

1. Definitions

Windows Server 2019	Enterprise OS for AD DS, DNS, DHCP, File/Print, Web, Virtualization
Domain Controller (DC)	Server authenticating users, enforcing policies, replicating AD
Active Directory (AD DS)	Directory service for managing users, computers, policies
DNS	Resolves hostnames to IP addresses
DHCP	Automates IP address assignment
GPO	Group Policy Object – rules/settings applied to users/computers
PKI	Public Key Infrastructure – manages digital certificates
Windows Defender Antivirus	Built-in malware protection
Windows Firewall with Advanced Security	Stateful firewall with rule-based inbound/outbound filtering
Remote Toolsets & Event Logs	MMC, RSAT, Event Viewer for monitoring and managing servers
Server Core	Minimal installation with CLI/PowerShell interface
PowerShell	CLI + scripting environment for automation
Windows Admin Center	GUI for remote management of Server Core/GUI servers
Nano Server	Lightweight container host
Containers	Virtualized app environments: Windows Server or Hyper-V containers
Docker & Kubernetes	Container deployment and orchestration tools
Shielded VMs	Protect VM data from tampering
NLB	Distributes network traffic across multiple servers
Failover Cluster	Ensures high availability for applications

2. Quick Step-by-Step Tasks

Task	Steps
Install Server	GUI/Core → IP, hostname, domain join → Updates
Create Domain	Install AD DS → Promote DC → Configure DNS
Create OU/User	ADUC → New OU → Add Users/Groups → Link GPO
DHCP Scope	DHCP → New Scope → Set IP range → Activate → Reservations/Failover
DNS Zone	Create Primary/Secondary → Add A, AAAA, CNAME, MX records
GPO	Create → Link OU → Configure policies → Update with <code>gpupdate /force</code>
Hyper-V VM	New VM Wizard → CPU/RAM → Virtual Switch → Install OS



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2. Quick Step-by-Step Tasks☰ (cont)

Containers	Pull image → Run container → Configure app → Test connectivity
NLB	Install NLB → Add servers → Assign VIP → Test
Failover Cluster	Install feature → Validate → Create cluster → Add nodes
Security	Enable Defender, configure Firewall → BitLocker → VPN/DirectAccess → ATA monitoring
Monitoring	Task Manager, Resource Monitor, Performance Monitor → Check CPU, memory, disk, network → Event Viewer for logs

4. Scenario-Based Tips ♡

DC Failure: Verify replication → DNS → Restore DC.

Slow Login / High CPU: Task Manager → Resource Monitor → Event Logs → Optimize processes.

Web App HA: NLB or failover cluster → Test load distribution.

Remote Branch Access: Configure VPN/AOVPN → Assign certificates → Test connectivity.

Password Policy / SSL Deployment: GPO → Apply → Issue certificates → Install SSL on server.

3. Quick Commands & PowerShell

PowerShell Tips >_

```
# List running services
Get-Service | Where-Object {$_.Status -eq "Running"}

# Restart a service
Restart-Service -Name "Spooler"

# DSC Configuration
Start-DscConfiguration -Path "C:\DSC" -Wait -Verbose
```

DHCP 🏠

```
# Add Scope
Add-DhcpServerv4Scope
-Name "OfficeScope"
-StartRange 192.168.1.10 -EndRange 192.168.1.50
-SubnetMask 255.255.255.0

# Reservation
Add-DhcpServerv4Reservation -ScopeId 192.168.1.0
-IPAddress 192.168.1.20
-ClientId "AA-BB-CC-DD-EE-FF"
```

DNS 📋

```
# Add A Record
Add-DnsServerRecord -Name "WebServer"
-ZoneName "domain.name.com"
-IPv4Address "192.168.1.100"
```

Active Directory & GPO 👤

```
# Install AD DS
Install-WindowsFeature AD-Domain-Services

# Create domain
Install-ADDSForest -DomainName "domain.name.com"

# Create GPO
New-GPO -Name "PasswordPolicy" | New-GPLink
-Target "OU=Users,DC=contoso,DC=com"
```

Hyper-V 🖥️

```
# Create VM
New-VM -Name "WebVM" -MemoryStartupBytes 2GB -Generation 2
-SwitchName "ExternalSwitch"

# Start VM
Start-VM -Name "WebVM"
```

Containers 🐳

```
docker pull mcr.microsoft.com/windows/servercore
docker run -it mcr.microsoft.com/windows/serve-core powershell
docker run --isolate on=hyperv -it <image>
```

5. Lab Checklist ✓

- ☐ Install Server GUI & Core
- ☐ Configure IP, hostname, join domain
- ☐ Create OUs, users, groups, GPOs
- ☐ DHCP scope/reservation/failover
- ☐ DNS zones & records
- ☐ Hyper-V VM & virtual switch creation
- ☐ Deploy Windows & Hyper-V containers
- ☐ Configure NLB & failover cluster
- ☐ Enable Defender, Firewall, BitLocker, VPN/AOVPN, ATA
- ☐ Monitor system: Task Manager, Perf Monitor, Event Logs
- ☐ Use PowerShell for automation & troubleshooting

