Overview

During network reconnaissance using Nmap, several common ports and services are often detected. Understanding the purpose of these services and the potential vulnerabilities they may expose is crucial for evaluating network security.

Common Ports, it’s Services, and it’s Risks

Port	Protocol	Service	Description	Common Security Risks
21	TCP	FTP (File Transfer Protocol)	Transfers files between systems.	- Plaintext credentials- Anonymous login- Vulnerable FTP software
22	TCP	SSH (Secure Shell)	Secure remote login.	- Brute force attacks- Weak keys/passwords- Outdated SSH versions
23	TCP	Telnet	Unsecured remote login.	- Transmits credentials in plaintext- Vulnerable to sniffing and MITM attacks
25	TCP	SMTP (Simple Mail Transfer Protocol)	Sends email messages.	- Open relay for spam- Spoofing attacks- Lack of authentication
53	TCP/UDP	DNS (Domain Name System)	Resolves domain names.	- DNS poisoning- Amplification attacks- Zone transfer exposure
80	TCP	HTTP (Hypertext Transfer Protocol)	Unsecured web traffic.	- Insecure login forms- Lack of encryption- Susceptible to XSS, CSRF
110	TCP	POP3 (Post Office Protocol)	Email retrieval.	- Plaintext transmission of credentials- Mailbox access vulnerabilities

135	TCP	Microsoft RPC	Used for DCOM services in Windows.	- DCOM vulnerabilities- Lateral movement risks
139	TCP	NetBIOS Session Service	File/printer sharing on Windows.	- SMB vulnerabilities- Information leakage- EternalBlue exploit risk
143	TCP	IMAP (Internet Message Access Protocol)	Email retrieval.	- Unencrypted logins- MITM risk
443	TCP	HTTPS (HTTP Secure)	Secure web communication.	- SSL/TLS misconfiguration- Weak ciphers/protocols
445	TCP	SMB (Server Message Block)	File sharing in Windows.	- Major target for worms/ransomware- EternalBlue, WannaCry vulnerabilities
3306	TCP	MySQL	Open-source database server.	- SQL injection- Default credentials- Unprotected access over network
3389	TCP	RDP (Remote Desktop Protocol)	Remote desktop on Windows.	- Brute-force attacks- BlueKeep vulnerability- RDP tunneling
8080	TCP	HTTP-alt / Web Proxy	Alternate HTTP port, often used for web apps.	- Same risks as port 80- Admin interfaces exposed
8443	TCP	HTTPS-alt	Alternative HTTPS port, usually for admin panels.	- Misconfigured SSL- Exposed admin interfaces

Top Threats Identified by Nmap Scans

1. Unsecured Services (Telnet, FTP, HTTP)

- Lack of encryption leads to data leakage.
- Should be replaced with secure alternatives (e.g., SSH, SFTP, HTTPS).

2. Outdated or Vulnerable Software

- Common with services like SMB (port 445), RDP (3389), MySQL (3306).
- Leads to exploits such as EternalBlue, BlueKeep.

3. Exposed Admin Interfaces

- Services on non-standard ports (e.g., 8080, 8443) may host web admin panels.
- If unprotected, can lead to full system compromise.

4. Poor Authentication

- Many services use default or weak credentials.
- Enforce strong password policies and multi-factor authentication (MFA).

5. Unfiltered Open Ports

- Unused services still accepting connections.
- Follow the principle of least privilege; close unused ports.

Security Recommendations

1. **Use firewalls** to restrict access to critical services.
2. **Enforce encryption**: Use HTTPS, SFTP, and disable plaintext protocols.
3. **Disable unused services** and remove legacy applications.
4. **Patch regularly**: Keep all services and OS updated.
5. **Use IDS/IPS**: Detect and prevent abnormal network behavior.
6. **Scan regularly with tools like Nmap and Nessus** to assess security posture.

Sample Nmap Command Used

nmap -sS -sV -p- -Pn 192.168.1.0/24 -oA network_scan

- -sS: SYN scan
- -sV: Service/version detection
- -p-: Scan all 65535 ports
- -Pn: Skip host discovery
- -oA: Save in all formats (Nmap, XML, Grep)

Example1:

Nmap 7.95 scan initiated Mon May 26 18:31:04 2025 as: /usr/lib/nmap/nmap --privileged -sS -oN report.txt 192.168.1.4/24
Nmap scan report for dsldevice.lan (192.168.1.1)
Host is up (0.0033s latency).
Not shown: 994 filtered tcp ports (no-response)
PORT STATE SERVICE
80/tcp open http
443/tcp open https
445/tcp closed microsoft-ds
8008/tcp closed http
49156/tcp closed unknown
49163/tcp closed unknown
MAC Address: 4C:06:17:13:8A:8C (Taicang T&W Electronics)

Nmap scan report for 192.168.1.2
Host is up (0.0056s latency).
Not shown: 995 closed tcp ports (reset)
PORT STATE SERVICE
80/tcp open http
8008/tcp open http
8009/tcp open ajp13
8443/tcp open https-alt
9000/tcp open cslistener
MAC Address: 40:49:0F:23:BC:2B (Hon Hai Precision Ind.)

Nmap scan report for 192.168.1.3
Host is up (0.021s latency).
Not shown: 996 closed tcp ports (reset)
PORT STATE SERVICE
8008/tcp open http
8009/tcp open ajp13
8443/tcp open https-alt
9000/tcp open cslistener

MAC Address: BC:C7:DA:BB:37:06 (Earda Technologies)

Nmap scan report for 192.168.1.5
Host is up (0.00050s latency).
Not shown: 999 filtered tcp ports (no-response)
PORT STATE SERVICE
6881/tcp open bittorrent-tracker
MAC Address: 70:1A:B8:71:7E:7E (Intel Corporate)

Nmap scan report for 192.168.1.8
Host is up (0.0028s latency).
Not shown: 998 closed tcp ports (reset)
PORT STATE SERVICE
80/tcp open http
554/tcp open rtsp
MAC Address: 28:18:FD:5A:38:36 (Aditya Infotech)

Nmap scan report for 192.168.1.4
Host is up (0.0000010s latency).
All 1000 scanned ports on 192.168.1.4 are in ignored states.
Not shown: 1000 closed tcp ports (reset)

Nmap done at Mon May 26 18:31:26 2025 -- 256 IP addresses (6 hosts up) scanned in 21.77 seconds

Example2:

Nmap 7.95 scan initiated Mon May 26 18:54:37 2025 as: /usr/lib/nmap/nmap --privileged -sS -sV -O -Pn -p- -oN report2.txt 192.168.1.4
Nmap scan report for 192.168.1.4
Host is up (0.000046s latency).
Not shown: 65533 closed tcp ports (reset)
PORT STATE SERVICE VERSION
1716/tcp open tcpwrapped
3443/tcp open ssl/http Ajenti http control panel
Device type: general purpose
Running: Linux 2.6.X|5.X
OS CPE: cpe:/o:linux:linux_kernel:2.6.32 cpe:/o:linux:linux_kernel:5 cpe:/o:linux:linux_kernel:6
OS details: Linux 2.6.32, Linux 5.0 - 6.2
Network Distance: 0 hops

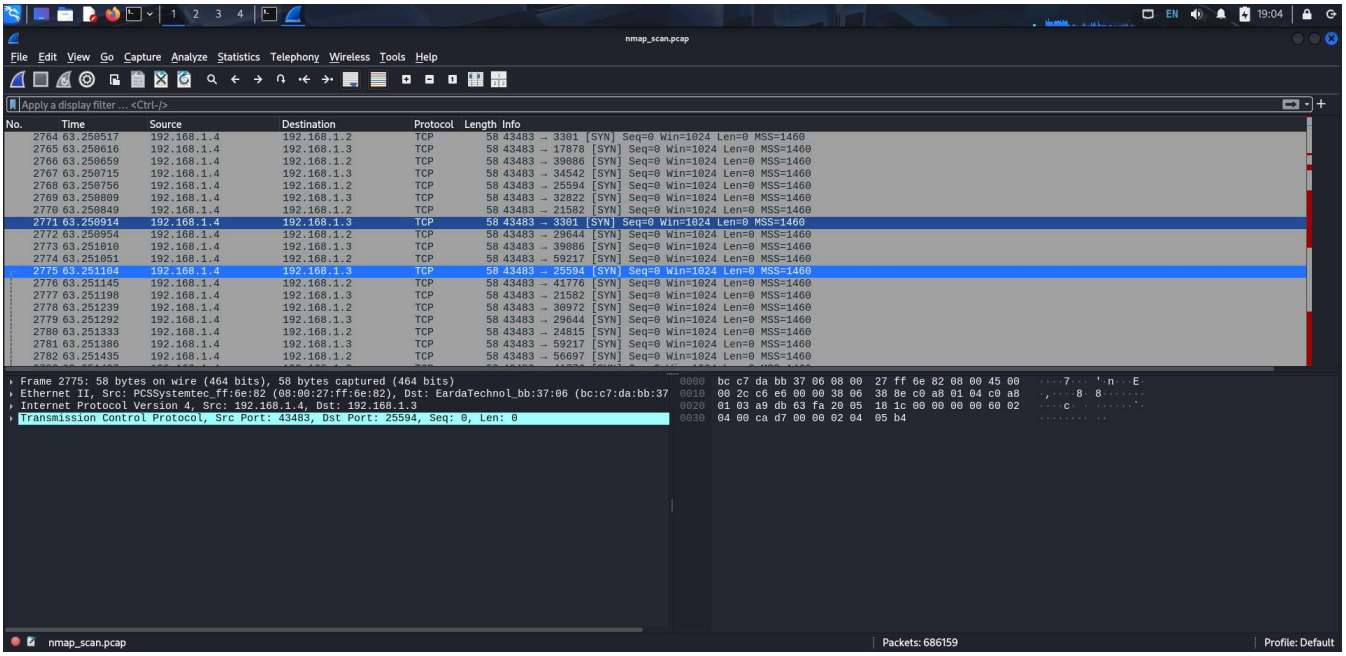
OS and Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done at Mon May 26 18:54:52 2025 -- 1 IP address (1 host up) scanned in 15.33 seconds

Sample Wireshark Used:

★ Capturing packet using tcpdump while running Nmap in another terminal.

sudo tcpdump -i eth0 -w nmap_scan.pcap

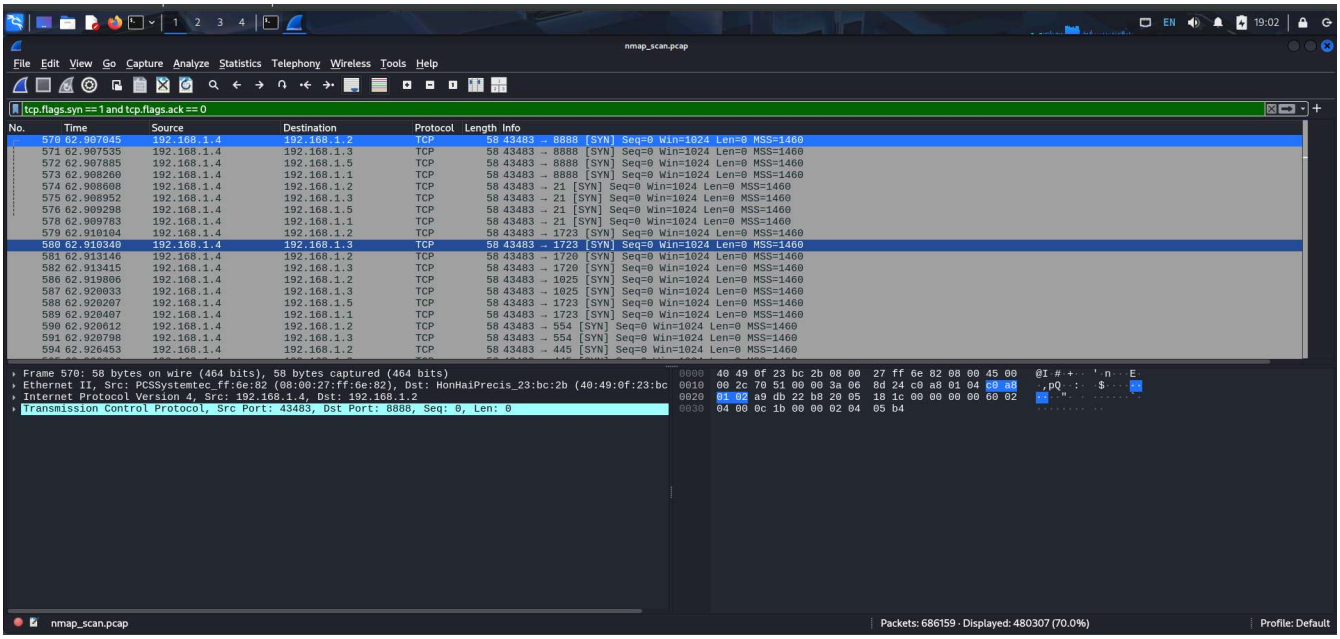
★ Stop `tcpdump` after the scan complete and open the capture in Wireshark:
wireshark nmap_scan.pcap



★ Analyzing packet capture by with Wireshark:

- Using `tcp.flags.syn == 1 and tcp.flags.ack == 0`:

shows SYN packets (initial connection attempts)



- Using `ip.addr == 192.168.1.10` :
  filters by IP