Implementing Cisco MPLS Traffic Engineering v2.0

1. **Understanding Traffic Engineering with MPLS**

   Basic Networking Concepts

   What Is Traffic Engineering?

   Traffic Engineering Before MPLS

   Enter MPLS

   Using MPLS TE in Real Life

2. **MPLS Forwarding Basics**

   MPLS Terminology

   Forwarding Fundamentals

   Label Distribution Protocol

   Label Distribution Protocol Configuration

3. **Information Distribution**

   MPLS Traffic Engineering Configuration

   What Information Is Distributed

   When Information Is Distributed

   How Information Is Distributed

4. **Path Calculation and Setup**

   How SPF Works

   CBR (Constraint based routing)

   How CSPF Works

   Tunnel Reoptimization

   Resource Reservation Protocol (RSVP)

   Interarea Tunnels

   Link Manager

5. **Forwarding Traffic Down Tunnels**

   Forwarding Traffic Down Tunnels Using Static Routes

   Forwarding Traffic Down Tunnels with Policy-Based Routing

   Forwarding Traffic Down Tunnels with AutoRoute

   Load Sharing

   Forwarding Adjacency

   Automatic Bandwidth Adjustment

6. **Quality of Service with MPLS TE**

   The DiffServ Architecture

A Quick MQC Review

DiffServ and IP Packets

DiffServ and MPLS Packets

Label Stack Treatment

Tunnel Modes

DiffServ-Aware Traffic Engineering (DS-TE)

Forwarding DS-TE Traffic Down a Tunnel

7. **Protection and Restoration**

The Need for Fast Reroute

What Is Protection?

Types of Protection

Link Protection

Node Protection

Advanced Protection Issues

8. **MPLS TE Management**

MPLS LSR MIB

MPLS TE MIB

9. **Network Design with MPLS TE**

Sample Network for Case Studies

Different Types of TE Design

Tactical TE Design

Online Strategic TE Design

Offline Strategic TE Design

Protection Scalability

Forwarding Adjacency Scalability

10. **MPLS TE Deployment Tips**

Bandwidth and Delay Measurements

Fine-Tuning MPLS TE Parameters

Migrating IS-IS from Narrow to Wide Metrics

TE and Multicast

Tunnel Identification Schemes

Combining MPLS TE with MPLS VPNs

Deployment Possibilities

11. **Troubleshooting MPLS TE**

Common Configuration Mistakes

Tools for Troubleshooting MPLS TE Problems

Finding the Root Cause of the Problem