The SIP School

Course Objectives

This course will take delegates through the basics of SIP into some very technical areas and is suited to people who will be installing and supporting SIP solutions of all kinds. It is also of value for people who need to have a good understanding to help them sell SIP Solutions and Services along with planning their implementations.

Being a modular training course, delegates can work through all modules or simply choose the module they really need. If delegates are new to SIP, they can start at the center of the circle and work their way outwards

Each module has it's own 'mini' quiz at the end to help delegates 'gauge' how well they are doing and the 'Final' SSCA™ accreditation test is available from the SIP School Login Page

The Modules are as follows with detailed descriptions further in this document

- Core SIP
- SIP Trunks
- SIP-T and the PSTN
- SIP Security
- SIP and Voice over IP
- SIP and Unified Communications
- ENUM and DNS
- Testing and Troubleshooting

Core SIP

SIP (The Session Initiation Protocol) is described in this module along with the many other Components and Services that will be encountered on a SIP based network

Topics include:

- What is SIP?
- SIP Components
- SIP Clients and Servers
- SIP Proxies
- SIP Redirect Servers
- SIP Registrars
- SIP Gateways
- The PSTN and SIP
- SIP Messages / Headers
- Registration
- Session Setup
- Request Examples
- Proxy Examples
- Redirect Examples
- The Call Process
- SIP Mobility
- Call Forking
- SDP and Examples
- SIP and MIME
- SIP and B2BUA

SIP Trunks

This module teaches the theory of connecting a SIP based PBX to the PSTN and it is the foundation of vendor specific **Trunking** modules.

Topics include:

- Benefits of SIP Trunks
- SIP and the Network
- SIP Peering
- SIP PBX Requirements
- SIP Trunk performance
- Setting up a SIP trunk
- NGNs
- SIP Interops

SIP-T and the PSTN

SIP Networks will of course have to allow connections to and from the PSTN. This module works through SIP and PSTN connectivity

Topics include:

- SIP to PSTN Call Flows
- SIP and Early Media
- SIP Gateways
- TRIP
- SIP-T and Bridging
- ISUP to SIP Code Mapping
- SIP INFO

SIP Security

SIP **Security** is a complex issue and this modules covers many SIP Security problems along with possible solutions

Topics include:

- Authentication
- Authorization
- Encryption
- Firewalls, NAT and SIP
- Firewall and NAT Solutions
- SIP Trunk security
- Attacks and Responses

SIP and VoIP

This module is a refresher module on the basics of **Voice over IP** and also focuses on components that are important to a SIP based Network

Topics include:

- Voice Sampling and Codecs
- Mean Opinion Scores
- RTP
- RTCP
- RTCP-XR
- Quality of Service
- VLANS
- Layer 2 and 3 Classification
- SIP, SDP and VoIP in action

Testing and Troubleshooting

Learn how to Monitor and Test SIP devices and services using Wireshark. This tool enables delegates to analyze call control messages to establish where a fault may lie in your SIP infrastructure. Full examples are provided and delegates are encouraged to follow the exercises to try for themselves.

Topics include:

- Setting up a Test Environment
- Installing a SIP Phone
- Installing a Soft Phone
- Choosing an ITSP
- Capturing Traffic with Wireshark
- SIP Message flows in Wireshark
- Common SIP Problems
- More Testing Tools

SIP and Unified Communications

SIP and Unified Communications shows you how SIP underpins all the elements of Unified Communications to realize efficiencies that a successful implementation promises to business.

Topics Include

- Todays issues
- IM Clients
- Presence
- Presence Networks
- Rich Presence
- Conferencing
- XMPP v SIMPLE
- Federations
- SIP and Unified Comms
- Relevant RFC's

ENUM and DNS

ENUM (along with **DNS**) is developing into an essential protocol on SIP networks and its purpose is to assist in finding destination SIP devices from a single SIP address.

Topics include:

- E.164
- What ENUM is and Why
- ENUM and DNS
- e164.arpa
- ENUM TIERS and Registrars
- DNS and AOR
- Public, Private and Operator ENUM
- ENUM queries
- NAPTR Records
- Testing ENUM
- Call Flows
- ENUM Registration