Fujitsu’s FLASHWAVE 4x70 Multi-Service Provisioning Platform (MSPP) series provides telecommunication carriers and service providers with a powerful solution to survive their fiercely competitive industry.

Integrating reliable and intelligent SDH functionality and efficient Ethernet aggregation and switching into a compact body, the FLASHWAVE 4x70 MSPP enables both traditional voice-based services and increasingly diverse data services to be delivered over a unified optical network.

Enriched with next-generation SDH functionality, the FLASHWAVE 4x70 MSPP allows carriers to not only simplify their network, but also to efficiently, flexibly, and dynamically use network bandwidth with a simple management procedure. In this way, the FLASHWAVE 4x70 MSPP helps to satisfy the growing end-user’s demand in an increasing variety of broadband services at a substantially reduced cost.

The FLASHWAVE 4170 is an STM-1/STM-4 MSPP optimized for Metro Aggregation and Access applications. Typical node configurations are:

- Single STM-4 ring with four STM-1 sub-rings and 63 (1:3) x E1 lines
- Triple STM-1 rings with 3 (1+1) x E3/DS3 and 32 x FE (transparent or L2 switching) lines
- Single STM-16 ring with an STM-4 sub-ring, two STM-1 sub-rings and four GE (transparent) lines

Key Benefits

- Carrier-class STM-1/STM-4 based platform upgradable to STM-16
- Compact and high-capacity subrack with horizontally arranged universal slots to accommodate up to eight interface cards and four connector cards
- All-in-one-box solution to satisfy service demands from STM-16, STM-4, STM-1, STM-1E, E3, DS3, and E1, to Fast Ethernet and Gigabit Ethernet
- Reliable optical network supported by traffic protection schemes such as 1+1 MSP, SNCP, and 2-fiber MS-SPRing for SDH layer, as well as Rapid Spanning Tree Protocol (RSTP) for Ethernet layer
- Non-blocking switching matrix with HO/LO capacity options according to network requirement; 7.2 Gbps/2.5 Gbps for a small-sized node and 15 Gbps/5 Gbps for a middle-sized node
- Tributary protection to prevent service outage from single point of failure
- Small Form-factor Pluggable (SFP) interfaces to deliver optical rate and parameter flexibility on a per-port basis
- Next-generation SDH functionality such as General Framing Protocol (GFP), Virtual Concatenations (VCAT), and Link Capacity Adjustment Scheme (LCAS) functions for dynamic bandwidth allocation, adjustments, and protection

Ethernet Transport Features

- Data service applications including EPL (Ethernet Private Line), EVPL (Ethernet Virtual Private Line), EPLAN (Ethernet Private LAN), and EVPLAN (Ethernet Virtual Private LAN)
- Layer 2 processing to reduce bandwidth requirements, and therefore enable cost-effective data transport over the SDH infrastructure
- VLANs or double-tagged VLANs to enable 802.1p QoS/CoS, as well as segregation of traffic flows, and thereby increase security without sacrificing bandwidth efficiency or network flexibility

Management Features

- Speedy operation and maintenance through local craft terminal FLEXR L
- Network element and sub-network-based management system FLEXR C, supporting all the FLASHWAVE 4x70 products, to enable seamless management of all SDH, PDH, and Ethernet layers

Compact Carrier-Grade Metro Access Platform

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Technical Specifications

Applications
- Terminal multiplexer
- Linear add-drop multiplexer
- Ring add-drop multiplexer
- Mini cross-connect

Traffic Interfaces
- STM-16 (L-16.2, L-16.1, S-16.1)
- STM-4 (V-4.2, L-4.2, L-4.1, S-4.1)
- STM-1 (V-1.2, L-1.2, L-1.1, S-1.1, electrical)
- E3/DS3
- E1 (75 ohms/120 ohms)
- GE (1000Base-T, GE-ZX, GE-E, GE-LX, GE-SX, transparent)
- FE (10/100Base-TX, transparent or L2 switching)
- Optical amplifier: Post-amp (13 dBm, 15 dBm, 18 dBm output), pre-amp (20 dB gain)

Cross-Connect
- Option 1: 7.2 Gbps for HO (45 x 45 VC-4) and 2.5 Gbps for LO (1008 x 1008 VC-12)
- Option 2: 15 Gbps for HO (97 x 97 VC-4) and 5 Gbps for LO (2016 x 2016 VC-12)
- Connection: Unidirectional, bidirectional, broadcast, drop and continue, loopback

Network Protection
- 1+1 MSP at STM-1, STM-4, STM-16
- 2-fiber MS-SPRing at STM-4, STM-16
- SNCP/I and SNCP/N at VC-12, VC-3, VC-4 and VC-4-4c

Hardware Protection
- STM-1E card: 1+1
- E3/DS3 card: 1+1
- E1 card: 1:N (N= 1 to 3)
- Power and CC cards: 1+1

Mapping
- G.7041/Y.1303 GFP-F
- G.7042 LCAS:VC-12, VC-3, VC-4
- G.707 VCAT: VC-12, VC-3, VC-4

Synchronization
- Internal clock: G.813 Option 1, Optional Stratum 3 clock
- Timing Source: External clock (2 Mbps, 2 MHz), SDH line, E1
- Operation: Free-running, hold-over, locked-mode
- Priority and quality (SSM) synchronization algorithms

Ethernet Features
- Layer 2 forwarding at wire-speed
- Layer 2 switching and aggregation
- 802.1Q VLAN and stackable VLAN
- 802.3x flow control
- MAC Address self-learning
- Layer 2 multicast (static provisioned or IGMP snooping)
- Rate-limiting per port and/or VLAN
- 802.1p QoS/CoS per port and/or VLAN
- 802.1w Rapid Spanning Tree Protocol (RSTP)

Power
- Input voltage: -48 V DC
- Power consumption: approx. 260 W

Mechanical Specifications
- Sub-rack size: 447W x 246H x 279D mm (incl. projection)
- Installation: Standard ETSI rack

Environment
- Operating temperature: -5 to 45 °C
- Start-up temperature: 0 to 45 °C

Management
- Local provisioning and maintenance by FLEXR L local craft terminal
- Remote centralized management at both element and network level by FLEXR C Sub-Network Management (SNM)
- SNMPv2 standard MIB

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