

Next Generation SDH

Course No. 2004

Duration: 1 Day

Course Overview:

Synchronous Digital Hierarchy, SDH, standardized the way information is multiplexed and transmitted in today's optical transport networks. This course will teach how data/Ethernet is carried efficiently over SDH. This course will also teach the more advanced SDH topics, including: how to track who is responsible for any signal degradation as the traffic crosses through independent networks; the various line, sub-network and path protection options; and various extensions added to the SDH protocol. Additional topics that will be explained on a basic level will be: the packet protocols for transport such as MPLS, T-MPLS, PBB and PWE3; the new management protocols GMPLS and ASON; and a quick look at DWDM and the Optical Transport Network or OTN with range extending FEC. Finally the course will review the technologies competing for the Packet Optical Transport Market.

Prerequisites:

This course is a continuation of the course Introduction to SDH and assumes that the student has taken the introductory course and is familiar with the basics of PDH and SDH.

Course Content:

1. General SDH Review:

- STS-1 Frame; STM-1 Frame
- Low-Order /High-Order Multiplexing
 - KLM Numbering Scheme
 - Contiguous Concatenation

2. Data/Ethernet Over SDH

- Packet Over SDH/Sonet (POS)
- GFP/VCAT/LCAS Virtual Concatenation
HO/LO:
 - Link Capacity Adjustment Scheme
 - Generic Frame Procedure
 - Generic Framing Format: GFP-F/GFP-T

3. Tandem Connection Monitoring

- High Order TCM – N1 Byte extensions
- Low Order TCM – N2 Byte extensions

4. Protection Options:

- Line Protection/MS-SPRing
- Sub-Network Protection – SNCP
- Automatic Protection Switch Protocol

5. Packet Transport Protocols

- Layer 1 vs. Layer 2 Transport
- RPR vs. MPLS
- T-MPLS vs. PBB/PBT
- Packet over TDM vs. TDM over Packet – PWE3

6. Management Protocols

- DCC: ISO vs. OSPF
- GMPLS and ASON

7. 2.5 Gbps and beyond

- Black & White vs. DWDM/CWDM
- Optical Transport Network
 - Multi-service capability
 - FEC for Extended Reach

8. The Packet Optical Transport Market

- SDH MSPP/MSTP
- Ethernet over WDM
- Carrier Ethernet Switches and Routers

9. Summary

10. Glossary