK or RDM
- Minimal configuration changes wrt traditional VCS DR Config.

# 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

vision

# 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?


**Native Technology**

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

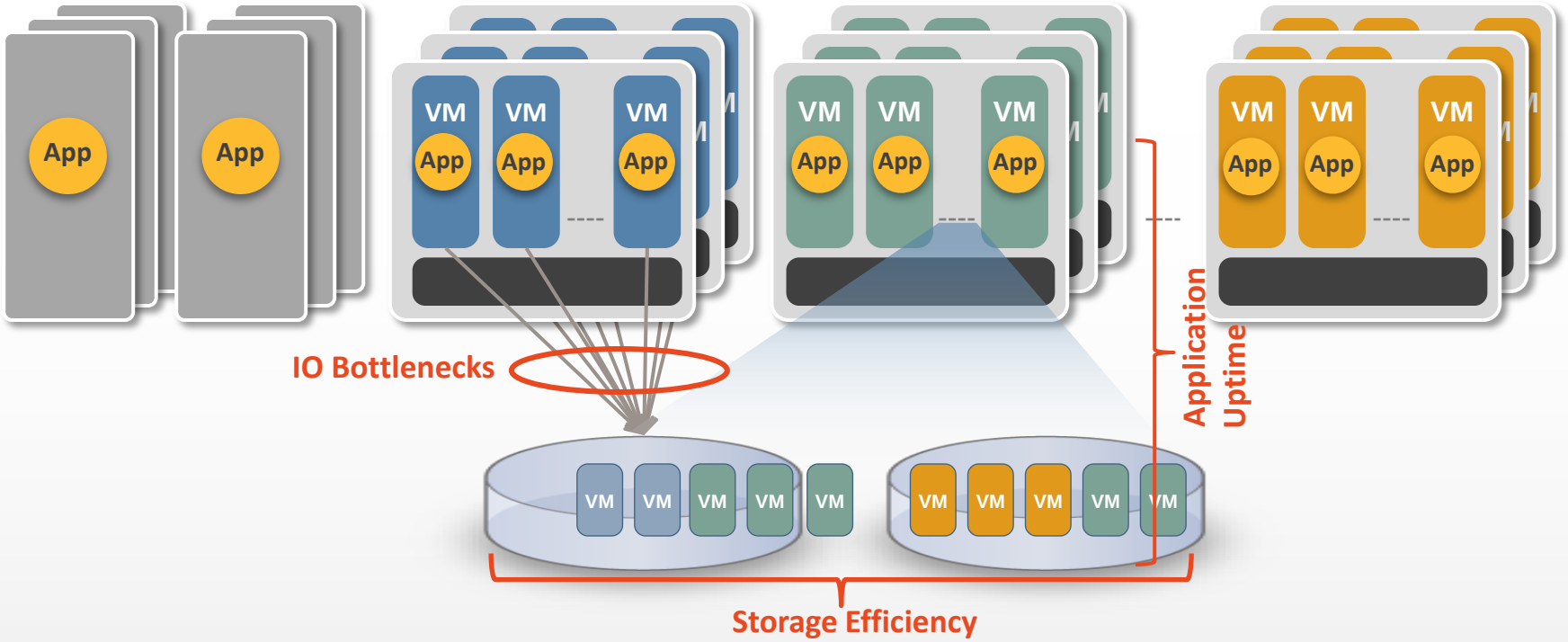
Windows Storage Spaces and ReFS: Is it time to ditch RAID for good?

**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 thoughput and dramatically simplifies operations **PureStorage**

# Challenges in Windows Hyper-V Environments



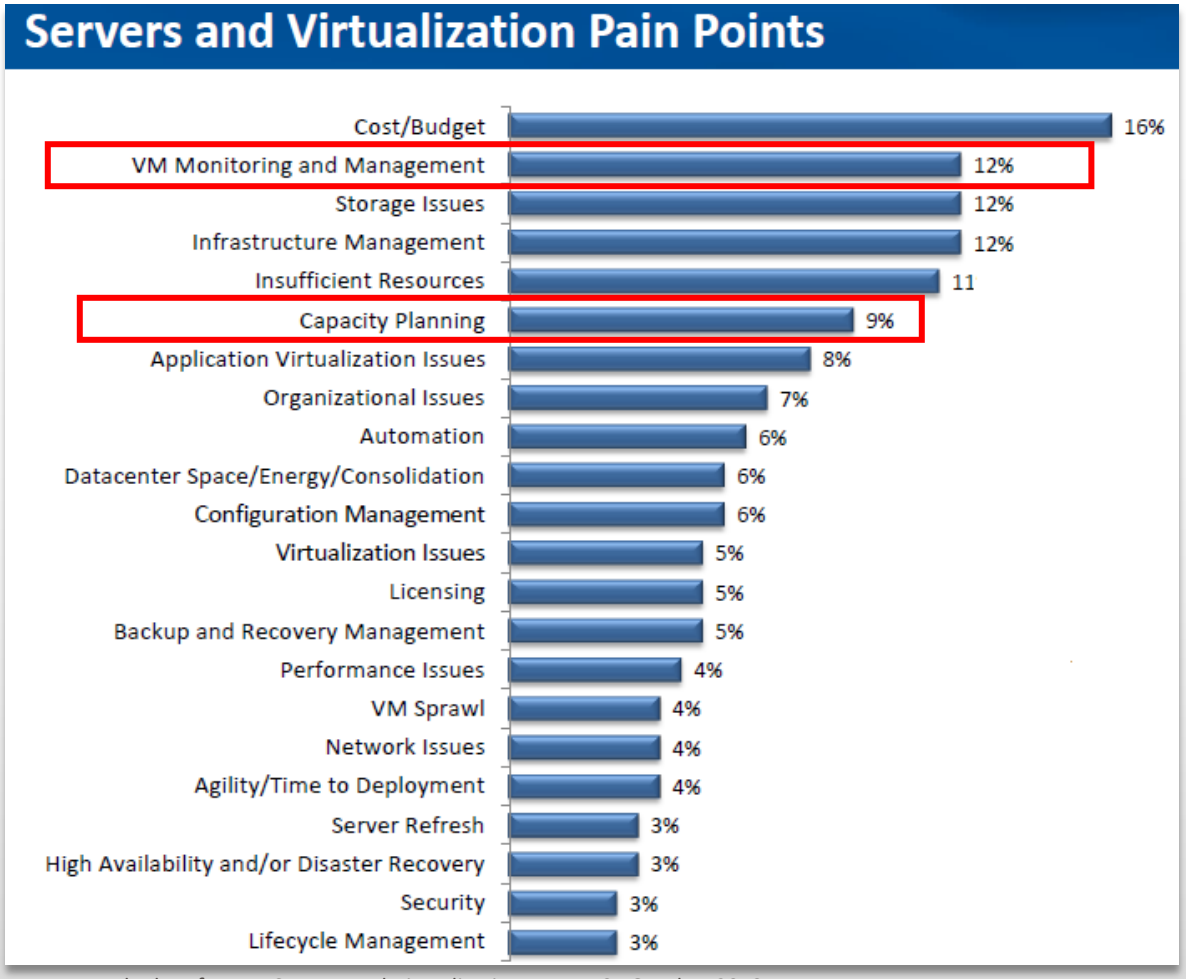

- Increasing VM (& app) consolidation ratio
- Storage growth, Increasing LUN sizes
- Create, delete, migrate of VMs & storage
- Maximize Application Availability

| Storage Pooling | I/O Performance | Application uptime |
|---|---|---|
| Cost-effective VM/application centric storage management | Leverage Flash and improve latency and throughput in physical/virtual | Maximize Application uptime |

vision

# Enterprise Availability for Hyper-V with Symantec

# Application availability a key requirement for virtualization of critical apps



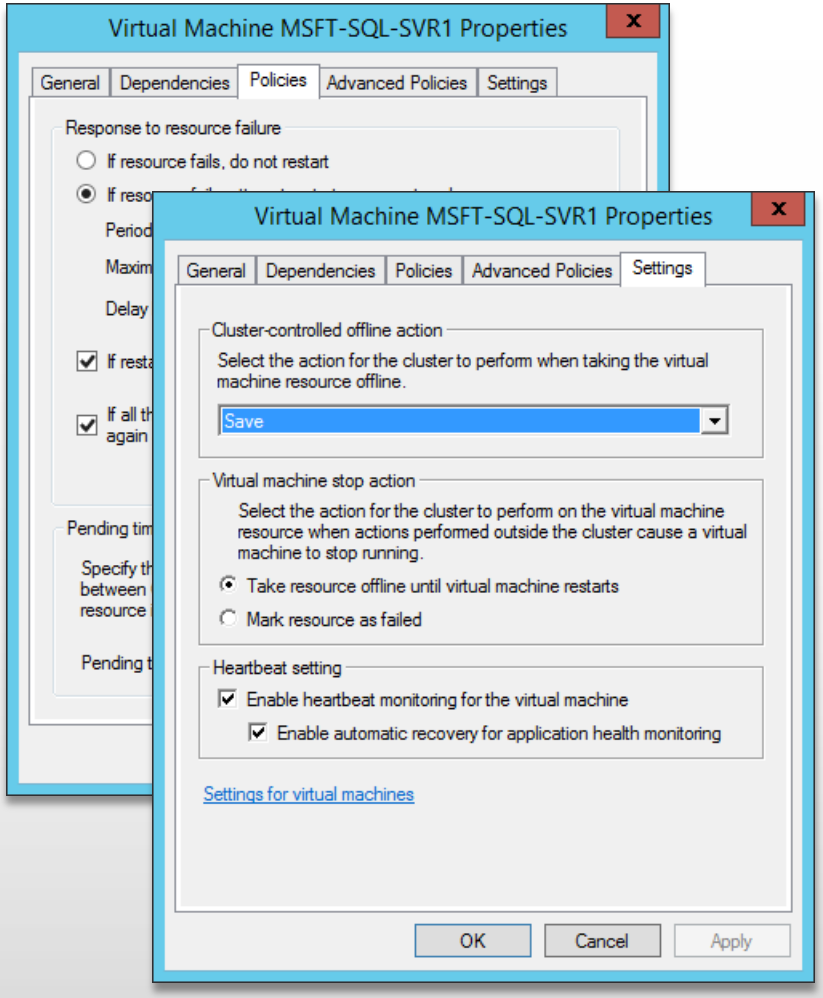

451 Research TheInfoPro – Servers and Virtualization Wave 13 , October 2013

# VM Monitoring in Windows Server 2012
## Overview

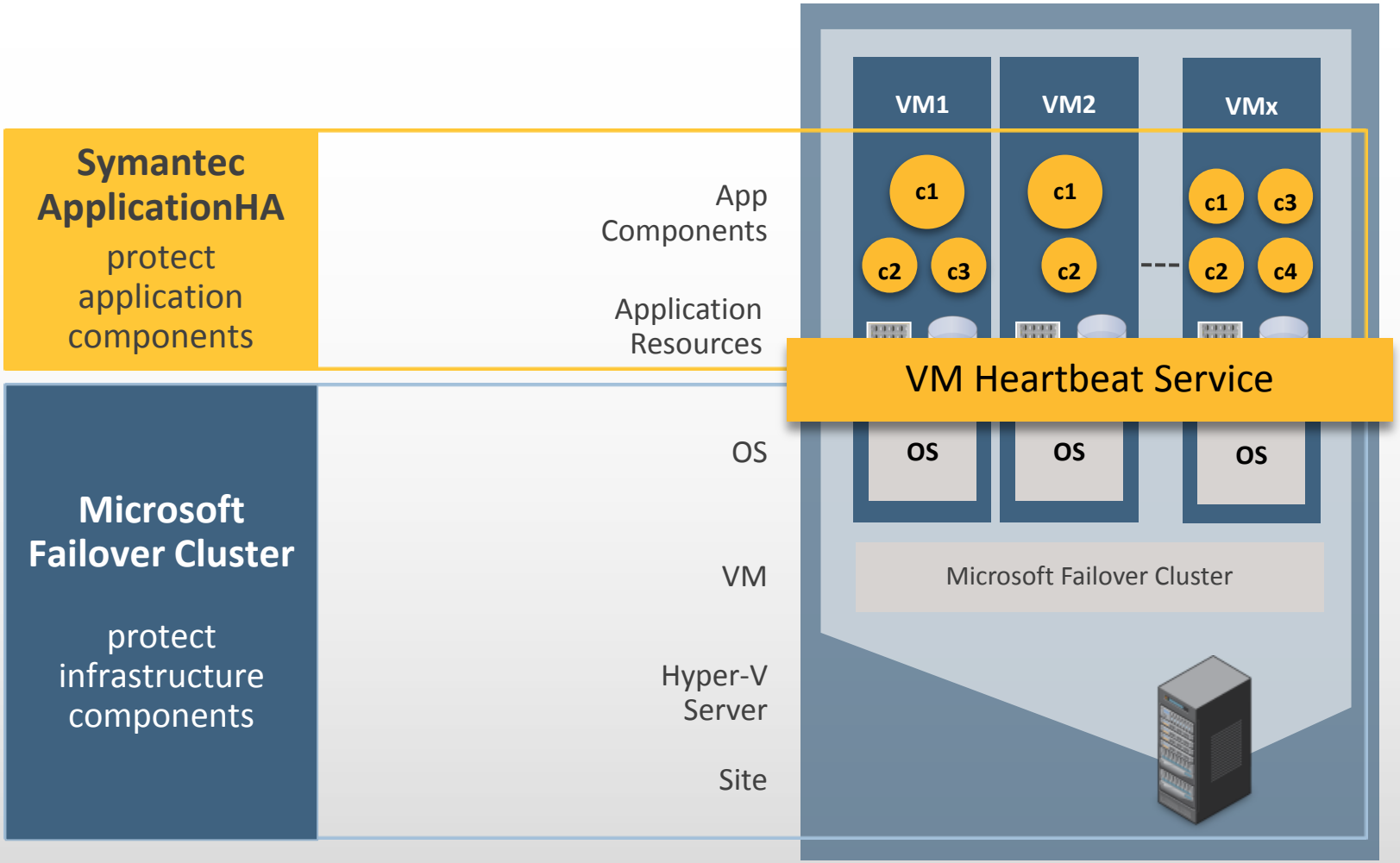
- *Application Health detection inside virtual machine*
- *Cluster service in host takes remedial action*
- *Independent of Guest Clustering*
  - No need for clustering in guest
- *Windows Server 2012 Required*
  - As both host and guest OS
  - Windows Server 2012 Hyper-V integration services on guest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

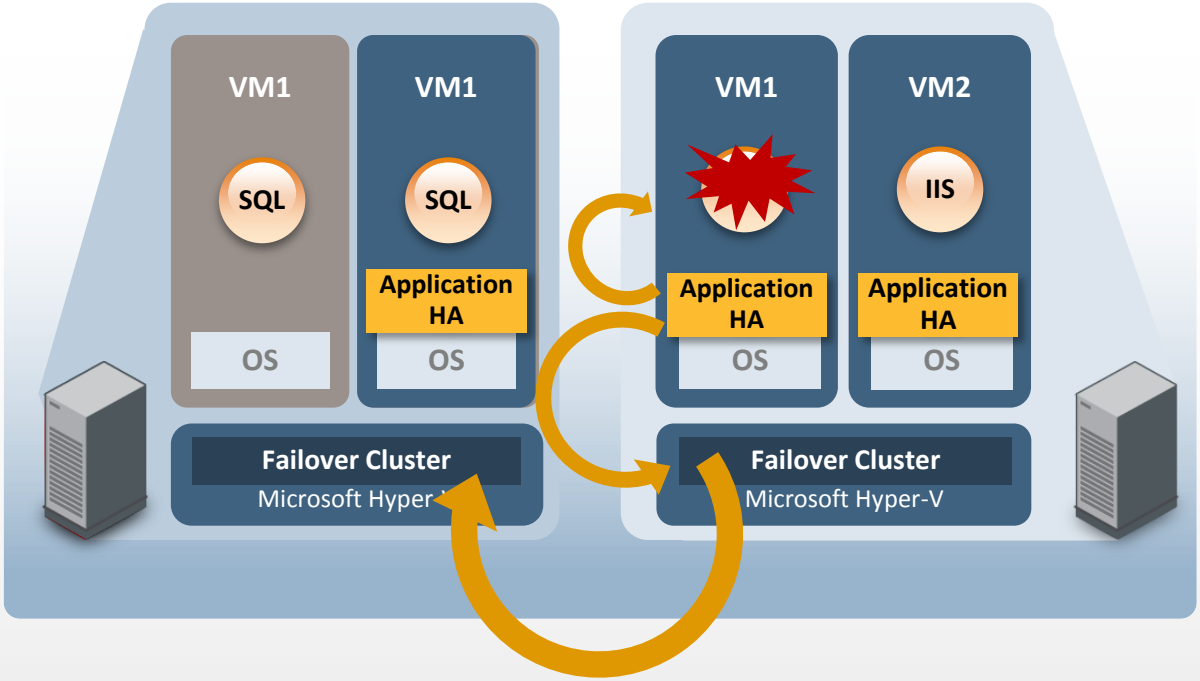


# Providing application resilience with Microsoft FOC and Symantec ApplicationHA



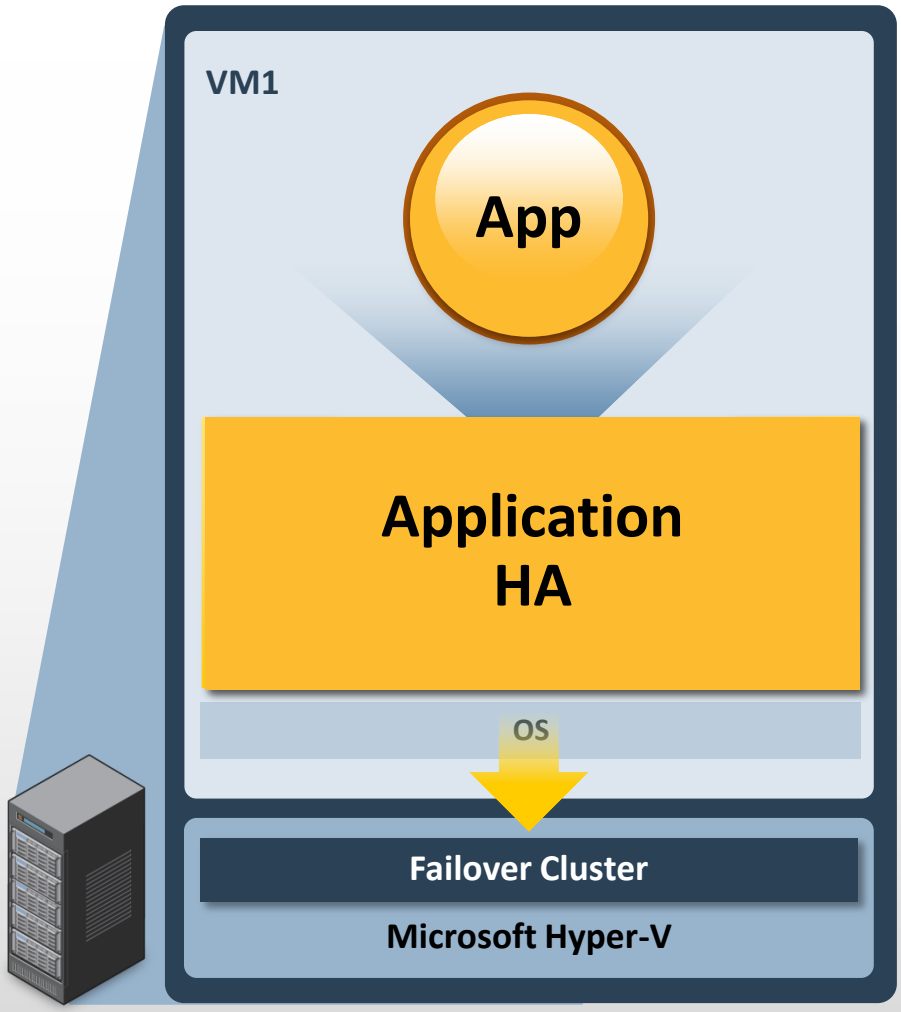
# Coordinated recovery between ApplicationHA and Microsoft Failover Cluster

- 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



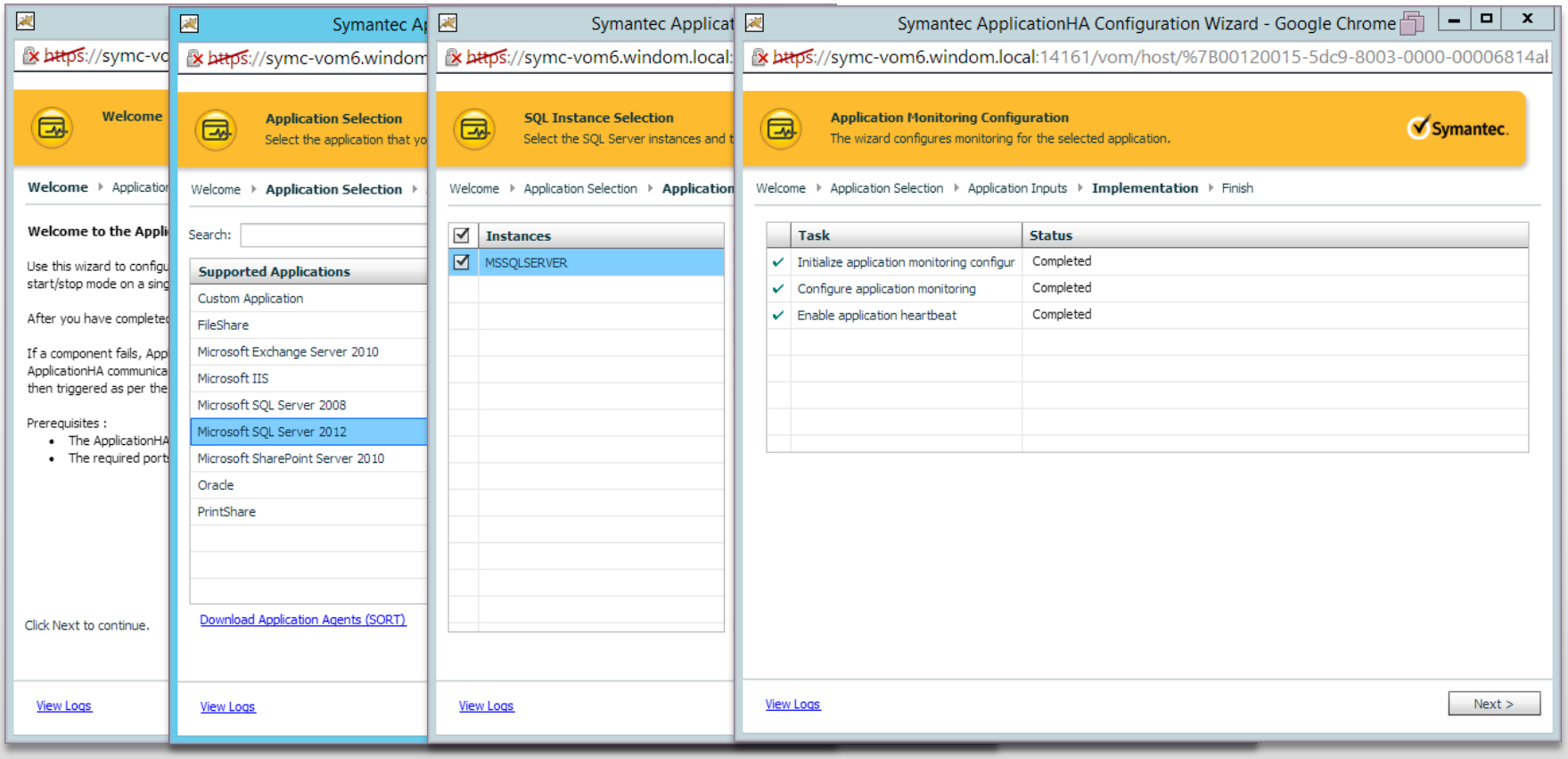
# Coordinated recovery between ApplicationHA and Failover Cluster – details

- 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

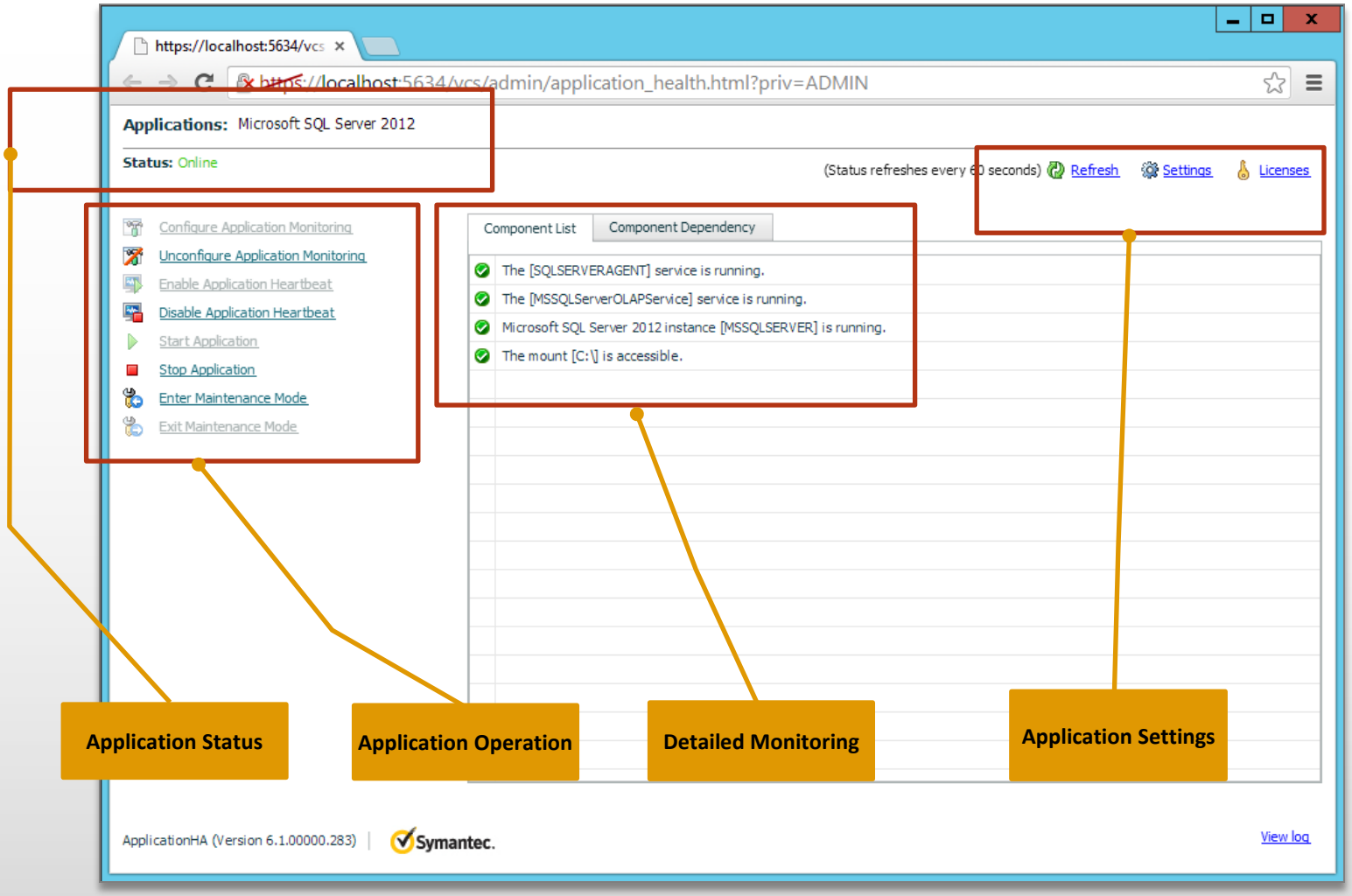


# Coordinated recovery between ApplicationHA and Microsoft Failover Cluster – details

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



# Visualize and control apps from web browser -
## Screenshot

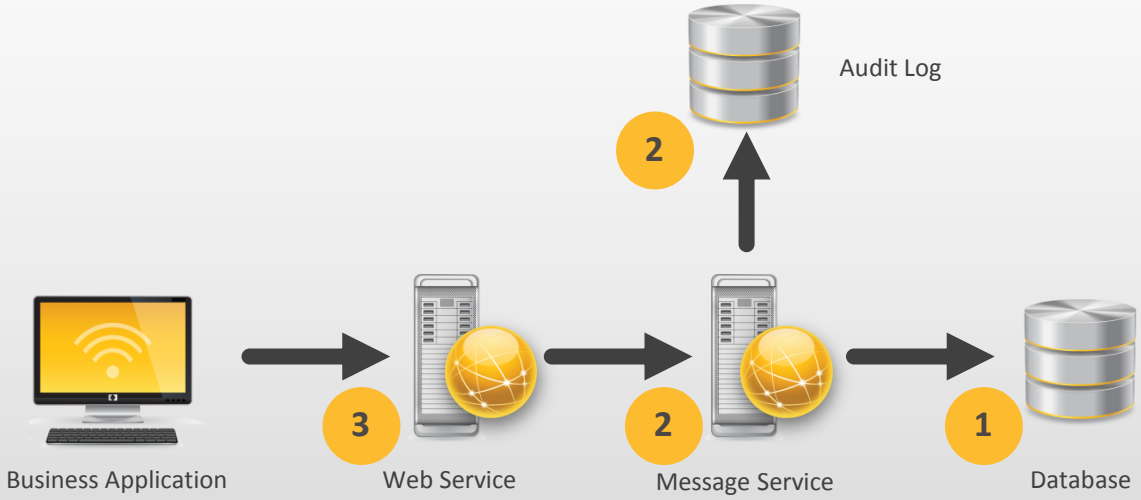


vision

# 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.



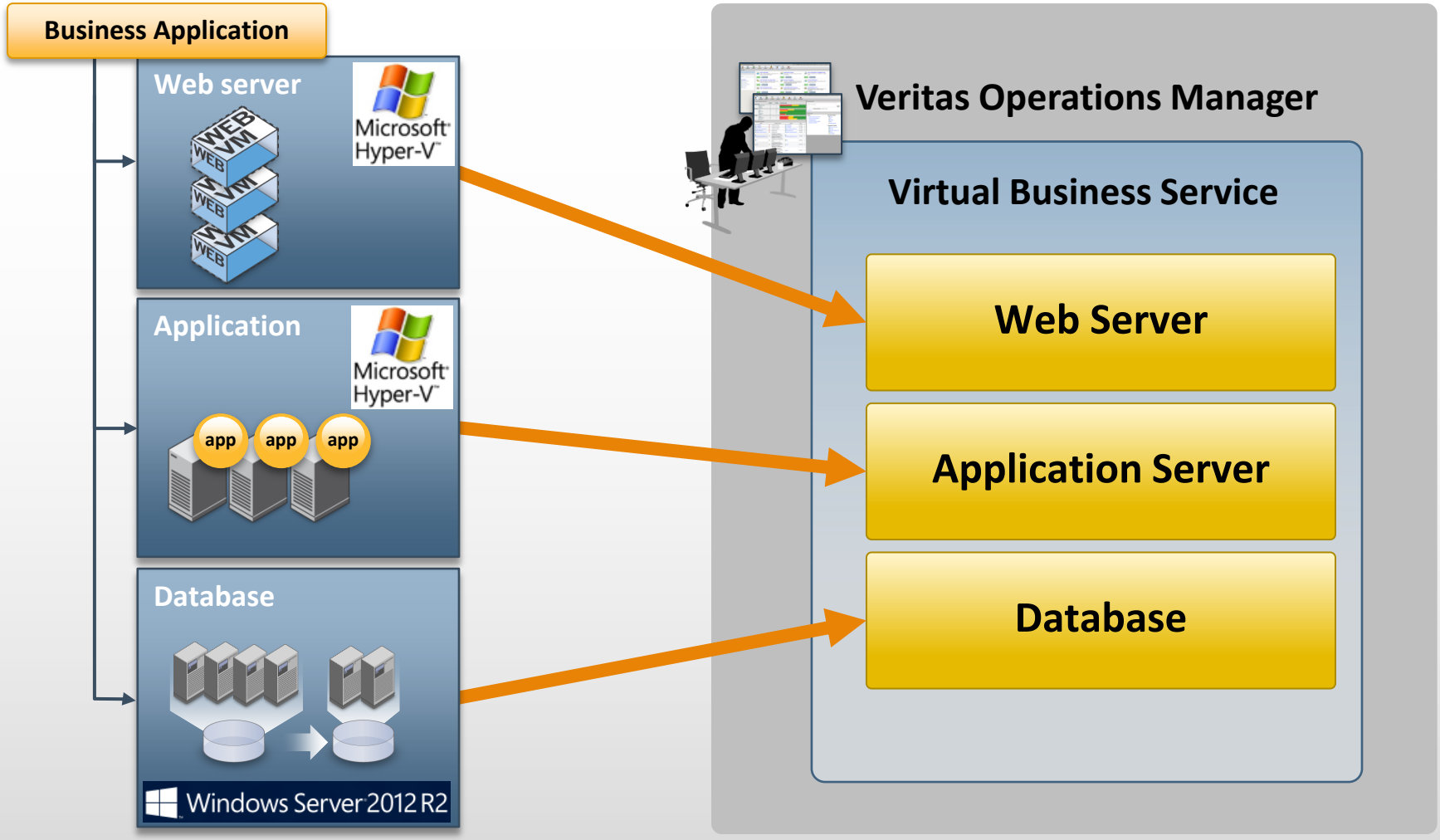
# Should it take hours to recover from a failed service?

Limited automation with different protection tools for each tier

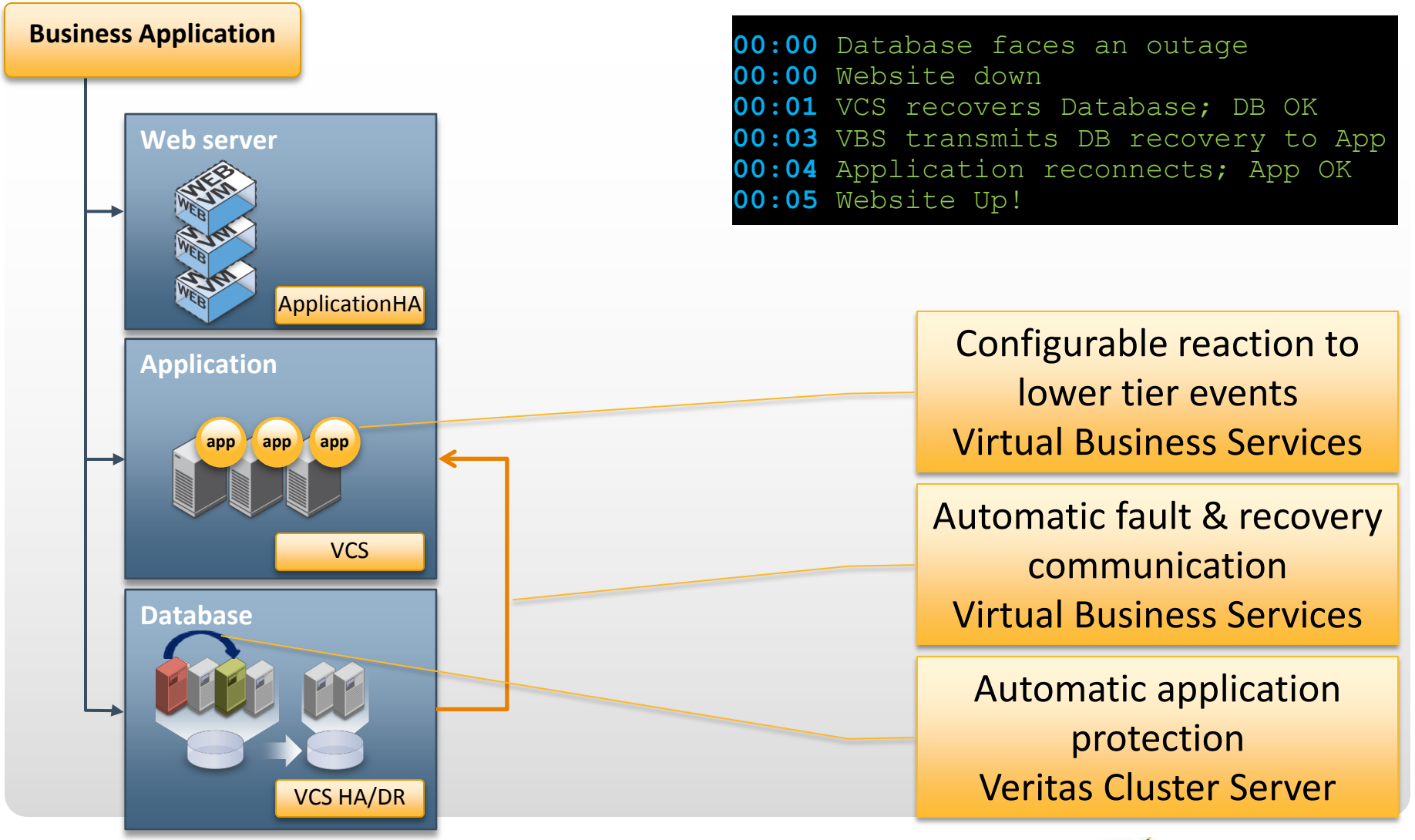
```
00:00 Database faces an outage, automatically recovered on standby node
00:01 Service fails, customers lose access to balance enquiry website
00:05 Monitoring software detects outage, creates ticket
00:10 Help desk starts processing ticket, finds service owner
00:20 Service owner starts troubleshooting: 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!
```



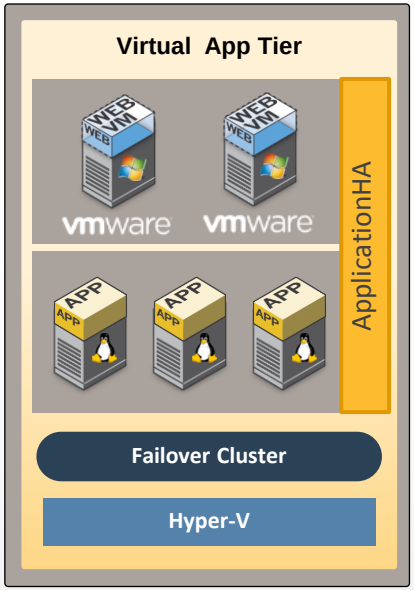

# Virtual Business Service
# Single logical entity for the multi-tier application

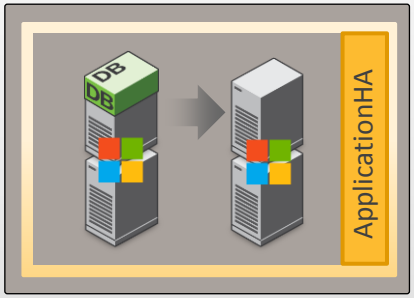


# Always-on automatic multi-tier protection with Virtual Business Services



# Introducing Virtual Business Services for Microsoft Failover Cluster




## Virtual Business Services

- **Web Servers**
- **Standalone Application Server**
- **Database (MS FOC)**

- Utilize current infrastructure to provide service level orchestration
- Proactive Service health validation – lower operational expenses
- Overcome operational silos, eliminate availability issues quicker

*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.*

vision

# Making Hyper-V Enterprise Ready with Symantec

GA

# 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.