

# BGP Troubleshooting Guide

## Abstract

The main purpose of this guide is to illustrate various issues encountered while configuring BGP on HP routers. This troubleshooting guide discusses ways of analyzing a problem and the corrective measures to resolve the issue for both, ProVision and Comware. This guide assumes that readers are familiar with the OSI layer and IP routing protocols.

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# 1 BGP Neighbor Relation Establishment

Below listed are the common problems found in the BGP Neighbor relation establishment:

- (ProVision) no BGP packets are being sent
- Incorrect IP address configured on the interface
- Incorrect Neighbor IP configured under **peer** command
- Incorrect AS-number included under **peer** command
- Loopback ip not configured for indirectly connected routers
- Missing Command **peer x.x.x.x connect-interface**
- Missing Command **peer x.x.x.x e-bgp maxhop <hops>**
- Undesirable configuration of **peer x.x.x.x connect-interface** command for directly connected routers
- No route to reach loopback interface
- **peer x.x.x.x ignore** command configured under BGP configuration
- ACL blocking TCP/BGP packets
- Duplicate router-id

## (ProVision) no BGP packets are being sent

BGP appears to be configured correctly however neither router is sending any BGP packets, and BGP peering relationships are not being established.

## Troubleshooting

Use the `show ip bgp summary` command to determine if packets are being sent. The State of "idle" indicates no packets are being sent.

```
RT1(bgp)# show ip bgp summary
```

```
Peer Information
```

Remote Address	Remote-AS	Local-AS	State	Admin Status
20.1.1.2	2	1	Idle	Start

To determine the actual status of the BGP protocol, use the **show ip bgp general** command.

```
RT1# show ip bgp general
```

```
BGP Configuration Information
```

```
Enable : No Local AS : 1
```

```

Local Distance      : 200          Local Identifier    : 1.1.1.0
Default Metric      :                Maximum Prefix      : 4294967295
Always Compare MED  : No           Cluster-ID          :
Miss MED As Worst   : No           Compare Router ID   : No
Ignore AS-Path Length : No       Open On Accept      : No
Compare Origin Id   : No           Allow-AS in         : 0
External Distance   : 20           Internal Distance    : 200
Log Neighbor Changes : No       C-to-C Reflection   : Yes
Log Prefix List     :
Hold Time           : 180          Keep Alive          : 60
Restart Time        : 120          Stalepath Time      : 360
Non Stop Forwarding : Disabled

```

## Solution

On ProVision platforms, the routing protocol must be explicitly enabled. The default status is disabled. The BGP routing protocol must be manually enabled inside the BGP context.

```

RT1(config)# router bgp 1
RT1(bgp)# enable
RT1(bgp)# show ip bgp general

```

### BGP Configuration Information

```

Enable              : Yes          Local AS            : 1
Local Distance      : 200          Local Identifier    : 1.1.1.0
Default Metric      :                Maximum Prefix      : 4294967295
Always Compare MED  : No           Cluster-ID          :
Miss MED As Worst   : No           Compare Router ID   : No
Ignore AS-Path Length : No       Open On Accept      : No
Compare Origin Id   : No           Allow-AS in         : 0
External Distance   : 20           Internal Distance    : 200
Log Neighbor Changes : No       C-to-C Reflection   : Yes
Log Prefix List     :
Hold Time           : 180          Keep Alive          : 60
Restart Time        : 120          Stalepath Time      : 360
Non Stop Forwarding : Disabled

```

## Verification

Use the **show ip bgp summary** command to verify the neighbor relationship.

```

R2(vlan-1)# show ip bgp summary

Peer Information

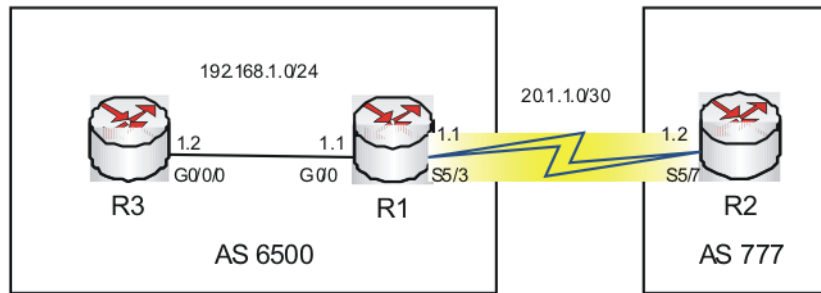
Remote Address  Remote-AS Local-AS State          Admin Status
-----

```

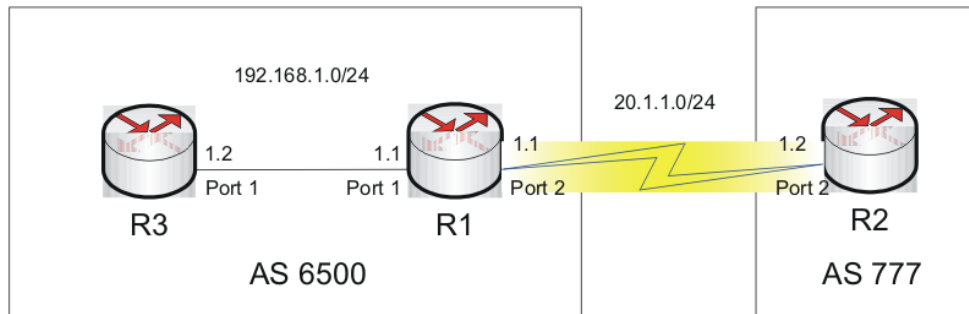
## Incorrect IP address configured on the interface

An example of an incorrect IP address configured on the interface is shown in [Figure 1](#) and [Figure 2](#).

**Figure 1 Incorrect IP address**



**Figure 2 Incorrect IP address**



R1 is trying to establish a neighbor relationship with R2. R1 and R2 are directly connected routers belonging to different AS.

## Troubleshooting

Use the **display bgp peer** or **show ip bgp summary** command to determine the BGP peer status.

Comware:

```
<R1>display bgp peer
```

```
BGP local router ID : 1.1.1.1
```

```
Local AS number : 6500
```

```
Total number of peers : 1
```

```
Peers in established state : 0
```

```

Peer          AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
20.1.1.2      777      0         0      0       0 00:03:39 Active

```

ProVision:

```
R1(config)# show ip bgp summary
```

```

Peer Information
Remote Address  Remote-AS  Local-AS  State          Admin Status
-----
20.1.1.2       777        6500     Connect       Start

```

Check the ping reply.

Comware:

```

<R1>ping 20.1.1.2
PING 20.1.1.2: 56 data bytes, press CTRL_C to break
  Request time out
  Request time out
  Request time out
  Request time out
  Request time out
--- 20.1.1.2 ping statistics ---
  5 packet(s) transmitted
  0 packet(s) received
 100.00% packet loss

```

ProVision:

```
R1(config)# ping 20.1.1.2
```

```
Request timed out.
```

R1 is not able to ping R2's interface ip.

Check the interface status at both ends.

## Router R1

Comware:

```

<R1>display int s 5/7
Serial5/7 current state: UP
Line protocol current state: UP
Description: Serial5/7 Interface

```



The Maximum Transmit Unit is 1500, Hold timer is 10(sec)  
Internet Address is 20.1.1.1/24 Primary  
Link layer protocol is PPP

### ProVision:

R1(config)# show ip

Internet (IP) Service  
IP Routing : Enabled

Default TTL : 64  
Arp Age : 20  
Domain Suffix :  
DNS server :

VLAN		IP Config	IP Address	Subnet Mask	Proxy ARP	
					Std	Local
-----	+	-----	-----	-----	-----	-----
DEFAULT_VLAN		Manual	20.1.1.1	255.255.255.0	No	No

## Router R2

### Comware:

[R2]display int s 5/3

Serial5/3 current state: UP

Line protocol current state: UP

Description: Serial5/3 Interface

The Maximum Transmit Unit is 1500, Hold timer is 10(sec)

Internet Address is 20.1.1.3/24 Primary

Link layer protocol is PPP

### ProVision:

R2(bgp)# show ip

Internet (IP) Service  
IP Routing : Enabled

Default TTL : 64  
Arp Age : 20  
Domain Suffix :  
DNS server :

VLAN		IP Config	IP Address	Subnet Mask	Proxy ARP	
					Std	Local
-----	+	-----	-----	-----	-----	-----

```

-----+-----
DEFAULT_VLAN      | Manual    20.1.1.3      255.255.255.0  No    No

```

The IP address configured on R2 is not correct.

## Solution

Configure router R2 with correct Interface IP.

Comware:

```

[R2]int s 5/3
[R2-Serial5/3]ip add 20.1.1.2 24

```

ProVision:

```

R2(vlan-1)# no ip address
R2(vlan-1)# ip address 20.1.1.2/24

```

## Verification

Use the **display bgp peer** or **show ip bgp summary** command to verify the neighbor relationship.

Comware:

```

[R2]disp bgp peer
BGP local router ID : 2.2.2.2
Local AS number : 777
Total number of peers : 1      Peers in established state : 0
  Peer           AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
  20.1.1.1      6500      0        0        0        0  00:11:01  Established

```

ProVision:

```

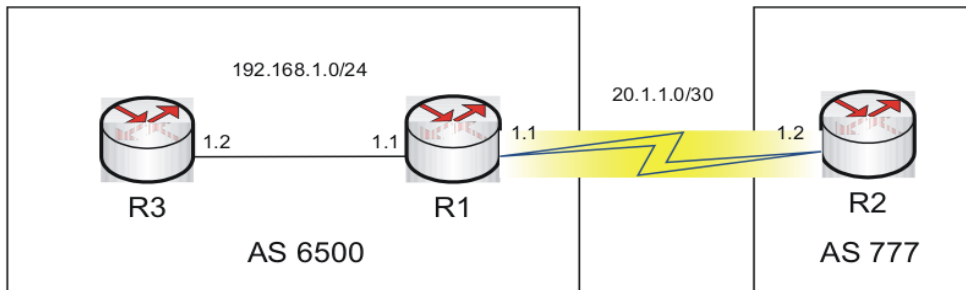
R2(vlan-1)# show ip bgp summary
Peer Information
Remote Address  Remote-AS  Local-AS  State          Admin Status
-----
20.1.1.1       6500       777       Established    Start

```

# Incorrect neighbor IP configured under peer command

An example of an incorrect neighbor IP address configured under peer command is shown in Figure 3.

**Figure 3** Incorrect neighbor IP address configured under peer command



## Troubleshooting

Use the **display bgp peer** or **show ip bgp summary** command to verify the peer status.

Comware:

```
[R1]disp bgp peer
BGP local router ID : 1.1.1.1
Local AS number : 6500
Total number of peers : 1          Peers in established state : 0
Peer      AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
20.1.1.2  777      0         0        0     0        00:00:22 Active
```

ProVision:

```
R1(config)# show ip bgp summary
Peer Information
Remote Address Remote-AS Local-AS State          Admin Status
-----
20.1.1.2       777      6500    Active         Start
```

BGP peer status is stuck in Active. Check the BGP configuration on both routers.

## Router R1

Comware:

```
[R1]disp current-configuration | begin bgp
bgp 6500
  undo synchronization
  timer keepalive 6 hold 18
  peer 20.1.1.2 as-number 777
```

ProVision:

```
R1(config)# show run
router bgp 6500
  enable
  neighbor 20.1.1.2 remote-as 777
  exit
```

## Router R2

Comware:

```
[R2]disp current-configuration | begin bgp
bgp 777
  undo synchronization
  timer keepalive 5 hold 30
  peer 20.1.1.3 as-number 6500
```

ProVision:

```
R2(config)# show run
router bgp 777
  enable
  neighbor 20.1.1.3 remote-as 6500
  exit
```

The peer command is followed by the incorrect IP address on R2.

## Solution

Correct the peer command configured on R2.

Comware:

```
[R2]bgp 777
[R2-bgp]undo peer 20.1.1.3
[R2-bgp]peer 20.1.1.1 as-number 6500
```

ProVision:

```
R2(bgp)# router bgp 777
R2(bgp)# no neighbor 20.1.1.3
R2(bgp)# neighbor 20.1.1.1 remote-as 6500
```

## Verification

Verify the BGP peer relationship status.

Comware:

```
[R2]disp bgp peer
BGP local router ID : 2.2.2.2
Local AS number : 777
Total number of peers : 1                Peers in established state : 1
Peer          AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
20.1.1.1     6500      3        3       0      0 00:00:10 Established
```

ProVision:

```
R1(config)# show ip bgp summary
```

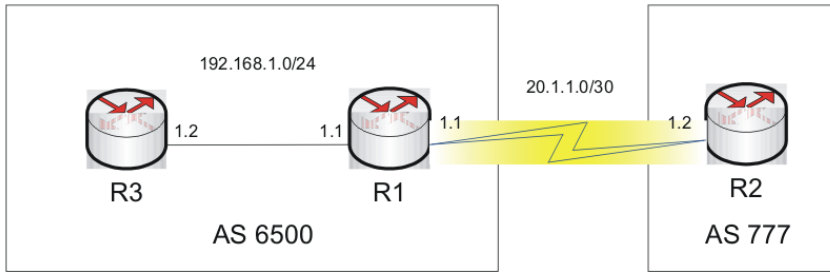
Peer Information

Remote Address	Remote-AS	Local-AS	State	Admin Status
20.1.1.2	777	6500	Established	Start

## Incorrect AS number included under peer command

An example of an incorrect AS number included under peer command is shown in [Figure 4](#).

Figure 4 Incorrect AS number included under peer command



## Troubleshooting

Verify the BGP peer status using the command **display bgp peer** or **show ip bgp summary**.

Comware:

```
<R1>disp bgp peer
BGP local router ID : 1.1.1.1
Local AS number : 6500
Total number of peers : 1          Peers in established state : 0
  Peer          AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
  20.1.1.2      777      1         1        0      0 00:00:31 Active
```

ProVision:

```
R1(config)# show ip bgp summary
```

Peer Information

Remote Address	Remote-AS	Local-AS	State	Admin Status
20.1.1.2	777	6500	Active	Start

Check the BGP configurations at both ends.

### Router R1

Comware:

```
[R1]disp current-configuration | begin bgp
bgp 6500
  undo synchronization
  timer keepalive 6 hold 18
  peer 20.1.1.2 as-number 777
```

ProVision:

```
R1(config)# show run
router bgp 6500
  enable
  neighbor 20.1.1.2 remote-as 777
  exit
```

## Router R2

Comware:

```
[R2]disp current-configuration | begin bgp
bgp 777
  undo synchronization
  timer keepalive 5 hold 30
  peer 20.1.1.1 as-number 6502
```

ProVision:

```
R2(config)# show run
router bgp 777
  enable
  neighbor 20.1.1.1 remote-as 6502
  exit
```

The as-number configured under BGP peer command on R2 is incorrect.

## Solution

Configure the Neighbor IP under correct AS

Comware:

```
[R2]bgp 777
[R2-bgp]undo peer 20.1.1.1
[R2-bgp]peer 20.1.1.1 as-number 6500
```

ProVision:

```
R2(bgp)# router bgp 777
R2(bgp)# no neighbor 20.1.1.1
R2(bgp)# neighbor 20.1.1.1 remote-as 6500
```

## Verification

Use **display bgp peer** or **show ip bgp summary** command to verify the BGP peer status.

Comware:

```
[R2]disp bgp peer
BGP local router ID : 2.2.2.2
Local AS number : 777
Total number of peers : 1      Peers in established state : 1
Peer AS MsgRcvd MsgSent OutQ PrefRcv Up/Down State
20.1.1.1 6500      5        6    0      0 00:00:23 Established
```

ProVision:

```
R1(config)# show ip bgp summary
```

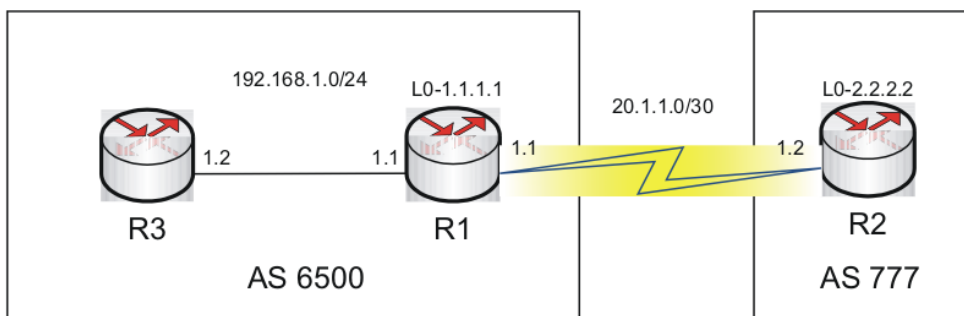
Peer Information

Remote Address	Remote-AS	Local-AS	State	Admin Status
20.1.1.2	777	6500	Established	Start

## Loopback IP not configured for indirectly connected routers

An example of a loopback IP not configured for indirectly connected routers is shown in [Figure 5](#).

**Figure 5 Loopback IP not configured for indirectly connected routers**



## Troubleshooting

Verify the BGP peer status using the command **display bgp peer** or **show ip bgp summary**.



Comware:

```
[R1]disp bgp peer
BGP local router ID : 1.1.1.1
Local AS number : 6500
Total number of peers : 1          Peers in established state : 0
  Peer      AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
  2.2.2.2   777      0         0        0      0      0 00:00:05 Idle
```

ProVision:

```
R1(lo-0)# show ip bgp summary
```

Peer Information

Remote Address	Remote-AS	Local-AS	State	Admin Status
2.2.2.2	777	6500	Idle	Start

Comware:

```
[R2]disp bgp peer
BGP local router ID : 2.2.2.2
Local AS number : 777
Total number of peers : 1          Peers in established state : 0
  Peer      AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
  1.1.1.1   6500      0         0        0      0      0 00:01:42 Active
```

ProVision:

```
R2(bgp)# show ip bgp summary
```

Peer Information

Remote Address	Remote-AS	Local-AS	State	Admin Status
1.1.1.1	6500	777	Connect	Start

Ping the loopback IPs to verify connectivity.

## Router R1

Comware:

```
[R1]ping 2.2.2.2
PING 2.2.2.2: 56 data bytes, press CTRL_C to break
  Reply from 2.2.2.2: bytes=56 Sequence=0 ttl=255 time=25 ms
  Reply from 2.2.2.2: bytes=56 Sequence=1 ttl=255 time=26 ms
  Reply from 2.2.2.2: bytes=56 Sequence=2 ttl=255 time=26 ms
```

```
Reply from 2.2.2.2: bytes=56 Sequence=3 ttl=255 time=26 ms
Reply from 2.2.2.2: bytes=56 Sequence=4 ttl=255 time=25 ms
```

```
--- 2.2.2.2 ping statistics ---
 5 packet(s) transmitted
 5 packet(s) received
 0.00% packet loss
 round-trip min/avg/max = 25/25/26 ms
```

ProVision:

```
R1(lo-0)# ping 2.2.2.2
2.2.2.2 is alive, time = 2 ms
```

Comware:

```
<R2>ping 1.1.1.1
PING 1.1.1.1: 56 data bytes, press CTRL_C to break
Request time out
Request time out
Request time out
Request time out
Request time out

--- 1.1.1.1 ping statistics ---
 5 packet(s) transmitted
 0 packet(s) received
100.00% packet loss
```

ProVision:

```
R2(bgp)# ping 1.1.1.1
Request timed out.
```

Check the loopback interface of R1

Comware:

```
[R1]disp int lo 0
LoopBack0 current state: UP
Line protocol current state: UP (spoofing)
Description: LoopBack0 Interface
The Maximum Transmit Unit is 1536
Internet protocol processing : disabled
```

ProVision:

```
R1(lo-0)# show ip
```

```
Internet (IP) Service
```

```
IP Routing : Enabled
```

```
Default TTL      : 64
```

```
Arp Age          : 20
```

```
Domain Suffix   :
```

```
DNS server      :
```

VLAN	IP Config	IP Address	Subnet Mask	Proxy ARP	
				Std	Local
-----+-----					
DEFAULT_VLAN	Manual	20.1.1.1	255.255.255.0	No	No

The loopback interface is up but no ip has been configured.

---

#### NOTE:

ProVision switch shows an absence of configuration on lo0.

---

## Solution

Configure the loopback interface of R1.

Comware:

```
[R1]int lo 0  
[R1-LoopBack0]ip add 1.1.1.1 32
```

ProVision:

```
R1(config)# int loop 0  
R1(lo-0)# ip address 1.1.1.1
```

## Verification

Verify the BGP peer relationship status using the command **display bgp peer**.

Comware:

```
[R1]disp bgp peer  
BGP local router ID : 1.1.1.1  
Local AS number : 6500
```

```

Total number of peers : 1           Peers in established state : 1
Peer           AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
2.2.2.2       777      2        2       0     0        00:00:26  Established

```

ProVition:

```
R1(lo-0)# show ip bgp summary
```

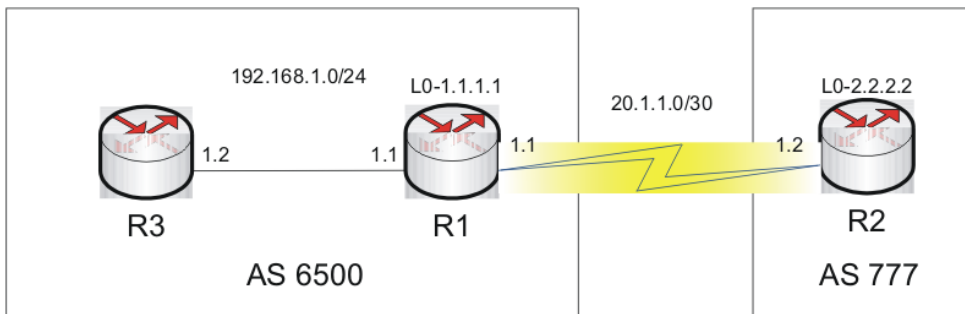
Peer Information

Remote Address	Remote-AS	Local-AS	State	Admin Status
2.2.2.2	777	6500	Established	Start

## Missing Command connect-interface or update-source

An example of a missing command is shown in [Figure 6](#).

**Figure 6 Missing command**



## Troubleshooting

Verify the BGP peer status using the command **display bgp peer** or **show ip bgp summary**.

Comware:

```

[R2]disp bgp peer
BGP local router ID : 2.2.2.2
Local AS number : 777
Total number of peers : 1           Peers in established state : 0

```

```

Peer          AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
1.1.1.1      6500      0         0      0      0      0 00:00:11 Idle

```

ProVision:

```
R2(bgp)# show ip bgp summ
```

Peer Information

```

Remote Address  Remote-AS  Local-AS  State          Admin Status
-----
1.1.1.1        6500       777       Active         Start

```

Verify the BGP configurations on both routers.

## Router R1

Comware:

```

[R1]disp current-configuration | begin bgp
bgp 6500
  router-id 1.1.1.1
  undo synchronization
  peer 2.2.2.2 as-number 777

```

ProVision:

```
R1(lo-0)# show run
```

```

router bgp 6500
  enable
  neighbor 2.2.2.2 remote-as 777
exit

```

## Router R2

Comware:

```

<R2>disp current-configuration | begin bgp
bgp 777
  router-id 2.2.2.2
  undo synchronization
  peer 1.1.1.1 as-number 6500

```

ProVision:

```
R2(bgp)# show run
router bgp 777
  enable
  neighbor 1.1.1.1 remote-as 6500
  exit
```

**connect-interface** or **update-source** command is missing from the BGP configurations on both routers. This command is mandatory when peering on loopback interfaces. This command forces BGP to use the loopback interface as the source address for outgoing BGP packets, rather than the native IP address of the outgoing interface.

## Solution

Include the command under the BGP configuration.

### Router R1

Comware:

```
[R1]bgp 6500
[R1-bgp]peer 2.2.2.2 connect-interface lo 0
```

ProVision:

```
R1(bgp)# router bgp 6500
R1(bgp)# neighbor 2.2.2.2 update-source 1.1.1.1
```

### Router R2

Comware:

```
[R2]bgp 777
[R2-bgp]peer 1.1.1.1 connect-interface lo 0
```

ProVision:

```
R2(config)# router bgp 777
R2(bgp)# neighbor 1.1.1.1 update-source 2.2.2.2
```

## Verification

Verify the BGP peer relationship status using the command **display bgp peer** or **show ip bgp summary**.

Comware:

```
[R2]disp bgp peer
BGP local router ID : 2.2.2.2
Local AS number : 777
Total number of peers : 1          Peers in established state : 1
Peer          AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
1.1.1.1      6500    2        3       0     0        00:00:12 Established
```

ProVision:

```
R2(bgp)# show ip bgp summary
```

Peer Information

Remote Address	Remote-AS	Local-AS	State	Admin Status
1.1.1.1	6500	777	Established	Start

---

#### NOTE:

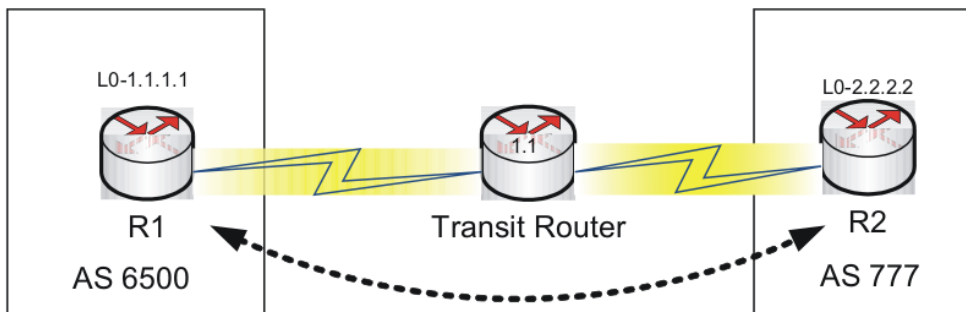
The "ebgp-max-hop" or "ebgp-multihop" command is not required when peering with the loopback ip address of a directly connected router.

---

## Missing Command ebgp-max-hop or ebgp-multihop

An example of a missing command **ebgp-max-hop** or **edgp-multihop** is shown in [Figure 7](#).

**Figure 7 Missing command ebgp-max-hop or edgp-multihop**



## Troubleshooting

Two indirectly connected EBGP neighbors do not form neighbor relation if the command **peer x.x.x.x e-bgp maxhop <hops>** or **neighbor x.x.x.x ebgp-multihop <hops>** is missing from the BGP configuration.

This command specifies the number of hops required to reach the neighbor router. If the number of hops configured in the BGP configuration is less than the actual hops needed to reach the router, a neighbor relationship cannot be established.

## Solution

Configure the command **peer x.x.x.x ebgp-max-hop <hops>** or **neighbor x.x.x.x ebgp-multihop <number>** with the proper hop counts.

## Verification

Verify the BGP peer relationship status using the command **display bgp peer** or **show ip bgp summary**.

Comware:

```
[R2]disp bgp peer
BGP local router ID : 2.2.2.2
Local AS number : 777
Total number of peers : 1          Peers in established state : 1
Peer          AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
1.1.1.1      6500      2        3       0      0 00:00:12 Established
```

ProVision:

```
R2(bgp)# show ip bgp summary
```

Peer Information

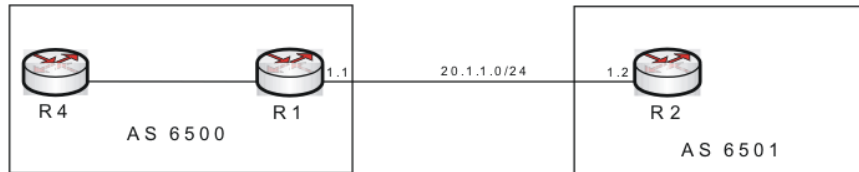
Remote Address	Remote-AS	Local-AS	State	Admin Status
1.1.1.1	6500	777	Established	Start



# Connect-interface or update-source configured for directly connected peers

An example of a “connect-interface” or “update-source” configured for directly connected peers is shown in Figure 8.

Figure 8 “Connect-interface” or “update-source” configured for directly connected peers



## Troubleshooting

Verify the BGP peer status using the command **display bgp peer**.

Comware:

```
[R2]display bgp peer
BGP local router ID : 2.2.2.2
Local AS number : 6501
Total number of peers : 1          Peers in established state : 0
Peer      AS   MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
20.1.1.1  6500    4        4        4    0        1 00:00:18 Active
```

ProVison:

```
R2(lo-0)# show ip bgp summary
```

Peer Information

Remote Address	Remote-AS	Local-AS	State	Admin Status
20.1.1.1	6500	6501	Connect	Start

Verify the BGP configurations on both routers.

Router R1

Comware:

```
[R1]disp current-configuration | begin bgp
bgp 6500
  peer 20.1.1.2 as-number 6501
```

ProVision:

```
R1(bgp)# show run
router bgp 6500
  enable
  neighbor 20.1.1.2 remote-as 6501
  exit
```

## Router R2

Comware:

```
[R2]disp current-configuration | begin bgp
bgp 6501
  peer 20.1.1.1 as-number 6500
  peer 20.1.1.1 connect-interface LoopBack0
```

ProVision:

```
R2(lo-0)# show run
router bgp 6501
  enable
  neighbor 20.1.1.1 remote-as 6500
  neighbor 20.1.1.1 update-source 2.2.2.2
  exit
```

## Solution

Remove the incorrect command from the BGP configuration on R2.

Comware:

```
[R2]bgp 6501
[R2-bgp]undo peer 20.1.1.1 connect-interface
```

ProVision:

```
R2(lo-0)# router bgp 6501
R2(bgp)# no neighbor 20.1.1.1 update-source
```

## Verification

Verify the BGP peer relationship status using the command **display bgp peer** or **show ip bgp summary**.

Comware::

```
[R2]disp bgp peer
BGP local router ID : 2.2.2.2
Local AS number : 6501
Total number of peers : 1          Peers in established state : 0
Peer      AS   MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
20.1.1.1  6500    4        4        4     0        1 00:00:18 Established
```

ProVision:

```
R2(bgp)# show ip bgp summary
```

Peer Information

Remote Address	Remote-AS	Local-AS	State	Admin Status
20.1.1.1	6500	6501	Established	Start

## No route to reach loopback interface

An example of no route to reach loopback interface is shown in [Figure 9](#) and [Figure 10](#).

**Figure 9 No route to reach loopback interface**

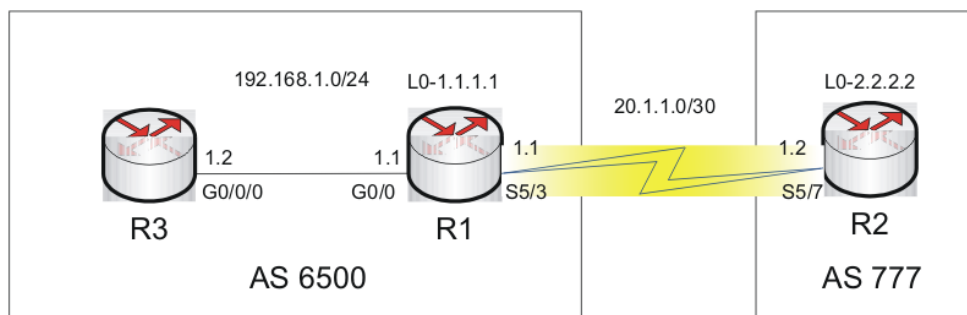
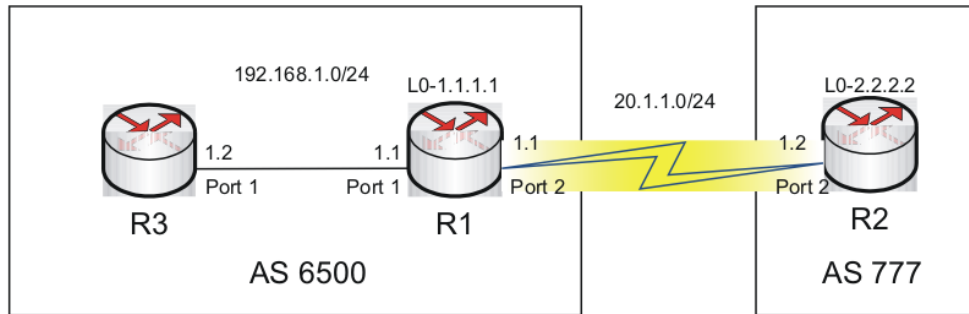


Figure 10 No route to reach loopback interface



## Troubleshooting

Verify the BGP peer status using the command **display bgp peer** or **show ip bgp summary**.

Comware:

```
[R1]disp bgp peer
BGP local router ID : 192.168.1.1
Local AS number : 6500
Total number of peers : 1      Peers in established state : 0
Peer          AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
 2.2.2.2     777         0         0       0         0 00:00:25 Active
```

ProVision:

```
R1(bgp)# show ip bgp summary
```

Peer Information

Remote Address	Remote-AS	Local-AS	State	Admin Status
2.2.2.2	777	6500	Connect	Start

Ping the loopback IPs to verify the connectivity.

Router R1

Comware:

```
R1]ping 2.2.2.2
PING 2.2.2.2: 56 data bytes, press CTRL_C to break
```

```
Reply from 2.2.2.2: bytes=56 Sequence=0 ttl=255 time=25 ms
Reply from 2.2.2.2: bytes=56 Sequence=1 ttl=255 time=26 ms
Reply from 2.2.2.2: bytes=56 Sequence=2 ttl=255 time=26 ms
Reply from 2.2.2.2: bytes=56 Sequence=3 ttl=255 time=26 ms
Reply from 2.2.2.2: bytes=56 Sequence=4 ttl=255 time=25 ms
```

```
--- 2.2.2.2 ping statistics ---
 5 packet(s) transmitted
 5 packet(s) received
 0.00% packet loss
 round-trip min/avg/max = 25/25/26 ms
```

ProVision:

```
R1(bgp)# ping 2.2.2.2
2.2.2.2 is alive, time = 2 ms
```

## Router R2

Comware:

```
[R2]ping 1.1.1.1
PING 1.1.1.1: 56 data bytes, press CTRL_C to break
 Request time out
 Request time out
 Request time out
 Request time out
 Request time out
```

```
--- 1.1.1.1 ping statistics ---
 5 packet(s) transmitted
 0 packet(s) received
100.00% packet loss
```

ProVision:

```
R2(config)# ping 1.1.1.1
The destination address is unreachable.
```

Check the routing table of R1 and R2.

## Router R1

Comware:

```
[R1]disp ip routing-table
Routing Tables: Public
    Destinations : 9           Routes : 9
```

Destination/Mask	Proto	Pre	Cost	NextHop	Interface
1.1.1.1/32	Direct	0	0	127.0.0.1	InLoop0
2.2.2.2/32	Static	60	0	20.1.1.2	S5/7
20.1.1.0/24	Direct	0	0	20.1.1.1	S5/7
20.1.1.1/32	Direct	0	0	127.0.0.1	InLoop0
20.1.1.2/32	Direct	0	0	20.1.1.2	S5/7
127.0.0.0/8	Direct	0	0	127.0.0.1	InLoop0
127.0.0.1/32	Direct	0	0	127.0.0.1	InLoop0
192.168.1.0/24	Direct	0	0	192.168.1.1	GE0/0
192.168.1.1/32	Direct	0	0	127.0.0.1	InLoop0

ProVision:

R1(bgp)# show ip route

#### IP Route Entries

Destination	Gateway	VLAN	Type	Sub-Type	Metric	Dist.
1.1.1.1/32	lo0		connected		1	0
2.2.2.2/32	20.1.1.2	1	static		1	1
20.1.1.0/24	DEFAULT_VLAN	1	connected		1	0
127.0.0.0/8	reject		static		0	0
127.0.0.1/32	lo0		connected		1	0
192.168.1.0/24	VLAN2	2	connected		1	0
192.168.2.0/24	192.168.1.2	2	bgp		0	200

R1 has a static route to R2's loopback ip.

## Router R2

Comware:

[R2]disp ip routing-table

Routing Tables: Public

Destinations : 6 Routes : 6

Destination/Mask	Proto	Pre	Cost	NextHop	Interface
2.2.2.2/32	Direct	0	0	127.0.0.1	InLoop0
20.1.1.0/24	Direct	0	0	20.1.1.2	S5/3
20.1.1.1/32	Direct	0	0	20.1.1.1	S5/3
20.1.1.2/32	Direct	0	0	127.0.0.1	InLoop0
127.0.0.0/8	Direct	0	0	127.0.0.1	InLoop0
127.0.0.1/32	Direct	0	0	127.0.0.1	InLoop0

ProVision:

```
R2(config)# show ip route
```

```
IP Route Entries
```

Destination	Gateway	VLAN	Type	Sub-Type	Metric	Dist.
2.2.2.2/32	lo0		connected		1	0
11.90.90.0/24	VLAN2	2	connected		1	0
20.1.1.0/24	DEFAULT_VLAN	1	connected		1	0
127.0.0.0/8	reject		static		0	0
127.0.0.1/32	lo0		connected		1	0

R2 does not have a route to R1's loopback interface.

## Solution

Configure a static route on R2 to confirm the connectivity to the loopback network on R1.

Comware:

```
[R2]ip route-static 1.1.1.1 32 20.1.1.1
```

ProVision:

```
R2(config)# ip route 1.1.1.1 255.255.255.255 20.1.1.1
```

## Verification

Verify the BGP peer relationship status using the command **display bgp peer**.

Comware:

```
[R2]disp bgp peer
BGP local router ID : 20.1.1.2
Local AS number : 777
Total number of peers : 1          Peers in established state : 1
Peer          AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
1.1.1.1      6500      2        2        0      0 00:00:08  Established
```

ProVision:

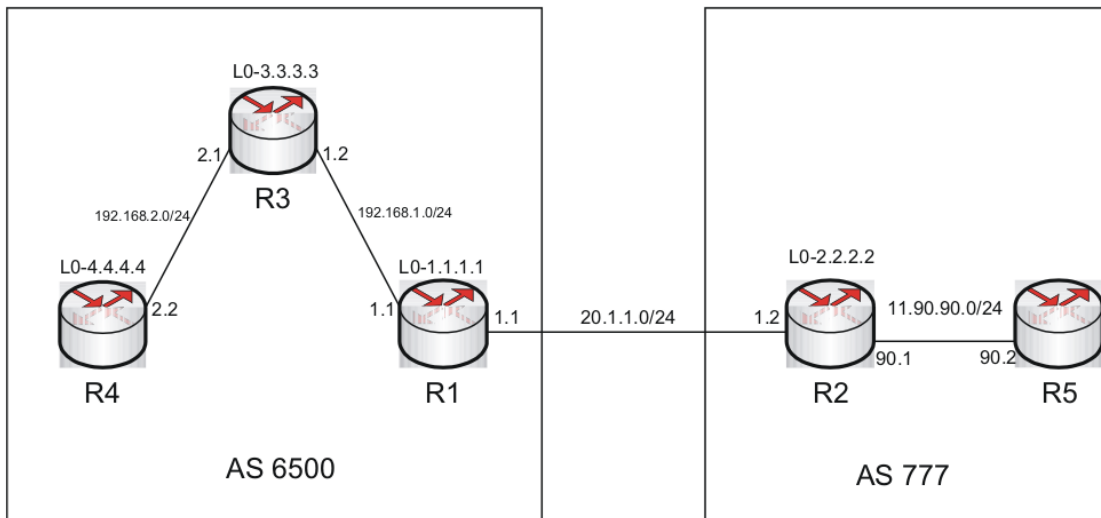
```
R2(config)# show ip bgp summary
```

```
Peer Information
Remote Address  Remote-AS  Local-AS  State          Admin Status
-----
1.1.1.1        6500       777       Established     Start
11.90.90.2     777        777       Established     Start
```

# Ignore or shutdown command configured on BGP peer

An example of **ignore** or **shutdown** command configured on BGP peer is shown in Figure 11.

Figure 11 Ignore or shutdown command configured on BGP peer



## Troubleshooting

Verify the BGP peer status using the command **display bgp peer** or **show ip bgp summary**.

### Router R2

Comware:

```
[R2]disp bgp peer
BGP local router ID : 2.2.2.2
Local AS number : 777
Total number of peers : 2          Peers in established state : 1

Peer      AS   MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
1.1.1.1   6500    0         0        0     0    00:01:54 Idle(Admin)
11.90.90.2  777    48        43        0     0    00:47:32 Established
```

ProVision:

```
R2(bgp)# show ip bgp summary
Peer Information
Remote Address  Remote-AS  Local-AS  State      Admin Status
-----
1.1.1.1         6500      777      Idle      Stop
```



## Router R1

### Comware:

```
[R1]disp bgp peer
BGP local router ID : 1.1.1.1
Local AS number : 6500
Total number of peers : 1          Peers in established state : 0
Peer      AS   MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
2.2.2.2   777      0        5       0      0    00:02:46  Active
```

### ProVision:

```
R1(bgp)# show ip bgp summary
```

#### Peer Information

Remote Address	Remote-AS	Local-AS	State	Admin Status
2.2.2.2	777	6500	Active	Start

The **display bgp peer** or **show ip bgp summary** command on R2 shows that the peer status is idle(admin) or Stop. This means that peer relationship is administratively down. The **ignore** or **shutdown** command is a way to suspend BGP peering without deleting commands from the configuration.

Check the BGP configuration on R2.

### Comware:

```
[R2]disp current-configuration | begin bgp
bgp 777
network 11.90.90.0 255.255.255.0
undo synchronization
peer 1.1.1.1 as-number 6500
peer 11.90.90.2 as-number 777
peer 1.1.1.1 ignore
peer 1.1.1.1 connect-interface LoopBack0
```

### ProVision:

```
R2(bgp)# show run
router bgp 777
enable
network 2.2.2.2 255.255.255.255
network 11.90.90.0 255.255.255.0
neighbor 1.1.1.1 remote-as 6500
```

```
neighbor 1.1.1.1 shutdown
neighbor 1.1.1.1 update-source 2.2.2.2
neighbor 11.90.90.2 remote-as 777
neighbor 11.90.90.2 next-hop-self
exit
```

## Solution

Undo **ignore** or **shutdown** command.

Comware:

```
[R2]bgp 777
[R2-bgp]undo peer 1.1.1.1 ignore
```

## Verification

Verify the BGP peer relationship status using the command **display bgp peer**.

Comware:

```
[R2]disp bgp peer
BGP local router ID : 2.2.2.2
Local AS number : 777
Total number of peers : 2    Peers in established state : 2
Peer   AS   MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
1.1.1.1   6500     3         3     0         1 00:00:19 Established
11.90.90.2 777     48        43     0         0 00:47:32 Established
```

ProVison:

```
R2(bgp)# show ip bgp summary
```

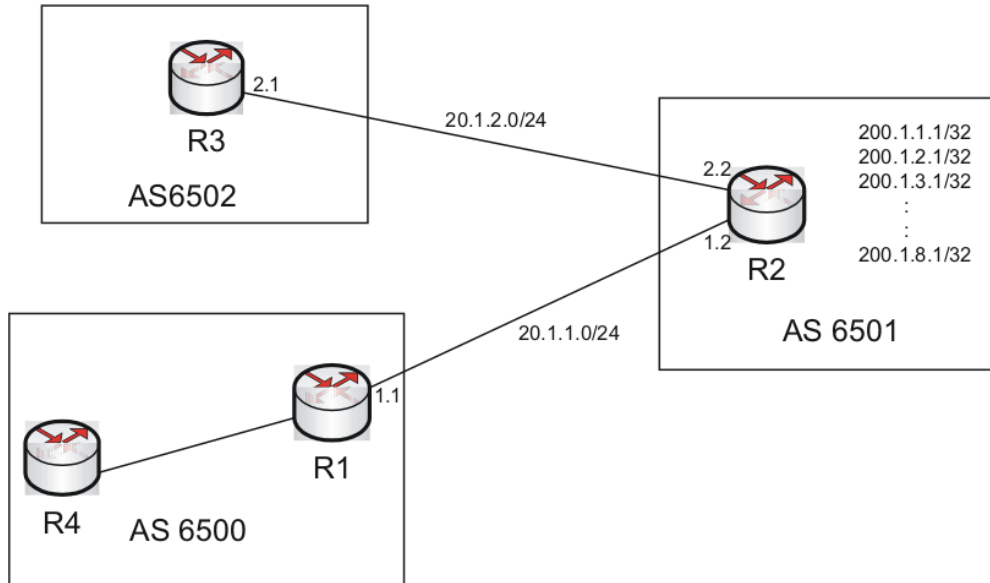
Peer Information

Remote Address	Remote-AS	Local-AS	State	Admin Status
1.1.1.1	6500	777	Established	Start

## ACL Blocking the TCP/BGP Packets

An example of ACL blocking the TCP/BGP packets is shown in [Figure 12](#).

Figure 12 ACL blocking the TCP/BGP packets



## Troubleshooting

Use **display bgp peer** or **show ip bgp summary** command to determine the BGP peer status.

Comware:

```
<R3>display bgp peer
BGP local router ID : 4.4.4.4
Local AS number : 6502
Total number of peers : 1          Peers in established state : 1
Peer   AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
20.1.2.2  6501      5        6      0      11 00:01:30 Active
```

ProVision:

```
R3(bgp)# show ip bgp summary
```

Peer Information

Remote Address	Remote-AS	Local-AS	State	Admin Status
20.1.2.2	6501	6502	Active	Start

Verify the BGP configuration on both routers.

## Router R3

Comware:

```
<R3>disp current-configuration | begin bgp
bgp 6502
  undo synchronization
  peer 20.1.2.2 as-number 6501
```

ProVision:

```
R3(bgp)# show run
router bgp 6502
  enable
  neighbor 20.1.2.2 remote-as 6501
  exit
```

## Router R2

Comware:

```
<R2>disp current-configuration | begin bgp
bgp 6501
  undo synchronization
  peer 20.1.2.1 as-number 6502
```

ProVision:

```
R2(bgp)# show run
router bgp 6501
  enable
  neighbor 20.1.1.1 remote-as 6500
  neighbor 20.1.2.1 remote-as 6502
  exit
```

step1: Check the ip address and subnet mask of the respective interfaces at both ends.

step2: Check the ping reply to the respective interfaces.

step3: Check the configuration on the interface. Is there any ACL configured?

## Router R2

Comware:

```
<R2>disp current-configuration | begin interface
:
:
:
```

```
interface GigabitEthernet0/1
  port link-mode route
  ip address 20.1.2.2 255.255.255.0
```

ProVition:

```
vlan 2
  name "VLAN2"
  untagged 2
  ip address 20.1.2.2 255.255.255.0
  exit
```

## Router R3

Comware:

```
<R3>disp current-configuration | begin interface
:
:
:
interface GigabitEthernet0/1
  port link-mode route
  firewall packet-filter 3000 outbound
  ip address 20.1.2.1 255.255.255.0
```

ProVition:

```
vlan 2
  name "VLAN2"
  untagged 2
  ip address 20.1.2.1 255.255.255.0
  ip access-group "100" out
  exit
```

Check the ACL configured on interface Gi 0/1 or Vlan 2 of R3.

Comware:

```
[R3]disp acl all
Advanced ACL 3000, named -none-, 1 rule,
ACL's step is 5
  rule 10 deny tcp (70 time(s) matched)
```

ProVition:

```
R3(bgp)# show access-list 100
```

## Access Control Lists

```
Name: 100
Type: Extended
Applied: Yes
```

### SEQ Entry

```
-----
10  Action: deny
    Src IP: 0.0.0.0          Mask: 255.255.255.255  Port(s):
    Dst IP: 0.0.0.0          Mask: 255.255.255.255  Port(s):
    Proto : TCP
    TOS   : -                Precedence: -
```

The ACL on the R3-interface is blocking all the TCP packets preventing establishment of a neighbor relationship.

## Solution

Modify the ACL rule to allow TCP packets

Comware:

```
[R3]acl number 3000
[R3-acl-adv-3000]rule 5 permit tcp destination 20.1.2.2 0.0.0.255
```

ProVision:

```
R3(config)# ip access-list extended 100
R3(config-ext-nacl)# 5 permit tcp any host 20.1.2.2
```

## Verification

Use the **display bgp peer** or **show ip bgp summary** command to verify that neighbor relationship has been established.

Comware:

```
<R3>disp bgp peer
BGP local router ID : 4.4.4.4
Local AS number : 6502
Total number of peers : 1          Peers in established state : 1
Peer      AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
20.1.2.2  6501      5         6     0      11 00:01:47 Established
```

ProVision:

```
R3(config-ext-nacl)# show ip bgp summary
```

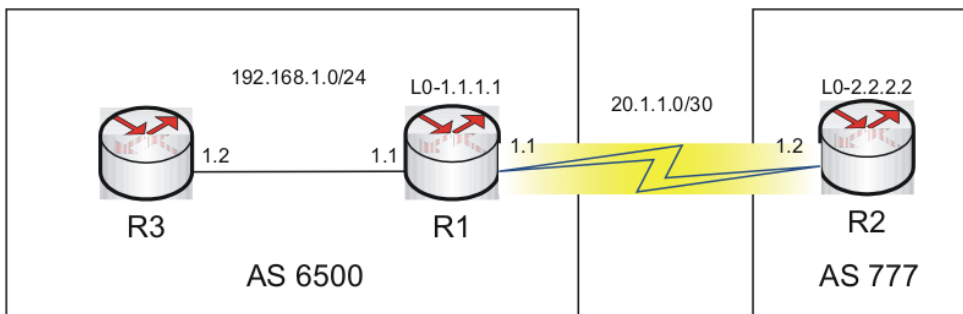
## Peer Information

Remote Address	Remote-AS	Local-AS	State	Admin Status
20.1.1.2	6501	6502	Established	Start

# Same Router-id configured on peers (Comware Only)

An example of same router-id configured on peers is shown in [Figure 13](#).

**Figure 13** same router-id configured on peers



## Troubleshooting

Use **display bgp peer** command to determine the BGP peer status.

### Router R1:

```
<R1>disp bgp peer
BGP local router ID : 1.1.1.1
Local AS number : 6500
Total number of peers : 1    Peers in established state : 0
Peer      AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
20.1.1.2  777      0         0        0     0        0 00:00:45 Active
```

### Router R2

```
<R2>disp bgp peer
BGP local router ID : 1.1.1.1
Local AS number : 777
Total number of peers : 1    Peers in established state : 0
```

Peer	AS	MsgRcvd	MsgSent	OutQ	PrefRcv	Up/Down	State
20.1.1.1	6500	0	0	0	0	00:00:05	Idle

Check the BGP configuration.

## Router R1

```
[R1]disp current-configuration | begin bgp
bgp 6500
router-id 1.1.1.1
undo synchronization
timer keepalive 6 hold 18
peer 20.1.1.2 as-number 777
```

## Router R2

```
[R2]disp current-configuration | begin bgp
bgp 777
router-id 1.1.1.1
undo synchronization
timer keepalive 5 hold 30
peer 20.1.1.1 as-number 6500
```

## Solution

Correct the router-id on R2

```
[R2]bgp 777
[R2-bgp]router-id 2.2.2.2
```

## Verification

Verify the BGP peer relationship status using the command **display bgp peer**.

```
[R2]disp bgp peer
BGP local router ID : 2.2.2.2
Local AS number : 777
Total number of peers :      Peers in established state : 1
Peer      AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
20.1.1.1  6500    4        4       0      0  00:00:13  Established
```

---

### NOTE:

ProVision devices allow establishment of a peer relationship when the router-ids are the same. Two ProVision devices can form a peer relationship with each other, where a Comware and ProVision device can not form a peer relationship, since the Comware device terminates the connection.

---



## 2 BGP Routing Issues

BGP Routing issues can be divided into two categories:

- BGP router not installing the routes in routing table
- BGP router not advertising the routes

### BGP router not installing the routes in routing table

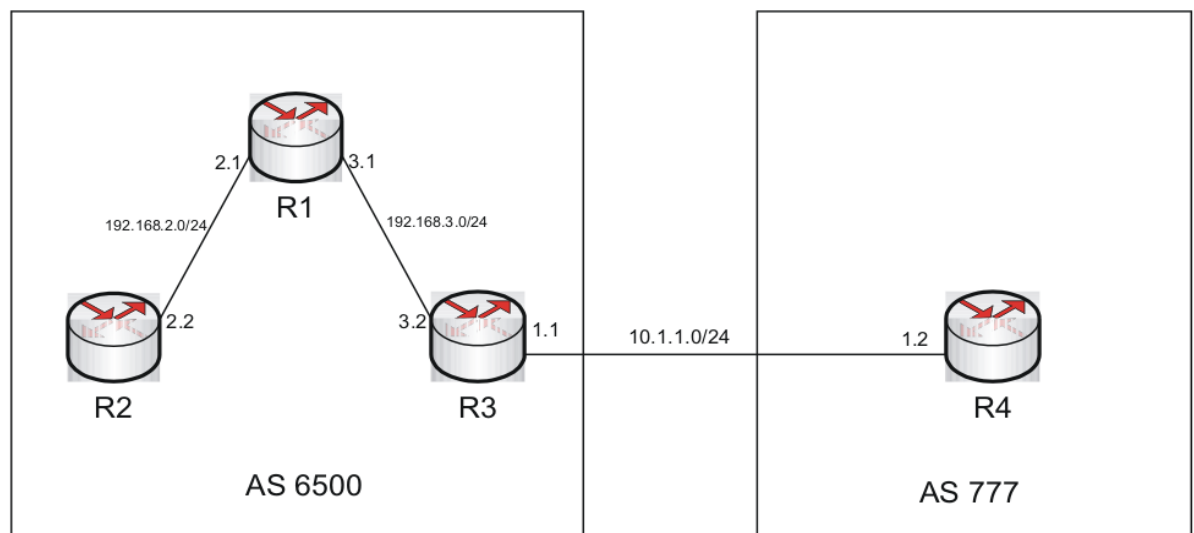
Below listed are some of the reasons:

- **network** command is not announcing the configured route
- Next-hop-local/next-hop-self command is missing

### Network command is not announcing the configured route

An example of **network** command is not announcing the configured route is shown in [Figure 14](#).

**Figure 14 Network command is not announcing the configured route**



#### Problem

R3 is not receiving the routes from R2 and vice versa

Comware:

```
<R3>ping 192.168.2.2
```

```

PING 192.168.2.2: 56 data bytes, press CTRL_C to break
  Request time out
  Request time out
  Request time out
  Request time out
  Request time out

--- 192.168.2.2 ping statistics ---
  5 packet(s) transmitted
  0 packet(s) received
  100.00% packet loss

```

ProVision:

```

R3(bgp)# ping 192.168.2.2
The destination address is unreachable.

```

Ping command executed from R3 to R2 is unsuccessful.

## Troubleshooting

Check the routing table of R3.

Comware:

```

[R3]display ip routing-table
Routing Tables: Public
  Destinations : 7          Routes : 7

```

Destination/Mask	Proto	Pre	Cost	NextHop	Interface
127.0.0.0/8	Direct	0	0	127.0.0.1	InLoop0
127.0.0.1/32	Direct	0	0	127.0.0.1	InLoop0
192.168.3.0/24	Direct	0	0	192.168.3.2	GE0/1
192.168.3.2/32	Direct	0	0	127.0.0.1	InLoop0

ProVision:

```

R3(bgp)# show ip route

```

### IP Route Entries

Destination	Gateway	VLAN	Type	Sub-Type	Metric	Dist.
20.1.2.0/24	VLAN2	2	connected		1	0
127.0.0.0/8	reject		static		0	0
127.0.0.1/32	lo0		connected		1	0
192.168.3.0/24	VLAN2	2	connected		1	0

The routing table of R3 does not contain the routes to the network 192.168.2.0/24.  
 Check the BGP routing table to verify the same.

Comware:

```
[R3]display bgp routing-table
Total Number of Routes: 3
BGP Local router ID is 3.3.3.3
Status codes: * - valid, > - best, d - damped,
              h - history, i - internal, s - suppressed, S - Stale
              Origin : i - IGP, e - EGP, ? - incomplete

Network          NextHop          MED           LocPrf        PrefVal Path/Ogn
*> 10.1.1.0/24    0.0.0.0         0             0             0       i
*                10.1.1.2         0             0             0       777i
*> 192.168.3.0   0.0.0.0         0             0             0       i
```

ProVision:

```
R3(bgp)# show ip bgp

Local AS           : 6500           Local Router-id   : 10.228.0.15
BGP Table Version  : 5

Status codes: * - valid, > - best, i - internal, e - external, s - stale
Origin codes: i - IGP, e - EGP, ? - incomplete

Network          Nexthop          Metric         LocalPref    Weight  AsPath
-----
i 192.168.3.0/24  192.168.3.1     0             100         0       i
```

Check the ip routing table of R1.

Comware:

```
[R1]display ip routing-table
Routing Tables: Public
      Destinations : 8          Routes : 8
Destination/Mask  Proto Pre Cost      NextHop          Interface
1.1.1.1/32       Direct 0  0       127.0.0.1       InLoop0
10.1.1.0/24      BGP    255 0       192.168.3.2     GE0/1
127.0.0.0/8     Direct 0  0       127.0.0.1       InLoop0
127.0.0.1/32    Direct 0  0       127.0.0.1       InLoop0
192.168.2.0/24   Direct 0  0       192.168.2.1     GE0/0
192.168.2.1/32   Direct 0  0       127.0.0.1       InLoop0
192.168.3.0/24   Direct 0  0       192.168.3.1     GE0/1
192.168.3.1/32   Direct 0  0       127.0.0.1       InLoop0
```

ProVision:

```
R1(bgp)# show ip route
```

IP Route Entries

Destination	Gateway	VLAN	Type	Sub-Type	Metric	Dist.
2.2.2.2/32	lo0		connected		1	0
127.0.0.0/8	reject		static		0	0
127.0.0.1/32	lo0		connected		1	0
192.168.2.0/24	DEFAULT_VLAN	1	connected		1	0
192.168.3.0/24	VLAN2	2	connected		1	0

The IP routing table of R1 shows an entry for 192.168.2.0/24 network. R1 is directly connected to that network, hence IP routing table entry has an entry for direct route.

Since iBGP is being used as the internal routing protocol among the routers in AS 6500 , the directly connected networks must be advertised using BGP.

Based on the information above, it appears that R1 is not advertising the network 192.168.3.0/24 via BGP. Check whether the BGP network advertised using network is the correct network.

Comware:

```
[R1]display bgp network
  BGP Local Router ID is 1.1.1.1.
  Local AS Number is 6500.
  Network      Mask      Route-policy  Short-cut
  192.168.0.0  255.255.0.0
```

ProVision:

```
R1(bgp)# show run
router bgp 6500
  enable
  network 192.168.0.0 255.255.0.0
  neighbor 192.168.2.2 remote-as 6500
  neighbor 192.168.3.2 remote-as 6500
  exit
```

The output above shows that the network configured for advertising is 192.168.0.0/16.

Unlike OSPF, BGP advertises a route only if the network command also has a matching route that has been installed in the global IP routing table.

In the above scenario, network command is followed by 192.168.0.0/16 subnet address. Though 192.168.0.0/16 is a supernet address and would include 192.168.2.0 subnet under it, this command does not advertise the 192.168.2.0/24 network. There is no route in the global routing table that is an exact match for 192.168.2.0/24. This rule prevents advertising of a BGP route if the router is not actually able to route the packet for that specific route.

## Solution

Remove the previously configured network command and configure the correct network command with the correct subnet mask under R1

Comware:

```
[R1]bgp 6500
[R1-bgp]undo network 192.168.0.0
[R1-bgp]network 192.168.2.0 24
[R1-bgp]network 192.168.3.0 24
```

ProVision:

```
R1(bgp)# router bgp 6500
R1(bgp)# no network 192.168.0.0 255.255.0.0
R1(bgp)# network 192.168.2.0 255.255.255.0
R1(bgp)# network 192.168.3.0 255.255.255.0
```

Since routes for 192.168.2.0/24 and 192.168.3.0/24 exist in the routing table of R1 as directly connected routes, R1 begins advertising those routes to both of its peers.

## Verification

Verify the BGP routing table of R1.

Comware:

```
[R1]display bgp routing-table
Total Number of Routes: 5
BGP Local router ID is 1.1.1.1
Status codes: * - valid, ^ - VPN best, > - best, d - damped,
               h - history, i - internal, s - suppressed, S - Stale
Origin : i - IGP, e - EGP, ? - incomplete

   Network          NextHop      MED      LocPrf    PrefVal  Path/Ogn
* >i 10.1.1.0/24      192.168.3.2    0         100        0        i
* >  192.168.2.0      0.0.0.0        0         0          0        i
* i                   192.168.2.2    0         100        0        i
* >  192.168.3.0      0.0.0.0        0         0          0        i
* i                   192.168.3.2    0         100        0        i
```

ProVision:

```
R1(bgp)# show ip bgp
```

```
Local AS          : 6500          Local Router-id   : 10.228.0.14
BGP Table Version : 0
```

```
Status codes: * - valid, > - best, i - internal, e - external, s - stale
Origin codes: i - IGP, e - EGP, ? - incomplete
```

	Network	Nexthop	Metric	LocalPref	Weight	AsPath
*>	192.168.2.0/24		0		32768	i
*>	192.168.3.0/24		0		32768	i

The BGP routing table of R1 now shows that it is announcing routes 192.168.2.0 and 192.168.3.0 since they are marked as “best” routes.

Now, ping R2 from R3.

Comware:

```
<R3>ping 192.168.2.2
  PING 192.168.2.2: 56 data bytes, press CTRL_C to break
    Reply from 192.168.2.2: bytes=56 Sequence=1 ttl=254 time=1 ms
    Reply from 192.168.2.2: bytes=56 Sequence=2 ttl=254 time=1 ms
    Reply from 192.168.2.2: bytes=56 Sequence=3 ttl=254 time=1 ms
      Reply from 192.168.2.2: bytes=56 Sequence=4 ttl=254 time=1 ms
    Reply from 192.168.2.2: bytes=56 Sequence=5 ttl=254 time=1 ms

--- 192.168.2.2 ping statistics ---
  5 packet(s) transmitted
  5 packet(s) received
  0.00% packet loss
  round-trip min/avg/max = 1/1/1 ms
R3 is receiving a successful ping reply.
```

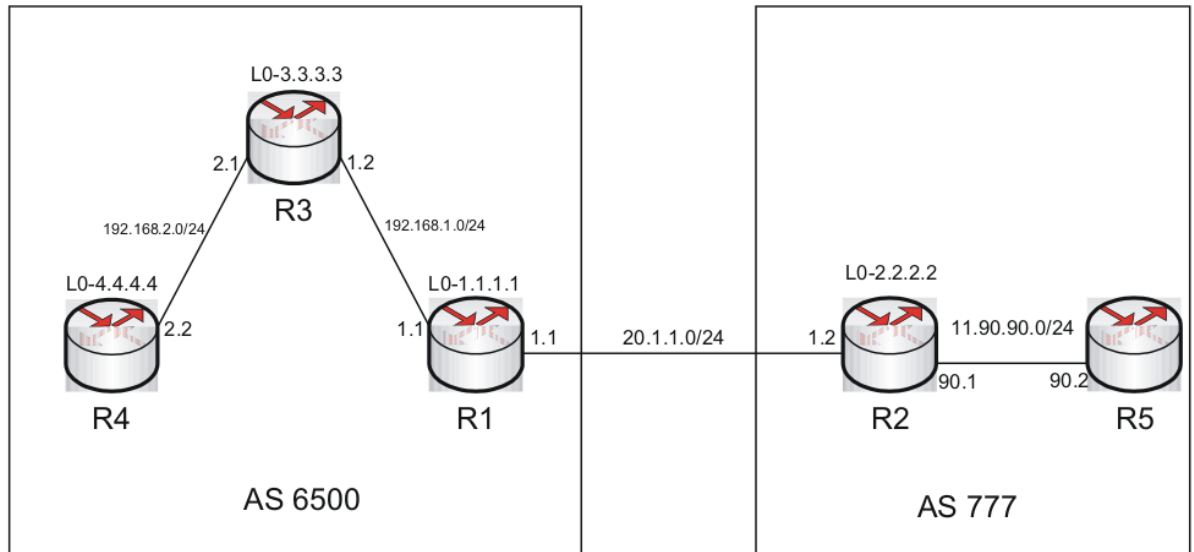
ProVision:

```
R3(bgp)# ping 192.168.2.2
192.168.2.2 is alive, time = 4 ms
```

## Next-hop-local/next-hop-self command is missing

An example of **next-hop-local/next-hop-self** command is missing is shown in [Figure 15](#).

Figure 15 Next-hop-local/next-hop-self command is missing



Router R5 is an IBGP neighbor of R2 whereas R2 and R1 are EBGP neighbors. R5 is trying to ping network in AS 6500. Routes from AS 6500 appear in the BGP routing table, however they are not installed into the router's global IP routing table.

## Troubleshooting

Verify the BGP routing table of R5.

Comware:

```
<R5>disp bgp routing-table
Total Number of Routes: 3
BGP Local router ID is 5.5.5.5
Status codes: * - valid, ^ - VPN best, > - best, d - damped,
               h - history, i - internal, s - suppressed, S - Stale
Origin : i - IGP, e - EGP, ? - incomplete

Network      NextHop      MED      LocPrf      PrefVal Path/Ogn
*   i 11.90.90.0/24  11.90.90.1    0          100         0         i
    i 192.168.1.0   1.1.1.1      0          100         0         6500i
    i 192.168.2.0   1.1.1.1      2          100         0         6500?
```

ProVision:

```
R5(bgp)# show ip bgp

Local AS           : 777           Local Router-id    : 11.90.90.2
BGP Table Version  : 4
```

Status codes: \* - valid, > - best, i - internal, e - external, s - stale  
 Origin codes: i - IGP, e - EGP, ? - incomplete

	Network	Nexthop	Metric	LocalPref	Weight	AsPath
*>	11.90.90.0/24		0		32768	i
* i	11.90.90.0/24	11.90.90.1	0	100	0	i
i	192.168.1.0/24	1.1.1.1	0	100	0	6500 i
i	192.168.2.0/24	1.1.1.1	0	100	0	6500 i

R5 is receiving the external-as routes from AS 6500. However, they are not being installed in the routing table. When AS 777 receives the routes, the NEXT\_HOP attribute is set to the outgoing interface of R1 (1.1.1.1). By default the NEXT\_HOP attribute is preserved inside an AS. However, routes to 192.168.1.0/24 and 192.168.2.0/24 cannot be installed into the global routing table, since there is no route to 1.1.1.1 in the global routing table already.

Comware:

```
[R5]ping 192.168.1.1
  PING 192.168.1.1: 56 data bytes, press CTRL_C to break
    Request time out
    Request time out
    Request time out
    Request time out
    Request time out

--- 192.168.1.1 ping statistics ---
  5 packet(s) transmitted
  0 packet(s) received
 100.00% packet loss
```

ProVision:

```
R5(bgp)# ping 192.168.1.1
The destination address is unreachable.
```

## Solution

Add the command **peer x.x.x.x next-hop-local** or **neighbor x.x.x.x next-hop-self** under the BGP configuration of R2. This changes the next-hop for external-as routes to R2 for all the IBGP neighbors in AS 777. Since a route to R2 exists in AS 777, the route is installed in the global routing table.

Comware:

```
[R2]bgp 777
[R2-bgp]peer 11.90.90.2 next-hop-local
```

ProVision:



```
R2(bgp)# router bgp 777
R2(bgp)# neighbor 11.90.90.2 next-hop-self
```

## Verification

Verify the BGP routing table of R5

Comware:

```
[R5]disp bgp routing-table
Total Number of Routes: 3
BGP Local router ID is 5.5.5.5
Status codes: * - valid, ^ - VPN best, > - best, d - damped,
              h - history, i - internal, s - suppressed, S - Stale
Origin : i - IGP, e - EGP, ? - incomplete
Network      NextHop      MED      LocPrf      PrefVal Path/Ogn
* i 11.90.90.0/24 11.90.90.1 0          100         0         i
* >i 192.168.1.0 11.90.90.1 0          100         0         6500i
* >i 192.168.2.0 11.90.90.1 2          100         0         6500?
```

ProVision:

```
R5(bgp)# show ip bgp

Local AS           : 777           Local Router-id   : 11.90.90.2
BGP Table Version  : 5

Status codes: * - valid, > - best, i - internal, e - external, s - stale
Origin codes: i - IGP, e - EGP, ? - incomplete

      Network          Nexthop          Metric      LocalPref  Weight  AsPath
-----
* i 11.90.90.0/24     11.90.90.1       0           100        0              i
*>i 192.168.1.0/24    11.90.90.1       0           100        0         6500      i
*>i 192.168.2.0/24    11.90.90.1       0           100        0         6500      i
```

R5 is now receiving the external-as routes with the next hop as 11.90.90.1 which is R2's interface ip.

Comware:

```
[R5]ping 192.168.1.1
PING 192.168.1.1: 56 data bytes, press CTRL_C to break
Reply from 192.168.1.1: bytes=56 Sequence=0 ttl=254 time=1 ms
Reply from 192.168.1.1: bytes=56 Sequence=1 ttl=254 time=1 ms
Reply from 192.168.1.1: bytes=56 Sequence=2 ttl=254 time=1 ms
Reply from 192.168.1.1: bytes=56 Sequence=3 ttl=254 time=1 ms
Reply from 192.168.1.1: bytes=56 Sequence=4 ttl=254 time=1 ms
```

```
--- 192.168.1.1 ping statistics ---
 5 packet(s) transmitted
 5 packet(s) received
 0.00% packet loss
 round-trip min/avg/max = 1/1/1 ms
```

ProVision:

```
R5(bgp)# ping 192.168.1.1
192.168.1.1 is alive, time = 3 ms
```

R5 is able to successfully ping the network in AS 6500.

As an alternative solution, the IGP in AS777 could be configured to have a route to R1 (1.1.1.1). This could be achieved by use of static routes or by injecting the route to 1.1.1.1 into your IGP. However, the solution presented above (next-hop-self, next-hop-local) is generally preferable.

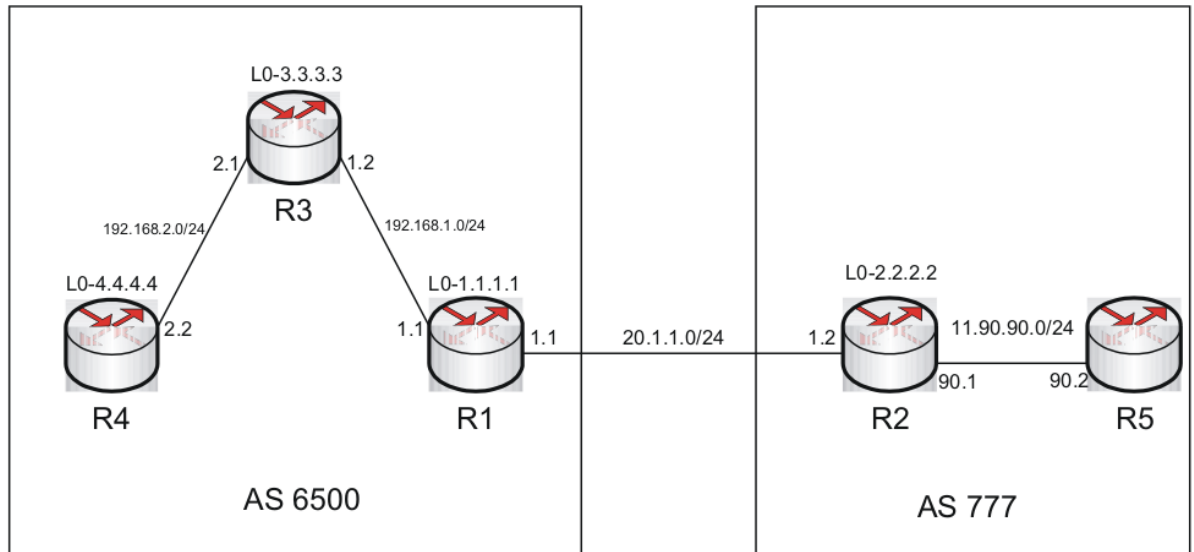
## BGP router not advertising the routes

The most common reason for this is, the Router is not configured as Route Reflector for IBGP neighbors.

## Router is not receiving External-AS routes or routes that are more than one hop away.

An example of router is not receiving external-AS routes, is shown in [Figure 16](#).

Figure 16 router is not receiving external-AS routes



## Problem

R4 is not able to reach the network 11.90.90.0/24 in AS 777.

## Troubleshooting

Check the IP routing table of R4

Comware:

```
[R4]disp ip routing-table
Routing Tables: Public
Destinations : 5          Routes : 5
```

Destination/Mask	Proto	Pre	Cost	NextHop	Interface
127.0.0.0/8	Direct	0	0	127.0.0.1	InLoop0
127.0.0.1/32	Direct	0	0	127.0.0.1	InLoop0
192.168.1.0/24	BGP	255	0	192.168.2.1	GE0/1
192.168.2.0/24	Direct	0	0	192.168.2.2	GE0/1
192.168.2.2/32	Direct	0	0	127.0.0.1	InLoop0

ProVision:

```
R4(bgp)# show ip route
```

```
IP Route Entries

Destination      Gateway          VLAN Type      Sub-Type  Metric  Dist.
```

```

-----
4.4.4.4/32      lo0              connected        1          0
127.0.0.0/8    reject          static           0          0
127.0.0.1/32   lo0              connected        1          0
192.168.1.0/24 192.168.2.1     1    bgp            0          200
192.168.2.0/24 DEFAULT_VLAN     1    connected      1          0

```

Verify the BGP routing table of R4 to check whether R4 is receiving the External-as routes.

Comware:

```
[R4]disp bgp routing-table
```

```
Total Number of Routes: 3
```

```
BGP Local router ID is 192.168.2.2
```

```
Status codes: * - valid, ^ - VPN best, > - best, d - damped,
              h - history, i - internal, s - suppressed, S - Stale
Origin : i - IGP, e - EGP, ? - incomplete
```

Network	NextHop	MED	LocPrf	PrefVal	Path/Ogn
* >i 192.168.1.0	192.168.2.1	0	100	0	i
* > 192.168.2.0	0.0.0.0	0		0	i
* i	192.168.2.1	0	100	0	i

ProVision:

```
R4(bgp)# show ip bgp
```

```
Local AS          : 6500          Local Router-id   : 192.168.2.2
BGP Table Version : 2
```

```
Status codes: * - valid, > - best, i - internal, e - external, s - stale
Origin codes: i - IGP, e - EGP, ? - incomplete
```

Network	Nexthop	Metric	LocalPref	Weight	AsPath
*>i 192.168.1.0/24	192.168.2.1	0	100	0	i
i 192.168.2.0/24	192.168.2.1	0	100	0	i

R4 is not receiving any external-as routes.

Check the routing table of R3 to verify whether it is receiving any external AS routes.

Comware:

```
[R3]disp bgp routing-table
Total Number of Routes: 5
BGP Local router ID is 3.3.3.3
Status codes: * - valid, ^ - VPN best, > - best, d - damped,
              h - history, i - internal, s - suppressed, S - Stale
              Origin : i - IGP, e - EGP, ? - incomplete
Network      NextHop      MED      LocPrf      PrefVal Path/Ogn
* >i 11.90.90.0/24 192.168.1.1 0          100         0          777i
* > 192.168.1.0 0.0.0.0     0          0           0          i
* i          192.168.1.1 0          100         0          i
* > 192.168.2.0 0.0.0.0     0          0           0          i
* i          192.168.2.2 0          100         0          i
```

ProVision:

```
R3(bgp)# show ip bgp
```

```
Local AS           : 6500           Local Router-id    : 192.168.2.1
BGP Table Version  : 4
```

```
Status codes: * - valid, > - best, i - internal, e - external, s - stale
Origin codes: i - IGP, e - EGP, ? - incomplete
```

	Network	Nexthop	Metric	LocalPref	Weight	AsPath
* i	11.90.90.0/24	20.1.1.2	0	100	0	777 i
* i	192.168.1.0/24	192.168.1.1	0	100	0	i
*>	192.168.2.0/24		0		32768	i

R3 is receiving the external-as routes. But R4 is not receiving the same routes.

Check the BGP configuration on R3.

Comware:

```
[R3]disp current-configuration | begin bgp
bgp 6500
network 192.168.1.0
network 192.168.2.0
undo synchronization
peer 192.168.1.1 as-number 6500
peer 192.168.2.2 as-number 6500
```

ProVision:

```
R3(bgp)# show run
router bgp 6500
enable
network 192.168.1.0 255.255.255.0
network 192.168.2.0 255.255.255.0
```

```
neighbor 192.168.1.1 remote-as 6500
neighbor 192.168.2.2 remote-as 6500
exit
```

R3 is an IBGP neighbor of R1. Even though R3 receives all the external-as routes from R1, it does not advertise those routes to R4. IBGP rules state that IBGP routes that are learned from another peer are not propagated.

To advertise these external-as routes to other IBGP neighbors in AS 6500, configure R3 as Route reflector for all routers in the AS. A route reflector acts as a hub for IBGP peers, allowing them to exchange routes directly with each other.

## Solution

Configure R3 as Route reflector for R4 and R1.

Comware:

```
[R3]bgp 6500
[R3-bgp]peer 192.168.2.2 reflect-client
[R3-bgp]peer 192.168.1.1 reflect-client
```

ProVision:

```
R3(bgp)# router bgp 6500
R3(bgp)# neighbor 192.168.1.1 route-reflector-client
R3(bgp)# neighbor 192.168.2.2 route-reflector-client
```

## Verification

Verify whether R4 is receiving the external-as routes.

Comware:

```
[R4]disp bgp routing-table
Total Number of Routes: 4
BGP Local router ID is 192.168.2.2
Status codes: * - valid, ^ - VPN best, > - best, d - damped,
               h - history, i - internal, s - suppressed, S - Stale
Origin : i - IGP, e - EGP, ? - incomplete
   Network          NextHop          MED           LocPrf        PrefVal Path/Ogn
* >i 11.90.90.0/24   192.168.1.1      0             100           0       777i
* >i 192.168.1.0     192.168.2.1      0             100           0       i
* > 192.168.2.0     0.0.0.0          0             0             0       i
* i                 192.168.2.1      0             100           0       i
```

ProVision:

```
R4(bgp)# show ip bgp
```

Local AS : 6500 Local Router-id : 192.168.2.2  
BGP Table Version : 4

Status codes: \* - valid, > - best, i - internal, e - external, s - stale  
Origin codes: i - IGP, e - EGP, ? - incomplete

	Network	Nexthop	Metric	LocalPref	Weight	AsPath
*>i	11.90.90.0/24	192.168.1.1	0	100	0	777 i
*>i	192.168.1.0/24	192.168.2.1	0	100	0	i
i	192.168.2.0/24	192.168.2.1	0	100	0	i

R4 is now receiving external-as routes

## 3 BGP Confederation issues (Comware Only)

### NOTE:

ProVision devices do not support BGP confederations.

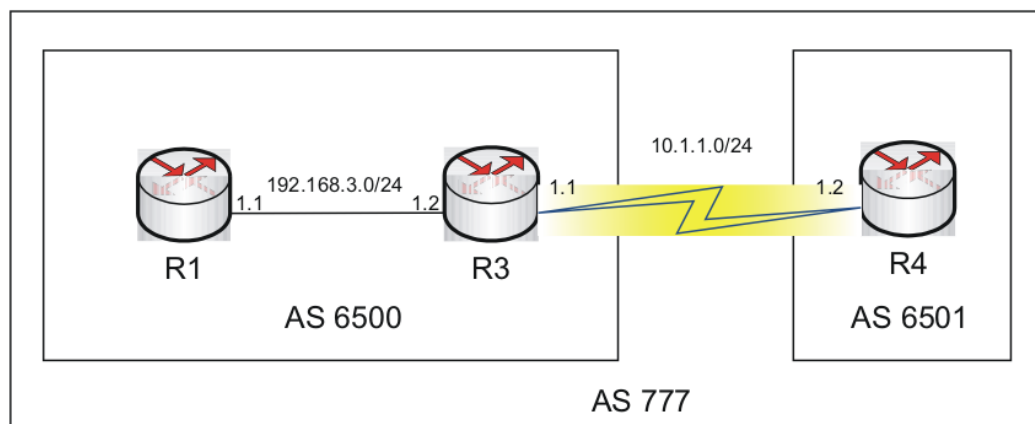
The common configuration mistakes which occur in BGP confederation setup are:

- Incorrect confederation peer ip
- Incorrect confederation peer-as
- Missing **confederation peer-as <AS Number>** command

## BGP Confederation peer relation not establishing: Incorrect peer IP configured

An example of BGP confederation peer relation not establishing: Incorrect peer IP configured is shown in Figure 17.

Figure 17 BGP confederation peer relation not establishing: Incorrect peer IP configured



## Problem

R3 is not forming peer relation with R4. Incorrect peer ip configured.

## Troubleshooting

Verify the peer relation between R3 and R4 using the command **display bgp peer**.

```
[R3]display bgp peer
BGP local router ID : 3.3.3.3
Local AS number : 6500
```



Peer	AS	MsgRcvd	MsgSent	OutQ	PrefRcv	Up/Down	State
192.168.3.1	6500	86	85	0	2	01:29:27	Established
10.1.1.3	6501	0	0	0	0	01:29:39	Active

The peer relationship is stuck in active state.

Check the BGP configuration on both the routers to verify the correctness in the configuration of the devices.

## Router R3

```
[R3]display current-configuration | begin bgp
bgp 6500
  confederation id 777
  confederation peer-as 6501
  network 10.1.1.0 255.255.255.0
  network 192.168.3.0
  undo synchronization
  peer 10.1.1.3 as-number 6501
  peer 192.168.3.1 as-number 6500
```

## Router R4

```
[R4]display current-configuration | begin bgp
bgp 6501
  confederation id 777
  confederation peer-as 6500
  network 10.1.1.0 255.255.255.0
  undo synchronization
  peer 10.1.1.1 as-number 6500
```

The peer command on R3 shows an incorrect IP configured.

## Solution

Input the correct peer ip under R3.

```
[R3]bgp 6500
[R3-bgp]undo peer 10.1.1.3
[R3-bgp]peer 10.1.1.2 as-number 6501
```

## Verification

Check the BGP peer status using the command **display bgp peer**.

```
<R3>display bgp peer
BGP local router ID : 3.3.3.3
```

```

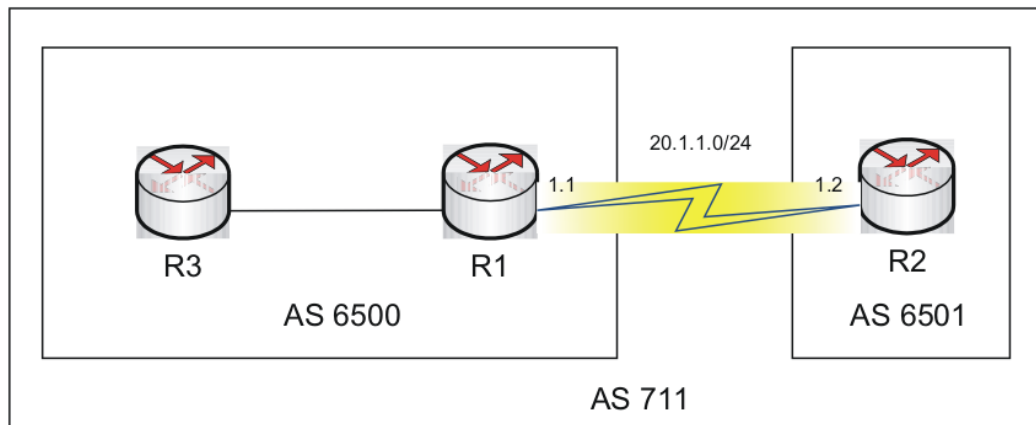
Local AS number : 6500
Total number of peers : 2                Peers in established state : 2
Peer          AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
192.168.3.1  6500    154      153     0      2 02:44:27 Established
10.1.1.2     6501     34       39     0      1 00:35:14 Established

```

## Incorrect confederation peer-as configured

An example of incorrect confederation peer-as configured is shown in [Figure 18](#).

**Figure 18** Incorrect confederation peer-as configured



## Troubleshooting

Verify the bgp peer status using the command **display bgp peer**.

```

[R2]disp bgp peer
BGP local router ID : 2.2.2.2
Local AS number : 6501
Total number of peers : 1                Peers in established state : 0
Peer      AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
20.1.1.1  6500     0         1       0      0 00:00:38 Active

```

Check the bgp configurations on both the routers.

### Router R1

```

[R1]disp current-configuration | begin bgp
bgp 6500
confederation id 711
confederation peer-as 6501
network 10.1.1.0 255.255.255.0
network 20.1.1.0 255.255.255.0

```

```
undo synchronization
peer 20.1.1.2 as-number 6501
```

## Router R2

```
[R2]disp current-configuration | begin bgp
bgp 6501
  confederation id 711
  confederation peer-as 6502
  network 20.1.1.0 255.255.255.0
  undo synchronization
  peer 20.1.1.1 as-number 6500
```

The confederation peer-as configured is incorrect.

## Solution

Correct the confederation AS configured.

```
[R2]bgp 6501
[R2-bgp]undo confederation peer-as 6502
[R2-bgp]confederation peer-as 6500
```

## Verification

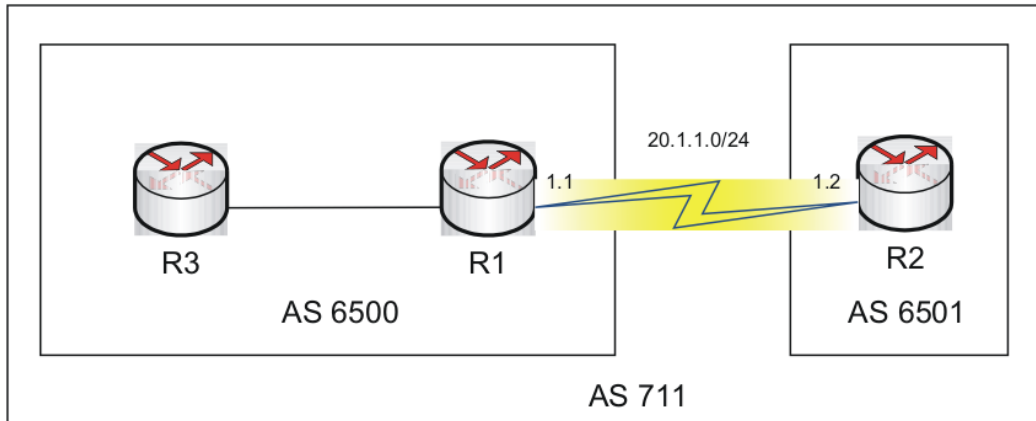
Verify the BGP peer status.

```
[R2]disp bgp peer
BGP local router ID : 2.2.2.2
Local AS number : 6501
Total number of peers : 1          Peers in established state : 1
Peer      AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
20.1.1.1  6500      6         5      0       3 00:01:01 Established
```

## Missing confederation peer-as <AS number> command

An example of missing **confederation peer-as <AS numbers>** command is shown in [Figure 19](#).

Figure 19 Missing confederation peer-as <AS numbers> command



## Troubleshooting

Verify the bgp peer status using the command **display bgp peer**.

```
[R1]display bgp peer
BGP local router ID : 1.1.1.1
Local AS number : 6500
Total number of peers : 1          Peers in established state : 0
Peer      AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
-----
20.1.1.2  6501      0         0        0      0      00:00:26 Idle
```

Check the BGP configuration on both routers.

### Router R1

```
[R1]disp current-configuration | begin bgp
bgp 6500
  confederation id 711
  network 10.1.1.0 255.255.255.0
  network 20.1.1.0 255.255.255.0
  undo synchronization
  peer 20.1.1.2 as-number 6501
```

confederation peer-as <as no.> command missing under BGP configuration for R1

### Router R2

```
[R2]disp current-configuration | begin bgp
bgp 6501
  confederation id 711
  confederation peer-as 6500
```

```
network 20.1.1.0 255.255.255.0
undo synchronization
peer 20.1.1.1 as-number 6500
```

## Solution

Configure the confederation AS number for router R2.

```
[R1]bgp 6500
[R1-bgp]confederation peer-as 6501
```

## Verification

R1 has formed successful peering with R2.

```
[R1]disp bgp peer
BGP local router ID : 1.1.1.1
Local AS number : 6500
Total number of peers : 1          Peers in established state : 1
Peer      AS  MsgRcvd  MsgSent  OutQ  PrefRcv  Up/Down  State
20.1.1.2  6501    6         5       0     4 00:00:40 Established
```

## 4 BGP Route Aggregation issue

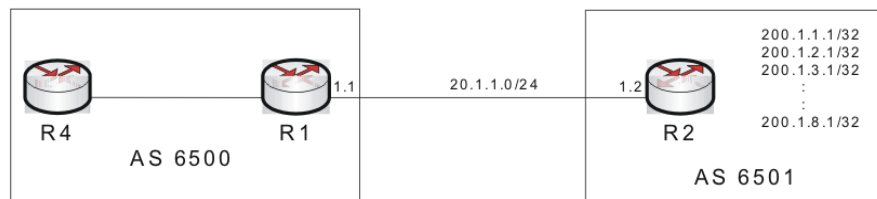
The most common problems found in the route aggregation in BGP are:

- Router receiving both detailed routes as well as summary route (Comware)
- No option to send a summary route (ProVision)
- Router not receiving summary route: route-policy blocking summary route

### Router receiving both detailed routes as well as summary route (Comware only)

An example of a router receiving both detailed routes as well as summary route is shown in Figure 20.

Figure 20 router receiving both detailed routes as well as summary route



Router R2 is advertising the following routes: 200.1.1.1/32, 200.1.2.1/32, 200.1.3.1/32, 200.1.4.1/32, 200.1.5.1/32, 200.1.6.1/32, 200.1.7.1/32 and 200.1.8.1/32.

These routes are being summarized at R2 before advertising to EBGP neighbor R1.

### Problem

R1 is receiving both Summarized routes and detailed routes.

### Troubleshooting

Check the BGP routing table of R1.

```
[R1]disp bgp routing-table
Total Number of Routes: 11
BGP Local router ID is 1.1.1.1
Status codes: * - valid, ^ - VPN best, > - best, d - damped,
              h - history, i - internal, s - suppressed, S - Stale
Origin : i - IGP, e - EGP, ? - incomplete
Network      NextHop      MED      LocPrf      PrefVal Path/Ogn
* > 20.1.1.0/24    0.0.0.0      0          0          i
*          20.1.1.2      0          0          6501i
* > 200.1.0.0/16  20.1.1.2      0          0          6501i
* > 200.1.1.1/32  20.1.1.2      0          0          6501i
* > 200.1.2.1/32  20.1.1.2      0          0          6501i
* > 200.1.3.1/32  20.1.1.2      0          0          6501i
* > 200.1.4.1/32  20.1.1.2      0          0          6501i
* > 200.1.5.1/32  20.1.1.2      0          0          6501i
* > 200.1.6.1/32  20.1.1.2      0          0          6501i
* > 200.1.7.1/32  20.1.1.2      0          0          6501i
* > 200.1.8.1/32  20.1.1.2      0          0          6501i
```

Check the BGP configuration on R2.

```
<R2> display current-configuration | begin bgp
bgp 6501
 aggregate 200.1.0.0 255.255.0.0
 network 20.1.1.0 255.255.255.0
 network 200.1.1.1 255.255.255.255
 network 200.1.2.1 255.255.255.255
 network 200.1.3.1 255.255.255.255
 network 200.1.4.1 255.255.255.255
 network 200.1.5.1 255.255.255.255
 network 200.1.6.1 255.255.255.255
 network 200.1.7.1 255.255.255.255
 network 200.1.8.1 255.255.255.255
 undo synchronization
 peer 20.1.1.1 as-number 6500
```

The **aggregate** command configured on R2 is not followed by **detail-suppress**. As a result all the detailed routes get advertised along with the summary route.

## Solution

There are two ways to curb this issue.

1. Include **detail-suppress** keyword in the **aggregate** command
2. Use IP prefix to filter out the detailed routes.

Both the solutions are described here.

## Solution1

Include the keyword **detail-suppress** in the **aggregate** command.

```
[R2]bgp 6500
[R2-bgp]aggregate 200.1.0.0 16 detail-suppressed
```

## Verification for Solution 1

R1 is receiving only the summarized routes.

```
[R1]disp bgp routing-table
Total Number of Routes: 3
BGP Local router ID is 1.1.1.1
Status codes: * - valid, ^ - VPN best, > - best, d - damped,
              h - history, i - internal, s - suppressed, S - Stale
              Origin : i - IGP, e - EGP, ? - incomplete
Network      NextHop      MED      LocPrf      PrefVal Path/Ogn
* > 20.1.1.0/24  0.0.0.0      0          0          i
*          20.1.1.2      0          0          6501i
* > 200.1.0.0/16 20.1.1.2      0          0          6501i
```

## Solution2

Use IP prefix to filter out the detailed routes on R2.

```
[R2]ip ip-prefix block_multiply index 10 deny 200.1.1.1 32
[R2]ip ip-prefix block_multiply index 11 deny 200.1.2.1 32
[R2]ip ip-prefix block_multiply index 12 deny 200.1.3.1 32
[R2]ip ip-prefix block_multiply index 13 deny 200.1.4.1 32
[R2]ip ip-prefix block_multiply index 14 deny 200.1.5.1 32
[R2]ip ip-prefix block_multiply index 15 deny 200.1.6.1 32
[R2]ip ip-prefix block_multiply index 16 deny 200.1.7.1 32
[R2]ip ip-prefix block_multiply index 17 deny 200.1.8.1 32
[R2]ip ip-prefix block_multiply index 50 permit 0.0.0.0 0 less-equal 32
[R2]bgp 6501
[R2-bgp]peer 20.1.1.1 ip-prefix block_multiply export
```

## Verification for Solution 2

R1 is receiving only the summary routes.

```
<R1>disp bgp routing-table
```



```

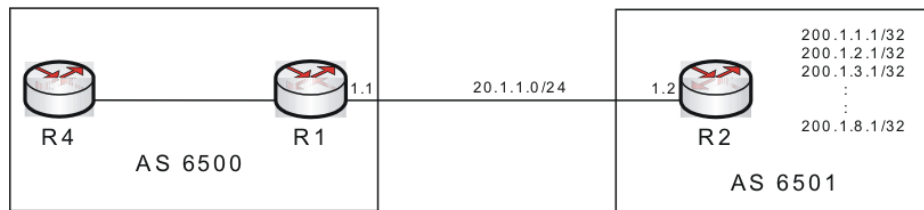
Total Number of Routes: 3
BGP Local router ID is 1.1.1.1
Status codes: * - valid, ^ - VPN best, > - best, d - damped,
              h - history, i - internal, s - suppressed, S - Stale
              Origin : i - IGP, e - EGP, ? - incomplete
Network      NextHop          MED          LocPrf      PrefVal Path/Ogn
* > 20.1.1.0/24 0.0.0.0        0            0           0       i
*           20.1.1.2        0            0           0       6501i
* > 200.1.0.0/16 20.1.1.2      0            0           0       6501i

```

## A manually configured summary route is not being advertised (ProVision only)

An example of a manually configured summary route is not being advertised is shown in [Figure 21](#).

**Figure 21 manually configured summary route is not being advertised**



The following routes exist in AS 6501: 200.1.1.1/32, 200.1.2.1/32, 200.1.3.1/32, 200.1.4.1/32, 200.1.5.1/32, 200.1.6.1/32, 200.1.7.1/32 and 200.1.8.1/32.

R2 should announce only the route 200.1.0.0/16 to R1, but ProVision devices do not offer the aggregate option.

## Problem

R1 is receiving the detailed routes. The desired behavior is for R1 to only receive the single summary route. The route 200.1.0.0/16 is configured to be advertised from R2, however R1 is not receiving the route.

## Troubleshooting

R2 is configured like this:

```

router bgp 6501
  enable
  network 200.1.0.0 255.255.0.0
  network 200.1.1.1 255.255.255.255
  network 200.1.2.1 255.255.255.255
  network 200.1.3.1 255.255.255.255
  network 200.1.4.1 255.255.255.255
  network 200.1.5.1 255.255.255.255
  network 200.1.6.1 255.255.255.255
  network 200.1.7.1 255.255.255.255
  network 200.1.8.1 255.255.255.255
  neighbor 20.1.1.1 remote-as 6500
  exit

```

R1's BGP routing table:

```
R1(bgp)# show ip bgp
```

```

Local AS           : 6500           Local Router-id   : 10.228.0.11
BGP Table Version  : 8

```

```

Status codes: * - valid, > - best, i - internal, e - external, s - stale
Origin codes: i - IGP, e - EGP, ? - incomplete

```

	Network	NextHop	Metric	LocalPref	Weight	AsPath
*>e	200.1.1.1/32	20.1.1.2	0		0	6501 i
*>e	200.1.2.1/32	20.1.1.2	0		0	6501 i
*>e	200.1.3.1/32	20.1.1.2	0		0	6501 i
*>e	200.1.4.1/32	20.1.1.2	0		0	6501 i
*>e	200.1.5.1/32	20.1.1.2	0		0	6501 i
*>e	200.1.6.1/32	20.1.1.2	0		0	6501 i
*>e	200.1.7.1/32	20.1.1.2	0		0	6501 i
*>e	200.1.8.1/32	20.1.1.2	0		0	6501 i

R1 is not receiving the summary route.

## Solution

The network command only announces the specified route, if that route exists in the routers global routing table. The routing table of R2 looks like this:

```
R2(config)# show ip route
```

### IP Route Entries

Destination	Gateway	VLAN	Type	Sub-Type	Metric	Dist.
20.1.1.0/24	DEFAULT_VLAN	1	connected		1	0
127.0.0.0/8	reject		static		0	0
127.0.0.1/32	lo0		connected		1	0
200.1.1.1/32	lo0		connected		1	0
200.1.2.1/32	lo1		connected		1	0
200.1.3.1/32	lo2		connected		1	0
200.1.4.1/32	lo3		connected		1	0
200.1.5.1/32	lo4		connected		1	0
200.1.6.1/32	lo5		connected		1	0
200.1.7.1/32	lo6		connected		1	0
200.1.8.1/32	lo7		connected		1	0

As expected, the detailed routes are announced, however since the summary route 200.1.0.0/16 does not exist in the routing table that route is not announced.

The desired behavior is to not announce the detailed routes, and to only announce the summary route. This can be accomplished by eliminating the network statements for the detailed routes and adding a "spoofed" route for the summary route.

The configuration would look like this:

```
router bgp 6501
  enable
  network 200.1.0.0 255.255.0.0
  neighbor 20.1.1.1 remote-as 6500
  exit
ip route 200.1.0.0/16 blackhole
```

By adding the blackhole route, R2 is now able to announce the summary route. Traffic is not actually being blackholed, since the more specific routes still exist in the routing table of R2.

---

#### NOTE:

Unlike when using the aggregate command, the summary route is always announced regardless of the existence of any of the detailed routes.

---

## Verification

```
R1(bgp)# show ip bgp
```

Local AS : 6500 Local Router-id : 10.228.0.11  
BGP Table Version : 17

Status codes: \* - valid, > - best, i - internal, e - external, s - stale  
Origin codes: i - IGP, e - EGP, ? - incomplete

	Network	Nexthop	Metric	LocalPref	Weight	AsPath
*>e	200.1.0.0/16	20.1.1.2	0		0	6501 ?