

<b>avodaq ADVANCED TRAINING</b>			
Classroom Training	5 Days		

## INTRODUCTION

This ILT course focuses on how to troubleshoot the Cisco PGW solution with the PGW operating in Call Control mode. Attendees should have a good understanding of the technologies stated in the prerequisites. The attendees will spend their time in theory/lab sessions learning various Cisco and generic commands and tools e.g. Show and Debug on IOS devices, PGW/HSI mml and Solaris CLI commands, Call Tracing on the PGW and HSI, Flow Analysis with Wireshark-, Cisco PTC-MT-, MDL-, Solaris Snoop protocol analyser and retrieving logs and alarms in order to troubleshoot.

The course will concentrate on the following call elements: PGW, HSI, AS5350 Universal Gateway with Integrated SLT, ITP, SER, IOS Voice Gateway, CCM and various endpoints. The course will replicate the following call scenarios for investigation: TDM (SS7, ISDN) to TDM, TDM (SS7, ISDN) to VoIP (H.323, SIP, EISUP), VoIP to VoIP.

This course provides the knowledge and skills required to troubleshoot PGW/HSI systems and IP network deployments, addressing both design/planning practices and hands-on experience troubleshooting. There will very little if any in the way of Technology theory. Attendees should be encouraged to use their own PC/laptop resource including packet analyser to capture configurations and packet traces.

## OBJECTIVES

**Given the prerequisites, upon completion of this course the delegate will be able to:**

- Understand all PGW solution deployments
- Develop generic troubleshooting approach
- Use all PGW deployment troubleshooting tool
- Troubleshoot PGW and HSI Solaris platform
- Troubleshoot IP Connectivity, Backhaul sessions and SIGTRAN
- Troubleshoot SS7 in PGW deployments
- Troubleshoot EISUP in PGW deployments
- Troubleshoot ISDN in PGW deployments
- Troubleshoot MGCP in PGW deployments
- Troubleshoot Fax over IP in PGW deployments
- Troubleshoot H.323 in PGW deployments
- Troubleshoot SIP in PGW deployments
- Troubleshoot PGW dial plans

## IMPORTANCE

The course is a prerequisite for network administrators and technicians involved in designing, integrating and troubleshooting complex PGW network environments.

## TARGET AUDIENCE

The course provides advanced training for senior level network professionals. Target audience for this course are upcoming PGW experts.

## PREREQUISITES KNOWLEDGE

- Qualification to Cisco Certified Network Associate (CCNA) level
- Attendance on PGW 2200 Call Control Course: PGWC
- Voice and VoIP Architectures
- Basic Solaris administration skills
- SS7 and Q.931 Call flow and Operation
- H.323 and SIP Call flow and Operation
- MGCP and Signaling Backhauling as IPFAS, BSMVO and SIGTRAN

## COURSE OUTLINE

- Lesson 1: PGW Solution Overview
  - PGW Deployment Scenarios
  - PGW Solution Components
  - Keepalives
  - Sources of Trouble
- Lesson 2: Troubleshooting Overview
  - Generic Troubleshooting Execution
  - PGW Deployment Based Execution
  - PGW Deployment Troubleshooting Tools
  - PGW Deployment Troubleshooting Docs
  - Common Problems
  - General PGW Troubleshooting Tips
- Lesson 3: PGW/HSI Platform Troubleshooting
  - PGW Redundancy
  - PGW Failover
  - Alarms and Logfiles
  - PGW/HSI Platform Housekeeping
  - Lab 3-1
- Lesson 4: IP Connectivity Troubleshooting
  - Protocols Review
  - IP Redundancy Concepts
  - Signaling Backhaul
  - IP Troubleshooting Areas
  - Example Scenarios
  - Lab 4-1
- Lesson 5: SS7 Troubleshooting
  - SS7 Architecture and Protocol Review
  - Troubleshoot PGW
  - Troubleshoot separate/integrated SLT Signaling
  - Troubleshoot ITP
  - Examples
  - Output Analyses
  - Lab 5-1, Lab 5-2
- Lesson 6: EISUP Troubleshooting
  - EISUP Architecture and Protocol review
  - Troubleshoot PGW – PGW EISUP
  - Troubleshoot PGW – HSI EISUP
  - Output Analyses
  - Lab 6-1
- Lesson 7: ISDN Troubleshooting
  - Architecture and Protocol Review
  - IOS ISDN Troubleshooting
  - PGW ISDN Troubleshooting
  - Example
  - Output Analysis
  - Lab 7-1
- Lesson 8: MGCP Troubleshooting
  - MGCP Architecture and Protocol Review
  - MGCP Parameters
  - MGCP Return and Reason Codes
  - PGW MGCP Troubleshooting
  - IOS MGCP Troubleshooting
  - MGCP Analysis with Wireshark
  - Example
  - Output Analysis
  - Lab 8-1, Lab 8-2
- Lesson 9: Fax over IP Troubleshooting
  - Fax over IP Methods
  - Fax over IP Troubleshooting Areas
  - Fax over IP Troubleshooting
- Lesson 10: H.323 Troubleshooting
  - H.323 Architecture and Protocol Review
  - HSI Data and H.323 Parameters
  - HSI H.323 Troubleshooting
  - Gatekeeper Troubleshooting
  - H.323 Analysis with Wireshark
  - Example
  - Output Analysis
  - Lab 10-1
- Lesson 11: SIP Troubleshooting
  - SIP Architecture and Protocol Review
  - PGW SIP Troubleshooting
  - IOS SIP Troubleshooting
  - Example
  - Output Analysis
  - Lab 11-1, Lab 11-2
- Lesson 12: Dial Plan Troubleshooting
  - Routing Concepts
  - Intermediate, early and end Result
  - Longest Match vs. no Longest Match
  - Call Verification
  - Output Analysis
  - Lab 12-1, Lab 12-2