

Overview of MPLS

eLearning | Average Duration: 3.5 hours | Course Number: IPC_106

As the services and applications of the Internet continue to expand, the Internet backbone must evolve to support them. The key areas of emphasis are routing, QoS, addressing, efficiency and security. Multi-Protocol Label Switching (MPLS) is designed to make the Internet fast, scalable and manageable, and capable of carrying heavy traffic, supporting QoS and new routing architectures. This course presents a technical overview of MPLS including a detailed discussion on the architecture of MPLS, the components of the MPLS network and the supporting protocols required for MPLS. Operational issues of MPLS and issues related to interworking MPLS with ATM are also explored. The course ends with a discussion of G-MPLS, which is the evolution of MPLS.

Intended Audience

This course is intended for anyone seeking an overview of MPLS, its features and capabilities.

Learning Objectives

After completing this course, the student will be able to:

- Describe the motivation behind MPLS
- State the role of MPLS in the convergence of networks
- List key applications of MPLS
- Compare and contrast the routing techniques of ATM and MPLS
- Sketch the architecture of MPLS
- Describe the important components and operations of MPLS
- Describe how MPLS is used to set up layer 3 and layer 2 VPNs
- Explain the role of MPLS in traffic engineering
- Identify the next steps for MPLS including G-MPLS

Course Outline

1. Prologue

- 1.1. Introduction to MPLS
- 1.2. Motivation for MPLS
- 1.3. IP forwarding techniques
- 1.4. MPLS forwarding techniques

2. Current state of IP networks

- 2.1. Limitations of IP networks
- 2.2. IP over ATM solutions

3. Why MPLS?

- 3.1. Advantages of MPLS
- 3.2. New applications

4. MPLS Networks

- 4.1. MPLS domain
- 4.2. Label edge router
- 4.3. Label switch router

5. MPLS Terminology

- 5.1. Label Switched Paths (LSP)
- 5.2. Forward Equivalence Class (FEC)
- 5.3. Structure of a label

6. Packet Forwarding Along LSPs

- 6.1. Label Forwarding Information Base (LFIB)
- 6.2. Packet forwarding along LSPs
- 6.3. Label stacking

7. LSP Setup Process

- 7.1. Hop-by-hop routed LSPs
- 7.2. Explicit routed LSPs

8. MPLS Protocols

- 8.1. New protocols
- 8.2. Example of protocol use

9. MPLS and Virtual Private Networks

- 9.1. VPNs support in MPLS
- 9.2. Layer 3 and Layer 2 VPNs establishment in MPLS
- 9.3. Label stacking and VPNs
- 9.4. MPLS based L2 VPN solutions

10. MPLS and Traffic Engineering

- 10.1. Introduction to traffic engineering
- 10.2. MPLS traffic engineering procedures

11. Deployment

- 11.1. Current deployments
- 11.2. Next steps

12. Evolution of MPLS

- 12.1. New applications
- 12.2. Generalized MPLS (G-MPLS)

13. Summary

Put It All Together

Assess the knowledge of the participant based on the objectives of the course