

IMS Architecture – 0,5 day

CONTENTS

This course presents the architecture and functionalities of the IP Multimedia Subsystem (IMS) as defined in the current R17 3GPP standards.

IMS as a generic platform designed to control and handle a variety of services accessible over several possible access networks is explained. The course shortly introduces the different possible IP Connectivity Access Networks (IP-CANs) that IMS can handle, but is mainly access-agnostic. There is a definite focus on the mobile access option from the 3GPP standards - mainly 4G and 5G – with mainly the telephony (VoLTE/Vo5G) service used as an example.

The course presents the benefits of deploying IMS control: service availability and subscription verification, session handling, security, charging. Session establishment, modification, and release, together with the policy management for resources within the used IP-CAN are discussed. Mobility-related and roaming considerations for mobile/nomadic devices are also presented.

PREREQUISITES

General technical knowledge of the fixed and mobile telecommunication technology is beneficial.

NOTE: This course is not delivered with the FoldOut methodology.

IMS Architecture

- Roles and functions of IMS Core, Policy Manager (PM), Subscription Database (SD)
- Role and functions of the different types of Call Session Control Functions (CSCF): Proxy CSCF, Interrogating CSCF, Serving CSCF
- Interaction with non-IMS networks: roles and functions of Signalling Gateway (SG), Border Gateway (BGW), Media Gateway (MGW), Breakout Gateway Control Function (BGCF), Media Gateway Control Function (MGCF)
- User Equipment (UE) and Application Server (AS) as Application endpoints
- Basic IMS connectivity scenarios: UE ↔ AS, AS ↔ AS, IMS ↔ non-IMS user
- Responsibilities of IMS Core functions in roaming scenarios

IMS Procedures

- IMS Subscription identification: IMS Public User Id (IMPU), IMS Private User ID (IMPI)
- Service handling settings: Service Profile, initial Filter Criteria
- IMS Signalling: Session Initiation Protocol (SIP), Diameter and HTTP protocols
- Basic IMS traffic cases: IMS Registration, Originating and Terminating Session Setup
- Establishment of User Plane resources with the support of the Policy Manager

Policy Management in IMS

- Policy and Charging Control in IMS, PCC
- Roles of the Policy Manager, especially the Policy and Charging Rules Function (PCRF) and Policy Control Function (PCF), including the division into Home and Visited network responsibilities in roaming scenarios
- Quality of Service Class Identifier (QCI) and 5G Quality of Service Identifier (5QI) values for resource definition in 4G and 5G as the IP-CAN

IMS Security

- Security procedures for UE authentication and authorization: IPCAN security, 5G slice security, IMS security,
- IMS Authorization and Key Agreement (AKA) as the IMS access security