Implementing SDN and Virtual Network Architectures Training Course

20 - 24 Dec 2026

Doha

5500 € (Per Person)

Ref: #NO1396_231024

Course Introduction / Overview:

The transition from traditional, hardware-centric networks to agile, software-defined infrastructures represents a fundamental shift in the IT landscape. This course provides a comprehensive exploration of Software-Defined Networking (SDN) and Network Function Virtualization (NFV), the core technologies driving this transformation. We will move beyond theoretical concepts to focus on practical implementation, equipping participants with the skills to design, deploy, and manage modern virtual networks. As detailed by leading experts like Thomas D. Nadeau and Ken Gray in their seminal work, "SDN: Software Defined Networks," the decoupling of the control plane from the data plane unlocks unprecedented levels of automation, flexibility, and programmability. This training program, offered by BIG BEN Training Center, is meticulously designed to bridge the gap between legacy networking principles and the demands of cloud computing, data centers, and 5G environments. Participants will gain hands-on experience with key protocols, controllers, and automation tools, enabling them to build resilient, scalable, and secure network architectures that align with contemporary business objectives and technological advancements.

Target Audience / This training course is suitable for:

- Network Engineers and Architects.
- System and Network Administrators.
- Cloud Infrastructure Engineers.
- IT Managers and Team Leaders.
- DevOps and Automation Specialists.
- Cybersecurity Professionals.
- Telecommunications Engineers.
- Solutions Architects.
- Data Center Engineers.

Target Sectors and Industries:

- Telecommunications and Service Providers.
- Cloud Computing and Data Center Services.
- Information Technology and Software Development.
- Financial Services and Banking.
- Healthcare and Medical Institutions.
- Government Agencies and Public Sector Bodies.
- Large-Scale Enterprise IT.
- Education and Research Institutions.

Target Organizations Departments:

- Information Technology (IT) Infrastructure.
- Network Operations Center (NOC).
- Cloud Engineering and Architecture.
- Cybersecurity and Information Security.
- Research and Development (R&D).
- Systems Engineering and Integration.
- DevOps and Site Reliability Engineering (SRE).

Course Offerings:

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

- Articulate the core principles of SDN, including the separation of control and data planes.
- Design and implement a functional SDN architecture using common controllers.
- Deploy and manage Virtualized Network Functions (VNFs) within an NFV framework.
- Utilize network programmability and automation scripts to configure network devices.
- Analyze and secure virtualized network environments against potential threats.
- Integrate SDN and NFV to create agile and dynamic network services.
- Troubleshoot common implementation issues in software-defined environments.
- Evaluate different SDN protocols and controller platforms for specific use cases.
- Develop a strategic plan for migrating from traditional to virtualized network infrastructure.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be highly interactive, immersive, and practical, ensuring participants gain tangible skills. This course moves beyond traditional lectures by integrating extensive hands-on lab sessions where participants will use industry-standard simulators and tools to build and manage virtual networks. Our approach emphasizes a balanced blend of theoretical knowledge and practical application. Each module is supported by real-world case studies that demonstrate successful SDN and NFV deployments in various industries, allowing participants to understand the strategic implications of these technologies. Collaborative group exercises and peer-to-peer discussions are central to the learning process, fostering a dynamic environment where complex problems are solved collectively. Expert instructors facilitate these sessions, providing continuous guidance, personalized feedback, and mentorship. The curriculum is structured to build knowledge incrementally, ensuring that foundational concepts are mastered before advancing to more complex implementation and automation topics, culminating in a comprehensive understanding of modern networking.

Course Agenda (Course Units):

Unit One: Foundations of Software-Defined and Virtual Networking

- Introduction to the limitations of traditional network architectures.
- Core concepts of network virtualization.
- The architectural principles of Software-Defined Networking (SDN).
- Understanding the separation of the control plane and data plane.
- Introduction to Network Function Virtualization (NFV).
- Comparing SDN, NFV, and traditional networking models.
- Key use cases and business benefits of network virtualization.

Unit Two: Deep Dive into SDN Architecture and Protocols

- Exploring the three layers of SDN architecture (Application, Control, Infrastructure).
- Detailed analysis of the OpenFlow protocol and its role.
- Understanding Southbound APIs (e.g., OpenFlow, Netconf).
- Exploring Northbound APIs and their function in network programmability.
- Overview of major SDN controllers (Open Daylight, ONOS, Ryu).
- Controller placement strategies and high-availability considerations.
- Packet flow and forwarding logic in an SDN environment.

Unit Three: Implementing Network Function Virtualization (NFV)

- The ETSI NFV architectural framework (NFVI, VNF, MANO).
- Understanding Virtualized Network Functions (VNFs) and their lifecycle.
- The role of the NFV Orchestrator and VNF Manager.
- Principles of service function chaining in virtualized environments.
- Deploying common VNFs such as virtual firewalls and load balancers.
- Integration of NFV with existing cloud management platforms.
- Performance and reliability considerations for VNFs.

Unit Four: Network Automation and Programmability

- Introduction to network automation principles.
- Using Python for network scripting and automation.
- Interacting with network devices and controllers via APIs.
- Hands-on labs with network simulation tools like Mininet.
- Developing simple network applications on an SDN controller.
- Introduction to configuration management tools (Ansible) for networking.
- Building automated workflows for network provisioning and monitoring.

Unit Five: Advanced Topics, Security, and Future Trends

- Security challenges and solutions in SDN and NFV environments.
- Techniques for monitoring and troubleshooting virtual networks.
- Introduction to Intent-Based Networking (IBN).
- The role of SDN and NFV in 5G and edge computing.
- Network slicing concepts and implementation.
- Case studies of large-scale SDN and NFV deployments.
- The future of networking and the evolution of the network engineer role.

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 programmability becomes standard, how does the role of the traditional network engineer evolve from a device-centric operator to a service-centric developer?

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

This training course distinguishes itself by focusing intensely on the practical implementation and strategic application of SDN and NFV, rather than remaining purely theoretical. While many courses cover the "what," we concentrate on the "how" and "why," equipping participants with the hands-on skills needed to architect and manage modern networks. Our curriculum is vendor-agnostic, providing a foundational understanding of core principles like OpenFlow and NFV MANO that can be applied across various platforms, ensuring the skills learned are versatile and future-proof. The course integrates extensive lab work using industry-relevant simulators, allowing participants to build, break, and fix virtual networks in a controlled environment. Furthermore, we delve into advanced, forward-looking topics such as intent-based networking and network slicing for 5G, ensuring participants are not just current with today's technology but also prepared for the next wave of network innovation. The emphasis on automation using Python and APIs directly addresses the industry's shift towards a DevOps culture, transforming network engineers into true infrastructure developers.