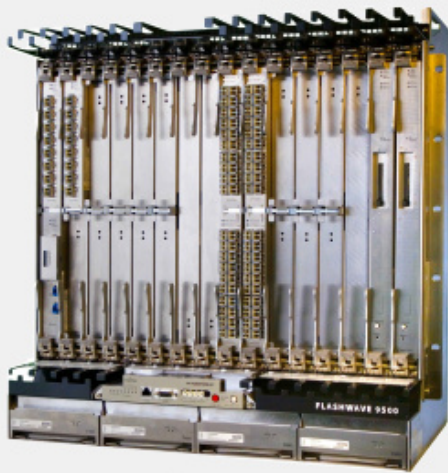# FLASHWAVE 9500 System Carrier Ethernet Planning and Engineering

Ordering Information

Course Code: 9500-CEE
Course Duration: 3 Days
Ordering Numbers:

- In-House: TRIH-9500CEE
- Suitcase: TRSC-9500CEE*
- MSP Suitcase: TRSE-9500CEE*

* For suitcase pricing, contact your Fujitsu Sales Representative or email our Training Coordinator at knowledge.delivery@fnc.fujitsu.com.

Prerequisites

- FLASHWAVE 9500 System Engineering
- SONET Tutorial
- Ethernet Tutorial
- DWDM Tutorial

Course Contents

Overview
Applications
System Components
E-Line Overview
Carrier Ethernet Policing And Shaping
Ethernet OAM
E-LAN Ethernet Service
Case Studies

Course Description

This course enables students to plan and engineer connection-oriented Ethernet applications using the FLASHWAVE 9500 Packet Optical Networking Platform. Case studies are provided for various Carrier Ethernet applications.

Who Should Attend

The course benefits all personnel responsible for planning and engineering networks using FLASHWAVE 9500 systems benefit from attending this course, including network planners and engineers, supervisors, and managers with budget responsibility.

What you will learn

Overview

- System Features
- System Components
- Functional Description
- Channel Assignments
- Applications
- NE Management and NE Security

Applications

- Ethernet Services
    - Ethernet E-Line Provisioning
    - Ethernet E-LAN Provisioning
    - Ethernet E-Access Service
- EoX Mapper
- ROADM
- Ethernet over SONET (EOS)/SDH

System Components

- High-Density Shelves/Backplane
- Standard-Density Shelves/Connectors
- HDS and SDS Shelf Power Feed Design
- HDS and SDS Shelf LAN Intershelf Connections
- HDS and SDS Shelf Units/Equipment
    - Frame and Management Units
    - Multirate/Multiservice (MRMS) Units
    - 1-Port OC-192NB Unit
    - 2-Port OC-192 Unit
    - 8+1 Muxponder Units
    - 100 Gb/s Muxponder Unit
    - 20-Port GbE Packet Unit
    - 2-Port 10 GbE Packet Unit
    - 10 GbE NBO Packet Unit
    - VT/TU Switch Fabric Unit

- Pluggable SFP/XFP/ Modules
- COM4 AND COM5 Panels
- FLASHWAVE 9500 Circuit Breaker Panel

E-Line Ethernet Overview

- FLASHWAVE Packet ONP Product Family
- MEF Service Terminology
- FLASHWAVE 9500 Carrier Ethernet
    - Fujitsu Data Provisioning Building Blocks
    - Ingress and Egress Traffic Management
    - Single and Dual VLAN Tag Operations
- Fujitsu Data Provisioning Building Blocks
    - Ethernet Interface and Logical Interface (LIF)
    - Transport Service Groups (TSGs)
    - Flow Points (FPs) and Flow point Members (FP-MBRs)
- Ethernet Supported Service Types
- Packet/TDM Interworking Unit (EoX Mapper)

Carrier Ethernet Policing And Shaping

- Mapping and Classification
- Detailed Packet Traffic Flow
- Ingress and Egress Traffic Management
- HDTD and WRED Queue Management
- Egress Class of Service and Egress Shaping

Ethernet OAM

- Ethernet Tunnels
- Link and Service OAM
- Ethernet Protection Domain
- Automatic Protection Switching (APS)
    - Ethernet Flows and Protection
    - APS Using SMEPs with Representative Flow
- Link Aggregation (LAG)
- Network Design (Tagging and Tunneling)

E-LAN Ethernet Services

- Bridge Components
- Interfaces, Flow Points/Units, and E-LANs
- Bridging Provisioning
- Access Control Lists
- Policing and Shaping
- SOAM
- Spanning Tree
- RSTP and MSTP on 802.1ad Provider Bridge
- Hairpinning