Systems & Network Training

Network management technologies

A 5 day Hands on training course

Save on expenses. This course is also available on your premises.

Description

A comprehensive tour of the available network management technologies available for todays networks. The course starts with basic tools such as syslog along with Python network automation. SNMP is then covered with the *flow technologies and streaming telemetry. Configuration management with ansible, Python, NETCONF and RESTCONF is then studied. The final part of the course looks at SDN. Hands on sessions are used throughout to reinforce the theory rather than teach specific manufacturer equipment. Note that sections are available as individual courses.

Key outcomes

By the end of the course delegates will be able to:

- ✔ Evaluate network management technologies.
- ✔ Recognise the weaknesses of SNMP versus NETCONF and streaming telemetry.
- ✔ Explain the role of NETCONF and RESTCONF.
- ✔ Compare & contrast *flow and streaming telemetry.
- ✔ Explain the role of SDN in network management.
- ✔ Automate network configuration with ansible and Python.

Training Approach

This structured course uses Instructor Led Training to provide the best possible learning experience. Small class sizes ensure students benefit from our engaging and interactive style of teaching with delegates encouraged to ask questions throughout the course. Quizzes follow each major section allowing checking of learning. Hands on sessions are used throughout to allow delegates to consolidate their new skills.

Details

Who will benefit?
Those wishing to manage networks.

Prerequisites
Introduction to data communications & networking.
(Previous Python experience is NOT needed)

Duration: 5 days

Overall rating: ★★★★★

Generic Training	Small Class Sizes	Hands On Training	Our Courseware	Customise Your Course
Generic training complements product specific courses covering the complete picture of all relevant devices including the protocols “on the wire”.	We limit our maximum class size to 8 delegates; often we have less than this. This ensures optimal interactivity between delegates and instructor.	The majority of our courses use hands on sessions to reinforce the theory.	We write our own courses; courseware does not just consist of slides and our slides are diagrams not bullet point text.	Please contact us if you would like a course to be customised to meet your specific requirements. Have the course your way.
“*Friendly environment with expert teaching that teaches the why before the how.*” G.C. Fasthosts	*“Excellent course. The small class size was a great benefit...”* M.B. IBM	*“Not many courses have practice added to it. Normally just the theoretical stuff is covered.”* J.W. Vodafone	*“Comprehensive materials that made the course easy to follow and will be used as a reference point.”* V.B. Rockwell Collins	*“I was very impressed by the combination of practical and theory. Very informative. Friendly approachable environment, lots of hands on.”* S.R. Qinetiq

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Course Content

Basic network management:

Network management
What is network management? Benefits, issues. FCAPS model. Fault management, Configuration management, accounting, performance, security. What to manage, what not to manage. Managing network devices, managing servers.

Monitoring networks:

Traditional network tools
Ping..., SSH, syslog, TFTP for configurations. nmap. Wireshark. CLI. Web based management. Splunk. Nessus, snort, Kali. Hands on: syslog, network inventories.

Network automation using the CLI
Programming and automating networks, netOps. Python, Git. Python network modules, SSH, paramiko, netmiko. EVE-NG. Hands on: Python network modules.

Structured versus unstructured data
Problems with automation and unstructured data. XML, JSON, YAML. The role of YANG. Hands on: Parsing data.

SNMP
SNMP architecture, SNMP MIBs, SMI, the SNMP protocol, polling security. Configuring SNMP. SNMPv1, v2, v3, SNMP security. Which version should you use? MIBs and MIB structure. mib-2, extra parts of mib-2, Private enterprise MIBs. Summary: What SNMP is good/bad at. Hands on: Configuring agents and a NMS. MIB browsing.

Server management
Microsoft, Linux, application polling. WMI vs SNMP. Hands on: Application polling.

Performance management

***flow**
Polling, push vs pull, netflow, sflow, IPFIX, *flow. Flows. Where to monitor traffic. Comparing *flow with SNMP. Architecture: Generators and collectors. When flows are exported. NetFlow reporting products. SolarWinds. Hands on: Netflow configuration. Collectors.

Streaming telemetry
Model driven telemetry, periodic/on change. Structured data. Telemetry protocol stack. gRPC and gNMI. Protobuf. gNMI operations. Telemetry architecture. Telegraf, databases, Grafana. Hands on: Telemetry example.

Configuration management

Configuration management tools
Chef, puppet, ansible, saltstack. Ansible architecture, controlling machines, nodes, agentless, SSH, modules. Inventories, playbooks, modules, network modules, jinja2 templates. Hands on: Network configuration with ansible.

NETCONF
What is NETCONF? Protocol stack, Data stores, traffic flows, validating configurations, rollback. YANG data models and how YANG is used by NETCONF. XML. Explorers and other tools. Hands on: anx, Python and NETCONF.

RESTCONF
The REST API, HTTP, What is RESTCONF? Tools including Postman. Comparison with NETCONF. Hands on: Configuration with RESTCONF.

Python network automation: configuration
SSH issues. Using structured data. Jinja2. ncclient, requests, NAPALM, Nornir. Automated testing. Hands on: Python network device configuration with nornir.

Software Defined Networks and orchestration

Classic SDN
What is SDN? benefits. SDN architecture. SDN applications, SDN switches, SDN controllers, Network Operating Systems. Control plane, data plane. Northbound interfaces. SDN components. Southbound interfaces. OpenFlow. ONF, OpenFlow ports, Flow tables.

Network virtualization
Virtual networks, virtual switches, NfV. Service chaining. NfV and SDN.

SDN implementations
Classic SDN, Hybrid SDN, SDN via APIs, SDN via overlays. Data centre SDN, VXLAN, Service Provider SDN, SD WAN, Enterprise SDN, WiFi.

SDN and open source
OpenDaylight, OpenVSwitch, Open Networking Forum, Open Network Operating System. Hands on: OpenStack.

SD-WAN
What is SD-WAN? Architecture: Edge, gateway, orchestrator, controller. Overlay and underlay. Use of MPLS, 4G/5G. Benefits and features. Secure Access Service Edge (SASE).