Local Peering BGP Lab

Introduction

The purpose of this exercise is to:

- Learn to configure basic eBGP to exchange routing information with local peers.

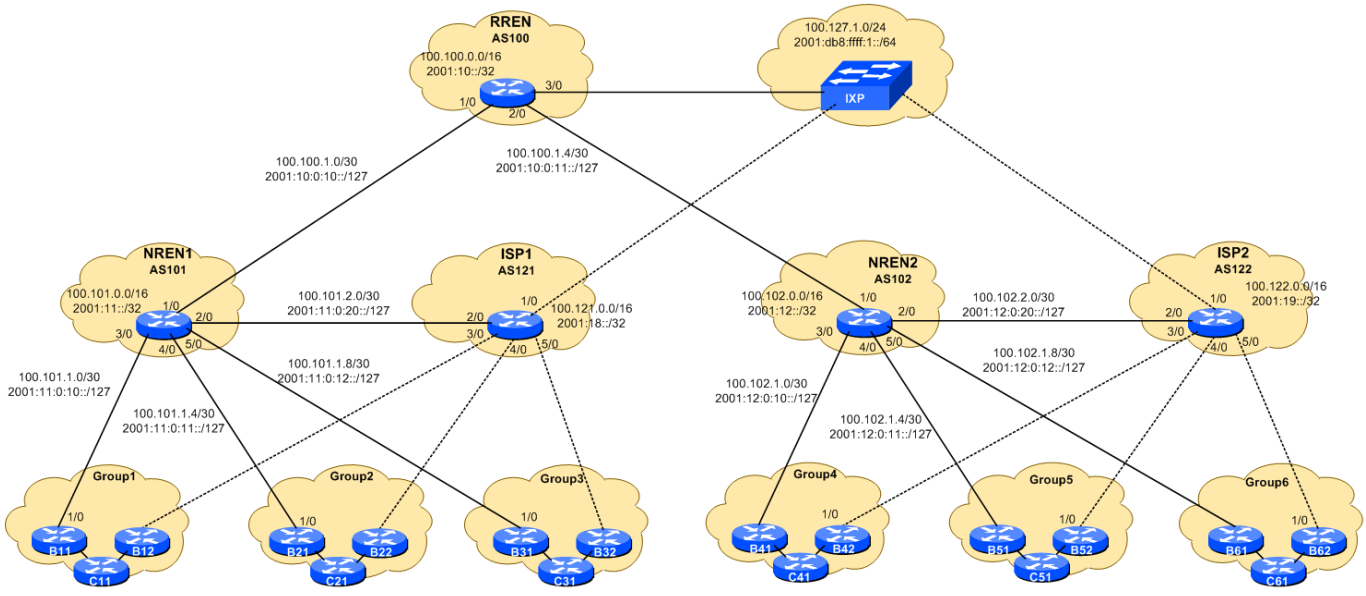
Pre-requisites

This exercise builds upon the configurations implemented in the IS-IS + Static routing lab. You must be able to:

- see routes by BGP from both your upstream ISP and your upstream NREN
- Ping your neighbour routers in other ASs by their address space.

Address Space Allocation

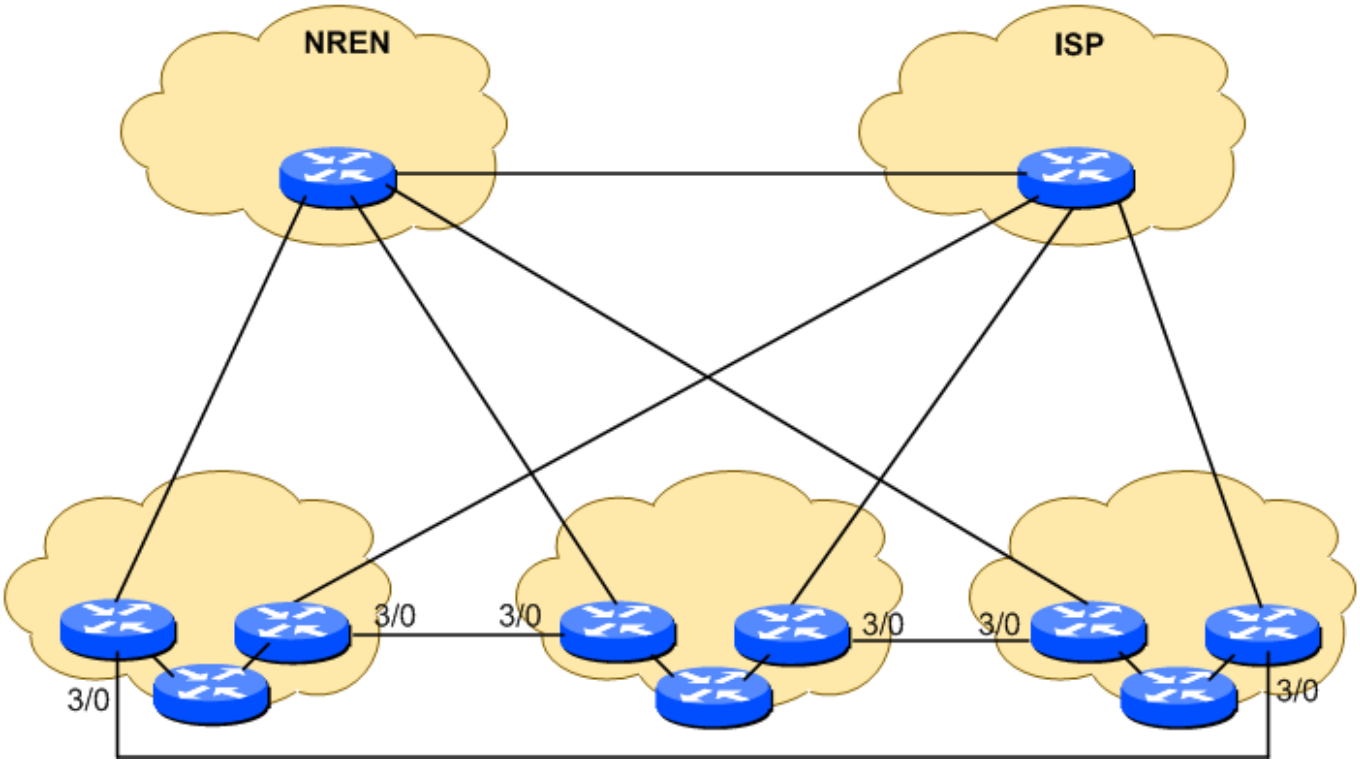
Refer to the IP Address Plan document for information about the IP address plan for the network infrastructure for these labs.



Traffic Exchange (Peering)

Direct traffic exchanges are usually established at no charge between two autonomous systems that want to save costs. The savings are achieved by not having to carry that traffic over expensive transit links via commercial providers. Also, these direct exchanges have the added benefit of reducing latency because there are fewer hops.

Usually traffic exchanges occur at public exchange points, also known as IXPs. The simplest kind of exchange point is a Layer-2 switch. In this exercise, we will simply configure direct links between routers, which is basically the same thing as connecting through a switch.



Peering with your neighbouring AS

This section sets up peering between adjacent groups in the classroom network.

Configure a point-to-point link to your neighbour AS as shown in the diagram. Consult the address plan used for the workshop to see which subnet addresses you should use.

For example, on B12:

```
interface GigabitEthernet3/0
 description Link to B21
 ip address 100.68.1.25 255.255.255.252
 no ip directed-broadcast
 no ip redirects
 no ip proxy-arp
 ipv6 address 2001:db8:1:12::/127
 ipv6 nd prefix default no-advertise
 ipv6 nd ra suppress all
 no shutdown
```

Configure prefix lists for your inbound filters

On B12:

```
ip prefix-list AS20-in permit 100.68.2.0/24
```

```
ipv6 prefix-list AS20-v6-in permit 2001:db8:2::/48
```

The equivalent needs to be done on B21 (which connects directly to B12).

Prefix lists for outbound filters should still exist from a previous step. You can verify like this:

```
B12#show ip prefix-list AS10-out
B12#show ipv6 prefix-list AS10-v6-out
```

Now create the BGP sessions and apply those inbound/outbound filters:

On B12:

```
router bgp 10
 address-family ipv4
  neighbor 100.68.1.26 remote-as 20
  neighbor 100.68.1.26 description eBGP with AS20
  neighbor 100.68.1.26 password NSRC-BGP
  neighbor 100.68.1.26 prefix-list AS10-out out
  neighbor 100.68.1.26 prefix-list AS20-in in
  neighbor 100.68.1.26 activate
!
 address-family ipv6
  neighbor 2001:db8:1:12::1 remote-as 20
  neighbor 2001:db8:1:12::1 description eBGP with AS20
  neighbor 2001:db8:1:12::1 password NSRC-BGP
  neighbor 2001:db8:1:12::1 prefix-list AS10-v6-out out
  neighbor 2001:db8:1:12::1 prefix-list AS20-v6-in in
  neighbor 2001:db8:1:12::1 activate
```

The equivalent needs to be done for B21.

Verify that the sessions are up:

```
B12# show ip bgp summary
B12# show ipv6 bgp unicast summary
```

...and that you are learning the prefix directly from the neighbour:

```
B12# show ip bgp neighbor 100.68.1.22 routes
B12# show bgp ipv6 unicast neighbor 2001:db8:1:11::1 routes
```

Do some traceroutes towards your peer and make sure that the path is direct.

Remember to save your configurations.

You are done! You have configured BGP in a multihomed environment and BGP is selecting the paths based on default values.

Direct Peering between NREN and ISP

The BGP session between the NREN and the ISP will also need to be set up as shown in the above diagram.

First create the interface on the NREN router and on the ISP router using exactly the same best practice configurations we used at the start of the workshop.

For NREN1:

```
interface GigabitEthernet2/0
 description P2P Link to ISP1
 ip address 100.101.2.1 255.255.255.252
 no ip redirects
 no ip proxy-arp
 ipv6 address 2001:11:0:20::/127
 ipv6 nd prefix default no-advertise
 ipv6 nd ra suppress all
 no shutdown
!
```

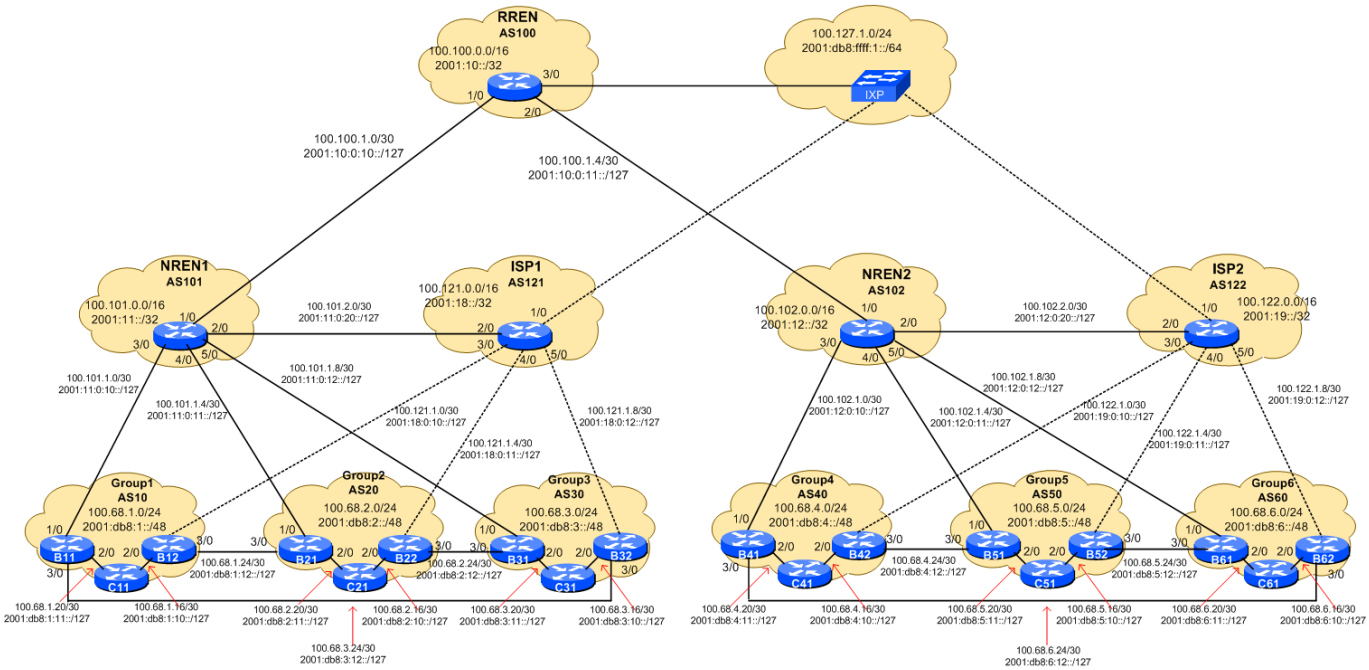
Do the same for the ISP1, NREN2 and ISP2 routers. They will have a very similar configuration, just the addresses will be different - refer to the address plan.

And then set up the external BGP session between the NREN and ISP routers. Here is a sample configuration for the ISP1 router:

```
router bgp 121
 address-family ipv4
  neighbor 100.101.2.1 remote-as 101
  neighbor 100.101.2.1 description eBGP with NREN1 (AS101)
  neighbor 100.101.2.1 password NSRC-BGP
  neighbor 100.101.2.1 activate
 !
 address-family ipv6
  neighbor 2001:11:0:20:: remote-as 101
  neighbor 2001:11:0:20:: description eBGP with NREN1 (AS101)
  neighbor 2001:11:0:20:: password NSRC-BGP
  neighbor 2001:11:0:20:: activate
!
```

The configuration for NREN1, NREN2 and ISP2 routers will be very similar - again refer to the address plan for the correct IP addresses to use.

Appendix - Complete Lab Diagram & Address Plan



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