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*I confirm that I understand my coursework needs to be submitted online via Google Classroom under the relevant module page before the deadline in order for my assignment to be accepted and marked. I am fully aware that late submissions will be treated as non-submission and a mark of zero will be awarded.*

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## **1.Introduction**

Active Directory (AD) is Microsoft's proprietary directory service. It runs on Windows Server and enables administrators to manage permissions and access to network resources.

Active Directory stores data as objects. An object is a single element, such as a user, group, application or device such as a printer. Objects are normally defined as either resources, such as printers or computers, or security principals, such as users or groups (Chai, 2021).

Authentication and authorization in Active Directory are carried out by a server called domain controller (DC). When a user logs in, AD goes and checks their username and password to ensure that it is correct. After it has been found to be correct, access to resources is provided according to their rights of the account. The main features of AD are Centralized Management, Security, Scalability. Management from a single location enables Centralized Management. In Security, what you are allowed to see and do, you can control using permissions and policies. In Scalability, it caters for both Small organizations and large businesses.

## **2. Aim of the report**

The report aims to provide an elaborate guide on how to set up and verify Active Directory Domain Controller in a Windows Server 2022 system. The main goal of this report is to simplify the processes of installation and configuration for your system administrators through step-by-step approaches

## **3.Objective of the report**

- Emphasize why Active Directory is important and what role it plays in network management.
- Description of the Active Directory functions.
- How it would help in managing resources like computers, printers, and devices.

- Instructing a step-by-step way to install and configure Active Directory Domain Services over the Windows Server 2022 Operating System
- Verification mechanisms following successful domain controller setup
- Illustrative useful commands to fetch domain and forest information after successful installation.

#### 4. Required Tools

- Windows Server 2022 with administrative access.
- Server Manager Application to manage server features and roles.
- PowerShell for verifying configurations and retrieving domain-related information.
- Internet access (if needed) for updates or troubleshooting during installation.

#### 5. Steps to install Active Directory Domain Services:

Step 1: Log in to the Windows Server 2022 system as an administrator and open the Server Manager using the procedure shown below:

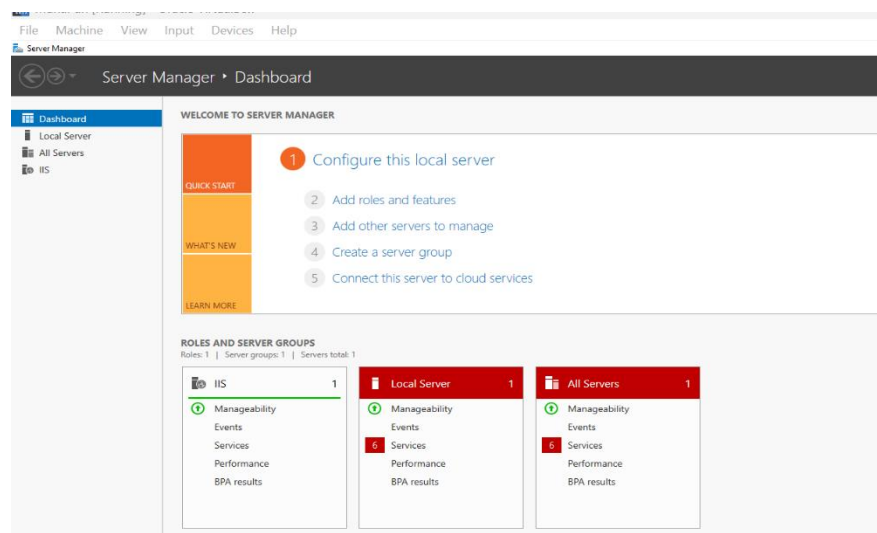


Figure 1: Sever Manager Dashboard

Step 2: Select the option 'Add Roles and Features,' which will open the 'Add Roles and Features Wizard' as presented.

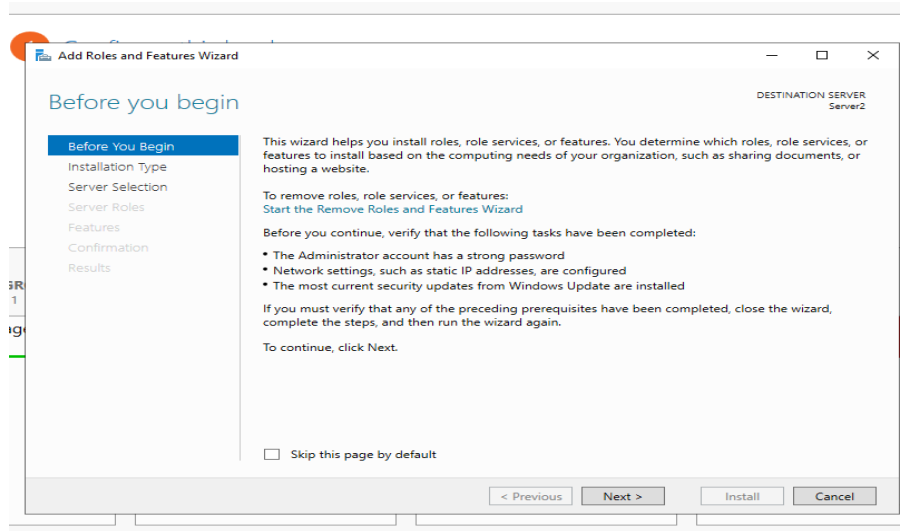


Figure 2: Adding roles and features

Step 3: Select 'Next' to configure an installation type, as displayed below.

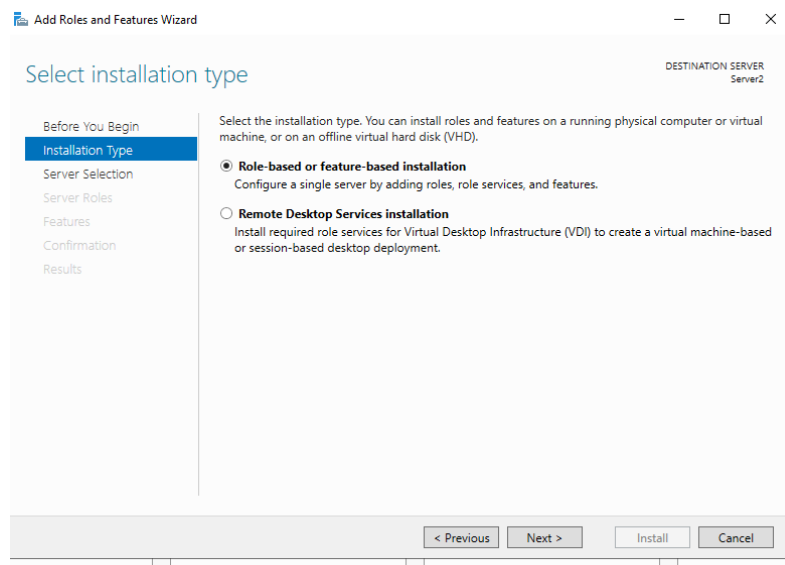


Figure 3: Clicking installation type

Step 4: Following the addition of a different wizard, Add Roles and Features, click 'Next.'

Step 5: Click 'Next' after selecting 'Select a server from the server pool.' You will be asked or shown how to choose from 'server roles' as displayed below:

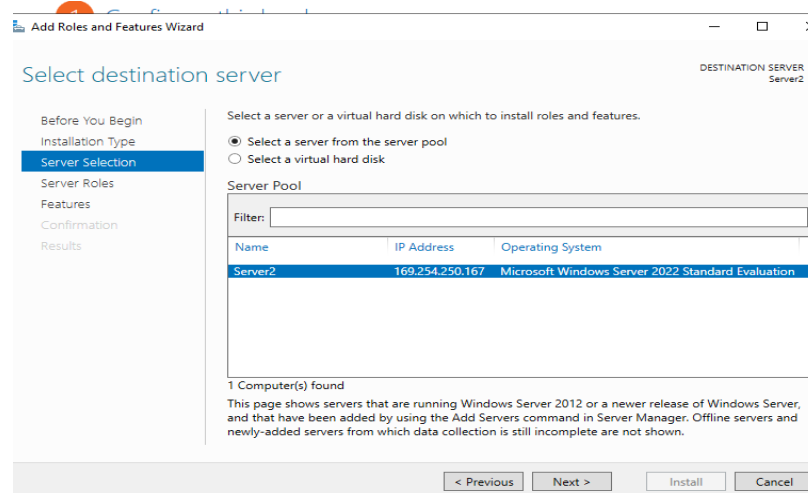


Figure 4: Selecting a destination Server

Step 6: Click 'Next' after selecting Active Directory Domain Services. It will ask you to select 'the following features of this server role,' as shown below:

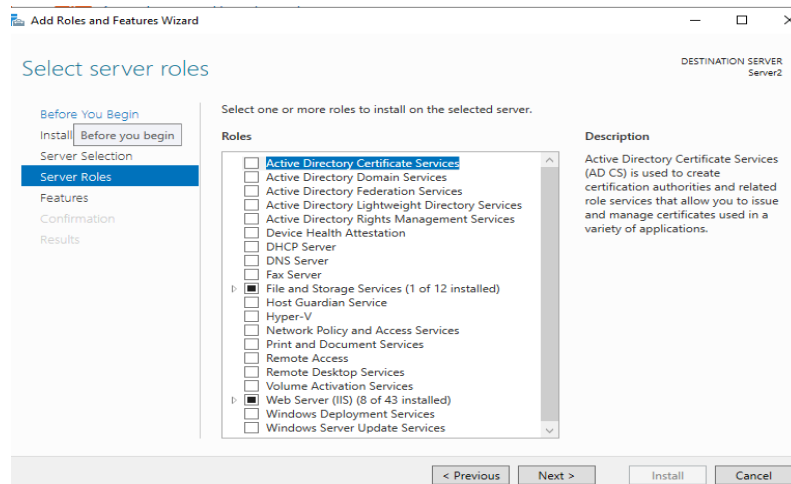


Figure 5: Selecting a server from server pool

Step 6: Click 'Next' after selecting Active Directory Domain Services. It will ask you to select 'the following features of this server role,' as shown below:

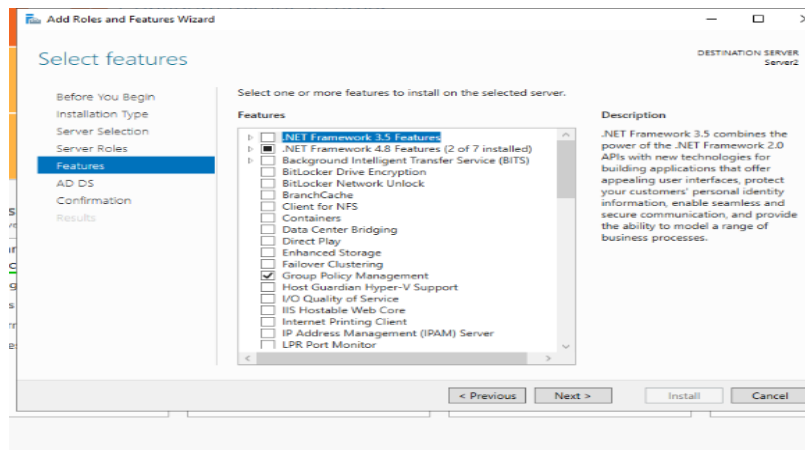


Figure 6: Active Directory Domain Services

Step 8: Click 'Install'—then, the installation process will begin. After doing this, you will be displayed with this page.

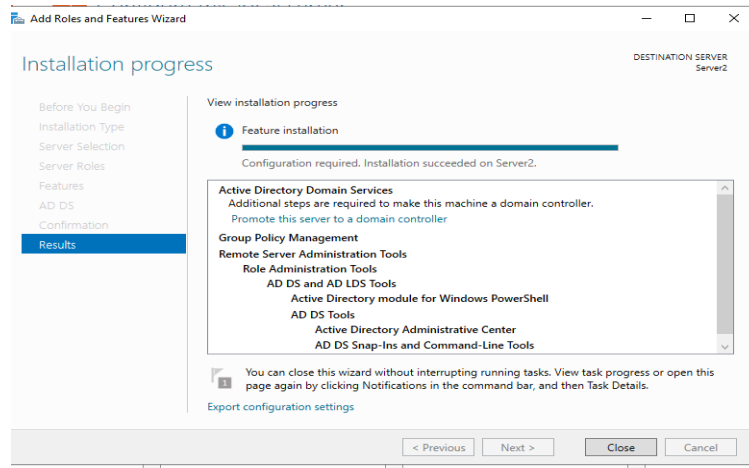


Figure 7: Installation Completed

Step 9: After done, click on the Close button. You should be reaching this page.

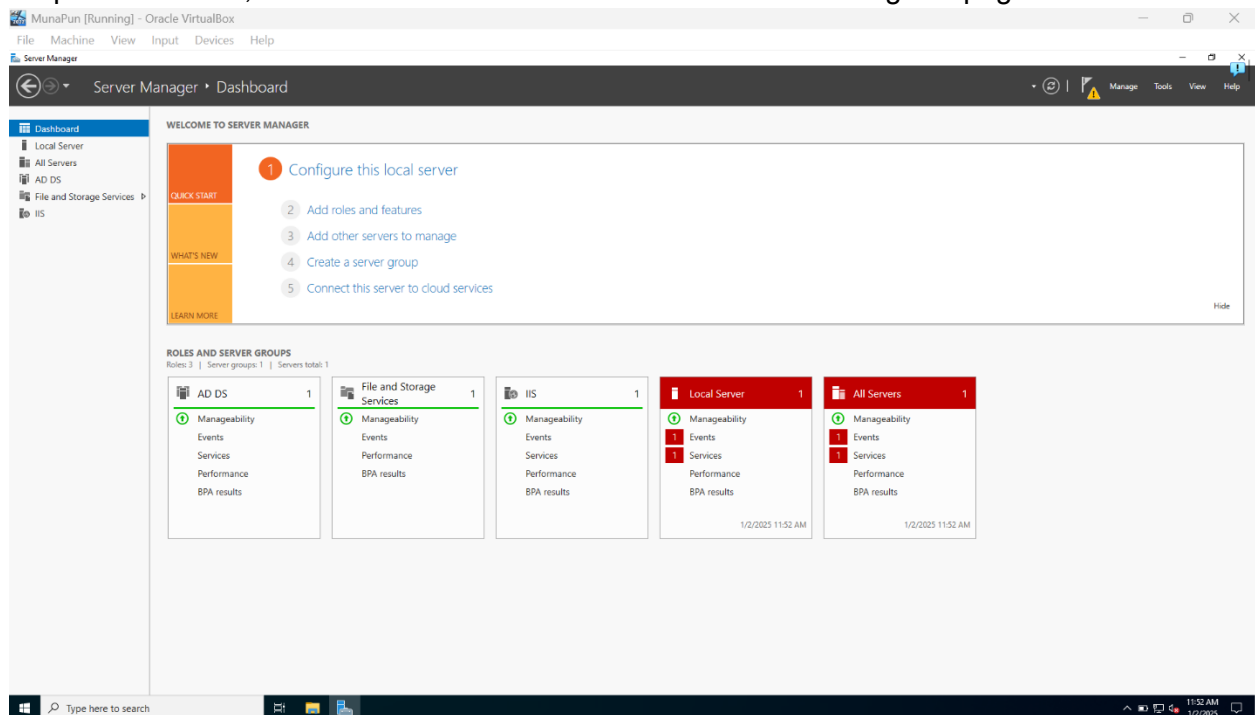


Figure 8: Server Manager dashboard after installing

Step 10: In step number 10, you will click on the yellow notification symbol. Take a look at the page below:



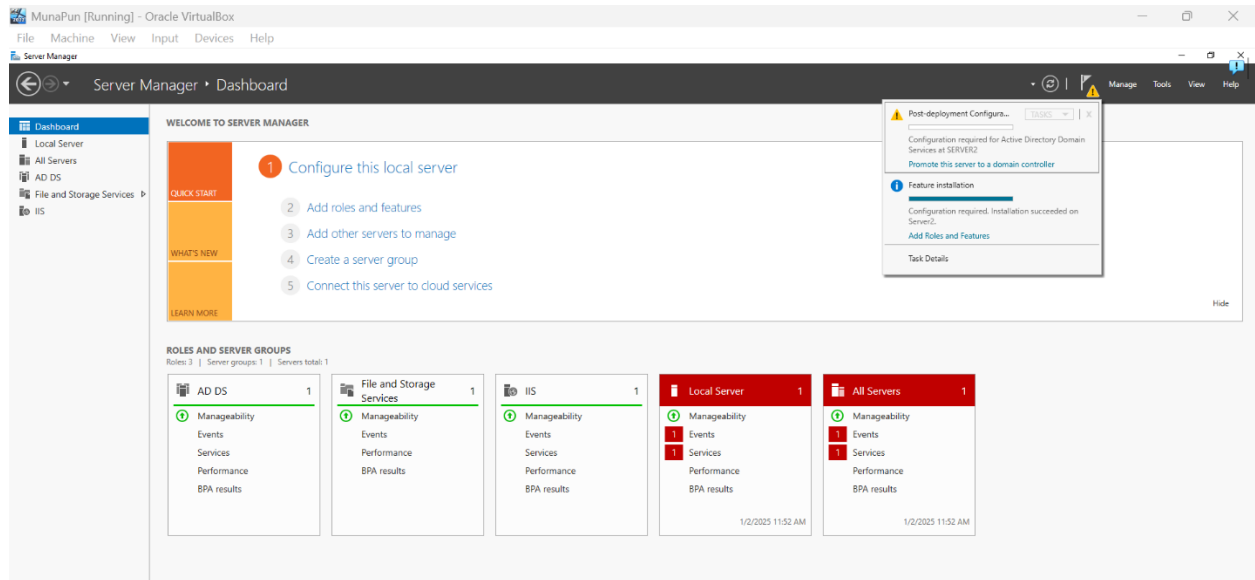


Figure 9: Clicking on a yellow notification icon

Step 11: In step 11, click on 'Promote this server to a domain controller.' Further, the deployment configuration page will appear, as shown below:

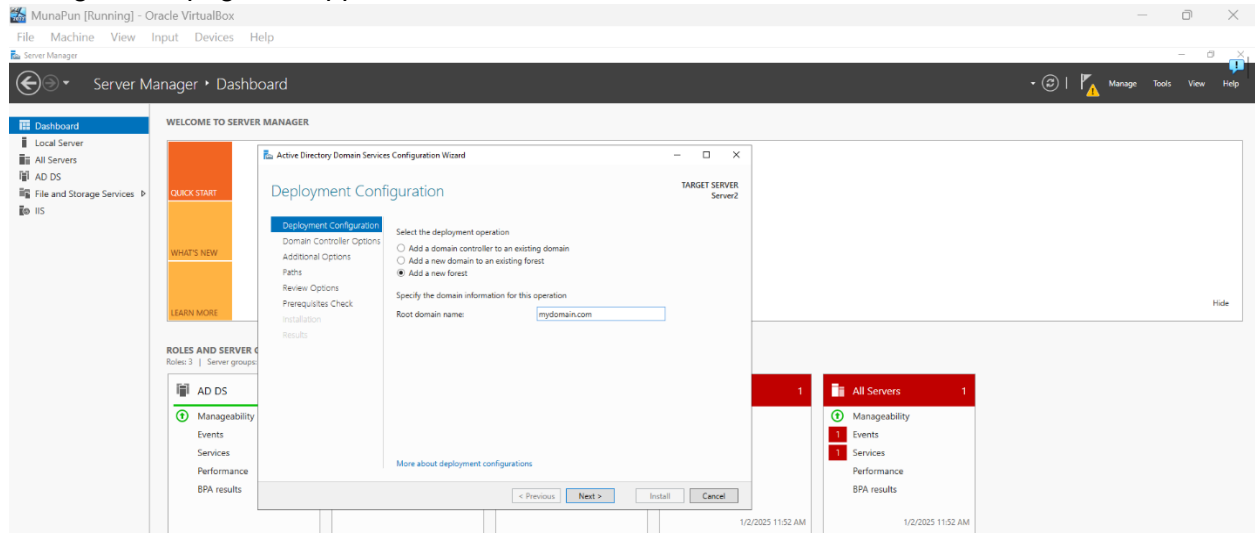


Figure 10: Deployment setup

Step 12: Hit the 'Next' button after selecting 'Add a new forest' and entering your domain name. The new domain controller options page will then be displayed, as shown below:

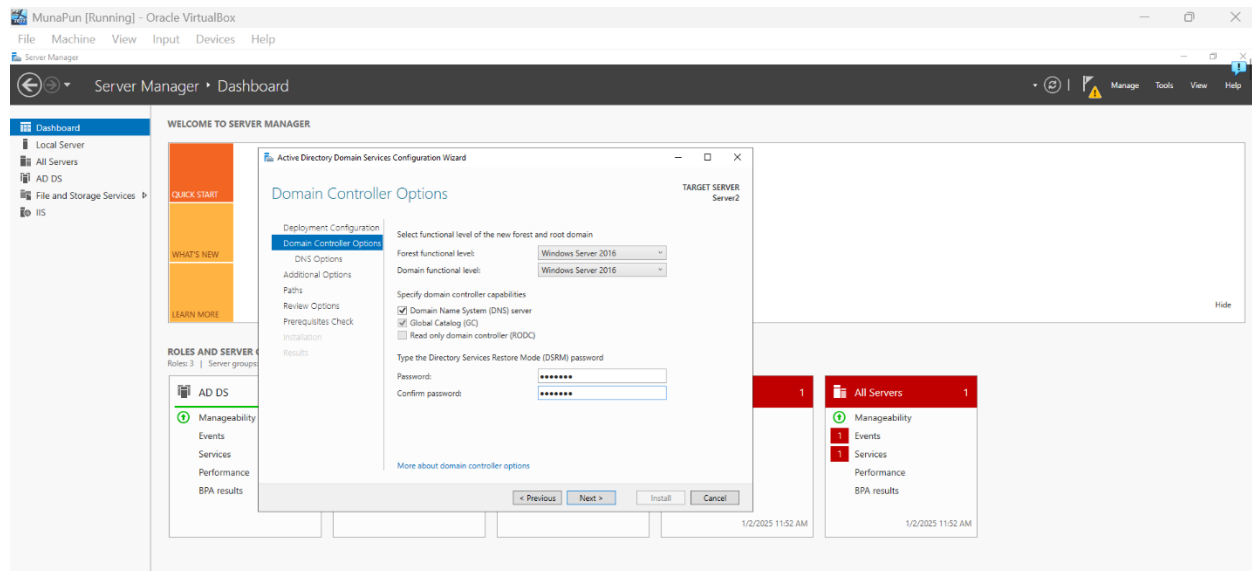


Figure 11: Typing password in a domain Controller Options

Step 13: Click 'Next' after typing in your directory service restore mode password. It will show the DNS options page, as follows

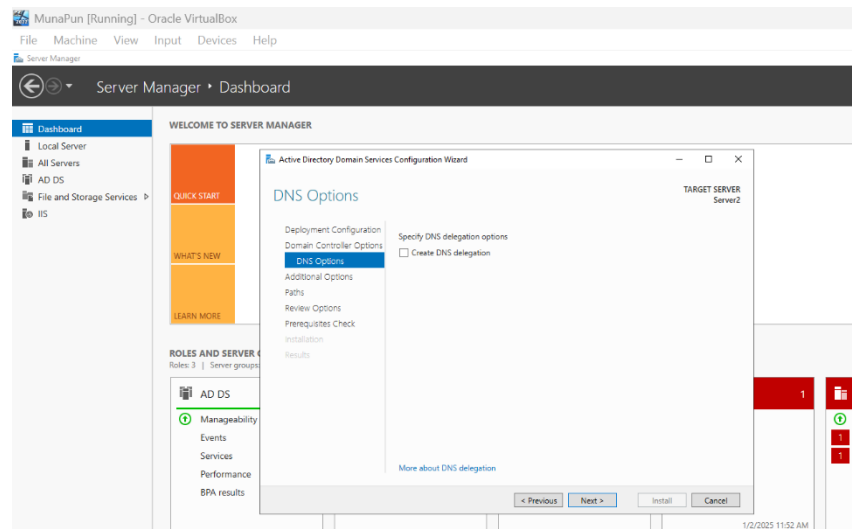


Figure 12: DNS option

Step 14: We select the option 'Next' to leave this on the default setup configuration. It will ask you to enter the NetBIOS name.

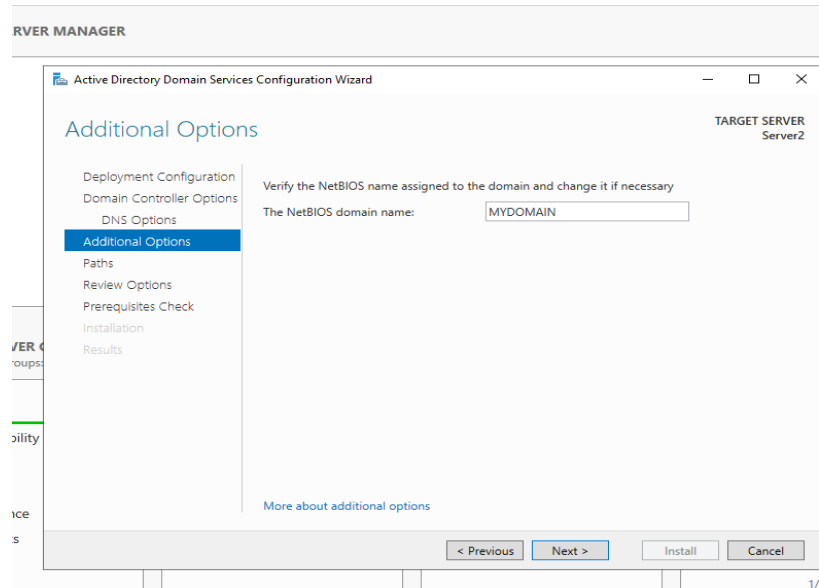


Figure 13: Additional options

Step 15: Click 'Next' after choosing your NetBIOS name. You will be asked to enter the location of the AD DS database path:

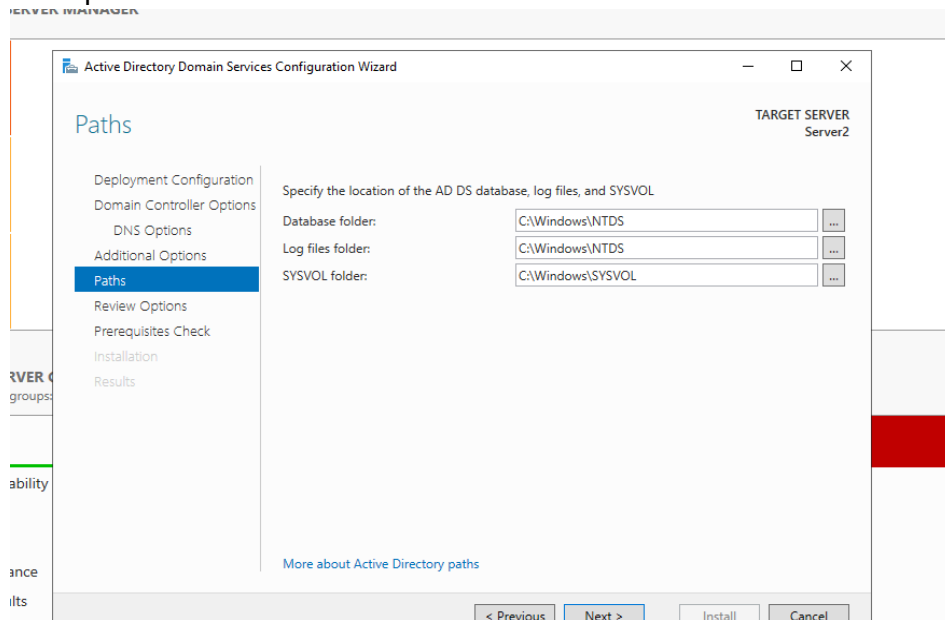


Figure 14: Paths for AD DS database

Step 16: Hit the Next button after using the default path. After that, monitor the page that reviews every option, as seen below.

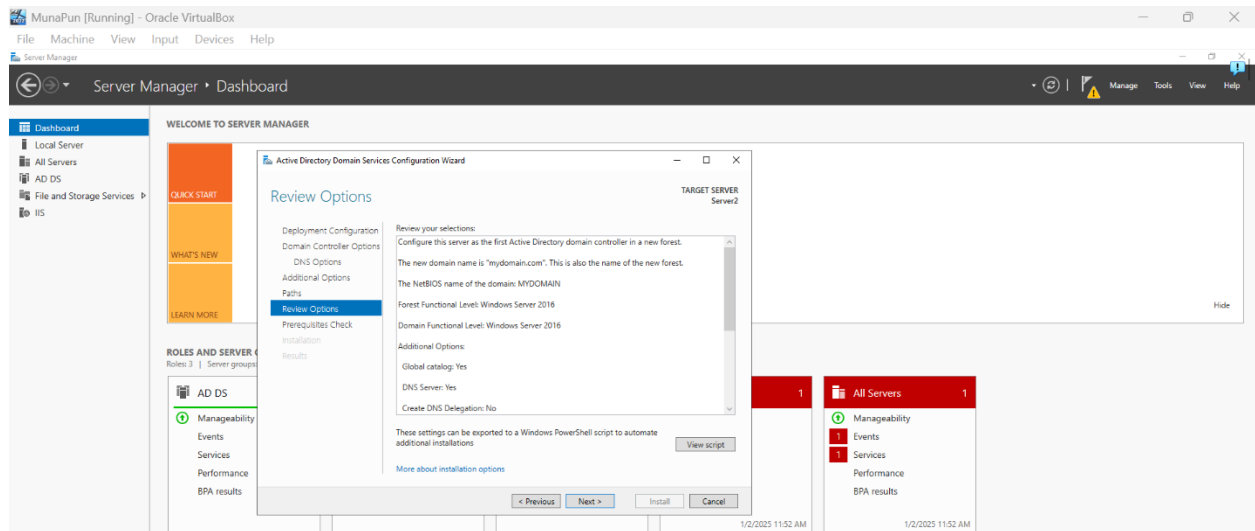


Figure 15:Review Option

Step 17: Click Next, having verified all the configuration. Then, the prerequisite check page will be shown as follows:

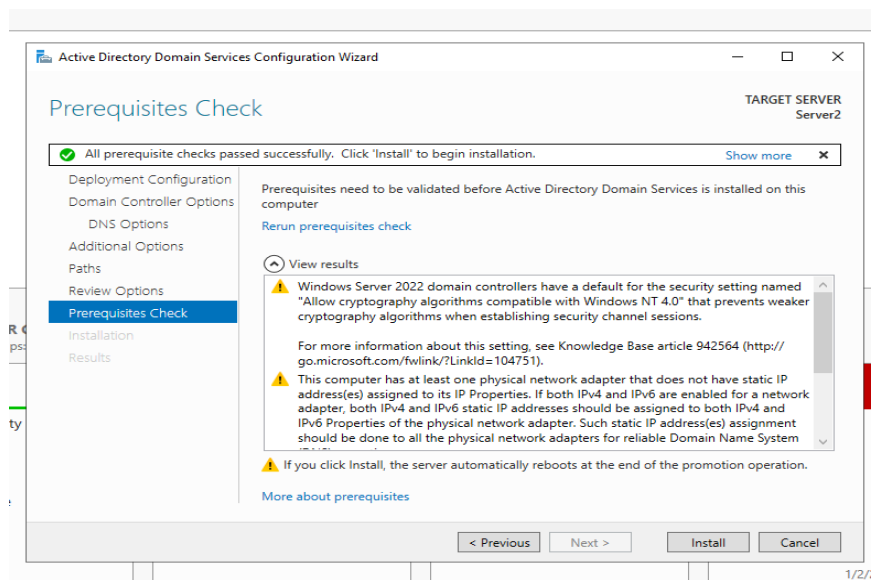


Figure 16:Prerequisites check

Step 18: After ensuring that all prerequisite checks are complete, click on Install. Your computer will reboot properly once the installation process is successfully done.

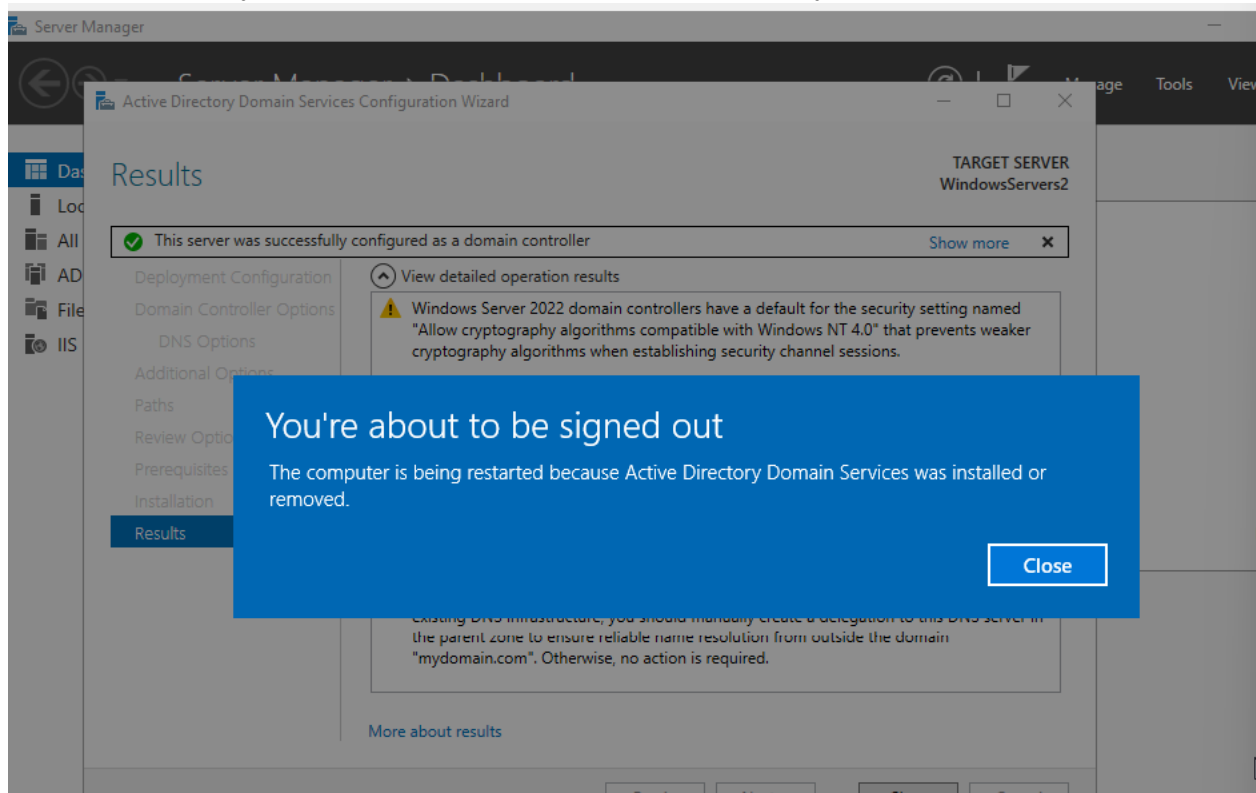


Figure 17: Signing out of active directory Domain Services

## Verify Domain Controller

In, Verify Domain Controller you have to make sure that domain controller properly set- up or not. You can even show it from PowerShell again. If you get the confirmation that the services were installed successfully to run the following command in Windows PowerShell.

The command is: `Get-Service adws, kdc, netlogon, dns`.

This output of this command will be displayed on screen

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\vboxuser> Get-Service adws,kdc,netlogon,dns

Status  Name      DisplayName
-----
Running adws      Active Directory Web Services
Running dns      DNS Server
Running kdc      Kerberos Key Distribution Center
Running Netlogon  netlogon
```

Figure 18:Runiing command to get service

Run the command which is displayed below in order to access each piece of information of the domain controller's configuration.

The command is: Get-ADDomainController

The output of this command will be displayed on screen

```
PS C:\Users\vboxuser> GET-ADDomainController

ComputerObjectDN      : CN=SERVER2,OU=Domain Controllers,DC=mydomain,DC=com
DefaultPartition      : DC=mydomain,DC=com
Domain                : mydomain.com
Enabled               : True
Forest                : mydomain.com
HostName              : Server2.mydomain.com
InvocationId          : 8ea4e153-aa4a-4d83-93d6-987ba0fea7d6
IPv4Address           : 192.168.1.71
IPv6Address           : 2404:7c00:4a:e3b2:6596:5e3b:92b1:faa7
IsGlobalCatalog       : True
IsReadOnly            : False
LdapPort              : 389
Name                  : SERVER2
NTDSSettingsObjectDN  : CN=NTDS Settings,CN=SERVER2,CN=Servers,CN=Default-First-Site-Name,CN=Sites,CN=Configuratio
n,DC=mydomain,DC=com
OperatingSystem        : Windows Server 2022 Standard Evaluation
OperatingSystemHotfix  :
OperatingSystemServicePack :
OperatingSystemVersion : 10.0 (20348)
OperationMasterRoles   : {SchemaMaster, DomainNamingMaster, PDCEmulator, RIDMaster...}
Partitions             : {DC=ForestDnsZones,DC=mydomain,DC=com, DC=DomainDnsZones,DC=mydomain,DC=com,
CN=Schema,CN=Configuration,DC=mydomain,DC=com, CN=Configuration,DC=mydomain,DC=com...}
ServerObjectDN         : CN=SERVER2,CN=Servers,CN=Default-First-Site-Name,CN=Sites,CN=Configuration,DC=mydomain,DC=
com
ServerObjectGuid       : b8584ae2-81be-4c16-9d93-30bd4fdbf2cf
Site                   : Default-First-Site-Name
SslPort                : 636

PS C:\Users\vboxuser>
```

*Figure 19: Get-ADDomainController command*

Run the command presented below to get complete domain information:

Get-ADDomain mydomain.com

Output of this command will display on Screen.

```

PS C:\Users\vboxuser> GET-ADDomain mydomain.com

AllowedDNSSuffixes      : {}
ChildDomains            : {}
ComputersContainer      : CN=Computers,DC=mydomain,DC=com
DeletedObjectsContainer : CN=Deleted Objects,DC=mydomain,DC=com
DistinguishedName       : DC=mydomain,DC=com
DNSRoot                 : mydomain.com
DomainControllersContainer : OU=Domain Controllers,DC=mydomain,DC=com
DomainMode              : Windows2016Domain
DomainSID               : S-1-5-21-842846246-4774167-3764600527
ForeignSecurityPrincipalsContainer : CN=ForeignSecurityPrincipals,DC=mydomain,DC=com
Forest                  : mydomain.com
InfrastructureMaster     : Server2.mydomain.com
LastLogonReplicationInterval :
LinkedGroupPolicyObjects : {CN={31B2F340-016D-11D2-945F-00C04FB984F9},CN=Policies,CN=System,DC=mydomain,DC=com}
LostAndFoundContainer    : CN=LostAndFound,DC=mydomain,DC=com
ManagedBy               :
Name                     : mydomain
NetBIOSName              : MYDOMAIN
ObjectClass              : domainDNS
ObjectGUID               : 7e82dd1b-1783-4026-bc3d-53dc8fb133c9
ParentDomain             :
PDCEmulator              : Server2.mydomain.com
PublicKeyRequiredPasswordRolling : True
QuotasContainer          : CN=NTDS Quotas,DC=mydomain,DC=com
ReadOnlyReplicaDirectoryServers : {}
ReplicaDirectoryServers  : {Server2.mydomain.com}
RIDMaster                : Server2.mydomain.com
SubordinateReferences    : {DC=ForestDnsZones,DC=mydomain,DC=com, DC=DomainDnsZones,DC=mydomain,DC=com, CN=Configuration,DC=mydomain,DC=com}
SystemsContainer         : CN=System,DC=mydomain,DC=com
UsersContainer           : CN=Users,DC=mydomain,DC=com

PS C:\Users\vboxuser>

```

Figure 20: Get -ADDomain mydomain.com command

Run the command described below to access your Active Directory Forest information:

The command is: Get-ADForest mydomain.com

The output of this command will be displayed on the screen:

```

PS C:\Users\vboxuser> GET-ADForest mydomain.com

ApplicationPartitions : {DC=ForestDnsZones,DC=mydomain,DC=com, DC=DomainDnsZones,DC=mydomain,DC=com}
CrossForestReferences : {}
DomainNamingMaster    : Server2.mydomain.com
Domains               : {mydomain.com}
ForestMode             : Windows2016Forest
GlobalCatalogs        : {Server2.mydomain.com}
Name                  : mydomain.com
PartitionsContainer    : CN=Partitions,CN=Configuration,DC=mydomain,DC=com
RootDomain             : mydomain.com
SchemaMaster           : Server2.mydomain.com
Sites                 : {Default-First-Site-Name}
SPNSuffixes           : {}
UPNSuffixes           : {}

PS C:\Users\vboxuser>

```

Figure 21: Get-ADForest mydoaim.com

## **6. Conclusion**

The report is quite detailed on how one can set up and validate an Active Directory Domain Controller. It provides a step-by-step process that will help system administrators have centralized management of network resources and increased security in their IT infrastructure. Besides, validation steps ensure that the setup works with a correct configuration for deployment confidence.

## **7.References**

Chai, W. ( 2021, June). *Tech Target*. Retrieved from What is Active Directory and how does it work?: <https://www.techtarget.com/searchwindowsserver/definition/Active-Directory>