

Power your team with a customized class taught by a world class instructor!

Learn from our 25+ years' technology experience and knowledge of industry best practices.

"Talk to us, an onsite class may be more affordable than you realize."

Why Eogogics?

- **Unmatched Expertise:** Industry-leading 500-course curriculum based on first-hand technology experience. We have been engaged in ground-breaking projects worldwide for 25+ years.
- **High Client Satisfaction:** All of our classes rate good-to-excellent, high client retention, bulk of our business is from loyal clients or their referrals. See our website for enthusiastic testimonials.
- **World-class Instructors:** Advanced degrees, 15-30 years in the real world, publications, patents, awards, honors. They mix teaching with R&D and consulting to keep their tech edge razor sharp. They are as dynamic and entertaining as they are knowledgeable.
- **Customized, Practical Courses** that focus on your technical needs. Take a class onsite or, in some cases, on the Web. Flexible schedules.
- **Buy Coach, Travel First Class:** Using technology to lower our operating expense, we offer best-in-class instructors and tailored courses for 10-15% below market.

Power Your Organization with an Eogogics Workshop! Avoid the cost and delay of trial-and-error. Benefit from our 25+ year knowledge of industry best practices and unbiased advice.

Join a Distinguished Clientele of Fortune 100/500 Companies

Lockheed Martin, UBS, Boeing, Disney, Raytheon, Dell, AT&T, ABC News, Verizon, Sprint, Comcast, LightSquared, TruePosition, DIRECTV, L-3, ITT, SAIC, URS. Shaw, NII, Intelsat, Crown Castle, Harris, Booz Allen Hamilton, Spectra Energy, Xerox, Cooper, Bain & Co., DoD, DHS, DoE, DoC, DoJ, GSA, NASA.

*So minimize the time and money lost to the learning curve, synch up with the industry best practices, receive a second opinion on your technology strategy, and arrive at your technology destination happier, more successful.
Call or email us today!*

Contact us today for free consultation with a subject matter expert!

MPLS: Integrated Routing / End-to-End QoS

COURSE ID MPLS | Duration 2-3 days | Private Class taught onsite

Course Overview

Course in a Nutshell



This course provides an in-depth study of MPLS including the theory and configuration, network design issues, operations, VPN, traffic engineering, and GMPLS. We will start with an overview of conventional routing and how it compares to MPLS routing. We will then learn the underlying concepts, features, functions, benefits, and applications of MPLS. We will also study the frame-mode and cell-mode MPLS, the concept of MPLS labels, label stack and different label formats, the label distribution process between LSRs, the loop detection and prevention mechanisms in MPLS, MPLS architecture, MPLS VPN, MPLS QoS, and MPLS traffic engineering. We will conclude with an exploration of the future trends related to the MPLS technology.

Customize It!

Customize this course to your specific needs at little-to-no additional cost. We offer distinct versions tailored for engineers, equipment or application designers, and less technical audiences such as managers, business planners, sales and marketing specialists, and operations and support personnel. If your audience is unfamiliar with IP, you may extend the course to three days to include an up-front review of the IP protocol.

Learn How To

- Describe the features, functions, and benefits of MPLS
- Identify suitable applications for MPLS
- Explain the underlying concepts of MPLS
- Elaborate on the frame-mode MPLS and cell-mode MPLS
- Describe the concept of MPLS labels, label stack and different label formats
- Describe the label distribution process between LSRs
- Describe the loop detection and prevention mechanisms in MPLS
- Describe the QoS mechanisms in MPLS
- Describe the VPN in MPLS
- Understand how MPLS will interact with emerging technologies

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Audience / Prerequisites

Aimed At

Those with a technical background who are familiar with data networking concepts and who have the need to understand the evolving MPLS-based systems.

Prerequisites

Familiarity with data networking and IP protocol concepts.

Related Courses

- MPLS – Comprehensive ([MPLS10](#), 2-4 days)
- MPLS Applications ([MPLSAEA](#), 2-3 days)
- MPLS Short Course ([MPLS1D](#), 1 day)
- TCP/IP Networks Overview ([TCPIP3](#), 3 days)
- TCP/IP Networks: Advanced Topics ([TCPIP2](#), 2 days)

Course Outline

- Overview of Routing and MPLS
 - Layer 3 Routing
 - Native Hop-by-Hop Network Layer Routing
 - Next Hop Selection Functions
 - Label Switching
 - MPLS Forwarding Paradigm
 - Integration of IP and ATM
 - Advantages of MPLS Forwarding over Conventional Network Layer Forwarding
 - Why MPLS?
- Label Switch Routers (LSRs)
 - LSR Basics
 - ATM LSRs
 - LSR Routing Operation

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- MPLS Labels
 - MPLS Labels Basics
 - Label Encapsulation
 - Label Assignment and Distribution
 - Upstream and Downstream LSR
 - Label Distribution: Purpose
 - Label Distribution: Protocols
 - Label Distribution: Methods
 - Label Retention Modes
 - Label Switched Path (LSP)
 - LSP Setup Control
- Route Selection
 - Basics
 - Standard IP and MPLS
 - IP Forwarding
 - MPLS Label Distribution
 - Label Switched Path (LSP)
 - Explicitly Routed LSP (ER-LSP): Basics, Example, Advantages
 - Hop-by-Hop versus Explicit Routing
- MPLS Architecture
 - MPLS Operation
 - MPLS Node Architecture
 - MPLS Elements
 - Loop Survival, Detection, and Prevention in MPLS
- Virtual Private Networks (VPNs) and MPLS
 - Overview of VPNs
 - Connection-Oriented VPNs
 - Connectionless VPNs
 - Comparison of VPN Technologies
 - MPLS VPN Operation
 - Layer 2 MPLS VPNs
 - Layer 3 MPLS VPNs
 - Route Reflectors
 - Trace Route Enhancements
 - Advantages of MPLS VPNs
 - MPLS VPN Management

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- MPLS Traffic Engineering
 - The Need for Traffic Engineering on the Internet
 - Unequal-Cost Load Balancing via Metric Manipulation
 - Advantages of MPLS Traffic Engineering
 - MPLS Traffic Engineering Elements (Dynamic/Static LSPs)
 - MPLS Traffic Engineering Configuration
 - Configuration Case Study of an MPLS Traffic-Engineered Network (IS-IS)
 - Configuration Case Study of an MPLS Traffic-Engineered Network (OSPF)
- MPLS and Quality of Service (QoS)
 - Introduction to Quality of Service
 - Overbuild vs. Preferential Treatment of Packets
 - Integrated Services
 - IP Precedence
 - Differentiated Services
 - Modular QoS CLI
 - MPLS Implementation of DiffServ
 - MPLS VPN Support of QoS
 - MPLS QoS Implementation
 - Configuring QoS for MPLS VPNs
 - MPLS QoS Case Study
- MPLS Design
 - MPLS VPN Design and Topologies
 - Designing MPLS Networks
 - Additional MPLS Design Considerations
- MPLS and Emerging Technologies
 - Control Planes and MPLS
 - Fixing the Problems of SONET
 - Generalized MPLS (GMPLS) and Automatic Switched Optical Network (ASON)
 - Separation of Connectivity and Services: Next Generation Network (NGN)
 - Getting Rid of SONET: MPLS and Optical Transport Network (OTN)
 - MPLS and Emerging Very High Speed Ethernet (>100 Mb/s)
 - New Architectures for Layer 2 Functionality
 - Virtualization and Software Defined Networking (SDN)
 - Network Functions Virtualization (NFV) and MPLS
- Conclusion: Recap, Q/A, and Evaluation

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About Eogogics: Founded in 2005 and located in Washington, DC, Eogogics offers technology and soft skills training and consulting to organizations worldwide.

Our Skillset: Wireless (2G to 5G+, Bluetooth, WiFi), RF, Microwaves, Spectrum Management, SATCOM, Telecom (IP Networks, Intelligent Networks, SONET/SDH, DWDM, backhaul, tmforum™ courses, Defense/Security/Public Safety related, Telecom for Non-engineers), Technologies (Mechanical Engineering/Manufacturing, Reliability, Software/Systems, Cloud Computing, SDN, NFV, Technical and Project Management), Leadership/Management, Soft Skills.

About the Eogogics Team: Eogogics is led by KK Arora, formerly Founder and Managing Director, Wireless Institute and Vice President, Human Capital Management, LCC International. A wireless telecom industry pioneer, award winning teacher, and author with 25 years of executive experience, he leads a team of highly accomplished professionals who rank at the top of their chosen fields and who have earned many distinctions including patents, publications, awards, and honors. Our five-person leadership team collectively offers: 106 years of technology experience (91 years in telecom, 66 years in wireless), 156 years in training (106 years in technology training, 50 years in soft skills training), and 101 years in consulting (61 years in technology, 40 years in soft skills).

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