How Vizioncore Deploys Its Own esxRanger *Professional* Software for Disaster Recovery

When Vizioncore, a leading developer of software for the virtualization industry, needed to implement an efficient, cost-effective disaster recovery strategy, it turned to its own esxRanger *Professional*™ software. In conjunction with VMware® Infrastructure 3, esxRanger *Professional* helped Vizioncore create a reliable, easy-to-maintain disaster recovery system running on Dell™ and Dell/EMC hardware.

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In 2004, Vizioncore created its flagship esxRanger™ software for a client that needed a cost-effective backup and disaster recovery solution. Today, Vizioncore is using this software in its own data center as well. Designed to meet the needs of enterprises of all sizes, esxRanger *Professional* can provide fast, reliable VM backup and recovery and includes key enterprise functionality such as differential image backups and file-level restores for virtual machines (VMs) running in a VMware virtualization environment.

Vizioncore disaster recovery design

The Vizioncore data center comprises 41 Dell PowerEdge™ servers. Of these servers, 34 are devoted to testing and development, with a majority running VMware virtualization software. The production environment runs 25 VMs, supporting Microsoft® SQL Server™, Exchange Server, Internet Information Services, Active Directory®, and other software. The non-virtualized physical servers run Citrix® software.

The storage back end is provided by a Dell/EMC CX300 array with 2 TB of storage, with backup storage provided by a Dell/EMC AX100 array, also with 2 TB of storage. The main network runs on Dell PowerConnect™ 6024 switches; the main wide area network (WAN) link is a T1 line for e-mail and Web traffic, while another dedicated T1 line supports voice over IP (VoIP) for inbound and outbound calls.

Vizioncore maintains a backup site for disaster recovery, which is located 23 miles away from its production data center. This off-site location includes a Dell/EMC AX150i array with 3 TB of storage and uses a dedicated 4 MB/sec wireless connection for data replication. Figure 1 illustrates the Vizioncore disaster recovery configuration.

Vizioncore performs nightly and weekly image backups of all servers using esxRanger *Professional* and VMware Consolidated Backup (VCB). The esxRanger *Professional* and VCB proxy server has one host bus adapter (HBA) connected to the Dell/EMC CX300 for VM backups, and one HBA connected to the Dell/EMC AX100 for storing backups before they are replicated. Once the backups are created, they are replicated to the disaster recovery site. Because Vizioncore can replicate its entire environment weekly and its critical servers hourly or daily, it can quickly restore its entire environment following a major failure. In addition, VMware Converter allows Vizioncore to store copies of its servers running Citrix software in case administrators need to virtualize them at the disaster recovery site.

The esxRanger *Professional* software can create image-level hot backups simply and easily while the VMs are

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running. Unlike file-level backup agent software, esxRanger *Professional* backs up the entire VM, including configuration settings, OS patches, the application itself, and data and other OS-level changes. The software supports the VMware platform in a number of key ways, including integration with VCB, VMware VirtualCenter, and VMware VMotion™ technology, which allows esxRanger *Professional* to follow VMs even after they have been moved to another host by VMware Distributed Resource Scheduler (DRS).

Tiered service levels and software redundancy

Vizioncore has assigned three service levels to its servers based on the data's importance and the required time for recovery:

- **Service level 1:** This level requires high availability, fast image recovery, database-consistent file backups, and off-site protection. Vizioncore supports this level by performing hourly off-site replication with Vizioncore esxReplicator™ software, nightly file-level backups with Veritas data protection software from Symantec, and weekly image backups using esxRanger *Professional* as well as weekly off-site image replication using the Distributed File System (DFS) in the Microsoft Windows Server® 2003 Release 2 (R2) OS.
- **Service level 2:** This level requires fast recovery at both the image and file levels, as well as off-site protection. Vizioncore uses esxRanger *Professional* for nightly and weekly image-level backups while utilizing the esxRanger *Professional* file-level restore functionality to retrieve user files, and replicates the nightly images off-site using Windows Server 2003 R2 DFS.
- **Service level 3:** This level requires simple image recovery and off-site protection. Vizioncore uses esxRanger *Professional* for weekly image-level backups, and replicates those images off-site using Windows Server 2003 R2 DFS.

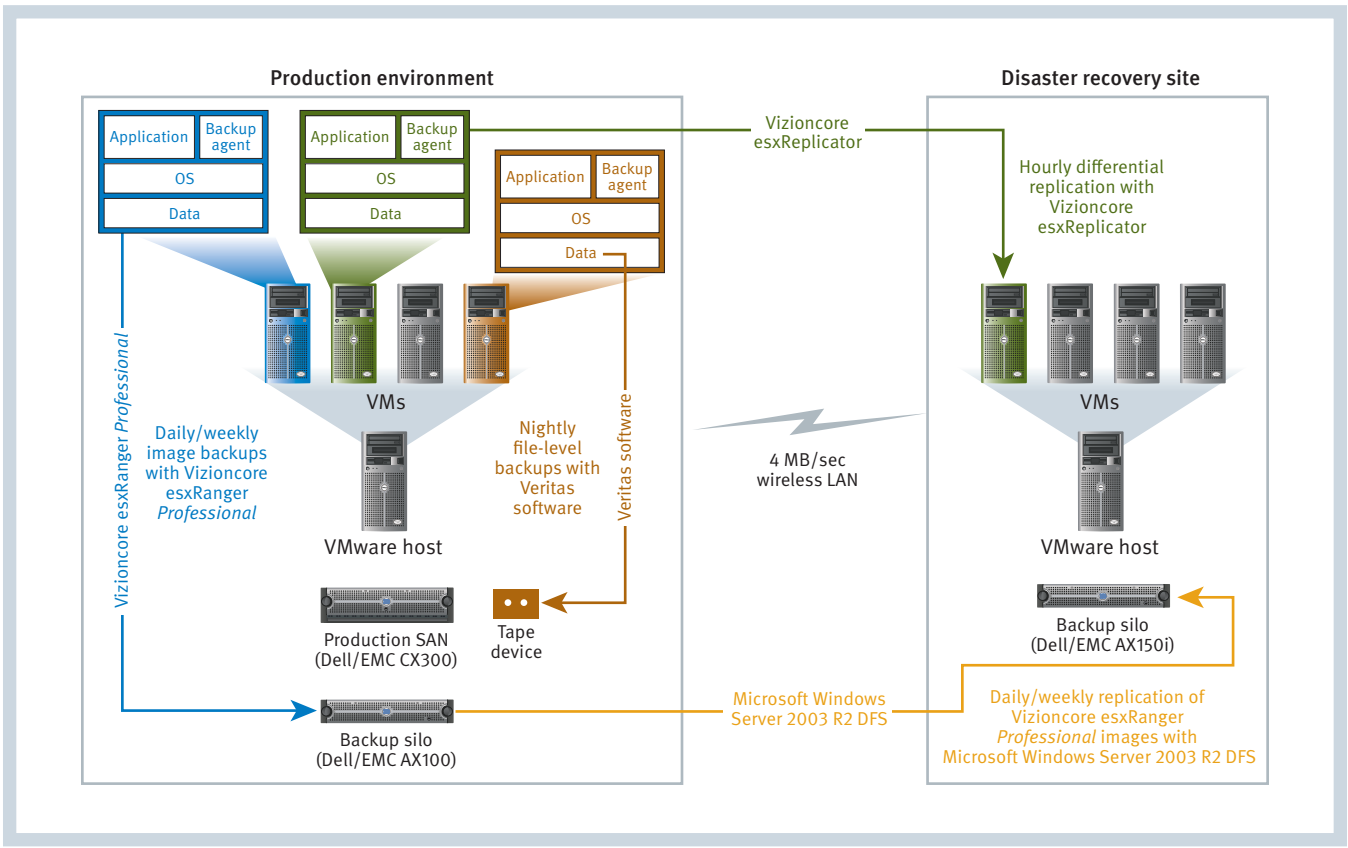

Figure 1. *Vizioncore disaster recovery configuration*

Like many enterprises, Vizioncore has rapidly changing data servers that need traditional file-level backups for databases, such as SQL Server and Exchange, in addition to image-level backups of entire VMs. Because storage utilization for backups is critical, Vizioncore analyzed its data and service levels to structure and utilize the esxRanger *Professional* retention policy, which helped maximize use of high-end storage for critical data. Only 10 of its VMs have frequently changing data that warrants nightly file-level backups. To help reduce downtime and simplify recovery of these VMs, Vizioncore performs weekly image backups and nightly differential image backups, utilizing the esxRanger *Professional* file-level recovery functionality to provide a comprehensive backup solution. The remaining VMs are relatively static and are backed up weekly as a full image, then overwritten after two weeks. Finally, the most current two weeks of full and differential image backups are replicated to the disaster recovery site.

"The Vizioncore data center's disaster recovery design allows administrators to quickly recover critical VMs following an outage, and the tiered backup approach helps reduce costs without compromising critical systems."

Also essential to the Vizioncore disaster recovery strategy is software redundancy. Veritas data protection software from Symantec is used primarily for frequently changing file-level data, and esxRanger *Professional* with VCB is employed for full and differential image backups to help ensure critical data is protected and can be recovered quickly. If the Veritas software fails on the database servers, then esxRanger *Professional* file-level recovery enables administrators to quickly restore single files from a full or differential image. And if esxRanger *Professional* experiences problems, administrators can manually rebuild a VM and run a Veritas file-level restore to recover the most current critical data (although this process can be much more involved and take much longer than restoring the image with esxRanger *Professional*).

For the process that Vizioncore recommends when creating a backup and disaster recovery solution, see the "Best practices for robust disaster recovery" sidebar in this article.

Efficient, cost-effective disaster recovery

The Vizioncore data center's disaster recovery design allows administrators to quickly recover critical VMs following an outage, and the tiered backup approach helps reduce costs without compromising critical systems. By relying on its own software in conjunction with VMware virtualization, Veritas software from Symantec, and Dell and Dell/EMC hardware, Vizioncore has created an efficient, cost-effective solution for maintaining the availability of its data and applications.

BEST PRACTICES FOR ROBUST DISASTER RECOVERY

When enterprises set out to create their own backup and disaster recovery systems, Vizioncore recommends they do the following:

- Investigate the use of virtualization—many applications can successfully run on VMs, and tools like VMware Converter can easily perform a physical-to-virtual conversion, so that even if the application remains on a physical platform, administrators can still back it up as a VM.
- Maintain one or more redundant physical infrastructures located far from the primary production site, with robust WAN connectivity between the sites.
- Analyze data and applications running on VMs, with the goal of prioritizing VMs for recovery following a major failure.
- Determine the ideal backup method (file, differential, or full image) or a combination of methods that is appropriate for specific environments.
- Determine the appropriate frequency of backups—daily, weekly, or, in the case of powered-down VMs, offline storage.
- Perform periodic tests to help ensure that the system performs as expected.

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