

# Best Practices for Streamlining Administration in Heterogeneous Virtualized Environments

Overcoming Management Challenges so You Can Unlock  
the Potential of Multiple Virtualization Platforms

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## Executive Summary

IT teams looking for robust, enterprise-grade virtualization platforms can now choose from VMware, Red Hat Enterprise Virtualization, Microsoft Hyper-V and others. Consequently, more organizations are looking to run multiple virtualization platforms. While monitoring and managing performance in virtualized environments has traditionally presented a range of challenges to IT administrators, those challenges are exacerbated in environments running multiple virtualization platforms. This paper looks at how heterogeneous virtualization environments are growing more common in today's organizations, and it offers a set of best practices administrators can use to efficiently and effectively manage performance in these environments.

## Introduction: The Increasingly Complex and Critical Nature of IT

To compete effectively, it's critical for businesses to wring the most value and performance out of their IT infrastructures. As a result, IT environments continue to become more virtualized, dynamic and business critical. Thus, leveraging monitoring to ensure uptime grows increasingly vital.

At the same time, IT teams continue to be asked to do more with less, contending with supporting an ever more diverse infrastructure, without adding resources. In many organizations, disparate groups continue to manage different platforms in isolation, for example, with one team supporting Windows platforms, while another is responsible for Linux/UNIX.

In order to meet their organization's efficiency and budgetary mandates, the individuals in IT teams tasked with monitoring will increasingly be asked to support a more diverse mix of platforms and system types. Further, today's IT environments are increasingly intertwined, running on a diverse mix of technologies and platforms, both inside the traditional data center, as well as in external hosted and cloud deployments. To effectively support their demanding and complex environments, IT teams can't continue to take a silo-based approach to monitoring each technology, platform and service.

To respond to their emerging requirements, administrators need a central, efficient way to track, control and optimize availability and performance—and to do so across all the organization's vital business services.

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## The Changing Nature of Virtualization

### Virtualization Increasingly Coming to Linux Platforms

In recent years, the use of virtualization in Linux environments hasn't spread as rapidly as it has onto other platforms. There are a couple key reasons for this:

- **High stakes.** Linux servers are often relied upon to host an organization's most critical applications, including ERP, CRM and more. Consequently, and understandably, organizations have taken a more cautionary approach to virtualizing these systems.
- **Highly utilized.** A non-virtualized Windows platform, which typically supports a single application, may commonly run at 5% of capacity. On the other hand, Linux platforms tend to be more highly utilized, running multiple applications. Consequently, the return on virtualization investments in Linux environments hasn't traditionally been as compelling as in Windows environments.

However, as IT teams seek to support agility and efficiency demands and emerging cloud initiatives, it will become an increasingly critical and common requirement to virtualize Linux platforms.

## Not So Homogenous: The Increased Adoption of Multiple Virtualization Platforms

In prior years, most organizations running virtualization have done so using a single platform. Today, we're starting to see a different picture emerge. As organizations' use of virtualization grows more widespread, and indispensable, management is also starting to become leery of being inextricably bound to a single vendor, concerns that can be exacerbated as a vendor institutes large cost increases.

Further, there are more, and more sophisticated, options available to organizations today than in years past. Today, IT teams looking for scalable, robust enterprise virtualization platforms can choose from a number of viable alternatives, including VMware, Red Hat Enterprise Virtualization, Microsoft Hyper-V and others. However, adoption of multiple virtualization platforms has been inhibited by concerns around administration. As an organization begins to deploy and support multiple virtualization platforms, IT teams confront significant challenges in terms of administrative complexity and effort. Without effective tools and approaches in place, these challenges can inhibit broader virtualization platform adoption. In the following sections, we look at some key approaches for overcoming these obstacles.

## Best Practices for Managing Heterogeneous Virtualization Environments

As organizations more frequently deploy virtualization in Linux environments, and adopt heterogeneous virtualization platforms, the demands on IT grow more intense. First, ensuring optimal availability and performance grows increasingly critical. Second, the monitoring and management demands of these heterogeneous virtualized environments can present a significant increase in administrative overhead to an IT organization that is already stretched thin.

These demands also grow more pronounced for the cloud, hosting and managed service providers that serve today's businesses. As they look to support their client base, the need to efficiently manage multiple virtualization platforms will become an increasingly essential business mandate.

In the following sections, we provide three best practices for accommodating the demands of heterogeneous virtualized environments.

### Best Practice #1: Ensure Deployment Efficiency in Dynamic Virtual Environments

Given the dynamic nature of virtualized environments, businesses need to automate as much as possible and battle inefficiencies arising from the sprawl of virtual machines across an organization. This is vital both to minimize administrative effort and to ensure monitoring information is sustained and meaningful. Following are the essential capabilities required to automate monitoring in virtualized environments:

- **Automated discovery.** Both physical and virtual resources may change often. For example, when a blade fails, a system in the virtual environment's management layer may migrate processing to new locations or move a virtual machine to a new machine.

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Using a self-service portal, a user may start a new virtual server instance. In these cases and more, monitoring solutions need to automatically discover guests, and detect, register, and apply appropriate monitoring to them—as they are brought online.

- **Agentless, automated monitoring via policy templates.** Once resources are discovered, businesses need to use templates to automate the policy applied to them. These templates should assign the monitoring configuration of common items—including CPU, disk, memory, and network—and be able to apply them by the type and characteristics of the image. For example, a business could set up a monitoring template for email servers that would specify a network resource threshold of 60%. On the other hand, a database server template may specify a threshold of 90%. These templates should be used both for alerts and performance management or historical and trending data.
- **Automated configuration and deployment of agent-based monitoring.** When agent-based monitoring is required—for instance to monitor Web server processes on a virtual machine instance or to deploy detailed monitoring to new database servers—organizations need to configure and deploy agent-based data collectors automatically. To do so, administrators must integrate appropriate monitoring data collectors and their configuration with “gold master” virtual machine images or through integration with provisioning systems and configuration management databases (CMDBs). As a result, they can dynamically create virtual machine instances that are automatically configured for monitoring.
- **Automated display.** Organizations also need to ensure that dashboards and reports are automatically populated with accurate, meaningful data. For example, data for a given instance needs to be properly associated with the right groups of physical servers and other resources. Further, if a virtual machine is decommissioned intentionally, for example due to scheduled maintenance or a policy being implemented, reporting mechanisms need to have the intelligence to distinguish that occurrence from an unplanned outage, so a host of false alarms don’t get generated.

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## Best Practice #2: Gain a Cohesive View to Optimize Performance and Availability

Within multi-layered virtualized infrastructures, workloads and resources are highly dynamic. Systems routinely come up and go down. The location of a given workload can change frequently, shifting both to different virtual and physical machines, with IP addresses changing routinely.

Further, underlying these virtualized systems are storage area network assignments, and physical and virtual networks. The processes and services that underpin the virtualized environment must also be adapted to the changes in the virtual realm. For example, if a blade in a rack of servers fails, the workload on that blade will need to be migrated onto another resource, and another new blade or other physical resource may need to be put online.

In many organizations, administrators tasked with monitoring these environments have had to resort to using several tools to track performance of all the physical, virtual, and application level elements. This is not only expensive, but costly and complex to maintain on an ongoing basis. Further, as organizations grow more virtualized and processing environments become more highly utilized, managing service levels grows more critical. To address this demand, administrators need to gain a comprehensive, multi-layered view of the entire virtualized infrastructure—including physical systems, virtualized resources and applications. Further, administrators need proactive alerting and insights to detect and preempt issues, before they have an impact on the business.

To be effective and efficient in these virtualized environments, administrators need to employ a monitoring solution that covers the entire infrastructure. They need to be able to quickly and easily view the current status of all points within the infrastructure, both to solve known issues and to spot trends and make corrections before problems arise.

### **Best Practice #3: Leverage Unified Platform to Monitor Entire Infrastructure**

To optimize monitoring investments, administrative efficiency and infrastructure performance, administrators need a unified view of all the IT systems that business services rely upon. As outlined earlier, this includes the need to gain visibility at every layer of the virtualization “stack”. Today, any given business service can rely on multiple, disparate platforms. With visibility of only a specific platform or technology, it is increasingly difficult to track overall service status, and troubleshoot when issues arise.

To efficiently manage performance, and detect and address issues, organizations need to gain unified visibility of their heterogeneous environments. This includes monitoring:

- Multiple virtualization platforms, including Red Hat Enterprise Virtualization, VMware and Hyper-V.
- Elements within the internal data center as well as within externally hosted cloud services, colocation environments and more.
- Applications, end user experience, databases, networking equipment and servers.
- Diverse server and operating system platforms, including Linux, UNIX and Windows.

Further, because virtualization monitoring plays such a central, critical role, it needs to be integrated with related business services, including service desk applications, CMDBs, and other IT infrastructure management tools. The more virtualization monitoring can be integrated with these systems, the better and more efficiently IT will operate. For instance, to maximize the productivity of help desk staff, IT teams should integrate virtualization monitoring with their organization’s standard IT ticketing workflow. In addition, CMDB integration enables automated deployment and updates to supported virtualization configurations, which significantly streamlines administration.

## **Conclusion**

To manage performance in increasingly heterogeneous virtualized environments, today’s IT teams simply can’t afford to rely on the piecemeal, manual monitoring approaches of the past. To optimize both performance and administrative efficiency, IT organizations need to leverage automated, cohesive and comprehensive monitoring approaches and solutions.

## **About Red Hat Enterprise Virtualization**

Red Hat Enterprise Virtualization is a complete virtualization management solution for server and desktop virtualization and the first enterprise-ready, fully open-source virtualization platform. Red Hat Enterprise Virtualization builds on the powerful Kernel-based Virtual Machine (KVM) hypervisor and the oVirt open virtualization management platform, projects started at Red Hat and released to the open source community. Red Hat Enterprise Virtualization represents a true strategic virtualization alternative to organizations looking for better total cost of ownership, faster return on investment, accelerated breakeven, and avoidance of vendor lock-in when compared to proprietary virtualization vendors.



## About Nimsoft Monitor for Red Hat Enterprise Virtualization

Nimsoft Monitor for Red Hat Enterprise Virtualization offers a comprehensive solution for monitoring Red Hat Enterprise Virtualization environments. With the solution, customers can monitor, manage and optimize the performance of their entire Red Hat Enterprise Virtualization infrastructure, including Red Hat-centric applications, virtualized resources, management layers, and the underlying infrastructure. With these comprehensive, sophisticated features, Nimsoft Monitor delivers these benefits:

- **Optimize utilization and value.** With its granular, correlated views of Red Hat Enterprise Virtualization and the underpinning infrastructure, Nimsoft Monitor delivers the insights administrators need to maximize the utilization and value of physical, virtual and cloud resources
- **Boost service levels.** Nimsoft Monitor provides the real-time intelligence, automated alerts and intuitive insights that help administrators more quickly spot potential issues and preempt them—before they result in outages and SLA breaches.
- **Streamline administration.** By automating monitoring, configuration and data collection, Nimsoft Monitor minimizes the time, effort and costs associated with monitoring dynamic Red Hat Enterprise Virtualization environments.

Further, with the solution's broad infrastructure coverage, organizations can leverage a unified console to monitor:

- All their virtualized environments, whether they're running Red Hat Enterprise Virtualization, VMware or Microsoft Hyper-V.
- On-premise, hosted and cloud-based services.
- The spectrum of applications, databases and servers deployed.
- The end user experience.

### About Red Hat

Red Hat, the world's leading provider of open source solutions and an S&P 500 company, is headquartered in Raleigh, NC with more than 70 offices spanning the globe. Red Hat provides high-quality, affordable technology with its operating system platform, Red Hat Enterprise Linux, together with cloud, virtualization, applications, management, storage and service-oriented architecture (SOA) solutions, including Red Hat Enterprise Virtualization and JBoss Enterprise Middleware. Red Hat also offers support, training and consulting services to its customers worldwide. Learn more: <http://www.redhat.com>.

### About Nimsoft

Nimsoft provides leading IT Management-as-a-Service solutions within the CA Technologies portfolio. Companies and service providers of all sizes use Nimsoft to rapidly and easily implement essential monitoring and service desk capabilities necessary to manage today's dynamic computing environments. Learn more at [www.nimsoft.com](http://www.nimsoft.com).

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