

# Lab 1: Network Commands & IP Addressing

## Checking Physical (MAC) Address

1. What command shows all network details including the physical (MAC) address?
  - `ipconfig /all`

```
Windows PowerShell
PS C:\Users\20110> ipconfig -all

Windows IP Configuration

Host Name . . . . . : Amir
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No

Ethernet adapter Ethernet:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Intel(R) Ethernet Connection (4) I219-LM
Physical Address. . . . . : 10-62-E5-4C-D6-16
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Local Area Connection* 1:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter
Physical Address. . . . . : 30-24-32-44-C8-3F
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Local Area Connection* 2:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Microsoft Wi-Fi Direct Virtual Adapter #2
Physical Address. . . . . : 32-24-32-44-C8-3E
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes

Wireless LAN adapter Wi-Fi:

Connection-specific DNS Suffix . :
Description . . . . . : Intel(R) Dual Band Wireless-AC 8265
Physical Address. . . . . : 30-24-32-44-C8-3E
DHCP Enabled. . . . . : Yes
Autoconfiguration Enabled . . . . : Yes
Link-local IPv6 Address . . . . : fe80::4298:6e62:6387:d20c%4(Preferred)
IPv4 Address. . . . . : 192.168.1.4(Preferred)
Subnet Mask . . . . . : 255.255.255.0
Lease Obtained. . . . . : Monday, November 17, 2025 9:55:15 AM
Lease Expires . . . . . : Tuesday, November 18, 2025 9:55:15 AM
Default Gateway . . . . . : 192.168.1.1
DHCP Server . . . . . : 192.168.1.1
DHCPv6 IAID . . . . . : 53486642
DHCPv6 Client DUID . . . . . : 00-01-00-01-29-0A-D2-8B-10-62-E5-4C-D6-16
DNS Servers . . . . . : 163.121.128.134
                        163.121.128.135
                        192.168.1.1
NetBIOS over Tcpip. . . . . : Enabled

Mobile Broadband adapter Cellular:

Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
Description . . . . . : Generic Mobile Broadband Adapter
Physical Address. . . . . : 88-A3-9E-45-5B-51
DHCP Enabled. . . . . : No
Autoconfiguration Enabled . . . . : Yes

PS C:\Users\20110>
```

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2. How can you see your device's MAC address?
  - `Getmac`

```
PS C:\Users\20110> Getmac

Physical Address      Transport Name
-----
10-62-E5-4C-D6-16     Media disconnected
30-24-32-44-C8-3E     \Device\Tcpip_{14CC1FB9-E152-4051-9D68-870FD6125EDE}
88-A3-9E-45-5B-51     Media disconnected
PS C:\Users\20110> |
```

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3. How can you show the MAC address with more details?

- getmac /v

```
Windows PowerShell
PS C:\Users\20110> getmac -v

Connection Name Network Adapter Physical Address Transport Name
-----
Ethernet        Intel(R) Ethern 10-62-E5-4C-D6-16 Media disconnected
Wi-Fi           Intel(R) Dual B 30-24-32-44-C8-3E \Device\Tcpip_{14CC1FB9-E152-4051-9D68-870FD6125EDE}
Cellular        Generic Mobile  88-A3-9E-45-5B-51 Media disconnected
PS C:\Users\20110> |
```

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APIPA & IP Configuration

4. What is the default APIPA address when the device fails to get an IP from DHCP?

- Starts with: 169.254.x.x

```
Connection-specific DNS Suffix . :
Link-local IPv6 Address . . . . . : fe80::4298:6e62:6387:d20c%4
Autoconfiguration IPv4 Address. . : 169.254.91.107
Subnet Mask . . . . . : 255.255.0.0
Default Gateway . . . . . :
```

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5. What command shows your current IP settings?

- Ipconfig

```
Windows PowerShell
PS C:\Users\20110> ipconfig

Windows IP Configuration

Ethernet adapter Ethernet:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 1:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . :
    Link-Local IPv6 Address . . . . . : fe80::4298:6e62:6387:d20c%4
    IPv4 Address. . . . . : 192.168.1.4
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.1.1

Mobile Broadband adapter Cellular:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :
PS C:\Users\20110> |
```

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## 6. How do you release your current IP address?

- ipconfig /release

```
Windows PowerShell
PS C:\Users\20110> ipconfig -release

Windows IP Configuration

No operation can be performed on Ethernet while it has its media disconnected.
No operation can be performed on Local Area Connection* 1 while it has its media disconnected.
No operation can be performed on Local Area Connection* 2 while it has its media disconnected.

Ethernet adapter Ethernet:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 1:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 2:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . :
    Link-Local IPv6 Address . . . . . : fe80::4298:6e62:6387:d20c%4
    Default Gateway . . . . . :

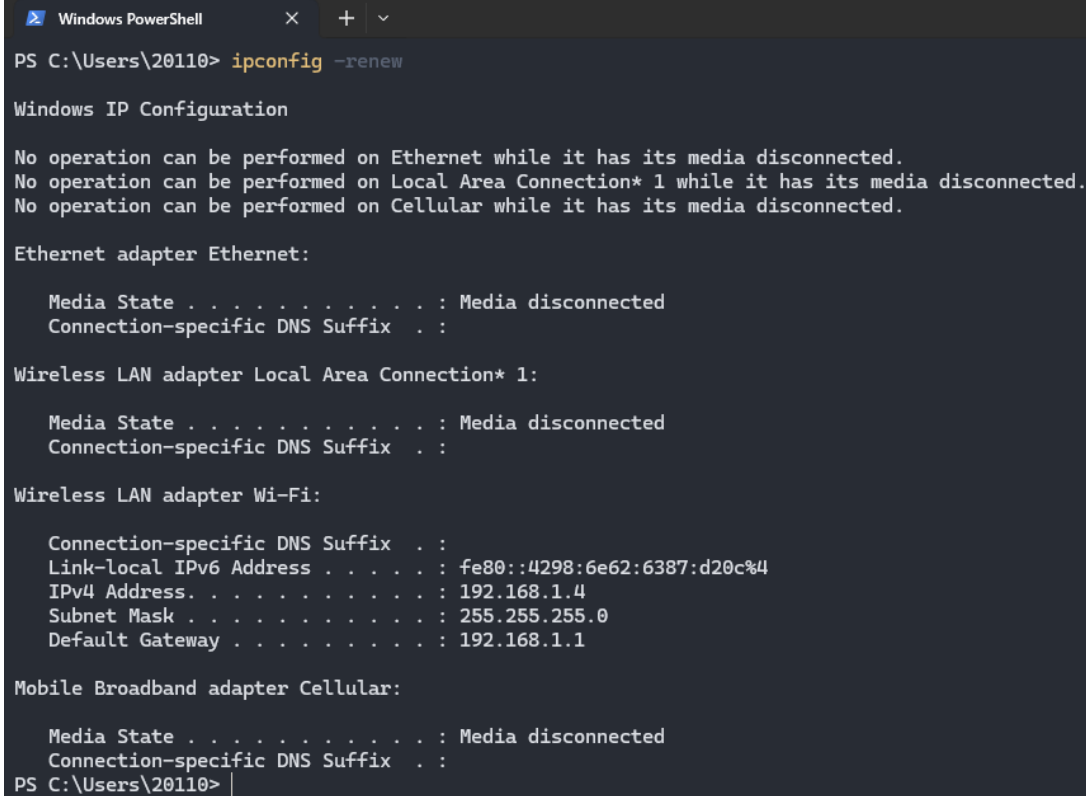
Mobile Broadband adapter Cellular:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :
PS C:\Users\20110> |
```

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## 7. How do you request a new IP address from DHCP?

- `ipconfig /renew`



```
Windows PowerShell
PS C:\Users\20110> ipconfig /renew

Windows IP Configuration

No operation can be performed on Ethernet while it has its media disconnected.
No operation can be performed on Local Area Connection* 1 while it has its media disconnected.
No operation can be performed on Cellular while it has its media disconnected.

Ethernet adapter Ethernet:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 1:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix  . :
    Link-local IPv6 Address . . . . . : fe80::4298:6e62:6387:d20c%4
    IPv4 Address. . . . . : 192.168.1.4
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.1.1

Mobile Broadband adapter Cellular:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix  . :
PS C:\Users\20110> |
```

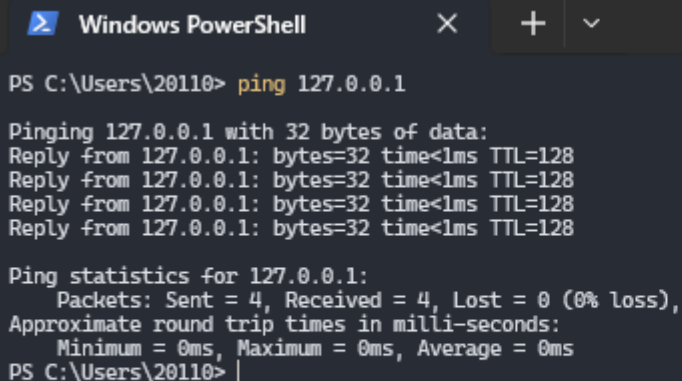
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## Ping Commands

### 9. How do you test connection to an IP address?

- `ping [IP address]`



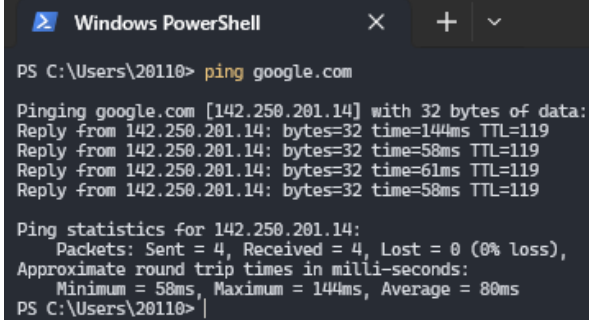
```
Windows PowerShell
PS C:\Users\20110> ping 127.0.0.1

Pinging 127.0.0.1 with 32 bytes of data:
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128
Reply from 127.0.0.1: bytes=32 time<1ms TTL=128

Ping statistics for 127.0.0.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
PS C:\Users\20110> |
```

10. How do you test connection to a website (URL)?

- o ping [www.example.com](http://www.example.com)



```
Windows PowerShell
PS C:\Users\20110> ping google.com

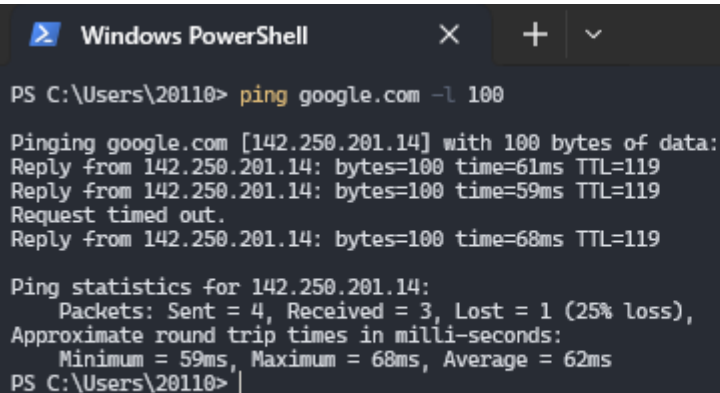
Pinging google.com [142.250.201.14] with 32 bytes of data:
Reply from 142.250.201.14: bytes=32 time=144ms TTL=119
Reply from 142.250.201.14: bytes=32 time=58ms TTL=119
Reply from 142.250.201.14: bytes=32 time=61ms TTL=119
Reply from 142.250.201.14: bytes=32 time=58ms TTL=119

Ping statistics for 142.250.201.14:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 58ms, Maximum = 144ms, Average = 80ms
PS C:\Users\20110> |
```

o

11. How do you send a ping with a specific data size?

- o ping [IP]-l [size]



```
Windows PowerShell
PS C:\Users\20110> ping google.com -l 100

Pinging google.com [142.250.201.14] with 100 bytes of data:
Reply from 142.250.201.14: bytes=100 time=61ms TTL=119
Reply from 142.250.201.14: bytes=100 time=59ms TTL=119
Request timed out.
Reply from 142.250.201.14: bytes=100 time=68ms TTL=119

Ping statistics for 142.250.201.14:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 59ms, Maximum = 68ms, Average = 62ms
PS C:\Users\20110> |
```

o

12. How do you send a specific number of ping requests?

- o ping [IP]-n [count]

```
Windows PowerShell
PS C:\Users\20110> ping google.com -n 7

Pinging google.com [142.250.201.14] with 32 bytes of data:
Reply from 142.250.201.14: bytes=32 time=81ms TTL=119
Reply from 142.250.201.14: bytes=32 time=99ms TTL=119
Reply from 142.250.201.14: bytes=32 time=59ms TTL=119
Reply from 142.250.201.14: bytes=32 time=112ms TTL=119
Request timed out.
Reply from 142.250.201.14: bytes=32 time=76ms TTL=119
Reply from 142.250.201.14: bytes=32 time=61ms TTL=119

Ping statistics for 142.250.201.14:
    Packets: Sent = 7, Received = 6, Lost = 1 (14% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 59ms, Maximum = 112ms, Average = 81ms
PS C:\Users\20110> |
```

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13. How do you send continuous ping requests until you stop it manually?

- ping [IP]-t

```
Windows PowerShell
PS C:\Users\20110> ping google.com -t

Pinging google.com [142.250.201.14] with 32 bytes of data:
Reply from 142.250.201.14: bytes=32 time=250ms TTL=119
Reply from 142.250.201.14: bytes=32 time=477ms TTL=119
Reply from 142.250.201.14: bytes=32 time=391ms TTL=119
Reply from 142.250.201.14: bytes=32 time=187ms TTL=119
Reply from 142.250.201.14: bytes=32 time=192ms TTL=119
Reply from 142.250.201.14: bytes=32 time=153ms TTL=119
Reply from 142.250.201.14: bytes=32 time=185ms TTL=119
Reply from 142.250.201.14: bytes=32 time=83ms TTL=119
Reply from 142.250.201.14: bytes=32 time=164ms TTL=119
Reply from 142.250.201.14: bytes=32 time=191ms TTL=119
Reply from 142.250.201.14: bytes=32 time=60ms TTL=119
Reply from 142.250.201.14: bytes=32 time=59ms TTL=119
Reply from 142.250.201.14: bytes=32 time=59ms TTL=119
Reply from 142.250.201.14: bytes=32 time=59ms TTL=119

Ping statistics for 142.250.201.14:
    Packets: Sent = 14, Received = 14, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 59ms, Maximum = 477ms, Average = 179ms
Control-C
PS C:\Users\20110> |
```

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## Netstat

19. How do you show all active connections?

- netstat-a

```

PS C:\Users\20110> netstat -a
Active Connections

Proto Local Address           Foreign Address         State
TCP    0.0.0.0:8125              *.*.*.*:.*              LISTENING
TCP    0.0.0.0:0.0.0.4045       *.*.*.*:.*              LISTENING
TCP    0.0.0.0:8123            *.*.*.*:.*              LISTENING
TCP    0.0.0.0:0.0.0.1153      *.*.*.*:.*              LISTENING
TCP    0.0.0.0:0.0.0.2261      *.*.*.*:.*              LISTENING
TCP    0.0.0.0:8124            *.*.*.*:.*              LISTENING
TCP    0.0.0.0:0.0.0.3386      *.*.*.*:.*              LISTENING
TCP    0.0.0.0:0.0.0.3388      *.*.*.*:.*              LISTENING
TCP    0.0.0.0:8122            *.*.*.*:.*              LISTENING
TCP    0.0.0.0:0.0.0.5040      *.*.*.*:.*              LISTENING
TCP    0.0.0.0:8127            *.*.*.*:.*              LISTENING
TCP    0.0.0.0:0.0.0.7808      *.*.*.*:.*              LISTENING
TCP    0.0.0.0:0.0.0.8880      *.*.*.*:.*              LISTENING
TCP    0.0.0.0:0.0.0.8992      *.*.*.*:.*              LISTENING
TCP    0.0.0.0:0.0.0.3368      *.*.*.*:.*              LISTENING
TCP    0.0.0.0:0.0.0.6666      *.*.*.*:.*              LISTENING
TCP    0.0.0.0:0.0.0.6665      *.*.*.*:.*              LISTENING
TCP    0.0.0.0:0.0.0.6666      *.*.*.*:.*              LISTENING
TCP    0.0.0.0:0.0.0.6667      *.*.*.*:.*              LISTENING
TCP    0.0.0.0:0.0.0.6668      *.*.*.*:.*              LISTENING
TCP    0.0.0.0:0.0.0.59110     *.*.*.*:.*              LISTENING
TCP    0.0.0.0:8111            *.*.*.*:.*              LISTENING
TCP    0.0.0.0:0.0.0.59112     *.*.*.*:.*              LISTENING
TCP    127.0.0.1:0.0.0.1029     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1030     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1031     *.*.*.*:.*              LISTENING
TCP    127.0.0.1:0.0.0.1032     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1033     *.*.*.*:.*              LISTENING
TCP    127.0.0.1:0.0.0.1039     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1041     *.*.*.*:.*              LISTENING
TCP    127.0.0.1:0.0.0.1044     *.*.*.*:.*              LISTENING
TCP    127.0.0.1:0.0.0.1044     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1044     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1059     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1081     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1082     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1083     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1084     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1085     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1086     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1087     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1086     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1086     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1087     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1087     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1088     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1088     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1089     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1091     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1094     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1105     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1121     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1122     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.1122     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.27017    *.*.*.*:.*              LISTENING
TCP    127.0.0.1:0.0.0.4900     *.*.*.*:.*              ESTABLISHED
TCP    127.0.0.1:0.0.0.5900     *.*.*.*:.*              ESTABLISHED
TCP    192.168.1.1:4139        198.142.58.148:https    ESTABLISHED
TCP    192.168.1.1:4139        32.137.186.10:https    ESTABLISHED
TCP    192.168.1.1:4139        96.46.133.186:https    ESTABLISHED
TCP    192.168.1.1:4139        93.188.188.52:netops   ESTABLISHED
TCP    192.168.1.1:4139        74.242.256.116:https   ESTABLISHED
TCP    192.168.1.1:4139        32.133.206.39:https    ESTABLISHED

```

20. How do you show active connections with numbers only?

- netstat-n

Windows PowerShell

```
PS C:\Users\20118> netstat -n
```

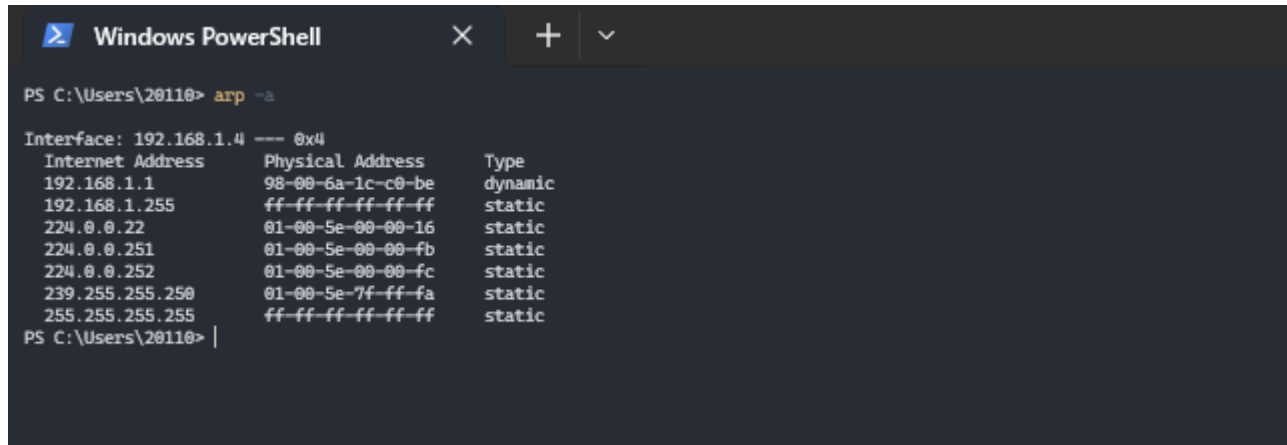
Active Connections

Proto	Local Address	Foreign Address	State
TCP	127.0.0.1:1029	127.0.0.1:1029	ESTABLISHED
TCP	127.0.0.1:1030	127.0.0.1:1029	ESTABLISHED
TCP	127.0.0.1:1031	127.0.0.1:1031	ESTABLISHED
TCP	127.0.0.1:1032	127.0.0.1:1032	ESTABLISHED
TCP	127.0.0.1:1033	127.0.0.1:1033	ESTABLISHED
TCP	127.0.0.1:1034	127.0.0.1:1034	ESTABLISHED
TCP	127.0.0.1:1035	127.0.0.1:1035	ESTABLISHED
TCP	127.0.0.1:1036	127.0.0.1:1036	ESTABLISHED
TCP	127.0.0.1:1037	127.0.0.1:1037	ESTABLISHED
TCP	127.0.0.1:1038	127.0.0.1:1038	ESTABLISHED
TCP	127.0.0.1:1039	127.0.0.1:1039	ESTABLISHED
TCP	127.0.0.1:1040	127.0.0.1:1040	ESTABLISHED
TCP	127.0.0.1:1041	127.0.0.1:1041	ESTABLISHED
TCP	127.0.0.1:1042	127.0.0.1:1042	ESTABLISHED
TCP	127.0.0.1:1043	127.0.0.1:1043	ESTABLISHED
TCP	127.0.0.1:1044	127.0.0.1:1044	ESTABLISHED
TCP	127.0.0.1:1045	127.0.0.1:1045	ESTABLISHED
TCP	127.0.0.1:1046	127.0.0.1:1046	ESTABLISHED
TCP	127.0.0.1:1047	127.0.0.1:1047	ESTABLISHED
TCP	127.0.0.1:1048	127.0.0.1:1048	ESTABLISHED
TCP	127.0.0.1:1049	127.0.0.1:1049	ESTABLISHED
TCP	127.0.0.1:1050	127.0.0.1:1050	ESTABLISHED
TCP	127.0.0.1:1051	127.0.0.1:1051	ESTABLISHED
TCP	127.0.0.1:1052	127.0.0.1:1052	ESTABLISHED
TCP	127.0.0.1:1053	127.0.0.1:1053	ESTABLISHED
TCP	127.0.0.1:1054	127.0.0.1:1054	ESTABLISHED
TCP	127.0.0.1:1055	127.0.0.1:1055	ESTABLISHED
TCP	127.0.0.1:1056	127.0.0.1:1056	ESTABLISHED
TCP	127.0.0.1:1057	127.0.0.1:1057	ESTABLISHED
TCP	127.0.0.1:1058	127.0.0.1:1058	ESTABLISHED
TCP	127.0.0.1:1059	127.0.0.1:1059	ESTABLISHED
TCP	127.0.0.1:1060	127.0.0.1:1060	ESTABLISHED
TCP	127.0.0.1:1061	127.0.0.1:1061	ESTABLISHED
TCP	127.0.0.1:1062	127.0.0.1:1062	ESTABLISHED
TCP	127.0.0.1:1063	127.0.0.1:1063	ESTABLISHED
TCP	127.0.0.1:1064	127.0.0.1:1064	ESTABLISHED
TCP	127.0.0.1:1065	127.0.0.1:1065	ESTABLISHED
TCP	127.0.0.1:1066	127.0.0.1:1066	ESTABLISHED
TCP	127.0.0.1:1067	127.0.0.1:1067	ESTABLISHED
TCP	127.0.0.1:1068	127.0.0.1:1068	ESTABLISHED
TCP	127.0.0.1:1069	127.0.0.1:1069	ESTABLISHED
TCP	127.0.0.1:1070	127.0.0.1:1070	ESTABLISHED
TCP	127.0.0.1:1071	127.0.0.1:1071	ESTABLISHED
TCP	127.0.0.1:1072	127.0.0.1:1072	ESTABLISHED
TCP	127.0.0.1:1073	127.0.0.1:1073	ESTABLISHED
TCP	127.0.0.1:1074	127.0.0.1:1074	ESTABLISHED
TCP	127.0.0.1:1075	127.0.0.1:1075	ESTABLISHED
TCP	127.0.0.1:1076	127.0.0.1:1076	ESTABLISHED
TCP	127.0.0.1:1077	127.0.0.1:1077	ESTABLISHED
TCP	127.0.0.1:1078	127.0.0.1:1078	ESTABLISHED
TCP	127.0.0.1:1079	127.0.0.1:1079	ESTABLISHED
TCP	127.0.0.1:1080	127.0.0.1:1080	ESTABLISHED
TCP	127.0.0.1:1081	127.0.0.1:1081	ESTABLISHED
TCP	127.0.0.1:1082	127.0.0.1:1082	ESTABLISHED
TCP	127.0.0.1:1083	127.0.0.1:1083	ESTABLISHED
TCP	127.0.0.1:1084	127.0.0.1:1084	ESTABLISHED
TCP	127.0.0.1:1085	127.0.0.1:1085	ESTABLISHED
TCP	127.0.0.1:1086	127.0.0.1:1086	ESTABLISHED
TCP	127.0.0.1:1087	127.0.0.1:1087	ESTABLISHED
TCP	127.0.0.1:1088	127.0.0.1:1088	ESTABLISHED
TCP	127.0.0.1:1089	127.0.0.1:1089	ESTABLISHED
TCP	127.0.0.1:1090	127.0.0.1:1090	ESTABLISHED
TCP	127.0.0.1:1091	127.0.0.1:1091	ESTABLISHED
TCP	127.0.0.1:1092	127.0.0.1:1092	ESTABLISHED
TCP	127.0.0.1:1093	127.0.0.1:1093	ESTABLISHED
TCP	127.0.0.1:1094	127.0.0.1:1094	ESTABLISHED
TCP	127.0.0.1:1095	127.0.0.1:1095	ESTABLISHED
TCP	127.0.0.1:1096	127.0.0.1:1096	ESTABLISHED
TCP	127.0.0.1:1097	127.0.0.1:1097	ESTABLISHED
TCP	127.0.0.1:1098	127.0.0.1:1098	ESTABLISHED
TCP	127.0.0.1:1099	127.0.0.1:1099	ESTABLISHED
TCP	127.0.0.1:1100	127.0.0.1:1100	ESTABLISHED
TCP	127.0.0.1:1101	127.0.0.1:1101	ESTABLISHED
TCP	127.0.0.1:1102	127.0.0.1:1102	ESTABLISHED
TCP	127.0.0.1:1103	127.0.0.1:1103	ESTABLISHED
TCP	127.0.0.1:1104	127.0.0.1:1104	ESTABLISHED
TCP	127.0.0.1:1105	127.0.0.1:1105	ESTABLISHED
TCP	127.0.0.1:1106	127.0.0.1:1106	ESTABLISHED
TCP	127.0.0.1:1107	127.0.0.1:1107	ESTABLISHED
TCP	127.0.0.1:1108	127.0.0.1:1108	ESTABLISHED
TCP	127.0.0.1:1109	127.0.0.1:1109	ESTABLISHED
TCP	127.0.0.1:1110	127.0.0.1:1110	ESTABLISHED
TCP	127.0.0.1:1111	127.0.0.1:1111	ESTABLISHED
TCP	127.0.0.1:1112	127.0.0.1:1112	ESTABLISHED
TCP	127.0.0.1:1113	127.0.0.1:1113	ESTABLISHED
TCP	127.0.0.1:1114	127.0.0.1:1114	ESTABLISHED
TCP	127.0.0.1:1115	127.0.0.1:1115	ESTABLISHED
TCP	127.0.0.1:1116	127.0.0.1:1116	ESTABLISHED
TCP	127.0.0.1:1117	127.0.0.1:1117	ESTABLISHED
TCP	127.0.0.1:1118	127.0.0.1:1118	ESTABLISHED
TCP	127.0.0.1:1119	127.0.0.1:1119	ESTABLISHED
TCP	127.0.0.1:1120	127.0.0.1:1120	ESTABLISHED
TCP	127.0.0.1:1121	127.0.0.1:1121	ESTABLISHED
TCP	127.0.0.1:1122	127.0.0.1:1122	ESTABLISHED
TCP	127.0.0.1:1123	127.0.0.1:1123	ESTABLISHED
TCP	127.0.0.1:1124	127.0.0.1:1124	ESTABLISHED
TCP	127.0.0.1:1125	127.0.0.1:1125	ESTABLISHED
TCP	127.0.0.1:1126	127.0.0.1:1126	ESTABLISHED
TCP	127.0.0.1:1127	127.0.0.1:1127	ESTABLISHED
TCP	127.0.0.1:1128	127.0.0.1:1128	ESTABLISHED
TCP	127.0.0.1:1129	127.0.0.1:1129	ESTABLISHED
TCP	127.0.0.1:1130	127.0.0.1:1130	ESTABLISHED
TCP	127.0.0.1:1131	127.0.0.1:1131	ESTABLISHED
TCP	127.0.0.1:1132	127.0.0.1:1132	ESTABLISHED
TCP	127.0.0.1:1133	127.0.0.1:1133	ESTABLISHED
TCP	127.0.0.1:1134	127.0.0.1:1134	ESTABLISHED
TCP	127.0.0.1:1135	127.0.0.1:1135	ESTABLISHED
TCP	127.0.0.1:1136	127.0.0.1:1136	ESTABLISHED
TCP	127.0.0.1:1137	127.0.0.1:1137	ESTABLISHED
TCP	127.0.0.1:1138	127.0.0.1:1138	ESTABLISHED
TCP	127.0.0.1:1139	127.0.0.1:1139	ESTABLISHED
TCP	127.0.0.1:1140	127.0.0.1:1140	ESTABLISHED
TCP	127.0.0.1:1141	127.0.0.1:1141	ESTABLISHED
TCP	127.0.0.1:1142	127.0.0.1:1142	ESTABLISHED
TCP	127.0.0.1:1143	127.0.0.1:1143	ESTABLISHED
TCP	127.0.0.1:1144	127.0.0.1:1144	ESTABLISHED
TCP	127.0.0.1:1145	127.0.0.1:1145	ESTABLISHED
TCP	127.0.0.1:1146	127.0.0.1:1146	ESTABLISHED
TCP	127.0.0.1:1147	127.0.0.1:1147	ESTABLISHED
TCP	127.0.0.1:1148	127.0.0.1:1148	ESTABLISHED
TCP	127.0.0.1:1149	127.0.0.1:1149	ESTABLISHED
TCP	127.0.0.1:1150	127.0.0.1:1150	ESTABLISHED
TCP	127.0.0.1:1151	127.0.0.1:1151	ESTABLISHED
TCP	127.0.0.1:1152	127.0.0.1:1152	ESTABLISHED
TCP	127.0.0.1:1153	127.0.0.1:1153	ESTABLISHED
TCP	127.0.0.1:1154	127.0.0.1:1154	ESTABLISHED
TCP	127.0.0.1:1155	127.0.0.1:1155	ESTABLISHED
TCP	127.0.0.1:1156	127.0.0.1:1156	ESTABLISHED
TCP	127.0.0.1:1157	127.0.0.1:1157	ESTABLISHED
TCP	127.0.0.1:1158	127.0.0.1:1158	ESTABLISHED
TCP	127.0.0.1:1159	127.0.0.1:1159	ESTABLISHED
TCP	127.0.0.1:1160	127.0.0.1:1160	ESTABLISHED
TCP	127.0.0.1:1161	127.0.0.1:1161	ESTABLISHED
TCP	127.0.0.1:1162	127.0.0.1:1162	ESTABLISHED
TCP	127.0.0.1:1163	127.0.0.1:1163	ESTABLISHED
TCP	127.0.0.1:1164	127.0.0.1:1164	ESTABLISHED
TCP	127.0.0.1:1165	127.0.0.1:1165	ESTABLISHED
TCP	127.0.0.1:1166	127.0.0.1:1166	ESTABLISHED
TCP	127.0.0.1:1167	127.0.0.1:1167	ESTABLISHED
TCP	127.0.0.1:1168	127.0.0.1:1168	ESTABLISHED
TCP	127.0.0.1:1169	127.0.0.1:1169	ESTABLISHED
TCP	127.0.0.1:1170	127.0.0.1:1170	ESTABLISHED
TCP	127.0.0.1:1171	127.0.0.1:1171	ESTABLISHED
TCP	127.0.0.1:1172	127.0.0.1:1172	ESTABLISHED
TCP	127.0.0.1:1173	127.0.0.1:1173	ESTABLISHED
TCP	127.0.0.1:1174	127.0.0.1:1174	ESTABLISHED
TCP	127.0.0.1:1175	127.0.0.1:1175	ESTABLISHED
TCP	127.0.0.1:1176	127.0.0.1:1176	ESTABLISHED
TCP	127.0.0.1:1177	127.0.0.1:1177	ESTABLISHED
TCP	127.0.0.1:1178	127.0.0.1:1178	ESTABLISHED
TCP	127.0.0.1:1179	127.0.0.1:1179	ESTABLISHED
TCP	127.0.0.1:1180	127.0.0.1:1180	ESTABLISHED
TCP	127.0.0.1:1181	127.0.0.1:1181	ESTABLISHED
TCP	127.0.0.1:1182	127.0.0.1:1182	ESTABLISHED
TCP	127.0.0.1:1183	127.0.0.1:1183	ESTABLISHED
TCP	127.0.0.1:1184	127.0.0.1:1184	ESTABLISHED
TCP	127.0.0.1:1185	127.0.0.1:1185	ESTABLISHED
TCP	127.0.0.1:1186	127.0.0.1:1186	ESTABLISHED
TCP	127.0.0.1:1187	127.0.0.1:1187	ESTABLISHED
TCP	127.0.0.1:1188	127.0.0.1:1188	ESTABLISHED
TCP	127.0.0.1:1189	127.0.0.1:1189	ESTABLISHED
TCP	127.0.0.1:1190	127.0.0.1:1190	ESTABLISHED
TCP	127.0.0.1:1191	127.0.0.1:1191	ESTABLISHED
TCP	127.0.0.1:1192	127.0.0.1:1192	ESTABLISHED
TCP	127.0.0.1:1193	127.0.0.1:1193	ESTABLISHED
TCP	127.0.0.1:1194	127.0.0.1:1194	ESTABLISHED
TCP	127.0.0.1:1195	127.0.0.1:1195	ESTABLISHED
TCP	127.0.0.1:1196	127.0.0.1:1196	ESTABLISHED
TCP	127.0.0.1:1197	127.0.0.1:1197	ESTABLISHED
TCP	127.0.0.1:1198	127.0.0.1:1198	ESTABLISHED
TCP	127.0.0.1:1199	127.0.0.1:1199	ESTABLISHED
TCP	127.0.0.1:1200	127.0.0.1:1200	ESTABLISHED
TCP	127.0.0.1:1201	127.0.0.1:1201	ESTABLISHED
TCP	127.0.0.1:1202	127.0.0.1:1202	ESTABLISHED
TCP	127.0.0.1:1203	127.0.0.1:1203	ESTABLISHED
TCP	127.0.0.1:1204	127.0.0.1:1204	ESTABLISHED
TCP	127.0.0.1:1205	127.0.0.1:1205	ESTABLISHED
TCP	127.0.0.1:1206	127.0.0.1:1206	ESTABLISHED
TCP	127.0.0.1:1207	127.0.0.1:1207	ESTABLISHED
TCP	127.0.0.1:1208	127.0.0.1:1208	ESTABLISHED
TCP	127.0.0.1:1209	127.0.0.1:1209	ESTABLISHED
TCP	127.0.0.1:1210	127.0.0.1:1210	ESTABLISHED
TCP	127.0.0.1:1211	127.0.0.1:1211	ESTABLISHED
TCP	127.0.0.1:1212	127.0.0.1:1212	ESTABLISHED
TCP	127.0.0.1:1213	127.0.0.1:1213	ESTABLISHED
TCP	127.0.0.1:1214	127.0.0.1:1214	ESTABLISHED
TCP	127.0.0.1:1215	127.0.0.1:1215	ESTABLISHED
TCP	127.0.0.1:1216	127.0.0.1:1216	ESTABLISHED
TCP	127.0.0.1:1217	127.0.0.1:1217	ESTABLISHED
TCP	127.0.0.1:1218	127.0.0.1:1218	ESTABLISHED
TCP	127.0.0.1:1219	127.0.0.1:1219	ESTABLISHED
TCP	127.0.0.1:1220	127.0.0.1:1220	ESTABLISHED
TCP	127.0.0.1:1221	127.0.0.1:1221	ESTABLISHED
TCP	127.0.0.1:1222	127.0.0.1:1222	ESTABLISHED
TCP	127.0.0.1:1223	127.0.0.1:1223	ESTABLISHED
TCP	127.0.0.1:1224	127.0.0.1:1224	ESTABLISHED
TCP	127.0.0.1:1225	127.0.0.1:1225	ESTABLISHED
TCP	127.0.0.1:1226	127.0.0.1:1226	ESTABLISHED
TCP	127.0.0.1:1227	127.0.0.1:1227	ESTABLISHED
TCP	127.0.0.1:1228	127.0.0.1:1228	ESTABLISHED
TCP	127.0.0.1:1229	127.0.0.1:1229	ESTABLISHED
TCP	127.0.0.1:1230	127.0.0.1:1230	ESTABLISHED
TCP	127.0.0.1:1231	127.0.0.1:1231	ESTABLISHED
TCP	127.0.0.1:1232	127.0.0.1:1232	ESTABLISHED
TCP	127.0.0.1:1233	127.0.0.1:1233	ESTABLISHED
TCP	127.0.0.1:1234	127.0.0.1:1234	ESTABLISHED
TCP	127.0.0.1:1235	127.0.0.1:1235	ESTABLISHED
TCP	127.0.0.1:1236	127.0.0.1:1236	ESTABLISHED
TCP	127.0.0.1:1237	127.0.0.1:1237	ESTABLISHED
TCP	127.0.0.1:1238	127.0.0.1:1238	ESTABLISHED
TCP	127.0.0.1:1239	127.0.0.1:1239	ESTABLISHED
TCP	127.0.0.1:1240	127.0.0.1:1240	ESTABLISHED
TCP	127.0.0.1:1241	127.0.0.1:1241	ESTABLISHED
TCP	127.0.0.1:1242	127.0.0.1:1242	ESTABLISHED
TCP	127.0.0.1:1243	127.0.0.1:1243	ESTABLISHED
TCP	127.0.0.1:1244	127.0.0.1:1244	ESTABLISHED
TCP	127.0.0.1:1245	127.0.0.1:1245	ESTABLISHED
TCP	127.0.0.1:1246	127.0.0.1:1246	ESTABLISHED

o

21. What command shows MAC addresses of other devices on the network?

arp -a



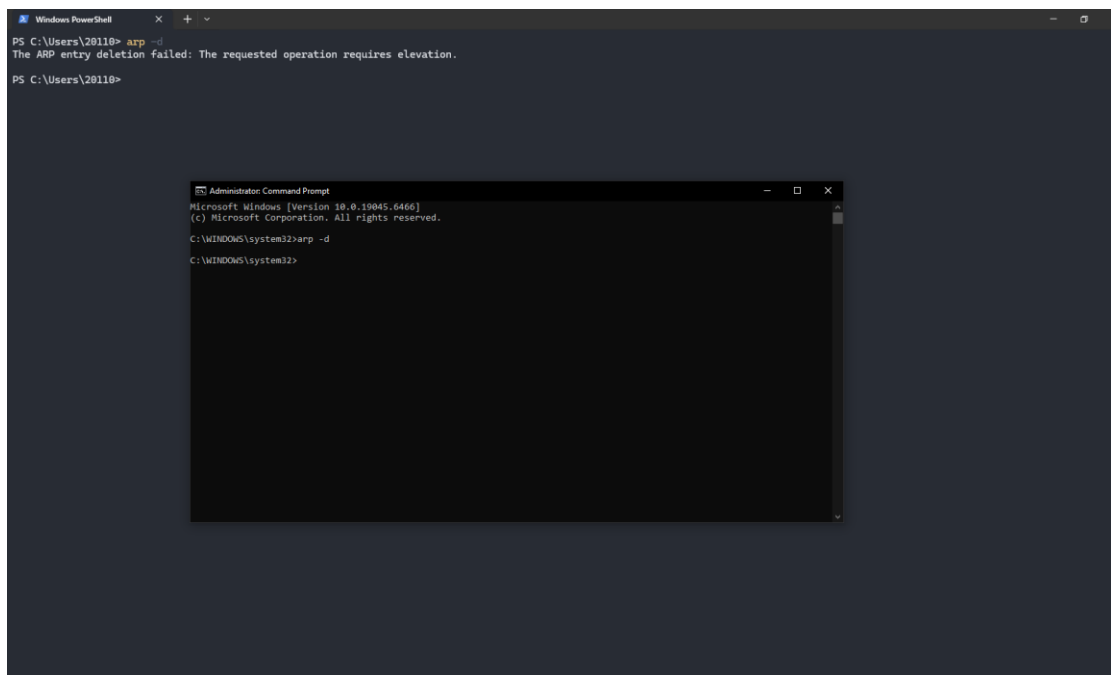
```
Windows PowerShell
PS C:\Users\20110> arp -a

Interface: 192.168.1.4 --- 0x4
Internet Address      Physical Address      Type
-----
192.168.1.1           98-00-6a-1c-c0-be     dynamic
192.168.1.255         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
PS C:\Users\20110> |
```

22.

23. What command deletes the ARP cache?

arp -d



```
Windows PowerShell
PS C:\Users\20110> arp -d
The ARP entry deletion failed: The requested operation requires elevation.
PS C:\Users\20110>
```

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.19045.6466]
(c) Microsoft Corporation. All rights reserved.
C:\WINDOWS\system32>arp -d
C:\WINDOWS\system32>
```

24.

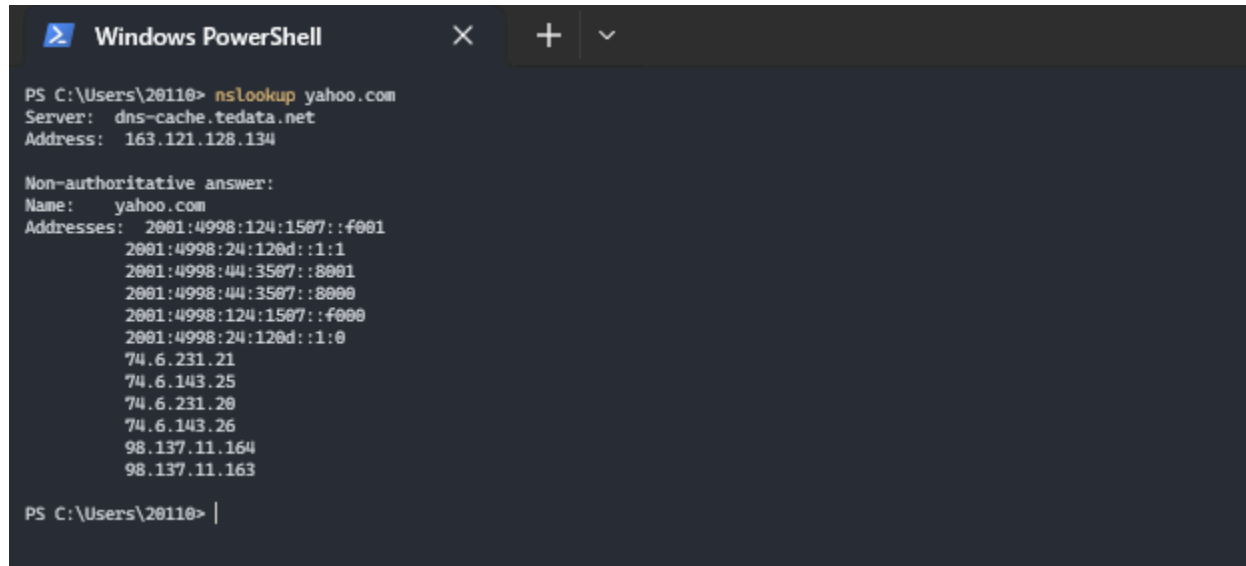
25. To know which IP address belongs to a domain name:



nslookup Domain\_Name

Example:

nslookup Yahoo.com



```
Windows PowerShell
PS C:\Users\20110> nslookup yahoo.com
Server: dns-cache.tedata.net
Address: 163.121.128.134

Non-authoritative answer:
Name: yahoo.com
Addresses: 2001:4998:124:1507::f001
           2001:4998:24:120d::1:1
           2001:4998:44:3507::8001
           2001:4998:44:3507::8000
           2001:4998:124:1507::f000
           2001:4998:24:120d::1:0
           74.6.231.21
           74.6.143.25
           74.6.231.20
           74.6.143.26
           98.137.11.164
           98.137.11.163

PS C:\Users\20110> |
```

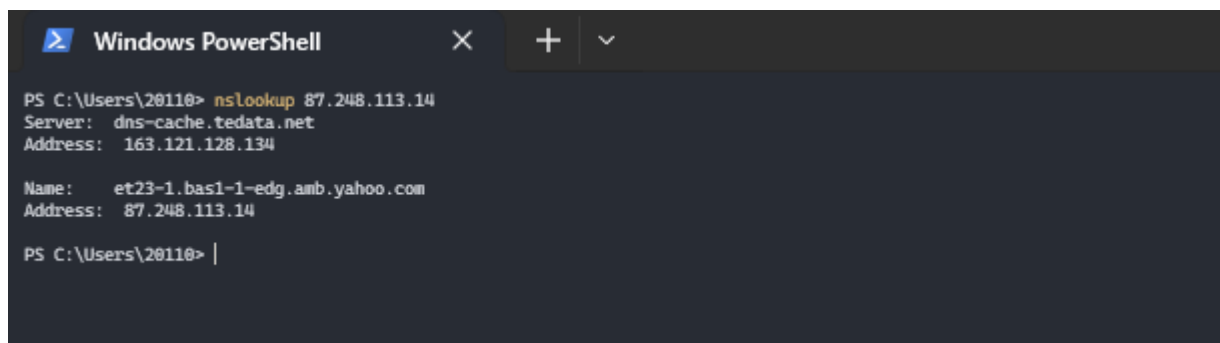
26. To know which domain name belongs to a specific IP address:

Type this command:

nslookup IP\_address

Example:

nslookup 87.248.113.14



```
Windows PowerShell
PS C:\Users\20110> nslookup 87.248.113.14
Server: dns-cache.tedata.net
Address: 163.121.128.134

Name: et23-1.bas1-1-edg.amb.yahoo.com
Address: 87.248.113.14

PS C:\Users\20110> |
```