

Course : Cisco routers, advanced

routing, OSPF, BGP, QoS, VPN, VoIP

Practical course - 5d - 35h00 - Ref. ROP

Price : 2840 € E.T.

★★★★☆ 4,4 / 5

This advanced course will help you master the concepts of distance vector, link state and path vector protocols, routing protocol selection criteria, the characteristics of RIP-2, EIGRP, OSPF and BGP, IP switching mechanisms, virtual private network design, Voice over IP and access security.

Teaching objectives

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

- ✓ Understanding routing protocols
- ✓ Implementing an EIGRP IP network interconnection
- ✓ Creating a secure OSPF interconnection
- ✓ Implement an IP network interconnection using the BGP4 protocol
- ✓ Create an IPSec VPN virtual private network

Intended audience

Anyone whose job requires knowledge of configuring routing protocols on Cisco routers.

Prerequisites

Good knowledge of TCP/IP and Cisco router configuration. Or knowledge equivalent to that acquired in the course "Cisco routers, IP implementation" (ref. ROC).

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

PARTICIPANTS

Anyone whose job requires knowledge of configuring routing protocols on Cisco routers.

PREREQUISITES

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TRAINER QUALIFICATIONS

The experts leading the training are specialists in the covered subjects. They have been approved by our instructional teams for both their professional knowledge and their teaching ability, for each course they teach. They have at least five to ten years of experience in their field and hold (or have held) decision-making positions in companies.

ASSESSMENT TERMS

The trainer evaluates each participant's academic progress throughout the training using multiple choice, scenarios, hands-on work and more.

Participants also complete a placement test before and after the course to measure the skills they've developed.

1 Compare routing options

- Topology: tree or mesh.
- Prioritization: flat or backbone network.
- Services: prioritization or not.
- Flows: synchronous or asynchronous.
- Technical or strategic criteria: throughput, lead time, price or preference.

2 Distance vector routing

- The RIP 2 protocol.
- The simplicity of RIP. Loop handling. Convergence. Message handling.
- Subnet routing, security. Multicast broadcasting, SNMP administration.
- External route management, Next Hop. Authentication.
- The EIGRP protocol.
- Multiple metrics. Best path selection. Loop processing, Split Horizon. Poison Reverse. Convergence.
- DUAL broadcast update algorithm. Hello and RTP protocols. External route management.
- Feasible Distance Possible Successor. Neighborhood. Topology. Configure EIGRP.
- Implement load sharing. Operator action on route selection.
- Globalization or not of subnets. Routing filtering: access lists.
- Compare convergence between EIGRP and RIP2. Configure authentication.

Hands-on work

RIP2 configuration commands on LAN, WAN. Validate limits. Implementing a network interconnection. Creating problems and debugging actions on RIP2. Implement EIGRP IP network interconnection. Implement load balancing.

3 Link-state routing

- Basic concepts. Database and topology. Link states.
- The OSPF protocol. Metrics and multiple paths: traffic distribution.
- The role of neighborhoods in rapid convergence.
- Hierarchical network with backbone and zones. The notion of designated router. Secure broadcasting of link status.
- Event-based updates. Network updates with or without broadcast.
- Define OSPF areas with or without globalization. Stub Area, Not So Stub Area, virtual link.
- Consequences for broadcasting. Backbone routing configuration, interzone, intrazone.
- Interpret database information. Customize link costs.
- Optimizing OSPF load. Traffic distribution.

Hands-on work

Implement a secure OSPF interconnection. Creation of a hierarchical network and definition of OSPF areas, verification of backbone broadcasts and the impact of the notion of terminal area (stub area and NSSA) with or without route synthesis. OSPF debugging actions.

TEACHING AIDS AND TECHNICAL RESOURCES

- The main teaching aids and instructional methods used in the training are audiovisual aids, documentation and course material, hands-on application exercises and corrected exercises for practical training courses, case studies and coverage of real cases for training seminars.
- At the end of each course or seminar, ORSYS provides participants with a course evaluation questionnaire that is analysed by our instructional teams.
- A check-in sheet for each half-day of attendance is provided at the end of the training, along with a course completion certificate if the trainee attended the entire session.

TERMS AND DEADLINES

Registration must be completed 24 hours before the start of the training.

ACCESSIBILITY FOR PEOPLE WITH DISABILITIES

Do you need special accessibility accommodations? Contact Mrs. Fosse, Disability Manager, at psh-accueil@orsys.fr to review your request and its feasibility.

4 BGP path vector routing

- Definition. Autonomous systems. Topology, tables, loops, routes, political routing.
- Path vectors. Attributes. BGP procedures. Exchanges, updates, polling.
- Political routing processing.

Hands-on work

Implementation of an IP network interconnection using the BGP4 protocol. Set up a network of autonomous systems. Verification of backbone broadcasts. BGP debugging actions. Creation of a decision table.

5 Multicast routing

- Overview. Implementing multicast processing on Cisco.
- IGMP protocol on LAN. Dense and Sparse mode PIM protocol between routers.
- DVMRP and MOSPF protocols on the backbone.
- Cisco GMP between router and switch.

6 QoS - Flow prioritization

- Definition of requirements.
- DiffServ: flow marking: DSCP. Solutions: traffic shaping, queuing.
- Fair Queuing, Priority Queuing. Custom Queuing.

Hands-on work

Configure different types of queues. Validate impact on transfers.

7 Virtual Private Networks: VPN

- MPLS VPN. MPLS components. VPN architecture. Associating flows, labels and QoS.
- IPsec VPN. How it works. Algorithm selection.
- Road and tunnel association. Principles of implementation.

Hands-on work

IPsec tunnel creation. Encryption mechanisms. IPsec configuration. Verification. Debug actions.

8 The IS-IS protocol

- Presentation.
- Implementation and use.
- Comparison with OSPF.

Hands-on work

Example of the IS-IS protocol.

Dates and locations

REMOTE CLASS

2026 : 15 June, 21 Sep.

PARIS LA DÉFENSE

2026 : 15 June, 21 Sep.