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**Assignment 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?**

**Ans:** The select the installation type window during the installation of Windows server 2016 offers two options:

Desktop Experience: Installs the full GUI and standard server roles and features.

Recommended for users who requires a GUI to manage and configure it more easily.

Server Core: Installs a minimal version without a GUI.

Recommended for advanced users who require a smaller attack surface, reduced maintenance, and better performance.

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

**Ans:** Configuring a windows server step by step install windows server.

Boot from the installation media and continue with the prompts for setup Choose the type of installation either Desktop Experience or Server core proceed with the installation account configuring a static IP address

Open Server Manger-Local Server click the Ethernet link to open network connections Right click your active network adapter then right click go to properties then select Internet Protocol Version 4 then double tap on the (tcp/ipv4) enter the static IP, subnet mask, default gateway, and DNS servers. Change the computer name in the server manager- local server, click the computer name.

In the system properties window, click change and enter a new name for the server and restart.

Enable remote desktop in server manager-local server, click disabled next to remote desktop. Select allow remote connections to this computer, then apply settings. Install roles and features

Open Server Manager- click manage – Add roles and features. Utilize the wizard to install roles such as Active Directory, DNS, DHCP, or File Services. Then restart the server if necessary. Configure Active Directory (optional)

If installing as a domain controller, the ADDS role needs to be installed. Use the Post-Deployment Configuration Wizard to promote the server to a domain controller configure DNS.

Install the DNS role if it has not been installed already. Open the DNS manager to create and manage DNS zones and records. Optional-set up DHCP role (if this is a required role).

Configure DHCP scopes with automatic IP address assignment Apply Security Updates Run windows update to ensure the server is fully patched. Enable automatic updates or schedule the updates during your maintenance windows.

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

**Ans:** The Pre installation tasks for windows server configuration are before installing windows server, ensure the system and environment are prepared to avoid potential issues during or after the installation.

Hardware requirements: processor minimum 1.4 GHz 64-bit architecture.

RAM: minimum 512mb recommended 2GB or more.

Space disk minimum 32GB on higher based on server roles.

Back up important data: create a backup of the data on the system to prevent data loss.

If upgrading backup current configurations and server settings.

Validate Network Requirements: Configure a static IP address for the server.

Verify DNS and DHCP are configured and accurate.

Validate network connectivity where the server will function.

Choose the Right Edition: Choose between Standard, Datacenter, or Essentials edition depending on workload and budget.

Assess licensing options, such as the number of users or devices.

Plan the server role: Identify the roles and features needed by the server, such as AD DS, DNS, DHCP, and IIS.

Plan the name of the domains and IP schema.

Collect Installation Media: Get the latest and genuine windows server ISO or installation media.

Use a tool like Rufus to make bootable USB or burn ISO to DVD.

BIOS/firmware Updates: Update system BIOS/UEFI firmware to the latest available version.

Enable any needed features, such as Virtualization support or secure Boot if supported.

Verify Storage Configuration: Verify RAID, SAN or disk partitions are configured to meet the needs of the server.

Format and prepare storage drives if necessary.

Choose Installation type: there are two type server core and Desktop experience

Prepare the Environment: Ensure adequate power supply and backup

Verify physical connections, such as network cables and hardware components.

Disable Non-Essential Peripherals: Disconnect unnecessary devices like USB drives or printers to avoid conflicts.

Disable antivirus software temporarily, if present.

Obtain product key: Have the valid product key/license ready for activation.

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

**Ans:** Post installation tasks are the crucial tasks performed after the installation of software, hardware, or systems to ensure optimum functionality, security, and usability.

1. System updates install updates and patches, and hotfixes are installed.

Check for compatibility: verify that the updates do not disturb the installed applications or configurations.

1. Configuration and customization system configuration: The system settings must be adjusted according to the operational requirements.

User Accounts: Create user accounts, roles and permissions

Localization: Configure the language, time zone and regional settings

Network settings: configure the IP addresses, DNS, gateways, and proxy servers.

1. Security Hardening Firewall configuration: Ensure the propre firewall rules.

User Access controls: Implement the strong passwords policies.

Disable Unnecessary Services: Disable unused or insecure services.

1. Testing and Validation  
   Functional Testing: The software or hardware should work correctly.  
   Connectivity Testing: Verify the connectivity and data transfer of the network.

Stress Testing: Determine system stability with heavy loads.

1. Backup and Recovery Setup  
   Data Backup: Set up automatic schedules for data backup.  
   Restore Testing: Verify that backups can be restored.  
   Disaster Recovery Plans: Develop plans in case the system fails.
2. Documentation Create Records: Record the installation procedure, configuration, and settings.  
   User Guides: Offer instructions on usage or training to the end user.  
   Change Logs: Keep a record of changes for future reference.
3. Performance Tuning  
   Resource Monitoring: Adjust CPU, memory, and disk allocations as necessary.  
   Performance Tuning: Optimize software and hardware for performance.  
   Enable Logging: Set up monitoring tools to monitor performance and problems.
4. Integration with Other Systems  
   Connectivity: Integrate with existing software, hardware, or cloud environments.  
   API/Database Connections: Configure APIs or databases for smooth operation.  
   Testing Interactions: Ensure interoperability with other systems.
5. **User Training**  
   Orientation Sessions: Teach the users to work with the system or application properly.  
   Share Resources: Make user manuals, quick-start guides, and FAQs available.
6. **Maintenance Planning**  
   Maintenance Windows: Schedule the time slots for maintenance.  
   Automation: Automate scheduled checks, updates, and backups.  
   Support: Create channels for support and escalation.

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

**Ans:** Windows server upgrades depend on the current version of the server and the target version of the server and the target version desired. The company has standard upgrade paths, depending on the versions and editions currently used, and can be upgraded directly without intermediate steps.

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

**Ans:** The physical structure of Active Directory refers to the arrangement of the network infrastructure at a physical level for the operation of AD. In other words, it is essentially concerned with where the servers are located and how they communicate. The physical structure of AD provides an efficient setup of its logical structure, the is domains, trees, forests and so no.

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

**Ans:** Logical Components of Active Directory

**Forest:** the top-level container representing the entire AD environment defines the security boundary and contains domains.

**Tree:** A hierarchy of domains sharing a contiguous namespace like server.windows.com

**Domain:** the primary administrative boundary, managing resources and policies for objects like users, groups, and computers.

**Organizational Unit (OU):** Logical containers within a domain used to organize objects and delegate management.

**Objects:** the elementary building blocks of AD such as users, computers, and groups with associated attributes, such as names or email addresses.

**Groups:** Collections of users or computers that can be used to simplify resource access and permissions.

Types: Security Groups- which have permissions and Distribution groups which send emails.

Global catalog: A partial replica of all objects in the forest, to facilitate searching and logon.

Schema: Specifies the object types and the attributes of these types. Ex. User must have a name and password.

Namespace: Objects and domains are organized using DNS names, for ex. DC=contoso, DC=com.

Trust Relationships: links between domains or forests that enable sharing of resources. Ex. Transitive or explicit trusts.

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

**Ans:** The full form of LDAP is **Lightweight Directory Access Protocol**

It is an open, industry standard protocol used for accessing and maintaining distributed directory information services, such as those in Active Directory. LDAP allows applications to query and modify directory services over a network.

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

**Ans:** the active directory database is stored in a file named NTDS.DIT (NT directory services directory information tree)

The default location is C:\Windows\NTDS\

And we should open through the Command prompt or powershell

Type the command: ntdsutil

Enter: files

1. **What is child DC?**

**Ans:** A child domain controller for a child domain, which is a subdomain of a parent domain within an Active Directory Forest.

1. **. Explain the term forest in AD**.

**Ans:** In Active Directory, a forest is the highest-level container, containing one or more domains. These domains share a common schema, configuration, and global catalog. Domains in a forest automatically have two-way trust relationships with each other, allowing them to share resources. It serves as an administrative and security boundary and enables centralized management throughout the structure.

1. **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**

**Ans: 1.** Microsoft’s implementation of a directory server

**2.** 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**

**Ans:** Administrator

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

**● Centralized authentication**

**● More detailed logging**

**● Centralized management with GPOs**

**● Better performance**

**Ans:** The main advantages for AD domain provides are

* Centralized authentication
* More detailed logging
* Centralized management with GPOs

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

**Ans:** The minimum hardware requirements for installing windows server 2016 are

1. Processor: 1.4 GHz 64bit processor compatible with x64 architecture supports NX, DEP, CMPXCHG16b,
2. RAM: minimum 512MB and 2GB for server with Desktop experience installation
3. Disk space: 32GB depending upon system roles or updates may be more
4. Network: Ethernet adapter with at least 1Gbps thought put.
5. Display: Super VGA (1024x768) or higher resolution monitor
6. Other things are keyboard and mouse or compatible pointing device.
7. **Explain the different editions of Windows Server 2016 and their features.**

**Ans:** Windows server 2016 is available in four main editions;

1. Essentials: for small bsinesses up to 25 users / 50 devices.

Files sharing and remote access no CALs required, only one virtual machine.

1. Standard: for small or medium sized businesses with a light virtualization requirement. Supports 2 Vms/CALs are required.
2. Features: storage spaces direct but not unlimited virtualization.
3. Datacenter: Required for large enterprises those would require more virtualization and advanced requirements.

Unlimited VMs/Shielded VMs/Storage Replica/Software-Defined networking. CALs are required.

1. Hyper-V: Dedicated virtualization host without additional roles/features.

No GUI, designed to run VMs only.

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

**Ans:** the steps of installing windows server 2016 using GUI mode are:

**Prepare Installation media:** Create a bootable USB/DVD and insert it into the server.

**Boot from Media:** Restart the server, select the boot device.

**Choose preferences:** select language, time and keyboard settings.

**Start installation:** click install now.

**Select edition:** choose the desired edition and server with desktop experience.

**Accept License:** Agree to the terms and click next.

**Custom installation:** Select custom and choose the installation disk.

**Install:** let the system copy files and install features.

**Set administrator password:** input your password, click finish.

**Login:** login by using the combination CTRL+ALT+DELETE to input the Administrator password

**Configure:** by using server manager, setting would be configured.

**That’s all.** Installation with GUI on windows server 2016

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

**Ans:** the steps for installing windows server 2016 in server core mode are:

**Preparation of installation media:** insert the bootable USB/DVD in the server.

**Boot from media:** server reboot, boot device selection.

**Preferences:** choice of language, time, keyboard

**Installation of server:** installation now

**Server core:** chose edition, without GUI

**Accept license:** check mark on agree to terms then next

**Custom:** choose custom select installation disk.

**Install:** Allow the system to copy files and install

**Admin password:** enter administrator password, then finish.

**Log on:** form CTRL+ALT+DELETE log on using the administrator password.

**Configure:** for post-installation configuration use either command prompt or powershell.

Install of your server core is complete.

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

**Ans:** the following describes the installation of windows server 2016 and how to set up its network settings;

**Pre installation:** the network settings automatically detect, but a manual setup can be configured after installing the system.

**Post installation (Server core):** open PowerShell in order to configure the network

**To view the network adapters:** get-net Adapter

**To set a static IP:** PowerShell Net-Net IP Address- interface Alias “Ethernet” -IP Address 192.168.1.110- prefix length 24 – Default Gateway 192.168.1.1

**Set DNS:** PowerShell- set DNS client server address- interface alias “Ethernet” – server Addresses (“8.8.8.8”, “8.8.4.4”)

**Press control panel> network and sharing center>change adapter settings.**

Right-click the adapter> properties> internet protocol version 4 (TCP/IPv4).

Configure IP and DNS to use addresses manually.

DHCP: To use DHCP, let’s enable it with control panel or PowerShell.

PowerShell: Set-NetIPAddress- interface Alias “Ethernet” -DHCP Enabled so, network settings can thus be set up after installation.

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

Ans: To promote a Windows Server to become a domain controller:

**Install the AD DS Role:** Open the Server Manager click on Add roles and features Click on Active Directory Domain Services (AD DS). Complete the installation wizard.  
Promote to Domain Controller: Click the notification flag located in Server Manager. Select the option Promote this server to a domain controller.

**Configure settings:** Selecting Add a new forest for creating a new domain or Add a domain controller to an existing domain.  
Specify the Root domain name, select DNS server, and set the DSRM password.  
**Complete Installation:** Review the settings, run the prerequisite check, and click Install. The server will reboot.  
**Verify:** Log in with domain admin credentials and verify using Active Directory Users and Computers or (dcdiag).

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

**Ans:** To step up to windows server 2016:

1. **Preparing:** check system requirements and make sure the current edition supports in place upgrades, like windows server 2012/2016 R2.

Make a backup and check application and driver compatibility

Update the existing server

1. **Upgrade steps:** run the setup.exe command form the windows server 2016 installation media

Choose to upgrade and leave files, settings and apps

Enter product key and confirm edition fix issues that the setup flagged as incompatible.

Complete the installation; the server will reboot a few times

1. **After upgrade tasks:** Validate the upgrade using winver.

Test your server roles, update drivers where necessary.

Install windows updates, and reapply security settings.

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

**Ans:** Active directory domain services is a windows server role that enables centralized identity and access management in a domain.

**Key points are:** Domain: Logical collections of objects, such as users or computers, with a common AD database.

**Trees:** A group of domains within a contiguous namespace.

**Forests:** A collection of domain trees with a common schema and a top-level security boundary.

**Organizational Units:** Containers to organize objects and a delegate control.

**Schema:** Describes object classes and attributes within the directory.

**Global Catalog (GC):** A distributed database that contains all directory objects information.

**Domain controllers (DCs):** hosts the data of AD and performs authentication operations.

**Replication:** the directory data is replicated across domain controllers.

**DNS Integration:** domain name resolution for AD DS.

**Group policy:** A centralized mechanism to manage user and computer settings.

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

**Ans:** To create a new Active Directory user account in windows server are

**First:** open Active Directory Users and computers (dsa.msc).

**Second:** navigate in the option Organizational Unit (OU).

**Third:** Right click the OU then new > User.

**Fourth:** enter the user’s details like name logon name click Next.

**Fifth:** set a password and configure option > click Finish.

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

**Ans:** To create and mange group policy object in windows server 2016/2019:

1. Open GPMC Win + R, then type gpmc.msc, and enter.
2. Create a GPO open group policy objects> new name it and ok.
3. Edit the GPO right-click GPO> edit.

Settings available under: computer configuration: the computer settings are located here

User configuration: the user’s settings are found there

1. Link the GPO: Right -click the target OU, domain, or site> Link an Existing GPO > select the GPO.
2. Test and Apply run gpupdate /force on a target system.

Verify with gpresult /r.

1. Manage GPOs Edit: Modify settings. Backup/restore: Right-click GPO> Back up or restore.

Delegate: Assign permissions.

Delete: Remove GPOs if no longer needed.

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

**Ans:** Organizational Unit (OUs) in Active Directory

The Ous in Active Directory serve as logical containers that are utilized to organize and manage objects like users, groups, and computers. They make it easier to organize AD for proper management, delegation, and policy implementation.

Uses of Ous Organize objects: Group by department, location, or function.

**Delegate control:** Assign admin permissions to specific Ous.

**Apply GPOs:** Enforce Group Policies for specific Ous.

**Control Scope:** Limit GPOs and admin tasks to specific objects.

How to Create and use OUs

**Create:** Open Active Directory Users and computers (dsa.msc).

Right click the domain> New > Organizational unit > name it.

**Move Objects**: Drag objects (like users, groups) into the OU or use Move.

**Delegate Control:** right click the OU > delegate control > Assign permission.

**Apply GPOs:** Link GPOs to Ous via Group Policy Management Console (GPMC).

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

**Ans:** Delegating Administrative Privileges in Active Directory

**To open ADUC:** win + R, type dsa.msc, and hit enter.

**OU/object:** Right click the OU or object > Delegate control.

**User/Group:** Add, select the user/group > Next.

**Tasks to Delegate:** Select one or more of the predefined tasks, such as “Create, delete, and manage user accounts”, or Custom tasks.

**Wizard Completion**

Review and then click Finish.

**Delegation Management view:** Right click the OU> properties > security > Advanced.

**Modify/Remove:** Edit permissions in the Advanced security settings.