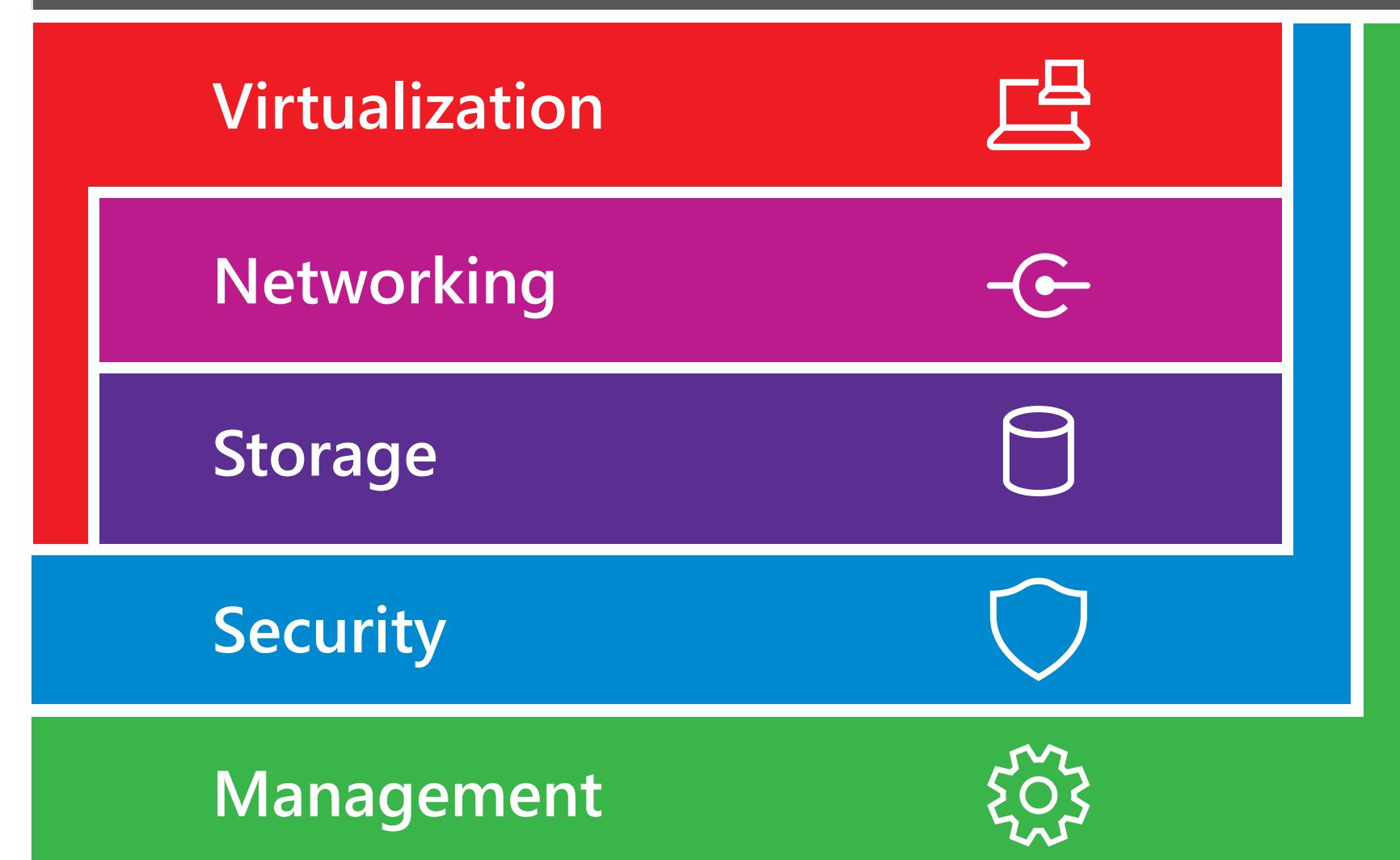


# Windows Server Software-Defined Datacenter



## Deploy

### Microsoft Services

#### Windows Server Software-Defined Solutions

Preferred Microsoft partners, DataON, Fujitsu, Lenovo, QCT, SuperMicro, Hewlett Packard Enterprise and Dell EMC, can get you up and running quickly and efficiently with Microsoft-validated design and best practices for seamless deployment and steady state operation.

Microsoft partners offer an array of Windows Server Software-Defined (WSSD) solutions that work with Windows Server to deliver high-performance storage over hyper-converged infrastructure. Hyper-converged solutions bring together compute, storage, and networking on industry-standard servers and components for improved datacenter intelligence and control.

*Partners offer three WSSD solutions*

Software-Defined Storage (SDS)	Enterprise-grade shared storage solution built on server node clusters replaces traditional SAN/NAS at a much lower cost. Organizations can quickly add storage capacity as needs grow over time. Support for all-flash NVMe drives univolved performance.
Hyper-Converged Infrastructure (HCI) Standard	Highly virtualized compute and storage are combined in the same server node cluster, making them easier to deploy, manage, and scale. By eliminating traditional IT compute, storage and networking silos, you can simplify your infrastructure.
Hyper-Converged Infrastructure (HCI) Premium	Comprehensive "software-defined datacenter in a box" adds Software-Defined Networking and Security Assurance features to HCI Standard. This makes it easy to scale compute, storage, and networking up and down to meet demand just like public cloud services.

## Configure

### Windows Server 2016

#### Software-Defined technologies

The software-defined technology in Windows Server 2016 provides a platform for hyper-converged infrastructure solutions that help organizations sustain efficiency and adjust to changing business needs.

## Manage

### System Center 2016

#### Management and automation

Cloud management with support for LAMP stack and VMware, including monitoring resources and services in Azure and Amazon Web Services.

Scan to learn more about the WSSD Program

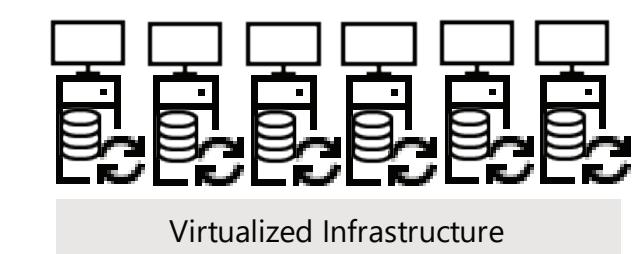


Check out these partners with validated platforms, deployment and support at [www.microsoft.com/wssd](http://www.microsoft.com/wssd) to get you up and running quickly.

## Virtualize anything

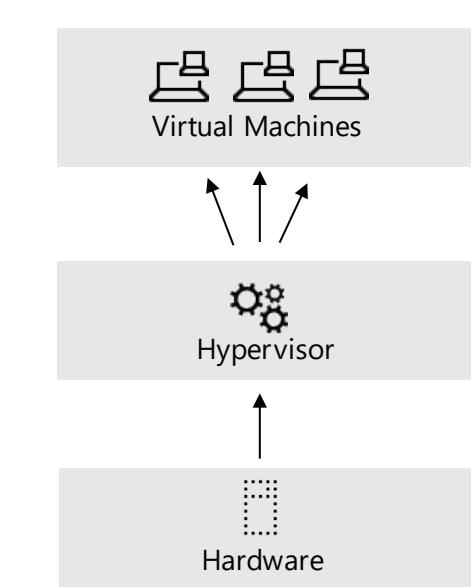
### Windows Server, Hyper-converged

Windows Server 2016 Virtualization technologies include updates to Hyper-V, Hyper-V Virtual Switch, and Guarded Fabric and Shielded Virtual Machines (VMs), that improve security, scalability, and reliability. Updates to failover clustering, networking, and storage make it even easier to deploy and manage these technologies when used with Hyper-V.



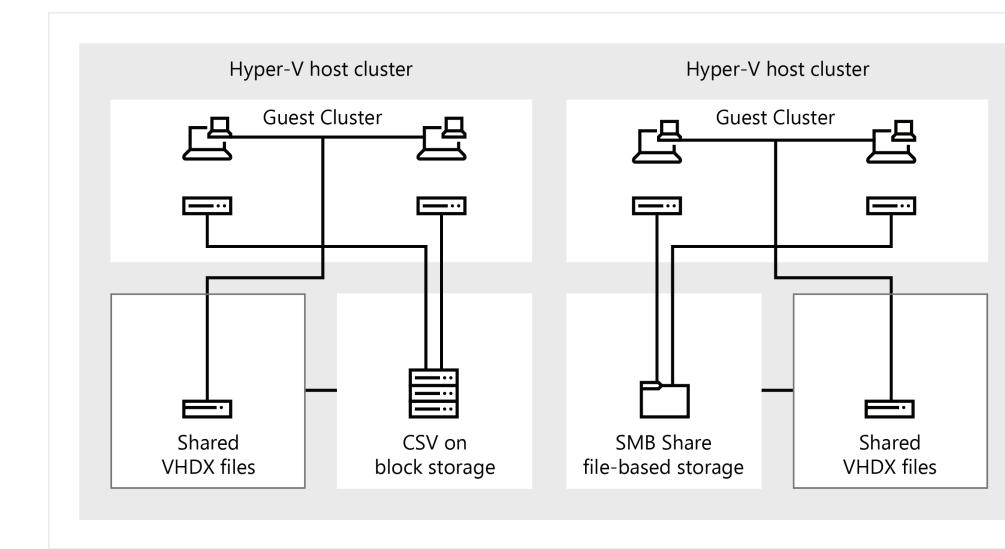
### Hyper-V Hypervisor

Hyper-V is a hypervisor-based virtualization technology for Windows. The hypervisor is core to virtualization. It is the processor-specific virtualization platform that allows multiple isolated operating systems to share a single hardware platform.



### Guest clustering with Shared VHDX

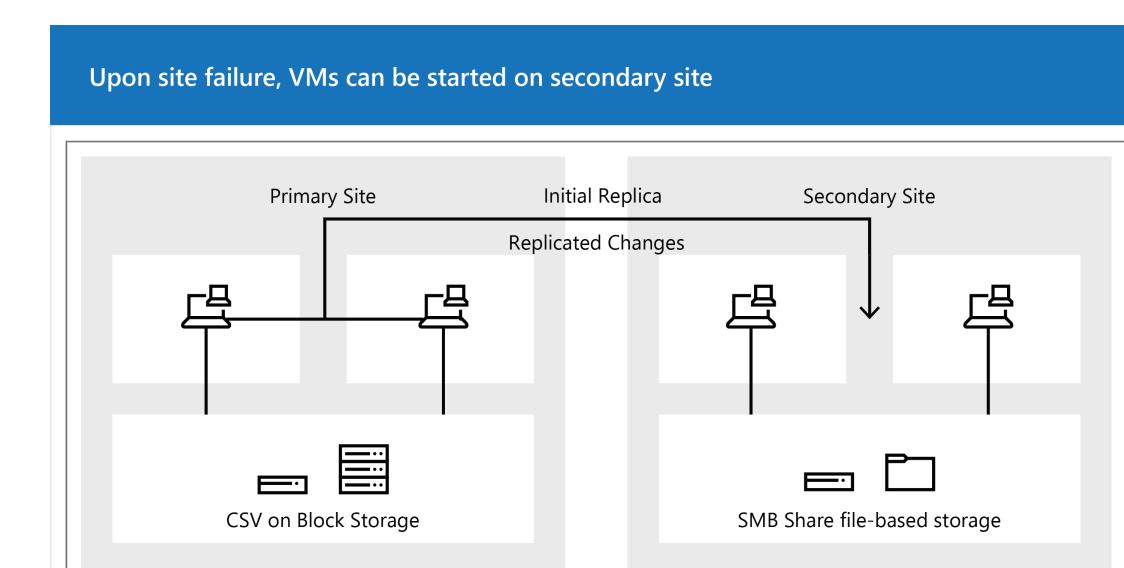
Flexible and secure, and not bound to the underlying storage topology, Shared VHDX removes the need to present the physical underlying storage to a guest OS. The new Shared VHDX supports online resize.



- Shared VHDX can reside on a Cluster Shared Volume (CSV) on block storage, or on SMB file-based storage.
- Protected: Shared VHDX supports Hyper-V Replica and host-level backup.

### Hyper-V Replica

Integrated software-based VM replication across the network with certificates. Not bound to server, network or storage hardware on either site.



- No need for other virtual machine replication technologies, reducing costs.
- Handles live migration automatically.
- Simple configuration and management — either through Hyper-V Manager, PowerShell, or with Azure Site Recovery.

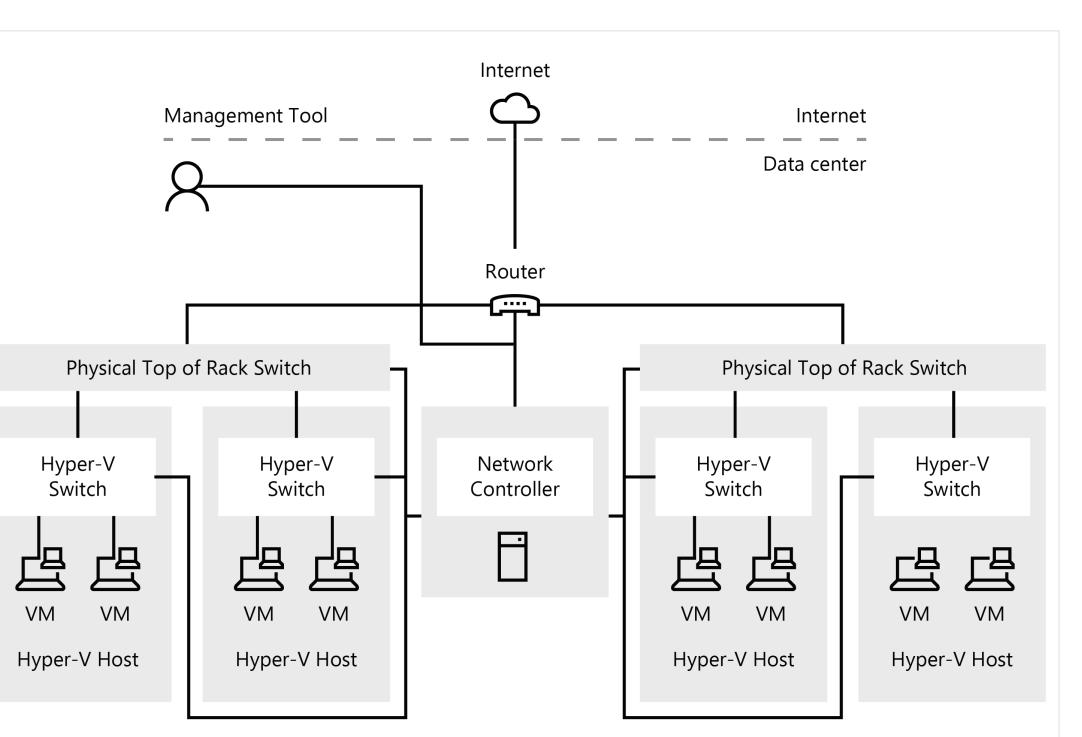


## Connect everything

## Connect everything

### Network Controller

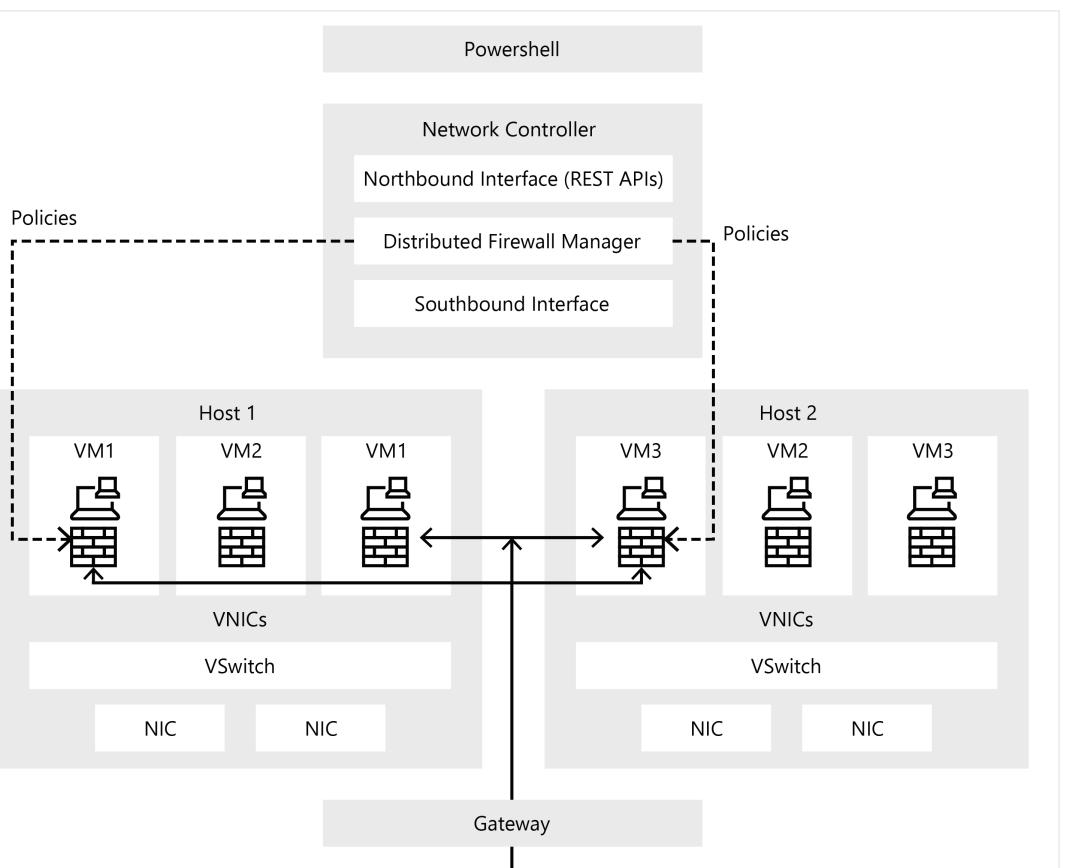
A centralized, programmable point of automation to manage, configure, monitor, and troubleshoot virtual and physical network infrastructure in your datacenter.



Administrators use a Management Tool that interacts directly with Network Controller. Network Controller provides information about the network infrastructure, including both virtual and physical infrastructure, to the Management Tool.

### Datacenter Firewall

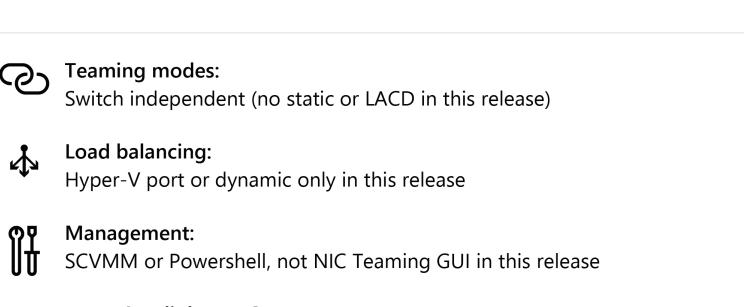
When deployed and offered as a service, tenant administrators can install and configure firewall policies to help protect virtual networks from unwanted traffic from Internet and intranet networks.



The service provider administrator, or the tenant administrator, can manage the Datacenter Firewall policies via the network controller.

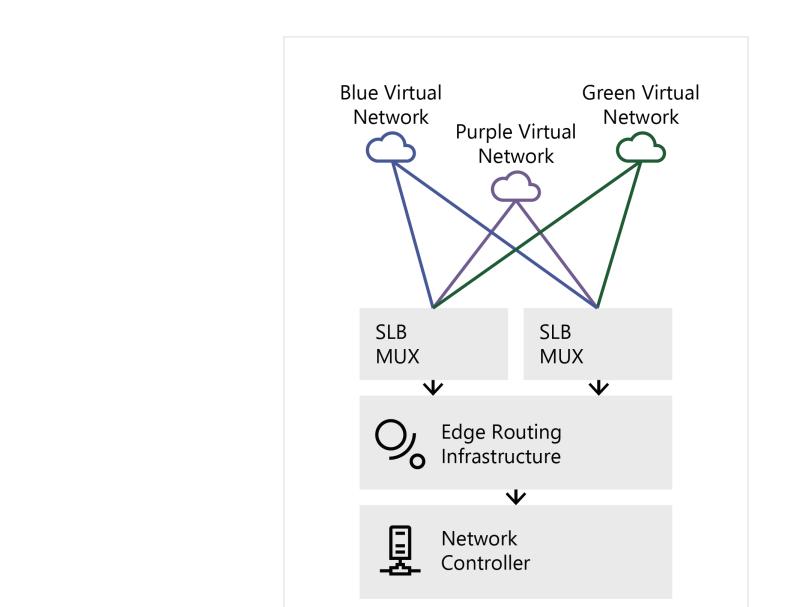
### Switch Embedded Teaming

SET is an alternative NIC Teaming solution that you can use in environments that include Hyper-V and the Software Defined Networking (SDN) stack.



### Software Load Balancing

SLB enables multiple servers to host the same workload, providing high availability and scalability. Scale out load balancing capabilities using SLB VMs on the same Hyper-V servers you use for your other VM workloads. SLB supports the rapid creation and deletion of load balancing endpoints for Cloud Service Provider operations. SLB supports tens of gigabytes per cluster, provides a simple provisioning model, and is easy to scale out and in.

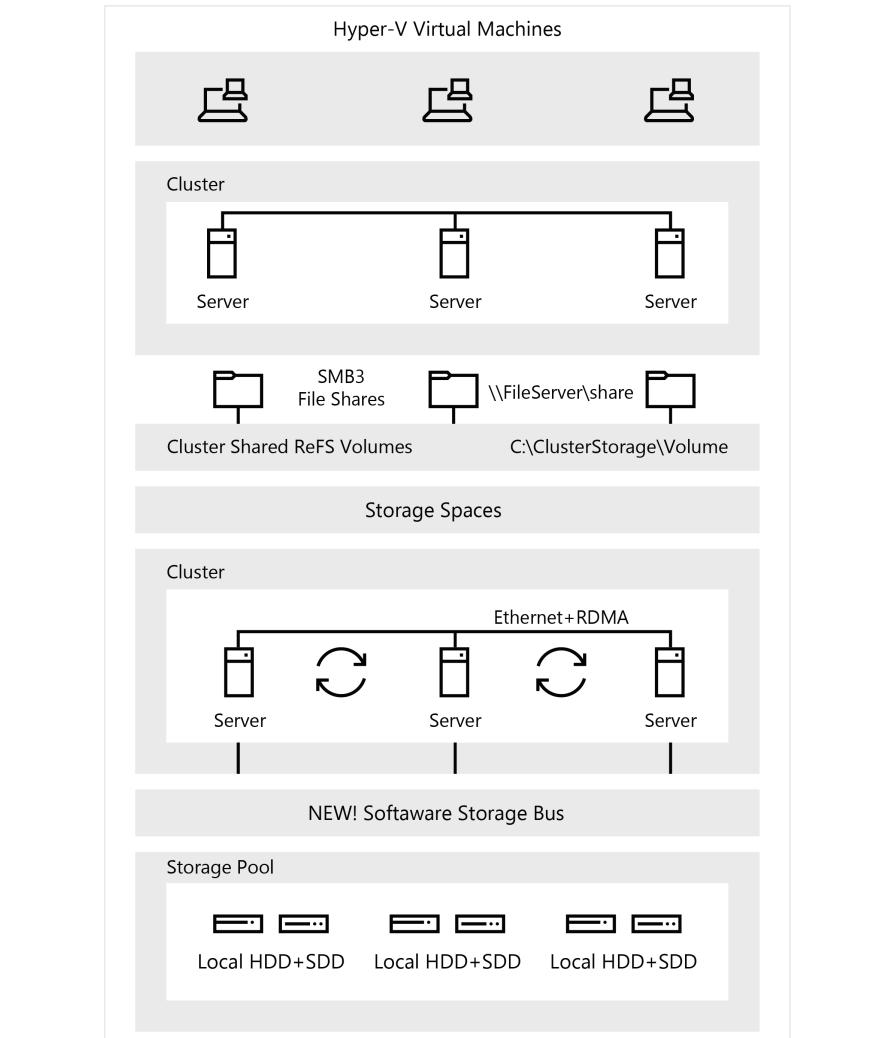


## Store more, spend less

## Store more, spend less

### Storage Spaces Direct

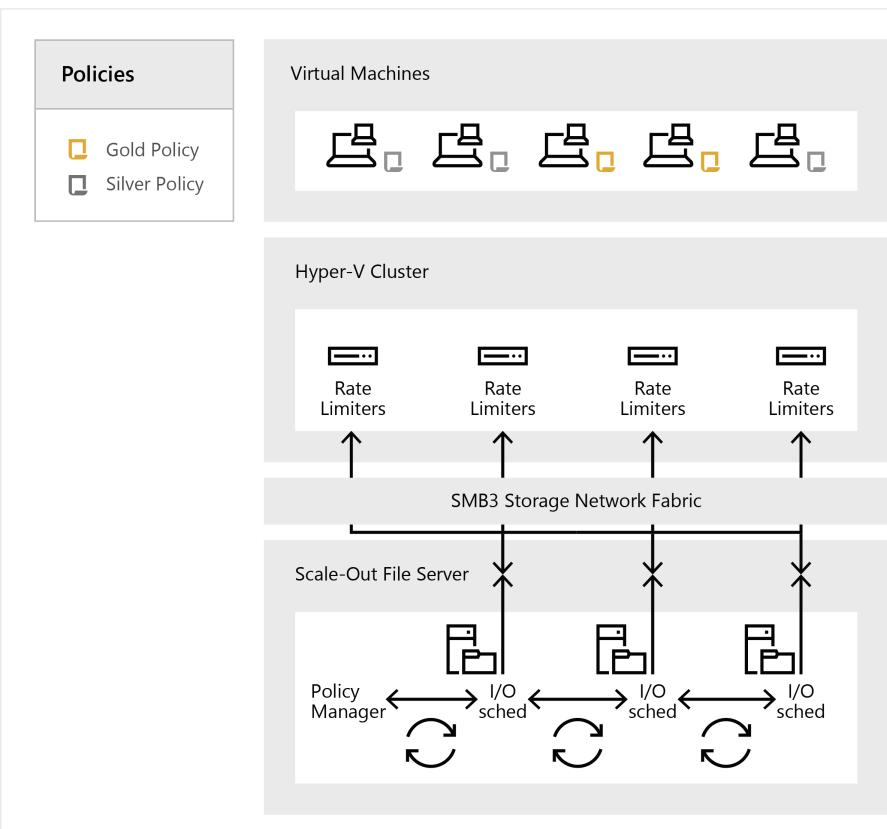
Using industry-standard servers with local-attached drives, SSD provides highly available, highly scalable software-defined storage at a fraction of the cost of traditional SAN or NAS arrays. Its architecture radically simplifies procurement and deployment.



SSD introduces the new Software Storage Bus and leverages many of the features you know today in Windows Server, such as Failover Clustering, the Cluster Shared Volume (CSV) file system, Server Message Block (SMB) 3, and Storage Spaces.

### Storage Quality of Service

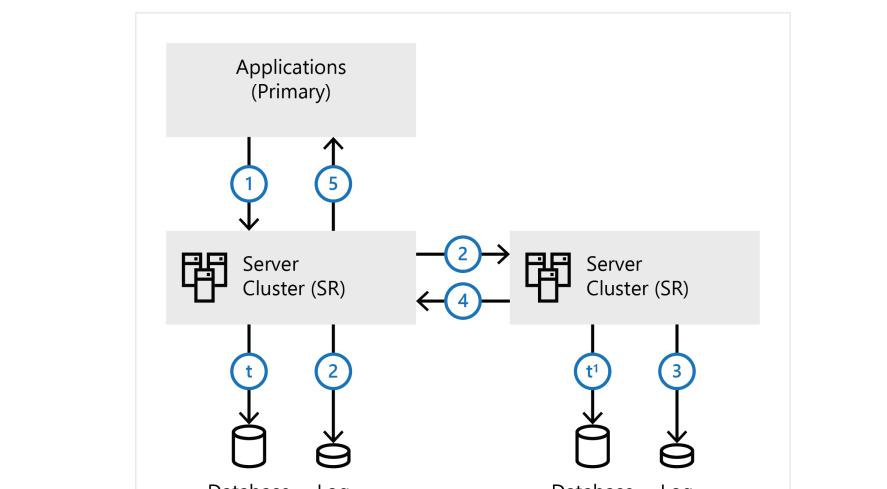
Centrally monitor and manage storage performance for virtual machines using Hyper-V and the Scale-Out File Server roles, improving storage resource fairness between multiple virtual machines.



Storage QoS is built into the Microsoft software-defined storage solution provided by Scale-Out File Server and Hyper-V using SMB3 protocol. A new Policy Manager provides central storage performance monitoring.

### Storage Replica

Disaster recovery and preparedness make possible zero data loss, with the ability to synchronously protect data on different racks, floors, buildings, campuses, cities, and countries with more efficient use of multiple datacenters.



### Synchronous Replication

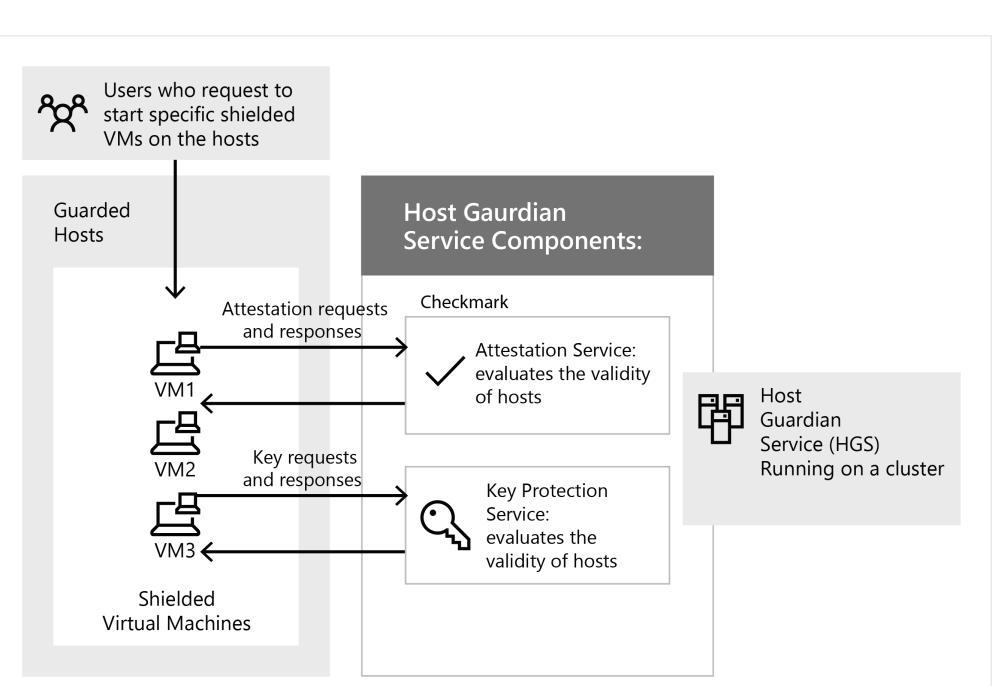
1. Application writes data
2. Log data is written and the data is replicated to the remote site
3. Log data is written at the remote site
4. Acknowledgement from the remote site
5. Application write acknowledged

t & t1 : Data flushed to the volume, logs always write through

## Protect assets

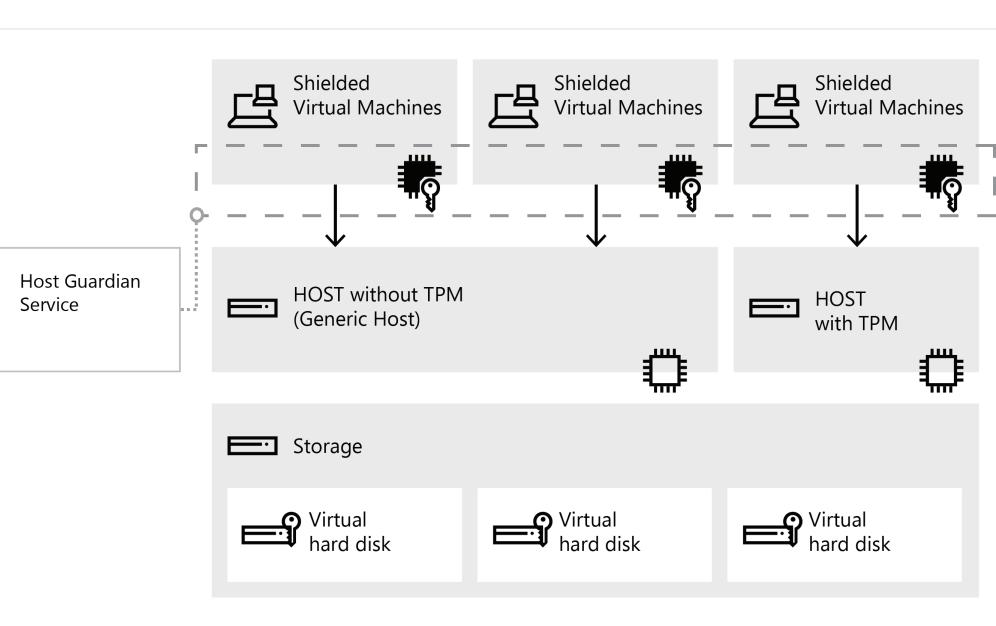
### Guarded Fabric

As a cloud service provider or enterprise private cloud administrator, you can use a guarded fabric to provide a more secure environment for VMs. A guarded fabric consists of one Host Guardian Service (HGS) - typically, a cluster of three nodes - plus one or more guarded hosts, and a set of shielded virtual machines (VMs).



### Shielded VM

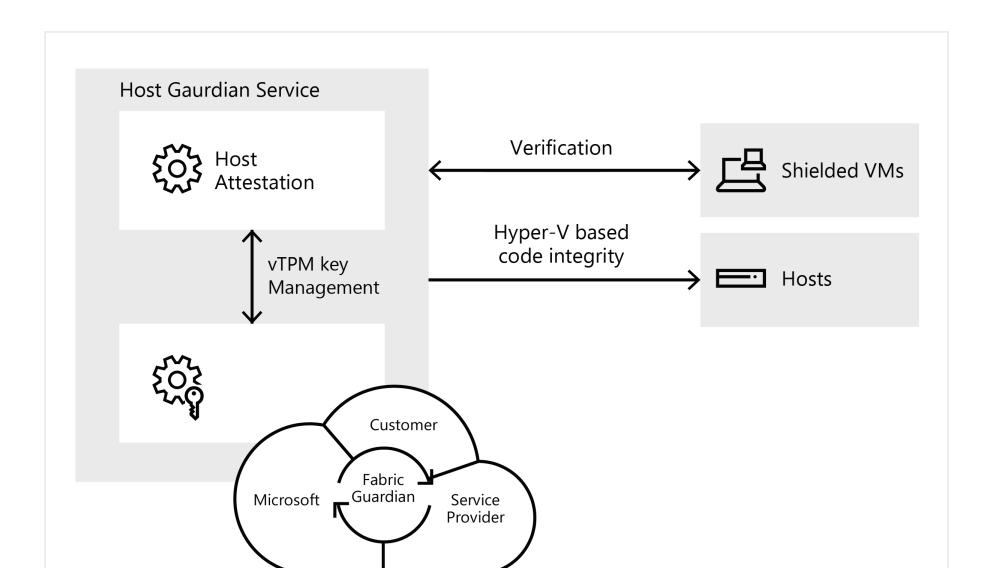
The data and state of a shielded VM are protected against inspection, theft and tampering, from both malware and datacenter administrators.



- Shielded VMs will only run in fabrics designated as owners of the VM.
- Shielded VMs are encrypted by BitLocker, or other means, so that only designated owners can run them.
- Running VMs can be converted to shielded.

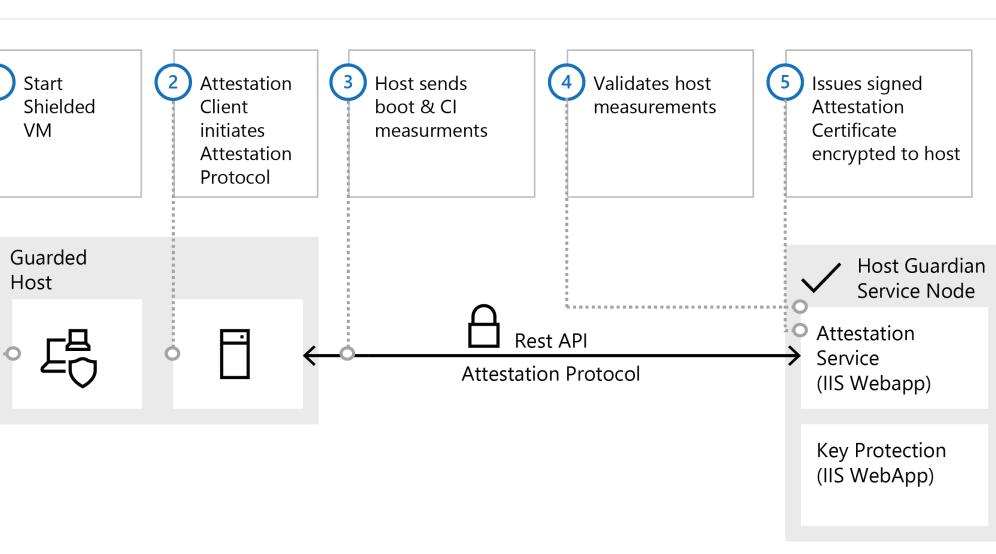
### Host Guardian Service

Host Guardian Service holds the keys to legitimate fabrics, as well as encrypted virtual machines.



### Device Health Attestation

Attestation enables enterprises to raise the security bar of their organization to hardware monitored and attested security, with minimal or no impact on operation costs.

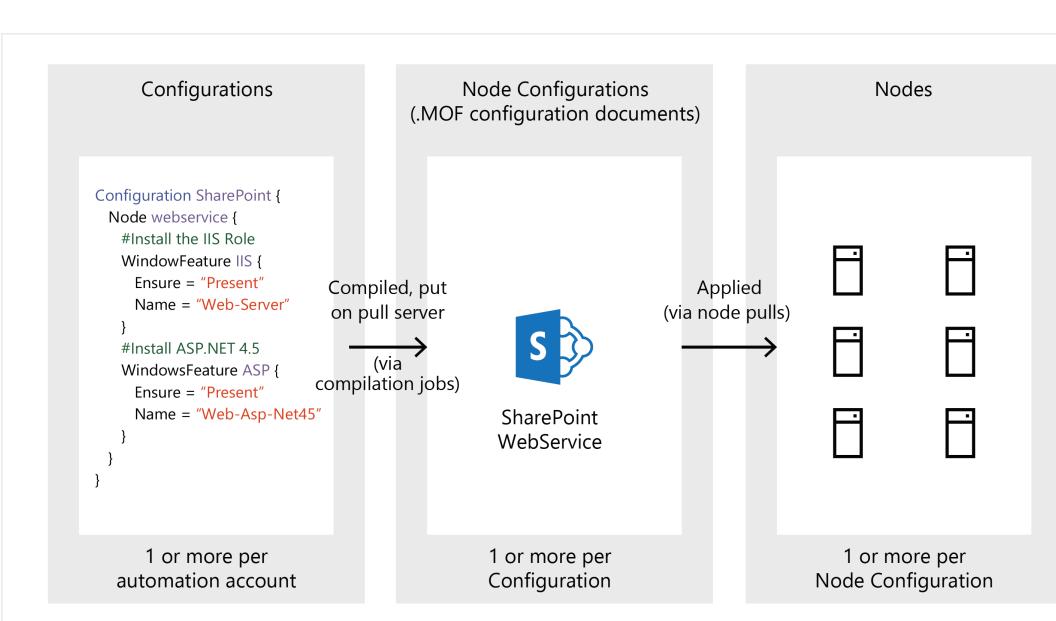


Hardware trusted mode, shown above, provides the highest level of assurance, with TPM v2.0 hardware rooted trust and compliance with code-integrity policy for key-release.

## Manage efficiently

### PowerShell DSC

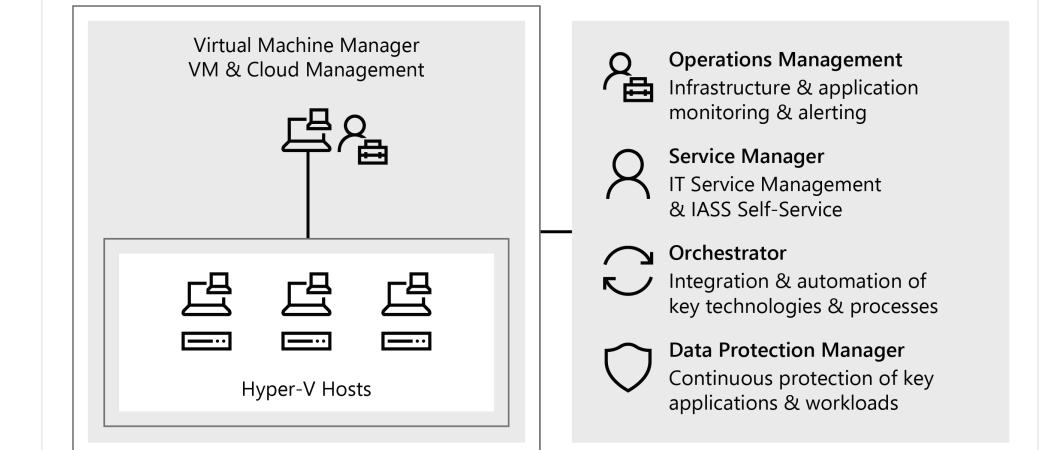
Windows PowerShell Desired State Configuration is a configuration management platform built into Windows that is based on open standards. DSC is flexible enough to function reliably and consistently in each stage of the deployment lifecycle (development, test, pre-production, production), as well as during scale-out.



- DSC supports "continuous deployments," so you can deploy configurations over and over without breaking anything.
- DSC configurations only apply settings that have changed from the original, for faster deployments.
- DSC can be used on-premises, and in a public or private Cloud environment.
- You can integrate DSC with any Microsoft or non-Microsoft solution, as long as you can execute a PowerShell script on the target system.

### System Center VMM

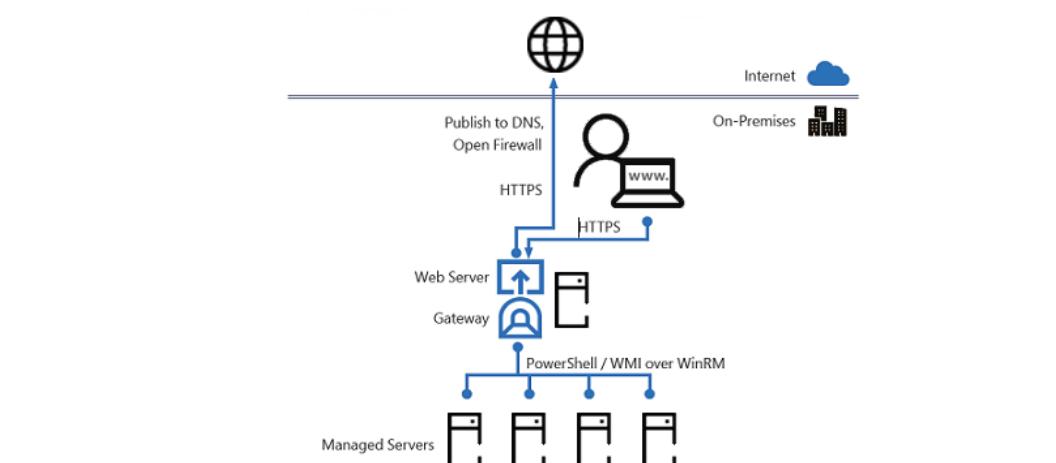
Virtual Machine Manager is part of the System Center suite, used to configure, manage and transform traditional datacenters to provide a unified management experience across on-premises, service provider, and the Azure cloud.



- Datacenter: Configure and manage datacenter components as a single fabric in VMM.
- Virtualization hosts: VMM can add, provision, and manage Hyper-V and VMware virtualization hosts and clusters.
- Networking: VMM provides network virtualization, including support for creating and managing virtual networks and network gateways.
- Storage: VMM can discover, classify, provision, allocate, and assign local and remote storage.

### Microsoft Project Honolulu

Honolulu is a locally deployed, browser-based, management toolset that enables on-premises administration of Windows Servers with no Azure or cloud dependency. Honolulu gives IT Admins full control over all aspects of their Windows Server infrastructure, and is particularly useful for management on private networks that are not connected to the Internet.



Publishing the web server to DNS and setting up the corporate firewall can allow you to access Honolulu from the public internet, enabling you to connect to, and manage, your servers from anywhere with Microsoft Edge or Google Chrome.

