IT SUPPORT · IT-04

Network Troubleshooting

Use this when: a user says "the internet is down" and you need to find where it breaks, fix the common causes, or escalate with proof.

BreakFixLearn

CompTIA A+ · Network+
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Scan to visit

Work up the stack: stop at the first failure

Gateway 192.0.2.1 in the examples

1 Link	2 IP address	3 Gateway	4 Internet	5 DNS	6 App / port
Cable lights? Wi-Fi on? Airplane mode off?	`ipconfig /all` 169.254.x.x = no DHCP	`ping 192.0.2.1` local network OK?	Ping a public IP your team trusts	`nslookup example.com` name resolves?	Is port 443 open? See Diagnose below

Symptom to likely cause

169.254.x.x address	No DHCP reply: cable, wrong VLAN or DHCP server down. Try `ipconfig /renew`.
IP works, names fail	DNS: wrong DNS server or bad cache. `ipconfig /flushdns`, check DNS in `ipconfig /all`.
"Connected, no internet"	Gateway or DNS problem. Ping the gateway, then a public IP.
One site fails	That site, a proxy or a web filter. Try another browser and `Test-NetConnection`.
IP conflict warning	Two devices with one IP, often a static one. `arp -a` shows the MAC behind it.
Slow or drops on Wi-Fi	Weak signal or a crowded 2.4 GHz band. `netsh wlan show interfaces` shows signal %.
Whole office down	Not this PC. Check the switch, ISP or outage page, then escalate.

Diagnose

Windows

`Get-NetIPConfiguration`	IP, gateway, DNS
`Resolve-DnsName example.com`	DNS answer
`Test-NetConnection example.com -Port 443`	Port open?
`ping -t 192.0.2.1`	Watch for drops
`pathping example.com`	Loss per hop

Wi-Fi checks

Signal	Low signal %? Move closer
Band	Try 5 GHz if 2.4 GHz is crowded
Profile	Forget the network, rejoin
Driver	Update; check power saving
Captive portal	Guest Wi-Fi: open a browser

Fix ladder

Admin prompt, in this order

1. `netsh winsock reset`
2. `netsh int ip reset`
3. `ipconfig /release` then `ipconfig /renew`
4. `ipconfig /flushdns`
5. Last resort: Settings › Network reset (reboots)

`tracert example.com`	Where it stops
`netsh wlan show wlanreport`	Wi-Fi history report

Escalate with proof

- ☐ User, PC name, location
- ☐ `ipconfig /all` output
- ☐ When it started
- ☐ Wired or Wi-Fi
- ☐ Which step failed
- ☐ How many users

DANGER Never turn off the firewall or antivirus "to test" the connection.

CAUTION `/release` drops a remote session. Network reset removes VPN clients and virtual switches.

REMEMBER

- **169.254** = DHCP never answered
- IP OK, name fails = **DNS**
- Many users down = not the PC

Sources: Microsoft Support (Fix Ethernet problems) · Microsoft Learn (TCP/IP) · CompTIA A+, Network+

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