CompTIA A+ Certification Exam Objectives
Exam Number: 220-802

Introduction
In order to receive CompTIA A+ certification a candidate must pass two exams. The first exam is the CompTIA A+ 220-801 Certification Exam. The CompTIA A+ 220-802 Certification Exam is the second exam required in order for CompTIA A+ certification candidates to complete their certification.

The CompTIA A+ 220-802 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+ 220-802 certification 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+ 220-802 certification exam is based on these objectives.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Percentage of Examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Systems</td>
<td>33%</td>
</tr>
<tr>
<td>Security</td>
<td>22%</td>
</tr>
<tr>
<td>Mobile Devices</td>
<td>9%</td>
</tr>
<tr>
<td>Troubleshooting</td>
<td>36%</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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http://certification.comptia.org/Training/testingcenters/policies.aspx

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Or verify against this list:

**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 Operating Systems

1.1 Compare and contrast the features and requirements of various Microsoft Operating Systems.

- Windows XP Home, Windows XP Professional, Windows XP Media Center, Windows XP 64-bit Professional
- Windows 7 Starter, Windows 7 Home Premium, Windows 7 Professional, Windows 7 Ultimate, Windows 7 Enterprise
- Features:
  - 32-bit vs. 64-bit
  - Aero, gadgets, user account control, bit-locker, shadow copy, system restore, ready boost, sidebar, compatibility mode, XP mode, easy transfer, administrative tools, defender, Windows firewall, security center, event viewer, file structure and paths, category view vs. classic view
- Upgrade paths – differences between in place upgrades, compatibility tools, Windows upgrade OS advisor

1.2 Given a scenario, install, and configure the operating system using the most appropriate method.

- Boot methods
  - USB
  - CD-ROM
  - DVD
  - PXE
- Type of installations
  - Creating image
  - Unattended installation
  - Upgrade
  - Clean install
  - Repair installation
  - Multiboot
  - Remote network installation
  - Image deployment
- Partitioning
  - Dynamic
  - Basic
  - Primary
  - Extended
  - Logical
- File system types/formatting
  - FAT
  - FAT32
  - NTFS
  - CDFS
  - Quick format vs. full format
- Load alternate third party drivers when necessary
- Workgroup vs. Domain setup
- Time/date/region/language settings
- Driver installation, software and windows updates
- Factory recovery partition

1.3 Given a scenario, use appropriate command line tools.
- Networking
  - PING
  - TRACERT
  - NETSTAT
  - IPCONFIG
  - NET
  - NSLOOKUP
  - NBTSTAT

- OS
  - TASKKILL
  - BOOTREC
  - SHUTDOWN
  - TASKLIST
  - MD
  - RD
  - CD
  - DEL
  - FORMAT
  - COPY
  - XCOPY
  - ROBOCOPY
  - DISKPART
  - SFC
  - CHKDSK
  - [command name] /?

- Recovery console
  - Fixboot
  - Fixmbr

1.4 Given a scenario, use appropriate operating system features and tools.

- Administrative
  - Computer management
  - Device manager
  - Users and groups
  - Local security policy
  - Performance monitor
  - Services
  - System configuration
  - Task scheduler
  - Component services
  - Data sources
  - Print management
  - Windows memory diagnostics
  - Windows firewall
  - Advanced security

- MSCONFIG
  - General
  - Boot
  - Services
  - Startup
  - Tools

- Task Manager
  - Applications
  - Processes
1.5 **Given a scenario, use Control Panel utilities** (the items are organized by “classic view/large icons” in Windows).

- **Common to all Microsoft Operating Systems**
  - Internet options
    - Connections
    - Security
    - General
    - Privacy
    - Programs
    - Advanced
  - Display/Display Settings
    - Resolution
  - User accounts
  - Folder options
    - View hidden files
    - Hide extensions
    - General options
    - View options
  - System
    - Performance (virtual memory)
    - Remote settings
    - System protection
  - Windows firewall
  - Power options
    - Hibernate
    - Power plans
    - Sleep/suspend
    - Standby

- **Disk management**
  - Drive status
  - Mounting
  - Extending partitions
  - Splitting partitions
  - Assigning drive letters
  - Adding drives
  - Adding arrays

- **Other**
  - User State Migration tool (USMT), File and Settings Transfer Wizard, Windows Easy Transfer

- **Performance**
- **Networking**
- **Users**
  - Disk management
    - Drive status
    - Mounting
    - Extending partitions
    - Splitting partitions
    - Assigning drive letters
    - Adding drives
    - Adding arrays

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The CompTIA A+ 220-802 Objectives are subject to change without notice.
• Unique to Windows XP
  o Add/remove programs
  o Network connections
  o Printers and faxes
  o Automatic updates
  o Network setup wizard
• Unique to Vista
  o Tablet PC settings
  o Pen and input devices
  o Offline files
  o Problem reports and solutions
  o Printers
• Unique to Windows 7
  o HomeGroup
  o Action Center
    ▪ Security Center
  o Remote Applications and Desktop Connections
  o Troubleshooting

1.6 Setup and configure Windows networking on a client/desktop.
• HomeGroup, file/print sharing
• WorkGroup vs. domain setup
• Network shares/mapping drives
• Establish networking connections
  o VPN
  o Dialups
  o Wireless
  o Wired
  o WWAN (Cellular)
• Proxy settings
• Remote desktop
• Home vs. Work vs. Public network settings
• Firewall settings
  o Exceptions
  o Configuration
  o Enabling/disabling Windows firewall
• Configuring an alternative IP address in Windows
  o IP addressing
  o Subnet mask
  o DNS
  o Gateway
• Network card properties
  o Half duplex/full duplex/auto
  o Speed
  o Wake-on-LAN
  o QoS

1.7 Perform preventive maintenance procedures using appropriate tools.
• Best practices
  o Schedules backups
  o Scheduled check disks
  o Scheduled defragmentation
  o Windows updates
  o Patch management
1.8 Explain the differences among basic OS security settings.

- User and groups
  - Administrator
  - Power user
  - Guest
  - Standard user
- NTFS vs. Share permissions
  - Allow vs. deny
  - Moving vs. copying folders and files
  - File attributes
- Shared files and folders
  - Administrative shares vs. local shares
  - Permission propagation
  - Inheritance
- System files and folders
- User authentication
  - Single sign-on

1.9 Explain the basics of client-side virtualization.

- Purpose of virtual machines
- Resource requirements
- Emulator requirements
- Security requirements
- Network requirements
- Hypervisor

2.0 Security

2.1 Apply and use common prevention methods.

- Physical security
  - Lock doors
  - Tailgating
  - Securing physical documents/passwords/shredding
  - Biometrics
  - Badges
  - Key fobs
  - RFID badge
  - Tokens
  - Privacy filters
  - Retinal
- Digital security
  - Antivirus
  - Firewalls
  - Antispyware
  - User authentication/strong passwords
2.2 **Compare and contrast common security threats.**
- Social engineering
- Malware
- Rootkits
- Phishing
- Shoulder surfing
- Spyware
- Viruses
  - Worms
  - Trojans

2.3 **Implement security best practices to secure a workstation.**
- Setting strong passwords
- Requiring passwords
- Restricting user permissions
- Changing default user names
- Disabling guest account
- Screensaver required password
- Disable autorun

2.4 **Given a scenario, use the appropriate data destruction/disposal method.**
- Low level format vs. standard format
- Hard drive sanitation and sanitation methods
  - Overwrite
  - Drive wipe
- Physical destruction
  - Shredder
  - Drill
  - Electromagnetic
  - Degaussing tool

2.5 **Given a scenario, secure a SOHO wireless network.**
- Change default user-names and passwords
- Changing SSID
- Setting encryption
- Disabling SSID broadcast
- Enable MAC filtering
- Antenna and access point placement
- Radio power levels
- Assign static IP addresses

2.6 **Given a scenario, secure a SOHO wired network.**
- Change default usernames and passwords
- Enable MAC filtering
- Assign static IP addresses
- Disabling ports
- Physical security

### 3.0 Mobile Devices

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3.1 Explain the basic features of mobile operating systems.
   - Android 4.0.x vs. iOS 5.x
     - Open source vs. closed source/vendor specific
     - App source (app store and market)
     - Screen orientation (accelerometer/gyroscope)
     - Screen calibration
     - GPS and geotracking

3.2 Establish basic network connectivity and configure email.
   - Wireless / cellular data network (enable/disable)
   - Bluetooth
     - Enable Bluetooth
     - Enable pairing
     - Find device for pairing
     - Enter appropriate pin code
     - Test connectivity
   - Email configuration
     - Server address
       - POP3
       - IMAP
       - Port and SSL settings
     - Exchange
     - Gmail

3.3 Compare and contrast methods for securing mobile devices.
   - Passcode locks
   - Remote wipes
   - Locator applications
   - Remote backup applications
   - Failed login attempts restrictions
   - Antivirus
   - Patching/OS updates

3.4 Compare and contrast hardware differences in regards to tablets and laptops.
   - No field serviceable parts
   - Typically not upgradeable
   - Touch interface
     - Touch flow
     - Multitouch
   - Solid state drives

3.5 Execute and configure mobile device synchronization.
   - Types of data to synchronize
     - Contacts
     - Programs
     - Email
     - Pictures
     - Music
     - Videos
   - Software requirements to install the application on the PC
   - Connection types to enable synchronization

4.0 Troubleshooting
4.1 Given a scenario, explain the troubleshooting theory.
   • Identify the problem
     ○ Question the user and identify user changes to computer and perform backups before making changes
   • Establish a theory of probable cause (question the obvious)
   • Test the theory to determine cause
     ○ Once theory is confirmed determine next steps to resolve problem
     ○ If theory is not confirmed re-establish new theory or escalate
   • Establish a plan of action to resolve the problem and implement the solution
   • Verify full system functionality and if applicable implement preventive measures
   • Document findings, actions and outcomes

4.2 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
     ○ BSOD
   • Tools
     ○ Multimeter
     ○ Power supply tester
     ○ Loopback plugs
     ○ POST card

4.3 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
     ○ BSOD
   • Tools
     ○ Screwdriver
     ○ External enclosures
     ○ CHKDSK
     ○ FORMAT
     ○ File recovery software

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4.4 Given a scenario, troubleshoot common video and display issues.
   • Common symptoms
     o VGA mode
     o No image on screen
     o Overheat shutdown
     o Dead pixels
     o Artifacts
     o Color patterns incorrect
     o Dim image
     o Flickering image
     o Distorted image
     o Discoloration (degaussing)
     o BSOD

4.5 Given a scenario, troubleshoot wired and wireless networks with appropriate tools.
   • Common symptoms
     o No connectivity
     o APIPA address
     o Limited connectivity
     o Local connectivity
     o Intermittent connectivity
     o IP conflict
     o Slow transfer speeds
     o Low RF signal
   • Tools
     o Cable tester
     o Loopback plug
     o Punch down tools
     o Toner probes
     o Wire strippers
     o Crimper
     o PING
     o IPCONFIG
     o TRACERT
     o NETSTAT
     o NBTSTAT
     o NET
     o Wireless locator

4.6 Given a scenario, troubleshoot operating system problems with appropriate tools.
   • Common symptoms
     o BSOD
     o Failure to boot
     o Improper shutdown
     o Spontaneous shutdown/restart
     o RAID not detected during installation
     o Device fails to start
     o Missing dll message
     o Services fails to start
     o Compatibility error
     o Slow system performance
     o Boots to safe mode
     o File fails to open
     o Missing NTLDR
     o Missing Boot.ini
• Missing operating system
• Missing Graphical Interface
• Graphical Interface fails to load
• Invalid boot disk

• Tools
  o Fixboot
  o Recovery console
  o Fixmbr
  o Sfc
  o Repair disks
  o Pre-installation environments
  o MSCONFIG
  o.DEFRAG
  o REGSRV32
  o REGEDIT
  o Event viewer
  o Safe mode
  o Command prompt
  o Emergency repair disk
  o Automated system recovery

4.7 Given a scenario, troubleshoot common security issues with appropriate tools and best practices.

• Common symptoms
  o Pop-ups
  o Browser redirection
  o Security alerts
  o Slow performance
  o Internet connectivity issues
  o PC locks up
  o Windows updates failures
  o Rogue antivirus
  o Spam
  o Renamed system files
  o Files disappearing
  o File permission changes
  o Hijacked email
  o Access denied

• Tools
  o Anti-virus software
  o Anti-malware software
  o Anti-spyware software
  o Recovery console
  o System restore
  o Pre-installation environments
  o Event viewer

• Best practices for malware removal
  o Identify malware symptoms
  o Quarantine infected system
  o Disable system restore
  o RemEDIATE infected systems
    ▪ Update anti-virus software
    ▪ Scan and removal techniques (safe mode, pre-installation environment)
  o Schedule scans and updates
4.8 Given a scenario, troubleshoot, and repair common laptop issues while adhering to the appropriate procedures.
- Common symptoms
  - No display
  - Dim display
  - Flickering display
  - Sticking keys
  - Intermittent wireless
  - Battery not charging
  - Ghost cursor
  - No power
  - Num lock indicator lights
  - No wireless connectivity
  - No Bluetooth connectivity
  - Cannot display to external monitor
- Disassembling processes for proper re-assembly
  - Document and label cable and screw locations
  - Organize parts
  - Refer to manufacturer documentation
  - Use appropriate hand tools

4.9 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
- Tools
  - Maintenance kit
  - Toner vacuum
  - Compressed air
  - Printer spooler
**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>AMD</td>
<td>advanced micro devices</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>
</tr>
<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>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>
<tr>
<td>CPU</td>
<td>central processing unit</td>
</tr>
<tr>
<td>CRIMM</td>
<td>Continuity Rambus Inline Memory Mode</td>
</tr>
<tr>
<td>CRT</td>
<td>cathode-ray tube</td>
</tr>
<tr>
<td>DAC</td>
<td>discretionary access control</td>
</tr>
<tr>
<td>DB-25</td>
<td>serial communications D-shell connector, 25 pins</td>
</tr>
<tr>
<td>DB-9</td>
<td>9 pin D shell connector</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC</td>
<td>direct current</td>
</tr>
<tr>
<td>DDOS</td>
<td>distributed denial of service</td>
</tr>
<tr>
<td>DDR</td>
<td>double data-rate</td>
</tr>
<tr>
<td>DDR RAM</td>
<td>double data-rate random access memory</td>
</tr>
<tr>
<td>DDR SDRAM</td>
<td>double data-rate synchronous dynamic random access memory</td>
</tr>
<tr>
<td>DFS</td>
<td>distributed file system</td>
</tr>
<tr>
<td>DHCP</td>
<td>dynamic host configuration protocol</td>
</tr>
<tr>
<td>DIMM</td>
<td>dual inline memory module</td>
</tr>
<tr>
<td>DIN</td>
<td>Deutsche Industrie Norm</td>
</tr>
<tr>
<td>DIP</td>
<td>dual inline package</td>
</tr>
<tr>
<td>DLT</td>
<td>digital linear tape</td>
</tr>
<tr>
<td>DLP</td>
<td>digital light processing</td>
</tr>
<tr>
<td>DMA</td>
<td>direct memory access</td>
</tr>
<tr>
<td>DMZ</td>
<td>demilitarized zone</td>
</tr>
<tr>
<td>DNS</td>
<td>domain name service or domain name server</td>
</tr>
<tr>
<td>DOS</td>
<td>denial of service</td>
</tr>
<tr>
<td>DRAM</td>
<td>dynamic random access memory</td>
</tr>
<tr>
<td>DSL</td>
<td>digital subscriber line</td>
</tr>
<tr>
<td>DVD</td>
<td>digital video disc or digital versatile disc</td>
</tr>
<tr>
<td>DVD-RAM</td>
<td>digital video disc-random access memory</td>
</tr>
<tr>
<td>DVD-ROM</td>
<td>digital video disc-read only memory</td>
</tr>
<tr>
<td>DVD-R</td>
<td>digital video disc-recordable</td>
</tr>
<tr>
<td>DVD-RW</td>
<td>digital video disc-rewritable</td>
</tr>
<tr>
<td>DVI</td>
<td>digital visual interface</td>
</tr>
<tr>
<td>ECC</td>
<td>error correction code</td>
</tr>
<tr>
<td>ECP</td>
<td>extended capabilities port</td>
</tr>
<tr>
<td>EEPROM</td>
<td>electrically erasable programmable read-only memory</td>
</tr>
<tr>
<td>EFS</td>
<td>encrypting file system</td>
</tr>
<tr>
<td>EIDE</td>
<td>enhanced integrated drive electronics</td>
</tr>
<tr>
<td>EMI</td>
<td>electromagnetic interference</td>
</tr>
<tr>
<td>EMP</td>
<td>electromagnetic pulse</td>
</tr>
<tr>
<td>EPROM</td>
<td>erasable programmable read-only memory</td>
</tr>
<tr>
<td>EPP</td>
<td>enhanced parallel port</td>
</tr>
<tr>
<td>ERD</td>
<td>emergency repair disk</td>
</tr>
<tr>
<td>ESD</td>
<td>electrostatic discharge</td>
</tr>
<tr>
<td>EVGA</td>
<td>extended video graphics adapter/array</td>
</tr>
<tr>
<td>EVDO</td>
<td>evolution data optimized or evolution data only</td>
</tr>
<tr>
<td>FAT</td>
<td>file allocation table</td>
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<tr>
<td>FAT12</td>
<td>12-bit file allocation table</td>
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<tr>
<td>FAT16</td>
<td>16-bit file allocation table</td>
</tr>
<tr>
<td>FAT32</td>
<td>32-bit file allocation table</td>
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<tr>
<td>FDD</td>
<td>floppy disk drive</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
</tr>
<tr>
<td>---------</td>
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</tr>
<tr>
<td>Fn</td>
<td>Function (referring to the function key on a laptop)</td>
</tr>
<tr>
<td>FPM</td>
<td>fast page-mode</td>
</tr>
<tr>
<td>FRU</td>
<td>field replaceable unit</td>
</tr>
<tr>
<td>FSB</td>
<td>Front Side Bus</td>
</tr>
<tr>
<td>FTP</td>
<td>file transfer protocol</td>
</tr>
<tr>
<td>FQDN</td>
<td>fully qualified domain name</td>
</tr>
<tr>
<td>Gb</td>
<td>gigabit</td>
</tr>
<tr>
<td>GB</td>
<td>gigabyte</td>
</tr>
<tr>
<td>GDI</td>
<td>graphics device interface</td>
</tr>
<tr>
<td>GHz</td>
<td>gigahertz</td>
</tr>
<tr>
<td>GUI</td>
<td>graphical user interface</td>
</tr>
<tr>
<td>GPS</td>
<td>global positioning system</td>
</tr>
<tr>
<td>GSM</td>
<td>global system for mobile communications</td>
</tr>
<tr>
<td>HAL</td>
<td>hardware abstraction layer</td>
</tr>
<tr>
<td>HAV</td>
<td>Hardware Assisted Virtualization</td>
</tr>
<tr>
<td>HCL</td>
<td>hardware compatibility list</td>
</tr>
<tr>
<td>HDD</td>
<td>hard disk drive</td>
</tr>
<tr>
<td>HDMI</td>
<td>high definition media interface</td>
</tr>
<tr>
<td>HPFS</td>
<td>high performance file system</td>
</tr>
<tr>
<td>HTML</td>
<td>hypertext markup language</td>
</tr>
<tr>
<td>HTPC</td>
<td>Home Theater PC</td>
</tr>
<tr>
<td>HTTP</td>
<td>hypertext transfer protocol</td>
</tr>
<tr>
<td>HTTPS</td>
<td>hypertext transfer protocol over secure sockets layer</td>
</tr>
<tr>
<td>I/O</td>
<td>input/output</td>
</tr>
<tr>
<td>ICMP</td>
<td>internet control message protocol</td>
</tr>
<tr>
<td>ICR</td>
<td>intelligent character recognition</td>
</tr>
<tr>
<td>IDE</td>
<td>integrated drive electronics</td>
</tr>
<tr>
<td>IDS</td>
<td>Intrusion Detection System</td>
</tr>
<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers</td>
</tr>
<tr>
<td>IIS</td>
<td>Internet Information Services</td>
</tr>
<tr>
<td>IMAP</td>
<td>internet mail access protocol</td>
</tr>
<tr>
<td>IP</td>
<td>internet protocol</td>
</tr>
<tr>
<td>IPCONFIG</td>
<td>internet protocol configuration</td>
</tr>
<tr>
<td>IPP</td>
<td>internet printing protocol</td>
</tr>
<tr>
<td>IPS</td>
<td>Intrusion prevention system</td>
</tr>
<tr>
<td>IPSEC</td>
<td>internet protocol security</td>
</tr>
<tr>
<td>IR</td>
<td>infrared</td>
</tr>
<tr>
<td>IrDA</td>
<td>Infrared Data Association</td>
</tr>
<tr>
<td>IRQ</td>
<td>interrupt request</td>
</tr>
<tr>
<td>ISA</td>
<td>industry standard architecture</td>
</tr>
<tr>
<td>ISDN</td>
<td>integrated services digital network</td>
</tr>
<tr>
<td>ISO</td>
<td>Industry Standards Organization</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Definition</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</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>
</tr>
<tr>
<td>LED</td>
<td>light emitting diode</td>
</tr>
<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>
</tr>
<tr>
<td>Mb</td>
<td>megabit</td>
</tr>
<tr>
<td>MB</td>
<td>megabyte</td>
</tr>
<tr>
<td>MBR</td>
<td>master boot record</td>
</tr>
<tr>
<td>MBSA</td>
<td>Microsoft Baseline Security Analyzer</td>
</tr>
<tr>
<td>MFD</td>
<td>multi-function device</td>
</tr>
<tr>
<td>MHz</td>
<td>megahertz</td>
</tr>
<tr>
<td>MicroDIMM</td>
<td>micro dual inline memory module</td>
</tr>
<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>MS CONFIG</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>NIC</td>
<td>network interface card</td>
</tr>
</tbody>
</table>
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
OWA   Outlook Web Access
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
PDA   personal digital assistant
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
PoE   Power over Ethernet
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
PROM  programmable read-only memory
PS/2  personal system/2 connector
PSTN  public switched telephone network
PSU   power supply unit
PVC   permanent virtual circuit
PXE   preboot execution environment
QoS   quality of service
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<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>
<tr>
<td>RDRAM</td>
<td>RAMBUS® dynamic random access memory</td>
</tr>
<tr>
<td>RDP</td>
<td>Remote Desktop Protocol</td>
</tr>
<tr>
<td>RF</td>
<td>radio frequency</td>
</tr>
<tr>
<td>RFI</td>
<td>radio frequency interference</td>
</tr>
<tr>
<td>RGB</td>
<td>red green blue</td>
</tr>
<tr>
<td>RIMM</td>
<td>RAMBUS® inline memory module</td>
</tr>
<tr>
<td>RIP</td>
<td>routing information protocol</td>
</tr>
<tr>
<td>RIS</td>
<td>remote installation service</td>
</tr>
<tr>
<td>RISC</td>
<td>reduced instruction set computer</td>
</tr>
<tr>
<td>RJ</td>
<td>registered jack</td>
</tr>
<tr>
<td>RJ-11</td>
<td>registered jack function 11</td>
</tr>
<tr>
<td>RJ-45</td>
<td>registered jack function 45</td>
</tr>
<tr>
<td>RMA</td>
<td>returned materials authorization</td>
</tr>
<tr>
<td>ROM</td>
<td>read only memory</td>
</tr>
<tr>
<td>RS-232 or RS-232C</td>
<td>recommended standard 232</td>
</tr>
<tr>
<td>RTC</td>
<td>real-time clock</td>
</tr>
<tr>
<td>SAN</td>
<td>storage area network</td>
</tr>
<tr>
<td>SAS</td>
<td>Serial Attached SCSI</td>
</tr>
<tr>
<td>SATA</td>
<td>serial advanced technology attachment</td>
</tr>
<tr>
<td>SC</td>
<td>subscription channel</td>
</tr>
<tr>
<td>SCP</td>
<td>secure copy protection</td>
</tr>
<tr>
<td>SCSI</td>
<td>small computer system interface</td>
</tr>
<tr>
<td>SCSI ID</td>
<td>small computer system interface identifier</td>
</tr>
<tr>
<td>SD card</td>
<td>secure digital card</td>
</tr>
<tr>
<td>SDRAM</td>
<td>synchronous dynamic random access memory</td>
</tr>
<tr>
<td>SEC</td>
<td>single edge connector</td>
</tr>
<tr>
<td>SFC</td>
<td>system file checker</td>
</tr>
<tr>
<td>SFF</td>
<td>Small Form Factor</td>
</tr>
<tr>
<td>SGRAM</td>
<td>synchronous graphics random access memory</td>
</tr>
<tr>
<td>SIMM</td>
<td>single inline memory module</td>
</tr>
<tr>
<td>SLI</td>
<td>scalable link interface</td>
</tr>
<tr>
<td>S.M.A.R.T.</td>
<td>self-monitoring, analysis, and reporting technology</td>
</tr>
<tr>
<td>SMB</td>
<td>server message block or small to midsize business</td>
</tr>
<tr>
<td>SMTP</td>
<td>simple mail transfer protocol</td>
</tr>
<tr>
<td>SNMP</td>
<td>simple network management protocol</td>
</tr>
<tr>
<td>SoDIMM</td>
<td>small outline dual inline memory module</td>
</tr>
<tr>
<td>SOHO</td>
<td>small office/home office</td>
</tr>
<tr>
<td>SP</td>
<td>service pack</td>
</tr>
<tr>
<td>SP1</td>
<td>service pack 1</td>
</tr>
</tbody>
</table>
SP2  service pack 2
SP3  service pack 3
SP4  service pack 4
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
SVGA  super video graphics array
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
TSR  Terminate and stay resident
UAC  user account control
UART  universal asynchronous receiver transmitter
UDMA  ultra direct memory access
UDP  user datagram protocol
UNC  universal naming convention
UPS  uninterruptible power supply
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 application protocol
WEP  wired equivalent privacy
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

CompTIA A+ 220-802 Objectives version6
• 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