Chapter 1

|  |  |
| --- | --- |
| Solutions to help prevent ESD damage | Keep all components in antistatic bags; use grounded floor mats in work areas |
| ATX12V | Most common power supply on market. It includes a second motherboard connector to provide dedicated power to the CPU |
| EPS12V | Power supply that was originally designed for network server, but is now commonly used in high-end desktop models |
| Motherboard | A printed circuit board that contains busses, or electrical pathways, that interconnects electronic components |
| Northbridge | Controls high speed access to the RAM and video card |
| Southbridge | Allows the CPU to communicate with slower speed devices like hard drives, USB ports and expansion slots |
| EPROM | Nonvolatile memory chip that can be erased by exposing it to strong ultraviolet light |
| PROM | Read-only memory chip that is manufactured blank and can be programmed when needed |
| L1 | Internal cache that is integrated into the CPU |

Chapter 2

|  |  |
| --- | --- |
| Power supply | The steps to install this are to open the case, align the screw holes with the case, and attach the screws |
| Motherboard | This component determines the type of case to use. The size and shape must match exactly |
| Power supply | This part must be compatible with the motherboard and provide appropriate wattage |
| CPU | When installing this component, use thermal paste to attach the heat sink |
| RAM | This component has levers to firmly lock it into the motherboard |
| Motherboard | A component that requires standoffs and is installed using an I/O plate |
| SATA | The most common type of internal mechanical hard drive |
| PCI and PCIe | Two types of motherboard expansion slots |
| HDD-LED | The front panel connector that blinks or is on when the drive is being written to or read from |
| Memory stick | Proprietary flash memory used in cameras, MP3 players, and hand-held video game systems |

Chapter 3

1. the process to check main hardware components of the computer when it starts : POST
2. a ROM chip on the motherboard that contains a small program to control the communication between the operating system and the hardware : BIOS
3. a memory chip on the motherboard that retains BIOS settings : CMOS
4. a program that enhances the BIOS by specifying a new model for the interface between computer operating systems and platform firmware : UEFI
5. a BIOS/UEFI security feature that consists of two programs; the Persistence Module and the Application Agent : LoJack
6. a chip designed to secure hardware by storing encryption keys, digital certificates, passwords, and data specific to the host system for hardware authentication : Trusted Platform Module
7. a UEFI security standard that ensures that a computer only boots an OS that is trusted by the motherboard manufacturer : secure boot
8. a term that describes one of the fundamental relationships found in electronic circuits: for a given resistance, current is directly proportional to voltage : Ohm's Law
9. a term to indicate the complete loss of AC power : black out
10. a term that describes the state of reduced voltage level of AC power that lasts for a period of time : brownout
11. a term to describe the interference on a power line from generators and lightning : noise
12. a term to describe a sudden increase in voltage that lasts for a short period and exceeds 100 percent of the normal voltage on a power line : spike
13. a term to describe the dramatic increase in voltage above the normal flow of electrical current : power surge
14. a CPU architecture that uses a relatively small set of instructions : Reduced Instruction Set Computer (RISC)
15. a CPU architecture that uses a broad set of instructions, resulting in fewer steps per operation : Complex Instruction Set Computer (CISC)
16. a CPU technology that enables multiple pieces of code (threads) to be executed simultaneously : Hyper-Threading
17. a high-speed connection between the CPU and the Northbridge chip : HyperTransport
18. a technique used to make a processor work at a faster speed than its original specification : overclocking
19. a technique used when the processor runs at less than the rated speed in order to conserve power or produce : CPU throttling
20. a chip that performs the rapid mathematical calculations required to render graphics : graphics processing unit (GPU)
21. a technology to store data across multiple storage devices for availability, reliability, capacity, redundancy, or performance improvement : Redundant Array of Independent Disks (RAID)
22. a RAID type that enables data to be distributed across multiple drives without redundancy, also called RAID 0 : RAID-striping
23. a RAID type that stores duplicate data on one or more other drives to provide redundancy, also called RAID 1 : RAID-mirroring
24. a RAID type that provides basic error checking and fault tolerance by storing checksums separately from data, also called RAID 5 : RAID with parity
25. a RAID type that provides fault tolerance up to two failed drives, also called RAID 6 : RAID with double parity
26. a computer bus interface for connecting ATA hard drives and other storage devices to the motherboard inside a computer : Serial ATA (SATA)
27. a standard for connecting peripheral and storage devices in a daisy-chain fashion : Small Computer Systems Interface (SCSI)
28. a fact sheet that summarizes information about material identification, including hazardous ingredients that can affect personal health, fire hazards, and first-aid requirements : Safety Data Sheet (SDS)

Chapter 4

1. a process with one or multiple procedures regularly performed on a computer or network device to reduce the likelihood of failure : preventive maintenance (PM)
2. two main factors that affect the likelihood of computer failure : computer location and computer use
3. the data on a computer hard drive that is saved to another storage device : data backup
4. the type of questions that allow customers to explain the details of the problem in their own words : open-ended questions
5. the type of questions that generally require a yes or no answer : closed-ended questions
6. step 1 of the 6-step troubleshooting process : identify the problem
7. step 2 of the 6-step troubleshooting process : establish a theory of probable cause
8. step 3 of the 6-step troubleshooting process : test the theory to determine the cause
9. step 4 of the 6-step troubleshooting process : establish a plan of action to resolve the problem and implement the solution
10. step 5 of the 6-step troubleshooting process : verify full system functionality and if applicable, implement preventive measures
11. step 6 of the 6-step troubleshooting process : document findings, actions, and outcomes

Chapter 5

1. a device connected to a network : host device
2. a device used to send data between network devices : intermediary device
3. 3 of the following: desktop, laptop, server, tablet, printer, camera, IP phone, scanner, smartphone : 3 host devices
4. 3 of the following: switch, access point (AP), router, wireless router, modem : 3 intermediary devices
5. Bluetooth network used for short distances : PAN
6. wired network in a specific geographic location such as a home or business : LAN
7. a switch technology used to create networks and isolate traffic between ports : VLAN
8. a wireless network that uses radio waves to transmit data : WLAN
9. a wireless mesh network used in businesses and cities: WMN
10. a network that covers a larger geographic area than a LAN does, such as throughout a city : MAN
11. a network that connects between two geographic areas such as two countries : WAN
12. a secure connection over an insecure network like the internet : VPN
13. always-on service that can carry video and data over the same digital phone line : DSL
14. an internet connection that originally was for video traffic : cable
15. a high bandwidth internet connection used for backbone connections : fiber
16. internet connectivity provided through a mobile device using Wi-Fi, Bluetooth, or USB : tethering
17. application, transport, internet, and network access : TCP/IP layers
18. TCP and UDP : 2 transport TCP/IP layers
19. transport protocol that ensures that data arrives : TCP
20. transport protocol that is fast, but does not provide reliability : UDP
21. 53 : DNS port number
22. 80 : HTTP port number
23. 443 : HTTPS port number
24. 25 : SMTP port number
25. 110 : POP3 port number
26. 143 : IMAP port number
27. 389 : LDAP port number
28. 20 and 21 : FTP port numbers
29. 22 : SSH port number
30. 23 : Telnet port number
31. 3389 : RDP port number
32. 161 and 162 : SNMP port numbers
33. 802.11a, 802.11n, 802.11ac : 802.11 5 GHz protocols
34. Z-Wave and Zigbee : 2 smart home standards
35. provides IP addressing information : DHCP server
36. provides translation of domain names to IP addresses : DNS server
37. DNS server : mail server protocols
38. sends data out all ports except the port the data came in on : hub
39. forwards data based on MAC address : switch
40. detects and acts on malicious traffic : IPS
41. remote device that can control and manage a large number of network devices : cloud-based network controller
42. used to test ports : loopback plug
43. used to trace cables : tone generator
44. most common Ethernet cable : UTP
45. T568A and T568B : 2 network wiring schemes
46. uses light to transmit data : fiber

Chapter 6

1. addressing that is hard coded onto the network interface card by the manufacturer : MAC address
2. addressing that is assigned by a network administrator based on the location of the device within the network : IP address
3. IP address used by a device to communicate with other computers connected to the same network within the same IP address range : link-local address
4. an address in the range of 169.254.0.0 - 169.254.255.255 that is automatically assigned by the operating system : automatic private IP addressing
5. a protocol that uses ICMP echo request messages to test connectivity between devices : ping
6. a protocol used to convert a private IP address to an Internet-routable address : Network Address Translation
7. a protocol used to guarantee that certain traffic types, like voice and video, are priortized over traffic that is not as time-sensitive, such as email or web browsing : QoS
8. Step 1 of the 6 step troubleshooting process. This step requires a technician asking a customer a series of questions about the problem : Identify a problem
9. the final stage of the 6 step troubleshooting process : Document findings, actions, and outcomes

Chapter 7

1. digital object like a video or photograph to record the location of the object : geotagging
2. uses a wireless network instead of a cellular carrier network : Wi-Fi calling
3. two of the following: Google Now, Siri, Cortana : 2 examples of virtual assistants
4. used to send emergency messages, such as weather alerts or a message from the President, through mobile carriers : WEA
5. memory module used in a laptop : SODIMM
6. display used more in mobile devices and digital cameras than used in laptops : OLED
7. motherboard or display : example of a laptop FRU
8. a short, mishandling, or improper charging : cause of a battery exploding
9. augmented reality headset overlays digital elements as part of a real world view : AR headset
10. 2 mobile device Internet connectivity options : Wi-Fi and cellular
11. adds improvements to 4G cellular technology : LTE
12. turns off cellular, Wi-Fi, and Bluetooth radios : airplane mode
13. provides Internet connectivity to other devices : hotspot
14. protocol used to send email to a mail server : SMTP
15. Android synchronization feature : Auto Sync
16. Microsoft cloud storage and synchronization product : OneDrive
17. dirt, contamination, spills, drops, excessive heat, excessive cold, excessive moisture : 3 harmful materials or situations for laptops
18. Establish a theory of probable cause.: 2nd step of troubleshooting process
19. not plugged in, battery not charged or battery will not hold a charge : 2 causes if a laptop won't power on
20. move closer to the Wi-Fi network, turn Wi-Fi on : solution if Wi-Fi is not available

Chapter 8

1. the predicted elapsed time between failures of a product during normal operation : mean time between failures (MTBF)
2. also known as i.LINK or IEEE 1394, a high-speed communication bus that is platform independent : FireWire
3. the four basic colors used for printing color images, the 4-color model uses a subtractive method when the 4 colors are blended : Cyan Magenta Yellow Black (CMYK)
4. dots per inch, the indicator for the resolution on print or display : dpi
5. a type of printer that uses ink cartridges that spray ink onto a page through tiny holes : inkjet printer
6. a type of printer that uses a laser beam to create an image : laserjet printer
7. a type of printer that create an image by selectively heating thermal sensitive paper : thermal printer
8. a type of printer with print heads that strike an inked ribbon, causing characters to be imprinted on the paper : impact printer
9. a printer interface in an operating system that either sends the print job to a file or transmits the information to a remote destination in the cloud for printing : virtual printer
10. also called additive manufacturing, a process of making three dimensional solid objects from a digital file : 3D printing
11. a piece of software that translates the printing objects to appropriate information understandable by a printer : printer driver
12. a type of code that describes the appearance of a document in a language that a printer can understand : page description Llanguage (PDL)
13. developed by Adobe Systems, a PDL that allows fonts and text types to share the same characteristics on the screen as on paper : PostScript

Chapter 9

1. an environment that separates the computer system from the hardware in which a computer host is not directly linked with the hardware it uses : computer virtualization
2. a computer instance created in a virtualized environment : virtual machine (VM)
3. a computing environment that separates the application from the hardware : cloud computing
4. software used to manage the host computer resources and VMs on the host computer, also called Virtual Machine Manager (VMM) : hypervisor
5. server VMs created in an organizational virtualization environment to provide optimized network resources and to reduce equipment and maintenance costs : server virtualization
6. virtualization environment created on a user computer to provide VMs for testing and learning purposes : client-virtualization
7. the physical computer that provides resources to multiple virtual machines : host computer
8. the operating system that is running in the host computer : host operating system
9. the operating system that is running in a VM : guest operating system (guest OS)
10. also called bare metal hypervisor, it runs directly on the hardware of a host computer and manages the allocation of system resources to virtual operating systems : Type 1 hypervisor
11. the VMM is supported by a host OS and provides a virtualized environment for VMs : Type 2 hypervisor
12. The cloud provider provides access to services, such as email, calendar, communication, and office tools, over the Internet on a subscription basis. : software as a service (SaaS)
13. The cloud provider provides access to operating systems, development tools, programming languages, and libraries used to develop, test, and deliver applications. : platform as a service (PaaS)
14. The cloud provider manages the network and provides organizations access to network equipment, virtualized network services, storage, software, and supporting network infrastructure. : infrastructure as a service (IaaS)
15. a technology-delivery method that treats information technology (IT) as a commodity, providing an organization with exactly the amount of hardware, software, and support that it needs for an agreed-on monthly fee. : IT as a service (ITaaS)
16. applications and services offered in this cloud type are for a specific organization or entity, such as the government : private cloud
17. applications and services offered in this cloud type are for exclusive use by a specific group of entities or organizations : community cloud
18. applications and services offered in this cloud type are made available to the general population : public cloud
19. this type of cloud is made of two or more different cloud types, where each part remains a distinctive object, but both are connected using a single architecture : hybrid cloud

Chapter 10

1. ability to support two or more CPUs : multiprocessing
2. control hardware access, manage files and folders, provide a user interface, and manage applications : four basic functions of an OS
3. Microsoft Windows, Apple macOS, and Linux : three desktop operating systems
4. Buy a new computer or upgrade one or more hardware components. : what to do if a computer does not meet minimum requirements for an app
5. 1 GHz : minimum CPU speed for a 64-bit Windows 10 computer
6. 4 GB : maximum RAM for a computer with a 32-bit architecture
7. Windows 7, Windows 8, or Windows 8.1 : two operating systems that can be upgraded to Windows 10
8. Formatting : disk drive process that allows a technician to select a file system
9. dynamic disk : type of disk that allows for creating a volume that spans more than one disk
10. NTFS : recommended file system for a Windows 10 business computer
11. full format : type of format used for a new hard drive
12. Standard User : type of Windows 10 account for an administrative assistant for a school principal
13. Device Manager : Windows utility used to verify video card driver version
14. Sysprep : Microsoft tool used when deploying a specific OS image to multiple computers
15. Preboot eXecution Environment (PXE) : type of OS installation that requires a special BIOS setting or NIC firmware
16. unattended installation : type of OS installation that requires an answer file
17. clean install : type of Windows upgrade that erases all files and data
18. PCmover Express : Microsoft-recommended tool for transferring files to a Windows 10 PC
19. Shift key : key held down in Windows 8 and 10 when selecting the Restart option from the Power menu in order to get to the Startup Settings menu
20. F8 : key used on a Windows 7 computer when wanting to access the Advanced Boot Options

Chapter 11

1. a group of computers and electronic devices with a common set of rules and procedures administered as a unit : domain
2. a collection of LAN workstations and servers that are designed to communicate and exchange data with one another : workgroup
3. These are identified with a dollar sign ($) at the end of the share name. : administrative shares (hidden shares)
4. These are addresses from a reserved range in the 169.254.x.y network space : Automatic Private IP Addressing (APIPA) IPv4
5. The Windows 10 network profile disables file and printer sharing and network discovery on the link. The PC is hidden from the network. : Windows 10 Public network profile
6. The Windows 10 profile allows the user to customize the sharing options. The PC is discoverable on the network. : Windows 10 Private network profile
7. displays additional network configuration information including DHCP and DNS servers, MAC address, NetBIOS status, and domain name : ipconfig /all
8. releases the IP address learned from the DHCP server and results in a network adapter or adapters no longer having an IP address : ipconfig /release
9. forces a DHCP client to renew its DHCP address lease from the DHCP server : ipconfig /renew
10. displays the DNS resolver cache, which contains host and domain names that have been recently queried : ipconfig /displaydns
11. clears the DNS resolver cache on the host : ipconfig /flushdns
12. the command that tests basic connectivity between devices by using ICMP echo request and reply messages : ping
13. the command that traces the route that packets take from your computer to a destination host and that displays where packets are lost in the network path : tracert
14. the command that is used to query the DNS server to discover IP addresses or host names : nslookup
15. Data is sent unencrypted and with no authentication. : No authentication (Open)
16. provides very weak security and should not be relied upon for confidentiality : WEP
17. uses the Advanced Encryption Standard (AES) cipher and a preshared key (PSK) to encrypt communications : WPA2-Personal
18. Authentication is passed from the access point to a centralized authentication server running Remote Authentication Dial-in User Service (RADIUS). : WPA2-Enterprise
19. a private network that connects remote sites or users together over a public network, like the internet : VPN
20. a command-line terminal emulation protocol and program that works over port 23 : Telnet
21. This is a secure alternative to Telnet and other file copy programs such as FTP, and which communicates over TCP port 22 using encryption to protect the session. : Secure Shell (SSH)
22. The client sends credentials to the SSH host, which are then verified against a local user database or sent to a centralized authentication server. : Username/Password
23. Networks which use this authentication protocol, such as Windows Active Directory, allow for Single Sign-On (SSO). SSO allows users to sign in to multiple systems with only one username and password. : Kerberos
24. The client requests authentication with a public key. The server generates a challenge with this key which the client must decrypt with the matching private key to complete the authentication. : Host-based authentication
25. This provides additional protection over host-based authentication. The user must enter a passphrase to access the private key. This helps prevent the private key from becoming compromised. : Public key authentication
26. This is used to open or execute a file using elevated permission. : Run as Administrator
27. This is a virtual folder that presents content from different locations within the same view. Windows 10 creates 6 default libraries on installation. : Library
28. Windows stores most of the files created by users in the Users Folder, C:\Users\User\_name\. : Users Folder
29. contains most of the files that are used to run the computer and is located in the folder C:\Windows\system32 : System Folder
30. used by most application installation programs to install software. In 32-bit versions of Windows, all programs are 32-bit and are installed in the folder C:\Program Files. In 64-bit systems, 64-bit programs are installed in the folder C:\Program Files, while 32-bit programs are installed in the folder C:\Program Files (x86). : Program Files
31. monitors programs on the computer and warns users when an action might present a threat to the computer : User Account Control (UAC)
32. This is the use of an external flash device to enable Windows to treat an external flash device, such as a USB drive, as hard drive cache to enhance performance. : Windows ReadyBoost
33. This is a service provided with Windows that will encrypt an entire volume of disk data so that it cannot be read by unauthorized parties : BitLocker
34. This command is extremely powerful with many options for the way that files are copied, the types of files to include in the copy action, and the file attributes to include for the destination files. : robocopy <source> <destination
35. This command opens its own command prompt under which many of the functions of the Windows Disk Management utility can be performed. : diskpart
36. This is used to create customized system image files that will be installed on computers in the enterprise. : dism
37. This is used to update a local machine and verify that the machine is getting Group Policy updates. : gpupdate
38. displays the Group Policy settings that are in effect for a currently logged in user : gpresult
39. opens Microsoft Management Console (MMC) : MMC
40. opens the System Information window, which shows a summary of system components, including hardware components and software information: MSINFO32
41. opens the Remote Desktop utility : MSTSC
42. It displays details for all DirectX components and drivers that are installed in a computer. : DxDiag (DirectX Diagnostic Tool)
43. a dynamic disk that has been moved to a computer from another computer running Windows : Foreign (disk status)
44. a volume that is functioning properly : Healthy (disk status)
45. a basic disk that is being converted into a dynamic disk : Initializing (disk status)
46. a dynamic disk that is corrupted, turned off, or disconnected : Missing (disk status)
47. a disk that does not contain a valid signature : Not Initialized (disk status)
48. a basic or dynamic disk that is accessible and shows no problems : Online (disk status)
49. I/O errors detected on a dynamic disk : Online (Errors) (disk status)
50. a dynamic disk that is corrupted or unavailable : Offline (disk status)
51. a basic or dynamic disk that has experienced hardware failure, corruption, or I/O errors : Unreadable (disk status)

Chapter 12

1. an open source, Linux based smartphone/tablet operating system : Android
2. a closed source Unix based operating system for smartphones and tablets made by Apple : iOS
3. a navigation system that determines the time and geographical location of the device by using messages from satellites in space and a receiver located on the device : Global Positioning System (GPS)
4. making phone calls using Wi-Fi networks : Wi-Fi calling
5. a private network established through a public network to remote sites : VPN (virtual private network )
6. a cloud service provided by Apple for iOS amd OS X devices : iCloud
7. a cloud service developed by Google to provide file storage and synchronization service : Google Drive
8. a file hosting service and synchronization service operated by Microsoft : OneDrive
9. a location of the OS that keeps code isolated from other resources and other code : sandbox in mobile devices
10. a method used on Android devices for removing restrictions and protections added to mobile operating systems : rooting
11. a method for removing restrictions and protections added to mobile operating systems, but typically on iOS devices : jailbreaking
12. a family of free and open-source software operating systems based on an operating system kernel : Linux
13. an operating system based on the Linux kernel and containing a software collection and a package management system : Linux distribution (also called Linux distro)
14. a program that interprets the commands from the keyboard and passes them to the operating system : shell in Linux and OS X
15. a backup tool in OS X : Time Machine
16. a monitoring system included in computer hard disk drives to detect and report drive status : S.M.A.R.T. (Self-Monitoring, Analysis and Reporting Technology)
17. a feature of a computer system that allows booting from more than one operating system : multiboot
18. a service in Linux and OS X for scheduling tasks to be executed at specific dates and times : cron

Chapter 13

1. a term to describe malicious software : malware
2. malware that displays unsolicited advertising using pop-up web browser windows, new toolbars, or redirects to a different website : adware
3. a malware that encrypts files on the target and then demands that a fee be paid in order to decrypt the files : ransomware
4. malware that is used by cybercriminals to gain administrator-account level access to a computer and control it remotely : rootkit
5. malware that uses keyloggers to monitor user activity and sends information to cybercriminals : spyware
6. malware that is packaged with legitimate software and is activated when a user installs the legitimate application : Trojan horse
7. malware that requires human action to spread and infect other hosts : virus
8. malware that exploits network applications to consume bandwidth, crash the device, or install other malware : worm
9. a set of security objectives that ensure the security of a network, the data, and the computer systems in an organization : security policy
10. a small room with two doors, one of which must be closed before the other can be opened : mantrap
11. an important access model describing that user access should be limited to only the resources the user needs in a computer system or on a network : principle of least privilege
12. a Windows feature that encrypts data and is directly linked to a specific user account : Encrypting File System (EFS)
13. a Windows feature that encrypts an entire hard drive : BitLocker
14. a specialized chip installed on the motherboard and whose function is required when using BitLocker : Trusted Platform Module (TPM)
15. a Windows feature that encrypts a removable drive : BitLocker To Go
16. a format method that creates the tracks on a hard disk and is usually performed at the factory : low-level format
17. a format method that creates the boot sector and file allocation table on a drive : standard format
18. a powerful magnet that must be held over hard drive platters to destroy the data contained on the drive : degaussing wand
19. a device that creates a very powerful electromagnetic field to destroy all data on a magnetic drive in seconds : electromagnetic degaussing device
20. software tools used to perform a secure erase and that is designed to overwrite existing data multiple times, rendering the data unreadable : data wiping software
21. a dedicated device or a software service that protects computers and networks by preventing undesirable traffic from entering internal networks : firewall
22. an access model that enables access through all ports, except those explicitly denied : permissive access model
23. an access model that allow access to configured ports, and for which access to any ports not explicitly permitted is denied : restrictive access model
24. also called message digest, a fixed length value generated by applying a mathematical function to an arbitrary length text : hash
25. a type of encryption that uses the same key to encrypt and decrypt the data : symmetric encryption
26. a type of encryption that requires the use of two keys, one for encryption and the other for decryption : asymmetric encryption
27. the name of the wireless network : Service Set Identifier (SSID)
28. a subnetwork in an organization that provides services to untrusted networks such as a website open to the internet : Demilitarized Zone (DMZ)