



SOLUTION IN REVIEW ●

CHALLENGE:

- Requirement to replicate business critical data to remote location
- Highly constrained datacenter
- Infrastructure connectivity was non-redundant

SOLUTION:

- Virtual Infrastructure implementation
- HP blade servers and SAN storage
- VirtualCenter 1.2 implemented as a management platform

RESULTS:

- Rapid response to new server requests
- Increased uptime, flexibility, and enhanced fault tolerance
- Savings on datacenter real estate, data and storage network ports and power and cooling costs

PRODUCTS:

- HP p-Series blade servers
- HP StorageWorks EVA Storage Arrays
- Brocade SAN infrastructure
- Microsoft Windows Server 2003, Windows 2000, NT 4.0
- HP ProLiant Essentials Rapid Deployment Pack 2.20
- VMware ESX 2.5 & VirtualCenter 1.2

City of Phoenix Aviation Department VMware Virtual Infrastructure Implementation Project

Customer Profile

The City of Phoenix owns and operates the Phoenix Airport System. The City of Phoenix Aviation Department manages the Deer Valley, Goodyear, and Phoenix Sky Harbor International airports. Phoenix Sky Harbor International, the largest of the three, is one of the ten busiest airports in the United States, serving over 41 million passengers per year. In 2005, the Phoenix Airport System provided a \$26.3 billion economic impact to the State of Arizona and provided employment for over 31,000 people.

Pre-Existing Environment

The Aviation Department had a single data center that housed all servers supporting enterprise business systems. Multiple networks were centrally managed in the data center. Application and database servers were a mix of Independent Software Vendor (ISV) systems, predominately running under the Microsoft Windows Server Operating System (OS). This traditional environment used server-centric disk storage on application-centric servers dedicated to an individual business solution. Server-centric storage was not redundant for all systems and was comprised primarily of IDE-based devices. Servers typically relied upon a single network interface operating at 100Mbit. A number of obsolete, out of support, servers were retained because legacy ISV business application design limitations required using out of support OS versions, such as Windows NT 4.0.

Business Challenge

The Aviation Department did not have any means of replicating business critical data to a remote location, other than off-site tape backup vaulting, thus limiting response for a potential outage to a recovery scenario rather than a business continuity environment. The existing data center was also highly constrained, with power and air conditioning nearing capacity and very limited amounts of available rack space. Connectivity to the rest of the City of Phoenix, as well as to the Internet, was through a non-redundant network infrastructure.

These limitations made it increasingly difficult for the Technology Division to effectively support the business needs of the Aviation Department and to respond rapidly to new or changing business requirements.

Technology Solution

The Aviation Department's Technology Division selected Hewlett-Packard (HP) and VMware technologies to help address these challenges. IT Partners engaged with the city's staff to implement Storage Area Network (SAN) solutions within the Aviation Department data center and SAN replication at the City of Phoenix IT Operations Center.

“With our new virtualized environment up and running, we are now doing incredible things.”

**Robert Koch, City of Phoenix
Aviation Department**

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City of Phoenix Aviation Department VMware Virtual Infrastructure Implementation Project

One HP StorageWorks Enterprise Virtual Array was established in the Aviation Department's Data center and a second implemented in the City's IT Operations Center eight miles away. These two arrays were configured for synchronous block level replication using HP StorageWorks Continuous Access software.

To enhance reliability and availability, the city's technical staff concurrently implemented network redundancy using alternate paths between the two facilities and upgraded all server connections to gigabit Ethernet.

IT Partners also implemented HP ProLiant P-Class blade servers in the two datacenters and configured them with VMware ESX server virtualization software. By integrating these technologies and using VMware Virtual Center and customized scripting, IT Partners was able to provide the Aviation Department with the ability to rapidly provision servers as needed, perform server maintenance and backups during business-hours without service disruptions, and to move active virtual machines between the two datacenters without user impact. Because servers and data are now replicated in two geographically separate locations, business continuity potential is optimized and traditional long lead time disaster recovery requirements are minimized.

Project Results

IT Partners consolidated multiple legacy servers running Windows Server and NT 4.0 versions to VMware virtual machines. VMware facilitated a solution using new hardware while retaining the capability to run older OS versions as business applications dictated. This mitigated the risk of failure of "out of support" hardware, and provided systems with full geographic redundancy. IT Partners provided in-depth knowledge transfer to Aviation Department employees to ensure they had the skills and knowledge needed to reliably manage the new blade server, storage, and VMware infrastructure.

Products Implemented

- HP p-Series blade servers
- HP StorageWorks EVA Storage Arrays
- Brocade SAN infrastructure
- Microsoft Windows Server 2003, Windows 2000, NT 4.0
- HP ProLiant Essentials Rapid Deployment Pack 2.20
- VMware ESX 2.5
- VMware VirtualCenter 1.2