

Multimedia Messaging System (MMS) in 3GSM-Networks

Course Duration:

2 days

Course Description:

- This unique course focuses on the detailed description and analysis of signaling procedures and protocols involved in MMS.
- Following a short review of SMS and WAP implementations, the course investigates in full detail the tasks, message structure and parameters of all relevant protocols within the MMS environment (MMS Relay/Server, User Agents, VAS, MM-Box...) and towards external systems (VMS, SMSC, Fax- and E-mail server...).
- All aspects of introducing and interworking of MMS within 2G/3G networks and its connection to ISP and VAS-providers are analyzed. One major aspect is the MMS-capable mobile station in combination with user terminals (e.g. laptop, PDA).
- Another major focus of this course is the analysis and description of the application address formats and their conversion e.g. while roaming. This part also focuses on the MMS data content itself (e.g. while interfacing with external networks).
- Whenever applicable, we use real live examples and reference material from various sources to provide a realistic view on MMS issues.

As in all our courses we integrated several interactive exercises for a perfect learning experience.

Pre-Requisites:

- General understanding of GSM/GPRS networks, protocols, operation and parameters. If required, we advise our courses "Introduction to GSM" and "GPRS from A-Z" to be taken upfront.
- A good understanding of TCP/IP protocols and its applications e.g. SMTP. For this requirement the INACON course "3GSM and TCP/IP- Protocols, Operation & Services" should be taken upfront.

Course Target:

- The student will be enabled to understand all relevant details of introducing and operating MMS within and among PLMN's as well as servers and applications.
- The student learns how to follow MMS-specific signaling, the procedures of MMS-data exchange and how to determine possible errors in such procedures.
- The student obtains the ability to customize and optimize MMS according to the specific needs of different network operators. An important point will be the topology of networks and requirements for roaming.

Some of your questions that will be answered:

- How is the interworking between SMS and MMS done?
- What is the meaning of the various new MMS related terms like: MIME Subtype, SMIL, Media Synchronization and Presentation Format, AMR, SOAP...?
- What is the meaning and function of the new protocols and messages (e.g. MM1_SUBMIT.REQ) that have been defined for MMS?
- How can I send a FAX to an MMS-capable mobile station and how are data and addresses reformatted?
- What is the impact of MMS introduction on existing protocols and network elements e.g. the HLR.
- Where and how are charging data records generated?
- How many media formats are supported by MMS and how are they identified and distinguished from each other?

Who should attend this class?

- Everybody who needs to implement MMS into existing 2G and 3G networks.
- Engineers who need to prove the correct behavior of MMS in PLMN's, access networks, core networks and mobile stations.
- Design engineers of network equipment and MMS-capable mobile stations.
- Field engineers who shall analyze MMS-recording files.
- Test engineers who need to interpret MMS-recording files in the lab.

Table of Contents:

MMS Services & Applications

- **New and well known Applications** / SMS review, WAP services, Introducing new service requirements like the Media Synchronization and Presentation, Multimedia elements
- **MMS Multimedia Elements** / Multimedia Types and Subtypes, Format Conversion and Translation,
- **Text** / ASCII, ISO-8859-1,
- **Speech** / AMR, IETF RFC 3267, POP3, IMAP4
- **Audio** / MPEG-4
- **Synthetic Audio** / MIDI
- **Still Image** / ISO/IEC JPEG and JFIF, TIFF, IETF
- **Bitmap Graphics** / GIF, PNG
- **Video** / MPEG-4, H.263
- **Vector Graphic** / 2D SVG-Tiny, SVG-Basic
- **Timed and Synchronized Multimedia** / MP4/3GP File Format, ISO Base Media File Format, Video, Associated Audio and Timed Text, SMIL, 3GPP PSS-5 Language Profile, XHTML
- **Existing Transfer Protocols and Message Formats** / Addressing, WAP, SMTP, ESMTP, SMIL, MIME, Message Encapsulation

Architecture of MMS capable Mobile Networks

- **General MMS Requirements** / MMSNA System Architecture, Service Elements for Storage, Delivery, Notification, MM-Box, Charging, VAS, Authentication, Screening
- **Addressing in MMS** / RFC 822 Routable Address, MSISDN (E164), Unique Domain Names for MMSEs (e.g. mms.operator-x.net), Address Mapping, Address Hiding
- **MMS User Agent** / Requirements for Presentation, Composing and Handling of MMS, Terminal Capability Negotiation, Mobility and Roaming, Signed MMS (User-to-User), Encryption and Decryption (User-to-User), Management of MM-Box Content, Handling of (U)SIM Stored Information, Storing on MS and External Devices, User Profile Management
- **MM-Box** / Task & Function, Network Based Storage, Interfaces

- **MMS and HLR** / Access Information, Subscription and Configuration Data, Service Capability, Roaming
- **MMS Relay and Server** / Combined and Non-Combined Configuration, Authentication and Security Mechanisms, Forwarding and Relaying, Temporary Storage, Interworking with External Systems (e.g. Voicemail, SMSC, FAX, E-Mail), MAP Interface to HLR, Format Conversion, Notification of User Agents, Terminal Capability Negotiation, Anonymous MMS, Prepaid Service, Screening
- **Value Added Service and Charging** / Generation of Billing Records, VAD-Services
- **MMS related Interfaces** / Reference Architecture and Interfaces MM1, MM2, ... , MM8

Protocol Stack for MMS

- **MMS Transfer Protocols** / Protocol Types, Address Types, MSISDN, E-mail (RFC 822), IP, FQDN Format
- **Higher Level Protocols and Service Elements used in MMS** / The Presentation Layer and Application Layer of MMS

MMS Messages and Scenarios

- **MMS Messages** / General Structure and Identification Means (e.g. MM4_FORWARD.REQ), Information Elements and their meaning (Sender Visibility, Earliest Delivery Time, MM States)
- **MML Scenarios** / Abstract Messages Flow
- **Submission of MMS** / Authentication, Routing of Delivery Report, Routing of Read Reply Report, Address Hiding, Content Type Identification, Recipient Address, Earliest Desired Delivery Time, Submission Time Stamp, Message Expiry Time, Address Overriding
- **Reception of MMS** / User Profile Verification, Deletion of MMS if Expiry Time is reached, Deletion after Delivery or Rejection, Notification of MMS-Recipient and MMS-Originator, Streaming Retrieval
- **Forwarding and Storage of MMS** / Time Constraints, Persistent Storage, Polling for Messages on External Networks
- **Terminal Equipment Capability Negotiation** / Tasks of the MMS capable MS, Tasks of the MMS Relay/Server, MM1 Implementation Dependent Capabilities (e.g. MM1=WAP), Maximum Supported MMS-Size, Image Resolution and Color Depth, Supported MIME Types, Character Sets, Preferred Language

Solutions for the Practical Exercises