BGP (Border Gateway Protocol)

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General Information

Summary

The Border Gateway Protocol (BGP) allows setting up an interdomain dynamic routing system that automatically generates the routing table for routing between autonomous systems (AS).

MikroTik RouterOS supports BGP Version 4, as defined in RFC1771.

The MikroTik RouterOS implementation of the BGP has filtering (using prefix lists) feature

Specifications

Packages required: routing
License required: level3
Home menu level: /routing bgp
Standards and Technologies: RFC1771
Hardware usage: requires additional RAM for storing routing information (128MB recommended)
Related Documents

- Package Management
- IP Addresses and ARP
- Routes, Equal Cost Multipath Routing, Policy Routing
- Prefix Lists

Description

The Border Gateway Protocol (BGP) is an Exterior Gateway Protocol (EGP). It allows setting up an interdomain routing system that automatically guarantees the loop-free exchange of routing information between autonomous systems (AS). It is widely used in companies assigned with a definite IP address ranges and connected to a number of ISPs simultaneously so that if one of the links is down, the IP address ranges are still reachable via an another ISP.

The MikroTik RouterOS implementation of the BGP supports filtering with prefix lists, that is used for filtering received and sent routing information.

The routes learned by BGP protocol are installed in the route list with the distance of 200 for iBGP (Internal BGP) routes and of 20 for eBGP (External BGP) routes.

Additional Documents

- http://www.ietf.org/rfc/rfc1771.txt

BGP Setup

Home menu level: /routing bgp

Property Description

**enabled** *(yes | no; default: no)* - enable or disable BGP

**as** *(integer; default: 1)* - autonomous system number

**router-id** *(IP address; default: 0.0.0.0)* - the Router identification in form of an IP address

**redistribute-connected** *(yes | no)* - if enabled, the router will redistribute the information about all connected routes, i.e., routes to the networks that can be directly reached

**redistribute-static** *(yes | no; default: no)* - if enabled, the router will redistribute the information about all static routes added to its routing database, i.e., routes that have been created using the /ip route add command on the router

**redistribute-rip** *(yes | no; default: no)* - if enabled, the router will redistribute the information about all routes learned by RIP protocol

**redistribute-ospf** *(yes | no; default: no)* - if enabled, the router will redistribute the information about all routes learned by OSPF protocol
about all routes learned by the OSPF protocol

**state** (read-only: disabled | running | terminating) - status of the BGP
- **disabled** - not working, has been disabled
- **running** - working
- **terminating** - shutting down, flushing all route information

**Notes**

Usually, you want to redistribute connected and static routes, if any. Therefore change the settings for these arguments and proceed to the BGP networks.

**Example**

To enable BGP protocol specifying that router 192.168.0.206, that belongs to the 65002 AS, should redistribute the connected routes

```bash
[admin@MikroTik] routing bgp>
[admin@MikroTik] routing bgp> print
  enabled: yes
  as: 65002
  router-id: 192.168.0.206
  redistribute-static: no
  redistribute-connected: yes
  redistribute-rip: no
  redistribute-ospf: no
  state: running
[admin@MikroTik] routing bgp>
```

**BGP Network**

**Home menu level:** /routing bgp network

**Description**

BGP Networks is a list of the networks to be advertised.

**Property Description**

**network** (IP address/mask; default: 0.0.0.0/0) - network to advertise

**Notes**

You can add to the list as many networks as required.

The router is not checking whether the network is in the routing table, it always advertises all the routes that are specified here.

Note the difference with OSPF, that use network list for different purpose - to determine where to send updates.

**Example**
To advertise the network 159.148.150.192/27:

```
[admin@modux] routing bgp network> add network=159.148.150.192/27
[admin@modux] routing bgp network> print
# NETWORK
0 159.148.150.192/27
[admin@modux] routing bgp network>
```

**BGP Peers**

Home menu level: `/routing bgp peer`

**Description**

You need to specify the BGP peer with whom you want to exchange the routing information. The BGP exchanges routing information only if it can establish a TCP connection to its peer. You can add as many peers as required.

**Property Description**

- `remote-address (IP address; default: 0.0.0.0)` - address of the remote peer
- `remote-as (integer; default: 0)` - AS number of the remote peer
- `multihop (yes | no; default: no)` - if enabled, allows BGP sessions, even when the neighbour is not on a directly connected segment. The multihop session is not established if the only route to the multi-hop peer's address is the default route (0.0.0.0/0)
- `route-reflect (yes | no; default: no)` - defines whether to redistribute further the routes learned from router of the same AS or not. If enabled, can significantly reduce traffic between routers in the same AS
- `prefix-list-in (name; default: '')` - name of the filtering prefix list for receiving routes
- `prefix-list-out (name; default: '')` - name of the filtering prefix list for advertising routes
- `state (read-only: connected | not-connected)` - the status of the BGP connection to the peer
- `routes-received` - the number of received routes from this peer

**Example**

To enable routing information exchange with the neighbour (non-multihop) 192.168.0.254 that belongs to 65002 AS:

```
[admin@MikroTik] routing bgp peer> add remote-address=192.168.0.254 remote-as=65002
[admin@MikroTik] routing bgp peer> print
# REMOTE-ADDRESS REMOTE-AS MULTIHOP ROUTE-REFLECT PREFIX-LIS... PREFIX-LI...
0 192.168.0.254 65002 no no none none
[admin@MikroTik] routing bgp peer> peer print status
# REMOTE-ADDRESS REMOTE-AS STATE ROUTES-RECEIVED
0 192.168.0.254 65002 connected 1
[admin@MikroTik] routing bgp>
```

**Troubleshooting**

**Description**
• *The BGP does not learn routes from its peer*
  Try to see if the peer is directly attached, or you should use the `multihop` flag when defining the peer and static routing to get the connection between the peers.

• *I can ping from one peer to the other one, but no routing exchange takes place*
  Check the status of the peer using `/routing bgp peer print detail` command. See if you do not have firewall that blocks TCP port 179.