



Online Insertion and Removal and Hot-Swapping

The online insertion and removal (OIR) operation lets you replace faulty data and voice modules without affecting system operations. The OIR is similar to hot-swapping. OIR commands are issued before removing and after installing a module. When performing OIR, use an identical module to replace an original one. If you need to perform the OIR operation on multiple modules within a router, perform the operation one module at a time.

The difference between hot-swapping and OIR is that OIR requires executing Cisco IOS commands before and after the OIR. Hot-swapping is strictly a hardware function and does not require the execution commands. Not all router components or modules use OIR, or can be hot swapped.

The following components use OIR in the routers:

- Service Modules (SMs)
- Network Interface Modules (NIMs)
- SFPs
- USB devices

The following components can be hot swapped:

- Fan tray
- Power supply: only when the router is backed up with an optional PSU

Requirement

To issue OIR commands, you must keep the module that is to be replaced in EnergyWise full-power mode. If the module is in EnergyWise power-saving or shutdown mode, you cannot issue OIR commands, and you cannot, therefore, remove the module.

OIR Procedures

The following procedures describe using the OIR process to remove and replace data and voice modules.

Remove a Module



Note

Ensure that the module is available before you issue the command to remove it.

From a console terminal run the **hw-module subslot <subslot> stop** command. The service module adapter LED blinks, turns off, and the console displays a prompt signaling the module can be removed.

See the following output:

```
Router# hw-module subslot 2/0 stop
Proceed with stop of module? [confirm]
damo-O2#
*Mar 22 20:43:31.088: %SPA_OIR-6-OFFLINECARD: SPA (SM-X-1T3/E3) offline in subslot 2/0
*Mar 22 20:43:31.088: %IOSXE_OIR-6-SOFT_STOPSPA: SPA(SM-X-1T3/E3) stopped in subslot 2/0,
interfaces disabled
Router# show hw-module subslot 2/0 oir
Module           Model                Operational Status
-----
subslot 2/0     SM-X-1T3/E3         stopped
```

Insert a Module

You require to run this step only if you run the **oir-stop** command when the module is not physically removed from the slot. If the module is physically removed, you do not require to run this command.

From a console terminal issue the **hw-module sm {slot} oir-start** command. The console displays output that shows the module change states:

```
Router# hw-module sm 2 oir-start
Router#
*Nov 11 21:06:17.546: %ATMOC3POM-6-SFP_IN: Interface ATM2/0 OC3 MM SFP has been inserted.
Router#
*Nov 11 21:06:19.442: %LINK-3-UPDOWN: Interface ATM2/0, changed state to up
*Nov 11 21:06:20.442: %LINEPROTO-5-UPDOWN: Line protocol on Interface ATM2/0, changed
state to up
```

Hot-Swapping Procedures

The following items can be hot-swapped:

- Fan trays
- Power supplies only when the router is backed up with an RPS

For details of the hot-swapping procedures, see the [“Replace a Fan Tray”](#) section on page 5-60 and the [“Remove and Replace Cisco 4000 Series ISRs Power Supplies”](#) section on page 5-40.