Assignment : Windows Server

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**Module 14: Identity With Windows Server**

**31. Explain the process of installing and configuring Hyper-V virtualization in Windows Server 2016.**

### > Installing & Configuring Hyper-V in Windows Server 2016 (Short Guide)

✅ Requirements:

* 64-bit CPU with SLAT & Virtualization enabled
* Minimum 4GB RAM
* Windows Server 2016 Standard/Datacenter

1️ Install Hyper-V

Using Server Manager:

1. Open Server Manager → Click "Add Roles and Features"
2. Select "Role-based installation" → Choose Hyper-V
3. Configure network adapters & enable Live Migration (optional)
4. Click Install → Restart Server

Using PowerShell:

Install-WindowsFeature -Name Hyper-V -IncludeManagementTools -Restart

2️ Configure Hyper-V

✅ Open Hyper-V Manager (Search in Start Menu)  
✅ Create a Virtual Switch:

* Open Virtual Switch Manager → Select External/Internal/Private
* Assign network adapter → Click OK

✅ Create a VM:

* In Hyper-V Manager → Click New → Virtual Machine
* Set RAM, Network Adapter, Disk, and OS Installation Media
* Click Finish

✅ Start & Manage VM:

* Select VM → Click Start → Install OS

**32. How do you monitor server performance and manage event logs in Windows Server?**

### > Monitoring Server Performance & Managing Event Logs (Windows Server)

✅ Monitor Server Performance:

* Task Manager: (Ctrl + Shift + Esc) → View CPU, RAM, Disk, Network
* Performance Monitor (PerfMon): (perfmon) → Add counters for system metrics
* Resource Monitor: (resmon) → Detailed system resource usage
* PowerShell (Real-time monitoring):
* Get-Counter "\Processor(\_Total)\% Processor Time"

✅ Manage Event Logs:

* Event Viewer (eventvwr.msc) → View System, Application, Security logs
* PowerShell (View recent logs):
* Get-EventLog -LogName System -Newest 10
* Clear Event Logs:
* Clear-EventLog -LogName System, Application, Security

**33. Describe the different types of storage options available in Windows Server.**

## > **Storage Options in Windows Server**

Windows Server provides multiple storage options to meet different needs, including local storage, network storage, and cloud-based solutions.

### **1️ Direct-Attached Storage (DAS)**

* Storage directly connected to a server (HDD, SSD, NVMe)
* **Pros:** High-speed, low latency
* **Cons:** Limited scalability, not shared across multiple servers
* **Use Case:** Single-server applications, boot drives

### **2️ Network-Attached Storage (NAS)**

* A dedicated storage device connected via a network
* Uses **SMB, NFS, or CIFS protocols** for file sharing
* **Pros:** Centralized storage, easy to configure
* **Cons:** Slower than SAN, dependent on network speed
* **Use Case:** File sharing, backup storage

### **3️ Storage Area Network (SAN)**

* High-performance network of storage devices
* Uses **Fibre Channel (FC) or iSCSI** for fast data transfer
* **Pros:** Highly scalable, ideal for large databases & virtualization
* **Cons:** Expensive, complex setup
* **Use Case:** Enterprise applications, virtualization (Hyper-V, VMware)

### **4️ File Storage**

* Data is stored in a hierarchical folder structure
* Uses **ReFS (Resilient File System) & NTFS**
* **Use Case:** Shared file storage, group collaboration

### **5️ Block Storage**

* Data is stored in fixed-sized blocks for fast read/write operations
* Used in **SAN & Hyper-V virtual disks (VHD, VHDX)**
* **Use Case:** Databases, virtualization, high-speed transactions

### **6️ Object Storage**

* Stores data as objects with metadata (e.g., Azure Blob Storage)
* **Pros:** Scalable, cost-effective for large data
* **Cons:** Not optimized for structured databases
* **Use Case:** Cloud backups, big data analytics

### **7️ Storage Spaces & Storage Spaces Direct (S2D)**

* **Storage Spaces:** Pools multiple drives into a single logical volume
* **S2D:** Software-defined storage (SDS) for **hyper-converged infrastructure (HCI)**
* **Use Case:** Virtualized workloads, failover clustering

### **8️ Cloud Storage**

* Azure Storage, OneDrive for Business, hybrid cloud solutions
* **Use Case:** Offsite backups, disaster recovery, scalable storage

**34. What is the role of File Server in Windows Server, and how do you configure it?**

### > File Server in Windows Server – Role & Configuration

✅ Role of File Server:

* Centralized storage & sharing of files across a network
* Access control using NTFS & share permissions
* Backup & recovery with Shadow Copies & DFS Replication

How to Configure a File Server

Step 1: Install File Server Role  
Using Server Manager:  
1️ Open Server Manager → Add Roles and Features  
2️ Select File and Storage Services → File Server → Install

Using PowerShell:

Install-WindowsFeature -Name FS-FileServer

Step 2: Create & Share a Folder  
1️ Create a folder (e.g., C:\SharedFiles)  
2️ Right-click → Properties → Sharing → Advanced Sharing  
3️ Check "Share this folder" → Set permissions (Full Control, Read)

Step 3: Configure NTFS Permissions  
1️ Go to Security tab → Edit Permissions  
2️ Add users/groups → Set access levels (Read, Modify, Full Control)

Step 4: Access the Shared Folder

* On a client PC, open Run (Win + R) → Type:
* \\Server-IP\SharedFiles
* Map network drive for easy access

**35. Explain the process of implementing and managing Distributed File System (DFS) in Windows Server 2016.**

## > **Implementing & Managing DFS in Windows Server 2016**

### **1️ Install DFS Role**

**Using Server Manager:**

* Add **DFS Namespaces & DFS Replication** under **File and Storage Services**

**Using PowerShell:**

Install-WindowsFeature -Name FS-DFS-Namespace, FS-DFS-Replication -IncludeManagementTools

### **2️ Configure DFS Namespace (DFS-N)**

**Using DFS Management (**dfsmgmt.msc**)**

* Create **New Namespace** → Choose **Domain-based (recommended)**
* Add shared folders → Users access via:
* \\DomainName\CompanyDFS\SharedFiles

### **3️ Configure DFS Replication (DFS-R)**

**Using DFS Management:**

* Create **Replication Group** → Add **Servers**
* Choose **Replication Topology (Full Mesh or Hub-Spoke)**
* Set **Bandwidth & Schedule**

**Using PowerShell:**

New-DfsReplicationGroup -GroupName "SalesData"

Add-DfsrMember -GroupName "SalesData" -ComputerName "Server1","Server2"

### **4️ Monitor & Manage DFS**

✅ **Check Namespace Status:**

Get-DfsnRoot

✅ **Monitor Replication:**

Get-DfsrBacklog -GroupName "SalesData" -SourceComputerName "Server1" -DestinationComputerName "Server2"

**36. Discuss the built-in backup and recovery options available in Windows Server 2016 or 2019.**

## > **Windows Server 2016/2019 Backup & Recovery Options**

### **1️ Windows Server Backup (WSB)**

* Backs up system state, files, and full server recovery
* **Install WSB:**
* Install-WindowsFeature -Name Windows-Server-Backup
* **Backup:**
* wbadmin start backup -backupTarget:D: -include:C: -allCritical -quiet

### **2️ System State Backup & Recovery**

* **Backup:**
* wbadmin start systemstatebackup -backupTarget:D: -quiet
* **Restore:**
* wbadmin start systemstaterecovery -backupTarget:D: -quiet

### **3️ Bare Metal Recovery (BMR)**

* Restores the entire server (OS, settings, files)
* **Process:** Boot into **Windows Recovery** → Select **System Image Recovery**

### **4️ Volume Shadow Copy (VSS)**

* Restores previous versions of files
* Enable via **Drive Properties → Shadow Copies → Enable**

### **5️ Active Directory Backup & Restore**

* **Reboot to Directory Services Restore Mode (DSRM):**
* bcdedit /set safeboot dsrepair
* **Restore AD from Backup:**
* wbadmin start systemstaterecovery -backupTarget:D:

### **6️ Storage Replica (Disaster Recovery)**

* **Real-time block-level replication between servers**
* **Enable Storage Replica:**
* Install-WindowsFeature -Name Storage-Replica -IncludeManagementTools

**37. How do you configure Windows Server Backup to back up critical data?**

## > **Configuring Windows Server Backup to Back Up Critical Data**

Windows Server Backup (WSB) helps protect **critical system files, applications, and data** through scheduled or manual backups.

### **1️ Install Windows Server Backup (WSB)**

**Using Server Manager:**  
1️ Open **Server Manager** → Click **"Add Roles and Features"**  
2️ Select **"Role-based or feature-based installation"** → Click **Next**  
3️ Choose the **server** → Click **Next**  
4️ Under **Features**, check **"Windows Server Backup"**  
5️ Click **Next → Install**

**Using PowerShell:**

Install-WindowsFeature -Name Windows-Server-Backup

### **2️ Open Windows Server Backup**

**Access WSB:**

* Open **Server Manager** → Go to **Tools** → Click **Windows Server Backup**

### **3️ Create a One-Time Backup**

1️ Open **Windows Server Backup**  
2️ Click **"Backup Once"** (for immediate backup)  
3️ Select **"Different options"** → Click **Next**  
4️ Choose **Full Server** (or Custom for critical data)  
5️ Select **Backup Destination** (Local Disk, Network Share, or Volume)  
6️ Click **Backup → Finish**

**Using PowerShell:**

wbadmin start backup -backupTarget:D: -include:C: -allCritical -quiet

### **4️ Schedule Automatic Backups**

1️ Open **Windows Server Backup**  
2️ Click **"Backup Schedule"** → Click **Next**  
3️ Choose **"Full Server"** or **"Custom"** (select critical files/folders)  
4️ Select **Backup Frequency** (Daily, Weekly, etc.)  
5️ Choose **Backup Destination** (Local Drive, Network Share)  
6️ Click **Finish**

**Using PowerShell:**

wbadmin enable backup -schedule -backupTarget:D: -include:C: -allCritical -quiet

### **5️ Verify Backup & Restore Data**

**Check Backup Status:**

wbadmin get versions

**Restore a Backup:**

wbadmin start recovery -version:04/10/2024-12:00 -itemType:Volume -items:C:

**38. Explain the steps for restoring files and folders using Windows Server Backup.**

## > **Restoring Files & Folders Using Windows Server Backup (WSB)**

Windows Server Backup (WSB) allows you to restore **files, folders, system state, or entire volumes** from a previous backup.

### **1️ Open Windows Server Backup**

* Open **Server Manager** → Click **Tools** → Select **Windows Server Backup**

### **2️ Choose the Restore Option**

1️ Click **Recover** (right pane)  
2️ Select **"This server"** (if backup is stored locally) or **"Another server"** (if stored remotely)  
3️ Click **Next**

### **3️ Select the Backup Version**

1️ Choose the **backup date & time**  
2️ Click **Next**

### **4️ Choose What to Restore**

* **Files & Folders** → Restore specific data
* **Volumes** → Restore full drives
* **System State** → Restore Windows settings & AD
* **Full Server** → Restore the entire system

**Select “Files and Folders” → Click Next**

### **5️ Choose Restore Location**

* **Original location** (overwrites existing files)
* **Alternate location** (restores to a new folder)

**Click Restore → Finish**

### **6️ Restore Using PowerShell**

**List available backups:**

wbadmin get versions

**Restore files from backup:**

wbadmin start recovery -version:04/10/2024-12:00 -itemType:File -items:C:\Data -backupTarget:D:

**Restore system state:**

wbadmin start systemstaterecovery -version:04/10/2024-12:00

### **7️ Verify Restored Data**

* Check the **restored files** in the selected location
* Ensure applications and services function correctly

**39. What are some common troubleshooting techniques for Windows Server startup issues?**

## > **Common Troubleshooting Techniques for Windows Server Startup Issues**

When a Windows Server fails to start properly, you can use various troubleshooting techniques to diagnose and resolve the issue.

### **1️ Boot into Safe Mode**

* **Restart the server** → Press F8 or Shift + F8 before Windows loads
* Select **Safe Mode** or **Safe Mode with Networking**
* Use **Event Viewer** (eventvwr.msc) to check error logs

**Force Safe Mode via PowerShell:**

bcdedit /set {default} safeboot minimal

### **2️ Use Windows Recovery Environment (WinRE)**

If Safe Mode fails, boot into **WinRE**:

* Insert **Windows Server Installation Media**
* Select **Repair your computer** → Choose **Troubleshoot**
* Use **Startup Repair**

**Manually enter WinRE:**

shutdown /r /o /f /t 0

### **3️ Check Boot Configuration (BCD & MBR Issues)**

**Rebuild Boot Configuration Data (BCD):**  
1️ Boot into **WinRE** → Open **Command Prompt**  
2️ Run:

bootrec /fixmbr

bootrec /fixboot

bootrec /scanos

bootrec /rebuildbcd

### **4️ Check Disk & File System Integrity**

**Run CHKDSK to fix disk errors:**

chkdsk C: /f /r /x

**Run System File Checker (SFC) to repair corrupted system files:**

sfc /scannow

**Check for driver issues with DISM:**

dism /online /cleanup-image /restorehealth

### **5️ Disable Problematic Drivers & Services**

* Boot into **Safe Mode**
* Open **msconfig** → Disable unnecessary startup services

**Disable a faulty driver:**

sc config <driver\_name> start=disabled

### **6 Restore from a Previous Backup**

**Perform a System State Recovery:**

wbadmin start systemstaterecovery -backupTarget:D:

### **7️ Reset or Reinstall Windows Server**

* If all else fails, reinstall the OS while preserving data using **In-Place Upgrade**
* **Fresh Install** (Last Resort)

**40. How do you troubleshoot network connectivity problems in Windows Server?**

## > **Troubleshooting Network Connectivity Issues in Windows Server**

When a Windows Server faces **network connectivity issues**, use the following **step-by-step troubleshooting techniques** to diagnose and fix the problem.

### **1️ Check Physical & Basic Network Settings**

✅ Verify cables, switches, and routers are properly connected.  
✅ Restart the **network adapter**:

Restart-NetAdapter -Name "Ethernet"

✅ Ensure the adapter is **enabled**:

Get-NetAdapter | Format-Table Name, Status

### **2️ Check IP Configuration**

**Verify IP settings:**

ipconfig /all

* Ensure the server has the **correct IP, Subnet Mask, Gateway, and DNS settings**.
* If using DHCP, try **releasing & renewing** the IP:

ipconfig /release

ipconfig /renew

**Manually set an IP (if needed):**

New-NetIPAddress -InterfaceAlias "Ethernet" -IPAddress 192.168.1.100 -PrefixLength 24 -DefaultGateway 192.168.1.1

### **3️ Test Network Connectivity**

**Ping Default Gateway & Other Devices**

ping 192.168.1.1

**Check Route Table** (for incorrect routes):

route print

**Trace the route to detect network drops:**

tracert google.com

### **4️ Verify DNS Configuration**

**Check current DNS settings:**

Get-DnsClientServerAddress

**Flush and re-register DNS records:**

ipconfig /flushdns

ipconfig /registerdns

**Test DNS resolution:**

nslookup google.com

### **5️ Check Windows Firewall & Security Rules**

**Disable Windows Firewall temporarily (for testing):**

Set-NetFirewallProfile -Profile Domain,Public,Private -Enabled False

**Check for blocked ports:**

netsh advfirewall firewall show rule name=all

**Re-enable Firewall after testing:**

Set-NetFirewallProfile -Profile Domain,Public,Private -Enabled True

### **6️ Verify Network Services & Logs**

**Restart network services:**

Restart-Service -Name DHCP, DNS, Netlogon

**Check Event Viewer for errors:**

eventvwr.msc

**Check active connections:**

netstat -ano

### **7️ Update & Reset Network Adapter**

**Update network drivers via Device Manager or PowerShell:**

Get-NetAdapter | Update-Driver

**Reset TCP/IP Stack:**

netsh int ip reset

netsh winsock reset

**Restart the server**

shutdown /r /t 0

**41. Discuss common Active Directory-related issues and their troubleshooting steps.**

# > **Common Active Directory Issues & Fixes**

### **1️ AD Replication Issues**

**Symptoms:** Inconsistent user data, login failures.  
 **Check & Force Replication:**

repadmin /replsummary

repadmin /syncall /APeD

**Verify DNS & Time Sync:**

dcdiag /test:dns

w32tm /query /status

### **2️ User Login Failures**

**Symptoms:** "Trust relationship failed," locked accounts.  
 **Unlock User & Reset Password:**

Unlock-ADAccount -Identity username

Set-ADAccountPassword -Identity username -Reset

**Reset Computer Account:**

netdom resetpwd /server:DCName /userd:DomainAdmin /passwordd:\*

### **3️ DNS Issues**

**Symptoms:** Slow login, GPO failures, nslookup errors.  
 **Flush & Re-register DNS:**

ipconfig /flushdns

ipconfig /registerdns

**Restart DNS Service:**

Restart-Service DNS

### **4️ GPO Not Applying**

**Symptoms:** Policies not enforced.  
 **Check GPO on Client:**

gpresult /r

**Force GPO Update:**

gpupdate /force

### **5️ AD Database Corruption**

**Symptoms:** AD services fail, missing directory data.  
 **Check & Repair Database:**

ntdsutil

activate instance ntds

semantic database analysis /fix

### **6️ Time Sync Issues**

**Symptoms:** Kerberos failures, replication delays.  
 **Manually Sync Time:**

w32tm /config /syncfromflags:manual /manualpeerlist:"time.windows.com"

w32tm /resync

### **7️ FSMO Role Failures**

**Symptoms:** Authentication & schema issues.  
 **Check FSMO Role Holders:**

netdom query fsmo

**Move FSMO Roles:**

Move-ADDirectoryServerOperationMasterRole -Identity DCName -OperationMasterRole PDCEmulator

**42. Explain how to troubleshoot performance problems on Windows Server 2016 or 2019.**

# > **Troubleshooting Performance Issues in Windows Server 2016/2019**

When a Windows Server experiences **slow performance, high CPU usage, or memory leaks**, follow these structured **troubleshooting steps** to diagnose and fix the problem.

## **1️ Check System Resource Usage**

**Use Task Manager (**taskmgr**)** to identify high CPU, RAM, or Disk usage.  
 **Use Resource Monitor (**resmon**)** for deeper analysis.

**Check CPU, Memory, and Disk Usage via PowerShell:**

Get-Process | Sort-Object CPU -Descending | Select -First 10

Get-Process | Sort-Object WorkingSet -Descending | Select -First 10

Get-PhysicalDisk | Select-Object DeviceId, Model, MediaType, SpindleSpeed, HealthStatus

## **2️ Analyze Running Processes & Services**

**Check high CPU-consuming processes:**

Get-Process | Sort-Object CPU -Descending | Select -First 5

**Stop unnecessary services:**

Stop-Service -Name "ServiceName"

**Disable unneeded startup programs:**

Get-Service | Where-Object { $\_.StartType -eq "Automatic" -and $\_.Status -eq "Stopped" } | Select DisplayName, StartType

## **3️ Monitor Server Performance with Performance Monitor (**perfmon**)**

**Open Performance Monitor:**

perfmon

**Track key counters:**

* **Processor(\_Total)% Processor Time** (CPU Usage)
* **Memory\Available MBytes** (Free RAM)
* **LogicalDisk% Free Space** (Disk Space)
* **Network Interface\Bytes Total/sec** (Network Usage)

## **4️ Identify & Resolve Disk Bottlenecks**

**Check Disk Usage:**

Get-PSDrive

**Check Read/Write Speed:**

winsat disk -v

**Defragment & Optimize Disks:**

Optimize-Volume -DriveLetter C -Defrag

## **5️ Analyze Network Performance Issues**

**Check Network Statistics:**

netstat -ano

Get-NetAdapterStatistics

**Monitor Network Latency:**

ping google.com

tracert google.com

**Reset TCP/IP Stack:**

netsh int ip reset

## **6️ Check Event Logs for Errors (**eventvwr.msc**)**

**Use PowerShell to find critical errors:**

Get-EventLog -LogName System -EntryType Error -Newest 10

**Review logs for frequent system crashes or service failures.**

## **7️ Apply System Updates & Driver Updates**

**Check for updates:**

sconfig

**Update drivers manually:**

Get-WmiObject Win32\_PnPSignedDriver | Select DeviceName, Manufacturer, DriverVersion

## **8️ Optimize Server Performance Settings**

**Adjust Virtual Memory (Pagefile):**

wmic pagefile list /format:list

**Disable Unused Features & Roles:**

Remove-WindowsFeature -Name "FeatureName"