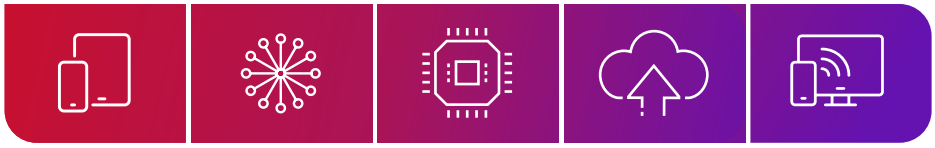
CompTIA A+ Certification Exam Objectives

EXAM NUMBER: CORE 1 (220-1201)



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.

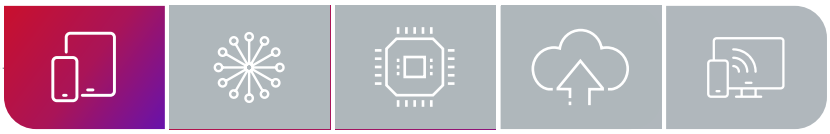
DOMAIN		PERCENTAGE OF EXAMINATION
1.0	Mobile Devices	13%
2.0	Networking	23%
3.0	Hardware	25%
4.0	Virtualization and Cloud Computing	11%
5.0	Hardware and Network Troubleshooting	28%
Total		**100%**

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.

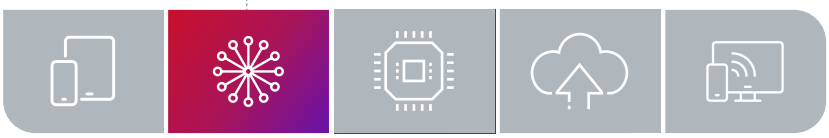
- Battery
- Keyboard/keys
- Random-access memory (RAM)
- Hard disk drive (HDD)/solid-state drive (SSD)
- Wireless cards
- Physical privacy and security components
  - Biometrics
  - Near-field scanner features
- Wi-Fi antenna connector/placement
- Camera/webcam
- Microphone

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
- Accessories
  - Stylus
  - Headsets
  - Speakers
  - Webcam
- Docking station
- Port replicator
- Trackpad/drawing pad/track points

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
- Bluetooth
  - Enable Bluetooth
  - Enable pairing
  - Find a device for pairing
  - Enter the appropriate personal identification number (PIN) code
  - Test connectivity
- 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.

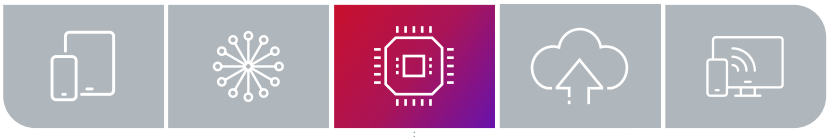
- Internet Protocol (IP) addressing
  - IPv4
    - Private addresses
    - Public addresses
  - IPv6
  - Automatic Private IP Addressing (APIPA)
  - Static
  - Dynamic
  - Subnet mask
  - Gateway

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

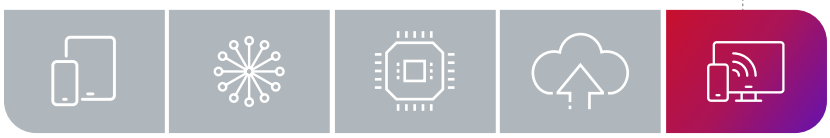
4.0 Virtualization and Cloud Computing

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
AAAA	Authentication, Authorization, Accounting, and Auditing
ACL	Access Control List
ADF	Automatic Document Feeder
AES	Advanced Encryption Standard
AMD	Advanced Micro Devices, Inc.
APFS	Apple File System
APIPA	Automatic Private Internet Protocol Addressing
ARM	Advanced RISC [Reduced Instruction Set Computer] Machine
ATX	Advanced Technology Extended
BEC	Business Email Compromise
BIOS	Basic Input/Output System
BSOD	Blue Screen of Death
BYOD	Bring Your Own Device
CAC	Calling-card Authorization Computer
CIFS	Common Internet File System
CMDB	Configuration Management Database
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
exFAT	Extended File Allocation Table
FAT32	32-bit File Allocation Table

ACRONYM	DEFINITION
FRT	Facial Recognition Technology
FTP	File Transfer Protocol
GFS	Grandfather-Father-Son
GPS	Global Positioning System
GPT	GUID [Globally Unique Identifier] Partition Table
GUID	Globally Unique Identifier
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
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
MAC	Media Access Control
MAN	Metropolitan Area Network
MBR	Master Boot Record
MDM	Mobile Device Management
MDR	Managed Detection and Response
MFA	Multifactor Authentication
MMC	Microsoft Management Console
MNDA	Mutual Non-disclosure Agreement
mSATA	Mini-serial Advanced Technology Attachment
MSDS	Material Safety Data Sheet
MX	Mail Exchange
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
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

ACRONYM	DEFINITION
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
PUP	Potentially Unwanted Program
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
RJ11	Registered Jack Function 11
RJ45	Registered Jack Function 45
RMM	Remote Monitoring and Management
RSR	Rapid Security Response
SaaS	Software as a Service
SAN	Storage Area Network
SAML	Security Assertions Markup Language
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
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
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
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

ACRONYM	DEFINITION
UTM	Unified Threat Management
VA	Vertical Alignment
VDI	Virtual Desktop Infrastructure
VGA	Video Graphics Array
VLAN	Virtual LAN [Local Area Network]
VNC	Virtual Network Computer
VoIP	Voice over Internet Protocol
VPN	Virtual Private Network
VRAM	Video Random-access Memory
WAN	Wide Area Network
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
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
- Sounds cards
- Network cards
- Wireless NICs
- Fans/cooling devices/heat sink
- CPUs
- Assorted connectors/cables
  - USB
  - HDMI
  - DisplayPort
  - DVI
  - VGA
- Adapters
  - Bluetooth adapter
- Network cables
- Unterminated 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

CompTIA