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Lab 1: Network Commands & IP Addressing

Checking Physical (MAC) Address

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

```
C:\WINDOWS\system32\cmd.exe
C:\Users\smart>ipconfig /all
Windows IP Configuration

Host Name . . . . . : DESKTOP-QOSF6A9
Primary Dns Suffix . . . . . :
Node Type . . . . . : Hybrid
IP Routing Enabled. . . . . : No
WINS Proxy Enabled. . . . . : No
DNS Suffix Search List. . . . . : home

Ethernet adapter Ethernet:

    Media State . . . . . : Media disconnected
    Connection-specific DNS Suffix . . . . . :
    Description . . . . . : Intel(R) Ethernet Connection I219-LM
    Physical Address. . . . . : 28-F1-0E-39-A8-4E
    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. . . . . : 48-45-20-08-02-47
    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 #
    Physical Address. . . . . : AA-45-20-08-02-46
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . . : Yes

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix . . . . . : home
    Description . . . . . : Intel(R) Dual Band Wireless-AC 7265
    Physical Address. . . . . : 48-45-20-08-02-46
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . . : Yes
    IPv6 Address. . . . . : f09c:69d1:47d2:1000:320a:b4c6:d444:86f6(PREFERRED)
    Temporary IPv6 Address. . . . . : f09c:69d1:47d2:1000:6961:110:2b8c:8535(PREFERRED)
    Link-local IPv6 Address . . . . . : fe80::962:9ca7:6c5:42e2%12(PREFERRED)
    IPv4 Address. . . . . : 192.168.1.11(PREFERRED)
```

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

```
C:\WINDOWS\system32\cmd.exe
C:\Users\smart>getmac
Physical Address      Transport Name
=====
28-F1-0E-39-A8-4E    Media disconnected
48-45-20-08-02-46   \Device\Tcpip_{9A281FAC-3A98-4BF5-92B6-DC00BCD572E3}

C:\Users\smart>
```

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

- o getmac /v

```
C:\WINDOWS\system32\cmd.exe
C:\Users\smart>getmac /v
Connection Name Network Adapter Physical Address      Transport Name
=====
Ethernet          Intel(R) Ethernet 28-F1-0E-39-A8-4E    Media disconnected
Wi-Fi            Intel(R) Dual Band Wireless-AC 48-45-20-08-02-46 \Device\Tcpip_{9A281FAC-3A98-4BF5-92B6-DC00BCD572E3}

C:\Users\smart>
```

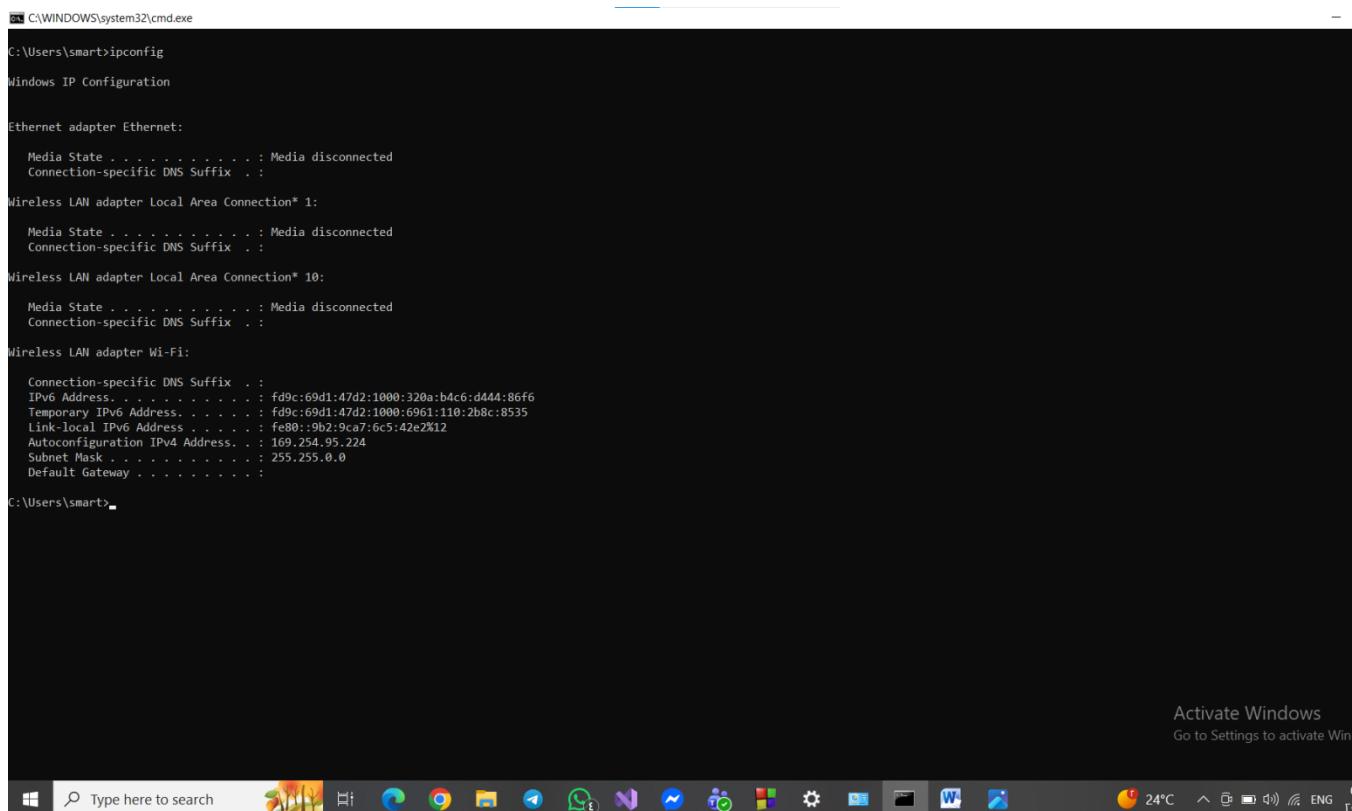
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APIPA & IP Configuration

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

- o 169.254.95.224



C:\WINDOWS\system32\cmd.exe
C:\Users\smart>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* 10:
Media State : Media disconnected
Connection-specific DNS Suffix . .
Wireless LAN adapter Wi-Fi:
Connection-specific DNS Suffix . .
IPv6 Address : fd9c:69d1:47d2:1000:320a:b4c6:d444:86f6
Temporary IPv6 Address : fd9c:69d1:47d2:1000:6961:110:2b8c:8535
Link-local IPv6 Address : fe80::962:9ca7:6c5:42e2%12
Autoconfiguration IPv4 Address : 169.254.95.224
Subnet Mask : 255.255.0.0
Default Gateway :

C:\Users\smart>

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5. What command shows your current IP settings?

- o Ipconfig

```
C:\WINDOWS\system32\cmd.exe
C:\Users\smart>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* 10:
  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . :

Wireless LAN adapter Wi-Fi:
  Connection-specific DNS Suffix . : home
  IPv6 Address . . . . . : fd9c:69d1:47d2:1000:320a:b4c6:d444:86f6
  Temporary IPv6 Address . . . . . : fd9c:69d1:47d2:1000:6961:110:2b8c:8535
  Link-local IPv6 Address . . . . . : fe80::9b2:9ca7:6c5:42e2%12
  IPv4 Address . . . . . : 192.168.1.11
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . : 192.168.1.1

C:\Users\smart>
```



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6. How do you release your current IP address?

- o ipconfig /release

```
C:\WINDOWS\system32\cmd.exe
C:\Users\smart>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* 10 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* 10:
  Media State . . . . . : Media disconnected
  Connection-specific DNS Suffix . :

Wireless LAN adapter Wi-Fi:
  Connection-specific DNS Suffix . :
  IPv6 Address . . . . . : fd9c:69d1:47d2:1000:320a:b4c6:d444:86f6
  Temporary IPv6 Address . . . . . : fd9c:69d1:47d2:1000:6961:110:2b8c:8535
  Link-local IPv6 Address . . . . . : fe80::9b2:9ca7:6c5:42e2%12
  Default Gateway . . . . . :
```



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

ipconfig /renew

```
C:\Users\smart>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 Local Area Connection* 10 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* 10:

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

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix . . : home
    IPv6 Address. . . . . : fd9c:69d1:47d2:1000:320a:b4c6:d444:86f6
    Temporary IPv6 Address. . . . . : fd9c:69d1:47d2:1000:6961:110:2b8c:8535
    Link-local IPv6 Address . . . . . : fe80::9b2:9ca7:6c5:42e2%12
    IPv4 Address. . . . . : 192.168.1.11
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.1.1

C:\Users\smart>
```

Ping Commands

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

- o ping [IP address]

```
C:\WINDOWS\system32\cmd.exe
C:\Users\smart>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

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

C:\Users\smart>
```

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10.

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

- o ping www.example.com

```
C:\Users\smart>ping www.google.com

Pinging www.google.com [142.250.185.100] with 32 bytes of data:
Reply from 142.250.185.100: bytes=32 time=63ms TTL=112
Reply from 142.250.185.100: bytes=32 time=63ms TTL=112
Reply from 142.250.185.100: bytes=32 time=64ms TTL=112
Reply from 142.250.185.100: bytes=32 time=62ms TTL=112

Ping statistics for 142.250.185.100:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 62ms, Maximum = 64ms, Average = 63ms

C:\Users\smart>
```

11.

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

- o ping [IP] -l [size]

```
C:\Users\smart>ping 8.8.8.8 -i 8

Pinging 8.8.8.8 with 32 bytes of data:
Reply from 192.178.99.215: TTL expired in transit.

Ping statistics for 8.8.8.8:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
```

```
C:\Users\smart>
```

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

- o ping [IP] -n [count]

```
C:\Windows\system32\cmd.exe
C:\Users\smart>ping www.google.com -n 6

Pinging www.google.com [142.251.209.36] with 32 bytes of data:
Reply from 142.251.209.36: bytes=32 time=67ms TTL=108
Reply from 142.251.209.36: bytes=32 time=67ms TTL=108
Reply from 142.251.209.36: bytes=32 time=63ms TTL=108
Reply from 142.251.209.36: bytes=32 time=61ms TTL=108
Reply from 142.251.209.36: bytes=32 time=62ms TTL=108
Reply from 142.251.209.36: bytes=32 time=62ms TTL=108

Ping statistics for 142.251.209.36:
    Packets: Sent = 6, Received = 6, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 61ms, Maximum = 67ms, Average = 63ms

C:\Users\smart>
```

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

- o ping [IP] -t

```
C:\Users\smart>ping www.google.com -t

Pinging www.google.com [142.250.185.100] with 32 bytes of data:
Reply from 142.250.185.100: bytes=32 time=63ms TTL=112
Reply from 142.250.185.100: bytes=32 time=61ms TTL=112
Reply from 142.250.185.100: bytes=32 time=89ms TTL=112
Reply from 142.250.185.100: bytes=32 time=62ms TTL=112
Reply from 142.250.185.100: bytes=32 time=67ms TTL=112
Reply from 142.250.185.100: bytes=32 time=61ms TTL=112
Reply from 142.250.185.100: bytes=32 time=63ms TTL=112
Reply from 142.250.185.100: bytes=32 time=94ms TTL=112
Reply from 142.250.185.100: bytes=32 time=65ms TTL=112
Reply from 142.250.185.100: bytes=32 time=69ms TTL=112
Reply from 142.250.185.100: bytes=32 time=61ms TTL=112
Reply from 142.250.185.100: bytes=32 time=61ms TTL=112
Reply from 142.250.185.100: bytes=32 time=62ms TTL=112
Reply from 142.250.185.100: bytes=32 time=63ms TTL=112
Reply from 142.250.185.100: bytes=32 time=62ms TTL=112
Reply from 142.250.185.100: bytes=32 time=62ms TTL=112
Reply from 142.250.185.100: bytes=32 time=63ms TTL=112
Reply from 142.250.185.100: bytes=32 time=69ms TTL=112
Reply from 142.250.185.100: bytes=32 time=70ms TTL=112
Reply from 142.250.185.100: bytes=32 time=65ms TTL=112
Reply from 142.250.185.100: bytes=32 time=63ms TTL=112
Reply from 142.250.185.100: bytes=32 time=62ms TTL=112
Reply from 142.250.185.100: bytes=32 time=62ms TTL=112

Ping statistics for 142.250.185.100:
    Packets: Sent = 23, Received = 23, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 61ms, Maximum = 94ms, Average = 66ms
Control-C
^C
C:\Users\smart>
```

Netstat

19. How do you show all active connections?

- o netstat -a

```

C:\Users\smart>netstat -a
Active Connections

Proto Local Address      Foreign Address      State
TCP   0.0.0.0:135         DESKTOP-Q5F6A9:0    LISTENING
TCP   0.0.0.0:445         DESKTOP-Q5F6A9:0    LISTENING
TCP   0.0.0.0:623         DESKTOP-Q5F6A9:0    LISTENING
TCP   0.0.0.0:1086        DESKTOP-Q5F6A9:0    LISTENING
TCP   0.0.0.0:5040        DESKTOP-Q5F6A9:0    LISTENING
TCP   0.0.0.0:5357        DESKTOP-Q5F6A9:0    LISTENING
TCP   0.0.0.0:16992       DESKTOP-Q5F6A9:0    LISTENING
TCP   0.0.0.0:33608       DESKTOP-Q5F6A9:0    LISTENING
TCP   0.0.0.0:49654       DESKTOP-Q5F6A9:0    LISTENING
TCP   0.0.0.0:49655       DESKTOP-Q5F6A9:0    LISTENING
TCP   0.0.0.0:49666       DESKTOP-Q5F6A9:0    LISTENING
TCP   0.0.0.0:49667       DESKTOP-Q5F6A9:0    LISTENING
TCP   0.0.0.0:49668       DESKTOP-Q5F6A9:0    LISTENING
TCP   0.0.0.0:49671       DESKTOP-Q5F6A9:0    LISTENING
TCP   127.0.0.1:12025     DESKTOP-Q5F6A9:0    LISTENING
TCP   127.0.0.1:12110     DESKTOP-Q5F6A9:0    LISTENING
TCP   127.0.0.1:12119     DESKTOP-Q5F6A9:0    LISTENING
TCP   127.0.0.1:12143     DESKTOP-Q5F6A9:0    LISTENING
TCP   127.0.0.1:12465     DESKTOP-Q5F6A9:0    LISTENING
TCP   127.0.0.1:12563     DESKTOP-Q5F6A9:0    LISTENING
TCP   127.0.0.1:12993     DESKTOP-Q5F6A9:0    LISTENING
TCP   127.0.0.1:12995     DESKTOP-Q5F6A9:0    LISTENING
TCP   127.0.0.1:27775     DESKTOP-Q5F6A9:0    LISTENING
TCP   127.0.0.1:3070      DESKTOP-Q5F6A9:0    LISTENING
TCP   127.0.0.1:49677     DESKTOP-Q5F6A9:0    ESTABLISHED
TCP   127.0.0.1:49678     DESKTOP-Q5F6A9:0    49678 ESTABLISHED
TCP   127.0.0.1:49678     DESKTOP-Q5F6A9:0    49677 ESTABLISHED
TCP   127.0.0.1:49686     DESKTOP-Q5F6A9:0    49687 ESTABLISHED
TCP   127.0.0.1:49686     DESKTOP-Q5F6A9:0    49686 ESTABLISHED
TCP   127.0.0.1:49687     DESKTOP-Q5F6A9:0    49689 ESTABLISHED
TCP   127.0.0.1:49688     DESKTOP-Q5F6A9:0    49688 ESTABLISHED
TCP   127.0.0.1:49689     DESKTOP-Q5F6A9:0    49689 ESTABLISHED
TCP   192.168.1.11:53401   52.112.122.48:https  ESTABLISHED
TCP   192.168.1.11:53408   98.66.133.185:https  ESTABLISHED
TCP   192.168.1.11:53412   104.18.39.21:https  ESTABLISHED
TCP   192.168.1.11:53414   20.215.74.205:https  ESTABLISHED
TCP   192.168.1.11:53430   20.50.201.205:https  ESTABLISHED
TCP   192.168.1.11:53430   whatsapp-cdn-shv-01-hbe1:5222 ESTABLISHED
TCP   192.168.1.11:53439   52.123.135.185:https  ESTABLISHED
TCP   192.168.1.11:53443   52.123.135.185:https  ESTABLISHED
C:\Users\smart>

```

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

- o netstat -n

```

C:\Users\smart>netstat -n
Active Connections

Proto Local Address      Foreign Address      State
TCP   127.0.0.1:49677    127.0.0.1:49678    ESTABLISHED
TCP   127.0.0.1:49678    127.0.0.1:49677    ESTABLISHED
TCP   127.0.0.1:49686    127.0.0.1:49687    ESTABLISHED
TCP   127.0.0.1:49687    127.0.0.1:49686    ESTABLISHED
TCP   127.0.0.1:49688    127.0.0.1:49689    ESTABLISHED
TCP   127.0.0.1:49689    127.0.0.1:49689    ESTABLISHED
TCP   127.0.0.1:49689    127.0.0.1:49688    ESTABLISHED
TCP   192.168.1.11:53401  52.112.122.48:443  ESTABLISHED
TCP   192.168.1.11:53408  98.66.133.185:443  ESTABLISHED
TCP   192.168.1.11:53414  20.215.74.205:443  ESTABLISHED
TCP   192.168.1.11:53430  20.50.201.205:443  ESTABLISHED
TCP   192.168.1.11:53439  102.112.97.54:5222  ESTABLISHED
TCP   192.168.1.11:53443  52.123.135.185:443  ESTABLISHED
TCP   192.168.1.11:53447  52.108.240.61:443  ESTABLISHED
TCP   192.168.1.11:53453  34.76.221.58:7500  ESTABLISHED
TCP   192.168.1.11:53464  98.66.133.186:443  ESTABLISHED
TCP   192.168.1.11:53470  173.254.104.188:5228 ESTABLISHED
TCP   192.168.1.11:53479  102.112.97.100:443  TIME_WAIT
TCP   192.168.1.11:53493  64.231.184.188:5228 ESTABLISHED
TCP   192.168.1.11:53494  74.242.255.116:443 ESTABLISHED
TCP   192.168.1.11:53495  52.108.9.12:443  ESTABLISHED
TCP   192.168.1.11:53503  52.113.194.133:443 ESTABLISHED
TCP   192.168.1.11:53504  52.113.194.132:443 ESTABLISHED
TCP   192.168.1.11:53505  52.108.240.63:443 ESTABLISHED
TCP   192.168.1.11:53506  52.108.9.12:443  ESTABLISHED
TCP   192.168.1.11:53507  52.108.9.12:443  ESTABLISHED
TCP   192.168.1.11:53507  98.66.133.185:443 ESTABLISHED
TCP   192.168.1.11:53508  52.108.9.12:443  ESTABLISHED
TCP   192.168.1.11:53509  104.18.32.47:443 ESTABLISHED
TCP   192.168.1.11:53510  104.18.39.21:443 ESTABLISHED
TCP   192.168.1.11:53515  34.117.223.223:443 TIME_WAIT
TCP   192.168.1.11:53516  34.117.223.223:443 TIME_WAIT
TCP   192.168.1.11:53517  34.117.223.223:443 TIME_WAIT
TCP   192.168.1.11:53519  34.169.176.28:443 TIME_WAIT
TCP   192.168.1.11:53521  34.117.223.223:443 TIME_WAIT
Active Connections

Proto Local Address      Foreign Address      State
TCP   127.0.0.1:49677    127.0.0.1:49678    ESTABLISHED
TCP   127.0.0.1:49678    127.0.0.1:49677    ESTABLISHED
TCP   127.0.0.1:49686    127.0.0.1:49687    ESTABLISHED
TCP   127.0.0.1:49687    127.0.0.1:49686    ESTABLISHED
TCP   127.0.0.1:49688    127.0.0.1:49689    ESTABLISHED
TCP   127.0.0.1:49689    127.0.0.1:49688    ESTABLISHED
TCP   192.168.1.11:53481  52.112.122.48:443  ESTABLISHED
C:\Users\smart>

```

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

arp -a

```
C:\Users\smart>arp -a

Interface: 192.168.1.11 --- 0xc
  Internet Address      Physical Address      Type
    192.168.1.1          9c-69-d1-47-d2-10    dynamic
    192.168.1.13         e6-14-84-03-48-ca    dynamic
    224.0.0.22           01-00-5e-00-00-16    static

C:\Users\smart>
```

22. What command deletes the ARP cache?

arp -d

```
Microsoft Windows [Version 10.0.19045.6466]
(c) Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>arp -d

C:\WINDOWS\system32>
```

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

nslookup Domain_Name

Example:

nslookup Yahoo.com

```
C:\Users\smart>nslookup Yahoo.com
Server: UnKnown
Address: fe80::1

DNS request timed out.
    timeout was 2 seconds.
DNS request timed out.
    timeout was 2 seconds.
Non-authoritative answer:
Name:    Yahoo.com
Addresses: 2001:4998:124:1507::f000
          2001:4998:44:3507::8001
          2001:4998:24:120d::1:1
          2001:4998:124:1507::f001
          2001:4998:24:120d::1:0
          2001:4998:44:3507::8000
          74.6.231.20
          74.6.231.21
          98.137.11.163
          98.137.11.164
          74.6.143.25
          74.6.143.26
```

```
C:\Users\smart>■
```

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

Type this command:

nslookup IP_address

Example:

nslookup 87.248.113.14

```
C:\Users\smart>nslookup 87.248.113.14
Server:  UnKnown
Address:  fe80::1

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

C:\Users\smart>
```