

How to Configure Local Preference in BGP

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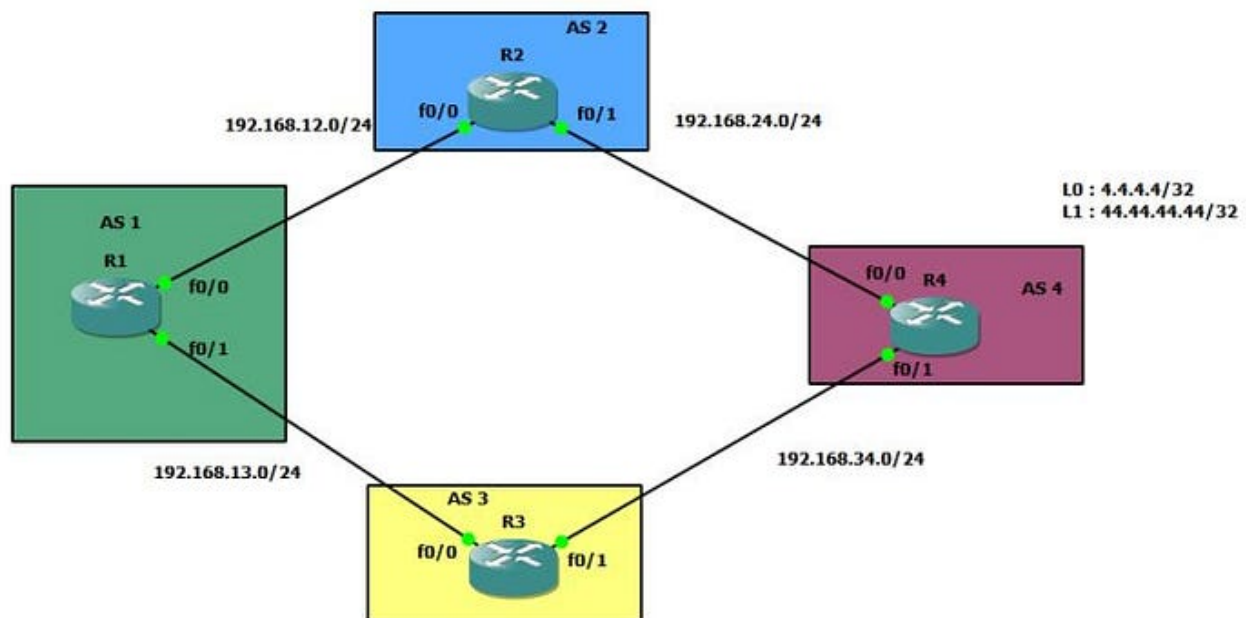
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In this session, we are going to see about how to configure Local Preference (BGP-Attribute).

The Topology that we are going to see is shown below:



:

```
R1#configure terminal
R1(config)#interface fastEthernet 0/0
R1(config-if)#ip address 192.168.12.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#interface fastEthernet 0/1
R1(config-if)#ip address 192.168.13.1 255.255.255.0
R1(config-if)#no shutdown
R1(config-if)#exit
R1(config)#interface loopback 0
R1(config-if)#ip address 1.1.1.1 255.255.255.255
R1(config-if)#end
R1#
```

```
R2(config)#interface fastEthernet 0/0
R2(config-if)#ip address 192.168.12.2 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#interface fastEthernet 0/1
R2(config-if)#ip address 192.168.24.2 255.255.255.0
R2(config-if)#no shutdown
R2(config-if)#exit
R2(config)#interface loopback 0
R2(config-if)#ip address 2.2.2.2 255.255.255.255
R2(config-if)#end
R2#
```

```
R3(config)#interface fastEthernet 0/0R3(config-if)#ip address 192.168.13.3
255.255.255.0R3(config-if)#no shutdownR3(config-if)#exitR3(config)#interface
fastEthernet 0/1R3(config-if)#ip address 192.168.35.3
255.255.255.0R3(config-if)#no shutdownR3(config-if)#R3(config-
if)#exitR3(config)#R3(config)#interface loopback 0R3(config-if)#ip address 3.3.3.3
255.255.255.255R3(config-if)#R3(config-if)#endR3#
```

```
R4#configure terminalR4(config)#interface fastEthernet 0/0R4(config-if)#ip
address 192.168.24.4 255.255.255.0R4(config-if)#no
shutdownR4(config-if)#exitR4(config)#interface fastEthernet 0/1R4(config-if)#ip
address 192.168.45.4 255.255.255.0R4(config-if)#no shutdownR4(config-
if)#exitR4(config)#interface loopback 0R4(config-if)#ip address 4.4.4.4
255.255.255.255R4(config-if)#exitR4(config)#
```

```
R5#configure terminalR5(config)#interface fastEthernet 0/0R5(config-if)#ip address
192.168.35.5 255.255.255.0R5(config-if)#no shutdownR5(config-
if)#exitR5(config)#int fastEthernet 0/1R5(config-if)#ip address 192.168.45.5
255.255.255.0R5(config-if)#no shutdownR5(config-if)#exitR5(config)#interface
loopback 0R5(config-if)#ip address 5.5.5.5 255.255.255.255R5(config-
if)#exitR5(config)#interface loopback 1R5(config-if)#ip address 55.55.55.55
255.255.255.255R5(config-if)#end R5#
```

```
R1#configure terminalEnter configuration commands, one per line. End with
CNTL/Z.R1(config)#R1(config)#router bgp 1R1(config-router)#neighbor 3.3.3.3
remote-as 3R1(config-router)#neighbor 3.3.3.3 update-source loopback 0R1(config-
router)#neighbor 3.3.3.3 ebgp-multihop 2R1(config-router)#R1(config-
router)#neighbor 2.2.2.2 remote-as 1R1(config-router)#neighbor 2.2.2.2 update-
source loopback 0R1(config-router)#neighbor 2.2.2.2 next-hop-self R1(config-
router)#R1(config-router)#endR1#
```

```
R2#configure terminalEnter configuration commands, one per line. End with
CNTL/Z.R2(config)#R2(config)#router bgp 1R2(config-router)#R2(config-
router)#neighbor 1.1.1.1 remote-as 1R2(config-router)#neighbor 1.1.1.1 update-
source loopback 0R2(config-router)#neighbor 1.1.1.1 next-hop-self R2(config-
router)#neighbor 4.4.4.4 remote-as 4R2(config-router)#neighbor 4.4.4.4 update-
source loopback 0R2(config-router)#neighbor 4.4.4.4 ebgp-multihop 2R2(config-
router)#endR2#
```

```
R3#configure terminalEnter configuration commands, one per line. End with
CNTL/Z.R3(config)#router bgp 3R3(config-router)#R3(config-router)#neighbor 1.1.1.1
remote-as 1R3(config-router)#neighbor 1.1.1.1 update-source loopback 0R3(config-
router)#neighbor 1.1.1.1 ebgp-multihop 2R3(config-router)#R3(config-
router)#neighbor 5.5.5.5 remote-as 5R3(config-router)#neighbor 5.5.5.5 update-
source loopback 0R3(config-router)#neighbor 5.5.5.5 ebgp-multihop 2R3(config-
router)#endR3#
```

```
R4#configure terminalEnter configuration commands, one per line. End with
CNTL/Z.R4(config)#router bgp 4R4(config-router)#R4(config-router)#neighbor 2.2.2.2
remote-as 1R4(config-router)#neighbor 2.2.2.2 update-source loopback 0R4(config-
router)#neighbor 2.2.2.2 ebgp-multihop 2R4(config-router)#R4(config-
router)#neighbor 5.5.5.5 remote-as 5R4(config-router)#neighbor 5.5.5.5 update-
source loopback 0R4(config-router)#neighbor 5.5.5.5 ebgp-multihop 5R4(config-
router)#endR4#
```

```
R5#configure terminalEnter configuration commands, one per line. End with
CNTL/Z.R5(config)#R5(config)#router bgp 5R5(config-router)#R5(config-
router)#neighbor 3.3.3.3 remote-as 3R5(config-router)#neighbor 3.3.3.3 update-
source loopback 0R5(config-router)#neighbor 3.3.3.3 ebgp-multihop 2R5(config-
router)#R5(config-router)#neighbor 4.4.4.4 remote-as 4R5(config-router)#neighbor
4.4.4.4 update-source loopback 0R5(config-router)#neighbor 4.4.4.4 ebgp-multihop
2R5(config-router)#endR5#
```

Configuring Static routes for reachability of Loopback IP for making BGP neighbors Up,
Because we are making BGP neighbors with the help of Loopback Ip.

```
R1(config)#ip route 3.3.3.3 255.255.255.255 fastEthernet
0/1R1(config)#R1(config)#ip route 2.2.2.2 255.255.255.255 fastEthernet
0/0R1(config)#*Mar 1 01:03:46.671: %BGP-5-ADJCHANGE: neighbor 2.2.2.2
UpR1(config)#*Mar 1 01:04:21.423: %BGP-5-ADJCHANGE: neighbor 3.3.3.3 Up
```

```
R2(config)#ip route 4.4.4.4 255.255.255.255 fastEthernet
0/1R2(config)#R2(config)#ip route 1.1.1.1 255.255.255.255 fastEthernet
0/0R2(config)#*Mar 1 01:03:46.895: %BGP-5-ADJCHANGE: neighbor 1.1.1.1
UpR2(config)#*Mar 1 01:04:34.423: %BGP-5-ADJCHANGE: neighbor 4.4.4.4 UpR2(config)#
```

```
R3(config)#ip route 1.1.1.1 255.255.255.255 fastEthernet
0/0R3(config)#R3(config)#ip route 5.5.5.5 255.255.255.255 fastEthernet
0/1R3(config)#*Mar 1 01:05:01.511: %BGP-5-ADJCHANGE: neighbor 1.1.1.1
UpR3(config)#R3(config)#*Mar 1 01:05:50.019: %BGP-5-ADJCHANGE: neighbor 5.5.5.5 Up
```

```
R4(config)#ip route 2.2.2.2 255.255.255.255 fastEthernet
0/0R4(config)#R4(config)#ip route 5.5.5.5 255.255.255.255 fastEthernet 0/1R4#*Mar
1 01:05:14.279: %BGP-5-ADJCHANGE: neighbor 2.2.2.2 Up R4#*Mar 1 01:05:50.339:
%BGP-5-ADJCHANGE: neighbor 5.5.5.5 UpR4#
```

```
R5(config)#ip route 4.4.4.4 255.255.255.255 fastEthernet
0/1R5(config)#R5(config)#ip route 3.3.3.3 255.255.255.255 fastEthernet 0/0R5#*Mar
1 00:52:49.575: %BGP-5-ADJCHANGE: neighbor 3.3.3.3 Up*Mar 1 00:52:49.915: %BGP-5-
ADJCHANGE: neighbor 4.4.4.4 UpR5#
```

All BGP routers form their Neighborhoodship.

```
R1#show ip bgp summary | begin NeighborNeighbor V AS MsgRcvd MsgSent TblVer InQ
OutQ Up/Down State/PfxRcd2.2.2.2 4 1 24 24 1 0 0 00:20:13
03.3.3.3 4 3 23 23 1 0 0 00:19:38 0
```

We are redistributing Connected interfaces into BGP in all routes.

```
R1#configure terminalR1(config)#router bgp 1R1(config-router)#redistribute
coR1(config-router)#redistribute connectedR2(config)#router bgp 1R2(config-
router)#redistribute connectedR3(config)#router bgp 3R3(config-
router)#redistribute connectedR3(config-router)#R4(config)#router bgp 4R4(config-
router)#redistribute connectedR5(config)#router bgp 5R5(config-
router)#redistribute connectedR5(config-router)#end
```

After redistributing Connected routes.

```
R1#show ip bgp summary | begin NeighborNeighbor V AS MsgRcvd MsgSent TblVer InQ
OutQ Up/Down 2.2.2.2 4 1 237 240 243 0 0 01:06:02 3.3.3.3 4
3 75 84 241 0 0 01:05:27
```

You can see that we can able to receive 7 prefixes via BGP through the 2.2.2.2 and 3.3.3.3 Neighbors.

```
R1#BGP routing table entry for 5.5.5.5/32, version 3Paths: (2 available, best #2,
table Default-IP-Routing-Table) Advertised to update-groups: 2   from 2.2.2.2
(2.2.2.2) Origin incomplete, metric 0, , valid, internal 3 5   from 3.3.3.3
(3.3.3.3) Origin incomplete, , valid, external, R1#R1#BGP routing table entry for
55.55.55.55/32, version 5Paths: (2 available, best #2, table Default-IP-Routing-
Table) Advertised to update-groups: 2   from 2.2.2.2 (2.2.2.2) Origin incomplete,
metric 0, , valid, internal 3 5   from 3.3.3.3 (3.3.3.3) Origin incomplete, ,
valid, external, R1#
```

From the above output we can see that we can see that best-path is via 3.3.3.3(AS 3) to reach the destination 5.5.5.5 of 55.55.55.55.

By default we have a local preference of 100 for all the routes.

```
R2#BGP routing table entry for 5.5.5.5/32, version 3Paths: (2 available, best #2,
table Default-IP-Routing-Table) Advertised to update-groups: 1   from 1.1.1.1
(1.1.1.1) Origin incomplete, metric 0, localpref 100, valid, internal   from
4.4.4.4 (4.4.4.4) Origin incomplete, localpref 100, valid, external, R2#R2#R2#BGP
routing table entry for 55.55.55.55/32, version 4Paths: (2 available, best #2,
table Default-IP-Routing-Table) Advertised to update-groups: 1   from 1.1.1.1
(1.1.1.1) Origin incomplete, metric 0, , valid, internal   from 4.4.4.4 (4.4.4.4)
Origin incomplete, , valid, external,
```

From the above output of R2, we can see that we can see that best-path is via 4.4.4.4(AS 4) to reach the destination 5.5.5.5 and 55.55.55.55.

Configuring Local-Preference using Route-Map on R1.

```
R1#configure terminalEnter configuration commands, one per line. End with
CNTL/Z.R1(config)#R1(config)#route-map permit 10R1(config-route-map)#R1(config-
route-map)#set local-preference R1(config-route-map)#match ip address R1(config-
route-map)#exitR1(config)#
```

Now we have created route-map with the name LOCAL-PREFERENCE, we have match it with the access-list 1 (Match ip address is nothing but matching the Access-list), and if it matches that Access-list 1 , it will set the weight to 7500.

```
R1(config)#access-list 1 permit 5.5.5.5 0.0.0.0
```

BGP Configuration to apply route-map to neighbor:

```
R1(config)#router bgp 1R1(config-router)#R1(config-router)#endR1#R1#clear ip bgp *
soft
```

Just clear the BGP sessions by using the above command. Don't forget to use the soft command, or else it will the BGP TCP sessions and BGP will be re-established.

You can now see the below output after clearing the BGP Sessions:

```
R1#BGP routing table entry for 5.5.5.5/32, version 470Paths: (1 available, best
#1, table Default-IP-Routing-Table)Flag: 0x800 Advertised to update-groups: 2 3 5
from 3.3.3.3 (3.3.3.3) Origin incomplete, , valid, external, R1#R1#BGP routing
table entry for 55.55.55.55/32, version 471Paths: (1 available, best #1, table
Default-IP-Routing-Table)Flag: 0x820 Advertised to update-groups: 1 4 5 from
2.2.2.2 (2.2.2.2) Origin incomplete, metric 0, , valid, internal,
```

We observe that local preference value is changed for the network 5.5.5.5, but the local preference is same (100) for the network 55.55.55.55

Also note that for the network 55.55.55.55 best-path changed to 2.2.2.2. Because the networks that matches the Access-list 1 will be forwarded to 3.3.3.3 (AS 3). Other routes will be moves on to the other path.

```
R2#BGP routing table entry for 5.5.5.5/32, version 460Paths: (2 available, best
#1, table Default-IP-Routing-Table) Advertised to update-groups: 2 3 5 from
1.1.1.1 (1.1.1.1) Origin incomplete, metric 0, , valid, internal, R2#BGP routing
table entry for 55.55.55.55/32, version 4Paths: (1 available, best #1, table
Default-IP-Routing-Table) Advertised to update-groups: 1 4 5 from 4.4.4.4
(4.4.4.4) Origin incomplete, , valid, external, R2#
```

We observe that local preference value is changed for the network 5.5.5.5, but the local preference is same (100) for the network 55.55.55.55

Note: I have not configured Route-map in R2.

Also note that for the network 5.5.5.5 best-path changed to 1.1.1.1. Because the networks that matches the Access-list 1 will be forwarded to 3.3.3.3 (AS 3). Other routes will be moves on to the other path.

Now you can see the for the prefix 5.5.5.5/32 the traffic moves via AS 3 with the Local Preference of 7500.

Note: The routes that want to reach the network 5.5.5.5 via AS 1 will always moves through the AS 3, because of Local Preference.

Local Preference will synchronize with all the neighbors with in the same AS(IBGP).

That's it about Weight in Local-Preference Configuration.