EXPERIMENT 1

AIM: To study different networking command

### **ipconfig Command**

Another indispensable and frequently used utility that is used for finding network information about your local machine like IP addresses, DNS addresses etc

**Basic Use: Finding Your IP Address and Default Gateway**

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| Ip config has a number of switches the most common are: ipconfig /all - displays more information about the network setup on your systems including the MAC address. ipconfig /release - release the current IP address ipconfig /renew - renew IP address ipconfig /? -shows help ipconfig/flushdns - flush the dns cache |

OUTPUT:

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| C:\Users\junai>ipconfig  Windows IP Configuration   Wireless LAN adapter Local Area Connection\* 1:   Media State . . . . . . . . . . . : Media disconnected  Connection-specific DNS Suffix . :  Wireless LAN adapter Local Area Connection\* 10:   Media State . . . . . . . . . . . : Media disconnected  Connection-specific DNS Suffix . :  Wireless LAN adapter Wi-Fi:   Connection-specific DNS Suffix . :  IPv6 Address. . . . . . . . . . . : 2409:4042:2211:aef1:d0c9:2cb:24a9:1206  Temporary IPv6 Address. . . . . . : 2409:4042:2211:aef1:f17b:61f8:61f:e6b9  Link-local IPv6 Address . . . . . : fe80::d0c9:2cb:24a9:1206%15  IPv4 Address. . . . . . . . . . . : 192.168.43.197  Subnet Mask . . . . . . . . . . . : 255.255.255.0  Default Gateway . . . . . . . . . : fe80::aa96:75ff:fe6a:ff70%15  192.168.43.1  Ethernet adapter Bluetooth Network Connection:   Media State . . . . . . . . . . . : Media disconnected  Connection-specific DNS Suffix . : |

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| C:\Users\junai>ipconfig /all  Windows IP Configuration   Host Name . . . . . . . . . . . . : DESKTOP-TO06OTG  Primary Dns Suffix . . . . . . . :  Node Type . . . . . . . . . . . . : Hybrid  IP Routing Enabled. . . . . . . . : No  WINS Proxy Enabled. . . . . . . . : No  Wireless LAN adapter Local Area Connection\* 1:   Media State . . . . . . . . . . . : Media disconnected  Connection-specific DNS Suffix . :  Description . . . . . . . . . . . : Microsoft Wi-Fi Direct Virtual Adapter  Physical Address. . . . . . . . . : 40-74-E0-D6-31-6C  DHCP Enabled. . . . . . . . . . . : Yes  Autoconfiguration Enabled . . . . : Yes  Wireless LAN adapter Local Area Connection\* 10:   Media State . . . . . . . . . . . : Media disconnected  Connection-specific DNS Suffix . :  Description . . . . . . . . . . . : Microsoft Wi-Fi Direct Virtual Adapter #2  Physical Address. . . . . . . . . : 42-74-E0-D6-31-6B  DHCP Enabled. . . . . . . . . . . : Yes  Autoconfiguration Enabled . . . . : Yes  Wireless LAN adapter Wi-Fi:   Connection-specific DNS Suffix . :  Description . . . . . . . . . . . : Intel(R) Wireless-AC 9560 160MHz  Physical Address. . . . . . . . . : 40-74-E0-D6-31-6B  DHCP Enabled. . . . . . . . . . . : Yes  Autoconfiguration Enabled . . . . : Yes  IPv6 Address. . . . . . . . . . . : 2409:4042:2211:aef1:d0c9:2cb:24a9:1206(Preferred)  Temporary IPv6 Address. . . . . . : 2409:4042:2211:aef1:f17b:61f8:61f:e6b9(Preferred)  Link-local IPv6 Address . . . . . : fe80::d0c9:2cb:24a9:1206%15(Preferred)  IPv4 Address. . . . . . . . . . . : 192.168.43.197(Preferred)  Subnet Mask . . . . . . . . . . . : 255.255.255.0  Lease Obtained. . . . . . . . . . : 25 February 2021 12.47.24 PM  Lease Expires . . . . . . . . . . : 25 February 2021 3.12.28 PM  Default Gateway . . . . . . . . . : fe80::aa96:75ff:fe6a:ff70%15  192.168.43.1  DHCP Server . . . . . . . . . . . : 192.168.43.1  DHCPv6 IAID . . . . . . . . . . . : 121664736  DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-27-B9-31-76-40-74-E0-D6-31-6B  DNS Servers . . . . . . . . . . . : 192.168.43.1  NetBIOS over Tcpip. . . . . . . . : Enabled  Ethernet adapter Bluetooth Network Connection:   Media State . . . . . . . . . . . : Media disconnected  Connection-specific DNS Suffix . :  Description . . . . . . . . . . . : Bluetooth Device (Personal Area Network)  Physical Address. . . . . . . . . : 40-74-E0-D6-31-6F  DHCP Enabled. . . . . . . . . . . : Yes  Autoconfiguration Enabled . . . . : Yes |

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### Netstat command

The netstat [command](https://www.lifewire.com/what-is-a-command-2625828), meaning *network statistics*, is a [Command Prompt command](https://www.lifewire.com/list-of-command-prompt-commands-4092302) used to display *very* detailed information about how your computer is communicating with other computers or network devices.

If you are experiencing problems with network communications, then network statistics can sometimes help point you toward the root cause of the problem. That’s where the aptly named NetStat command comes into play. This command has a number of different functions, but the most useful of these is to display network summary information for the device. To see this type of summary information, just type NetStat -e.

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| C:\Users\junai>netstat -e Interface Statistics   Received Sent  Bytes 2085195300 322460532 Unicast packets 2723430 1026888 Non-unicast packets 138 7794 Discards 0 0 Errors 0 0 Unknown protocols 0  C:\Users\junai>netstat  Active Connections   Proto Local Address Foreign Address State  TCP 127.0.0.1:9012 DESKTOP-TO06OTG:63852 ESTABLISHED  TCP 127.0.0.1:62389 DESKTOP-TO06OTG:62390 ESTABLISHED  TCP 127.0.0.1:62390 DESKTOP-TO06OTG:62389 ESTABLISHED  TCP 127.0.0.1:62391 DESKTOP-TO06OTG:62392 ESTABLISHED  TCP 127.0.0.1:62392 DESKTOP-TO06OTG:62391 ESTABLISHED  TCP 127.0.0.1:62393 DESKTOP-TO06OTG:62394 ESTABLISHED  TCP 127.0.0.1:62394 DESKTOP-TO06OTG:62393 ESTABLISHED  TCP 127.0.0.1:62395 DESKTOP-TO06OTG:62396 ESTABLISHED  TCP 127.0.0.1:62396 DESKTOP-TO06OTG:62395 ESTABLISHED  TCP 127.0.0.1:63852 DESKTOP-TO06OTG:9012 ESTABLISHED  TCP 192.168.43.197:49191 bom07s28-in-f2:https ESTABLISHED  TCP 192.168.43.197:49516 52.139.250.253:https ESTABLISHED  TCP 192.168.43.197:54657 bom07s28-in-f2:https ESTABLISHED |

### Netsat -an command

This command shows TCP as well as UDP connections. The ‘\*|\*’ notation is for those devices who want to mask their ip address.

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| C:\Users\junai>netstat -an  Active Connections   Proto Local Address Foreign Address State  TCP 0.0.0.0:22 0.0.0.0:0 LISTENING  TCP 0.0.0.0:135 0.0.0.0:0 LISTENING  TCP 0.0.0.0:445 0.0.0.0:0 LISTENING  TCP 0.0.0.0:5040 0.0.0.0:0 LISTENING  TCP 0.0.0.0:5357 0.0.0.0:0 LISTENING  TCP 0.0.0.0:5700 0.0.0.0:0 LISTENING  TCP 0.0.0.0:49664 0.0.0.0:0 LISTENING  TCP 0.0.0.0:49665 0.0.0.0:0 LISTENING  TCP 0.0.0.0:49666 0.0.0.0:0 LISTENING  TCP 0.0.0.0:49667 0.0.0.0:0 LISTENING  TCP 0.0.0.0:49668 0.0.0.0:0 LISTENING  TCP 0.0.0.0:49670 0.0.0.0:0 LISTENING  TCP 0.0.0.0:50080 0.0.0.0:0 LISTENING  TCP 0.0.0.0:50443 0.0.0.0:0 LISTENING  TCP 127.0.0.1:5354 0.0.0.0:0 LISTENING  TCP 127.0.0.1:8884 0.0.0.0:0 LISTENING  TCP 127.0.0.1:9012 0.0.0.0:0 LISTENING  TCP 127.0.0.1:9012 127.0.0.1:63852 ESTABLISHED  TCP 127.0.0.1:49938 0.0.0.0:0 LISTENING  TCP 127.0.0.1:62389 127.0.0.1:62390 ESTABLISHED  TCP 127.0.0.1:62390 127.0.0.1:62389 ESTABLISHED  TCP 127.0.0.1:62391 127.0.0.1:62392 ESTABLISHED  TCP 127.0.0.1:62392 127.0.0.1:62391 ESTABLISHED  TCP 127.0.0.1:62393 127.0.0.1:62394 ESTABLISHED  TCP 127.0.0.1:62394 127.0.0.1:62393 ESTABLISHED  TCP 127.0.0.1:62395 127.0.0.1:62396 ESTABLISHED  TCP 127.0.0.1:62396 127.0.0.1:62395 ESTABLISHED  TCP 127.0.0.1:63852 127.0.0.1:9012 ESTABLISHED  TCP 192.168.43.197:139 0.0.0.0:0 LISTENING  TCP 192.168.43.197:49516 52.139.250.253:443 ESTABLISHED  TCP 192.168.43.197:54885 151.101.2.217:443 TIME\_WAIT  TCP 192.168.43.197:55158 151.101.154.137:443 ESTABLISHED  TCP 192.168.43.197:55269 52.109.124.116:443 TIME\_WAIT  TCP 192.168.43.197:55273 104.47.29.22:443 TIME\_WAIT  TCP 192.168.43.197:55276 52.109.56.48:443 TIME\_WAIT  TCP 192.168.43.197:55277 52.109.56.48:443 TIME\_WAIT  TCP 192.168.43.197:55278 52.109.124.127:443 TIME\_WAIT  TCP 192.168.43.197:55280 52.109.20.0:443 TIME\_WAIT  TCP 192.168.43.197:55282 52.114.158.91:443 TIME\_WAIT  TCP 192.168.43.197:55288 23.21.140.195:443 CLOSE\_WAIT  TCP 192.168.43.197:55289 40.126.47.17:443 ESTABLISHED  TCP 192.168.43.197:55290 52.114.32.112:443 ESTABLISHED  TCP 192.168.43.197:62319 23.54.24.38:443 ESTABLISHED  TCP 192.168.43.197:62438 52.114.7.161:443 ESTABLISHED  TCP 192.168.43.197:62558 52.114.15.55:443 ESTABLISHED  TCP 192.168.43.197:62562 52.109.124.92:443 ESTABLISHED  TCP 192.168.43.197:62565 52.111.244.0:443 ESTABLISHED  TCP 192.168.43.197:62580 52.114.40.59:443 ESTABLISHED  TCP 192.168.43.197:62599 52.114.88.22:443 ESTABLISHED  TCP 192.168.43.197:62665 52.114.132.20:443 ESTABLISHED  TCP 192.168.43.197:62666 52.114.132.20:443 ESTABLISHED  TCP 192.168.43.197:63528 34.193.242.66:443 ESTABLISHED  TCP [::]:22 [::]:0 LISTENING  TCP [::]:135 [::]:0 LISTENING  TCP [::]:445 [::]:0 LISTENING  TCP [::]:5357 [::]:0 LISTENING  TCP [::]:5700 [::]:0 LISTENING  TCP [::]:49664 [::]:0 LISTENING  TCP [::]:49665 [::]:0 LISTENING  TCP [::]:49666 [::]:0 LISTENING  TCP [::]:49667 [::]:0 LISTENING  TCP [::]:49668 [::]:0 LISTENING  TCP [::]:49670 [::]:0 LISTENING  TCP [::]:50080 [::]:0 LISTENING  TCP [::]:50443 [::]:0 LISTENING  TCP [::1]:49669 [::]:0 LISTENING  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:54660 [2404:6800:4009:821::2002]:443 TIME\_WAIT  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:54708 [2a03:2880:f2ff:c0:face:b00c:0:167]:443 ESTABLISHED  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:54728 [2404:6800:4009:81d::200a]:443 ESTABLISHED  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:54730 [2404:6800:4009:80b::200e]:443 ESTABLISHED  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:54827 [2404:6800:4009:810::2002]:443 TIME\_WAIT  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:54851 [2606:4700:8d7c:3157:eaca:30:3f76:eefd]:80 ESTABLISHED  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:54852 [2606:4700:8d7c:3157:eaca:30:3f76:eefd]:80 ESTABLISHED  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:55130 [2404:6800:4009:807::200e]:443 ESTABLISHED  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:55140 [2404:6800:4009:828::200e]:443 ESTABLISHED  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:55172 [2404:6800:4009:82b::200e]:443 TIME\_WAIT  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:55174 [2404:6800:4003:c05::9c]:443 TIME\_WAIT  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:55275 [2a01:111:f400:febe::16]:443 TIME\_WAIT  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:55279 [2603:1046:900:2c::2]:443 TIME\_WAIT  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:55286 [2404:6800:4009:820::2003]:443 ESTABLISHED  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:55287 [2404:6800:4009:80b::200e]:443 ESTABLISHED  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:55294 [2a03:2880:f2ff:c0:face:b00c:0:167]:443 ESTABLISHED  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:55295 [2a03:2880:f2ff:c0:face:b00c:0:167]:443 ESTABLISHED  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:55296 [2603:1046:900:40::2]:443 ESTABLISHED  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:55297 [2603:1046:900:40::2]:443 ESTABLISHED  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:62664 [2404:6800:4003:c04::bc]:5228 ESTABLISHED  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:65340 [2603:1046:500:d::2]:443 ESTABLISHED  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:65424 [2603:1046:900:c::2]:443 ESTABLISHED  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:65425 [2603:1046:900:c::2]:443 ESTABLISHED  TCP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:65426 [2603:1046:900:c::2]:443 ESTABLISHED  UDP 0.0.0.0:3702 \*:\*  UDP 0.0.0.0:3702 \*:\*  UDP 0.0.0.0:3702 \*:\*  UDP 0.0.0.0:3702 \*:\*  UDP 0.0.0.0:5050 \*:\*  UDP 0.0.0.0:5353 \*:\*  UDP 0.0.0.0:5353 \*:\*  UDP 0.0.0.0:5353 \*:\*  UDP 0.0.0.0:5353 \*:\*  UDP 0.0.0.0:5353 \*:\*  UDP 0.0.0.0:5355 \*:\*  UDP 0.0.0.0:49664 \*:\*  UDP 0.0.0.0:51460 \*:\*  UDP 0.0.0.0:59764 \*:\*  UDP 0.0.0.0:63183 \*:\*  UDP 0.0.0.0:63404 \*:\*  UDP 127.0.0.1:1900 \*:\*  UDP 127.0.0.1:49666 \*:\*  UDP 127.0.0.1:59803 \*:\*  UDP 192.168.43.197:137 \*:\*  UDP 192.168.43.197:138 \*:\*  UDP 192.168.43.197:1900 \*:\*  UDP 192.168.43.197:5353 \*:\*  UDP 192.168.43.197:50001 \*:\*  UDP 192.168.43.197:50025 \*:\*  UDP 192.168.43.197:50050 \*:\*  UDP 192.168.43.197:50054 \*:\*  UDP 192.168.43.197:59802 \*:\*  UDP [::]:3702 \*:\*  UDP [::]:3702 \*:\*  UDP [::]:3702 \*:\*  UDP [::]:3702 \*:\*  UDP [::]:5353 \*:\*  UDP [::]:5353 \*:\*  UDP [::]:5353 \*:\*  UDP [::]:5355 \*:\*  UDP [::]:49665 \*:\*  UDP [::]:51460 \*:\*  UDP [::]:59765 \*:\*  UDP [::]:63183 \*:\*  UDP [::]:63405 \*:\*  UDP [::1]:1900 \*:\*  UDP [::1]:5353 \*:\*  UDP [::1]:59801 \*:\*  UDP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:50017 \*:\*  UDP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:50024 \*:\*  UDP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:50052 \*:\*  UDP [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]:50058 \*:\*  UDP [fe80::d0c9:2cb:24a9:1206%15]:1900 \*:\*  UDP [fe80::d0c9:2cb:24a9:1206%15]:59800 \*:\* |

### Ping command

The ping command is one of the most often used networking utilities for detecting devices on a network and for troubleshooting network problems.

When you ping a device you send that device a short message, which it then sends back **(the echo**).

The general format is **ping hostname** or **ping IPaddress**.

Example

**ping www.google.com** or **ping 216.58.208.68**

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| **C:\Users\junai>ping -t IP address must be specified.  C:\Users\junai>ping www.google.com  Pinging www.google.com [2404:6800:4009:80c::2004] with 32 bytes of data: Reply from 2404:6800:4009:80c::2004: time=139ms Reply from 2404:6800:4009:80c::2004: time=148ms Reply from 2404:6800:4009:80c::2004: time=90ms Reply from 2404:6800:4009:80c::2004: time=126ms  Ping statistics for 2404:6800:4009:80c::2004:  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss), Approximate round trip times in milli-seconds:  Minimum = 90ms, Maximum = 148ms, Average = 125ms** |

### Pathping command

Entering the PathPing command followed by a host name initiates what looks like a somewhat standard Tracert process. Once this process completes however, the tool takes 300 seconds (five minutes) to gather statistics, and then reports latency and packet loss statistics that are more detailed than those provided by Ping or Tracert.

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| C:\Users\junai>pathping www.google.com  Tracing route to www.google.com [2404:6800:4009:81f::2004] over a maximum of 30 hops:  0 DESKTOP-TO06OTG [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]  1 2409:4042:2211:aef1::2  2 \* \* \* Computing statistics for 25 seconds...  Source to Here This Node/Link Hop RTT Lost/Sent = Pct Lost/Sent = Pct Address  0 DESKTOP-TO06OTG [2409:4042:2211:aef1:f17b:61f8:61f:e6b9]  100/ 100 =100% |  1 --- 100/ 100 =100% 0/ 100 = 0% 2409:4042:2211:aef1::2  Trace complete. |

### ARP command

Displays and modifies entries in the Address Resolution Protocol (ARP) cache, which contains one or more tables that are used to store IP addresses and their resolved Ethernet or Token Ring physical addresses. There is a separate table for each Ethernet or Token Ring network adapter installed on your computer.

**Syntax**

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| arp [-a [InetAddr] [-N IfaceAddr]] [-g [InetAddr] [-N IfaceAddr]] [-d InetAddr [IfaceAddr]] [-s InetAddr EtherAddr [IfaceAddr]] |

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| --- |
| C:\Users\junai>arp -a  Interface: 192.168.43.197 --- 0xf  Internet Address Physical Address Type  192.168.43.1 a8-96-75-6a-ff-70 dynamic  192.168.43.255 ff-ff-ff-ff-ff-ff static  224.0.0.22 01-00-5e-00-00-16 static  224.0.0.251 01-00-5e-00-00-fb static  224.0.0.252 01-00-5e-00-00-fc static  239.255.255.250 01-00-5e-7f-ff-fa static  255.255.255.255 ff-ff-ff-ff-ff-ff static |

### NSLookup command

NSLookup is a great utility for diagnosing DNS name resolution problems. Just type the NSLookup command, and Windows will display the name and IP address of the device’s default DNS server. From there, you can type host names in an effort to see if the DNS server is able to resolve the specified host name.

|  |
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| C:\Users\junai>nslookup Default Server: UnKnown Address: 192.168.43.1 |