



Answers to the “Do I Know This Already?” Quizzes and Q&A Questions

“Do I Know This Already?” Quizzes

Chapter 1

1. B
2. D
3. B
4. A
5. D
6. C
7. B
8. B and D
9. B and C
10. B

Chapter 2

1. D
2. B
3. D
4. B
5. A
6. C
7. A
8. A
9. A
10. D

Chapter 3

1. B
2. D
3. C
4. B
5. C
6. A and D
7. C
8. A
9. C
10. A and D

Chapter 4

1. D
2. C
3. D
4. C
5. D
6. D

Chapter 5

1. C
2. D
3. B

4. C
5. A and C
6. B

Chapter 6

1. D
2. A
3. D
4. A
5. B
6. A

Chapter 7

1. B
2. B
3. C
4. A
5. D
6. B

Chapter 8

1. D
2. A
3. B
4. C
5. C
6. C
7. A
8. D

Chapter 9

1. B
2. C
3. B
4. C
5. A and D
6. D

Chapter 10

1. B
2. B and D
3. A
4. D
5. C
6. A

Chapter 11

1. A and D
2. A
3. A
4. C
5. A
6. C
7. A
8. C

Chapter 12

1. D
2. B
3. D
4. A
5. C
6. B

Chapter 13

1. A
2. A and C
3. B, C, and D
4. D
5. C
6. C
7. B
8. B

Chapter 14

1. A
2. C
3. A
4. A
5. D
6. C

Chapter 15

1. A
2. C
3. A
4. C
5. D

Chapter 16

1. B
2. B
3. B
4. A and D
5. A

Chapter 17

1. C
2. C
3. A
4. B

Chapter 18

1. A
2. A
3. C
4. D

Chapter 19

1. C
2. C
3. C
4. A
5. A, B, and D
6. B

Chapter 20

1. C
2. D
3. C
4. D

Q&A

Chapter 1

1. Nested virtualization
2. 32 GB
3. Standard Edition
4. Upgrade and Custom
5. License conversion
6. Active Directory-based Activation and KMS

Chapter 2

1. A compute host for Hyper-V virtual machines; a storage host; a DNS server; an IIS server; a host for container apps
2. Headless; runs only 64-bit applications; cannot be an AD domain controller; Group Policy not supported; NIC teaming not supported; cannot proxy to Internet
3. VHDX
4. **-Defender**
5. PowerShell; WMI; Windows Remote Management; EMS
6. Add the IP address of your management workstation to trusted hosts; add the account to the Nano Server's administrators; enable CredSSP if using that feature

Chapter 3

1. Not UEFI compatible; migration to Azure; no OS support; unsupported boot method
2. MAP Toolkit
3. Speed; architecture; number
4. DISM
5. **/Enable-Feature**
6. **PSSession**
Invoke-Command

Chapter 4

1. Disk Management
2. NFS Share - Advanced
3. Deny

Chapter 5

1. Hard disk drives (HDDs) and solid state drives (SSD)
2. **Connect-IscsiTarget**
3. GPT initialized disks and Datacenter Edition

Chapter 6

1. General-purpose file servers, VDI deployments, and backup targets
2. Optimization policy
3. **OptimizedFilesSavingsRate** and **SavingsRate**

Chapter 7

1. UEFI 2.3.1c, TPM v2.0, IOMMU, Generation 2, and supported OS
2. Choose the **Add Roles and Features** option from the *Manage* menu of Server Manager.
3. At least 4 GB of RAM; Windows Server 2016 or Windows 10 Anniversary Update; a virtual machine running Hyper-V that is the same build as the host; and an Intel processor with VT-x and EPT technology

Chapter 8

1. SCSI controller, legacy network adapter, virtual Fibre Channel adapter, and Microsoft RemoteFX 3D video adapter
2. They must be manually updated.
3. Install later, Install from a bootable image file, and Install from a network location
4. Copies of VM configuration, checkpoints, and virtual hard disk files
5. Exporting a checkpoint and exporting the virtual machine with a checkpoint
6. Set minimum and maximum memory; use dynamic memory; avoid using differencing disks if possible; use multiple Hyper-V network adapters connected to different external virtual switches; and store virtual machine files on their own volumes

Chapter 9

1. **Edit Disk**
2. Standard checkpoint
3. **New-StorageQosPolicy**

Chapter 10

1. Additional network function virtualization; container-aware virtual network features; the network controller component; SET; RDMA; and CNAs
2. Virtual Switch Manager
3. Provision enough actual bandwidth; use NIC teaming where possible; use bandwidth management; use adapters that support VMQ; and with a large number of VMs, use network virtualization for VM isolation as opposed to VLANs.

Chapter 11

1. Hyper-V containers and Windows Server containers
2. At least two
3. Server Core/Nano Server
4. **sc config** and a configuration file

Chapter 12

1. **docker ps -a**
2. Transparent
3. **-m**

Chapter 13

1. **Enable Replication**
2. A user account with permission; the Hyper-V role; source and destination machines in the same AD or that are in trusted domains; and Hyper-V management tools
3. Files must use virtual hard disks, and VMs cannot use pass-through disks.

Chapter 14

1. Identical hardware and configuration on nodes; network adapters with identical configurations; Certified for Windows Server 2016 logos; same OS versions and editions and updates; separate networks for various traffic forms recommended; redundant networking equipment recommended
2. **New-Cluster**
3. Minimum of three disks, 4 GB each, and SAS or iSCSI
4. Node monitoring; application migration; host availability; VM migration; nested clustering

Chapter 15

1. AES
2. Services
3. First Failure, Second Failure, and Subsequent Failures
4. **New-ClusterFaultDomain**

Chapter 16

1. Datacenter Edition, at least six drives, and no RAID
2. **Enable-ClusterStorageSpacesDirect**

Chapter 17

1. The Quick Migration has a delay, and the Quick Migration can move a stopped VM.
2. **Advanced Features > Protected Network**

Chapter 18

1. Multiple Host
2. Single

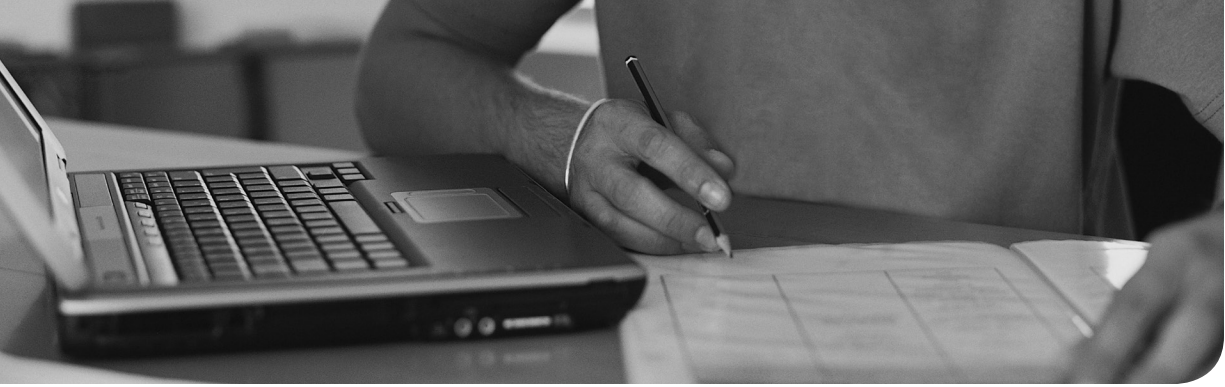
Chapter 19

1. That database server cannot be a domain controller; the WSUS server cannot run Remote Desktop Services; the database server must be in the AD or must be in a trusted AD; they must be in the same time zone and have the time synchronized.

2. Windows Defender Network Inspection Service; Windows Error Reporting Service; Windows Update Service
3. VHDX

Chapter 20

1. Data Collector Sets
2. Overview, CPU, Memory, Disk, and Network



Memory Tables

Chapter 1

Table 1-3 Upgrade Options

Current Version	Upgrade Options
Windows Server 2012 Standard	
Windows Server 2012 Datacenter	
Windows Server 2012 R2 Standard	
Windows Server 2012 R2 Datacenter	
Windows Server 2012 R2 Essentials	
Windows Storage Server 2012 Standard	
Windows Storage Server 2012 Workgroup	
Windows Storage Server 2012 R2 Standard	
Windows Storage Server 2012 R2 Workgroup	

Chapter 3

Table 3-2 Windows Generation 2 Support

64-Bit Windows Version	Generation 2 Support?
Windows Server 2012 R2	
Windows Server 2012	
Windows Server 2008 R2	
Windows Server 2008	
Windows 10	
Windows 8.1	
Windows 8	
Windows 7	

Table 3-3 Other Generation 2 Supported Operating Systems

Other 64-Bit OS	Generation 2 Support?
RHEL/CentOS 7.x series	
RHEL/CentOS 6.x series	
RHEL/CentOS 5.x series	
Debian 7.x series	
Debian 8.x series	
FreeBSD 10 and 10.1	
FreeBSD 9.1 and 9.3	
FreeBSD 8.4	
Oracle Linux 7.x series	
Oracle Linux 6.x series	
Oracle Linux UEK R3 QU3	
Oracle Linux UEK R3 QU2	
Oracle Linux UEK R3 QU1	
Oracle Linux UEK R4	
SUSE Linux Enterprise Server 12 series	
SUSE Linux Enterprise Server 11 series	
Open SUSE 12.3	
Ubuntu 14.04 and later versions	
Ubuntu 12.04	

Chapter 4

Table 4-2 SMB PowerShell Cmdlets

PowerShell Cmdlet	Description
Block-SmbShareAccess	
Close-SmbOpenFile	
Close-SmbSession	

PowerShell Cmdlet	Description
Disable-SmbDelegation	
Enable-SmbDelegation	
Get-SmbBandwidthLimit	
Get-SmbClientConfiguration	
Get-SmbClientNetworkInterface	
Get-SmbConnection	
Get-SmbDelegation	
Get-SmbMapping	
Get-SmbMultichannelConnection	
Get-SmbMultichannelConstraint	
Get-SmbOpenFile	
Get-SmbServerConfiguration	
Get-SmbServerNetworkInterface	
Get-SmbSession	
Get-SmbShare	
Get-SmbShareAccess	
Grant-SmbShareAccess	
New-SmbMapping	
New-SmbMultichannelConstraint	
New-SmbShare	

PowerShell Cmdlet	Description
Remove-SmbBandwidthLimit	
Remove-SmbMapping	
Remove-SmbMultichannelConstraint	
Remove-SmbShare	
Revoke-SmbShareAccess	
Set-SmbBandwidthLimit	
Set-SmbClientConfiguration	
Set-SmbPathAcl	
Set-SmbServerConfiguration	
Set-SmbShare	
Unblock-SmbShareAccess	
Update-SmbMultichannelConnection	

Table 4-3 NFS PowerShell Cmdlets

PowerShell Cmdlet	Description
Disconnect-NfsSession	
Get-NfsClientConfiguration	
Get-NfsClientgroup	
Get-NfsClientLock	
Get-NfsMappedIdentity	
Get-NfsMappingStore	
Get-NfsMountedClient	
Get-NfsNetgroup	
Get-NfsNetgroupStore	
Get-NfsOpenFile	

PowerShell Cmdlet	Description
Get-NfsServerConfiguration	
Get-NfsSession	
Get-NfsShare	
Get-NfsSharePermission	
Get-NfsStatistics	
Grant-NfsSharePermission	
Install-NfsMappingStore	
New-NfsClientgroup	
New-NfsMappedIdentity	
New-NfsNetgroup	
New-NfsShare	
Remove-NfsClientgroup	
Remove-NfsMappedIdentity	
Remove-NfsNetgroup	
Remove-NfsShare	
Rename-NfsClientgroup	
Reset-NfsStatistics	
Resolve-NfsMappedIdentity	
Revoke-NfsClientLock	
Revoke-NfsMountedClient	
Revoke-NfsOpenFile	
Revoke-NfsSharePermission	
Set-NfsClientConfiguration	
Set-NfsClientgroup	
Set-NfsMappedIdentity	

PowerShell Cmdlet	Description
Set-NfsMappingStore	
Set-NfsNetgroup	
Set-NfsNetgroupStore	
Set-NfsServerConfiguration	
Set-NfsShare	
Test-NfsMappedIdentity	
Test-NfsMappingStore	

Chapter 5

Table 5-2 Determining Usage Scenarios for Storage Replica

	Virtual Machine	SYSVOL	File Server	Microsoft Exchange	SQL Server
Hyper-V Replica	Yes	Not applicable	Yes (VMs)	No	Yes (VMs)
Storage Replica					
SQL Server AlwaysOn Failover Cluster Instance					
SQL Server AlwaysOn Availability Groups					
Microsoft Exchange Database Availability Groups					
Distributed File System Replication					

Chapter 9

Table 9-2 Storage QoS Terms

Storage QoS Term	Definition
Normalized IOPs	
Flow	
InitiatorName	
InitiatorID	
Policy	
PolicyId	
MinimumIOPS	
MaximumIOPS	
Aggregated	
Dedicated	

Chapter 10

Table 10-2 Virtual Switch Types

Virtual Switch Type	Description
External virtual switch	
Internal virtual switch	
Private virtual switch	

Table 10-3 Networking Technologies Compatible and Not Compatible with SET in Windows Server 2016

Compatible	Not Compatible

Chapter 11

Table 11-2 Container Concepts

Concept	Description
Container host	
Container image	
Sandbox	
Container OS image	
Container repository	

Concept	Description
Container management technology	
Containers for IT professionals	
Containers for developers	

Table 11-3 Supported Base Images

Host OS	Windows Server Container	Hyper-V Container
Windows 10 Pro/Enterprise	Not available	Server Core/Nano Server

Chapter 12

Table 12-2 Docker Daemon Container Management Commands

Command	Example	Description
<code>docker run -it</code>	<code>docker run --name test -it debian</code>	
<code>docker ps</code>	<code>docker ps -a</code>	
<code>docker start</code>	<code>docker start dbf9674d14b9</code>	
<code>docker stop</code>	<code>docker stop dbf9674d14b9</code>	
<code>docker attach</code>	<code>docker attach dbf9674d14b9</code>	
<code>docker commit</code>	<code>docker commit dbf9674d14b9 samples/awesome:1.1</code>	
<code>docker rm</code>	<code>docker rm dbf9674d14b9</code>	

Table 12-3 PowerShell Container Management Commands

Command	Example	Description
Get-Container	get-container	
Start-Container	start-container dbf9674d14b9	
Stop-Container	stop-container dbf9674d14b9	
Enter-ContainerSession, aliased to Attach-Container	enter-containersession dbf9674d14b9	
ConvertTo-ContainerImage, aliased to Commit-Container	convertto-containerimage -containeridornname dbf9674d14b9 -repository samples/awesome -tag 1.1	
Remove-Container	remove-container dbf9674d14b9	

Table 12-4 Memory Parameters with **docker run**

Parameter	Description
-m or --memory	
-memory-swap	
-kernel-memory	
-oom-kill-disable	

Table 12-5 CPU Parameters with **docker run**

Parameter	Description
-c or --cpu-shares	
-cpuset-cpus	
-cpuset-mems	

Chapter 15

Table 15-2 Failover Cluster Roles and Feature Prerequisites

Cluster Role	Role or Feature Prerequisite
DFS Namespace Server	
DHCP Server	
Distributed Transaction Coordinator (DTC)	
File Server	
Generic Application	
Generic Script	
Generic Service	
Hyper-V Replica Broker	
iSCSI Target Server	
iSNS Server	
Message Queuing	
Other Server	
Virtual Machine	
WINS Server	

Chapter 19

Table 19-2 Windows Defender Services

Service Name	File Location	Description
Windows Defender service (Windefend)	C:\Program Files\Windows Defender\MsMpEng.exe	
Windows Defender Network Inspection service (Wdnissvc)	C:\Program Files\Windows Defender\NisSrv.exe	
Windows Error Reporting service (Wersvc)	C:\WINDOWS\System32\svchost.exe -k WerSvcGroup	
Windows Firewall (MpsSvc)	C:\WINDOWS\system32\svchost.exe -k LocalServiceNoNetwork	
Windows Update (Wuauaserv)	C:\WINDOWS\system32\svchost.exe -k netsvcs	



Memory Tables Answer Key

Chapter 1

Table 1-3 Upgrade Options

Current Version	Upgrade Options
Windows Server 2012 Standard	Windows Server 2016 Standard or Datacenter
Windows Server 2012 Datacenter	Windows Server 2016 Datacenter
Windows Server 2012 R2 Standard	Windows Server 2016 Standard or Datacenter
Windows Server 2012 R2 Datacenter	Windows Server 2016 Datacenter
Windows Server 2012 R2 Essentials	Windows Server 2016 Essentials
Windows Storage Server 2012 Standard	Windows Storage Server 2016 Standard
Windows Storage Server 2012 Workgroup	Windows Storage Server 2016 Workgroup
Windows Storage Server 2012 R2 Standard	Windows Storage Server 2016 Standard
Windows Storage Server 2012 R2 Workgroup	Windows Storage Server 2016 Workgroup

Chapter 3

Table 3-2 Windows Generation 2 Support

64-Bit Windows Version	Generation 2 Support?
Windows Server 2012 R2	Yes
Windows Server 2012	Yes
Windows Server 2008 R2	No
Windows Server 2008	No
Windows 10	Yes
Windows 8.1	Yes
Windows 8	Yes
Windows 7	No

Table 3-3 Other Generation 2 Supported Operating Systems

Other 64-Bit OS	Generation 2 Support?
RHEL/CentOS 7.x series	Yes
RHEL/CentOS 6.x series	No
RHEL/CentOS 5.x series	No
Debian 7.x series	No
Debian 8.x series	Yes
FreeBSD 10 and 10.1	No
FreeBSD 9.1 and 9.3	No
FreeBSD 8.4	No
Oracle Linux 7.x series	Yes
Oracle Linux 6.x series	No
Oracle Linux UEK R3 QU3	No
Oracle Linux UEK R3 QU2	No
Oracle Linux UEK R3 QU1	No
Oracle Linux UEK R4	Yes
SUSE Linux Enterprise Server 12 series	Yes
SUSE Linux Enterprise Server 11 series	No
Open SUSE 12.3	No
Ubuntu 14.04 and later versions	Yes
Ubuntu 12.04	No

Chapter 4

Table 4-2 SMB PowerShell Cmdlets

PowerShell Cmdlet	Description
Block-SmbShareAccess	Adds a deny ACE for a trustee to the security descriptor of the SMB share
Close-SmbOpenFile	Closes a file that is open by one of the clients of the SMB server
Close-SmbSession	Forcibly ends the SMB session

PowerShell Cmdlet	Description
Disable-SmbDelegation	Disables a constrained delegation authorization for an SMB client and server
Enable-SmbDelegation	Enables a constrained delegation authorization for an SMB client and server
Get-SmbBandwidthLimit	Gets the list of SMB bandwidth caps for each traffic category
Get-SmbClientConfiguration	Retrieves the SMB client configuration
Get-SmbClientNetworkInterface	Retrieves the network interfaces used by the SMB client
Get-SmbConnection	Retrieves the connections established from the SMB client to the SMB servers
Get-SmbDelegation	Gets the constrained delegation authorizations for an SMB client
Get-SmbMapping	Retrieves the SMB client directory mappings created for a server
Get-SmbMultichannelConnection	Retrieves the SMB connections made between the SMB client network interfaces and the SMB server network interfaces
Get-SmbMultichannelConstraint	Retrieves the constraints that define how the SMB client uses network interfaces to connect to the servers
Get-SmbOpenFile	Retrieves basic information about the files that are open on behalf of the clients of the SMB server
Get-SmbServerConfiguration	Retrieves the SMB server configuration
Get-SmbServerNetworkInterface	Retrieves the network interfaces used by the SMB server
Get-SmbSession	Retrieves information about the SMB sessions that are currently established between the SMB server and the associated clients
Get-SmbShare	Retrieves the SMB shares on the computer
Get-SmbShareAccess	Retrieves the ACL of the SMB share
Grant-SmbShareAccess	Adds an allow ACE for a trustee to the security descriptor of the SMB share
New-SmbMapping	Creates an SMB mapping
New-SmbMultichannelConstraint	Creates an SMB multichannel constraint for the specified server
New-SmbShare	Creates an SMB share

PowerShell Cmdlet	Description
Remove-SmbBandwidthLimit	Removes SMB bandwidth caps
Remove-SmbMapping	Removes the SMB mapping to an SMB share
Remove-SmbMultichannelConstraint	Removes SMB multichannel constraints
Remove-SmbShare	Deletes the specified SMB shares
Revoke-SmbShareAccess	Removes all the allow ACEs for a trustee from the security descriptor of the SMB share
Set-SmbBandwidthLimit	Adds an SMB bandwidth cap
Set-SmbClientConfiguration	Sets the SMB client configuration
Set-SmbPathAcl	Sets the ACL for the file system folder to match the ACL used by an SMB share
Set-SmbServerConfiguration	Sets the SMB Service configuration
Set-SmbShare	Modifies the properties of the SMB share
Unblock-SmbShareAccess	Removes all the deny ACEs for the trustee from the security descriptor of the SMB share
Update-SmbMultichannelConnection	Forces the SMB client to update the multichannel-related information

Table 4-3 NFS PowerShell Cmdlets

PowerShell Cmdlet	Description
Disconnect-NfsSession	Disconnects NFS sessions that a client computer established on an NFS server
Get-NfsClientConfiguration	Gets configuration settings for an NFS client
Get-NfsClientgroup	Gets client groups configured on an NFS server
Get-NfsClientLock	Gets file locks that a client computer holds on an NFS server
Get-NfsMappedIdentity	Gets an NFS mapped identity
Get-NfsMappingStore	Gets configuration settings for an identity mapping store
Get-NfsMountedClient	Gets clients that are connected to an NFS server
Get-NfsNetgroup	Gets a netgroup
Get-NfsNetgroupStore	Gets settings for a netgroup store
Get-NfsOpenFile	Gets information about files that are open on an NFS server for a client computer

PowerShell Cmdlet	Description
Get-NfsServerConfiguration	Gets configuration settings for an NFS server
Get-NfsSession	Gets information about which client computers are currently connected to one or more shares on an NFS server
Get-NfsShare	Gets NFS shares on an NFS server
Get-NfsSharePermission	Gets information about permissions that an NFS server grants to exported NFS shares
Get-NfsStatistics	Gets RPC call statistics that an NFS server maintains
Grant-NfsSharePermission	Grants permission to access shares that an NFS server exports
Install-NfsMappingStore	Installs and initializes an AD LDS instance as an identity mapping store
New-NfsClientgroup	Creates a client group on an NFS server
New-NfsMappedIdentity	Creates a new NFS mapped identity
New-NfsNetgroup	Creates a netgroup
New-NfsShare	Creates an NFS file share
Remove-NfsClientgroup	Removes a client group from an NFS server
Remove-NfsMappedIdentity	Removes a mapping between a UNIX account and a Windows account
Remove-NfsNetgroup	Removes a netgroup
Remove-NfsShare	Stops sharing NFS shares
Rename-NfsClientgroup	Renames a client group on an NFS server
Reset-NfsStatistics	Resets RPC call statistics that an NFS server maintains
Resolve-NfsMappedIdentity	Resolves the mapping of a Windows user account or group account to a UNIX identifier
Revoke-NfsClientLock	Releases file locks that a client computer holds on an NFS server
Revoke-NfsMountedClient	Revokes a mounted client from an NFS server
Revoke-NfsOpenFile	Revokes open files on an NFS server for a client computer
Revoke-NfsSharePermission	Revokes permission to access shares that an NFS server exports
Set-NfsClientConfiguration	Changes configuration settings for an NFS client
Set-NfsClientgroup	Adds and removes client computers from a client group
Set-NfsMappedIdentity	Modifies a mapped identity

PowerShell Cmdlet	Description
Set-NfsMappingStore	Modifies configuration settings for an identity mapping store
Set-NfsNetgroup	Modifies a netgroup
Set-NfsNetgroupStore	Modifies netgroup configuration settings
Set-NfsServerConfiguration	Changes configuration settings for an NFS server
Set-NfsShare	Changes configuration settings of an NFS share
Test-NfsMappedIdentity	Verifies that a mapped identity is correctly configured
Test-NfsMappingStore	Verifies that an identity mapping store is configured correctly

Chapter 5

Table 5-2 Determining Usage Scenarios for Storage Replica

	Virtual Machine	SYSVOL	File Server	Microsoft Exchange	SQL Server
Hyper-V Replica	Yes	Not applicable	Yes (VMs)	No	Yes (VMs)
Storage Replica	Yes	No	Yes	No	Yes
SQL Server AlwaysOn Failover Cluster Instance	No	Not applicable	Not applicable	Not applicable	Yes
SQL Server AlwaysOn Availability Groups	No	Not applicable	Not applicable	Not applicable	Yes
Microsoft Exchange Database Availability Groups	No	Not applicable	Not applicable	Yes	Not applicable
Distributed File System Replication	No	Yes	Yes	No	No

Chapter 9

Table 9-2 Storage QoS Terms

Storage QoS Term	Definition
Normalized IOPs	A count of the storage input/output operations per second
Flow	Each file opened by a Hyper-V server to a virtual hard disk
InitiatorName	The name of the virtual machine that is reported to Scale-Out File Server for each flow
InitiatorID	An identifier that matches the virtual machine ID
Policy	A QoS object stored in the cluster database that has the following properties: PolicyId, MinimumIOPS, MaximumIOPS, ParentPolicy, and PolicyType
PolicyId	A unique identifier for a policy
MinimumIOPS	The minimum normalized IOPs that will be provided by a policy; a reservation
MaximumIOPS	The maximum normalized IOPS that will be limited by a policy; a limit
Aggregated	A policy type in which the specified MinimumIOPS and MaximumIOPS and Bandwidth are shared among all flows assigned to the policy
Dedicated	A policy type in which the specified MinimumIOPS and MaximumIOPS and Bandwidth are managed for individual VHD/VHDX

Chapter 10

Table 10-2 Virtual Switch Types

Virtual Switch Type	Description
External virtual switch	This virtual switch maps a network to a specific network adapter or network adapter team. You can map an external network to a wireless network adapter if you have installed the wireless LAN service on the host Hyper-V server and if the Hyper-V server has a compatible network adapter.
Internal virtual switch	This virtual switch permits communication between the virtual machines on a Hyper-V host and permits communication between the virtual machines and the Hyper-V host itself.
Private virtual switch	Private virtual switches permit communication between virtual machines on a Hyper-V host. You cannot use private switches to communicate between the virtual machines and the Hyper-V host.

Table 10-3 Networking Technologies Compatible and Not Compatible with SET in Windows Server 2016

Compatible	Not Compatible
Data Center Bridging (DCB)	802.1X authentication
Hyper-V network virtualization; NV-GRE and VXLAN are both supported in Windows Server 2016	IPsec Task Offload (IPsecTO)
Receive-side checksum offloads (IPv4, IPv6, TCP); these are supported if any of the SET team members support them	QoS in host or native operating systems
Remote Direct Memory Access (RDMA)	Receive Segment Coalescing (RSC)
SDN quality of service	Receive Side Scaling (RSS)
Transmit-side checksum offloads (IPv4, IPv6, TCP); these are supported if all the SET team members support them	TCP Chimney Offload
Virtual Machine Queues (VMQ)	Virtual machine QoS (VM-QoS)
Virtual Receive Side Scaling (RSS)	

Chapter 11

Table 11-2 Container Concepts

Concept	Description
Container host	A container host is a physical or virtual computer system configured with the Windows Container feature; it runs one or more Windows containers.
Container image	The container image shows the state of the virtual container, including such things as registry or file system changes; you can discard a container image or use it as a base image for new containers.
Sandbox	After a container has started, all write actions such as file system modifications, registry modifications, or software installations are captured in the sandbox layer.
Container OS image	The container OS image is the first layer of potentially many image layers that make up a container; this image provides the operating system environment and cannot be modified.
Container repository	Each time you create a container image, the container image and its dependencies are stored in a local repository.

Concept	Description
Container management technology	You can manage Windows containers by using both Windows PowerShell and Docker.
Containers for IT professionals	IT professionals can use containers to provide standardized environments for their development, QA, and production teams.
Containers for developers	When you containerize an app, only the app and the components needed to run it are combined into an image; you can use containers to start up lightweight and portable app components—or micro-services—for distributed apps and quickly scale each service separately.

Table 11-3 Supported Base Images

Host OS	Windows Server Container	Hyper-V Container
Server 2016 with Desktop	Server Core/Nano Server	Server Core/Nano Server
Server 2016 Core	Server Core/Nano Server	Server Core/Nano Server
Nano Server	Nano Server	Server Core/Nano Server
Windows 10 Pro/Enterprise	Not available	Server Core/Nano Server

Chapter 12

Table 12-2 Docker Daemon Container Management Commands

Command	Example	Description
<code>docker run -it</code>	<code>docker run --name test -it debian</code>	Runs a container named <code>test</code> ; <code>-it</code> instructs Docker to allocate a pseudo TTY connected to the container
<code>docker ps</code>	<code>docker ps -a</code>	Display a list of all the running containers on the host
<code>docker start</code>	<code>docker start dbf9674d14b9</code>	Starts a stopped container
<code>docker stop</code>	<code>docker stop dbf9674d14b9</code>	Stops a running container
<code>docker attach</code>	<code>docker attach dbf9674d14b9</code>	Connects to a session on a running container
<code>docker commit</code>	<code>docker commit dbf9674d14b9 samples/awesome:1.1</code>	Creates a new image
<code>docker rm</code>	<code>docker rm dbf9674d14b9</code>	Removes a container completely

Table 12-3 PowerShell Container Management Commands

Command	Example	Description
Get-Container	get-container	Displays a list of all containers on the host
Start-Container	start-container dbf9674d14b9	Starts a stopped container
Stop-Container	stop-container dbf9674d14b9	Stops a running container
Enter-ContainerSession, aliased to Attach-Container	enter-containersession dbf9674d14b9	Connects to a session on a running container
ConvertTo-ContainerImage, aliased to Commit-Container	convertto-containerimage -containeridorname dbf9674d14b9 -repository samples/awesome -tag 1.1	Creates a new image
Remove-Container	remove-container dbf9674d14b9	Removes a container

Table 12-4 Memory Parameters with **docker run**

Parameter	Description
-m or --memory	Specifies the amount of memory the container can use; values are an integer and the unit identifier b, k, m, or g (for bytes, kilobytes, megabytes, or gigabytes)
-memory-swap	Specifies the total amount of memory plus virtual memory that the container can use
-kernel-memory	Specifies the amount of the memory limit set using the -m switch that can be used for kernel memory
-oom-kill-disable	Prevents the kernel from killing container processes when an out-of-memory error occurs

Table 12-5 CPU Parameters with **docker run**

Parameter	Description
-c or --cpu-shares	Specifies a value from 0 to 1024 that specifies the weight of the container in contention for the CPU cycles
-cpuset-cpus	Specifies which CPUs in a multiprocessor host system the container can use
-cpuset-mems	Specifies which nodes on a NUMA host the container can use

Chapter 15

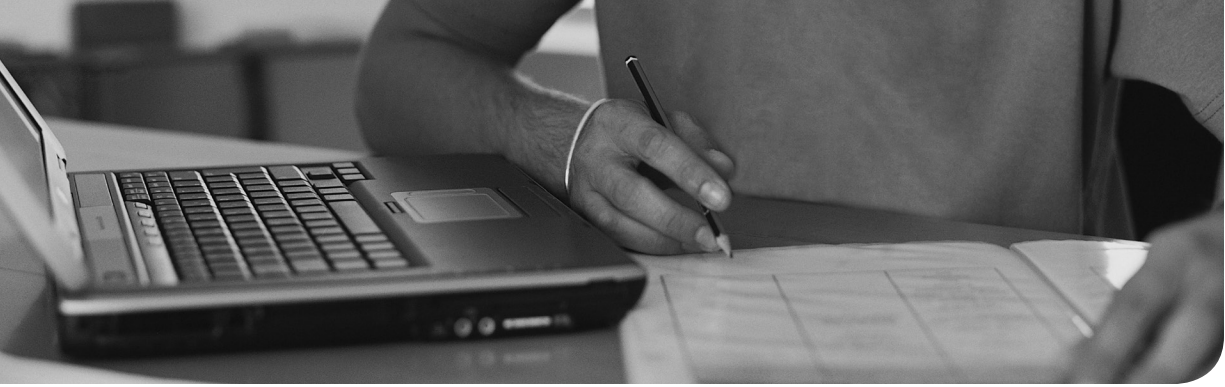
Table 15-2 Failover Cluster Roles and Feature Prerequisites

Cluster Role	Role or Feature Prerequisite
DFS Namespace Server	DFS Namespaces (part of File Server role)
DHCP Server	DHCP Server role
Distributed Transaction Coordinator (DTC)	None
File Server	File Server role
Generic Application	Not applicable
Generic Script	Not applicable
Generic Service	Not applicable
Hyper-V Replica Broker	Hyper-V role
iSCSI Target Server	iSCSI Target Server (part of File Server role)
iSNS Server	iSNS Server Service feature
Message Queuing	Message Queuing Services feature
Other Server	None
Virtual Machine	Hyper-V role
WINS Server	WINS Server feature

Chapter 19

Table 19-2 Windows Defender Services

Service Name	File Location	Description
Windows Defender service (Windefend)	C:\Program Files\Windows Defender\MsMpEng.exe	This is the main Windows Defender service that needs to be running at all times.
Windows Defender Network Inspection service (Wdnissvc)	C:\Program Files\Windows Defender\NisSrv.exe	This service is invoked when Windows Defender encounters a trigger to load it.
Windows Error Reporting service (Wersvc)	C:\WINDOWS\System32\svchost.exe -k WerSvcGroup	This service sends error reports to Microsoft.
Windows Firewall (MpsSvc)	C:\WINDOWS\system32\svchost.exe -k LocalServiceNoNetwork	We recommend leaving the Windows Firewall service enabled.
Windows Update (Wuauserv)	C:\WINDOWS\system32\svchost.exe -k netsvcs	Windows Update is needed to get definition updates and antimalware engine updates.



Glossary

Active Directory-Based Activation A role service that allows you to use Active Directory Domain Services (AD DS) to store activation objects.

Advanced Format disk A disk that uses a 4092-byte physical sector.

Affinity The ability to control how a cluster reacts to repeated requests from the same client.

Alerts A Data Collector Set feature that allows you to configure notifications when counters breach certain thresholds.

Automatic Virtual Machine Activation A technology that allows you to install virtual machines on a properly activated Windows server without having to manage product keys for each individual virtual machine.

Azure Container Services (ACS) Clustered virtual machines for running container-based applications.

Checkpoints Point-in-time images of a virtual machine.

Chunk A section of a file that has been selected by the Data Deduplication chunking algorithm as likely to occur in other, similar files.

Chunk Store An organized series of container files in the System Volume Information folder that Data Deduplication uses to uniquely store chunks.

Cluster-Aware Updating (CAU) Windows Update technology for clusters.

Cluster Name Object (CNO) An object for the cluster in Active Directory.

Cluster Operation Mode A mode that determines whether a cluster uses unicast or multicast.

Configuration Version A virtual machine's compatibility settings.

CSVFS A pseudo file system that sits on top of NTFS in a Clustered Shared Volume (CSV).

Data Collector Set A tool that allows the collection of selected Performance Monitor data.

Datacenter Edition The most powerful edition of Server 2016.

DCB Priority-based flow control for a converged storage network.

DDA An abbreviation for Discrete Device Assignment, which permits hardware to communicate directly with a VM.

Dedup An abbreviation for Data Deduplication that's commonly used in PowerShell, Windows Server APIs and components, and the Windows Server community.

Differencing Disk A virtual hard disk that stores only changes from parent virtual hard disk.

DISM An abbreviation for Deployment Imaging Servicing and Management; this command line tool has many uses including the preparation of Windows images for automated deployment in the network.

Docker A well-known application for maintaining containers.

Docker Daemon The actual running Docker engine on a container host.

Dockerfile Instructions and statements for each instruction that create a Docker image.

DockerHub A public repository for storing and sharing Docker images.

Drain on Shutdown A new Windows Server 2016 clustering feature that automatically live migrates all the roles on a node before shutdown.

Enhanced Session Mode A mode that permits the use of a local computer's resources.

Essentials Edition The smallest edition of Server 2016, designed for small businesses.

Extended (Chained) Replication Hyper-V Replica using three hosts.

External virtual switch A switch that connects to a wired physical network.

Failback A process in which a cluster moves a role back to the original node.

File Metadata Metadata that describes interesting properties about the file that are not related to the main content of the file.

File Stream The main content of a file.

File System The software and on-disk data structure that an operating system uses to store files on storage media.

File System Filter A plug-in that modifies the default behavior of the file system.

Gen 1 Versus Gen 2 Virtual machine type options in Hyper-V.

GUID Partition Table (GPT) A newer partition style that supports larger disk space.

Headless Reference to the fact that Nano Server provides no user interface.

Hyper-V Container A container that runs in a special lightweight VM.

Hyper-V Manager The GUI that permits the management of Hyper-V.

Hyper-V Replica A feature that provides replication of virtual machines from one host to another for disaster recovery scenarios.

Internal Virtual Switch A switch that is used only by the virtual machines on the host.

iSCSI Initiator A client in the iSCSI network.

iSCSI Target An iSCSI component that advertises storage to the iSCSI network.

iSNS A protocol used for discovery of iSCSI resources.

Key Management Service (KMS) A role service that allows you to activate systems within a network from a server where a KMS host has been installed.

LIS/BIS Integration services and drivers for Linux and FreeBSD VMs.

Live Migration The movement of a virtual machine from one host to another.

MAP An abbreviation for Microsoft Assessment and Planning Toolkit; this collection of tools seeks to make it easy to assess the current IT infrastructure for a variety of technology migration projects; the Solution Accelerator provides a powerful inventory, assessment, and reporting tool to simplify the migration planning process.

Master Boot Record (MBR) An older partition style that does not support disk space larger than 2 TB.

MPIO A resiliency feature for a SAN.

Nano Server The smallest possible installation option of Windows Server 2016, with no user interface.

Nested Virtualization The ability to run Hyper-V virtualization from within a virtual machine.

Network Health Protection A tool that allows dynamic monitoring of a VM to see if it has a healthy network connection.

Network Load Balancing (NLB) Cluster A group of hosts that dynamically distribute client traffic to hosts in a cluster.

NFS A sharing technology used by UNIX-based systems.

NIC Teaming Using multiple NICs in parallel; this is not supported in Nano Server.

Node Fairness A balancing technique in Windows Server 2016 which ensures that nodes in a cluster are not overtaxed with workloads.

Nodes Members of a failover cluster.

NTFS A common file system for Windows Server 2016.

NUMA A computer memory design in which the memory access time depends on the memory location relative to the processor.

Optimization A process in which a file is optimized (or deduplicated) by data deduplication if it has been chunked, and its unique chunks have been stored in the chunk store.

Optimization Policy A policy which specifies the files that should be considered for Data Deduplication.

Pass-Through Disk A disk that permits a VM access to the storage system of a host.

Performance Monitor An MMC that permits careful analysis of server performance.

Port Rules Rules that define the types of TCP/IP traffic an NLB cluster processes.

PowerShell and Desired State Configuration (DSC) A method of deploying Server 2016 and ensuring the consistency of the deployed configurations.

PowerShell Direct A feature that permits commands to be run against virtual machines from a local PowerShell installation.

Private Virtual Switch A switch that does not permit communication between a host and VMs.

Quick Migration An early form of the Live Migration that causes some delay in processing.

Quorum A method of preventing a split-brain cluster.

RDMA An abbreviation for Remote Direct Memory Access, which permits Hyper-V switches to use this memory feature.

ReFS An abbreviation for Resilient File System, a new file system supported by Windows Server 2016.

Repair Point A special tag that notifies the file system to pass off I/O to a specified file system filter.

Resource Metering The gathering of resource utilization data for a VM.

Resource Monitor A basic tool for quick analysis of performance data on a Server system.

Rolling Upgrade An update of the OS in machines of a cluster on a gradual basis.

Scale-Out File Server (SoFS) A clustered role that provides highly available storage for applications.

Second Level Address Translation A required feature of the processor for running Server 2016.

Server Core An installation option for Windows Server 2016 that has no GUI.

Server Message Block (SMB) 3.0 An enhanced version of technology that makes Windows shares available on the network.

Server with Desktop Experience An installation option of Windows Server 2016 that has a GUI.

SET Switch Embedded Teaming, a new NIC Teaming option that provides faster performance.

Shared-Nothing Live Migration The movement of a virtual machine and its storage from one host to another while not using clustering or shared storage.

Shared Virtual Hard Disk A virtual hard disk used by multiple VMs.

Shielded Virtual Machine A feature that allows the encryption of virtual machines.

Simultaneous Upgrade An update in which the NLB cluster is brought down and then all hosts are upgraded.

Site-Aware Clusters Clusters in which the fault domain values are used with nodes to find the site the node belongs to in a stretch cluster.

Smart Paging Disk paging used for temporary memory.

SMB An abbreviation for Server Message Block, a sharing technology used by Windows systems.

Standard The typical edition of Server 2016 for most medium to large businesses.

Standard Format Disk A disk that uses a 512-byte physical sector.

Storage Migration The movement of a virtual machine's files from one host to another.

Storage Pool A collection of physical disks that can be presented to users as logical disks.

Storage Quality of Service New technology in Windows Server 2016 that enhances the IOPS of a virtual machine's access storage.

Storage Replica Storage-agnostic data replication between servers or clusters.

Storage Spaces A storage virtualization technology in Windows Server 2016.

Storage Spaces Direct A technology that makes shared clustered storage directly available to clusters using Storage Space-type technology.

Stretch Cluster A cluster with nodes in different geographic areas.

Tiered Storage Disks of different speeds used optimally.

VHD or VHDX An abbreviation for virtual hard disk, which is a method of installing Nano Server.

Virtual Machine Queue A type of hardware packet filtering that delivers packets from an outside virtual machine network directly to a VM host OS.

vNIC An abbreviation for virtual network interface card; this virtual component permits a virtual machine to connect to a network.

Volume A Windows construct for a logical storage drive that may span multiple physical storage devices across one or more servers.

Volume Activation Services Server Role A role that enables you to automate and simplify the issuance and management of Microsoft software volume licenses for a variety of scenarios and environments.

Windows Container Stack Networking components that permit container network access.

Windows Server Container A container that achieves isolation through namespace and process isolation.

Witness A device that acts as a tie-breaker in a quorum.

Workload An application that runs on Windows Server.