

Virtual Machine Migration Utilities

NetApp Solutions

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Virtual Machine Migration Utilities

Migrating virtual machines (VMs) between virtualization environments (Shift Toolkit)

With the NetApp Shift toolkit, migrating virtual machines (VMs) is no longer a concern. This standalone product enables fast and efficient migration of VMs from VMware ESXi to Microsoft Hyper-V. Additionally, it supports disk-level conversions between various virtual disk formats.

Usecase

Every organization is now seeing the benefit of having multi-hypervisor environment. With recent changes in the market, every organization is deciding on the best course(s) of action by weighing technical and commercial risks including migrating workload VMs to alternate hypervisors and focus on achieving business-defined objectives, and controlling vendor lock-in. This enables them to operate in an optimized fashion wrt licensing cost and extend IT budget on the right areas than spending for those unused cores on a specific hypervisor. However, the challenge has always been around migration time and the associated downtime.

With the NetApp Shift toolkit, migrating virtual machines (VMs) is no longer a concern. This standalone product enables fast and efficient migration of VMs from VMware ESXi to Microsoft Hyper-V. Additionally, it supports disk-level conversions between various virtual disk formats. Thanks to the out-of-the-box capabilities provided by ONTAP, these migrations can be incredibly swift, with minimal downtime. For example, converting a 1TB VMDK file typically takes a couple of hours, but with the Shift toolkit, it can be completed in seconds.

Toolkit Overview

The NetApp Shift toolkit is an easy-to-use, graphical user interface (GUI) solution that allows to migrate virtual machines (VMs) between different hypervisors and convert virtual disk formats. It utilizes NetApp FlexClone® technology to quickly convert VM hard disks. Additionally, the toolkit manages the creation and configuration of destination VMs.

Shift toolkit provides flexibility in a multi-hypervisor environment by supporting bidirectional conversion between the following hypervisors:

- VMware ESXi to Microsoft Hyper-V
- Microsoft Hyper-V to VMware ESXi (Upcoming release)

Shift toolkit supports disk-level conversions of virtual disks between hypervisors for the following disk formats:

- VMware ESX to Microsoft Hyper-V (virtual machine disk [VMDK] to virtual hard disk format [VHDX])
- VMware ESX to KVM compatible hypervisors (VMDK to QCOW2)

Shift toolkit can be downloaded here and is available for Windows Systems only.

Benefits of VM portability

ONTAP is ideal for any hypervisor and in any hyperscalar. With FlexClone technology. VM portability in minutes is a reality than waiting for longer downtimes or settling down with pass through options.

Shift toolkit:

- · helps minimize downtime and enhances business productivity.
- offers choice and flexibility by reducing licensing costs, lock-in, and commitments to a single vendor.
- enables organizations looking to optimize VM licensing costs and extend IT budgets.
- reduces virtualization costs with VM portability and is offered free from NetApp.

How Shift toolkit works

At conversion time, Shift toolkit connects to Microsoft Hyper-V and VMware ESXi hosts and to shared NetApp storage. Shift toolkit leverages FlexClone to convert VM hard drives from one hypervisor to another by using three key NetApp technologies:

• Single volume and multiple protocols

With NetApp ONTAP, multiple protocols can be easily used to access a single volume. For example, VMware ESXi can access a volume that is enabled with the Network File System (NFS) protocol, and Microsoft Hyper-V can access the same volume with the CIFS/SMB protocol.

FlexClone technology

FlexClone allows the rapid cloning of entire files or volumes with no data copy. Common blocks on the storage system are shared between multiple files or volumes. As a result, large VM disks can be cloned very quickly.

• VM disk conversion

The NetApp PowerShell Toolkit and Shift toolkit contain a large number of workflows that can be used to perform various actions on a NetApp storage controller. Included are PowerShell cmdlets that convert virtual disks to different formats. For example, VMware VMDK can be converted to Microsoft VHDX, and vice versa. These conversions are performed with FlexClone, which enables very rapid cloning and conversion of disk formats in one step.



Protocols and communication methods

Shift toolkit uses the following protocols during conversion or migration operations.

- HTTPS Used by the Shift toolkit to communicate with the Data ONTAP cluster.
- VI Java (VI SDK), VMware PowerCLI Used to communicate with VMware ESXi.
- Windows PowerShell module Used to communicate with Microsoft Hyper-V.

Installing and Setting Up Shift toolkit

To get started with the toolkit, use a windows operating system on a designated virtual machine and make sure you meet the prerequisites, then install the package.

Shift toolkit can be run on Windows 2019 and 2022 version. Download the Shift toolkit package from NetApp Toolchest and then unzip the package and run the batch file to install and start the service.

Shift toolkit can be installed on a Microsoft Hyper-V server or on a stand-alone server (physical or virtual), and it is a best practice to install Shift toolkit on its own VM. This approach allows you to target different Microsoft Hyper-V servers or VMware ESXi servers with a single Shift toolkit server.

Pre-requisites:

Hardware requirements

Ensure that Shift server host meets minimum hardware requirements.

- · CPU 2vCPUs
- Memory 4GB minimum
- Disk Space minimum 10 GB

Connectivity requirements

- Ensure the hypervisor and storage environment is configured so that Shift toolkit can interact properly with all components in the environment.
- Shift toolkit can be installed on a Microsoft Hyper-V server or on a standalone Windows server (physical or virtual).
- The Shift server, Data ONTAP CIFS server, Hyper-V server, and guest operating systems must be on the same Windows domain.
- Multiple LIFs for CIFS and NFS are supported for use with Storage Virtual Machine when doing VM conversions. The Hyper-V server and ESXi hosts access the Storage Virtual Machine (SVM) at the IP addresses of these LIFs.
- For CIFS operations, the time settings for the Windows domain controller and the NetApp storage controller must be synchronized.

Creating a New SVM (recommended)

Move the VMs to be migrated or converted to a new designated Data ONTAP Storage Virtual Machine (SVM) using Storage vMotion. It is a best practice to configure a new SVM for the VMs, so that you can be sure you are not converting VMs on a production SVM. Use the ONTAP CLI or System Manager to create the new SVM.

Follow the steps provided in this link to provision a new SVM allowing both NFS and SMB protocol.

For ESX to Hyper-V conversion, specifies the fully qualified path name of the CIFS share (specifically, CIFS qtree on the controller) as the destination path.

Note: It is a good practice creating a new SVM to be sure that the SVM meets the Shift toolkit requirements without having to modify the production SVM in ways that might be disruptive. Note: The destination path must be on the same volume of the source VM. Note: Shift toolkit only supports the conversion of VMs residing in a NAS environment (NFS). It does not support the conversion of VMs residing in SAN environments (LUNs).

Supported operating systems

Ensure that a supported versions of Windows and Linux for guest operating systems are used for conversion and that Shift toolkit supports the version of ONTAP.

Supported VM guest operating systems

The following versions of Windows are supported as guest operating systems for VM conversions:

- Windows Server 2016
- Windows Server 2019
- Windows Server 2022

The following versions of Linux are supported as guest operating systems for VM conversions:

- Red Hat Enterprise Linux 6.7 or later
- Red Hat Enterprise Linux 7.2 or later
- Red Hat Enterprise Linux 8.x
- Red Hat Enterprise Linux 9.x
- Ubuntu 2018
- Ubuntu 2022
- Ubuntu 2024
- Debian 10
- Debian 11
- Debian 12



CentOS Linux/RedHat for Red Hat Enterprise Linux 5 is not supported.

Supported versions of ONTAP

Shift toolkit supports platforms that are running ONTAP 9.14.1 or later.

Installation

1. Download Shift toolkit package.

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2. Extract the package to the designated folder.

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				mongosetup.sh		12/9/2024 11:01 AM	SH File	8 KE				
		This PC		N nssm		12/9/2024 11:01 AM	Application	324 KB				
		Network		() uninstall		12/9/2024 11:01 AM	Windows Batch File	1 KB				
							Windows Patch Life	2.60				

3. Run the Shift toolkit package by clicking on **install** batch file.

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4. The installer will begin the installation process. This will open the command prompt and start installing the pre-requisites including MongoDB, Windows PowerShell 7, NetApp ONTAP PowerShell Toolkit, Hyper-V module for Windows PowerShell, VMware.PowerCLI package and Java which is all packed into the package.



5. After this, CredSSP is enabled which is in interactive prompt. Press Y and continue.



6. After enabling CredSSP, the installer will install the JAVA package (required for qcow conversion).



7. Once done, the installer will prompt to enter the IP address that will be used to access Shift toolkit UI.



8. Once done, "Press any key to continue" to close the command prompt.



The installation can take 8-10mins.

Using the GUI

Run Shift toolkit

- Using the browser, access Shift toolkit UI by entering the http://<IP address specified during installation>:3001.
- Access the UI using default credentials as below: Username: admin Password: admin



The admin credential can be changed using "Change Password" option.

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■ NetApp	
Shift Toolkit Stripted Solution with GUB Username	
Password	
 Login	

Accept the legal EULA by clicking on "Accept and Continue"

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Accept and Continue	Activate Windows Re to Settings to activate Windows

Shift Toolkit Configuration

Once the storage and connectivity to both the source and destination hypervisors have been configured properly, begin configuring Shift toolkit to automate the migration or conversion of the virtual machine VMDK to appropriate format, leveraging the FlexClone functionality.

Add Sites

The first step is to discover and add the source vCenter and then the target Hyper-V details (both hypervisors and storage) to Shift toolkit. Open Shift toolkit in a supported browser and use the default username and password (admin/admin) and Add Sites.

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ift Toolkit (Shift) leverages SnapMirror/Cross-region rep werful and economical solution for protecting data and ware environments both on-premises and Cloud with	blication based approach for a d applications running on	Endowments	15 Barage Environmenta	Topology Canase			temestes Yes ()
NetApp's DRO provides an ideal solution for customers who need a flexible solution for easy disaster recovery including a zero-compute footprint approach; it offers the benefits of a proven and trusted DR platform with the scale and flexibility of the public cloud.			2 114 Fides 209	Prevale to result of central result of central result 7/ 18.52	Ond Rench000-w Meu/112	93 201 Star 19 55 198	
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Sites can also be added using Discover option.

Add the following platforms:

Source

- Source Site Details
 - Site Name Provide a name for the site
 - Hypervisor Select VMware as the source (only option available during preview)
 - Site Location Select the default option
 - · Connector Select the default selection
 - Storage type Select the default option

Once filled, click Continue.

NetApp Shift Toolkit Dashboard Discover Resource Gr	roups Blueprints Job Monitoring	ê 🌣 😗 🔍
Add New Site Site Type	Site Details (3) Hypervisor Details (4) Storage Details	×
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	Hypervisor 0	
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	default-connector 👻	
	Storage Type	
	NetApp ONTAP ~	
	Ac	tivate Windows
	Previous Continue	to accord to delitible trineons.

- Source vCenter
 - $\circ\,$ Endpoint Enter the IP address or FQDN of the vCenter server
 - Username username to access the vCenter (in UPN format: username@domain.com)
 - vCenter Password Password to access vCenter for performing inventory of the resources.
 - vCenter SSL Thumbprint (optional)

Select "Accept Self signed certificate" and click Continue.

NetApp Shift Toolkit 📏 Dashboard Discover	Resource Groups Blueprints Job Monitoring	🌲 💠 😧 🕥
Add New Site	Site Type Site Details 1 Hypervisor Details 4 Storage Details	×
	Source vCenter Details	
	vCenter Endpoint	
	vCenter Username	
	administrator@nimdemo.com	
	vCenter SSL Thumbprint (optional)	
	Accept self-signed certificates	
		Activate Windows
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ONTAP Storage system credentials

NetApp Shift Toolkit N Dashboard Discover Reso	rce Groups Blueprints Job Monitoring	A 1	¢ 0	9
Add New Site 📀 Sit	Type 🕑 Site Details 🕢 Hypervisor Details 🔇 Storage Details			×
	Source Storage Details			
	Storage Endpoint			
	10.61.180.106			
	admin			
	Storage Password			
	Accept self-signed certificates			
	Activat Go to Set	e Window ttings to active	te Window	vs.

Once added, Shift toolkit will perform an automatic discovery and display the VMs along with the relevant metadata information. Shift toolkit will automatically detect the networks and portgroups used by the VMs and will populate them.

NetApp	Shift Toolkit 📏 Dashboard Discover Resource Groups Blueprints Job Monitoring 🌲 🏚 🕴	? 😩
	Image: Site Type Imag	
	1 Site Add New Site	
	DemoSRC Source On Prem VMware 1 1 View VM List • hv-vcsa.nimdemo.com ⓒ Success ····	

To view the data for a specific vCenter, go to the dashboard, click on "View VM List" against the appropriate site name. The page will display the VM inventory along with the VM attributes.

NetApp	Shift Tool	kit 📏 Dashboard Discove	r Resource Groups	Blueprints J	ob Monitoring				🌲 🌣 📀 😩
	Back			Site: DemoSRC vC	VM List enter: hv-vcsa.nimdemo	.com			
							VM Protection		
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	62 vm	3 VM Name 🗢 📋	VM Status	VM State	DataStore 💠	CPU (0 Memory (Used Provisione	Q Create Resource (Sroup acity (Used
	~	ShiftTk02_RHEL7	Not Protected	() Powered On	nimshiftstage	1		0 GB 2 GB	
	~	ShiftTk02_RHEL8	Not Protected	() Powered On	nimshiftstage	1		0 GB 2 GB	
	~	kvmubusrv	Not Protected	() Powered On	NestedVMware_DS01	8		0 GB 24 GB	
	~	ConvTest_U18kvm	0 Not Protected	() Powered On	NestedVMware_DS01	4		0 GB 16 GB Activate	e Windows
	~	U18_20241017_VM01	0 Not Protected	O Powered Off	nimshifttestDS	2		Go to Set	tings to activate Windows.



The VM inventory is refreshed every 24 hours.

()

Shift toolkit supports ESXi version 7.0 and later

Next step is to add the destination hypervisor.

Destination



- Destination Site Details
 - Site Name Provide a name for the site
 - $\,\circ\,$ Hypervisor Select Hyper-V or KVM as the target
 - Site Location Select the default option

· Connector – Select the default selection

Once filled, click Continue.

NetApp Shift Toolkit 📏 Dashboard	Discover Resource Groups Blueprints	Job Monitoring		A 🌣 💿 🕥
Add New Site	Site Type Site Details	s ③ Hypervisor Details	(4) Storage Details	×
	Des	tination Site Details		
	Site Name			
	DemoTarget			
	Hypervisor	- Select -	0	
		Hyper-V		
		KVM		
	Connector		0	
		default-connector	<u> </u>	
				Activate Windows
	Pret	vious Continue		Go to Settings to activate Windows:

Based on the hypervisor selection, fill in the necessary details.

- Destination Hyper-V details
 - · Hyper-V Standalone or failover cluster manager IP address or FQDN
 - Username username to access Hyper-V (in UPN format: username@domain.com)
 Password Password to access Hyper-V for performing inventory of the resources.

RetApp Shift Toolkit Dashboard	Discover Resource Groups Blueprints Job Monitoring	🌲 🌣 🔮 😩
Add New Site	Site Type Site Details 1 Hypervisor Details 3 Storage Details	×
	Destination Hyper-V Details	
	Standalone ③ ● Failover Cluster ④ SCVMM ④	
	Hyper-V Endpoint	
	10.61.182.105	
	Hyper-V Username	
	Hyper-V Password	
		Activate Windows
	Previous Continue	co to settings to activate withows.

Once done, Click Continue

Shift toolkit does not communicate with System Center directly in the current release.
 In the current release, end to end virtual machine migration is supported with Hyper-V only.
 In the current release, for KVM as the destination, VMDK to qcow2 conversion is the only supported workflow. Hence, if KVM is selected from the dropdown, hypervisor details are not required. The qcow2 disk can be used for provisioning virtual machine on KVM variants.

ONTAP Storage system

NetApp Shift Toolkit Dashboard	Discover Resource Groups Blueprints Job Monitoring	4 ¢ @ @
Add New Site	Site Type Site Details Hypervisor Details Storage Details	×
	Destination Storage Details	
	Storage Endpoint	
	Storage Username	
	admin	
	Storage Password	
	Accept self-signed certificates	
		Activate Windows
	Previous Create Site	Go to Settings to activate Windows.

The source and destination storage system should be the same as the disk format conversion happens at the volume level.

Shirt Toolkit	Dashboard	Discover	Resource Group:	s Blueprints	i Job Mon	hitoring				4	¢ (?
	2 Sites	2 1	er et	Microsoft 1	ß	2 Datastores		Site Type	1			
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2 Sites									٩٥	Add New Site		
2 Sites Site Name DemoTarget	: Site Type 후 Destination	Location \Xi On Prem	Hypervisor - V Hyper-V 1	Yirtual Environ S	Storage 🗘	VM List	Discovery Status		Q 9	Add New Site		

Next step is to group the required VMs into their migration groups as resource groups.

Resource Groupings

Once the platforms have been added, group the VMs you want to migrate or convert into resource groups. Shift toolkit resource groups allow you to group set of dependent VMs into logical groups that contain their boot orders, boot delays, as well as optional application validations that can be executed upon recovery.

To start creating resource groups, click on the "Create New Resource Group" menu item.

1. Access Resource groups, click on "Create New Resource Group".

netApp	Shift Toolkit 📏 Dashboard Discover	Resource Groups Blueprints	Job Monitoring			¢ 0	9
	Resource Group	Site	đ	VCenter	Virtual Machine		
	0 Resource Group			Q 0	Create New Resource Group]	
	Resource Group Name 🔷 🗍 Site Name	· 〒 │ Source vCenter	⇒ Workflow	⇒ Destination 0 V	'M List		

- 2. On the "New resource group", select the Source site from the dropdown and click "Create"
- 3. Provide Resource Group Details and select the workflow. The workflow provides two options
 - a. Clone based Migration performs end to end migration of the VM from source hypervisor to destination hypervisor.
 - b. Clone based Conversion Performs conversion of the disk format to the selected hypervisor type.

🖬 NetApp Shift Toolkit 📏 Dashboard Discover Resource Groups Blueprints Job Monitoring	A 🌣 🕲 🗈
Create Resource Group 1 Resource Group Details (2) Select Virtual Machines (3) Destination Details (4) Boot order and Delay	×
Resource Group Details	
Resource Group Name	
Associated Site	
DemoSRC	
Associated vCenter	
Workflow	
I - Select - A	
Clone based Migration NetApp ONTAP (NFS/CIFS)	
Clone based Conversion NetApp ONTAP (NFS/CIFS)	ctivate Windows
Continue	o to Settings to activate Windows.

- 4. Click on "Continue"
- 5. Select appropriate VMs using the search option. The default filter option is "Datastore".



Move the VMs to convert or migrate to a designated datastore on a newly created ONTAP SVM before conversion. This helps isolating the production NFS datastore and the designated datastore can be used for staging the virtual machines.

Crea	ate Resource	Group 🕢 Resource	Group Details 2 Selo	ct Virtual Machines 3 Destination Det	tails ④ Boot order and Delay		
				Select Virtual Machines			
			Datastore]	0		
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	24	0	CLIPTICS	nimshiftstage			0
	34 VMs	<u>u</u>	Shittik04	NestedVMware_DS01			u .
	•	Virtual Machine	Datasto	nimshifttestDS	Machine	Datastore	
		ShiftTk04_W2K22	nimshift		*		
		ShiftTk04_Win2K19	nimshiftstage				
		ShiftTk04_U18	nimshiftstage				
		ShiftTk04_U24	nimshiftstage	•			
		ShiftTk04_Deb12	nimshiftstage				
		ShiftTk04_RHEL9	nimshiftstage				

6. Update the migration details by selecting "Destination Site", Destination Hyper-V entry" and Datastore to Qtree mapping.

Resource Group	Blueprints Job Monitoring		• •	9
Create Resource Group 🥢 Resource Group Details	Select Virtual Machines Destination Details (4) Boot order and Delay			×
	Migration Details			
	Skip Migration Details 🔘			
D	DemoTarget ~			
D	stination Hyper-V			
	* CVT-201-10/UT			
	nimshiftstage			
Γ	Datastore -> Qtree Mapping			
	Source Destination QTree			
	nimshiftstage -> shiftoolkit +		c	
	Previous Continue	as to activ	ate Winde	



Make sure that the destination path (where the converted VMs are stored) is set to a qtree when converting VMs from ESX to Hyper-V. Set the destination path to the appropriate qtree.

7. Select the Boot Order and Boot delay (secs) for all the selected VMs. Set the order of power on sequence by selecting each virtual machine and setting up the priority for it. 3 is the default value for all virtual machines.

Options are as follows:

- 1 The first virtual machine to power on
- 3 Default
- 5 The last virtual machine to power on

NetApp Shift Toolkit 📏 Dashboard Discover	Resource Groups Blueprints	Job Monitoring		4	* ?	9
Create Resource Group 🔗 Resource	iroup Details 🔗 Select Virtual Mac	hines 🕢 Destination Detail	s 🕜 Boot order and Delay			×
	Boot	order and Delay				
3 умя			a	£		
VM Name	Boot O	Irder 🜒 Boo	t Delay (secs)			
ShiftTk04_	Win2K19 3	0				
ShiftTk04_	J18 3	0				
ShiftTk04_	RHEL9 3	0				
			-	Activate Windo Go to Settings to ad	ows tivate Windo	
	Previous	Create Resource Group				

8. Click on "Create Resource Group".

NetApp Shift	t Toolkit 📏 🛛 Dashboa	rd Discover Reso	ource Groups Blueprints 1	lob Monitoring			4	¢ 0	
	2 1 Resource	Group	C 1 Site]	2 1 vCenter	6	3 Virtual Machines		
1	Resource Group					Q 0	Create New Resource Group	(- I	
	Resource Group Name	C Site Name		∀ Workflow Micration	= •	Sociation	List View VM List		
L	Demoks	Demoske	nv-vcsa.nimoemo.com	Migration	1		view Vivi List	J	
		Resource gro	up registered			×	Activate Wind		
							Go to Settings to a	tivate Wind	ows,

Blueprints

To migrate or convert virtual machines, a plan is necessary. Select the source and destination hypervisor platforms from the drop down and pick the resource groups to be included in this blueprint, along with the grouping of how applications should be powered on (i.e. domain controllers, then tier-1, then tier-2, etc). These are often called as migration plans as well. To define the blueprint, navigate to the "Blueprints" tab and click on

"Create New Blueprint".

To start creating blueprint, click on the "Create New Blueprint".

1. Access Blueprints, click on "Create New Blueprint".

NetApp	Shift Toolkit 📏 Dashboard Discover Resource Groups	Blueprints Job Monitoring		• • • •
	Blueprints Resource Groups	Source Details	Destination Details	
	0 Blueprint	Siltes vCenters	Siltes	
	Plan Name C Active Site Status	Compliance Source Site 💠 De	stination Site 🗢	

- 2. On the "New Blueprint", provide a name for plan and add necessary host mappings by selecting Source Site, associated vCenter, Destination Site and associated Hyper-V hypervisor.
- 3. Once mappings are done, select the cluster and host mapping.

🖬 NetApp Shift Toolkit 📏 Dashi	board Discover Resource Group	os Blueprints Job	Monitoring		ê 🌣 😧 🛎
Create New Blueprint	Plan and Site Details	2 Select Resource Gro	ups ③ Set Execution Order	(4) Set VM Details	×
		Bluepr	int Details		
	Blueprint Name				
	DemoBP				
		Recover	ry Mapping		
	Source Site	0	Destination Site	0	
	DemoSRC	÷	DemoTar	get ~	
	Source vCenter	.0	Destination Hyper-V		
	hv-vcsa.nimdem	io.com +	10.61.182	105 v	
		Cluster and	Host Mapping		-
	No mo	ore Source/Destination clu	ister resources available for mapp	ing	
	Source Resource	Destination	n Resource		
	HV-Cluster01	nimHVHost	01	Delete	Activate Windows
			Continue		Go to Settings to activate Windows,

4. Select Resource Group Details and click on "Continue"

NetApp Shift Toolkit 📏 Dashboard	Discover Resource Groups Blueprints	Job Monitoring		۵		?	9
Create New Blueprint	Plan and Site Details 2 Select Resource	Groups 3 Set Execution Order	(4) Set VM Details				×
	Select	Resource Groups					
0 Unselected Resource Group	ps Q	1 Selected Resource	Groups	Q			
Resource Group Name	Workflow	Resource Group Na	ime Workflow				
		DemoRG	Migration				
		•					
			A	ctivate Winde			
	Descious	Continue		to Settings to a	tivate Win	dows.	

- 5. Set Execution Order for Resource Group. This option enables to select the sequence of operations when multiple resource groups exist.
- 6. Once done, select Network Mapping to the appropriate virtual switch. The virtual switches should already be provisioned within Hyper-V.



i.

The virtual switch type "External" is the only supported option for network selection.

Although network mapping is available in the GUI, Shift toolkit does not perform IP address assignment in the current release, however in the upcoming release, "Retain IP" will be an option. In the current release, "Do no configure Network" is the default selection. Once the disk is converted and virtual machine is bought on Hyper-V side, manually assign the network switches to match the relevant portgroups and vLANs on the VM ware side.

NetApp Shift Toolkit 📏 Dashb	ward Discover Resource Group:	s Blueprints Job Monitoring			4	¢ ?	9
Create New Blueprint	Plan and Site Details	Select Resource Groups 3	Set Execution Order (4)	Set VM Details			3
		Select Execution C	rder				
	Resource Group Name	Exi	ecution Order 🌘				
	DemoRG	3					
		Network Mappi					
	Source Site Resource	O Destination Site Resource					
	VMN_3510	*	tst *	Add			
	Source Resource	Destination Resource					
	VMN_182	tst		Delete			
		Datastore Mapp	ing				
	Source DataStore	Destination Volume	QTree	2			
	nimshiftstage	nimshiftstage	shiftte	polkit	Activate Wind		
		Previous	Continue			ctivate Wind	

- 7. Based on the selection of VMs, storage mappings will be automatically selected. Note: Make sure the qtree is provisioned beforehand and the necessary permissions are assigned so the virtual machine can be created and powered ON from SMB share.
- Under VM details, provide service account details for each OS type. This is used to connect to the virtual machine to create and run certain scripts that are necessary for removing VMware tools and backing up IP configuration details.

🗖 NetApp Shift Toolkit 🔖 Das	shboard Discov	ver Resource Group	as Blueprints Jo	ob Monitoring						۹	¢ ?	۹
Create New Blueprint	Ø PI	an and Site Details	Select Resource Gro	oups 🕢 Set	Execution Order	Set VI	M Details					×
	Virtual Machines Details											
		Service Account ()										
	os	Username	P	assword								
	Windows	administrator		•••••		0	Apply To All					
	Linux	root				0	Apply To All					
			IF	P Config								
		O Do Not Co	nfigure 🔿 Retair	n IP 🔘 As	sign New IP	O DHCP						
3 vms									٩			
VM Name	CPUs	Mem (MB)	NIC/IP	Power On/Off	Boot Order 👩 Override 🔳	Gen	Remove VMware Tools	Retain MAC	Service Account Override			
			Previous	Create B	lueprint				Go to Settings I	ndov to actir	VS Vate Windo)WS,

- 9. Again, under VM details, select the IP config option. This release do not support IP address assignment, hence "Do not configure" is selected by default.
- 10. The next step is VM configuration.
 - Optionally resize the VMs CPU/RAM parameters which can be very helpful for resizing purposes.
 - Boot Order override: Also modify the Boot Order and Boot delay (secs) for all the selected VMs across the resource groups. This is an additional option to modify the boot order if any changes required from what was selected during Resource group boot order selection. By default, the boot order selected during resource group selection is used, however any modifications can be done at this stage.
 *Power ON: Uncheck this option if workflow should not power ON the virtual machine. Default option is ON meaning the VM will be powered ON.
 - Remove VMware tools: Shift toolkit removes VMware tools before the conversion. This option is selected by default.
 - Generation: Shift toolkit uses the following rule of thumb and defaults to the appropriate one- Gen1 > BIOS and Gen2 > EFI. No selection is possible for this option.
 - Retain MAC: The MAC address of the respective VMs can be retained to overcome licensing challenges for those applications relying on MAC. This option is disabled since the network is not modifiable in this release.
 - Service Account override: This option allows to specify a separate service account if the global one cannot be used.

Create New Blueprint	🕑 Plan a	nd Site Details	Select Resource Grou	ps 🕢 Se	t Execution Order	Set VA	A Details		
			Service	Account (+)				
			IP	Config					
		O Do Not Confi	gure 🔿 Retain	IP Ó A	ssign New IP	O DHCP			
3 vms									٩
VM Name	CPUs	Mem (MB)	NIC/IP	Power On/Off	Boot Order 🌒 Override 🛢	Gen	Remove VMware Tools	Retain MAC	Service Account Override
Resource Group : De	moRG								
ShiftTk04_RHEL9	1	2048	172.21.253.177		3	Gen 1 Gen 2	0		a
ShiftTk04_Win2K19	2	4096	No IP		3	Gen 1 Gen 2	0		a

11. Click on "Create Blueprint".

Migration

Once the blueprint is created, "Migrate" option can be exercised. During migrate option, shift toolkit performs a series of steps to convert the disk format and use the converted disk to create virtual machine on Hyper-V host as defined in the blueprint. The high level steps performed are as follows:

- Trigger VM snapshots for Blueprint at source
- Trigger volume snapshots
- · Prepare VM by cloning network configuration and removing VMware Tools for all VMs
 - Based on the OS type, necessary Hyper-V drivers are added <optional>



For detailed information, refer System stucked in dracut after the migration of a RHEL VM to hyper-v

- Power OFF VMs in the protection group at source
- · Delete existing snapshots for all VMs in the blueprint
- · Clone and Convert VMDK to VHDx format for all VMs
- Power ON VMs in protection group at target

To trigger Migrate workflow with the configuration specified in Blueprint as is, click on Migrate.

Shift Toolkit 📏 Dashboard Discover Resource Groups	Blueprints Job Monitoring		4 Ø
Blueprints	Source Details	Destination Details	at 1
1 Blueprint Plan Name 1 Active Site Status	Compliance Source Ste	Q O Creat	te New Blueprint
Demo8P ⓒ Source ⓒ Active	⊘ Healthy DemoSRC	DemoTarget Resource Groups Bh	s
		Ed	tit Blueprint
		Ma	igrate un Compliance
		De Ac Go	elete Blueprint ctivate Windows) to Settings to activate 1

Once triggered, the preparation stage kicks in and the conversion process runs through the steps mentioned above.

()

We recommend that no more than ten conversions be triggered parallelly from the same ESXi source to the same Hyper-V destination

Back				
	Migrate Steps		1	
	Migration Plan: DemoBP			
~	Preparing VMs for migration in parallel	⊘ Success	21.4 Seconds 🛈	
~	Removing VMWare tools for all VMs (in parallel)	⊘ Success	0.4 Seconds 🕡	
~	Powering off VMs in protection group - DemoRG - in source (parallel)	⊘ Success	0.1 Seconds 🛈	
~	Deleting existing snapshots for all VMs in the setup	⊘ Success	30.5 Seconds 🛈	
~	Triggering VM snapshots for resource groups at source (in parallel)	⊘ Success	30.2 Seconds 🛈	
~	Triggering volume snapshots in parallel	⊘ Success	5.1 Seconds 🛈	
~	Powering off VMs in protection group - DemoRG - in target (parallel)	⊘ Success	15.2 Seconds ()	Windows
	Theoreticine 18.4 is broad (in parallel)	OSurrer	Go to Set	ings to activate Windows

The conversion of VMDK to VHDx happens in seconds which makes this approach the fastest of all the options that are available for an additional cost. This also helps to reduce VM downtime during migration.

■ NetApp S	ihift Toolkit	N Dashboard Discover Resource Groups Blueprints Job Monitoring			🌢 🌣 😧 😩	
	_		-			
	~	Triggering VM snapshots for resource groups at source (in parallel)	⊘ Success	30.2 Seconds 🕡		
	~	Triggering volume snapshots in parallel	⊘ Success	5.1 Seconds 🛈		
	~	Powering off VMs in protection group - DemoRG - in target (parallel)	Success	15.2 Seconds 🛈		
	~	Unregistering VMs in target (in parallel)	⊘ Success	14.6 Seconds 🛈		
	^	Converting VMDK disks to VHDX format for all VMs (in parallel)	⊘ Success	4.3 Seconds 🛈		
		Converting VMDK disks to VHDX format for VM - ShiftTk04_RHEL9	⊘ Success	4.3 Seconds ()		
		Converting VMDK disks to VHDX format for VM - ShiftTk04_Win2K19 Converting VMDK disks to VHDX format for VM - ShiftTk04_U18	Success Success	3.9 Seconds () 3.9 Seconds ()		
	~	Registering VMs (in parallel)	⊘ Success	19.3 Seconds 🕢		
	~	Powering on VMs in protection group - DemoRG - in target (in parallel)	⊘ Success	Activate 18.7 seconds Ottin	Vindows is to activate Windows.	10.203

Once the job is complete, the status of the blueprint changes to "migration Complete".

hift Toolkit 🦄	Dashboard Discover	Resource Groups Bi	Source Details	g	Destination Details	4
	Aueprints	1 Resource Groups	Sites 1	2 1 vCenters	C 1 Sites	Hosts
1 Blueprint					٩	Create New Blueprint
Plan Name	C Active Site	Status	Compliance	Source Site 🗘	Destination Site	1
DamaDD	Company of the second se					

With migration complete, it's time to validate the VMs on Hyper-V side. Below screenshot shows the VMs running on the Hyper-V host that was specified during the blueprint creation.

NIMHVHOSTOI	Virtual Inductions Name RHEL5 RHEL7 RHEL3 RHEL3 RHEL3 RHEL3 RHEL5 RHEL5 RHEL5 SHT03A Wo2X13 SHT03A Wo2X13 RHEL5 RH	State Running Running Running Off	CPU Usage 0% 2% 0%	Assigned Memory 1024 MB 1024 MB	Uptime 27.23.09.27	Status	Configurati	NIMHVH0ST01	-
	RHELS RHELS RHEL7 RHE3 RHE3 RHE3 rHE3 rHE3 rHE3 rHE3 rHE19 rhe54ocal1 RHE19 SwhTx04 Wn7K13 SwhTx04 RHE19 SwhTx04 RHE19	Bunning Bunning Bunning Bunning Off	0% 2% 0%	1024 MB 1024 MB	27.23.09.27	(Alara)	a desired as desired		
	RHEL7 RHEL8 RHES dhi946cal1 RHEJhomac Shift(03A.Wh2K19 Shift(03A.Wh2K19 Shift(03A.Wh2K19	Running Running Running Off	2% 0%	1024 MB	#1. #10 10 m #1		10.0	New	
	RHELS RHES Hel940cal1 RHE3homac ShtTk03A Wo2K19 ShtTk034 RHEL9 ShtTk04 RHEL9	Running Running Off	0%		27.22:54:29		10.0	🐴 Import Virtual Machine	
	RHB9 chel94ocal1 RHE13homac Swittk04,RHE19 Swittk04,RHE19 Swittk04,RHE19	Running		1024 MB	27.22:45:24		10.0	Hyper-V Settings	
	Hel94ocal1 RHEL9nomac SubTk03A Win2K19 Shi/Tk04_RHEL9	Off	0%	1024 MB	27.22:38:31		10.0	Virtual Switch Manager	
	RHEL9nomac Shift Tk 03A, Win2K19 Shift Tk 04, RHEL9 Shift Tk 04, RHEL9	1046					10.0	3 Virtual SAN Manager	
	Shintko4_RHEL9	Off					10.0	C. Friedrich	
	She'th G4 LITE	Displayer	01	2048 MD	00.07.28		10.0	Edit Disk	
		Business	01	2048 MB	00.07.35		10.0	Inspect Disk	
	Shift Tk.04 Win2K19	Running		4096 MB	00.07.36		10.0	Stop Service	
								🗙 Remove Server	
								8 Refresh	
								View	
								👔 Help	
	Overkonints							Selected Virtual Machines	-
	Concernance of the second s							-Connect	
				Ca	nnot display checkp	points for multiple virtual mach	ines.	Settings	
								Turn Off	
								G Shut Down	
								o fair	
								Save	
								11 Pause	
								IÞ Reset	
								🕞 Checkpoint	
								Export	
								🔢 Help	
	Details				Multiple vit	ual machines selected.			



After conversion, all the VM disks except for the OS disk will be offline. This is because the NewDiskPolicy parameter is set to offlineALL on VMware VMs by default.

Conversion

The Clone based conversion option allows to simply convert the virtual disk between hypervisors for the following disk formats:

- VMware ESX to Microsoft Hyper-V (VMDK to VHDX)
- VMware ESX to Red Hat KVM (VMDK to QCOW2)

Convert to QCOW2 format

To convert the virtual disks to QCOW2 format with NetApp Shift toolkit, follow these high-level steps:

• Create a destination site type specifying Hyper-V or KVM as the hypervisor. Note: Hypervisor details are not required for KVM.

Shift Toolkit 📏 🛛 Da	shboard Discover Resource Gro	ups Blueprints Job Monitoring		A 🗘 🕘
Add New Site	Site Type	2 Site Details (3) Hypervisor Detail	s ④ Storage Details	
		Destination Site Detai	ls	
		Site Name		
		DemoSRCqcow		
		Hypervisor	0	
		KVM		
		Site Location On Prem		
		Connector	0	

Create a resource group with the VMs for which the disk conversion is required

NetApp Shift Toolkit N Dashboard Discover Resource Group	ps Blueprints Job Monitoring	4	1	¢	?	۹
Create Resource Group O Resource Group Details	(2) Select Virtual Machines (3) Destination Details (4) Boot order and Delay					;
	Resource Group Details					
,	Resource Group Name					
	DemoqcowconvRG					
	Associated Site					
	DemoSRC					
	Associated vCenter 0					
	he-vcsa.nimdemo.com					
7	Norkflow					
	Clone based Conversion *					
	Activ Go to 1	ate Win Settings to	dow:			
	Continue					

n NetApp	Shift Toolkit Dashbo	oard Discover Resource Gr	roups Blueprints Job M	lonitoring	Screenshot 2024-12-11 at 00.57	.07	•	?	9
	Create Resource Group	Resource Group Details	Select Virtual Machines	Oestination Details	(4) Boot order and Delay				
			Conversi	on Details					
			🗌 Skip Conv	version Details 🕕					
			Destination Site						
			Select Destin	nation site	-				
			KV	M					
			DemoT	Target					
			Нуре	er•V -					
					Activ	ate Win	dows		
			Previous	Continue					

• Create the blueprint to convert the virtual disk to QCOW2 format.

NetApp Shift Toolkit 🔪 Dashboard Discover Resource Groups Blueprints Job Moni	itoring	
Create New Blueprint Plan and Site Details Celect Resource Groups	(3) Set Execution Order (4) Set VM Details	
Blueprint	Details	
Blueprint Name		0
Demoqcowconv8P		
Recovery N	Mapping	
Source Site	Destination Site	0
DemoSRC v	DemoSRCqcow	•
Source vCenter 0		
hv-vcsa.nimdemo.com +		
		Activate Windows Go to Settings to activate Windows.
Contin	ue -	

🖬 NetApp Shift Toolkit 📏 Da	ishboard D	iscover Resource Gro	oups Blueprints Job Mor	nitoring				• •	?	9
Create New Blueprint	0	Plan and Site Details	Select Resource Groups	Set Execution	n Order 🕢 Set VM Details					
			Virtual Mach	ines Details						
			Service Act	count ()						
	os	Username	Passw	ord						
	Windows				@ Apply	To All				
	Linux				Apply	To All				
	1 умя					٩				
	VM Nam	9	Remove 1	/Mware Tools	Service Account Override	,				
	Resource	Group : Demoqcowcor	nvRG							
	ShiftTk04	_U24		0						
							Activate Wi			
			Previous	Create Blueprint						

• Select "Convert" once the necessary downtime is raised for the VMs.

NetApp	Shift Toolkit 📏 🕴 Dasl	hboard Discover	Resource Groups Blu	eprints Job Monito	ring			4	۰	?	9
	Bluepri	ints	3 Resource Groups	Source Details	2 1 vCenters	Destination D Sites 2	letails	taan 1 Hosts			
	3 Blueprints						۹٥	Create New Blueprint	ĺ,		
	Plan Name	Active Site	Status		Source Site 2	Destination Site	Retnurce	Groups			
	DemoconvHVBP	⊘ source	Conversion Error	Partially Healthy	DemoSRC	DemoTarget	Resource	Blueprint Details		1	
	Demo8P	O Destination	() Migration Complete	A Partially Healthy	DemoSRC	DemoTarget	Resource	Edit Blueprint			
								Run Compliance			
								Delete Blueprint	_	J.	
								Activate Windo Go to Settings to a	DW5 tivate \	Nindov	

• The convert operation executes each operation against the VM and respective disk to generate the appropriate format.

	Convert Steps		
	Blueprint: DemoqcowconvBP		
~	Preparing VMs for conversion in parallel	 Success 	0 Seconds ()
~	Removing VMWare tools for all VMs (in parallel)	C In progress	- ()
~	Powering off VMs in protection group - DemoqcowconvRG - in source	✓ Initialized	- ①
~	Deleting existing snapshots for all VMs in the setup	✓ Initialized	-0
~	Triggering VM snapshots for resource groups at source (in parallel)	✓ Initialized	-0
~	Triggering volume snapshots in parallel	✓ Initialized	-0
~	Converting VMDK disks to QCOW2 format for all VMs (in parallel)	✓ Initialized	- ①

NetApp	Shift Toolkit	Dashboard Discover Resource Groups Blueprints Job Monitoring			¢	? 🖲
	Back	Convert Steps Blueprint: DemoqcowconvBP				
	~	Preparing VMs for conversion in parallel	Success 0 Seconds ()			
	~	Removing VMWare tools for all VMs (in parallel)	⊘ Success 303.4 Seconds ()			
	~	Powering off VMs in protection group - DemoqcowconvRG - in source	Success 6.8 Seconds ()			
	~	Deleting existing snapshots for all VMs in the setup.	Success 0.3 Seconds ()			
	~	Triggering VM snapshots for resource groups at source (in parallel)	Success 30.1 Seconds 🕢			
	~	Triggering volume snapshots in parallel	⊘ Success 5.2 Seconds ①			
	^	Converting VMDK disks to QCOW2 format for all VMs (in parallel)	Success 22.9 Seconds ()			
		Converting VMDK disks to QCOW2 format for VM - ShiftTk04_U24	Converting VMDK disks to QCOW2 format for all VMs (in parallel) Success Go to Setting	Vindow s to active	S ate Wir	

• Use the converted disk by manually creating the VM and attaching the disk to it.

File Home	Share View			
← → • ↑ 📙	> Network > 10.61.181.77 > nimshiftstage	> shifttoolkit > ShiftTk04_U24		
	Name	Date modified	Туре	Size
🖈 Quick access	ShiftTk04_U24.qcow2	12/10/2024 5:11 PM	QCOW2 File	20,974,912
🕹 Downloads	*			



Shift toolkit only support disk conversions. They do not support VM conversion. To use the converted disk in a VM, the VM must be created manually, and the disk must be attached to it.



Shift toolkit does not support VM-level conversions for the KVM hypervisor. However, it does support disk conversions to QCOW2 disk format, a virtual disk format used by the KVM hypervisor.

Convert to VHDX format

To convert the virtual disks to VHDX format with NetApp Shift toolkit, follow these high-level steps:

• Create a destination site type specifying Hyper-V or KVM as the hypervisor.



Hypervisor details are not required for KVM.

🗖 NetApp Shift Toolkit 📏 Dashboard	Discover Resource Groups Blueprin	nts Job Monitoring		🌲 🌣 🍳 😩
Add New Site	Site Type 2 Site Det	ails ③ Hypervisor Details	(4) Storage Details	
	D	estination Site Details		
	Site Name			
	DemoVHDXco	n		
	Hypervisor		6	
		Hyper-V	*	
	Site Location		0	
		On Prem		
	Connector	default-connector	0	
		detault-connector		
				Activate Windows
		Previous Continue		

· Create a resource group with the VMs for which the disk conversion is required

NetApp Shift Toolkit N Dashboard Discover Resource (Sroups Blueprints Job Monitoring	ê 🌣 📀 😩
Create Resource Group 📀 Resource Group Details	Select Virtual Machines Destination Details (4) Boot order and Delay	
	Conversion Details	
	Skip Conversion Details Destination Site	
	DemoVHDXcon	
	ONTAP Volume	
	Datastore -> Qtree Mapping	
	Source Destination QTree	
	nimshiftstage	
	Previous Continue	Activate Windows Go to Settings to activate Windows.

• Create the blueprint to convert the virtual disk to VHDX format.

netApp Shift Toolkit 📏 Dash	iboard Disc	over Resource Gro	oups Blueprints Job Mor	nitoring				۵	٠	?	٩
Create New Blueprint	\odot	Plan and Site Details	Select Resource Groups	Set Execution Orde	r 🚯 Set VM Details						
			Virtual Mach	ines Details							
			Service Act	count ()							
	os	Username	Passw	ord							
	Windows				Apply To All						
	Linux				Apply To All						
	1 ума					٩					
	VM Name		Remo	ve VMware Tools	Service Account Override						
	Resource Gr	oup : DemoVHDXco	onvRG								
	ShiftTk04_De	b12		۵							
							Activate	Wind	ows		
			Previous	Create Blueprint					tivate \		

• Select "Convert" once the necessary downtime is raised for the VMs.

NetApp	shift Toolkit 🔌 Dash	iboard Discover	Resource Groups Blu	Source Details	ing	Destination D	Details		*	•	
	Bluepri	nts	4 Resource Groups	I Sites	VCenters	Sites 3		Hosts			
	4 Blueprints						۹٥	Create New Blueprint			
	Plan Name 🗘 DemoVHDXConvBP	Active Site	Status 🔹	Compliance I Not Available	Source Site	Destination Site CemoVHDXcon	Resource G	roups			
	DemoqcowconvBP	⊘ Source	 Conversion Complete 	 Healthy 	DemoSRC	DemoSRCqcow	Resource C	Blueprint Details Edit Blueprint			
	DemoconvHVBP DemoBP	 Source Destination 	Conversion Error Migration Complete	Partially Healthy Partially Healthy	DemoSRC DemoSRC	DemoTarget	Resource C	Convert Run Compliance		1	
								Delete Blueprint			
								Activate Windo Go to Settings to ac)W5 tivate \	Nindov	

• The convert operation executes each operation against the VM and respective disk to generate the appropriate VHDX format.

NetApp	Shift Toolkit	Dashboard Discover Resource Groups Blueprints Job Monitoring			٠	۰	?	٩
	Back	Convert Steps Blueprint: DemoVHDXConv8P						
	~	Preparing VMs for conversion in parallel	Success	0 Seconds ()				
	~	Removing VMWare tools for all VMs (in parallel)	 Success 	304.1 Seconds 🕕				
	~	Powering off VMs in protection group - DemoVHDXconvRG - in source	 Success 	5.8 Seconds 🕕				
	~	Deleting existing snapshots for all VMs in the setup	⊘ Success	0.5 Seconds 🕕				
	~	Triggering VM snapshots for resource groups at source (in parallel)	 Success 	30.1 Seconds 🕕				
	~	Triggering volume snapshots in parallel	⊘ Success	5.3 Seconds ()				
	^	Converting VMDK disks to VHDX format for all VMs (in parallel)	 Success 	23.6 Seconds 🕕				
		Converting VMDK disks to VHDX format for VM - ShiftTk04_Deb12	Success	23.6 Seconds 10 W Go to Settings	indo to ac	WS ivate V	Vindov	

• Use the converted disk by manually creating the VM and attaching the disk to it.



To use the converted VHDX disk in a VM, the VM must be created manually via Hyper-V manager or PowerShell commands, and the disk must be attached to it. Along with this, network should also be mapped manually.

Monitoring and Dashboard

(;)

Monitor the status of the jobs using Job Monitoring.

NetApp	Shift Toolkit 📏	Dashboard Discover	Resource Groups	Blueprints Job Monitori	ng			? 2
	1 Job						0	
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With the intuitive UI, confidently evaluate the status of migration, conversion and blueprints. This enables administrators to swiftly identify successful, failed, or partially failed plans along with the number of VMs migrated or converted.

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SAN Environments

As a key requirements of Shift toolkit, the VMs to be converted must reside in a NAS environment (NFS for ESX). If the VMs reside in a SAN environment (iSCSI, FC, FCoE, NVMeFC), then they must be migrated to a NAS environment before conversion.



The approach above depicts a typical SAN environment in which VMs are stored in a SAN datastore. The VMs to be converted from ESX to Hyper-V along with their disks are first migrated to an NFS data-store with VMware vSphere Storage vMotion. Shift toolkit uses FlexClone to convert the VMs from ESX to Hyper-V. The converted VMs (along with their disks) reside on a CIFS share. The converted VMs (along with their disks) are migrated back to the SAN enabled CSV with Hyper-V Storage Live Migration.

Conclusion

NetApp Shift toolkit helps an administrator to rapidly and seamlessly convert VMs from VMware to Hyper-V. It can also convert just the virtual disks between the different hypervisors. Therefore, Shift toolkit saves you several hours of effort each time that you want to move workloads from one hypervisor to the other. Organizations can now host multi-hypervisor environments without having to worry about whether workloads are tied down to a single hypervisor. This capability increases flexibility and reduces licensing costs, lock-in, and commitments to a single vendor.

Next Steps

Unlock the potential with Data ONTAP by downloading Shift toolkit package and start migrating or converting the virtual machines or the disk files to simplify and streamline migrations.

To learn more about this process, feel free to follow the detailed walkthrough.

Copy less migration from ESX to Hyper-V

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