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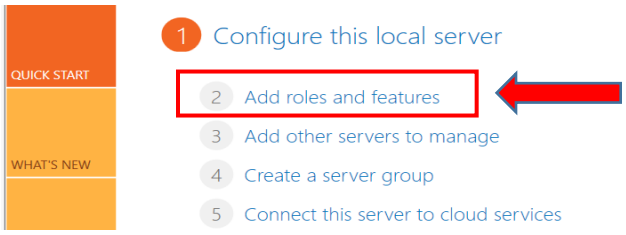
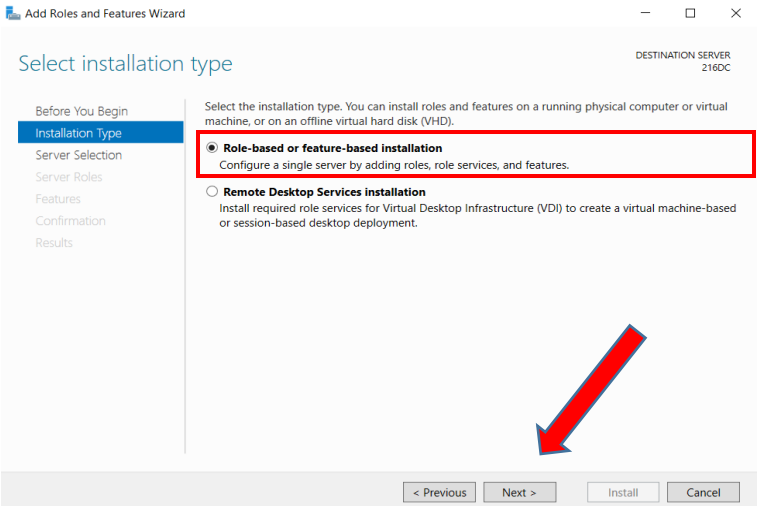
1. Creating a Static IP address for the DNS Server and associating the DNS Server address to our TCP/IP Interface

1.1 Setting a Static IP address for the DNS Server

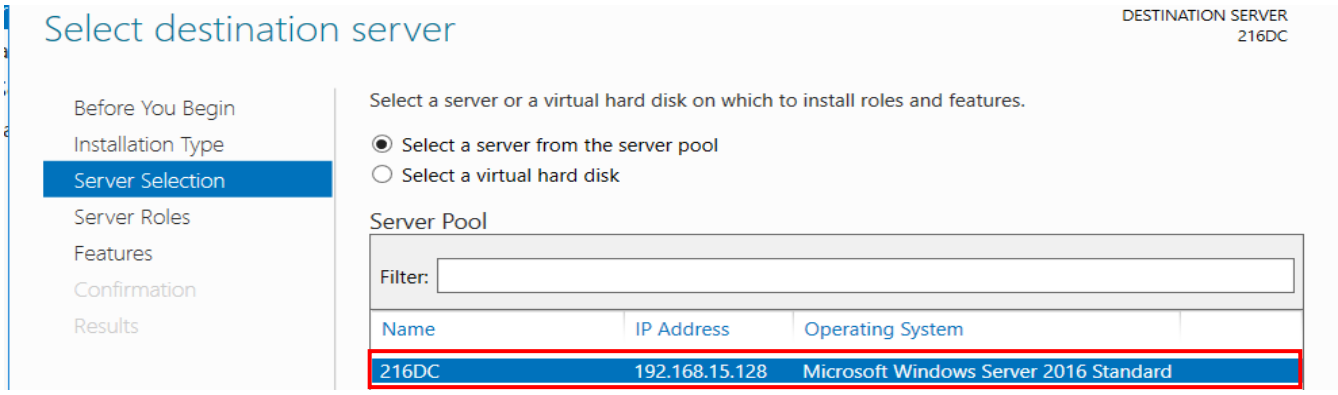
1. First we will verify through Server Manager on our Windows Server 2016 machine that we have a dynamic IP address. To do this on the Server Manager Dashboard we will select **Add roles and features**.



2. Select **Next** on the Before you begin page and make sure **Role-based or feature-based installation** is selected on the Select installation type page and click **Next**.



3. On the Select destination server page we can verify that our IP address is not the assigned IP address of 192.168.15.20. Once we verify this address, we can hit **Cancel** to exit out of this page.



4. To set a Static IP address and Subnet Mask of 192.168.15.120 /24 we need to open PowerShell and type in this command.

New-NetIPAddress -InterfaceAlias “Ethernet0” 192.168.15.120 -PrefixLength 24

```
Administrator: Windows PowerShell
PS C:\Users\Administrator> New-NetIPAddress -InterfaceAlias "Ethernet0" 192.168.15.120 -PrefixLength 24


IPAddress         : 192.168.15.120
InterfaceIndex    : 4
InterfaceAlias    : Ethernet0
AddressFamily     : IPv4
Type              : Unicast
PrefixLength      : 24
PrefixOrigin      : Manual
SuffixOrigin      : Manual
AddressState      : Tentative
ValidLifetime     : Infinite ([TimeSpan]::MaxValue)
PreferredLifetime : Infinite ([TimeSpan]::MaxValue)
SkipAsSource      : False
PolicyStore       : ActiveStore

IPAddress         : 192.168.15.120
InterfaceIndex    : 4
InterfaceAlias    : Ethernet0
AddressFamily     : IPv4
Type              : Unicast
PrefixLength      : 24
PrefixOrigin      : Manual
SuffixOrigin      : Manual
AddressState      : Invalid
ValidLifetime     : Infinite ([TimeSpan]::MaxValue)
PreferredLifetime : Infinite ([TimeSpan]::MaxValue)
SkipAsSource      : False
PolicyStore       : PersistentStore
```

5. To verify that the IP was set correctly we will type the command: Get-NetIPConfiguration as shown in the screen shot below.

```
PS C:\Users\Administrator> Get-NetIPConfiguration


InterfaceAlias       : Ethernet0
InterfaceIndex       : 4
InterfaceDescription : Intel(R) 82574L Gigabit Network Connection
NetProfile.Name      : Unidentified network
IPv4Address          : 192.168.15.120
IPv6DefaultGateway   :
IPv4DefaultGateway   :
DNSServer            : fec0:0:0:ffff::1
                       fec0:0:0:ffff::2
                       fec0:0:0:ffff::3
```

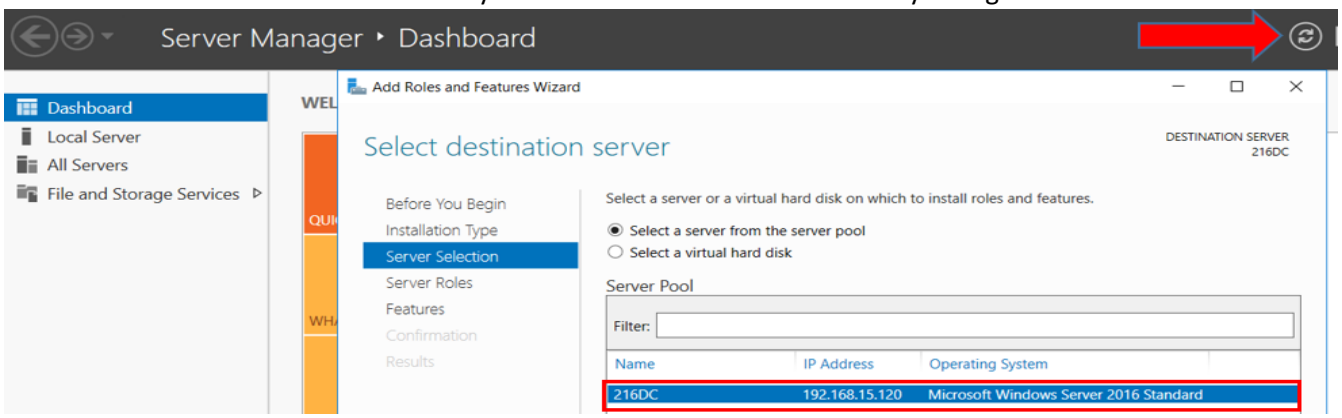
1.2 Setting the DNS Server address that is associated with our interface for the 216DC Machine

1. To associate our DNS Server IP address to our interface on the 216DC VM we need to type the command

Set-DNSClientServerAddress -InterfaceIndex 4 -ServerAddress 192.168.15.120 in PowerShell as shown in the screenshot below.

```
PS C:\Users\Administrator> Set-DNSClientServerAddress -InterfaceIndex 4 -ServerAddress 192.168.15.120
PS C:\Users\Administrator>
```

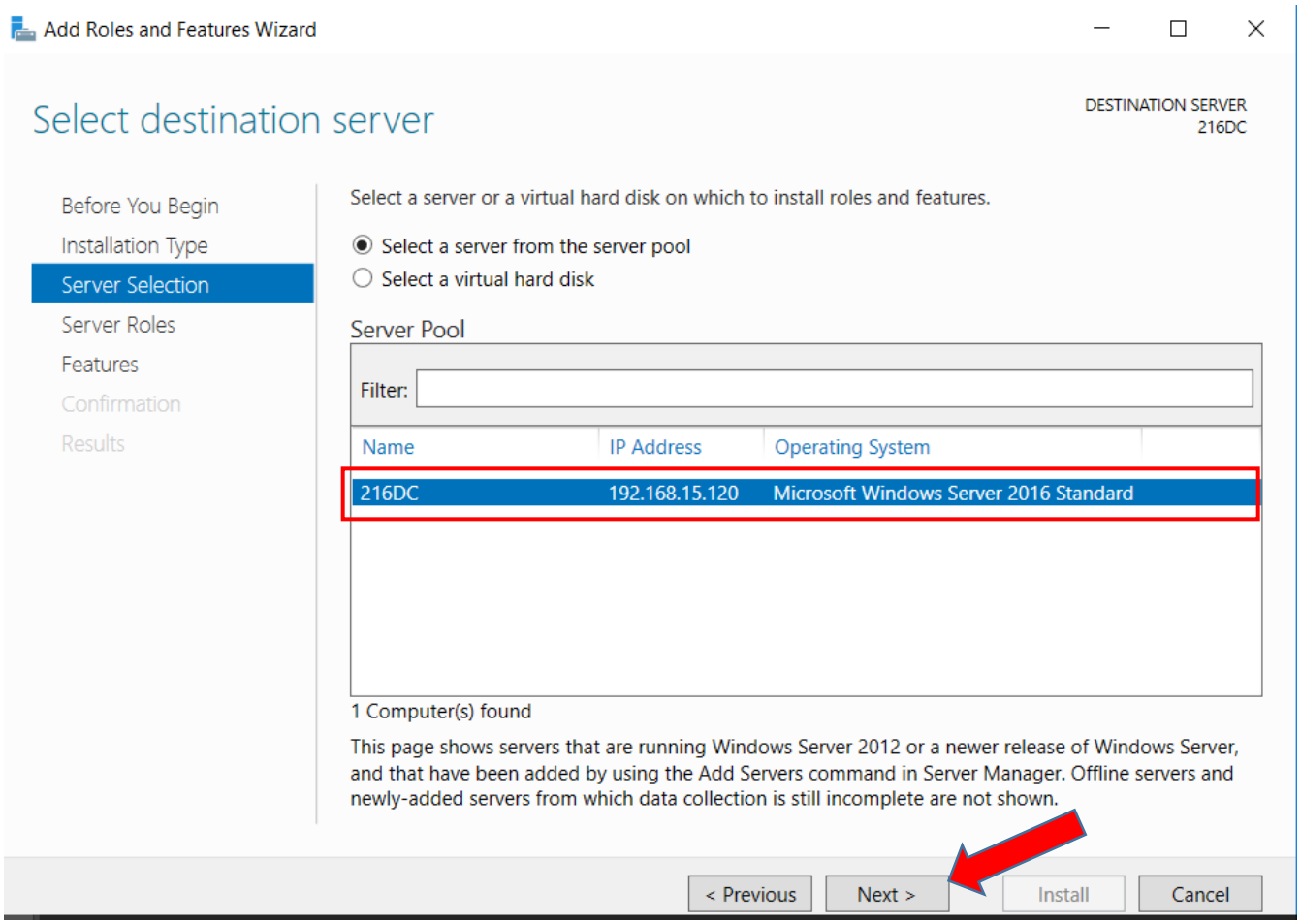
2. To verify that the IP address of the DNS Server will be correct we need to get to the Select destination server page on Server Manager and to do this just follow the first three steps above on Creating a Static IP address for the DNS Server. We will want to refresh the dashboard on Server Manager as show on the arrow below and from the screenshot below we can verify that the IP address was successfully changed to 192.168.15.120.



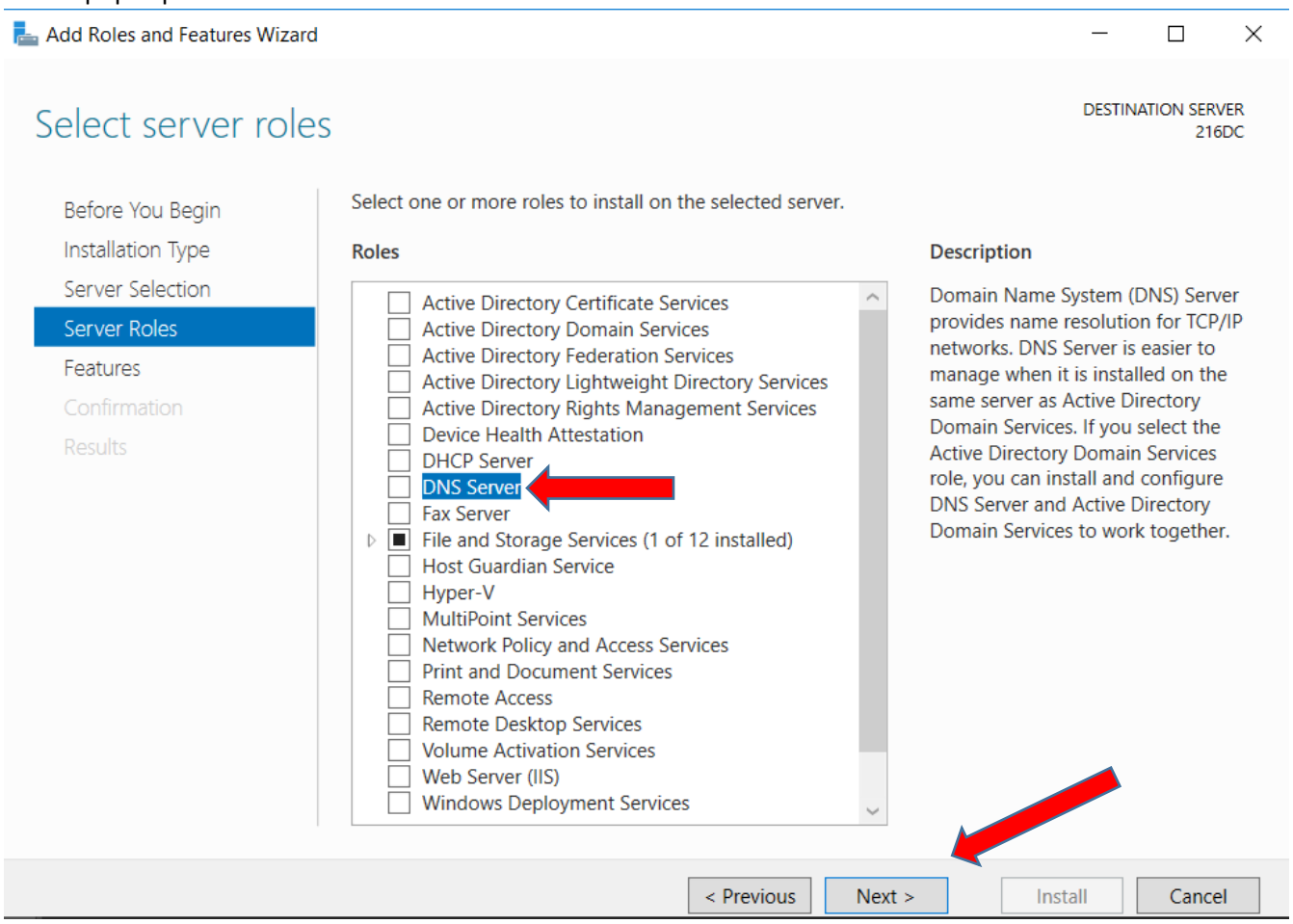
2. Installing the DNS Server Role and creating a Primary DNS Zone

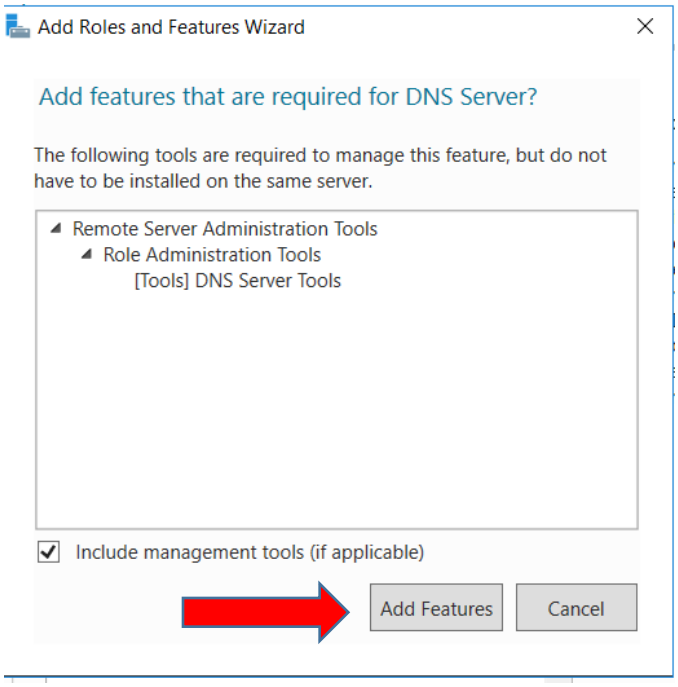
2.1 Installing the DNS Server Role

1. While continuing on the Select destination server page that we verified our server IP address on, we will want to make sure our server is highlighted on the Server Pool box and then click **Next**.

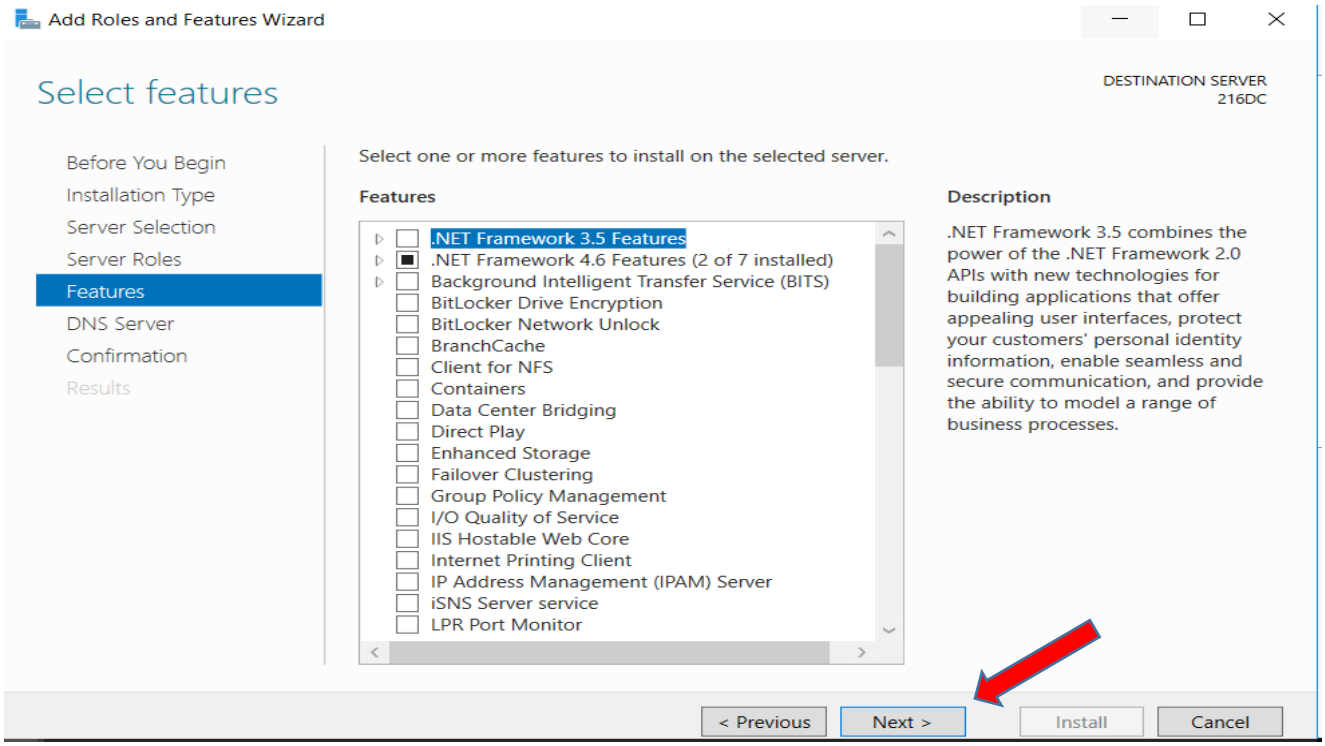


2. Select the **DNS Server** under Roles on the Select Server roles page, and when the Add features for DNS Server pops up click on **Add Features** and **Next.**

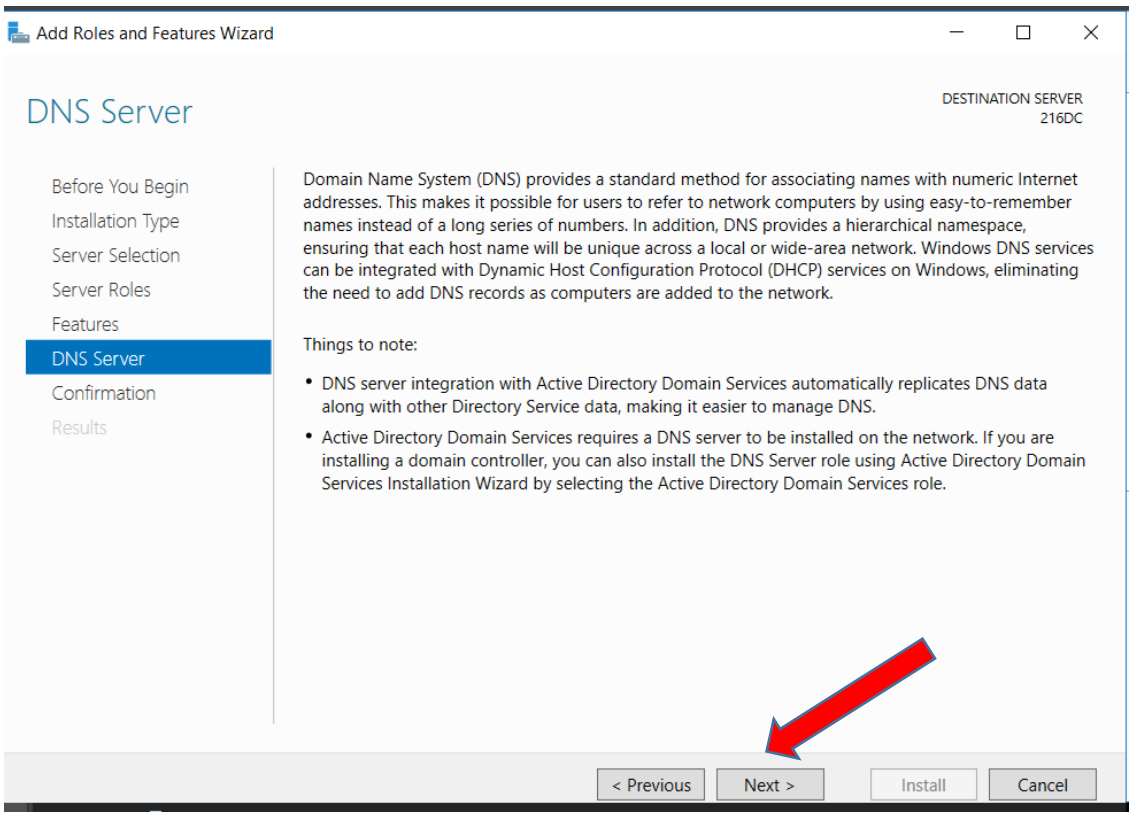




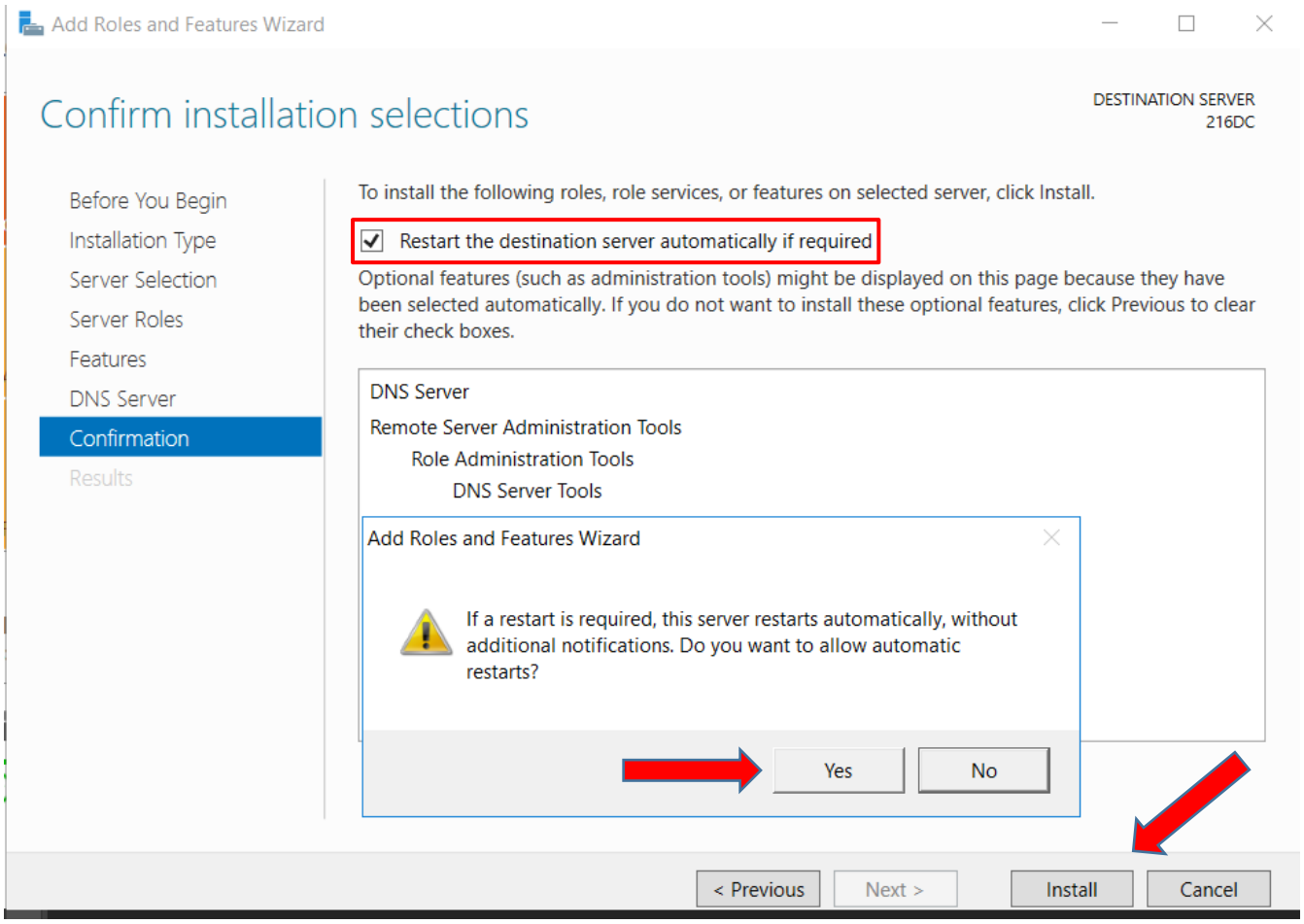
3. On the Select features page click **Next**.



4. Click **Next** on the DNS Server page.

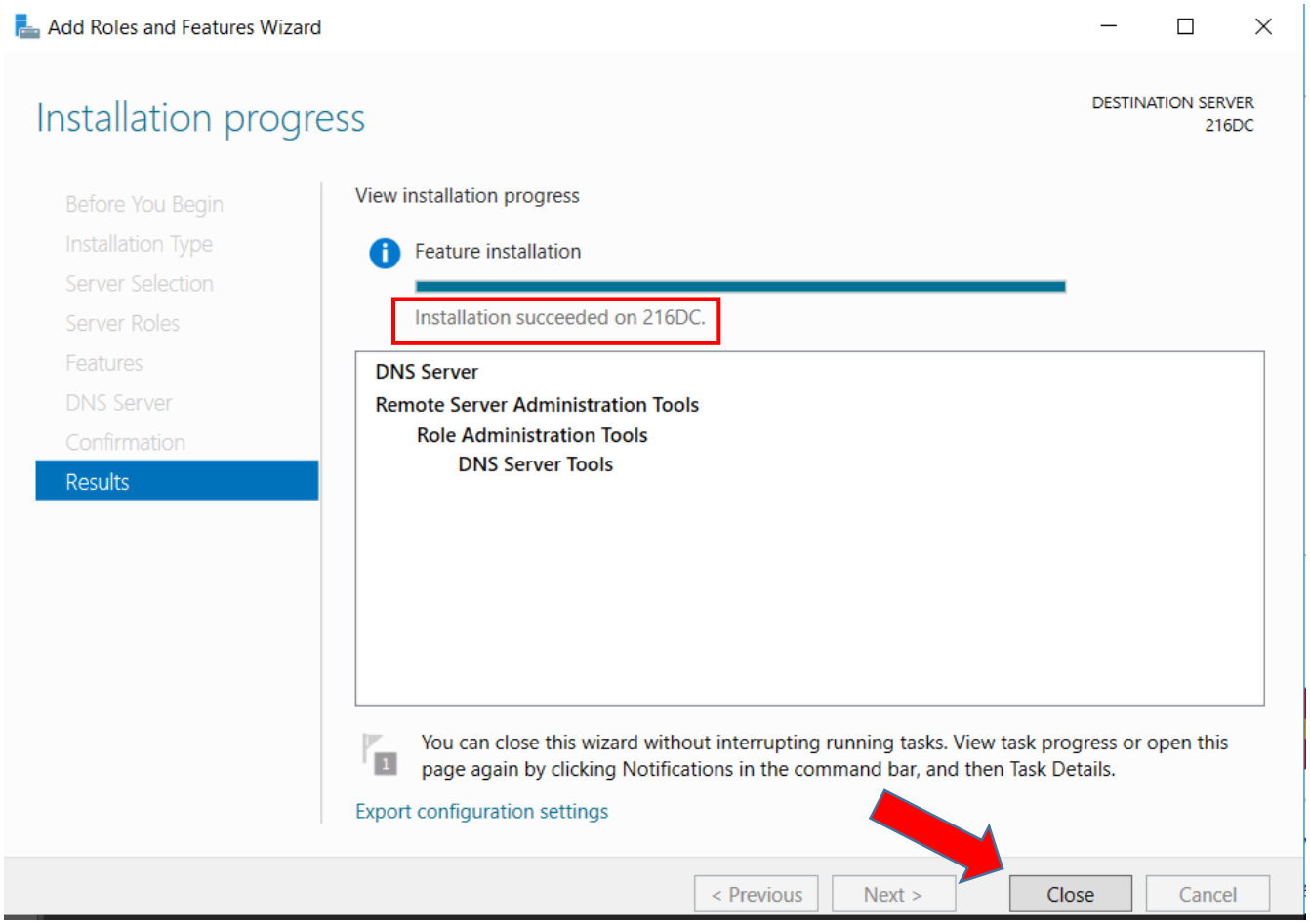


5. On the Confirm installation selections page, put a check in **Restart the destination server automatically if required**. Click **Yes** on the pop up that asks about automatic restarts, and then select **Install**.



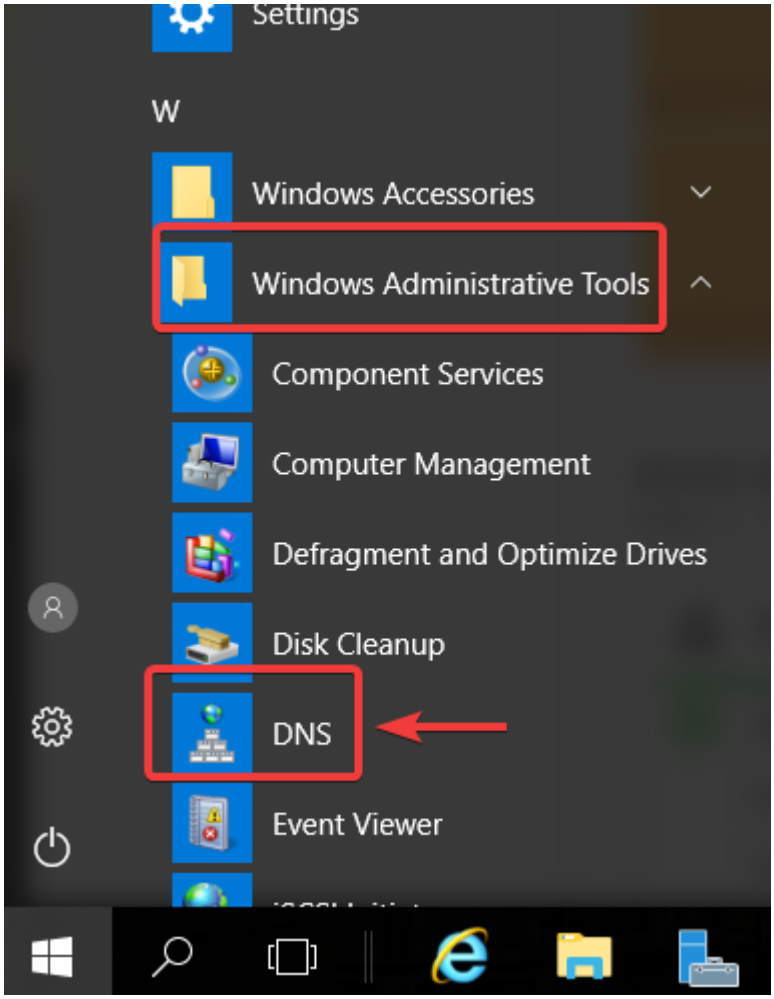
6. You will get a verification under the blue progress bar when the installation completes,

once the installation completes click **Close**.

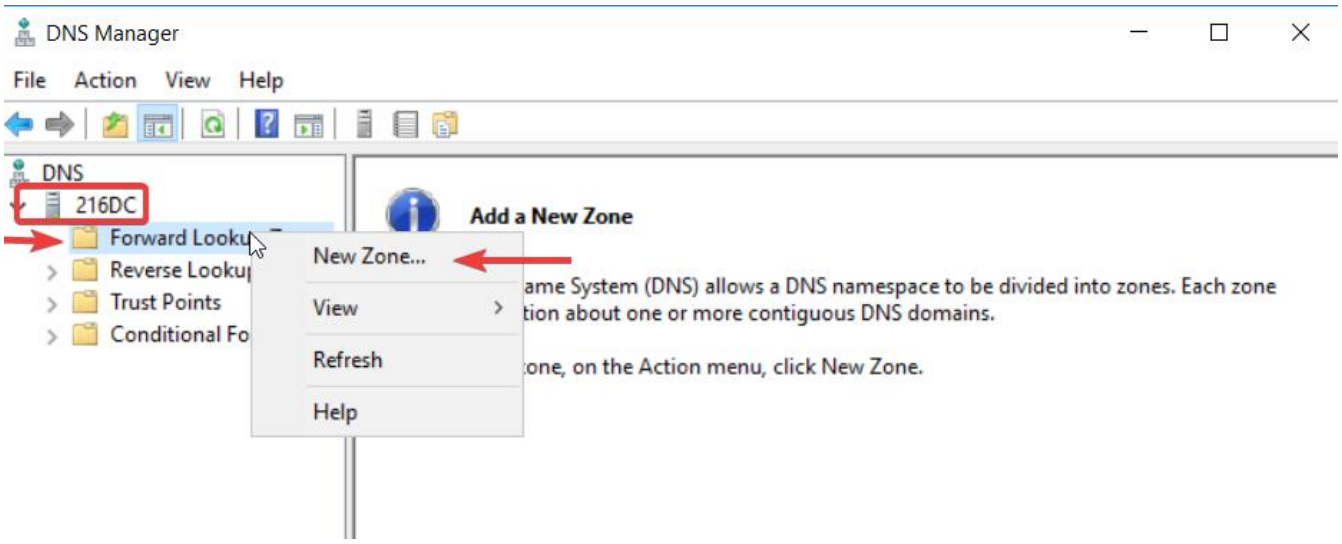


2.2 Creating a Primary DNS Zone

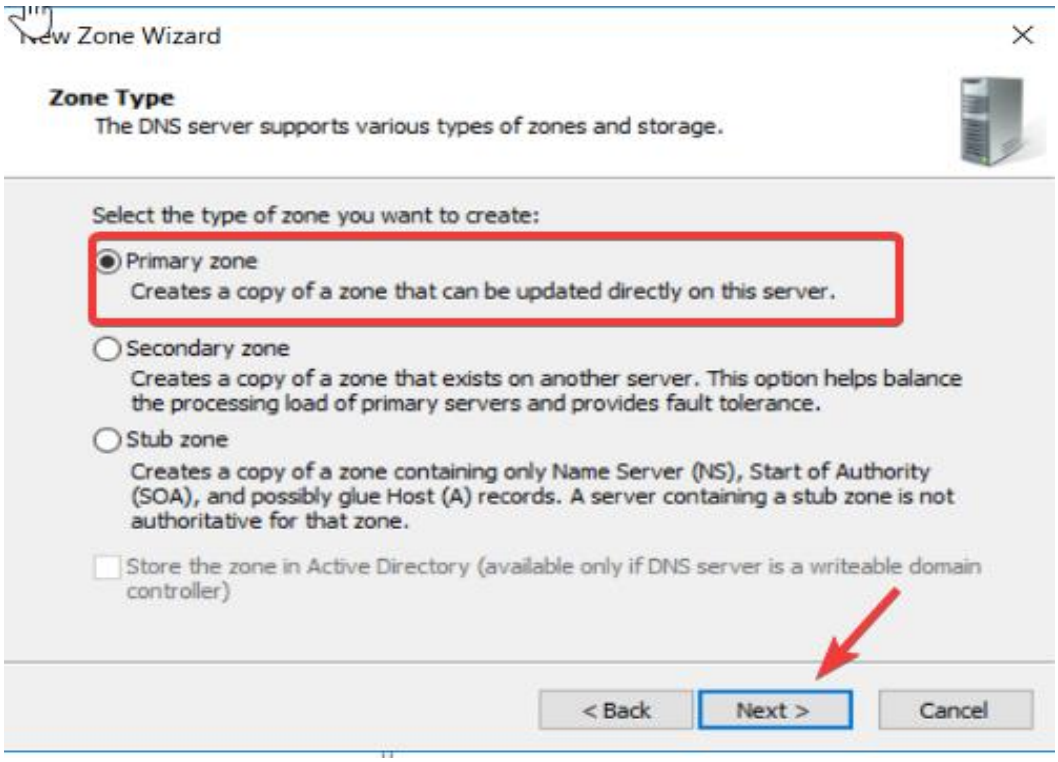
1. Now we are going to create a Primary Zone, to do this we will want to open DNS Manager. To get to DNS Manager we will click the **Start** button, open up **Windows Administrative Tools** and scroll down and select **DNS**.



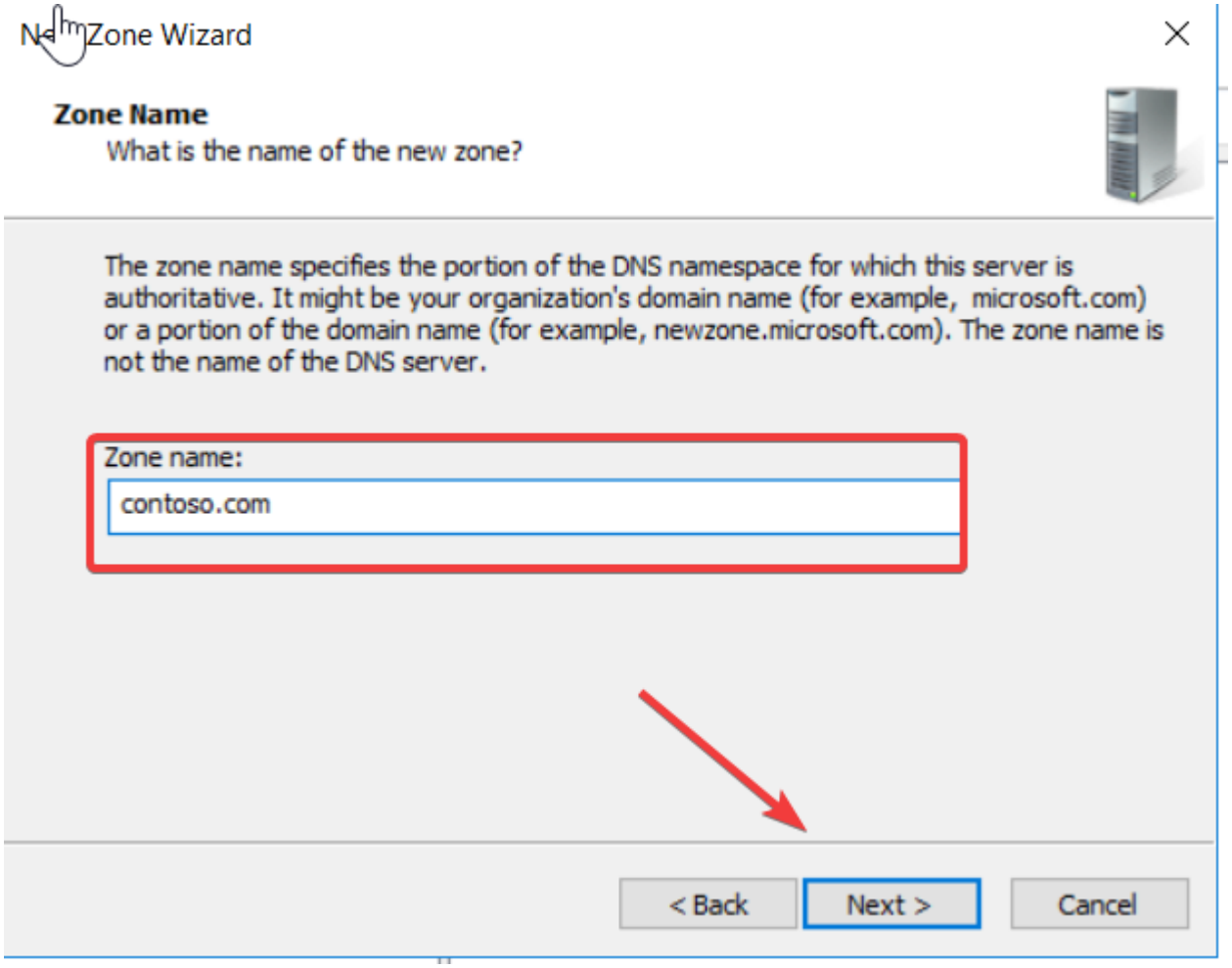
2. Once we have the DNS Manager MMC open we will want to click on the **216DC** drop down arrow and highlight **Forward Lookup Zones** on the left side then right click and select **New Zone**.



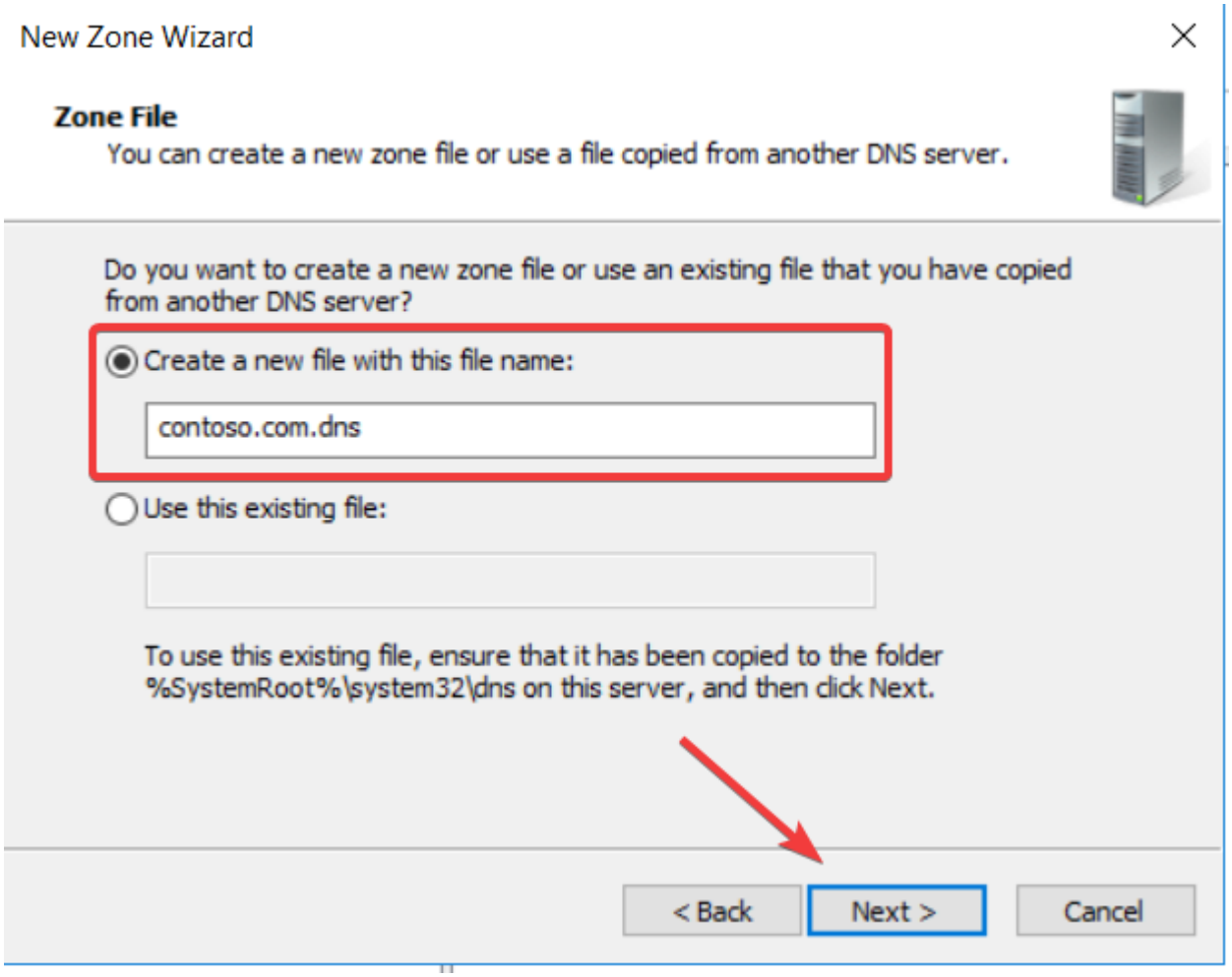
3. Click **Next** when the Welcome to the New Zone Wizard opens up, then make sure **Primary Zone** is selected and click **Next**.



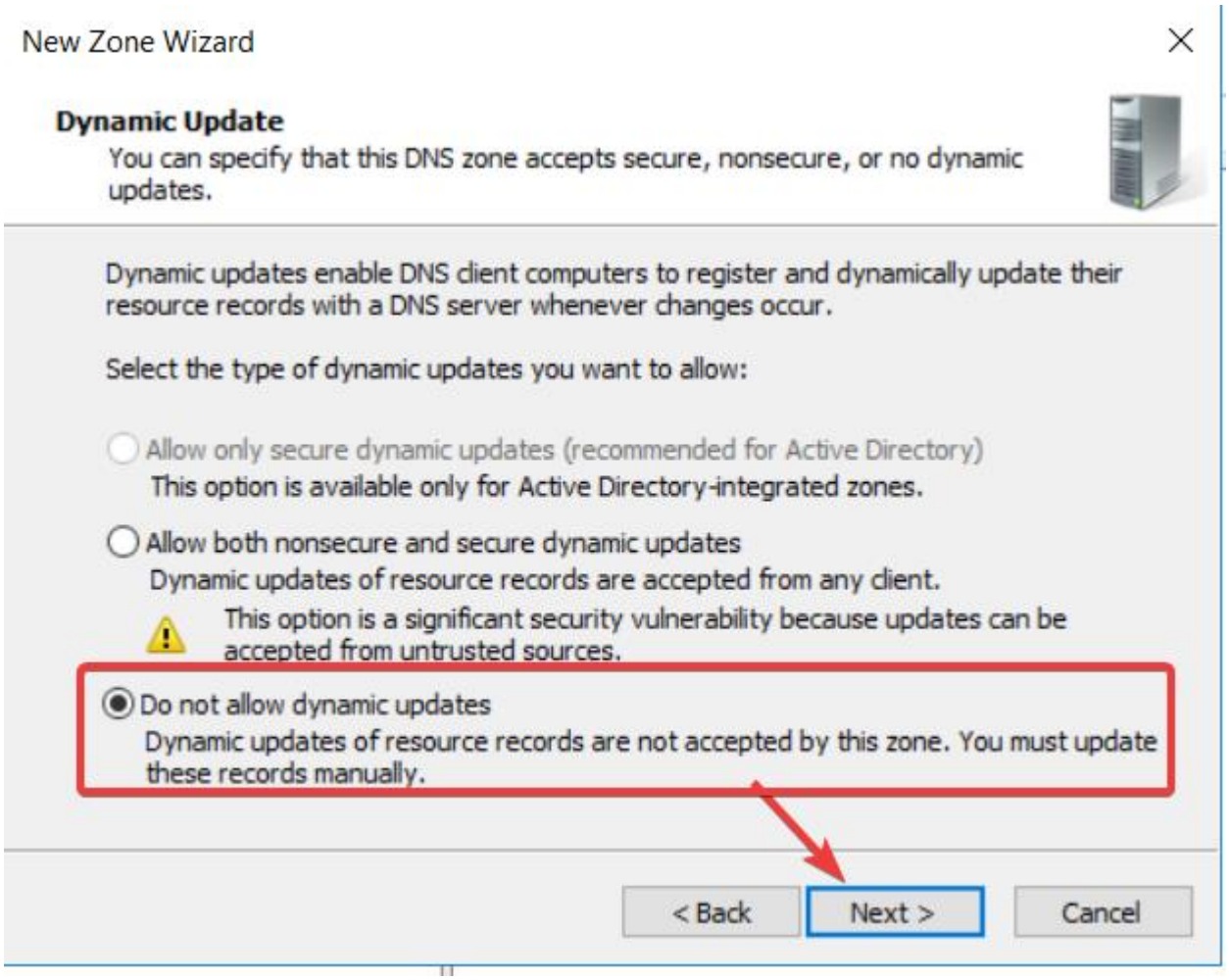
4. When prompted for a Zone name put **contoso.com** in the box, then click **Next**.



5. On the Zone File screen, leave it on the default **Create a new file with this file name**, and click **Next**.

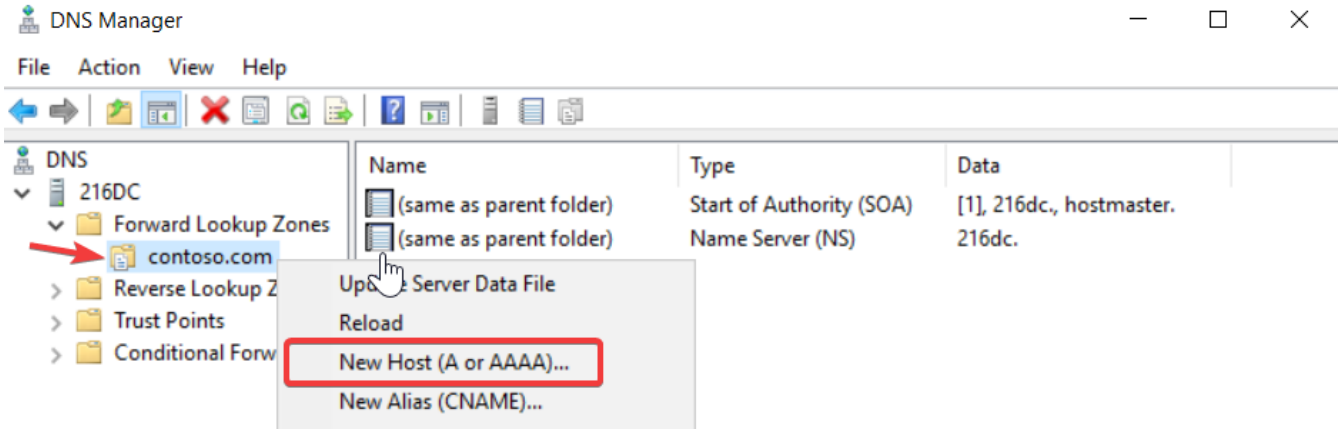


6. On the Dynamic Update page, make sure **Do not allow dynamic updates** is selected then select **Next**. We want to make sure this is selected due to potential security risks of the other selections.

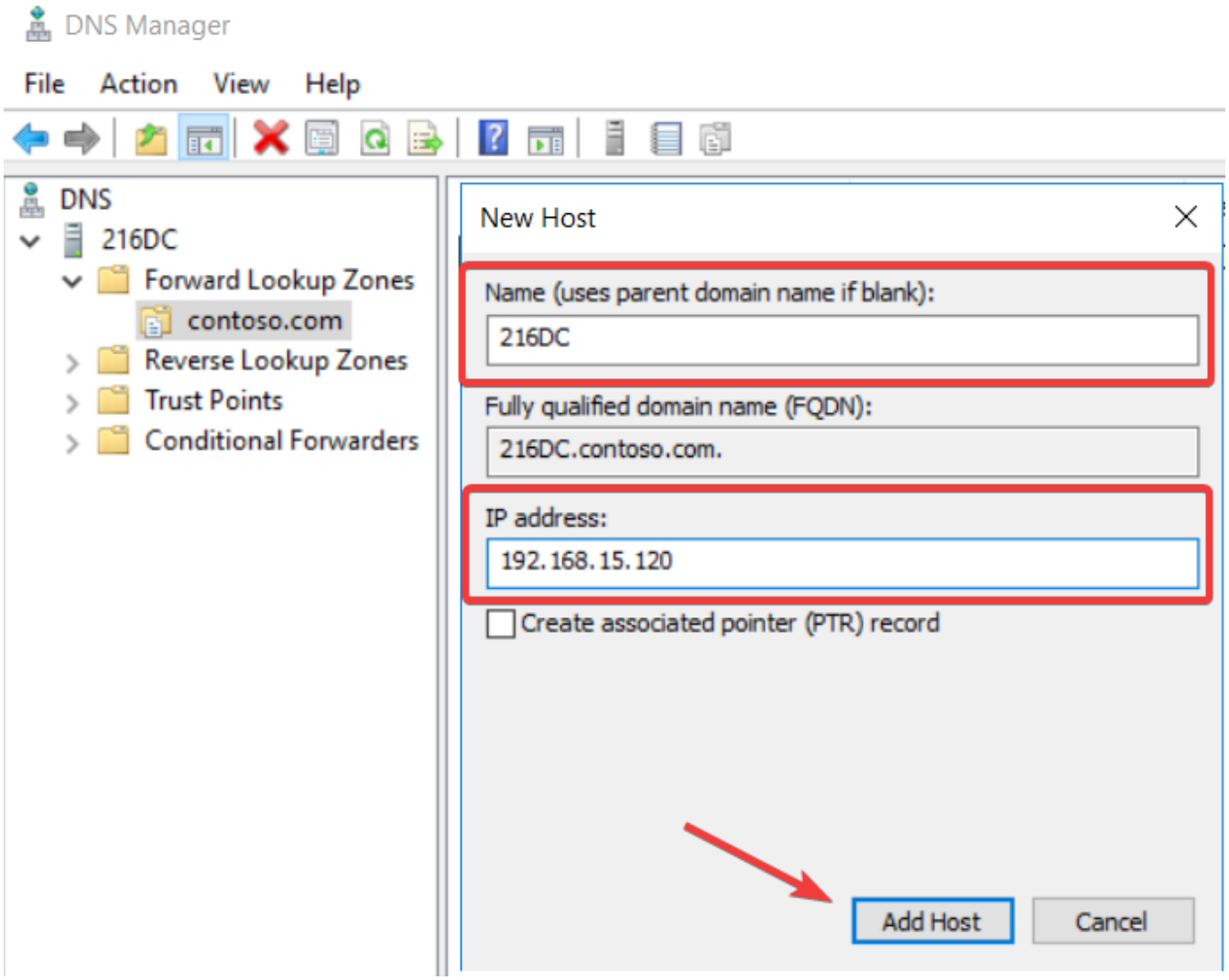


7. Now select **Finish** on the New Zone Wizard to complete the New Zone Wizard.

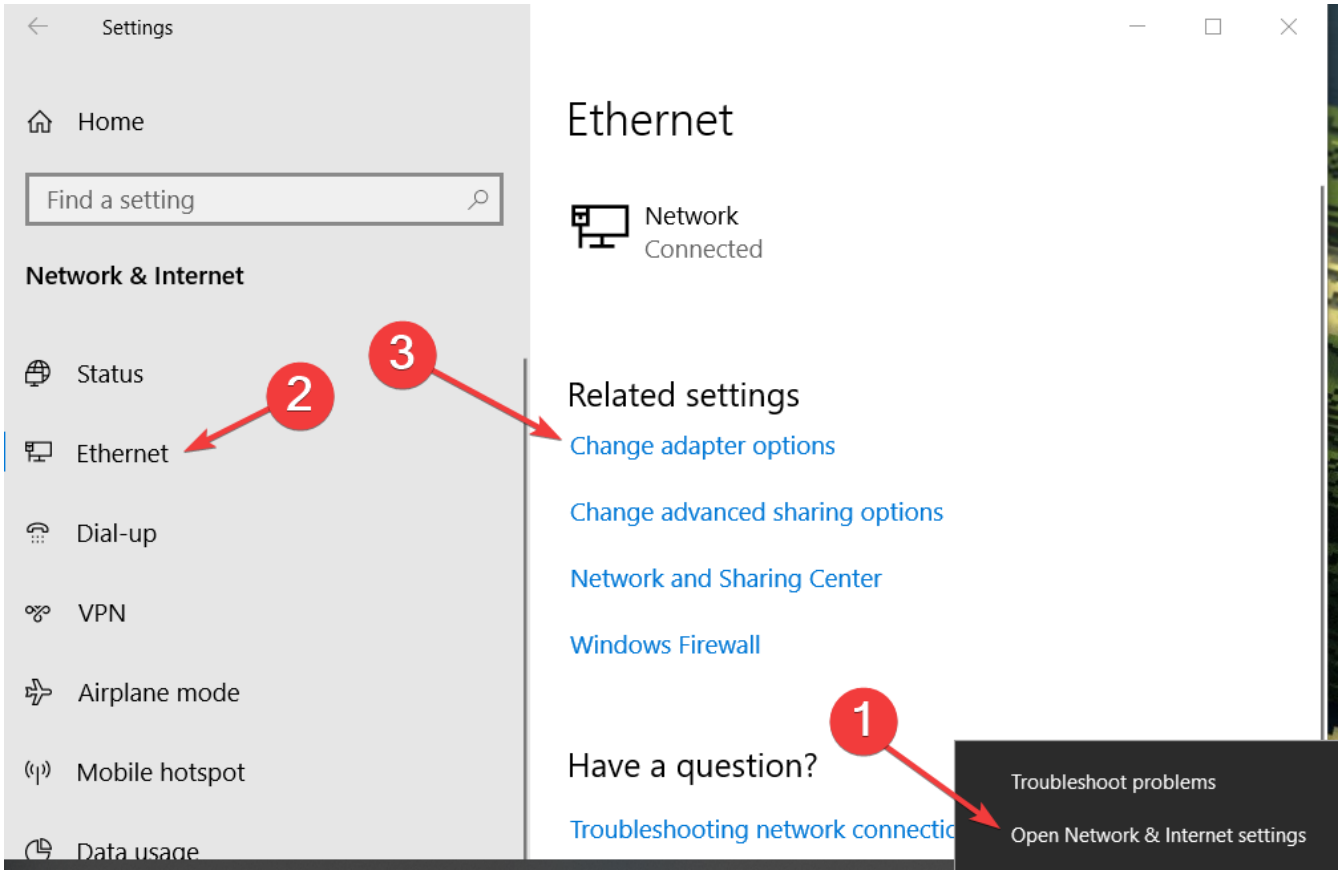
8. The next step is to create a new host on the contoso.com zone. While still in DNS Manager expand **Forward Lookup Zones** on the left side and highlight and right click **contoso.com,** hover down to **New Host (A or AAAA).**



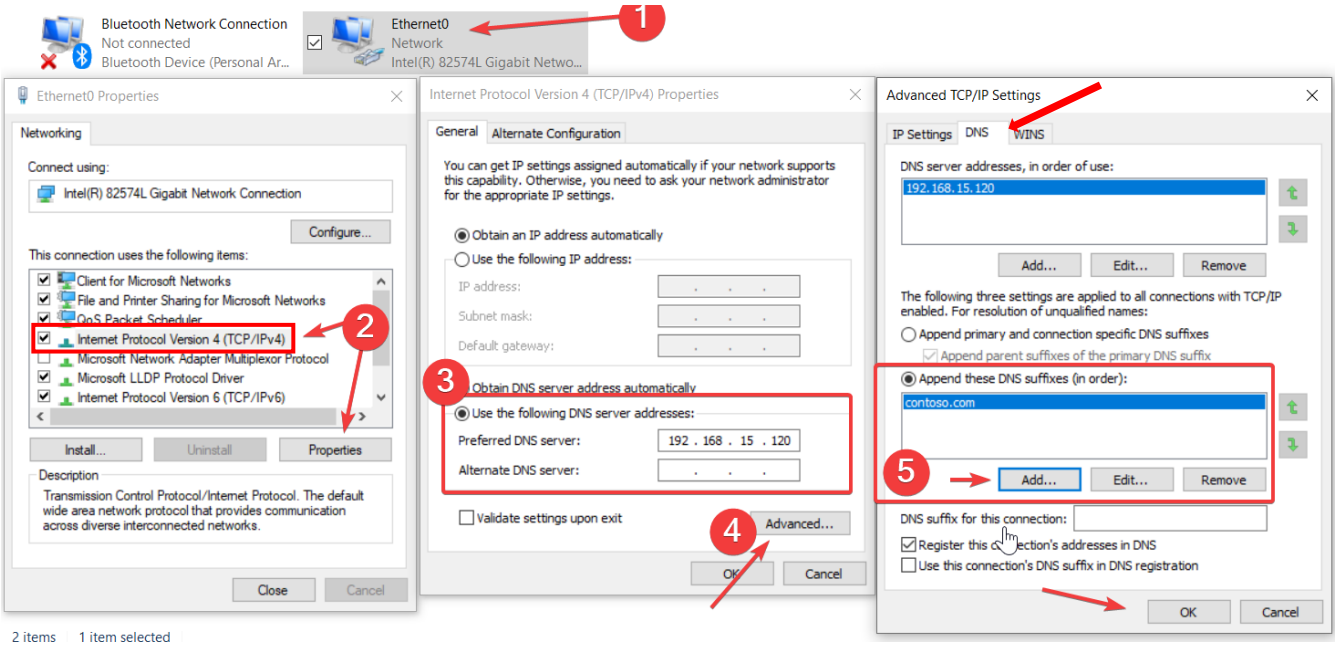
9. For the New Host use **216DC** and in the IP address box put an IP address of **192.168.15.120** and click **Add Host**.



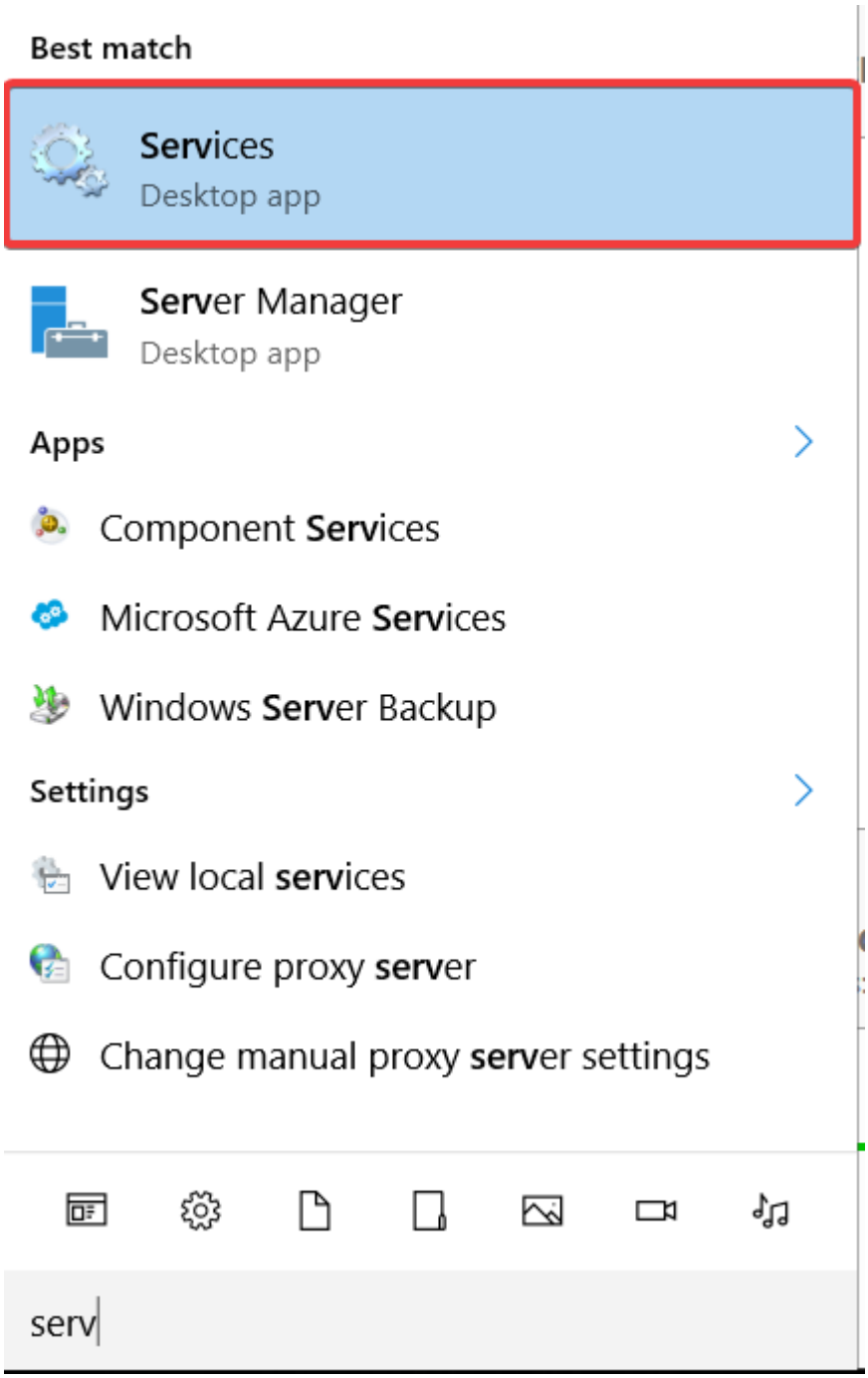
10. Now we want to log in to our 216Client Windows 10 machine and set the ethernet adapter to the IP address of our DNS server. To do this we want to right click the **network icon** on the bottom right of the task bar, select **Ethernet** on the left, and select **Change adapter options**.



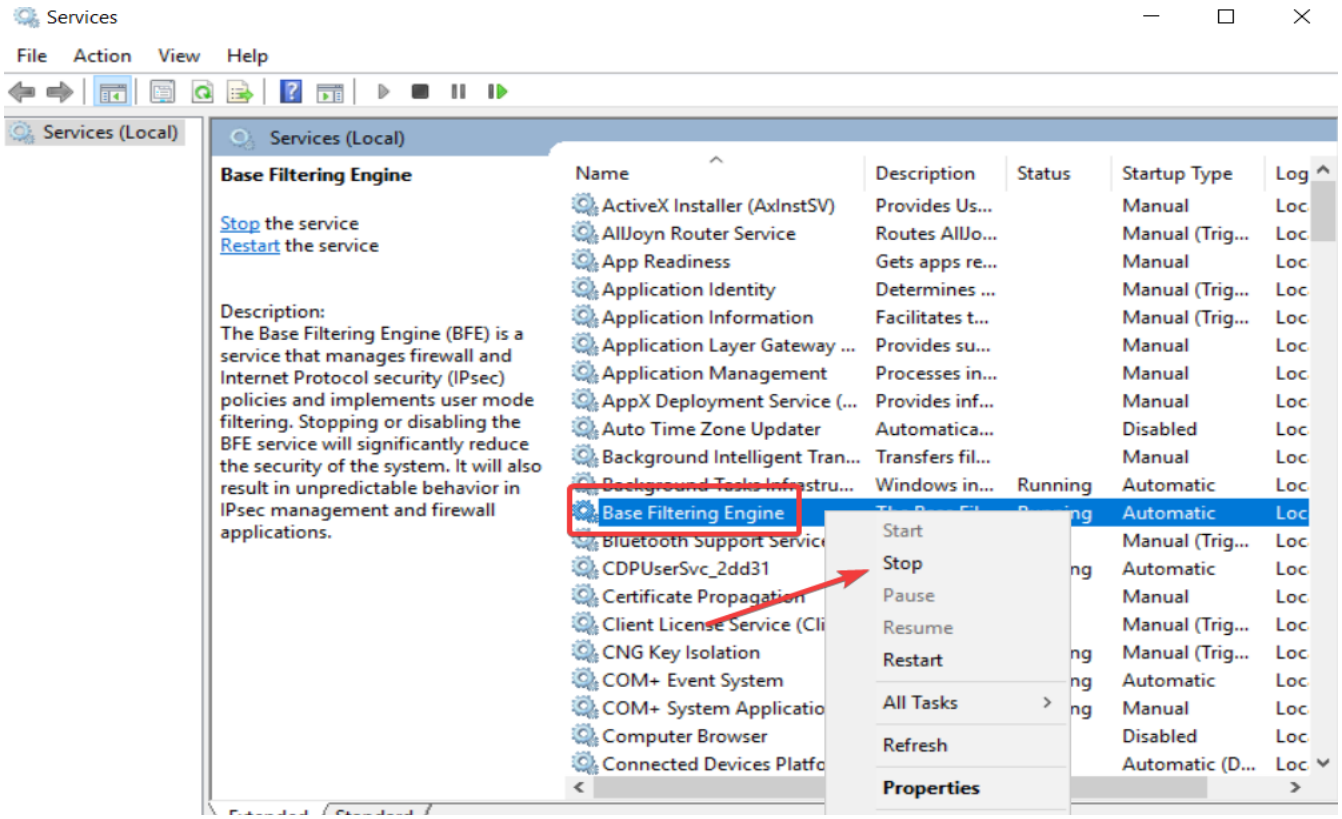
11. To set the DNS Server address right click on **Ethernet0** (*step 1*), select **Internet Protocol Version 4 (TCP/IPv4)** and select **Properties** (*step 2*). On the Internet Protocol Version 4 applet, select **Use the following DNS server addresses** (*step 3*) and enter the IP address of **192.168.15.120**. Next select the **Advanced** tab (step 4), select the **DNS** tab, and at the bottom make sure **Append these DNS suffixes (in order)** is selected. Click **Add** and type in **contoso.com** and click **OK** *(step 5)*.

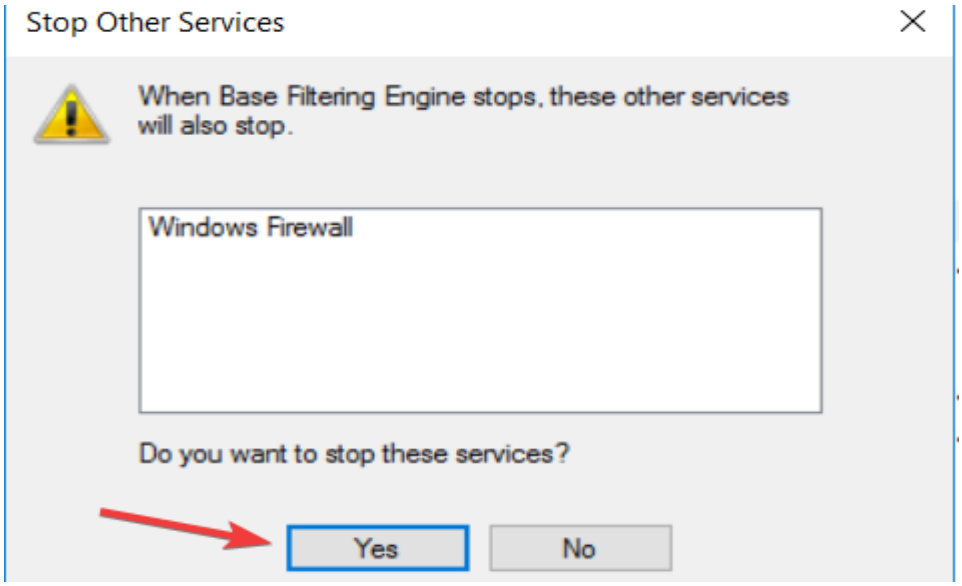


12. Now we are going to turn off Windows Firewall on the 216DC machine. To do this go into **Services MMC Snap-in** by typing Services in the bottom left search box.



13. Scroll down to **Base Filtering Engine**, right click and select **Stop**. Select **Yes** when it asks you if you want to stop Windows Firewall.





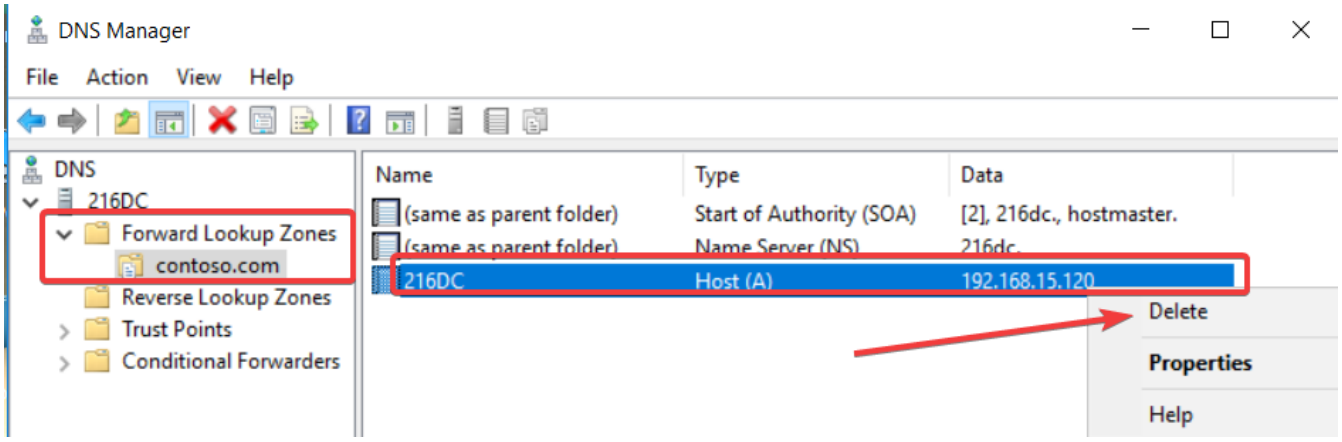
14. Now that we have everything configured, we should be able to ping from the 216Client machine to the 216DC machine. To do this we need open up **PowerShell** on the **216Client** and type **ping 216DC**. If we followed each step correctly, we will get a successful ping as shown in the screenshot below.

```
PS C:\Users\pmueller> ping 216DC

Pinging 216DC.contoso.com [192.168.15.120] with 32 bytes of data:
Reply from 192.168.15.120: bytes=32 time<1ms TTL=128
Reply from 192.168.15.120: bytes=32 time<1ms TTL=128
Reply from 192.168.15.120: bytes=32 time<1ms TTL=128
Reply from 192.168.15.120: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.15.120:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

15. Now we are going to delete the A record from the DNS zone and see if we can still ping. To do this we will want to go back to **Windows Administrative Tools** > **DNS** and expand **Forward Lookup Zones**. Click on **contoso.com** and on the right side right click on **216DC** and select **Delete.**



16. Now on the 216 Client machine try and ping 216DC. Even though we deleted the A record we still get a successful ping. Now we can try the command **ipconfig /flushdns** to clear the DNS cache and then see if we can get a ping from 216DC.

```
PS C:\Users\pmueller> ping 216DC

Pinging 216DC.contoso.com [192.168.15.120] with 32 bytes of data:
Reply from 192.168.15.120: bytes=32 time<1ms TTL=128
Reply from 192.168.15.120: bytes=32 time<1ms TTL=128
Reply from 192.168.15.120: bytes=32 time<1ms TTL=128
Reply from 192.168.15.120: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.15.120:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

17. It looks like after we cleared the DNS cache, we still get a ping reply.

```
PS C:\Users\pmueller> ipconfig /flushdns

Windows IP Configuration

Successfully flushed the DNS Resolver Cache.
PS C:\Users\pmueller> ping 216DC

Pinging 216DC [fe80::c4ad:1b17:a590:b844%13] with 32 bytes of data:
Reply from fe80::c4ad:1b17:a590:b844%13: time<1ms
Reply from fe80::c4ad:1b17:a590:b844%13: time<1ms
Reply from fe80::c4ad:1b17:a590:b844%13: time<1ms
Reply from fe80::c4ad:1b17:a590:b844%13: time<1ms

Ping statistics for fe80::c4ad:1b17:a590:b844%13:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```