FIREBRAND

Microsoft

MCSE: Server Infrastructure

Certification

Courseware

Version 1.0

MCSE Server Infrastructure

Planning Exercise

Planning Exercises to supplement MOC Material for exam 70-413 and 70-414

XYZ Ltd

XYZ Ltd is a UK based company who specialise in making scented candles for the emerging Nordic market.

XYZ has two locations in the UK, a manufacturing centre in Hebden Bridge and a HQ office in Bedford.

HQ Office

The Main HQ has around 500 members of staff. The head office staff are split into several departments, the key departments being:

- Administration
- Sales
- Accounts
- IT
- HR

Manufacturing Centre

The Manufacturing centre has around 150 members of staff, the staff are split into the following departments

- Administration
- Engineering
- IT

Current Windows infrastructure

Currently XYZ Ltd.'s IT is based around Windows Server 2003. 3 Servers running Windows Server 2003 Advanced Server currently run at Head Office managing a single Windows Domain named XYZ.Local. 1 File and Print server exists at the Manufacturing Centre managing Local printer access and access to Home folders, departmental folders used to store departmental files.

The desktop operating systems are currently a mixture of Windows 2000 Professional and Windows XP.

Other Infrastructure elements

Internet access for the company is managed through a connection at head office

Currently there is a single WAN connection that connects the manufacturing centre to head office.

TCP/IP is used as the main protocol suite and all IP Addresses are assigned manually for a pool of 172.16.0.0/20. A single IP subnet is used by both sites

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Requirements

The company requires that all servers be replaced with new servers capable of running Windows Server 2012

All desktops will be standardised on Windows 8

All Internet access should still be routed through head office,

Management of servers, IP addresses, accounts and other IT elements should be as easy as possible.

The company has registered an Internet name of XYZ.com and wishes to use this as it new AD root domain name.

Provision should be made to allow 10 members of staff to work from home and access all corporate resources,

Single points of failure should be avoided where possible but unfortunately there is no money in the budget for faster or extra WAN links.

An accounting package should be made available to all members of the accounts department

Office will be deployed to all desktop machines

A standard desktop should be deployed to all desktop machines

Windows Defender will be used to guard against viruses and other malicious software

Departmental files should be modified in 1 place but be made available in both sites even if there is a WAN failure

Questions

1) The current Windows 2003 infrastructure will eventually be removed, can you make suggestions to XYZ Ltd considering the following
    a. Will you upgrade or migrate from the current environment?
    b. What steps would you need to take if you choose to migrate from the current environment?
2) Design an IP addressing scheme for XYZ Ltd:
    a. How many IP subnets will you use?
    b. What will those subnets be?
    c. How will IP addresses be assigned?
    d. How will you provide redundancy for your IP address assignment method?
3) How many Active Directory domains will be deployed?
4) How many active directory sites will be created:
    a. What will they be called?
    b. What protocol will be used to replicate AD information?
    c. What schedule and interval and cost will you use?
5) Consider the name resolution strategy for XYZ Ltd:
    a. What DNS zones will be created?
    b. Where will they be created?
    c. How will external name resolution be provided?
6) How will external access for the 10 remote workers be provided?
7) How will Office and the accounts application be deployed?
8) How will you configure and enforce a standard desktop?
9) How will you keep Widows Defender up-to-date, include information on how you would configure any supporting services needed?
10) How will you provide access to the departmental files?

70-413 Review Questions

1) You deploy an active directory domain named abc.com, the domain is linked to an Active Directory integrated zone. All domain controllers run Windows Server 2012 and are DNS Servers. You want to deploy a child domain named child.abc.com. You need to recommend a DNS infrastructure that will allow people in child.abc.com to access the servers in abc.com.

2) What is Branch Office Direct Printing?

3) What is the Microsoft Assessment and Planning toolkit?

4) Please explain the different BranchCache Modes?

5) You are responsible for a single domain AD Forest called xyz.com, you install a second forest called test.com. A global security group in xyz.com called GPOADMINS needs to manage group policies in test.com. What do you need to do to achieve your goals?

6) With regards to DirectAccess what is Force Tunnelling?

7) What is Delegwiz.inf?

8) What is Loopback Processing?

9) What is a Stub Zone?

10) Please name the different NAP enforcement methods.

abc.com

abc.com is the maker of high end widgets, based in the north of England. ABC.com is about to merger with one of its major competitors Widgets.com. You have been tasked with merging the IT infrastructure of both organisations.

abc.com existing Infrastructure

abc.com has a single domain windows 2012 forest, the domain is named abc.com and is hosted by 2 domain controllers. The abc.com domain hosts around 500 user accounts and around 350 computer accounts along with supporting global and domain local groups, the current DNS infrastructure has a single primary zone named abc.com hosted on a member server named DNS1 and a secondary server hosted on a server named DNS2. The functional level of the domain is Server 2012 and the functional level of the forest is Server 2003.

widgets.com existing infrastructure

widgets has a single domain windows 2008 R2 forest, the domain is named widgets.com and is hosted on two domain controllers. Widgets hosts around 50 users and 50 computer accounts. The current DNS infrastructure has a single ADI zone called widgets.com hosted on the two domain controllers. The functional level of the forest is Windows 2003.

Requirements for stage 1 of the merger

Internet access for both organisations is managed through a local ISP and should remain so after the merger.

The IT ADMIN group from abc.com should have complete control over both forests.

Users in either forest should be able to resolve names from either forest; additionally you need to make sure that user in abc.com can resolve names from widgets.com even if the WAN link to widgets.com fails.

Questions:

1) What trusts need to be established?
2) What DNS zones need to be created?
3) What groups need to be created?

Requirements for stage 2 of the merger

All remote access should be managed through a server at abc.com called RRAS 1. RRAS 1 is a Windows Server 2012 server that has two network interface cards. 1 card connects to the internal abc.com network and another connects to the outside world with an IP address of 50.0.0.1.

Users will be connecting in using a mixture of home PC's and Windows 8 Laptops provided by corporate IT. Unfortunately you have no control over the home PC's used except there is a minimum version level of Windows XP. You need to provide the RRAS solution for abc.com

Questions?

1) What RRAS solutions will you need to put in place?
2) What RRAS Protocols will you need to deploy?
3) What additional features/controls can you deploy to the corporate laptops compared to the home PC's?

Requirements for the 3rd stage of the merger

abc.com would like to test virtualization technology by installing 2 Windows 2012 Servers with the Hyper V role installed. These servers will run 3 virtual machines named VM1 VM2 and VM3. Each VM will run a network service

VM1	New DC for widgets.com
VM2	DHCP server
VM3	DHCP and IPAM server

It is important that the VM's be made highly available but corporate would like to assess at least two solutions that provide High Availability for the 3 virtual machines

Questions:

1) Describe the possible solutions to provide high availability for the three Virtual machines.
2) Describe at least two strategies for providing High availability for the DHCP service.

Requirements for the 4th stage of the merger

widgets.com would like a standard desktop to be deployed to all workstations in the organisation. widgets.com would also like to automate the update process for the organisation.

Questions:

1) What roles/GPO's will need to be deployed to satisfy the requirements?

Server 2012 PowerShell CMDLETS

GPO CMDLETS

CMDLET	Description
Backup-GPO	Backs up one GPO or all the GPOs in a domain.
Copy-GPO	Copies a GPO
Import-GPO	Imports the Group Policy settings from a backed-up GPO into a specified GPO
Invoke-GPUPDATE	Updates Group Policy on a local computer or remote computer.
New-GPLink	Links a GPO to a site, domain, or OU.
New-GPO	Links a GPO to a site, domain, or OU.
Set-GPInheritance	Blocks or unblocks inheritance for a specified domain or OU
Set-GPPermission	Grants a level of permissions to a security principal for one GPO or for all the GPOs in a domain
Set-GPLink	Sets the properties of the specified GPO link

DISM CMDLETS

The Deployment Image Servicing and Management (DISM) platform is used to mount and service Windows® images before deployment. A subset of DISM commands can be used on online Windows images. You can use DISM tools to mount, and get information about, Windows image (.wim) files or virtual hard disks (.vhd or .vhdx). You can also use it to install, uninstall, configure, and update Windows features, packages, and drivers in a Windows image or to change the edition of a Windows image.

CMDLET	Description
Add-AppxProvisionedPackage	Adds an app package (.appx) that will install for each new user to a Windows image.
Add-WindowsDriver	Adds a driver to an offline Windows image
Enable-WindowsOptionalFeature	Enables a feature in a Windows image.
Mount-WindowsImage	Mounts a Windows image in a WIM or VHD file to a directory on the local computer.
Set-WindowsProductKey	Sets the product key for a Windows image

AD CS Administration Cmdlets

The CA administration cmdlets can only be run on a computer that has the CA role service installed.

CMDLET	Description
Add-CATemplate	Adds a certificate template to the CA
Add-CACrlDistributionPoint	Adds a certificate revocation list (CRL) distribution point uniform resource indicator (URI) where the CA publishes certification revocations.
Add-CAAuthorityInformationAccess	Configures Authority Information Access (AIA) or Online Certificate Status Protocol (OCSP) URI on a CA.

Active Directory Domain Services Cmdlets

You can use the Active Directory module cmdlets to perform various administrative, configuration, and diagnostic tasks in your AD DS and AD LDS environments.

CMDLET	Description
Enable-ADOptionalFeature	Enables an Active Directory Optional Feature
New-ADServiceAccount	Creates a new Active Directory managed service account or group managed service account object
Install-ADServiceAccount	Installs an Active Directory managed service account on a computer or caches a group managed service account on a computer
Add-ADComputerServiceAccount	Adds one or more service accounts to an Active Directory computer
New-AdFineGrainedPasswordPolicy	Creates a new Active Directory fine grained password policy
Set-ADFineGrainedPasswordPolicy	Modifies an Active Directory fine grained password policy.
Set-ADUser	Modifies an Active Directory user
New-Aduser	Creates a new Active Directory user.

Hyper-V Cmdlets

CMDLET	Description
Checkpoint-VM	Creates a snapshot of a virtual machine
Enable-VMResourceMetering	Collects resource utilization data collection for a virtual machine or resource pool
Measure-VM	Reports resource utilization data for one or more virtual machines
Measure-VMReplication	Gets replication statistics and information associated with a virtual machine
Add-VMFibreChannelHba	Adds a virtual Fibre Channel host bus adapter to a virtual machine

Note.

The above are examples of CMDLETS, hopefully they give you an idea of the range of CMDLETS available for you to use. For a more complete list of all the CMDLETS available for Windows Server 2012 go to the following site:

http://technet.microsoft.com/en-gb/library/hh801904.aspx

Windows Server 2012 Hyper-V High Availability and Migration Features

Options

Virtual Machine and Storage Migration

With Windows Server 2012 Microsoft has introduce a new feature that allows you to migrate a running virtual machine and its storage to a new location without first needing to Cluster the Hyper-V host servers. This type of migration is sometimes called shared nothing migration. To enable this type of migration we need to take two steps.

Step 1 – Enable Live Migration support on a Windows Server 2012 Hyper-V Server

Step 2 – Use the new Move wizard to migrate a Virtual Machine and its storage

<u>Step 1</u>

If you access Hyper-V Settings on both the Hyper-V host server you wish to migrate to and the Hyper-V host server you wish to replicate from, you will see a screen shot similar to the one below. Here we can see a Hyper-V host server that has been configured to allow Live
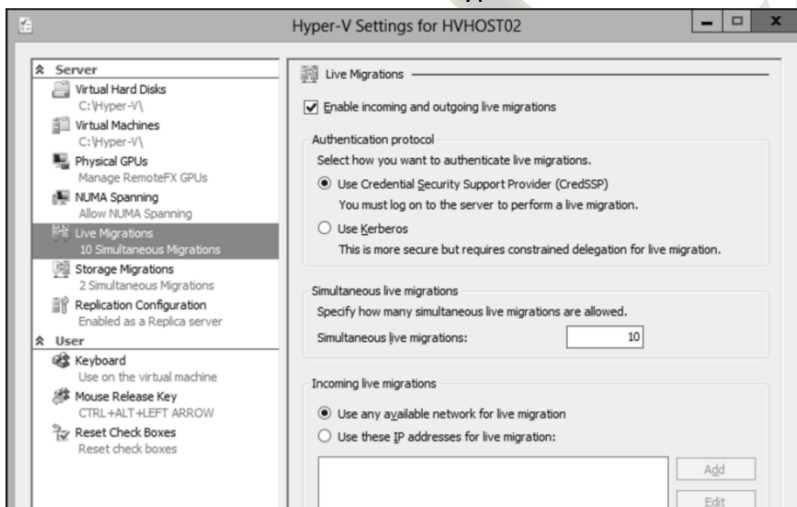
Migrations (VM and Storage Migration), we can see the type of authentication that has been configured, how many simultaneous live migrations we will allow and the IP Networks we will allow Live Migration on. Once we have configured the destination server and source server we can then go to the Source VM and use the Move wizard to migrate a VM and its storage.
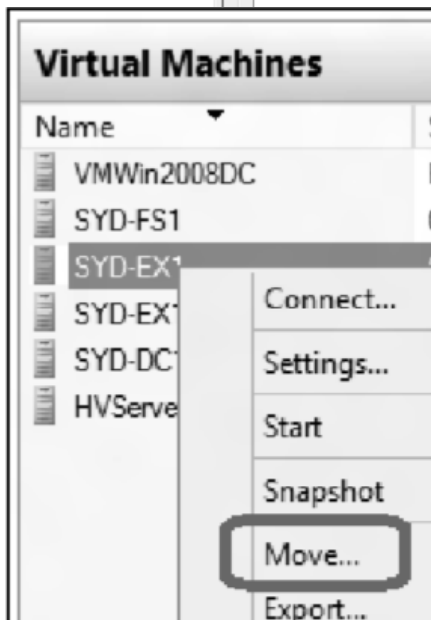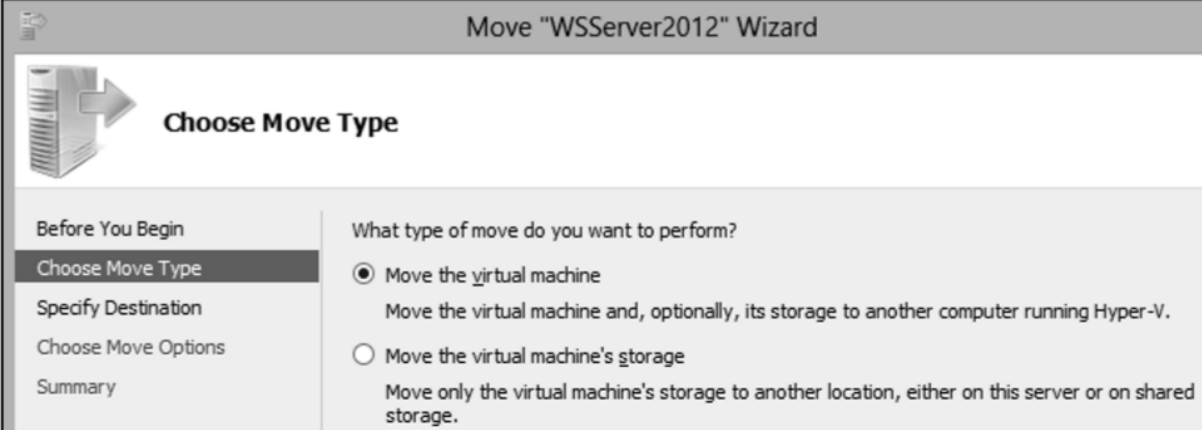
<u>Step 2</u>

The 2nd part of this process involves choosing the virtual machines you wish to Migrate, remember when you choose a Virtual Machine to migrate you can choose to migrate the Virtual Machine and its Storage at the same time or just its Storage.

Here we have selected a virtual Machine and selected Move.

The next screen we see asks us to choose the move type. Here we get to select whether we want to Move the virtual Machines and optionally its storage to another computer running Hyper-V or just move the Virtual Machines Storage to another location on this or another server.

Once we have chosen an option we are then asked to select a destination we wish to move the VM or storage to. We are then asked for Move options, this allows us to choose to move to VM and storage to the same location or to different locations or Move the VM only.

Quick Migration

For the Microsoft exams the term Quick Migration is most likely used to describe the process of Migrating a VM from one node in a cluster to another. For non-clustered VM hosts they will want you to use Virtual Machine and Storage Migration.

When you initiate quick migration, the cluster copies the memory being used by the virtual machine to a disk in storage, so that when the transition to another node actually takes place, the memory and state information needed by the virtual machine can quickly be read from the disk by the node that is taking over ownership. A quick migration can be used for planned maintenance but not for an unplanned failover.

During a Quick Migration there will be down time.

Live Migration

For the Microsoft exams the term Live Migration is most likely used to describe the process of Migrating a VM from one node in a cluster to another without down time. For non-clustered VM hosts they will want you to use Virtual Machine and Storage Migration.

Live migrations are now able to utilize higher network bandwidths (up to 10 Gigabit) to complete migrations faster. You can also perform multiple simultaneous live migrations to enable you to move many virtual machines in a cluster quickly. These changes allow you to implement high levels of mobility and flexibility in private cloud solutions.

You can also perform a live migration of a virtual machine between two non-clustered servers running Hyper-V when you are only using local storage for the virtual machine. (This is sometimes referred to as a "shared nothing" live migration. In this case, the virtual machines storage is mirrored to the destination server over the network, and then the virtual machine is migrated, while it continues to run and provide network services.

When you initiate live migration, the cluster copies the memory being used by the virtual machine from the current node to another node, so that when the transition to the other node actually takes place, the memory and state information is already in place for the virtual machine. The transition is usually fast enough that a client using the virtual machine does not lose the network connection. If you are using Cluster Shared Volumes, live migration is almost instantaneous, because no transfer of disk ownership is needed. A live migration can be used for planned maintenance but not for an unplanned failover.
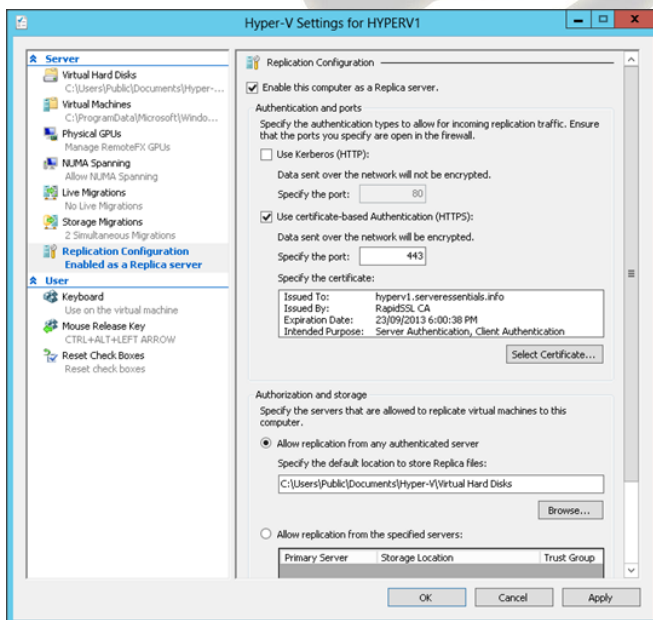
Hyper-V Replica

Hyper-V Replica provides asynchronous replication of Hyper-V virtual machines between two hosting servers. It is simple to configure and does not require either shared storage or any particular storage hardware. Any server workload that can be virtualized in Hyper-V can be replicated. Replication works over any ordinary IP-based network, and the replicated data can be encrypted during transmission. Hyper-V Replica works with standalone servers, failover clusters, or a mixture of both. The servers can be physically co-located or widely separated geographically. The physical servers do not need to be in the same domain, or even joined to any domain at all.

Once replication is configured and enabled, an initial copy of data from the primary virtual machines must be sent to the Replica virtual machines. We call this "initial replication" and you can choose to accomplish it directly over the network or by copying the data to a physical device and transporting that to the Replica site.

When replication is underway, changes in the primary virtual machines are transmitted over the network periodically to the Replica virtual machines. The exact frequency varies depending on how long a replication cycle takes to finish (depending in turn on the network throughput, amongst other things), but generally replication occurs approximately every 5-15 minutes.

You can choose to move operations on any primary virtual machine to its corresponding Replica virtual machine at any time, an action we call "planned failover." In a planned failover, any un-replicated changes are first copied over to the Replica virtual machine and the primary virtual machine is shut down, so no loss of data occurs. After the planned failover, the Replica virtual machine takes over the workload; to provide similar protection for the virtual machine that is now servicing the workload, you configure "reverse replication" to send changes back to the primary virtual machine (once that comes back online).

If the primary server should fail unexpectedly, perhaps as a result of a major hardware failure or a natural disaster, you can bring up the Replica virtual machines to take over the workload—this is "unplanned failover." In unplanned failover, there is the possibility of data loss, since there was no opportunity to copy over changes that might not have been replicated yet.


Enabling Hyper-V Replica requires first of all enabling Replication Configuration on the Hyper-V server you wish to replicate to. Here we can see Hyper-V Settings and the Replication Configuration section. Here we can enable this computer as a Replica Server, we can specify the type of authentication you want to use, notice we can user HTTP or HTTPS (HTTPS will require a digital certificate). We must also specify the servers we want to allow replication from.
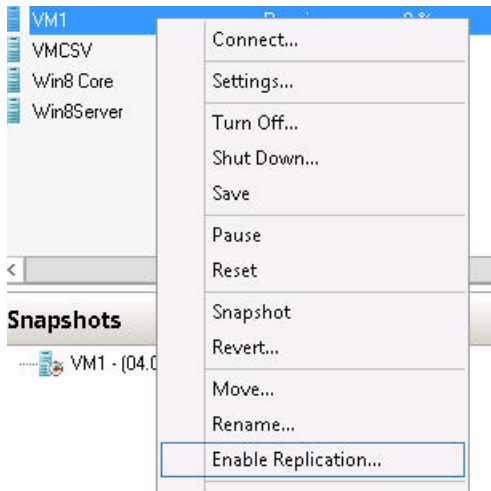
Once we have enabled replication on the destination server we can then choose a VM that we wish to replicate, here I have selected a VM called VM1, right click and you can see an option for Enable Replication. This will start the replication wizard during which we will be asked

1) Which Server is the Replica Server

2) Specify Ports, Authentication etc.

3) Choose VHD's that I don't want to replicate

4) Choose Recovery Points

5) Choose Initial Replication Method

Finally we will be shown a summary of our choices and when we finish replication can begin.
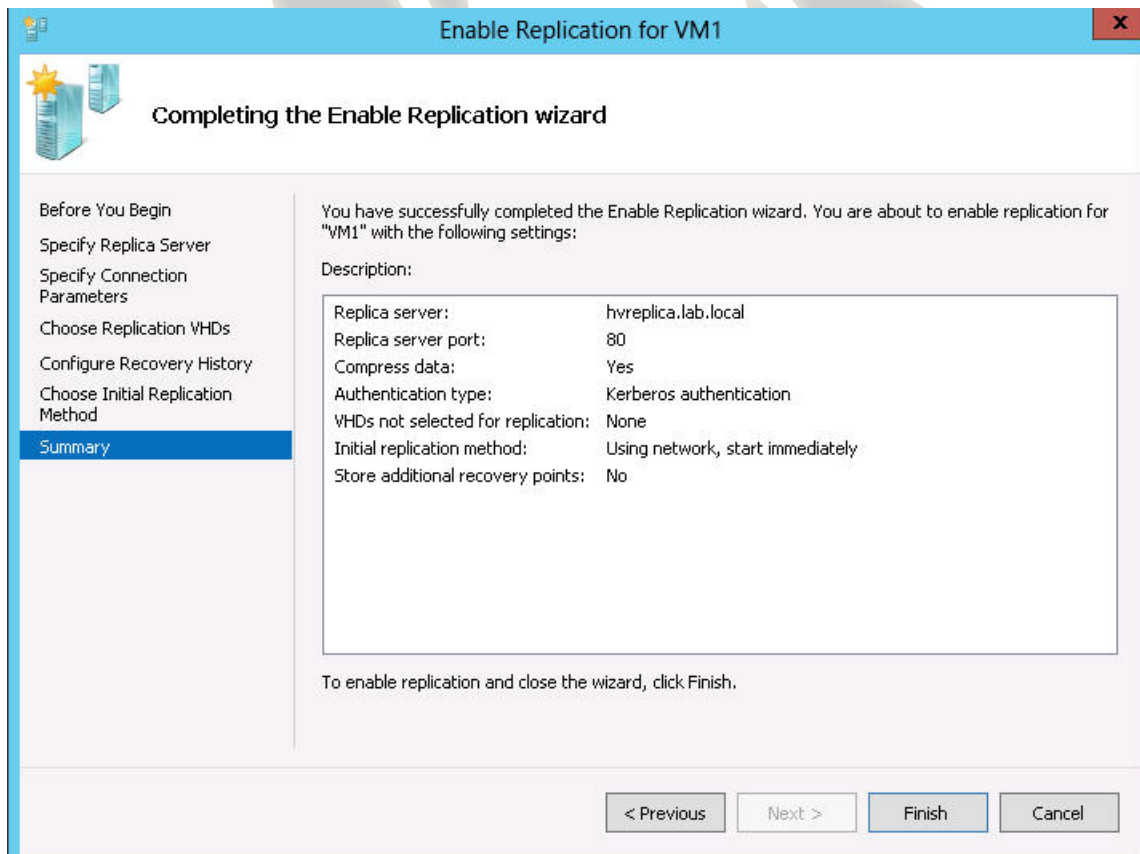
Import Virtual Machines

Administrators often think of a virtual machine as a single, stand-alone entity that they can move around to address their operational needs. However, a virtual machine consists of several parts, which administrators do not normally need to think about:

- Virtual hard disks, stored as files on the physical storage.

- Virtual machine snapshots, stored as a special type of virtual hard disk file.

- The saved state of the different, host-specific devices.

- The memory file for the virtual machine or its snapshot.

- The virtual machine configuration file, which organizes all of those parts and arranges them into a working virtual machine.

Each virtual machine and every snapshot associated with it must be unique, so globally unique identifiers are used. Additionally, virtual machines store and use some host-specific information, such as the path information for virtual hard disk files. When Hyper-V tries to start a virtual machine, it goes through a series of validation checks before being started. Problems such as hardware differences that might exist when a virtual machine is moved to another host can cause these validation checks to fail. That, in turn, prevents the virtual machine from starting. The administrator is left with files on the disk that take up space and are not useful.

Hyper-V in Windows Server 2012 introduces a new Import wizard that detects and fixes more than 40 different types of incompatibilities. The Import wizard walks you through the steps of addressing incompatibilities when you import the virtual machine to the new host—so this wizard can help with configuration that is associated with physical hardware, such as memory, virtual switches, and virtual processors.

Also, you no longer need to export a virtual machine to be able to import it. You can simply copy a virtual machine and its associated files to the new host, and then use the Import wizard to specify the location of the files. This "registers" the virtual machine with Hyper-V and makes it available for use. You can copy a virtual machine to an NTFS-formatted USB drive, and you can recover virtual machines in cases where the system drive fails but the data drive that stores the virtual machines is intact.

In addition to the new wizard, automation support is available. The new Hyper-V module for Windows PowerShell includes cmdlets for importing virtual machines.