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Sign up

MPLS & Segment Routing Training

3 days (21 hours)

Overview

MPLS and Segment Routing are the cornerstones of modern networks. MPLS optimizes routing and QoS, while Segment Routing simplifies signaling and provides native programmability for NetDevOps and the cloud.

Our MPLS & Segment Routing training course teaches you how to deploy, administer and automate MPLS and SR networks: LSP, RSVP?TE, migration to SR?MPLS/SRv6, SR?TE and integration into your CI/CD pipelines.

You'll also see how to monitor and automate with Prometheus, Grafana, Ansible and Terraform, to prepare your infrastructures for cloud?native and 5G.

On completion, you'll be able to design, deploy and operate a resilient, high-performance MPLS/SR network, integrated into your DevOps workflows.

As with all our training courses, this one uses the latest stable versions of IETF protocols.

Objectives

- Understand MPLS and Segment Routing
- Deploy MPLS, SR?MPLS and SRv6
- Configure RSVP?TE, SR?TE and SR policies
- Automate via API, Ansible, Terraform
- Monitoring with Prometheus and Grafana
- Prepare for migration to cloud?native and 5G

Target audience

- DevOps engineers
- Network engineers
- Cloud & infrastructure architects
- NetOps & NetDevOps teams

Prerequisites

- Solid grounding in IP networks, OSPF, BGP
- Notions of automation

MPLS & Segment Routing training program

Introduction to MPLS and Segment Routing

- The role of MPLS and labels in modern architectures
- Traditional IP limits and the benefits of label switching
- Segment Routing overview: SR?MPLS, SRv6
- Operator, datacenter and cloud use cases
- MPLS ? SR
- Workshop: Configuring an MPLS LSP on a virtual lab

MPLS architecture

- Data plane : Label Switching, label stack
- Control plane: LDP, RSVP?TE
- FEC, LSR and forwarding behavior
- Classic MPLS vs. SR
- QoS & SLA integration
- Workshop: Setting up an MPLS core with LDP

Traffic engineering with MPLS

- Constraining paths with RSVP?TE
- Reservations, bandwidth and QoS policies
- Link protection & fast?reroute
- Cloud/DevOps use cases
- Preparing for migration to SR
- Workshop: Creating an MPLS RSVP?TE tunnel

Introduction to Segment Routing

- SID concepts (node, adjacency, service)
- SR?MPLS: principles and differences with MPLS
- SRv6: encoding in IPv6, SRH
- Advantages: simplification, scalability, SDN?ready

- Case studies (backbone, 5G, cloud)
- Workshop: Basic SR?MPLS deployment

Architecture & operation Segment Routing

- OSPF / IS?IS extensions for SR
- Data planes: SR?MPLS vs SRv6
- SDN controllers, PCE/PCEP
- Path and policy modeling
- NetDevOps integration
- Workshop: Explicit path via SR?MPLS

Traffic engineering with SR

- SR?TE: flexibility and flow steering
- SR Policy, constraints and objectives
- Protection: TI?LFA / FRR with SR
- Comparing SR?TE vs RSVP?TE
- Hyperscale and 5G patterns
- Workshop: Setting up an SR Policy

DevOps automation & integration

- APIs, Netconf/YANG and programmability
- Ansible and Terraform automation
- CI/CD integration and config testing
- Infrastructure as Code network
- NetDevOps case studies
- Workshop: Deploying MPLS/SR config via Ansible

MPLS/SR monitoring & observability

- Telemetry (SNMP, streaming)
- Prometheus / Grafana monitoring
- KPIs: latency, jitter, losses, SLAs
- SR tools: SR ping, SR trace
- Anomaly detection & runbooks
- Workshop: Grafana SR?MPLS Dashboard

Summary & outlook

- MPLS vs. Segment Routing
- MPLS? migration strategies SR?MPLS / SRv6
- Towards cloud?native & 5G
- Industrialization best practices
- Post-training roadmap

- Workshop: MPLS? SR

Companies concerned

This training course is aimed at both individuals and companies, large or small, wishing to train their teams in a new advanced IT technology, or to acquire specific business knowledge or modern methods.

Positioning on entry to training

Positioning at the start of training complies with Qualiopi quality criteria. As soon as registration is finalized, the learner receives a self-assessment questionnaire which enables us to assess his or her estimated level of proficiency in different types of technology, as well as his or her expectations and personal objectives for the forthcoming course, within the limits imposed by the selected format. This questionnaire also enables us to anticipate any connection or security difficulties within the company (intra-company or virtual classroom) which could be problematic for the follow-up and smooth running of the training session.

Teaching methods

Practical training: 60% hands-on, 40% theory. Training material distributed in digital format to all participants.

Organization

The course alternates theoretical input from the trainer, supported by examples, with brainstorming sessions and group work.

Validation

At the end of the session, a multiple-choice questionnaire verifies the correct acquisition of skills.

Certification

A certificate will be awarded to each trainee who has completed the entire course.