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The fact that the PC can ping the router means it can reach it, so the local network is working

However, it cannot reach google.com.

This usually means there is a problem with DNS — in other words, DNS is not translating website names into IP addresses

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Problems:

1. unstable internet
2. losing connection
3. packets may arrive at the wrong device

Reason:

4. someone manually set a static IP that was already in use
5. misconfigured network settings
6. DHCP accidentally gave the same IP to two devices

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Wi-Fi signal only shows that the device can talk to the router well

1. too many devices are using Wi-Fi
2. weak ISP connection

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It means the wireless connection is failing

1. broken Wi-Fi adapter
2. problem with security settings
3. the device is too far from the router

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1. the website is blocked
2. the server is down
3. the site's SSL certificate is broken

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Connected means the router is connected to the device, but it does not mean it has internet

Causes:

1. problem with ISP
2. the router lost its WAN IP address
3. the internet plan or package expired and needs to be paid

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If everything works on other devices, then it's a device-level problem

1. VPN is blocking some services
2. browser issues
3. antivirus blocking domains
4. wrong system time

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1. weak signal
2. Wi-Fi glitch
3. sleep mode
4. unstable Wi-Fi adapter

0008

1. Router's WAN configuration is incorrect
2. ISP issues
3. broken cable
4. router blocks external traffic

0009

1. phone doesn't hold charge and overheats
2. low frequency (weak signal / low performance)
3. too many apps running
4. software issues

0010

mac address - data link layer

it identifies a device inside the local network

ipv4 address - network layer

used to route packets between different networks

port 443 - transport layer

ports help tcp/udp find the correct service; 443 is for https

wi-fi signal - physical layer

it's a radio signal that carries bits

ethernet frame - data link layer

uses mac addresses and works inside the lan

router - network layer

moves packets from one network to another

tcp handshake - transport layer

creates a reliable connection before sending data

collision domain -data link layer

shows where devices share the same medium and can collide

arp- data link layer

finds the mac address that matches an ip address

subnet mask - network layer

shows the network part and host part of an ip

default gateway - network layer

the router that sends traffic outside the local network

switch - data link layer

forwards frames to the correct device using mac addresses