SIP Trunk Operations (DTSIP)

COURSE OVERVIEW

SIP Trunk Operations (DTSIP) is a 5-day instructor-led course designed for Cisco collaboration administrators seeking in-depth knowledge of SIP protocol operations within Cisco's collaboration deployments.

This updated course offers new tools and labs to enhance skills in advanced troubleshooting, automation, and real-world problem-solving. With a focus on the latest Cisco Unified Communications Manager version 15, participants will explore modern practices, such as SIP trace analysis, AI-powered solutions, and DevOps programmability. In addition to mastering traditional SIP technologies, participants will gain the foundational knowledge required to configure Cisco Unified Border Element (CUBE) for enterprise PSTN access and Webex Calling.

New Content and Labs

- **In-depth SIP Trace Analysis:** Learn to use Wireshark, RTMT, and TranslatorX for advanced SIP message tracing and troubleshooting.
- **AI-Enhanced Troubleshooting:** Use AI tools like ChatGPT to analyze SIP debug outputs, interpret call traces, and streamline troubleshooting processes.
- **DevOps with Cisco CUBE:** Apply AI to create Ansible scripts for automating Cisco Session Border Controller (CUBE) deployments, integrating DevOps practices into collaboration environments.
- **Hands-On URI Call Routing:** Explore the advanced configuration of SIP URI dialing, enabling efficient call routing across CUCM clusters and Cisco CUBEs.
- **SIP Troubleshooting Tools and Techniques:** Gain expertise in leveraging diagnostic tools like Wireshark and TranslatorX to debug and analyze SIP traces effectively.
- **Foundations for Webex Calling on CUBE:** Gain an overview of the key concepts involved in using CUBE as a local gateway for Webex Calling.

The course starts by analyzing SIP Request and Response messages, including the role and purpose of SDP offers and answers. Topics such as SIP early offer and early media are covered, with practical insights into the behavior and capabilities of CUCM SIP trunks. Participants will explore headers within SIP messages, along with best practices for configuring SIP profiles on CUCM for both trunk and endpoint configurations.

The course continues with SIP URI dialing, where participants learn to use ILS, GDPR, and SME servers for dynamic dial plan distribution. Labs introduce advanced CUBE topics, including the use of E.164 pattern maps, server groups, and URI call routing for optimizing call handling. Participants will also implement Voice Translation Profiles and Dial Peer Groups, along with Provisioning Policies to streamline outbound dial-peer selection.

Throughout the course, participants will engage in real-world troubleshooting labs using Wireshark, RTMT, and TranslatorX, learning how to analyze SIP debugs and traces. A final lab challenges participants to implement an end-to-end SIP solution across multiple CUCM clusters and Cisco CUBEs, mirroring real-world deployments and problem-solving scenarios.

WHO WILL BENEFIT FROM THIS COURSE?

This course is intended for students who have general knowledge about:
- Cisco Unified Communications Manager (CUCM)
- Professionals with CCNA Collaboration and/or CCNP Collaboration Certification
- Customers and partners managing Cisco SIP solutions
- IT teams supporting Webex Calling and local gateways
- DevOps professionals automating Cisco CUBE deployments
- AI users applying tools like ChatGPT for SIP troubleshooting

PREREQUISITES

To fully benefit from this course, students should have the following prerequisite skills and knowledge:
- Basic knowledge of Cisco Unified Communications Manager (CUCM)
- Familiarity with networking concepts and protocols
- CCNA Collaboration or equivalent knowledge

COURSE OBJECTIVES

After completing this course, students will be able to:
- Understand the purpose of SIP requests, responses, and SDP
- Set up and manage SIP trunks and SIP profiles on CUCM
- Implement URI-based call routing across CUCM clusters and Cisco CUBEs
- Configure Cisco CUBE with advanced features, such as translation profiles, pattern maps, server groups, and provisioning policies
- Use Wireshark, RTMT, and TranslatorX to capture and analyze SIP traces from servers, routers, endpoints, and CUBEs
- Troubleshoot SIP issues like call routing errors, one-way audio, and registration failures using AI tools such as ChatGPT
- Apply DevOps practices by automating CUBE configurations with Ansible scripts
- Ensure call continuity and fault tolerance with SIP SRST solutions

COURSE OUTLINE

Module 1: Examining Collaboration Solutions
- Exploring the Path to Collaboration - CLFNDU
- Describe On-Premise deployment
- Examine cloud deployments
- Examine collaboration endpoints

Module 2: Examining SIP Call Signaling and Codecs

- Exploring Codecs and Call Signaling - CLFNDU and Exploring Call Signaling over IP Networks - CLCOR
- Describe SIP call signaling, voice and video codecs, RTP and RTCP
- Describe the Call Setup and Teardown Process
- Describe SIP Call Signaling for Call Setup and Teardown
- Explore Media Streams at the Application Layer
- Compare Audio Codecs
- Compare Video Codecs

Module 3: Analyzing and Troubleshooting SIP Signaling

- Analyzing and Troubleshooting Signaling and Media Protocols- CLACCM
- Analyze and troubleshoot SIP and media protocols
- Examine the characteristics and features of SIP
- SIP Trunking Considerations
- SIP Troubleshooting Tools
- Configuring SIP Traces using RTMT
- Using Wireshark and TranslatorX to read SIP debugs and traces
- Using Cisco Support Tools like CUBE DNA and Collaboration Analyzer to troubleshoot SIP calls

Module 4: Implementing SIP URI Calling on CUCM

- Implementing URI Calling in Cisco Unified Communications Manager - CLACCM
- Implementing URI calling in CUCM for calls within a cluster and between clusters
- Provide an overview of URI call routing in CUCM
- Describe Directory URIs in CUCM
- Describe the URI call routing process in CUCM
- Describe how CUCM routes SIP URI calls to other call control systems using SIP route patterns and SIP trunks
- Describe what needs to be considered when implementing URI call routing in CUCM

Module 5: Deploying ILS and GDPR

- Examining Global Dial Plan Replication- CLACCM
- Describe how to implement ILS between CUCM clusters and enable GDPR
- Describe global dial plan issues
- Describe the characteristics of ILS and its services
- Describe the components of GDPR and their interaction
- Describe how calls are routed using GDPR
- Describe how to implement PSTN backup for intercluster calls when using GDPR

Module 6: Deploying Cisco SIP Voice Gateways

- Describing the Cisco ISR as a Voice Gateway - CLFNDU
- Describe the function, purpose, and configuration of the Cisco SIP ISR gateway
- Describe Cisco Voice Gateways
- Describe SIP gateways
- Describe Call Legs and Dial Peers

- Describe Digital Signaling Processors
- Explore the DSP Calculator

Module 7: Configuring Session Border Controllers (CUBEs)
- Configuring and Troubleshooting Cisco Unified Border Element - CLACCM
- Configure and troubleshoot Cisco Unified Border Element (CUBE)
- Describe the Cisco Unified Border Element
- Describe the call-routing logic in CUBE for numeric and URI calls
- Understand the advanced options for CUBE
- Describe how to manipulate SIP header and SDP elements in CUBE using SIP profiles
- Understand CUBE signaling and media bindings

Module 8: Configuring CUBE-based URI Call Routing
- Configuring inbound URL dial-peer matching
- Configuring outbound URL dial-peer matching
- Configuring SIP Calling and Connected Party Info
- Configuring Provisioning Policies
- Normalizing SIP Messages

Module 9: Configuring Additional SIP CUBE Settings
- Implementing Voice Gateways - CLCOR
- Describe how to implement digit manipulation, Early Offer, and OPTIONS on a Cisco SIP CUBE
- Configuring Voice translation profiles on CUBE
- Configuring SIP Early offer on the CUBE
- Configuring MTP on SIP Trunk to support early offer
- Configuring SIP OPTIONS keepalives on CUBE

Module 10: Programing CUBE with Ansible
- Introduction to APIs
- RESTful API Concepts
- Using Ansible for Configuration Management
- Leveraging GitHub for Collaboration
- Use AI for API and Ansible Insights

Module 11: Foundations for Webex Calling on CUBE
- Introduction to CUBE High Availability (HA) Deployments
- Exploring Key CUBE Configuration Elements for Webex Local Gateway
- Examining SIP Header Manipulation and Media Handling Policies
- Describe Security and Encryption parameters for Webex Calling on CUBE

Course Labs and Agenda Highlights
This hands-on course ensures participants are equipped with both theoretical knowledge and practical skills to deploy, troubleshoot, and optimize Cisco SIP communication solutions.
- SIP Overview and Messages
- Analyzing SIP Traffic with Wireshark
- CUCM SIP Trunk Configuration

- Setting Up Local Gateways for Webex Calling
- URI Call Routing with ILS and SME
- SIP SRST for Call Continuity
- Session Border Controller (CUBE) Deployment and Management
- RTMT and TranslatorX for SIP Debugging and Trace Analysis
- AI-Driven Troubleshooting with ChatGPT
- Automated CUBE Deployments with Ansible Scripts
- Advanced SIP Troubleshooting Techniques

WHY TRAIN WITH SUNSET LEARNING INSTITUTE?

Sunset Learning Institute (SLI) has been an innovative leader in developing and delivering authorized technical training since 1996. Our goal is to help our customers optimize their technology Investments by providing convenient, high quality technical training that our customers can rely on. We empower students to master their desired technologies for their unique environments.

What sets SLI apart is not only our immense selection of trainings options, but our convenient and consistent delivery system. No matter how complex your environment is or where you are located, SLI is sure to have a training solution that you can count on!

Premiere World Class Instruction Team
- All SLI instructors have a four-year technical degree, instructor level certifications and field consulting work experience
- Sunset Learning has won numerous Instructor Excellence and Instructor Quality Distinction awards since 2012

Enhanced Learning Experience
- The goal of our instructors during class is ensure students understand the material, guide them through our labs and encourage questions and interactive discussions.

Convenient and Reliable Training Experience
- You have the option to attend classes live with the instructor, at any of our established training facilities, or from the convenience of your home or office
- All Sunset Learning Institute classes are guaranteed to run – you can count on us to deliver the training you need when you need it!

Outstanding Customer Service
- You will work with a dedicated account manager to suggest the optimal learning path for you and/or your team
- An enthusiastic student services team is available to answer any questions and ensure a quality training experience

Interested in Private Group Training?

Contact Us