CCO and Other References

This appendix contains all the URLs mentioned in this book, as well as pointers to other resources that might be of use.

Here are a few notes on this appendix:

- This appendix is laid out by chapter number. Things are just easier that way.

- Some of the references have comments, and others don't. That's because some of the things referenced are self-explanatory, and others aren't.

- Some things (particularly other Cisco Press books) are referenced more than once in this book. This is because we figured that the more we point to other people's work, the less we have to do of our own! Nevertheless, if we mentioned a particular reference more than once in this book, we mention it only once in this appendix.

- Some of these URLs are long and cumbersome, especially the CCO (Cisco Connection Online, located at www.cisco.com, a.k.a cco.cisco.com). To this end, we have done two things to help you:

    — Provided document titles—This makes them easier to find using CCO's search function. Plug the document title in, and the document referred to should be one of the top few hits.

    — Provided you with a web page—www.ciscopress.com/1587050315. This web page contains all the references from this appendix, so there's no need to copy URLs from this book to your computer.

- CCO has different login privilege levels, depending on whether you're a registered Cisco customer, a reseller, a partner, or an employee. You can retrieve any of these documents without even being logged into CCO. However, you might likely find more information available to you if you log in and search, so consider this appendix a starting point rather than an exhaustive list.

- Things change. Documentation gets updated, URLs can change, and so forth. If you can't find the document you're looking for, search for the title. Chances are it's either there somewhere or it's been supplanted by something with a similar name.

Resources for Chapter 1, "Understanding Traffic Engineering with MPLS"

Table B-1 provides information about resources related to Chapter 1's topics.

Table B-1   *Chapter 1 Resources*

URL	Title	Description
www.ietf.org/html.charters/ mpls-charter.html	"Multiprotocol Label Switching (MPLS)"	This is the IETF MPLS working group page. It contains information on drafts and RFCs that have come from this group, as well as other exciting information. If you're looking for the latest status on a standard or specification, go here first.
www.cisco.com/warp/ public/cc/so/neso/vpn/ unvpnst/atomf_ov.htm	"Any Transport Over MPLS—Technical Overview"	A technical overview of Layer 2 VPN services.

Resources for Chapter 2, "MPLS Forwarding Basics"

Table B-2 provides information about resources related to Chapter 2's topics.

Table B-2   *Chapter 2 Resources*

URL/Author(s)	Title	Description	Additional Publication Information
www.cisco.com/go/mpls/	"Cisco IOS MPLS"	A one-stop shop for MPLS information, including business-facing stuff, customer profiles, and other such marketing issues.	
Davie, B. and Y. Rekhter	*MPLS: Technology and Applications*	For a while, this was the only MPLS book you could get. It's still one of the better books to cover both the basics and the history. It was written by two MPLS designers who were there from the start.	Published in 2000 by Morgan Kaufmann
www.cisco.com/univercd/cc/td/doc/product/wanbu/bpx8600/mpls/9_3_1/mpls01.htm	"Introduction to MPLS"	This document is an introduction to IP+ATM on the ATM switch (BPX, MGX) platform. It's a good place to start if you're into MPLS and ATM integration, which we hardly spent any time on in this book.	
www.cisco.com/univercd/cc/td/doc/product/wanbu/bpx8600/mpls/9_3_1/mpls02.htm	"Integrating MPLS with IP and ATM"	Along the same lines and in the same collection as the "Introduction to MPLS" document, only more detailed. Contains the entire 9.3.1 doc set.	
www.cisco.com/univercd/cc/td/doc/product/wanbu/bpx8600/mpls/9_3_1/	Release 9.3.10	A good resource, albeit decidedly ATM-centric.	

continues

Table B-2   *Chapter 2 Resources (Continued)*

URL/Author(s)	Title	Description	Additional Publication Information
www.cisco.com/ networkers/nw01/ pres/#8		The presentations from Cisco's Networkers 2001. Check out the Introduction to MPLS, OSPF, and IS-IS presentations if you need more details on those topics. There are probably other Networkers presentations at www.cisco.com/networkers/ nw02/, /nw03/, and so forth, as they happen (typically in late summer or early fall of a given year).	
www.cisco.com/ univercd/cc/td/doc/ product/software/ ios122/122newft/ 122t/122t2/ ldp_221t.htm	"MPLS Label Distribution Protocol (LDP)"	A basic guide to LDP, focusing mainly on configuration and debugs.	
Andersson, L., P. Doolan, N. Feldman, A. Fredette, and R. Thomas	RFC 3036: "LDP Specification"	The RFC that defines LDP. Not for the faint of heart or those low on time, but it explains how everything in LDP is supposed to work.	Published in January 2001
Bollapragada, V., C. Murphy, and R. White	*Inside Cisco IOS Software Architecture*	More than you ever wanted to know about router internals, including things such as CEF. Although it contains no MPLS coverage (so nothing in the way of LFIB/TFIB/label switching), it's still a valuable reference to see how things actually work.	Published in 2000 by Cisco Press

Resources for Chapter 3, "Information Distribution"

Table B-3 provides information about resources related to Chapter 3's topics.

Table B-3   *Chapter 3 Resources*

URL	Title	Description
www.cisco.com/univercd/ cc/td/doc/product/software/ ios121/121newft/121t/ 121t3/traffeng.htm	"MPLS Traffic Engineering and Enhancements"	From September of 2000. It doesn't cover any then-nonexistent stuff like DS-TE and FRR, but it's a good configuration guide and command reference for the basics.
www.cisco.com/warp/ public/97/tlvs_5739.html	"Intermediate System-to-Intermediate System (IS-IS) TLVs"	Covers all the defined (not necessarily implemented) IS-IS TLVs, including the ones used for MPLS TE—22 and 135.
www.ietf.org/rfc/ rfc2370.txt?number=2370	"The OSPF Opaque LSA Option"	Defines opaque LSAs for OSPF, including the Type 10 LSA that carries MPLS TE information in OSPF.
http://search.ietf.org/ internet-drafts/draft-katz-yeung-ospf-traffic-06.txt	"Traffic Engineering Extensions to OSPF"	Defines the sub-TLVs used inside a Type 10 opaque LSA to carry MPLS TE information. Might have expired and/or been ratified as an RFC by the time you read this.
http://search.ietf.org/ internet-drafts/draft-ietf-isis-traffic-04.txt	"IS-IS Extensions for Traffic Engineering"	Defines the new IS-IS TLVs and sub-TLVs necessary to carry MPLS TE information in IS-IS. Might have expired and/or been ratified as an RFC by the time you read this.

Resources for Chapter 4, "Path Calculation and Setup"

Table B-4 provides information about resources related to Chapter 4's topics.

Table B-4   *Chapter 4 Resources*

URL/Author(s)	Title	Description	Additional Publication Information
Perlman, R.	*Interconnections: Bridges, Routers, Switches, and Internetworking Protocols*	A must-have in anyone's networking library. Radia's explanation of SPF (pages 317–319), although not exactly the same as a CSPF algorithm, is a particularly good introduction to the Dijkstra algorithm.	Published in 1999 by Addison-Wesley
www.ietf.org/rfc/ rfc2205.txt?number= 2205	"Resource ReSerVation Protocol (RSVP)—Version 1 Functional Specification"	The basic RSVP specification.	
www.ietf.org/rfc/ rfc3209.txt?number= 3209	"RSVP-TE: Extensions to RSVP for LSP Tunnels"	Extensions to RSVP to signal TE tunnels.	
www.ietf.org/rfc/ rfc2210.txt?number= 2210	"The Use of RSVP with IETF Integrated Services"	This RFC defines the SENDER_TSPEC, FLOWSPEC, and ADSPEC objects used to signal QoS requirements (primarily bandwidth) in MPLS TE tunnels.	

Resources for Chapter 5, "Forwarding Traffic Down Tunnels"

Table B-5 provides information about resources related to Chapter 5's topics.

Table B-5   *Chapter 5 Resources*

URL	Title	Description
www.cisco.com/warp/public/ cc/techno/protocol/tech/ plicy_wp.htm	"Policy-Based Routing"	A white paper on the uses and benefits of PBR.
www.cisco.com/univercd/cc/ td/doc/product/software/ ios120/12cgcr/qos_c/qcpart1/ qcpolicy.htm	"Configuring Policy-Based Routing"	A basic guide to configuring PBR.
www.cisco.com/warp/public/ 105/46.html	"How Does Load-Balancing Work?"	Although this paper is a bit dated (circa 11.1CC), its information might still be useful if you're trying to find out more about CEF and its load-balancing capabilities.
www.cisco.com/warp/public/ cc/pd/ifaa/pa/much/prodlit/ loadb_an.htm	"Load Balancing with Cisco Express Forwarding"	Although this paper is a bit dated (circa 11.1CC), its information might still be useful if you're trying to find out more about CEF and its load-balancing capabilities.
www.cisco.com/univercd/cc/ td/doc/product/software/ ios120/120newft/120limit/ 120st/120st16/fs_tefa.htm	"MPLS Traffic Engineering Forwarding Adjacency"	This document describes the configuration and capabilities of forwarding adjacency.

Resources for Chapter 6, "Quality of Service with MPLS TE"

Table B-6 provides information about resources related to Chapter 6's topics.

Table B-6   *Chapter 6 Resources*

URL	Title	Description
www.cisco.com/go/qos/	"Cisco IOS Quality of Service"	A good place to start with QoS in general. Because MPLS QoS and IP QoS are fairly closely related, learning more about IP QoS can help you understand MPLS QoS.
www.cisco.com/univercd/cc/td/doc/product/software/ios120/12cgcr/qos_c/qcintro.htm	"Introduction: Quality of Service Overview"	As the title says, this is an introduction to and overview of QoS.
www.cisco.com/univercd/cc/td/doc/product/wanbu/bpx8600/mpls/9_3_1/mpls04.htm	"Quality of Service in MPLS Networks"	Despite its name, this document emphasizes the IP+ATM side of things. Still, it's a good guide to some of the MPLS QoS issues you might face.
www.cisco.com/warp/public/cc/pd/iosw/prodlit/mpios_wp.htm	"Cisco IOS MPLS Quality of Service"	A good starting point for understanding MPLS QoS.
www.cisco.com/univercd/cc/td/doc/product/software/ios120/120newft/120limit/120xe/120xe5/mqc/mcli.htm	"Modular Quality of Service Command-Line Interface"	A basic guide to MQC. MQC provides different mechanisms on different platforms and IOS versions, but this reference gives you the platform-independent basics.
www.cisco.com/warp/public/cc/pd/iosw/prodlit/dlypl_pg.htm	"Deploying MPLS QoS"	As the title says, this is a presentation on deploying MPLS QoS.
www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122t/122t4/ft_ds_te.htm	"Diff-Serv-aware MPLS Traffic Engineering (DS-TE)"	A configuration and usage guide for DS-TE.
www.cisco.com/univercd/cc/td/doc/product/software/ios122/122newft/122t/122t8/ftcsc8.htm	"MPLS VPN Carrier Supporting Carrier"	A basic document that discusses Cisco's CSC feature.

Resources for Chapter 7, "Protection and Restoration"

Table B-7 provides information about resources related to Chapter 7's topics.

Table B-7   *Chapter 7 Resources*

URL	Title	Description
www.cisco.com/univercd/cc/ td/doc/product/software/ ios120/120newft/120limit/ 120st/120st16/frr.htm	"MPLS Traffic Engineering Fast Reroute—Link Protection"	Basic configuration documentation for FRR link protection.
draft-ietf-mpls-rsvp-lsp-fastreroute-00.txt	"Fast Reroute Extensions to RSVP-TE for LSP Tunnels"	This draft defines different FRR techniques, including the one Cisco uses (referred to here as Facility backup or bypass tunnel). As with all drafts, the version number might have changed, or this might be an RFC by the time you look for it.

As of this writing, FRR node protection hasn't yet been released, so there is no CCO documentation to refer to. Try searching CCO for "MPLS node FRR" or something similar, and you're bound to find node protection configuration documentation.

Resources for Chapter 8, "MPLS TE Management"

Table B-8 provides information about resources related to Chapter 8's topics.

Table B-8 *Chapter 8 Resources*

URL/Author(s)	Title	Description	Additional Publication Information
www.cisco.com/ univercd/cc/td/doc/ product/software/ ios122/122newft/122t/ 122t2/lsrmibt.htm	"MPLS Label Switching Router MIB"	Documentation on the LSR MIB.	
www.cisco.com/ univercd/cc/td/doc/ product/software/ ios122/122newft/122t/ 122t2/te_mib12.htm	"MPLS Traffic Engineering (TE) MIB"	Documentation on the TE MIB.	
Nadeau, Thomas D.	*MPLS Network Management: MIBs, Tools and Techniques*	As the title says, a guide to MPLS network management. Written by the primary author of several MPLS MIBs.	Published by Morgan Kaufmann in 2002
Della Maggiora, Paul L. (editor), Christopher E. Elliott, James M. Thompson, Robert L. Pavone, Jr., and Kent J. Phelps	*Performance and Fault Management*	A general text on network management. It's helpful for those who want to under-stand more about network management practices.	Published in 2000 by Cisco Press. Part of the Cisco Press Core series.
Stallings, William	*SNMP, SNMPv2, SNMPv3, and RMON 1 and 2*	One of the classic SNMP (and RMON) texts.	Published by Addison-Wesley in 1999
RFC 1555	"Structure and Identification of Management Information for TCP/IP-Based Internets"	This, and the three remaining RFCs, define both SNMP and MIBs.	
RFC 1157	"A Simple Network Management Protocol (SNMP)"		

Table B-8   *Chapter 8 Resources (Continued)*

URL/Author(s)	Title	Description	Additional Publication Information
RFC 1212	"Concise MIB Definitions"		
RFC 1213	"Management Information Base for Network Management of TCP/IP-Based Internets: MIB II"		

Resources for Chapter 9, "Network Design with MPLS TE"

Table B-9 provides information about resources related to Chapter 9's topics.

Table B-9   *Chapter 9 Resources*

URL	Title	Description
www.cisco.com/univercd/cc/ td/doc/product/software/ ios120/120newft/120limit/ 120st/120st14/scalable.htm	"MPLS Traffic Engineering (TE)—Scalability Enhancements"	This paper discusses the scalability numbers stated in Chapter 9—600 headend tunnels, 10,000 midpoint, and 5000 tail.

Resources for Chapter 10, "MPLS TE Deployment Tips"

Table B-10 provides information about resources related to Chapter 10's topics.

Table B-10   *Chapter 10 Resources*

URL	Title	Description
www.cisco.com/go/netflow/	"Cisco IOS Netflow"	A fine place to start when you're looking for NetFlow information.
www.cisco.com/univercd/cc/ td/doc/product/software/ ios121/121newft/121t/121t5/ egress.htm	"MPLS Egress NetFlow Accounting"	A configuration guide for how and where to use the command **mpls netflow egress**.
www.cisco.com/univercd/cc/ td/doc/product/software/ ios121/121newft/121t/121t5/ tms.htm	"Traffic Matrix Statistics"	An overview and configuration guide for TMS.
www.cisco.com/univercd/cc/ td/doc/product/software/ ios122/122cgcr/fswtch_c/ swprt1/xcfcef.htm	"Cisco Express Forwarding Overview"	Useful for its discussion of CEF and TMS interaction.
www.cisco.com/univercd/cc/ td/doc/product/software/ ios120/120newft/120t/120t5/ saaoper.htm	"Service Assurance Agent"	A basic SAA configuration guide.
www.cisco.com/univercd/cc/ td/doc/product/software/ ios120/120newft/120t/120t7/ te120_7t.htm	"MPLS Traffic Engineering"	Particularly useful is the section "Transitioning an IS-IS Network to a New Technology," which talks about migrating from narrow to wide metrics.
www.cisco.com/warp/public/ 127/sonet_aps_tech_tips.html	"A Brief Overview of SONET APS Technology"	As the title says, this is an overview of APS.

Resources for Chapter 11, "Troubleshooting MPLS TE"

Table B-11 provides information about resources related to Chapter 11's topics.

Table B-11 *Chapter 11 Resources*

URL	Title	Description
www.cisco.com/warp/public/105/mpls_tsh.html	"MPLS Troubleshooting"	Covers basic MPLS trouble-shooting steps. It's not TE-specific, but it's a good place to start.

Remember that most command documentation comes with a troubleshooting section, and that the MPLS and MPLS TE debugs are documented. See Appendix A, "MPLS TE Command Index," for more ideas on where to start.