The CompTIA A+ Cram Sheet

This cram sheet contains the distilled, key facts about the CompTIA A+ 220-701 and 220-702 exams. Review this information as the last step before you enter the testing center, paying special attention to those areas where you think that you need to the most review.

Hardware

1. Motherboards connect everything together. Typical form factors include ATX (most common), BTX, microATX, and NLX. The chipset includes a northbridge that connects the CPU, RAM, and x16 PCIe devices, and southbridge that connects secondary systems such as USB, SATA, IDE, and sound. Types of expansion busses include PCI, AGP, PCI Express (PCIe), AMR, CNR, and PC Card (PCMCIA).

2. The central processing unit (CPU) or processor takes care of all calculations. Common CPUs such as the Core 2 can have multiple cores and usually connect to LGA775 sockets.

3. Random Access Memory (RAM) types include SDRAM, DDR, DDR2, DDR3, RDRAM, and SODIMMs.

4. ATX Power Supplies connect to the motherboard by way of a P1 20-pin or 24-pin cable. Switchable between 115 and 230 VAC.

5. Hard disk drives are nonvolatile devices that store data, generally 3.5". Types of hard disks include:
   - PATA: Parallel ATA drives range between 33MHz and 133MHz (Ultra ATA/33 through /133), use a 4-pin Molex power connector, 40-pin IDE ribbon cable for data, and can be jumpered as single, master, slave, or cable select.
   - SATA: Serial ATA drives come in 150, 300, and 600MB/s versions, use a 15-pin power connector, and 7-pin data connector.
   - SCSI: Small Computer System Interface drives range in transfer rates from 160MB/s to 640MB/s, and use 68-pin, 80-pin, or serial connectors.

6. RAID stands for Redundant Array of Inexpensive Disks. RAID 0 is striping, RAID 1 is mirroring, and RAID 5 is striping with parity. RAID 0 is not fault tolerant.

7. Optical disc drives use removable media to store and retrieve data, typically 5.25". Types of optical discs include:
   - CD-ROM: Data CDs can typically hold 700MBs, can read and write at up to 52x (7.8MB/s), and rewrite at up to 32x (4.8MB/s).
   - DVD-ROM: DVDs have a capacity ranging from 4.7GB (DVD-5) to 17GB (DVD-18 dual-sided and dual-layered). Recording technologies include DVD-R, DVD-R, DVD+RW, and DVD-RW.
   - Blu-Ray: Blu-Rays are used for HD and games, have a capacity of 50GB, and a write speed of between 1x and 8x (36MB — 288MB). Blu-Ray drives connect via SATA only.

8. Floppy drives use 1.44MB 3.5" disks and connect to the motherboard via 34-pin data cable and 4-pin mini power connector. A LED that won’t shut off indicates an upside-down data cable.

9. Solid-state media includes USB flash drives, CompactFlash, and Secure Digital (SD) cards.

10. Laptops are smaller versions of desktop PCs. They have replaceable items such as keyboards, SODIMM RAM, displays, inverters, optical discs, and 2.5" hard drives.

11. Video cards connect to motherboards by way of x1 PCIe (black), AGP (brown), or PCI (white) expansion slots. Video connectors include DVI, VGA, HDMI, S-Video, and Component Video/RBG. Common color depths include 16-bit, 24-bit, and 32-bit.

12. Sound cards connect as x1 PCIe or PCI cards, and normally have PC 99 color-coded 1/8" mini-jacks for I/O and speakers, and optical I/Os known as S/PDIF.

13. USB (Universal Serial Bus) can have up to 127 devices. USB 1.1 (full speed) runs at 12Mbps with a max. cable length of 3 meters; USB 2.0 (high-speed) runs at 480Mbps, max cable length: 5 meters. Computers usually have Type A connectors built in.

14. IEEE 1394a (FireWire) 400 runs at 400Mbps. FireWire 800 runs at 800Mbps. IEEE 1394b incorporates FireWire 800 and also specifies 1600Mbps and 3200Mbps. IEEE 1394 chains can have up to 63 devices.


Software

16. Windows 7 min. requirements: CPU=1GHz, RAM=1GB (2GB for 64-bit), Free disk space=16GB (20GB for 64-bit).

17. Windows Vista min. requirements: CPU=800MHz, RAM=512MB, and Free disk space=15GB. New features in Vista include GUI called Aero, extended partitions, and UAC (User Account Control) that requires administrator credentials from users to accomplish certain tasks.

18. Windows XP min. requirements: CPU=233MHz, RAM=64MB, Free disk space=1.5GB.


20. Graphical User Interface (GUI) includes the desktop, icons, taskbar, Start menu, Quick Launch, System Tray, application windows and dialog boxes, and gadgets.

21. Command Prompt is the command-line utility in Windows. To run in elevated mode:
   - Click Start > All Programs > Accessories; System Tools, and Command Prompt.

22. Snap-ins are console windows that can be added to a Microsoft Management Console (MMC).

23. Libraries in Windows 7 logically represent user-defined collections of folders.

24. Common system tools include Device Manager, System Information tool, Task Manager, Msconfig.

25. User data can be migrated using Windows Easy Transfer (Windows 7 and Vista only).

26. The Registry is a database that stores the settings for Windows. It can be accessed by opening the Regedit prompt and typing regedit.exe. hive sets store settings; a commonly modified hive is HKEY_LOCAL_MACHINE.

27. Remote Desktop software enables a user to see, and control, the GUI of a remote computer.

28. The %systemroot% in Windows 7/Vista/XP is C:\Windows, and in 2000 is C:\Winnt.

29. Windows 7/Vista boot files include Bootmgr, BCD. XP boot files include NTLDR, Boot.ini, and NTdetect.com.

30. Directories can be added with the MD command, removed with the RD command, and navigated to with the CD command.

31. File checking command-line tools that can be used in Windows include Chkdsk and SFC (System File Checker).

32. A hard disk can have four partitions: up to four primary partitions, but only one extended partition. Logical drives are sections of an extended partition. The Active partition is the one that is booted from; it usually contains the OS.

33. A service pack (SP) is a group of updates, bug fixes, updated drivers, and security fixes installed from one downloadable package or from one disc.

34. Windows Update can be accessed from Start > All Programs > Windows Update.

35. A hard disk can be maintained with tools such as Disk Cleanup and Disk Defragmenter (defrag.exe).

36. Backups can be accomplished in Windows 7/Vista with Backup and Restore and in XP with NTBackup.

37. System Restore can fix issues caused by defective hardware or software by reverting back to an earlier time.

38. F8 brings up the Advanced Boot Options menu that includes options such as Safe Mode, Enable low-resolution video, and Last Known Good Configuration. Safe Mode boots the system with minimal drivers.

39. The Windows 7/Vista Windows Recovery Environment (WinRE) includes System Recovery Options such as Startup Repair, System Restore, and Command Prompt.

40. Windows XP uses the Recovery Console as its repair environment.

41. The Event Viewer warns about possible issues and displays errors as they occur within three main log files: System, Application, and Security. Security displays information if auditing has been turned on.

42. A stop error (also known as a Blue Screen of Death or BSOD) completely halts the operating system and displays a blue screen with various text and code.
Networking

43. IPv4 addresses are 32-bit dotted-decimal numbers, for example, 192.168.1.1 and can be statically (manually) inputed or dynamically assigned (DHCP). IP Classes include
   ▶ Class A range: 1–126, subnet mask: 255.0.0.0. Private: 10.x.x.x
   ▶ Class B range: 128–191, subnet mask: 255.255.0.0. Private: 172.16.0.0–172.31.255.255
   ▶ Class C range: 192–223, subnet mask: 255.255.255.0. Private: 192.168.x.x

44. IPv6 addresses are 128-bit hexadecimal numbers, for example: 2001:7120:0000:0000:0000:0000:0000:1F10. ::1 is the loopback address. Unicast IPv6 addresses are assigned to a single interface and are the most common type.

45. Common network speeds are 1000Mbps and 100Mbps.

46. Common protocols include
   ▶ FTP (File Transfer Protocol). Port 21
   ▶ SSH (Secure Shell). Port 22
   ▶ Telnet. Port 23
   ▶ SMTP (Simple Mail Transfer Protocol). Port 25
   ▶ HTTP (Hypertext Transfer Protocol). Port 80
   ▶ POP3 (Post Office Protocol). Port 110
   ▶ HTTPS (HTTP Secure). Port 443

47. Common cabling protocols include
   ▶ Category 3: 10Mbps
   ▶ Category 5: 100Mbps
   ▶ Category 5e: Rated for 100Mbps and gigabit networks
   ▶ Category 6: Rated for 100Mbps and gigabit networks

48. Common command-line tools include
   ▶ Ipconfig: Displays current TCP/IP network configuration values; Ipconfig/all shows additional information.
   ▶ Ping: Tests whether another host is available over the network (example: ping 192.168.1.1)
   ▶ Tracert: Sends packets to test destinations beyond the local computer’s network
   ▶ Netstat: Shows the network statistics for the local computer
   ▶ Nslookup: Used to query DNS servers to find out DNS details including the IP address of hosts
   ▶ Net: Used to map network drives, view computers, and start and stop services.

49. Wireless Ethernet versions, including their name, data transfer rate, frequency, and modulation used
   ▶ 802.11a, 54Mbps, 5GHz, OFDM
   ▶ 802.11b, 11Mbps, 2.4 GHz, DSSS
   ▶ 802.11g, 54Mbps, 2.4 GHz, OFDM
   ▶ 802.11n, 600Mbps (300 typical), 5 and 2.4GHz, OFDM

50. Bluetooth is a short range technology aimed at simplifying communications and synchronization among network devices. Bluetooth is divided into three classes. Class I has a maximum transmission range of 100 meters, Class II (the most common) has a range of 10 meters, and Class III is short range and hardly used at 1 meter. Bluetooth Version 1 has a maximum data transfer rate of 721Kbps, and version 2 is 2.1Mbps.

51. Wireless encryption protocols include
   ▶ WEP (Wired Equivalent Privacy), 64-bit key size (typical)
   ▶ WPA (Wi-Fi Protected Access), 256-bit
   ▶ TKIP (Temporal Key Integrity Protocol), 128-bit
   ▶ AES (Advanced Encryption Standard), 128-bit, 192-bit, and 256-bit

52. Port forwarding forwards an external network port to an internal IP address and port.

53. Port triggering enables you to specify outgoing ports that your computer uses for special applications; their corresponding inbound ports open automatically when the sessions are established.

Security

54. Data security is the act of protecting data from threats and possible corruption. Threats include
   ▶ Malicious software: Known as malware, this includes computer viruses, worms, Trojan Horses, spyware, rootkits, and adware.
   ▶ Unauthorized access: Access to computer resources and data without consent of the owner.
   ▶ System failure: Computer crashes or individual application failure.
   ▶ Social engineering: The act of manipulating users into revealing confidential information or performing other actions detrimental to the user.

55. Data security technologies that can protect against, or help recover from, the preceding threats include
   ▶ Authentication: This is the verification of a person’s identity, and it helps protect against unauthorized access.

56. BIOS security includes supervisor and user passwords, drivelowt passwords, disabling removable media, and setting the boot device priority to hard drive first.

57. Malicious software, or malware, is software that is designed to infiltrate a computer system and possibly damage it without the user’s knowledge or consent. Types include
   ▶ Virus: A virus is code that runs on a computer without the user’s knowledge; it infects the computer when the code is accessed and executed. Types include Boot Sector, Macro, Program, Polymorphic, Stealth, and Multipartite.
   ▶ Worms: Worms are much like viruses except that they self-replicate whereas a virus does not.

58. Permission Inheritance: If you create a folder, the default action it takes is to inherit permissions from the parent folder.

59. Types of encryption include
   ▶ Symmetric key: Uses a common shared key between the sender and receiver. Examples of symmetric key technology include Encyrpting File System (EFS), BitLocker, WEP, WPA, Kerberos, AES, 3DES, and Rivest Cipher.
   ▶ Asymmetric key: Uses two keys, one is public, the other private. Examples of asymmetric key technology include RSA and ECC.
   ▶ Encrypting File System (EFS): Encrypts one or more files or folders directly within the Properties page.
   ▶ BitLocker: Encrypts an entire disk, available only on Vista Ultimate and Vista Enterprise.

CompTIA Six-Step Troubleshooting Process

60. Following is the newly revised CompTIA six-step troubleshooting process:
   1. Identify the problem.
   2. Establish a theory of probable cause. (Question the obvious.)
   3. Test the theory to determine the cause.
   4. Establish a plan of action to resolve the problem and implement the solution.
   5. Verify full system functionality and if applicable implement preventative measures.
   6. Document findings, actions, and outcomes.

Student Area

Fill in anything else you think will be valuable to you here.