BCT9708 Innovative Approaches for High Availability / Disaster Recovery in the VMware Server Environment

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Agenda

- HA / DR Challenges in a virtual server environment
- Existing availability solutions for the virtual environment
- Veritas Cluster Server for VMware ESX
- Demo
Virtualization Goals

Question: What are the most common virtualization goals for data center managers today?

Biggest drivers of Virtualization:
- Consolidation
- Cost Reduction
Virtualization Consideration Points

Virtualization Cons

Question: What cons do you see with a virtualization model based on 4- or 8-way servers with multiple VMs running on them?

- Vulnerability
- Manageability
- Costs
- Cost Justification
- Licensing
- Environmentals
- Other

Need to address
- Vulnerability &
- Manageability
for the virtual environment
Vulnerability Issues

Virtualization can increase the risk of downtime

Server consolidation
10~20 servers in one box

Adding more layers creates complexity.

- Physical servers
- Virtual servers
- Applications
- Network components
- Storage components
- Virtual links

“it’s like having too many eggs in one basket”
Manageability Issues

- Another “platform” has been added
- Many existing data center tools built on physical server model and don’t adapt well to virtual server architectures
- Servers, Apps now mobile, need to be tracked
- Virtual interface/links need to be maintained

“I want the visibility and manageability of a physical environment”
Solution?
Traditional “Guest OS” Clustering

- Traditional clustering running within the guest OS
- Is this as good as it gets?
Limitations to the Existing Solution

- Virtual Server A
  - Clustering SW
  - Virtualization Hypervisor
  - Hardware (x86)

- Virtual Server B
  - Clustering SW
  - Virtualization Hypervisor
  - Hardware (x86)

- Virtual Server A'
  - Clustering SW
  - Virtualization Hypervisor
  - Hardware (x86)

- Virtual Server B'
  - Clustering SW
  - Virtualization Hypervisor
  - Hardware (x86)
Limitations to the Existing Solution

- Passive Virtual Machines are standing by, using resources
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Limitations to the Existing Solution

- Passive Virtual Machines are standing by, using resources
- Additional VM's cost more $ in application licensing
- Individual cluster software overhead → performance issue
- Management complexity (hypervisor, servers, OS, apps, scripts)
VMware HA - Great protection against physical server failure. But...
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* Does not protect against VM / App / Resource failures
VMware HA - Great protection against physical server failure. But...

- Does not protect against VM / App / Resource failures
- Does not protect from wide area disasters
- Does not provide automated response / notification
VMotion, DRS: for “known” activities only
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VMotion, DRS - Great for planned maintenance & load balancing. But...
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VMotion, DRS - Great for planned maintenance & load balancing. But...

- Requires virtual machines to be in a running state
- Does not protect from unplanned downtime and sudden outages
Veritas Cluster Server (VCS)

- **#1 Market Share** in cross-platform server clustering
  - Source: IDC 2006 IDC Clustering and Availability Software Survey

- Provides **High Availability** and **Disaster Recovery** all in one package

- **Supported Platforms:**
  - Windows NT, 2000, 2003
  - Linux (RedHat, SUSE)
  - Solaris, HP/UX, AIX
  - **VMware ESX Server**
Veritas Cluster Server for VMware ESX Server

Highlights

- **Virtual machine and application monitoring**
  - Provides higher level of availability by monitoring application and resources as well as the server

- **Multi-cluster management and reporting**
  - Manages multiple local and remote clusters in physical and virtual environments from a single console, regardless of OS

- **Leverage VMware ESX Server advanced features**
  - Recognizes and works seamlessly with VMotion and DRS

- **Automated Disaster Recovery**
  - Configure / Test / Provide Disaster Recovery using VCS
Veritas Cluster Server 5 for VMware ESX Server

Primary Site
ESX Server Node A

Virtual Machine1
App1
App Agent

Virtual Machine2
App2
App Agent

Virtual Machine3
App3

Veritas Cluster Server

VMware ESX Server Console OS

Hardware

Global Cluster Heartbeat

Local Cluster Heartbeat

No Target Virtual Machines Required

Shared Storage

Hardware-Based Data Replication

Secondary Site
ESX Server Node C

No Target Virtual Machines Required

DR Agent

Primary Site
ESX Server Node B

VCS

VMware ESX Server Console OS

Hardware

Primary Data Center
ESX Server Node A

Remote Data Center
ESX Server Node C

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VCS in Action

Primary Site
ESX Server Node A

- Virtual Machine1
  - App1
  - App Agent

- Virtual Machine2
  - App2
  - App Agent

- Virtual Machine3
  - App3

Veritas Cluster Server
VMware ESX Server Console OS
Hardware

Local Cluster Heartbeat
Shared Storage

Primary Site
ESX Server Node B

- Virtual Machine3
  - App3

VCS
VMware ESX Server Console OS
Hardware

Global Cluster Heartbeat

Secondary Site
ESX Server Node C

No Target Virtual Machines Required

DR Agent

Hardware-Based Data Replication

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VCS in Action

Primary Site
ESX Node A

Primary Site
ESX Node B

Secondary Site
ESX Node C

Virtual Machine1
App1
DR Agent

Virtual Machine2
App2

Virtual Machine3
App3

Local Cluster Heartbeat

Shared Storage

Global Cluster Heartbeat

Hardware

VCS

VMware ESX Console OS

Hardware

Hardware-based Data Replication
Benefits of using VCS 5 for VMware ESX

**Added Protection**

- Comprehensive availability for the production applications

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<th>With VMware monitors and provides failover for…</th>
<th>With VCS Provide added protection for…</th>
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Benefits of using VCS 5 for VMware ESX

Granular Management

> Granular management, just like a physical environment
> Simple to manage (mouse clicks) both Windows and Linux
> Automated response and notification to various situations
> Maintain resource dependencies
Benefits of using VCS 5 for VMware ESX

Virtual Machine Dependencies

- Enforce virtual machine dependencies
- Support services that span multiple virtual servers
Benefits of using VCS 5 for VMware ESX Across Data Centers

- Maintain availability during a site-wide disaster
- Simplified automated disaster recovery process
- Have one view of all VCS clusters across the globe
- Use one framework to manage multiple data centers

One Management Console
Benefits of using VCS 5 for VMware ESX

Virtual Environment Specific

- VCS allows for **N+M clusters**
  - No need to have 2x the hardware
  - Cluster according to performance, cost requirements

- **VMotion, DRS compatible**
  - Utilize VMware features without complications

- **No** need to install **duplicate stand-by failover instances**
  - Only one application to license
  - Install VCS only once

- Fire Drill tool **verifies the virtual disaster recovery plan**
  - No impact to the production environment
  - DR plans should be tested whether it is physical or virtual
What is VCS Fire Drill?

Fire Drill is a cloned VCS Service Group modified to use snapshot storage.

Fire Drill:
- Creates snapshot
- Configures snapshot
- Imports snapshot
- Mounts snapshot
- Starts SG on the mount
- Requires SF 5.0

Any errors are logged by VCS.

Fire Drill SGs are isolated from production SGs.
VCS for VMware ESX Use Cases

- **Standardization** – Use the same tools for physical and virtual environments
  - **Pain:** Different tools for different platforms is expensive and complex
  - **Value:** Reduce training costs, more flexible IT staff

- **Zones**
- **Containers**
- **LPARs**
- **Micro-Partitions**
- **vPars**
- **nPars**
- **Virtual Machines**
- **Secure Resource Partitions**

VERITAS Cluster Server 5 for VMware ESX
Overall protection of the production environment

- Pain: Users don’t know the health of the applications and VMs
- Value: IT can monitor everything regarding the VM and can have a proven Enterprise Class HA solution for their production applications
VCS for VMware ESX Use Cases

- Overall protection of the production environment
  - Pain: Users don't know the health of the applications and VMs
  - Value: IT can monitor everything regarding the VM and can have a proven Enterprise Class HA solution for their production applications
M+N clusters, P-to-V*, V-to-P*, and V-to-V configurations

- Pain: Duplicate hardware for HA/DR is expensive
- Value: Arrange servers into cluster configurations that fit your needs

* Requires VCS for Windows/Linux/Unix
Availability over any distance

> **Pain**: Need disaster recovery solution for VMware environments

> **Value**: Companies can failover virtual machines to remote data centers regardless of distance
Demo
Value to the Data Center

With VCS for VMware ESX,

Have a virtual environment…
- Protected top-to-bottom to run mission critical applications
- Using simple-to-use virtual-aware cluster management tools
- Integrated Availability Management All-In-One Package
For further information:

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