

SS7 Signalling in Mobile Networks – 3 days

CONTENTS

The SS7 Signalling in Mobile Networks course explains and describes the world's most widespread inter-exchange signalling system used in fixed and mobile telecommunication today: Signalling System No 7. It provides the basic ideas and structure of the SS7 protocol stack. Different aspects of various signalling protocols and signalling applications in the telecommunications world are covered. There are a few detailed examples from both mobile and fixed networks.

The course focus is on ITU SS7 and GSM/UMTS core network protocols that are based on SS7 system. The participants will also gain a general understanding on how to interpret log files and traces taken from live networks.

PREREQUISITES

General telecom and basic signalling knowledge is recommended. For background knowledge, we recommend the Apis' course 3GPP Mobile Systems Overview.

SS7 Introduction

- The overview of the SS7 system
- The definition and structure of the SS7 signalling network: SP, STP, SL, LS, etc.
- The logical division of SS7: MTP and User Parts
- Use of SS7 protocol in 2G and 3G mobile networks and fixed networks
- Overview of various SS7 protocols

MTP - Message Transfer Part

- The functions of the different MTP levels
- The structure and functions of MTP signal units, signalling link states and link management functions
- MTP 3 message handling – addressing, routing, load sharing, and distribution
- The overview of Signalling Network Management and Testing functions

ISUP - ISDN User Part

- Use and functions of ISUP in PSTN, ISDN, and mobile networks
- Various ISUP signalling procedures: call handling, circuit management, etc.
- ISUP messages and their structure

SCCP - Signalling Connection Control Part

- SCCP functions and applications
- SCCP signalling modes: connectionless and connection oriented
- SCCP addresses and their usage in 3GPP networks
- SCCP messages and their structure

TCAP - Transaction Capabilities Application Part

- TCAP functions and applications
- Functions of TCAP component and transaction sub-layer
- TCAP messages and their structure

MAP - Mobile Application Part

- GSM/UMTS MAP interfaces and operations

- Overview of MAP signalling scenarios for mobility, call handling, supplementary services management, recovery, etc.
- Dialog portion functions

Traffic case

- Detailed analysis of a mobile terminating call scenario with focus on MTP, SCCP, ISUP, TCAP, and MAP messages and their parameters

CAMEL Application Part

- An introduction to Intelligent Networks nodes and functions with CAMEL as an example
- Overview of IN call triggers and CAMEL subscription information records
- Overview of basic CAP operations.

SS7 over ATM

- Overview of SAAL-NNI protocols, their functions, and message formats
- Example SSCF and SSCOP procedures

SS7 over IP

- Overview of SS7-over-IP interfaces, protocols, and emulation options
- Functions and messages of SCTP protocol, example SCTP packet flow
- Overview of M3UA functions and messages
- M3UA addressing with routing keys and routing contexts
- Example M3UA signalling scenarios for establishment of an association, user data transfer, and signalling network management.