Introduction
In order to receive CompTIA A+ certification a candidate must pass two exams. The first exam is CompTIA A+ 220-801 Certification Exam. The CompTIA A+ 220-801 examination measures necessary competencies for an entry-level IT professional with the equivalent knowledge of at least 12 months of hands-on experience in the lab or field. 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 while applying troubleshooting skills. Successful candidates will also provide appropriate customer support; understand the basics of virtualization, desktop imaging, and deployment.

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. The following CompTIA A+ 220-801 exam objectives result from subject matter expert workshops and industry-wide survey results regarding the skills and knowledge required of an entry-level IT professional. The percentages in this document represent the relative importance of the subject areas (domains) in the associated body of knowledge, and together establish the foundation of an entry-level IT professional.

This examination blueprint includes domain weighting, test objectives, and example content. Example topics and concepts are included to clarify the test objectives and should not be construed as a comprehensive listing of all the content of this examination.

Candidates are encouraged to use this document to guide their studies. The table below lists the domains measured by this examination and the extent to which they are represented. The CompTIA A+ 220-801 exam is based on these objectives.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Percentage of Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>PC Hardware</td>
<td>40%</td>
</tr>
<tr>
<td>Networking</td>
<td>27%</td>
</tr>
<tr>
<td>Laptops</td>
<td>11%</td>
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<tr>
<td>Printers</td>
<td>11%</td>
</tr>
<tr>
<td>Operational Procedures</td>
<td>11%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>
CompTIA Authorized Materials Use Policy

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Or verify against this list: [http://certification.comptia.org/Training/testingcenters/policies/unauthorized.aspx](http://certification.comptia.org/Training/testingcenters/policies/unauthorized.aspx)

**Note:** The lists of examples provided in bulleted format below each objective 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.*
1.0 PC Hardware

1.1 Configure and apply BIOS settings.
- Install 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, lo-jack)
- Use built-in diagnostics
- Monitoring
  - Temperature monitoring
  - Fan speeds
  - Intrusion detection/notification
  - Voltage
  - Clock
  - Bus speed

1.2 Differentiate between motherboard components, their purposes, and properties.
- Sizes
  - ATX
  - Micro-ATX
  - ITX
- Expansion slots
  - PCI
  - PCI-X
  - PCIe
  - miniPCI
  - CNR
  - AGP2x, 4x, 8x
- RAM slots
- CPU sockets
- Chipsets
  - North Bridge
  - South Bridge
  - CMOS battery
- Jumpers
- Power connections and types
- Fan connectors
- Front panel connectors
  - USB
  - Audio
  - Power button
  - Power light
  - Drive activity lights
  - Reset button
- Bus speeds

1.3 Compare and contrast RAM types and features.
• Types
  o DDR
  o DDR2
  o DDR3
  o SDRAM
  o SODIMM
  o RAMBUS
  o DIMM
  o Parity vs. non-parity
  o ECC vs. non-ECC
  o RAM configurations
    • Single channel vs. dual channel vs. triple channel
  o Single sided vs. double sided
• RAM compatibility and speed

1.4 Install and configure expansion cards.
• Sound cards
• Video cards
• Network cards
• Serial and parallel cards
• USB cards
• Firewire 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
  o CD-ROM
  o DVD-ROM
  o Blu-Ray
• Combo drives and burners
  o CD-RW
  o DVD-RW
  o Dual Layer DVD-RW
  o BD-R
  o BD-RE
• Connection types
  o External
    • USB
    • Firewire
    • eSATA
    • Ethernet
  o Internal SATA, IDE and SCSI
    • IDE configuration and setup (Master, Slave, Cable Select)
    • SCSI IDs (0 – 15)
  o Hot swappable drives
• Hard drives
  o Magnetic
  o 5400 rpm
  o 7200 rpm
  o 10,000 rpm
  o 15,000 rpm
- Solid state/flash drives
  - Compact flash
  - SD
  - Micro-SD
  - Mini-SD
  - xD
  - SSD
- RAID types
  - 0
  - 1
  - 5
  - 10
- Floppy drive
- Tape drive
- Media capacity
  - CD
  - CD-RW
  - DVD-RW
  - DVD
  - Blu-Ray
  - Tape
  - Floppy
  - DVD DL

### 1.6 Differentiate among various CPU types and features and select the appropriate cooling method.

- Socket types
  - Intel: LGA, 775, 1155, 1156, 1366
  - AMD: 940, AM2, AM2+, AM3, AM3+, FM1, F
- Characteristics
  - Speeds
  - Cores
  - Cache size/type
  - Hyperthreading
  - Virtualization support
  - Architecture (32-bit vs. 64-bit)
  - Integrated GPU
- Cooling
  - Heat sink
  - Fans
  - Thermal paste
  - Liquid-based

### 1.7 Compare and contrast various connection interfaces and explain their purpose.

- Physical connections
  - USB 1.1 vs. 2.0 vs. 3.0 speed and distance characteristics
    - Connector types: A, B, mini, micro
  - Firewire 400 vs. Firewire 800 speed and distance characteristics
  - SATA1 vs. SATA2 vs. SATA3, eSATA, IDE speeds
  - Other connector types
    - Serial
    - Parallel
    - VGA
    - HDMI
    - DVI
    - Audio
    - RJ-45
- RJ-11
  - Analog vs. digital transmission
- VGA vs. HDMI

- Speeds, distances and frequencies of wireless device connections
  - Bluetooth
  - IR
  - RF

1.8 Install an appropriate power supply based on a given scenario.

- Connector types and their voltages
  - SATA
  - Molex
  - 4/8-pin 12v
  - PCIe 6/8-pin
  - 20-pin
  - 24-pin
  - Floppy

- Specifications
  - Wattage
  - Size
  - Number of connectors
  - ATX
  - Micro-ATX

- Dual voltage options

1.9 Evaluate and select appropriate components for a custom configuration, to meet customer specifications or needs.

- Graphic / CAD / CAM design workstation
  - Powerful 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
  - Powerful processor
  - High-end video/specialized GPU
  - Better 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 running Windows

- Thin client
  - Basic applications
  - Meets minimum requirements for running Windows

- Home Server PC
  - Media streaming
  - File sharing
1.10 Given a scenario, evaluate types and features of display devices.

- Types
  - CRT
  - LCD
  - LED
  - Plasma
  - Projector
  - OLED
- Refresh rates
- Resolution
- Native resolution
- Brightness/lumens
- Analog vs. digital
- Privacy/antiglare filters
- Multiple displays

1.11 Identify connector types and associated cables.

- Display connector types
  - DVI-D
  - DVI-I
  - DVI-A
  - DisplayPort
  - RCA
  - HD15 (i.e. DE15 or DB15)
  - BNC
  - miniHDMI
  - RJ-45
  - miniDin-6
- Display cable types
  - HDMI
  - DVI
  - VGA
  - Component
  - Composite
  - S-video
  - RGB
  - Coaxial
  - Ethernet
- Device connectors and pin arrangements
  - SATA
  - eSATA
  - PATA
    - IDE
    - EIDE
  - Floppy
  - USB
  - IEEE1394
  - SCSI
  - PS/2
  - Parallel
  - Serial (DB-9)
  - Audio
1.12 **Install and configure various peripheral devices.**

- **Input devices**
  - Mouse
  - Keyboard
  - Touch screen
  - Scanner
  - Barcode reader
  - KVM
  - Microphone
  - Biometric devices
  - Game pads
  - Joysticks
  - Digitizer

- **Multimedia devices**
  - Digital cameras
  - Microphone
  - Webcam
  - Camcorder
  - MIDI enabled devices

- **Output devices**
  - Printers
  - Speakers
  - Display devices

### 2.0 Networking

#### 2.1 Identify 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 Categorize characteristics of connectors and cabling.

- **Fiber**
  - Types (single-mode vs. multi-mode)
  - Speed and transmission limitations
• Twisted pair
  o Types: STP, UTP, CAT3, CAT5, CAT5e, CAT6, plenum, PVC
  o Speed and transmission limitations
• Coaxial
  o Types: RG-6, RG-59
  o Speed and transmission limitations

2.3 Explain properties and characteristics of TCP/IP.
• IP class
  o Class A
  o Class B
  o Class C
• IPv4 vs. IPv6
• Public vs. private vs. APIPA
• Static vs. dynamic
• Client-side DNS
• DHCP
• Subnet mask
• Gateway

2.4 Explain common TCP and UDP ports, protocols, and their purpose.
• Ports
  o 21 – FTP
  o 23 – TELNET
  o 25 – SMTP
  o 53 – DNS
  o 80 – HTTP
  o 110 – POP3
  o 143 – IMAP
  o 443 – HTTPS
  o 3389 – RDP
• Protocols
  o DHCP
  o DNS
  o LDAP
  o SNMP
  o SMB
  o CIFS
  o SSH
  o SFTP
• TCP vs. UDP

2.5 Compare and contrast wireless networking standards and encryption types.
• Standards
  o 802.11 a/b/g/n
  o Speeds, distances and frequencies
• Encryption types
  o WEP, WPA, WPA2, TKIP, AES

2.6 Install, configure, and deploy a SOHO wireless/wired router using appropriate settings.
• MAC filtering
• Channels (1 – 11)
• Port forwarding, port triggering
• SSID broadcast (on/off)
• Wireless encryption
• Firewall
• DHCP (on/off)
• DMZ
• NAT
• WPS
• Basic QoS

2.7 Compare and contrast Internet connection types and features.
• Cable
• DSL
• Dial-up
• Fiber
• Satellite
• ISDN
• Cellular (mobile hotspot)
• Line of sight wireless internet service
• WiMAX

2.8 Identify various types of networks.
• LAN
• WAN
• PAN
• MAN
• Topologies
  - Mesh
  - Ring
  - Bus
  - Star
  - Hybrid

2.9 Compare and contrast network devices, their functions, and features.
• Hub
• Switch
  - PoE
• Router
• Access point
• Bridge
• Modem
• NAS
• Firewall
• VoIP phones
• Internet appliance

2.10 Given a scenario, use appropriate networking tools.
• Crimper
• Multimeter
• Toner probe
• Cable tester
• Loopback plug
• Punchdown tool

3.0 Laptops

3.1 Install and configure laptop hardware and components.
• Expansion options
  - Express card /34
  - Express card /54
  - PCMCIA
  - SODIMM
  - Flash
3.2 Compare and contrast the components within the display of a laptop.

- Types
  - LCD
  - LED
  - OLED
  - Plasma
- Wi-Fi antenna connector/placement
- Inverter and its function
- Backlight

3.3 Compare and contrast laptop features.

- Special function keys
  - Dual displays
  - Wireless (on/off)
  - Volume settings
  - Screen brightness
  - Bluetooth (on/off)
  - Keyboard backlight
- Docking station vs. port replicator
- Physical laptop lock and cable lock

4.0 Printers

4.1 Explain the differences between the various printer types and summarize 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

4.2 Given a scenario, install, and configure printers.
• Use appropriate printer drivers for a given operating system
• Print device sharing
  o Wired
    ▪ USB
    ▪ Parallel
    ▪ Serial
    ▪ Ethernet
  o Wireless
    ▪ Bluetooth
    ▪ 802.11x
    ▪ Infrared (IR)
  o Printer hardware print server
• Printer sharing
  o Sharing local/networked printer via Operating System settings

4.3 Given a scenario, perform printer maintenance.
• Laser
  o Replacing toner, applying maintenance kit, calibration, cleaning
• Thermal
  o Replace paper, clean heating element, remove debris
• Impact
  o Replace ribbon, replace print head, replace paper

5.0 Operational Procedures

5.1 Given a scenario, use appropriate safety procedures.
• ESD straps
• ESD mats
• Self-grounding
• Equipment grounding
• Personal safety
  o Disconnect power before repairing PC
  o Remove jewelry
  o Lifting techniques
  o Weight limitations
  o Electrical fire safety
  o CRT safety – proper disposal
  o Cable management
• Compliance with local government regulations

5.2 Explain environmental impacts and the purpose of environmental controls.
• MSDS documentation for handling and disposal
• Temperature, humidity level awareness and proper ventilation
• Power surges, brownouts, blackouts
  o Battery backup
  o Surge suppressor
• Protection from airborne particles
  o Enclosures
  o Air filters
• Dust and debris
  o Compressed air
  o Vacuums
• Component handling and protection
  o Antistatic bags
• Compliance to local government regulations

5.3 Given a scenario, demonstrate proper communication and professionalism.
• Use proper language – avoid jargon, acronyms, slang when applicable
• Maintain a positive attitude
• Listen and do not interrupt the customer
• Be culturally sensitive
• Be on time (if late contact the customer)
• Avoid distractions
  o Personal calls
  o Talking to co-workers while interacting with customers
  o Personal interruptions
• Dealing with difficult customer or situation
  o Avoid arguing with customers and/or being defensive
  o Do not minimize customer’s problems
  o Avoid being judgmental
  o Clarify customer statements (ask open ended questions to narrow the scope of the problem, restate the issue or question to verify understanding)
• Set and meet expectations/timeline and communicate status with the customer
  o Offer different repair/replacement options if applicable
  o Provide proper documentation on the services provided
  o Follow up with customer/user at a later date to verify satisfaction
• Deal appropriately with customers confidential materials
  o Located on a computer, desktop, printer, etc

5.4 Explain the fundamentals of dealing with prohibited content/activity.
• First response
  o Identify
  o Report through proper channels
  o Data/device preservation
• Use of documentation/documentation changes
• Chain of custody
  o Tracking of evidence/documenting process
### CompTIA A+ Acronyms

#### Introduction
The following is a list of acronyms which 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.

<table>
<thead>
<tr>
<th>ACRONYM</th>
<th>SPELLED OUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC</td>
<td>alternating current</td>
</tr>
<tr>
<td>ACL</td>
<td>access control list</td>
</tr>
<tr>
<td>ACPI</td>
<td>advanced configuration power interface</td>
</tr>
<tr>
<td>ACT</td>
<td>activity</td>
</tr>
<tr>
<td>ADSL</td>
<td>asymmetrical digital subscriber line</td>
</tr>
<tr>
<td>AGP</td>
<td>accelerated graphics port</td>
</tr>
<tr>
<td>AHCI</td>
<td>Advanced host controller interface</td>
</tr>
<tr>
<td>AMD</td>
<td>advanced micro devices</td>
</tr>
<tr>
<td>AP</td>
<td>Access point</td>
</tr>
<tr>
<td>APIPA</td>
<td>automatic private internet protocol addressing</td>
</tr>
<tr>
<td>APM</td>
<td>advanced power management</td>
</tr>
<tr>
<td>ARP</td>
<td>address resolution protocol</td>
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<tr>
<td>ASR</td>
<td>automated system recovery</td>
</tr>
<tr>
<td>ATA</td>
<td>advanced technology attachment</td>
</tr>
<tr>
<td>ATAPI</td>
<td>advanced technology attachment packet interface</td>
</tr>
<tr>
<td>ATM</td>
<td>asynchronous transfer mode</td>
</tr>
<tr>
<td>ATX</td>
<td>advanced technology extended</td>
</tr>
<tr>
<td>A/V</td>
<td>Audio Video</td>
</tr>
<tr>
<td>BIOS</td>
<td>basic input/output system</td>
</tr>
<tr>
<td>BNC</td>
<td>Bayonet-Neill-Concelman or British Naval Connector</td>
</tr>
<tr>
<td>BTX</td>
<td>balanced technology extended</td>
</tr>
<tr>
<td>CAPTCHA</td>
<td>Completely Automated Public Turing Test To Tell Computers and Humans Apart</td>
</tr>
<tr>
<td>CCFL</td>
<td>Cold Cathode Fluorescent Lamp</td>
</tr>
<tr>
<td>CD</td>
<td>compact disc</td>
</tr>
<tr>
<td>CD-ROM</td>
<td>compact disc-read-only memory</td>
</tr>
<tr>
<td>CD-RW</td>
<td>compact disc-rewritable</td>
</tr>
<tr>
<td>CDFS</td>
<td>compact disc file system</td>
</tr>
<tr>
<td>CFS</td>
<td>Central File System, Common File System, Command File System</td>
</tr>
<tr>
<td>CIFS</td>
<td>Common Internet File System</td>
</tr>
<tr>
<td>CMOS</td>
<td>complementary metal-oxide semiconductor</td>
</tr>
<tr>
<td>CNR</td>
<td>Communications and Networking Riser</td>
</tr>
<tr>
<td>COMx</td>
<td>communication port (x=port number)</td>
</tr>
</tbody>
</table>
CPU  central processing unit
CRIMM  Continuity Rambus Inline Memory Mode
CRT  cathode-ray tube
DAC  discretionary access control
DB-25  serial communications D-shell connector, 25 pins
DB-9  9 pin D shell connector
DC  direct current
DDOS  distributed denial of service
DDR  double data-rate
DDR RAM  double data-rate random access memory
DDR SDRAM  double data-rate synchronous dynamic random access memory
DFS  distributed file system
DHCP  dynamic host configuration protocol
DIMM  dual inline memory module
DIN  Deutsche Industrie Norm
DIP  dual inline package
DLT  digital linear tape
DLP  digital light processing
DMA  direct memory access
DMZ  demilitarized zone
DNS  domain name service or domain name server
DOS  denial of service
DRAM  dynamic random access memory
DSL  digital subscriber line
DVD  digital video disc or digital versatile disc
DVD-RAM  digital video disc-random access memory
DVD-ROM  digital video disc-read only memory
DVD-R  digital video disc-recordable
DVD-RW  digital video disc-rewritable
DVI  digital visual interface
ECC  error correction code
ECP  extended capabilities port
EEPROM  electrically erasable programmable read-only memory
EFS  encrypting file system
EIDE  enhanced integrated drive electronics
EMI  electromagnetic interference
EMP  electromagnetic pulse
EPROM  erasable programmable read-only memory
EPP  enhanced parallel port
ERD  emergency repair disk
ESD  electrostatic discharge
EVGA  extended video graphics adapter/array
EVDO  evolution data optimized or evolution data only
FAT  file allocation table
FAT12 12-bit file allocation table
FAT16 16-bit file allocation table
FAT32 32-bit file allocation table
FDD floppy disk drive
Fn Function (referring to the function key on a laptop)
FPM fast page-mode
FRU field replaceable unit
FSB Front Side Bus
FTP file transfer protocol
FQDN fully qualified domain name
Gb gigabit
GB gigabyte
GDI graphics device interface
GHz gigahertz
GUI graphical user interface
GPS global positioning system
GSM global system for mobile communications
HAL hardware abstraction layer
HAV Hardware Assisted Virtualization
HCL hardware compatibility list
HDD hard disk drive
HDMI high definition media interface
HPFS high performance file system
HTML hypertext markup language
HTPC Home theater PC
HTTP hypertext transfer protocol
HTTPS hypertext transfer protocol over secure sockets layer
I/O input/output
ICMP internet control message protocol
ICR intelligent character recognition
IDE integrated drive electronics
IDS Intrusion Detection System
IEEE Institute of Electrical and Electronics Engineers
IIS Internet Information Services
IMAP internet mail access protocol
IP internet protocol
IPCONFIG internet protocol configuration
IPP internet printing protocol
IPSEC internet protocol security
IR infrared
IrDA Infrared Data Association
IRQ interrupt request
ISA industry standard architecture
ISDN integrated services digital network
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ISO</td>
<td>Industry Standards Organization</td>
</tr>
<tr>
<td>ISP</td>
<td>internet service provider</td>
</tr>
<tr>
<td>JBOD</td>
<td>just a bunch of disks</td>
</tr>
<tr>
<td>Kb</td>
<td>kilobit</td>
</tr>
<tr>
<td>KB</td>
<td>Kilobyte or knowledge base</td>
</tr>
<tr>
<td>LAN</td>
<td>local area network</td>
</tr>
<tr>
<td>LBA</td>
<td>logical block addressing</td>
</tr>
<tr>
<td>LC</td>
<td>Lucent connector</td>
</tr>
<tr>
<td>LCD</td>
<td>liquid crystal display</td>
</tr>
<tr>
<td>LDAP</td>
<td>lightweight directory access protocol</td>
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<td>LED</td>
<td>light emitting diode</td>
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<tr>
<td>Li-on</td>
<td>lithium-ion</td>
</tr>
<tr>
<td>LPD/LPR</td>
<td>line printer daemon / line printer remote</td>
</tr>
<tr>
<td>LPT</td>
<td>line printer terminal</td>
</tr>
<tr>
<td>LVD</td>
<td>low voltage differential</td>
</tr>
<tr>
<td>MAC</td>
<td>media access control / mandatory access control</td>
</tr>
<tr>
<td>MAPI</td>
<td>messaging application programming interface</td>
</tr>
<tr>
<td>MAU</td>
<td>media access unit, media attachment unit</td>
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<td>MB</td>
<td>megabit</td>
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<td>MB</td>
<td>megabyte</td>
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<tr>
<td>MBR</td>
<td>master boot record</td>
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<tr>
<td>MBSA</td>
<td>Microsoft Baseline Security Analyzer</td>
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<tr>
<td>MCA</td>
<td>Micro Channel Architecture</td>
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<tr>
<td>MFD</td>
<td>multi-function device</td>
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<tr>
<td>MFP</td>
<td>multi-function product</td>
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<tr>
<td>MHz</td>
<td>megahertz</td>
</tr>
<tr>
<td>MicroDIMM</td>
<td>micro dual inline memory module</td>
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<tr>
<td>MIDI</td>
<td>musical instrument digital interface</td>
</tr>
<tr>
<td>MIME</td>
<td>multipurpose internet mail extension</td>
</tr>
<tr>
<td>MIMO</td>
<td>Multiple Input Multiple Output</td>
</tr>
<tr>
<td>MMC</td>
<td>Microsoft management console</td>
</tr>
<tr>
<td>MMX</td>
<td>multimedia extensions</td>
</tr>
<tr>
<td>MP3</td>
<td>Moving Picture Experts Group Layer 3 Audio</td>
</tr>
<tr>
<td>MP4</td>
<td>Moving Picture Experts Group Layer 4</td>
</tr>
<tr>
<td>MPEG</td>
<td>Moving Picture Experts Group</td>
</tr>
<tr>
<td>MSCONFIG</td>
<td>Microsoft configuration</td>
</tr>
<tr>
<td>MSDS</td>
<td>material safety data sheet</td>
</tr>
<tr>
<td>MUI</td>
<td>multilingual user interface</td>
</tr>
<tr>
<td>NAC</td>
<td>network access control</td>
</tr>
<tr>
<td>NAS</td>
<td>network-attached storage</td>
</tr>
<tr>
<td>NAT</td>
<td>network address translation</td>
</tr>
<tr>
<td>NetBIOS</td>
<td>networked basic input/output system</td>
</tr>
<tr>
<td>NetBEUI</td>
<td>networked basic input/output system extended user interface</td>
</tr>
<tr>
<td>NFS</td>
<td>network file system</td>
</tr>
<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>NIC</td>
<td>network interface card</td>
</tr>
<tr>
<td>NiCd</td>
<td>nickel cadmium</td>
</tr>
<tr>
<td>NiMH</td>
<td>nickel metal hydride</td>
</tr>
<tr>
<td>NLX</td>
<td>new low-profile extended</td>
</tr>
<tr>
<td>NNTP</td>
<td>network news transfer protocol</td>
</tr>
<tr>
<td>NTFS</td>
<td>new technology file system</td>
</tr>
<tr>
<td>NTLDR</td>
<td>new technology loader</td>
</tr>
<tr>
<td>NTP</td>
<td>Network Time Protocol</td>
</tr>
<tr>
<td>OCR</td>
<td>optical character recognition</td>
</tr>
<tr>
<td>OEM</td>
<td>original equipment manufacturer</td>
</tr>
<tr>
<td>OLED</td>
<td>Organic Light Emitting Diode</td>
</tr>
<tr>
<td>OS</td>
<td>operating system</td>
</tr>
<tr>
<td>PAN</td>
<td>personal area network</td>
</tr>
<tr>
<td>PATA</td>
<td>parallel advanced technology attachment</td>
</tr>
<tr>
<td>PC</td>
<td>personal computer</td>
</tr>
<tr>
<td>PCI</td>
<td>peripheral component interconnect</td>
</tr>
<tr>
<td>PCIe</td>
<td>peripheral component interconnect express</td>
</tr>
<tr>
<td>PCIX</td>
<td>peripheral component interconnect extended</td>
</tr>
<tr>
<td>PCL</td>
<td>printer control language</td>
</tr>
<tr>
<td>PCMCIA</td>
<td>Personal Computer Memory Card International Association</td>
</tr>
<tr>
<td>PDA</td>
<td>personal digital assistant</td>
</tr>
<tr>
<td>PGA</td>
<td>pin grid array</td>
</tr>
<tr>
<td>PGA2</td>
<td>pin grid array 2</td>
</tr>
<tr>
<td>PII</td>
<td>Personally Identifiable Information</td>
</tr>
<tr>
<td>PIN</td>
<td>personal identification number</td>
</tr>
<tr>
<td>PKI</td>
<td>public key infrastructure</td>
</tr>
<tr>
<td>PnP</td>
<td>plug and play</td>
</tr>
<tr>
<td>POP3</td>
<td>post office protocol 3</td>
</tr>
<tr>
<td>PoS</td>
<td>Point of Sale</td>
</tr>
<tr>
<td>POST</td>
<td>power-on self test</td>
</tr>
<tr>
<td>POTS</td>
<td>plain old telephone service</td>
</tr>
<tr>
<td>PPP</td>
<td>point-to-point protocol</td>
</tr>
<tr>
<td>PPTP</td>
<td>point-to-point tunneling protocol</td>
</tr>
<tr>
<td>PRI</td>
<td>primary rate interface</td>
</tr>
<tr>
<td>PROM</td>
<td>programmable read-only memory</td>
</tr>
<tr>
<td>PS/2</td>
<td>personal system/2 connector</td>
</tr>
<tr>
<td>PSTN</td>
<td>public switched telephone network</td>
</tr>
<tr>
<td>PSU</td>
<td>power supply unit</td>
</tr>
<tr>
<td>PVC</td>
<td>permanent virtual circuit</td>
</tr>
<tr>
<td>PXE</td>
<td>preboot execution environment</td>
</tr>
<tr>
<td>QoS</td>
<td>quality of service</td>
</tr>
<tr>
<td>RAID</td>
<td>redundant array of independent (or inexpensive) discs</td>
</tr>
<tr>
<td>RAM</td>
<td>random access memory</td>
</tr>
<tr>
<td>RAS</td>
<td>remote access service</td>
</tr>
</tbody>
</table>
RDRAM: RAMBUS® dynamic random access memory
RDP: Remote Desktop Protocol
RF: radio frequency
RFI: radio frequency interference
RGB: red green blue
RIMM: RAMBUS® inline memory module
RIP: routing information protocol
RIS: remote installation service
RISC: reduced instruction set computer
RJ: registered jack
RJ-11: registered jack function 11
RJ-45: registered jack function 45
RMA: returned materials authorization
ROM: read only memory
RS-232 or RS-232C: recommended standard 232
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
SGRAM: synchronous graphics random access memory
SIMM: single inline memory module
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
SP1: service pack 1
SP2: service pack 2
SP3: service pack 3
SP4: service pack 4
SPDF: Sony-Philips digital interface format
SPGA: staggered pin grid array
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRAM</td>
<td>static random access memory</td>
</tr>
<tr>
<td>SSH</td>
<td>secure shell</td>
</tr>
<tr>
<td>SSID</td>
<td>service set identifier</td>
</tr>
<tr>
<td>SSL</td>
<td>secure sockets layer</td>
</tr>
<tr>
<td>ST</td>
<td>straight tip</td>
</tr>
<tr>
<td>STP</td>
<td>shielded twisted pair</td>
</tr>
<tr>
<td>SVGA</td>
<td>super video graphics array</td>
</tr>
<tr>
<td>SXGA</td>
<td>super extended graphics array</td>
</tr>
<tr>
<td>TB</td>
<td>terabyte</td>
</tr>
<tr>
<td>TCP</td>
<td>transmission control protocol</td>
</tr>
<tr>
<td>TCP/IP</td>
<td>transmission control protocol/internet protocol</td>
</tr>
<tr>
<td>TDR</td>
<td>time domain reflectometer</td>
</tr>
<tr>
<td>TFTP</td>
<td>trivial file transfer protocol</td>
</tr>
<tr>
<td>TKIP</td>
<td>Temporal Key Integrity Protocol</td>
</tr>
<tr>
<td>TPM</td>
<td>trusted platform module</td>
</tr>
<tr>
<td>UAC</td>
<td>user account control</td>
</tr>
<tr>
<td>UART</td>
<td>universal asynchronous receiver transmitter</td>
</tr>
<tr>
<td>UDF</td>
<td>user defined functions or universal disk format or universal data format</td>
</tr>
<tr>
<td>UDMA</td>
<td>ultra direct memory access</td>
</tr>
<tr>
<td>UDP</td>
<td>user datagram protocol</td>
</tr>
<tr>
<td>UNC</td>
<td>universal naming convention</td>
</tr>
<tr>
<td>UPS</td>
<td>uninterruptible power supply</td>
</tr>
<tr>
<td>URL</td>
<td>uniform resource locator</td>
</tr>
<tr>
<td>USB</td>
<td>universal serial bus</td>
</tr>
<tr>
<td>USMT</td>
<td>user state migration tool</td>
</tr>
<tr>
<td>UTP</td>
<td>unshielded twisted pair</td>
</tr>
<tr>
<td>UXGA</td>
<td>ultra extended graphics array</td>
</tr>
<tr>
<td>VESA</td>
<td>Video Electronics Standards Association</td>
</tr>
<tr>
<td>VFAT</td>
<td>virtual file allocation table</td>
</tr>
<tr>
<td>VGA</td>
<td>video graphics array</td>
</tr>
<tr>
<td>VM</td>
<td>Virtual Machine</td>
</tr>
<tr>
<td>VoIP</td>
<td>voice over internet protocol</td>
</tr>
<tr>
<td>VPN</td>
<td>virtual private network</td>
</tr>
<tr>
<td>VRAM</td>
<td>video random access memory</td>
</tr>
<tr>
<td>WAN</td>
<td>wide area network</td>
</tr>
<tr>
<td>WAP</td>
<td>wireless application protocol</td>
</tr>
<tr>
<td>WEP</td>
<td>wired equivalent privacy</td>
</tr>
<tr>
<td>WIFI</td>
<td>wireless fidelity</td>
</tr>
<tr>
<td>WINS</td>
<td>windows internet name service</td>
</tr>
<tr>
<td>WLAN</td>
<td>wireless local area network</td>
</tr>
<tr>
<td>WPA</td>
<td>wireless protected access</td>
</tr>
<tr>
<td>WPS</td>
<td>WiFi Protected Setup</td>
</tr>
<tr>
<td>WUXGA</td>
<td>wide ultra extended graphics array</td>
</tr>
<tr>
<td>XGA</td>
<td>extended graphics array</td>
</tr>
</tbody>
</table>
**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**

- iPad tablet
- Android tablet
- Laptop
- Desktop
- Monitors
- SOHO Router/switch
- Access point
- Printer (laser/wireless)
- Power strips
- Surge suppressor
- UPS

**Spare parts/hardware**

- Motherboards
- RAM
- Hard drives
• Power supplies
• Video cards
• Sounds cards
• Network cards
• Wireless NICs
• Fans/cooling devices
• CPUs
• Connectors/cables
• Adapters
• Network cables/ connectors
• AC adapters
• Optical drives
• Jumpers/screws/ stand-offs
• Cases
• Bulk cable
• Maintenance kit

Tools

• Screw drivers
• Multimeter
• Wire cutters
• Punchdown tool
• Crimper
• Power supply tester
• Cable stripper
• POST cards
• Standard technician toolkit
• ESD strap

Software

• Operating system disks (WinXP, Vista, Windows 7)
• Antivirus software
• Virtualization software
• Anti-malware
• Driver software
• Anti-spyware