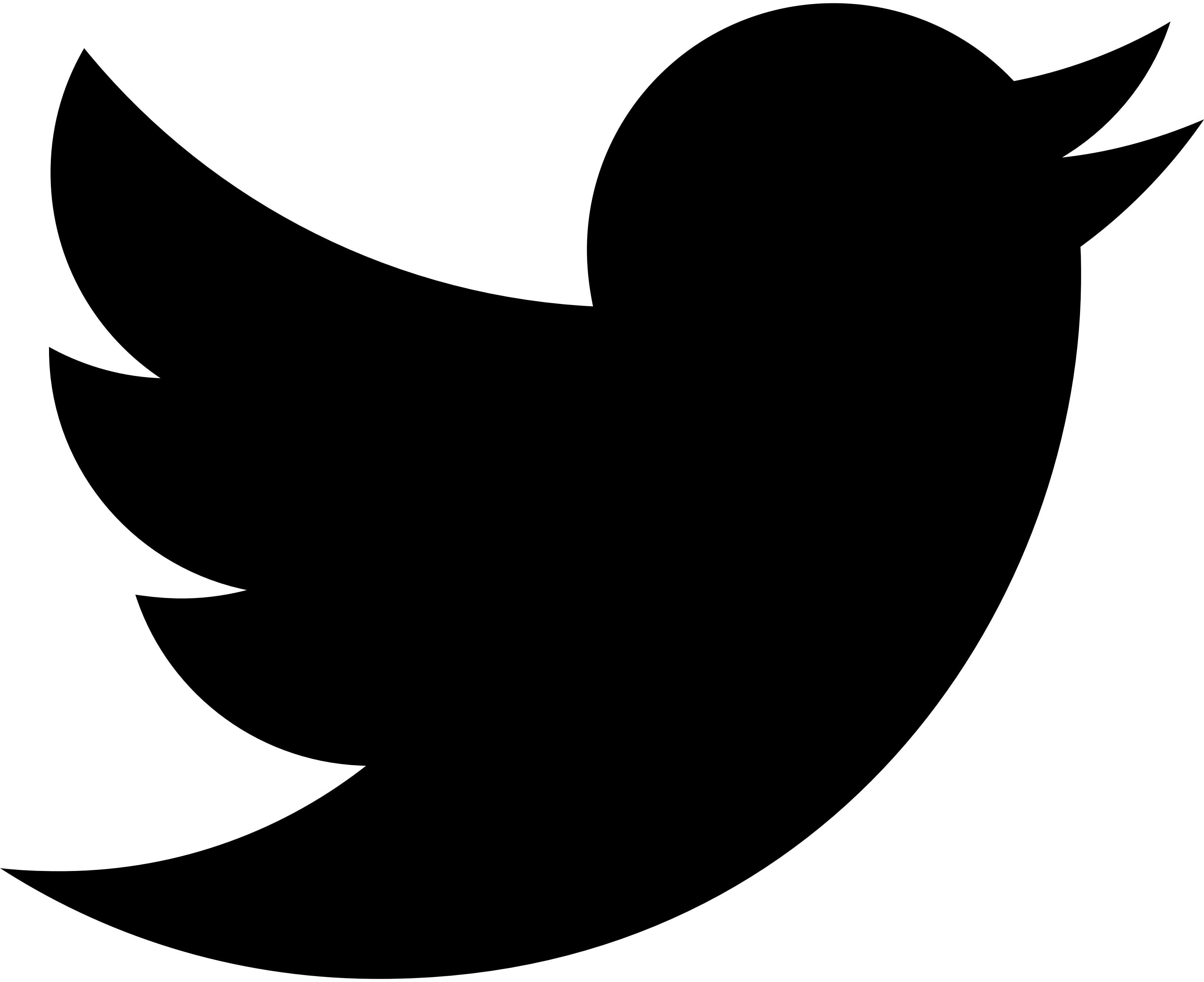
Nmap Cheat Sheet 2023: All the Commands, Flags & Switches

January 4, 2023 / By Nathan House



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The one downside to a tool as robust and powerful as Nmap is remembering so many commands. Even many seasoned industry professionals fail to make the most of Nmap simply because keeping track of all its flags can prove such a challenge.

We have compiled and organized this Nmap cheat sheet to help you master what is arguably the most useful tool in any penetration tester's arsenal. Whether you use it to memorize Nmap's options, as a quick reference to keep nearby, or as a study sheet for your CEH/Pentest+ exam, we're certain it will help you become a Nmap pro.

Download your own copy of this cheat sheet **here**. Now, let's get to the Nmap commands.

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Target Specification

SWITCH	EXAMPLE	DESCRIPTION
	nmap 192.168.1.1	Scan a single IP
	nmap 192.168.1.1 192.168.2.1	Scan specific IPs
	nmap 192.168.1.1-254	Scan a range
	nmap scanme.nmap.org	Scan a domain
	nmap 192.168.1.0/24	Scan using CIDR notation
-iL	nmap -iL targets.txt	Scan targets from a file
-iR	nmap -iR 100	Scan 100 random hosts
–exclude	nmap –exclude 192.168.1.1	Exclude listed hosts

Nmap Scan Techniques

SWITCH	EXAMPLE	DESCRIPTION
-sS	nmap 192.168.1.1 -sS	TCP SYN port scan (Default)
-sT	nmap 192.168.1.1 -sT	TCP connect port scan (Default without root privilege)
-sU	nmap 192.168.1.1 -sU	UDP port scan
-sA	nmap 192.168.1.1 -sA	TCP ACK port scan
-sW	nmap 192.168.1.1 -sW	TCP Window port scan

SWITCH	EXAMPLE	DESCRIPTION
-sM	nmap 192.168.1.1 -sM	TCP Maimon port scan

Host Discovery

SWITCH	EXAMPLE	DESCRIPTION
-sL	nmap 192.168.1.1-3 -sL	No Scan. List targets only
-sn	nmap 192.168.1.1/24 -sn	Disable port scanning. Host discovery only.
-Pn	nmap 192.168.1.1-5 -Pn	Disable host discovery. Port scan only.
-PS	nmap 192.168.1.1-5 -PS22-25,80	TCP SYN discovery on port x. Port 80 by default
-PA	nmap 192.168.1.1-5 -PA22-25,80	TCP ACK discovery on port x. Port 80 by default
-PU	nmap 192.168.1.1-5 -PU53	UDP discovery on port x. Port 40125 by default
-PR	nmap 192.168.1.1-1/24 -PR	ARP discovery on local network
-n	nmap 192.168.1.1 -n	Never do DNS resolution

Port Specification

SWITCH	EXAMPLE	DESCRIPTION
-p	nmap 192.168.1.1 -p 21	Port scan for port x
-p	nmap 192.168.1.1 -p 21-100	Port range
-p	nmap 192.168.1.1 -p U:53,T:21-25,80	Port scan multiple TCP and UDP ports
-p	nmap 192.168.1.1 -p-	Port scan all ports
-p	nmap 192.168.1.1 -p http,https	Port scan from service name
-F	nmap 192.168.1.1 -F	Fast port scan (100 ports)

SWITCH	EXAMPLE	DESCRIPTION
–top-ports	nmap 192.168.1.1 –top-ports 2000	Port scan the top x ports
-p-65535	nmap 192.168.1.1 -p-65535	Leaving off initial port in range makes the scan start at port 1
-p0-	nmap 192.168.1.1 -p0-	Leaving off end port in range makes the scan go through to port 65535

Service and Version Detection

SWITCH	EXAMPLE	DESCRIPTION
-sV	nmap 192.168.1.1 -sV	Attempts to determine the version of the service running on port
-sV –version-intensity	nmap 192.168.1.1 -sV –version-intensity 8	Intensity level 0 to 9. Higher number increases possibility of correctness
-sV –version-light	nmap 192.168.1.1 -sV –version-light	Enable light mode. Lower possibility of correctness. Faster
-sV –version-all	nmap 192.168.1.1 -sV –version-all	Enable intensity level 9. Higher possibility of correctness. Slower
-A	nmap 192.168.1.1 -A	Enables OS detection, version detection, script scanning, and traceroute

OS Detection

SWITCH	EXAMPLE	DESCRIPTION
-O	nmap 192.168.1.1 -O	Remote OS detection using TCP/IP stack fingerprinting
-O –osscan-limit	nmap 192.168.1.1 -O –osscan-limit	If at least one open and one closed TCP port are not found it will not try OS detection against host
-O –osscan-guess	nmap 192.168.1.1 -O –osscan-guess	Makes Nmap guess more aggressively

SWITCH	EXAMPLE	DESCRIPTION
-O –max-os-tries	nmap 192.168.1.1 -O –max-os-tries 1	Set the maximum number x of OS detection tries against a target
-A	nmap 192.168.1.1 -A	Enables OS detection, version detection, script scanning, and traceroute

Timing and Performance

SWITCH	EXAMPLE	DESCRIPTION
-T0	nmap 192.168.1.1 -T0	Paranoid (0) Intrusion Detection System evasion
-T1	nmap 192.168.1.1 -T1	Sneaky (1) Intrusion Detection System evasion
-T2	nmap 192.168.1.1 -T2	Polite (2) slows down the scan to use less bandwidth and use less target machine resources
-T3	nmap 192.168.1.1 -T3	Normal (3) which is default speed
-T4	nmap 192.168.1.1 -T4	Aggressive (4) speeds scans; assumes you are on a reasonably fast and reliable network
-T5	nmap 192.168.1.1 -T5	Insane (5) speeds scan; assumes you are on an extraordinarily fast network

Timing and Performance Switches

SWITCH	EXAMPLE INPUT	DESCRIPTION
–host-timeout <time>	1s; 4m; 2h	Give up on target after this long
–min-rtt-timeout/max-rtt-timeout/initial-rtt-timeout <time>	1s; 4m; 2h	Specifies probe round trip time
–min-hostgroup/max-hostgroup <size<size>	50; 1024	Parallel host scan group sizes
–min-parallelism/max-parallelism <numprobes>	10; 1	Probe parallelization
–max-retries <tries>	3	Specify the maximum number of port scan probe retransmissions
–min-rate <number>	100	Send packets no slower than <number> per second
–max-rate <number>	100	Send packets no faster than <number> per second

NSE Scripts

SWITCH	EXAMPLE	DESCRIPTION
-sC	nmap 192.168.1.1 -sC	Scan with default NSE scripts. Considered useful for discovery and safe
–script default	nmap 192.168.1.1 –script default	Scan with default NSE scripts. Considered useful for discovery and safe
–script	nmap 192.168.1.1 –script=banner	Scan with a single script. Example banner
–script	nmap 192.168.1.1 –script=http*	Scan with a wildcard. Example http
–script	nmap 192.168.1.1 –script=http,banner	Scan with two scripts. Example http and banner
–script	nmap 192.168.1.1 –script “not intrusive”	Scan default, but remove intrusive scripts
–script-args	nmap –script snmp-sysdescr –script-args snmpcommunity=admin 192.168.1.1	NSE script with arguments

Useful NSE Script Examples

COMMAND	DESCRIPTION
nmap -Pn –script=http-sitemap-generator scanme.nmap.org	http site map generator
nmap -n -Pn -p 80 –open -sV -vvv –script banner,http-title -iR 1000	Fast search for random web servers
nmap -Pn –script=dns-brute domain.com	Brute forces DNS hostnames guessing subdomains
nmap -n -Pn -vv -O -sV –script smb-enum*,smb-ls,smb-mbenum,smb-os-discovery,smb-s*,smb-vuln*,smbv2* -vv 192.168.1.1	Safe SMB scripts to run
nmap –script whois* domain.com	Whois query
nmap -p80 –script http-unsafe-output-escaping scanme.nmap.org	Detect cross site scripting vulnerabilities
nmap -p80 –script http-sql-injection scanme.nmap.org	Check for SQL injections

Firewall / IDS Evasion and Spoofing

SWITCH	EXAMPLE	DESCRIPTION
-f	nmap 192.168.1.1 -f	Requested scan (including ping scans) use tiny fragmented IP packets. Harder for packet filters
–mtu	nmap 192.168.1.1 –mtu 32	Set your own offset size
-D	nmap -D 192.168.1.101,192.168.1.102,192.168.1.103,192.168.1.23 192.168.1.1	Send scans from spoofed IPs
-D	nmap -D decoy-ip1,decoy-ip2,your-own-ip,decoy-ip3,decoy-ip4 remote-host-ip	Above example explained
-S	nmap -S www.microsoft.com www.facebook.com	Scan Facebook from Microsoft (-e eth0 -Pn may be required)
-g	nmap -g 53 192.168.1.1	Use given source port number
–proxies	nmap –proxies http://192.168.1.1:8080, http://192.168.1.2:8080 192.168.1.1	Relay connections through HTTP/SOCKS4 proxies
–data-length	nmap –data-length 200 192.168.1.1	Appends random data to sent packets

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nmap -f -t 0 -n -Pn –data-length 200 -D
192.168.1.101,192.168.1.102,192.168.1.103,192.168.1.23 192.168.1.1
```

Output

SWITCH	EXAMPLE	DESCRIPTION
-oN	nmap 192.168.1.1 -oN normal.file	Normal output to the file normal.file

SWITCH	EXAMPLE	DESCRIPTION
-oX	nmap 192.168.1.1 -oX xml.file	XML output to the file xml.file
-oG	nmap 192.168.1.1 -oG grep.file	Grepable output to the file grep.file
-oA	nmap 192.168.1.1 -oA results	Output in the three major formats at once
-oG –	nmap 192.168.1.1 -oG –	Grepable output to screen. -oN -, -oX – also usable
–append-output	nmap 192.168.1.1 -oN file.file –append-output	Append a scan to a previous scan file
-v	nmap 192.168.1.1 -v	Increase the verbosity level (use -vv or more for greater effect)
-d	nmap 192.168.1.1 -d	Increase debugging level (use -dd or more for greater effect)
–reason	nmap 192.168.1.1 –reason	Display the reason a port is in a particular state, same output as -vv
–open	nmap 192.168.1.1 –open	Only show open (or possibly open) ports
–packet-trace	nmap 192.168.1.1 -T4 –packet-trace	Show all packets sent and received
–iflist	nmap –iflist	Shows the host interfaces and routes
–resume	nmap –resume results.file	Resume a scan

Helpful Nmap Output examples

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nmap -p80 -sV -oG – –open 192.168.1.1/24 | grep open	Scan for web servers and grep to show which IPs are running web servers
nmap -iR 10 -n -oX out.xml | grep “Nmap” | cut -d ” ” -f5 > live-hosts.txt	Generate a list of the IPs of live hosts
nmap -iR 10 -n -oX out2.xml | grep “Nmap” | cut -d ” ” -f5 >> live-hosts.txt	Append IP to the list of live hosts

COMMAND	DESCRIPTION
ndiff scanl.xml scan2.xml	Compare output from nmap using the ndif
xsltproc nmap.xml -o nmap.html	Convert nmap xml files to html files
grep " open " results.nmap | sed -r ‘s/ +/ /g’ | sort | uniq -c | sort -rn | less	Reverse sorted list of how often ports turn up

Miscellaneous Nmap Flags

SWITCH	EXAMPLE	DESCRIPTION
-6	nmap -6 2607:f0d0:1002:51::4	Enable IPv6 scanning
-h	nmap -h	nmap help screen

Other Useful Nmap Commands

COMMAND	DESCRIPTION
nmap -iR 10 -PS22-25,80,113,1050,35000 -v -sn	Discovery only on ports x, no port scan
nmap 192.168.1.1-1/24 -PR -sn -vv	Arp discovery only on local network, no port scan
nmap -iR 10 -sn -traceroute	Traceroute to random targets, no port scan
nmap 192.168.1.1-50 -sL –dns-server 192.168.1.1	Query the Internal DNS for hosts, list targets only

You are only doing yourself a disservice by failing to learn and utilize all of Nmap’s features. It is the

Keep a copy of this Nmap cheat sheet to refer back to, and consider our **Complete Nmap Ethical Hacking Course**. It, and many other ethical hacking courses, are available in our VIP Member’s Section.

Frequently Asked Questions

⊖ **What is Nmap, and why is it used?**

Nmap is a free network scanning tool used to discover hosts and services on a network by analyzing responses to various packets and requests.

⊕ **What is the Nmap command used for?**

⊕ **Is Nmap scanning legal?**

⊕ **What can we hack with Nmap?**

⊕ **How do I scan an IP with Nmap?**

⊕ **Is it OK to Nmap Google?**

⊕ **Do firewalls block Nmap?**

⊕ **Is Nmap a vulnerability?**

⊕ **Can Nmap bypass a firewall?**

⊕ **Can Nmap hack WiFi?**

⊕ **Can Nmap crack passwords?**

⊕ **How do I read Nmap results?**

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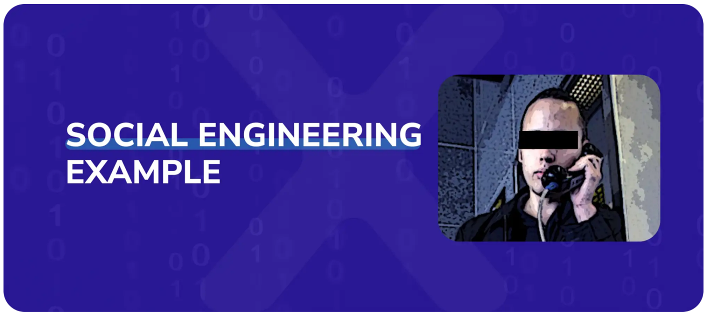

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00:00 00:00 1