



Shelf Configuration Rules

The design of the Cisco ONS 15530 requires that a set of rules be followed during physical configuration of the shelf. These rules, along with examples, are provided in this chapter. This chapter contains the following major sections:

- [Shelf Rules for OADM Modules, page 3-1](#)
- [Shelf Rules for PSMs, page 3-2](#)
- [Shelf Rules for 2.5-Gbps ITU Trunk Cards, page 3-2](#)
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Note

Applying the shelf configuration rules requires an understanding of the Cisco ONS 15530 system components and protection schemes.

Shelf Rules for OADM Modules

This section describes the shelf rules for OADM (optical add/drop multiplexer) modules for different types of protection.

Cabling OADM Modules

The following rules apply when cabling the trunk, thru, and OSC ports on the OADM modules:

- Use fiber optical cables with MU connectors to cable an OADM module to other OADM modules, to OSC modules, to transponder line cards, 2.5-Gbps ITU trunk cards, and to 10-Gbps ITU trunk cards.
- Connect the OSC IN on the OADM module to tx on the OSC module and connect the OSC OUT on the OADM module to rx on the same OSC module. Perform the same process with the redundant OADM module and OSC module.

- Connect west to east, never west to west or east to east, between nodes in a ring.
- Connect Thru OUT to Thru IN between the OADM modules for ring configurations.

For examples of OADM module cabling in a protected ring configuration, see [Figure 1-17 on page 1-30](#).

Rules for Protected Configurations

The rules for OADM modules in protected configurations are as follows:

- You must use two OADM modules that support the same channel band.
- If the OSC is used for APS channel protocol messages, the OADM modules must both support the OSC.

In trunk fiber protected configurations, only one OADM module can be used in single shelf configurations because the PSM (protection switch module) occupies one of the subslots in slot 0.

Shelf Rules for PSMs

For trunk fiber protection to function when the PSM (protection switch module) is connected to an OADM module, the OSC or the in-band message channel (or both) must be available on the shelf. If the OSC is present, the PSM must connect to an OADM module that supports the OSC if it is a multiple shelf node. If the PSM connects to an ITU trunk card, use the in-band message channel as the APS message channel to support trunk fiber protection. If the PSM connects to a transponder line card, use IP for the APS message channel.

Shelf Rules for 2.5-Gbps ITU Trunk Cards

The rules for 2.5-Gbps ITU trunk cards are as follows:

- The 2.5-Gbps ITU trunk cards must support channels in the same 4-channel band supported by the OADM module.
- Two OADM modules are required when configuring splitter protection.

Shelf Rules for Transponder Line Cards

The rules for transponder line cards are as follows:

- When using y-cable protection, ensure that both transponder line cards are the same type (single-mode or multimode) for a given client signal. For example, if client signal A connects by a y-cable to transponders in slot 2 and slot 3, then both of those transponder line cards must either be single-mode or multimode.
- The transponder line cards must support channels in the same 4-channel band supported by the OADM module.

Shelf Rules for 10-Gbps ITU Trunk Cards

The rules for 10-Gbps ITU trunk cards are as follows:

- The 10-Gbps ITU trunk cards must support channels in the same channel band supported by the OADM module.
- Two OADM modules are required when configuring splitter protection.

Shelf Rules for 10-Gbps ITU Tunable Trunk Cards

The rules for 10-Gbps ITU tunable trunk cards are as follows:

- The 10-Gbps ITU trunk cards must support channels in the same channel band supported by the OADM module.
- Two OADM modules are required when configuring splitter protection.

Shelf Rules for 10-Gbps Uplink Cards

The rules for 10-Gbps uplink cards are as follows:

- The 10-Gbps uplink cards must connect to 10-Gbps uplink cards on another Cisco ONS 15530, or to a 10-GE client module on a Cisco ONS 15540 ESP or Cisco ONS 15540 ESPx.
- If the Cisco ONS 15530 shelf has 10-Gbps uplink cards and no 2.5-Gbps transponder line cards, 2.5-Gbps ITU trunk cards, or 10-Gbps ITU trunk cards, no OADM modules or OSC modules are required.

Shelf Rules for OSC Modules

The rules for OSC modules are as follows:

- For unprotected and trunk fiber protected configurations, use one OSC module and one OADM module with OSC support.
- For splitter and line card protected configurations, use two OSC modules and two OADM modules with OSC support.

General Rules for Ring Topologies

The following network rules apply to ring topologies:

- A channel must be present on only two nodes in the ring when using splitter protection.
- All channels added by a node on an east OADM module must be dropped on a west OADM module of one or more other nodes on the ring. All channels added by a node on a west OADM module must be dropped by an east OADM module of one or more other nodes on the ring. This rule may be violated during migration.
- A node cannot add a channel that is already present in the same direction until it has dropped that channel.

