



Making a Smooth Transition to a Hybrid Cloud with Microsoft Cloud OS

Transitioning from today's highly virtualized data center environments to a true cloud environment requires solutions that let companies deploy, manage, and migrate applications to the best platform, public or private, as requirements change over time.



In This Paper

- Most organizations must make a rapid migration to hybrid clouds
- Commonly used virtualization and management solutions fall short when it comes to transitioning to a true cloud environment.
- Microsoft Cloud OS, based on Windows Server® and Windows Azure™, addresses the challenges of moving to a hybrid cloud

eWeek

Executive Brief

Introduction

Companies frequently must overcome many obstacles to run their critical applications in a cloud environment.

Microsoft Cloud OS, based on **Windows Server®** and **Windows Azure™**, addresses the challenges of moving to a cloud architecture, letting companies deploy, manage, and migrate applications to public, hybrid, or private clouds, as requirements change over time.

Specifically, Microsoft Cloud OS solutions overcome limitations of some legacy solutions, which simply do not offer the capabilities and features to ensure a successful transition to a cloud-based operation.

With Microsoft Cloud OS, Windows Server and Windows Azure are complemented by other solutions, such as **System Center** and **Hyper-V®**. Together, these technologies provide a consistent platform for infrastructure, applications, and data that can span an enterprise data center, service provider data centers, and the Microsoft Azure public cloud. As a result, Microsoft is uniquely positioned to meet an organization's cloud requirements across private, hybrid, and public clouds.



Top three reasons you need to reevaluate your core cloud technologies to address current and future needs

Many organizations find their widely used virtualization and management solutions fall short when it comes to transitioning to a cloud environment. Here is why:

Reason 1: The legacy solutions might not scale, limiting the number of virtual machines (VMs) that can be supported. Most do not support a multi-hypervisor environment, which is increasingly common in data centers today.

Reason 2: Many virtualization and management tools do not provide the resource monitoring capabilities needed to ensure optimized application performance in a cloud environment. They do not measure or provide an understanding of interdependencies of compute, storage, and networking cloud resources.

Reason 3: Many legacy management solutions are designed for either private cloud deployments or public cloud services and do not offer a way to manage the mixed environment or seamlessly migrate between the two as business requirements change over time. In fact, most do not support the easy migration of VMs and their associated data between private and public clouds.

Microsoft Cloud OS offers a hybrid cloud platform that overcomes these limitations. Windows Server and Windows Azure offer industry-leading multi-hypervisor virtualization host support enabling the scalability required in large cloud deployments; deliver new features and enhancements to evaluate and optimize compute, storage, and networking resource utilization; and provide enhanced features to simplify the efficient migration of VMs between private and Windows Azure public cloud environments.

Required characteristics of a cloud solution

When preparing for a hybrid cloud environment, organizations need solutions that offer a common core of characteristics to ensure application performance levels are met, management duties do not grow, resources are used efficiently, and maximum flexibility is afforded.

To start, any solution today must offer enterprise-class virtualization and a cloud platform that provides the scalability and availability to meet business needs. The solution must support large numbers of VMs, offer rapid provisioning and deployment features, monitoring and optimization capabilities to meet service level agreements, and resiliency features to reduce downtime and ensure high availability.

Other key characteristics include:

- *A hypervisor that supports integration with cloud-based services and the building out of hybrid environments*
 - *Incorporation of storage and network provisioning to help optimize their use based on application workloads*
 - *Service automation capabilities, including automated provisioning and deployment, to drive down costs*
 - *Support for heterogeneous data center environments to allow use of the best solutions based on business requirements*
 - *Multi-hypervisor management to allow lines of business to make use of the most suitable technology for their needs, while easing IT chores when it comes to management and VM migration between private and public clouds*
- Monitoring capabilities that provide deep insight into applications and workloads to deliver predictable SLAs.*

Microsoft® as your technology partner

Organizations need a solutions provider that takes all of these characteristics and requirements into account. Enter the **Microsoft Cloud OS**.

The Microsoft Cloud OS is based on Windows Server and Windows Azure and handles the chores of a traditional OS, such as managing applications and hardware. However, Microsoft Cloud OS is capable of doing these things at the scale of cloud computing.

Using **Windows Server, Windows Azure**, and other Microsoft technologies, such as System Center and Hyper-V, organizations get a single platform to develop, deploy, and manage infrastructure and applications. Specifically, the same procedures are used to provision resources, push out, migrate, and administer VMs whether they run on a private or public cloud, or move between the two over time.

The Microsoft Cloud OS brings to market a set of common technologies and capabilities that extend across hybrid cloud environments. The 2012 R2 versions of Windows Server, System Center, and Hyper-V have many new and enhanced features, in general, and many that are designed to help organizations support a mixed cloud environment. When used in conjunction with Windows

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Azure, organizations can realize a true cloud environment that offers the flexibility to deploy, manage, and migrate applications as best suits the company's needs.

To that point, the cloud-related capabilities of these offerings include:

Windows Server 2012 R2: Windows Server 2012 R2 offers a proven, enterprise-class virtualization and cloud platform that can scale to continuously run the largest workloads, while enabling robust recovery options to protect against service outages. Key features and new enhancements include:

- Supports private, hybrid, and Windows Azure public clouds
- Portability between Windows Server 2012 R2 and Windows Azure
- Live migration compression that boosts performance roughly by 2x for most workloads
- New storage features and storage tiering allowing organizations to take advantage of lower-cost industry-standard hardware (rather than purpose-built storage devices)
- Storage Spaces, which provides sophisticated virtualization enhancements to the storage stack that can be used to pool multiple physical hard disk drives together and provide highly resilient and reliable storage arrays for critical workloads.

Windows Azure: Windows Azure is an open and flexible cloud platform that enables organizations to quickly build,

deploy, and manage applications across a global network of Microsoft-managed data centers. The applications can be built using any language, tool, or framework. IT can integrate its public cloud applications with an existing IT environment. Key features of Windows Azure include:

- Enables easy scaling of applications to any size
- Fully automated self-service platform that allows organizations to provision resources within minutes
- Organizations can elastically grow or shrink resource usage based on needs, paying only for the resources an application uses
- Service-level agreements and an enterprise-class infrastructure ensuring high availability
- Scalable, durable cloud storage, backup, and recovery solutions for any data
- Enterprise-ready cloud identity service via Windows Azure Active Directory, enabling a single sign-on experience across cloud and on-premises applications.

System Center 2012 R2: System Center offers unified management, giving administrators the ability to manage applications, systems, and devices across private, hosted, and public clouds through a single pane of glass. Key features and new enhancements include:

- Ability to provision and manage VMs in on-premises and Windows Azure environments
- Easy workload portability without

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- a need for format conversion
- Ability to manage a multi-hypervisor environment, which might include a mix of Hyper-V, VMware®, and Xen® Hypervisor
- The Virtual Machine Manager (VMM) component of System Center 2012 R2 is capable of supporting large scale cloud environments.

Hyper-V 2012 R2: Windows Server 2012 Hyper-V offers a number of features and enhancements for hybrid cloud environments. New features and key enhancements include:

- Industry-leading virtualization host support for 320 logical processors, 4TB of physical memory, and 1,024 active VMs per host. Hyper-V supports 64-node clusters and 8,000 VMs per cluster
- Live migration has been updated to allow an administrator to select the optimal performance options when moving VMs to a different server
- A compression engine, built into Live Migration in Windows Server 2012 R2 Hyper-V, works on the data associated with a VM to reduce the total number of bytes that must be transmitted over the wire
- Ability to export or clone a running VM from System Center Virtual Machine Manager 2012 R2 with a few mouse clicks.

Together, Windows Azure, Windows Server 2012 R2, Service Center 2012 R2, and Hyper-V 2012 R2 form the core elements of the Microsoft Cloud

OS. The 2012 R2 versions specifically let organizations more efficiently manage data center resources as a whole, including networking, storage and compute elements. Applications and new IT services can be delivered much faster across private, hybrid, and public clouds. Additionally, organizations will be able to support applications on any device, while maintaining security and compliance.

Try Microsoft Cloud OS now

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Find out more about Windows Azure by visiting: <http://www.windowsazure.com>