

Install & Configure Windows Deployment Service

For an administrator it is difficult to install Windows operating system on a large number of computer systems. In large organizations administrators frequently require to perform this task. Also in most of the organizations the computer systems are without a DVD drive. Thus going to each system carrying an external DVD drive and installing Windows OS is very tedious and time consuming task.

Thus to help administrators overcome this problem, Microsoft provided this Windows Deployment Service. The service was first introduced in Windows 2000 Server by name Remote Installation Service (RIS). However it was modified in Windows Server 2003 Service pack 2 and named as Windows Deployment Service.

Allows network-based installation of Windows operating systems, which reduces the complexity and cost when compared to manual installations. Supports deploying images for mixed environments including Windows 11 and Windows Server 2012 R2 through Windows 2022. Transmits data and images by using multicast functionality. Allows you to create images of a reference computer using the Image Capture Wizard, which is an alternative to the ImageX tool. Allows you to add driver packages to the server and configure them to be deployed to client computers along with the install image.

Prerequisite for Installing WDS Service

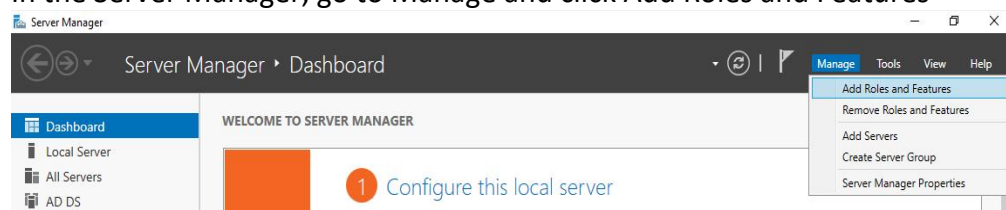
1. An active directory forest and a domain with its domain controller up and running.
2. A working DNS server
3. A NTFS Volume on the server
4. A DHCP Server installed and configured

Installation Steps

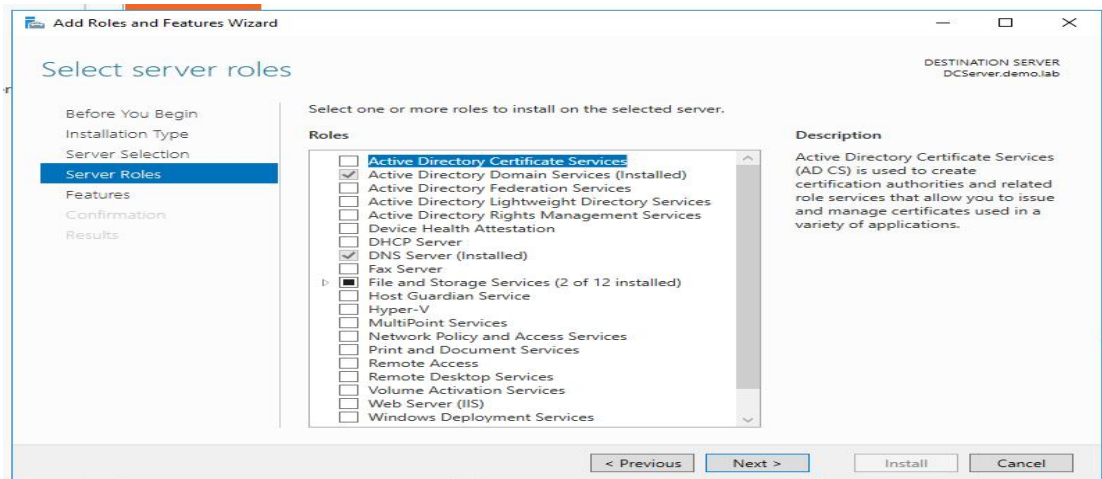
1. For this lab it is assumed that you have already a working domain controller hosting a domain in a forest.
2. All the steps can be performed on a member server , however for this lab all the steps will be performed on the domain controller only.
3. Make sure you have logged on as administrator on the domain controller.
4. Install DHCP Server and configure it.

A. Add DHCP Role.

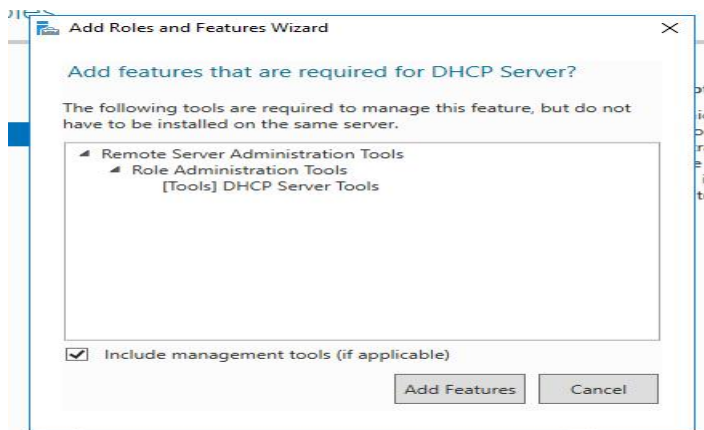
In the Server Manager, go to Manage and click Add Roles and Features



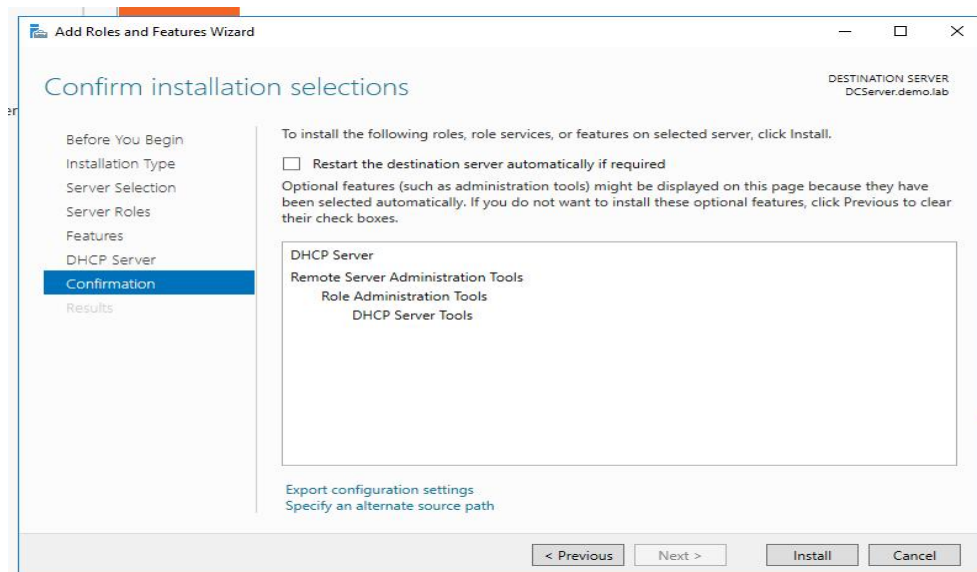
Click Next on all the screens till you get to the following screen.



On this screen click the check box of DHCP Server . A new window will open displaying the features required. Click Add Features button.



Click Next till you get to the following screen.

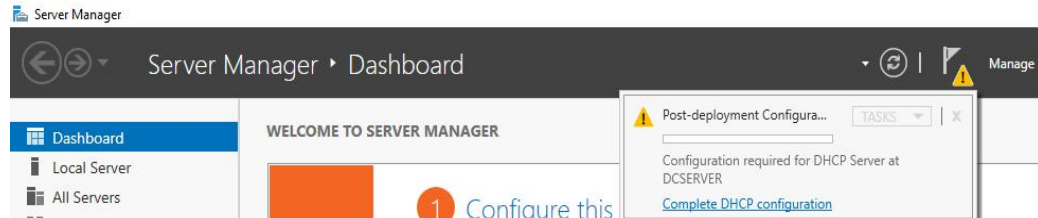


Click Install button to install the DHCP Server service.
Click Close on the installation is successful.

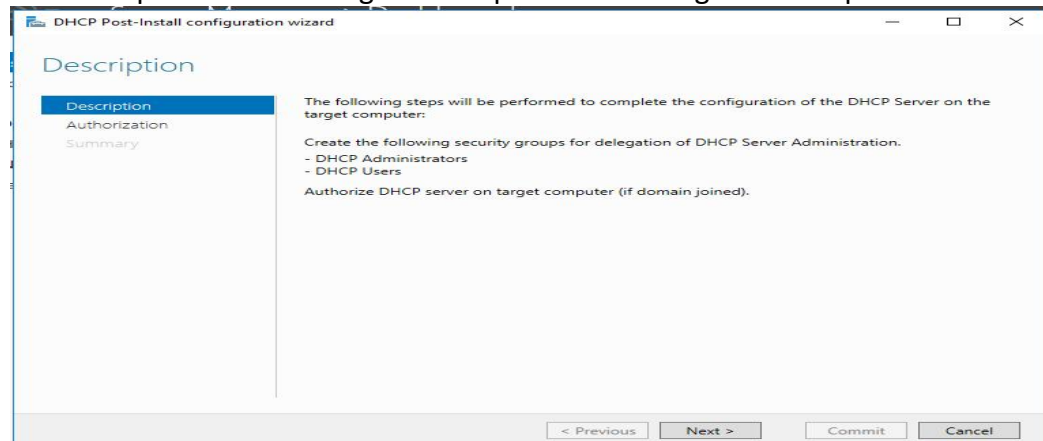
B. DHCP Configuration

Once the DHCP server role is successfully added, a yellow triangle will appear in the Server Manager near Manage.

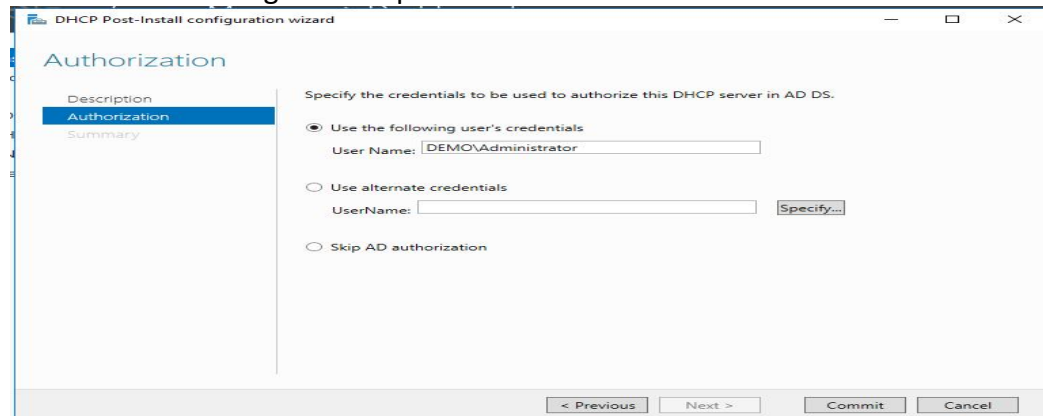
Click on the yellow triangle and you will see the following option.



Click Complete DHCP Configuration option. Following window opens.



Click Next. Following screen opens.



Click Commit. Following screen opens.

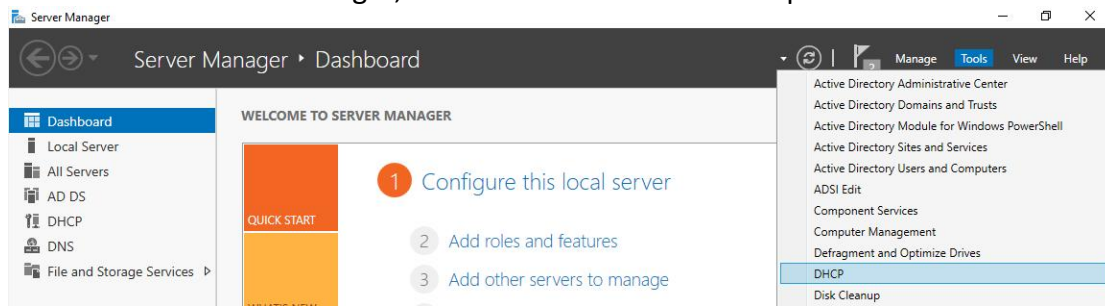


Click Close.

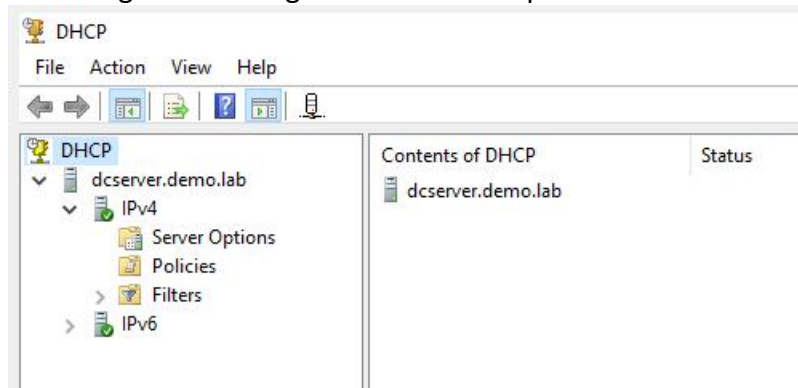
This authorizes the DHCP server in the Active Directory.

C. Configure DHCP Server

In the Server Manager, click Tools and select DHCP option as shown below.

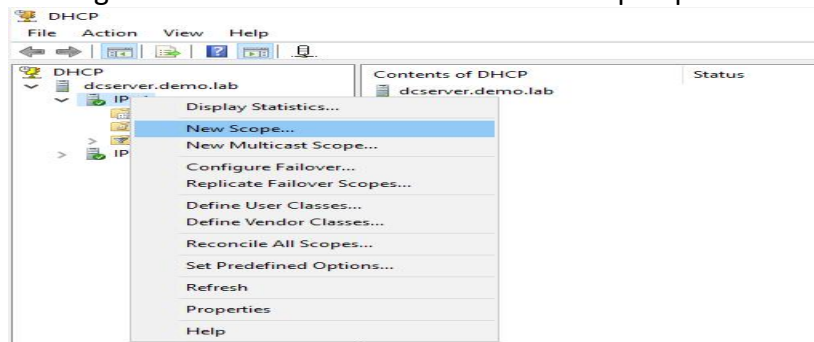


Following DHCP configuration console opens.

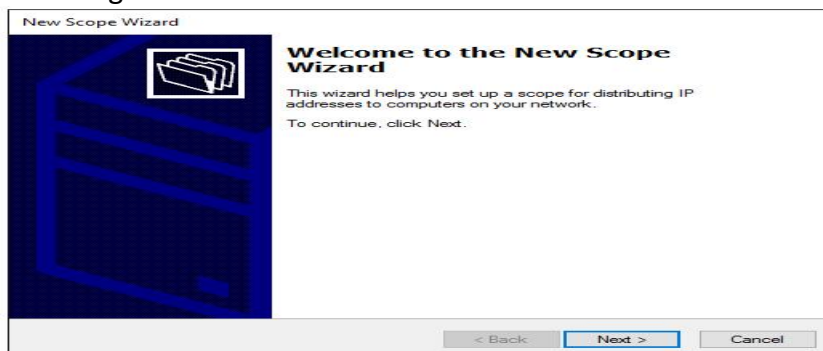


Expand the Server name displayed below DHCP option. Make sure The IPv4 and IPv6 option have a green tick mark. This means the DHCP service is running properly.

Now right click on the IPv4. Then click New Scope option as shown below.

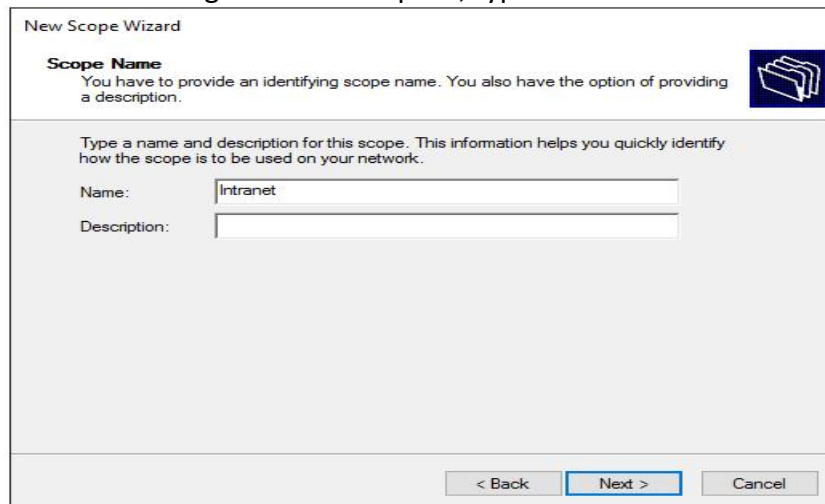


Following wizard starts.



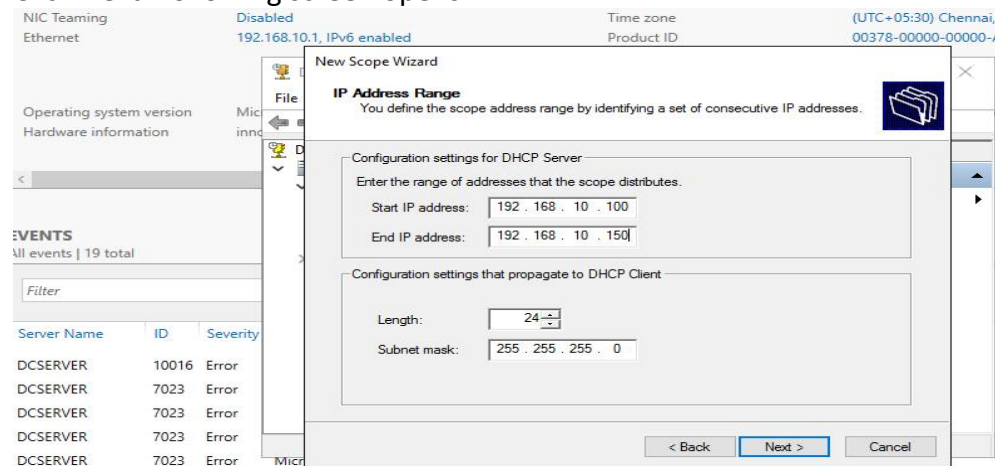
Click Next.

On the following screen that opens, type some name for the scope.



The screenshot shows the 'New Scope Wizard' window, specifically the 'Scope Name' step. The title bar reads 'New Scope Wizard'. Below the title, the text says 'Scope Name' and 'You have to provide an identifying scope name. You also have the option of providing a description.' There is a folder icon on the right. The main area contains the instruction 'Type a name and description for this scope. This information helps you quickly identify how the scope is to be used on your network.' Below this, there are two text input fields: 'Name:' with the value 'Intranet' and 'Description:' which is empty. At the bottom, there are three buttons: '< Back', 'Next >' (highlighted with a blue border), and 'Cancel'.

Click Next. Following screen opens.



The screenshot shows the 'New Scope Wizard' window, specifically the 'IP Address Range' step. The title bar reads 'New Scope Wizard'. Below the title, the text says 'IP Address Range' and 'You define the scope address range by identifying a set of consecutive IP addresses.' There is a folder icon on the right. The main area contains the instruction 'Configuration settings for DHCP Server' and 'Enter the range of addresses that the scope distributes.' Below this, there are two text input fields: 'Start IP address:' with the value '192 . 168 . 10 . 100' and 'End IP address:' with the value '192 . 168 . 10 . 150'. Below these, there is another section titled 'Configuration settings that propagate to DHCP Client' with two text input fields: 'Length:' with the value '24' and 'Subnet mask:' with the value '255 . 255 . 255 . 0'. At the bottom, there are three buttons: '< Back', 'Next >' (highlighted with a blue border), and 'Cancel'.

On this screen provide a range of IP address that the DHCP server will allocate to the network clients. Make sure the range is within the same IP subnet as of the DHCP server. Also make sure you do not include the server IP address in the range.

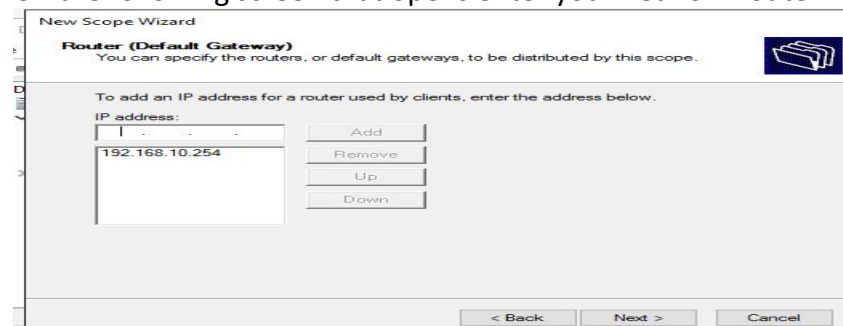
Click Next.

On the next screen click Next. We do not want to exclude any IP addresses from range provided.

Click Next on the next screen to accept the default lease time of 8 days.

On the next screen keep the default option "Yes, I want to configure these options now" and click Next.

On the following screen that opens enter your network router IP address. Click Add.



The screenshot shows the 'New Scope Wizard' window, specifically the 'Router (Default Gateway)' step. The title bar reads 'New Scope Wizard'. Below the title, the text says 'Router (Default Gateway)' and 'You can specify the routers, or default gateways, to be distributed by this scope.' There is a folder icon on the right. The main area contains the instruction 'To add an IP address for a router used by clients, enter the address below.' Below this, there is a text input field labeled 'IP address:' with the value '192.168.10.254'. To the right of the input field, there are four buttons: 'Add', 'Remove', 'Up', and 'Down'. At the bottom, there are three buttons: '< Back', 'Next >' (highlighted with a blue border), and 'Cancel'.

Click Next.

On the next screen click Next to accept the default DNS server. You may add additional DNS servers.

New Scope Wizard
Domain Name and DNS Servers
 The Domain Name System (DNS) maps and translates domain names used by clients on your network.

You can specify the parent domain you want the client computers on your network to use for DNS name resolution.
 Parent domain:

To configure scope clients to use DNS servers on your network, enter the IP addresses for those servers.

Server name	IP address
<input type="text"/>	<input type="text" value="192.168.10.1"/>

Buttons: Resolve, Add, Remove, Up, Down

Navigation: < Back, Next >, Cancel

Click Next.

Click Next on the WINS server screen. Finally the following screen is displayed.

New Scope Wizard
Activate Scope
 Clients can obtain address leases only if a scope is activated.

Do you want to activate this scope now?

☒ Yes, I want to activate this scope now

☐ No, I will activate this scope later

Navigation: < Back, Next >, Cancel

Keep the option "Yes, I want to activate the scope now" selected and click Next.

The DHCP server is now configured. Expand the scope created. It will be displayed as below.

DHCP

File Action View Help

Navigation icons

Left pane tree view:

- DHCP
 - dcserver.demo.lab
 - IPv4
 - Scope [192.168.10.0] Intra
 - Address Pool
 - Address Leases
 - Reservations
 - Scope Options
 - Policies
 - Server Options
 - Policies
 - Filters
 - IPv6

Right pane table:

Start IP Address	End IP Address	Description
192.168.10.100	192.168.10.150	Address range for distribution

5. Install WDS Role.

Go to Server Manager and go to Manage and then Click Add Roles and Features.

Click Next on all screens, till you get to the following screen.

Add Roles and Features Wizard
Select server roles

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

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

Roles

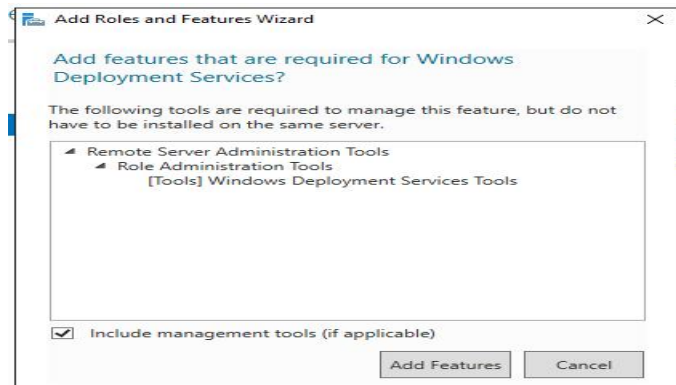
- ☐ Active Directory Federation Services
- ☐ Active Directory Lightweight Directory Services
- ☐ Active Directory Rights Management Services
- ☐ Device Health Attestation
- ☒ DHCP Server (Installed)
- ☒ DNS Server (Installed)
- ☐ Fax Server
- ☐ File and Storage Services (2 of 12 installed)
- ☐ Host Guardian 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**
- ☐ Windows Server Essentials Experience
- ☐ Windows Server Update Services

Description

Active Directory Certificate Services (AD CS) is used to create certification authorities and related role services that allow you to issue and manage certificates used in a variety of applications.

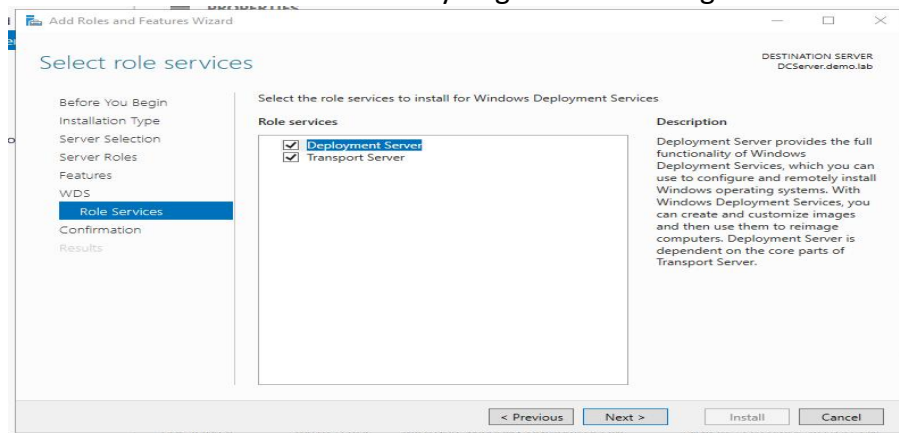
Navigation: < Previous, Next >, Install, Cancel

On this screen click the check box to select Windows Deployment Service.



Click Add Features button.

Then Click Next on all screens till you get the following screen.



Make sure both the check boxes are selected. Click Next.

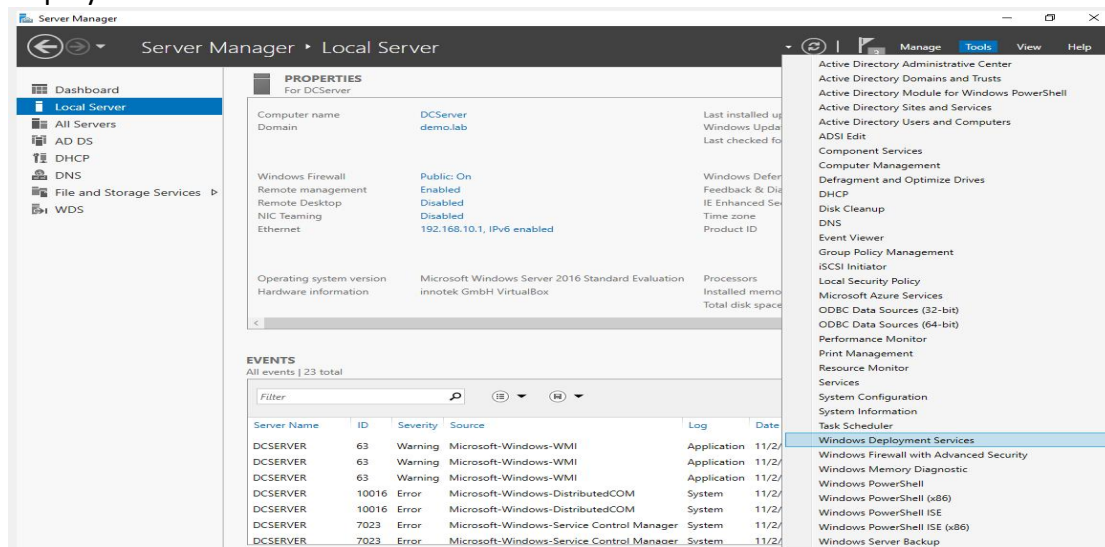
Finally Click Install to install the WDS role.

Once the installation is complete, click close.

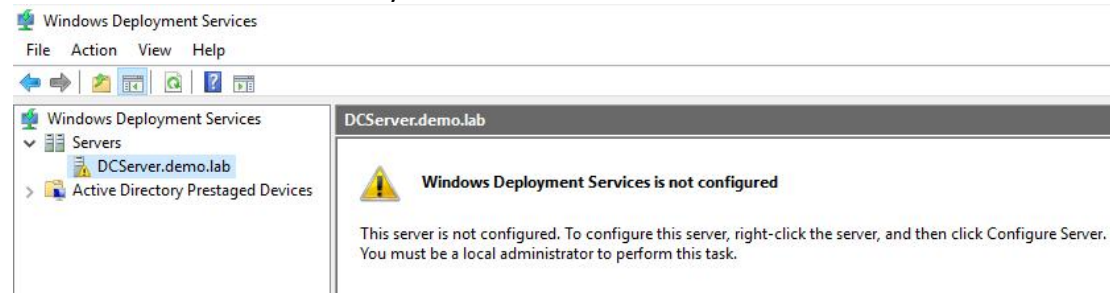
The WDS role is installed.

6. Configuration of WDS

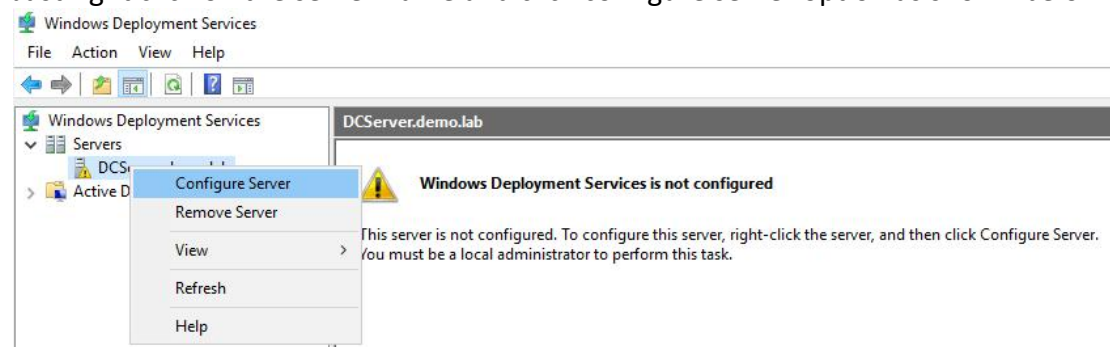
To configure WDS service, go to Server Manager. Click Tools and select Windows Deployment Service as shown below.



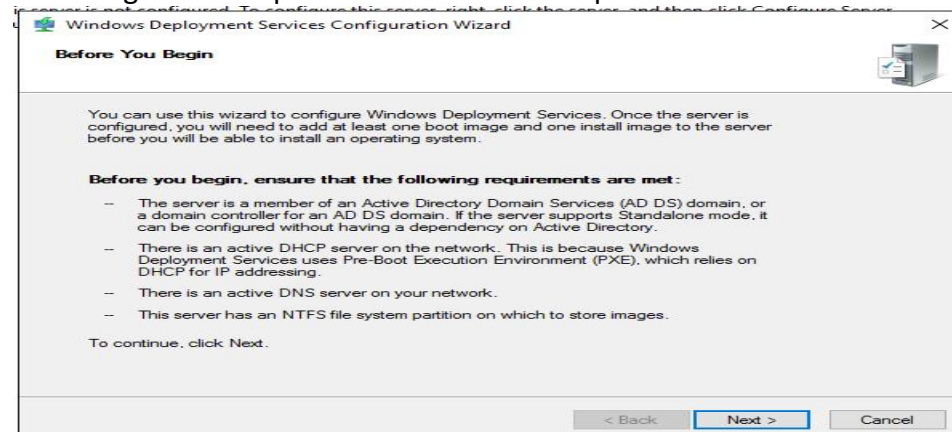
The WDS configuration console opens. Expand the servers option to display your server name. There will be a yellow mark on the name of the server as shown below.



Microsoft provides help about the next step to be performed. On the right side pane it mentions the action to be performed to configure the WDS. Just right click on the server name and click configure server option as shown below.



Following window opens. It mentions the requirements for WDS service.

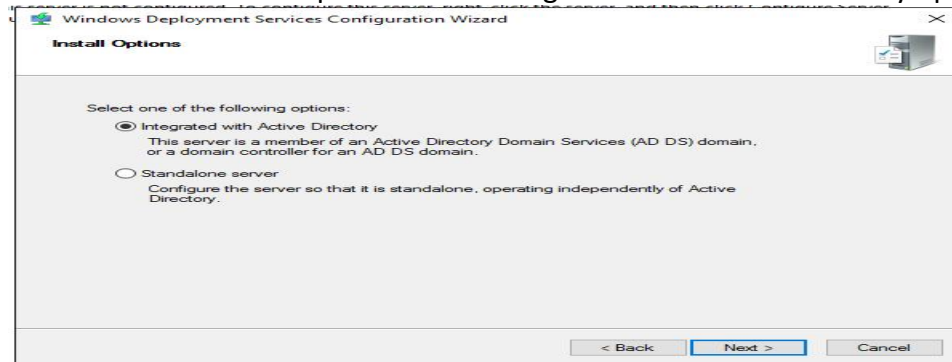


Click Next. The following screen displays an option to install WDS in Active directory integrated mode or in standalone Server mode.

The Active Directory allows an administrator to create computer accounts in Active Directory using UUID (a unique number provided by manufacturer and can be found in the computer BIOS setup) before an OS is installed on them. WDS treats them as known clients. Thus you can restrict the Windows OS installation to these computers only using WDS. Also these computers will be automatically added to domain as members. Also there computer accounts can be placed in the required OU's.

In Standalone Server mode it will simply install OS on all clients.

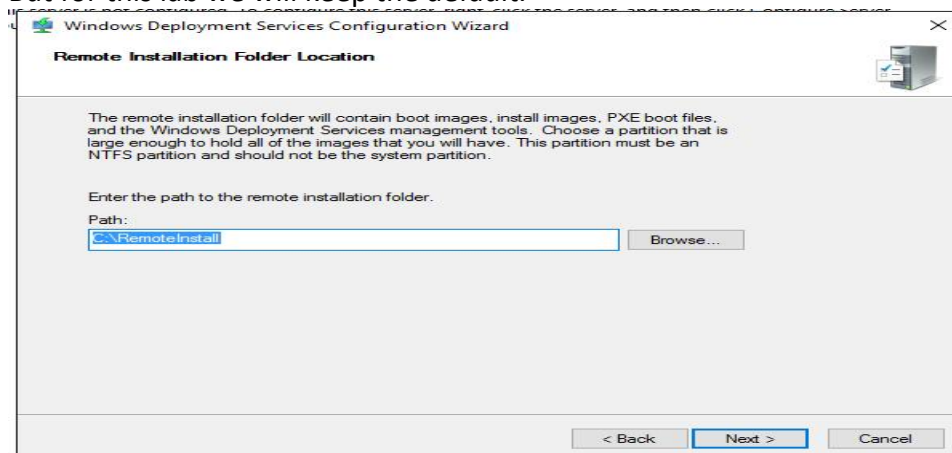
Here for this lab we keep the default Integrated with Active Directory option.



Click Next.

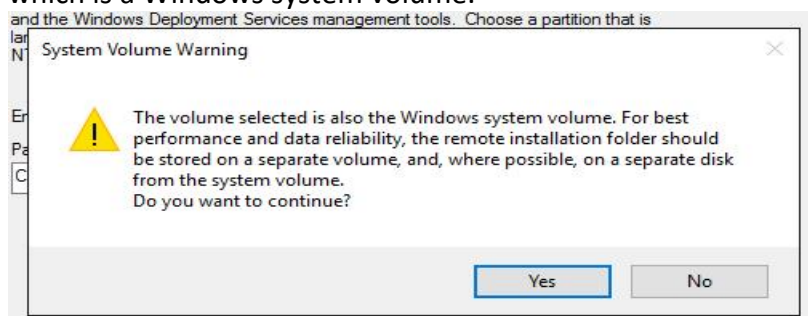
The next screen will prompt you for the location to store all WDS images and other data. It is recommended to store this directory on a separate partition with sufficient storage space other than C drive.

But for this lab we will keep the default.



Click Next.

Following warning will be displayed as we are storing the WDS folder on C drive which is a Windows system volume.

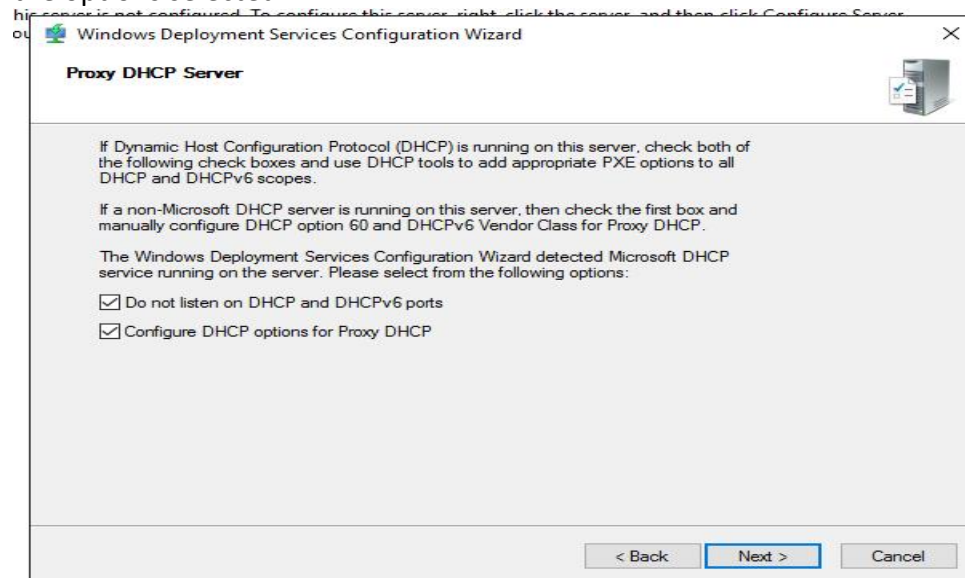


The next screen options are based on the DHCP Server configuration.

You need to keep both the check boxes selected if your DHCP server is installed on the same server where WDS is installed.

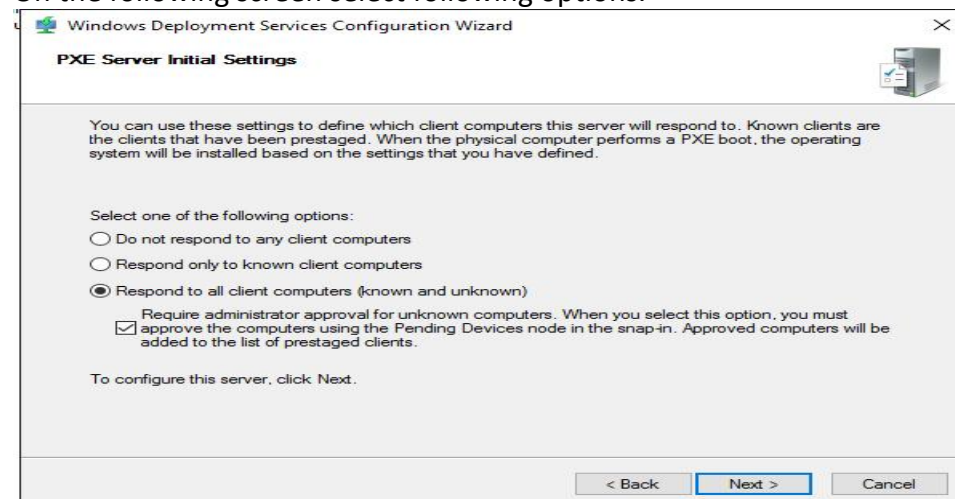
However if the DHCP server is installed on a separate server then you do not select these check boxes. Also you need to manually configure DHCP option 60.

In our lab scenario same server is hosting DHCP and WDS servers. Thus keep both the options selected.



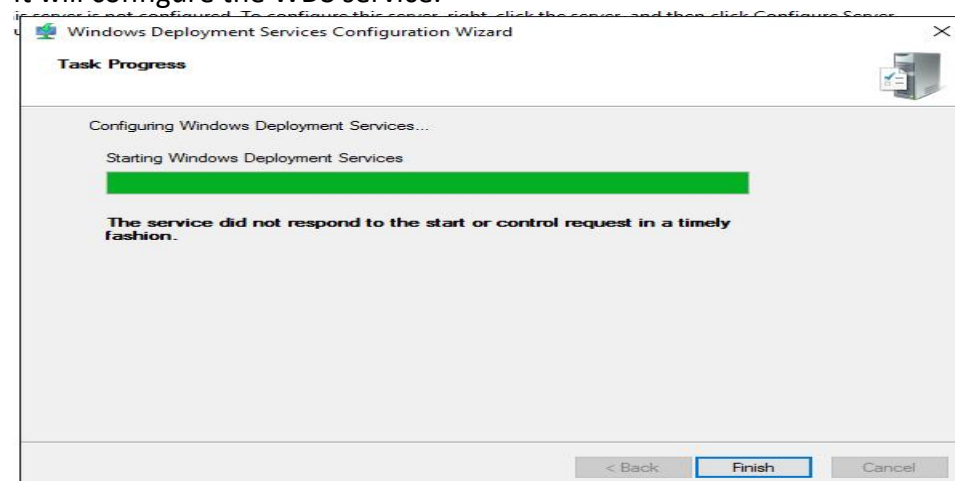
Click Next.

On the following screen select following options.



Click Next.

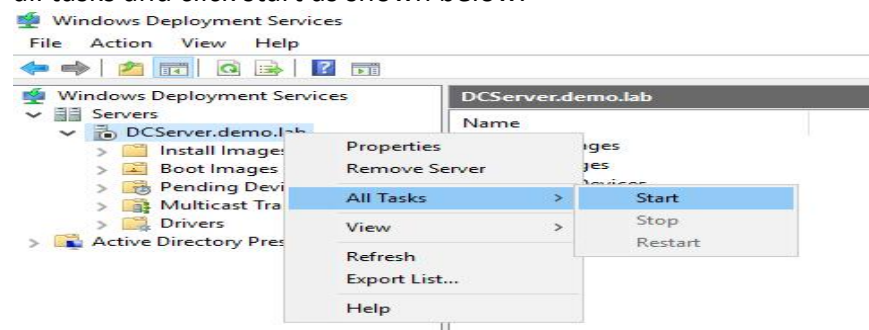
It will configure the WDS service.



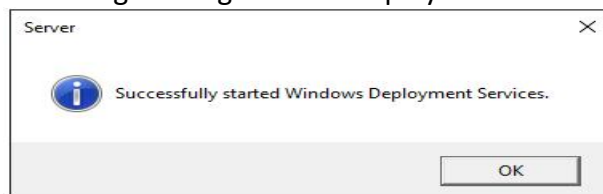
Click Finish.

The above screen shows an error that the service did not respond to the start. However this error may not appear on some servers. Do not worry about this error.

Because of this error the server name will show a black square on it. This means the WDS service is not running. To start the service, right click the server name and go to all tasks and click start as shown below.



Following message will be displayed.

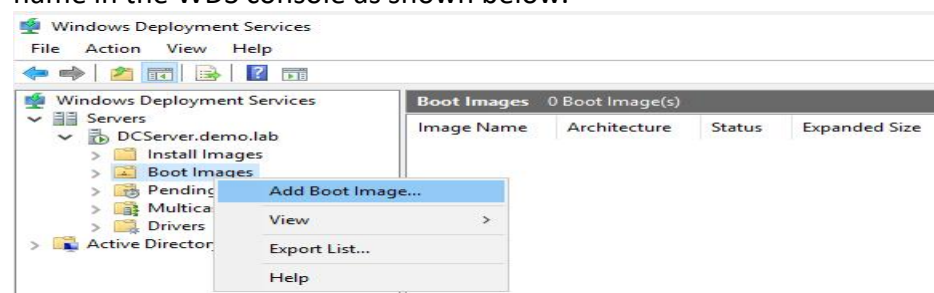


Click Ok.

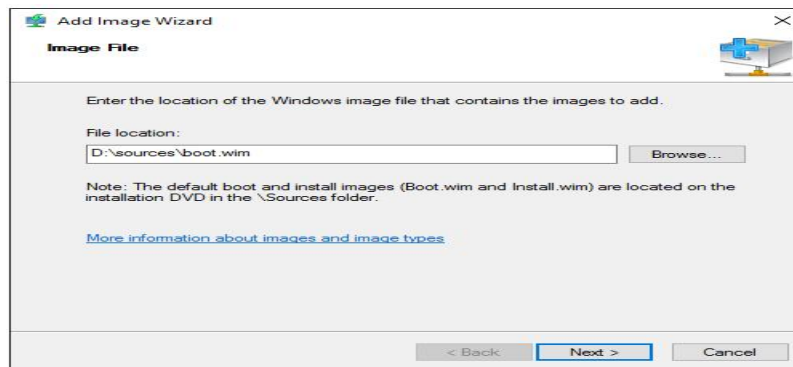
Now instead of Black square a green arrow should appear on the name of the server. It means the WDS service started successfully.

Next step is to add a boot image. The boot image is provided on the Microsoft Windows DVD. Boot image is common for all computers. Thus only one boot image is sufficient. You can add it from any Windows DVD. If you have 32 bit and 64 bit computer systems then you need to copy 2 Boot images one from 32 bit OS DVD and second from 64 bit OS DVD.

To add a boot image, first attach the Windows ISO image to virtual machine CDROM. It may be already present. Then right click on the boot images folder below server name in the WDS console as shown below.

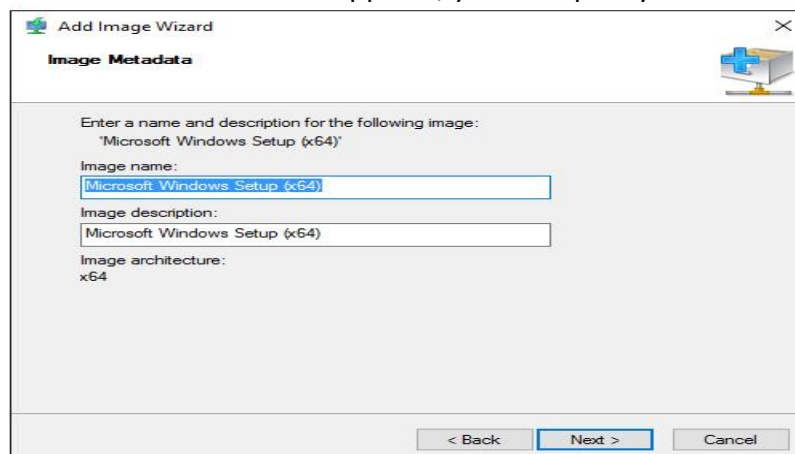


Click Add Boot Images . On the new screen that is displayed, click Browse button and select the CD/DVD drive. Go to the sources folder and select **boot.wim** file. As shown below.



Click Next.

On the below screen that appears, you can specify a name for the image.



Here we keep everything default and click Next.

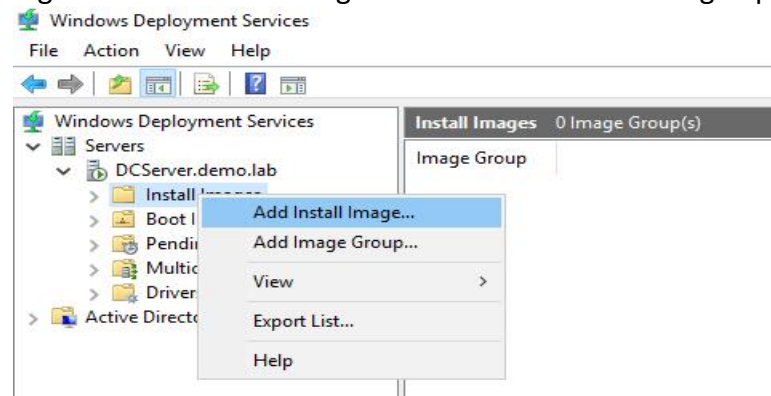
On the next Summary page also Click Next.

It will start copying the file. Once the file is copied successfully click Finish on the final screen.

Now add Install image.

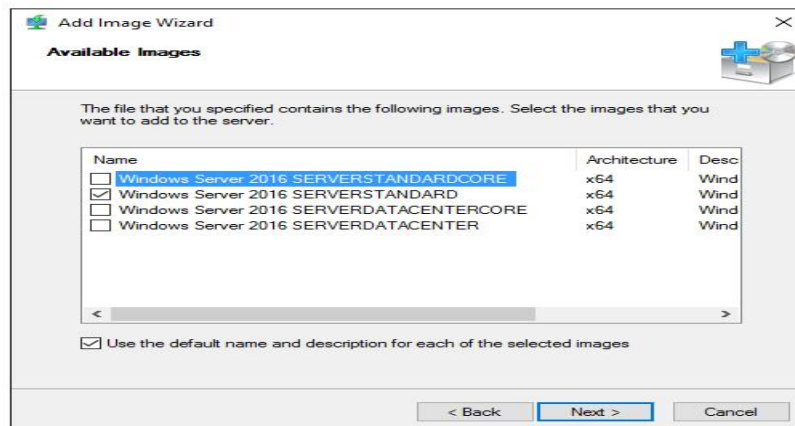
The install image contains the Windows OS installation setup. The Boot image contains windows bootable files and helps client boot using it. Then client will download this install image from the WDS server and start installing Windows OS.

Right click the Install Images and click Add Install image option.



On the next screen Click Next. The next screen that appears Browse and select your CD drive. Go to the sources folder and this time select install.wim. Click Next.

Following screen will be displayed. The options displayed will be different based on the Windows OS DVD attached. Like for Windows 11 you may get different options.



Keep required OS based on your license selected and uncheck all other check boxes as shown above. Click Next.

Then Click Next on the next screen.

It will copy the file. It may take time based on the options selected.

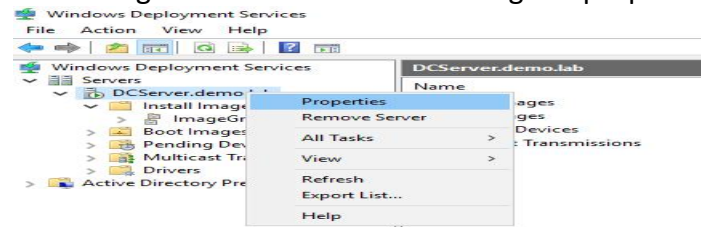
Once the file is copied click Finish.

This is how add all the Install images of all the Windows OS that you need to install on your client computers. You need to insert or attach the respective DVD of that OS and copy install.wim file.

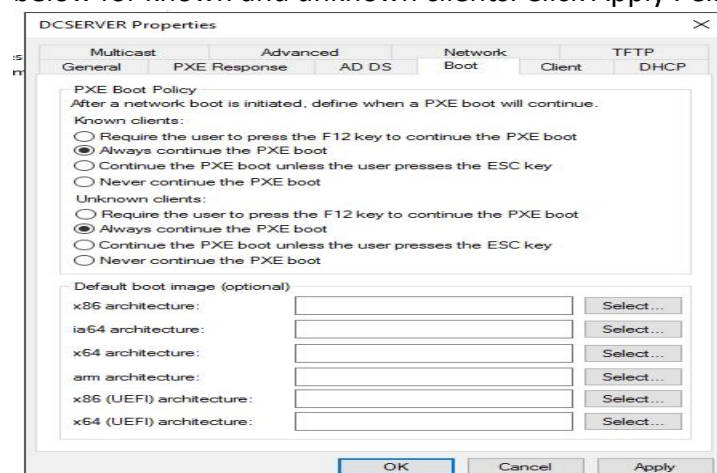
Now your WDS server is ready.

But Before we create a client and install Windows OS on it, we will disable a requirement to press F12 button on client to start boot and installation from WDS.

For this right click the server name and go to properties.



On the new Window that opens, go to the Boot tab. Change the options as shown below for known and unknown clients. Click Apply . Click OK to close the window.



If you are doing this lab in virtual machine then you need to disable built in DHCP server in VMWare Workstation/Player or Oracle VirtualBox.

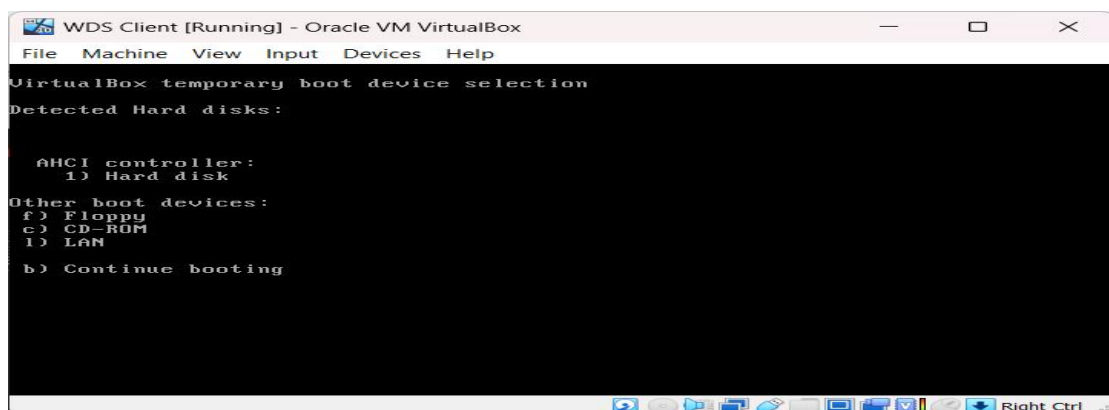
Also in Oracle VirtualBox make sure the WDS server and the client network cards are in Host-only mode.

Now Create a new Virtual Machine. Do not attach any ISO image. You may remove the CD drive from the settings of the menu.

Then Boot the machine with boot from network option. In Oracle Virtual Box you have to press F12 (On laptop may be Fn + F12) as soon as the VM starts and Virtual Box logo is displayed.



Following screen appears.



Press l to boot from LAN.

Once the machine boots over the network . If you may get a screen similar to the following.


```

Network boot from Intel E1000
Copyright (C) 2003-2008 VMware, Inc.
Copyright (C) 1997-2000 Intel Corporation

CLIENT MAC ADDR: 00 0C 29 EF 61 B2  GUID: 564D708C-8D51-33A3-DEB8-797615EF61B2
CLIENT IP: 192.168.1.100  MASK: 255.255.255.0  DHCP IP: 192.168.1.10

Downloaded WDSNBP...

Press F12 for network service boot
Architecture: x64

The details below show the information relating to the PXE boot request for
this computer. Please provide these details to your Windows Deployment Services
Administrator so that this request can be approved.

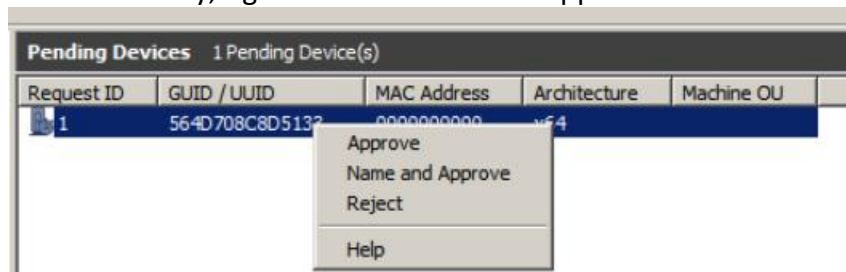
Pending Request ID: 1

Message from Administrator:

Contacting Server: 192.168.1.10._

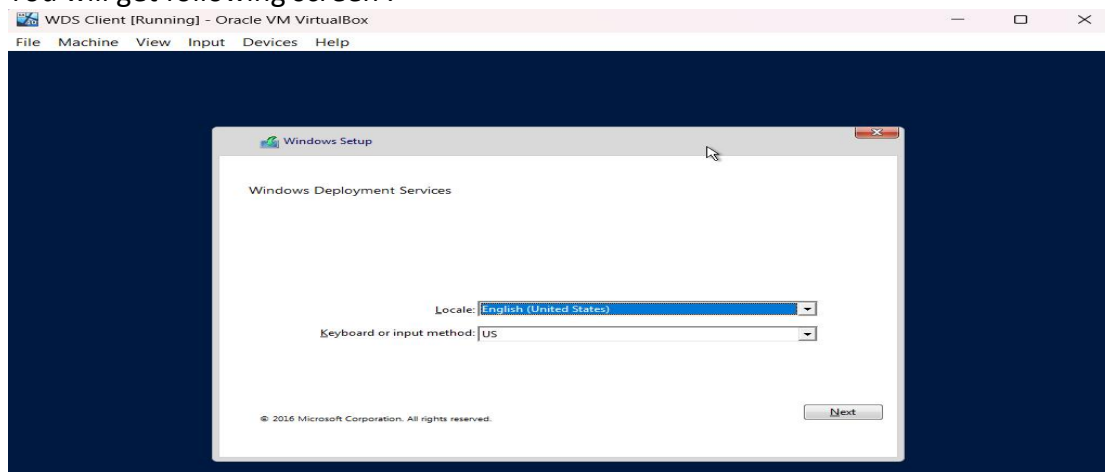
```

Now go to the WDS console. Click on the Pending Devices. On the right side there will be an entry, right click on it and click Approve



In some cases the installation may start on the VM. You do not require to Approve.

You will get following screen .



Click Next. Logon as Domain administrator and continue with the installation.

This is how you have successfully deployed the Windows Deployment Service.