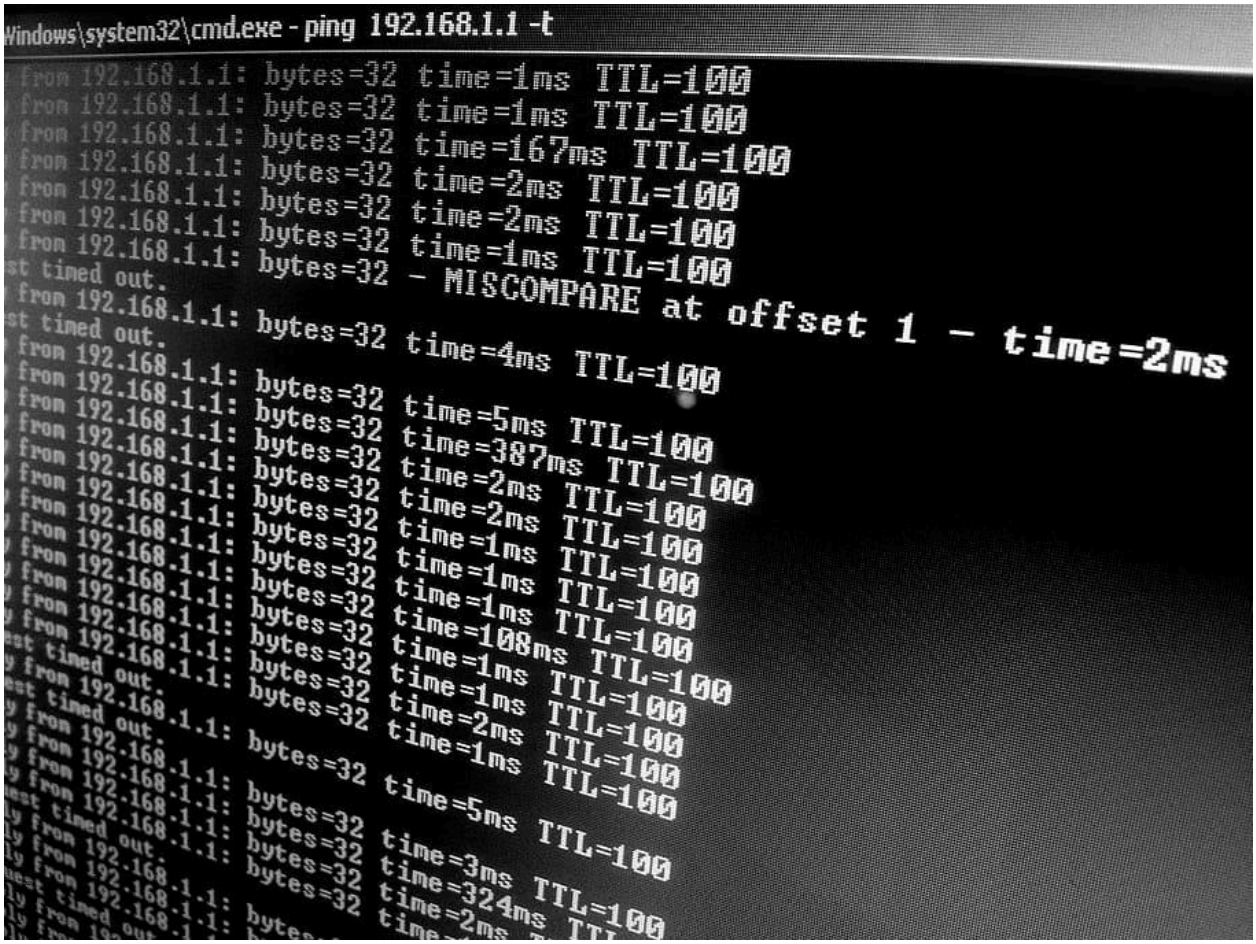


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# 🖥️ Ping Command Tutorial

**Test Network Connectivity Like a Pro**

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## 📌 What is the Ping Command?

The **ping command** is a basic networking tool used to test whether your computer can communicate with another device (like a website, server, or another computer).

It works by sending small data packets (ICMP Echo Requests) and measuring how long it takes to receive a response.

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# 🎯 Why Use Ping?

You use ping to:

- Check if a website is reachable
- Test your internet connection
- Troubleshoot network issues
- Measure network speed (latency)
- Detect packet loss

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# ⚙️ Basic Syntax

ping [destination]

**Examples:**

ping google.com
ping 8.8.8.8

---

# 🧪 Example Output Explained

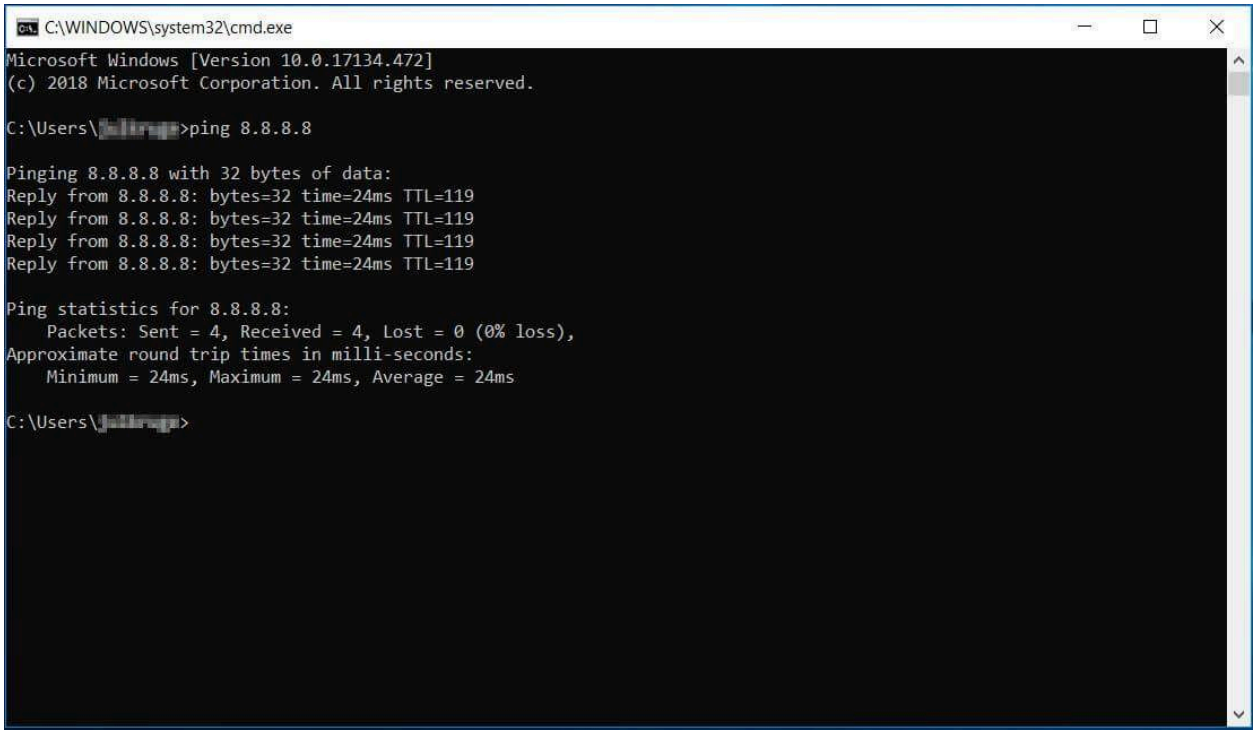
Reply from 142.250.190.78: bytes=32 time=14ms TTL=117

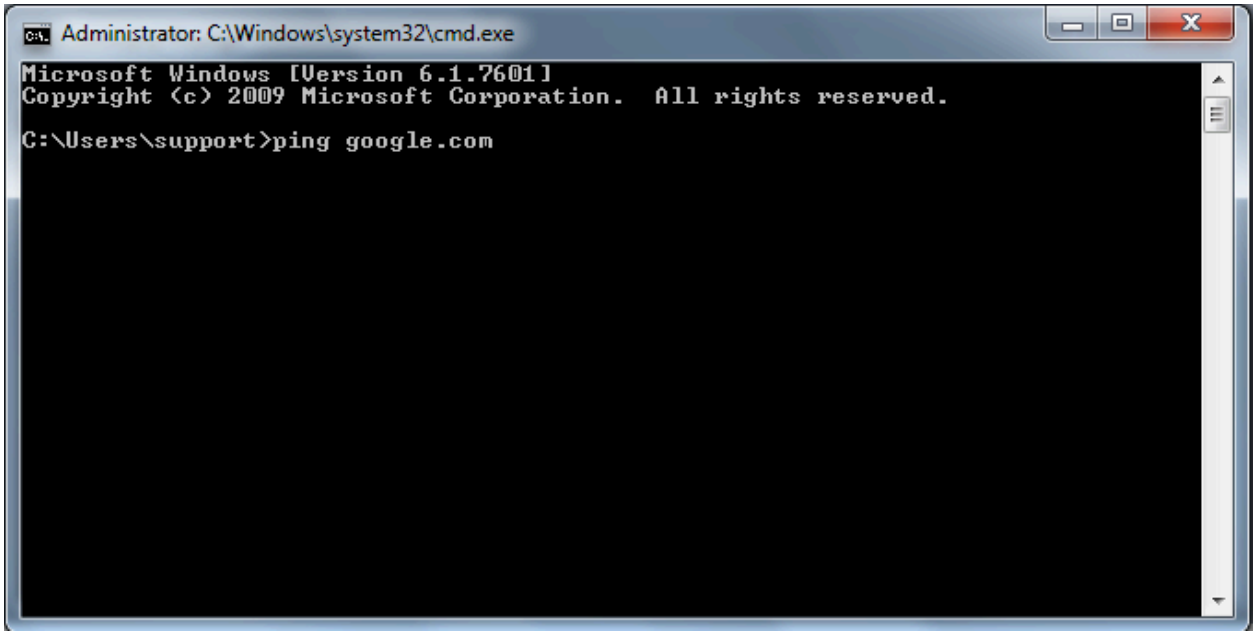
- **Reply from** → The server responded
- **bytes=32** → Size of the packet
- **time=14ms** → Latency (lower is better)
- **TTL=117** → Time To Live (network hop limit)

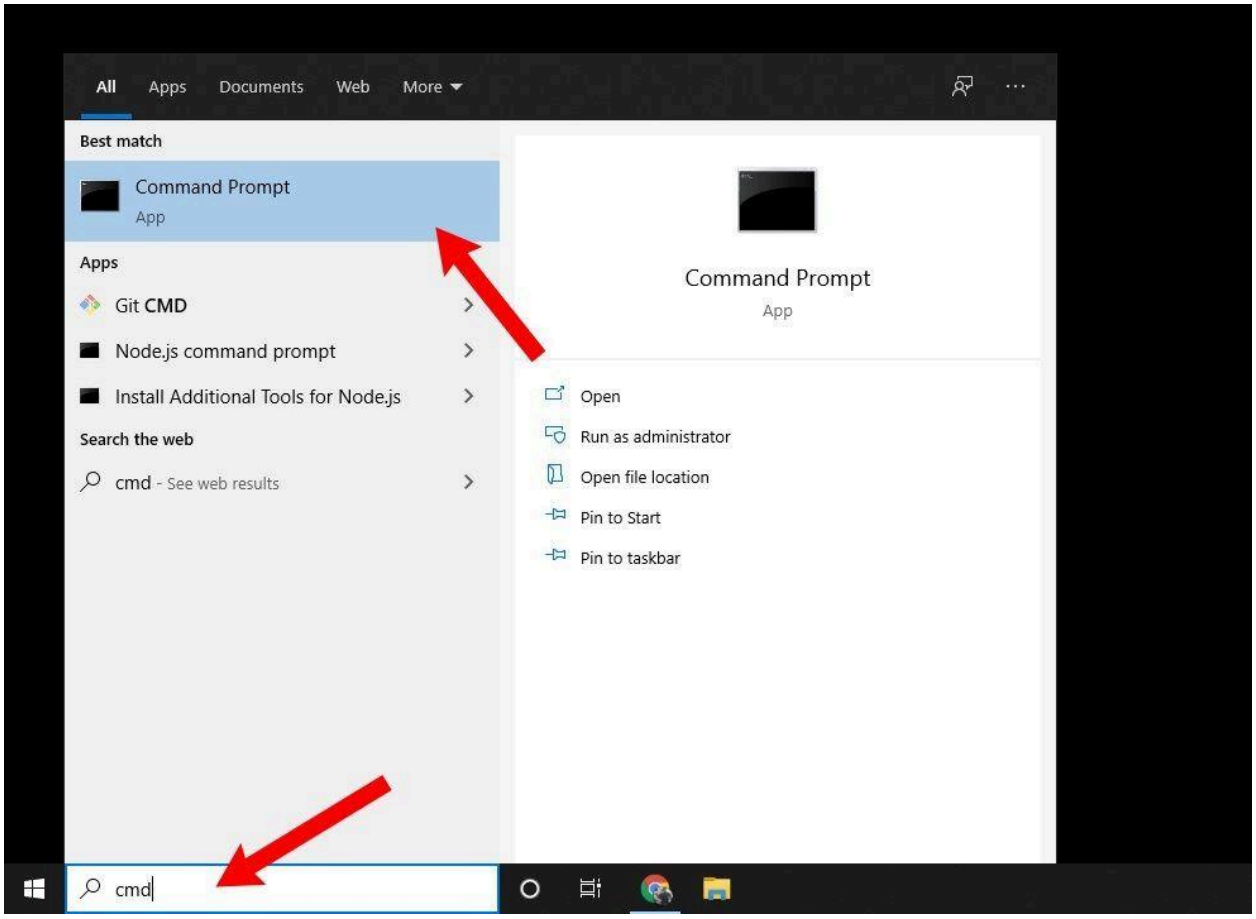
---

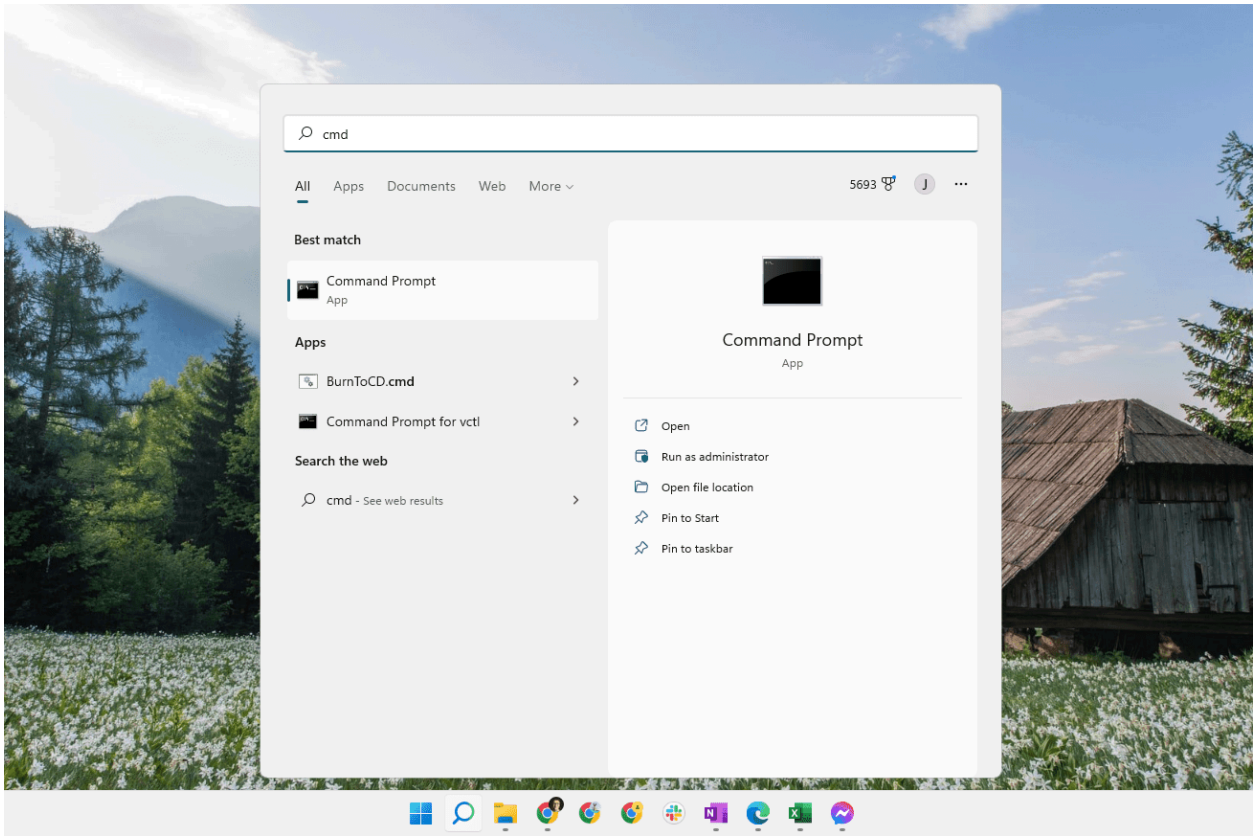
# 💻 How to Run Ping (Step-by-Step)

## 🪟 On Windows


C:\WINDOWS\system32\cmd.exe
Microsoft Windows [Version 10.0.17134.472]
(c) 2018 Microsoft Corporation. All rights reserved.
C:\Users\[redacted]>ping 8.8.8.8
Pinging 8.8.8.8 with 32 bytes of data:
Reply from 8.8.8.8: bytes=32 time=24ms TTL=119
Reply from 8.8.8.8: bytes=32 time=24ms TTL=119
Reply from 8.8.8.8: bytes=32 time=24ms TTL=119
Reply from 8.8.8.8: bytes=32 time=24ms TTL=119
Ping statistics for 8.8.8.8:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 24ms, Maximum = 24ms, Average = 24ms
C:\Users\[redacted]>


Administrator: C:\Windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.
C:\Users\support>ping google.com


All
Apps
Documents
Web
More
Best match
Command Prompt
App
Apps
Git CMD
Node.js command prompt
Install Additional Tools for Node.js
Search the web
cmd - See web results
Command Prompt
App
Open
Run as administrator
Open file location
Pin to Start
Pin to taskbar
cmd



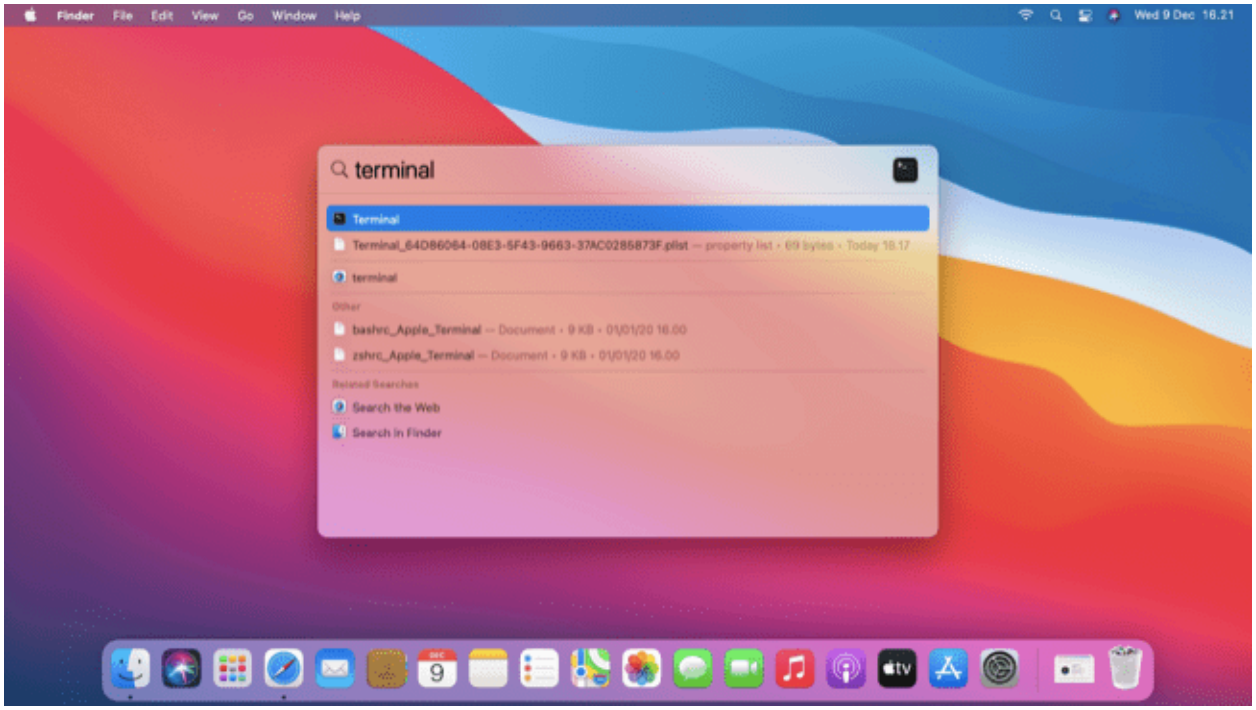

1. Press **Windows + S**
2. Type **Command Prompt**
3. Open it
4. Type:

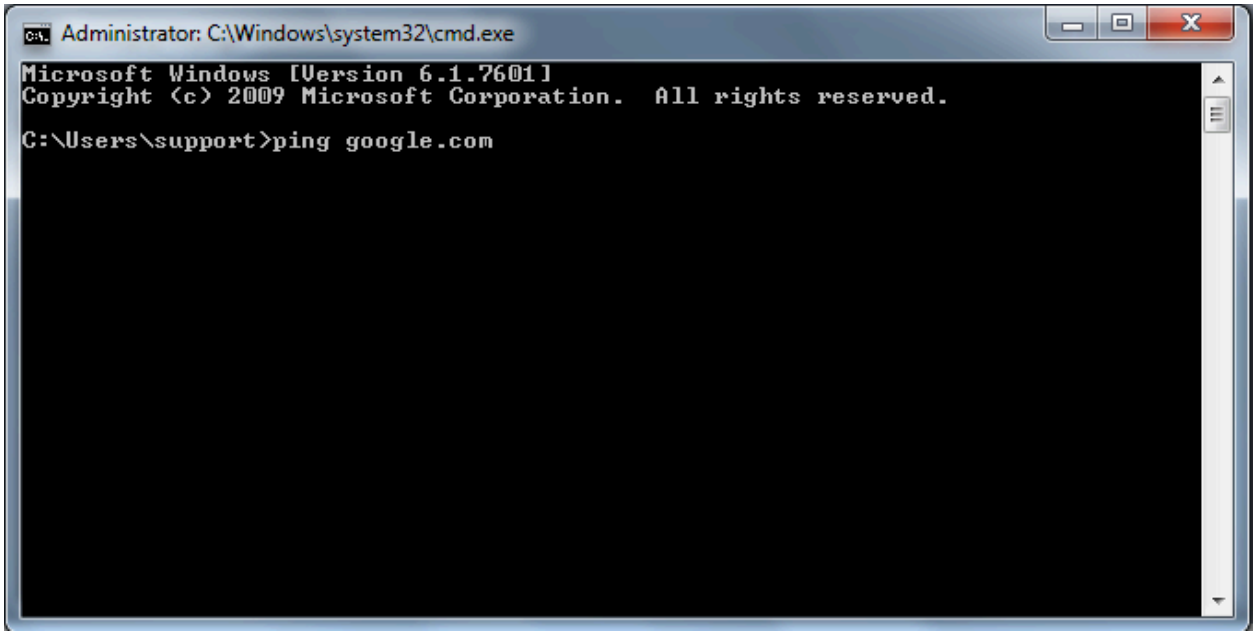
```
ping google.com
```

5. Press **Enter**

---

## 🍎 On macOS




1. Press **Command + Space**
2. Type **Terminal**
3. Open it

4. Type:

ping google.com

5. Press **Enter**

---

### 🐧 On Linux

1. Open **Terminal**
2. Type:

ping google.com

3. Press **Enter**

---

## 🛑 How to Stop Ping

- **Windows:** Press `Ctrl + C`
- **Mac/Linux:** Press `Ctrl + C`

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## 🔧 Useful Ping Options

### Limit Number of Pings

**Windows:**

ping -n 4 google.com

**Mac/Linux:**

ping -c 4 google.com

---

### Change Packet Size

ping -l 1000 google.com  (Windows)
ping -s 1000 google.com  (Mac/Linux)

---

### Continuous Ping (Windows)

ping -t google.com

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# 🚨 Troubleshooting with Ping

## ❌ Request Timed Out

- Target device is offline
- Network issue
- Firewall blocking

## ❌ Destination Host Unreachable

- Router or gateway issue
- Incorrect IP address

## ⚠️ High Response Time

- Slow network
- Congestion
- Long-distance server

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# 🧠 Pro Tips (Cybersecurity + Networking Insight)

- Ping uses **ICMP**, which is sometimes blocked for security reasons
- A failed ping doesn't always mean the system is down
- Combine ping with tools like:
    - `tracert` / `traceroute`
    - `netstat`
    - `ipconfig` / `ifconfig`

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## 📊 Real-World Use Case

Imagine your AI cybersecurity agent (like your dissertation project):

- Ping can be used to:
    - Detect unreachable devices
    - Identify suspicious latency spikes
    - Support anomaly detection in network behavior

---

## ✅ Quick Practice Exercise

Try this:

1. Ping your local router:

```
ping 192.168.1.1
```

2. Ping a public DNS server:

```
ping 8.8.8.8
```

3. Compare response times

---

## 📌 Summary

- Ping checks connectivity
- Measures response time
- Helps troubleshoot networks
- Works on Windows, Mac, and Linux

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