

Overview.....	2
What is the Virtualization Barrier?.....	3
Why Should Enterprises Care.....	4
Repeatable Practices for Moving Virtualization Forward.....	4
Use Case: Running Your Database in the Cloud.....	6
Conclusion .....	7
About Zenoss.....	7
About Hosting.com.....	8

## Breaking Through the “Virtualization Stall” Barrier

### Accelerating the Value and Penetration of Virtualized IT

Cost savings and increased server utilization have long been the promise of virtualization. While most organizations initially embraced virtualization for its benefits in saving money and improving IT productivity, business agility and server consolidation, research shows that organizations that lack adequate human and technical resources are experiencing a phenomenon known as “virtualization stall” (or VM stall), which limits their utilization of virtualization to approximately 30% of their servers. By breaking through the virtualization stall barrier, companies can realize the benefits a full-scale virtual environment has to offer.

In this white paper, you will understand the technical and management challenges that have created VM stall, and how combining the right human and technical resources can help businesses accelerate the value and penetration of virtualized IT.

# Overview

Cost savings and increased server utilization have long been the promise of virtualization. While most organizations initially embraced virtualization for its benefits in saving money and improving IT productivity, business agility and server consolidation, research shows that organizations that lack adequate human and technical resources are experiencing a phenomenon known as “virtualization stall” (or VM stall), which limits their utilization of virtualization to approximately 30% of their servers. By breaking through the virtualization stall barrier, companies can realize the benefits a full-scale virtual environment has to offer.

Businesses that have successfully virtualized low-risk, low-impact systems often run into new challenges when taking the next step to convert high-risk, higher-impact business-critical applications. These systems often are at the heart of a company’s business operations, and there is typically little to no tolerance for application outages or performance degradation.

Virtualization of these applications requires organizations to implement the appropriate technology, management tools and expertise to effectively manage and support them. Until they do, most business owners will not move forward with virtualization deployments on their mission-critical applications.

For businesses that have launched their virtualization programs but now find themselves stuck in the virtualization stall, not moving forward with their deployment significantly limits their ability to reap the benefits promised by virtualization, including increased IT efficiency, security, reduced energy consumption and costs, and the ease of configuring and managing servers. While many believe virtualization stall is simply part of the maturation process, studies suggest that leveraging management tools can help companies avoid the VM stall.

Organizations looking to break through the virtualization barrier need to address three primary issues preventing wider scale virtualization:

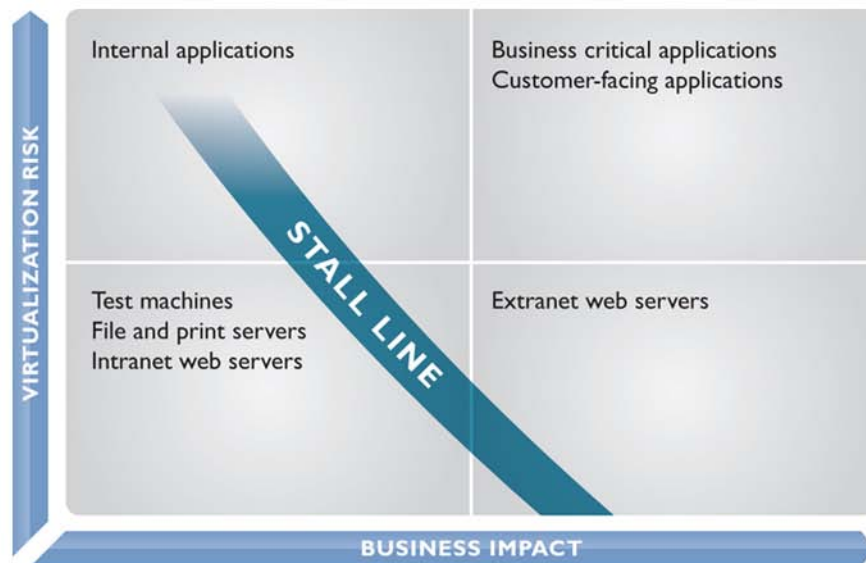
- **Risk aversion** – Companies need increased visibility into their virtualized applications and hardware to identify and respond to any problems before they occur and minimize risk
- **Efficient management tooling** – Point tools are simply not sufficient when managing virtualized mission-critical applications
- **Skilled virtualization resources** – Companies should leverage services that increase virtualization expertise for their staff.

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# What is the Virtualization Barrier?

In an effort to consolidate their servers, organizations start by virtualizing their low-risk, low-impact systems. These Web servers, file servers, internal applications, and test machines generally make up about one-third of the total number of servers. Low-impact servers don't require 100% control over how the data is moving from host-to-host. These systems deploy quickly and without fuss, winning over IT and business owners, who then set loftier goals for virtualizing more business-critical applications. However, in the next stage companies begin to realize that virtualizing mission-critical systems is very different than low-risk, low-impact systems because they require higher levels of expertise and technical resources to deploy and manage the applications. While enterprises recognize the financial benefits derived from virtualization, they simply aren't comfortable virtualizing their most critical applications due to the complexity and urgency of the data and the applications' functions.

A phenomenon known as "virtualization stall" (see diagram below) hits many organizations around 30% into deployment, as Forrester Research recently confirmed when it found the average enterprise has virtualized only 30% of their servers.



While there are many reasons why organizations have difficulty getting past the virtualization stall barrier, three reasons stand out:

- Risk aversion
- Efficient management tooling
- Skilled virtualization resources

These items taken together combine to limit the benefits organizations could obtain from virtualization. Is your business stuck at this virtualization barrier? Here are some indicators that an organization is experiencing virtualization stall:

- Restrictions on the use of virtualization
- Unable to fill virtualization management positions
- Cloud projects are delayed because of virtualization management limitations
- Concerns expressed about meeting internal or external SLAs if virtualization is expanded

# Why Should Enterprises Care?

If enterprises aren't missing out on any significant benefits, then why should they care? The answer is simple: Organizations stuck in the virtualization stall are unable to realize the full scope of benefits that a fully virtualized enterprise can provide, including:

- **Direct cost reductions** – Data centers continue to spend billions annually on power and cooling alone. A highly virtualized environment reduces the datacenter footprint, which can drive down energy costs by 80%. As a result, companies do not have to bear the growing costs associated with purchasing and maintaining additional hardware that is no longer needed.
- **Performance improvements** – Both development and IT increase environment predictability and speed of deployment of new resources. As your virtualization deployment grows, companies have more visibility and control over their dynamically changing environments. This allows them to improve the overall performance and availability of their IT services.
- **Security** – A more predictable and securely tuned environment is possible with virtualization. With solid adoption across the computing, storage and network layers, a strong security architecture that leverages tools that work in the virtual platform can protect applications and data across the entire enterprise.
- **Flexibility and agility** – Cloud services and virtualization go hand in hand. A highly virtualized infrastructure is typically the first step toward deployment of an on-demand cloud computing environment because it changes the operating structure and the way business processes are enabled. This is why a virtualization strategy is essential to fully tap public or private cloud potential.

## Repeatable Practices for Moving Virtualization Forward on Mission-Critical Servers and Applications

For organizations to gain the full benefits from a virtualized environment they must look to address three key barriers to the expansion of virtualization: risk, management tools, and expert resources. The following repeatable practices reduce risk, identify requirements for virtualization ready tools and virtualization experts, and help ensure success as your organization moves to broader deployment of virtualization.

### Staff Appropriate Resources Who Understand Virtualization

A key to expanding virtualization within your organization is employing an expert staff experienced and versed in virtualization deployment and management of business-critical servers and applications. One of the major roadblocks companies run into is the ability to manage significantly more servers. For example, in the physical world, a typical organization's admin-per-server ratio is one admin per 10 servers. In a virtual world, that ratio can instantly jump to one admin per 1,000 servers. For businesses that lack the necessary skill sets and ongoing training in virtualization, simply buying virtualization out of the box will only take them so far.

Finding experts in virtualization isn't always an easy task. Employing or contracting with experts in virtualization can provide organizations with the skill sets and staffing needed to keep their programs moving along. Managed services and co-location hosting providers like Hosting.com uniquely provide businesses with a team of engineers and operations professionals all certified within the virtualization technologies (VTCS) to consult, design, manage and support virtualization environments. They've also developed close relationships with EMC, VMware, Dell, HP, and other leading providers to build the virtual architecture. Using these services helps augment your staff with resources that would otherwise be unavailable or too costly, as well as reduces the risk of deploying virtualized assets.

Your IT staff and extended team should be intimately familiar with implementing appropriate business processes for ensuring the success of your virtualized resources.

**Provisioning** – Deployment of new virtual machines should be automated and predictable

**Monitoring** – There should be a standard process for monitoring virtualized resources and identifying indications of problems

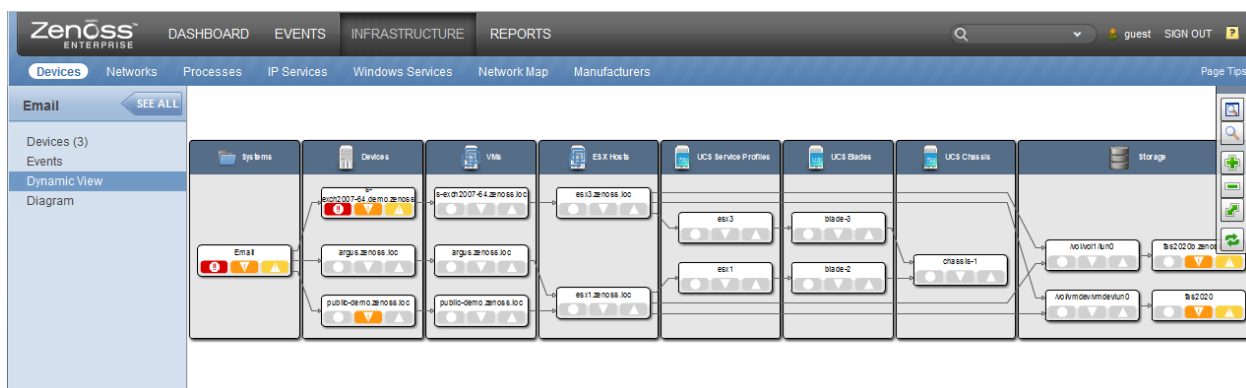
**Maintenance and Troubleshooting** – Your team should be familiar with using appropriate tools to identify areas for maintenance and addressing any pending problems

**Disaster recovery** – Your team should be able to quickly respond and address any outage or degradation of performance of your critical virtualized resources

## Map and Identify Your Key Virtualization Metrics

Unless an organization has a real-time IT infrastructure that allows them to monitor all the dynamic changes going on within their virtual machines on a moment-by-moment basis, they will never be able to track what's going on within their environment or have an accurate read on the performance and availability of their systems. This is the big issue most business application owners ask themselves when it comes to moving virtualization forward on their mission-critical applications. Enterprise IT management companies such as Zenoss provide comprehensive monitoring solutions for VMware enterprises, allowing businesses adopting virtualization to:

- Automatically take inventory of all VMware infrastructure components including virtual machines, ESX servers, clusters and data stores
- Monitor performance of all virtual machines including memory, disk and CPUs
- Track applications from packaged applications to custom applications or middleware
- Track network usage and availability
- Identify and resolve storage performance issues



Having real-time access to these metrics (see above) is critical to reducing the risk associated with deploying critical applications in a virtualized environment.

## Unify Your View of Virtualized Resources

When companies start to expand virtualization on their mission-critical servers and applications, they need to think about their organization differently. Point tools for monitoring applications, and operating system resources and servers, don't make the connection between these resource dependencies and often fail to provide advanced warning of problems. Point

tools also fail in helping current staff develop virtualization expertise as some completely fail to take virtualization into account and others provide only minimum expertise.

The enterprise processes need to mature to and provide a unified environment that ensures real-time visibility into all virtual machines so that all staff experts can see exactly what is running on all servers at any given time. This is a major challenge for businesses that lack virtualization expertise and use legacy point tools.

Breaking the virtualization barrier requires the ability to have the dynamic mapping and understanding of what a changing configuration looks like at any moment in time. To ensure complete visibility into a virtual and physical infrastructure requires the right monitoring tools that enable businesses to:

- Identify key resources and utilization metrics to increase server utilization and optimization
- Understand resource dependencies to help identify and resolve misconfiguration or storage performance issues
- Create a unified view of managed resources critical to improving the performance, security and availability of a dynamically changing environment
- Real-time detection when virtual machines move from one host to another
- Automatically maintain linkages across virtual host and storage device boundaries

This comprehensive view of the environment will help increase and spread virtualization knowledge among existing staff. Experts in each discipline will be able to see how changes in their area of expertise are reflected through the virtualization layer into application performance and adjust their knowledge and behavior for better results.

As we've established, breaking the virtualization barrier cannot be done simply through the technology behind it. The right tools combined with the right team that has virtualization expertise is essential to make it work. Companies would love nothing more than to increase their virtualization footprint because of the significant cost, efficiency and security advantages it provides. Employing the right tools and team can reduce the risk of these deployments and help businesses break through the virtualization barrier.

## Use Case: Running Your Database in the Cloud

For companies considering deploying mission-critical applications into a virtualization or cloud environment, their primary concerns are around supporting the load of their virtual machines. While aversions are largely based on risks, manageability and skill-gap issues, advancements in virtualization, growing skill sets, and the interconnectivity between virtualized servers and the storage equipment now enable the cloud to be a secure environment for databases.

Many of the same reasons virtualization took off in data centers are why virtualization is a good match for the cloud -- it provides better utilization of their existing physical resources and has significant advantages. For example, in order for cloud computing to deliver IT services on-demand and elastically, virtualization provides the flexibility needed for applications to run on-demand and move from a one location to another within a single data center or between multiple colocation facilities. Virtualization also enables the cloud to scale IT services in or out, allowing businesses to lower costs in a more controlled and predictable incremental payment model based on usage or service levels.

A good example of delivering business-critical databases in the cloud is the partnership of Hosting.com and Zenoss. The tools provided by Zenoss combined with the expertise and operational processes of Hosting.com enable them to provide cloud-based managed database services with comprehensive monitoring capabilities to ensure high availability, security and performance and meet aggressive customer SLAs.

With Hosting.com managing the provisioning engine, dedicated customers can choose from a variety of data platforms such

as Microsoft SQL Enterprise or Standard, while taking advantage of the many benefits around flexibility, no upfront investment in infrastructure, and the scaling of multiple virtual machines without the additional SQL licensing costs.

Other key advantages of deploying a database into a cloud include:

- Maximum efficiency
- Optimized resource utilization and automation, leading to increasingly low-cost delivery
- Increased agility
- On-demand nature in a self-service environment dramatically increases responsiveness to business demands
- An approach that empowers end-users through managed IT service delivery, defined Service Level Agreements, and putting the business back in charge of its destiny
- Better recovery times in the case of server failure. With dedicated servers failure recovery can take days while virtualized environments can automatically move application workloads to other nodes in a matter of minutes.

The bottom line is, today's technology and available expertise can enable any company to move their mission-critical applications to a virtualized environment, whatever the application. As companies reach the VM stall barrier, they can choose to augment their existing internal virtualization solution with an outsourced cloud by managing what they can, internally, and outsource to a federated cloud the pieces that are out of the scope of their resources and capabilities.

## Conclusion

While many organizations have virtualized their low-risk, low-impact applications, a number of factors including risk aversion, inappropriate tools and inadequate resourcing are conspiring to stall or stop further virtualization deployments on their mission-critical systems. While business owners understand the operational and financial benefits of virtualization, there continues to be a reticence on the part of business owners who aren't comfortable moving forward until they have the right human and technical resources that can assure reliable service to their business-critical applications.

Breaking through the 30% virtualization barrier requires the combination of a skilled virtualization proficient team with the adoption of appropriate enterprise ready management tools and business processes. Hosting.com and Zenoss are working together to provide businesses with the expertise and real-time IT infrastructures needed to monitor their dynamically changing virtualized and cloud environments, and make changes to highly mobile systems. Only then will businesses be able to break through the virtualization barrier, and start to accelerate the value and penetration of virtualized IT.

## About Zenoss

Zenoss is the leading provider of Dynamic Service Assurance to the next generation datacenter. Zenoss Enterprise is a purpose-built Dynamic Service Assurance product that assures IT service delivery to applications, business services and real-time physical, virtual and cloud-based infrastructures. With a community of over 85,000 users, Zenoss products monitor over one million network and server devices daily and have been used in over 25,000 organizations in 180 countries around the world. Commercial customers include leading companies such as Rackspace, VMware, LinkedIn, Carlson, Motorola and Deutsche Bank. To learn more about Zenoss' award-winning IT operations management software, visit [www.zenoss.com](http://www.zenoss.com).

# About Hosting.com

Hosting.com is a global provider of enterprise-class IT infrastructure solutions, services and facilities. Hosting.com's geographically-dispersed data centers and Cloud Super Sites coupled with the industry's top networking and connectivity technologies provide clients with the highest levels of security, reliability and support. The most recognized names in Retail, Financial Services, Healthcare, Government, Technology and Web 2.0 rely on Hosting.com's colocation, cloud hosting, dedicated and managed hosting solutions. To learn more about Hosting.com, visit [www.hosting.com](http://www.hosting.com).