EC-Council

EDRPv3

Classroom Lab Setup Guide

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Classroom Setup Instructions: EDRP

This document contains setup instructions for the EC-Council Disaster Recovery Professional (EDRP) course. The course requires a standard modular classroom seating configuration, one computer for each student, one computer for the instructor, a dedicated switch, dedicated firewall, and Internet connection. This class teaches network security techniques.

Before beginning the class, install and configure all computers using the information and instructions that follow.

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Classroom Requirements

This section describes classroom equipment required for the EC-Council Disaster Recovery Professional.

Classroom Equipment

The following equipment is required for the general classroom setup:

- Climate control system adjustable within the classroom
- Lighting controls, adjustable within the classroom
- Whiteboard, 3 feet X 6 feet (1m X 2m) or larger
- Markers, whiteboard, assorted colors
- Eraser, whiteboard cleaner liquid
- Easel with flipchart or butcher paper pad, 24 inches X 36 inches
- Felt tip pens, blue and black required, other colors optional, chisel tip (not fine-point)
- Screen, projection, 6 feet diagonal measurement (non-reflective whiteboard surface may be substituted)
- Instructor station:
  - Desk, chair, and ergonomic keyboard
  - Power outlet
  - Network jack
  - Projector, LCD, capable of 740 X 1280 pixels minimum w/ all connecting cables
- Student station (per student)
  - Chair, ergonomic keyboard
  - Workstation, minimum horizontal workspace 9 square feet (3 feet X 3 feet)
  - Power outlet, one per student station
  - Network jack, one per student station

Hardware

Hardware requirements for instructor, student and victim computers are identical:

- Intel Core i5 or equivalent CPU with minimum CPU speed of 3.2 GHz
- Minimum 16 GB RAM
- Hard disk, 500 GB or larger, 7200 RPM or faster
- DVD drive (DVD R/W drive preferred)
- 1 Network adapters (minimum of a 10/100 NIC, but a 10/100/1000 is preferred), full duplex (disable any additional network adapters installed)
- Monitor (minimum requirement is 17-inch LCD
- Mouse or compatible pointing device, and sound card with amplified speakers
- Internet access

The following additional hardware is also required:

- An unmanaged switch, with sufficient ports to allow connection of all instructor and student workstations plus at least 5 additional, unused ports for connection of additional equipment or for use as "spares."

Software

All computers in the class require the following software:

- Windows Server 2012 R2 or later* (64-bit Standard Edition with GUI), fully patched
- Microsoft Windows Server 2012 R2 Standard (64-bit) ISO/DVD
- Microsoft Windows Server 2016 (64-bit) ISO/DVD
- FreeNAS 9.10.1 (downloadable at http://www.freenas.org/download-freenas-release/)
- Microsoft Windows 10 Enterprise (64-bit) ISO/DVD
- Ubuntu Linux 16.04 LTS (x64) (downloadable at http://ubuntu.excellmedia.net/releases/16.04.1/ubuntu-16.04.1-desktop-amd64.iso)
- EDRP Essential Tools downloadable from Aspen portal.

Setup Document Overview

This document provides background information for technical staff responsible for setting up a training room facility for the EDRP course. This guide describes the requirements for the network equipment and computer stations that are installed and configured by the facilities personnel for the training courses.

Training Room Environment

The training room environment consists primarily of the following equipment:

- Instructor's Computer
- Student Workstation

Equipment	Number (Class of 12 Students)	Operating System	Minimum System Requirements
Instructor's Computer	1	Any Windows/Linux OS	Intel Core i5 or equivalent PC with 200 GB free disk space (with two logical partitions C: and D:), minimum of 16 GB RAM, 1 NIC (disable or unplug extras), 17-inch monitor, and compatible mouse
Student Workstations	12	Any Windows/Linux OS	Intel Core i5 or equivalent PC with 200 GB free disk space (with two logical partitions C: and D:), minimum of 16 GB RAM, 1 NIC (disable or unplug extras), 17-inch monitor, and compatible mouse

Instructor's Computer

The instructor's computer must:

- Be installed with **Windows Server 2012 R2** or later with the latest service packs and full patches applied
- Have Microsoft Office/Open Office or PowerPoint, Word, and Excel Viewers installed
- Be running IP protocol
- Have all EDRP Essential Tools downloaded from Aspen to the hard drive in D:\EDRP-Tools folder for easy access (See CT#1 in Configuration Task section)
- Adding Hyper-V role in Server Manager of Windows Server 2012 Host Machine (See Configuration Task CT#2)
- Configuring Internal Network for Hyper-V (See Configuration Task CT#3)
- Be configured with Hyper-V VMs and guest operating systems
    - Create and Configure Windows Server 2016 Virtual Machine (See Configuration Task CT#4)
        - Create a Virtual Machine and Install Windows Server 2016 (See Configuration Task CT#4.1)
        - Change the Computer Name to Server2016 (See Configuration Task CT#4.2)
        - Configure Static IP Address (IP: 10.10.10.16, Subnet: 255.0.0.0, Gateway: 10.10.10.2, and DNS: 8.8.8.8) (See Configuration Task CT#4.3)
        - Share EDRP-Tools Folder from the host machine to the Windows Server 2016 VM (See Configuration Task CT#4.4)
        - Installing Active Directory (See Configuration Task CT#4.5)
    - Create and Configure Windows 10 Virtual Machine (See Configuration Task CT#5)
        - Create a Virtual Machine and Install Windows 10 Guest OS (See Configuration Task CT#5.1)
        - Change the Computer Name to Windows10 (See Configuration Task CT#5.2)
        - Configure Static IP Address (IP: 10.10.10.10, Subnet: 255.0.0.0, Gateway: 10.10.10.2, and DNS: 8.8.8.8) (See Configuration Task CT#5.3)
        - Share EDRP-Tools Folder from the host machine to the Windows 10 VM (See Configuration Task CT#5.4)
    - Create and Configure Ubuntu Virtual Machine (See Configuration Task CT#6)
        - Configure Static IP Address (IP: 10.10.10.13, Subnet: 255.0.0.0, Gateway: 10.10.10.2, and DNS: 8.8.8.8) (See Configuration Task CT#6.1)
        - Map EDRP-Tools from Host Machine to Ubuntu VM (See Configuration Task

CT#6.2)

  - Create and Configure Windows Server 2012 virtual machine as Primary Server (See Configuration Task CT#7)
    - Create a Virtual Machine and Install Windows Server 2012 VM named as Primary Server (See Configuration Task CT#7.1)
    - Change the Computer Name to Primary Server and change the domain name to ECClabs.com (See Configuration Task CT#7.2)
    - Configure Static IP Address (IP: 10.10.10.14, Subnet: 255.0.0.0, Gateway: 10.10.10.2, and DNS: 10.10.10.16) (See Configuration Task CT#7.3)
    - Share EDRP-Tools Folder from the host machine to the Primary Server VM (See Configuration Task CT#7.4)
  - Create and Configure Windows Server 2012 virtual machine as Secondary Server (See Configuration Task CT#8)
    - Create a Virtual Machine and Install Windows Server 2012 VM named as Secondary Server (See Configuration Task CT#8.1)
    - Change the Computer Name to Secondary Server and change the domain name to ECClabs.com (See Configuration Task CT#8.2)
    - Configure Static IP Address (IP: 10.10.10.15, Subnet: 255.0.0.0, Gateway: 10.10.10.2, and DNS: 10.10.10.16) (See Configuration Task CT#8.3)
    - Share EDRP-Tools Folder from the host machine to the Primary Server VM (See Configuration Task CT#8.4)
  - Create and Configure FreeNAS virtual machine configured with CIFS (NAS) shared folder (See Configuration Task CT#9)
    - Create a Virtual Machine and Install FreeNAS VM named as FreeNAS (See Configuration Task CT#9.1)
    - Configure the FreeNAS virtual machine and change the Static IP Address (IP: 10.10.10.11, Subnet: 255.0.0.0) (See Configuration Task CT#9.2)
  - Create and Configure FreeNAS virtual machine configured with iSCSI target (See Configuration Task CT#10)
    - Create a Virtual Machine and Install FreeNAS VM named as FreeNAS iSCSI (See Configuration Task CT#10.1)
    - Configure the FreeNAS virtual machine and change the Static IP Address (IP: 10.10.10.12, Subnet: 255.0.0.0) (See Configuration Task CT#10.2)
- Have all the VMs configured as per the Configuration Tasks (see Configuration Task section for details)
- Have an LCD Projector connected to the instructor's machine?
- The use of Ghost images is recommended to reduce setup time if computer failure occurs

Student Workstations

Student workstations must:

- Be installed with **Windows Server 2012 R2** or later with the latest service packs and full patches applied
- Have Microsoft Office/Open Office or PowerPoint, Word, and Excel Viewers installed
- Be running IP protocol
- Have all EDRP Essential Tools downloaded from Aspen to the hard drive in D:\EDRP-Tools folder for easy access (See CT#1 in Configuration Task section)
- Adding Hyper-V role in Server Manager of Windows Server 2012 Host Machine (See Configuration Task CT#2)
- Configuring Internal Network for Hyper-V (See Configuration Task CT#3)
- Be configured with Hyper-V VMs and guest operating systems
    - Create and Configure Windows Server 2016 Virtual Machine (See Configuration Task CT#4)
        - Create a Virtual Machine and Install Windows Server 2016 (See Configuration Task CT#4.1)
        - Change the Computer Name to Server2016 (See Configuration Task CT#4.2)
        - Configure Static IP Address (IP: 10.10.10.16, Subnet: 255.0.0.0, Gateway: 10.10.10.2, and DNS: 8.8.8.8) (See Configuration Task CT#4.3)
        - Share EDRP-Tools Folder from the host machine to the Windows Server 2016 VM (See Configuration Task CT#4.4)
        - Installing Active Directory (See Configuration Task CT#4.5)
    - Create and Configure Windows 10 Virtual Machine (See Configuration Task CT#5)
        - Create a Virtual Machine and Install Windows 10 Guest OS (See Configuration Task CT#5.1)
        - Change the Computer Name to Windows10 (See Configuration Task CT#5.2)
        - Configure Static IP Address (IP: 10.10.10.10, Subnet: 255.0.0.0, Gateway: 10.10.10.2, and DNS: 8.8.8.8) (See Configuration Task CT#5.3)
        - Share EDRP-Tools Folder from the host machine to the Windows 10 VM (See Configuration Task CT#5.4)
    - Create and Configure Ubuntu Virtual Machine (See Configuration Task CT#6)
        - Configure Static IP Address (IP: 10.10.10.13, Subnet: 255.0.0.0, Gateway: 10.10.10.2, and DNS: 8.8.8.8) (See Configuration Task CT#6.1)
        - Map EDRP-Tools from Host Machine to Ubuntu VM (See Configuration Task CT#6.2)

- Create and Configure Windows Server 2012 virtual machine as Primary Server (See Configuration Task CT#7)
    - Create a Virtual Machine and Install Windows Server 2012 VM named as Primary Server (See Configuration Task CT#7.1)
    - Change the Computer Name to Primary Server and change the domain name to ECClabs.com (See Configuration Task CT#7.2)
    - Configure Static IP Address (IP: 10.10.10.14, Subnet: 255.0.0.0, Gateway: 10.10.10.2, and DNS: 10.10.10.16) (See Configuration Task CT#7.3)
    - Share EDRP-Tools Folder from the host machine to the Primary Server VM (See Configuration Task CT#7.4)
- Create and Configure Windows Server 2012 virtual machine as Secondary Server (See Configuration Task CT#8)
    - Create a Virtual Machine and Install Windows Server 2012 VM named as Secondary Server (See Configuration Task CT#8.1)
    - Change the Computer Name to Secondary Server and change the domain name to ECClabs.com (See Configuration Task CT#8.2)
    - Configure Static IP Address (IP: 10.10.10.15, Subnet: 255.0.0.0, Gateway: 10.10.10.2, and DNS: 10.10.10.16) (See Configuration Task CT#8.3)
    - Share EDRP-Tools Folder from the host machine to the Primary Server VM (See Configuration Task CT#8.4)
- Create and Configure FreeNAS virtual machine configured with CIFS (NAS) shared folder (See Configuration Task CT#9)
    - Create a Virtual Machine and Install FreeNAS VM named as FreeNAS (See Configuration Task CT#9.1)
    - Configure the FreeNAS virtual machine and change the Static IP Address (IP: 10.10.10.11, Subnet: 255.0.0.0) (See Configuration Task CT#9.2)
- Create and Configure FreeNAS virtual machine configured with iSCSI target (See Configuration Task CT#10)
    - Create a Virtual Machine and Install FreeNAS VM named as FreeNAS iSCSI (See Configuration Task CT#10.1)
    - Configure the FreeNAS virtual machine and change the Static IP Address (IP: 10.10.10.12, Subnet: 255.0.0.0) (See Configuration Task CT#10.2)

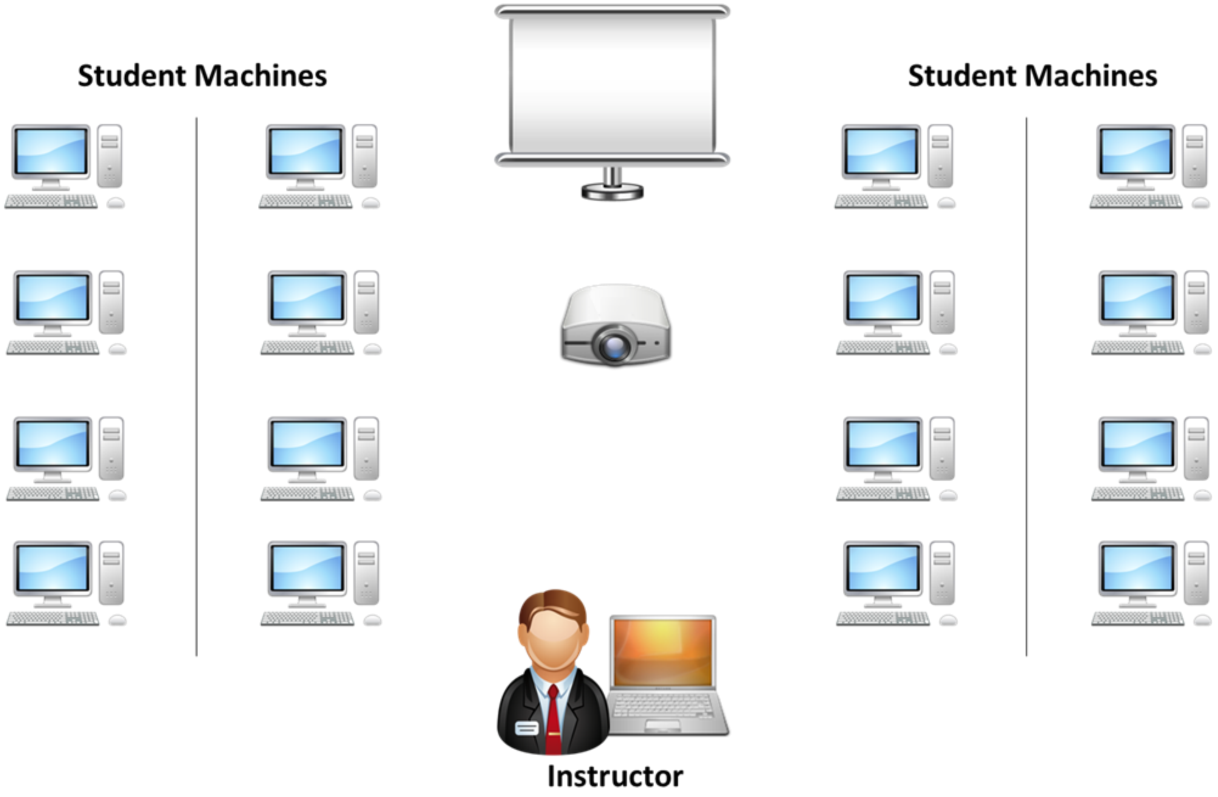
- Have all the VMs configured as per the Configuration Tasks (see Configuration Task section for details)
- The use of Ghost images is recommended to reduce setup time if computer failure occurs

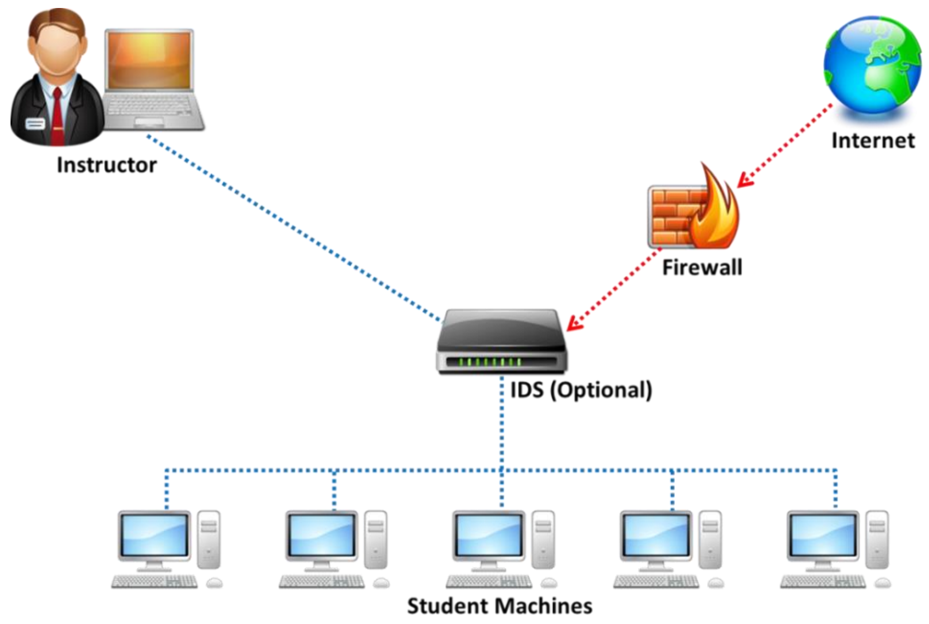
Room Environment

- The room must contain a whiteboard measuring a minimum of 1 yard by 2-3 yards in length (1 meter by 2-3 meters)
- The room should contain an easel and large tablet (optional)
- The room must be equipped with legible black and blue felt tip pens

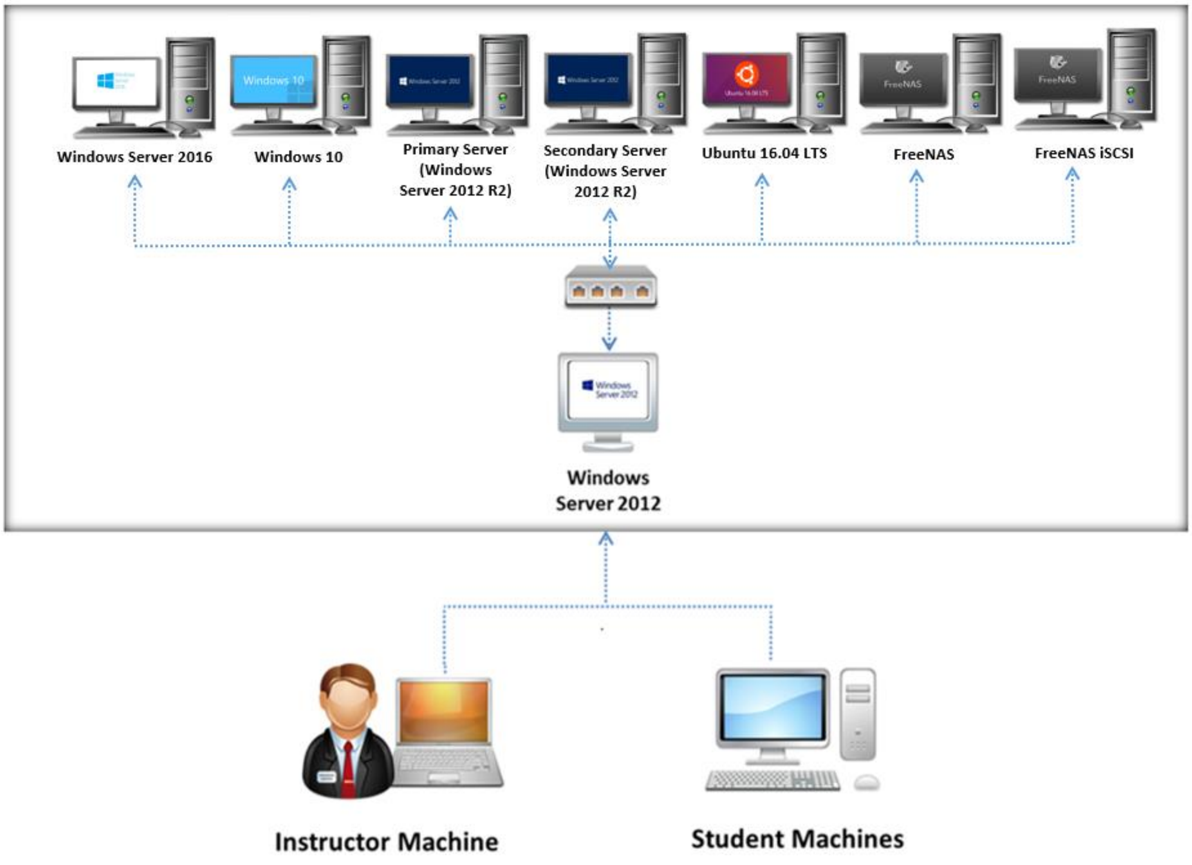
Classroom Configuration

The configuration of this classroom is modular. Computers can be added or removed by either row or column, depending on the needs of the particular class. The following is a sample room setup that provides optimal support. This setup allows for ease of access to "***troublespots***" by the instructor, and allows students to break into functional small and larger teams.




Instructor
Internet
Firewall
IDS (Optional)
Student Machines

Set up the machines based on the classroom setup diagram. The lab exercises for the students are instructor led and they are based on the network security tools in the trainer slides.


Windows Server 2016
Windows 10
Primary Server (Windows Server 2012 R2)
Secondary Server (Windows Server 2012 R2)
Ubuntu 16.04 LTS
FreeNAS
FreeNAS iSCSI
Windows Server 2012
Instructor Machine
Student Machines

Computer Names

Assign computer names to student machines like EDRPSTUDENT1, EDRPSTUDENT2, EDRPSTUDENT3, and so on. Instructor machine should be named as INSTRUCTOR.

Instructor Acceptance

Before the training class is scheduled to begin, the instructor will visit the training facility to inspect and accept the setup. The technical contact (System Administrator) for the facility must be available to answer questions and correct any setup issues. Both the instructor and the facility technical contact will ensure completion of the following checklists before the training setup is deemed acceptable.

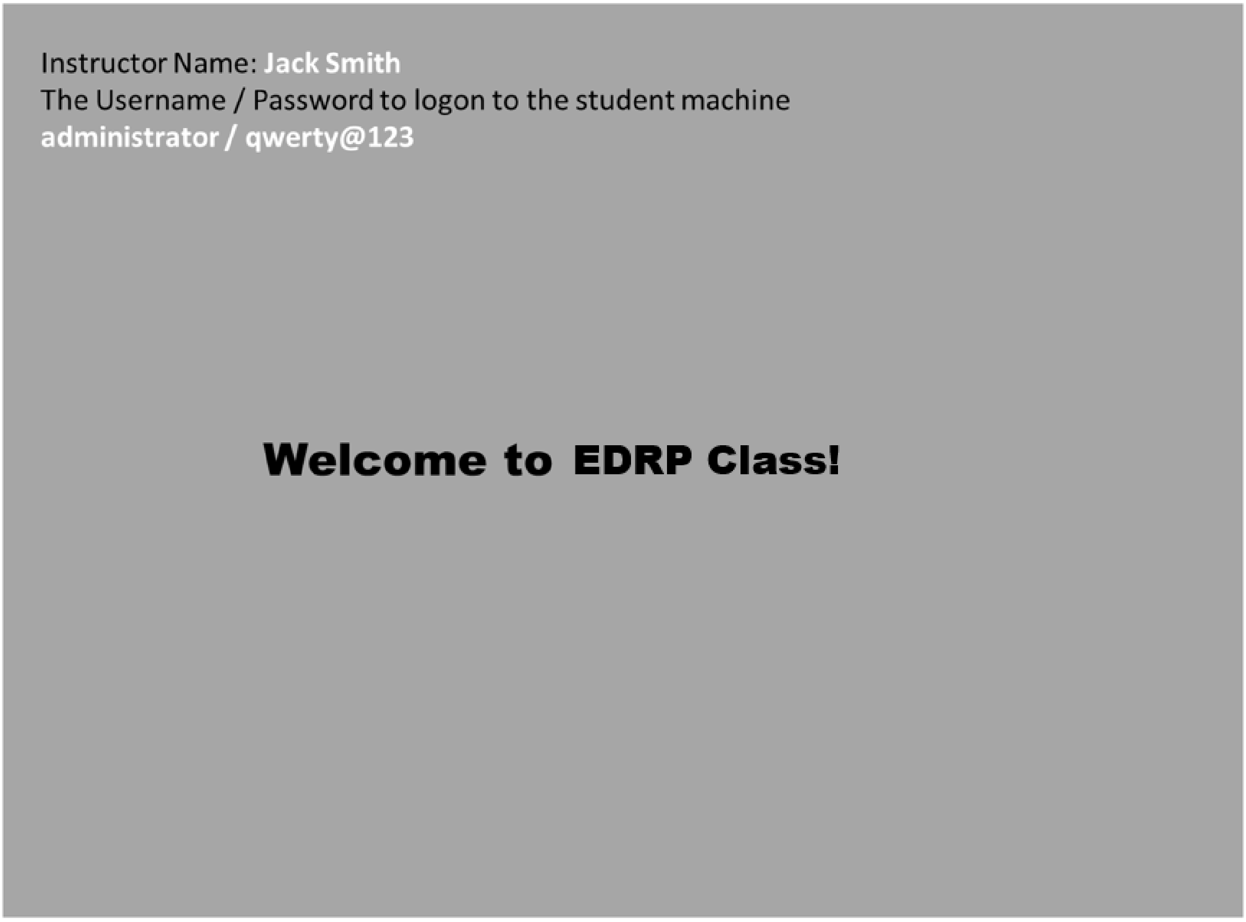
Firewall Settings

Do not block any ports while accessing the Internet through the firewall. You should be able to ping servers on the Internet.

Blackboard

- Write the following on the blackboard top left corner
    - Instructor name: <Name of the instructor>
    - The username/password to logon to the student machine
- At the center of the board write the following letters in bold

Welcome to EDRP Class!



Instructor Name: **Jack Smith**
The Username / Password to logon to the student machine
administrator / qwerty@123

Welcome to EDRP Class!

Setup Checklist

The arrangement of items in the setup checklists is designed to allow the process to be completed in the most efficient manner possible and validate that the setup has been done correctly. Before beginning the setup checklist, log off any connected users.

Tick Here	List
☐	Open Network. Verify that all classroom computers are visible in Network
☐	Verify that the EDRP tools are on the computer in EDRP-Tools folder in the D:\ drive
☐	Verify that Internet access is available
☐	Visit https://www.eccouncil.org to check the Internet access
☐	Verify each computer has 200 GB or more free disk space
☐	Verify Microsoft PowerPoint, Word, and Excel viewer are installed (or Microsoft office/Open Office is installed)
☐	Verify if you can successfully boot Windows Server 2016, Windows 10, Ubuntu, Primary Server, Secondary Server, FreeNAS and FreeNAS iSCSI virtual machines
☐	Verify that all the VMs are configured as per the configuration tasks
☐	Verify that the Instructor computer can image through the overhead projector
☐	Placement of LCD (overhead) projector is appropriate
☐	Cable wiring organized and labeled
☐	Student workstations and chair placement is satisfactory
☐	Whiteboard and dry erase markers and erasers are available
☐	Instructor station is properly organized and oriented
☐	Computers are labeled with client number
☐	EC-Council courseware (Official EC-Council EDRP Box) is available for students
☐	Write down the facility's technical contact person's mobile phone number. Contact him in case of network problem

Instructor Acceptance

The technical contact (System Administrator) for the facility must be available to answer questions and correct any setup issues.

The Instructor will inspect both the classroom and the items covered in the setup checklist(s) to ensure that the classroom and setup meet EC Council standards. Any deficiencies discovered by the Instructor must be corrected before the scheduled start time for the class.

Assistance

If you have problems or require assistance in setting up the Lab for your EDRP class, please e-mail partnersupport@eccouncil.org

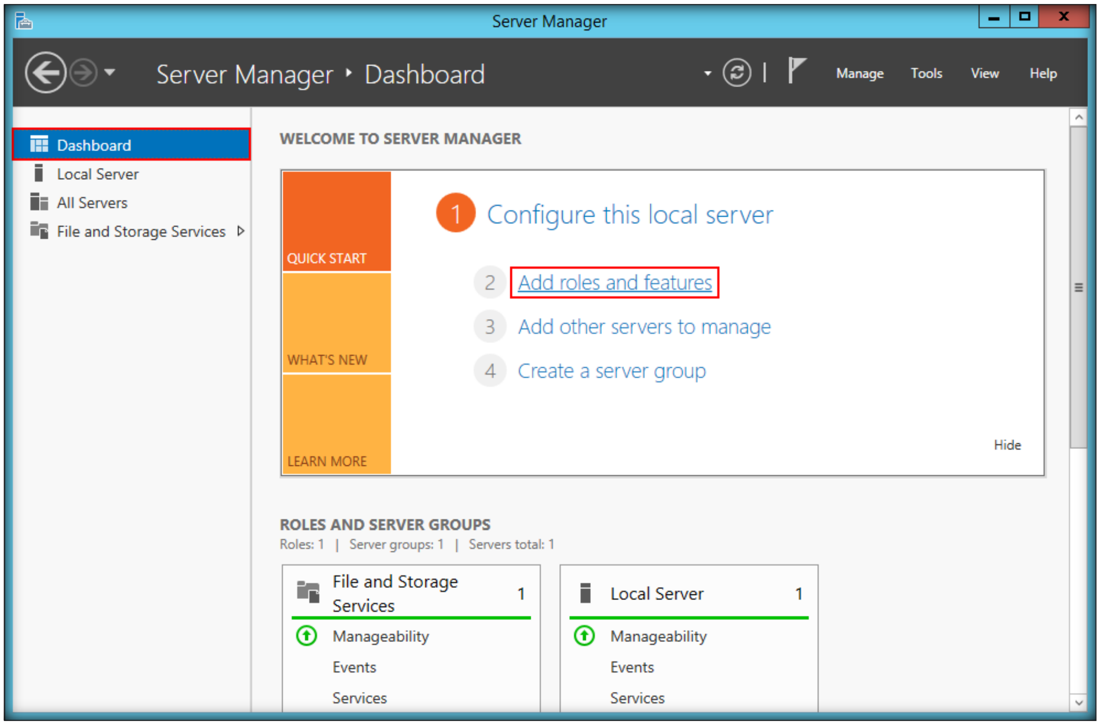
Detailed Configuration Tasks (CT)

CT#1: Download EDRP Tools

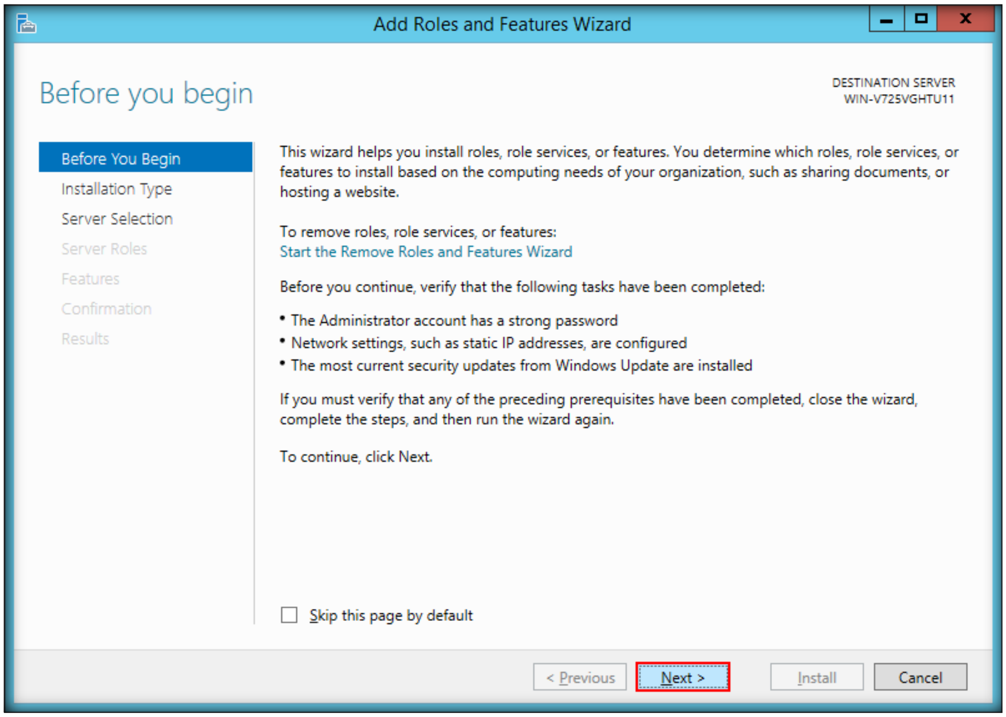
1. Create a folder in the Drive **D:** named **EDRP-Tools**
2. Login to your Aspen account → click **Academia** icon under the **Learning Resources** section → enter the **Access Code** (check with Training Center or EC Council support)(If not already used) → click **Submit** → select **EDRPv3 Courseware** from the **Select Courseware** drop-down list in the **Download Courseware** section → scroll down to the **Tools** section
3. Download all the tools to the **D:\EDRP-Tools** folder
4. Right-click the .zip files in the **D:\EDRP-Tools** folder and select **Extract Here** option

CT#2: Adding Hyper-V role in Server Manager of Windows Server 2012 Host Machine

1. To open Server Manager, click **Server Manager** icon on the taskbar
2. In Server Manager **Dashboard**, click **Add Roles and Features**


Server Manager
Server Manager ‣ Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
File and Storage Services
WELCOME TO SERVER MANAGER
QUICK START
WHAT'S NEW
LEARN MORE
1 Configure this local server
2 Add roles and features
3 Add other servers to manage
4 Create a server group
Hide
ROLES AND SERVER GROUPS
Roles: 1 | Server groups: 1 | Servers total: 1
File and Storage Services 1
Manageability
Events
Services
Local Server 1
Manageability
Events
Services

3. **Add Roles and Features** Wizard appears, click **Next**


Add Roles and Features Wizard
Before you begin
DESTINATION SERVER
WIN-V725VGHTU11
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results
< Previous
Next >
Install
Cancel

This wizard helps you install roles, role services, or features. You determine which roles, role services, or features to install based on the computing needs of your organization, such as sharing documents, or hosting a website.

To remove roles, role services, or features:
Start the Remove Roles and Features Wizard

Before you continue, verify that the following tasks have been completed:

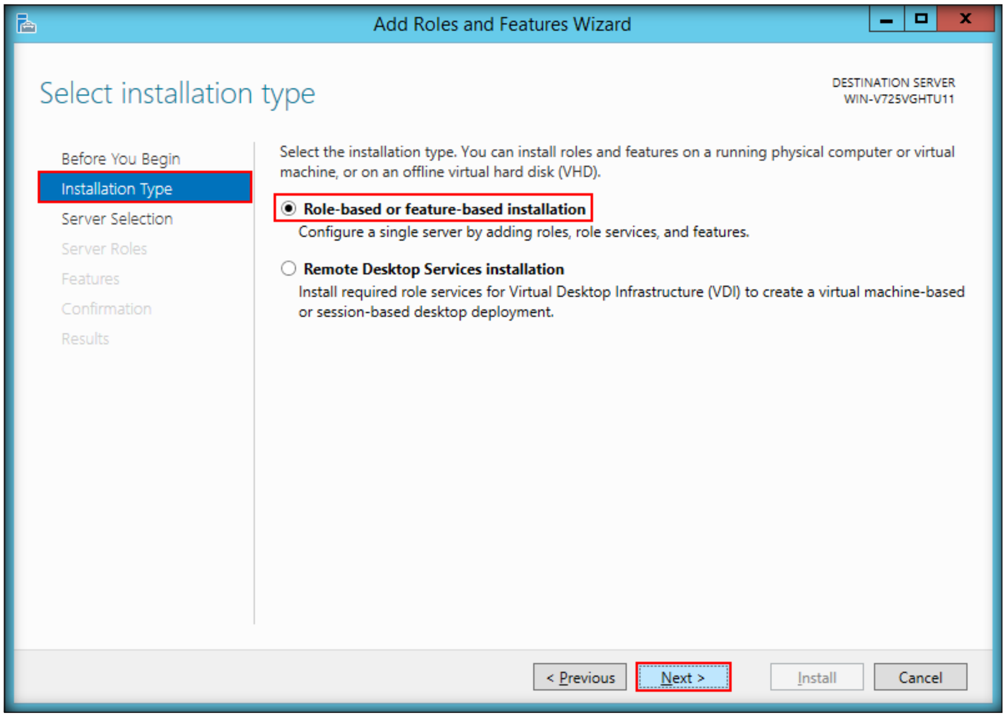
- The Administrator account has a strong password
- Network settings, such as static IP addresses, are configured
- The most current security updates from Windows Update are installed

If you must verify that any of the preceding prerequisites have been completed, close the wizard, complete the steps, and then run the wizard again.

To continue, click Next.

☐ Skip this page by default

4. In **Installation Type** section of the wizard, select **Role-based or feature-based installation** radio button and click **Next**

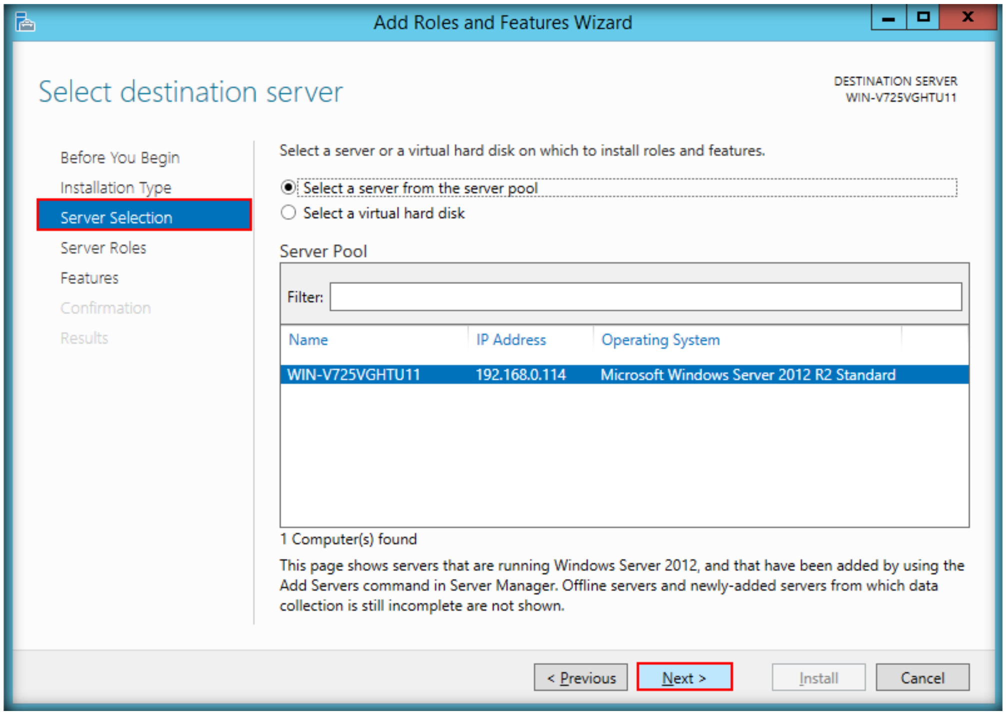

Add Roles and Features Wizard
Select installation type
DESTINATION SERVER
WIN-V725VGHTU11
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results
< Previous
Next >
Install
Cancel

Select the installation type. You can install roles and features on a running physical computer or virtual machine, or on an offline virtual hard disk (VHD).

● **Role-based or feature-based installation**
Configure a single server by adding roles, role services, and features.

○ **Remote Desktop Services installation**
Install required role services for Virtual Desktop Infrastructure (VDI) to create a virtual machine-based or session-based desktop deployment.

5. In **Server Selection** section, leave the selections to default and click **Next**


Add Roles and Features Wizard
Select destination server
DESTINATION SERVER
WIN-V725VGHTU11
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results
Server Pool
Filter:
< Previous
Next >
Install
Cancel

Select a server or a virtual hard disk on which to install roles and features.

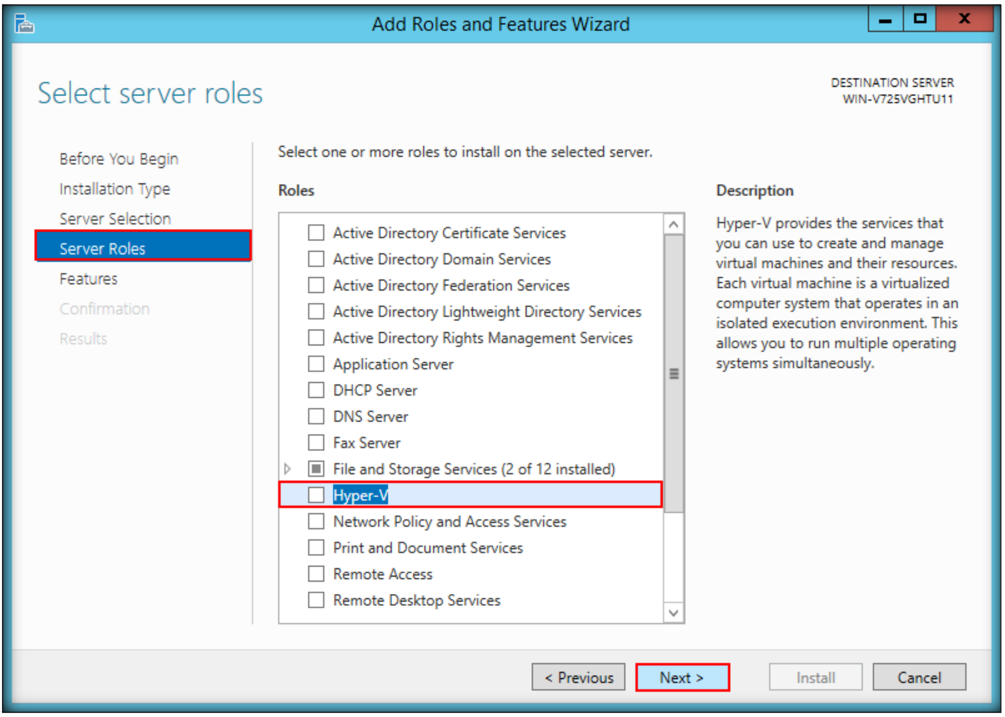
● Select a server from the server pool
○ Select a virtual hard disk

Name	IP Address	Operating System
WIN-V725VGHTU11	192.168.0.114	Microsoft Windows Server 2012 R2 Standard

1 Computer(s) found

This page shows servers that are running Windows Server 2012, and that have been added by using the Add Servers command in Server Manager. Offline servers and newly-added servers from which data collection is still incomplete are not shown.

6. Check the **Hyper-V** role in **Server Roles** section.

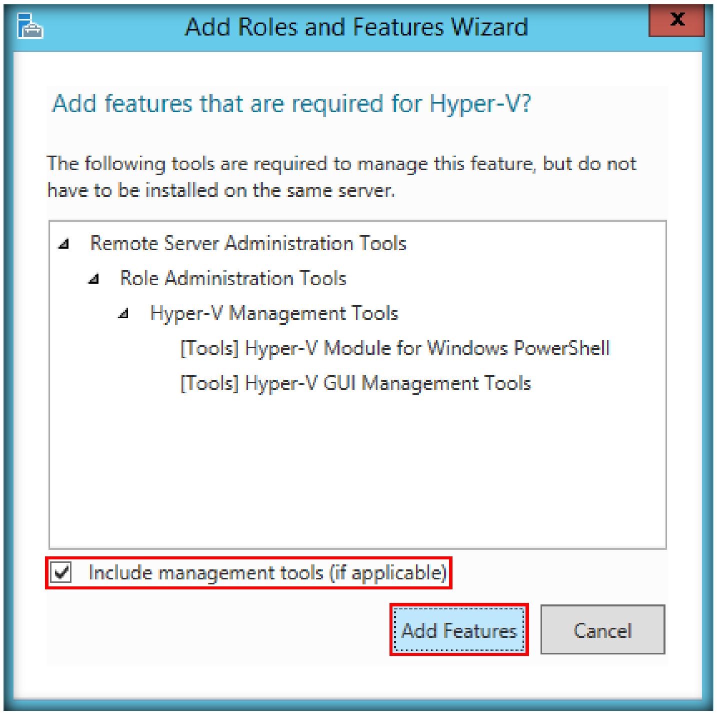

Add Roles and Features Wizard
Select server roles
DESTINATION SERVER
WIN-V725VGHTU11
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results
Roles
Description
< Previous
Next >
Install
Cancel

Select one or more roles to install on the selected server.

- ☐ Active Directory Certificate Services
- ☐ Active Directory Domain Services
- ☐ Active Directory Federation Services
- ☐ Active Directory Lightweight Directory Services
- ☐ Active Directory Rights Management Services
- ☐ Application Server
- ☐ DHCP Server
- ☐ DNS Server
- ☐ Fax Server
- ■ File and Storage Services (2 of 12 installed)
- ☐ Hyper-V
- ☐ Network Policy and Access Services
- ☐ Print and Document Services
- ☐ Remote Access
- ☐ Remote Desktop Services

Hyper-V provides the services that you can use to create and manage virtual machines and their resources. Each virtual machine is a virtualized computer system that operates in an isolated execution environment. This allows you to run multiple operating systems simultaneously.

7. **Add Roles and Features wizard** for Hyper-V will appear. Click **Add Features.**


Add Roles and Features Wizard
Add Features
Cancel

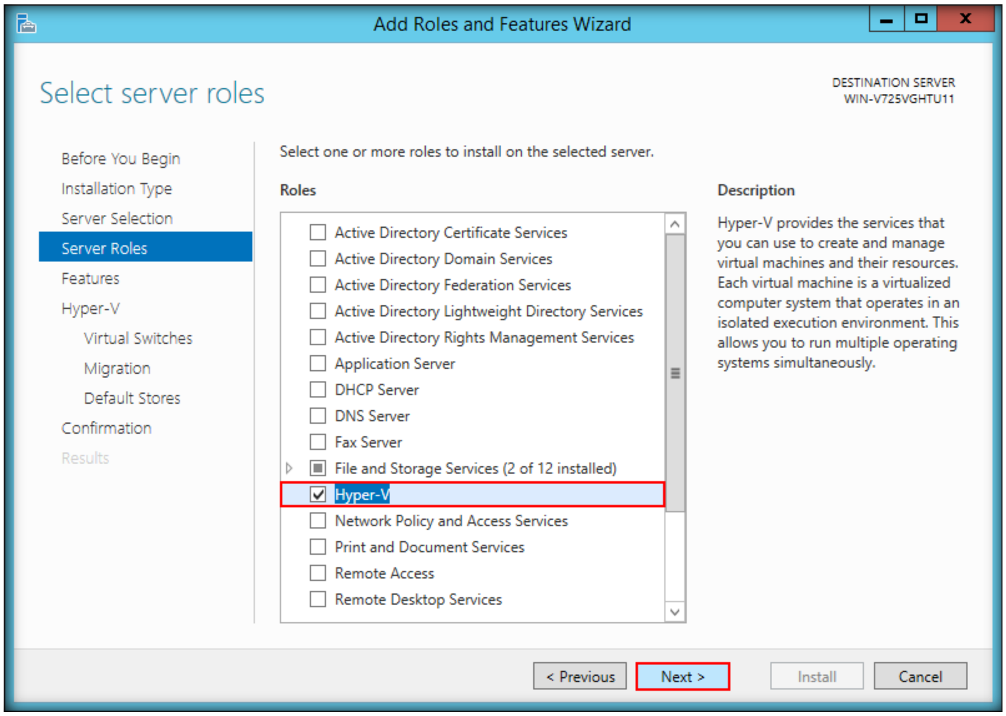
Add features that are required for Hyper-V?

The following tools are required to manage this feature, but do not have to be installed on the same server.

- Remote Server Administration Tools
  - Role Administration Tools
    - Hyper-V Management Tools
      - [Tools] Hyper-V Module for Windows PowerShell
      - [Tools] Hyper-V GUI Management Tools

☑ Include management tools (if applicable)

8. You will observe that the Hyper-V server role option is checked. Click **Next.**


Add Roles and Features Wizard
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Hyper-V
Virtual Switches
Migration
Default Stores
Confirmation
Results
< Previous
Next >
Install
Cancel

Select server roles

DESTINATION SERVER
WIN-V725VGHTU11

Select one or more roles to install on the selected server.

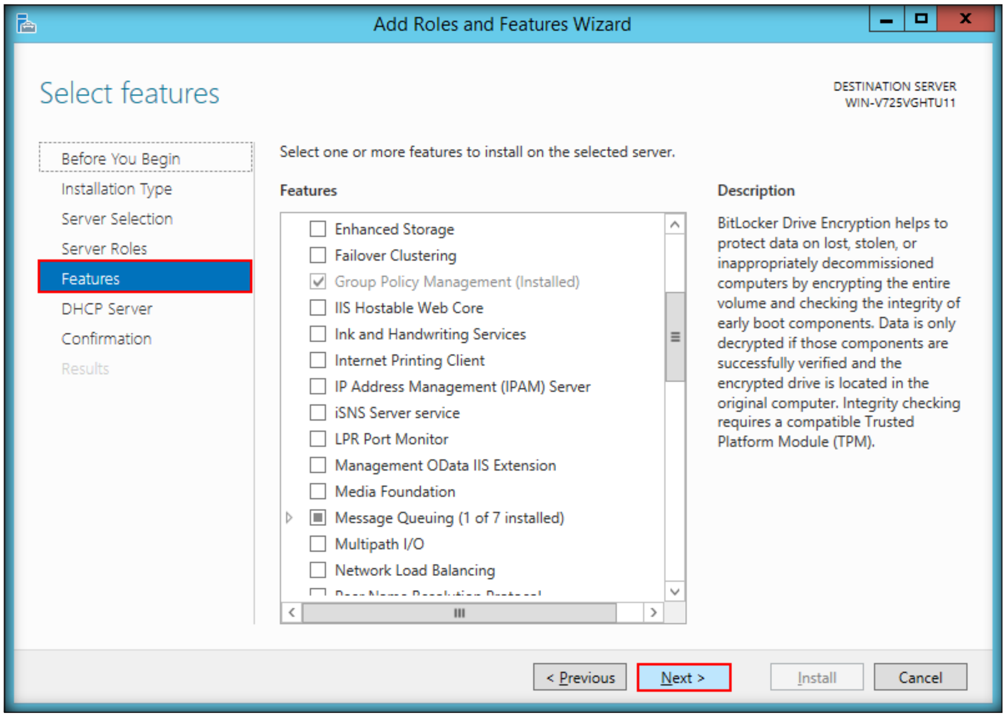
Roles

☐ Active Directory Certificate Services
☐ Active Directory Domain Services
☐ Active Directory Federation Services
☐ Active Directory Lightweight Directory Services
☐ Active Directory Rights Management Services
☐ Application Server
☐ DHCP Server
☐ DNS Server
☐ Fax Server
▨ File and Storage Services (2 of 12 installed)
☑ Hyper-V
☐ Network Policy and Access Services
☐ Print and Document Services
☐ Remote Access
☐ Remote Desktop Services

Description

Hyper-V provides the services that you can use to create and manage virtual machines and their resources. Each virtual machine is a virtualized computer system that operates in an isolated execution environment. This allows you to run multiple operating systems simultaneously.

9. **Add Roles and Features Wizard** will appear for **Features** selection; click **Next** without selecting any role


Add Roles and Features Wizard
Before You Begin
Installation Type
Server Selection
Server Roles
Features
DHCP Server
Confirmation
Results
< Previous
Next >
Install
Cancel

Select features

DESTINATION SERVER
WIN-V725VGHTU11

Select one or more features to install on the selected server.

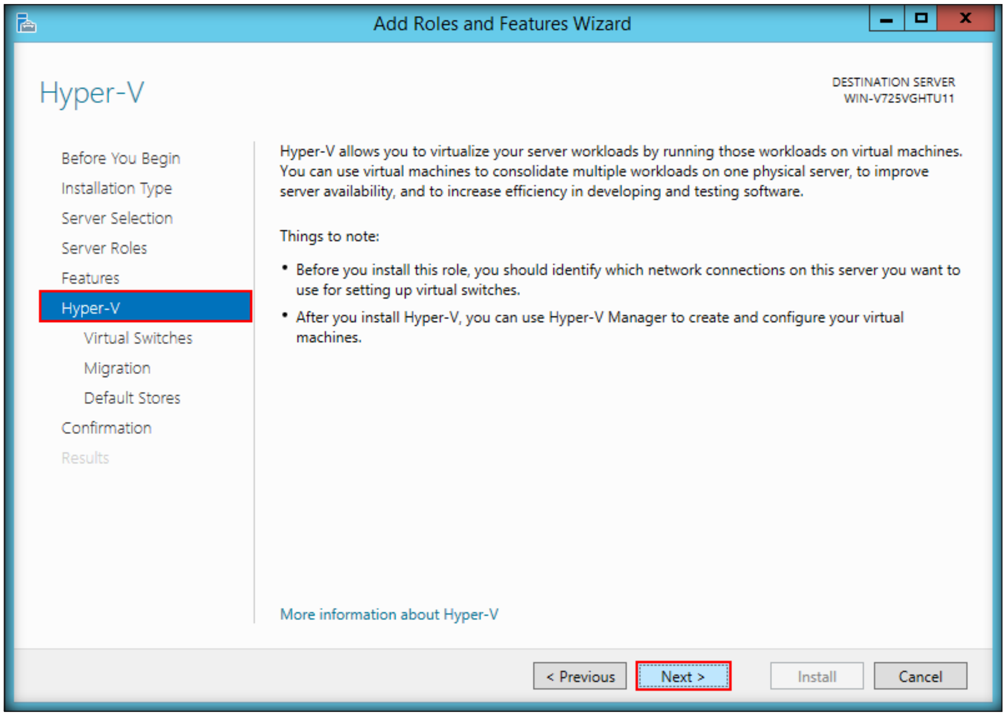
Features

- ☐ Enhanced Storage
- ☐ Failover Clustering
- ☑ Group Policy Management (Installed)
- ☐ IIS Hostable Web Core
- ☐ Ink and Handwriting Services
- ☐ Internet Printing Client
- ☐ IP Address Management (IPAM) Server
- ☐ iSNS Server service
- ☐ LPR Port Monitor
- ☐ Management OData IIS Extension
- ☐ Media Foundation
- ▨ Message Queuing (1 of 7 installed)
- ☐ Multipath I/O
- ☐ Network Load Balancing

Description

BitLocker Drive Encryption helps to protect data on lost, stolen, or inappropriately decommissioned computers by encrypting the entire volume and checking the integrity of early boot components. Data is only decrypted if those components are successfully verified and the encrypted drive is located in the original computer. Integrity checking requires a compatible Trusted Platform Module (TPM).

10. **Hyper-V** section appears in the wizard, explaining the detailed information for **Hyper-V**. Click **Next**


Add Roles and Features Wizard
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Hyper-V
Virtual Switches
Migration
Default Stores
Confirmation
Results
More information about Hyper-V
< Previous
Next >
Install
Cancel

Hyper-V

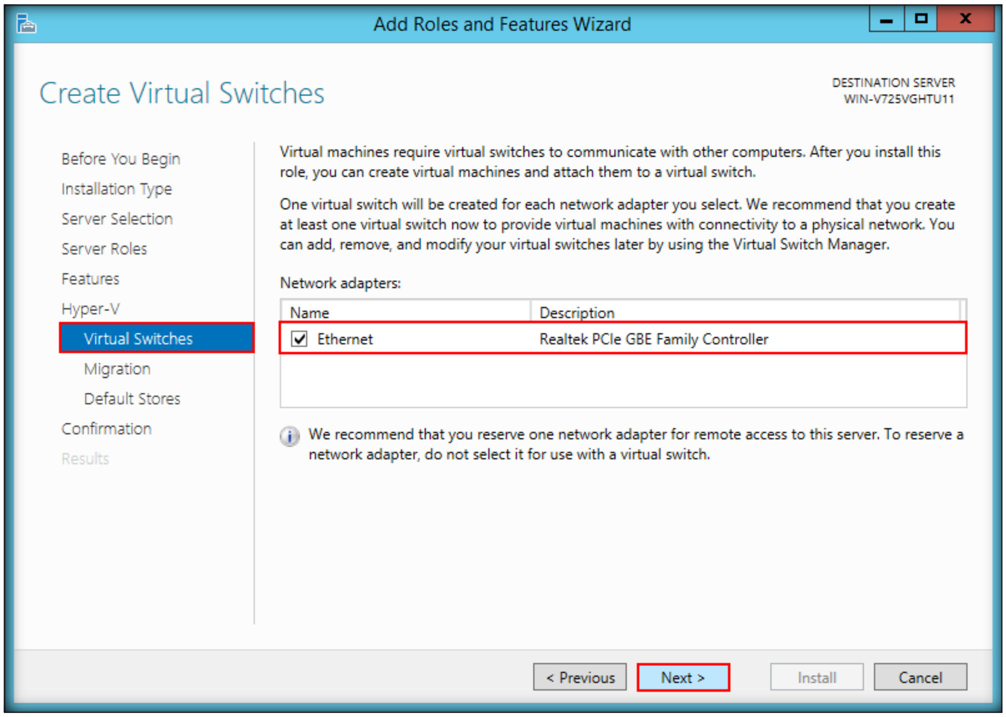
DESTINATION SERVER
WIN-V725VGHTU11

Hyper-V allows you to virtualize your server workloads by running those workloads on virtual machines. You can use virtual machines to consolidate multiple workloads on one physical server, to improve server availability, and to increase efficiency in developing and testing software.

Things to note:

- Before you install this role, you should identify which network connections on this server you want to use for setting up virtual switches.
- After you install Hyper-V, you can use Hyper-V Manager to create and configure your virtual machines.

11. **Virtual Switches** section appears in the wizard. Under the **Network adapters** field, select the available network connection (here **Ethernet**) and click **Next**


Add Roles and Features Wizard
DESTINATION SERVER
WIN-V725VGHTU11
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Hyper-V
Virtual Switches
Migration
Default Stores
Confirmation
Results
< Previous
Next >
Install
Cancel

Create Virtual Switches

Virtual machines require virtual switches to communicate with other computers. After you install this role, you can create virtual machines and attach them to a virtual switch.

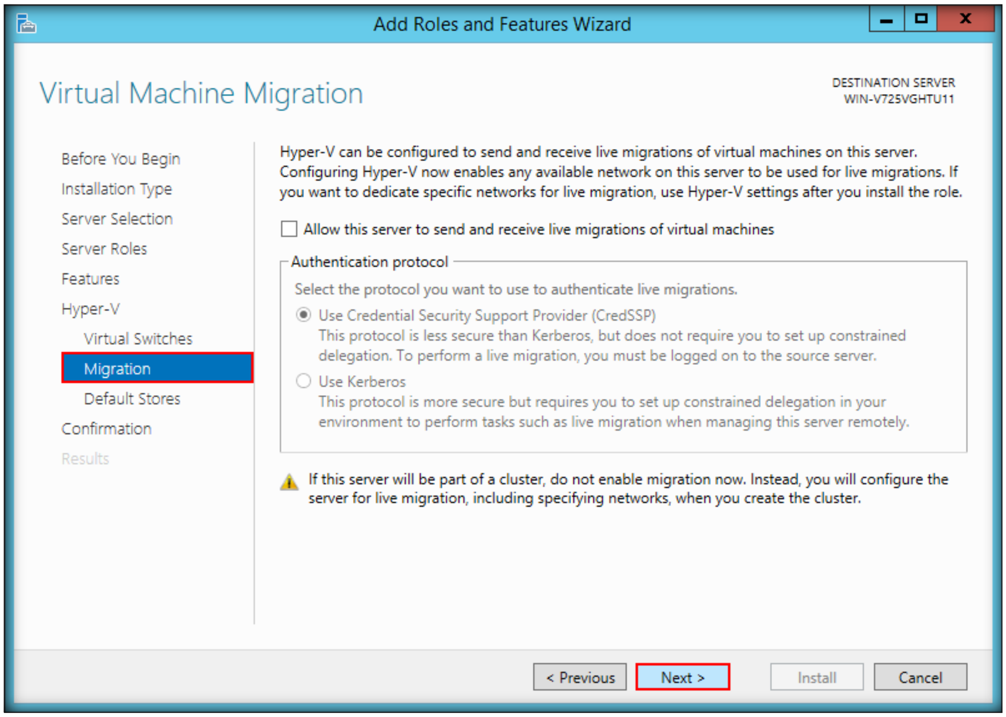
One virtual switch will be created for each network adapter you select. We recommend that you create at least one virtual switch now to provide virtual machines with connectivity to a physical network. You can add, remove, and modify your virtual switches later by using the Virtual Switch Manager.

Network adapters:

Name	Description
☑ Ethernet	Realtek PCIe GBE Family Controller

We recommend that you reserve one network adapter for remote access to this server. To reserve a network adapter, do not select it for use with a virtual switch.

12. In the **Migration** section of the wizard, leave the options set to default and click **Next**


Add Roles and Features Wizard
DESTINATION SERVER
WIN-V725VGHTU11
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Hyper-V
Virtual Switches
Migration
Default Stores
Confirmation
Results
< Previous
Next >
Install
Cancel

Virtual Machine Migration

Hyper-V can be configured to send and receive live migrations of virtual machines on this server. Configuring Hyper-V now enables any available network on this server to be used for live migrations. If you want to dedicate specific networks for live migration, use Hyper-V settings after you install the role.

☐ Allow this server to send and receive live migrations of virtual machines

Authentication protocol

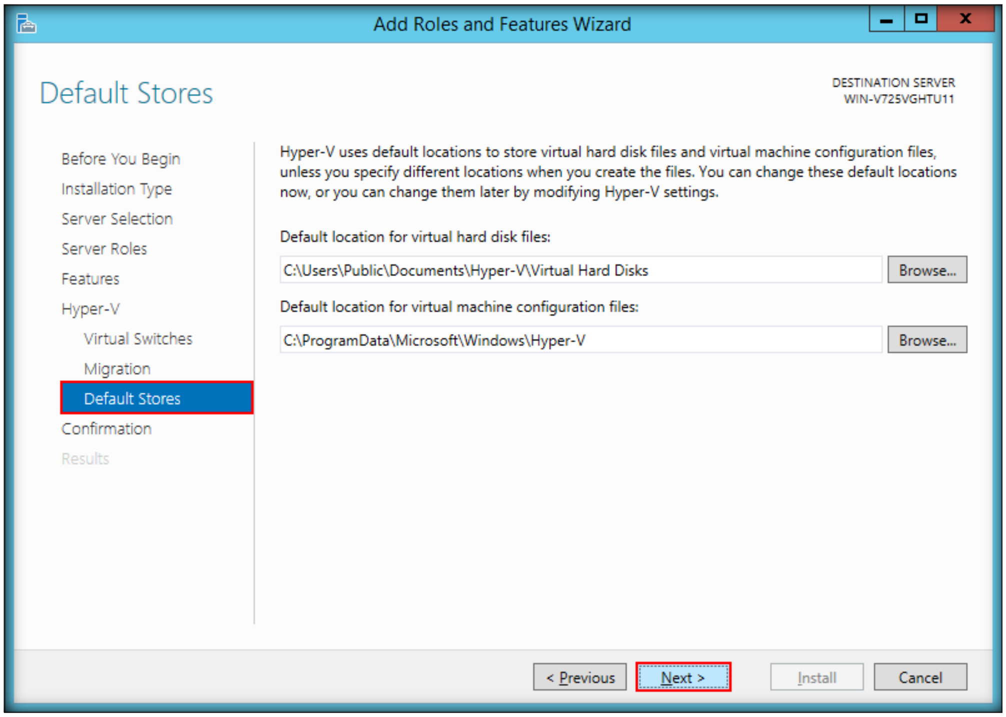
Select the protocol you want to use to authenticate live migrations.

● Use Credential Security Support Provider (CredSSP)
This protocol is less secure than Kerberos, but does not require you to set up constrained delegation. To perform a live migration, you must be logged on to the source server.

○ Use Kerberos
This protocol is more secure but requires you to set up constrained delegation in your environment to perform tasks such as live migration when managing this server remotely.

If this server will be part of a cluster, do not enable migration now. Instead, you will configure the server for live migration, including specifying networks, when you create the cluster.

13. In **Default Stores** section, Hyper-V uses default location to store the disk and configuration files. Leaving the options set to default, click **Next**.



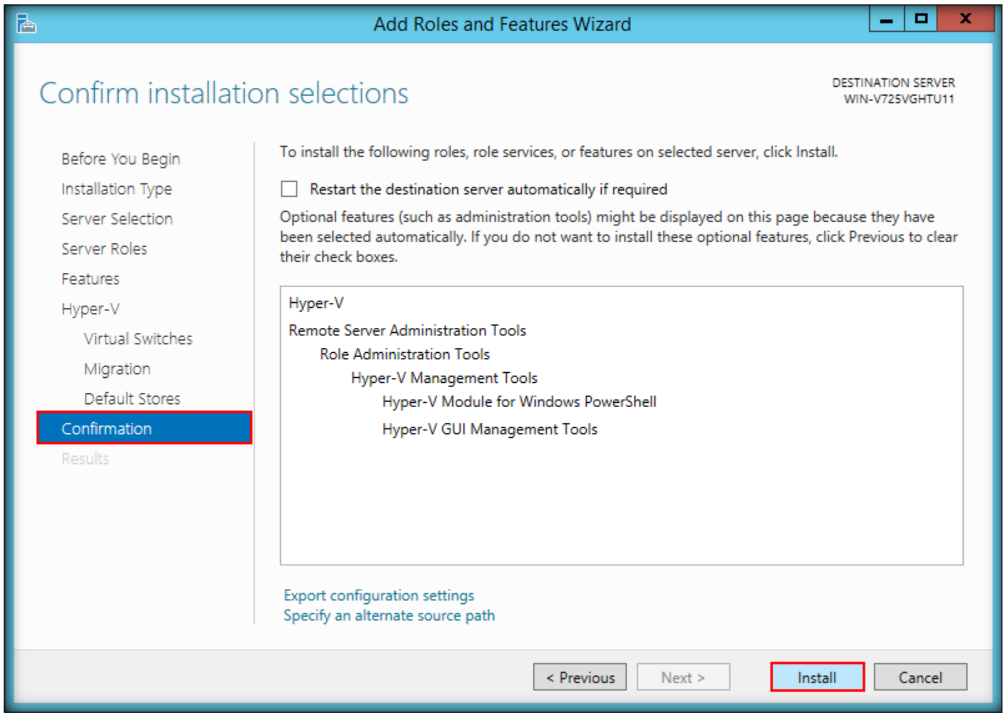
Add Roles and Features Wizard
Default Stores
DESTINATION SERVER
WIN-V725VGHTU11
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Hyper-V
Virtual Switches
Migration
Default Stores
Confirmation
Results
Browse...
Browse...
< Previous
Next >
Install
Cancel

Hyper-V uses default locations to store virtual hard disk files and virtual machine configuration files, unless you specify different locations when you create the files. You can change these default locations now, or you can change them later by modifying Hyper-V settings.

Default location for virtual hard disk files: C:\Users\Public\Documents\Hyper-V\Virtual Hard Disks

Default location for virtual machine configuration files: C:\ProgramData\Microsoft\Windows\Hyper-V

14. Click **Install** button to confirm installation for the selected Roles and Features



Add Roles and Features Wizard
Confirm installation selections
DESTINATION SERVER
WIN-V725VGHTU11
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Hyper-V
Virtual Switches
Migration
Default Stores
Confirmation
Results
Export configuration settings
Specify an alternate source path
< Previous
Next >
Install
Cancel

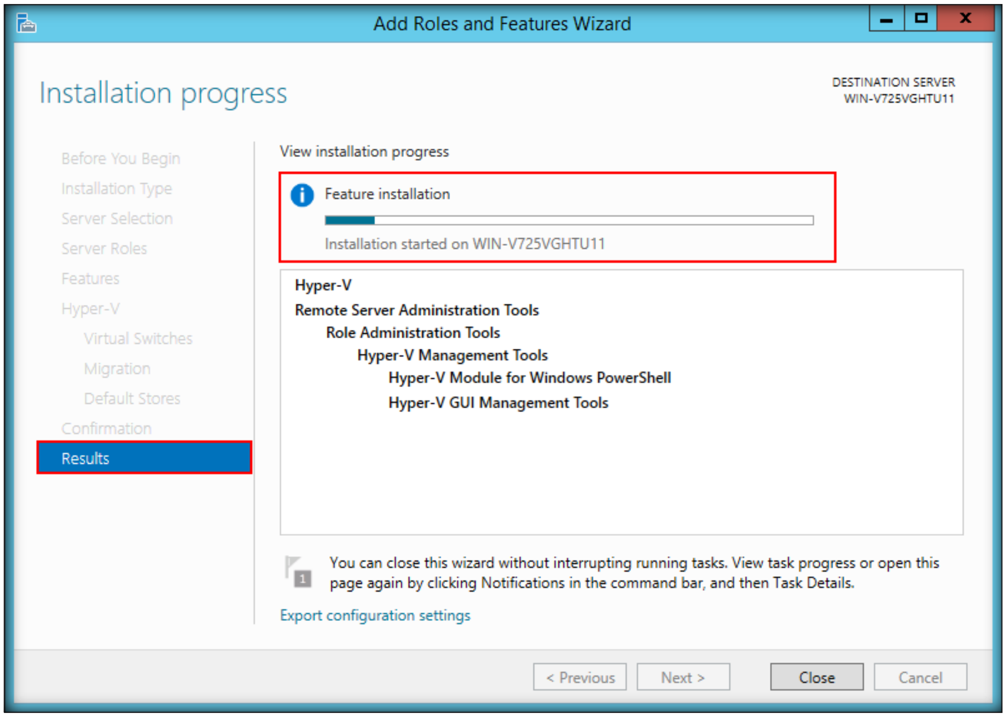
To install the following roles, role services, or features on selected server, click Install.

☐ Restart the destination server automatically if required

Optional features (such as administration tools) might be displayed on this page because they have been selected automatically. If you do not want to install these optional features, click Previous to clear their check boxes.

- Hyper-V
- Remote Server Administration Tools
  - Role Administration Tools
    - Hyper-V Management Tools
      - Hyper-V Module for Windows PowerShell
      - Hyper-V GUI Management Tools

15. It will take a while to **complete** installation of selected roles and features


Add Roles and Features Wizard
Installation progress
DESTINATION SERVER
WIN-V725VGHTU11
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Hyper-V
Virtual Switches
Migration
Default Stores
Confirmation
Results
View installation progress
< Previous
Next >
Close
Cancel

Feature installation

Installation started on WIN-V725VGHTU11

Hyper-V
Remote Server Administration Tools
  Role Administration Tools
    Hyper-V Management Tools
      Hyper-V Module for Windows PowerShell
      Hyper-V GUI Management Tools

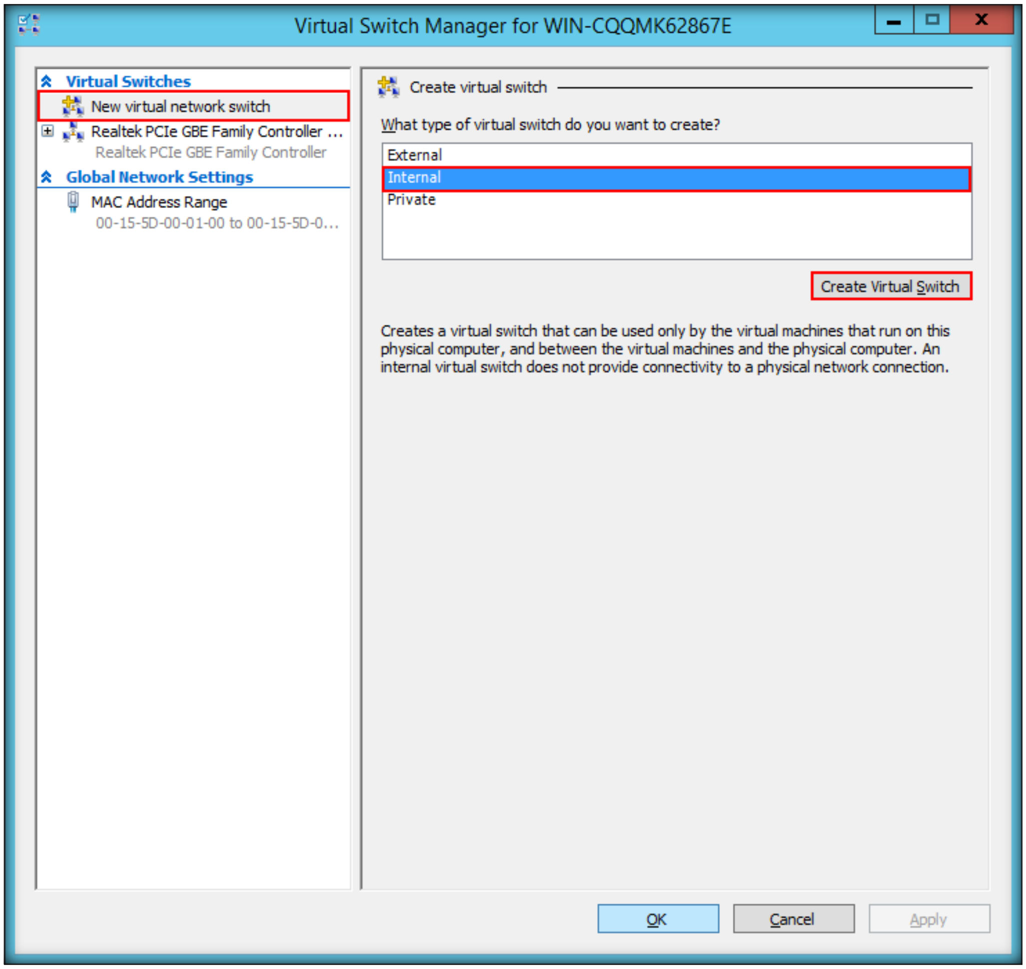
You can close this wizard without interrupting running tasks. View task progress or open this page again by clicking Notifications in the command bar, and then Task Details.

Export configuration settings

16. After the completion of installation, click **Close** and restart the machine.

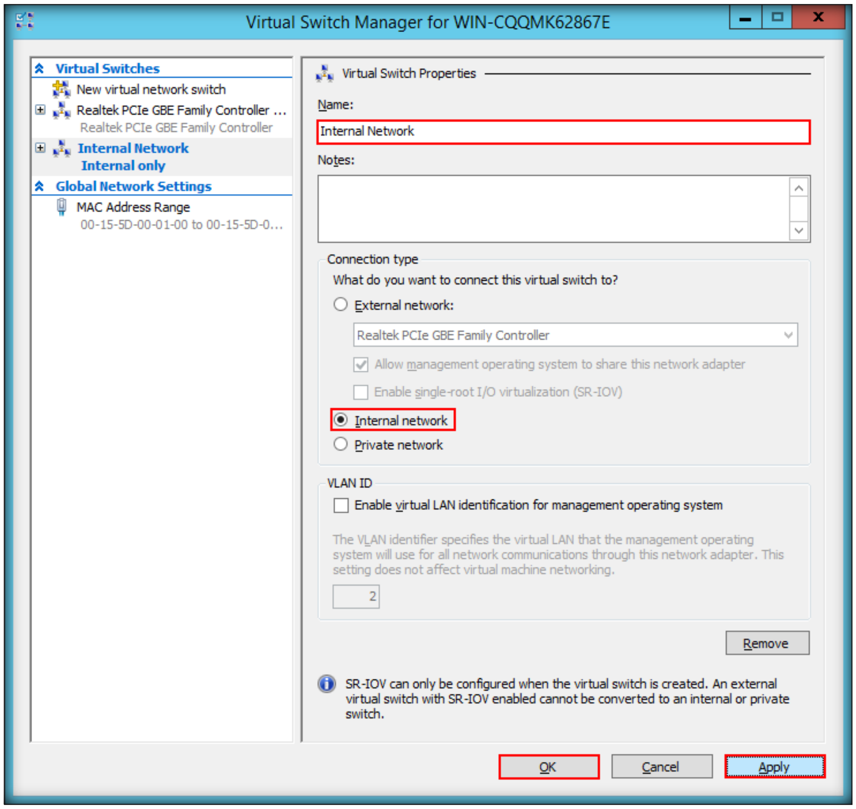
CT#3: Configuring Internal Network for Hyper-V

1. Launch Hyper-V Manager
2. Click **Virtual Switch Manager** in the right pane of **Hyper-V Manager**. The **Virtual Switch Manager** window appears
3. Select **New virtual network switch** from left pane, and select **Internal** as the network type in the pane of the window
4. Click **Create Virtual Switch** button


Virtual Switch Manager for WIN-CQQMK62867E
Virtual Switches
New virtual network switch
Realtek PCIe GBE Family Controller ...
Realtek PCIe GBE Family Controller
Global Network Settings
MAC Address Range
00-15-5D-00-01-00 to 00-15-5D-0...
Create virtual switch
What type of virtual switch do you want to create?
External
Internal
Private
Create Virtual Switch
OK
Cancel
Apply

Creates a virtual switch that can be used only by the virtual machines that run on this physical computer, and between the virtual machines and the physical computer. An internal virtual switch does not provide connectivity to a physical network connection.

5. The newly created virtual switch appears in the left pane. Enter the name of the virtual switch as **Internal Network** under the **Name** field, select **Internal network** radio button, click **Apply** and then click **OK**


Virtual Switch Manager for WIN-CQQMK62867E
Virtual Switches
New virtual network switch
Realtek PCIe GBE Family Controller ...
Realtek PCIe GBE Family Controller
Internal Network
Internal only
Global Network Settings
MAC Address Range
00-15-5D-00-01-00 to 00-15-5D-0...
Virtual Switch Properties
Notes:
Connection type
Remove
OK
Cancel
Apply

Name: Internal Network

What do you want to connect this virtual switch to?

○ External network:

Realtek PCIe GBE Family Controller

☑ Allow management operating system to share this network adapter

☐ Enable single-root I/O virtualization (SR-IOV)

● Internal network

○ Private network

VLAN ID

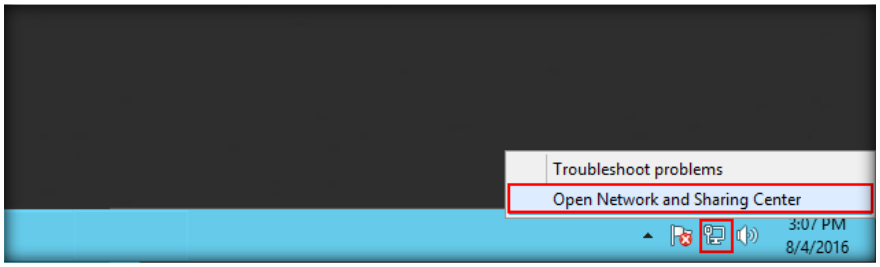
☐ Enable virtual LAN identification for management operating system

The VLAN identifier specifies the virtual LAN that the management operating system will use for all network communications through this network adapter. This setting does not affect virtual machine networking.

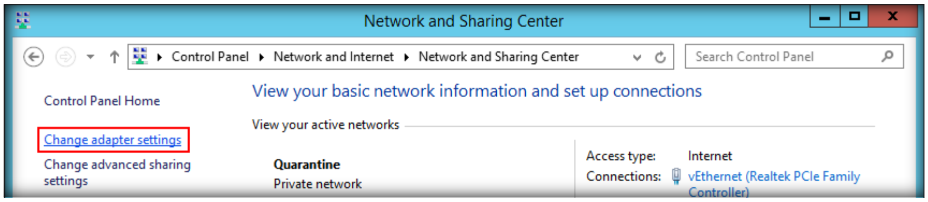
2

SR-IOV can only be configured when the virtual switch is created. An external virtual switch with SR-IOV enabled cannot be converted to an internal or private switch.

6. **Right-click Network icon** (lower right corner of the desktop), and click **Open Network and Sharing Center** from the context menu


Troubleshoot problems
Open Network and Sharing Center
3:07 PM
8/4/2016

7. **Network and Sharing Centre** window appears, click **Change adapter settings** link from the left pane


Network and Sharing Center
Control Panel
Network and Internet
Network and Sharing Center
Search Control Panel
Control Panel Home
Change adapter settings
Change advanced sharing settings

View your basic network information and set up connections

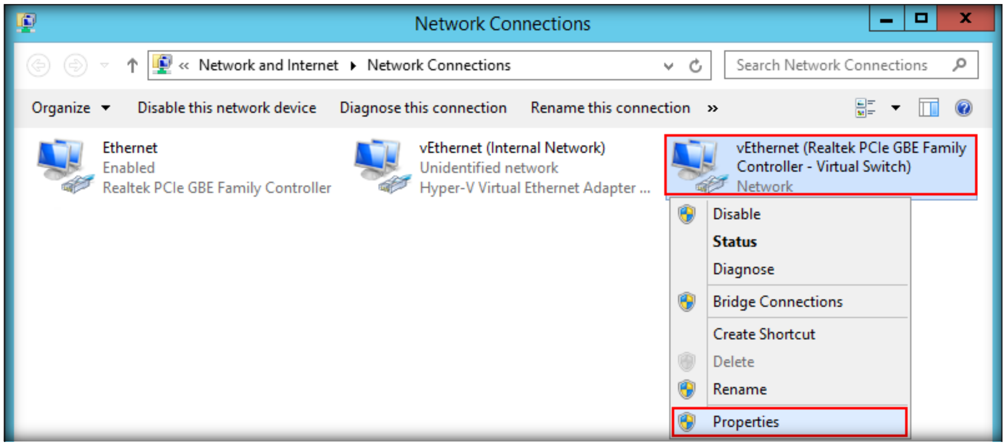
View your active networks

Quarantine
Private network

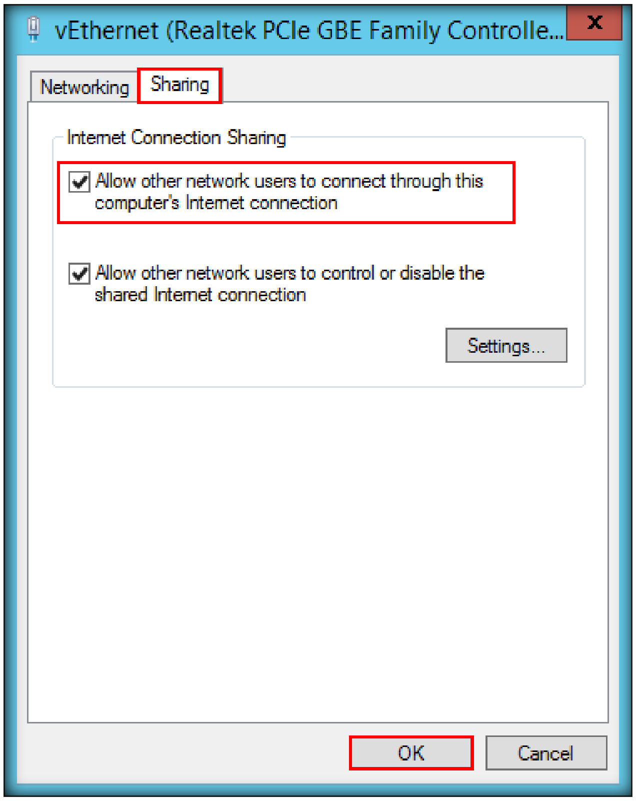
Access type: Internet
Connections: vEthernet (Realtek PCIe Family Controller)

8. **Right-click** the **External Network (vEthernet –Virtual Switch)**; and click **Properties** from the context menu as shown in the screenshot.

   Note: Screenshot may differ in your lab environment.


Network Connections
Network and Internet
Network Connections
Search Network Connections
Organize
Disable this network device
Diagnose this connection
Rename this connection
Ethernet
Enabled
Realtek PCIe GBE Family Controller
vEthernet (Internal Network)
Unidentified network
Hyper-V Virtual Ethernet Adapter ...
vEthernet (Realtek PCIe GBE Family Controller - Virtual Switch)
Network
Disable
Status
Diagnose
Bridge Connections
Create Shortcut
Delete
Rename
Properties

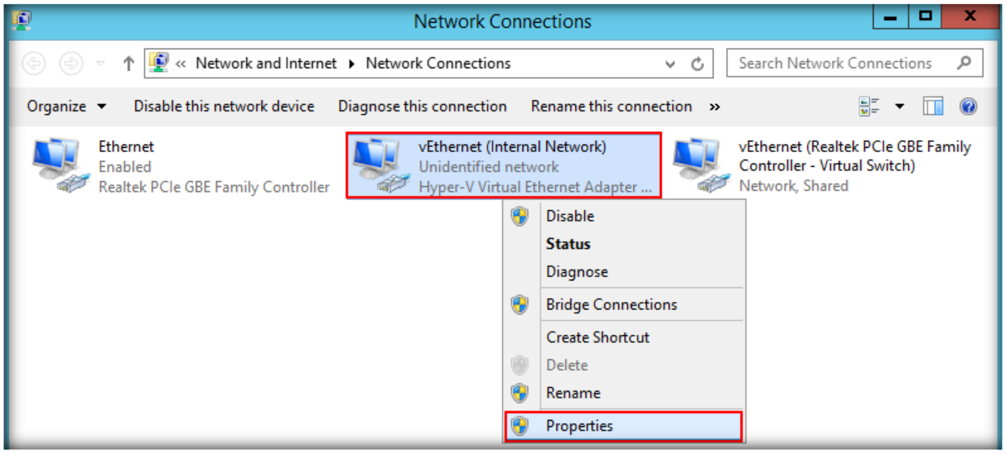
9. External Network adapter properties window appears, click **Sharing** tab. In the Sharing tab check **Allow other network users to connect through this computer's Internet connection** option, and then click **OK**


vEthernet (Realtek PCIe GBE Family Controlle...
Networking
Sharing
Internet Connection Sharing
Settings...
OK
Cancel

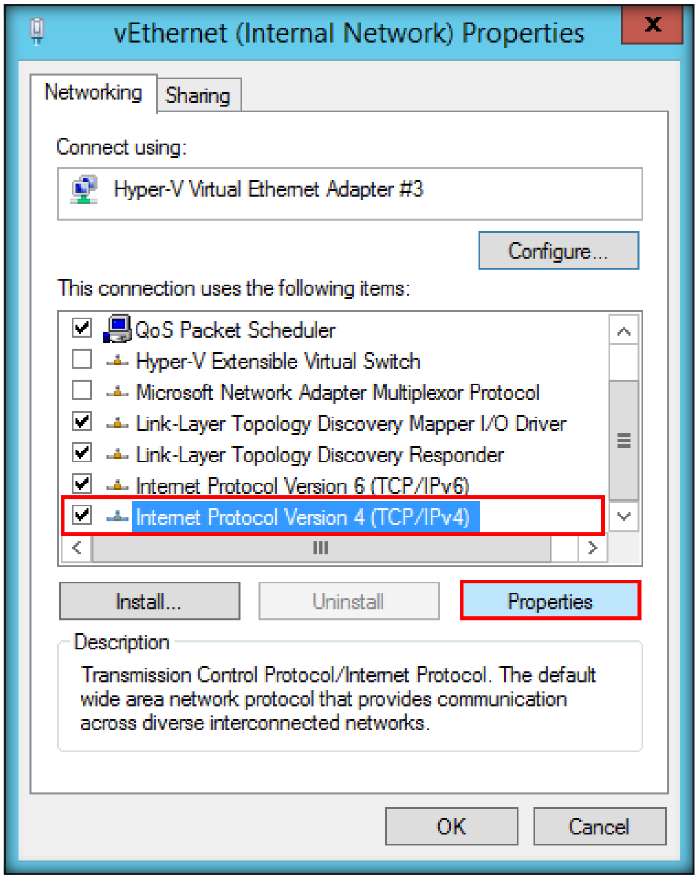
☑ Allow other network users to connect through this computer's Internet connection

☑ Allow other network users to control or disable the shared Internet connection

10. In the **Network Connections** window, **right-click** created **Internal Network** switch: **vEthernet**; and click **Properties** from the context menu.


Network Connections
« Network and Internet ▸ Network Connections
Search Network Connections
Organize ▾
Disable this network device
Diagnose this connection
Rename this connection
»
Ethernet
Enabled
Realtek PCIe GBE Family Controller
vEthernet (Internal Network)
Unidentified network
Hyper-V Virtual Ethernet Adapter ...
vEthernet (Realtek PCIe GBE Family Controller - Virtual Switch)
Network, Shared
Disable
Status
Diagnose
Bridge Connections
Create Shortcut
Delete
Rename
Properties

11. **Internal Network** adapter properties window appears, scroll down and select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties.**


vEthernet (Internal Network) Properties
Networking
Sharing
Configure...
Install...
Uninstall
Properties
OK
Cancel

Connect using:

Hyper-V Virtual Ethernet Adapter #3

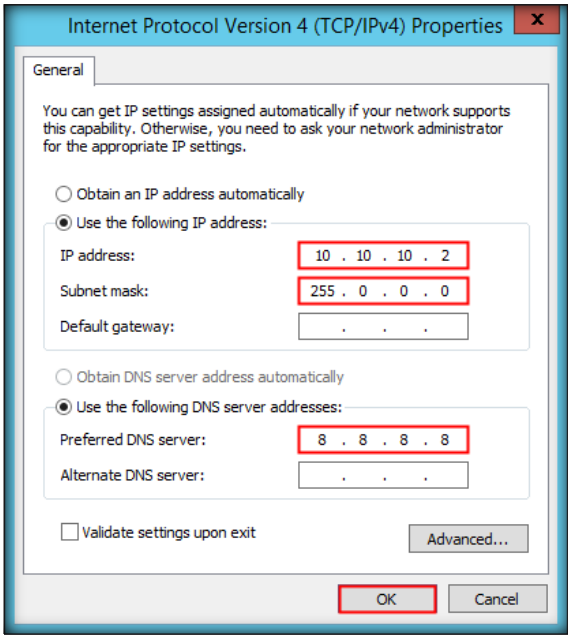
This connection uses the following items:

- ☑ QoS Packet Scheduler
- ☐ Hyper-V Extensible Virtual Switch
- ☐ Microsoft Network Adapter Multiplexor Protocol
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder
- ☑ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version 4 (TCP/IPv4)

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

12. Select **Use the following IP address** radio button, and type the following values as shown in the screenshot, and click **OK**.
    - **IP address: 10.10.10.2**
    - **Subnet mask: 255.0.0.0**
    - **Default gateway: Leave empty**
    - **Preferred DNS server: 8.8.8.8**


Internet Protocol Version 4 (TCP/IPv4) Properties
General
Advanced...
OK
Cancel

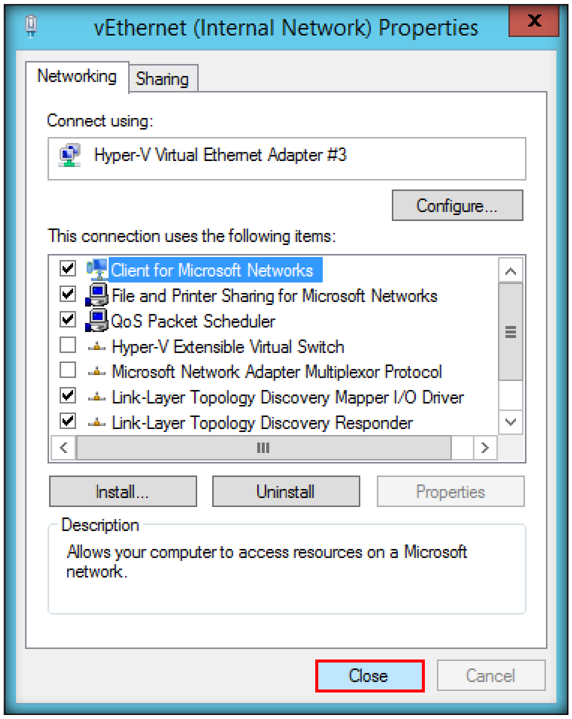
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically
● Use the following IP address:
IP address: 10 . 10 . 10 . 2
Subnet mask: 255 . 0 . 0 . 0
Default gateway: . . .

○ Obtain DNS server address automatically
● Use the following DNS server addresses:
Preferred DNS server: 8 . 8 . 8 . 8
Alternate DNS server: . . .

☐ Validate settings upon exit

13. **Close** the **Properties** window, and other windows that were open except Hyper-V Manager


vEthernet (Internal Network) Properties
Networking
Sharing
Configure...
Install...
Uninstall
Properties
Close
Cancel

Connect using:
Hyper-V Virtual Ethernet Adapter #3

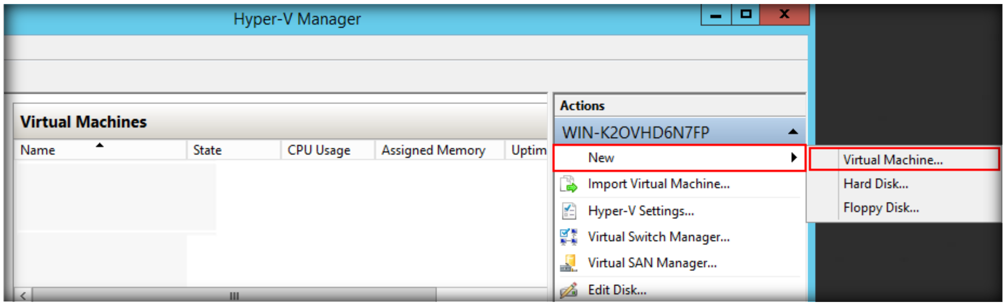
This connection uses the following items:
☑ Client for Microsoft Networks
☑ File and Printer Sharing for Microsoft Networks
☑ QoS Packet Scheduler
☐ Hyper-V Extensible Virtual Switch
☐ Microsoft Network Adapter Multiplexor Protocol
☑ Link-Layer Topology Discovery Mapper I/O Driver
☑ Link-Layer Topology Discovery Responder

Description
Allows your computer to access resources on a Microsoft network.

CT#4: Creating and Configuring Windows Server 2016 Virtual Machine

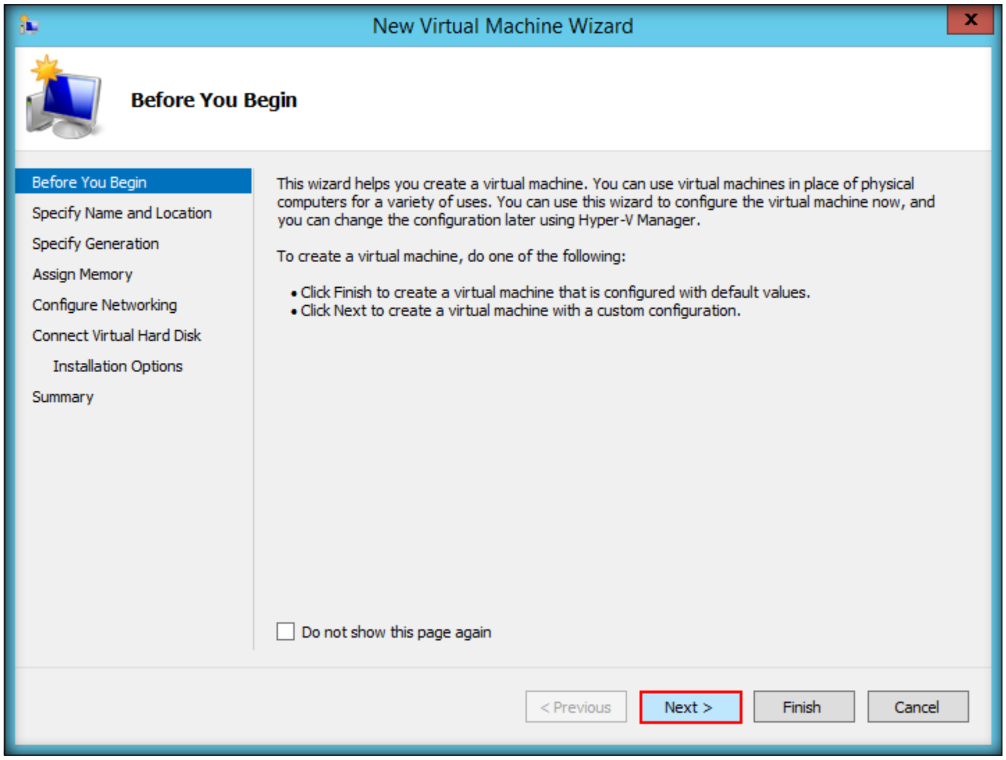
CT#4.1: Creating a Virtual Machine and Installing Windows Server 2016 R2 Guest OS

1. Launch Hyper-V Manager.
2. Select your local machine in the left pane, then click **New**, and then click **Virtual Machine...** in the right pane as shown in the screen shot.


Hyper-V Manager
Virtual Machines
Name
State
CPU Usage
Assigned Memory
Uptim
Actions
WIN-K2OVHD6N7FP
New
Import Virtual Machine...
Hyper-V Settings...
Virtual Switch Manager...
Virtual SAN Manager...
Edit Disk...
Virtual Machine...
Hard Disk...
Floppy Disk...

Note: Every machine has a unique name, so the name of your machine differs from the name shown in the above screenshot.

3. **New Virtual Machine Wizard** window appears, click **Next** button


New Virtual Machine Wizard
Before You Begin
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
☐ Do not show this page again
< Previous
Next >
Finish
Cancel

This wizard helps you create a virtual machine. You can use virtual machines in place of physical computers for a variety of uses. You can use this wizard to configure the virtual machine now, and you can change the configuration later using Hyper-V Manager.

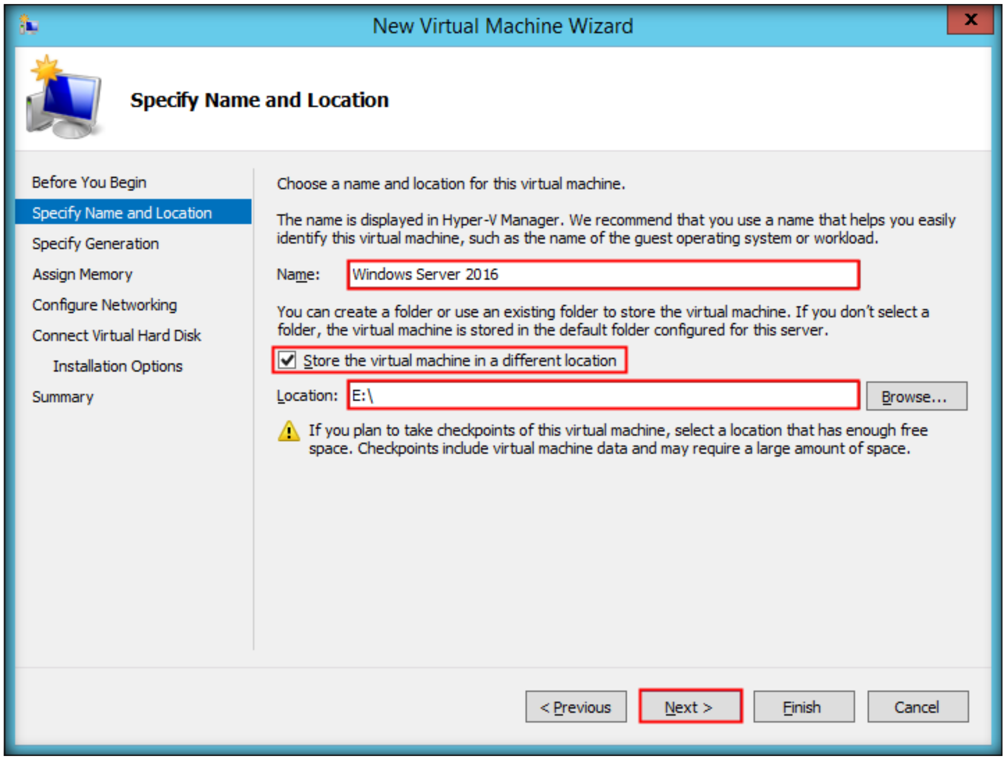
To create a virtual machine, do one of the following:

- Click Finish to create a virtual machine that is configured with default values.
- Click Next to create a virtual machine with a custom configuration.

4. Specify **Name** and **location** of new virtual machine. Assign the name of the virtual machine as **Windows Server 2016.**

5. The default location for storing the virtual machine is **C:\ProgramData\Microsoft\Windows\Hyper-V\**. You can choose different location to store the VM's or set it to default location. Click **Next**

   Note: You can specify the location either in the **Specify Name and Location** section or in the forthcoming **Connect Virtual Hard Disk** section


New Virtual Machine Wizard
Specify Name and Location
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
Browse...
< Previous
Next >
Finish
Cancel

Choose a name and location for this virtual machine.

The name is displayed in Hyper-V Manager. We recommend that you use a name that helps you easily identify this virtual machine, such as the name of the guest operating system or workload.

Name: Windows Server 2016

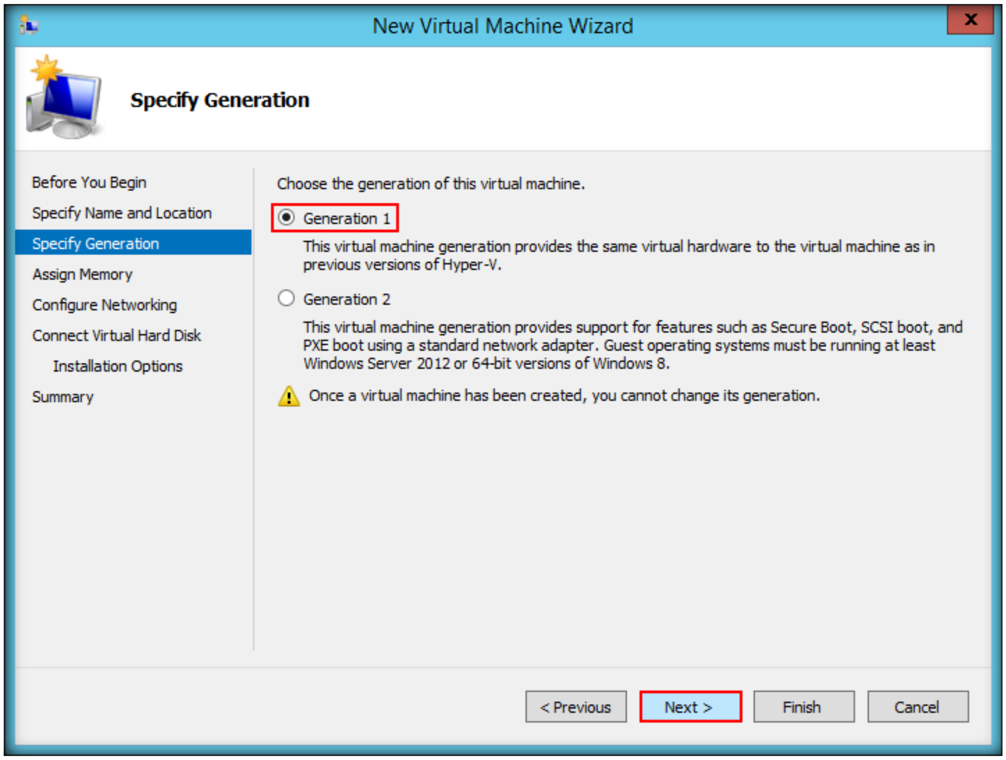
You can create a folder or use an existing folder to store the virtual machine. If you don't select a folder, the virtual machine is stored in the default folder configured for this server.

☑ Store the virtual machine in a different location

Location: E:\

If you plan to take checkpoints of this virtual machine, select a location that has enough free space. Checkpoints include virtual machine data and may require a large amount of space.

6. Choose the generation of the virtual machine (here, **Generation 1**) and click **Next**



New Virtual Machine Wizard
Specify Generation
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

Choose the generation of this virtual machine.

● Generation 1

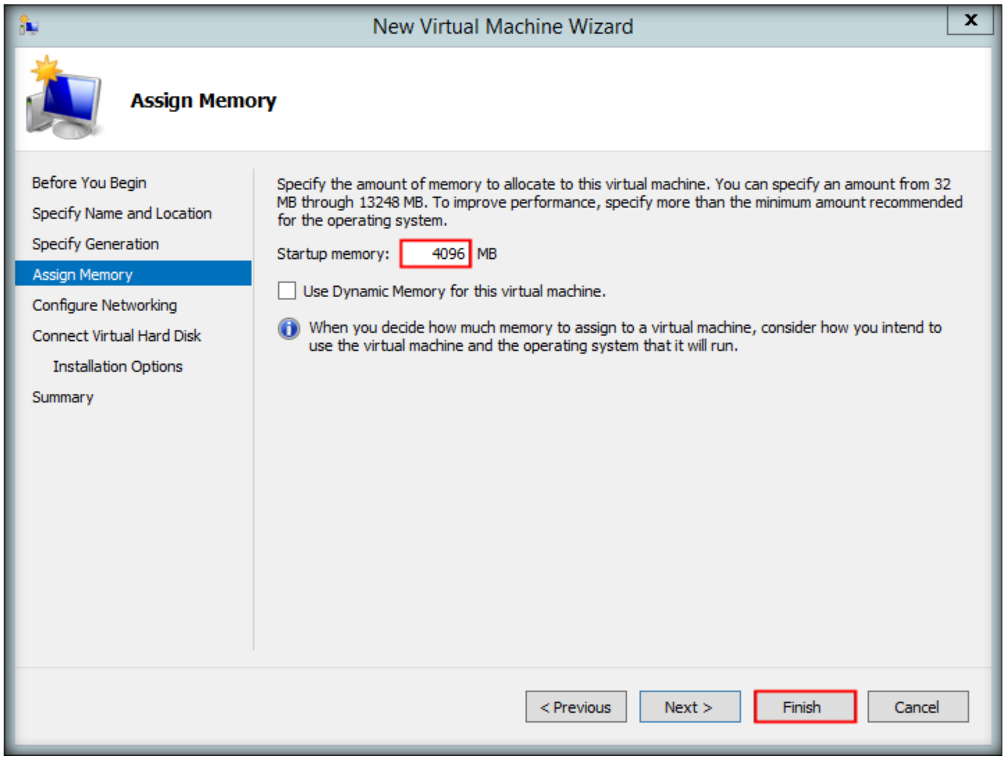
This virtual machine generation provides the same virtual hardware to the virtual machine as in previous versions of Hyper-V.

○ Generation 2

This virtual machine generation provides support for features such as Secure Boot, SCSI boot, and PXE boot using a standard network adapter. Guest operating systems must be running at least Windows Server 2012 or 64-bit versions of Windows 8.

Once a virtual machine has been created, you cannot change its generation.

7. Assign the amount of **Startup memory** to allocate to this virtual machine in MB (here, **4096** MB). Click **Next**



New Virtual Machine Wizard
Assign Memory
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

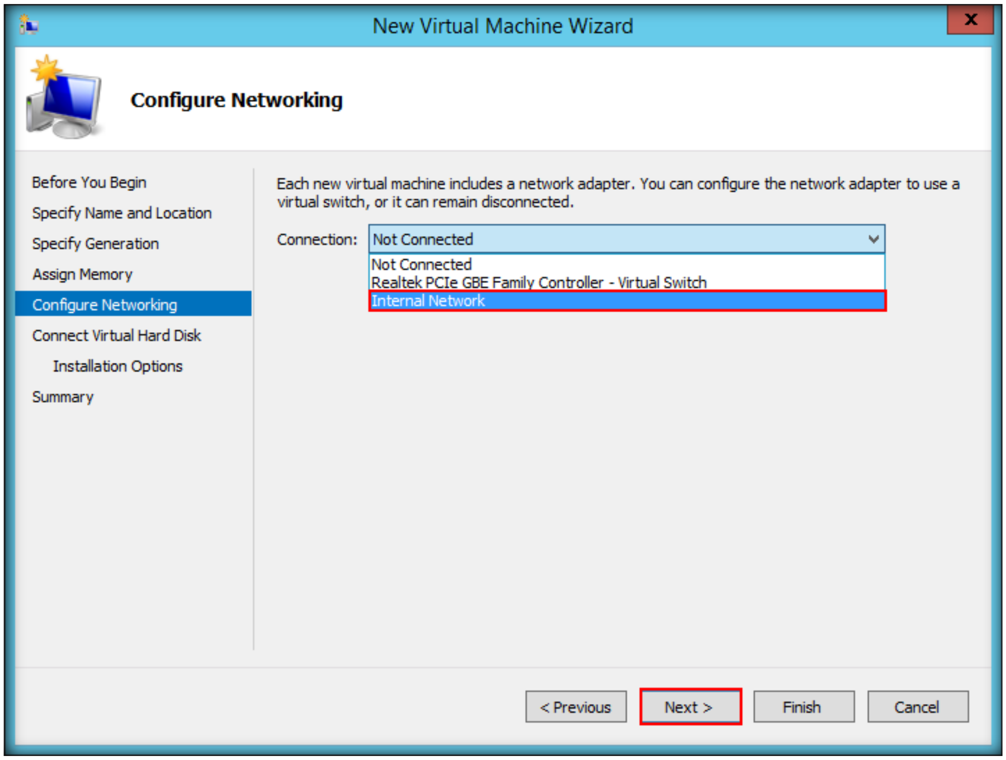
Specify the amount of memory to allocate to this virtual machine. You can specify an amount from 32 MB through 13248 MB. To improve performance, specify more than the minimum amount recommended for the operating system.

Startup memory: 4096 MB

☐ Use Dynamic Memory for this virtual machine.

When you decide how much memory to assign to a virtual machine, consider how you intend to use the virtual machine and the operating system that it will run.

8. In the next step, select **network adapter** as **Internal Network** from connection drop-down list and click **Next**

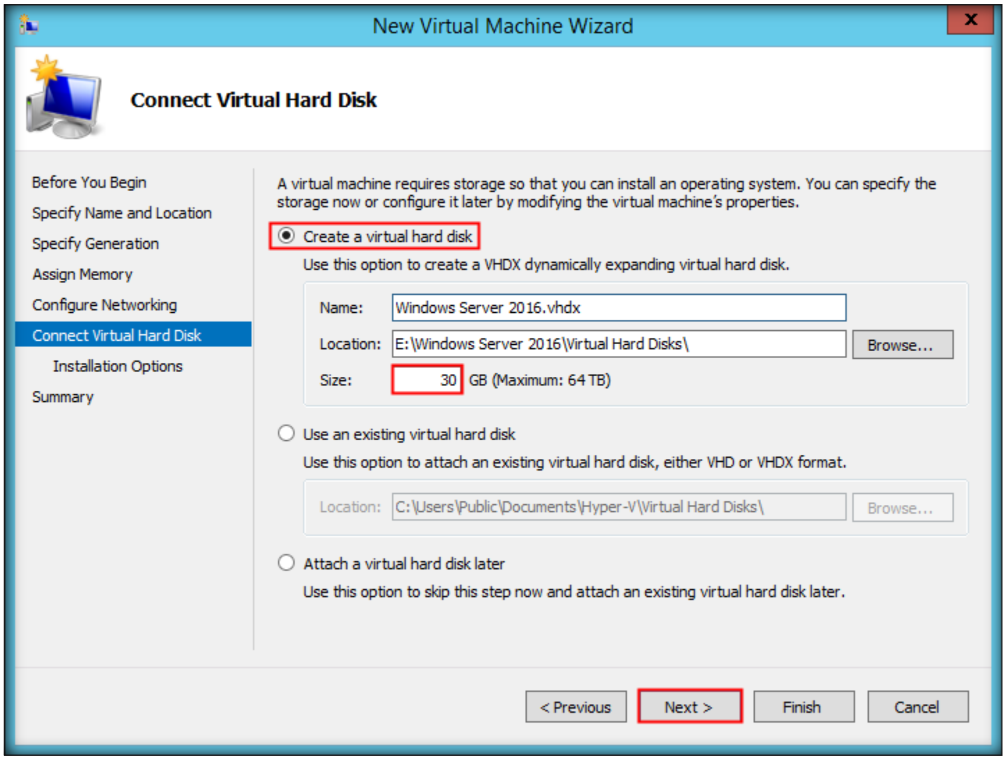


New Virtual Machine Wizard
Configure Networking
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
Not Connected
Realtek PCIe GBE Family Controller - Virtual Switch
Internal Network
< Previous
Next >
Finish
Cancel

Each new virtual machine includes a network adapter. You can configure the network adapter to use a virtual switch, or it can remain disconnected.

Connection: Not Connected

9. **Connect Virtual Hard Disk** section appears, allocate **30 GB** space for hard disk and click **Next**



New Virtual Machine Wizard
Connect Virtual Hard Disk
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
Browse...
Browse...
< Previous
Next >
Finish
Cancel

A virtual machine requires storage so that you can install an operating system. You can specify the storage now or configure it later by modifying the virtual machine's properties.

● Create a virtual hard disk

Use this option to create a VHDX dynamically expanding virtual hard disk.

Name: Windows Server 2016.vhdx

Location: E:\Windows Server 2016\Virtual Hard Disks\

Size: 30 GB (Maximum: 64 TB)

○ Use an existing virtual hard disk

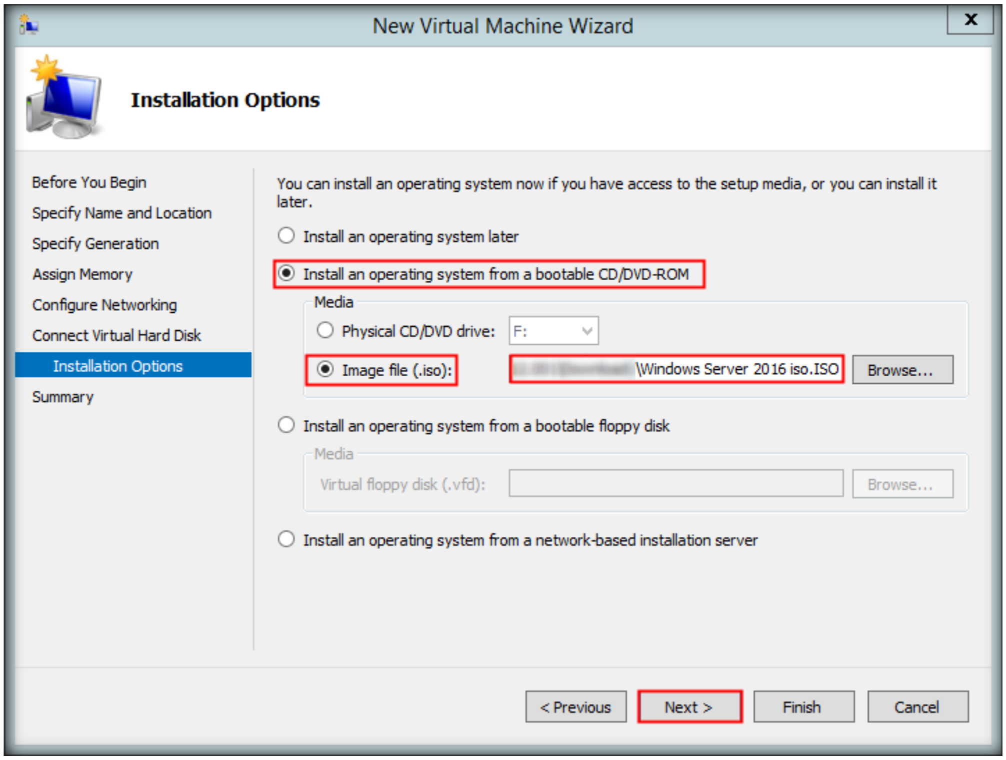
Use this option to attach an existing virtual hard disk, either VHD or VHDX format.

Location: C:\Users\Public\Documents\Hyper-V\Virtual Hard Disks\

○ Attach a virtual hard disk later

Use this option to skip this step now and attach an existing virtual hard disk later.

10. The **installation options** section appears, select **Install an operating system from a bootable CD/DVD-ROM** radio button.
    - If you have a Windows Server 2016 DVD, choose Physical CD/DVD drive radio button and then click **Next**.
    - If you have a Windows Server 2016 ISO file, then choose Image file (.iso) radio button and click browse button to provide the path of ISO file and click **Next**.


New Virtual Machine Wizard
Installation Options
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
Media
Browse...
Media
Browse...
< Previous
Next >
Finish
Cancel

You can install an operating system now if you have access to the setup media, or you can install it later.

○ Install an operating system later

● Install an operating system from a bootable CD/DVD-ROM

○ Physical CD/DVD drive: F:

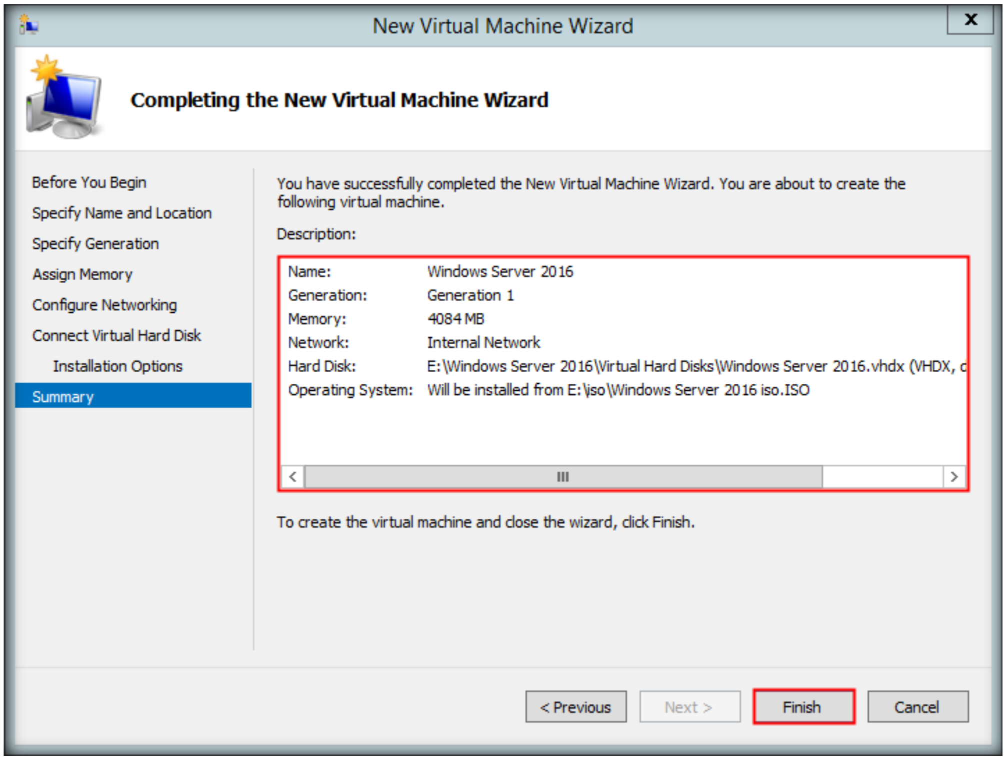
● Image file (.iso): [redacted]\Windows Server 2016 iso.ISO

○ Install an operating system from a bootable floppy disk

Virtual floppy disk (.vfd):

○ Install an operating system from a network-based installation server

11. Virtual machine wizard appears with summary information. Click **Finish**


New Virtual Machine Wizard
Completing the New Virtual Machine Wizard
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

You have successfully completed the New Virtual Machine Wizard. You are about to create the following virtual machine.

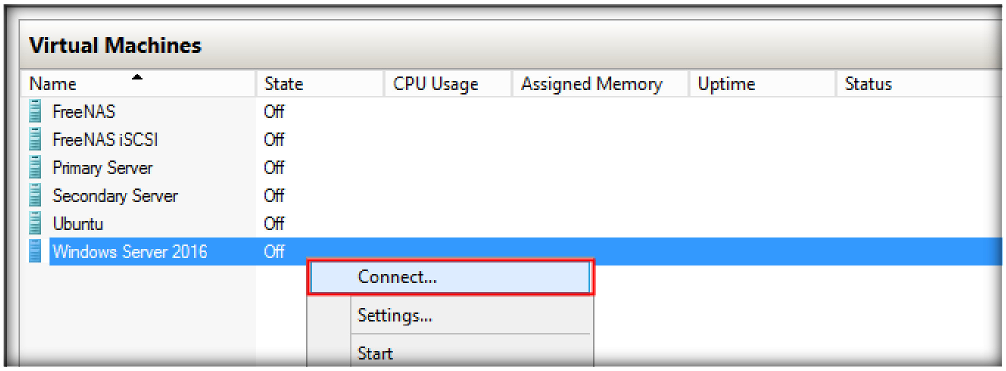
Description:

Name: Windows Server 2016
Generation: Generation 1
Memory: 4084 MB
Network: Internal Network
Hard Disk: E:\Windows Server 2016\Virtual Hard Disks\Windows Server 2016.vhdx (VHDX,
Operating System: Will be installed from E:\iso\Windows Server 2016 iso.ISO

To create the virtual machine and close the wizard, click Finish.

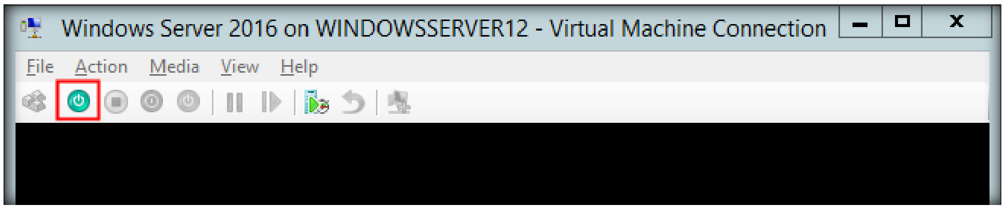
12. Hyper-V Manager creates **Windows Server 2016** virtual machine profile

13. In **Hyper-V Manager** main window, you see a new virtual machine named **Windows Server 2016**. **Right-click** the newly created virtual machine and click **Connect** from the context menu.

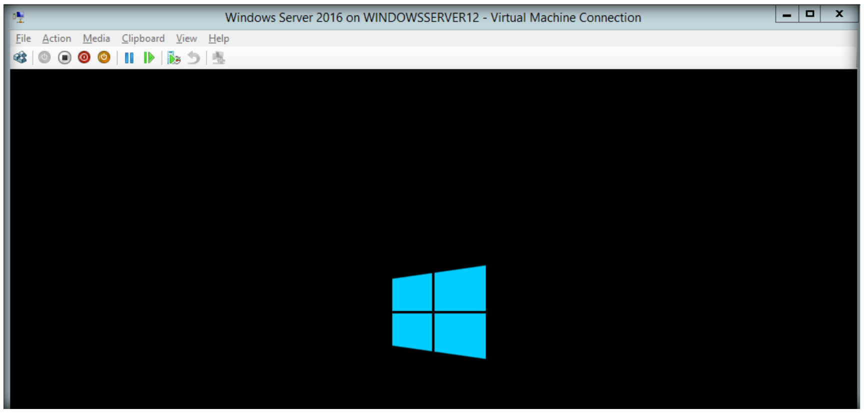

Virtual Machines
Connect...
Settings...
Start

Name	State	CPU Usage	Assigned Memory	Uptime	Status
FreeNAS	Off				
FreeNAS iSCSI	Off				
Primary Server	Off				
Secondary Server	Off				
Ubuntu	Off				
Windows Server 2016	Off				

14. Windows Server 2016 Virtual Machine window appears click **Start** button as shown in the screenshot

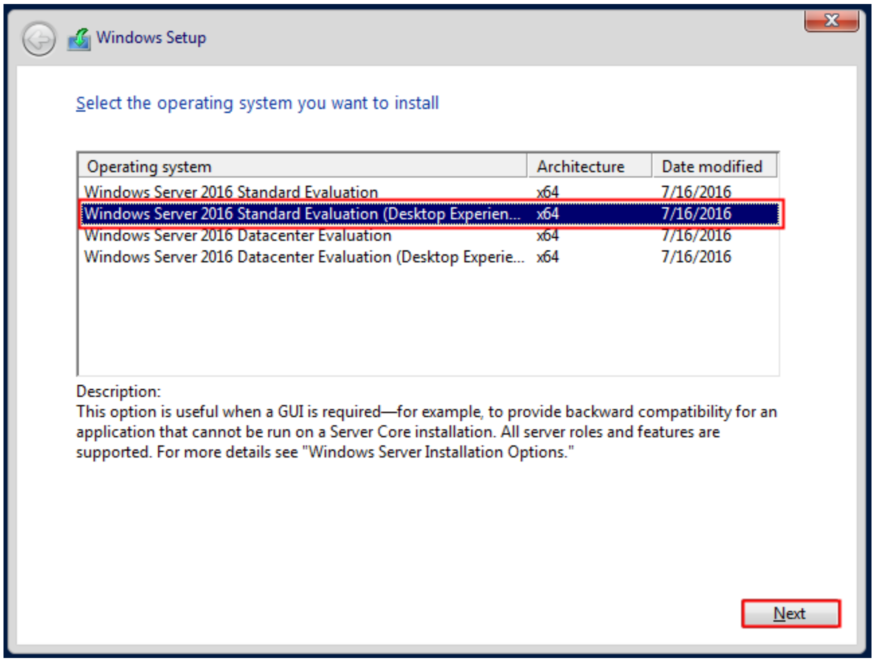

Windows Server 2016 on WINDOWSSERVER12 - Virtual Machine Connection
File
Action
Media
View
Help

15. **Windows Server 2016** virtual machine starts booting with the provided source.


Windows Server 2016 on WINDOWSSERVER12 - Virtual Machine Connection
File Action Media Clipboard View Help

16. While installing, Windows Setup appears, choose **Windows Server 2016 Standard Evaluation (Desktop Experience)** option and click **Next**. Follow the instructions during the installation and install Windows Server 2016 operating system. Once the installation is finished, Windows Server 2016 will restart.

    Note: Actual screenshots in the labs may vary.

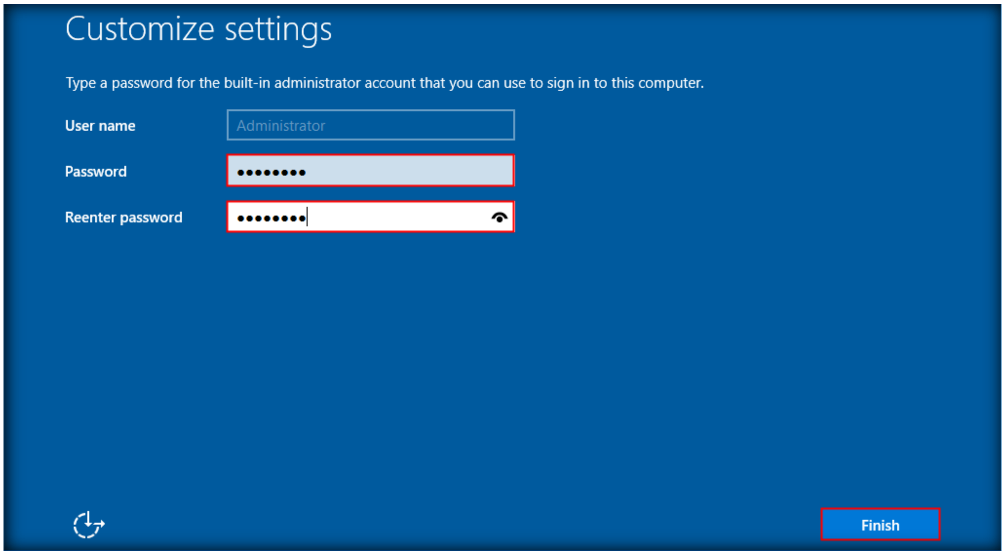


Select the operating system you want to install

Operating system	Architecture	Date modified
Windows Server 2016 Standard Evaluation	x64	7/16/2016
Windows Server 2016 Standard Evaluation (Desktop Experien...	x64	7/16/2016
Windows Server 2016 Datacenter Evaluation	x64	7/16/2016
Windows Server 2016 Datacenter Evaluation (Desktop Experie...	x64	7/16/2016

Description:
This option is useful when a GUI is required—for example, to provide backward compatibility for an application that cannot be run on a Server Core installation. All server roles and features are supported. For more details see "Windows Server Installation Options."

17. On installation, **Customize Settings** window appears where the username is set by default as **Administrator**. Enter the password as **Pa$$w0rd** in Password and Re-enter Password fields, and click **Finish**



Customize settings

Type a password for the built-in administrator account that you can use to sign in to this computer.

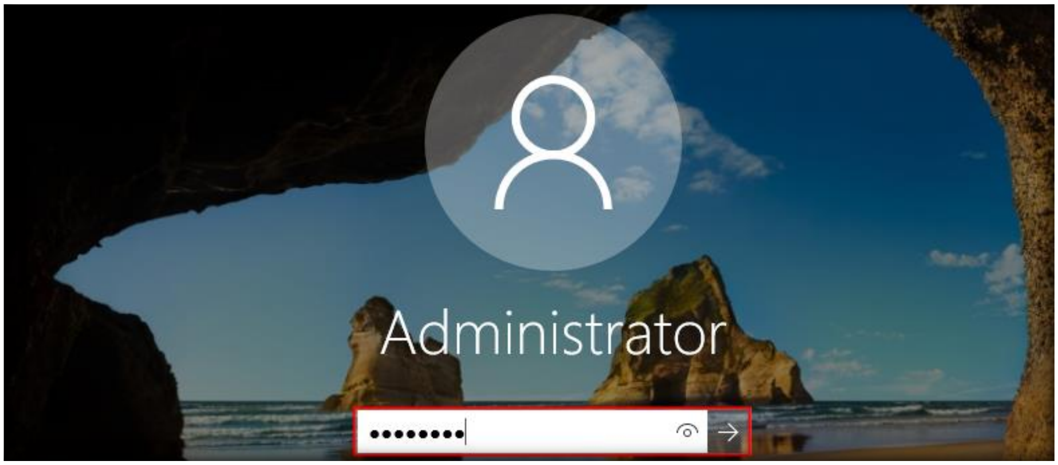
User name: Administrator

Password: ••••••••

Reenter password: ••••••••

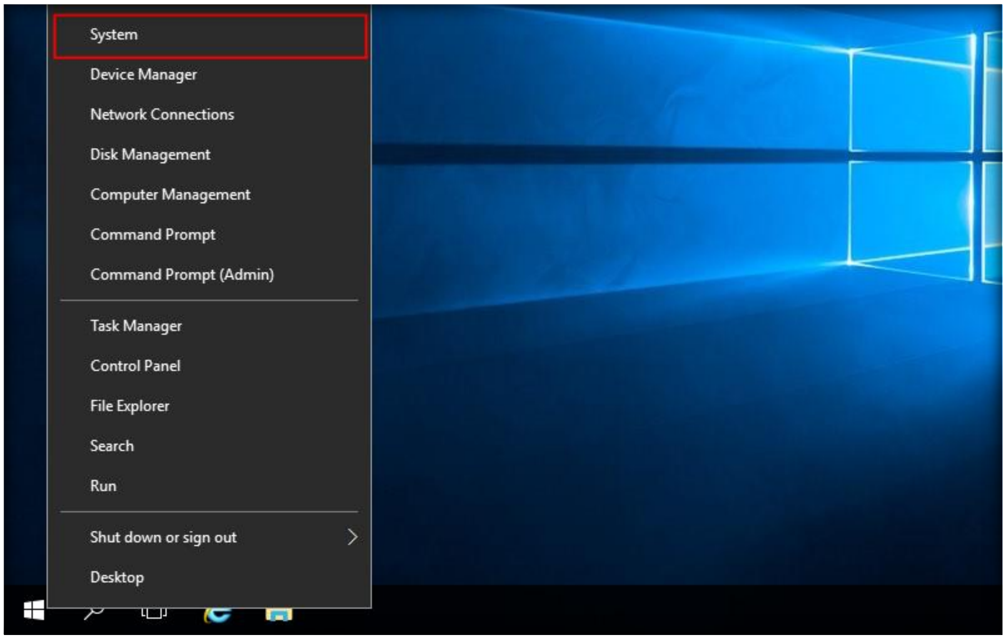
18. Click **Ctrl+Alt+Delete** icon on the menu-bar to login.

19. Login screen appears. Type the password (**Pa$$w0rd**) and press **Enter**.

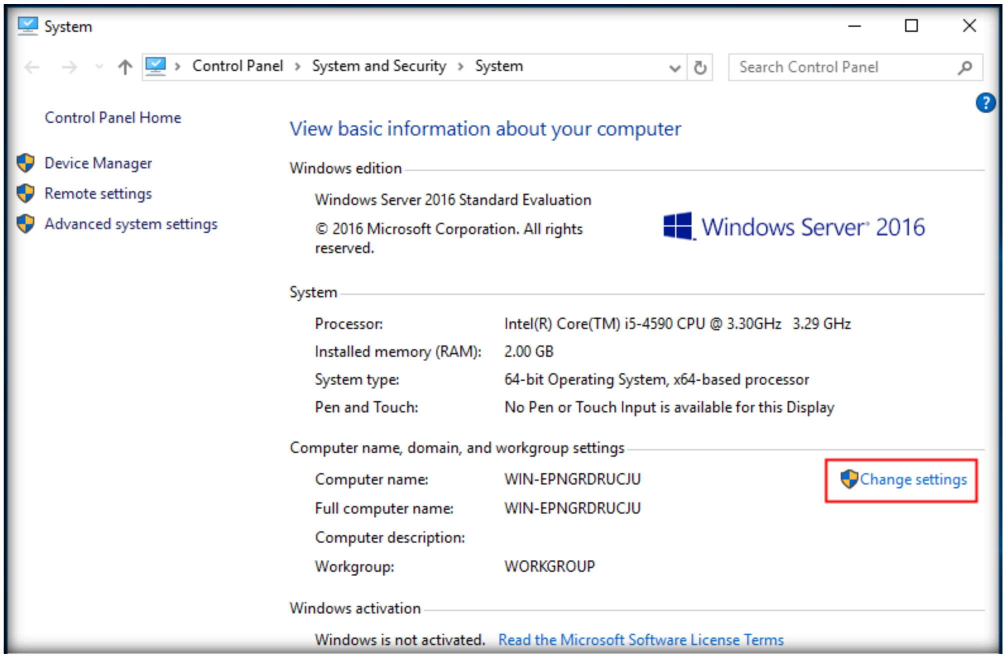


CT#4.2: Changing the Computer Name

1. Close the **Server Manager** window that opens. **Right-click Start** icon and click **System**.


System
Device Manager
Network Connections
Disk Management
Computer Management
Command Prompt
Command Prompt (Admin)
Task Manager
Control Panel
File Explorer
Search
Run
Shut down or sign out
Desktop

2. In the **System** window, click **Change settings** link.


System
Control Panel › System and Security › System
Search Control Panel
Control Panel Home
Device Manager
Remote settings
Advanced system settings
View basic information about your computer
Windows Server 2016
Change settings
Read the Microsoft Software License Terms

Windows edition

Windows Server 2016 Standard Evaluation

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System

Processor: Intel(R) Core(TM) i5-4590 CPU @ 3.30GHz 3.29 GHz

Installed memory (RAM): 2.00 GB

System type: 64-bit Operating System, x64-based processor

Pen and Touch: No Pen or Touch Input is available for this Display

Computer name, domain, and workgroup settings

Computer name: WIN-EPNGRDRUCJU

Full computer name: WIN-EPNGRDRUCJU

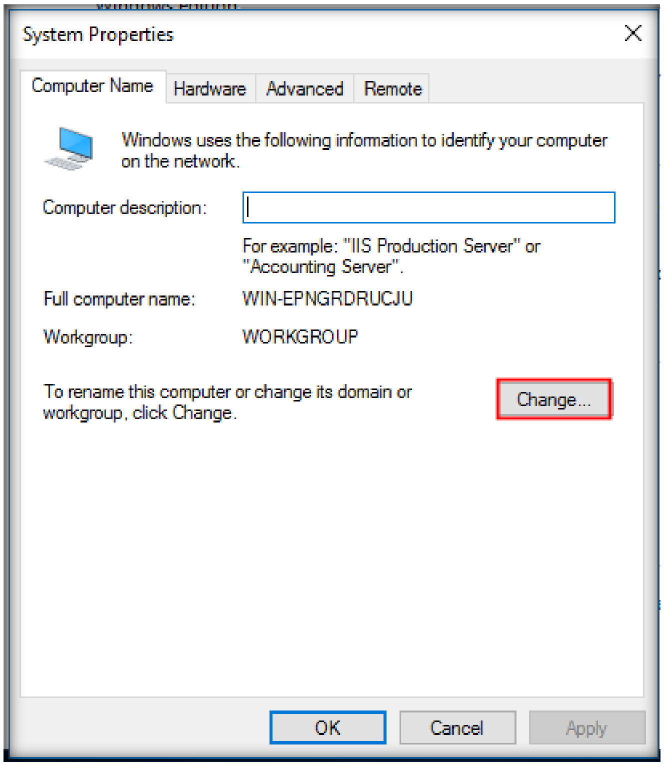
Computer description:

Workgroup: WORKGROUP

Windows activation

Windows is not activated.

3. In the **Computer Name** tab of the **System Properties** window, click **Change...** button.



System Properties

Windows uses the following information to identify your computer on the network.

Computer description:

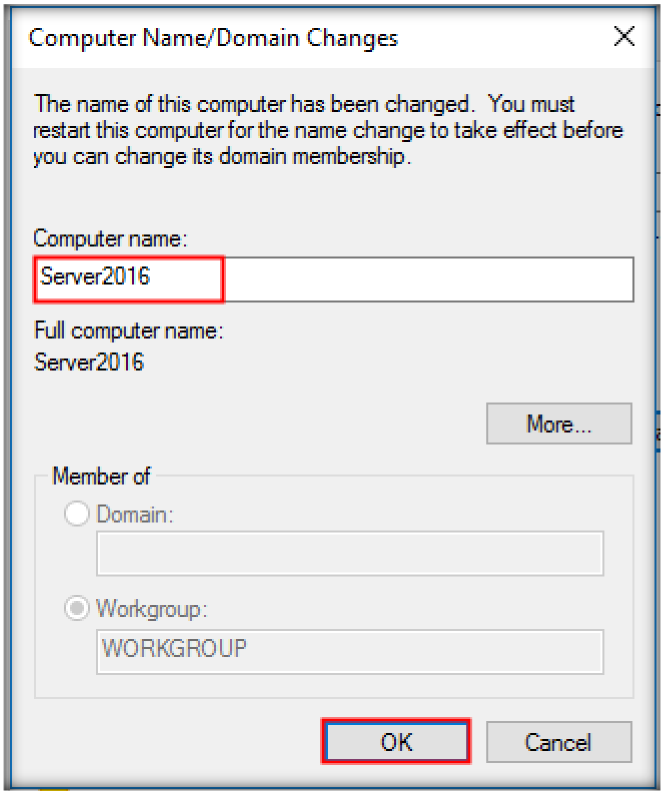
For example: "IIS Production Server" or "Accounting Server".

Full computer name: WIN-EPNGRDRUCJU

Workgroup: WORKGROUP

To rename this computer or change its domain or workgroup, click Change.

4. In the **Computer name** field enter **Server2016** and click **OK**.



Computer Name/Domain Changes

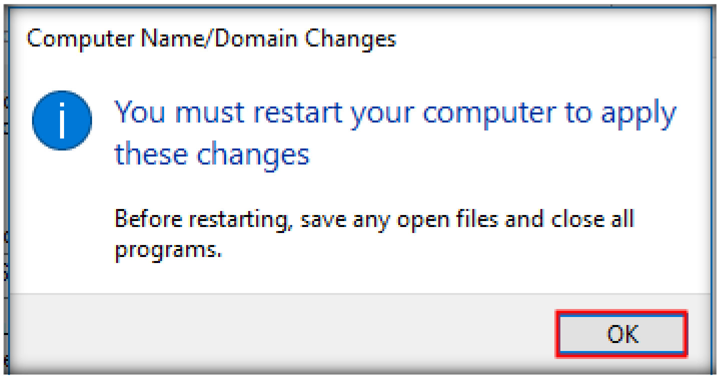
The name of this computer has been changed. You must restart this computer for the name change to take effect before you can change its domain membership.

Computer name: Server2016

Full computer name:
Server2016

Member of
○ Domain:
● Workgroup: WORKGROUP

5. When prompted to restart the system, click **OK**.

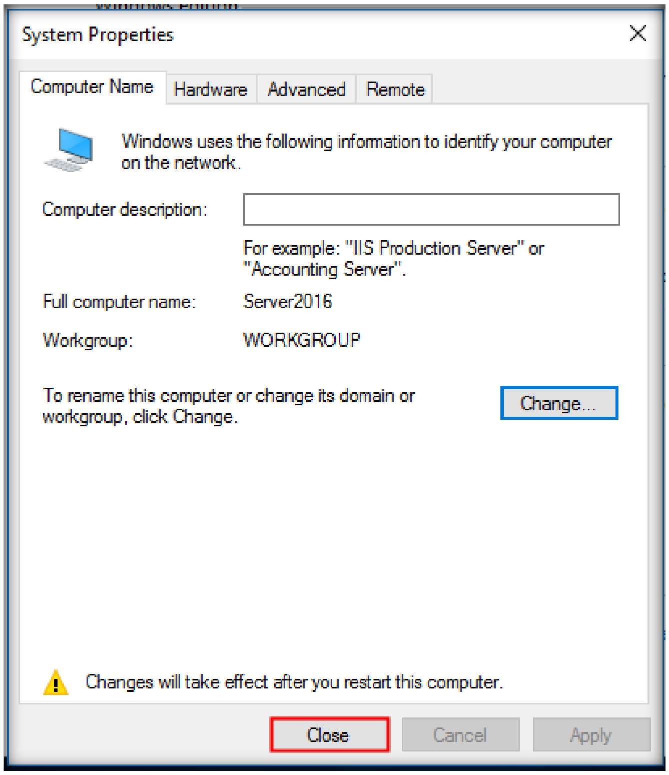


Computer Name/Domain Changes

You must restart your computer to apply these changes

Before restarting, save any open files and close all programs.

6. You will be returned back to System Properties window, click **Close**



System Properties

Computer Name: Windows uses the following information to identify your computer on the network.

Computer description:

For example: "IIS Production Server" or "Accounting Server".

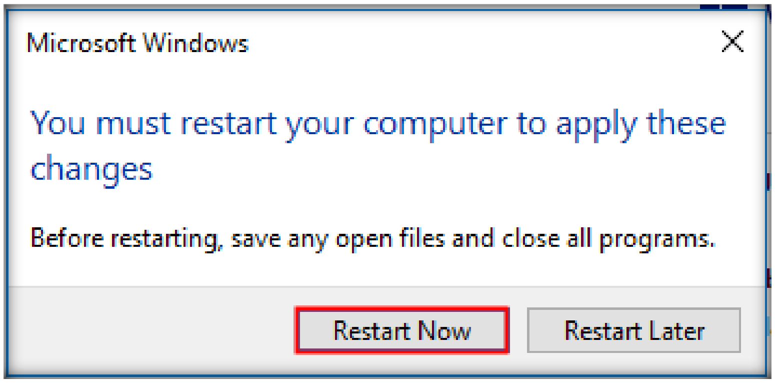
Full computer name: Server2016

Workgroup: WORKGROUP

To rename this computer or change its domain or workgroup, click Change.

Changes will take effect after you restart this computer.

7. You will be prompted to restart the system, click **Restart Now**.



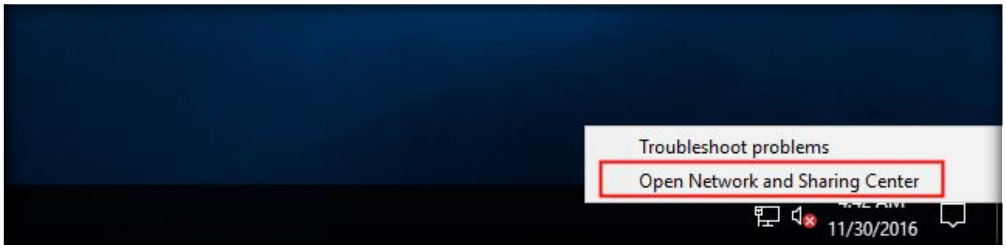
Microsoft Windows

You must restart your computer to apply these changes

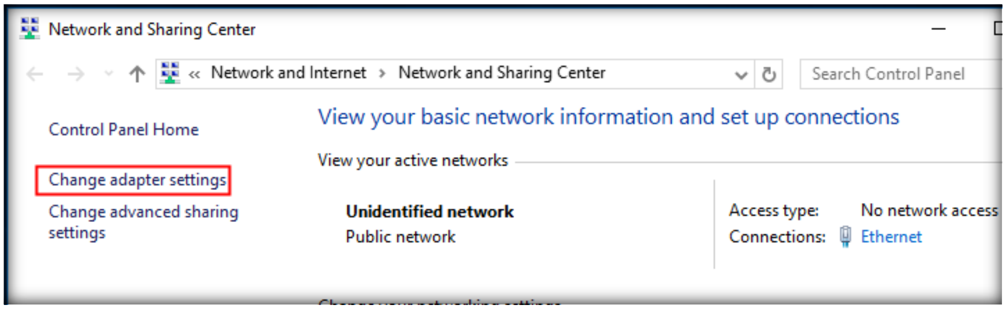
Before restarting, save any open files and close all programs.

CT#4.3: Configuring Static IP Address

1. Login as Administrator. Close the **Server Manager** window that opens after successful sign in, **right-click Network** icon (lower right corner of the desktop) and click **Open Network and Sharing Center** from the context menu.


Troubleshoot problems
Open Network and Sharing Center
11/30/2016

2. Network and Sharing Center window appears, click **Change adapter settings** link from the left pane


Network and Sharing Center
Network and Internet › Network and Sharing Center
Search Control Panel
Control Panel Home
Change adapter settings
Change advanced sharing settings

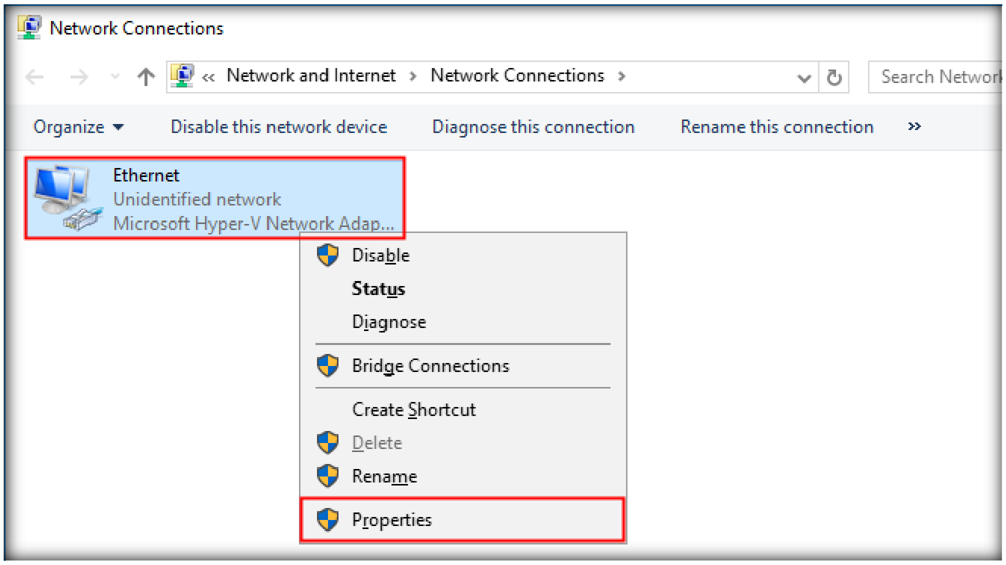
View your basic network information and set up connections

View your active networks

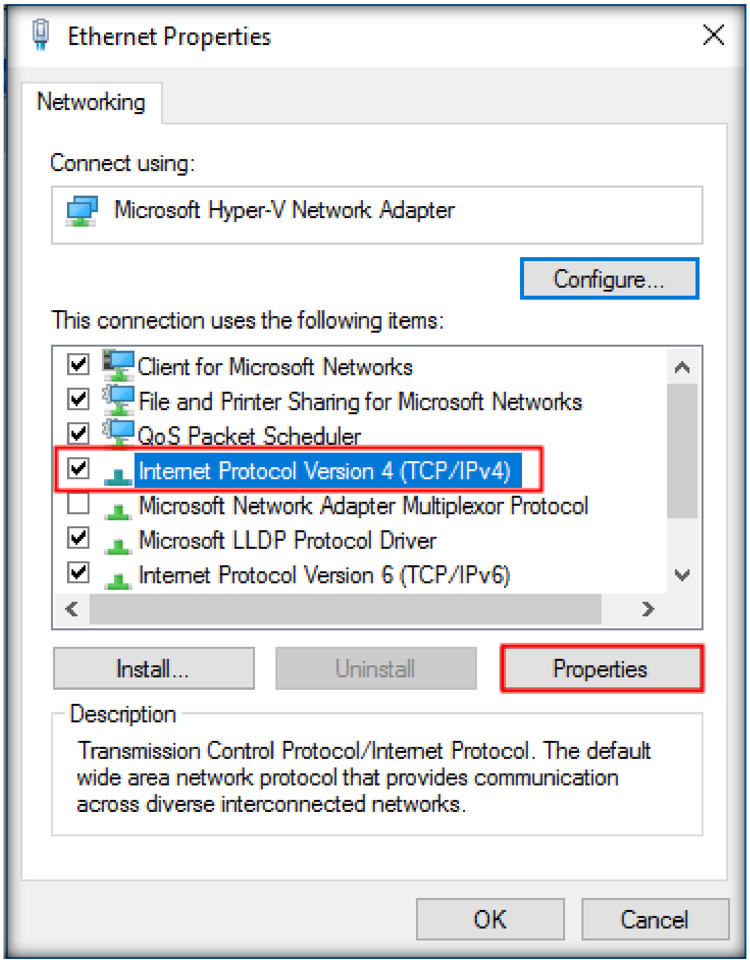
Unidentified network
Public network

Access type: No network access
Connections: Ethernet

3. In the **Network Connections** window, **right-click Ethernet** adapter and click **Properties** from the context menu


Network Connections
Network and Internet › Network Connections ›
Search Network
Organize
Disable this network device
Diagnose this connection
Rename this connection
»
Ethernet
Unidentified network
Microsoft Hyper-V Network Adap...
Disable
Status
Diagnose
Bridge Connections
Create Shortcut
Delete
Rename
Properties

4. **Ethernet Properties** window appears; and select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**

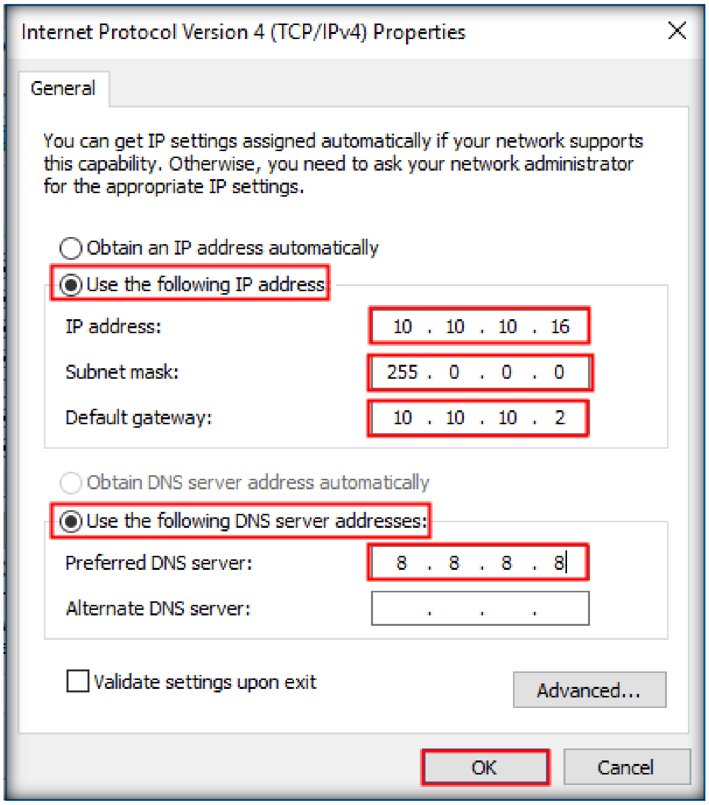


Ethernet Properties
Networking
Connect using:
Microsoft Hyper-V Network Adapter
Configure...
This connection uses the following items:
☑ Client for Microsoft Networks
☑ File and Printer Sharing for Microsoft Networks
☑ QoS Packet Scheduler
☑ Internet Protocol Version 4 (TCP/IPv4)
☐ Microsoft Network Adapter Multiplexor Protocol
☑ Microsoft LLDP Protocol Driver
☑ Internet Protocol Version 6 (TCP/IPv6)
Install...
Uninstall
Properties
Description
OK
Cancel

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

5. Select **Use the following IP address** and **Use the following DNS server addresses** radio buttons, and type the following values as shown in the screenshot, and click **OK**.
    - **IP address: 10.10.10.16**
    - **Subnet mask: 255.0.0.0**
    - **Default gateway: 10.10.10.2**
    - **Preferred DNS server: 8.8.8.8**

   Note: Once you click **OK** button if Networks section appears on the right side of the desktop screen, and then click **Yes**.



Internet Protocol Version 4 (TCP/IPv4) Properties

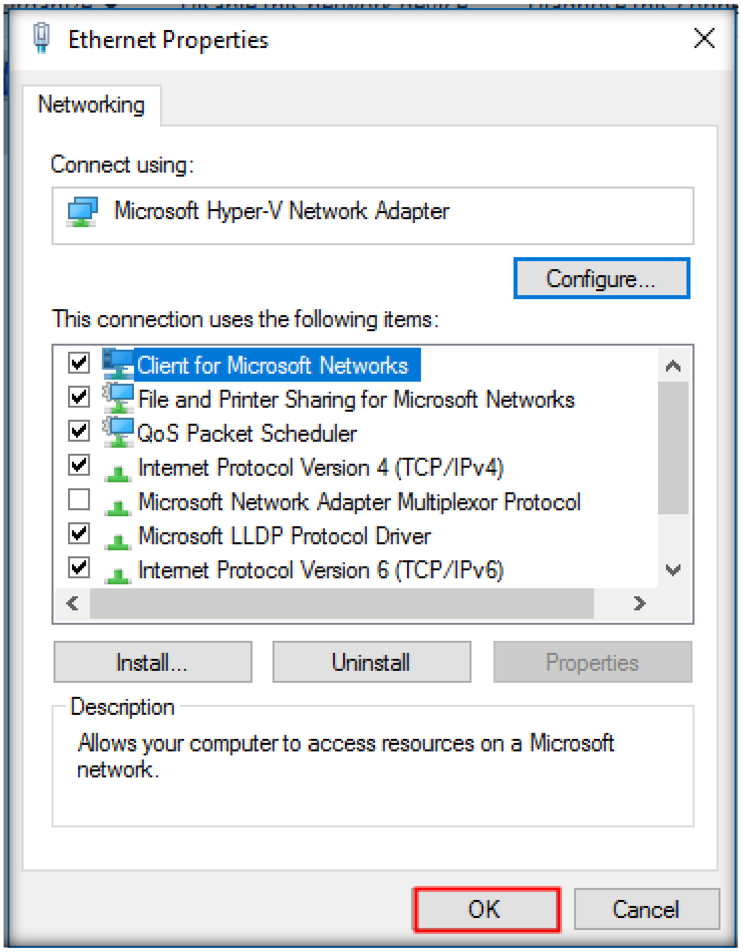
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically
● Use the following IP address
IP address: 10 . 10 . 10 . 16
Subnet mask: 255 . 0 . 0 . 0
Default gateway: 10 . 10 . 10 . 2

○ Obtain DNS server address automatically
● Use the following DNS server addresses:
Preferred DNS server: 8 . 8 . 8 . 8
Alternate DNS server: . . .

☐ Validate settings upon exit

6. Click **Close** to close the **Ethernet Properties** window

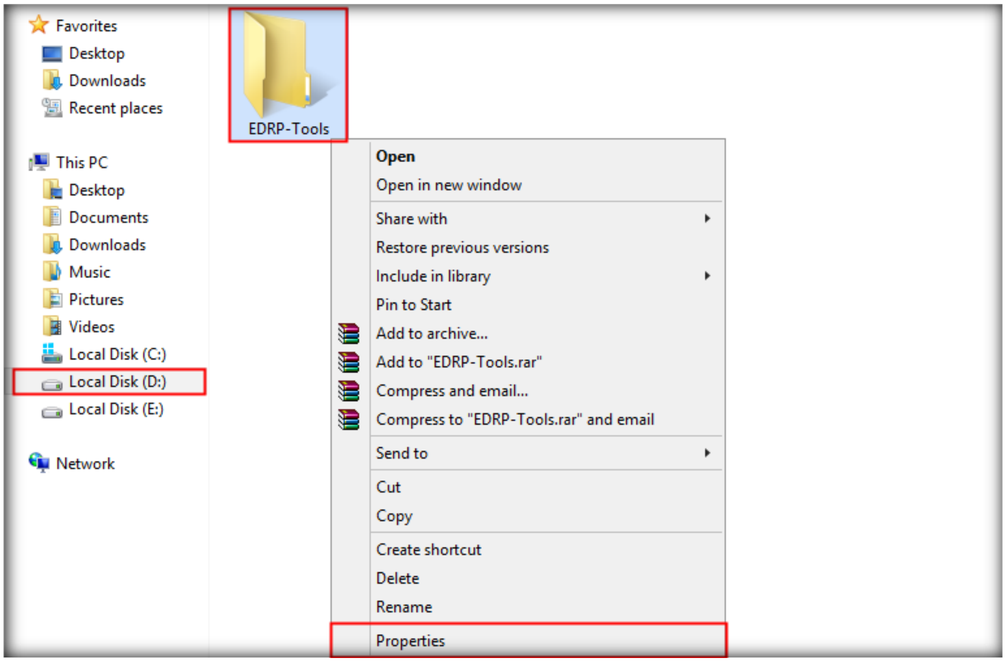

Ethernet Properties
Networking
Connect using:
Microsoft Hyper-V Network Adapter
Configure...
This connection uses the following items:
☑ Client for Microsoft Networks
☑ File and Printer Sharing for Microsoft Networks
☑ QoS Packet Scheduler
☑ Internet Protocol Version 4 (TCP/IPv4)
☐ Microsoft Network Adapter Multiplexor Protocol
☑ Microsoft LLDP Protocol Driver
☑ Internet Protocol Version 6 (TCP/IPv6)
Install...
Uninstall
Properties
Description
Allows your computer to access resources on a Microsoft network.
OK
Cancel

7. Now, check whether Windows Server 2016 is installed and working properly and check whether Internet is accessible

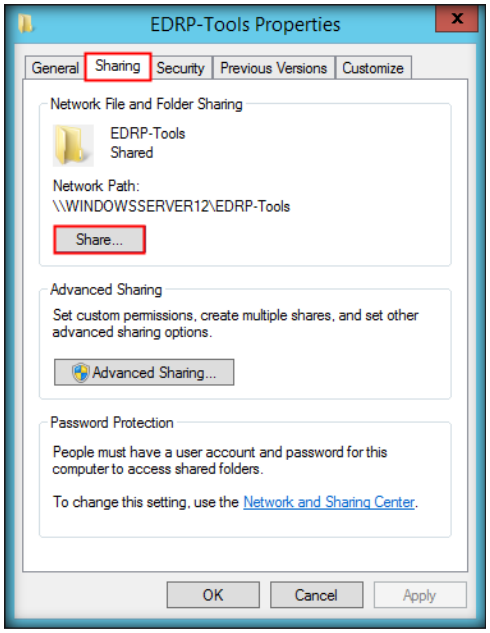
CT#4.4: Sharing EDRP-Tools Folder from Host Machine and Mapping to Windows Server 2016 VM

1. Navigate to **D:\** (where EDRP-Tools) folder is located in your host machine
2. **Right-click EDRP-Tools** folder and click **Properties** from the context menu

   Note: If you have placed EDRP-Tools in a different drive then screenshots may differ in your lab environment.


Favorites
Desktop
Downloads
Recent places
This PC
Desktop
Documents
Downloads
Music
Pictures
Videos
Local Disk (C:)
Local Disk (D:)
Local Disk (E:)
Network
EDRP-Tools
Open
Open in new window
Share with
Restore previous versions
Include in library
Pin to Start
Add to archive...
Add to "EDRP-Tools.rar"
Compress and email...
Compress to "EDRP-Tools.rar" and email
Send to
Cut
Copy
Create shortcut
Delete
Rename
Properties

3. **EDRP-Tools Properties** window appears, click **Sharing** tab, and then click **Share...** button as shown in the screenshot.


EDRP-Tools Properties
General
Sharing
Security
Previous Versions
Customize
Network File and Folder Sharing
EDRP-Tools
Shared
Share...
Advanced Sharing
Advanced Sharing...
Password Protection
Network and Sharing Center
OK
Cancel
Apply

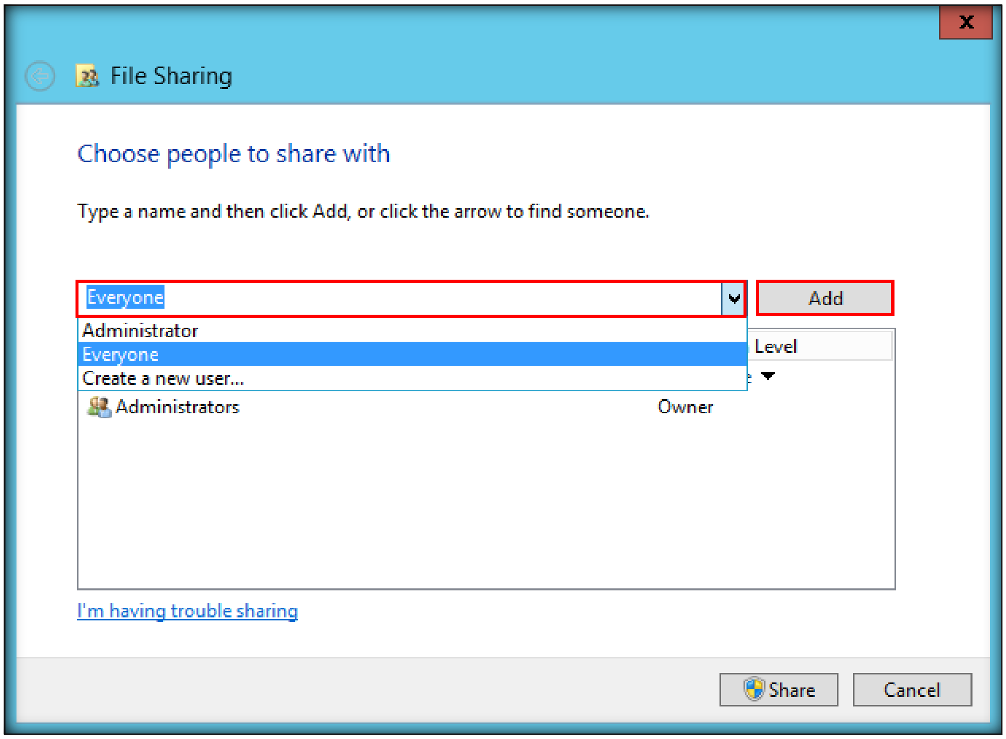
Network Path:
\\WINDOWSSERVER12\EDRP-Tools

Set custom permissions, create multiple shares, and set other advanced sharing options.

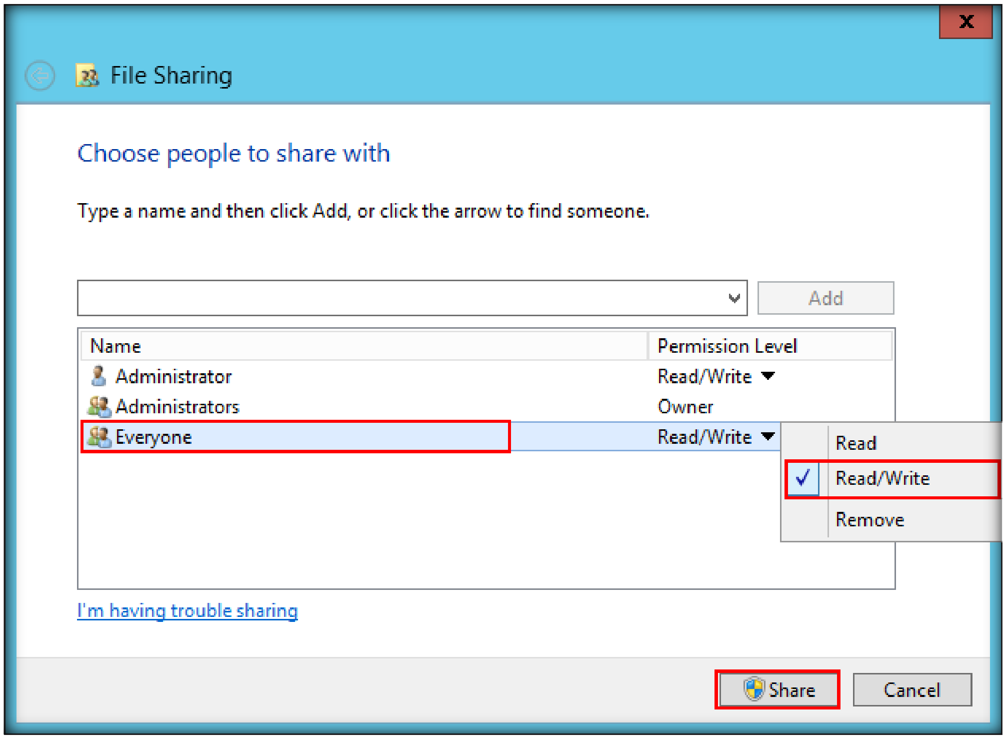
People must have a user account and password for this computer to access shared folders.

To change this setting, use the Network and Sharing Center.

4. File Sharing window appears, select **Everyone** from drop-down list and click **Add** in Choose people to share with wizard

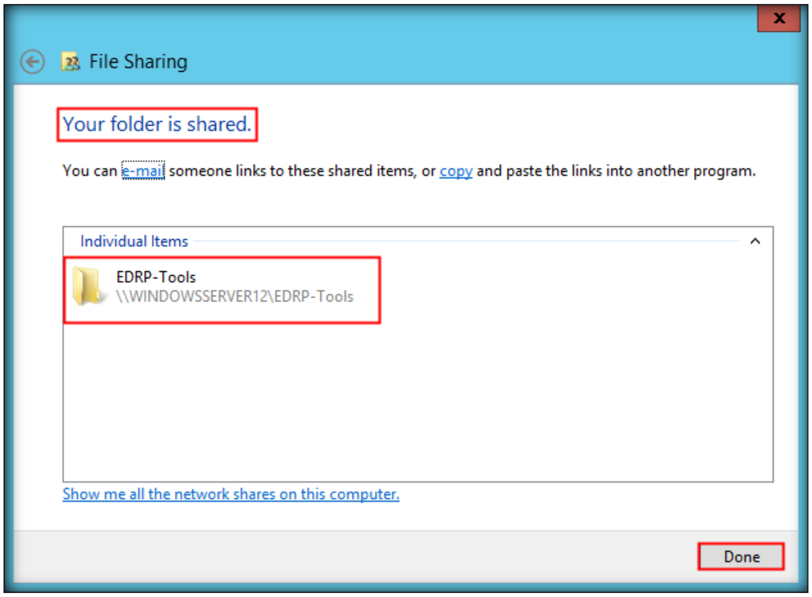

File Sharing
Choose people to share with
Type a name and then click Add, or click the arrow to find someone.
Everyone
Add
Administrator
Everyone
Create a new user...
Level
Administrators
Owner
I'm having trouble sharing
Share
Cancel

5. Everyone will be added to the list, click to give access of **Read/Write** option and click **Share** button


File Sharing
Choose people to share with
Type a name and then click Add, or click the arrow to find someone.
Add
Name
Permission Level
Administrator
Read/Write
Administrators
Owner
Everyone
Read/Write
Read
Read/Write
Remove
I'm having trouble sharing
Share
Cancel

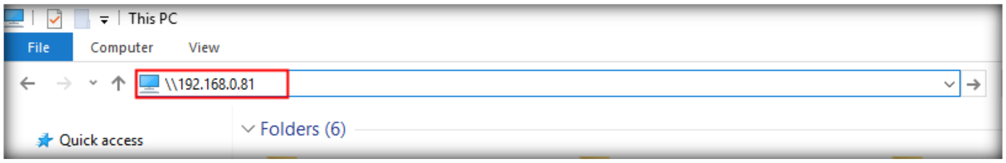
6. Your folder is shared screen appears, click **Done** button as shown in the screenshot

   Note: Your local host machine name will differ in your lab environment.

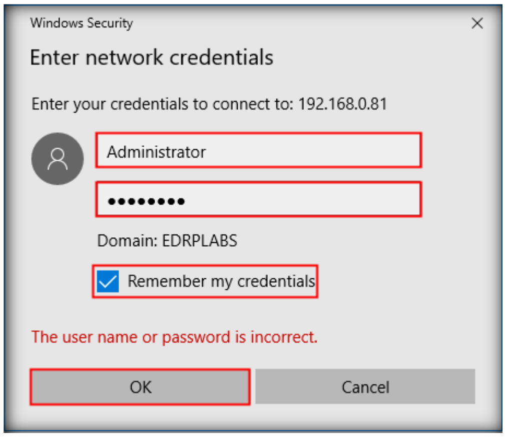

File Sharing
Your folder is shared.
You can e-mail someone links to these shared items, or copy and paste the links into another program.
Individual Items
EDRP-Tools
\\WINDOWSSERVER12\EDRP-Tools
Show me all the network shares on this computer.
Done

7. Close all the windows that were open in your host machine
8. Switch to **Windows Server 2016** virtual machine, if it is turned off then turn on the machine, and login with the administrator credentials. After logged in to the machine close the Server Manager window
9. Open File Explorer, and type **\\[IP Address of your host machine]** e.g. **\\192.168.0.81**, in the address bar and press **Enter**

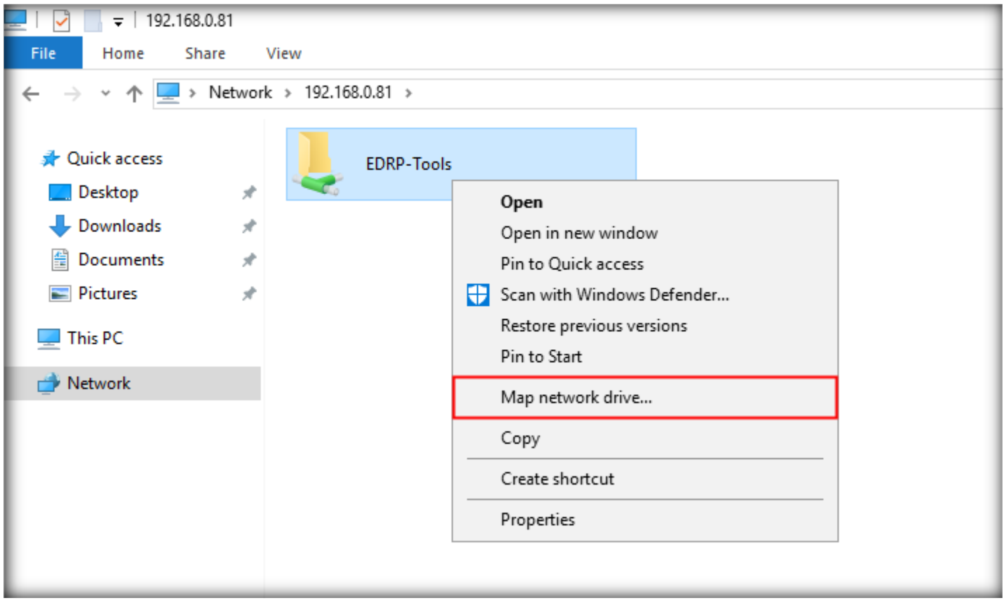
   Note: IP address may vary.


This PC
File
Computer
View
\\192.168.0.81
Quick access
Folders (6)

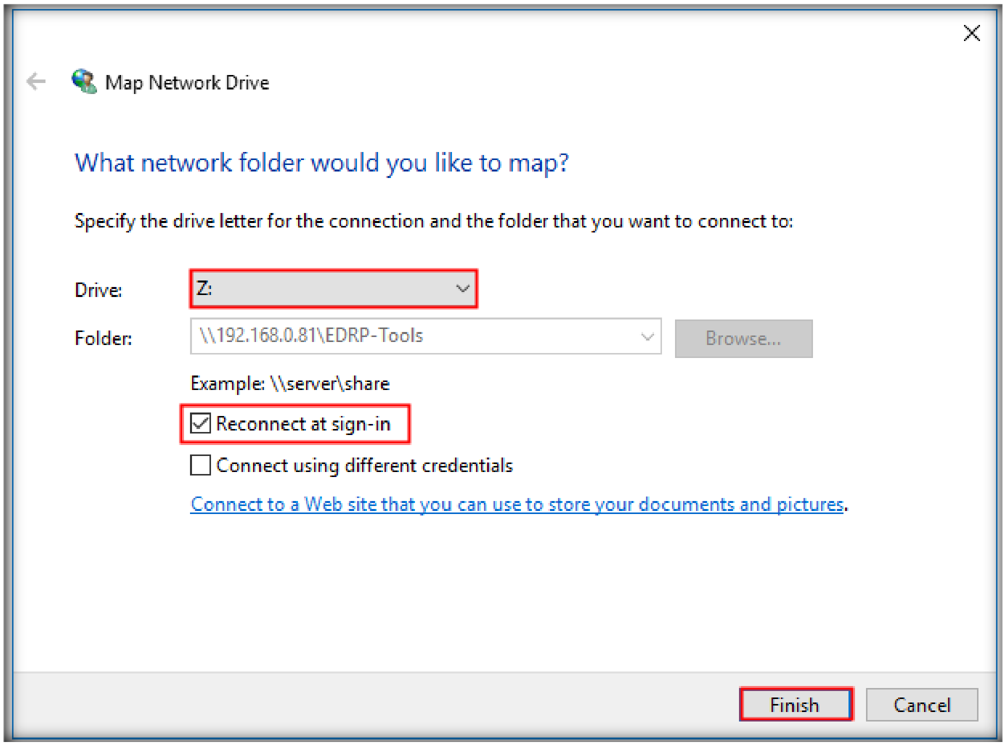
10. Type your Host machine credentials, check the **Remember my credentials** check box and click **OK**, in the **Windows Security** pop-up window.


Windows Security
Enter network credentials
Enter your credentials to connect to: 192.168.0.81
Administrator
••••••••
Domain: EDRPLABS
☑ Remember my credentials
The user name or password is incorrect.
OK
Cancel

11. **Right-click EDRP-Tools** shared folder and click **Map network** drive from the context menu as shown in the screenshot


192.168.0.81
File
Home
Share
View
Network
192.168.0.81
Quick access
Desktop
Downloads
Documents
Pictures
This PC
Network
EDRP-Tools
Open
Open in new window
Pin to Quick access
Scan with Windows Defender...
Restore previous versions
Pin to Start
Map network drive...
Copy
Create shortcut
Properties

12. **Map Network Drive** window appears, assign drive letter as **Z:\**, make sure that **Reconnect at sign-in option** is checked and click **Finish**


Map Network Drive
Browse...
Finish
Cancel

What network folder would you like to map?

Specify the drive letter for the connection and the folder that you want to connect to:

Drive: Z:

Folder: \\192.168.0.81\EDRP-Tools

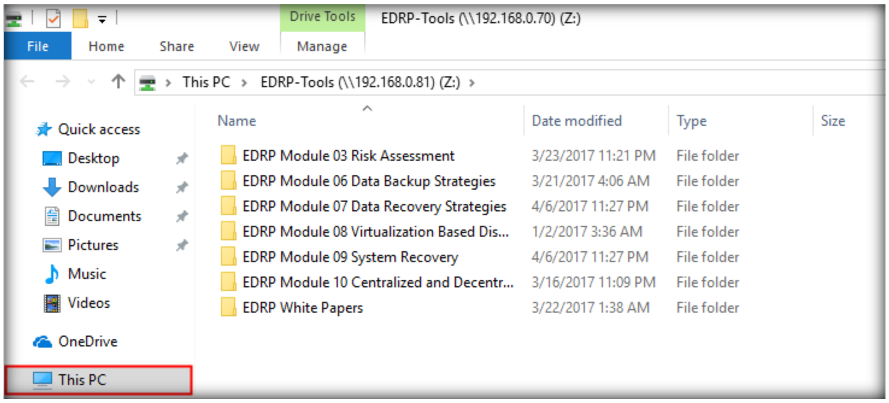
Example: \\server\share

☑ Reconnect at sign-in

☐ Connect using different credentials

Connect to a Web site that you can use to store your documents and pictures.

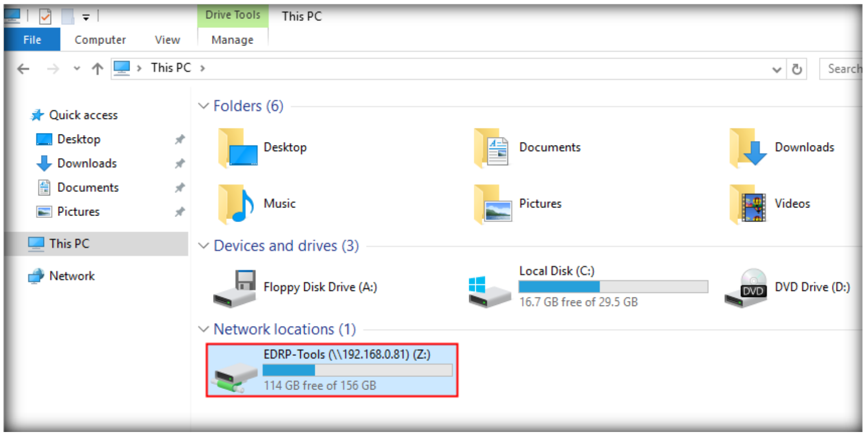
13. EDRP-Tools mapped network drive appears in the File Explorer view, click **This-PC** from the left pane to confirm


Drive Tools
EDRP-Tools (\\192.168.0.70) (Z:)
File
Home
Share
View
Manage
This PC › EDRP-Tools (\\192.168.0.81) (Z:) ›
Quick access
Desktop
Downloads
Documents
Pictures
Music
Videos
OneDrive
This PC

Name	Date modified	Type	Size
EDRP Module 03 Risk Assessment	3/23/2017 11:21 PM	File folder	
EDRP Module 06 Data Backup Strategies	3/21/2017 4:06 AM	File folder	
EDRP Module 07 Data Recovery Strategies	4/6/2017 11:27 PM	File folder	
EDRP Module 08 Virtualization Based Dis...	1/2/2017 3:36 AM	File folder	
EDRP Module 09 System Recovery	4/6/2017 11:27 PM	File folder	
EDRP Module 10 Centralized and Decentr...	3/16/2017 11:09 PM	File folder	
EDRP White Papers	3/22/2017 1:38 AM	File folder	

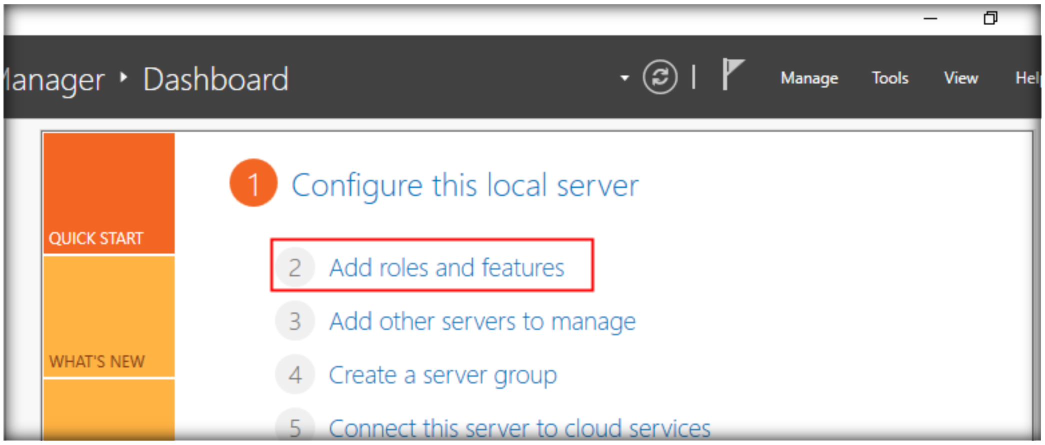
14. Now you can see that **EDRP-Tools** directory is mapped to the Windows Server 2016 machine as shown in the screenshot

Note: Throughout this configuration, the IP address of the host machine may differ in your lab environment.

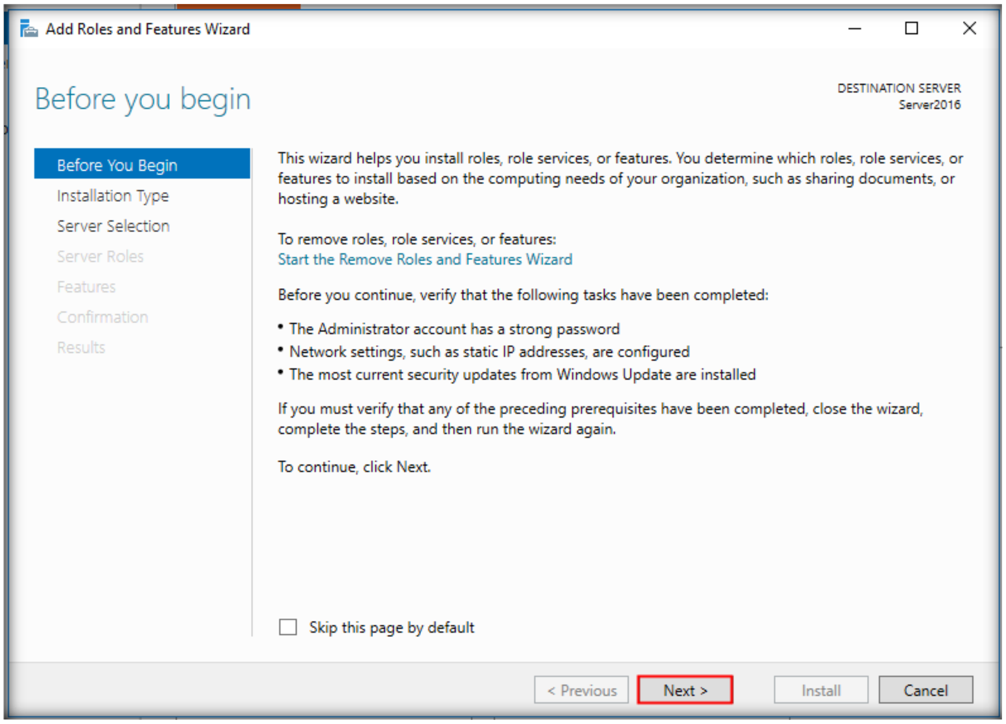

Drive Tools
This PC
File
Computer
View
Manage
This PC ›
Search
Quick access
Desktop
Downloads
Documents
Pictures
This PC
Network
Folders (6)
Desktop
Documents
Downloads
Music
Pictures
Videos
Devices and drives (3)
Floppy Disk Drive (A:)
Local Disk (C:)
16.7 GB free of 29.5 GB
DVD Drive (D:)
Network locations (1)
EDRP-Tools (\\192.168.0.81) (Z:)
114 GB free of 156 GB

CT#4.5: Installing Active Directory

1. To install Active Directory (AD) in Server 2016 VM, launch Server Manager, click **Add roles and features** option in **Configure this local server pane**.


lanager ‣ Dashboard
Manage
Tools
View
Hel
QUICK START
WHAT'S NEW
1 Configure this local server
2 Add roles and features
3 Add other servers to manage
4 Create a server group
5 Connect this server to cloud services

2. **Add Roles and Features wizard** appears click **Next** to, continue.



Add Roles and Features Wizard

Before you begin

DESTINATION SERVER
Server2016

Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results

This wizard helps you install roles, role services, or features. You determine which roles, role services, or features to install based on the computing needs of your organization, such as sharing documents, or hosting a website.

To remove roles, role services, or features:
Start the Remove Roles and Features Wizard

Before you continue, verify that the following tasks have been completed:

- The Administrator account has a strong password
- Network settings, such as static IP addresses, are configured
- The most current security updates from Windows Update are installed

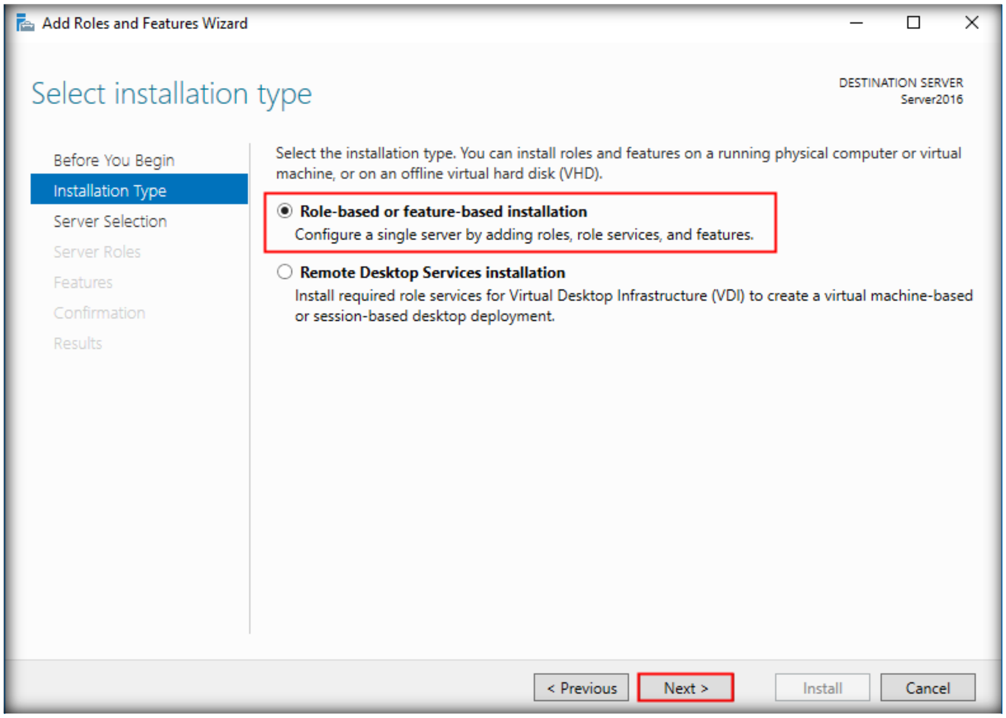
If you must verify that any of the preceding prerequisites have been completed, close the wizard, complete the steps, and then run the wizard again.

To continue, click Next.

☐ Skip this page by default

< Previous
Next >
Install
Cancel

3. Select **Role-based or feature-based installation** radio button in wizard and click **Next**.



Add Roles and Features Wizard

Select installation type

DESTINATION SERVER
Server2016

Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results

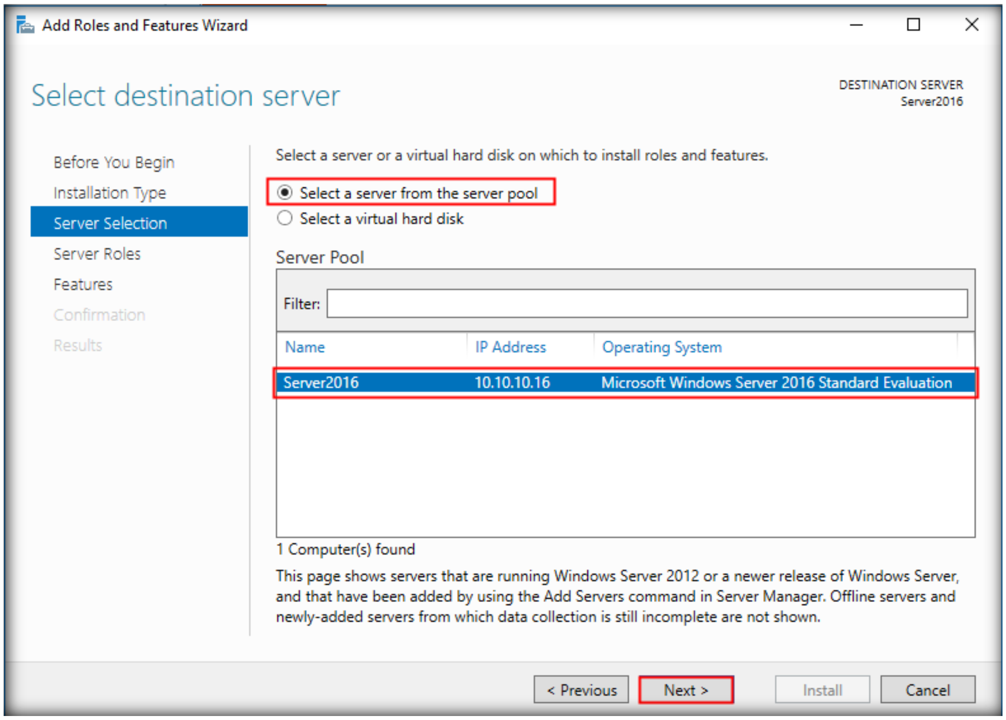
Select the installation type. You can install roles and features on a running physical computer or virtual machine, or on an offline virtual hard disk (VHD).

● **Role-based or feature-based installation**
Configure a single server by adding roles, role services, and features.

○ **Remote Desktop Services installation**
Install required role services for Virtual Desktop Infrastructure (VDI) to create a virtual machine-based or session-based desktop deployment.

< Previous
Next >
Install
Cancel

4. **Select destination server** window will appear. **Select a server from the server pool** radio button is selected by default. Click **Next** button to continue.


Add Roles and Features Wizard
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results
< Previous
Next >
Install
Cancel

Select destination server

DESTINATION SERVER
Server2016

Select a server or a virtual hard disk on which to install roles and features.

● Select a server from the server pool
○ Select a virtual hard disk

Server Pool

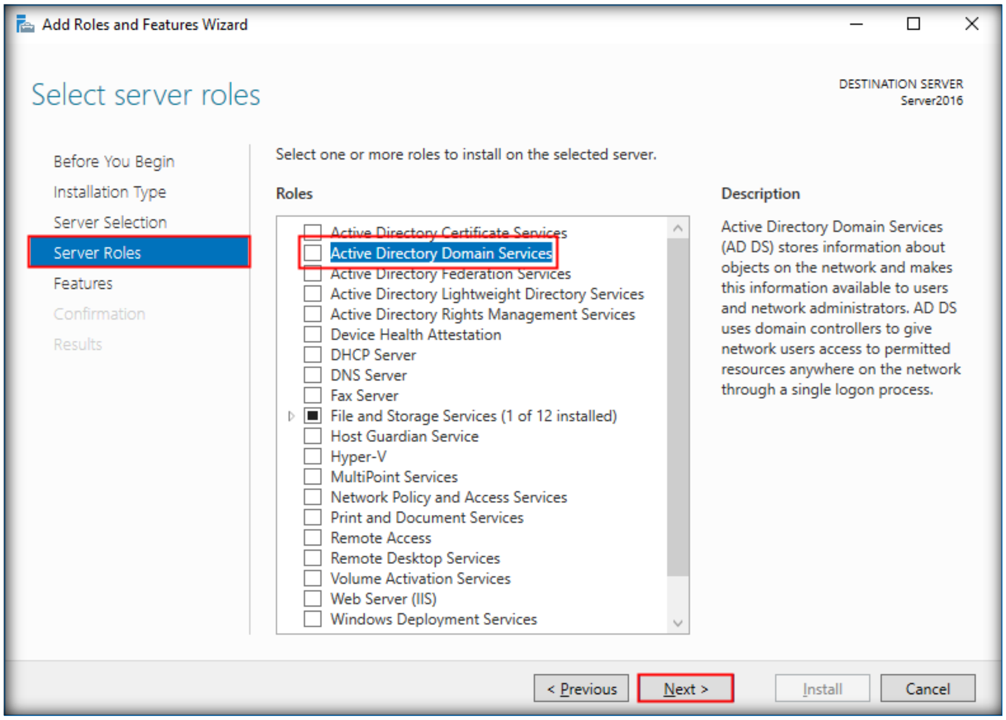
Filter:

Name	IP Address	Operating System
Server2016	10.10.10.16	Microsoft Windows Server 2016 Standard Evaluation

1 Computer(s) found

This page shows servers that are running Windows Server 2012 or a newer release of Windows Server, and that have been added by using the Add Servers command in Server Manager. Offline servers and newly-added servers from which data collection is still incomplete are not shown.

5. **Select Server Roles** window will appear, click **Active Directory Domain Services** checkbox in the Roles pane.


Add Roles and Features Wizard
Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results
< Previous
Next >
Install
Cancel

Select server roles

DESTINATION SERVER
Server2016

Select one or more roles to install on the selected server.

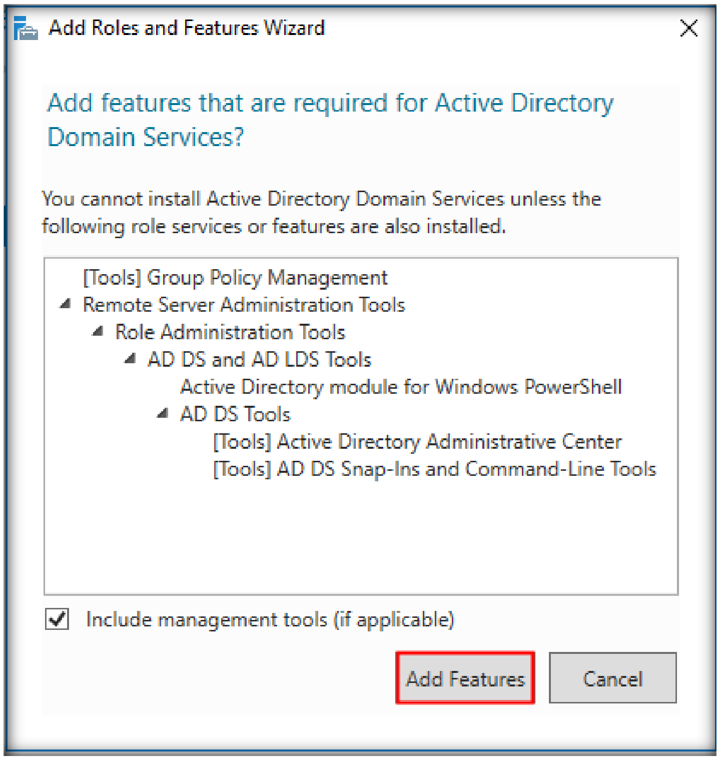
Roles

- ☐ Active Directory Certificate Services
- ☐ Active Directory Domain Services
- ☐ Active Directory Federation Services
- ☐ Active Directory Lightweight Directory Services
- ☐ Active Directory Rights Management Services
- ☐ Device Health Attestation
- ☐ DHCP Server
- ☐ DNS Server
- ☐ Fax Server
- ■ File and Storage Services (1 of 12 installed)
- ☐ Host Guardian Service
- ☐ Hyper-V
- ☐ MultiPoint Services
- ☐ Network Policy and Access Services
- ☐ Print and Document Services
- ☐ Remote Access
- ☐ Remote Desktop Services
- ☐ Volume Activation Services
- ☐ Web Server (IIS)
- ☐ Windows Deployment Services

Description

Active Directory Domain Services (AD DS) stores information about objects on the network and makes this information available to users and network administrators. AD DS uses domain controllers to give network users access to permitted resources anywhere on the network through a single logon process.

6. **Add Roles and Features Wizard** window will pop up, click **Add Features** button.



Add Roles and Features Wizard

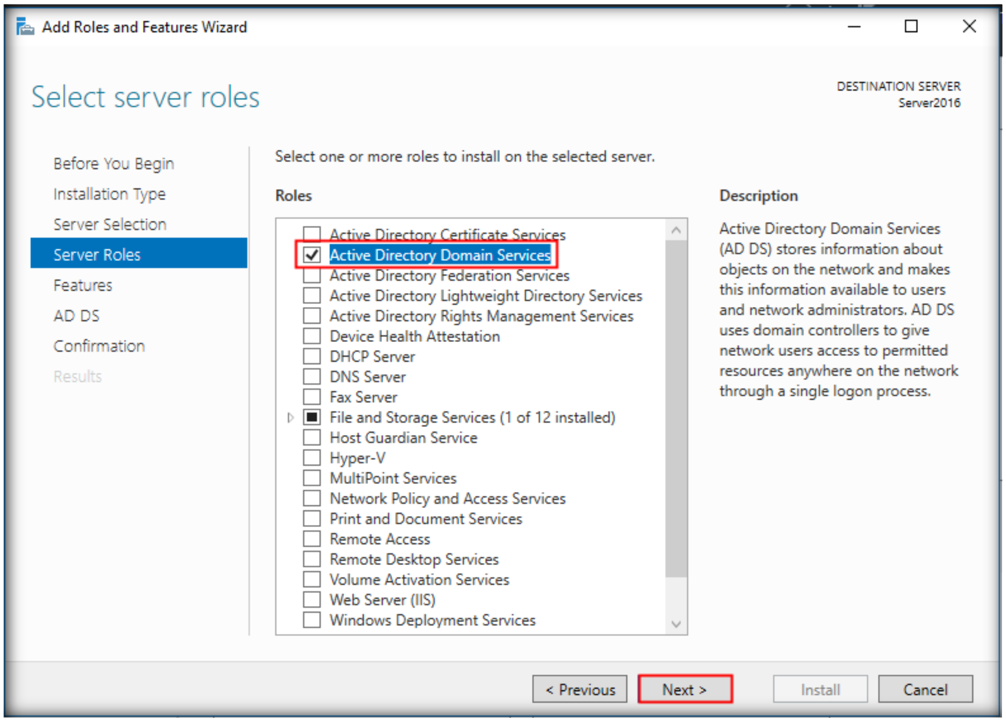
Add features that are required for Active Directory Domain Services?

You cannot install Active Directory Domain Services unless the following role services or features are also installed.

- [Tools] Group Policy Management
- Remote Server Administration Tools
  - Role Administration Tools
    - AD DS and AD LDS Tools
      - Active Directory module for Windows PowerShell
      - AD DS Tools
        - [Tools] Active Directory Administrative Center
        - [Tools] AD DS Snap-Ins and Command-Line Tools

☑ Include management tools (if applicable)

7. Again **Server Roles** window will appear again, Active Directory Domain Services check-box is ticked. Click **Next** button to continue.



Add Roles and Features Wizard

Select server roles

DESTINATION SERVER
Server2016

Select one or more roles to install on the selected server.

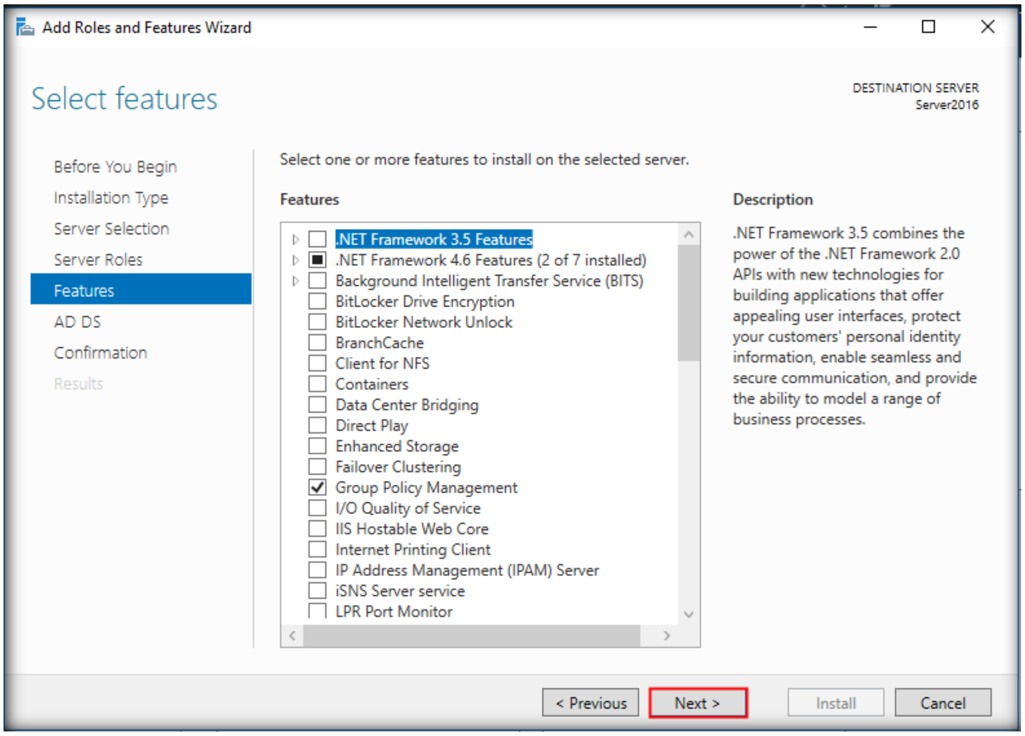
Roles

- ☐ Active Directory Certificate Services
- ☑ Active Directory Domain Services
- ☐ Active Directory Federation Services
- ☐ Active Directory Lightweight Directory Services
- ☐ Active Directory Rights Management Services
- ☐ Device Health Attestation
- ☐ DHCP Server
- ☐ DNS Server
- ☐ Fax Server
- ■ File and Storage Services (1 of 12 installed)
- ☐ Host Guardian Service
- ☐ Hyper-V
- ☐ MultiPoint Services
- ☐ Network Policy and Access Services
- ☐ Print and Document Services
- ☐ Remote Access
- ☐ Remote Desktop Services
- ☐ Volume Activation Services
- ☐ Web Server (IIS)
- ☐ Windows Deployment Services

Description

Active Directory Domain Services (AD DS) stores information about objects on the network and makes this information available to users and network administrators. AD DS uses domain controllers to give network users access to permitted resources anywhere on the network through a single logon process.

8. **Features** window will appear, click **Next** button to continue.



Add Roles and Features Wizard
Select features
DESTINATION SERVER
Server2016
Before You Begin
Installation Type
Server Selection
Server Roles
Features
AD DS
Confirmation
Results
< Previous
Next >
Install
Cancel

Select one or more features to install on the selected server.

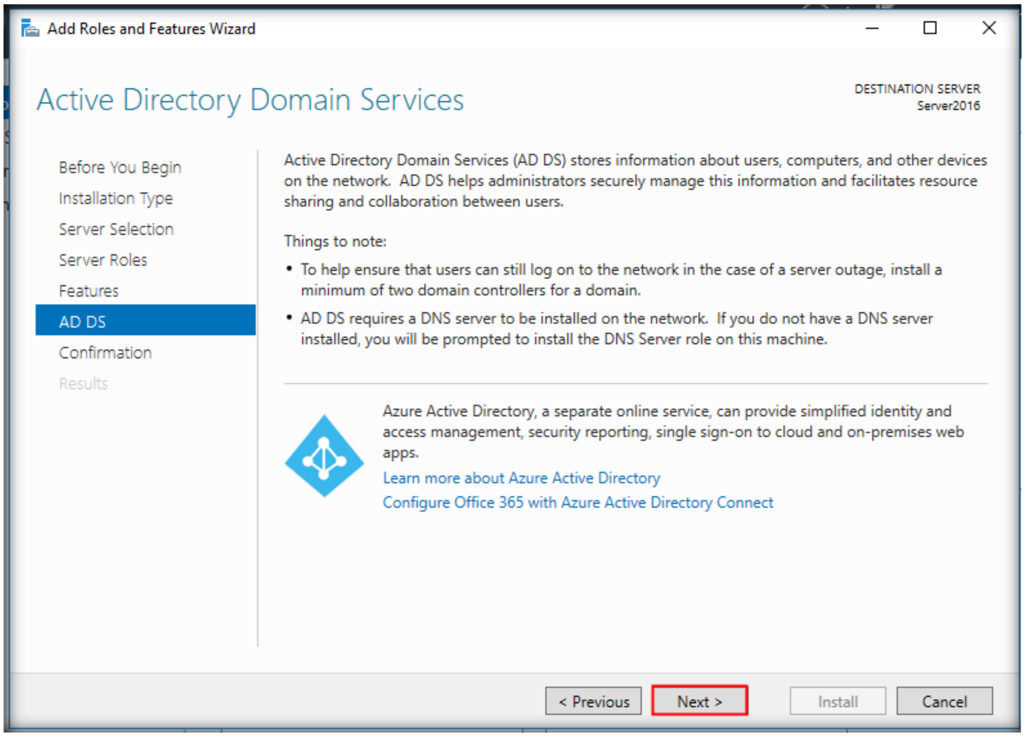
Features

- ☐ .NET Framework 3.5 Features
- ■ .NET Framework 4.6 Features (2 of 7 installed)
- ☐ Background Intelligent Transfer Service (BITS)
- ☐ BitLocker Drive Encryption
- ☐ BitLocker Network Unlock
- ☐ BranchCache
- ☐ Client for NFS
- ☐ Containers
- ☐ Data Center Bridging
- ☐ Direct Play
- ☐ Enhanced Storage
- ☐ Failover Clustering
- ☑ Group Policy Management
- ☐ I/O Quality of Service
- ☐ IIS Hostable Web Core
- ☐ Internet Printing Client
- ☐ IP Address Management (IPAM) Server
- ☐ iSNS Server service
- ☐ LPR Port Monitor

Description

.NET Framework 3.5 combines the power of the .NET Framework 2.0 APIs with new technologies for building applications that offer appealing user interfaces, protect your customers' personal identity information, enable seamless and secure communication, and provide the ability to model a range of business processes.

9. **Active Directory Domain Services** window appears, click **Next** button.



Add Roles and Features Wizard
Active Directory Domain Services
DESTINATION SERVER
Server2016
Before You Begin
Installation Type
Server Selection
Server Roles
Features
AD DS
Confirmation
Results
< Previous
Next >
Install
Cancel

Active Directory Domain Services (AD DS) stores information about users, computers, and other devices on the network. AD DS helps administrators securely manage this information and facilitates resource sharing and collaboration between users.

Things to note:

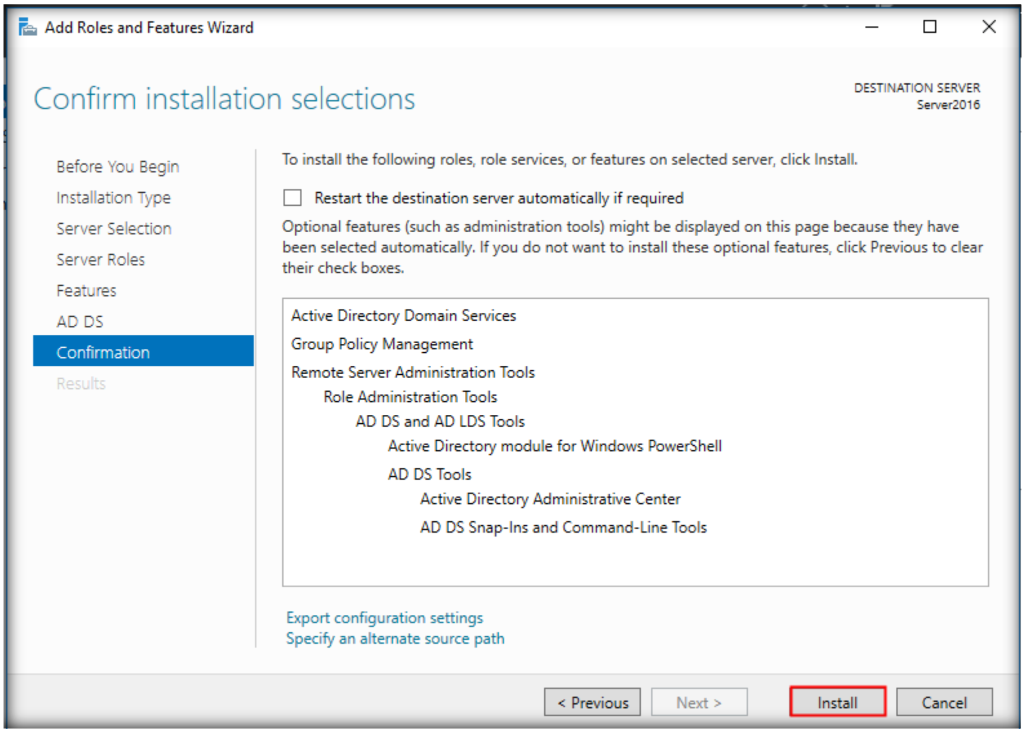
- To help ensure that users can still log on to the network in the case of a server outage, install a minimum of two domain controllers for a domain.
- AD DS requires a DNS server to be installed on the network. If you do not have a DNS server installed, you will be prompted to install the DNS Server role on this machine.

Azure Active Directory, a separate online service, can provide simplified identity and access management, security reporting, single sign-on to cloud and on-premises web apps.

Learn more about Azure Active Directory

Configure Office 365 with Azure Active Directory Connect

10. In **Confirm Installation Selection** window, click **Install** button to Install the role.


Add Roles and Features Wizard
Before You Begin
Installation Type
Server Selection
Server Roles
Features
AD DS
Confirmation
Results
Export configuration settings
Specify an alternate source path
< Previous
Next >
Install
Cancel

Confirm installation selections

DESTINATION SERVER
Server2016

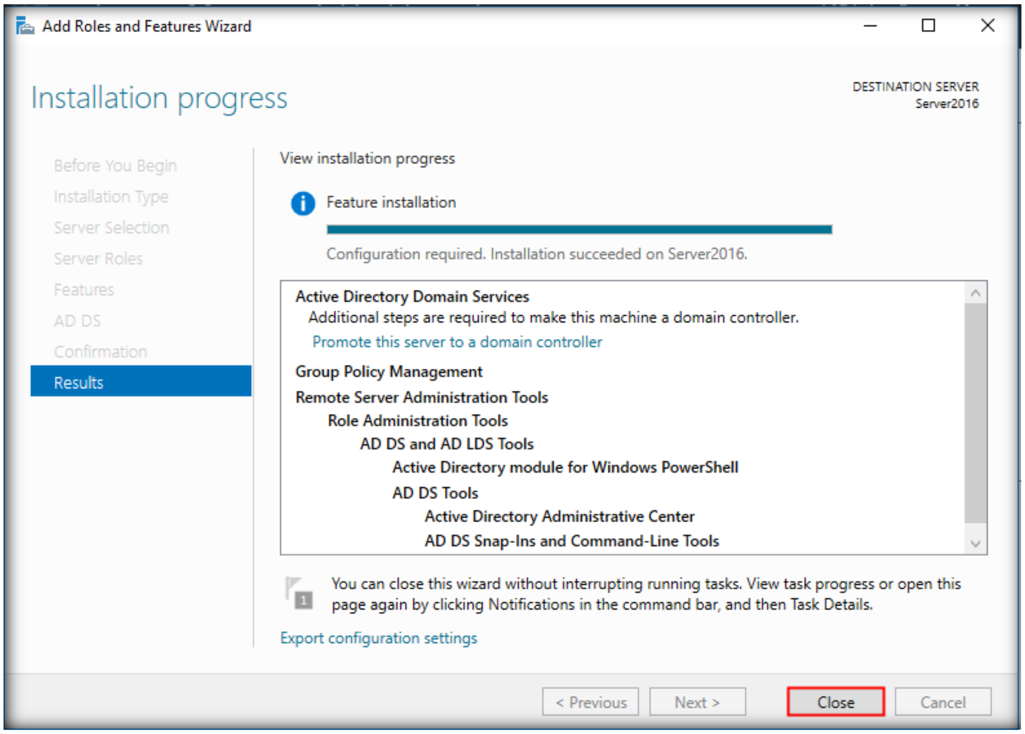
To install the following roles, role services, or features on selected server, click Install.

☐ Restart the destination server automatically if required

Optional features (such as administration tools) might be displayed on this page because they have been selected automatically. If you do not want to install these optional features, click Previous to clear their check boxes.

- Active Directory Domain Services
- Group Policy Management
- Remote Server Administration Tools
  - Role Administration Tools
    - AD DS and AD LDS Tools
      - Active Directory module for Windows PowerShell
      - AD DS Tools
        - Active Directory Administrative Center
        - AD DS Snap-Ins and Command-Line Tools

11. After the installation of the Active Directory Domain Services role, click **Close** button to close the window.


Add Roles and Features Wizard
Before You Begin
Installation Type
Server Selection
Server Roles
Features
AD DS
Confirmation
Results
Export configuration settings
< Previous
Next >
Close
Cancel

Installation progress

DESTINATION SERVER
Server2016

View installation progress

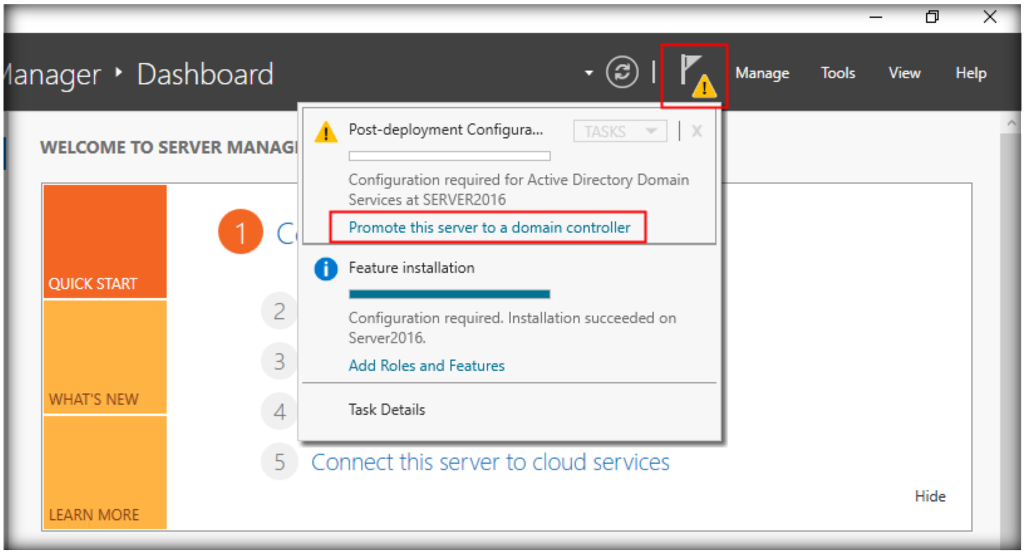
Feature installation

Configuration required. Installation succeeded on Server2016.

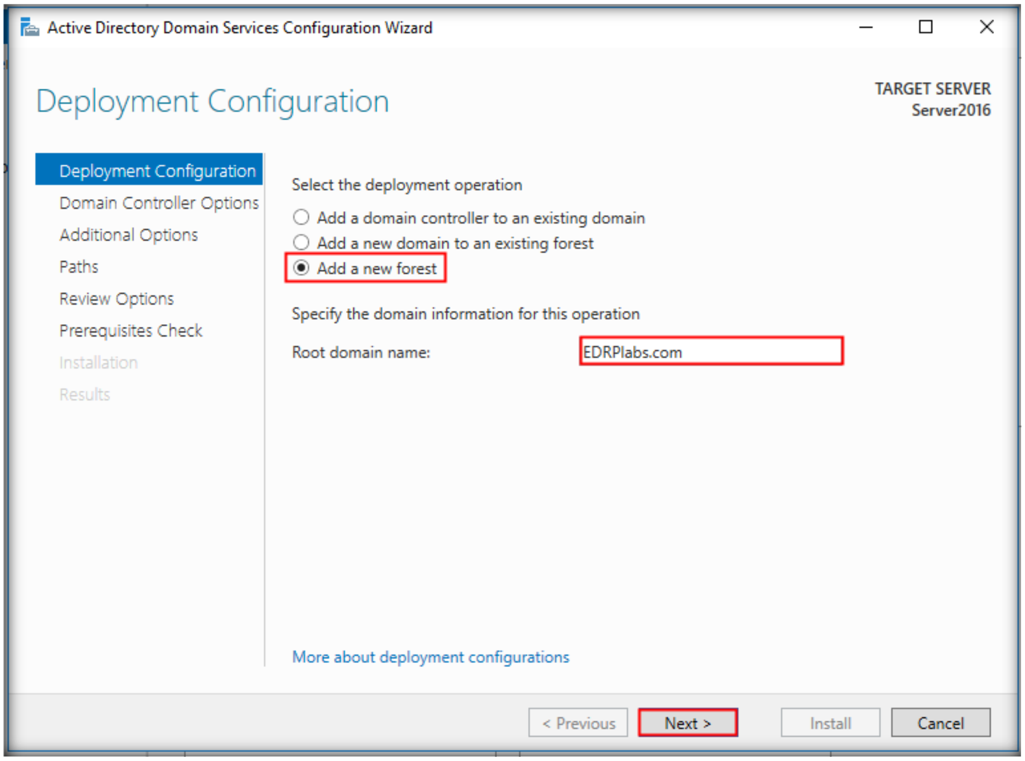
- Active Directory Domain Services
  Additional steps are required to make this machine a domain controller.
  Promote this server to a domain controller
- Group Policy Management
- Remote Server Administration Tools
  - Role Administration Tools
    - AD DS and AD LDS Tools
      - Active Directory module for Windows PowerShell
      - AD DS Tools
        - Active Directory Administrative Center
        - AD DS Snap-Ins and Command-Line Tools

You can close this wizard without interrupting running tasks. View task progress or open this page again by clicking Notifications in the command bar, and then Task Details.

12. Click the **Notification icon** in the Server Manager window, and click **Promote this server to a domain controller** option from the dropdown menu as shown in the screenshot.


Manager ‣ Dashboard
Manage
Tools
View
Help
WELCOME TO SERVER MANAG
QUICK START
WHAT'S NEW
LEARN MORE
Post-deployment Configura...
TASKS
Configuration required for Active Directory Domain Services at SERVER2016
Promote this server to a domain controller
Feature installation
Configuration required. Installation succeeded on Server2016.
Add Roles and Features
Task Details
5 Connect this server to cloud services
Hide

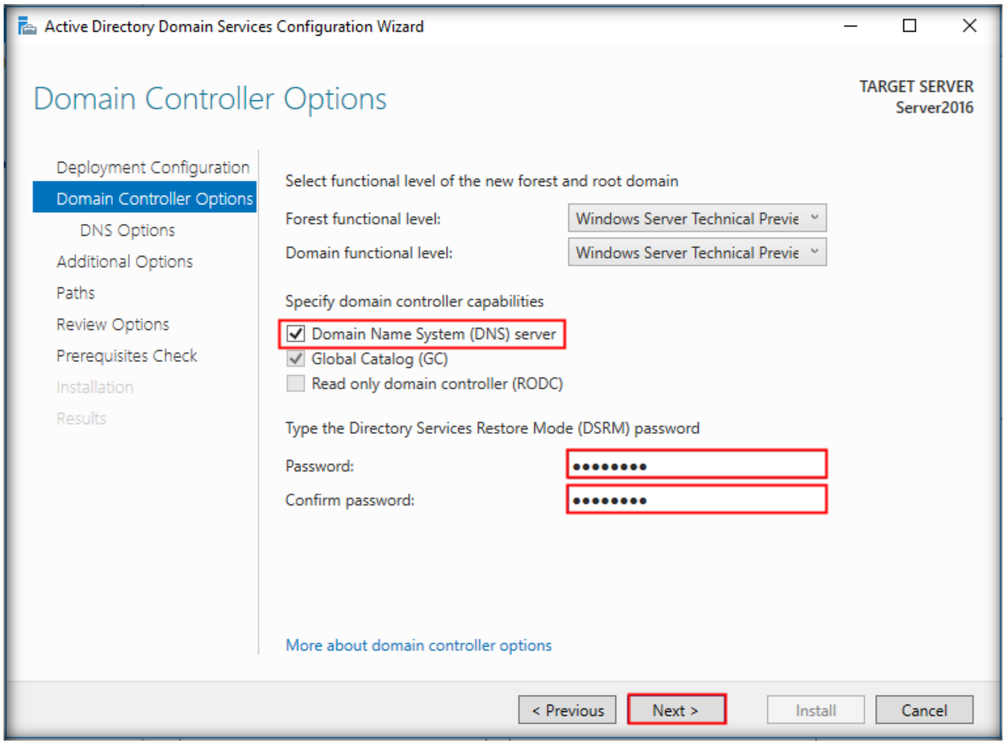
13. **Active Directory Domain Services Configuration Wizard** will appear. Select the **Add a new forest** radio button. In the lab environment, provide **Root Domain name** as **EDRPlabs.com.** Click **Next** button to continue.


Active Directory Domain Services Configuration Wizard
Deployment Configuration
TARGET SERVER
Server2016
Deployment Configuration
Domain Controller Options
Additional Options
Paths
Review Options
Prerequisites Check
Installation
Results
More about deployment configurations
< Previous
Next >
Install
Cancel

Select the deployment operation
○ Add a domain controller to an existing domain
○ Add a new domain to an existing forest
● Add a new forest

Specify the domain information for this operation
Root domain name: EDRPlabs.com

14. In **Domain Controller Options** window, **Domain Name System (DNS) Server** is selected by default. Assign the **Directory Services Restore Mode (DSRM)** password as **Pa$$w0rd** and in **Confirm password:** field enter **Pa$$w0rd** as shown in screenshot. Click **Next** button to continue.


Active Directory Domain Services Configuration Wizard
Domain Controller Options
TARGET SERVER
Server2016
Deployment Configuration
Domain Controller Options
DNS Options
Additional Options
Paths
Review Options
Prerequisites Check
Installation
Results
More about domain controller options
< Previous
Next >
Install
Cancel

Select functional level of the new forest and root domain

Forest functional level: Windows Server Technical Previe

Domain functional level: Windows Server Technical Previe

Specify domain controller capabilities

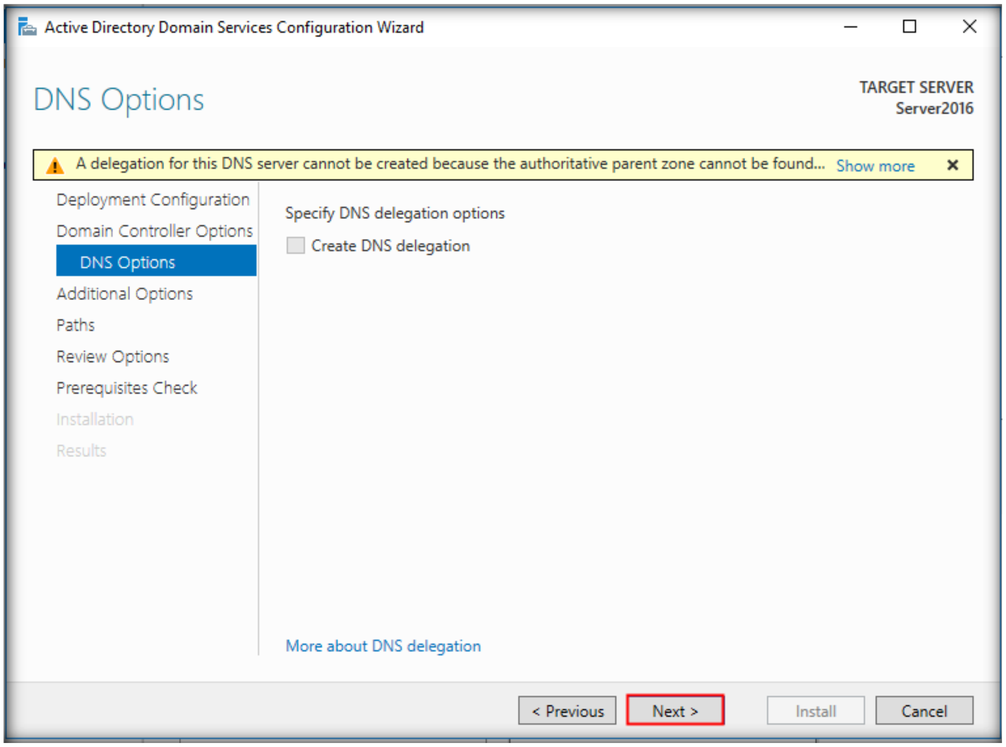
☑ Domain Name System (DNS) server
☑ Global Catalog (GC)
☐ Read only domain controller (RODC)

Type the Directory Services Restore Mode (DSRM) password

Password: ●●●●●●●●

Confirm password: ●●●●●●●●

15. **DNS Options** window will appear, click **Next** button.

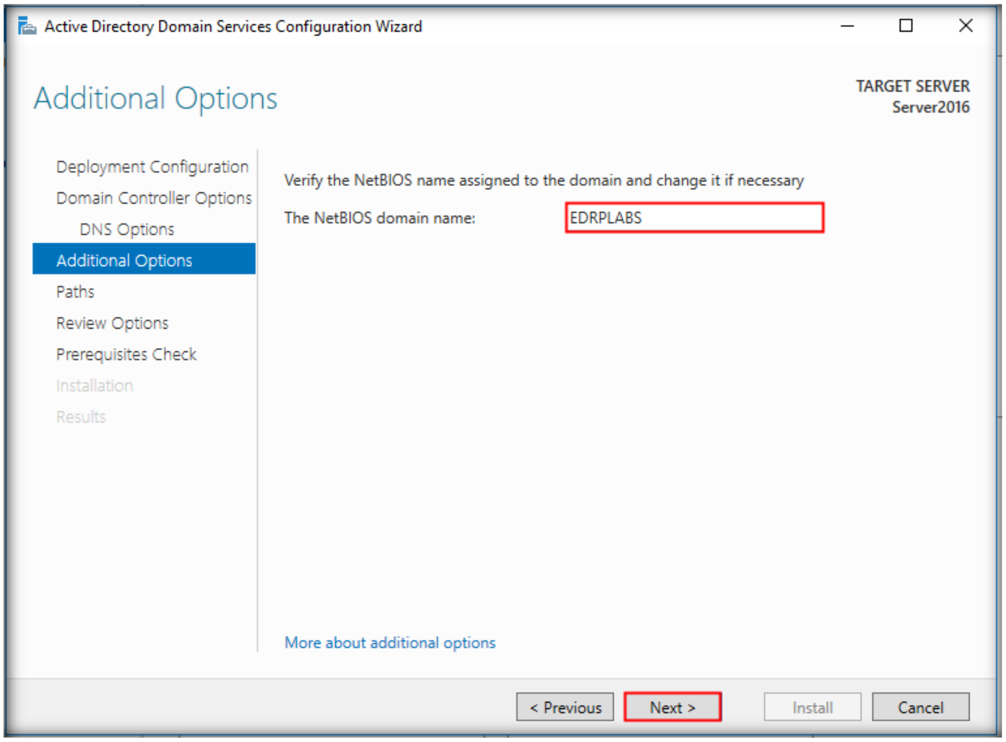

Active Directory Domain Services Configuration Wizard
DNS Options
TARGET SERVER
Server2016
Show more
Deployment Configuration
Domain Controller Options
DNS Options
Additional Options
Paths
Review Options
Prerequisites Check
Installation
Results
More about DNS delegation
< Previous
Next >
Install
Cancel

A delegation for this DNS server cannot be created because the authoritative parent zone cannot be found...

Specify DNS delegation options

☐ Create DNS delegation

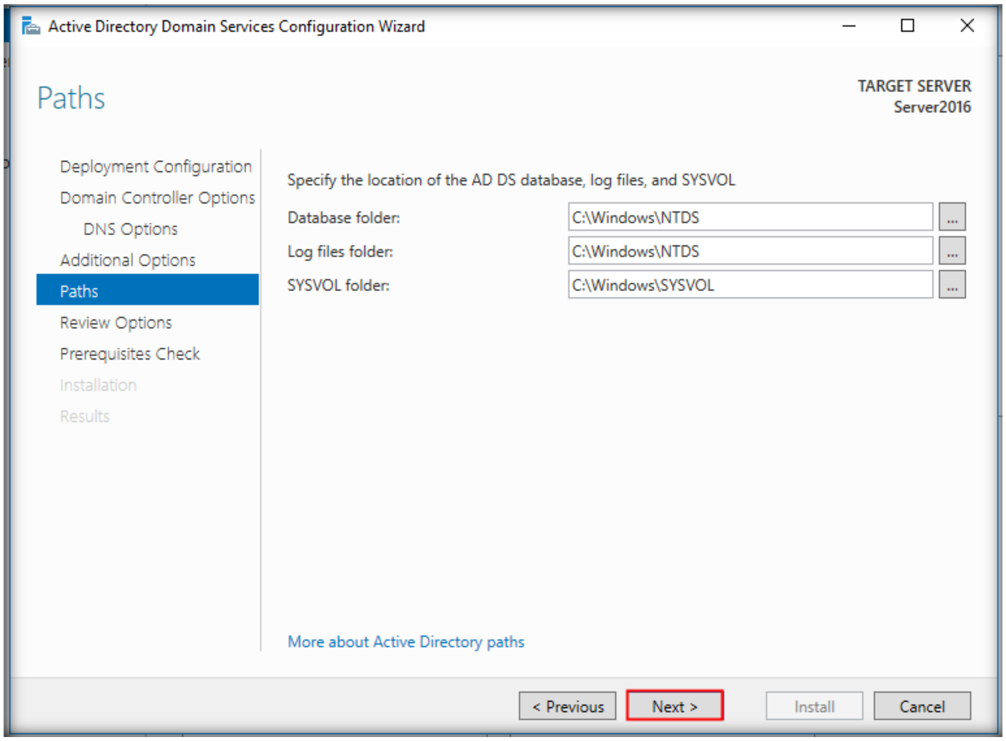
16. **Additional Options** window will appear. **EDRPLABS** is assigned as default **NetBIOS domain name**. Click **Next** button to continue.


Active Directory Domain Services Configuration Wizard
Additional Options
TARGET SERVER
Server2016
Deployment Configuration
Domain Controller Options
DNS Options
Additional Options
Paths
Review Options
Prerequisites Check
Installation
Results
More about additional options
< Previous
Next >
Install
Cancel

Verify the NetBIOS name assigned to the domain and change it if necessary

The NetBIOS domain name: EDRPLABS

17. **Paths** window will appear, click **Next** button to continue.


Active Directory Domain Services Configuration Wizard
Paths
TARGET SERVER
Server2016
Deployment Configuration
Domain Controller Options
DNS Options
Additional Options
Paths
Review Options
Prerequisites Check
Installation
Results
...
...
...
More about Active Directory paths
< Previous
Next >
Install
Cancel

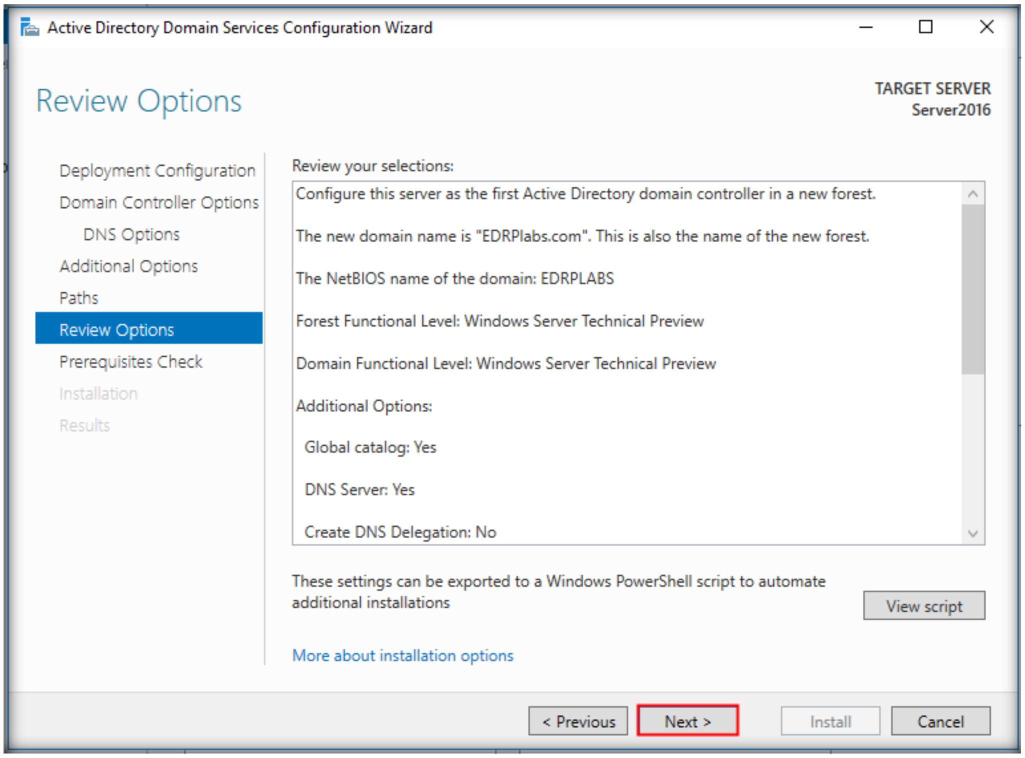
Specify the location of the AD DS database, log files, and SYSVOL

Database folder: C:\Windows\NTDS

Log files folder: C:\Windows\NTDS

SYSVOL folder: C:\Windows\SYSVOL

18. In **Review Options** window, click **Next** button.


Active Directory Domain Services Configuration Wizard
TARGET SERVER
Server2016
Deployment Configuration
Domain Controller Options
DNS Options
Additional Options
Paths
Review Options
Prerequisites Check
Installation
Results
View script
< Previous
Next >
Install
Cancel

Review Options

Review your selections:

Configure this server as the first Active Directory domain controller in a new forest.

The new domain name is "EDRPlabs.com". This is also the name of the new forest.

The NetBIOS name of the domain: EDRPLABS

Forest Functional Level: Windows Server Technical Preview

Domain Functional Level: Windows Server Technical Preview

Additional Options:

Global catalog: Yes

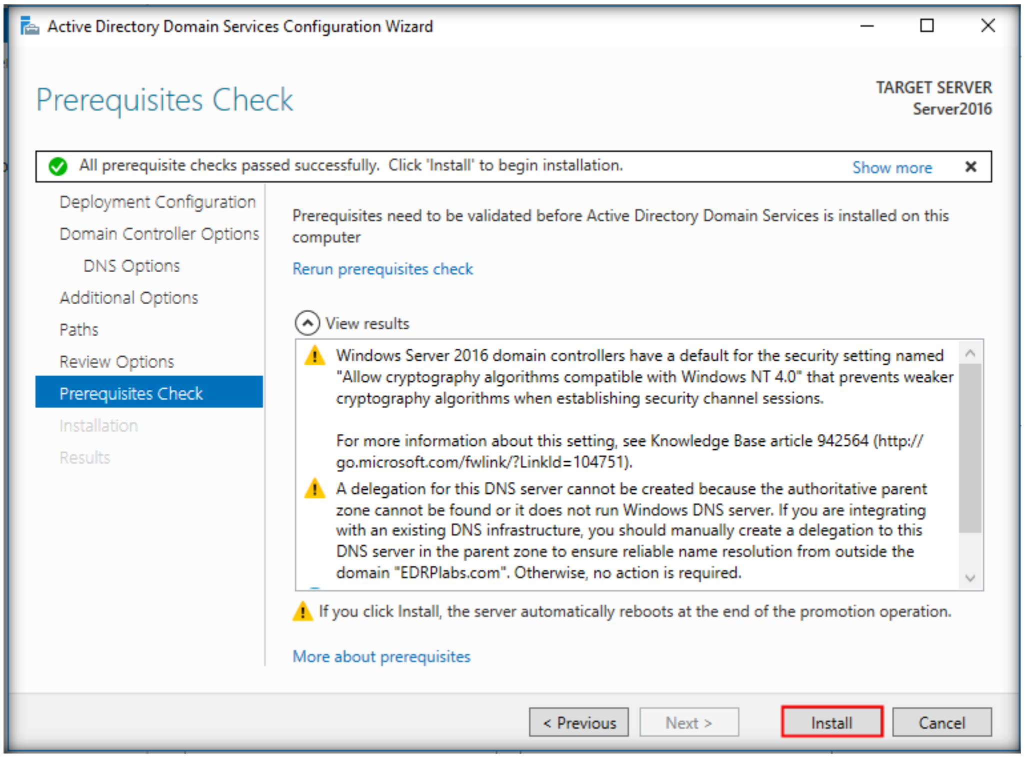
DNS Server: Yes

Create DNS Delegation: No

These settings can be exported to a Windows PowerShell script to automate additional installations

More about installation options

19. **Prerequisites Check** window will appear. After the prerequisite checks are passed, click **Install** button.


Active Directory Domain Services Configuration Wizard
TARGET SERVER
Server2016
Show more
Deployment Configuration
Domain Controller Options
DNS Options
Additional Options
Paths
Review Options
Prerequisites Check
Installation
Results
View results
< Previous
Next >
Install
Cancel

Prerequisites Check

All prerequisite checks passed successfully. Click 'Install' to begin installation.

Prerequisites need to be validated before Active Directory Domain Services is installed on this computer

Rerun prerequisites check

Windows Server 2016 domain controllers have a default for the security setting named "Allow cryptography algorithms compatible with Windows NT 4.0" that prevents weaker cryptography algorithms when establishing security channel sessions.

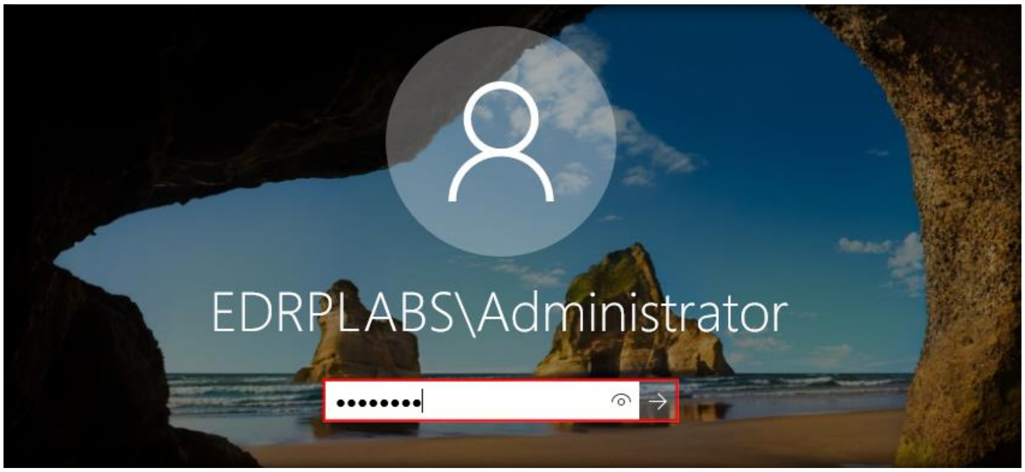
For more information about this setting, see Knowledge Base article 942564 (http://go.microsoft.com/fwlink/?LinkId=104751).

A delegation for this DNS server cannot be created because the authoritative parent zone cannot be found or it does not run Windows DNS server. If you are integrating with an existing DNS infrastructure, you should manually create a delegation to this DNS server in the parent zone to ensure reliable name resolution from outside the domain "EDRPlabs.com". Otherwise, no action is required.

If you click Install, the server automatically reboots at the end of the promotion operation.

More about prerequisites

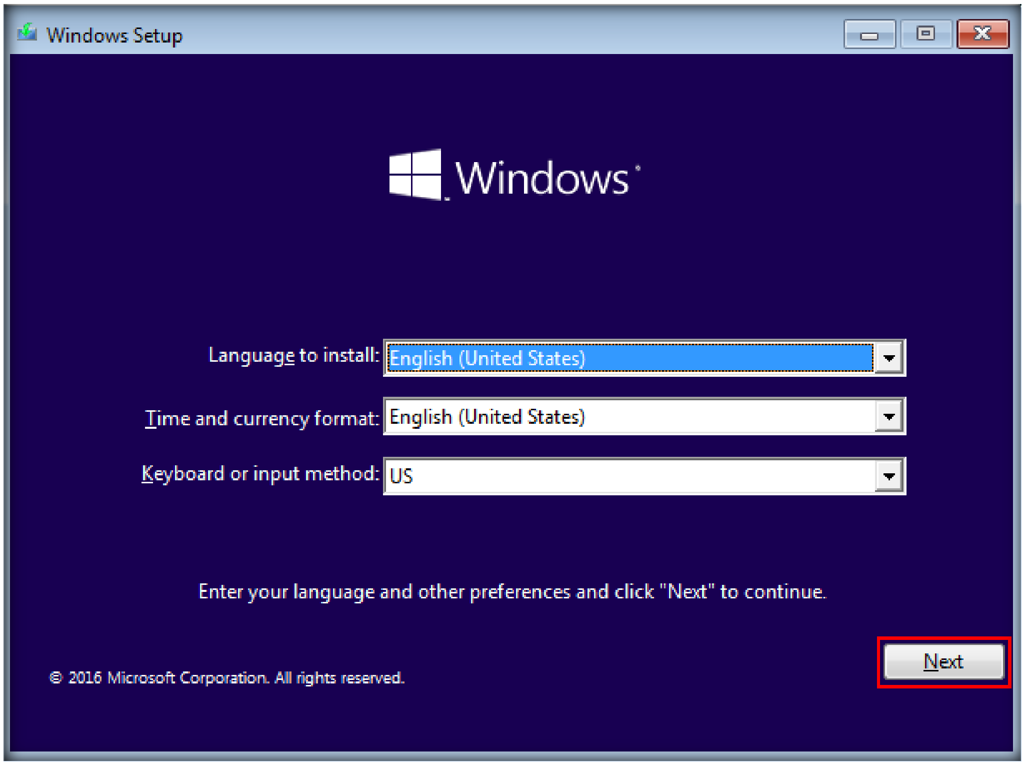
20. After installation, the Server 2016 VM will restart. Navigate to the login page of Server 2016 virtual machine by clicking **Ctrl+Alt+Delete** button. Type the password as **Pa$$w0rd** and click **Login** button.



CT#5: Creating and Configuring Windows 10 Virtual Machine

CT#5.1: Creating a Virtual Machine and Installing Windows 10 Enterprise Guest OS

1. Follow the steps of CT#4.1 to create a VM **Windows 10** guest OS.
2. Wait until Windows Setup screen appears, in Windows Setup screens choose the **Language** and other preferences then click **Next**.



Language to install: English (United States)

Time and currency format: English (United States)

Keyboard or input method: US

Enter your language and other preferences and click "Next" to continue.

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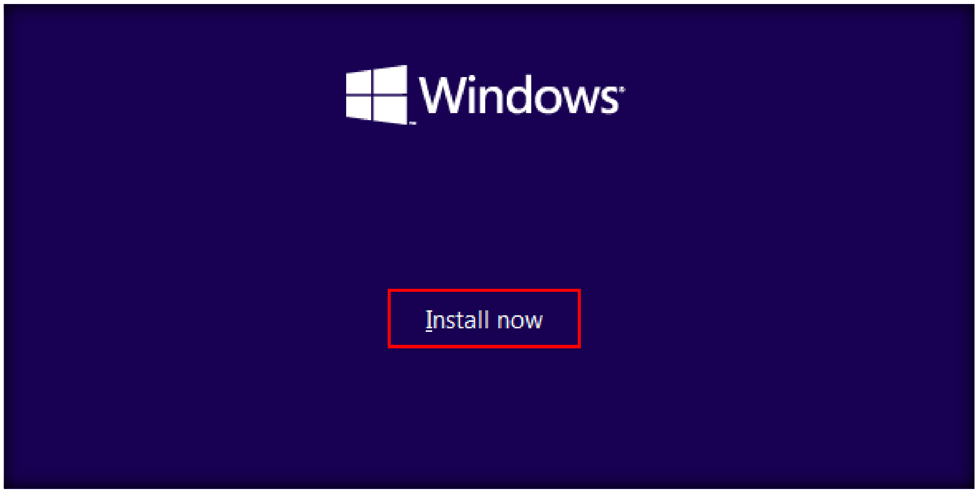
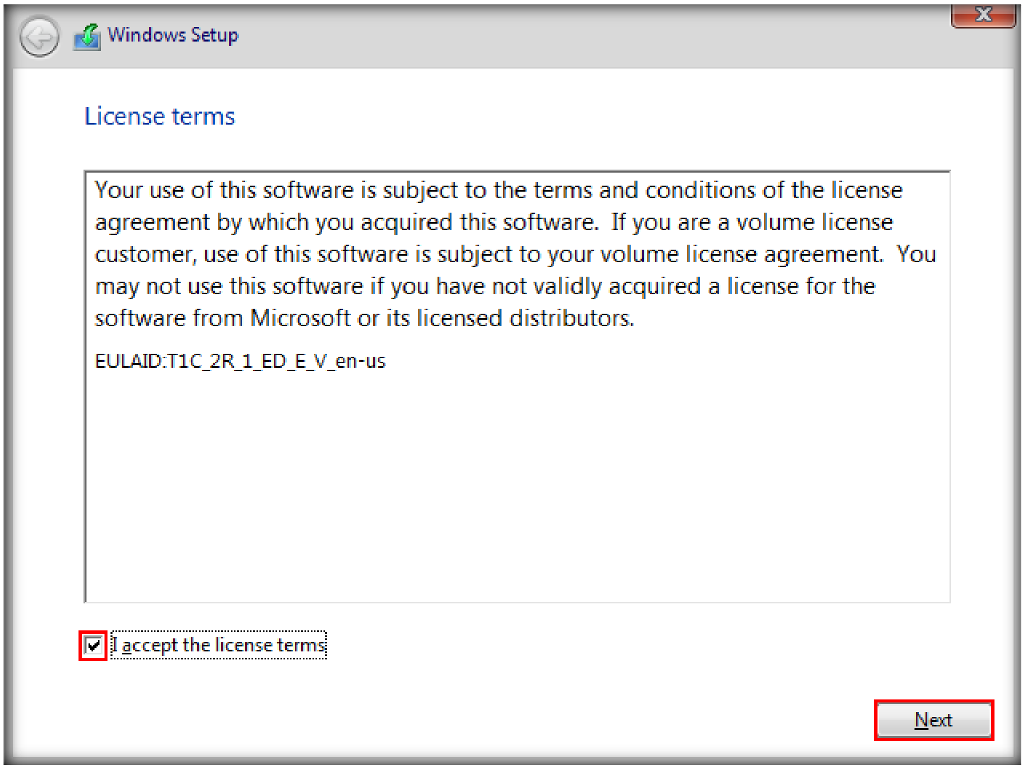
3. Click **Install now** button to start the installation process of Windows 10.



4. **License** terms page appears of the Windows Setup window, check **I accept the license terms** check and box and click **Next**.



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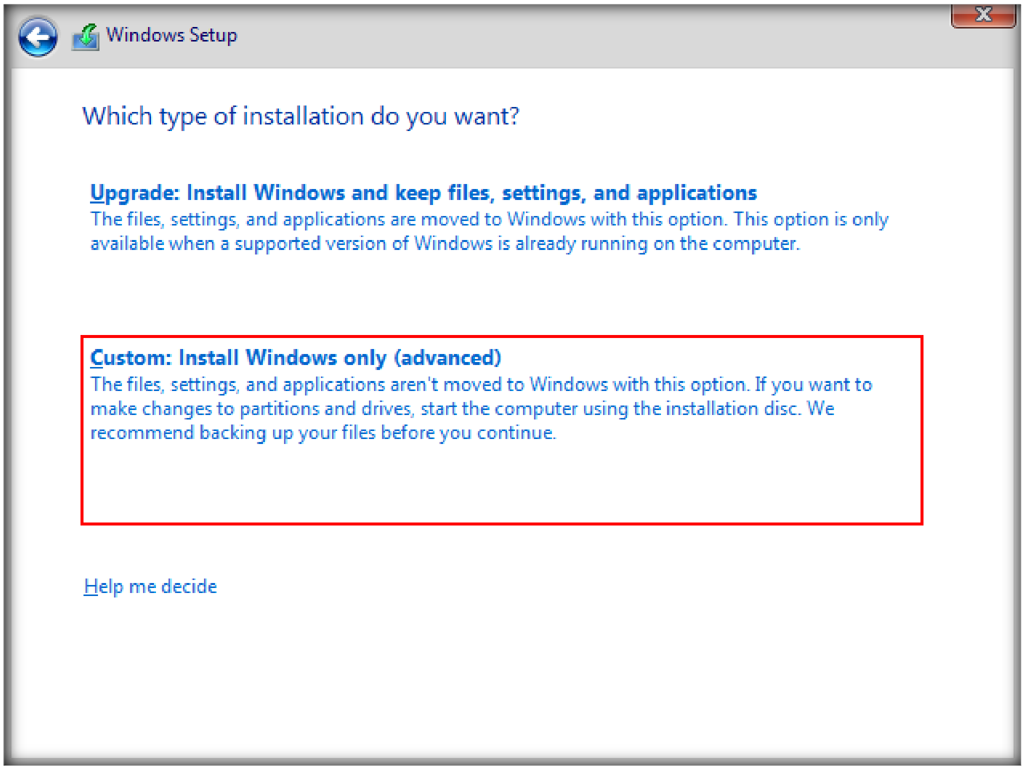
EULAID:T1C_2R_1_ED_E_V_en-us

☑ I accept the license terms

5. Click **Custom: Install Windows only (advanced)** option to proceed with the installation.

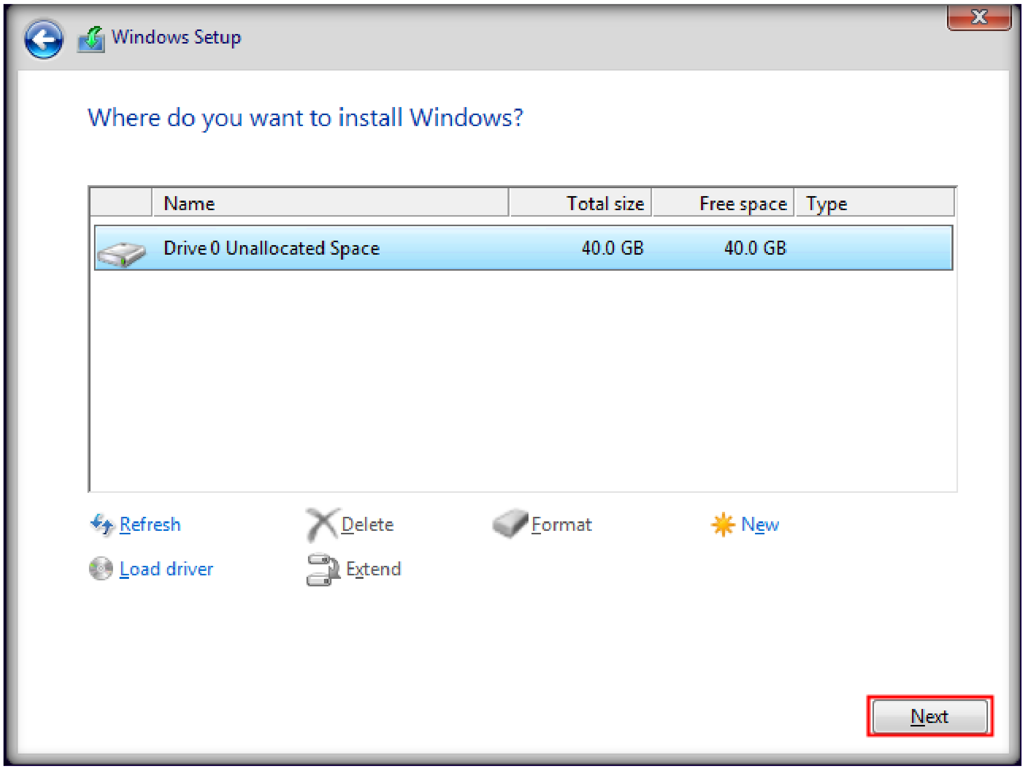


Which type of installation do you want?

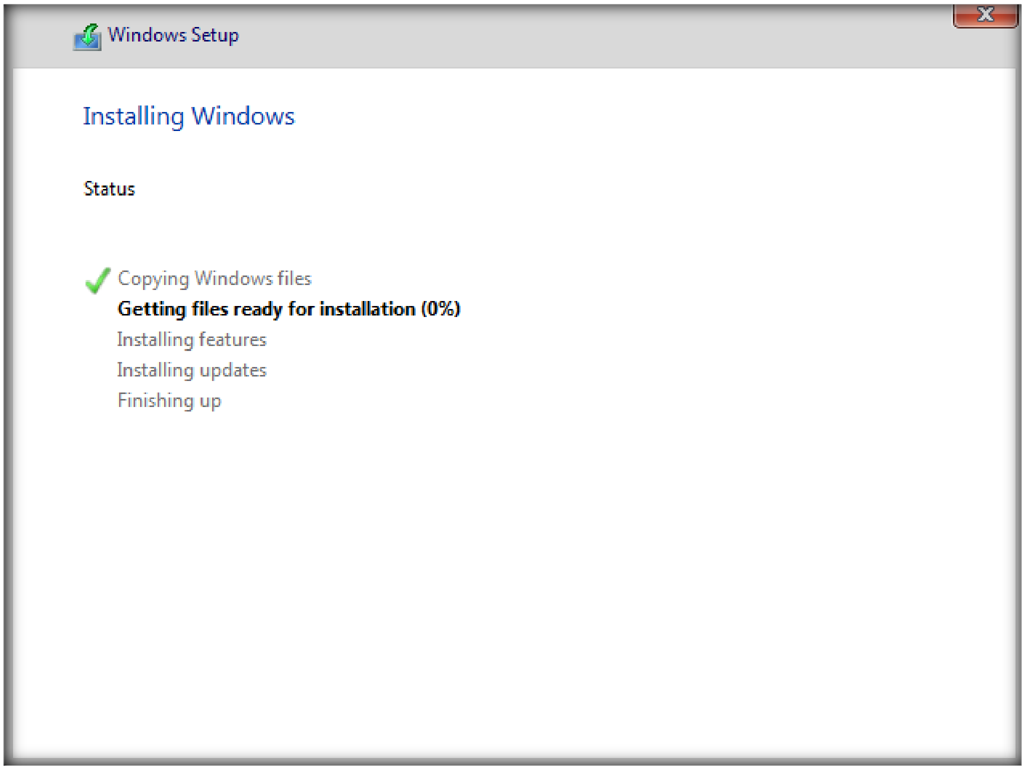
Upgrade: Install Windows and keep files, settings, and applications
The files, settings, and applications are moved to Windows with this option. This option is only available when a supported version of Windows is already running on the computer.

Custom: Install Windows only (advanced)
The files, settings, and applications aren't moved to Windows with this option. If you want to make changes to partitions and drives, start the computer using the installation disc. We recommend backing up your files before you continue.

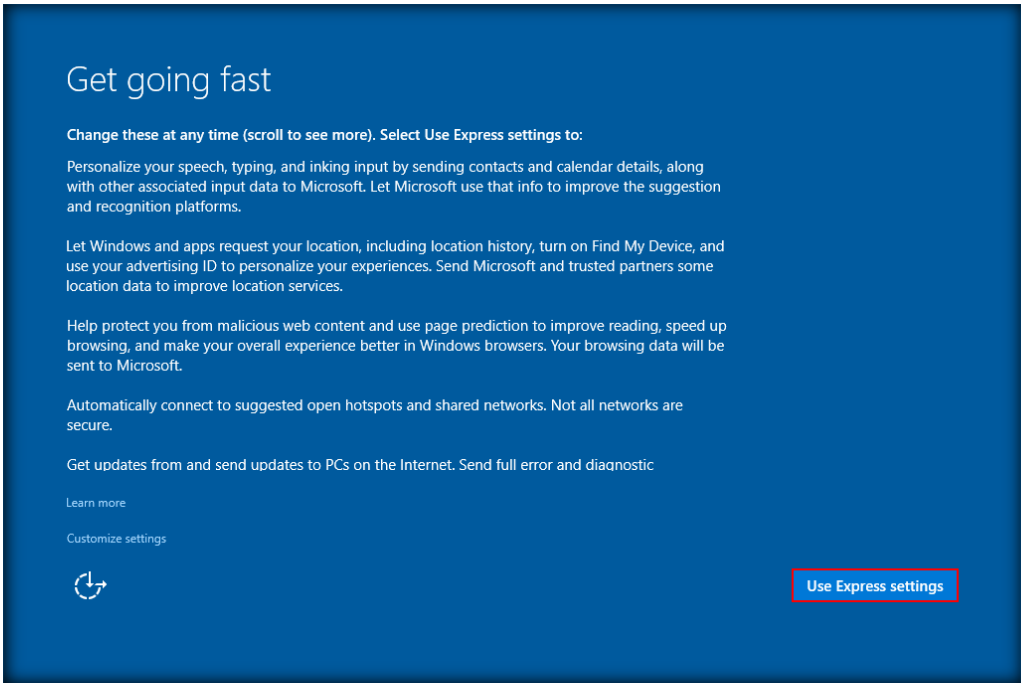
6. **Where do you want to install Windows?** wizard appears, click **Next** button.


Windows Setup
Where do you want to install Windows?
Name
Total size
Free space
Type
Drive 0 Unallocated Space
40.0 GB
40.0 GB
Refresh
Delete
Format
New
Load driver
Extend
Next

7. **Installing Windows** screen appears; wait until the completion of installation.


Windows Setup
Installing Windows
Status
Copying Windows files
Getting files ready for installation (0%)
Installing features
Installing updates
Finishing up

8. Once the installation is completed machine will restart, and you will see the **Get going fast** screen. Click **Use Express settings** button.



Get going fast

Change these at any time (scroll to see more). Select Use Express settings to:

Personalize your speech, typing, and inking input by sending contacts and calendar details, along with other associated input data to Microsoft. Let Microsoft use that info to improve the suggestion and recognition platforms.

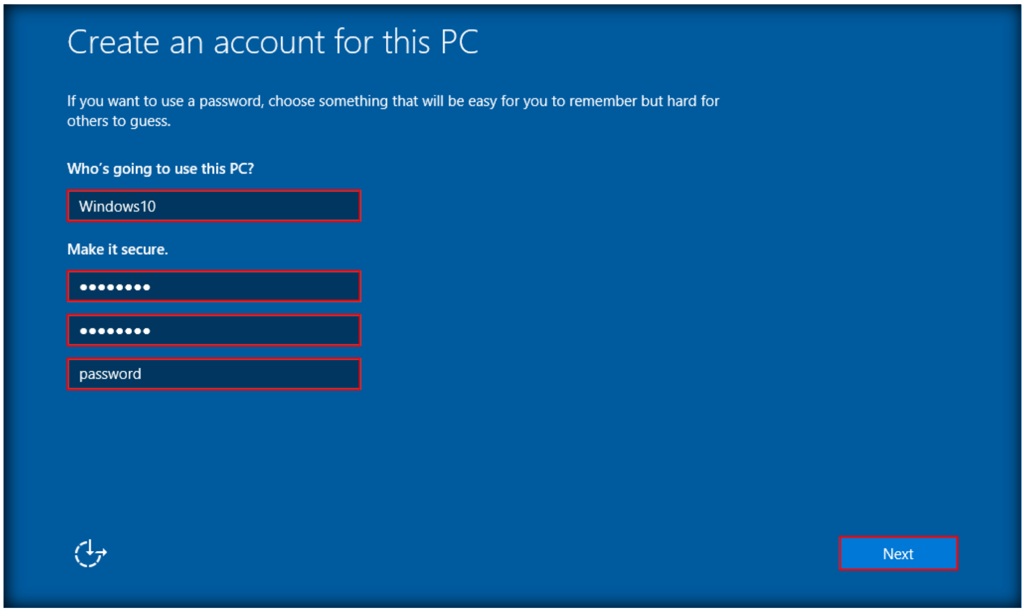
Let Windows and apps request your location, including location history, turn on Find My Device, and use your advertising ID to personalize your experiences. Send Microsoft and trusted partners some location data to improve location services.

Help protect you from malicious web content and use page prediction to improve reading, speed up browsing, and make your overall experience better in Windows browsers. Your browsing data will be sent to Microsoft.

Automatically connect to suggested open hotspots and shared networks. Not all networks are secure.

Get updates from and send updates to PCs on the Internet. Send full error and diagnostic

9. **Create an account for this PC** window will appear, assign user name as **Windows10** and password as **Pa$$w0rd**. Click **Next** button to continue.



Create an account for this PC

If you want to use a password, choose something that will be easy for you to remember but hard for others to guess.

Who's going to use this PC?

Windows10

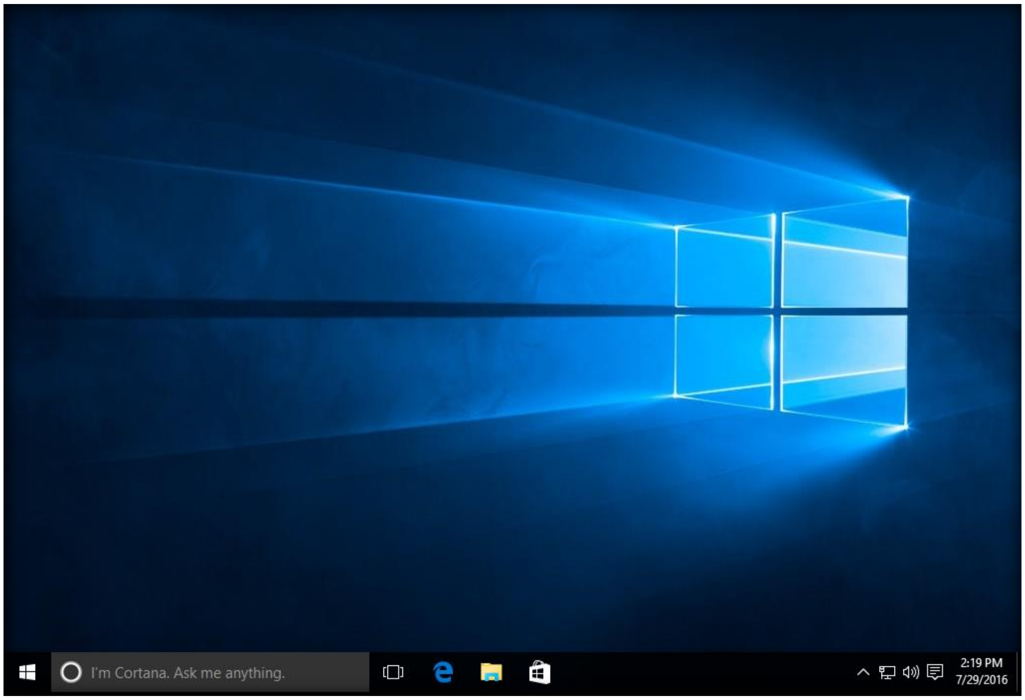
Make it secure.

••••••••

••••••••

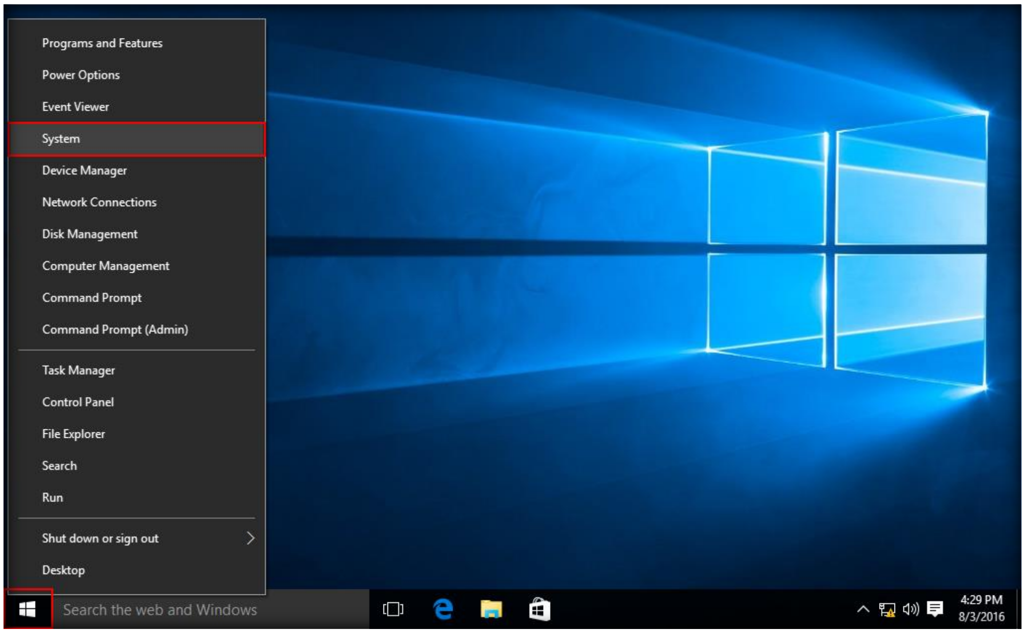
password

10. Windows 10 machine is ready as shown in the screenshot.

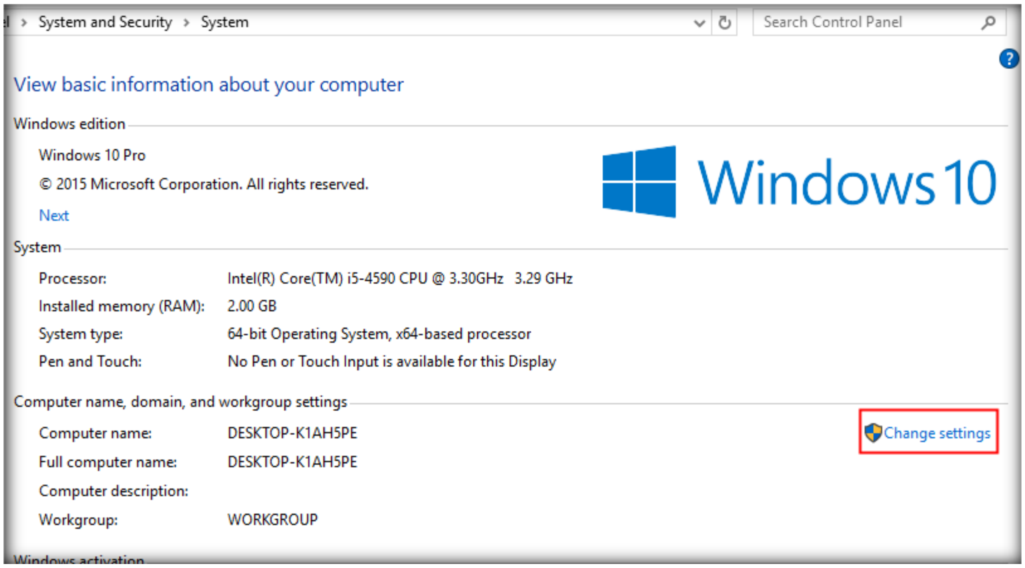

I'm Cortana. Ask me anything.
2:19 PM
7/29/2016

CT#5.2: Change the Computer Name

1. Right-click **Start** icon and click **System** option.


Programs and Features
Power Options
Event Viewer
System
Device Manager
Network Connections
Disk Management
Computer Management
Command Prompt
Command Prompt (Admin)
Task Manager
Control Panel
File Explorer
Search
Run
Shut down or sign out
Desktop
Search the web and Windows
4:29 PM
8/3/2016

2. In the **System properties** window, click **Change settings**.



System and Security > System
Search Control Panel

View basic information about your computer

Windows edition

Windows 10 Pro

© 2015 Microsoft Corporation. All rights reserved.

Next
Windows 10

System

Processor: Intel(R) Core(TM) i5-4590 CPU @ 3.30GHz 3.29 GHz

Installed memory (RAM): 2.00 GB

System type: 64-bit Operating System, x64-based processor

Pen and Touch: No Pen or Touch Input is available for this Display

Computer name, domain, and workgroup settings

Computer name: DESKTOP-K1AH5PE

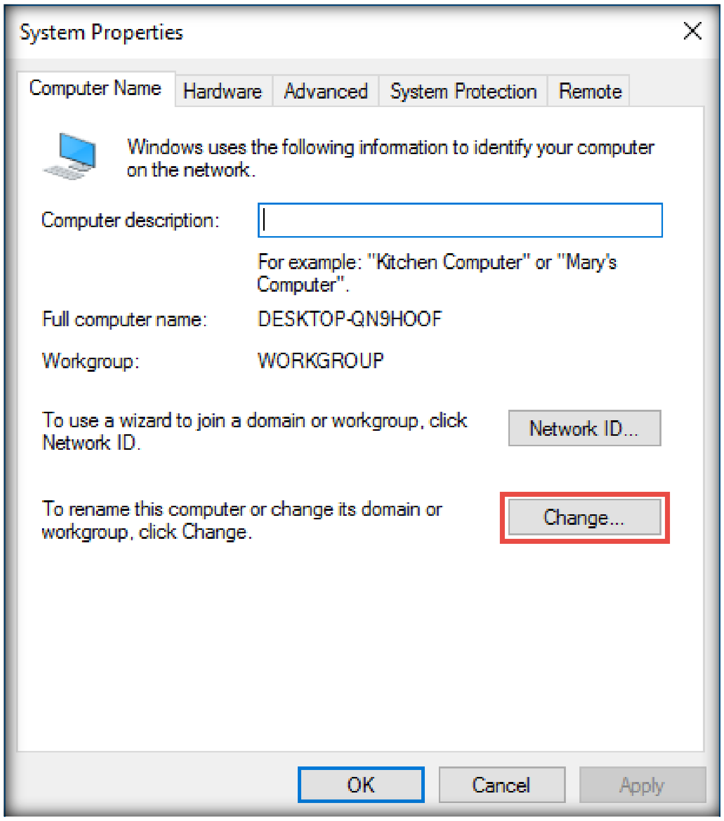
Full computer name: DESKTOP-K1AH5PE

Computer description:

Workgroup: WORKGROUP

Change settings
Windows activation

3. In the **Computer Name** tab of the **System Properties** window, click **Change**.



System Properties
Computer Name
Hardware
Advanced
System Protection
Remote

Windows uses the following information to identify your computer on the network.

Computer description:

For example: "Kitchen Computer" or "Mary's Computer".

Full computer name: DESKTOP-QN9HOOF

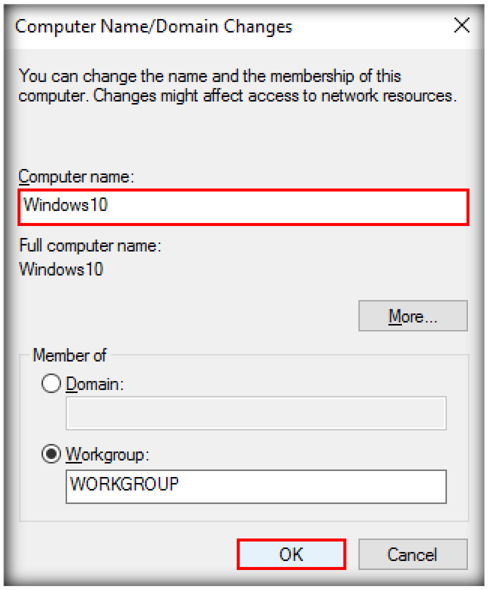
Workgroup: WORKGROUP

To use a wizard to join a domain or workgroup, click Network ID.

To rename this computer or change its domain or workgroup, click Change.

Network ID...
Change...
OK
Cancel
Apply

4. In the **Computer Name** field enter **Windows10** and click **OK**.


Computer Name/Domain Changes

You can change the name and the membership of this computer. Changes might affect access to network resources.

Computer name: Windows10

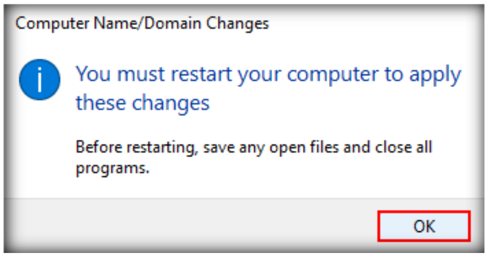
Full computer name: Windows10

Member of

○ Domain:

● Workgroup: WORKGROUP

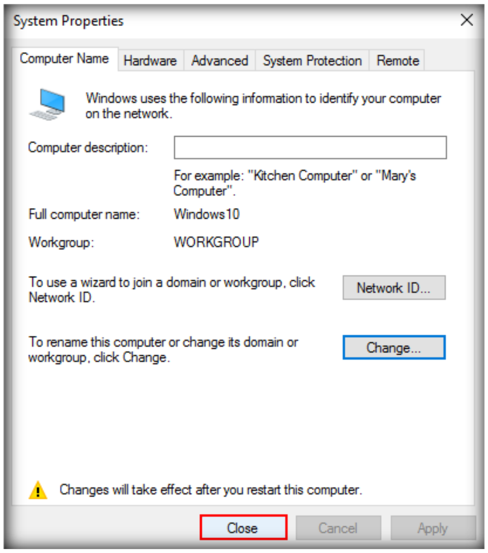
5. When prompted to restart the system, click **OK**.


Computer Name/Domain Changes

You must restart your computer to apply these changes

Before restarting, save any open files and close all programs.

6. You will be returned back to System Properties window, click **Close**.


System Properties

Windows uses the following information to identify your computer on the network.

Computer description:

For example: "Kitchen Computer" or "Mary's Computer".

Full computer name: Windows10

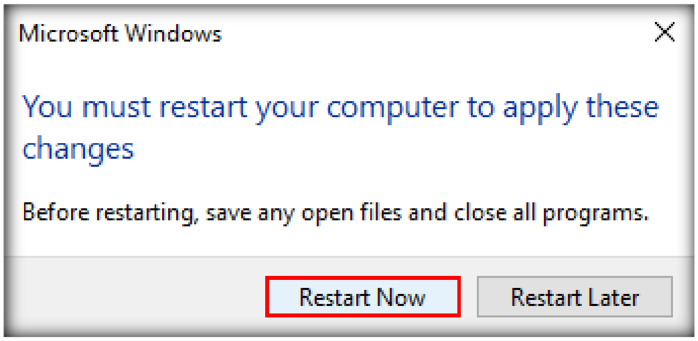
Workgroup: WORKGROUP

To use a wizard to join a domain or workgroup, click Network ID.

To rename this computer or change its domain or workgroup, click Change.

Changes will take effect after you restart this computer.

7. You will be prompted to restart the system, click **Restart Now**.



You must restart your computer to apply these changes

Before restarting, save any open files and close all programs.

CT#5.3: Configuring Static IP Address

1. Follow the steps as in Configuration Task, CT#4.3. Configure IPv4 address in the Windows 10 VM with the following values:
    - **IP Address: 10.10.10.10**
    - **Subnet Mask: 255.0.0.0**
    - **Default Gateway: 10.10.10.2**
    - **Preferred DNS server: 8.8.8.8**

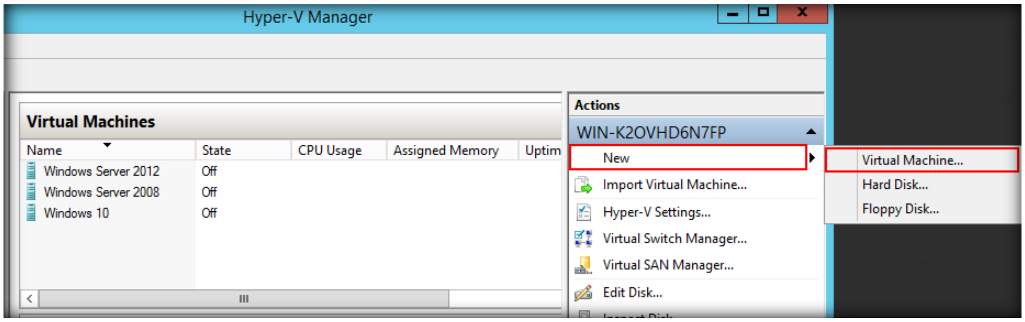
CT#5.4: Mapping EDRP-Tools Folder from Host Machine to Windows 10 VM

1. Follow the steps 8 to 14 of CT#4.4, to share **EDRP-Tools** directory in Windows 10 VM

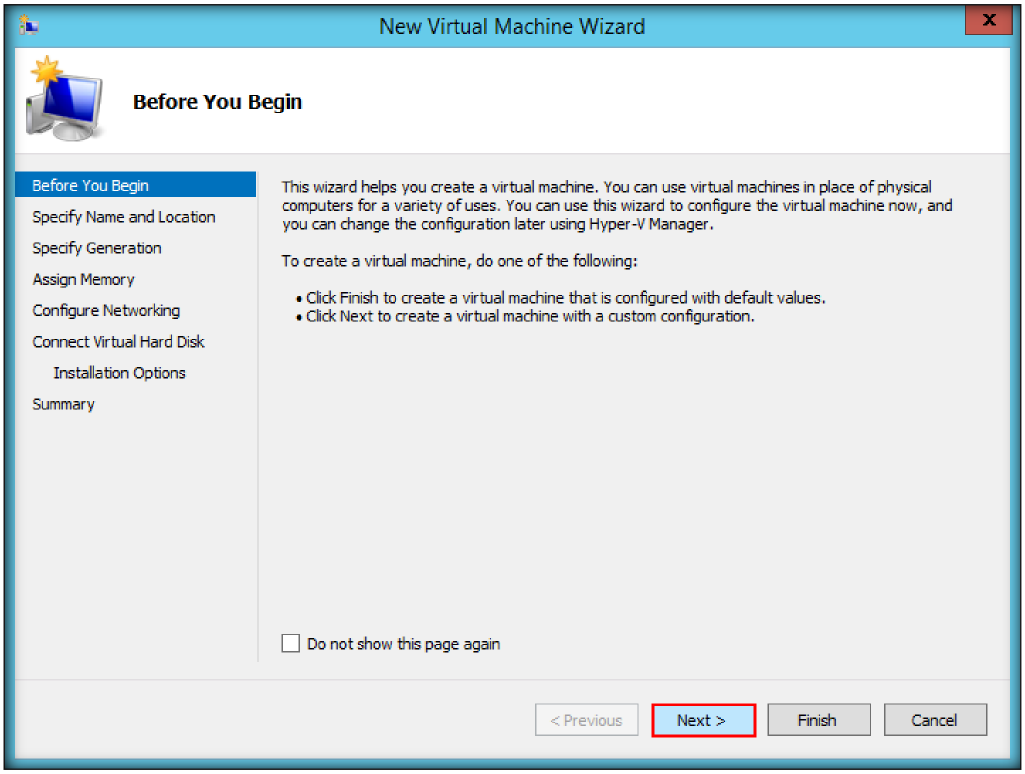
CT#6: Creating and Configuring Ubuntu Virtual Machine

CT#6.1: Creating a Virtual Machine and Installing Ubuntu Guest OS

1. Launch Hyper-V Manager. If already launched, skip to step two.
2. Select your local machine in the left pane, then click **New**, and then click **Virtual Machine...** in the right pane as shown in the screenshot.


Hyper-V Manager
Virtual Machines
Name
State
CPU Usage
Assigned Memory
Uptim
Windows Server 2012
Off
Windows Server 2008
Off
Windows 10
Off
Actions
WIN-K2OVHD6N7FP
New
Import Virtual Machine...
Hyper-V Settings...
Virtual Switch Manager...
Virtual SAN Manager...
Edit Disk...
Virtual Machine...
Hard Disk...
Floppy Disk...

3. **New Virtual Machine Wizard** window appears, click **Next** button


New Virtual Machine Wizard
Before You Begin
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

This wizard helps you create a virtual machine. You can use virtual machines in place of physical computers for a variety of uses. You can use this wizard to configure the virtual machine now, and you can change the configuration later using Hyper-V Manager.

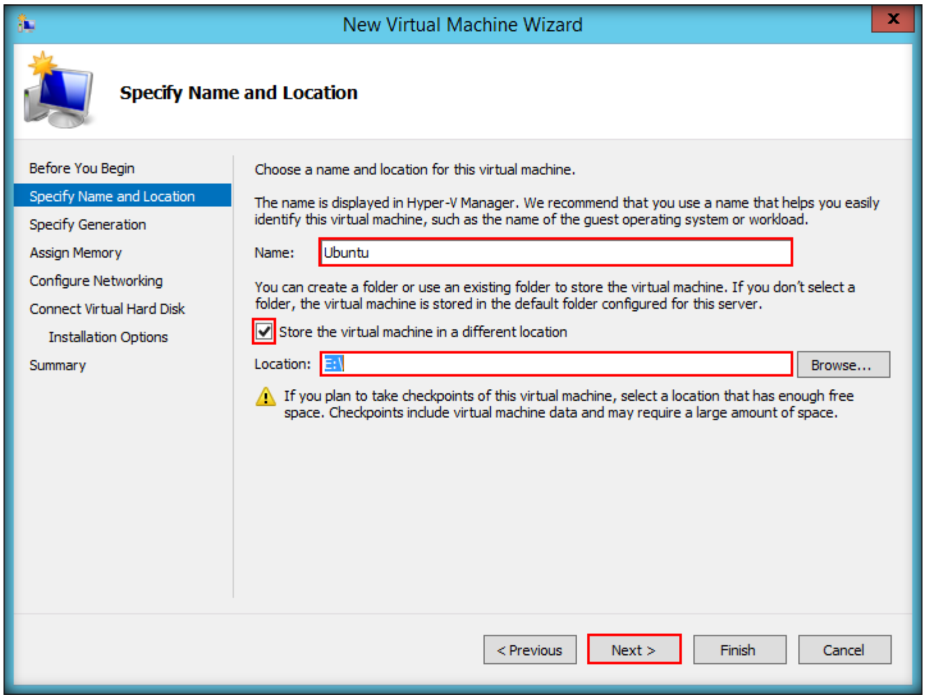
To create a virtual machine, do one of the following:

- Click Finish to create a virtual machine that is configured with default values.
- Click Next to create a virtual machine with a custom configuration.

☐ Do not show this page again

4. Specify Name and location of new virtual machine. Assign the name of the virtual machine as **Ubuntu**. The default location for storing the virtual machine is **C:\ProgramData\Microsoft\Windows\Hyper-V\**. You can choose different location to store the VM's or set it to default location. Click **Next**

   Note: You can specify the location either in the Specify Name and Location section or in the forthcoming Connect Virtual Hard Disk section


New Virtual Machine Wizard
Specify Name and Location
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
Browse...
< Previous
Next >
Finish
Cancel

Choose a name and location for this virtual machine.

The name is displayed in Hyper-V Manager. We recommend that you use a name that helps you easily identify this virtual machine, such as the name of the guest operating system or workload.

Name: Ubuntu

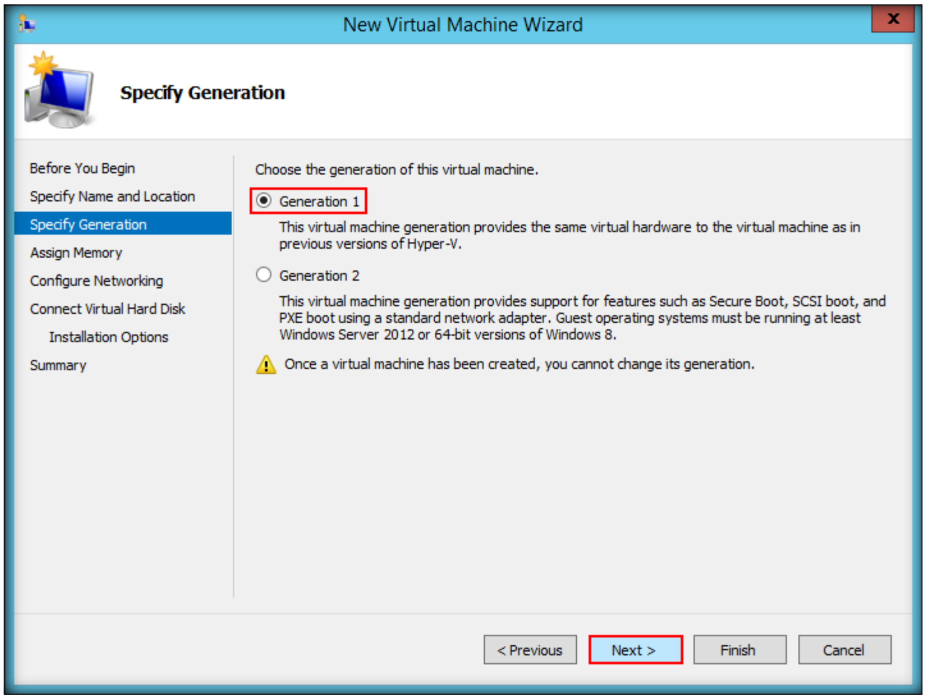
You can create a folder or use an existing folder to store the virtual machine. If you don't select a folder, the virtual machine is stored in the default folder configured for this server.

☑ Store the virtual machine in a different location

Location: E:\

If you plan to take checkpoints of this virtual machine, select a location that has enough free space. Checkpoints include virtual machine data and may require a large amount of space.

5. Choose the generation of the virtual machine (here, **Generation 1**) and click **Next**


New Virtual Machine Wizard
Specify Generation
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

Choose the generation of this virtual machine.

● Generation 1

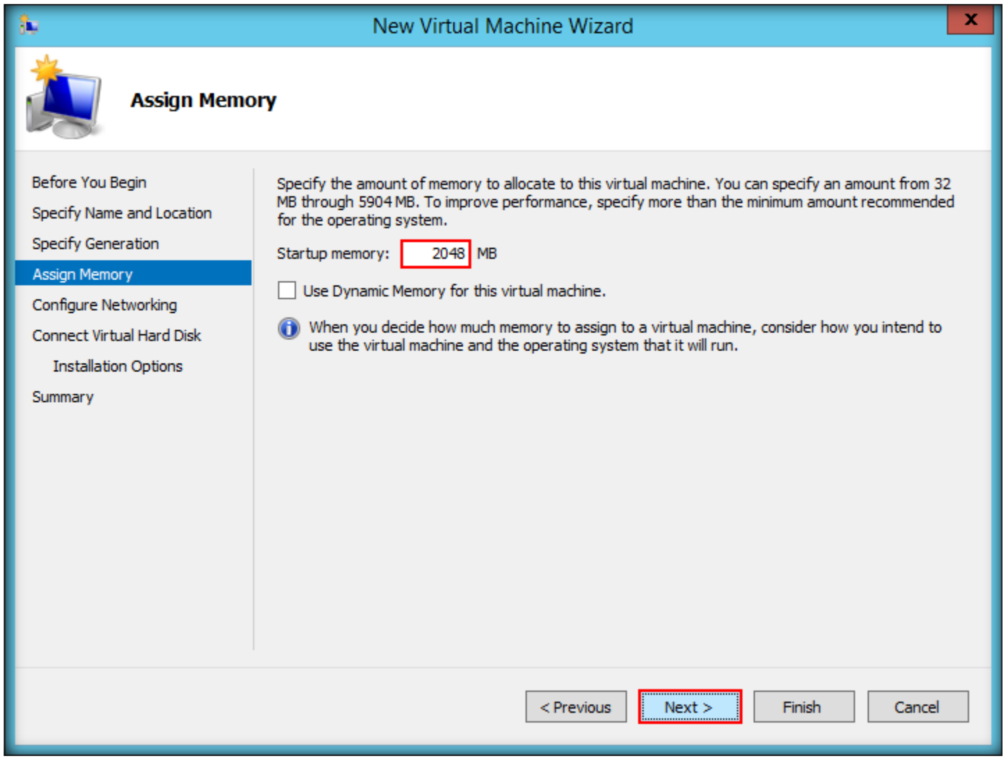
This virtual machine generation provides the same virtual hardware to the virtual machine as in previous versions of Hyper-V.

○ Generation 2

This virtual machine generation provides support for features such as Secure Boot, SCSI boot, and PXE boot using a standard network adapter. Guest operating systems must be running at least Windows Server 2012 or 64-bit versions of Windows 8.

Once a virtual machine has been created, you cannot change its generation.

6. Assign the amount of **Startup memory** to allocate to this virtual machine in MB (here, **2048**). Click **Next.**



New Virtual Machine Wizard
Assign Memory
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

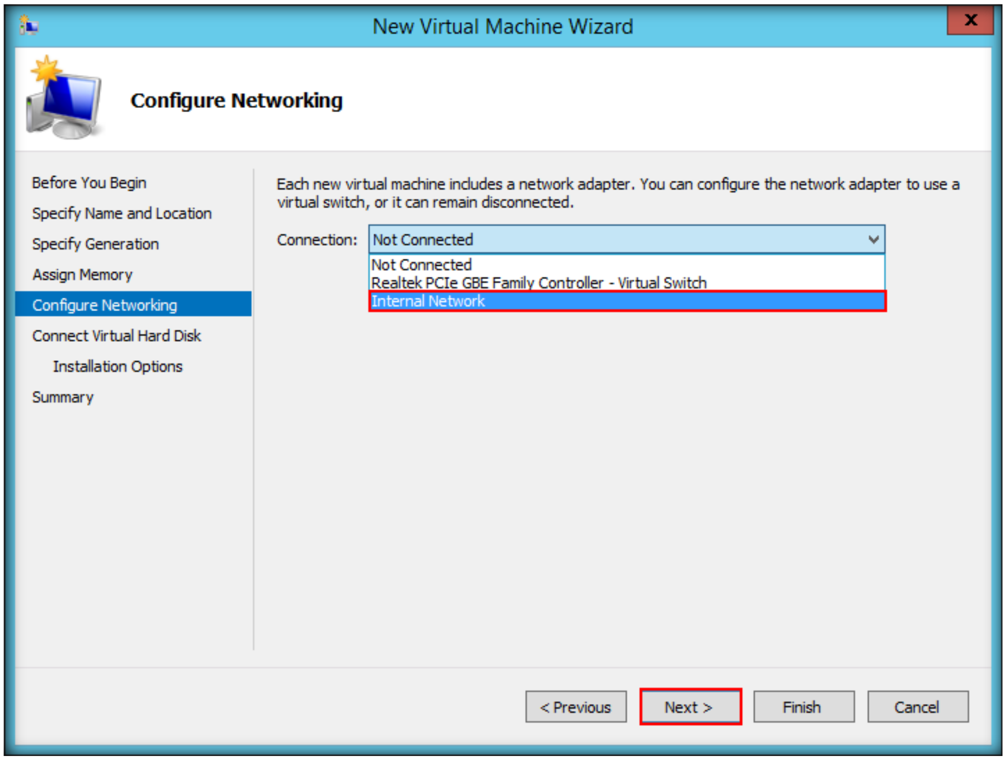
Specify the amount of memory to allocate to this virtual machine. You can specify an amount from 32 MB through 5904 MB. To improve performance, specify more than the minimum amount recommended for the operating system.

Startup memory: 2048 MB

☐ Use Dynamic Memory for this virtual machine.

When you decide how much memory to assign to a virtual machine, consider how you intend to use the virtual machine and the operating system that it will run.

7. In the next step, select **network adapter** as **Internal Network** from connection **drop-down list** and click **Next**

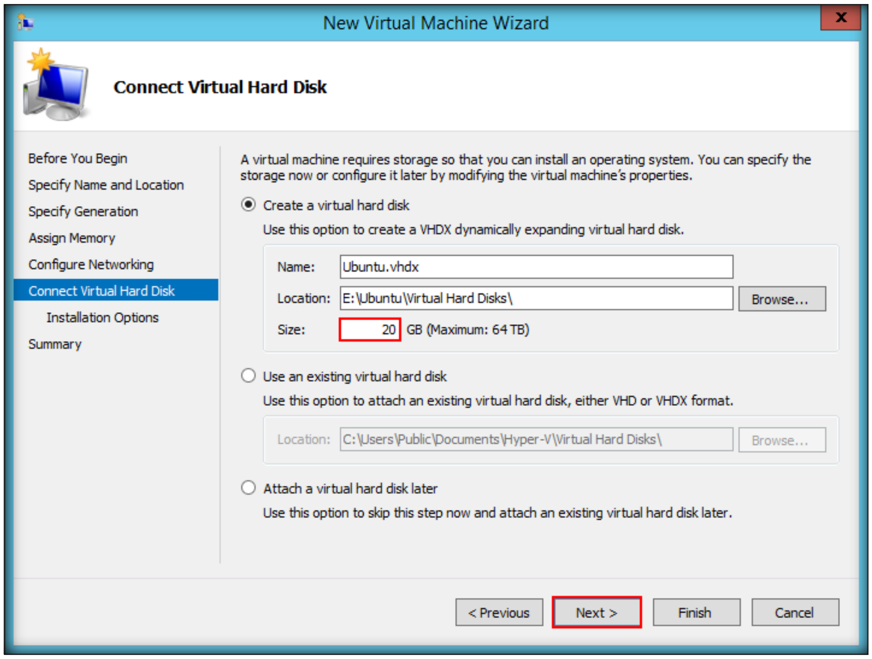


New Virtual Machine Wizard
Configure Networking
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
Not Connected
Realtek PCIe GBE Family Controller - Virtual Switch
Internal Network
< Previous
Next >
Finish
Cancel

Each new virtual machine includes a network adapter. You can configure the network adapter to use a virtual switch, or it can remain disconnected.

Connection: Not Connected

8. **Connect Virtual Hard Disk** section appears, allocate **20 GB** space for hard disk size and click **Next**


New Virtual Machine Wizard
Connect Virtual Hard Disk
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
Browse...
Browse...
< Previous
Next >
Finish
Cancel

A virtual machine requires storage so that you can install an operating system. You can specify the storage now or configure it later by modifying the virtual machine's properties.

● Create a virtual hard disk

Use this option to create a VHDX dynamically expanding virtual hard disk.

Name: Ubuntu.vhdx

Location: E:\Ubuntu\Virtual Hard Disks\

Size: 20 GB (Maximum: 64 TB)

○ Use an existing virtual hard disk

Use this option to attach an existing virtual hard disk, either VHD or VHDX format.

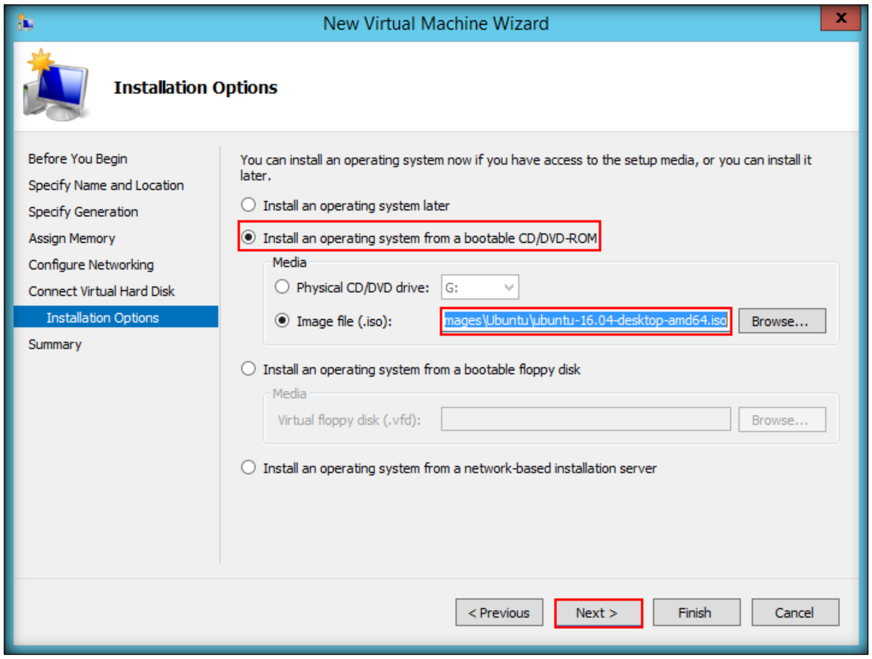
Location: C:\Users\Public\Documents\Hyper-V\Virtual Hard Disks\

○ Attach a virtual hard disk later

Use this option to skip this step now and attach an existing virtual hard disk later.

9. The **installation options** section appears, select **Install an operating system from a bootable CD/DVD-ROM** radio button.

   - If you have an Ubuntu DVD, choose **Physical CD/DVD drive** radio button and then click **Next**.
   - If you have an Ubuntu ISO file, then choose **Image file (.iso)** radio button and click browse button to provide the path of ISO file and click **Next**.


New Virtual Machine Wizard
Installation Options
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
Media
Browse...
Media
Browse...
< Previous
Next >
Finish
Cancel

You can install an operating system now if you have access to the setup media, or you can install it later.

○ Install an operating system later

● Install an operating system from a bootable CD/DVD-ROM

○ Physical CD/DVD drive: G:

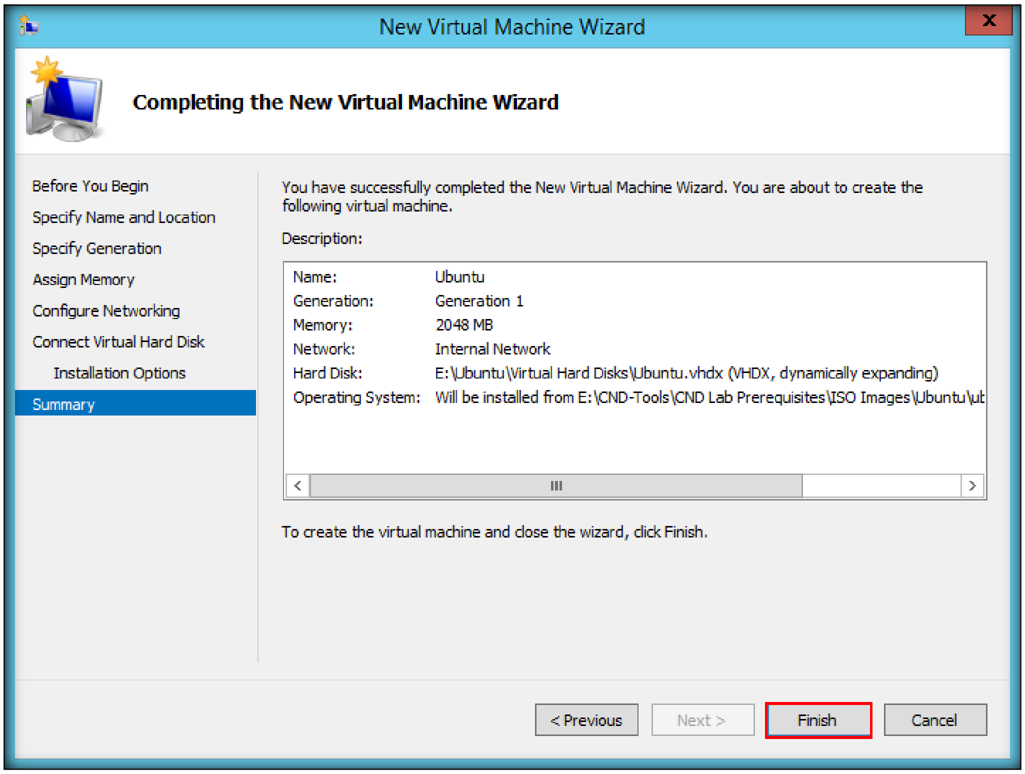
● Image file (.iso): mages\Ubuntu\ubuntu-16.04-desktop-amd64.iso

○ Install an operating system from a bootable floppy disk

Virtual floppy disk (.vfd):

○ Install an operating system from a network-based installation server

10. Virtual machine wizard appears with summary information. Click **Finish**


New Virtual Machine Wizard
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

Completing the New Virtual Machine Wizard

You have successfully completed the New Virtual Machine Wizard. You are about to create the following virtual machine.

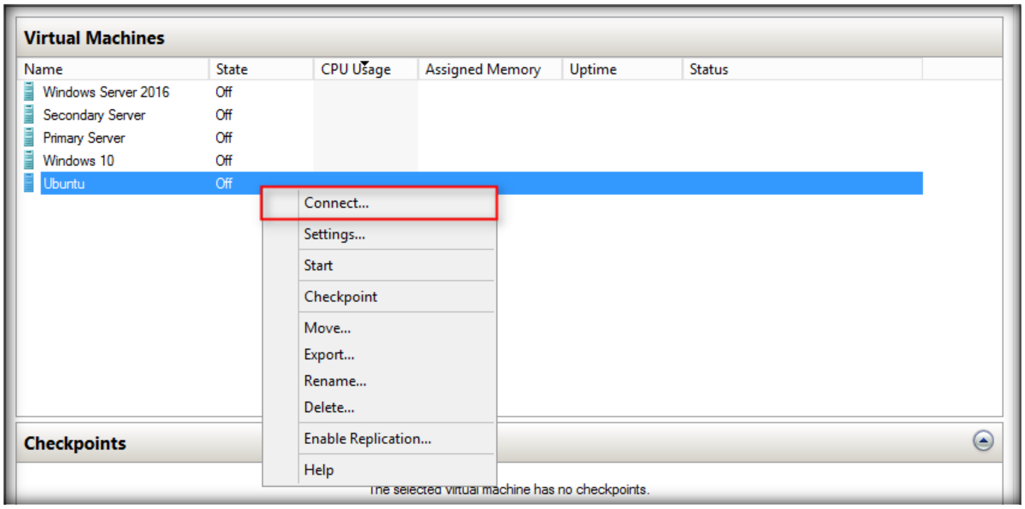
Description:

Name: Ubuntu
Generation: Generation 1
Memory: 2048 MB
Network: Internal Network
Hard Disk: E:\Ubuntu\Virtual Hard Disks\Ubuntu.vhdx (VHDX, dynamically expanding)
Operating System: Will be installed from E:\CND-Tools\CND Lab Prerequisites\ISO Images\Ubuntu\ub

To create the virtual machine and close the wizard, click Finish.

11. Hyper-V Manager creates **Ubuntu** virtual machine profile

12. In **Hyper-V Manager** main window, you see a new virtual machine named **Ubuntu**. **Right-click** the newly created virtual machine and click **Connect** from the context menu.



Virtual Machines

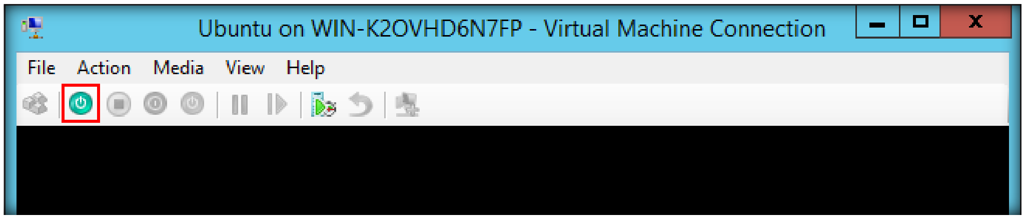
Name	State	CPU Usage	Assigned Memory	Uptime	Status
Windows Server 2016	Off				
Secondary Server	Off				
Primary Server	Off				
Windows 10	Off				
Ubuntu	Off				

Connect...
Settings...
Start
Checkpoint
Move...
Export...
Rename...
Delete...
Enable Replication...
Help

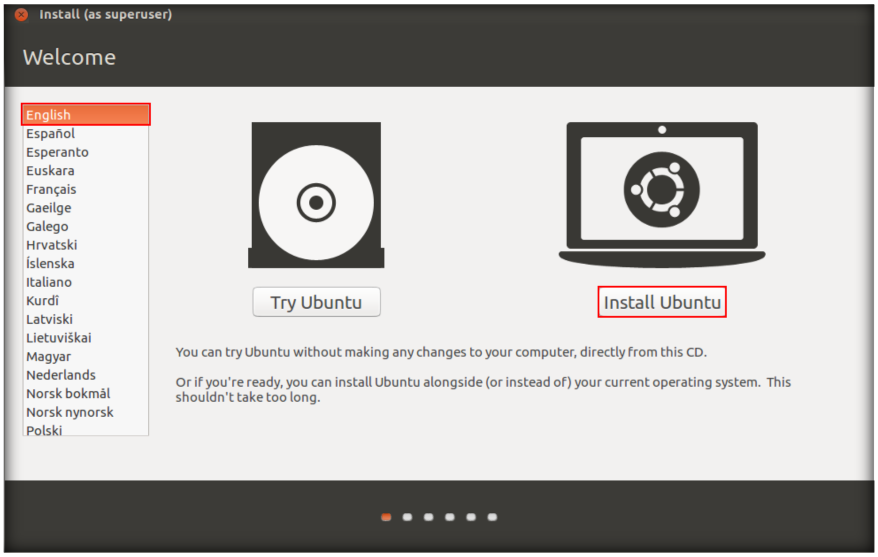
Checkpoints

The selected virtual machine has no checkpoints.

13. Ubuntu Virtual Machine window appears click **Start** button as shown in the screenshot


Ubuntu on WIN-K2OVHD6N7FP - Virtual Machine Connection
File
Action
Media
View
Help

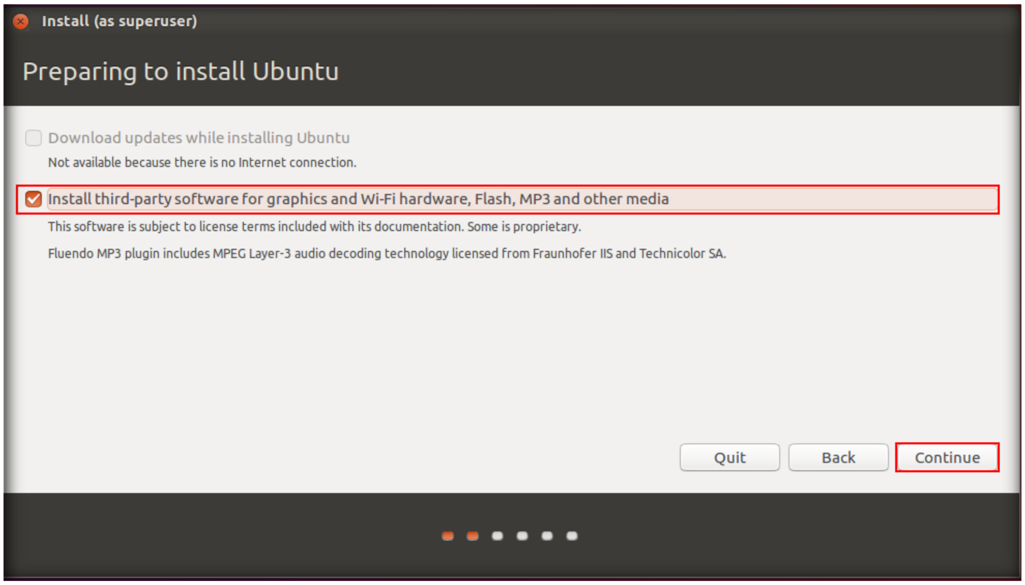
14. Ubuntu virtual machine starts booting with the provided source. Choose preferred language on the left hand-side and click **Install Ubuntu** in the Welcome screen


Install (as superuser)
Welcome
English
Español
Esperanto
Euskara
Français
Gaeilge
Galego
Hrvatski
Íslenska
Italiano
Kurdî
Latviski
Lietuviškai
Magyar
Nederlands
Norsk bokmål
Norsk nynorsk
Polski
Try Ubuntu
Install Ubuntu

You can try Ubuntu without making any changes to your computer, directly from this CD.

Or if you're ready, you can install Ubuntu alongside (or instead of) your current operating system. This shouldn't take too long.

15. Preparing to install Ubuntu wizard appears, check the check box as shown in the screenshot and click **Continue**


Install (as superuser)
Preparing to install Ubuntu
Quit
Back
Continue

☐ Download updates while installing Ubuntu

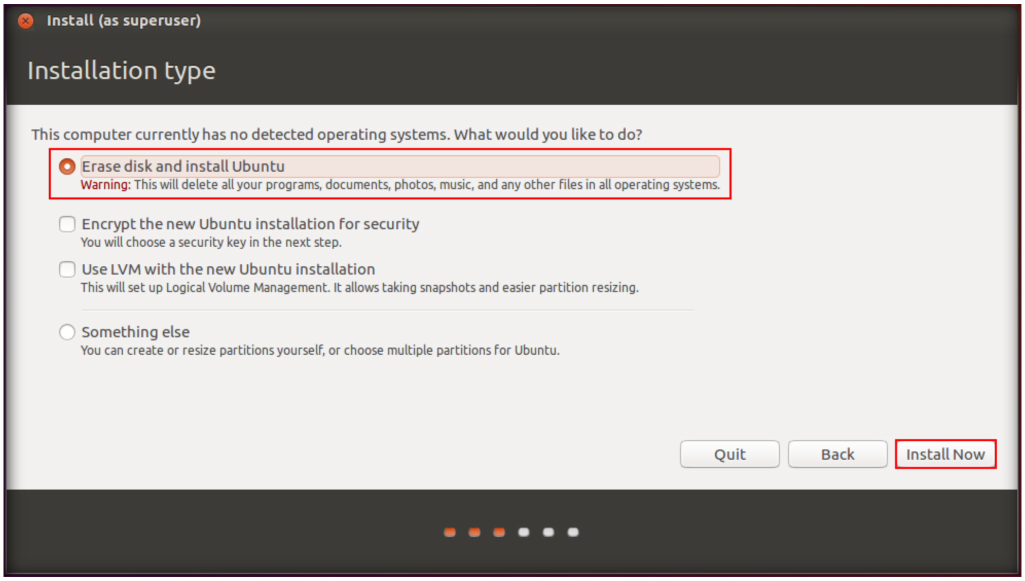
Not available because there is no Internet connection.

☑ Install third-party software for graphics and Wi-Fi hardware, Flash, MP3 and other media

This software is subject to license terms included with its documentation. Some is proprietary.

Fluendo MP3 plugin includes MPEG Layer-3 audio decoding technology licensed from Fraunhofer IIS and Technicolor SA.

16. In Installation type, choose **Erase disk and install Ubuntu** radio button and click **Install Now**


Install (as superuser)
Installation type
Quit
Back
Install Now

This computer currently has no detected operating systems. What would you like to do?

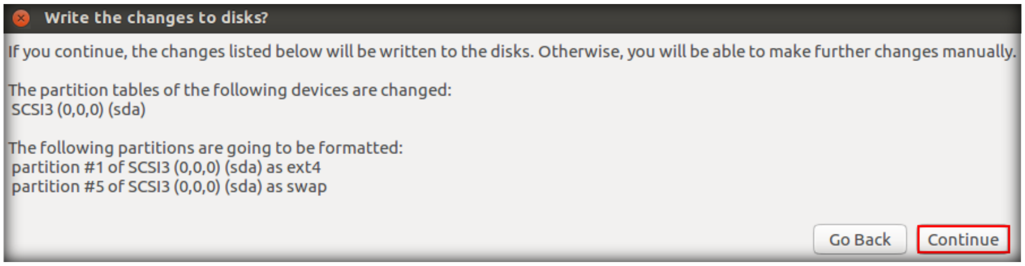
● Erase disk and install Ubuntu
Warning: This will delete all your programs, documents, photos, music, and any other files in all operating systems.

☐ Encrypt the new Ubuntu installation for security
You will choose a security key in the next step.

☐ Use LVM with the new Ubuntu installation
This will set up Logical Volume Management. It allows taking snapshots and easier partition resizing.

○ Something else
You can create or resize partitions yourself, or choose multiple partitions for Ubuntu.

17. Write the changes to disks pop-up appears, click **Continue**

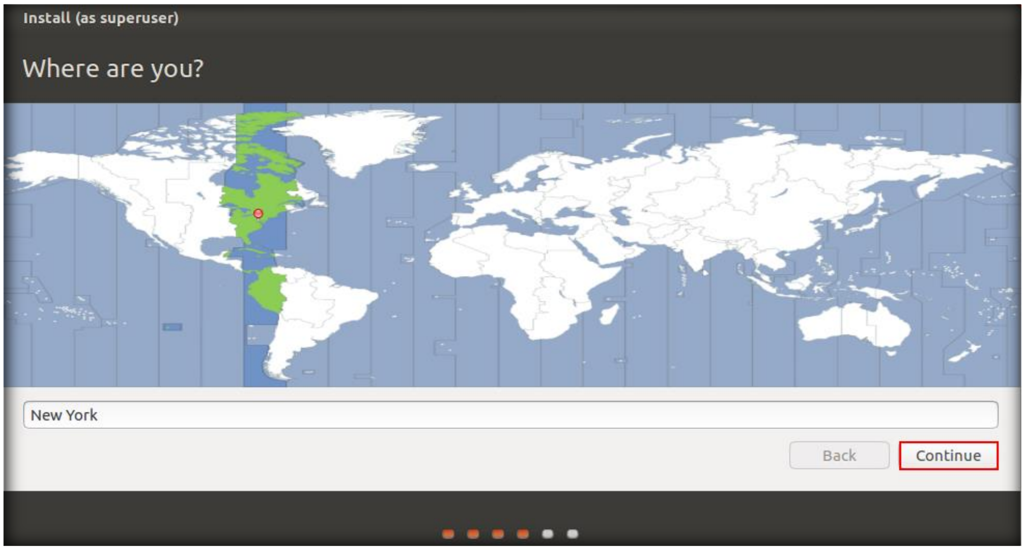

Write the changes to disks?
Go Back
Continue

If you continue, the changes listed below will be written to the disks. Otherwise, you will be able to make further changes manually.

The partition tables of the following devices are changed:
SCSI3 (0,0,0) (sda)

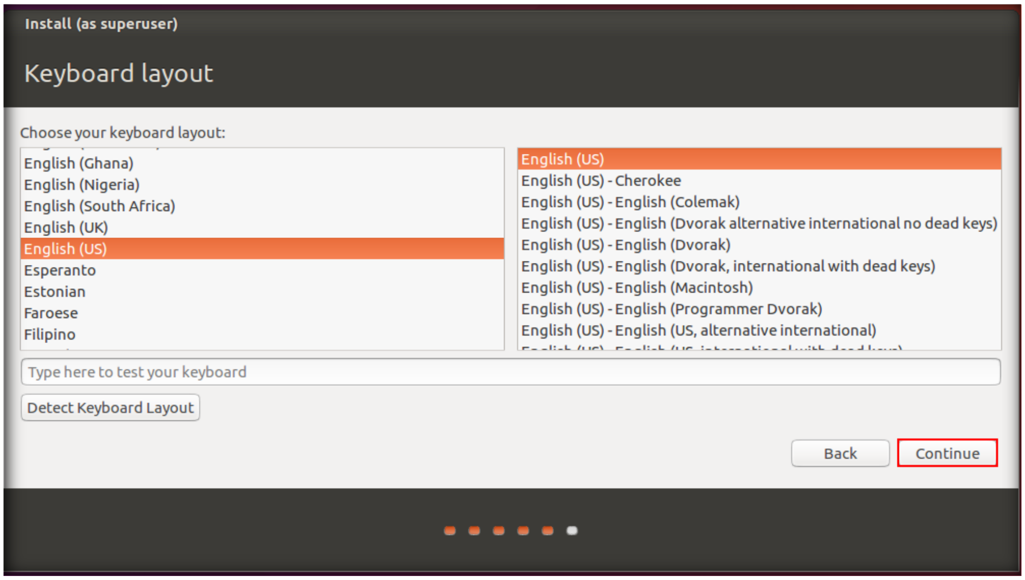
The following partitions are going to be formatted:
partition #1 of SCSI3 (0,0,0) (sda) as ext4
partition #5 of SCSI3 (0,0,0) (sda) as swap

18. **Where are you?** screen appears, choose the location or leave the settings to default and click **Continue**


Install (as superuser)
Where are you?
Back
Continue

New York

19. Keyboard layout screen appears, leave the settings to default and click **Continue**



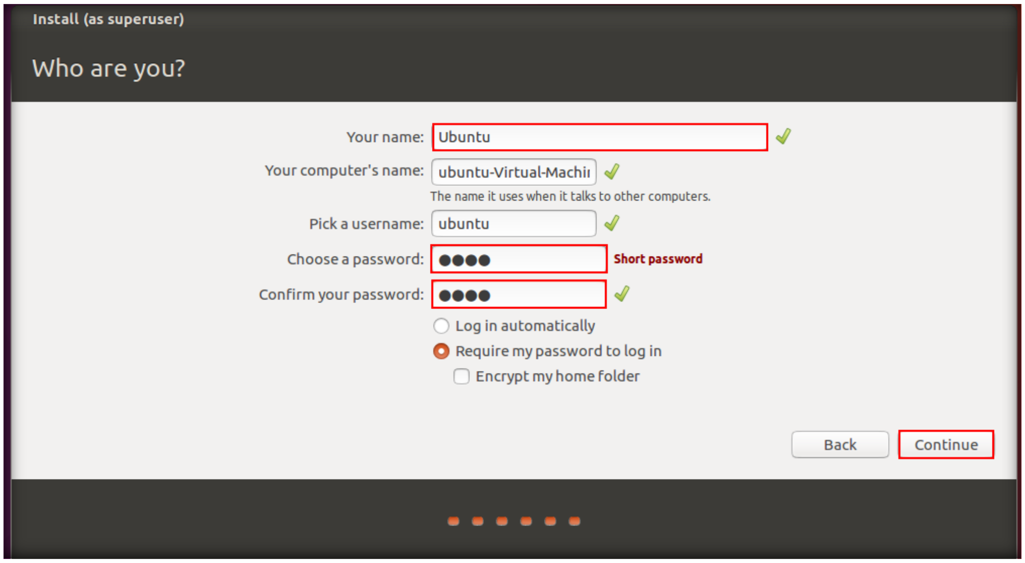
Install (as superuser)

Keyboard layout

Choose your keyboard layout:

English (Ghana)	English (US)
English (Nigeria)	English (US) - Cherokee
English (South Africa)	English (US) - English (Colemak)
English (UK)	English (US) - English (Dvorak alternative international no dead keys)
English (US)	English (US) - English (Dvorak)
Esperanto	English (US) - English (Dvorak, international with dead keys)
Estonian	English (US) - English (Macintosh)
Faroese	English (US) - English (Programmer Dvorak)
Filipino	English (US) - English (US, alternative international)

20. **Who are you?** screen appears, type **Ubuntu** in **Your name** field. The corresponding fields Your computer's name and **Pick a username** are **auto filled**. Type **toor** in **Choose a password** and **Confirm your password** fields and click **Continue**



Install (as superuser)

Who are you?

Your name: Ubuntu ✓

Your computer's name: ubuntu-Virtual-Machi ✓

The name it uses when it talks to other computers.

Pick a username: ubuntu ✓

Choose a password: ●●●● Short password

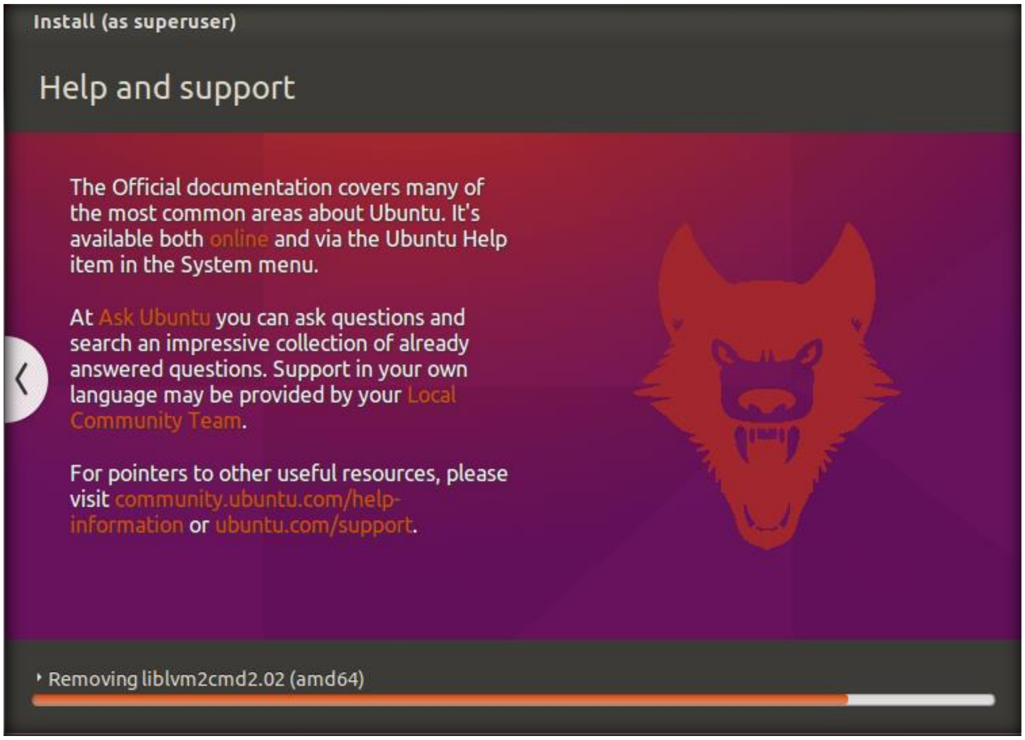
Confirm your password: ●●●● ✓

○ Log in automatically

● Require my password to log in

☐ Encrypt my home folder

21. Ubuntu installation will start, wait till you get the Ubuntu login screen as shown the screenshot below:



The Official documentation covers many of the most common areas about Ubuntu. It's available both online and via the Ubuntu Help item in the System menu.

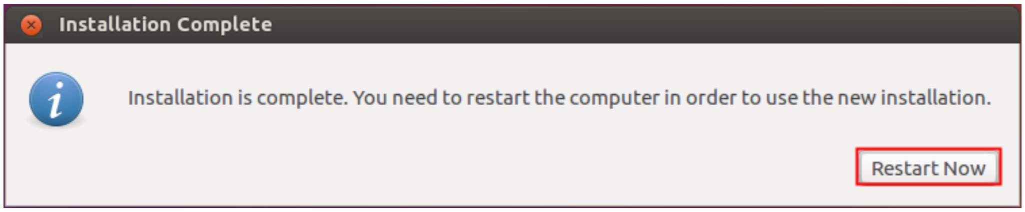
At Ask Ubuntu you can ask questions and search an impressive collection of already answered questions. Support in your own language may be provided by your Local Community Team.

For pointers to other useful resources, please visit community.ubuntu.com/help-information or ubuntu.com/support.

Removing liblvm2cmd2.02 (amd64)

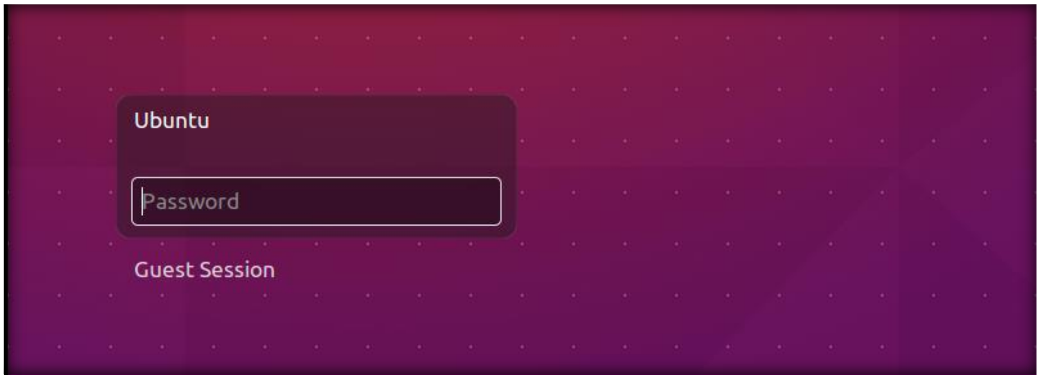
22. Once the installation is completed, click **Restart Now** button.

Note: You must change the boot order to **IDE** from the **BIOS** options present in the **Settings for Ubuntu** in settings window of Hyper-V Manager.



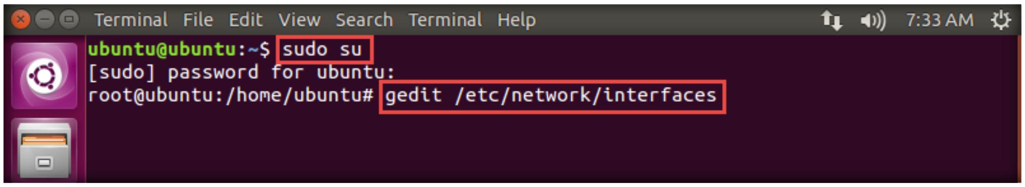
Installation is complete. You need to restart the computer in order to use the new installation.

23. After restart, login screen appears, type **toor** in the Password field and press **Enter**.



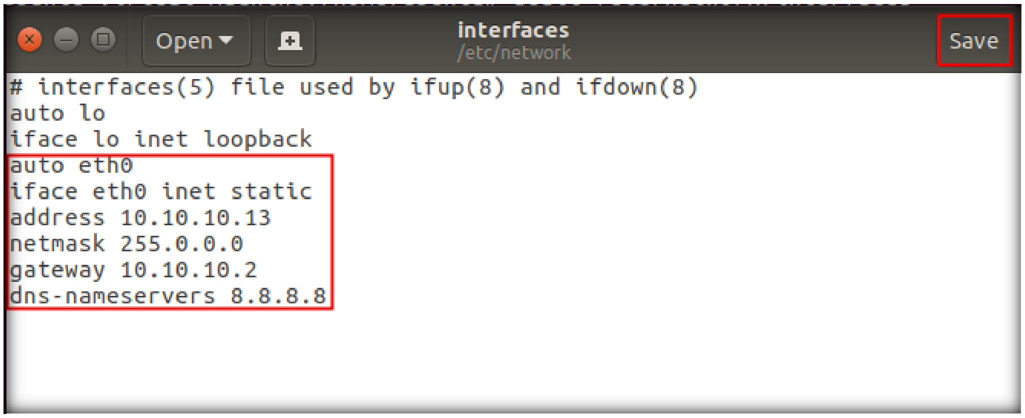
CT#6.2: Configuring Static IP Address

1. Login to Ubuntu machine (Username: **Ubuntu**, Password: **toor**).
2. Launch a **Terminal** and type **sudo su** and hit **Enter**. It will ask for password, type **toor** and press **Enter**.
3. Then, type **gedit /etc/network/interfaces** and hit **Enter**. It will open interfaces file in gedit.



```
ubuntu@ubuntu:~$ sudo su
[sudo] password for ubuntu:
root@ubuntu:/home/ubuntu# gedit /etc/network/interfaces
```

4. Modify the interfaces file as shown in the screenshot below:
   - **address 10.10.10.13**
   - **netmask 255.0.0.0**
   - **gateway 10.10.10.2**
   - **dns-nameservers 8.8.8.8**
5. Click **Save** button and then close the Interfaces file.



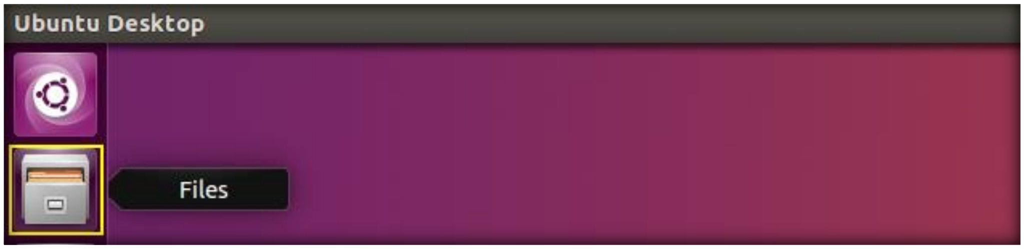
```
# interfaces(5) file used by ifup(8) and ifdown(8)
auto lo
iface lo inet loopback
auto eth0
iface eth0 inet static
address 10.10.10.13
netmask 255.0.0.0
gateway 10.10.10.2
dns-nameservers 8.8.8.8
```

6. Type **reboot** in the terminal to restart the Ubuntu machine.

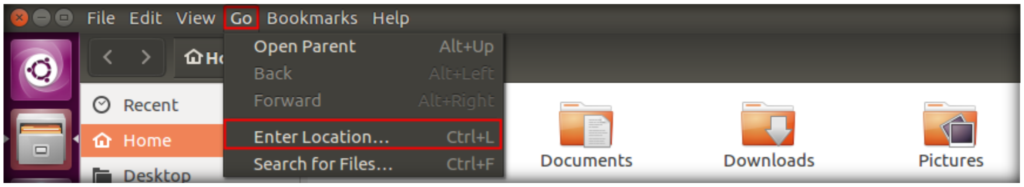
   Note: Until and unless you restart the machine, network configuration will not be applied.

CT#6.3: Mapping EDRP-Tools Folder from Host Machine to Ubuntu Virtual Machine

1. Click **Files** icon from the taskbar menu as shown in the screenshot

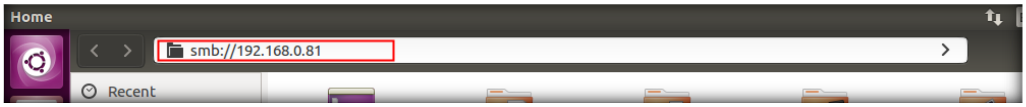


2. File Explorer window appears, click **Enter Location** from the **Go** menu as shown in the screenshot


File
Edit
View
Go
Bookmarks
Help
Open Parent Alt+Up
Back Alt+Left
Forward Alt+Right
Enter Location… Ctrl+L
Search for Files… Ctrl+F
Recent
Home
Desktop
Documents
Downloads
Pictures

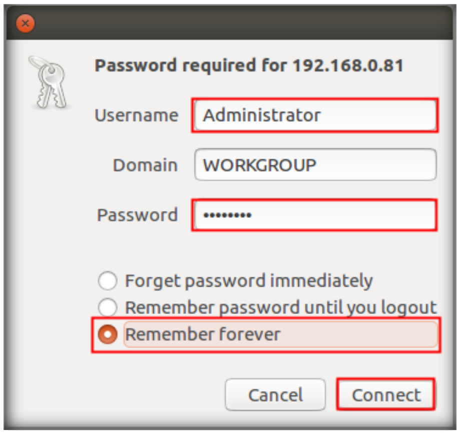
3. Type **smb://[IP address of your host machine]** in the address bar and press **Enter**

   Note: IP address will differ in your lab environment


Home
Recent

smb://192.168.0.81

4. Password required for [IP address of your host machine] pop-up appears, type credentials of your host machine, select Remember forever radio button and click **Connect**



Password required for 192.168.0.81

Username: Administrator

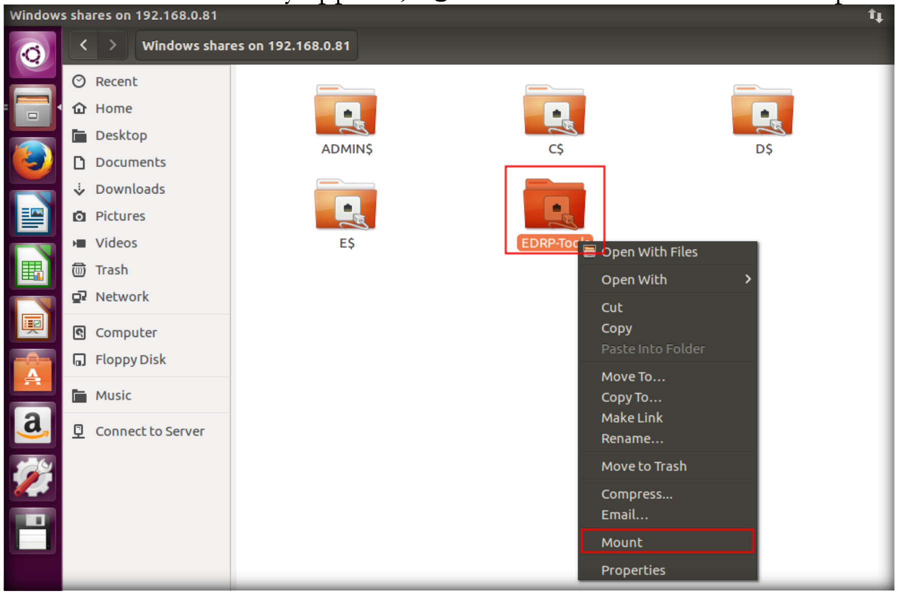
Domain: WORKGROUP

Password: ••••••••

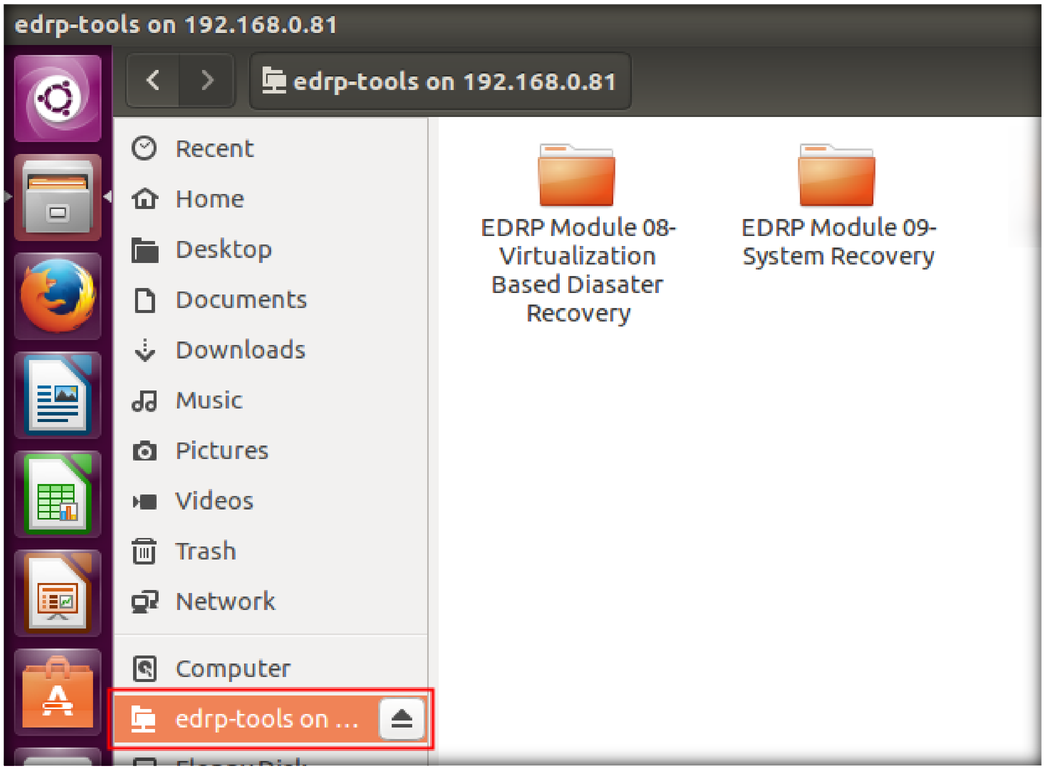
○ Forget password immediately
○ Remember password until you logout
● Remember forever

Cancel
Connect

5. Shared EDRP-Tools directory appears, **right-click** and click **Mount** to map the shared folder


Windows shares on 192.168.0.81
Windows shares on 192.168.0.81
Recent
Home
Desktop
Documents
Downloads
Pictures
Videos
Trash
Network
Computer
Floppy Disk
Music
Connect to Server
ADMIN$
C$
D$
E$
EDRP-Too
Open With Files
Open With
Cut
Copy
Paste Into Folder
Move To…
Copy To…
Make Link
Rename…
Move to Trash
Compress…
Email…
Mount
Properties

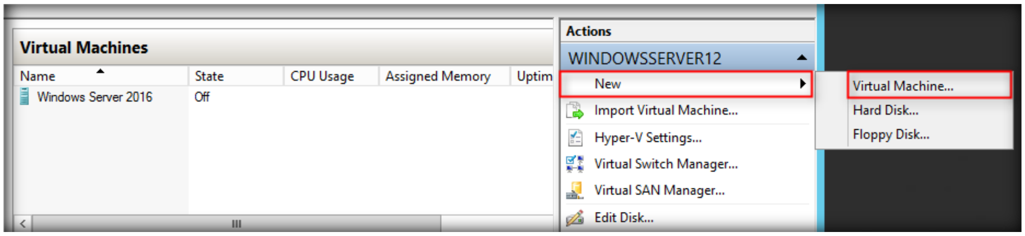
6. **Shared folder** appears in the **left pane**, and the contents of the folder appears as shown in the screenshot


edrp-tools on 192.168.0.81
edrp-tools on 192.168.0.81
Recent
Home
Desktop
Documents
Downloads
Music
Pictures
Videos
Trash
Network
Computer
edrp-tools on ...
EDRP Module 08-Virtualization Based Diasater Recovery
EDRP Module 09-System Recovery

CT#7: Creating and Configuring Windows Server 2012 Virtual Machine as Primary Server

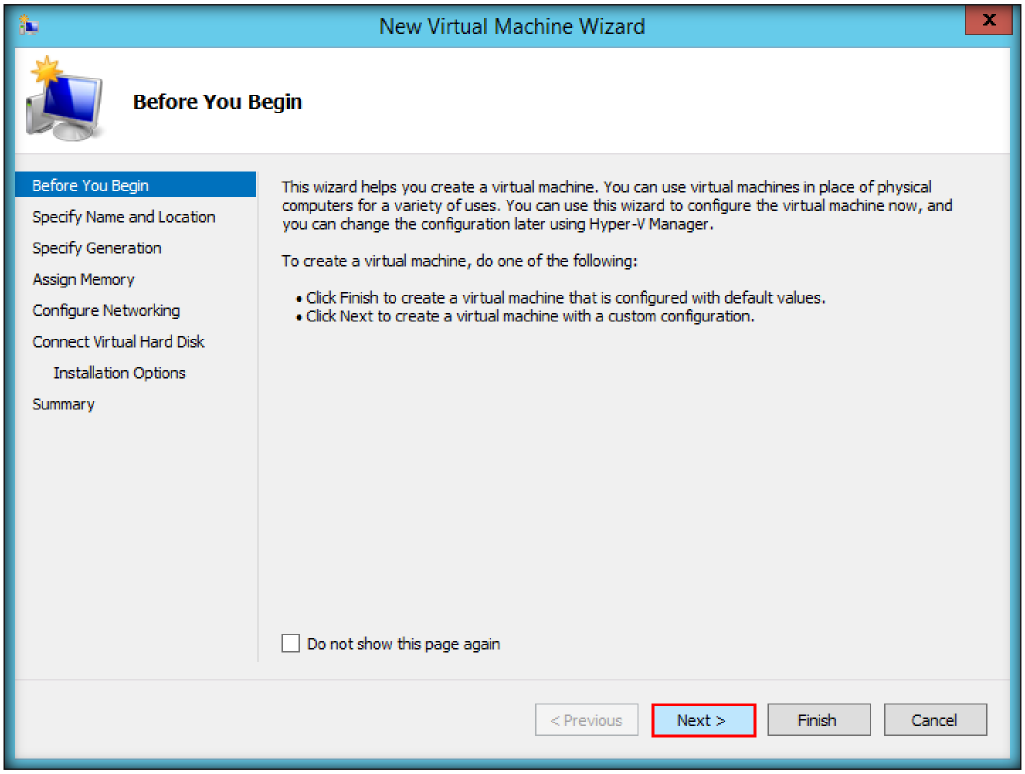
CT#7.1: Creating a Virtual Machine and Installing Windows Server 2012 R2 Standard Guest OS as Primary Server

1. Launch Hyper-V Manager. If already launched, skip to step two.
2. Select your local machine in the left pane, then click **New**, and then click **Virtual Machine...** in the right pane as shown in the screen shot.


Virtual Machines
Name
State
CPU Usage
Assigned Memory
Uptim
Windows Server 2016
Off
Actions
WINDOWSSERVER12
New
Import Virtual Machine...
Hyper-V Settings...
Virtual Switch Manager...
Virtual SAN Manager...
Edit Disk...
Virtual Machine...
Hard Disk...
Floppy Disk...

Note: Every machine has a unique name, so the name of your machine differs from the name shown in the above screenshot.

3. **New Virtual Machine Wizard** window appears, click **Next** button


New Virtual Machine Wizard
Before You Begin
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

This wizard helps you create a virtual machine. You can use virtual machines in place of physical computers for a variety of uses. You can use this wizard to configure the virtual machine now, and you can change the configuration later using Hyper-V Manager.

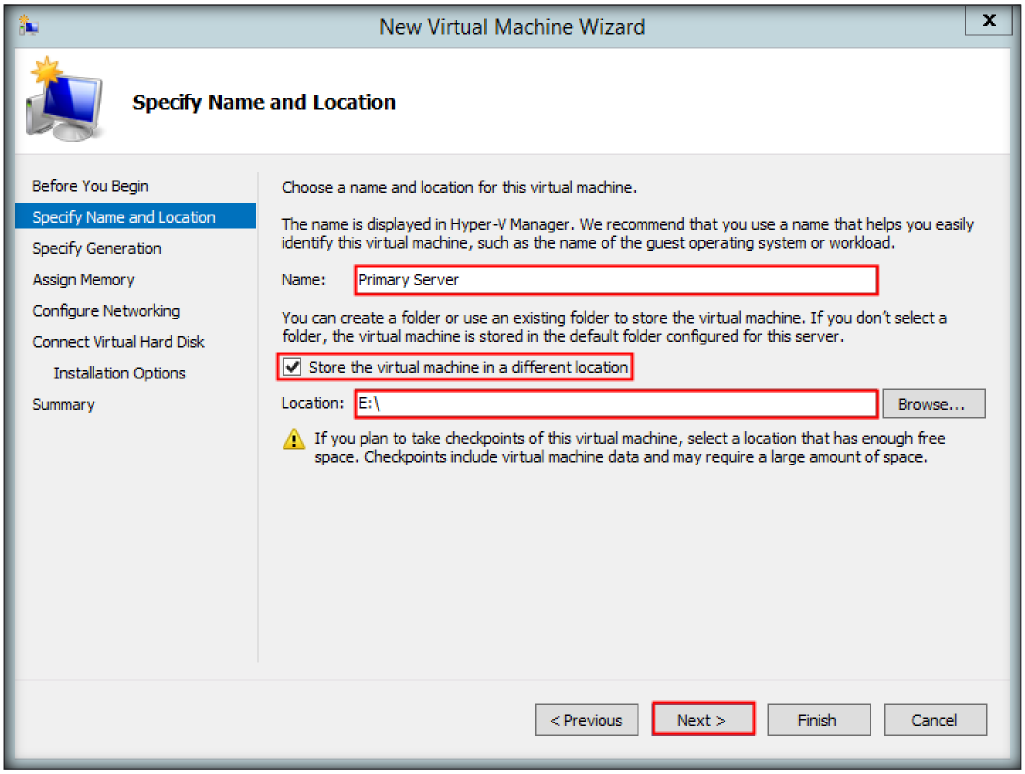
To create a virtual machine, do one of the following:

- Click Finish to create a virtual machine that is configured with default values.
- Click Next to create a virtual machine with a custom configuration.

☐ Do not show this page again

4. Specify **Name** and **location** of new virtual machine. Assign the name of the virtual machine as **Primary Server**.
5. The default location for storing the virtual machine is **C:\ProgramData\Microsoft\Windows\Hyper-V\**. You can choose different location to store the VM's or set it to default location. Click **Next**

   Note: You can specify the location either in the **Specify Name and Location** section or in the forthcoming **Connect Virtual Hard Disk** section


New Virtual Machine Wizard
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
Browse...
< Previous
Next >
Finish
Cancel

Specify Name and Location

Choose a name and location for this virtual machine.

The name is displayed in Hyper-V Manager. We recommend that you use a name that helps you easily identify this virtual machine, such as the name of the guest operating system or workload.

Name: Primary Server

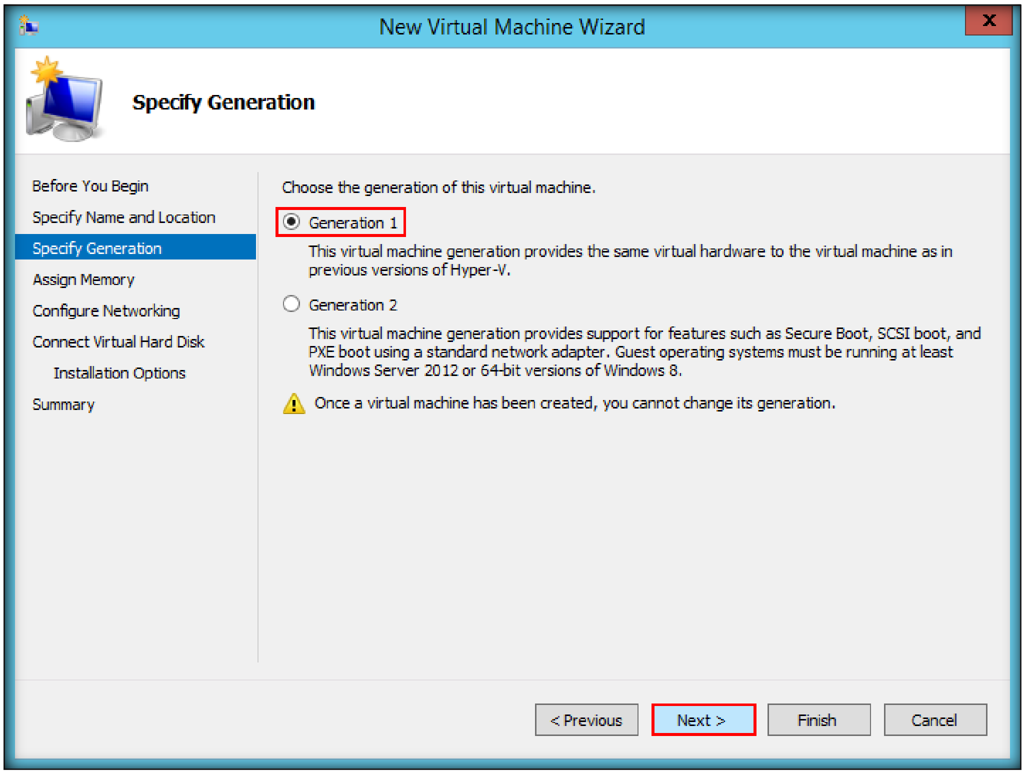
You can create a folder or use an existing folder to store the virtual machine. If you don't select a folder, the virtual machine is stored in the default folder configured for this server.

☑ Store the virtual machine in a different location

Location: E:\

If you plan to take checkpoints of this virtual machine, select a location that has enough free space. Checkpoints include virtual machine data and may require a large amount of space.

6. Choose the generation of the virtual machine (here, **Generation 1**) and click **Next**



New Virtual Machine Wizard
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

Specify Generation

Choose the generation of this virtual machine.

● Generation 1

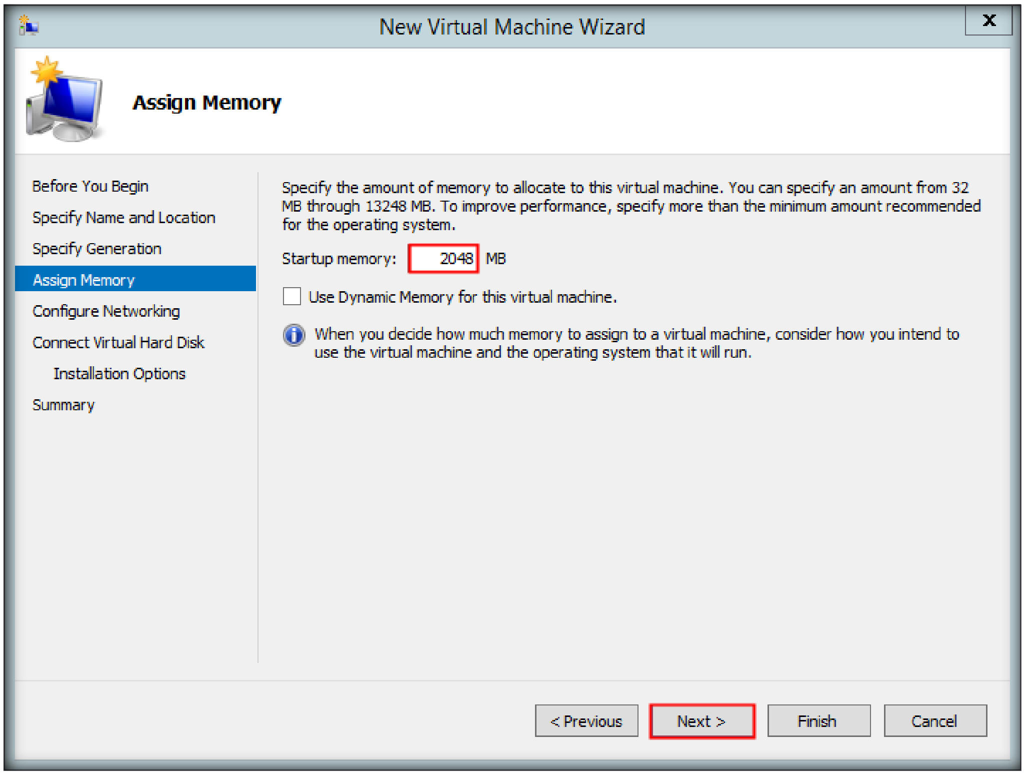
This virtual machine generation provides the same virtual hardware to the virtual machine as in previous versions of Hyper-V.

○ Generation 2

This virtual machine generation provides support for features such as Secure Boot, SCSI boot, and PXE boot using a standard network adapter. Guest operating systems must be running at least Windows Server 2012 or 64-bit versions of Windows 8.

⚠ Once a virtual machine has been created, you cannot change its generation.

7. Assign the amount of **Startup memory** to allocate to this virtual machine in MB (here, **2048**) Click **Next.**



New Virtual Machine Wizard
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

Assign Memory

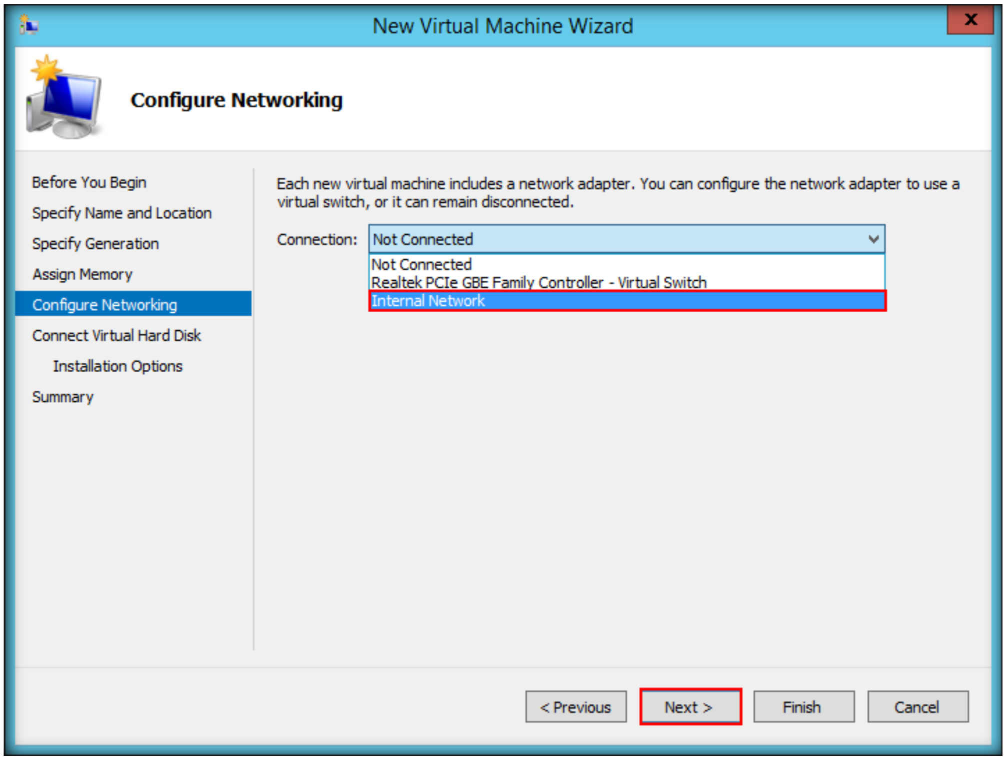
Specify the amount of memory to allocate to this virtual machine. You can specify an amount from 32 MB through 13248 MB. To improve performance, specify more than the minimum amount recommended for the operating system.

Startup memory: 2048 MB

☐ Use Dynamic Memory for this virtual machine.

When you decide how much memory to assign to a virtual machine, consider how you intend to use the virtual machine and the operating system that it will run.

8. In the next step, select **network adapter** as **Internal Network** from connection drop-down list and click **Next**



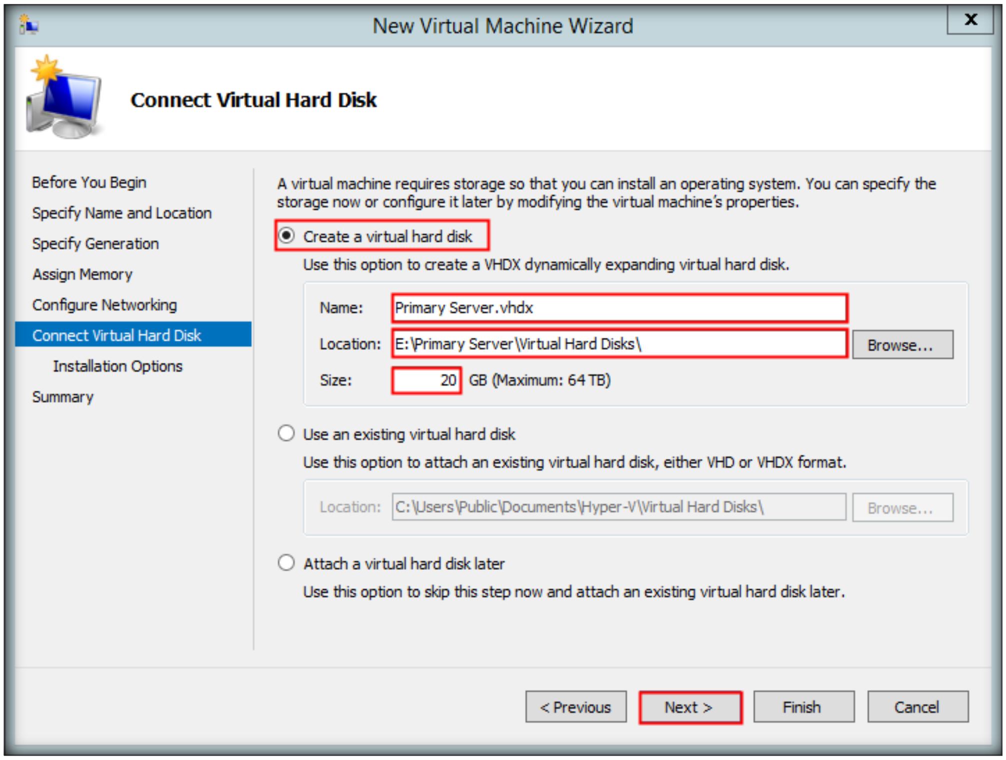
New Virtual Machine Wizard
Configure Networking
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

Each new virtual machine includes a network adapter. You can configure the network adapter to use a virtual switch, or it can remain disconnected.

Connection: Not Connected

Not Connected
Realtek PCIe GBE Family Controller - Virtual Switch
Internal Network

9. Connect Virtual Hard Disk section appears, allocate **20 GB** space for hard disk and click **Next**



New Virtual Machine Wizard
Connect Virtual Hard Disk
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
Browse...
Browse...
< Previous
Next >
Finish
Cancel

A virtual machine requires storage so that you can install an operating system. You can specify the storage now or configure it later by modifying the virtual machine's properties.

● Create a virtual hard disk

Use this option to create a VHDX dynamically expanding virtual hard disk.

Name: Primary Server.vhdx

Location: E:\Primary Server\Virtual Hard Disks\

Size: 20 GB (Maximum: 64 TB)

○ Use an existing virtual hard disk

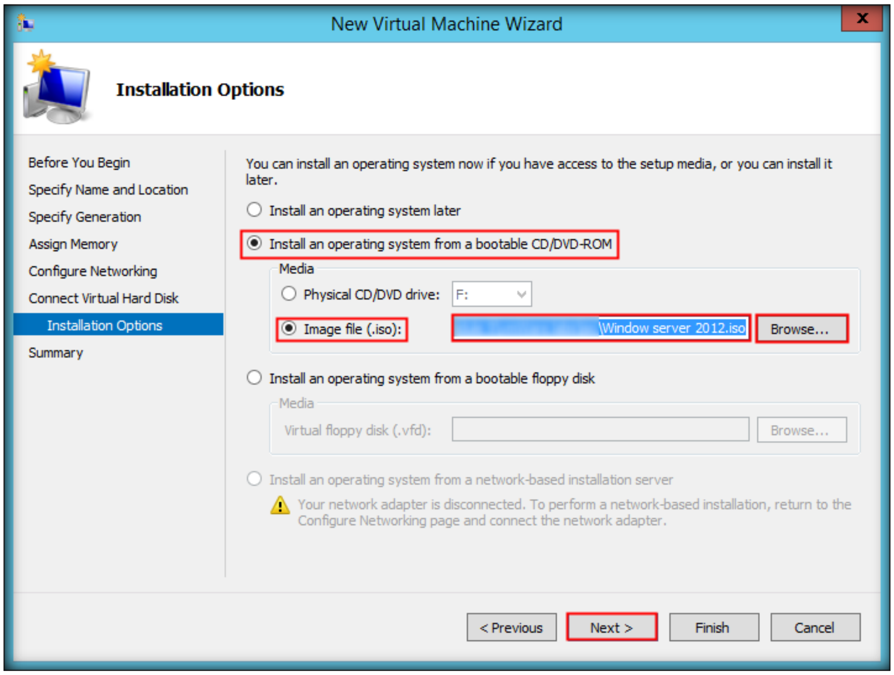
Use this option to attach an existing virtual hard disk, either VHD or VHDX format.

Location: C:\Users\Public\Documents\Hyper-V\Virtual Hard Disks\

○ Attach a virtual hard disk later

Use this option to skip this step now and attach an existing virtual hard disk later.

10. The **installation options** section appears, select **Install an operating system from a bootable CD/DVD-ROM** radio button.
    - If you have a Windows Server 2012 DVD, choose **Physical CD/DVD drive** radio button and then click **Next**.
    - If you have a Windows Server 2012 ISO file, then choose **Image file (.iso)** radio button and click browse button to provide the path of ISO file and click **Next**.


New Virtual Machine Wizard
Installation Options
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
Media
Browse...
Media
Browse...
< Previous
Next >
Finish
Cancel

You can install an operating system now if you have access to the setup media, or you can install it later.

○ Install an operating system later

● Install an operating system from a bootable CD/DVD-ROM

○ Physical CD/DVD drive: F:

● Image file (.iso): \Window server 2012.iso

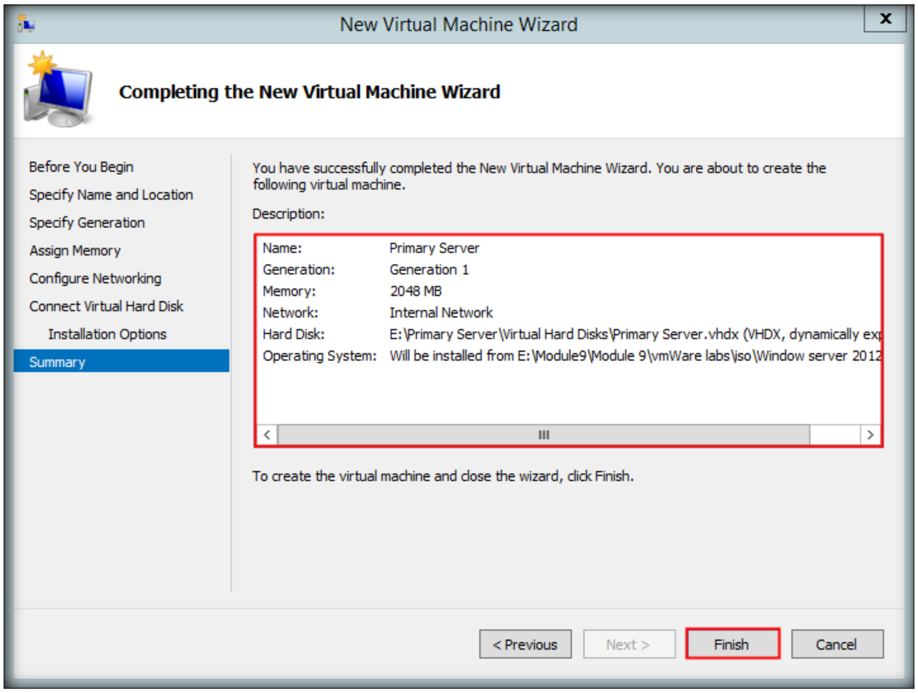
○ Install an operating system from a bootable floppy disk

Virtual floppy disk (.vfd):

○ Install an operating system from a network-based installation server

Your network adapter is disconnected. To perform a network-based installation, return to the Configure Networking page and connect the network adapter.

11. Virtual machine wizard appears with summary information. Click **Finish**


New Virtual Machine Wizard
Completing the New Virtual Machine Wizard
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

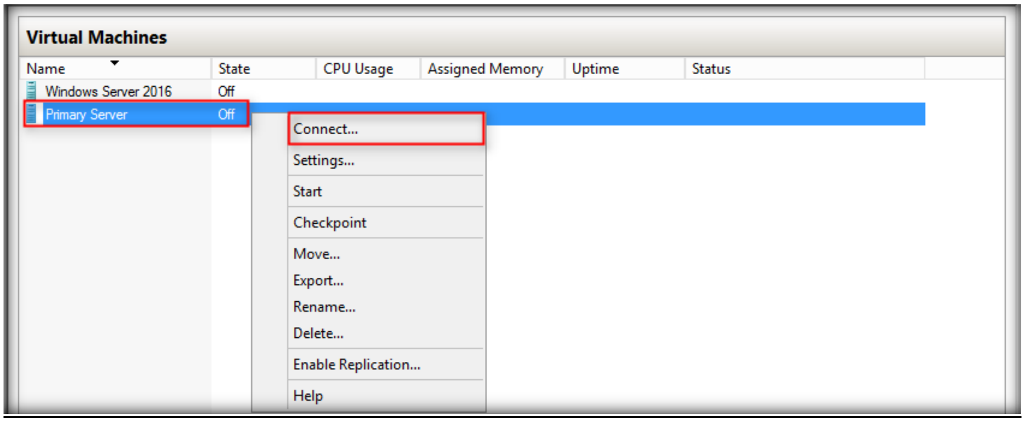
You have successfully completed the New Virtual Machine Wizard. You are about to create the following virtual machine.

Description:

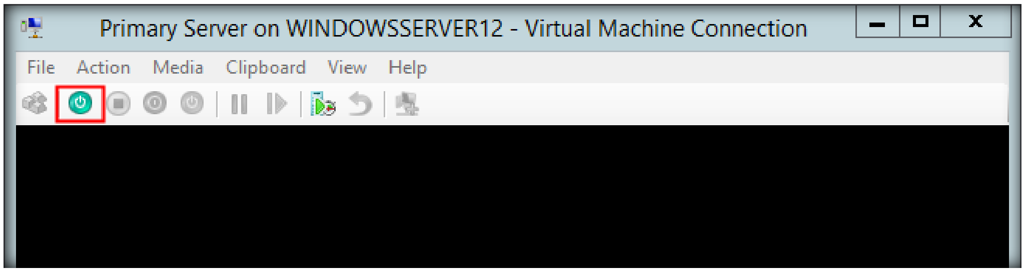
Name: Primary Server
Generation: Generation 1
Memory: 2048 MB
Network: Internal Network
Hard Disk: E:\Primary Server\Virtual Hard Disks\Primary Server.vhdx (VHDX, dynamically ex
Operating System: Will be installed from E:\Module9\Module 9\vmWare labs\iso\Window server 2012

To create the virtual machine and close the wizard, click Finish.

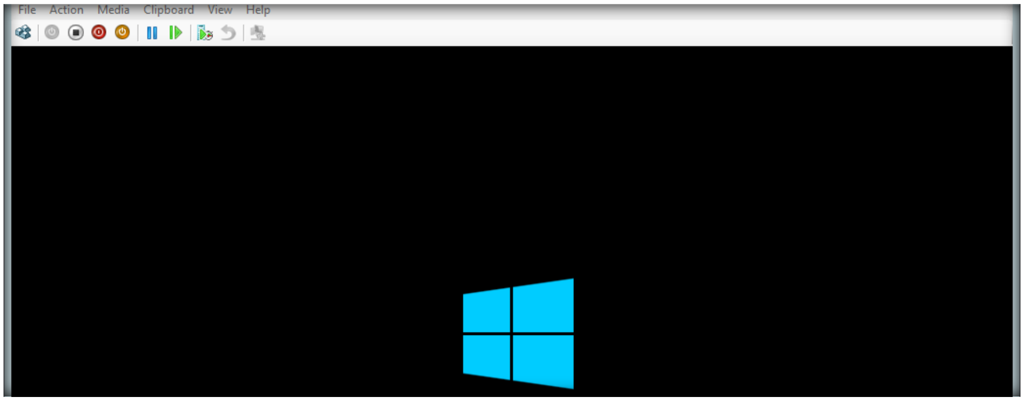
12. Hyper-V Manager creates **Primary Server** virtual machine profile
13. In **Hyper-V Manager** main window, you see a new virtual machine named **Primary Server**. **Right-click** the newly created virtual machine and click **Connect** from the context menu.


Virtual Machines
Name
State
CPU Usage
Assigned Memory
Uptime
Status
Windows Server 2016
Off
Primary Server
Off
Connect...
Settings...
Start
Checkpoint
Move...
Export...
Rename...
Delete...
Enable Replication...
Help

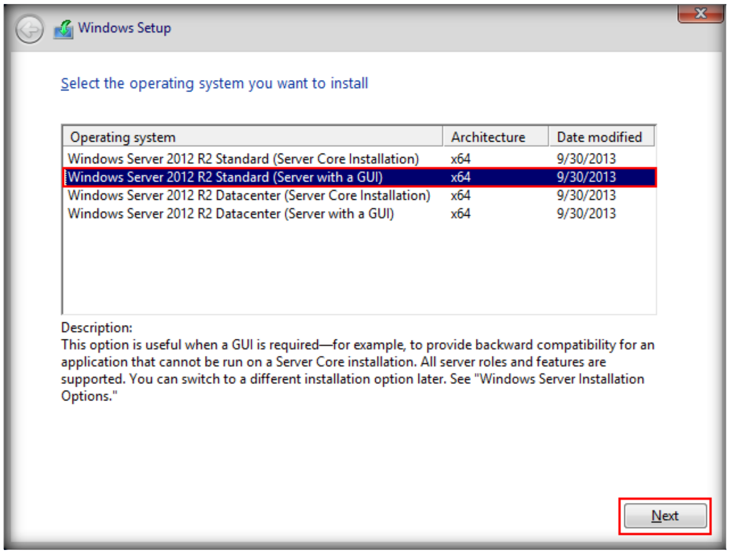
14. **Primary Server** Virtual Machine window appears click **Start** button as shown in the screenshot


Primary Server on WINDOWSSERVER12 - Virtual Machine Connection
File
Action
Media
Clipboard
View
Help

15. Primary Server virtual machine starts booting with the provided source.


File
Action
Media
Clipboard
View
Help

16. While installing, **Windows Setup** appears, choose **Windows Server 2012 R2 Standard (Server with a GUI)** option and click **Next**.
17. Follow the instructions during the installation and install Windows Server 2012 operating system. Once the installation is finished, Windows Server 2012 will restart.

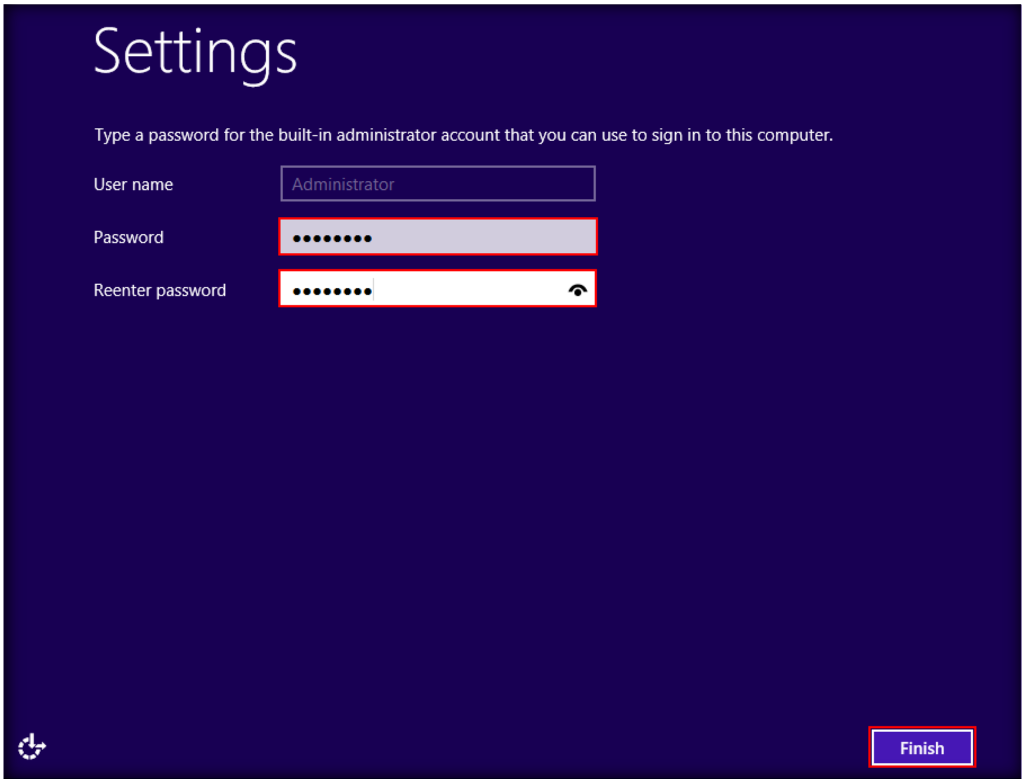


Select the operating system you want to install

Operating system	Architecture	Date modified
Windows Server 2012 R2 Standard (Server Core Installation)	x64	9/30/2013
Windows Server 2012 R2 Standard (Server with a GUI)	x64	9/30/2013
Windows Server 2012 R2 Datacenter (Server Core Installation)	x64	9/30/2013
Windows Server 2012 R2 Datacenter (Server with a GUI)	x64	9/30/2013

Description:
This option is useful when a GUI is required—for example, to provide backward compatibility for an application that cannot be run on a Server Core installation. All server roles and features are supported. You can switch to a different installation option later. See "Windows Server Installation Options."

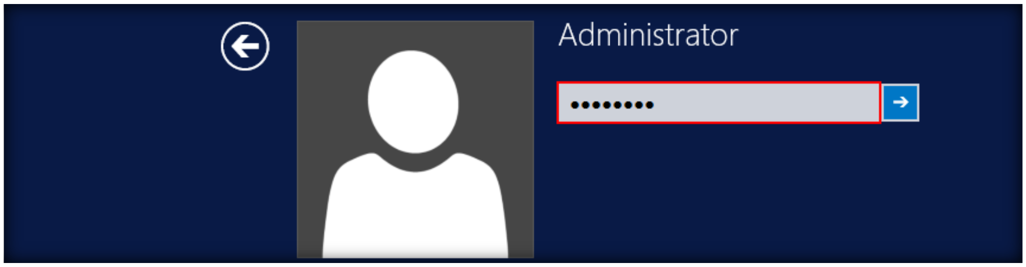
18. On installation, Settings window appears where the username is set by default as **Administrator**. Enter the password as **Pa$$w0rd** in **Password** and **Re-enter password** fields, and click **Finish**



Type a password for the built-in administrator account that you can use to sign in to this computer.

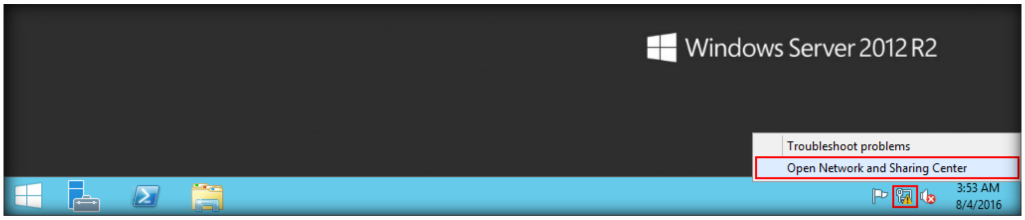
User name: Administrator
Password: ••••••••
Reenter password: ••••••••

19. Click **Ctrl+Alt+Delete** icon on the menu to login.
20. **Login** screen appears. Type the password (**Pa$$w0rd**) and press **Enter**.

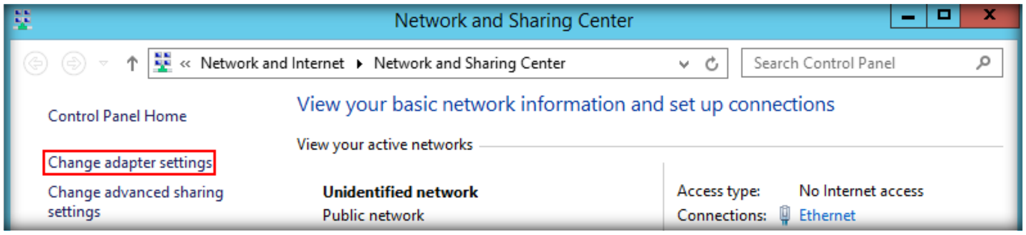

Administrator
•••••••••

CT#7.2: Configuring Static IP Address

1. Login as Administrator. Close the **Server Manager** window that opens after successful sign in, **right-click Network** icon (lower right corner of the desktop) and click **Open Network and Sharing Center** from the context menu.


Windows Server 2012 R2
Troubleshoot problems
Open Network and Sharing Center
3:53 AM
8/4/2016

2. Network and Sharing Center window appears, click **Change adapter settings** link from the left pane


Network and Sharing Center
« Network and Internet ▸ Network and Sharing Center
Search Control Panel
Control Panel Home
Change adapter settings
Change advanced sharing settings

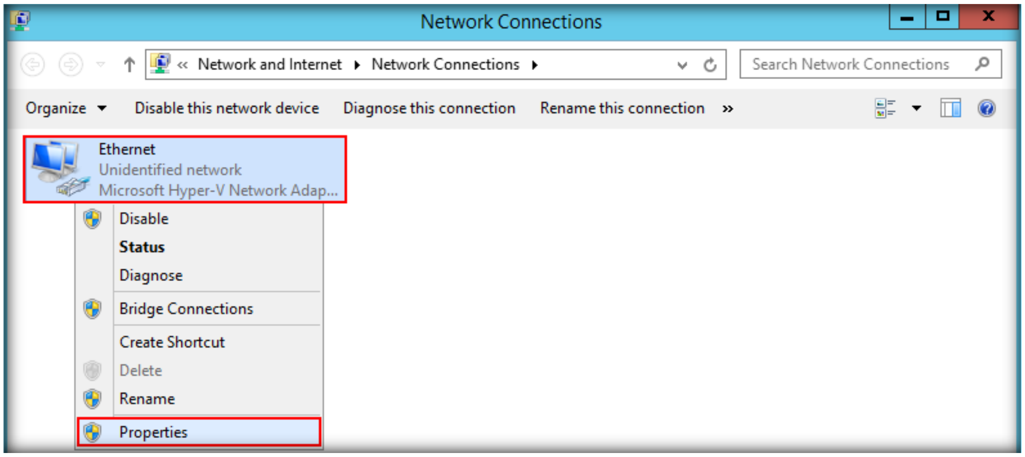
View your basic network information and set up connections

View your active networks

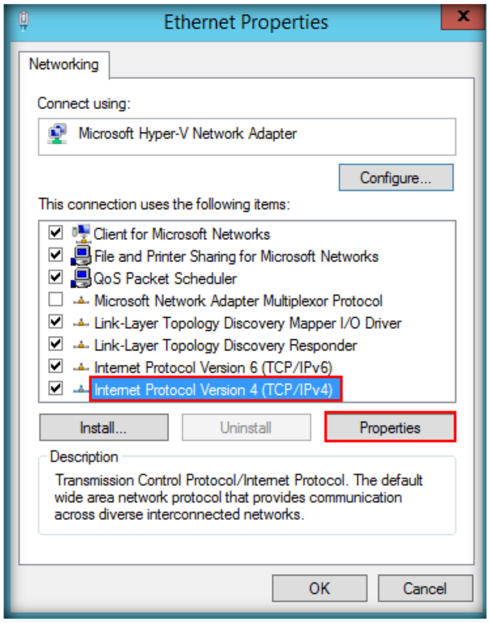
Unidentified network
Public network

Access type: No Internet access
Connections: Ethernet

3. In the **Network Connections** window, **right-click Ethernet** adapter and click **Properties** from the context menu


Network Connections
« Network and Internet ▸ Network Connections ▸
Search Network Connections
Organize ▾
Disable this network device
Diagnose this connection
Rename this connection
»
Ethernet
Unidentified network
Microsoft Hyper-V Network Adap...
Disable
Status
Diagnose
Bridge Connections
Create Shortcut
Delete
Rename
Properties

4. **Ethernet Properties** window appears; and select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**



Connect using:

Microsoft Hyper-V Network Adapter

This connection uses the following items:

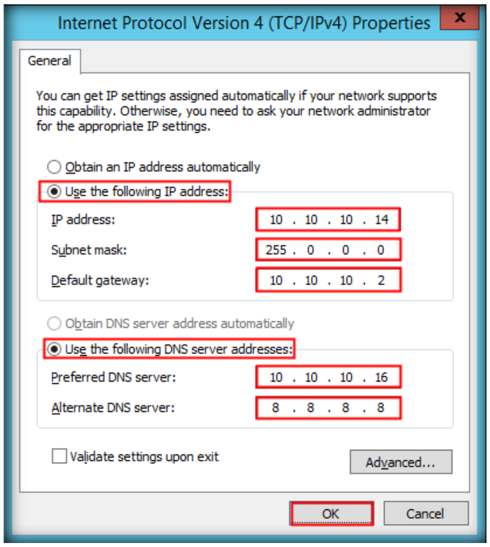
- ☑ Client for Microsoft Networks
- ☑ File and Printer Sharing for Microsoft Networks
- ☑ QoS Packet Scheduler
- ☐ Microsoft Network Adapter Multiplexor Protocol
- ☑ Link-Layer Topology Discovery Mapper I/O Driver
- ☑ Link-Layer Topology Discovery Responder
- ☑ Internet Protocol Version 6 (TCP/IPv6)
- ☑ Internet Protocol Version 4 (TCP/IPv4)

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

5. Select **Use the following IP address** and **Use the following DNS server addresses** radio buttons, and type the following values as shown in the screenshot, and click **OK**.
   - **IP address: 10.10.10.14**
   - **Subnet mask: 255.0.0.0**
   - **Default gateway: 10.10.10.2**
   - **Preferred DNS server: 10.10.10.16**
   - **Alternate DNS Server: 8.8.8.8**

   Note: Once you click **OK** button if Networks section appears on the right side of the desktop screen, and then click **Yes**.



You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically

● Use the following IP address:

IP address: 10 . 10 . 10 . 14

Subnet mask: 255 . 0 . 0 . 0

Default gateway: 10 . 10 . 10 . 2

○ Obtain DNS server address automatically

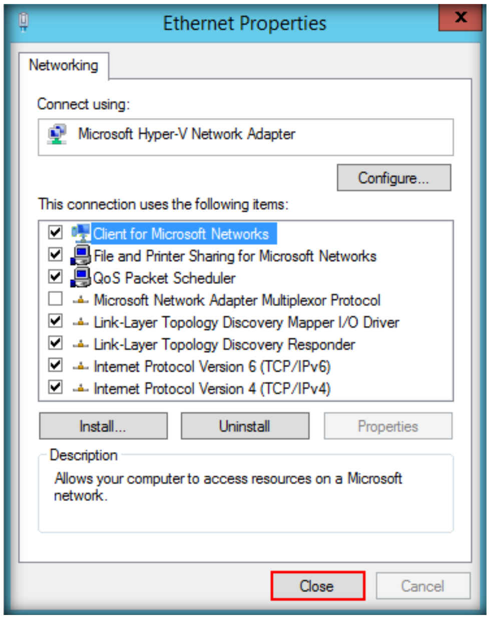
● Use the following DNS server addresses:

Preferred DNS server: 10 . 10 . 10 . 16

Alternate DNS server: 8 . 8 . 8 . 8

☐ Validate settings upon exit

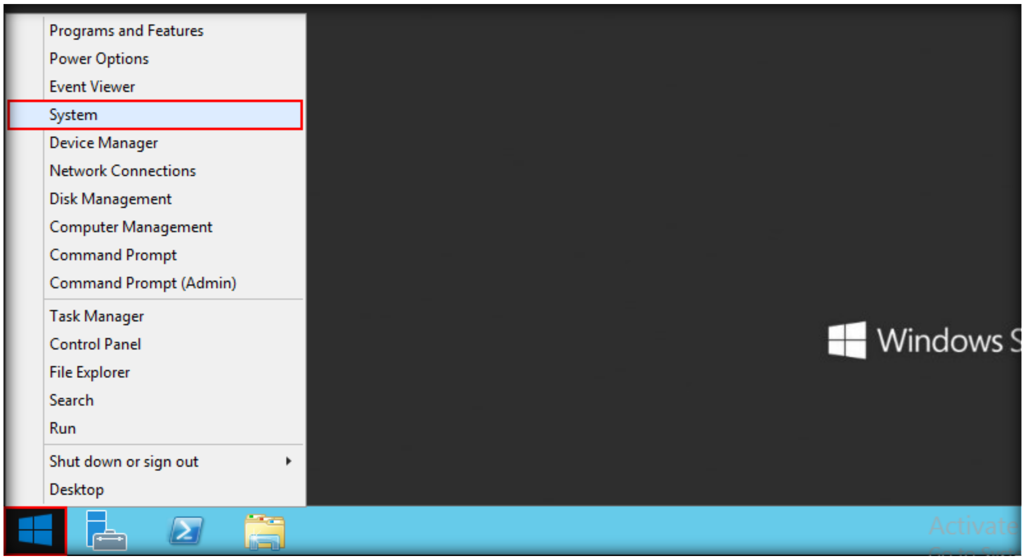
6. Click **Close** to close the **Ethernet Properties** window


Ethernet Properties
Networking
Connect using:
Microsoft Hyper-V Network Adapter
Configure...
This connection uses the following items:
☑ Client for Microsoft Networks
☑ File and Printer Sharing for Microsoft Networks
☑ QoS Packet Scheduler
☐ Microsoft Network Adapter Multiplexor Protocol
☑ Link-Layer Topology Discovery Mapper I/O Driver
☑ Link-Layer Topology Discovery Responder
☑ Internet Protocol Version 6 (TCP/IPv6)
☑ Internet Protocol Version 4 (TCP/IPv4)
Install...
Uninstall
Properties
Description
Allows your computer to access resources on a Microsoft network.
Close
Cancel

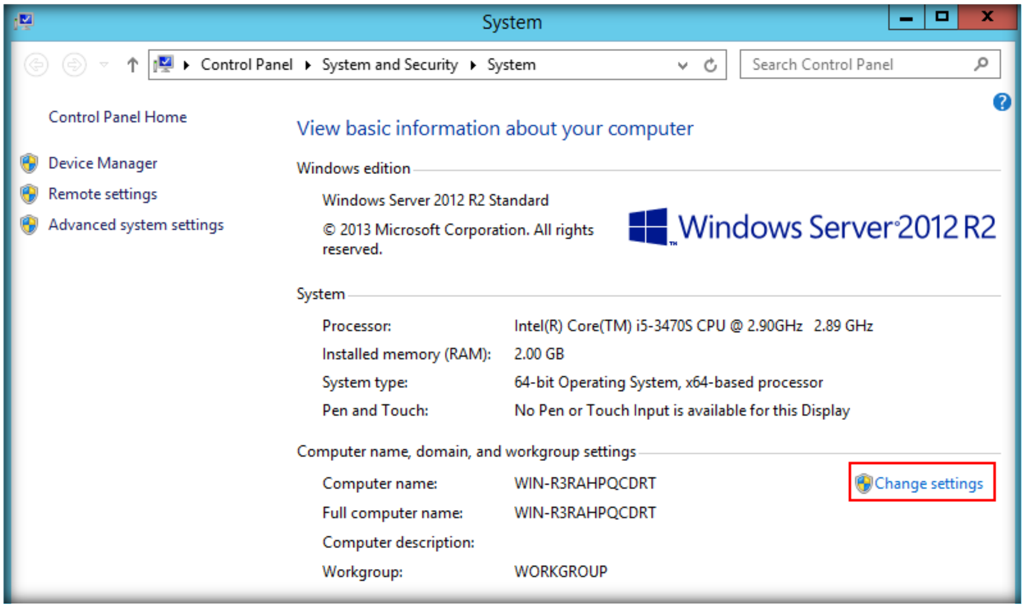
7. Now, check whether Windows Server 2012 is installed and working properly and check whether Internet is accessible

CT#7.3: Changing the Computer Name and join the Domain Name: EDRPlabs.com

1. Close the **Server Manager** window that opens. **Right-click Start** icon and click **System**.


Programs and Features
Power Options
Event Viewer
System
Device Manager
Network Connections
Disk Management
Computer Management
Command Prompt
Command Prompt (Admin)
Task Manager
Control Panel
File Explorer
Search
Run
Shut down or sign out
Desktop
Windows S

2. In the System properties window, click **Change settings**.
   Note: Before moving further, ensure that the **Server 2016** virtual machine is **running** on the Hyper-V.


System
Control Panel ▸ System and Security ▸ System
Search Control Panel
Control Panel Home
Device Manager
Remote settings
Advanced system settings
Change settings

View basic information about your computer

Windows edition

Windows Server 2012 R2 Standard

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Windows Server 2012 R2

System

Processor: Intel(R) Core(TM) i5-3470S CPU @ 2.90GHz 2.89 GHz

Installed memory (RAM): 2.00 GB

System type: 64-bit Operating System, x64-based processor

Pen and Touch: No Pen or Touch Input is available for this Display

Computer name, domain, and workgroup settings

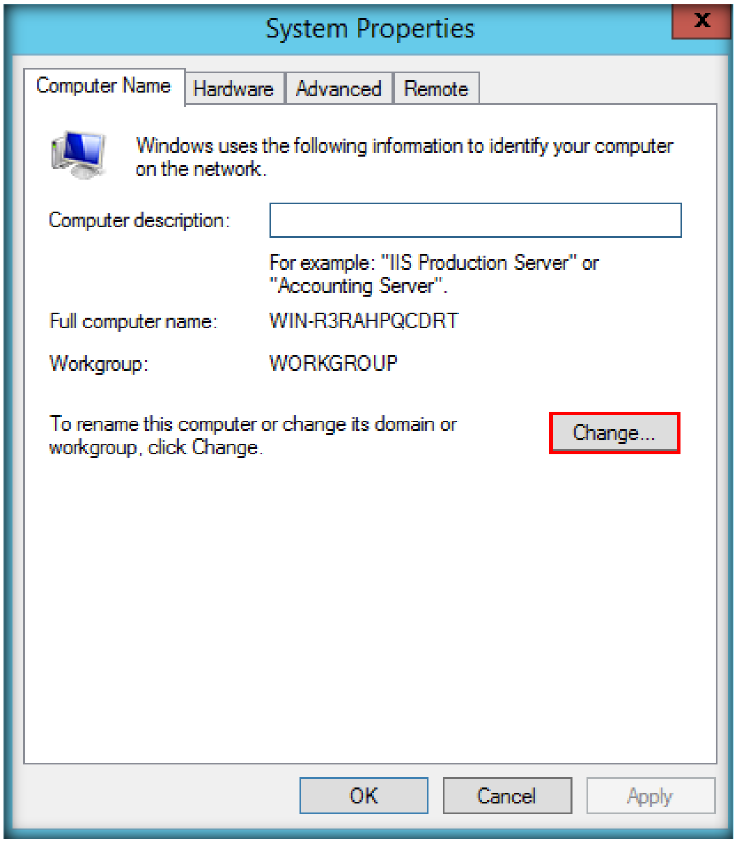
Computer name: WIN-R3RAHPQCDRT

Full computer name: WIN-R3RAHPQCDRT

Computer description:

Workgroup: WORKGROUP

3. In the **Computer Name** tab of the **System Properties** window, click **Change**.


System Properties
Computer Name
Hardware
Advanced
Remote
Change...
OK
Cancel
Apply

Windows uses the following information to identify your computer on the network.

Computer description:

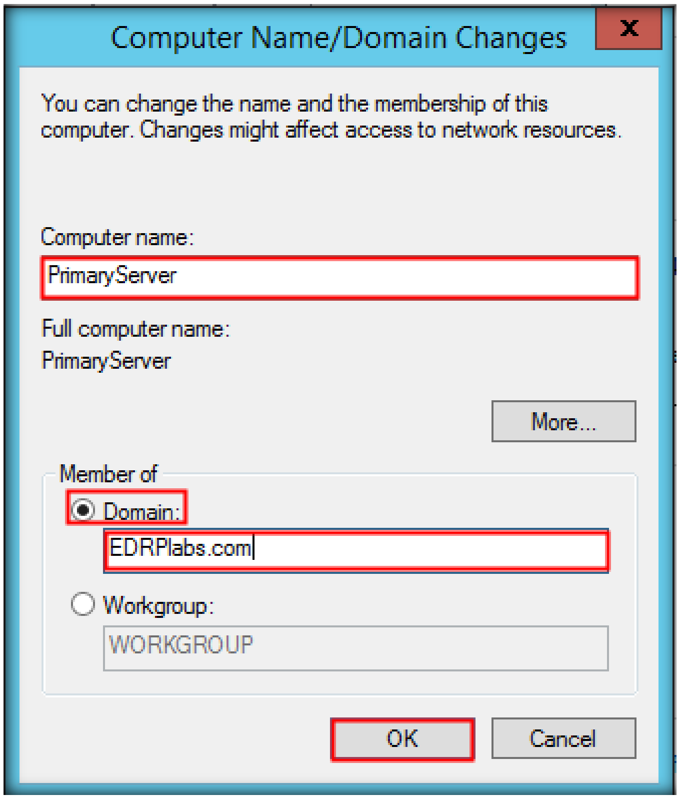
For example: "IIS Production Server" or "Accounting Server".

Full computer name: WIN-R3RAHPQCDRT

Workgroup: WORKGROUP

To rename this computer or change its domain or workgroup, click Change.

4. In the **Computer Name** field enter **PrimaryServer** and select the **Domain** radio button and enter **EDRPlabs.com** in the empty field. Click **OK** button.



Computer Name/Domain Changes

You can change the name and the membership of this computer. Changes might affect access to network resources.

Computer name: PrimaryServer

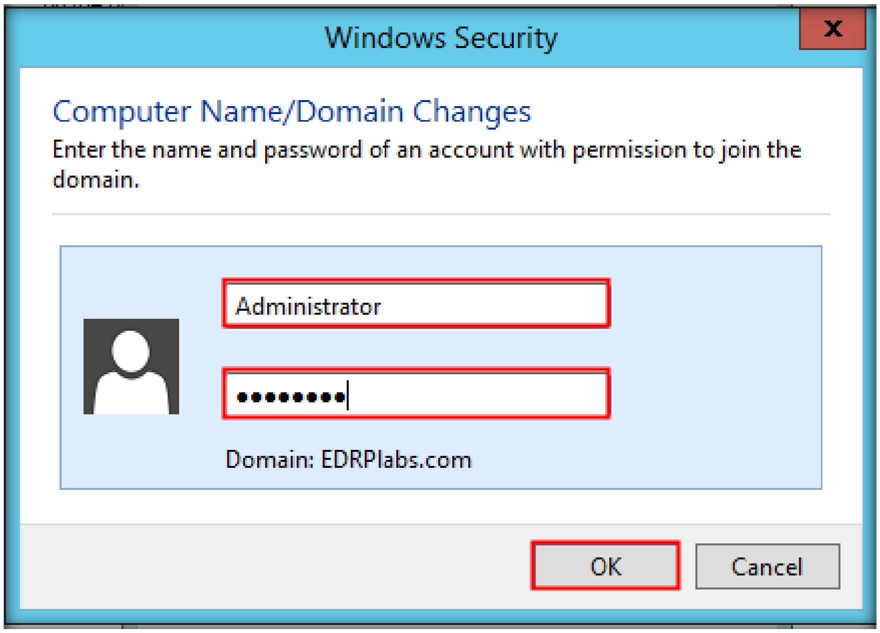
Full computer name: PrimaryServer

Member of

● Domain: EDRPlabs.com

○ Workgroup: WORKGROUP

5. **Windows Security** window will pop-up. Enter the login credentials of the Server 2016 (DC) i.e. **Administrator** and Password as **Pa$$w0rd** and click **OK** button.



Windows Security

Computer Name/Domain Changes

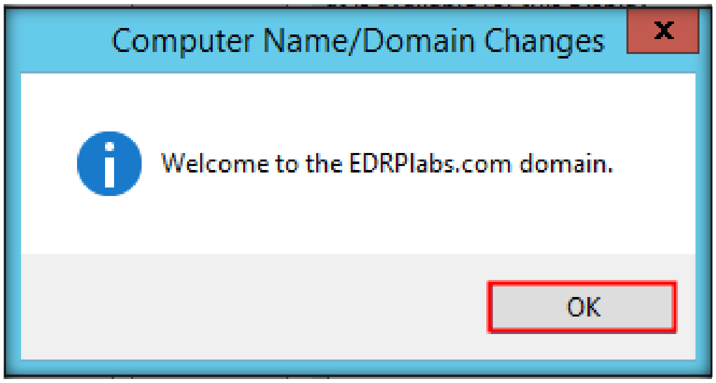
Enter the name and password of an account with permission to join the domain.

Administrator

••••••••

Domain: EDRPlabs.com

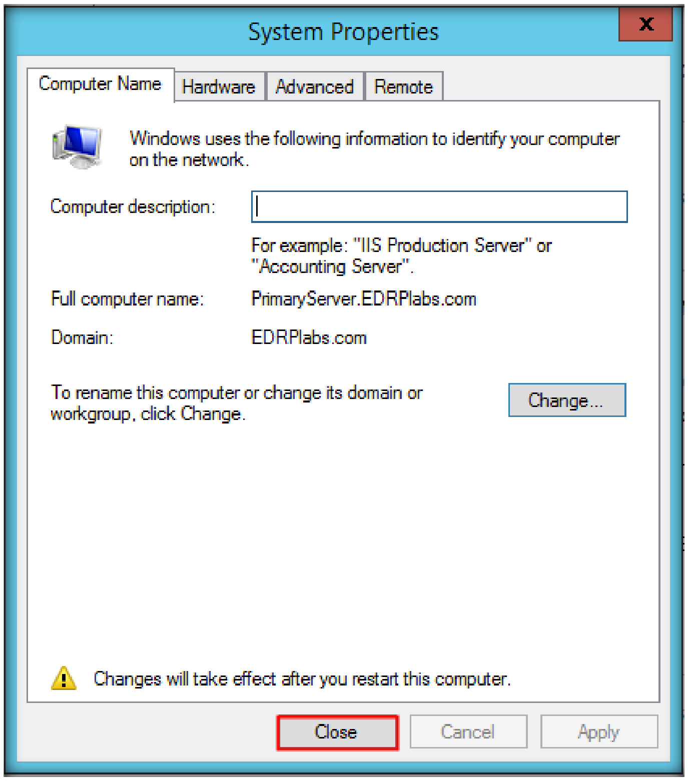
6. **Computer Name/Domain Changes** window will pop-up. Click **OK** button.



Computer Name/Domain Changes

Welcome to the EDRPlabs.com domain.

7. Again **System Properties** window will appear. Click **Close** button.



System Properties

Windows uses the following information to identify your computer on the network.

Computer description:

For example: "IIS Production Server" or "Accounting Server".

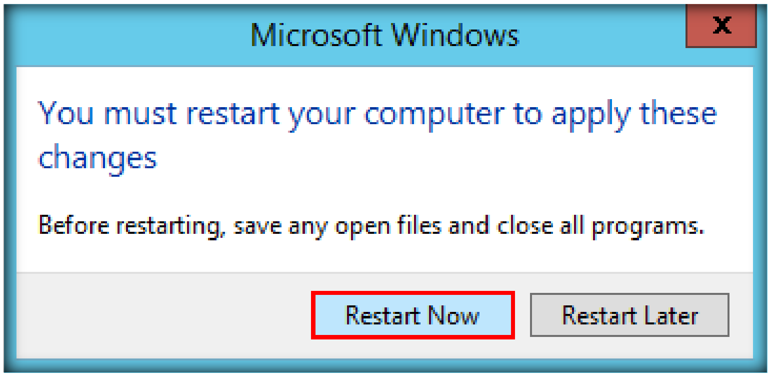
Full computer name: PrimaryServer.EDRPlabs.com

Domain: EDRPlabs.com

To rename this computer or change its domain or workgroup, click Change.

Changes will take effect after you restart this computer.

8. You will be prompted to restart the system, click **Restart Now**.

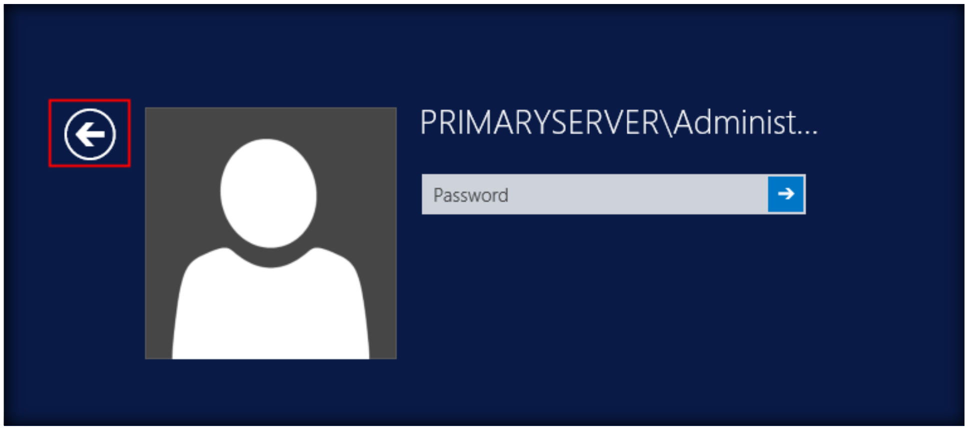


Microsoft Windows

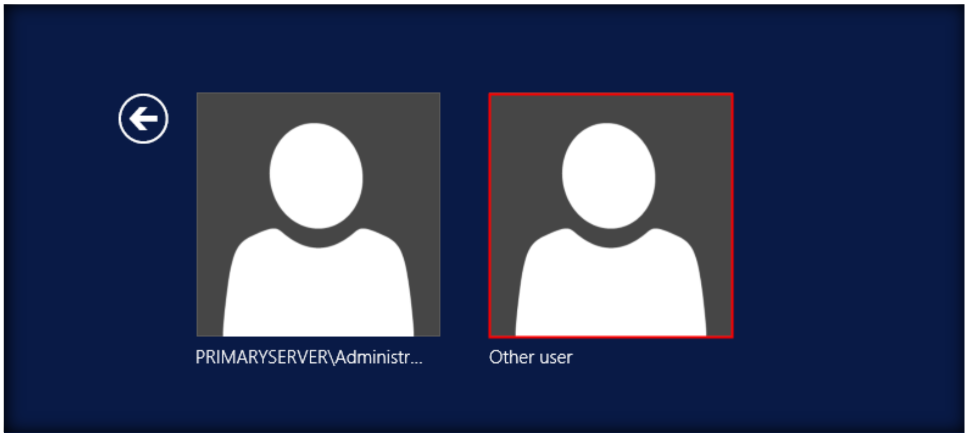
You must restart your computer to apply these changes

Before restarting, save any open files and close all programs.

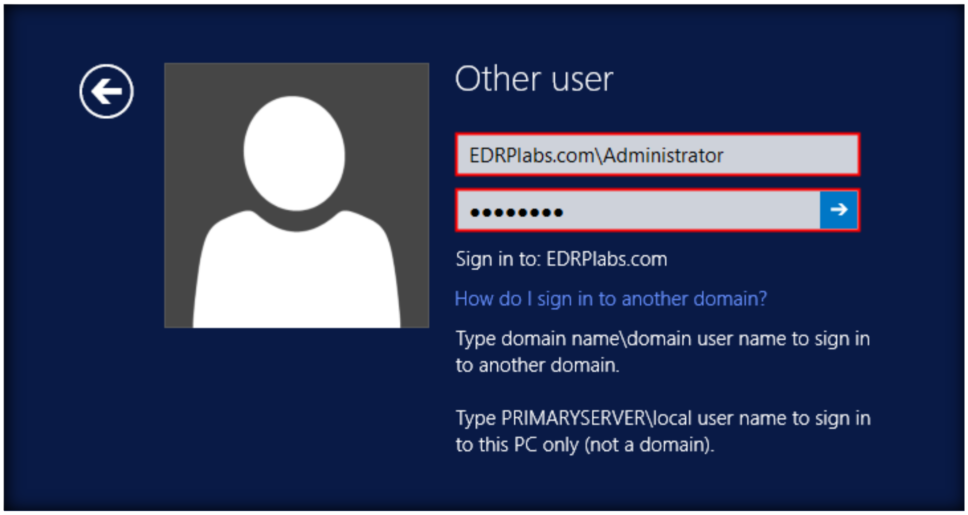
9. **Login** screen will appear on the **Primary Server** VM, click **Arrow** button.


PRIMARYSERVER\Administ...
Password

10. Select **Other user** account option.


PRIMARYSERVER\Administr...
Other user

11. In **Other user** login page, enter **EDRPlabs.com\Administrator** in the **user** field and **pa$$w0rd** in the **password** field. Hit **enter** to login.


Other user

EDRPlabs.com\Administrator

••••••••

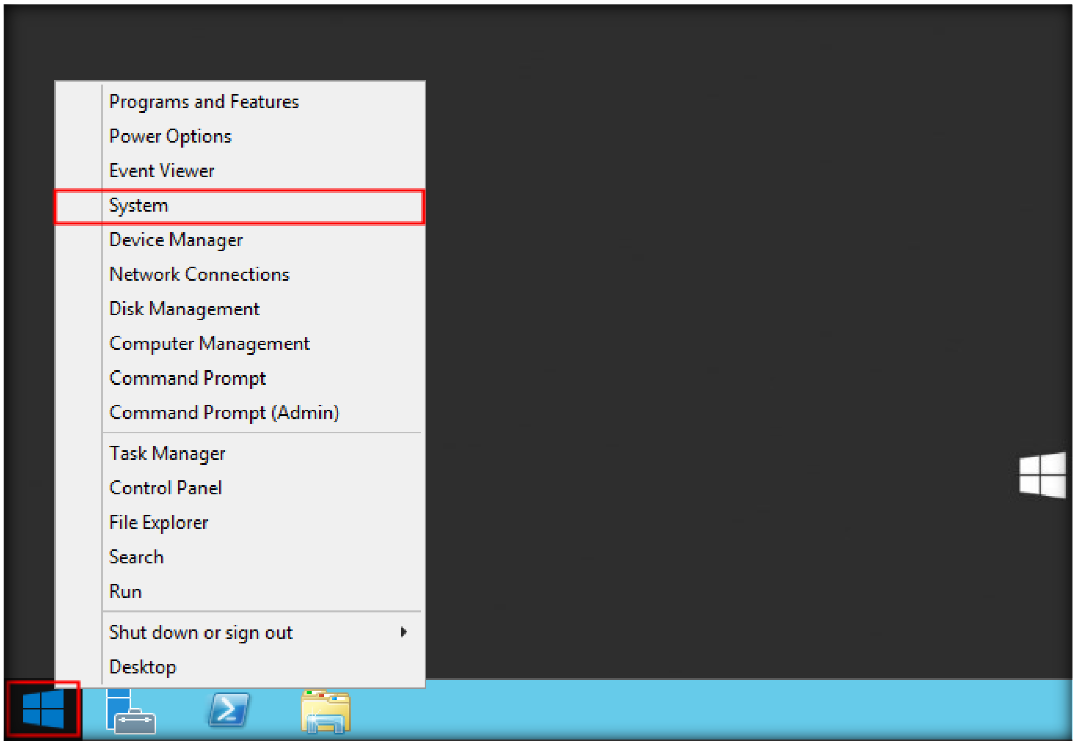
Sign in to: EDRPlabs.com

How do I sign in to another domain?

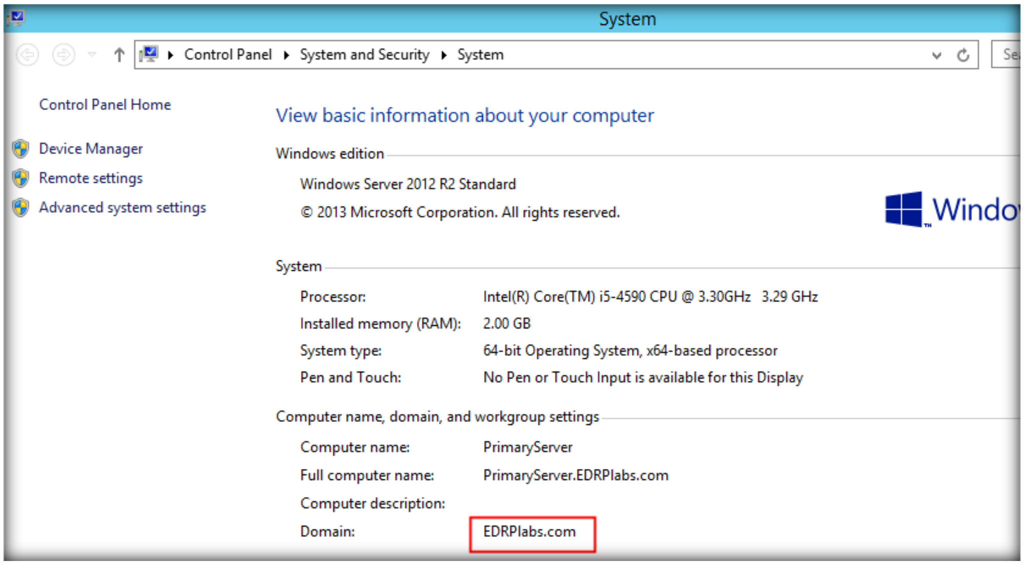
Type domain name\domain user name to sign in to another domain.

Type PRIMARYSERVER\local user name to sign in to this PC only (not a domain).

12. **Desktop** window of **Primary Server** will appear. **Right-click** the **start** button and select **System** option from the context menu.


Programs and Features
Power Options
Event Viewer
System
Device Manager
Network Connections
Disk Management
Computer Management
Command Prompt
Command Prompt (Admin)
Task Manager
Control Panel
File Explorer
Search
Run
Shut down or sign out
Desktop

13. **System** window will appear. Verify the domain as **EDRPlabs.com**.


System
Control Panel ▸ System and Security ▸ System
Control Panel Home
Device Manager
Remote settings
Advanced system settings
Windo

View basic information about your computer

Windows edition

Windows Server 2012 R2 Standard

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System

Processor: Intel(R) Core(TM) i5-4590 CPU @ 3.30GHz 3.29 GHz

Installed memory (RAM): 2.00 GB

System type: 64-bit Operating System, x64-based processor

Pen and Touch: No Pen or Touch Input is available for this Display

Computer name, domain, and workgroup settings

Computer name: PrimaryServer

Full computer name: PrimaryServer.EDRPlabs.com

Computer description:

Domain: EDRPlabs.com

CT#7.4: Mapping EDRP-Tools Folder from Host Machine to Primary Server VM

1. Follow the steps 8 to 14 of CT#4.4, to share **EDRP-Tools** directory in **Primary Server** VM

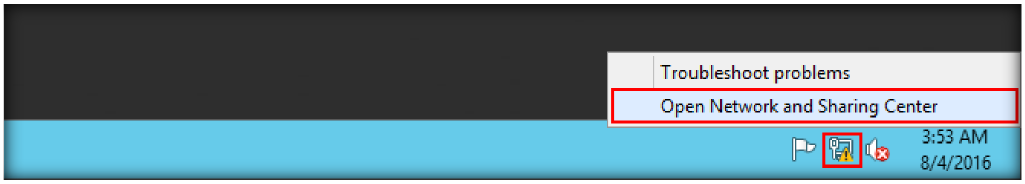
CT#8: Creating and Configuring Windows Server 2012 Virtual Machine: Secondary Server

CT#8.1: Creating a Virtual Machine and Installing Windows Server 2012 R2 Standard Guest OS as Secondary Server

1. Follow the **steps** from **1-20** of CT#7.1 to create a VM: **Secondary Server**.

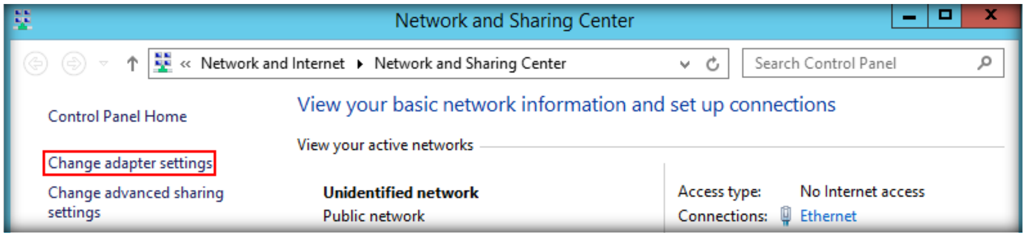
CT#8.2: Configuring Static IP Address

1. Login as Administrator. Close the **Server Manager** window that opens after successful sign in, **right-click Network** icon (lower right corner of the desktop) and click **Open Network and Sharing Center** from the context menu.



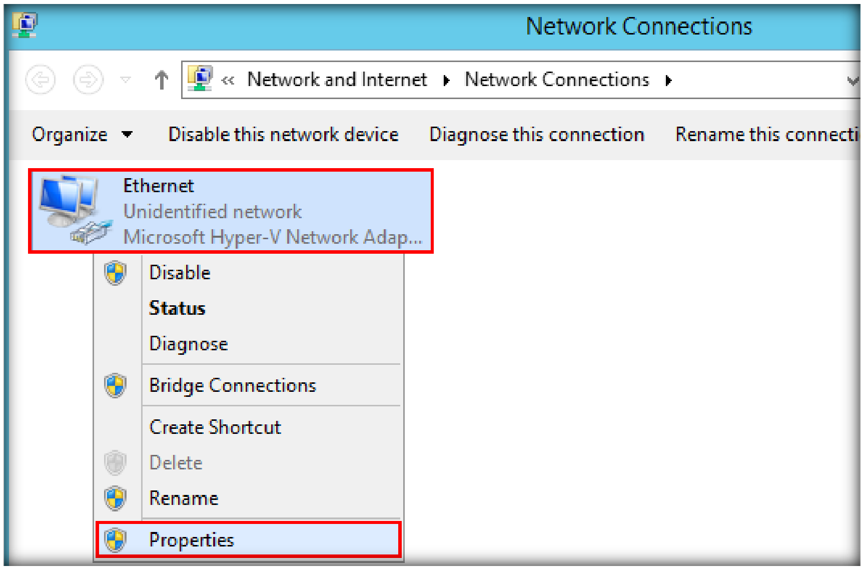
Troubleshoot problems
Open Network and Sharing Center
3:53 AM
8/4/2016

2. **Network and Sharing Center** window appears, click **Change adapter settings** link from the left pane



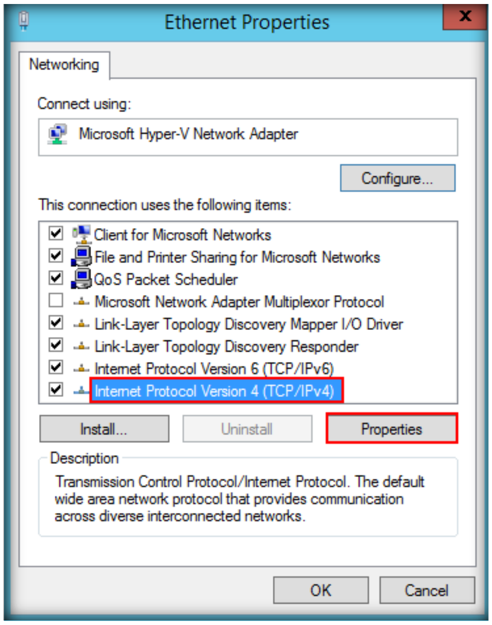
Network and Sharing Center
« Network and Internet ▸ Network and Sharing Center
Search Control Panel
Control Panel Home
Change adapter settings
Change advanced sharing settings
View your basic network information and set up connections
View your active networks
Unidentified network
Public network
Access type: No Internet access
Connections: Ethernet

3. In the **Network Connections** window, **right-click Ethernet** adapter and click **Properties** from the context menu



Network Connections
« Network and Internet ▸ Network Connections ▸
Organize ▾
Disable this network device
Diagnose this connection
Rename this connecti
Ethernet
Unidentified network
Microsoft Hyper-V Network Adap...
Disable
Status
Diagnose
Bridge Connections
Create Shortcut
Delete
Rename
Properties

4. **Ethernet Properties** window appears; and select **Internet Protocol Version 4 (TCP/IPv4)** and click **Properties**



Connect using:
Microsoft Hyper-V Network Adapter

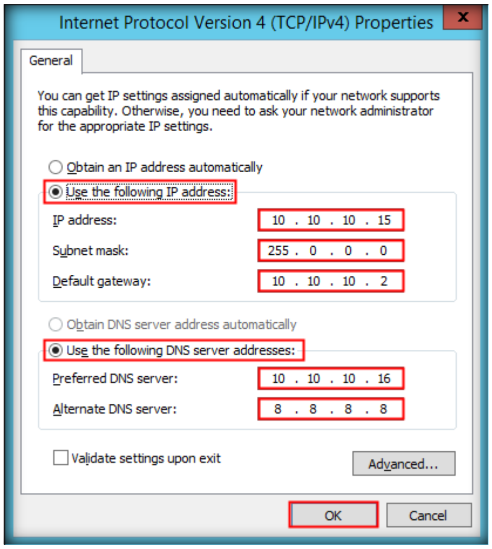
This connection uses the following items:
☑ Client for Microsoft Networks
☑ File and Printer Sharing for Microsoft Networks
☑ QoS Packet Scheduler
☐ Microsoft Network Adapter Multiplexor Protocol
☑ Link-Layer Topology Discovery Mapper I/O Driver
☑ Link-Layer Topology Discovery Responder
☑ Internet Protocol Version 6 (TCP/IPv6)
☑ Internet Protocol Version 4 (TCP/IPv4)

Description
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

5. Select **Use the following IP address** and **Use the following DNS server addresses** radio buttons, and type the following values as shown in the screenshot, and click **OK**.

   - **IP address: 10.10.10.15**
   - **Subnet mask: 255.0.0.0**
   - **Default gateway: 10.10.10.2**
   - **Preferred DNS server: 10.10.10.16**
   - **Alternate DNS Server: 8.8.8.8**

   Note: Once you click **OK** button if Networks section appears on the right side of the desktop screen, and then click **Yes**.



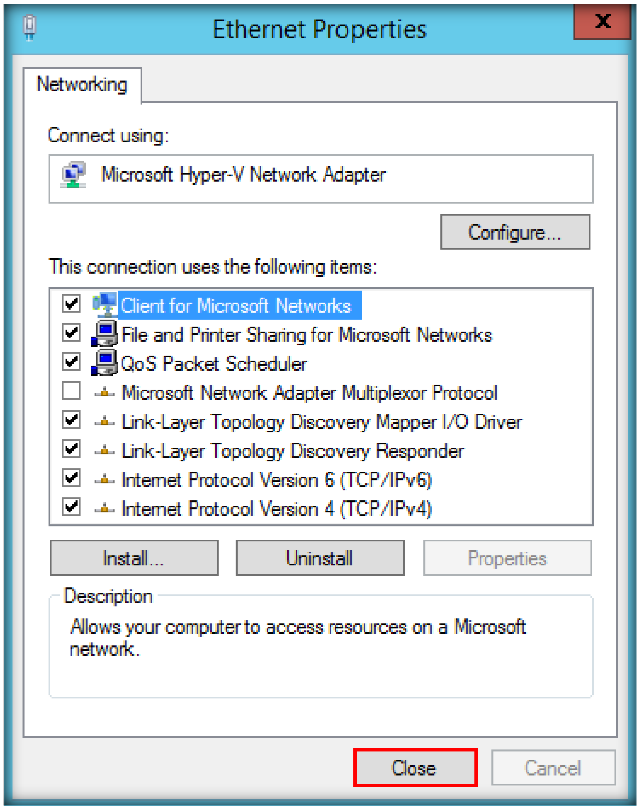
You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

○ Obtain an IP address automatically
● Use the following IP address:
IP address: 10 . 10 . 10 . 15
Subnet mask: 255 . 0 . 0 . 0
Default gateway: 10 . 10 . 10 . 2

○ Obtain DNS server address automatically
● Use the following DNS server addresses:
Preferred DNS server: 10 . 10 . 10 . 16
Alternate DNS server: 8 . 8 . 8 . 8

☐ Validate settings upon exit

6. Click **Close** to close the **Ethernet Properties** window



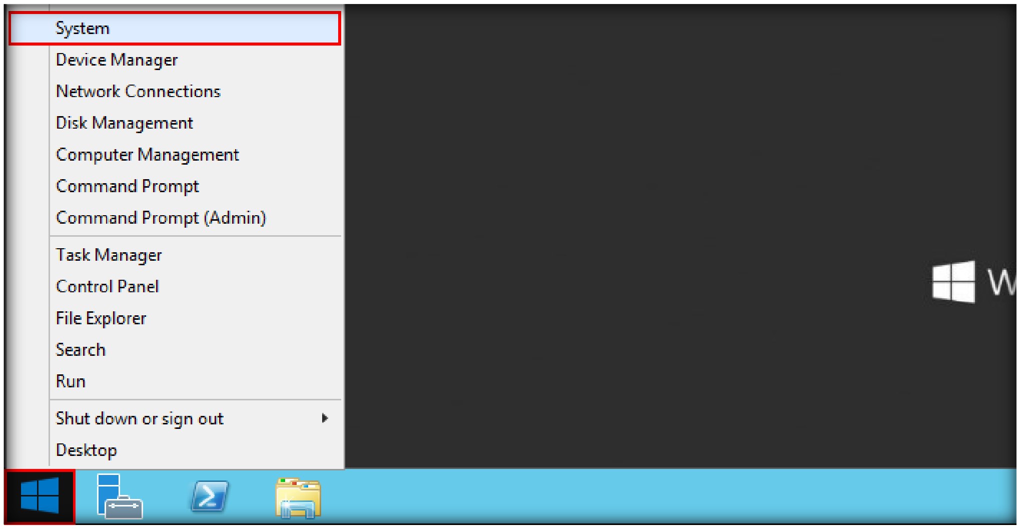
Ethernet Properties
Networking
Connect using:
Microsoft Hyper-V Network Adapter
Configure...
This connection uses the following items:
☑ Client for Microsoft Networks
☑ File and Printer Sharing for Microsoft Networks
☑ QoS Packet Scheduler
☐ Microsoft Network Adapter Multiplexor Protocol
☑ Link-Layer Topology Discovery Mapper I/O Driver
☑ Link-Layer Topology Discovery Responder
☑ Internet Protocol Version 6 (TCP/IPv6)
☑ Internet Protocol Version 4 (TCP/IPv4)
Install...
Uninstall
Properties
Description
Close
Cancel

Allows your computer to access resources on a Microsoft network.

7. Now, check whether Secondary Server is installed and working properly and check whether Internet is accessible

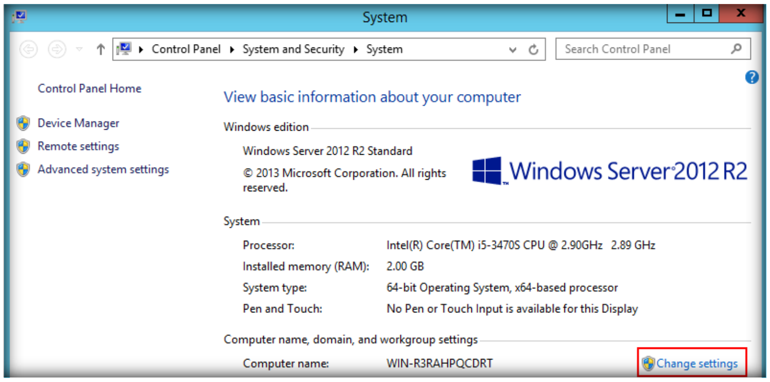
CT#8.3: Changing the Computer Name and join the Domain Name: EDRPlabs.com

1. Close the Server Manager window that opens. **Right-click Start** icon and click **System**.



System
Device Manager
Network Connections
Disk Management
Computer Management
Command Prompt
Command Prompt (Admin)
Task Manager
Control Panel
File Explorer
Search
Run
Shut down or sign out
Desktop

2. In the **System** window, click **Change settings**.
   Note: Before moving further, ensure that the **Server 2016** virtual machine is **running** on the Hyper-V.


System
Control Panel ▸ System and Security ▸ System
Search Control Panel
Control Panel Home
Device Manager
Remote settings
Advanced system settings
Windows Server 2012 R2
Change settings

View basic information about your computer

Windows edition

Windows Server 2012 R2 Standard

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System

Processor: Intel(R) Core(TM) i5-3470S CPU @ 2.90GHz 2.89 GHz

Installed memory (RAM): 2.00 GB

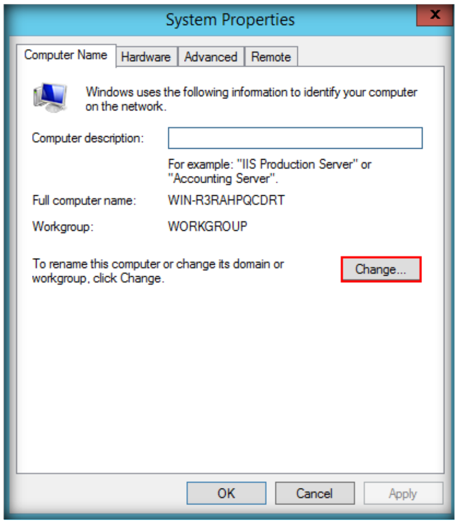
System type: 64-bit Operating System, x64-based processor

Pen and Touch: No Pen or Touch Input is available for this Display

Computer name, domain, and workgroup settings

Computer name: WIN-R3RAHPQCDRT

3. In the **Computer Name** tab of the **System Properties** window, click **Change**.


System Properties
Computer Name
Hardware
Advanced
Remote
Change...
OK
Cancel
Apply

Windows uses the following information to identify your computer on the network.

Computer description:

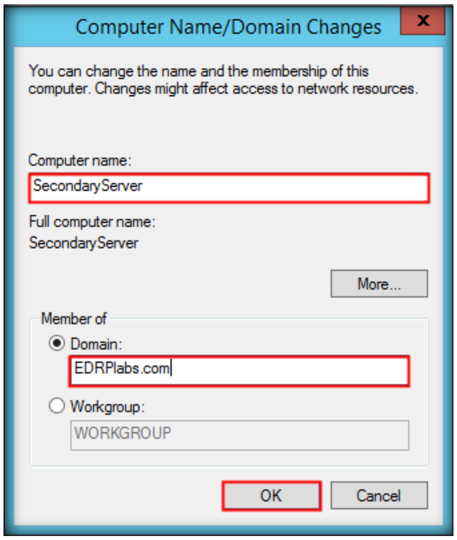
For example: "IIS Production Server" or "Accounting Server".

Full computer name: WIN-R3RAHPQCDRT

Workgroup: WORKGROUP

To rename this computer or change its domain or workgroup, click Change.

4. In the **Computer Name** field enter **SecondaryServer** and select the **Domain** radio button and enter **EDRPlabs.com** in the empty field. Click **OK** button.


Computer Name/Domain Changes
More...
OK
Cancel

You can change the name and the membership of this computer. Changes might affect access to network resources.

Computer name: SecondaryServer

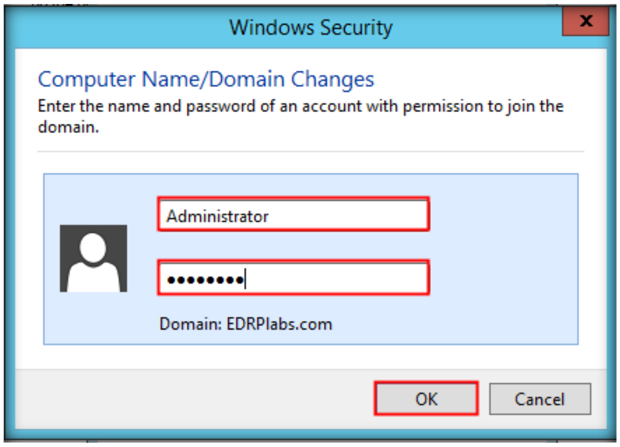
Full computer name: SecondaryServer

Member of

● Domain: EDRPlabs.com

○ Workgroup: WORKGROUP

5. **Windows Security** window will pop-up. Enter the login credentials of the Server 2016 (DC) i.e. **Administrator** and Password as **Pa$$w0rd** and click **OK** button.



Windows Security
x
OK
Cancel

Computer Name/Domain Changes

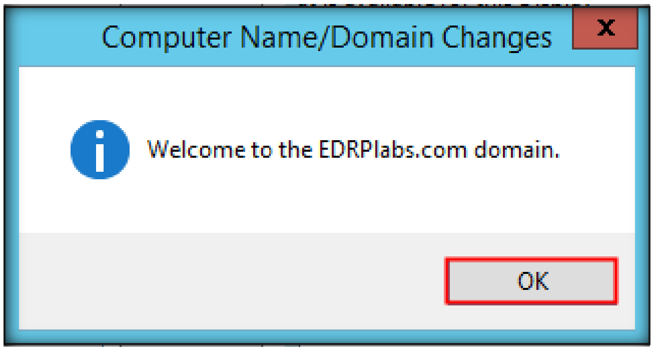
Enter the name and password of an account with permission to join the domain.

Administrator

••••••••

Domain: EDRPlabs.com

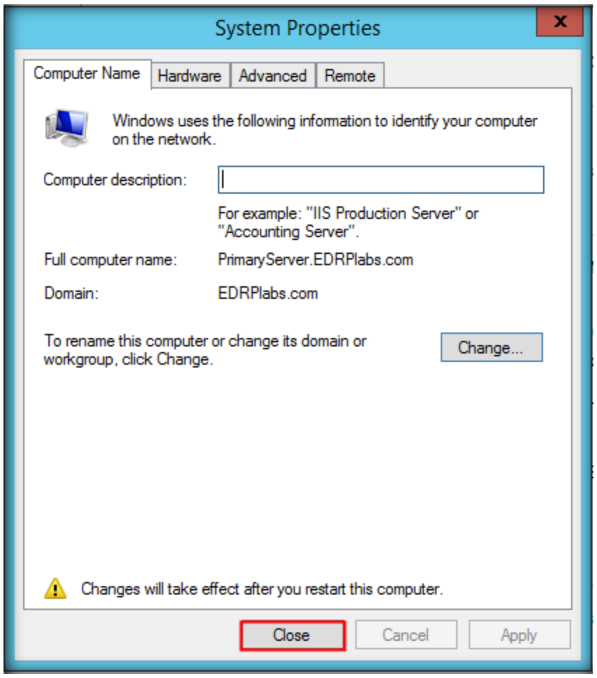
6. **Computer Name/Domain Changes** window will pop-up. Click **OK** button.



Computer Name/Domain Changes
X
OK

Welcome to the EDRPlabs.com domain.

7. Again **System Properties** window will appear. Click **Close** button.



System Properties
x
Computer Name
Hardware
Advanced
Remote
Change...
Close
Cancel
Apply

Windows uses the following information to identify your computer on the network.

Computer description:

For example: "IIS Production Server" or "Accounting Server".

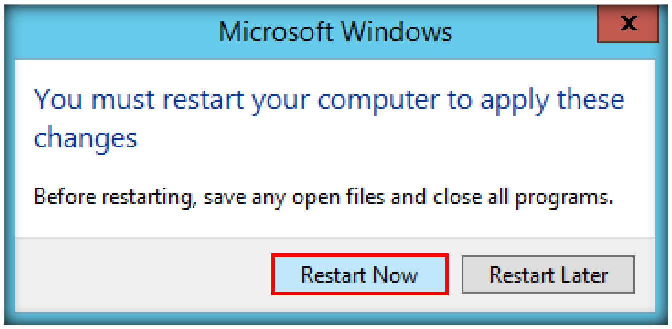
Full computer name: PrimaryServer.EDRPlabs.com

Domain: EDRPlabs.com

To rename this computer or change its domain or workgroup, click Change.

Changes will take effect after you restart this computer.

8. You will be prompted to restart the system, click **Restart Now**.



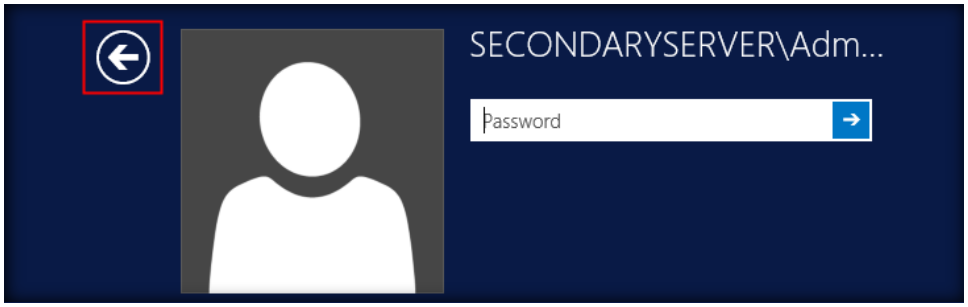
Microsoft Windows

You must restart your computer to apply these changes

Before restarting, save any open files and close all programs.

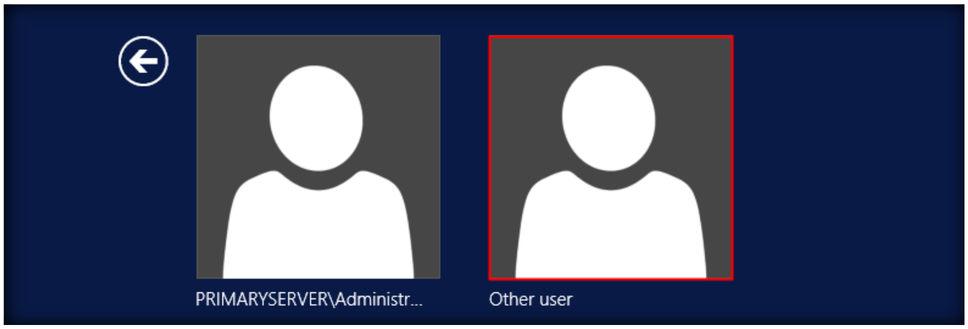
x
Restart Now
Restart Later

9. **Login** screen will appear on the **Secondary Server**, click **Arrow** button.



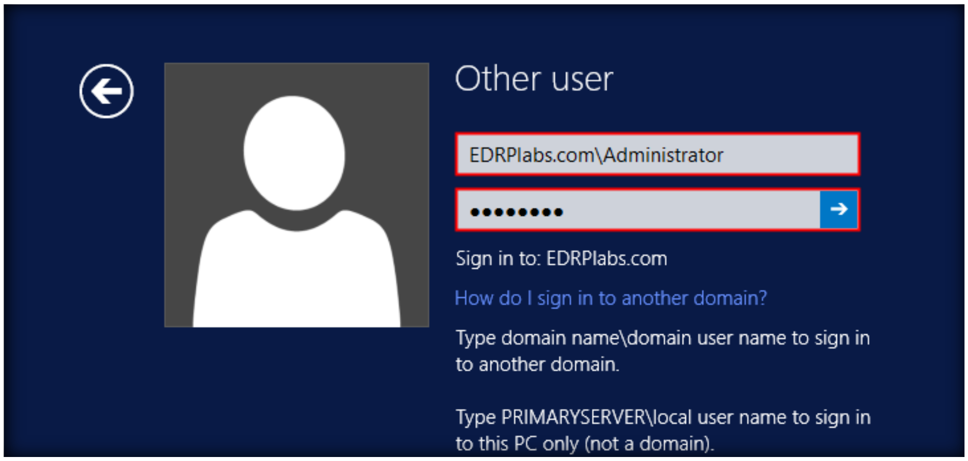
SECONDARYSERVER\Adm...
Password

10. Select **Other user** account option.



PRIMARYSERVER\Administr...
Other user

11. In **Other user** login page, enter **EDRPlabs.com\Administrator** in the **user** field and **Pa$$w0rd** in the **password** field. Hit **enter** to login.



Other user

EDRPlabs.com\Administrator

••••••••

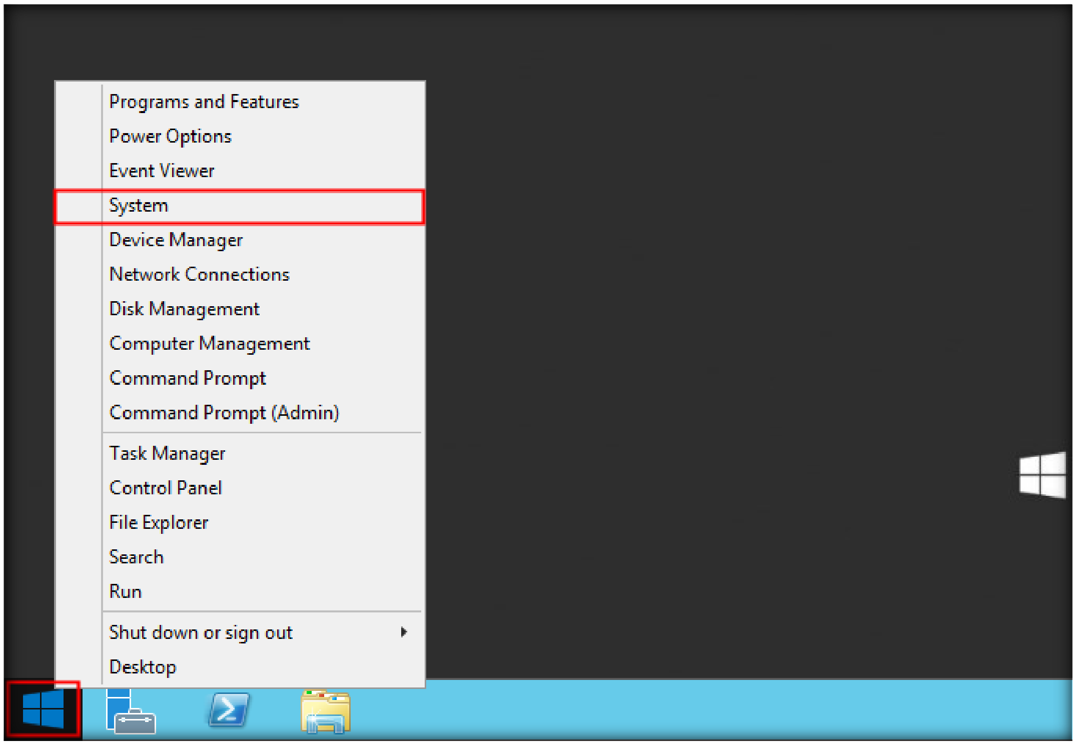
Sign in to: EDRPlabs.com

How do I sign in to another domain?

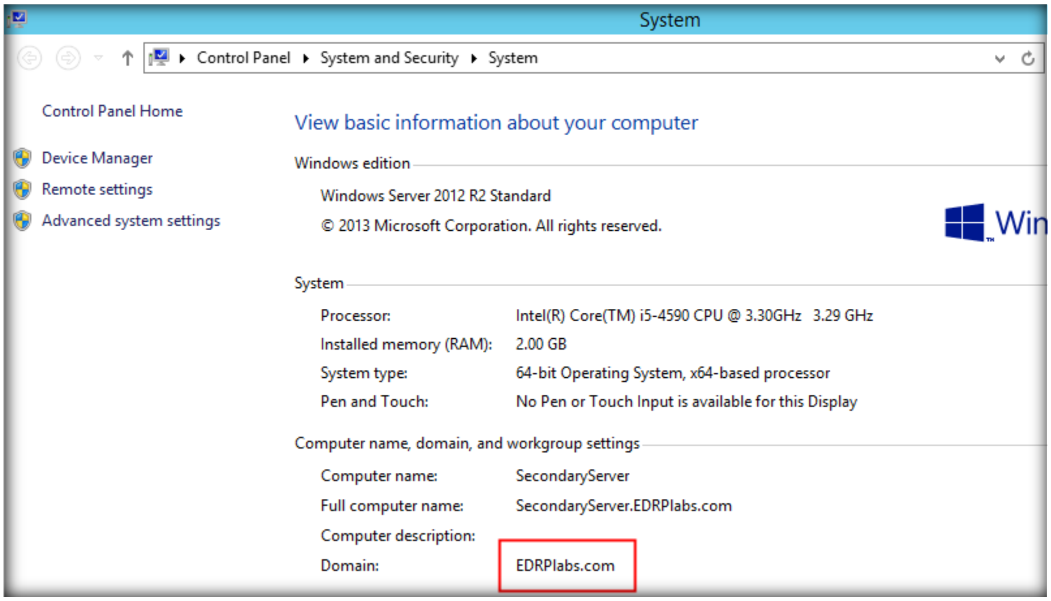
Type domain name\domain user name to sign in to another domain.

Type PRIMARYSERVER\local user name to sign in to this PC only (not a domain).

12. **Desktop** window of **Secondary Server** will appear. **Right-click** the **start** button and select **System** option from the context menu.


Programs and Features
Power Options
Event Viewer
System
Device Manager
Network Connections
Disk Management
Computer Management
Command Prompt
Command Prompt (Admin)
Task Manager
Control Panel
File Explorer
Search
Run
Shut down or sign out
Desktop

13. **System** window will appear. Verify the domain as **EDRPlabs.com**.


System
Control Panel ▸ System and Security ▸ System
Control Panel Home
Device Manager
Remote settings
Advanced system settings
Win

View basic information about your computer

Windows edition

Windows Server 2012 R2 Standard

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System

Processor: Intel(R) Core(TM) i5-4590 CPU @ 3.30GHz 3.29 GHz

Installed memory (RAM): 2.00 GB

System type: 64-bit Operating System, x64-based processor

Pen and Touch: No Pen or Touch Input is available for this Display

Computer name, domain, and workgroup settings

Computer name: SecondaryServer

Full computer name: SecondaryServer.EDRPlabs.com

Computer description:

Domain: EDRPlabs.com

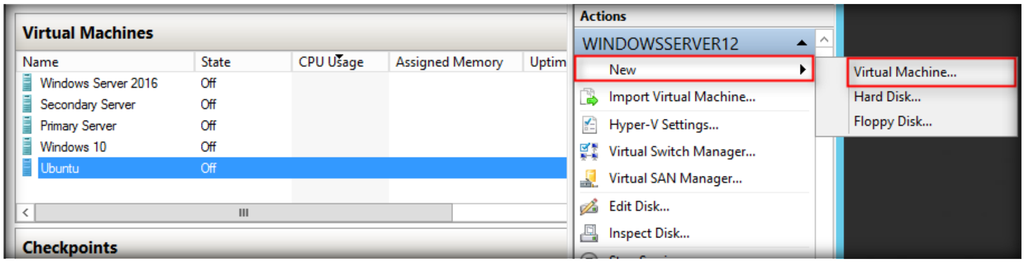
CT#8.4: Mapping EDRP-Tools Folder from Host Machine to Secondary Server VM

1. Follow the steps 8 to 14 of CT#4.4, to share **EDRP-Tools** directory in **Secondary Server** VM

CT#9: Installing and Configuring FreeNAS with CIFS (NAS) Shared Folder

CT#9.1: Installing FreeNAS

1. Launch Hyper-V Manager.
2. Select your local machine in the left pane, then click **New**, and then click **Virtual Machine...** in the right pane as shown in the screen shot.

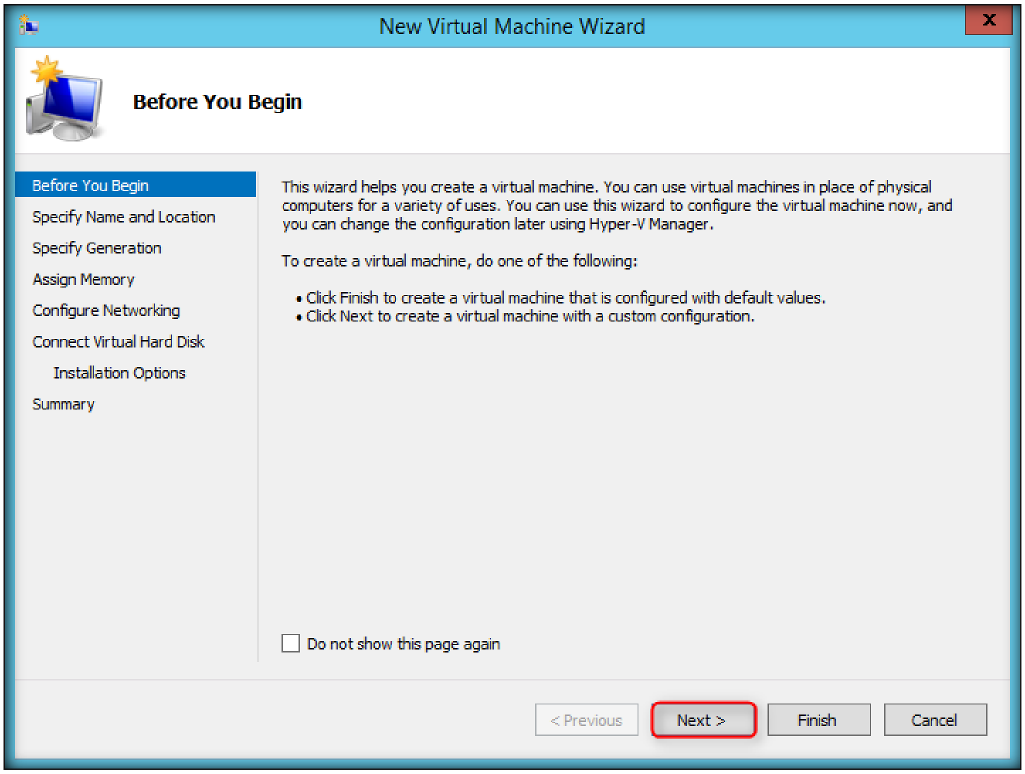


Virtual Machines

Name	State	CPU Usage	Assigned Memory	Uptim
Windows Server 2016	Off			
Secondary Server	Off			
Primary Server	Off			
Windows 10	Off			
Ubuntu	Off			

Checkpoints
Actions
WINDOWSSERVER12
New
Import Virtual Machine...
Hyper-V Settings...
Virtual Switch Manager...
Virtual SAN Manager...
Edit Disk...
Inspect Disk...
Virtual Machine...
Hard Disk...
Floppy Disk...

3. **New Virtual Machine Wizard** window appears, click **Next** button



New Virtual Machine Wizard
Before You Begin
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

This wizard helps you create a virtual machine. You can use virtual machines in place of physical computers for a variety of uses. You can use this wizard to configure the virtual machine now, and you can change the configuration later using Hyper-V Manager.

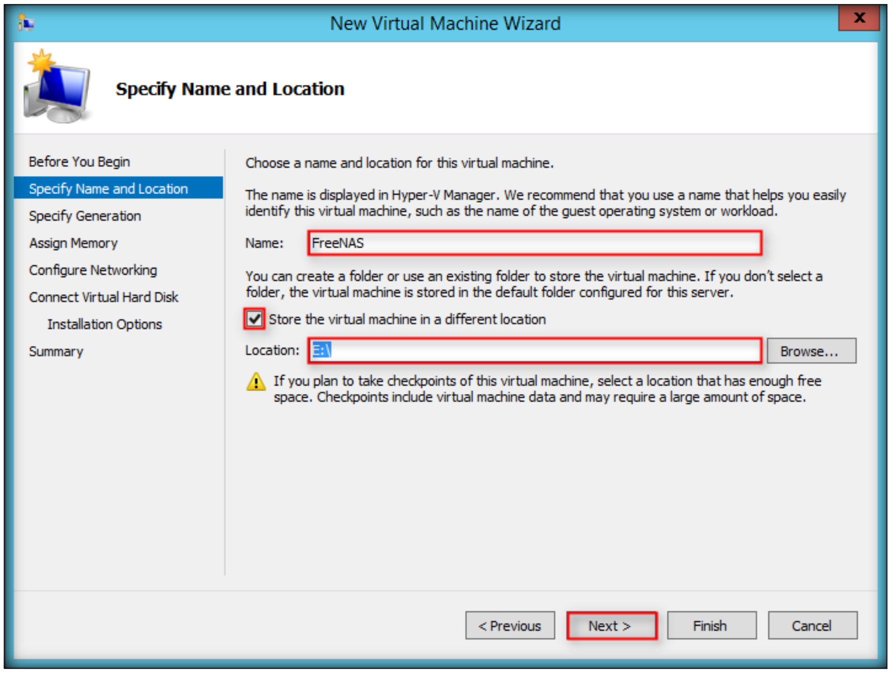
To create a virtual machine, do one of the following:

- Click Finish to create a virtual machine that is configured with default values.
- Click Next to create a virtual machine with a custom configuration.

☐ Do not show this page again

4. Specify **Name** and **location** of new virtual machine. Assign the name of the virtual machine as **FreeNAS**. The default location for storing the virtual machine is **C:\ProgramData\Microsoft\Windows\Hyper-V\**. Choose different location to store the VM's i.e. **E:\**. Click **Next**

   Note: You can specify the location either in the **Specify Name and Location** section or in the forthcoming **Connect Virtual Hard Disk** section


New Virtual Machine Wizard
Specify Name and Location
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel
Browse...

Choose a name and location for this virtual machine.

The name is displayed in Hyper-V Manager. We recommend that you use a name that helps you easily identify this virtual machine, such as the name of the guest operating system or workload.

Name: FreeNAS

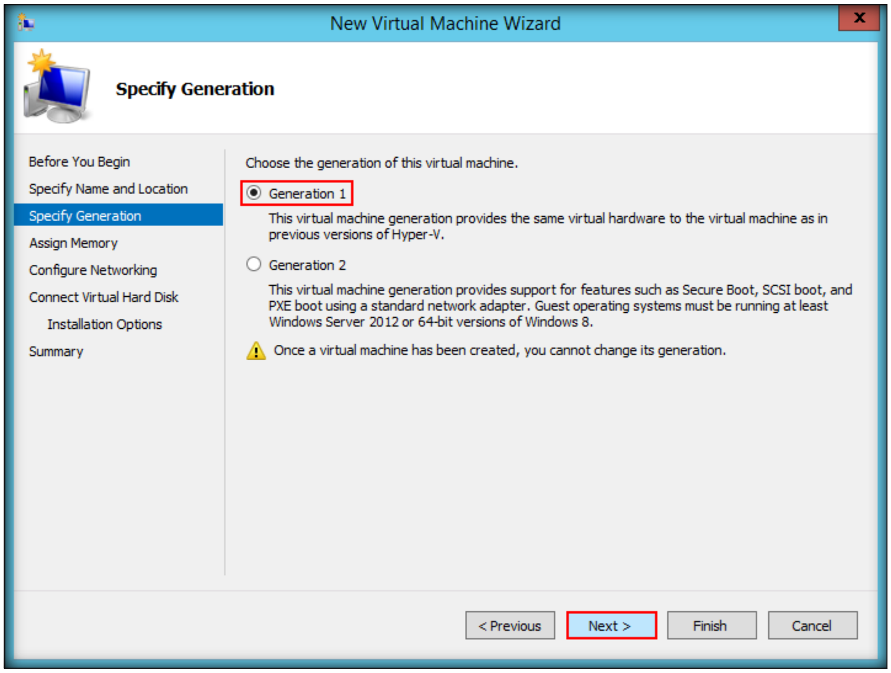
You can create a folder or use an existing folder to store the virtual machine. If you don't select a folder, the virtual machine is stored in the default folder configured for this server.

☑ Store the virtual machine in a different location

Location: E:\

If you plan to take checkpoints of this virtual machine, select a location that has enough free space. Checkpoints include virtual machine data and may require a large amount of space.

5. Choose the generation of the virtual machine (in this scenario, **Generation 1**) and click **Next**


New Virtual Machine Wizard
Specify Generation
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

Choose the generation of this virtual machine.

● Generation 1

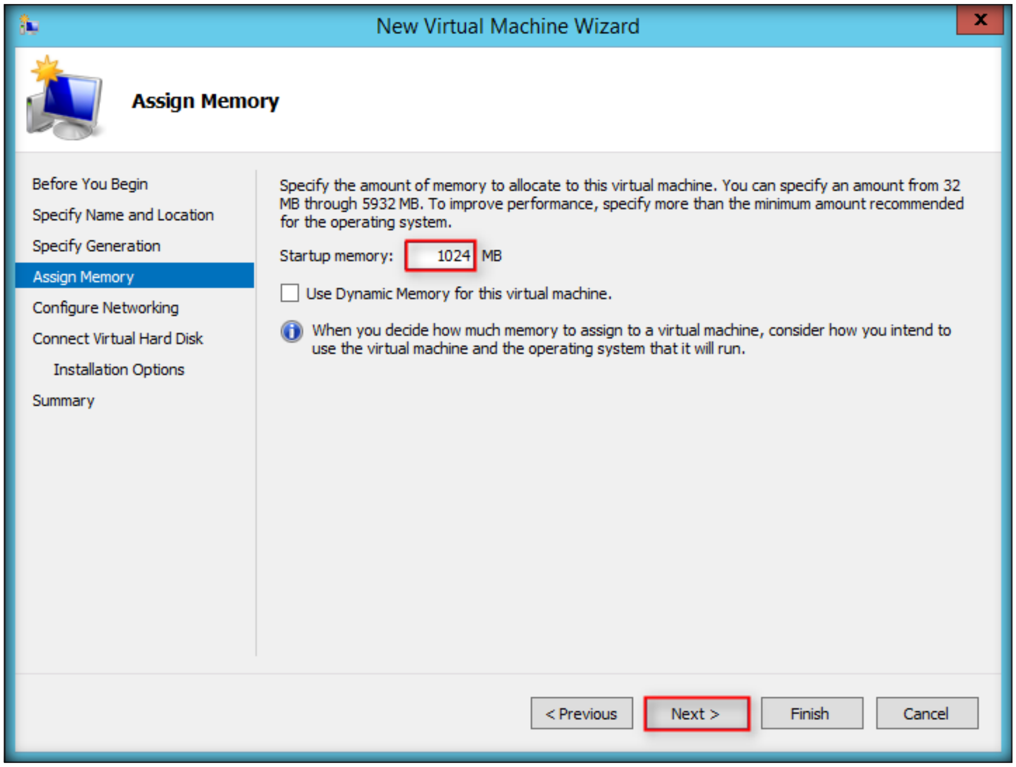
This virtual machine generation provides the same virtual hardware to the virtual machine as in previous versions of Hyper-V.

○ Generation 2

This virtual machine generation provides support for features such as Secure Boot, SCSI boot, and PXE boot using a standard network adapter. Guest operating systems must be running at least Windows Server 2012 or 64-bit versions of Windows 8.

Once a virtual machine has been created, you cannot change its generation.

6. Assign the amount of **Startup memory** to allocate to this virtual machine in MB (here, **1024**) and click **Next**



New Virtual Machine Wizard
Assign Memory
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

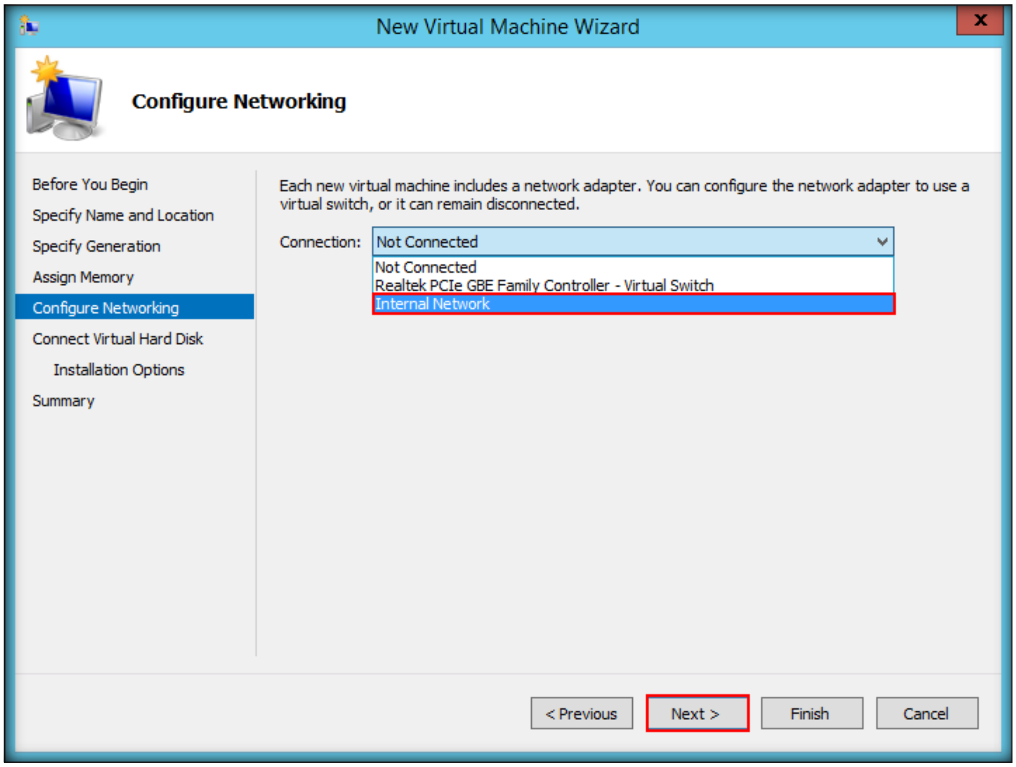
Specify the amount of memory to allocate to this virtual machine. You can specify an amount from 32 MB through 5932 MB. To improve performance, specify more than the minimum amount recommended for the operating system.

Startup memory: 1024 MB

☐ Use Dynamic Memory for this virtual machine.

When you decide how much memory to assign to a virtual machine, consider how you intend to use the virtual machine and the operating system that it will run.

7. In the next step, select **network adapter** as **Internal Network** from connection drop-down list and click **Next**



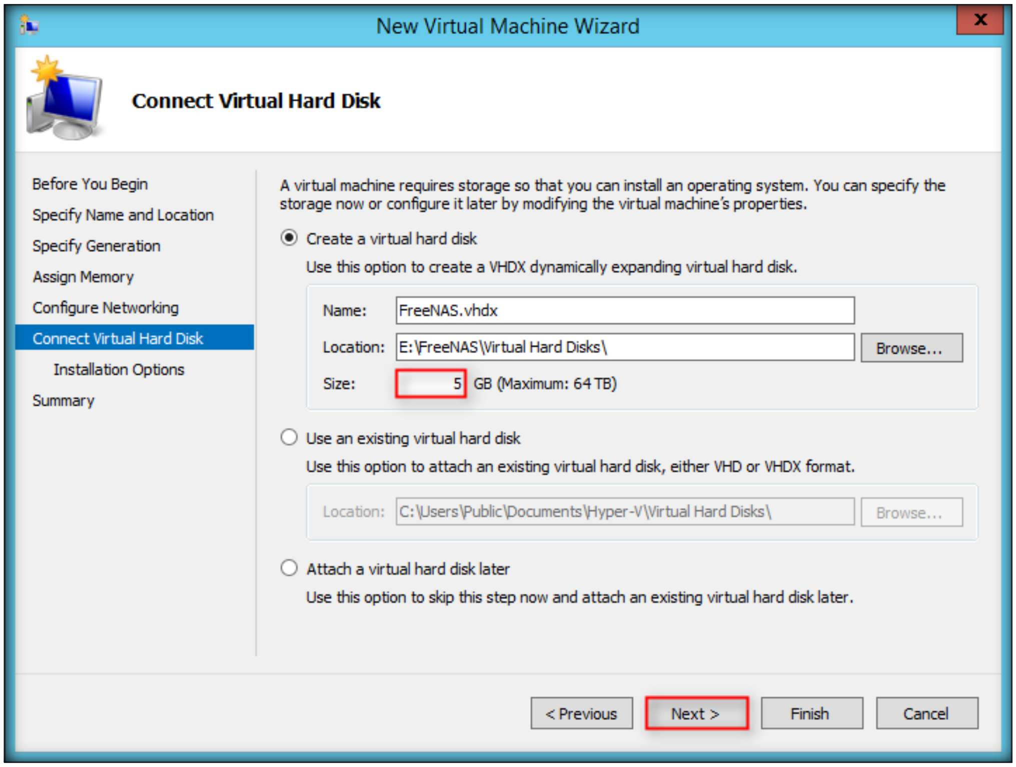
New Virtual Machine Wizard
Configure Networking
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

Each new virtual machine includes a network adapter. You can configure the network adapter to use a virtual switch, or it can remain disconnected.

Connection: Not Connected

Not Connected
Realtek PCIe GBE Family Controller - Virtual Switch
Internal Network

8. **Connect Virtual Hard Disk** section appears, allocate **5 GB** space for hard disk and click **Next**



New Virtual Machine Wizard

Connect Virtual Hard Disk

Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary

A virtual machine requires storage so that you can install an operating system. You can specify the storage now or configure it later by modifying the virtual machine's properties.

● Create a virtual hard disk

Use this option to create a VHDX dynamically expanding virtual hard disk.

Name: FreeNAS.vhdx

Location: E:\FreeNAS\Virtual Hard Disks\ Browse...

Size: 5 GB (Maximum: 64 TB)

○ Use an existing virtual hard disk

Use this option to attach an existing virtual hard disk, either VHD or VHDX format.

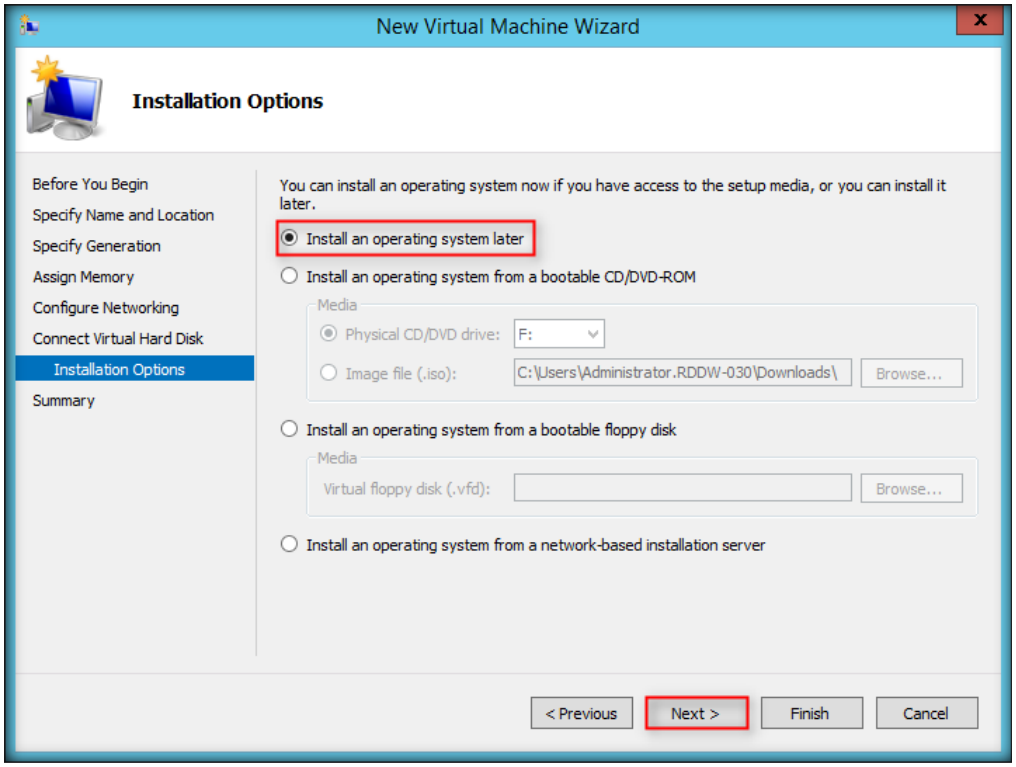
Location: C:\Users\Public\Documents\Hyper-V\Virtual Hard Disks\ Browse...

○ Attach a virtual hard disk later

Use this option to skip this step now and attach an existing virtual hard disk later.

< Previous
Next >
Finish
Cancel

9. The **installation options** window appears, select **Install an operating system later** radio button and click **Next**.



New Virtual Machine Wizard

Installation Options

Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary

You can install an operating system now if you have access to the setup media, or you can install it later.

● Install an operating system later

○ Install an operating system from a bootable CD/DVD-ROM

Media

● Physical CD/DVD drive: F:

○ Image file (.iso): C:\Users\Administrator.RDDW-030\Downloads\ Browse...

○ Install an operating system from a bootable floppy disk

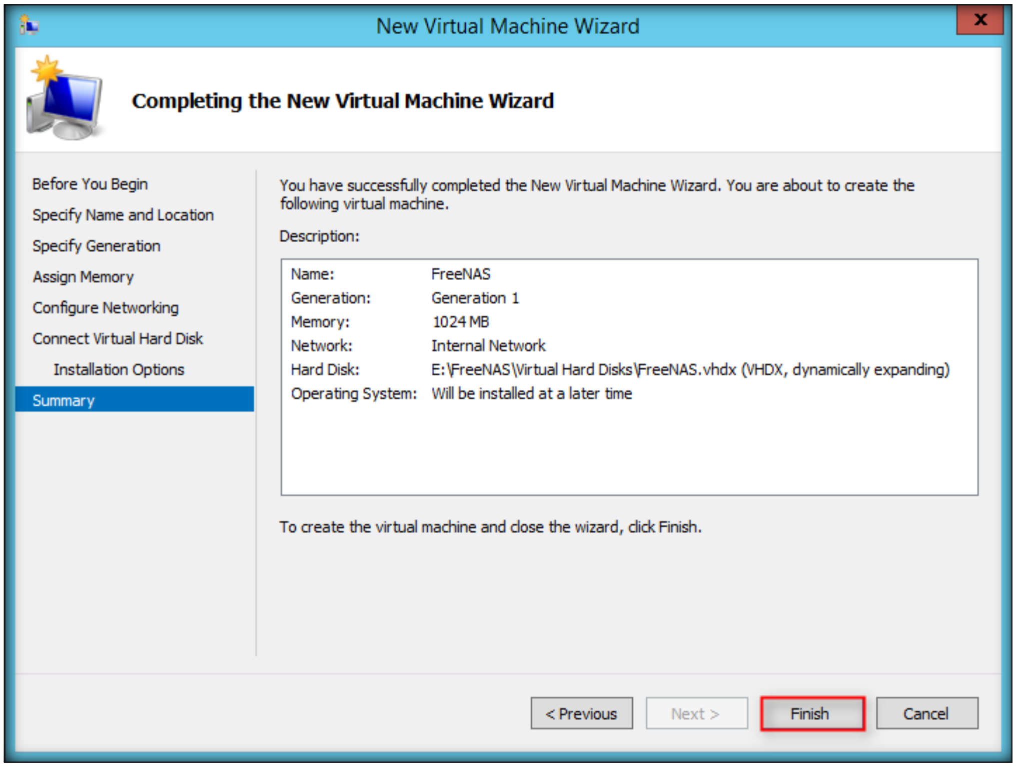
Media

Virtual floppy disk (.vfd): Browse...

○ Install an operating system from a network-based installation server

< Previous
Next >
Finish
Cancel

10. Virtual machine wizard appears with summary information. Click **Finish** to close the wizard



New Virtual Machine Wizard
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

Completing the New Virtual Machine Wizard

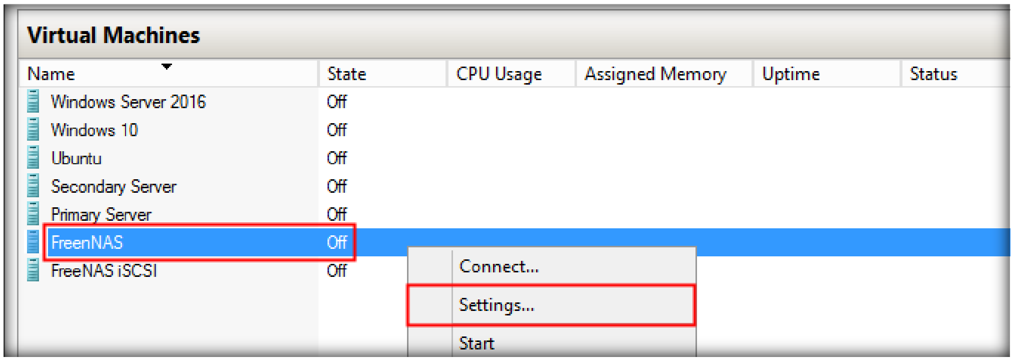
You have successfully completed the New Virtual Machine Wizard. You are about to create the following virtual machine.

Description:

Name: FreeNAS
Generation: Generation 1
Memory: 1024 MB
Network: Internal Network
Hard Disk: E:\FreeNAS\Virtual Hard Disks\FreeNAS.vhdx (VHDX, dynamically expanding)
Operating System: Will be installed at a later time

To create the virtual machine and close the wizard, click Finish.

11. In Hyper-V Manager window, **right-click** created **FreeNAS** virtual machine and click **Settings** from the context menu

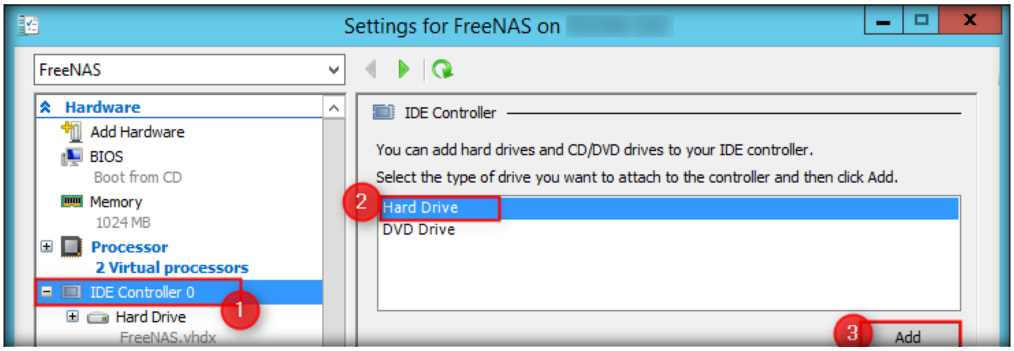


Virtual Machines

Name	State	CPU Usage	Assigned Memory	Uptime	Status
Windows Server 2016	Off				
Windows 10	Off				
Ubuntu	Off				
Secondary Server	Off				
Primary Server	Off				
FreenNAS	Off				
FreeNAS iSCSI	Off				

Connect...
Settings...
Start

12. **Settings for FreeNAS window** appears, click IDE **Controller 0** from the left pane and then click **Hard Drive**. Click **Add**



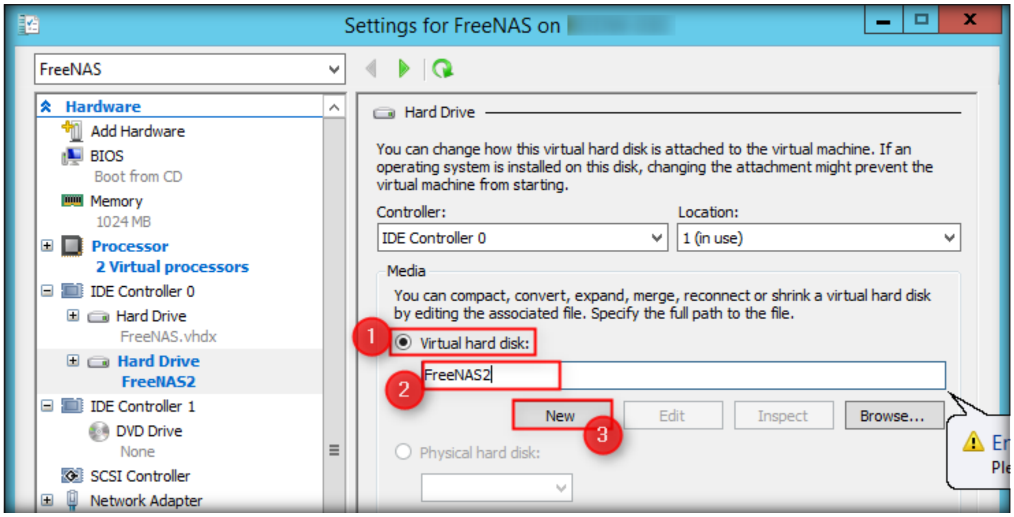
Settings for FreeNAS on [redacted]

FreeNAS
Hardware
Add Hardware
BIOS
Boot from CD
Memory
1024 MB
Processor
2 Virtual processors
IDE Controller 0
Hard Drive
FreeNAS.vhdx
IDE Controller
Hard Drive
DVD Drive
Add
1
2
3

You can add hard drives and CD/DVD drives to your IDE controller.

Select the type of drive you want to attach to the controller and then click Add.

13. Hard Drive option window will appear, click **Virtual hard disk** radio button and enter the name of the virtual hard disk i.e. **FreeNAS2**. Click **New**



Settings for FreeNAS on [redacted]

FreeNAS

Hardware
Add Hardware
BIOS
Boot from CD
Memory
1024 MB
Processor
2 Virtual processors
IDE Controller 0
Hard Drive
FreeNAS.vhdx
Hard Drive
FreeNAS2
IDE Controller 1
DVD Drive
None
SCSI Controller
Network Adapter

Hard Drive

You can change how this virtual hard disk is attached to the virtual machine. If an operating system is installed on this disk, changing the attachment might prevent the virtual machine from starting.

Controller: IDE Controller 0

Location: 1 (in use)

Media

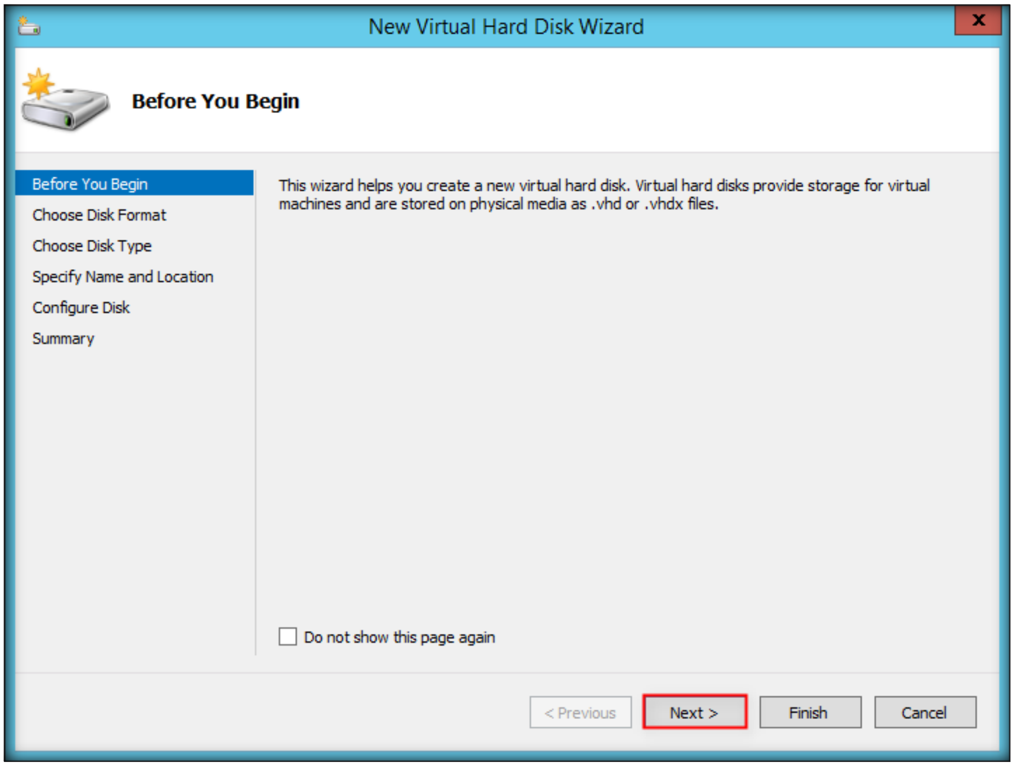
You can compact, convert, expand, merge, reconnect or shrink a virtual hard disk by editing the associated file. Specify the full path to the file.

● Virtual hard disk: FreeNAS2

○ Physical hard disk:

1
2
3
New
Edit
Inspect
Browse...
Er
Ple

14. A **New Virtual Hard Disk Wizard** window will appear, click **Next**



New Virtual Hard Disk Wizard

Before You Begin

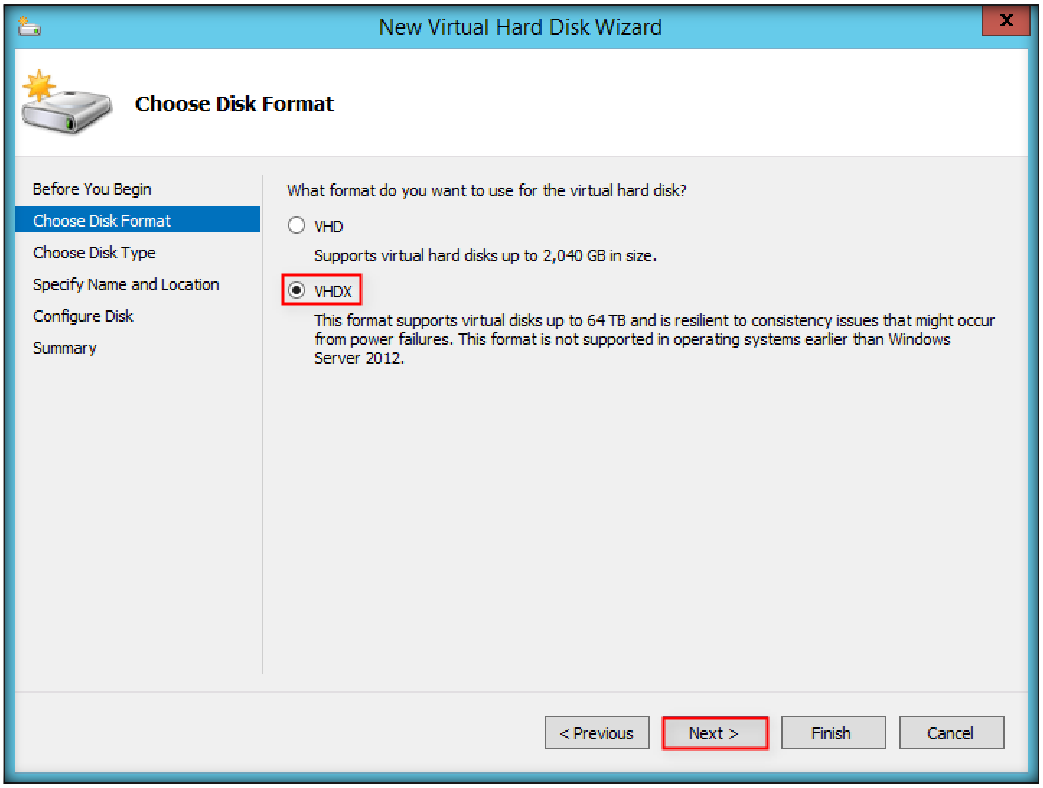
Before You Begin
Choose Disk Format
Choose Disk Type
Specify Name and Location
Configure Disk
Summary

This wizard helps you create a new virtual hard disk. Virtual hard disks provide storage for virtual machines and are stored on physical media as .vhd or .vhdx files.

☐ Do not show this page again

< Previous
Next >
Finish
Cancel

15. **Choose Disk Format** window will appear, select **VHDX** radio button and click **Next**



New Virtual Hard Disk Wizard
Choose Disk Format
Before You Begin
Choose Disk Format
Choose Disk Type
Specify Name and Location
Configure Disk
Summary
< Previous
Next >
Finish
Cancel

What format do you want to use for the virtual hard disk?

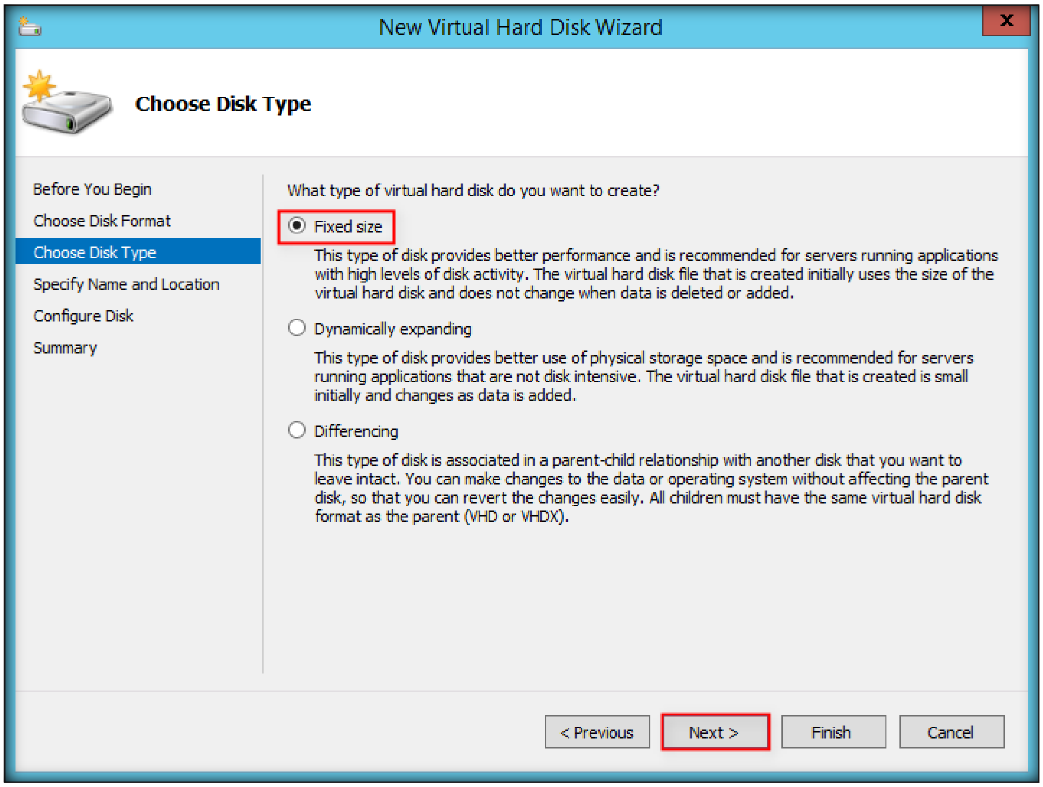
○ VHD

Supports virtual hard disks up to 2,040 GB in size.

● VHDX

This format supports virtual disks up to 64 TB and is resilient to consistency issues that might occur from power failures. This format is not supported in operating systems earlier than Windows Server 2012.

16. **Choose Disk Type** window will appear, select **Fixed size** radio button and click **Next**



New Virtual Hard Disk Wizard
Choose Disk Type
Before You Begin
Choose Disk Format
Choose Disk Type
Specify Name and Location
Configure Disk
Summary
< Previous
Next >
Finish
Cancel

What type of virtual hard disk do you want to create?

● Fixed size

This type of disk provides better performance and is recommended for servers running applications with high levels of disk activity. The virtual hard disk file that is created initially uses the size of the virtual hard disk and does not change when data is deleted or added.

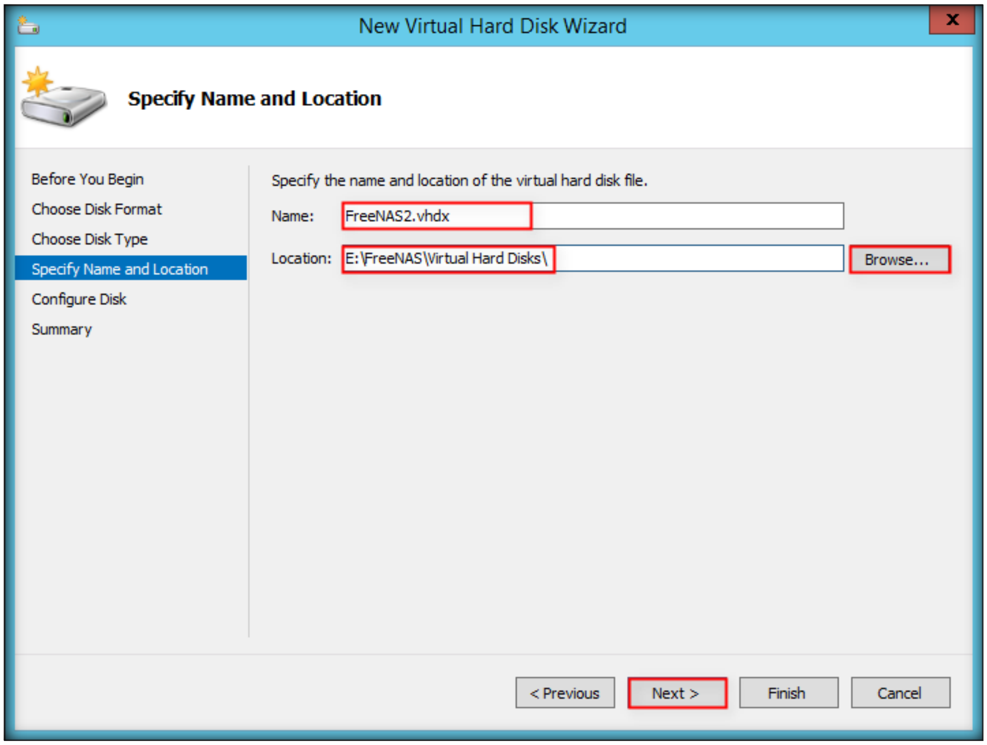
○ Dynamically expanding

This type of disk provides better use of physical storage space and is recommended for servers running applications that are not disk intensive. The virtual hard disk file that is created is small initially and changes as data is added.

○ Differencing

This type of disk is associated in a parent-child relationship with another disk that you want to leave intact. You can make changes to the data or operating system without affecting the parent disk, so that you can revert the changes easily. All children must have the same virtual hard disk format as the parent (VHD or VHDX).

17. In **Specify Name and Location** window, Specify the **Name** and **Location** of the new virtual Hard Disk. In **Name** field, enter **FreeNAS2.vhdx** and select the **Location** to: **E:\FreeNAS\Virtual Hard Disks**, Click **Next**

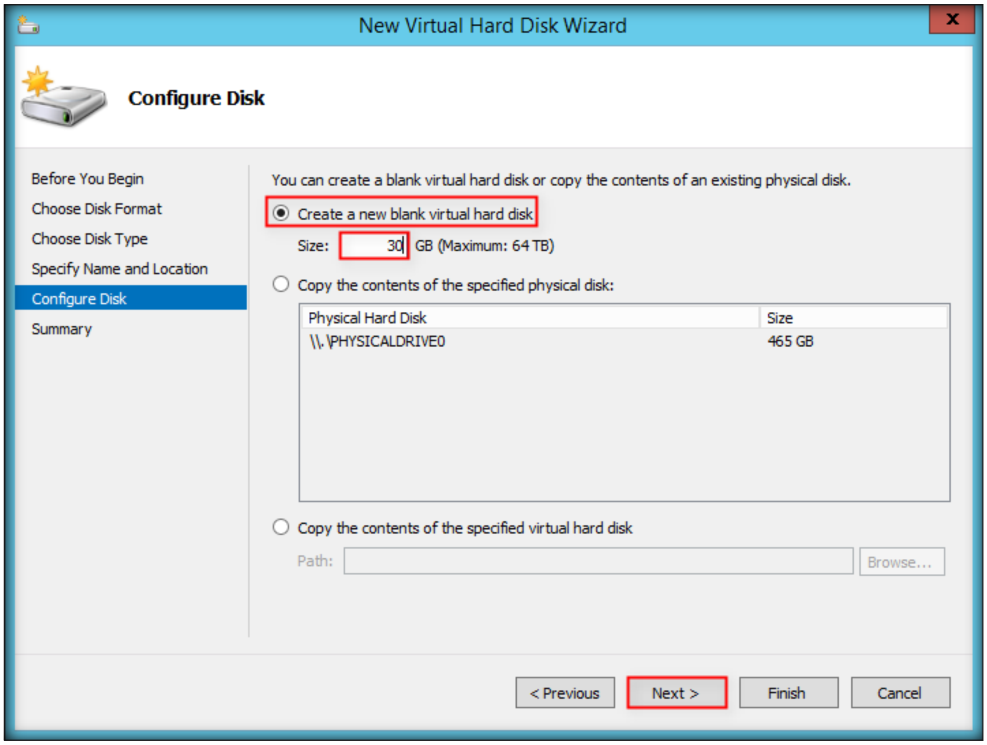

New Virtual Hard Disk Wizard
Specify Name and Location
Before You Begin
Choose Disk Format
Choose Disk Type
Specify Name and Location
Configure Disk
Summary
Browse...
< Previous
Next >
Finish
Cancel

Specify the name and location of the virtual hard disk file.

Name: FreeNAS2.vhdx

Location: E:\FreeNAS\Virtual Hard Disks\

18. In **Configure Disk** window, specify the size of the virtual hard disk. Click **Create a new blank virtual hard disk** radio button and mention the size as **30** GB. Click **Next**


New Virtual Hard Disk Wizard
Configure Disk
Before You Begin
Choose Disk Format
Choose Disk Type
Specify Name and Location
Configure Disk
Summary
Browse...
< Previous
Next >
Finish
Cancel

You can create a blank virtual hard disk or copy the contents of an existing physical disk.

● Create a new blank virtual hard disk

Size: 30 GB (Maximum: 64 TB)

○ Copy the contents of the specified physical disk:

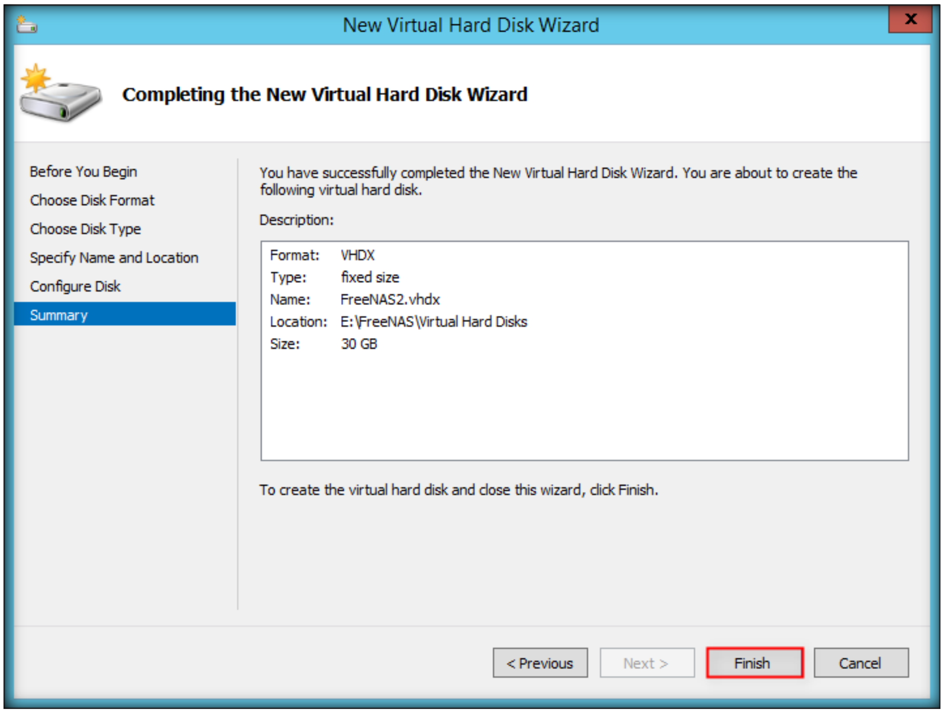
Physical Hard Disk	Size
\\.\PHYSICALDRIVE0	465 GB

○ Copy the contents of the specified virtual hard disk

Path:

19. **Completing the New Virtual Hard Disk Wizard** window will appear, click **Finish**

Note: After clicking Finish, it may take 5-10 minutes to complete the process


New Virtual Hard Disk Wizard
Completing the New Virtual Hard Disk Wizard
Before You Begin
Choose Disk Format
Choose Disk Type
Specify Name and Location
Configure Disk
Summary
< Previous
Next >
Finish
Cancel

You have successfully completed the New Virtual Hard Disk Wizard. You are about to create the following virtual hard disk.

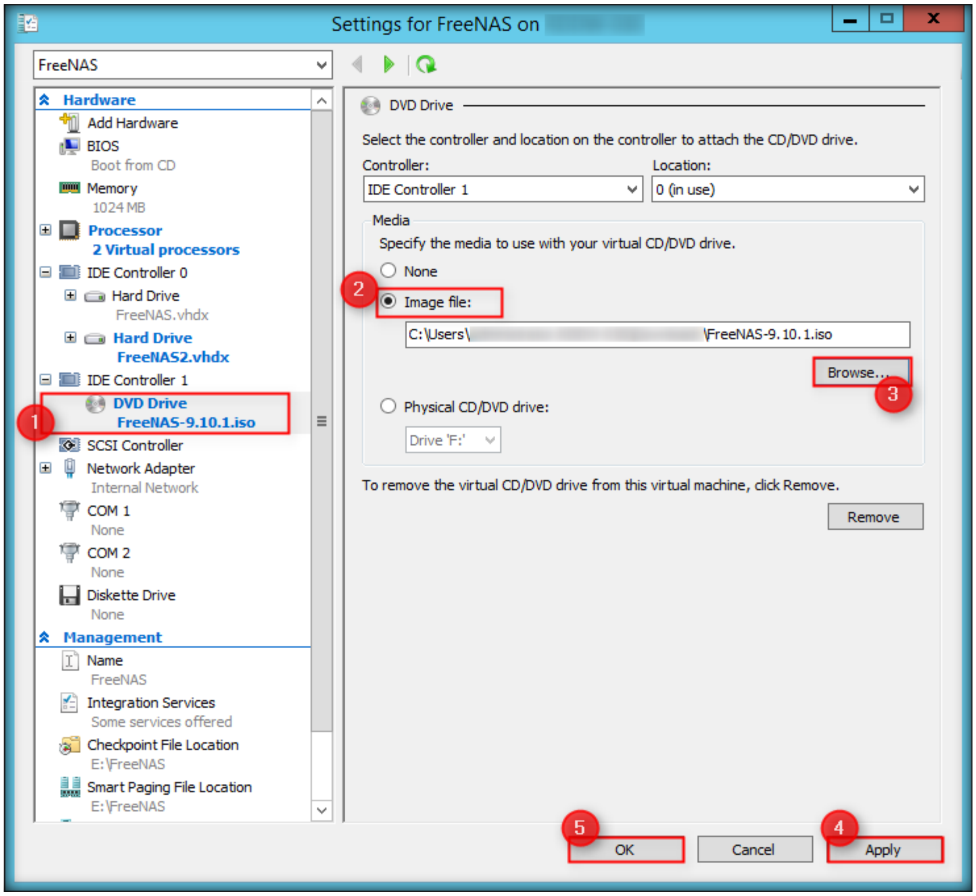
Description:

Format: VHDX
Type: fixed size
Name: FreeNAS2.vhdx
Location: E:\FreeNAS\Virtual Hard Disks
Size: 30 GB

To create the virtual hard disk and close this wizard, click Finish.

20. Again in the **Settings** window of FreeNAS, click **DVD Drive** to install the FreeNAS
    - If you have an FreeNAS DVD, choose Physical CD/DVD drive radio button and then click **Next**
    - If you have an FreeNAS ISO file, then choose Image file (.iso) radio button and click browse button to provide the path of ISO.

    Click **Apply** and then **OK**


Settings for FreeNAS on [redacted]
FreeNAS
Hardware
Add Hardware
BIOS
Boot from CD
Memory
1024 MB
Processor
2 Virtual processors
IDE Controller 0
Hard Drive
FreeNAS.vhdx
Hard Drive
FreeNAS2.vhdx
IDE Controller 1
DVD Drive
FreeNAS-9.10.1.iso
SCSI Controller
Network Adapter
Internal Network
COM 1
None
COM 2
None
Diskette Drive
None
Management
Name
FreeNAS
Integration Services
Some services offered
Checkpoint File Location
E:\FreeNAS
Smart Paging File Location
E:\FreeNAS
DVD Drive
Media
Browse...
Remove
OK
Cancel
Apply
1
2
3
4
5

Select the controller and location on the controller to attach the CD/DVD drive.

Controller: IDE Controller 1

Location: 0 (in use)

Specify the media to use with your virtual CD/DVD drive.

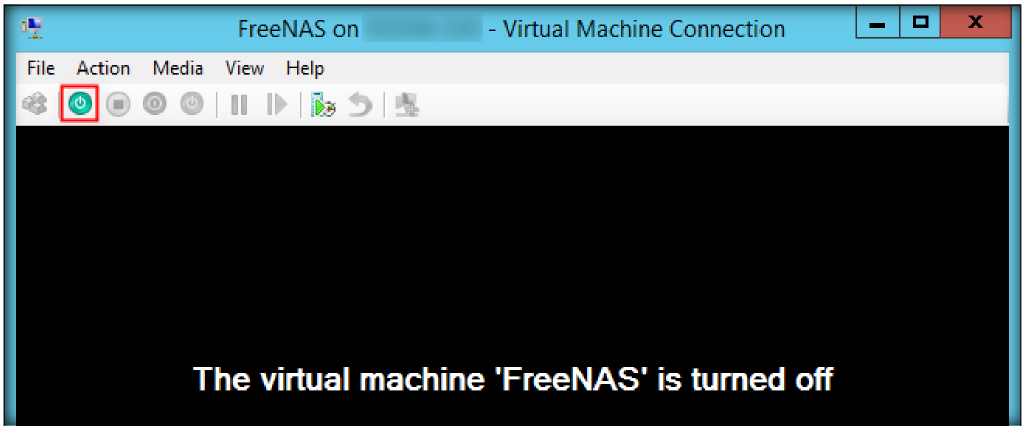
○ None

● Image file: C:\Users\[redacted]\FreeNAS-9.10.1.iso

○ Physical CD/DVD drive: Drive 'F:'

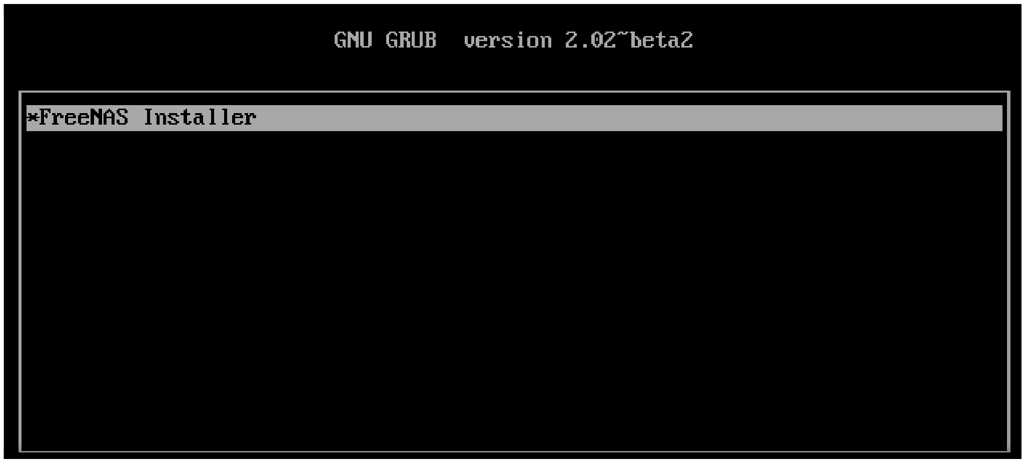
To remove the virtual CD/DVD drive from this virtual machine, click Remove.

21. **FreeNAS** window appears. Click **Start** button as shown in the screenshot

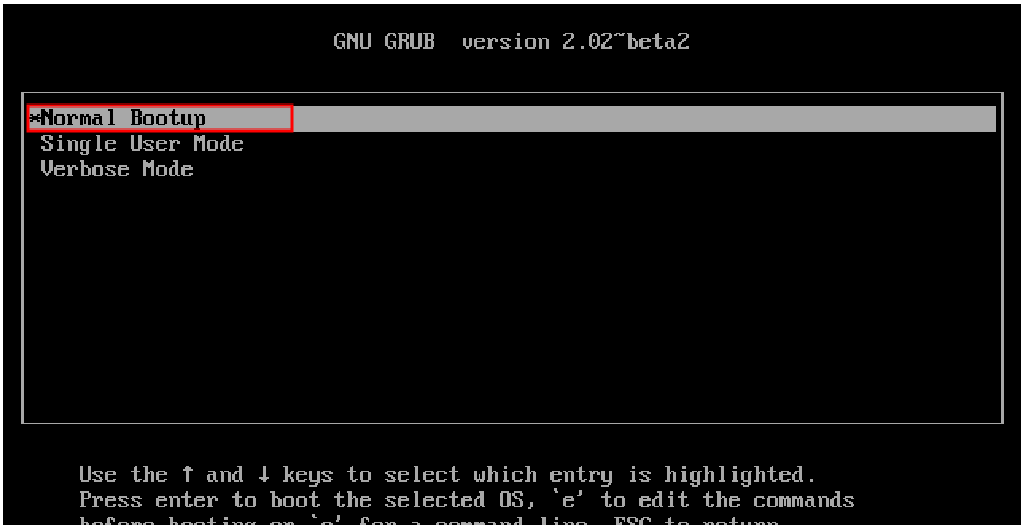

FreeNAS on [redacted] - Virtual Machine Connection
File
Action
Media
View
Help

The virtual machine 'FreeNAS' is turned off

22. FreeNAS virtual machine starts booting and installation process starts as shown in the screenshot. Press **Enter** or wait for 15 seconds to continue the installation of FreeNAS

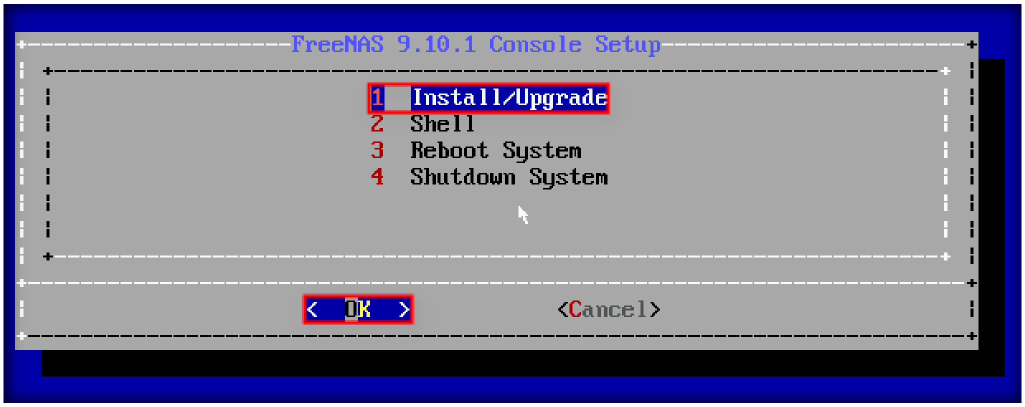

GNU GRUB version 2.02~beta2
*FreeNAS Installer

23. In next window, highlight the Normal Bootup option and press enter

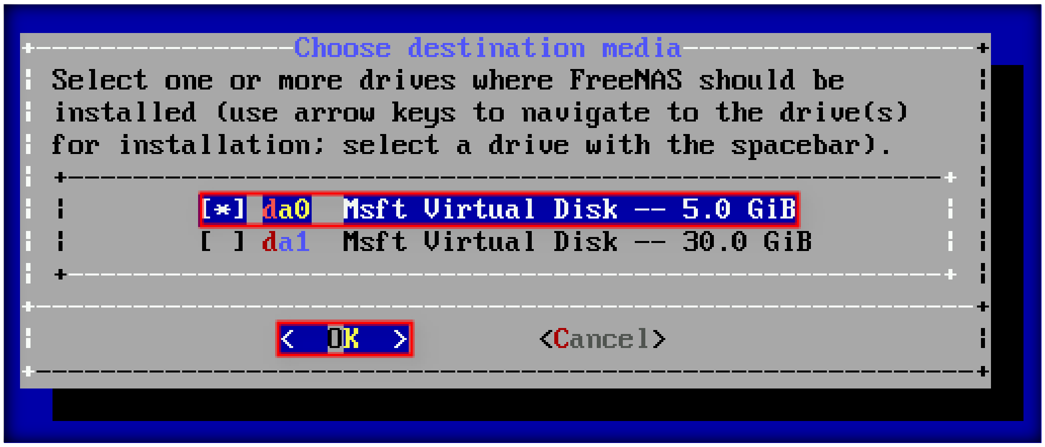

GNU GRUB version 2.02~beta2
*Normal Bootup
Single User Mode
Verbose Mode

Use the ↑ and ↓ keys to select which entry is highlighted.
Press enter to boot the selected OS, `e' to edit the commands

24. After initial installation process, a window will appear. Select **Install/Upgrade** option by the help of arrow keys and press **Enter**

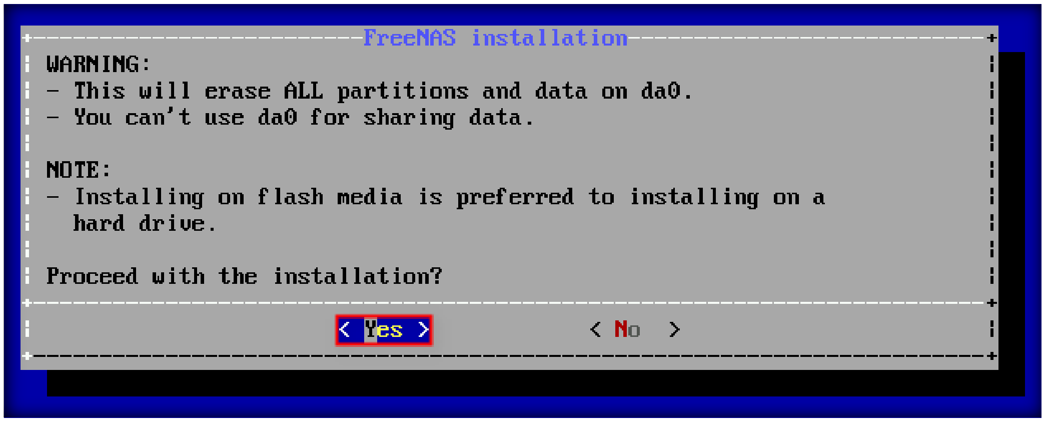

FreeNAS 9.10.1 Console Setup
1 Install/Upgrade
2 Shell
3 Reboot System
4 Shutdown System
< OK >
<Cancel>

25. **Choose destination media** window will appear, Select the virtual hard disk **da0** having 5 GB of storage



```
Choose destination media
Select one or more drives where FreeNAS should be
installed (use arrow keys to navigate to the drive(s)
for installation; select a drive with the spacebar).

      [*] da0  Msft Virtual Disk -- 5.0 GiB
      [ ] da1  Msft Virtual Disk -- 30.0 GiB

            <  OK  >          <Cancel>
```

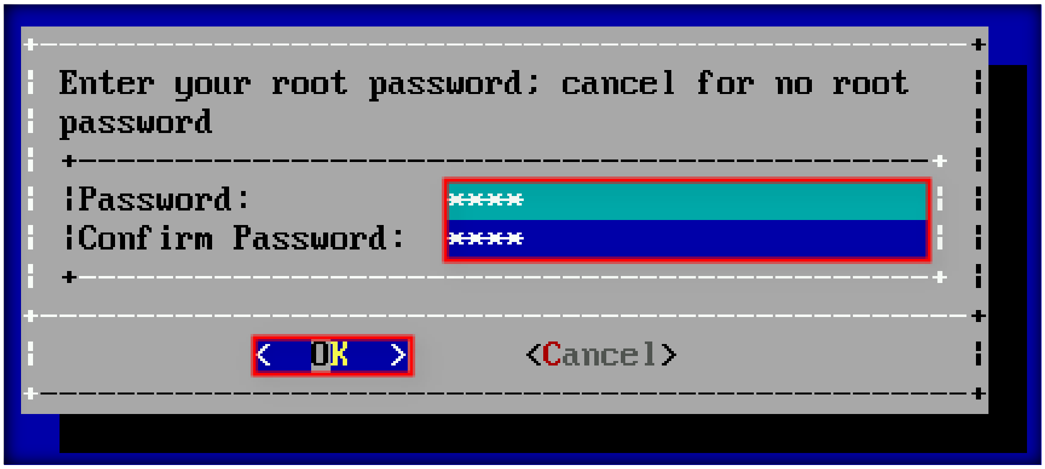
26. A warning window will appear, select **Yes** and press **Enter**



```
FreeNAS installation
WARNING:
- This will erase ALL partitions and data on da0.
- You can't use da0 for sharing data.

NOTE:
- Installing on flash media is preferred to installing on a
  hard drive.

Proceed with the installation?

                < Yes >          < No  >
```

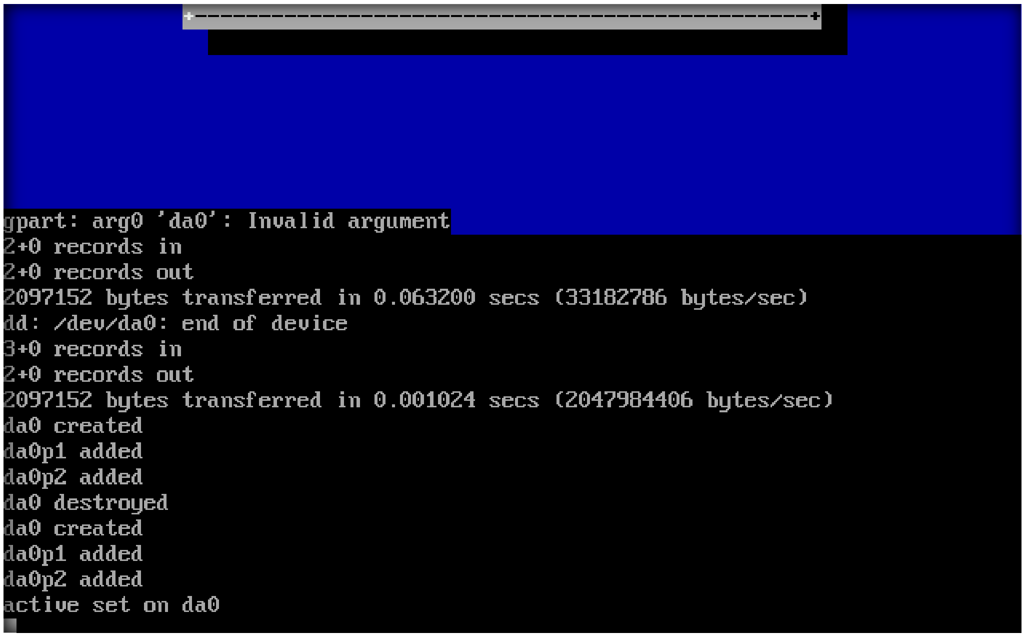
27. In next window, it will ask to setup the **root password**. Use **toor** as the password. Select **OK** and press **Enter**

Note: This password will used as the administrative password for the further installation of the FreeNAS through web based GUI. And user name by default is **root**



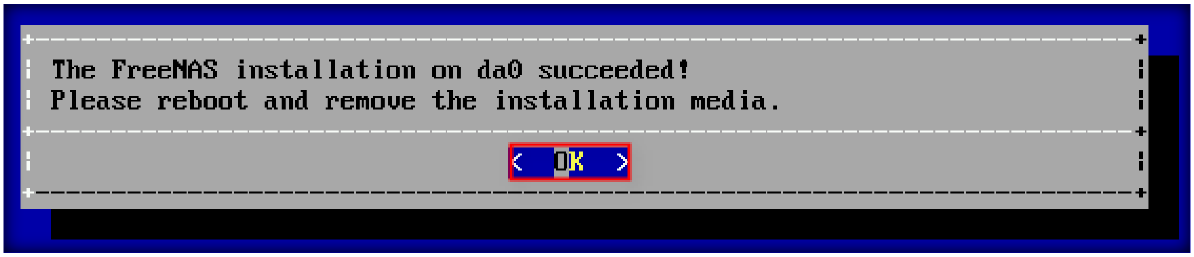
```
Enter your root password; cancel for no root
password

 Password:           ****
 Confirm Password:   ****

          <  OK  >          <Cancel>
```

28. The installation process will continue. This may take few minutes to complete this process



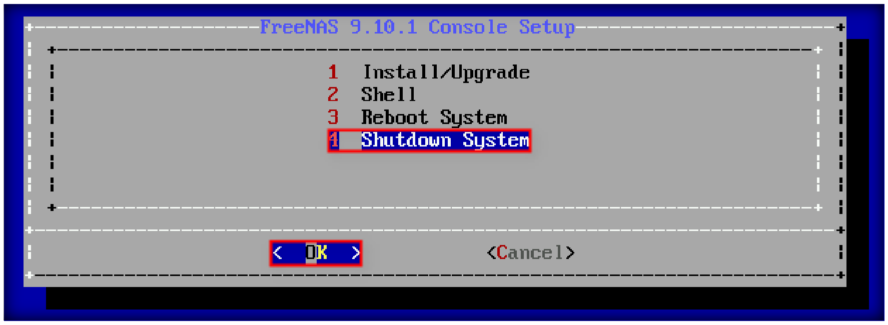
```
gpart: arg0 'da0': Invalid argument
2+0 records in
2+0 records out
2097152 bytes transferred in 0.063200 secs (33182786 bytes/sec)
dd: /dev/da0: end of device
3+0 records in
2+0 records out
2097152 bytes transferred in 0.001024 secs (2047984406 bytes/sec)
da0 created
da0p1 added
da0p2 added
da0 destroyed
da0 created
da0p1 added
da0p2 added
active set on da0
```

29. A notification window will appear asking for reboot. **OK** is highlighted, press **Enter** to proceed



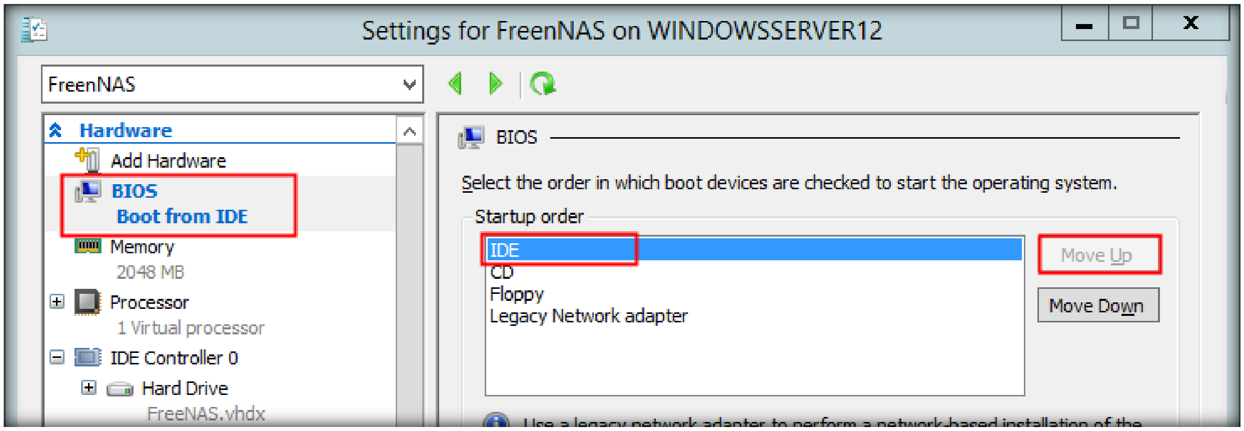
```
The FreeNAS installation on da0 succeeded!
Please reboot and remove the installation media.
```

30. **Console Setup** window will appear. Select the **Shutdown System** option and press **OK**. The FreeNAS virtual machine will shut down



31. Again navigate to the **Settings** window of the **FreeNAS** virtual machine

32. In settings, click **BIOS**. Change the Startup order by moving **IDE** to the top of the order using **Move Up** button as shown in the screenshot.



Settings for FreeNAS on WINDOWSSERVER12

BIOS

Select the order in which boot devices are checked to start the operating system.

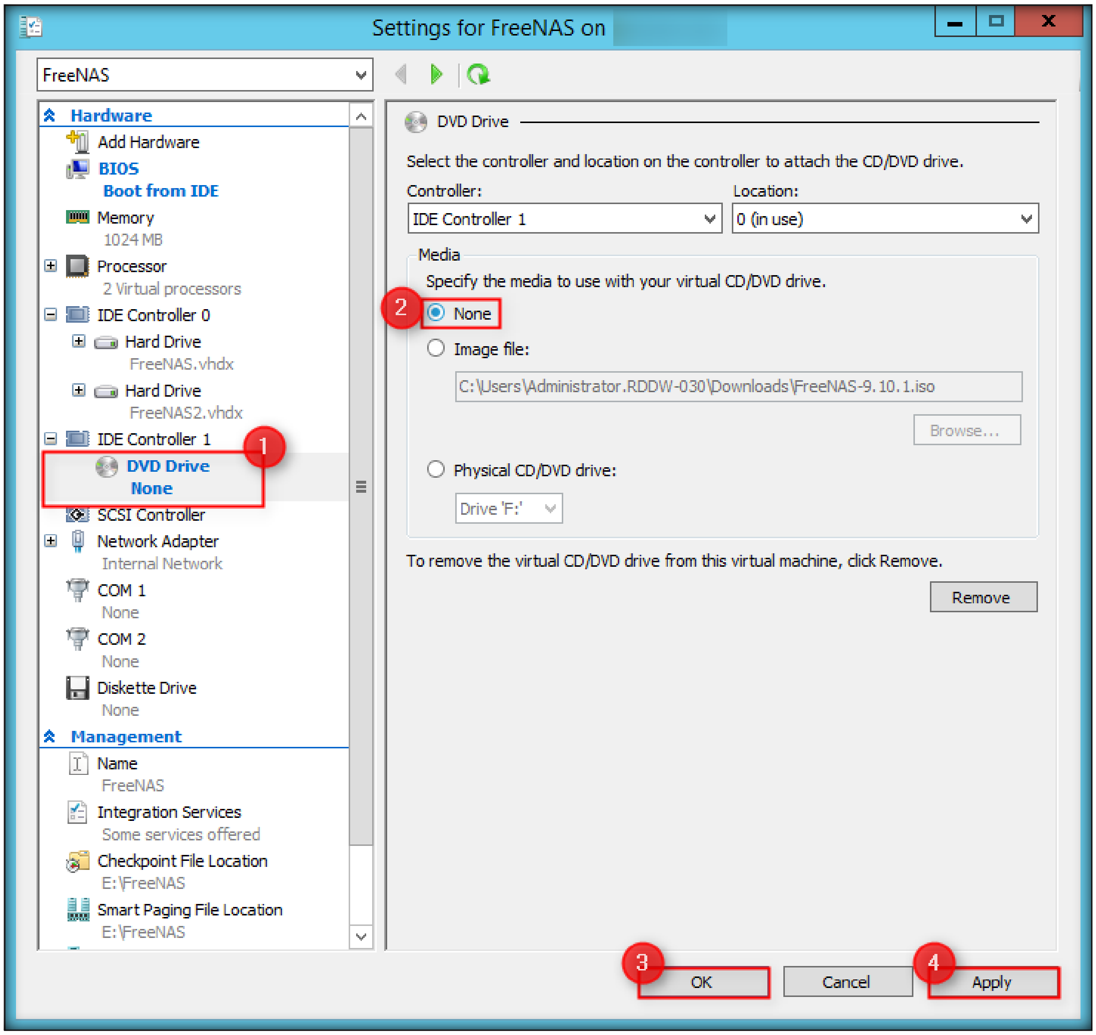
Startup order

- IDE
- CD
- Floppy
- Legacy Network adapter

Use a legacy network adapter to perform a network-based installation of the

FreeNAS
Hardware
Add Hardware
BIOS
Boot from IDE
Memory
2048 MB
Processor
1 Virtual processor
IDE Controller 0
Hard Drive
FreeNAS.vhdx
Move Up
Move Down

33. In same setting window, click **DVD Drive** and in central pane, select **None**. Now click **Apply** and **OK** to change the settings



Settings for FreeNAS on

DVD Drive

Select the controller and location on the controller to attach the CD/DVD drive.

Controller: IDE Controller 1

Location: 0 (in use)

Media

Specify the media to use with your virtual CD/DVD drive.

● None

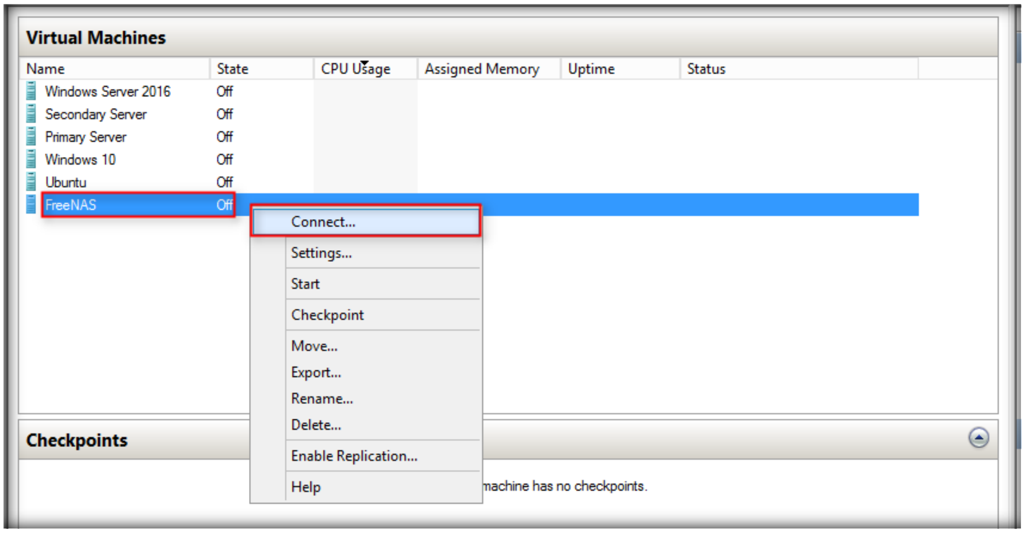
○ Image file: C:\Users\Administrator.RDDW-030\Downloads\FreeNAS-9.10.1.iso

○ Physical CD/DVD drive: Drive 'F:'

To remove the virtual CD/DVD drive from this virtual machine, click Remove.

FreeNAS
Hardware
Add Hardware
BIOS
Boot from IDE
Memory
1024 MB
Processor
2 Virtual processors
IDE Controller 0
Hard Drive
FreeNAS.vhdx
Hard Drive
FreeNAS2.vhdx
IDE Controller 1
1
DVD Drive
None
SCSI Controller
Network Adapter
Internal Network
COM 1
None
COM 2
None
Diskette Drive
None
Management
Name
FreeNAS
Integration Services
Some services offered
Checkpoint File Location
E:\FreeNAS
Smart Paging File Location
E:\FreeNAS
2
Browse...
Remove
3
OK
Cancel
4
Apply

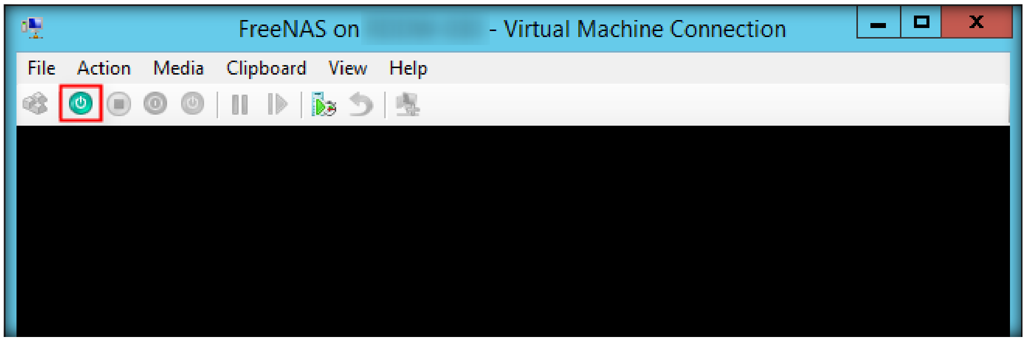
34. Again, in Hyper-V Manager main window **right-click** the **FreeNAS** virtual machine and click **Connect** from the context menu


Virtual Machines
Connect...
Settings...
Start
Checkpoint
Move...
Export...
Rename...
Delete...
Enable Replication...
Help
Checkpoints

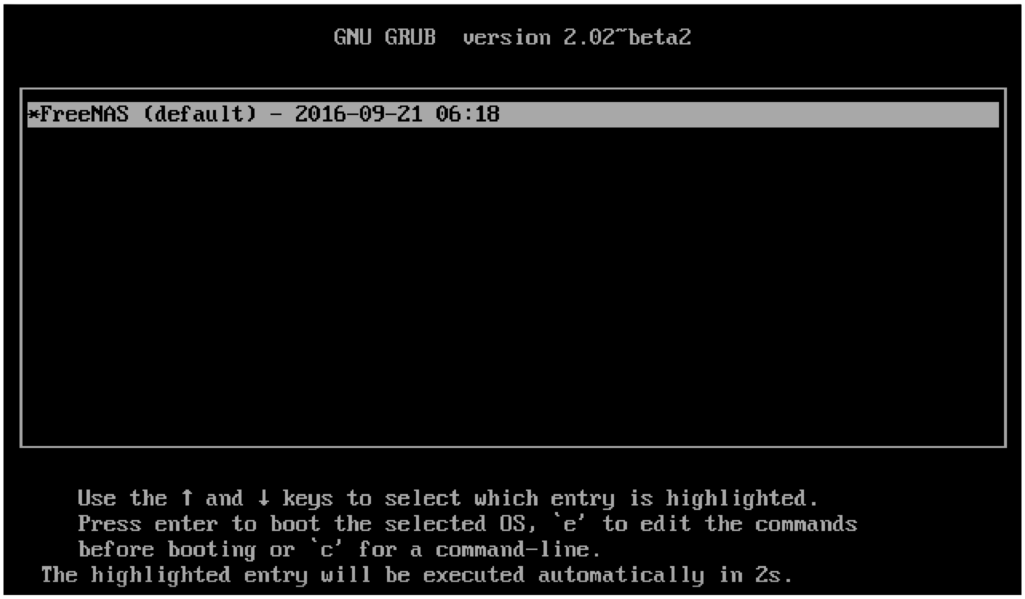
Name	State	CPU Usage	Assigned Memory	Uptime	Status
Windows Server 2016	Off				
Secondary Server	Off				
Primary Server	Off				
Windows 10	Off				
Ubuntu	Off				
FreeNAS	Off				

machine has no checkpoints.

35. **FreeNAS** Virtual Machine window appears click **Start** button as shown in the screenshot

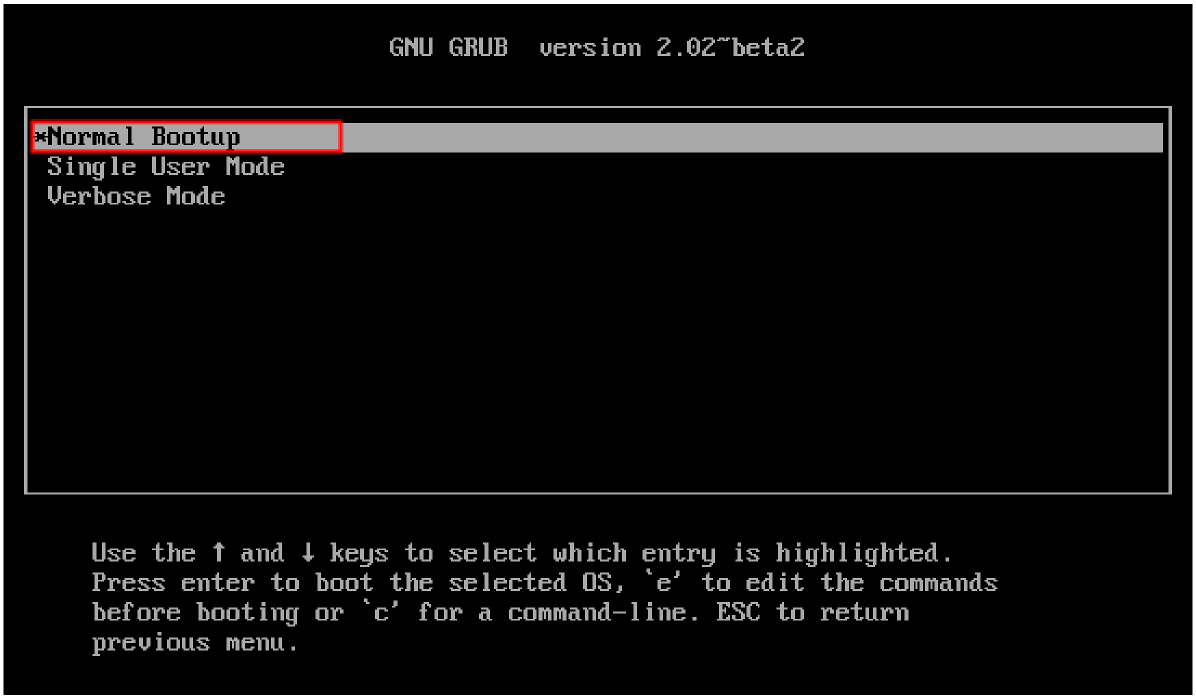

FreeNAS on [redacted] - Virtual Machine Connection
File
Action
Media
Clipboard
View
Help

36. FreeNAS boot up page will appear; press **Enter** or wait for 15 seconds to boot.



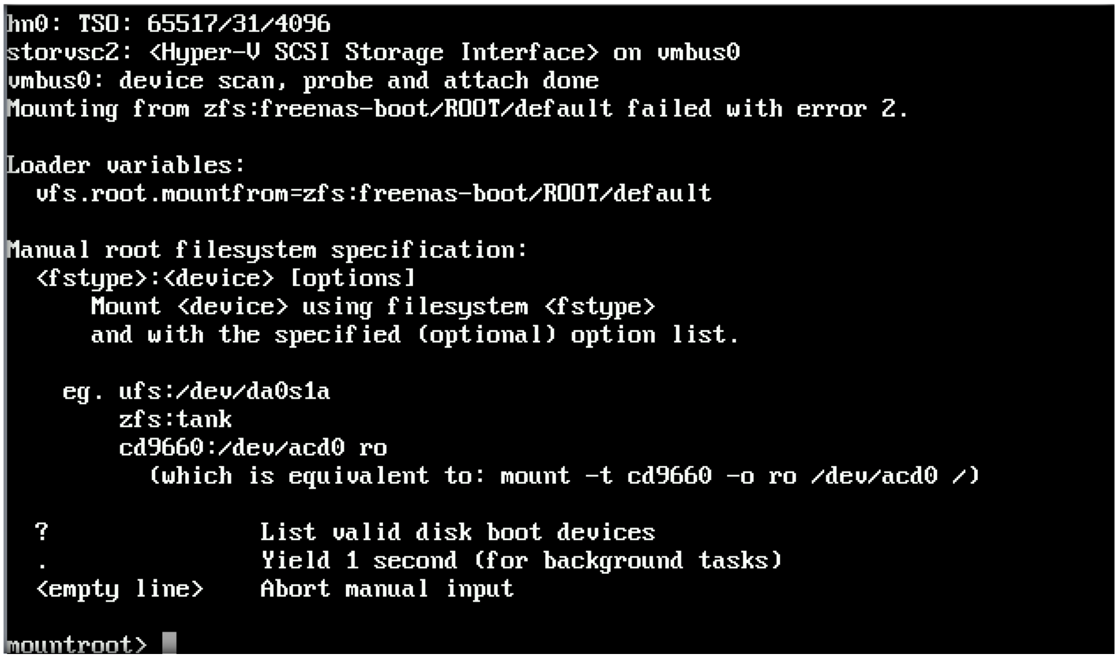
```
GNU GRUB  version 2.02~beta2

*FreeNAS (default) - 2016-09-21 06:18

   Use the ↑ and ↓ keys to select which entry is highlighted.
   Press enter to boot the selected OS, `e' to edit the commands
   before booting or `c' for a command-line.
The highlighted entry will be executed automatically in 2s.
```

37. In next window, highlight the **Normal Bootup** option and press **enter**



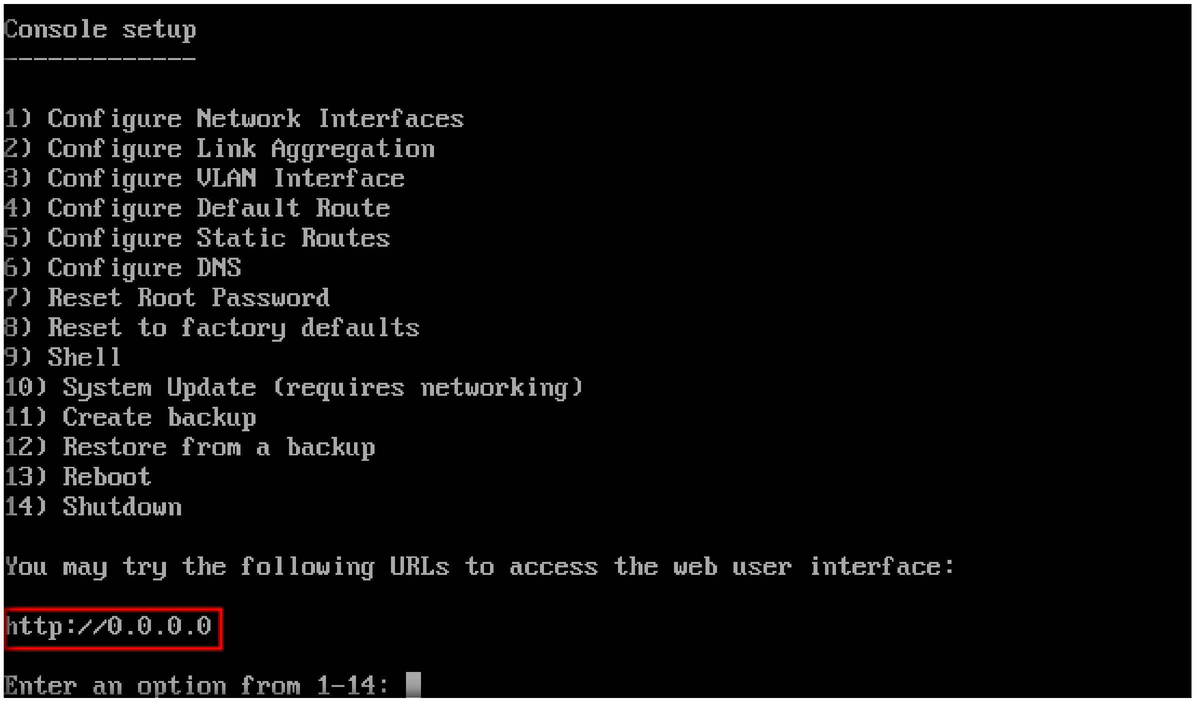
```
GNU GRUB  version 2.02~beta2

*Normal Bootup
 Single User Mode
 Verbose Mode

   Use the ↑ and ↓ keys to select which entry is highlighted.
   Press enter to boot the selected OS, `e' to edit the commands
   before booting or `c' for a command-line. ESC to return
   previous menu.
```

WARNING: If FreeNAS VM is not booting properly and showing the following screen as shown in the screenshot below, Restart FreeNAS VM by selecting **Turn Off** option from the **Action** drop-down menu present in menu-bar of FreeNAS Hyper-V window and then restarting it using **Start** button. If FreeNAS VM is booting properly, then skip to **Step 38**.



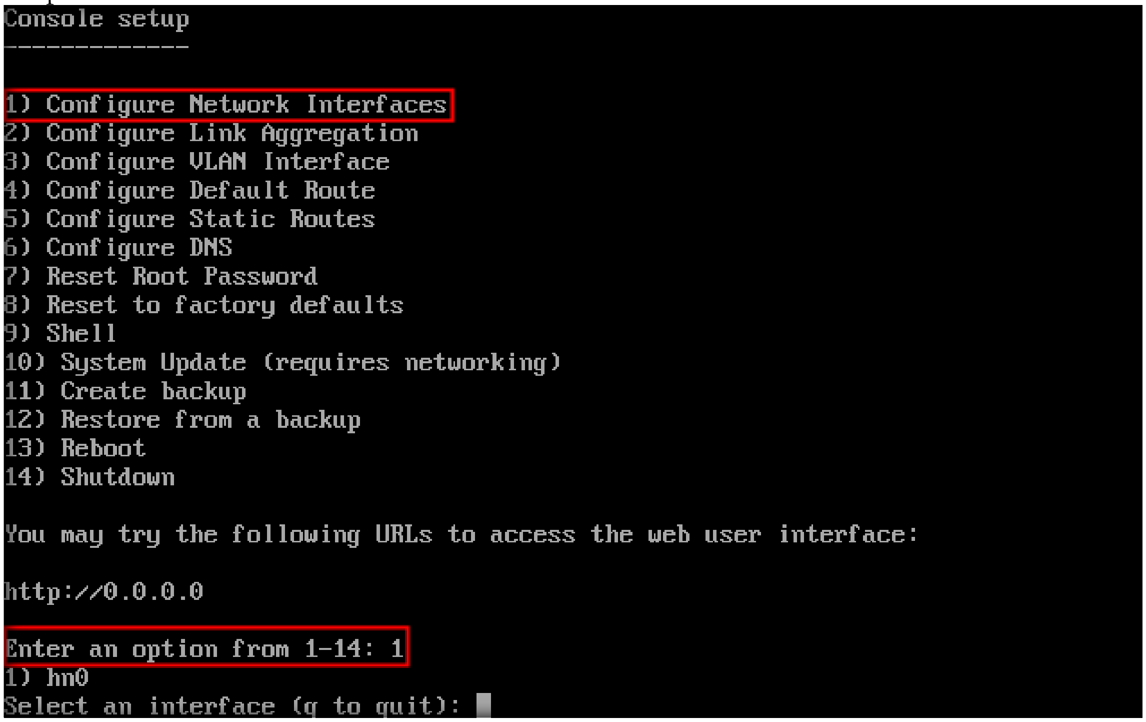
```
hn0: TSO: 65517/31/4096
storvsc2: <Hyper-V SCSI Storage Interface> on vmbus0
vmbus0: device scan, probe and attach done
Mounting from zfs:freenas-boot/ROOT/default failed with error 2.

Loader variables:
  vfs.root.mountfrom=zfs:freenas-boot/ROOT/default

Manual root filesystem specification:
  <fstype>:<device> [options]
      Mount <device> using filesystem <fstype>
      and with the specified (optional) option list.

    eg. ufs:/dev/da0s1a
        zfs:tank
        cd9660:/dev/acd0 ro
          (which is equivalent to: mount -t cd9660 -o ro /dev/acd0 /)

  ?               List valid disk boot devices
  .               Yield 1 second (for background tasks)
  <empty line>    Abort manual input

mountroot> 
```

38. After completion of booting, the setup will generate a IP address i.e. **0.0.0.0** in order to access the web user interface. This IP will not work; we will have to **Configure Network Interfaces**



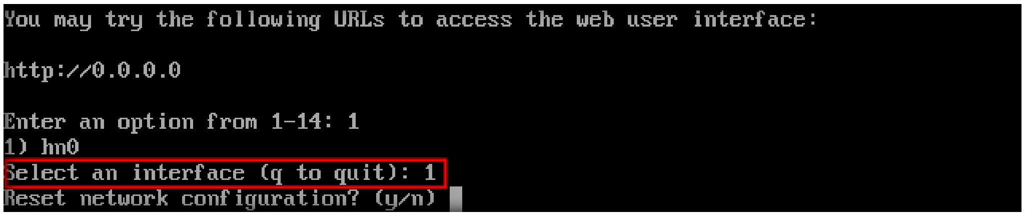
```
Console setup
-------------

1) Configure Network Interfaces
2) Configure Link Aggregation
3) Configure VLAN Interface
4) Configure Default Route
5) Configure Static Routes
6) Configure DNS
7) Reset Root Password
8) Reset to factory defaults
9) Shell
10) System Update (requires networking)
11) Create backup
12) Restore from a backup
13) Reboot
14) Shutdown

You may try the following URLs to access the web user interface:

http://0.0.0.0

Enter an option from 1-14:
```

39. To **Configure Network Interfaces**, type **1** in the **Enter an option from 1-14:** menu and press **Enter**



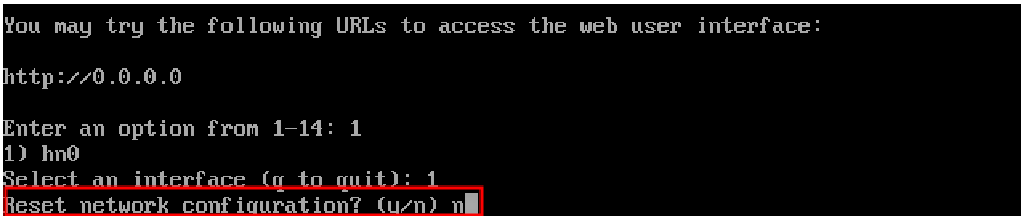
```
Console setup
-------------

1) Configure Network Interfaces
2) Configure Link Aggregation
3) Configure VLAN Interface
4) Configure Default Route
5) Configure Static Routes
6) Configure DNS
7) Reset Root Password
8) Reset to factory defaults
9) Shell
10) System Update (requires networking)
11) Create backup
12) Restore from a backup
13) Reboot
14) Shutdown

You may try the following URLs to access the web user interface:

http://0.0.0.0

Enter an option from 1-14: 1
1) hn0
Select an interface (q to quit):
```

40. In **Select an interface** option, enter the serial number of the interface **hn0** i.e. **1** as shown in screenshot and press **Enter**



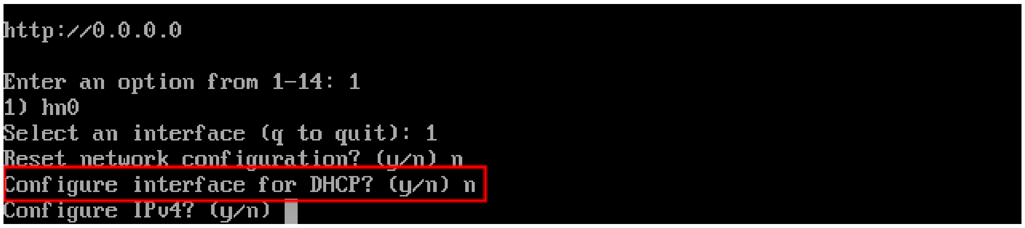
```
You may try the following URLs to access the web user interface:

http://0.0.0.0

Enter an option from 1-14: 1
1) hn0
Select an interface (q to quit): 1
Reset network configuration? (y/n) 
```

41. In **Reset network configuration** option, type **n** and press **Enter**



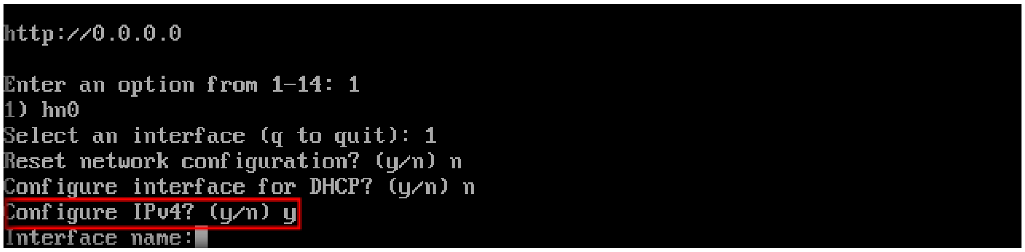
```
You may try the following URLs to access the web user interface:

http://0.0.0.0

Enter an option from 1-14: 1
1) hn0
Select an interface (q to quit): 1
Reset network configuration? (y/n) n
```

42. In **Configure interface for DHCP** option, type **n** and press **Enter**



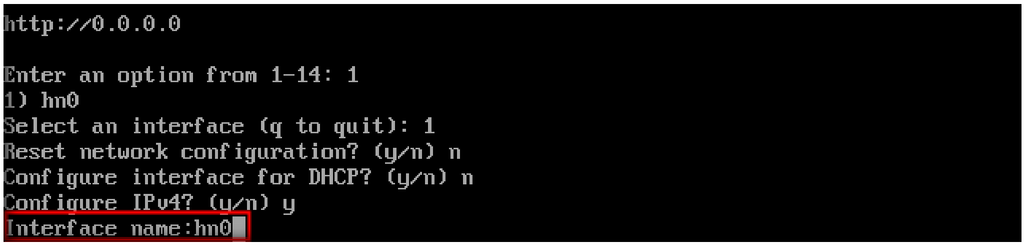
```
http://0.0.0.0

Enter an option from 1-14: 1
1) hn0
Select an interface (q to quit): 1
Reset network configuration? (y/n) n
Configure interface for DHCP? (y/n) n
Configure IPv4? (y/n) 
```

43. In **Configure IPv4** option, type **y** and press **Enter**. This will enable the manual configuration of the IP address.



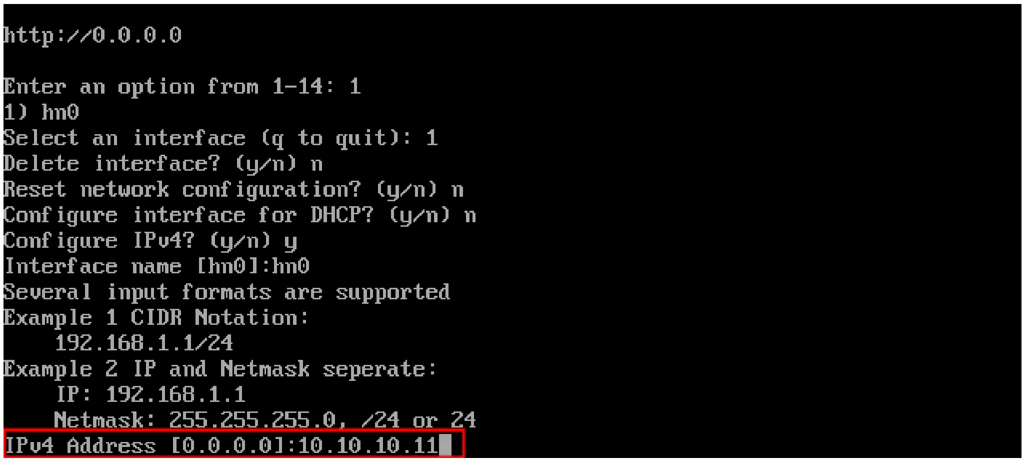
```
http://0.0.0.0

Enter an option from 1-14: 1
1) hn0
Select an interface (q to quit): 1
Reset network configuration? (y/n) n
Configure interface for DHCP? (y/n) n
Configure IPv4? (y/n) y
Interface name:
```

44. **Interface name** option will appear, type the name of the interface i.e. **hn0** and press **Enter**



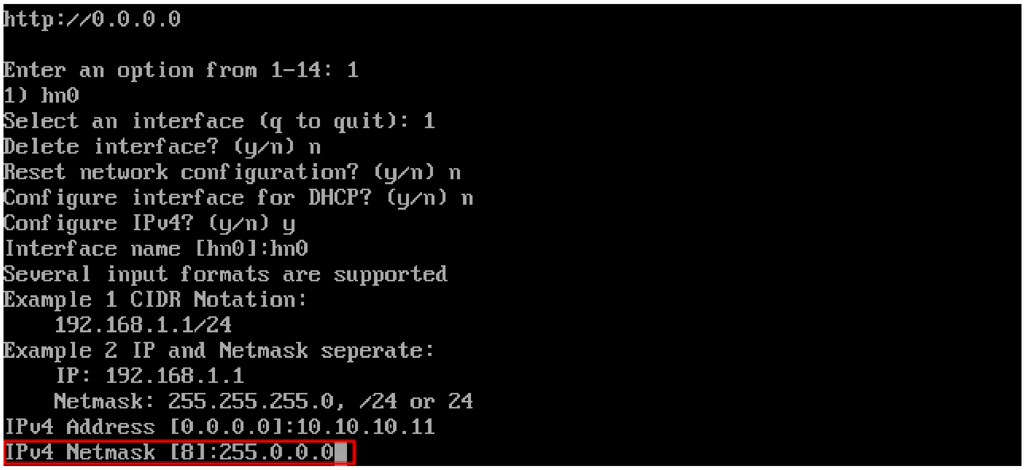
```
http://0.0.0.0

Enter an option from 1-14: 1
1) hn0
Select an interface (q to quit): 1
Reset network configuration? (y/n) n
Configure interface for DHCP? (y/n) n
Configure IPv4? (y/n) y
Interface name:hn0
```

45. **IPv4 Address** option will appear. Type the IP address **10.10.10.11**, which we want to assign to the **hn0** port and press **Enter.**
    Note: This FreeNAS virtual machine is configured on internal switch which has the gateway: 10.10.10.2, so we will have to assign the interface **hn0** the IP of same domain, so we will apply IP: **10.10.10.11**



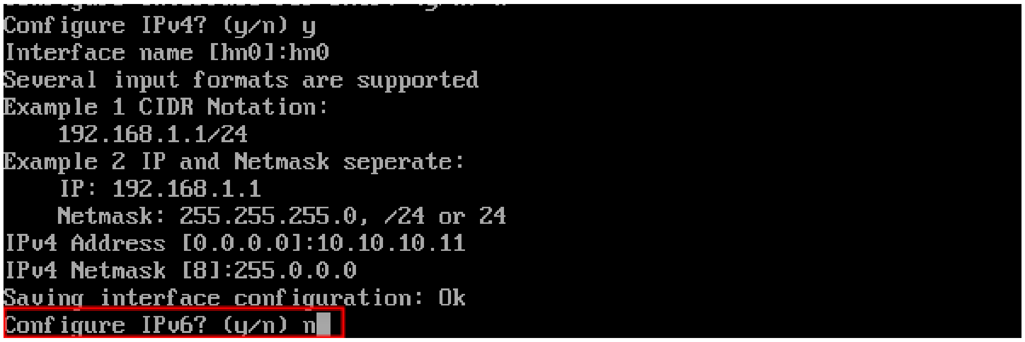
```
http://0.0.0.0

Enter an option from 1-14: 1
1) hn0
Select an interface (q to quit): 1
Delete interface? (y/n) n
Reset network configuration? (y/n) n
Configure interface for DHCP? (y/n) n
Configure IPv4? (y/n) y
Interface name [hn0]:hn0
Several input formats are supported
Example 1 CIDR Notation:
    192.168.1.1/24
Example 2 IP and Netmask seperate:
    IP: 192.168.1.1
    Netmask: 255.255.255.0, /24 or 24
IPv4 Address [0.0.0.0]:10.10.10.11
```

46. After applying the interface IP, **IPv4 Netmask** option will appear. Since the interface IP we entered is **class A** IP, so here we will apply **255.0.0.0** as the **IPv4 Netmask** and press **Enter**



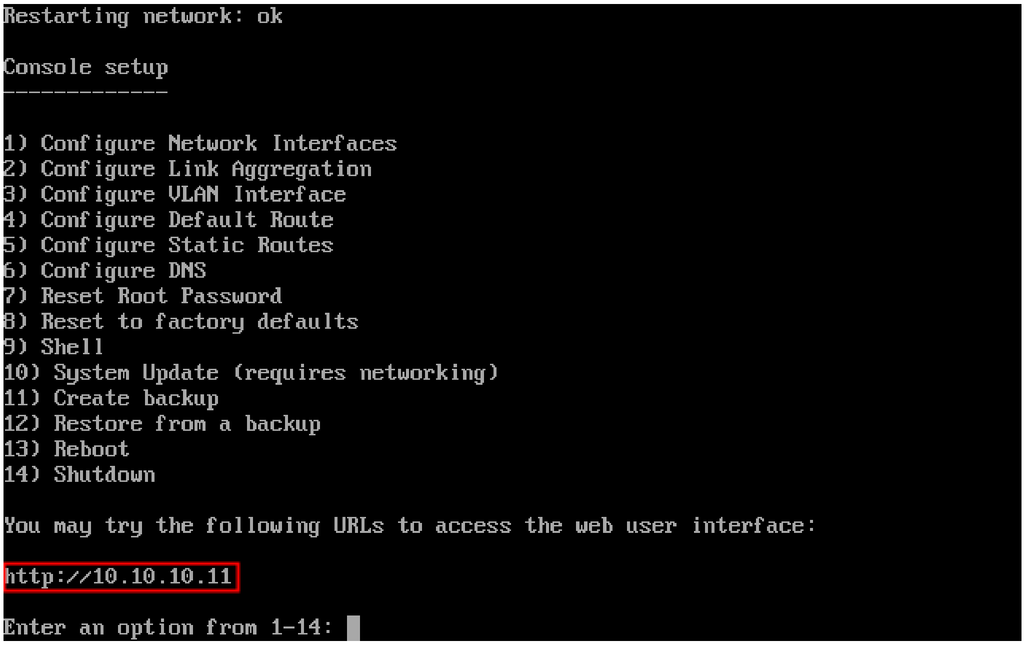
```
http://0.0.0.0

Enter an option from 1-14: 1
1) hn0
Select an interface (q to quit): 1
Delete interface? (y/n) n
Reset network configuration? (y/n) n
Configure interface for DHCP? (y/n) n
Configure IPv4? (y/n) y
Interface name [hn0]:hn0
Several input formats are supported
Example 1 CIDR Notation:
    192.168.1.1/24
Example 2 IP and Netmask seperate:
    IP: 192.168.1.1
    Netmask: 255.255.255.0, /24 or 24
IPv4 Address [0.0.0.0]:10.10.10.11
IPv4 Netmask [8]:255.0.0.0
```

47. **Configure IPv6** option will appear, type **n** and press **Enter** as shown in the screenshot



```
Configure IPv4? (y/n) y
Interface name [hn0]:hn0
Several input formats are supported
Example 1 CIDR Notation:
    192.168.1.1/24
Example 2 IP and Netmask seperate:
    IP: 192.168.1.1
    Netmask: 255.255.255.0, /24 or 24
IPv4 Address [0.0.0.0]:10.10.10.11
IPv4 Netmask [8]:255.0.0.0
Saving interface configuration: Ok
Configure IPv6? (y/n) n
```

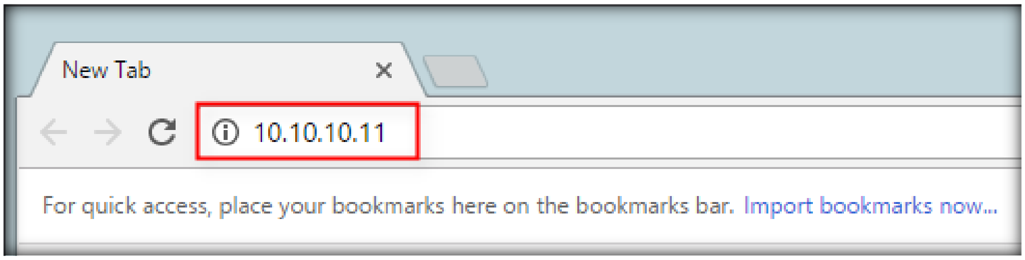
48. The interface **hn0** will be reconfigured and FreeNAS will generate a new IP address i.e. **http://10.10.10.11** for the further configuration of the FreeNAS through web user interface



```
Restarting network: ok

Console setup
-------------

1) Configure Network Interfaces
2) Configure Link Aggregation
3) Configure VLAN Interface
4) Configure Default Route
5) Configure Static Routes
6) Configure DNS
7) Reset Root Password
8) Reset to factory defaults
9) Shell
10) System Update (requires networking)
11) Create backup
12) Restore from a backup
13) Reboot
14) Shutdown

You may try the following URLs to access the web user interface:

http://10.10.10.11

Enter an option from 1-14:
```

CT#9.2: Configuring CIFS Shared Folder (NAS) in FreeNAS

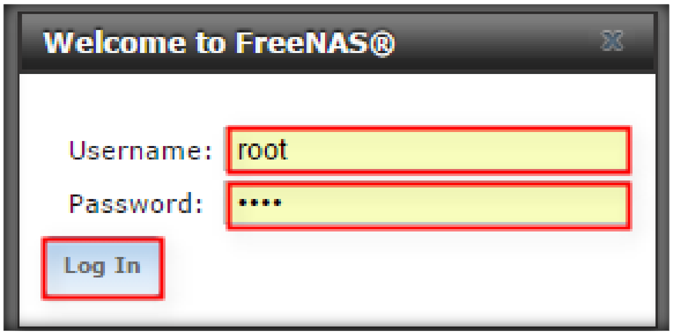
1. For the further configuration of the FreeNAS using web user interface, on **Host system** i.e. **Windows Server 2012**, type the IP i.e. **10.10.10.11** on the **address bar** of any internet browser and press **Enter**



10.10.10.11

For quick access, place your bookmarks here on the bookmarks bar. Import bookmarks now...

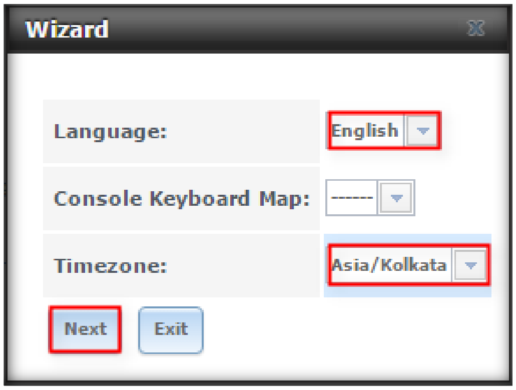
2. **Welcome to FreeNAS** window will pop up, enter the **Username** and **Password**.
   Note: Username is **root** by default and **Password** is **toor**



Username: root

Password: ••••

3. A **Wizard** window will pop up for the configuration of the FreeNAS. Choose the appropriate **Language** and **Timezone** and click **Next**



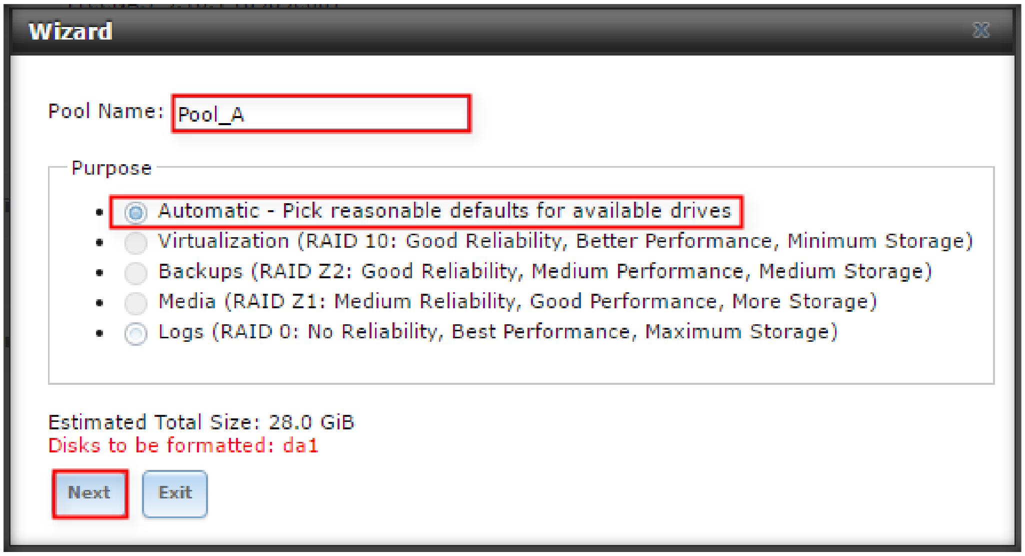
Wizard

Language: English

Console Keyboard Map: ------

Timezone: Asia/Kolkata

4. In next window of the wizard, enter the **Pool Name** as **Pool_A** and select **Automatic** radio button present in **Purpose** menu. Click **Next** button



Wizard

Pool Name: Pool_A

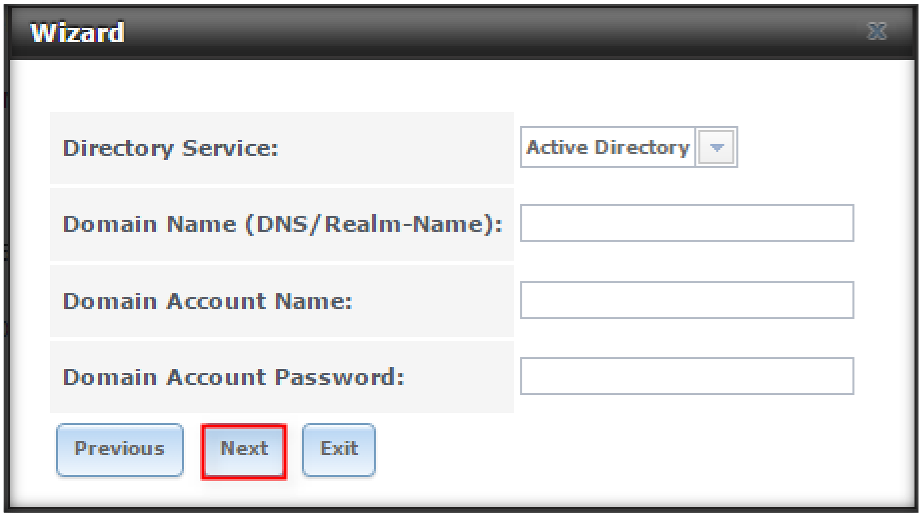
Purpose

- ● Automatic - Pick reasonable defaults for available drives
- ○ Virtualization (RAID 10: Good Reliability, Better Performance, Minimum Storage)
- ○ Backups (RAID Z2: Good Reliability, Medium Performance, Medium Storage)
- ○ Media (RAID Z1: Medium Reliability, Good Performance, More Storage)
- ○ Logs (RAID 0: No Reliability, Best Performance, Maximum Storage)

Estimated Total Size: 28.0 GiB

Disks to be formatted: da1

5. Next window of wizard will appear, click **Next**



Wizard

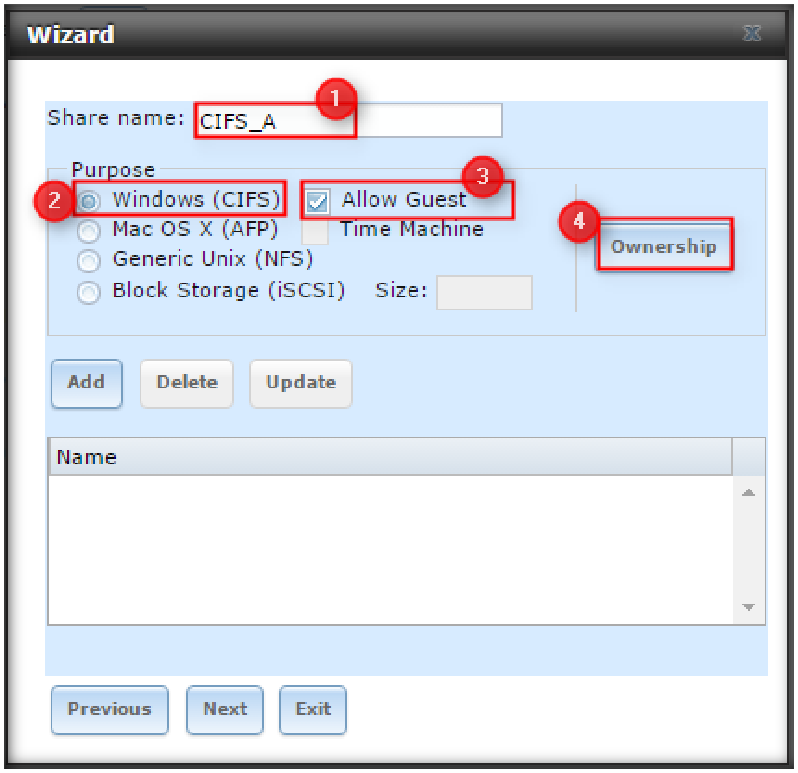
Directory Service: Active Directory

Domain Name (DNS/Realm-Name):

Domain Account Name:

Domain Account Password:

6. Next window will appear, In **Share name** column enter **CIFS_A** as the name of the shared folder. Select **Windows (CIFS)** radio button from the **Purpose** section and check the **Allow Guest** box. Click **Ownership** button present on right side as shown in the screenshot



Wizard

Share name: CIFS_A

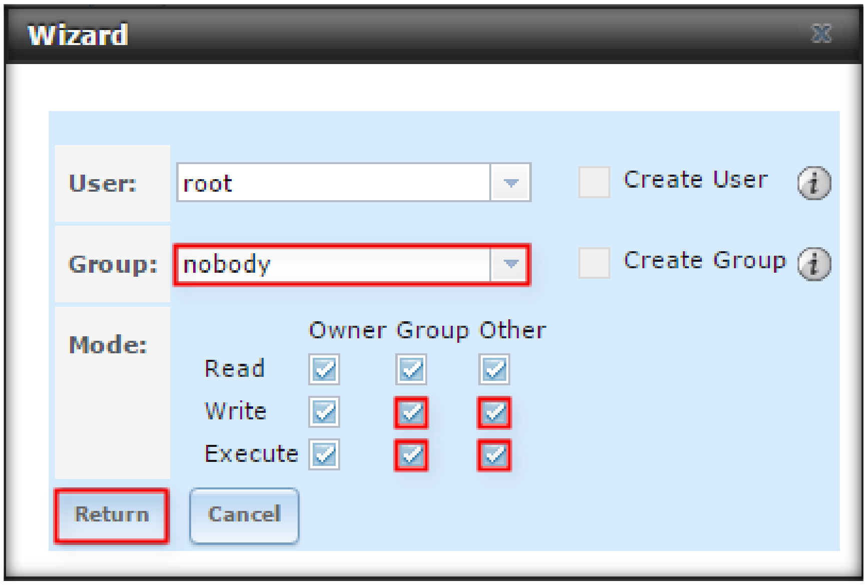
Purpose

● Windows (CIFS)
○ Mac OS X (AFP)
○ Generic Unix (NFS)
○ Block Storage (iSCSI)

☑ Allow Guest
☐ Time Machine

Size:

7. After clicking **Ownership** button, next window will appear, keep the **root** as **User** and from the **Group** drop-down menu select **nobody**. Check the remaining **Write** and **Execute** boxes of **Group** and **Other** and then click **Return**, as shown in the screenshot



Wizard

User: root

☐ Create User

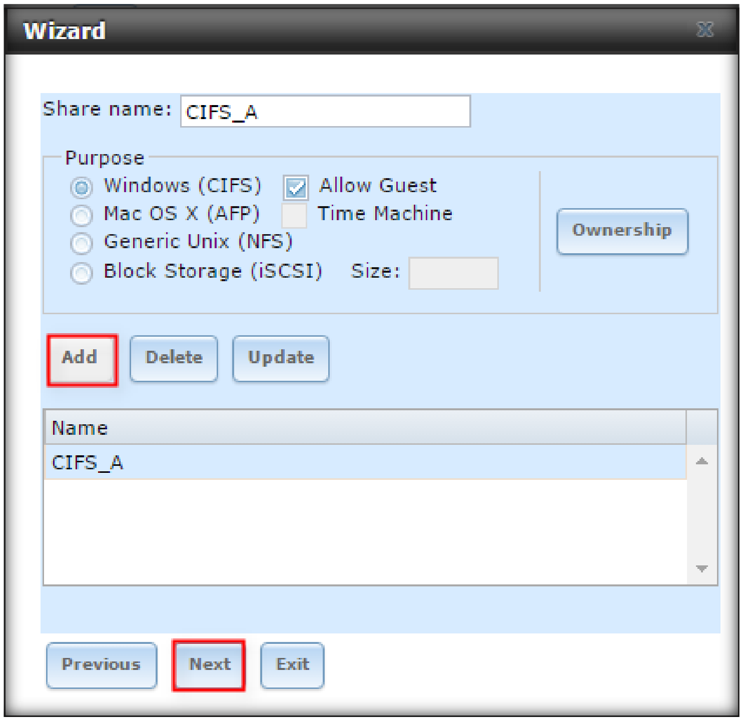
Group: nobody

☐ Create Group

Mode:

	Owner	Group	Other
Read	☑	☑	☑
Write	☑	☑	☑
Execute	☑	☑	☑

8. Click **Add** button, this will add the shared folder **CIFS_A** share. Click **Next**

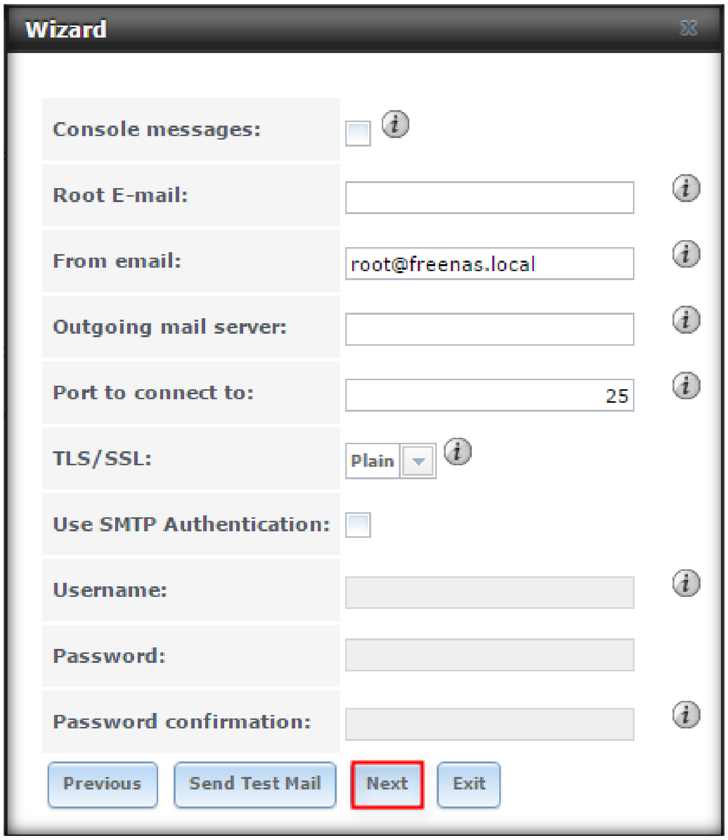

Wizard
Purpose
Ownership
Add
Delete
Update
Previous
Next
Exit

Share name: CIFS_A

● Windows (CIFS) ☑ Allow Guest
○ Mac OS X (AFP) ☐ Time Machine
○ Generic Unix (NFS)
○ Block Storage (iSCSI) Size:

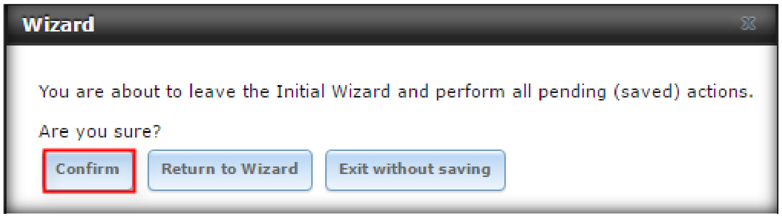
Name
CIFS_A

9. In next window of the wizard, click **Next**


Wizard
Previous
Send Test Mail
Next
Exit

Console messages: ☐
Root E-mail:
From email: root@freenas.local
Outgoing mail server:
Port to connect to: 25
TLS/SSL: Plain
Use SMTP Authentication: ☐
Username:
Password:
Password confirmation:

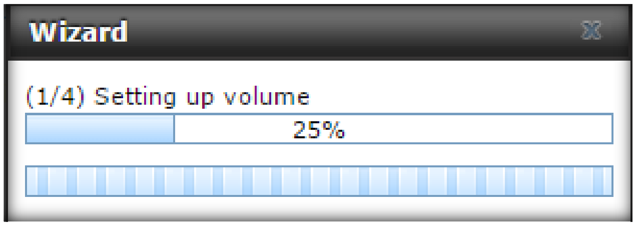
10. In next window, it will ask to save the configuration. Click **Confirm** button


Wizard
Confirm
Return to Wizard
Exit without saving

You are about to leave the Initial Wizard and perform all pending (saved) actions.

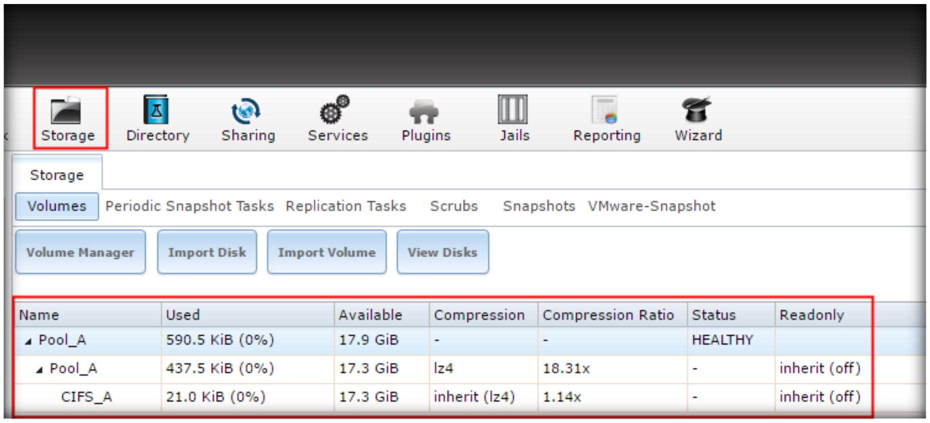
Are you sure?

11. The wizard will set up the volumes for the NAS, this may take 2-5 minutes to finish



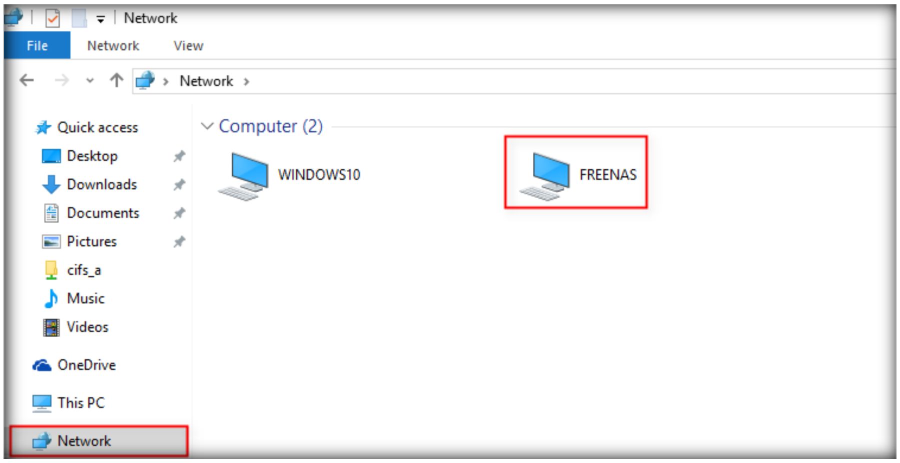
(1/4) Setting up volume

12. To check the created NAS volume, click the **Storage** icon, this will show the volumes available for the NAS

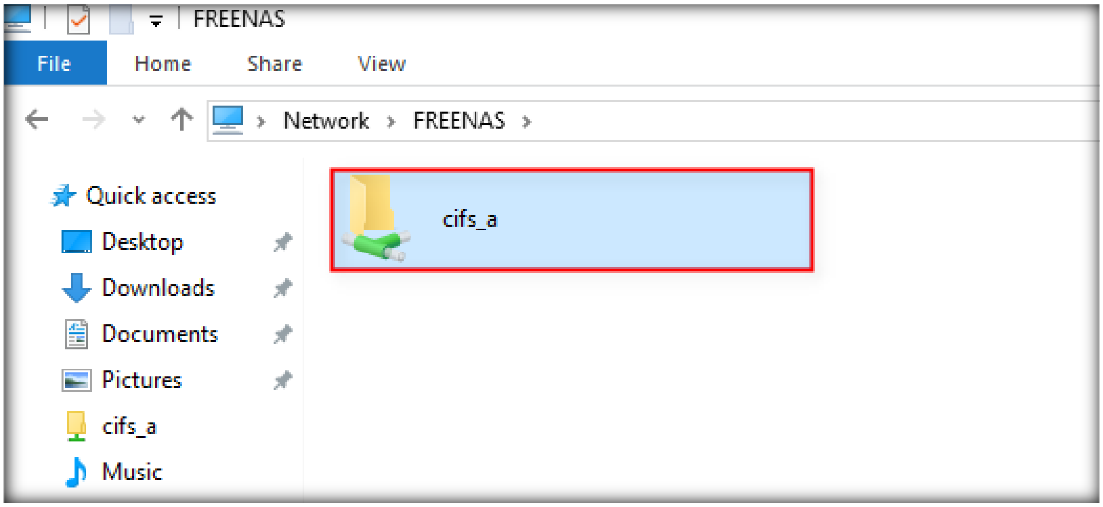

Storage
Directory
Sharing
Services
Plugins
Jails
Reporting
Wizard
Storage
Volumes
Periodic Snapshot Tasks
Replication Tasks
Scrubs
Snapshots
VMware-Snapshot
Volume Manager
Import Disk
Import Volume
View Disks

Name	Used	Available	Compression	Compression Ratio	Status	Readonly
◢ Pool_A	590.5 KiB (0%)	17.9 GiB	-	-	HEALTHY	
◢ Pool_A	437.5 KiB (0%)	17.3 GiB	lz4	18.31x	-	inherit (off)
CIFS_A	21.0 KiB (0%)	17.3 GiB	inherit (lz4)	1.14x	-	inherit (off)

13. Open **Windows Explorer** in any of Guest virtual machine (e.g. Windows 10), and click **Network**, this will show the created NAS as **FREENAS**, as shown in the screenshot
Note: If **FREENAS** does not shows up in the network, you can type: **\\10.10.10.11** on the run command, this will show the **FREENAS** shared folder


Network
File
Network
View
Network ›
Quick access
Desktop
Downloads
Documents
Pictures
cifs_a
Music
Videos
OneDrive
This PC
Network
Computer (2)
WINDOWS10
FREENAS

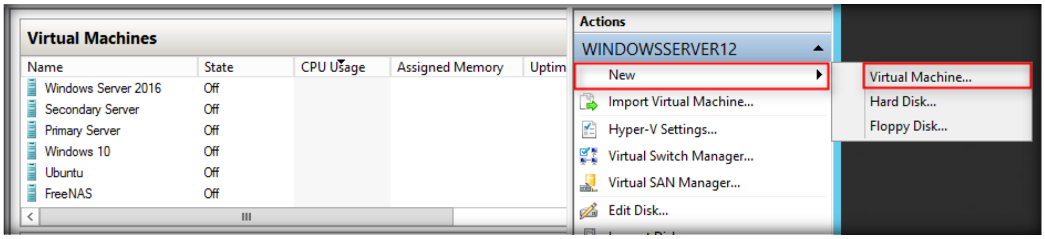
14. **Double-click** the **FREENAS**, this will show the shared folder i.e. **cifs_a**, as shown in the screenshot


FREENAS
File
Home
Share
View
Network › FREENAS ›
Quick access
Desktop
Downloads
Documents
Pictures
cifs_a
Music
cifs_a

CT#10: Installing and Configuring FreeNAS with iSCSI target configuration

CT#10.1: Installing FreeNAS

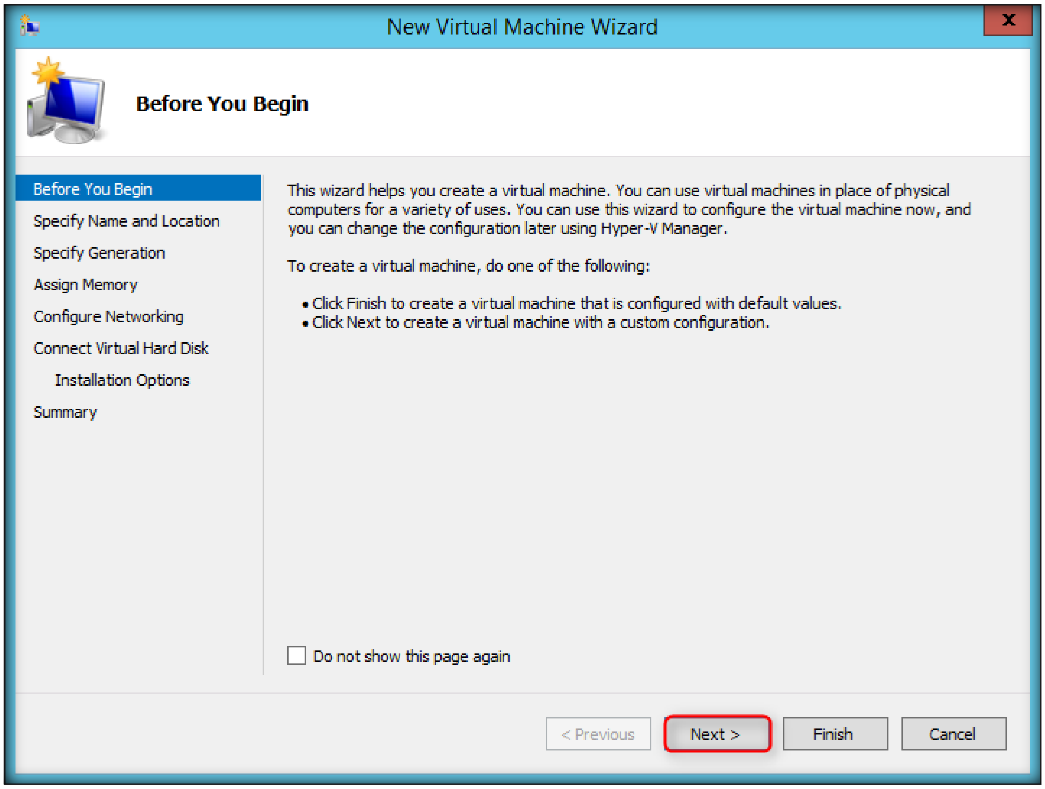
1. Launch Hyper-V Manager.
2. Select your local machine in the left pane, then click **New**, and then click **Virtual Machine...** in the right pane as shown in the screen shot.



Virtual Machines
Actions
WINDOWSSERVER12
New
Import Virtual Machine...
Hyper-V Settings...
Virtual Switch Manager...
Virtual SAN Manager...
Edit Disk...
Virtual Machine...
Hard Disk...
Floppy Disk...

Name	State	CPU Usage	Assigned Memory	Uptim
Windows Server 2016	Off			
Secondary Server	Off			
Primary Server	Off			
Windows 10	Off			
Ubuntu	Off			
FreeNAS	Off			

3. **New Virtual Machine Wizard** window appears, click **Next** button



New Virtual Machine Wizard
Before You Begin
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

This wizard helps you create a virtual machine. You can use virtual machines in place of physical computers for a variety of uses. You can use this wizard to configure the virtual machine now, and you can change the configuration later using Hyper-V Manager.

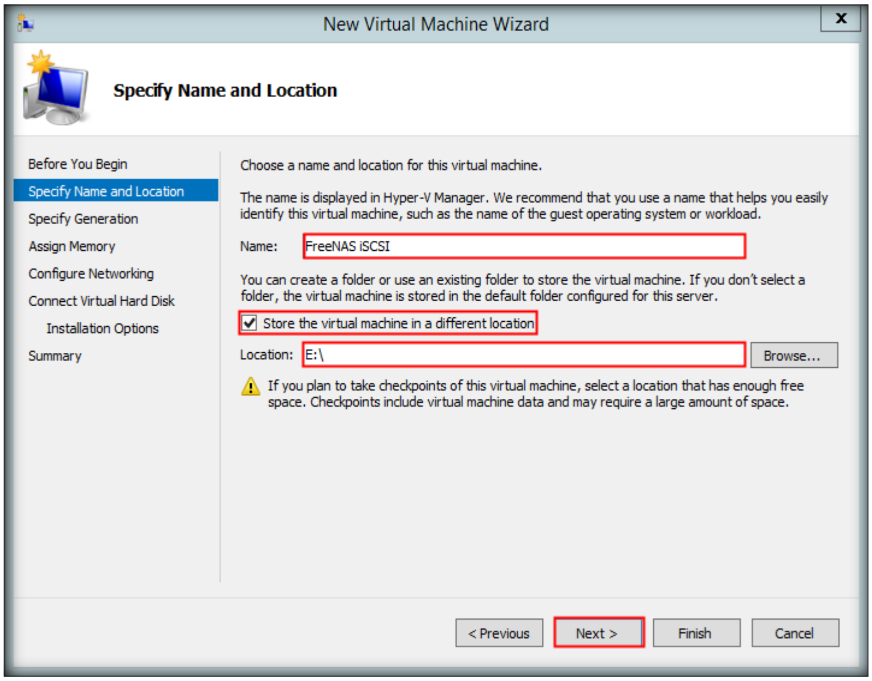
To create a virtual machine, do one of the following:

- Click Finish to create a virtual machine that is configured with default values.
- Click Next to create a virtual machine with a custom configuration.

☐ Do not show this page again

4. Specify **Name** and **location** of new virtual machine. Assign the name of the virtual machine as **FreeNAS iSCSI**. The default location for storing the virtual machine is **C:\ProgramData\Microsoft\Windows\Hyper-V\**. Choose different location to store the VM's i.e. **E:\**. Click **Next**

   Note: You can specify the location either in the **Specify Name and Location** section or in the forthcoming **Connect Virtual Hard Disk** section


New Virtual Machine Wizard
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
Browse...
< Previous
Next >
Finish
Cancel

Specify Name and Location

Choose a name and location for this virtual machine.

The name is displayed in Hyper-V Manager. We recommend that you use a name that helps you easily identify this virtual machine, such as the name of the guest operating system or workload.

Name: FreeNAS iSCSI

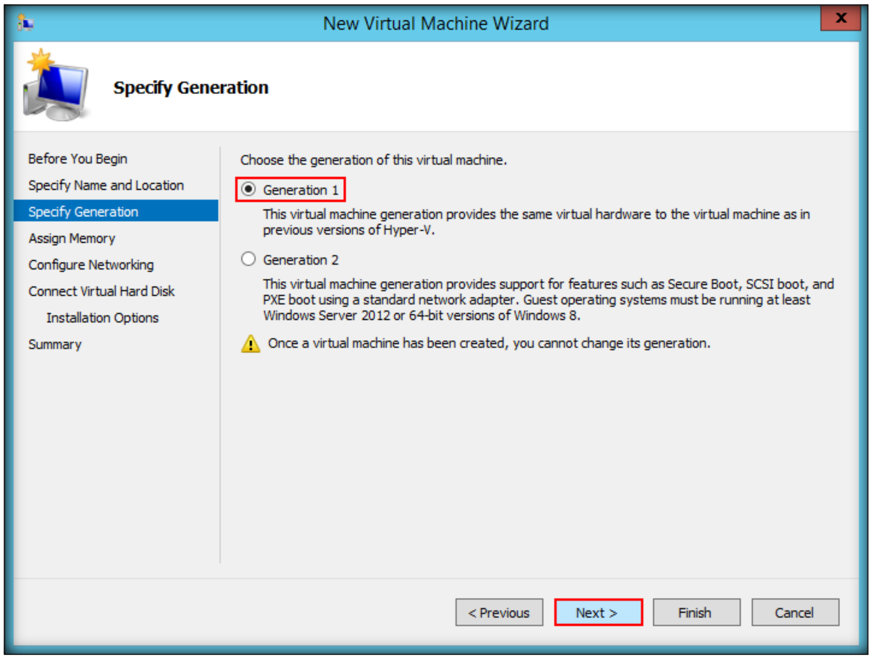
You can create a folder or use an existing folder to store the virtual machine. If you don't select a folder, the virtual machine is stored in the default folder configured for this server.

☑ Store the virtual machine in a different location

Location: E:\

If you plan to take checkpoints of this virtual machine, select a location that has enough free space. Checkpoints include virtual machine data and may require a large amount of space.

5. Choose the generation of the virtual machine (in this scenario, **Generation 1**) and click **Next**


New Virtual Machine Wizard
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

Specify Generation

Choose the generation of this virtual machine.

● Generation 1

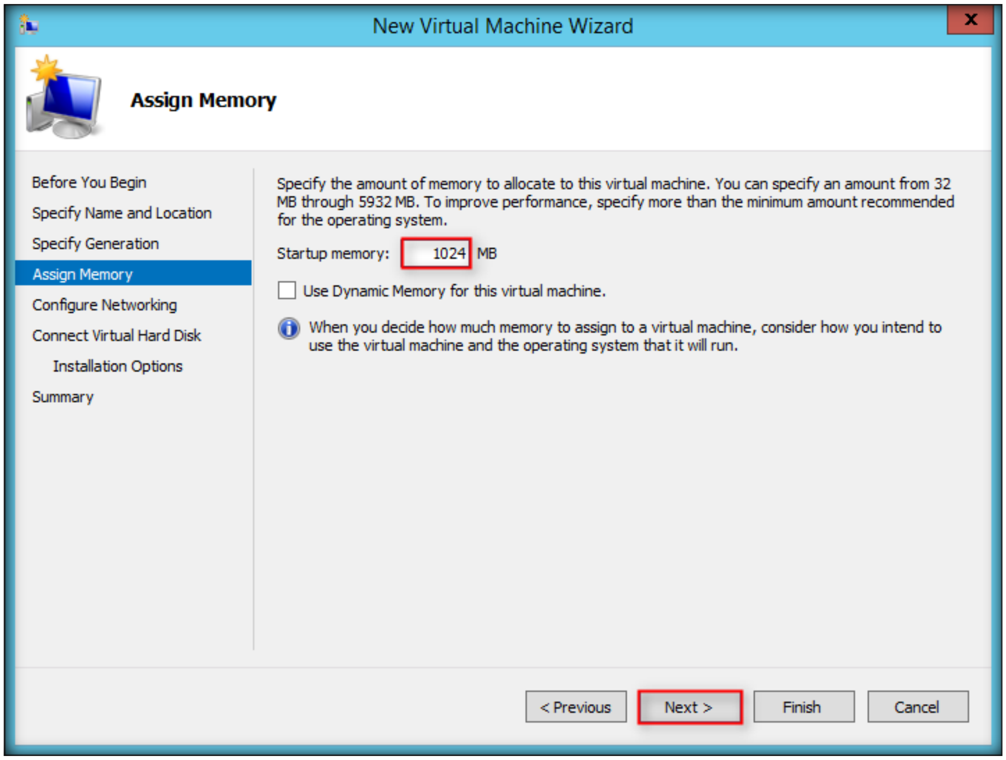
This virtual machine generation provides the same virtual hardware to the virtual machine as in previous versions of Hyper-V.

○ Generation 2

This virtual machine generation provides support for features such as Secure Boot, SCSI boot, and PXE boot using a standard network adapter. Guest operating systems must be running at least Windows Server 2012 or 64-bit versions of Windows 8.

Once a virtual machine has been created, you cannot change its generation.

6. Assign the amount of **Startup memory** to allocate to this virtual machine in MB (here, **1024**) and click **Next**


New Virtual Machine Wizard
Assign Memory
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

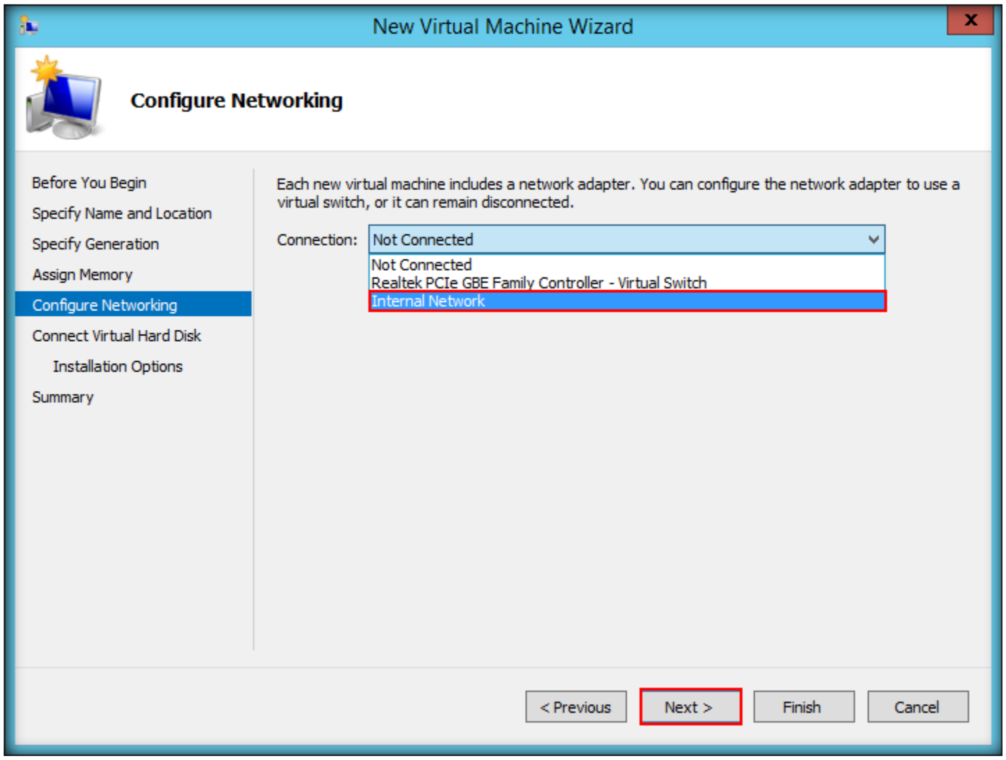
Specify the amount of memory to allocate to this virtual machine. You can specify an amount from 32 MB through 5932 MB. To improve performance, specify more than the minimum amount recommended for the operating system.

Startup memory: 1024 MB

☐ Use Dynamic Memory for this virtual machine.

When you decide how much memory to assign to a virtual machine, consider how you intend to use the virtual machine and the operating system that it will run.

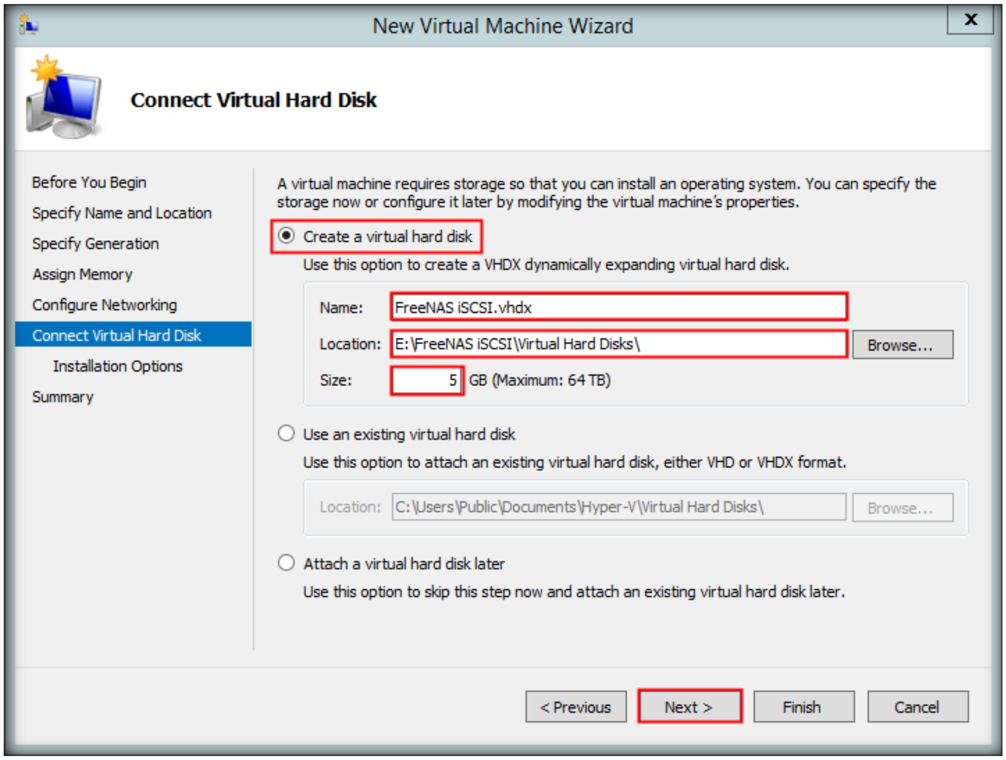
7. In the next step, select **network adapter** as **Internal Network** from connection drop-down list and click **Next**


New Virtual Machine Wizard
Configure Networking
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
Not Connected
Realtek PCIe GBE Family Controller - Virtual Switch
Internal Network
< Previous
Next >
Finish
Cancel

Each new virtual machine includes a network adapter. You can configure the network adapter to use a virtual switch, or it can remain disconnected.

Connection: Not Connected

8. **Connect Virtual Hard Disk** section appears, allocate **5 GB** space for hard disk and click **Next**



New Virtual Machine Wizard

Connect Virtual Hard Disk

Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary

A virtual machine requires storage so that you can install an operating system. You can specify the storage now or configure it later by modifying the virtual machine's properties.

● Create a virtual hard disk

Use this option to create a VHDX dynamically expanding virtual hard disk.

Name: FreeNAS iSCSI.vhdx

Location: E:\FreeNAS iSCSI\Virtual Hard Disks\

Size: 5 GB (Maximum: 64 TB)

○ Use an existing virtual hard disk

Use this option to attach an existing virtual hard disk, either VHD or VHDX format.

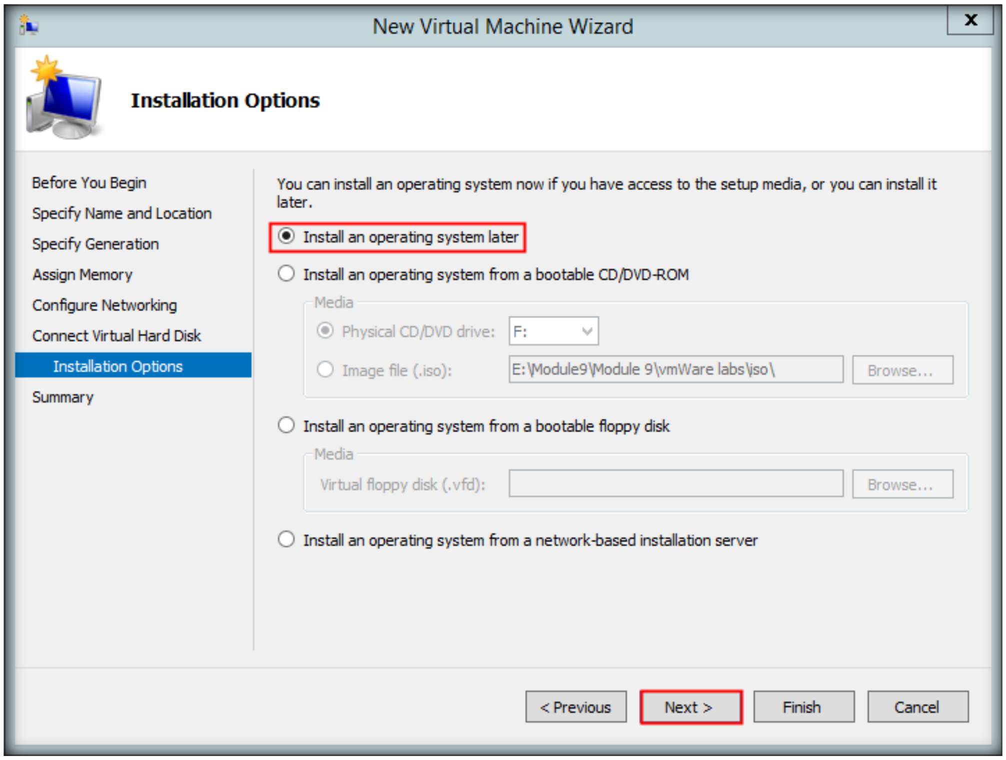
Location: C:\Users\Public\Documents\Hyper-V\Virtual Hard Disks\

○ Attach a virtual hard disk later

Use this option to skip this step now and attach an existing virtual hard disk later.

Browse...
Browse...
< Previous
Next >
Finish
Cancel

9. The **installation options** window appears, select **Install an operating system later** radio button and click **Next**.



New Virtual Machine Wizard

Installation Options

Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary

You can install an operating system now if you have access to the setup media, or you can install it later.

● Install an operating system later

○ Install an operating system from a bootable CD/DVD-ROM

Media

● Physical CD/DVD drive: F:

○ Image file (.iso): E:\Module9\Module 9\vmWare labs\iso\

○ Install an operating system from a bootable floppy disk

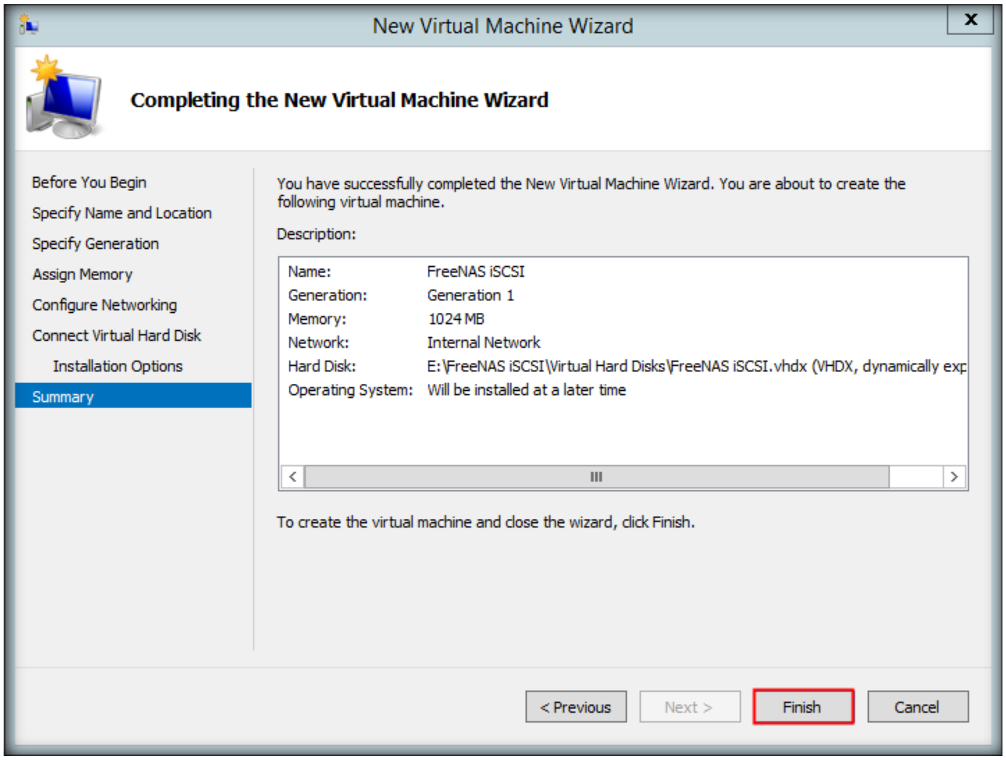
Media

Virtual floppy disk (.vfd):

○ Install an operating system from a network-based installation server

Browse...
Browse...
< Previous
Next >
Finish
Cancel

10. Virtual machine wizard appears with summary information. Click **Finish** to close the wizard


New Virtual Machine Wizard
Before You Begin
Specify Name and Location
Specify Generation
Assign Memory
Configure Networking
Connect Virtual Hard Disk
Installation Options
Summary
< Previous
Next >
Finish
Cancel

Completing the New Virtual Machine Wizard

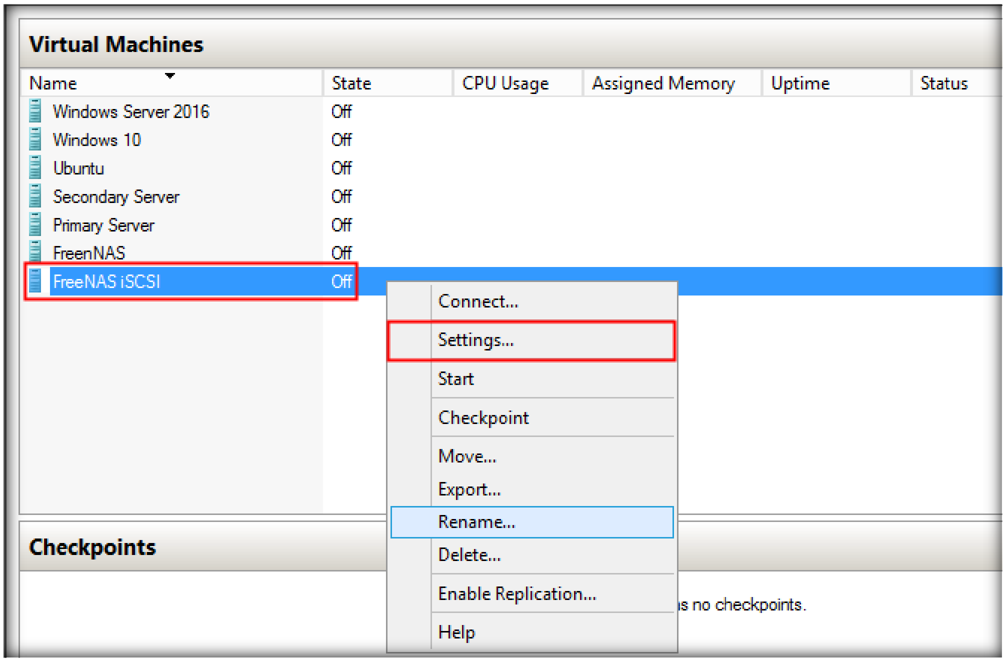
You have successfully completed the New Virtual Machine Wizard. You are about to create the following virtual machine.

Description:

Name: FreeNAS iSCSI
Generation: Generation 1
Memory: 1024 MB
Network: Internal Network
Hard Disk: E:\FreeNAS iSCSI\Virtual Hard Disks\FreeNAS iSCSI.vhdx (VHDX, dynamically exp
Operating System: Will be installed at a later time

To create the virtual machine and close the wizard, click Finish.

11. In Hyper-V Manager window, **right-click** created **FreeNAS iSCSI** virtual machine and click **Settings** from the context menu


Connect...
Settings...
Start
Checkpoint
Move...
Export...
Rename...
Delete...
Enable Replication...
Help

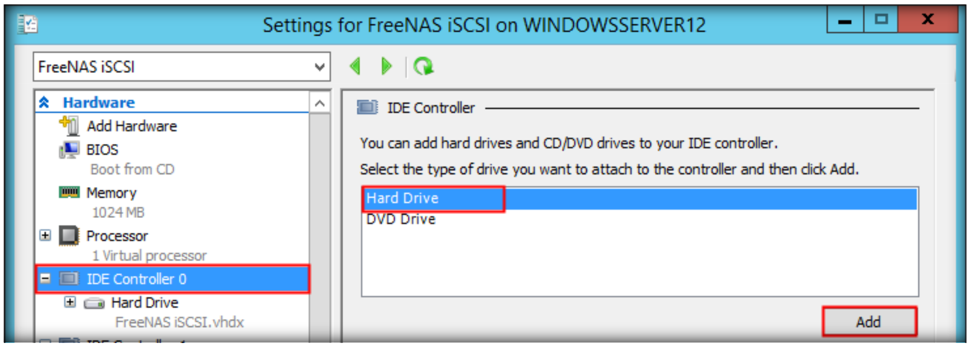
Virtual Machines

Name	State	CPU Usage	Assigned Memory	Uptime	Status
Windows Server 2016	Off				
Windows 10	Off				
Ubuntu	Off				
Secondary Server	Off				
Primary Server	Off				
FreenNAS	Off				
FreeNAS iSCSI	Off				

Checkpoints

s no checkpoints.

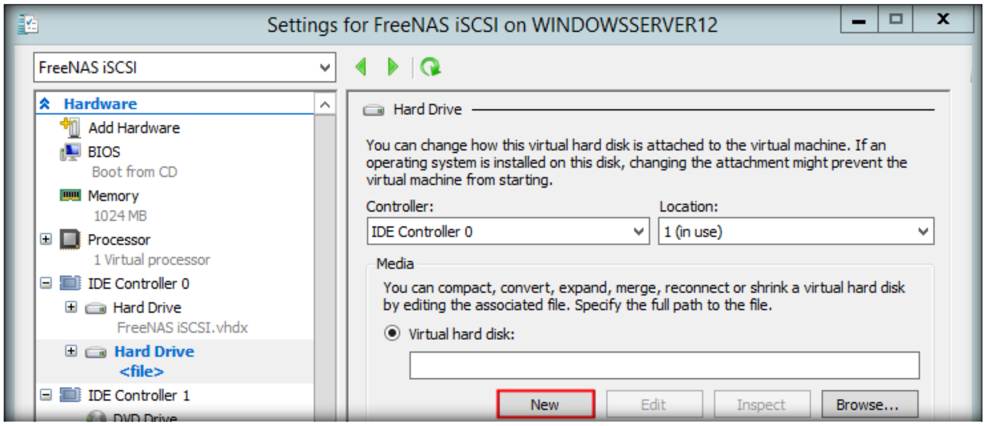
12. **Settings for FreeNAS iSCSI window** appears, click IDE **Controller 0** from the left pane and then click **Hard Drive**. Click **Add**


Settings for FreeNAS iSCSI on WINDOWSSERVER12
FreeNAS iSCSI
Hardware
Add Hardware
BIOS
Boot from CD
Memory
1024 MB
Processor
1 Virtual processor
IDE Controller 0
Hard Drive
FreeNAS iSCSI.vhdx
IDE Controller
Hard Drive
DVD Drive
Add

You can add hard drives and CD/DVD drives to your IDE controller.

Select the type of drive you want to attach to the controller and then click Add.

13. **Hard Drive** option window will appear, click **Virtual hard disk** radio button and click **New.**


Settings for FreeNAS iSCSI on WINDOWSSERVER12
FreeNAS iSCSI
Hardware
Add Hardware
BIOS
Boot from CD
Memory
1024 MB
Processor
1 Virtual processor
IDE Controller 0
Hard Drive
FreeNAS iSCSI.vhdx
Hard Drive
<file>
IDE Controller 1
DVD Drive
Hard Drive
Media
New
Edit
Inspect
Browse...

You can change how this virtual hard disk is attached to the virtual machine. If an operating system is installed on this disk, changing the attachment might prevent the virtual machine from starting.

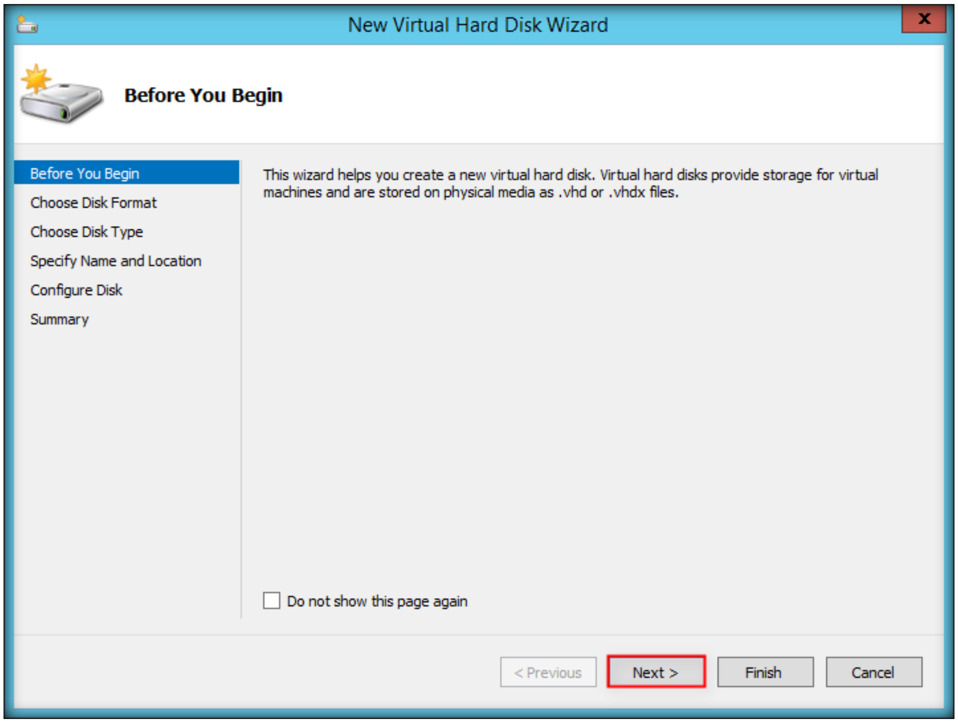
Controller: IDE Controller 0

Location: 1 (in use)

You can compact, convert, expand, merge, reconnect or shrink a virtual hard disk by editing the associated file. Specify the full path to the file.

● Virtual hard disk:

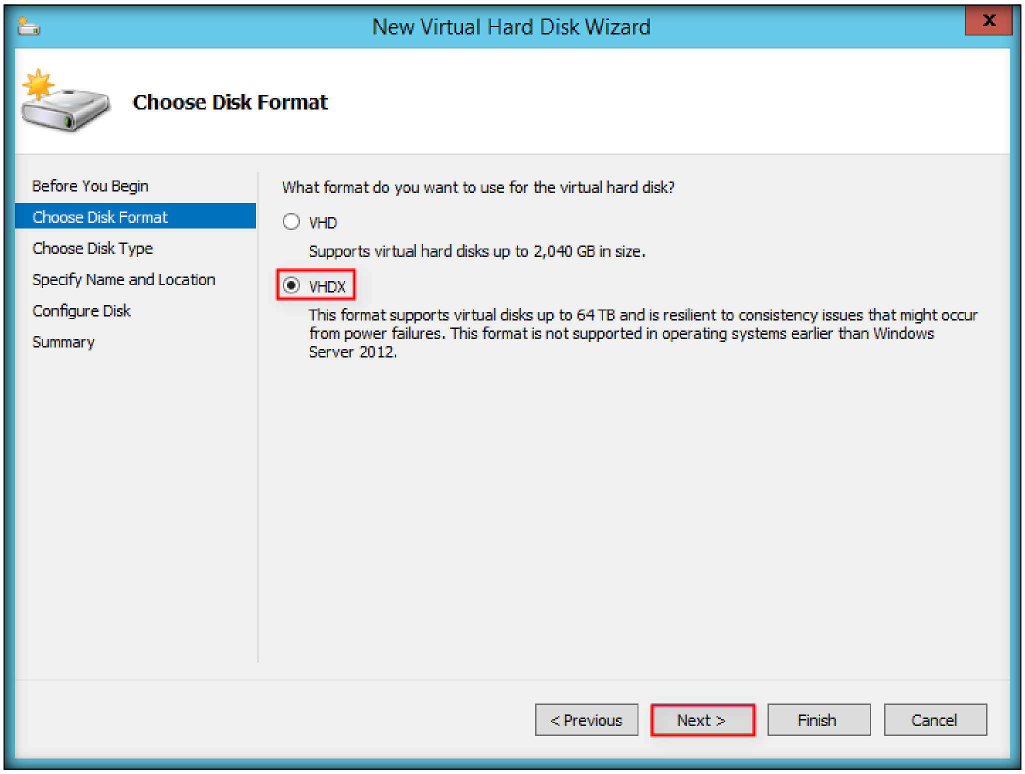
14. A **New Virtual Hard Disk Wizard** window will appear, click **Next**


New Virtual Hard Disk Wizard
Before You Begin
Before You Begin
Choose Disk Format
Choose Disk Type
Specify Name and Location
Configure Disk
Summary
< Previous
Next >
Finish
Cancel

This wizard helps you create a new virtual hard disk. Virtual hard disks provide storage for virtual machines and are stored on physical media as .vhd or .vhdx files.

☐ Do not show this page again

15. **Choose Disk Format** window will appear, select **VHDX** radio button and click **Next**


New Virtual Hard Disk Wizard
Before You Begin
Choose Disk Format
Choose Disk Type
Specify Name and Location
Configure Disk
Summary
< Previous
Next >
Finish
Cancel

Choose Disk Format

What format do you want to use for the virtual hard disk?

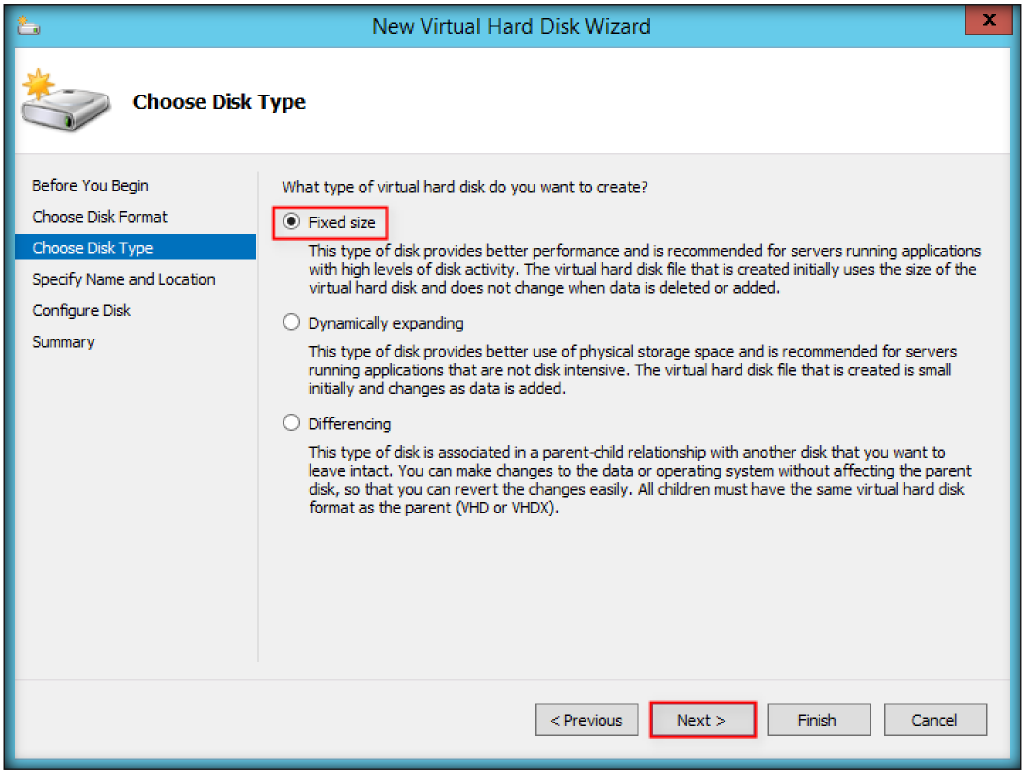
○ VHD

Supports virtual hard disks up to 2,040 GB in size.

● VHDX

This format supports virtual disks up to 64 TB and is resilient to consistency issues that might occur from power failures. This format is not supported in operating systems earlier than Windows Server 2012.

16. **Choose Disk Type** window will appear, select **Fixed size** radio button and click **Next**


New Virtual Hard Disk Wizard
Before You Begin
Choose Disk Format
Choose Disk Type
Specify Name and Location
Configure Disk
Summary
< Previous
Next >
Finish
Cancel

Choose Disk Type

What type of virtual hard disk do you want to create?

● Fixed size

This type of disk provides better performance and is recommended for servers running applications with high levels of disk activity. The virtual hard disk file that is created initially uses the size of the virtual hard disk and does not change when data is deleted or added.

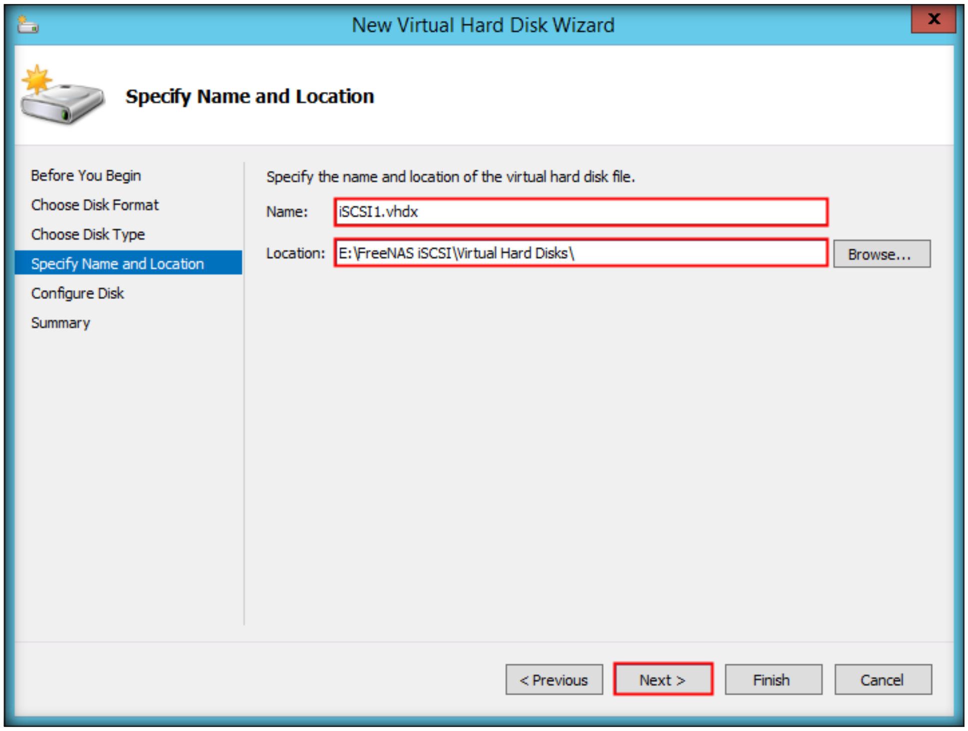
○ Dynamically expanding

This type of disk provides better use of physical storage space and is recommended for servers running applications that are not disk intensive. The virtual hard disk file that is created is small initially and changes as data is added.

○ Differencing

This type of disk is associated in a parent-child relationship with another disk that you want to leave intact. You can make changes to the data or operating system without affecting the parent disk, so that you can revert the changes easily. All children must have the same virtual hard disk format as the parent (VHD or VHDX).

17. In **Specify Name and Location** window, Specify the **Name** and **Location** of the new virtual Hard Disk. In Name field, enter **iSCSI1.vhdx** and select the **Location** to: **E:\FreeNAS iSCSI\Virtual Hard Disks**, Click **Next**

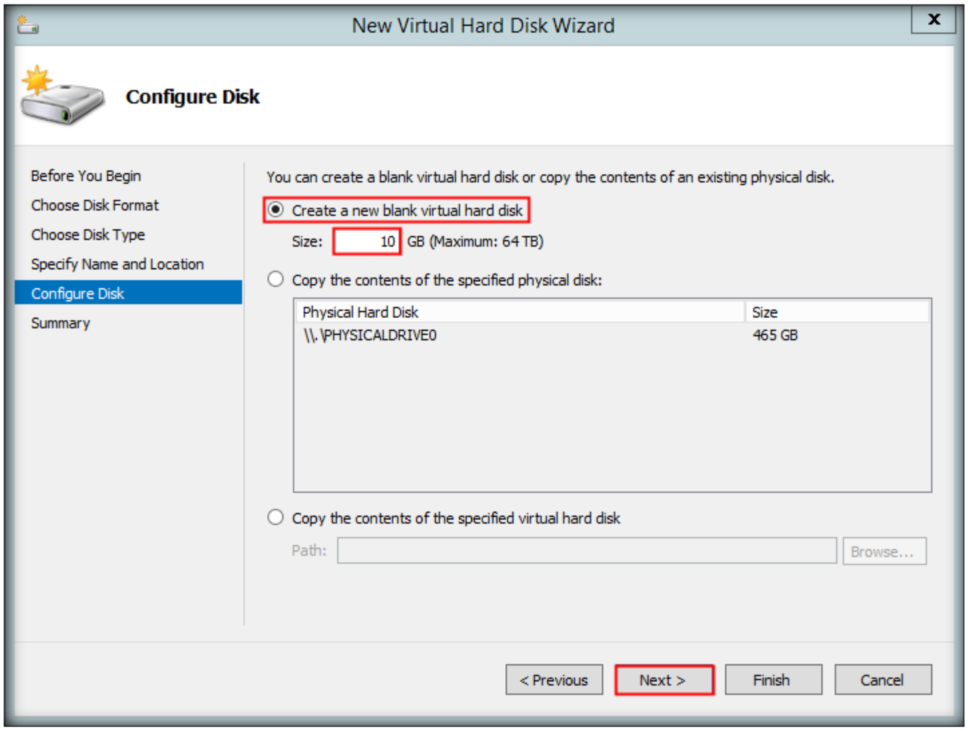

New Virtual Hard Disk Wizard
Specify Name and Location
Before You Begin
Choose Disk Format
Choose Disk Type
Specify Name and Location
Configure Disk
Summary
Browse...
< Previous
Next >
Finish
Cancel

Specify the name and location of the virtual hard disk file.

Name: iSCSI1.vhdx

Location: E:\FreeNAS iSCSI\Virtual Hard Disks\

18. In **Configure Disk** window, specify the size of the virtual hard disk. Click **Create a new blank virtual hard disk** radio button and mention the size as **10** GB. Click **Next**


New Virtual Hard Disk Wizard
Configure Disk
Before You Begin
Choose Disk Format
Choose Disk Type
Specify Name and Location
Configure Disk
Summary
Browse...
< Previous
Next >
Finish
Cancel

You can create a blank virtual hard disk or copy the contents of an existing physical disk.

● Create a new blank virtual hard disk

Size: 10 GB (Maximum: 64 TB)

○ Copy the contents of the specified physical disk:

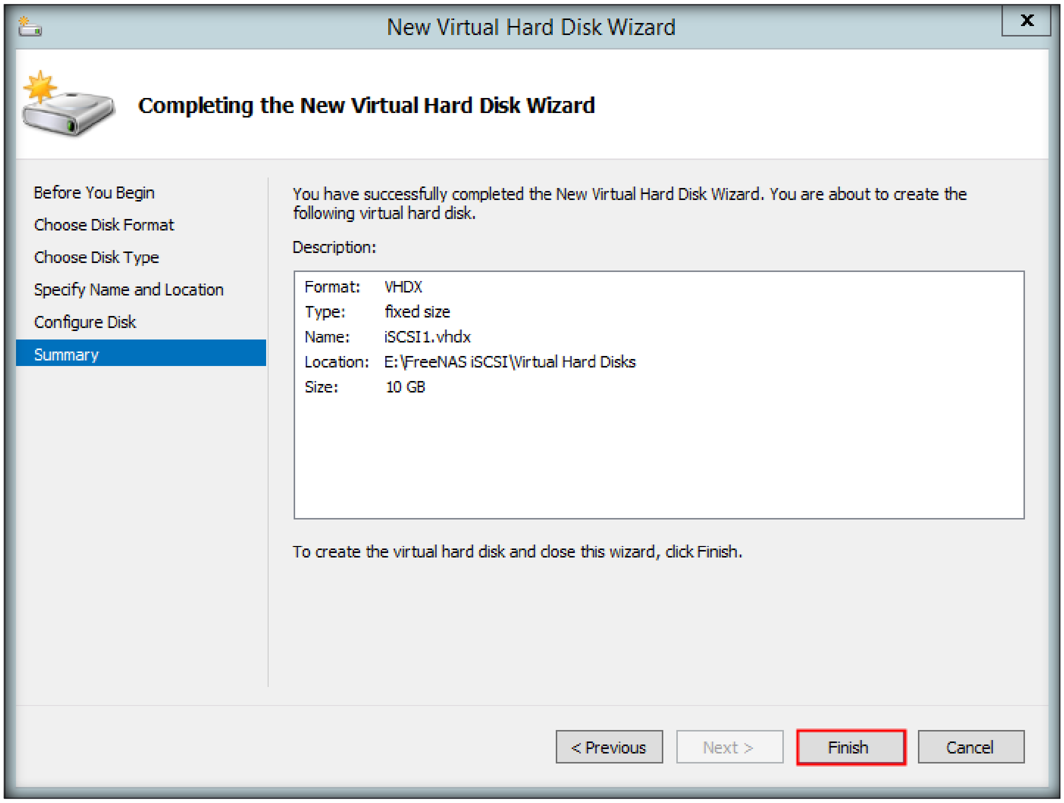
Physical Hard Disk	Size
\\.\PHYSICALDRIVE0	465 GB

○ Copy the contents of the specified virtual hard disk

Path:

19. **Completing the New Virtual Hard Disk Wizard** window will appear, click **Finish**

    Note: After clicking Finish, it may take 5-10 minutes to complete the process


New Virtual Hard Disk Wizard
Completing the New Virtual Hard Disk Wizard
Before You Begin
Choose Disk Format
Choose Disk Type
Specify Name and Location
Configure Disk
Summary
< Previous
Next >
Finish
Cancel

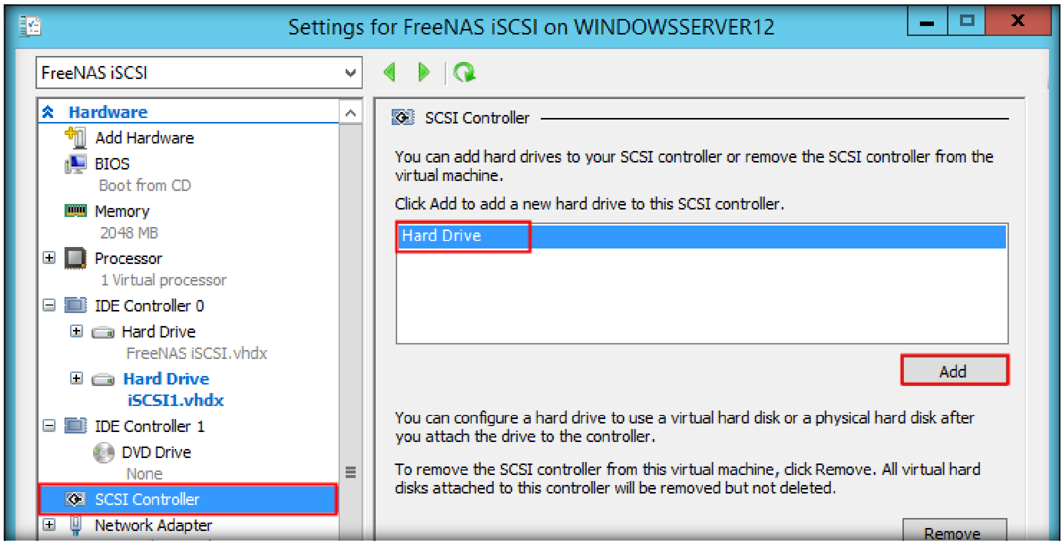
You have successfully completed the New Virtual Hard Disk Wizard. You are about to create the following virtual hard disk.

Description:

Format: VHDX
Type: fixed size
Name: iSCSI1.vhdx
Location: E:\FreeNAS iSCSI\Virtual Hard Disks
Size: 10 GB

To create the virtual hard disk and close this wizard, click Finish.

20. **Settings for FreeNAS iSCSI window** appears again, click **SCSI Controller** from the Hardware pane and then select **Hard Drive**. Click **Add.**


Settings for FreeNAS iSCSI on WINDOWSSERVER12
FreeNAS iSCSI
Hardware
Add Hardware
BIOS
Boot from CD
Memory
2048 MB
Processor
1 Virtual processor
IDE Controller 0
Hard Drive
FreeNAS iSCSI.vhdx
Hard Drive
iSCSI1.vhdx
IDE Controller 1
DVD Drive
None
SCSI Controller
Network Adapter
SCSI Controller
Hard Drive
Add
Remove

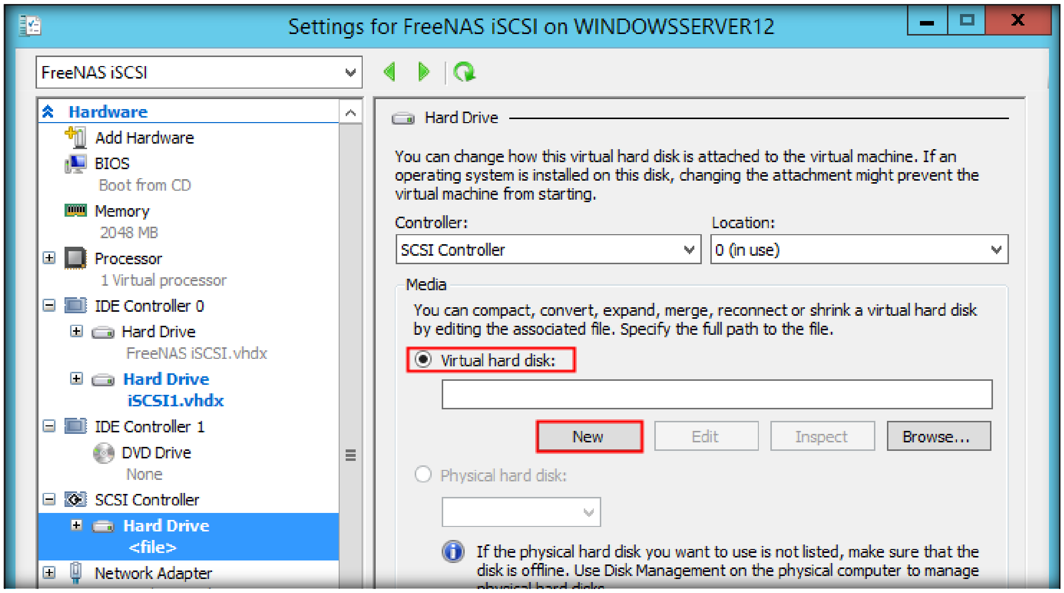
You can add hard drives to your SCSI controller or remove the SCSI controller from the virtual machine.

Click Add to add a new hard drive to this SCSI controller.

You can configure a hard drive to use a virtual hard disk or a physical hard disk after you attach the drive to the controller.

To remove the SCSI controller from this virtual machine, click Remove. All virtual hard disks attached to this controller will be removed but not deleted.

21. Hard Drive option window will appear, in left pane click **Virtual hard disk** radio button and click **New.**


Settings for FreeNAS iSCSI on WINDOWSSERVER12
FreeNAS iSCSI
Hardware
Add Hardware
BIOS
Boot from CD
Memory
2048 MB
Processor
1 Virtual processor
IDE Controller 0
Hard Drive
FreeNAS iSCSI.vhdx
Hard Drive
iSCSI1.vhdx
IDE Controller 1
DVD Drive
None
SCSI Controller
Hard Drive
<file>
Network Adapter
Hard Drive
Media
New
Edit
Inspect
Browse...
○ Physical hard disk:

You can change how this virtual hard disk is attached to the virtual machine. If an operating system is installed on this disk, changing the attachment might prevent the virtual machine from starting.

Controller: SCSI Controller

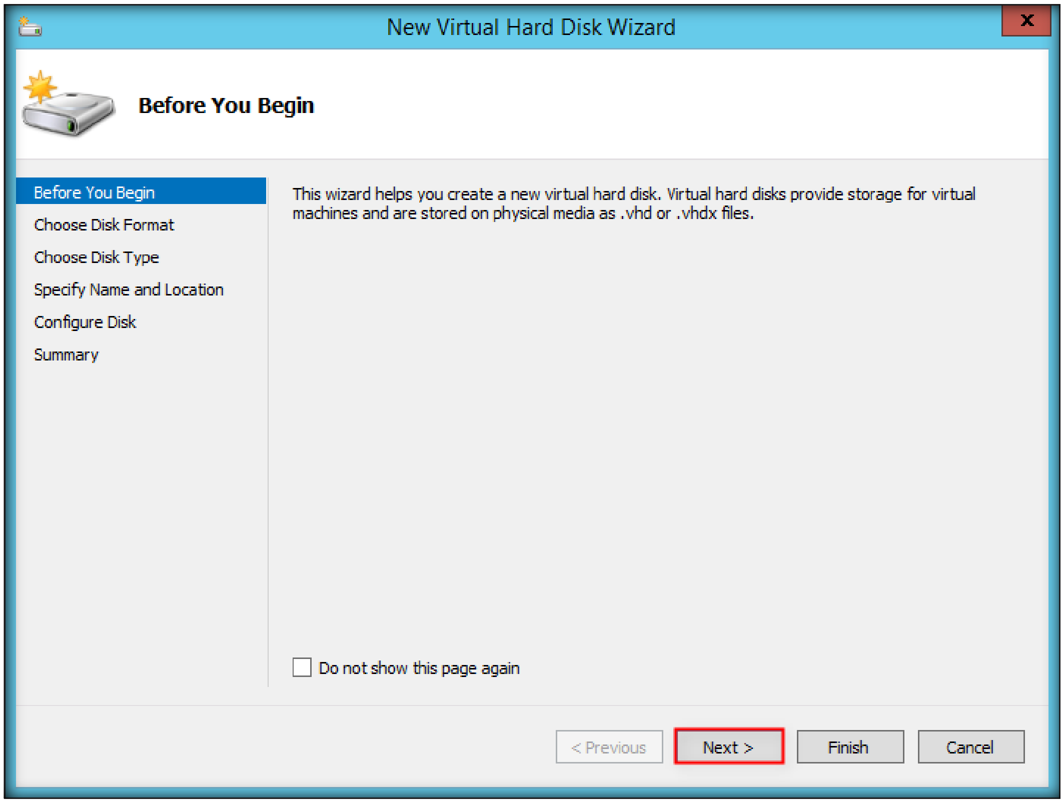
Location: 0 (in use)

You can compact, convert, expand, merge, reconnect or shrink a virtual hard disk by editing the associated file. Specify the full path to the file.

● Virtual hard disk:

If the physical hard disk you want to use is not listed, make sure that the disk is offline. Use Disk Management on the physical computer to manage

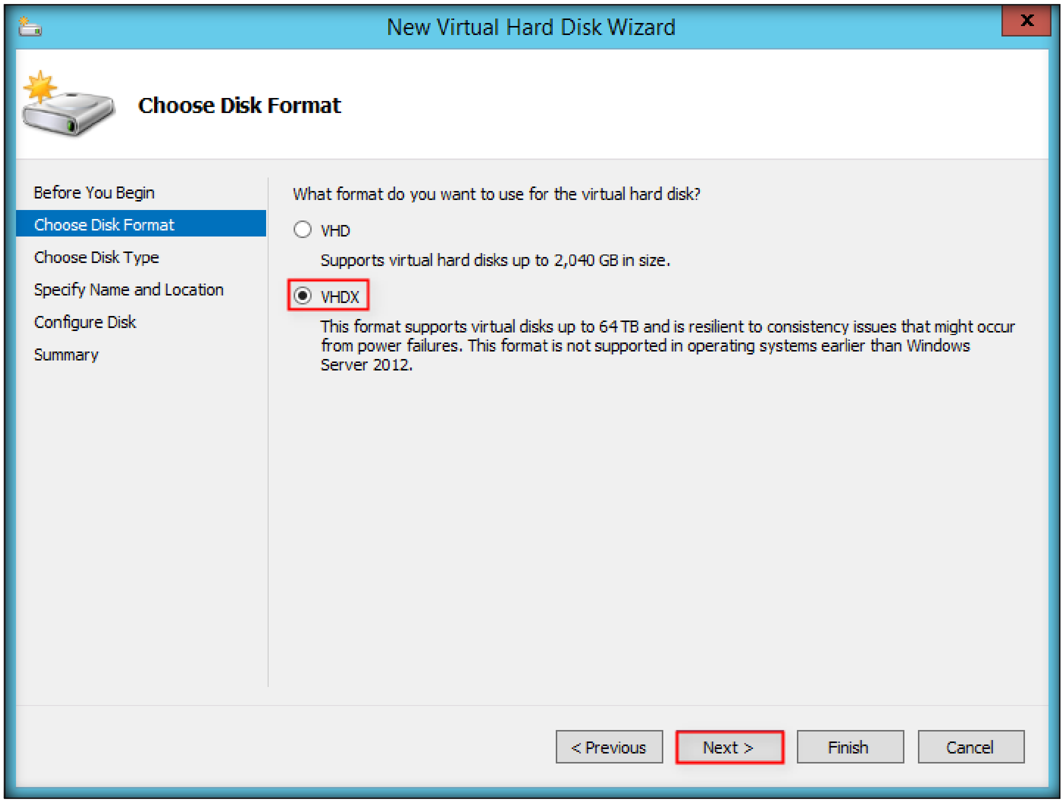
22. A **New Virtual Hard Disk Wizard** window will appear, click **Next**


New Virtual Hard Disk Wizard
Before You Begin
Before You Begin
Choose Disk Format
Choose Disk Type
Specify Name and Location
Configure Disk
Summary
< Previous
Next >
Finish
Cancel

This wizard helps you create a new virtual hard disk. Virtual hard disks provide storage for virtual machines and are stored on physical media as .vhd or .vhdx files.

☐ Do not show this page again

23. **Choose Disk Format** window will appear, select **VHDX** radio button and click **Next**


New Virtual Hard Disk Wizard
Choose Disk Format
Before You Begin
Choose Disk Format
Choose Disk Type
Specify Name and Location
Configure Disk
Summary
< Previous
Next >
Finish
Cancel

What format do you want to use for the virtual hard disk?

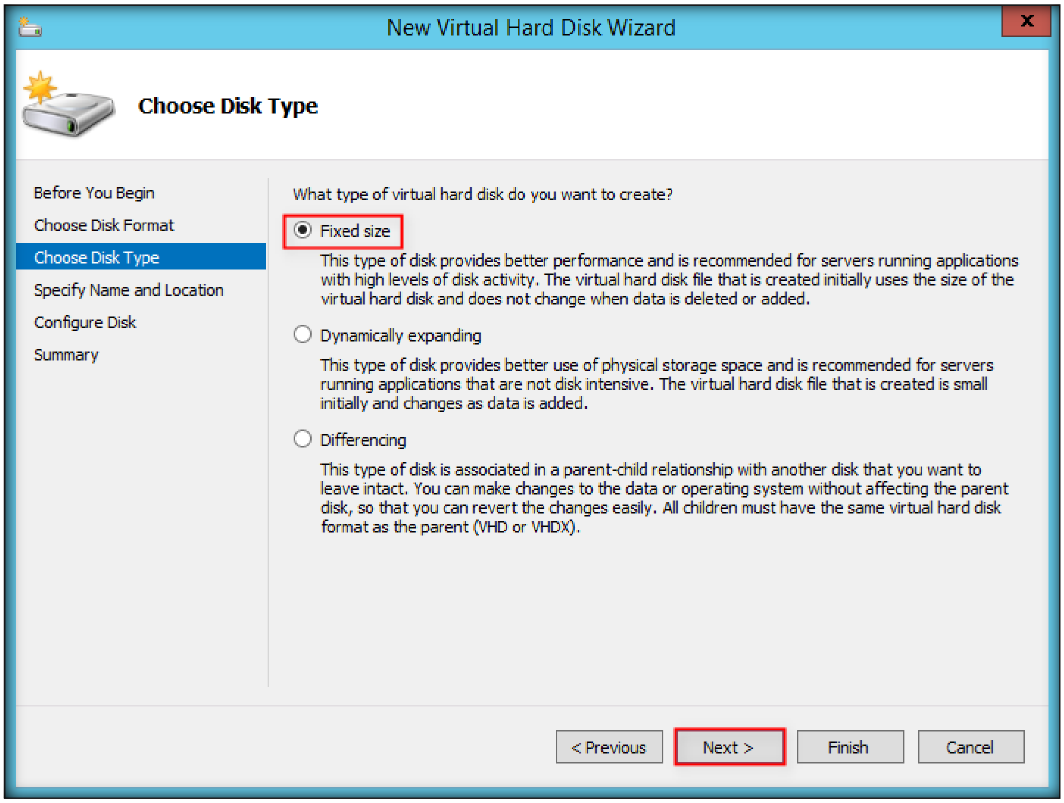
○ VHD

Supports virtual hard disks up to 2,040 GB in size.

● VHDX

This format supports virtual disks up to 64 TB and is resilient to consistency issues that might occur from power failures. This format is not supported in operating systems earlier than Windows Server 2012.

24. **Choose Disk Type** window will appear, select **Fixed size** radio button and click **Next**


New Virtual Hard Disk Wizard
Choose Disk Type
Before You Begin
Choose Disk Format
Choose Disk Type
Specify Name and Location
Configure Disk
Summary
< Previous
Next >
Finish
Cancel

What type of virtual hard disk do you want to create?

● Fixed size

This type of disk provides better performance and is recommended for servers running applications with high levels of disk activity. The virtual hard disk file that is created initially uses the size of the virtual hard disk and does not change when data is deleted or added.

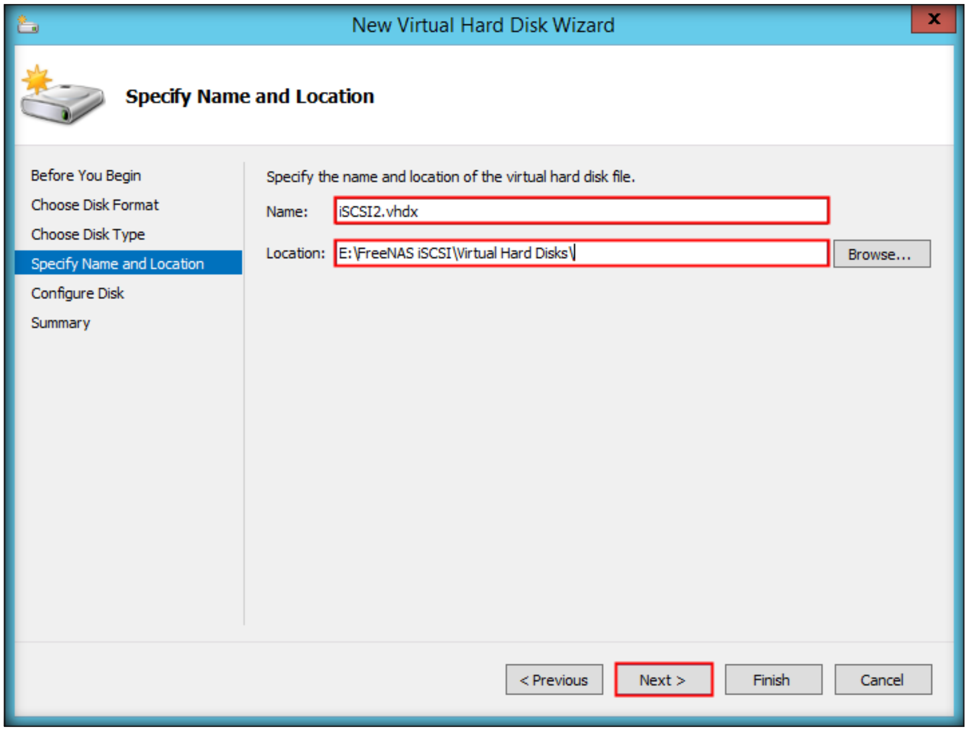
○ Dynamically expanding

This type of disk provides better use of physical storage space and is recommended for servers running applications that are not disk intensive. The virtual hard disk file that is created is small initially and changes as data is added.

○ Differencing

This type of disk is associated in a parent-child relationship with another disk that you want to leave intact. You can make changes to the data or operating system without affecting the parent disk, so that you can revert the changes easily. All children must have the same virtual hard disk format as the parent (VHD or VHDX).

25. In **Specify Name and Location** window, Specify the **Name** and **Location** of the new virtual Hard Disk. In Name field, enter **iSCSI2.vhdx** and select the Location to: **E:\FreeNAS iSCSI\Virtual Hard Disks**, Click **Next**

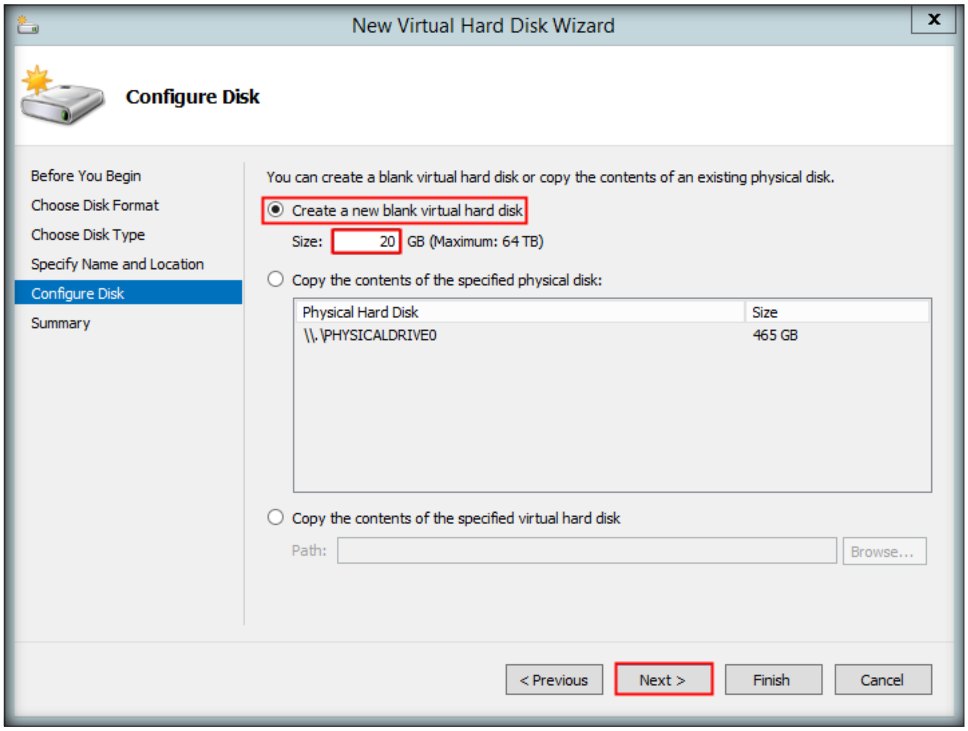

New Virtual Hard Disk Wizard
Specify Name and Location
Before You Begin
Choose Disk Format
Choose Disk Type
Specify Name and Location
Configure Disk
Summary
Browse...
< Previous
Next >
Finish
Cancel

Specify the name and location of the virtual hard disk file.

Name: iSCSI2.vhdx

Location: E:\FreeNAS iSCSI\Virtual Hard Disks\

26. In **Configure Disk** window, specify the size of the virtual hard disk. Click **Create a new blank virtual hard disk** radio button and fill the **Size** as **20** GB. Click **Next**


New Virtual Hard Disk Wizard
Configure Disk
Before You Begin
Choose Disk Format
Choose Disk Type
Specify Name and Location
Configure Disk
Summary
Browse...
< Previous
Next >
Finish
Cancel

You can create a blank virtual hard disk or copy the contents of an existing physical disk.

● Create a new blank virtual hard disk

Size: 20 GB (Maximum: 64 TB)

○ Copy the contents of the specified physical disk:

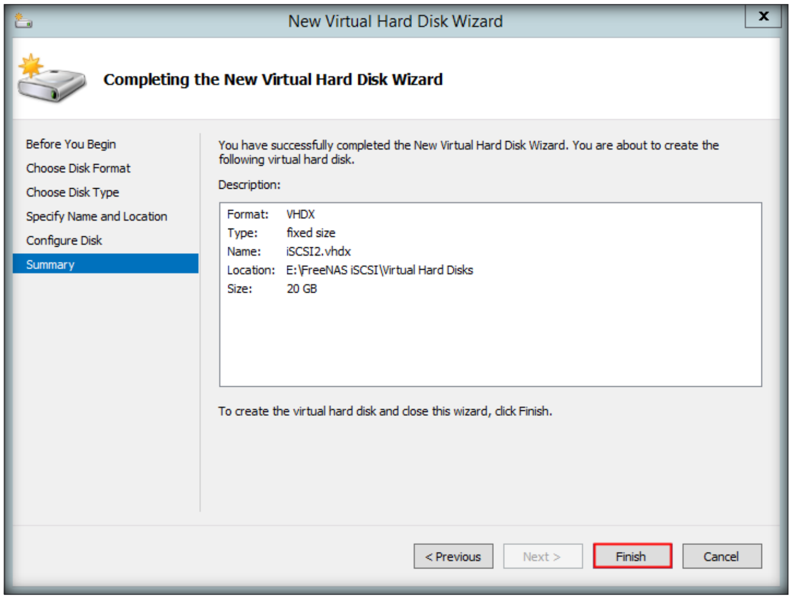
Physical Hard Disk	Size
\\.\PHYSICALDRIVE0	465 GB

○ Copy the contents of the specified virtual hard disk

Path:

27. **Completing the New Virtual Hard Disk Wizard** window will appear, click **Finish**

    Note: After clicking Finish, it may take 5-10 minutes to complete the process



New Virtual Hard Disk Wizard

Completing the New Virtual Hard Disk Wizard

You have successfully completed the New Virtual Hard Disk Wizard. You are about to create the following virtual hard disk.

Description:

Format: VHDX
Type: fixed size
Name: iSCSI2.vhdx
Location: E:\FreeNAS iSCSI\Virtual Hard Disks
Size: 20 GB

To create the virtual hard disk and close this wizard, click Finish.

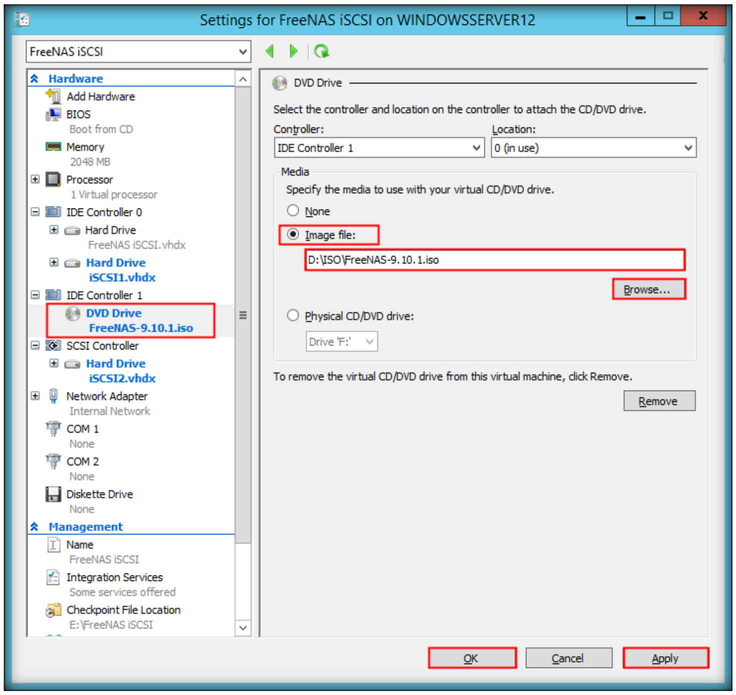
Before You Begin
Choose Disk Format
Choose Disk Type
Specify Name and Location
Configure Disk
Summary
< Previous
Next >
Finish
Cancel

28. Again in the settings window of **FreeNAS iSCSI** will appear, click **DVD Drive** to install the FreeNAS iSCSI virtual machine

    a. If you have an FreeNAS DVD, choose Physical **CD/DVD drive:** radio button and then click **Next**

    b. If you have an FreeNAS ISO file, then choose **Image file:** radio button and click **Browse...** button to provide the path of ISO.

    Click **Apply** and then **OK**



Settings for FreeNAS iSCSI on WINDOWSSERVER12

DVD Drive

Select the controller and location on the controller to attach the CD/DVD drive.

Controller: IDE Controller 1

Location: 0 (in use)

Media

Specify the media to use with your virtual CD/DVD drive.

○ None

● Image file:

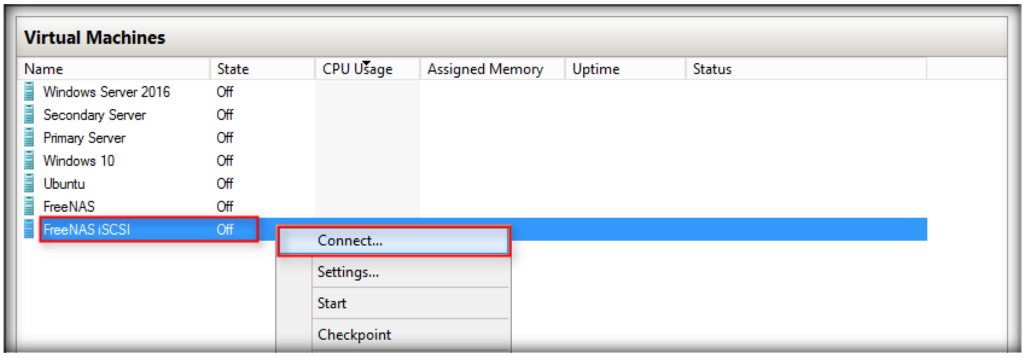
D:\ISO\FreeNAS-9.10.1.iso

○ Physical CD/DVD drive: Drive 'F:'

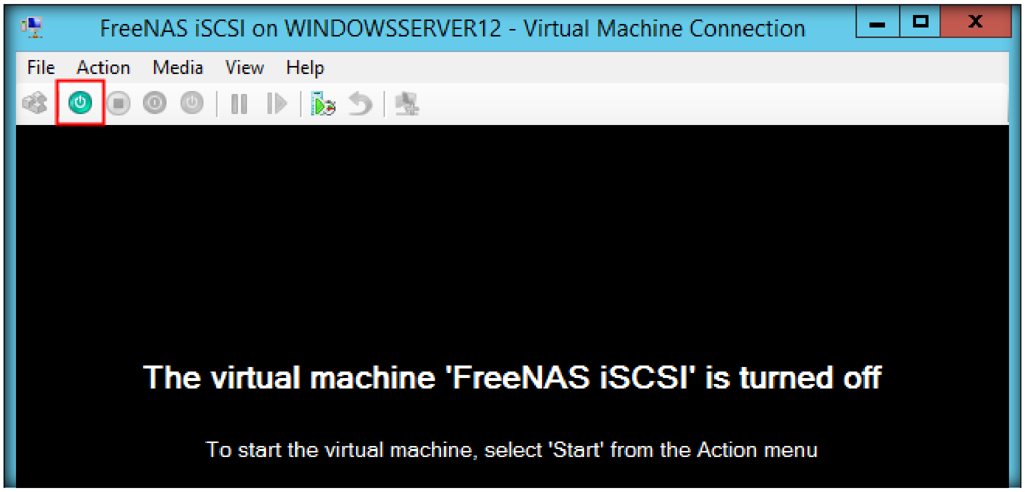
To remove the virtual CD/DVD drive from this virtual machine, click Remove.

FreeNAS iSCSI
Hardware
Add Hardware
BIOS
Boot from CD
Memory
2048 MB
Processor
1 Virtual processor
IDE Controller 0
Hard Drive
FreeNAS iSCSI.vhdx
Hard Drive
iSCSI1.vhdx
IDE Controller 1
DVD Drive
FreeNAS-9.10.1.iso
SCSI Controller
Hard Drive
iSCSI2.vhdx
Network Adapter
Internal Network
COM 1
None
COM 2
None
Diskette Drive
None
Management
Name
FreeNAS iSCSI
Integration Services
Some services offered
Checkpoint File Location
E:\FreeNAS iSCSI
Browse...
Remove
OK
Cancel
Apply

29. Navigate to Hyper-V manager. **Right-click** the **FreeNAS iSCSI** virtual machine and select **Connect**.


Virtual Machines
Name
State
CPU Usage
Assigned Memory
Uptime
Status
Windows Server 2016
Off
Secondary Server
Off
Primary Server
Off
Windows 10
Off
Ubuntu
Off
FreeNAS
Off
FreeNAS iSCSI
Off
Connect...
Settings...
Start
Checkpoint

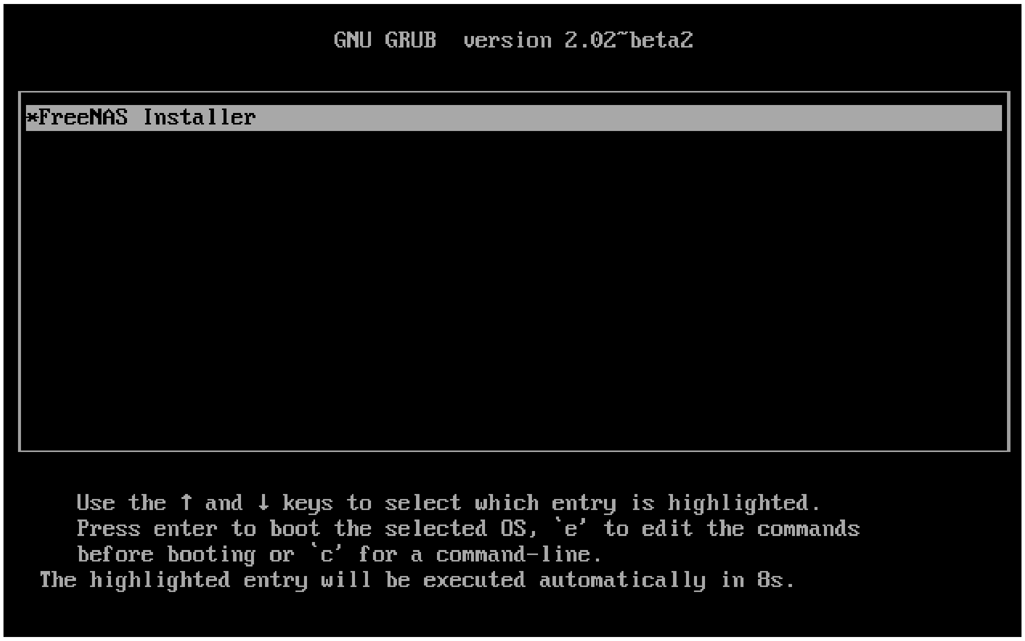
30. **FreeNAS iSCSI** window appears. Click **Start** button as shown in the screenshot.


FreeNAS iSCSI on WINDOWSSERVER12 - Virtual Machine Connection
File
Action
Media
View
Help

The virtual machine 'FreeNAS iSCSI' is turned off

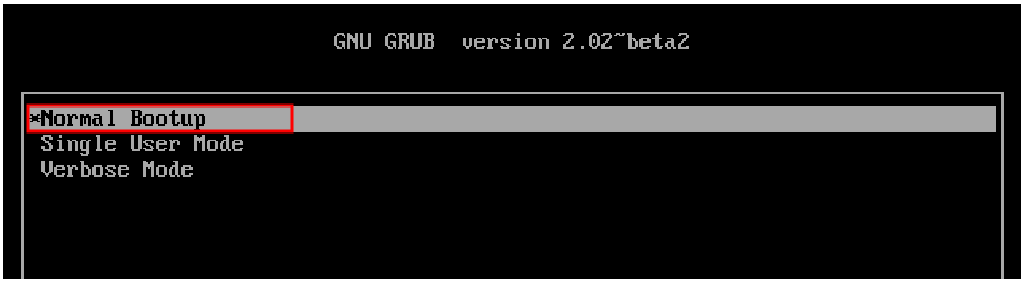
To start the virtual machine, select 'Start' from the Action menu

31. FreeNAS boots, press **Enter** or wait for 15 seconds to continue the installation of FreeNAS.

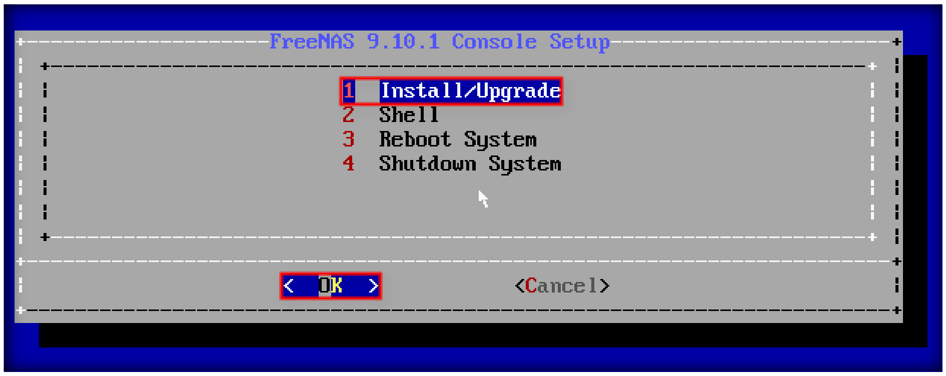


```
                 GNU GRUB  version 2.02~beta2

*FreeNAS Installer

    Use the ↑ and ↓ keys to select which entry is highlighted.
    Press enter to boot the selected OS, `e' to edit the commands
    before booting or `c' for a command-line.
 The highlighted entry will be executed automatically in 8s.
```

32. In next window, highlight the **Normal Bootup** option and press **enter.**

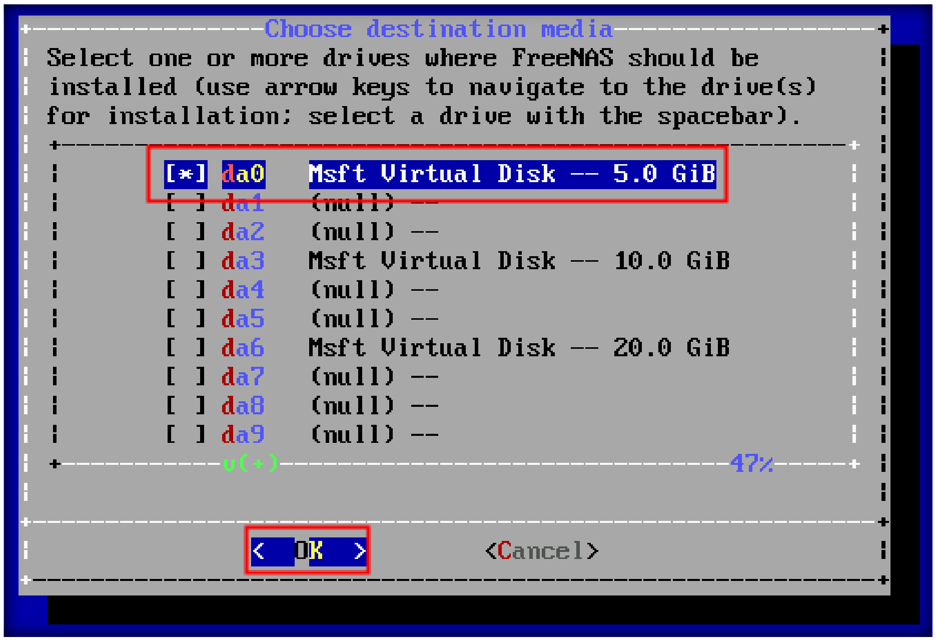

GNU GRUB version 2.02~beta2
*Normal Bootup
Single User Mode
Verbose Mode

33. After initial installation process, a **Console Setup** window will appear. Select **Install/Upgrade** option by the help of arrow keys and press **Enter.**


FreeNAS 9.10.1 Console Setup
1 Install/Upgrade
2 Shell
3 Reboot System
4 Shutdown System
< OK >
<Cancel>

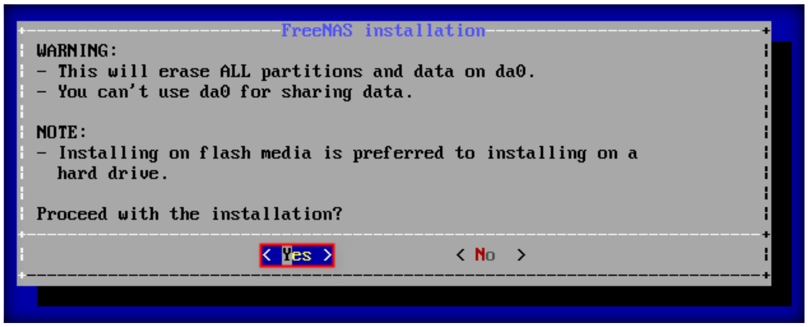
34. **Choose destination media** window will appear, Select the virtual hard disk **da0** having **5 GB** of storage.

Note: For selection of the virtual hard disk hard disk, use **spacebar**. For installation, we generally select the virtual hard disk of low storage capacity. In this case we will select the **5 GB** virtual hard disk.



```
Choose destination media
Select one or more drives where FreeNAS should be
installed (use arrow keys to navigate to the drive(s)
for installation; select a drive with the spacebar).

[*] da0   Msft Virtual Disk -- 5.0 GiB
[ ] da1   (null) --
[ ] da2   (null) --
[ ] da3   Msft Virtual Disk -- 10.0 GiB
[ ] da4   (null) --
[ ] da5   (null) --
[ ] da6   Msft Virtual Disk -- 20.0 GiB
[ ] da7   (null) --
[ ] da8   (null) --
[ ] da9   (null) --
        v(+)                          47%

< OK >          <Cancel>
```

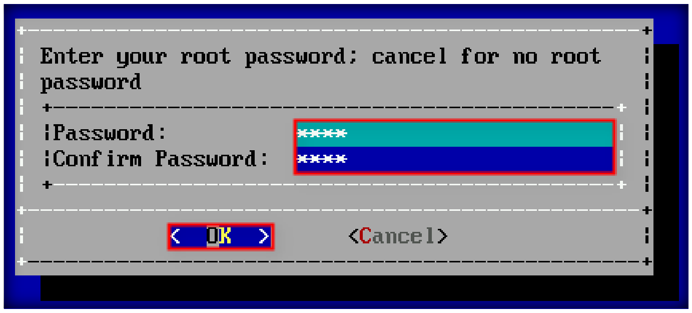
35. FreeNAS installation warning window will appear, select **Yes** and press **Enter.**



```
WARNING:
- This will erase ALL partitions and data on da0.
- You can't use da0 for sharing data.

NOTE:
- Installing on flash media is preferred to installing on a
  hard drive.

Proceed with the installation?
```

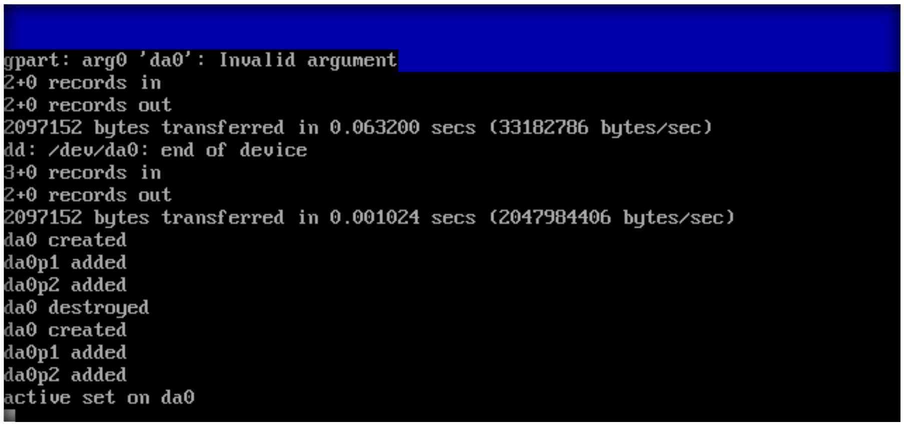
36. In next window, it will ask to setup the **root password**. Use **toor** as the password. Select **OK** and press **Enter.**

Note: This password will used as the administrative password for the further installation of the FreeNAS iSCSI. And default user name is **root.**



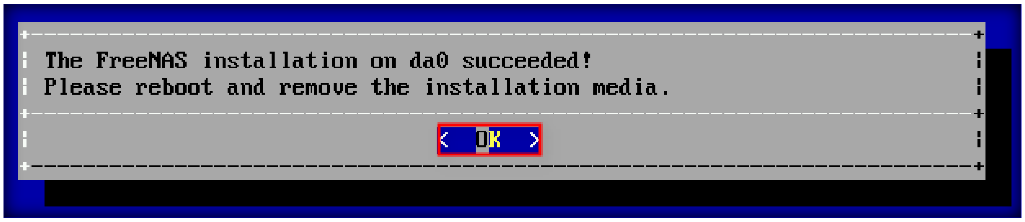
```
Enter your root password; cancel for no root
password
Password:          ****
Confirm Password:  ****
```

37. The installation process will continue. This may take few minutes to complete this process.



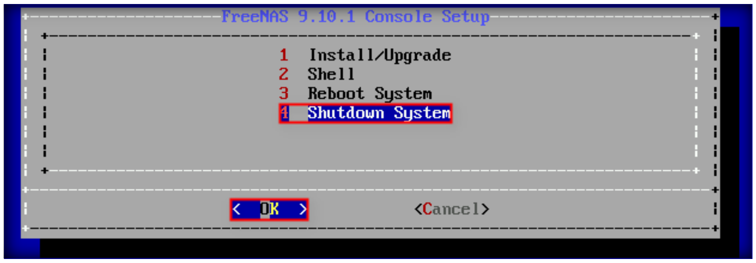
```
gpart: arg0 'da0': Invalid argument
2+0 records in
2+0 records out
2097152 bytes transferred in 0.063200 secs (33182786 bytes/sec)
dd: /dev/da0: end of device
3+0 records in
2+0 records out
2097152 bytes transferred in 0.001024 secs (2047984406 bytes/sec)
da0 created
da0p1 added
da0p2 added
da0 destroyed
da0 created
da0p1 added
da0p2 added
active set on da0
```

38. A notification window will appear asking for reboot. **OK** is highlighted, press **Enter** to proceed.



```
The FreeNAS installation on da0 succeeded!
Please reboot and remove the installation media.
```

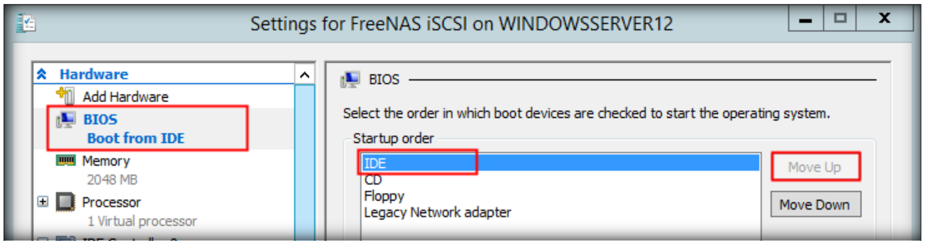
39. **Console Setup** window will appear. Select the **Shutdown System** option and press **OK**. The FreeNAS virtual machine will shut down.



FreeNAS 9.10.1 Console Setup
1 Install/Upgrade
2 Shell
3 Reboot System
4 Shutdown System
< OK >
<Cancel>

40. Again navigate to the **Settings** window of the **FreeNAS iSCSI** virtual machine.

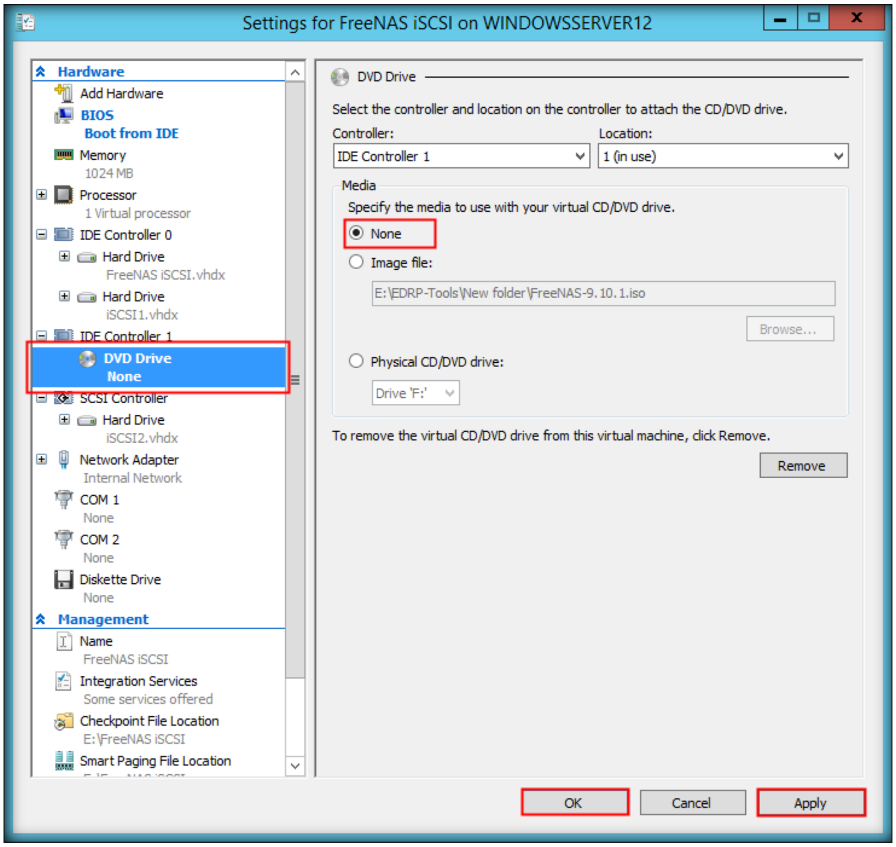
41. In settings, click **BIOS**. Change the Startup order by moving **IDE** to top using **Move Up** button.



Settings for FreeNAS iSCSI on WINDOWSSERVER12
Hardware
Add Hardware
BIOS
Boot from IDE
Memory
2048 MB
Processor
1 Virtual processor
BIOS
Startup order
IDE
CD
Floppy
Legacy Network adapter
Move Up
Move Down

Select the order in which boot devices are checked to start the operating system.

42. In same setting window, click **DVD Drive** and select **None** radio button in right pane. Click **Apply** and **OK** to change the settings



Settings for FreeNAS iSCSI on WINDOWSSERVER12
Hardware
Add Hardware
BIOS
Boot from IDE
Memory
1024 MB
Processor
1 Virtual processor
IDE Controller 0
Hard Drive
FreeNAS iSCSI.vhdx
Hard Drive
iSCSI1.vhdx
IDE Controller 1
DVD Drive
None
SCSI Controller
Hard Drive
iSCSI2.vhdx
Network Adapter
Internal Network
COM 1
None
COM 2
None
Diskette Drive
None
Management
Name
FreeNAS iSCSI
Integration Services
Some services offered
Checkpoint File Location
E:\FreeNAS iSCSI
Smart Paging File Location
DVD Drive
Browse...
Remove
OK
Cancel
Apply

Select the controller and location on the controller to attach the CD/DVD drive.

Controller: IDE Controller 1

Location: 1 (in use)

Media

Specify the media to use with your virtual CD/DVD drive.

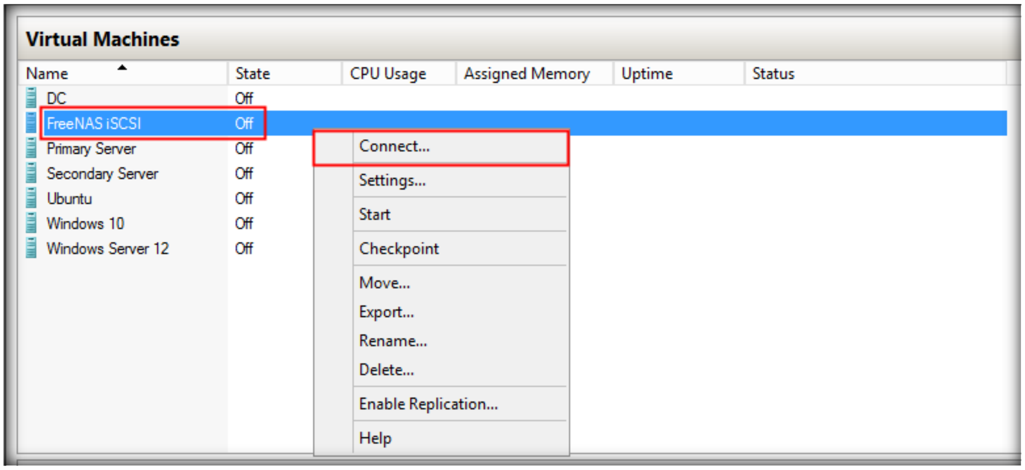
● None

○ Image file: E:\EDRP-Tools\New folder\FreeNAS-9.10.1.iso

○ Physical CD/DVD drive: Drive 'F:'

To remove the virtual CD/DVD drive from this virtual machine, click Remove.

43. Again, in Hyper-V Manager window, navigate to Virtual Machines pane and **right-click** the **FreeNAS iSCSI** virtual machine. Click **Connect...** from the context menu.

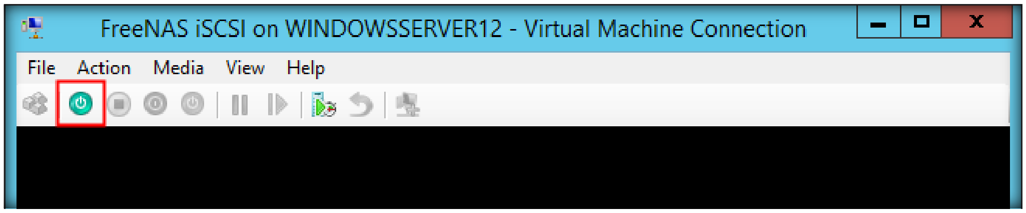


Virtual Machines

Name	State	CPU Usage	Assigned Memory	Uptime	Status
DC	Off				
FreeNAS iSCSI	Off				
Primary Server	Off				
Secondary Server	Off				
Ubuntu	Off				
Windows 10	Off				
Windows Server 12	Off				

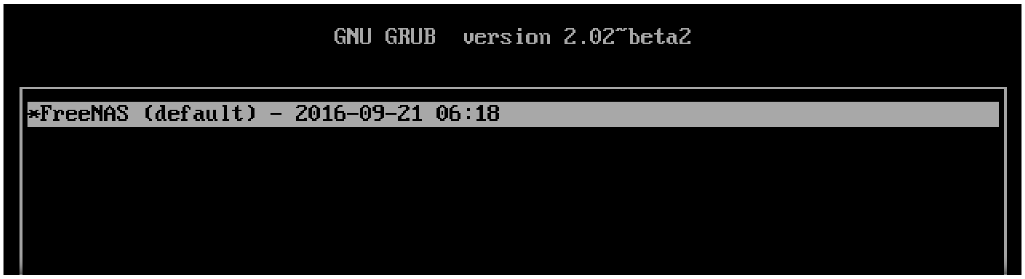
Connect...
Settings...
Start
Checkpoint
Move...
Export...
Rename...
Delete...
Enable Replication...
Help

44. **FreeNAS iSCSI** Virtual Machine window appears click **Start** button as shown in the screenshot.



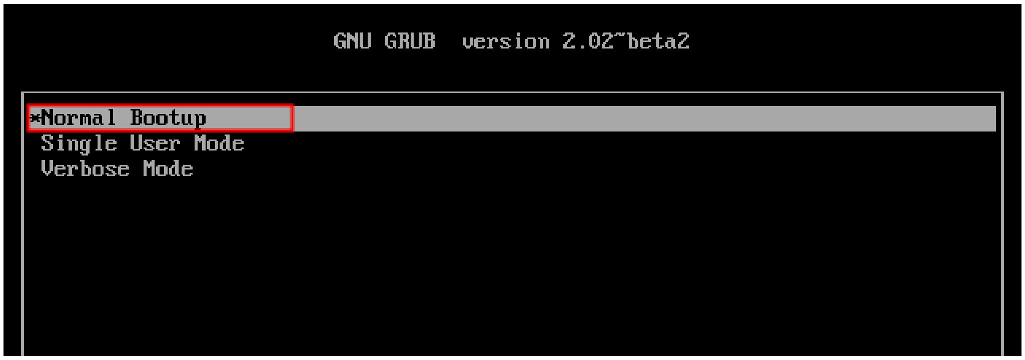
FreeNAS iSCSI on WINDOWSSERVER12 - Virtual Machine Connection
File
Action
Media
View
Help

45. FreeNAS boot up page will appear; press **Enter** or wait for 15 seconds to boot. It may take 5-10 minutes to complete the boot setup.



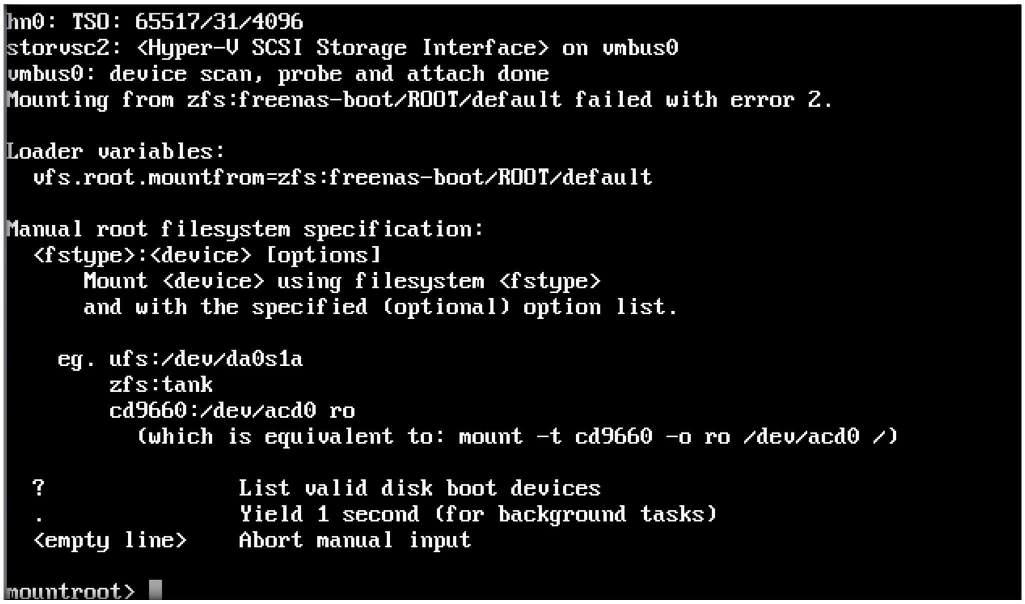
```
GNU GRUB  version 2.02~beta2

*FreeNAS (default) - 2016-09-21 06:18
```

46. In next window, highlight the **Normal Bootup** option and press **enter.**



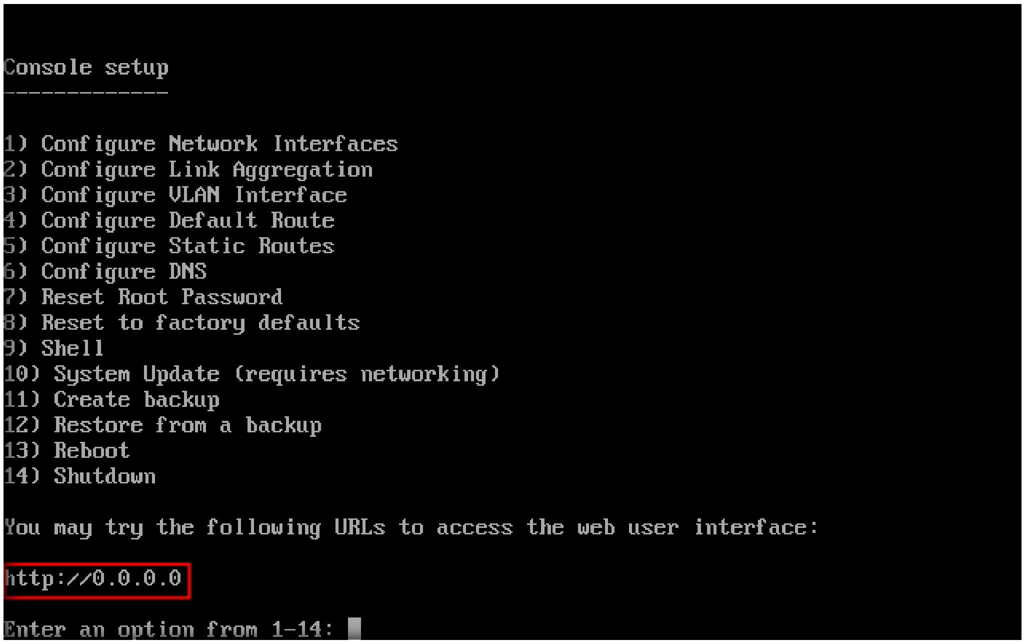
```
GNU GRUB  version 2.02~beta2

*Normal Bootup
 Single User Mode
 Verbose Mode
```

WARNING: If FreeNAS iSCSI VM not booting properly and showing the following screen as shown in the screenshot below, Restart FreeNAS iSCSI VM by selecting **Turn Off** option from the **Action** drop-down menu present in menu-bar of FreeNAS Hyper-V window and then restarting it using **Start** button. If FreeNAS iSCSI VM is booting properly, then skip to **Step 48**.



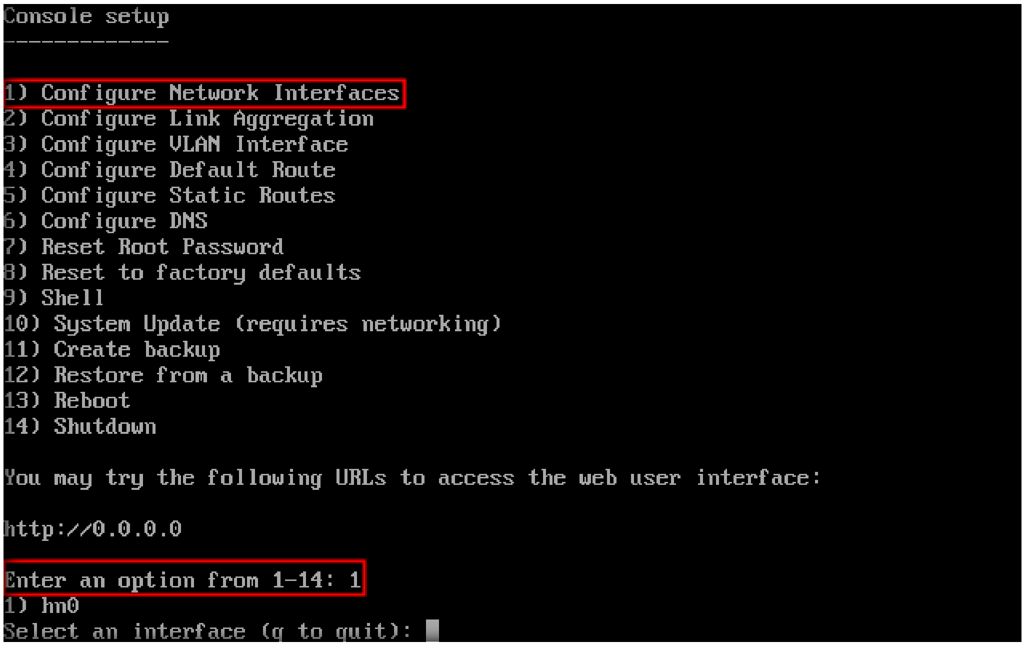
```
hn0: TSO: 65517/31/4096
storvsc2: <Hyper-V SCSI Storage Interface> on vmbus0
vmbus0: device scan, probe and attach done
Mounting from zfs:freenas-boot/ROOT/default failed with error 2.

Loader variables:
  vfs.root.mountfrom=zfs:freenas-boot/ROOT/default

Manual root filesystem specification:
  <fstype>:<device> [options]
      Mount <device> using filesystem <fstype>
      and with the specified (optional) option list.

    eg. ufs:/dev/da0s1a
        zfs:tank
        cd9660:/dev/acd0 ro
          (which is equivalent to: mount -t cd9660 -o ro /dev/acd0 /)

  ?               List valid disk boot devices
  .               Yield 1 second (for background tasks)
  <empty line>    Abort manual input

mountroot> █
```

47. After completion of booting, the setup will generate a IP address i.e. **0.0.0.0** in order to access the web user interface. This IP will not work; we will have to **Configure Network Interfaces.**



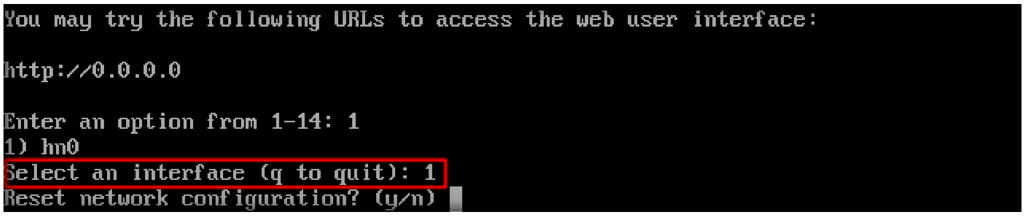
```


Console setup
-------------


1) Configure Network Interfaces
2) Configure Link Aggregation
3) Configure VLAN Interface
4) Configure Default Route
5) Configure Static Routes
6) Configure DNS
7) Reset Root Password
8) Reset to factory defaults
9) Shell
10) System Update (requires networking)
11) Create backup
12) Restore from a backup
13) Reboot
14) Shutdown

You may try the following URLs to access the web user interface:

http://0.0.0.0

Enter an option from 1-14: █
```

48. To **Configure Network Interfaces**, type **1** in the **Enter an option from 1-14:** field and press **Enter.**



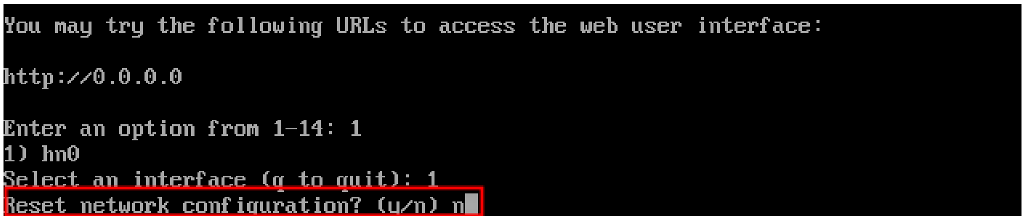
```
Console setup
-------------

1) Configure Network Interfaces
2) Configure Link Aggregation
3) Configure VLAN Interface
4) Configure Default Route
5) Configure Static Routes
6) Configure DNS
7) Reset Root Password
8) Reset to factory defaults
9) Shell
10) System Update (requires networking)
11) Create backup
12) Restore from a backup
13) Reboot
14) Shutdown

You may try the following URLs to access the web user interface:

http://0.0.0.0

Enter an option from 1-14: 1
1) hn0
Select an interface (q to quit):
```

49. In **Select an interface** field, enter the serial number of the interface i.e. **1** for interface **hn0** as shown in screenshot and press **Enter.**



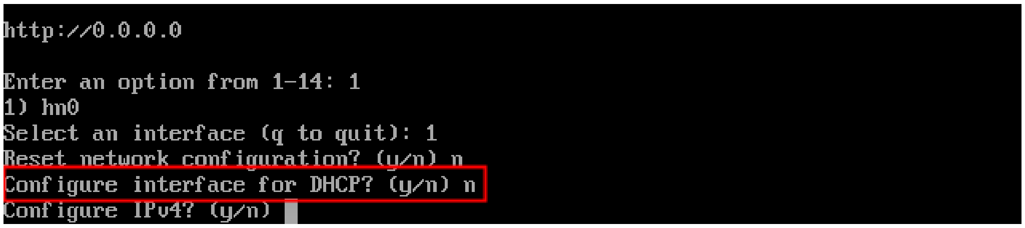
```
You may try the following URLs to access the web user interface:

http://0.0.0.0

Enter an option from 1-14: 1
1) hn0
Select an interface (q to quit): 1
Reset network configuration? (y/n)
```

50. In **Reset network configuration** field, type **n** and press **Enter.**



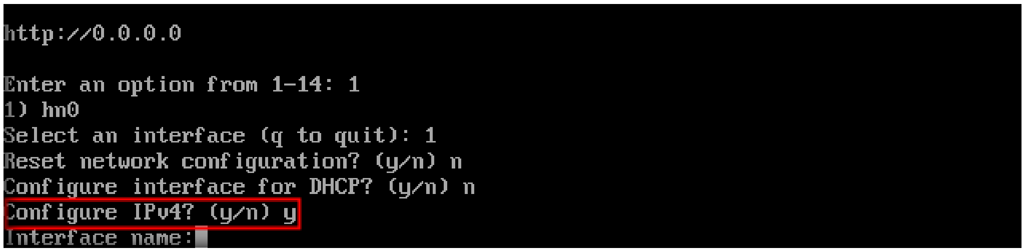
```
You may try the following URLs to access the web user interface:

http://0.0.0.0

Enter an option from 1-14: 1
1) hn0
Select an interface (q to quit): 1
Reset network configuration? (y/n) n
```

51. In **Configure interface for DHCP** field, type **n** and press **Enter.**



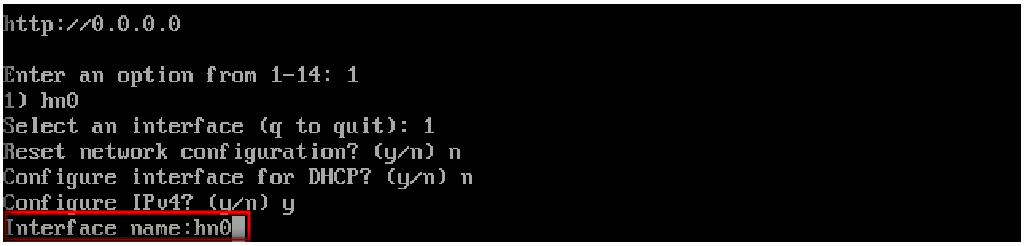
```
http://0.0.0.0

Enter an option from 1-14: 1
1) hn0
Select an interface (q to quit): 1
Reset network configuration? (y/n) n
Configure interface for DHCP? (y/n) n
Configure IPv4? (y/n)
```

52. In **Configure IPv4** field, type **y** and press **Enter**. This will enable the manual configuration of the IP address.



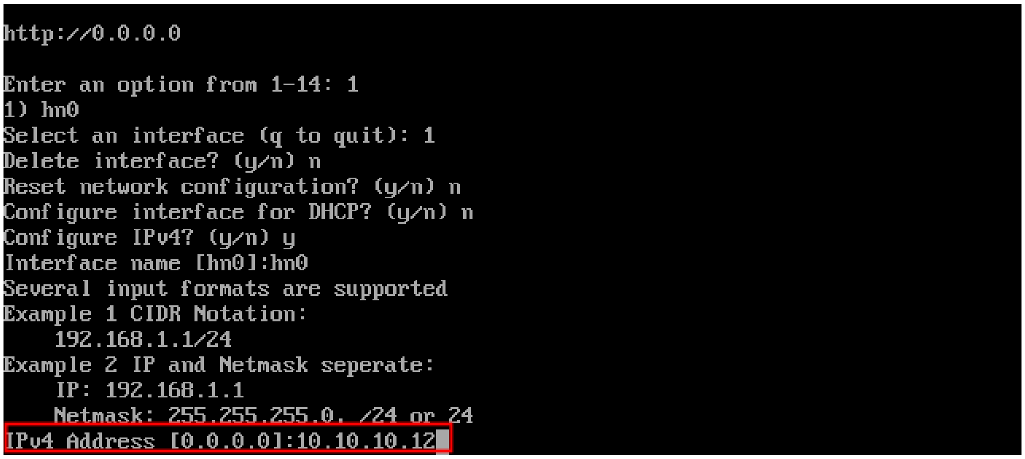
```
http://0.0.0.0

Enter an option from 1-14: 1
1) hn0
Select an interface (q to quit): 1
Reset network configuration? (y/n) n
Configure interface for DHCP? (y/n) n
Configure IPv4? (y/n) y
Interface name:
```

53. **Interface name** field will appear, in this option, type the name of the interface i.e. **hn0** and press **Enter.**



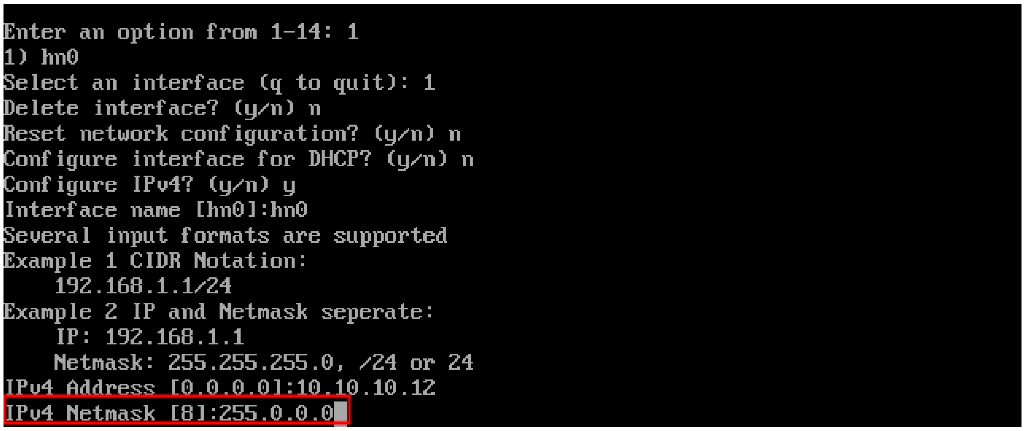
```
http://0.0.0.0

Enter an option from 1-14: 1
1) hn0
Select an interface (q to quit): 1
Reset network configuration? (y/n) n
Configure interface for DHCP? (y/n) n
Configure IPv4? (y/n) y
Interface name:hn0
```

54. **IPv4 Address** field will appear, here type the IP address i.e. **10.10.10.12** assigned for the **hn0** port. Press **Enter**.
    Note: This FreeNAS virtual machine is working on internal switch which is configured for the gateway, whose IP is **10.10.10.2**, so we will have to assign the interface **hn0** the IP of same domain, so we will apply IP: **10.10.10.12.**



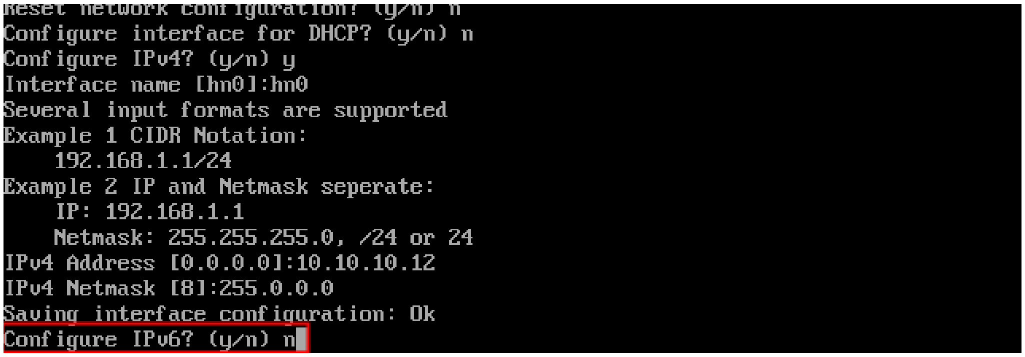
```
http://0.0.0.0

Enter an option from 1-14: 1
1) hn0
Select an interface (q to quit): 1
Delete interface? (y/n) n
Reset network configuration? (y/n) n
Configure interface for DHCP? (y/n) n
Configure IPv4? (y/n) y
Interface name [hn0]:hn0
Several input formats are supported
Example 1 CIDR Notation:
    192.168.1.1/24
Example 2 IP and Netmask seperate:
    IP: 192.168.1.1
    Netmask: 255.255.255.0, /24 or 24
IPv4 Address [0.0.0.0]:10.10.10.12
```

55. After applying the interface IP, **IPv4 Netmask** option will appear. Since the interface IP we entered is a **class A** IP, so enter **255.0.0.0** as the IPv4 Netmask and press **Enter.**



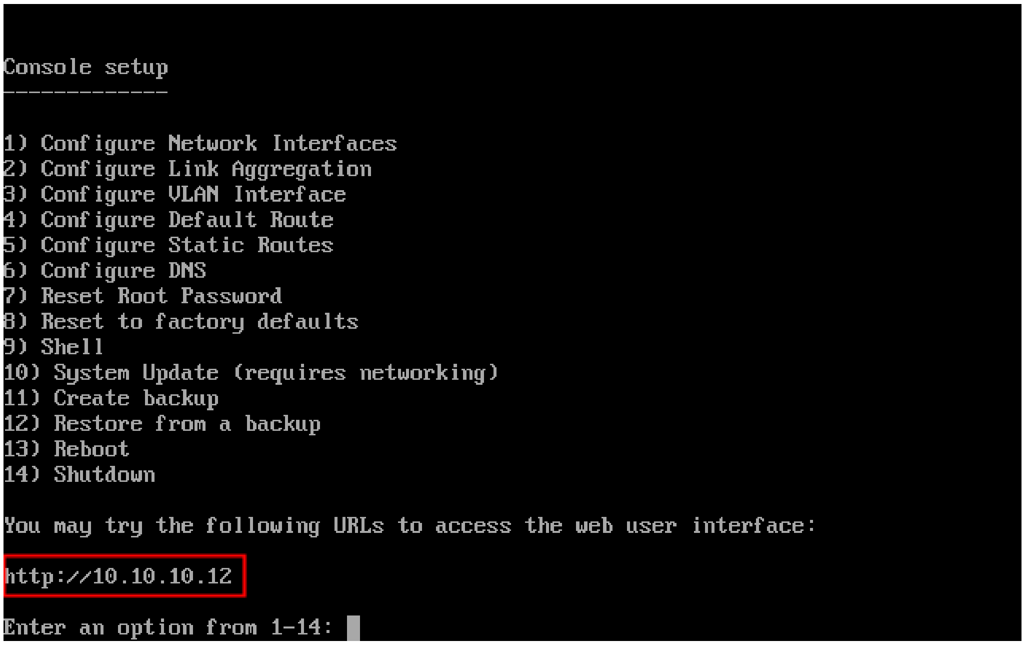
```
Enter an option from 1-14: 1
1) hn0
Select an interface (q to quit): 1
Delete interface? (y/n) n
Reset network configuration? (y/n) n
Configure interface for DHCP? (y/n) n
Configure IPv4? (y/n) y
Interface name [hn0]:hn0
Several input formats are supported
Example 1 CIDR Notation:
    192.168.1.1/24
Example 2 IP and Netmask seperate:
    IP: 192.168.1.1
    Netmask: 255.255.255.0, /24 or 24
IPv4 Address [0.0.0.0]:10.10.10.12
IPv4 Netmask [8]:255.0.0.0
```

56. **Configure IPv6** option will appear, type **n** and press **Enter** as shown in the screenshot.



```
Reset network configuration? (y/n) n
Configure interface for DHCP? (y/n) n
Configure IPv4? (y/n) y
Interface name [hn0]:hn0
Several input formats are supported
Example 1 CIDR Notation:
    192.168.1.1/24
Example 2 IP and Netmask seperate:
    IP: 192.168.1.1
    Netmask: 255.255.255.0, /24 or 24
IPv4 Address [0.0.0.0]:10.10.10.12
IPv4 Netmask [8]:255.0.0.0
Saving interface configuration: Ok
Configure IPv6? (y/n) n
```

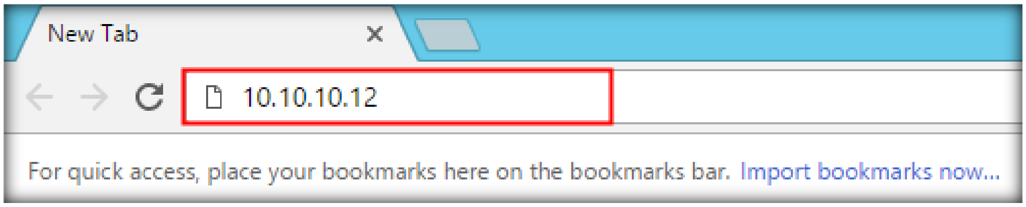
57. The interface hn0 will reconfigure and **FreeNAS iSCSI** VM will generate a new IP i.e. **10.10.10.12** for further configuration from the web user interface.



```
Console setup
-------------

1) Configure Network Interfaces
2) Configure Link Aggregation
3) Configure VLAN Interface
4) Configure Default Route
5) Configure Static Routes
6) Configure DNS
7) Reset Root Password
8) Reset to factory defaults
9) Shell
10) System Update (requires networking)
11) Create backup
12) Restore from a backup
13) Reboot
14) Shutdown

You may try the following URLs to access the web user interface:

http://10.10.10.12

Enter an option from 1-14:
```

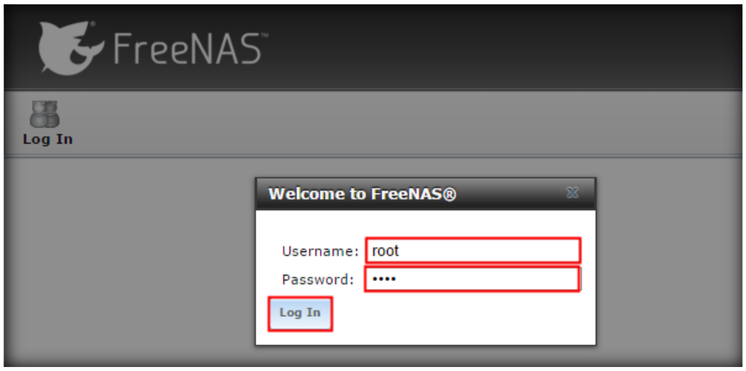
CT#10.2: Configuring iSCSI targets of FreeNAS iSCSI VM

1. For the further configuration of the FreeNAS iSCSI using web user interface, on Host system, type the IP i.e. **10.10.10.12** on the **address bar** of an internet browser and press **Enter**



New Tab
10.10.10.12
For quick access, place your bookmarks here on the bookmarks bar. Import bookmarks now...

2. **Welcome to FreeNAS** window pop up, enter the **Username** and **Password** as **root** and **toor**. Click **Log In** button.

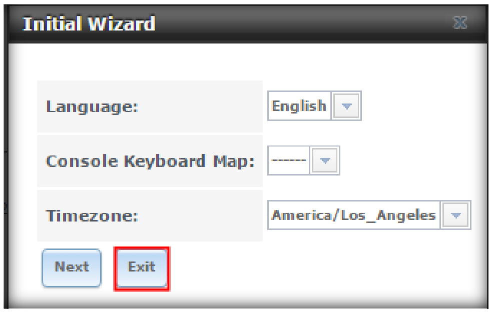


FreeNAS
Log In
Welcome to FreeNAS®

Username: root
Password: ••••

Log In

3. **Initial Wizard** appears, click **Exit** to close the wizard.

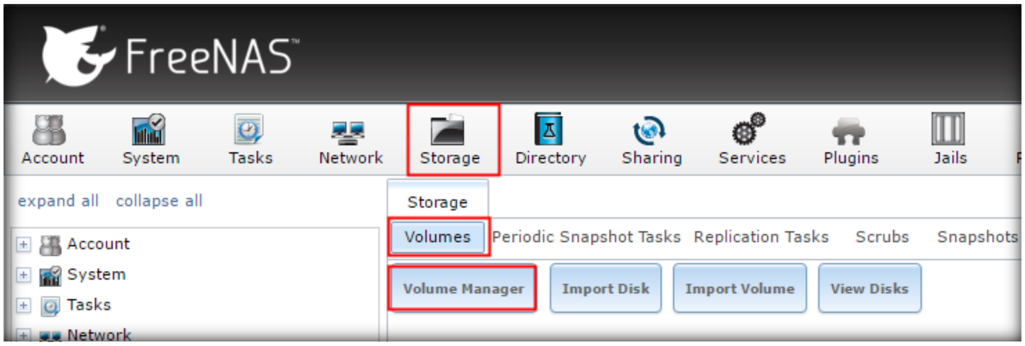


Initial Wizard

Language: English
Console Keyboard Map: ------
Timezone: America/Los_Angeles

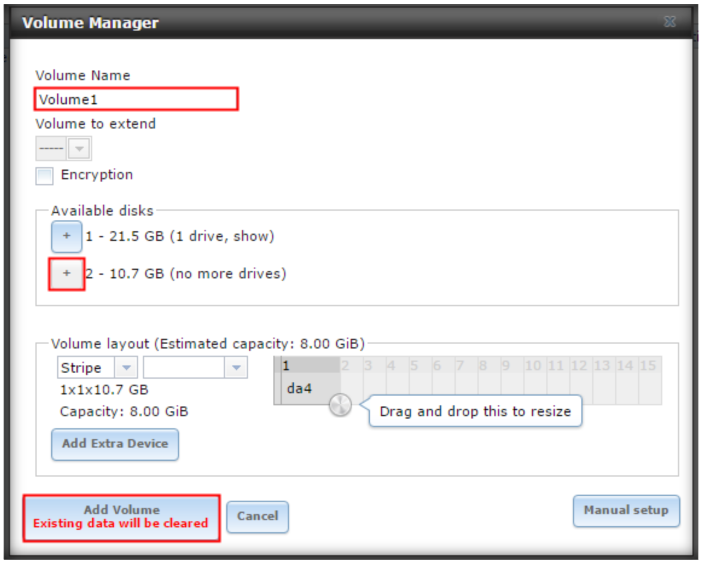
Next
Exit

4. Click **Storage** icon present on the top and click **Volumes** and then **Volume Manager,** as shown in the screenshot.



FreeNAS
Account
System
Tasks
Network
Storage
Directory
Sharing
Services
Plugins
Jails
expand all
collapse all
Account
System
Tasks
Network
Storage
Volumes
Periodic Snapshot Tasks
Replication Tasks
Scrubs
Snapshots
Volume Manager
Import Disk
Import Volume
View Disks

5. **Volume Manager** window will appear, in **Volume Name** field, enter **Volume1**. In Available disk pane, click **+** button present in front of **10 GB disk** and click **Add Volume** button after that, as shown in the screenshot.



Volume Manager

Volume Name: Volume1

Volume to extend: ------

☐ Encryption

Available disks

1 - 21.5 GB (1 drive, show)

2 - 10.7 GB (no more drives)

Volume layout (Estimated capacity: 8.00 GiB)

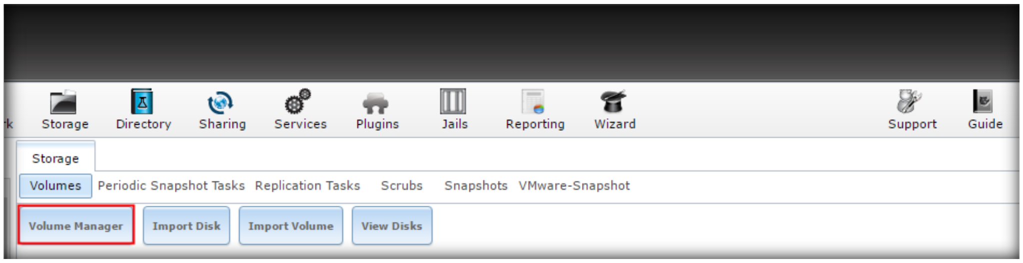
Stripe

1x1x10.7 GB

Capacity: 8.00 GiB

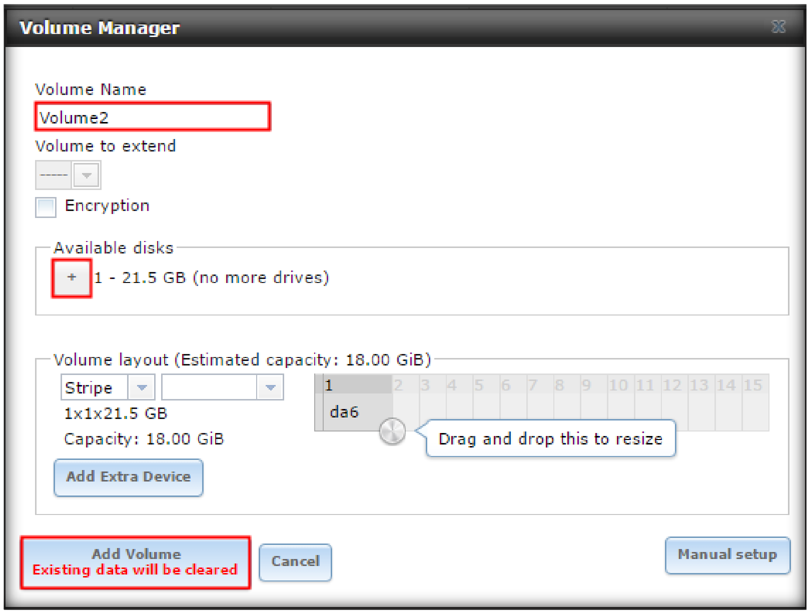
+
+
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
da4
Drag and drop this to resize
Add Extra Device
Add Volume
Existing data will be cleared
Cancel
Manual setup

6. Again click **Volume Manager** button.



Storage
Directory
Sharing
Services
Plugins
Jails
Reporting
Wizard
Support
Guide
Storage
Volumes
Periodic Snapshot Tasks
Replication Tasks
Scrubs
Snapshots
VMware-Snapshot
Volume Manager
Import Disk
Import Volume
View Disks

7. In **Volume Name** field, enter **Volume2** and in **Available disk** pane click **+** button present in front of **20 GB disk**. Click **Add Volume** button.



Volume Manager

Volume Name: Volume2

Volume to extend: ------

☐ Encryption

Available disks

1 - 21.5 GB (no more drives)

Volume layout (Estimated capacity: 18.00 GiB)

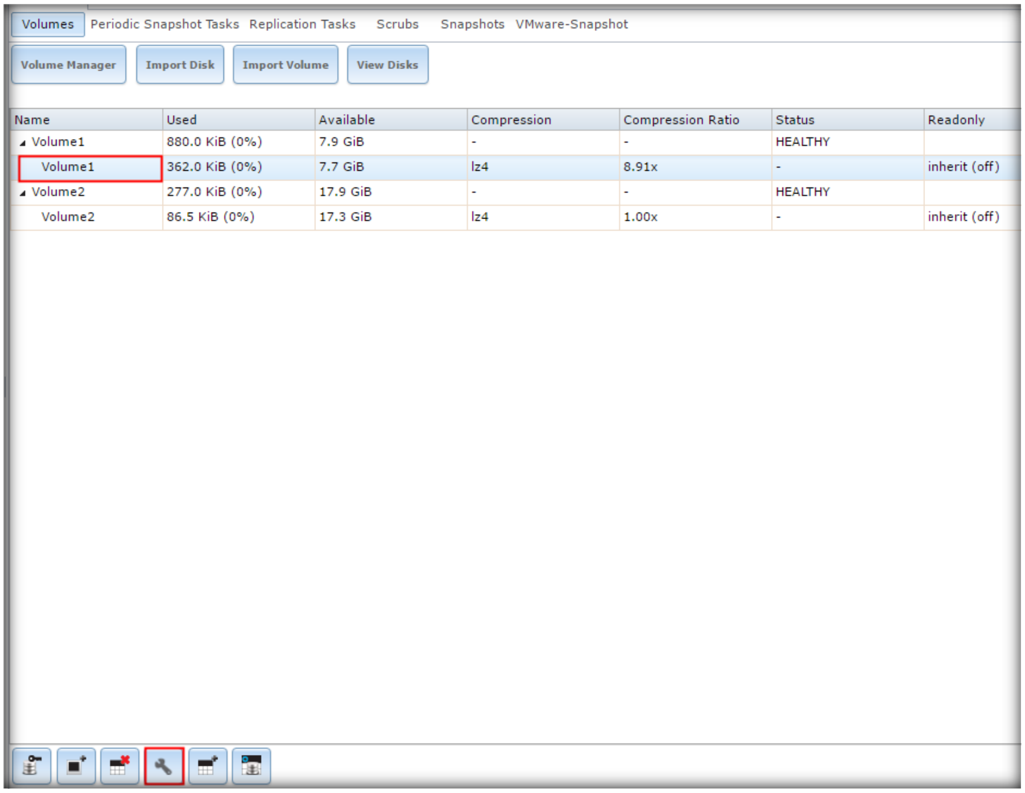
Stripe

1x1x21.5 GB

Capacity: 18.00 GiB

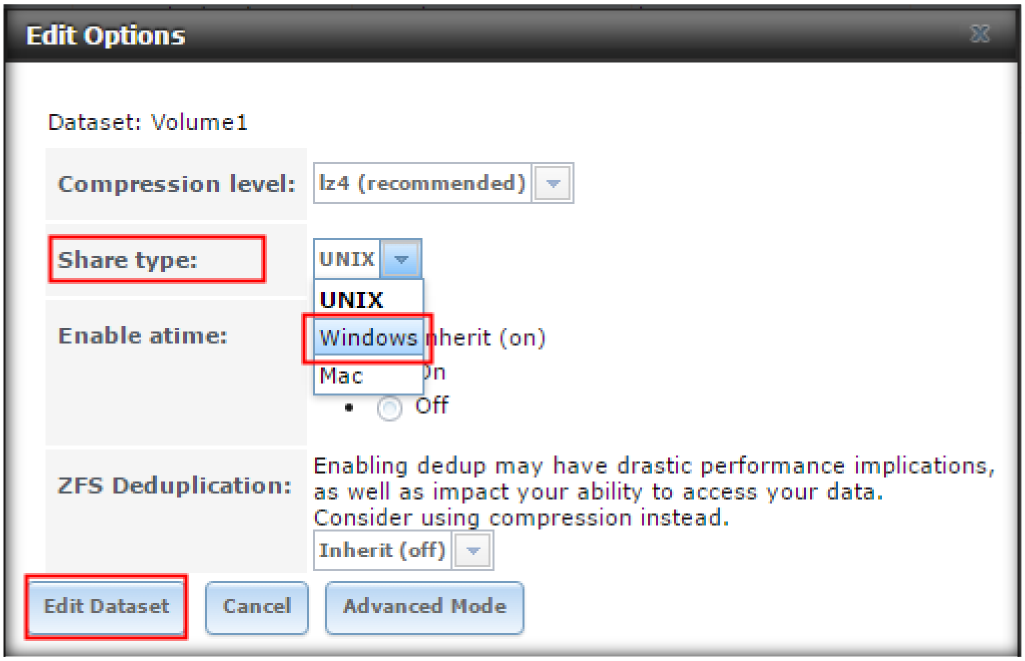
+
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
da6
Drag and drop this to resize
Add Extra Device
Add Volume
Existing data will be cleared
Cancel
Manual setup

8. **Volume1** and **Volume2** will be added. Click **Volume1** and then click **Edit Options** button.


Volumes
Periodic Snapshot Tasks
Replication Tasks
Scrubs
Snapshots
VMware-Snapshot
Volume Manager
Import Disk
Import Volume
View Disks

Name	Used	Available	Compression	Compression Ratio	Status	Readonly
◢ Volume1	880.0 KiB (0%)	7.9 GiB	-	-	HEALTHY	
Volume1	362.0 KiB (0%)	7.7 GiB	lz4	8.91x	-	inherit (off)
◢ Volume2	277.0 KiB (0%)	17.9 GiB	-	-	HEALTHY	
Volume2	86.5 KiB (0%)	17.3 GiB	lz4	1.00x	-	inherit (off)

9. **Edit Options** window will pop up. In **Share type** dropdown menu, select **Windows** and click **Edit Dataset** button.


Edit Options
UNIX
Windows
Mac
Edit Dataset
Cancel
Advanced Mode

Dataset: Volume1

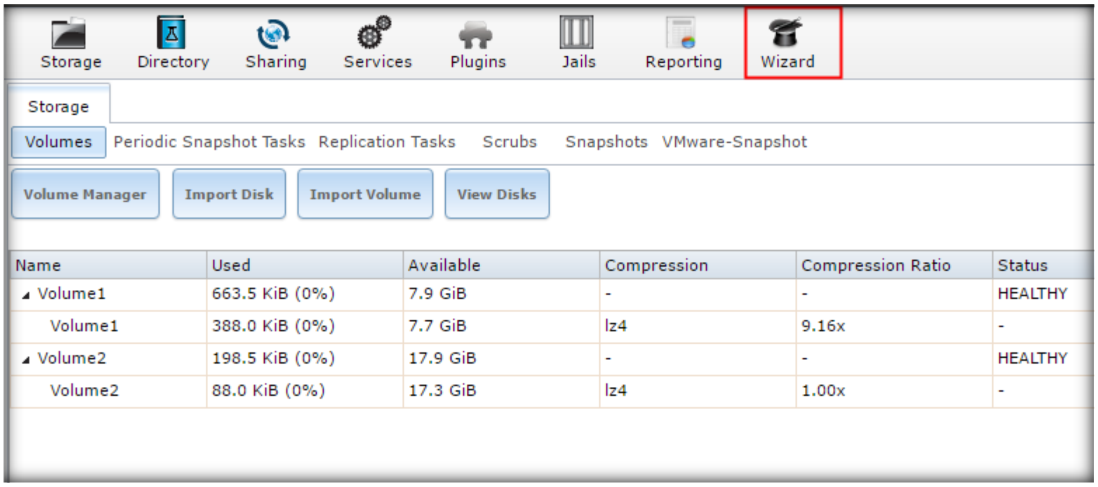
Compression level: lz4 (recommended)

Share type: UNIX

Enable atime: Inherit (on) / On / ○ Off

ZFS Deduplication: Enabling dedup may have drastic performance implications, as well as impact your ability to access your data. Consider using compression instead. Inherit (off)

10. Repeat steps **7** and **8** for **Volume2**.
11. Click **Wizard** icon present on the **top-left** side of the window.


Storage
Directory
Sharing
Services
Plugins
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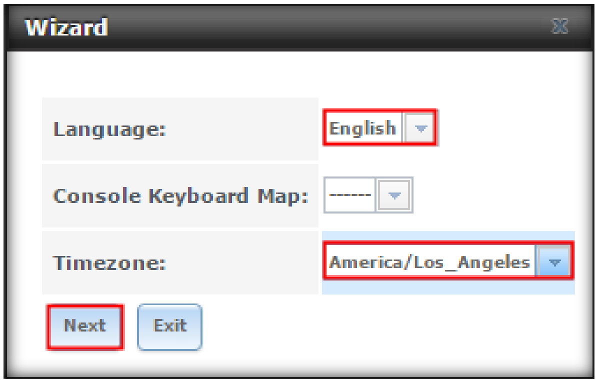
Reporting
Wizard
Storage
Volumes
Periodic Snapshot Tasks
Replication Tasks
Scrubs
Snapshots
VMware-Snapshot
Volume Manager
Import Disk
Import Volume
View Disks

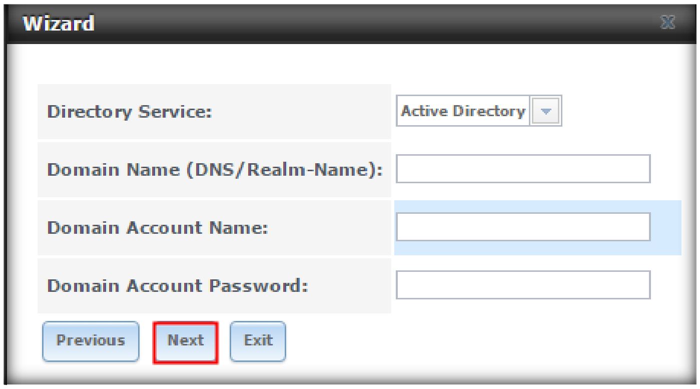
Name	Used	Available	Compression	Compression Ratio	Status
◢ Volume1	663.5 KiB (0%)	7.9 GiB	-	-	HEALTHY
Volume1	388.0 KiB (0%)	7.7 GiB	lz4	9.16x	-
◢ Volume2	198.5 KiB (0%)	17.9 GiB	-	-	HEALTHY
Volume2	88.0 KiB (0%)	17.3 GiB	lz4	1.00x	-

12. The **Wizard** window will appear, select the **Language** and **Timezone** and click **Next**.


Wizard
Next
Exit

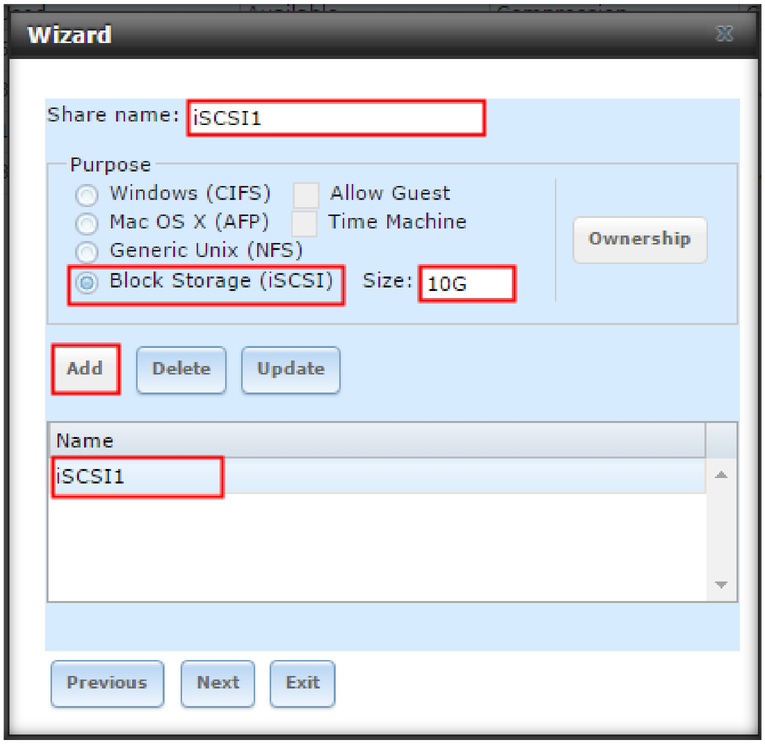
Language: English
Console Keyboard Map: ------
Timezone: America/Los_Angeles

13. In next window, click **Next**.


Wizard
Previous
Next
Exit

Directory Service: Active Directory
Domain Name (DNS/Realm-Name):
Domain Account Name:
Domain Account Password:

14. In next window of wizard, enter **iSCSI1** in the **Share name** field. Click the **Block Storage (iSCSI)** radio button and enter **10G** on **Size:** field. Click **Add** button. **iSCSI1** share will be added.



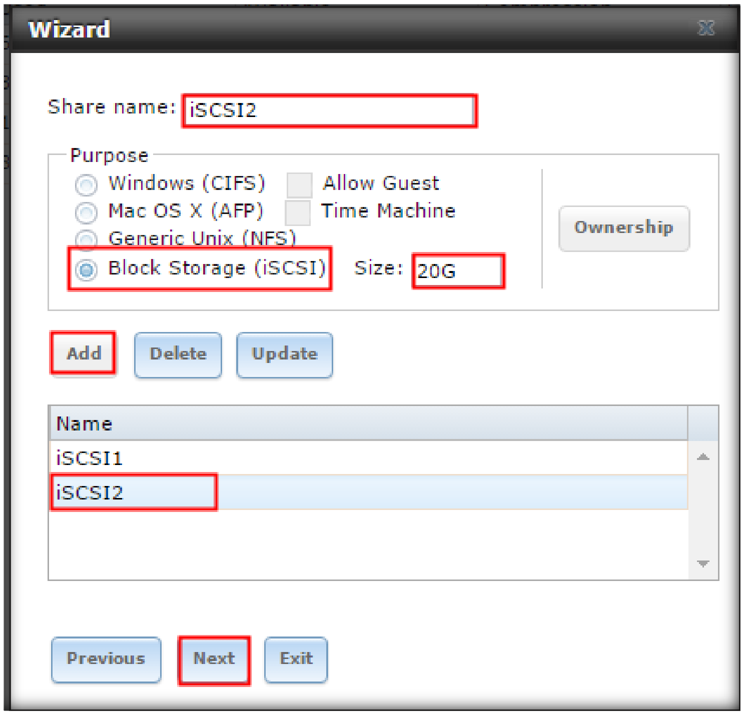
Wizard
Ownership
Add
Delete
Update
Previous
Next
Exit

Share name: iSCSI1

Purpose
○ Windows (CIFS) ☐ Allow Guest
○ Mac OS X (AFP) ☐ Time Machine
○ Generic Unix (NFS)
● Block Storage (iSCSI) Size: 10G

Name
iSCSI1

15. Again in same window, enter **iSCSI2** in the **Share name** field. Click **Block Storage (iSCSI)** radio button and in **Size** field enter **20G** and click **Add** button. Both **iSCSI1** and **iSCSI2** iSCSI share targets are added, click **Next** button.



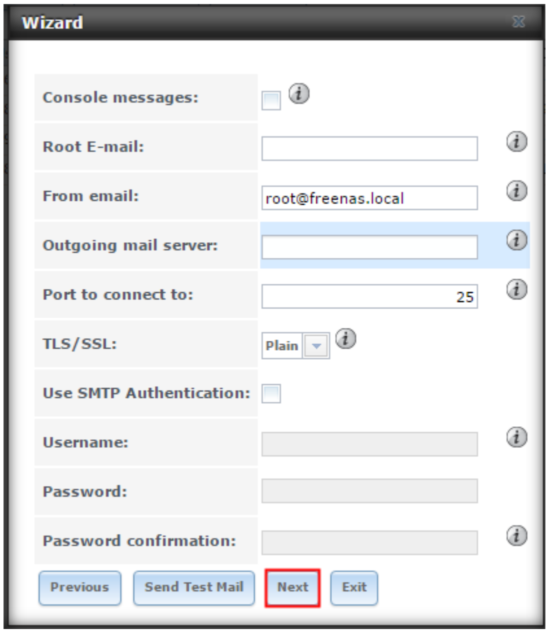
Wizard
Ownership
Add
Delete
Update
Previous
Next
Exit

Share name: iSCSI2

Purpose
○ Windows (CIFS) ☐ Allow Guest
○ Mac OS X (AFP) ☐ Time Machine
○ Generic Unix (NFS)
● Block Storage (iSCSI) Size: 20G

Name
iSCSI1
iSCSI2

16. Click **Next** button in the window of the wizard.


Wizard
Previous
Send Test Mail
Next
Exit

Console messages: ☐

Root E-mail:

From email: root@freenas.local

Outgoing mail server:

Port to connect to: 25

TLS/SSL: Plain

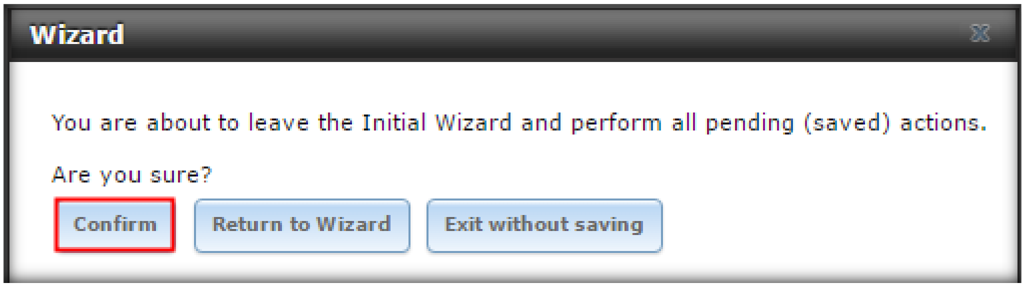
Use SMTP Authentication: ☐

Username:

Password:

Password confirmation:

17. In next window, click **Confirm** button.

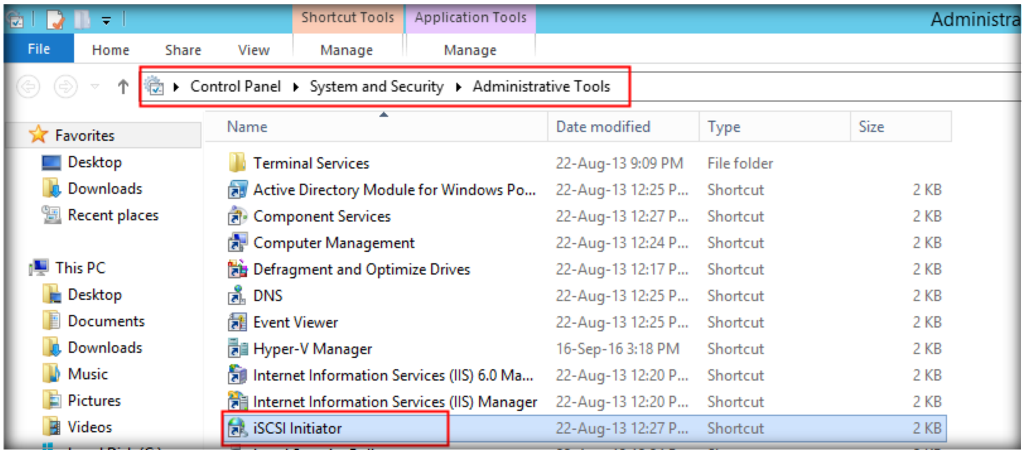

Wizard
Confirm
Return to Wizard
Exit without saving

You are about to leave the Initial Wizard and perform all pending (saved) actions.

Are you sure?

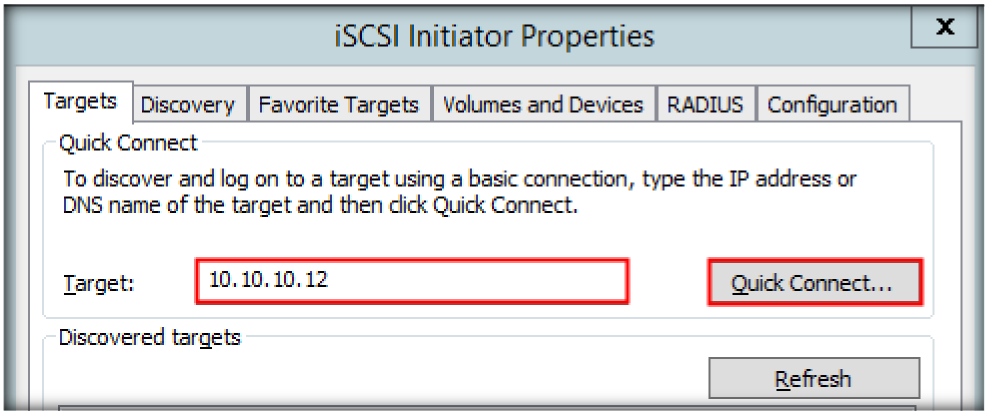
18. To verify the configuration, navigate to **Administrative Tools** window and **double-click iSCSI Initiator** icon, in host machine.

Note: Alternatively, you can navigate to **iSCSI Initiator** by clicking on the **Tools** button present on the **Server Manager** and then clicking **iSCSI Initiator** button from the dropdown menu.


Shortcut Tools
Application Tools
Administra
File
Home
Share
View
Manage
Manage
Control Panel
System and Security
Administrative Tools
Favorites
Desktop
Downloads
Recent places
This PC
Desktop
Documents
Downloads
Music
Pictures
Videos

Name	Date modified	Type	Size
Terminal Services	22-Aug-13 9:09 PM	File folder	
Active Directory Module for Windows Po...	22-Aug-13 12:25 P...	Shortcut	2 KB
Component Services	22-Aug-13 12:27 P...	Shortcut	2 KB
Computer Management	22-Aug-13 12:24 P...	Shortcut	2 KB
Defragment and Optimize Drives	22-Aug-13 12:17 P...	Shortcut	2 KB
DNS	22-Aug-13 12:25 P...	Shortcut	2 KB
Event Viewer	22-Aug-13 12:25 P...	Shortcut	2 KB
Hyper-V Manager	16-Sep-16 3:18 PM	Shortcut	2 KB
Internet Information Services (IIS) 6.0 Ma...	22-Aug-13 12:20 P...	Shortcut	2 KB
Internet Information Services (IIS) Manager	22-Aug-13 12:20 P...	Shortcut	2 KB
iSCSI Initiator	22-Aug-13 12:27 P...	Shortcut	2 KB

19. **iSCSI Initiator Properties** window will appear, in **Targets** tab. In **Target:** field, enter the IP address of the FreeNAS iSCSI virtual machine i.e.: **10.10.10.12** and click **Quick Connect...** button as shown in the screenshot.



iSCSI Initiator Properties

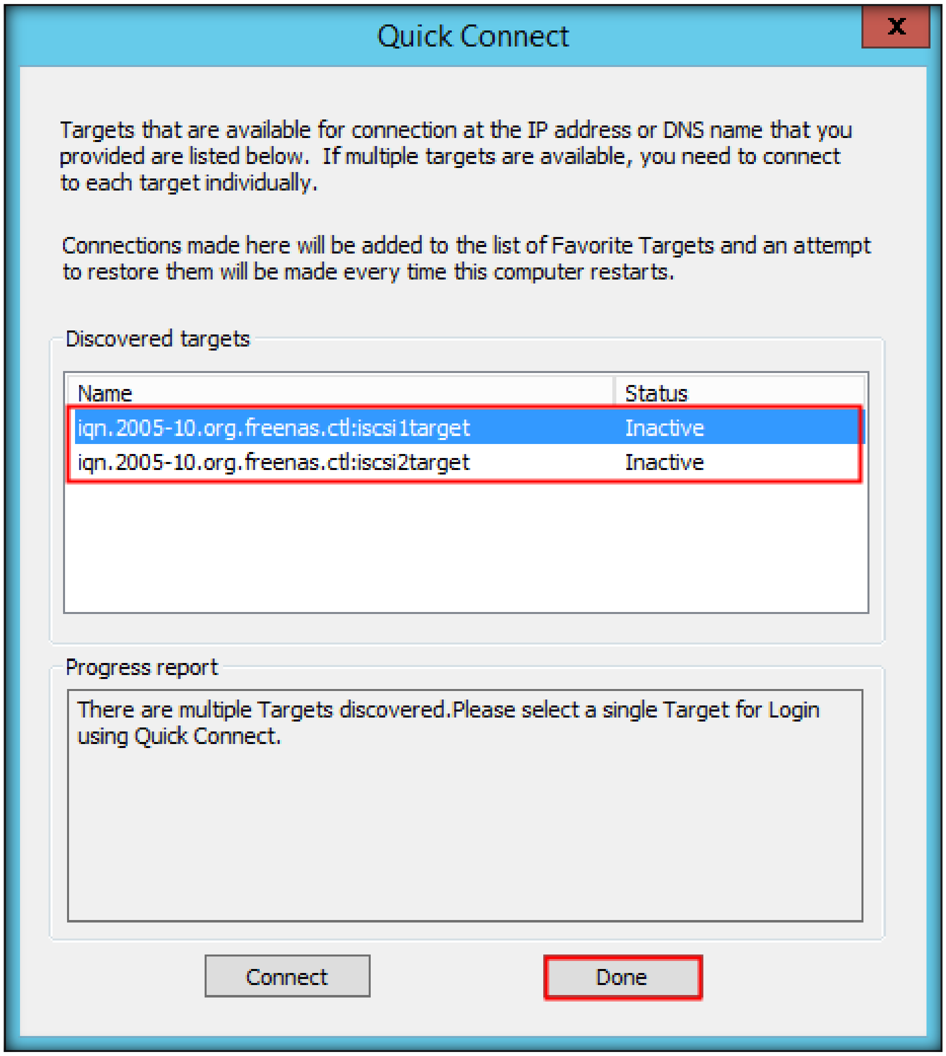
Quick Connect

To discover and log on to a target using a basic connection, type the IP address or DNS name of the target and then click Quick Connect.

Target: 10.10.10.12

Discovered targets

20. **Quick Connect** window will pop up, two iSCSI targets are now discoverable and inactive. Click **Done** to close the window.



Quick Connect

Targets that are available for connection at the IP address or DNS name that you provided are listed below. If multiple targets are available, you need to connect to each target individually.

Connections made here will be added to the list of Favorite Targets and an attempt to restore them will be made every time this computer restarts.

Discovered targets

Name	Status
iqn.2005-10.org.freenas.ctl:iscsi1target	Inactive
iqn.2005-10.org.freenas.ctl:iscsi2target	Inactive

Progress report

There are multiple Targets discovered.Please select a single Target for Login using Quick Connect.

End of the Document

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