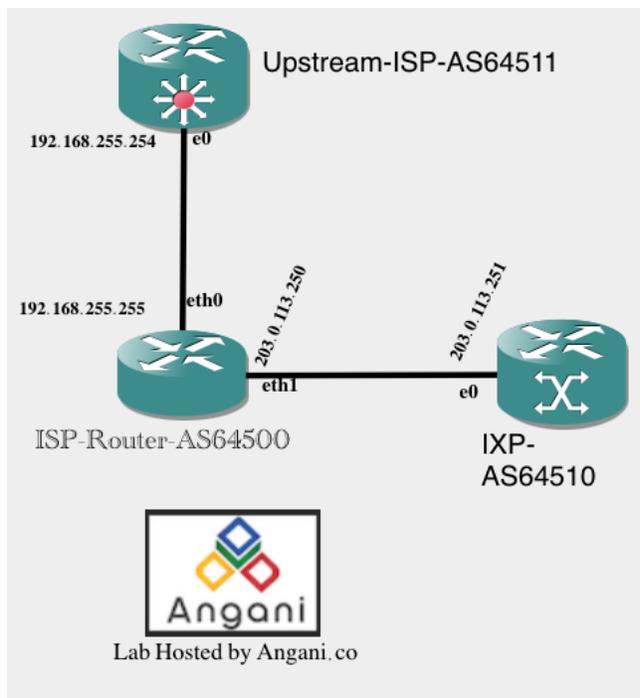


KeNOG BGP Intro lab

Welcome to the KeNOG BGP lab. This lab has been graciously hosted by Angani.co (<https://angani.co>) . It consists of a ISP Router which you will configure and is connected to an IXP and an Upstream ISP Router. The goal is to configure and activate BGP between your router and the IXP and Upstream-ISP router.

After logging into the lab, you will see three tabs: "ISP-Router", "IXP" and "Upstream-ISP". You will configure the device on the "ISP-Router" tab and the remaining two tabs will be used to check if you have configured your router correctly.

The Topology



The ISP router is using [FRRouting](#) and uses a Cisco like syntax. It has the following links:



- interface eth0 – 192.168.255.255/31 - connected to the Upstream-ISP whose IP address is 192.168.255.254
- interface eth1 – 203.0.113.250/31 - connected to the IXP router whose IP address is 203.0.113.251

Your ISP Router has ASN 64500. The IXP Router has ASN 64511. The Upstream-ISP Router has ASN 64510.

Your ISP Router will originate the following prefixes over BGP **to the Upstream-ISP**.

- 198.51.100.0/24

Your ISP Router will originate and receive the following prefixes over BGP **to the IXP Router**.

- 198.51.100.0/24
- 198.51.100.0/25
- 198.51.100.128/25

The Upstream-ISP (AS64500)

The Upstream-ISP will send you the following route which you will accept 10.0.0.0/8.

It will also send other routes which you will **reject**.

The IXP Router (AS64511)

The IXP router will send you the following route which you will accept: 192.0.2.0/24.

Reject all other routes.

Accessing the router

Click on the "ISP-Router" tab and hit the "Enter" key. You should see:

frr#

Enter the configure terminal



```
config terminal
```

If you get an error, you may be in the wrong mode. Type the following then enter the configure terminal.

```
vttysh
```

Configuring your ISP Router

1. Configure the network interfaces (you can copy and paste)

Enter the configure terminal

```
config terminal
```

2. Add the hostname and the interface IP addresses

```
hostname ISP-Router
```

```
interface eth0
  description To AS64510 - Upstream-ISP
  ip address 192.168.255.255/31
exit
```

```
interface eth1
  description To AS64511 - IXP
  ip address 203.0.113.250/31
exit
exit
```

3. Test that you can ping the IXP and Upstream ISP routers.

```
ping 192.168.255.254
ping 203.0.113.251
```

4. Configure BGP

```
router bgp 64500
  bgp log-neighbor-changes
  no bgp default ipv4-unicast
  neighbor 192.168.255.254 remote-as 64510
  neighbor 192.168.255.254 description Upstream-Transit
  neighbor 203.0.113.251 remote-as 64511
  neighbor 203.0.113.251 description IXP
  address-family ipv4 unicast
    network 198.51.100.0/25
    network 198.51.100.128/25
    network 198.51.100.0/24
  neighbor 192.168.255.254 activate
  neighbor 192.168.255.254 soft-reconfiguration inbound
  neighbor 192.168.255.254 prefix-list TRANSIT-IN in
```



```
neighbor 192.168.255.254 prefix-list TRANSIT-OUT out
neighbor 203.0.113.251 activate
neighbor 203.0.113.251 soft-reconfiguration inbound
neighbor 203.0.113.251 prefix-list IXP-IN in
neighbor 203.0.113.251 prefix-list IXP-OUT out
exit-address-family
exit
```

5. Add the prefix lists to control what you are sending and receiving

```
config t
```

```
ip prefix-list IXP-IN seq 5 permit 192.0.2.0/24
ip prefix-list IXP-IN seq 10 deny 0.0.0.0/0 le 32
ip prefix-list IXP-OUT seq 5 permit 198.51.100.0/25
ip prefix-list IXP-OUT seq 10 permit 198.51.100.128/25
ip prefix-list IXP-OUT seq 15 permit 198.51.100.0/24
ip prefix-list TRANSIT-OUT seq 5 permit 198.51.100.0/24
ip prefix-list TRANSIT-OUT seq 10 deny 0.0.0.0/0 le 32
ip prefix-list TRANSIT-IN seq 5 permit 10.0.0.0/8
ip prefix-list TRANSIT-IN seq 10 deny 0.0.0.0/0 le 32
exit
wr
```

6. Test that the BGP sessions are up

```
sh ip bgp summary
```

You should see something like this:

| Neighbor | V | AS | MsgRcvd | MsgSent | TblVer | InQ | OutQ |
|-----------------|---|-------|--------------------|---------|--------|-----|------|
| 192.168.255.254 | 4 | 64510 | 119 | 102 | 0 | 0 | 0 |
| 00:40:35 | 1 | | 1 Upstream-Transit | | | | |
| 203.0.113.251 | 4 | 64511 | 113 | 102 | 0 | 0 | 0 |
| 00:40:35 | 1 | | 3 IXP | | | | |

=====

Check the other tabs to see if you have configured correctly

The full router config is below:

```
configure terminal
```

```
hostname ISP-Router
!
ip route 198.51.100.0/24 Null0
ip route 198.51.100.0/25 Null0
```



```
ip route 198.51.100.128/25 Null0
!
interface eth0
  description To AS64510 - Upstream-ISP
  ip address 192.168.255.255/31
exit
!
interface eth1
  description To AS64511 - IXP
  ip address 203.0.113.250/31
exit
!
router bgp 64500
  bgp log-neighbor-changes
  no bgp default ipv4-unicast
  neighbor 192.168.255.254 remote-as 64510
  neighbor 192.168.255.254 description Upstream-Transit
  neighbor 203.0.113.251 remote-as 64511
  neighbor 203.0.113.251 description IXP
  !
  address-family ipv4 unicast
    network 198.51.100.0/24
    network 198.51.100.0/25
    network 198.51.100.128/25
    neighbor 192.168.255.254 activate
    neighbor 192.168.255.254 soft-reconfiguration inbound
    neighbor 192.168.255.254 prefix-list TRANSIT-IN in
    neighbor 192.168.255.254 prefix-list TRANSIT-OUT out
    neighbor 203.0.113.251 activate
    neighbor 203.0.113.251 soft-reconfiguration inbound
    neighbor 203.0.113.251 prefix-list IXP-IN in
    neighbor 203.0.113.251 prefix-list IXP-OUT out
  exit-address-family
exit
!
ip prefix-list IXP-IN seq 5 permit 192.0.2.0/24
ip prefix-list IXP-IN seq 10 deny 0.0.0.0/0 le 32
ip prefix-list IXP-OUT seq 5 permit 198.51.100.0/25
ip prefix-list IXP-OUT seq 10 permit 198.51.100.128/25
ip prefix-list IXP-OUT seq 15 permit 198.51.100.0/24
ip prefix-list TRANSIT-OUT seq 5 permit 198.51.100.0/24
ip prefix-list TRANSIT-OUT seq 10 deny 0.0.0.0/0 le 32
ip prefix-list TRANSIT-IN seq 5 permit 10.0.0.0/8
ip prefix-list TRANSIT-IN seq 10 deny 0.0.0.0/0 le 32
!
end
```