Transforming Telecom Networks with SDN and NFV Training Course

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4100 € (Per Person)

Ref: #TEL5284_285424

Course Introduction / Overview:

The telecommunications industry is undergoing a monumental shift, moving away from rigid, hardware-centric infrastructures towards agile, software-driven environments. This transformation is powered by two key technologies: Software-Defined Networking (SDN) and Network Functions Virtualization (NFV). This course provides a comprehensive exploration of SDN and NFV, from fundamental principles to advanced implementation strategies within the telecom sector. We will delve into how these technologies enable unprecedented network programmability, automation, and operational efficiency, paving the way for next-generation services like 5G network slicing and dynamic SD-WAN solutions. As detailed by authors like Thomas D. Nadeau in his seminal work "Software-Defined Networking (SDN): A Comprehensive Approach", understanding the decoupling of the control and data planes is crucial for modern network architects. BIG BEN Training Center has designed this program to equip participants with the practical skills needed to design, deploy, and manage virtualized network infrastructures. This course demystifies complex concepts such as the ETSI NFV framework, MANO architecture, and service function chaining, ensuring participants can confidently navigate the transition to a telco cloud environment and leverage network automation to reduce operational expenditures and accelerate service delivery.

Target Audience / This training course is suitable for:

- Network Engineers and Architects.
- Telecommunications Professionals.
- IT Managers and Systems Administrators.
- Cloud Infrastructure Engineers.
- Solutions Architects and Designers.
- Network Operations Center (NOC) staff.
- Technical Project Managers involved in network transformation.
- R&D Professionals in the telecom sector.

Target Sectors and Industries:

- Telecommunication Service Providers.
- Internet Service Providers (ISPs).
- Cloud and Data Center Providers.
- Managed Service Providers (MSPs).
- Large Enterprise IT.
- Government and Public Sector for critical network infrastructure.
- Technology Vendors and System Integrators.
- Financial Services and Banking.

Target Organizations Departments:

- Network Planning and Engineering.
- IT Infrastructure and Operations.
- Research and Development (R&D).
- Cloud and Virtualization Teams.
- Service Delivery and Provisioning.
- Cybersecurity and Network Security.
- Product Development.
- Corporate Strategy and Technology.

Course Offerings:

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

- Articulate the core concepts, drivers, and benefits of SDN and NFV in telecommunications.
- Analyze the key components of SDN architecture, including controllers and the OpenFlow protocol.
- Design a network architecture based on the ETSI NFV framework, including MANO components.
- Differentiate between Virtual Network Functions (VNFs) and Containerized Network Functions (CNFs).
- Implement service function chaining to create agile and dynamic service delivery models.
- Evaluate the role of SDN and NFV in enabling 5G core networks and network slicing.
- Develop strategies for migrating from legacy network infrastructure to a virtualized telco cloud.
- Assess security challenges and mitigation techniques specific to SDN and NFV environments.
- Apply network automation principles for zero-touch provisioning and management.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be highly interactive, practical, and engaging, ensuring that participants not only learn the theory but also understand its real-world application. This course combines expert-led presentations with in-depth technical discussions to break down complex topics like NFV MANO and data plane programming. A significant portion of the training is dedicated to case studies of successful SDN/NFV deployments by leading global telecommunication service providers, allowing participants to analyze challenges and best practices. Collaborative group exercises and workshops will encourage participants to design solutions for hypothetical network transformation scenarios, fostering teamwork and critical thinking. The sessions will feature demonstrations of key technologies and management platforms, providing a visual and practical understanding of concepts like SDN controllers and NFV orchestrators. Our expert instructors facilitate an open learning environment where questions are encouraged, and peer-to-peer knowledge sharing is valued. This blended approach ensures a comprehensive learning experience that equips professionals with the confidence and skills to implement SDN and NFV solutions within their own organizations.

Course Agenda (Course Units):

Unit One: The Revolution of Network Virtualization

- Introduction to modern networking challenges.
- The evolution from traditional networks to software-defined environments.
- Core concepts of Software-Defined Networking (SDN).
- Fundamental principles of Network Functions Virtualization (NFV).
- Distinguishing between SDN, NFV, and network automation.
- Business drivers and value proposition for telecom operators.
- Key industry standards bodies and open-source projects.

Unit Two: A Deep Dive into SDN Architecture

- The separation of control and data planes.
- Detailed exploration of the SDN architecture: application, control, and infrastructure layers.
- The role and function of the OpenFlow protocol.
- Southbound and Northbound APIs in SDN.
- Analysis of leading SDN controllers like Open Daylight and ONOS.
- Use cases for SDN in traffic engineering and network optimization.
- Implementing network programmability and automation with SDN.

Unit Three: Understanding the NFV Framework

- The ETSI NFV Architectural Framework explained.
- Virtual Network Functions (VNF) and their lifecycle management.
- The role of the NFV Infrastructure (NFVI).
- Management and Orchestration (MANO) deep dive.
- Components of MANO: NFV Orchestrator (NFVO), VNF Manager (VNFM), and Virtualised Infrastructure Manager (VIM).
- The importance of descriptors and catalogs in the NFV ecosystem.
- Challenges in VNF performance and interoperability.

Unit Four: SDN and NFV Synergy for Next-Generation Services

- How SDN and NFV complement each other in a telco cloud.
- Implementing dynamic Service Function Chaining (SFC).
- The architecture and benefits of Software-Defined WAN (SD-WAN).
- SDN and NFV as enablers for 5G network architecture.
- Understanding 5G network slicing for customized service delivery.
- The role of virtualization in the Evolved Packet Core (vEPC) and Radio Access Network (vRAN).
- Use cases in IoT, edge computing, and mobile networks.

Unit Five: Deployment, Operations, and Future Trends

- Strategies for migrating from legacy to virtualized networks.
- Operational best practices for managing an SDN/NFV environment.
- Performance monitoring and assurance in a virtualized infrastructure.
- Security considerations and attack vectors in SDN and NFV.
- Introduction to Cloud-Native Networking and Containerized Network Functions (CNFs).
- The role of Kubernetes and containers in modern telecom.
- Future outlook: AI in network operations, zero-touch automation, and beyond.

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:

As network functions become disaggregated software components, how does the industry maintain carrier-grade reliability and security standards traditionally associated with monolithic hardware?

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

This course distinguishes itself by offering a holistic and pragmatic perspective on network transformation, specifically tailored for the telecommunications industry. While many courses focus narrowly on either SDN or NFV as separate technologies, our curriculum is built around their powerful synergy, demonstrating how they combine to solve real-world challenges and unlock next-generation services like 5G and SD-WAN. We move beyond purely theoretical discussions to provide actionable insights into deployment strategies, operational challenges, and migration planning. The content is forward-looking, addressing the critical shift towards cloud-native principles with Containerized Network Functions (CNFs) and Kubernetes, preparing participants not just for the technology of today but for the future of networking. The curriculum emphasizes practical application through detailed case studies of global telecom operators, allowing participants to learn from real successes and failures. Rather than just teaching features, this course cultivates a strategic mindset, enabling professionals to architect, deploy, and manage agile, automated, and cost-effective networks that can adapt to the relentless pace of technological innovation.