PROJECT REPORT

LOCAL NETWORK PORT SCANNING USING NMAP

(Scanning and Analyzing Open Ports in a Local Network using Nmap on Windows)

1. Objective

To identify open ports and active services running on devices within the local network using Nmap, in order to assess potential network exposure and security risks.

2. Tools Used

- **Nmap** (Network Mapper)
- **Zenmap GUI** (optional)
- **Wireshark** (for packet-level traffic analysis – optional)
- **Operating System**: Windows 10/11

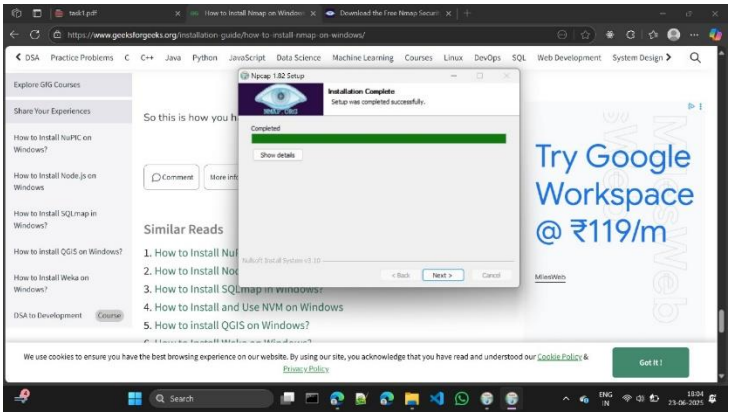
3. Network Details

- **IPv4 Address**: 192.168.208.160
- **Subnet Mask**: 255.255.255.0
- **Network Range (CIDR)**: 192.168.208.0/24
- **Usable IP Range**: 192.168.208.1 – 192.168.208.254

4. Procedure

Step 1: Installed Nmap

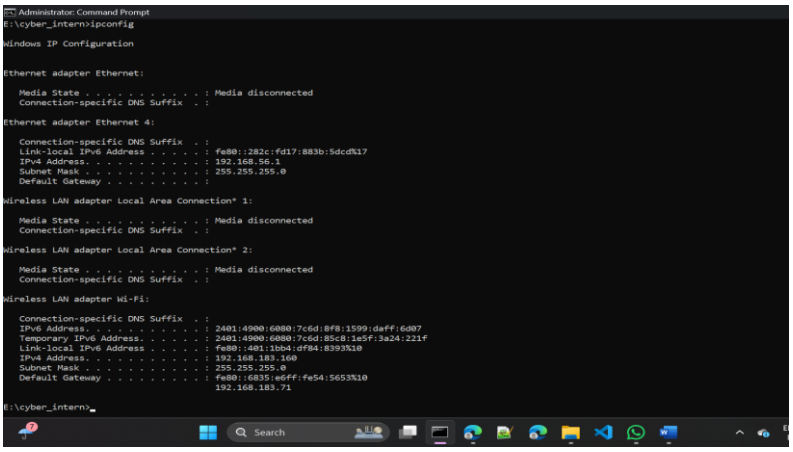
- Downloaded from https://nmap.org/download.html
- Installed using the Windows self-installer
- Verified installation via Command Prompt (nmap -version)



Step 2: Identified Local Network Range

- Ran ipconfig to find IPv4 address and subnet mask

- Calculated network range: 192.168.208.0/24

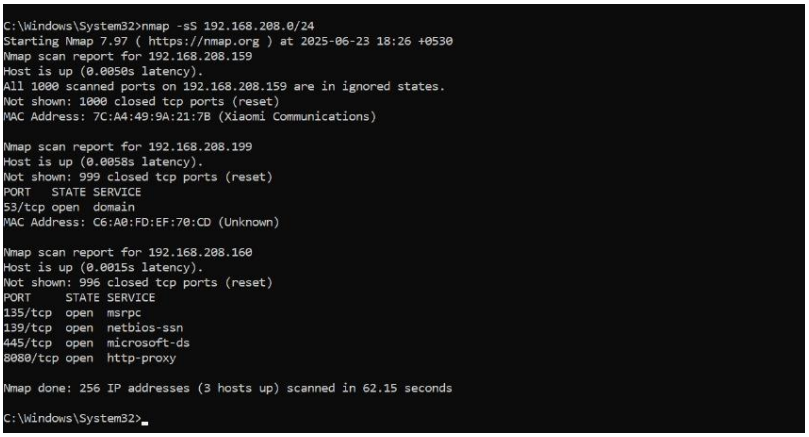


Step 3: Performed Port Scan

- Opened Command Prompt as Administrator
- Executed the scan:

nmap -sS 192.168.208.0/24

- Recorded all active hosts and open ports from the output



Step 4: Analyzed Traffic with Wireshark

- Captured packet data during scan
- Filtered TCP SYN and response packets
- Identified scan behavior and response types

Wireshark shows **thousands of packets**, so you need to **filter** to focus.

tcp.port == 80

To filter all traffic to/from a specific IP:

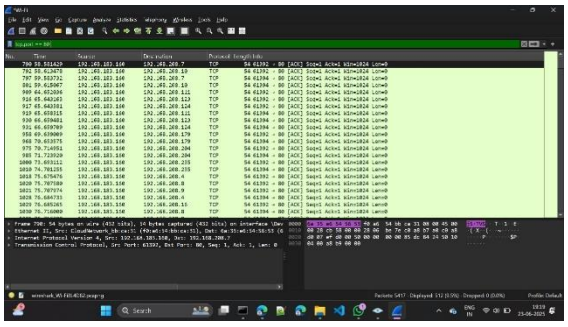
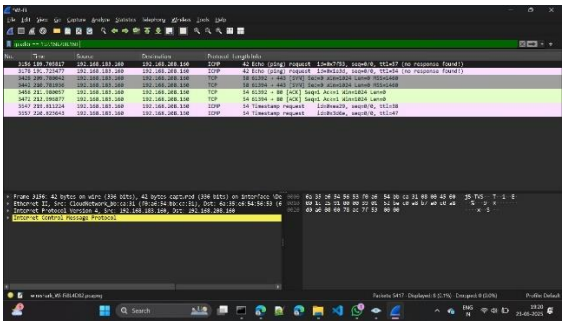
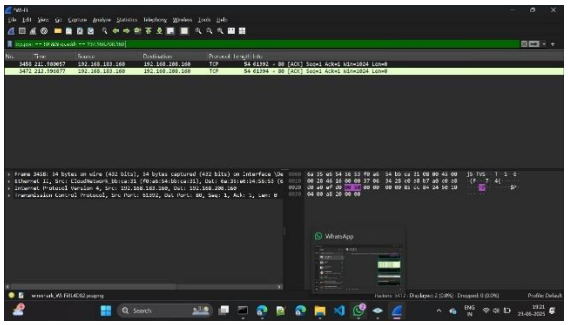
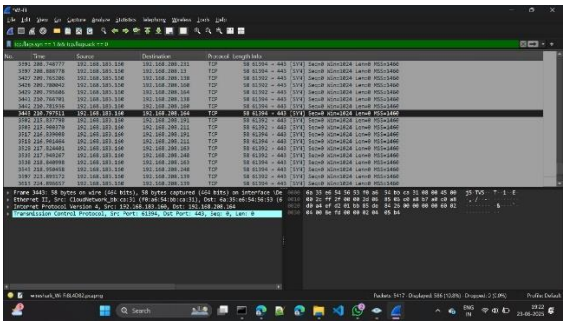
ip.addr == 192.168.208.160

Combine both:

tcp.port == 80 && ip.addr == 192.168.208.160

To filter **Nmap SYN scan traffic**:

tcp.flags.syn == 1 && tcp.flags.ack == 0

5. **Saved Scan Output**
   - Used the following command to save:

     nmap -sS 192.168.208.0/24 > scan_results.txt

6. **Save Nmap Results as a .html File (Using Zenmap GUI)**

   - Installed **Zenmap** (comes with Nmap installer)

   1. **Set Up the Scan**:
      - In **Target**, type: **192.168.208.0/24**
      - In **Profile**, choose: **Intense scan**
      - Click the **Scan** button

   2. **Wait for Scan to Complete**:
      - Zenmap will scan all IPs in your network and display the results in the bottom pane
        - IP addresses

- Hostnames (if found)
- Open ports and the service names

3. **Save the Results**:
   - Go to the menu bar: File → Save Scan
   - Choose a folder and name your file (e.g., nmap_report.html)
   - Set the file type as: **.html**
   - Click **Save**

7. Risk Analysis

Port	Service	Security Risk	Recommendation
135	MS RPC (Microsoft Remote Procedure Call)	High – Often exploited for lateral movement in Windows networks (e.g., DCOM attacks, EternalBlue variants)	Disable if not used; restrict to trusted IPs only
139	NetBIOS Session Service	High – Legacy file/printer sharing; vulnerable to enumeration and attacks	Disable NetBIOS over TCP/IP; use SMBv2/v3 instead
445	SMB (Server Message Block)	High – Target for ransomware and exploits like EternalBlue	Disable if not needed; patch system and restrict via firewall
8080	HTTP Alternate (Web services)	Medium – Used for development/web servers; may run unprotected apps	Ensure apps on this port are authenticated and secured

8. Conclusion

Through this task, I gained practical experience in using Nmap to scan local networks and identify open ports and active services. This helped me understand basic cybersecurity principles such as network exposure, potential vulnerabilities, and the importance of minimizing unnecessary services.

9. References

- https://nmap.org/download.html
- How to Install Nmap on Windows? - GeeksforGeeks
- https://www.wireshark.org/
- How to Install Wireshark on Windows? - GeeksforGeeks