# Advanced IP Networking and Services for Telecom Engineers Training Course



07 - 11 Dec 2026

Lisbon

4500 € (Per Person)

Ref: #TEL6766_1671

## Course Introduction / Overview:

This training course is designed to equip telecom engineers, network architects, and IT professionals with the strategic and technical skills needed to design, implement, and manage IP networks for the modern telecommunications industry. As networks transition to all-IP architectures, a deep understanding of IP routing, network protocols, and service delivery is critical for ensuring performance and reliability. This program, offered by BIG BEN Training Center, provides a comprehensive framework for understanding the core principles of IP networking, from foundational concepts to advanced topics like MPLS and SDN. We will explore key concepts such as traffic engineering, Quality of Service (QoS), and IPv6 deployment. The curriculum is informed by the academic work of authors like Andrew S. Tanenbaum, whose book, Computer Networks, provides a foundational and detailed understanding of the layers and protocols that make up modern IP networks. This course goes beyond a simple overview of technology to provide a deep understanding of how to implement real-world solutions that ensure network efficiency, resilience, and scalability. We prepare participants to be leaders who can build more agile and high-performing telecom infrastructure.

## Target Audience / This training course is suitable for:

- Telecom engineers.
- Network architects.
- IP network specialists.
- IT professionals.
- Network operations center (NOC) staff.
- System integrators.
- Technical project managers.
- Government agencies and equivalents.

## Target Sectors and Industries:

- Telecommunications.
- Mobile Network Operators (MNOs).
- Internet Service Providers (ISPs).
- Data Center Operators.
- Cloud Service Providers.
- Managed Services.
- Critical Infrastructure.
- Government and public administration agencies.

## Target Organizations Departments:

- Network Engineering.
- Network Planning and Optimization.
- IP/MPLS Engineering.
- Core Network Operations.
- IT Infrastructure.
- Technical Services.
- Research and Development (R&D).
- Strategic Planning.

## Course Offerings:

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

- Understand the fundamental principles of IP routing.
- Master key IP network protocols.
- Design and implement scalable IP network architectures.
- Configure and troubleshoot IP services.
- Ensure Quality of Service (QoS) for various applications.
- Manage and optimize network traffic.
- Implement security protocols for IP networks.
- Plan for IPv6 deployment and migration.

## Course Methodology:

This training course uses a highly practical and case-study driven methodology. The program is built on real-world examples of successful IP network deployments and the challenges they faced. Participants will work in teams to design an IP network solution for a specific telecom scenario, applying the tools and frameworks learned in the course. We will use interactive workshops to practice skills like traffic engineering and protocol configuration. The curriculum is designed to be a collaborative experience where participants can share their unique challenges and innovative solutions. Our trainers, with extensive experience in the field, will provide direct feedback and guidance throughout the course. BIG BEN Training Center is committed to providing a dynamic and practical learning environment, ensuring that participants leave with the skills and confidence to lead effective IP networking initiatives.

## Course Agenda (Course Units):

### Unit One: Foundations of IP Networking for Telecom

- The evolution to all-IP networks.
- IP routing and forwarding principles.
- TCP/IP and network protocols.
- Subnetting and IPv4 addressing.
- Introduction to IPv6.
- Network devices: routers and switches.
- The role of IP in telecom services.

### Unit Two: Advanced Routing and Traffic Engineering

- OSPF and IS-IS routing protocols.
- BGP for external routing.
- Traffic engineering with MPLS.
- MPLS forwarding and labels.
- VPNs over MPLS: L3 and L2 VPNs.
- Quality of Service (QoS) mechanisms.
- Link aggregation and redundancy.

### Unit Three: IP Services and Network Virtualization

- VoIP and IPTV over IP networks.
- Network virtualization with SDN and NFV.
- Network slicing for 5G.
- DNS and DHCP services.
- Network access control.
- Security protocols and best practices.
- Implementing IP services.

## Unit Four: Network Monitoring and Troubleshooting

- Network monitoring tools and techniques.
- Packet analysis with Wireshark.
- Troubleshooting common IP network issues.
- Performance management.
- Alarm and fault management.
- Network configuration management.
- Log analysis.

## Unit Five: The Future of IP Networks

- The impact of 5G on IP networks.
- IP for IoT and M2M.
- Cloud networking and data centers.
- IPv6 migration strategies.
- Strategic leadership in a digital world.
- Career pathways in IP networking.
- The future of telecom infrastructure.

# 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:

How can telecom engineers leverage a deep understanding of IP networking to move beyond a reactive troubleshooting approach and strategically design a future-proof, service-aware network that can support a wide range of emerging technologies?

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

This training course is unique because it provides a dedicated, strategic focus on IP networking specifically for telecom engineers. While other programs may cover general IP concepts, our curriculum is designed to empower professionals with the specific skills needed to address the unique challenges of the telecom environment, from MPLS traffic engineering to QoS for real-time services. The program is a hands-on experience, with exercises that directly simulate the challenges and decisions involved in a real-world network design or troubleshooting scenario. We go beyond theoretical concepts to provide a clear, actionable roadmap for balancing business needs with the imperative of delivering seamless and high-quality user experience. This course is for professionals who want to lead their organizations toward a more agile, efficient, and future-proof network.