BGP Named Community Lists

Feature History

Release	Modification
12.0(10)S	This feature was introduced.
12.0(16)ST	This feature was integrated into Cisco IOS Release 12.0(16)ST.
12.1(9)E	This feature was integrated into Cisco IOS Release 12.1(9)E.
12.2(8)T	This feature was integrated into Cisco IOS Release 12.2(8)T.
12.2(14)S	This feature was integrated into Cisco IOS Release 12.2(14)S.

This feature module describes the BGP Named Community Lists feature and includes the following sections:

Feature Overview

Border Gateway Protocol (BGP) communities are attributes that are used to group and filter routes. Communities are designed to give the network operator the ability to apply policies to large numbers of routes by using match and set clauses in the configuration of route maps. Community lists are used in this process to identify and filter routes by their common attributes.

The BGP Named Community Lists feature introduces a new type of community list called the named community list. The BGP Named Community Lists feature allows the network operator to assign meaningful names to community lists and increases the number of community lists that can be configured. A named community list can be configured with regular expressions and with numbered

community lists. All rules of numbered communities apply to named community lists except that there is no limitation on the number of community attributes that can be configured for a named community list.

> **Note** Both standard and expanded community lists have a limitation of 100 community groups that can be configured within each type of list. A named community list does not have this limitation.

Benefits

The BGP Named Community Lists feature allows the network operator to assign meaningful names to community lists. This feature also increases the number of community lists that can be configured by a network operator because there is no limitation on the number of named community list that can be configured.

Related Features and Technologies

The BGP Named Community Lists feature is an extension of the BGP routing protocol. For more information about configuring BGP, policy routing, community lists, route maps, and route filtering, refer to the "Configuring BGP" chapter of the Release 12.2 *Cisco IOS IP Configuration Guide* and the "BGP Commands" chapter of the Release 12.2 *Cisco IOS IP Command Reference, Volume 2 of 3: Routing Protocols*.

Supported Platforms

The BGP Named Community List feature is supported by all platforms in Cisco IOS Release 12.2(14)S that support BGP:

- Cisco 7200 series
- Cisco 7400 series
- Cisco 7500 series

Determining Platform Support Through Cisco Feature Navigator

Cisco IOS software is packaged in feature sets that support specific platforms. To get updated information regarding platform support for this feature, access Cisco Feature Navigator. Cisco Feature Navigator dynamically updates the list of supported platforms as new platform support is added for the feature.

Cisco Feature Navigator is a web-based tool that enables you to determine which Cisco IOS software images support a specific set of features and which features are supported in a specific Cisco IOS image. You can search by feature or release. Under the release section, you can compare releases side by side to display both the features unique to each software release and the features in common.

To access Cisco Feature Navigator, you must have an account on Cisco.com. If you have forgotten or lost your account information, send a blank e-mail to cco-locksmith@cisco.com. An automatic check will verify that your e-mail address is registered with Cisco.com. If the check is successful, account details with a new random password will be e-mailed to you. Qualified users can establish an account on Cisco.com by following the directions at http://www.cisco.com/register.

Cisco Feature Navigator is updated regularly when major Cisco IOS software releases and technology releases occur. For the most current information, go to the Cisco Feature Navigator home page at the following URL:

http://www.cisco.com/go/fn

Availability of Cisco IOS Software Images

Platform support for particular Cisco IOS software releases is dependent on the availability of the software images for those platforms. Software images for some platforms may be deferred, delayed, or changed without prior notice. For updated information about platform support and availability of software images for each Cisco IOS software release, refer to the online release notes or, if supported, Cisco Feature Navigator.

Supported Standards, MIBs, and RFCs

Standards

No new or modified standards are supported by this feature.

MIBs

No new or modified MIBs are supported by this feature.

To obtain lists of supported MIBs by platform and Cisco IOS release, and to download MIB modules, go to the Cisco MIB website on Cisco.com at the following URL:

http://www.cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml

RFCs

- RFC 1997, *BGP Communities Attribute*
- RFC 1998, *An Application of the BGP Community Attribute in Multihome Routing*

Configuration Tasks

See the following sections for configuration tasks for the BGP Named Community Lists feature. Each task in the list is identified as required or optional.

- Configuring the BGP Named Community Lists Feature (required)
- Verifying the BGP Named Community Lists Feature (optional)

A named community list can be configured as a standard or expanded community list and can use regular expressions when configured as an expanded community list.

Note Regular expressions can be used only with expanded numbered community lists and expanded named community lists.

Configuring the BGP Named Community Lists Feature

To configure a named community list with standard community numbers, use the following commands in router configuration mode:

	Command	Purpose
Step 1	Router(config)# **ip community-list standard** *community-list-name*	Creates a named community list.
Step 2	Router(config)# **ip community-list standard** *community-list-name* **deny** *community*	Configures the named community list to deny any routes with matching communities.
Step 3	Router(config)# **ip community-list standard** *community-list-name* **permit** community	Configures a named community list to permit routes with matching communities.
Step 4	Router(config)# **ip community-list expanded** *community-list-name* **deny** *regular-expression*	Configures a named community list to deny routes that match the regular expression.
Step 5	Router(config)# **end**	Saves the configuration and exits router configuration mode.

Verifying the BGP Named Community Lists Feature

To verify that a named community list has been configured, use the **show ip bgp community-list** command. The output of this command will display the community list name or number and any configured route map clauses.

The following sample output is similar to the output that will be displayed when the **show ip community-list** command is entered:

```
Router# show ip community-list

Named Community standard list COMMUNITY_LIST_NAME
    permit 1234:123 9876:321
    permit 5678:123 9876:321
    permit 1234:123 64984:1
    permit 5678:123 64984:1
Named Community expanded list COMMUNITY_LIST_NAME_TWO
    permit 1
    deny 2
```

The community list name can be specified when entering the **show ip community-list** command. This option can be useful for filtering the output of this command and verifying a single named community list.

The following sample output is similar to the output that will be displayed when the **show ip community-list** command is entered and the community list name is specified:

```
Router# show ip community-list COMMUNITY_LIST_NAME_TWO

Named Community expanded list COMMUNITY_LIST_NAME_TWO
    permit 1
    deny 2
```

Monitoring and Maintaining BGP Named Community Lists

To display BGP Named Community Lists feature information, use the following EXEC commands:

Command	Purpose
Router# **show ip bgp**	Displays entries in the BGP routing table.
Router# **show ip bgp community**	Displays routes that belong to specified BGP communities.
Router# **show ip bgp community-list**	Displays routes that are permitted by the BGP community list.
Router# **show ip community-list**	Displays configured community lists.

Configuration Examples

The configuration examples in this section create and configure named community lists with the **ip community-list** global configuration command.

The following configuration example creates a named community list with the name COMMUNITY_A:

```
Router(config)# ip community-list standard COMMUNITY_A:
```

The following configuration example configures a named community list with the name COMMUNITY_B that will deny routes that are part of community 10:

```
Router(config)# ip community-list standard COMMUNITY_B deny 10
```

The following configuration example configures a named community list with the name COMMUNITY_C that will permit routes that are part of community 20:

```
Router(config)# ip community-list standard COMMUNITY_C permit 20
```

The following configuration example configures a named community list with the name COMMUNITY_D that uses a regular expression to permit any routes that are part of community 100:

```
Router(config)# ip community-list expanded COMMUNITY_D permit 100:.*
```

Command Reference

This section documents modified commands. All other commands used with this feature are documented in the Cisco IOS Release 12.2 command reference publications.

- **ip community-list**
- **match community**
- **set comm-list delete**
- **show ip bgp community-list**
- **show ip community-list**

ip community-list

To create a numbered or named community list for Border Gateway Protocol (BGP) and to control access to it, use the **ip community-list** command in global configuration command. To delete the community list, use the **no** form of this command.

> **ip community-list** {*standard-list-number* | *expanded-list-number* [*regular-expression*] | {**standard** | **expanded**} *community-list-name*} {**permit** | **deny**} *community-number* | *regular-expression*

> **no ip community-list** *standard-list-number* | *extended-list-number* | *community-list-name*

Syntax Description

standard-list-number	Specifies a standard community list number from 1 to 99 that identifies one or more permit or deny groups of communities.
expanded-list-number	Specifies an expanded community list number from 100 to 199 that identifies one or more permit or deny groups of communities.
regular-expression	(Optional) A pattern to match against an input string. **Note** Regular expressions can be used only with expanded community lists
standard	Configures a standard named community list.
expanded	Configures an expanded named community list.
community-list-name	The community list name.
permit	Permits access for a matching condition.
deny	Denies access for a matching condition.
community-number	Community number configured by a **set community** command. Valid value is one of the following: • A number from 1 to 4294967200. You can specify a single number or multiple numbers separated by a space. • **internet**—The Internet community. • **no-export**—Routes with this community are sent to peers in other subautonomous systems within a confederation. Do not advertise this route to an external BGP (eBGP) peer. External systems are those outside the confederation. If there is no confederation, an external system is any eBGP peer. • **local-as**—Send this route to peers in other subautonomous systems within the local confederation. Do not advertise this route to an external system. • **no-advertise**—Do not advertise this route to any peer (internal or external).

Defaults

Once you permit a value for the community number, the community list defaults to an implicit deny for everything else that has not been permitted.

Command Modes	Global configuration

Command History

Release	Modification
10.3	This command was introduced.
12.0	The **local-as** attribute was added.
12.0(10)S	Named community list support was added.
12.0(16)ST	Named community list support was integrated into Cisco IOS Release 12.0(16)ST.
12.1(9)E	Named community list support was integrated into Cisco IOS Release 12.1(9)E.
12.2(8)T	Named community list support was integrated into Cisco IOS Release 12.2(8)T.
12.2(14)S	Named community list support was integrated into Cisco IOS Release 12.2(14)S.

Usage Guidelines   The **standard** and **expanded** keywords are required only to configure named community lists and are not required to configure numbered community lists.

A named community list can be configured with regular expressions and with numbered community lists. All rules of numbered communities apply to named community lists except that there is no limitation on the number of community attributes that can be configured for a named community list.

Examples   The following example creates a standard community list that permits all routes except the routes with the communities 5 and 10 or 10 and 15:

```
Router(config)# ip community-list 1 deny 5 10
Router(config)# ip community-list 1 deny 10 15
Router(config)# ip community-list 1 permit internet
```

The following example creates a standard community list that permits all routes within the local autonomous system:

```
Router(config)# ip community-list 1 permit local-as
```

The following example creates a standard named community list with the name COMMUNITY_A that permits all routes within the local autonomous system and denies all routes with the internet community attribute:

```
Router(config)# ip community-list standard COMMUNITY_A permit local-AS
Router(config)# ip community-list standard COMMUNITY_A deny internet
```

The following example creates an expanded named community list with the name COMMUNITY_B that will not advertise routes to eBGP peers:

```
Router(config)# ip community-list expanded COMMUNITY_B permit no-export
```

The following example creates a named community list with the name COMMUNITY_C that will not advertise this route to any iBGP or eBGP peers:

```
Router(config)# ip community-list expanded COMMUNITY_C permit no-advertise
```

The following example uses a regular expression. The example creates a filter that will deny all communities that contain a number:

```
Router(config)# ip community-list 100 deny [0-9]*
```

Related Commands

Command	Description
match community	Matches a BGP community.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another, or enables policy routing.
set community	Sets the BGP communities attribute.
set comm-list delete	Removes communities from the community attribute of an inbound or outbound update.
show ip bgp community	Displays routes that belong to specified BGP communities.

match community

To match a Border Gateway Protocol (BGP) community, use the **match community** command in route-map configuration mode. To remove the **match community** command from the configuration file and restore the system to its default condition where the software removes the BGP community list entry, use the **no** form of this command.

> **match community** *standard-list-number | expanded-list-number | community-list-name* [**exact**]

> **no match community** *standard-list-number | expanded-list-number | community-list-name* [**exact**]

Syntax Description		
	standard-list-number	Specifies a standard community list number from 1 to 99 that identifies one or more permit or deny groups of communities.
	expanded-list-number	Specifies an expanded community list number from 100 to 199 that identifies one or more permit or deny groups of communities.
	community-list-name	The community list name.
	exact	(Optional) Indicates that an exact match is required. All of the communities and only those communities specified must be present.

Defaults   No community list is matched by the route map.

Command Modes   Route-map configuration

Command History

Release	Modification
12.1(9)E	Named community list support was integrated into Cisco IOS Release 12.1(9)E.
12.2(8)T	Named community list support was integrated into Cisco IOS Release 12.2(8)T.
12.2(14)S	Named community list support was integrated into Cisco IOS Release 12.2(14)S.

Usage Guidelines   A route map can have several parts. Any route that does not match at least one **match** command relating to a **route-map** command will be ignored; that is, the route will not be advertised for outbound route maps and will not be accepted for inbound route maps. If you want to modify only some data, you must configure a second route-map section with an explicit match specified.

Matching based on community list number is one of the types of **match** commands applicable to BGP.

Examples   The following example shows that the routes matching community list 1 will have the weight set to 100. Any route that has community 109 will have the weight set to 100.

```
Router(config)# ip community-list 1 permit 109
Router(config)# !
Router(config)# route-map set_weight
Router(config-route-map)#  match community 1
Router(config-route-map)# set weight 100
```

The following example shows that the routes matching community list 1 will have the weight set to 200. Any route that has community 109 alone will have the weight set to 200.

```
Router(config)# ip community-list 1 permit 109
Router(config)# !
Router(config)# route-map set_weight
Router(config-route-map)# match community 1 exact
Router(config-route-map)# set weight 200
```

In the following example, the routes that match community list LIST_NAME will have the weight set to 100. Any route that has community 101 alone will have the weight set to 100.

```
Router(config)# ip community-list 1 permit 101
Router(config)# !
Router(config)# route-map set_weight
Router(config-route-map)# match community LIST_NAME
Router(config-route-map)# set weight 100
```

Related Commands

Command	Description
ip community-list	Creates a community list for BGP and controls access to it.
route-map (IP)	Defines the conditions for redistributing routes from one routing protocol into another.
set weight	Specifies the BGP weight for the routing table.

set comm-list delete

To remove communities from the community attribute of an inbound or outbound update, use the **set comm-list delete** command in route-map configuration mode. To negate a previous **set comm-list delete** command, use the **no** form of this command.

> **set comm-list** *community-list-number | community-list-name* **delete**

> **no set comm-list** *community-list-number | community-list-name* **delete**

Syntax Description

community-list-number	A standard or expanded community list number.
community-list-name	A standard or expanded community list name.

Defaults

No communities are removed.

Command Modes

Route-map configuration

Command History

Release	Modification
12.0	This command was introduced.
12.0(10)S	Named community list support was added.
12.0(16)ST	Named community list support was integrated into Cisco IOS Release 12.0(16)ST.
12.1(9)E	Named community list support was integrated into Cisco IOS Release 12.1(9)E.
12.2(8)T	Named community list support was integrated into Cisco IOS Release 12.2(8)T.
12.2(14)S	Named community list support was integrated into Cisco IOS Release 12.2(14)S.

Usage Guidelines

This **set** route-map configuration command removes communities from the community attribute of an inbound or outbound update using a route map to filter and determine the communities to be deleted. Depending upon whether the route map is applied to the inbound or outbound update for a neighbor, each community that passes the route map **permit** clause and matches the given community list will be removed from the community attribute being received from or sent to the Border Gateway Protocol (BGP) neighbor.

Each entry of a standard community list should list only one community when used with the **set comm-list delete** command. For example, in order to be able to delete communities 10:10 and 10:20, you must use the following format to create the entries:

```
ip community-list 5 permit 10:10
ip community-list 5 permit 10:20
```

The following format for a community list entry, while acceptable otherwise, does not work with the **set comm-list delete** command:

```
config ip community-list 5 permit 10:10 10:20
```

When both the **set community** *community-number* and **set comm-list delete** commands are configured in the same sequence of a route map attribute, the deletion operation (**set comm-list delete**) is performed before the set operation (**set community** *community-number*).

Examples

In the following example, the communities 100:10 and 100:20 (if present) will be deleted from updates received from 172.16.233.33. Also, except for 100:50, all communities beginning with 100: will be deleted from updates sent to 172.16.233.33.

```
router bgp 100
 neighbor 172.16.233.33 remote-as 120
 neighbor 172.16.233.33 route-map ROUTEMAPIN in
 neighbor 172.16.233.33 route-map ROUTEMAPOUT out
!
ip community-list 1 permit 100:10
ip community-list 1 permit 100:20
!
ip community-list 120 deny   100:50
ip community-list 120 permit 100:.*
!
route-map ROUTEMAPIN permit 10
 set comm-list 1 delete
!
route-map ROUTEMAPOUT permit 10
 set comm-list 120 delete
```

Related Commands

Command	Description
set community	Sets the BGP communities attribute.

show ip bgp community-list

To display routes that are permitted by the Border Gateway Protocol (BGP) community list, use the **show ip bgp community-list** command in EXEC mode.

> **show ip bgp community-list** *standard-community-list-number | expanded-community-list-number | community-list-name* [**exact-match**]

Syntax Description

standard-community-list-number	Community list number in the range from 1 to 99.
expanded-community-list-number	Community list number in the range from 100 to 199.
community-list-name	Community list name. The community list name can be standard or expanded.
exact-match	(Optional) Displays only routes that have an exact match.

Command Modes   EXEC

Command History

Release	Modification
10.3	This command was introduced.
12.0(10)S	Named community list support was added.
12.0(16)ST	Named community list support was integrated into Cisco IOS Release 2.0(16)ST.
12.1(9)E	Named community list support was integrated into Cisco IOS Release 12.1(9)E.
12.2(8)T	Named community list support was integrated into Cisco IOS Release 12.2(8)T.
12.2(14)S	Named community list support was integrated into Cisco IOS Release 12.2(14)S.

Usage Guidelines   This command requires the network operator to specify an argument when used. The **exact-match** keyword is optional.

Examples   The following is sample output of the **show ip bgp community-list** command in privileged EXEC mode:

```
Router# show ip bgp community-list 20

BGP table version is 716977, local router ID is 192.168.32.1
Status codes: s suppressed, * valid, > best, i - internal
Origin codes: i - IGP, e - EGP, ? - incomplete

   Network          Next Hop          Metric LocPrf Weight Path
* i3.0.0.0          10.0.22.1              0    100      0 1800 1239 ?
*>i                 10.0.16.1              0    100      0 1800 1239 ?
* i6.0.0.0          10.0.22.1              0    100      0 1800 690 568 ?
*>i                 10.0.16.1              0    100      0 1800 690 568 ?
```

```
* i7.0.0.0          10.0.22.1            0    100     0 1800 701 35 ?
*>i                 10.0.16.1            0    100     0 1800 701 35 ?
*                   10.92.72.24                         0 1878 704 701 35 ?
* i8.0.0.0          10.0.22.1            0    100     0 1800 690 560 ?
*>i                 10.0.16.1            0    100     0 1800 690 560 ?
*                   10.92.72.24                         0 1878 704 701 560 ?
* i13.0.0.0         10.0.22.1            0    100     0 1800 690 200 ?
*>i                 10.0.16.1            0    100     0 1800 690 200 ?
*                   10.92.72.24                         0 1878 704 701 200 ?
* i15.0.0.0         10.0.22.1            0    100     0 1800 174 ?
*>i                 10.0.16.1            0    100     0 1800 174 ?
* i16.0.0.0         10.0.22.1            0    100     0 1800 701 i
*>i                 10.0.16.1            0    100     0 1800 701 i
*                   10.92.72.24                         0 1878 704 701 i
```

Table 1 describes the significant fields shown in the display.

Table 1   ***show ip bgp community-list Field Descriptions***

Field	Description
BGP table version	Internal version number of the table. This number is incremented whenever the table changes.
local router ID	IP address of the router.
Status codes	Status of the table entry. The status is displayed at the beginning of each line in the table. It can be one of the following values: s—The table entry is suppressed. *—The table entry is valid. >—The table entry is the best entry to use for that network. i—The table entry was learned via an internal BGP (iBGP) session.
Origin codes	Origin of the entry. The origin code is placed at the end of each line in the table. It can be one of the following values: i—Entry originated from an Interior Gateway Protocol (IGP) and was advertised with a **network** router configuration command. e—Entry originated from an Exterior Gateway Protocol (EGP). ?—Origin of the path is not clear. Usually, this is a router that is redistributed into BGP from an IGP.
Network	IP address of a network entity.
Next Hop	IP address of the next system that is used when forwarding a packet to the destination network. An entry of 0.0.0.0 indicates that the router has some non-BGP routes to this network.
Metric	If shown, this is the value of the interautonomous system metric. This field is frequently not used.
LocPrf	Local preference value as set with the **set local-preference** route-map configuration command. The default value is 100.
Weight	Weight of the route as set via autonomous system filters.
Path	Autonomous system paths to the destination network. There can be one entry in this field for each autonomous system in the path.

show ip community-list

To display configured community lists, use the **show ip community-list** command in EXEC mode.

> **show ip community-list** [*standard-community-list-number* | *extended-community-list-number* | *community-list-name*] [**exact-match**]

Syntax Description

standard-community-list-number	(Optional) Community list number in the range from 1 to 99.
expanded-community-list-number	(Optional) Community list number in the range from 100 to 199.
community-list-name	(Optional) Community list name. The community list name can be standard or expanded.
exact-match	(Optional) Displays only routes that have an exact match.

Command Modes   EXEC

Command History

Release	Modification
11.0	This command was introduced.
12.0(10)S	Named community list support was added.
12.0(16)ST	Named community lists support was integrated into Cisco IOS Release 12.0(16)ST.
12.1(9)E	Named community lists support was integrated into Cisco IOS Release 12.1(9)E.
12.2(8)T	Named community lists support was integrated into Cisco IOS Release 12.2(8)T.
12.2(14)S	Named community lists support was integrated into Cisco IOS Release 12.2(14)S.

Usage Guidelines   This command can be used without any arguments or keywords. If no arguments are specified, this command will display all community lists. However, the community list name or number can be specified when entering the **show ip community-list** command. This option can be useful for filtering the output of this command and verifying a single named or numbered community list.

Examples   The following sample output is similar to the output that will be displayed when the **show ip community-list** command is entered in privileged EXEC mode:

```
Router# show ip community-list

Community standard list 1
    permit 3
    deny 5
Community (expanded) access list 101
    deny 4
    permit 6
Named Community standard list COMMUNITY_LIST_NAME
    permit 1
```

```
    deny 7
Named Community expanded list COMMUNITY_LIST_NAME_TWO
    deny 2
    permit 8
```

Table 2 describes the significant fields shown in the display.

Table 2   show ip bgp community list Field Descriptions

Field	Description
Community standard list	If shown, this value will display a standard community list number (1 to 99). The standard community list number will immediately follow this value.
Community (expanded) access list	If shown, this value will display an expanded community list number (100 to 199). The expanded community list number will immediately follow this value.
Named community standard list	If shown, this value will display a standard community list name. The standard community list name will immediately follow this value.
Named community expanded list	If shown, this value will display an expanded community list name. The expanded community list name will immediately follow this value.