使用32位AS编号的BGP实施配置示例

目录

简介

本文档介绍如何使用32位AS编号配置边界网关协议(BGP)。在BGP中，每个路由域都是一个管理域，并且分配有唯一的AS编号，并在统一的路由策略集中运行。它还维护域间路由。

在本文档中，在16位和32位发言的BGP路由器之间配置BGP对等。新的32位AS模式与16位AS模式兼容。可以在32位模式下运行的BGP对等体对新功能做出积极响应，该会话在新模式下运行。另一方面，32位BGP对等体在与16位BGP发言者通信时，16位发言路由器会忽略此新功能并在16位模式下运行其BGP会话。

先决条件

要求

建议本文的读者具备 BGP 的基础知识。

硬件与软件版本

本文中的配置基于装有 Cisco IOS® 软件版本 15.0(1) 的 Cisco 7200 系列路由器。

规则

有关文档规则的详细信息，请参阅 Cisco 技术提示规则。

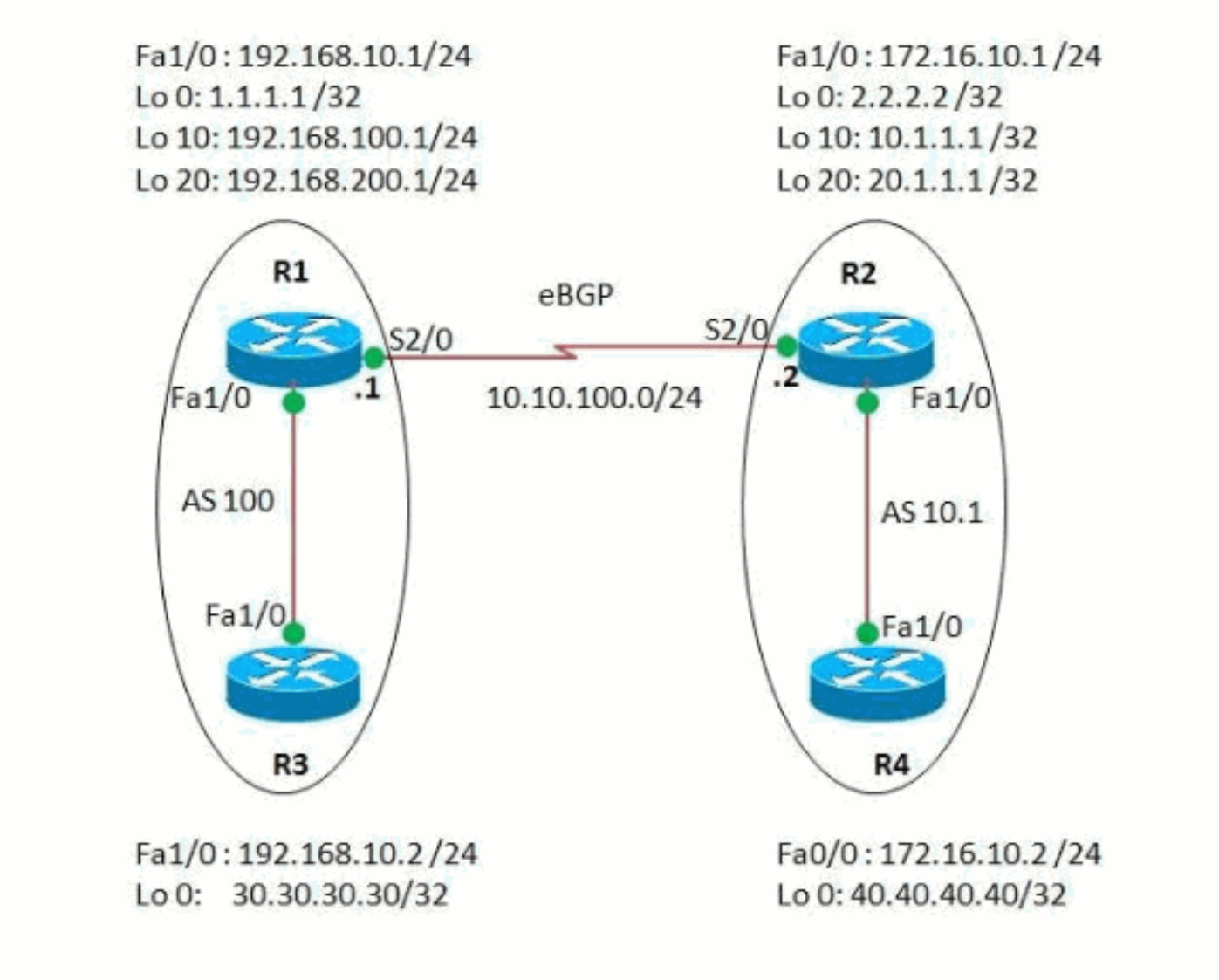
配置

在本例中，路由器R1和R3配置为处于AS 100中，使用16位AS模式形成iBGP关系。路由器R2和R4在AS 10.1中配置，并使用32位AS模式形成iBGP对等。路由器R1和R2运行和IGP协议（在本例中，路由器R1和R2相互之间采用OSPF），并在它们之间形成eBGP邻居。

注意：使用命令查找工具(仅限注册客户)可查找有关本文档中使用的命令的详细信息。

网络图

本文档使用以下网络设置：



配置

本文档使用以下配置：

- 路由器 R1
- 路由器 R2
- 路由器 R3
- 路由器R4

路由器 R1

```
R1#show run
Building configuration...
!
version 15.0
!
hostname R1
!
ip cef
!
interface Loopback0
ip address 1.1.1.1 255.255.255.255
!
interface Loopback10
ip address 192.168.100.1 255.255.255.0
!
interface Loopback20
ip address 192.168.200.1 255.255.255.0
!
interface FastEthernet1/0
ip address 192.168.10.1 255.255.255.0
duplex auto
 speed auto
!
interface Serial2/0
 ip address 10.10.100.1 255.255.255.0
 serial restart-delay 0
!
router ospf 1
 log-adjacency-changes
 network 1.1.1.1 0.0.0.0 area 0
 network 10.10.100.0 0.0.0.255 area 0
!
router bgp 100
!--- BGP is configured using 16-bit AS number no
synchronization bgp router-id 10.10.10.10 bgp asnotation
dot
!--- This command change the default asplain notation to
dot notation. !--- Note that without this command the AS
number will treated as asplain notation i.e. 10.1 will
be displayed as 655361

 bgp log-neighbor-changes
 network 192.168.100.0
 network 192.168.200.0
 neighbor 2.2.2.2 remote-as 10.1
!--- The AS number of the eBGP peer in 32-bit neighbor
2.2.2.2 ebgp-multihop 255 neighbor 2.2.2.2 update-source
Loopback0 neighbor 192.168.10.2 remote-as 100 neighbor
192.168.10.2 next-hop-self no auto-summary ! end
```

路由器 R2

```
R2#show run
!
version 15.0
!
hostname R2
!
ip cef
!
interface Loopback0
```

```
ip address 2.2.2.2 255.255.255.0
!
interface Loopback10
ip address 10.1.1.1 255.255.255.255
!
interface Loopback20
ip address 20.1.1.1 255.255.255.255
!
interface FastEthernet1/0
ip address 172.16.10.1 255.255.255.0
duplex auto
speed auto
!
interface Serial2/0
ip address 10.10.100.2 255.255.255.0
serial restart-delay 0
!
!
router ospf 1
 log-adjacency-changes
 network 2.2.2.2 0.0.0.0 area 0
 network 10.10.100.0 0.0.0.255 area 0
!
router bgp 10.1
!--- BGP is configured using 32-bit AS number no
synchronization bgp router-id 20.20.20.20 bgp asnotation
dot bgp log-neighbor-changes network 10.1.1.1 mask
255.255.255.255 network 20.1.1.1 mask 255.255.255.255
neighbor 1.1.1.1 remote-as 100 neighbor 1.1.1.1 ebgp-
multihop 255 neighbor 1.1.1.1 update-source Loopback0
neighbor 172.16.10.2 remote-as 10.1 neighbor 172.16.10.2
next-hop-self no auto-summary ! end
```

路由器 R3

```
R3#show run
Building configuration...
!
version 15.0
ip cef
!
interface Loopback0
 ip address 30.30.30.30 255.255.255.255
!
interface FastEthernet1/0
 ip address 192.168.10.2 255.255.255.0
 duplex auto
 speed auto
!
router bgp 100
 no synchronization
 bgp router-id 3.3.3.3
 bgp log-neighbor-changes
 network 30.30.30.30 mask 255.255.255.255
 neighbor 192.168.10.1 remote-as 100
 neighbor 192.168.10.1 next-hop-self
 no auto-summary
!--- iBGP peering is formed between routers R1 and R3
using 16-bit AS number. ! end
```

路由器R4

```
R4#show run
Building configuration...
!
version 15.0
ip cef
!
interface Loopback0
 ip address 40.40.40.40 255.255.255.255
!
interface FastEthernet1/0
 ip address 172.16.10.2 255.255.255.0
 duplex auto
 speed auto
!
router bgp 10.1
 no synchronization
 bgp router-id 4.4.4.4
 bgp asnotation dot
 bgp log-neighbor-changes
 network 40.40.40.40 mask 255.255.255.255
 neighbor 172.16.10.1 remote-as 10.1
 no auto-summary
!
end
!--- iBGP peering is formed between routers R2 and R4
using 32-bit AS number.
```

验证

使用本部分可确认配置能否正常运行。

命令输出解释程序（仅限注册用户）(OIT) 支持某些 show 命令。使用 OIT 可查看对 show 命令输出的分析。

显示命令

要验证BGP是否可支持32位ASN，请使用show ip bgp neighbor命令。

show ip bgp neighbor

在路由器 R1 中
 	
R1#**show ip bgp neighbor 2.2.2.2**
BGP neighbor is 2.2.2.2, remote AS 10.1, external link
  BGP version 4, remote router ID 20.20.20.20
  BGP state = Established, up for 03:28:22
  Last read 00:00:41, last write 00:00:29, hold time is 180, keepalive interval is 60 seconds
  Neighbor sessions:
  1 active, is multisession capable
  Neighbor capabilities:
  Route refresh: advertised and received(new)
  Four-octets ASN Capability: advertised and received
  Address family IPv4 Unicast: advertised and received
  Multisession Capability: advertised and received
  Message statistics, state Established:
  InQ depth is 0
  OutQ depth is 0

```
                         Sent       Rcvd
    Opens:                  1          1
    Notifications:          0          0
    Updates:                3          3
    Keepalives:           229        230
    Route Refresh:          0          0
    Total:                233        234

!--- Output omitted---!
```

要显示BGP路由表中的条目，请使用[show ip bgp命](#)令。

show ip bgp

在路由器 R1 中

```
R1#sh ip bgp
BGP table version is 13, local router ID is 10.10.10.10
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
*> 10.1.1.1/32      2.2.2.2                  0
0 10.1 I
*> 20.1.1.1/32      2.2.2.2                  0
0 10.1 I
*>i30.30.30.30/32   192.168.10.2             0    100
0 I
*> 40.40.40.40/32   2.2.2.2
0 10.1 I
*> 192.168.100.0    0.0.0.0                  0
32768 I
*> 192.168.200.0    0.0.0.0                  0
32768 I

 !--- Note that the routes highlighted are received from
the eBGP peer router R2 which is in 32-bit AS 10.1. In
router R3



R3#sh ip bgp
BGP table version is 11, local router ID is 3.3.3.3
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
*>i10.1.1.1/32      192.168.10.1             0    100
0 655361 I
*>i20.1.1.1/32      192.168.10.1             0    100
0 655361 I
*> 30.30.30.30/32   0.0.0.0                  0
32768 I
*>i40.40.40.40/32   192.168.10.1             0    100
0 655361 I
*>i192.168.100.0    192.168.10.1             0    100
0 I
*>i192.168.200.0    192.168.10.1             0    100
```

```
0 I

 !--- The router R3 does not have bgp asnotation dot
configured in it. Therefore, the route received from the
router in 32-bit AS AS 10.1 is displayed as 655361.


In router R4



R4#sh ip bgp
BGP table version is 7, local router ID is 4.4.4.4
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
*>i10.1.1.1/32      172.16.10.1              0    100
0 I
*>i20.1.1.1/32      172.16.10.1              0    100
0 I
*>i30.30.30.30/32   172.16.10.1              0    100
0 100 I
*> 40.40.40.40/32   0.0.0.0                  0
32768 I
*>i192.168.100.0    172.16.10.1              0    100
0 100 I
*>i192.168.200.0    172.16.10.1              0    100
0 100 I

 !--- The above output shows the entries in BGP routing
table of router R4.
```

要检验路由器之间的连通性，请使用ping命令。

ping

从路由器R3

```
R3#ping 40.40.40.40

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 40.40.40.40, timeout
is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip
min/avg/max = 68/101/148 ms
```

从路由器R4

```
R4#ping 30.30.30.30

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 30.30.30.30, timeout
is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip
min/avg/max = 56/89/112 ms
!--- The above output shows that End to End connectivity
is established between R3 and R4, where R3 is AS 100(16-
```

```
bit AS) and router R4 is in AS 10.1(32-bit AS).
```

相关信息

- Cisco IOS BGP 4字节ASN支持
- BGP 支持页
- BGP 案例分析
- 探索自治系统编号
- 技术支持和文档 - Cisco Systems