Configuring Active Directory on a Windows Server involves several steps. While the process can be complex, I'll provide a simplified and understandable overview of the steps involves

1. Install the Active Directory Domain Services (AD DS) Role:

   - Open the Server Manager on your Windows Server.

   - Select "Manage" and choose "Add Roles and Features."

   - Proceed through the wizard and select the "Active Directory Domain Services" role.

   - Complete the installation process.

2. Promote the Server to a Domain Controller:

   - Open the Server Manager and click on the exclamation mark icon.

   - Choose "Promote this server to a domain controller."

   - Select "Add a new forest" and provide a root domain name for your Active Directory.

   - Set the Forest and Domain functional levels (usually the latest supported level).

   - Specify a Directory Services Restore Mode (DSRM) password.

   - Continue with the installation and let the server reboot.

3. Configure Active Directory Domain Services:

   - After the server restarts, log in as a domain administrator.

   - Open the Server Manager and select "Tools" > "Active Directory Users and Computers."

   - Create Organizational Units (OUs) to organize your Active Directory structure.

   - Create user accounts, groups, and assign appropriate permissions using the Active Directory Users and Computers tool.

4. Configure DNS for Active Directory:

   - Open the Server Manager and choose "Tools" > "DNS Manager."

   - Create a new forward lookup zone for your Active Directory domain name.

- Ensure that DNS records are properly configured, including the domain controller's own DNS settings.

5. Configure Group Policy:

  - Open the Group Policy Management console from the Server Manager.

  - Create and link Group Policy Objects (GPOs) to OUs to manage and enforce settings for users and computers.

6. Test and Verify Active Directory Functionality:

  - Ensure that client computers can join the domain by updating their network settings to point to the domain controller as the primary DNS server.

  - Join a test computer to the domain and verify that it successfully connects.

  - Test user authentication, group membership, and other Active Directory features.

Installing pfSense, an open-source firewall and routing software

  STEPS OF INSTALLING PFSENSE

1. Download the pfSense Installation Image:

  - Go to the pfSense website (https://www.pfsense.org/) and navigate to the "Downloads" section.

  - Choose the appropriate installation image based on your hardware architecture (e.g., 64-bit, ARM).

  - Download the installation image file (usually in ISO format).

2. Create a Bootable USB Drive or CD:

  - Use a tool like Rufus (https://rufus.ie/) or Etcher (https://www.balena.io/etcher/) to create a bootable USB drive by selecting the pfSense installation image file.

  - Alternatively, burn the ISO file to a CD or DVD using a disc-burning software.

3. Prepare the Hardware:

  - Ensure that your target hardware meets the minimum requirements for running pfSense (e.g., CPU, RAM, storage).

  - Connect the hardware to the network, ensuring that you have at least two network interfaces available (one for WAN and one for LAN).

4. Install pfSense:

  - Insert the bootable USB drive or CD into the target hardware.

  - Start or restart the hardware, and access the boot menu or BIOS settings to set the boot order to prioritize the USB drive or CD.

  - Save the changes and let the system boot from the pfSense installation media.

5. Begin the Installation:

  - The pfSense installation wizard will guide you through the process.

  - Select "Install" to begin the installation.

  - Choose the appropriate keymap, and press "Enter" to proceed.

  - Accept the license agreement.

  - Select the destination disk where you want to install pfSense.

  - Confirm the installation and allow the process to complete.

6. Configure Network Interfaces:

  - After the installation, the system will prompt you to assign network interfaces.

  - Follow the on-screen instructions to assign the interfaces as WAN or LAN.

  - Configure IP addresses, subnet masks, and other network settings as per your network setup.

7. Finalize the Installation:

  - Once the network interfaces are configured, you can set the webGUI (web-based graphical user interface) password.

  - Choose a strong password for administrative access to the pfSense web interface.

  - Confirm the settings and let the system finalize the installation.

8. Access the pfSense Web Interface:

  - Connect a computer to the same network as the pfSense LAN interface.

  - Open a web browser and enter the IP address assigned to the pfSense LAN interface.

  - Log in using the webGUI credentials set during the installation.

From the web interface, you can further configure pfSense by setting up firewall rules, NAT, VPN, DHCP, and other network services based on your requirements.