Course : Juniper, routing and switching, advanced

Practical course - 5d - 35h00 - Ref. JUP
Price : 3630 € E.T.

Master the concepts of distance vector, link state and path vector protocols with this advanced training course. You'll also learn about the characteristics of the RIP, OSPF and BGP routing protocols, IP switching mechanisms and VPN design.

Teaching objectives

At the end of the training, the participant will be able to:

- Master advanced routing and switching techniques
- Setting up a mutli-area OSPF network with static route redistribution and RIP
- Configuring a Mutli-AS network with BGP routing and OSPF as IGP
- Implementing MSTP and VSTP
- Implementing Level 2 and Level 3 QoS on the same IP network

Intended audience

Network engineer/administrator and technician.

Prerequisites

Good knowledge of TCP/IP and Juniper router configuration, or knowledge equivalent to that provided by the course "Juniper, routing and switching, implementation" (ref. JUN).

Practical details

Hands-on work

Discussions, experience sharing, demonstrations, tutorials and case studies.

Teaching methods

Active pedagogy based on examples, demonstrations, experience sharing, case studies and assessment of learning throughout the course.

Course schedule

1. Routing infrastructure in JUNOS

- Static, aggregated, generated routes.
- Multi-instance routing tables, VRF.
- Load balancing and filter-based routing.
- IP tunnels: GRE, IP-IP.
- Introduction to IPSec.

Hands-on work
Aggregated route configuration, summarized announcements, virtual routers, GRE tunnel configuration.

2. Advanced OSPF and multi-area

- Link-state routing theory-OSPF: a detailed review.
- Reminders on basic single-area OSPF.
- OSPF multi-area, redistribution of external routes.
- Configuration of advanced features (Stub Area, NSSA, Authentication).

Hands-on work
Configuration of a multi-area OSPF network with static route redistribution and RIP.

3. BGP path vector routing

- BGP, autonomous systems and the Internet.
- Basic BGP configuration, INGP and EBGP.
- Review of BGP attributes, advanced features.
- Advanced BGP: route reflectors and confederations.

Hands-on work
Configuration of a multi-AS network with BGP routing, OSPF as IGP and route reflectors.

4. Multicast routing

- Multicast at levels 2 and 3, protocols and their merits.
- The PIM protocol in Dense mode.
- Intelligent Pim: Sparse and Sparse-dense modes.

Hands-on work
Implementation of a multicast routing network in dense and sparse mode.

5. Advanced Ethernet Swithing

- VLAN assignment by filtering.
- Private VLAN.
- Automated VLAN management: the MVRP protocol.
- Level 2 tunneling: Q-in-Q.

Hands-on work
Use of VLAN/filtering, Private VLAn, MVRP management, use of Q-in-Q.

6 The advanced Spanning Tree protocol

- The weaknesses of Spanning Tree (STP).
- Rapid Spanning Tree (802.1D-2004).
- Multiple Spanning Tree (802.1Q-2003) and VSTP exception.
- Protection against attacks on STP.

Hands-on work
MSTP and VSTP implementation.

7 Service quality at levels 2 and 3

- Guarantee the highest possible and most reliable throughput across an IP fabric.
- QoS: classification, classes, queues, priorities, congestion, scheduling, BA rewriting.
- Layer 2 configuration (802.1p).
- Layer 3 configuration (DSCP, TOS, IP precedence).

Hands-on work
Implement QoS at both levels on the same IP network.