Configuring Graceful Insertion and Removal

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About Graceful Insertion and Removal

You can use graceful insertion and removal to gracefully eject a switch and isolate it from the network in order to perform debugging or upgrade operations. The switch is removed from the regular forwarding path with minimal traffic disruption. When you are finished performing debugging or upgrade operations, you can use graceful insertion to return the switch to its fully operational (normal) mode.

In graceful removal, all protocols and vPC domains are gracefully brought down and the switch is isolated from the network. In graceful insertion, all protocols and vPC domains are restored.

The following protocols are supported (for both IPv4 and IPv6 address families):

• Border Gateway Protocol (BGP)
• Enhanced Interior Gateway Routing Protocol (EIGRP)
• Intermediate System-to-Intermediate System (ISIS)
• Open Shortest Path First (OSPF)
• Protocol Independent Multicast (PIM)
• Routing Information Protocol (RIP)
For graceful insertion and removal, the PIM protocol is applicable only to vPC environments. During graceful removal, the vPC forwarding role is transferred to the vPC peer for all northbound sources of multicast traffic.

Profiles

By default, the system isolates all enabled protocols during graceful removal and restores them during graceful insertion. The protocols are isolated and restored in a predefined order.

If you want to isolate, shut down, or restore the protocols individually (or perform additional configurations), you can create a profile with configuration commands that can be applied during graceful removal or graceful insertion. However, you need to make sure that the order of the protocols is correct and any dependencies are considered.

The switch supports the following profiles:

- Maintenance-mode profile—Contains all the commands that will be executed during graceful removal, when the switch enters maintenance mode.
- Normal-mode profile—Contains all the commands that will be executed during graceful insertion, when the switch returns to normal mode.

The following commands (along with any configuration commands) are supported in the profiles:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>isolate</code></td>
<td>Isolates the protocol from the switch and puts the protocol in maintenance mode.</td>
</tr>
<tr>
<td><code>no isolate</code></td>
<td>Restores the protocol and puts the protocol in normal mode.</td>
</tr>
<tr>
<td><code>shutdown</code></td>
<td>Shuts down the protocol or vPC domain.</td>
</tr>
<tr>
<td><code>no shutdown</code></td>
<td>Brings up the protocol or vPC domain.</td>
</tr>
<tr>
<td><code>system interface shutdown</code></td>
<td>Shuts down the system interfaces (except the management interface).</td>
</tr>
<tr>
<td><code>no system interface shutdown</code></td>
<td>Brings up the system interfaces.</td>
</tr>
<tr>
<td><code>sleep instance instance-number seconds</code></td>
<td>Delays the execution of the command by a specified number of seconds. You can delay multiple instances of the command.</td>
</tr>
<tr>
<td></td>
<td>The range for the <code>instance-number</code> and <code>seconds</code> arguments is from 0 to 2177483647.</td>
</tr>
</tbody>
</table>
Configuring Graceful Insertion and Removal

Snapshots

In Cisco NX-OS, a snapshot is the process of capturing the running states of selected features and storing them on persistent storage media.

Snapshots are useful to compare the state of a switch before graceful removal and after graceful insertion. The snapshot process consists of three parts:

- Creating a snapshot of the states of a few preselected features on the switch and storing them on the persistent storage media
- Listing the snapshots taken at various time intervals and managing them
- Comparing snapshots and showing the differences between features

Licensing Requirements for GIR

<table>
<thead>
<tr>
<th>Product</th>
<th>License Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco NX-OS</td>
<td>Graceful insertion and removal (GIR) requires no license. Any feature not included in a license package is bundled with the nx-os image and is provided at no extra charge to you. For a complete explanation of the Cisco NX-OS licensing scheme, see the <em>Cisco NX-OS Licensing Guide</em>.</td>
</tr>
</tbody>
</table>

GIR Workflow

Follow these steps to complete the graceful insertion and removal (GIR) workflow:

1. (Optional) Create the maintenance-mode profile. (See Configuring the Maintenance-Mode Profile, on page 4.)
2. (Optional) Create the normal-mode profile. (See Configuring the Normal-Mode Profile, on page 5.)
3. Take a snapshot before triggering graceful removal. (See Creating a Snapshot, on page 6.)
4. Trigger graceful removal to put the switch in maintenance mode. (See Triggering Graceful Removal, on page 10.)

Command

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>python instance instance-number uri [python-arguments]</td>
<td>Configures Python script invocations to the profile. You can add multiple invocations of the command to the profile. You can enter a maximum of 32 alphanumeric characters for the Python arguments.</td>
</tr>
</tbody>
</table>
5. Trigger graceful insertion to return the switch to normal mode. (See Triggering Graceful Insertion, on page 12.)
6. Take a snapshot after triggering graceful insertion. (See Creating a Snapshot, on page 6.)
7. Use the `show snapshots compare` command to compare the operational data before and after the graceful removal and insertion of the switch to make sure that everything is running as expected. (See Verifying the GIR Configuration, on page 14.)

## Configuring the Maintenance-Mode Profile

You can create a maintenance-mode profile with configuration commands that can be applied during graceful removal or graceful insertion.

### SUMMARY STEPS

1. `configure maintenance profile maintenance-mode`
2. `end`
3. `show maintenance profile maintenance-mode`

### DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>Enters a configuration session for the maintenance-mode profile. Depending on which protocols you have configured, you must now enter the appropriate commands to bring down the protocols. For a list of supported commands, see Profiles, on page 2.</td>
</tr>
<tr>
<td><code>configure maintenance profile maintenance-mode</code></td>
<td>Example: <code>switch# configure maintenance profile maintenance-mode</code> Enter configuration commands, one per line. End with CNTL/Z. <code>switch(config-mm-profile)#</code></td>
</tr>
<tr>
<td><strong>Step 2</strong></td>
<td>Closes the maintenance-mode profile.</td>
</tr>
<tr>
<td><code>end</code></td>
<td>Example: <code>switch(config-mm-profile)# end</code> <code>switch#</code></td>
</tr>
<tr>
<td><strong>Step 3</strong></td>
<td>Displays the details of the maintenance-mode profile.</td>
</tr>
<tr>
<td><code>show maintenance profile maintenance-mode</code></td>
<td>Example: <code>switch# show maintenance profile maintenance-mode</code></td>
</tr>
</tbody>
</table>

### Example

This example shows how to create a maintenance-mode profile:

```
switch# configure maintenance profile maintenance-mode
Enter configuration commands, one per line. End with CNTL/Z.
switch(config-mm-profile)# ip pim isolate
switch(config-mm-profile)# vpc domain 10
switch(config-mm-profile-config-vpc-domain)# shutdown
```
Configuring the Normal-Mode Profile

You can create a normal-mode profile with configuration commands that can be applied during graceful removal or graceful insertion.

**SUMMARY STEPS**

1. configure maintenance profile normal-mode
2. end
3. show maintenance profile normal-mode

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>configure maintenance profile normal-mode</td>
<td>Enters a configuration session for the normal-mode profile. Depending on which protocols you have configured, you must now enter the appropriate commands to bring up the protocols. For a list of supported commands, see Profiles, on page 2.</td>
</tr>
<tr>
<td>Example:</td>
<td>switch# configure maintenance profile normal-mode</td>
<td></td>
</tr>
<tr>
<td>Example:</td>
<td>Enter configuration commands, one per line. End with CNTL/Z. switch(config-mm-profile)#</td>
<td></td>
</tr>
</tbody>
</table>

| Step 2 | end | Closes the normal-mode profile. |
| Example: | switch(config-mm-profile)# end switch# |

| Step 3 | show maintenance profile normal-mode | Displays the details of the normal-mode profile. |
| Example: | switch# show maintenance profile normal-mode |
Creating a Snapshot

You can create a snapshot of the running states of selected features. When you create a snapshot, a predefined set of `show` commands are run and the outputs are saved.

**SUMMARY STEPS**

1. `snapshot create snapshot-name description`
2. `show snapshots`
3. `show snapshots compare snapshot-name-1 snapshot-name-2 [summary | ipv4routes | ipv6routes]`

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> <code>snapshot create snapshot-name description</code></td>
<td>Captures the running state or operational data of selected features and stores the data on persistent storage media. You can enter a maximum of 64 alphanumeric chapters for the snapshot name and a maximum of 254 alphanumeric characters for the description. Use the `snapshot delete {all</td>
</tr>
<tr>
<td><strong>Example:</strong> <code>switch# snapshot create snap_before_maintenance Taken before maintenance</code></td>
<td>Executing 'show interface'... Done Executing 'show ip route summary vrf all'... Done Executing 'show ipv6 route summary vrf all'... Done Executing 'show bgp sessions vrf all'... Done Executing 'show ip eigrp topology summary'... Done</td>
</tr>
</tbody>
</table>
### Command or Action

<table>
<thead>
<tr>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executing 'show ipv6 eigrp topology summary'... Done</td>
</tr>
<tr>
<td>Feature 'vpc' not enabled, skipping... Executing 'show ip ospf vrf all'... Done</td>
</tr>
<tr>
<td>Feature 'ospfv3' not enabled, skipping... Feature 'isis' not enabled, skipping... Feature 'rip' not enabled, skipping... Snapshot 'snap_before_maintenance' created</td>
</tr>
</tbody>
</table>

### Step 2

**show snapshots**

**Example:**

```
switch# show snapshots
Snapshot Name     Time                          Description
snap_before_maintenance   Wed Aug 19 13:53:28 2015  Taken before maintenance
```

### Step 3

**show snapshots compare snapshot-name-1 snapshot-name-2 [**summary** | ipv4routes | ipv6routes]**

**Example:**

```
switch# show snapshots compare snap_before_maintenance snap_after_maintenance
```

---

### Example

The following example shows a summary of the changes between two snapshots:

```
switch# show snapshots compare snapshot1 snapshot2 summary
feature              snapshot1 snapshot2 changed
basic summary
# of interfaces 16 12 *
# of vlans 10 4 *
# of ipv4 routes 33 3 *

interfaces
# of eth interfaces 3 0 *
# of eth interfaces up 2 0 *
# of eth interfaces down 1 0 *
# of eth interfaces other 0 0
# of vlan interfaces 3 1 *
# of vlan interfaces up 3 1 *
# of vlan interfaces down 0 0
# of vlan interfaces other 0 1 *
```

The following example shows the changes in IPv4 routes between two snapshots:

```
switch# show snapshots compare snapshot1 snapshot2 ipv4routes
metric              snapshot1 snapshot2 changed
# of routes 33 3 *
# of adjacencies 10 4 *
Prefix               Changed Attribute
```
Adding Show Commands to Snapshots

You can specify additional show commands to be captured in snapshots. These show commands are defined in user-specified snapshot sections.

**SUMMARY STEPS**

1. snapshot section add section "show-command" row-id element-key1 [element-key2]
2. show snapshots sections
3. show snapshots compare snapshot-name-1 snapshot-name-2 [summary | ipv4routes | ipv6routes]

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> snapshot section add section &quot;show-command&quot; row-id element-key1 [element-key2]</td>
<td>Adds a user-specified section to snapshots. The section is used to name the show command output. You can use any word to name the section. The show command must be enclosed in quotation marks. Non-show commands will not be accepted. The row-id argument specifies the tag of each row entry of the show command’s XML output. The element-key1 and element-key2 arguments specify the tags used to distinguish among row entries. In most cases, only the element-key1 argument needs to be specified to be able to distinguish among row entries. <strong>Note</strong> To delete a user-specified section from snapshots, use the snapshot section delete section command.</td>
</tr>
<tr>
<td><strong>Example:</strong> switch# snapshot section add myshow “show ip interface brief” ROW_intf intf-name</td>
<td></td>
</tr>
</tbody>
</table>

| **Step 2** show snapshots sections | Displays the user-specified snapshot sections. |
| **Example:** switch# show snapshots sections |

| **Step 3** show snapshots compare snapshot-name-1 snapshot-name-2 [summary | ipv4routes | ipv6routes] | Displays a comparison of two snapshots. The summary option displays just enough information to see the overall changes between the two snapshots. The ipv4routes and ipv6routes options display the changes in IPv4 and IPv6 routes between the two snapshots. |
| **Example:** switch# show snapshots compare snap1 snap2 |
Example

The following example adds the `show ip interface brief` command to the myshow snapshot section. It also compares two snapshots (snap1 and snap2) and shows the user-specified sections in both snapshots.

```bash
switch# snapshot section add myshow "show ip interface brief" ROW_intf intf-name
switch# show snapshots sections
user-specified snapshot sections
--------------------------------
[myshow]
  cmd: show ip interface brief
  row: ROW_intf
  key1: intf-name
  key2: -

[sect2]
  cmd: show ip ospf vrf all
  row: ROW_ctx
  key1: instance_number
  key2: cname

switch# show snapshots compare snap1 snap2
============================================================================= Feature Tag snap1 snap2
============================================================================= [bgp]---------------------------------------------------------------------------- [interface]---------------------------------------------------------------------------- [interface:mgmt0]
  vdc_lvl_in_pkts 692310 **692317**
  vdc_lvl_in_mcast 575281 **575287**
  vdc_lvl_in_bcast 77209 **77210**
  vdc_lvl_in_bytes 63293252 **63293714**
  vdc_lvl_out_pkts 41197 **41198**
  vdc_lvl_out_ucast 33966 **33967**
  vdc_lvl_out_bytes 6419714 **6419788**

[ospf]----------------------------------------------------------------------------

[myshow]---------------------------------------------------------------------------- [interface:Ethernet1/1]
  state up **down**
  admin_state up **down**
```

Configuring Graceful Insertion and Removal
Triggering Graceful Removal

In order to perform debugging or upgrade operations, you can trigger a graceful removal of the switch, which will eject the switch and isolate it from the network.

**Before you begin**

If you want the system to use a maintenance-mode profile that you create, see Configuring the Maintenance-Mode Profile, on page 4.

**SUMMARY STEPS**

1. configure terminal
2. system mode maintenance [dont-generate-profile | timeout value | shutdown | on-reload reset-reason reason]
3. (Optional) show system mode
4. (Optional) copy running-config startup-config

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Step</th>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1</td>
<td>configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>switch# configure terminal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>switch(config)#</td>
<td></td>
</tr>
<tr>
<td>Step 2</td>
<td>system mode maintenance [dont-generate-profile</td>
<td>timeout value</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>switch(config)# system mode maintenance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Following configuration will be applied:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>ip pim isolate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>router bgp 65502</td>
<td></td>
</tr>
<tr>
<td></td>
<td>isolate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>router ospf p1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>isolate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>router ospfv3 p1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>isolate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Do you want to continue (y/n)? [no] y</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Generating a snapshot before going into maintenance mode</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Starting to apply commands...</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Applying : ip pim isolate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Applying : router bgp 65502</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Applying : isolate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Applying : router ospf p1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Applying : isolate</td>
<td></td>
</tr>
</tbody>
</table>

The following options are available:

- **dont-generate-profile**—Prevents the dynamic searching of enabled protocols and executes commands configured in a maintenance-mode profile. Use this option if you want the system to use a maintenance-mode profile that you have created.

- **timeout value**—Keeps the switch in maintenance mode for a specified number of minutes. The range is from 5 to 65535. Once the configured time elapses, the switch returns to normal mode automatically. The **no** system mode maintenance timeout command disables the timer.

- **shutdown**—Shuts down all protocols, vPC domains, and interfaces except the management interface (using the shutdown command). This option is disruptive while the default (which uses the isolate command) is not.
Applying router ospfv3 p1
Applying isolate

Maintenance mode operation successful.

• **on-reload reset-reason reason**—Boots the switch into maintenance mode automatically in the event of a specified system crash. The **no system mode maintenance on-reload reset-reason** command prevents the switch from being brought up in maintenance mode in the event of a system crash.

The maintenance mode reset reasons are as follows:

• HW_ERROR—Hardware error
• SVC_FAILURE—Critical service failure
• KERN_FAILURE—Kernel panic
• WDOG_TIMEOUT—Watchdog timeout
• FATAL_ERROR—Fatal error
• LC_FAILURE—Line card failure
• MATCH_ANY—Any of the above reasons

The system prompts you to continue. Enter **y** to continue or **n** to terminate the process.

**Step 3**
(Optional) **show system mode**

**Example:**

```
switch(config)# show system mode
System Mode: Maintenance
```

Displays the current system mode.

The switch is in maintenance mode. You can now perform any desired debugging or upgrade operations on the switch.

**Step 4**
(Optional) **copy running-config startup-config**

**Example:**

```
switch(config)# copy running-config startup-config
```

Copies the running configuration to the startup configuration. This command is required if you want to preserve maintenance mode following a reboot.

**Example**

This example shows how to shut down all protocols, vPC domains, and interfaces on the switch:

```
switch(config)# system mode maintenance shutdown
```

Following configuration will be applied:

```
vpc domain 10
  shutdown
router bgp 65502
  shutdown
router ospf p1
  shutdown
router ospfv3 p1
  shutdown
system interface shutdown
```

Do you want to continue (y/n)? [no] y
Generating a snapshot before going into maintenance mode

Starting to apply commands...

Applying: vpc domain 10
Applying: shutdown
Applying: router bgp 65502
Applying: shutdown
Applying: router ospf p1
Applying: shutdown
Applying: router ospfv3 p1
Applying: shutdown

Maintenance mode operation successful.

This example shows how to automatically boot the switch into maintenance mode if a fatal error occurs:

```
switch(config)# system mode maintenance on-reload reset-reason fatal_error
```

## Triggering Graceful Insertion

When you finish performing any debugging or upgrade operations, you can trigger a graceful insertion to restore all protocols.

### Before you begin

If you want the system to use a normal-mode profile that you create, see Configuring the Maintenance-Mode Profile, on page 4.

### SUMMARY STEPS

1. `configure terminal`
2. `no system mode maintenance [dont-generate-profile]`
3. (Optional) `show system mode`

### DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
</table>
| **Step 1**
   - `configure terminal`
   - Example:
     - `switch# configure terminal`
     - `switch(config)#` |
   | Enters global configuration mode. |
| **Step 2**
   - `no system mode maintenance [dont-generate-profile]`
   - Example:
     - `switch(config)# no system mode maintenance dont-generate-profile`
     - `Following configuration will be applied:` |
   | Puts all enabled protocols in normal mode (using the `no isolate` command). |
   | The `dont-generate-profile` option prevents the dynamic searching of enabled protocols and executes commands configured in a normal-mode profile. Use this option if you |
### Command or Action

- `no ip pim isolate`
- `router bgp 65502`
- `no isolate`
- `router ospf p1`
- `no isolate`
- `router ospfv3 p1`
- `no isolate`

Do you want to continue (y/n)? [no] y

Starting to apply commands...

- Applying : `no ip pim isolate`
- Applying : `router bgp 65502`
- Applying : `no isolate`
- Applying : `router ospf p1`
- Applying : `no isolate`
- Applying : `router ospfv3 p1`
- Applying : `no isolate`

Maintenance mode operation successful.

Generating Current Snapshot

### Purpose

want the system to use a normal-mode profile that you have created.

The system prompts you to continue. Enter y to continue or n to terminate the process.

---

### Step 3

**Optional** show system mode

**Example:**

```
switch(config)# show system mode
System Mode: Normal
```

 Displays the current system mode. The switch is now in normal mode and is fully operational.

---

## Maintenance Mode Enhancements

The following maintenance mode enhancements are added to Cisco Nexus 3600 platform switches:

- In the system maintenance shutdown mode, the following message is added:

  
  **NOTE:** The command `system interface shutdown` will shutdown all interfaces excluding mgmt 0.

- Entering the CLI command, `system mode maintenance` checks and sends alerts for the orphan ports.

- In isolate mode, when the vPC is configured, the following message is added:

  
  **NOTE:** If you have vPC orphan interfaces, please ensure vpc orphan-port suspend is configured under them, before proceeding further.

- Custom Profile Configuration: A new CLI command, `system mode maintenance always-use-custom-profile` is added for custom profile configuration. A new CLI command, `system mode maintenance non-interactive` is added under #ifdef for Cisco Nexus 9000 Series switches only.

  When you create a custom profile (in maintenance or normal mode), it displays the following message:

  Please use the command `system mode maintenance always-use-custom-profile` if you want to always use the custom profile.

- A delay has been added before the after_maintenance snapshot is taken. The `no system mode maintenance` command exits once all the configuration for the normal mode has been applied, the mode has been changed to normal mode, and a timer has been started to take the after_maintenance snapshot. Once the
timer expires, the after_maintenance snapshot is taken in the background and a new warning syslog, MODE_SNAPSHOT_DONE is sent once the snapshot is complete.

The final output of the CLI command no system mode maintenance indicates when the after_maintenance snapshot is generated:

The after_maintenance snapshot will be generated in <delay> seconds. After that time, please use show snapshots compare before_maintenance after_maintenance to check the health of the system. The timer delay for the after maintenance snapshot is defaulted to 120 seconds but it can be changed by a new configuration command.

The new configuration command to change the timer delay for the after_maintenance snapshot is system mode maintenance snapshot-delay <seconds>. This configuration overrides the default setting of 120 seconds to any value between 0 and 65535 and it is displayed in the ASCII configuration.

A new show command, show maintenance snapshot-delay has also been added to display the current snapshot-delay value. This new show command supports the XML output.

- A visible CLI indicator has been added to display when the system is in the maintenance mode, for example, switch (m-mode) #.
- Support for the SNMP traps has been added when the device moves from the maintenance mode to the normal mode and vice-versa through CLI reload, or system reset. The snmp-server enable traps mmode cseMaintModeChangeNotify trap is added to enable changing to the maintenance mode trap notification. The snmp-server enable traps mmode cseNormalModeChangeNotify is added to enable changing to the normal mode trap notification. Both the traps are disabled by default.

## Verifying the GIR Configuration

To display the GIR configuration, perform one of the following tasks:

<table>
<thead>
<tr>
<th>Command</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>show interface brief</td>
<td>Displays abbreviated interface information.</td>
</tr>
<tr>
<td>show maintenance on-reload reset-reasons</td>
<td>Displays the reset reasons for which the switch comes up in maintenance mode. For a description of the maintenance mode reset reasons, see Triggering Graceful Removal, on page 10.</td>
</tr>
<tr>
<td>show maintenance profile [maintenance-mode</td>
<td>normal-mode]</td>
</tr>
<tr>
<td>show maintenance timeout</td>
<td>Displays the maintenance-mode timeout period, after which the switch automatically returns to normal mode.</td>
</tr>
<tr>
<td>show {running-config</td>
<td>startup-config} mmode [all]</td>
</tr>
<tr>
<td>show snapshots</td>
<td>Displays snapshots present on the switch.</td>
</tr>
<tr>
<td>Command</td>
<td>Purpose</td>
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</table>
| **show snapshots compare snapshot-name-1**  
**snapshot-name-2 [summary | ipv4routes | ipv6routes]** | Displays a comparison of two snapshots.  
The **summary** option displays just enough information to see the overall changes between the two snapshots.  
The **ipv4routes** and **ipv6routes** options display the changes in IPv4 and IPv6 routes between the two snapshots. |
| **show snapshots dump snapshot-name** | Displays the content of each file that was generated when the snapshot was taken. |
| **show snapshots sections** | Displays the user-specified snapshot sections. |
| **show system mode** | Displays the current system mode. |
Verifying the GIR Configuration