



MPLS and VPN Architectures

Volume II

Master the latest MPLS VPN solutions to design, deploy, and troubleshoot advanced or large-scale networks

MPLS and VPN Architectures, Volume II

Jim Guichard, CCIE No. 2069 Ivan Pepelnjak, CCIE No. 1354 Jeff Apcar

Cisco Press

201 West 103rd Street Indianapolis, IN 46290 USA

MPLS and VPN Architectures, Volume II

Table of Contents

Table of Contents

Introduction

Part I: Introduction

Chapter 1 MPLS VPN Architecture Overview

MPLS VPN Terminology

Connection-Oriented VPNs

Connectionless VPNs

MPLS-Based VPNs

New MPLS VPN Developments

Summary

Part II: Advanced PE-CE Connectivity

Chapter 2 Remote Access to an MPLS VPN

Feature Enhancements for MPLS VPN Remote Access

Overview of Access Protocols and Procedures

Providing Dial-In Access to an MPLS VPN

Providing Dial-Out Access via LSDO

Providing Dial-Out Access Without LSDO (Direct ISDN)

Providing Dial Backup for MPLS VPN Access

Providing DSL Access to an MPLS VPN

Providing Cable Access to an MPLS VPN

Advanced Features for MPLS VPN Remote Access

Summary

Chapter 3 PE-CE Routing Protocol Enhancements and Advanced Features



Table of Contents

PE-CE Connectivity: OSPF

PE-CE Connectivity: Integrated IS-IS

PE-CE Connectivity: EIGRP

Summary

Chapter 4 Virtual Router Connectivity

Configuring Virtual Routers on CE Routers

Linking the Virtual Router with the MPLS VPN Backbone

VRF Selection Based on Source IP Address

Performing NAT in a Virtual Router Environment

Summary

Part III: Advanced Deployment Scenarios

Chapter 5 Protecting the MPLS-VPN Backbone

Inherent Security Capabilities

Neighbor Authentication

CE-to-CE Authentication

Control of Routes That Are Injected into a VRF

PE to CE Circuits

Extranet Access

Internet Access

IPSec over MPLS

Summary

Chapter 6 Large-Scale Routing and Multiple Service Provider Connectivity

Large Scale Routing: Carriers Carrier Solution Overview

Carrier Backbone Connectivity

Label Distribution Protocols on PE-CE Links

BGP-4 Between PE/CE Routers

Hierarchical VPNs: Carriers Carrier MPLS VPNs

VPN Connectivity Between Different Service Providers

Summary



Table of Contents

Chapter 7 Multicast VPN

Introduction to IP Multicast

Enterprise Multicast in a Service Provider Environment

mVPN Architecture

MDTs

Case Study of mVPN Operation in SuperCom

Summary

Chapter 8 IP Version 6 Transport Across an MPLS Backbone

IPv6 Business Drivers

Deployment of IPv6 in Existing Networks

Quick Introduction to IPv6

In-Depth 6PE Operation and Configuration

Complex 6PE Deployment Scenarios

Summary

Part IV: Troubleshooting

Chapter 9 Troubleshooting of MPLS-Based Solutions

Introduction to Troubleshooting of MPLS-Based Solutions

Troubleshooting the MPLS Backbone

Other Quick Checks

MPLS Control Plane Troubleshooting

MPLS Data Plane Troubleshooting

MPLS VPN Troubleshooting

In-Depth MPLS VPN Troubleshooting

Summary

Index

