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Optimizing Virtualization Success with Facts and Transparency



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Executive Summary

Many organizations are adopting virtualization as part of a strategic initiative to consolidate hardware infrastructure, increase IT agility, and reduce Total Cost of Ownership (TCO). But without fact-based transparency into the complex and heterogeneous IT environment, executives in the Office of the CIO struggle to measure the potential opportunity and ultimate success of virtualization initiatives, and to understand their impact on larger business objectives such as decreasing the cost and complexity of IT delivery.

If not managed properly, virtual environments can become a liability. Virtual machines by nature are mobile, flexible and easy to deploy, which puts them at greater risk for being out of compliance. To effectively manage the business of IT in today's increasingly virtualized environment, CIOs need visibility and relevant insight into the IT environment spanning physical and virtual machines throughout the enterprise.

BDNA Insight creates a trusted fact base of IT assets, both physical and virtual, throughout the enterprise. With the transparency provided by BDNA Insight, the office of the CIO can measure and manage virtualization initiatives, and confidently manage strategic functions like Security, Procurement and IT Operations management in an increasingly virtual computing environment.

Virtualization Adoption and the Resulting Virtual Sprawl

The 1990s saw a rapid explosion of servers and multi-tier applications as IT tried to meet the growing needs of the business. Because these assets were deployed rapidly and distributed globally throughout the enterprise, gaining visibility into this growing asset base was challenging. In some cases, companies adopted a trust model with their vendors, or purchased enterprise license agreements beyond their needs.

Growth eventually slowed as management concerns and cost pressures forced IT to consolidate and centralize application infrastructures. Physically co-locating multiple applications on a single server was not always possible, as applications had specific hardware and software requirements and could impact each other. However, virtualization technologies now enable multiple applications to reside in isolation on a single server, increasing server utilization while decreasing the number of physical servers needed to support the same base of applications.

Unfortunately, virtualization has not reduced the sheer number of instances required to support application-specific configurations. The ease of deploying and replicating these virtual environments is now leading to "virtual sprawl." Gaining visibility into these virtual environments is even more critical as the number of instances can significantly outnumber the count of physical servers. IT Operations can get an idea of physical management overhead by simply looking over a server room, but with virtualization, the number of physical servers is a fraction of the total number of instances. Lack of visibility into these instances can lead to ballooning management costs and compliance risk.

BDNA Insight provides visibility into both physical and virtual assets at both a summary and detail level with phenomenal speed, requiring almost no deployment time. It discovers detailed information about the IT environment, enriches it with corporate ownership and market data, and creates a comprehensive fact base about the physical and virtual IT environment.

Stages of Virtualization

We can summarize the lifecycle of virtualization adoption in three stages: planning, deployment and maintenance.

To effectively manage the business of IT in today's increasingly virtualized environment, CIOs need visibility and relevant insight into the IT environment spanning physical and virtual machines throughout the enterprise.

IT Operations must monitor the virtual environment continuously and make incremental adjustments to ensure optimal growth, such as migrating applications to balance server workload.

Virtualization planning

In planning for server virtualization, it is important to set goals and identify the right metrics to track progress and measure overall success. IT organizations need to collect the data to create these metrics and support essential planning. These metrics are derived from a firm understanding of the current environment, combined with the objectives of the target environment. This necessary data includes:

- Server hardware specification, identifying obsolete servers or servers with adequate resources to support virtualization
- Application/server configuration, including lists of applications on obsolete servers that may be candidates for migrating to under-utilized servers
- Server CPU utilization, I/O and other performance metrics to determine server workload and support capacity planning

Understanding and measuring the current hardware environment is essential for identifying objectives and measuring process. Metrics may be based on server footprint, age of hardware and percentage of virtualization. By comparing current state to the original and target states, the executives responsible for the project can measure and manage virtualization initiatives. Without transparency into the IT environment, it is difficult to set realistic expectations within scope and budget, and identify and measure success.

Deployment

A successful virtualization project requires a solid deployment and test plan that is aligned with the overall goals defined in the planning phase. By tracking metrics such as server utilization during testing and deployment, IT organizations can track the success of the project to plan.

Testing helps ensure that the applications function in a virtualized environment without sacrificing performance. Performance information is critical if these applications are migrating from unsupported configurations on obsolete servers to a supported configuration within a virtual instance. Ample testing during deployment, together with proper capacity planning done in the planning phase, helps ensure that the final rollout will optimize the use of the hardware. Testing also provides insight into how to size for future growth.

Maintenance

Just as in the physical environment, each virtual instance needs to be managed. As the overall environment grows and changes, it must maintain the benefits gained through virtualization.

IT Operations must monitor the virtual environment continuously and make incremental adjustments to ensure optimal growth, such as migrating applications to balance server workload. Again in the maintenance phase, IT Operations needs visibility into the virtual environment. Accurate insight into virtual and physical assets supports the successful deployment and operation of virtual environments aligned with corporate standards and objectives.

Supporting the Virtualized Environment with BDNA Insight

BDNA Insight discovers both physical and virtual IT assets quickly and accurately using patented discovery technology. It verifies both operating system detail and application information from virtual servers.

BDNA Insight does not require software agents, regardless of the breadth or depth of discovery. This breakthrough technology supports a rapid, non-intrusive implementation that provides value to the customer within days rather than months. BDNA also provides unique Virtualization Maps (V-Maps) that align host and guest operating systems in the virtual environment automatically. Thus, the task of tracking “which virtual server where?” is automated and highly trustworthy.

BDNA Insight enriches the discovered data with corporate ownership and market data, creating a comprehensive and trusted fact base. It supplements this fact base with an intuitive analytic

engine and role-specific insight to give IT management the insight they need to measure and manage the business of IT. For virtualization initiatives, it delivers the initial planning insight and ongoing transparency to measure and define success.

Figure 1: System and application details for a virtual server

Property	Value	Add To Report
Manufacturer	Microsoft Corporation	<input type="checkbox"/>
Version	5.1.2600	<input type="checkbox"/>
Edition	Professional	<input type="checkbox"/>
Patch Level (Service Pack)	Service Pack 2	<input type="checkbox"/>
Up Time	1522	<input type="checkbox"/>
OS Domain	MSHOME	<input type="checkbox"/>
Last Logon User	MK700Mmoy	<input type="checkbox"/>
Number of Processes	84	<input type="checkbox"/>
Total Memory	2129051648	<input type="checkbox"/>
Number of CPUs	1	<input checked="" type="checkbox"/>
Installed Software	Details...	<input type="checkbox"/>
BIOS Release Date	2006-03-20	<input type="checkbox"/>

Children	Property	Value
Windows XP: MSHOME\MK700M (mk700m.acme.com)		
Adobe Acrobat on Windows		
Adobe Photoshop Elements		
Adobe Premiere Elements		
Apple QuickTime		
CPUs		
File Systems		

Using BDNA helps IT organizations prevent virtual sprawl, ensure compliance in the virtual environment, and manage/decrease overall IT complexity.

BDNA Insight provides detailed insight into the virtual environment, with the ability to view data by operating system and business organization, and to drill down to virtual system details. Using BDNA helps IT organizations prevent virtual sprawl, ensure compliance in the virtual environment, and manage/decrease overall IT complexity.

Identifying virtualization opportunities and objectives

BDNA Insight helps organizations define their virtualization plans and objectives by highlighting the areas of greatest risk and opportunity in the IT environment.

High-level insight into the IT environment offers a summary view of:

- Complexity of the environment
- Adherence to corporate standards
- Areas of risk from unsupported or unsecured platforms

Virtual environments, like physical environments, are not static. Because it is so easy to replicate virtual systems, a single non-compliant system may quickly multiply throughout the IT environment, becoming many non-compliant systems.

By generating and refreshing a trusted and comprehensive fact base about the IT environment, BDNA Insight makes it easier to measure and manage virtualization initiatives. Accurate insight into virtual environments helps organizations adjust priorities as the landscape changes and address the most important issues first.

Preventing virtual sprawl

One of the greatest advantages of virtualization is the isolation of virtual instances or environments. Isolation enables multiple virtual instances to exist on the same platform without affecting one

BDNA Insight provides visibility into the adoption rate of virtual technologies in different business units and the proliferation of virtual environment in specific projects, while offering visibility into each virtual machine.

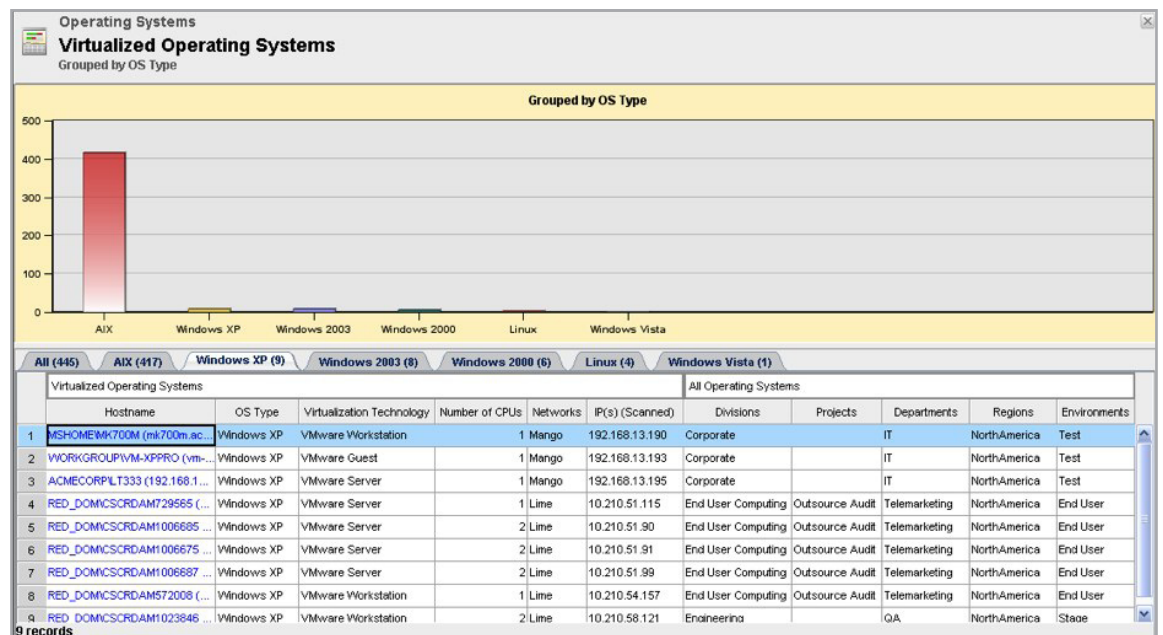
another. Under-utilized servers can be used more efficiently by stacking multiple virtual instances of an application on a server, avoiding incompatible combinations of operating systems and applications.

However, this benefit has led to a 'sprawl' effect similar to physical server sprawl, except that virtual sprawl is not as visible. While reducing the number of physical servers, many organizations actually maintain or increase the number of unique application/operating system combinations in the virtual environment. Each instance needs to be managed like a physical environment and contributes to administrative overhead costs. Management costs can quickly consume the gains derived from reducing the number of physical servers.

Organizations can help contain virtual sprawl by insisting on justification for virtual instances, much as they require justification for physical servers. BDNA Insight helps organizations see which applications are housed by virtual instances, as well as the high water mark for applications like databases. The V-Maps make this approach highly powerful and simple to use.

BDNA Insight can segment information by corporate ownership data, such as project, division or region. A project may use only a few physical servers running many virtual servers, each of which consumes a software license. BDNA Insight provides visibility into the adoption rate of virtual technologies in different business units and the proliferation of virtual environment in specific projects, while offering visibility into each virtual machine. Without this level of transparency, businesses cannot easily manage the proliferation of virtual machines.

Figure 2: Virtual systems grouped by business categories (division, department, region, etc.)



Maintaining compliance in the virtual environment

Without good visibility into the virtual environment, where it is so easy to deploy and replicate instances, many organizations face compliance risk—including license, security or corporate standards violations.

Virtualization technologies allow IT organizations to deploy a virtual instance almost instantly. It is easy to provision servers and move or copy virtual instances within an enterprise as needed. As the number of virtual instances increases, organizations must ensure that these instances follow corporate standards before they are replicated.

BDNA Insight offers visibility into heterogeneous virtual environments, providing aggregated information that supports compliance. For example, BDNA Insight can show if all the virtual

systems have up-to-date virus scanning software. If some lack virus scanning software, then not only do those images need an instant update, but the process of creating and deploying virtual images needs questioning. Were these images created from the same seed, or were they all created independently? IT organizations may need new processes to address virtual environments, similar to those in place for provisioning physical environments.

Depending on software contracts, license compliance can also be at risk. With rapid instance replication, many virtual instances consume available software licenses. An application in a virtual environment may need a contract update to allow flexibility for virtual environments.

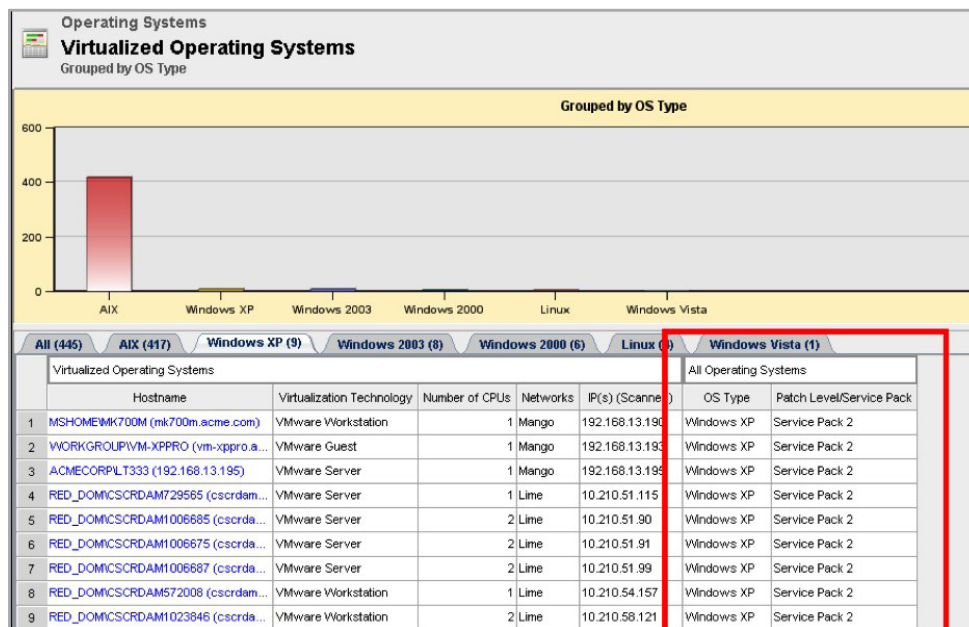
By providing insight into these complex virtual environments, BDNA Insight supports proactive compliance management.

Managing complexity

One of the concerns about virtualization platforms is the increase in complexity of the environment.

Figure 3: Confirming that all Windows XP servers are at the same service pack level

By providing insight into complex virtual environments, BDNA Insight supports proactive compliance management.



Before virtualization, cost was one of the key barriers to supporting new applications and platforms. Although cost is still an issue, a server can now be divided among multiple applications, each housed in its own virtual instance, instead of being dedicated to one application. The ability to increase server workload has decreased the cost barrier. This not only allows many more application configurations to exist but also enables obsolete applications or applications in obsolete configurations to run and in some cases to exist undetected.

BDNA Insight delivers information about these instances so that IT organizations can focus on decreasing the complexity of the IT landscape. BDNA Insight can discover the number of supported OS vendors or OS versions for a particular vendor and track the progress of migration efforts. It can also extend to the application layer to track supported database/OS configurations.

Managing complexity is essential to maintaining reasonable support costs; BDNA Insight helps by providing visibility into a dynamic and growing landscape.

Summary

As businesses increase their adoption of virtualization to achieve strategic objectives, CIOs and IT Operations need visibility into the increasing virtual computing environment. Accurate insight into the current environment helps identify opportunities for virtualization and optimize efficiency across both physical and virtual systems.

While data centers are consolidating physical servers, the virtual machines on those servers are proliferating. The benefits of virtualization can be offset by compliance risks and increased management costs as the number of instances balloons and non-compliant systems are propagated in the virtual environment. IT organizations can quickly find themselves supporting unique environments that do not align with corporate standards.

BDNA Insight offers complete and timely visibility into virtual environments, helping mitigate risks and optimize the use of virtualization, consistent with the business' strategic objectives. Using BDNA Insight, IT organizations can leverage the benefits of virtualization, align initiatives with business objectives, and manage IT based on performance, even in increasingly hybrid and virtualized environments.

About BDNA

BDNA's software provides IT organizations the tools to significantly reduce IT spending through a best-in-class agentless discovery, the industry's best IT products catalog and award-winning IT asset management solutions. Our 350 customers are trend setters in ROI-driven initiatives; they include HSBC, Lockheed Martin, Motorola, Pfizer, State of California, Telecom Italia, US Army and the World Bank.

BDNA is based in Mountain View, California, with sales offices and partners throughout North America and Europe. For more information, please visit bdna.com.