



Module Code & Module Title
Level 5 – Network Operating System

Assessment Type
Logbook 9
Semester 1
2023/2024 Autumn

Student Name: Dipen Khatri
London Met ID: 23056968
College ID: NP04CP4A230133
Assignment Due Date: 4 January 2025
Assignment Submission Date: 4 January 2025
Submitted To: Mr. Prasant Adhikari

I confirm that I understand my coursework needs to be submitted online via GitHub before the deadline 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.

Table of Contents

Introduction	4
STEP 1	5
STEP 2	6
STEP 3	7
STEP 4	8
STEP 5	9
STEP 6	10
STEP 7	11
STEP 8	12
STEP 9	13
STEP 10	14
STEP 11	15
STEP 12	16
STEP 13	17
STEP 14	18
STEP 15	19
STEP 16	20
STEP 17:	21
STEP 18	22
Verify Domain Controller	22
Conclusion	26

Table of figures

Figure 1: Opening Server manager	5
Figure 2: Add Roles & Features.....	6
Figure 3: Select Installation Type.....	7
Figure 4: Select Destination Server	8
Figure 5: Select Server Roles	9
Figure 6: Select Features	10
Figure 7: Installation selection	11
Figure 8: Installation Finished	12
Figure 9: After The Installation	13
Figure 10: Clicking on Yellow icon	14
Figure 11: Deployment Configuration Page	15
Figure 12: Domain Controller Option	16
Figure 13: DNS Option Page	17
Figure 14: NetBIOS Name	18
Figure 15: Database Path Location	19
Figure 16: Review All Option Page	20
Figure 17: Prerequisites Check Page	21
Figure 18: Status Of all Services	22
Figure 19: Displaying all Configuration Details	23
Figure 20: Detailed Information about our Domain	24
Figure 21: Displaying Active Directory Forest Details	25

Introduction

This log provides a comprehensive record of the process involved in setting up an **Active Directory Domain Controller** in a **Windows Server 2022** environment. Active Directory (AD) is a critical Microsoft technology that enables centralized management of network resources, including users, computers, and other devices. By implementing a Domain Controller, we can enforce security policies, streamline user authentication, and efficiently manage access to network resources. This log aims to document the steps taken to set up a Domain Controller, providing a clear and traceable record of the configuration process.

The log begins by explaining the fundamental concepts of Active Directory, using an analogy to a mobile phone's contact application to illustrate its functionality. This helps us understand AD as a system that organizes and manages objects (like contacts) across the network. It then provides a detailed, step-by-step walkthrough of the installation and configuration process. Each step is supported by screenshots, ensuring clarity and ease of understanding. These steps include installing **Active Directory Domain Services (AD DS)**, promoting the server to a Domain Controller, and configuring essential settings, such as the domain name and **Directory Services Restore Mode (DSRM)** password.

Finally, the log concludes with verification procedures to confirm the successful setup of the Domain Controller. It outlines how we can use **PowerShell commands** to:

- Check the status of critical services,
- Retrieve domain and Domain Controller information, and
- Verify the overall health of the Active Directory environment.

By following this log, we can create a detailed audit trail of the deployment and configuration process for our Active Directory infrastructure. This documentation serves as a valuable reference for troubleshooting and future maintenance, ensuring a secure and efficient network environment.

STEP 1

Login to Windows server 2022 as an administrator and open the Server Manager as shown below:

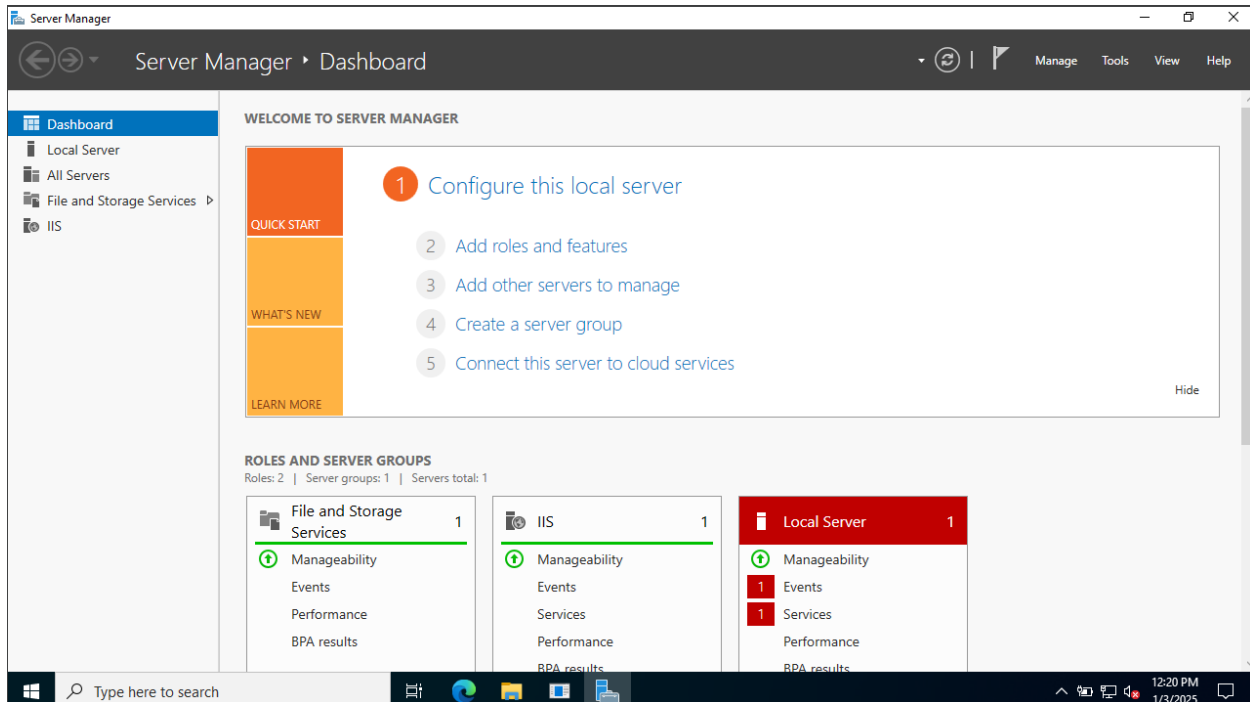


Figure 1: Opening Server manager

STEP 2

Click on the **Add Roles and Features**. This will open the Add Roles and Features Wizard as shown below:

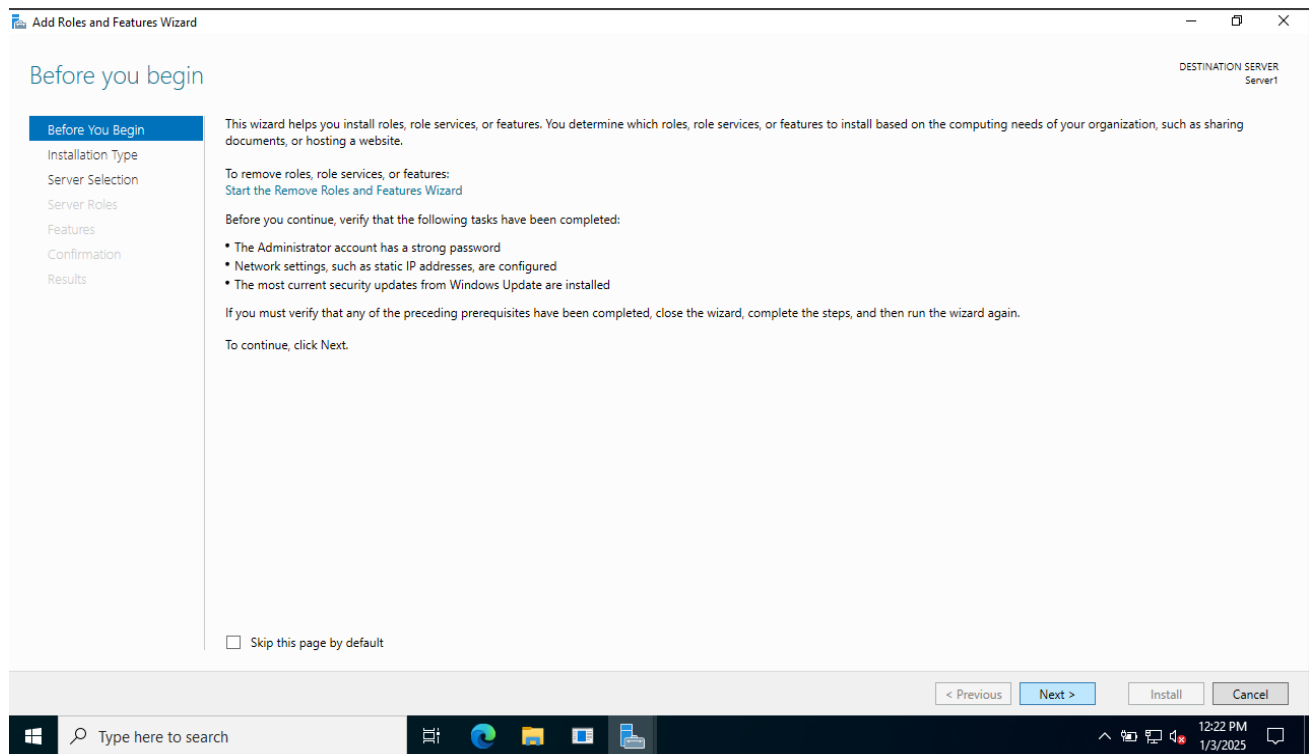


Figure 2: Add Roles & Features

STEP 3

Click on the **Next** button. We will be asked to select the installation type as shown below:

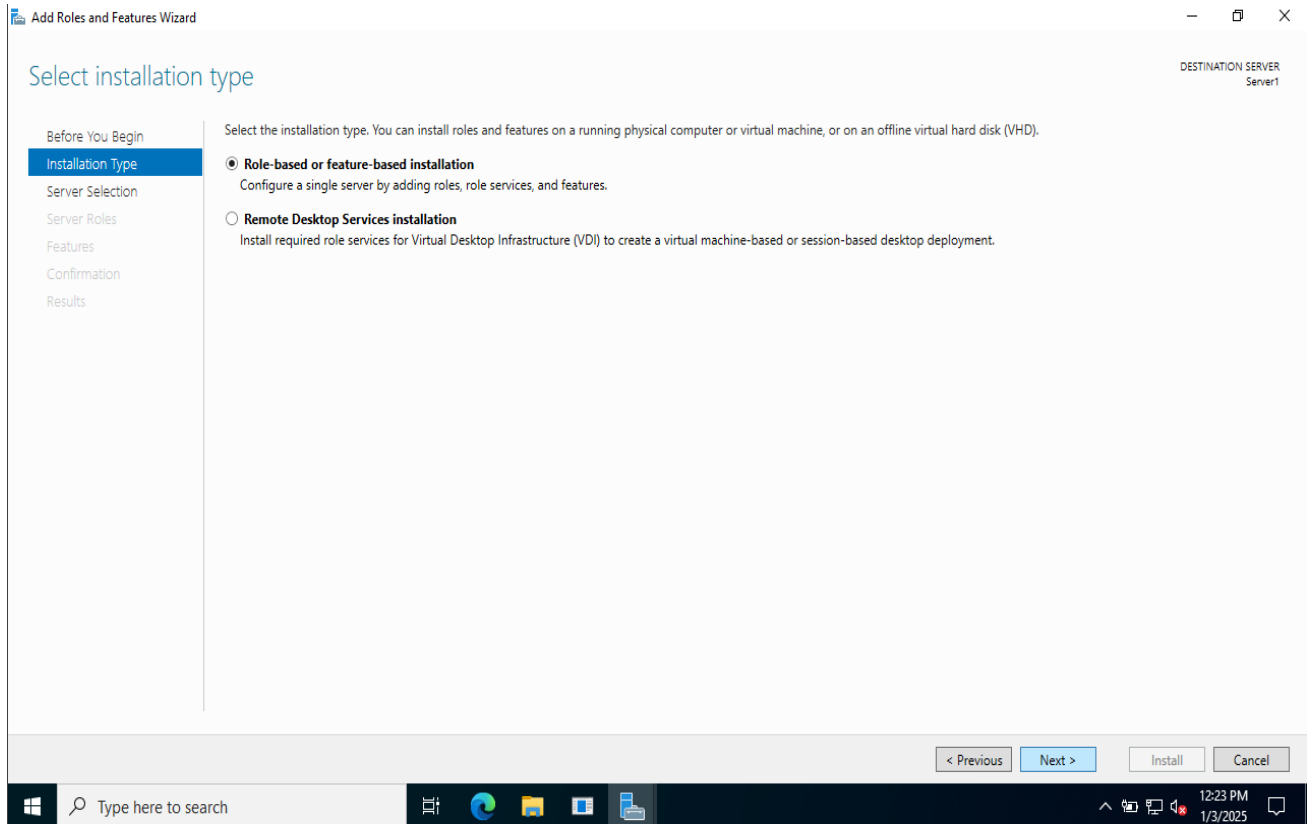


Figure 3: Select Installation Type

STEP 4

Select **Add Roles and Features** Wizard and click on the **Next** button. Next, we will be asked to select a destination server as shown below:

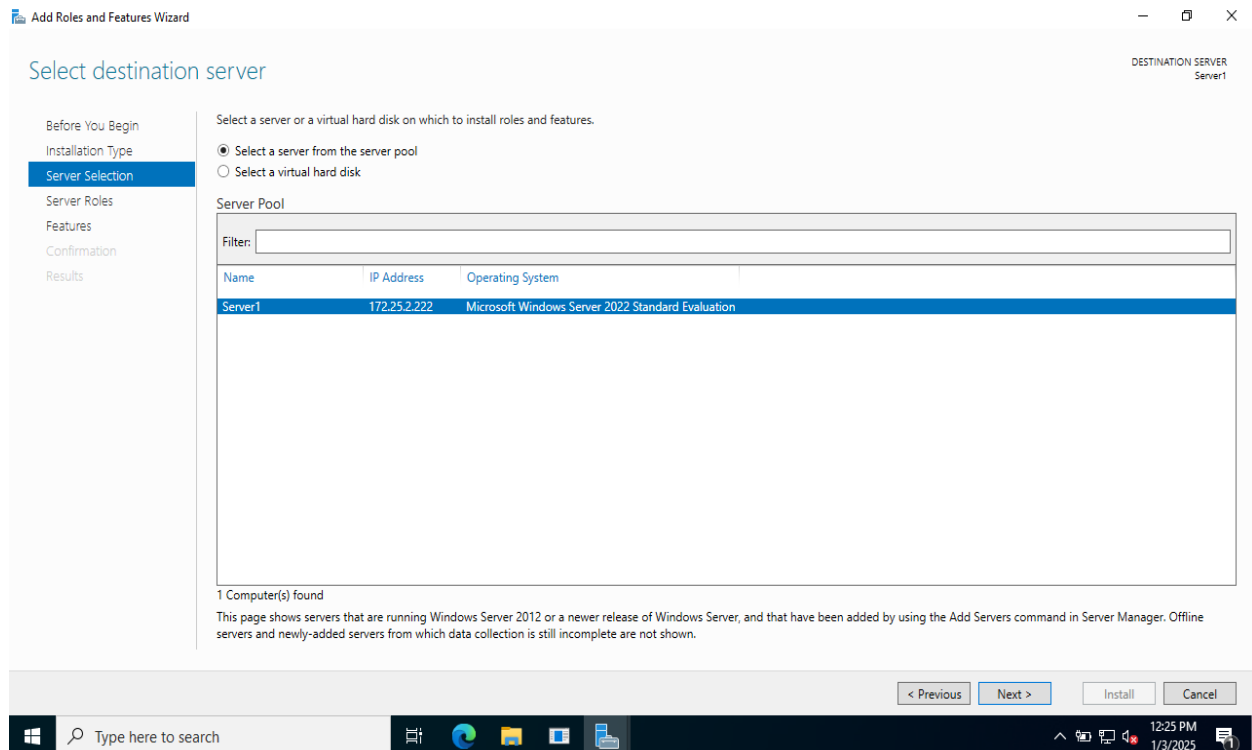


Figure 4: Select Destination Server

STEP 5

Select **“Select a server from the server pool”** and click on the **Next** button. Next, We will be asked to select server roles as shown below:

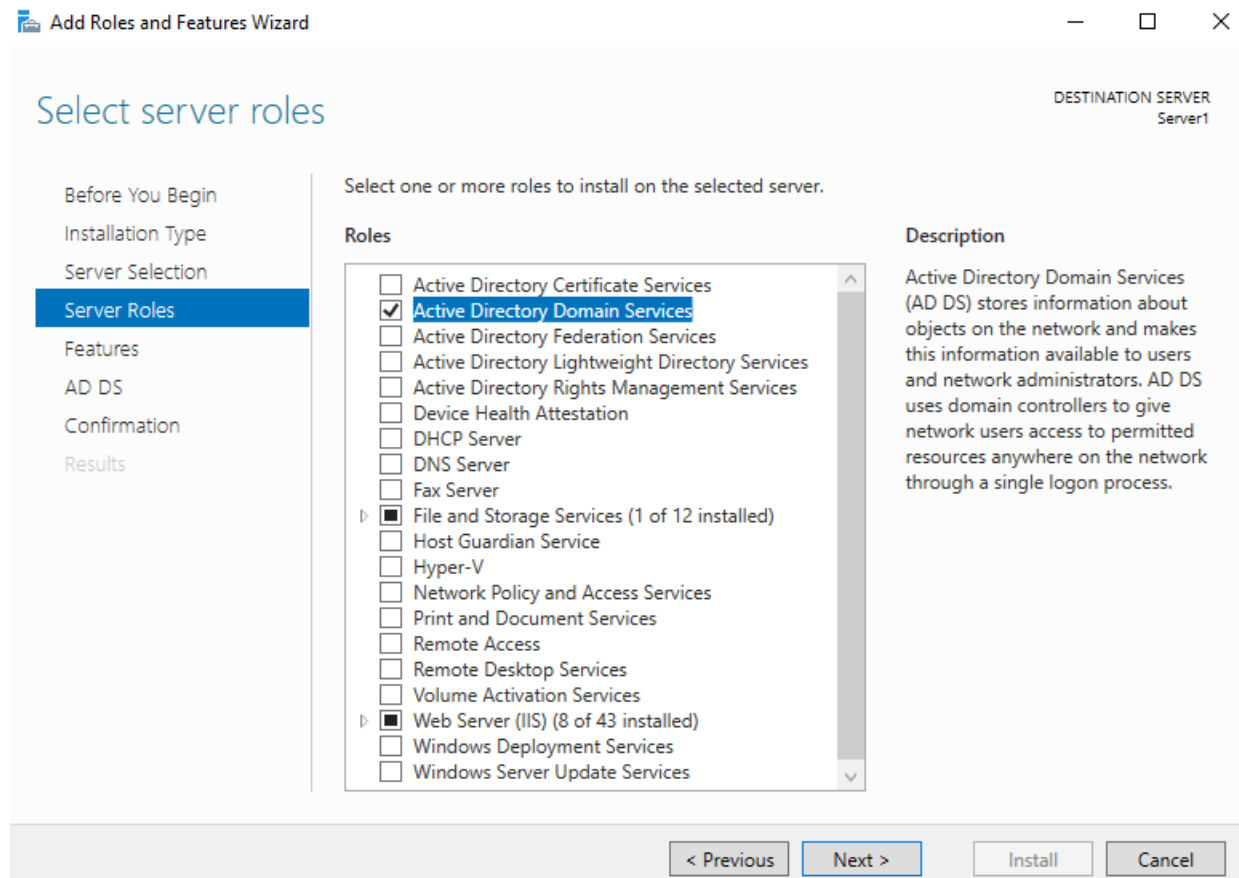


Figure 5: Select Server Roles

STEP 6

Select **Active Directory Domain Services** and click on the **Next** button. We will be asked to select features as shown below:

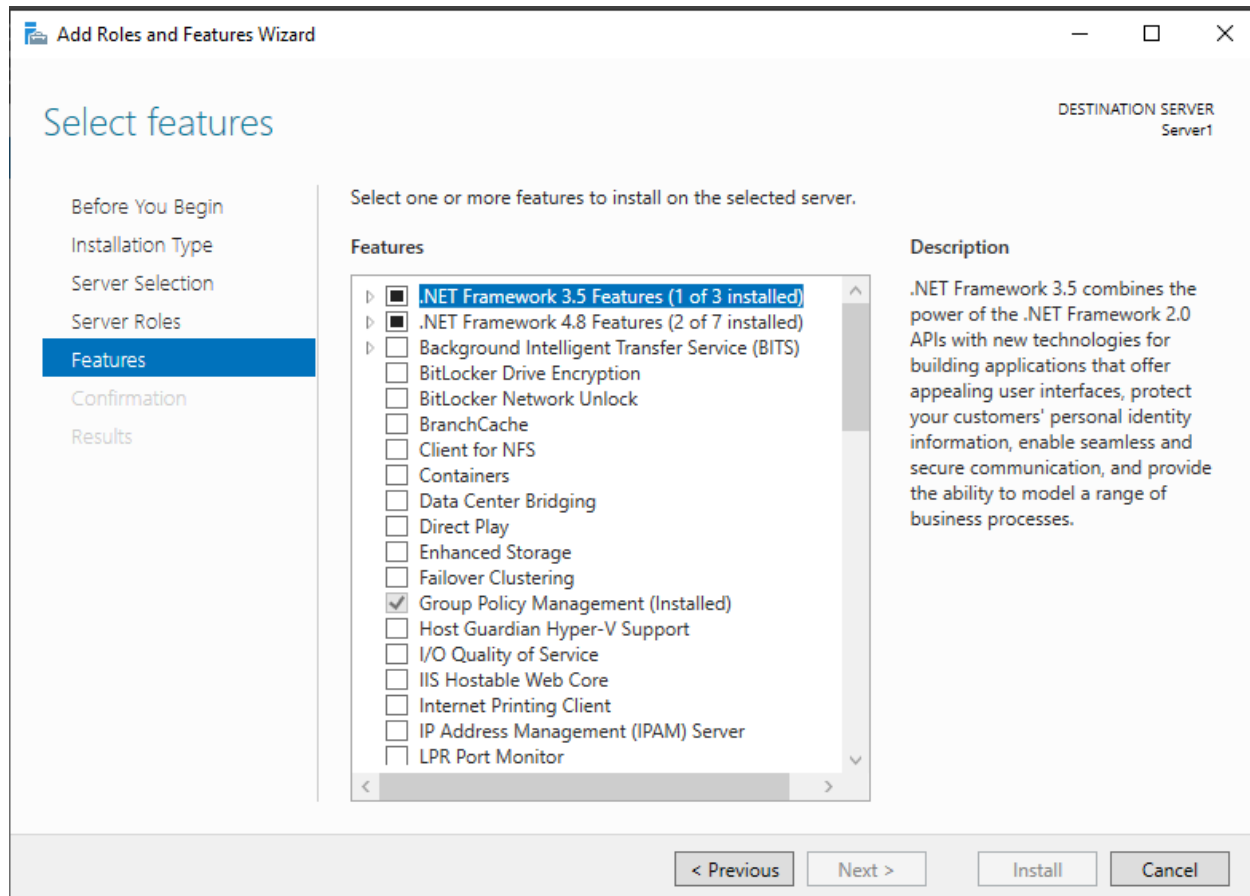


Figure 6: Select Features

STEP 7

Leave all default settings and click on the **Next** button. Next, We should see the confirm installations selections page.

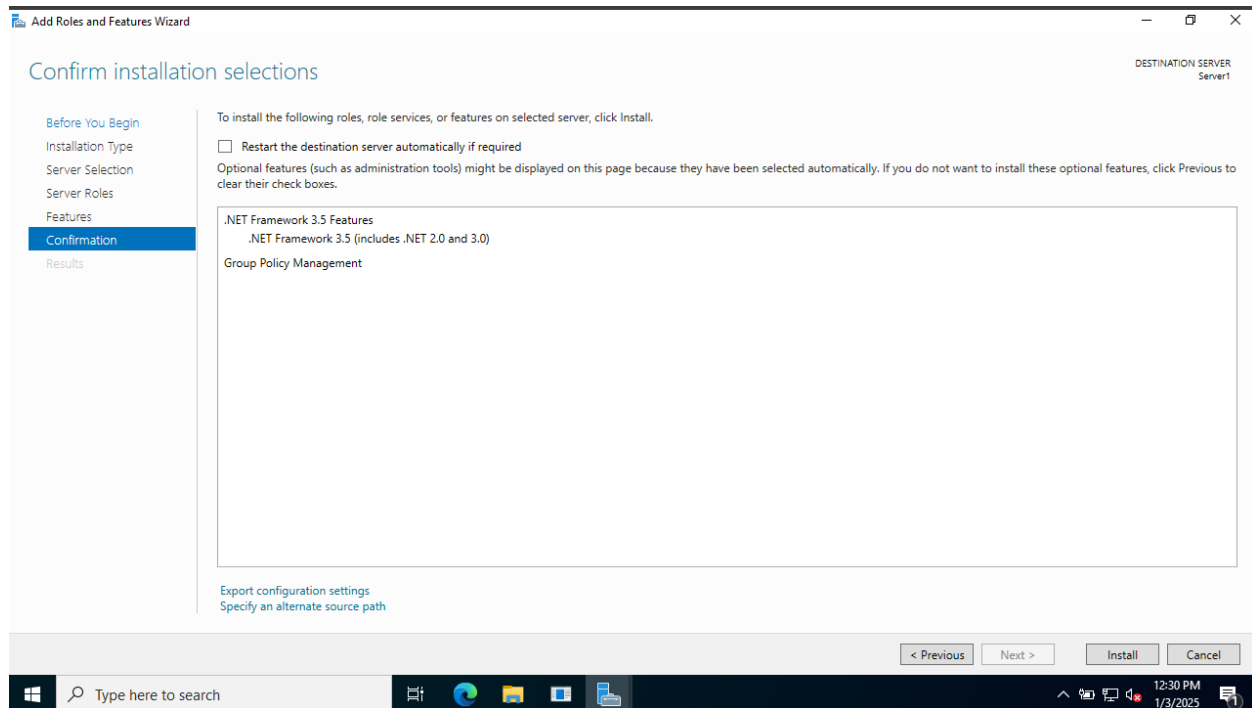


Figure 7: Installation selection

STEP 8

Click on the **Install** button to start the installation. Once the installation has been finished. We should see the following page.

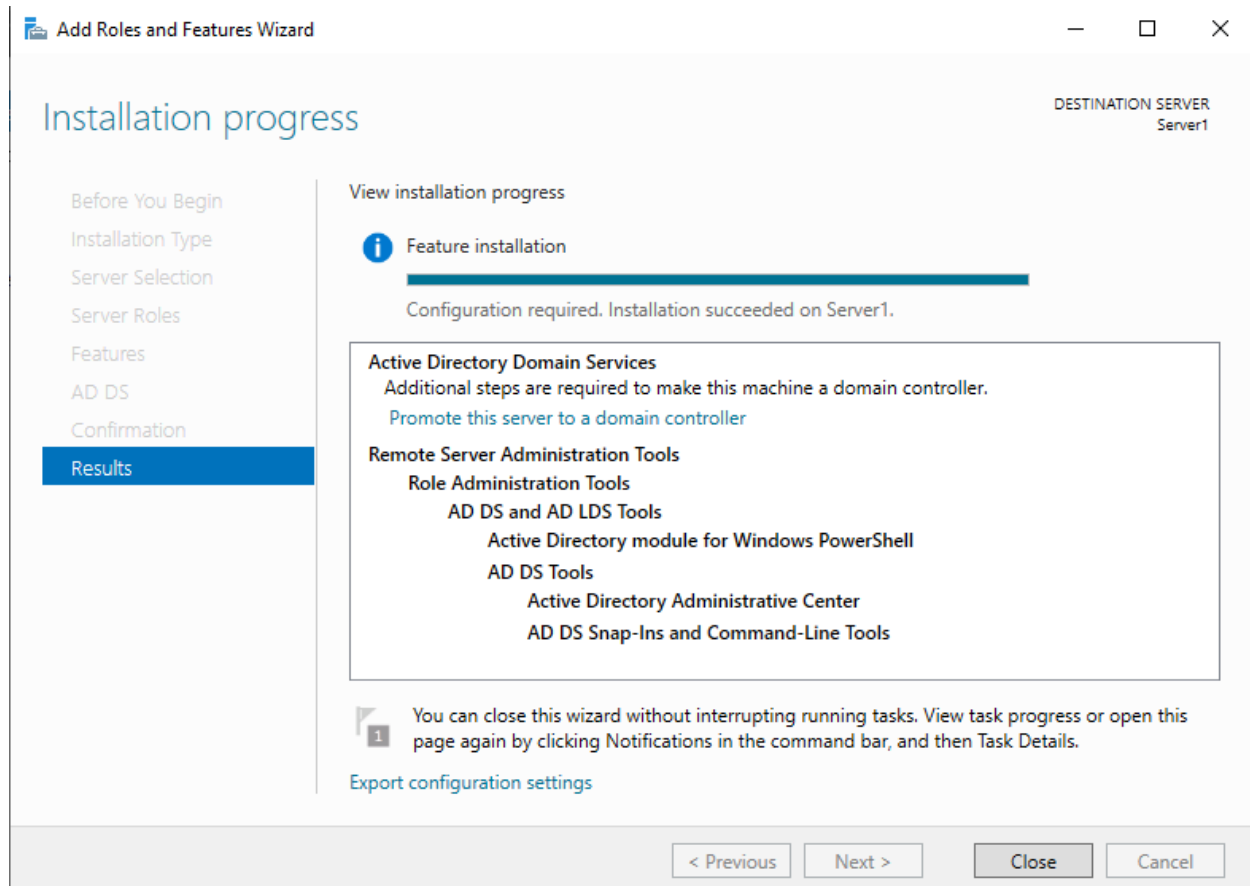


Figure 8: Installation Finished

STEP 9

Click on the **Close** button. We should see the following page.

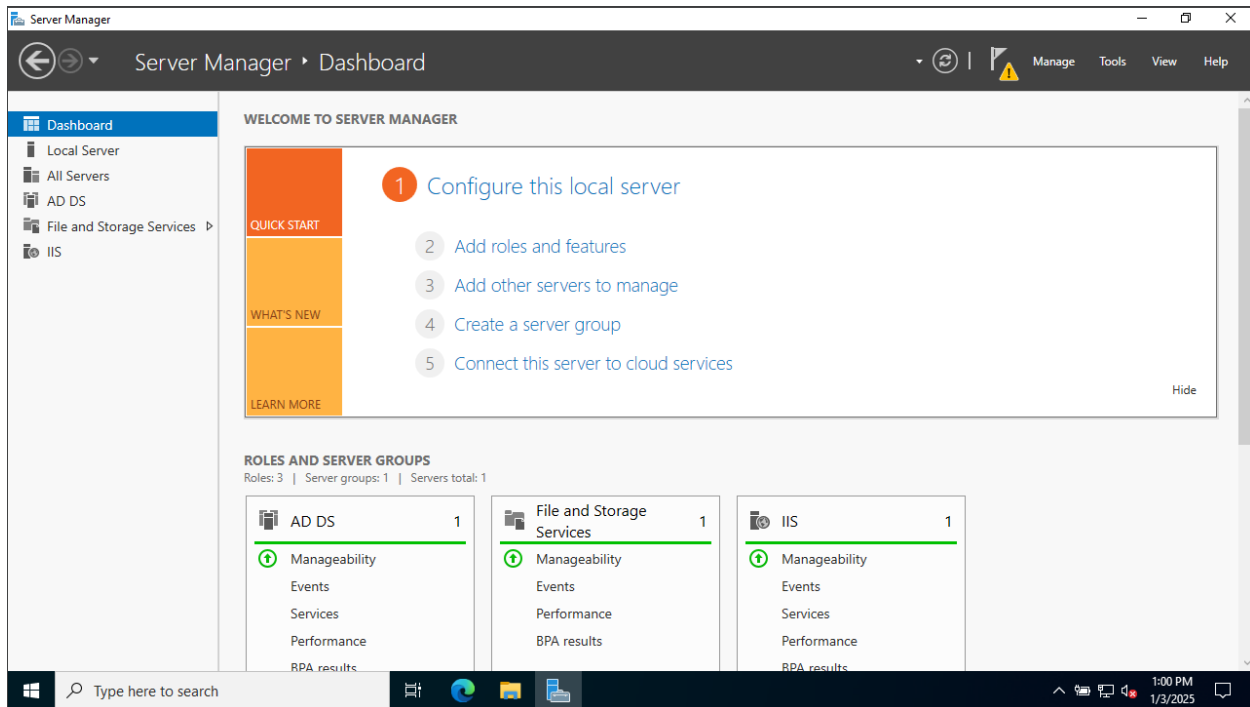


Figure 9: After The Installation

STEP 10

Click on the **yellow notification** icon. We should see the following page:

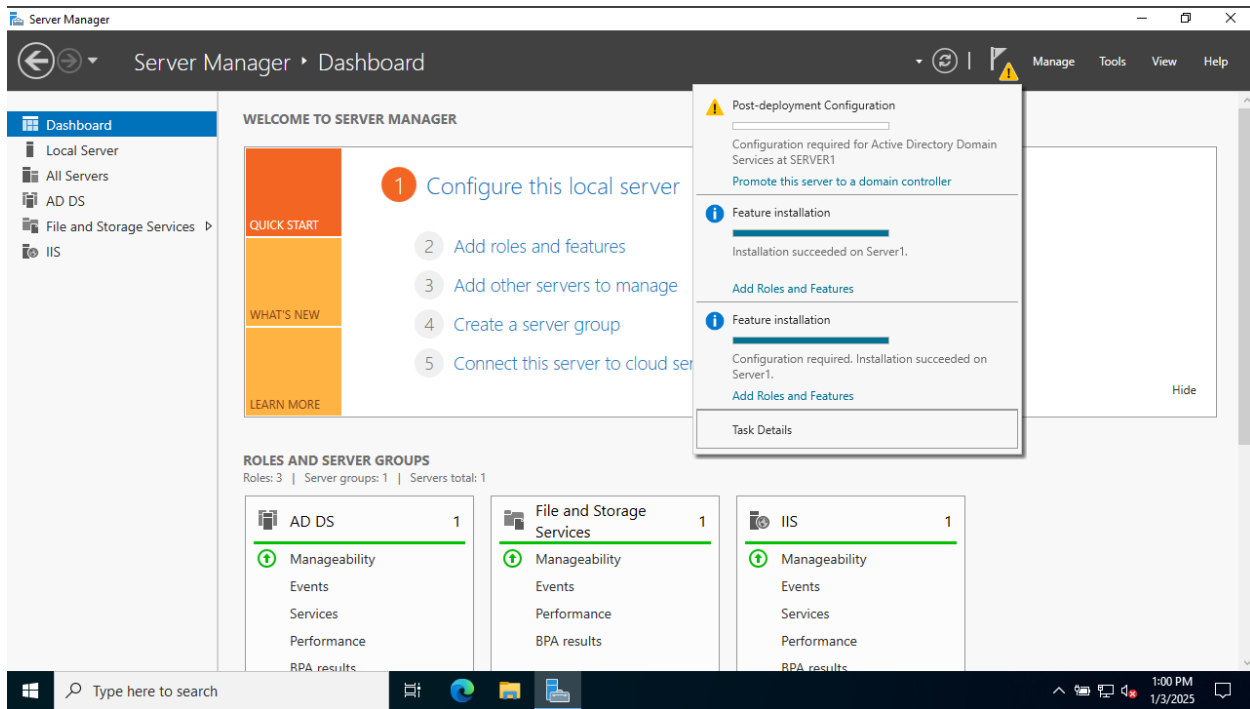


Figure 10: Clicking on Yellow icon

STEP 11

Click on **Promote this server to a domain controller**. We should see the deployment configuration page:

The screenshot shows the 'Active Directory Domain Services Configuration Wizard' window. The title bar reads 'Active Directory Domain Services Configuration Wizard'. The main window has a light blue header with the title 'Deployment Configuration' on the left and 'TARGET SERVER Server1' on the right. A left-hand navigation pane lists the following steps: 'Deployment Configuration' (highlighted in blue), 'Domain Controller Options', 'Additional Options', 'Paths', 'Review Options', 'Prerequisites Check', 'Installation', and 'Results'. The main content area is titled 'Select the deployment operation' and contains three radio button options: 'Add a domain controller to an existing domain', 'Add a new domain to an existing forest', and 'Add a new forest' (which is selected). Below this, a section titled 'Specify the domain information for this operation' contains a text box labeled 'Root domain name:' with the value 'mydomain.com' entered. At the bottom of the main content area is a link that says 'More about deployment configurations'. The bottom of the window features a navigation bar with four buttons: '< Previous', 'Next >' (highlighted in blue), 'Install', and 'Cancel'.

Figure 11: Deployment Configuration Page

STEP 12

Select **add a new forest**, defining our domain name and clicking on the **Next** button. We should see the domain controller options page:

The screenshot shows the 'Active Directory Domain Services Configuration Wizard' window. The title bar includes the Windows logo, the text 'Active Directory Domain Services Configuration Wizard', and standard window controls. The main content area is titled 'Domain Controller Options' in blue. On the right side, it says 'TARGET SERVER Server1'. A left-hand navigation pane lists several steps: 'Deployment Configuration', 'Domain Controller Options' (which is highlighted with a blue background), 'DNS Options', 'Additional Options', 'Paths', 'Review Options', 'Prerequisites Check', 'Installation', and 'Results'. The main area contains the following configuration options:

- Select functional level of the new forest and root domain**
 - Forest functional level: Windows Server 2016 (dropdown menu)
 - Domain functional level: Windows Server 2016 (dropdown menu)
- 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: [password field with 8 dots]
 - Confirm password: [password field with 8 dots]

At the bottom of the main area is a blue link: [More about domain controller options](#). The bottom of the window features a grey bar with four buttons: '< Previous', 'Next >' (highlighted with a blue border), 'Install', and 'Cancel'.

Figure 12: Domain Controller Option

STEP 13

Defining our directory service restore mode password and clicking on the **Next** button. We should see the DNS options page:

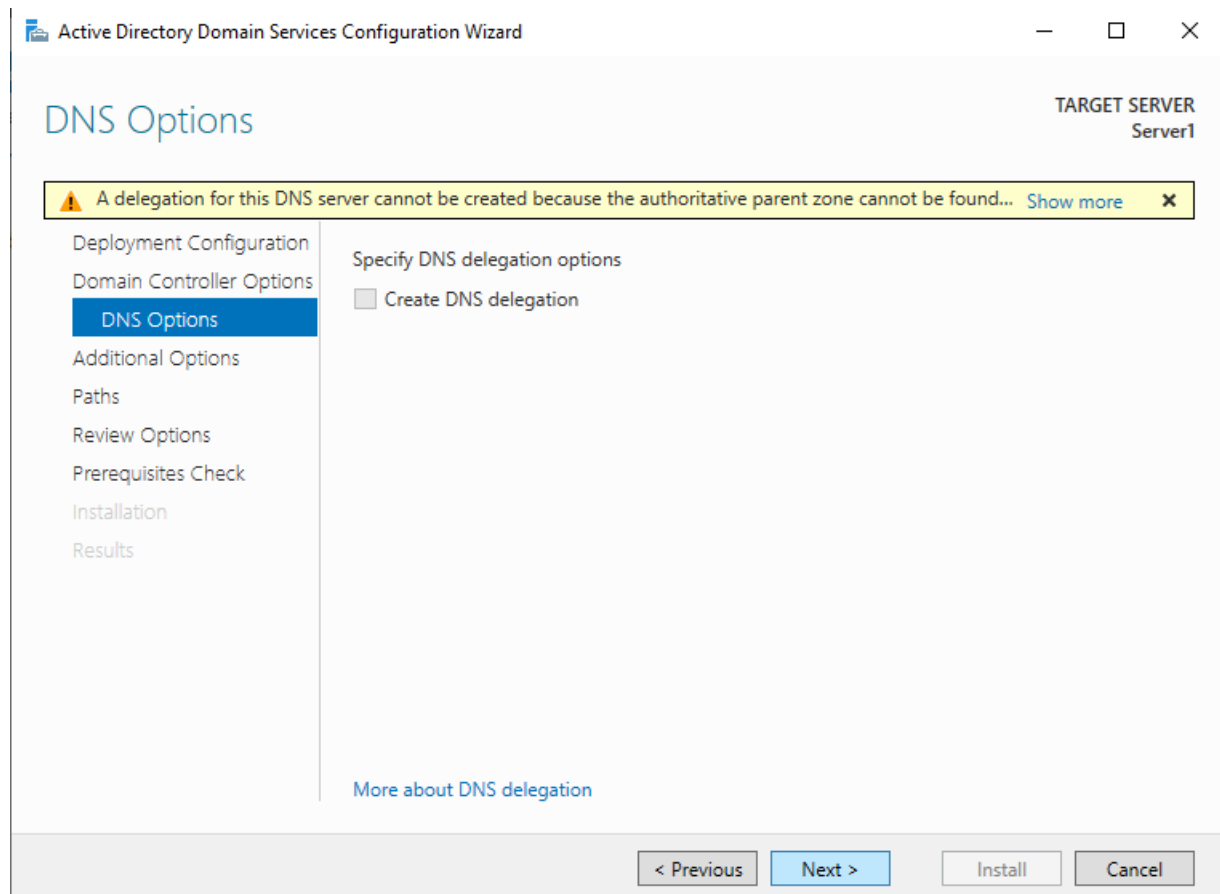
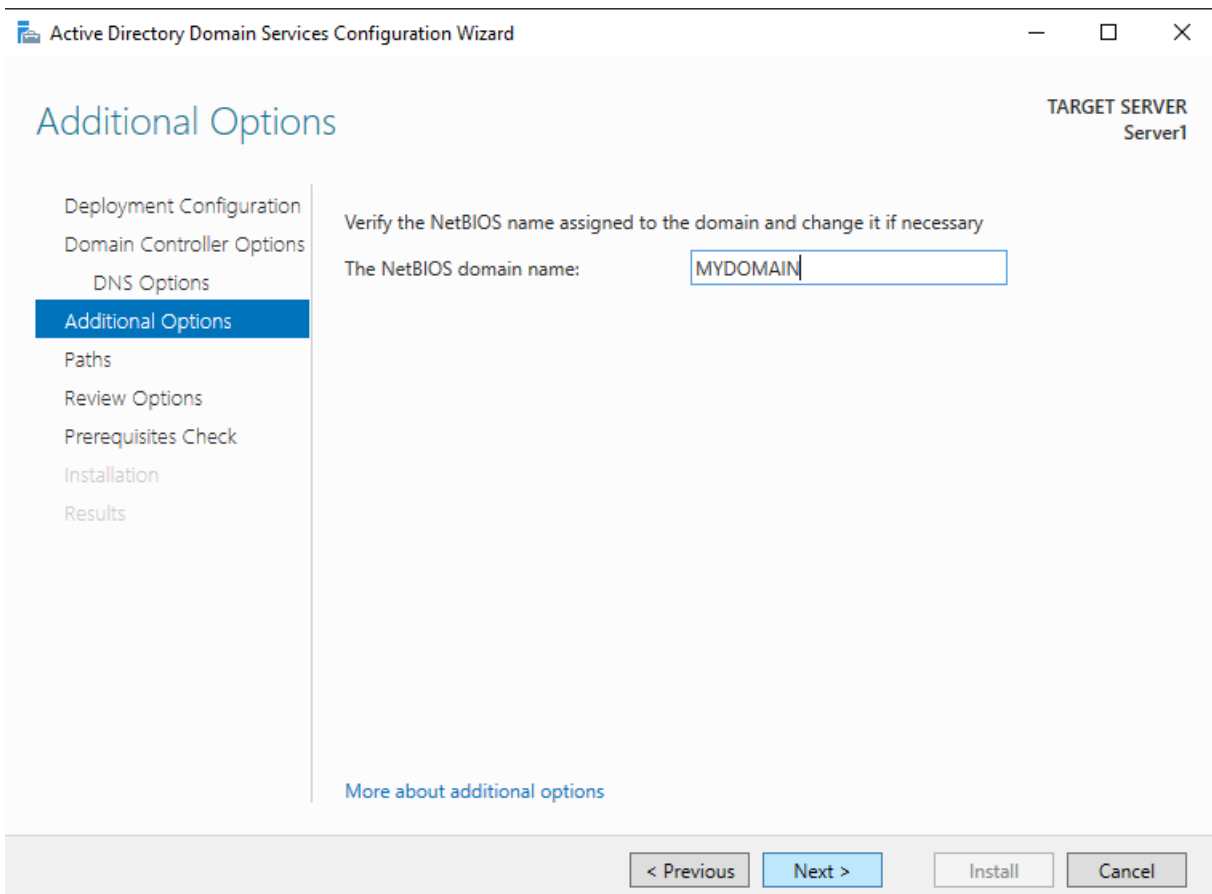


Figure 13: DNS Option Page

STEP 14

Leave the default configuration and click on the **Next** button. We will be asked to set a NetBIOS name as shown below:



The screenshot shows the 'Active Directory Domain Services Configuration Wizard' window. The title bar includes the Windows icon, the text 'Active Directory Domain Services Configuration Wizard', and standard window controls (minimize, maximize, close). The main window has a light gray background. On the left is a vertical navigation pane with the title 'Additional Options' in blue. Below the title are several menu items: 'Deployment Configuration', 'Domain Controller Options', 'DNS Options', 'Additional Options' (highlighted with a blue background), 'Paths', 'Review Options', 'Prerequisites Check', 'Installation', and 'Results'. The main area of the wizard is titled 'Additional Options' in blue. In the top right corner of this area, it says 'TARGET SERVER Server1'. The main content area has the text 'Verify the NetBIOS name assigned to the domain and change it if necessary' followed by 'The NetBIOS domain name:'. To the right of this text is a text input box containing the value 'MYDOMAIN'. At the bottom of the main area is a blue link that says 'More about additional options'. At the very bottom of the window is a gray bar containing four buttons: '< Previous' (disabled), 'Next >' (active/highlighted), 'Install' (disabled), and 'Cancel' (disabled).

Figure 14: NetBIOS Name

STEP 15

Setting our NetBIOS name and clicking on the **Next** button. We will be asked to define AD DS database path location:

The screenshot shows the 'Active Directory Domain Services Configuration Wizard' window. The title bar includes the text 'Active Directory Domain Services Configuration Wizard' and standard window controls. The main window has a light gray background. On the left, a vertical navigation pane lists the following steps: 'Deployment Configuration', 'Domain Controller Options', 'DNS Options', 'Additional Options', 'Paths' (highlighted in blue), 'Review Options', 'Prerequisites Check', 'Installation', and 'Results'. The main area is titled 'Paths' in blue text. In the top right corner of the main area, it says 'TARGET SERVER Server1'. Below the title, the instruction 'Specify the location of the AD DS database, log files, and SYSVOL' is displayed. There are three input fields with corresponding labels: 'Database folder:' with the value 'C:\Windows\NTDS', 'Log files folder:' with the value 'C:\Windows\NTDS', and 'SYSVOL folder:' with the value 'C:\Windows\SYSVOL'. Each input field has a small '...' button to its right. At the bottom of the main area, there is a link that says 'More about Active Directory paths'. The bottom of the window features a gray bar with four buttons: '< Previous' (disabled), 'Next >' (active/highlighted), 'Install' (disabled), and 'Cancel' (disabled).

Figure 15: Database Path Location

STEP 16

Leave the default path as it is and click on the **Next** button. We should see the review all options page:

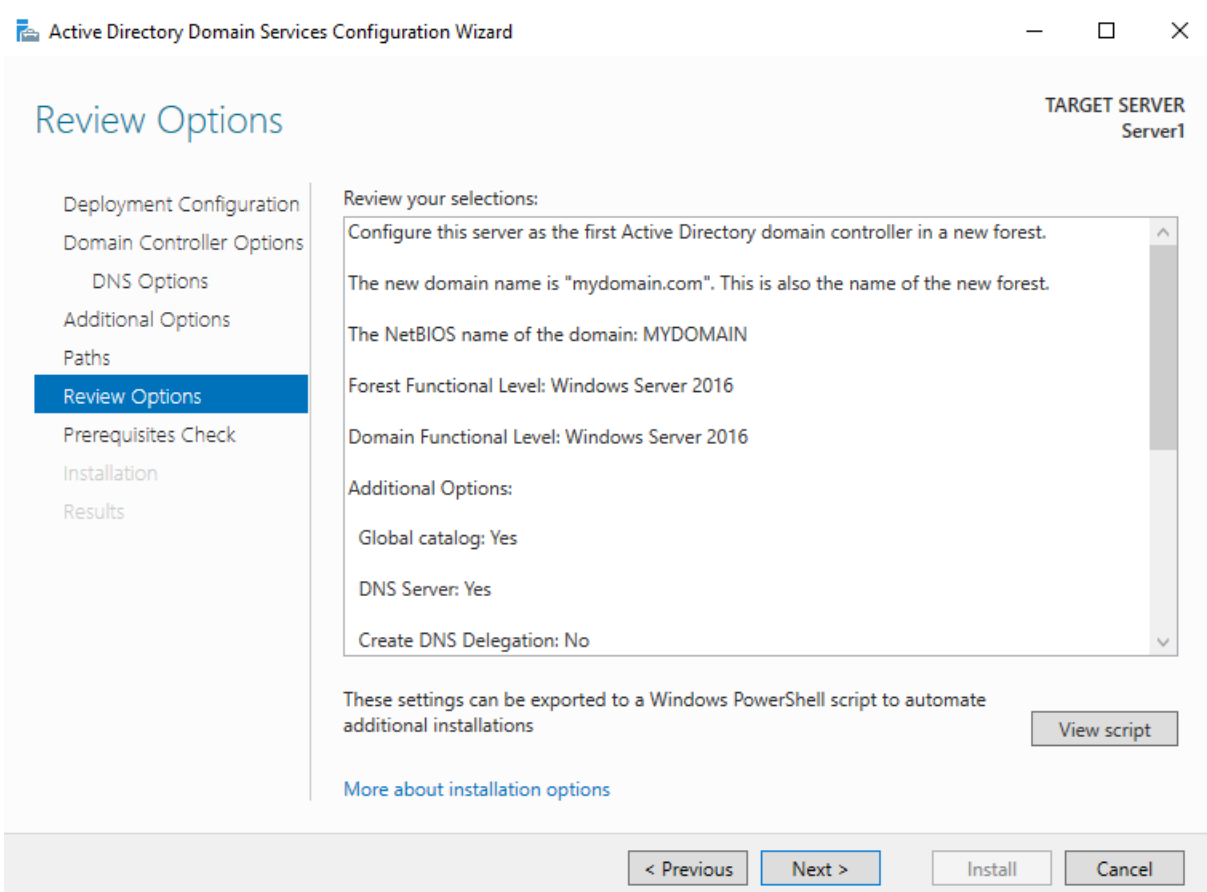


Figure 16: Review All Option Page

STEP 17:

Review all the configurations and click on the **Next** button. We should see the prerequisites check page:

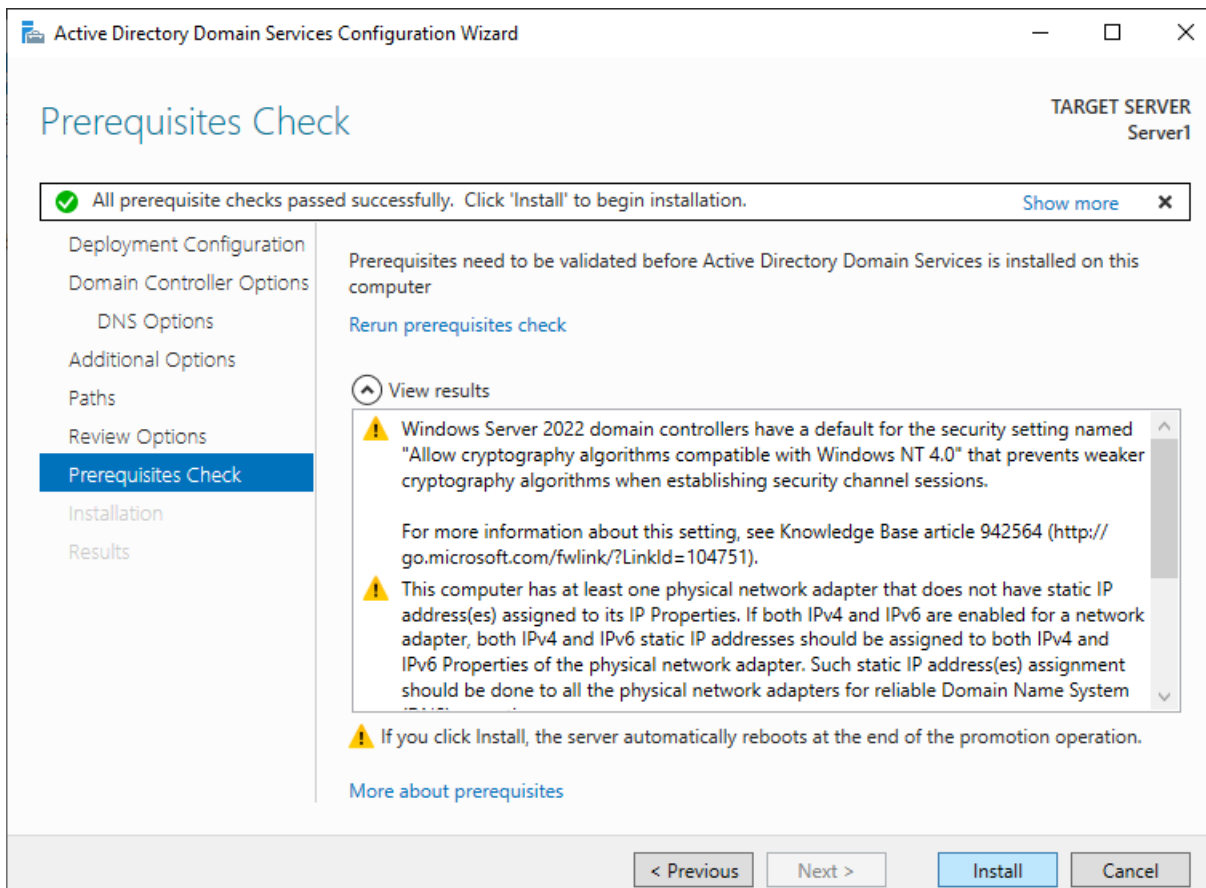


Figure 17: Prerequisites Check Page

STEP 18

Make sure all prerequisite checks are successful, then click on the **Install** button. Once the installation has been finished, our system will be restarted automatically.

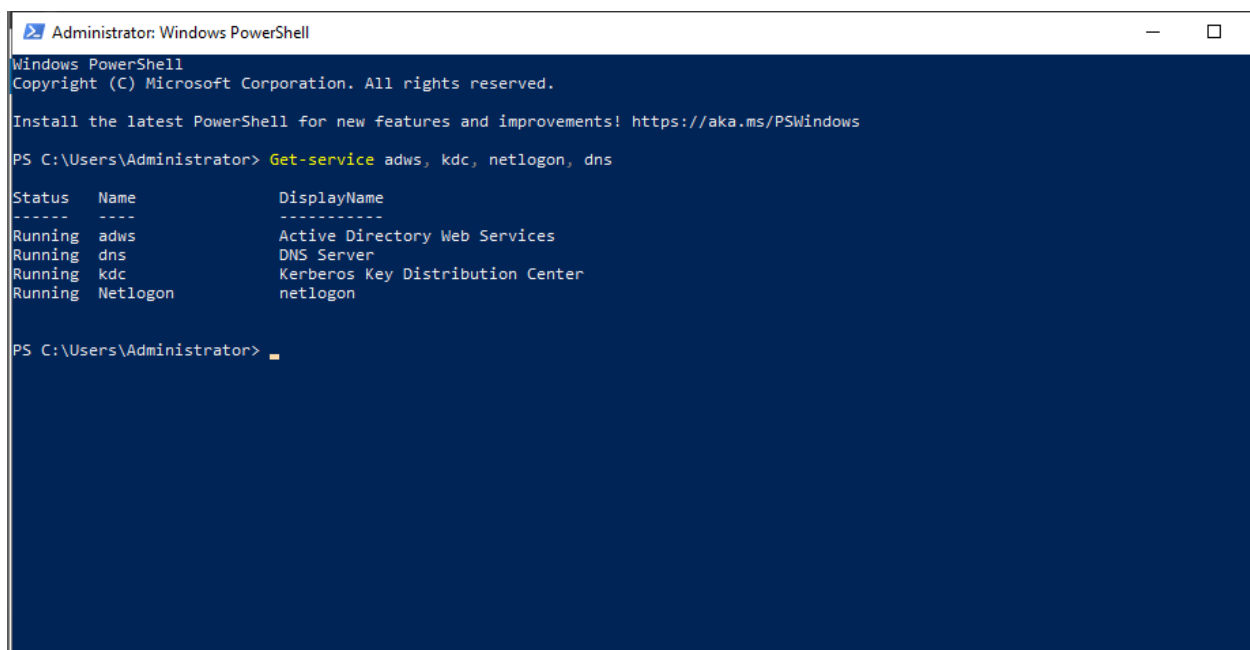
Verify Domain Controller

Next, we will need to verify whether the Domain Controller has been set up properly. We can do this using PowerShell.

To confirm the successful installation of the services, we can run the following command in Windows PowerShell:

```
Get-Service adws,kdc,netlogon,dns
```

We should see the status of all services on the following screen:



```
Administrator: Windows PowerShell
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\Administrator> 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

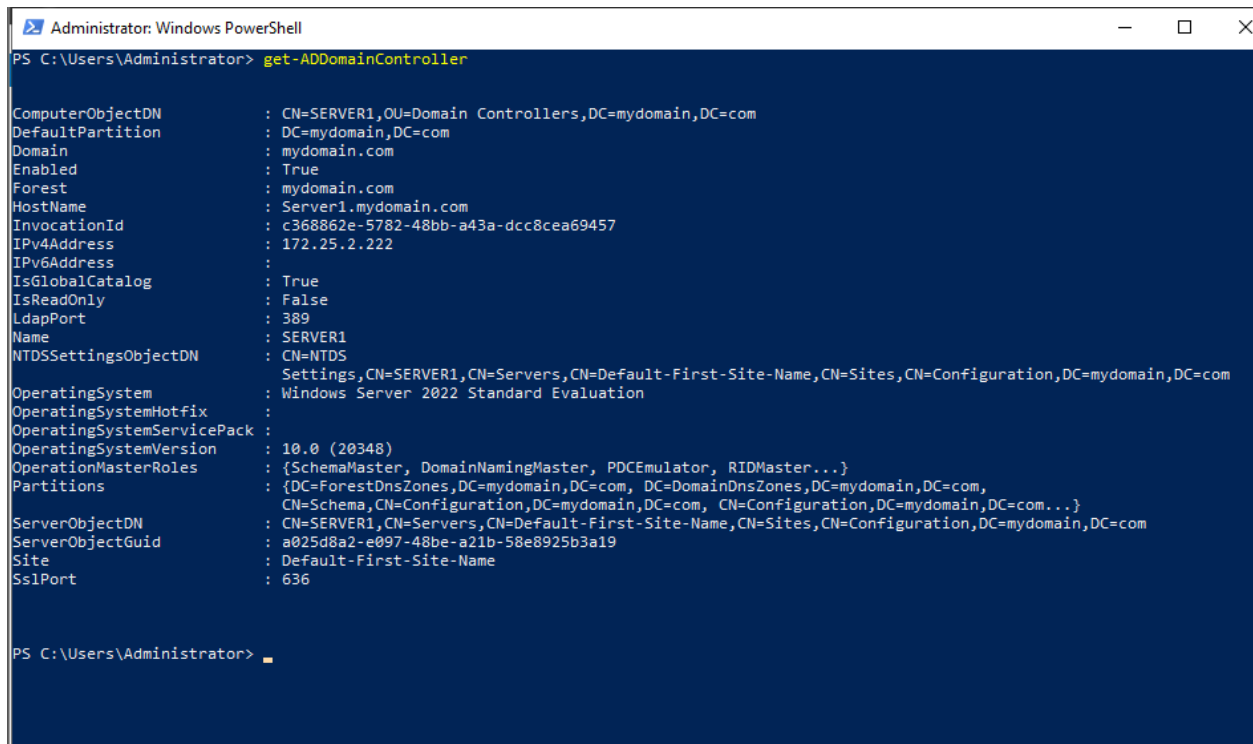
PS C:\Users\Administrator> 
```

Figure 18: Status Of all Services

To display all the configuration details of the domain controller, run the following command:

Get-ADDomainController

We should see all the information on the following screen:



```
Administrator: Windows PowerShell
PS C:\Users\Administrator> get-ADDomainController

ComputerObjectDN      : CN=SERVER1,OU=Domain Controllers,DC=mydomain,DC=com
DefaultPartition      : DC=mydomain,DC=com
Domain                : mydomain.com
Enabled               : True
Forest                : mydomain.com
HostName              : Server1.mydomain.com
InvocationId          : c368862e-5782-48bb-a43a-dcc8cea69457
IPv4Address           : 172.25.2.222
IPv6Address           :
IsGlobalCatalog       : True
IsReadOnly            : False
LdapPort              : 389
Name                  : SERVER1
NTDSSettingsObjectDN  : CN=NTDS
                     : Settings,CN=SERVER1,CN=Servers,CN=Default-First-Site-Name,CN=Sites,CN=Configuration,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=SERVER1,CN=Servers,CN=Default-First-Site-Name,CN=Sites,CN=Configuration,DC=mydomain,DC=com
ServerObjectGuid       : a025d8a2-e097-48be-a21b-58e8925b3a19
Site                  : Default-First-Site-Name
SslPort               : 636

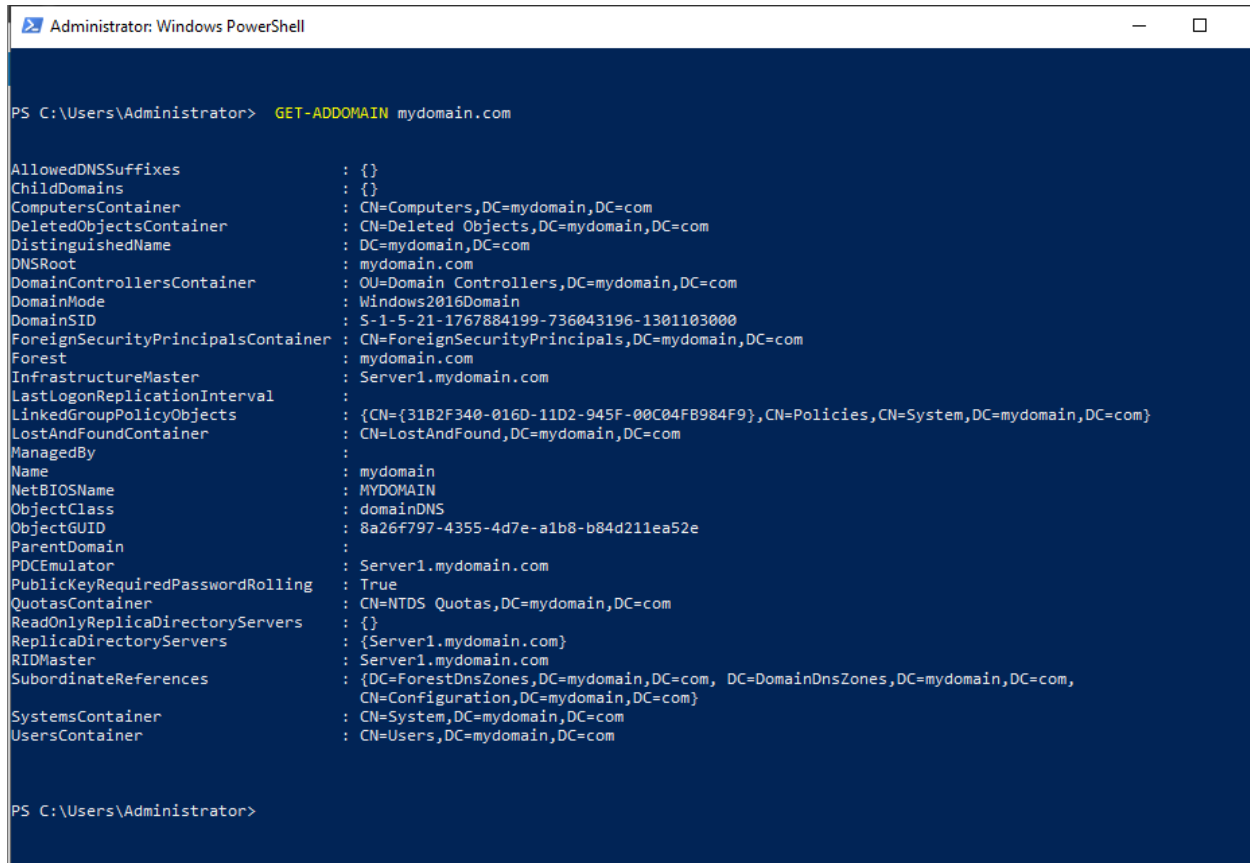
PS C:\Users\Administrator>
```

Figure 19: Displaying all Configuration Details

To get detailed information about our domain, run the following command:

```
Get-ADDomain mydomain.com
```

We should see the next screen:



```

Administrator: Windows PowerShell

PS C:\Users\Administrator> 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-1-5-21-1767884199-736043196-1301103000
ForeignSecurityPrincipalsContainer : CN=ForeignSecurityPrincipals,DC=mydomain,DC=com
Forest                  : mydomain.com
InfrastructureMaster     : Server1.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               : 8a26f797-4355-4d7e-a1b8-b84d211ea52e
ParentDomain             : 
PDCEmulator              : Server1.mydomain.com
PublicKeyRequiredPasswordRolling : True
QuotasContainer          : CN=NTDS Quotas,DC=mydomain,DC=com
ReadOnlyReplicaDirectoryServers : {}
ReplicaDirectoryServers  : {Server1.mydomain.com}
RIDMaster                : Server1.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

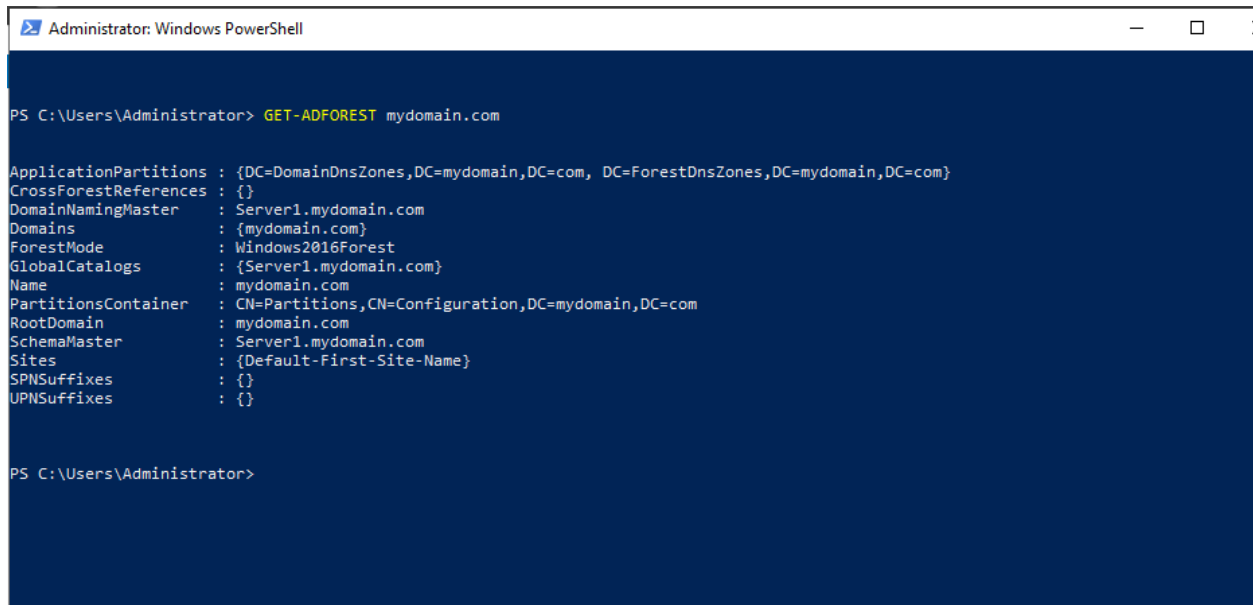
PS C:\Users\Administrator>
  
```

Figure 20: Detailed Information about our Domain

To display our Active Directory Forest details, run the following command:

```
Get-ADForest mydomain.com
```

We should see the next screen:

A screenshot of a Windows PowerShell window titled "Administrator: Windows PowerShell". The window has a dark blue background. The command prompt shows the user is at "PS C:\Users\Administrator>". The command "GET-ADFOREST mydomain.com" has been entered and executed. The output is a list of Active Directory forest details in a key-value format. The details include ApplicationPartitions, CrossForestReferences, DomainNamingMaster, Domains, ForestMode, GlobalCatalogs, Name, PartitionsContainer, RootDomain, SchemaMaster, Sites, SPNSuffixes, and UPNSuffixes. The command prompt returns to "PS C:\Users\Administrator>" after the output.

```
PS C:\Users\Administrator> GET-ADFOREST mydomain.com

ApplicationPartitions : {DC=DomainDnsZones,DC=mydomain,DC=com, DC=ForestDnsZones,DC=mydomain,DC=com}
CrossForestReferences : {}
DomainNamingMaster    : Server1.mydomain.com
Domains               : {mydomain.com}
ForestMode             : Windows2016Forest
GlobalCatalogs        : {Server1.mydomain.com}
Name                  : mydomain.com
PartitionsContainer    : CN=Partitions,CN=Configuration,DC=mydomain,DC=com
RootDomain             : mydomain.com
SchemaMaster          : Server1.mydomain.com
Sites                 : {Default-First-Site-Name}
SPNSuffixes           : {}
UPNSuffixes           : {}

PS C:\Users\Administrator>
```

Figure 21: Displaying Active Directory Forest Details

Conclusion

This log provides a detailed record of the step-by-step process for setting up an **Active Directory Domain Controller** in a **Windows Server 2022** environment. Through this process, we have successfully installed Active Directory Domain Services (AD DS), promoted the server to a Domain Controller, and configured essential settings such as the domain name, Directory Services Restore Mode (DSRM) password, and NetBIOS name.

The log also demonstrates how to verify the setup using PowerShell commands to check the status of services, retrieve configuration details, and ensure the overall health of the Active Directory environment. These verification steps provide confidence in the deployment and help us maintain a reliable and secure network infrastructure.

By following the documented steps and visual references, we can ensure a clear understanding of the process and create a valuable resource for troubleshooting, auditing, and future enhancements to the network. This log serves as a foundation for implementing an efficient and secure Active Directory environment that supports centralized management and seamless resource access.