



CompTIA A+ Certification Exam Objectives

EXAM NUMBER: 220-901



About the Exam

Candidates are encouraged to use this document to help prepare for CompTIA A+ 220-901. In order to receive the CompTIA A+ certification, you must pass two exams: 220-901 and 220-902. CompTIA A+ 220-901 measures the necessary skills for an entry-level IT professional. Successful candidates will have the knowledge required to:

- Assemble components based on customer requirements
- Install, configure and maintain devices, PCs and software for end users
- Understand the basics of networking and security/forensics
- Properly and safely diagnose, resolve and document common hardware and software issues
- Apply troubleshooting skills
- Provide appropriate customer support
- Understand the basics of virtualization, desktop imaging and deployment

These content examples are meant to clarify the test objectives and should not be construed as a comprehensive listing of all the content of this examination.

EXAM ACCREDITATION

CompTIA A+ is accredited by ANSI to show compliance with the ISO 17024 Standard and, as such, undergoes regular reviews and updates to the exam objectives.

EXAM DEVELOPMENT

CompTIA exams result from subject matter expert workshops and industry-wide survey results regarding the skills and knowledge required of an entry-level IT professional.

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PLEASE NOTE

The lists of examples provided in bulleted format are not exhaustive lists. Other examples of technologies, processes or tasks pertaining to each objective may also be included on the exam although not listed or covered in this objectives document. CompTIA is constantly reviewing the content of our exams and updating test questions to be sure our exams are current and the security of the questions is protected. When necessary, we will publish updated exams based on existing exam objectives. Please know that all related exam preparation materials will still be valid.

TEST DETAILS

| | |
|------------------------|--|
| Required exam | CompTIA A+ 220-901 |
| Number of questions | Maximum of 90 |
| Types of questions | Multiple choice and performance-based |
| Length of test | 90 minutes |
| Recommended experience | Six to 12 months hands-on experience in the lab or field |
| Passing score | CompTIA A+ 220-901: 675 (on a scale of 900) |

EXAM OBJECTIVES (DOMAINS)

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

| DOMAIN | PERCENTAGE OF EXAMINATION |
|--|---------------------------|
| 1.0 Hardware | 34% |
| 2.0 Networking | 21% |
| 3.0 Mobile Devices | 17% |
| 4.0 Hardware & Network Troubleshooting | 28% |
| Total | 100% |



1.0 Hardware

1.1 Given a scenario, configure settings and use BIOS/UEFI tools on a PC.

- **Firmware upgrades/flash BIOS**
- **BIOS component information**
 - RAM
 - Hard drive
 - Optical drive
 - CPU
- **BIOS configurations**
 - Boot sequence
- Enabling and disabling devices
- Date/time
- Clock speeds
- Virtualization support
- BIOS security (passwords, drive encryption: TPM, LoJack, secure boot)
- **Built-in diagnostics**
- **Monitoring**
 - Temperature monitoring
 - Fan speeds
 - Intrusion detection/notification
 - Voltage
 - Clock
 - Bus speed

1.2 Explain the importance of motherboard components, their purpose and properties.

- **Sizes**
 - ATX
 - Micro-ATX
 - Mini-ITX
 - ITX
- **Expansion slots**
 - PCI
 - PCI-X
 - PCIe
 - miniPCI
- **RAM slots**
- **CPU sockets**
- **Chipsets**
 - Northbridge
 - Southbridge
- **CMOS battery**
- **Power connections and types**
- **Fan connectors**
- **Front/top panel connectors**
 - USB
 - Audio
 - Power button
 - Power light
 - Drive activity lights
- **Bus speeds**
- **Reset button**

1.3 Compare and contrast various RAM types and their features.

- **Types**
 - DDR
 - DDR2
 - DDR3
 - SODIMM
 - DIMM
 - Parity vs. non-parity
- ECC vs. non-ECC
- RAM configurations
 - Single channel vs. dual channel vs. triple channel
- Single sided vs. double sided
- Buffered vs. unbuffered
- **RAM compatibility**

1.4 Install and configure PC expansion cards.

- Sound cards
 - Video cards
 - Network cards
 - USB cards
 - Firewire cards
 - Thunderbolt cards
 - Storage cards
 - Modem cards
 - Wireless/cellular cards
 - TV tuner cards
 - Video capture cards
 - Riser cards
-

1.5 Install and configure storage devices and use appropriate media.

- **Optical drives**
 - CD-ROM/CD-RW
 - DVD-ROM/DVD-RW/DVD-RW DL
 - Blu-ray
 - BD-R
 - BD-RE
 - **Magnetic hard disk drives**
 - 5400 rpm
 - 7200 rpm
 - 10,000 rpm
 - **Hot swappable drives**
 - **Solid state/flash drives**
 - Compact flash
 - SD
 - microSD
 - MiniSD
 - xD
 - SSD
 - Hybrid
 - eMMC
 - **RAID types**
 - 0
 - 1
 - 5
 - 10
 - **Tape drive**
 - **Media capacity**
 - CD
 - CD-RW
 - DVD-RW
 - DVD
 - Blu-ray
 - Tape
 - DVD DL
-

1.6 Install various types of CPUs and apply the appropriate cooling methods.

- **Socket types**
 - Intel: 775, 1155, 1156, 1366, 1150, 2011
 - AMD: AM3, AM3+, FM1, FM2, FM2+
- **Characteristics**
 - Speeds
 - Cores
 - Cache size/type
 - Hyperthreading
 - Virtualization support
 - Architecture (32-bit vs. 64-bit)
 - Integrated GPU
 - Disable execute bit
- **Cooling**
 - Heat sink
 - Fans
 - Thermal paste
 - Liquid-based
 - Fanless/passive



1.7 Compare and contrast various PC connection interfaces, their characteristics and purpose.

- **Physical connections**
 - USB 1.1 vs. 2.0 vs. 3.0
 - Connector types: A, B, mini, micro
 - Firewire 400 vs. Firewire 800
 - SATA1 vs. SATA2 vs. SATA3, eSATA
 - Other connector types
 - VGA
 - HDMI
 - DVI
- Audio
 - Analog
 - Digital (Optical connector)
- RJ-45
- RJ-11
- Thunderbolt
- **Wireless connections**
 - Bluetooth
 - RF
- IR
- NFC
- **Characteristics**
 - Analog
 - Digital
 - Distance limitations
 - Data transfer speeds
 - Quality
 - Frequencies

1.8 Install a power supply based on given specifications.

- **Connector types and their voltages**
 - SATA
 - Molex
 - 4/8-pin 12v
 - PCIe 6/8-pin
 - 20-pin
 - 24-pin
- **Specifications**
 - Wattage
 - Dual rail
 - Size
 - Number of connectors
 - ATX
 - MicroATX
 - Dual voltage options

1.9 Given a scenario, select the appropriate components for a custom PC configuration to meet customer specifications or needs.

- **Graphic/CAD/CAM design workstation**
 - Multicore processor
 - High-end video
 - Maximum RAM
- **Audio/video editing workstation**
 - Specialized audio and video card
 - Large fast hard drive
 - Dual monitors
- **Virtualization workstation**
 - Maximum RAM and CPU cores
- **Gaming PC**
 - Multicore processor
- High-end video/specialized GPU
- High-definition sound card
- High-end cooling
- **Home theater PC**
 - Surround sound audio
 - HDMI output
 - HTPC compact form factor
 - TV tuner
- **Standard thick client**
 - Desktop applications
 - Meets recommended requirements for selected OS
- **Thin client**
 - Basic applications
 - Meets minimum requirements for selected OS
 - Network connectivity
- **Home server PC**
 - Media streaming
 - File sharing
 - Print sharing
 - Gigabit NIC
 - RAID array



1.10 Compare and contrast types of display devices and their features.

- | | | |
|--|--|--|
| <ul style="list-style-type: none"> • Types <ul style="list-style-type: none"> - LCD <ul style="list-style-type: none"> - TN vs. IPS - Fluorescent vs. LED backlighting - Plasma - Projector - OLED | <ul style="list-style-type: none"> • Refresh/frame rates • Resolution • Native resolution • Brightness/lumens • Analog vs. digital • Privacy/antiglare filters • Multiple displays | <ul style="list-style-type: none"> • Aspect ratios <ul style="list-style-type: none"> - 16:9 - 16:10 - 4:3 |
|--|--|--|
-

1.11 Identify common PC connector types and associated cables.

- | | |
|---|---|
| <ul style="list-style-type: none"> • Display connector types <ul style="list-style-type: none"> - DVI-D - DVI-I - DVI-A - DisplayPort - RCA - HD15 (i.e., DE15 or DB15) - BNC - miniHDMI - miniDin-6 • Display cable types <ul style="list-style-type: none"> - HDMI - DVI - VGA - Component - Composite - Coaxial | <ul style="list-style-type: none"> • Device cables and connectors <ul style="list-style-type: none"> - SATA - eSATA - USB - Firewire (IEEE1394) - PS/2 - Audio • Adapters and convertors <ul style="list-style-type: none"> - DVI to HDMI - USB A to USB B - USB to Ethernet - DVI to VGA - Thunderbolt to DVI - PS/2 to USB - HDMI to VGA |
|---|---|
-

1.12 Install and configure common peripheral devices.

- | | | |
|---|--|---|
| <ul style="list-style-type: none"> • Input devices <ul style="list-style-type: none"> - Mouse - Keyboard - Scanner - Barcode reader - Biometric devices - Game pads - Joysticks - Digitizer - Motion sensor | <ul style="list-style-type: none"> - Touch pads - Smart card readers - Digital cameras - Microphone - Webcam - Camcorder • Output devices <ul style="list-style-type: none"> - Printers - Speakers - Display devices | <ul style="list-style-type: none"> • Input & output devices <ul style="list-style-type: none"> - Touch screen - KVM - Smart TV - Set-top Box - MIDI-enabled devices |
|---|--|---|

1.13 Install SOHO multifunction device/printers and configure appropriate settings.

- **Use appropriate drivers for a given operating system**
 - Configuration settings
 - Duplex
 - Collate
 - Orientation
 - Quality
 - **Device sharing**
 - Wired
 - USB
 - Serial
 - Ethernet
 - Wireless
 - Bluetooth
 - 802.11 (a/b/g/n/ac)
 - Infrastructure vs. ad hoc
 - Integrated print server (hardware)
 - Cloud printing/remote printing
 - **Public/shared devices**
 - Sharing local/networked device via operating system settings
 - TCP/Bonjour/AirPrint
 - Data privacy
 - User authentication on the device
 - Hard drive caching
-

1.14 Compare and contrast differences between the various print technologies and the associated imaging process.

- **Laser**
 - Imaging drum, fuser assembly, transfer belt, transfer roller, pickup rollers, separate pads, duplexing assembly
 - Imaging process: processing, charging, exposing, developing, transferring, fusing and cleaning
 - **Inkjet**
 - Ink cartridge, print head, roller, feeder, duplexing assembly, carriage and belt
 - Calibration
 - **Thermal**
 - Feed assembly, heating element
 - Special thermal paper
 - **Impact**
 - Print head, ribbon, tractor feed
 - Impact paper
 - **Virtual**
 - Print to file
 - Print to PDF
 - Print to XPS
 - Print to image
-

1.15 Given a scenario, perform appropriate printer maintenance.

- **Laser**
 - Replacing toner, applying maintenance kit, calibration, cleaning
- **Thermal**
 - Replace paper, clean heating element, remove debris
- **Impact**
 - Replace ribbon, replace print head, replace paper
- **Inkjet**
 - Clean heads, replace cartridges, calibration, clear jams



2.0 Networking

2.1 Identify the various types of network cables and connectors.

- **Fiber**
 - Connectors: SC, ST and LC
- **Twisted Pair**
 - Connectors: RJ-11, RJ-45
 - Wiring standards: T568A, T568B
- **Coaxial**
 - Connectors: BNC, F-connector

2.2 Compare and contrast the characteristics of connectors and cabling.

- **Fiber**
 - Types (single-mode vs. multi-mode)
 - Speed and transmission limitations
- **Twisted pair**
 - Types: STP, UTP, CAT3, CAT5, CAT5e, CAT6, CAT6e, CAT7, plenum, PVC
 - Speed and transmission limitations
 - Splitters and effects on signal quality
- **Coaxial**
 - Types: RG-6, RG-59
 - Speed and transmission limitations
 - Splitters and effects on signal quality

2.3 Explain the properties and characteristics of TCP/IP.

- **IPv4 vs. IPv6**
- **Public vs. private vs. APIPA/link local**
- **Static vs. dynamic**
- **Client-side DNS settings**
- **Client-side DHCP**
- **Subnet mask vs. CIDR**
- **Gateway**

2.4 Explain common TCP and UDP ports, protocols and their purpose.

- **Ports**
 - 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
 - LDAP
 - SNMP
 - SMB
 - CIFS
 - SSH
 - AFP
- **Protocols**
 - DHCP
 - DNS
- **TCP vs. UDP**

2.5 Compare and contrast various WiFi networking standards and encryption types.

- Standards
 - 802.11 (a/b/g/n/ac)
 - Speeds, distances and frequencies
 - Encryption types
 - WEP, WPA, WPA2, TKIP, AES
-

2.6 Given a scenario, install and configure SOHO wireless/wired router and apply appropriate settings.

- Channels
 - Port forwarding, port triggering
 - DHCP (on/off)
 - DMZ
 - NAT/DNAT
 - Basic QoS
 - Firmware
 - UPnP
-

2.7 Compare and contrast Internet connection types, network types and their features.

- Internet connection types
 - Cable
 - DSL
 - Dial-up
 - Fiber
 - Satellite
 - ISDN
 - Cellular
 - Tethering
 - Mobile hotspot
 - Line-of-sight wireless Internet service
 - Network Types
 - LAN
 - WAN
 - PAN
 - MAN
-

2.8 Compare and contrast network architecture devices, their functions and features.

- Hub
 - Switch
 - Router
 - Access point
 - Bridge
 - Modem
 - Firewall
 - Patch panel
 - Repeaters/extenders
 - Ethernet over Power
 - Power over Ethernet injector
-

2.9 Given a scenario, use appropriate networking tools.

- Crimper
- Cable stripper
- Multimeter
- Tone generator and probe
- Cable tester
- Loopback plug
- Punchdown tool
- WiFi analyzer



3.0 Mobile Devices

3.1 Install and configure laptop hardware and components.

- **Expansion options**
 - Expresscard /34
 - Expresscard /54
 - SODIMM
 - Flash
 - Ports/Adapters
 - Thunderbolt
 - DisplayPort
 - USB to RJ-45 dongle
 - USB to WiFi dongle
 - USB to Bluetooth
 - USB Optical Drive
- **Hardware/device replacement**
 - Keyboard
 - Hard drive
 - SSD vs. hybrid vs. magnetic disk
 - 1.8in vs. 2.5in
 - Memory
 - Smart card reader
 - Optical drive
 - Wireless card
 - Mini-PCIe
 - Screen
 - DC jack
 - Battery
 - Touchpad
 - Plastics/frames
 - Speaker
 - System board
 - CPU

3.2 Explain the function of components within the display of a laptop.

- **Types**
 - LCD
 - TN vs. IPS
 - Fluorescent vs. LED backlighting
 - OLED
- **WiFi antenna connector/placement**
- **Webcam**
- **Microphone**
- **Inverter**
- **Digitizer**

3.3 Given a scenario, use appropriate laptop features.

- **Special function keys**
 - Dual displays
 - Wireless (on/off)
 - Cellular (on/off)
 - Volume settings
 - Screen brightness
 - Bluetooth (on/off)
 - Keyboard backlight
 - Touch pad (on/off)
 - Screen orientation
 - Media options (fast forward/rewind)
 - GPS (on/off)
 - Airplane mode
- **Docking station**
- **Physical laptop lock and cable lock**
- **Rotating/removable screens**



3.4 Explain the characteristics of various types of other mobile devices.

- **Tablets**
 - **Smartphones**
 - **Wearable technology devices**
 - Smart watches
 - Fitness monitors
 - Glasses and headsets
 - **Phablets**
 - **e-Readers**
 - **Smart camera**
 - **GPS**
-

3.5 Compare and contrast accessories and ports of other mobile devices.

- **Connection types**
 - NFC
 - Proprietary vendor-specific ports (communication/power)
 - MicroUSB/miniUSB
 - Lightning
 - Bluetooth
- IR
- Hotspot/tethering
- **Accessories**
 - Headsets
 - Speakers
 - Game pads
 - Docking stations
- Extra battery packs/battery chargers
- Protective covers/water proofing
- Credit card readers
- Memory/MicroSD



4.0 Hardware and Network Troubleshooting

4.1 Given a scenario, troubleshoot common problems related to motherboards, RAM, CPU and power with appropriate tools.

• Common symptoms

- Unexpected shutdowns
- System lockups
- POST code beeps
- Blank screen on bootup
- BIOS time and settings resets
- Attempts to boot to incorrect device
- Continuous reboots

- No power
- Overheating
- Loud noise
- Intermittent device failure
- Fans spin – no power to other devices
- Indicator lights
- Smoke
- Burning smell

- Proprietary crash screens (BSOD/pin wheel)
- Distended capacitors

• Tools

- Multimeter
- Power supply tester
- Loopback plugs
- POST card/USB

4.2 Given a scenario, troubleshoot hard drives and RAID arrays with appropriate tools.

• Common symptoms

- Read/write failure
- Slow performance
- Loud clicking noise
- Failure to boot
- Drive not recognized
- OS not found
- RAID not found

- RAID stops working
 - Proprietary crash screens (BSOD/pin wheel)
 - S.M.A.R.T. errors
- #### • Tools
- Screwdriver
 - External enclosures
 - CHKDSK

- FORMAT
- File recovery software
- Bootrec
- Diskpart
- Defragmentation tool

4.3 Given a scenario, troubleshoot common video, projector and display issues.

• Common symptoms

- VGA mode
- No image on screen
- Overheat shutdown
- Dead pixels

- Artifacts
- Color patterns incorrect
- Dim image
- Flickering image
- Distorted image

- Distorted geometry
- Burn-in
- Oversized images and icons

4.4 Given a scenario, troubleshoot wired and wireless networks with appropriate tools.

• Common symptoms

- No connectivity
- APIPA/link local address
- Limited connectivity
- Local connectivity
- Intermittent connectivity
- IP conflict
- Slow transfer speeds
- Low RF signal
- SSID not found

• Hardware tools

- Cable tester
- Loopback plug
- Punchdown tools
- Tone generator and probe
- Wire strippers
- Crimper
- Wireless locator

• Command line tools

- PING
 - IPCONFIG/IFCONFIG
 - TRACERT
 - NETSTAT
 - NBTSTAT
 - NET
 - NETDOM
 - NSLOOKUP
-

4.5 Given a scenario, troubleshoot and repair common mobile device issues while adhering to the appropriate procedures.

• Common symptoms

- No display
- Dim display
- Flickering display
- Sticking keys
- Intermittent wireless
- Battery not charging
- Ghost cursor/pointer drift
- No power
- Num lock indicator lights

- No wireless connectivity
- No Bluetooth connectivity
- Cannot display to external monitor
- Touchscreen non-responsive
- Apps not loading
- Slow performance
- Unable to decrypt email
- Extremely short battery life
- Overheating
- Frozen system

- No sound from speakers
- GPS not functioning
- Swollen battery

• Disassembling processes for proper re-assembly

- Document and label cable and screw locations
 - Organize parts
 - Refer to manufacturer resources
 - Use appropriate hand tools
-

4.6 Given a scenario, troubleshoot printers with appropriate tools.

• Common symptoms

- Streaks
- Faded prints
- Ghost images
- Toner not fused to the paper
- Creased paper
- Paper not feeding
- Paper jam
- No connectivity

- Garbled characters on paper
- Vertical lines on page
- Backed up print queue
- Low memory errors
- Access denied
- Printer will not print
- Color prints in wrong print color
- Unable to install printer
- Error codes

- Printing blank pages
- No image on printer display

• Tools

- Maintenance kit
- Toner vacuum
- Compressed air
- Printer spooler

CompTIA A+ Acronyms

The following is a list of acronyms that appear on the CompTIA A+ exams. Candidates are encouraged to review the complete list and attain a working knowledge of all listed acronyms as a part of a comprehensive exam preparation program.

| ACRONYM | SPELLED OUT | ACRONYM | SPELLED OUT |
|----------------|--|----------------|---|
| AC | Alternating Current | CPU | Central Processing Unit |
| ACL | Access Control List | CRT | Cathode Ray Tube |
| ACPI | Advanced Configuration Power Interface | DAC | Discretionary Access Control |
| ACT | Activity | DB-25 | Serial Communications D-Shell Connector, 25 Pins |
| ADSL | Asymmetrical Digital Subscriber Line | DB-9 | 9 Pin D Shell Connector |
| AGP | Accelerated Graphics Port | DC | Direct Current |
| AHCI | Advanced Host Controller Interface | DDoS | Distributed Denial of Service |
| AP | Access Point | DDR | Double Data Rate |
| APIPA | Automatic Private Internet Protocol Addressing | DDR RAM | Double Data Rate Random-Access Memory |
| APM | Advanced Power Management | DDR SDRAM | Double Data Rate Synchronous Dynamic Random-Access Memory |
| ARP | Address Resolution Protocol | DFS | Distributed File System |
| ASR | Automated System Recovery | DHCP | Dynamic Host Configuration Protocol |
| ATA | Advanced Technology Attachment | DIMM | Dual Inline Memory Module |
| ATAPI | Advanced Technology Attachment Packet Interface | DIN | Deutsche Industrie Norm |
| ATM | Asynchronous Transfer Mode | DLT | Digital Linear Tape |
| ATX | Advanced Technology Extended | DLP | Digital Light Processing |
| AUP | Acceptable Use Policy | DMA | Direct Memory Access |
| A/V | Audio Video | DMZ | Demilitarized Zone |
| BIOS | Basic Input/Output System | DNS | Domain Name Service or Domain Name Server |
| BNC | Bayonet-Neill-Concelman or British Naval Connector | DoS | Denial of Service |
| BTX | Balanced Technology Extended | DRAM | Dynamic Random Access Memory |
| CAPTCHA | Completely Automated Public Turing Test to tell Computers and Humans Apart | DRM | Digital Rights Management |
| CCFL | Cold Cathode Fluorescent Lamp | DSL | Digital Subscriber Line |
| CD | Compact Disc | DVD | Digital Video Disc or Digital Versatile Disc |
| CD-ROM | Compact Disc-Read-Only Memory | DVD-RAM | Digital Video Disc-Random-Access Memory |
| CD-RW | Compact Disc-Rewritable | DVD-ROM | Digital Video Disc-Read-Only Memory |
| CDFS | Compact Disc File System | DVD-R | Digital Video Disc-Recordable |
| CFS | Central File System or Common File System or Command File System | DVD-RW | Digital Video Disc-Rewritable |
| CIFS | Common Internet File System | DVI | Digital Visual Interface |
| CMOS | Complementary Metal-Oxide Semiconductor | ECC | Error Correcting Code or Error Checking and Correction |
| CNR | Communications and Networking Riser | ECP | Extended Capabilities Port |
| COMx | Communication Port (x=Port Number) | EEPROM | Electrically Erasable Programmable Read-Only Memory |

| ACRONYM | SPELLED OUT | ACRONYM | SPELLED OUT |
|----------------|--|----------------|--|
| EFS | Encrypting File System | IMEI | International Mobile Equipment Identity |
| EIDE | Enhanced Integrated Drive Electronics | IMSI | International Mobile Subscriber Identity |
| EMI | Electromagnetic Interference | IP | Internet Protocol |
| EMP | Electromagnetic Pulse | IPCONFIG | Internet Protocol Configuration |
| EPROM | Erasable Programmable Read-Only Memory | IPP | Internet Printing Protocol |
| EPP | Enhanced Parallel Port | IPS | In-Plane Switching |
| ERD | Emergency Repair Disk | IPSec | Internet Protocol Security |
| ESD | Electrostatic Discharge | IR | Infrared |
| EULA | End-User License Agreement | IrDA | Infrared Data Association |
| EVGA | Extended Video Graphics Adapter/Array | IRP | Incident Response Plan |
| EVDO | Evolution Data Optimized or Evolution Data Only | IRQ | Interrupt Request |
| FAT | File Allocation Table | ISDN | Integrated Services Digital Network |
| FAT12 | 12-Bit File Allocation Table | ISO | International Organization for Standardization/ Industry Standards Organization |
| FAT16 | 16-Bit File Allocation Table | ISP | Internet Service Provider |
| FAT32 | 32-Bit File Allocation Table | JBOD | Just a Bunch Of Disks |
| FDD | Floppy Disk Drive | Kb | Kilobit |
| Fn | Function (referring to the function key on a laptop) | KB | Kilobyte or Knowledge Base |
| FPM | Fast Page Mode | LAN | Local Area Network |
| FRU | Field Replaceable Unit | LBA | Logical Block Addressing |
| FSB | Front Side Bus | LC | Lucent Connector |
| FTP | File Transfer Protocol | LCD | Liquid Crystal Display |
| FQDN | Fully Qualified Domain Name | LDAP | Lightweight Directory Access Protocol |
| Gb | Gigabit | LED | Light Emitting Diode |
| GB | Gigabyte | LI-ON | Lithium-Ion |
| GDI | Graphics Device Interface | LPD/LPR | Line Printer Daemon/Line Printer Remote |
| GHz | Gigahertz | LPT | Line Printer Terminal |
| GUI | Graphical User Interface | LVD | Low Voltage Differential |
| GPS | Global Positioning System | MAC | Media Access Control or Mandatory Access Control |
| GSM | Global System for Mobile Communications | MAPI | Messaging Application Programming Interface |
| HAL | Hardware Abstraction Layer | MAU | Media Access Unit or Media Attachment Unit |
| HAV | Hardware-Assisted Virtualization | Mb | Megabit |
| HCL | Hardware Compatibility List | MB | Megabyte |
| HDD | Hard Disk Drive | MBR | Master Boot Record |
| HDMI | High-Definition Media Interface | MBSA | Microsoft Baseline Security Analyzer |
| HPFS | High-Performance File System | MFD | Multi-Function Device |
| HTML | Hypertext Markup Language | MFP | Multi-Function Product |
| HTPC | Home Theater PC | MHz | Megahertz |
| HTTP | Hypertext Transfer Protocol | MicroDIMM | Micro Dual Inline Memory Module |
| HTTPS | Hypertext Transfer Protocol Over Secure Sockets Layer | MIDI | Musical Instrument Digital Interface |
| I/O | Input/Output | MIME | Multipurpose Internet Mail Extension |
| ICMP | Internet Control Message Protocol | MIMO | Multiple Input Multiple Output |
| ICR | Intelligent Character Recognition | MMC | Microsoft Management Console |
| IDE | Integrated Drive Electronics | MP3 | Moving Picture Experts Group Layer 3 Audio |
| IDS | Intrusion Detection System | MP4 | Moving Picture Experts Group Layer 4 |
| IEEE | Institute of Electrical and Electronics Engineers | MPEG | Moving Picture Experts Group |
| IIS | Internet Information Services | MSCONFIG | Microsoft Configuration |
| IMAP | Internet Mail Access Protocol | MSDS | Material Safety Data Sheet |
| | | MUI | Multilingual User Interface |
| | | NAC | Network Access Control |
| | | NAS | Network Attached Storage |
| | | NAT | Network Address Translation |
| | | NetBIOS | Networked Basic Input/Output System |

| ACRONYM | SPELLED OUT |
|---------|---|
| NetBEUI | Networked Basic input/output system |
| | Extended User Interface |
| NFS | Network File System |
| NIC | Network Interface Card |
| NiCd | Nickel Cadmium |
| NiMH | Nickel Metal Hydride |
| NLX | New Low profile Extended |
| NNTP | Network News Transfer Protocol |
| NTFS | New Technology File System |
| NTLDR | New Technology Loader |
| NTP | Network Time Protocol |
| OCR | Optical Character Recognition |
| OEM | Original Equipment Manufacturer |
| OLED | Organic Light Emitting Diode |
| OS | Operating System |
| PAN | Personal Area Network |
| PATA | Parallel Advanced Technology Attachment |
| PC | Personal Computer |
| PCI | Peripheral Component Interconnect |
| PCIe | Peripheral Component Interconnect express |
| PCIX | Peripheral Component Interconnect Extended |
| PCL | Printer Control Language |
| PCMCIA | Personal Computer Memory Card International Association |
| PE | Preinstallation Environment |
| PGA | Pin Grid Array |
| PGA2 | Pin Grid Array 2 |
| PII | Personally Identifiable Information |
| PIN | Personal Identification Number |
| PKI | Public Key Infrastructure |
| PnP | Plug and Play |
| POP3 | Post Office Protocol 3 |
| PoS | Point of Sale |
| POST | Power On Self Test |
| POTS | Plain Old Telephone Service |
| PPP | Point-to-Point Protocol |
| PPTP | Point-to-Point Tunneling Protocol |
| PRI | Primary Rate Interface |
| PRL | Preferred Roaming List |
| PROM | Programmable Read-Only Memory |
| PS/2 | Personal System/2 Connector |
| PTSN | Public Switched Telephone Network |
| PSU | Power Supply Unit |
| PVC | Permanent Virtual Circuit |
| PXE | Preboot Execution Environment |
| QoS | Quality of Service |
| RAID | Redundant Array of Independent (or Inexpensive) Discs |
| RAM | Random Access Memory |
| RAS | Remote Access Service |
| RDP | Remote Desktop Protocol |
| RF | Radio Frequency |
| RFI | Radio Frequency Interference |

| ACRONYM | SPELLED OUT |
|------------|---|
| RGB | Red Green Blue |
| RIP | Routing Information Protocol |
| RIS | Remote Installation Service |
| RISC | Reduced Instruction Set Computer |
| RJ-11 | Registered Jack Function 11 |
| RJ-45 | Registered Jack Function 45 |
| RMA | Returned Materials Authorization |
| ROM | Read-Only Memory |
| RTC | Real-Time Clock |
| SAN | Storage Area Network |
| SAS | Serial Attached SCSI |
| SATA | Serial Advanced Technology Attachment |
| SC | Subscription Channel |
| SCP | Secure Copy Protection |
| SCSI | Small Computer System Interface |
| SCSI ID | Small Computer System Interface Identifier |
| SD Card | Secure Digital Card |
| SDRAM | Synchronous Dynamic Random-Access Memory |
| SEC | Single Edge Connector |
| SFC | System File Checker |
| SFF | Small Form Factor |
| SLI | Scalable Link Interface or System Level Integration or Scanline Interleave Mode |
| S.M.A.R.T. | Self-Monitoring, Analysis, and Reporting Technology |
| SMB | Server Message Block or Small To Midsize Business |
| SMTP | Simple Mail Transfer Protocol |
| SNMP | Simple Network Management Protocol |
| SoDIMM | Small outline Dual Inline Memory Module |
| SOHO | Small Office, Home Office |
| SP | Service Pack |
| SPDIF | Sony/Philips Digital Interface Format |
| SPGA | Staggered Pin Grid Array |
| SRAM | Static Random-Access Memory |
| SSH | Secure Shell |
| SSID | Service Set Identifier |
| SSL | Secure Sockets Layer |
| ST | Straight Tip |
| STP | Shielded Twisted Pair |
| SXGA | Super Extended Graphics Array |
| TB | Terabyte |
| TCP | Transmission Control Protocol |
| TCP/IP | Transmission Control Protocol/Internet Protocol |
| TDR | Time Domain Reflectometer |
| TFTP | Trivial File Transfer Protocol |
| TKIP | Temporal Key Integrity Protocol |
| TPM | Trusted Platform Module |
| UAC | User Account Control |
| UDF | User Defined Functions or Universal Disk Format or Universal Data Format |
| UDP | User Datagram Protocol |
| UEFI | Unified Extensible Firmware Interface |
| UNC | Universal Naming Convention |
| UPS | Uninterruptible Power Supply |

| ACRONYM | SPELLED OUT |
|----------------|---|
| URL | Uniform Resource Locator |
| USB | Universal Serial Bus |
| USMT | User State Migration Tool |
| UTP | Unshielded Twisted Pair |
| UXGA | Ultra Extended Graphics Array |
| VESA | Video Electronics Standards Association |
| VFAT | Virtual File Allocation Table |
| VGA | Video Graphics Array |
| VM | Virtual Machine |
| VoIP | Voice over Internet Protocol |
| VPN | Virtual Private Network |
| VRAM | Video Random-Access Memory |
| WAN | Wide Area Network |
| WAP | Wireless Access Protocol or Wireless Access Point |
| WEP | Wired Equivalent Privacy |
| WiFi | Wireless Fidelity |
| WINS | Windows Internet Name Service |
| WLAN | Wireless Local Area Network |
| WPA | Wireless Protected Access |
| WPS | WiFi Protected Setup |
| WUXGA | Wide Ultra Extended Graphics Array |
| XGA | Extended Graphics Array |
| ZIF | Zero Insertion Force |
| ZIP | Zig-zag Inline Package |

A+ Proposed Hardware and Software List

CompTIA has included this sample list of hardware and software to assist candidates as they prepare for the A+ exam. This list may also be helpful for training companies who wish to create a lab component to their training offering. The bulleted lists below each topic are a sample list and not exhaustive.

EQUIPMENT

- Apple tablet/smartphone
- Android tablet/smartphone
- Windows tablet/smartphone
- Windows laptop/Mac laptop/Linux laptop
- Windows desktop/Mac desktop/Linux desktop
- Monitors
- Projectors
- SOHO router/switch
- Access point
- VoIP phone
- Printer
 - Laser/inkjet
 - Wireless
- Surge suppressor
- UPS

SPARE PARTS/HARDWARE

- Motherboards
- RAM
- Hard drives
- Power supplies
- Video cards
- Sound cards
- Network cards
- Wireless NICs
- Fans/cooling devices/heat sink
- CPUs
- Assorted connectors/cables
 - USB
 - HDMI
 - etc

- Adapters
- Network cables
- Unterminated network cable/connectors
- AC adapters
- Optical drives
- Screws/stand-offs
- Cases
- Maintenance kit
- Mice/keyboards

TOOLS

- Screw drivers
- Multimeter
- Wire cutters
- Punchdown tool
- Crimper
- Power supply tester
- Cable stripper
- POST cards
- Standard technician toolkit
- ESD strap
- Thermal paste
- Cable tester
- WiFi analyzer
- SATA to USB connectors

SOFTWARE

- Operating system disks
- Antivirus software
- Virtualization software
- Anti-malware
- Driver software