

## Introduction

Welcome to BCMSN! In 2006, Cisco Press came to me and told me, albeit very quietly, that there was going to be a major revision of the CCNP certification exams. They then asked whether I would be interested in working on a command guide in the same fashion as my previous books for Cisco Press: the Cisco Networking Academy Program *CCNA Command Quick Reference* and the *CCNA Portable Command Guide*. The original idea was to create a single-volume command summary for all four of the new CCNP exams. However, early on in my research, I quickly discovered that there was far too much information in the four exams to create a single volume—that would have resulted in a book that was neither portable nor quick as a reference. So, I jokingly suggested that they let me author four books—one for each exam. Well, I guess you have to be careful what you wish for, because Cisco Press readily agreed. They were so excited about the idea that they offered to cut the proposed writing time by a few months to get these books to market faster. How nice of them, don't you think?

This book is the second in a four-volume set that attempts to summarize the commands and concepts that you need to pass one of the CCNP certification exams—in this case, the Building Cisco Multilayer Switched Networks exam. It follows the format of my previous books, which are in fact a cleaned-up version of my own personal engineering journal. I have long been a fan of what I call the “Engineering Journal”—a small notebook that can be carried around and that contains little nuggets of information—commands that you forget, the IP addressing scheme of some remote part of the network, little reminders about how to do something you only have to do once or twice a year, but is vital to the integrity and maintenance of your network. This journal has been a constant companion by my side for the past eight years; I only teach some of these concepts every second or third year, so I constantly need to refresh commands and concepts, and learn new commands and ideas as they are released by Cisco. With the creation of two brand-new CCNP exams, the amount of new information out there is growing on an almost daily basis. There is always a new white paper to read, a new Webinar to view, another slideshow from a Networkers session that I didn't get to. My journals are the best way for me to review because they are written in my own words, words that I can understand. At least, I better understand them, because if I didn't, I have only myself to blame.

To make this guide a more realistic one for you to use, the folks at Cisco Press have decided to continue with my request for an appendix of blank pages—pages that are for you to put your own personal touches—your own configurations, commands that are not in this book but are needed in your world, and so on. That way this book will look less like my journal and more like your own.

I hope that you learn as much from reading this guide as I did when I wrote it.

## Networking Devices Used in the Preparation of This Book

To verify the commands in this book, I had to try them out on a few different devices. The following is a list of the equipment I used in the writing of this book:

- C2620 router running Cisco IOS Software Release 12.3(7)T, with a fixed Fast Ethernet interface, a WIC-2A/S serial interface card, and a NM-1E Ethernet interface
- C2811 ISR bundle with PVDM2, CMME, a WIC-2T, FXS and FXO VICs, running 12.4(3g) IOS
- WS-C3560-24-EMI Catalyst switch, running 12.2(25)SE IOS
- WS-C3550-24-EMI Catalyst switch, running 12.1(9)EA1c IOS
- WS-C2960-24TT-L Catalyst switch, running 12.2(25)SE IOS
- WS-C2950-12 Catalyst switch, running Version C2950-C3.0(5.3)WC(1) Enterprise Edition software
- AIR-WLC4402 Wireless LAN Controller

These devices were not running the latest and greatest versions of Cisco IOS Software. Some of it is quite old.

Those of you familiar with Cisco devices will recognize that a majority of these commands work across the entire range of the Cisco product line. These commands are not limited to the platforms and Cisco IOS versions listed. In fact, in most cases, these devices are adequate for someone to continue his or her studies beyond the CCNP level, too.

## Who Should Read This Book

This book is for those people preparing for the CCNP BCMSN exam, whether through self-study, on-the-job training and practice, study within the Cisco Academy Program, or study through the use of a Cisco Training Partner. There are also some handy hints and tips along the way to make life a bit easier for you in this endeavor. It is small enough that you will find it easy to carry around with you. Big, heavy textbooks might look impressive on your bookshelf in your office, but can you really carry them all around with you when you are working in some server room or equipment closet somewhere?

## Organization of This Book

This book follows the list of objectives for the CCNP BCMSN exam:

- **Chapter 1, “Network Design Requirements”**—Provides an overview of the two different design models from Cisco—the Service-Oriented Network Architecture and the Enterprise Composite Network Model.
- **Chapter 2, “VLANs”**—Describes how to configure, verify, and troubleshoot VLANs, including topics such as Dynamic Trunking Protocol (DTP) and VLAN Trunking Protocol (VTP).

- **Chapter 3, “STP and EtherChanel”**—Describes how to configure, verify, and troubleshoot Spanning Tree Protocol (STP), including topics such as configuring the root switch; port priorities; timers; PortFast; BPDU Guard; UplinkFast and BackboneFast; Configuring L2 and L3 EtherChannel; load balancing; and verifying EtherChannel.
- **Chapter 4, “Inter-VLAN Routing”**—Describes how to configure, verify, and troubleshoot inter-VLAN routing, including topics such as router-on-a-stick; switch virtual interfaces; Cisco Express Forwarding (CEF); and creating a routed port on a switch.
- **Chapter 5, “High Availability”**—Covers topics such as Hot Standby Router Protocol (HSRP), Virtual Router Redundancy Protocol (VRRP), and Gateway Load Balancing Protocol (GLBP).
- **Chapter 6, “Wireless Client Access”**—Describes how to configure and verify the configuration of a wireless LAN controller using both the Command-Line Wizard and the GUI Wizard.
- **Chapter 7, “Minimizing Service Loss and Data Theft”**—Covers topics such as port security, sticky MAC addresses, private VLANs, VLAN access maps, DHCP snooping, dynamic ARP inspection, 802.1x authentication, Cisco Discovery Protocol (CDP) issues, Secure Shell (SSH), vty access control lists (ACL), disabling unneeded services, and securing end device access ports.
- **Chapter 8, “Voice Support in Campus Switches”**—Covers topics such as attaching a Cisco IP Phone, configuring AutoQos on a 2960/3560 switch, configuring AutoQos on a 6500, and verifying AutoQoS information.

### **Did I Miss Anything?**

I am always interested to hear how my students, and now readers of my books, do on both vendor exams and future studies. If you would like to contact me and let me know how this book helped you in your certification goals, please do so. Did I miss anything? Let me know. I can't guarantee I'll answer your e-mail message, but I can guarantee that I will read all of them. My e-mail address is [ccnpguide@empson.ca](mailto:ccnpguide@empson.ca).