

Configure the BGP Local-AS Feature

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Introduction

This document describes the Border Gateway Protocol (BGP) local-AS feature, which was initially available in Cisco IOS® Software Release 12.0(5)S.

Prerequisites

Requirements

This document requires an knowledge of the BGP routing protocol and its operations. For more information, refer to the [Examine Border Gateway Protocol Case Studies](#).

Components Used

The information in this document applies to these software and hardware versions:

- Cisco IOS Software Release 12.2(28)
- Cisco 2500 Series Routers

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Conventions

For more information on document conventions, refer to the [Cisco Technical Tips Conventions](#).

Background Information

The local-AS feature allows a router to appear to be a member of a second autonomous system (AS), in addition to its real AS. This feature can only be used for true eBGP peers. You cannot use this feature for two peers that are members of different confederation sub-ASs.

The local-AS feature is useful if ISP-A purchases ISP-B, but ISP-B customers do not want to modify any peering arrangements or configurations. The local-AS feature allows routers in ISP-B to become members of ISP-A AS. At the same time, these routers appear to their customers to retain their ISP-B AS number.

In [Figure 1](#), ISP-A has not yet purchased ISP-B. In [Figure 2](#), ISP-A has purchased ISP-B, and ISP-B uses the local-AS feature.

In [Figure 2](#), ISP-B belongs to AS 100, and ISP-C to AS 300. When peering with ISP-C, ISP-B uses AS 200 as its AS number with the use of the `neighbor ISP-C local-as 200` command. In updates sent from ISP-B to ISP-C, the AS_SEQUENCE in the AS_PATH attribute contains "200 100". The "200" is prepended by ISP-B due to the `local-as 200` command configured for ISP-C.

Normally a combined ISP-A/B renumbers the routers in ISP-B to be part of AS 100. What if ISP-C is unable to change its eBGP configurations with ISP-B? Prior to the local-AS feature, the combined ISP-A/B has to maintain two AS numbers. The `local-as` command allows ISP-A/B to physically be one AS while it appears to be two ASs to ISP-C.

Command Syntax

This list shows the syntax of the commands that the configurations in this document use:

- `neighbor x.x.x.x local-as local-AS-number`
- `neighbor peer-group local-as local-AS-number`

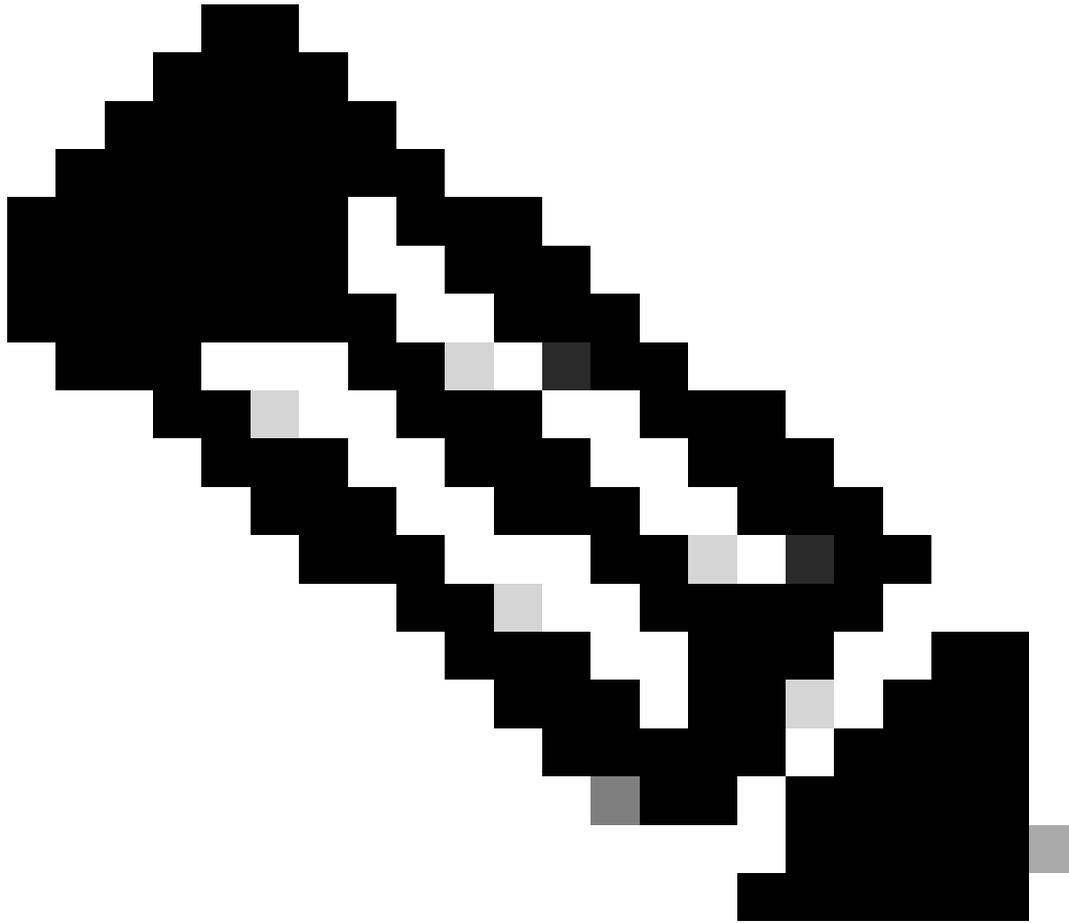
Local-AS cannot be customized for individual peers in a peer group.

Local-AS cannot have the local BGP protocol AS number or the AS number of the remote peer.

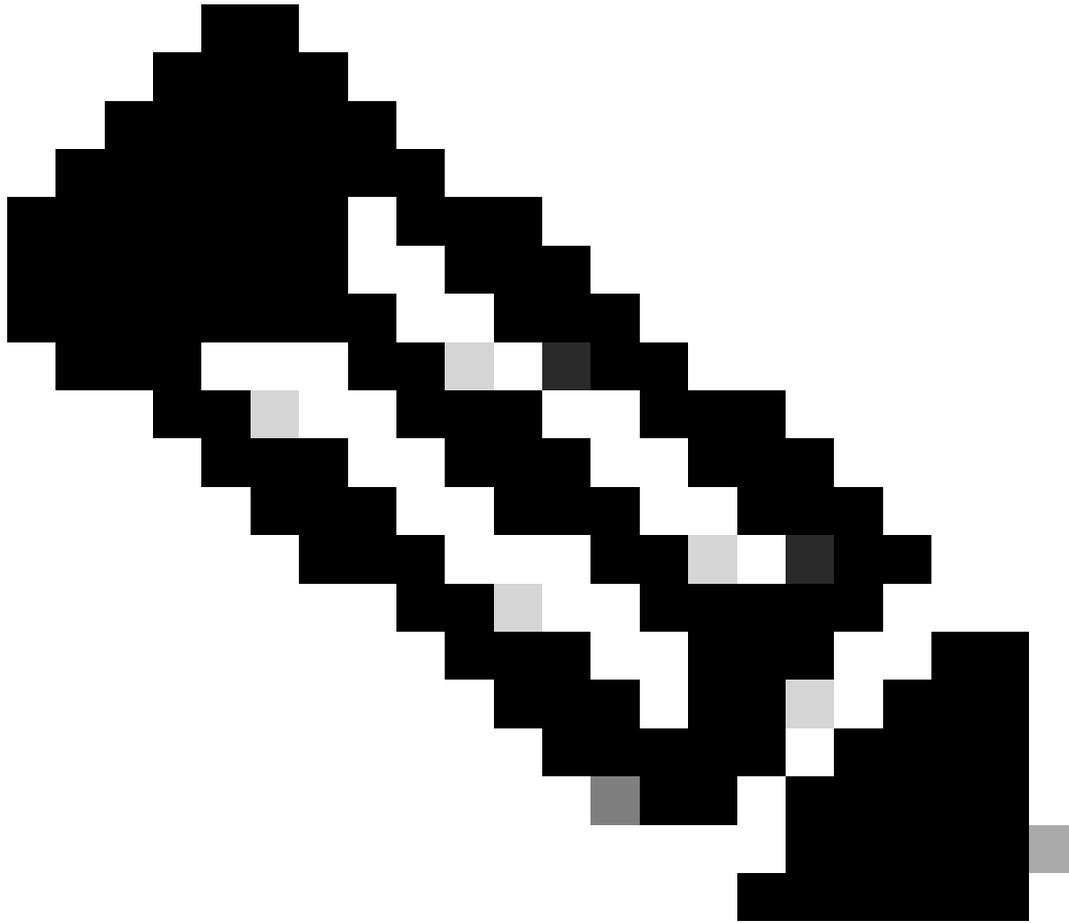
The `local-as` command is valid only if the peer is a true eBGP peer. It does not work for two peers in different sub-ASs in a confederation.

Configure

This section presents you with the information to configure the features this document describes.



Note: Note: In order to find additional information on the commands this document uses, use the Command Lookup Tool.



Note: Only registered Cisco users can access internal Cisco tools and information.

Network Diagrams

This document uses these network setups.

Figure 1

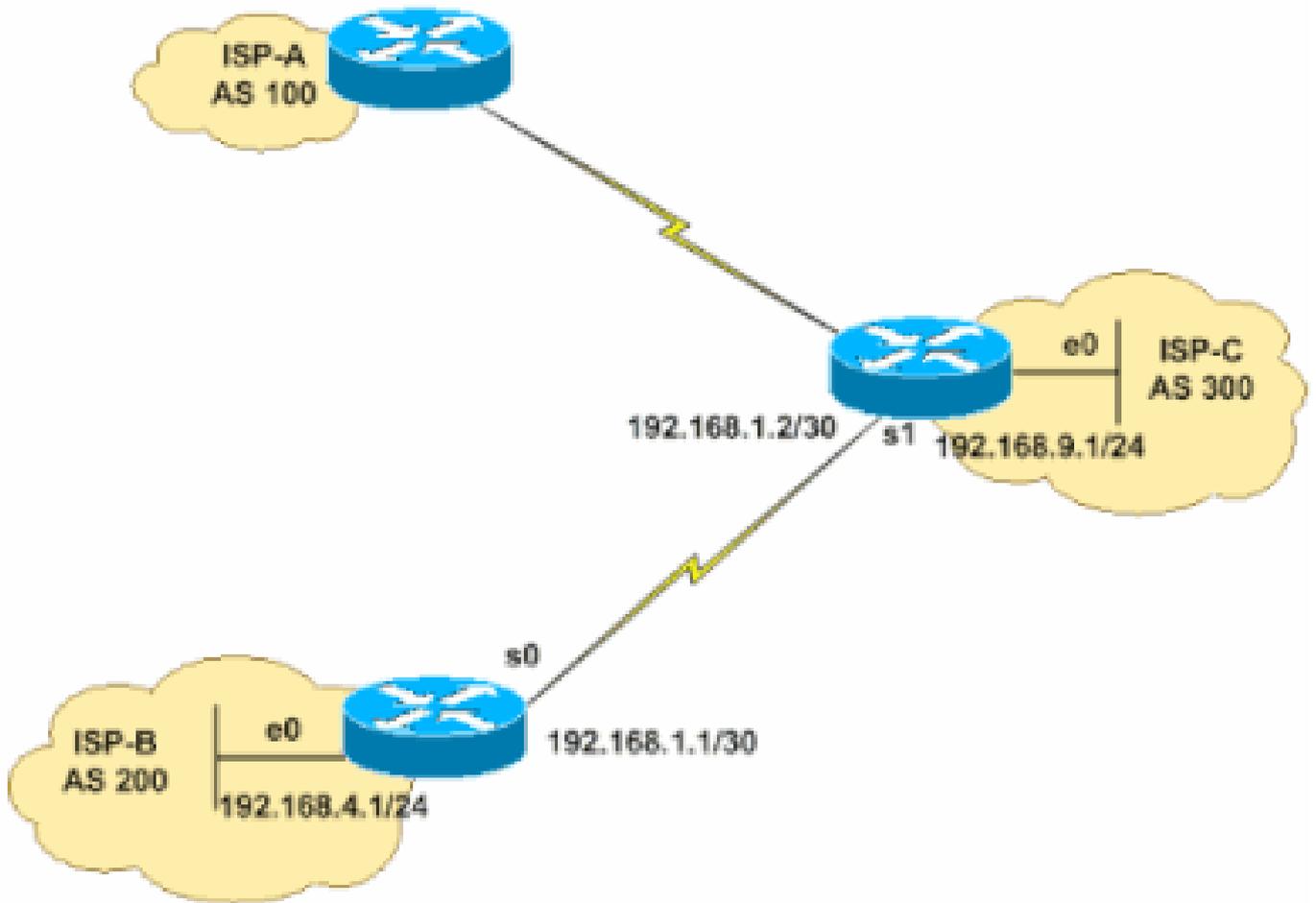
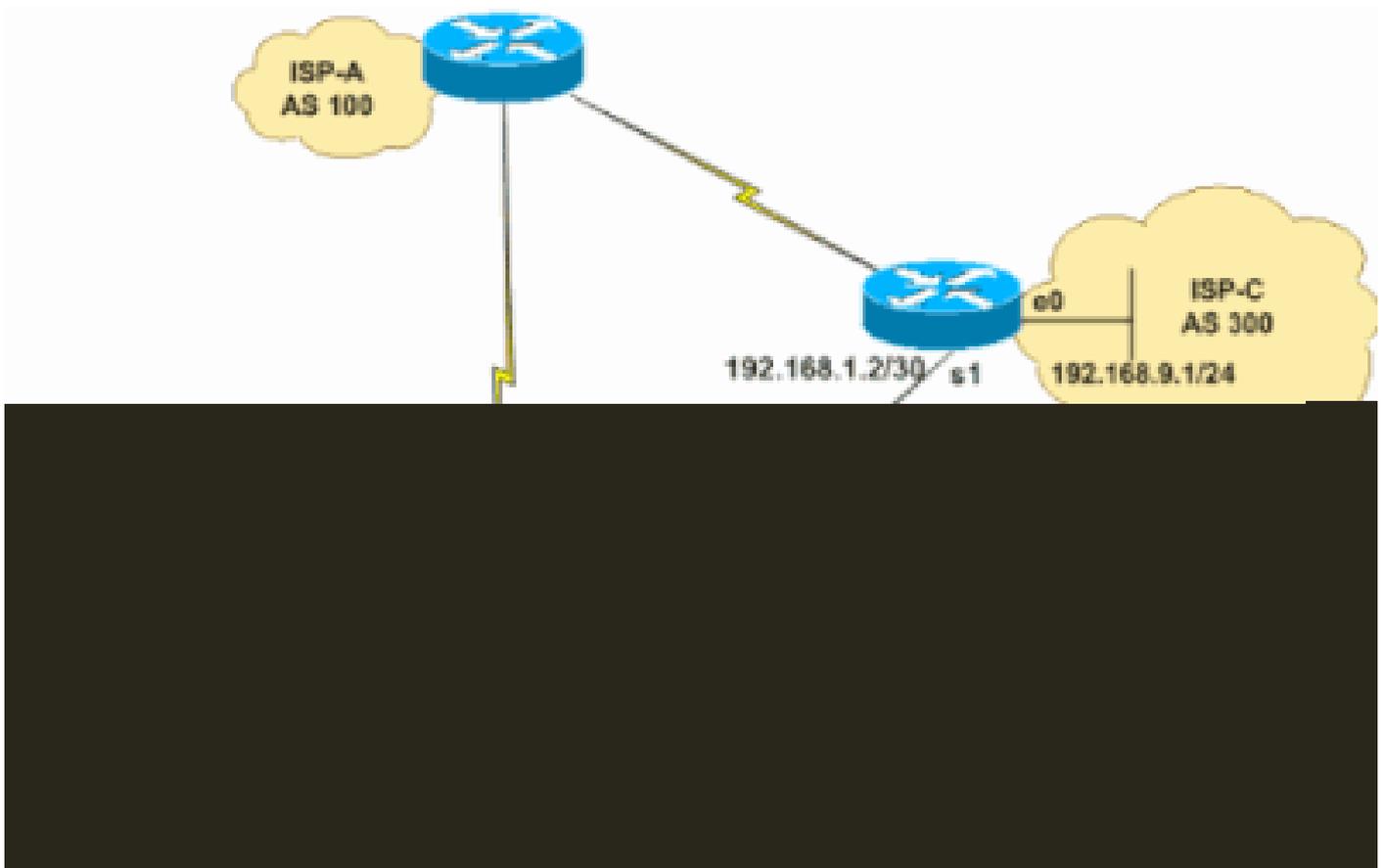


Figure 2



Configurations

This document uses these configurations:

- [ISP-B \(AS 100, local-as 200\)](#)
- [ISP-C \(AS 300\)](#)

ISP-B (AS 100, local-as 200)

```
hostname ISP-B
!
interface serial 0
ip address 192.168.1.1 255.255.255.252
!
interface ethernet 0
ip address 192.168.4.1 255.255.255.0
!
router bgp 100

!--- Note the AS number 100. This is the AS number of ISP-A, which is now
!--- used by all routers in ISP-B after its acquisition by ISP-A.

neighbor 192.168.1.2 remote-as 300

!--- Defines the e-BGP connection to ISP-C.

neighbor 192.168.1.2 local-as 200

!--- This command makes the remote router in ISP-C to see this
!--- router as belonging to AS 200 instead of AS 100.
!--- This also make this router to prepend AS 200 in
!--- all updates to ISP-C.

network 192.168.4.0
!
!
```

ISP-C (AS 300)

```
hostname ISP-C
!
interface serial 1
ip address 192.168.1.2 255.255.255.252
!
interface ethernet 0
ip address 192.168.9.1 255.255.255.0
!
router bgp 300
neighbor 192.168.1.1 remote-as 200

!--- Defines the e-BGP connection to ISP-B.

!--- Note AS is 200 and not AS 100.
```

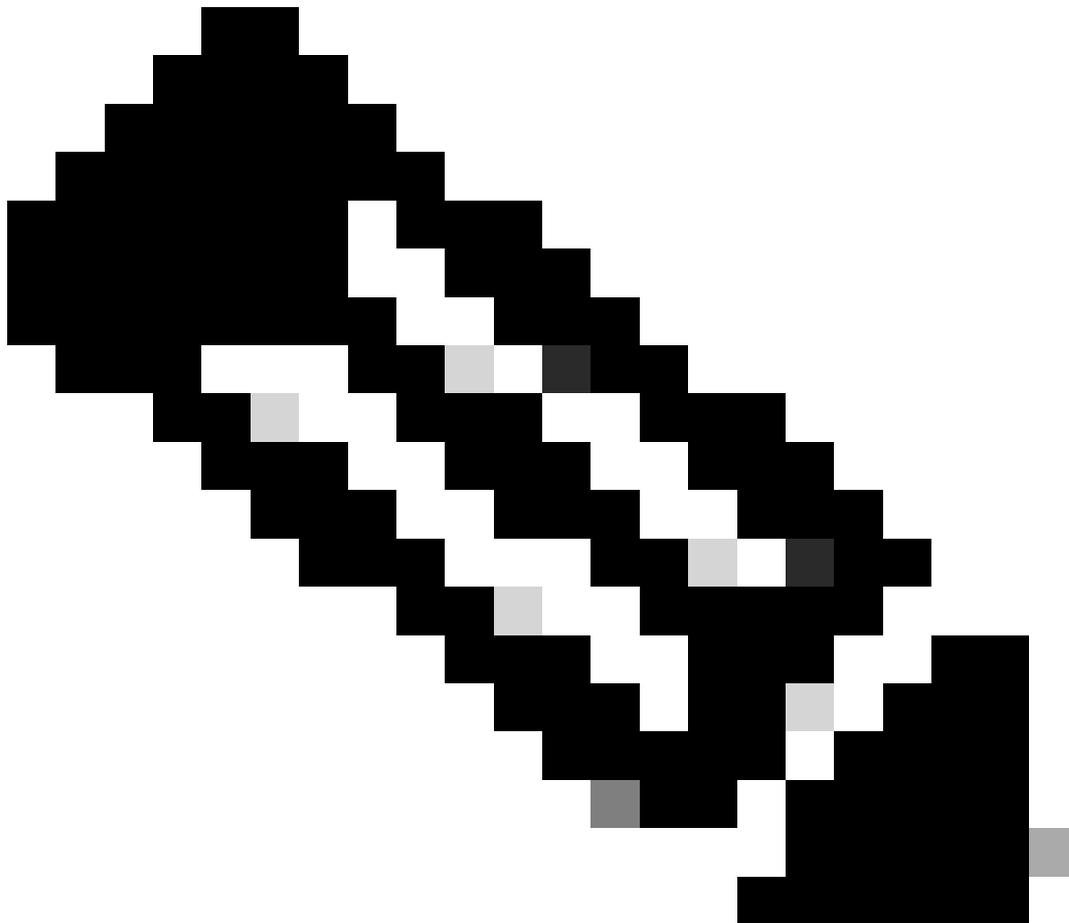
```
network 192.168.9.0
```

```
!  
!
```

Verify

This section provides information you can use to confirm your configuration properly works.

Certain `show` commands are supported by the Output Interpreter Tool, which allows you to view an analysis of `show` command output.



Note: Only registered Cisco users can access internal Cisco tools and information.

View the BGP routing table to see how the `local-as` command changed the `AS_PATH`. What you observe is that ISP-B prepends AS 200 to updates that are sent to and received from ISP-C. In addition, note that ISP-B is in AS number 100.

<#root>

ISP-B#

show ip bgp summary

BGP router identifier 192.168.4.1,

local AS number 100

BGP table version is 3, main routing table version 3
2 network entries and 2 paths using 266 bytes of memory
2 BGP path attribute entries using 104 bytes of memory
1 BGP AS-PATH entries using 24 bytes of memory
0 BGP route-map cache entries using 0 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory
BGP activity 2/6 prefixes, 2/0 paths, scan interval 15 secs

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
192.168.1.2	4	300	29	29	3	0	0	00:25:19	1

In this output, note that ISP-C sees ISP-B as part of AS 200.

<#root>

ISP-C#

show ip bgp summary

BGP table version is 3, main routing table version 3
2 network entries (2/6 paths) using 480 bytes of memory
2 BGP path attribute entries using 192 bytes of memory
0 BGP route-map cache entries using 0 bytes of memory
0 BGP filter-list cache entries using 0 bytes of memory

Neighbor	V	AS	MsgRcvd	MsgSent	TblVer	InQ	OutQ	Up/Down	State/PfxRcd
192.168.1.1	4								

200

34	34	3	0	0	00:30:19	1
----	----	---	---	---	----------	---

Notice in this output that ISP-B prepends "200" to the routes learned from ISP-C.

<#root>

ISP-B#

show ip bgp

BGP table version is 3, local router ID is 192.168.4.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 192.168.4.0	0.0.0.0	0		32768	i
*> 192.168.9.0	192.168.1.2	0		0	

200

300 i

Notice that ISP-C sees routes from ISP-B with an AS_PATH of "200 100".

<#root>

ISP-C#

show ip bgp

BGP table version is 3, local router ID is 192.168.1.2
Status codes: s suppressed, d damped, h history, * valid, > best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete

Network	Next Hop	Metric	LocPrf	Weight	Path
*> 192.168.4.0	192.168.1.1	0		0	
200 100					
i					
*> 192.168.9.0	0.0.0.0	0		32768	i

These commands show the configured **local-as** values in their output:

- show ip bgp neighbor x.x.x.x
- show ip bgp peer-group peer group name

<#root>

ISP-B#

show ip bgp neighbors 192.168.1.2

BGP neighbor is 192.168.1.2, remote AS 300,

local AS 200

, external link

BGP version 4, remote router ID 192.168.9.1

BGP state = Established, up for 00:22:42

Last read 00:00:42, hold time is 180, keepalive interval is 60 seconds

Neighbor capabilities:

Route refresh: advertised and received(old & new)

Address family IPv4 Unicast: advertised and received

Message statistics:

InQ depth is 0

OutQ depth is 0

	Sent	Rcvd
Opens:	1	1
Notifications:	0	0
Updates:	2	1
Keepalives:	25	25
Route Refresh:	0	1
Total:	28	28

Default minimum time between advertisement runs is 30 seconds

! Output Suppressed

Troubleshoot

The **debug ip bgp updates** command displays the received prefixes with its attributes from the neighbor. This output shows that the prefix 192.168.4.0/24 is received with AS PATH 200, 100.

```
<#root>
```

```
ISP-C#
```

```
*May 10 12:45:14.947: BGP(0): 192.168.1.1 computing updates, afi 0, neighbor version 0, table version 5, starting at 0.0.0.0
```

```
*May 10 12:45:14.947: BGP(0): 192.168.1.1 send UPDATE (format) 192.168.9.0/24, next 192.168.1.2, metric 0, path
```

```
*May 10 12:45:14.947: BGP(0): 192.168.1.1 1 updates enqueued (average=52, maximum=52)
```

```
*May 10 12:45:14.947: BGP(0): 192.168.1.1 update run completed, afi 0, ran for 0 ms, neighbor version 0, start version 5, throttled to 5
```

```
*May 10 12:45:14.947: BGP: 192.168.1.1 initial update completed
```

```
*May 10 12:45:15.259: BGP(0): 192.168.1.1 rcvd UPDATE w/ attr: nexthop 192.168.1.1, origin i, metric 0, path
```

```
200 100
```

```
ISP-C#
```

```
*May 10 12:45:15.259: BGP(0): 192.168.1.1 rcvd
```

```
192.168.4.0/24
```

```
*May 10 12:45:15.279: BGP(0): Revise route installing 192.168.4.0/24 -> 192.168.1.1 to main IP table
```

```
ISP-C#
```

Related Information

- [Examine Border Gateway Protocol Frequently Asked Questions](#)
- [BGP Technical Support](#)
- [Cisco Technical Support & Downloads](#)