



IT Disaster Recovery: What Happens When “What-If” Happens

BUSINESS GROUP

IT Operations

KEY CHALLENGES

Fully document VMware application and infrastructure interdependencies and business processes to establish a blueprint against which a disaster recovery plan could be tested and implemented.

SOLUTION:

Design and test disaster recovery plan, including fail-over and fail-back, using the cloud for redundancy and incurring no data loss.

BUSINESS BENEFITS

- Successfully execute failover and failback of the production system controlled environment, exceeding the goal for Recovery Time Objective (RTO).
- Implement storage replication technology to automate duplication of data in a failover, supporting and meeting goals for Recovery Point Objective.
- Gain world-class stability and availability for core business processes, services and supporting applications.

VMware’s rapidly growing global business drove the need for an enterprise IT Disaster Recovery (DR) plan to protect corporate assets and prevent loss in the event that any disaster—fire, flood, cyber attacks, earthquake, plane crashes—were to hit one of its data centers.

VMware’s IT Disaster Recovery program strategically combines people, business processes and technology to ensure that a data center failover and failback can occur in production with little or no data loss and with a minimum of business disruption. Replication of application infrastructure and storage is automated through VMware’s own technologies. Cross training of personnel in different locations ensures that IT people are available to respond in a crisis.

The Challenge

While risk is the norm in a globally competitive business, safeguarding corporate assets, information and people in the event of a disaster does not happen by accident. Disaster Recovery planning is increasingly becoming a business imperative in a world experiencing epic fires, floods, tsunamis, earthquakes and, in the case of VMware, even a plane crash.

VMware experienced the unexpected in 2010 when a private plane crashed into electrical power lines near its Palo Alto data center, causing a power outage in the area. In the wake of that event, VMware launched an enterprise-wide Disaster Recovery program, a multi-phase and cross organizational effort that includes business protocols for C-level oversight in the event of a disaster, a business continuity program to ensure that all VMware offices have a plan for unexpected events and an IT initiative for Disaster Recovery.

IT’s Disaster Recovery program leverages a combination of physical, virtual and cloud technologies to ensure that the entire operations of its data centers can automatically fail over to a geographically diverse location if needed.

“Our goal is to ensure we have consistent and standard best practices to guide people in the event of a disaster, be it a natural one, an act of terrorism or cyber attack,” said Alexander Price, Director of Infrastructure and Cloud Architecture. “New data is created constantly, and we must prevent the loss or corruption of any data during a disaster.”

IT began by setting guidelines for the maximum levels of downtime and data loss the business could tolerate in a worst-case scenario. Obviously the goal is zero downtime and no data loss, but understanding that it must plan for catastrophe, IT set its own parameters for two common industry protocols: Recovery Time Objective (RTO), which is the maximum tolerable length of time that an application or its supporting

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infrastructure can be down after a failure, and Recovery Point Objective (RPO), which is the maximum tolerable period in which data might be lost from an IT service due to a major incident. Both these parameters gave IT a set of limits it could design to in terms of Disaster Recovery planning, according to Price.

Auditing Business Processes

The Disaster Recovery (DR) planning process began with a thorough auditing and documentation of all business processes and existing infrastructure, noted Price; to put it simply, before you can ensure that what you have is protected, you must know what you have. One difficulty with starting a Disaster Recovery plan is that there is no legacy practice or single source of truth for the underlying IT structures that store data, Price added. Over the past two years VMware has consolidated its infrastructure as much as possible. The current information architecture involves a single private cloud.

“We needed to understand and document the application and infrastructure interdependencies and business processes before we could architect, design and build a DR plan,” noted Price. “The absence of no clear DR standards in the beginning meant there was no single source of truth, so it was labor-intensive. The consolidation of the past couple of years into a unified private cloud has simplified the architecture and supports our DR program.”

Today the Disaster Recovery program provides automated failover from VMware’s primary data center in Silicon Valley to VMware’s secondary data center in Wenatchee, Washington (WDC). Business processes have been put in place to empower the CIO to define a disaster and declare the move to failover. Protocols guide IT personnel through the escalation of events to notify and keep the CIO informed.

The Solution

Cloud Drives Highly Available, Redundant Application Environment

Today business users can have confidence that IT can protect them against significant loss of data in the event of a catastrophe.

“Cloud enables redundancy by creating a snapshot of the current infrastructure. We are also testing application blueprinting that supports the full automation of application recovery,” said Price.

“As we grow and add new production applications to our environment, they can be replicated in our Disaster Recovery site, and it is completely transparent to the user,” Price continued. “This is a fantastic benefit for business users. We can tell them as soon as their app is in our production cloud that it’s auto-replicated. If needed, we can fail over and back.”

Testing for Disaster Conditions

Disaster Recovery testing takes place in a staged environment that replicates production, said Price. “Today we can’t take the business down, so we simulate the production environment for our many custom applications,” said Price. This includes myvmware.com, vmware.com, all VMware’s license and partner portals, Socialcast, and Perforce— VMware’s source code management application.

When RTO testing was conducted last year, IT was able to complete fail over to production levels in well under the maximum goal and with no data loss. That same testing phase resulted in an RPO time well under the maximum parameter.

For third-party SaaS applications, such as Salesforce.com, only integration components are tested. However VMware requires a documented DR review of all SaaS providers, Price added.

“One of the benefits of using a SaaS vendor is that you externalize your risk for that business functionality and data when it comes to anything happening to your physical facility,” said Price. The risk we manage includes visibility into the health of the business as well as the architecture of the provider – for example, are they geo diverse like VMware?

Disaster Recovery Design

There are three tracks for Disaster Recovery—physical, virtual and cloud—all with failover plans and abilities in place. The early phases of Disaster Recovery planning, conducted in 2012, focused on failover and failback automation technologies, training and organizational change, such as the creation of a new class of “cloud administrators” and changes to architectural governance, provisioning, release management and monitoring, said Sunyo Suhaimi, IT Cloud Transformation program director, who oversaw the initiative until early 2013.

“With both failover and failback automated, the role of IT in a disaster changes in the cloud era,” said Suhaimi. “IT is focused on monitoring and escalating issues to the CIO and generally implementing the Disaster Recovery guidelines to help quickly restore business as usual.”

The DR initiatives were launched during the second phase of VMware’s IT Cloud Transformation program, which advanced the company’s transition to a Software-Defined Data Center and focused on automation wherever possible. In this phase, VMware IT also seamlessly migrated 15 mission-critical applications to a high governance private cloud from a virtualized environment with minimal downtime, Suhaimi said. In testing, administrators were able to scale vertically and horizontally on request, he added. Business agility has been greatly improved by enabling end users to automatically provision multiple, real-time, linked business-critical applications in dev/test environments.

Also during Phase 2, VMware implemented off-the-shelf technologies from VMware as well as Cisco and EMC to create a cloud-enabled disaster recovery solution across data centers to enable deployment of mission-critical applications, according to Suhaimi.

EMC’s Recover Point protects against data loss by restoring applications to a specific point in time. Using heterogeneous array replication, Recover Point provides continuous data protection and multiple recovery points, which help IT organizations to reduce recovery times.

Bi-directional storage replication using EMC’s VPLEX and Recover Point/GEO technologies combine with vMAX to drive high availability. Cisco OTV enables transparent workload mobility at both data centers (Palo Alto and Wenatchee, WA), while VMware’s Site Recovery Manager serves as the orchestrator to move virtual machines to one data center and back.

Business Continuity

But what if the IT people or IT’s business partners have just been flooded out of their workspace?

This is where the Business Continuity (BCP) program comes in, building in redundancy that seeks to prepare companies in the event of a business interruption. In this case, VMware has cross-trained employees in Bangalore and Palo Alto to the point where they can literally take over each others’ jobs, on the assumption that most disasters are regional in scope. IT’s Disaster Recovery program is just one element in VMware’s overall Business Continuity Program, which drives best practices and policies to guide employees in the event of a disaster.

“Business Continuity is a global program that helps us return to business as usual following a business interruption,” said Dawn Grzena, senior manager, Business Continuity Program. “The goal is to ensure that our operations stay as functional as possible during and after a disaster. To prepare, we regularly document critical business processes, update our recovery plans and conduct annual exercises. While IT ensures that our infrastructure remains as available as possible, I start from the assumption that our infrastructure is down and that employees will be implementing manual strategies to keep our customers happy.”

Disaster planning and recovery is, to some extent, part of everyone’s job, noted Price. It’s a kind of “literacy” that eventually is built into all business practices; for instance, IT people are starting to ask SaaS vendors questions about their own DR programs as part of due diligence in the selection process.

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For a rapidly growing global company with assets in the billions, having a mature and tested plan for “what if...?” is a business imperative.

VMWARE ON VMWARE

As the leading proponent of our own products, VMware is committed to passing on the lessons learned by our internal IT group in applying virtualization and cloud management technology to solve business challenges.

