



# CompTIA A+ Certification Exam Objectives

**Exam Number: 220-901** 

### Introduction

In order to receive CompTIA A+ certification a candidate must pass two exams. The first exam is CompTIA A+ 220-901 Certification Exam. The CompTIA A+ 220-901 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
- Apply troubleshooting skills
- 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+ 220-901 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+ 220-901 exam is based on these objectives.

Domain	Percentage of Examination
1.0 Hardware	34%
2.0 Networking	21%
3.0 Mobile Devices	17%
4.0 Hardware & Network Troubleshooting	28%
Total	100%

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\*\*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 Hardware

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

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

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

- Sizes
  - $\circ$  ATX
  - o Micro-ATX
  - o Mini-ITX
  - o ITX
- Expansion slots
  - o PCI
  - o PCI-X
  - o PCIe
  - o miniPCI
- RAM slots
- CPU sockets
- Chipsets
  - o North Bridge
  - o South Bridge
- CMOS battery
- Power connections and types
- Fan connectors
- Front/Top panel connectors
  - o USB
  - o Audio
  - o Power button
  - o Power light
  - o Drive activity lights
  - Reset button

#### • Bus speeds

#### 1.3 Compare and contrast various RAM types and their features.

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

#### 1.4 Install and configure PC expansion cards.

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

## 1.5 Install and configure storage devices and use appropriate media.

- Optical drives
  - o CD-ROM / CD-RW
  - O DVD-ROM / DVD-RW / DVD-RW DL
  - o Blu-Ray
  - o BD-R
  - o BD-RE
- Magnetic hard disk drives
  - o 5400 rpm
  - o 7200 rpm
  - o 10,000 rpm
- Hot swappable drives
  - Solid state/flash drives
    - Compact flash
    - o SD
    - o Micro-SD
    - o Mini-SD
    - $\circ$  xD
    - o SSD
    - Hybrid
    - o eMMC
- RAID types

- $\circ$  0
- 0 1
- 0 5
- 0 10
- Tape drive
- Media capacity
  - o CD
  - CD-RW
  - o DVD-RW
  - o DVD
  - o Blu-Ray
  - o Tape
  - o DVD DL

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

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

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

- Physical connections
  - o USB 1.1 vs. 2.0 vs. 3.0
    - Connector types: A, B, mini, micro
  - o Firewire 400 vs. Firewire 800
  - o SATA1 vs. SATA2 vs. SATA3, eSATA
  - Other connector types
    - VGA
    - HDMI
    - DVI
    - Audio
      - Analog
      - Digital (Optical connector)
    - RJ-45
    - RJ-11
    - Thunderbolt
- Wireless connections
  - Bluetooth
  - RF
  - o IR

- o NFC
- Characteristics
  - Analog
  - o Digital
  - o Distance limitations
  - Data transfer speeds
  - Quality
  - Frequencies

#### 1.8 Install a power supply based on given specifications.

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

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

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

- Home Server PC
  - o Media streaming
  - o File sharing
  - o Print sharing
  - o Gigabit NIC
  - o RAID array

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

- Types
  - o LCD
    - TN vs. IPS
    - Fluorescent vs. LED backlighting
  - o Plasma
  - Projector
  - o OLED
- Refresh / frame rates
- Resolution
- Native resolution
- Brightness/lumens
- Analog vs. digital
- Privacy/antiglare filters
- Multiple displays
- Aspect ratios
  - 0 16:9
  - 0 16:10
  - o 4:3

#### 1.11 Identify common PC connector types and associated cables.

- Display connector types
  - o DVI-D
  - o DVI-I
  - o DVI-A
  - DisplayPort
  - o RCA
  - o HD15 (i.e. DE15 or DB15)
  - o BNC
  - $\circ \quad miniHDMI$
  - o miniDin-6
- Display cable types
  - o HDMI
  - o DVI
  - o VGA
  - Component
  - o Composite
  - Coaxial
- Device cables and connectors
  - o SATA
  - o eSATA
  - o USB
  - o Firewire (IEEE1394)
  - o PS/2
  - o Audio
- Adapters and convertors
  - o DVI to HDMI

- o USB A to USB B
- USB to Ethernet
- o DVI to VGA
- Thunderbolt to DVI
- PS/2 to USB
- o HDMI to VGA

#### 1.12 Install and configure common peripheral devices.

- Input devices
  - o Mouse
  - o Keyboard
  - Scanner
  - Barcode reader
  - Biometric devices
  - o Game pads
  - Joysticks
  - o Digitizer
  - Motion sensor
  - Touch pads
  - Smart card readers
  - Digital cameras
  - o Microphone
  - o Webcam
  - Camcorder
- Output devices
  - o Printers
  - Speakers
  - Display devices
- Input & Output devices
  - Touch screen
  - $\circ$  KVM
  - o Smart TV
  - o Set-Top Box
  - MIDI enabled devices

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

- Use appropriate drivers for a given operating system
  - Configuration settings
    - Duplex
    - Collate
    - Orientation
    - Quality
- Device sharing
  - o Wired
    - USB
    - Serial
    - Ethernet
  - Wireless
    - Bluetooth
    - 802.11(a,b,g,n,ac)
    - Infrastructure vs. adhoc
  - o Integrated print server (hardware)
  - Cloud printing/remote printing
- Public/shared devices
  - Sharing local/networked device via Operating System settings

- TCP/Bonjour/AirPrint
- Data privacy
  - User authentication on the device
  - Hard drive caching

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

- Laser
  - o 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
  - o Ink cartridge, print head, roller, feeder, duplexing assembly, carriage and belt
  - o Calibration
- Thermal
  - o Feed assembly, heating element
  - o Special thermal paper
- Impact
  - o Print head, ribbon, tractor feed
  - Impact paper
- Virtual
  - o Print to file
  - Print to PDF
  - o Print to XPS
  - Print to image

#### 1.15 Given a scenario, perform appropriate 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
- Inkjet
  - o Clean heads, replace cartridges, calibration, clear jams

# 2.0 Networking

#### 2.1 Identify the various types of network cables and connectors.

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

#### 2.2 Compare and contrast the characteristics of connectors and cabling.

- Fiber
  - o Types (single-mode vs. multi-mode)
  - Speed and transmission limitations
- Twisted pair
  - Types: STP, UTP, CAT3, CAT5, CAT5e, CAT6, CAT6e, CAT7, plenum, PVC

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- o Speed and transmission limitations
- Splitters and effects on signal quality
- Coaxial
  - o Types: RG-6, RG-59
  - Speed and transmission limitations
  - Splitters and effects on signal quality

### 2.3 Explain the properties and characteristics of TCP/IP.

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

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

- Ports
  - $\circ \quad 21-FTP$
  - o 22 SSH
  - o 23 TELNET
  - 25 SMTP
  - o 53 DNS
  - o 80 HTTP
  - o 110 POP3
  - o 143 IMAP
  - o 443 HTTPS
  - o 3389 RDP
  - o 137-139 NetBIOS/NetBT
  - $\circ$  445 SMB/CIFS
  - o 427 SLP
  - o 548 AFP
- Protocols
  - o DHCP
  - o DNS
  - o LDAP
  - o SNMP
  - o SMB
  - o CIFS
  - o SSH
  - AFP
- TCP vs. UDP

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

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

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

- Channels
- Port forwarding, port triggering

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- DHCP (on/off)
- DMZ
- NAT / DNAT
- Basic QoS
- Firmware
- UPnP

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

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

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

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

#### 2.9 Given a scenario, use appropriate networking tools.

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

#### 3.0 Mobile Devices

#### 3.1 Install and configure laptop hardware and components.

- Expansion options
  - o Express card /34

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

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

- Types
  - o LCD
    - TN vs. IPS
    - Fluorescent vs. LED backlighting
  - OLED
- Wi-Fi antenna connector/placement
- Webcam
- Microphone
- Inverter
- Digitizer

#### 3.3 Given a scenario, use appropriate laptop features.

- Special function keys
  - Dual displays
  - Wireless (on/off)
  - o Cellular (on/off)
  - Volume settings
  - Screen brightness
  - o Bluetooth (on/off)
  - Keyboard backlight
  - o Touch pad (on/off)
  - o Screen orientation
  - o Media options (fast forward/rewind)
  - o GPS (on/off)
  - Airplane mode

- Docking station
- Physical laptop lock and cable lock
- Rotating / removable screens

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

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

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

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

# 4.0 Hardware and Network Troubleshooting

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

- Common symptoms
  - Unexpected shutdowns
  - System lockups
  - o POST code beeps
  - o Blank screen on bootup
  - o BIOS time and settings resets
  - Attempts to boot to incorrect device
  - Continuous reboots
  - o No power
  - Overheating
  - Loud noise
  - o Intermittent device failure
  - Fans spin no power to other devices
  - Indicator lights
  - Smoke

- o Burning smell
- Proprietary crash screens (BSOD/pin wheel)
- o Distended capacitors
- Tools
  - Multimeter
  - Power supply tester
  - Loopback plugs
  - o POST card / USB

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

- Common symptoms
  - o Read/write failure
  - o Slow performance
  - Loud clicking noise
  - Failure to boot
  - o Drive not recognized
  - OS not found
  - RAID not found
  - o RAID stops working
  - o Proprietary crash screens (BSOD/pin wheel)
  - o S.M.A.R.T. errors
- Tools
  - Screwdriver
  - o External enclosures
  - CHKDSK
  - o FORMAT
  - o File recovery software
  - o Bootrec
  - o Diskpart
  - o Defragmentation tool

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

- Common symptoms
  - o VGA mode
  - o No image on screen
  - o Overheat shutdown
  - o Dead pixels
  - Artifacts
  - o Color patterns incorrect
  - o Dim image
  - Flickering image
  - o Distorted image
  - Distorted geometry
  - o Burn-in
  - Oversized images and icons

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

- Common symptoms
  - No connectivity
  - o APIPA/link local address
  - Limited connectivity
  - Local connectivity
  - Intermittent connectivity
  - IP conflict
  - Slow transfer speeds

- Low RF signal
- SSID not found
- Hardware tools
  - Cable tester
  - Loopback plug
  - Punch down tools
  - Tone generator and probe
  - o Wire strippers
  - Crimper
  - Wireless locator
- Command line tools
  - o PING
  - IPCONFIG/IFCONFIG
  - o TRACERT
  - o NETSTAT
  - o NBTSTAT
  - NET
  - o NETDOM
  - o NSLOOKUP

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

- Common symptoms
  - No display
  - Dim display
  - Flickering display
  - Sticking keys
  - Intermittent wireless
  - Battery not charging
  - Ghost cursor/pointer drift
  - No power
  - o Num lock indicator lights
  - No wireless connectivity
  - No Bluetooth connectivity
  - Cannot display to external monitor
  - Touchscreen non-responsive
  - Apps not loading
  - Slow performance
  - o Unable to decrypt email
  - Extremely short battery life
  - Overheating
  - Frozen system
  - No sound from speakers
  - o GPS not functioning
  - Swollen battery
- Disassembling processes for proper re-assembly
  - Document and label cable and screw locations
  - Organize parts
  - o Refer to manufacturer resources
  - Use appropriate hand tools

#### 4.6 Given a scenario, troubleshoot printers with appropriate tools.

- Common symptoms
  - Streaks
  - o Faded prints

- o Ghost images
- o Toner not fused to the paper
- Creased paper
- Paper not feeding
- o Paper jam
- o No connectivity
- Garbled characters on paper
- Vertical lines on page
- o Backed up print queue
- Low memory errors
- Access denied
- o Printer will not print
- o Color prints in wrong print color
- Unable to install printer
- Error codes
- o Printing blank pages
- No image on printer display
- Tools
  - o Maintenance kit
  - o Toner vacuum
  - o Compressed air
  - o Printer spooler

# 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.

Acronym	Definition
AC	alternating current
ACL	access control list
ACPI	advanced configuration power interface
ACT	activity
ADSL	asymmetrical digital subscriber line
AGP	accelerated graphics port
AHCI	Advanced host controller interface
AP	Access point
APIPA	automatic private internet protocol addressing
APM	advanced power management
ARP	address resolution protocol
ASR	automated system recovery
ATA	advanced technology attachment
ATAPI	advanced technology attachment packet interface

ATM asynchronous transfer mode
ATX advanced technology extended

AUP Acceptable Use Policy

A/V Audio Video

BIOS basic input/output system

BNC Bayonet-Neill-Concelman or British Naval Connector

BTX balanced technology extended

CAPTCHA Completely Automated Public Turing Test To Tell Computers and Humans

'"` Apart

CCFL Cold Cathode Fluorescent Lamp

CD compact disc

CD-ROM compact disc-read-only memory

CD-RW compact disc-rewritable CDFS compact disc file system

CFS Central File System, Common File System, Command File System

CIFS Common Internet File System

CMOS complementary metal-oxide semiconductor
CNR Communications and Networking Riser
COMx communication port (x=port number)

CPU central processing unit 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

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

DRM Digital Rights Management 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 correcting code/error checking and correction

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

EULA End User License Agreement

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

HAV 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

IMEI International Mobile Equipment Identity
IMSI International Mobile Subscriber Identity

IP internet protocol

IPCONFIG internet protocol configuration
IPP internet printing protocol
IPS In-plane Switching

IPSEC Internet Protocol Security

IR Infrared

IrDA Infrared Data Association IRP Incident Response Plan

IRQ Interrupt Request

ISDN Integrated Services Digital Network

ISO International Organization for Standardization/Industry Standards

Organization

ISP Internet Service Provider
JBOD Just a Bunch of Disks

Kb Kilobit

KB Kilobyte or Knowledge Base

LAN Local Area Network

LBA Logical Block Addressing

LC Lucent Connector
LCD liquid Crystal Display

LDAP lightweight directory access protocol

LED light emitting diode

Li-on lithium-ion

LPD/LPR line printer daemon / line printer remote

LPT line printer terminal LVD low voltage differential

MAC media access control / mandatory access control
MAPI messaging application programming interface
MAU media access unit, media attachment unit

Mb megabit MB megabyte

MBR master boot record

MBSA Microsoft Baseline Security Analyzer

MFD multi-function device MFP multi-function product

MHz megahertz

MicroDIMM micro dual inline memory module
MIDI musical instrument digital interface
MIME multipurpose internet mail extension

MIMO Multiple Input Multiple Output MMC Microsoft management console

MP3 Moving Picture Experts Group Layer 3 Audio

MP4 Moving Picture Experts Group Layer 4

MPEG Moving Picture Experts Group

MSCONFIG Microsoft configuration
MSDS material safety data sheet
MUI multilingual user interface
NAC network access control
NAS network-attached storage
NAT network address translation

NetBIOS networked basic input/output system

NetBEUI networked basic input/output system extended user interface

NFS network file system
NIC network interface card

NiCd nickel cadmium

NiMH nickel metal hydride

NLX new low-profile extended

NNTP network news transfer protocol
NTFS new technology file system
NTLDR new technology loader
NTP Network Time Protocol

OCR optical character recognition
OEM original equipment manufacturer
OLED Organic Light Emitting Diode

OS operating system
PAN personal area network

PATA parallel advanced technology attachment

PC personal computer

PCI peripheral component interconnect

PCIe peripheral component interconnect express PCIX peripheral component interconnect extended

PCL printer control language

PCMCIA Personal Computer Memory Card International Association

PE Preinstallation Environment

PGA pin grid array PGA2 pin grid array 2

PII Personally Identifiable Information

PIN personal identification number

PKI public key infrastructure

PnP plug and play

POP3 post office protocol 3

PoS Point of Sale
POST power-on self test

POTS plain old telephone service PPP point-to-point protocol

PPTP point-to-point tunneling protocol

PRI primary rate interface

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

RAID redundant array of independent (or inexpensive) discs

RAM random access memory
RAS remote access service
RDP Remote Desktop Protocol

RF radio frequency

RFI radio frequency interference

RGB red green blue

RIP routing information protocol RIS remote installation service

RISC reduced instruction set computer

RJ-11 registered jack function 11
RJ-45 registered jack function 45
RMA returned materials authorization

ROM read only memory RTC real-time clock

SAN storage area network SAS Serial Attached SCSI

SATA serial advanced technology attachment

SC subscription channel SCP secure copy protection

SCSI small computer system interface

SCSI ID small computer system interface identifier

SD card secure digital card

SDRAM synchronous dynamic random access memory

SEC single edge connector
SFC system file checker
SFF Small Form Factor

SLI scalable link interface or system level integration or scanline interleave mode

S.M.A.R.T. self-monitoring, analysis, and reporting technology SMB server message block or small to midsize business

SMTP simple mail transfer protocol

SNMP simple network management protocol
SoDIMM small outline dual inline memory module

SOHO small office/home office

SP service pack

SPDIF Sony-Philips digital interface format

SPGA staggered pin grid array

SRAM static random access memory

SSH secure shell

SSID service set identifier SSL secure sockets layer

ST straight tip

STP shielded twisted pair

SXGA super extended graphics array

TB terabyte

TCP transmission control protocol

TCP/IP transmission control protocol/internet protocol

TDR time domain reflectometer TFTP trivial file transfer protocol

TKIP Temporal Key Integrity Protocol

TPM trusted platform module UAC user account control

UDF user defined functions or universal disk format or universal data format

UDP user datagram protocol

UEFI Unified Extensible Firmware Interface

UNC universal naming convention
UPS uninterruptible power supply
URL uniform resource locator
USB universal serial bus

USB universal serial bus
USMT user state migration tool
UTP unshielded twisted pair

UXGA ultra extended graphics array

VESA Video Electronics Standards Association

VFAT virtual file allocation table VGA video graphics array VM Virtual Machine

VoIP voice over internet protocol VPN virtual private network

VRAM video random access memory

WAN wide area network

WAP wireless access protocol/wireless access point

WEP wired equivalent privacy

WIFI wireless fidelity

WINS windows internet name service
WLAN wireless local area network
WPA wireless protected access
WPS WiFi Protected Setup

WUXGA wide ultra extended graphics array

XGA extended graphics array
ZIF zero-insertion-force
ZIP zigzag inline package

## A+ Proposed Hardware and Software List

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

## **Equipment**

- Apple tablet / Smart phone
- Android tablet / Smart phone
- Windows tablet / Smart phone
- Windows Laptop / Mac Laptop / Linux Laptop
- Windows Desktop / Mac Desktop / Linux Desktop
- Monitors
- Projectors
- SOHO Router/switch
- Access point
- VoIP phone
- Printer
  - Laser / Inkjet
  - Wireless
- Surge suppressor
- UPS

## Spare parts/hardware

- Motherboards
- RAM
- Hard drives
- Power supplies

- Video cards
- Sounds cards
- Network cards
- Wireless NICs
- Fans/cooling devices/heat sink
- CPUs
- Assorted connectors/cables
  - o USB
  - o HDMI
  - o etc
- Adapters
- Network cables
- Unterminated network cable / connectors
- AC adapters
- Optical drives
- Screws/stand-offs
- Cases
- Maintenance kit
- Mice/keyboards

#### **Tools**

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

#### **Software**

- Operating system disks
- Antivirus software
- Virtualization software

- Antimalware
- Driver software