Professor Messer

Professor Messer's Quick Reference Guide to NMAP

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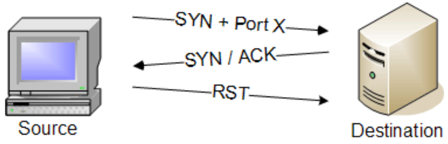
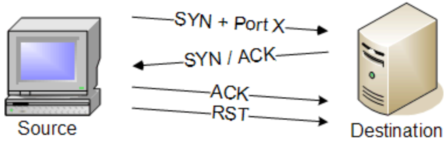
Identifying Open Ports with Nmap

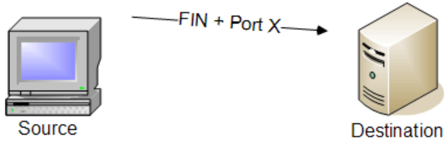
TCP SYN SCAN (`-sS`)



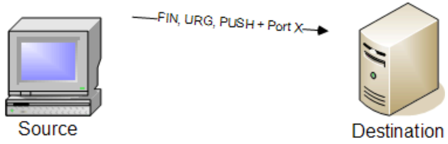
TCP connect() SCAN (`-sT`)



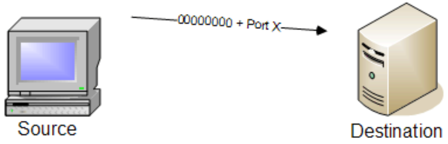
TCP FIN SCAN (`-sF`)



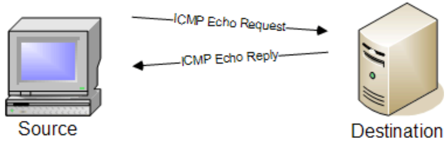
TCP XMAS TREE SCAN (`-sX`)



TCP NULL SCAN (`-sN`)

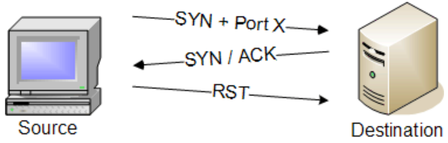


TCP PING SCAN (`-sP`)

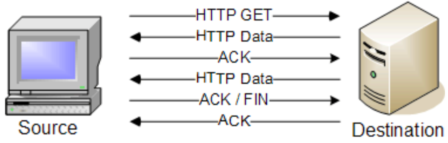


VERSION DETECTION SCAN (`-sV`)

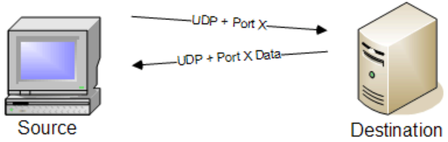
Version scan identifies open ports with a TCP SYN scan...



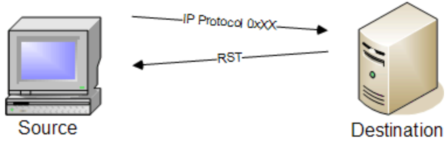
...and then queries the port with a customized signature.



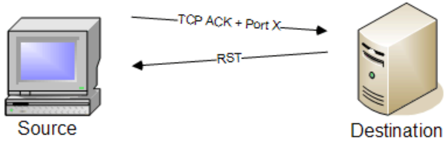
UDP SCAN (`-sU`)



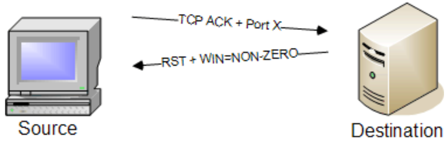
IP PROTOCOL SCAN (`-sO`)



TCP ACK SCAN (`-sA`)

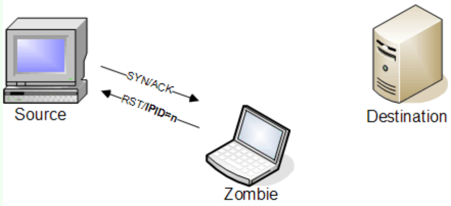


TCP WINDOW SCAN (`-sW`)

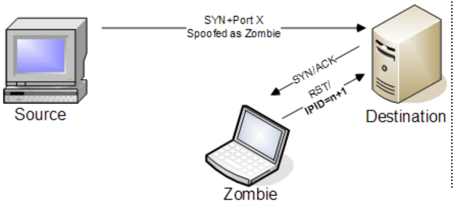


IDLESCAN (`-sI <zombie host:[probeport]>`)

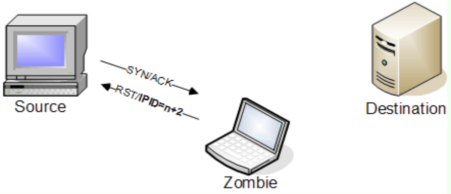
Step 1: Nmap sends a SYN/ACK to the zombie workstation to induce a RST in return. This RST frame contains the initial IPID that nmap will remember for later.



Step 2: Nmap sends a SYN frame to the destination address, but nmap spoofs the IP address to make it seem as if the SYN frame was sent from the zombie workstation.

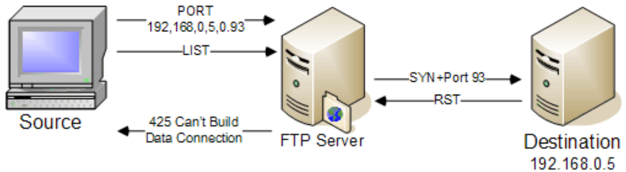


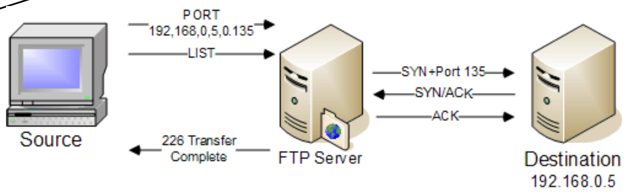
Step 3: Nmap repeats the original SYN/ACK probe of the zombie station. If the IPID has incremented, then the port that was spoofed in the original SYN frame is open on the destination device.



FTP BOUNCE ATTACK (`-b <ftp_relay_host>`)

A closed port will result with the FTP server informing the source station that the FTP server can't build the connection.





An open port completes the transfer over the specified connection.

Scripting Engine

-sC Run default scripts

--script=<ScriptName>|<ScriptCategory>|<ScriptDir>...
Run individual or groups of scripts

--script-args=<Name1=Value1,...>
Use the list of script arguments

--script-updatedb
Update script database

Script Categories

Nmap's script categories include, but are not limited to, the following:

auth: Utilize credentials or bypass authentication on target hosts.
broadcast: Discover hosts not included on command line by broadcasting on local network.
brute: Attempt to guess passwords on target systems, for a variety of protocols, including http, SNMP, IAX, MySQL, VNC, etc.
default: Scripts run automatically when -sC or -A are used.
discovery: Try to learn more information about target hosts through public sources of information, SNMP, directory services, and more.
dos: May cause denial of service conditions in target hosts.
exploit: Attempt to exploit target systems.
external: Interact with third-party systems not included in target list.
fuzzer: Send unexpected input in network protocol fields.
intrusive: May crash target, consume excessive resources, or otherwise impact target machines in a malicious fashion.
malware: Look for signs of malware infection on the target hosts.
safe: Designed not to impact target in a negative fashion.
version: Measure the version of software or protocol spoken by target hosts.
vul: Measure whether target systems have a known vulnerability.

Notable Scripts

A full list of Nmap Scripting Engine scripts is available at http://nmap.org/nsedoc/

Some particularly useful scripts include:

dns-zone-transfer: Attempts to pull a zone file (AXFR) from a DNS server.

```
$ nmap --script dns-zone-transfer.nse --script-args dns-zone-transfer.domain=<domain> -p53 <hosts>
```

http-robots.txt: Harvests robots.txt files from discovered web servers.

```
$ nmap --script http-robots.txt <hosts>
```

smb-brute: Attempts to determine valid username and password combinations via automated guessing.

```
$ nmap --script smb-brute.nse -p445 <hosts>
```

smb-psexec: Attempts to run a series of programs on the target machine, using credentials provided as scriptargs.

```
$ nmap --script smb-psexec.nse –script-args=smbuser=<username>,smbpass=<password>[,config=<config>] -p445 <hosts>
```

Nmap Cheat Sheet v1.0

POCKET REFERENCE GUIDE
SANS Institute
http://www.sans.org

Base Syntax

```
# nmap [ScanType] [Options] {targets}
```

Target Specification

IPv4 address: **192.168.1.1**
IPv6 address: **AABB:CCDD::FF%eth0**
Host name: **www.target.tgt**
IP address range: **192.168.0-255.0-255**
CIDR block: **192.168.0.0/16**
Use file with lists of targets: **-iL <filename>**

Target Ports

No port range specified scans 1,000 most popular ports

-F	Scan 100 most popular ports
-p<port1>-<port2>	Port range
-p<port1>,<port2>,...	Port List
-pU:53,U:110,T20-445	Mix TCP and UDP
-r	Scan linearly (do not randomize ports)
--top-ports <n>	Scan n most popular ports
-p-65535	Leaving off initial port in range makes Nmap scan start at port 1
-p0-	Leaving off end port in range makes Nmap scan through port 65535
-p-	Scan ports 1-65535

Probing Options

-Pn	Don't probe (assume all hosts are up)
-PB	Default probe (TCP 80, 445 & ICMP)
-PS<portlist>	Check whether targets are up by probing TCP ports
-PE	Use ICMP Echo Request
-PP	Use ICMP Timestamp Request
-PM	Use ICMP Netmask Request

Scan Types

-sP	Probe only (host discovery, not port scan)
-sS	SYN Scan
-sT	TCP Connect Scan
-sU	UDP Scan
-sV	Version Scan
-O	OS Detection
--scanflags	Set custom list of TCP using URGACKPSHRSTSYNFIN in any order

Fine-Grained Timing Options

--min-hostgroup/max-hostgroup <size>
Parallel host scan group sizes

--min-parallelism/max-parallelism <numprobes>
Probe parallelization

--min-rtt-timeout/max-rtt-timeout/initial-rtt-timeout <time>
Specifies probe round trip time.

--max-retries <tries>
Caps number of port scan probe retransmissions.

--host-timeout <time>
Give up on target after this long

--scan-delay/--max-scan-delay <time>
Adjust delay between probes

--min-rate <number>
Send packets no slower than <number> per second

--max-rate <number>
Send packets no faster than <number> per second

Aggregate Timing Options

-T0	*Paranoid:* Very slow, used for IDS evasion
-T1	*Sneaky:* Quite slow, used for IDS evasion
-T2	*Polite:* Slows down to consume less bandwidth, runs ~10 times slower than default
-T3	*Normal:* Default, a dynamic timing model based on target responsiveness
-T4	*Aggressive:* Assumes a fast and reliable network and may overwhelm targets
-T5	*Insane:* Very aggressive; will likely overwhelm targets or miss open ports

Output Formats

-oN	Standard Nmap output
-oG	Greppable format
-oX	XML format
-oA *<basename>*	Generate Nmap, Greppable, and XML output files using basename for files

Misc Options

-n	Disable reverse IP address lookups
-6	Use IPv6 only
-A	Use several features, including OS Detection, Version Detection, Script Scanning (default), and traceroute
--reason	Display reason Nmap thinks port is open, closed, or filtered