Exemplo de Configuração de Implementação de BGP Usando o Número AS de 32 bits

Contents

Introduction

Este documento descreve como configurar o Border Gateway Protocol (BGP) usando um número AS de 32 bits. No BGP, cada domínio de roteamento é um único domínio administrativo e tem um número AS exclusivo atribuído a ele e é operado dentro de um conjunto uniforme de políticas de roteamento. Também mantém o roteamento entre domínios.

Neste documento, o peering BGP é configurado entre roteadores BGP falantes de 16 bits e 32 bits. O novo modo AS de 32 bits é compatível com o modo AS de 16 bits. Os peers BGP que podem operar no modo de 32 bits respondem positivamente ao novo recurso, e essa sessão opera em novo modo. Por outro lado, os peers BGP de 32 bits ao se comunicarem com os alto-falantes BGP de 16 bits, os roteadores que falam 16 bits ignoram esse novo recurso e operam suas sessões BGP no modo de 16 bits.

Prerequisites

Requirements

A Cisco recomenda que você tenha conhecimento básico do BGP.

Versões de hardware e software

As configurações neste documento são baseadas no Cisco 7200 Series Router com Cisco IOS® Software Release 15.0(1).

Conventions

Consulte as Convenções de Dicas Técnicas da Cisco para obter mais informações sobre convenções de documentos.

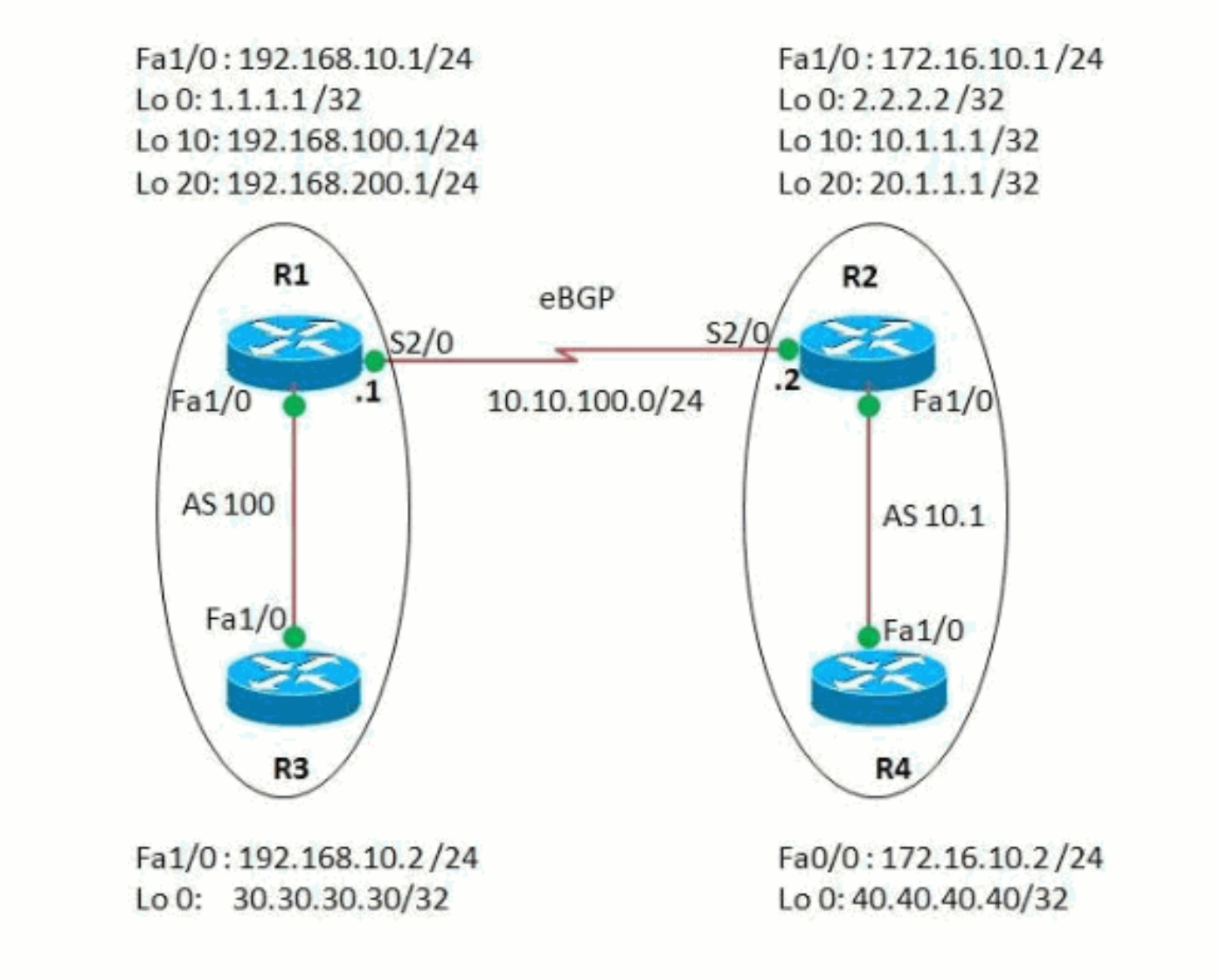
Configurar

Neste exemplo, os roteadores R1 e R3 estão configurados para estarem no AS 100 formando a relação iBGP usando o modo AS de 16 bits. Os roteadores R2 e R4 são configurados no AS 10.1 e formam o peering do iBGP usando o modo AS de 32 bits. Os roteadores R1 e R2 executam e o protocolo IGP, neste exemplo, o OSPF entre si e também forma a vizinhança de eBGP entre eles.

Observação: use a Command Lookup Tool (somente clientes registrados) para encontrar mais informações sobre os comandos usados neste documento.

Diagrama de Rede

Este documento utiliza a seguinte configuração de rede:



Configurações

Este documento utiliza as seguintes configurações:

- Roteador R1
- Roteador R2
- Roteador R3
- Roteador R4

Roteador 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
```

Roteador 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
```

Roteador 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
```

Roteador 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.
```

Verificar

Use esta seção para confirmar se a sua configuração funciona corretamente.

A Output Interpreter Tool (somente clientes registrados) (OIT) oferece suporte a determinados comandos show. Use a OIT para visualizar uma análise da saída do comando **show**.

comandos show

Para verificar se o BGP pode suportar ASN de 32 bits, use o comando show ip bgp neighbor.

show ip bgp neighbor

No roteador R1

```
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---!
```

Para mostrar as entradas na tabela de roteamento BGP, use o comando [show ip bgp](#).

show ip bgp

No roteador R1

```
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.
```

Para verificar a acessibilidade entre os roteadores, use o comando **ping**.

ping
Do roteador 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 **Do roteador 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).
```

Informações Relacionadas

- Suporte ASN de 4 bytes do Cisco IOS BGP
- Página de suporte de BGP
- Estudos de caso de BGP
- Explorando números de sistemas autônomos
- Suporte Técnico e Documentação - Cisco Systems