

Better Business Continuity

With VMware Virtual Infrastructure

Business Continuity Challenges

Implementing plans to ensure business continuity for key IT services is an essential requirement for organizations today. Downtime of important applications is a costly proposition and extended downtime can even be fatal—industry research finds that a significant number of companies that experience extended interruption to IT services soon go out of business.

While most organizations recognize the importance of business continuity, their ability to provide high availability and disaster recovery for key applications is often constrained by the following challenges:

- **High costs.** Business continuity solutions become exponentially more expensive as availability requirements increase. Many solutions require significant investment in additional hardware, software and services. Disaster recovery plans in particular often require duplicating data center infrastructure. These requirements drive up the cost of business continuity and result in a proliferation of underutilized servers.
- **High complexity.** Most traditional business continuity solutions add significant complexity to data center environments. Acquiring and managing additional servers, implementing and maintaining specialized business continuity software and developing specialized processes for business continuity all contribute to this complexity.
- **Failure to meet recovery time and availability goals.** Due to the cost and complexity of business continuity solutions, organizations are often forced to compromise on solutions that are unlikely to meet objectives for availability and recovery time.
- **Insufficient reliability.** Testing complex business continuity solutions is challenging and requires significant equipment and personnel resources. The complexity of these specialized solutions also makes them difficult to maintain and makes it harder to ensure that sufficient staff are trained and available when needed.

VMware provides cost-effective, simpler, more reliable solutions for increasing availability and improving disaster recovery so that organizations can implement dramatically better and broader business continuity plans.

Key Benefits

- Reduce downtime due to both planned and unplanned outages.
- Lower cost of business continuity plans.
- Provide high availability for all applications with standard server hardware.
- Share fault-tolerant server, storage and networking hardware between multiple applications
- Simplify infrastructure and processes for business continuity.

Key Building Blocks

- The VMware Infrastructure (Standard) software suite includes the VMware® ESX Server platform to provide virtualization for x86 servers and VMware HA and Consolidated Backup for business continuity.
- Virtual infrastructure management with VMware VirtualCenter provides centralized management of large virtual infrastructure deployments.
- VMware Infrastructure (Enterprise) includes VMware VMotion and Storage VMotion for non-disruptive live migration of virtual machines and virtual machine storage across servers and storage arrays.
- Software tools such as VMware Converter and third-party clustering, backup, recovery and replication software.
- Professional services such as VMware Disaster Recovery and Backup engagement to learn backup and recovery techniques for virtualized environments.

"As well as having a significant cost benefit, basing our disaster recovery infrastructure on VMware software has enabled us to get servers up and running in just eight minutes, compared to eight hours with our previous configuration."

Steve Fountain, IT Director, Markel International

Higher Availability with VMware Virtual Infrastructure

VMware virtual infrastructure software helps organizations increase availability by reducing both planned and unplanned downtime.

Most data center downtime is typically planned. Organizations using VMware software can slash planned downtime by eliminating most scheduled hardware maintenance outages. VMware VMotion™ technology allows IT administrators to move live virtual machines (software containers that hold a complete operating system and applications) from one physical server to another, making it possible to conduct zero-downtime hardware maintenance by moving running applications to other physical servers as needed.

VMware software also helps organizations to reduce unplanned downtime by providing new capabilities and by making existing solutions simpler and more cost-effective. For example, standby servers can be easily created by provisioning virtual machines to underutilized servers without requiring the purchase of additional hardware. Support for servers with multiple network and storage interfaces is built into VMware ESX Server, significantly cutting the cost of fault-tolerance by sharing redundant hardware between multiple virtual machines. VMware Distributed Resource Scheduler (DRS) can reduce unplanned downtime by automating the process of using VMotion to migrate running applications away from servers that cross utilization thresholds.

VMware High Availability (HA) provides easy-to-use, cost-effective high availability for applications running in virtual machines. In the event of server failure, affected virtual machines are automatically restarted on other physical servers that have spare capacity. VMware HA minimizes downtime and IT service disruption while eliminating the need for dedicated standby hardware and installation of additional software. VMware HA provides uniform high availability across the entire virtualized IT environment without the cost and complexity of failover solutions tied to either operating systems or specific applications.

Where 100% uptime in the face of server failures is necessary, VMware software also makes it possible to implement third-party failover clustering solutions less expensively. Cluster nodes from different applications can be consolidated in virtual machines onto fewer servers, providing significant savings in hardware costs. It also provides the flexibility to cluster physical servers with virtual machines or virtual machines with virtual machines.

Figure 1

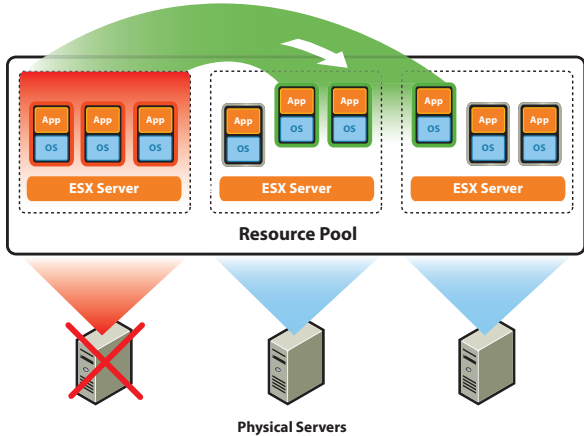
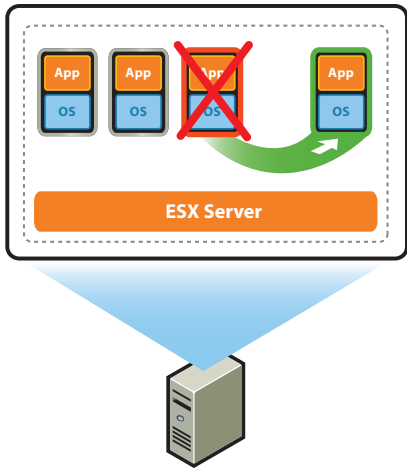
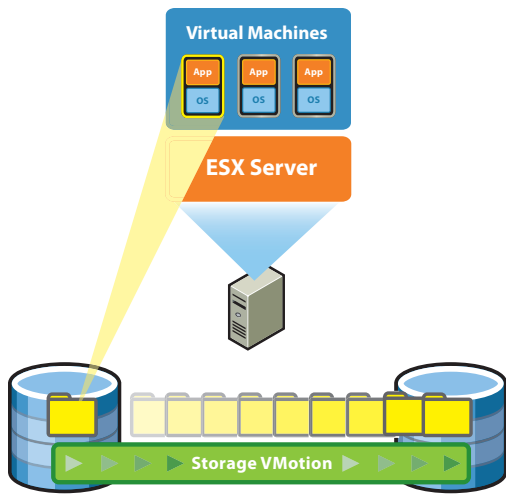


Figure 2



VMware HA protects your business critical applications from host failures (Figure 1), and OS related VM failures (Figure 2) by automatically restarting virtual machines on available hosts.

Finally, to minimize downtime related to storage related operations, Storage VMotion non-disruptively migrates virtual machine disk files on storage. Storage VMotion builds on VMware’s pioneering VMotion technology and provides storage independent movement of virtual machines disks within arrays or across arrays with no impact to applications or users.

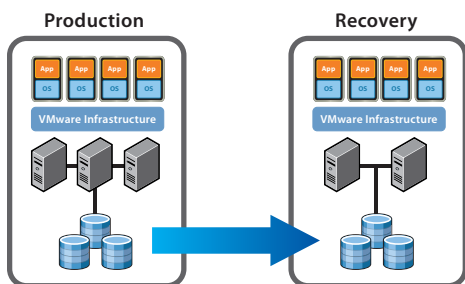


Storage VMotion eliminates storage related application downtime, by providing live migration of virtual machine disk stores within and across storage arrays.

Typical use cases for Storage VMotion include non-disruptive array refreshes, array migrations, improving virtual machine I/O performance, and upgrades to virtual disk formats. Many of these operations typically would take extensive coordination and often require off-lining of applications with sever impact to users.

Better Disaster Recovery with Virtual Infrastructure

Traditional disaster recovery solutions are costly, complex and frequently do not meet recovery objectives. They are costly because they require significant investments in hardware and in specialized software. Recovery frequently requires complex, time-consuming multi-step processes. Meeting recovery time objectives is difficult because of the complexity and cost of advanced solutions.



VMware Infrastructure is a key enabler for cost-effective high availability and disaster recovery

VMware virtual infrastructure provides a solution that makes it possible to implement disaster recovery plans at a significantly lower cost. Traditional disaster recovery plans require that recovery target hardware must exactly duplicate production hardware, effectively doubling hardware requirements for protected applications. In contrast, VMware virtual machines are hardware-independent so any physical server can serve as a recovery target for any virtual machine. Organizations can significantly reduce the cost of hardware for disaster recovery by repurposing underutilized existing servers for recovery targets and disaster recovery testing.

Server backups are much easier to manage with VMware Consolidated Backup. Consolidated Backup provides an easy to use, centralized facility for LAN-free backup of virtual machines. Entire virtual machine disk contents or selected files are backed up from a centralized Windows 2003 proxy server rather than directly from each ESX Server instance. Consolidated Backup lets virtual machines operate continuously with no backup window downtime and backup operations place no processor or network load on the ESX Server installations.

VMware virtual infrastructure also simplifies and accelerates recovery, helping IT organizations meet their time-to-recovery targets. Complex multi-step procedures using specialized software for bare-metal recovery and operating system recovery can be simplified to single-step file recovery because virtual machines are completely encapsulated in a small number of files and can be restored to any hardware. This encapsulation property also makes it possible to use third-party replication software to replicate entire virtual machines to a recovery site, reducing recovery time to just a few hours.

Recently VMware announced VMware Site Recovery Manager a disaster recovery workflow and automation product that simplifies reliable disaster recovery.

Finally, virtual infrastructure enables a more reliable disaster recovery plan. Because it simplifies disaster recovery processes, the ability to meet time-to-recovery targets is improved, testing of disaster recovery plans is simpler, and training personnel in disaster recovery procedures is easier. The hardware-independence of virtual machines also eliminates complications that can arise due to hardware differences between primary and recovery site hardware.

VMware virtual infrastructure enables a better disaster recovery plan whether or not organizations have virtualized their production servers. Physical servers can be recovered to virtual machine recovery targets in a “physical-to-virtual” recovery scenario, providing the benefits of simpler and hardware-independent recovery. Even greater simplicity, reliability, and cost savings can be realized in a “virtual-to-virtual” recovery scenario where virtual machines in production are recovered to virtualized recovery target servers.

Benefits of Business Continuity Solutions with Virtual Infrastructure

Customers who have used VMware virtual infrastructure to improve their business continuity plans have realized benefits including

- **Reduced downtime.** Customers can eliminate much of their planned downtime with a virtual infrastructure solution. They can also prevent and reduce unplanned downtime through economical sharing of fault-tolerant hardware features and automated restart of application servers. Encapsulated virtual machines enable dramatic reductions in time to recovery for disaster scenarios.
- **Lower costs.** Virtual infrastructure makes it possible for companies to implement better business continuity at a lower cost by slashing the need for additional hardware and specialized software.
- **Simplified processes.** Virtual infrastructure removes the complexity of maintaining duplicate physical systems for disaster recovery. It also eliminates and streamlines much of the recovery process.
- **Broader protection.** Because virtual infrastructure reduces the cost of business continuity solutions, companies can cost-effectively increase availability and ensure more rapid disaster recovery for more of their important applications.

Summary

VMware provides proven solutions that are used by 100 of the Fortune 100 companies. Customers of all sizes and industries use VMware software to improve their business continuity plans.

To learn more about how VMware can help you build better business continuity solutions, visit the VMware Web site at <http://www.vmware.com> or call 1-877-4VMWARE.