Self-Paced Learning @ Karneliuk.com

Multi vendor Network Automation Training

What exactly do we offer to YOU?

Self-Paced Learning Package

- **32 hours** of the concentrated training video grouped into *10 sessions to learn the concepts*
- **10 slide decks** with learning materials covered in the video *to be your reference*
- **9 lab guides** *to master your practical skills*
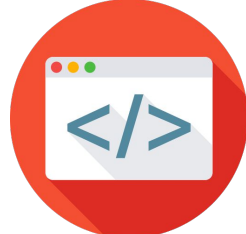- **10 examples** of the Ansible, Bash, and Python code *to be your reference*

Network vendors covered for automation

NOKIA

CISCO

CUMULUS

ARISTA

How to learn?

Watch video   Read materials   Do lab   Repeat

x10

High-level overview of content

- Use cases of the network automation
- Linux, Virtualisation (KVM) and Containerisation (Docker)
- Data models (YANG) and formats (XML/JSON/YAML)
- Network API (SSH, NETCONF, REST API)
- Network automation with Bash
- Network automation with Ansible
- Network automation with Python

What is YOUR ultimate benefit of learning with us?

What? Top technical expertise and REAL-LIFE practical experience

Why? We build automation ourselves. We know HOW do it. We teach YOU how to do it

What? Technology-first and vendor neutrality approach (NO VENDOR LOCK)

Why? YOU learn ALL major and emerging vendors (Cisco, Nokia, Arista, Cumulus)

What? Dedication to YOUR success

Why? If YOU like training, YOU recommend us. So we aim to create the best content

What will YOU learn? (1)

Session #1

Description:

The 1st session of the network automation training aims to teach you how to build the network development's host:
- Advantages and challenges of the automation
- Specifics and use cases of the network automation
- Success strategies to create and implement network automation in companies
- Course outline

Duration: 2:37:00

Session #2

Description:

The 2nd session of the network automation training aims to teach you how to build the network development's host:
- Approaches to build lab
- How to choose and configure proper Linux-based operation system
- How to emulate the network with the VMs
- How to deploy modern containerised applications
- How to properly version, distribute and control your code

Live DEMO:
- Installation and configuration of CentOS Linux
- Installation and configuration of KVM
- Building network using KVM VMs
- Installation and configuration of Docker
- Connecting VMs to Containers
- Creation of your GitHub repo

Duration: 3:56:00

What will YOU learn? (2)

Session #3

Description:

The 3rd session of the network automation training aims to teach you how to work with the data, data models and data formats necessary for network modelling:
- Explains what are the data models and their requirements
- Covers in-depth data modelling language YANG
- Provides info about data model encoding with XML, JSON and YML

Live DEMO:
- Conversion of YANG into XML documents used in NETCONF
- Conversion of YANG into JSON documents used in REST API
- Conversion of YANG into YAML documents used by humans (and some automation tools)

Duration: 2:16:00

Session #4

Description:

The 4th session of the network automation training aims to teach you about SSH/CLI, NETCONF/YANG and RESTCONG/YANG including OpenConfig:
- OpenConfig YANG data models
- Configuration of the multivendor network running Cisco IOS XR, Nokia SR OS, Cumulus Linux, and Arista EOS using CLI/SSH
- Details of the NETCONF/YANG operation
- Configuration of the multivendor network running Cisco IOS XR, Nokia SR OS, and Arista EOS using NETCONF/YANG
- Details of the RESTCONF/YANG operation

Live DEMO:
- Testing NETCONF/YANG operation towards multiple devices over SSH from CLI
- Collecting information using RESTCONF/YANG using curl from CLI and POSTMAN

Duration: 3:31:00

{ REST:CONF }

What will YOU learn? (3)

Session #5

Description:

The 5th session of the network automation training aims to teach you how to program in BASH:
- Covers the advantages and use cases for BASH
- Explains BASH code structure
- Covers variables, conditionals, loops and other management constructions of BASH
- Explains the Linux tools and the relation between them and BASH

Live DEMO:
- Code development in Bash to parse JSON input, collect the information from multiple vendors (Cisco, Nokia, Arista, Cumulus) using CLI, processing this data and saving it in YAML format

Duration: 3:05:00

Session #6

Description:

The 6th session of the network automation training aims to teach you how to program in Ansible (basics):
- Covers the structure and benefits of Ansible
- Explains the major building blocks of Ansible (variables, loops, conditionals)
- Demonstrates the vendor CLI modules (Cisco, Nokia, Arista, Cumulus)

Live DEMO:
- Code development in Ansible to parse JSON data, use it in the Ansible code and configure the multivendor network with Cumulus Linux, Cisco IOS XR, Arista EOS and Nokia SR OS

Duration: 3:00:00

What will YOU learn? (4)

Session #7

Description:

The 7th session of the network automation training aims to teach you advanced use cases of the Ansible:
- Works with Jinja2 templates (inline and separate modules)
- Describes the approach to the structured Ansible code using roles
- Covers the security aspects with Ansible vault
- Demonstrating the NETCONF modules and explaining the automated operation of JSON/XML conversion

Live DEMO:
- Code development in Ansible to configure the multivendor network with Cumulus Linux, Cisco IOS XR, Arista EOS and Nokia SR OS using the Jinja2 templates and vendor-native CLI modules
- Code development in Ansible to configure the multivendor network with Cisco IOS XR, Arista EOS and Nokia SR OS using the NETCONF and OpenConfig YANG modules

Duration: 3:06:00

Session #8

Description:

The 8th session of the network automation training aims to teach you basics of the Python:
- Describes the Python history and use cases
- Covers the Python building blocks (modules, variables, conditionals, loops)
- Explains works with files
- Provides details on working with Jinja2 templates using jinja2 module
- Demonstrates conversion of JSON data in Python dictionary using json module
- Shows the interaction with the network element over SSH using paramiko module

Live DEMO:
- Code development in Python to configure the multivendor network with Cumulus Linux, Cisco IOS XR, Arista EOS and Nokia SR OS using the Jinja2 templates, JSON parsing and SSH using paramiko module

Duration: 3:13:00

What will YOU learn? (5)

Session #9

Description:

The 9th session of the network automation training aims to teach you advanced topics in Python:
- Describes the concepts of the Object Oriented Programming
- Covers the Python classes, propertied (public and private) and methods (public and privates)
- Explains the error handling and intercept of exceptions
- Provides details on automated creation of JSON files out of Python classes in YANG data model format
- Demonstrates the automated conversion of JSON into XML using JTOX with Pythong
- Shows the interaction with the network element over NETCONF using ncclient

Live DEMO:
- Code development in Python to configure the multivendor network with Cisco IOS XR, Arista EOS and Nokia SR OS using NETCONF/YANG

Duration: 3:23:00

Session #10

Description:

The 10th session of the network automation training aims to teach you the REST API and NetBox basics:
- Describes the micro services architecture for applications
- Covers the capabilities of the modern network controllers
- Explains the REST API session establishment and calls within CRUD framework
- Demonstrates the POSTman tool to explore the REST API interface of the application
- Shows the NetBox tool for network documentation
- Provides details on interacting with application over REST API using Ansible with URI module and Python with requests module

Live DEMO:
- Code development in Python and Ansible to interact with the application via REST API to collect the data and turn them into variables, which you can use in your application

Duration: 2:51:00

About karneliuk.com

Brief description

In industry: since 2007
Education: MSc. Telecommunication
Certificates: 2x CCIE #49412 (RS, SP), NRS1, CAPM, ITIL-F
Industry-recognized blog about a multivendor interop, SDN, automation and programmability: https://karneliuk.com
GitHub repo with multivendor SDN and network automation:
https://github.com/akarneliuk
Speaker: Cisco Live 2019, SReXperts 2019, UKNOF 45
Author: Network Programmability and Automation, Volume 1, Cisco Press
Awards: #CiscoChampion 2019 and 2020 as one of the top tech influencers world-wide

Anton Karneliuk

Delivered projects in

vodafone
Fiber Internet Center
BUILDING PROACTIVE MANAGED FIBER NETWORKS SINCE 2001
NOKIA
eventim
GlobalOneBel
velcom A1

Expertise with

CISCO
NOKIA
paloalto NETWORKS
DELL
{ REST }
Terraform
influxdb
Kapacitor
docker
OPENCONFIG
ARISTA
CUMULUS
Mellanox TECHNOLOGIES
WatchGuard
ANSIBLE
HashiCorp Vagrant
Grafana
telegraf
netbox
KVM

Thank you very much for your attention!

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