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## 1. Introduction

Active Directory is a Microsoft product that operates on Windows Server. It is a database and set of services developed to help you with access, management, and permissions for your network resources. (Microsoft, 2024)

## 2. Objectives

The objective of this practical lab is to install Active Directory and simplify and understand the concept of AD better.

To install Active Directory.

To understand concept of AD better.

## 3. Tools and software used

### 3.1 Oracle VirtualBox

Oracle VirtualBox is a powerful open source virtualization program that allows to run multiple operating systems at the same time on one piece of hardware. It's versatile for testing, development and deployment, supporting multiple host and guest Operating Systems and is developed and supported by Oracle Corporation. (VirtualBox, n.d.)

### 3.2 Windows server 2022

Windows server is the platform for building an infrastructure of connected applications, networks, and web services from the workgroup to the data centre. It bridges on premises environments with Azure, adding additional layers of security while helping you modernize your applications and infrastructure. Windows Server 2022 offers hybrid capabilities with Azure, enhancing multi-layer security and flexible application platform. It features secured-core capabilities, protecting hardware, firmware, and OS against advanced security threats. It also introduces faster encrypted HTTPS connections and industry standard encryption. (Microsoft, n.d.)

## 4. Steps to replicate

### Step 1

Login to windows server 2022 as an administrator and open the Server Manager as shows below.

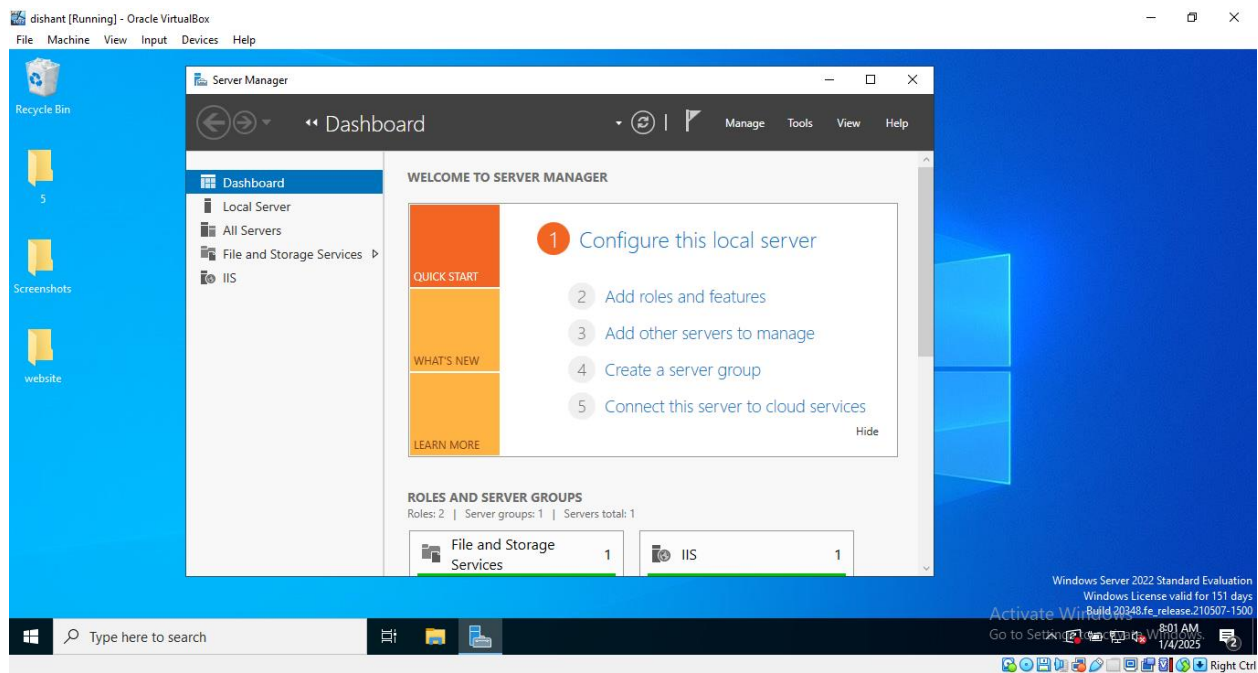


Figure 1: opening Server Manager

## Step 2

Click on the **Add Roles and Features**.

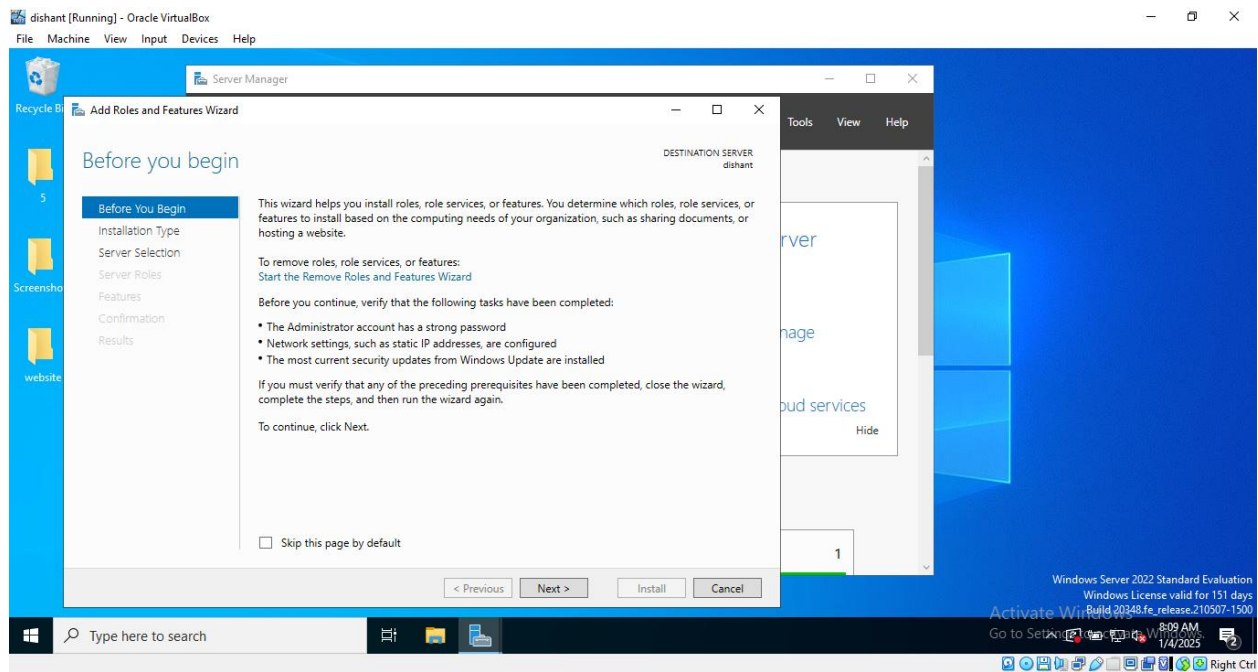


Figure 2: add roles and features wizard

### Step 3

Click on the **Next** button. You'll be asked to select the installation type as shown below

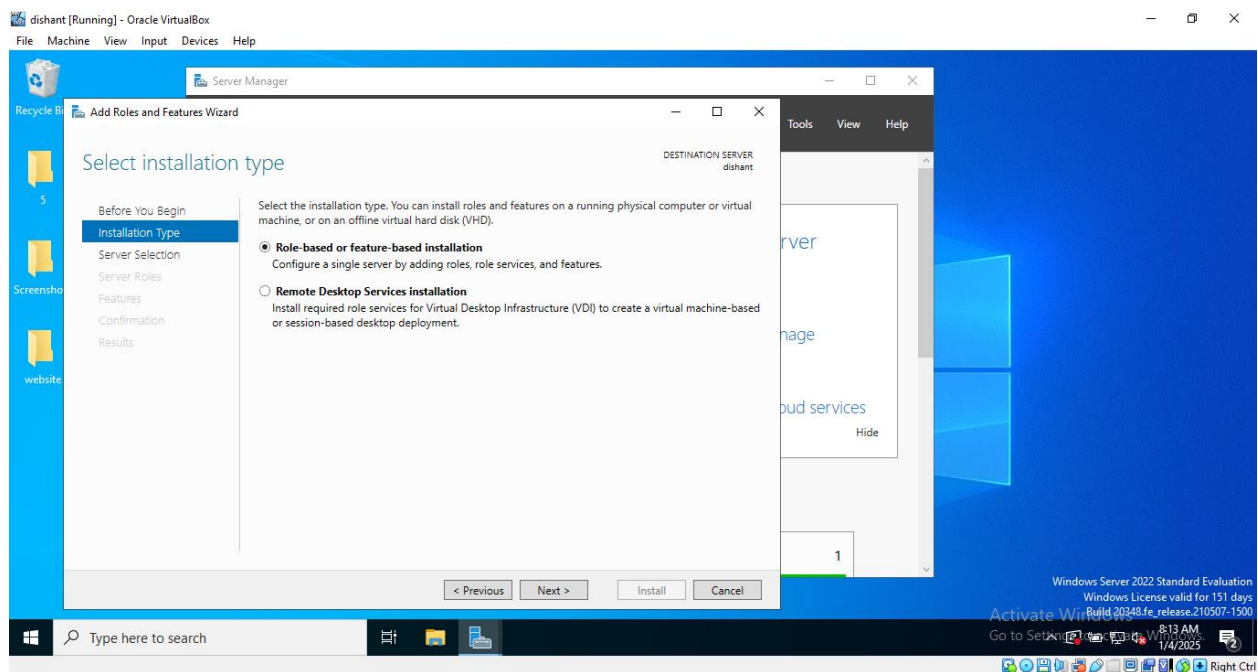


Figure 3: clicking next button

## Step 4

Click on the **Next** button. You'll be asked to select a destination server as shown below

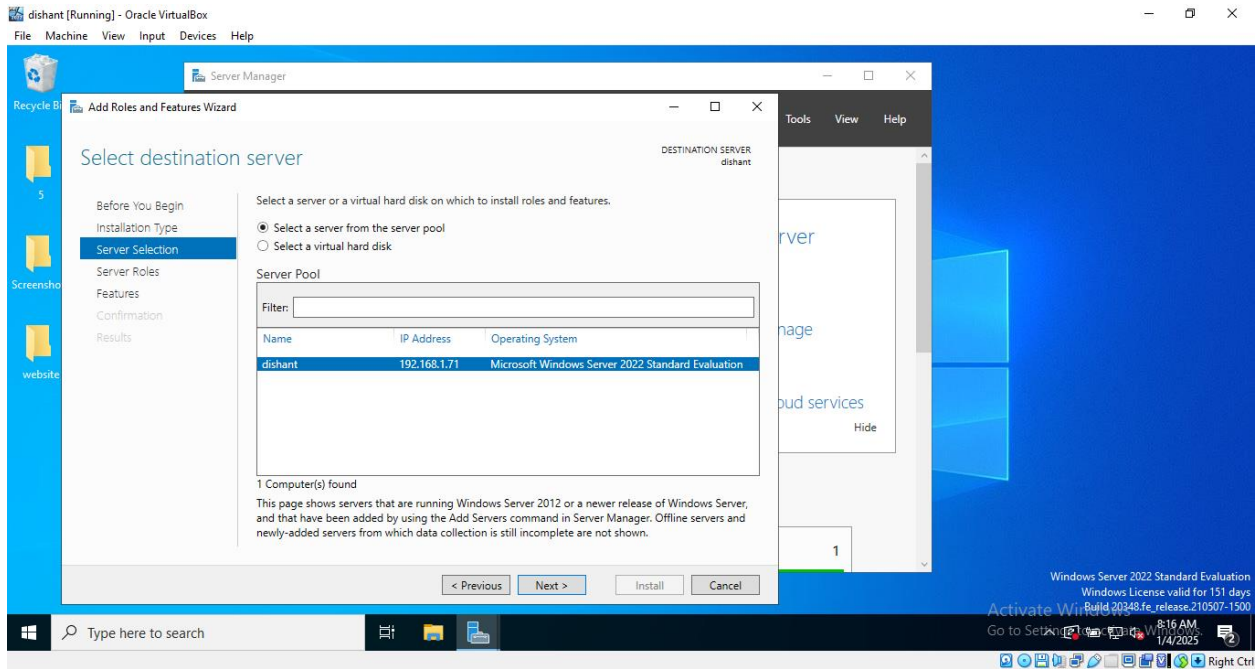


Figure 4: clicking next button on destination server

## Step 5

Select '**Select a server from the server pool**'. And click the **Next** button

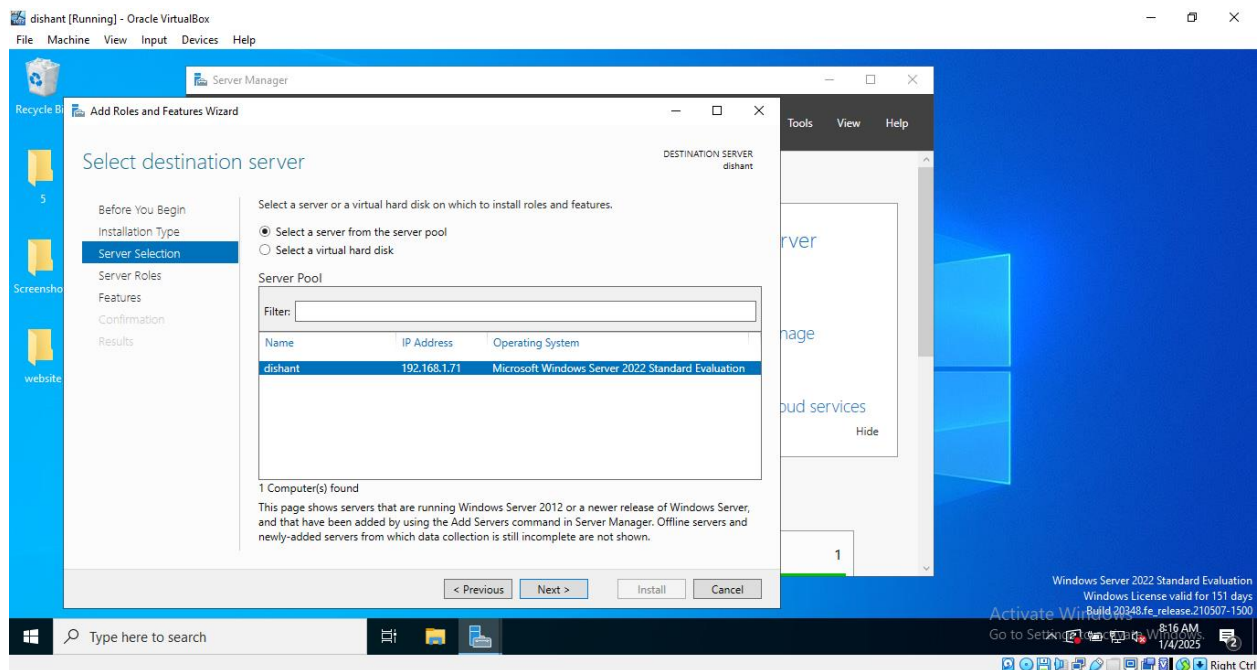


Figure 5: selecting 'selecting from the server pool'

## Step 6

Select **Active Directory Domain Services** and click on the **Next** button.

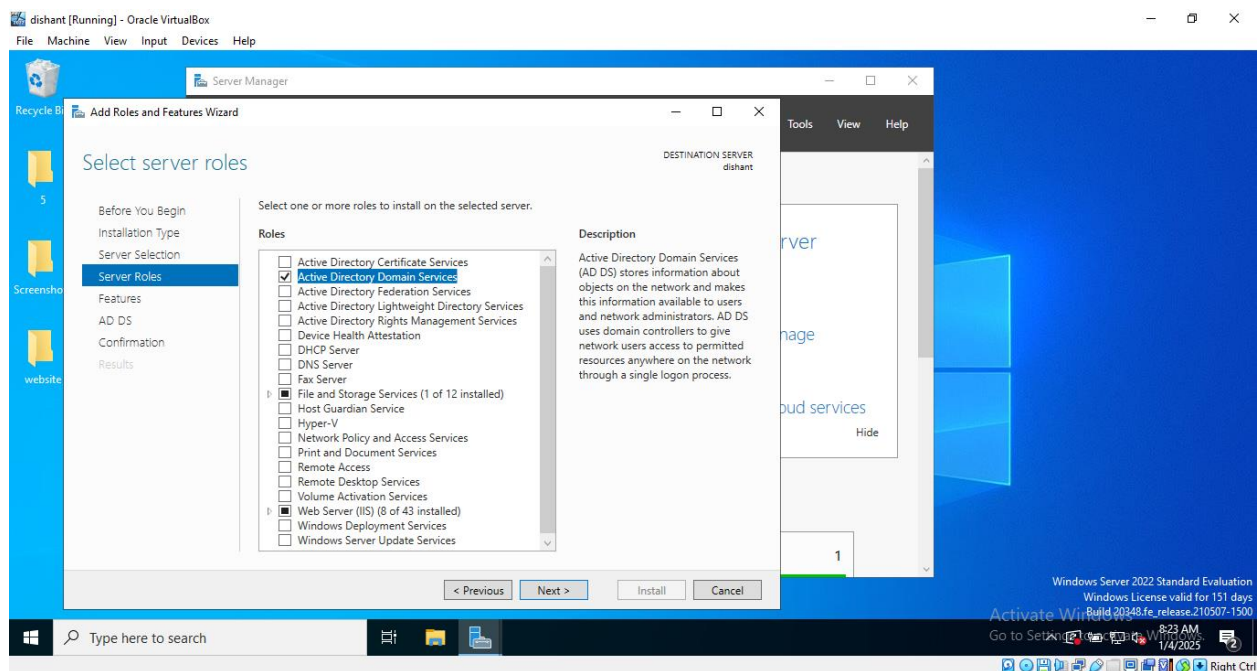


Figure 6: selecting 'Activate Directory Services'



## Step 7

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

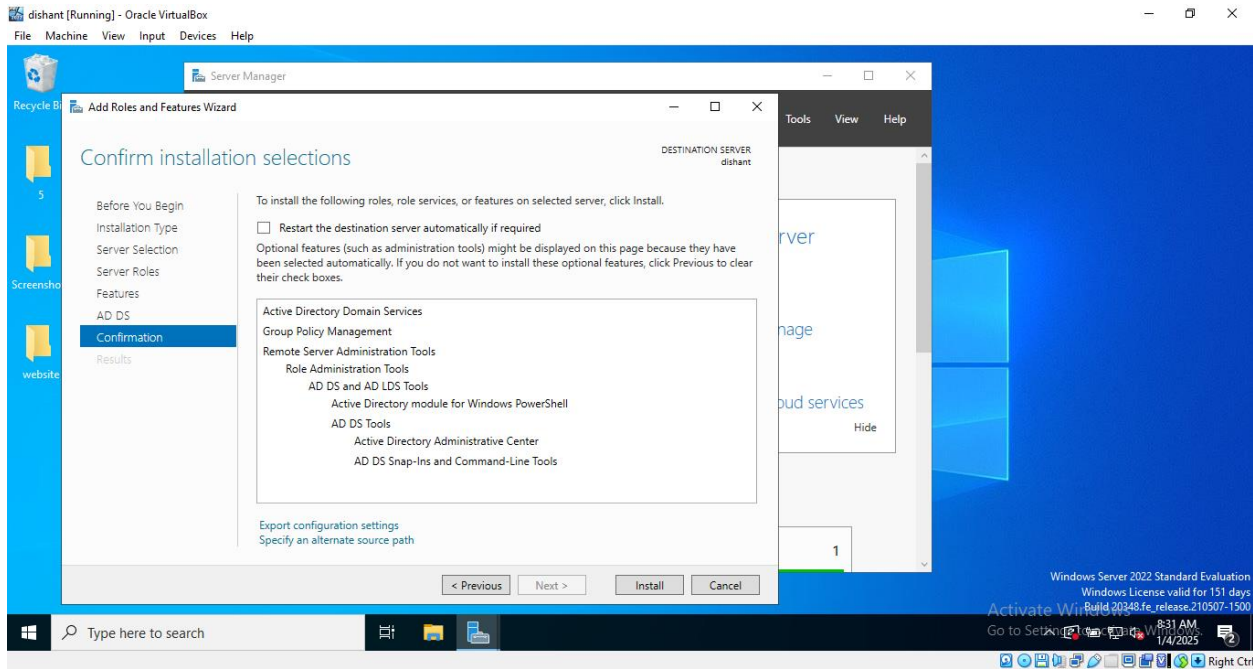


Figure 7: confirming installation page

## Step 8

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

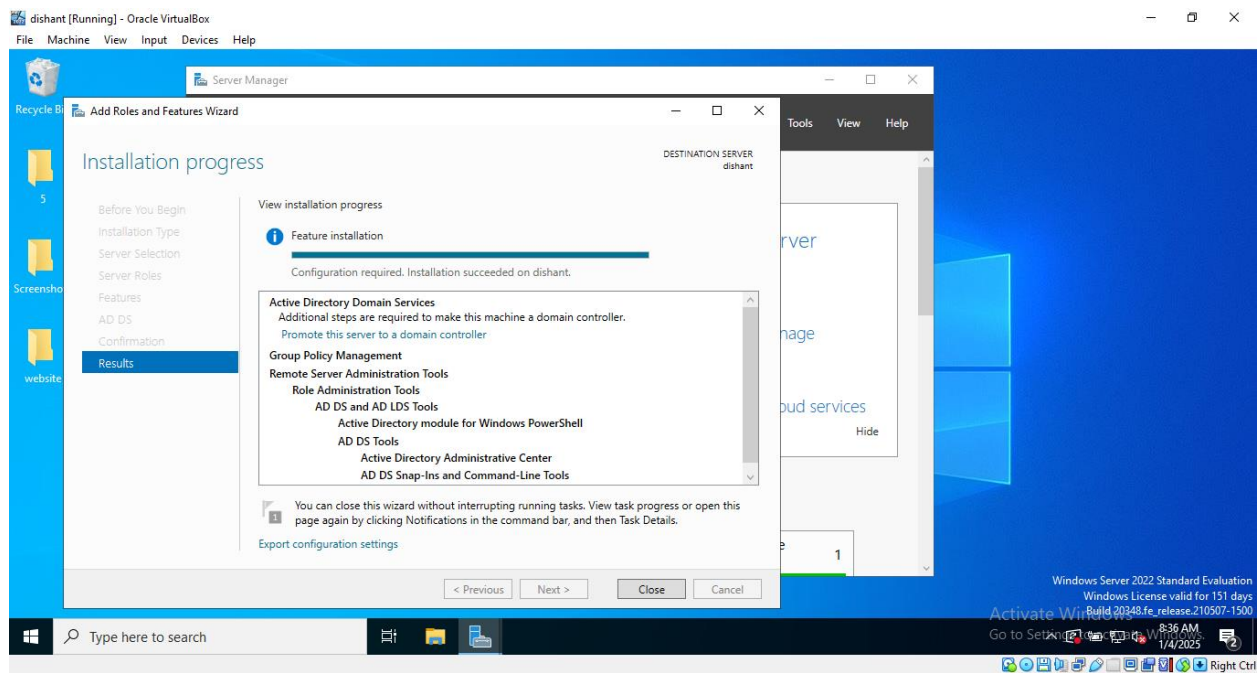


Figure 8: successful feature installation

## Step 9

Click on the **Close** button.

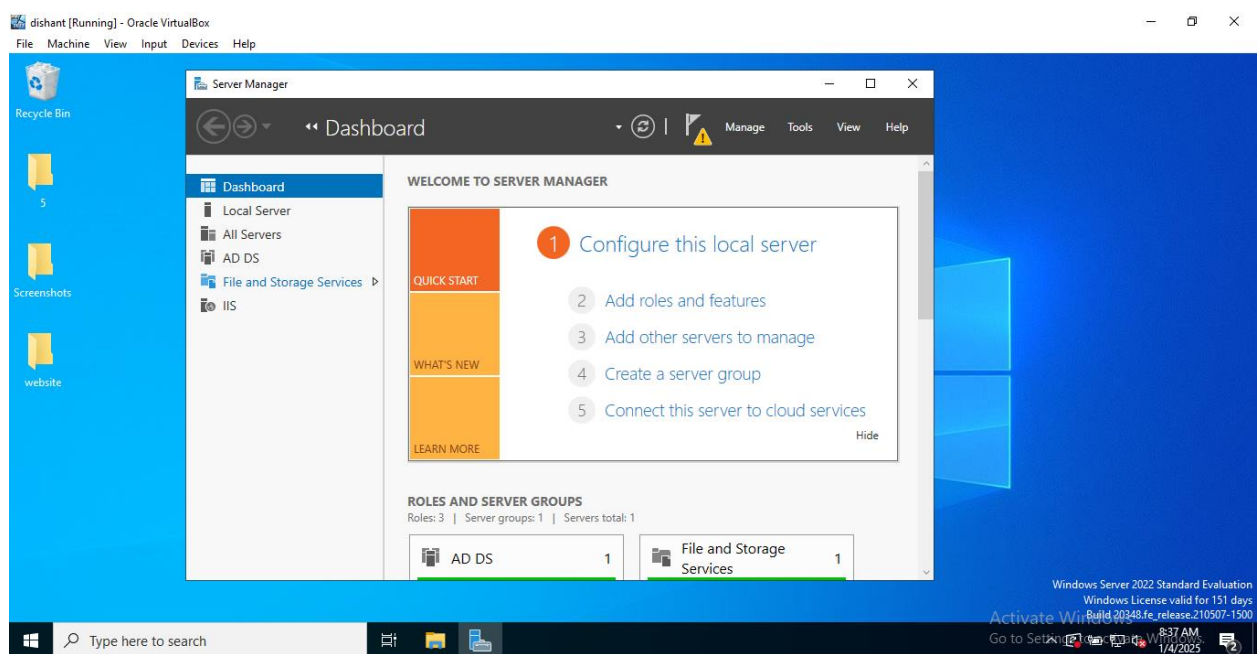


Figure 9: clicking the Close button

## Step 10

Click on the **yellow notification icon**.

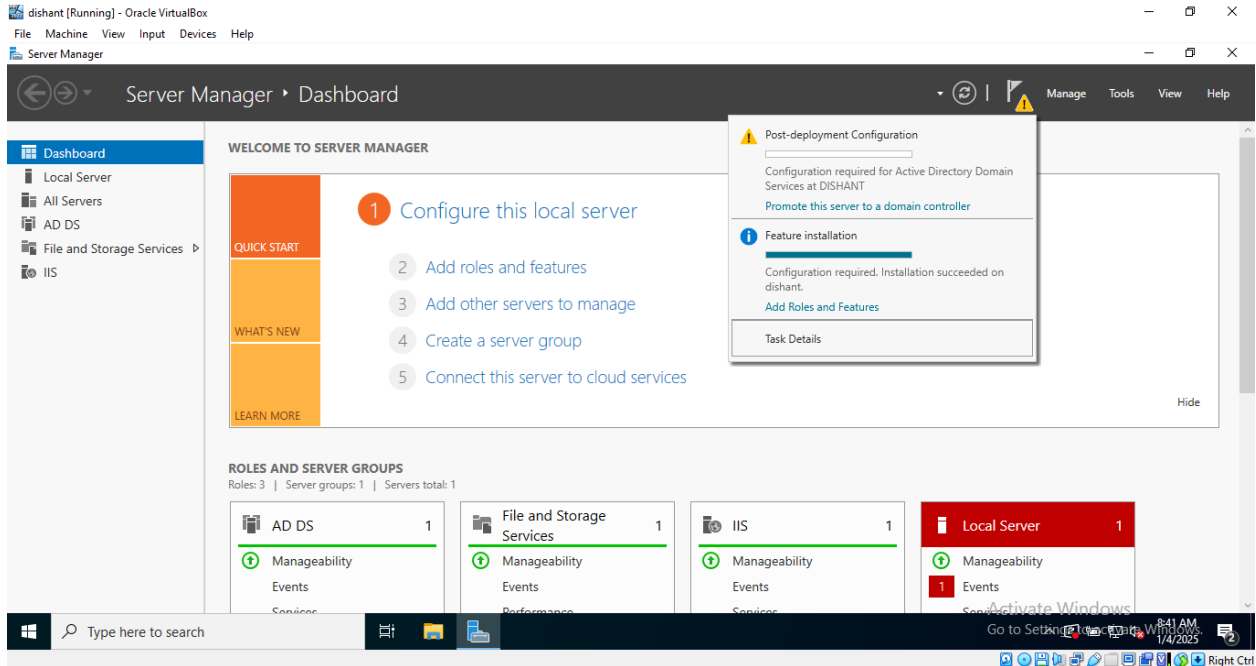


Figure 10: clicking on yellow notification

## Step 11

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

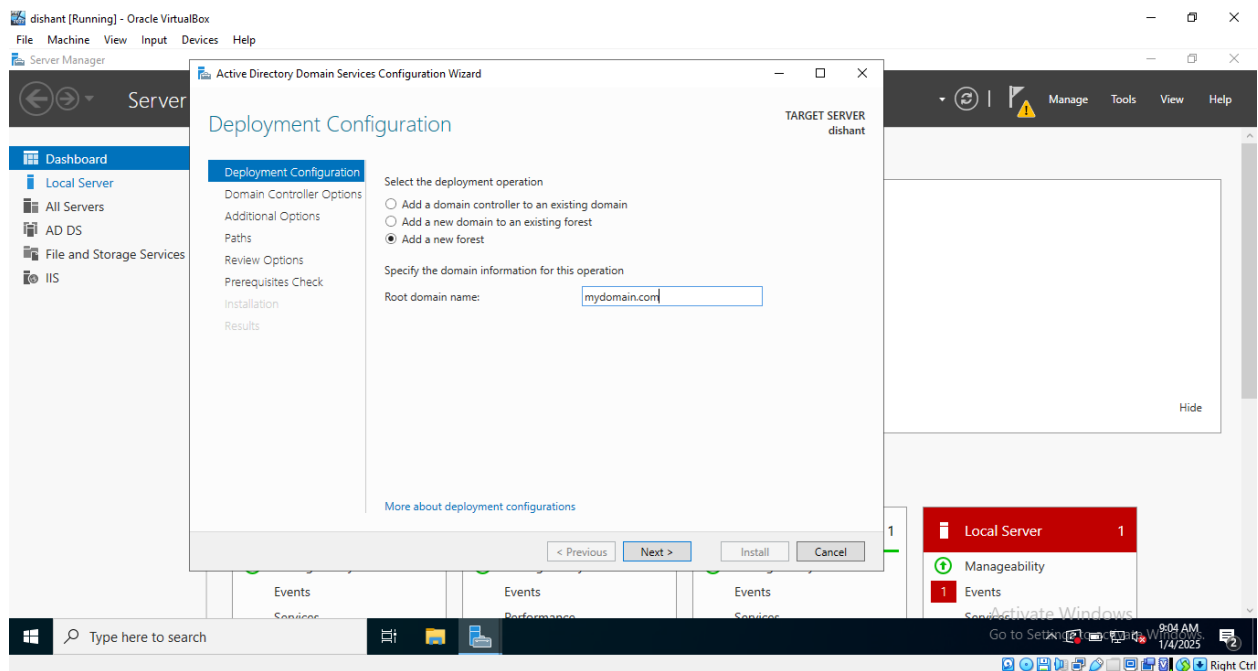


Figure 11: clicking promote this server to domain controller

## Step 12

Select **add a new forest**. Define your name and click on the **Next** button. You should see the domain controller options page

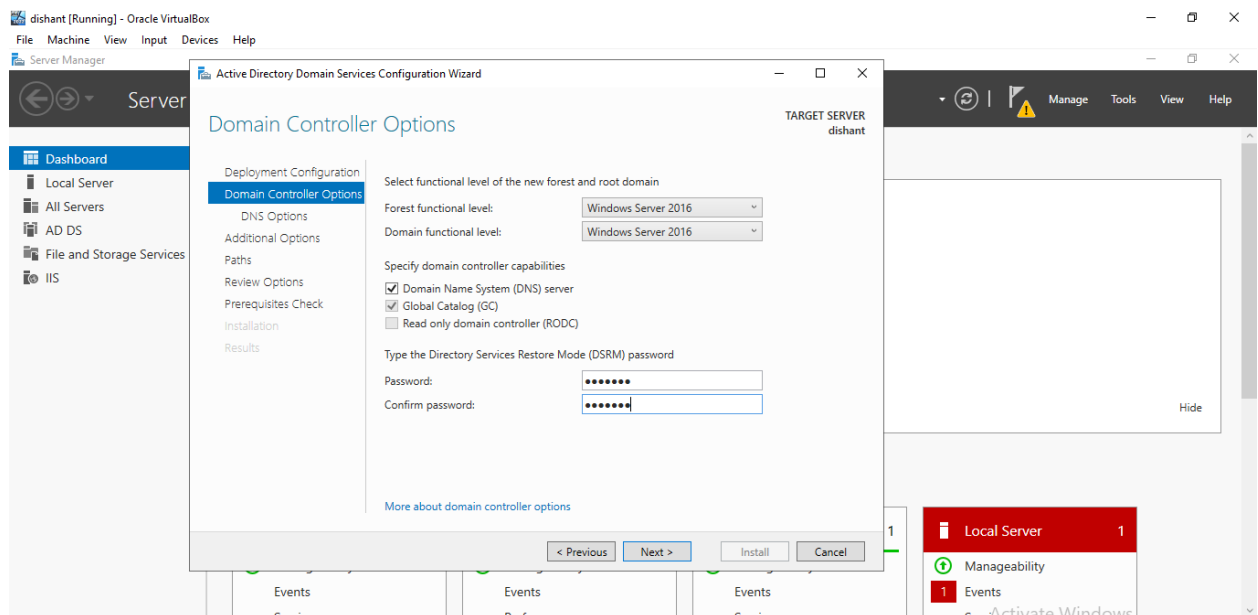


Figure 12: defining password

### Step 13

Define your directory service restore mode password and click on the **Next** button. You should see the DNS options page

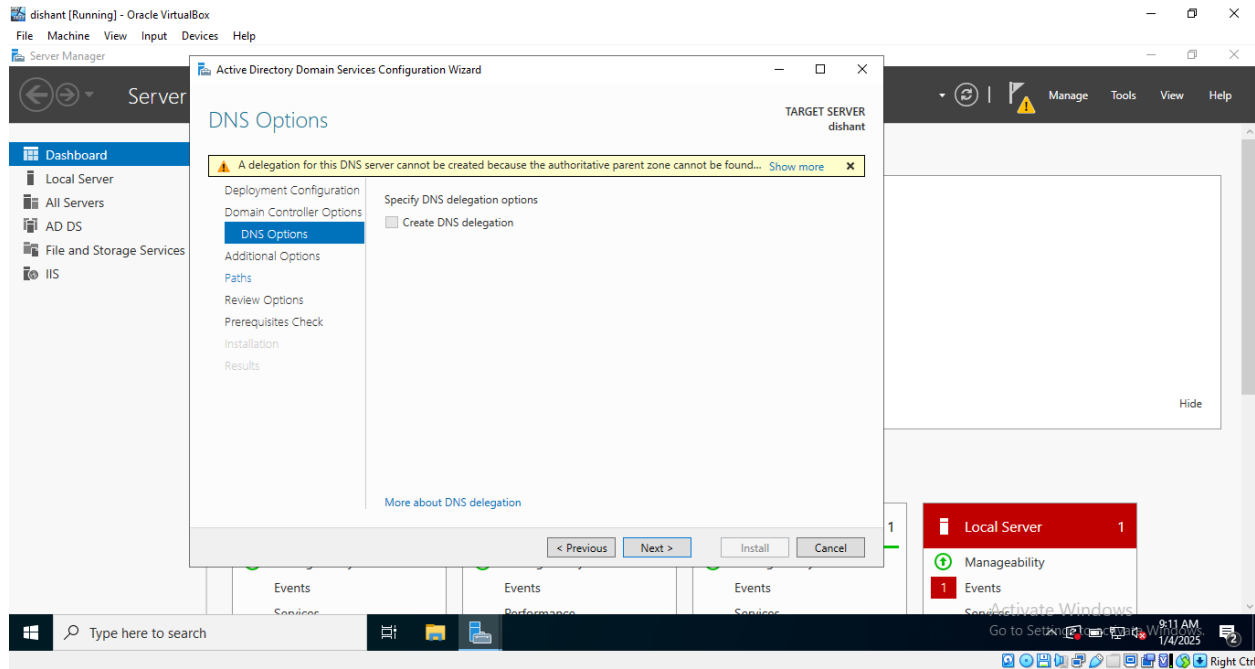


Figure 13: DNS options page

### Step 14

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

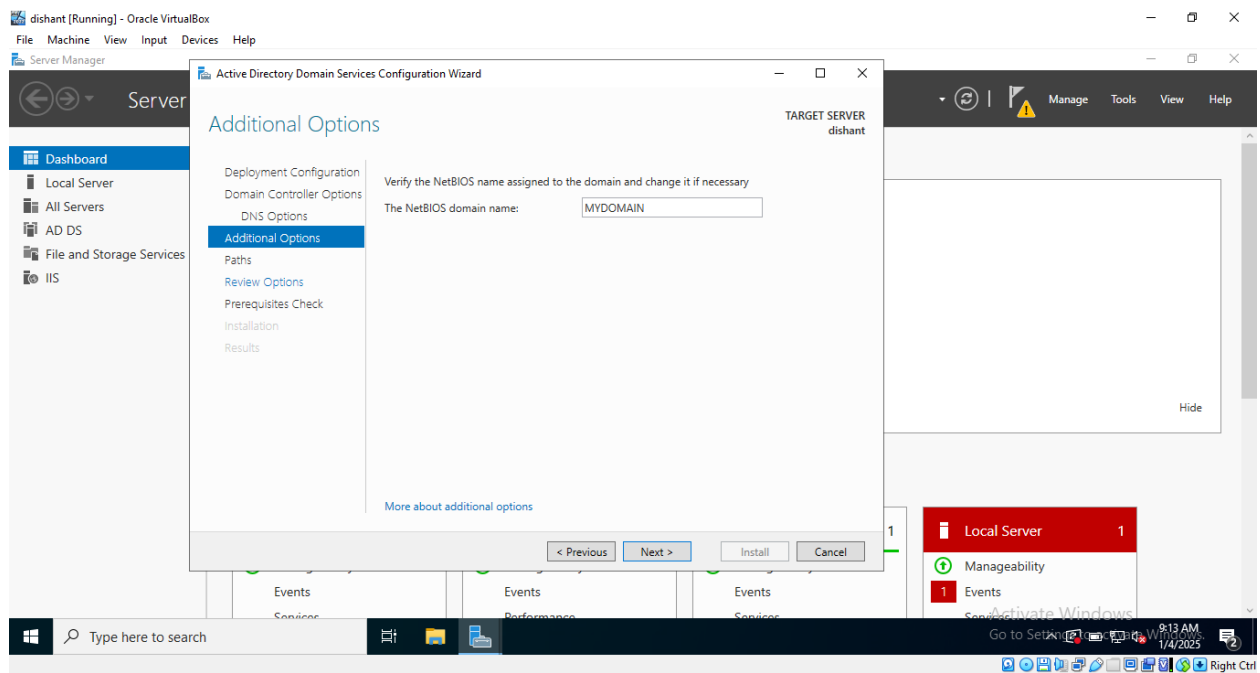


Figure 14: setting NetBIOS name

## Step 15

Set your **NetBIOS** name and click on the **Next** button. You will be asked to define AD DS database path location.

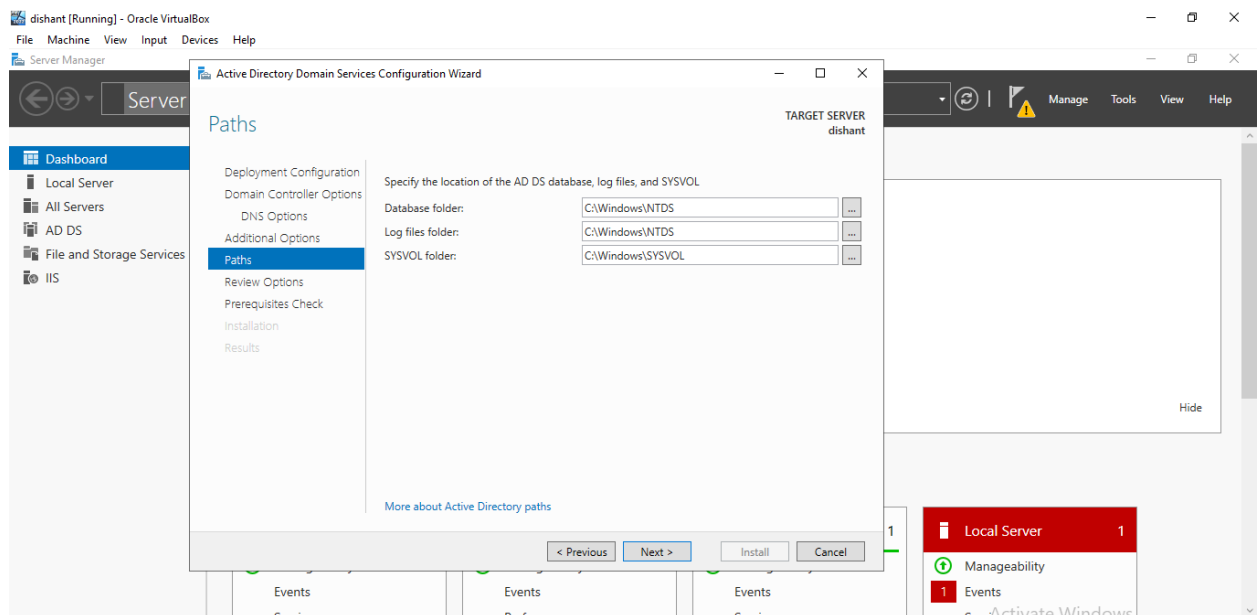


Figure 15: defining AD DS database path

## Step 16

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

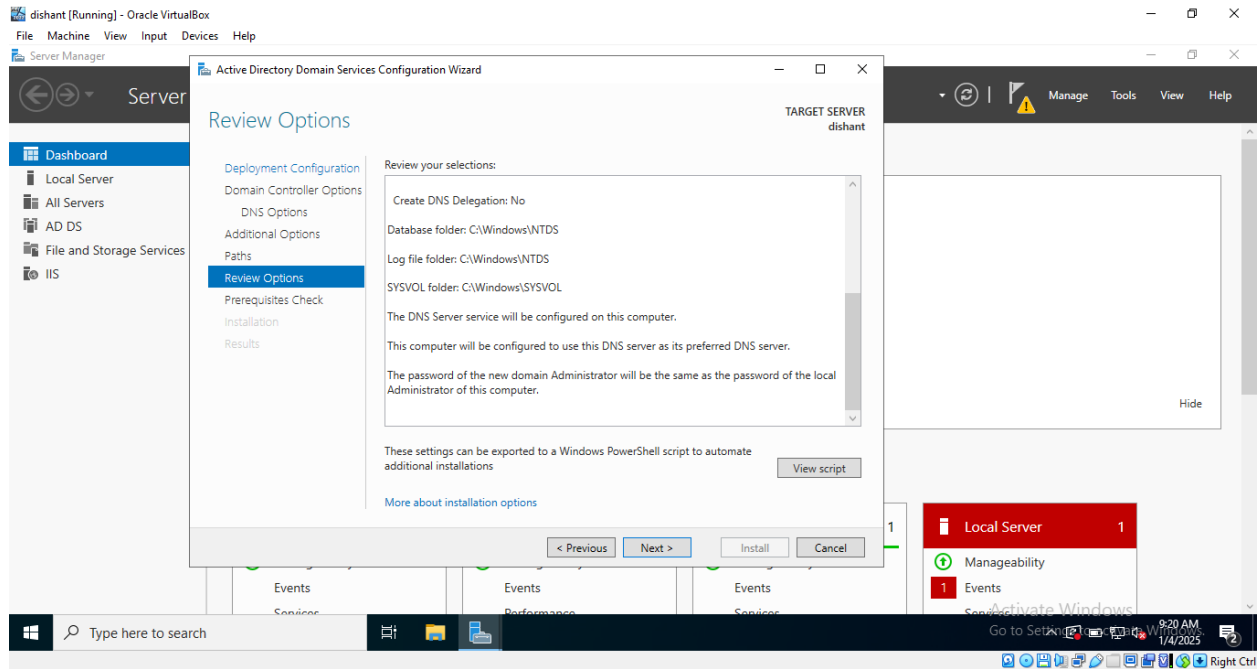


Figure 16: review options page

## Step 17

Review all the configurations and click on the **Next** button. You should see the prerequisite check page.

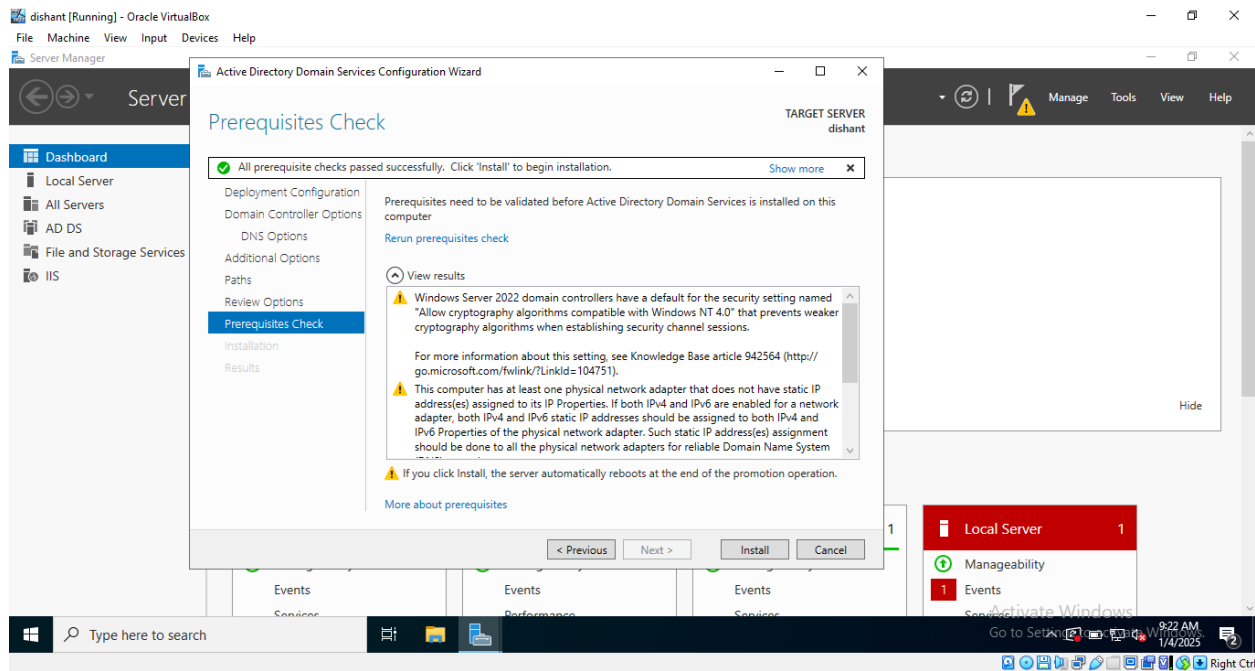


Figure 17: prerequisites check page

## Step 18

Make sure all the prerequisite checks are successful then click on the **Install** button.

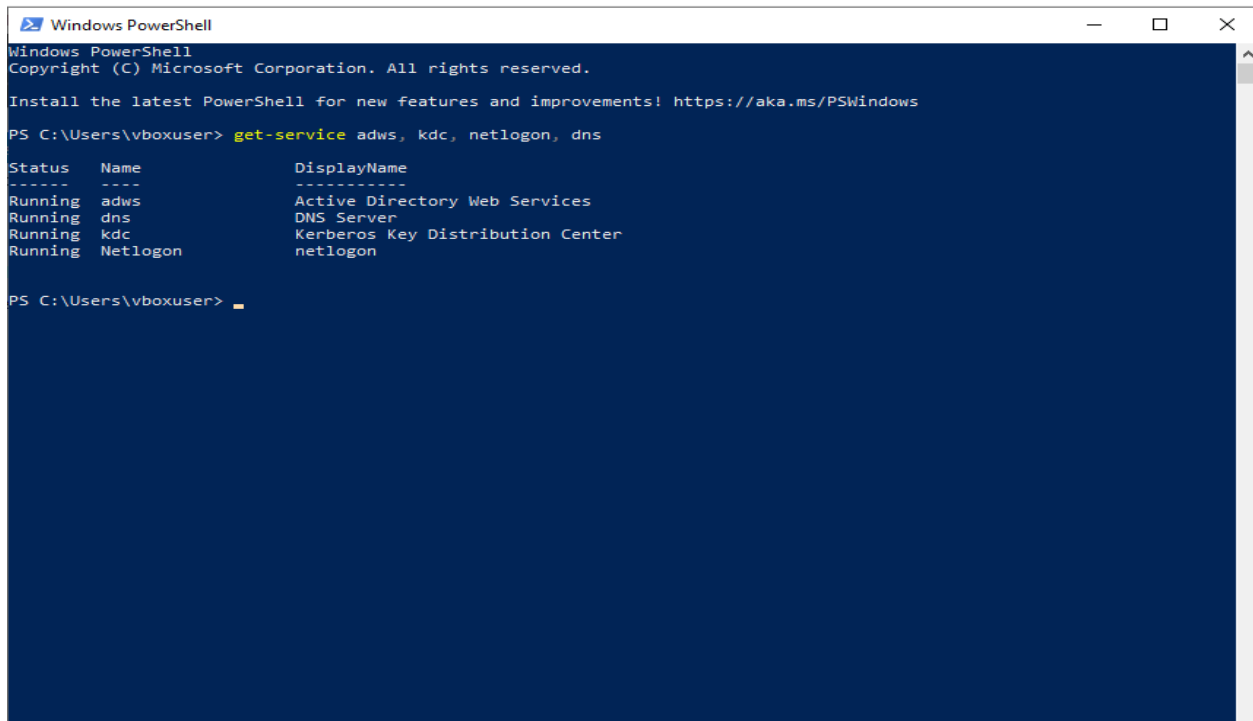
## Step 19 - Verify Domain Controller

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 that successful installation of the services run the following command on Windows PowerShell.

Get-Service adws, kdc, netlogon, dns





```
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

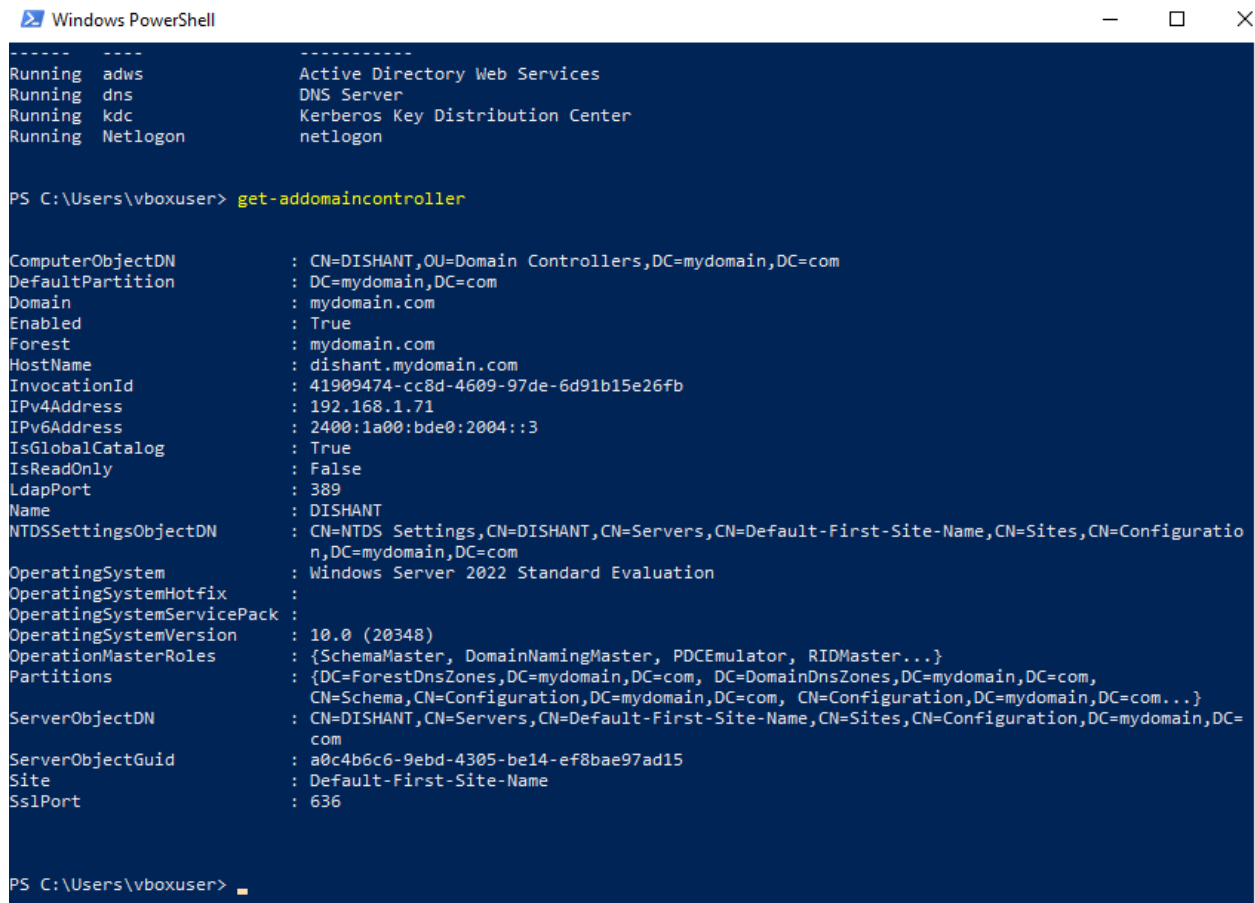
Status      Name      DisplayName
-----
Running     adws      Active Directory Web Services
Running     dns       DNS Server
Running     kdc       Kerberos Key Distribution Center
Running     Netlogon  netlogon

PS C:\Users\vboxuser>
```

Figure 18: verifying domain controller

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

Get-ADDomainController



```

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

PS C:\Users\vboxuser> get-addomaincontroller

ComputerObjectDN      : CN=DISHANT,OU=Domain Controllers,DC=mydomain,DC=com
DefaultPartition      : DC=mydomain,DC=com
Domain                : mydomain.com
Enabled               : True
Forest                : mydomain.com
HostName              : dishant.mydomain.com
InvocationId          : 41909474-cc8d-4609-97de-6d91b15e26fb
IPv4Address           : 192.168.1.71
IPv6Address           : 2400:1a00:bde0:2004::3
IsGlobalCatalog       : True
IsReadOnly            : False
LdapPort              : 389
Name                  : DISHANT
NTDSSettingsObjectDN  : CN=NTDS Settings,CN=DISHANT,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=DISHANT,CN=Servers,CN=Default-First-Site-Name,CN=Sites,CN=Configuration,DC=mydomain,DC=
com
ServerObjectGuid       : a0c4b6c6-9ebd-4305-be14-ef8bae97ad15
Site                   : Default-First-Site-Name
SslPort                : 636

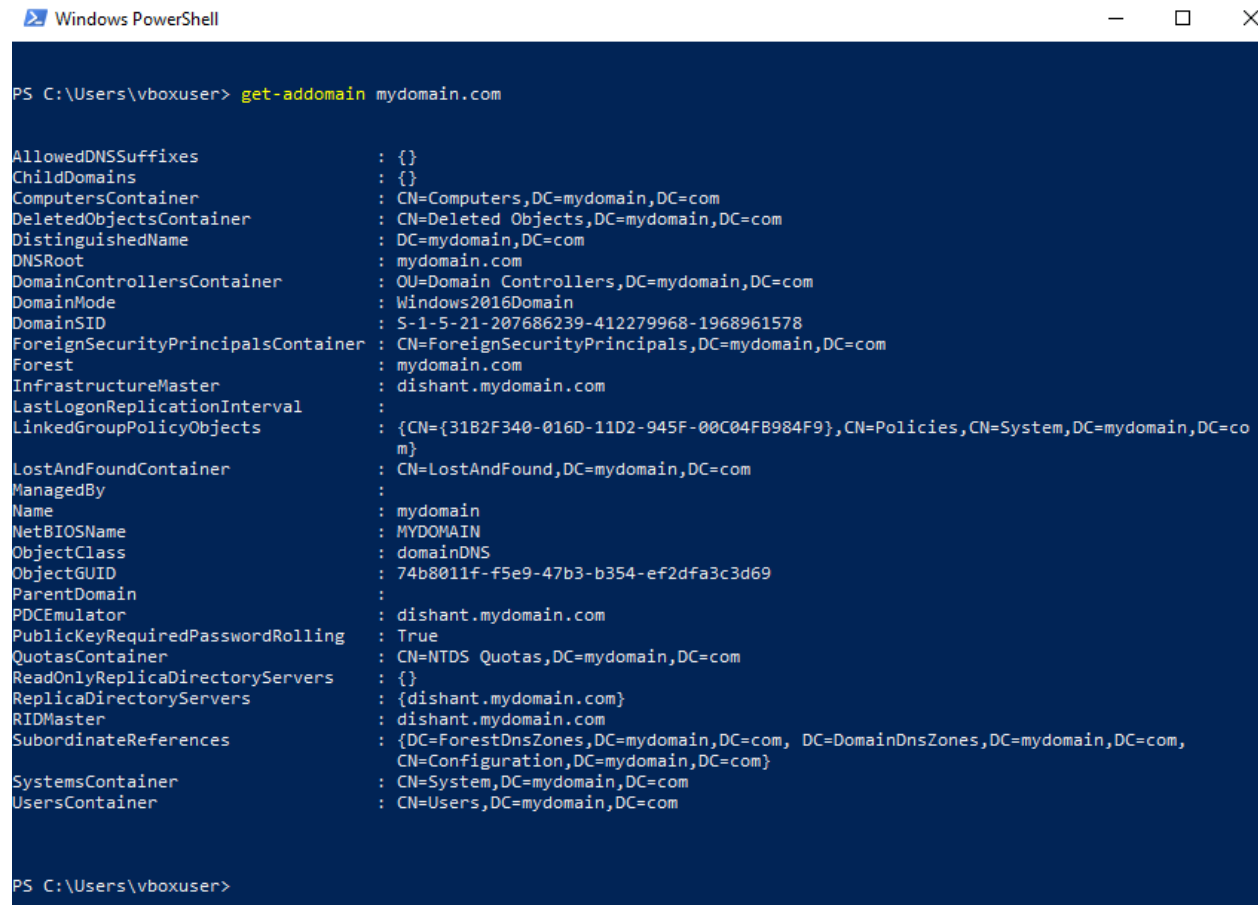
PS C:\Users\vboxuser>

```

Figure 19: displaying all configuration details

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

Get-addomain mydomain.com



```

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-1-5-21-207686239-412279968-1968961578
ForeignSecurityPrincipalsContainer : CN=ForeignSecurityPrincipals,DC=mydomain,DC=com
Forest                  : mydomain.com
InfrastructureMaster     : dishant.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               : 74b8011f-f5e9-47b3-b354-ef2dfa3c3d69
ParentDomain             :
PDCEmulator              : dishant.mydomain.com
PublicKeyRequiredPasswordRolling : True
QuotasContainer          : CN=NTDS Quotas,DC=mydomain,DC=com
ReadOnlyReplicaDirectoryServers : {}
ReplicaDirectoryServers  : {dishant.mydomain.com}
RIDMaster                : dishant.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: detailed information of my domain

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

Get-ADForest mydomain.com



```

PS C:\Users\vboxuser> get-adforest mydomain.com

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

```

Figure 21: Active Directory Forest details

## 5. Conclusion

In this lab we installed Active Directory and verified the installation of Domain Controller via some PowerShell commands. Using these commands, we checked that the Active Directory environment has been configured properly looking at critical pieces of information on the forest, domain, and configuration changes. This verification procedure has enhanced our understanding of how AD organizes and polices network resources. Overall, the lab provided valuable information about the installation process and administrative assets to manage and secure Active Directory configurations efficiently.

## 6. Bibliography

Microsoft. (2024, January 11). *active directory domain services overview*. Retrieved from microsoft.com: <https://learn.microsoft.com/en-us/windows-server/identity/ad-ds/get-started/virtual-dc/active-directory-domain-services-overview>

Microsoft. (n.d.). *Windows server 2022*. Retrieved from www.microsoft.com: <https://www.microsoft.com/en-us/evalcenter/evaluate-windows-server-2022?msocid=1d6627b7b0d4624230fd32b7b1d2632c>

VirtualBox. (n.d.). Retrieved from VirtualBox: <https://www.virtualbox.org/>

