Module 4 – DNS

In Module 4 students will learn the details of how DNS translates host names to IP addresses and the process of DNS name resolution for both the client and server. Topics will also include; creating zone and zone transfers, creating or converting an Active Directory-integrated zone, creating and editing resource records, configuring client registration, automatically updating DNS using Dynamic DNS, resolving queries using stub zones and forwarding, using root hints and a root zone, managing zones through zone delegation, creating WINS-integrated zones and GlobalNames zones support, and implementing strategies and goals when designing a DNS solution.

Section 4.1: DNS Concepts

Summary

In this section students will learn concepts of how the Domain Name System (DNS) translates host names to IP addresses.
- DNS is a distributed database with multiple servers holding different portions of the data.
- Components of the DNS hierarchy
    - .(dot) domain
    - Top Level Domains (TLDs) (.com, .edu, .gov)
    - Second-level and additional domains
    - Hosts
- Terms that relate to DNS:
    - A fully qualified domain name (FQDN)
    - Forward lookup
    - Authoritative server
    - Referral
    - Recursion
- Authoritative DNS zones:
    - Primary
    - Secondary
    - Active Directory-integrated
- Zone types:
    - Forward lookup zone
    - Reverse lookup zone
- Common resource records:
    - SOA (Start of Authority)
    - NS (name server)
    - A (host address)
    - AAAA (quad-A)
    - PTR (pointer)
    - CNAME (canonical name)
    - MX (Mail Exchanger)
    - SRV (service locator)

      o WINS and WINS-R resource records
- The role of Dynamic DNS (DDNS)
- Secure DDNS

Configuring Server 2008 Network Infrastructure Objectives

- 201. Configure a Domain Name System (DNS) server.
- 202. Configure DNS zones.
  - Zone types
  - Dynamic Domain Name System (DDNS)
  - Secure DDNS
  - Reverse lookup zones
- 203. Configure DNS records.
  - Record types

<mark>**Log into LabSim and complete the tasks listed under Resources for each of the items listed below. As you complete them Checkoff the boxes:**</mark>

Video/Demo	Time
☐ 4.1.1 DNS Concepts	8:44
☐ 4.1.3 Authoritative Zones	8:28
☐ 4.1.5 Resource Records	4:52
☐ 4.1.7 Dynamic DNS	2:41
Total	*24:45*

Total Time: About 30 minutes

Section 4.2: Name Resolution

Summary

This section examines the process of DNS name resolution for both the client and the server. Details include:
- On the client side, there are three checks a client can go through to resolve a DNS name to an IP address:
  - Hosts file
  - Local DNS cache
  - DNS server
- Command to view the local DNS cache (**ipconfig /displaydns**)
- Command to clear the local DNS cache (**ipconfig /flushdns**)
- The DNS name resolution process on the server:

Configuring Server 2008 Network Infrastructure Objectives

- 205. Configure name resolution for client computers.

Video/Demo	**Time**
☐ 👤 4.2.1 DNS Client Name Resolution	9:41
☐ 👤 4.2.2 DNS Server Name Resolution	3:54
☐ 🖥 4.2.3 Examining Name Resolution	7:26
Total	*21:01*

☐ **Number of Exam Questions: 1 question**

Total Time: About 25 minutes

Section 4.3: Zone Configuration

Summary

In this section students will learn the basics of zone configuration.
- Configuring the DNS server role
- The role of A zone transfer
- The role of a reverse lookup zone

Students will learn how to:

- Add the DNS server role to a server.
- Create primary, secondary, and reverse lookup zones.
- Configure zone transfers between primary and secondary zones.

Configuring Server 2008 Network Infrastructure Objectives

- 201. Configure a Domain Name System (DNS) server.
  - o Cache-only
- 202. Configure DNS zones.
  - o Reverse lookup zones
- 204. Configure DNS replication.
  - o DNS secondary zones
  - o Securing zone transfer
  - o SOA refresh

Video/Demo	**Time**
☐ 🖥 4.3.1 Creating a Primary Zone	7:17

☐ 🖥 4.3.3 Creating Secondary Zones   8:12
☐ 👤 4.3.6 Reverse Lookup Zones   6:14
☐ 🖥 4.3.7 Creating Reverse Lookup Zones   <u>4:15</u>
      Total   *25:58*

Lab/Activity

- ☐ Create a Primary Zone
- ☐ Create a Secondary Zone
- ☐ Create a Reverse Lookup Zone

☐ **Number of Exam Questions: 19 questions**

Total Time: About 65 minutes

Section 4.4: Active Directory-integrated Zones

Summary

This section discusses how Active Directory-integrated zones can be used to manage zone information.

Students will learn how to:

- Create an Active Directory-integrated zone and configure the replication scope.
- Convert a primary zone to an Active Directory-integrated zone.

Configuring Server 2008 Network Infrastructure Objectives

- 202. Configure DNS zones.
    - o Active Directory integration
- 204. Configure DNS replication.
    - o Active Directory Integrated replication scopes

==Log into LabSim and complete the tasks listed under Resources for each of the items listed below. As you complete them Checkoff the boxes:==

Video/Demo   **Time**

☐ 👤 4.4.1 DNS Integration with AD   8:06
☐ 🖥 4.4.2 Managing Active Directory-integrated Zones   <u>10:31</u>
      Total   *18:37*

Lab/Activity

- ☐ Create an Active Directory-integrated Zone

- ☐ Convert a Zone

☐ **Number of Exam Questions: 10 questions**

Total Time: About 40 minutes

Section 4.5: Resource Records

Summary

This section provides information about creating and managing resource records.

Students will learn how to:

- Create common resource records.
- Adding or deleting a DNS record.

Configuring Server 2008 Network Infrastructure Objectives

- 203. Configure DNS records.

<mark>Log into LabSim and complete the tasks listed under Resources for each of the items listed below. As you complete them Checkoff the boxes:</mark>

Video/Demo	Time
☐ 🖥 4.5.1 Creating Resource Records	8:03

Lab/Activity

- ☐ Create a Zone and Add Records
- ☐ Create A and CNAME Records
- ☐ Troubleshoot Name Resolution 1
- ☐ Troubleshoot Name Resolution 2

☐ **Number of Exam Questions: 11 questions**

Total Time: About 40 minutes

Section 4.6: Client Configuration

Summary

In this section students will learn how to configure DNS client settings.

Students will learn how to:

- Configure a connection-specific suffix using advanced TCP/IP properties.
- Specify a suffix search order.
- Manage DNS client registration.

Configuring Server 2008 Network Infrastructure Objectives

- 205. Configure name resolution for client computers.
    - Suffix search order

Video/Demo   **Time**

☐ 📺 4.6.1 DNS Client Settings   4:33

Lab/Activity

- ☐ Configure DNS Server Addresses
- ☐ Configure Search Suffixes 1
- ☐ Configure Search Suffixes 2
- ☐ Configure DNS Client Registration
- ☐ Configure DNS Group Policy Settings

☐ **Number of Exam Questions: 4 questions**

Total Time: About 35 minutes

Section 4.7: Dynamic DNS

Summary

This section covers using Dynamic DNS to automatically update DNS records. Settings on the following components are used to configure Dynamic DNS:
- Client
- DHCP server
- DNS server

Students will learn how to:

- Enable dynamic updates on a DNS zone.
- Configure DHCP server settings to support dynamic updates.

Configuring Server 2008 Network Infrastructure Objectives

- 202. Configure DNS zones.
    - Secure DDNS

- 203. Configure DNS records.

Lab/Activity

- ☐ Enable Dynamic DNS Updates
- ☐ Troubleshoot Dynamic DNS 1
- ☐ Troubleshoot Dynamic DNS 2
- ☐ Troubleshoot Dynamic DNS 3

☐ **Number of Exam Questions: 4 questions**

Total Time: About 25 minutes

Section 4.8: Stub Zones and Forwarding

Summary

This section discusses using stub zones and forwarding to resolve queries. Methods to control the server's use of forwarders include:

- Secondary zone
- Stub zone
- Conditional forwarder

Students will learn how to:

- Create a stub zone.
- Configure forwarders and conditional forwarding.

Configuring Server 2008 Network Infrastructure Objectives

- 201. Configure a Domain Name System (DNS) server.
    - o Conditional forwarding
- 204. Configure DNS replication.
    - o DNS secondary zones
    - o DNS stub zones
    - o Active Directory Integrated replication scopes
    - o Securing zone traffic

Video/Demo	Time
☐ 4.8.1 Stub Zones and Conditional Forwarding	10:05

☐ 🖥 4.8.2 Configuring Forwarding and Stub Zones   <u>11:16</u>
  Total   *21:21*

Lab/Activity

- ☐ Configure a Stub Zone
- ☐ Configure Conditional Forwarding

☐ **Number of Exam Questions: 4 questions**

Total Time: About 35 minutes

Section 4.9: Root Hints and Root Zone

Summary

This section provides an overview of root hints and the root zone.

Students will learn how to:

- Configure or delete a root zone.
- Configure other DNS servers to point to your server via root hints.

Configuring Server 2008 Network Infrastructure Objectives

- 201. Configure a Domain Name System (DNS) server.
    - o Root hints

Log into LabSim and complete the tasks listed under Resources for each of the items listed below. As you complete them Checkoff the boxes:

Video/Demo	Time
☐ 🖥 4.9.1 Root Hints	4:26

Lab/Activity

- ☐ Configure Root Hints
- ☐ Create a Root Zone

☐ **Number of Exam Questions: 5 questions**

Total Time: About 20 minutes

Section 4.10: Zone Delegation

Summary

This section explores using zone delegation to divide DNS namespace into separate zones.

Students will learn how to:

- Manage zones through delegation.

Configuring Server 2008 Network Infrastructure Objectives
- 202. Configure DNS zones.
  - Zone delegation

<mark>Log into LabSim and complete the tasks listed under Resources for each of the items listed below. As you complete them Checkoff the boxes:</mark>

Video/Demo	Time
☐ 4.10.1 DNS Zone Delegation	5:12
☐ 4.10.2 Delegating a Domain	5:21
Total	*10:33*

Lab/Activity
- ☐ Delegate Domains
- ☐ Create a Delegated Zone

☐ **Number of Exam Questions: 1 question**

Total Time: About 20 minutes

Section 4.11: DNS Features

Summary
This section discusses the following DNS features:
- Aging and Scavenging
- Methods for performing load balancing through DNS:
  - DNS Round Robin
  - Netmask Ordering

- o Record Weighting
- o Network Load Balancing (NLB)
- Windows Server 2008 R2 command-line tools

Students will learn how to:

- Configure DNS Round Robin.
- Manage DNS from the command line.

Configuring Server 2008 Network Infrastructure Objectives
- 202. Configure DNS zones.
  - o Zone scavenging
- 204. Configure DNS replication.
  - o Round robin

==**Log into LabSim and complete the tasks listed under Resources for each of the items listed below. As you complete them Checkoff the boxes:**==

Video/Demo	Time
☐ 4.11.1 DNS Refresh and Scavenging	2:58
☐ 4.11.3 DNS Round Robin	3:23
☐ 4.11.6 DNS Command-line Tools	<u>12:21</u>
Total	*18:42*

Lab/Activity

- ☐ Configure DNS Round Robin

☐ **Number of Exam Questions: 9 questions**

Total Time: About 35 minutes

Section 4.12: New DNS Features

Summary
This section discusses new features for Windows Server 2008 and Windows 2008 R2:
- Link-Local Multicast Name Resolution (LLMNR)
- Background zone loading
- IPv6 DNS Support
- Read-only Domain Controller (RODC)
- GlobalNames Zone
- Global Query block List
- Conditional Forwarding
- Domain controller search

- DNSSEC
- Devolution
- Cache Locking
- Socket Pool
- Auditing

Students will learn how to:
- Configure DNS Devolution.
- Configure DNS Cache Locking.
- Configure DNS Socket Pools.

Configuring Server 2008 Network Infrastructure Objectives
- 201. Configure a Domain Name System (DNS) server.
  - Conditional forwarding
  - Socket pooling
  - Cache locking
- 202. Configure DNS zones.
  - GlobalNames
  - DNS Security Extensions (DNSSEC)
- 205. Configure name resolution for client computers.
  - Link-Local Multicast Name Resolution (LLMNR)
  - DNS devolution

==**Log into LabSim and complete the tasks listed under Resources for each of the items listed below. As you complete them Checkoff the boxes:**==

Video/Demo	Time
☐ 4.12.1 New 2008 DNS Features	4:11
☐ 4.12.2 DNS Devolution	3:46
☐ 4.12.3 Configuring DNS Devolution	4:16
☐ 4.12.4 Cache Locking and Socket Pools	3:06
☐ 4.12.5 Configuring DNS Cache Locking	5:47
☐ 4.12.6 Configuring Socket Pool	3:12
☐ 4.12.7 DNS Security (DNSSec)	4:36
Total	*28:54*

☐ **Number of Exam Questions: 10 questions**

Total Time: About 45 minutes

Section 4.13: Single-label Name Resolution

Summary

In this section students will learn how to configure a GlobalNames zone. Details include:
- Strategies to provide single-label name resolution:
    - GlobalNames zone
    - Link-Local Multicast Name Resolution (LLMNR)
    - HOSTS file
- Managing the GlobalNames zone

Students will learn how to:
- Enable GlobalNames zone support.
- Create a GlobalNames zone and add CNAME records to support single-label name resolution.

Configuring Server 2008 Network Infrastructure Objectives

- 202. Configure DNS zones.
    - GlobalNames
- 205. Configure name resolution for client computers
    - Configuring HOSTS file
    - Link-Local Multicast Name Resolution (LLMNR)

<mark>**Log into LabSim and complete the tasks listed under Resources for each of the items listed below. As you complete them Checkoff the boxes:**</mark>

Video/Demo	Time
☐ 4.13.1 GlobalNames Zones and LLMNR	2:06
☐ 4.13.2 Configuring the GlobalNames Zone	8:50
Total	*10:56*

Lab/Activity

- ☐ Configure a GlobalNames Zone

☐ **Number of Exam Questions: 8 questions**

Total Time: About 25 minutes

Section 4.14: DNS Design

Summary

In this section students will learn the strategies and goals for designing DNS namespace. They will also learn a variety of configuration options to use and security considerations when designing a DNS solution. Details include:

- The goals of Namespace design:
  - Allow internal users to access internal resources.
  - Allow external users to access external resources.
  - Allow internal users to access external public resources.
  - Prevent external users from accessing internal resources.
- Methods to accomplish these goals:
  - Same internal and external domain name
  - Different internal and external domain names
  - External domain name with an internal subdomain
- DNS configuration options:
  - Primary zone
  - Secondary zone
  - Reverse lookup zone
  - Active Directory-integrated zone
  - Caching-only server
  - Zone delegation
  - Forwarders
  - Conditional forwarding
  - Stub zone
  - Root zone
  - Root hints
  - Dynamic DNS
  - WINS-integrated zone
  - GlobalNames zone
  - Link-Local Multicast Name Resolution (LLMNR)
  - HOSTS file
- Goals for designing security for DNS
- Methods to improve DNS security

Configuring Server 2008 Network Infrastructure Objectives

- 201. Configure a Domain Name System (DNS) server.
  - Conditional forwarding
  - Root hints
  - Cache-only

- 202. Configure DNS zones.
    - Zone types
    - Active Directory integration
    - Dynamic Domain Name System (DDNS)
    - GlobalNames
    - Zone delegation
    - Reverse lookup zones
- 204. Configure DNS replication.
    - DNS stub zones
    - Securing zone transfer
- 205. Configure name resolution for client computers
    - Link-Local Multicast Name Resolution (LLMNR)

Log into LabSim and complete the tasks listed under Resources for each of the items listed below. As you complete them Checkoff the boxes:

Video/Demo	Time
☐ 4.14.1 DNS Namespace Design	7:40

☐ **Number of Exam Questions: 2 questions**

Total Time: About 20 minutes