

BGP Lab Exercise 1

1. Remove ISIS from your router and shutdown your links.
We will only be using the Ethernet link for this exercise. ISIS can be removed by doing "no router isis si-afnog". The instructors will reconfigure the network following the completion of the ISIS exercise.
2. Confirm that you are no longer receiving IPv4 or IPv6 ISIS routes by doing a "show ip route isis" and "show ipv6 route isis".
3. Work out your AS number from the diagram and write it down here:

AS:

4. Verify the IP address block used for your PC link. Your group was assigned a /28 IPv4 address block. You will need to sub-divide it for these BGP exercises, using part of it for the LAN with your PC, part of it for the router loopback (as you did for the ISIS exercise previously), and the rest for other requirements later on.

Address block:

Mask:

More-specific block used for LAN:

5. We will set up peering sessions according to the diagram. Your router is connecting to the AS 100 router. Ask the workshop instructors what IP address you should use for the Point-to-Point link with your upstream.

Address block used for point to point link to AS 100:

6. Configure BGP on your router to announce your network. This is an example for RouterA team:

```
RouterA# config term
Enter configuration commands, one per line. End with CNTL/Z.
RouterA(config)# ip bgp-community new-format
RouterA(config)# router bgp 1          ! use your AS number
RouterA(config-router)# network 196.200.220.32 mask 255.255.255.240
                                     ! use your network and mask
RouterA(config-router)# no synchronization
RouterA(config-router)# no auto-summary
```

BGP is now configured on your router, but not yet talking to any other routers yet.

7. Set up a peering session with your upstream neighbour, for example:

```
RouterA(config)# router bgp 1          ! use your AS number
RouterA(config-router)# neighbor 196.200.222.1 remote-as 100
                        ! use the IP address and AS number of your neighbour
RouterA(config-router)# neighbor 196.200.222.1 descr My-Peer-with-AS100
```

8. Check to see if the peering session is up:

```
RouterA# show ip bgp summary
BGP router identifier 196.200.220.47, local AS number 1
BGP table version is 3, main routing table version 3
```

```
Neighbor      V AS  MsgRcvd MsgSent TblVer InQ OutQ Up/Down State/PfxRcd
196.200.222.1 4 100    0      0    0  0  0 never  Idle
```

9. Check to see if you are sending routes to your neighbour? Why or why not? If you aren't, what do you think could be wrong?

```
RouterA# sh ip bgp neighbor x.x.x.x advertised-routes
```

Recall that the BGP network statement means that the prefix will be announced *only* if the same prefix is already present in the routing table. To do this we need to add a static route to Null0 for our address block. Refer to the BGP presentation.

10. Check to see if you are receiving routes from your neighbour.

```
RouterA# show ip bgp
```

What routes are you receiving?

Other commands to monitor BGP:

```
RouterA# sh ip route
RouterA# sh ip bgp
RouterA# sh ip bgp neighbor
RouterA# sh ip bgp neighbor x.x.x.x routes
```

11. We will now repeat the above steps to add IPv6 to the workshop network. Your group was assigned a /60 IPv6 address block during the ISIS exercise. During the ISIS exercise, you subdivided it, using the first /64 subnet for the LAN with your PC. Write down this address block here.

Address block: _____ Mask: _____

More-specific (/64) block used for LAN: _____

Ask the workshop instructors what IPv6 address you should use for the Point-to-Point link with your upstream.

Address block used for point to point link to AS 100:

12. Configure BGP on your router to announce your IPv6 network. This is an example for RouterA team:

```
RouterA# config term
Enter configuration commands, one per line. End with CNTL/Z.
RouterA(config)# router bgp 1          ! use your AS number
RouterA(config-router)# no bgp default ipv4-unicast
RouterA(config-router)# address-family ipv6 ! IPv6 address family
RouterA(config-router-af)# network 2001:4348:220:10::/60
                                   ! use your network and mask
```

What was the purpose of the "no bgp default ipv4-unicast" configuration line? Can you remember from the presentation? Write the reason down here:

BGP is now configured on your router, but not yet talking to any other IPv6 routers yet.

13. Set up a peering session with your upstream neighbour, for example:

```
RouterA(config)# router bgp 1          ! use your AS number
RouterA(config-router)# address-family ipv6 ! IPv6 address family
RouterA(config-router-af)# neighbor 2001:4348:220:1::1 remote-as 100
                                   ! use the IPv6 address and AS number of your neighbour

RouterA(config-router-af)# neighbor 2001:4348:220:1::1 descr AS100-Peer
RouterA(config-router-af)# activate
```

14. Check to see if the peering session is up:

```
RouterA# show bgp ipv6 unicast summary
BGP router identifier 196.200.220.47, local AS number 1
BGP table version is 3, main routing table version 3

Neighbor      V  AS  MsgRcvd MsgSent TblVer  InQ  OutQ  Up/Down State/PfxRcd
2001:4348:220:1::1 4 100   0      0      0  0  0 never      Idle
```

15. Check to see if you are sending routes to your neighbour? Why or why not? If you aren't, what do you think could be wrong? Review the presentation slides - they will give you the hint as to what might be wrong.

```
RouterA# sh bgp ipv6 unicast neighbor x.x.x.x advertised-routes
```

16. Check to see if you are receiving routes from your neighbour.

```
RouterA# show bgp ipv6 unicast
```

What routes are you receiving?

Other commands to monitor BGP:

```
RouterA# sh ipv6 route
```

```
RouterA# sh bgp ipv6 unicast
```

```
RouterA# sh bgp ipv6 unicast neighbor
```

```
RouterA# sh bgp ipv6 unicast neighbor x.x.x.x routes
```

17. Finally, take a look at the BGP configuration on the router. What do you see? Is there anything unusual with the output?

Once you enable the IPv6 address family, you will see that the router will "tidy" up the BGP configuration, separating generic, IPv4 and IPv6 configuration into different sections. When making configuration changes, it is important to specify which address family the changes are required in. The best advice is to simply enter the chosen address family before any configuration changes are required.

Print out the configuration, or make a copy of it below here. It will be a useful reference point for you in future as you work through the rest of the exercises in this workshop.