

15-Minute Guide to
**Effectively Virtualizing
Mission-Critical Applications
with VMware**



Effectively virtualizing mission-critical applications with VMware

If your organization is like most, you already know that virtualization can help you significantly reduce both capital and operating expenditures—and enable you to more effectively respond to changing business needs. As the tough economy forces companies to cut costs and strive to improve efficiencies, the case for virtualization becomes that much more compelling. Moreover, C-level executives are upping the pressure on IT to accelerate virtualization efforts in order to more quickly realize cost savings.

However, expanding the virtualization environment to meet business demands requires organizations to virtualize mission-critical (Tier 1) applications. This requires a robust set of technologies that helps all elements of a virtual infrastructure work in concert to deliver greater flexibility, availability, and cost savings—as well as new skill-set combinations within the organization. But given the hectic pace with which technologies change, it's quite difficult for most in-house IT staff to stay current with the latest tools and solutions. Organizations must realign skill sets and fill any knowledge gaps with vendor support and tools that help minimize risk and accelerate deployment.

As the gold standard in data center virtualization technologies, VMware® provides a broad portfolio of capabilities that organizations can leverage to maximize the value, efficiency, and effectiveness of their virtualization initiatives. VMware offers tools that address your needs at every point in the virtualization lifecycle—from adoption and planning, to deployment, implementation, and management—to help you quickly provision new mission-critical applications and improve capacity utilization in your organization.

EMC provides reference architectures and best practices based on well-tested configurations that encompass a wide range of scenarios. This guide discusses the best way to virtualize mission-critical applications with VMware technology—and how EMC's holistic view of the data center, strong integration with VMware, and broad portfolio of solutions, tools, and reference architectures can help get you there faster.

Building the right virtual infrastructure for mission-critical applications

No IT organization should trust its mission-critical applications to an untested set of technologies. EMC recognizes this and understands that it is not enough for a vendor to simply say its solutions work together. Instead, a vendor must prove its technologies can solve customer problems in such areas as backup and archiving, security, management, and business continuity.

EMC provides validated solutions that help organizations more quickly and efficiently virtualize mission-critical applications. These solutions help identify challenges and offer best practices developed to address the following areas of customer concern:

- Designing the virtual environment
- Ensuring business continuity (BC)
- Managing operations in a dynamic environment
- Backing up and archiving solutions for a consolidated environment
- Ensuring security and compliance

EMC® Proven® Solutions are validated combinations of EMC, VMware, and third-party technologies that enable customers to reduce virtual infrastructure configuration time by more than 65 percent and deployment time by as much as 50 percent; reduce e-mail archiving volumes for Microsoft® Exchange® Server 2007 by more than 85 percent; enable full-scale disaster recovery rehearsal without interruption to SAP production data; and reduce CPU cycles and improve resource efficiency for Oracle in virtual environments.

EMC's Solution Stack

Virtual Infrastructure

Management

Backup and Archive

Security

Designing the virtual environment

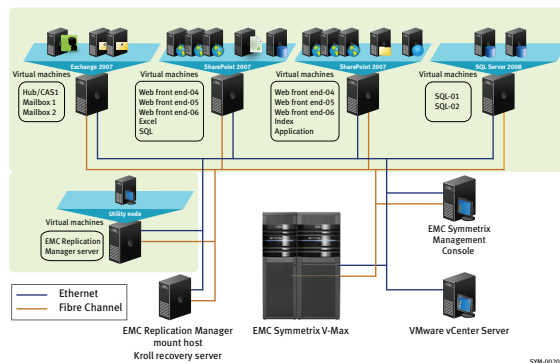
EMC Proven Solutions for VMware integrate our best-in-class products with technologies from leading vendors to create validated solutions for VMware environments. These configurations are tested for performance, scalability, and interoperability to ensure predictable performance with very little risk. Leveraging these solutions helps your organization accelerate the deployment of mission-critical applications in VMware environments—which enables you to realize value faster.

Because any delay in bringing mission-critical applications to production—or utilizing the infrastructure designed to support these applications—reduces return on investment (ROI) and increases total cost of ownership (TCO), you need to get them up and running as quickly and effectively as possible. With EMC Proven Solutions for VMware, you can do so with technologies that enable you to safely, quickly, and effectively deploy mission-critical applications, reduce costs, and help drive revenues for your business.

EMC Proven Solutions for VMware demonstrate the best practices and established implementation models EMC has developed for mission-critical applications such as Microsoft Exchange Server, Microsoft SQL Server®, SAP, and Oracle—which help speed the deployment of your Tier 1 applications while reducing risks and lowering costs.

EMC Proven Solutions for VMware represent best-in-class products and services in a suite of hardware and software combinations that have been pre-tested and validated for VMware environments, resulting in high-performance, low-risk implementations.

Figure 1:
With EMC Proven Solutions for VMware, you can leverage validated implementation models that speed deployment and ensure a faster time to value.



Ensuring business continuity

Developing a business continuity strategy helps ensure the ongoing availability of your virtual infrastructure—and the mission-critical applications deployed within it. Just like in a physical environment, a business continuity strategy in a virtual infrastructure is defined by its recovery point objectives (RPOs) and recovery time objectives (RTOs)—the documented point in time to which an application must be restored and the timeframe for the recovery process.

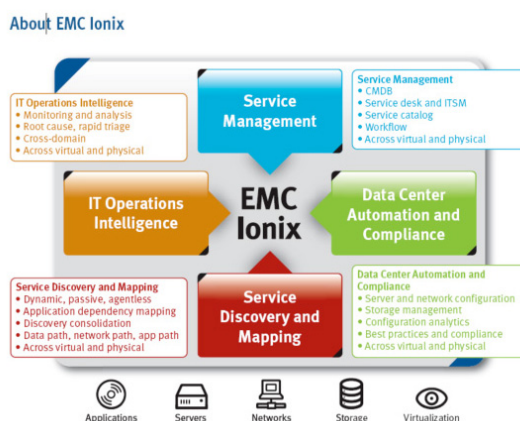
Deciding to virtualize your mission-critical applications should help you both simplify and strengthen their recoverability—so they can more closely align with the established RPOs and RTOs. And with the right technologies supporting your business continuity strategy, your organization will be well positioned to bolster the uptime, availability, and resiliency of the mission-critical applications deployed in your virtual infrastructure.

EMC snapshot software provides the ideal protection for mission-critical applications. By taking instantaneous, operating system- and application-consistent, point-in-time snapshots of virtual machines, snapshot technology enables you to quickly recreate any corrupted virtual machine—without significant data loss or negative performance impact. In this way, EMC snapshot software becomes a cornerstone of any business continuity strategy aimed at protecting mission-critical applications in a virtual infrastructure.

Likewise, VMware vCenter™ Site Recovery Manager gives your organization a framework in which to orchestrate the failover of virtual assets in a consistent fashion. Site Recovery Manager helps you develop reliable disaster recovery measures that eliminate complex, error-prone manual steps, accelerate recovery times, and recover critical processes and applications in a logical order that delivers consistent data. EMC storage and replication platforms support Site Recovery Manager across protocols, helping to ensure that your business continuity measures tightly align with your storage strategies.

And with EMC RecoverPoint, you gain continuous data protection and remote replication capabilities that deliver on-demand recovery of application data at any point in time. RecoverPoint enables you to simultaneously recover multiple virtualized components—such as a set of database applications—keeping data consistent and intact when the assets regain activity. In addition, because RecoverPoint enables you to recover from a point in time 60 seconds prior to corruption, you'll be better positioned to minimize data loss and meet your organization's RPOs and RTOs.

Figure 2:
The EMC Ionix software family helps you effectively manage the full virtual and physical data center ecosystem across networks, storage systems, servers, and applications, as well as the IT services that rely on these infrastructure elements.



Managing operations in a dynamic environment

Moving from a physical to virtual (p-to-v) environment simplifies the process of bringing new applications online—and addressing emerging business challenges with timeliness and agility. Yet, it also requires high levels of visibility that enable management teams to see the relationships and interdependencies between virtual and physical servers, network resources, and storage systems.

With a robust management framework that works across virtual, physical, network, and storage areas, your organization can leverage the powerful features of virtualization to quickly provision its mission-critical applications as business needs dictate.

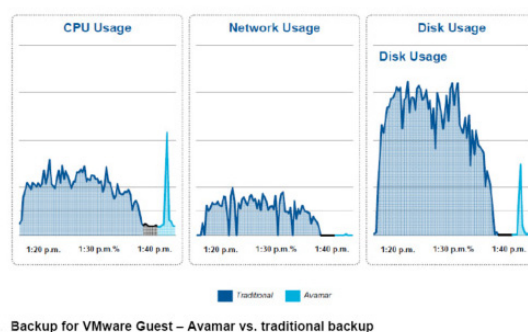
EMC Navisphere® Management Suite enables your storage team to manage, discover, monitor, and configure your EMC storage systems from a web browser, allowing them to leverage robust storage resource, SAN, and replication management functionality anytime, anywhere. What's more, Navisphere integrates with the EMC Ionix™ family of IT management products, providing a comprehensive set of resource management capabilities that help you optimize storage processes in your virtual infrastructure. For example, EMC Ionix ControlCenter® solutions deliver greater visibility into resource consumption across the storage infrastructure, helping you improve capacity management and ensure that all mission-critical applications have the right amount of resources dedicated to them.

In addition, Ionix Unified Infrastructure Manager simplifies and centralizes the provisioning, configuration, change, and compliance management activities in EMC Vblock Infrastructure Packages—integrated networking, security, and storage solutions comprising EMC, Cisco, and VMware technologies—via an intuitive dashboard-base management view. By consolidating management processes in this way, Ionix Unified Infrastructure Manager helps you manage your Vblock Infrastructure Packages more efficiently and effectively.

Helping you automate processes for greater effectiveness and easing your transition to a private cloud, EMC's new Ionix IT management services leverage Information Technology Infrastructure Library (ITIL) and IT Service Management (ITSM) principles and best practices for both physical and virtual environments.

And to further simplify storage management in a virtual environment, EMC RecoverPoint includes a unique management view that helps you see how your applications map to a virtual world. This functionality seamlessly integrates with VMware vCenter, enabling it to perform the necessary p-to-v mapping and centralize views of p-to-v relationships—all while minimizing the resources needed to perform this function.

Figure 3:
Use Avamar deduplication technology during full backups to significantly minimize impact on shared resources—when compared to traditional backup methods.



Backing up and archiving solutions for a consolidated environment

The process of backing up your virtual infrastructure is quite similar to the methods you employ to secure your physical resources. In each case, you must pay close attention to how the volumes of data you back up affect your organization's computing resources. However, as you deploy more virtual machines and virtualize a greater number of mission-critical applications, the vast amount of virtualized data you back up can affect the performance of CPU, memory, I/O, and network components. Fortunately, EMC offers powerful deduplication technologies that lessen the strain backup processes place on your valuable computing resources.

EMC Data Domain® deduplication storage systems align with the backup and archive needs of the mission-critical applications in your virtual infrastructure. With Data Domain products you get advanced deduplication capabilities that eliminate the high degrees of redundancy common among virtual data files. So you can minimize your storage footprint, ease network traffic, and enhance your disaster recovery readiness—all while freeing computing resources for other business initiatives.

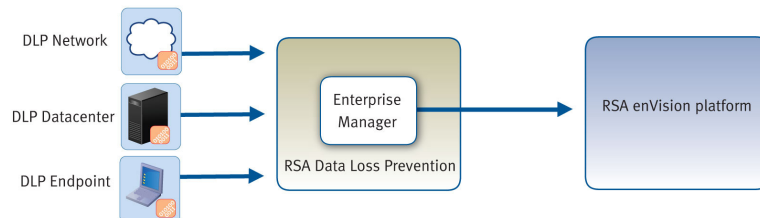
And EMC Avamar® backup and recovery solutions utilize patented global data deduplication technology to identify redundant data at the source—minimizing backup data before it is sent over the LAN/WAN. Avamar Virtual Edition for VMware, a fully virtualized backup and recovery solution developed for VMware virtual infrastructures, reduces the size of backup data within and across virtual machines—before it travels across the network to be stored. Avamar Virtual Edition for VMware helps you unburden underlying hardware resources in your virtual infrastructure and experience significant increases in backup performance.

Ensuring security and compliance

Many of the security challenges faced in a virtual infrastructure are similar to those in physical computing environments. One advantage of virtualization technology is the ability to provide not only physical separation of secure resources, but also logical separation at the virtualization layer. This simplifies the ability to secure mission-critical applications. However, certain aspects of virtualization, such as virtual desktop implementations, require specific considerations and make the need for security measures developed expressly for virtual infrastructures quite important.

VMware VMsafe™ helps protect your virtual infrastructure by providing fine-grained visibility over virtual machine resources. This enables you to monitor every aspect of the system and stop viruses and malware before they damage your mission-critical applications and data. Moreover, a unique application program interface (API)-sharing program enables you to develop security products for VMware environments—for an open, customizable approach that provides a secure platform tailored to your virtual infrastructure.

Figure 4:
The RSA DLP Suite gives you insight into the risk status and trends of sensitive data in your enterprise—based on policies—regardless of whether the data resides in a data center, on a network, or out at the endpoints.



And many technologies from RSA®, The Security Division of EMC, seamlessly integrate with VMware environments, to help you more effectively protect your mission-critical applications. RSA products and solutions leverage leading encryption, dual-factor authentication, and data loss prevention capabilities that work in concert to help you identify sensitive data, know where it resides, and set the appropriate controls based on organizational risk-control policies. So you can develop a comprehensive security framework that protects data throughout its lifecycle.

Specifically, the RSA Data Loss Prevention (DLP) Suite enables you to adopt a policy-based approach to securing the sensitive data produced by your mission-critical applications. The RSA DLP Suite classifies and discovers this data across your enterprise, helping you more effectively enforce controls, produce reports, conduct audits, and ensure that data protection complies with organizational policies.

With the RSA enVision® platform, your organization gains an effective security and information event management (SIEM) and log management solution that monitors data and provides alerts in real time—helping you quickly and decisively respond to high-risk security events. And when integrated with the DLP Suite, enVision helps you achieve a single-pane-of-glass view for recognizing, investigating, and responding to security events.

And RSA Authentication Manager helps you address the growing need to validate user identifications and secure valuable corporate information by centralizing the administration of authentication policies across your organization. The power behind the RSA SecurID® product, Authentication Manager supports millions of users and hundreds of simultaneous authentication requests and interoperates with more than 300 networking products and applications right out of the box—helping you seamlessly scale your authentication processes as your operations expand.

Getting started: success criteria

As previously shown, effectively virtualizing a mission-critical application means you must consider a multitude of factors. Unlike smaller, Tier 2 applications, which can often be virtualized in a self-contained manner, virtualizing Tier 1 applications requires a holistic approach that involves a greater number of people, processes, and technologies. To ensure your large-scale virtualization initiative delivers the expected results, it's important to first examine your existing infrastructure to understand how current hardware and software configurations—as well as such factors as storage space and network bandwidth—will be affected by the process of virtualizing mission-critical applications.

1. Take stock of your infrastructure. By performing this initial examination of your current infrastructure, you'll be able to determine which components can readily support your new business and technical requirements, and which ones may need an update or upgrade.
2. Align processes for a virtual world. Based on your infrastructure assessment, you'll be poised to align policies and processes to a virtual world—and address such factors as information and application availability requirements and whether or not you'll need a test and development environment.
3. Retool your backup strategy. As you begin to develop operating procedures for your virtual infrastructure, one primary area of focus should be your backup strategy. With numerous virtual machines residing on a single server, you have to schedule and manage multiple, concurrent backup jobs per server. And because virtual infrastructures promote high levels of resource utilization, network bandwidth is most likely at a premium—putting significant emphasis on backup measures that effectively secure data while minimizing disk space consumption.
4. Broaden your management view. Virtualizing mission-critical applications also necessitates a management methodology that accounts for both physical and virtual components in a single view. The silos that persist in a physical world will only hinder performance as more and more applications are virtualized—in part because they fail to provide the visibility needed to understand the interdependencies among virtualized components across the organization. By adopting a broader, more holistic management perspective, you will be better positioned to track resource consumption across your virtual infrastructure and plan resource allocations accordingly.

5. Look for ways to minimize risk. Finally, as you undertake the process of deploying mission-critical applications, it's important that you minimize risk wherever possible. To that end, EMC Proven Solutions for VMware leverage a host of best practices and the experience gained from successful implementations in VMware environments to help you easily deploy a storage architecture that effectively protects the availability of virtualized applications.

Proven solutions, demonstrated expertise

Working with EMC to deploy your mission-critical applications in a VMware environment will help you realize the value of virtualization across your organization—and enable you to speed deployment times, increase flexibility and reduce risks and costs in the process. With over 400 VMware certified professionals on staff—each of whom boasts an exceptional combination of data center experience and VMware expertise—EMC is uniquely positioned to provide you with the strategic guidance you need to effectively virtualize your Tier 1 applications.

For example, EMC consultants can help you develop the strategies, business cases and roadmaps that will guide your transition from a physical to virtual infrastructure in a way that lowers capital and operating expenses, improves service levels, and delivers greater flexibility.

And with 99 proven solutions developed around virtualization, EMC delivers the technologies you need to develop, build, manage, and maintain the right environment for your most mission-critical applications.

15-Minute Guides to:

Efficient IT for SAP:

<http://www.EMC.com/collateral/hardware/pocket-guide/h1308-sap-web.pdf>

Extending the Capabilities of Microsoft Exchange Server:

<http://www.EMC.com/collateral/software/15-min-guide/h6692-ms-exchange.pdf>

Building Efficient Infrastructures for Microsoft SharePoint Server:

<http://www.EMC.com/collateral/software/15-min-guide/h6561-15min-sharepoint.pdf>

Take the next step

For more information on how you can leverage EMC's expertise and proven solutions when virtualizing mission-critical applications, visit <http://www.emc.com/solutions/application-environment/vmware/vmware-and-mission-critical-applications.htm>.



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