

XTM SERIES

PROTECTION CONTROL UNIT

Enabling High-availability Protection

The **Protection Control Unit (PCU)** is part of the Infinera XTM Series, which enables optimized and cost-efficient transport networks based on CWDM and DWDM technology. The PCU is optimized for metro/access applications.

Redundancy Level Challenges

Protection between two traffic units within the same card cage of a chassis is normally secure enough since the chassis has redundant power supplies as well as redundant fan units. As the traffic units are placed in the same card cage, it is easy to provide sub-50 ms switching since a direct hardware (HW) connection can be used to provide the required fast signaling between the units.

However, in special cases this redundancy level is not sufficient. To further enhance the availability figures, the two traffic units must be placed in separate chassis, so that it is possible to place them in separate buildings or even at separate sites.

To enable the transponders to be placed in separate chassis, the signaling between the units/chassis must be solved in a manner that still can provide carrier-grade switching within 50 ms. This rules out a data communications network (DCN)-based solution since this will involve the node control unit and software functionality.

XTM Series Protection Control Unit

The PCU is a special plug-in unit that is placed in the chassis involved in the protection scheme. The PCU is an active, half-height plug-in unit with two SFP ports.

In the TM-3000 card cage, up to 10 half-height units can be mounted in the right-hand side via the supporting shelf.



Key benefits:

- Carrier-grade protection between traffic units placed at different locations
- High-availability protection selectable on a per-unit basis
- Cost-efficient protection against total node failure, for example loss of primary power
- Can be mixed with other protection schemes for an optimal protection level of transported traffic

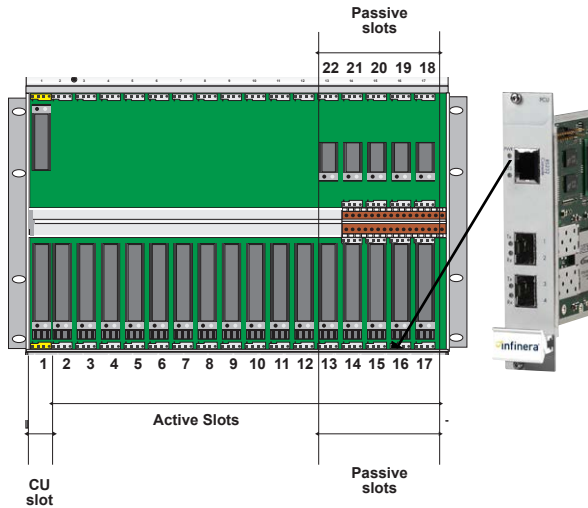


Fig 1. TM-3000 Card Cage.

The back plane has “active connectors,” also in the right-hand section, enabling active full-height units to be placed here because the supporting shelf is reduced in length. Consequently an active half-height unit can also be inserted here given that it is placed in the lower part of the card cage where the active connectors are placed, i.e. in slots 13 – 17.

Fiber Connection Sets Distance Between Chassis

The connection between two PCUs uses an optical fiber pair. The distance is thus limited by the SFP type used. Alternatively, the signal can be carried over a single fiber by connecting the SFP to a single-fiber add-drop filter or using a single-strand SFP. The choice is given depends on the distance between the PCUs.

A protection setup where the transponders are placed in separate chassis will use an optical coupler/combiner (OCU) as shown in Figure 2 to separate the client signal onto two paths. The OCU is a passive unit and can be placed in either of the chassis containing the transponders, or in a separate chassis next to the client equipment.

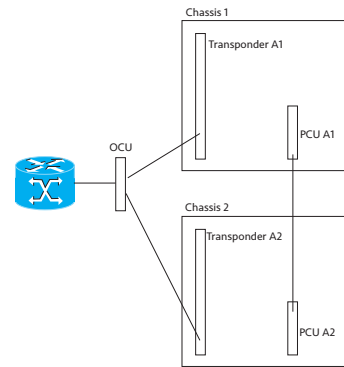


Fig 2. Principal Configuration.

One PCU can support protection to all traffic units within a card cage. It is also possible to have a mix of different protection alternatives within a network element, i.e. units without protection, units with protection in the same card cage and protection between different card cages using PCUs.

Switching Criteria

Protection switching is based on the following criteria:

- Node failure, i.e. power loss of a node. If chassis 1 in the example above has the active transponder and loses electrical power, traffic will switch to the standby transponder in chassis 2. This is achieved via “dying gasp” functionality.
- Board failure, i.e. if the active transponder fails, a switch will be made to the standby transponder.
- Signal failure, i.e. if the active transponder loses an input line or client signal, or receives a remote fail signal, a switch will be made to the standby transponder.

The switch is non-revertive. A forced toggle of active/standby side can be performed.

Alarms will be raised if the PCU to PCU connection is lost or if any of the standby connections are lost.



Specifications

Line Interfaces	2x SFP interfaces, one for future use Uncolored, CWDM and single-strand SFPs supported Line rate equal to Gigabit Ethernet. Framing is proprietary
Protection	Equipment protection/sub-network connection protection Sub-50 ms Non-revertive Automatic, forced
Power Consumption	Max 6 W worst case (with one SFP port active), 5 W w/o SFPs

Specifications and Features Are Subject to Change

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