Advanced Network Troubleshooting and Root Cause Analysis Training Course



21 - 25 Dec 2026

California

7900 € (Per Person)

Ref: #NO7775_118143

Course Introduction / Overview:

In today's digitally-driven landscape, network downtime is not merely an inconvenience; it is a direct threat to operational continuity and business revenue. This course moves beyond basic network fixes to instill a deep, systematic approach to diagnosing and resolving complex network issues at their source. Participants will learn to transition from a reactive to a proactive mindset, mastering the art and science of root cause analysis (RCA). We will explore advanced diagnostic techniques, packet-level analysis, and sophisticated troubleshooting methodologies. Drawing upon foundational principles articulated by experts like W. Richard Stevens in his seminal work "TCP/IP Illustrated," this program provides a comprehensive understanding of network protocols and their failure modes. The curriculum at BIG BEN Training Center is meticulously designed to equip professionals with the skills to not only solve today's network problems but also to anticipate and prevent future ones. This training course provides a holistic framework for achieving network stability and performance, turning participants into invaluable assets who can ensure robust and resilient IT infrastructure through methodical network fault isolation and performance analysis.

Target Audience / This training course is suitable for:

- Network Engineers and Administrators.
- IT Support Specialists (Level 2 and 3).
- Systems Administrators.
- Network Operations Center (NOC) Engineers.
- Security Analysts and Engineers.
- IT Infrastructure Managers.
- Solutions Architects.
- Technical Team Leads.

Target Sectors and Industries:

- Telecommunications and Internet Service Providers.
- Financial Services and Banking.
- Healthcare and Medical Institutions.
- E-commerce and Online Retail.
- Information Technology and Managed Services.
- Manufacturing and Industrial Operations.
- Government Agencies and Public Sector Organizations.
- Education and Research Institutions.

Target Organizations Departments:

- Information Technology (IT).
- Network Operations.
- Infrastructure Management.
- Security Operations Center (SOC).
- Technical Support and Help Desk.
- Engineering and Development Operations (DevOps).
- Quality Assurance.
- Data Center Management.

Course Offerings:

By the end of this course, the participants will have able to:

- Implement a structured methodology for troubleshooting complex network problems.
- Perform deep packet capture and analysis using industry-standard tools.
- Diagnose and resolve intricate issues related to core protocols like TCP/IP, DNS, and DHCP.
- Effectively identify and isolate network performance bottlenecks and latency issues.
- Apply root cause analysis frameworks to prevent the recurrence of network faults.
- Analyze and troubleshoot advanced routing and switching problems in enterprise environments.
- Correlate data from various sources like logs, monitoring systems, and packet captures.
- Develop proactive network monitoring and performance baselining strategies.

Course Methodology:

The training methodology at BIG BEN Training Center is centered on immersive, hands-on learning to ensure participants can immediately apply their new skills. This course eschews a purely theoretical approach in favor of a practical, lab-intensive environment where participants engage with real-world network problems. The training combines expert-led instruction with interactive workshops, collaborative group exercises, and detailed case study analysis. Each module is supported by extensive hands-on labs that simulate complex network failure scenarios, challenging participants to apply systematic troubleshooting techniques and root cause analysis frameworks. Our instructors facilitate dynamic discussions, encouraging peer-to-peer learning and knowledge sharing. Continuous feedback is provided throughout the sessions to guide participants and reinforce key concepts. This blended approach ensures a comprehensive understanding of both the tools and the cognitive processes required for advanced network diagnostics, fostering the development of critical thinking and problem-solving skills essential for modern IT professionals.

Course Agenda (Course Units):

Unit One Foundations of Systematic Troubleshooting

- Defining a structured troubleshooting methodology.
- Differentiating between root causes, contributing factors, and symptoms.
- Introduction to essential diagnostic tools (ping, traceroute, nslookup).
- Overview of advanced analysis tools like Wireshark and tcpdump.
- Establishing network performance baselines.
- Understanding network topology and documentation.
- The importance of a problem-solving mindset in IT infrastructure.

Unit Two Deep Packet Inspection and Analysis

- Mastering the Wireshark interface and capture filters.
- Applying display filters for targeted traffic analysis.
- Analyzing the TCP three-way handshake and connection termination.
- Identifying and analyzing TCP retransmissions and errors.
- Following TCP and UDP streams to reconstruct application data.
- Graphing network traffic to identify patterns and anomalies.
- Using expert information systems to pinpoint issues.

Unit Three Troubleshooting Core Network Services

- Advanced DNS troubleshooting techniques and record types.
- Diagnosing DHCP client and server communication failures.
- Resolving network time protocol (NTP) synchronization issues.
- Troubleshooting HTTP and HTTPS performance problems.
- Analyzing FTP and other file transfer protocol issues.
- Investigating email protocol (SMTP, POP3, IMAP) failures.
- Securing and troubleshooting remote access protocols.

Unit Four Diagnosing Switching and Routing Issues

- Identifying and resolving Spanning Tree Protocol (STP) problems.
- Troubleshooting VLANs and inter-VLAN routing.
- Diagnosing OSPF and EIGRP neighbor adjacency and routing table issues.
- Analyzing BGP path selection and peering problems.
- Troubleshooting firewall rule and Access Control List (ACL) logic.
- Resolving VPN connectivity and performance issues.
- Investigating Quality of Service (QoS) misconfigurations.

Unit Five Root Cause Analysis and Proactive Management

- Applying RCA frameworks like the 5 Whys and Fishbone Diagrams.
- Correlating events across logs, packet captures, and monitoring tools.
- Documenting findings and creating a knowledge base.
- Developing a proactive network monitoring strategy.
- Implementing predictive analysis for network health.
- Conducting post-incident reviews and reports.
- Building a culture of continuous improvement in network operations.

FAQ:

Qualifications required for registering to this course?

There are no requirements.

How long is each daily session, and what is the total number of training hours for the course?

This training course spans five days, with daily sessions ranging between 4 to 5 hours, including breaks and interactive activities, bringing the total duration to 20 - 25 training hours.

Something to think about:

Beyond technical proficiency, how does a culture of systematic root cause analysis, rather than a 'quick fix' mentality, impact an organization's long-term operational resilience and innovation capacity?

What unique qualities does this course offer compared to other courses?

This course distinguishes itself by focusing on the cognitive framework of troubleshooting rather than merely demonstrating software tools. While participants will gain expert-level proficiency in tools like Wireshark, the core emphasis is on developing a systematic, repeatable methodology for problem-solving. Unlike other programs that may present a series of isolated fixes, this training course integrates packet analysis, log correlation, and protocol theory into a holistic diagnostic approach. We move beyond identifying symptoms to rigorously pursuing the foundational root cause, a skill that transforms a network engineer into a true infrastructure strategist. The curriculum is built around complex, multi-layered case studies that mirror the intricate and often ambiguous problems found in modern enterprise networks, forcing participants to think critically and connect disparate pieces of evidence. The ultimate goal is to cultivate a proactive mindset, enabling professionals to not only resolve current incidents but also to engineer more resilient and stable networks for the future, thereby driving operational excellence and business continuity.