Server Administration

Module Number: 04

Module Name: Configuring DNS Zones and Records

Version Code:SA1_Updated
Released Date:20-Feb-2019

Configuring DNS Zones and Records

AIM:

To equip students with Configuration of DNS Zones and Records.

Configuring DNS Zones and Records

Objectives:

The Objectives of this module are:

- To know the key concepts of DNS.
- To understand the concepts of DNS zones and Address resolution Mechanism.
- To describe the Types of Records.
- To understand the Configuration of different types of Zones.
- To define the Configuration of Records.

Configuring DNS Zones and Records

Outcomes:

At the end of this module, you are expected to:

- Explain the concept of DNS and its types.
- Illustrate the Configuration Mechanism of different types of Zones.
- Define and understand the Records and its types.
- Outline the configuration of records.

Configuring DNS Zones and Records

Contents

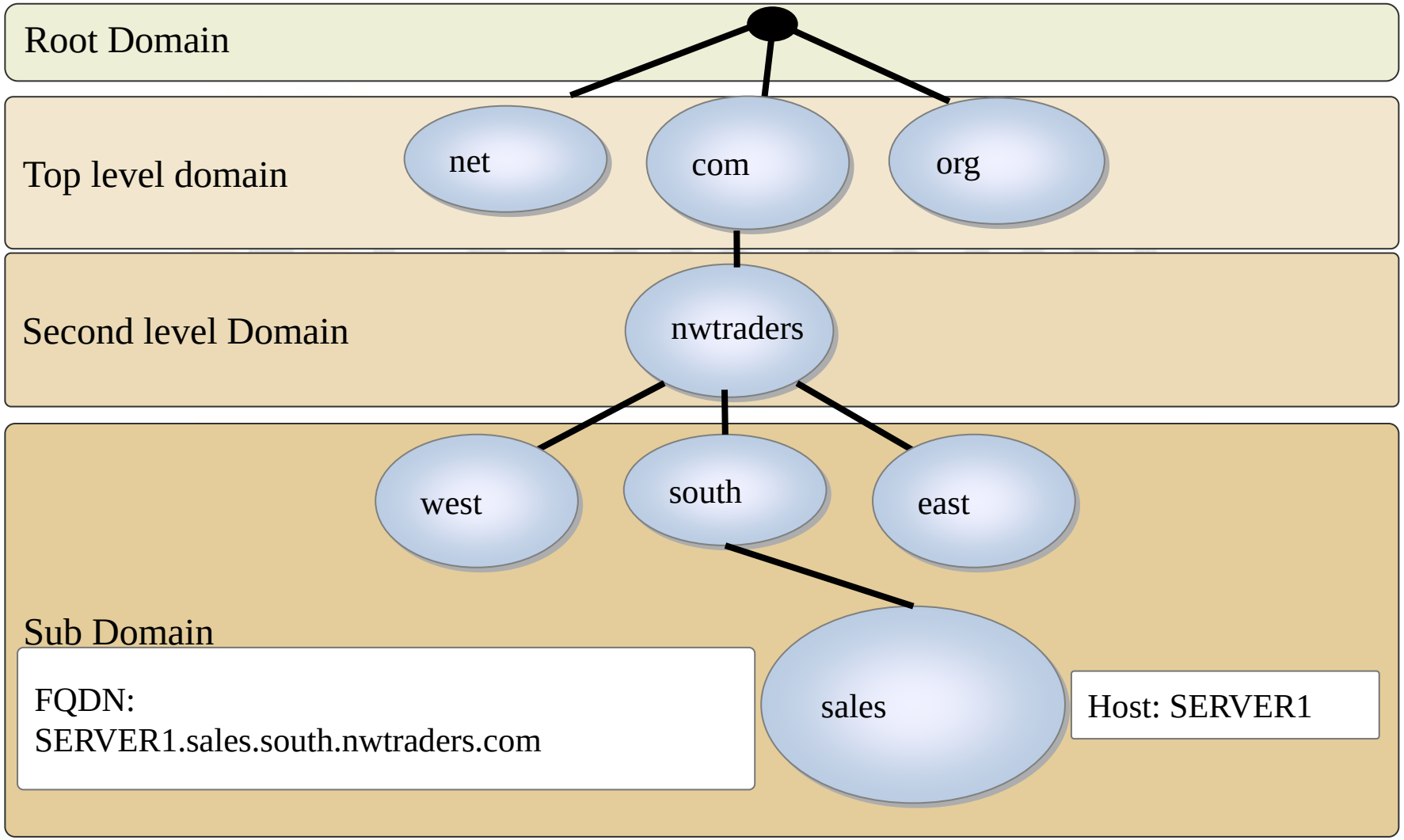
1. DNS- Names and Zones
2. Address Resolution Mechanism
3. Installing, Managing and Configuration of DNS zones
4. Configuring caching only servers
5. Forwarding and Conditional Forwarding
6. DNS records types and Recourse records
7. SOA, NS, CNAME
8. Host(A and AAAA), Pointer records

Introduction to DNS

Domain Name System (DNS) is a hierarchical distributed database.

- DNS is the foundation of the Internet naming scheme.
- DNS supports accessing resources by using alpha-numeric names.
- InterNIC is responsible for managing the domain namespace.
- DNS was created to support the Internet's growing number of hosts.

Overview of the DNS Namespace



DNS Improvements for Windows Server 2008

New or enhanced features in the Windows Server 2008 version of DNS include:

- Background zone loading
- IP version 6 support
- Support for read-only domain controllers
- Global single names

Demonstration: Installing the DNS Server Role

In this demonstration, you will see how to install the DNS Server role

1. Open Server Manager, click **Roles**, click **Add Role**, click **DNS**, and then go through the Installation wizard.
2. Open the Firewall applet in Control Panel and show the class that the list does not include the port for DNS.
3. After the DNS service is installed, open the Firewall applet in Control Panel, click **Advanced**, and show the class that Server Manager created the necessary exception in the firewall.
4. Remove the DNS service, and then reboot the server.
5. Install the DNS role from the command prompt:
   Click **Start**, and then click **Command Prompt**.
   Type: **servermanagercmd -install dns -resultPath installResult.xml.**
   The role will install.
6. Open the **installResult.xml** file using Notepad.
   Information about installing the role is displayed.

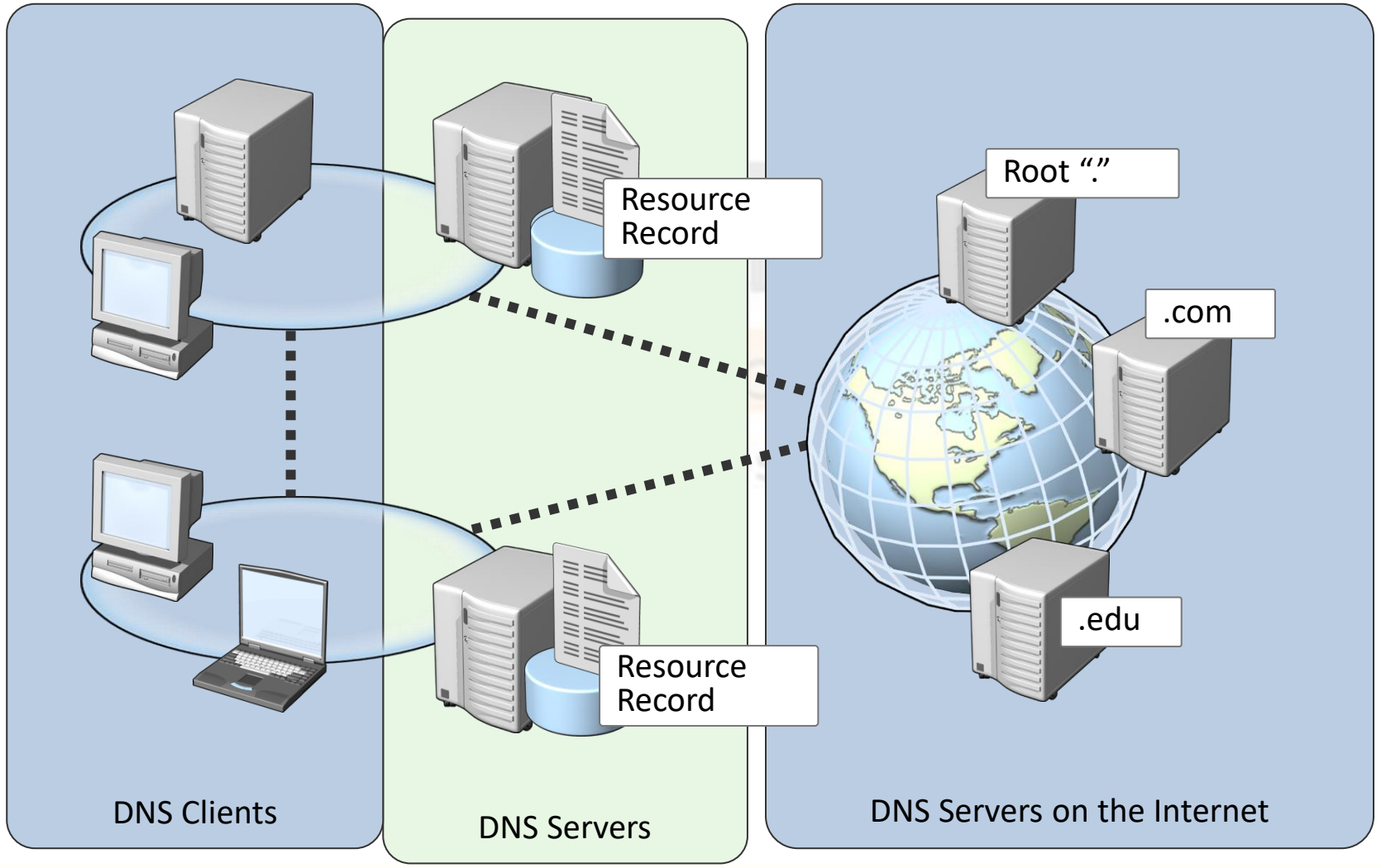
Considerations for Deploying the DNS Server Role

- The user account must be a member of the local administrators group or equivalent.
- Manually configuring the server to use a static IP address is recommended.
- Manually editing the server and boot files is not recommended.
- Use the DNS console or dnscmd.
- Active Directory-integrated DNS zones cannot be administered using a text editor.

Configuring the DNS Server Role

1. What are the Components of a DNS Solution?
2. What is DNS Resource Records?
3. What Are Root Hints?
4. What Is a DNS Query?
5. What Are Recursive Queries?
6. What Are Iterative Queries?
7. What Is a Forwarder?
8. What Is Conditional Forwarding?
9. How DNS Server Caching Works?
10. Demonstration: Configuring the DNS Server Role

What Are the Components of a DNS Solution?



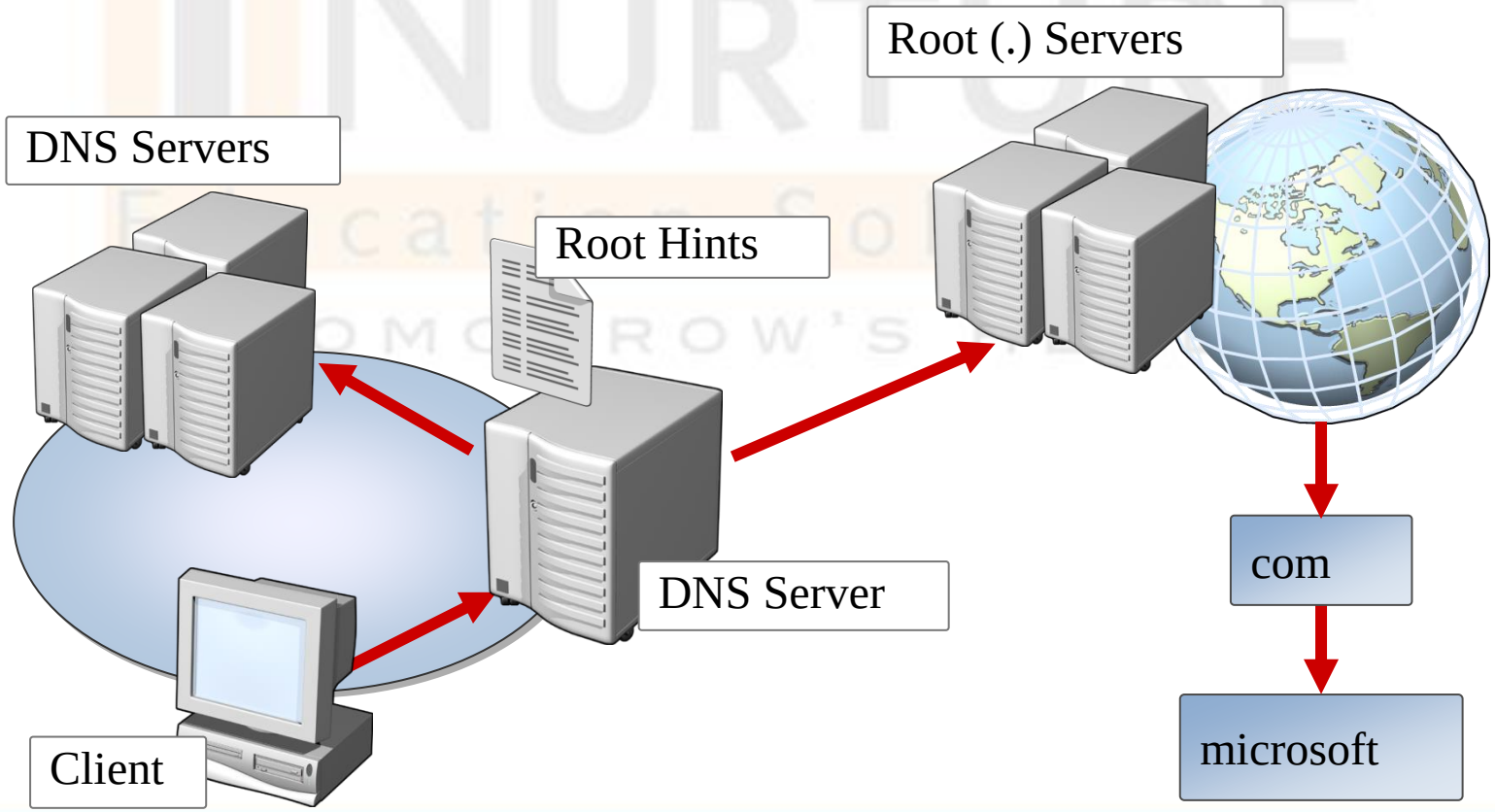
DNS Resource Records

DNS resource records include:

- SOA: Start of Authority Record
- A: Host Address Record
- CNAME: Alias Record
- MX: Mail Exchange Record
- PTR: Pinter resource record
- SRV: Service Resources Record
- NS: Name Servers
- AAAA: IPv6 DNS Record

What Are Root Hints?

Root hints contain the IP addresses for DNS root servers.



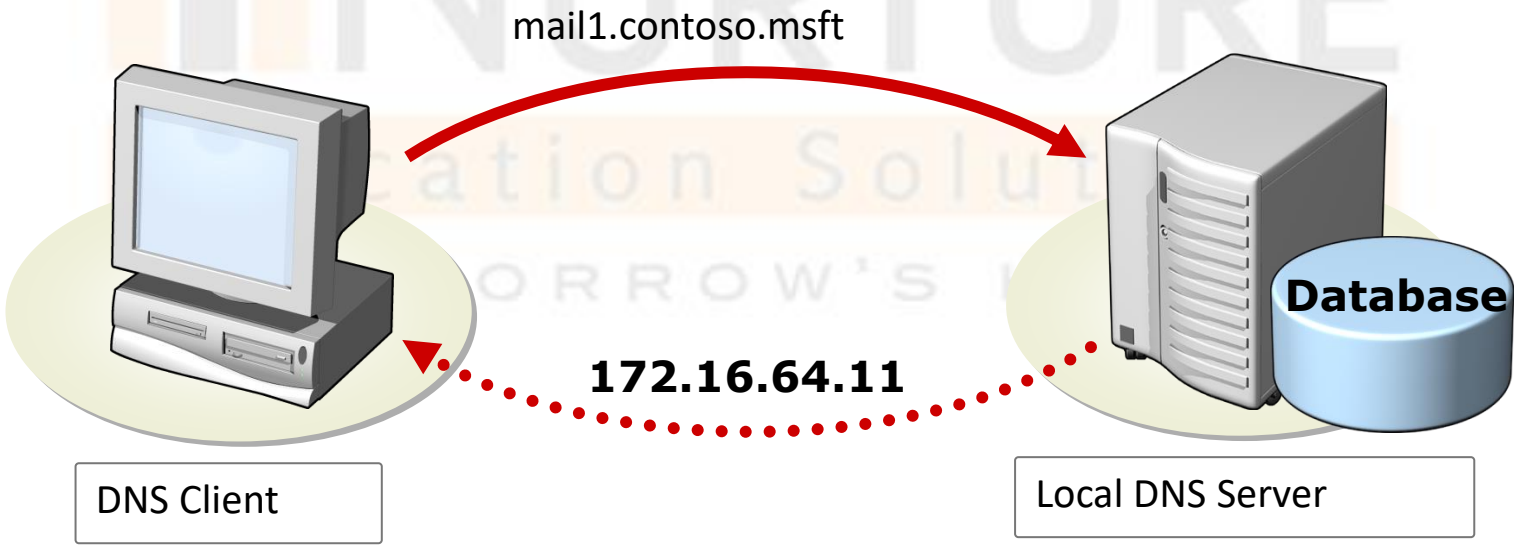
What Is a DNS Query?

A query is a request for name resolution and is directed to a DNS server.

- Queries are recursive or iterative
- DNS clients and DNS servers both initiate queries
- DNS servers are authoritative or nonauthoritative for a namespace
- An authoritative DNS server for the namespace will either:
  - Return the requested IP address
  - Return an authoritative “No”
- A non-authoritative DNS server for the namespace will either:
  - Check its cache
  - Use forwarders
  - Use root hints

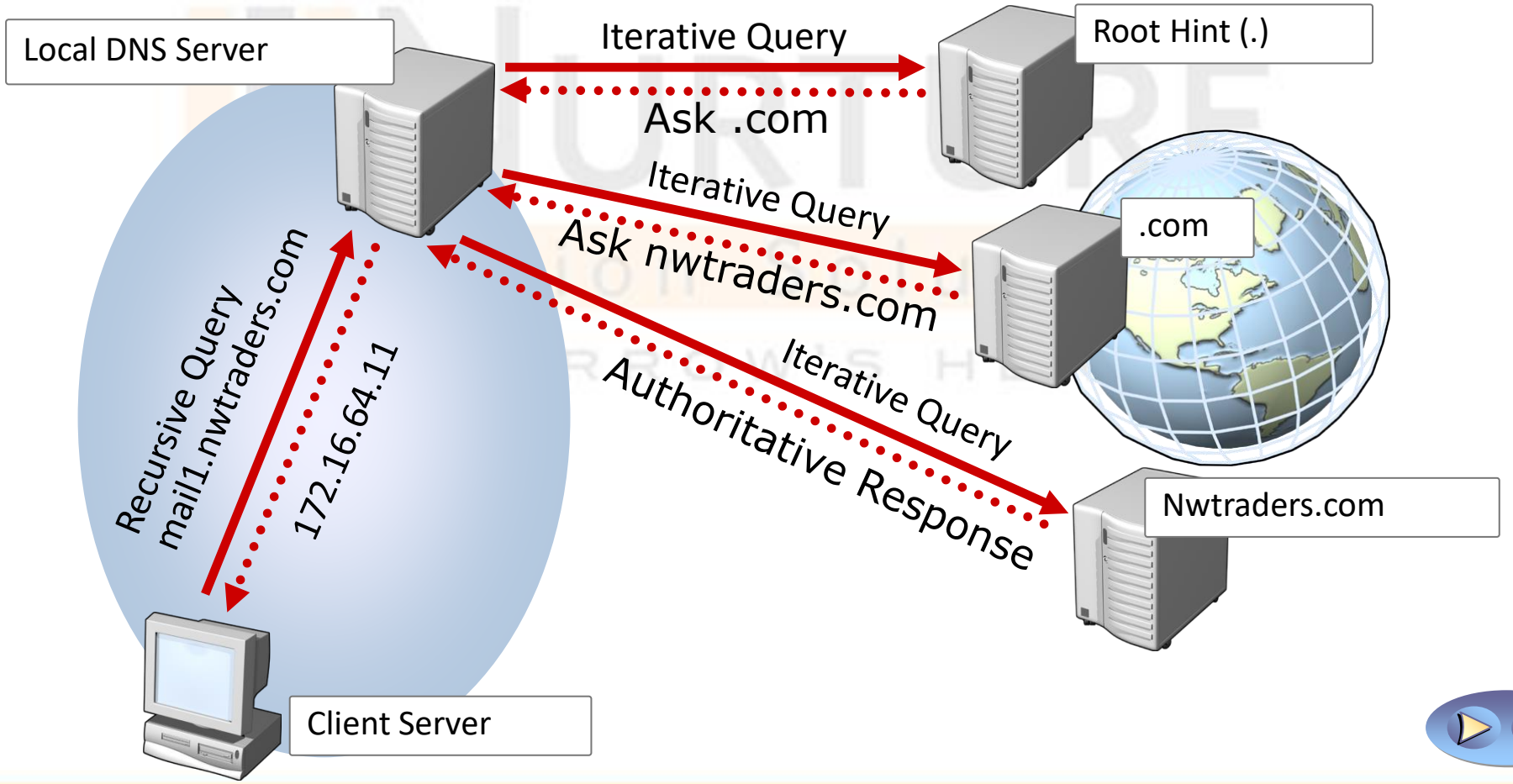
What Are Recursive Queries?

A Recursive Query is sent to a DNS server and requires a complete answer.



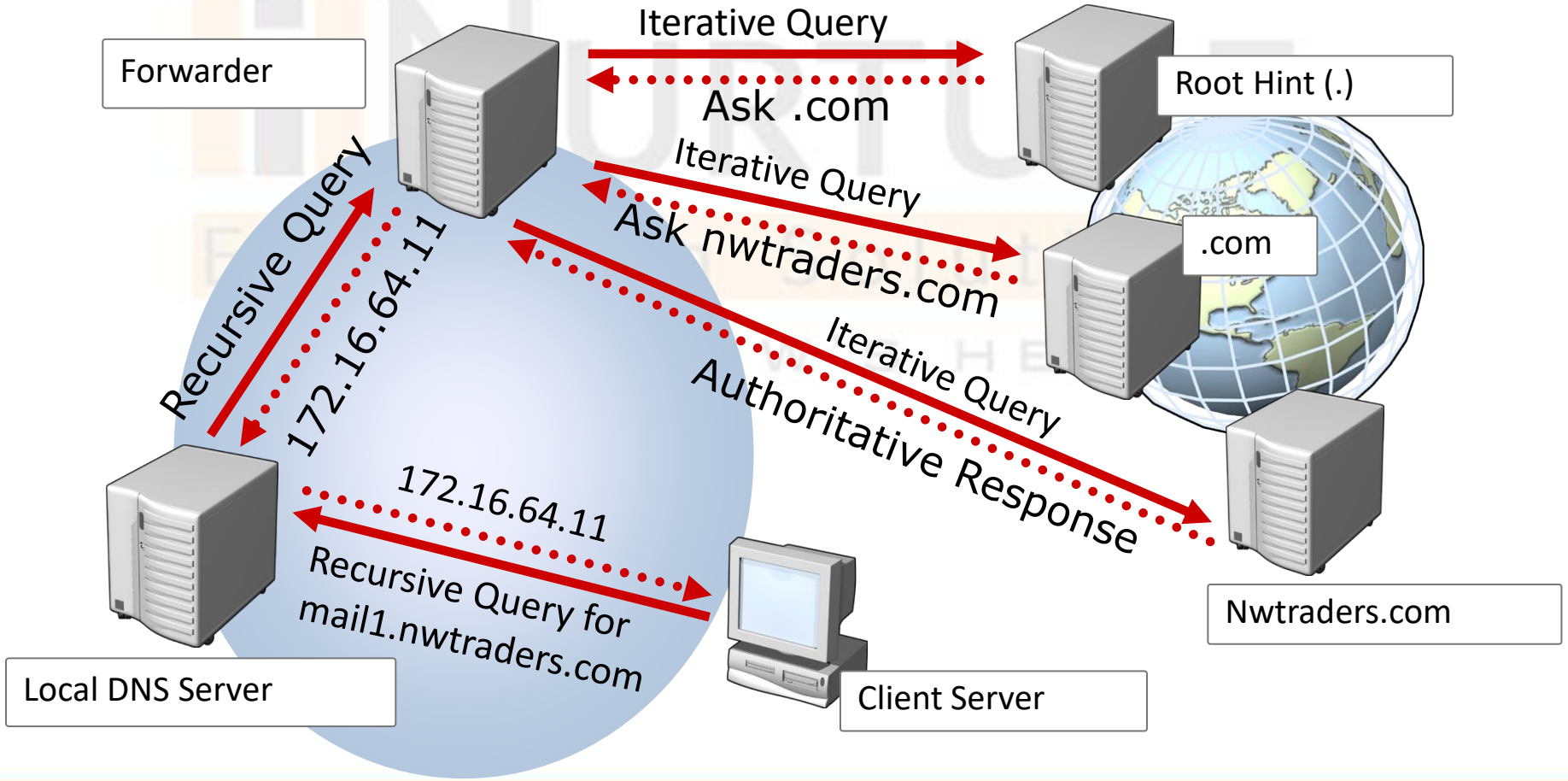
What Are Iterative Queries?

An iterative query directed to a DNS server may be answered with a referral to another DNS server.



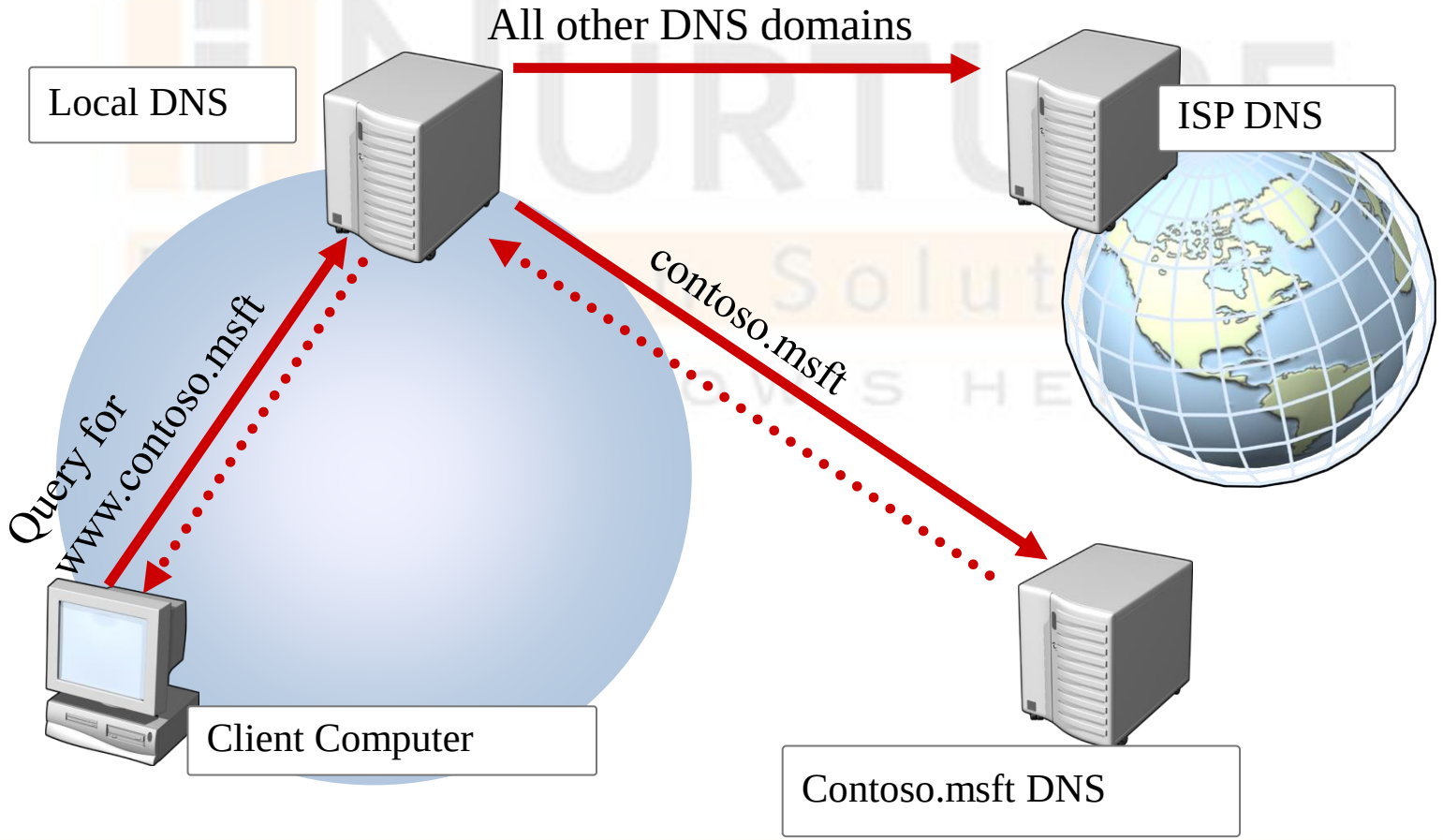
What Is a Forwarder?

A *forwarder* is a DNS server designated to resolve external or offsite DNS domain names.



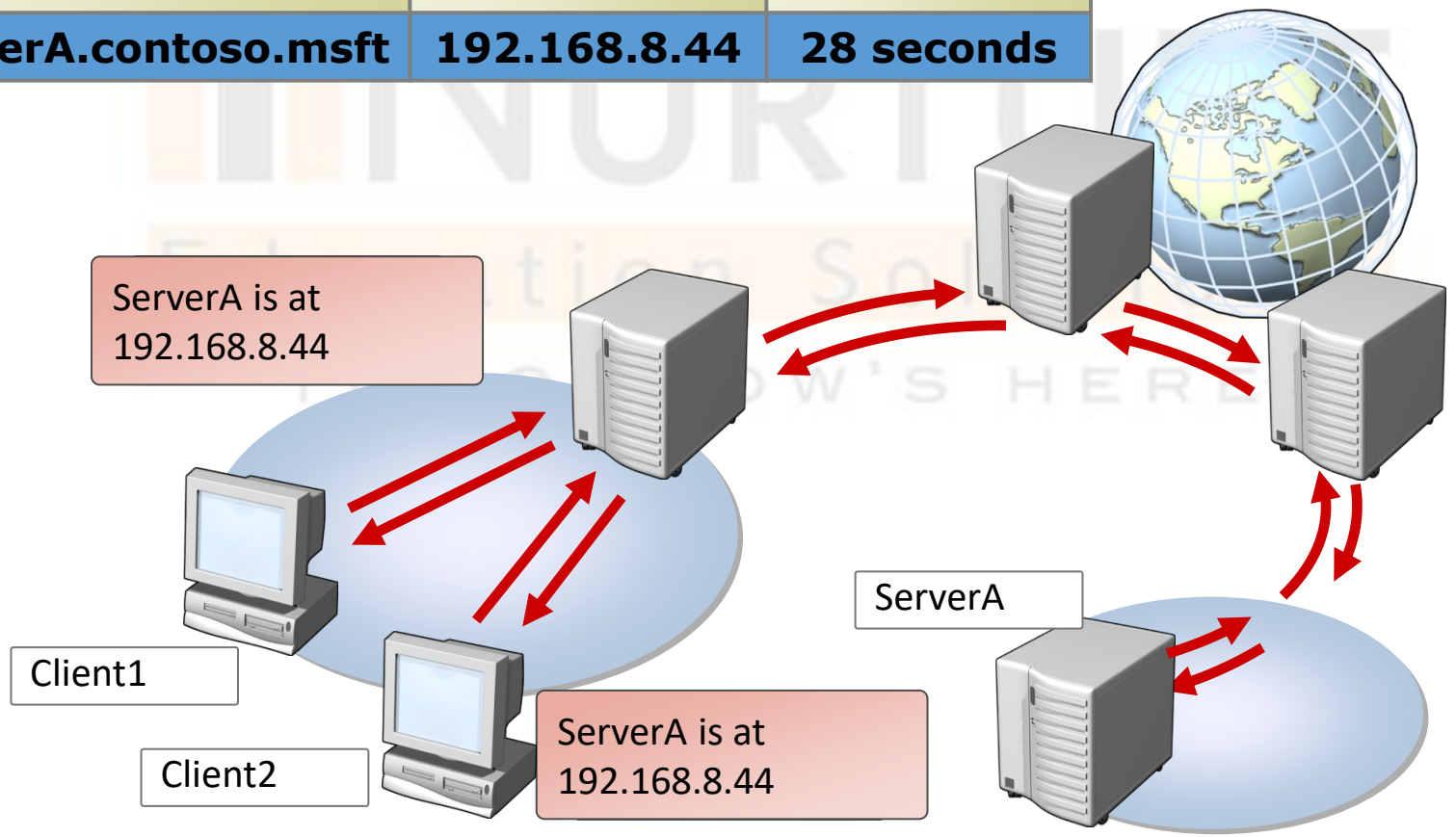
What Is Conditional Forwarding?

Conditional forwarding forwards requests using a domain name condition.



How DNS Server Caching Works

DNS server cache		
Host name	IP address	TTL
ServerA.contoso.msft	**192.168.8.44**	**28 seconds**



Demonstration: Configuring the DNS Server Role

In this demonstration, you will see how to:

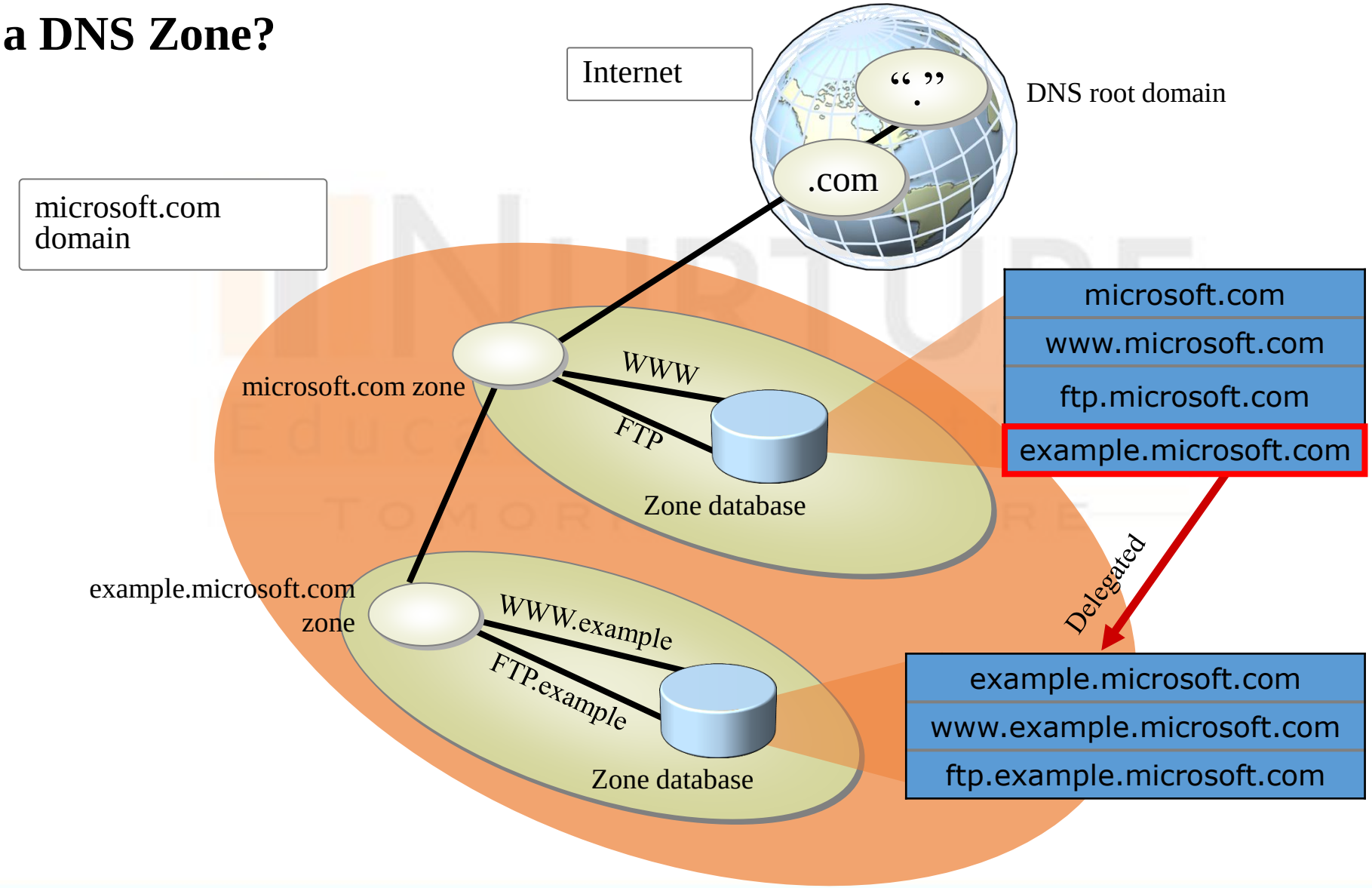
- Update root hints on a DNS server.
- Configure a DNS server to use a forwarder.
- Clear the DNS server cache by using the DNS console.
- Clear the DNS server cache by using the DNSCmd command.

Configuring DNS Zones

- What Is a DNS Zone?
- What Are the DNS Zone Types?
- What Are Forward and Reverse Lookup Zones?
- What are Stub Zones?
- Demonstration: Creating Forward and Reverse Lookup Zones
- DNS Zone Delegation

Configuring DNS Zones and Records

What Is a DNS Zone?

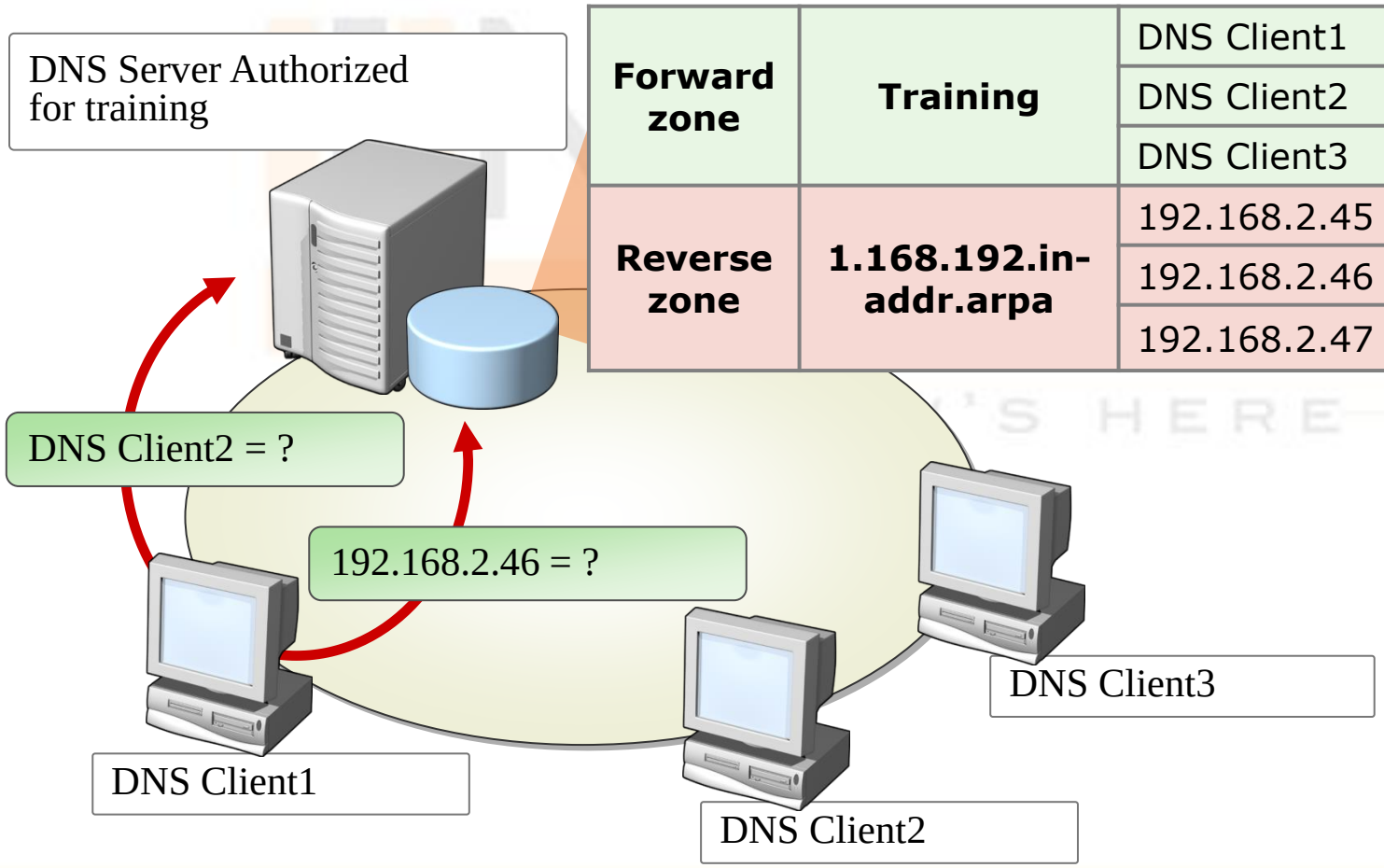


What Are the DNS Zone Types?

Zones	Description
Primary	Read/write copy of a DNS database
Secondary	Read-only copy of a DNS database
Stub	Copy of a zone that contains only records used to locate name servers
Active Directory integrated	Zone data is stored in Active Directory rather than in zone files

What Are Forward and Reverse Lookup Zones?

Namespace: training.nwtraders.msft

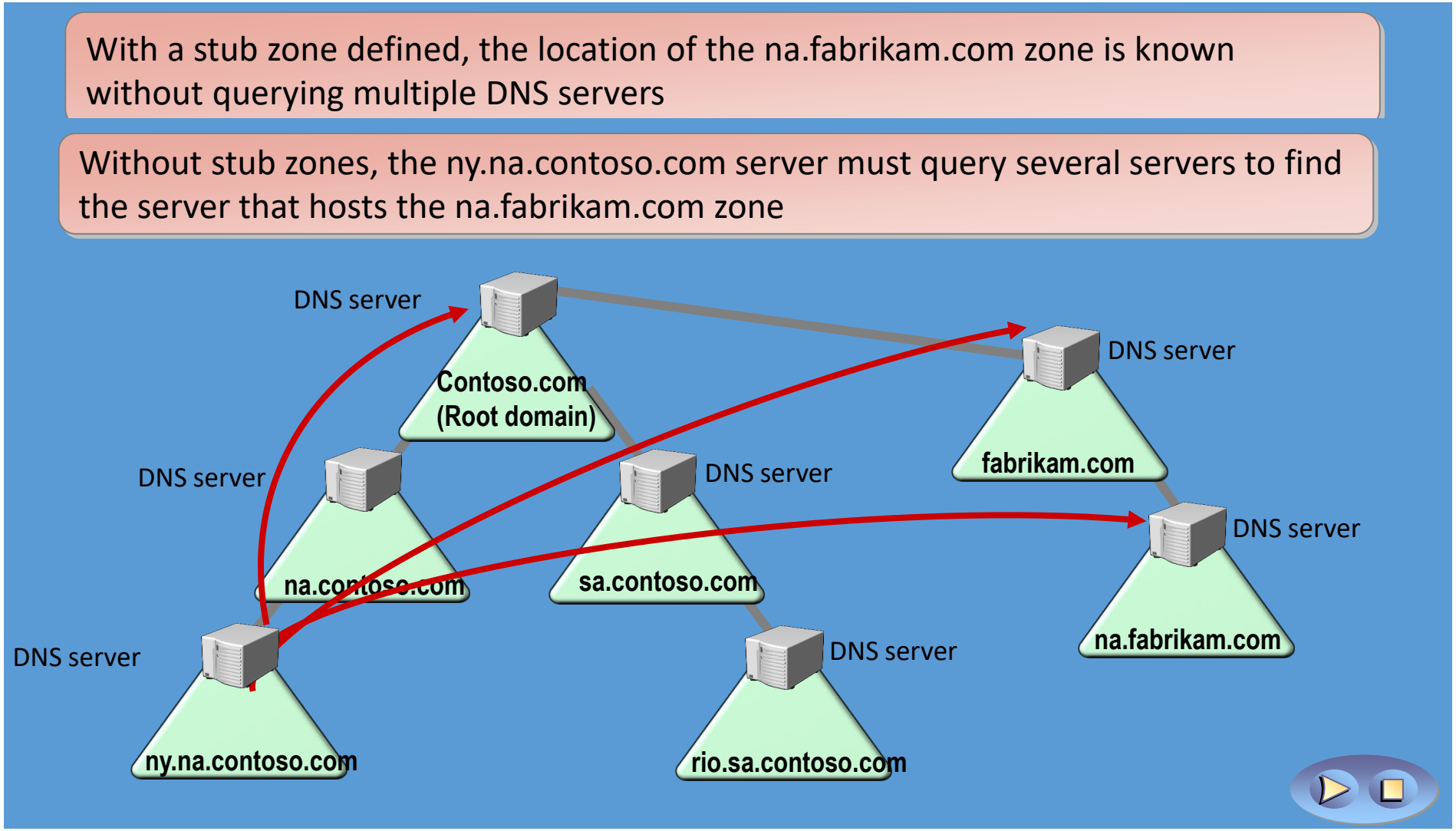


Forward zone	**Training**	DNS Client1	192.168.2.45
		DNS Client2	192.168.2.46
		DNS Client3	192.168.2.47
Reverse zone	**1.168.192.in-addr.arpa**	192.168.2.45	DNS Client1
		192.168.2.46	DNS Client2
		192.168.2.47	DNS Client3

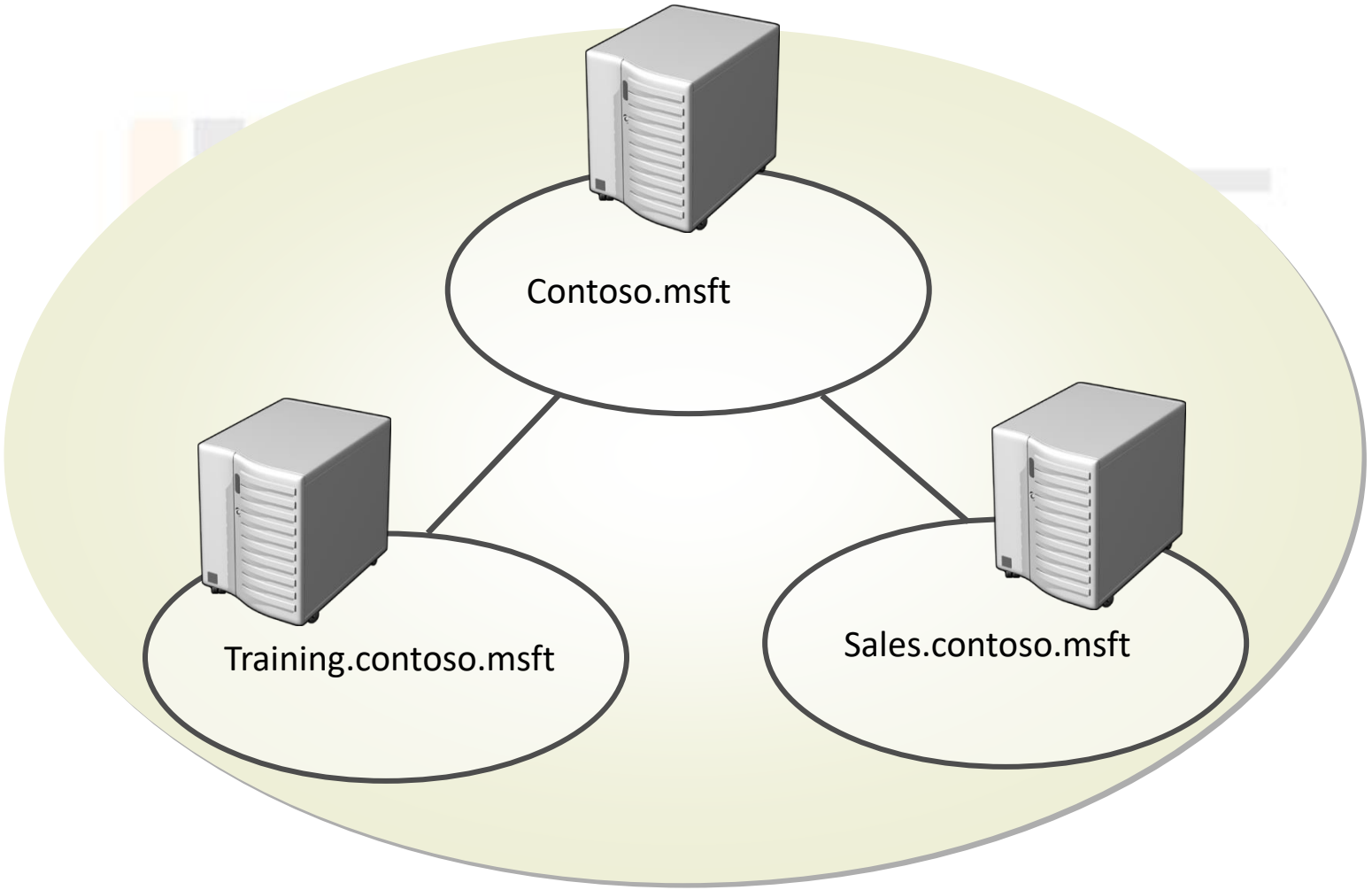
What Are Stub Zones?

With a stub zone defined, the location of the na.fabrikam.com zone is known without querying multiple DNS servers

Without stub zones, the ny.na.contoso.com server must query several servers to find the server that hosts the na.fabrikam.com zone



DNS Zone Delegation

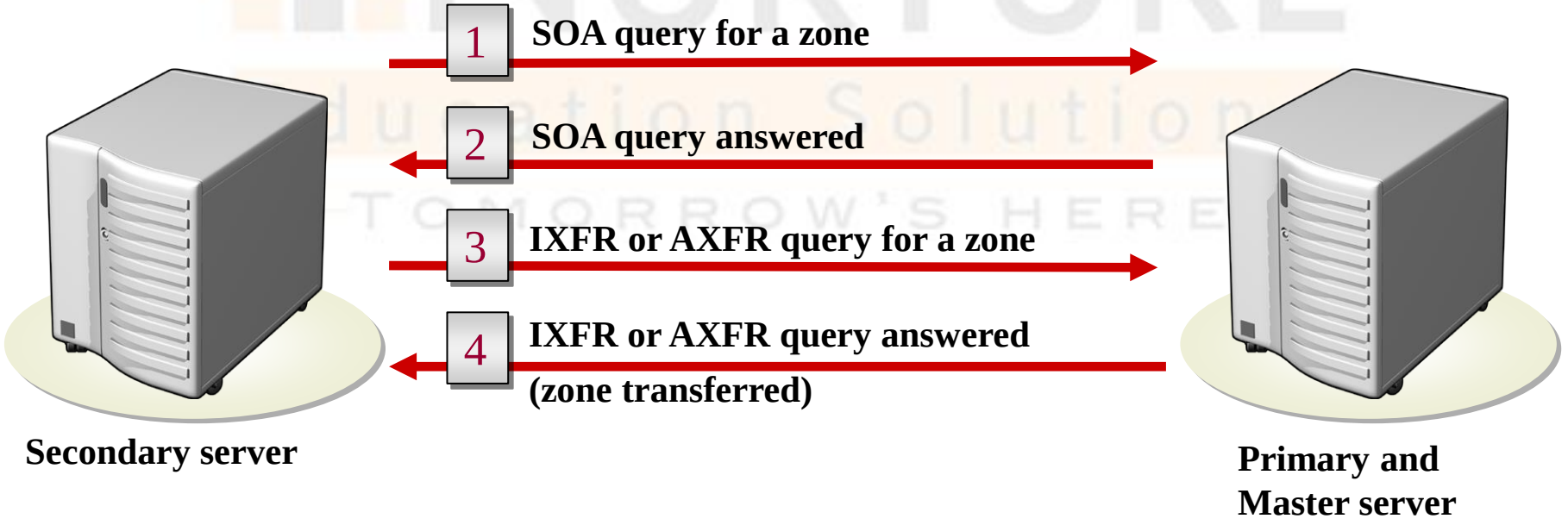


Configuring DNS Zone Transfers

- What Is a DNS Zone Transfer?
- How DNS Notify Works?
- Securing Zone Transfers
- Demonstration: Configuring DNS Zone Transfers

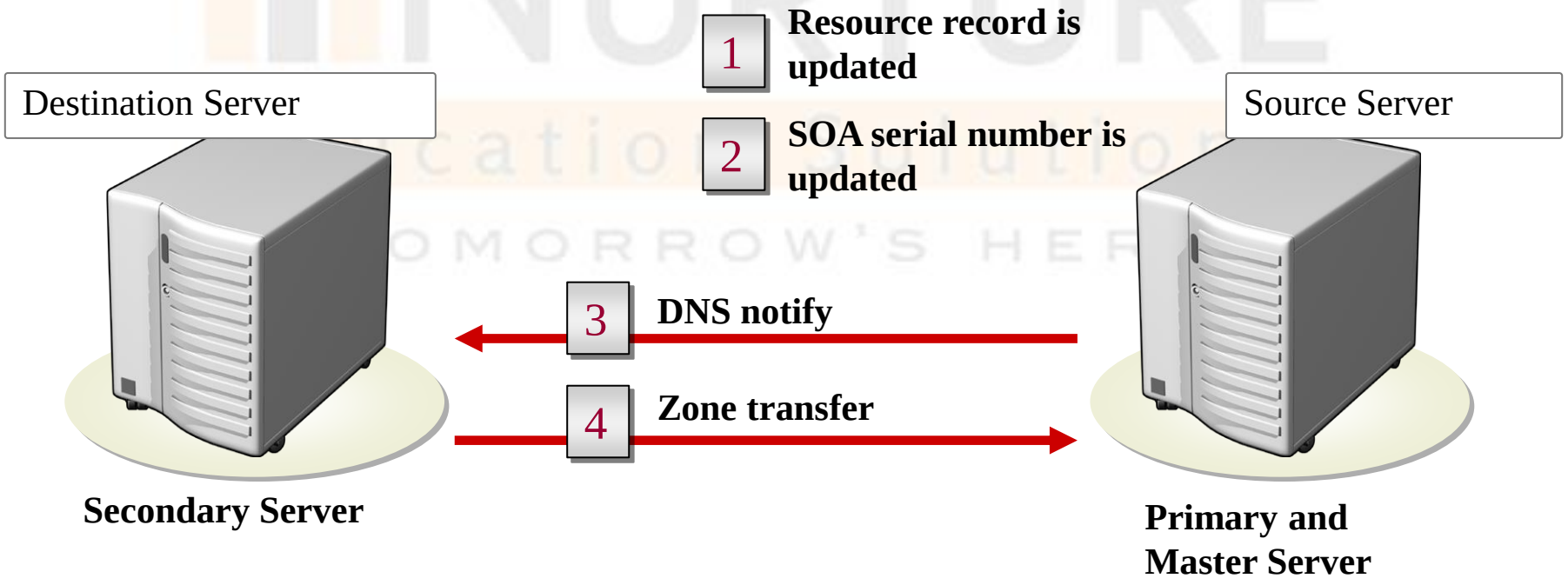
What Is a DNS Zone Transfer?

A DNS zone transfer is the synchronization of authoritative DNS zone data between DNS servers.



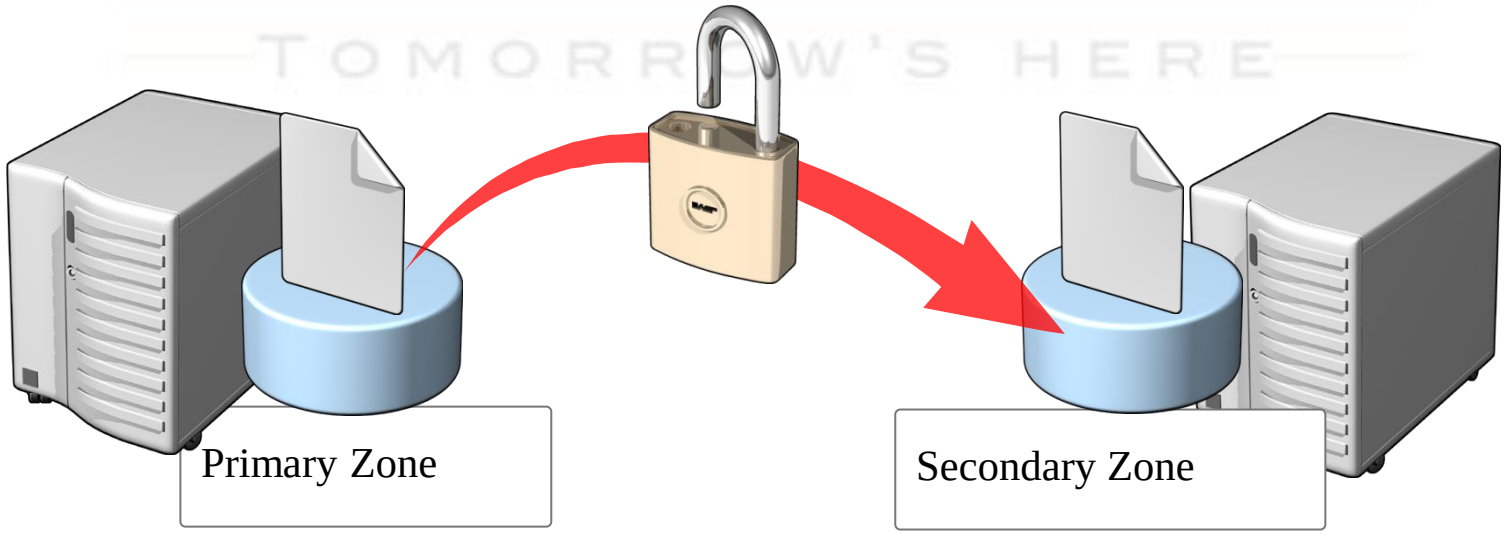
How DNS Notify Works

A DNS notify is an update to the original DNS protocol specification that permits notification to secondary servers when zone changes occur



Securing Zone Transfers

- Restrict zone transfer to specified servers
- Encrypt zone transfer traffic
- Consider using Active Directory-integrated zones



Configuring DNS Zone Transfers

In this demonstration, you will see how to:

- Configure DNS zone transfers
- Configure a secondary zone

Configure DNS zone transfers

Here is how you can add a Windows Server 2012 DNS server in the Name Servers list in order to allow it to receive the DNS updates via DNS zone transfers:

- Log on to the Windows Server 2012 DNS server using the Enterprise Admin or Domain Admin account credentials.
- If not already started, initialize the Server Manager window from the bottom left corner of the screen.
- Once the **Server Manager** window is initialized, from the left pane, click to select the **DNS**category.

Configure DNS zone transfers

- From the right pane, under the **SERVERS** section, right-click the DNS server.
- From the context menu that appears, click **DNS Manager.**
- On the opened **DNS Manager** snap-in from the left pane, expand the server name (DC-01.MYDOMAIN.COM for this demonstration), and then expand **Forward Lookup Zones**.
- From the expanded list, click to select and then right-click the domain name. (MYDOMAIN.COM for this demonstration).

Configure DNS zone transfers

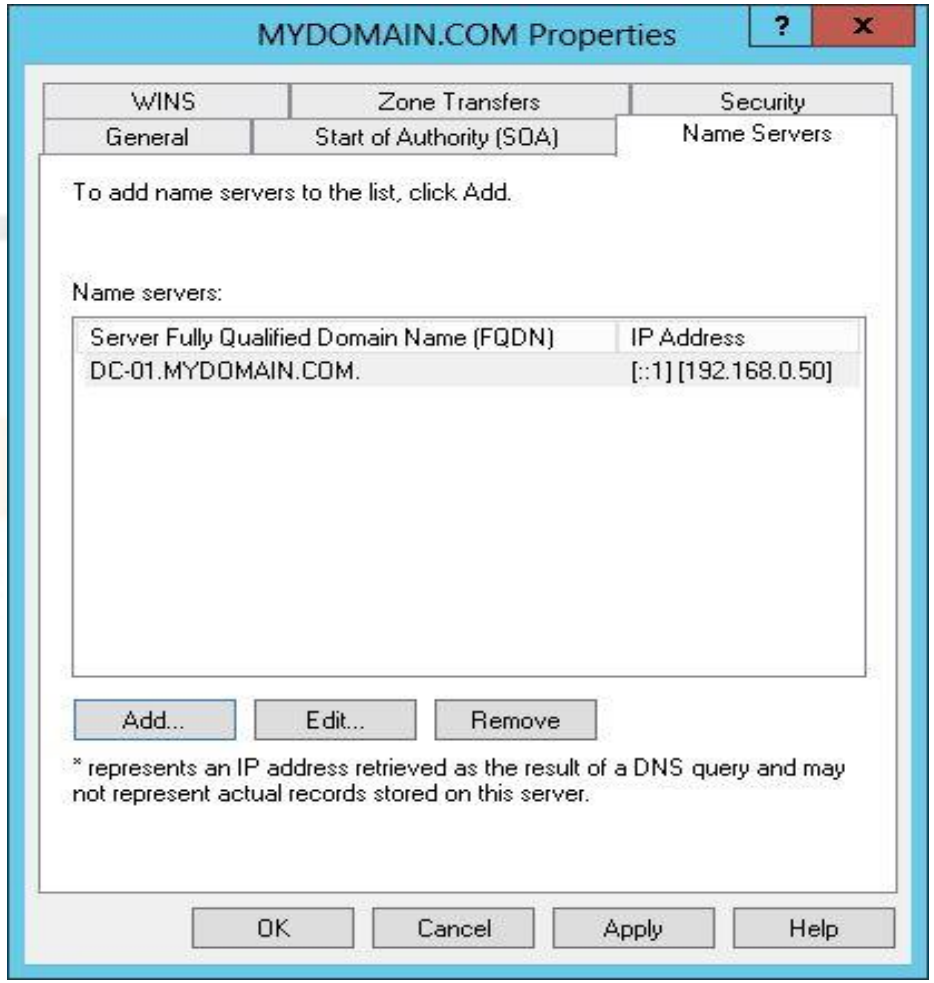
- From the displayed context menu, click the **Properties** option.
- On the opened domain's properties box, go to the **Zone Transfers** tab.
- On the displayed interface, make sure that the **Allow zone transfers** checkbox is checked.
- Also ensure that the **Only to servers listed on the Name Servers tab** radio button is selected.
- Once verified, go to the **Name Servers** tab.
- From the displayed interface, click the **Add** button.

Configure DNS zone transfers

- On the opened **New Name Server Record** box, type the FQDN for the target DNS server in the **Server fully qualified domain name (FQDN)** field.
- Click the **Resolve** button to resolve the IP address for the typed host name.
- Once the IP address is resolved, click the **OK**.
- Back on the domain's properties box, click **OK** to save the changes and to close the box.
- Back on the **DNS Manager** snap-in, right-click the server name. (DC-01.MYDOMAIN.COM for this demonstration).

Configure DNS zone transfers

- From the displayed context menu, go to **All Tasks**, and click **Restart** from the submenu that appears. Wait till the DNS service restarts before the DNS server starts working using the modified settings.



Configure a secondary zone

- Click on **Start** button, select the down arrow and select **DNS**.
- To configure secondary DNS server, right-click **Forward lookup zone** and select "**New Zone**".
- Click on **next** to continue.
- In the "**Zone type**" window, select the type of zone that you want to use. For this practical we'll use Secondary. Click on next to continue.
- To configure secondary DNS server, type the name. In this example, we are creating Secondary for "**ABC.COM**". Click on next to continue.

Configure a secondary zone

- To configure secondary DNS server, type an IP address of Primary. IP address of Primary DNS is 192.168.1.10. Hit **enter**.
- A green check confirms that Secondary is able to communicate with Primary. In case of failure check the communication. Click on **next** to continue.
- Click on **Finish** to close the wizard.
- On the Secondary we can see an error message “Zone Not Loaded by DNS Server”. We can see this error message because we didn’t complete the prerequisite of allowing zone transfer on Primary /Active Directory Integrated. We cannot create Secondary until we allow zone transfer in primary.

Configure a secondary zone

- To allow “Zone Transfer”, go to Primary. Right click the domain name and select properties.
- In the Domain properties window, select “Zone Transfer” tab and select an option “Allow zone transfer”. Under zone transfer we can see three options:
- **Options to allow zone transfer:**

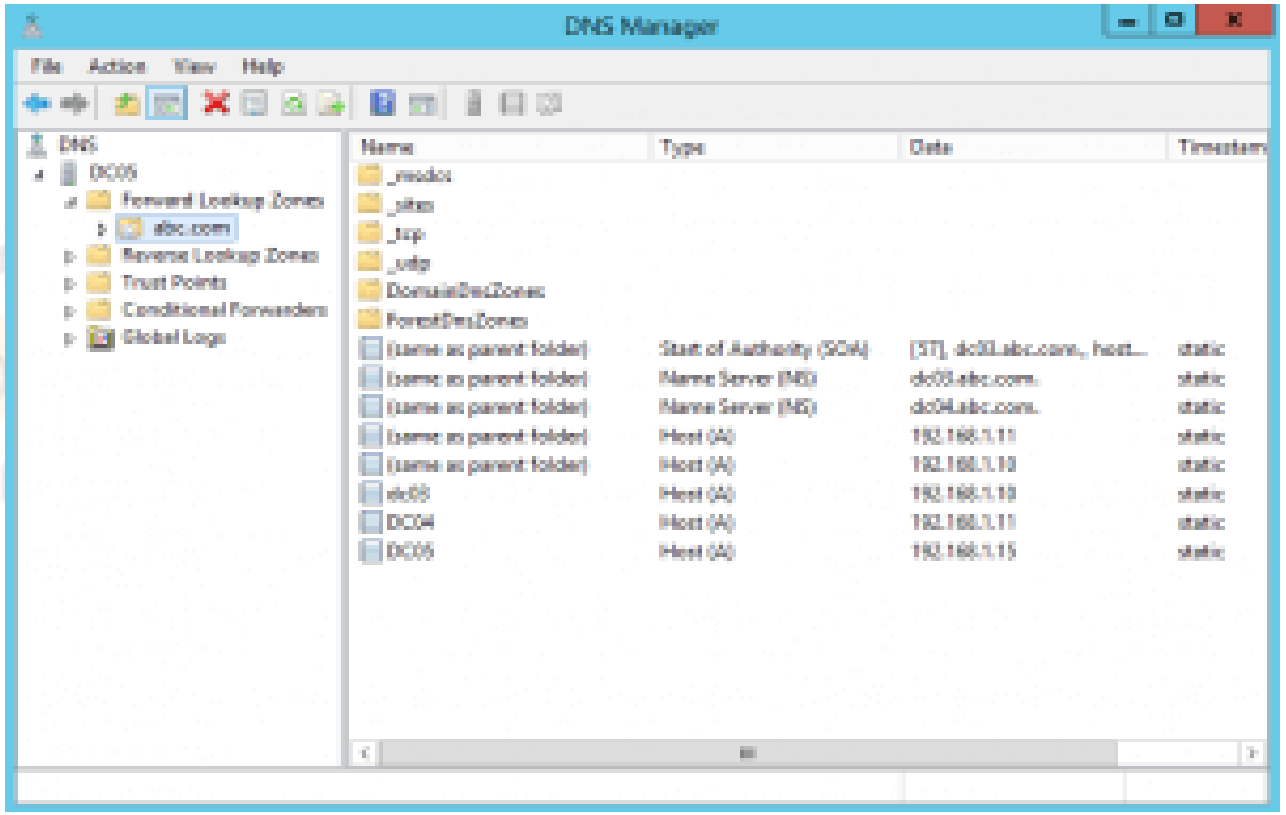
  a) To any server: This would allow zone transfer to any server. This option is not secured as we are not restricting the list of computers to transfer data.

  b) Only the servers listed in the Name Server tab: This option will only allow the Zone transfer to the computers listed in the Name Server tab.

  c) Only to the following servers: You can define the list of computers to which zone transfer will be allowed.

Configure a secondary zone

- After we allow Zone transfer in Primary. Go back to the Secondary DNS and refresh the console. Now we can see all the data visible in Secondary. We cannot create any Resource records in Secondary as it is read only copy of Primary.



How DNS Server Caching Works

- DNS caching increases the performance of the organization's DNS system by decreasing the time it takes to provide DNS lookups.
- When a DNS server resolves a DNS name successfully, it adds the name to its cache.
- This builds a cache of domain names and their associated IP addresses for the most common domains that the organization uses or accesses.
- The default time to cache DNS data is one hour. You can configure this by changing the SOA record for the appropriate DNS zone.

How DNS Server Caching Works

- A caching-only server will not host any DNS zone data; it only answers lookups for DNS clients.
- This is the ideal type of DNS server to use as a forwarder.
- The DNS client cache is a DNS cache that the DNS Client service stored on the local computer.
- The DNS client cache is a DNS cache that the DNS Client service-

  ipconfig /displaydns command at the command prompt
- If you need to clear the local cache

  you can use **ipconfig/flushdns.**

What Is Active Directory-Integrated DNS Zone?

- If a DNS server is installed and configured on the computer that is also playing the role of the Active Directory Domain Controller, the administrators can configure the Active Directory-Integrated DNS zone to allow a smooth DNS replication without any administrative overhead.
- If the administrators do not configure the Active Directory-Integrated DNS zone, they are required to configure a separate DNS replication topology through which the DNS records are replicated with the other DNS servers that the organization may have.
- On the other hand, if the Active Directory-Integrated DNS zone is configured, the administrators are not required to create a separate replication topology, and the DNS replication takes place along with the Active Directory replication process among all the available Active Directory domain controllers that the organization has.

What Is Active Directory-Integrated DNS Zone?

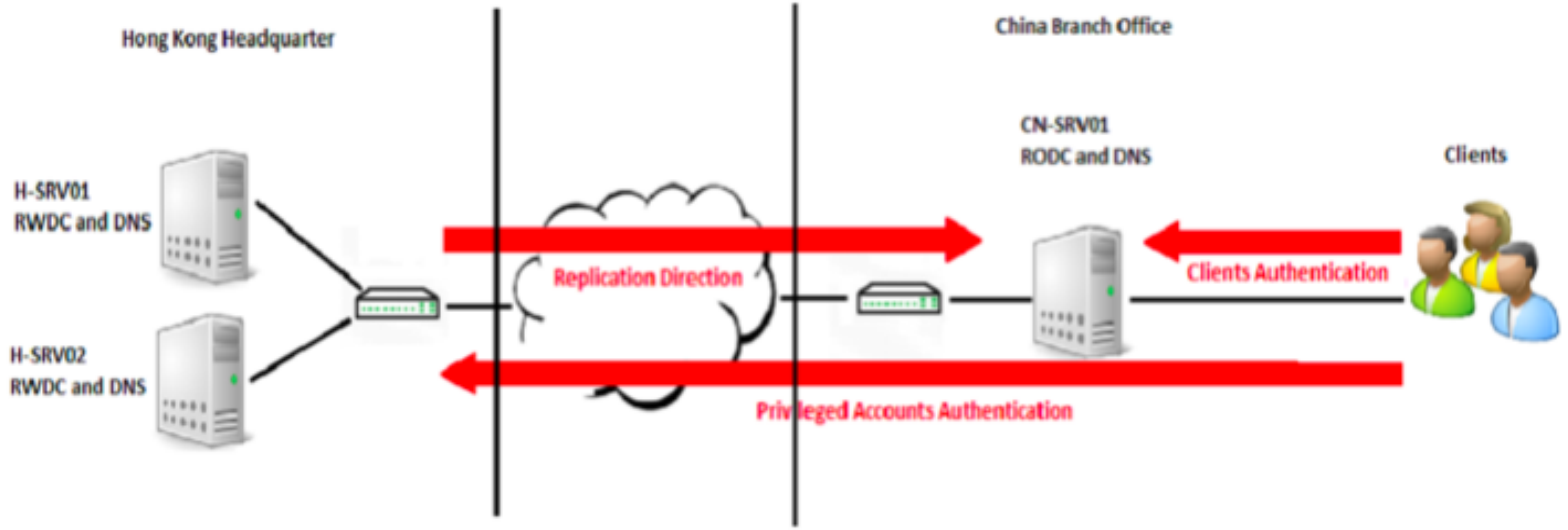


Figure 1

What Is Active Directory-Integrated DNS Zone?

- Active Directory-Integrated DNS zone cannot be configured on a server on which only the DNS services are installed, and the server does not have the Active Directory Domain Services installed on it, i.e. the server is not an Active Directory domain controller.
- When a DNS server role is installed and configured on an Active Directory domain controller itself, by default it is configured to store its information in the Active Directory database.
- With the help of this default configuration, the DNS replication takes place along with the replication process of the Active Directory, which is comparatively securer and also it does not require any administrative overhead that the administrators would otherwise have to face in order to configure the DNS replication separately.

Configure Active Directory Integrated DNS Zone in Windows Server 2012 DNS Server

Here is how you can configure the Windows Server 2012 DNS server to have the Active Directory integrated DNS zone:

- Log on to the Windows Server 2012 DNS server using the Enterprise Admin or Domain Admin account credentials.
- If not already started, initialize the Server Manager window from the bottom left corner of the screen.
- Once the **Server Manager** window is initialized, from the left pane, click to select the **DNS**category.
- From the right pane, under the **SERVERS** section, right-click the DNS server.

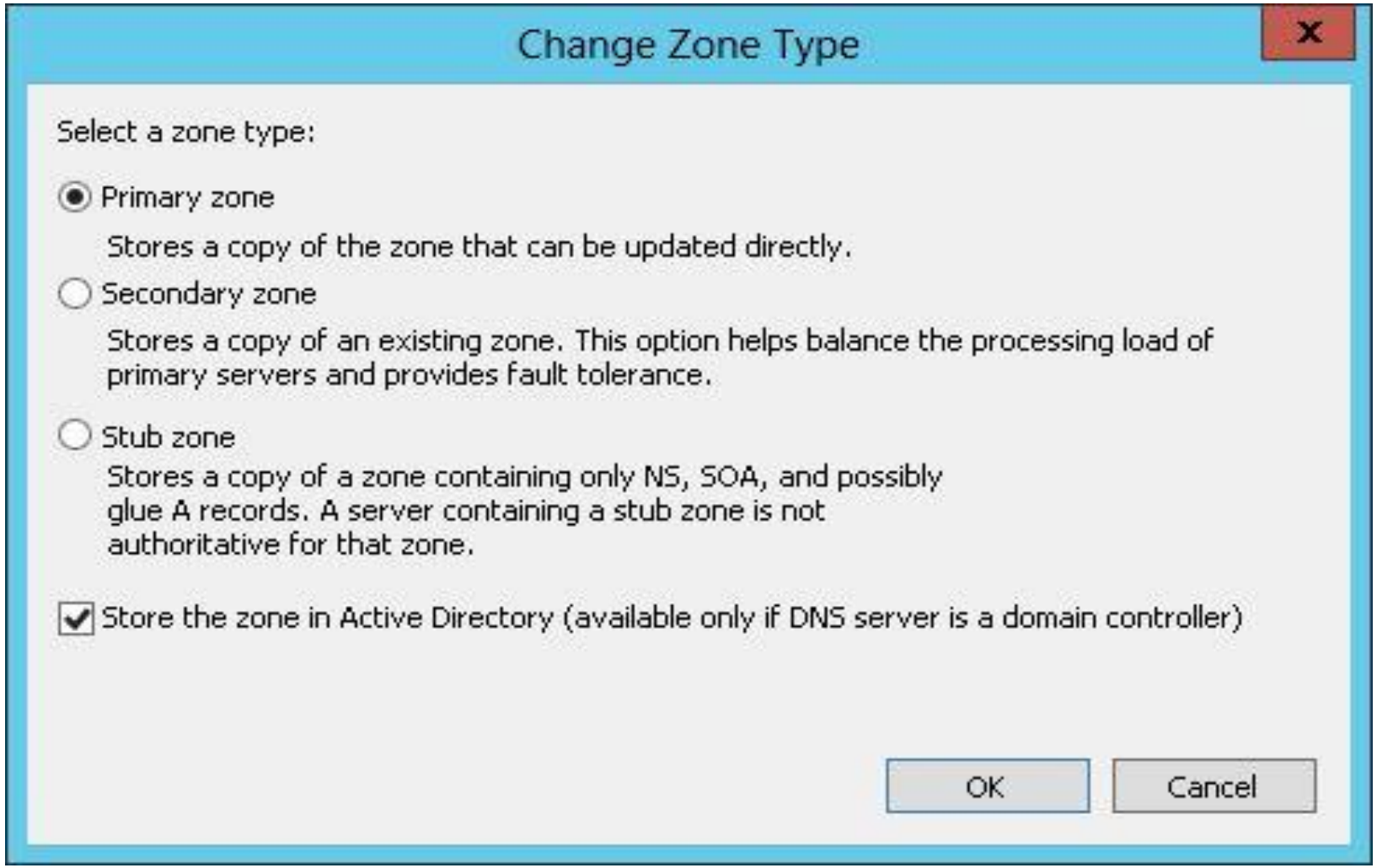
Configure Active Directory Integrated DNS Zone in Windows Server 2012 DNS Server

- From the context menu that appears, click **DNS Manager**.
- On the opened **DNS Manager** snap-in from the left pane, expand the server name (DC-01.MYDOMAIN.COM for this demonstration), and then expand **Forward Lookup Zones**.
- From the expanded list, click to select and then right-click the domain name. (MYDOMAIN.COM for this demonstration).
- From the displayed context menu, click the **Properties** option.
- On the opened domain's properties box, make sure that the **General** tab is selected.

Configure Active Directory Integrated DNS Zone in Windows Server 2012 DNS Server

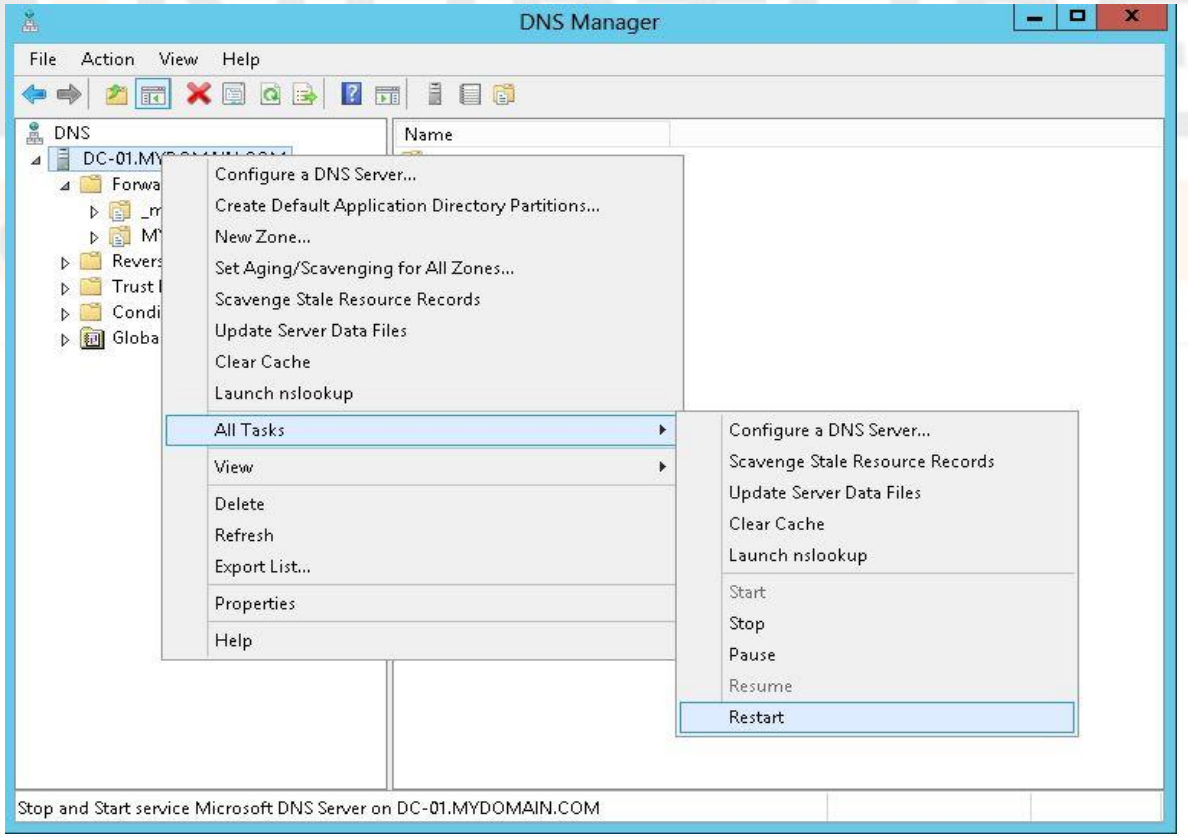
- On the displayed interface, click the **Change** button opposite to the **Type** label.
- On the **Change Zone Type** box, check the **Store the zone Active Directory (available only if DNS server is a domain controller)** checkbox.(see fig. in next slide)
- Once done, click **OK**, and back on the domain's properties box, click **OK** again to save the changes
- Back on the **DNS Manager** snap-in, right-click the server name. (DC-01.MYDOMAIN.COM for this demonstration).

Configure Active Directory Integrated DNS Zone in Windows Server 2012 DNS Server



Configure Active Directory Integrated DNS Zone in Windows Server 2012 DNS Server

- From the displayed context menu, go to **All Tasks**, and click **Restart** from the submenu that appears.
- Wait till the DNS service restarts before the DNS server starts working using the modified settings.



Configuring Zone Delegation

- Delegation - Similar to what the root servers do to the top level domains (com, org, net etc.). They "know" there's something down there, they "know" who is the DNS server that's holding that information(i.e authoritative for that domain).

  In order to delegate a domain, the DNS that is delegating needs to hold the parent domain. For example, DNS holding the ab.abc.org zone CAN delegate to the sales sub-domain under ab.abc.org. It CANNOT delegate to the abc.com domain.

  And, they do not need the sub-domain's permissions to do that.

Configuring DNS Zones and Records

Steps for configuration

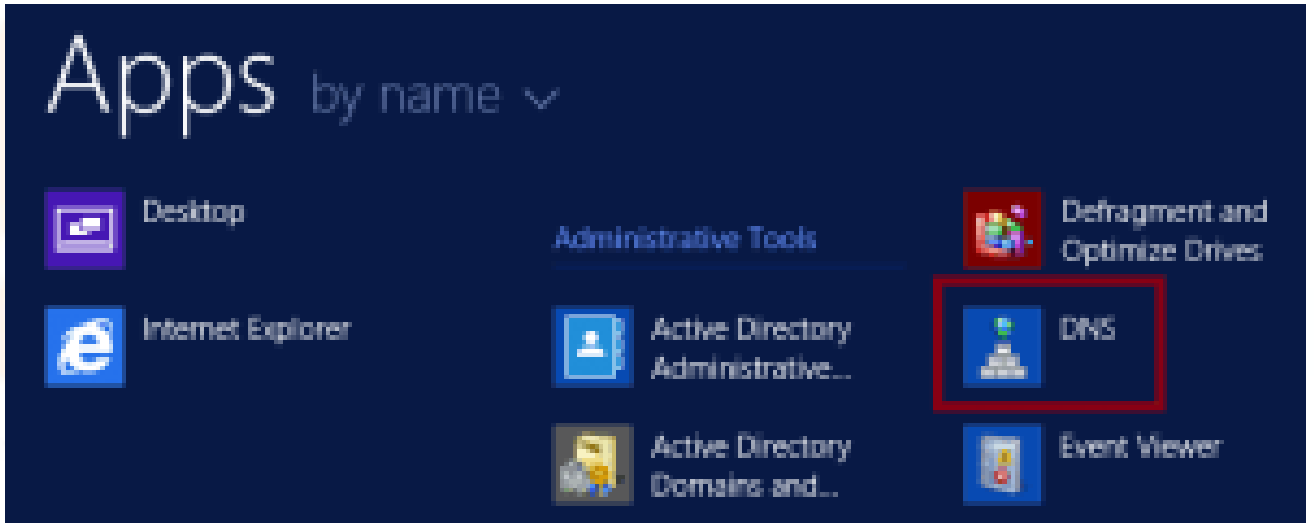
- Open the DNS management snap-in by selecting **Start | Administrative Tools | DNS**.
- Expand the DNS server and locate the zone you created earlier.
- Right-click the zone and choose the **New Delegation** command.
- The **New Delegation Wizard** appears. Click **Next** to close the initial wizard page.
- Enter **ns1** (or whatever other name you like) in the **Delegated Domain** field of the **Delegated Domain Name** page. This is the name of the domain for which you want to delegate authority to another DNS server. It should be a subdomain of the primary domain (eg: to delegate authority for admin.coatbank.com, you'd enter admin in the **Delegated Domain** field). Click **Next** to complete this step.
- When the **Name Servers** page appears, click the **Add** button to add the name and IP address(es) of the servers that will be hosting the newly delegated zone (enter the zone name you used earlier). Click the **Resolve** button to automatically resolve this domain name's IP address into the IP address field. Click **OK,** then click Next to continue with the wizard.
- Click **Finish**. The **New Delegation** wizard will disappear and you'll see the new zone you've just created appear beneath the zone you selected in Step 4. The newly delegated zone's folder icon is drawn in grey to indicate that control of the zone is delegated.

Configuring Stub Zones

- A stub zone is similar to a secondary zone, but only keeps limited DNS data specifying which DNS server is a master server and thus authoritative for the domain in question. These zones are useful when wishing to reduce zone transfer\replication traffic as they simply pass on requests to authoritative servers, otherwise it uses its local DNS cache information to resolve DNS queries for clients. Used to maintain/improve DNS name resolution efficiency.
- Read-only copy of a zone containing specific resource records.
- Records in zone identify authoritative DNS servers for domain.
- Typically used in a parent zone to enable the parent to keep up to date with Name Servers in the child domain.
- Stub zones contain only: Start of Authority (SOA) record
- Name Server (NS) records
- (A) records
- An administrator of stub zone cannot modify resource records, and changes must be made in original primary zone. Both Primary and Stub Zones can be integrated into an Active Directory based LAN. When AD integrated, the DNS data is no longer kept in a simple text type file (zone_name.dns), but instead is stored in the Active Directory database where it mingles with the rest of the network data that this object database stores. Integration of DNS with AD is favorable for security and performance reasons, and prevents rogue entries from unauthorized clients registering records with DNS.

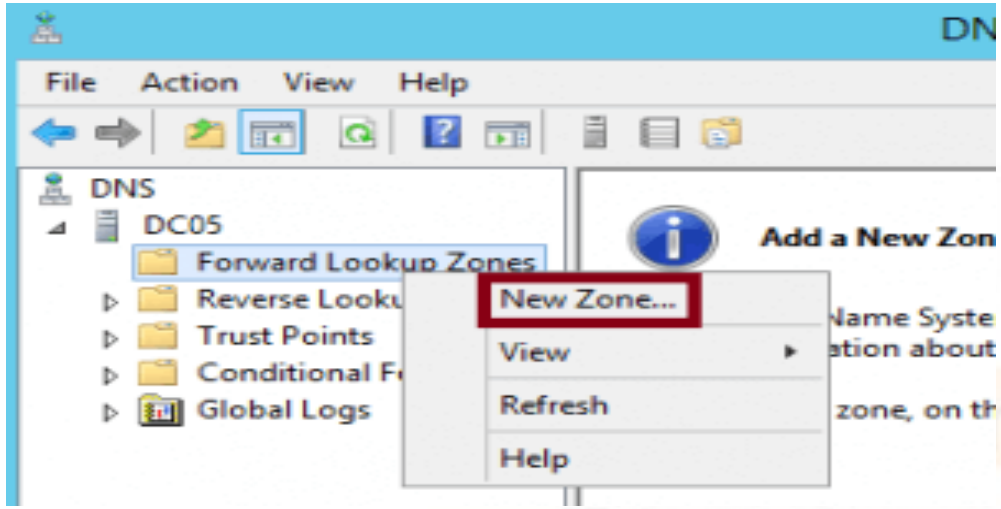
Configuring Stub Zones

- Click on **Start** button, select the down arrow and select **DNS**. That would open DNS manager.



- To configure Stub Zone, in DNS manager, expand computer name. Right-click Forward lookup and select “New Zone”.

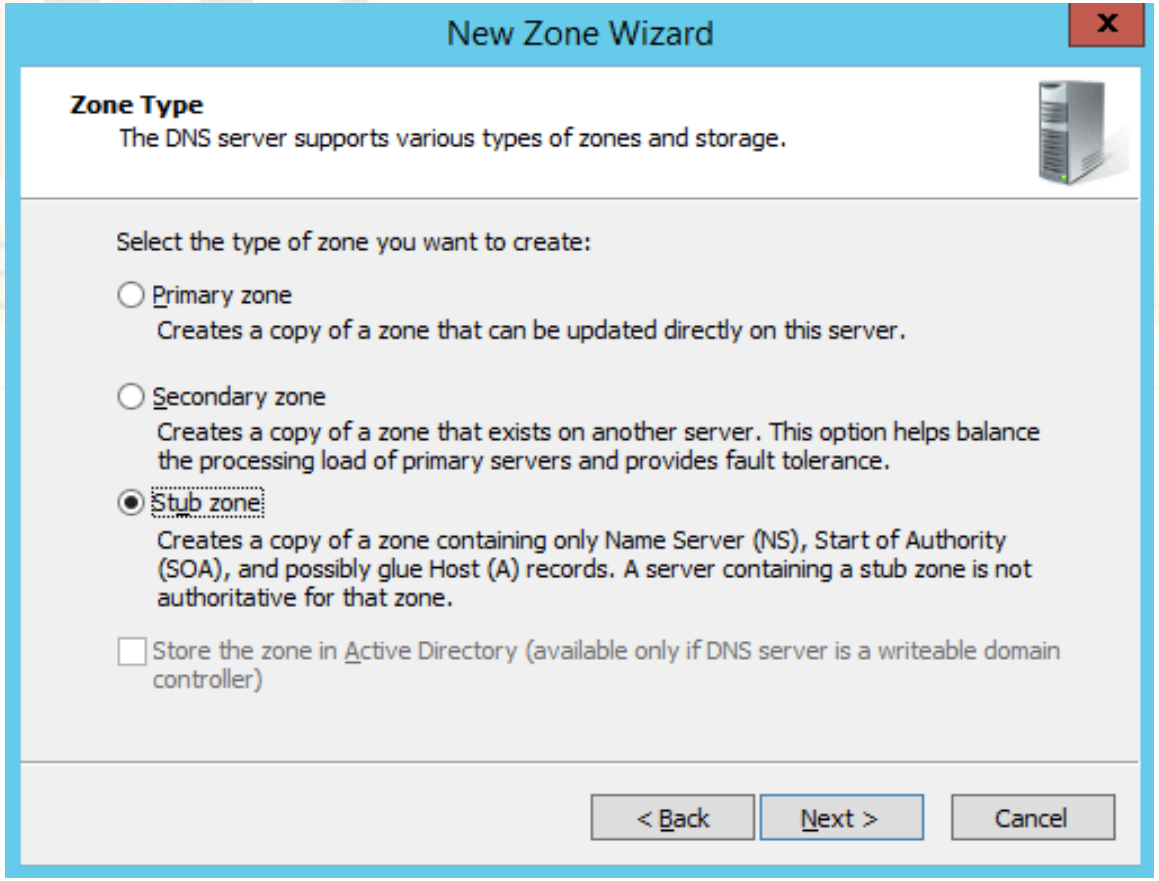
Configuring Stub Zones



- Click on **next** to continue.

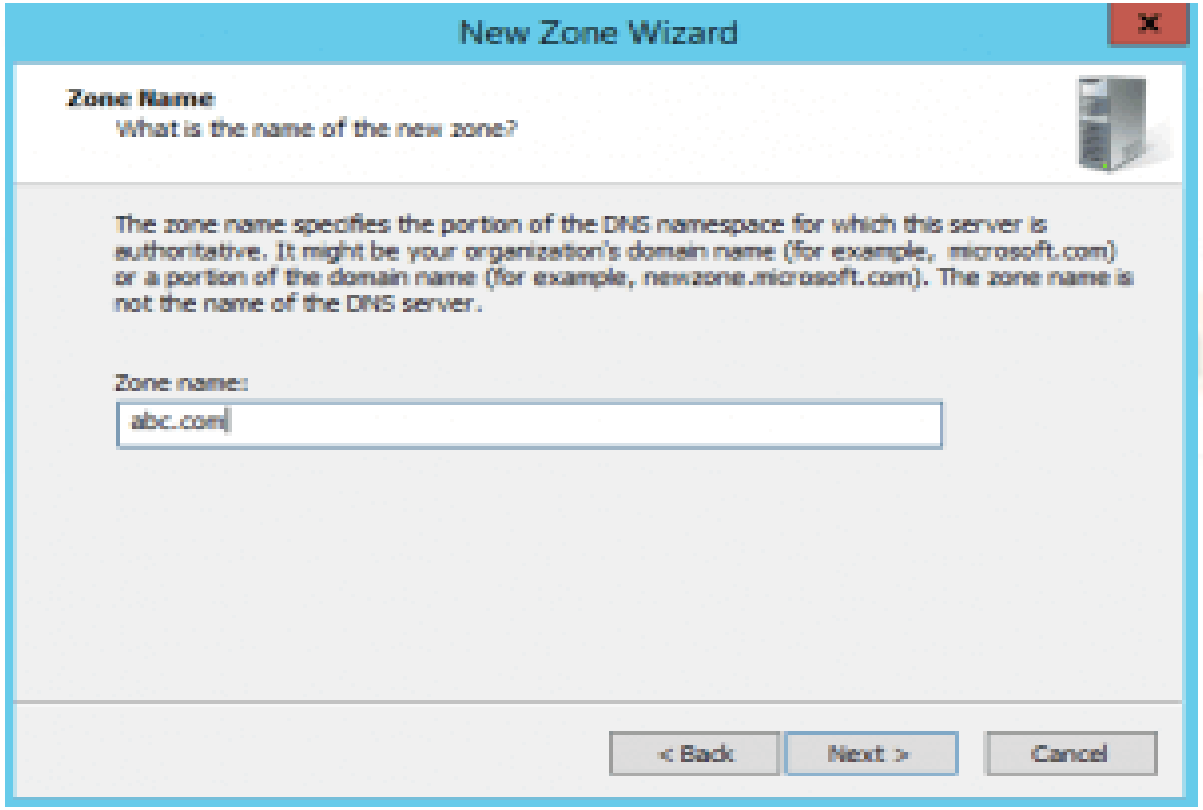
Configuring Stub Zones

- In the “Zone type” window, select the type of zone that you want to use. For this practical we’ll use Stub. Click on next to continue.



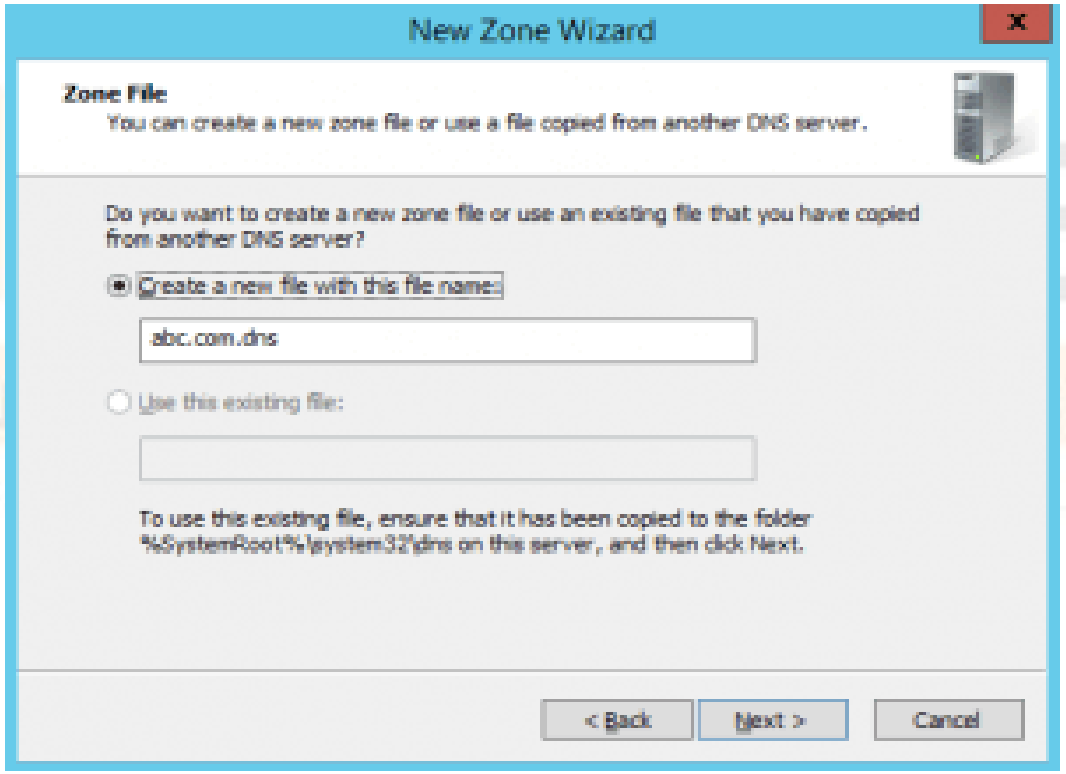
Configuring Stub Zones

- Type the name of domain. In this example, we are creating Stub for “ABC.COM”. Click on next to continue.



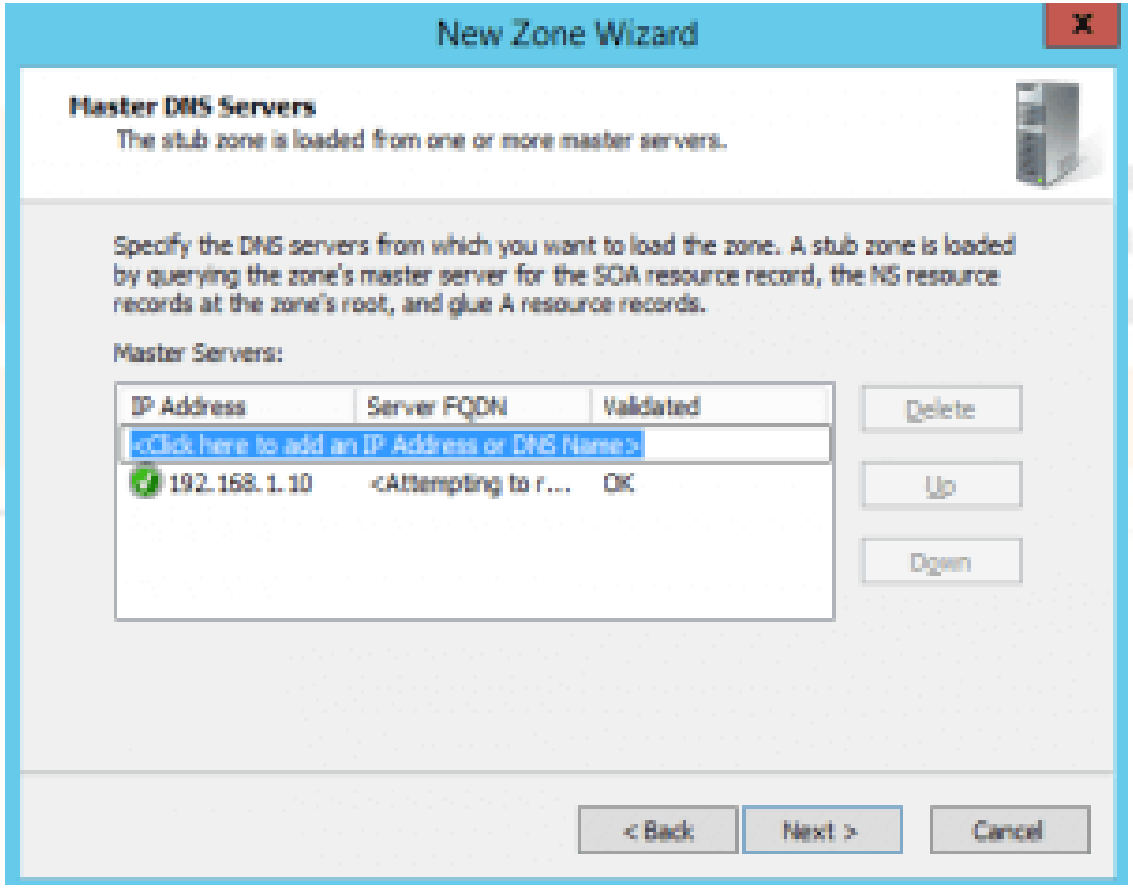
- Select Create a new file with this file name and hit Next.

Configuring Stub Zones



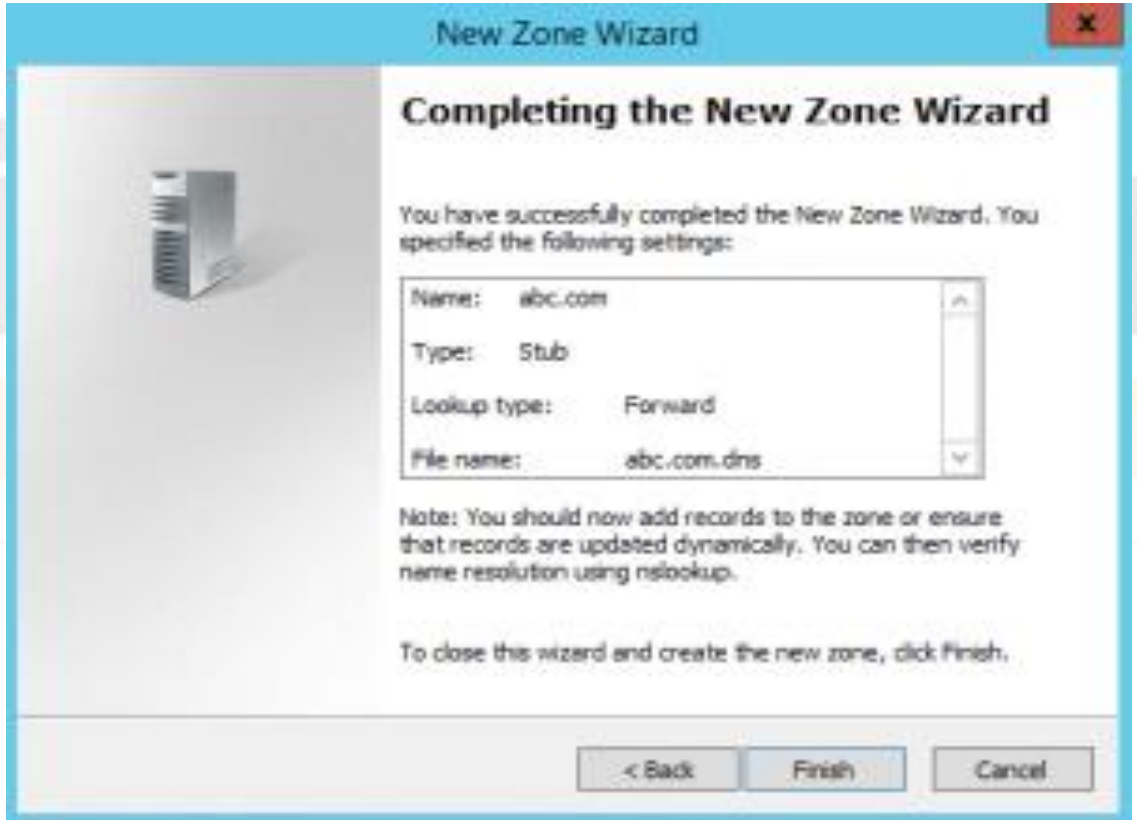
- Type an IP address of Primary. IP address of Primary DNS is 192.168.1.10. Hit enter. A green check confirms that Stub is able to communicate with Primary. In case of failure check the communication. Click on next to continue.

Configuring Stub Zones



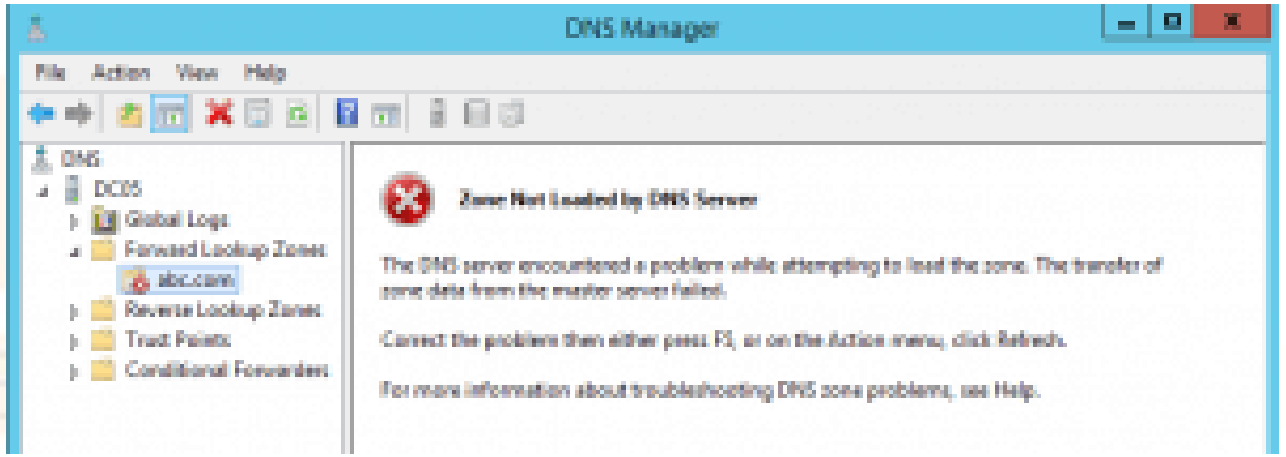
- Click on Finish to close the Wizard.

Configuring Stub Zones



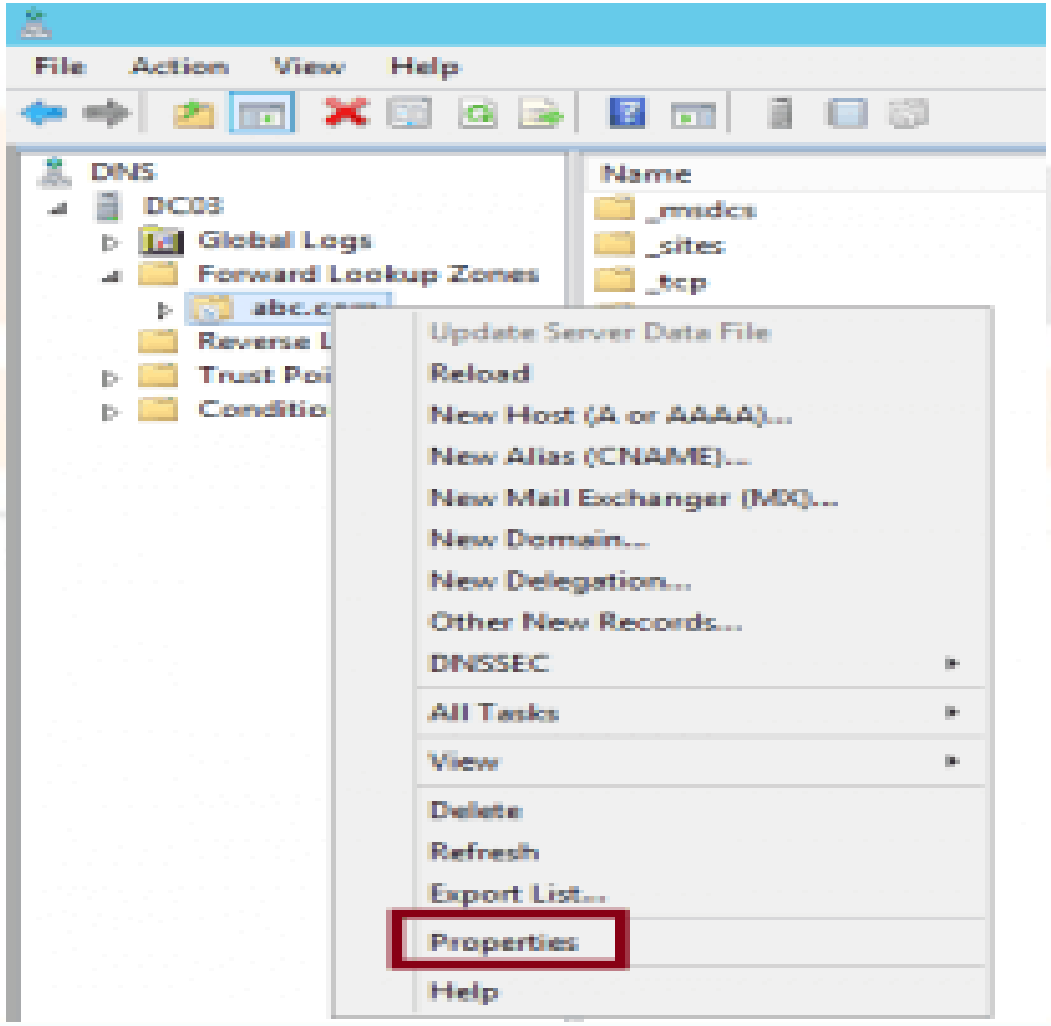
- On the Stub we can see an error message ‘Zone not Loaded by DNS Server’. This error occurs because we didn’t complete the prerequisite of allowing zone transfer on Primary\Active Directory Integrated.

Configuring Stub Zones



- To allow “Zone Transfer”, go to Primary. Right click the domain name and select properties.

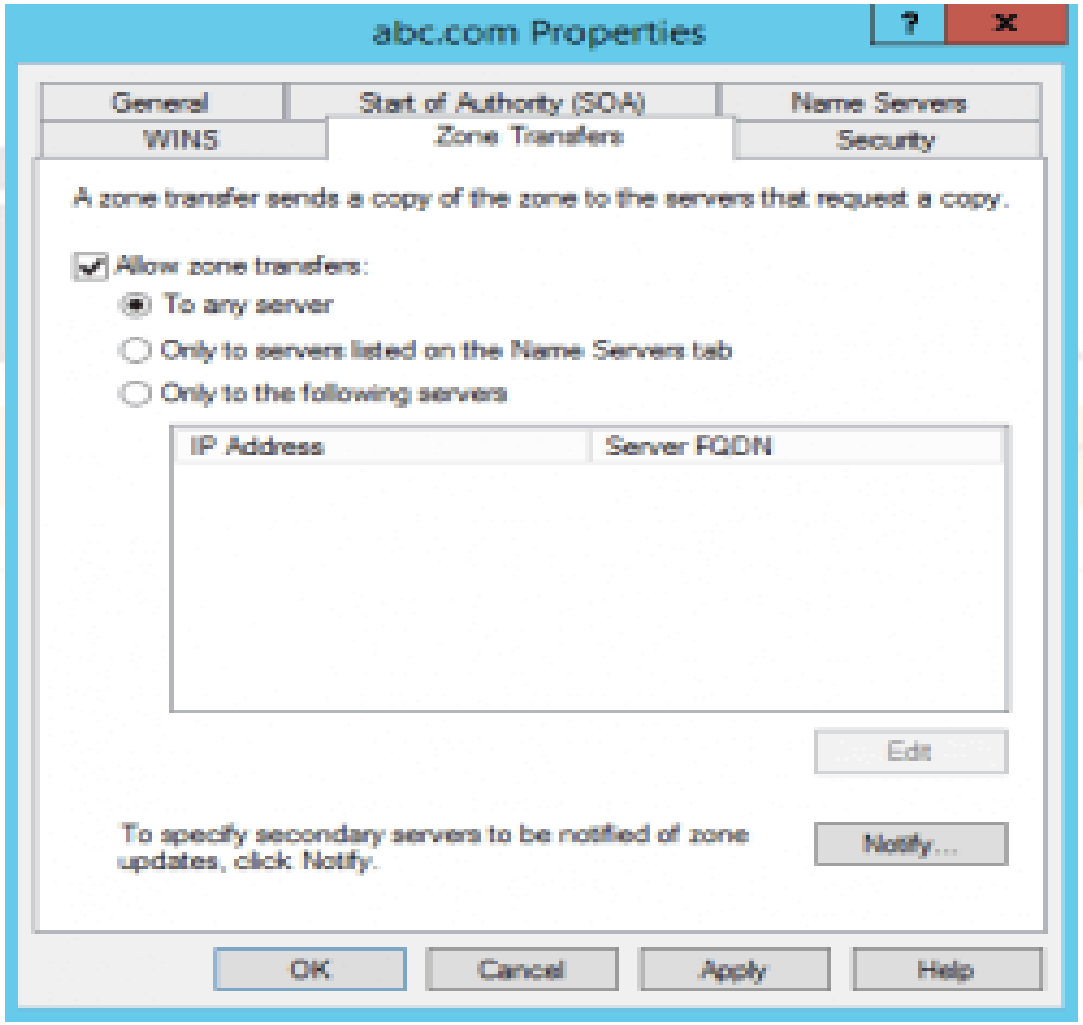
Configuring Stub Zones



Configuring Stub Zones

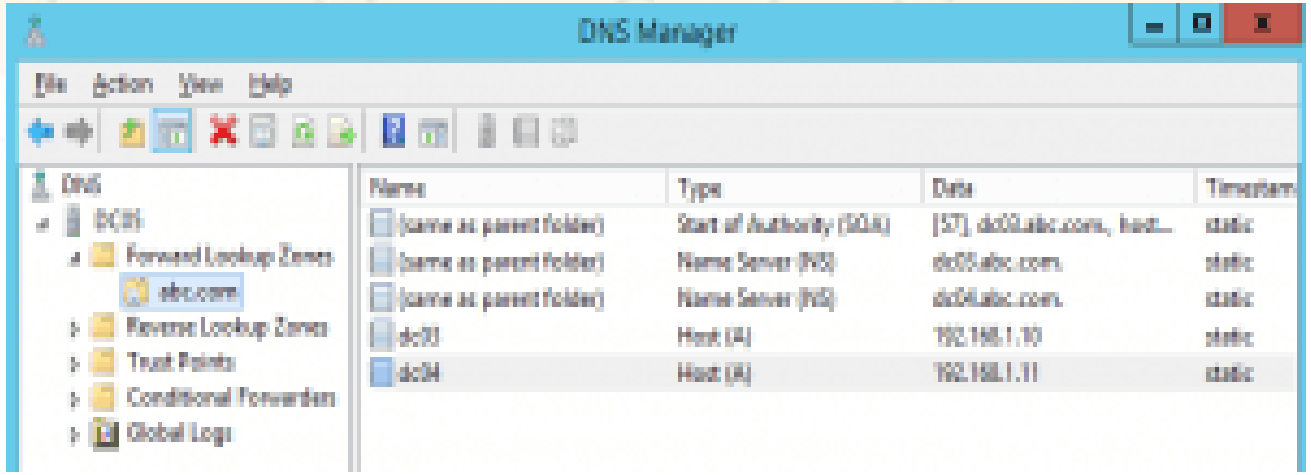
- In the Domain properties window, select “Zone Transfer” tab and select an option “Allow zone transfer”. Under zone transfer we can see three options:
- **Options to allow zone transfer**:
  a. **To any server**: This would allow zone transfer to any server. This option is not secured as we are not restricting the list of computers to transfer data.
  b. **Only the servers listed in the Name Server tab**: This option will only allow the Zone transfer to the computers listed in the Name Server tab.
  c. **Only to the following servers**: You can define the list of computers to which zone transfer will be allowed.

Configuring Stub Zones



Configuring Stub Zones

- After we allow Zone transfer in Primary. Go back to the Stub DNS and refresh the console. Now we can see all the data visible in Stub. We cannot create any Resource records in Stub as it is read only copy of Primary i.e. you cannot create any record or delete any record from here.



Configuring Caching-Only Servers

- All name servers cache (store) the data they receive in response to a query. A caching-only server, however, is not authoritative for any domain. Responses derived from cached information are flagged in the response. When a caching-only server receives a query, it checks its cache for the requested information. If it does not have the information, it queries a local name server or a root name server, passes the information to the client, and caches the answer for future queries. The names and addresses of the root name servers are acquired from the servers listed in the hints file, the name and file path of which are specified in the name server's configuration file.
- You can manually configure a name server to create a large cache of responses to queries that are frequently requested and reduce the number of queries made to master servers. The name server that you configure as a caching-only server stores data for a period of time determined by the time-to-live (ttl) value, and the cached information is lost if the name server is restarted.

Configuring Caching-Only Servers

- Normally a DNS server holds records about various DNS zones which are replicated between other DNS servers (via the Active Directory in a AD enabled zone).
- Caching-only DNS servers don't actually host any zones and are not authoritative for any domains but rather just cache results from queries asked them by clients. If a client asks it to resolve www.savilltech.com it will a zone holding DNS server to resolve it and cache the answer so if another client asks it to resolve the same record it can answer from its cache. This is similar in a way to a proxy server that caches popular web pages.
- These are useful for sites connected via a WAN with a local caching-only DNS server saving on network traffic.

Configuring Caching-Only Servers

To configure a caching only DNS server perform the following:

- Ensure the machine has a static IP address.
- Install the DNS service as per normal (Start - Settings - Control Panel - Add/Remove Software - Add/Remove Windows Components - Components - Networking Services - Details - Domain Name System (DNS) - OK - Next - Finish).
- Start the DNS MMC (Start - Programs - Administrative Tools - DNS).
- From the Action menu select 'Connect To Computer...'
- In the Select Target Computer window enable 'The following computer:' and enter the name of a DNS server you want to cache.
- Click OK.

Configuring Forwarding and Conditional Forwarding

- DNS forwarding is the process by which particular sets of DNS queries are handled by a designated server, rather than being handled by the initial server contacted by the client. Usually, all DNS servers that handle address resolution within the network are configured to forward requests for addresses that are outside the network to a dedicated forwarder.
- When deciding how to allocate DNS resources on a network it's important to implement some separation between external and internal Domain Name Services. Having all DNS servers configured to handle both external and internal resolution can impact the performance and security of a network.

Configuring Forwarding and Conditional Forwarding

CONFIGURE FORWARDERS

1. Open Server Manager.
2. Click Tools > DNS to open the DNS Manager console.
3. If necessary, expand the DNS console to a full-screen view.
4. Right-click the DNS server and select Properties. The Server Properties dialog box opens.
5. Select the Forwarders tab.
6. Click the Edit button. The Edit Forwarders dialog box opens.
7. In the IP address column, type the IP address of the DNS server that you want to forward DNS queries to and press the Enter key.
8. Click the OK button to close the Forwarders dialog box.
9. Click the OK button to close the server Properties dialog box.
10. When the installation is done, click the Close button.

Configuring Forwarding and Conditional Forwarding

CONFIGURE CONDITIONAL FORWARDERS

1. Open Server Manager.
2. Click Tools > DNS to open the DNS Manager console.
3. If necessary, expand the DNS console to a full-screen view.
4. Expand the server so that you can see the Conditional Forwarders folder.
5. Right-click Conditional Forwarders Zones and click New Conditional. Forwarder. The New Conditional Forwarder dialog box appears.
6. Type the name of the DNS domain included in DNS queries that you want to forward in the DNS Domain text box.
7. In the IP Address column, type the IP address of the DNS server that you want to forward to, and then press the Enter key.
8. Click the OK to close the New Conditional Forwarder dialog box. The zone appears under Conditional Forwarders.

Configuring DNS Record types

- Once a Windows DNS server is up and has been configured with a forward and reverse lookup zone it is ready to be configured with DNS records.

Basic DNS Record Types

- There are a few different types of records that are primarily used for most of the devices on the Internet and inside company intranets. The following is a list of these primary record types:
- **Host Address (A) record –** This type of record is used to translate a domain name to a specific IPv4 address.
- **Host Address (AAAA) record –** This type of record is used to translate a domain name to a specific IPv6 address.
- **Canonical name (CNAME) record –** This type of record is used to specify a secondary name (commonly referred to as alias) for an existing A or AAAA record.
- **Mail Exchange (MX) record –** This type of record is used to direct the mail communications for specific domains on the Internet. The record includes a priority and mail exchange agent domain name (this references an existing A, AAAA, or CNAME).
- **Start of Authority (SOA) record –** This type of record is typically configured with the creation of a zone and includes authoritative information about a specific domain name.
- **Name Server (NS) record –** This delegates the authoritative name servers for a specific domain, this record is also typically configured with the creation of the zone

Configuring DNS Record types

1. Open server Manager-> select DNS Server
2. Once DNS has been selected, the available DNS servers will be displayed. Right-click on the target server and select **DNS Manager.**
3. This will now bring up the DNS Manager. Here you can see that both a forward and reverse lookup zone have been created.
4. Choose the **forward lookup zone**, which will bring up a list of the existing zone records. Figure 4 below shows the basic records that are automatically created by the DNS configuration wizard. The first record that will be created is an **A record** linking the parent domain name (testing.local in this case) to the IPv4 address 192.168.1.100.

Configuring DNS Record types

5. Right-click in the right pane and select **New Host (A or AAAA)**. This will bring up a window.
6. Now fill out the IP address textbox with the target address of 192.168.1.100.
7. Click on the **Create associated pointer (PTR) record** and select **Add Host**.
8. This will display the successful creation of the record. Select **OK** and bring back the Add Host window in case multiple records need to be created.
9. Select **Close**. The screen will now show a new A record with the information that was entered.

Configuring DNS Record types

11. Click on the **reverse zone** that was previously created. Notice that a new PTR record now exists. This record will allow a reverse lookup of the 192.168.1.100 record to the testing.local domain name.
12. Click back on the forward zone, then right-click on the right pane again and select **New Alias (CNAME)**. This will bring up the window.
13. At this point enter www in the Alias Name textbox and enter testing.local in the **Fully Qualified Domain name (FQDN) for target host** textbox. This will create an alias record for www.testing.local that maps to the A record for testing.local.
14. Select **Next**, this will bring back the main DNS Manager window with a new CNAME record.

Configuring DNS Record types

14. The next record type that will be created is a **MX record**. Right-click on the right pane and select **New Mail Exchanger**, which will bring up the window shown in Figure 10. From this window the only thing that will be configured is the "Fully qualified domain name (FQDN) of mail server" textbox. This is because the mail being routed is for the whole testing.local domain and not specific sub-domains. The name that is placed in this textbox is the name of the mail server, in this case mail.testing.local. (An A record for mail.testing.local was added previous to this step but was not covered in the walkthrough).

15. Once complete, select **OK**. This will bring back the main DNS Manager window showing a new MX record.

Configuring DNS Record types

- The last record that will be shown created is an **AAAA record**, which is similar to the A record but works with an IPv6 address instead of an IPv4 address.

16. Right-click on the right pane and select **New Host (A or AAAA)**. This will bring up the window. In this window enter the IPv6 address 2001:DB8::1 to link to the parent domain name.
17. Once complete select **Add Host**, then select **OK**.
18. Select **Done** to get back to the main DNS Manager. This window shows that a new host record has been created using an IPv6 address.
19. And finally these records can be tested by using the Windows **nslookup** command. As shown below, the various records are looking up correctly.

Creating and Configuring DNS Resource Records

- You can manually create A, PTR, MX, SRV and 15 other types of record. There are two essential things to remember: you must right-click the zone and use either the **New Record** command or the **Other New Records** command, and you must know how to fill in the fields of whatever record type you're creating, eg: to create an MX record, you only need three items of information (the domain, the mail server, and the priority), but to create an SRV record, you need several more.
- Membership in **Administrators**, or equivalent, is the minimum required to perform this procedure.

Creating and Configuring DNS Resource Records

To add a DNS resource record

- In Server Manager, click **IPAM**. The IPAM client console appears.
- In the navigation pane, in **MONITOR AND MANAGE**, click **DNS Zones**. The navigation pane divides into an upper navigation pane and a lower navigation pane.
- In the lower navigation pane, click **Forward Lookup**. All IPAM-managed DNS Forward Lookup zones are displayed in the display pane search results. Right-click the zone where you want to add a resource record, and then click **Add DNS resource record**.
- The **Add DNS Resource Records** dialog box opens. In **Resource record properties**, click **DNS server** and select the DNS server where you want to add one or more new resource records.

  In **Configure DNS resource records**, click **New**.

Creating and Configuring DNS Resource Records

- The dialog box expands to reveal **New Resource Record**. Click **Resource record type**.
- The list of resource record types is displayed. Click the resource record type that you want to add.
- In **New Resource Record,** in **Name**, type a resource record name. In **IP Address**, type an IP address, and then select the resource record properties that are appropriate for your deployment. Click **Add Resource Record**.
- If you do not want to create additional new resource records, click **OK**. If you want to create additional new resource records, click **New**.

Creating and Configuring DNS Resource Records

- The dialog box expands to reveal **New Resource Record**. Click **Resource record type**. The list of resource record types is displayed. Click the resource record type that you want to add.
- In **New Resource Record,** in **Name**, type a resource record name. In **IP Address**, type an IP address, and then select the resource record properties that are appropriate for your deployment. Click **Add Resource Record**.
- If you want to add more resource records, repeat the process for creating records. When you are done creating new resource records, click **Apply**.
- The **Add Resource Record** dialog box displays a resource records summary while IPAM creates the resource records on the DNS server that you specified. When the records are successfully created, the **Status** of the record is **Success**. Click **OK.**

Start of Authority (SOA) Records

- An SOA record is a Start of Authority. Every domain must have a Start of Authority record at the cutover point where the domain is delegated from its parent domain. For example if the domain mycompany.com is delegated to DNSimple name servers, we must include an SOA record for the name mycompany.com in our authoritative DNS records. We add this record automatically for every domain that is added to DNSimple and we show this record to you as a System Record in your domain's Manage page.
- The Start of Authority (SOA) record in a DNS database indicates which server is authoritative for that particular zone. The server referenced by the SOA records is subsequently the server that is assumed to be the authoritative source of information about a particular zone and is in charge of processing zone updates.

Start of Authority (SOA) Records

The SOA record includes the following details:

- The primary name server for the domain, which is ns1.dnsimple.com or the first name server in the vanity name server list for vanity name servers.
- The responsible party for the domain, which is admin.dnsimple.com.
- A timestamp that changes whenever you update your domain.
- The number of seconds before the zone should be refreshed.
- The number of seconds before a failed refresh should be retried.
- The upper limit in seconds before a zone is considered no longer authoritative.
- The negative result TTL (for example, how long a resolver should consider a negative result for a subdomain to be valid before retrying).

Name Server(NS) Records

- NS-records identify the DNS servers responsible (authoritative) for a zone.
- A zone should contain one NS-record for each of its own DNS servers (primary and secondaries).
- This is mostly used for zone transfer purposes (notify messages).
- These NS-records have the same name as the zone in which they are located.
- The more important function of the NS-record is delegation.
- Delegation means that part of a domain is delegated to other DNS servers.

Name Server(NS) Records

- Poorly constructed NS records pose a security risk because they create conditions under which an adversary might be able to provide the missing authoritative name services that are improperly specified in the zone file. The adversary could issue bogus responses to queries that clients would accept because they learned of the adversary's name server from a valid authoritative name server, one that need not be compromised for this attack to be successful. The list of slave servers must remain current within 72 hours of any changes to the zone architecture that would affect the list of slaves. If a slave server has been retired or is not operational but remains on the list, then an adversary might have a greater opportunity to impersonate that slave without detection, rather than if the slave was actually online.

Host(A and AAAA) Records

- **Host (A)** – Host (A) records are the names of the computers along with their corresponding IPv4 IP addresses that are registered with the DNS server. In order to associate a domain name with an IP address, it's usually necessary to use A records. These can be in the form of many different host names and subdomains. This is done by declaring a record. In this case, "mail," "www" or "ntp" would be the defined A records. These might point at any IPv4 IP address, such as 12.34.56.78. Looking up which IP address is associated with a domain name in this way occurs through a forward DNS lookup, or query.
- **Host (AAAA)** – Host (AAAA) records are the names of the computers along with their corresponding IPv6 IP addresses that are registered with the DNS server. As IPv6 becomes more prevalent, the AAAA record (or "quad-A") will become more popular. This is simply the IPv6 equivalent of the IPv4 version, and it differs because IPv6 uses 128-bit addresses. This means that AAAA records are notated using eight groups of 16-bit values, such as: fe80:226:18ff:fed3::cc2a.

Host(A and AAAA) Records

Add Host (A) DNS Records Manually

- Log on to Windows server 2008 R2 DNS server computer with domain admin or enterprise admin credentials.
- From the desktop screen, click **Start**.
- From the Start menu, go to **Administrative Tools > DNS**.
- On **DNS Manager** snap-in, from the console tree in the left pane, double-click to expand the DNS server name.
- From the expanded list, double-click **Forward Lookup Zones**.
- From the displayed zones list, click to select the DNS zone for which Host (A) DNS record is to be added.
- Once selected, right-click the DNS zone.
- From the displayed context menu, click **New Host (A or AAAA)**.

Host(A and AAAA) Records

- On **New Host** box, type in the Fully Qualified Domain Name (FQDN) along with the IP address of the target host computer in the **Name (uses parent domain name if blank)** and **IP address** fields respectively.
- Once done, click **Add Host**. Optionally, **Create associated pointer (PTR) record** checkbox can also be checked to automatically generate a PTR entry of the target computer in the **Reverse Lookup Zones** before clicking **Add Host** button.
- On the displayed message box, click **OK**.
- Back on the **New Host** box, click **Done**.
- Close **DNS Manager** snap-in when done.

Canonical Name(CNAME) Records

- A canonical name is the properly denoted host name of a computer or network server.

  A CNAME specifies an alias or nickname for a canonical host name record in a domain name system (DNS) database. In programming, the term "canonical" means "according to the rules." The DNS is the standard method of defining the locations of sites on the Internet, particularly Web sites.

- CNAME records can be used to alias one name to another. CNAME stands for Canonical Name.

- A common example is when you have both example.com and www.example.com pointing to the same application and hosted by the same server. In this case, to avoid maintaining two different records, it’s common to create:

Canonical Name(CNAME) Records

- A record for example.com pointing to the server IP address.
- A CNAME record for www.example.com pointing to example.com.
- As a result, example.com points to the server IP address, and www.example.com points to the same address via example.com. Should the IP address change, you only need to update it in one place: just edit the A record for example.com, and www.example.com automatically inherits the changes.

Restrictions

- A CNAME record must always point to another domain name, and never directly to an IP address.
- A CNAME record cannot co-exist with another record for the same name. For instance, it's not possible to have both a CNAME and TXT record for www.example.com.
- A CNAME can point to another CNAME, although this configuration is generally not recommended for performance reasons. When applicable, the CNAME should point as closely as possible to the target name in order to avoid unnecessary performance overheads.

Pointer(PTR) Records

- The “PTR” record stands for “pointer record” and maps an Ipv4 address to the CNAME on the host.
- PTR-records are primarily used as "reverse records" - to map IP addresses to domain names (reverse of A-records and AAAA-records).
- For a reverse IPv4 mapping, the name of the PTR-record is the IP address with the segments reversed and with "in-addr.arpa" appended to the end.
- As an example, looking up the domain name for IP address "12.23.34.45" is done with a query for the PTR-record for "45.34.23.12.in-addr.arpa".
- For a reverse IPv6 mapping, the name of the PTR-record is each hex digit of the IP address in reverse order, with dots between each digit, and with "ip6.arpa" appended to the end.

Pointer(PTR) Records

- As an example, looking up the domain name for IPv6 address "1234:5678:90ab:cdef:1234:5678:90ab:cdef" is done with a query for the PTR-record for "f.e.d.c.b.a.0.9.8.7.6.5.4.3.2.1.f.e.d.c.b.a.0.9.8.7.6.5.4.3.2.1.ip6.arpa".
- To create a PTR-record use one of the following options:
- The Reverse zone IP-to-Name Mappings dialog.
- The "Update Reverse Zone" check box in the Record Properties dialog for an A-record or AAAA-record.
- Right-click a reverse zone in the DNS Records window, and select "New PTR-record" from the pop-up menu.
- This record type is defined in RFC1035.

Pointer(PTR) Records

- A **Pointer** (PTR) **record** resolves an IP address to a fully-qualified domain name (FQDN) as an opposite to what **A record** does. PTR records are also called Reverse DNS records.
- PTR records are mainly used to check if the server name is actually associated with the IP address from where the connection was initiated.
- IP addresses of all Intermedia mail servers already have PTR records created.
- If you are using both Intermedia mail servers and external mail servers (e.g. Dedicated Web Server or Cloud Server) and the external server does not belong to Intermedia infrastructure, you need to create PTR record because it will help your server pass some security tests when connecting to other mail servers. To do that, you will need to contact the company which owns the IP address of the server. Usually it is your Internet Service Provider (ISP).

Self Assessment Question

1. What command-line utility can you use to join a computer to a domain?

   a. Joinad
   b. Adjoin
   c. Netdom
   d. Joindomain

Answer: Netdom

Self Assessment Question

2. How much RAM does Windows Server 2012 support?

a. 2TB
b. 4TB
c. 8TB
d. 16TB

Answer: 4TB

Self Assessment Question

3. Which two command line tools can you use to create an Active Directory group?

a. adadd

b. Dsadd

c. New-Adgroup

d. AD-Newgroup

Answer: B, C

Self Assessment Question

4. What type of DNS record is used to store IP address to name mappings used for reverse lookups?

a. A
b. ADDR
c. IP
d. PTR

Answer: PTR

Self Assessment Question

5. What type of DNS query requires the DNS server receiving the request to take full responsibility for resolving the name?

   a. Authority
   b. Iterative
   c. NameServer
   d. Recursive

Answer: Recursive

Self Assessment Question

6. What is the domain of the person represented by this Distinguished Name (DN)?

   cn=John Smith,ou=Sales,dc=example,dc=com.

   a. Example
   b. Example.com
   c. Com
   d. Sales

Answer: Example.com

Self Assessment Question

7. Which type of zone prevents the DNS server from looking outside the zone on the DNS server to resolve a name?

   a. Stub zone
   b. Primary zone
   c. A root zone
   d. Active directory integrated zone

Answer: A root zone

Self Assessment Question

8. Which type of zone resolves an IP address to a name?

a. Reverse lookup zone

b. Forward lookup zone

c. Primary zone

d. Secondary zone

Answer: Reverse lookup zone

Self Assessment Question

9. If a DNS server has both a conditional forwarder defined for a given domain and a server level forwarder, which forwarder will be used to resolve a query in the given domain?

   a. The conditional forwarder
   b. Forwarder
   c. Zone delegation
   d. None of the above

Answer: The conditional forwarder

Self Assessment Question

10. Which of the following is not a reason to use AD integrated zones rather than standard zones?.

a. Fault-tolerance

b. Security

c. Simplicity of management

d. The database is stored in easy-to-edit text files.

Answer: The database is stored in easy-to-edit text files.

Self Assessment Question

11. Which of the following DC resource record types would you look for if trying to troubleshoot workstations not being able to log on to a domain? [Select multiple correct answers.]

    a. A
    b. CNAME
    c. SRV
    d. MX

Answer: A and C

Self Assessment Question

12. Which of the following name-resolution methods use manually updated text files to record name mappings? [Select multiple correct answers].

    a. DNS
    b. HOSTS
    c. WINS
    d. LMHOSTS

Answer: B and D

Self Assessment Question

13. In a standard primary zone, what name server(s) can an administrator update the zone database on? [Choose the best answer].

    a. Secondary zone
    b. Active directory integrated zone.
    c. Primary zone
    d. Any Server

Answer: Primary zone

Self Assessment Question

14. When monitoring a DNS server, which type of test sends a query to other name servers for resolution? [Choose the best answer].

    a. Simple query
    b. Recursive query
    c. Forward lookup query
    d. Iterative query

Answer: Recursive query

Self Assessment Question

15. Which of the following elements is required to successfully install and configure DNS? [Choose the best answer].

    a. DHCP
    b. Static IP Address
    c. Active directory
    d. Windows 2000 client

Answer: Static IP Address

Assignment

Answer the following set of questions:

1. What is the DNS?
2. Explain address resolution mechanism.
3. What are the types of DNS Zones?
4. How can we configure cache –only servers?
5. What are DNS Records types?
6. How can we create DNS recourse records?
7. What is conditional forwarding?
8. How can we configure primary and secondary zones?
9. What are the functionalities of NS, A and CNAME records?
10. What are the functionalities of SOA and PTR records?

Configuring DNS Zones and Records

Summary:

- DNS clients and DNS servers both initiate queries
- DNS was created to support the Internet's growing number of hosts.
- Zone data is stored in Active Directory rather than in zone files
- When a DNS server resolves a DNS name successfully, it adds the name to its cache.
- A caching-only server will not host any DNS zone data; it only answers lookups for DNS clients.
- DNS forwarding is the process by which particular sets of DNS queries are handled by a designated server.
- CNAME records can be used to alias one name to another. CNAME stands for Canonical Name.

Configuring DNS Zones and Records

Document Links

Topics	URL	Note
Understanding DNS, Understanding DNS Names and Zones, Understanding the Address Resolution Mechanism, configuring and Managing DNS Zones	http://www.tomshardware.com/faq/id-1932439/active-directory-integrated-dns-zone.html http://www.itingredients.com/how-to-configure-ad-integrated-dns-zone-windows-server-2012-r2/ http://www.tomshardware.com/faq/id-1954324/configure-active-directory-integrated-dns-zone-windows-server-2012-dns-server.html https://mizitechinfo.wordpress.com/2014/07/07/step-by-step-configure-dns-zone-transfer-in-windows-server-2012-r2/ https://www.interfacett.com/blogs/how-to-configure-a-dns-secondary-zone-in-windows-server-2008-2012/	The links will give the depth idea about DNS,its address resolution and management of DNS Zones
Understanding DNS, Understanding DNS Names and Zones, Understanding the Address Resolution Mechanism, configuring and Managing DNS Zones	https://www.windows-server-2012-r2.com/dns-zone-delegation.html https://www.techveze.com/configuring-zone-delegation/	The links will give the depth idea about DNS,its address resolution and management of DNS Zones

Configuring DNS Zones and Records

Document Links

Topics	URL	Note
Installing DNS, Configuring Primary and Secondary Zones, Configuring Active Directory-Integrated Zones, configuring Zone Delegation	https://www.sqa.org.uk/e-learning/NetInf102CD/page_34.htm https://social.technet.microsoft.com/Forums/en-US/7d58ec09-3f8a-475d-b935-ebb97dc0d8ff/dns-zone-delegation?forum=winserveripamdhcpdns https://social.technet.microsoft.com/Forums/en-US/60892ad6-bb7a-429a-aef4-4ac717cf80cd/windows-server-dns-delegation?forum=winserverDS	The links will give the understanding to install and configure different zone types
configuring Zone Delegation, configuring Stub Zones	https://www.lynda.com/Server-tutorials/Configure-zone-delegation/440664/463136-4.html https://www.interfacett.com/blogs/how-to-configure-a-dns-stub-zone-in-windows-server/ http://www.itingredients.com/how-to-configure-stub-zone-in-dns/ https://www.dell.com/support/article/in/en/indhs1/sln164029/how-to-create-a-stub-zone-on-a-windows-dns-server?lang=en https://www.c-sharpcorner.com/UploadFile/cd7c2e/how-to-create-a-stub-zone-in-windows-server-2012/	The links will give the understanding to install and configure different zone types, zone delegation

Configuring DNS Zones and Records

Document Links

Topics	URL	Note
configuring Stub Zones, configuring Caching-Only Servers	http://www.mcmcse.com/microsoft/guides/70-411/dns_zones.shtml https://www.itprotoday.com/compute-engines/how-do-i-create-caching-only-dns-server http://techgenix.com/windows-server-2012-dns-part2/ https://www.serverwatch.com/tutorials/article.php/2193011/Back-To-Basics-DNS-Server-Roles--Cachingonly-Servers.htm https://social.technet.microsoft.com/Forums/en-US/b71e0d43-1789-4fc1-b560-48ddea424040/dns-server-cache-only?forum=winserverNIS	Links will describe the installation and configuration steps to stub zone and cache only servers
configuring Stub Zones, configuring Caching-Only Servers	https://www.digitalocean.com/community/tutorials/how-to-configure-bind-as-a-caching-or-forwarding-dns-server-on-ubuntu-14-04 https://www.ibm.com/support/knowledgecenter/en/SSLTBW_2.3.0/com.ibm.zos.v2r3.halz002/dns_caching_only_servers.htm https://www.sqa.org.uk/e-learning/NetInf102CD/page_28.htm	Links will describe the installation and configuration steps to stub zone and cache only servers

Configuring DNS Zones and Records

Document Links

Topics	URL	Note
Configuring Forwarding and Conditional Forwarding	https://medium.com/tech-jobs-academy/dns-forwarding-and-conditional-forwarding-f3118bc93984 http://social.dnsmadeeasy.com/blog/understanding-dns-forwarding/ https://www.oreilly.com/library/view/windows-server-cookbook/0596006330/ch13s10.html https://www.interfacett.com/blogs/windows-server-how-to-configure-a-conditional-forwarder-in-dns/ https://www.techveze.com/configuring-forwarding-conditional-forwarding/ https://www.petri.com/configure-basic-dns-records-windows-server-2008-r2-and-2012	Links will give idea to configuring forwarding and conditional forwarding
Configuring DNS Record types	https://docs.microsoft.com/en-us/windows-server/networking/technologies/ipam/dns-resource-record-management https://simpledns.com/help/dns-record-types https://docs.microsoft.com/en-us/windows-server/networking/technologies/ipam/add-a-dns-resource-record	Links will describe the steps to configure different records types

Configuring DNS Zones and Records

Document Links

Topics	URL	Note
DNS Record types, creating and Configuring DNS Resource Records	http://www.tomshardware.com/faq/id-1954305/adding-dns-host-record-windows-server-2012-dns-server.html https://www.microsoftpressstore.com/articles/article.aspx?p=2756482&seqNum=2 http://gopalthorve.com/create-dns-resource-record-windows-server/ http://www.tutorialspoint.com/articles/adding-host-a-dns-records-in-windows-server-2008-r2 https://www.sqa.org.uk/e-learning/NetInf102CD/page_39.htm https://support.dnsimple.com/articles/soa-record/ https://www.oreilly.com/library/view/windows-server-2012/9780133116007/ch10lev2sec6.html	Links will give the detailed idea about different record & creating and managing resource records
DNS Record types, creating and Configuring DNS Resource Records	https://blogs.msmvps.com/acefekay/category/dns-ns-record/ https://simpledns.com/help/ns-records https://social.technet.microsoft.com/Forums/windows/en-US/26f3e751-c41c-4af3-9cfc-4c89af3ecf5f/adding-ns-records-to-primary-nonad-dns-zones?forum=winserveripamdhcpdns	Links will give the detailed idea about different record & creating and managing resource records

Configuring DNS Zones and Records

Document Links

Topics	URL	Note
Start of Authority(SOA) Records, Name Server(NS) Records, Host(A and AAAA) Records, Canonical Name(CNAME) Records, Pointer(PTR) Records	https://serverfault.com/questions/595208/proper-way-to-create-an-ns-record-in-windows-dns https://www.stigviewer.com/stig/microsoft_windows_2012_server_domain_name_system/2015-03-30/finding/V-58593 http://dns-record-viewer.online-domain-tools.com/ http://www.pcnames.com/articles/what-are-dns-records https://www.techopedia.com/2/28806/internet/12-dns-records-explained https://searchwindowsserver.techtarget.com/definition/canonical-name https://support.dnsimple.com/articles/cname-record/	Give description, management and configuration of records types
Start of Authority(SOA) Records, Name Server(NS) Records, Host(A and AAAA) Records, Canonical Name(CNAME) Records, Pointer(PTR) Records	https://www.server-world.info/en/note?os=Windows_Server_2012&p=dns&f=6 https://docs.microsoft.com/en-us/windows-server/networking/core-network-guide/cncg/server-certs/create-an-alias-cname-record-in-dns-for-web1 https://simpledns.com/help/cname-records	Give description, management and configuration of records types

Configuring DNS Zones and Records

Document Links

Topics	URL	Note
Start of Authority(SOA) Records, Name Server(NS) Records, Host(A and AAAA) Records, Canonical Name(CNAME) Records, Pointer(PTR) Records	http://www.tutorialspoint.com/articles/creating-cname-records-in-windows-2008-r2-dns-server https://simpledns.com/help/ptr-records https://www.server-world.info/en/note?os=Windows_Server_2012&p=dns&f=4 https://kb.intermedia.net/Article/1317 https://www.serverbrain.org/solutions-2003/host-address-a-and-pointer-ptr-records.html	Give description, management and configuration of records types
Start of Authority(SOA) Records, Name Server(NS) Records, Host(A and AAAA) Records, Canonical Name(CNAME) Records, Pointer(PTR) Records	https://www.itprotoday.com/compute-engines/how-do-i-create-caching-only-dns-server ftp://ftp.iitb.ac.in/LDP/en/solrhe/chap21sec164.html	Give description, management and configuration of records types

Configuring DNS Zones and Records

Video Links

Topics	URL	Note
DNS, Address Resolution mechanism, installing and configuring DNS zones	https://www.youtube.com/watch?v=JIwi6ii-rzI https://www.youtube.com/watch?v=3EvjwlQ43_4 https://www.youtube.com/watch?v=W7NvaBnkyWI https://www.youtube.com/watch?v=4VD0RMyfg2Y https://www.youtube.com/watch?v=WFdPz3mGquc	Links will describe about DNS, its address resolution mechanism and configuration of Zones
Configuring active directory zone, stub zone, cache only servers, forwarding	https://www.youtube.com/watch?v=OOzZHaxb3sw https://www.youtube.com/watch?v=VtSPwXnHK0s https://www.youtube.com/watch?v=ukGljpnMi2M https://www.youtube.com/watch?v=dtnIpq0jDlg https://www.youtube.com/watch?v=4IOdpGZBvrA	Links will give the clear idea about configuration of zones , forwarding and cache only servers
Zone delegation , Records types, resource record, SOA,NS,CNAME,PTR,A & AAAA	https://www.youtube.com/watch?v=6uEwzkfViSM https://www.youtube.com/watch?v=cwT82ibOM2Q https://www.youtube.com/watch?v=iktrnk3Nd2E https://www.youtube.com/watch?v=mxa1UTNf-I0 https://www.youtube.com/watch?v=WefNAjaiR3Y	Links will describe different types of records

Configuring DNS Zones and Records

E-Book Links

Topics	URL
DNS, Address Resolution mechanism, installing and configuring DNS zones	https://www.google.co.in/search?q=01-WS2012-R2-intro+to+R2&oq=01-WS2012-R2-intro+to+R2&aqs=chrome..69i57.1101j0j7&sourceid=chrome&ie=UTF-8 http://social.dnsmadeeasy.com/wp-content/uploads/2016/12/DNS-for-Dummies-ebook-3-min.pdf
Configuring active directory zone, stub zone, cache only servers, forwarding	http://download.microsoft.com/download/0/C/B/0CB33133-C6F7-48A6-B7CC-D927988FCB32/Microsoft_Press_ebook_Introducing_Windows_Server_2012_PDF.pdf
Zone delegation , Records types, resource record	https://ptgmedia.pearsoncmg.com/images/9780735684249/samplepages/9780735684249.pdf https://hub.dyn.com/product-collateral/ebook-dns-fundamentals-from-a-technical-perspective http://www.trustfm.net/ebooks/DedicatedServer.php?page=DNS
SOA,NS,CNAME,PTR,A & AAAA	https://blogs.technet.microsoft.com/keithmayer/2014/02/11/12-free-ebooks-on-windows-server-2012-r2-windows-8-1-system-center-2012-r2-windows-azure-and-more/ https://www.digitalocean.com/community/tutorials/an-introduction-to-dns-terminology-components-and-concepts