

SDH-PDH-PCM: How does it work? Techniques, Standards, Applications and Tests – Including Measurement Examples

NewGen SDH is seen as an extension to and urgently needed “Ethernet adaptation” of the globally available “classic” SDH and SONET wide area network technologies: new ITU-T standards define the complex adaptation mechanisms needed for transporting asynchronous, packet-oriented data over synchronous digital hierarchy and synchronous optical networks at data rates well in to the gigabit range.

SDH & SONET provide a reliable foundation for rapidly growing Ethernet applications below the TCP / IP layer in the OSI model. Lately, the transition to “NewGen” is being accomplished by functions such as GFP (Generic Framing Procedure), VCAT (Virtual Concatenation) and LCAS (Link Capacity Adjustment Scheme).

In this seminar, participants will learn how a classic synchronous digital transport network is structured, and which equipment and mechanisms are needed to operate and monitor it effectively.

Additionally, detailed information about frame structures, overhead bytes, pointers, synchronous clocks, and alarm monitoring is also given. The link to “NewGen” SDH is provided by the newly added sections on GFP, VCAT and LCAS.

Test methods and standardized tests for installation and maintenance, troubleshooting, and (re-) commissioning are also discussed and practically demonstrated and evaluated in some cases with the aid of appropriate test equipment.

The “Glossary of Abbreviations” and an “Overview of International Standards” are a practical addition to the seminar documentation.

Contents

- ▶ PCM and PDH refresher
- ▶ SDH principles:
 - Backbone network
 - SDH network structure
 - Network topology and network elements
 - STM-1 frame structure
 - SDH transmission sections
 - Regenerator section – Multiplex section – Path section
 - Overhead bytes: RSOH – MSOH - POH
 - Mapping and MUX structures
 - Pointer technology
 - Higher bit rates: STM-4 up to STM-256
 - Concatenation
 - Comparison: SDH and SONET
 - Error and alarm monitoring
 - TCM - Tandem Connection Monitoring
 - APS - Automatic Protection Switching
 - Interfaces
- ▶ SDH measurement tasks
- ▶ Quality assessment: G.821
 - G.826 – M.2100
- ▶ Network synchronization
- ▶ NextGen SDH: GFP – VCAT – LCAS
- ▶ Standards and recommendations
- ▶ Glossary

Equipment discussed

- ▶ PDH and SDH test applications

Course objectives

Participants will be able to understand the main, fundamental functions and relationships of SDH / SONET / NextGen SDH technology, and be able to describe and classify standardized system parameters, as well as to evaluate and compare measurement results.

Target group

All who want to gain a solid overview of the SDH segment with up to date information about “Next Generation” SDH.

Prerequisites

General knowledge of digital telecommunications..

Related seminars

- ▶ **Getting in**
“PCM and PDH Technology
- ▶ **Continuation seminars**
“Network Quality – Network Synchronization, Jitter, Wander, and Measurements”
“WDM – Terabit Speeds in Glass Fibers”
“Ethernet in Carrier Networks – Next Generation Ethernet for the Metro Area”

Seminar info

- ▶ **Duration**
2 days, from 9.00 to 16.30 h
- ▶ **Date, location and price on request or see under www.viavisolutions.com**
- ▶ **On-site or customized seminars and E-Learning on request**

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