BGP Monitoring Protocol

The BGP Monitoring Protocol (BMP) feature supports the following functionality to monitor Border Gateway Protocol (BGP) neighbors, also called BMP clients:

• Configure devices to function as BMP servers, and set up parameters on the servers, that are required for monitoring of the BGP neighbors.
• Establish connectivity of the BMP servers with BGP neighbors for monitoring.
• Generate statistics report from monitoring the BGP neighbors.
• Perform appropriate error handling on the BGP neighbors.
• Graceful scale up and degradation to the point of closing connectivity between the BMP servers and BGP neighbors.

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Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see Bug Search Tool and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.
Prerequisites for BGP Monitoring Protocol

Before you configure BGP Monitoring Protocol (BMP) servers, you must configure Border Gateway Protocol (BGP) neighbors, which function as BMP clients, and establish a session with its peers using either IPv4/IPv6 or VPNv4/VPNv6 address-family identifiers.

Information About BGP Monitoring Protocol

BGP Monitoring Protocol Overview

The BGP Monitoring Protocol (BMP) feature enables monitoring of BGP neighbors (called BMP clients). You can configure a device to function as a BMP server, which monitors either one or several BMP clients, which in turn, has several active peer sessions configured. You can also configure a BMP client to connect to one or more BMP servers. The BMP feature enables configuration of multiple BMP servers (configured as primary servers) to function actively and independent of each other, simultaneously to monitor BMP clients.

Each BMP server is specified by a number and you can use command-line interface (CLI) to configure parameters such as IP address, port number, and so on. Upon activation of a BMP server, it attempts to connect to BMP clients by sending an initiation message. The CLI enables multiple—独立的 and asynchronous—BMP server connections.

BGP neighbors, called BMP clients, are configured to send data to specific BMP servers for monitoring purposes. These clients are configured in a queue. When a request for a connection arrives from BMP clients to BMP servers, the connection is established based on the order in which the requests arrived. Once the BMP server connects with the first BMP neighbor, it sends out refresh requests to monitor the BMP clients and starts monitoring those BMP clients with whom the connection is already established.

The session connection requests from the other BMP clients in queue to the BMP servers initiates after an initial delay that you can configure using the `initial-delay` command. If a connection establishes but fails later, due to some reason, the connection request is retried after a delay, which you can configure using the `failure-retry-delay` command. If there is repeated failure in connection establishment, the connection retries are delayed based on the delay configured using the `flapping-delay` command. Configuring the delay for such requests becomes significant because the route refresh requests that are sent to all connected BMP clients causes considerable network traffic and load on the device.

To avoid excessive load on the device, the BMP servers sends route refresh requests to individual BMP clients at a time, in the order in which connections are established in the queue. Once a BMP client that is already connected is in the “reporting” state, it sends a “peer-up” message to the BMP server. After the client receives a route-refresh request, route monitoring begins for that neighbor. Once the route refresh request ends, the next neighbor in the queue is processed. This cycle continues until all “reporting” BMP neighbors are reported and all routes sent by these “reporting” BMP neighbors are continuously monitored. If a neighbor establishes after BMP monitoring has begun, it does not require a route-refresh request. All received routes from that client is sent to BMP servers.

It is advantageous to batch up refresh requests from BMP clients, if several BMP servers are activated in quick succession. Use the `bmp initial-refresh delay` command to configure a delay in triggering the refresh mechanism when the first BMP server comes up. If other BMP servers come online within this time-frame, only one set of refresh requests is sent to the BMP clients. You can also configure the `bmp initial-refresh skip` command to skip all refresh requests from BMP servers and just monitor all incoming messages from the peers.
In a client-server configuration, it is recommended that the resource load of the devices be kept minimal and adding excessive network traffic must be avoided. In the BMP configuration, you can configure various delay timers on the BMP server to avoid flapping during connection between the server and client. To avoid excessive message throughput or high usage of system resources, you can configure the maximum buffer limit for the BMP session.

How to Configure BGP Monitoring Protocol

Configuring a BGP Monitoring Protocol Session

Perform this task to configure BGP Monitoring Protocol (BMP) session parameters for the BMP servers to establish connectivity with BMP clients.

SUMMARY STEPS

1. enable
2. configure terminal
3. router bgp as-number
4. bmp {buffer-size buffer-bytes | initial-refresh {delay refresh-delay | skip} | server server-number-n
5. end

DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 enable</td>
<td>Enables privileged EXEC mode.</td>
</tr>
<tr>
<td>Example: Device&gt; enable</td>
<td>• Enter your password if prompted.</td>
</tr>
<tr>
<td>Step 2 configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Example: Device# configure terminal</td>
<td></td>
</tr>
<tr>
<td>Step 3 router bgp as-number</td>
<td>Enters router configuration mode and creates a BGP routing process.</td>
</tr>
<tr>
<td>Example: Device(config)# router bgp 65000</td>
<td></td>
</tr>
<tr>
<td>Step 4 bmp {buffer-size buffer-bytes</td>
<td>initial-refresh {delay refresh-delay</td>
</tr>
<tr>
<td>Example: Device(config-router)# bmp initial-refresh delay 30</td>
<td></td>
</tr>
</tbody>
</table>
Configuring BGP Monitoring Protocol on BGP Neighbors

Perform this task to activate BGP Monitoring Protocol (BMP) on BGP neighbors (also called BMP clients) so that the client activity is monitored by the BMP server configured on the neighbor.

**SUMMARY STEPS**

1. **enable**
2. **configure terminal**
3. **router bgp as-number**
4. **neighbor [ipv4-addr | neighbor-tag | ipv6-addr] bmp-activate {all | server server-number-1 [server server-number-2 . . . [server server-number-n]]}**
   - Repeat Steps 1 to 4 to configure other BMP clients in the session.
5. **end**

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td><strong>enable</strong></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Device&gt; enable</td>
</tr>
<tr>
<td></td>
<td>Enables privileged EXEC mode.</td>
</tr>
<tr>
<td></td>
<td>• Enter your password if prompted.</td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td><strong>configure terminal</strong></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Device# configure terminal</td>
</tr>
<tr>
<td></td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td><strong>router bgp as-number</strong></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Device(config)# router bgp 65000</td>
</tr>
<tr>
<td></td>
<td>Enters router configuration mode and creates a BGP routing process.</td>
</tr>
<tr>
<td><strong>Step 4</strong></td>
<td>**neighbor [ipv4-addr</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td>Activates BMP monitoring on a BGP neighbor.</td>
</tr>
<tr>
<td></td>
<td>• Repeat Steps 1 to 4 to configure other BMP clients in the session.</td>
</tr>
</tbody>
</table>
### Configuring BGP Monitoring Protocol Servers

Perform this task to configure BGP Monitoring Protocol (BMP) servers and its parameters in BMP server configuration mode.

**SUMMARY STEPS**

1. **enable**
2. **configure terminal**
3. **router bgp as-number**
4. **bmp {buffer-size buffer-bytes | initial-refresh {delay refresh-delay | skip} | server server-number-n**
5. **activate**
6. **address {ipv4-addr | ipv6-addr} port-number port-number**
7. **description LINE server-description**
8. **failure-retry-delay failure-retry-delay**
9. **flapping-delay flap-delay**
10. **initial-delay initial-delay-time**
11. **set ip dscp dscp-value**
12. **stats-reporting-period report-period**
13. **update-source interface-type interface-number**
14. **exit-bmp-server-mode**

• Repeat Steps 1 to 14 to configure other BMP servers in the session.

15. **end**

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
</table>
| **Step 1**

**enable**

**Example:**

Device# enable

Enables privileged EXEC mode.

• Enter your password if prompted.

| **Step 2**

**configure terminal**

**Example:**

Device# configure terminal

Enters global configuration mode.
### Purpose

**Step 3**

**Command or Action**: `router bgp as-number`  
Example:  
Device(config)# router bgp 65000  

Enters router configuration mode and creates a BGP routing process.

**Step 4**

**Command or Action**: `bmp {buffer-size buffer-bytes | initial-refresh {delay refresh-delay | skip} | server server-number-n}`  
Example:  
Device(config-router)# bmp server 1  

Enters BMP server configuration mode to configure BMP servers.

**Step 5**

**Command or Action**: `activate`  
Example:  
Device(config-router-bmpsrvr)# activate  

Initiates a connection between BMP server and BGP neighbors.

**Step 6**

**Command or Action**: `address {ipv4-addr | ipv6-addr} port-number`  
Example:  
Device(config-router-bmpsrvr)# address 10.1.1.1 port-number 8000  

Configures IP address and port number to a specific BMP server.

**Step 7**

**Command or Action**: `description LINE server-description`  
Example:  
Device(config-router-bmpsrvr)# description LINE SERVER1  

Configures a textual description of a BMP server.

**Step 8**

**Command or Action**: `failure-retry-delay`  
Example:  
Device(config-router-bmpsrvr)# failure-retry-delay 40  

Configures delay in the retry requests during failures when sending BMP server updates.

**Step 9**

**Command or Action**: `flapping-delay`  
Example:  
Device(config-router-bmpsrvr)# flapping-delay 120  

Configures delays in flapping when sending BMP server updates.

**Step 10**

**Command or Action**: `initial-delay initial-delay-time`  
Example:  
Device(config-router-bmpsrvr)# initial-delay 20  

Configures delays in sending initial requests for updates from the BMP servers.

**Step 11**

**Command or Action**: `set ip dscp dscp-value`  
Example:  

Configures the IP Differentiated Services Code Point (DSCP) values for BMP servers.
<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Device(config-router-bmpsrvr)# set ip dscp 5</td>
<td>Configures the time interval in which the BMP server receives the statistics report from BGP neighbors.</td>
</tr>
<tr>
<td><strong>Step 12</strong></td>
<td></td>
</tr>
<tr>
<td><strong>stats-reporting-period</strong> report-period**</td>
<td></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td></td>
</tr>
<tr>
<td>Device(config-router-bmpsrvr)# stats-reporting-period 30</td>
<td></td>
</tr>
<tr>
<td><strong>Step 13</strong></td>
<td></td>
</tr>
<tr>
<td><strong>update-source</strong> interface-type interface-number</td>
<td>Configures the interface source for routing updates on the BMP servers.</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td></td>
</tr>
<tr>
<td>Device(config-router-bmpsrvr)# update-source ethernet 0/0</td>
<td></td>
</tr>
<tr>
<td><strong>Step 14</strong></td>
<td></td>
</tr>
<tr>
<td><strong>exit-bmp-server-mode</strong></td>
<td>Exits from BMP server configuration mode and returns to router configuration mode.</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td></td>
</tr>
<tr>
<td>Device(config-router-bmpsrvr)# exit-bmp-server-mode</td>
<td></td>
</tr>
<tr>
<td><strong>Step 15</strong></td>
<td></td>
</tr>
<tr>
<td><strong>end</strong></td>
<td>Returns to privileged EXEC mode.</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td></td>
</tr>
<tr>
<td>Device(config-router)# end</td>
<td></td>
</tr>
</tbody>
</table>

### Verifying BGP Monitoring Protocol

Perform the following steps to verify the configuration for the BGP Monitoring Protocol (BMP) servers and BMP clients:

**SUMMARY STEPS**

1. **enable**
2. **show ip bgp bmp**
3. **show running-config**

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td></td>
</tr>
<tr>
<td><strong>enable</strong></td>
<td>Enables privileged EXEC mode.</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td></td>
</tr>
<tr>
<td>Device&gt; enable</td>
<td></td>
</tr>
<tr>
<td><strong>Step 14</strong></td>
<td></td>
</tr>
<tr>
<td><strong>exit-bmp-server-mode</strong></td>
<td></td>
</tr>
</tbody>
</table>
## Monitoring BGP Monitoring Protocol

Perform the following steps to enable debugging and monitor the BGP Monitoring Protocol (BMP) servers.

### SUMMARY STEPS

1. `enable`
2. `debug ip bgp bmp`
3. `show debugging`

### DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> <code>enable</code></td>
<td>Enables privileged EXEC mode.</td>
</tr>
<tr>
<td>Example: <code>Device&gt; enable</code></td>
<td>* Enter your password if prompted.</td>
</tr>
<tr>
<td><strong>Step 2</strong> <code>debug ip bgp BMP</code></td>
<td>Enables debugging of the BMP attributes.</td>
</tr>
<tr>
<td>Example: <code>Device# debug ip bgp bmp server</code></td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong> <code>show debugging</code></td>
<td>Displays information about the types of debugging that are enabled on a device.</td>
</tr>
<tr>
<td>Example: <code>Device# show debugging</code></td>
<td></td>
</tr>
</tbody>
</table>
Configuration Examples for BGP Monitoring Protocol

Examples for Configuring, Verifying, and Monitoring BGP Monitoring Protocol

Examples: Configuring BGP Monitoring Protocol

Note

There are two levels of configuration required for the BGP Monitoring Protocol (BMP) to function as designed. You must enable BMP monitoring on each BGP neighbor (also called BMP client) to which several peers are connected in a network, and establish connectivity between the BMP servers and clients. Then, configure each BMP server in BMP server configuration mode for a specific server with the parameters required for monitoring the associated BMP clients.

The following example shows how to activate BMP on a neighbor with IP address 30.1.1.1, which is monitored by BMP servers (in this case, server 1 and 2):

```
Device> enable
Device# configure terminal
Device(config)# router bgp 65000
Device(config-router)# neighbor 30.1.1.1 bmp-activate server 1 server 2
Device(config-router)# end
```

The following example shows how to configure initial refresh delay of 30 seconds for BGP neighbors on which BMP is activated using the `neighbor bmp-activate` command:

```
Device> enable
Device# configure terminal
Device(config)# router bgp 65000
Device(config-router)# bmp initial-refresh delay 30
Device(config-router)# bmp buffer-size 2048
Device(config-router)# end
```

The following example show how to enter BMP server configuration mode and initiate connection between a specific BMP server with the BGP BMP neighbors. In this example, connection to clients is initiated from BMP servers 1 and 2 along with configuration of the monitoring parameters:

```
Device> enable
Device# configure terminal
Device(config)# router bgp 65000
Device(config-router)# bmp server 1
Device(config-router-bmpsrvr)# activate
Device(config-router-bmpsrvr)# address 10.1.1.1 port-number 8000
Device(config-router-bmpsrvr)# description LINE SERVER1
Device(config-router-bmpsrvr)# failure-retry-delay 40
Device(config-router-bmpsrvr)# flapping-delay 120
Device(config-router-bmpsrvr)# initial-delay 20
Device(config-router-bmpsrvr)# set ip dscp 5
Device(config-router-bmpsrvr)# stats-reporting-period 30
Device(config-router-bmpsrvr)# update-source ethernet 0/0
Device(config-router-bmpsrvr)# exit-bmp-server-mode
Device(config-router-bmpsrvr)# bmp server 2
```
Examples: Verifying BGP Monitoring Protocol

The following is sample output from the `show ip bgp bmp server` command for server number 1. The attributes displayed are configured in the BMP server configuration mode:

```
Device# show ip bgp bmp server 1

Print detailed info for 1 server number 1.

bmp server 1
  address: 10.1.1.1  port 8000
  description SERVER1
  up time 00:06:22
  session-startup route-refresh
  initial-delay 20
  failure-retry-delay 40
  flapping-delay 120
  activated
```

The following is sample output from the `show ip bgp bmp server` command for server number 2. The attributes displayed are configured in the BMP server configuration mode:

```
Device# show ip bgp bmp server 2

Print detailed info for 1 server number 2.

bmp server 2
  address: 20.1.1.1  port 9000
  description SERVER2
  up time 00:06:23
  session-startup route-refresh
  initial-delay 20
  failure-retry-delay 40
  flapping-delay 120
  activated
```

The following is sample output from the `show ip bgp bmp server summary` command after deactivating the BMP server 1 and 2 connections:

```
Device# show ip bgp bmp server summary

Number of BMP servers configured: 2
Number of BMP neighbors configured: 10
Number of neighbors on TransitionQ: 0, MonitoringQ: 0, ConfigQ: 0
Number of BMP servers on StatsQ: 0
BMP Refresh not in progress, refresh not scheduled
Initial Refresh Delay configured, refresh value 30s
BMP buffer size configured, buffer size 2048 MB, buffer size bytes used 0 MB
```
The following is sample output from the `show ip bgp bmp neighbors` command, which shows the status of the BGP BMP neighbors after reactivating the BMP server 1 and 2 connections:

Device# `show ip bgp bmp server neighbors`

Number of BMP neighbors configured: 10
BMP Refresh not in progress, refresh not scheduled
Initial Refresh Delay configured, refresh value 30s
BMP buffer size configured, buffer size 2048 MB, buffer size bytes used 0 MB

The following is sample output from the `show ip bgp bmp server` command for BMP server number 1 and 2. The statistics reporting interval on BMP server 1 and 2 has been set to 30 seconds, therefore each server receives statistics messages from its connected BGP BMP neighbor in each cycle of 30 seconds:

Device# `show ip bgp bmp server summary`

Number of BMP servers configured: 2
Number of BMP neighbors configured: 10
Number of neighbors on TransitionQ: 0, MonitoringQ: 0, ConfigQ: 0
Number of BMP servers on StatsQ: 0
BMP Refresh not in progress, refresh not scheduled
Initial Refresh Delay configured, refresh value 30s
BMP buffer size configured, buffer size 2048 MB, buffer size bytes used 0 MB

The following is sample output from the `show ip bgp bmp server` command for BMP server number 1 and 2. The statistics reporting interval on BMP server 1 and 2 has been set to 30 seconds, therefore each server receives statistics messages from its connected BGP BMP neighbor in each cycle of 30 seconds:

Device# `show ip bgp bmp server summary`

Number of BMP servers configured: 2
Number of BMP neighbors configured: 10
Number of neighbors on TransitionQ: 0, MonitoringQ: 0, ConfigQ: 0
Number of BMP servers on StatsQ: 0
BMP Refresh not in progress, refresh not scheduled
Initial Refresh Delay configured, refresh value 30s
BMP buffer size configured, buffer size 2048 MB, buffer size bytes used 0 MB
If we configure several BGP BMP neighbors to be monitored by the BMP servers, for example 10, then 10 statistics messages are received by both servers in each periodic cycle that is configured.

The following is sample output from the `show running-config` command, which shows the running configuration on the device:

```
Device# show running-config | section bmp

bmp server 1
address 10.1.1.1 port-number 8000
description SERVER1
initial-delay 20
failure-retry-delay 40
flapping-delay 120
update-source Ethernet0/0
set ip dscp 3
activate
exit-bmp-server-mode

bmp server 2
address 20.1.1.1 port-number 9000
description SERVER2
initial-delay 20
failure-retry-delay 40
flapping-delay 120
update-source Ethernet2/0
set ip dscp 5
activate
exit-bmp-server-mode

bmp initial-refresh delay 30
bmp-activate all
```

**Examples: Monitoring BGP Monitoring Protocol**

The following example shows how to enable debugging of the various BMP attributes:

```
Device# debug ip bgp bmp event
BGP BMP events debugging is on

Device# debug ip bgp bmp neighbor
BGP BMP neighbor debugging is on

Device# debug ip bgp bmp server
BGP BMP server debugging is on

The following is sample output from the `show debugging` command after you enable the BGP BMP server debugging:

```
Device# show debugging
IP routing:
BGP BMP server debugging is on
Device#```
Additional References for BGP Monitoring Protocol

Related Documents

<table>
<thead>
<tr>
<th>Related Topic</th>
<th>Document Title</th>
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</thead>
<tbody>
<tr>
<td>Cisco IOS commands</td>
<td>Cisco IOS Master Command List, All Releases</td>
</tr>
<tr>
<td>BGP commands</td>
<td>Cisco IOS IP Routing: BGP Command Reference</td>
</tr>
</tbody>
</table>

Technical Assistance

<table>
<thead>
<tr>
<th>Description</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Cisco Support website provides extensive online resources, including</td>
<td><a href="http://www.cisco.com/support">http://www.cisco.com/support</a></td>
</tr>
<tr>
<td>documentation and tools for troubleshooting and resolving technical issues</td>
<td></td>
</tr>
<tr>
<td>with Cisco products and technologies.</td>
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<tr>
<td>To receive security and technical information about your products, you can</td>
<td></td>
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<tr>
<td>subscribe to various services, such as the Product Alert Tool (accessed from</td>
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<tr>
<td>Field Notices), the Cisco Technical Services Newsletter, and Really Simple</td>
<td></td>
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<tr>
<td>Syndication (RSS) Feeds.</td>
<td></td>
</tr>
<tr>
<td>Access to most tools on the Cisco Support website requires a Cisco.com user</td>
<td></td>
</tr>
<tr>
<td>ID and password.</td>
<td></td>
</tr>
</tbody>
</table>
Feature Information for BGP Monitoring Protocol

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.
Table 1: Feature Information for BGP Monitoring Protocol

<table>
<thead>
<tr>
<th>Feature Name</th>
<th>Releases</th>
<th>Feature Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGP Monitoring Protocol</td>
<td>Cisco IOS XE Release 3.11S</td>
<td></td>
</tr>
<tr>
<td>Feature Name</td>
<td>Releases</td>
<td>Feature Description</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>----------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Feature Description</td>
<td></td>
<td>The BMP feature supports the following functionality to enable monitoring of the Border Gateway Protocol (BGP) neighbors, which become BMP clients:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Configure devices to function as BMP servers, and set up parameters on the servers, that are required for monitoring of the BGP neighbors.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Establish connectivity of the BMP servers with BGP neighbors for monitoring.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Generate statistics report from monitoring the BGP neighbors.</td>
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<tr>
<td></td>
<td></td>
<td>• Perform appropriate error handling on the BGP neighbors.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Graceful scale up and degradation to the point of closing connectivity between the BMP servers and BGP neighbors.</td>
</tr>
<tr>
<td>The following commands were</td>
<td></td>
<td>introduced or modified:</td>
</tr>
<tr>
<td>introduced or modified:</td>
<td></td>
<td><strong>bmp</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>debug ip bgp bmp</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>neighbor bmp-activate</strong></td>
</tr>
<tr>
<td></td>
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<td><strong>show ip bgp bmp</strong></td>
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<tr>
<td>The following commands were</td>
<td></td>
<td>introduced in BMP server configuration mode, to configure specific BMP servers:</td>
</tr>
<tr>
<td>introduced in BMP server</td>
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<td>configuration mode, to configure specific BMP servers:</td>
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<td>configuration mode, to configure</td>
<td></td>
<td>specific BMP servers:</td>
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<tr>
<td>specific BMP servers:</td>
<td></td>
<td><strong>activate</strong></td>
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<tr>
<td></td>
<td></td>
<td><strong>address</strong></td>
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<td><strong>default</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>description</strong></td>
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<tr>
<td></td>
<td></td>
<td><strong>exit-bmp-server-mode</strong></td>
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<tr>
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<td><strong>failure-retry-delay</strong></td>
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<td><strong>flapping-delay</strong></td>
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BGP Monitoring Protocol
<table>
<thead>
<tr>
<th>Feature Name</th>
<th>Releases</th>
<th>Feature Description</th>
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<tbody>
<tr>
<td>initial-delay</td>
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<td>set ip dscp</td>
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<td>stats-reporting-period</td>
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<td>update-source</td>
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