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I confirm that I understand my proposal needs to be submitted online via College's MST PORTAL under the relevant module page 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.

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## **1.Introduction**

Active Directory (AD) is a foundational Microsoft product operating on Windows Server that enables efficient access, management, and permission handling for network resources. In this workshop, we aim to demystify Active Directory, explaining its importance and practical applications. AD acts like a centralized directory for your network, akin to a "Contacts" app on your phone, but with far broader capabilities, including managing not just people but also groups, printers, computers, and other devices.

This workshop focuses on understanding and implementing Active Directory (AD), a Microsoft directory service designed to manage and control access to resources within a network. It emphasizes hands-on practice in setting up an Active Directory Domain Controller, exploring its functionalities, verifying configurations, and exploring essential PowerShell commands for managing AD. By the end of this workshop, you will be equipped with the knowledge and skills to implement Active Directory in your organization effectively.

## 2. Steps to Setup Active Directory Domain Controller

### I. Login to Windows server 2022 as an administrator and opening server manager

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

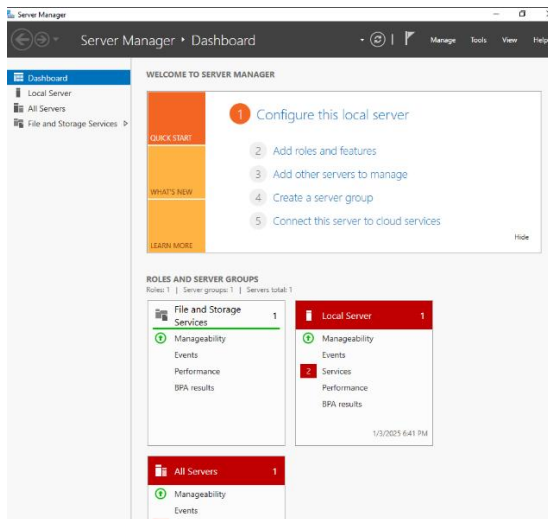


Figure 1: Opening Windows server as an administrator and opening server manager

## II. Add Roles and Features

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

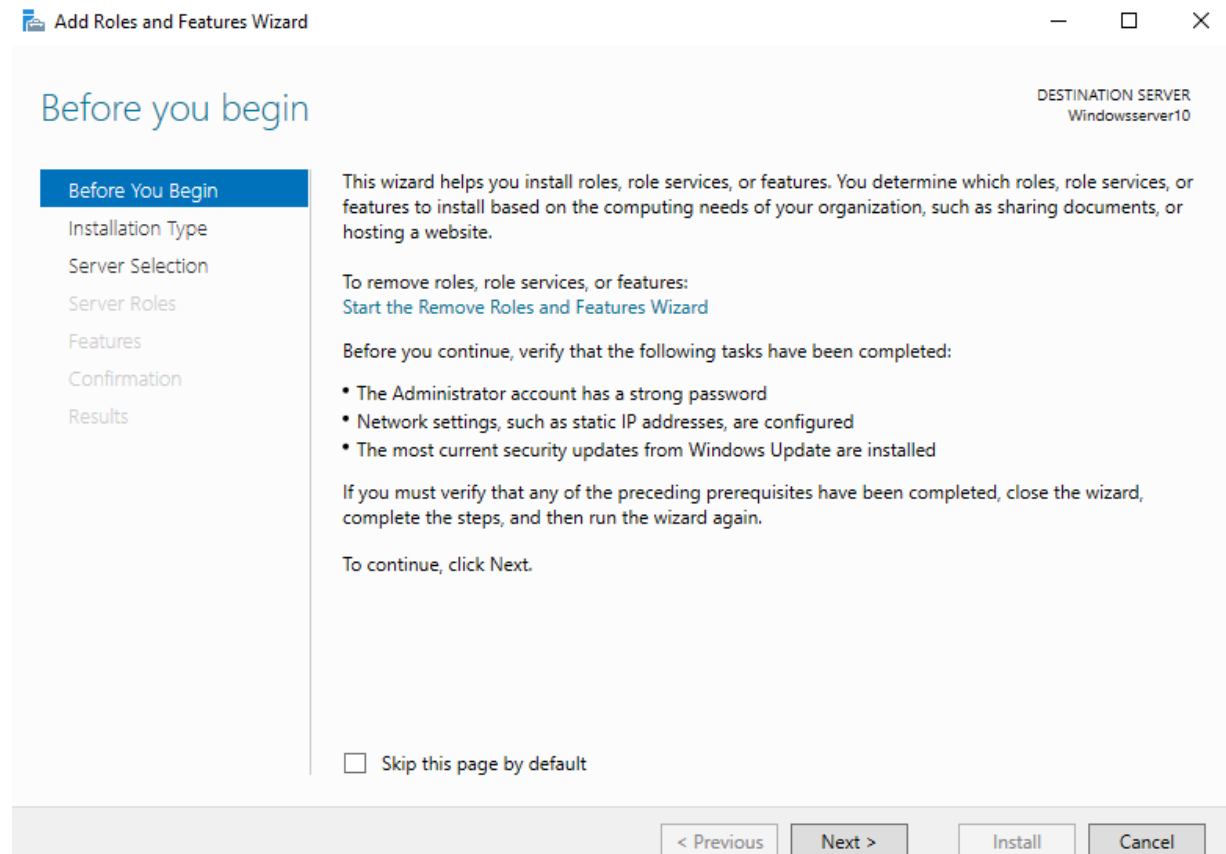


Figure 2: Add Roles and Features

### III. Selecting the installation type

Click on the next button. You will be asked to select the installation type as shown below:

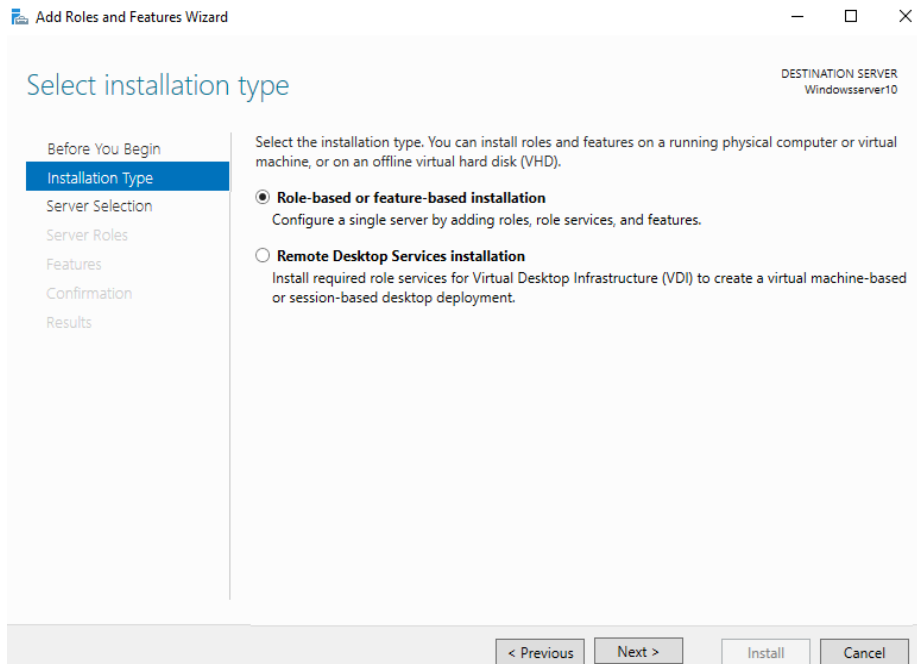


Figure 3: Selecting the installation type

## IV. Select Add Roles and Features

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

The screenshot shows the 'Add Roles and Features Wizard' window. The title bar reads 'Add Roles and Features Wizard'. The main heading is 'Select destination server'. In the top right corner, it says 'DESTINATION SERVER: Windowsserver10'. On the left, a navigation pane lists the steps: 'Before You Begin', 'Installation Type', 'Server Selection' (which is highlighted), 'Server Roles', 'Features', 'Confirmation', and 'Results'. The main area contains the instruction 'Select a server or a virtual hard disk on which to install roles and features.' with two radio buttons: 'Select a server from the server pool' (selected) and 'Select a virtual hard disk'. Below this is a 'Server Pool' section with a 'Filter:' text box. A table lists the available servers:

| Name            | IP Address | Operating System                                  |
|-----------------|------------|---|
| Windowsserver10 | 10.0.2.15  | Microsoft Windows Server 2022 Standard Evaluation |

Below the table, it states '1 Computer(s) found'. A descriptive paragraph follows: '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.' At the bottom, there are four buttons: '< Previous', 'Next >', 'Install', and 'Cancel'.

Figure 4: Add Roles and Features



## V. Selecting a server from the server pool

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

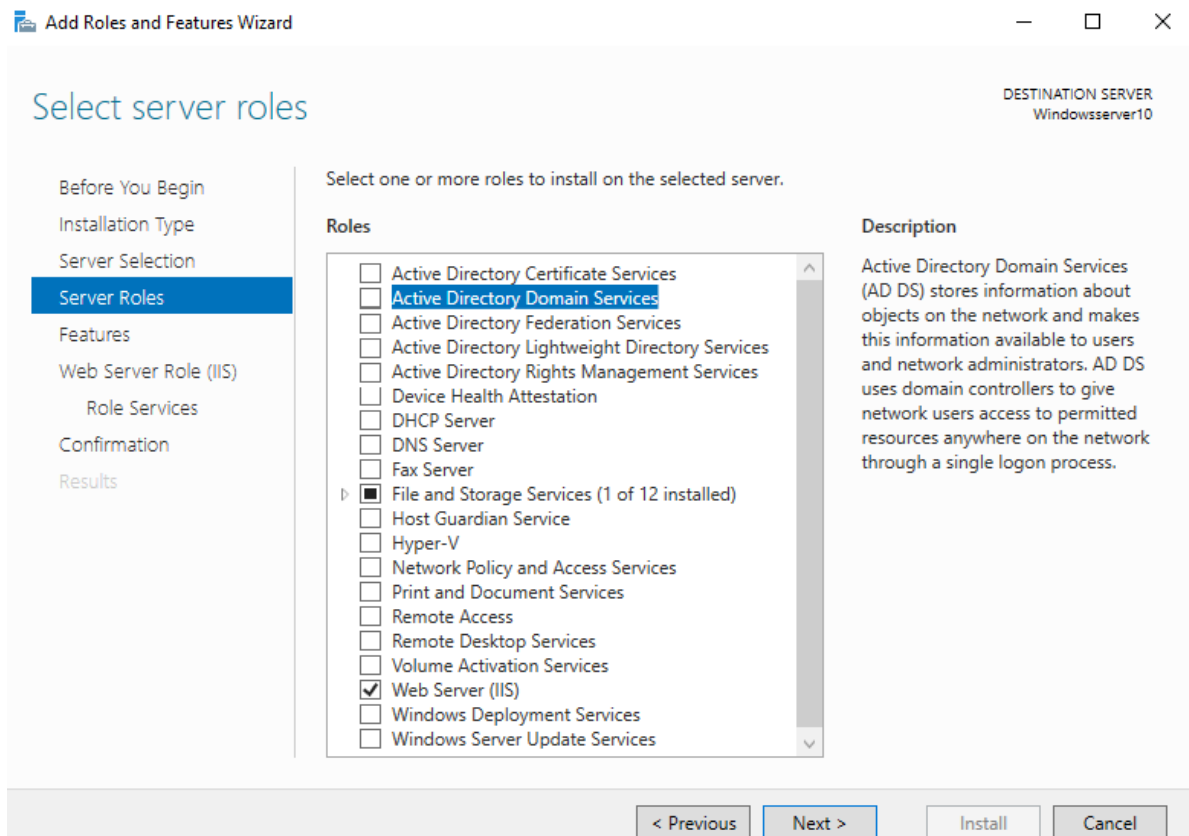


Figure 5: Selecting a server from the server pool

## VI. Selecting Active Directory Domain Services

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

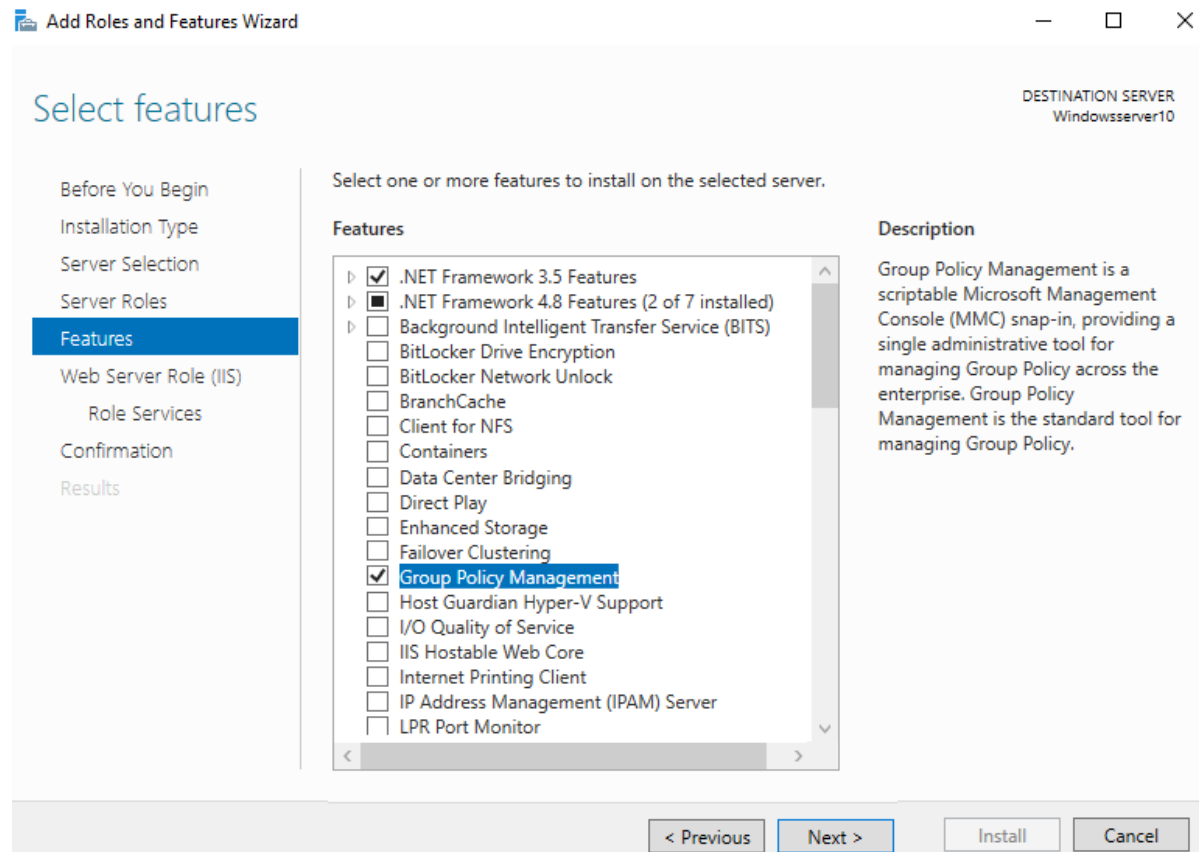


Figure 6: Selecting Active Directory Domain Services

## VII. Viewing confirm installation selection page

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

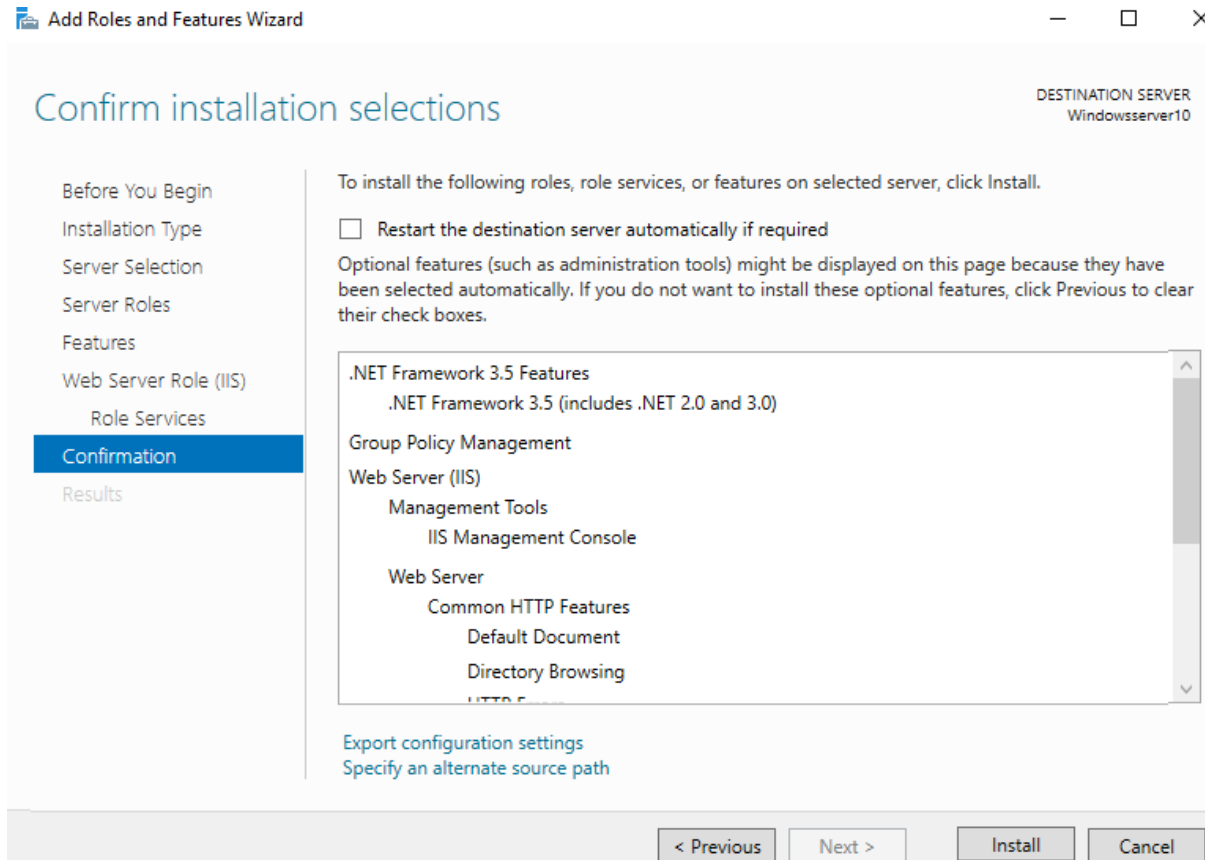


Figure 7: Viewing confirm installations selection page

## VIII. Starting the installation process

Click on the install button to start the installation. Once the installation has been finished. You should see the following page.

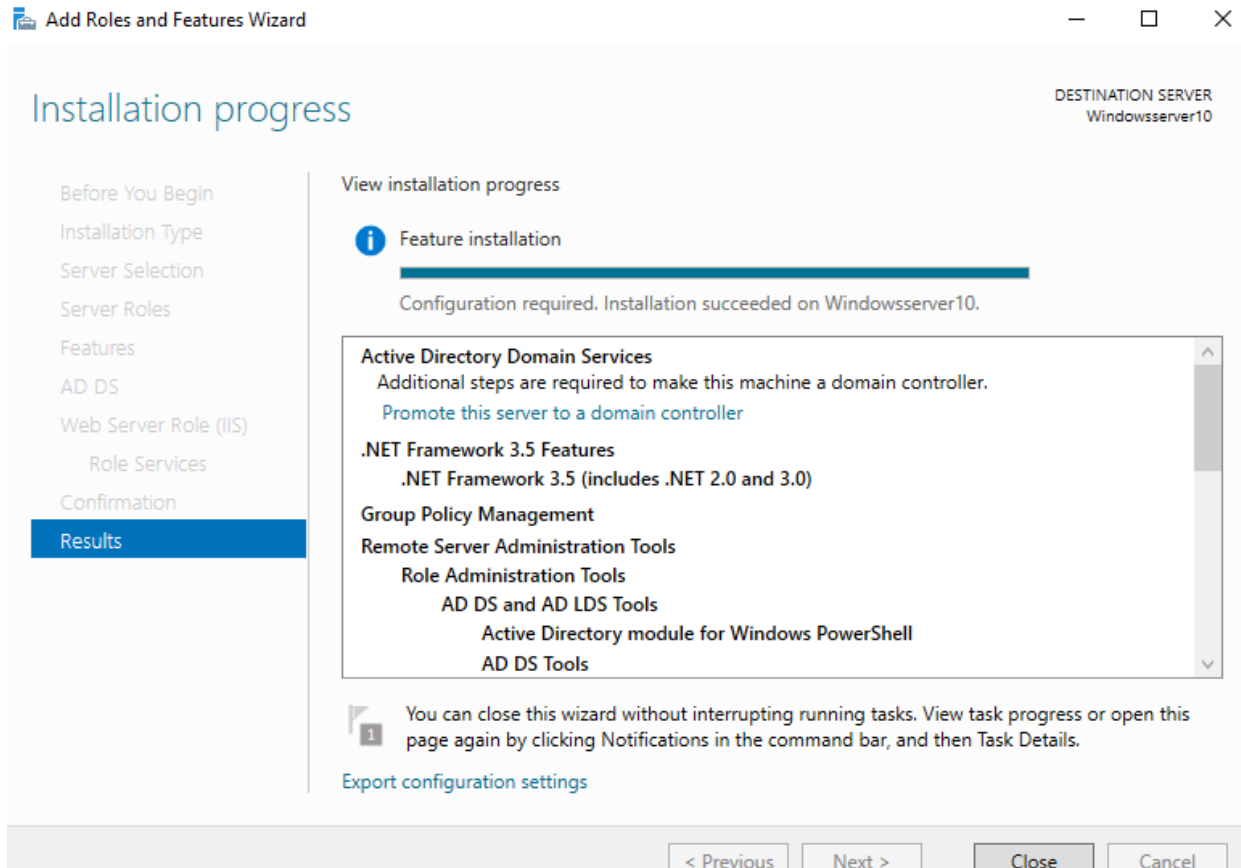


Figure 8: Starting the installation process

## IX. Click on Close button

Click on Close button. You should see the following page.

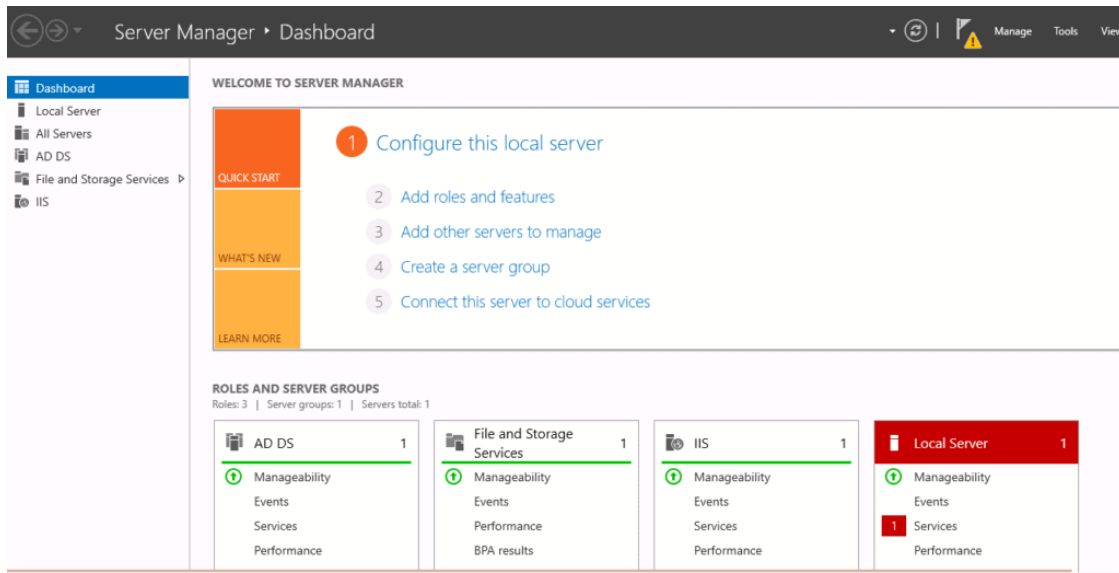


Figure 9: Click on close button

## X. Click on Yellow notification icon

Click on the Yellow notification icon. You should see the following page:

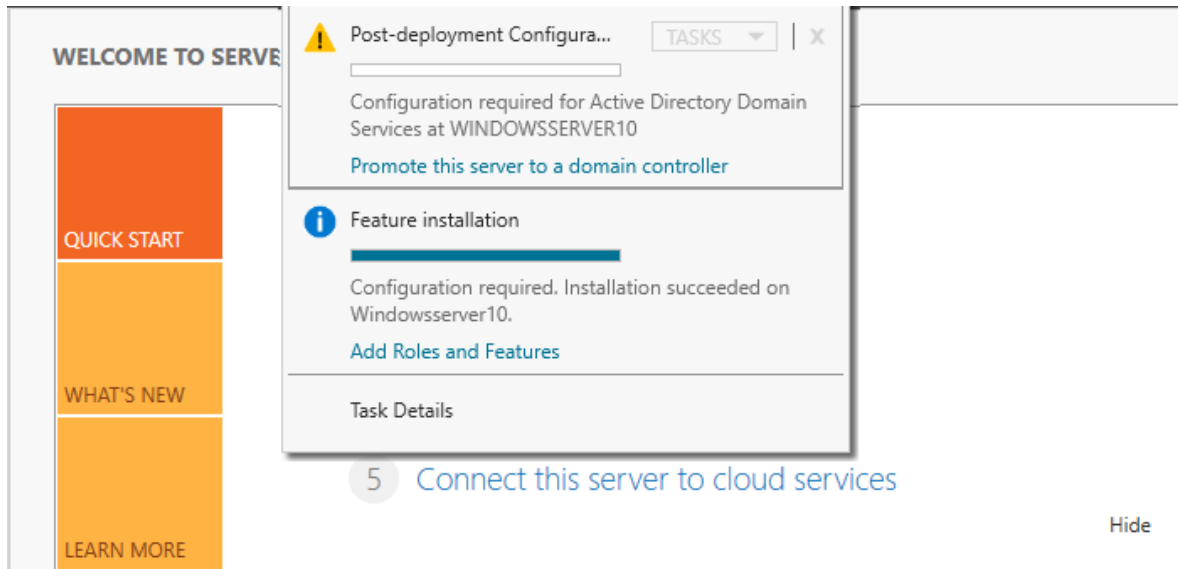


Figure 10: Click on Yellow notification icon

## XI. Click on Promote this server to the domain controller.

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

The screenshot shows the 'Active Directory Domain Services Configuration Wizard' window. The title bar includes the application icon, the text 'Active Directory Domain Services Configuration Wizard', and standard window controls (minimize, maximize, close). The main content area is titled 'Deployment Configuration' in a large blue font. In the top right corner, it says 'TARGET SERVER: Windowsserver10'. On the left, a vertical 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 pane contains the following sections: 'Select the deployment operation' with 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); 'Specify the domain information for this operation' with a text box labeled 'Root domain name:' containing the value 'mydomain1.com'; and a link at the bottom that says 'More about deployment configurations'. At the bottom of the window, there is a navigation bar with four buttons: '< Previous', 'Next >' (highlighted in blue), 'Install', and 'Cancel'.

Figure 11: Click on Promote this server to domain controller

## XII. Select add a new forest

Select add a new forest, define your domain name and click on the next button. You should see the domain controller options page:

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 content area is titled 'Domain Controller Options' in blue. In the top right corner, it says 'TARGET SERVER: Windowsserver10'. On the left, a vertical navigation pane lists the following steps: 'Deployment Configuration' (highlighted in blue), 'Domain Controller Options' (highlighted in blue), 'DNS Options', 'Additional Options', 'Paths', 'Review Options', 'Prerequisites Check', 'Installation', and 'Results'. The main area contains the following sections: 1. 'Select functional level of the new forest and root domain' with two dropdown menus, both set to 'Windows Server 2016'. 2. 'Specify domain controller capabilities' with three checkboxes: 'Domain Name System (DNS) server' (checked), 'Global Catalog (GC)' (checked), and 'Read only domain controller (RODC)' (unchecked). 3. 'Type the Directory Services Restore Mode (DSRM) password' with two password fields labeled 'Password:' and 'Confirm password:', both containing masked characters (dots). At the bottom of the main area is a link: 'More about domain controller options'. The bottom of the window features a navigation bar with four buttons: '< Previous' (disabled), 'Next >' (active/highlighted), 'Install' (disabled), and 'Cancel' (disabled).

Active Directory Domain Services Configuration Wizard

Domain Controller Options

TARGET SERVER  
Windowsserver10

Deployment Configuration  
Domain Controller Options  
DNS Options  
Additional Options  
Paths  
Review Options  
Prerequisites Check  
Installation  
Results

Select functional level of the new forest and root domain

Forest functional level: Windows Server 2016

Domain functional level: Windows Server 2016

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: .....

[More about domain controller options](#)

< Previous Next > Install Cancel

Figure 12: Select add a new forest



### XIII. Define directory service restore mode password

Define directory service restore mode password and click on next button. You should see the DNS options page:

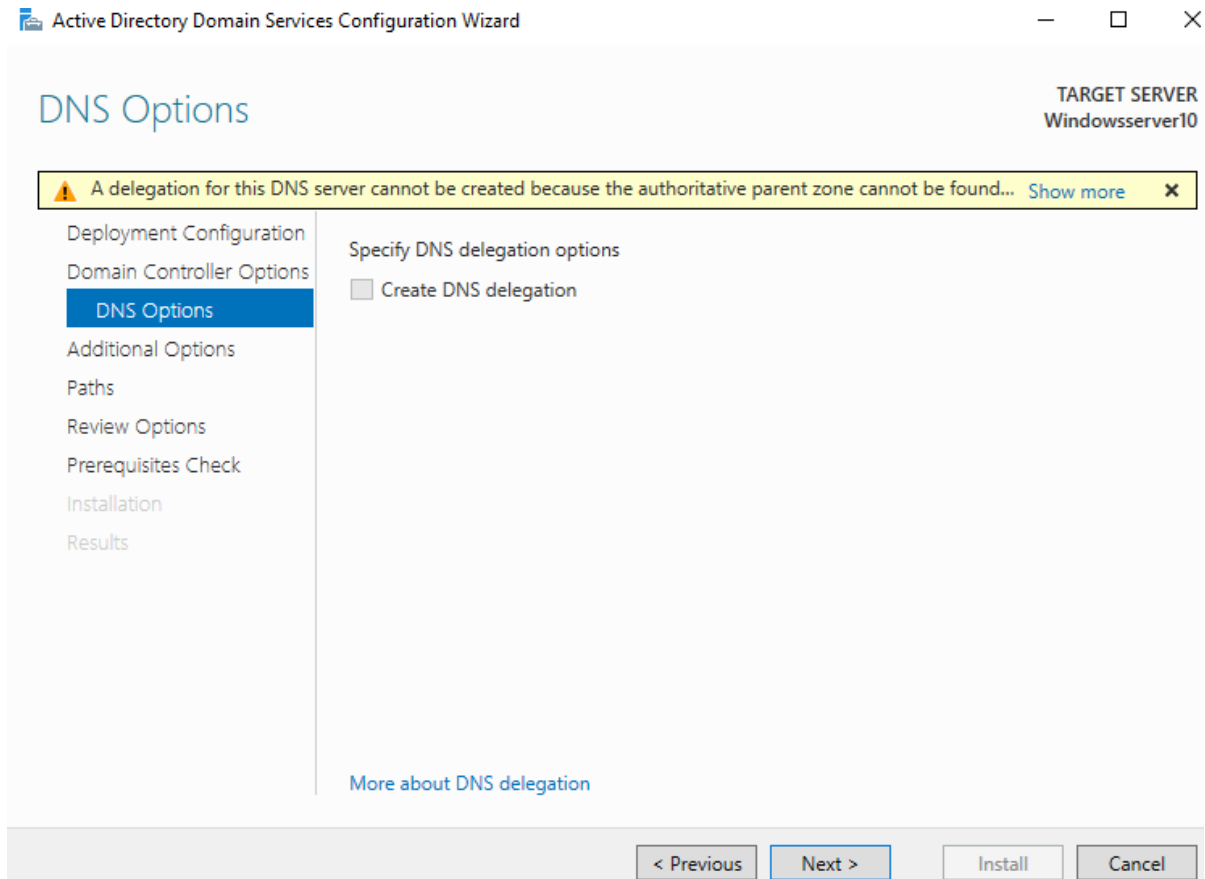


Figure 13: Define directory service restore mode password

### XIV. Leave the default configuration

Leave the default configuration and click on the Next button. You will be asked to set a Net BIOS name as shown

## Additional Options

TARGET SERVER  
Windowsserver10

Deployment Configuration

Domain Controller Options

DNS Options

Additional Options

Paths

Review Options

Prerequisites Check

Installation

Results

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

The NetBIOS domain name:

[More about additional options](#)

< Previous

Next >

Install

Cancel

Figure 14: Leaving the default configuration

## XV. Setting up NetBIOS name

Set your NetBIOS name and click on the Next button. You 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 window name and standard minimize, maximize, and close buttons. The main window has a light gray background. On the left, a vertical navigation pane lists the 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 a large blue font. In the top right corner, it says 'TARGET SERVER: Windowsserver10'. Below this, a subtitle reads 'Specify the location of the AD DS database, log files, and SYSVOL'. There are three input fields with 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 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', 'Next >' (highlighted in blue), 'Install', and 'Cancel'.

Active Directory Domain Services Configuration Wizard

Paths

TARGET SERVER  
Windowsserver10

Deployment Configuration  
Domain Controller Options  
DNS Options  
Additional Options  
**Paths**  
Review Options  
Prerequisites Check  
Installation  
Results

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 ...

[More about Active Directory paths](#)

< Previous Next > Install Cancel

Figure 15: Setting up NetBIOS name

## XVI. Leave Default path as it is

Leave the default path as it is and click on the Next Button. You should see the review all the options page:

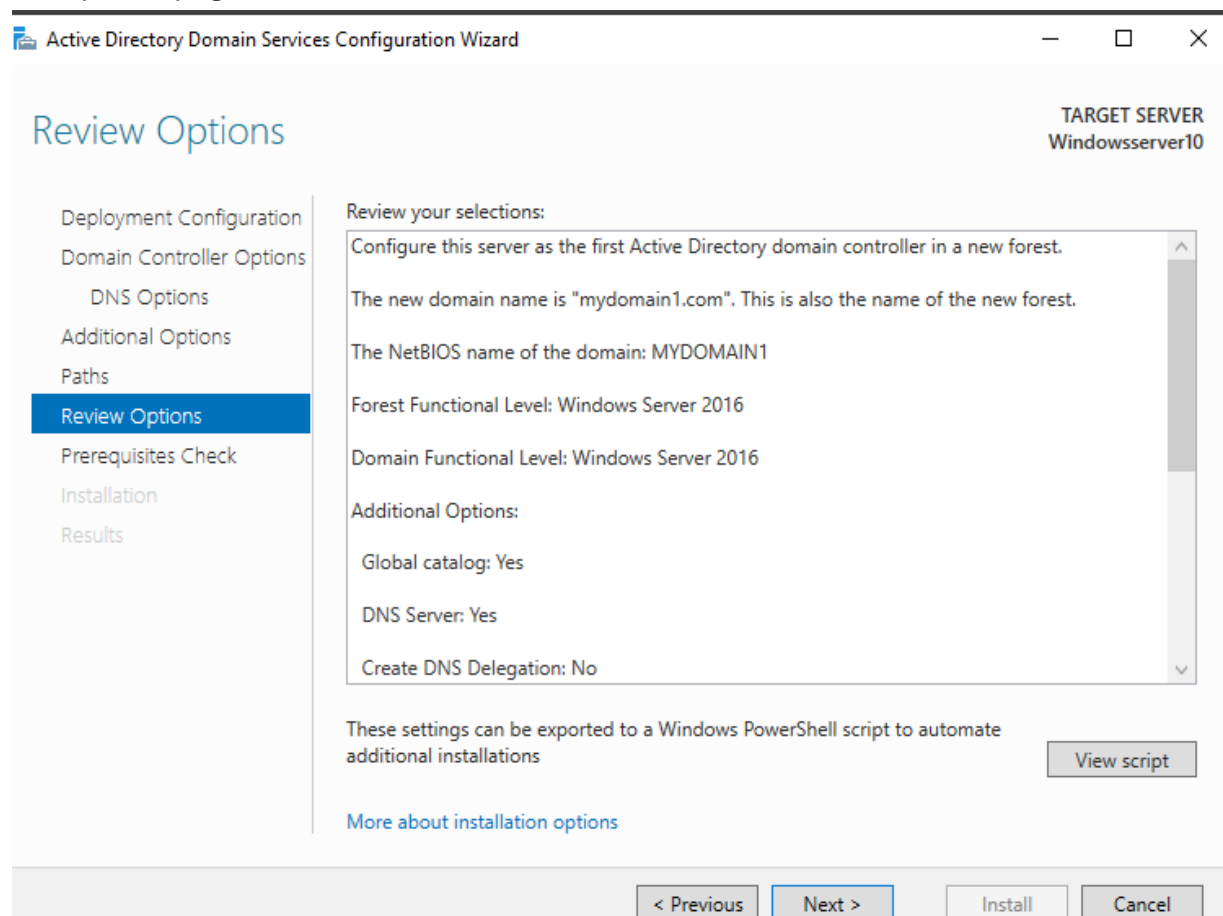


Figure 16: Leave the default path as it is

## XVII. Review all the configurations

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

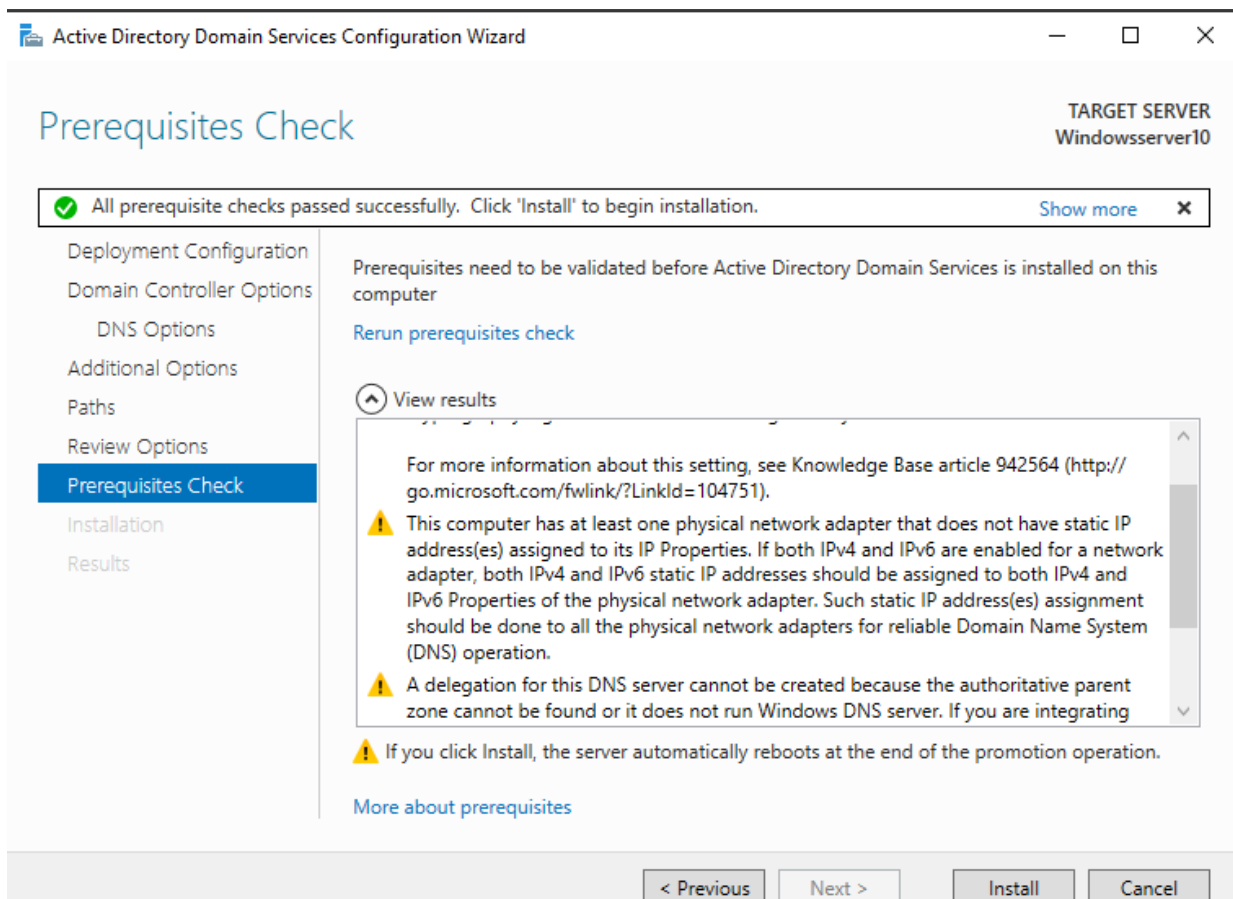


Figure 17: Review all the configurations

## XVIII. Make sure all prerequisite checks are successfully installed.

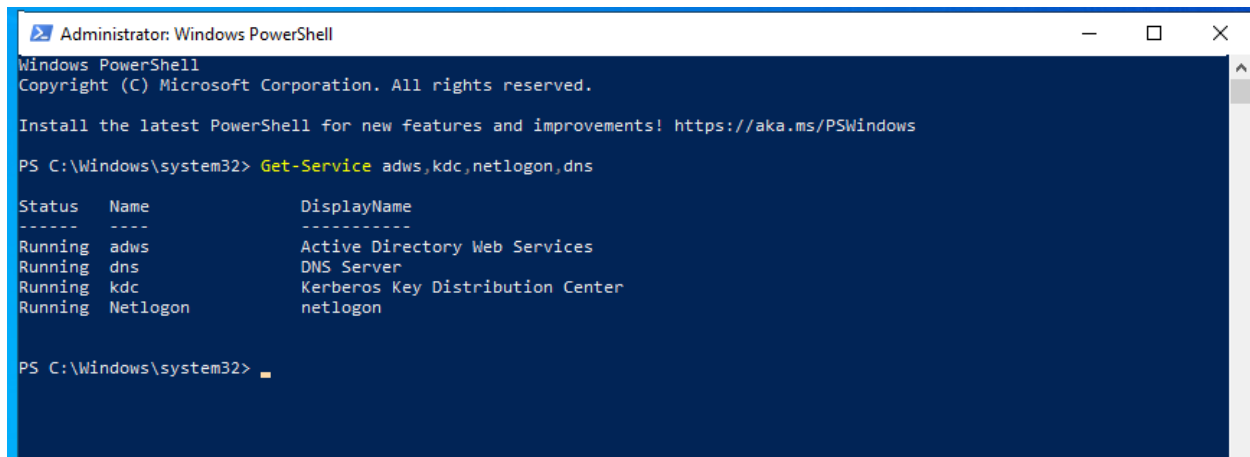
### 3. Verify Domain Controller

Next, you will need to verify whether the Domain Controller is adequately set up or not. Again, you can prove it from PowerShell.

To confirm the successful installation of the services, run the following command on Windows PowerShell.

Get-Service adws,kdc,netlogon,dns

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

A screenshot of a Windows PowerShell window titled "Administrator: Windows PowerShell". The window has a dark blue background with white text. The text shows the PowerShell prompt "PS C:\Windows\system32>" followed by the command "Get-Service adws,kdc,netlogon,dns". Below the command, a table of service status is displayed. The table has three columns: "Status", "Name", and "DisplayName". The data rows show that all four services (adws, dns, kdc, and netlogon) are in a "Running" state. The window also displays standard Windows PowerShell headers and a message about installing the latest PowerShell version.

```
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:\Windows\system32> 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:\Windows\system32>
```

Figure 18: Confirming successful installation of services

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

Get-ADDomainController

You should see all the information on the following screen:

```

PS C:\Windows\system32> Get-ADDomainController

ComputerObjectDN      : CN=WINDOWSSERVER10,OU=Domain Controllers,DC=mydomain1,DC=com
DefaultPartition      : DC=mydomain1,DC=com
Domain                : mydomain1.com
Enabled               : True
Forest                : mydomain1.com
HostName              : Windowsserver10.mydomain1.com
InvocationId          : a2876dfb-70e9-4fba-a2f5-93bcc33967b1
IPv4Address            : 10.0.2.15
IPv6Address           : fd00::990f:7a75:1749:d4e
IsGlobalCatalog       : True
IsReadOnly             : False
LdapPort              : 389
Name                  : WINDOWSSERVER10
NTDSSettingsObjectDN  : CN=NTDS Settings,CN=WINDOWSSERVER10,CN=Servers,CN=Default-First-Site-Name,CN=Sites,CN=Configuration,DC=mydomain1,DC=com
OperatingSystem        : Windows Server 2022 Standard Evaluation
OperatingSystemHotfix  :
OperatingSystemServicePack :
OperatingSystemVersion : 10.0 (20348)
OperationMasterRoles   : {SchemaMaster, DomainNamingMaster, PDCEmulator, RIDMaster...}
Partitions              : {DC=ForestDnsZones,DC=mydomain1,DC=com, DC=DomainDnsZones,DC=mydomain1,DC=com, CN=Schema,CN=Configuration,DC=mydomain1,DC=com, CN=Configuration,DC=mydomain1,DC=com...}
ServerObjectDN         : CN=WINDOWSSERVER10,CN=Servers,CN=Default-First-Site-Name,CN=Sites,CN=Configuration,DC=mydomain1,DC=com
ServerObjectGuid       : 76fb64a7-3e83-4f4d-8408-ed99874329b6
Site                   : Default-First-Site-Name
SslPort                : 636

```

Figure 19: Displaying configuration details of domain controller

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

```
Get-ADDomain mydomain1.com
```

You should see the next screen:

```

PS C:\Windows\system32> Get-ADDomain mydomain1.com

AllowedDNSSuffixes      : {}
ChildDomains            : {}
ComputersContainer      : CN=Computers,DC=mydomain1,DC=com
DeletedObjectsContainer : CN=Deleted Objects,DC=mydomain1,DC=com
DistinguishedName       : DC=mydomain1,DC=com
DNSRoot                 : mydomain1.com
DomainControllersContainer : OU=Domain Controllers,DC=mydomain1,DC=com
DomainMode              : Windows2016Domain
DomainSID               : S-1-5-21-2265675594-2647683366-3959296320
ForeignSecurityPrincipalsContainer : CN=ForeignSecurityPrincipals,DC=mydomain1,DC=com
Forest                  : mydomain1.com
InfrastructureMaster     : Windowsserver10.mydomain1.com
LastLogonReplicationInterval :
LinkedGroupPolicyObjects : {CN={31B2F340-016D-11D2-945F-00C04FB984F9},CN=Policies,CN=System,DC=mydomain1,DC=com}
LostAndFoundContainer    : CN=LostAndFound,DC=mydomain1,DC=com
ManagedBy              :
Name                    : mydomain1
NetBIOSName             : MYDOMAIN1
ObjectClass              : domainDNS
ObjectGUID              : d87f7970-c11b-4b44-91ad-3f7be07ec905
ParentDomain            :
PDCEmulator             : Windowsserver10.mydomain1.com
PublicKeyRequiredPasswordRolling : True
QuotasContainer         : CN=NTDS Quotas,DC=mydomain1,DC=com
ReadOnlyReplicaDirectoryServers : {}
ReplicaDirectoryServers  : {Windowsserver10.mydomain1.com}
RIDMaster               : Windowsserver10.mydomain1.com
SubordinateReferences    : {DC=ForestDnsZones,DC=mydomain1,DC=com, DC=DomainDnsZones,DC=mydomain1,DC=com, CN=Configuration,DC=mydomain1,DC=com}
SystemsContainer        : CN=System,DC=mydomain1,DC=com
UsersContainer          : CN=Users,DC=mydomain1,DC=com

```

Figure 20: Detailed information about your domain

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

Get-ADForest mydomain1.com

You should see the next screen:

```

PS C:\Windows\system32> GET-ADFOREST mydomain1.com

ApplicationPartitions : {DC=ForestDnsZones,DC=mydomain1,DC=com, DC=DomainDnsZones,DC=mydomain1,DC=com}
CrossForestReferences : {}
DomainNamingMaster    : Windowsserver10.mydomain1.com
Domains               : {mydomain1.com}
ForestMode            : Windows2016Forest
GlobalCatalogs       : {Windowsserver10.mydomain1.com}
Name                  : mydomain1.com
PartitionsContainer    : CN=Partitions,CN=Configuration,DC=mydomain1,DC=com
RootDomain            : mydomain1.com
SchemaMaster          : Windowsserver10.mydomain1.com
Sites                 : {Default-First-Site-Name}
SPNSuffixes           : {}
UPNSuffixes           : {}

```

Figure 21: Displaying Active dictionary forest



## **4. References**

Microsoft Documentation on Active Directory

<https://learn.microsoft.com/en-us/windows-server/identity/active-directory-domain-services>