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JEFF T. PARKER
QUENTIN DOCTER

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CompTIA® A+®

Complete Practice Tests

Exam Core 1 (220-1001) and
Exam Core 2 (220-1002)

Second Edition



Jeff T. Parker
Quentin Docter

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A Wiley Brand

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10 9 8 7 6 5 4 3 2 1

To my faithful canine companion, Abby. For me, Abby starts with A+.

—Jeff

To my girls

—Quentin

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Introduction

If you're picking up this book, there's a good chance that you want to pass the CompTIA A+ exam. It means that you're likely either an IT professional looking for certifications or someone who has a bit of computer knowledge and wants to start an IT career. The A+ exam is entry level and is often the first certification test IT technicians will take.

While still considered an entry-level credential, the exam has become more challenging compared to what it was a few years ago. You'll see why when comparing exam objectives, prior versus new. First, the breadth of material has expanded, including an entirely new domain "Virtualization and Cloud Computing." Second, the exam coverage for the domain "Operational Procedures" has nearly doubled. To achieve this, CompTIA balances the remaining domains more evenly. Overall, our opinion is the industry will understand this exam to be more practical and vigorous, and the credential will be even more valued. The time to gain this credential is now.

While we're confident that if you can answer all the questions in this book, you can pass the exam, we encourage you to go beyond memorizing questions and answers. One reason is that the questions on the actual exams will be different than the ones written for this book. Another (better) reason is that life isn't a multiple-choice exam. When you're in the field and trying to fix a computer, you won't have possible solutions given to you—you need to have a solid base of knowledge to work from.

CompTIA A+ Complete Practice Tests, Second Edition, combined with the Sybex *CompTIA A+ Complete Study Guide, Fourth Edition* (both the Standard and Deluxe Editions), will help give you the foundation you need to pass the exams. Study them well and they will also give you the tools you need to navigate a myriad of technical topics and make you more valuable to prospective employers.

What Is A+ Certification?

The A+ certification program was developed by the Computing Technology Industry Association (CompTIA) to provide an industry-wide means of certifying the competency of computer service technicians. The A+ certification is granted to those who have attained the level of knowledge and troubleshooting skills that are needed to provide capable support in the field of personal computers and mobile devices. It is similar to other certifications in the computer industry, such as the Cisco Certified Network Associate (CCNA) program and the Microsoft certification programs. The theory behind these certifications is that if you need to have service performed on a certain vendor's products, you would prefer to use a technician who has been certified in one of the appropriate certification programs rather than just the first "expert" that pops up in a Google search. The difference with A+ is that it's an industry-wide certification and vendor agnostic. That means by passing it, you're capable of handling different issues regardless of the software or hardware vendor.

Everyone must take and pass two exams: Core 1 (220-1001) and Core 2 (220-1002). You don't have to take the 220-1001 exam and the 220-1002 exam at the same time, but the A+ certification isn't awarded until you've passed both tests.

Tests are administered by CompTIA's global testing partner, Pearson VUE. For more information on taking the exam, visit the CompTIA website at www.comptia.org. You can also visit Pearson VUE at www.pearsonvue.com.

Who Should Buy This Book?

If you want to pass the A+ exam, this book is definitely for you. This book is an exam prep book. If you're an experienced computer professional, a book like this may be all you need to pass the exam.

However, a book of exam questions isn't designed to give you all the background you need to truly understand the basics of personal computers, mobile devices, and virtualization. If you're newer to the industry, we encourage you to buy a study guide as well, such as the Sybex *CompTIA A+ Complete Study Guide*. The study guide will provide more depth and context to help you acquire the skills and knowledge you need to be successful. This book then becomes a great companion as you prepare to take the exam.

How to Use This Book and the Interactive Online Learning Environment and Test Bank

This book includes 1,200 practice test questions, which will help you get ready to pass the A+ exam. The interactive online learning environment that accompanies *CompTIA A+ Complete Practice Tests* provides a robust test bank to help you prepare for the certification exams and increase your chances of passing them the first time! By using this test bank, you can identify weak areas up front and then develop a solid studying strategy using each of these testing features.

The test bank also offers two practice exams. Take these practice exams just as if you were taking the actual exam (without any reference material). When you've finished the first exam, move on to the next one to solidify your test-taking skills. If you get more than 90 percent of the answers correct, you're ready to take the certification exams.



You can access the Sybex interactive online test bank at <http://www.wiley.com/go/Sybextestprep>.

Tips for Taking the A+ Exams

Here are some general tips for taking your exams successfully:

- Bring two forms of ID with you. One must be a photo ID, such as a driver's license. The other can be a major credit card or a passport. Both forms must include a signature.
- Arrive early at the exam center so you can relax and review your study materials, particularly tables and lists of exam-related information.
- Read the questions carefully. Don't be tempted to jump to an early conclusion. Make sure you know exactly what the question is asking.
- Don't leave any unanswered questions. Unanswered questions are scored against you.
- There will be questions with multiple correct responses. When there is more than one correct answer, a message at the bottom of the screen will prompt you to either "Choose two" or "Choose all that apply." Be sure to read the messages displayed to know how many correct answers you must choose.
- When answering multiple-choice questions you're not sure about, use a process of elimination to get rid of the obviously incorrect answers first. Doing so will improve your odds if you need to make an educated guess.
- On form-based tests (nonadaptive), because the hard questions will eat up the most time, save them for last. You can move forward and backward through the exam.
- For the latest pricing on the exams and updates to the registration procedures, visit CompTIA's website at www.comptia.org.

Exam Objectives

CompTIA goes to great lengths to ensure that its certification programs accurately reflect the IT industry's best practices. The company does this by establishing Cornerstone Committees for each of its exam programs. Each committee comprises a small group of IT professionals, training providers, and publishers who are responsible for establishing the exam's baseline competency level and who determine the appropriate target audience level.

Once these factors are determined, CompTIA shares this information with a group of hand-selected subject-matter experts (SMEs). These folks are the true brainpower behind the certification program. They review the committee's findings, refine them, and shape them into the objectives you see before you. CompTIA calls this process a Job Task Analysis (JTA).

Finally, CompTIA conducts a survey to ensure that the objectives and weightings truly reflect the job requirements. Only then can the SMEs go to work writing the hundreds of questions needed for the exam. And, in many cases, they have to go back to the drawing board for further refinements before the exam is ready to go live in its final state. So, rest assured, the content you're about to learn will serve you long after you take the exam.

A+ Certification Exam Objectives: Core 1 (220-1001)

The following table lists the domains measured by this examination and the extent to which they are represented on the exam:

| Domain | Percentage of Exam |
|--|--------------------|
| 1.0 Mobile Devices | 14% |
| 2.0 Networking | 20% |
| 3.0 Hardware | 27% |
| 4.0 Virtualization and Cloud Computing | 12% |
| 5.0 Hardware and Network Troubleshooting | 27% |
| Total | 100% |

| Objective | Chapter |
|---|---------|
| 1.0 Mobile Devices | |
| 1.1 Given a scenario, install and configure laptop hardware and components. | 1, 10 |
| Hardware/device replacement | 1, 10 |
| - Keyboard | |
| - Hard drive | |
| - SSD vs. hybrid vs. magnetic disk | |
| - 1.8in vs. 2.5in | |
| - Memory | |
| - Smart card reader | |
| - Optical drive | |
| - Wireless card/Bluetooth module | |
| - Cellular card | |
| - Video card | |
| - Mini PCIe | |
| - Screen | |
| - DC jack | |
| - Battery | |
| - Touchpad | |
| - Plastics/frames | |
| - Speaker | |
| - System board | |
| - CPU | |

| Objective | Chapter |
|--|----------------|
| 1.2 Given a scenario, install components within the display of a laptop. | 1, 10 |
| Types | 1, 10 |
| - LCD | |
| - OLED | |
| Wi-Fi antenna connector/placement | 1, 10 |
| Webcam | 1, 10 |
| Microphone | 1, 10 |
| Inverter | 1, 10 |
| Digitizer/touchscreen | 1, 10 |
| 1.3 Given a scenario, use appropriate laptop features. | 1, 10 |
| Special function keys | 1, 10 |
| - Dual displays | |
| - Wireless (on/off) | |
| - Cellular (on/off) | |
| - Volume settings | |
| - Screen brightness | |
| - Bluetooth (on/off) | |
| - Keyboard backlight | |
| - Touchpad (on/off) | |
| - Screen orientation | |
| - Media options (fast forward/rewind) | |
| - GPS (on/off) | |
| - Airplane mode | |
| Docking station | 1, 10 |
| Port replicator | 1, 10 |
| Physical laptop lock and cable lock | 1, 10 |
| Rotating/removable screens | 1, 10 |
| 1.4 Compare and contrast characteristics of various types of other mobile devices. | 1, 10 |
| Tablets | 1, 10 |
| Smartphones | 1, 10 |

| Objective | Chapter |
|--|----------------|
| Wearable technology devices - Smart watches, Fitness monitors, VR/AR headsets | 1, 10 |
| E-readers | 1, 10 |
| GPS | 1, 10 |
| 1.5 Given a scenario, connect and configure accessories and ports of other mobile devices. | 1, 10 |
| Connection types | 1, 10 |
| - Wired | |
| - Micro-USB/Mini-USB/USB-C | |
| - Lightning | |
| - Tethering | |
| - Proprietary vendor-specific ports (communication/power) | |
| - Wireless | |
| - NFC | |
| - Bluetooth | |
| - IR | |
| - Hotspot | |
| Accessories | 1, 10 |
| -Headsets, Speakers, Game pads, Extra battery packs/battery chargers, Protective covers/waterproofing, Credit card readers, Memory/MicroSD | |
| 1.6 Given a scenario, configure basic mobile device network connectivity and application support. | 1, 10 |
| Wireless/cellular data network (enable/disable) | 1, 10 |
| - Hotspot | |
| - Tethering | |
| - Airplane mode | |
| Bluetooth | 1, 10 |
| - Enable Bluetooth. | |
| - Enable pairing. | |
| - Find a device for pairing. | |
| - Enter the appropriate pin code. | |
| - Test connectivity. | |

| Objective | Chapter |
|---|----------------|
| Corporate and ISP email configuration | 1, 10 |
| - POP3 | |
| - IMAP | |
| - Port and SSL settings | |
| - S/MIME | |
| Integrated commercial provider email configuration | 1, 10 |
| - iCloud | |
| - Google/Inbox | |
| - Exchange Online | |
| - Yahoo | |
| PRI updates/PRL updates/baseband updates | 1, 10 |
| Radio firmware | 1, 10 |
| IMEI vs. IMSI | 1, 10 |
| VPN | 1, 10 |
| 1.7 Given a scenario, use methods to perform mobile device synchronization. | 1, 10 |
| Synchronization methods | 1, 10 |
| - Synchronize to the cloud. | |
| - Synchronize to the desktop. | |
| - Synchronize to the automobile. | |
| Types of data to synchronize | 1, 10 |
| - Contacts | |
| - Applications | |
| - Email | |
| - Pictures | |
| - Music | |
| - Videos | |
| - Calendar | |
| - Bookmarks | |
| - Documents | |
| - Location data | |
| - Social media data | |
| - E-books | |
| - Passwords | |
| Mutual authentication for multiple services (SSO) | 1, 10 |

| Objective | Chapter |
|--|----------------|
| Software requirements to install the application on the PC | 1, 10 |
| Connection types to enable synchronization | 1, 10 |
| 2.0 Networking | 2, 10 |
| 2.1 Compare and contrast TCP and UDP ports, protocols, and their purposes. | 2, 10 |
| Ports and protocols | 2, 10 |
| - 21 – FTP | |
| - 22 – SSH | |
| - 23 – Telnet | |
| - 25 – SMTP | |
| - 53 – DNS | |
| - 80 – HTTP | |
| - 110 – POP3 | |
| - 143 – IMAP | |
| - 443 – HTTPS | |
| - 3389 – RDP | |
| - 137-139 – NetBIOS/NetBT | |
| - 445 – SMB/CIFS | |
| - 427 – SLP | |
| - 548 – AFP | |
| - 67/68 – DHCP | |
| - 389 – LDAP | |
| - 161/162 – SNMP | |
| TCP vs. UDP | 2, 10 |
| 2.2 Compare and contrast common networking hardware devices. | 2, 10 |
| Routers | 2, 10 |
| Switches | 2, 10 |
| - Managed | |
| - Unmanaged | |
| Access points | 2, 10 |
| Cloud-based network controller | 2, 10 |
| Firewall | 2, 10 |
| Network interface card | 2, 10 |

| Objective | Chapter |
|--|----------------|
| Repeater | 2, 10 |
| Hub | 2, 10 |
| Cable/DSL modem | 2, 10 |
| Bridge | 2, 10 |
| Patch panel | 2, 10 |
| Power over Ethernet (PoE) | 2, 10 |
| - Injectors | |
| - Switch | |
| Ethernet over Power | 2, 10 |
| 2.3 Given a scenario, install and configure a basic wired/wireless SOHO network. | 2, 10 |
| Router/switch functionality | 2, 10 |
| Access point settings | 2, 10 |
| IP addressing | 2, 10 |
| NIC configuration | 2, 10 |
| - Wired | |
| - Wireless | |
| End-user device configuration | 2, 10 |
| IoT device configuration | 2, 10 |
| - Thermostat | |
| - Light switches | |
| - Security cameras | |
| - Door locks | |
| - Voice-enabled, smart speaker/digital assistant | |
| Cable/DSL modem configuration | 2, 10 |
| Firewall settings | 2, 10 |
| - DMZ | |
| - Port forwarding | |
| - NAT | |
| - UPnP | |
| - Whitelist/blacklist | |
| - MAC filtering | |

| Objective | Chapter |
|---|----------------|
| QoS | 2, 10 |
| Wireless settings | 2, 10 |
| - Encryption | |
| - Channels | |
| - QoS | |
| 2.4 Compare and contrast wireless networking protocols. | 2, 10 |
| 802.11a | 2, 10 |
| 802.11b | 2, 10 |
| 802.11g | 2, 10 |
| 802.11n | 2, 10 |
| 802.11ac | 2, 10 |
| Frequencies | 2, 10 |
| - 2.4Ghz | |
| - 5Ghz | |
| Channels | 2, 10 |
| - 1-11 | |
| Bluetooth | 2, 10 |
| NFC | 2, 10 |
| RFID | 2, 10 |
| Zigbee | 2, 10 |
| Z-Wave | 2, 10 |
| 3G | 2, 10 |
| 4G | 2, 10 |
| 5G | 2, 10 |
| LTE | 2, 10 |

| Objective | Chapter |
|--|----------------|
| 2.5 Summarize the properties and purposes of services provided by networked hosts. | 2, 10 |
| Server roles | 2, 10 |
| - Web server | |
| - File server | |
| - Print server | |
| - DHCP server | |
| - DNS server | |
| - Proxy server | |
| - Mail server | |
| - Authentication server | |
| - syslog | |
| Internet appliance | 2, 10 |
| - UTM | |
| - IDS | |
| - IPS | |
| - End-point management server | |
| Legacy/embedded systems | 2, 10 |
| 2.6 Explain common network configuration concepts. | 2, 10 |
| IP addressing | 2, 10 |
| - Static | |
| - Dynamic | |
| - APIPA | |
| - Link local | |
| DNS | 2, 10 |
| DHCP | 2, 10 |
| - Reservations | |
| IPv4 vs. IPv6 | 2, 10 |
| Subnet mask | 2, 10 |
| Gateway | 2, 10 |
| VPN | 2, 10 |
| VLAN | 2, 10 |
| NAT | 2, 10 |

| Objective | Chapter |
|--|----------------|
| 2.7 Compare and contrast Internet connection types, network types, and their features. | 2, 10 |
| Internet connection types | 2, 10 |
| - Cable | |
| - DSL | |
| - Dial-up | |
| - Fiber | |
| - Satellite | |
| - ISDN | |
| - Cellular | |
| - Tethering | |
| - Mobile hotspot | |
| - Line-of-sight wireless Internet service | |
| Network types | 2, 10 |
| - LAN | |
| - WAN | |
| - PAN | |
| - MAN | |
| - WMN | |
| 2.8 Given a scenario, use appropriate networking tools. | 2, 10 |
| Crimper | 2, 10 |
| Cable stripper | 2, 10 |
| Multimeter | 2, 10 |
| Tone generator and probe | 2, 10 |
| Cable tester | 2, 10 |
| Loopback plug | 2, 10 |
| Punchdown tool | 2, 10 |
| Wi-Fi analyzer | 2, 10 |
| 3.0 Hardware | 3, 10 |
| 3.1 Explain basic cable types, features, and their purposes. | 3, 10 |

| Objective | Chapter |
|--------------------------------------|----------------|
| Network cables | 3, 10 |
| - Ethernet | |
| - Cat 5 | |
| - Cat 5e | |
| - Cat 6 | |
| - Plenum | |
| - Shielded twisted pair | |
| - Unshielded twisted pair | |
| - 568A/B | |
| - Fiber | |
| - Coaxial | |
| - Speed and transmission limitations | |
| Video cables | 3, 10 |
| - VGA | |
| - HDMI | |
| - Mini-HDMI | |
| - DisplayPort | |
| - DVI | |
| - DVI-DDVI-I | |
| Multipurpose cables | 3, 10 |
| - Lightning | |
| - Thunderbolt | |
| - USB | |
| - USB-C | |
| - USB 2.0 | |
| - USB 3.0 | |
| Peripheral cables | 3, 10 |
| - Serial | |
| Hard drive cables | 3, 10 |
| - SATA | |
| - IDE | |
| - SCSI | |
| Adapters | 3, 10 |
| - DVI to HDMI | |
| - USB to Ethernet | |
| - DVI to VGA | |

| Objective | Chapter |
|--|----------------|
| 3.2 Identify common connector types. | 3, 10 |
| RJ-11 | 3, 10 |
| RJ-45 | 3, 10 |
| RS-232 | 3, 10 |
| BNC | 3, 10 |
| RG-59 | 3, 10 |
| RG-6 | 3, 10 |
| USB | 3, 10 |
| Micro-USB | 3, 10 |
| Mini-USB | 3, 10 |
| USB-C | 3, 10 |
| DB-9 | 3, 10 |
| Lightning | 3, 10 |
| SCSI | 3, 10 |
| eSATA | 3, 10 |
| Molex | 3, 10 |
| 3.3 Given a scenario, install RAM types. | 3, 10 |
| RAM types | 3, 10 |
| - SODIMM | |
| - DDR2 | |
| - DDR3 | |
| - DDR4 | |
| Single channel | 3, 10 |
| Dual channel | 3, 10 |
| Triple channel | 3, 10 |

| Objective | Chapter |
|--|----------------|
| Error correcting | 3, 10 |
| Parity vs. non-parity | 3, 10 |
| 3.4 Given a scenario, select, install and configure storage devices. | 3, 10 |
| Optical drives | 3, 10 |
| - CD-ROM/CD-RW | |
| - DVD-ROM/DVD-RW/DVD-RW DL | |
| - Blu-ray | |
| - BD-R | |
| - BD-RE | |
| Solid-state drives | 3, 10 |
| - M2 drives | |
| - NVME | |
| - SATA 2.5 | |
| Magnetic hard drives | 3, 10 |
| - 5,400rpm | |
| - 7,200rpm | |
| - 10,000rpm | |
| - 15,000rpm | |
| - Sizes: | |
| -2.5 | |
| -3.5 | |
| Hybrid drives | 3, 10 |
| Flash | 3, 10 |
| - SD card | |
| - CompactFlash | |
| - MicroSD card | |
| - MiniSD card | |
| - xD | |
| Configurations | 3, 10 |
| - RAID 0, 1, 5, 10 | |
| - Hot swappable | |

| Objective | Chapter |
|---|----------------|
| 3.5 Given a scenario, install and configure motherboards, CPUs, and add-on cards. | 3, 10 |
| Motherboard form factor | 3, 10 |
| - ATX | |
| - mATX | |
| - ITX | |
| - mITX | |
| Motherboard connector types | 3, 10 |
| - PCI | |
| - PCIe | |
| - Riser card | |
| - Socket types | |
| - SATA | |
| - IDE | |
| - Front panel connector | |
| - Internal USB connector | |
| BIOS/UEFI settings | 3, 10 |
| - Boot options | |
| - Firmware updates | |
| - Security settings | |
| - Interface configurations | |
| - Security | |
| - Passwords | |
| - Drive encryption | |
| - TPM | |
| - LoJack | |
| - Secure boot | |
| CMOS battery | 3, 10 |
| CPU features | 3, 10 |
| - Single-core | |
| - Multicore | |
| - Virtual technology | |
| - Hyperthreading | |
| - Speeds | |
| - Overclocking | |
| - Integrated GPU | |

| Objective | Chapter |
|--|----------------|
| Compatibility | 3, 10 |
| - AMD | |
| - Intel | |
| Cooling mechanism | 3, 10 |
| - Fans | |
| - Heat sink | |
| - Liquid | |
| - Thermal paste | |
| Expansion cards | 3, 10 |
| - Video cards | |
| - Onboard | |
| - Add-on card | |
| - Sound cards | |
| - Network interface card | |
| - USB expansion card | |
| - eSATA card | |
| <hr/> | |
| 3.6 Explain the purposes and uses of various peripheral types. | 3, 10 |
| <hr/> | |
| Printer | 3, 10 |
| ADF/flatbed scanner | 3, 10 |
| Barcode scanner/QR scanner | 3, 10 |
| Monitors | 3, 10 |
| VR headset | 3, 10 |
| Optical | 3, 10 |
| DVD drive | 3, 10 |
| Mouse | 3, 10 |
| Keyboard | 3, 10 |
| Touchpad | 3, 10 |
| Signature pad | 3, 10 |
| Game controllers | 3, 10 |
| Camera/webcam | 3, 10 |

| Objective | Chapter |
|---|----------------|
| Microphone | 3, 10 |
| Speakers | 3, 10 |
| Headset | 3, 10 |
| Projector | 3, 10 |
| - Lumens/brightness | |
| External storage drives | 3, 10 |
| KVM | 3, 10 |
| Magnetic reader/chip reader | 3, 10 |
| NFC/tap pay device | 3, 10 |
| Smart card reader | 3, 10 |
| 3.7 Summarize power supply types and features. | 3, 10 |
| Input 115V vs. 220V | 3, 10 |
| Output 5.5V vs. 12V | 3, 10 |
| 24-pin motherboard adapter | 3, 10 |
| Wattage rating | 3, 10 |
| Number of devices/types of devices to be powered | 3, 10 |
| 3.8 Given a scenario, select and configure appropriate components for a custom PC configuration to meet customer specifications or needs. | 3, 10 |
| Graphic/CAD/CAM design workstation | 3, 10 |
| - Multicore processor | |
| - High-end video | |
| - Maximum RAM | |
| Audio/video editing workstation | 3, 10 |
| - Specialized audio and video card | |
| - Large, fast hard drive | |
| - Dual monitors | |