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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 8: BGP** | | |
| **Performed Date** | **09/08/2019** | |
| **Instructor's Sign** |  | **(marks)**  100 |

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

1. Use the right routers and switches to define the following topology (bandwidth of the interfaces not matter)
2. Skip Basic Router Configuration except each router has hostname <your\_initial\_R#>
3. Divide the following subnets into the required subnet size and purpose, then apply to the interfaces.

|  |  |  |
| --- | --- | --- |
| **Subnet** | **Purpose** | **Subnet size to divide into** |
| **7.0.0.0/25** | **Loopback address** | **/32 for R4 and R3** |
| **11.0.0.128/25** | **Loopback address** | **/32 for R1and R2** |
| **8.0.0.0/25** | **Point-to-point** | **/30 for AS64812** |
| **12.0.0.128/25** | **Point-to-point** | **/30 for AS65535** |
| **9.0.0.0/24** | **VLAN 10 for PCs connected to SW#1** | **/24** |
| **10.0.0.0/24** | **VLAN 20 for PCs connected to SW#2** | **/24** |

1. Use OSPF as IGP for each individual ASN Please allow MD5 authentication for each OSPF interfaces. All routers are in area0 for each individual ASN
2. Do you able to see the VLAN10 routes on both R3 and R4? Do you able to see the VLAN20 routes on both R1 and R2?

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

|  |  |  |
| --- | --- | --- |
| Type of route (connected/static/OSPF/BGP) | Destination subnet | Next-hop interfaces |
| OSPF | 255.255.255.252 | GigabitEthernet0/0 |
| OSPF | 255.255.255.0 | GigabitEthernet0/0 |
| Connected | 255.255.255.0 | GigabitEthernet0/0.10 |
| Local | 255.255.255.252 | GigabitEthernet0/0.10 |
| Connected | 255.255.255.255 | Loopback0 |

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

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

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

|  |  |  |
| --- | --- | --- |
| Type of route (connected/static/OSPF/BGP) | Destination subnet | Next-hop interfaces |
| Connected | 255.255.255.255 | Loopback0 |
| Connected | 255.255.255.252 | GigabitEthernet0/1 |
| Local | 255.255.255.255 | GigabitEthernet0/1 |
| Connected | 255.255.255.252 | GigabitEthernet0/2 |
| Local | 255.255.255.255 | GigabitEthernet0/2 |
| Connected | 255.255.255.252 | GigabitEthernet0/0.20 |
| Local | 255.255.255.255 | GigabitEthernet0/0.20 |

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

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

1. Establish the eBGP session between AS#64812 and AS#65535. Use the ptp IP from AS#64812 to peer with AS#65535.

R1>show ip bgp sum

R2>show ip bgp sum

R3>show ip bgp sum

Capture the output:

===R2===

KP\_R2>show ip bgp sum

BGP router identifier 11.0.0.130, local AS number 65535

BGP table version is 78, main routing table version 6

23 network entries using 3036 bytes of memory

23 path entries using 1196 bytes of memory

12/8 BGP path/bestpath attribute entries using 1840 bytes of memory

2 BGP AS-PATH entries using 48 bytes of memory

0 BGP route-map cache entries using 0 bytes of memory

0 BGP filter-list cache entries using 0 bytes of memory

Bitfield cache entries: current 1 (at peak 1) using 32 bytes of memory

BGP using 6152 total bytes of memory

BGP activity 6/0 prefixes, 23/0 paths, scan interval 60 secs

Neighbor V AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd

8.0.0.9 4 64812 240 196 78 0 0 02:46:14 4

8.0.0.5 4 64812 222 195 78 0 0 02:45:14 4

===R3===

BGP router identifier 7.0.0.2, local AS number 64812

BGP table version is 52, main routing table version 6

17 network entries using 2244 bytes of memory

17 path entries using 884 bytes of memory

5/7 BGP path/bestpath attribute entries using 1104 bytes of memory

2 BGP AS-PATH entries using 48 bytes of memory

0 BGP route-map cache entries using 0 bytes of memory

0 BGP filter-list cache entries using 0 bytes of memory

Bitfield cache entries: current 1 (at peak 1) using 32 bytes of memory

BGP using 4312 total bytes of memory

BGP activity 6/0 prefixes, 17/0 paths, scan interval 60 secs

Neighbor V AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd

8.0.0.10 4 65535 241 196 52 0 0 02:47:06 4

===R4===

KP\_R4>

KP\_R4>show ip bgp sum

BGP router identifier 7.0.0.1, local AS number 64812

BGP table version is 55, main routing table version 6

16 network entries using 2112 bytes of memory

16 path entries using 832 bytes of memory

5/7 BGP path/bestpath attribute entries using 1104 bytes of memory

2 BGP AS-PATH entries using 48 bytes of memory

0 BGP route-map cache entries using 0 bytes of memory

0 BGP filter-list cache entries using 0 bytes of memory

Bitfield cache entries: current 1 (at peak 1) using 32 bytes of memory

BGP using 4128 total bytes of memory

BGP activity 6/0 prefixes, 16/0 paths, scan interval 60 secs

Neighbor V AS MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd

8.0.0.6 4 65535 229 196 55 0 0 02:46:37 4

1. Can you find out the best path from PC1 to PC11? Please list the route together with the forwarding table result on R3 Why?

Save the pkt file and submit to the submission folder for lab8.

Tracing route to 9.0.0.2 over a maximum of 30 hops:

1 0 ms 0 ms 0 ms 10.0.0.1

2 0 ms 0 ms 0 ms 12.0.0.129

3 0 ms 0 ms 0 ms 8.0.0.9

4 0 ms 0 ms 0 ms 9.0.0.2

7.0.0.0/32 is subnetted, 1 subnets

C 7.0.0.2/32 is directly connected, Loopback0

8.0.0.0/8 is variably subnetted, 5 subnets, 2 masks

C 8.0.0.0/30 is directly connected, GigabitEthernet0/1

L 8.0.0.2/32 is directly connected, GigabitEthernet0/1

B 8.0.0.4/30 [20/1] via 8.0.0.10, 00:00:00

C 8.0.0.8/30 is directly connected, GigabitEthernet0/2

L 8.0.0.9/32 is directly connected, GigabitEthernet0/2

9.0.0.0/8 is variably subnetted, 2 subnets, 2 masks

C 9.0.0.0/24 is directly connected, GigabitEthernet0/0.20

L 9.0.0.1/32 is directly connected, GigabitEthernet0/0.20

10.0.0.0/24 is subnetted, 1 subnets

B 10.0.0.0/24 [20/2] via 8.0.0.10, 00:00:00

12.0.0.0/30 is subnetted, 1 subnets

B 12.0.0.128/30 [20/1] via 8.0.0.10, 00:00:00

1. If I want to alter the path to use longer path, what should I do? You don’t need to provide configuration. Just express your idea

Basic way of changing default path is to define static route explicitly in router R3 pointing to R4.

Another way to setup different path is to define hop count smaller then R2 to R3 path.

