Overview

This is a three-day course where the participants will be able to understand the IMS concept, IP Multimedia Subsystem architecture, and various protocols and services offered with quality of service.

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Overview

This is a three-day course where the participants will be able to understand the IP Multimedia Subsystem (IMS) concept, IP multimedia subsystem architecture, and various protocols and services offered with quality of service.

Objectives

After completing this course, students will be able to:

- Understand concepts behind All-IP Multimedia Networks
- Service oriented interconnection
- Connectivity oriented Interconnection
- Interconnection border control function
- IMS application layer gateway
- Media Resource Broker
- Translation gateway
- IMS security registration
- Call origination and termination
- Roaming and hand overs
- Supplementary services
- Session renegotiation
- External services
- IMS security architecture
- IMS session establishment
- Interworking
- Charging, policy & quality of service
- Policy and charging control
- Diameter in IMS

Learning outcomes

**IP multimedia subsystem overview**

- Telecom evolution
- Convergence
- VoIP and system information protocol
- IMS market opportunities
- IMS in the 3GPP, 3GPP2, ETSI, TISPAN, and CableLabs
- Delivering value added services enabled by IMS
- Mobile content and delivery
- Push to services
- Converged voice services
- Multimedia messaging
- Conferencing messaging
- Response services
- Service roaming

**What is IMS?**

- Service creation and delivery
- IMS elements
- SIP protocol for session control
- Service elements and functions

- IMS resource and media control elements
- Signalling and transport interworking elements
- Session control in the IMS
- Media encoding
- Media transport
- SIP and diameter in the IMS
- Diameter Cx and Dx interfaces
- Security in the IMS
- Policy in the IMS
- QoS in the IMS

**Architecture of IP multimedia subsystem (IMS)**

- Reference architecture
- Application layer
- Service control layer
- Media layer
- Interfaces and protocols
- SIP extensions for IMS
- Call session control function
- Serving-CSCF
- Interrogating-CSCF
- Proxy-CSCF
- Home subscriber server
- Subscription locator function
- Policy decision function
- Application server
- Media gateway control function
- Media gateway
- Breakout gateway control function
- IP multimedia service switching function
- Media resource function controller
- Media resource function processor

**Course outline**

1. **Module 1: Review of NGN**
   - NGN network description
   - Core network
   - Transport network
   - Access network
   - Service planning and assessment of NGN capability
   - Requirements to accommodate new services
   - Quad-play repertoire
   - Impairments
   - Voice over IP (VoIP)
2. Modules 2 to 6: IP Multimedia Subsystem over NGN

Module 2: IMS Overview
- What is IMS?
- Business drivers for IMS
- IMS benefits and technical advantages of IMS
- Feature development process
- Technological and business advantages of IMS
- Operational impact on carriers and service providers
- Convergence between all networks

Module 3: IMS concepts and architecture
- The three architectural planes
- NGN platform
- SIP concepts and processes
- SIP protocol dynamics
- SIP components
- SIP request and response
- Home subscriber server and its place in the network
- Different types of call session control functions
- Three types of application servers
- Media resource function
- Border gateway control function
- Session control in IMS
- IMS protocols

IMS in the mobile network
- 3GPP IMS architecture
- Major IMS functional elements in a mobile application
- Providing services: application server
- Inter-working between fixed-wireline and wireless networks
- Session flow and charging
- Wireless data
- Mobile positioning and LBS

IMS policy, quality of service and KPI
- Policy
- QoS
- QoS and KPI’s for voice services and interactive multimedia services

Module 4: IMS applications
- Framework for applications
- Push to talk over cellular
- FMC-UMA and VCC
- Advertising
- IMS and WiMAX
- Digital broadcasting
- VAS applications
- Why is VAS Important?
- Service delivery platforms
- Location and presence
- Identity management

4. Module 5: challenges in transitioning to an IMS network
- Convergence Issues
- Standards Issues
- Who are the players in the IMS Market
- IMS and VNO’s
- Service provider challenges
- Wireless and fixed-wireline carriers vis-a-vis content providers
- Handset features and distribution
- Service rollout challenges
- Dealing with HSS
- Dealing with QoS
- No standard SCM
- Content management and regulation
- Network management challenges
- Service configuration issues
- Revenue distribution

5. Module 6: Technology evolutions impacting IMS
- SDN – Software defined networks
- NFV – Network function virtualisation
- CSP – Cloud service provisioning

Trainer profile

P.K. Agnihotri

Pradeep Kumar Agnihotri, a citizen of India, is employed with Bharat Samchar Nigam Limited in India as Deputy General Manager.

Pradeep Kumar Agnihotri, is having academic qualification of Science Graduate (B.Sc), MBA(HR) and has a vast working experience in Digital Switching and Signaling in Telecommunication of over 20 years. Mr. Pradeep Kumar Agnihotri had been involved in the Operations and Maintenance of E10-B electronic PSTN system(CIT Alcatel, France) and new technology EWSD Digital Switching System(Siemens, Germany).
Mr. Pradeep Kumar Agnihotri, is presently posted as faculty head for NGN training in ALTTC, Ghaziabad to provide training for IMS Class-5 NGN Switch (Huawei, China).

Om Pal Singh

Om Pal Singh, a citizen of India, is currently employed with Bharat Sanchar Nigam Limited (BSNL), leading telecom service provider of India. Mr. Singh holds Electronics & Communication Engineering degree and also completed MBA in Human Resource Management and is an expert CTO Trainer.

Presently, he is working as Sr. Trainer (Assistant Director) at Advanced Level Telecommunication Training Centre (ALTTC), Ghaziabad for the last 12+ years, the apex level telecom training institute set up jointly by Government of India, ITU & APT to cater to the telecom training needs of India and abroad.

He had joined BSNL in the year 2003 and is having an experience of over 14 years. He has a rich experience in design, development and imparting training on various courses in Telecom Switching and Signalling (12+ Years) that includes Signalling System No. 7 (SS7) and details like MTP, User Parts (ISUP, DUP, MAP, TCAP etc.). In this SS7 over IP is also covered with discussion SIGTRAN suite of protocols like M3UA, SUA etc. During this period, he has gathered experience in the field of operation and maintenance of different Telecom systems, developed and implemented by various vendors in BSNL.

He was mainly involved in planning, installation, operation & maintenance and deployment of National Signalling Network Solution equipment for the whole telecom network of the country and worked as in-charge of Training Model Node on Signalling Solution for imparting training on various kinds of signalling solutions like SS7 and SIGTRAN.

At ALTTC, he is responsible for design, development and conduction of Courses / Workshops / Seminars on various telecom equipments like M/s Siemens EWSD switching system, M/s ZTE NGN Equipment, M/s TEKELEC based signalling solution equipment and M/s Huawei IMS equipment.

Mr. Singh as a CTO expert trainer, Imparted training to the participants of diversified background in training on “Diploma in Telecommunications Management Studies” for M/s Vodafone Ghana, at Accra, Ghana as a CTO PDT programme. The programme was very much appreciated by the participants and also by the organisation (M/s. Vodafone Ghana).

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He is amongst the organisers & faculty in “Next Generation Network Project Planning & Costing”, ITU Centre of Excellence Program for Asia Pacific Region successfully conducted at ALTTC, Ghaziabad, India.

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