

Utah CTE

Computer Systems 1 (2023)

Mobile Devices 1

1 Recognize laptop hardware and components. 1.1

- 1 Hardware 1.1.1
 - 1 Keyboard 1.1.1.1
 - 2 Hard drive 1.1.1.2
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 - 2 1.8in vs. 2.5in 1.1.1.2.2
 - 3 RAM (Random Access Memory) 1.1.1.3
 - 4 Smart card reader 1.1.1.4
 - 5 Optical drive 1.1.1.5
 - 6 Wireless card/Bluetooth module 1.1.1.6
 - 7 Cellular card 1.1.1.7
 - 8 Video card 1.1.1.8
 - 9 PCI/PCIe 1.1.1.9
 - 10 Screen 1.1.1.10
 - 11 DC Jack 1.1.1.11
 - 12 Battery 1.1.1.12
 - 13 Touchpad 1.1.1.13
 - 14 Plastics/frame 1.1.1.14
 - 15 Speaker 1.1.1.15
 - 16 System Board 1.1.1.16
 - 17 CPU 1.1.1.17
 - 18 Webcam 1.1.1.18
 - 19 Microphone 1.1.1.19
 - 20 WiFi antenna connector 1.1.1.20
 - 21 Inverter 1.1.1.21
- 2 Features and types 1.1.2
 - 1 Special function keys 1.1.2.1
 - 2 Docking station 1.1.2.2
 - 3 Port replicator 1.1.2.3
 - 4 Rotating/removeable screens 1.1.2.4
 - 5 Tablets 1.1.2.5
 - 6 Smartphones 1.1.2.6
 - 7 Wearable technology devices 1.1.2.7
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9 E-readers 1.1.2.9

10 Wired and wireless 1.1.2.10

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2 Synchronize to the desktop 1.2.1.2

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2 Types of data to synchronize 1.2.2

1 Contacts 1.2.2.1

2 Applications 1.2.2.2

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4 Pictures 1.2.2.4

5 Music 1.2.2.5

6 Etc. 1.2.2.6

Networking 2

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1 Ports and protocols 2.1.1

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2 22 – SSH 2.1.1.2

3 23 – Telnet 2.1.1.3

4 25 – SMTP 2.1.1.4

5 53 – DNS 2.1.1.5

6 80 – HTTP 2.1.1.6

7 110 – POP3 2.1.1.7

8 143 – IMAP 2.1.1.8

9 3389 – RDP 2.1.1.9

10 538 – AFP 2.1.1.10

11 67/68 – DHCP 2.1.1.11

12 389 – LDAP 2.1.1.12

2 TCP vs. UDP 2.1.2

2 Compare and contrast common networking hardware devices. 2.2

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- 2 Switches 2.2.2
 - 1 Managed 2.2.2.1
 - 2 Unmanaged 2.2.2.2
- 3 Access points 2.2.3
- 4 Cloud-based network controller 2.2.4
- 5 Firewall 2.2.5
- 6 Network interface card 2.2.6
- 7 Repeater 2.2.7
- 8 Hub 2.2.8
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- 10 Bridge 2.2.10
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- 12 Power over Ethernet (PoE) 2.2.12
 - 1 Injectors 2.2.12.1
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5 802.11ac 2.4.5

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- 4 DHCP server 2.5.1.4
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 - 1 Tethering 2.7.3.1
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8 Understand appropriate use of networking tools. 2.8

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 - 2 Cable stripper 2.8.2
 - 3 Multimeter 2.8.3
 - 4 Tone generator and probe 2.8.4
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 - 6 Loopback plug 2.8.6
 - 7 Punchdown tool 2.8.7
 - 8 WiFi analyzer 2.8.8
 - 9 Ethernet cable tester 2.8.9
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1 Explain basic cable types, features, and their purposes. 3.1

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 - 1 Ethernet 3.1.1.1
 - 1 Cat 5 3.1.1.1.1
 - 2 Cat 5e 3.1.1.1.2
 - 3 Cat 6 3.1.1.1.3
 - 4 Cat 6a 3.1.1.1.4
 - 5 Plenum vs. Riser cable 3.1.1.1.5
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 - 1 VGA 3.1.2.1
 - 2 HDMI 3.1.2.2
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 - 1 DVI to HDMI 3.1.6.1

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2 RJ-45 3.2.2

3 RS-232 3.2.3

4 RG-59 3.2.4

5 RG-6 3.2.5

6 USB 3.2.6

7 Mini-USB 3.2.7

8 USB-C 3.2.8

9 Lightning 3.2.9

10 eSATA 3.2.10

11 Molex 3.2.11

3 Compare, contrast, and install RAM types. 3.3

1 RAM Types 3.3.1

1 SODIMM 3.3.1.1

2 DDR2 3.3.1.2

3 DDR3 3.3.1.3

4 DDR4 3.3.1.4

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5 Error correcting 3.3.5

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1 M2 drives 3.4.2.1

2 NVME 3.4.2.2

3 SATA 2.5 3.4.2.3

3 Magnetic hard drives 3.4.3

1 5,400rpm 3.4.3.1

2 7,200rpm 3.4.3.2

3 10,000rpm 3.4.3.3

4 15,000rpm 3.4.3.4

5 Sizes: 3.4.3.5

1 2.5 3.4.3.5.1

2 3.5 3.4.3.5.2

4 Hybrid drives 3.4.4

5 Flash 3.4.5

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2 Micro-SD card 3.4.5.2

3 Mini-SD card 3.4.5.3

4 xD 3.4.5.4

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1 RAID 0, 1, 5, 10 3.4.6.1

1 Hardware vs. software raids (benefits) 3.4.6.1.1

2 Hot-swappable 3.4.6.2

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 - 2 mATX 3.5.1.2
 - 3 ITX 3.5.1.3
 - 4 mITX 3.5.1.4
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 - 2 PCIe 3.5.2.2
 - 3 Riser card 3.5.2.3
 - 4 Socket types 3.5.2.4
 - 5 SATA 3.5.2.5
 - 6 SAS 3.5.2.6
 - 7 Front panel connector 3.5.2.7
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 - 5 Security 3.5.3.5
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 - 4 Hyperthreading 3.5.5.4
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 - 7 Integrated GPU 3.5.5.7

- 6 Compatibility 3.5.6
 - 1 AMD 3.5.6.1
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- 8 Expansion cards 3.5.8
 - 1 Video cards 3.5.8.1
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 - 2 Sound cards 3.5.8.2
 - 3 Network interface card 3.5.8.3
 - 4 USB expansion card 3.5.8.4
 - 5 eSATA card 3.5.8.5

6 Understand the use of various peripherals. 3.6

- 1 Printer 3.6.1
- 2 ADF/flatbed scanner 3.6.2
- 3 Barcode scanner/QR scanner 3.6.3
- 4 Monitors 3.6.4
- 5 VR/AR headset 3.6.5
- 6 Optical drive types 3.6.6
- 7 Mouse 3.6.7
- 8 Keyboard 3.6.8
- 9 Touchpad 3.6.9
- 10 Signature pad 3.6.10
- 11 Game controllers 3.6.11
- 12 Camera/webcam 3.6.12
- 13 Microphone 3.6.13
- 14 Speakers 3.6.14
- 15 Headset 3.6.15
- 16 Projector 3.6.16
 - 1 Lumens/brightness 3.6.16.1
- 17 External storage drives 3.6.17
- 18 KVM 3.6.18
- 19 Magnetic reader/chip reader 3.6.19
- 20 NFC/tap pay device 3.6.20
- 21 Smart card reader 3.6.21

7 Understand power supply installation types and features. 3.7

- 1 Input 115V vs. 220V 3.7.1
- 2 Output 5V v. 12V 3.7.2
- 3 24-pin motherboard adapter 3.7.3
- 4 Wattage rating 3.7.4
- 5 Number of devices/types of devices to be powered 3.7.5

8 Understand the appropriate components needed for a custom PC configuration. 3.8

- 1 Graphic/CAD/CAM design workstation 3.8.1
 - 1 SSD 3.8.1.1
 - 2 High-end video 3.8.1.2
 - 3 Maximum RAM 3.8.1.3
- 2 Audio/video editing workstation 3.8.2
 - 1 Specialized audio and video card 3.8.2.1
 - 2 Large, fast hard drive 3.8.2.2
 - 3 Dual monitors 3.8.2.3
- 3 Virtualization workstation 3.8.3
 - 1 Maximum RAM and CPU cores 3.8.3.1
- 4 Gaming PC 3.8.4
 - 1 SSD 3.8.4.1
 - 2 High-end video/specialized GPU 3.8.4.2
 - 3 High-definition sound card 3.8.4.3
 - 4 High-end cooling 3.8.4.4
- 5 Network attached storage device 3.8.5
 - 1 Media streaming 3.8.5.1
 - 2 File sharing 3.8.5.2
 - 3 Gigabit NIC 3.8.5.3
 - 4 RAID array (0, 1, 5, 1+0) 3.8.5.4
 - 5 Hard drive 3.8.5.5
 - 6 JBOD 3.8.5.6
- 6 Standard thick client 3.8.6
 - 1 Desktop applications 3.8.6.1
 - 2 Meets recommended requirements for selection OS 3.8.6.2
- 7 Thin client 3.8.7
 - 1 Basic applications 3.8.7.1
 - 2 Meets minimum requirements for selected OS 3.8.7.2
 - 3 Network connectivity 3.8.7.3

9 Understand printer types and installation. 3.9

1 Use appropriate drivers for a given operating system 3.9.1

1 Configuration settings 3.9.1.1

1 Duplex 3.9.1.1.1

2 Collate 3.9.1.1.2

3 Orientation 3.9.1.1.3

4 Quality 3.9.1.1.4

2 Device sharing 3.9.2

1 Wired 3.9.2.1

1 USB 3.9.2.1.1

2 Serial 3.9.2.1.2

3 Ethernet 3.9.2.1.3

2 Wireless 3.9.2.2

1 Bluetooth 3.9.2.2.1

2 802.11(a, b, g, n, ac, ax) 3.9.2.2.2

3 Infrastructure vs. ad hoc 3.9.2.2.3

3 Integrated print server (hardware) 3.9.2.3

4 Cloud printing/remote printing 3.9.2.4

3 Public/shared devices 3.9.3

1 Sharing local/networked device via operating system settings 3.9.3.1

1 TCP/Bonjour/AirPrint/Google Print 3.9.3.1.1

2 Data privacy 3.9.3.2

1 User authentication on the device 3.9.3.2.1

2 Hard drive caching 3.9.3.2.2

4 Print technologies 3.9.4

1 Laser 3.9.4.1

1 Imaging drum, fuser assembly, transfer belt, transfer roller, pickup rollers, separate pads, duplexing assembly 3.9.4.1.1

2 Imaging process: processing, charging, exposing, developing, transferring fusing, and cleaning 3.9.4.1.2

3 Maintenance Replace toner, apply maintenance kit, calibrate, clean 3.9.4.1.3

2 Inkjet 3.9.4.2

1 Ink cartridge, print head, roller, feeder, duplexing assembly, carriage, and belt 3.9.4.2.1

2 Calibrate 3.9.4.2.2

- 3 Maintenance: Clean heads, replace cartridges, calibrate, clear jams 3.9.4.2.3
 - 3 Thermal 3.9.4.3
 - 1 Feed assembly, heating element 3.9.4.3.1
 - 2 Special thermal paper 3.9.4.3.2
 - 3 Maintenance: Replace paper, clean heating element, remove debris 3.9.4.3.3
 - 4 Impact 3.9.4.4
 - 1 Print head, ribbon, tractor feed 3.9.4.4.1
 - 2 Impact paper 3.9.4.4.2
 - 3 Maintenance: Replace ribbon, replace print head, replace paper 3.9.4.4.3
 - 5 Virtual 3.9.4.5
 - 1 Print to file 3.9.4.5.1
 - 2 Print to PDF 3.9.4.5.2
 - 3 Print to XPS 3.9.4.5.3
 - 4 Print image 3.9.4.5.4
 - 6 3D printers 3.9.4.6
 - 1 Plastic filament 3.9.4.6.1
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Hardware and Network Troubleshooting 4

1 Use the best practice methodology to resolve problems. 4.1

- 1 Always consider corporate policies, procedures, and impacts before implementing changes. 4.1.1
 - 1 Identify the problem 4.1.1.1
 - 1 Question the user and identify user changes to computer and perform backups before making changes 4.1.1.1.1
 - 2 Inquire regarding environmental or infrastructure changes 4.1.1.1.2
 - 3 Review system and application logs 4.1.1.1.3
 - 2 Establish a theory of probable cause (question the obvious) 4.1.1.2
 - 1 If necessary, conduct external or internal research based on symptoms 4.1.1.2.1
 - 3 Test the theory to determine cause 4.1.1.3
 - 1 Once the theory is confirmed, determine the next steps to resolve problem 4.1.1.3.1
 - 2 If theory is not confirmed re-establish new theory or escalate 4.1.1.3.2
 - 4 Establish a plan of action to resolve the problem and implement the solution 4.1.1.4
 - 5 Verify full system functionality and, if applicable, implement preventive measures 4.1.1.5
 - 6 Document findings, actions, and outcomes 4.1.1.6

2 Understand the trouble shooting process relating to motherboards, RAM, CPU's, and power. 4.2

- 1 Common symptoms 4.2.1
 - 1 Unexpected shutdowns 4.2.1.1
 - 2 System lockups 4.2.1.2
 - 3 POST code beeps 4.2.1.3
 - 4 Blank screen on bootup 4.2.1.4
 - 5 CMOS 4.2.1.5
 - 6 time and setting resets 4.2.1.6
 - 7 Attempts to boot to incorrect device 4.2.1.7
 - 8 Continuous reboots 4.2.1.8
 - 9 No power 4.2.1.9
 - 10 Overheating 4.2.1.10
 - 11 Loud noise 4.2.1.11
 - 12 Intermittent device failures 4.2.1.12
 - 13 Fans pain- no power to other devices 4.2.1.13
 - 14 Indicator lights 4.2.1.14
 - 15 Smoke 4.2.1.15
 - 16 Burning smell 4.2.1.16
 - 17 Proprietary crash screens (BSOD/pin wheel) 4.2.1.17
 - 18 Distended capacitors 4.2.1.18
 - 19 Log entries and error messages 4.2.1.19

3 Troubleshooting storages devices. 4.3

- 1 Common symptoms 4.3.1
 - 1 Read/write failure 4.3.1.1
 - 2 Slow performance 4.3.1.2
 - 3 Loud clicking noise 4.3.1.3
 - 4 Failure to boot 4.3.1.4
 - 5 Drive not recognized 4.3.1.5
 - 6 OS not found 4.3.1.6
 - 7 RAID not found 4.3.1.7
 - 8 RAID stops working 4.3.1.8
 - 9 Proprietary crash screens (BSOD/pin wheel) 4.3.1.9
 - 10 S.M.A.R.T. errors 4.3.1.10

4 Troubleshooting multimedia components. 4.4

- 1 Common systems 4.4.1
 - 1 VGA mode 4.4.1.1
 - 2 No image on screen 4.4.1.2
 - 3 Overheat shutdown 4.4.1.3
 - 4 Dead pixels 4.4.1.4
 - 5 Artifacts 4.4.1.5
 - 6 Incorrect color patterns 4.4.1.6
 - 7 Dim image 4.4.1.7
 - 8 Flickering image 4.4.1.8
 - 9 Distorted image 4.4.1.9
 - 10 Distorted geometry 4.4.1.10
 - 11 Burn-in 4.4.1.11
 - 12 Oversized images and icons 4.4.1.12

5 Troubleshoot common network problems. 4.5

- 1 Common symptoms 4.5.1
 - 1 Limited connectivity 4.5.1.1
 - 2 Unavailable resources 4.5.1.2
 - 1 Internet 4.5.1.2.1
 - 2 Local resources 4.5.1.2.2
 - 1 Shares 4.5.1.2.2.1
 - 2 Printers 4.5.1.2.2.2
 - 3 Email 4.5.1.2.2.3
 - 3 No connectivity 4.5.1.3
 - 4 APIPA/link local address 4.5.1.4
 - 5 Intermittent connectivity 4.5.1.5
 - 6 IP conflict 4.5.1.6
 - 7 Slow transfer speeds 4.5.1.7
 - 8 Low RF signal 4.5.1.8
 - 9 SSID not found 4.5.1.9
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Operational Procedures 5

1 Understand proper communication techniques and professionalism. 5.1

- 1 Use proper language and avoid jargon, acronyms, and slang, when applicable 5.1.1
- 2 Maintain a positive attitude/ project confidence 5.1.2
- 3 Actively listen (taking notes) and avoid interrupting the customer 5.1.3
- 4 Be respectful of different cultures 5.1.4
 - 1 Use appropriate professional titles, when applicable 5.1.4.1
- 5 Be on time (if late, contact the customer) 5.1.5
- 6 Avoid distractions 5.1.6
 - 1 Personal calls 5.1.6.1
 - 2 Texting/social media sites 5.1.6.2
 - 3 Talking to coworkers while interacting with customers 5.1.6.3
 - 4 Personal interruptions 5.1.6.4
- 7 Dealing with difficult customers or situations 5.1.7
 - 1 Do not argue with customers and/or be defensive 5.1.7.1
 - 2 Avoid dismissing customer problems 5.1.7.2
 - 3 Avoid being judgmental 5.1.7.3
 - 4 Clarify customer statements (ask open-ended questions to narrow the 5.1.7.4
 - 5 scope of the problem, restate the issue, or question to verify understanding) 5.1.7.5
 - 6 Do not disclose experiences via social media outlets 5.1.7.6
- 8 Set and meet expectations/timeline and communicate status with the customer 5.1.8
 - 1 Offer different repair/ replacement options, if applicable 5.1.8.1
 - 2 Provide proper documentation on the services provided 5.1.8.2
 - 3 Follow up with customer/user at a later date to verify satisfaction 5.1.8.3
- 9 Deal appropriately with customers' confidential and private materials 5.1.9
 - 1 Located on a computer, desktop, printer, etc. 5.1.9.1