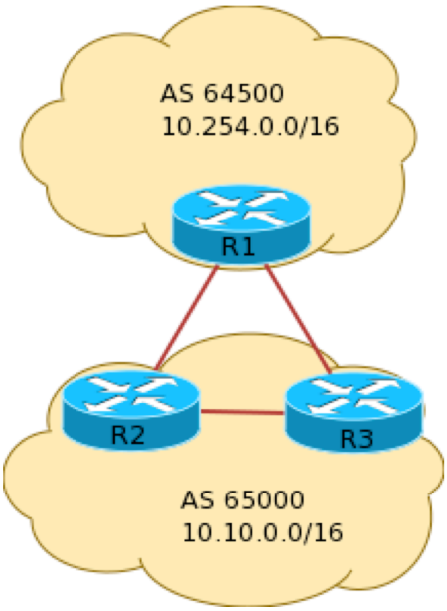
BGP Configuration Guide 1 – Cisco Routers

Configuration Example

```
hostname R1
!
interface Loopback 0
 ip address 10.254.254.1 255.255.255.255
!
interface FastEthernet0/0
 ip address 10.254.100.1 255.255.255.252
 description p2p link to R2
!
interface FastEthernet0/1
 ip address 10.254.100.5 255.255.255.252
 description p2p link to R3
!
router BGP 64500
 bgp log-neighbor-changes
 no synchronization
 no auto-summary
 distance bgp 200 200 200
 neighbor CustomerA peer-group
 neighbor CustomerA remote-as 65000
 neighbor CustomerA password N$RC
 neighbor CustomerA prefix-list cust-in in
 neighbor 10.254.100.2 peer-group CustomerA
 neighbor 10.254.100.6 peer-group CustomerA
 network 10.254.0.0 mask 255.255.0.0
!
ip prefix-list cust-in permit 10.10.0.0/16 le 32
!
ip route 10.254.0.0 255.255.0.0 null0 250
```




```
hostname R2
!
interface Loopback 0
 ip address 10.10.254.2 255.255.255.255
!
interface FastEthernet0/0
 ip address 10.254.100.2 255.255.255.252
 description p2p link to R1
!
interface FastEthernet0/1
 ip address 10.10.200.1 255.255.255.252
 description p2p link to R3
 ip ospf 100 area 0
!
router ospf 100
 redistribute connected subnets
 passive-interface default
 no passive-interface FastEthernet0/1
!
router BGP 65000
 bgp log-neighbor-changes
 no synchronization
 no auto-summary
 distance bgp 200 200 200
 neighbor 10.254.100.2 remote-as 65000
 neighbor 10.254.100.2 description eBGP to R1
 neighbor 10.254.100.2 password N$RC
 neighbor 10.10.254.3 remote-as 64500
 neighbor 10.10.254.3 description iBGP to R3
 neighbor 10.10.254.3 password N$RC
 neighbor 10.10.254.3 update-source Loopback0
 network 10.10.0.0 mask 255.255.0.0
!
ip route 10.10.0.0 255.255.0.0 null0 250
```

```
hostname R3
!
interface Loopback 0
 ip address 10.10.254.3 255.255.255.255
!
interface FastEthernet0/0
 ip address 10.254.100.6 255.255.255.252
 description p2p link to R1
!
interface FastEthernet0/1
 ip address 10.10.200.2 255.255.255.252
 description p2p link to R2
 ip ospf 100 area 0
!
router ospf 100
 redistribute connected subnets
 passive-interface default
 no passive-interface FastEthernet0/1
!
router BGP 65000
 bgp log-neighbor-changes
 no synchronization
 no auto-summary
 distance bgp 200 200 200
 neighbor 10.254.100.1 remote-as 65000
 neighbor 10.254.100.1 description eBGP to R1
 neighbor 10.254.100.1 password N$RC
 neighbor 10.10.254.2 remote-as 64500
 neighbor 10.10.254.2 description iBGP to R2
 neighbor 10.10.254.2 password N$RC
 neighbor 10.10.254.2 update-source Loopback0
 network 10.10.0.0 mask 255.255.0.0
!
ip route 10.10.0.0 255.255.0.0 null0 250
```

Basic BGP Terminology

Term	Description
Autonomous System	A routing domain under the administrative control of a single entity
eBGP	BGP session with a router in a different autonomous system
iBGP	BGP session with a router in the same autonomous system
Peering	A relationship between two routers that exchange routing information and traffic
Transit	Carrying traffic across a network, usually for a fee
Prefix List	A list of IP address blocks used for filtering and applying policy

BGP Configuration Commands

Command example	Description
`router bgp 65000`	Start BGP configuration for Autonomous System 65000
`bgp log-neighbor-changes`	Log neighbor up/down events
`no synchronization`	Do not require routes to exist in IGP before announcing
`no auto-summary`	Do not automatically summarize to classful block
`distance bgp 200 200 200`	Give eBGP, iBGP and local routes the same distance
`neighbor 1.2.3.4 remote-as 65000`	Configure neighbor address and autonomous system
`neighbor 1.2.3.4 update-source Lo0`	iBGP sessions should use loopback addresses
`neighbor CustomerA peer-group`	Define peer-group to assign common parameters
`neighbor 1.2.3.4 peer-group Customer`	Associate neighbor address with peer-group
`network 1.2.3.4 mask M.M.M.M`	Specify network to be announced via BGP
`neighbor 1.2.3.4 prefix-list list1 in`	Filter incoming routes from neighbor using “list1”
`ip prefix-list list1 permit 10.10.0.0/16`	Define a prefix-list called “list1” matching 10.10.0.0/16
`neighbor 1.2.3.4 soft-reconfig inbound`	Enable soft reset of inbound session with neighbor

BGP Troubleshooting Commands

Command example	Description
`show ip bgp summary`	Show general BGP information and neighbor state
`show ip bgp`	Show a list of learned BGP routes
`show ip bgp neighbors`	Show detailed information about each BGP neighbor
`show ip bgp neig 1.2.3.4 advertised-routes`	Show routes advertised to a particular neighbor
`show ip route [bgp]`	Show installed routes, optionally only from BGP
`debug ip bgp […]`	Show BGP events of various kinds
`clear ip bgp neighbor 1.2.3.4 [soft] in`	If soft-reconfiguration inbound is enabled, “soft” option tells router to re-evaluate inbound policies. Otherwise, it asks neighbor to resend routes
`clear ip bgp neighbor 1.2.3.4 out`	Resend routes to neighbor
`show ip bgp neigh [1.2.3.4] advertised-routes`	Show prefixes advertised to neighbor
`Show ip bgp neigh [1.2.3.4] received-routes`	Show prefixes received from neighbor (requires soft-reconfiguration inbound configuration)

BGP Neighbor States

State	Description
Idle	Session shut down or neighbor not responding
Connect	Waiting for TCP negotiation with peer
Active	Attempting to connect to neighbor
OpenSent	Open message has been sent to peer, waiting for peer to validate
OpenConfirm	Peer has validated Open message. Waiting for peer to send Keepalive message
Established	Peers are sending Update messages to exchange routing information