

CompTIA A+ Cram Sheet

This cheat sheet summarizes key facts for the CompTIA A+ Core 1 (220-1101) and Core 2 (220-1102) exams, designed for last-minute review.

220-1101: Core 1 Exam

Mobile Devices and Laptops

- **Laptops:** Portable PCs with replaceable keyboards, touchpads. Fn key for secondary functions. Drives: 2.5" or 1.8" (SSD, HDD, hybrid). Expansion: M.2, Mini PCIe. RAM: SODIMM (DDR3: 204-pin; DDR4: 260-pin; DDR5: 262-pin).
- **Smartphones/Tablets:** ARM CPUs, flash memory, multitouch, Li-ion batteries. IP68-compliant. Connectors: Android (USB-C/microUSB); iOS (USB-C/Lightning).
- **Location:** GPS, geotracking.
- **Connectivity:** Cellular WWAN (5G, 4G, LTE, CDMA, GSM), WISP, Wi-Fi (WLAN).

Networking Basics

- **Network Types:** LAN, WAN, MAN, PAN, SAN, WMN, WLAN.
- **Devices:** Switches (LAN), Routers (LANs/Internet), Firewalls, IDS, IPS.
- **Connectors:** Twisted pair (RJ45, RJ11); Fiber (SC, ST, LC); Coaxial (RG-6, F-connector).
- **Cabling Standards** (max 100 m):

Category	Speed	Notes
Cat 5	100 Mbps	Basic Ethernet
Cat 5e	100 Mbps/Gigabit	Common for Gigabit
Cat 6/6a	Gigabit/10 Gbps	Higher speeds

- **T568B Pinout:** 1. White/orange, 2. Orange, 3. White/green, 4. Blue, 5. White/blue, 6. Green, 7. White/brown, 8. Brown. T568A reverses orange/green. Straight: T568B-T568B; Crossover: T568B-T568A.
- **IP Addressing:**
 - IPv4: 32-bit (e.g., 192.168.1.1). Static/DHCP. Loopback: 127.0.0.1. APIPA: 169.254.x.x.
 - IPv6: 128-bit hex (e.g., 2001:7120:0000:8001:0000:0000:0000:1F10). Loopback: ::1. Link-local: FE80::/10.
- **Speeds:** Gigabit (1000 Mbps), 10 Gbps Ethernet.

Protocol	Port	Notes/Secure
FTP	20/21	FTPS (989/990), SFTP (22)
SSH	22	Secure remote
Telnet	23	Insecure
SMTP	25	SSL/TLS (587/465)
DNS	53	Domain resolution
DHCP	67/68	IP assignment
HTTP	80	Web
POP3	110	SSL/TLS (995)
NetBIOS	137–139	Sharing
IMAP	143	SSL/TLS (993)
SNMP	161/162	Network mgmt
LDAP	389	SSL/TLS (636)
HTTPS	443	Secure web
SMB/CIFS	445	File sharing
RDP	3389	Remote desktop

• Wireless Standards:

Standard	Frequency	Notes
802.11a	5 GHz	Older
802.11b	2.4 GHz	Basic
802.11g	2.4 GHz	Improved
802.11n	2.4/5 GHz	MIMO
802.11ac	5 GHz	Wi-Fi 5
802.11ax	5 GHz	Wi-Fi 6

- **Channels:** 2.4 GHz (1–11); 5 GHz (36, 40, 44, 48, 149, 153, 157, 161, 165).
- **Bluetooth:** Classes: I (100m), II (10m), III (1m), IV (0.5m).
- **Advanced:** NAT (IP modification), Port Forwarding, DMZ (server area), QoS (prioritize), PoE (802.3af, power via Ethernet).

Hardware Components

- **Video:** PCIe x16. Connectors: DVI, VGA, HDMI, Mini-HDMI, DisplayPort.
- **USB:** Type A/B (desktop), microUSB/USB-C (mobile). 2.0 (480 Mbps), 3.0 (5 Gbps), 3.1 (10 Gbps), 3.2 (10/20 Gbps, USB-C).
- **Thunderbolt:** Ver 1 (10 Gbps, DisplayPort), Ver 2 (20 Gbps, DisplayPort), Ver 3 (40 Gbps, USB-C). Lightning: 8-pin (USB 3.0).
- **RAM:** DIMMs (DDR3: 240-pin; DDR4/5: 288-pin). E.g., DDR4-2666 = 21,333 MB/s. Channels: Dual (128-bit), Triple (192-bit), Quad (256-bit). ECC corrects.
- **Storage:** HDD (magnetic), SSD (flash, SATA/M.2). SATA: 15-pin power, 7-pin data. Rev 3 (6 Gb/s), 3.2 (16 Gbps).
- **RAID:** 0 (striping), 1 (mirroring), 5 (striping+parity), 10 (striped mirrors).
- **Power Supply:** ATX 12V 2.x (24-pin mobo, 4/8-pin CPU, 6/8-pin PCIe, 15-pin SATA, 4-pin Molex).
- **BIOS/UEFI:** Initializes, boots (drive/optical/USB/PXE). Battery: CR2032. Settings: Time, boot order, passwords, WOL, virtualization, etc. Update: Flash.
- **CPU:** GHz. Sockets: PGA (AMD), LGA (Intel). Cache: L1/L2 per core, L3 shared. Thermal paste. TDP e.g., 140W.
- **Printers:** Laser: Process, charge, expose, develop, transfer, fuse, clean. Settings: Duplex, orientation, DPI (600/1200), tray (8.5x11).

Cloud and Virtualization

- **Types:** SaaS, IaaS, PaaS.
- **Concepts:** Metered (pay for use), rapid elasticity (scale).
- **Virtualization:** Type 1 (bare metal), Type 2 (hosted). E.g., VMware, Hyper-V, VirtualBox. Networking: Bridged, NAT, host-only, none.

Troubleshooting Methodology

1. Identify the problem.
 2. Establish theory of probable cause.
 3. Test theory.
 4. Plan and implement solution.
 5. Verify functionality, implement prevention.
 6. Document findings, actions, outcomes.
- Note: Consider corporate policies before changes.

Hardware Troubleshooting

- **Time/Date:** Check battery, sync to time server.
- **CPU:** Fan, heat sink, thermal compound, overclocking, secure.
- **Noise:** Fans (CPU/case/PSU), clean air/vacuum.
- **RAM:** Reseat, clean, heat sinks, check POST codes.
- **Power:** Test outlet, PSU (3.3V/5V/-5V/12V/-12V). PSU is FRU.
- **Storage:** Slow—defrag, cleanup, AV. Not recognized—connections, BIOS, initialize/partition/format.
- **Laptop Display:** No second—Fn key. Blank—brightness, resolution, inverter/backlight.
- **Printer:** Jam—cycle, tray/rollers/paper/fuser/path. Blank—toner/transfer. Lines—drum/primary wire/toner. Fuse—fusing. Garbled—driver. Ghost—drum/toner. Size—tray/paper. No connect—power/network/share/IP/default.
- **Network:** No connect—link light/cable/NIC/switch/IP/troubleshooter. Limited—ping local/outward, ipconfig/all. Poor wireless—distance/antennas/update. APIPA/conflict—ipconfig /release /renew, DHCP. Tools: Patch/cable tester, tone/probe, loopback.

220-1102: Core 2 Exam

Operating Systems

- **Windows 10:** CPU 1 GHz, RAM 2 GB, Space 32 GB.
- **Windows 11:** CPU 1 GHz, RAM 4 GB, Space 64 GB, UEFI/Secure Boot, TPM 2.0, DirectX 12, 720p.
- **Tools:** Device Manager, System Info, Task Manager, msconfig.
- **Remote:** RDP for GUI control.
- **Networks:** Workgroups (max 20 inbound), Domains (via Active Directory).
- **Defaults:** %systemroot% = C:\Windows.
- **CLI Commands:**
 - Navigation: DIR (list), CD (change, e.g., CD., CD\).

- Files: del, copy, robocopy (multi-files/trees).
- Drives: format (new FS), diskpart (partition mgmt).
- Checks: chkdsk (/F fix, /R recover), sfc /scannow.
- **Partitions:** GPT (128 parts, >2TB, UEFI). MBR (4 primary/1 extended, logical in extended). Active (boot). Volume (lettered). Dynamic (resizable). FS: NTFS, exFAT.
- **Backups:** File History, Windows Backup.
- **Recovery:** System Restore, WinRE (Startup Repair, Restore, CLI, Settings). Startup: Safe Mode, low-res, Last Known Good.
- **Event Viewer:** System, Application, Security (auditing).
- **Errors:** BSOD (hardware/driver); macOS: spinning pinwheel.
- **Policies:** gpresult (display), gpupdate (refresh).

Command	Function	Examples/Notes
ipconfig	TCP/IP config	/all (MAC)
ping	Test host	127.0.0.1, -t, -n, -l, -a
tracert	Route path	Similar: pathping
netstat	Sessions/stats	TCP/UDP
nslookup	DNS query	IP/hosts
net	Manage	use, view, user, start/stop, time

- **Troubleshooting:** WinRE, Startup Settings, MSConfig Safe Boot, Troubleshooter, services.msc, Task Manager, Programs/Features, Windows Features, certmgr.msc.

macOS and Linux

- **macOS:** Dock, Finder, Keychain, Mission Control, Spotlight, iCloud, Screen Sharing, Boot Camp, Time Machine, Terminal.
- **Linux:** GPT/ext4. Paths: / (e.g., /Downloads/PDFs). Distros: Debian, Ubuntu, Fedora, Red Hat, CentOS, Kali, Mint. Version: cat /etc/os-release.

Command	Function	Notes
ip a	IP config	Like ipconfig
ls	List dir	Contents
chmod	Permissions	Modify
chown	Ownership	Change
ps	Processes	Info
apt-get/yum	Install pkgs	Package mgmt
sudo	Admin exec	Root-like
vi/Vim/nano	Text editor	Edit
passwd	Change pwd	User
pwd	Path	Working dir
shutdown	Power off	System down
kill	Terminate	Processes
cat	Display file	Content
grep	Search	Match text
df	Disk usage	Space
man	Help	Manual
top	Processes	CPU/RAM
find	Locate files	Search
dig	DNS info	Queries

Security

- **Wireless Encryption:** WPA2/3, AES. Best: WPA3+AES. PSK (AP), RADIUS (1812). Deprecated: WEP, WPA1, TKIP.
- **Malware:** Virus (hidden), Trojan (fake), Spyware (tracks), Rootkit (admin access), Keylogger (keystrokes), Ransomware (locks), Cryptominer (hash calc).
- **Malware Removal:**
 1. Identify/verify symptoms.
 2. Quarantine systems.
 3. Disable System Restore.
 4. Remediate: Update AV, scan/remove (Safe Mode/Preinstall).
 5. Schedule scans/updates.
 6. Enable System Restore/create point.
 7. Educate user.
- **Social Engineering:** Phishing, vishing, whaling, impersonation, shoulder surfing, tailgating, dumpster diving.
- **Network Attacks:** On-path, spoofing, zero-day, dictionary, brute force, DDoS (botnet), evil twin.
- **Authentication:** Knows (pwd/PIN), Has (card), Is (biometrics), Does (signature/voice). MFA (e.g., pwd+card). UAC (admin tasks).
- **Techniques:** Mantrap, OTP, RFID, biometrics, smart cards, ACLs.
- **Encryption:** EFS (files/folders), BitLocker (drive, TPM), BitLocker To Go (removable).
- **Disposal:** Clearing (reuse), Purging (zeroing), Destruction (shred/drill/degauss, certify).
- **BIOS/UEFI:** Admin/user pwds, drivelock, disable removable, Secure Boot, boot priority.
- **Permissions:** Restrictive wins (NTFS vs. share). Inheritance: Child from parent. Move same: Retain. Move/copy other: Inherit new.
- **Mobile:** Screenlocks, lockout, remote wipe/backup, AV. Avoid rooting/jailbreaking.
- **Wireless:** Change pwd/SSID, reduce power, disable WPS, WPA3/AES, MAC filter, firmware, firewall, disable ports, content filter.

Safety and Professionalism

- **Safety:** Avoid PSU opening, test outlets, CO2/BC extinguisher, 911. Cable mgmt, MSDS (chemicals).
- **ESD:** Strap/mat, touch chassis, antistatic bags, unplug, humidity.
- **UPS:** Battery backup.
- **Tickets:** User/device, problem, severity; clear writing.
- **Change Mgmt:** Purpose, scope, affected, risk, acceptance, approvals, rollback, sandbox.
- **Incident Response:** Identify/report, preserve, document, chain of custody.
- **Regulated Data:** PII, PHI, govt ID, PCI DSS, GDPR. Secure with encryption/permissions/lockouts.
- **Professionalism:** Appearance, punctual, listen/notes/clarify, positive, sensitive, set expectations, avoid distractions/confidential data.

Scripting and Remote Access

- **Basics:** Loops (e.g., for) repeat. Variables: \$ in PowerShell/Bash.
- **Types:** .ps1 (PowerShell), .bat (batch), .sh (Bash), .py (Python), .vbs (VB), .js (JS).
- **Remote:** RDP (3389), SSH (22), VNC.

Final Note

Good luck! Be confident—you can do this!