Ticket 08: R1 doesn't have BGP routes from BB2

R1 (AS 65501) doesn't have any BGP routes from BB2 (AS 64512) in its routing table. Please help to resolve the issue!

Explanation:

```
R1#sh ip bgp
BGP table version is 270056, local router ID is 172.16.11.11
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              r RIB-failure, S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete

   Network          Next Hop            Metric LocPrf Weight Path
*> 172.16.2.0/24    172.16.3.3                             0 65503 65500 65502 i
*> 172.16.100.0/24  172.16.3.3                             0 65503 65500 65502 i
*> 172.16.101.0/24  172.16.3.3                             0 65503 65500 65502 i
*> 172.16.102.0/24  172.16.3.3                             0 65503 65500 65502 i
*> 172.16.103.0/24  172.16.3.3                             0 65503 65500 65502 i
*> 172.16.200.0/24  172.16.3.3                             0 65503 65500 i
```

As we can see, all BGP routes are originated from either AS 65502 or 65500. Since R1 does not have EBGP connection between BB2, the next hop AS to BB2 is 65503. Let's check BGP routes on R3 which is in AS 65503:

```
R3#sh ip bgp
BGP table version is 270149, local router ID is 172.16.3.3
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal,
              r RIB-failure, S Stale, m multipath, b backup-path, x best-externa
l, f RT-Filter
Origin codes: i - IGP, e - EGP, ? - incomplete

   Network          Next Hop            Metric LocPrf Weight Path
*> 172.16.2.0/24    172.16.5.5                             0 65500 65502 i
*> 172.16.100.0/24  172.16.5.5                             0 65500 65502 i
*> 172.16.101.0/24  172.16.5.5                             0 65500 65502 i
*> 172.16.102.0/24  172.16.5.5                             0 65500 65502 i
*> 172.16.103.0/24  172.16.5.5                             0 65500 65502 i
*> 172.16.200.0/24  172.16.5.5                             0 65500 i
*> 172.17.200.0/24  172.16.5.5                             0 65500 64512 i
*> 172.17.201.0/24  172.16.5.5                             0 65500 64512 i
*> 172.17.202.0/24  172.16.5.5                             0 65500 64512 i
*> 172.17.203.0/24  172.16.5.5                             0 65500 64512 i
*> 172.17.204.0/24  172.16.5.5                             0 65500 64512 i
*> 172.17.220.0/24  172.16.5.5                             0 65500 64512 i
*> 172.17.230.0/24  172.16.5.5                             0 65500 64512 i
R3#
```

R3 has BGP routes originated from BB2, but R1 doesn't, meaning that something wrong between R1 (AS 65501) and R3 (AS 65503).

```
R3#sh ip bgp summary
BGP router identifier 172.16.3.3, local AS number 65503
BGP table version is 270209, main routing table version 270209
13 network entries using 1768 bytes of memory
13 path entries using 728 bytes of memory
3/3 BGP path/bestpath attribute entries using 384 bytes of memory
3 BGP AS-PATH entries using 72 bytes of memory
1 BGP community entries using 24 bytes of memory
1 BGP route-map cache entries using 36 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP using 3012 total bytes of memory
BGP activity 70659/70646 prefixes, 135107/135094 paths, scan interval 60 secs

Neighbor        V           AS MsgRcvd MsgSent   TblVer  InQ OutQ Up/Down  State
/PfxRcd
172.16.5.5      4        65500  124025   72768   270209    0    0 6w3d
 13
172.16.11.11    4        65501   66121   95107   270209    0    0 6w3d
  0
R3#
```

R3 and R1 have BGP connection established successfully. But R3 has a policy configured in the outbound direction to R1:

```
R3#sh ip bgp neighbors 172.16.11.11 policy
 Neighbor: 172.16.11.11, Address-Family: IPv4 Unicast
 Locally configured policies:
  route-map FilterR1 out
  send-community
R3#
```

R3 uses a community list to match all routes with community 64512, before R3 sends all these routes out to R1, R3 sets the next hop ip address to 172.16.13.1 which is the s0/0/1 interface of R1 itself.

```
R3#show route-map FilterR1
route-map FilterR1, permit, sequence 10
  Match clauses:
    community (community-list filter): 1
  Set clauses:
    metric 0
    local-preference 105
    community internet
    ip next-hop 172.16.13.1
  Policy routing matches: 0 packets, 0 bytes
route-map FilterR1, permit, sequence 20
  Match clauses:
  Set clauses:
  Policy routing matches: 0 packets, 0 bytes
```

```
R3#show ip community-list 1
Community standard list 1
    permit 64512
R3#
```

Let's double check if routes with community 64512 coming from AS 64512. On R4, we found the configuration that set the community of all routes coming from BB2 (AS6412) to 64512.

```
R4#sh route-map
route-map CONN, permit, sequence 10
  Match clauses:
    interface GigabitEthernet0/0
  Set clauses:
  Policy routing matches: 0 packets, 0 bytes
route-map BB2, permit, sequence 10
  Match clauses:
    as-path (as-path filter): 1
  Set clauses:
    community 64512
  Policy routing matches: 0 packets, 0 bytes
R4#
```

```
R4#show ip as-path-access-list
AS path access list 1
    permit _64512$
```

Solution:

R3: route-map FilterR1 per 10
no set ip next-hop 172.16.13.1