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31 Days Before Your CompTIA A+ Exams

Second Edition

Ben Conry

A Day-by-Day Review Guide for the CompTIA A+ 220-701 and 220-702 Exams

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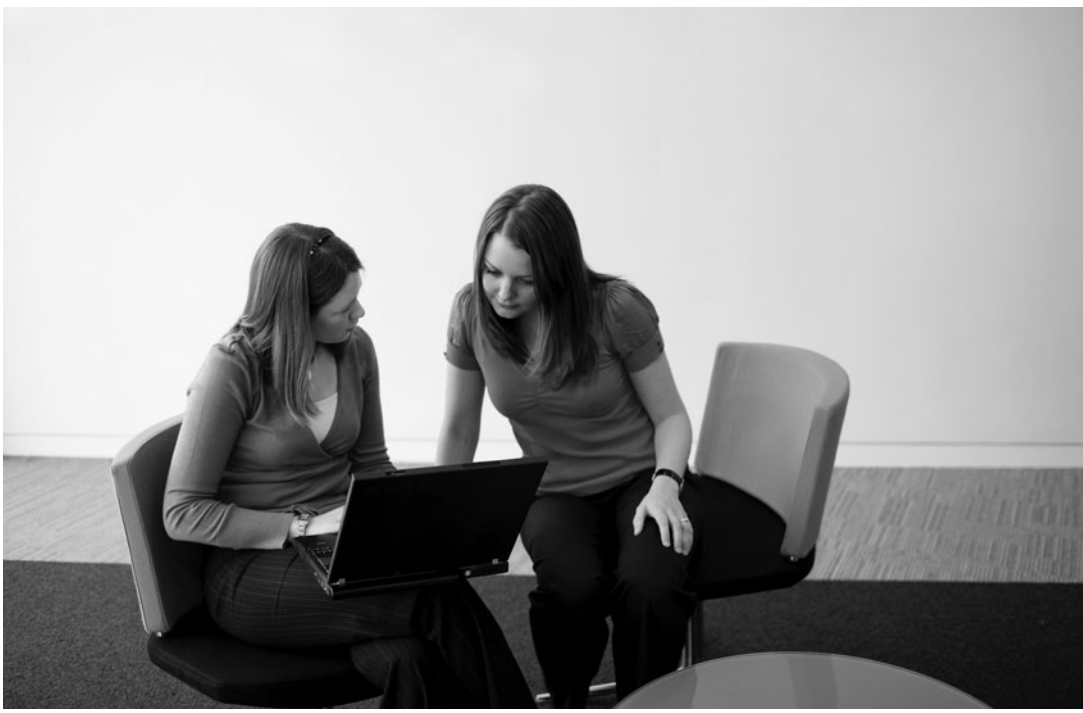

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Dedications

This book is dedicated to my mother.

—Ben Conry

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Mary Beth Ray is among the kindest, most-forward-thinking people I know, period. It is an honor and privilege to work with her.

Dayna Isley has taught me more about my own language than I care to admit on record. Thank you. We will miss you. Best wishes in your new endeavor.

—Ben Conry

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Command Syntax Conventions

The conventions used to present command syntax in this book are the same conventions used in the IOS Command Reference. The Command Reference describes these conventions as follows:

- **Boldface** indicates commands and keywords that are entered literally as shown. In actual configuration examples and output (not general command syntax), boldface indicates commands that are manually input by the user (such as a **show** command).
- *Italic* indicates arguments for which you supply actual values.
- Vertical bars (|) separate alternative, mutually exclusive elements.
- Square brackets ([ ]) indicate an optional element.
- Braces ({ }) indicate a required choice.
- Braces within brackets ([{ }]) indicate a required choice within an optional element.

Introduction

31 Days Before Your CompTIA A+ Exams is a bridge between learning the art of computer repair and actually taking the CompTIA A+ exams. You stand ready to make your knowledge official, provable, to become a professional computer technician. Every day for the next 31 days, you will cover a small area of the exams. The divide-and-conquer strategy allows you to focus on the topics at hand and not be overwhelmed with the massive amount of tested material.

Professional certifications have been an important part of the computing industry for many years and will continue to become more important. Many reasons exist for these certifications, but the most popularly cited reason is that of credibility. All other considerations held equal, the certified employee/consultant/job candidate is considered more valuable than one who is not.

Goals and Methods

The goal of this book is to provide you with a step-by-step method of study and preparation for the CompTIA A+ Essentials exam (220-701) and the CompTIA A+ Practical Application exam (220-702). Students must pass both exams to earn the CompTIA A+ certification.

In this book, you will find the following:

- Short summaries of topics, definitions, and diagrams of important concepts
- Tables, figures, and examples of devices, directions, and commands you might find on the CompTIA A+ exams
- A Study Resources table to provide a quick reference to in-depth treatment of the day's topics
- Occasional attempts at nerd humor

This book can also serve as a guide for instructors to review the Cisco Networking Academy IT Essentials: PC Hardware and Software Version 4.1 course and prepare an entire class for the A+

exams. You can use this book to fit certification exam preparation into a busy schedule, because it requires just a little bit of study each day.

Who Should Read This Book?

This book is for anyone preparing for the CompTIA A+ exams working with one of the following resources:

- *IT Essentials: PC Hardware and Software Course and Companion Guide*, Fourth Edition (Cisco Press). ISBN: 9781587132636
- *CompTIA A+ Cert Guide (220-701 and 220-702)*, Second Edition (Que Publishing). ISBN: 9780789747907 (Mark Edward Soper, Scott William Mueller, David L. Prowse)
- *The Complete A+ Guide to PC Repair*, Fifth Edition Update (Addison Wesley). ISBN: 9780132727594 (Cheryl Ann Schmidt)
- *The Comprehensive A+ Guide to Managing and Maintaining Your PC*, Seventh Edition (Course Technology). ISBN: 9781435497788 (Jean Andrews)
- *CompTIA A+ Certification All-in-One Exam Guide (Exams 220-701 and 220-702)*, Seventh Edition (McGraw-Hill). ISBN: 9780071701334 (Mike Meyers)
- *Mike Meyers' All-in-One Guide to Supporting Windows 7 for CompTIA A+ Certification: Exams 701 & 702* (McGraw-Hill). ISBN: 9780071763929 (Mike Meyers)

Strategies for Exam Preparation

Find a distraction-free area: no kids, no siblings, no pets, no headphones, no radio or TV. (A cup of coffee and a fireplace are recommended, however.) Dedicate about an hour every day to study in this refuge. It can be difficult at first to find the time and place, but it is time and effort well spent. To that retreat, bring this book, your attention, and preferably access to any of the resources noted earlier. A set of A+ flash cards is a great resource, too. Pearson IT Certification offers a great set that you can find at www.pearsonitcertification.com/title/9781587132605.

How This Book Is Organized

The CompTIA A+ certification has two paths to completion. Generally, people take the A+ Essentials exam first, and then the Practical Application exam.

This book begins with the Essentials exam coverage in Day 31 to Day 15. Then Day 14 to Day 1 you prepare for the Practical Application exam.

NOTE: Refer to the CompTIA website (www.comptia.org) for more information about the exam domains.

To aid in your exam preparation, use the calendars printed on the tearout card to map out each day of study. Also, before you take the Essentials and Practical Application exams, use the checklists on the back of the tearout to ensure you have a firm grasp of the exam topics.

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Storage

A+ 220-701 Exam Objective

Objective 1.1: Categorize storage devices and backup media

Key Points

Today you learn the names, purposes, and characteristics of storage devices. Today is the first of many challenging days. It does get easier. The internal devices have many details, all of which are fair game on the CompTIA A+ exam. Faced with entering a cold swimming pool, a running-start, closed-eye, tucked-knee cannonball is a great way to get in the water (and impress your friends). So, take a big breath and hold your nose.

Storage Devices

Storage devices include hard drives, floppy drives, nonvolatile random-access memory (NVRAM), tape drives, optical drives (CD and DVD drives), flash drives, and network drives.

Hard Drives

The hard disk drive (HDD) has been a mainstay of PCs for a long time. Because of its widespread use, it is a big part of the A+ exam. Traditionally, the HDD stores the operating system and the bulk of data in the PC. It is mounted in a 3.5-inch bay, and connects internally through a parallel advanced technology attachment (PATA) channel. PATA interfaces are sometimes referred to as advanced technology attachment (ATA) or integrated drive electronics (IDE). Jumpers are used to determine the HDD's designation as master, slave, or cable select.

Most new PCs use a controller called serial ATA (SATA) for HDD and optical drives. SATA does not use jumpers or designations. Instead, SATA uses one header and one cable per drive.

All HDDs work the same way. Arms move read/write (R/W) heads over the surface of spinning magnetic platters. These R/W heads either align molecules to create a positive charge (a 1) or leave it with a neutral charge (a 0), thus making the binary code. When reading, the heads float above the disks and feel the positive charges or no pull from the neutral.

Floppy Drives

Incredibly, this is still on the exam. Luckily, there are just a few things to know about them. In many ways, a floppy disk drive (FDD) is like an HDD. It spins a disk, moves R/W heads across the surface, and stores data magnetically. There are two important differences: Capacity is limited to 1.44 MB, and the disk is removable by the end user. They mount in 3.5-inch bays that have access to the outside of the case.

A classic A+ question involves an FDD status light that stays lit all the time. The cable is oriented backward. Turn off the PC, unplug the FDD cable from the drive, flip it over, and plug it back in. Normally, the colored wire on the ribbon cable (pin 1) is closest to the Berg power connector. On the motherboard end, it should be oriented based on the numbers printed around the FDD cable header. Because there are 34 wires in an FDD cable, it is narrower than a PATA ribbon.

Solid-State HDD and NVRAM

Ranging from small external universal serial bus (USB) devices to larger-capacity HDDs, solid-state drives are in reality NVRAM storage devices. NVRAM, often referred to as flash memory or flash RAM, is slower than RAM but still faster than traditional magnetic storage media. Unlike RAM, NVRAM can maintain its data when not powered. Solid-state drives are especially good for laptops where portability, performance, durability, and low power consumption are valued over price and drive capacity.

Tape Drives

A magnetic tape is drawn across stationary R/W heads, but the same magnetic process takes place. The tape is removable by the user, but the drive remains mounted and connected to the PC. Tape capacity is large, comparable to HDDs, but access time is slow because of the sequential nature of tape media. These are primarily used as server backups.

CD, DVD, and BD Drives

The basic optical drive is a compact disc read-only memory (CD-ROM). This CD-ROM drive reads premade discs and cannot write (burn) CDs. The CD can hold 650 MB or 700 MB of data. The CD-ROM drive mounts in a 5.25-inch bay and connects to the motherboard via a PATA or SATA interface.

Digital versatile disc (DVD) has many more variations. The basic read and write letters still apply, but there are two formats: + and –. For our purposes, they are the same. Just note that they are not compatible with each other. Plus drives only read/write plus CDs. Newer +/– hybrid drives can read and write both. Generally speaking, DVD drives are backward compatible and can use CDs. A typical DVD holds 4.7 GB of data or 8.5 GB for double layered (on the same side). Blu-Ray disks (BD) can hold up to 50 GB of data. A Blu-Ray disk can contain 25 GB for a single layer and 50 GB for double layer.

Optical media that is designated RW means it can be rewritten. If it is labeled with just an R that means once it is “burned” it cannot be changed.

Table 31-1 compares CD, DVD, and Blu-Ray drives.

Table 31-1 Optical Drives

CD Family	DVD Family	Blu-Ray Family	Need to Know
CD-ROM	DVD-ROM	BD-ROM	Can only read premade discs.
CD-R	DVD+/–R	BD-R	(Recordable) Write a disc once, and it is read-only after that.
CD-RW	DVD+/–RW	BD-RE	BD-RW (Rewritable) Read and write a disc repeatedly.
CDRAM (not an optical drive)	DVD-RAM		(“Endlessly” rewritable) Used primarily as surveillance-camera footage.

Network Drives

These drives are often referred to as remote, shared, or mapped drives. This means that the storage device resides on another computer, server, or other network device, not on the end user's (local) PC.

Interfaces and Cables

All storage devices in the computer are connected to the motherboard through cables. For your A+ exam, you just need to know a few basics about each cable. The term *hot swappable* means the drive can be connected and unplugged while the PC is running. Pin 1 is always the pin with the blue, red, or pink stripe. Both the device and the motherboard specify (usually with inhumanly small numbers) which side is pin 1. If no indication shows how to orient the cable, put pin 1 closest to the Molex power plug.

Table 31-2 compares the features of different drive interfaces.

Table 31-2 Drive Interfaces

Interface	Drives per Channel	Number of Pins	Hot Swappable	Need to Know (In Order of Importance)
PATA, ATA, IDE, EIDE	2	40	No	Old standard.
		80		Two drives per channel.
				Jumpers assign master and slave drives.
SCSI	8 or 16	50	Yes	Typically found on servers.
		68		Drives are arranged along a bus-like cable with terminators on both ends.
		80		Jumpers or dip switches assign drive numbers in binary.
SATA	1	7	Yes	Small cable improves air cooling.
				Faster than PATA.
				One drive per channel.
				No jumpers, no master, and no slave.
FDD	1	34	No	Only for the FDD.
				Pin 1 is usually oriented closest to the power connector, but look for the red stripe.
				Some old FDD cables support multiple FDDs. They have a twist in the middle of the ribbon connectors.

Homework

Each day there is some homework. Today's homework is to memorize the information in Table 31-2.

Funwork

Each day there is also some funwork. It is important that you see the wider scope of a career as an A+ technician. Computer repair is not just pocket protectors, badly repaired glasses, and screwdrivers. It is home theater, surveillance systems, cell phones, credit cards, Facebook, Xbox, and World of Warcraft. You're studying not for the sake of memorizing facts and information, but to add to your technical skill sets and learn to enjoy what you do. And let's not start with how cool cybersecurity is. Can you imagine what the music and entertainment industry would look like without computer geeks?

Today, spend some quality time and observe all the ways computers touch our lives. Is there some "computery geekness" in medicine, military, banking, aerospace? How about a person using an iPad in a Starbucks to FaceTime a friend in Europe? Just imagine what goes on behind the scenes to make that happen. That is what we do. That is our world. We make that happen. That is some really cool stuff.

Here's another example of the results of our world. Right now, I am drinking coffee paid for via credit card in a Barnes and Noble. I am listening to Pandora Radio (Daft Punk's *Tron: Legacy* soundtrack) on my cell phone with noise-canceling headphones. I'm on my favorite laptop using a wireless mouse and Microsoft Word, and just got a text from one of my students about her super-fast gaming computer with six monitors. Do you see the bigger picture? This is our world, and it is awesome. Welcome.

Study Resources

For today's exam topics, refer to the following resources for more study:

- Cisco Networking Academy Curriculum. Chapters 3 and 11
- *CompTIA A+ Cert Guide* by Mark Edward Soper, Scott William Mueller, and David L. Prowse. Chapters 3, 7, and 12
- *The Complete A+ Guide to PC Repair* by Cheryl Ann Schmidt. Chapter 7
- *The Comprehensive Guide to Managing and Maintaining Your PC* by Jean Andrews. Chapter 8
- *All-in-One CompTIA Certification Exam Guide*, Seventh Edition by Mike Meyers. Chapters 11 and 12

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