

# Cisco® Troubleshooting and Maintaining Cisco® IP Networks v2.0 (TSHOOT)

## Course Overview

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This is a 5-day class

TSHOOT v2.0, a five-day ILT course, includes major updates and follows an updated blueprint. (However, note that this course does not cover all items listed on the blueprint.) Some older topics have been removed or simplified, while several new IPv6 routing topics have been added. The course content has been adapted to Cisco IOS Software Release 15 and technically updated. Students will learn and practice techniques to monitor and troubleshoot routed and switched networks. Troubleshooting methods, procedures, and tools are explored. Different organizations are introduced in a series of scenarios for the student to work with. Students will work to solve as many of the troubleshooting tickets as they can during each scenario.

## Who Should Attend

Learners who aim to be network professionals and who have knowledge that is obtained from Cisco CCNA courses.

## Course Objectives

Describe the troubleshooting tools and methodologies that are used to identify and resolve issues in complex enterprise networks. Isolate and fix the network issues that your company, SECHNIK Networking Ltd., is facing. 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 POLONA Ltd., is facing. Isolate and fix the network issues that your customer, RADULKO Transport Ltd., is facing.

## Course Outline

### 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



[nhls.com](http://nhls.com)



# Cisco® Troubleshooting and Maintaining Cisco® IP Networks v2.0 (TSHOOT)

- Common Maintenance Tasks
- Troubleshooting as Part of Maintenance
- Maintenance Planning
- Change Control
- Saving Configurations
- Restoring Configurations
- Archiving Configurations
- 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
- 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

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## 2 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

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

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

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## 3 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

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

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

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 FHRPs

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

## 4 Troubleshooting at PILE Forensic Accounting Ltd.

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

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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  
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  
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  
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  
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

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## 5 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

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

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

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

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## 6 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

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

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

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