Troubleshooting and Maintaining Cisco IP Networks (TSHOOT)

COURSE OVERVIEW:
Troubleshooting and Maintaining Cisco IP Networks (TSHOOT) v2.0 is a five-day instructor-led training course developed to help students prepare for the Cisco CCNP certification. The TSHOOT course is a component of the CCNP Routing and Switching curriculum.

This course is designed to train network engineers on monitoring and troubleshooting routed and switched networks through extensive use of hands-on lab exercises. The goal is to help network professionals gain the skills and knowledge needed to diagnose and resolve network problems quickly and effectively. Some older topics have been removed or simplified from TSHOOT v1.0, while several new IPv6 routing topics have been added. The course content has been adapted to Cisco IOS Software Release 15 and technically updated.

WHO WILL BENEFIT FROM THIS COURSE?
This course is intended for network professionals who want to increase their skill level at maintaining and troubleshooting complex Cisco IP networks.

PREREQUISITES:
Prior to attending this course, students should have the knowledge of and experience with the implementation and verification of enterprise routing and switching technologies as offered by the Implementing Cisco Switched Networks (SWITCH) v2.0 and Implementing Cisco IP Routing (ROUTE) courses or equivalent skills and knowledge.

This includes knowledge and experience of the following technologies:

- Layer 2 switching
- Link aggregation protocols
- STP
- Inter-VLAN routing solutions
- FHRPs, including HSRP, VRRP, and GLBP
- Branch office operations
- EIGRP
- OSPF
- Layer 3 path control
- Redistribution
- BGP
- IPv6 Networking
COURSE OBJECTIVES:
After completion of this course, students will be able to...

- Describe the troubleshooting tools and methodologies that are used to identify and resolve issues in complex enterprise networks
- Describe how to isolate and fix the network issues that your company, SECHNIK Networking Ltd., is facing
- Describe how to isolate and fix the network issues that your customer, TINC Garbage Disposal Ltd., is facing
- Isolate and fix the network issues that your customer, PILE Forensic Accounting Ltd., is facing
- Isolate and fix the network issues that your customer, Bank of POLENA Ltd., is facing
- Isolate and fix the network issues that your customer, RADUKO Transport Ltd., is facing

COURSE OUTLINE:

Module 1: Tools and Methodologies of Troubleshooting

Lesson 1: Describing Troubleshooting Methodologies
- What Is Troubleshooting?
- Diagnostic Principles
- Troubleshooting Methods
- Structured Network Troubleshooting
- Common Troubleshooting Approaches
- Top-Down Method
- Bottom-Up Method
- Divide-and-Conquer Method
- Following the Traffic Path
- Spot the Differences
- Swapping Components
- Case Study: Troubleshooting Approaches

Lesson 2: Using Troubleshooting Procedures
- Network Troubleshooting Procedures
- Defining the Problem
- Gathering Information
- Analyzing the Gathered Information
- Proposing and Eliminating Potential Problem Causes
- Proposing a Hypothesis
- Testing and Verifying a Hypothesis
- Solving and Documenting the Problem
- Case Study: Troubleshooting Procedures
Lesson 3: Following Recommended Practices During Routine Network Maintenance

- Common Maintenance Tasks
- Troubleshooting as Part of Maintenance
- Change Control
- Saving Configurations
- Restoring Configurations
- Archiving Configurations
- Discovery 1: Maintaining and Documenting a Network
  - Labeling Interfaces and Cables
  - Documentation
  - Implementing Time Services
  - Implementing Logging Services
  - Creating a Baseline
  - Communication
- Summary

Lesson 4: Using Basic Cisco IOS Troubleshooting Tools

- Layer 2 Switching Process
- Layer 3 Routing Process
- Filtering show Commands
- Filtering show Command Output Using Regular Expressions
- Redirecting show Command Output to a File
- Discovery 2: Troubleshooting Connectivity
  - Basic Hardware Diagnostics
  - Debug Commands
- Summary

Lesson 5: Using Specialized Troubleshooting Tools

- Troubleshooting Tools
- Categories of Troubleshooting Tools
- Case Study: Syslog
- Case Study: Troubleshooting with SPAN
- Case Study: Troubleshooting with SNMP
- Case Study: NetFlow
- Introducing the Cisco IOS Embedded Event Manager
- EEM Example: Logging when Configuration Mode Is Entered
- EEM Example: Bring Up a Disabled Interface
Module 2: Troubleshooting at SECHNIK Networking Ltd.

Challenge Lab 1: First Troubleshooting at SECHNIK Networking Ltd.
Lesson 1: Debrief of the First Troubleshooting at SECHNIK Networking Ltd.
- Trouble Tickets Overview
- Example of Troubleshooting Flow: PC1 Unable to Access Data on the Server
- Troubleshooting Trunks
- Example of Troubleshooting Flow: PC2 Unable to Access the Internet
- Troubleshooting NAT
- Example of Troubleshooting Flow: PC3 Unable to Use SSH to Connect to the Server
- Troubleshooting Interfaces
- Example of Troubleshooting Flow: PC4 Unable to Access the Internet Through IPv6
- Troubleshooting IPv6 Address Assignment on Clients

Challenge Lab 2: Second Troubleshooting at SECHNIK Networking Ltd.
Lesson 2: Debrief of the Second Troubleshooting at SECHNIK Networking Ltd.
- Trouble Tickets Overview
- Example of Troubleshooting Flow: PC1 Unable to Access the Internet Host
- Troubleshooting Network Layer Connectivity
- Example of Troubleshooting Flow: PC2 Cannot Use SSH to Connect to the Internal Server
- TCP Handshake
- Example of Troubleshooting Flow: PC4 Does Not Acquire an IP Address via DHCP After Port Security Is Implemented
- Troubleshooting an Error-Disabled Port

Challenge Lab 3: Third Troubleshooting at SECHNIK Networking Ltd.
Lesson 3: Debrief of the Third Troubleshooting at SECHNIK Networking Ltd.
- Trouble Tickets Overview
- Example of Troubleshooting Flow: PC1 and PC2 Cannot Ping the Internet Host
- Troubleshooting DHCP
- Passive Interfaces with Different Routing Protocols
- Example of Troubleshooting Flow: PC3 Cannot Connect to the Internet
- IPv6 Review

Module 3: Troubleshooting at TINC Garbage Disposal Ltd.

Challenge Lab 4: First Troubleshooting at TINC Garbage Disposal Ltd.
Lesson 1: Debrief of the First Troubleshooting at TINC Garbage Disposal Ltd.
- Trouble Tickets Overview
- Example of Troubleshooting Flow: GW2 Does Not Serve as the Backup to the Internet
- Troubleshooting BGP Neighbor Relationships
- Example of Troubleshooting Flow: PC1 and PC2 Do Not Have Internet Connectivity
- Troubleshooting Port Security
- Example of Troubleshooting Flow: Classroom PC2 Does Not Have Internet Connectivity
- Troubleshooting VLANs
- Troubleshooting a Native VLAN
Challenge Lab 5: Second Troubleshooting at TINC Garbage Disposal Ltd.
Lesson 2: Debrief of the Second Troubleshooting at TINC Garbage Disposal Ltd.

- Trouble Tickets Overview
- Example of Troubleshooting Flow: GW1 Only Has OSPF Adjacency with GW2
- Troubleshooting OSPF Adjacency
- Example of Troubleshooting Flow: R2 Is Not Accessible Via SSH v2
- Troubleshooting Management Access
- Example of Troubleshooting Flow: Duplicate IP Addresses on Routers R1 and R2
- Troubleshooting HSRP

Challenge Lab 6: Third Troubleshooting at TINC Garbage Disposal Ltd.
Lesson 3: Debrief of the Third Troubleshooting at TINC Garbage Disposal Ltd.

- Trouble Ticket Overview
- Example of Troubleshooting Flow: Sporadic Access to Internet
- Troubleshooting Problems with Routing Sources
- Example of Troubleshooting Flow: Multiple Masters in a VRRP Group
- Troubleshooting VRRP
- Example of Troubleshooting Flow: Nonfunctional EtherChannel
- Troubleshooting EtherChannel

Challenge Lab 7: Fourth Troubleshooting at TINC Garbage Disposal Ltd.
Lesson 4: Debrief of the Fourth Troubleshooting at TINC Garbage Disposal Ltd.

- Trouble Ticket Overview
- Example of Troubleshooting Flow: Occasional Lack of Network Connectivity for PCs 1 and 2
- Troubleshooting GLBP
- Troubleshooting FHRP
- Example of Troubleshooting Flow: Sporadic Loss of Connectivity on PC4
- DHCP Snooping
- Cisco TAC
- Example of Troubleshooting Flow: No SSH Connectivity to GW2 From PC4

Module 4: Troubleshooting at PILE Forensic Accounting Ltd.

Challenge Lab 8: First Troubleshooting at PILE Forensic Accounting Ltd.
Lesson 1: Debrief of the First Troubleshooting at PILE Forensic Accounting Ltd.

- Trouble Ticket Overview
- Example of Troubleshooting Flow: Branch Without Internet Connectivity
- Troubleshooting EIGRP Adjacency
- Example of Troubleshooting Flow: ISP2 Not Serving as a Backup
- Summary
Challenge Lab 9: Second Troubleshooting at PILE Forensic Accounting Ltd.
Lesson 2: Debrief of the Second Troubleshooting at PILE Forensic Accounting Ltd.
- Trouble Tickets Overview
- Example of Troubleshooting Flow: PC3 Unable to Remotely Access the Branch Router
- Example of Troubleshooting Flow: No Internet Connectivity
- BGP Filtering
- BGP Transit Area
- Troubleshooting BGP
- Example of Troubleshooting Flow: HQ1 Does Not Synchronize with the Primary NTP Server
- Troubleshooting NTP
- Summary

Challenge Lab 10: Third Troubleshooting at PILE Forensic Accounting Ltd.
Lesson 3: Debrief of the Third Troubleshooting at PILE Forensic Accounting Ltd.
- Trouble Ticket Overview
- Example of Troubleshooting Flow: Connectivity Issue After Disaster
- Disaster Recovery
- Troubleshooting Inter-VLAN Routing
- Example of Troubleshooting Flow: Connectivity Issue When Using Domain Names
- Troubleshooting DNS
- Remote Device Management Challenges
- Summary

Challenge Lab 11: Fourth Troubleshooting at PILE Forensic Accounting Ltd.
Lesson 4: Debrief of the Fourth Troubleshooting at PILE Forensic Accounting Ltd.
- Trouble Ticket Overview
- Example of Troubleshooting Flow: EIGRP Reconfiguration Issue
- EIGRP Named Configuration
- Troubleshooting the EIGRP Stub
- Example of Troubleshooting Flow: Lack of Management Access
- Providing the Default Route on Layer 2 and Multilayer Devices
- Summary

Challenge Lab 12: Fifth Troubleshooting at PILE Forensic Accounting Ltd.
Lesson 5: Debrief of the Fifth Troubleshooting at PILE Forensic Accounting Ltd.
- Trouble Tickets Overview
- Example of Troubleshooting Flow: Internet Access via Router HQ0 Does Not Work
- Troubleshooting BGP Route Selection
- Example of Troubleshooting Flow: PC3 Is Able to Use Telnet to Connect to Router BR
- Securing the Management Plane
- Summary
Module 5: Troubleshooting at Bank of POLONA Ltd.

Challenge Lab 13: First Troubleshooting at Bank of POLONA Ltd.
Lesson 1: Debrief of the First Troubleshooting at Bank of POLONA Ltd.
- Trouble Ticket Overview
- Example of Troubleshooting Flow: Lack of Connectivity
- Troubleshooting Redistribution
- Example of Troubleshooting Flow: Suboptimal Routing
- Troubleshooting FHRP Tracking
- Example of Troubleshooting Flow: IP SLA Does Not Start
- Troubleshooting IP SLA

Challenge Lab 14: Second Troubleshooting at Bank of POLONA Ltd.
Lesson 2: Debrief of the Second Troubleshooting at Bank of POLONA Ltd.
- Trouble Ticket Overview
- Example of Troubleshooting Flow: Incorrect EIGRP Summarization
- Troubleshooting EIGRP Summarization
- Example of Troubleshooting Flow: IPv4 and IPv6 Internet Access Issue
- Troubleshooting Basic RIPng
- Example of Troubleshooting Flow: Internet Connectivity Lost
- Troubleshooting Access Lists

Challenge Lab 15: Third Troubleshooting at Bank of POLONA Ltd.
Lesson 3: Debrief of the Third Troubleshooting at Bank of POLONA Ltd.
- Trouble Tickets Overview
- Example of Troubleshooting Flow: Branch 1 Cannot Reach the Headquarters
- Troubleshooting GRE Tunnels
- Example of Troubleshooting Flow: Route Summarization from Branch 3 Does Not Work
- Troubleshooting OSPF Summarization
- Example of Troubleshooting Flow: AAA Does Not Work on Router BR1
- Troubleshooting AAA

Challenge Lab 16: Fourth Troubleshooting at Bank of POLONA Ltd.
Lesson 4: Debrief of the Fourth Troubleshooting at Bank of POLONA Ltd.
- Trouble Ticket Overview
- Example of Troubleshooting Flow: PC0 Does Not Have Connectivity to IPv6 Internet Sites
- Troubleshooting OSPF for IPv6
- Example of Troubleshooting Flow: Totally Stubby Area on the Branch Is Not Working
- Troubleshooting OSPF Stubby Areas
Module 6: Troubleshooting at RADULKO Transport Ltd.

Challenge Lab 17: First Troubleshooting at RADULKO Transport Ltd.
Lesson 1: Debrief of the First Troubleshooting at RADULKO Transport Ltd.
- Trouble Ticket Overview
- Example of Troubleshooting Flow: A Layer 2 Loop in the Network
- Troubleshooting STP
- Example of Troubleshooting Flow: Configuring a Route Map Causes a Local Connectivity Issue
- Troubleshooting PBR
- Example of Troubleshooting Flow: Cisco Discovery Protocol Neighboring Issue
- Troubleshooting Cisco Discovery Protocol and LLDP

Challenge Lab 18: Second Troubleshooting at RADULKO Transport Ltd.
Lesson 2: Debrief of the Second Troubleshooting at RADULKO Transport Ltd.
- Trouble Tickets Overview
- Example of Troubleshooting Flow: PC1 and PC2 Do Not Have Connectivity to the Internet
- Troubleshooting VTP
- Example of Troubleshooting Flow: BR Does Not Have Connectivity to the Internet Via IPv6
- Troubleshooting EIGRP for IPv6
- Example of Troubleshooting Flow: IPv6 BGP Is Not Established to ISP2
- Troubleshooting MP-BGP

Challenge Lab 19: Third Troubleshooting at RADULKO Transport Ltd.
Lesson 3: Debrief of the Third Troubleshooting at RADULKO Transport Ltd.
- Trouble Ticket Overview
- Example of Troubleshooting Flow: Lack of Connectivity
- Troubleshooting the OSPFv3 Address Families Feature
- Example of Troubleshooting Flow: Authentication Problem

Challenge Lab 20: Fourth Troubleshooting at RADULKO Transport Ltd.
Lesson 4: Debrief of the Fourth Troubleshooting at RADULKO Transport Ltd.
- Trouble Tickets Overview
- Example of Troubleshooting Flow: External OSPF Routes on Router DST
- Example of Troubleshooting Flow: PC1 and PC2 Cannot Access the Internet via IPv6
Lab Outline:
There are 2 different types of labs being used to aid learning. Discovery labs are instructor guided labs through which students explore new topics in an interactive way. Challenge labs are designed to test students understanding of the topics being taught and to provide vital hands-on practice.

- Discovery 1: Maintaining and Documenting a Network
- Discovery 2: Troubleshooting Connectivity
- Challenge 1: First Troubleshooting at SECHNIK Networking Ltd.
- Challenge 2: Second Troubleshooting at SECHNIK Networking Ltd.
- Challenge 3: Third Troubleshooting at SECHNIK Networking Ltd.
- Challenge 4: First Troubleshooting at TINC Garbage Disposal Ltd.
- Challenge 5: Second Troubleshooting at TINC Garbage Disposal Ltd.
- Challenge 6: Third Troubleshooting at TINC Garbage Disposal Ltd.
- Challenge 7: Fourth Troubleshooting at TINC Garbage Disposal Ltd.
- Challenge 8: First Troubleshooting at PILE Forensic Accounting Ltd.
- Challenge 9: Second Troubleshooting at PILE Forensic Accounting Ltd.
- Challenge 10: Third Troubleshooting at PILE Forensic Accounting Ltd.
- Challenge 11: Fourth Troubleshooting at PILE Forensic Accounting Ltd.
- Challenge 12: Fifth Troubleshooting at PILE Forensic Accounting Ltd.
- Challenge 13: First Troubleshooting at Bank of POLONA Ltd.
- Challenge 14: Second Troubleshooting at Bank of POLONA Ltd.
- Challenge 15: Third Troubleshooting at Bank of POLONA Ltd.
- Challenge 16: Fourth Troubleshooting at Bank of POLONA Ltd.
- Challenge 17: First Troubleshooting at RADULKO Transport Ltd.
- Challenge 18: Second Troubleshooting at RADULKO Transport Ltd.
- Challenge 19: Third Troubleshooting at RADULKO Transport Ltd.
- Challenge 20: Fourth Troubleshooting at RADULKO Transport Ltd.
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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.

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