

Altiris Managed Virtualization

Standardized Configuration Management for Virtual Physical Environments

White Paper

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ALTIRIS: NOW PART OF SYMANTEC

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INTRODUCTION

In recent years virtualization has become a key strategy for datacenter administrators tasked to "do more with less." Virtualization delivers many benefits that make it an obvious choice. For instance, IT managers can use virtualized computers to generate greater efficiencies for existing hardware investments while simultaneously reducing cooling and power costs.

As with other types of system environments, virtualized environments require various levels of system management. System management tools significantly aid in the implementation and ongoing maintenance of the systems and infrastructures that make up the key components of companies' virtualization strategies. Managed virtualization is the term that Symantec uses to describe its overall approach to how virtualization is included in its overall systems management tools and best practices.

Objectives

This paper has two key objectives:

First, to acknowledge Symantec's perspective that virtual computers provide a compelling technology that offers professionals within IT organizations significant benefits including:

- Improved utilization
- Portability (encapsulate full systems into a single, hardwareindependent file)
- Application partitioning (multiple operating systems or incompatible applications can run on the same device)
- Flexibility (fast deployments, application load balancing, roll-back, recovery, and so forth)

Second and more to the point of this paper, to explain that Symantec's interest with regard to virtualization focuses on the total cost of ownership (TCO) and dependability of virtual environments. While implementing virtual computers and the related infrastructure solves some challenges it simultaneously introduces others. Just like physical computers, virtual computers require a broader view of the entire environment and its inherent challenges to understand the real TCO of an implementation.

Some of these virtualization challenges include:

- Infrastructure deployment (ESX Server host deployment)
- VM Proliferation (identification and license tracking)
- Enforceable VM security/configuration (compliance auditing, patching, and so forth)

"... Symantec's interest with regard to virtualization focuses on the total cost of ownership (TCO) of virtual environments while providing capabilities to ensure dependability of those same environments"

- Disparate tools (multiple consoles for virtual computers, hardware management, operating system management, and so forth)
- Maintenance and inventory of virtual computers and backups regardless of power state (for example, running, stopped, or suspended)
- Proper assignment and provisioning of virtual servers on physical hosts

This paper reviews Altiris solutions for several of the aforementioned challenges to demonstrate that a managed approach to virtualization yields the lowest overall TCO and most dependable infrastructure possible. Without an appropriate virtualization management strategy, customers ultimately exchange one set of system management issues for another.

VIRTUALIZATION AWARENESS

Unlike many vendors who provide separate management tools to address the needs of virtual computers, Symantec has elected to make its existing solutions "virtualization aware." A key tenet of managed virtualization is to provide one console and data repository that can address the TCO concerns of physical and virtual computers.

Therefore, Altiris solutions have been extended where appropriate to incorporate capabilities to manage virtual computers and virtual infrastructure servers. The intent is to ensure a seamless experience in managing the full IT environment, whether in the datacenter or throughout the corporate desktop environment.

Standardized Configuration Management

The concept of standardized configuration management denotes the ability of Altiris management tools to cover all critical areas within the corporate IT environment, which include the datacenter, corporate desktop environment, and other specialized areas like test and development labs.



STANDARDIZE

Overall, virtualization benefits revolve around savings in terms of hardware and associated costs but do little to save in terms of labor or software costs. In fact, a common trend in corporate IT environments today is that while virtualization is successful in aiding in the consolidation of hardware there is a corresponding increase over time in the number of overall systems deployed (as measured by the number of running operating systems). For example, the numbers surveyed today for customers using virtualization in production environments reveal that the average reduction in physical servers is typically about 20 percent. Interestingly, it is not uncommon for those same IT organizations to see

Figure 1

Illustration of Symantec's approach to standardized configuration management (physical and virtual Systems). an average increase of close to 50 percent in the total number of overall systems managed (physical and virtual).

Accordingly, the importance of standardized configuration management as a means to keep labor and software costs low becomes critical to acknowledge. By making the Altiris management platform and related solutions "virtualization aware" some of the management hurdles are lowered and overall virtualization then actually becomes a complementary component to existing infrastructures and environments.

A recent report¹ from Enterprise Management Associates states,

"Operating system and server virtualization can lead to a rapid proliferation of system images, because it is so much easier and faster to deploy a new virtual image than to deploy a new physical server, without approval or hardware procurement. This can impose very high management and maintenance costs, and potentially lead to significant licensing issues including higher costs and compliance risks...

"...Enterprises need to manage their virtual environment with the same level of discipline as their physical infrastructure, using discovery tools to detect and prevent new systems from being created without following proper process. As one respondent noted, 'when this flexibility is recognized by the users it can lead to virtual systems lying everywhere and a sort of versioning is needed—in other words, planning and maintenance is required.'"

Below is a summary list of those benefits that will be discussed in more detail throughout the remainder of this document:

Altiris Benefits for Virtual Infrastructures

- Single console for both physical and virtual device management
- Policy-based automation of management functions (risk reduction)
- Standardized configuration across physical and virtual resources (patching, auditing, tracking, licensing, and so forth)
- Virtualization-aware collections
- VM security compliance and auditing ensures all servers, physical and virtual, are properly protected from known vulnerabilities
- Assurance that virtual computers are compliant with regulations and standards like SOX, HIPPA, FISMA, and so forth
- Fast, standardized deployment and re-purposing of the virtual infrastructure
- Increased visibility and control of virtual computers
- Detailed configuration inventory

"Enterprises need to manage their virtual environment with the same level of discipline as their physical infrastructure, using discovery tools to detect and prevent new systems from being created without following proper process."

—EMA, July 2006

Standardized deployment, backup, and recovery of virtual computers

- Console integration with Virtual Center
- Discovery of managed and non-managed virtual computers

Seamless Management of Physical and Virtual Systems

In recognizing the significant potential adoption of virtual systems across corporate environments, whether in the datacenter, desktop environment, or otherwise, Altiris, now part of Symantec, has worked closely with VMware and Microsoft to enable all Altiris solutions to seamlessly manage virtual computers. In fact, these vendors have made changes to specifically address issues that were found through that collaboration.

In addition to ensuring compatibility of Altiris agents running within virtual computers and on physical hosts, Altiris® Notification Server[™] software has also been validated as supported running in a virtual computer session.

An outline of the supported scenarios of virtual computer and infrastructure support is listed below:

- 1. **Hosted Server:** Running the Notification Server and supported solutions in a virtual computer session
- 2. **Managed Virtual Computer:** Managing a virtual computer using Altiris solutions
- Managed Host: Managing a physical system that hosts guest virtual computers using Altiris solutions**

**This scenario includes running on VMware* ESX Server, VMware Server (GSX) along with Linux and Microsoft Windows* operating systems.

Altiris has specifically recognized has issued a statement regarding Altiris management capabilities in virtualization environments. You can access the Altiris Virtual Machine Support Statement at:

http://www.altiris.com/SS-Altiris_Virtual_Machine_Support

BENEFITS OF VIRTUALIZATION AWARENESS

This section focuses on areas in the corporate environment where virtualization provides unique benefits while also introducing new system management challenges. This section will also highlight available Altiris solutions that enable IT environments to actually realize those benefits.

Reduction in Number of Management Tools

The practice of requiring IT staffs to retool and retrain on yet another management console and infrastructure is a significant burden for them. As a best practice, companies worldwide have moved toward consolidating their tools and strategically aligning themselves with software vendors that also provide consolidated management tools. Altiris, now part of Symantec, has been a pioneer in that approach with its powerful open platform and broad set of solutions. Symantec is also a leader in allowing other vendors' technologies and products to run on its platform alongside its own solutions.

Common IT Management Console

In the spirit of trying to alleviate customer pain with the growing number of IT management tools and their related consoles, Symantec has made it a point to offer a single point of management for all of the technologies it supports. That practice has also been extended in its pursuit of making Altiris solutions capable of managing virtual computers in the same manner with the same processes and functionality offered to traditional physical system management.

In addition to that, Symantec has also created a special resource denotation that allows users to recognize virtual computer resources and bring in virtual computer specific information.

For example, the new release of Altiris Inventory Solution® for servers will include inventory data specific to virtual computers and their relationship to the virtual infrastructure they are hosted on. Information about virtual computer guest and host relationships and the state of the computer (stopped, suspended, running, and so forth) is gathered and recorded through traditional inventory jobs to allow users to utilize that unique information within the management console.

Single Configuration Management Database (CMDB)

With a similar approach to providing a common console, Altiris architected a powerful data repository known as a CMDB that also maintains information about virtual and physical computers. This repository stores and maintains data gathered from all of the integrated management products to allow for common reporting and for integrated products to leverage data from each other to extend their management capabilities in a way that single-point products cannot. Overall, the IT data for virtual and physical systems that the Altiris CMDB is designed to support is change management, software packaging, software delivery, deployment and migration, patch management, security assessment and remediation, server provisioning, network management (in terms of configuration and change primarily), financial and contractual asset management, incident management, and problem resolution.



Figure 2

Illustration of how the Altiris CMDB plays a key role within Altiris' standardized configuration management approach.

Altiris® Asset Management Solution[™] software is an example of a product that can access the CMDB and leverage the data gathered by Inventory Solution for servers. Key asset management issues like license tracking, charge-backs, and so forth, can be extended to include virtual computers along with physical computers. This also allows the solution to provide the extra information specific to the virtual computers to help alleviate the management nightmare of tracking virtual computers. In fact, this is a huge cost and time saving feature of the solution that helps address the issue of "virtual computer sprawl."

Console Integration with VMware Virtual Infrastructure

As Altiris, now part of Symantec, has maintained a strong partnership with VMware, we've recognized the importance of giving IT staff the capability to manage as much of the IT infrastructure from a single location as possible. To that point, Symantec has integrated closely with VMware Virtual Infrastructure in Altiris® Deployment Solution[™] software.

As Virtual Infrastructure functionality is expanded, it is Symantec's intent to continue to import the relevant functions that Virtual Infrastructure offers into the Altiris Console so that IT staff can continue to manage both their physical and virtual computers in one location.

Increased Visibility and Control of Virtual Computers

The current integration that Altiris solutions offer with VMware Virtual Infrastructure 3.0 (VI 3.0) within its console is a combination of the ability to display information from VI 3.0 about virtual computers and their host relationships and the ability to control virtual computers. Within Deployment Solution, administrators can sequence a variety of virtualization-specific and hardware-specific management functions. For example, a single drag-and-drop job can be created that will deploy and configure server hardware from bare metal, then install ESX, then provision virtual computers.

See additional white paper below for specific details on these capabilities to control virtual computers using Deployment Solution:

Managed Virtualization: Using Altiris Deployment Solution 6.8 to Provision and Manage VMware Virtual Infrastructure 3.0

http://www.altiris.com/WP-Managed_Virtualization_VI3



Policy-Based Automation of Management Tools

Another key element of standardized configuration management is policy-based automation of various management functions.

Some examples are:

- OS patching
- Software delivery

Figure 3

Altiris Console views of VMware Virtual Center Integration.

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- Baseline compliance
- Security audit of configuration and compliance
- Uniform deployment and provisioning of virtual and physical computers

This is important to managing virtual infrastructure and computers because it gives IT staff the granular capability to include virtual systems in the same policies used by physical computers where it makes sense, while giving the option of separating them where it doesn't.

Uniformity in the IT Environment

One key advantage of policy-based management is the automation and accuracy that are gained because each system is dynamically managed based on its properties. System properties can include operating system type, amount of memory (RAM), make, model, system composition (physical or virtual), and so forth. As properties of a system change (for example, it may be repurposed or updated) the Altiris server automatically moves it in and out of collections that associate it with management policies. Policies ensure that each system adheres to predetermined configurations that enforce security concerns, software versions, patch deployments, and so forth. Policies ensure standardized management across physical and virtual computers while allowing differences where needed.

As datacenters and other areas within the corporate environment go through changes such as consolidation and merges, uniformity through standardized policies gives confidence to IT organizations concerning what is running and how it is configured to run.

Examples policies might include:

- OS patching for the Windows 2003 server collection
- Audit all physical and virtual servers for unauthorized software, hardware, and known configuration vulnerabilities
- Only deploy hardware updates to physical computer collections running Windows
- Install OEM hardware agents only to physical servers
- Install Altiris management agents on all Linux computers regardless of virtual or physical composition
- Provision all virtual infrastructure hosts to have identical configurations regardless of datacenter



Standardized Provisioning

A core function for all IT environments and in all areas of the environment (datacenter, desktop, endpoint, test labs, and so forth) is standardized provisioning. This includes predictable and uniform deployment and configuration of all systems. With the enablement added to the Altiris platform, virtual computers can also be deployed and configured leveraging the same standardized options as physical servers to capitalize on the benefit of uniformity while also performing these common tasks from a single console.

Common OS Deployment and Configuration (Physical and Virtual)

Many users of Altiris solutions have indicated that they use Deployment Solution as a best practice for provisioning all systems in their environments. This includes virtual systems and physical systems. The advantage they gain revolves around the uniformity and the ability to achieve repeatable results.

For example, some administrators employ virtual environments for preproduction testing purposes but intend to run the actual operating systems and applications on physical computers when ready for production. Standardized deployments via Deployment Solution provide the capability to support this scenario by deploying pre-configured systems to both virtual and physical computers and ensuring repeatability of that process.

Figure 4

Automated patch management policy for critical Microsoft update bulletins. A key item to note is that Altiris solutions can deploy and configure both **virtual computers** (workstation or server operating systems) along with **virtual infrastructure servers** (physical servers running specialized operating systems or applications for hosting the guest virtual computers).

Rapid and Uniform Provisioning of Virtual Infrastructures

Given that virtual infrastructure servers (for example, VMware ESX, VMware Server) all run directly on physical computers uniform deployment and configuration is critical. All servers need to be configured to run in the same manner to confidently leverage the powerful migration capability of virtual computers running on top of the infrastructure. Three areas that Altiris Deployment Solution 6.8 can aid in provisioning virtual infrastructures are listed below.

- 1. Provision virtual infrastructure servers from bare metal
 - VMware Virtual Infrastructure 3.0 (ESX 3.0)
 - VMware ESX 2.5
 - VMware GSX, VMware Server
 - Microsoft Windows Server 2003
 - SUSE*, Red Hat* AS/ES
- 2. Deploy virtual systems to host servers
- 3. Remotely configure and manage virtual systems and their physical host servers

The following is a quote² from an Altiris solution user regarding their recent experience using Altiris tools to provision virtual systems and virtual infrastructure servers.

""We're using Altiris with VMware on our ESX server farm to quickly provision new servers," said Danny Burtenshaw, System Engineer. "We can drop a script on an ESX server and it will create the virtual hardware. Then we can drop an Altiris image and that takes the virtual creation of a computer down to only about five minutes, instead of the 30 minutes it would take to clone a VMware Gold image."

For more details about using Altiris solutions to provision virtual computers and VMware Virtual Infrastructure 2.5, 3.0 servers see the white paper below:

Managed Virtualization: Using Altiris Deployment Solution 6.8 to Provision and Manage VMware Virtual Infrastructure 3.0

http://www.altiris.com/WP-Managed_Virtualization_VI3

"We're using Altiris with VMware on our ESX server farm to quickly provision new servers," said Danny Burtenshaw, System Engineer. "We can drop a script on an ESX server and it will create the virtual hardware. Then we can drop an Altiris image and that takes the virtual creation of a computer down to only about five minutes. instead of the 30 minutes it would take to clone a VMware Gold image."

—University of Utah Health Sciences Center

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Application Deployment and Management

In addition to deployment and configuration of operating systems, the other key area requiring a standardized provisioning approach is the deployment and management of server applications and server management agents. Time savings and cost savings, which are critical to IT organizations, can easily be lost when applications are mismanaged or otherwise left unmanaged.

Virtual systems don't solve that problem and actually further exacerbate the issue by increasing the number of individual systems running in the environment. Initial deployment and configuration and ongoing maintenance via an automated and remote solution has become key to successful application management.

For example, an Altiris Deployment Server job can be created to deploy Oracle 10g to a Windows 2003 Server operating system. This job can be used to deploy Oracle 10g to either physical or virtual servers ensuring that all Oracle installations maintain a similar configuration. Relying on a tested build across the organization improves availability by removing configuration differences that might be introduced by manual build processes. IT administrators that leverage Altiris solutions automation

Figure 5

View of Deployment Solution 6.8 showing jobs for VMware ESX Server deployment from bare metal and other virtual computers tasks.

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are assured that every server or application installation is deployed and configured the same way every time.

Software Delivery and Maintenance

Altiris Software Delivery Solution[™] is part of the Altiris "Virtualization Awareness" initiative and thereby is enabled to provide the same level of support given to traditional physical systems to virtual systems. Both virtual servers and virtual desktops can be managed by the same tool to remotely deploy server and client applications.

New Approach: Altiris® Software Virtualization Solution™ software (SVS)

Altiris has provided a unique new option for application deployment through its own addition to virtualization. Through SVS, users can capture the installation and configuration of software applications in layers that can then be virtualized on top of either virtual or physical systems. IT administrators can then distribute and activate layers in seconds to allow for use of that application in a predetermined or preconfigured manner. Remote management of this functionality is also provided within the Altiris Console.



SVS can also be a key component to various thin client approaches as it allows for the distribution of application layers and capturing of user sessions to maintain the personal preferences of the individual user.

Figure 6

View of Software Virtualization Solution (SVS) management tool. These are examples of thin client approaches supported by SVS:

- Hewlett-Packard* CCI
- IBM* Virtual Hosted Client / VMware* VDI
- Dell* Smart Client / Ardence* Software-Streaming Platform

Get more information about Software Virtualization Solution: <u>http://www.altiris.com/Products/SoftwareVirtualizationSolution.aspx</u>

Security Configuration and Compliance

Using virtualization for consolidation of server hardware or desktop replacement does not do anything to solve the burden of configuration management on the virtualized operating systems that are placed into production. As VMware explains, virtual computers don't know that they are virtual so the requirements to continually maintain and manage operating systems running on physical hardware extend to operating systems running on virtual hardware.

Another quote³ from Enterprise Management Associates clearly states the importance of security as it relates to virtualization,

"While virtualization can have many worthwhile security benefits, security also becomes more of a management issue in a virtualized environment. There will be more systems to secure, more points of entry, more holes to patch, and more interconnection points—across virtual systems (where there is most likely no router or firewall), as well as across physical systems. Access to the host environment becomes more critical, as it will often allow access to multiple guest images and applications. Enterprises need to secure virtual images just as well as they secure physical systems."

One of the key areas requiring continual maintenance and management is security configuration and compliance. In the current landscape of companies being required to conform to multiple regulatory policies and industry standards across all of their environments (datacenter, desktop, and notebook) it is ever critical to maintain a standardized approach to the audit and remediation procedures or processes.

Common Regulatory Policies

- HIPAA (Health Insurance Portability and Accountability Act of 1996)
- SOA (Sarbanes-Oxley Act section 404 COSO, CobiT)
- GLBA Gramm-Leach-Bliley Act of 1999
- NERC (National Energy Regulatory Compliance standard 1200)
- FISMA (NIST 800-53 Draft)

"While virtualization can have many worthwhile security benefits, security also becomes more of a management issue in a virtualized environment. There will be more systems to secure, more points of entry, more holes to patch, and more interconnection points – across virtual systems (where there is most likely no router or firewall), as well as across physical systems. ..."

-EMA, July 2006

- Basel II Capital Accord
- PCI DSS Payment Card Industry
- VISA CISP

Common Industry Standards

- ISO 17799
- CIS Benchmark (Center for Internet Security)
- SANS / FBI Top 20
- NSA

Altiris provides the ability to standardize the auditing and security configuration management as required by compliance standards and regulations. As with all Altiris solutions, this approach is extended to all virtual systems as well.

Altiris SecurityExpressions[™] software allows for the information produced by audits to be replicated into the Altiris CMDB. This replication of data provides for common reporting and for further management by Altiris remediation products (Altiris Software Delivery Solution, Altiris® Patch Management Solution[™], and so forth). The CMDB provides a centralized source for configuration data that automated policies can leverage to correct any incorrect or inadequate security configurations on both virtual and physical systems.

Symantec's Approach to Security Audit and Compliance

With tools regarded as "best of breed" in the area of security policy compliance and vulnerability auditing, Altiris solutions boast one of the most encompassing approaches to automated auditing of virtual and physical servers, desktops, and notebooks. This approach includes both agent-based and agentless options that provide equivalent auditing capabilities.

Referenced below are the seven top-level audit categories:

- System security configuration changes
- Security patch status
- Antivirus status
- Personal firewall status
- Industry-known vulnerabilities
- Unauthorized software
- Unauthorized hardware



Figure 7

Altiris SecurityExpressions security compliance audit report of virtual systems.

Remediation and Patch Management

One of the key differentiators between the Altiris solutions offerings and traditional security vendors or remediation/patch management vendors is that Altiris solutions provide both functions in an integrated process whereas the other vendors typically only provide one or the other. This means that, Altiris solutions can independently and automatically keep IT assets up-to-date with the latest patches and security configurations. This is another key area where the CMDB and integrated solutions play a vital role in maintaining the growing number of physical and virtual systems in the IT environment.

As with other Altiris solutions, Patch Management Solution and Software Delivery Solution have been tested to manage virtual systems in the same manner as the physical host systems underneath. Taking advantage of that capability as part of an IT automation approach allows IT staff to act quickly and appropriately on the audit data gathered. This allows service levels to increase while minimizing down-time and potential service disruptions from viruses, worms, and other maliscous exploits.

Simply stated, Altiris solutions work together to allow for the much needed vigilance on the security front for an entire IT environment so that all infrastructure and systems, whether virtual or physical, can be confidently maintained and protected.

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	CSHELPDESK2	48	3	52	60	0			
	DELL-0B77C12E95	49	9	1	4	0			
	DELL-27D36B20BC	49	3	1	0	0			
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Figure 8

Illustration of compliance report generated from the Altiris CMDB

Identification and Change Management (CMDB)

Another fundamental function of IT configuration management is discovery and inventory and how changes in the information gained from those exercises are tracked and recorded. One of the core products of the Altiris platform is Inventory Solution. As part of Inventory Solution, IT administrators have the flexibility to run jobs on demand or a set schedule through either an agent-based or agentless (no-touch) mechanism.

The data gathered within these inventory runs has proven to be very broad and comprehensive. It also features very configurable, granular search and identification capabilities. Detecting application files and, in this case, virtual computer images that may be on a computer provides a powerful solution for taming virtual computer sprawl.

Detailed Configuration Inventory

To effectively manage your enterprise, you need an accurate and thorough inventory of your virtual and physical computers, whether they are desktops, servers, or other devices. Knowing what you have and where it's located empowers you to reduce IT support costs, protect your network, improve success of software deployments, and focus on higherlevel objectives.

As Inventory Solution feeds all of its data into the CMDB, it allows for other integrating products to leverage the data. The amount of data and type of data gathered for each computer can be very detailed and in depth and can include traditional types of configuration information. In the case of virtual computers it adds specific data about the state of the computer and other information specific to virtual computers like location, size of the virtual computer disks, and memory allocations.

Increased Visibility of Virtual Computers

As part of a standardized approach to configuration management it is important to be able to flexibly include or exclude virtual computers when creating and maintaining granular policies and reports. By gathering detailed information about virtual computers, Altiris collections (a specified group of computers) can be customized to include virtual computers of various types (for example, server or desktop) and associate them with management policies. These policies can be used for IT tasks, including application rollout, patch management, and deployment.

With the new release of Inventory Solution for servers, the state and guest-host relationship can also be identified and recorded. This allows subsequent use in management policies. An example use might be to identify virtual computers that have been powered off to perform maintenance updates on production and back up systems. This particularly helps with ensuring that back up systems can be brought back online quickly and confidently.



Figure 9

Illustration of the granular capability to define collections based on the virtualized format.

Figure 10

Identification section of this figure shows an example of virtual computer serial numbers.



Complete Asset Management

Applications and related infrastructure exist to deliver business value. Very few business models today could consistently outperform current competitors or new entrants, unless computing agility and efficiency are well-tuned. Asset management is the approach of utilizing that computing power to enable overall cost reduction and time-savings throughout the entire IT environment even when virtual systems and infrastructures are added.

As virtualization vendors will agree, the issue of managing virtual systems is increasingly becoming important as the technology continues to mature and become a dominant presence in production environments where costs become much more critical to manage. Traditional uses of virtualization resided in areas like development and test lab management where they were much more contained and limited in use. With the recent recognition of virtualization as a valid option in the datacenter and corporate desktop environments, the need for complete asset management has arisen to be able to manage virtualized assets along with other traditional assets.

In addition to that, asset management capable of incorporating virtualized assets is a common area that is not well addressed by virtualization management vendors, if addressed at all. That void in functionality is yet another reason to recognize the benefits gained by making Altiris traditional IT lifecycle management virtualization-aware. By standardizing on a platform that addresses all of your IT life-cycle management needs, users can seamlessly add asset management across the complete IT environment and not leave those virtualized assets "out in the cold." A couple of the critical areas that are lacking in new virtual computer management offerings are license tracking and cost management functionality. Without these pieces, critical issues like charge-backs become very difficult to tackle.

License Tracking

License tracking, is necessary tool for both legal and financial reasons. It ensures legal compliance while at the same time maintaining knowledge of what licensed tools (hardware and software) are being used, who are using them and where, and finally how much or how little they are being used.

With the versatility of virtual computers that allows them to be flexibly run and stored in so many more places than before, the task of tracking those virtual computers and what is enabled on them becomes much more complex. In addition to location of the images, the state of the computer also adds another consideration in that there are cases when valid virtual computers would be in a stopped or suspended state. In those cases, the related assets (which would consist of the virtual computer itself, the operating system running in the virtual computer, and the application software enabled on the operating system) all have to be tracked, counted, and reconciled. Accordingly, software license management solutions provide that necessary support in conjunction with Inventory Solution.

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Software License Management

As virtual computers are tracked more like software rather than physical hardware, common software license management practices come into play.

Basic steps to software license management are:

- 1. Run the Software Audit
 - What applications do I have installed or running?
- 2. Gather the Licenses
 - How many licenses have I purchased?
- 3. Determine Software Usage
 - How many applications am I really using?
 - Who is really using them?
- 4. Understand the Data
 - How many licenses do I need?

Cost Management (Including Charge-backs)

Once an organization installs a set of processes to help IT organizations achieve business objectives by providing detailed information about assets and their configurations, next step is to manage the related costs. Asset relationships and their associated costs come into the picture and

Figure 11

Example of VMware Workstation license tracking. accordingly the assets must be displayed by location, cost center (accounting unit), or employees to ensure businesses make decisions targeted at controlling costs.

The purposes of asset management and, in this case, cost management extend naturally to the virtual infrastructure and virtual computers running there on. An additional layer of complexity to traditional IT cost management is that notion of being able to run computers owned by different cost centers on the same piece of hardware. Having information available about location of assets further detailed by guest-host relationships to reconcile against cost center data becomes very significant when undertaking that task of reconciling costs within the entire IT environment and especially in the datacenter.



As Altiris® Service & Asset Management Suite[™] software has been a market leader by virtue of its strong customer satisfaction, broad set of functionality, and capability to leverage the entire CMDB, it becomes another key consideration for customers to incorporate into their management toolkit for both virtual and physical system management. As with other solutions, its native integration onto the Altiris platform allows it to benefit users in a more complete and compelling manner.

Figure 12

Illustration of asset relationships for performing cost management for a specific virtual system.

CONCLUSION

In conclusion, the Altiris managed virtualization strategy extends virtualization awareness across its entire management platform to create a very distinctive and effective approach for standardized systems management. It allows IT organizations to address the TCO concerns of both physical and virtual environments using a single console and CMDB to create policies for automated system administration.

Symantec is confident that approaching management of the entire IT environment in this manner will create a vehicle for facilitating growth for the corporations, while minimizing inherent risks and costs.

REFERENCES

¹ Enterprise Management Associates, Research Report, "Virtualization: Exposing the Intangible Enterprise", July, 2006

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