**What Are Server Roles?**

**In Windows Server, a server role is a specific function or job that the server is configured to perform.**

**Each role enables the server to offer a particular service or feature to users or other devices on the network.**

**You can install multiple roles on a single Windows Server, depending on what you need.**

**Common Server Roles in Windows Server**

| **Role Name** | **Description** |
| --- | --- |
| **Active Directory Domain Services (AD DS)** | Turns your server into a domain controller, managing users, computers, and security (authentication/authorization). |
| **DHCP Server** | Assigns IP addresses automatically to devices on the network. |
| **DNS Server** | Resolves domain names (like google.com) into IP addresses. |
| **File and Storage Services** | Allows the server to act as a file server—store and manage shared files and folders. |
| **Web Server (IIS)** | Installs Internet Information Services to host websites or web applications. |
| **Print and Document Services** | Allows the server to manage shared printers and print queues. |
| **Remote Desktop Services (RDS)** | Enables users to connect to the server or other PCs using Remote Desktop Protocol (RDP). |
| **Hyper-V** | Turns your server into a virtualization platform, letting you run virtual machines. |
| **Windows Deployment Services (WDS)** | Used to deploy Windows OS over the network to client machines. |
| **Network Policy and Access Services (NPAS)** | Allows centralized management of network access, VPN, and routing. |
| **Windows Server Update Services (WSUS)** | Lets you manage and distribute Windows updates to computers in your network. |

**Migrating Roles and Features to Server**

## What Does "Migrating Roles and Features" Mean?

**Migration** means **moving something from one place to another**.

In our case:

* **It is moving roles and features** (like DNS, DHCP, Active Directory, etc.)
* From **an old server** to **a new server**

Think of it like moving furniture (roles) from your **old house** (old server) to your **new house** (new server).

## What Are "Roles and Features"?

* **Roles** = What the server does (main job)
  + Example: File Server, DNS Server, Domain Controller
* **Features** = Extra tools that support roles
  + Example: .NET Framework, Group Policy Management, etc.

## Why Would You Migrate?

Reasons you might want to migrate:

| **Reason** | **Example** |
| --- | --- |
| Old server is outdated | You're using Windows Server 2012 and upgrading to 2022 |
| Hardware is failing | The physical machine is slow or broken |
| Better performance | New server has more RAM and storage |
| Moving to virtual environment | From physical to virtual server (like Hyper-V or Azure) |

## How Do You Migrate?

### Step-by-Step Overview:

#### ✅ Step 1: Plan the Migration

* Identify what roles/features need to move
* Check Windows Server version compatibility
* Make sure the new server is ready

#### ✅ Step 2: Backup Everything

* Always take full backup of the old server
* This prevents data loss in case something goes wrong

#### ✅ Step 3: Install the Same Roles/Features on the New Server

* Use **Server Manager** or PowerShell to install them
* Example: If old server had DHCP, install DHCP role on the new one

#### ✅ Step 4: Transfer Configuration and Data

* Use **Windows Server Migration Tools** or built-in wizards
  + Example: Migrate DHCP using Export-DhcpServer and Import-DhcpServer PowerShell commands
* Copy settings, users, data files

#### ✅ Step 5: Test Everything

* Check if the new server is doing the job properly
* Make sure users can access resources

#### ✅ Step 6: Retire the Old Server

* Once the new server works fine, remove or shut down the old one
* Update DNS records or network settings if needed

## What Tools Can Be Used?

| **Tool** | **Purpose** |
| --- | --- |
| Server Manager | Add/remove roles easily |
| Windows Server Migration Tools | Built-in tools for moving roles/features |
| PowerShell | For exporting/importing settings |
| Storage Migration Service | Moves files and shares |

## Summary

| **Term** | **Meaning** |
| --- | --- |
| Migration | Moving roles/features from old server to new |
| Role | Main job (DNS, DHCP, File Server) |
| Feature | Supporting tools (Group Policy, .NET) |
| Tools | Server Manager, Migration Tools, PowerShell |

**Deciding Server Version for Installation**

When setting up a Windows Server, you must choose:

1. **Which version** to install (e.g., 2016, 2019, 2022, or 2025)
2. **Which edition** (Standard, Datacenter, Azure Datacenter)
3. **Which installation type** (Server Core or Desktop Experience)

1. Choose the Server Version

| **Version** | **Best For** | **Why Choose It** |
| --- | --- | --- |
| 2016 / 2019 | Small to medium setups | Stable, good features, lower hardware needs |
| 2022 | Larger businesses | Better security, faster performance |
| 2025 | Cloud-connected setups | Latest features, hybrid cloud support |

2. Pick the Edition

| **Edition** | **Use Case** | **Key Features** |
| --- | --- | --- |
| Standard | Basic server roles | File sharing, DNS, DHCP, AD, etc. |
| Datacenter | Heavy virtualization | Unlimited VMs, advanced storage/clustering |
| Azure Datacenter | Hybrid cloud environments | Azure integration, cloud-first features |

3. Choose Installation Type

| **Type** | **Interface** | **Best For** |
| --- | --- | --- |
| Server Core | Command line only | Fast, secure, low resource use |
| Desktop Experience | Full GUI | Easy management, familiar layout |