

Application Note

Flexible Optical Transport Network (OTN) Access up to 100G



Application Benefits

- Fiber relief
- Demarcation
- High availability
- Remote visibility

Functional Elements

- FLASHWAVE CDS
- NETSMART 1500 or Virtuora®

A transition is occurring in optical transport networking as network operators move from using OTN solely as a digital wrapper for enhanced Dense Wavelength Division Multiplexing (DWDM) performance to using it as a switching mechanism for the next generation of service grooming and aggregation. OTN is perfectly suited to this new function as it provides fully-transparent global transport for Ethernet, SONET, SDH, and wholesale service extensions.

Description

Fujitsu offers service providers a modular architecture to enhance their business services and optimize their access network. The FLASHWAVE® CDS Micro Packet Optical Platform delivers flexible, high-density access up to 100G for Ethernet, SONET and OTN services. The platform incorporates a non-blocking OTN switch with multi-rate input/output to provide high-density OTN switching and multiplexing. Self-healing network facility protection is afforded by industry-standard SNC-Ne/S using sub-50 millisecond protection switching.

The modular FLASHWAVE CDS platform is available in two chassis configurations:

- A 1RU, one-slot, AC-powered chassis for OTN cards offers an optimized footprint for customer premise equipment demarcation
- Cross-card operation and Y-cable protection support on the 2RU, two-slot, DC-powered chassis provides hardware resiliency for high-availability applications

The FLASHWAVE CDS has multiple OTN-based demarcation and aggregator interface cards:

- Demarcation cards: 1GbE, OTU1, 10GbE, OC-192, OTU2, 40GbE, 100GbE and OTU4
- Aggregator cards: 1GbE, 10GbE, OTU1 and OC-3/12/48 over 10G (OTU2); and 10GbE, OC192, OTU2 and OTU2e over 10G (OTU2/2e) or 100G (OTU4)

A comprehensive end-to-end management system using the Fujitsu NETSMART™ 1500 or Virtuora®, including provisioning and remote visibility for proactive performance monitoring, provides the service provider high availability SLAs throughout the Ethernet, SONET and OTN access network.

Benefits and Value to the Customer

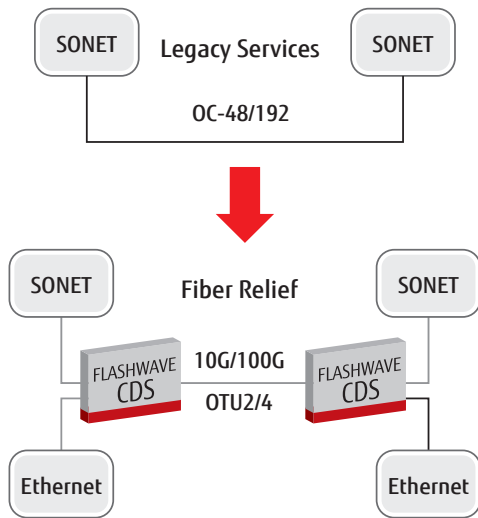
The FLASHWAVE CDS has service transport capabilities providing value across a range of applications.

- Fiber relief. Transparently maintain active legacy services that previously exhausted fiber facilities while offering new Ethernet service capability.
- Modular Ethernet, SONET and OTN service demarcation for customer premise and wholesale handoff.
- High availability. Self-healing resilient design for diverse path and ring network facility and hardware.
- Comprehensive remote visibility using OTN OA&M suite of metrics for the Ethernet, SONET and OTN service ports to easily identify remote impacts.

OTN Delivers Valuable Applications

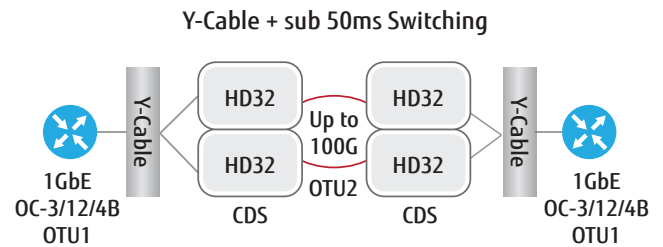
Fiber Relief

The FLASHWAVE CDS scales capacity for new and existing services over exhausted facilities without adding fiber. New or higher capacity Ethernet services can be transparently maintained on the same fiber along with legacy SONET by using OTN.



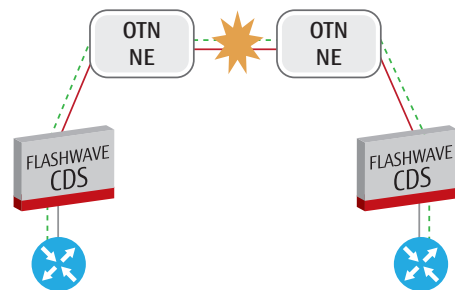
High Availability

The FLASHWAVE CDS provides 99.999% (five nines) availability via path diversity and network resiliency using the HD32 or HD62 OTN aggregator cards for 10G (OTU2) and 100G (OTU4) service delivery, respectively. The platform can act as a self-healing network facility via OTN diverse path switching and offer an extra level of resiliency via hardware protection using the optical Y-cable.



Remote Visibility

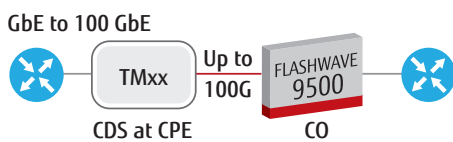
The OTN architecture of the FLASHWAVE CDS locates faults easily and remotely through a comprehensive OA&M suite of metrics for the Ethernet, SONET and OTN service ports captured every 15-minutes and stored in bins for reviewing performance statistics over time. One example of the many performance monitoring functions is the OTN fault-type, fault-location (FTFL) function. FTFL reduces time to repair (TTR) significantly, thus reducing or eliminating no-trouble found (NTF) truck rolls. This remote visibility works in-network or with wholesale network service. End-to-end OTN performance monitoring insures SLAs are maintained.



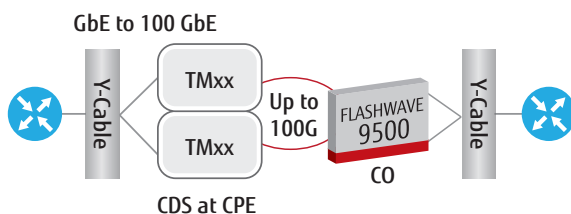
Demarcation

The FLASHWAVE CDS delivers 1GbE, 10GbE, 40GbE, OTU2, OTU2e or 100GbE CPE demarcation as an extension of the FLASHWAVE 9500 platform, using the TM41, TM51 and TM61 OTN demarcation cards. The platform can provide basic point-to-point service delivery using one OTN card in a 1RU chassis or resilient service delivery using two OTN cards and optical Y-cable support in a 2RU chassis.

Basic Service Delivery



Resilient Service Delivery



Fujitsu Provides Unique Advantages

Competitive Differentiators for Our Solution

The Fujitsu OTN Access solution offers several important advantages over competitor's products:

1. Ring support for OTU-4 aggregation, as opposed to only hub-and-spoke support, offers network fiber protection and minimizes required fiber assets – a cost effective advantage in out-of-franchise environments.
2. Equipment protection for the 10G or 100G aggregator on a 2RU shelf is used when high availability operation is required. Two cards used in redundant operations for one function provides the ability for the system to self-heal if one card fails, without a disruption in service.

Conclusion

Fujitsu offers OTN switching and aggregation solutions to provide a transparent transport interface between critical services and the network edge. The FLASHWAVE CDS offers transparent service delivery, aggregation and demarcation for Ethernet, SONET and OTN services. Service capacities include Ethernet at 1G to 100G, SONET at OC3 to OC192 and OTN at OTU1 to OTU4 service delivery. This compact, modular, carrier-class, platform offers aggregation using 400 GB of switching capacity. The 1RU or 2RU fully-resilient configurations provide customer premise demarcation, wholesale service extension and fiber relief solutions.

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