15

BGP Configuration Application

The BGP Configuration Application contains the following tabs, subtabs, and windows:

The BGP Configuration application allows you to configure the Border Gateway Protocol (BGP) routing protocol on the router.

The BGP performs interdomain routing in TCP/IP networks. BGP is an Exterior Gateway Protocol (EGP), which means that it performs routing between multiple autonomous systems and exchanges routing and reachability information with other BGP systems.

Like any routing protocol, BGP maintains routing tables, sends routing updates, and bases routing decisions on routing metrics.

Each BGP router maintains a routing table listing all feasible paths to a particular network. Periodic refreshing of the routing table is not performed. Routing information received from peer routers is retained until an incremental update is received.

BGP devices exchange routing information in the following situations:

- Initial data exchange—When a router first connects to the network, BGP routers exchange their entire BGP routing tables.

- Incremental updates—When the routing table changes, routers send the portion of their routing table that has changed.

BGP routers do not send regularly scheduled routing updates. BGP routing updates advertise only the optimal path to a network.

BGP uses a single routing metric to determine the best path to a given network. This metric consists of an arbitrary unit number specifying the degree of preference of a particular link.

The BGP metric is typically assigned to each link by the network administrator. The value assigned to a link can be based on any number of criteria, including the following:

- Autonomous system count—The number of autonomous systems through which the path passes.

- Type of link—How stable or fast the link is.

- Other factors—Other criteria, for example, delay and cost.

See Figure 15-1 for an example of the BGP Configuration application.

See the *Cisco Craft Works Interface User Interface Guide* for information on the common window elements and common activities procedures in the BGP Configuration application.

Figure 15-1   BGP Configuration Application
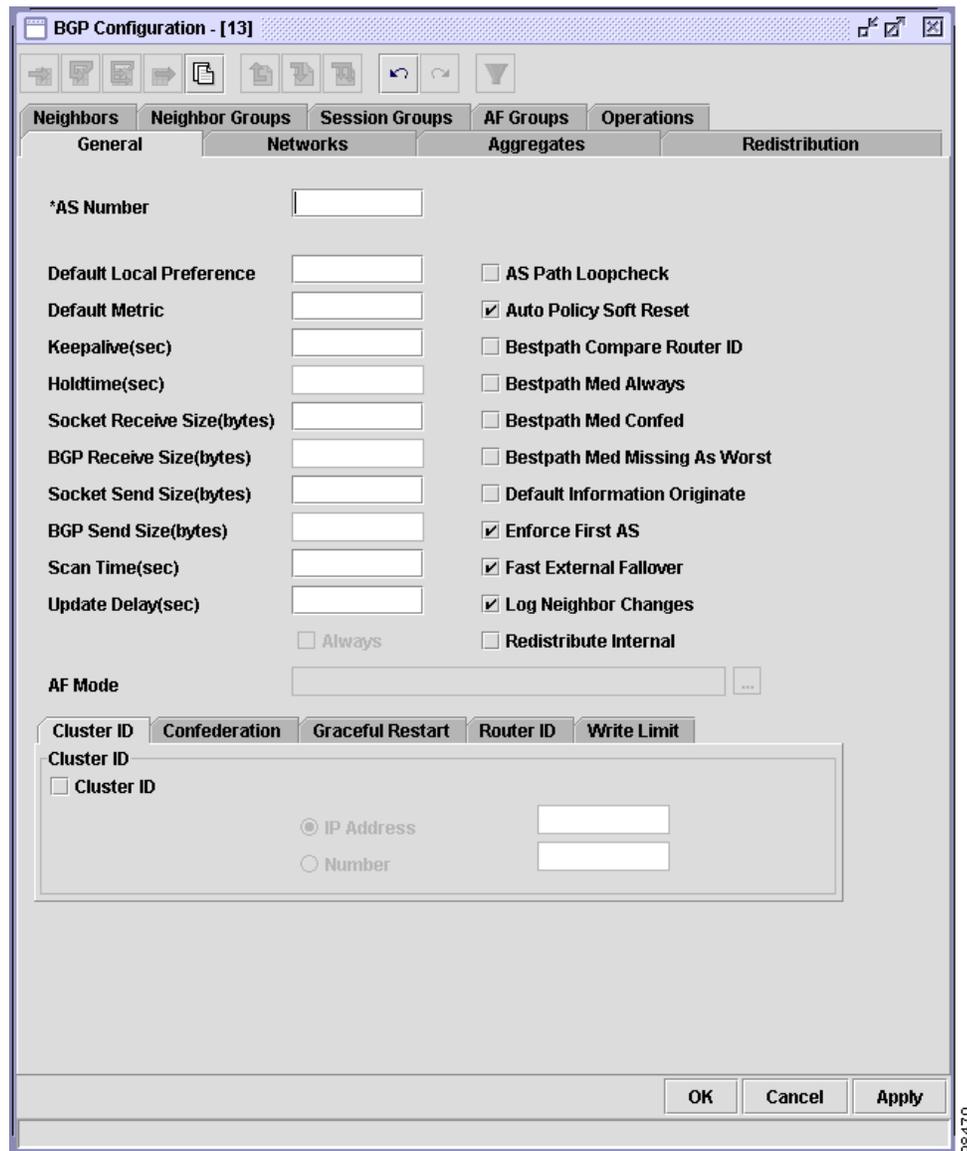
General Tab

The General tab contains five subtabs: Cluster ID, Confederation, Graceful Restart, Router ID, and Write Limit. The Cluster ID subtab is displayed by default when the General tab is clicked.

The General tab allows you to perform the following tasks:

- Specify an autonomous system (AS) number, local preference, local metric, send buffer sizes, receive buffer sizes, and best path parameters.

- Configure the global address family modes.

See Figure 15-1 for an example of the General tab. Table 15-1 describes the General tab fields.

Table 15-1   General Tab Description

Field	Description
AS Number field	Allows you to enter the router autonomous system number.
Default Local Preference field	Allows you to enter a value for the default local preference. Generally, the default value of 100 allows you to easily define a particular path as less preferable than paths with no local preference attribute. The preference is sent to all networking devices in the local AS[1].
Default Metric field	Allows you to enter the default metric value for the BGP[2]. A default metric helps solve the problem of redistributing routes with incompatible metrics. Whenever metrics do not convert, using a default metric provides a reasonable substitute and enables the redistribution to proceed. In BGP, setting the default metric sets the MED[3] metric.
Keepalive(sec) field	Allows you to enter a value for the frequency, in seconds, with which the software sends keepalive messages to the neighbor. The configured value for the keepalive time is used provided it does not exceed a third of the negotiated hold time. If it does, a value of a third of the negotiated hold time will be used.
Holdtime(sec) field	Allows you to enter a value for the interval after not receiving a keepalive message from the neighbor that the software terminates the neighbor BGP session. Enter 0 to disable keepalive and hold time. Note that the values 1 and 2 are not allowable since the minimum allowable keepalive time is a third of the holdtime.
Socket Receive Size(bytes) field	Allows you to enter the receive socket buffer size.
BGP Receive Size(bytes) field	Allows you to enter the BGP receive buffer size.
Socket Send Size(bytes) field	Allows you to enter the send socket buffer size.
BGP Send Size(bytes) field	Allows you to enter the BGP write buffer size.
Scan Time(sec)	Allows you to enter the scanner interval.
Update Delay(sec) field	Allows you to enter a value for the maximum delay time for a BGP-speaking networking device.
Always check box	Allows you to disable the keepalive trigger best path and enforce the delay specified in the Update Delay(sec) field. (See Update Delay(sec) field.)
AS Path Loopcheck check box	Allows you to enable an autonomous system path for loop checking iBGP[4] peers.
Auto Policy Soft Reset check box	Allows you to enable an automatic soft peer reset on the reconfiguration for BGP peers.

Table 15-1   General Tab Description (continued)

Field	Description
Bestpath Compare Router ID check box	Allows you to enable the comparison of identical routes received from eBGP[5] peers during the best path selection process and switch the best path to the route with the lowest router ID. By default, during the best path selection process, when BGP receives identical routes from eBGP peers (all the attributes are the same except for the router ID), the best path is not switched to the route with the lowest router ID if that route was not the first route received. If the Bestpath Compare Router ID check box is checked, then similar routes are compared and the best path is switched to the route with the lowest router ID.
Bestpath Med Always check box	Allows you to enable the comparison of the MED for paths from neighbors in different autonomous systems. The software chooses the path with the lowest MED. By default, during the best path selection process, there is a MED comparison only among paths from the same autonomous system. Checking the Bestpath Med Always check box allows comparison of MEDs among paths regardless of the autonomous system from which the paths are received.
Bestpath Med Confed check box	Allows you to enable MED comparison among paths learned from confederation peers. There is a comparison between MEDs only if no external autonomous systems are in the path (an external autonomous system is an autonomous system that is not within the confederation). If an external autonomous system is in the path, then the external MED passes transparently through the confederation, and the comparison is not made. For example, assume that autonomous systems 65000, 65001, 65002, and 65004 are part of the confederation. Autonomous system 1 is not. The software compares route A with the following four paths: • path 1 = 65000 65004, med=2 • path 2 = 65001 65004, med=3 • path 3 = 65002 65004, med=4 • path 4 = 65003 1, med=1 If the Bestpath Med Confed check box is checked, the software chooses path 1. The fourth path has a lower MED, but the software does not include path 4 in the MED comparison because an external autonomous system is in this path.
Bestpath Med Missing As Worst check box	Allows you to have the software consider a missing MED attribute in a path as having a value of infinity, making the path without a MED value the least desirable path.
Default Information Originate check box	Allows you to enable the distribution of a default route (set the originate network to 0.0.0.0 into the BGP table).
Enforce First AS check box	Allows you to enable the enforcement of the first autonomous system (known as the AS-path) of a route received from an eBGP peer to be the same as the configured remote autonomous system. By default, the software ignores any update received from an eBGP neighbor that does not have the autonomous system configured for that neighbor at the beginning of the AS-path. When checked, the Enforce First AS check box applies to all eBGP peers of the networking device.
Fast External Fallover check box	Allows you to enable the immediate reset of the BGP sessions of any directly adjacent external peers if the link used to reach them goes down. Performing an immediate session reset allows the network to recover faster when links go down between BGP peers.

Table 15-1   General Tab Description (continued)

Field	Description
Log Neighbor Changes check box	Allows you to enable logging of BGP neighbor resets.
	Log Neighbor Changes enables logging of BGP neighbor status changes (up or down) and resets for troubleshooting network connectivity problems and measuring network stability. Unexpected neighbor resets might indicate high error rates or high packet loss in the network, and should be investigated.
Redistribute Internal check box	Allows you to enable the redistribution of iBGP routes into an IGP[6] such as IS-IS[7] or OSPF[8].
	⚠ **Caution** Redistributing iBGP routes into IGPs may cause routing loops to form within an autonomous system.
AF Mode	Allows you to create an address family group for BGP neighbors.
	An address family group for BGP neighbors is used to group address family-specific neighbor parameters within an IP address family. Neighbors that have the same address family configuration are able to use the address family group name under that address family. Further, neighbors will inherit the configuration parameters of the entire address family group.
AF Mode field	Allows you to view the address family group.
AF Mode button	Allows you to configure an address family group from the Global Address Family Configuration window. Configure the global address family using the Family Configuration window. See the "Global Address Family Configuration Window" section on page 15-154.

1. AS = autonomous system
2. BGP = Border Gateway Protocol
3. MED = Multi Exit Discriminator
4. iBGP = internal Border Gateway Protocol
5. eBGP = external BGP
6. IGP = Interior Gateway Protocol
7. IS-IS = Intermediate System-to-Intermediate System
8. OSPF = Open Shortest Path First

Global Address Family Configuration Window

The Global Address Family Configuration window is opened when the AF Mode button is clicked in the General tab.

The Global Address Family Configuration window allows you to perform the following tasks:

- Choose the address family mode.
- Configure the address family distances.
- Specify the number of paths to a single destination.
- Specify the scanner interval.
- Specify a policy name.
- Configure dampening parameters.

See Figure 15-2 for an example of the Global Address Family Configuration window. Table 15-2 describes the Global Address Family Configuration window fields.
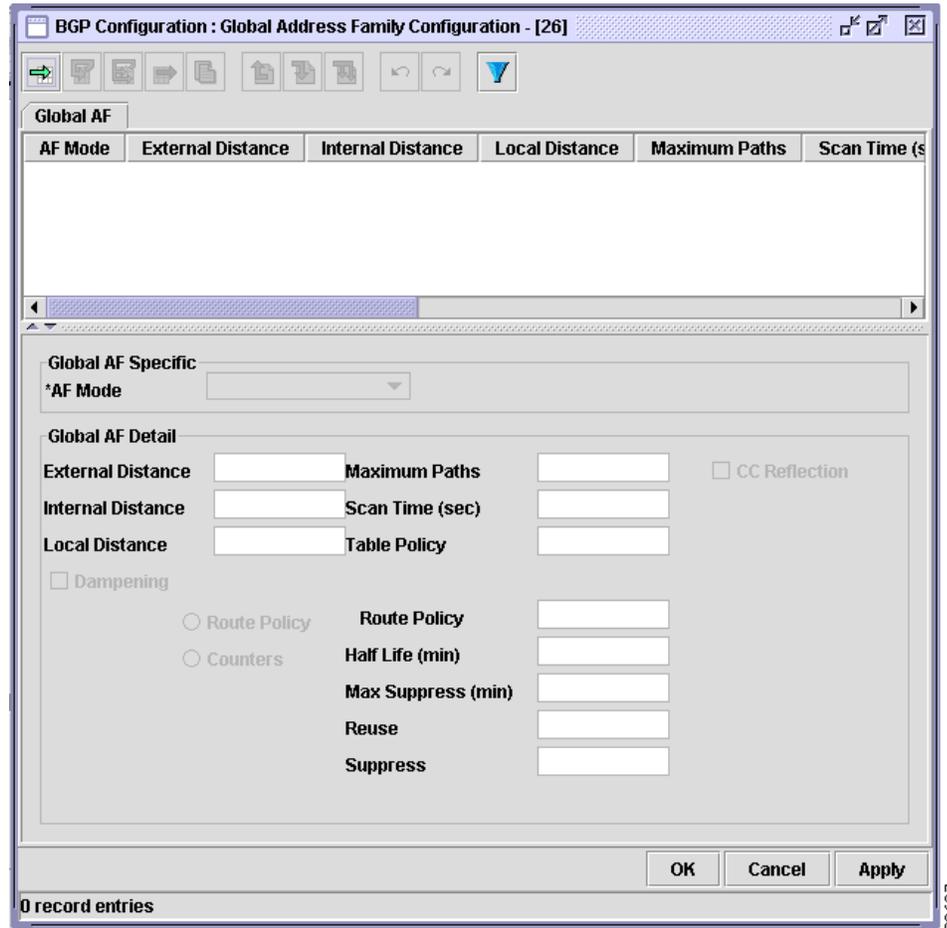
Figure 15-2   Global Address Family Configuration Window

Table 15-2   Global Address Family Configuration Window Description

Field	Description
AF Mode list	Allows you to choose the address family mode. The following options are listed: • IPv4Unicast • IPv4Multicast • IPv6Unicast
Global AF Detail Area	
External Distance field	Allows you to specify the distance for routes external to the AS[1]. The external distance is the administrative distance for BGP[2] external routes. External routes are routes for which the best path is learned from a neighbor external to the autonomous system. An administrative distance is a rating of the trustworthiness of a routing information source, such as an individual networking device or a group of networking devices. In general, the higher the value, the lower the trust rating. An administrative distance of 255 means the routing information source cannot be trusted at all and should be ignored.

Table 15-2   Global Address Family Configuration Window Description (continued)

Field	Description
Internal Distance field	Allows you to specify the distance for routes internal to the AS. This is the administrative distance for BGP internal routes. Internal routes are those routes that are learned from another BGP entity within the same autonomous system. An administrative distance is a rating of the trustworthiness of a routing information source, such as an individual networking device or a group of networking devices. In general, the higher the value, the lower the trust rating. An administrative distance of 255 means the routing information source cannot be trusted at all and should be ignored.
Local Distance field	Allows you to specify the distance for local routes. This is the administrative distance for BGP local routes. The local-distance parameter applies to locally generated aggregate routes and backdoor routes installed in the routing table. ⚠ **Caution** Changing the administrative distance of BGP internal routes is considered risky and is not recommended. One problem that can arise is the accumulation of routing table inconsistencies, which can interfere with routing. An administrative distance is a rating of the trustworthiness of a routing information source, such as an individual networking device or a group of networking devices. In general, the higher the value, the lower the trust rating. An administrative distance of 255 means the routing information source cannot be trusted at all and should be ignored.
Maximum Paths field	Allows you to enter the maximum number of paths to a single destination.
CC Reflection check box	Allows you to enable route reflection from a BGP route reflector to clients. Click the CC Reflection check box to enable CC[3] reflection. Clients of a route reflector are not required to be fully meshed and the routes from a client are reflected to other clients. However, if the clients are fully meshed, route reflection is not required. If the neighbors are fully meshed, there is no need for client-to-client reflection. It the neighbors are not fully meshed, the RR[4] configuration can be based on the address family-specific number.
Scan Time (sec) field	Allows you to specify the scanning intervals of BGP-speaking networking devices. The specified scan time shortens the interval times where the BGP scanner processes routing information. Internal BGP features may work more efficiently if the routing tables are updated faster.
Table Policy field	Allows you to specify a routing policy for updates advertised to or received from a BGP neighbor. The policy can be used to filter routes and to modify route attributes.
Dampening check box	Allows you to enable BGP dampening for the global address family. Check the Dampening check box to enable dampening.
Route Policy	Allows you to specify the name of the route policy.
Route Policy radio button	Allows you to select route policy filtering.
Route Policy field	Allows you to enter the name of the route policy. This field is enabled when the Route Policy radio button is activated. (See Route Policy radio button.)
Counters radio button	Allows you to configure dampening using counters. When this radio button is clicked, the Half Life, Max Suppress, Reuse, and Suppress fields become available in sequence when values are entered into the fields.

Table 15-2   Global Address Family Configuration Window Description (continued)

Field	Description
Half Life (min) field	Allows you to specify the time after which a penalty is decreased. Once the route has been assigned a penalty, the penalty is decreased by half after the half-life period. Penalty reduction happens every 5 sec.
Max Suppress (min) field	Allows you to specify the maximum time a route can be suppressed. The default is four times the half-life value. If the default half-life value is selected, the maximum suppress time defaults to 60 min.
Reuse field	Allows you to enter the route reuse value. If the penalty for a flapping route decreases enough to fall below this value, the route is unsuppressed. Routes are unsuppressed in 10-sec increments.
Suppress field	Allows you to enter a value for when route suppression should start. A route is suppressed when its penalty exceeds this limit.

1. AS = autonomous system

2. BGP = Border Gateway Protocol

3. CC = client-to-client

4. RR = route reflection

Cluster ID Subtab

The Cluster ID subtab allows you to specify the cluster ID IP address or number.

See Figure 15-1 for an example of the Cluster ID subtab. Table 15-3 describes the Cluster ID subtab fields.

Table 15-3   Cluster ID Subtab Description

Field	Description
Cluster ID check box	Allows you to enable the configuring of the cluster ID if the BGP[1] cluster has more than one route reflector. Together, a route reflector and its clients form a cluster. Checking the check box enables the IP Address and Number radio buttons. (See IP Address and Number.)
	Usually a cluster of clients will have a single route reflector. In that case, the cluster is identified by the software as the networking device ID of the route reflector. In order to increase redundancy and avoid a single point of failure in the network, a cluster might have more than one route reflector. In this case, all route reflectors in the cluster must be configured with the 4-B cluster ID so that a route reflector can recognize updates from route reflectors in the same cluster.
	If the cluster has more than one route reflector, checking the Cluster ID check box configures the cluster ID.
IP Address	Allows you to enter an IP address for the cluster ID.
IP Address radio button	Allows you to specify an IP address.
IP Address field	Allows you to enter an IP address for the cluster ID.
	This field is enabled when the IP Address radio button is activated. (See IP Address radio button.)
Number	Allows you to enter a number for the cluster ID. The number must be the cluster ID of the networking device acting as a route reflector.

Table 15-3   Cluster ID Subtab Description (continued)

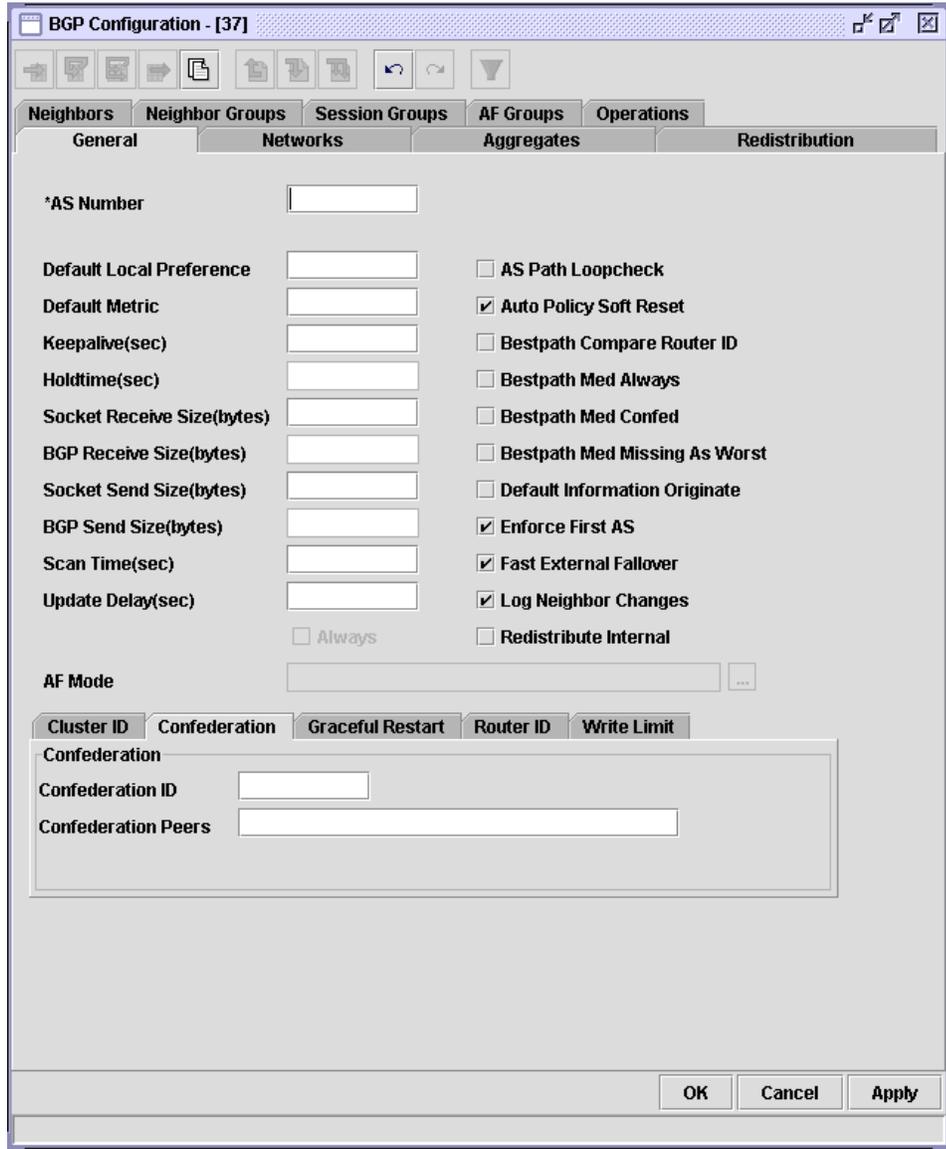| Field	Description
Number radio button	Allows you to specify a number.
Number field	Allows you to enter a number for the cluster ID.
	This field is enabled when the Number radio button is activated. (See Number radio button.)

1.   BGP = Border Gateway Protocol

Confederation Subtab

The Confederation subtab allows you to perform the following tasks:

- Specify the confederation ID.
- Specify the confederation neighbors.

See Figure 15-3 for an example of the Confederation subtab. Table 15-4 describes the Confederation subtab fields.

Figure 15-3   Confederation Subtab

Table 15-4   Confederation Subtab Description

Field	Description
Confederation ID field	Allows you to specify a BGP[1] confederation identifier. The confederation ID is an autonomous system number that internally includes multiple autonomous systems.
	One way to reduce the iBGP[2] mesh is to divide an autonomous system into multiple autonomous systems and group them into a single confederation. Each autonomous system is fully meshed within itself, and has a few connections to another autonomous system in the same confederation. Even though the peers in different autonomous systems have eBGP[3] sessions, they exchange routing information as if they are iBGP peers. Specifically, the confederation maintains the next hop and local preference information and that allows you to retain a single IGP for all the autonomous systems. To the outside world, the confederation looks like a single autonomous system.
Confederation Peers field	Allows you to configure the autonomous systems that belong to a confederation by entering the autonomous system numbers for BGP peers that will belong to the confederation.
	The autonomous systems specified are visible internally to a confederation. Each autonomous system is fully meshed within itself.

1. BGP = Border Gateway Protocol

2. iBGP = internal Border Gateway Protocol

3. eBGP = external Border Gateway Protocol

Graceful Restart Subtab

The Graceful Restart subtab allows you to perform the following tasks:

- Specify graceful restart and graceful reset.

- Specify the purge time.

- Specify the restart time.

- Specify the stale path time.

See Figure 15-4 for an example of the Graceful Restart subtab. Table 15-5 describes the Graceful Restart subtab fields.

Figure 15-4   Graceful Restart Subtab

Table 15-5   Graceful Restart Subtab Description

Field	Description
Graceful Restart check box	Allows you to enable graceful restart support.
Graceful Reset check box	Allows you to reset gracefully if the configuration change forces a peer reset.
Purge Time(sec) field	Allows you to enter the maximum time before stale routes are purged.

Table 15-5   Graceful Restart Subtab Description (continued)

Field	Description
Restart Time(sec) field	Allows you to enter the maximum time advertised to neighbors.
Stalepath Time(sec) field	Allows you to enter the maximum time to wait for the End-of-RIB message from a neighbor that has been restarted before deleting learned routes.

Router ID Subtab

The Router ID subtab allows you to configure a router ID IP address or interface name.

See Figure 15-5 for an example of the Router ID subtab. Table 15-6 describes the Router ID subtab fields.

Figure 15-5   Router ID Subtab

Table 15-6   Router ID Subtab Description

Field	Description
Router ID check box	Allows you to enable the configuration of a fixed router ID for a BGP[1]-speaking networking device. A loopback interface, if one is configured, is more effective as an identifier because there is no physical link to go down.
IP Address	Allows you to specify an IP address for the router ID.
IP Address radio button	Allows you to specify the IP address.
IP Address field	Allows to enter an IP address for the router ID. This field is enabled when the IP Address radio button is activated. (See IP Address radio button.)

Table 15-6   Router ID Subtab Description (continued)

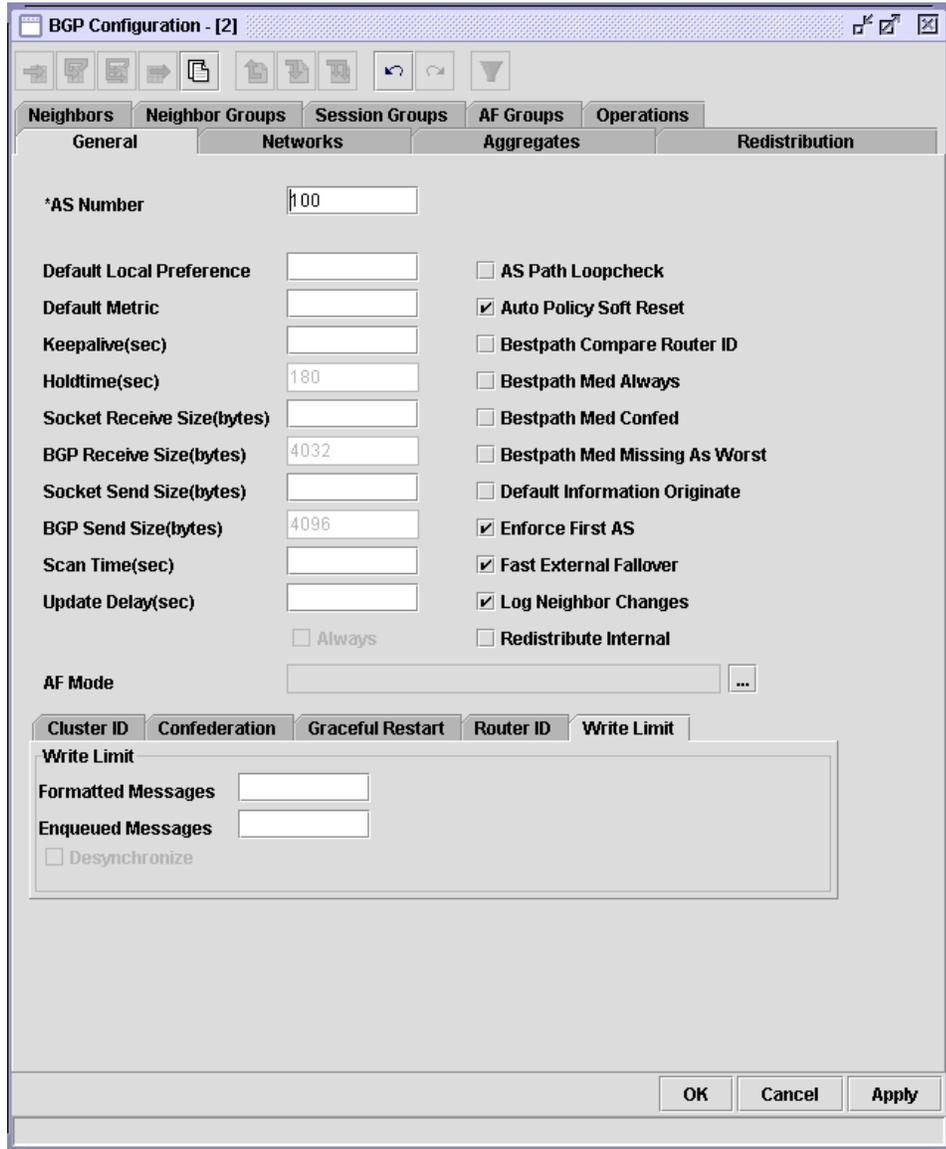| Field	Description
Interface Name	Allows you to enter an interface name.
Interface Name radio button	Allows you to specify an interface name.
Interface Name field	Allows you to view the chosen interface name.
Interface Name button	Allows you to choose an interface from the Select Interfaces dialog box. This button is enabled when the Interface Name radio button is activated. (See Interface Name radio button.)

1. BGP = Border Gateway Protocol

Write Limit Subtab

The Write Limit subtab allows you to perform the following tasks:

- Specify a formatted messages limit.
- Specify an enqueued messages limit.
- Disable desynchronization.

See Figure 15-6 for an example of the Write Limit subtab. Table 15-7 describes the Write Limit subtab fields.

Figure 15-6   Write Limit Subtab

Table 15-7   Write Limit Subtab Description

Field	Description
Formatted Messages field	Allows you to enter the maximum number of formatted messages for an update group.
Enqueued Messages field	Allows you to enter the number of messages that can be enqueued in total.
Desynchronize check box	Allows you to desynchronize. Desynchronization is the process where BGP[1] will separate and update groups into slow and fast peers so that the slow peers do not increase the update latency of the fast peers.

1. BGP = Border Gateway Protocol

Networks Tab

The Networks tab allows you to perform the following tasks:

- Specify the IP address and mask for a network.
- Choose the address family mode.
- Specify a backdoor route.

See Figure 15-7 for an example of the Networks tab. Table 15-8 describes the Networks tab fields.

Figure 15-7   Networks Tab

Table 15-8   Networks Tab Description

Field	Description
Network Area	
IP Address	Allows you to specify a local network that the BGP[1] routing process should originate and advertise to its neighbors.
	The BGP determines which local networks will be originated by the networking device and included in routing advertisements to its neighbors. Only routes that are specified using Networks tab will be originated and advertised to neighbors even if there is a corresponding non-BGP route in the routing table. Such routes can be learned using connected networks, static routing, or dynamic routing using an IGP.
IP Address field	Allows you to enter an IP address.
IP Address button	Allows you to choose an IP address from the Select IP Address dialog box.
AF Mode list	Allows you to choose the address family mode. The following options are listed: - IPv4Unicast - IPv4Multicast - IPv6Unicast
Mask field	Allows you to enter an IP address mask for the network.
AutoGenerate Mask button	Allows you to automatically generate a mask. Click the button to automatically generate a mask.
Policy field	Allows you to enter the name of the route policy.
Backdoor check box	Allows you enable a BGP backdoor route. The backdoor route is to a BGP border networking device. This device will provide better information than the local networking device about the network.

1. BGP = Border Gateway Protocol

Aggregates Tab

The Aggregates tab allows you to perform the following tasks:

- Specify the IP address and mask for aggregates.
- Choose the address format mode and optionally choose to generate AS confederation set path information and filter routes from updates.
- Configure the filtering policy for aggregates.

See Figure 15-8 for an example of the Aggregates tab. Table 15-9 describes the Aggregates tab fields.

Figure 15-8   Aggregates Tab

Table 15-9   Aggregates Tab Description

Field	Description
Aggregate Address Area	
IP Address field	Allows you to specify an IP address to create an aggregate entry in a BGP[1] routing table.
Mask field	Allows you to enter an aggregate IP address mask.
AutoGenerate Mask button	Allows you to automatically generate an aggregate mask. Click the button to automatically generate a mask.
AS Set check box	Allows you to generate AS set path information.

Table 15-9   Aggregates Tab Description (continued)

Field	Description
AF Mode list	Allows you to choose the address family mode. The following options are listed: • IPv4Unicast • IPv4Multicast • IPv6Unicast
AS Confed Set check box	Allows you to generate autonomous system set path information and community information from contributing paths.
Summary Only check box	Allows you to filter more specific routes from updates. Checking the Summary Only check box creates the aggregate route (for example, 172.20.0.0/8) but suppresses advertisements of more specific routes to all neighbors.
Policy field	Allows you to enter a policy on which to condition advertisement, suppression, and attributes.

1. BGP= Border Gateway Protocol

Redistribution Tab

The Redistribution tab allows you to perform the following tasks:

- Choose the address family mode for redistribution.
- Configure connected routes.
- Configure static routes.
- Configure OSPF routes.
- Configure IS-IS routes.

See Figure 15-9 for an example of the Redistribution tab. Table 15-10 describes the Redistribution tab fields.
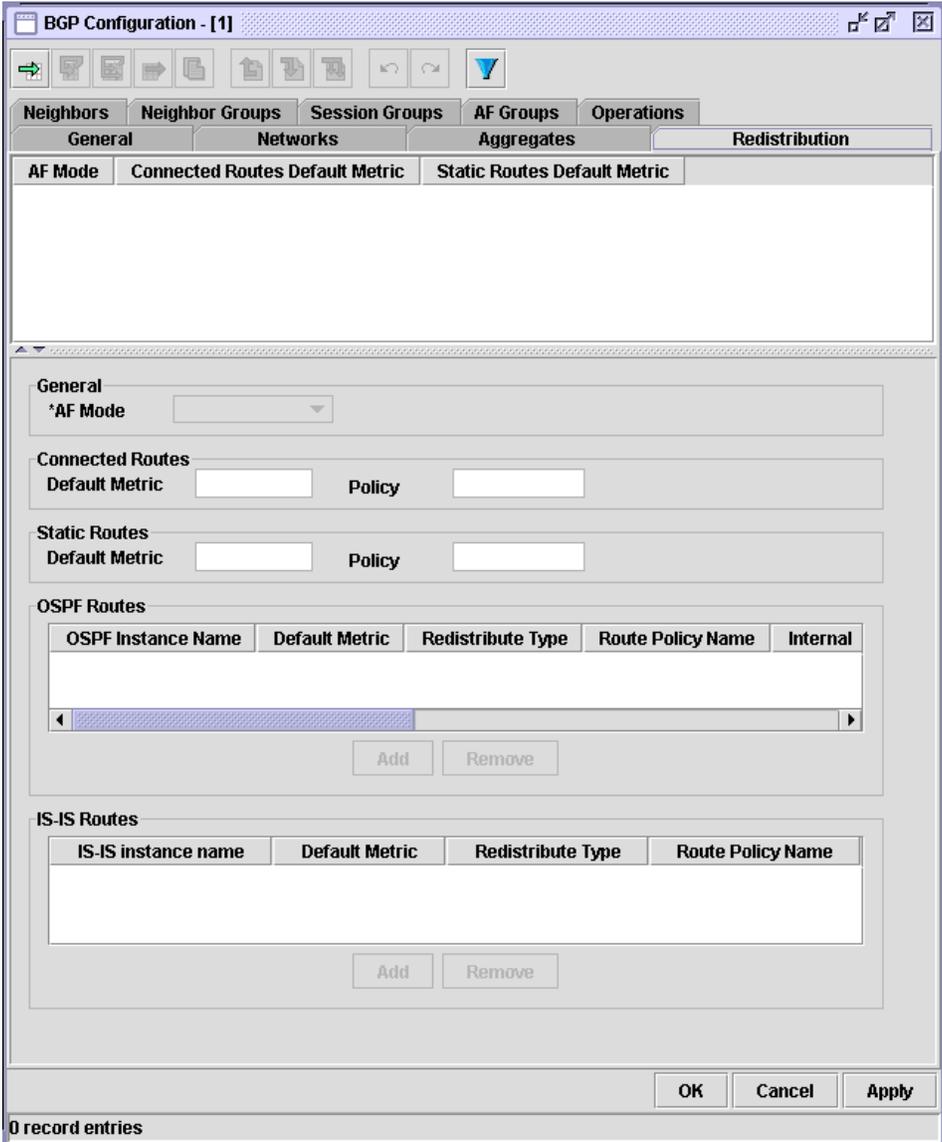
Figure 15-9   Redistribution Tab

Table 15-10 Redistribution Tab Description

Field	Description
General Area	
AF Mode list	Allows you to choose the address family mode to redistribute routes from another routing protocol into BGP. The following options are listed: • IPv4Unicast • IPv4Multicast • IPv6Unicast Each protocol (and instance of a protocol) may be redistributed independently of the others. Changing or removing redistribution for a particular instance does not affect the redistribution capability of other protocols or other instances of the same protocol. Networks specified using the Networks tab are not affected by the Redistribution tab settings; that is, the policy specified in the Network tab takes precedence over the policy specified through the Redistribution tab.
Connected Routes Area	
Default Metric field	Allows you to specify a metric value to assign to connected routes.
Policy field	Allows you to enter a routing policy to filter connected routes.
Static Routes Area	
Default Metric field	Allows you to specify a metric value to assign to static routes.
Policy field	Allows you to enter a routing policy to filter static routes.
OSPF Routes Area	
OSPF Instance Name column	Specifies the OSPF[1] instance. Click the cell then enter a value.
Default Metric column	Specifies the metric value to assigned to the routes. Click the cell then enter a value.
Redistribute Type column	Specifies the redistribution type. Click the cell then enter a value.
Route Policy Name column	Specifies the name of the route policy that is used. Click the cell then enter a value.
Internal column	Indicates whether the internal OSPF routes are redistributed. The options are true or false. Double-click the cell to activate it, then double-click to choose true or false.
External column	Indicates whether the external OSPF routes are redistributed. The options are true or false. Double-click the cell to activate it, then double-click to choose true or false.
External Type 1 column	Specifies whether the route is an external route type 1. The options are true or false. Double-click the cell to activate it, then double-click to choose true or false.
External Type 2 column	Specifies whether the route is an external route type 2. The options are true or false. Double-click the cell to activate it, then double-click to choose true or false.
NSSA External column	Specifies whether the external OSFP routes are redistributed to the NSSA[2]. The options are true or false. Double-click the cell to activate it, then double-click to choose true or false.
NSSA External Type 1 column	Specifies whether the NSSA External type is Type 1. The options are true or false. Double-click the cell to activate it, then double-click to choose true or false.

Table 15-10 Redistribution Tab Description (continued)

Field	Description
NSSA External Type 2 column	Column specifies whether the NSSA External type is Type 2. The options are true or false. Double-click the cell to activate it, then double-click to choose true or false.
IS-IS Routes Area	
IS-IS instance name column	Specifies the IS-IS[3] name. Click the cell then enter a value.
Default Metric column	Specifies the metric value assigned to the routes. Click the cell then enter a value.
Redistribute Type column	Allows you to choose the redistribute type. The following options are listed: • Level1 • Level2 • Level1and2 Double-click the cell to activate the list, then choose a redistribute type.
Route Policy Name column	Specifies the name of the route policy. Click the cell then enter a value.

1. OSPF = Open Shortest Path First

2. NSSA = not-so-stubby area

3. IS-IS = Intermediate System-to-Intermediate System

Neighbors Tab

The Neighbors tab allows you to perform the following tasks:

- Specify the neighbor IP address and AS number.

- Configure the neighbor inheritance.

- Configure neighbor details including demilitarized zone (DMZ) link bandwidth (DmzLinkBw) password, send and receive buffer sizes, shutdown, timers, and address family mode.

See Figure 15-10 for an example of the Neighbors tab. Table 15-11 describes the Neighbors tab fields.

Figure 15-10 Neighbors Tab

Table 15-11 Neighbors Tab Description

Field	Description
Neighbor Specific Area	
IP Address field	Allows you to enter an IP address of the BGP-speaking neighbor. Once a BGP[1] neighbor is created, routing information is exchanged.
AS Number field	Allows you to enter the autonomous system number to which the neighbor belongs.
	The AS[2] Number field assigns a remote AS number to a neighbor and causes the neighbor to be created. A neighbor must have a remote AS number before any other parameters can be configured for it.

Table 15-11 Neighbors Tab Description (continued)

Field	Description
Neighbor Inheritance Area	
Neighbor Group Name	Allows you to choose a neighbor group name.
Neighbor Group Name field	Allows you to view the chosen neighbor group name.
Neighbor Group Name button	Allows you to choose a neighbor group name from the Select Neighbor Group dialog box.
Session Group Name	Allow you to choose a session group name. Click the Session Group Name button to open a Select Session Group dialog box and choose a session group name from the dialog box.
Session Group Name field	Allows you to view the chosen session group name.
Session Group Name button	Allows you to choose a session group name from the Select Session Group dialog box.
Neighbor Details Area	
Ad. Interval(sec) field	Allows you to enter the minimum advertisement interval time.
Description field	Allows you to enter a description of the neighbor.
EBGP Multihop field	Allows you to enter the maximum hop count.
	The hop count allows the router to accept and attempt BGP connections to external peers residing on networks that are not directly connected.
Local AS field	Allows you to assign local AS numbers.
	Each BGP peer can be made to have a local autonomous system value for the purpose of peering. In the case of neighbor groups and session groups, the local autonomous system value is valid for all peers in the neighbor group.
	This feature cannot be customized for individual peers in a group.
	You cannot use the local BGP autonomous system number or the autonomous system number of the remote peer.
	This is valid only if the peer is a true eBGP[3] peer—it does not work for two peers in different subautonomous systems in a confederation.
Update Source	Allows you to specify an interface name specifying an interface type and instance.
	• interface type—Interface to be used to obtain the local IP address for the BGP session with the neighbor.
	• interface number—The interface number of the interface-type argument.
	Choosing an interface allows internal iBGP[4] sessions to use the IP address from a particular interface as the local address when forming an iBGP session with a neighbor.
	This mechanism allows a BGP session to remain up even if the outbound interface goes down, provided there is another route to the neighbor.
	If you configure the update source for a neighbor group or session group, all neighbors using the group will inherit the characteristics configured with the Update Source field. (See the "Neighbor Groups Tab" section on page 15-183 and the "Session Groups Tab" section on page 15-193.) Configuring the update source directly for the neighbor will override the value inherited from the group.

Table 15-11 Neighbors Tab Description (continued)

Field	Description
Update Source field	Allows you to view the chosen interface name.
Update Source button	Allows you to choose an interface name from the Select Interfaces dialog box.
AF Mode	Allows you to specify the address family mode. Click the AF Mode button to open a Neighbor Address Family Configuration window and configure a neighbor address family (see the "Neighbor Address Family Configuration Window" section on page 15-177).
AF Mode field	Allows you to view the chosen address family mode.
AF Mode button	Allows you to configure an address family mode from the Neighbor Address Family Configuration window.
Buffer Sizes - Receive and Send Area	
Socket Read(bytes) field	Allows you to enter the receive socket buffer size.
BGP Read(bytes) field	Allows you to enter the BGP read buffer size.
Socket Send(bytes) field	Allows you to enter the send socket buffer size.
BGP Send(bytes) field	Allows you to enter the BGP write buffer size.
DMZLinkBw Area	
DmzLinkBw check box	Allows you to propagate DMZ[5] link bandwidth, which advertises the bandwidth of links that are used to exit an autonomous system. This feature supports only single hop links over iBGP. BGP can originate the link bandwidth community only for eBGP peers that are one hop away.
Enable Inheritance check box	Allows you to enable DMZ link bandwidth to be inherited, allowing propagation and inheritance from a parent.
Password Area	
Password field	Allows you to enter a neighbor password. When a password is entered, it enables MD5[6] authentication on a TCP[7] connection between two BGP neighbors. You can invoke authentication between two BGP neighbors, causing each segment sent on the TCP connection between them to be verified. The password must be configured the same on both BGP neighbors, otherwise the connection will not be made. The authentication feature uses the MD5 algorithm. Specifying the password causes the software to generate and check the MD5 digest on every segment sent on the TCP connection. If you configure a password for a neighbor, an existing session will be torn down and a new one established. If you specify a BGP neighbor group or session group, all the members of the group will inherit the password characteristic. To override any inherited password configuration from a neighbor group or session group, disable the password on the neighbor.

Table 15-11 Neighbors Tab Description (continued)

Field	Description
Encryption Type list	Allows you to choose a password encryption type. The following options are listed: • None • Cisco Proprietary
Password Disable check box	Allows you to disable the password even if the parent has one. Check the Password Disable check box to disable the password for the neighbor and uncheck the check box to enable the password.
Shutdown Area	
Shutdown check box	Allows you to shut down the neighbor. Check the Shutdown check box to enable shut down and uncheck the check box to disable shut down.
Enable Inheritance check box	Allows you to enable shutdown of the neighbor from a parent.
Timers Area	
Keepalive(sec) field	Allows you to enter the keepalive interval timer. This is the frequency, in seconds, with which the software sends keepalive messages to the neighbor. The timers actually used in connection with the neighbor group may not be the same as those configured because the actual timers are negotiated with the neighbor when establishing the session. The negotiated hold time is the minimum of the configured time and the time received from the neighbor. If the negotiated hold time is 0, keepalives will be disabled and the software never terminates the session when a keepalive is not received. The configured value for the keepalive time is used provided it does not exceed a third of the negotiated hold time. If it does, a value of a third of the negotiated hold time will be used.
Holdtime(sec) field	Allows you to enter the hold-time timer. This value is the interval, in seconds, after not receiving a keepalive message from the neighbor, that the software terminates the neighbor BGP session. Enter 0 in the Holdtime(sec) field to disable the keepalive and hold-time timers. Note that the values 1 and 2 are not allowable since the minimum allowable keepalive time is a third of the holdtime.
TTL Security Area	
TTL Security check box	Allows you to enable BGP TTL security.
Enable Inheritance check box	Allows you to enable inheritance from a parent.

1. BGP = Border Gateway Protocol

2. AS = autonomous system

3. eBGP = external Border Gateway Protocol

4. iBGP = internal Border Gateway Protocol

5. DMZ = demilitarized zone

6. MD5 = Message Digest 5

7. TCP = Transmission Control Protocol

Neighbor Address Family Configuration Window

The Neighbor Address Family Configuration window is opened when the AF Mode button is clicked in the Neighbors tab.

The Neighbor Address Family Configuration window allows you to specify the address family group and mode.

See Figure 15-11 for an example of the Neighbor Address Family Configuration window. Table 15-12 describes the Neighbor Address Family Configuration window fields.

Figure 15-11 Neighbor Address Family Configuration Window

Table 15-12 Neighbor Address Family Configuration Window Description

Field	Description
AF Group Area	
AF Mode list	Allows you to choose the address family mode. The following options are listed: • IPv4Unicast • IPv4Multicast • IPv6Unicast
AF Group	Allows you to choose the address family group.
AF Group field	Allows you to view the chosen address family group.
AF Group button	Allows you to choose the address group from the Select AF Group dialog box.

Generic Config Subtab

The Generic Config subtab allows you to perform the following tasks:

• Specify the maximum number of prefixes and threshold.

• Configure the default originate.

• Configure the route reflector client.

• Disable the next hop calculation.

• Remove private AS updates.

• Send communities to an eBGP group.

• Configure soft reconfiguration.

See Figure 15-17 for an example of the Generic Config subtab. Table 15-21 describes the Generic Config subtab fields.

Table 15-13 Generic Config Subtab Description

Field	Description
Advertise Map	This field and button allow you to choose to map to conditionally advertise.
Advertise Map field	Allows you to view the advertise map.
Advertise Map button	Allows you to choose the advertise map from the Select routemap dialog box.
Conditional Map	This field and button allow you to choose the conditional map.
Conditional Map field	Allows you to view the conditional map.
Conditional Map button	Allows you to choose the map from the Select routemap dialog box.
Condition Type list	Allows you to choose the type of condition. The following options are listed: • ConditionMatch—Advertises if a map is matched. • ConditionNoMatch—Advertises if a match is not matched.

Table 15-13 Generic Config Subtab Description (continued)

Field	Description
ORF Capability list	Allows you to choose the capability ORF[1]. The following options are listed: • Receive • Send • Both • None
Max Prefix field	Allows you to enter the maximum number of prefixes. The Max Prefix field configures a maximum number of prefixes that a BGP[2] networking device is allowed to receive from a neighbor. It adds another mechanism (in addition to routing policy) to control prefixes received from a peer. When the number of received prefixes exceeds the maximum number configured, the software terminates the peering (by default). However, if the Enable Warning check box is activated, the software sends only a log message, but continues peering with the sender.
Threshold field	Allows you to enter the threshold value based on the maximum value in the Max Prefix field. When the threshold is reached (specified percent of the maximum received prefixes), a warning is generated.
Enable Warning check box	Allows you to configure the software to generate a log message when the maximum argument value (threshold) is exceeded, instead of terminating the peering.
Weight field	Allows you to specify the default weight.
Default Originate Area	
Default Originate check box	Allows you to enable default originate. Default originate allows you to originate network 0.0.0.0 into the BGP table.
Enable Inheritance check box	Allows you to prevent default originate from being inherited from a parent (session group or neighbor group).
Route Reflector Client Area	
RR Client check box	Allows you to enable client-to-client reflection. When client-to-client reflection is enabled, the clients of a route reflector cannot be members of a peer group. If the neighbors are fully meshed, there is no need for client-to-client reflection.
Enable Inheritance check box	Allows you to specify that all neighbors using the address family group will inherit the characteristics configured with the RR[3] Client check box.
Send Extended Community EBGP Area	
Send Ext Comm check box	Allows you to specify that extended community attributes are sent to an eBGP[4] neighbor and cannot be configured for iBGP[5] neighbors.
Enable Inheritance check box	Allows you to specify that all neighbors using the address family group will inherit the characteristics configured with the Send Ext Comm check box.
Next Hop Self Area	
Next Hop Self check box	Allows you to disable next hop calculation for BGP updates advertised by the networking device causing all routes to be advertised with this network device as the next hop. Disabling the next hop calculation is useful in nonmeshed networks (such as Frame Relay or X.25) where BGP neighbors may not have direct access to all other neighbors on the same IP subnet.

Table 15-13 Generic Config Subtab Description (continued)

Field	Description
Enable Inheritance check box	Allows you to specify that all neighbors using the address family group will inherit the characteristics configured with the Next Hop Self check box.
Remove Private AS Area	
Remove Private AS check box	Allows you to remove private autonomous system numbers. When an update is passed to the external neighbor, the software will drop any private autonomous system numbers in the AS-path. This feature is available for eBGP neighbors only.
	If the AS-path includes both private and public autonomous system numbers, the software considers the two numbers to be a configuration error and does not remove the private autonomous system numbers.
	If the AS path contains the autonomous system number of the eBGP neighbor, the private autonomous system numbers will not be removed.
	If this feature is used with Confederation (see the "Confederation Subtab" section on page 15-158), it works as long as the private autonomous system numbers follow the confederation portion of the AS-path.
	If you configure this command for a neighbor group or address family group, all neighbors using the group will inherit the characteristics. Configuring the remove private AS directly for the neighbor will override the value inherited from the group.
Enable Inheritance check box	Allows you to specify that all neighbors using the address family group will inherit the characteristics configured with the Remove Private AS check box.
Send Community EBGP Area	
Send Community check box	Allows you to specify that community attributes should be sent to an eBGP neighbor and not to iBGP neighbors.
Enable Inheritance check box	Allows you to specify that all neighbors using the address family group will inherit the characteristics configured with the Send Community check box.

Table 15-13 Generic Config Subtab Description (continued)

Field	Description
Soft Reconfig Inbound Area	
Soft Reconfiguration check box	Allows you to enable soft reconfiguration allowing the software to store updates received from a neighbor.
	When an inbound policy is used to filter out or modify some of the updates received from a neighbor, this feature causes the software to store the original unmodified route in addition to the one that was changed or filtered out. This feature allows a "soft clear" to be performed after the inbound policy is changed. The original routes are then passed through the new policy, which then updates the set of routes be used.
	When the Soft Reconfiguration check box is checked, the following three radio button options are described:
	• Enable—Allow inbound soft reconfiguration. If the neighbor supports route refresh capability, then the original routes are not stored because they can be retrieved from the neighbor by making a route refresh request. Click the Enable radio button to allows inbound soft reconfiguration.
	• Disable—Do not allow inbound soft reconfiguration. If the neighbor does not support the route refresh capability, then an inbound soft clear is not possible. In that case, the only way to rerun the inbound policy is to perform a "hard clear," which is to reset the neighbor BGP session. Click the Disable radio button to deny inbound soft reconfiguration.
	• Soft Always—Always use soft reconfiguration even when route refresh is supported. Checking the Soft Always check box enables the storing of received updates, even if the neighbor supports route refresh capability. Click the Soft Always radio button to always use soft reconfiguration.

1. ORF = Outbound Route Filter
2. BGP = Border Gateway Protocol
3. RR = route reflection
4. eBGP = external Border Gateway Protocol
5. iBGP = internal Border Gateway Protocol

Filtering Policy Subtab

The Filtering Policy subtab allows you to perform the following tasks:

- Specify the prefix list.
- Specify the policy.
- Configure the outgoing route filter.

See Figure 15-12 for an example of the Filtering Policy subtab. Table 15-14 describes the Filtering Policy subtab fields.

Figure 15-12 Filtering Policy Subtab

Table 15-14 Filtering Policy Subtab Description

Field	Description
Prefix List (in)	Allows you to choose a prefix list to filter updates advertised to or received from a neighbor. Choosing a prefix list applies the prefix list to incoming advertisements to that neighbor.
	All neighbors using this group will inherit the characteristics configured with the Prefix List (in) field.
Prefix List (in) field	Allows you to view the prefix list.
Prefix List (in) button	Allows you to choose the prefix list from the Select prefix dialog box.
Policy (in) field	Allows you to enter the name of a policy to apply to inbound routes.

Table 15-14 Filtering Policy Subtab Description (continued)

Field	Description
Prefix List (out)	Allows you to choose a prefix list filter for updates advertised from or sent to a neighbor. Choosing a prefix list applies the prefix list to outgoing advertisements from that neighbor. All neighbors using this group will inherit the characteristics configured with the Prefix List (out) field.
Prefix List (out) field	Allows you to view the chosen prefix list.
Prefix List (out) button	Allows you to choose the prefix list from the Select prefix list dialog box.
Policy (out) field	Allows you to enter the name of a policy to apply to outbound routes.

Neighbor Groups Tab

The Neighbor Groups tab allows you to perform the following tasks:

- Specify the neighbor group name and AS number.
- Configure the neighbor group inheritance.
- Configure neighbor group address family-independent and address family specific-information including DMZ link bandwidth, password, send and receive buffer sizes, shutdown, timers, and address family mode.

See Figure 15-13 for an example of the Neighbor Groups tab. Table 15-15 describes the Neighbor Groups tab fields.

Figure 15-13 Neighbor Groups Tab

Table 15-15 Neighbor Groups Tab Description

Field	Description
Neighbor Group Specific Area	
Neighbor Group Name field	Allows you to enter a neighbor group name.
AS Number field	Allows you to assign a remote AS[1] number to the remote neighbor.
Neighbor Group Inheritance Area	
Parent	Allows you to specify a neighbor group parent for inheritance. Click the Parent button to open a Select Neighbor Group dialog box and choose a neighbor group from the dialog box.
Parent field	Allows you to view the neighbor group parent.

Table 15-15 Neighbor Groups Tab Description (continued)

Field	Description
Parent button	Allows you to choose the neighbor group parent from the Select Neighbor Group dialog box.
Session Group Name	This field and button allow you to specify a session group name for inheritance. Click the Session Group Name button to open a Select Session Group dialog box and choose a session group from the dialog box.
Session Group Name field	Allows you to view the chosen the session group name.
Session Group Name button	Allows you to choose the session group name.
Neighbor Group Details Area	
Ad. Interval(sec) field	Allows you to enter the minimum advertisement interval time.
Description field	Allows you to enter a description of the neighbor group.
EBGP Multihop field	Allows you to enter the maximum hop count. The hop count allows the router to accept and attempt BGP[2] connections to external peers residing on networks that are not directly connected.
Local AS field	Allows you to assign local AS numbers. Each BGP peer can be made to have a local autonomous system value for the purpose of peering. In the case of neighbor groups and session groups, the local autonomous system value is valid for all peers in the neighbor group.
Update Source	Allows you to specify an interface name specifying an interface type and instance for the following options: • interface type—Interface to be used to obtain the local IP address for the BGP session with the neighbor. • interface number—The interface number of the interface-type argument. Click the Update Source button to open a Select Interfaces dialog box and choose an interface from the dialog box.
Update Source field	Allows you to view the chosen interface name.
Update Source button	Allows you to choose an interface name from the Select Interfaces dialog box.
AF Mode	Allows you to specify the address family mode.
AF Mode field	Allows you to view the chosen address family mode.
AF Mode button	Allows you to configure the address family mode from the Neighbor Group Address Family Configuration window. (See the "Neighbor Group Address Family Configuration Window" section on page 15-187.)
Buffer Sizes - Receive and Send Area	
Socket Read (bytes) field	Allows you to enter the receive socket buffer size.
BGP Read (bytes) field	Allows you to enter the BGP read buffer size.
Socket Send (bytes) field	Allows you to enter the send socket buffer size.

Table 15-15 Neighbor Groups Tab Description (continued)

Field	Description
BGP Send (bytes) field	Allows you to enter the BGP write buffer size.
DMZLinkBw Area	
DmzLinkBw check box	Allows you to propagate DMZ[3] link bandwidth, which advertises the bandwidth of links that are used to exit an autonomous system. This feature supports only single hop links over iBGP[4]. BGP can originate the link bandwidth community only for eBGP peers that are one hop away.
Enable Inheritance check box	Allows you to enable DMZ link bandwidth to be inherited, allowing propagation and inheritance from a parent.
Password Area	
Password field	Allows you to enter a neighbor password. When a password is entered, it enables MD5 authentication on a TCP[5] connection between two BGP neighbors. You can invoke authentication between two BGP neighbors, causing each segment sent on the TCP connection between them to be verified. The password must be configured the same on both BGP neighbors; otherwise, the connection is not made. The authentication feature uses the MD5[6] algorithm. Specifying the password causes the software to generate and check the MD5 digest on every segment sent on the TCP connection. If you configure a password for a neighbor, an existing session will be torn down and a new one established. If you specify a BGP neighbor group, all the members of the group will inherit the password characteristic.
Encryption Type list	Allows you to choose a password encryption type. The following options are listed: • None • Cisco Proprietary
Password Disable check box	Allows you to disable the password for the neighbor group even if the parent has one.
Shutdown Area	
Shutdown check box	Allows you to shut down the neighbor group. Check the Shutdown check box to enable shut down and uncheck the check box to disable shut down.
Enable Inheritance check box	Allows you to shut down the neighbor group independent of the parent.
Timers Area	
Keepalive (sec) field	Allows you to enter the keepalive interval timer. This is the frequency, in seconds, with which the software sends keepalive messages to the neighbor. The timers actually used in connection with the neighbor group may not be the same as those configured because the actual timers are negotiated with the neighbor group when establishing the session. The negotiated hold time is the minimum of the configured time and the time received from the neighbor group. If the negotiated hold time is 0, keepalives will be disabled and the software never terminates the session when a keepalive is not received. The configured value for the keepalive time is used provided it does not exceed a third of the negotiated hold time. If it does, a value of a third of the negotiated hold time is used.

Table 15-15 Neighbor Groups Tab Description (continued)

Field	Description
Holdtime(sec) field	Allows you to enter the hold-time timer. This value is the interval, in seconds, after not receiving a keepalive message from the neighbor group, that the software terminates the neighbor group BGP session.
	Enter 0 in the Holdtime(sec) field to disable the keepalive and hold-time timers.
TTL Security Area	
TTL Security check box	Allows you to enable BGP TTL security.
Enable Inheritance check box	Allows you to enable inheritance from a parent.

1. AS = autonomous system
2. BGP = Border Gateway Protocol
3. DMZ = demilitarized zone
4. iBGP = internal Border Gateway Protocol
5. TCP = Transmission Control Protocol
6. MD5 = Message Digest 5

Neighbor Group Address Family Configuration Window

The Neighbor Group Address Family Configuration window is opened when the AF Mode button is clicked in the Neighbor Groups tab.

The Neighbor Group Address Family Configuration window allows you to specify the address family group and mode.

See Figure 15-14 for an example of the Neighbor Group Address Family Configuration window. Table 15-16 describes the Neighbor Group Address Family Configuration window fields.

Figure 15-14 Neighbor Group Address Family Configuration Window

Table 15-16 Neighbor Group Address Family Configuration Window Description

Field	Description
AF Group Area	
AF Mode list	Allows you to choose the address family mode. The following options are listed: • IPv4Unicast • IPv4Multicast • IPv6Unicast
AF Group	Allows you to choose the address family group.
AF Group field	Allows you to view the chosen address family group.
AF Group button	Allows you to choose the address group from the Select AF Group dialog box.

Generic Config Subtab

The Generic Config subtab allows you to perform the following tasks:

- Specify the maximum number of prefixes and threshold.
- Configure the default originate.
- Configure the route reflector client.
- Disable the next hop calculation.
- Remove private AS updates.
- Send communities to an eBGP group.
- Configure soft reconfiguration.

See Figure 15-14 for an example of the Generic Config subtab. Table 15-17 describes the Generic Config subtab fields.

Table 15-17 Generic Config Subtab Description

Field	Description
Advertise Map	This field and button allow you to choose to map to conditionally advertise.
Advertise Map field	Allows you to view the advertise map.
Advertise Map button	Allows you to choose the conditional map.
Conditional Map	This field and button allow you to choose the conditional map.
Conditional Map field	Allows you to view the conditional map.
Conditional Map button	Allows you to choose the map from the Select routemap dialog box.
Condition Type list	Allows you to choose the type of condition. The following options are listed: • ConditionMatch—To advertise if a map is matched. • ConditionNoMatch—To advertise if a match is not matched.
ORF Capability list	Allows you to choose the capability ORF[1]. The following options are listed: • Receive • Send • Both • None
Max Prefix field	Allows you to enter the maximum number of prefixes. The Max Prefix field configures a maximum number of prefixes that a BGP[2] networking device is allowed to receive from a neighbor. It adds another mechanism (in addition to routing policy) to control prefixes received from a peer. When the number of received prefixes exceeds the maximum number configured, the software terminates the peering (by default). However, if the Enable Warning check box is activated, the software sends only a log message, but continues peering with the sender.
Threshold field	Allows you to enter the threshold value based on the maximum value in the Max Prefix field. When the threshold is reached (specified percent of the maximum received prefixes), a warning is generated.

Table 15-17 Generic Config Subtab Description (continued)

Field	Description
Enable Warning check box	Allows you to configure the software to generate a log message when the maximum argument value (threshold) is exceeded, instead of terminating the peering.
Weight field	Allows you to specify the default weight.
Default Originate Area	
Default Originate check box	Allows you to enable default originate. Default originate allows you to originate network 0.0.0.0 into the BGP table.
Enable Inheritance check box	Allows you to prevent default originate from being inherited from a parent (session group or neighbor group).
Route Reflector Client Area	
RR Client check box	Allows you to enable client-to-client reflection.
	If the neighbors are fully meshed, there is no need for client-to-client reflection.
Enable Inheritance check box	Allows you to specify that all neighbors using the address family group will inherit the characteristics configured with the RR[3] Client check box.
Send Extended Community EBGP Area	
Send Ext Comm check box	Allows you to specify that extended community attributes are sent to an eBGP neighbor and cannot be configured for iBGP[4] neighbors.
Enable Inheritance check box	Allows you to specify that all neighbors using the address family group will inherit the characteristics configured with the Send Ext Comm check box.
Next Hop Self Area	
Next Hop Self check box	Allows you to disable next hop calculation for BGP updates advertised by the networking device causing all routes to be advertised with this network device as the next hop.
	Disabling the next hop calculation is useful in nonmeshed networks (such as Frame Relay or X.25) where BGP neighbors may not have direct access to all other neighbors on the same IP subnet.
Enable Inheritance check box	Allows you to specify that all neighbors using the address family group will inherit the characteristics configured with the Next Hop Self check box.
Remove Private AS Area	
Remove Private AS check box	Allows you to remove private autonomous system numbers. When an update is passed to the external neighbor, the software drops any private autonomous system numbers in the AS[5]-path. This feature is available for eBGP[6] neighbors only.
	If the AS-path includes both private and public autonomous system numbers, the software considers the two numbers to be a configuration error and does not remove the private autonomous system numbers.
	If the AS path contains the autonomous system number of the eBGP neighbor, the private autonomous system numbers will not be removed.
	If this feature is used with Confederation (see the "Confederation Subtab" section on page 15-158), it will work as long as the private autonomous system numbers follow the confederation portion of the AS-path.
	If you configure this command for a neighbor group or address family group, all neighbors using the group will inherit the characteristics. Configuring the remove private AS directly for the neighbor will override the value inherited from the group.

Table 15-17 Generic Config Subtab Description (continued)

Field	Description
Enable Inheritance check box	Allows you to specify that all neighbors using the address family group will inherit the characteristics configured with the Remove Private AS check box.
Send Community EBGP Area	
Send Community check box	Allows you to specify that community attributes should be sent to an eBGP neighbor and not to iBGP neighbors.
Enable Inheritance check box	Allows you to specify that all neighbors using the address family group will inherit the characteristics configured with the Send Community check box.
Soft Reconfig Inbound Area	
Soft Reconfiguration check box	Allows you to enable soft reconfiguration allowing the software to store updates received from a neighbor.
	When an inbound policy is used to filter out or modify some of the updates received from a neighbor, this feature causes the software to store the original unmodified route in addition to the one that was changed or filtered out. This feature allows a "soft clear" to be performed after the inbound policy is changed. The original routes are then passed through the new policy, which then updates the set of routes be used.
	When the Soft Reconfiguration check box is checked, the following radio button options are listed:
	• Enable—Allow inbound soft reconfiguration. If the neighbor supports route refresh capability, then the original routes are not stored because they can be retrieved from the neighbor by making a route refresh request. Click the Enable radio button to allows inbound soft reconfiguration.
	• Disable—Do not allow inbound soft reconfiguration. If the neighbor does not support the route refresh capability, then an inbound soft clear is not possible. In that case, the only way to rerun the inbound policy is to perform a "hard clear," which is to reset the neighbor BGP session. Click the Disable radio button to deny inbound soft reconfiguration.
	• Soft Always—Always use soft reconfiguration even when route refresh is supported. Checking the Soft Always check box enables the storing of received updates, even if the neighbor supports route refresh capability. Click the Soft Always radio button to always use soft reconfiguration.

1. ORF = Outbound Route Filter
2. BGP = Border Gateway Protocol
3. RR = route reflection
4. iBGP = internal Border Gateway Protocol
5. AS = autonomous system
6. eBGP = external Border Gateway Protocol

Filtering Policy Subtab

The Filtering Policy subtab allows you to perform the following tasks:

- Specify the prefix list.
- Specify the policy.

See Figure 15-15 for an example of the Filtering Policy subtab. Table 15-18 describes the Filtering Policy subtab fields.

Figure 15-15 Filtering Policy Subtab

Table 15-18 Filtering Policy Subtab Description

Field	Description
Prefix List (in)	Allows you to choose a prefix list to filter updates advertised to or received from a neighbor. Choosing a prefix list applies the prefix list to incoming advertisements to that neighbor. All neighbors using this group will inherit the characteristics configured with the Prefix List (in) field.
Prefix List (in) field	Allows you to view the prefix list.
Prefix List (in) button	Allows you to choose the prefix list from the Select prefix dialog box.
Policy (in) field	Allows you to enter the name of a policy to apply to inbound routes.

Table 15-18 Filtering Policy Subtab Description (continued)

Field	Description
Prefix List (out)	Allows you to choose a prefix list filter for updates advertised from or sent to a neighbor. Choosing a prefix list applies the prefix list to outgoing advertisements from that neighbor. All neighbors using this group will inherit the characteristics configured with the Prefix List (out) field.
Prefix List (out) field	Allows you to view the chosen prefix list.
Prefix List (out) button	Allows you to choose the prefix list from the Select prefix list dialog box.
Policy (out) field	Allows you to enter the name of a policy to apply to outbound routes.

Session Groups Tab

The Session Groups tab allows you to perform the following tasks:

- Specify the session group name and AS number.
- Configure the session group inheritance.
- Configure session group address family-independent information including DMZ link bandwidth, password, send and receive buffer sizes, shutdown, and timers.

See Figure 15-16 for an example of the Session Groups tab. Table 15-19 describes the Session Groups tab fields.

Figure 15-16 Session Groups Tab

Table 15-19 Session Groups Tab Description

Field	Description
Session Group Specific Area	
Session Group Name field	Allows you to enter the session group name.
AS Number field	Allows you to assign a remote AS[1] number to the session group.
Session Group Inheritance Area	
Parent	Allows you to specify a session group parent for inheritance.
Parent field	Allows you to view the session group parent.
Parent button	Allows you to choose the session group parent from the Select Session Group dialog box.

Table 15-19 Session Groups Tab Description (continued)

Field	Description
Session Group Details Area	
Ad. Interval(sec) field	Allows you to enter the minimum advertisement interval time in seconds.
Description field	Allows you to enter a description of the session group.
EBGP Multihop field	Allows you to enter the maximum hop count.
	The hop count allows the router to accept and attempt BGP[2] connections to external peers residing on networks that are not directly connected.
Local AS field	Allows you to assign local AS numbers.
	Each BGP neighbor can be made to have a local autonomous system value for the purpose of peering. In the case of neighbor groups and neighbors, the local autonomous system value is valid for all neighbor in the session group.
Update Source	Allows you to specify an interface name specifying an interface type and instance for the following options:
	• interface type—Interface to be used to obtain the local IP address for the BGP session with the neighbor.
	• interface number—The interface number of the interface-type argument.
Update Source field	Allows you to view the interface name.
Update Source button	Allows you to choose the interface name from the Select Interfaces dialog box.
Buffer Sizes - Receive and Send Area	
Socket Read(bytes) field	Allows you to enter the receive socket buffer size.
BGP Read(bytes) field	Allows you to enter the BGP read buffer size.
Socket Send(bytes) field	Allows you to enter the send socket buffer size.
BGP Send(bytes) field	Allows you to enter the BGP write buffer size.
DmzLinkBw check box	Allows you to propagate DMZ[3] link bandwidth, which advertises the bandwidth of links that are used to exit an autonomous system.
	This feature only supports single hop links over internal iBGP. BGP can originate the link bandwidth community only for eBGP peers that are one hop away.
Enable Inheritance check box	Allows you to enable DMZ link bandwidth to be inherited, allowing propagation and inheritance from a parent.

Table 15-19 Session Groups Tab Description (continued)

Field	Description
Password Area	
Password field	Allows you to enter a session password. When a password is entered, it enables MD5[4] authentication on a TCP[5] connection between two BGP neighbors. You can invoke authentication between two BGP peers, causing each segment sent on the TCP connection between them to be verified. The password must be configured the same on both BGP peers, otherwise the connection will not be made. The authentication feature uses the MD5 algorithm. Specifying the password causes the software to generate and check the MD5 digest on every segment sent on the TCP connection. If you specify a BGP session group, all the members of the group will inherit the password characteristic. To override any inherited password configuration from a neighbor or neighbor group, disable the password for the neighbor or neighbor group.
Encryption Type list	Allows you to choose a password encryption type. The following options are listed: • None • Cisco Proprietary
Password Disable check box	Allows you to disable the password even if the parent has one.
Shutdown Area	
Shutdown check box	Allows you to shut down the session group.
Enable Inheritance check box	Allows you to shut down the session group from a parent.
Timers Area	
Keepalive(sec) field	Allows you to enter the keepalive interval timer. This is the frequency, in seconds, with which the software sends keepalive messages to the neighbor. The timers actually used in connection with the session group may not be the same as those configured because the actual timers are negotiated with the session group when establishing the session. The negotiated hold time is the minimum of the configured time and the time received from the session group. If the negotiated hold time is 0, keepalives will be disabled and the software never terminates the session when a keepalive is not received. The configured value for the keepalive time is used provided it does not exceed a third of the negotiated hold time. If it does, a value of a third of the negotiated hold time will be used.
Holdtime(sec) field	Allows you to enter the hold-time timer. This value is the interval, in seconds, after not receiving a keepalive message from the session group, that the software terminates the session group BGP session. Enter 0 in the Holdtime(sec) field to disable the keepalive and hold-time timers.

Table 15-19 Session Groups Tab Description (continued)

Field	Description
TTL Security Area	
TTL Security check box	Allows you to enable BGP TTL security.
Enable Inheritance check box	Allows you to enable inheritance from a parent.

1. AS = autonomous system
2. BGP = Border Gateway Protocol
3. DMZ = demilitarized zone
4. MD5 = Message Digest 5
5. TCP = Transmission Control Protocol

AF Groups Tab

The AF Groups tab contains two subtabs: Generic Config and Filtering Policy. The Generic Config subtab is displayed by default when the AF Groups tab is clicked.

The AF Groups tab allows you to perform the following tasks:

- Specify the address family group name and mode.
- Specify an address group parent for inheritance.

See Figure 15-17 for an example of the AF Groups tab. Table 15-20 describes the AF Groups tab fields.

Figure 15-17 AF Groups Tab

Table 15-20 AF Groups Tab Description

Field	Description
AF Group Area	
AF Group Name field	Allows you to enter a BGP[1] address family group name.
AF Mode list	Allows you to choose the address family mode. The following options are listed: • IPv4Unicast • IPv4Multicast • IPv6Unicast

Table 15-20 AF Groups Tab Description (continued)

Field	Description
AF Group Inheritance Area	
Parent	This field and button allow you to specify an address group parent for inheritance.
Parent field	Allows you to view the chosen address group parent.
Parent button	Allows you to choose the address group parent from the Select AF Group dialog box.

1. BGP = Border Gateway Protocol

Generic Config Subtab

The Generic Config subtab allows you to perform the following tasks:

- Specify the maximum number of prefixes and threshold.
- Configure the default originate.
- Configure the route reflector client.
- Disable the next hop calculation.
- Remove AS updates from outbound updates.
- Send communities to an eBGP group.
- Configure soft reconfiguration.

See Figure 15-17 for an example of the Generic Config subtab. Table 15-21 describes the Generic Config subtab fields.

Table 15-21 Generic Config Subtab Description

Field	Description
Capability ORF list	Allows you to choose the capability ORF[1]. The following options are listed: • Receive • Send • Both • None
Max Prefix field	Allows you to enter the maximum number of prefixes. The Max Prefix field configures a maximum number of prefixes that a BGP[2] networking device is allowed to receive from a neighbor. It adds another mechanism (in addition to routing policy) to control prefixes received from a peer. When the number of received prefixes exceeds the maximum number configured, the software terminates the peering (by default). However, if the Enable Warning check box is activated, the software sends only a log message, but continues peering with the sender.
Threshold field	Allows you to enter the threshold value based on the maximum value in the Max Prefix field. When the threshold is reached (specified percent of the maximum received prefixes), a warning is generated.
Enable Warning check box	Allows you to configure the software to generate a log message when the maximum argument value (threshold) is exceeded, instead of terminating the peering.
Weight field	Allows you to specify the default weight.

Table 15-21 Generic Config Subtab Description (continued)

Field	Description
Default Originate Area	
Default Originate check box	Allows you to enable default originate. Default originate allows you to originate network 0.0.0.0 into the BGP table.
Enable Inheritance check box	Allows you to prevent default originate from being inherited from a parent (session group or neighbor group).
Route Policy field	Allows you to enter a route policy name to specify criteria to originate default.
Route Reflector Client Area	
RR Client check box	Allows you to enable client-to-client reflection.
	When client-to-client reflection is enabled, the clients of a route reflector cannot be members of a peer group.
	If the neighbors are fully meshed, there is no need for client-to-client reflection.
Enable Inheritance check box	Allows you to specify that all neighbors using the address family group will inherit the characteristics configured with the RR[3] Client check box.
Send Extended Community EBGP Area	
Send Ext Comm check box	Allows you to specify that extended community attributes are sent to an eBGP[4] neighbor and cannot be configured for iBGP[5] neighbors.
Enable Inheritance check box	Allows you to specify that all neighbors using the address family group will inherit the characteristics configured with the Send Ext Comm check box.
Next Hop Self Area	
Next Hop Self check box	Allows you to disable next hop calculation for BGP updates advertised by the networking device causing all routes to be advertised with this network device as the next hop.
	Disabling the next hop calculation is useful in nonmeshed networks (such as Frame Relay or X.25) where BGP neighbors may not have direct access to all other neighbors on the same IP subnet.
Enable Inheritance check box	Allows you to specify that all neighbors using the address family group will inherit the characteristics configured with the Next Hop Self check box.
Remove Private AS Area	
Remove Private AS check box	Allows you to remove private autonomous system numbers. When an update is passed to the external neighbor, the software will drop any private autonomous system numbers in the AS-path. This feature is available for eBGP neighbors only.
	If the AS-path includes both private and public autonomous system numbers, the software considers the two numbers to be a configuration error and does not remove the private autonomous system numbers.
	If the AS path contains the autonomous system number of the eBGP neighbor, the private autonomous system numbers will not be removed.
	If this feature is used with Confederation (see the "Confederation Subtab" section on page 15-158), it will work as long as the private autonomous system numbers follow the confederation portion of the AS-path.
	If you configure this command for a neighbor group or address family group, all neighbors using the group will inherit the characteristics. Configuring the remove private AS directly for the neighbor will override the value inherited from the group.

Table 15-21 Generic Config Subtab Description (continued)

Field	Description
Enable Inheritance check box	Allows you to specify that all neighbors using the address family group will inherit the characteristics configured with the Remove Private AS check box.
Send Community EBGP Area	
Send Community check box	Allows you to specify that community attributes should be sent to an eBGP neighbor and not to iBGP neighbors.
Enable Inheritance check box	Allows you to specify that all neighbors using the address family group will inherit the characteristics configured with the Send Community check box.
Soft Reconfig Inbound Area	
Soft Reconfiguration check box	Allows you to enable soft reconfiguration allowing the software to store updates received from a neighbor.
	When an inbound policy is used to filter out or modify some of the updates received from a neighbor, this feature causes the software to store the original unmodified route in addition to the one that was changed or filtered out. This feature allows a "soft clear" to be performed after the inbound policy is changed. The original routes are then passed through the new policy, which then updates the set of routes be used.
	When the Soft Reconfiguration check box is checked, the following radio button options are listed:
	• Enable—Allow inbound soft reconfiguration. If the neighbor supports route refresh capability, then the original routes are not stored because they can be retrieved from the neighbor by making a route refresh request. Click the Enable radio button to allows inbound soft reconfiguration.
	• Disable—Do not allow inbound soft reconfiguration. If the neighbor does not support the route refresh capability, then an inbound soft clear is not possible. In that case, the only way to rerun the inbound policy is to perform a "hard clear," which is to reset the neighbor BGP session. Click the Disable radio button to deny inbound soft reconfiguration.
	• Soft Always—Always use soft reconfiguration even when route refresh is supported. Checking the Soft Always check box enables the storing of received updates, even if the neighbor supports route refresh capability. Click the Soft Always radio button to always use soft reconfiguration.

1. ORF = Outbound Route Filter
2. BGP = Border Gateway Protocol
3. RR = route reflection
4. eBGP = external Border Gateway Protocol
5. iBGP = internal Border Gateway Protocol

Filtering Policy Subtab

The Filtering Policy subtab allows you to perform the following tasks:

- Specify the prefix list.
- Specify the policy.

See Figure 15-18 for an example of the Filtering Policy subtab. Table 15-22 describes the Filtering Policy subtab fields.

Figure 15-18 Filtering Policy Subtab

Table 15-22 Filtering Policy Subtab Description

Field	Description
Prefix List (in)	Allows you to choose a prefix list to filter updates advertised to or received from a neighbor. Choosing a prefix list applies the prefix list to incoming advertisements to that neighbor.
	All neighbors using this group will inherit the characteristics configured with the Prefix List (in) field.
Prefix List (in) field	Allows you to view the prefix list.
Prefix List (in) button	Allows you to choose the prefix list from the Select prefix dialog box.
Policy (in) field	Allows you to enter the name of a policy to apply to inbound routes.

Table 15-22 Filtering Policy Subtab Description (continued)

Field	Description
Prefix List (out)	Allows you to choose a prefix list filter for updates advertised from or sent to a neighbor. Choosing a prefix list applies the prefix list to outgoing advertisements from that neighbor. All neighbors using this group will inherit the characteristics configured with the Prefix List (out) field.
Prefix List (out) field	Allows you to view the chosen prefix list.
Prefix List (out) button	Allows you to choose the prefix list from the Select prefix list dialog box.
Policy (out) field	Allows you to enter the name of a policy to apply to outbound routes.

Operations Tab

The Operations tab allows you to perform the following tasks:

- Specify clear BGP parameters and execute the operation.
- Specify clear BGP dampening parameters and execute the operation.
- Specify clear BGP flap statistics parameters and execute the operation.
- Specify clear BGP peer drop parameters and execute the operation.
- Clear BGP performance statistics.
- Clear BGP self-originated routes.

See Figure 15-19 for an example of the Operations tab. Table 15-23 describes the Operations tab fields.

Figure 15-19 Operations Tab

Table 15-23 Operations Tab Description

Field	Description
Clear BGP Area	
All radio button	Allows you to reset all BGP[1] neighbors.
External Peers radio button	Allows you to reset all external neighbors.
Neighbor	Allows you to reset a neighbor based on IP address.
Neighbor radio button	Allows you to enable the resetting of neighbors based on IP address.

Table 15-23 Operations Tab Description (continued)

Field	Description
Neighbor field	Allows you to view the chosen neighbor.
	This field is enabled when the Neighbor radio button is activated. (See Neighbor radio button.)
Neighbor button	Allows you to choose the neighbor from the Select Neighbor dialog box.
	This button is enabled when the Neighbor radio button is activated. (See Neighbor radio button.)
Peers in AS	Allows you to reset a neighbor based on the AS[2] number.
Peers in AS radio button	Allows you to enable the resetting of neighbors based on AS number.
Peers in AS field	Allows you to enter an AS number.
	This field is enabled when the Peers in AS radio button is activated. (See Peers in AS radio button.)
Official AF list	Allows you to choose the official address family mode. The following options are listed: • IPv4 • IPv6 • All
Subsequent AF list	Allows you to choose the subsequent address family mode. The following options are listed: • Unicast • Multicast • All
Clear Direction list	Allows you to choose the clear direction. The following options are listed: • SoftInbound—The router uses soft inbound or from route refresh reconfiguration (cached routes). • SoftOutbound—The router uses soft outbound reconfiguration (cached routes). • Both—The router uses soft inbound and outbound reconfiguration. • Hard—The router clears with a hard reset. This option can be chosen only if Official AF and Subsequent AF are set to All. (See Official AF list and Subsequent AF list.). • Hard(Graceful)—The router clears with a hard reset (for example, terminate the TCP connection) and a graceful restart. This option can be chosen only if Official AF and Subsequent AF are set to All. (See Official AF list and Subsequent AF list.)
Prefix ORF check box	Allows you to send a new ORF to the neighbor. The BGP neighbor installs the new ORF and resends its routes.
Clear button	Executes the clear operation based on the criteria configured in the Clear BGP area. When the button is clicked, a Confirm dialog box appears. Click Yes to proceed with the clear operation or click No to cancel the operation.
	This Clear button is disabled by default. You must choose a radio button in an area to enable the Clear button.
Clear BGP Dampening Area	
All radio button	Allows you to clear BGP route dampening information and unsuppress the specified suppressed routes for all AS neighbors.
Network	Allows you to clear BGP dampening information based on IP address network prefix.

Table 15-23 Operations Tab Description (continued)

Field	Description
Network radio button	Allows you to enable the clearing of BGP dampening information based on an IP address network prefix.
Network field	Allows you to enter the IP address. This field is enabled when the Network radio button is activated. (See Network radio button.)
Mask field	Allows you to enter a prefix mask that is applied to the IP address. This field is enabled when the Network radio button is clicked. (See Network radio button.)
Official AF list	Allows you to choose the official address family mode. The following options are listed: • IPv4 • IPv6 • All
Subsequent AF list	Allows you to choose the subsequent address family mode. The following options are listed: • Unicast • Multicast • All
Clear button	Executes the clear operation based on the criteria configured in the Clear BGP Dampening area. When the button is clicked, a Confirm dialog box appears. Click Yes to proceed with the clear operation or click No to cancel the operation. This Clear button is disabled by default. You must choose a radio button in an area to enable the Clear button.
Clear BGP Flap Statistics Area	
Filter List	Allows you to clear BGP flap counts for a specified group of routes based on filter list. Specifying a filter list clears the flap counts for the chosen address families for the specified group of routes.
Filter List radio button	Allows you to enable the clearing of BGP flap counts based on a filter list.
Filter List field	Allows you to view the chosen filter list. This field is enabled when the Filter List radio button is activated. (See Filter List radio button.)
Filter List button	Allows you to choose the filter list from the Select AS path ACL dialog box. This button is enabled when the Filter List radio button is activated. (See Filter List radio button.)
Neighbor	Allows you to clear BGP flap counts for a specified group based on the neighbor address.
Neighbor radio button	Allows you to enable the clearing of BGP flap counts based on a neighbor address.
Neighbor field	Allows you to view the chosen neighbor address. This field is enabled when the Neighbor radio button is activated. (See Neighbor radio button.)
Neighbor button	Allows you to choose the neighbor address from the Select Neighbor dialog box. This button is enabled when the Neighbor radio button is activated. (See Neighbor radio button.)
Network	Allows you to clear flap counts based on IP address network prefix.
Network radio button	Allows you to enable the clearing of BGP flap counts based on a network prefix.

Table 15-23 Operations Tab Description (continued)

Field	Description
Network field	Allows you to enter an IP address network prefix. This field is enabled when the Network radio button is activated. (See Network radio button.)
Mask field	Allows you to enter a prefix mask that is applied to the IP address. This field is enabled when the Network radio button is clicked. Enter a network mask in the Mask field. (See Network radio button.)
Regular Exp	Allows you to enter a regular expression.
Regular Exp radio button	Allows you to enable the clearing of BGP flap counts based on a regular expression.
Regular Exp field	Allows you to enter a regular expression. This field is enabled when the Regular Exp radio button is activated. (See Regular Exp radio button.)
Official AF list	Allows you to choose the official address family mode. The following options are listed: • IPv4 • IPv6 • All
Subsequent AF list	Allows you to choose the subsequent address family mode. The following options are listed: • Unicast • Multicast • All
Clear button	Executes the clear operation based on the criteria configured in the Clear BGP Flap Statistics area. When the button is clicked, a Confirm dialog box appears. Click Yes to proceed with the clear operation or click No to cancel the operation. This Clear button is disabled by default. You must choose a radio button in an area to enable the Clear button.
Clear BGP Peer Drops Area	
All radio button	Allows you to clear the connections dropped counter for all neighbors.
Neighbor	Allows you to clear BGP neighbor drops for a specified group based on the neighbor address.
Neighbor radio button	Allows you to enable the clearing of BGP peer drops based on a neighbor address.
Neighbor field	Allows you to view the chosen neighbor address. This field is enabled when the Neighbor radio button is activated. (See Neighbor radio button.)
Neighbor button	Allows you to choose a neighbor address from the Select Neighbor dialog box. This button is enabled when the Neighbor radio button is activated. (See Neighbor radio button.)
Clear button	Executes the clear operation based on the criteria configured in the Clear BGP Peer Drops area. When the button is clicked, a Confirm dialog box appears. Click Yes to proceed with the clear operation or click No to cancel the operation. This Clear button is disabled by default. You must choose a radio button in an area to enable the Clear button.

Table 15-23 Operations Tab Description (continued)

Field	Description
Clear BGP Performance Statistics Area	
Clear BGP Performance Statistics button	Allows you to clear the performance statistics for all address families. When the button is clicked, a Confirm dialog box appears. Click Yes to proceed with the clear operation or click No to cancel the operation.
Clear BGP Self Originated Area	
Clear Self Originated Routes button	Allows you to clear BGP routes that are self-originated (redistributed network and aggregate routes originated by the local system).When the button is clicked, a Confirm dialog box appears. Click Yes to proceed with the clear operation or click No to cancel the operation.
Official AF list	Allows you to choose the official address family mode. The following options are listed: • IPv4 • IPv6 • All
Subsequent AF list	Allows you to choose the subsequent address family mode. The following options are listed: • Unicast • Multicast • All

1. BGP = Border Gateway Protocol

2. AS = autonomous system