Ejemplo de Configuración de la Implementación de BGP Usando el Número AS de 32 bits

Contenido

Introducción

Este documento describe cómo configurar Border Gateway Protocol (BGP) utilizando números AS de 32 bits. En BGP, cada dominio de ruteo es un dominio administrativo único y tiene un número AS único asignado a él, y se opera dentro de un conjunto uniforme de políticas de ruteo. También mantiene el ruteo interdominio.

En este documento, el peering BGP se configura entre los routers BGP de 16 bits y 32 bits que hablan. El nuevo modo AS de 32 bits es compatible con el modo AS de 16 bits. Los peers BGP que pueden funcionar en el modo de 32 bits responden positivamente a la nueva capacidad, y esa sesión funciona en el nuevo modo. Por otra parte, los peers BGP de 32 bits cuando se comunican con los altavoces BGP de 16 bits, los routers de habla de 16 bits ignoran esta nueva capacidad y operan su sesión BGP en modo de 16 bits.

Prerequisites

Requirements

Cisco recomienda que tenga conocimiento básico de BGP.

Versiones de hardware y de software

Las configuraciones en este documento se basan en el Cisco 7200 Series Router con Cisco IOS® Software Release 15.0(1).

Convenciones

Consulte Convenciones de Consejos TécnicosCisco para obtener más información sobre las convenciones del documento.

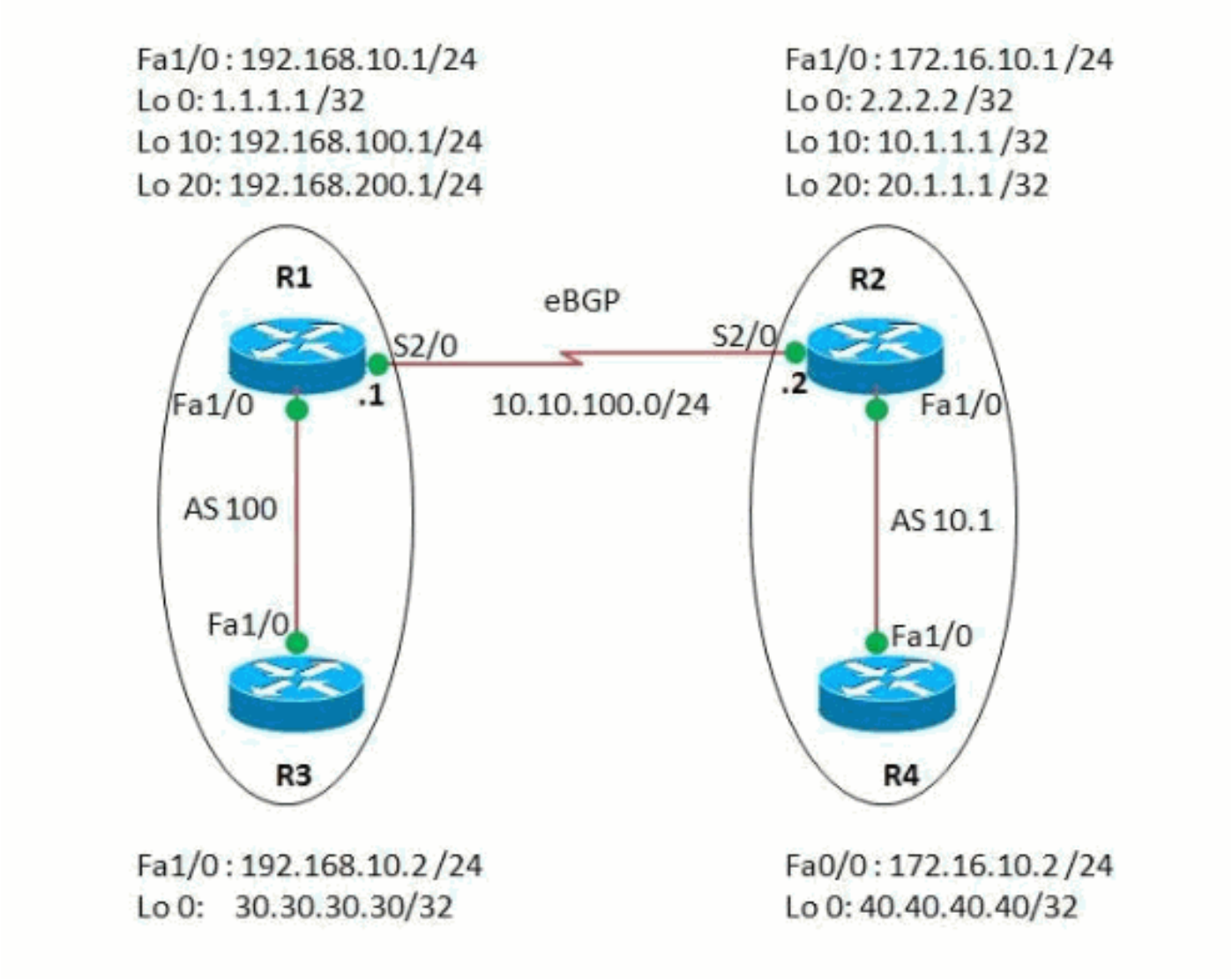
Configurar

En este ejemplo, los routers R1 y R3 están configurados para estar en AS 100 formando una relación iBGP usando el modo AS de 16 bits. Los routers R2 y R4 se configuran en AS 10.1 y forman el peering iBGP usando el modo AS de 32 bits. Los routers R1 y R2 se ejecutan y el protocolo IGP, en este ejemplo OSPF entre sí y también forman un vecino eBGP entre ellos.

Nota: Use la Command Lookup Tool (sólo para clientes registrados) para encontrar más información sobre los comandos usados en este documento.

Diagrama de la red

En este documento, se utiliza esta configuración de red:



Configuraciones

En este documento, se utilizan estas configuraciones:

- Router R1
- Router R2
- Router R3
- Router R4

Router 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
```

Router 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
```

Router 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
```

Router 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.
```

Verificación

Utilize esta sección para confirmar que su configuración funcione correctamente.

La herramienta Output Interpreter Tool (clientes registrados solamente) (OIT) soporta ciertos comandos show. Utilize el OIT para ver una análisis de la salida del comando show.

Comandos show

Para verificar que BGP pueda soportar el ASN de 32 bits, utilice el comando show ip bgp neighbor.

show ip bgp neighbor

En el router 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 las entradas en la tabla de ruteo BGP, utilice el comando [show ip bgp.]

show ip bgp

En el router 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 el alcance entre los routers, utilice el comando ping.

ping
Desde el router 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

Desde el router 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).
```

Información Relacionada

- Soporte de ASN de 4 Bytes BGP de Cisco IOS
- Página de Soporte de BGP
- Casos Prácticos de BGP
- Exploración de números de sistema autónomos
- Soporte Técnico y Documentación - Cisco Systems