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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 is Microsoft's user directory service and is arguably the most popular solution for organisations to manage and organise their staff's IT profiles for authentication, authorisation, and accounting purposes. Active Directory offers several services useful for managing the IT infrastructure of an organisation. Active Directory's primary purpose is to provide authorisation, authentication, and accounting measures to organisations for use by systems/network administrators. User profiles are required for users to log in to domain-connected machines. Once a user has signed onto a machine via authentication, their actions will be restricted based on authorisation and logged through accounting. From these user accounts, policies can be applied through Group Policy Objects (GPOs) for various workplace purposes, such as assigning user groups based on department, then assigning printer or file sharing to those users, or any policy that the organisation requires. For many organisations, these services are critical to business operations. (Grant McDonald, 2022)

This project guidelines the steps to install and configure Active Directory Domain Services on Windows Server 2022 , enabling centralized management and control of network resources.

2. Objectives

The objectives of this work are :

- Understand Active Directory
- Install Active Directory Domain Services(AD DS)
- Configure Domain Controller(DC)
- Setup DC
- Verify DC Setup

3. Required tools and software

3.1 Virtual Box



Figure 1 Oracle Virtual Box

Oracle VirtualBox, the world's most popular open source, cross-platform, virtualization software, enables developers to deliver code faster by running multiple operating systems on a single device. IT teams and solution providers use VirtualBox to reduce operational costs and shorten the time needed to securely deploy applications on-premises and to the cloud. (virtualbox, n.d.)

3.2 Windows Server 2022(desktop experience)

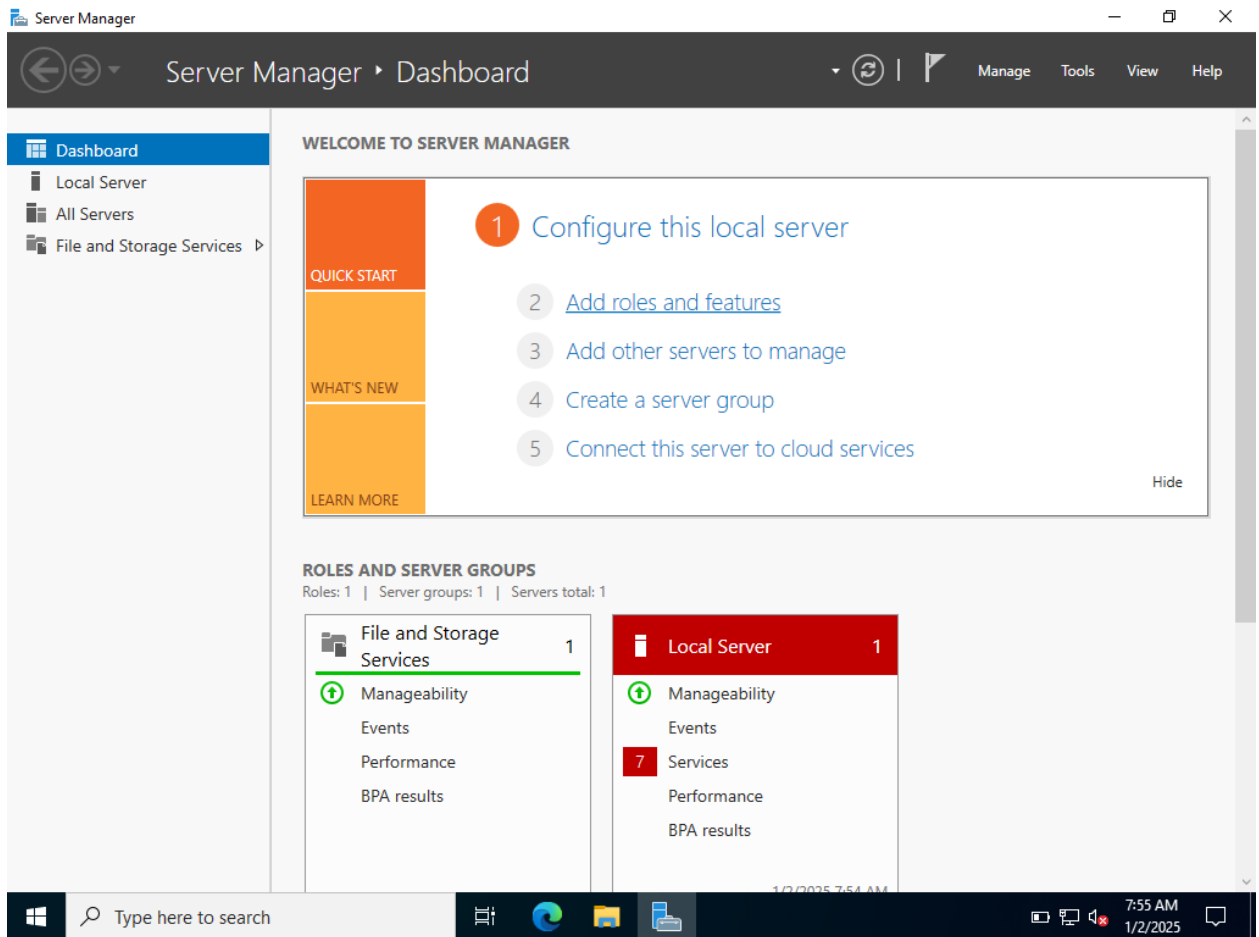


Figure 2 windows server 2022

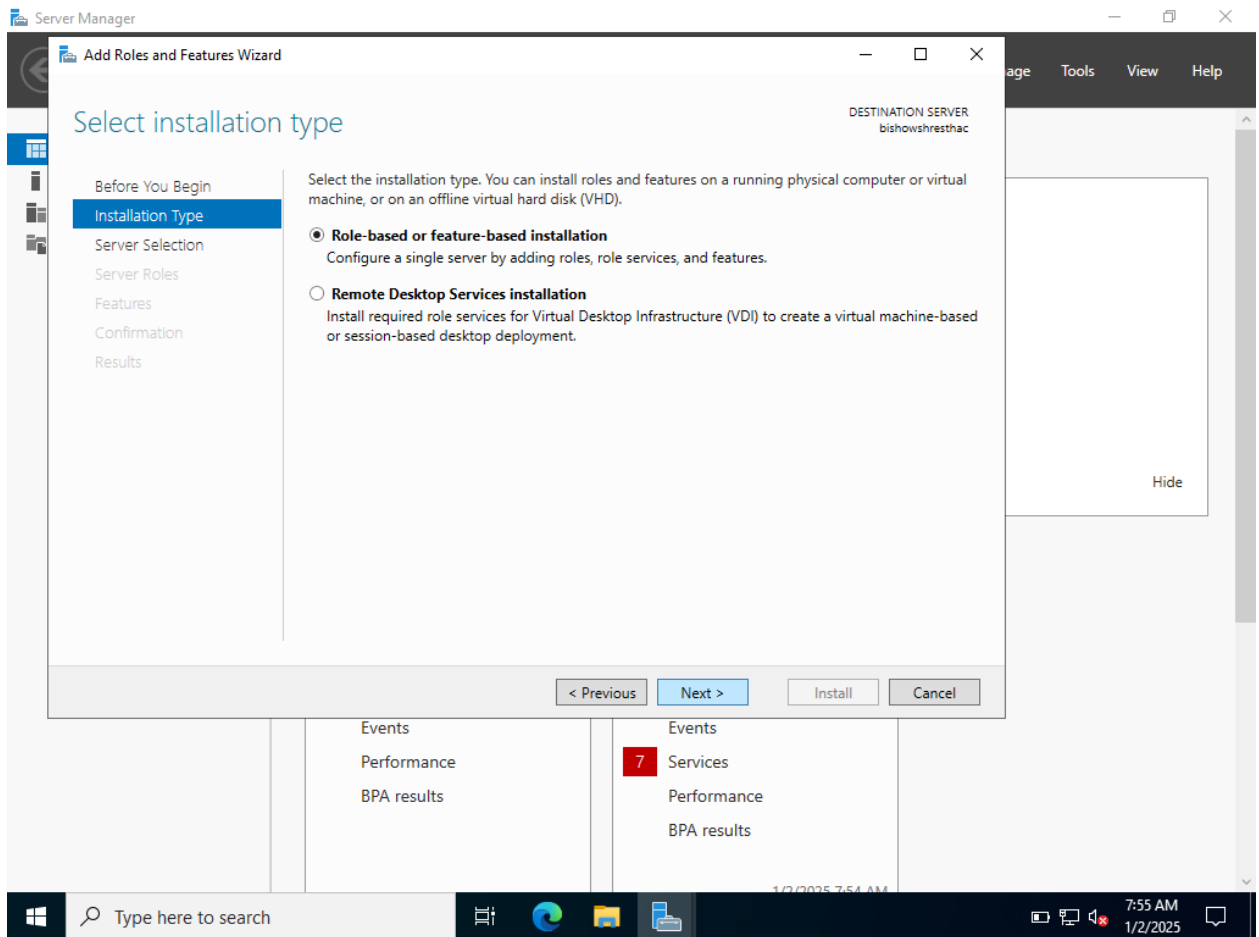
Windows Server is a line of Microsoft operating systems (OSes) comprised of extremely powerful machines. Windows Server was first launched in April 2003. It's typically installed on heavy-use servers serving as a backbone for most IT companies, applications, and services. The server handles the administrative group-related activities on a network. It organizes, stores, sends, and receives files from devices connected to a network. (windows-server, n.d.)

4. Steps to replicate

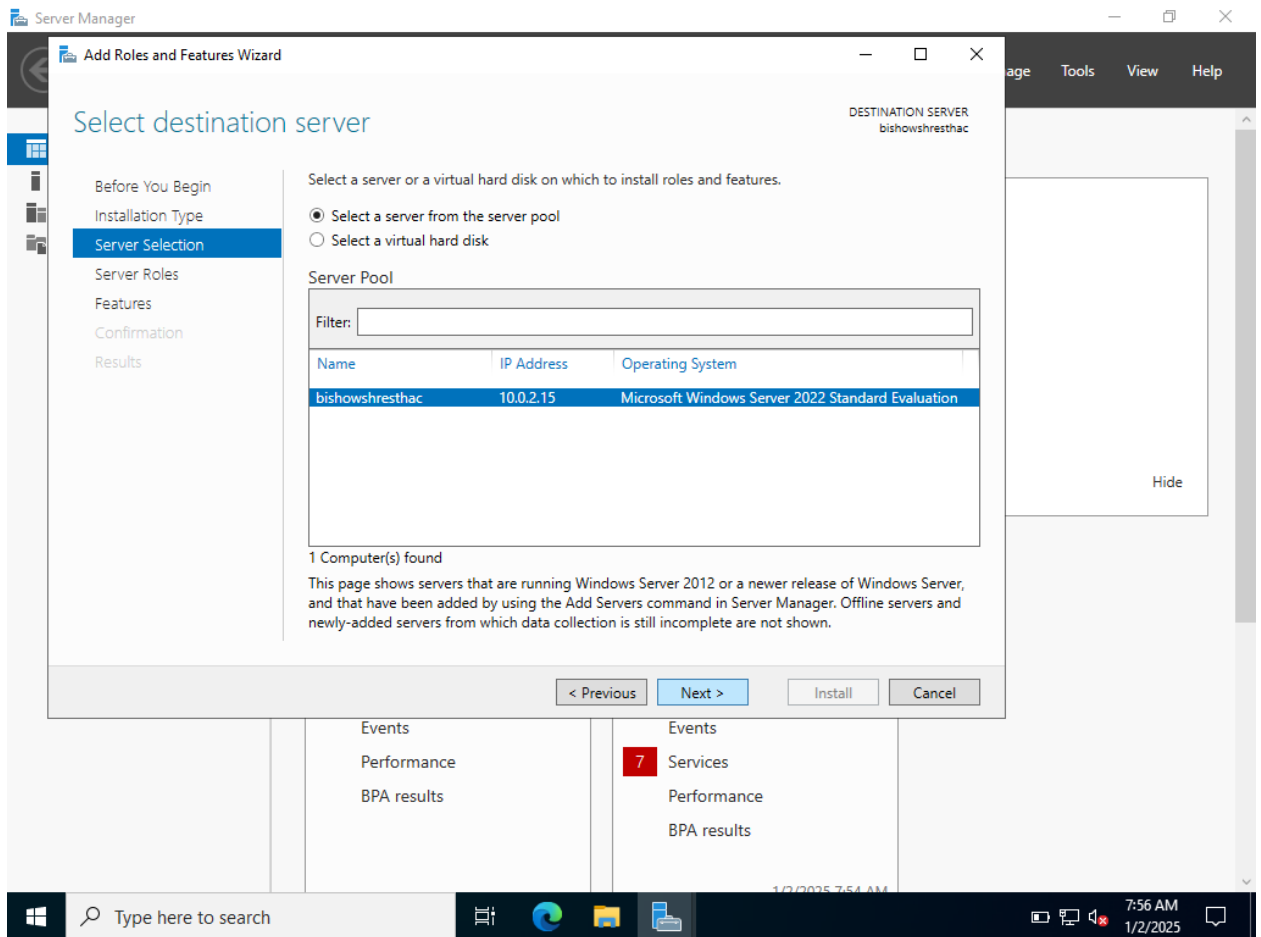
Open Server Manager



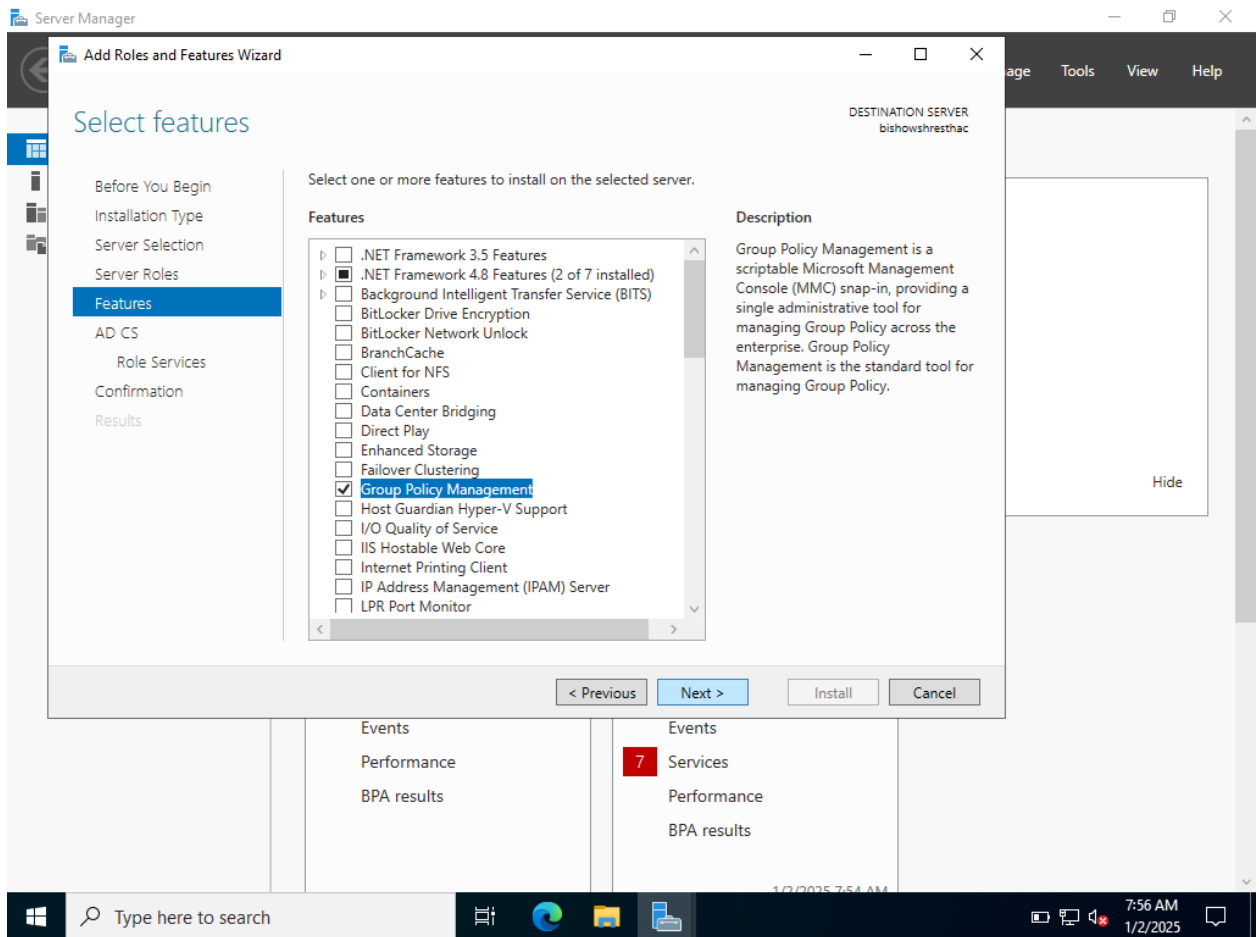
Click on add roles and features



Click on Role based or Feature based installation,



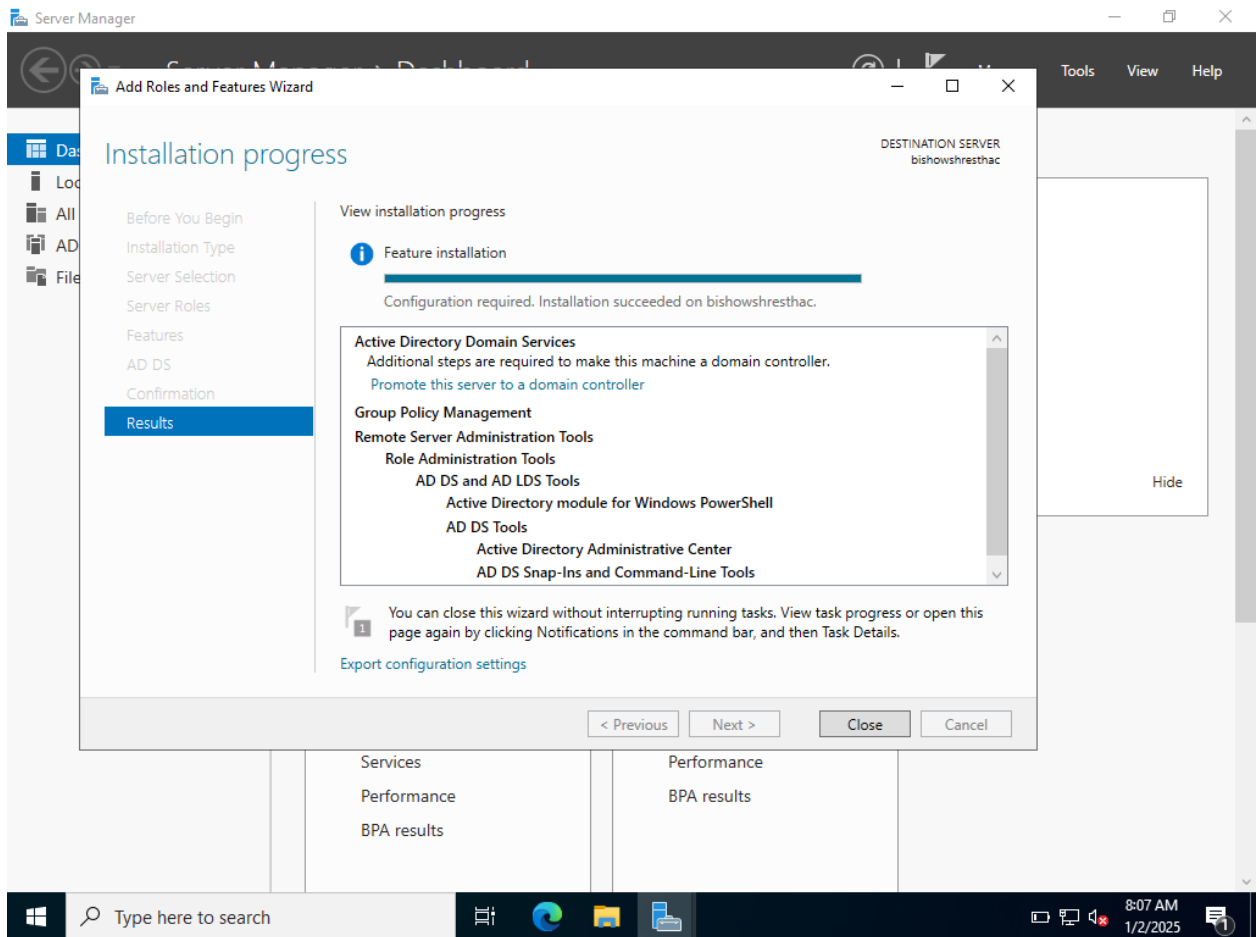
Do not change anything just click Next,



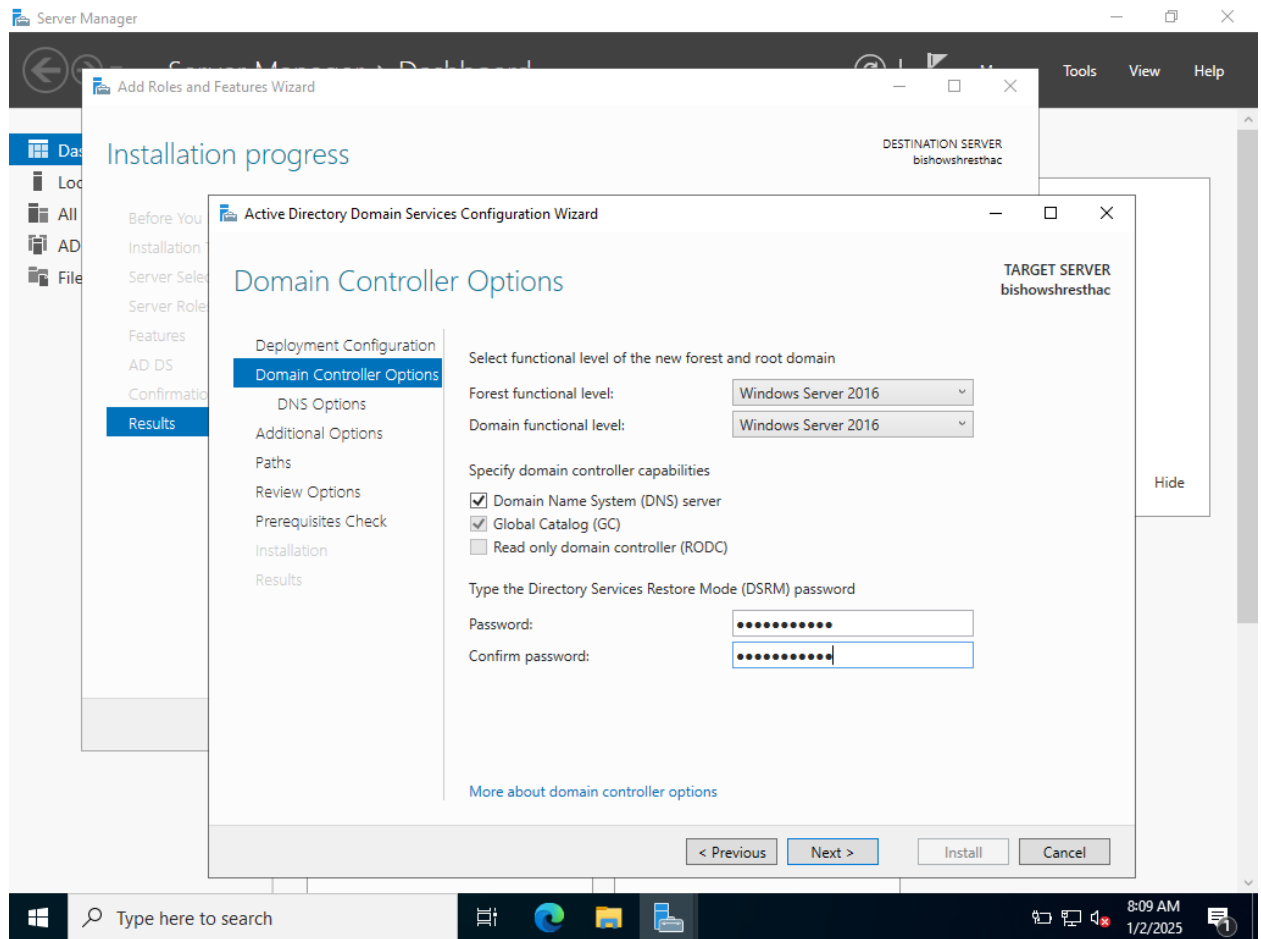
click Active Directory Domain Service and click next,

and

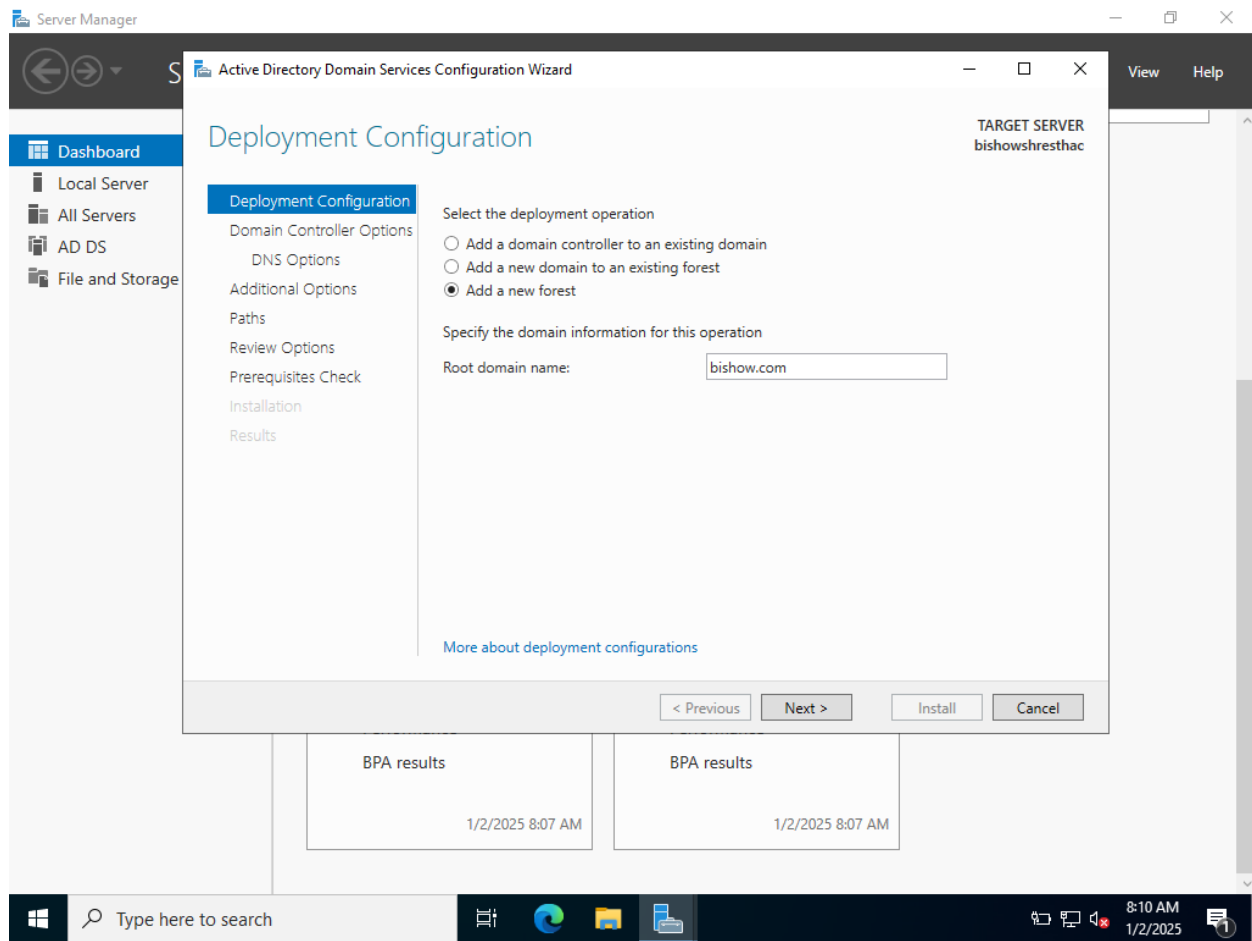
Click Install,



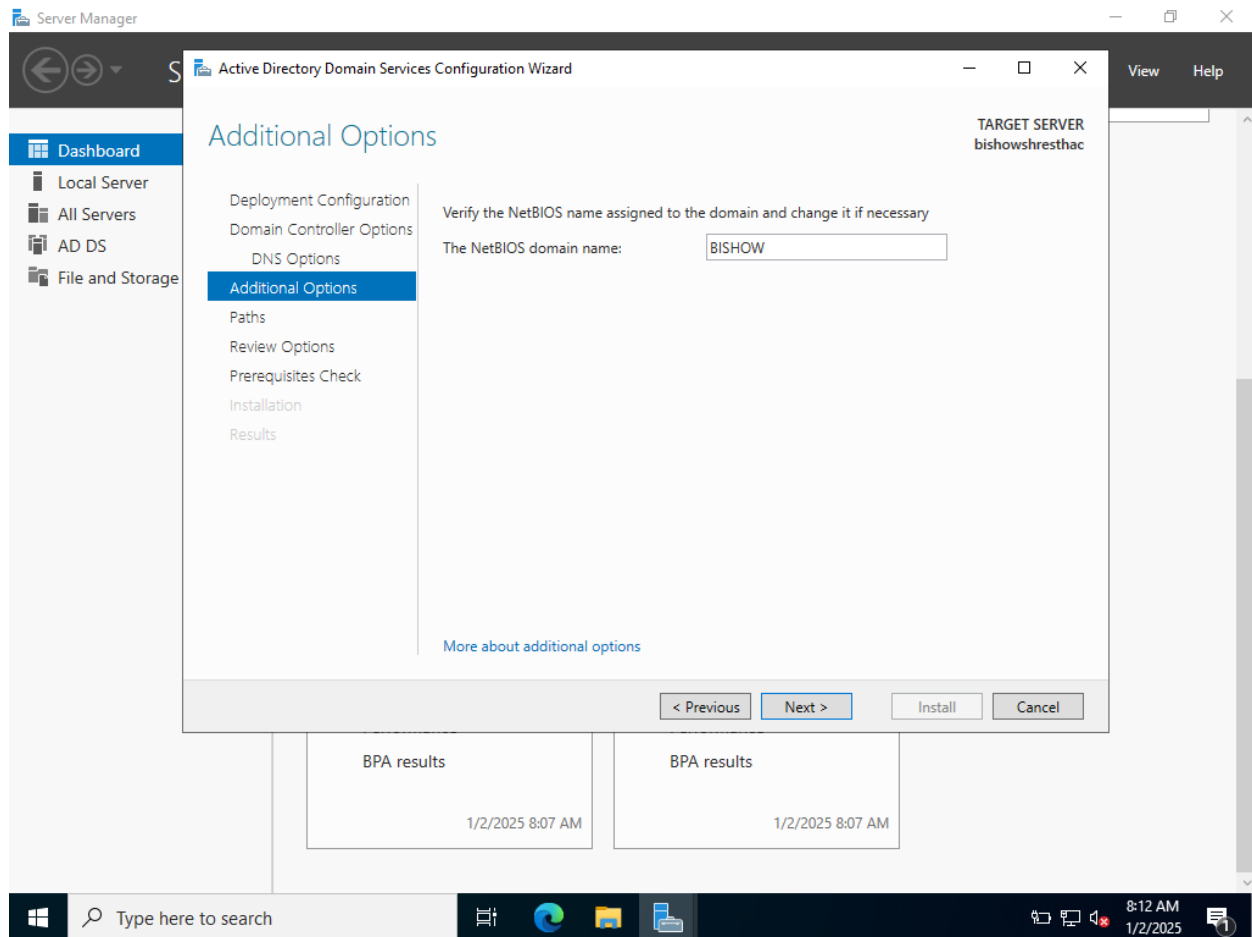
After it is installed, Click on the promote this server to a domain controller ,



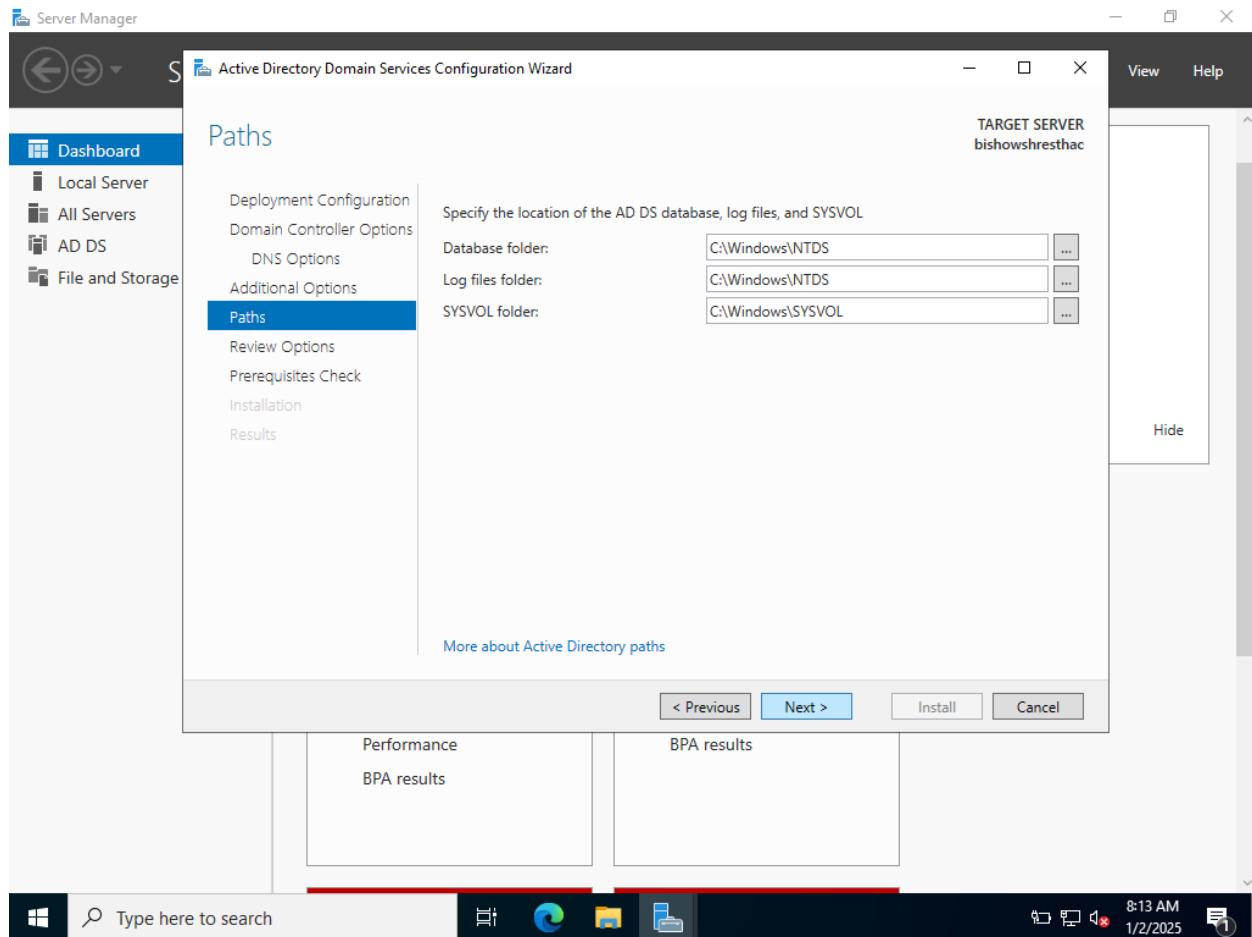
Change the DSRM Password if you want to and click next button,



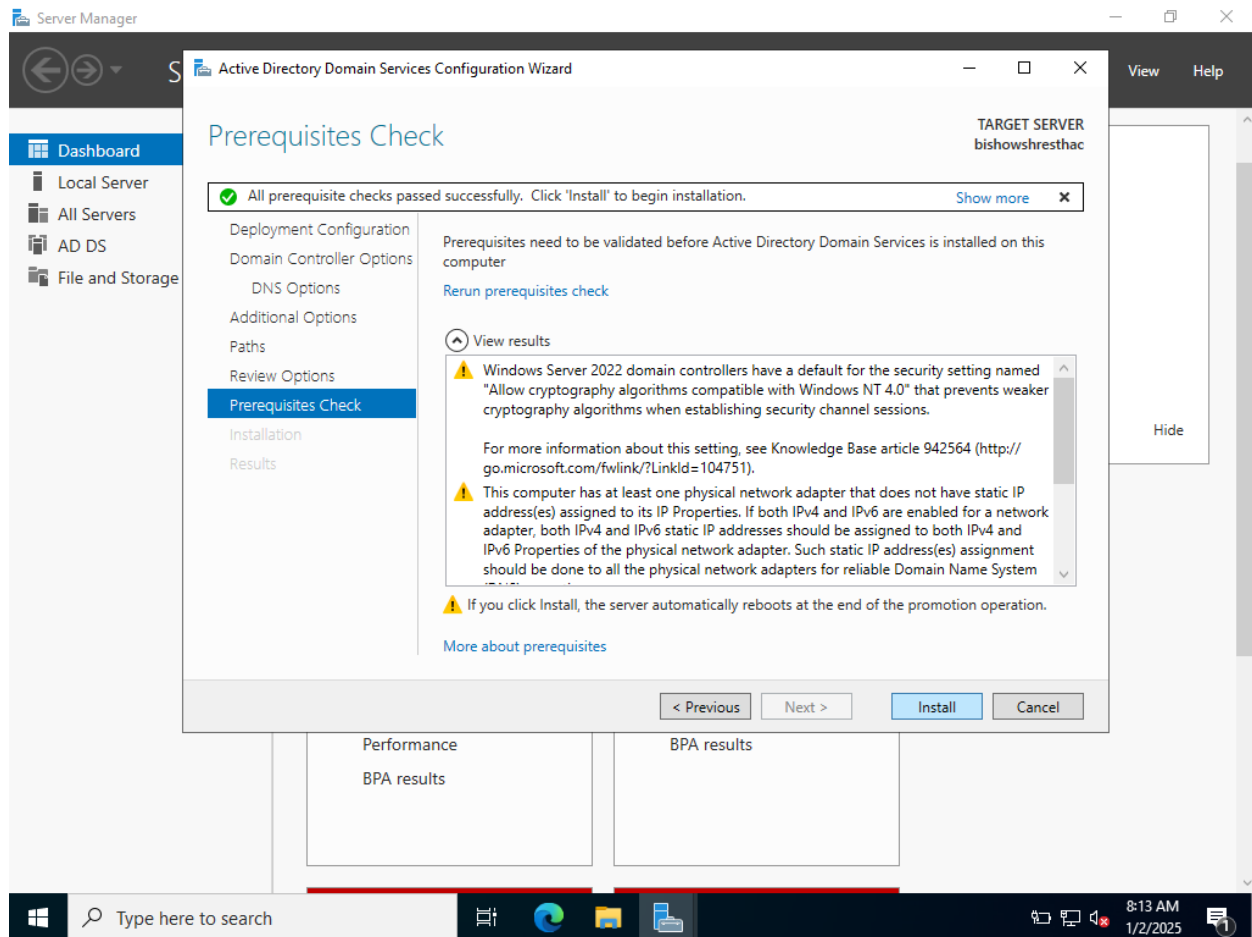
Click the Add a new forest button and Give the root domain name of your choice and click next,



Give the NetBIOS a name of your choice and click next,



Give the AD DS File location of your choice and click next,

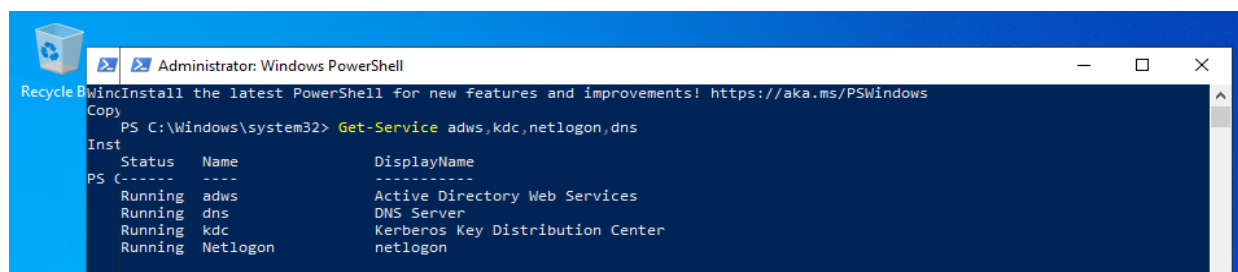


Click Install,

Now to verify whether the Domain Controller is adequately set up or not , Use Windows Powershell and run it as administrator.

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

COMMAND : GET_SERVICE ADWS,KDC,NETLOGON,DNS



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

GET_ADDDOMAINCONTROLLER

```
PS C:\Windows\system32> Get-ADDMAINCONTROLLER
```

```
ComputerObjectDN      : CN=BISHOWSHRESTHAC,OU=Domain Controllers,DC=bishow,DC=com
DefaultPartition      : DC=bishow,DC=com
Domain                : bishow.com
Enabled               : True
Forest                : bishow.com
HostName              : bishowshresthac.bishow.com
InvocationId          : 1f5f1fe6-5c7d-475b-bb7f-79ef55fb6930
IPv4Address           : 10.0.2.15
IPv6Address           : fd00::2044:552a:b9b4:aeca
IsGlobalCatalog       : True
IsReadOnly            : False
LdapPort              : 389
Name                  : BISHOWSHRESTHAC
NTDSSettingsObjectDN  : CN=NTDS Settings,CN=BISHOWSHRESTHAC,CN=Servers,CN=Default-First-Site-Name,CN=Sites,CN=Conf
                    : uration,DC=bishow,DC=com
OperatingSystem       : Windows Server 2022 Standard Evaluation
OperatingSystemHotfix :
OperatingSystemServicePack :
OperatingSystemVersion : 10.0 (20348)
OperationMasterRoles  : {SchemaMaster, DomainNamingMaster, PDCEmulator, RIDMaster...}
Partitions             : {DC=ForestDnsZones,DC=bishow,DC=com, DC=DomainDnsZones,DC=bishow,DC=com,
                    : CN=Schema,CN=Configuration,DC=bishow,DC=com, CN=Configuration,DC=bishow,DC=com...}
ServerObjectDN        : CN=BISHOWSHRESTHAC,CN=Servers,CN=Default-First-Site-Name,CN=Sites,CN=Configuration,DC=bish
                    : ow,DC=com
ServerObjectGuid       : 03d0155b-0217-47c5-a5ff-9443a1b5deaf
Site                  : Default-First-Site-Name
SslPort               : 636
```

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

GET_ADDDOMAIN BISHOW.COM

```
Administrator: Windows PowerShell
Recycle Bin
ServerObjectDN : CN=BISHOWSHRESTHAC,CN=Servers,CN=Default-First-Site-Name,CN=Sites,CN=Configuration,DC=bish
Copy : ow,DC=com
ServerObjectGuid : 03d0155b-0217-47c5-a5ff-9443a1b5deaf
InstSite : Default-First-Site-Name
SslPort : 636
PS C:\Windows\system32> Get-ADDOMAIN bishow.com

AllowedDNSSuffixes : {}
ChildDomains : {}
ComputersContainer : CN=Computers,DC=bishow,DC=com
DeletedObjectsContainer : CN=Deleted Objects,DC=bishow,DC=com
DistinguishedName : DC=bishow,DC=com
DNSRoot : bishow.com
DomainControllersContainer : OU=Domain Controllers,DC=bishow,DC=com
DomainMode : Windows2016Domain
DomainSID : S-1-5-21-3603593051-751078092-1534201738
ForeignSecurityPrincipalsContainer : CN=ForeignSecurityPrincipals,DC=bishow,DC=com
Forest : bishow.com
InfrastructureMaster : bishowshresthac.bishow.com
LastLogonReplicationInterval :
LinkedGroupPolicyObjects : {CN={31B2F340-016D-11D2-945F-00C04FB984F9},CN=Policies,CN=System,DC=bishow,DC=com}
LostAndFoundContainer : CN=LostAndFound,DC=bishow,DC=com
ManagedBy :
Name : bishow
NetBIOSName : BISHOW
ObjectClass : domainDNS
ObjectGUID : b0907ed2-e06c-4e18-aa69-d963d5961328
ParentDomain :
PDCEmulator : bishowshresthac.bishow.com
PublicKeyRequiredPasswordRolling : True
QuotasContainer : CN=NTDS Quotas,DC=bishow,DC=com
ReadOnlyReplicaDirectoryServers : {}
ReplicaDirectoryServers : {bishowshresthac.bishow.com}
RIDMaster : bishowshresthac.bishow.com
SubordinateReferences : {DC=ForestDnsZones,DC=bishow,DC=com, DC=DomainDnsZones,DC=bishow,DC=com,
CN=Configuration,DC=bishow,DC=com}
SystemsContainer : CN=System,DC=bishow,DC=com
UsersContainer : CN=Users,DC=bishow,DC=com

PS C:\Windows\system32>
```

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

GET_ADFOREST BISHOW.COM

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

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

PS C:\Windows\system32>
```


5. Conclusion

In conclusion, I've learned many things from this workshop. I learned how to add roles of AD DS and how to promote a computer into a domain controller by giving domain name , NetBIOS name etc. . Additionally I've learned how to Add a forest and verify the Domain Controller Setup using Windows Powershell running as Administrator. This project gave me a handful experience in managment of Active Direcotry creating a centralized infrastructure and also things regarding domain management.

References

- Grant McDonald, P. P. (2022). Ransomware: Analysing the Impact on Windows Active Directory Domain Services. *Cyber Situational Awareness in Computer Networks*.
- virtualbox*. (n.d.). Retrieved from oracle.com: <https://www.oracle.com/virtualization/virtualbox/>
- windows-server*. (n.d.). Retrieved from solarwinds.com: <https://www.solarwinds.com/resources/it-glossary/windows-server>