SS7 over IP – SIGTRAN

Who Should Attend?

The course is intended for network engineers and anyone else who needs technical knowledge of the functionality of SIGTRAN and the possibilities of SS7 message transmission over an IP network.

Course Scope

1. Introduction:
   - IP Networks,
   - SS7 – Signalling System No. 7 and Need for IP Transport.
2. SCTP – Stream Control Transmission Protocol:
   - Packets, Association Establishment,
   - Multi-homing,
   - Data Transmission,
   - Data Streams,
   - Sequence Control,
   - Ordered and Unordered Delivery,
   - Association Shut Down and Abort Procedures.
3. SCTP – exercises.
4. Other SCTP usage (TCP Replacement and LTE Signalling).
5. SIGTRAN Terminology and Design:
   - IPSP,
   - ASP,
   - SGW,
   - User Adaptations, etc.
6. SIGTRAN Architecture and Common Scenarios:
   - IPSP communication,
   - ASP setup and fail-over,
   - Key Registration and De-registration.
7. SCTP Adaptation Layers:
   - IUA – ISDN User Adaptation,
   - V5UA – V5.2 User Adaptation,
   - M2UA – MTP2 User Adaptation Layer,
   - M2PA – MTP2-User Peer-to-Peer Adaptation,
   - M3UA – MTP3-User Adaptation Layer,
   - SUA – SCCP-User Adaptation Layer.
8. MTP3 User Adaptation Layer:
   - M3UA - System Architecture,
   - Services Offered by M3UA,
   - Protocol Stack,
   - Data Structure,
   - Routing,
   - M3UA Messages and Control Procedures.

9. M3UA – exercises.
10. MTP2 User Adaptation Layer / MTP2 Peer-to-Peer Adaptation Layer:
    ○ M2UA and M2PA - System Architecture,
    ○ Services Offered by M2UA/M2PA,
    ○ Protocol Stack,
    ○ Data Structure,
    ○ Messages and Control Procedures.
11. M2UA/M2PA – exercises.
12. SCCP User Adaptation Layer – SUA:
    ○ Services Provided by the SUA Layer,
    ○ Protocol Stack,
    ○ Routing and Address Translation,
    ○ Protocol Elements,
    ○ Messages and Procedures.
13. SUA - exercises.
14. ISDN Q.921 - User Adaptation Layer – IUA:
    ○ Services Provided By the IUA Layer,
    ○ Protocol Stack,
    ○ Protocol Elements,
    ○ Messages and Procedures.
15. IUA - exercises.
16. Practical Issues with SIGTRAN:
    ○ Redundancy on Different UA, SCTP, IP, LAN,
    ○ Migration from Legacy SS7 to SIGTRAN,
    ○ Typical Compatibility Issues.

Course Objectives

This course gives the participants detailed knowledge of the structure and functions of SIGTRAN that can be used to carry SS7 messages over IP connections. During the course, we will discuss all SIGTRAN protocols, stressing especially SCTP and M3UA, as the first is mandatory for any SIGTRAN system and the second is chosen by major GSM/UMTS equipment vendors to be implemented in their products.

Prerequisites

The participants should have basic knowledge of SS7 and IP.

Training Structure

Two-day training divided into logical sessions.

Methodology

Instructor-led training with trace analysis and exercises based on the provided traces (working with a protocol analyser), presenting both positive and negative scenarios.