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| **Sheridan College** | | |
| **Course** | **TELE33324: Data Network Design and Configuration – Routers and Switches** | |
| **Professor** | **Ida Leung** | |
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| **Table number** |  | |
| **Lab 4 : RIP** | | |
| **Performed Date** | **19/06/2019** | |
| **Instructor's Sign** |  | **(marks)** |

**Follow the procedure to configure your topology:**

1. Define the topology like figure#1, use the routers and switches have the right amount of interfaces. Each router and switch expects to have the EST timezone, hostname (initial#), enable password “cisco” and secret password “TELE33324”.
2. Define the interfaces by use the following information:

|  |  |  |
| --- | --- | --- |
| **A-End Interface Name** | **Z-End Interface Name** | **Subnet for the point-to-point** |
| **R1 G0/0** | **R2 G0/0** | **10.0.0.4/30 (IPv4)**  **2607:f798:10:0:0:4::/127 (IPv6)** |
| **R1 G0/1** | **R4 G0/1** | **10.0.4.8/30 (IPv4)**  **2607:f798:10:0:4:8::/127 (IPv6)** |
| **R2 G0/1** | **R3 G0/1** | **10.0.7.16/30 (IPv4)**  **2607:f798:10:0:7:16::/127** |
| **R4 G0/0** | **R5 G0/0** | **10.0.8.20/30 (IPv4)**  **2607:f798:10:0:8:20::/127** |
| **R5 G0/1** | **R3 G0/0** | **10.0.9.24/30 (IPv4)**  **2607:f798:10:0:9:24::/127** |
| **R3 G0/2** | **Switch** | **8.0.0.0/24 (IPv4)**  **2607:f798:8::/64** |
| **PC1** | **Switch** | **8.0.0.0/24 (IPv4)**  **2607:f798:8::/64** |
| **PC2** | **Switch** | **8.0.0.0/24 (IPv4)**  **2607:f798:8::/64** |
| **PC3** | **Switch** | **8.0.0.0/24 (IPv4)**  **2607:f798:8::/64** |
| **PC4** | **Switch** | **8.0.0.0/24 (IPv4)**  **2607:f798:8::/64** |
| **PC5** | **Switch** | **8.0.0.0/24 (IPv4)**  **2607:f798:8::/64** |
| **PC6** | **Switch** | **8.0.0.0/24 (IPv4)**  **2607:f798:8::/64** |

**Ping each point-to-point interface on both IPv4 and IPv6 to ensure connectivity works fine.**

1. Configure the PC to ensure it has IP, subnet mask and default gateway for both IPv4 and IPv6.

Ping from R3 to each PC to ensure the connectivity is fine.

1. Configure Loopback address for each router and switch as below:

|  |  |
| --- | --- |
| **Device Name** | **Loopback0 IP** |
| **R1** | **7.0.0.1/32**  **2607:fea8::1/128** |
| **R2** | **7.0.0.2/32**  **2607:fea8::2/128** |
| **R3** | **7.0.0.3/32**  **2607:fea8::3/128** |
| **R4** | **7.0.0.4/32**  **2607:fea8::4/128** |
| **R5** | **7.0.0.5/32**  **2607:fea8::5/128** |
| **Switch#1** | **7.0.0.6/32**  **2607:fea8::6/128** |

When the loopback interfaces is down, are the interfaces up and running?

Yes, because loopback interface act as independent and virtual connection.

Make sure no shut all the loopback interfaces after testing.

1. Enable RIP among each router’s neighbor. Which version of RIP are you using and why?

RIPv2

Only RIPv2 allow us to use rigid boundless subnet and we are using /30 subnet in router config which is not part of bounded classful address assignment.

1. Go to R1 and check the route to 8.0.0.2 PC#1 and see which path is taken. Why?

It goes through router 2 to 3 because it is smallest path in both two routes. In this case path router 4 and router 2 have same administrative distance, so router will decide to send packet with shortest path.

1. Verify with a traceroute from R1 to PC1 for the actual path.

KP\_R1>traceroute 8.0.0.2

Type escape sequence to abort.

Tracing the route to 8.0.0.2

1 10.0.0.6 0 msec 0 msec 0 msec

2 10.0.7.18 1 msec 0 msec 0 msec

3 8.0.0.2 0 msec 1 msec 0 msec

1. Check out the routing table for all routers:

R1> show ip route

R1> show ip protocol

Fill in the following table for R1 (add more lines if needed)

|  |  |  |
| --- | --- | --- |
| Type of route (connected/static) | Destination subnet | Next-hop interfaces |
| Connected | 255.255.255.252 | Loopback 0 |
| RIP | 255.0.0.0 | GigabitEthernet0/0 |
| RIP | 255.0.0.0 | GigabitEthernet0/0 |
| Connected | 255.255.255.252 | GigabitEthernet0/0 |
| Local | 255.255.255.255 | GigabitEthernet0/0 |
| Connected | 255.255.255.252 | GigabitEthernet0/1 |
| Local | 255.255.255.255 | GigabitEthernet0/1 |
| RIP | 255.255.255.252 | GigabitEthernet0/0 |
| RIP | 255.255.255.252 | GigabitEthernet0/1 |

Fill in the following table for R2 (add more lines if needed)

|  |  |  |
| --- | --- | --- |
| Type of route (connected/static) | Destination subnet | Next-hop interfaces |
| Connected | 255.255.255.255 | Loopback0 |
| RIP | 255.0.0.0 | GigabitEthernet0/1 |
| Connected | 255.255.255.252 | GigabitEthernet0/0 |
| Local | 255.255.255.255 | GigabitEthernet0/0 |
| RIP | 255.255.255.252 | GigabitEthernet0/0 |
| Connected | 255.255.255.252 | GigabitEthernet0/1 |
| Local | 255.255.255.255 | GigabitEthernet0/1 |
| RIP | 255.255.255.252 | GigabitEthernet0/0 |
| RIP | 255.255.255.252 | GigabitEthernet0/1 |

Fill in the following table for R3 (add more lines if needed)

|  |  |  |
| --- | --- | --- |
| Type of route (connected/static) | Destination subnet | Next-hop interfaces |
| Connected | 255.255.255.255 | Loopback0 |
| Connected | 255.255.255.0 | GigabitEthernet0/2 |
| Local | 255.255.255.255 | GigabitEthernet0/2 |
| RIP | 255.255.255.252 | GigabitEthernet0/1 |
| RIP | 255.255.255.252 | GigabitEthernet0/0 |
| Connected | 255.255.255.252 | GigabitEthernet0/1 |
| Local | 255.255.255.255 | GigabitEthernet0/1 |
| RIP | 255.255.255.252 | GigabitEthernet0/0 |
| Connected | 255.255.255.252 | GigabitEthernet0/0 |
| Local | 255.255.255.252 | GigabitEthernet0/0 |

Fill in the following table for R4 (add more lines if needed)

|  |  |  |
| --- | --- | --- |
| Type of route (connected/static) | Destination subnet | Next-hop interfaces |
| Connected | 255.255.255.255 | Loopback0 |
| RIP | 255.0.0.0 | GigabitEthernet0/0 |
| RIP | 255.255.255.252 | GigabitEthernet0/1 |
| Connected | 255.255.255.252 | GigabitEthernet0/1 |
| Local | 255.255.255.255 | GigabitEthernet0/1 |
| RIP | 255.255.255.252 | GigabitEthernet0/1 |
| RIP | 255.255.255.252 | GigabitEthernet0/0 |
| Connected | 255.255.255.252 | GigabitEthernet0/0 |
| Local | 255.255.255.255 | GigabitEthernet0/0 |
| RIP | 255.255.255.252 | GigabitEthernet0/0 |

Fill in the following table for R5 (add more lines if needed)

|  |  |  |
| --- | --- | --- |
| Type of route (connected/static) | Destination subnet | Next-hop interfaces |
| Connected | 255.255.255.255 | Loopback0 |
| RIP | 255.0.0.0 | GigabitEthernet0/1 |
| RIP | 255.255.255.252 | GigabitEthernet0/0 |
| RIP | 255.255.255.252 | GigabitEthernet0/1 |
| RIP | 255.255.255.252 | GigabitEthernet0/0 |
| Connected | 255.255.255.252 | GigabitEthernet0/0 |
| Local | 255.255.255.255 | GigabitEthernet0/0 |
| Connected | 255.255.255.252 | GigabitEthernet0/1 |
| Local | 255.255.255.255 | GigabitEthernet0/1 |

1. Now go to shutdown the R3 interfaces facing switch#1. Then go back to R1 to verify the route to PC1. Do you able to observe the holddown process for the route 8.0.0.0/24 and the flush route process? Cut and paste the output to below box and identify each process.

KP\_R1>tra

KP\_R1>traceroute 8.0.0.2

Type escape sequence to abort.

Tracing the route to 8.0.0.2

1 10.0.0.6 1 msec 0 msec 0 msec

2 10.0.7.18 0 msec 0 msec 0 msec

3 10.0.7.18 !H \* !H

4 \* \*

KP\_R1>

10. Do a no shut to the R3 interface-facing switch#1. Do you have a way to change the path to network 8.0.0.0/24 from R1-R2-R3 to R1-R4-R5-R3? How? Configure in your pkt file to verify your solution. Why it works?

Yes, by setting up static route in network from R1 to R4.

KP\_R1>traceroute 8.0.0.2

Type escape sequence to abort.

Tracing the route to 8.0.0.2

1 10.0.4.10 0 msec 0 msec 0 msec

2 10.0.8.22 0 msec 1 msec 0 msec

3 10.0.9.26 0 msec 1 msec 0 msec

4 8.0.0.2 1 msec 1 msec 0 msec

KP\_R1>



Figure Network Topology