Graceful Insertion and Removal

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Overview

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.

When you place the switch in maintenance mode, all configured Layer 3 control-plane protocols are isolated from the network. Directly connected routes are not withdrawn or modified during this state. When normal mode is restored, the advertisement of all routes is restored.

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)

Type of Profiles

Note 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.

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.

Note The **shutdown** command takes precedence when both **shutdown** and **isolate** are configured under a routing protocol instance or maintenance-mode profile.

Command	Description
isolate	Isolates the protocol from the switch and puts the protocol in maintenance mode.
no isolate	Restores the protocol and puts the protocol in normal mode.
shutdown	Shuts down the protocol or vPC domain.
no shutdown	Brings up the protocol or vPC domain.
system interface shutdown [**exclude fex-fabric**]	Shuts down the system interfaces (except the management interface).
no system interface shutdown [**exclude fex-fabric**]	Brings up the system interfaces.
sleep instance *instance-number seconds*	Delays the execution of the command by a specified number of seconds. You can delay multiple instances of the command. The range for the *instance-number* and *seconds* arguments is from 0 to 2177483647.

Command	Description
python instance *instance-number uri* [*python-arguments*] Example: **python instance 1 bootflash://script1.py**	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.

Note Beginning with Cisco NX-OS Release 9.3(5), the **isolate** command is provided with the **include-local** option, which is applicable only to **router bgp**.

If you use this option, BGP withdraws all the routes from its peers. If you do not use this option, then BGP only withdraws remotely learned routes, and the locally originated routes such as aggregate, injected, network and redistribute continue to be advertised with maximum Multi-Exit Discriminator (MED) to eBGP peers and minimum local preference to iBGP peers.

Workflow

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

1. (Optional) Create the maintenance-mode profile. (See Configure Maintenance-Mode Profile, on page 4.)
2. (Optional) Create the normal-mode profile. (See Configure Normal-Mode Profile, on page 7.)
3. Take a snapshot before triggering graceful removal. (See Create Snapshot, on page 8.)
4. Trigger graceful removal to put the switch in maintenance mode. (See Trigger Graceful Removal, on page 11.)
5. Trigger graceful insertion to return the switch to normal mode. (See Trigger Graceful Insertion, on page 14.)
6. Take a snapshot after triggering graceful insertion. (See Create Snapshot, on page 8.)
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 Verify Configuration, on page 16.)

Guidelines and Limitations

General Guidelines

- Remove all existing custom profiles before creating new custom profiles for normal-mode and maintenance-mode.

Release Specific Guidelines

- Beginning with Cisco NX-OS Release 9.2(1), L2 Graceful Insertion and Replacement is supported. When moving from normal to maintenance mode, MCT goes down resulting in north to south traffic convergence. Zero packet loss is not supported. The following table provides an example of traffic convergence of 10 vPCs with 2 port member on each VPC port and 60k mac scale.

  Table 1:

Trigger	Role	North to South Traffic	South to North Traffic
Normal to maintenance mode	Primary	760 ms	1320 ms
Maintenance mode to normal	Primary	13155 ms	27980 ms
Normal to maintenance mode	Secondary	300 ms	1375 ms
Maintenance mode to normal	Secondary	15905 ms	23350 ms

- Beginning with Cisco NX-OS Release 9.2(1), if you configure the isolate option for OSPF, direct routes and stub routes are advertised as max-metric routes. As a result, north-to-south traffic to the SVI hosts goes through the vPC peer when only one vPC switch is isolated.
- Beginning with Cisco NX-OS Release 9.3(5), the **include-local** option is added to the existing **isolate** command. However, the **include-local** option applies only to **router bgp**.

  The default maintenance-mode profile can cause an Anycast BGW to drop multi-fabric BUM traffic for VNIs on which the BGW is the designated forwarder. Use a custom profile that configures `isolate include-local` under BGP when the BGW enters maintenance mode. Configure `no isolate include-local` under BGP in the corresponding normal-mode profile.
- Beginning with Cisco NX-OS Release 10.3(1)F, during a binary reload scenario, when the system is switched to maintenance mode, the interface is shut until the system boots up completely and declares system readiness.

Configure Maintenance-Mode Profile

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

Note During the maintenance mode the SVI becomes UP after the reload. In this scenario, use the **isolate include-local** command under router BGP or keep interfaces in shutdown state through maintenance mode to avoid the impact of advertising connected/static routes.

Procedure

Step 1 Enter a configuration session for the maintenance-mode profile using the command [**no**] **configure maintenance profile maintenance-mode**

Example:

```
switch# configure maintenance profile maintenance-mode
      Enter configuration commands, one per line. End with CNTL/Z.
      switch(config-mm-profile)#
```

The **no** option deletes the maintenance profile maintenance-mode.

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 .

Step 2 Close the maintenance-mode profile using the command **end**

Example:

```
switch(config-mm-profile)# end
 switch#
```

Step 3 Display the details of the maintenance-mode profile using the command **show maintenance profile maintenance-mode**

Example:

```
switch# show maintenance profile maintenance-mode
```

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)#
router bgp 100
switch(config-mm-profile-router)#
shutdown
switch(config-mm-profile)#
router eigrp 10
switch(config-mm-profile-router)#
shutdown
switch(config-mm-profile-router)#
address-family ipv6 unicast
switch(config-mm-profile-router-af)#
shutdown
switch(config-mm-profile)#
vpc domain 10
switch(config-mm-profile-config-vpc-domain)#
shutdown
switch(config-mm-profile)#
system interface shutdown
switch(config-mm-profile)#
end
Exit maintenance profile mode.
```

```
switch#
show maintenance profile maintenance-mode
[Maintenance Mode]
ip pim isolate
router bgp 100
shutdown
router eigrp 10
shutdown
address-family ipv6 unicast
shutdown
vpc domain 10
shutdown
system interface shutdown
```

This example shows how to configure sleep instance in a custom profile to add a delay before the next protocol change.

```
switch#
configure maintenance profile maintenance-mode
Enter configuration commands, one per line. End with CNTL/Z.
switch(config-mm-profile)#
router bgp 65001
switch(config-mm-profile-router)#
isolate
switch(config-mm-profile-router)#
sleep instance 1 10
switch(config-mm-profile)#
router eigrp 200
switch(config-mm-profile-router)#
isolate
switch(config-mm-profile-router)#
sleep instance 2 15
switch(config-mm-profile)#
router ospf 100
switch(config-mm-profile-router)#
isolate
switch(config-mm-profile-router)#
sleep instance 3 20
switch(config-mm-profile)#
router ospfv3 300
switch(config-mm-profile-router)#
isolate
switch(config-mm-profile-router)#
sleep instance 4 5
switch(config-mm-profile)#
router isis 400
switch(config-mm-profile-router)#
isolate
switch(config-mm-profile)#
end
Exit maintenance profile mode.
switch#
```

Note If you need to run exec commands or add a dynamic delay while the maintenance mode profile is applied, use the **python instance** *instance-number uri* [*python-arguments*] script.

Configure Normal-Mode Profile

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

Procedure

Step 1 Enter a configuration session for the normal-mode profile using the command [**no**] **configure maintenance profile normal-mode**

Example:

```
switch# configure maintenance profile normal-mode
      Enter configuration commands, one per line. End with CNTL/Z.
      switch(config-mm-profile)#
```

The **no** version removes the maintenance profile normal-mode.

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 .

Step 2 Close the normal-mode profile using the command **end**

Example:

```
switch(config-mm-profile)# end
 switch#
```

Step 3 Display the details of the normal-mode profile using the command **show maintenance profile normal-mode**

Example:

```
switch# show maintenance profile normal-mode
```

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

```
switch#
configure maintenance profile normal-mode
switch(config-mm-profile)#
no system interface shutdown
switch(config-mm-profile)#
vpc domain 10
switch(config-mm-profile-config-vpc-domain)#
no shutdown
switch(config-mm-profile)#
router eigrp 10
switch(config-mm-profile-router)#
no shutdown
switch(config-mm-profile-router)#
address-family ipv6 unicast
switch(config-mm-profile-router-af)#
no shutdown
switch(config-mm-profile)#
router bgp 100
switch(config-mm-profile-router)#
```

```
no shutdown
switch(config-mm-profile)#
no ip pim isolate
switch(config-mm-profile)#
end
Exit maintenance profile mode.
switch#
show maintenance profile normal-mode
[Normal Mode]
no system interface shutdown
vpc domain 10
no shutdown
router eigrp 10
no shutdown
address-family ipv6 unicast
no shutdown
router bgp 100
no shutdown
no ip pim isolate
```

Create 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.

Procedure

Step 1 Capture the running state or operational data of selected features and stores the data on persistent storage media using the command **snapshot create** *snapshot-name description*

Example:

```
switch# snapshot create snap_before_maintenance Taken before maintenance
 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
 Executing 'show ipv6 eigrp topology summary'... Done
 Feature 'vpc' not enabled, skipping...
 Executing 'show ip ospf vrf all'... Done
 Feature 'ospfv3' not enabled, skipping...
 Feature 'isis' not enabled, skipping...
 Feature 'rip' not enabled, skipping...
 Snapshot 'snap_before_maintenance' created
```

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** | *snapshot-name* } command to delete all snapshots or a specific snapshot.

Step 2 Display snapshots present on the switch using the command **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 Display a comparison of two snapshots using the command **show snapshots compare** *snapshot-name-1 snapshot-name-2* [**summary** | **ipv4routes** | **ipv6routes**]

Example:

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

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.

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
------             -----------------
23.0.0.0/8         not in snapshot2
10.10.10.1/32      not in snapshot2
21.1.2.3/8         adjacency index has changed from 29 (snapshot1) to 38 (snapshot2)
……
There were 28 attribute changes detected
```

Add 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.

Procedure

Step 1 Add a user-specified section to snapshots using the command **snapshot section add** *section "show-command" row-id element-key1* [*element-key2*]

Example:

```
switch# snapshot section add myshow "show ip interface brief" ROW_intf intf-name
```

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 specified to be able to distinguish among row entries.

Note To delete a user-specified section from snapshots, use the **snapshot section delete** *section* command.

Step 2 Display the user-specified snapshot sections using the command **show snapshots sections**

Example:

```
switch# show snapshots sections
```

The following example adds the **show ip interface brief** command to the myshow snapshot section.

```
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
```

Trigger Graceful Removal

Use this task to trigger a graceful removal of the switch, which will eject the switch and isolate it from the network for debugging or upgrade operations.

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 Configure Maintenance-Mode Profile, on page 4 .

Procedure

Step 1 Enter global configuration mode using the command **configure terminal**

Example:

```
switch# configure terminal
 switch(config)#
```

Step 2 Put all enabled protocols in maintenance mode (using the **isolate** command) **system mode maintenance** [**dont-generate-profile** | **timeout** *value* | **shutdown** | **on-reload reset-reason** *reason*]

Example:

```
switch(config)# system mode maintenance
Following configuration will be applied:
ip pim isolate
router bgp 65502
isolate
router ospf p1
isolate
router ospfv3 p1
isolate
Do you want to continue (y/n)? [no]
y
Generating a snapshot before going into maintenance mode
Starting to apply commands...
Applying : ip pim isolate
Applying : router bgp 65502
Applying :   isolate
Applying : router ospf p1
Applying :   isolate
Applying : router ospfv3 p1
Applying :   isolate
Maintenance mode operation successful.
```

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.

  Note The timeout value 65535 is the default setting and is treated as "no timeout." This value will not appear in the running configuration/show running-config all.

- **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.
- **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

  Note
  - During reload, a binary form of configuration file is used to restore the system. However, this is not possible in all scenarios, for example, when the reloaded image is new. Then, the system switches to ASCII reload.
  - During an unexpected reload, when the system switches to maintenance mode, the interface will be in a shut state (reason: **mmodeBootIntfShut**), until the system comes up completely from normal mode to maintenance mode.
  - During reload, if the system does not come up completely for a duration that is longer than expected, then collect the debugging information using the following commands and contact Cisco Support :
    - **show tech support mmode**
    - **show tech support system manager**
    - **show tech support interface manager**
    - **show accounting**

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

Step 3 Display the current system mode using the command **show system mode**

Example:

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

This is

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

Step 4 Copy the running configuration to the startup configuration using the command **copy running-config startup-config**

Example:

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

This is an optional step. This command is required if you want to preserve maintenance mode following a reboot.

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
```

Trigger 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 Configure Maintenance-Mode Profile, on page 4 .

Procedure

Step 1 Enter global configuration mode using the command **configure terminal**

Example:

```
switch# configure terminal
 switch(config)#
```

Step 2 Put all enabled protocols in normal mode (using the **no isolate** command) **no system mode maintenance** [**dont-generate-profile**]

Example:

```
switch(config)# no system mode maintenance dont-generate-profile
Following configuration will be applied:
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
```

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 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) Display the current system mode using the command **show system mode**

Example:

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

This is an optional command. The switch is now in normal mode and is fully operational.

Maintenance Mode Enhancements

Starting with Release 7.0(3)I5(1), the following maintenance mode enhancements have been added to Cisco Nexus 9000 Series 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 for Cisco Nexus 9000 Series switches only. It provides a way to facilitate the transition to maintenance mode or normal mode without confirmation being done or each step being printed on the CLI session.

  When a loopback interface is configured with an IP address on a device, and this device is advertised to a peer device, then the device (with the loopback interface) moves to maintenance mode. In such a case, use the custom maintenance profile when **system interface shutdown** is configured on the device.

  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(maint-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.
- During maintenance mode, you can remove router from forward traffic with BGP active. You can advertise route installed locally to its iBGP peers with local setting in the absence of graceful shutdown. From Cisco NX-OS Release 10.4(1)F, you can configure custom isolation on route-map. In this mode, you can configure a route-map to choose the routes for BGP to be advertise.

Verify Configuration

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

Command	Purpose
show interface brief	Displays abbreviated interface information.
show maintenance on-reload reset-reasons	Displays the reset reasons for which the switch comes up in maintenance mode. For a description of the maintenance mode reset reasons, see Trigger Graceful Removal, on page 11 .
show maintenance profile [**maintenance-mode** | **normal-mode**]	Displays the details of the maintenance-mode or normal-mode profile.
show maintenance timeout	Displays the maintenance-mode timeout period, after which the switch automatically returns to normal mode.
show { **running-config** | **startup-config** } **mmode** [**all**]	Displays the maintenance-mode section of the running or startup configuration. The **all** option includes the default values.
show snapshots	Displays snapshots present on the switch.

Command	Purpose
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.

Configuration Examples

The **redistribute direct** configuration under Border Gateway Protocol (BGP) will attract traffic as the BGP isolate mode does not withdraw direct routes. This example shows how to use the **route-map** command to enable BGP to withdraw direct routes in isolate mode.

Policy Configuration

From Cisco NX-OS Release 10.4(1)F, you can match locally originated, redistributed direct routes.Configure route maps using below command:

Configuring redistribute for route-map

```
switch(config)# route-map <route map name>
switch(config-routemap)# match route-type redistributed-direct
```

Use the **route-map my-rmap-deny** command in maintenance mode to exclude SVIs with a tag 200 configuration.

```
switch(config)# route-map my-rmap-deny deny 10
switch(config-route-map)# match tag 200
switch(config-route-map)# exit
switch(config)# route-map my-rmap-deny permit 20
```

Use the **route-map my-rmap-permit** command in normal mode to include SVIs with a tag 200 configuration.

```
switch(config)# route-map my-rmap-permit permit 10
switch(config-route-map)# match tag 200
switch(config-route-map)# exit
switch(config)# route-map my-rmap-permit permit 20
```

Virtual IP (vIP)/Switch Virtual Interface (SVI) Configuration

```
switch(config)# interface loopback 200
switch(config-if)# ip address 192.0.2.100/8 tag 200
switch(config)# interface vlan 2
switch(config-if)# ip address 192.0.2.108/8 tag 200
....
switch(config)# interface vlan 3
switch(config-if)# ip address 192.0.2.102/8 tag 200
```

BGP Configuration

```
switch(config)# feature bgp
switch(config)# router bgp 100
switch(config-router)# neighbor 192.0.2.100
....
```

Maintenance Mode Profile

```
switch# configure maintenance profile maintenance-mode
switch(config-mm-profile)# router bgp 200
switch(config-mm-profile-router)# address-family ipv4 unicast
switch(config-mm-profile-router-af)# redistribute direct route-map my-rmap-deny
switch(config-mm-profile-router-af)# exit
switch(config-mm-profile)# sleep instance 1 10
```

Normal Mode Profile

```
switch# configure maintenance profile normal-mode
switch(config-mm-profile)# router bgp 100
switch(config-mm-profile-router)# address-family ipv4 unicast
switch(config-mm-profile-router-af)# redistribute direct route-map my-rmap-permit
switch(config-mm-profile-router-af)# exit
switch(config-mm-profile)# sleep instance 1 20
```

Custom Isolation Mode Profile

```
switch# configure maintenance profile maintenance-mode
switch(config-mm-profile)# router bgp 100
switch(config-mm-profile-router)# isolate route-map <route map name>
```

Anycast BGW Normal Mode Profile

```
configure maintenance profile normal-mode
no ip pim isolate
router bgp 65001
no isolate include-local
```

Anycast BGW Maintenance Mode Profile

```
configure maintenance profile maintenance-mode
ip pim isolate
router bgp 65001
isolate include-local
```