



Configuring Interfaces in Breakout Mode

This chapter describes how to configure interfaces in breakout mode.

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Finding Feature Information

Your software release might not support all the features documented in this module. For the latest caveats and feature information, see the Bug Search Tool at <https://tools.cisco.com/bugsearch/> and the release notes for your 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 "New and Changed Information" chapter or the Feature History table in this chapter.

Feature History for Breakout

This table includes only the updates for those releases that have resulted in additions or changes to the feature.

Table 1: Feature History for Breakout

Feature Name	Release	Feature Information
QSA support for M/F4 modules	8.4(2)	Added support to bring up the link with CVR-QSFP-SFP10G adapter in a M3/F4 100G module.
Breakout	8.4(1)	Added support for the Breakout feature that enables splitting of both 40 Gigabit and 100 Gigabit ethernet ports on the Cisco Nexus 7700 F4-Series 30-port 100-Gigabit Ethernet I/O module.

Feature Name	Release	Feature Information
Breakout	8.3(1)	Added support for the Breakout feature that enables splitting of 40 Gigabit ethernet ports on the Cisco Nexus 7700 M3-Series 12-port 100-Gigabit Ethernet I/O module.
Breakout	8.0(1)	Added support for the Breakout feature on the following I/O modules: <ul style="list-style-type: none"> • Cisco Nexus 7000 M3-Series 24-port 40-Gigabit Ethernet Module • Cisco Nexus 7700 M3-Series 24-port 40-Gigabit Ethernet Module
Breakout	6.2(6) 6.2(8)	Added support for the Breakout feature on the Cisco Nexus 7000 Series Switches. Added support for the Breakout feature on the Cisco Nexus 7700 Switches.

Information About Breakout

The Cisco Nexus 7000 Series Switches and the Cisco Nexus 7700 Series Switches support the Breakout feature. Breakout enables a 40 Gigabit Ethernet port to be split into four independent and logical 10 Gigabit Ethernet ports. Breakout is supported on an active Twinax (1 to 10 m) cable or a multimode fiber cable (SR4 optic cable with an MTP connector or an MPO connector). For the list of transceivers that are supported on Cisco Nexus 7000 Series switches, refer the [Cisco Nexus 7000 Series NX-OS Release Notes](#).

Starting from Cisco NX-OS Release 8.4(1), the Breakout feature also enables a 100 Gigabit Ethernet port to be split into four independent and logical 25 Gigabit Ethernet ports. This feature is supported only on the Cisco Nexus 7700 F4-Series 30-port 100-Gigabit Ethernet I/O module (N77-F430CQ-36).



Note When the Breakout feature is configured, the configuration for the corresponding interface is removed.

The Breakout feature that enables a 40 Gigabit Ethernet port to be split into four independent and logical 10 Gigabit Ethernet ports is supported in the following modules:

- Cisco Nexus 7000 F3-Series 12-Port 40 Gigabit Ethernet Module
- Cisco Nexus 7000 M2-Series 6-Port 40 Gigabit Ethernet Module
- Cisco Nexus 7700 F3-Series 24-Port 40 Gigabit Ethernet Module

Starting from Cisco NX-OS Release 8.0(1), the Breakout feature that enables a 40 Gigabit Ethernet port to be split into four independent and logical 10 Gigabit Ethernet ports is also supported in the following modules:

- Cisco Nexus 7000 M3-Series 24-port 40-Gigabit Ethernet Module
- Cisco Nexus 7700 M3-Series 24-port 40-Gigabit Ethernet Module

Starting from Cisco NX-OS Release 8.3(1), the Breakout feature that enables a 40 Gigabit Ethernet port to be split into four independent and logical 10 Gigabit Ethernet ports is also supported in the Cisco Nexus 7700 M3-Series 12-port 100-Gigabit Ethernet I/O module.

Starting from Cisco NX-OS Release 8.4(1), the breakout feature that enables splitting of both 40 Gigabit and 100 Gigabit ethernet ports, based on the transceiver at the interface, is supported on the Cisco Nexus 7700 F4-Series 30-port 100-Gigabit Ethernet I/O module. The 40 Gigabit Ethernet port can be split into four independent and logical 10 Gigabit Ethernet ports. The 100 Gigabit Ethernet port can be split into four independent and logical 25 Gigabit Ethernet ports.

Guidelines and Limitations for Breakout

- In a Cisco Nexus 7700 F3-Series 24-Port 40 Gigabit Ethernet Module, you can break out any 19 ports of the available 24 ports.
- In a Cisco Nexus 7700 F4-Series 30-port 100-Gigabit Ethernet module, you can break out 20 ports of the available 30 ports. Breakout is not supported on the following ports: 3,6,9,12,15,18,21,24,27 and 30.
- In a Cisco Nexus 7000 M3-Series 24-port 40-Gigabit Ethernet Module, you can break out any port from 1 to 12. You cannot break out any port from 13 to 24.
- In a Cisco Nexus 7700 M3-Series 24-port 40-Gigabit Ethernet Module, you can break out any 23 ports of the available 24 ports.
- Before swapping a line card type, remove the breakout configurations configured for current line card ports. Use the **no interface breakout module slot port port-range** command to remove the breakout configurations.
- The Cisco QSFP to SFP or SFP+ Adapter (QSA) module is not supported with the 12-port 100-Gigabit Ethernet I/O module (N77-M312CQ-26L) and the 30-port 100-Gigabit Ethernet I/O module (N77-F430CQ-36).
- 40G breakout configuration is not supported on a 100G transceiver. Similarly, 100G breakout configuration is not supported on a 40G transceiver.
- To bring up the link with CVR-QSFP-SFP10G adapter in a M3/F4 100G module, you need to perform the 10x4g breakout configuration on the interface. In older release versions with CVR-QSFP-SFP10G, the adapter link remains down. After ISSU to Cisco NX-OS Release 8.4(2) the link will still remain down. Perform OIR to bring up the link.

Configuring Breakout in a Port

Before you begin

Before you configure this feature for the entire system, ensure that you are in the correct VDC. To change the VDC, use the **switchto vdc** command.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# interface breakout module <i>slot port port-range map {10g-4x 25g-4x}</i>	Configures the Breakout feature for a port. The 10g-4x keyword enables a 40 Gigabit Ethernet port to be split into four independent and logical 10 Gigabit Ethernet ports. The 25g-4x keyword enables a 100 Gigabit Ethernet port to be split into four independent and logical 25 Gigabit Ethernet ports. <ul style="list-style-type: none"> • <i>slot</i>—Slot number of port depending on the chassis model. • <i>port-range</i>—Single port or range of ports on which breakout is configured.
Step 3	(Optional) switch(config)# copy running-config startup-config	Saves the changes by copying the running configuration to the startup configuration.

Example

This example shows how to break out a 40 Gigabit Ethernet port into four 10 Gigabit Ethernet ports:

```
switch# configure terminal
switch(configure)# interface breakout module 1 port 12 map 10g-4x
switch(configure)# copy running-config startup-config
```

This example shows how to break out a 100 Gigabit Ethernet port into four 25 Gigabit Ethernet ports:

```
switch# configure terminal
switch(configure)# interface breakout module 1 port 8 map 25g-4x
switch(configure)# copy running-config startup-config
```

Removing the Breakout Configuration

Before you begin

Before you configure this feature for the entire system, ensure that you are in the correct VDC. To change the VDC, use the **switchto vdc** command.

Procedure

	Command or Action	Purpose
Step 1	switch# configure terminal	Enters global configuration mode.
Step 2	switch(config)# no interface breakout module <i>slot port port-range map {10g-4x 25g-4x}</i>	Removes the breakout configuration for a port module and returns the interface to the 40

	Command or Action	Purpose
		<p>Gigabit Ethernet or the 100 Gigabit Ethernet mode of operation.</p> <ul style="list-style-type: none"> • <i>slot</i>—Slot number of module depending on the chassis model. <p>Note Enter the same <i>slot</i> module value that you used for the corresponding port while configuring the Breakout feature.</p> <ul style="list-style-type: none"> • <i>port-range</i>—Single port or range of ports. <p>Note Enter the same <i>port-range</i> value that you used for the corresponding port while configuring the Breakout feature.</p>
Step 3	(Optional) <code>switch(config)# copy running-config startup-config</code>	Saves the changes by copying the running configuration to the startup configuration.

Example

This example shows how to remove the breakout configuration in a port and return to the 40 Gigabit Ethernet mode of operation:

```
switch# configure terminal
switch(configure)# no interface breakout module 1 port 12 map 10g-4x
switch(configure)# copy running-config startup-config
```

This example shows how to remove the breakout configuration in a port and return to the 100 Gigabit Ethernet mode of operation:

```
switch# configure terminal
switch(configure)# no interface breakout module 1 port 8 map 25g-4x
switch(configure)# copy running-config startup-config
```

Verifying a Breakout Configuration

Use the following commands to verify a breakout configuration. You can use the commands in any order.

Procedure

Step 1 `show interface eth1/1 capabilities`

Displays information about the interface configuration.

Step 2 **show interface brief**

Displays a brief summary of the interface configuration.

Example

This example shows how to display information about the breakout capabilities of the interfaces:

```
switch# show interface breakout
```

```
-----
Parent                Breakout Map   Breakout Ports
-----
Eth8/4                25g-4x       Eth8/4/1-4
```

This example shows how to verify a breakout configuration for an interface:

```
switch# show interface ethernet 1/1 capabilities | i Breakout
```

```
Breakout capable:      yes
```

This example shows how to display the summary of an interface configuration:

```
switch# show interface brief | grep 1/1
```

```
Eth1/1/1    --    eth  routed down    SFP not inserted    auto(D) --
Eth1/1/2    --    eth  routed down    SFP not inserted    auto(D) --
Eth1/1/3    --    eth  routed down    SFP not inserted    auto(D) --
Eth1/1/4    --    eth  routed down    SFP not inserted    auto(D) --
```