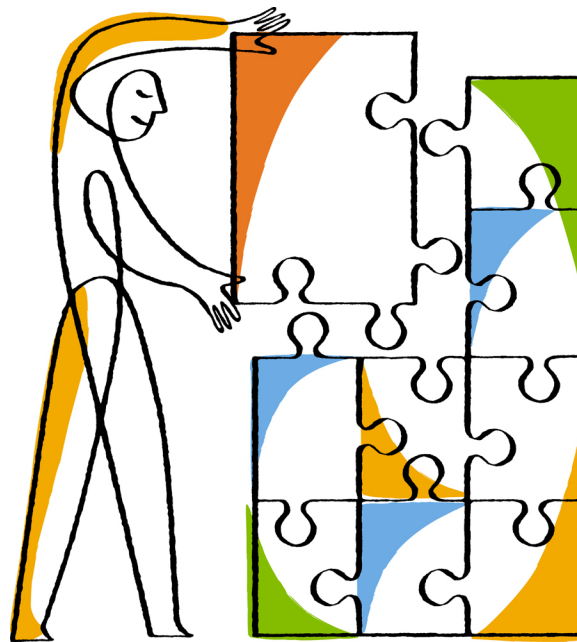




NetApp®

NetApp® OnCommand® Shift 1.0

Installation and Setup Guide



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Product overview

OnCommand Shift is a Windows PowerShell-based interface that enables you to migrate virtual machines from one hypervisor to another.

OnCommand Shift leverages FlexClone technology for the rapid conversion of virtual machine hard drives from one hypervisor format to another. OnCommand Shift 1.0 supports bidirectional conversion as follows:

- VMware ESXi to Microsoft Hyper-V
- Microsoft Hyper-V to VMware ESXi

OnCommand Shift replaces the MAT4Shift tool.

OnCommand Shift components

You can install OnCommand Shift either on a Microsoft Hyper-V server or on a stand-alone server (either physical or virtual). OnCommand Shift consists of multiple components that enable you to migrate virtual machines from one hypervisor to another.

Shift Server

The Shift Server executes OnCommand Shift operations. The Shift Server communicates with VMware ESXi and Microsoft Hyper-V using VMware Power CLI and Hyper-V Server PowerShell module. For supported Shift Server hosts, see the Interoperability Matrix.

The Shift Server can run one hypervisor format conversion at a time. If you need to run multiple concurrent conversions, you can define multiple instances of the Shift Server.

Data ONTAP SVM

A Storage Virtual Machine (SVM) is a logical storage server that provides data access to LUNs and the Network Attached Storage (NAS) namespace from one or more LIFs. You must create an SVM for use during OnCommand Shift operations. All VMs you want to convert must first be moved onto this SVM using either VMware vSphere Storage vMotion or Microsoft Hyper-V Storage Live Migration on your Data ONTAP storage. For more information about SVMs, see the *Clustered Data ONTAP System Administration Guide*.

ShiftClient

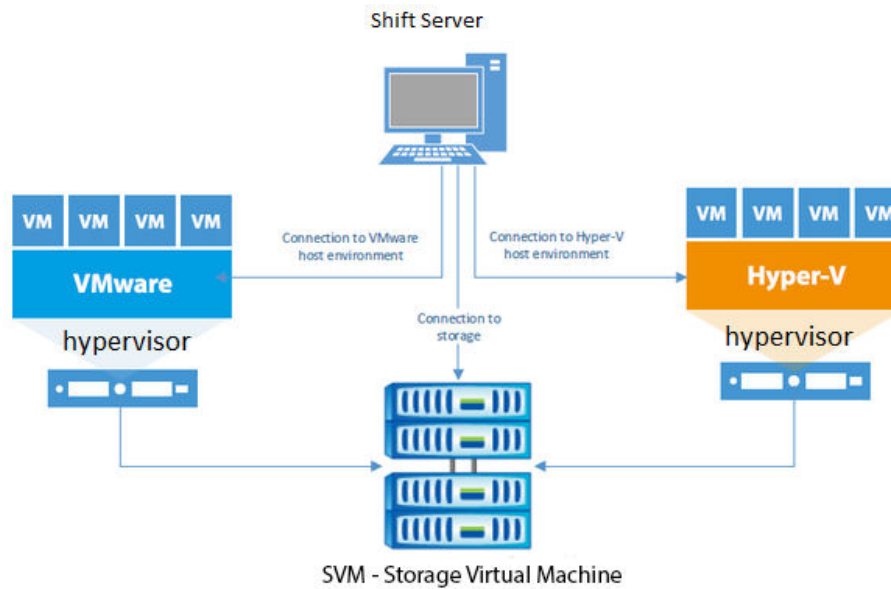
ShiftClient is a PowerShell module installed with OnCommand Shift containing all the PowerShell cmdlets.

Related information

[Clustered Data ONTAP 8.3 System Administration Guide](#)
[NetApp Interoperability Matrix Tool](#)

How OnCommand Shift works

OnCommand Shift works by connecting the Shift Server to your Microsoft Hyper-V and VMware ESXi hosts, as well as to shared storage. OnCommand Shift leverages FlexClone technology to convert the virtual machine hard drives from one hypervisor format to the other.



Protocols and communication methods

You should be familiar with the protocols and communication methods that OnCommand Shift uses during its operations.

HTTPS

Used by the OnCommand Shift client to communicate with the Shift Server; also used to communicate to the NetApp cluster. IPv6 is not supported. IPv4 is supported.

VI Java (VI SDK), VMware PowerCLI

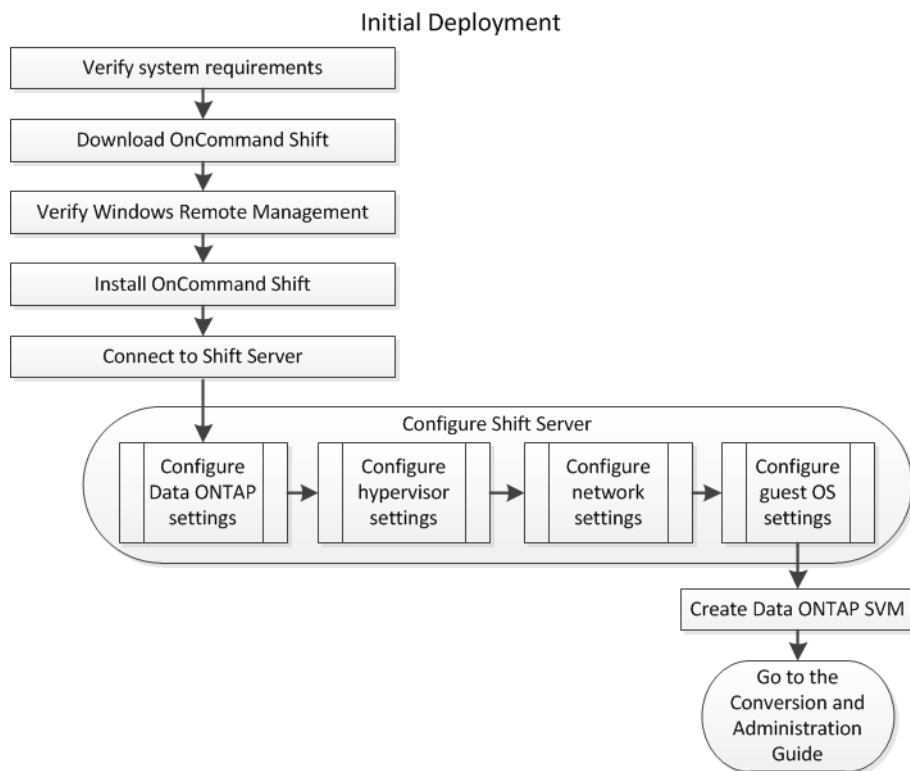
Used when communicating with VMware ESXi.

Windows PowerShell module or PowerShell ISE

Used when communicating with Microsoft Hyper-V.

Initial deployment workflow

To deploy OnCommand Shift, you must verify system requirements, verify Windows Remote Management, install OnCommand Shift, configure your Shift Server, and create your Data ONTAP SVM.



Verifying system requirements

Before deploying OnCommand Shift, you must make sure that your system meets hardware, software, storage system, licensing, and other requirements.

About this task

You must verify the following:

Steps

1. [Connectivity requirements](#) on page 8
2. [Supported hypervisor operating systems](#) on page 9
3. [Supported disk formats](#) on page 9
4. [Supported operating systems](#) on page 10
5. [Shift Server system hardware requirements](#) on page 10
6. [Software requirements](#) on page 11
7. [Data ONTAP license requirements](#) on page 11

Related tasks

[Installing and setting up OnCommand Shift for the first time](#) on page 15

Connectivity requirements

You must configure your hypervisor and storage environment so that OnCommand Shift can interact properly with all components in your environment.

- The Shift Server must be on the same Windows domain as the Hyper-V server.
- The Data ONTAP CIFS server must be on same Windows domain as the Shift Server and the Hyper-V server.
- The guest OS host name must be in the delegated host list on Microsoft Hyper-V.
- The Hyper-V and ESXi hosts must access the Storage Virtual Machine (SVM) over the same LIF for CIFS and NFS.
- For CIFS operations, the time settings for the Windows domain controller and the NetApp storage controller must be synchronized.

Supported hypervisor operating systems

Before installing OnCommand Shift, you must verify that your hypervisors are running supported operating systems.

Hypervisor	Supported versions
Microsoft Hyper-V	- Windows Server 2012 (x64), Datacenter Edition Full Edition - Windows Server 2012 R2 (x64), Datacenter Full Edition - Windows Server 2012 R2 (x64), Datacenter Server Core - Microsoft Hyper-V Server 2012 R2 (x64)
VMware ESXi	VMware ESXi 5.0, 5.1, and 5.5 VMware ESXi 6.0 is not supported.

Related information

[NetApp Interoperability Matrix Tool](#)

Supported disk formats for VMware ESXi and Microsoft Hyper-V

Different disk formats are supported for VMWare ESXi and Microsoft Hyper-V.

OnCommand Shift supports the following disk formats for VMware ESXi.

Source disk type	Destination disk type	Supported
VMware ESXi VMDK - Monolithic Flat	VHD - fixed	No
VMDK - Monolithic Flat	VHD - dynamic	No
VMDK - Monolithic Flat	VHDX - fixed	No
VMDK - Monolithic Flat	VHDX - dynamic	Yes

OnCommand Shift supports the following disk formats for Microsoft Hyper-V.

Source disk type	Destination disk type	Supported
Microsoft Hyper-V VHD - fixed	VMDK- Monolithic Flat	Yes
VHD - dynamic	VMDK - Monolithic Flat	No
VHDX - fixed	VMDK - Monolithic Flat	Yes
VHDX - dynamic	VMDK - Monolithic Flat	Yes

Supported operating systems

Only certain versions of the Windows operating system and Data ONTAP are supported for various components of OnCommand Shift.

Supported VM guest operating systems

The following versions of Windows are supported as guest operating systems for migration.

- Windows Server 2008
- Windows Server 2008 R2
- Windows Server 2012
Windows Server 2012 Foundation is not supported.
- Windows Server 2012 R2
- Windows 7
- Windows 8
- Windows 8.1

Support versions of Windows Server

The following versions of Windows Server are supported for the Shift Server platform.

- Windows Server 2012
- Windows Server 2012 R2

Supported versions of Data ONTAP

OnCommand Shift supports platforms running clustered Data ONTAP 8.2.3 or later.

Shift Server host hardware requirements

You must verify that your host meets minimum hardware requirements before installing OnCommand Shift. Depending on your network configuration and how many virtual machines you are converting, if your host does not meet minimum requirements, you might experience performance degradation or other problems.

Hardware	Requirements
Memory	512 MB minimum
Available disk space	10 GB You must have 150 MB temporary disk space available for installation.
CPU	• Dual-core 4.0 GHz minimum • Quad-core 4.0 GHz recommended

Software requirements

Before you install OnCommand Shift, you must first install and verify the required software.

The following software is required and should be installed in the following order:

1. Windows PowerShell 3.0 or 4.0
2. Microsoft .NET Framework 3.5, which includes .NET 2.0
3. VMware vSphere PowerCLI 5.5

Data ONTAP license requirements

To use OnCommand Shift, each Data ONTAP controller must have a license for CIFS, FlexClone, and NFS. No licenses are required for your Windows or ESXi hosts.

Preparing for installation

There are several tasks you should complete to prepare for your installation of OnCommand Shift.

Steps

1. [Download OnCommand Shift](#) on page 12.
2. [Setup Windows Remote Management on the Shift Server host](#) on page 12.
3. [Setup Windows Remote Management on the Hyper-V Server](#) on page 14.

Downloading OnCommand Shift

Before installing OnCommand Shift, you must download the OnCommand Shift software package from the NetApp Support Site.

Before you begin

You must have a NetApp Support Site account.

Steps

1. Log in to the NetApp Support Site.
2. Go to the **Download Software** page.
3. Locate OnCommand Shift and select the operating system on which you want to install OnCommand Shift.
4. Click **Go!**
5. Follow the instructions on the OnCommand Shift page to download the software.

Related information

[NetApp Support](#)

Setting up Windows Remote Management on the Shift Server host

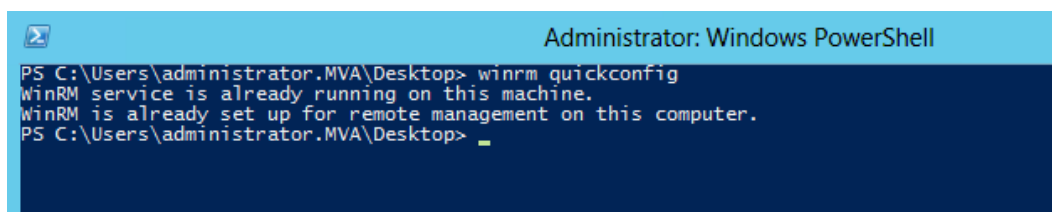
During the conversion process, the Shift Server must run various scripts on the guest operating system. The credentials to run these scripts are passed from the Shift Server to the guest operating system through the hypervisor using Windows Remote Management (WinRM). You should configure WinRM on the Shift Server host and all Hyper-V Servers before you install OnCommand Shift.

About this task

You must perform the following steps on the Shift Server from the administrator PowerShell window. Perform these steps before setting up WinRM on the Hyper-V server.

Steps

1. From the PowerShell command prompt, verify that WinRM is enabled: **winrm quickconfig**.
If WinRM is running and setup for remote management, the following is displayed:

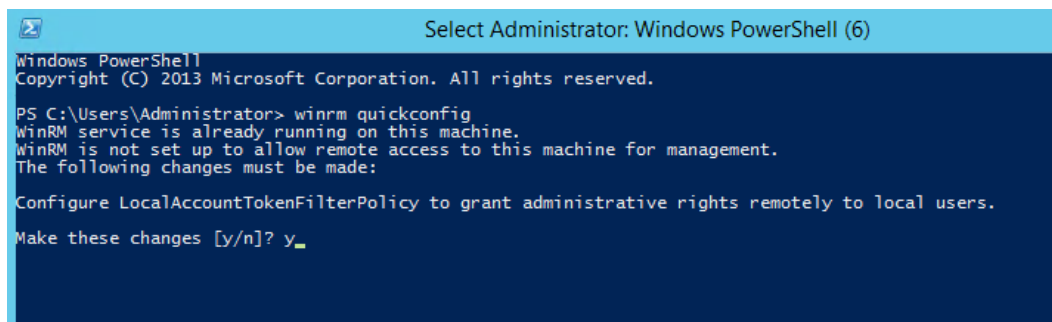


```

Administrator: Windows PowerShell
PS C:\Users\administrator.MVA\Desktop> winrm quickconfig
WinRM service is already running on this machine.
WinRM is already set up for remote management on this computer.
PS C:\Users\administrator.MVA\Desktop>

```

If WinRM is not set up for remote management, the following is displayed:



```

Select Administrator: Windows PowerShell (6)
Windows PowerShell
Copyright (C) 2013 Microsoft Corporation. All rights reserved.

PS C:\Users\Administrator> winrm quickconfig
WinRM service is already running on this machine.
WinRM is not set up to allow remote access to this machine for management.
The following changes must be made:

Configure LocalAccountTokenFilterPolicy to grant administrative rights remotely to local users.
Make these changes [y/n]? y

```

2. If WinRM is not set up for remote management, enter **y**.
WinRM is automatically configured.
3. Check the state of the client configuration settings: **winrm get winrm/config/client**.
A list of client authentication protocols is returned.
4. If the output for CredSSP is false, do the following.
 - a. Enter **Enable-WSManCredSSP -Role Server**.
 - b. Select **Yes**, when prompted.
 - c. Enter **Enable-WSManCredSSP -Role Client -DelegatedComputer domain**.
Several options can be supplied for **-DelegatedComputer**:
 - To grant access to any host, use *****.
 - To grant access to a specific host, use the Fully Qualified Domain Name: **servername.mydomain.com**.
 - To grant access to a specific domain, use ***.mydomain.com**.

Note: Enabling CredSSP authentication for the entire domain does not mean that a remote system can access the servers without the appropriate administrative account and privileges. Credentials are still required to access the remote system using WinRM.
5. Retrieve the configuration: **Get-WSManCredSSP**.
The following output is displayed:
The machine is not configured to allow delegating fresh credentials
This computer is not configured to receive credentials from a remote client computer.

6. Enable the Shift Server to send credentials to the Hyper-V Server: **Enable-WSManCredSSP -role client -DelegateComputer Hyper-V_Server_FQDN**.

Hyper-V_Server_FQDN is the fully qualified domain name of the Hyper-V server used in the migration environment.

7. Confirm the settings: **Get-WSManCredSSP**.

The following output is displayed:

This machine is configured to all delegating fresh credentials to the following target(s):

The machine is configured to receive credentials from a remote client computer.

8. Verify that CredSSP is true:

```
winrm get winrm/config/client
```

CredSSP="true" appears in the output.

9. Add the Hyper-V server as a TrustedHosts for the Shift Server client: **Set-Item WSMan:\localhost\Client\TrustedHosts Hyper-V_Server_FQDN**

Hyper-V_Server_FQDN is the fully qualified domain name of the Hyper-V server used in the migration environment.

10. Verify that the TrustedHosts = "host.domain.com" field is populated correctly:

```
winrm get winrm/config/client
```

After you finish

Complete the steps to set up WinRM on your Microsoft Hyper-V servers.

Setting up Windows Remote Management on the Hyper-V Server

For Windows Remote Management (WinRM) to enable the Shift Server to run various scripts on the guest operating system, the Hyper-V Server must be set up to receive credentials from the Shift Server through the hypervisors.

Before you begin

WinRM must be configured on the Shift Server host.

About this task

You should perform the following steps on the Hyper-V server used in the migration environment.

Steps

1. Allow credentials to be received from the Shift Server:
Enable-WSManCredSSP -role server
2. Enter **y** to enable CredSSP authentication.

After you finish

If you still experience problems, consult Microsoft documentation: [Microsoft TechNet: Test-WSMan](#).

Installing and setting up OnCommand Shift for the first time

If you are installing and setting up OnCommand Shift for the first time, you must perform a series of specific tasks in a specific order. For successful completion of installation and setup, do not deviate from the linear progression of tasks prescribed in the procedure.

Steps

1. [Installing OnCommand Shift](#) on page 15
2. [Setting up the Shift Server](#) on page 17
3. [Connecting to the Shift Server](#) on page 17
4. [Verifying and importing ShiftClient](#) on page 18
5. [Ways to Create a Data ONTAP SVM](#) on page 20
6. [Parameters for creating a new SVM using New-SVM](#) on page 21
7. [Configuring the Data ONTAP settings](#) on page 24
8. [Configuring the hypervisor settings](#) on page 24
9. [Adding network mappings](#) on page 25
10. [Removing network mappings](#) on page 26
11. [Configuring the default guest OS settings](#) on page 27
12. [Example OnCommand Shift configuration](#) on page 27

Related tasks

[Verifying system requirements](#) on page 8

Installing OnCommand Shift

You can install OnCommand Shift software using the wizard or silent command line. You can use OnCommand Shift to convert VMs from one hypervisor to another.

Before you begin

You must have the following credentials and software:

- Login credentials for the Windows Administrator account
- The OnCommand Shift software package
- VMware vSphere PowerCLI 5.5 or later
- Microsoft .NET Framework 3.5 (which includes .NET 2.0)

You must have configured the following component:

- Windows Remote Management (WinRM)

About this task

Without any reconfiguration, OnCommand Shift can communicate only between one ESXi and one Hyper-V environment. Therefore, if you are using OnCommand Shift to migrate VMs between multiple ESXi or Hyper-V environments, you must install multiple instances of OnCommand Shift

so that each Shift Server can have a different configuration. Alternatively, you can use PowerShell cmdlets to script the configuration of OnCommand Shift.

Steps

1. Log in to the Windows system with an Administrator account.
Both local and domain administrators are supported.
2. You can install OnCommand Shift in two ways: using the wizard, or silently, using the command line.

Option	Action
Wizard	a. Navigate to the directory that contains the OnCommand Shift software package, and double-click the package name. b. Complete the steps in the setup wizard. c. In the Port Configuration page, enter the port number. The default HTTPS port is 8443. You should not alter the port number unless absolutely necessary; you can edit the port number only if Apache Tomcat 7.0 is not installed. d. In the OnCommand Shift Server credentials page, set your Shift Server administrator account credentials: • User name Only the default “admin” user is supported. • Password • Password confirmation Note: This is your credential to connect to the Shift Server using <code>Connect-ShiftServer</code> in Windows PowerShell. e. Press Finish.
Silent, Command line	a. From the command line, switch to the directory to which you saved the executable file. b. Run the executable: <code>C:\Users\Administrator\Desktop\OnCommand Shift.exe" /debuglog"C:\OnCommand Shiftlogfile.log" /silent /AGENT_HTTPS_PORT:8443 /CONFIRMPASSWORD=password /USERPASSWORD=password.</code> The process begins and runs in the background. c. Check the executable name. d. Change the order of the password options.

3. Complete the following steps:
 - a. From PowerShell, enter **Get-Module -ListAvailable** and verify that ShiftClient 1.0 is installed.
 - b. From PowerShell, enter **Get-ShiftServerState** and verify that the prompt returns Shift server is running.
 - c. Ensure that the cmdlets can be executed by entering from PowerShell **Set-ExecutionPolicy Unrestricted**.

Set-ExecutionPolicy Unrestricted does not change the execution policy for external scripts. See the [NetApp OnCommand Shift 1.0 Conversion and Administration Guide](#) Troubleshooting text for more information.

- d. From **Control Panel > Services**, verify that Apache Tomcat 7.0 is running.

Setting up the Shift Server

You must verify your system requirements and configure your PowerShell profile before you set up the Shift Server.

Steps

1. If vSphere PowerCLI 5.5 is not installed on your system, install it:
 - a. From your Shift Server platform (Windows Server 2012 or Windows Server 2012 R2), log in with an administrator account, such as LOCAL\Administrator.
 - b. Navigate to **Roles and Features**.
 - c. Enable .NET 3.5 (which includes .NET 2.0).
 - d. Install vSphere PowerCLI 5.5.
2. Configure your PowerShell profile:
 - a. From PowerShell, confirm the profile location: **\$profile**.
 PowerShell should return C:\Users\localadmin\Documents\WindowsPowerShell\Microsoft.PowerShell_profile.ps1.
 PowerShell ISE should return C:\Users\localadmin\Documents\WindowsPowerShell\Microsoft.PowerShellISE_profile.ps1
 - b. Edit the file returned from \$profile to include the following lines:
 - **Add-PSSnapin VMware.VimAutomation.Core**
 - **Import-Module DataONTAP**
 You must perform this step for each administrator account associated with OnCommand Shift.
3. Relaunch PowerShell and verify that no errors are reported:
 - a. Enter **Get-PSSnapin** and verify that VMware.VimAutomation.Core is installed.
 - b. Enter **Get-Module** and verify that Data ONTAP is installed.
4. Enter **Get-ShiftServerState** to confirm the Shift Server state.
 Shift server is running is returned.

Connecting to the Shift Server

To perform most operations on the Shift Server, you must first connect to the Shift Server using Connect-ShiftServer.

About this task

You must run Connect-ShiftServer before issuing any other PowerShell cmdlets, except Get-ShiftServerState.

Issue these commands from the Shift Server using a PowerShell or PowerShell ISE prompt.

Steps

1. Enter your server information:

Connect-ShiftServer -host *string* -port *integer* -credential *PSCredential* -timeoutsec *integer*

If you do not specify the `-credential` parameter, you are prompted for your user name and password.

Example

The following example connects to the Shift Server with the default host “localhost” and default port number 8443:

Connect-ShiftServer

Example

The next example connects to the Shift Server with a specified host name and port number:

Connect-ShiftServer -host *ShiftServer3* -port *8181*

2. Optional: Check the Shift Server status:

Get-ShiftServerState -host *string* -port *integer* -timeoutsec *integer*

Verifying and importing ShiftClient

ShiftClient is a PowerShell module that should be imported by default with OnCommand Shift. You should verify that the import was successful. If the import was not successful, you should import it.

Before you begin

- OnCommand Shift is installed.
- Your PowerShell profile is configured

About this task

Issue these commands from the Shift Server using a PowerShell or PowerShell ISE prompt.

Steps

1. Verify that ShiftClient is imported:

Get-Module

ShiftClient should appear in the output list. If it does not, proceed to the next step.

2. Import ShiftClient if it does not appear in the output list:

Import-Module ShiftClient

Automatically loading required ShiftClient PowerShell modules

Data ONTAP PowerShell Toolkit and VMware PowerCLI modules are required with ShiftClient. You can configure your profile to always load these modules in ShiftClient.

About this task

Issue these commands from the Shift Server using a PowerShell or PowerShell ISE prompt.

Steps

1. Enter `Test-Path $Profile`.
2. If true is returned, go to the next step; otherwise, create a new PowerShell profile:
`New-Item -path $Profile -type File -force`
3. Edit `$Profile`: `Notepad $Profile`.
4. Add the following line to your profile:
`Add-PSSnapin VMware.VimAutomation.Core`
5. Add the following line to your profile:
`Import-Module DataONTAP`
6. Save and close Notepad.
7. Exit PowerShell.

ShiftClient PowerShell cmdlets

ShiftClient contains various PowerShell cmdlets for use in OnCommand Shift.

OnCommand Shift 1.0 contains the following cmdlets. These cmdlets are covered in detail in the *NetApp OnCommand Shift 1.0 Cmdlet Reference Guide*.

Cmdlet	Description
<code>Connect-ShiftServer</code>	Connects the client to the OnCommand Shift Server
<code>Convert-VirtualMachine</code>	Converts the VM from the source hypervisor to the destination hypervisor
<code>Disconnect-ShiftServer</code>	Disconnects the client from the OnCommand Shift Server
<code>Get-ShiftGuestOSConfig</code>	Returns the configuration for the guest VM (user name, password, and domain)
<code>Set-ShiftGuestOSConfig</code>	Configures the configuration for the guest VM (user name, password, and domain)
<code>Get-ShiftHypervisorConfig</code>	Returns the configuration for the VMware ESXi and Microsoft Hyper-V hypervisors
<code>Set-ShiftHypervisorConfig</code>	Specifies the configuration for the VMware ESXi and Microsoft Hyper-V hypervisors
<code>Get-ShiftJobStatus</code>	Returns the Shift migration job list or individual job information
<code>Get-ShiftNetworkConfig</code>	Returns the network mapping configuration
<code>Set-ShiftNetworkConfig</code>	Specifies a network mapping configuration
<code>Remove-ShiftNetworkConfig</code>	Removes (deletes) a network mapping configuration
<code>Get-ShiftOntapConfig</code>	Returns the credential information for the Data ONTAP environment
<code>Set-ShiftOntapConfig</code>	Specifies the credential information for the Data ONTAP environment

Cmdlet	Description
Get-ShiftReport	Generates a report in .csv format for the VMs migrated with OnCommand Shift
Get-ShiftServerState	Returns the current state of the Shift Server
Set-ShiftServerCredentials	Specifies the credentials to be used with the Shift Server
New-SVM	Creates a new SVM to be used with OnCommand Shift
Restore-VirtualMachine	Restores a VM to its original, premigration state in case of a VM migration failure

Related information

[NetApp OnCommand Shift 1.0 Cmdlet Reference Guide](#)

Ways to Create a Data ONTAP SVM

All VMs that you want to convert must first be moved to a Data ONTAP Storage Virtual Machine (SVM) using Storage vMotion or Live Migration. There are several ways you can create an SVM suitable for Shift operations.

- Enter the New-SVM cmdlet to create a new SVM.

New-SVM has many parameters. Instead of entering each individual parameter, you should create a configuration text file and use only the `-file` parameter.

For example, you create a text file called `svm_params.txt` with the following parameters:

```
vserverName=Shift
aggrName=myAggr
cifsPort=ela
nfsPort=ela
dataVolumeName=vmdata
volumeSizeGig=200
nfsIpAddress=10.225.13.144
cifsIpAddress=10.225.13.144
nfsNetMask=255.255.252.0
cifsNetMask=255.255.252.0
cifsServerName=shiftCifsServer
cifsShareName=shiftsCifsShare
esxMountPoint=shiftNfsShare
dnsDomain=domain.company.com
dnsNameServers=10.255.12.103,10.225.12.104
datastoreName=Shift_DataStore
esxIpAddr=10.225.24.198
destinationAddress=10.225.12.0/22
routingGroup=d10.225.12.0/22
gatewayAddress=10.225.12.1
```

You can then enter `New-SVM -file svm_params.txt`. You are prompted for the domain administrator credentials, but you are not prompted for all the individual parameters. If you make a mistake and the SVM creation fails, you can modify `svm_params.txt` and try again.

Note: If the SVM creation fails, OnCommand Shift reverses the process before exiting the cmdlet.

- Use OnCommand System Manager to create a new SVM.
- Modify an existing SVM.

Note: Modifying an existing SVM is not recommended. Best practice is to create a new SVM. Creating a new SVM helps prevent migrated VMs from residing on an SVM in your production environment.

Related references

[Parameters for creating a new SVM using New-SVM](#) on page 21

Parameters for creating a new SVM using New-SVM

Before converting an VM, it must be moved to a Storage Virtual Machine (SVM). You can use the New-SVM PowerShell cmdlet to create a new SVM for migrations.

Enter New-SVM with the following parameters when creating a new SVM. You should create and use a configuration text file to use with the `-file` parameter instead of entering each parameter individually.

Parameter	Description	Example
<code>-file</code>	Optional: Directs the command to an external file that includes all required input parameters. [Value format: .txt]	<i>svm_params.txt</i>
<code>-vserverName</code>	Specifies the name of the SVM that you are creating.	<i>Shift</i>
<code>-aggrName</code>	Assigns the specified aggregate to the SVM. To find the aggregate name, log in to the cluster console and run <code>aggr show</code> .	<i>myAggr</i>
<code>-cifsPort</code>	Specifies the target CIFS port number. This is a string. Run <code>net int show</code> to show the list of network interfaces available on the cluster. Then, choose where you want to create your CIFS and NFS LIFs.	<i>e1a</i>
<code>-nfsPort</code>	Specifies the target NFS port number. This is a string. Run <code>net int show</code> to show the list of network interfaces available on the cluster. Then, choose where you want to create your CIFS and NFS LIFs. CIFS and NFS LIFs must be on the same data port.	<i>e1a</i>

Parameter	Description	Example
-dataVolumeName	Specifies the target data volume name to create. [Short form: -volName] You can name this whatever you want. A volume's name must start with an alphabetic character (a to z or A to Z) and be 150 or fewer characters in length for Infinite Volumes, and 203 or fewer characters in length for all other volume types. Volume names must be unique within a SVM. The volume name cannot contain dashes (-). Only thick volumes are supported through New-SVM cmdlet.	<i>vmdata</i>
-volumeSizeGig	Specifies the size of the target volume in gigabytes. [Short form: -volSize] The size of the volume should be less than the available space in the aggregate. You can find the available space on the aggregate by running <code>aggr show</code> on the cluster console.	<i>200</i>
-nfsIpAddress	Specifies the target NFS IP address. [Short form: -nfsIP] This is the IP address to be used for the NFS LIF. You must choose this based on your network. A cluster LIF cannot be on the same subnet as a management or data LIF. CIFS and NFS IP addresses must be the same.	<i>10.255.13.144</i>
-cifsIpAddress	Specifies the target CIFS IP address. [Short form: -cifsIP] This is the IP address to be used for the CIFS LIF. You must choose this based on your network. A cluster LIF cannot be on the same subnet as a management or data LIF. CIFS and NFS IP addresses must be the same.	<i>10.255.13.144</i>
-nfsNetMask	Specifies the target NFS netmask. Use it to specify NFS LIF netmask.	<i>255.255.252.0</i>
-cifsNetMask	Specifies the target CIFS netmask. Use it to specify CIFS LIF netmask.	<i>255.255.252.0</i>

Parameter	Description	Example
-domaincred	Specifies the domain credential used to create the CIFS server. [Short form: -cred] This is the domain credential of the domain controller. If using -file, you are prompted for your domain administrator user name and password.	Prompted if left blank
-cifsServerName	Specifies the target CIFS server name. This is the name of the CIFS server you want to create (up to 15 characters). This is the CIFS server NetBIOS name.	<i>shiftCifsServer</i>
-cifsShareName	Specifies the CIFS share name. This parameter specifies the name of the CIFS share that you want to create. A share name can be up to 256 characters long.	<i>shiftCifsShare</i>
-esxMountPoint	Specifies the target ESX mount point. This is the NFS share name.	<i>shiftNfsShare</i>
-dnsDomain	Specifies the target DNS domain.	<i>domain.company.com</i>
-dnsNameServers	Specifies the DNS name servers.	<i>10.225.12.103, 10.225.12.104</i>
-datastoreName	Specifies the ESX Datastore to be created. This is the name as it will appear in vCenter.	<i>Shift_dataStore</i>
-esxIpAddr	Specifies the ESX server management IP address.	<i>10.225.24.190</i>
-destinationAddress	Specifies the destination IP address of the route's destination. [Short form: -destAddress]. Specifies the IP address and subnet mask of destination.	<i>10.225.12.0/22</i>
-routingGroup	Specifies the name of the routing group within which you want to create the new route: for example, d192.168.1.0/24 ("d" stands for data LIF and 192.168.1.0/24 is subnet).	<i>d10.225.12.0/22</i>
-gatewayAddress	Specifies the IP address of the gateway server leading to the route's destination.	<i>10.225.12.1</i>

Parameter	Description	Example
-force	Bypasses the confirmation prompt.	not applicable

Related concepts

[Ways to Create a Data ONTAP SVM](#) on page 20

Configuring the Data ONTAP settings

Before you can convert virtual machines, you must first configure several Shift settings. These settings are necessary to connect to your storage system, your VMware ESXi host, and your Microsoft Hyper-V host.

Before you begin

The Shift Server must already be connected.

About this task

Issue these commands from the Shift Server using a PowerShell or PowerShell ISE prompt.

Steps

1. Configure the Data ONTAP settings:

Set-ShiftOntapConfig -clusterIp *string* -destinationPath *string* -force

-clusterIp is the cluster management LIF.

If you do not specify the -credential parameter, you are prompted for your cluster management administrator user name and password:

Example

Set-ShiftOntapConfig -clusterIp 10.0.0.1 -destinationPath /dest/vm

2. To script this command, you can add the -credential parameter and a saved credential object.

For more information about creating saved credential objects, see Microsoft documentation about Get-Credential: [Microsoft TechNet Script Center: Get-Credential](#).

Configuring the hypervisor settings

You must enter your hypervisor configuration settings for VMware ESXi and Microsoft Hyper-V.

Before you begin

The Shift Server must already be connected.

About this task

Issue these commands from the Shift Server using a PowerShell or PowerShell ISE prompt.

Steps

1. Configure the VMware ESXi hypervisor:

```
Set-ShiftHypervisorConfig -name VMWARE -IPAddress hypervisor_IPaddress -hostname hypervisor_host_name -datacenter data_center -force
```

- The `-name` parameter is not case sensitive, so both `VMWARE` and `vmware` can be used. The `(-)` in Hyper-V is required.
- The `-datacenter` parameter is the name of the data center you are connecting to.
- If you do not specify the `-credential` parameter, you are prompted for your ESXi host user name and password.

Example

Updating the VMware ESXi hypervisor configuration:

```
Set-ShiftHypervisorConfig -name vmware -IPAddress 10.0.0.1
```

2. Configure the Microsoft Hyper-V hypervisor:

```
Set-ShiftHypervisorConfig -name HYPER-V -IPAddress string -hostname string -datacenter string -force
```

If you do not specify the `-credential` parameter, you are prompted for your Hyper-V administrator host user name and password.

Example

Updating the Hyper-V hypervisor configuration using a saved credential object:

```
$password = ConvertTo-SecureString -AsPlainText -Force  
"HypervisorPassword"
```

```
$cred = new-object -typename System.Management.Automation.PSCredential -argumentlist "HypervisorUsername", $password
```

```
Set-ShiftHypervisorConfig -name vmware -IPAddress 10.0.0.1 -cred $cred
```

3. To script this command, you can add the `-credential` parameter and a saved credential object.

For more information about creating saved credential objects, see Microsoft documentation about Get-Credential: [Microsoft TechNet Script Center: Get-Credential](#).

Adding network mappings

Network settings within VMs are automatically detected, but the external networks configured within ESXi (also known as *vmPortGroups*) and Hyper-V (also known as *Hyper-V switches*) are not. Before you can migrate a VM, you must define the network mappings so that the VM can continue to communicate on the network.

Before you begin

The Shift Server must already be connected.

To create network adapters on the converted virtual machine, you must have mapped existing Microsoft Hyper-V virtual switches to VMware ESXi standard switches.

About this task

Issue these commands from the Shift Server using a PowerShell or PowerShell ISE prompt.

Steps

1. Find all the networks that exist in your environment:

- For ESXi, run `Get-VirtualPortGroup`.
- For Hyper-V, run `Get-VMSwitch`.

A table is returned with all the network adapters associated with the Hyper-V server. These network adapters are listed in the `Name` column.

2. Find all the networks connected to a specific VM:

- For ESXi, run the following:
`Get-VM -Name VMName | Get-NetworkAdapter`
- For Hyper-V, run the following:
`Get-VMNetworkAdapter -VMName "VirtualMachineName"`

If the VM exists, a table is returned with all the network adapters associated with the VM. For ESXi, the adapters are listed in the `NetworkName` column. For Hyper-V, the network adapters are listed in the `SwitchName` column.

3. Add the network mapping: **`Add-ShiftNetworkConfig -name string -vmPortGroup string -hypervSwitch string -vLanId string -force`**

OnCommand Shift does not verify the names of the network. Be sure that they are entered correctly based on the information gathered in the previous steps.

Example

The ESXi network that connects to the VM to be migrated to the 10.10.10.0 network is named *ESX10Network*. The Hyper-V network that connects to the 10.10.10.0 network is named *HyperV10Network*. The following command creates a network mapping with a name *Shift10Network*:

`Add-ShiftNetworkConfig -name Shift10Network - vmPortGroup ESX10Network - hypervSwitch HyperV10Network -vLanId 0 -force`

4. Repeat the previous step for each pair of switches to be mapped.

After you finish

If you change your credentials or settings, you are prompted to reenter your credentials.

Removing network mappings

You can use PowerShell to remove a single network mapping, or to reset all your network mappings and start over. Removing OnCommand Shift network mappings does not affect any configurations on the hypervisors.

Before you begin

You must know the friendly name associated with the network mapping you want to remove.

Steps

1. Retrieve the friendly name for the network mapping you want to remove, if you do not have it:
`Get-ShiftNetworkConfig`
2. Remove the network mapping:
 - To remove a single network mapping, enter the following:

```
Get-ShiftNetworkConfig -name network_friendly_name -force
```

- To reset all the network mappings, enter the following:

```
Get-ShiftNetworkConfig | ForEach-Object {Remove-ShiftNetworkConfig -  
name $_.hypervisorNetworkConfigName -force -Verbose}
```

Configuring the default guest OS settings

When converting virtual machines, you can enter guest OS credentials for each VM to be converted. If the credentials are always the same, you can set default guest OS credentials to be used.

Before you begin

The Shift Server must already be connected.

About this task

Issue these commands from the Shift Server using a PowerShell or PowerShell ISE prompt.

Steps

1. Update the existing guest OS configuration from the command prompt:

```
Set-ShiftGuestOSConfig -credential PSCredential -domain string -force
```

The `-domain` parameter is the domain to which the VM to be migrated is currently connected. It is only required if the `-credential` parameter is specified. If you do not specify the `-credential` parameter, you will be prompted for your guest OS username and password.

Example

Updating the default guest OS configuration:

```
Set-ShiftGuestOSConfig -domain eng
```

Example

Updating the default guest OS configuration with credentials provided in the `$cred` parameter:

```
$password = ConvertTo-SecureString -AsPlainText -Force "GuestOSpassword"  
$cred = new-object -typename System.Management.Automation.PSCredential  
-argumentlist "GuestOSusername", $password
```

```
Set-ShiftGuestOSConfig -domain eng -cred $cred
```

2. To script this command, you can add the `-credential` parameter and a saved credential object.

For more information about creating saved credential objects, see Microsoft documentation about Get-Credential: [Microsoft TechNet Script Center: Get-Credential](#).

Example OnCommand Shift configuration

You might find it useful to consult an example model of the basic Shift Server setup and configuration workflow.

This example is based on the assumption that you have correctly installed OnCommand Shift and configured Windows Remote Management.

Typical configuration commands

```
# OnCommand Shift PowerShell Cmdlets Example

Get-ShiftServerState
Connect-ShiftServer -host 10.0.0.1 -port 8443

Set-ShiftOntapConfig -clusterIp "10.0.0.2" -destinationPath "/Volume/
Share/Folder" -force
Get-ShiftOntapConfig
winrm get winrm/config/client

Set-ShiftHypervisorConfig -name "VMWARE" -IPAddress "10.0.0.3" -hostname
"10.0.0.3" -datacenter "ha-datacenter" -Force
Set-ShiftHypervisorConfig -name "HYPER-V" -IPAddress "10.0.0.4" -
hostname "YOURHOST.YOURDOMAIN.COM" -datacenter "myDataCenter" -Force
Get-ShiftHypervisorConfig

Add-ShiftNetworkConfig -name "Primary Network" -sourceSwitch "ESX
Standard Switch 1" -destinationSwitch "Hyper-V Virtual Switch 1" -vLanId
100
Add-ShiftNetworkConfig -name "Secondary Network" -sourceSwitch "ESX
Standard Switch 2" -destinationSwitch "Hyper-V Virtual Switch 2" -vLanId
100
Get-ShiftNetworkConfig

Set-ShiftGuestOSConfig -domain LOCAL -force
Get-ShiftGuestOSConfig
```

Repairing and uninstalling OnCommand Shift

You can repair and uninstall OnCommand Shift using either the installation wizard or silent mode.

Repairing or reinstalling OnCommand Shift

You can use the OnCommand Shift installer to repair or reinstall OnCommand Shift, which repairs installation errors in the program and fixes missing or corrupt files, shortcuts, and registry entries.

Before you begin

The OnCommand Shift software must already exist on your system.

About this task

During silent repair or reinstallation, no interface, progress bars, or error messages are displayed. Any error messages are written to a log file that is located in a specified log file path (`/debuglog"C:\OnCommand Shiftlogfile.log"`).

Steps

1. Log in to the Windows system with an Administrator account.
Both local and domain administrators are supported.
2. You can repair or reinstall OnCommand Shift in two ways: using the wizard, or silently, using the command line:

Option	Actions
Wizard	a. Navigate to the directory that contains the OnCommand Shift software package and double-click the package name. b. Follow the steps in the setup wizard. c. When prompted, choose Repair. d. Press Finish.
Command line (silent)	a. From the command line, switch to the directory to which you saved the executable file. b. Run the executable: <code>C:\Users\Administrator\Desktop\OnCommand Shift.exe" /debuglog"C:\OnCommand Shiftlogfile.log" /silent /repair</code>. The process begins and runs in the background.

Uninstalling OnCommand Shift

You can uninstall OnCommand Shift from the host by using the installation wizard, the Control Panel, or the silent command line. You can uninstall and reinstall if necessary to troubleshoot any issues with the software.

About this task

After you uninstall OnCommand Shift, all your Shift Server configurations are removed. There is no way to uninstall OnCommand Shift and preserve your settings.

During a silent uninstall process, no interface, progress bars, or error messages are displayed. Any error messages are written to a log file that is located in a specified log file path (**/debuglog"C:\OnCommand Shiftlogfile.log"**).

Steps

1. If you want to uninstall all components associated with OnCommand Shift, complete the following steps in order:
 - a. Uninstall Apache Tomcat 7.0.
 - b. Uninstall JRE 1.7.
2. You can uninstall OnCommand Shift in three ways:

Option	Action
Control Panel	Select the Windows Control Panel > All Control Panel Items > Programs and Features utility.
Wizard	a. Navigate to the directory that contains the OnCommand Shift software package and double-click the package name. b. Complete the steps in the wizard. c. When prompted, select Uninstall. d. Press Finish.
Command line (silent)	a. From the command line, switch to the directory to which you saved the executable file. b. Run the executable: C:\Users\Downloads\OnCommand Shift.exe" /silent /remove /debuglog"C:\OnCommand Shift _Suite_Remove.log. The process begins and runs in the background.

Silent install, repair, and uninstall syntax

When you want to run an install, repair, or uninstall process in the background, you construct a command to do so using a particular set of parameters and variables.

Silent install

The installer passes the parameters in the following order:

```
"C:\Users\Administrator\Desktop\OnCommand Shift.exe" /debuglog"C:\
\OnCommand Shiftlogfile.log" /silent /AGENT_HTTPS_PORT:8443 /
USERPASSWORD=password /CONFIRMPASSWORD=password
```

Silent repair

The installer passes the parameters in the following order:

```
"C:\Users\Administrator\Desktop\OnCommand Shift.exe" /debuglog"C:\
\OnCommand Shiftlogfile.log" /silent /repair
```

Silent uninstall

The installer passes the parameters in the following order:

```
"C:\Users\Downloads\OnCommand Shift.exe" /silent /remove /debuglog"C:\
OnCommand_Shift _Suite_Remove.log"
```

Parameters and variables

silent

Specifies silent mode.

AGENT_HTTPS_PORT

Specifies the Shift Server port number.

USERPASSWORD

Specifies the administrator password for Shift Server.

repair

Specifies to run the installer in repair mode against an existing instance of OnCommand Shift.

remove

Specifies to uninstall OnCommand Shift.

debuglog"path"

Optional: Specifies where to save the operation log. Do not put a space between the parameter and the path.

Validating the Data ONTAP SVM

You can manually validate that your Data ONTAP SVM is correctly configured for OnCommand Shift. You can also modify an existing SVM to work for OnCommand Shift.

Steps

1. Check whether CIFS and NFS protocols are enabled: **vserver show-protocols -vserver shift**.

- a. If CIFS or NFS protocol are not enabled, enable them using **vserver add-protocols**.

```
cluster::> vserver show-protocols -vserver shift

Vserver: shift
Protocols: nfs, cifs, fcp, iscsi, ndmp
```

2. Check whether the SVM has a data LIF with NFS and CIFS protocols:

net int show -vserver shift

- a. If CIFS and NFS are configured on different data LIFs, change them to use the same data LIF.
- b. If there is no data LIF, create it:

```
net int create -vserver shift -lif datalif -role data -data-protocol
cifs,nfs,fcache -home-node node-b -home-port e1a -address 10.10.10.1 -
netmask 10.10.10.4 - status-admin up
```

```
cluster::> net int show -vserver shift
```

Current Is	Logical	Status	Network	Current
Vserver	Interface	Admin/Oper	Address/Mask	Node
Port	Home			
shift				
shift	shift_data	up/up	10.10.10.1/22	node-a e1a
true				

```
cluster::> net int show -vserver shift -lif
```

```
shift_data
```

```
(network interface show)
```

```

Vserver Name: shift
Logical Interface Name: shift_data
Role: data
Data Protocol: nfs, cifs
Home Node: node-b
Home Port: e1a
Current Node: node-b
Current Port: e1a
Operational Status: up
Extended Status: -
Is Home: true
Network Address: 10.10.10.1
Netmask: 10.10.10.4
Bits in the Netmask: 22
IPv4 Link Local: -
Subnet Name: -
Administrative Status: up
Failover Policy: system-defined
```

```

Firewall Policy: data
Auto Revert: false
Fully Qualified DNS Zone Name: none
DNS Query Listen Enable: false
Failover Group Name: 10.10.10.2/22
FCP WWPN: -
Address family: ipv4
Comment: -
IPspace of LIF: Default

```

3. Check for the network routing group route:

```
net route show-lifs -vserver shift
```

- a. If you see no valid route entry, create one:

```
net route create -vserver shift -destination 10.10.10.5/22 -gateway 10.10.10.3
```

```

cluster::> net route show-lifs -vserver shift

Vserver: shift
Destination          Gateway              Logical Interfaces
-----
10.10.10.5/22        10.10.10.3          shift_data

cluster::> net route show -vserver shift
(network route show)
Vserver      Destination      Gateway      Metric
-----
shift        10.10.10.5/22   10.10.10.3   20

```

4. Verify the DNS configuration:

```
vserver services dns show -vserver shift
```

- a. If you need to configure the DNS, enter:

```
vserver services dns create -vserver shift -domains yourdomain.yourcompany.com -name-servers 10.10.10.6,10.10.10.7 -state enabled
```

```

cluster::> vserver services dns show -vserver shift

Vserver: shift
Domains: yourdomain.yourcompany.com
Name Servers: 10.10.10.6, 10.10.10.7
Enable/Disable DNS: enabled
Timeout (secs): 2
Maximum Attempts: 1

```

5. Check that the CIFS Server is running:

```
cifs server show -vserver shift
```

- a. If CIFS server status is down, bring it up:

```
cifs server modify -vserver shift -status-admin up
```

- b. If there is no CIFS server, create it:

```
cifs server create -vserver shift -cifs-server SHISTCIFSSERVER -domain YOURDOMAIN.YOURCOMPANY.COM -status-admin up
```

```
cluster::> cifs server show -vserver shift

Vserver: shift
CIFS Server NetBIOS Name: SHIFTCIFSSERVER
NetBIOS Domain/Workgroup Name: YOURDOMAIN
Fully Qualified Domain Name:
YOURDOMAIN.YOURCOMPANY.COM
Default Site Used by LIFs Without Site Membership:
Authentication Style: domain
CIFS Server Administrative Status: up
CIFS Server Description:
List of NetBIOS Aliases: -
```

6. Verify that the NFS Server is running and meets requirements: **nfs show -vserver shift**.

"NFS v3" must be enabled and "General NFS Access" must be set to true.

- a. If the NFS server is not running or does not meet requirements, create it:

nfs create -vserver shift -access true -v3 enabled

```
cluster::> nfs show -vserver shift

Vserver: shift
General NFS Access: true
NFS v3: enabled
NFS v4.0: disabled
UDP Protocol: enabled
TCP Protocol: enabled
Default Windows User: -
NFSv4.0 ACL Support: disabled
NFSv4.0 Read Delegation Support: disabled
NFSv4.0 Write Delegation Support: disabled
NFSv4 ID Mapping Domain: defaultv4iddomain.com
NFSv4 Grace Timeout Value (in secs): 45
Preserves and Modifies NFSv4 ACL (and NTFS File Permissions in
Unified Security
Style): enabled
NFSv4.1 Minor Version Support: disabled
Rquota Enable: disabled
NFSv4.1 Parallel NFS Support: enabled
NFSv4.1 ACL Support: disabled
NFS vStorage Support: disabled
NFSv4 support for Numeric Owner IDs: enabled
Default Windows Group: -
NFSv4.1 Read Delegation Support: disabled
NFSv4.1 Write Delegation Support: disabled
NFS Mount Root Only: enabled
NFS Root Only: disabled
Permitted Kerberos Encryption Types: des, des3, aes-128, aes-256
Showmount Enabled: disabled
Set the Protocol Used for Name Services Lookups for Exports: udp
```

7. Verify the export rule for ESX server IP address: **export-policy rule show -vserver shift**.

- a. If it is incorrect, create it:

**export-policy rule create -vserver shift -policyname default -
clientmatch 10.10.10.8 -rorule any -rwrule any -protocol nfs,cifs -
superuser any**

```
cluster::> export-policy rule show -vserver shift
```

Vserver Rule	Policy Name	Rule Index	Access Protocol	Client Match	RO

```

-----
shift      default      1      cifs,  10.10.10.8  any
           nfs

```

8. Verify the user mapping for Windows and UNIX:

name-mapping show -vserver shift

- a. If mappings are missing, create win-unix:

name-mapping create -vserver shift -direction win-unix -position 1 -pattern YourDomain\\Administrator -replacement root

- b. If mappings are missing, create unix-win:

cluster::> name-mapping create -vserver shift -direction unix-win -position 1 -pattern root -replacement YourDomain\\Administrator

```

cluster::> name-mapping show -vserver shift

Vserver      Direction Position
-----
shift        win-unix  1      Pattern: YourDomain\\Administrator
              Replacement: root
shift        unix-win  1      Pattern: root
              Replacement: YourDomain\\Administrator
2 entries were displayed.

```

9. You can either use an existing volume or create a new volume.

Make sure that the volume satisfies the following rules:

- Security style of the volume must be mixed or NTFS.
- Compression must be disabled on the volume.

```

//security style
cluster::> volume show -vserver shift -volume datavol -fields
security-style
vserver volume      security-style
-----
shift  datavol mixed

cluster::> volume show -vserver shift -volume datavol -fields
security-sty

// compression check

cluster::> efficiency show -vserver shift -volume datavol

There are no entries matching your query.

```

10. Create a qtree for the CIFS share:

qtree create -vserver shift -volume datavol -qtree Shiftcifsshare -security-style ntfs

```

cluster::> qtree show -vserver shift -volume  datavol

Vserver      Volume      Qtree      Style      Oplocks      Status
-----
shift        datavol      ""          mixed      enable
normal

```


browsable
changenotify
continuously-available

14. Create a datastore from the ESX server:
 - a. From the vSphere Client, select your ESX server.
 - b. Select the **Configuration** tab.
 - c. Under **Hardware**, select **Storage**.
 - d. Select the **Add Storage** link.
 - e. Select the **Network File System** option and click **Next**.
 - f. For the **Server** field, enter the NFS LIF IP address.
 - g. For the **Folder** field, enter the path of the NFS qtree (/datavol/Shiftnfsshare) created earlier.
 - h. For the **Datastore Name** field, enter any datastore name.
 - i. Follow the screen instructions to create the datastore.

Where to go next

After you have installed and configured OnCommand Shift, you are ready to move your VMs onto the Data ONTAP SVM and convert them using the OnCommand Shift PowerShell cmdlets. In addition, you can manage your Shift Server, manage your configurations, and troubleshoot issues.

You can find more information about these tasks, as well as release-specific information for the OnCommand Shift, in the following documentation:

- [*NetApp OnCommand Shift product library*](#)
Contains links to the OnCommand Shift documentation set.
- [*NetApp OnCommand Shift 1.0 Conversion and Administration Guide*](#)
Describes how to convert VMs, modify configurations, and troubleshoot OnCommand Shift.
- [*NetApp OnCommand Shift 1.0 Cmdlet Reference Guide*](#)
Provides descriptions, parameters, syntax, and examples for OnCommand Shift PowerShell cmdlets.
- [*NetApp OnCommand Shift 1.0 Release Notes*](#)
Provides information about features, limitations, and known issues for OnCommand Shift.
- [*NetApp Knowledgebase*](#)
Contains articles you can use to troubleshoot OnCommand Shift.

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