

SEC504 – Hacker Tools, Techniques, and Incident Handling

Index

AADInternals	B2 – 27	common name	B2 – 20
AADSTS	B3 – 16	compliance search	B5 – 73
access logs	B1 – 72, B3 – 79	COMSPEC	B1 – 55
ACLs	B3 – 69	conditional access	B3 – 23
AppArmor	B4 – 11	containment	B1 – 29
application allow lists	B5 – 8	continuous recording	B1 – 93
AppLocker		crawl	B2 – 25
blocking mode	B5 – 8	credential stuffing	B3 – 8-9
learning mode	B5 – 8	crypt	B3 – 42
logs	B5 – 8	CSP	B4 – 60
Argon2	B3 – 45	detection	B1 – 26
ASEPs	WB – 20, B5 – 39	behavioral anomaly analysis	B5 – 7
authentication		signature based	B5 – 7
Microsoft 365	B3 – 15-6	differential analysis .	B3 – 25, WB – 25-31, B1 – 57
Microsoft conditional access	B3 – 23	discovery	B2 – 10
multifactor		DLL injection	B4 – 8
bypass	B3 – 23	DNS	
deployment	B3 – 64	automated interrogation	B2 – 14
AWS	B4 – 92	logs	B2 – 18, B3 – 79
CLI	B4 – 92	multicast	B5 – 31
enumeration	B5 – 68	split	B2 – 18
IAM policies	B5 – 69-70	zone transfer	B2 – 13
pacu exploitation framework	B5 – 70	domain controller	
security token service	B5 – 68	backup	B3 – 36
AWS API gateway	B3 – 20	hashes	B3 – 36
Azure		drive-by	B4 – 19
smart logout	B3 – 19	empty hashes	
backdoors	B3 – 90-1	format	B3 – 40
behavioral analysis	B1 – 88, 92, 93	encoding	B1 – 45
Berkeley Packet Filters	B1 – 70	endpoint security	
broadcast protocols	B5 – 35	bypass	B5 – 5
browsers	B4 – 20	enumeration	B2 – 11
hooks	B4 – 29	certificates	B2 – 15
bypass		cloud provider IP	B2 – 54
DefenderCheck	B5 – 6	DNS	B2 – 12
endpoint security	B5 – 5	SMB shares	B2 – 69-72
C2 behavior	B5 – 56	subdomains	B2 – 17
certificate authorities	B2 – 15	eradication	B1 – 30
certificates		EternalBlue	B2 – 76
authority	B2 – 15	evasion	B5 – 5
CN field	B2 – 20	behavioral anomaly analysis	B5 – 7
transparency	B2 – 15-6	signature-detection	B5 – 6-7
untrusted	B2 – 15	event logs	B5 – 49, B1 – 55
CIM	B1 – 42	event of interest	B1 – 83
client-side attacks	B4 – 18	event subscription	B5 – 43
cloud storage		exfiltration	B5 – 72-3
AWS S3	B3 – 71	exploit protection	B4 – 11
Azure blobs	B3 – 73	FIDO2	B3 – 64
endpoint URLs	B3 – 70	FIFO files	B3 – 93-4
GCP buckets	B3 – 72	flags	
ACLs	B3 – 69	HTTPOnly	B4 – 60
permissions	B3 – 74	Secure	B4 – 60
CN field	B2 – 20	gold image	B1 – 57
command injection	B4 – 39	golden ticket attack	B5 – 45
blind	B4 – 39	GPO	B3 – 62
separators	B4 – 46	GPU	B3 – 44
stacking	B4 – 43	group policy	B3 – 62

SEC504 – Hacker Tools, Techniques, and Incident Handling

hashcat	
attack modes	
combinator	B3 – 54
hybrid	B3 – 57-8
mask	B3 – 55-6
straight	B3 – 53
potfile	B3 – 59
rules	B3 – 60
hashes	B3 – 46
domain controller	B3 – 33
empty	B3 – 40
indicators	B3 – 42
LANMAN	B3 – 32
Linux format	B3 – 42
MD4,5	B3 – 42-44
NT	B3 – 33
PBKDF2	B3 – 44
SHA256,512	B3 – 42-44
Windows format	B3 – 40
hashing rounds	B3 – 43-4
algorithms	B3 – 42, 45
Hayabusa	B2 – 86
high-low strategy	B5 – 6
hijacking attacks	B5 – 31
HKCU	WB – 20
HKLM	WB – 20
hooks	B4 – 29
host attribution	B2 – 54
http192-254-169-254	B4 – 91
IANA	B2 – 40
IMDS	B4 – 91
credential disclosure	B4 – 94
headers	B4 – 94
v2	B4 – 97
input filtering	B4 – 59, 78
json	
cloud	B2 – 50
kerberos	B3 – 62
golden ticket attack	B5 – 45
krbtgt	B5 – 45
root of trust	B5 – 45
LANMAN hashes	B3 – 32
living off the land	
linux	B5 – 14
windows	B5 – 11-3
LLMNR	B5 – 31
login	
bypass	B3 – 23, 90
logs	
access	B1 – 72, B3 – 79
AppLocker	B5 – 8
cloud	B5 – 79
DNS	B2 – 18, B3 – 79
event	B5 – 49, B1 – 55
overflow	B5 – 79
zeek	B5 – 56
LSASS	B1 – 42-3
macros	B4 – 22
malware	
obfuscation	B5 – 7
malware analysis	
behavioral	B1 – 88, 92-3
online	B1 – 89
static	B1 – 88, 98
man-in-the-middle	B5 – 31
managed object format	B5 – 43
Masscan	B2 – 54
mDNS	B5 – 31
metasploit	
auxiliary	B4 – 5
exploits	B4 – 6
meterpreter	B4 – 8-10
payloads	B4 – 8
post-exploitation	B4 – 5
Microsoft 365	
authentication	B3 – 15-6
compliance search	B5 – 73
lockout bypass	B3 – 20-24
smart lockout	B3 – 19
unified audit logging	B3 – 25
Microsoft conditional access	B3 – 23
mitm	B5 – 31
MITRE ATT&CK	B2 – 6-8
mof	B5 – 43
multifactor	B3 – 64
bypass	B3 – 23
named pipes	B3 – 93-4
netcat	
backdoors	B3 – 90-1
client	B3 – 86
data transfer	B3 – 88
listen	B3 – 87
port scanner	B3 – 89
relays	B3 – 93-4
NMAP	B2 – 14, 35-47
default behavior	B2 – 37
port scan	B2 – 39
scripts	B2 – 44-5
NoLMHash	B3 – 61
NSE scripts	B2 – 44-5
NT hashes	B3 – 33
NTDS.dit	B3 – 36
obfuscation	B5 – 7
Object Relational Mapping	B4 – 75
ORM	B4 – 75
OSINT	B2 – 23
framework	B2 – 31
output encoding	B4 – 59
pacu exploitation framework	B5 – 70
PAM	B3 – 62
password	
cracking	B3 – 49
guessing	B3 – 4
hashes	B3 – 46
length	B3 – 62
mutation	B3 – 49

SEC504 – Hacker Tools, Techniques, and Incident Handling

reset	B2 – 79	SQL	B4 – 66
salts	B3 – 33-5	error-based	B4 – 69-70
spraying	B3 – 5	ORM	B4 – 75
wordlist generation	B3 – 7	SQLMap	B4 – 71-5
PBKDF2	B3 – 45	statements formatting	B4 – 66
persistence	B5 – 39	unions	B4 – 69-70
pivoting		ssh	
meterpreter	B5 – 21-3	tunneling	B5 – 24
port forwarding		SSRF	
meterpreter	B5 – 21-3	cloud	B4 – 90
netsh	B5 – 25	exploits	B4 – 84-9
ssh	B5 – 24	IMDS	B4 – 90
ports		static analysis	B1 – 88
common	B2 – 40	SYSTEM hive	B3 – 36
SMB	B2 – 81	tautology	B4 – 67
post-incident	B1 – 33	threat hunting	B4 – 13
prefetch	B1 – 95	RITA	B4 – 13
preparation	B1 – 25	ticket granting ticket	B5 – 45
proc virtual file system	B4 – 96	typo-squatting	B4 – 18
proxies		unified audit logging	B3 – 25
API gateways	B3 – 20	VLAN	B2 – 81, B3 – 95
meterpreter	B5 – 21	WAF	B4 – 45
netsh	B5 – 25	watering-hole	B4 – 21
relay	B3 – 93	web	
web	B1 – 71	application firewall	B4 – 45, B2 – 61
RADIUS	B3 – 62	browsers	B4 – 20
recovery	B1 – 31	crawl	B2 – 25
reflection	B5 – 12-3	proxies	B1 – 71
registry keys	WB – 20	shells	B5 – 47
SYSTEM hive	B3 – 36	Windows	
relays	B3 – 93-4	Defender	B4 – 11
remediation	B1 – 32	Event Log	B1 – 55
RITA	B5 – 56	Exploit Protection	B4 – 11
root of trust	B5 – 45	Windows services	B5 – 42
salts	B3 – 33-5	WMI	B1 – 42
SAM	B3 – 33	event subscription	B5 – 43
scheduled tasks	B5 – 43	wordlist generation	
scoping	B1 – 28	bucket names	B3 – 78
security token service	B5 – 68	passwords	B3 – 7
SELinux	B4 – 11	wrapping	B5 – 7
services	B5 – 42	XSS	
setuid	B5 – 14	CSP	B4 – 60
shells		definition	B4 – 50
bind	B4 – 8	HTTPOnly	B4 – 60
reverse	B4 – 8	input filtering	B4 – 59
Sigma rules	B2 – 86	output encoding	B4 – 59
signature detection	B5 – 6	polyglot	B4 – 58
situation report	B5 – 68	reflected	B4 – 53-5
SMB		Secure	B4 – 60
password attacks	B2 – 77	stored	B4 – 52
shares	B2 – 69-73	YARA	B2 – 86
versions	B2 – 68	Yescrypt	B3 – 45
SMBGhost	B2 – 76	zeek	B5 – 56
SMBleed	B2 – 76	zone transfer	B2 – 13
snapshot	B1 – 93		
SNI	B3 – 79		
Snort	B2 – 86		
split DNS	B2 – 18		

SEC504 – Hacker Tools, Techniques, and Incident Handling

Commands

Linux

awk	L1 – 51
dig	B2 – 12-4
exiftool	B2 – 26
gsutil	B3 – 75
hashdump	B3 – 38
mkfifo	B3 – 94
msfconsole	B4 – 28
msfvenom	B4 – 27
nc	B3 – 88
nmap	B2 – 38-46
nohup	B3 – 91
openssl	B2 – 56
rpcclient	B2 – 75
secretsdump.py	B3 – 37
sha256sum	B1 – 91
shred	B3 – 59
smbclient	B2 – 74
strings	B1 – 91
tcpdump	L1 – 55, B1 – 68-9

Windows

Close-SmbSession	B2 – 79
Disable-WindowsOptionalFeature	B2 – 68
Export-ScheduledTask	B1 – 54
Format-List	B1 – 50
Get-ChildItem	B1 – 51
Get-CimInstance	B1 – 40, B2 – 69
Get-FileHash	B1 – 91
Get-ItemProperty	B1 – 51
Get-LocalGroupMember	B1 – 53
Get-LocalGroup	B1 – 53
Get-LocalUser	B1 – 53
Get-MsolUser	B2 – 80
Get-NetTCPConnection	B1 – 46
Get-Process	WB – 14-6, B1 – 40
Get-ScheduledTaskInfo	B1 – 54
Get-ScheduledTask	B1 – 54
Get-Service	B1 – 50
Get-SmbSession	B2 – 79
Get-WinEvent	B1 – 55
Import-Module	B2 – 27
InstallUtil	B5 – 12-3
Invoke-AADIntReconAsOutsider	B2 – 27
Invoke-AADIntUserEnumerationAsOutsider	B2 – 27
Invoke-LocalPasswordSpray	B2 – 77
New-SmbMapping	B2 – 77
Remove-ItemProperty	WB – 23, 24
Select-Object	WB – 15-7, B1 – 40
Stop-Process	B1 – 40
Where-Object	WB – 15-7, B1 – 53
mofcomp	B5 – 43
net.exe	B5 – 41, B2 – 69, 80
netsh	B5 – 25
nslookup	B2 – 12
ntdsutil.exe	B3 – 36-9

Tools

AADInternals	B2 – 27
AppArmor	B4 – 11
AppLocker	B5 – 8
AWS CloudMapper	B5 – 76
AWS Cloudwatch	B4 – 97
AWS-CLI	B5 – 48, 68, B4 – 92
AzViz	B5 – 76
Basic Blob Finder	B3 – 73
BeEF	B4 – 29
Blue Coat	B1 – 71
Bucket Finder	B3 – 71
BuiltWith	B2 – 51
Burp Suite	B2 – 24
cert.sh	B2 – 16
CeWL	B2 – 25
Copernic Desktop Search	B2 – 71
CyberChef	B1 – 45
DefenderCheck	B5 – 6
Dehashed	B2 – 29
DomainPasswordSpray	B2 – 78
Elastic Filebeat	B3 – 80
exiftool	B2 – 26
EyeWitness	B2 – 59, 60
findbeacons.py	L1 – 52
FireProx	B3 – 22
Forefront TMG	B1 – 71
gcloud cli	B5 – 72
GCPBucketBrute	B3 – 72
Ghidra	B1 – 98
Google Network Topology Tool	B5 – 76
gsutil	B3 – 72, B5 – 72, 75
Hashcat	B3 – 49-60
haveibeenpwned	B2 – 28
Hayabusa	B2 – 86
HTML Purifier	B4 – 59
Hybrid Analysis	B1 – 89
Hydra	B3 – 6
IDA Pro	B1 – 98
Impacket	
secretsdump.py	B3 – 37
IronPython	B5 – 6
Java Encoder Project	B4 – 59
Joi	B4 – 59
jslinksummary	B2 – 24
JSON Query	B3 – 16, B2 – 50
LocalPasswordSpray.ps1	B2 – 77
LOLBAS	B5 – 11
Masscan	B2 – 54
Metasploit and Armitage	B4 – 6
Meterpreter	
Hashdump	B3 – 38
persistence	B5 – 41-4
pivoting	B5 – 21-3
MFASweep	B3 – 23
Mimikatz	B5 – 9-10, B3 – 38
ModSecurity	B4 – 79
msfvenom	B4 – 27-31
MSOLSpray	B3 – 18

SEC504 – Hacker Tools, Techniques, and Incident Handling

Netcat	B3 – 85-98
NetSShareEnum	B2 – 70
NMAP	B2 – 14, 35-47
openssl	B2 – 56
OSINT Framework	B2 – 31
Pacu	B5 – 69
Powershell	B1 – 39
cheatsheet	B1 – 59, 60
Regshot	B1 – 94-5
Responder	B5 – 33-4
RITA	B4 – 13, B5 – 56-63
Samba smb/rpcclient	B2 – 74-5
ScoutSuite	B5 – 77
SELinux	B4 – 11
Shodan	B2 – 30
SMBegle	B2 – 71
Snort	B2 – 86
SQLMap	B4 – 71-4
Squid	B1 – 71
Subfinder	B2 – 17
Sysinternals	B1 – 61
Autoruns	B5 – 49, B1 – 61
Procdump	B5 – 9, B1 – 61
Process Explorer	B1 – 61
Process Monitor	B1 – 61, 96-7
Sysmon	B1 – 61
TCPView	B1 – 61
Timeline Explorer	B2 – 98
TLS-Scan	B2 – 57-8
VirusTotal	B1 – 89
Volatility	L1 – 63, B1 – 77-82
Windows Defender	B4 – 11
WinPmem	B1 – 77-82
YARA	B2 – 86

SEC504 – Hacker Tools, Techniques, and Incident Handling

DFIR

AI for IR	
summary of	B1 – 103, 120
Incident Response	
DAIR Dynamic Approach	B1 – 25-34
PICERL Six-Step Process	B1 – 21-2
summary of	B1 – 35-6
Live Examination	
of accounts	B1 – 53
of encoded data	B1 – 45
of logs	B1 – 55
of network activity	B1 – 46-9
of processes	B1 – 40-5
of registry keys	B1 – 51-2
of scheduled tasks	B1 – 54
of services	B1 – 50
summary of	B1 – 62
Malware Investigations	
monitoring the environment	B1 – 92
summary of	B1 – 99
Memory Investigations	
summary of	B1 – 99
Network Investigations	
summary of	B1 – 73
Sigma Rules	B2 – 88-98
Threat Hunting	
C2 characteristics	B5 – 57-61
summary	B5 – 62-4

Defense Evasion

allow lists	B5 – 8-14
defenses	B5 – 15
evading signature-detection	B5 – 6
living off the land	B5 – 8-14
obfuscation and wrapping	B5 – 7
password attacks	B3 – 20-24
summary	B5 – 15

Initial Access

Cloud	
challenges and opportunities	B2 – 49
cloud IP enumeration	B2 – 52-55
defenses	B2 – 52-55
host attribution	B2 – 52-55
IAM	B5 – 48
IMDS	B4 – 90
IMDSv2	B4 – 97
persistence	B5 – 48
SSRF	B4 – 90-9
storage bucket exploit	B3 – 75-7
storage buckets	B3 – 68-82
summary of	B2 – 63-4
Command Injection	
defense	B4 – 45
summary	B4 – 46-7
Discovery and Enumeration	
certificates	B2 – 15-6
defense against	B2 – 18
DNS	B2 – 12-4
subdomains	B2 – 17

summary	B2 – 19
Drive-By Attacks	
defense	B4 – 32-3
summary	B4 – 34
Metasploit	
defenses	B4 – 11
payloads	B4 – 8
summary	B4 – 14-5
Netcat	
defenses	B3 – 95
purposes	B3 – 85-98
summary	B3 – 97
NMAP Scanning	
defaults	B2 – 37
summary of	B2 – 46
types	B2 – 41
Password Attacks	
APIs	B3 – 16
bypasses	B3 – 20-24
cloud	B3 – 15
cracking	B3 – 49-65
defenses	B3 – 61-4
domain controller	B3 – 36-8
hashes	B3 – 31-47
hashing algorithms	B3 – 44-5
hashing rounds	B3 – 42-3
local windows	B3 – 36-8
Microsoft 365 summary	B3 – 27
salting	B3 – 33-5
spraying,stuffing	B3 – 4-11
SMB	
challenges	B2 – 67
defenses	B5 – 35-6, B2 – 79-81
enumeration	B2 – 69-73
password attacks	B2 – 77
security features	B2 – 67
summary of	B2 – 83
SQL Injection	
cloud	B4 – 75
defense	B4 – 78
summary	B4 – 80-1
SSRF	
cloud	B4 – 90-9
defense	B4 – 97
summary	B4 – 98-9
Web Recon	
defenses	B2 – 32
summary of	B2 – 33
XSS	
defense	B4 – 59-60
impact	B4 – 56
summary	B4 – 61-2

Post-Exploitation

Cloud	
exfiltration	B5 – 72-3
exfiltration defenses	B5 – 75-80
logging	B5 – 79
Pacu	B5 – 70

SEC504 – Hacker Tools, Techniques, and Incident Handling

persistence defenses	B5 – 49
summary	B5 – 81
Persistence	
defenses	B5 – 49
summary	B5 – 51-3
with accounts	B5 – 41
with cloud resources	B5 – 48
with kerberos	B5 – 45-6
with scheduled tasks	B5 – 43
with services	B5 – 42
with web shells	B5 – 47
Pivoting	
lol	B5 – 24-6
metasploit	B5 – 20-3
summary	B5 – 27
Responder	
defenses	B5 – 35
hijacking attacks	B5 – 31-34
summary	B5 – 36

SEC504 – Hacker Tools, Techniques, and Incident Handling

Labs

Live Investigation

- 1.1 Windows HostL1 – 13
- 1.2 NetworksL1 – 45
- 1.3 MemoryL1 – 45
- 1.4 MalwareL1 – 45

Recon, Scanning, Enumeration

- 2.1 DNSL1 – 116
- 2.2 NMAPL1 – 139
- 2.3 CloudL1 – 162
- 2.4 SMBL1 – 180
- 3.4 Cloud Bucket DiscoveryL1 – 317

Threat Analysis

- 2.5 HayabusaL1 – 204

Password Attacks

- 3.1 MetasploitL1 – 241
- 3.2 Microsoft 365L1 – 261

- 3.3 HashcatL1 – 290

Remote Attacks

- 4.1 MetasploitL2 – 1
- 4.2 BeEFL2 – 31
- 4.3 Command InjectionL2 – 44
- 4.4 XSSL2 – 57
- 4.5 SQL InjectionL2 – 77
- 4.6 Cloud SSRF and IMDSL2 – 98

Post-Exploitation

- 3.4 NetcatL1 – 350
- 5.1 Allow List BypassL2 – 124
- 5.2 PivotingL2 – 148
- 5.3 ResponderL2 – 170
- 5.4 MetasploitL2 – 180
- 5.6 Cloud ConfigurationsL2 – 227

Threat Analysis

- 5.5 RITAL2 – 209