

Setup of a BGP Feed using Quagga 0.97.3

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Abstract—This paper describes configuration of BGP Quagga software on a FreeBSD host receiving BGP updates.

Index Terms—Quagga, BGP, bgpd.

I. INTRODUCTION

This report gives a brief outline of how to install the Quagga Routing Software and how to log BGP announcements. Quagga supports different routing protocols including BGP, OSPF and RIP. It is supported on different operating systems including FreeBSD, Linux, Solaris and NetBSD [1].

II. INSTALLING AND CONFIGURING QUAGGA

The version of Quagga that was installed was 0.97.3. To download the latest version or install the port version, go to `/usr/ports/net/quagga/` and type `make install clean`. Quagga was installed on the FreeBSD 8.1-RELEASE kernel.

Once Quagga is installed the Border Gateway Protocol Daemon (bgpd) needs to be configured. This is done in the `/etc/rc.conf` file as shown below:

```
quagga_enable="YES"
quagga_flags="-d"
quagga-daemons="bgpd"
```

III. BGP FEED FROM APNIC

In this project the Asia-Pacific network Information Centre (APNIC) provided the upstream BGP feed to our local FreeBSD machine. In this section we have omitted sensitive APNIC details such as peer IP addresses.

The file that is to be edited is the `bgpd.conf` file found in the `/usr/local/etc/quagga` directory. The full configuration is shown below:

```
hostname <hostname>
password <password>
enable password <enable_password>
log file Aug_1-00_00_02.log
!
debug bgp updates
!
router bgp <Local AS Number>
bgp router-id <Local IP address>
```

```
! Connect to APNIC
neighbor <neighbor IP> remote-as <neighbor AS>
neighbor <neighbor IP> description APNIC feed
neighbor <neighbor IP> ebgp-multihop 255
neighbor <neighbor IP> soft-reconfiguration inbound
neighbor <neighbor IP> filter-list 95 out address-family ipv6
neighbor <neighbor IP> activate
neighbor <neighbor IP> soft-reconfiguration inbound
!
ip as-path access-list 95 deny .*
```

The details of each configuration line above can be found in [1].

The `hostname` field is the name that the BGP daemon runs with (bgpd). There are two modes supported by Quagga, the normal mode and enable mode. The normal mode permits viewing of data and configuration only. The enable mode permits updates to the configuration. The normal mode requires a `password password` configuration option to be specified. The enable mode requires an `enable password` to be specified.

To collect and store the output of the BGP announcements received from the upstream host, a log file `file name` must be specified. It is here that the BGP announcements will be stored. To enable management of the data a cronjob script has been written and run on the host that causes the file name to be changed every 24 hours and new updates to go to the new file.

Having debug bgp updates uncommented is how BGP announcements are generated.

To set up a connection feed to a different Autonomous System (AS) it is necessary to configure the FreeBSD machine as a BGP daemon. To do this the router `bgp` command must have an *Autonomous System Number* and a `bgp router-id Local FreeBSD IP address` specified.

The next step is to include the neighbouring Autonomous System number to the BGP daemon configuration. To achieve this we set up the `neighbor neighbor IP remote-as neighbor AS` line which specifies the Neighbour's IP address and Autonomous System number.

For the host to receive updates, the upstream host must carry out similar configuration actions.

* The author was a CAIA intern during the work described in this report

The `ebgp-multihop` was used to establish a BGP peering session with the APNIC router which is not a directly connected router. The `soft-reconfiguration inbound` enables policy changes without the neighbor having to send the entire routing table. The `filter-list` is used to deny all outbound traffic to the Neighbor's network. Finally, since Quagga supports both IPv4 and IPv6, address-family IPv6 was activated with `soft-reconfiguration` reapplied.

IV. STARTING THE BGP DAEMON (BGPD)

Once the configuration is set up as described the `bgpd` can be started by:

```
/usr/local/etc/rc.d/quagga start
```

To check the status of the daemon use:

```
Socketstat -4 | grep bgpd
```

The status can also be checked by logging into the daemon. Quagga supports multiple routing protocols, with ports:

Zebra	2601
Ripd	2602
Ripng	2603
Ospdfd	2604
Bgpd	2605
Ospf6d	2606

To log into `bgpd` use:

```
telnet localhost 2605
```

To see if the `bgpd` neighbours are active use:

```
Show ip bgp sum
```

To see the whole local routing table use:

```
Show ip bgp
```

V. CONCLUSION

Quagga is very useful software that enables us to receive an upstream BGP feed. This paper describes the installation and configuration of Quagga, how to collect BGP announcements, and store them within a log file.

Acknowledgments

The authors gratefully acknowledge the support of APNIC in providing the BGP feed.

References

- [1] "Quagga routing suite," <http://www.nongunu.org/quagga/>, accessed 8th August 2013.