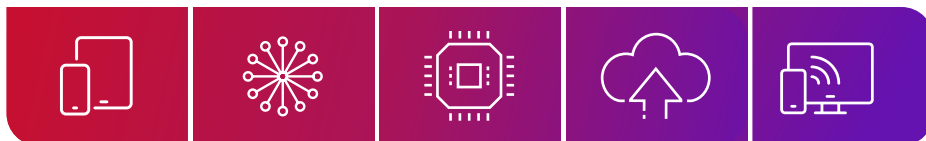




CompTIA A+ Certification Exam Objectives

EXAM NUMBER: CORE 1 (220-1201) V15



About the Exam

Candidates are encouraged to use this document to help prepare for the CompTIA A+ 220-1201 certification exam. In order to receive the CompTIA A+ certification, you must pass two exams: Core 1 (220-1201) and Core 2 (220-1202). The CompTIA A+ Core 1 (220-1201) and Core 2 (220-1202) certification exams will verify the successful candidate has the knowledge and skills required to:

- Install, configure, and maintain computer equipment, mobile devices, and software for end users.
- Service components based on customer requirements.
- Understand networking basics and apply basic cybersecurity methods to mitigate threats.
- Properly and safely diagnose, resolve, and document common hardware and software issues.
- Apply troubleshooting skills and provide customer support using appropriate communication skills.
- Understand the basics of scripting, cloud technologies, virtualization, and multi-OS deployments in corporate environments.

EXAM ACCREDITATION

The CompTIA A+ Core 1 (220-1201) and Core 2 (220-1202) exams are accredited by ANSI to show compliance with the ISO 17024 standard and, as such, undergo 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 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 | A+ Core 1 (220-1201) |
| Number of questions | Maximum of 90 |
| Types of questions | Multiple-choice and performance-based |
| Length of test | 90 minutes |
| Recommended experience | 12 months of hands-on experience in an IT support specialist job role |
| Passing Score | 675 (on a scale of 100–900) |

EXAM OBJECTIVES (DOMAINS)

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

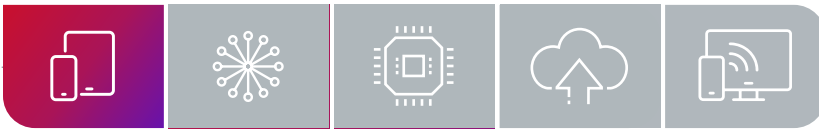
| DOMAIN | | PERCENTAGE OF EXAMINATION |
|--------|--------------------------------------|---------------------------|
| 1.0 | Mobile Devices | 13% |
| 2.0 | Networking | 23% |
| 3.0 | Hardware | 25% |
| 4.0 | Virtualization and Cloud Computing | 11% |
| 5.0 | Hardware and Network Troubleshooting | 28% |
| Total | | 100% |

TROUBLESHOOTING METHODOLOGY KNOWLEDGE

During the job task analysis workshop for the A+ 220-1200 series, subject matter experts deemed the troubleshooting methodology an effective best practice that new job incumbents should be aware of and leverage as they engage in troubleshooting new issues on the job. However, while this methodology is practical, the decision was made to not include it in the exam. While the methodology itself will not be tested, there remains an emphasis on troubleshooting within the job role context. Therefore, the troubleshooting methodology section appears here as part of this “competency standard” but does not constitute a formal objective or part of the A+ certification exam. Training institutions that prepare individuals with very little technical knowledge and experience are encouraged to leverage this methodology, especially when such individuals might be applying for their first IT job.

The troubleshooting methodology includes the following steps:

- Identify the problem.
- Establish a theory of probable cause (question the obvious).
 - Research knowledge base/internet, if applicable.
- Test the theory to determine the cause.
- 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/lessons learned, actions, and outcomes.



1.0 Mobile Devices

1.1 Given a scenario, monitor mobile device hardware and use appropriate replacement techniques.

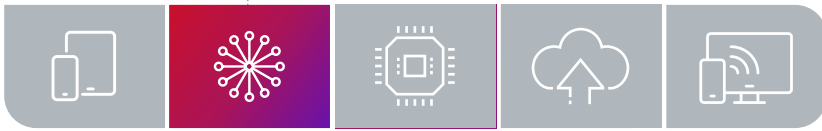
- Battery
- Keyboard/keys
- Random-access memory (RAM)
- Hard disk drive (HDD)/solid-state drive (SSD)
- Wireless cards
- Physical privacy and security components
 - Biometrics
 - Near-field scanner features
- Wi-Fi antenna connector/placement
- Camera/webcam
- Microphone

1.2 Compare and contrast accessories and connectivity options for mobile devices.

- Connection methods
 - Universal Serial Bus (USB)/USB-C/microUSB/miniUSB
 - Lightning
 - Near-field communication (NFC)
 - Bluetooth
 - Tethering/hotspot
- Docking station
- Port replicator
- Trackpad/drawing pad/track points
- Accessories
 - Stylus
 - Headsets
 - Speakers
 - Webcam

1.3 Given a scenario, configure basic mobile device network connectivity and provide application support.

- Wireless/cellular data network (enable/disable)
 - 3G/4G/5G
 - Hotspot
 - Wi-Fi
 - Subscriber Identity Module (SIM)/eSIM
- Location services
 - Global positioning system (GPS) services
 - Cellular location services
- Mobile device management (MDM)
 - Device configurations
 - Corporate
 - Bring your own device (BYOD)
 - Policy enforcement
 - Corporate applications
- Mobile device synchronization
 - Recognizing data caps
 - Calendar
- Contacts
- Business applications
 - Mail
 - Cloud storage



2.0 Networking

2.1 Compare and contrast Transmission Control Protocol (TCP) and User Datagram Protocol (UDP) ports, protocols, and their purposes.

- Ports and protocols
 - 20-21 – File Transfer Protocol (FTP)
 - 22 – Secure Shell (SSH)
 - 23 – Telnet
 - 25 – Simple Mail Transfer Protocol (SMTP)
 - 53 – Domain Name System (DNS)
 - 67/68 – Dynamic Host Configuration Protocol (DHCP)
 - 80 – Hypertext Transfer Protocol (HTTP)
 - 110 – Post Office Protocol 3 (POP3)
 - 143 – Internet Mail Access Protocol (IMAP)
 - 137-139 Network Basic Input/Output System (NetBIOS)/NetBIOS over TCP/IP (NetBT)
 - 389 – Lightweight Directory Access Protocol (LDAP)
 - 443 – Hypertext Transfer Protocol Secure (HTTPS)
 - 445 – Server Message Block (SMB)/Common Internet File System (CIFS)
 - 3389 – Remote Desktop Protocol (RDP)
- TCP vs. UDP

2.2 Explain wireless networking technologies.

- Frequencies
 - 2.4GHz
 - 5GHz
 - 6GHz
- Channels
 - Regulations
 - Channel selection
 - Widths
 - Frequencies
 - Bands
- Bluetooth
- 802.11 standards
- NFC
- Radio-frequency identification (RFID)

2.3 Summarize services provided by networked hosts.

- Server roles
 - DNS
 - DHCP
 - Fileshare
 - Print servers
 - Mail servers
 - Syslog
 - Web servers
 - Authentication, Authorization, and Accounting (AAA)
 - Database servers
 - Network Time Protocol (NTP)
- Internet appliances
 - Spam gateways
 - Unified threat management (UTM)
 - Load balancers
 - Proxy servers
- Legacy/embedded systems
 - Supervisory control and data acquisition (SCADA)
- Internet of Things (IoT) devices



2.4 Explain common network configuration concepts.

- DNS
 - A
 - AAAA
 - Canonical Name (CNAME)
 - Mail exchanger (MX)
 - Text (TXT)
 - Spam management
 - DomainKeys Identified Mail (DKIM)
 - Sender Policy Framework (SPF)
- Domain-based Message Authentication, Reporting, and Conformance (DMARC)
- DHCP
 - Leases
 - Reservations
 - Scope
 - Exclusions
- Virtual LAN [local area network] (VLAN)
- Virtual private network (VPN)

2.5 Compare and contrast common networking hardware devices.

- Routers
- Switches
 - Managed
 - Unmanaged
- Access points
- Patch panel
- Firewall
- Power over Ethernet (PoE)
 - Injectors
 - Switch
 - PoE standards
- Cable modem
- Digital subscriber line (DSL)
- Optical network terminal (ONT)
- Network interface card (NIC)
 - Physical media access control (MAC) address

2.6 Given a scenario, configure basic wired/wireless small office/home office (SOHO) networks.

- Internet Protocol (IP) addressing
 - IPv4
 - Private addresses
 - Public addresses
 - IPv6
 - Automatic Private IP Addressing (APIPA)
 - Static
 - Dynamic
 - Subnet mask
 - Gateway

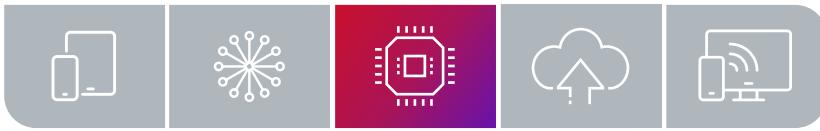


2.7 Compare and contrast internet connection types, network types, and their characteristics.

- Internet connection types
 - Satellite
 - Fiber
 - Cable
 - DSL
 - Cellular
 - Wireless internet service provider (WISP)
- Network types
 - LAN
 - Wide area network (WAN)
 - Personal area network (PAN)
 - Metropolitan area network (MAN)
 - Storage area network (SAN)
 - Wireless local area network (WLAN)

2.8 Explain networking tools and their purposes.

- Crimper
- Cable stripper
- Wi-Fi analyzer
- Toner probe
- Punchdown tool
- Cable tester
- Loopback plug
- Network tap



3.0 Hardware

3.1 Compare and contrast display components and attributes.

- **Types**
 - Liquid crystal display (LCD)
 - In-plane switching (IPS)
 - Twisted nematic (TN)
 - Vertical alignment (VA)
 - Organic light-emitting diode (OLED)
 - Mini light-emitting diode (Mini-LED)
- Touch screen/digitizer
- **Inverter**
- **Attributes**
 - Pixel density
 - Refresh rates
 - Screen resolution
 - Color gamut

3.2 Summarize basic cable types and their connectors, features, and purposes.

- **Network cables**
 - Copper
 - Categories
 - T568A/T568B standards
 - Coaxial
 - Shielded twisted pair
 - Direct burial
 - Unshielded twisted pair
 - Plenum-rated
 - Optical
 - Single-mode
 - Multimode
- **Peripheral cables**
 - USB 2.0
 - USB 3.0
 - Serial
- Thunderbolt
- **Video cables**
 - High-definition Multimedia Interface (HDMI)
 - DisplayPort
 - Digital Visual Interface (DVI)
 - Video Graphics Array (VGA)
 - USB-C
- **Hard drive cables**
 - Serial Advanced Technology Attachment (SATA)
 - External SATA (eSATA)
- **Adapters**
- **Connector types**
 - RJ11
 - RJ45
 - F-type
 - Straight tip (ST)
 - Subscriber connector (SC)
 - Lucent connector (LC)
 - Punchdown block
 - MicroUSB
 - MiniUSB
 - USB-C
 - Molex
 - Lightning
 - DB9

3.3 Compare and contrast RAM characteristics.

- **Form factors**
 - Small Outline Dual In-line Memory Module (SODIMM)
 - Dual In-line Memory Module (DIMM)
- Double Data Rate (DDR) iterations
- Error-correcting code (ECC) vs. non-ECC RAM
- Channel configurations



3.4 Compare and contrast storage devices.

- Hard drives
 - Spindle speeds
 - Form factors
 - 2.5-inch
 - 3.5-inch
- Solid-state drives
 - Communications interfaces
 - Non-volatile Memory Express (NVMe)
 - SATA
- Peripheral Component Interconnect Express (PCIe)
- Serial Attached SCSI [Small Computer System Interface] (SAS)
- Form factors
 - M.2
 - Mini-serial Advanced Technology Attachment (mSATA)
- Drive configurations
 - Redundant Array of Independent Disks (RAID) 0, 1, 5, 6, 10
- Removable storage
 - Flash drives
 - Memory cards
- Optical drives

3.5 Given a scenario, install and configure motherboards, central processing units (CPUs), and add-on cards.

- Motherboard form factors
 - Advanced Technology Extended (ATX)
 - microATX
 - Information Technology eXtended (ITX)
- Motherboard connector types
 - Peripheral Component Interconnect (PCI)
 - PCIe
 - Power connectors
 - SATA
 - eSATA
 - Headers
 - M.2
- Motherboard compatibility
 - CPU socket types
 - Advanced Micro Devices, Inc. (AMD)
 - Intel
 - Multisocket
- BIOS/Unified Extensible Firmware Interface (UEFI) settings
 - Boot options
 - USB permissions
 - Trusted Platform Module (TPM) security features
 - Fan considerations
 - Secure Boot
 - Boot password
 - BIOS password
 - Temperature monitoring
- Virtualization support
- Encryption
 - TPM
 - Hardware security module (HSM)
- CPU architecture
 - x86/x64
 - Advanced RISC [Reduced Instruction Set Computer] Machine (ARM)
 - Core configurations
- Expansion cards
 - Sound card
 - Video card
 - Capture card
 - Network interface card
- Cooling
 - Fans
 - Heat sink
 - Thermal paste/pads
 - Liquid

3.6 Given a scenario, install the appropriate power supply.

- Input 110–120 VAC vs. 220–240 VAC
- Output 3.3V vs. 5V vs. 12V
- 20+4 pin motherboard connector
- Redundant power supply
- Modular power supply
- Wattage rating
- Energy efficiency

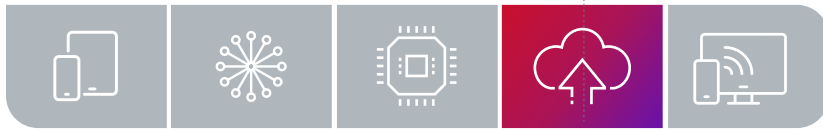


3.7 Given a scenario, deploy and configure multifunction devices/printers and settings.

- Properly unbox device and consider set-up location
- Use appropriate drivers for a given operating system
 - Printer Control Language (PCL) vs. postscript
- Firmware
- Device connectivity
 - USB
 - Ethernet
 - Wireless
- Public/shared devices
 - Printer share
 - Print server
- Configuration settings
 - Duplex
 - Orientation
 - Tray settings
 - Quality
- Security
 - User authentication
 - Badging
- Audit logs
- Secured prints
- Network scan services
 - Email
 - SMB
 - Cloud services
- Automatic document feeder (ADF)/flatbed scanner

3.8 Given a scenario, perform appropriate printer maintenance.

- Laser
 - Maintenance: Replace toner, apply maintenance kit, calibrate, and clean
- Inkjet
 - Ink cartridge, printhead, roller, and feeder
 - Maintenance: Clean printheads, replace cartridges, calibrate, and clear jams
- Thermal
 - Feed assembly
 - Special thermal paper
 - Maintenance: Replace paper, clean heating element, and remove debris
- Impact
 - Multipart paper
 - Maintenance: Replace ribbon, printhead, and paper



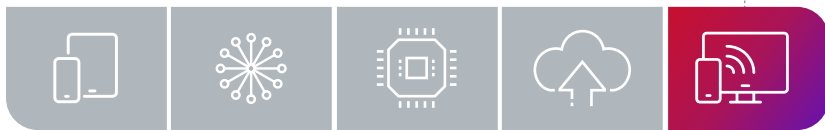
4.0 Virtualization and Cloud Computing

4.1 Explain virtualization concepts.

- Purpose of virtual machines
 - Sandbox
 - Test development
 - Application virtualization
 - Legacy software/OS
 - Cross-platform virtualization
- Requirements
 - Security
 - Network
 - Storage
- Desktop virtualization
 - Virtual Desktop Infrastructure (VDI)
- Containers
- Hypervisors
 - Type 1
 - Type 2

4.2 Summarize cloud computing concepts.

- Common cloud models
 - Private cloud
 - Public cloud
 - Hybrid cloud
 - Community cloud
 - Infrastructure as a service (IaaS)
 - Software as a service (SaaS)
 - Platform as a service (PaaS)
- Cloud characteristics
 - Shared resources vs. dedicated resources
 - Metered utilization
 - Ingress/egress
 - Elasticity
 - Availability
 - File synchronization
 - Multitenancy



5.0 Hardware and Network Troubleshooting

5.1 Given a scenario, troubleshoot motherboards, RAM, CPUs, and power.

- Common symptoms
 - Power-on self-test (POST) beeps
 - Proprietary crash screens
 - Blank screen
 - No power
 - Sluggish performance
 - Overheating
 - Burning smell
 - Random shutdown
 - Application crashes
 - Unusual noise
 - Capacitor swelling
 - Inaccurate system date/time

5.2 Given a scenario, troubleshoot drive and RAID issues.

- Common symptoms
 - Light-emitting diode (LED) status indicators
 - Grinding noises
 - Clicking sounds
 - Bootable device not found
 - Data loss/corruption
 - RAID failure
 - Self-monitoring and Reporting Technology (S.M.A.R.T.) failure
 - Extended read/write times
 - Low performance input/output operations per second (IOPS)
 - Missing drives in OS
 - Array missing
 - Audible alarms

5.3 Given a scenario, troubleshoot video, projector, and display issues.

- Common symptoms
 - Incorrect input source
 - Physical cabling issues
 - Burnt-out bulb
 - Fuzzy image
 - Display burn-in
 - Dead pixels
 - Flashing screen
 - Incorrect color display
 - Audio issues
 - Dim image
 - Intermittent projector shutdown
 - Sizing issues
 - Distorted image

5.4 Given a scenario, troubleshoot common mobile device issues.

- Common symptoms
 - Poor battery health
 - Swollen battery
 - Broken screen
 - Improper charging
 - Poor/no connectivity
 - Liquid damage
 - Overheating
 - Digitizer issues
 - Physically damaged ports
 - Malware
 - Cursor drift/touch calibration
 - Unable to install new applications
 - Stylus does not work
 - Degraded performance



5.5 Given a scenario, troubleshoot network issues.

- Common symptoms
 - Intermittent wireless connectivity
 - Slow network speeds
 - Limited connectivity
 - Jitter
 - Poor Voice over Internet Protocol (VoIP) quality
- Port flapping
- High latency
- External interference
- Authentication failures
- Intermittent internet connectivity

5.6 Given a scenario, troubleshoot printer issues.

- Lines down the printed pages
- Garbled print
- Paper jams
- Faded prints
- Paper not feeding
- Multipage misfeed
- Multiple prints pending in queue
- Speckling on printed pages
- Double/echo images on the print
- Grinding noise
- Finishing issues
 - Staple jams
 - Hole punch
- Incorrect page orientation
- Tray not recognized
- Connectivity issues
- Frozen print queue

CompTIA A+ Core 1 (220-1201) Acronym List

The following is a list of acronyms that appears on the CompTIA Core 1 (220-1201) exam. Candidates are encouraged to review the complete list and attain a working knowledge of all listed acronyms as part of a comprehensive exam preparation program.

| ACRONYM | DEFINITION |
|---------|---|
| AAA | Authentication, Authorization, and Accounting |
| ACL | Access Control List |
| ADF | Automatic Document Feeder |
| AES | Advanced Encryption Standard |
| AMD | Advanced Micro Devices, Inc. |
| AP | Access Point |
| APFS | Apple File System |
| APIPA | Automatic Private Internet Protocol Addressing |
| ARM | Advanced RISC [Reduced Instruction Set Computer] Machine |
| ATX | Advanced Technology Extended |
| AUP | Acceptable Use Policy |
| BEC | Business Email Compromise |
| BIOS | Basic Input/Output System |
| BNC | Bayonet Neill-Concelman |
| BSOD | Blue Screen of Death |
| BYOD | Bring Your Own Device |
| CAC | Calling-card Authorization Computer |
| CIFS | Common Internet File System |
| CMDB | Configuration Management Database |
| CMOS | Complementary Metal-Oxide Semiconductor |
| CNAME | Canonical Name |
| CPU | Central Processing Unit |
| DB-9 | Serial Communications D-Shell Connector, 9 pins |
| DDoS | Distributed Denial of Service |
| DDR | Double Data Rate |
| DHCP | Dynamic Host Configuration Protocol |
| DIMM | Dual In-line Memory Module |
| DKIM | DomainKeys Identified Mail |
| DLP | Data Loss Prevention |
| DMARC | Domain-based Message Authentication, Reporting, and Conformance |
| DNS | Domain Name System |
| DoS | Denial of Service |
| DRM | Digital Rights Management |
| DSL | Digital Subscriber Line |
| DVI | Digital Visual Interface |
| ECC | Error-correcting Code |
| EDR | Endpoint Detection and Response |
| EFS | Encrypting File System |
| EOL | End-of-life |
| eSATA | External Serial Advanced Technology Attachment |
| ESD | Electrostatic Discharge |
| EULA | End-user License Agreement |

| ACRONYM | DEFINITION |
|----------------|---|
| exFAT | Extended File Allocation Table |
| FAT32 | 32-bit File Allocation Table |
| FRT | Facial Recognition Technology |
| FTP | File Transfer Protocol |
| GFS | Grandfather-Father-Son |
| GPS | Global Positioning System |
| GPT | GUID [Globally Unique Identifier] Partition Table |
| GPU | Graphics Processing Unit |
| GUID | Globally Unique Identifier |
| HD | High Definition |
| HDD | Hard Disk Drive |
| HDMI | High-definition Media Interface |
| HSM | Hardware Security Module |
| HTTP | Hypertext Transfer Protocol |
| HTTPS | Hypertext Transfer Protocol Secure |
| IaaS | Infrastructure as a Service |
| IAM | Identity and Access Management |
| IMAP | Internet Mail Access Protocol |
| IOPS | Input/Output Operations Per Second |
| IoT | Internet of Things |
| IP | Internet Protocol |
| IPS | In-plane Switching |
| IR | Infrared |
| ISO | International Organization for Standardization |
| ITX | Information Technology eXtended |
| KVM | Keyboard-Video-Mouse |
| LAN | Local Area Network |
| LC | Lucent Connector |
| LCD | Liquid Crystal Display |
| LDAP | Lightweight Directory Access Protocol |
| LED | Light-emitting Diode |
| LTE | Long-Term Evolution |
| MAC | Media Access Control |
| MAN | Metropolitan Area Network |
| MBR | Master Boot Record |
| MDM | Mobile Device Management |
| MDR | Managed Detection and Response |
| MFA | Multifactor Authentication |
| MFP | Multifunction Printer |
| MMC | Microsoft Management Console |
| MNDA | Mutual Non-disclosure Agreement |
| mSATA | Mini-serial Advanced Technology Attachment |
| MSDS | Material Safety Data Sheet |
| MX | Mail Exchange |
| NAC | Network Access Control |
| NDA | Non-disclosure Agreement |
| NetBIOS | Network Basic Input/Output System |
| NFC | Near-field Communication |
| NIC | Network Interface Card |
| NTFS | New Technology File System |
| NTP | Network Time Protocol |
| NVMe | Non-volatile Memory Express |
| OLED | Organic Light-emitting Diode |
| ONT | Optical Network Terminal |

| ACRONYM | DEFINITION |
|----------------|---|
| OS | Operating System |
| OTP | One-time Password (or Passcode) |
| PaaS | Platform as a Service |
| PAM | Privileged Access Management |
| PAN | Personal Area Network |
| PC | Personal Computer |
| PCI | Peripheral Component Interconnect |
| PCIe | Peripheral Component Interconnect Express |
| PCL | Printer Command Language |
| PII | Personally Identifiable Information |
| PIN | Personal Identification Number |
| PIV | Personal Identity Verification |
| PoE | Power over Ethernet |
| POP | Post Office Protocol |
| POST | Power-on Self-test |
| PSU | Power Supply Unit |
| PUP | Potentially Unwanted Program |
| PXE | Preboot eXecution Environment |
| QoS | Quality of Service |
| RADIUS | Remote Authentication Dial-in User Server |
| RAID | Redundant Array of Independent Disks |
| RAM | Random-access Memory |
| RDP | Remote Desktop Protocol |
| ReFS | Resilient File System |
| RFID | Radio-frequency Identification |
| RGB | Red-Green-Blue |
| RISC | Reduced Instruction Set Computer |
| RJ11 | Registered Jack Function 11 |
| RJ45 | Registered Jack Function 45 |
| RMM | Remote Monitoring and Management |
| RPM | Revolutions Per Minute |
| RSR | Rapid Security Response |
| SaaS | Software as a Service |
| SAML | Security Assertions Markup Language |
| SAN | Storage Area Network |
| SAS | Serial Attached SCSI [Small Computer System Interface] |
| SATA | Serial Advanced Technology Attachment |
| SC | Subscriber Connector |
| SCADA | Supervisory Control and Data Acquisition |
| SCSI | Small Computer System Interface |
| SD | Secure Digital |
| SFTP | Secure File Transfer Protocol |
| SIM | Subscriber Identity Module |
| SLA | Service-level Agreement |
| S.M.A.R.T | Self-monitoring Analysis and Reporting Technology |
| SMB | Server Message Block |
| SMS | Short Message Service |
| SMTP | Simple Mail Transfer Protocol |
| SODIMM | Small Outline Dual In-line Memory Module |
| SOHO | Small Office/Home Office |
| SOP | Standard Operating Procedure |
| SPF | Sender Policy Framework |
| SPICE | Software Process Improvement and Capability Determination |
| SQL | Structured Query Language |

| ACRONYM | DEFINITION |
|----------------|--|
| SSD | Solid-state Drive |
| SSH | Secure Shell |
| SSID | Service Set Identifier |
| SSO | Single Sign-on |
| ST | Straight Tip |
| TACACS | Terminal Access Controller Access-control System |
| TCP | Transmission Control Protocol |
| TKIP | Temporal Key Integrity Protocol |
| TN | Twisted Nematic |
| TOTP | Time-based One-time Password |
| TPM | Trusted Platform Module |
| TXT | Text |
| UAC | User Account Control |
| UDP | User Datagram Protocol |
| UEFI | Unified Extensible Firmware Interface |
| UPnP | Universal Plug and Play |
| UPS | Uninterruptible Power Supply |
| USB | Universal Serial Bus |
| USB-C | Universal Serial Bus Type C |
| UTM | Unified Threat Management |
| VA | Vertical Alignment |
| VDI | Virtual Desktop Infrastructure |
| VGA | Video Graphics Array |
| VLAN | Virtual LAN [Local Area Network] |
| VM | Virtual Machine |
| VNC | Virtual Network Computer |
| VoIP | Voice over Internet Protocol |
| VPN | Virtual Private Network |
| VRAM | Video Random-access Memory |
| WAN | Wide Area Network |
| WAP | Wireless Access Point |
| WinRM | Windows Remote Management |
| WISP | Written Internet Service Provider |
| WLAN | Wireless LAN [Local Area Network] |
| WPA | Wi-Fi Protected Access |
| WWAN | Wireless Wide Area Network |
| XaaS | Anything As A Service |
| XDR | Extended Detection and Response |
| XFS | Extended File System |
| XXS | Cross-site Scripting |

CompTIA A+ Core 1 (220-1201) Hardware and Software List

CompTIA has included this sample list of hardware and software to assist candidates as they prepare for the A+ Core 1 (220-1201) certification exam. This list may also be helpful for training companies that wish to create a lab component for their training offering. The bulleted lists below each topic are sample lists and are not exhaustive.

EQUIPMENT

- Apple tablet/smartphone
- Android tablet/smartphone
- Windows tablet
- Chromebook
- Windows laptop/Mac laptop/Linux laptop
- Windows desktop/Mac desktop/Linux desktop
- Windows server with Active Directory and Print Manager
- Monitors
- Projectors
- SOHO router/switch
- Access point
- VoIP phone
- Printer
 - Laser/inkjet
 - Wireless
 - 3-D printer
 - Thermal
- Surge suppressor
- UPS
- Smart devices (IoT devices)
- Server with a hypervisor
- Punchdown block
- Patch panel
- Webcams
- Speakers
- Microphones

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
 - DisplayPort
 - DVI
 - VGA
- Adapters
 - Bluetooth adapter
- Network cables
- Underterminated network cable/connectors
- AC adapters
- Optical drives
- Screws/stand-offs
- Cases
- Maintenance kit
- Mice/keyboards
- Keyboard-Video-Mouse (KVM)
- Console cable
- SSD

TOOLS

- Screwdrivers
- Multimeter
- Wire cutters
- Punchdown tool
- Crimper
- Power supply tester
- Cable stripper
- Standard technician toolkit
- Electrostatic discharge (ESD) strap
- Thermal paste
- Cable tester
- Cable toner
- Wi-Fi analyzer
- Serial Advanced Technology Attachment (SATA) to USB connectors

SOFTWARE

- Operating systems
 - Linux