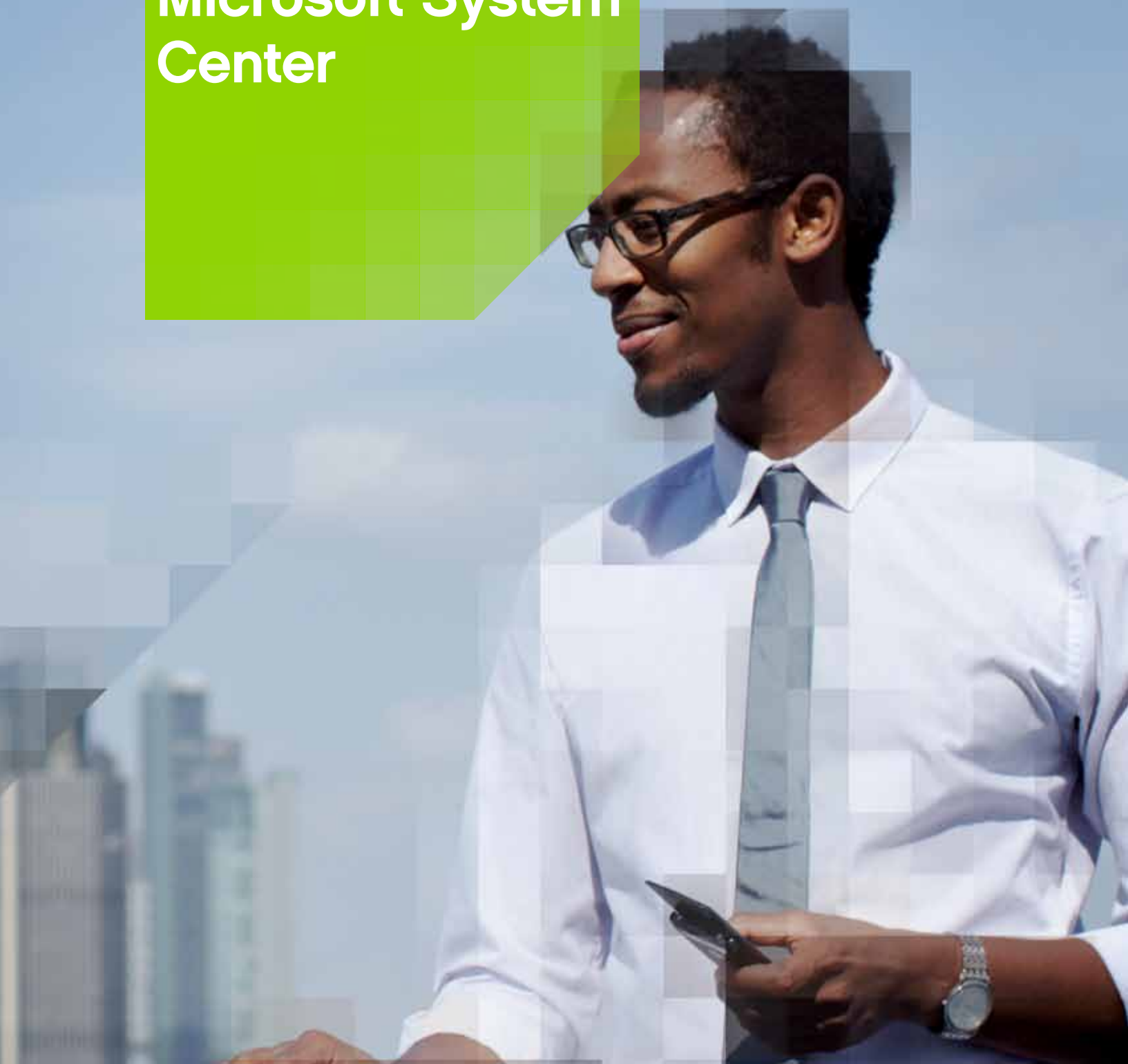


AppSense user virtualization with Microsoft System Center

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Executive summary

Against a backdrop of desktop transformation projects, operating system migrations and cost management initiatives, IT professionals are forced to face the challenge of enabling an evermore demanding and mobile workforce to access corporate applications from a growing multiplicity of devices and environments, for this to be successful enterprise IT departments are moving away from the outdated and rigid infrastructure computing and are rapidly planning and adopting a user-centric IT strategy. Delivering this new “Dynamic Desktop” requires appropriate application of technology to:-

- Deliver applications and resources to an increasingly diverse range of users who expect to be able to work productively using an ever-increasing range of accessing devices

- Manage the infrastructure, physical and virtual, needed to meet these requirements while delivering a personalized and productive user experience
- Ensure policy, security and compliance requirements are achieved throughout the desktop, application and user estate based on the user, their location, device and time & date to dynamically configure their access capabilities

With these basic but fundamental challenges managed, the focus of the “Dynamic Desktop” problem becomes meeting the diverse needs of users and enabling a contextual yet consistent user experience across platforms and devices. This is the area where IT departments are seeing the biggest challenges and most significant increases in costs.

What is Microsoft System Center

Microsoft System Center solutions help to manage physical and virtual IT environments across datacenters, client computers, and devices. System Center Configuration Manager (ConfigMgr) provides a foundation to build a secure and well managed desktop infrastructure. It provides a solution for cost-effective deployment of operating systems and applications, proactive management of system health and performance and management of user security and access requirements. System Center captures and aggregates knowledge about systems, policies, processes, and best practice that can optimize infrastructure to reduce costs, improve application availability, and enhance service delivery.

Welcome and introductions

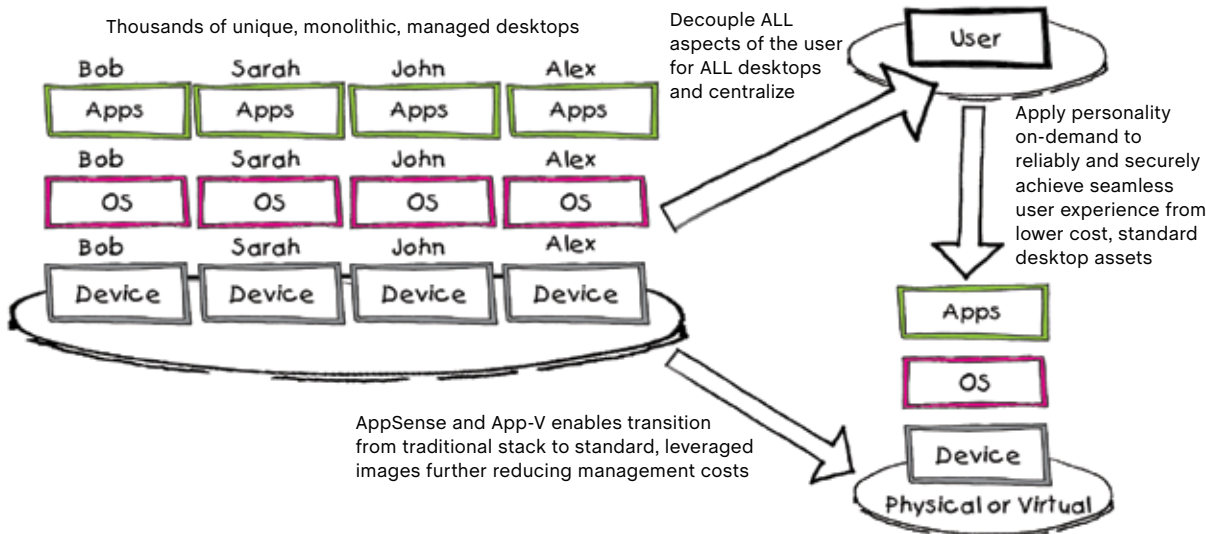
What is AppSense user virtualization

AppSense user virtualization is an infrastructure technology solution that virtualizes, centralizes, manages and applies the user environment on to a desktop on-demand. User virtualization spans all desktops across multiple OS platforms, desktop and application delivery mechanisms, devices and locations.

Virtualization technology providers such as Microsoft, Citrix and all embrace and promote a move to the component desktop model as part of a user-centric computing strategy and recognize the essential nature of the user layer.

AppSense user virtualization technology can work with Microsoft System Center to deliver a truly dynamic desktop experience and reduce the total cost of ownership and delivery of personalized, contextual user desktops. The user components of a desktop are decoupled from the operating system and applications, managed independently and applied into a desktop on-demand without scripting, group policies or use of cumbersome user profiles - regardless of how the desktop is being delivered.

It is the application of user personality which enables pooled or standardized desktops to be tailored and personalized to each and every individual user, ensuring optimal quality of service, user adoption and reduction in IT administration costs. AppSense, a member of the Microsoft System Center Alliance, delivers user-centric features and capabilities to the base functionalities of Microsoft System Center. AppSense Management Center tools, System Center Operations Management (OpsMgr) Packs and professional service expertise ensure reliable integration and interoperability with Microsoft System Center technologies:-





Benefits matrix

Below is a benefits matrix summary table, detailing the benefits AppSense user virtualization brings to the individual Microsoft System Center components.

Customer problem definition / user story	Microsoft System Centre Technology	AppSense User Virtualization Solution	Customer benefits
How to deploy and install the AppSense product suite in an environment using the Microsoft System Center framework	Microsoft System Center Configuration Manager (ConfigMgr)	Integrated deployment of AppSense Product Suite, complemented with back office use of AppSense Management Center for configuration change control	IT training is simplified as administrators can use ConfigMgr as a standard tool for software deployment AppSense Management Center complements solution by providing robust change control of user configurations
How to manage, monitor and maintain the AppSense product suite using the Microsoft System Center framework	Microsoft System Center Operations Manager (OpsMgr)	Performance and Event Management with the AppSense OpsMgr Management Packs, and the assistance of AppSense Professional Services experts	AppSense OpsMgr management packs enable monitoring and maintenance of the AppSense User Virtualization Suite within Microsoft System Center consoles Microsoft System Center customers can benefit from AppSense best practice and professional services expertise
How to manage, monitor and maintain the AppSense product suite using the Microsoft System Center framework	System Center Virtual Machine Manager (SCVMM)	Personalized on-demand with AppSense Environment Manager	AppSense Environment Manager provides necessary functionality to personalize virtual desktops based on shared “golden images”, including options for seamless integration with Microsoft Application Virtualization (App-V)

Microsoft System Center provides a foundation for cost effective desktop deployment, delivery and operational management. Layering on AppSense user virtualization products enables the personalized, consistent, contextually aware delivery of the user experience irrespective of the operating system version or application delivery concept.

Managing desktops can consume up to 80% of IT budgets, as users start to access more desktops (physical, virtual, published), from multiple devices, the cost of management increases with each addition option, meaning the gap between user demands and IT service will increase to a point whereby all resource is consumed in a tail chasing, reactive IT strategy. The only way for IT to maintain control and facilitate the access to IT services while reducing workload and budget requirements is to manage the user once, across all desktops.

Numerous customer deployments of AppSense user virtualization with Microsoft System Center demonstrate that the above combination of capabilities enables the “Dynamic Desktop”, helps control and reduce IT costs and adds significant value to customer implementations.

Microsoft ConfigMgr and AppSense user virtualization

AppSense is integrated with Windows 7, System Center Configuration Manager (ConfigMgr) comprehensively assesses, deploys, and updates servers, client computers, and devices across physical, virtual, distributed, and mobile environments. System management tools included provide asset intelligence, software update management, desired configuration management, software distribution, operating system deployment and power management.

As a component of the user virtualization suite, AppSense provides Management Center (AMC), an integrated tool to deploy and manage AppSense software components, known as agents, and their respective configuration.

AppSense Management Center and Microsoft System Center can be used stand alone, or together in an integrated modality to enable the deployment of AppSense user virtualization software in large enterprise wide deployments. Fundamentally three approaches have been adopted within the AppSense customer base.

AppSense Management Center provides a comprehensive solution to deploy and manage the AppSense agents and configurations, and has been used successfully in large deployments of tens of thousands of desktops.

In environments where Microsoft ConfigMgr is established as the standard for software and operating system deployment however, it is challenging to justify the adoption of alternative software deployment tools. In addition, applying an integrated approach with Microsoft ConfigMgr reduces training requirements for administrative personnel and simplifies deployment infrastructure.

Customer success story

“Within AXA group, the original 14,500 device estate is being migrated to Win 7, running in rich client or thin client modes and using AppSense user virtualization products. AXA use Microsoft System Center to manage all software and operating systems within our business, so when we deployed AppSense it made perfect sense to use ConfigMgr to deploy AppSense user virtualization agents and configurations. The AppSense tools are used to manage the change control of configurations, with Microsoft System Center used for deployment and management.”

Tom Hickling,
User Virtualization Project Lead, AXA

	Deployment of UV Agents	Deployment of UV Configurations
Option 1 AppSense Management Center used exclusively	 AppSense Management Center	 AppSense Management Center
Option 2 Hybrid solution	 Microsoft System Center Configuration Manager	 AppSense Management Center
Option 3 Microsoft System Center used exclusively	 Microsoft System Center Configuration Manager	 Microsoft System Center Configuration Manager



The scalable, distributed deployment features of Microsoft ConfigMgr provide a robust and effective route to installing the AppSense UV agents to every endpoint desktop in very large estates. AppSense enables this process with a series of software distribution packages created for every AppSense software component which can be delivered to the desktop estate with granular control in the form of an ConfigMgr Advertisement.

Although the majority of AppSense clients using Microsoft System Center still choose to deploy and manage configuration updates with AppSense Management Center, it is possible to use Microsoft ConfigMgr exclusively to deploy both the agent and configuration files.

Using Microsoft ConfigMgr exclusively mitigates the need to deploy the AppSense CCA, as ConfigMgr will handle all file transfers required to support the user virtualization environment. The additional simplicity does come with a compromise, as compared to the AMC, ConfigMgr provides less granular control in respect of the timing of delivery of configuration updates. Configuration files also tend to be small in size, and the benefits of the ConfigMgr advanced client and management point concepts are somewhat reduced.



The architecture of the AppSense product suite enables simple integration with Microsoft ConfigMgr and fully supports the three modes of working described. AppSense application of industry standard Microsoft technologies such as IIS web services, MSSQL databases, and MSI file encapsulation facilitates integration with enterprise tools, such as Microsoft System Center. Leveraging the scalable features of Microsoft Windows Server technologies, MSSQL, System Center and IIS helps ensure AppSense can be deployed with confidence, facilitating user virtualization and personalization to tens of thousands of desktop across the enterprise.

Settings Management

Microsoft ConfigMgr's core capability is to deploy and manage applications to a variety of end point types. In Microsoft ConfigMgr 2007 R2, support was added for App-V package deployment in addition to native application installation and management. This allows customers to support different methods of package deployment from the one console, ensure that application management infrastructure is reduced.

While ConfigMgr 2012 provides client management based on user context, it does not provide a solution to an individual user's settings and personalization management. This is where AppSense user virtualization adds value on top of ConfigMgr 2012 and previous versions.

For example, customers may choose to deploy the same application using a combination of both native and App-V based applications from Microsoft ConfigMgr however the user settings cannot natively move between these different application deployment types.

AppSense user virtualization uniquely ensures that irrespective of application deployment method, whether natively installed or virtualized applications, the user settings and personalization move between desktops, laptops, VDI or Session Virtualization with a consistent and transparent user experience.

Application Install Triggering

AppSense UV has the ability to align to the user centric application installation approach with ConfigMgr 2012 and previous versions. When an application doesn't exist on a user's PC that AppSense knows should be there, rather than deploying the application directly like competitive solutions and thus out of band of ConfigMgr, AppSense UV can trigger ConfigMgr to install the application directly on the end point. This ensures a central application management focus through ConfigMgr which is then aware of the application presence on the end point. This knowledge can then roll up into application servicing, reporting and other metrics.

Microsoft OpsMgr and AppSense user virtualization

AppSense user virtualization + Microsoft System Center Operations Manager

System Center Operations Manager (OpsMgr) provides end-to-end service monitoring in the enterprise IT environment. It includes tools to monitor thousands of significant events and service performance across disparate operating systems and applications providing a single view of the health of an organization's IT environment.

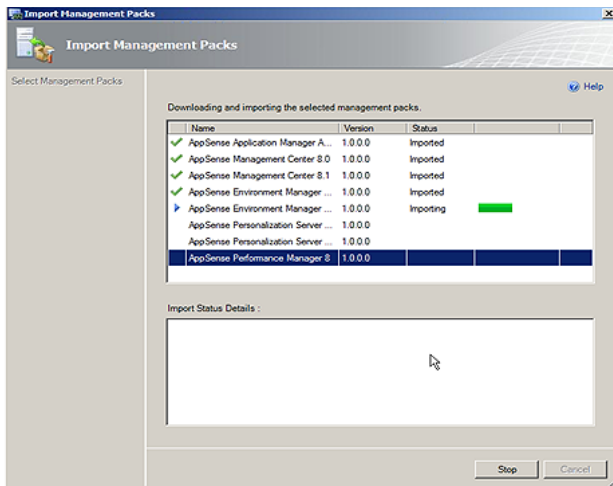
AppSense Management Center console, a standard component of the AppSense User Virtualization Suite provides operational management tools specifically designed maintain AppSense software agents and UV software components. Functionality of the AppSense Management Center includes product specific event reporting, alert management, security access controls, license distribution, enterprise reporting and integration with Microsoft Active Directory.

Where customers have deployed Microsoft System Center, it is not desirable or efficient to require IT managers and administrators to use multiple operations management tools, particularly when Microsoft SCOM has been conceived as a single console to manage the enterprise wide IT environment. Fortunately, Microsoft OpsMgr supports the concept of Management Packs to simplify management of third party software solutions.

Management Packs are the building blocks which extend OpsMgr management capabilities to operating systems, applications, and other technology components. A Management Pack (MP) encapsulates best practice knowledge to discover, monitor, troubleshoot, report on, and resolve problems for a specific technology component.

AppSense provide an AppSense OpsMgr Management Pack, that enable monitoring of all AppSense product events and related performance counters. AppSense are able to provide individual management packs for each AppSense product, and have preconfigured version specific packs for AppSense Environment Manager 8.0 and 8.1. AppSense consultants work with an organization's System Center experts to ensure that the base OpsMgr packs can be configured to meet the needs of your organizations regional or global IT management policies.

The AppSense Management Pack for OpsMgr enables the remote monitoring of all computer end points and servers in the network where AppSense technology is deployed. After installing the AppSense OpsMgr pack a number of additional Monitoring views for each AppSense product are created. These views allow an administrator to monitor alerts, events and state for all AppSense products. AppSense have configured Object Discovery Classes that enable automated discovery and grouping of all networked computers with AppSense products installed.





Expanding a particular AppSense product OpsMgr pack node will show the operational status for the managed computers. This provides a quick view of the health of the related software components and services. If a problem is highlighted it is then possible to action a context sensitive task. For example administrators can action a task to restart the AppSense product service from within the OpsMgr console node.

Status information from the AppSense products are communicated via a system of Events and Alerts. All documented events accessible from the AppSense Management console are supported by the AppSense OpsMgr packs, and can be displayed and monitored in the OpsMgr console. In addition, a number of specific product events have been configured to trigger OpsMgr Alerts. These are typically events which require action by the system administrator to resolve an issue. Examples of alerts are an agent windows service not running, an agent not being correctly licensed, or a problem with system resources being raised by AppSense Performance Manager.

The AppSense Management Pack are available via the AppSense Professional Services team. Our team of experts will work with your team to configure ConfigMgr to deploy AppSense software, deploy our base OpsMgr pack, and discuss any specific needs for training or extending functionality of the management pack to meet site specific integration and reporting requirements.

Target	Type	Inherited from	Management Pack	Enabled by Default
AppSense AM Agent 8				
Entity Health	Aggregate Rollup	Entity	Health Library	Yes
Availability	Aggregate Rollup	Entity	Health Library	Yes
AppSense AM 8 Agent Service Monitor	Basic Service Monitor	(Not inherited)	AppSense Application Manager Agent 8	Yes
Configuration	Aggregate Rollup	Entity	Health Library	Yes
MOH 2005 Computer Role Health	Aggregate Rollup	Windows Computer ...	MOH 2005 Backward Compatibility	Yes
Performance	Aggregate Rollup	Entity	Health Library	Yes
Security	Aggregate Rollup	Entity	Health Library	Yes
AppSense Client Communications Agent 8.0				
Entity Health	Aggregate Rollup	Entity	Health Library	Yes
Availability	Aggregate Rollup	Entity	Health Library	Yes
AppSense CCA Service	Basic Service Monitor	(Not inherited)	AppSense Management Center 8.0	Yes
AppSense Watchdog Service	Basic Service Monitor	(Not inherited)	AppSense Management Center 8.0	Yes
Configuration	Aggregate Rollup	Entity	Health Library	Yes
MOH 2005 Computer Role Health	Aggregate Rollup	Windows Computer ...	MOH 2005 Backward Compatibility	Yes
Performance	Aggregate Rollup	Entity	Health Library	Yes
Security	Aggregate Rollup	Entity	Health Library	Yes
AppSense Client Communications Agent 8.1				
AppSense EM Agent 8.0				

Microsoft SCVMM and AppSense user virtualization

AppSense user virtualization + Microsoft System Center Virtual Machine Manager

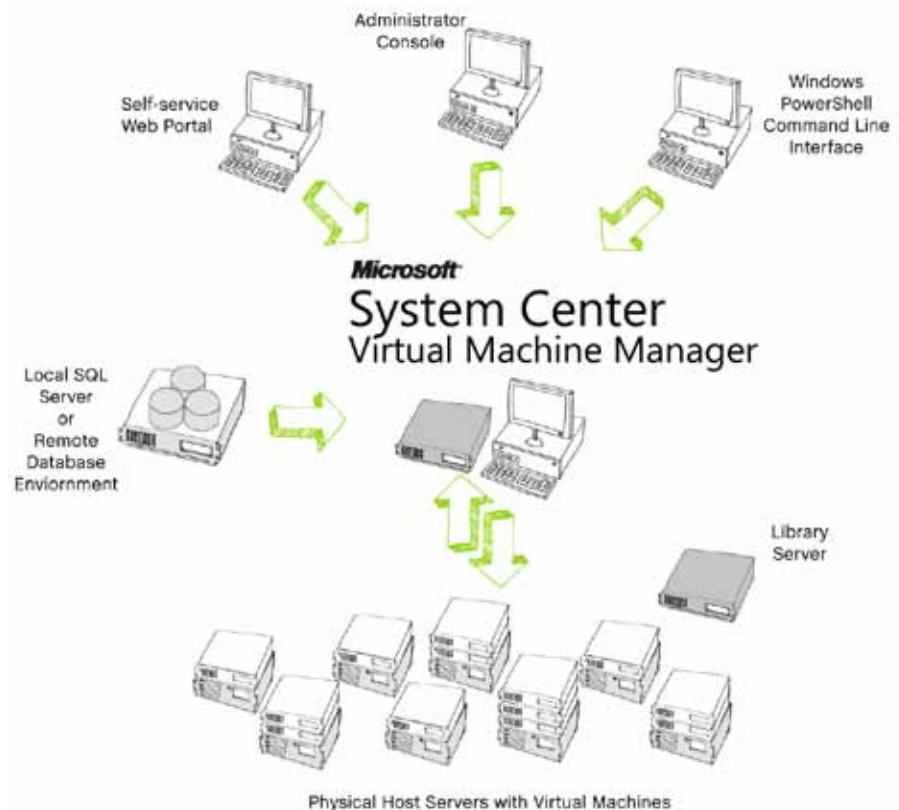
System Center Virtual Machine Manager (SCVMM) helps enable centralized management of physical and virtual IT infrastructure, increased server utilization, and dynamic resource optimization across multiple virtualization platforms. It includes end-to-end capabilities such as planning, deploying, managing, and optimizing the virtual infrastructure.

SCVMM support a range of virtualization environments from single machines through to complex, distributed datacenter topologies. Fundamental to this capability is the management of multiple virtual machine hosts, which are the physical servers running the virtualization software. Microsoft SCVMM currently supports Microsoft Virtual Server 2005 R2, Microsoft Windows Server 2008 Hyper-V and VMware ESX server virtualization solutions. In the near future, SCVMM will also support the Citrix XenServer virtualization platform.

While the use of SCVMM for managing virtualized datacenters is well known, a number of products are available that use SCVMM as a platform for desktop virtualization and virtual desktop infrastructure (VDI). Products that use SCVMM as a platform include Citrix XenDesktop, Quest vWorkspace and Visual Studio Lab Management.

Desktop virtualization enables organizations to host individual desktops inside virtual machines running in a data center. Users access the desktops remotely from a PC or a thin client. By running all desktops within a data center, organizations now have central control of operating systems and applications.

Typical first stage desktop virtualization takes an existing physical desktop - referred to here as an 'image' and migrates this to a datacenter. While this approach is relatively easy, it does not necessarily provide a cost effective, easy to manage environment when scaled out, as each individual desktop must be individually stored and managed in the datacenter.





Conclusion

Microsoft SCVMM includes the ability to do a P2V (physical-to-virtual) migration of Windows computers. The process scans the contents of the hard disk and converts them into virtual hard disks (VHD's). The machine specification is converted into a virtual machine configuration. The requirements for physical computers depend on whether you are performing an online or offline P2V. In both cases, VMM temporarily installs an agent on the physical source computer being converted to capture the image as a VHD.

In order to reduce storage costs and maintenance, desktop images can be 'pooled'; essentially consolidating many desktops to a single desktop and using this as a standard for similar types of users. Whilst this reduces the management, infrastructure and storage overhead, it also tends to reduce the end user experience, since all users are now working from a standard "gold image" desktop that is not personal to them in the way the physical PC was.

User virtualization personalizes standardized corporate desktops by treating user information as a separate layer of the desktop. This layer is applied to the desktop as and when needed and is accessible in any environment - physical or virtual. User environment management involves the abstraction of user data from the desktop, managing this data independently of the user environment and using it to personalize a standard image on-demand.

Three best practices are enabled through the inclusion of user environment management in a virtual desktop implementation.

1. Migration of users to a virtual environment
2. Dynamic personalization of standard images
3. Dynamic desktop assembly

Implementation of these three best practices will yield an effective, scalable, minimal cost and most importantly, an accepted virtual desktop environment.

AppSense Environment Manager provides necessary functionality in conjunction with SCVMM to automatically create personalized instances of virtual desktops from golden Windows images, including options for seamless integration with Microsoft Application Virtualization (App-V).

To fully embrace and benefit from the shift from infrastructure to service based computing we must understand and remove user complexity. Managing desktop estates at just the device level impacts user productivity and increases IT costs as the gap between user demands and IT capabilities increases. User virtualization enables flexibility, freedom of choice for both IT and users, and eliminates barriers to technology adoption. The combination of AppSense user virtualization and Microsoft System Center is proven to enable organizations to quicken the adoption of new technology platforms, simplify desktop management and reduce associated costs, and enable users the freedom to access their desktops', applications and data, from any device with a personalized, yet compliant experience.

About AppSense

We are the leading provider of user virtualization technology to enterprise organizations. User virtualization is a way of managing user-specific information independent of the desktop, and applying this information into any desktop (local install, virtualized, published, streamed etc) on-demand. This enables IT to standardize the desktop build, automate desktop and application delivery, and migrate users to new desktops – all while ensuring the user experience is seamless, personal, predictable and easily manageable.