



Course Synopsis

Course : **Advanced SIP and IMS**

Duration: **4 days**

Q6 Code : **GEN3031**

Introduction

This course examines the subject of SIP at an advanced level. The course focuses on the issues involved in SIP within IMS networks.

Course Objectives

- ?? Have a detailed understanding of SIP
- ?? Explore the individual technologies used to support SIP
- ?? Understand the present and future potential role of SIP
- ?? Understand the implementation of SIP within 3G IMS

Who Should Attend

Anyone who requires a detailed understanding of SIP and how it operates within an IMS architecture.

Prerequisites

Students require some IP knowledge. Each student is required to have access to a PC running Windows 2000 or XP with admin controls.

Course Outline

Introduction to SIP

- What is SIP
- Why Use It?
- Marketing drivers
- SIP attributes

SIP Development

- Proposals, ongoing development and emerging standards

IP and IPv6 relationship to SIP

Properties and Operational Overview

- Key features and extensions
- Components and relative functions, Call Flows based on methods
- Addresses and URL flexibility, Syntax and Message Programming
- Servers, Clients and Request/ Response
- 3-digit HTTP Code and SIP Extensions

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Session Description Protocol (SDP)

- Protocols overview
- Syntax and message structure
- Relationship to SIP

Server Functions

- Registration, Home and Away Scenarios
- Location and Directory Services
- Stateful and Stateless Servers

Call Establishment

- Connection properties
- Session Initiation and Server Location
- Outbound Proxy, INVITE Method
- Tagging, Key Header fields

Call Control

- Redirect Options
- Transfers, Conferences
- SIP Services

General Security Considerations

- Encryption and Keying, Access Control and Authentication
- Hop-by-hop and End-to-end, SIP and Firewalls, SIP and NAT
- SIP message forking and challenges, S/MIME, IPsec, TLS

RTP and RTCP

- Header, Features, Packet types
- Encapsulation, Timing, Header Compression
- RTCP
- Functions, Packet types
- Performance Statistics

SIP and Applications

- SIP and H323 Characteristics, Scalability and Services SIP
- MEGACO Comparison, Fundamental SIP services Benefits

SIP Traffic analysis

- Delegates build a SIP Network
- Capture and analyse the traffic

3GPP and IETF Development

- 3GPP - Release 5
- Important Interfaces
- 3GPP/SIP standardisation document overview
- SIP Extensions needed by 3GPP
- Service-Route and Path
- SIGCOMP Compression
- Session Policies

3GPP Rel 5 - SIP Components

- Main SIP-servers P-CSCF, I-CSCF, S-CSCF
- PSTN Gateways, A few words on MEGACO/H.248

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- MGCF, BGCF and Media Gateways Conferencing support, MRFC and MRFP
- Different conferencing scenarios
- Registration of the Mobile with SIP
- HTTP Digest authentication with UMTS-Authentication Key Agreement
- Application servers, Interaction with CSCFs Back 2 Back User Agents

SIP in 3G - AAA (Authentication, Authorisation, and Accounting)

- HSS (the Home Subscriber Server) The Public and private user id.
- Service filters for application execution
- Cx Interface, Evolution of Radius - The Diameter protocol
- Diameter Base protocol 3GPP DIAMETER Applications
- Authorisation of Qos Mapping between SIP and GRPS Qos
- Policy Decision Function, The COPS protocol

SIP in 3G - Signalling and services

- Mobile to mobile, Mobile to PSTN, Integrating application servers
- Push to talk services, Open Mobile Alliance, POC Specification
- Conferencing examples with MRF and application server

SIP in 3G - Summary

- A look at 3GPP UMTS Release 6. Instant messaging, Efficient event notifications
- Interworking with other SIP-networks