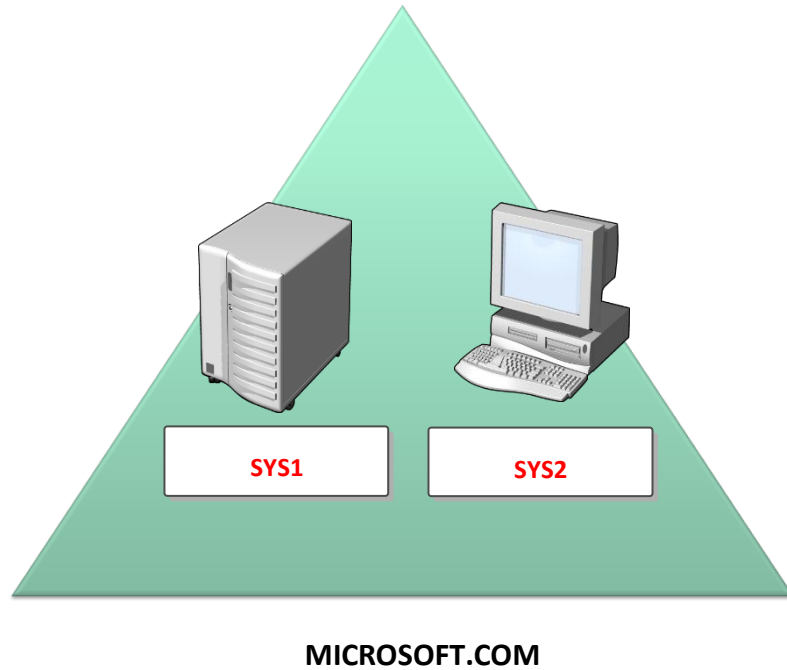


DOMAIN NAMING SYSTEM (DNS)

Prerequisites:

Before working on this lab, you must have

1. A computer running windows 2012 server or Domain Controller.
2. A computer running windows 2012 server.



SYS1

Domain Controller / DNS Server

IP Address	10.0.0.1
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.1

SYS2

Member Server / DNS Server

IP Address	10.0.0.2
Subnet Mask	255.0.0.0
Preferred DNS	10.0.0.2

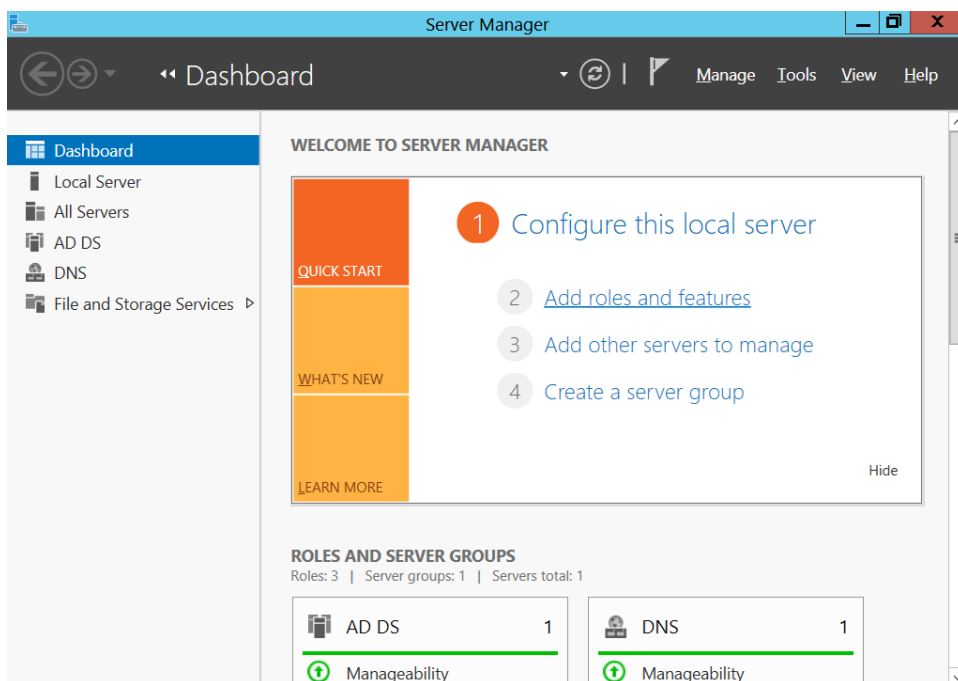
Lab – 1: Installing DNS Service

SYS1 -CONFIGURATION

1. Select Click **Server Manager**.



2. In the Server Manager Console, Select **Add roles and features**



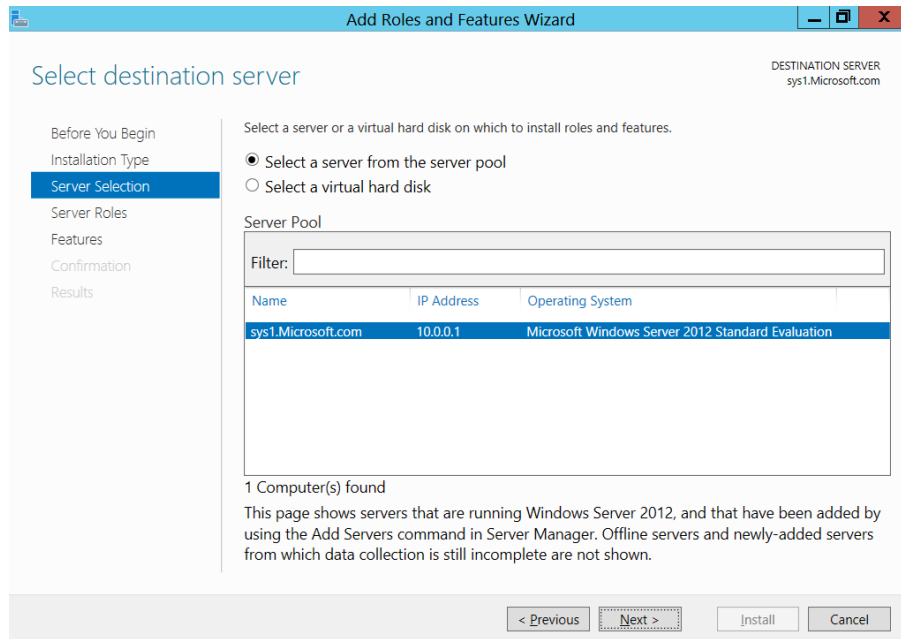
3. In Before you begin page, click **Next**.

The screenshot shows the 'Add Roles and Features Wizard' window. The title bar reads 'Add Roles and Features Wizard'. The main heading is 'Before you begin'. On the right, it says 'DESTINATION SERVER sys1.Microsoft.com'. A left-hand navigation pane lists: 'Before You Begin' (selected), 'Installation Type', 'Server Selection', 'Server Roles', 'Features', 'Confirmation', and 'Results'. The main content area explains the wizard's purpose: 'This wizard helps you install roles, role services, or features. You determine which roles, role services, or features to install based on the computing needs of your organization, such as sharing documents, or hosting a website.' It then lists prerequisites: 'To remove roles, role services, or features: Start the Remove Roles and Features Wizard' and 'Before you continue, verify that the following tasks have been completed: • The Administrator account has a strong password • Network settings, such as static IP addresses, are configured • The most current security updates from Windows Update are installed'. It also states: 'If you must verify that any of the preceding prerequisites have been completed, close the wizard, complete the steps, and then run the wizard again. To continue, click Next.' At the bottom left is a checkbox labeled 'Skip this page by default'. At the bottom right are buttons: '< Previous', 'Next >' (highlighted with a dashed border), 'Install', and 'Cancel'.

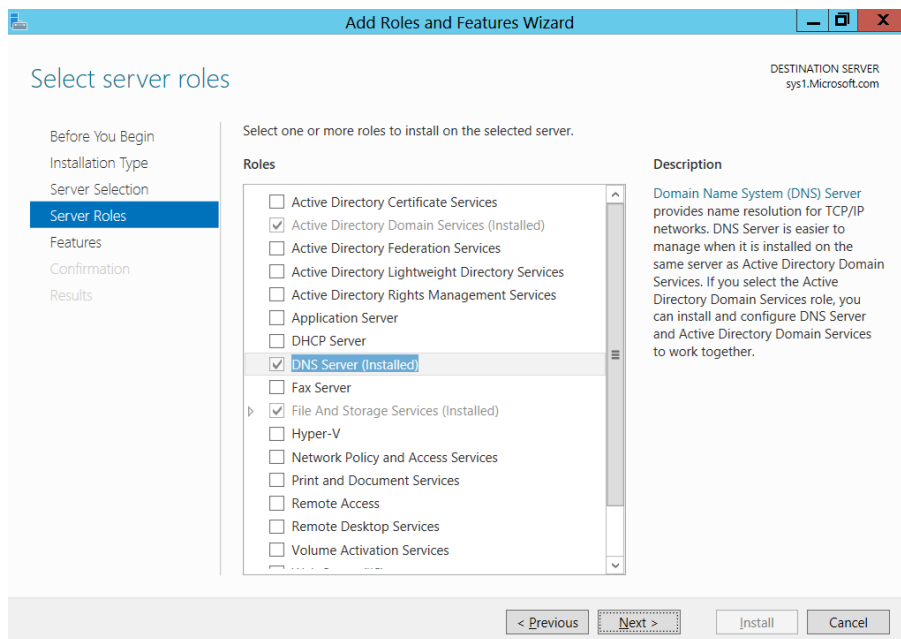
4. Select Role-based or feature-based installation and click **Next**.

The screenshot shows the 'Add Roles and Features Wizard' window at the 'Select installation type' step. The title bar reads 'Add Roles and Features Wizard'. The main heading is 'Select installation type'. On the right, it says 'DESTINATION SERVER sys1.Microsoft.com'. The left-hand navigation pane lists: 'Before You Begin', 'Installation Type' (selected), 'Server Selection', 'Server Roles', 'Features', 'Confirmation', and 'Results'. The main content area explains the selection: 'Select the installation type. You can install roles and features on a running physical computer or virtual machine, or on an offline virtual hard disk (VHD)'. There are two radio button options: 'Role-based or feature-based installation' (selected) with the description 'Configure a single server by adding roles, role services, and features.', and 'Remote Desktop Services installation' with the description 'Install required role services for Virtual Desktop Infrastructure (VDI) to create a virtual machine-based or session-based desktop deployment.' At the bottom right are buttons: '< Previous', 'Next >' (highlighted with a dashed border), 'Install', and 'Cancel'.

5. Select a server (**sys1.Microsoft.com**) from the server pool and click **Next**.



6. Check box **DNS Server**, click **Next** → **Next** → **Install** → **Finish**.

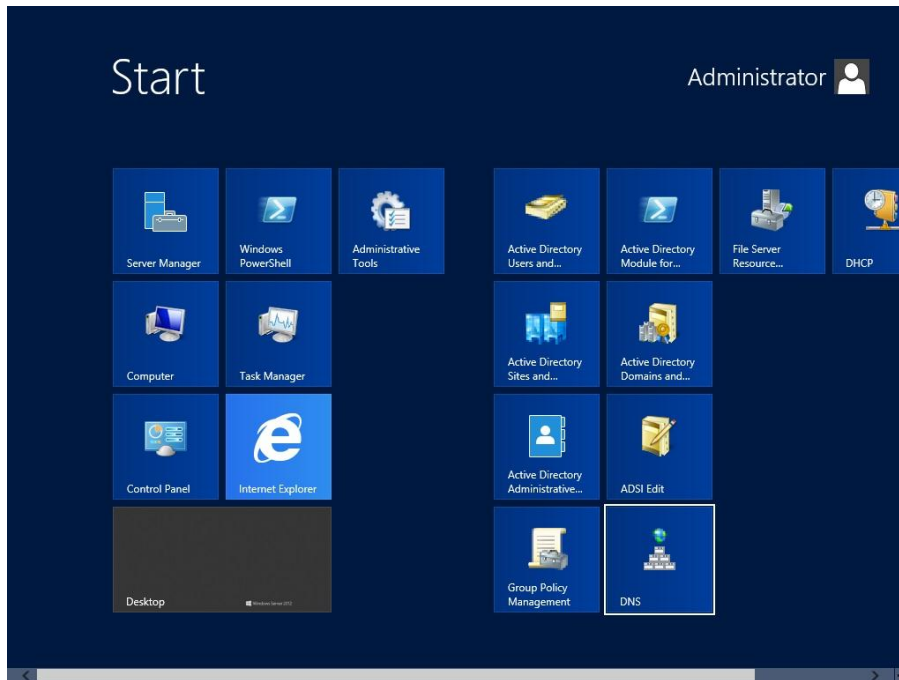


Note: On **Domain Controller**, by default DNS Server Role will be installed.

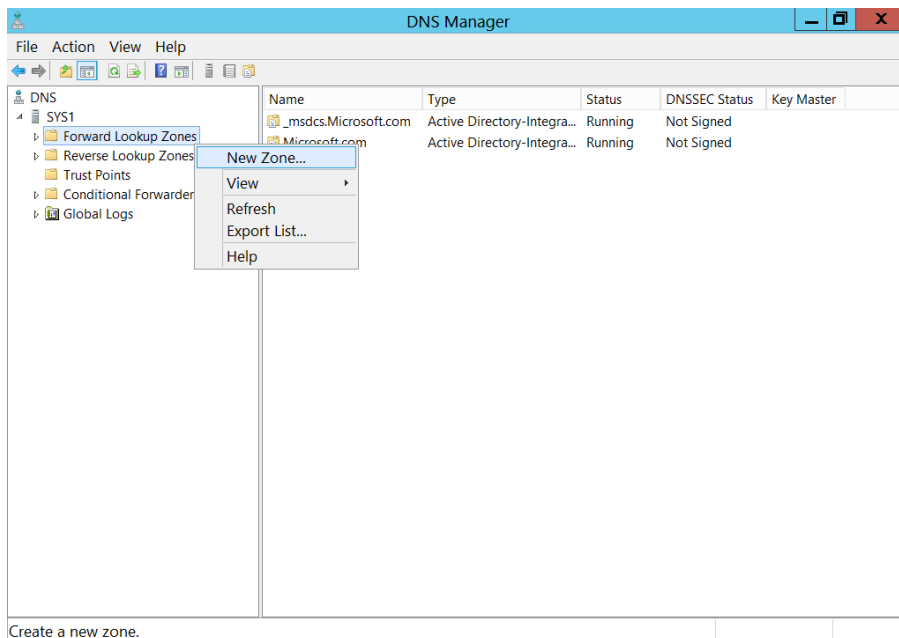
On **Member Server** we have to install the DNS Server Role Manually using the same process.

Lab – 2: Creating Standard Primary - Forward Lookup Zone

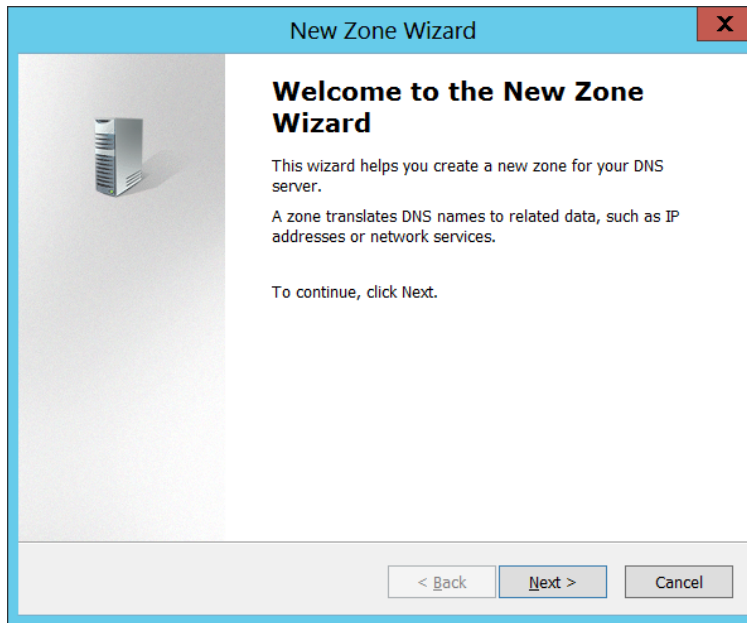
1. Go to Start, select **DNS**.



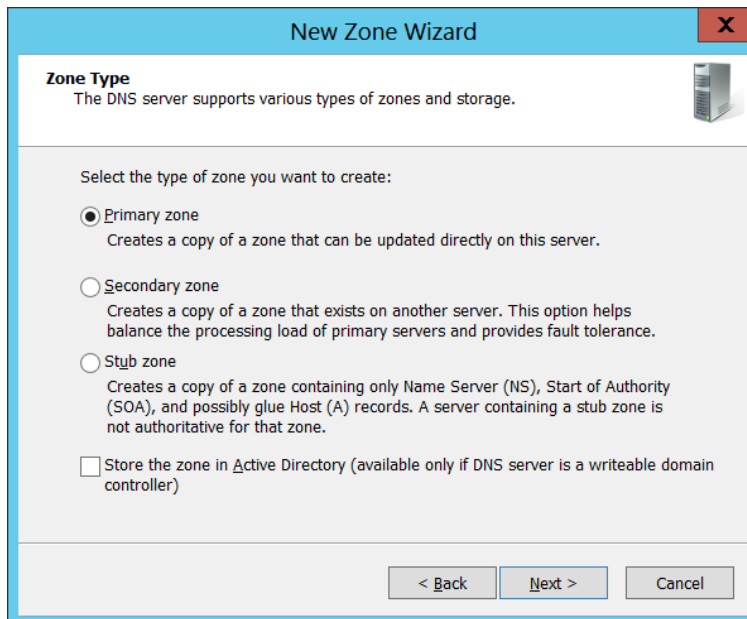
2. In the DNS dialog box, Expand the **DNS → Server name** in the left pane, right click the **Forward Lookup Zones** → select **New Zone**



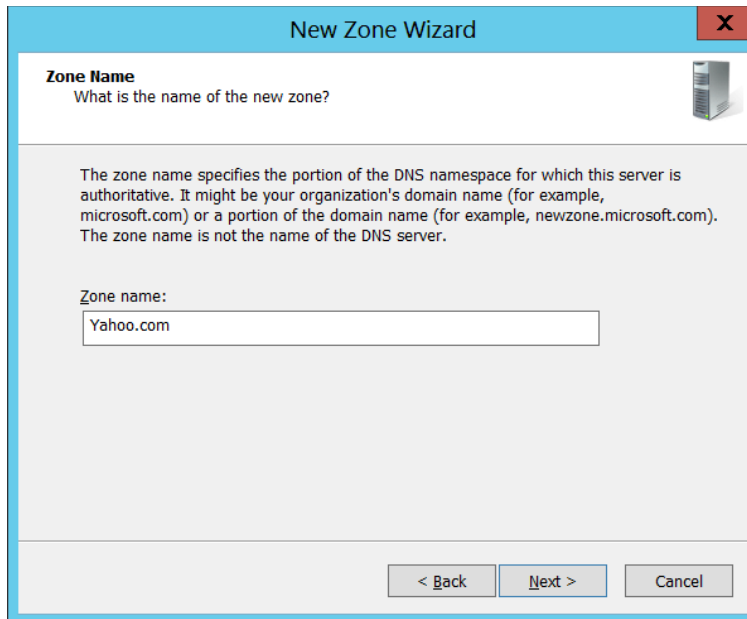
3. In the welcome to new zone wizard click **Next**



4. Select **"Primary Zone"** and Remove the check box for **"Store the zone in Active Directory"**, click **Next**.

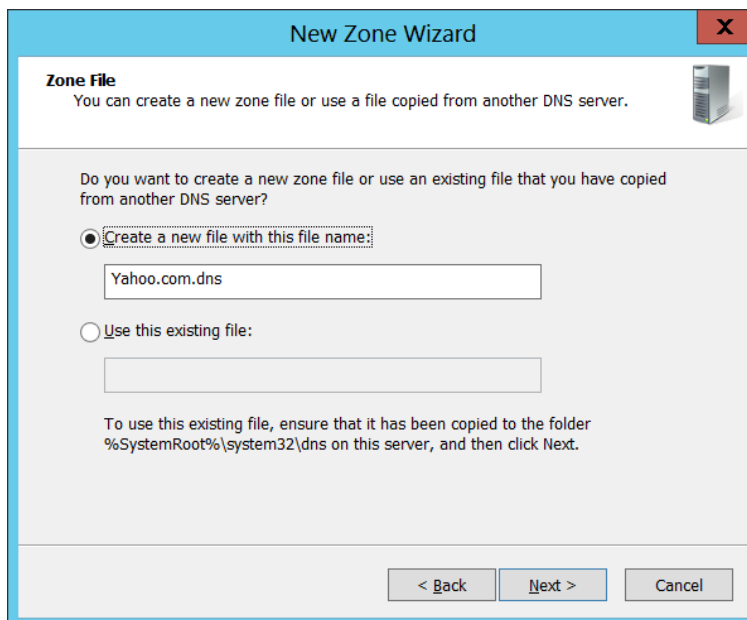


5. In the Zone Name screen, type in the name of the zone you are creating. This name is usually the FQDN of the DNS domain that the zone will contain, such as **YAHOO.COM** → click **Next**.



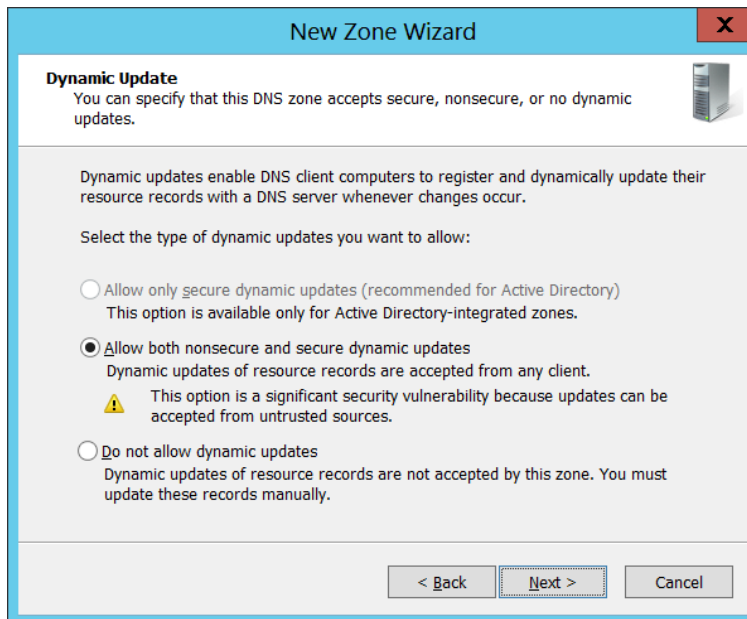
The screenshot shows the 'New Zone Wizard' dialog box with the 'Zone Name' tab selected. The title bar reads 'New Zone Wizard' with a close button (X). The 'Zone Name' section has a sub-header 'What is the name of the new zone?' and a server icon. Below this, explanatory text states: 'The zone name specifies the portion of the DNS namespace for which this server is authoritative. It might be your organization's domain name (for example, microsoft.com) or a portion of the domain name (for example, newzone.microsoft.com). The zone name is not the name of the DNS server.' A text box labeled 'Zone name:' contains the text 'Yahoo.com'. At the bottom are three buttons: '< Back', 'Next >', and 'Cancel'.

6. The Zone File screen appears. In this screen, you can either create a new zone file for the new zone, or configure the new zone to use an existing file. Click **Next**.

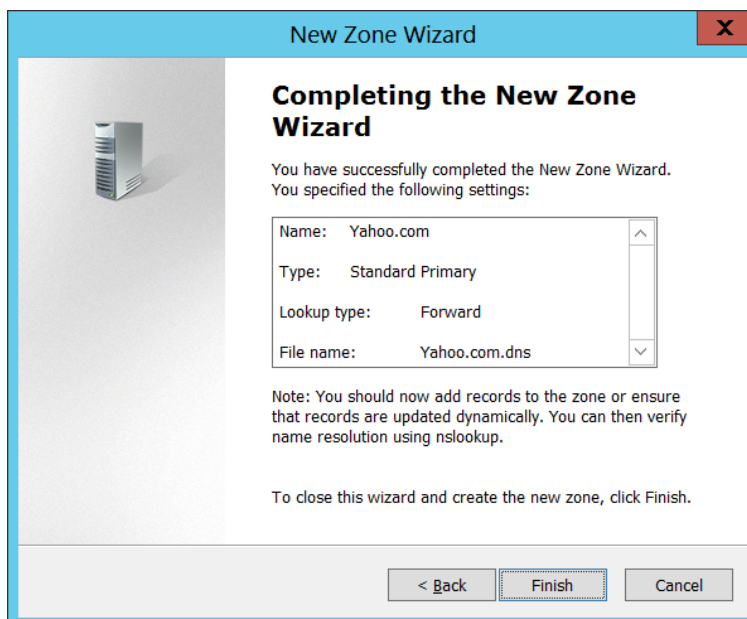


The screenshot shows the 'New Zone Wizard' dialog box with the 'Zone File' tab selected. The title bar reads 'New Zone Wizard' with a close button (X). The 'Zone File' section has a sub-header 'You can create a new zone file or use a file copied from another DNS server.' and a server icon. Below this, a question asks: 'Do you want to create a new zone file or use an existing file that you have copied from another DNS server?'. There are two radio button options: 'Create a new file with this file name:' (which is selected) and 'Use this existing file:'. The first option has a text box containing 'Yahoo.com.dns'. The second option has an empty text box. Below these options, a note states: 'To use this existing file, ensure that it has been copied to the folder %SystemRoot%\system32\dns on this server, and then click Next.' At the bottom are three buttons: '< Back', 'Next >', and 'Cancel'.

7. In dynamic Update Select "**Allow both non-secure and secure dynamic update**"→click **Next**.



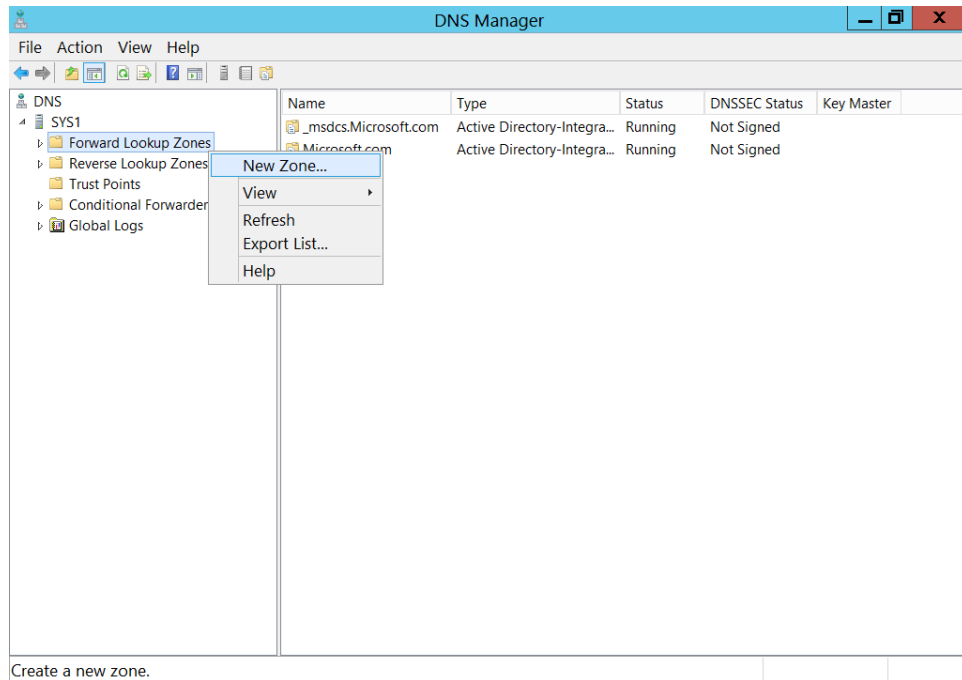
8. The Completing the New Zone Wizard screen appears. Click **Finish**.



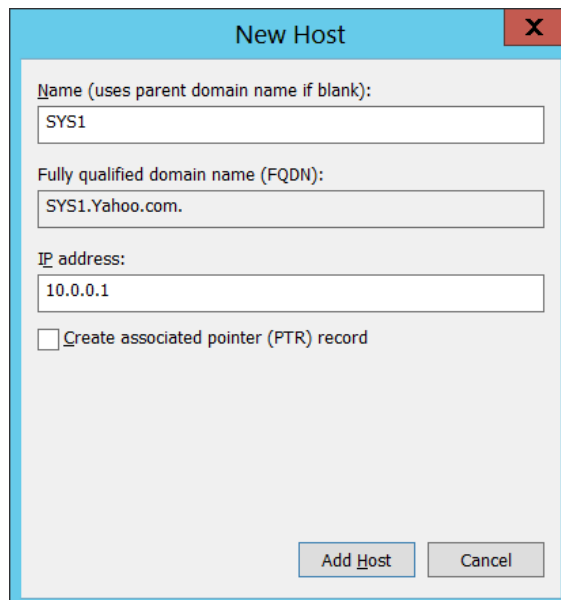
9. In the DNS Console, the new zone you created appears in the right pane.

Creating Host Records for the standard primary zone

1. Go to Start, select **DNS**.
2. Right click the zone and select **New Host**.

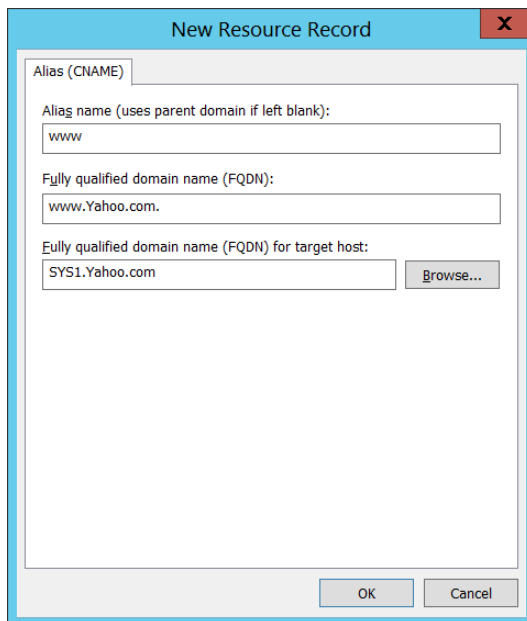


3. Enter the **Host name** for which you are configuring the record Ex: **SYS1**, enter the **corresponding IP address of the host** → click **Add Host** → **OK** → **Done**.



Creating an Alias record for the host record

1. Go to Start, select **DNS**.
2. Right click the zone and select **New Alias**.
3. Enter the name in the '**Alias Name**' dialog box Ex: www
4. Click Browse → Double click system name → double click Forward Lookup Zone → double click the zone name → select the host name → click **OK** → **OK**



VERIFICATION:

1. Open **Command Prompt** → type **ping FQDN** (Fully Qualified Domain Name)
Ex: Ping SYS1.YAHOO.COM (or) Ping WWW.YAHOO.COM
2. Name should be resolved into IP Address.

```
Administrator: C:\Windows\system32\cmd.exe
Microsoft windows [Version 6.2.9200]
(c) 2012 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>ping www.yahoo.com

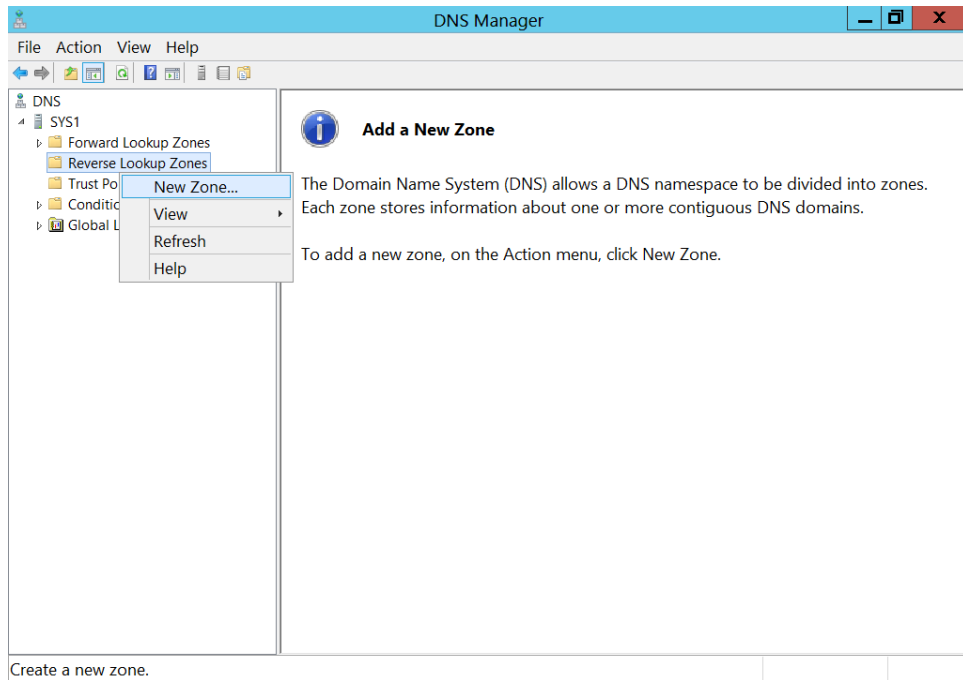
Pinging sys1.yahoo.com [10.0.0.1] with 32 bytes of data:
Reply from 10.0.0.1: bytes=32 time<1ms TTL=128
Reply from 10.0.0.1: bytes=32 time<1ms TTL=128
Reply from 10.0.0.1: bytes=32 time<1ms TTL=128
Reply from 10.0.0.1: bytes=32 time<1ms TTL=128

Ping statistics for 10.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\Users\Administrator>
```

Lab – 3: Creating Standard Primary - Reverse Lookup Zone

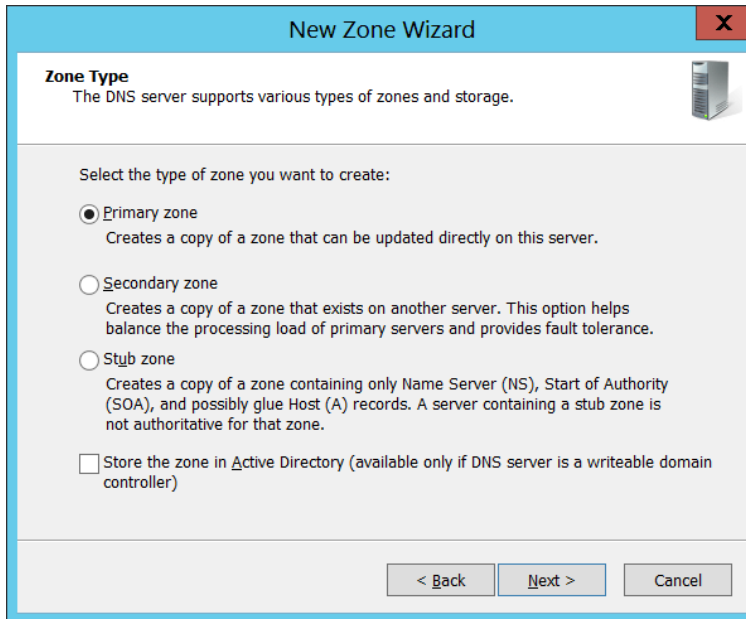
1. Go to Start, select **DNS**.
2. In the DNS dialog box, expand the **DNS server's name** in the left pane →right click the **Reverse Lookup Zones** →Select **New Zone**.



3. Click **Next**



4. Select **"Primary Zone"** and Remove the check box for **"Store the zone in Active Directory"**, click **Next**.



The screenshot shows the 'New Zone Wizard' window with the 'Zone Type' tab selected. The window title is 'New Zone Wizard' with a close button (X) in the top right corner. Below the title bar, there is a section titled 'Zone Type' with a server icon and the text 'The DNS server supports various types of zones and storage.' The main area contains the instruction 'Select the type of zone you want to create:' followed by three radio button options: 'Primary zone' (selected), 'Secondary zone', and 'Stub zone'. Each option has a descriptive text below it. At the bottom, there is an unchecked checkbox labeled 'Store the zone in Active Directory (available only if DNS server is a writeable domain controller)'. At the very bottom are three buttons: '< Back', 'Next >', and 'Cancel'.

Zone Type
The DNS server supports various types of zones and storage.

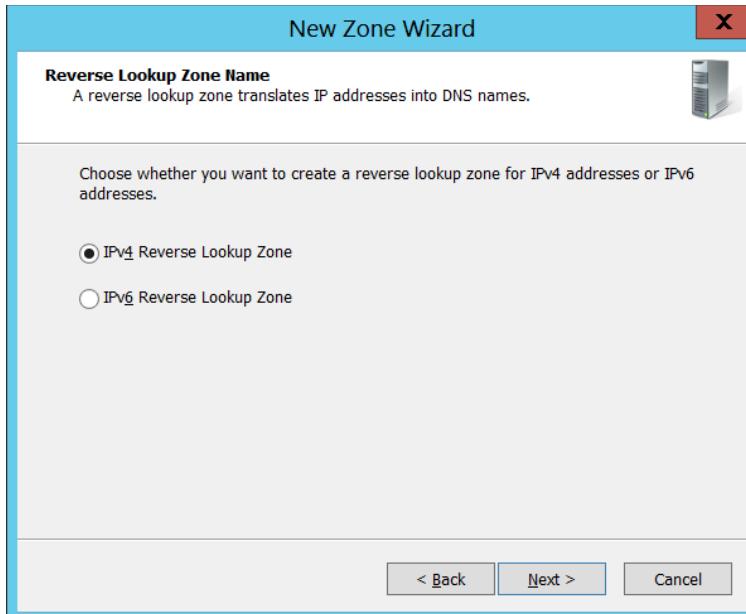
Select the type of zone you want to create:

- ☒ **Primary zone**
Creates a copy of a zone that can be updated directly on this server.
- ☐ **Secondary zone**
Creates a copy of a zone that exists on another server. This option helps balance the processing load of primary servers and provides fault tolerance.
- ☐ **Stub zone**
Creates a copy of a zone containing only Name Server (NS), Start of Authority (SOA), and possibly glue Host (A) records. A server containing a stub zone is not authoritative for that zone.

☐ Store the zone in Active Directory (available only if DNS server is a writeable domain controller)

< Back Next > Cancel

5. Check **IPv4 Reverse Lookup Zone**



The screenshot shows the 'New Zone Wizard' window with the 'Reverse Lookup Zone Name' tab selected. The window title is 'New Zone Wizard' with a close button (X) in the top right corner. Below the title bar, there is a section titled 'Reverse Lookup Zone Name' with a server icon and the text 'A reverse lookup zone translates IP addresses into DNS names.' The main area contains the instruction 'Choose whether you want to create a reverse lookup zone for IPv4 addresses or IPv6 addresses.' followed by two radio button options: 'IPv4 Reverse Lookup Zone' (selected) and 'IPv6 Reverse Lookup Zone'. At the bottom are three buttons: '< Back', 'Next >', and 'Cancel'.

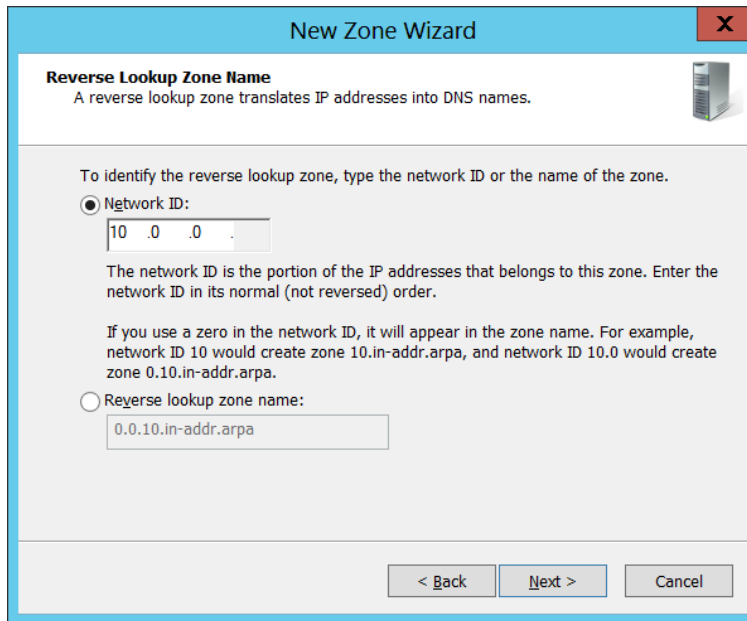
Reverse Lookup Zone Name
A reverse lookup zone translates IP addresses into DNS names.

Choose whether you want to create a reverse lookup zone for IPv4 addresses or IPv6 addresses.

- ☒ **IPv4 Reverse Lookup Zone**
- ☐ **IPv6 Reverse Lookup Zone**


< Back Next > Cancel

6. In the network ID give the first three octets Ex: 10.0.0→Next



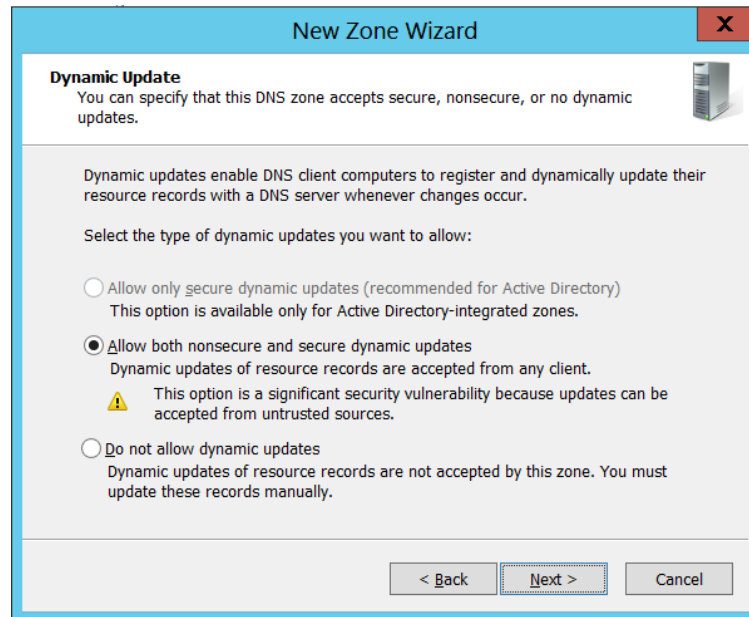
The screenshot shows the 'New Zone Wizard' window with the 'Reverse Lookup Zone Name' step. The title bar says 'New Zone Wizard' with a close button. The main heading is 'Reverse Lookup Zone Name' with a subtext: 'A reverse lookup zone translates IP addresses into DNS names.' Below this, a text box says 'To identify the reverse lookup zone, type the network ID or the name of the zone.' There are two radio buttons: 'Network ID:' (selected) and 'Reverse lookup zone name:'. The 'Network ID:' option has a text box containing '10 .0 .0'. Below this, a paragraph explains: 'The network ID is the portion of the IP addresses that belongs to this zone. Enter the network ID in its normal (not reversed) order. If you use a zero in the network ID, it will appear in the zone name. For example, network ID 10 would create zone 10.in-addr.arpa, and network ID 10.0 would create zone 0.10.in-addr.arpa.' The 'Reverse lookup zone name:' option has a text box containing '0.0.10.in-addr.arpa'. At the bottom right are three buttons: '< Back', 'Next >', and 'Cancel'.

7. Click Next



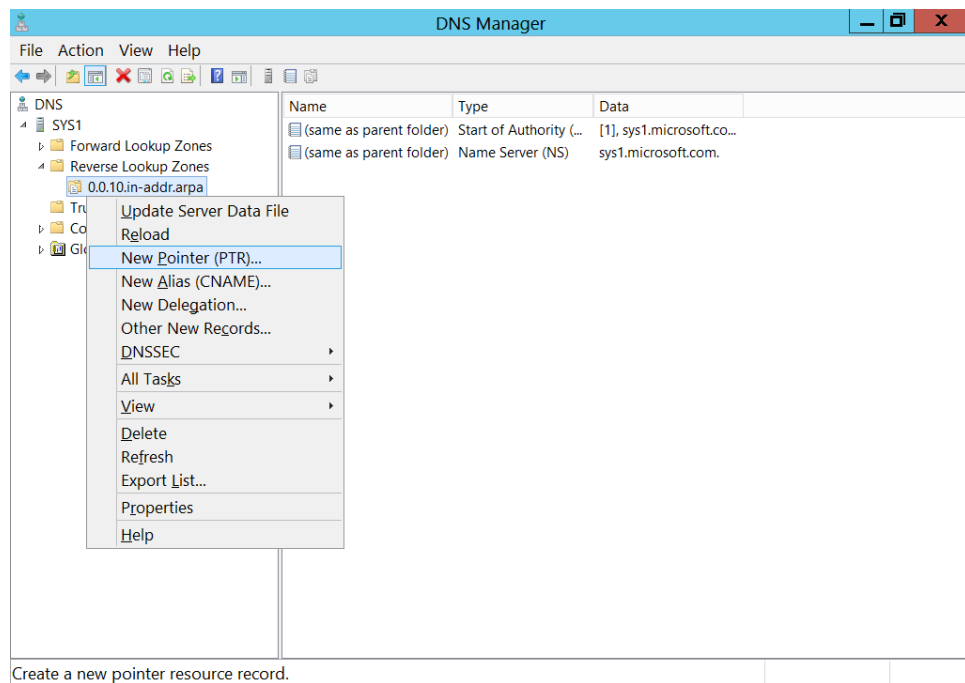
The screenshot shows the 'New Zone Wizard' window with the 'Zone File' step. The title bar says 'New Zone Wizard' with a close button. The main heading is 'Zone File' with a subtext: 'You can create a new zone file or use a file copied from another DNS server.' Below this, a text box says 'Do you want to create a new zone file or use an existing file that you have copied from another DNS server?'. There are two radio buttons: 'Create a new file with this file name:' (selected) and 'Use this existing file:'. The 'Create a new file with this file name:' option has a text box containing '0.0.10.in-addr.arpa.dns'. The 'Use this existing file:' option has an empty text box. Below this, a paragraph explains: 'To use this existing file, ensure that it has been copied to the folder %SystemRoot%\system32\dns on this server, and then click Next.' At the bottom right are three buttons: '< Back', 'Next >', and 'Cancel'.

8. In dynamic Update Select "**Allow both non-secure and secure dynamic update**" →click **Next** →**Finish**

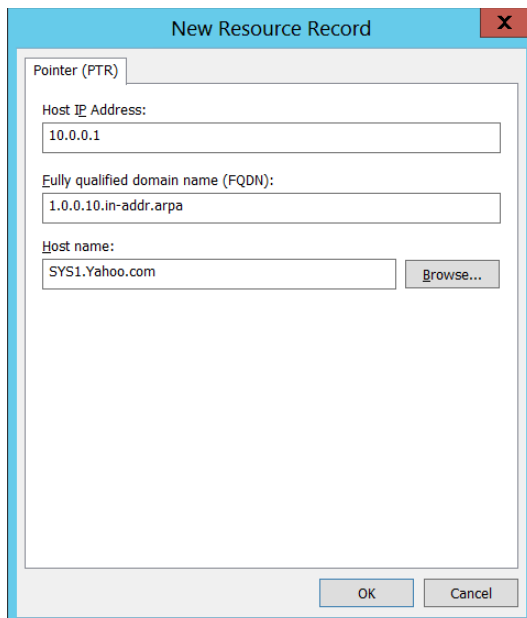


Creating pointer record

1. Go to Start, select **DNS**.
2. Expand Reverse lookup zone and Right click the zone →select **New Pointer**

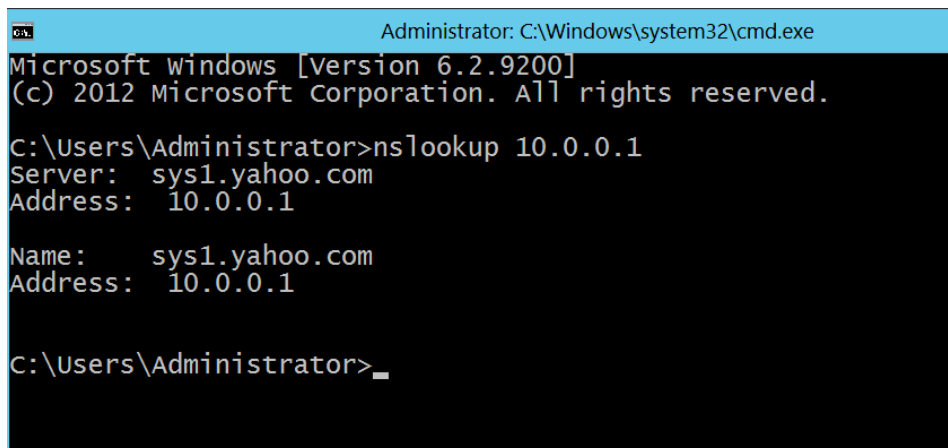


3. In the pointer record give the fourth octet →click browse →double click server name (SYS1) →double click Forward Lookup Zone →double click the zone name (Yahoo.com) →double click the host name (SYS1) →OK



Verification:

1. Open the command prompt and type **nslookup 10.0.0.1**



```
Administrator: C:\Windows\system32\cmd.exe
Microsoft windows [Version 6.2.9200]
(c) 2012 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>nslookup 10.0.0.1
Server: sys1.yahoo.com
Address: 10.0.0.1

Name: sys1.yahoo.com
Address: 10.0.0.1

C:\Users\Administrator>
```

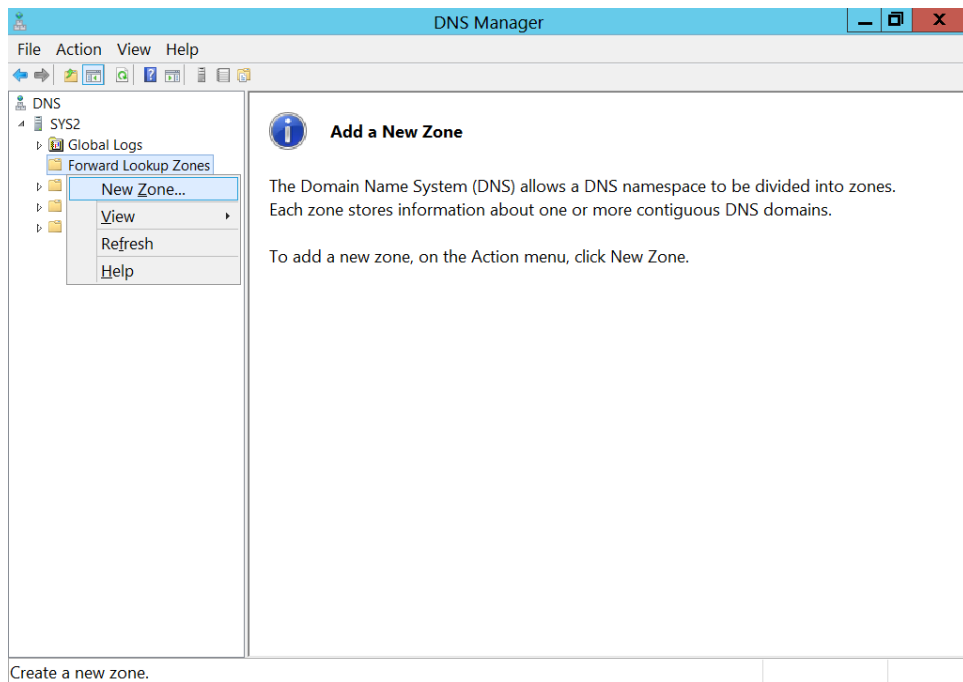
Lab – 4: Creating secondary zone

SYS1 - CONFIGURATION

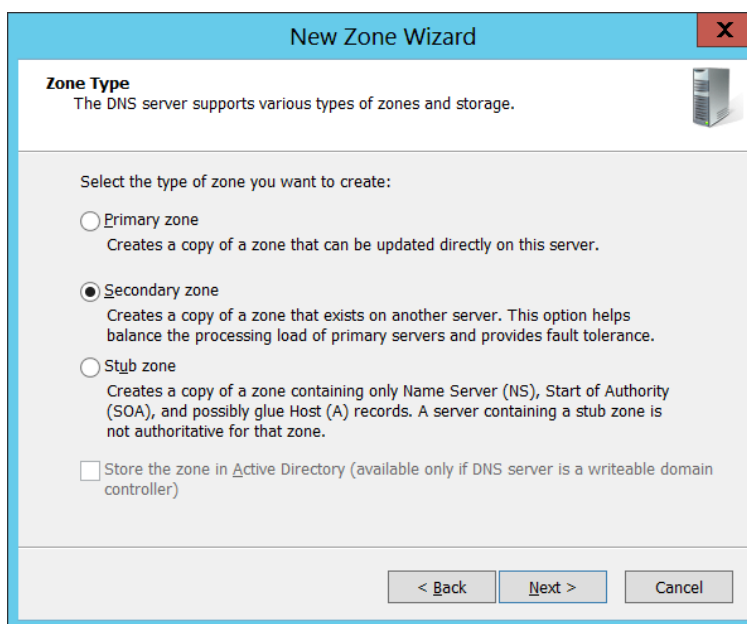
1. In **SYS1** one primary zone should be present. E.g.: Yahoo.com

SYS2 - CONFIGURATION

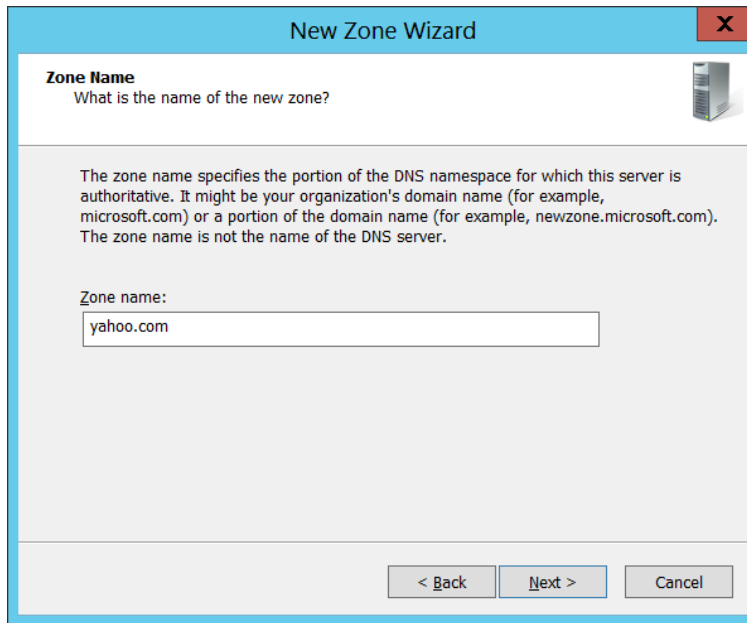
2. Go to Start, select **DNS**.
3. In the DNS dialog box, expand the DNS server's name in the left pane. Right click **Forward Lookup Zones** →select **New Zone** →Next



4. Select **Secondary zone** →Next.



5. Give the name of **primary zone** →click **Next**.



The screenshot shows the 'New Zone Wizard' window with the 'Zone Name' step. The title bar says 'New Zone Wizard' with a close button. The main heading is 'Zone Name' with a sub-heading 'What is the name of the new zone?'. Below this is a paragraph explaining that the zone name specifies the portion of the DNS namespace for which this server is authoritative, giving examples like 'microsoft.com' or 'newzone.microsoft.com'. A text box labeled 'Zone name:' contains 'yahoo.com'. At the bottom are three buttons: '< Back', 'Next >', and 'Cancel'.

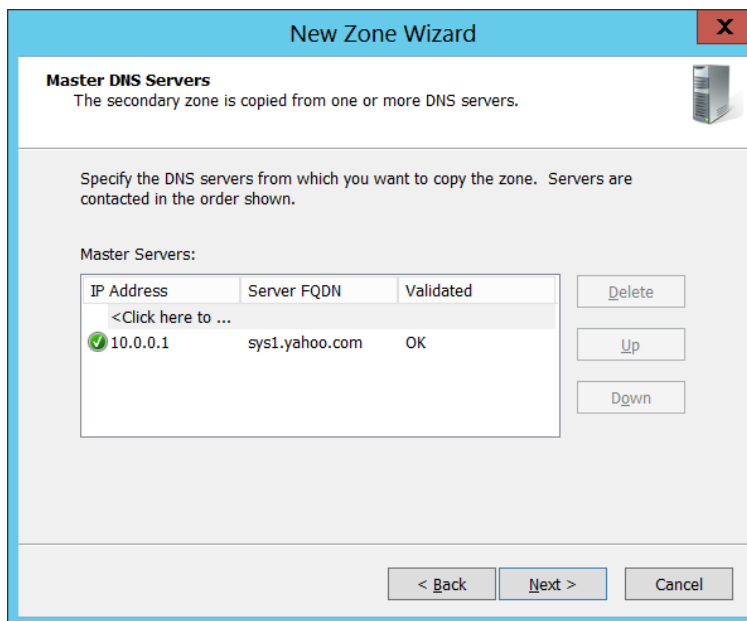
Zone Name
What is the name of the new zone?

The zone name specifies the portion of the DNS namespace for which this server is authoritative. It might be your organization's domain name (for example, microsoft.com) or a portion of the domain name (for example, newzone.microsoft.com). The zone name is not the name of the DNS server.

Zone name:
yahoo.com

< Back Next > Cancel

6. Give the **IP address of primary zone** Ex: 10.0.0.1 →click **Next**.



The screenshot shows the 'New Zone Wizard' window with the 'Master DNS Servers' step. The title bar says 'New Zone Wizard' with a close button. The main heading is 'Master DNS Servers' with a sub-heading 'The secondary zone is copied from one or more DNS servers.' Below this is a paragraph explaining that the secondary zone is copied from one or more DNS servers and that servers are contacted in the order shown. A table titled 'Master Servers:' has three columns: 'IP Address', 'Server FQDN', and 'Validated'. The first row shows '10.0.0.1' with a green checkmark, 'sys1.yahoo.com', and 'OK'. To the right of the table are buttons for 'Delete', 'Up', and 'Down'. At the bottom are three buttons: '< Back', 'Next >', and 'Cancel'.

Master DNS Servers
The secondary zone is copied from one or more DNS servers.

Specify the DNS servers from which you want to copy the zone. Servers are contacted in the order shown.

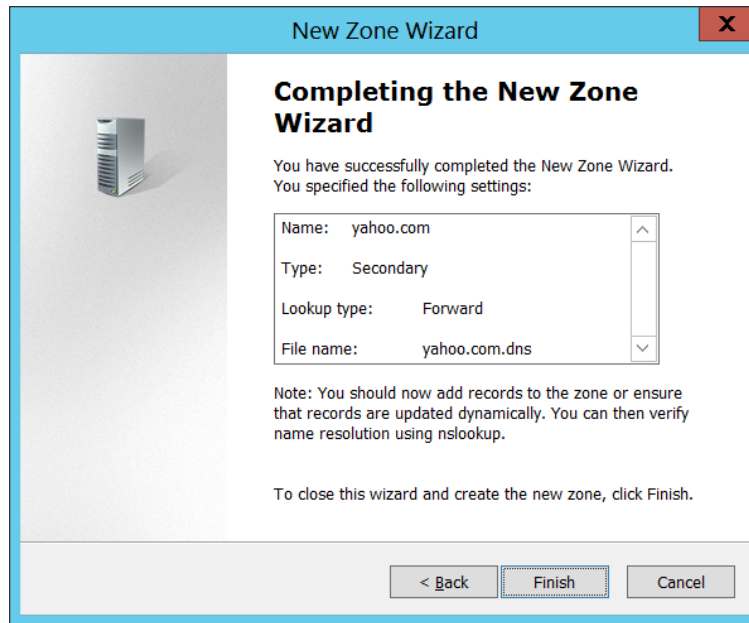
Master Servers:

IP Address	Server FQDN	Validated
<Click here to ...>		
✓ 10.0.0.1	sys1.yahoo.com	OK

Delete
Up
Down

< Back Next > Cancel

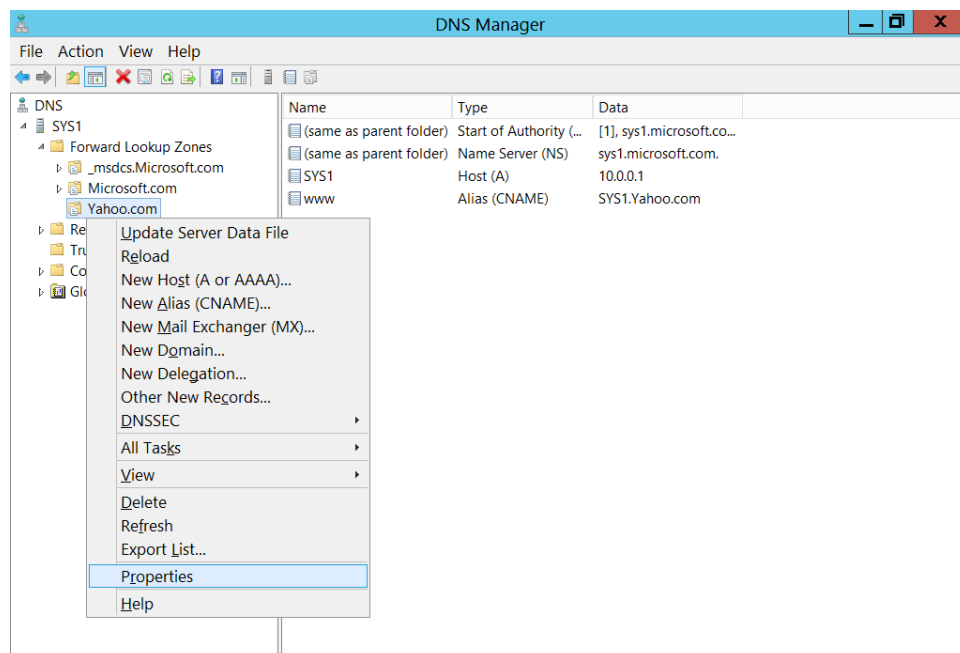
7. Click **Next** → **Finish**.



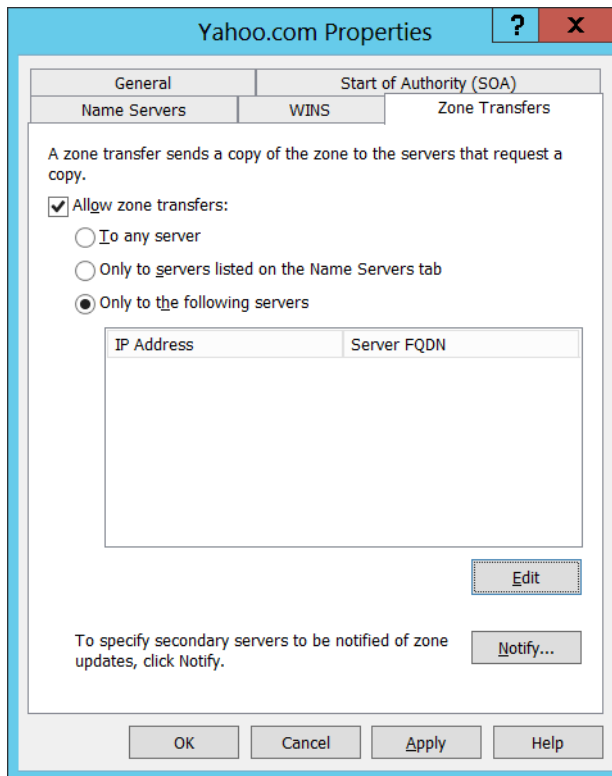
Allow zone transfers to secondary zone

SYS1-CONFIGURATION

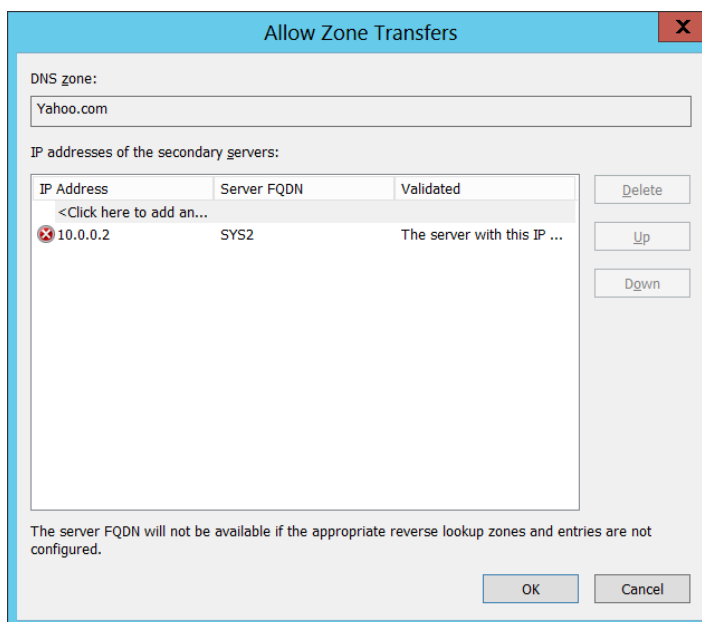
1. Go to Start, select **DNS**.
2. In the DNS dialog box, expand the DNS server's name in the left pane → Expand Forward Lookup Zone → right click **primary zone** → select **Properties**.



3. Select **Zone Transfers** Tab → check the box for **Allow zone transfers** → select **Only to the following servers**.



4. Click **Edit** and mention the **Computer IP Address of secondary zone**. Click **Notify** → Select **to the following servers** → and mention the **Computer IP Address of secondary zone**.



5. Click **Apply** → **OK** → Again Click **Apply** → **OK**.

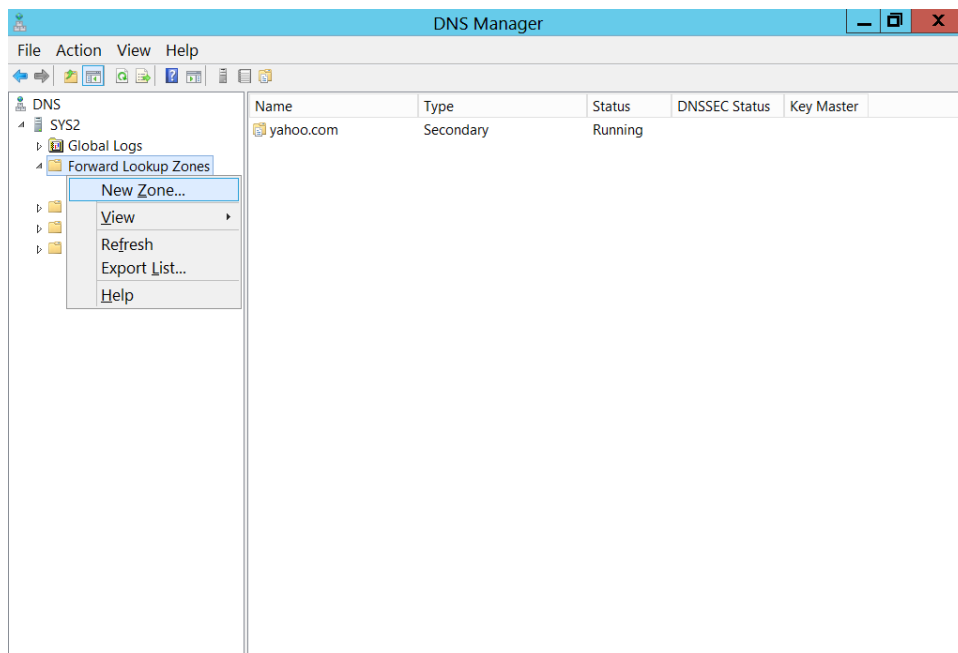
Lab – 5: Creating Stub zone

SYS1-CONFIGURATION

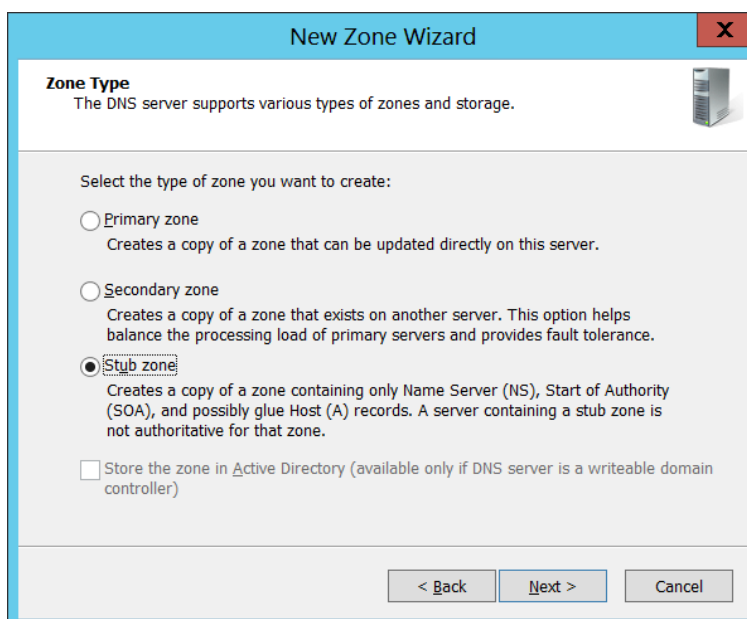
1. Log on to **SYS1** and create a primary zone **Msn.com** along with host and alias records.

SYS2-CONFIGURATION

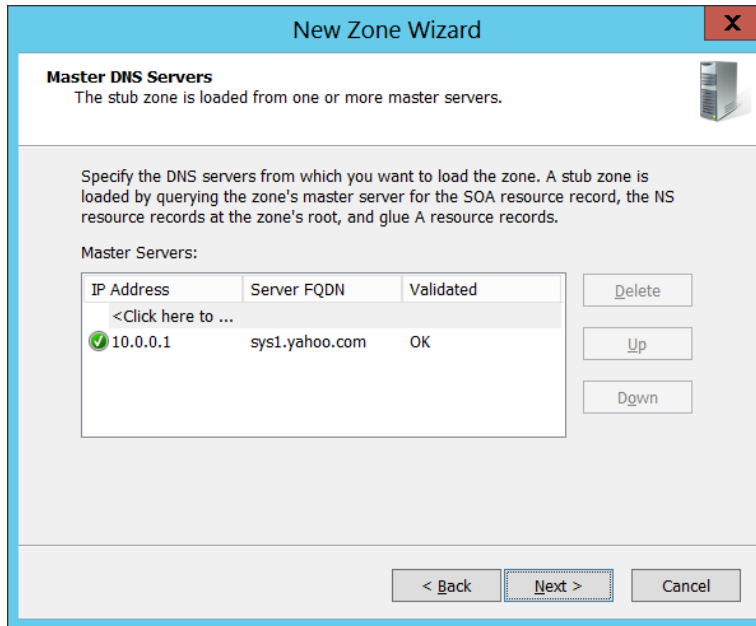
1. Log on to **SYS2** and Go to Start, select **DNS**.
2. In the DNS dialog box, Expand **DNS Server name** in the left pane, right click **Forward Lookup Zones** → Select **New Zone** → Next



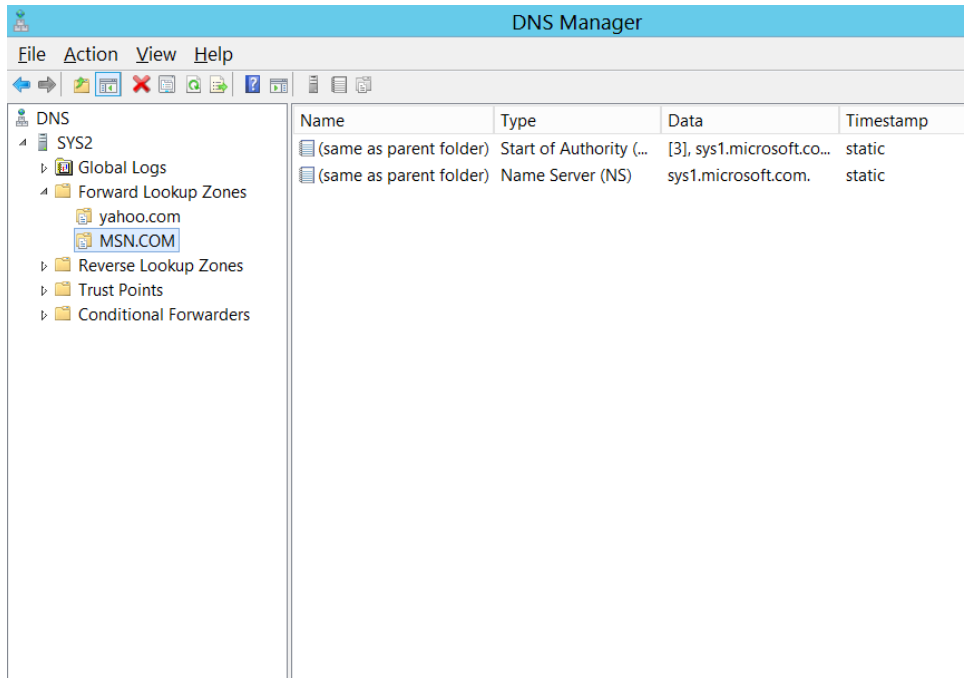
4. Select **Stub zone** → Next



5. Give the name of **primary zone (Msn.com)** → click **Next**.
6. Give the **IP address of primary zone** Ex: 10.0.0.1 → click **Next**.

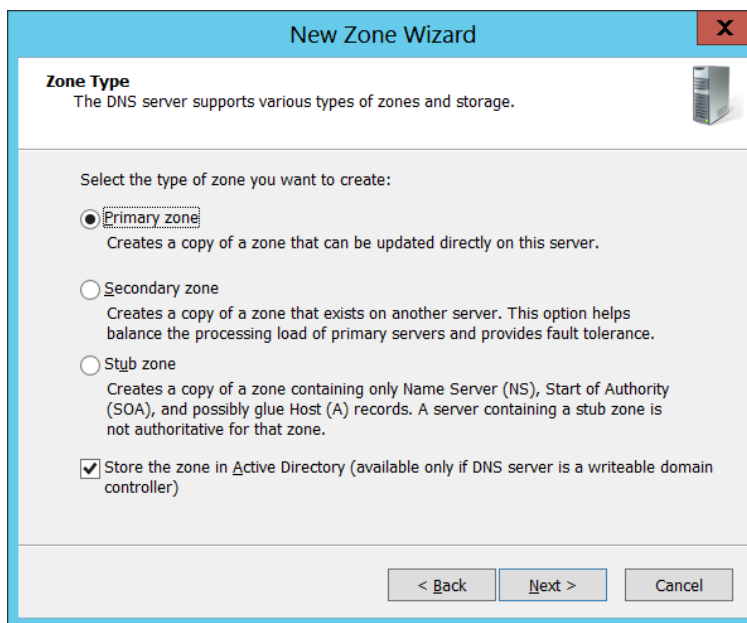


8. Click Next → **Finish**.
9. **Refresh the stub zone** and verify for records.

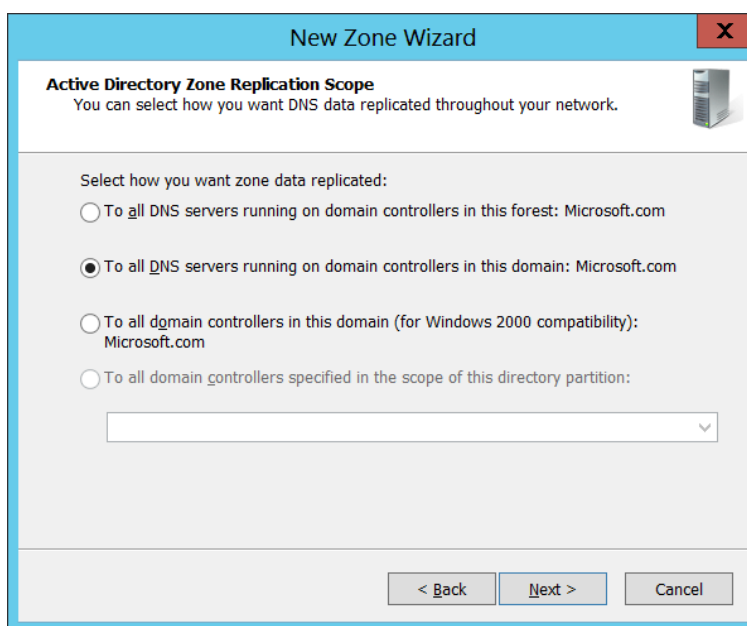


Lab – 6: Creating Active Directory Integrated Primary zone

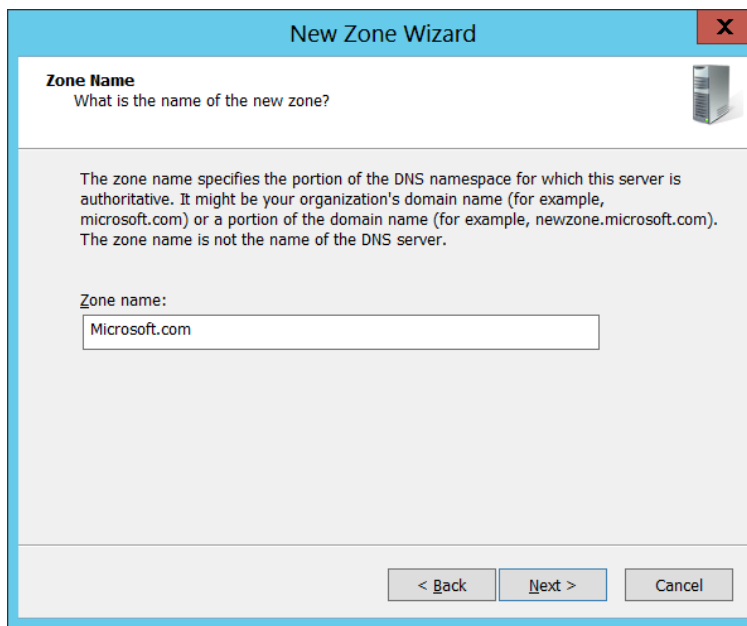
1. Go to Start, select **DNS**.
2. In the DNS dialog box, expand the DNS server's name in the left pane, right click **Forward Lookup Zones** →select **New Zone**
3. Click **Next**→ Accept the default option of **"Primary Zone"** and Select the check box for **"Store the zone in Active Directory"**→click **Next**.



4. In AD Zone Replication Scope, Select the **"To all DNS servers in Active directory domain"**→click **Next**.



5. Give the Zone Name same as the **Domain Name** (Ex: Microsoft.com), click **Next**.



The screenshot shows the 'New Zone Wizard' window with the 'Zone Name' step selected. The title bar says 'New Zone Wizard' with a close button. The main heading is 'Zone Name' with a sub-heading 'What is the name of the new zone?'. Below this is a paragraph explaining that the zone name specifies the portion of the DNS namespace for which the server is authoritative, and it might be the organization's domain name or a portion of it. A text box labeled 'Zone name:' contains 'Microsoft.com'. At the bottom are three buttons: '< Back', 'Next >', and 'Cancel'.

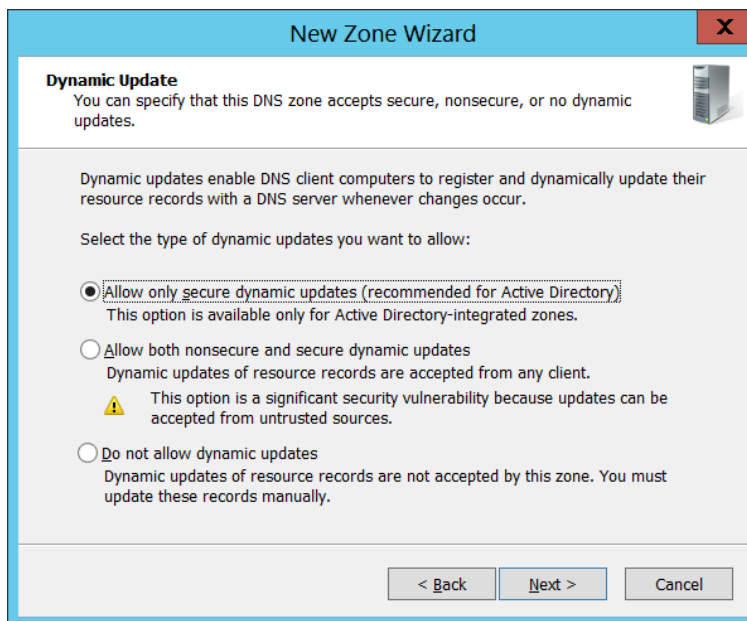
Zone Name
What is the name of the new zone?

The zone name specifies the portion of the DNS namespace for which this server is authoritative. It might be your organization's domain name (for example, microsoft.com) or a portion of the domain name (for example, newzone.microsoft.com). The zone name is not the name of the DNS server.

Zone name:
Microsoft.com

< Back Next > Cancel

6. Select **"Allow only secure and dynamic update"** → click **Next** → **Finish**.




The screenshot shows the 'New Zone Wizard' window with the 'Dynamic Update' step selected. The title bar says 'New Zone Wizard' with a close button. The main heading is 'Dynamic Update' with a sub-heading 'You can specify that this DNS zone accepts secure, nonsecure, or no dynamic updates.' Below this is a paragraph explaining that dynamic updates enable DNS client computers to register and dynamically update their resource records. A section titled 'Select the type of dynamic updates you want to allow:' contains three radio button options. The first option, 'Allow only secure dynamic updates (recommended for Active Directory)', is selected and has a note that it is available only for Active Directory-integrated zones. The second option, 'Allow both nonsecure and secure dynamic updates', has a warning icon and a note that it is a significant security vulnerability. The third option, 'Do not allow dynamic updates', has a note that dynamic updates are not accepted by this zone. At the bottom are three buttons: '< Back', 'Next >', and 'Cancel'.

Dynamic Update
You can specify that this DNS zone accepts secure, nonsecure, or no dynamic updates.

Dynamic updates enable DNS client computers to register and dynamically update their resource records with a DNS server whenever changes occur.

Select the type of dynamic updates you want to allow:

☒ **Allow only secure dynamic updates (recommended for Active Directory)**
This option is available only for Active Directory-integrated zones.

☐ **Allow both nonsecure and secure dynamic updates**
Dynamic updates of resource records are accepted from any client.
 This option is a significant security vulnerability because updates can be accepted from untrusted sources.

☐ **Do not allow dynamic updates**
Dynamic updates of resource records are not accepted by this zone. You must update these records manually.

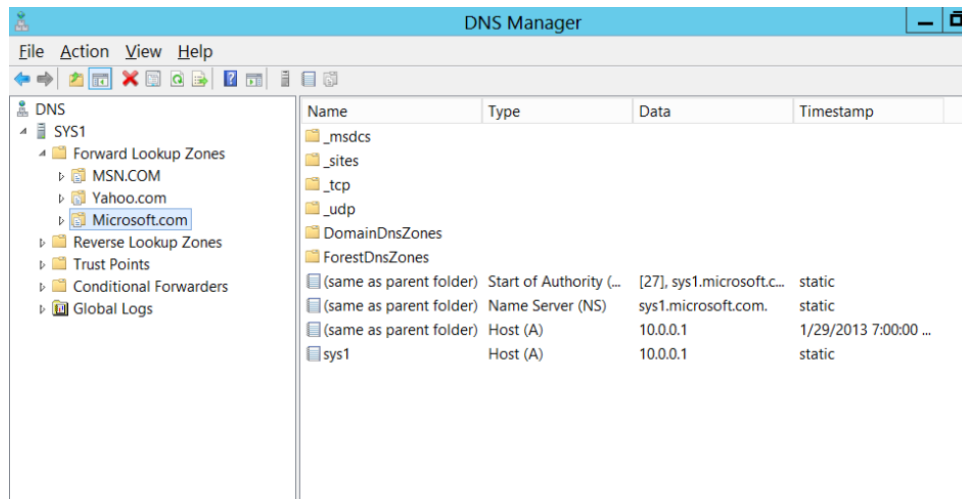
< Back Next > Cancel

Verification:

1. Verify for the Service records in Microsoft.com zone.

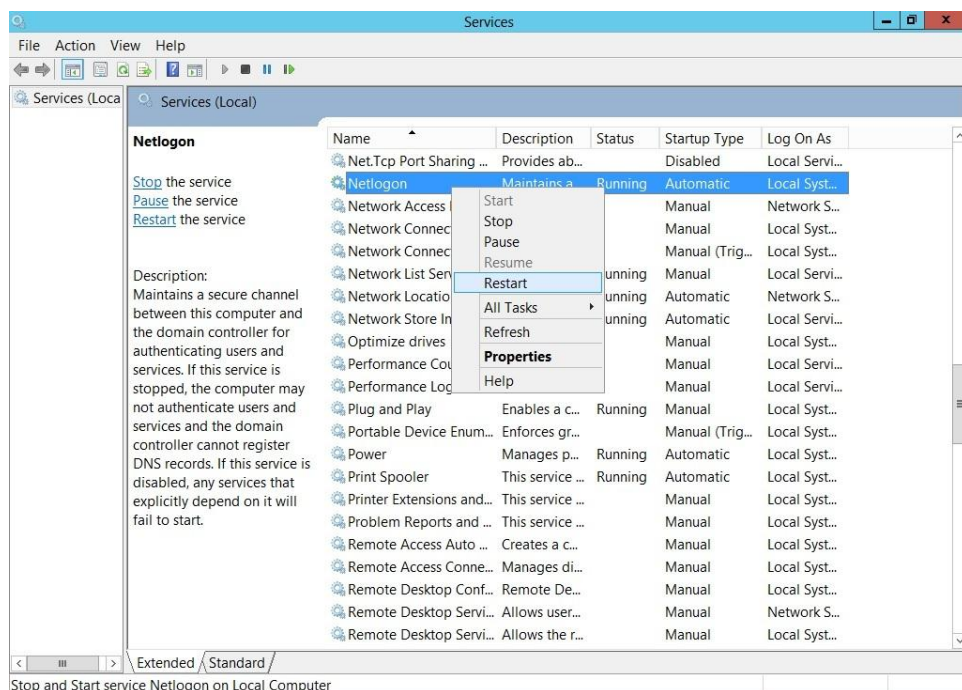
NOTE: Service records are available only for the zone with the domain name.

2. In **DC** by default the service records are created in the DNS server in the zone with domain name.



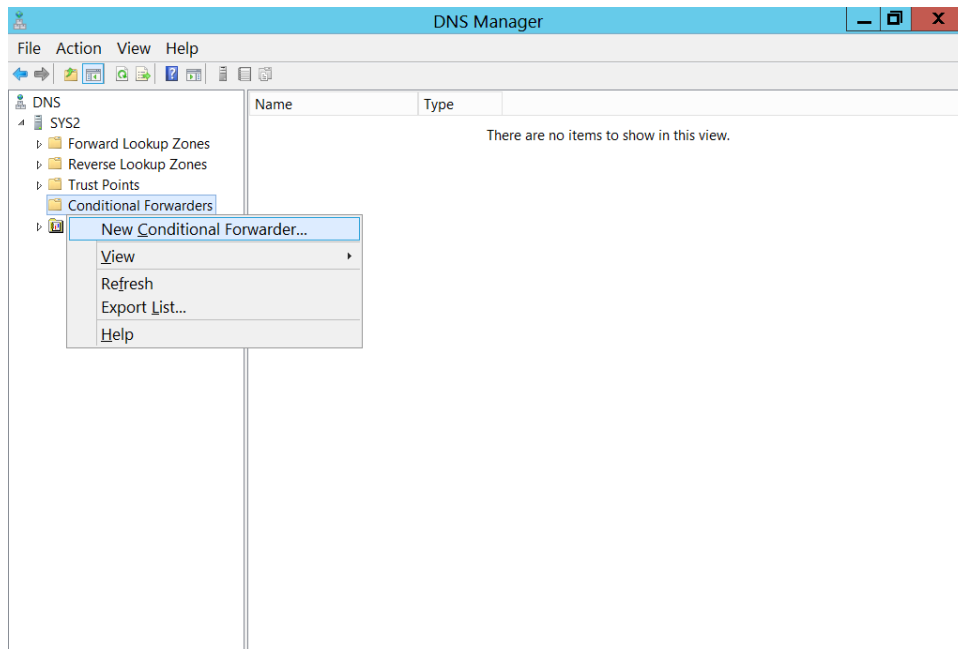
Note: To get the missing records restart the services **Netlogon** and **DNS Server**.

3. Go to Start, type Services in Search Apps, and select Services
4. Right click **Netlogon** and click **Restart**, Right click **DNS Server** and click **Restart**.

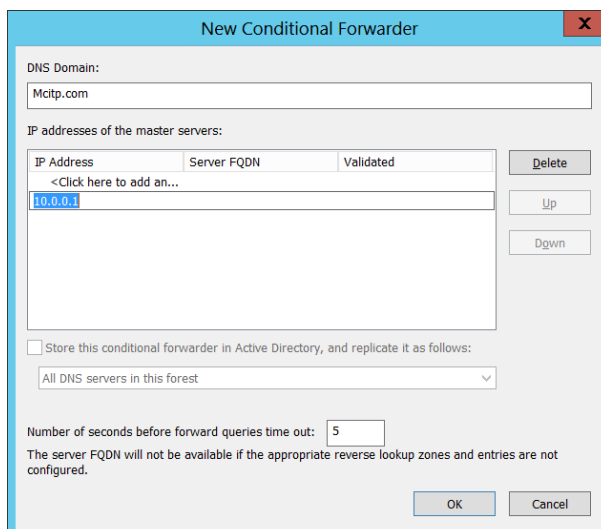


Lab – 7: Conditional Forwarders

1. In **SYS1** create a zone with the name Ex: **MCITP.COM** with host and alias records.
2. In **SYS1** open the command prompt and type ping www.MCITP.COM
3. There will be a reply from 10.0.0.1
4. In **SYS2** assign the **IP Address** and **Preferred DNS** as **10.0.0.2**
5. In **SYS2** open the command prompt and type ping www.MCITP.COM
6. There will not be any reply because the information is in 10.0.0.1
7. If **SYS2** has to resolve the query then configure forwarders in **SYS2** properties.
8. Go to DNS dialog box in **SYS2** → Right click **conditional forwarders** → select **New conditional forwarders**



9. Mention the DNS Domain as **MCITP.COM** and add the IP address of primary zone.

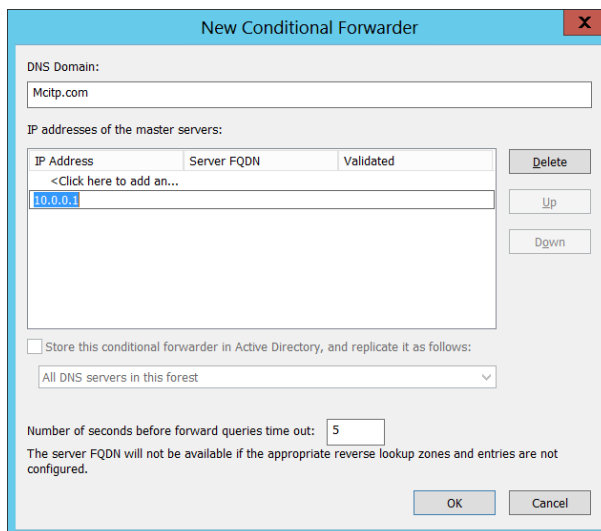


10. In **SYS2** open the command prompt and type ping www.MCITP.COM
11. There will be a reply from 10.0.0.1

Note: Only MCITP.COM names can be resolved with the above process.

Lab – 8: Forwarders

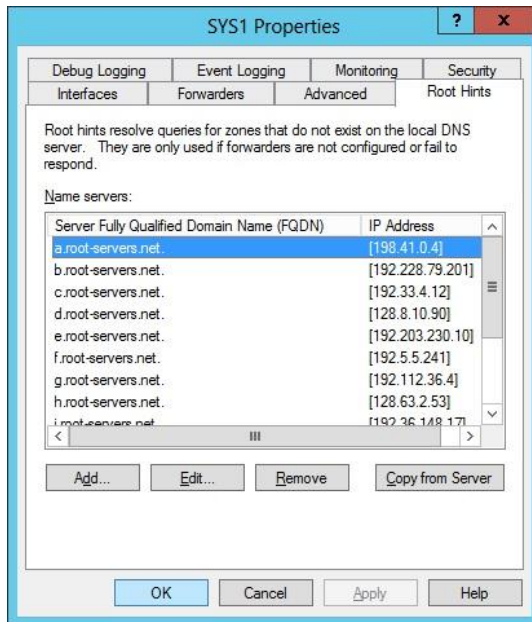
1. In **SYS1** create a zone with the domain name Ex: **Microsoft.com** with host and alias records.
2. In **SYS1** open the command prompt and type ping www.Microsoft.com
3. There will be a reply from 10.0.0.1
4. In **SYS2** assign the **IP Address** and **Preferred DNS** as **10.0.0.2**
5. In **SYS2** open the command prompt and type ping www.Microsoft.com
6. There will not be any reply because the information is in 10.0.0.1
7. If **SYS2** has to resolve the query then configure forwarders in **SYS2** properties.
8. Open DNS in **SYS2** → Right click **SYS2** → select properties → select forwarders → click Edit.
9. Mention the IP address of primary zone → click **OK** → click **OK**.



10. In **SYS2** open the command prompt and type ping www.Microsoft.com
11. There will be a reply from 10.0.0.1

Lab – 9: Root Hints

1. Root hints contain the information of 13 root servers
2. Open DNS → Right click the system name → select Properties → select **Root Hints**



Lab – 10: Cache server

1. To see the information present in the cache type the command
"Ipconfig /displaydns"
2. To clear the cache information type the command
"Ipconfig /flushdns"

