Network Automation and Programmability with Python Training Course



21 - 25 Dec 2026

Düsseldorf

5900 € (Per Person)

Ref: #NO9182_119172

Course Introduction / Overview:

This course provides a comprehensive journey into the world of network automation and programmability using Python, designed to transform traditional network engineers into modern network developers. In an era where network agility and efficiency are paramount, manual configuration is no longer sustainable. This program, offered by BIG BEN Training Center, addresses this shift by equipping participants with the skills to automate network tasks, manage configurations at scale, and build programmable network infrastructures. We will explore foundational concepts and advance to sophisticated techniques, drawing on principles outlined by industry pioneers like Kirk Byers, the creator of the Netmiko library. The curriculum is structured to be practical and hands-on, reflecting the real-world challenges discussed in texts such as "Mastering Python Networking" by Eric Chou. Participants will move beyond simple scripting to understand the core principles of infrastructure as code, API integration, and the DevOps mindset as applied to networking, ensuring they can design, build, and maintain resilient and automated network environments from the ground up.

Target Audience / This training course is suitable for:

- Network Engineers and Administrators.
- Systems Engineers and Administrators.
- DevOps and Site Reliability Engineers (SRE).
- Network Architects and Designers.
- IT Managers and Team Leaders overseeing network operations.
- Technical Support Professionals seeking to advance their skills.
- Solutions Architects involved in infrastructure design.

Target Sectors and Industries:

- Telecommunications and Internet Service Providers.
- Information Technology and Services.
- Financial Services and Banking.
- Cloud Computing and Data Center Providers.
- Healthcare and Pharmaceutical sectors.
- Government Agencies and Public Sector Organizations.
- E-commerce and Retail.
- Manufacturing and Industrial Automation.

Target Organizations Departments:

- Network Operations Center (NOC).
- IT Infrastructure and Operations.
- Cloud Engineering and Architecture.
- Cybersecurity and Network Security.
- Research and Development (R&D).
- DevOps and Automation Teams.
- Enterprise Architecture.

Course Offerings:

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

- Develop Python scripts to automate repetitive network configuration tasks.
- Utilize essential Python libraries such as Netmiko, NAPALM, and Nornir for multi-vendor device management.
- Interact with network device APIs, including REST, NETCONF, and RESTCONF.
- Parse and manipulate structured data formats like JSON, YAML, and XML for network operations.
- Implement configuration management principles using tools like Ansible for networking.
- Automate network troubleshooting and data gathering processes.
- Apply version control with Git to manage network configurations and automation scripts.
- Design and build scalable and resilient network automation workflows.
- Integrate automation into a CI/CD pipeline for network changes.

Course Methodology:

The training methodology at BIG BEN Training Center is designed to be immersive, practical, and highly interactive, ensuring participants gain tangible skills they can apply immediately. This course moves beyond theoretical lectures by emphasizing a hands-on, lab-centric approach where over 60% of the time is dedicated to practical exercises. Participants will work in a simulated enterprise network environment, writing and executing Python scripts to solve real-world problems. The learning process is facilitated through a blend of expert-led instruction, guided lab sessions, and collaborative group projects that encourage peer-to-peer learning. We will analyze case studies of successful network automation implementations to understand best practices and potential pitfalls. Interactive Q&A sessions, live coding demonstrations, and continuous feedback from the instructor are integral to the course, creating a dynamic learning atmosphere. This approach ensures a deep understanding of not just the "how" but also the "why" behind network automation and programmability principles, fostering a mindset of continuous improvement and innovation.

Course Agenda (Course Units):

Unit One: Foundations of Python for Network Engineers

- Introduction to network programmability and automation.
- Setting up a Python development environment for networking.
- Python fundamentals including data types, variables, and operators.
- Control flow with conditional statements and loops.
- Working with Python functions, modules, and packages.
- Introduction to data structures like lists, dictionaries, and tuples.
- File handling for reading and writing configuration files.

Unit Two: Core Network Automation with Python Libraries

- Introduction to SSH and Telnet automation concepts.
- Automating device interaction using the Paramiko library.
- Simplifying multi-vendor SSH connections with Netmiko.
- Abstracting network operations with the NAPALM library.
- Executing commands and pushing configurations to multiple devices.
- Handling exceptions and errors in automation scripts.
- Managing device credentials and sensitive data securely.

Unit Three: Working with Network Data and APIs

- Understanding structured data formats: JSON, YAML, and XML.
- Parsing and generating network data with Python.
- Introduction to Application Programming Interfaces (APIs).
- Fundamentals of REST APIs and HTTP methods.
- Using the Python requests library to interact with web services.
- Practical lab on interacting with a network device's REST API.
- Introduction to Postman for API testing and development.

Unit Four: Advanced Programmability and Automation Frameworks

- Introduction to model-driven programmability with YANG.
- Understanding the NETCONF and RESTCONF protocols.
- Using Python libraries to interact with NETCONF/RESTCONF APIs.
- Introduction to Ansible for network automation.
- Writing Ansible playbooks for network configuration management.
- Managing inventory and variables in Ansible for network environments.
- Exploring concurrent automation with the Nornir framework.

Unit Five: Building and Scaling Automation Solutions

- Version control for network automation scripts with Git.
- Fundamentals of Git commands: clone, commit, push, and pull.
- Structuring a network automation project.
- Introduction to Continuous Integration/Continuous Deployment (CI/CD) for networking.
- Building a simple CI/CD pipeline for network configuration validation.
- Best practices for writing clean, reusable, and scalable automation code.
- Final project: Developing an end-to-end network automation workflow.

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 automation moves towards intent-based systems, how does the role of the network engineer evolve from a hands-on operator to a strategic developer?

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

This course distinguishes itself by focusing on building a foundational programmability mindset rather than just teaching the syntax of specific tools. While many courses concentrate on a single vendor or library, our curriculum provides a vendor-agnostic perspective, empowering participants with versatile skills applicable across diverse network environments. We emphasize the "why" behind automation, exploring architectural principles and best practices that lead to scalable and resilient solutions. The curriculum uniquely bridges the gap between traditional networking and modern DevOps culture by integrating essential concepts like version control with Git and CI/CD principles from day one. This holistic approach ensures that participants learn not only how to write a script but also how to manage code, collaborate effectively, and build robust, production-ready automation workflows. Our extensive hands-on labs are designed to simulate complex, real-world scenarios, pushing participants to think critically and develop problem-solving skills that go far beyond simple command execution. The focus is on creating adaptable network professionals who can architect the future of network operations.