Assignment : Windows Server

**Submitted By :- Purv Patel**

**Module 12: Installation, Storage, and Compute with Windows Server**

**1. What two options are provided in the type of installation window during Windows Server 2016 installation?**

**> Windows Server 2016 (Desktop Experience)** – This installs the full graphical user interface (GUI) along with all the standard desktop features, making it suitable for users who prefer a traditional Windows environment.

**Windows Server 2016 (Server Core)** – This is a minimal installation without a GUI, designed for improved security, reduced resource usage, and remote management. It is recommended for experienced administrators who use PowerShell and command-line tools for configuration and management.

**2. Write the step How to configure server step by step?**

**> Configuring Windows Server 2016**

**1 Log in to Server** – Use the administrator credentials.

**2 Set Static IP** – Configure IP settings in **Network & Sharing Center**.

**3 Rename Server** – Change the computer name in **System Properties** and restart.

**4 Enable Remote Desktop** – Go to **Server Manager → Local Server → Enable RDP**.

**5 Install Roles & Features** – Open **Server Manager → Add Roles and Features**.

**6 Update Windows** – Go to **Settings → Update & Security → Check for updates**.

**7 Configure Firewall & Security** – Open **Windows Defender Firewall**, set rules.

**8 Join Domain (if needed)** – Go to **System Properties → Change → Enter Domain**.

**9 Create User Accounts** – Open **Computer Management → Local Users & Groups**.

**10 Test Configuration** – Use ping, check services (services.msc), and verify roles.

**3. What are the Pre installation tasks?**

> **Pre-Installation Tasks for Windows Server 2016**

**1 Check System Requirements** – Ensure hardware meets minimum requirements (CPU, RAM, storage).

**2 Verify Compatibility** – Check software and driver compatibility.

**3 Backup Important Data** – Save existing data to prevent loss.

**4 Plan Server Roles** – Decide on roles (e.g., AD DS, DNS, DHCP).

**5 Obtain Installation Media** – Prepare bootable USB/DVD with Windows Server 2016.

**6 Configure BIOS/UEFI** – Set boot order (USB/DVD first).

**7 Network Planning** – Assign static IP, subnet, and gateway.

**8 Check RAID Configuration** – If using RAID, configure it in BIOS.

**9 Gather License Keys** – Have activation keys ready.

**10 Review Security Policies** – Ensure compliance with security best practices.

**4. What are the Post installation tasks?**

> **Post-Installation Tasks for Windows Server 2016**

**1 Install Windows Updates** – Go to **Settings → Update & Security** and install updates.

**2 Set Static IP Address** – Configure network settings in **Network & Sharing Center**.

**3 Rename the Server** – Change computer name in **System Properties** and restart.

**4 Enable Remote Desktop** – In **Server Manager → Local Server**, enable RDP if needed.

**5 Activate Windows** – Use **slmgr.vbs /ato** or activate via GUI.

**6 Install Necessary Roles & Features** – Use **Server Manager → Add Roles & Features**.

**7 Configure Firewall & Security** – Set firewall rules and security policies.

**8 Join the Server to a Domain** – If applicable, join the domain in **System Properties**.

**9 Create User Accounts** – Manage local and domain users via **Computer Management**.

**10 Verify System Performance** – Check logs, services, and system health using **Task Manager** & **Event Viewer**.

**11 Set Up Backup & Recovery** – Configure **Windows Server Backup** for disaster recovery.

**12 Document Configuration** – Record all settings, passwords, and network details for future reference.

**5. What is the standard upgrade path for Windows Server?**

**> Standard Upgrade Path for Windows Server**

The standard upgrade path allows you to move from an older version of Windows Server to a newer version while retaining settings, files, and roles.

**Supported Upgrade Paths**

| **Current Version** | **Can Upgrade To** |
| --- | --- |
| Windows Server 2012 R2 | Windows Server 2016, 2019 |
| Windows Server 2016 | Windows Server 2019, 2022 |
| Windows Server 2019 | Windows Server 2022 |

**Upgrade Guidelines:**

**Check Compatibility** – Ensure your hardware and applications support the new version.

**Backup Your Data** – Always take a full system backup before upgrading.

**Run Compatibility Check** – Use **Microsoft Upgrade Advisor** or **Setup.exe /compat**.

**Perform the Upgrade** – Insert installation media, run **setup.exe**, and choose **Upgrade**.

**Verify After Upgrade** – Check system functionality, drivers, and installed roles.

**6. What is the Physical structure of AD?**

**> Physical Structure of Active Directory (AD)**

The **physical structure** of **Active Directory (AD)** refers to how the directory is implemented on the network and how domain controllers (DCs) interact. It includes the following key components:

**1 Domain Controllers (DCs)** – Servers that store and replicate the AD database.

**2 Sites** – A group of **DCs in the same geographic location**, optimized for network traffic.

**3 Subnets** – Defines the **IP address ranges** within a site to optimize replication.

**4 Replication** – The process of synchronizing AD data between **DCs within a site (intrasite replication)** and **across sites (intersite replication)**.

**5 Global Catalog (GC)** – A DC that stores a **readable copy of all objects** for fast searches.

**7. What is the Logical components of Active Directory?**

> **Logical Components of Active Directory (AD)**

The **logical structure** of **Active Directory (AD)** defines how resources, users, and policies are organized within the directory. The main components are:

**Forest** – The highest level in AD, containing one or more domains that share a common schema and trust relationships.

**Domain** – A collection of **users, computers, and resources** that share a common database and security policies.

**Organizational Units (OUs)** – Logical containers within a domain used to group objects (users, groups, computers) for easier management and applying Group Policies.

**Tree** – A hierarchy of one or more **domains** that share a contiguous namespace (e.g., company.com, sales.company.com).

**Schema** – Defines the structure of objects (users, groups, printers) in AD, ensuring consistency.

**Global Catalog (GC)** – A searchable index of all objects in a forest, used to speed up searches and logins.

**Group Policy Objects (GPOs)** – Rules and settings applied to users and computers to enforce security and configurations.

**8. What is the Full form Of LDAP?**

**>** LDAP is an open protocol used to access and manage directory services over a network. It helps in querying, modifying, and authenticating information stored in Active Directory (AD) or other directory services.

**9. What is the location of the AD database?**

> The **Active Directory database (NTDS.dit)** is stored in the following location on a Domain Controller (DC):

📂 C:\Windows\NTDS\NTDS.dit

**10. What is child DC?**

**>** A Child Domain Controller (Child DC) is a Domain Controller that manages a Child Domain within an Active Directory (AD) Forest.

**11. Explain the term forest in AD**> A Forest is the highest level of the Active Directory (AD) structure and acts as the security boundary for an organization. It contains one or more domains that share a common schema, global catalog, and directory configuration.

**12. What is Active Directory? Check all that apply.**

**● An open-source directory server**

**● A Windows-only implementation of a directory server**

**● Microsoft's implementation of a directory server**

**● An LDAP-compatible directory server**

**Correct Answers:-**

Microsoft's implementation of a directory server

An LDAP-compatible directory server

**13. When you create an Active Directory domain, what's the name of the default user account?**

**● Superuser**

**● Root**

**● Username**

**● Administrator**

**>** Administrator

**14. AD domain provides which of the following advantages? Check all that apply.**

**● Centralized authentication**

**● More detailed logging**

**● Centralized management with GPOs**

**● Better performance**

**>** Centralized authentication

More detailed logging

Centralized management with GPOs

**15. What are the minimum hardware requirements for installing Windows Server 2016?**

> To install Windows Server 2016, your system must meet the following minimum hardware requirements:

| Component | Minimum Requirement |
| --- | --- |
| Processor (CPU) | 1.4 GHz 64-bit processor with x64 architecture |
| RAM (Memory) | 512 MB (for Server Core) / 2 GB (for GUI) |
| Storage (HDD/SSD) | 32 GB minimum (more for updates & roles) |
| Network Adapter | Gigabit (1 Gbps) Ethernet adapter |
| Firmware | UEFI 2.3.1 or later with Secure Boot |
| Display | Super VGA (1024x768) or higher |
| Optical Drive (Optional) | DVD-ROM (if installing from disk) |

Recommended Specs for Better Performance:  
 Processor: 2 GHz or faster, 4+ cores  
 RAM: 8 GB or more (especially for AD, Hyper-V, or databases)  
 Storage: SSD for faster performance, minimum 60 GB

**16. Explain the different editions of Windows Server 2016 and their features.**

> Windows Server 2016 comes in four main editions, each designed for different use cases:

| Edition | Best For | Key Features |
| --- | --- | --- |
| Datacenter | Large enterprises, virtualization, cloud environments | - Unlimited VMs with Hyper-V - Shielded Virtual Machines for added security - Software-defined networking (SDN) - Storage Spaces Direct & Replica |
| Standard | Small to medium businesses, basic virtualization | - Supports 2 VMs with Hyper-V - Basic storage replication - Same core features as Datacenter but without advanced virtualization & SDN |
| Essentials | Small businesses (up to 25 users, 50 devices) | - No CALs required (limited to 25 users/50 devices) - Integrated dashboard for easier management - Supports Azure integration |
| Hyper-V Server | Virtualization-only environments | - Free edition for running virtual machines - No GUI (command-line only) - Requires separate licensing for VMs |

How to Choose the Right Edition?

Datacenter → Best for large enterprises with heavy virtualization needs.  
Standard → Best for SMBs needing limited virtualization.  
Essentials → Best for small businesses with basic server needs.  
Hyper-V Server → Best for running VMs in a free, lightweight environment.

**17. Walk through the steps of installing Windows Server 2016 using GUI mode.**

1️ **Boot from Installation Media** – Insert USB/DVD, set BIOS to boot from it.  
2️ **Start Installation** – Choose language, click **Install Now**.  
3️ **Select Edition** – Pick **"Desktop Experience"** for GUI mode.  
4️ **Accept License** – Check the box and click **Next**.  
5️ **Choose Installation Type** – Select **Custom (fresh install)**.  
6️ **Partition Disk** – Choose or create a drive, click **Next**.  
7️ **Installation Begins** – Wait for files to copy and system to restart.  
8️ **Set Admin Password** – After reboot, create a strong password.  
9️ **Login & First Setup** – Press **Ctrl + Alt + Delete**, log in.  
10 **Post-Installation** – Set **IP, rename server, install updates, configure roles**.

**16. Describe the steps for installing Windows Server 2016 in Server Core mode.**

>

1️ Boot from USB/DVD → Select language → Click Install Now.  
2️ Select Edition → Choose Server Core (Standard/Datacenter) → Click Next.  
3️ Accept License → Check "I accept the license terms" → Click Next.  
4️ Choose Installation Type → Select Custom (fresh install).  
5️ Partition Disk → Select drive → Click Next to start installation.  
6️ Wait for Installation → System copies files and reboots.  
7️ Set Admin Password → After reboot, create a strong password.  
8️ Login to Server Core → Press Ctrl + Alt + Delete, enter Administrator credentials.  
9️ Configure Server Core using sconfig → Set IP, hostname, domain, updates, remote access.

**17. How do you configure network settings during Windows Server 2016 installation?**

> **Configuring Network Settings During Windows Server 2016 Installation**

Network settings are not configured during the installation process itself but can be set up **after** installation. Here’s how you can configure them:

**For GUI Mode (Desktop Experience)**

1️ Open **Server Manager** → Click **Local Server**.  
2️ Click on **Ethernet (NIC adapter)**.  
3️ In the **Network Connections** window, right-click your network adapter → **Properties**.  
4️ Select **Internet Protocol Version 4 (TCP/IPv4)** → Click **Properties**.  
5️ Choose **"Use the following IP address"** and enter:

**IP Address:** (e.g., 192.168.1.100)

**Subnet Mask:** (e.g., 255.255.255.0)

**Default Gateway:** (e.g., 192.168.1.1)  
6️ Set **Preferred DNS Server** (e.g., 192.168.1.1 or another DNS).  
7️ Click **OK** → Close all windows.  
8️ Restart the server to apply changes.

**For Server Core (Command Line Mode)**

1️ Open **Command Prompt** after logging in.  
2️ Type ipconfig /all to check the current network settings.  
3️ Use sconfig for easy configuration:

Type sconfig and press **Enter**.

Select **Option 8 (Network Settings)**.

Choose the adapter to configure.

Enter a **static IP address**, **subnet mask**, and **default gateway**.  
4️ Set the DNS Server:

netsh interface ip set dns "Ethernet" static 192.168.1.1

5️ Verify settings using:

ipconfig /all

ping 8.8.8.8

**18. Explain the process of promoting a Windows Server to a domain controller.**

> **Steps to Promote Windows Server 2016 to a Domain Controller**

1️ **Install AD DS Role** → Open **Server Manager** → **Add Roles and Features** → Select **Active Directory Domain Services (AD DS)** → **Install**.  
2️ **Promote to DC** → Click **"Promote this server to a domain controller"**.  
3️ **Choose Deployment Type** →

**New Forest** **(for a new domain)**

**Add to Existing Domain** (for an additional DC)  
4️ **Set Domain Name & Options** → Enter **Domain Name** → Set **DSRM password** → Click **Next**.  
5️ **Review & Install** → Click **Install** (Server will restart).  
6️ **Verify DC Status** → Log in with **DomainName\Administrator** → Open **Active Directory Users and Computers** to confirm.

**19. Discuss the steps involved in upgrading from a previous version of Windows Server to Windows Server 2016.**

**> Steps to Upgrade to Windows Server 2016**

Upgrading from an older version of Windows Server (2012 R2, 2008 R2) to **Windows Server 2016** involves the following steps:

**Step 1: Check Upgrade Compatibility**

Ensure your **current OS supports an in-place upgrade**:

**Supported Upgrades:** Windows Server 2012 → 2016, Windows Server 2012 R2 → 2016

**Not Supported:** Windows Server 2008/2008 R2 → Must upgrade to 2012 first  
 Verify **hardware meets Windows Server 2016 requirements**.  
 Backup critical data to **prevent data loss**.

**Step 2: Insert Installation Media & Start Setup**

1️ Insert the **Windows Server 2016 DVD/USB** or mount the **ISO file**.  
2️ Run **setup.exe** from the installation media.

**Step 3: Choose Upgrade Option**

1️ Select **"Upgrade: Install Windows and keep files, settings, and applications"**.  
2️ Choose the **Windows Server 2016 edition** matching your current edition.

**Step 4: Accept License Terms & Start Upgrade**

1️ Accept the **Microsoft License Agreement**.  
2️ Click **Next**, and the upgrade process will begin.

**Step 5: Wait for Installation to Complete**

The server will restart **multiple times** during the upgrade.  
 Wait for the installation to finish (**duration depends on system specs**).

**Step 6: Post-Upgrade Tasks**

1️ Log in and verify **Windows Server 2016 version** (winver command).  
2️ Install **latest updates & drivers**.  
3️ Check **Active Directory, DNS, and other roles** for functionality.  
4️ Remove **old system files** using Disk Cleanup.

**20. What is Active Directory Domain Services (AD DS), and what are its key components?**

> Active Directory Domain Services (AD DS) & Its Key Components

What is AD DS?  
Active Directory Domain Services (AD DS) is a directory service by Microsoft that stores and manages information about network resources (users, computers, groups, etc.) and allows centralized authentication and authorization. It is the core component of Windows Active Directory.

Key Components of AD DS

1️ Domain – A logical group of computers, users, and devices sharing a common database and security policies.

2️ Forest – The highest-level structure in AD, consisting of one or more domains with shared configurations.

3️ Tree – A hierarchical collection of domains within a forest that share a contiguous namespace.

4️ Organizational Units (OUs) – Subdivisions within a domain used to organize users, computers, and groups for easy management.

5️ Schema – Defines objects (e.g., users, groups, computers) and attributes stored in AD.

6️ Global Catalog (GC) – A distributed database that stores information about all objects in the forest for faster searches.

7️ Domain Controllers (DCs) – Servers that store and manage the AD database, authenticate users, and enforce security policies.

8️ Sites – Physical network locations that help optimize replication and authentication traffic.

AD DS enables centralized network management, security, and authentication for organizations.

**21. How do you create a new Active Directory user account in Windows Server ?**

> Creating a New Active Directory User Account in Windows Server

You can create a new Active Directory (AD) user using GUI (Active Directory Users and Computers - ADUC) or powershell.

Method 1: Using GUI (ADUC)

1️ Open Server Manager → Click Tools → Active Directory Users and Computers.  
2️ Expand your domain → Right-click the OU (Organizational Unit) where you want to create the user.  
3️ Click New → Select User.  
4️ Enter User details (First Name, Last Name, Logon Name).  
5️ Set a Password → Choose options like "User must change password at next logon".  
6️ Click Next → Finish.

Method 2: Using powershell

Run the following command to create a user:

New-aduser -Name "John Doe" -samaccountname jdoe -userprincipalname jdoe@yourdomain.com -Path "OU=Users,DC=yourdomain,DC=com" -accountpassword (convertto-securestring "P@ssw0rd" -asplaintext -Force) -Enabled $true

This creates a user John Doe with a specified password in the Users OU.

**22. Explain the process of creating and managing Group Policy Objects (GPOs) in Windows Server 2016 or 2019.**

> **Creating and Managing Group Policy Objects (GPOs) in Windows Server 2016/2019**

Group Policy Objects (**GPOs**) are used to **enforce security settings, configurations, and policies** across users and computers in an Active Directory (AD) environment.

**Steps to Create a GPO**

**1️ Open Group Policy Management Console (GPMC)**

1️ Open **Server Manager** → Click **Tools** → Select **Group Policy Management**.  
2️ Expand **Forest** → **Domains** → Select your domain.

**2️ Create a New GPO**

1️ Right-click **Group Policy Objects** → Click **New**.  
2️ Enter a **name** for the GPO (e.g., "Password Policy GPO").  
3️ Click **OK**.

**3️ Edit the GPO**

1️ Right-click the **newly created GPO** → Click **Edit**.  
2️ The **Group Policy Management Editor** opens.  
3️ Navigate to:

**Computer Configuration** (applies to computers).

**User Configuration** (applies to users).  
4️ Configure settings under **Policies** → **Administrative Templates/Security Settings**.

**4️ Link the GPO to an OU, Domain, or Site**

1️ Right-click the **OU, Domain, or Site** where the policy should apply.  
2️ Click **Link an Existing GPO**.  
3️ Select the GPO you created and click **OK**.

**Managing GPOs**

**1️ Force GPO Update**

To apply the GPO immediately, run the following command on a client machine:

gpupdate /force

**2️ Check GPO Application**

Run this command to see applied policies:

gpresult /r

**3️ Modify or Delete GPO**

Open **GPMC**, right-click the GPO, and select **Edit** to modify.

To delete, right-click the GPO under **Group Policy Objects** → Click **Delete**.

**23. What are Organizational Units (OUs) in Active Directory, and how do you use them?**

> Organizational Units (OUs) in Active Directory

What is an OU?  
An Organizational Unit (OU) is a logical container in Active Directory (AD) that helps organize users, computers, groups, and other objects within a domain. It is used for delegation of administration and applying Group Policy Objects (GPOs).

How OUs Are Used in AD

1️ Group and Organize AD Objects – Helps structure AD by department, location, or function (e.g., "HR", "IT", "Finance").

2️ Apply Group Policies (GPOs) – Assign different security settings and restrictions to users/computers within an OU.

3️ Delegate Administrative Control – Assign specific administrators or permissions for managing users/computers in an OU.

4️ Simplify AD Management – Makes it easier to search, manage, and secure AD resources.

Steps to Create an OU in Active Directory

1️ Open Active Directory Users and Computers (ADUC).  
2️ Right-click your domain → Select New → Click Organizational Unit.  
3️ Enter an OU Name (e.g., "Sales Department").  
4️ Check "Protect container from accidental deletion".  
5️ Click OK – OU is now created! 🎉

🔹 Managing an OU

Move Users/Computers → Drag & drop objects into the OU.  
 Apply GPOs → Link a Group Policy Object to the OU for enforcing settings.  
 Delegate Control → Right-click the OU → Select Delegate Control to assign permissions.

**24. Describe the process of delegating administrative privileges in Active Directory.**

> **Delegating Administrative Privileges in Active Directory**

**🔹 What is Delegation of Control?**  
Delegation of Control in **Active Directory (AD)** allows administrators to assign **specific permissions** to users or groups for managing **OUs, users, computers, and other AD objects** without granting full domain admin rights.

**🔹 Steps to Delegate Administrative Privileges in AD**

**1️ Open Active Directory Users and Computers (ADUC)**

1️ Open **Server Manager** → Click **Tools** → Select **Active Directory Users and Computers**.  
2️ Expand the domain → Navigate to the **OU** where you want to delegate control.

**2️ Launch the Delegation of Control Wizard**

1️ Right-click the **OU** → Select **Delegate Control**.  
2️ Click **Next** to open the wizard.

**3️ Select Users or Groups**

1️ Click **Add** → Enter the name of the user or group.  
2️ Click **Check Names** to verify and then **OK** → Click **Next**.

**4️ Assign Permissions**

1️ Choose from predefined tasks (e.g., **Reset passwords, Create/delete user accounts, Modify group membership**).  
2️ OR select **"Create a custom task to delegate"** for more specific control.  
3️ Click **Next** and review the summary.

**5️ Finish and Verify Delegation**

1️ Click **Finish** – The user/group now has delegated permissions! 🎉  
2️ Verify permissions by checking **OU Security settings** (OU Properties → Security Tab).

**🔹 Common Delegation Scenarios**

**Helpdesk Teams** → Allow to **reset passwords, unlock accounts**.  
 **Department Admins** → Manage **users, groups, and computers** in their OU.  
 **Junior Administrators** → Assign specific **GPOs or permissions** without full AD admin rights.