

Course ID

**SIP**

Course Duration

**1 day**

Course Title

**SIP Protocol, Architecture, and Design**

**Related Courses**

- SIP Security: A Comprehensive Short Course (SIPSEC, 1 day)
- VoIP: Protocols, Design, and Implementation (VOIP, 2-3 days)
- State-of-the-art of VoIP Technology for Professionals, Managers, and Executives (VOIP-EXEC, 1 day)
- VoIP Security (VOIPSEC, 2 days)
- Principles of Network Security: CompTIA Security+ and US DoD Directive 8570.1 (NETSEC, 3-4 days)
- IMS: The Technology, Applications, and Challenges (IMS, 2 days)
- 3G, IMS, and the Carrier Business Economics (3G-IMS-STRAT, 2 days)
- Multimedia Applications: IMS, SIP, and VoIP (MULTIMEDIA, 2 days)
- Internetworking with TCP/IP Version 6 (IPV6, 2-3 days)
- IP-Based Systems: TCP/IP and Mobile IP (IPSYS, 2-3 days)
- MPLS: Integrated Routing with End-to-End QoS for the Next Generation Networks (MPLS, 2-3 days)
- Traffic Engineering Models for Network Design (TRAFFIC, 3 days)

**Aimed At**

If you are a communications, systems, or software engineer; data network, telephony, IT, or marketing/sales professional; technical or strategy manager or consultant, or someone charged with evaluating, designing, or implementing security mechanisms, processes, and policies for your SIP-based (such as a VoIP) system, applications, or services, this course is meant for you.

**Group Size**

5-25

**Prerequisites**

While there are no particular prerequisites for this course, a technical background and prior exposure to telecommunications or IT issues will certainly be helpful.

**Course in a Nutshell**

Session Initiation Protocol (SIP) is a widely adopted standard for VoIP systems, devices, and software. In this short but intensive course, you will review the SIP architecture, including the components such as media servers, application servers, gateways and endpoints. You will study the SIP messages, when and why they are used, how they are handled, and the components of each SIP message that is transported on the network. You will learn about the design components and process, with the application and sizing of each component covered in detail. You will also learn how VoIP works, its benefits, and its implementation. At the end of the day, you will have a very good understanding of the SIP protocol, messaging, routing, components, and design considerations.

We can transform this course into an Action Learning Workshop by including an extended hands-on design and procurement exercise related to your organization's specific requirements.

**Customize It!**

We can adapt this course to your group's background and project requirements at little to no added charge. We can focus the course on business issues or implementation details depending on the varying requirements of audiences such as engineers, marketing or sales personnel, procurement specialists, and managers or executives. The optional third day allows you to immediately apply the course content to the development of a SIP design/procurement document for your organization.

**Learn How To**

- Describe why SIP was adopted as a standard protocol for VoIP
- Assess the strengths and limitations of SIP versus other VoIP approaches and protocols
- Summarize the current applications and adopters for SIP
- List the key components of a SIP design and detail how they fit together
- Explain design considerations such as sizing, redundancy, disaster recovery, and emergency planning.
- Characterize when and how to apply particular features and components to your own design

**Course Outline**

- SIP: An Overview
  - IETF and the history of SIP
  - Why was SIP needed?
  - Why is SIP so widely adopted?
  - Basics of SIP
  - SIP's place in today's business and telecommunications marketplace
- Protocol Messages and Features
  - Protocol and how it's handled on the network
  - Elements of a SIP message: Header, RTP stream, and more
  - Routing SIP messages
  - Call set-up
  - Control features supported
- SIP Devices and Systems: How Each Element is Used, Potential Issues, Design and Security Considerations
  - Gateways
  - Media servers
  - Application servers
  - Registrars
  - Proxy servers
  - Load balancers
  - End points

- Route plans
- SIP and Media Control: An In-depth Discussion of How the Media (Audio, Video, or Messaging) are Handled in SIP for Recording, Conferencing, and Mixed Applications
- SIP and VoIP System Planning and Design: A Typical SIP Deployment Scenario
  - Design process
  - Security issues
  - Wide area networking considerations
  - Putting the pieces together
  - Migration strategies
- Action Learning Workshop (Optional Third-Day, Internet Connectivity Required)
  - Develop a high-level design
  - Use appropriate tools to size network requirements
  - Build endpoint requirements plan
  - Data network impact considered
  - Select deployment model and procurement requirements
- Course Wrap-up
  - Course recap
  - Future of multimedia protocols and applications
  - Q/A and evaluations

### **How You Will Learn**

- A SIP/VoIP subject matter expert who is also an accomplished instructor will teach this course in instructor-led format.
- Along with interactive lecture, we will use suitable examples and exercises to help you understand and apply the SIP concepts and techniques taught in this course.
- If you already know something about the IP based technologies, we will build on that. If your background is less technical, we will use appropriate examples and analogies to make the technical content of SIP easier to understand.
- We will provide you with a Participant Handbook that will help you recall and reference what you learned in class and apply it to your SIP needs back on your job.

*Revised*

*May 15f, 2007*