CompTIA A+ Core 1 (220-1201)

Full Learning Guide

Welcome to your complete CompTIA A+ Core 1 (220-1201) study manual.
This guide is designed to teach you each domain deeply, with real-world context, not just surface-level summaries.

Learning Objectives and Expectations

By completing this guide, you will:

- Master every CompTIA A+ Core 1 exam objective
- Understand how real-world IT hardware and support workflows operate
- Learn to troubleshoot, configure, and deploy systems with confidence

Each domain includes:

- Full concept breakdowns with real-world examples
- Troubleshooting and configuration scenarios
- Exam tips, comparison tables, and memory tricks

CompTIA A+ Core 1 Domains

Each domain is weighted differently on the exam. Troubleshooting and hardware are the most heavily tested.

- **Domain 1**: Mobile devices (13%)
- **Domain 2**: Networking (23%)
- **Domain 3**: Hardware (25%)
- **Domain 4**: Virtualization and cloud computing (11%)
- **Domain 5**: Hardware and network troubleshooting (28%)

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How the Exam Works

- Number of Questions: Up to 90
- Format: Multiple Choice + Performance-Based Questions (PBQs)
- Time Limit: 90 minutes
- Passing Score: 675 out of 900 (approximately 75%)
- Test Provider: Pearson VUE (in person or online)

Top 10 A+ Core 1 Exam Tips

1. **Review Core Concepts Frequently:** Focus on port numbers, cable types, hardware components, printer types, and RAID levels.
2. **Get Quality Sleep the Night Before:** Clear thinking and energy are essential, especially for multi-step troubleshooting questions.
3. **Arrive Early and Prepare for the Testing Environment:** Bring valid government-issued ID. For online exams, prep your workspace in advance and ensure stable internet.
4. **Skip PBQs If Needed – Come Back Later:** Don't waste 10 minutes on one simulation. Flag it, finish all multiple-choice first, and return if time allows.
5. **Manage Your Time Strategically:** Average about 1 minute per question. Mark and revisit tough ones later. Don't spend 5 minutes on a single question.
6. **Read Questions Carefully:** Watch for key terms like NOT, BEST, FIRST, MOST LIKELY. These change the expected answer entirely.
7. **Use Elimination First:** Remove obviously wrong options to improve guessing odds. Narrowing four choices to two doubles your chances.
8. **Never Leave a Question Blank:** There's no penalty for guessing. If time is almost up, answer every question.
9. **Trust Your Preparation:** If you've studied thoroughly, you likely know more than you think. Don't overthink. Go with first instincts if stuck.
10. **Use Remaining Time to Review:** Go back to flagged questions, but only change answers if you're sure of the correction. Don't second-guess everything.

Remember — you don't need to be perfect to pass!

The A+ Core 1 passing score is about **75%**. That means you **miss up to 22 questions out of 90** and still pass!

Don't panic if you don't know one or two topics. Stay calm, keep working through the test, and **trust your preparation**.

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Domain 1: Mobile Devices (13%)

This domain focuses on installing, configuring, and troubleshooting mobile devices like laptops, smartphones, tablets, and wearable tech. You need to understand internal hardware, accessories, network configurations, and mobile OS settings.

1.1 – Install and Configure Laptop Hardware and Components

Common Components

- **Battery**
  - Lithium-ion (Li-ion) is the standard.
  - Symptoms of failure: swelling, short battery life, or sudden shutdowns.
  - Replacement involves removing the back panel or using a latch (older models).
- **Keyboard**
  - May be attached with screws or clips. Ribbon cable connects to the motherboard.
  - Replacement is common after liquid spills or key damage.
- **Hard Drive / SSD**
  - 2.5-inch SATA drives or M.2 (SATA or NVMe) SSDs.
  - Replacement requires drive cloning or OS reinstallation.
- **RAM**
  - SODIMM modules for laptops.
  - Located under access panel or behind full backplate.
- **Wireless Cards**
  - M.2 or mini PCIe cards. Often include Wi-Fi and Bluetooth.
  - Watch for antenna wire placement.
- **Display**
  - LCD with LED backlight (modern) or CCFL (older).
  - Issues like no image or dim screen can mean inverter or backlight failure.
- **Inverter**
  - Powers backlight in older CCFL-based screens.
  - Not found in LED-backlit displays.
- **Speakers, Touchpads, Webcams**
  - Integrated but replaceable with access and disassembly.
- **DC Jack**
  - Failure leads to power issues. May be soldered or replaceable as a module.

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1.2 – Compare and Contrast Features of Mobile Devices

Types

- **Smartphones**
  - Touchscreen, cellular, GPS, cameras.
  - Android and iOS are dominant platforms.
- **Tablets**
  - Larger screens, no physical keyboards (unless external).
  - Often used for media, browsing, light productivity.
- **Wearables**
  - Smartwatches, fitness trackers.
  - Bluetooth-connected, low battery use, some with LTE.
- **E-Readers**
  - Use e-ink displays.
  - Long battery life, limited use.
- **GPS Devices**
  - Used for navigation.
  - Often replaced by smartphone apps.

1.3 – Connect and Configure Accessories and Ports

Wired Interfaces

- **Micro-USB / Mini-USB**
  - Older Android and portable devices.
- **USB-C**
  - Reversible, supports power, data, and video (with Alt Mode).
- **Lightning**
  - Apple devices only (pre-USB-C iPhones).
- **Headphone Jacks**
  - 3.5mm analog. Some devices require adapters.

Wireless Technologies

- **Bluetooth**
  - Short-range (10m). Used for headsets, mice, keyboards, speakers.
- **NFC**
  - Very short-range. Used for payments and pairing.
- **Infrared (IR)**
  - Rare; used in remotes.
- **Hotspot**
  - Turn a smartphone into a Wi-Fi router.

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Docking Station vs. Port Replicator

- **Docking Station**
  - Expands connectivity (USB, display, Ethernet, power).
- **Port Replicator**
  - Adds ports but usually lacks power delivery.

1.4 – Configure Basic Mobile Device Network Connectivity and Application Support

Wireless Configuration

- **Wi-Fi**
  - SSID, security settings (WPA2, WPA3), IP (DHCP/static).
- **Bluetooth Pairing**
  - Discovery mode, pairing code (sometimes), connection confirmation.
- **Hotspot/Tethering**
  - USB, Bluetooth, or Wi-Fi sharing of cellular data.

Mobile Email Configuration

- **POP3 / IMAP / Exchange**
  - Settings include server names, ports, SSL, authentication.
  - IMAP is best for multi-device sync.

Synchronization Options

- **iCloud, Google Account, Exchange**
  - Sync email, contacts, calendar, photos, documents.
- **Methods**
  - Cloud, local (via USB and software), wireless local (e.g., AirDrop).

1.5 – Compare and Contrast Methods for Securing Mobile Devices

Screen Lock Types

- PIN, Password, Pattern, Face ID, Fingerprint.

Remote Wipe / Locator Services

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- Find My iPhone, Android Device Manager.

Security Features

- **Biometrics** – Face, Fingerprint.
- **Auth Apps** – MFA tools (Google Authenticator).
- **Antivirus** – Less common, but growing on Android.

Device Access Control

- MDM (Mobile Device Management): enforce policies.
- BYOD challenges: separation of personal and work data.

Data Encryption

- iOS and Android use full-disk encryption by default.

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Domain 1 Summary – Mobile Devices (13%)

Things You Must Memorize:

- Laptop components: RAM, storage, wireless card, display/inverter
- Mobile device types: smartphones, tablets, wearables, GPS
- Mobile ports: USB-C, Lightning, Micro-USB, Mini-USB
- Wireless tech: Bluetooth, NFC, IR, Wi-Fi
- Docking stations vs. port replicators
- Sync methods: cloud, local USB, Wi-Fi
- Email config: IMAP, POP3, SMTP, Exchange
- Mobile security: screen locks, biometrics, MDM, remote wipe

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Domain 2: Networking (23%)

This domain focuses on networking fundamentals, device types, cables, connections, configuration, tools, and protocols. It's heavy on terminology, port numbers, and troubleshooting scenarios.

2.1 – Common Network Ports, Protocols, and Their Purpose

You must **memorize key port numbers**, protocol functions, and service types.

Essential Ports Table

Protocol	Port	Function
FTP	20/21 TCP	File Transfer
SSH	22 TCP	Secure command-line access
Telnet	23 TCP	Insecure remote login
SMTP	25 TCP	Send mail
DNS	53 TCP/UDP	Resolve names to IPs
DHCP	67/68 UDP	Assign IP config
HTTP	80 TCP	Unencrypted web
POP3	110 TCP	Retrieve email
IMAP	143 TCP	Sync email folders
HTTPS	443 TCP	Secure web traffic
SMB	445 TCP	File/printer sharing
RDP	3389 TCP	Remote Desktop
LDAP	389 TCP/UDP	Directory services
SNMP	161/162 UDP	Network monitoring
SFTP	22 TCP	Secure FTP over SSH
AFP	548 TCP	Apple file services

Protocol Tips:

- **TCP**: reliable, ordered, error-checked.
- **UDP**: fast, no error-checking (streaming, VoIP, DNS).

Study Tips:

- Use flashcards or mnemonics.
- Group ports by service type (email, web, file sharing).

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2.2 – Wi-Fi Standards, Frequencies, and Encryption

Wireless Standards Overview

Standard	Band	Max Speed	Notes
802.11a	5 GHz	54 Mbps	Short range
802.11b	2.4 GHz	11 Mbps	Interference-prone
802.11g	2.4 GHz	54 Mbps	Legacy
802.11n	2.4/5 GHz	600 Mbps	MIMO support
802.11ac	5 GHz	>1 Gbps	Beamforming
802.11ax (Wi-Fi 6)	2.4/5/6 GHz	9.6 Gbps	Dense areas, OFDMA

Encryption Types

- **WEP** – Weak, outdated.
- **WPA2 (AES)** – Secure, standard.
- **WPA3** – Stronger, newer.
- Avoid WEP in any setup.

2.3 – Network Services and Applications

Essential Network Services

Service	Function
DHCP	Auto IP assignment
DNS	Resolves domain names
NTP	Time sync
File/Print Server	Local resource sharing
Web Server	Hosts web apps/sites
Email Server	Send/receive mail
Authentication Server	Login and identity (e.g. RADIUS, LDAP)

Service Roles

- SMB: Windows file sharing
- AFP: Apple file sharing
- LDAP: Directory (user logins, contacts)

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2.4 – Networking Devices

Device	Function
Router	Directs traffic between networks
Switch	Connects devices on LAN, MAC-based
Hub	Legacy, broadcasts to all
Access Point	Provides wireless access
Modem	Converts ISP signal to Ethernet
Bridge	Connects two network segments
Firewall	Blocks/filters network traffic
Repeater	Boosts signal over distance
Patch Panel	Organizes cable runs
PoE Injector	Adds power over Ethernet

2.5 – SOHO Router Configuration

Key Settings:

- WAN: DHCP, static, PPPoE
- LAN: Subnet mask, IP range, DHCP scope
- NAT: Translates private to public IP
- Port Forwarding: For remote access (e.g. 3389 → RDP)
- DMZ: Exposes internal IP (avoid unless needed)
- QoS: Prioritizes traffic (e.g., VoIP over Netflix)

2.6 – Network Types and Topologies

Type	Description
LAN	Local Area Network (office/home)
WAN	Internet or large-scale interconnect
PAN	Personal (Bluetooth, IR)
MAN	City-wide network
WLAN	Wireless LAN
SAN	Storage Area Network (enterprise)
CAN	Campus Area Network (university)

Topologies:

- **Star**: Modern; devices connect to switch.
- **Bus**: Legacy, shared medium.
- **Mesh**: Every device connected (fully or partially).

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2.7 – Internet Connection Types

Type	Description
Cable	Coaxial, fast, shared bandwidth
DSL	Phone lines, distance-limited
Fiber	Fast, expensive, low latency
Satellite	High latency, rural access
Cellular	Mobile broadband (3G–5G)
ISDN	Obsolete digital dial-up
Line-of-sight wireless (WISP)	Rural, tower required

2.8 – Networking Tools

Tool	Use
Crimper	Attach RJ-45/RJ-11 connectors
Cable Tester	Validate pinouts, continuity
Tone Generator/Probe	Locate cables in bundles
Loopback Plug	Test NIC functionality
Punchdown Tool	Terminate wires to patch panels
Wi-Fi Analyzer	Detect SSIDs, interference
Multimeter	Voltage, resistance, continuity
Spectrum Analyzer	Wireless signal interference

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Domain 2 Summary – Networking (23%)

Things You Must Memorize:

- Common ports & protocols: SSH (22), DNS (53), HTTP/HTTPS (80/443), SMB (445), RDP (3389)
- Wireless standards: 802.11a/b/g/n/ac/ax, 2.4 GHz vs. 5 GHz
- Encryption types: WEP, WPA, WPA2, WPA3
- Networking devices: router, switch, AP, modem, patch panel
- SOHO setup: DHCP, NAT, port forwarding, IP config
- Network types: LAN, WAN, PAN, MAN, SAN, WLAN
- Internet types: fiber, DSL, cable, satellite, cellular
- Tools: crimper, tone probe, loopback plug, Wi-Fi analyzer

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Domain 3: Hardware (25%)

This domain is the largest in the exam and includes PC components, peripheral devices, storage, displays, power supplies, connectors, and **printer installation/configuration**.

3.1 – Display Types and Features

Display Technologies

Type	Description
LCD (LED-backlit)	Most common. Uses liquid crystals and LED backlight
OLED	Each pixel emits light. Excellent contrast
TN	Fast response, poor viewing angles (cheap)
IPS	Great color and viewing angles
VA	Best contrast among LCDs
Projectors	DLP (mirrors), LCD (3-panel)
Touchscreens	Resistive (pressure), Capacitive (touch conductivity)

Attributes

- **Brightness** (nits)
- **Contrast Ratio**
- **Refresh Rate** (Hz)
- **Resolution** (e.g. 1920x1080 = 1080p)
- **Color Depth** (bit)
- **Aspect Ratio** (16:9, 4:3, etc.)
- **Panel Size & Type**

Inverter

- Powers CCFL backlights (older LCDs)
- Modern LED-backlit screens don't use them

3.2 – Cables and Connectors

Video

Type	Description
HDMI	Audio + video, standard for TVs/monitors

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DisplayPort	High-res PC monitor standard
DVI	Digital video, legacy
VGA	Analog video, obsolete

Networking

Connector	Description
RJ-45	Ethernet
RJ-11	Phone, DSL

Peripheral/Data

Type	Use
USB-A, B, Micro, Mini, C	Universal connectivity
Thunderbolt	High-speed, USB-C shape
Lightning	Apple devices
eSATA	External drives
FireWire	Legacy Apple/video data
Serial/DB-9	Legacy COM port
Parallel/DB-25	Obsolete printer port
Molex	Power for older drives/fans
SATA Power & Data	Modern storage devices

3.3 – RAM Types and Features

Term	Meaning
DIMM	Desktop memory module
SO-DIMM	Laptop RAM
DDR3/DDR4/DDR5	Memory generations (not interchangeable)
ECC	Error Checking; used in servers
Dual Channel	Paired RAM for more bandwidth
Parity	Detects errors (not correct)
Buffered/Registered	Server memory (not consumer boards)

- Match speed, size, and type with motherboard specs
- RAM must be fully seated and latched

3.4 – Storage Devices and RAID

Drive Types

Type	Description

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HDD	Magnetic platter, slower, larger capacity
SSD	Fast, no moving parts, less power
M.2 NVMe SSD	Small, ultra-fast PCIe SSD
Hybrid (SSHD)	Combines SSD cache + HDD
Optical	CD/DVD/Blu-ray – legacy use
Flash	USB/thumb drives, SD cards

RAID Levels

RAID	Function	Drives	Tolerance
0	Striping	2+	None
1	Mirroring	2	1 drive
5	Striping + parity	3+	1 drive
6	Dual parity	4+	2 drives
10	Mirror + Stripe	4+	1 per pair

- **RAID = not a backup**
- Used for fault tolerance and/or speed

3.5 – Motherboards, CPUs, and Expansion Cards

Motherboard Form Factors

Type	Size
ATX	Full-size desktop
microATX	Smaller
Mini-ITX	Compact/small systems

Sockets

- **Intel (LGA)**: no pins on CPU
- **AMD (PGA)**: pins on CPU
- Ensure CPU and socket match

BIOS/UEFI

- Configure boot devices, clock, virtualization
- Update BIOS carefully (risk of bricking)

Expansion Cards

- **Video card (GPU)** – PCIe x16
- **Sound card** – PCIe x1
- **NIC** – Add more/faster Ethernet ports

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- **Capture card** – Video input
- **Storage controller** – RAID/SAS

3.6 – Power Supplies

Specifications

- **Wattage** – Must match or exceed system needs
- **Connectors** – 24-pin ATX, 4/8-pin CPU, PCIe 6/8-pin, SATA, Molex
- **Input voltage** – 110V/220V (auto-switching or manual)
- **Form factors** – ATX, SFX, etc.
- **Efficiency** – 80 PLUS rating (Bronze, Gold, etc.)

Voltages

Rail	Use
+12V	CPUs, GPUs, fans
+5V	Legacy, USB
+3.3V	Logic, memory
-12V	Serial ports
+5VSB	Standby (wake on LAN, etc.)

3.7 – Printer Types and Technologies

Type	How it Works	Notes
Laser	Toner fused via heat	Fast, high-volume
Inkjet	Sprays liquid ink	Good for photos
Thermal	Heat-sensitive paper	Receipt printers
Impact (dot matrix)	Pins strike ribbon	Multipart forms
Virtual	Print to PDF/XPS/image	No physical output

3.8 – Printer Installation and Configuration

Installation Methods

- USB, Ethernet, Wi-Fi
- Windows “Add Printer Wizard”
- Use correct **drivers** (32-bit/64-bit match)

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Printer Sharing

- Local share via Windows
- Network printing via IP (static or DHCP reservation)
- **Cloud printing** (e.g., Mopria, AirPrint)

Configuration Options

- Default tray/paper type
- Print quality (DPI)
- Duplex (2-sided printing)
- Color/B&W
- Collate, copies

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Domain 3 Summary – Hardware (25%)

Things You Must Memorize:

- Display types: LCD, OLED, IPS, TN, inverters
- Cables and connectors: HDMI, DisplayPort, USB, SATA, Molex, RJ-45
- RAM: DIMM, SO-DIMM, DDR3/4/5, ECC vs. non-ECC, dual-channel
- Storage: HDD, SSD, M.2 NVMe, hybrid, optical
- RAID levels: 0, 1, 5, 6, 10 – redundancy vs. performance
- Motherboards: ATX, microATX, Mini-ITX; socket types
- CPU: Intel LGA vs. AMD PGA; BIOS vs. UEFI
- PSU specs: wattage, rails (12V, 5V, 3.3V), connectors, 80 PLUS ratings
- Printers: laser, inkjet, thermal, dot matrix; drivers, sharing, config

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Domain 4: Virtualization and Cloud Computing (11%)

This domain tests your understanding of virtualization technologies, cloud models, and hosting concepts. It also includes basic configuration of virtual machines and an understanding of cloud infrastructure terms.

4.1 – Compare and contrast cloud computing concepts

Cloud service models

Model	What It Provides	Example
IaaS – Infrastructure as a Service	Full infrastructure (VMs, storage, networks); customer installs OS and apps	AWS EC2, Azure VMs
PaaS – Platform as a Service	Platform to develop/deploy apps; OS/updates handled for you	Heroku, Google App Engine
SaaS – Software as a Service	Complete software delivered via the web; user just uses the app	Gmail, Office 365

- ***IaaS = You manage OS***
- ***PaaS = You manage app***
- ***SaaS = You just use it***

Cloud characteristics

Term	Meaning
Rapid elasticity	Scale resources up/down on demand
On-demand	Provision resources instantly
Resource pooling	Multiple users share physical resources
Measured service	Pay for what you use (e.g., storage, bandwidth)
High availability	Redundant resources keep services online

Cloud deployment models

Model	Description
Public cloud	Shared, third-party hosted (AWS, Azure)
Private cloud	Exclusive to one organization
Hybrid cloud	Mix of public and private
Community cloud	Shared between similar orgs (e.g., schools, hospitals)

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4.2 – Set up and configure client-side virtualization

Virtualization = running one or more operating systems on a single physical machine.

Hypervisors

Type	Description	Example
Type 1	Bare-metal hypervisor; runs directly on hardware	VMware ESXi
Type 2	Hosted hypervisor; runs inside an OS	VirtualBox, VMware Workstation

Host vs guest

- **Host** = physical machine
- **Guest** = VM (virtual machine)

Common virtualization settings

Setting	Description
RAM allocation	Guest RAM pulled from host
Virtual CPU (vCPU)	Number of logical CPUs assigned
NIC	NAT, bridged, host-only options
Virtual disk	VHD/VMDK image files simulate drives
Snapshot	Save VM state before testing/updates
GPU passthrough	Assign physical GPU to VM (advanced setups)

Benefits

- Efficient hardware use
- Easy testing
- Isolation of environments
- Easy backups via snapshots

Limitations

- Host resources are shared
- Not suitable for high-performance needs unless hardware supports virtualization (Intel VT-x / AMD-V)

Exam tip: You may be asked how to configure a VM for a test environment or troubleshoot performance issues (e.g., increase allocated RAM).

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Domain 4 Summary – Virtualization and Cloud Computing (11%)

Things You Must Memorize:

- Cloud models: IaaS, PaaS, SaaS
- Deployment types: public, private, hybrid, community
- Cloud characteristics: elasticity, on-demand, pooled, metered
- Virtualization: hypervisors (Type 1 vs. 2), host vs. guest
- VM settings: memory, CPU, storage, snapshots, network types

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Domain 5: Hardware and Network Troubleshooting (28%)

This domain focuses on identifying and resolving issues related to hardware components, peripherals, storage, displays, mobile devices, networking, and printers.

5.1 – Troubleshoot problems with motherboards, RAM, CPUs, and power

Symptoms & Causes

Symptom	Likely Cause
No power, no boot	Dead PSU, unplugged cable, failed motherboard
POST beeps	RAM not seated, missing CPU, no video
Burning smell or smoke	PSU failure, short circuit
Random reboots	Overheating, failing PSU or RAM
System lockups	RAM issues, thermal events
Fans spin but no display	Bad GPU, CPU not seated, no RAM
Time/date resets	Dead CMOS battery

Troubleshooting steps

- Reseat RAM/CPU
- Test with known-good PSU
- Clear CMOS
- Use POST code display/beeps

5.2 – Troubleshoot hard drives and RAID arrays

Common Symptoms

Symptom	Cause
Slow performance	Failing HDD, full disk, fragmentation
Failure to boot	Bad boot order, missing OS
Drive not detected	Loose SATA cable, BIOS disabled, dead drive
RAID array degraded	Failed drive; needs replacement
Clicking/grinding	Mechanical failure (backup immediately)

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Tools

- chkdsk, diskpart, sfc
- SMART monitoring (CrystalDiskInfo, BIOS)
- Disk cloning tools (Macrium, Clonezilla)
- RAID software tools (rebuild/recover)

5.3 – Troubleshoot video, projector, and display issues

Symptoms

Symptom	Possible Cause
No display	Loose cable, wrong input, dead GPU
Dim screen	Inverter failure (old laptops), brightness setting
Flickering	Refresh rate mismatch, failing cable
Artifacts	Overheating GPU, driver issues
Color issues	Loose cable, bad monitor
BSODs with video driver	Driver conflict or GPU hardware fault

Fixes

- Verify connections
- Swap monitors/cables
- Reinstall GPU drivers
- Test known-good GPU

5.4 – Troubleshoot mobile device issues

Common Mobile Issues

Symptom	Cause
Unresponsive touchscreen	Digitizer damaged
Swollen battery	Battery failure (replace immediately)
Won't charge	Damaged port, dead charger
Overheating	Battery issue, background apps
No Wi-Fi/Bluetooth	Airplane mode, hardware toggle off
Slow performance	Too many apps, low storage

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Fixes

- Reboot or factory reset
- Update OS/apps
- Replace battery or port
- Reset network settings

5.5 – Troubleshoot printers

Common Symptoms

Symptom	Cause
Paper jams	Dirty/worn rollers, poor paper quality
Ghosting (light duplicate images)	Bad drum or fuser
Streaks/lines	Dirty printhead, clogged nozzles
Faded print	Low toner/ink, draft mode enabled
Access denied	Permission issue
Error codes	Check printer display or manual

Maintenance Steps

- Clean rollers, replace toner/ink
- Run head cleaning/alignment
- Reboot printer/spooler
- Check share permissions and drivers

5.6 – Troubleshoot network connections

Common Symptoms

Symptom	Root Cause
Limited or no connectivity	DHCP failed, bad IP, cable unplugged
APIPA address (169.254.x.x)	No DHCP server response
Slow transfer	Interference, low signal, duplex mismatch
IP conflict	Two devices using same static IP
Unable to connect to host	DNS failure, firewall blocking

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Troubleshooting Tools

Tool	Use
ipconfig	View IP address and gateway
ping	Test reachability
tracert	Show route to host
nslookup	Check DNS resolution
netstat	View open ports/sessions
Loopback plug	Test NIC
Cable tester	Validate Ethernet cables

Other Checks

- Reboot router/device
- Verify SSID/security key
- Update drivers
- Check MAC filters, firewall

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Domain 5 Summary – Hardware and Network Troubleshooting (28%)

Things You Must Memorize:

- Motherboard/CPU/RAM symptoms: POST beeps, reboots, no power
- Storage issues: SMART warnings, no boot, RAID failures
- Display problems: no video, artifacts, flicker, dim screens
- Printer errors: jams, ghosting, faded prints, driver issues
- Mobile device issues: cracked screens, no charging, unresponsive touch
- Network issues: APIPA, DNS failure, IP conflict, slow speeds
- Tools: ping, ipconfig, nslookup, cable tester, loopback plug, traceroute

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Terms and Definitions

Mobile Device Terms

Term	Definition
SODIMM	Small Outline DIMM; laptop-sized memory module
Digitizer	Touch input layer over display (capacitive/resistive)
Docking Station	Expands connectivity (video, USB, power)
Port Replicator	Adds ports but no power/docking functionality
Hotspot	Phone acting as mobile router
Tethering	Sharing internet via USB/Bluetooth

Networking Terms

Term	Definition
DHCP	Dynamically assigns IP, subnet, gateway, DNS
DNS	Resolves domain names to IP addresses
NAT	Translates private IPs to public
SSID	Name of a wireless network
MAC address	Unique hardware address (Layer 2)
APIPA	169.254.x.x address when DHCP fails
Latency	Time delay in data transmission
Bandwidth	Max data rate of a connection
Throughput	Actual achieved data rate

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Hardware Terms

Term	Definition
DIMM	Standard desktop memory module
ECC RAM	Error-correcting memory (used in servers)
RAID	Redundant Array of Independent Disks; fault-tolerant storage setup
Form factor	Physical size/shape of hardware (e.g., ATX, microATX)
PSU	Power supply unit; converts AC to DC
CMOS battery	Powers BIOS settings and system clock
Thermal paste	Compound between CPU and heatsink to aid heat transfer

Cabling and Connectors

Term	Definition
RJ-45	8-pin connector for Ethernet
RJ-11	4- or 6-pin phone line connector
HDMI	Audio/video digital interface
DisplayPort	High-res video interface (PC)
SATA	Storage drive data interface
Molex	Legacy 4-pin power connector
Thunderbolt	High-speed interface via USB-C or Mini DisplayPort
USB-C	Reversible USB connector; supports data, power, video

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Printer Terms

Term	Definition
Duplexing	Printing on both sides of the paper
Collate	Grouping multi-page copies in order
Toner	Dry powder used in laser printers
Fuser	Melts toner onto paper in laser printers
Printhead	Ink delivery mechanism in inkjets
Impact printer	Dot-matrix; uses ribbon and pins

Virtualization and Cloud Terms

Term	Definition
Hypervisor	Software managing VMs (Type 1 or 2)
Snapshot	Save state of a VM for rollback
IaaS	Infrastructure as a Service – full control of virtual machines
PaaS	Platform as a Service – develop/deploy apps
SaaS	Software as a Service – use the app, no backend access
Resource pooling	Shared cloud resources for multiple customers
Elasticity	Auto-scale up/down cloud resources

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