

Attributes	
Name	Description
Well-known Mandatory · Must be supported and propagated	
1 Origin	Origin type (IGP, EGP, or unknown)
2 AS Path	List of autonomous systems which the advertisement has traversed
3 Next Hop	External peer in neighboring AS
Well-known Discretionary · Must be supported; propagation optional	
5 Local Preference	Metric for internal neighbors to reach external destinations (default 100)
6 Atomic Aggregate	Includes ASes which have been dropped due to route aggregation
Optional Transitive · Marked as partial if unsupported by neighbor	
7 Aggregator	ID and AS of summarizing router
8 Community	Route tag
Optional Nontransitive · Deleted if unsupported by neighbor	
4 Multiple Exit Discriminator (MED)	Metric for external neighbors to reach the local AS (default 0)
9 Originator ID	The originator of a reflected route
10 Cluster List	List of cluster IDs
13 Cluster ID	Originating cluster
-- Weight	Cisco proprietary, not communicated to peers (default 0)

Path Selection		
Attribute	Description	Preference
1 Weight	Administrative preference	Highest
2 Local Preference	Communicated between peers within an AS	Highest
3 Self-originated	Prefer paths originated locally	True
4 AS Path	Minimize AS hops	Shortest
5 Origin	Prefer IGP-learned routes over EGP, and EGP over unknown	IGP
6 MED	Used externally to enter an AS	Lowest
7 External	Prefer eBGP routes over iBGP	eBGP
8 IGP Cost	Consider IGP metric	Lowest
9 eBGP Peering	Favor more stable routes	Oldest
10 Router ID	Tie breaker	Lowest

Influencing Path Selection			
Weight	neighbor 172.16.0.1 weight 200	Local Preference	bgp default local-preference 100
MED	default-metric 400	Route Map	neighbor 172.16.0.1 route-map Foo
Ignore AS Path	bgp bestpath as-path ignore	Ignore Cost Communities	bgp bestpath cost-community ignore

About BGP	
Type	Path Vector
eBGP AD	20
iBGP AD	200
Standard	RFC 4271
Protocols	IP
Transport	TCP/179
Authentication	MD5

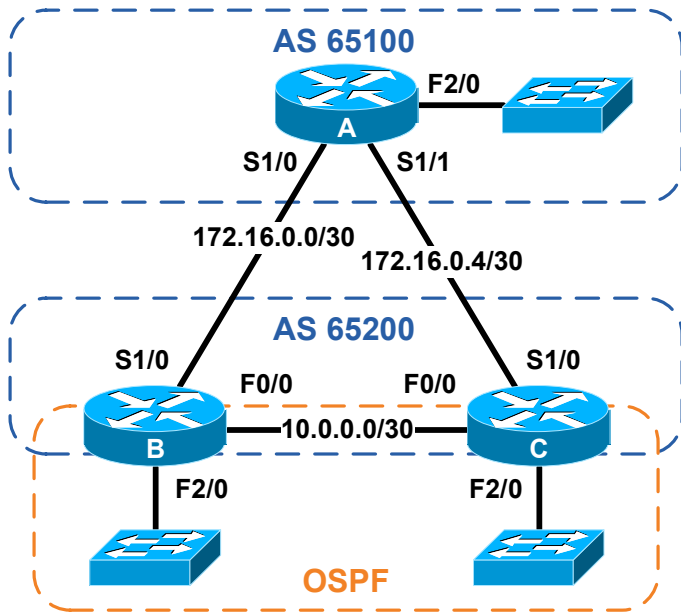
Terminology	
Autonomous System (AS)	A logical domain under the control of a single entity
External BGP (eBGP)	BGP adjacencies which span autonomous system boundaries
Internal BGP (iBGP)	BGP adjacencies formed within a single AS
Synchronization Requirement	A route must be known by an IGP before it may be advertised to BGP peers

Packet Types	
Open	Update
Keepalive	Notification

Neighbor States	
Idle	Neighbor is not responding
Active	Attempting to connect
Connect	TCP session established
Open Sent	Open message sent
Open Confirm	Response received
Established	Adjacency established

Troubleshooting	
show ip bgp [summary]	
show ip bgp neighbors	
show ip route [bgp]	
clear ip bgp * [soft]	
debug ip bgp [...]	

Configuration Example



```

interface Serial1/0
description Backbone to B
ip address 172.16.0.1 255.255.255.252
!
interface Serial1/1
description Backbone to C
ip address 172.16.0.5 255.255.255.252
!
interface FastEthernet2/0
description LAN
ip address 192.168.1.1 255.255.255.0
!
router bgp 65100
no synchronization
network 172.16.0.0 mask 255.255.255.252
network 172.16.0.4 mask 255.255.255.252
network 192.168.1.0
neighbor South peer-group
neighbor South remote-as 65200
neighbor 172.16.0.2 peer-group South
neighbor 172.16.0.6 peer-group South
no auto-summary
    
```

```

interface FastEthernet0/0
description Backbone to C
ip address 10.0.0.1 255.255.255.252
!
interface Serial1/0
description Backbone to A
ip address 172.16.0.2 255.255.255.252
!
interface FastEthernet2/0
description LAN
ip address 192.168.2.1 255.255.255.0
!
router ospf 100
network 10.0.0.1 0.0.0.0 area 0
network 192.168.2.1 0.0.0.0 area 1
!
router bgp 65200
no synchronization
redistribute ospf 100 route-map LAN_Subnets
neighbor 10.0.0.2 remote-as 65200
neighbor 172.16.0.1 remote-as 65100
no auto-summary
!
access-list 10 permit 192.168.0.0 0.0.255.255
!
route-map LAN_Subnets permit 10
match ip address 10
set metric 100
    
```

```

interface FastEthernet0/0
description Backbone to B
ip address 10.0.0.2 255.255.255.252
!
interface Serial1/0
description Backbone to A
ip address 172.16.0.6 255.255.255.252
!
interface FastEthernet2/0
description LAN
ip address 192.168.3.1 255.255.255.0
!
router ospf 100
network 10.0.0.2 0.0.0.0 area 0
network 192.168.3.1 0.0.0.0 area 2
!
router bgp 65200
no synchronization
redistribute ospf 100 route-map LAN_Subnets
neighbor 10.0.0.1 remote-as 65200
neighbor 172.16.0.5 remote-as 65100
no auto-summary
!
access-list 10 permit 192.168.0.0 0.0.255.255
!
route-map LAN_Subnets permit 10
match ip address 10
set metric 100
    
```

Router A Routing Table

```

172.16.0.0/30 is subnetted, 2 subnets
C    172.16.0.4 is directly connected, S1/1
C    172.16.0.0 is directly connected, S1/0
C    192.168.1.0/24 is directly connected, F2/0
B    192.168.2.0/24 [20/100] via 172.16.0.2
B    192.168.3.0/24 [20/100] via 172.16.0.2
    
```

Router B Routing Table

```

172.16.0.0/30 is subnetted, 2 subnets
B    172.16.0.4 [20/0] via 172.16.0.1
C    172.16.0.0 is directly connected, S1/0
10.0.0.0/30 is subnetted, 1 subnets
C    10.0.0.0 is directly connected, F0/0
B    192.168.1.0/24 [20/0] via 172.16.0.1
C    192.168.2.0/24 is directly connected, F2/0
0 IA 192.168.3.0/24 [110/2] via 10.0.0.2, F0/0
    
```