

Network

Ahmed Ehab Ahmed

Lab1

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Windows PowerShell
PS D:\> 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 . . .
    Link-local IPv6 Address . . . . . : fe80::ff04:cad1:ab66:19c1%12
    IPv4 Address. . . . . : 192.168.1.104
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.1.1
PS D:\> ipconfig -all

Windows IP Configuration

    Host Name . . . . . : Ahmed-Ehab
    Primary Dns Suffix . . . . . :
    Node Type . . . . . : Hybrid
    IP Routing Enabled. . . . . : No
```

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Windows PowerShell
PS D:\> ipconfig /all

Windows IP Configuration

    Host Name . . . . . : Ahmed-Ehab
    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 . . . . . : Realtek PCIe GBE Family Controller
    Physical Address. . . . . : B8-22-7A-DF-51-E4
    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. . . . . : 38-FC-98-E6-EF-20
    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. . . . . : 3A-FC-98-E6-EF-1F
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . . : Yes

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix . . .
    Description . . . . . : Intel(R) Wi-Fi 6 AX201 160MHz
    Physical Address. . . . . : 38-FC-98-E6-EF-1F
    DHCP Enabled. . . . . : Yes
    Autoconfiguration Enabled . . . . . : Yes
    Link-local IPv6 Address . . .
        IPv6 Address . . . . . : fe80::ff04:cad1:ab66:19c1%12(Preferred)
        IPv4 Address . . . . . : 192.168.1.104(PREFERRED)
    Subnet Mask . . . . . : 255.255.255.0
    Lease Obtained. . . . . : Thursday, 27 November 2025 10:31:42 am
    Lease Expires . . . . . : Friday, 28 November 2025 12:31:44 pm
    Default Gateway . . . . . : 192.168.1.1
    DHCP Server . . . . . : 192.168.1.1
    DHCPv6 IAID . . . . . : 154729624
    DHCPv6 Client DUID. . . . . : 00-01-00-01-2D-C4-D5-1A-B0-22-7A-DF-51-E4
    DNS Servers . . . . . : 192.168.1.1
    NetBIOS over Tcpip. . . . . : Enabled
```

```
Windows PowerShell + X - X
PS D:\> 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 . :
    Link-local IPv6 Address . . . . . : fe80::ff04:cad1:ab66:19c1%12
    Default Gateway . . . . . :

PS D:\>
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```
Windows PowerShell + X - X X
Link-local IPv6 Address . . . . . : fe80::ff04:cad1:ab66:19c1%12
Default Gateway . . . . . :
PS D:\> 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 . :

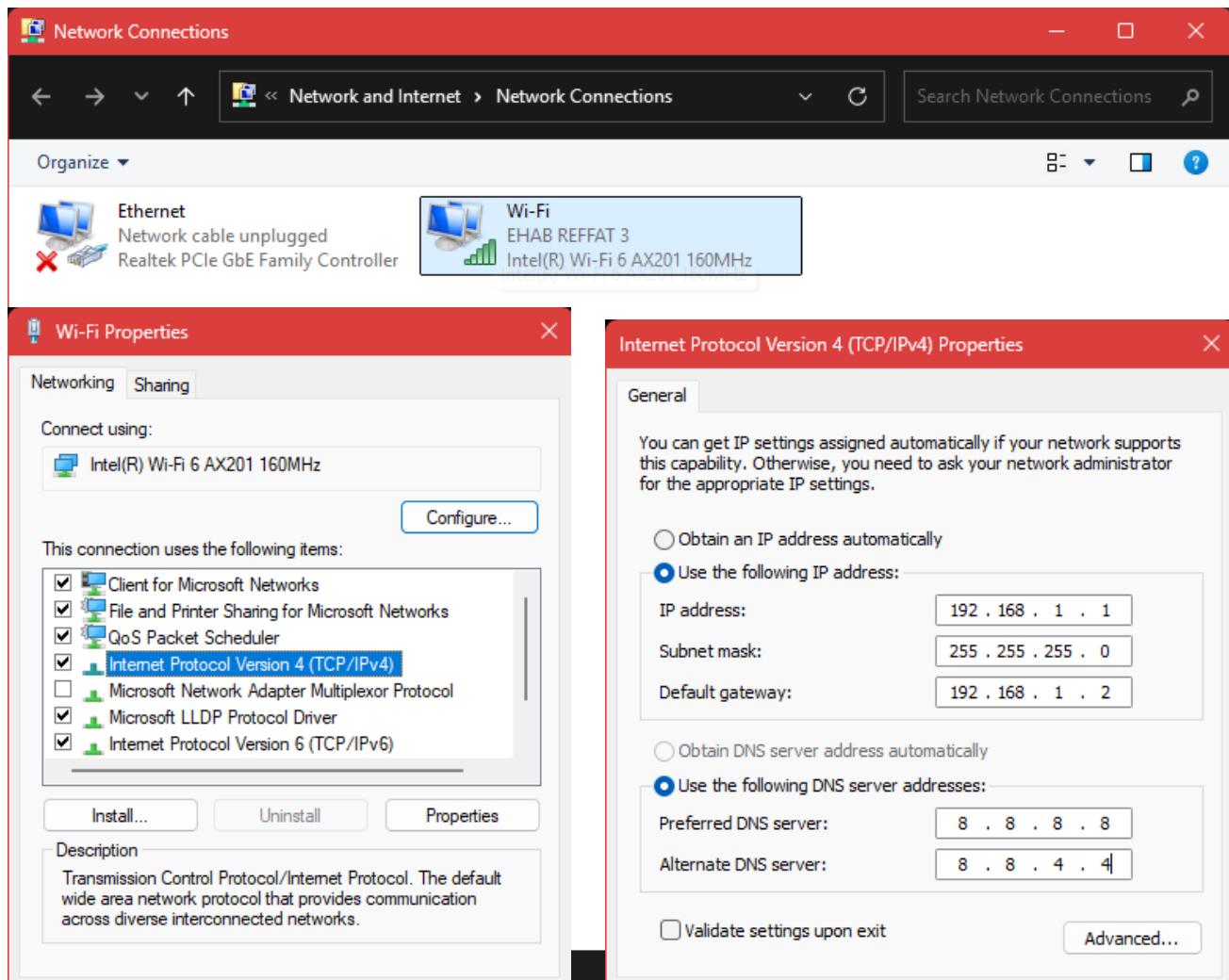
Wireless LAN adapter Local Area Connection* 10:

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

Wireless LAN adapter Wi-Fi:

    Connection-specific DNS Suffix . :
    Link-local IPv6 Address . . . . . : fe80::ff04:cad1:ab66:19c1%12
    IPv4 Address. . . . . : 192.168.1.104
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 192.168.1.1

PS D:\>
```



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Windows PowerShell x + v

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 . :
  Link-local IPv6 Address . . . . . : fe80::ff04:cad1:ab66:19c1%12
  IPv4 Address. . . . . : 192.168.1.104
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . : 192.168.1.1
PS D:\> ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:
Reply from 192.168.1.1: bytes=32 time=3ms TTL=64
Reply from 192.168.1.1: bytes=32 time=3ms TTL=64
Reply from 192.168.1.1: bytes=32 time=4ms TTL=64
Reply from 192.168.1.1: bytes=32 time=2ms TTL=64

Ping statistics for 192.168.1.1:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
  Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 4ms, Average = 3ms
PS D:\> |
```

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Windows PowerShell x + v

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 . :
  Link-local IPv6 Address . . . . . : fe80::ff04:cad1:ab66:19c1%12
  IPv4 Address. . . . . : 192.168.1.104
  Subnet Mask . . . . . : 255.255.255.0
  Default Gateway . . . . . : 192.168.1.1
PS D:\> ping 192.168.1.1

Pinging 192.168.1.1 with 32 bytes of data:
Reply from 192.168.1.1: bytes=32 time=3ms TTL=64
Reply from 192.168.1.1: bytes=32 time=3ms TTL=64
Reply from 192.168.1.1: bytes=32 time=4ms TTL=64
Reply from 192.168.1.1: bytes=32 time=2ms TTL=64

Ping statistics for 192.168.1.1:
  Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
  Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 4ms, Average = 3ms
PS D:\> getmac

Physical Address      Transport Name
===== =====
38-FC-98-E6-EF-1F  \Device\Tcpip_{7EB74B5D-ADD9-4A73-AB27-2A7B8B5A4B88}
B0-22-7A-DF-51-E4  Media disconnected
PS D:\> getmac /v

Connection Name Network Adapter Physical Address      Transport Name
===== ===== ===== =====
Wi-Fi           Intel(R) Wi-Fi 38-FC-98-E6-EF-1F  \Device\Tcpip_{7EB74B5D-ADD9-4A73-AB27-2A7B8B5A4B88}
Ethernet        Realtek PCIe Gb B0-22-7A-DF-51-E4  Media disconnected
PS D:\>
```

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Windows PowerShell + - X
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 4ms, Average = 3ms
PS D:\> getmac

Physical Address      Transport Name
===== =====
38-FC-98-E6-EF-1F   \Device\Tcpip_{7EB74B5D-ADD9-4A73-AB27-2A7B8B5A4B88}
B0-22-7A-DF-51-E4   Media disconnected

PS D:\> getmac /v

Connection Name Network Adapter Physical Address      Transport Name
===== ===== ===== =====
Wi-Fi           Intel(R) Wi-Fi 38-FC-98-E6-EF-1F   \Device\Tcpip_{7EB74B5D-ADD9-4A73-AB27-2A7B8B5A4B88}
Ethernet        Realtek PCIe Gb B0-22-7A-DF-51-E4   Media disconnected

PS D:\> arp -a

Interface: 192.168.1.104 --- 0xc
Internet Address      Physical Address      Type
192.168.1.1            b4-b0-24-1b-f7-a8  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 D:\> arp -d
The ARP entry deletion failed: The requested operation requires elevation.

PS D:\>
```

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Administrator: Windows PowerShell + - X
Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\WINDOWS\system32> arp -a

Interface: 192.168.1.104 --- 0xc
Internet Address      Physical Address      Type
192.168.1.1            b4-b0-24-1b-f7-a8  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:\WINDOWS\system32> arp -d
PS C:\WINDOWS\system32> arp -a

Interface: 192.168.1.104 --- 0xc
Internet Address      Physical Address      Type
192.168.1.1            b4-b0-24-1b-f7-a8  dynamic
224.0.0.22              01-00-5e-00-00-16  static

PS C:\WINDOWS\system32> |
```

```
PS D:\> netstat -n

Active Connections

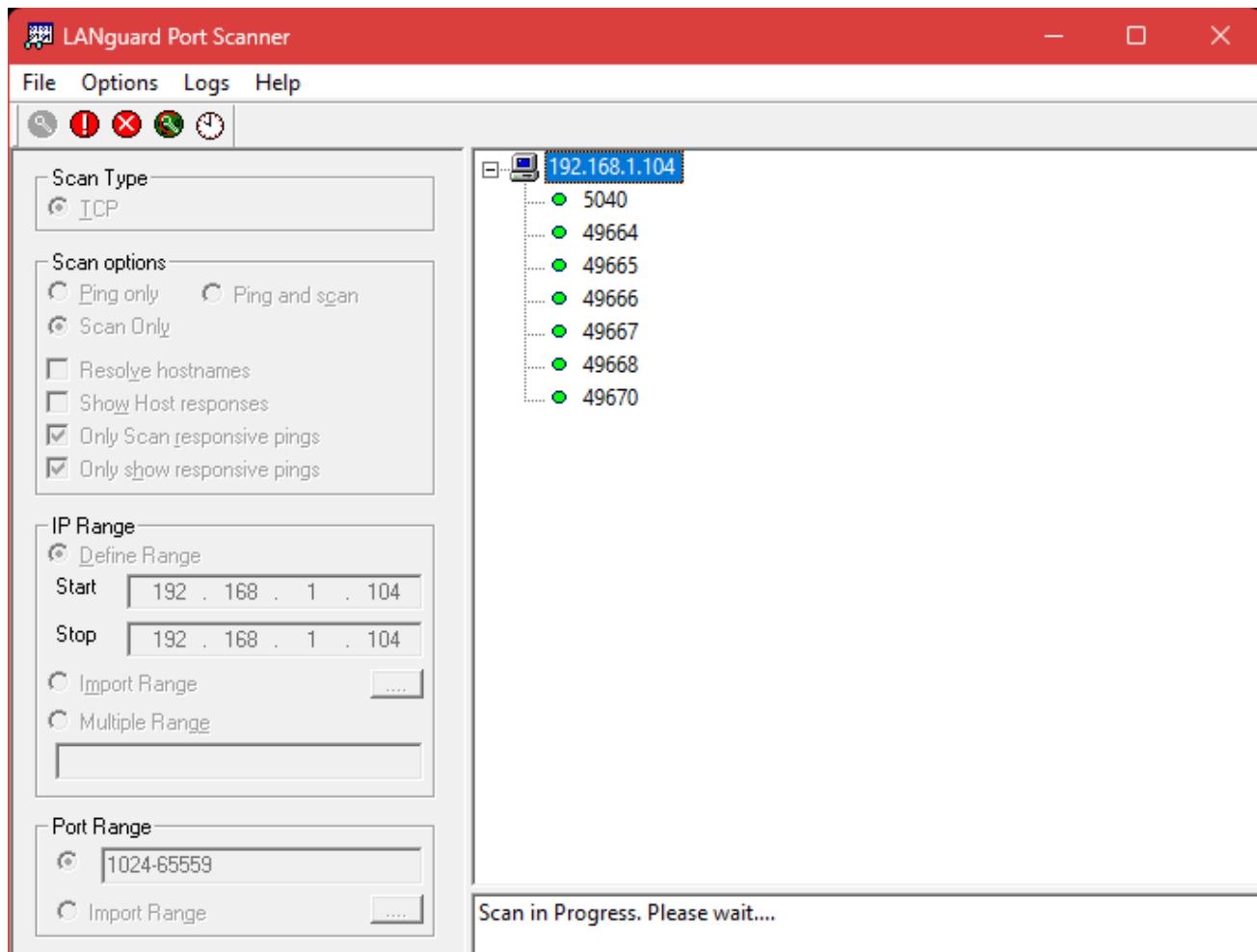
Proto  Local Address          Foreign Address        State
TCP    127.0.0.1:53626        127.0.0.1:63967      ESTABLISHED
TCP    127.0.0.1:63967        127.0.0.1:53626      ESTABLISHED
TCP    192.168.1.104:49414    74.242.255.116:443  ESTABLISHED
TCP    192.168.1.104:49639    4.208.32.153:443   ESTABLISHED
TCP    192.168.1.104:49641    52.123.243.7:443   ESTABLISHED
TCP    192.168.1.104:49678    98.66.133.184:443  ESTABLISHED
TCP    192.168.1.104:49679    142.250.180.174:443 TIME_WAIT
TCP    192.168.1.104:49751    52.111.231.12:443   ESTABLISHED
TCP    192.168.1.104:50541    102.132.103.60:443  ESTABLISHED
TCP    192.168.1.104:51027    142.251.140.106:443 TIME_WAIT
TCP    192.168.1.104:51098    52.123.243.16:443   ESTABLISHED
TCP    192.168.1.104:51403    52.111.231.54:443  ESTABLISHED
TCP    192.168.1.104:51606    2.20.109.89:443   ESTABLISHED
TCP    192.168.1.104:51871    52.98.159.18:443   ESTABLISHED
TCP    192.168.1.104:51929    41.128.126.50:443  ESTABLISHED
TCP    192.168.1.104:52487    216.58.204.238:443 TIME_WAIT
TCP    192.168.1.104:52856    146.75.34.73:443   ESTABLISHED
TCP    192.168.1.104:52896    41.128.126.57:443  ESTABLISHED
TCP    192.168.1.104:53888    41.128.126.11:443  ESTABLISHED
TCP    192.168.1.104:53911    13.107.246.77:443  CLOSE_WAIT
TCP    192.168.1.104:53969    95.101.35.169:443  ESTABLISHED
TCP    192.168.1.104:54353    216.58.209.54:443 TIME_WAIT
TCP    192.168.1.104:54561    23.53.1.151:443   ESTABLISHED
TCP    192.168.1.104:55178    20.50.73.8:443   ESTABLISHED
TCP    192.168.1.104:55274    142.251.143.110:443 ESTABLISHED
TCP    192.168.1.104:55534    23.55.48.170:443  ESTABLISHED
TCP    192.168.1.104:55804    163.181.97.182:443  ESTABLISHED
TCP    192.168.1.104:56055    216.58.204.251:443 TIME_WAIT
```

```
PS D:\> nslookup
Default Server: Unknown
Address: 192.168.1.1

> www.google.com
Server: Unknown
Address: 192.168.1.1

Non-authoritative answer:
Name: www.google.com
Addresses: 2a00:1456:4002:402::2004
           142.250.180.132

>
PS D:\>
```



The screenshot shows a Windows PowerShell window titled "Administrator: Windows PowerShell". The command run is "PS C:\WINDOWS\system32> netstat -ano". The output displays active network connections:

Proto	Local Address	Foreign Address	State	PID
TCP	0.0.0.0:135	0.0.0.0:0	LISTENING	1484
TCP	0.0.0.0:445	0.0.0.0:0	LISTENING	4
TCP	0.0.0.0:5040	0.0.0.0:0	LISTENING	8628
TCP	0.0.0.0:7680	0.0.0.0:0	LISTENING	5044
TCP	0.0.0.0:49664	0.0.0.0:0	LISTENING	1176
TCP	0.0.0.0:49665	0.0.0.0:0	LISTENING	592
TCP	0.0.0.0:49666	0.0.0.0:0	LISTENING	1956
TCP	0.0.0.0:49667	0.0.0.0:0	LISTENING	2748
TCP	0.0.0.0:49668	0.0.0.0:0	LISTENING	5828
TCP	0.0.0.0:49670	0.0.0.0:0	LISTENING	1148
TCP	127.0.0.1:1001	0.0.0.0:0	LISTENING	4
TCP	127.0.0.1:53626	0.0.0.0:0	LISTENING	14512
TCP	192.168.1.104:139	0.0.0.0:0	LISTENING	4
TCP	192.168.1.104:49595	102.132.97.54:443	ESTABLISHED	1412
TCP	192.168.1.104:49906	102.132.97.54:443	TIME_WAIT	0
TCP	192.168.1.104:50053	52.123.128.14:443	ESTABLISHED	4288
TCP	192.168.1.104:50150	135.225.243.215:443	ESTABLISHED	9984
TCP	192.168.1.104:51815	104.83.138.254:80	TIME_WAIT	0
TCP	192.168.1.104:51816	41.128.126.42:80	TIME_WAIT	0
TCP	192.168.1.104:51821	98.66.133.186:443	ESTABLISHED	6248
TCP	192.168.1.104:52928	216.58.204.142:443	ESTABLISHED	4288
TCP	192.168.1.104:53917	162.159.142.9:80	TIME_WAIT	0
TCP	192.168.1.104:54138	41.128.126.9:80	TIME_WAIT	0
TCP	192.168.1.104:54139	41.128.126.9:80	TIME_WAIT	0
TCP	192.168.1.104:54765	216.58.205.46:443	ESTABLISHED	4288
TCP	192.168.1.104:55096	13.107.213.43:443	ESTABLISHED	4288
TCP	192.168.1.104:55354	20.190.181.23:443	TIME_WAIT	0
TCP	192.168.1.104:55355	51.141.119.73:443	TIME_WAIT	0
TCP	192.168.1.104:55357	20.54.232.160:443	TIME_WAIT	0
TCP	192.168.1.104:55358	51.116.246.104:443	TIME_WAIT	0

```

Administrator: Windows PowerShell - 

[+] + - X
+--> Administrator: Windows Pow... X

PS C:\WINDOWS\system32> netstat -ano
          Proto Local Address        Foreign Address      State       PID
TCP    0.0.0.0:135           0.0.0.0:0      LISTENING   1484
TCP    0.0.0.0:445           0.0.0.0:0      LISTENING   4
TCP    0.0.0.0:5040          0.0.0.0:0      LISTENING   78640
TCP    0.0.0.0:7680          0.0.0.0:0      LISTENING   5044
TCP    0.0.0.0:49664         0.0.0.0:0      LISTENING   1176
TCP    0.0.0.0:49665         0.0.0.0:0      LISTENING   592
TCP    0.0.0.0:49670         0.0.0.0:0      LISTENING   1148
TCP    0.0.0.0:63650          0.0.0.0:0      LISTENING   78092
TCP    0.0.0.0:63652          0.0.0.0:0      LISTENING   78816
TCP    0.0.0.0:63654          0.0.0.0:0      LISTENING   80500
TCP    127.0.0.1:1001         0.0.0.0:0      LISTENING   4
TCP    127.0.0.1:53626        0.0.0.0:0      LISTENING   14512
TCP    192.168.1.104:139       0.0.0.0:0      LISTENING   4
TCP    192.168.1.104:49595     102.132.97.54:443 ESTABLISHED 1412
TCP    192.168.1.104:49824     52.111.231.7:443 ESTABLISHED 39298
TCP    192.168.1.104:49859     52.111.231.7:443 ESTABLISHED 39298
TCP    192.168.1.104:50150     135.225.243.215:443 ESTABLISHED 9984
TCP    192.168.1.104:51821     98.66.133.186:443 ESTABLISHED 6248
TCP    192.168.1.104:52436     74.242.255.116:443 ESTABLISHED 85696
TCP    192.168.1.104:53707     52.112.122.46:443 ESTABLISHED 4288
TCP    192.168.1.104:54912     18.97.36.56:443 ESTABLISHED 4288
TCP    192.168.1.104:55750     41.128.126.56:443 ESTABLISHED 10744
TCP    192.168.1.104:57543     52.112.122.46:443 ESTABLISHED 4288
TCP    192.168.1.104:59033     4.208.35.46:443 ESTABLISHED 15628
TCP    192.168.1.104:63651     4.208.165.241:443 TIME_WAIT    0
TCP    192.168.1.104:65035     52.98.200.242:443 ESTABLISHED 10232
TCP    192.168.1.104:65036     52.98.200.242:443 ESTABLISHED 10232

PS C:\WINDOWS\system32> taskkill /PID 8628 /PID 1176 /PID 592 /PID 1956 /PID 2748 /PID 5828 /PID 1148 /F
ERROR: The process with PID 592 could not be terminated.
Reason: Access is denied.
ERROR: The process with PID 1148 could not be terminated.
Reason: This is critical system process. Taskkill cannot end this process.
ERROR: The process with PID 1176 could not be terminated.
Reason: Access is denied.
SUCCESS: The process with PID 1956 has been terminated.
SUCCESS: The process with PID 2748 has been terminated.
SUCCESS: The process with PID 5828 has been terminated.
SUCCESS: The process with PID 8628 has been terminated.
PS C:\WINDOWS\system32> |

```

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Administrator: Windows PowerShell - 

[+] + - X
+--> Administrator: Windows Pow... X

PS C:\WINDOWS\system32> netstat -ano
          Proto Local Address        Foreign Address      State       PID
TCP    0.0.0.0:135           0.0.0.0:0      LISTENING   1484
TCP    0.0.0.0:445           0.0.0.0:0      LISTENING   4
TCP    0.0.0.0:5040          0.0.0.0:0      LISTENING   78640
TCP    0.0.0.0:7680          0.0.0.0:0      LISTENING   5044
TCP    0.0.0.0:49664         0.0.0.0:0      LISTENING   1176
TCP    0.0.0.0:49665         0.0.0.0:0      LISTENING   592
TCP    0.0.0.0:49670         0.0.0.0:0      LISTENING   1148
TCP    0.0.0.0:63650          0.0.0.0:0      LISTENING   78092
TCP    0.0.0.0:63652          0.0.0.0:0      LISTENING   78816
TCP    0.0.0.0:63654          0.0.0.0:0      LISTENING   80500
TCP    127.0.0.1:1001         0.0.0.0:0      LISTENING   4
TCP    127.0.0.1:53626        0.0.0.0:0      LISTENING   14512
TCP    192.168.1.104:139       0.0.0.0:0      LISTENING   4
TCP    192.168.1.104:49595     102.132.97.54:443 ESTABLISHED 1412
TCP    192.168.1.104:49824     52.111.231.7:443 ESTABLISHED 39298
TCP    192.168.1.104:49859     52.111.231.7:443 ESTABLISHED 39298
TCP    192.168.1.104:50150     135.225.243.215:443 ESTABLISHED 9984
TCP    192.168.1.104:51821     98.66.133.186:443 ESTABLISHED 6248
TCP    192.168.1.104:52436     74.242.255.116:443 ESTABLISHED 85696
TCP    192.168.1.104:53707     52.112.122.46:443 ESTABLISHED 4288
TCP    192.168.1.104:54912     18.97.36.56:443 ESTABLISHED 4288
TCP    192.168.1.104:55750     41.128.126.56:443 ESTABLISHED 10744
TCP    192.168.1.104:57543     52.112.122.46:443 ESTABLISHED 4288
TCP    192.168.1.104:59033     4.208.35.46:443 ESTABLISHED 15628
TCP    192.168.1.104:63651     4.208.165.241:443 TIME_WAIT    0
TCP    192.168.1.104:65035     52.98.200.242:443 ESTABLISHED 10232
TCP    192.168.1.104:65036     52.98.200.242:443 ESTABLISHED 10232

PS C:\WINDOWS\system32> 

```

Port 5040:

Why It's Open

Part of the Windows Diagnostics Hub, used by developers and system administrators to collect logs and diagnostic info remotely.

Common Risks

- Information Leakage: Can expose detailed system logs and telemetry.
- Privilege Escalation: Debug services can sometimes be misused for local privilege escalation.
- Poor Access Controls: Not always well protected in default setups.

Port 49666:

Why It's Open

Port 49666 is in the dynamic/ephemeral port range and is commonly used by Windows RPC services, malware command and control, backdoor applications, and dynamic service bindings. The "666" suffix makes it particularly suspicious as it's often chosen by malicious software for psychological impact or to evade basic filtering rules.

Common Risks

- Malware command and control
Port commonly used by trojans and backdoors for remote access
- Windows RPC exploitation
Remote Procedure Call vulnerabilities may allow system compromise
- Data exfiltration
Malicious software may use this port to steal sensitive information
- Unauthorized remote access
Attackers may establish persistent backdoor connections
- Dynamic service binding abuse
Legitimate services may be hijacked or impersonated
- Network reconnaissance
Port scanning may reveal active Windows services
- Covert communication channels
Attackers may use high ports to avoid detection