TSHOOT: Troubleshooting and Maintaining Cisco IP Networks (TSHOOT) 2.0

Get the skills to maintain your networks and to diagnose and resolve network problems quickly and effectively.

$3,595.00

- 5 Days
- Promotional and package discounts apply

Upcoming Dates

Course Description

Troubleshooting and Maintaining Cisco IP Networks (TSHOOT) v2.0 is an instructor-led training course that is presented by Cisco training partners to customers who use Cisco products. This five-day course is designed to help network professionals improve the skills and knowledge that they need to maintain their network and to diagnose and resolve network problems quickly and effectively. It also assists the network professional in preparing for Cisco CCNP certification. This course is a component of the CCNP curriculum.

The course is designed to teach professionals who work in complex network environments the skills that they need to maintain their networks and to diagnose and resolve network problems quickly and effectively. The course will provide information about troubleshooting and maintaining particular technologies, as well as procedural and organizational aspects of the troubleshooting and maintenance process. A large part of the training will consist of practicing these skills and reinforcing the concepts by putting them to use in a controlled environment. At the end of the course, the students will have increased their skill level and developed a set of best practices that are based on their own experience and the experiences of other students and that they can take back to their organizations.

Course Outline

1. Planning Maintenance for Complex Networks

Applying Maintenance Methodologies

- Evaluate the models and methodologies that are commonly used for network maintenance and identify the benefits that these models bring to an organization
- Select generalized maintenance models and planning tools that fit your organization

Common Maintenance Processes and Procedures

- Identify essential network maintenance tasks
- Describe the advantages of scheduled maintenance
- Evaluate the key decision factors that affect change control procedures in order to create procedures that fit the needs of your organization
- Describe the essential elements of network documentation and their function
- Plan for efficient disaster recovery
- Describe the importance of network monitoring and performance measurement as an integral element of a proactive network maintenance strategy

Network Maintenance Tools, Applications, and Resources

- Identify, evaluate, and implement the elements of a basic network maintenance toolkit
- Evaluate tools that support the documentation process and select the tools that are appropriate to your organization
- Describe how configuration, software, and hardware resource management software can improve disaster recovery procedures
- Describe how network monitoring software benefits the maintenance process
- Analyze the metrics that could be used to measure network performance and the primary elements of the performance measurement process in order to create a performance measurement plan that is appropriate to your organization

2. Planning Troubleshooting Processes for Complex Enterprise Networks

Applying Troubleshooting Methodologies

- Identify the fundamental elements of a troubleshooting process
- Describe the advantages of a structured network troubleshooting method
- Evaluate and assess common troubleshooting approaches
- Select a combination of troubleshooting methods that are appropriate to a specific troubleshooting scenario

Planning and Implementing Troubleshooting Procedures

- Identify the fundamental sub-processes of the generic troubleshooting process
- Formulate correct problem definitions and assign responsibilities
- Gather information in a structured manner
- Interpret and analyze the gathered information
- Isolate a problem through a process of elimination
- Formulate a hypothesis and evaluate the necessary actions to take after you have formulated a hypothesis
- Test a hypothesis and roll back if a hypothesis is not confirmed
- Integrate a solution into the existing network

Integrating Troubleshooting into the Network Maintenance Process

- Evaluate the benefits gained by aligning troubleshooting procedures to network maintenance procedures
- Create and update documentation as part of routine maintenance to support the troubleshooting process and routinely update documentation as part of the troubleshooting process to keep the documentation accurate and up-to-date.
- Identify abnormal network behavior through the comparison of actual behavior to a baseline created as part of the network maintenance process
- Implement communication processes that increase the effectiveness of the troubleshooting process
- Implement change procedures that are flexible enough to support the changes that need to be made during troubleshooting, but also controlled enough so that changes are integrated into the standard maintenance and documentation procedures

3. Maintenance and Troubleshooting Tools and Applications

Assembling a Basic Diagnostic Toolkit Using Cisco IOS Software

- Test network connectivity using Cisco IOS commands
- Diagnose basic hardware-related problems

Using Specialized Maintenance and Troubleshooting Tools

- Identify tools and their underlying technologies to support the troubleshooting process
- Enable SPAN and RSPAN to facilitate the use of packet sniffers
- Configure routers and switches for communication with SNMP-based or
- NetFlow-based network management systems in order to facilitate the collection of device and traffic statistics that are part of a network baseline
- Configure routers and switches to send SNMP traps to provide fault notification to SNMP-based network management systems

4. Maintaining and Troubleshooting Campus Switching-Based Solutions

Troubleshooting VLANs

- Understand the process involved in switching a frame from a host in a VLAN to another host in the same VLAN across multiple switched hops
- Analyze information gathered from switch data structures to verify proper operation of Layer 2 forwarding within a VLAN

Troubleshooting Spanning Tree

- Understand the steps that spanning tree goes through to attain a loop-free topology
- Determine the spanning-tree topology using Cisco IOS commands
- Recognize the symptoms of spanning-tree failures and remediate such failures
- Understand the mechanisms involved in EtherChannel load balancing

Troubleshooting Switched Virtual Interfaces and Inter-VLAN Routing

- Utilize the information contained in the data structures used in the operation of multilayer switching to diagnose issues related to multilayer switching
- Diagnose problems related to SVI and routed ports based on an understanding of the essential differences between these two types of Layer 3 interfaces on a multilayer switch

Troubleshooting FHRPs

- Understand the HSRP election process and packet forwarding via HSRP routers
- Verify the operation of HSRP using Cisco IOS commands
- Understand the similarities and major differences between HSRP, VRRP, and GLBP

Troubleshooting Performance Problems on Switches

- Use Cisco IOS commands to diagnose physical and data link layer problems on switch ports
- Use Cisco IOS commands to analyze TCAM utilization on switches to determine the root cause of TCAM allocation failures

References to Additional Campus Switching Technologies in E-Learning

- Describe the content of the Troubleshooting Performance Problems on Switches e-learning module
- Describe the content of the Troubleshooting Wireless Integration e-learning module
- Describe the content of the Troubleshooting Voice over IP Integration e-learning module
- Describe the content of the Troubleshooting Video Integration e-learning module
- Understand the process of accessing and using e-learning content

5. Maintaining and Troubleshooting Routing-Based Solutions

Troubleshooting Network Layer Connectivity

- Describe the processes involved in routing packets across multiple router hops from one host to another host in a different subnet
- Analyze information gathered from a router's routing table and FIB to verify the IP packet forwarding process
- Verify the mapping of Layer 3 information to Layer 2 information to ensure that routed packets are correctly encapsulated and transmitted using the data link protocol of the egress interface

Troubleshooting EIGRP

- Apply your knowledge of EIGRP data structures to plan the gathering of necessary information as part of a structured approach to troubleshooting EIGRP routing problems

- Apply your knowledge of the processes that EIGRP uses to exchange routing information to interpret and analyze the information that is gathered during an EIGRP troubleshooting process
- Use Cisco IOS commands to gather information from the EIGRP data structures and track the flow of EIGRP routing information to troubleshoot EIGRP operation

Troubleshooting OSPF

- Apply your knowledge of OSPF data structures to plan the gathering of necessary information as part of a structured approach to troubleshooting OSPF routing problems
- Apply your knowledge of the processes that OSPF uses to exchange network topology information within an area, to interpret and analyze the information that is gathered during an OSPF troubleshooting process
- Apply your knowledge of the processes that OSPF uses to exchange network topology information between areas, to interpret and analyze the information that is gathered during an OSPF troubleshooting process
- Use Cisco IOS commands to gather information from the OSPF data structures and track the flow of OSPF routing information to troubleshoot OSPF operation

Troubleshooting Route Redistribution

- Describe the data structures and processes involved in route redistribution
- Verify the correct operation of a route redistribution process

Troubleshooting BGP

- Apply your knowledge of BGP data structures to plan the gathering of necessary information as part of a structured approach to troubleshooting BGP routing problems
- Apply your knowledge of the processes that BGP uses to exchange routing information to interpret and analyze the information that is gathered during a BGP troubleshooting process
- Use Cisco IOS commands to gather information from the BGP data structures and track the flow of BGP routing information in order to troubleshoot BGP operation

Troubleshooting Performance Problems on Routers

- Use the IOS tools to analyze CPU usage to determine the root cause of high CPU usage on a router
- Use the IOS tools to analyze packet forwarding through a router
- Use the IOS tools to analyze memory usage to troubleshoot router performance problems

References to Additional Troubleshooting on NAT and DHCP in E-Learning

- Describe the content of the Troubleshooting NAT and PAT e-learning module
- Describe the content of the Troubleshooting DHCP e-learning module
- Describe the content of the Troubleshooting IPv6, OSPFv3, and RIPng e-learning module
- Understand the process of accessing and using e-learning content

6. Maintaining and Troubleshooting Network Security Solutions

Troubleshooting Security Features

- Describe the impact of security features on network troubleshooting
  Network and Device Security

Security Features Review

- Diagnose and resolve transport layer problems in a structured manner
- Verify the operation of Cisco IOS Firewall stateful packet inspection
- Diagnose and resolve problems related to the use of AAA on routers and switches

References to Additional Security Troubleshooting in E-Learning

- Describe the content of the Troubleshooting Network Applications Services e-learning module
- Describe the content of the Troubleshooting Branch Office and Remote Worker
- Problems e-learning module
- Understand the process of accessing and using e-learning content

7. Maintaining and Troubleshooting Integrated, Complex Enterprise Networks

Troubleshooting Complex Environments

- List the primary lessons learned about network maintenance and troubleshooting tasks during previous labs
- Initiate Lab 7-1, Troubleshooting Complex Environments. in order to practice troubleshooting in a complex environment and be assessed on the skills acquired during this course

Labs:

- Lab 1-1: Lab Access
- Lab 2-1: Introduction to Troubleshooting
- Lab 3-1: Maintenance and Troubleshooting Tools
- Lab 4-1: Layer 2 Connectivity and Spanning Tree
- Lab 4-2: Layer 3 Switching and First-Hop Redundancy
- Lab 5-1: Layer 3 Connectivity and EIGRP
- Lab 5-2: OSPF and Route Redistribution
- Lab 5-3: Border Gateway Protocol
- Lab 5-4: Router Performance
- Lab 6-1: Introduction to Network Security
- Lab 6-2: Cisco IOS Security Features
- Lab 7-1: Troubleshooting Complex Environments

Audience

This course is intended for those engineers who are candidates for Cisco CCNP certifications as well as those who are candidates for Cisco CCIE Routing and Switching and CCIE certifications. Others who will benefit from this course are:

- Network professionals who want to increase their skill level at maintaining and troubleshooting complex Cisco IP networks. The typical job roles for this type of professional are network engineer; network operations center (NOC) technical support personnel, or help desk technicians.
- Any individual involved in network operations and support.

Prerequisites

In addition to CCNA certification, it is recommended that the student have practical experience in installing, operating, and maintaining Cisco routers and switches in an enterprise environment. It is also recommended that the student have knowledge and experience with the implementation and verification of routing and switching technologies as offered by the Implementing Cisco Switched Networks (SWITCH) and Implementing Cisco IP Routing (ROUTE) courses or equivalent skills and knowledge.

This includes knowledge and experience of the following technologies:

- Layer 2 switching
- Private VLANs, VLAN access control lists, port security

- Switch security issues
- Link aggregation protocols
- Spanning Tree Protocol (STP)
- Multiple Spanning Tree (MST)
- Per VLAN Spanning Tree (PVST)
- Per VLAN Rapid Spanning Tree (PVRST)
- Inter-VLAN routing solutions
- First Hop Redundancy Protocols (FHRPs)
- Hot Standby Router Protocol (HSRP
- Virtual Router Redundancy Protocol (VRRP)
- Gateway Load Balancing Protocol (GLBP)
- Infrastructure support of wireless, VoIP and video
- Branch office operations
- Enhanced Interior Gateway Routing Protocol (EIGRP)
- Open Shortest Path First (OSPF)
- Layer 3 path control
- Redistribution
- External Border Gateway Protocol (EBGP)
- IP version 6 (IPv6) migration

What You Will Learn

Upon completing this course, the student will be able to meet these overall objectives:

- Plan and document the most commonly performed maintenance functions in complex enterprise networks
- Develop a troubleshooting process to identify and resolve problems in complex enterprise networks
- Select tools that best support specific troubleshooting and maintenance processes in large, complex enterprise networks
- Practice maintenance procedures and fault resolution in switching-based environments
- Practice maintenance procedures and fault resolution in routing-based environments
- Practice maintenance procedures and fault resolution in a secure infrastructure
- Troubleshoot and maintain integrated, complex enterprise networks