Port Protection

This chapter explains the Cisco ONS 15310-CL port protection configurations. To provision port protection, refer to the *Cisco ONS 15310-CL Procedure Guide*. Chapter topics include:

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3.1 Introduction

The Cisco ONS 15310-CL has a single common control card (15310-CTX-CL), so no redundant common control protection is available. The only card protection available is 1+1 optical protection through the two optical ports. The 15310-CL does not provide electrical interface protection (1:1 and 1:N).

The optical ports on the 15310-CTX-CL are provided via small form factor pluggables (SFPs), which are termed PPMs (pluggable port modules) in Cisco Transport Controller (CTC), the ONS 15310-CL software interface.

3.2 Optical Port Protection

When you set up 1+1 optical protection for the ONS 15310-CL, the working optical port on one ONS 152310-CL node is paired with a working optical port on other ONS 15310-CL nodes in a 1+1 protection group. Similarly, the protect optical port on one ONS 152310-CL node is paired with protect optical ports on other ONS 15310-CL nodes in a 1+1 protection group. The data rate and port type of the protect port must match that of the working port. Because the ONS 15310-CL has only two optical ports, they must always be in the same protection group. The rates of the two ports must be the same, either OC-3 or OC-12.

1+1 span protection can be either revertive or nonrevertive. With nonrevertive 1+1 protection, when a failure occurs and the signal switches from the working port to the protect port, the signal stays switched until it is manually switched back. Revertive 1+1 protection automatically switches the signal back to the working port when the working port comes back online.

To provision 1+1 protection, refer to the "Turn Up Node" chapter in the *Cisco ONS 15310-CL Procedure Guide*.

3.3 Unprotected Ports

An unprotected port is not included in a protection scheme; therefore, a port failure or a signal error results in lost data. Because no bandwidth lies in reserve for protection, unprotected schemes maximize the available ONS 15310-CL bandwidth. Unprotected is the default protection type.

3.4 Automatic Protection Switching

Unidirectional switching allows traffic on the transmit and receive fibers to switch independently.

With nonrevertive 1+1 protection, automatic protection switching (APS) switches a signal after a failure from the working port to the protect port and the signal stays switched to the protect port until it is manually switched back. Revertive switching automatically switches the signal back to the working port when the working port comes back online. 1+1 protection is unidirectional and nonrevertive by default; revertive switching is easily provisioned using CTC.

Traffic over a 1+1 APS link is errorless during a soft reboot or a software upgrade for ONS 15310-CL nodes regardless of whether the 1+1 APS protection is active.

3.5 External Switching Commands

The external switching commands on the ONS 15310-CL are Manual, Force, and Lock out. A Manual switch will switch traffic if the path has an error rate less than the signal degrade. A Force switch will switch traffic even if the path has signal degrade (SD) or signal fail (SF) conditions. A Force switch has a higher priority than a Manual switch. In 1+1 mode, however, if there is an SF condition on the protect line, the SF condition has a higher priority than Force, and Force cannot override the SF condition to make a switch to the protect line. Lockouts can only be applied to a protect port (in 1+1 configurations) and prevent traffic from switching to the protect port under any circumstance. Lockouts have the highest priority. In a 1+1 configuration you can also apply a lock on to the working port. A working port with a lock on applied cannot switch traffic to the protect port in the protection group (pair).