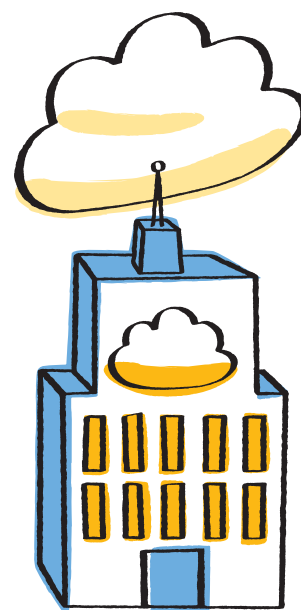




Solution Brief

NetApp for Microsoft Private Cloud



KEY FEATURES

Reduce Costs

Reduce the cost of delivering and managing IT services and applications using a private cloud infrastructure.

Increase Agility

Respond faster to changing business needs while making sure of application availability with a IT infrastructure.

Improve Efficiency

Automate data management tasks using Microsoft System Center integrated with NetApp OnCommand™ Plug-in for Microsoft and Data ONTAP® PowerShell Toolkit.

Utilize Proven Platform

NetApp and Microsoft offer a robust set of tools, including solution, build, and operation guides plus validated reference architectures and best practices, to help you jump-start your NetApp for Microsoft Private Cloud deployment.

Transform the Promise into Results

Cloud computing has become a reality. The cloud model delivers on-demand and secure access to pools of IT resources, empowering companies to increase flexibility and efficiency while cutting capex and opex.

The combination of NetApp storage with Microsoft Private Cloud, featuring Microsoft Windows Server® 2008 R2 Hyper-V™ and Microsoft System Center 2012, facilitates the delivery of IT services and applications for your organization.

NetApp and Microsoft deliver on the promise of private clouds, enabling you to:

- Accelerate time to market by enabling faster responses to changing business needs using a scalable and dynamic IT infrastructure that maintains performance levels while at the same time permitting growth at scale.
- Improve operational efficiencies through automated IT resource management that provides policy-based provisioning, efficiency, and protection through metering,

analytics, and self-service capabilities.

- Safeguard data availability during periodic component upgrade and system replacement.
- Lower overall costs using a flexible multi-tenant and efficient shared IT infrastructure with high utilization.

NetApp: The Foundation of Microsoft Private Cloud

The scope, scale, and complexity of today's data-driven world create new demands in the data center. NetApp infrastructure optimizes storage management at scale and thus enables rapid response to business opportunity. Our sophisticated storage and data management software integration with Microsoft provide a strong foundation for a Microsoft Private Cloud, built on Windows Server 2008 R2 Hyper-V and System Center 2012. NetApp's shared infrastructure enhances private cloud deployments with the following features:

- **Storage efficiency.** NetApp complements Microsoft Private Cloud by virtualizing the underlying storage environment to provide the same efficiencies and availability for storage that Hyper-V does

Interoperability with Microsoft products, expertise in storage and cloud computing, and a strong partnership with Microsoft make NetApp your partner of choice for transforming the promise of a Microsoft Private Cloud into real-world business results.

for servers. You can dynamically provision and resize storage; deduplicate redundant data; create near-instantaneous Snapshot™ backups; and leverage leading storage efficiency features such as thin provisioning, application-aware data protection, and multi-tenancy, all of which makes NetApp a very capable storage foundation for Microsoft Private Clouds.

- **Unified architecture.** The NetApp Unified Storage Architecture and NetApp Data ONTAP operating system provide a common and flexible platform that supports multiple protocols (iSCSI, FC, and FCoE SAN as well as SMB/NAS) and diverse workloads and can meet changing requirements without forklift upgrades.
- **Integrated solutions with Microsoft.** NetApp is integrated with Microsoft Private Cloud to enable seamless deployments of cloud infrastructures. Your organization can leverage NetApp and Microsoft technologies to achieve storage and server virtualization. With System Center you can manage your enterprise data center infrastructure, including a variety of enterprise applications such as Exchange Server, SQL Server®, and SharePoint® Server, as well as Citrix XenDesktop for virtual desktop infrastructure, which you deploy in the cloud.

- **Private cloud expertise.** With a growing portfolio of successful private cloud deployments and a strong partnership with Microsoft, NetApp is the ideal partner to help you implement your Microsoft Private Cloud infrastructure. Our expertise is available to you through documented solution guides and operational best practices, services that can help you jump-start your private cloud project, hands-on experience from NetApp Professional Services and our partners, and knowledge transfer to enable your long-term success.

A Closer Look at NetApp for Microsoft Private Cloud

Key components of NetApp for Microsoft Private Cloud (as illustrated in Figure 1 on the next page) include:

- **NetApp storage systems** running the Data ONTAP operating system provide data management capabilities, including policy-based storage management, provisioning, backup, recovery, and disaster recovery.
- **Microsoft Systems Center 2012** components, including Virtual Machine Manager (SCVMM), Operations Manager (SCOM), Service Manager (SCSM), App Controller, and Orchestrator, can leverage the unique capabilities of NetApp storage solutions through products

such as NetApp OnCommand Plug-In for Microsoft (OCPM) and Data ONTAP PowerShell Toolkit to provide comprehensive private cloud management and self-service capabilities.

- **Microsoft Windows Server 2008 R2 Hyper-V** enables consolidation of physical servers into virtual machines that can run various application workloads, including Microsoft Exchange Server, SharePoint Server, and SQL Server.

Our solution ships integration with SCVMM, SCO, and SCOM. The cloud services pack sits on top of SCSM, and utilizes System Center connectors to orchestrate the entire System Center stack. These tightly integrated components enable NetApp for Microsoft Private Cloud to deliver:

- **Dynamic scalability.** New business opportunities bring a relentless thirst for data, driven by a new wave of mobile and machine-generated data sources. Together, NetApp and Microsoft enhance the flexibility and scalability of resources in your private cloud. For example, NetApp FlexVol® software allows you to add storage capacity and expand volumes—without taking the NetApp storage system offline and with no disruption to the applications running. NetApp provides a dynamic infrastructure

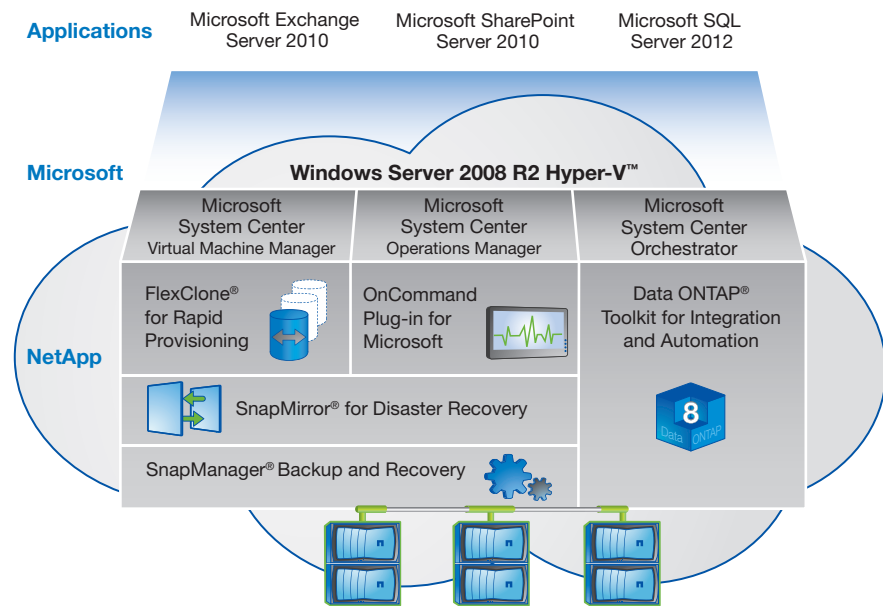


Figure 1) Key components of NetApp for Microsoft Private Cloud.

that maintains performance levels while at the same time permitting data growth at scale.

- **Automated workflow.** Continual data growth can overwhelm IT resources and limit the ability to turn data into value. The combination of System Center Orchestrator with sample workflows, integration packs, and PowerShell scripts from NetApp enables improved productivity and reduced risk through workflow automation.
- **Predictable, multi-tenant platform.** Monitoring storage utilization, performance, and system health with SCOM and OCPM increases overall predictability of cloud deployments. Also, OCPM and SCVMM can alert administrators to storage issues affecting a specific virtual machine (VM) and perform autoremediation before issues become problems. Multi-tenancy is part of NetApp storage and Windows Server 2008 R2 Hyper-V, enabling the cost-effective partitioning of a single system to support multiple tenants, such as customers, business units, or workgroups.
- **On-demand self-service.** Through Microsoft's System Center Cloud Services Process Pack business administrators can provision VMs with minimal assistance from central IT. NetApp's tight integration with

Orchestrator makes sure that NetApp customers can utilize FlexClone® copies of VHD files within a LUN for quick creation of space-efficient VHD clones as part of the VM provisioning process.

- **Application centric.** NetApp SnapManager® products for Exchange Server, SharePoint Server, SQL Server, and Hyper-V provide backup and recovery and disaster recovery capabilities so you can protect key workloads in your Microsoft Private Cloud. You can meet backup windows with near-instantaneous backups, create frequent point-in-time copies, simplify backup operations through policy-based automation, restore all of your Microsoft application data in minutes, provide single mailbox recovery (for Exchange Server) as needed without affecting other users, and efficiently replicate backups to other locations for additional protection.

The Road to the Private Cloud

You can move to the Microsoft Private Cloud incrementally, without ripping and replacing your current infrastructure. The path your company takes depends on your starting points and objectives, but in general there are four steps to consider:

- **Standardize.** Unifying hardware and creating repeatable processes help to

deliver predictable services that can result in shorter provisioning times and lower support costs.

- **Consolidate and virtualize.** Consolidating and virtualizing servers and storage are prerequisites to the construction of private clouds. This step helps you increase asset utilization by making it easier to move workloads and scale on demand; it also enhances availability by making it easier to implement high availability and disaster recovery for many applications.
- **Automate and orchestrate.** Once you begin automating regular practices such as provisioning, activation, backup, and replication, your IT staff will be able to orchestrate and scale IT services using private clouds.
- **Centralize management.** Centralized management is a necessary characteristic of private clouds because it gives you a complete picture of what resources are available and needed and a projection of future usage and expenditures. It also allows IT to measure usage and implement chargeback models, and it enables IT to implement self-service portals that empower users to perform common tasks, freeing up IT staff to focus on value-added services.

Take the Next Step Toward IT Flexibility and Efficiency

Interoperability with Microsoft products, expertise in storage and cloud computing, and a strong partnership with Microsoft make NetApp your partner of choice for transforming the promise of a Microsoft Private Cloud into real-world business results.

So take the next step to delivering IT services and applications. Learn more about NetApp for Microsoft Private Cloud. Contact your local NetApp or partner sales representative today.

Use of the word "partner" or "partnership" does not imply a legal partnership between NetApp and any other company.

About NetApp

NetApp creates innovative storage and data management solutions that deliver outstanding cost efficiency and accelerate business breakthroughs. Discover our passion for helping companies around the world go further, faster at www.netapp.com.

Go further, faster®



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