Lab Answer Key: Module 8: Implementing IPv6

Lab: Implementing IPv6

Exercise 1: Configuring an IPv6 Network

Task 1: Verify IPv4 routing

1. On LON-SVR2, on the taskbar, click the Windows PowerShell icon.

2. At the Windows PowerShell prompt, type ping lon-dc1, and then press Enter.
   
   Notice that there are four replies from 172.16.0.10.

3. Type ipconfig, and then press Enter.
   
   Verify that the only IPv6 address listed is a link-local address that cannot be routed.

4. Type Get-NetIPAddress, and then press Enter.
   
   Notice that Get-NetIPAddress cmdlet returns a link-local IPv6 address.

Task 2: Disable IPv6 on LON-DC1

1. On LON-DC1, in Server Manager, click Local Server.

2. In the Properties window, next to the Ethernet section, click 172.16.0.10, IPv6 enabled.

3. In the Network Connections window, right-click Ethernet, and then click Properties.

4. In the Ethernet Properties dialog box, clear the Internet Protocol Version 6 (TCP/IPv6) check box, and then click OK.
5. Close the Network Connections window.

6. In Server Manager, verify that Ethernet lists only **172.16.0.10**. You may need to refresh the view.

   LON-DC1 is now an IPv4-only host.

**Task 3: Disable IPv4 on LON-SVR2**

1. On LON-SVR2, in Server Manager, click **Local Server**.

2. In the **Local Server Properties** dialog box, next to Ethernet, click **10.10.0.11**, IPv6 enabled.

3. In the Network Connections window, right-click **Ethernet**, and then click **Properties**.

4. In the **Ethernet Properties** dialog box, clear the **Internet Protocol Version 4 (TCP/IPv4)** check box, and then click **OK**.

5. Close the Network Connections window.

6. In Server Manager, verify that Ethernet now lists only **IPv6 enabled**. You may need to refresh the view.

   LON-SVR2 is now an IPv6-only host.

**Task 4: Configure an IPv6 network on LON-RTR**

1. On LON-RTR, on the taskbar, click the **Windows PowerShell** icon.

2. Configure a network address that will be used on the IPv6 network. At the Windows PowerShell prompt, type the following cmdlet, and then press Enter:

   ```powershell
tenroute -interfaceAlias "Ethernet 2" -destinationPrefix 2001:db8:0:1::/64
   ```
3. Allow clients to obtain the IPv6 network address automatically from LON-RTR. At the Windows PowerShell prompt, type the following cmdlet, and then press Enter:

   ```
   Set-NetIPInterface -InterfaceAlias "Ethernet 2" -AddressFamily IPv6 -Advertising Enabled
   ```

4. Type `ipconfig`, and then press Enter.

   Notice that Ethernet 2 now has an IPv6 address on the 2001:db8:0:1::/64 network. This address is used for communication on the IPv6-only network.

**Task 5: Verify IPv6 on LON-SVR2**

1. On LON-SVR2, on the taskbar, click the **Windows PowerShell** icon.

2. At the Windows PowerShell prompt, type `ipconfig`, and then press Enter.

   Notice that the Ethernet now has an IPv6 address on the 2001:db8:0:1::/64 network. The network address was obtained from the router through stateless configuration.

**Results:** After completing the exercise, you will have configured an IPv6–only network.

**Exercise 2: Configuring an ISATAP Router**

**Task 1: Add an ISATAP host record to DNS**
1. On LON-DC1, in Server Manager, click **Tools**, and then click **DNS**.

2. In DNS Manager, expand **LON-DC1**, expand **Forward Lookup Zones**, and then click **Adatum.com**.

3. Right-click **Adatum.com**, and then click **New Host (A or AAAA)**.

4. In the New Host window, in the **Name** box, type **ISATAP**.

5. In the **IP address** box, type **172.16.0.1**, and then click **Add Host**. ISATAP clients resolve this host name to find the ISATAP router.

6. Click **OK** to clear the success message.

7. Click **Done** to close the New Host window.

8. Close **DNS Manager**.

**Task 2: Enable the ISATAP router on LON-RTR**

1. On LON-RTR, configure the IP address of the **Ethernet** adapter as the ISATAP router. At the Windows PowerShell prompt, type the following cmdlet, and then press Enter:

   ```powershell
   Set-NetIsatapConfiguration -Router 172.16.0.1
   ```

2. Type the following command, and then press Enter:

   ```powershell
   Get-NetIPAddress | Format-Table InterfaceAlias,InterfaceIndex,IPv6Address
   ```

3. Record the **InterfaceIndex** of the ISATAP interface that has an IPv6 address that includes **172.16.0.1**.

   ```plaintext
   Interface index: [Enter]
   ```
4. Type the following command, and then press Enter:

```
Get-NetIPInterface -InterfaceIndex IndexYouRecorded -PolicyStore ActiveStore | Format-List
```

5. Verify that Forwarding is enabled for the interface and that Advertising is disabled.

6. The ISATAP interface for an ISATAP router must have forwarding enabled and advertising enabled. Type the following command, and then press Enter:

```
Set-NetIPInterface -InterfaceIndex IndexYouRecorded -Advertising Enabled
```

7. Create a new IPv6 network that will be used for the ISATAP network. Type the following command, and then press Enter:

```
New-NetRoute -InterfaceIndex IndexYouRecorded -DestinationPrefix 2001:db8:0:2::/64 -Publish Yes
```

8. View the IP address configuration for the ISATAP interface. Type the following command, and then press Enter:

```
Get-NetIPAddress -InterfaceIndex IndexYouRecorded
```

9. Verify that an IPv6 address is listed on the 2001:db8:0:2::/64 network.

**Task 3: Remove ISATAP from the Global Query Block List**
1. On LON-DC1, at the Windows PowerShell prompt, type the following command, and then press Enter:

   ```powershell
dnscmd /config /globalqueryblocklist wpad
   ```

2. At the Windows PowerShell prompt, type `Restart-Service DNS -Verbose`, and then press Enter.

3. Type `ping isatap`, and then press Enter.

   The name should resolve and you should receive four replies from 172.16.0.1.

**Task 4: Enable LON-DC1 as an ISATAP client**

1. On LON-DC1, at the Windows PowerShell prompt, type the following command, and then press Enter:

   ```powershell
   Set-NetIsatapConfiguration -State Enabled
   ```

2. Type `ipconfig`, and then press Enter.

3. Verify that the Tunnel adapter for ISATAP has an IPv6 address on the 2001:db8:0:2/64 network.

   Notice that this address includes the IPv4 address of LON-DC1.

**Task 5: Test connectivity**

1. On LON-SVR2, at the Windows PowerShell prompt, type the following command, and then press Enter:

   ```powershell
   ping 2001:db8:0:2:0:5efe:172.16.0.10
   ```
2. In Server Manager, if necessary, click Local Server.

3. In the Local Server Properties dialog box, next to Ethernet, click IPv6 enabled.

4. In the Network Connections window, right-click Ethernet, and then click Properties.

5. In the Ethernet Properties dialog box, click Internet Protocol Version 6 (TCP/IPv6), and then click Properties.

6. In the Internet Protocol Version 6 (TCP/IPv6) Properties dialog box, click Use the following DNS server addresses.

7. In the Preferred DNS server box, type 2001:db8:0:2:5efe:172.16.0.10, and then click OK.

8. In the Ethernet Properties dialog box, click Close.

9. Close the Network Connections window.

10. At the Windows PowerShell prompt, type ping LON-DC1, and then press Enter.

    Notice that four replies are received from LON-DC1.

    **Note:** A ping from LON-DC1 to LON-SVR2 does not respond because the firewall configuration on LON-SVR2 blocks ping requests.

**Results:** After completing this exercise, you will have configured an ISATAP router on LON-RTR to allow communication between an IPv6–only network and an IPv4–only network.

**Prepare for the next module**

After you finish the lab, revert the virtual machines back to their initial state.
To do this, complete the following steps.

1. On the host computer, start Hyper-V® Manager.

2. In the **Virtual Machines** list, right-click **20410C-LON-DC1**, and then click **Revert**.

3. In the **Revert Virtual Machine** dialog box, click **Revert**.

4. Repeat steps 2 and 3 for **20410C-LON-SVR1**, **20410C-LON-RTR** and **20410C-LON-SVR2**.