Topics	sqlmap + ZAP
Introduction and Information Catherine	Summary
Introduction and Information Gathering Wy the Web?1-7-10	NGG GGDD LVVD
DApplication Assessment Methodologies . 1–11-30	XSS, SSRF, and XXE
Web Application Pen Tester's Toolkit 1–31-37	Document Object Model (DOM)4-7-16
Interception Proxies1–37-55	Cross-Site Scripting (XSS) Primer4–17-31
BONUS EXERCISE: Testing and Exploiting	EXERCISE: HTML Injection 4–32-33
	XSS Impacts 4–34-42
Heartbleed	BeEF4–43-49
EXERCISE: Configuring Interception Proxies1–	EXERCISE: BeEF4-50-51
56-57	Classes of XSS 4–50-73
EXERCISE: Gathering Server Information 1–156-	EXERCISE: DOM-Based XSS 4–74-75
157	Discovering XSS
EXERCISE: Testing HTTPS 1–138-139	XSS Tools
HTTP Syntax and Semantics1–90-124	EXERCISE: XSS
HTTPS and Testing for Weak Ciphers . 1–125-137	AJAX4–101-115
Summary	Data Attacks
Target Profiling	REST and SOAP4–122-130
Open-Source Intelligence (OSINT) 1–58-71	Server-Side Request Forgery (SSRF)4–131-138
Virtual Host Discovery	EXERCISE: Server-Side Request Forgery4–139-
EXERCISE: Virtual Host Discovery1–88-89	140
	XML External Entities (XXE)4–141-150
Content Discovery, Authentication, and Session	EXERCISE: XXE 4–151-152
Testing	Summary4–153
Insufficient Loggin and Monitoring 2–7-11	
Spidering Web Applications2–12-23	CSRF, Logic Flaws, and Advanced Tools
EXERCISE: Web Spidering2–24-25	Cross-Site Request Forgery5-7-14
Forced Browsing	EXERCISE: CSRF5-15-16
EXERCISE: ZAP and fuff Forced Browse 2–33-34	Logic Flaws
Fuzzing	Python for Web App Pen Testers 5–22-38
Information Leakage	EXERCISE: Python
Authentication	WPScan and ExploitDB5-41-43
EXERCISE: Authentication2-77-78	EXERCISE: WPScan and ExploitDB 5–44-45
Username Harvesting	Burp Scanner 5–46-63
Burp Intruder	Metasploit
EXERCISE: Fuzzing with Burp Intruder .2–97-98	EXERCISE: Metasploit5-79-80
Session Management	Nuclei 5–81-87
EXERCISE: Burp Sequencer2–115-116	EXERCISE: Nuclei/Jenkins5-88-89
Authentication and Authorization Bypass . 2–117-	When Tools Fail
125	EXERCISE: When Tools Fail
Vulnerable Web Apps: Mutillidaw 2–126-130	Business of Penetration Testing: Preparation5-
EXERCISE: Authentication Bypass2–131-132	99-112
Summary	Business of Penetration Testing: Post Assessment
Appendix: Shellshock2–135-144	5-113-123
Exploiting Shellshock2–145	Summary
T	BONUS EXERCISE: Bonus Challenges 5–126
Injection	
HTTP Response Security Controls 3–7-18	Workbook
Command Injection	Exercise 1.1 - Configuring Interception Proxies
EXERCISE: Command Injection3–33-34	W-2-22
File Inclusion and Directory Traversal3–35-40	Exercise 1.2 - Virtual Host Discovery W-23-37
EXERCISE: Local/Remote File Inclusion 3–41-42	Exercise 1.3 - Testing HTTPSW-38-43
Insecure Description	Exercise 1.4 - Gathering Server Information W-
EXERCISE: Insecure Descrialization 3-62-63	44-54
SQL Injection Primer	Exercise 1.Bonus - Testing and Exploiting Heart-
Discovering SQL	bleed
Exploiting SQLi	Exercise 2.1 - Web Spidering
EXERCISE: Error-Based SQLi 3–126-127	Exercise 2.2 - ZAP and fuff Forced Browse W-78-

Exercise 2.3 - Authentication W-88-101 diff	
Exercise 2.5 - Fuzzing with Burp Intruder W-117- compare sitemaps	
126 dig	
	ype ANY
Exercise 2.Bonus - Exploiting Shellshock . W-167- DNSRecon	, 02 00
1 0	
Exercise 2.Donus-2 - Shake Chanenge . W-177-188 Zone transfer Exercise 3.1 - Command Injection W-189-206 fuff	vv-28
· ·	W 202 204
,	tories
	W-85-86
Exercise 3.3 - Insecure Deserialization .W-215-229 grep	III 40
	output
Exercise 4.1 - HTML InjectionW-251-260 id	777 400
	n
Exercise 4.3 - DOM-Based XSS W-276-284 ifconfig	TTT 100
· · · · · · · · · · · · · · · · · · ·	
Exercise 4.5 - Servre-Side Request Forgery W- iptables	
-	
	ecryptor
•	
	tails
Exercise 5.5 - Nuclei and Jenkins W-377-393 nc	
Exercise 5.6 - When Tools FailW-394-405 backdoor listener	
Exercise 5.Bonus - Python	st
Exercise 5.Bonus - Python	
Exercise 5.Bonus - Python	st
Exercise 5.Bonus - Python W-406-409 Exercise 5.Bonus2 - Exploiting Ruby on Rails W- 410-422 ## Tools base32 W-204 BeEF W-261 DOM-Based XSS W-283-284 Burp Suite auth bypass W-142-165 BApp - Retire.js W-51-53 blind injection W-201 Collaborator W-200-205 fuzzing W-18-126 insecure deserialization W-219-228 LFI/RFI W-207-212 request params W-177-182 request params W-177-182 reguest params W-101-18-126 run scan with cool php cmd shell craft HTTP request shell craft HTTP request shell shell	st
Exercise 5.Bonus - Python W-406-409 Exercise 5.Bonus2 - Exploiting Ruby on Rails W- 410-422 ## Tools base32	st
Exercise 5.Bonus - Python W-406-409 Exercise 5.Bonus2 - Exploiting Ruby on Rails W- 410-422 ## Tools base32	st
Exercise 5.Bonus - Python	st
Exercise 5.Bonus - Python W-406-409 Exercise 5.Bonus2 - Exploiting Ruby on Rails W- 410-422	st

 $ssrf \ldots \ldots W-305\text{--}309$

1 : 4 11 W 04F 47	DEC 1 191
count records in table	DES1–131
dump db users and password hashes W-249	TDES/3DES1–131
dump dbs	American Fuzzy Lop1–9
dump table contents	Application Frameworks1–151
identify vulnerable param	Application Information Gathering
level	Spidering
read file	Application Infrastructure1–150
search col names $\dots W-250$	Application Security1–10
$ssrf \ldots W-310-314$	Assessing1–12-13
user-agent $\dots W-228$	Dynamic Application Security Testing (DAST)
ssllabs.com	1-13, 1-17-18
strings	Improving1–12
tcpdump	Interactive Application Security Testing (IAST)
blind injection	1–13
${ m tr}$	Out-of-Band Application Security Testing
-d	(OAST)1–13
user_enum W-104-105	Static Application Security Testing (SAST) .1–13,
wc	1–16
wget	Testing
spidering	Full Knowledge1–13
wpscan	Zero-Knowledge
ysoserial	Arachni Scanner
insecure deserialization	ARPANET
ZAP	Assessments
basic auth	Automated
CSRF	Frameworks
digest auth	OWASP Web Security Testing Guide 1–22
forced browse	Penetration Testing Execution Standard
form-based auth	(PTES)
method interchange W-98-100	Full-Knowledge
spidering	Manual1–20
SQLi error W-242	Methodology1–22
user enum	Testing Techniques1–22
	Zero-Knowledge1–13, 1–21
٨	Assymetric 1–131
${f A}$	Attack Platform
. 1 11	Attack platform1–32
access control problems1–15	Attack strings2–36
Acunetix Vulnerability Scanner1–35	Auditing 1–54
Administrative Pages1–152	Authentication
AJAX4–102-103	Basic2-52-53
Penetration Testing4–112	Illustrated
proxy4–109	Issues2-55
Spidering	Bearer 2–72
$XMLHttpRequest \rightarrow XMLHttpRequest \dots 4-104$	Bypass2–119
Algorithms1–131	Parameter Tampering and Direct Page Access
Assymetric1–131	2-120
DH1–131	SQLi2–121
DSA1–131	Digest
ECDH1–131	Illustrated2-57
ECDSA1–131	Issues2–58
RSA1–131	Form-based2-63-64
Hashing	Illustrated
MD51–131	Issues2–66
SHA1–131	Integrated Windows2–59
SHA2561–131	Illustrated
SHA3841–131	Issues2-61
Symmetric	OAuth2-68-71
AES1–131	

0 11/0 11/01155 1 11 11 11 11 11 11	DI 0 0 0
Openid/Oauth/SAML Authentication2-67	Discover Content2–28
Schemes2–50	Engagement Tools1-55
Authentication (ATHN)1–28	Cenerage CSRF PoC1-55
Authorization	Content Discovery1-55
Attacks2–123	Find Commment / Find Scripts1–55
Bypass2–122	Search1-55
Role Enforcement	Simulate Manual Testing1–55
Authorization (ATHZ)1–28	Target Analyzer
Automated Scanning1–20	Extender
Tratomatou Souming	Grep Payloads
	Heads-Up Dispaly1–43
В	Intruder
Ъ	
backdoors	Battering Ram2–94
BApp Store	Cluster Bomb2–96
Bash shell	Pitchfork2–95
	Reflection Tests4–92-95
Basic Authentication	Sniper
Illustrated	Issues
Issues2–55	Retesting and Remediation Verification 5–62-63
bcrypt2–87	Vulnerability Verification 5–61
Bearer Authentication	Proxy1–47
BeEF4–44-46	Repeater
Issuinng Commands4–48	Inspector
Metasploit5–70-71	Sequencer
Payloads	Spidering
Best1–20	Target
Bing1–65	Scope1–44
Broswers	Site Map
Bypassing Filters	-
Browser	Site Map - Filter
	business functionality testing1–10
Browsers 1_36	D ' I ' (DIICI) 1 00
Browsers	Business Logic (BUSL)
Authentication Schemes	Business Logic (BUSL)1–28
Authentication Schemes Required	Business Logic (BUSL)1–28
$\begin{array}{ccc} \text{Authentication Schemes} & & 2-51 \\ \text{Required} & & & 2-11 \\ \text{Developer Tools} & & & 4-11 \\ \end{array}$	Business Logic (BUSL)1–28 $f C$
$\begin{array}{ccc} \text{Authentication Schemes} & & 2-51 \\ \text{Required} & & 2-51 \\ \text{Developer Tools} & & 4-11 \\ \text{Bugtraq} & & 1-10 \\ \end{array}$	\mathbf{C}
$\begin{array}{ccc} \text{Authentication Schemes} & & 2-51 \\ \text{Required} & & 2-51 \\ \text{Developer Tools} & & 4-11 \\ \text{Bugtraq} & & 1-10 \\ \text{BuprSuite Pro Active/Live Scan} & & 1-35 \\ \end{array}$	C Cache-Control
$\begin{array}{ccc} \text{Authentication Schemes} & & & 2-51 \\ \text{Required} & & & 2-51 \\ \text{Developer Tools} & & & 4-11 \\ \text{Bugtraq} & & & 1-10 \\ \text{BuprSuite Pro Active/Live Scan} & & 1-35 \\ \text{Burp Suite} & & & & 1 \end{array}$	C Cache-Control
$\begin{array}{ccc} \text{Authentication Schemes} & & & \\ \text{Required} & & & 2-51 \\ \text{Developer Tools} & & & 4-11 \\ \text{Bugtraq} & & & 1-10 \\ \text{BuprSuite Pro Active/Live Scan} & & 1-35 \\ \text{Burp Suite} & & & \\ \text{Infiltrator} & & & 1-13 \\ \end{array}$	C Cache-Control 1–124 CERN 1–91 Certificate Authorities 1–87, 1–132
$\begin{array}{cccc} \text{Authentication Schemes} & & & & \\ & \text{Required} & & & 2-51 \\ & \text{Developer Tools} & & & 4-11 \\ & \text{Bugtraq} & & & 1-10 \\ & \text{BuprSuite Pro Active/Live Scan} & & 1-35 \\ & \text{Burp Suite} & & & & \\ & \text{Infiltrator} & & & 1-13 \\ & \text{Request Parameters} & & & 1-111 \\ \end{array}$	C Cache-Control 1–124 CERN 1–91 Certificate Authorities 1–87, 1–132 Certificate Transparency 1–87
Authentication Schemes Required 2-51 Developer Tools 4-11 Bugtraq 1-10 BuprSuite Pro Active/Live Scan 1-35 Burp Suite Infiltrator 1-13 Request Parameters 1-111 Burp Suite Professional 1-38, 1-42	C Cache-Control 1–124 CERN 1–91 Certificate Authorities 1–87, 1–132 Certificate Transparency 1–87 CEWL
Authentication Schemes Required 2-51 Developer Tools 4-11 Bugtraq 1-10 BuprSuite Pro Active/Live Scan 1-35 Burp Suite Infiltrator 1-13 Request Parameters 1-111 Burp Suite Professional 1-38, 1-42 AJAX 2-21	C Cache-Control 1–124 CERN 1–91 Certificate Authorities 1–87, 1–132 Certificate Transparency 1–87 CEWL Spidering 2–22
Authentication Schemes Required 2-51 Developer Tools 4-11 Bugtraq 1-10 BuprSuite Pro Active/Live Scan 1-35 Burp Suite Infiltrator 1-13 Request Parameters 1-111 Burp Suite Professional 1-38, 1-42 AJAX 2-21 Authenticating 2-62	C Cache-Control 1–124 CERN 1–91 Certificate Authorities 1–87, 1–132 Certificate Transparency 1–87 CEWL Spidering 2–22 CGI Scripts 2–139
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	C Cache-Control 1–124 CERN 1–91 Certificate Authorities 1–87, 1–132 Certificate Transparency 1–87 CEWL Spidering 2–22 CGI Scripts 2–139 CHAOSNET 1–81
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	C Cache-Control 1–124 CERN 1–91 Certificate Authorities 1–87, 1–132 Certificate Transparency 1–87 CEWL Spidering 2–22 CGI Scripts 2–139 CHAOSNET 1–81 Checklist 1–29
Authentication Schemes Required 2-51 Developer Tools 4-11 Bugtraq 1-10 BuprSuite Pro Active/Live Scan 1-35 Burp Suite 1-13 Request Parameters 1-111 Burp Suite Professional 1-38, 1-42 AJAX 2-21 Authenticating 2-62 Automated Scanning 5-47-48 Add to Task 5-57 Automatic 5-60	C Cache-Control 1-124 CERN 1-91 Certificate Authorities 1-87, 1-132 Certificate Transparency 1-87 CEWL Spidering 2-22 CGI Scripts 2-139 CHAOSNET 1-81 Checklist 1-29 Cipher Suites 1-130
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	C Cache-Control 1-124 CERN 1-91 Certificate Authorities 1-87, 1-132 Certificate Transparency 1-87 CEWL Spidering 2-22 CGI Scripts 2-139 CHAOSNET 1-81 Checklist 1-29 Cipher Suites 1-130 Cipher suites
Authentication Schemes Required 2-51 Developer Tools 4-11 Bugtraq 1-10 BuprSuite Pro Active/Live Scan 1-35 Burp Suite 1-13 Request Parameters 1-111 Burp Suite Professional 1-38, 1-42 AJAX 2-21 Authenticating 2-62 Automated Scanning 5-47-48 Add to Task 5-57 Automatic 5-60	C Cache-Control 1–124 CERN 1–91 Certificate Authorities 1–87, 1–132 Certificate Transparency 1–87 CEWL Spidering 2–22 CGI Scripts 2–139 CHAOSNET 1–81 Checklist 1–29 Cipher Suites 1–130 Cipher suites 1–134
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	C Cache-Control 1–124 CERN 1–91 Certificate Authorities 1–87, 1–132 Certificate Transparency 1–87 CEWL Spidering 2–22 CGI Scripts 2–139 CHAOSNET 1–81 Checklist 1–29 Cipher Suites 1–130 Cipher suites
Authentication Schemes Required 2-51 Developer Tools 4-11 Bugtraq 1-10 BuprSuite Pro Active/Live Scan 1-35 Burp Suite Infiltrator 1-13 Request Parameters 1-111 Burp Suite Professional 1-38, 1-42 AJAX 2-21 Authenticating 2-62 Automated Scanning 5-47-48 Add to Task 5-57 Automatic 5-60 Configuration 5-53-56 Instantiating Scans 5-52	C Cache-Control 1–124 CERN 1–91 Certificate Authorities 1–87, 1–132 Certificate Transparency 1–87 CEWL Spidering 2–22 CGI Scripts 2–139 CHAOSNET 1–81 Checklist 1–29 Cipher Suites 1–130 Cipher suites 1–134
Authentication Schemes Required 2-51 Developer Tools 4-11 Bugtraq 1-10 BuprSuite Pro Active/Live Scan 1-35 Burp Suite Infiltrator 1-13 Request Parameters 1-111 Burp Suite Professional 1-38, 1-42 AJAX 2-21 Authenticating 2-62 Automated Scanning 5-47-48 Add to Task 5-57 Automatic 5-60 Configuration 5-53-56 Instantiating Scans 5-52 Live 5-51	C Cache-Control 1–124 CERN 1–91 Certificate Authorities 1–87, 1–132 Certificate Transparency 1–87 CEWL Spidering 2–22 CGI Scripts 2–139 CHAOSNET 1–81 Checklist 1–29 Cipher Suites 1–130 Cipher suites 1–134 Testing 1–134 Clickjacking 3–15
Authentication Schemes Required 2-51 Developer Tools 4-11 Bugtraq 1-10 BuprSuite Pro Active/Live Scan 1-35 Burp Suite 1nfiltrator 1-13 Request Parameters 1-111 Burp Suite Professional 1-38, 1-42 AJAX 2-21 Authenticating 2-62 Automated Scanning 5-47-48 Add to Task 5-57 Automatic 5-60 Configuration 5-53-56 Instantiating Scans 5-52 Live 5-51 Passive 5-49	C Cache-Control 1–124 CERN 1–91 Certificate Authorities 1–87, 1–132 Certificate Transparency 1–87 CEWL Spidering 2–22 CGI Scripts 2–139 CHAOSNET 1–81 Checklist 1–29 Cipher Suites 1–130 Cipher suites 1–134 Testing 1–134 Clickjacking 3–15 Client Side (CLNT) 1–28
Authentication Schemes Required 2-51 Developer Tools 4-11 Bugtraq 1-10 Bupr Suite Pro Active/Live Scan 1-35 Burp Suite 1-13 Request Parameters 1-111 Burp Suite Professional 1-38, 1-42 AJAX 2-21 Authenticating 2-62 Automated Scanning 5-47-48 Add to Task 5-57 Automatic 5-60 Configuration 5-53-56 Instantiating Scans 5-52 Live 5-51 Passive 5-49 Push Button 5-50 Results 5-58-59	C Cache-Control 1–124 CERN 1–91 Certificate Authorities 1–87, 1–132 Certificate Transparency 1–87 CEWL Spidering 2–22 CGI Scripts 2–139 CHAOSNET 1–81 Checklist 1–29 Cipher Suites 1–130 Cipher suites 1–134 Clickjacking 3–15 Client Side (CLNT) 1–28 Client-side scripting languages 3–11
Authentication Schemes Required 2-51 Developer Tools 4-11 Bugtraq 1-10 BuprSuite Pro Active/Live Scan 1-35 Burp Suite 1-13 Infiltrator 1-13 Request Parameters 1-111 Burp Suite Professional 1-38, 1-42 AJAX 2-21 Authenticating 2-62 Automated Scanning 5-47-48 Add to Task 5-57 Automatic 5-60 Configuration 5-53-56 Instantiating Scans 5-52 Live 5-51 Passive 5-49 Push Button 5-50	C Cache-Control 1–124 CERN 1–91 Certificate Authorities 1–87, 1–132 Certificate Transparency 1–87 CEWL Spidering 2–22 CGI Scripts 2–139 CHAOSNET 1–81 Checklist 1–29 Cipher Suites 1–130 Cipher suites 1–134 Clickjacking 3–15 Client Side (CLNT) 1–28 Client-side scripting languages 3–11 Cloud
Authentication Schemes Required 2-51 Developer Tools 4-11 Bugtraq 1-10 Bupr Suite Pro Active/Live Scan 1-35 Burp Suite Infiltrator 1-13 Request Parameters 1-111 Burp Suite Professional 1-38, 1-42 AJAX 2-21 Authenticating 2-62 Automated Scanning 5-47-48 Add to Task 5-57 Automatic 5-60 Configuration 5-53-56 Instantiating Scans 5-52 Live 5-51 Passive 5-49 Push Button 5-50 Results 5-58-59 BApp Store 1-53	C Cache-Control 1-124 CERN 1-91 Certificate Authorities 1-87, 1-132 Certificate Transparency 1-87 CEWL Spidering 2-22 CGI Scripts 2-139 CHAOSNET 1-81 Checklist 1-29 Cipher Suites 1-130 Cipher suites 1-134 Clickjacking 3-15 Client Side (CLNT) 1-28 Client-side scripting languages 3-11 Cloud Metadata 4-137
Authentication Schemes Required 2-51 Developer Tools 4-11 Bugtraq 1-10 Bupr Suite Pro Active/Live Scan 1-35 Burp Suite Infiltrator 1-13 Request Parameters 1-111 Burp Suite Professional 1-38, 1-42 AJAX 2-21 Authenticating 2-62 Automated Scanning 5-47-48 Add to Task 5-57 Automatic 5-60 Configuration 5-53-56 Instantiating Scans 5-52 Live 5-51 Passive 5-49 Push Button 5-50 Results 5-58-59 BApp Store 1-53 Collaborator 3-28 Blind Exfil 3-29	C Cache-Control 1-124 CERN 1-91 Certificate Authorities 1-87, 1-132 Certificate Transparency 1-87 CEWL Spidering 2-22 CGI Scripts 2-139 CHAOSNET 1-81 Checklist 1-29 Cipher Suites 1-130 Cipher suites 1-134 Clickjacking 3-15 Client Side (CLNT) 1-28 Client-side scripting languages 3-11 Cloud Metadata 4-137 Cloudflare Challenge 1-163
Authentication Schemes Required 2-51 Developer Tools 4-11 Bugtraq 1-10 Bupr Suite Pro Active/Live Scan 1-35 Burp Suite Infiltrator 1-13 Request Parameters 1-111 Burp Suite Professional 1-38, 1-42 AJAX 2-21 Authenticating 2-62 Automated Scanning 5-47-48 Add to Task 5-57 Automatic 5-60 Configuration 5-53-56 Instantiating Scans 5-52 Live 5-51 Passive 5-49 Push Button 5-50 Results 5-58-59 BApp Store 1-53 Collaborator 3-28 Blind Exfil 3-29 Comparer 1-52	C Cache-Control 1–124 CERN 1–91 Certificate Authorities 1–87, 1–132 Certificate Transparency 1–87 CEWL Spidering 2–22 CGI Scripts 2–139 CHAOSNET 1–81 Checklist 1–29 Cipher Suites 1–130 Cipher suites 1–134 Clickjacking 3–15 Client Side (CLNT) 1–28 Client-side scripting languages 3–11 Cloud Metadata 4–137 Cloudflare Challenge 1–163 Code review 1–13 Command 1–13
Authentication Schemes Required 2-51 Developer Tools 4-11 Bugtraq 1-10 BuprSuite Pro Active/Live Scan 1-35 Burp Suite Infiltrator 1-13 Request Parameters 1-111 Burp Suite Professional 1-38, 1-42 AJAX 2-21 Authenticating 2-62 Automated Scanning 5-47-48 Add to Task 5-57 Automatic 5-60 Configuration 5-53-56 Instantiating Scans 5-52 Live 5-51 Passive 5-49 Push Button 5-50 Results 5-58-59 BApp Store 1-53 Collaborator 3-28 Blind Exfil 3-29 Comparer 1-52 Cookie Jar 3-138-139	C Cache-Control 1-124 CERN 1-91 Certificate Authorities 1-87, 1-132 Certificate Transparency 1-87 CEWL Spidering 2-22 CGI Scripts 2-139 CHAOSNET 1-81 Checklist 1-29 Cipher Suites 1-130 Cipher suites 1-134 Clickjacking 3-15 Client Side (CLNT) 1-28 Client-side scripting languages 3-11 Cloud Metadata 4-137 Cloudflare Challenge 1-163 Code review 1-13 Command HTTP/0.9 1-95
Authentication Schemes Required 2-51 Developer Tools 4-11 Bugtraq 1-10 BuprSuite Pro Active/Live Scan 1-35 Burp Suite Infiltrator 1-13 Request Parameters 1-111 Burp Suite Professional 1-38, 1-42 AJAX 2-21 Authenticating 2-62 Automated Scanning 5-47-48 Add to Task 5-57 Automatic 5-60 Configuration 5-53-56 Instantiating Scans 5-52 Live 5-51 Passive 5-49 Push Button 5-50 Results 5-58-59 BApp Store 1-53 Collaborator 3-28 Blind Exfil 3-29 Comparer 1-52 Cookie Jar 3-138-139 Crawling/Auditing 1-54	C Cache-Control 1-124 CERN 1-91 Certificate Authorities 1-87, 1-132 Certificate Transparency 1-87 CEWL Spidering 2-22 CGI Scripts 2-139 CHAOSNET 1-81 Checklist 1-29 Cipher Suites 1-130 Cipher suites 1-134 Clickjacking 3-15 Client Side (CLNT) 1-28 Client-side scripting languages 3-11 Cloud Metadata 4-137 Cloudflare Challenge 1-163 Code review 1-13 Command 1-15 HTTP/0.9 1-95 HTTP/1.0 1-96
Authentication Schemes Required 2-51 Developer Tools 4-11 Bugtraq 1-10 BuprSuite Pro Active/Live Scan 1-35 Burp Suite Infiltrator 1-13 Request Parameters 1-111 Burp Suite Professional 1-38, 1-42 AJAX 2-21 Authenticating 2-62 Automated Scanning 5-47-48 Add to Task 5-57 Automatic 5-60 Configuration 5-53-56 Instantiating Scans 5-52 Live 5-51 Passive 5-49 Push Button 5-50 Results 5-58-59 BApp Store 1-53 Collaborator 3-28 Blind Exfil 3-29 Comparer 1-52 Cookie Jar 3-138-139	C Cache-Control 1-124 CERN 1-91 Certificate Authorities 1-87, 1-132 Certificate Transparency 1-87 CEWL Spidering 2-22 CGI Scripts 2-139 CHAOSNET 1-81 Checklist 1-29 Cipher Suites 1-130 Cipher suites 1-134 Clickjacking 3-15 Client Side (CLNT) 1-28 Client-side scripting languages 3-11 Cloud Metadata 4-137 Cloudflare Challenge 1-163 Code review 1-13 Command HTTP/0.9 1-95

Blind	Concurrency attacks
Exploiting	Confidentiality
Finding	Configuration and Deployment Management (CONF)
Command Substitution	1–28
Commands Commands	Configuration Files
Base 32	Content Management Systems (CMS)
Base64 Encode2–53	Content-Security-Policy (CSP)3–17-18
Blind DNS exfil	Defined
DELETE request	Content-Type
	Cookie
dig (many)	
dig domain lookup	Cookies
DNSRecon	Protecting
echo prevent CR	HttpOnly Attribute
Enumerate HTTP methods1–153-154	SameSite Attribute
Fuff2-30-32	Secure Attribute3–10
full (AXFR) zone transfer1–75	Coomand Injection
HEAD request1–113	Non-blind3–24
heartbleed.py1–164	Crawling
nc port scan1–142	Cross Origin Resource Sharing (CORS)4–110
nmap https1–135	Headers
OPTIONS request1-116-117	Cross Site Request Forgery (CSRF)
pause using ping3-26	SameSite Cookie Attribute3–12-13
Python - check if installed/version 5–25	Cross-Site Requist Forgery (CSRF)
Python - POST	CSRF vs XSS5–9
Python - PSSL/TLS5-37	Example visualized
Python - Putting it Together5–38	Step 4
Python - retrieve Server header 5–24	Tokens5–13
Python3 - install requests5–27	Visualized
reverse DNS1–76	Step 1
Server strings1–123-124	Step 2
SHA1 hash of session id1–104	Step 3
SQL DB Fingerprinting3–105	ZAP
SQL DB Meta Info queries3–107	Cross-Site Scripting (XSS)4–18
SQL Stacked Queries	Bypassing Broswer Filters4–88
SQLi Binary/Boolean Inference Testing 3–99	Classes
SQLi equivalent string injections3-96-98	Client and Server
SQLi payload	DOM-Based
Strip off equal signs3–29	Reflected
testssl.sh	Stored/Persistent
Wget	Common Injection Contexts4–80
robots off2–18	Existing JS
	HTML
set proxy	
XSS Evnet Handler	Tag Attributes
XSS Existing JS	cross-Site aspect
XSS HTML img onerror	Discovery
XSS Tag Attributes	DOM Event Handler Bypass4–86
xxd	Filter
XXE PoC using cURL4–144-146	Bypass/Evasion4–85
ysoserial.jar	Tests
Communo Vulnerabilities and Exposures (CVE)	Fuzzing
CVE-2014-62692–138	GET -; POST Flaws4–98
CVE-2014-62712-137	HTML Event Handler Injection4–87
CVE-2014-62772–138	Injection Points4–78
CVE-2014-62782-138	Interception Proxies4–91
CVE-2014-62862–138	Burp Intruder - Reflection Tests 4–92-95
Common Name1–87	PoC Payloads4-35-37, 4-89
Common Vulnerabilities and Exposures (CVE) 2–48	Reflected POST4–97

Reflection Tests	dig1-80-81
Session Abuse	DNSRecon
Hijacking	Nmap
URL Encoding	nslookup1–79
Burp4–59	Repositories
Cross-Site Tracing (XST)1–114	Dnsdumpster.com 1–85
CRUD1–118	Farsight Security's DNSDB1–85
Cryptographic Failures 1–126	Reverse1–75
cryptographic weaknesses1–15	Zone Transfer
Cryptography (CRYP)1–28	Dorking
	Dorks
D	Drupal
D	Drupalgeddon 5-75-78 Got hacked? 5-76
Data	Metasploit
Attacks	DuckDuckGo
Formats	Dynamic Application Security Testing (DAST)1–13,
Database	1–17-18, 1–35
Fingerprinting3-105	Scanners
Meta Info	Tools1–17-18
Databases	Dynamic web application security scanners 1–32
DB Fingerprinting	
Decoding1–51	D
Default Web Pages1–151	${f E}$
DELETE1–105	T
Developer comments 2-23 Diffie-Helman 1-129	Easter eggs1–15
Dig1–74	EDNS
dig1-74	Elasticsearch
Syntax1-81	embedded
Digest Authentication	Encoding
Illustrated	Enrors
Issues	Information Leakage
DirBuster 2–29	Enterprise Resource Management (ERM)5–116
Direct Page Access	Entropy2–112
Directory Broswing2–46	Error Handling (ERRH)1–28
Directory Browsing	Exploit Database (EDB)1–10
Google2–47	
Directory brute forcing	${f F}$
Directory Traversal	$oldsymbol{\Gamma}$
DNS DNS	FFuF
Blind injection	Custom Filters
Data exfil	HTTP request
DNSRecon	Virtual Host Discovery2-31-32
Document Object Model (DOM)4–8	filter bubble1–64
Browser Objects	Fingerprinting1–141
JavaScript	Firefox
Objects	URL Encoding4–62
Document	flawed business logic
Window	Forced Browsing
Tree	BurpSuite
Documentation	FFuF
Brute Force Scans1–77	ZAP
EDNS	Form-based Authentication
PTR	Illustrated
Querying Directly1–75	Issues
Recon Tools1–78	Fortify WebInspect

forward proxy	Hypertext Transfer Protocol (HTTP)
Full Disclosure	0.91–95
Full-Knowledge1–13, 1–21	1.01–95-96
FuzzDB2–40	1.11–97
Fuzzing2–36	3 QUIC1–100
Examples2–37	21–98-99
Reviewing the Responses2–38	History1–9, 1–91
XSS PoC Payloads4–89	0.91–9
ZAP2–41	QUIC1–93
	Request
\mathbf{G}	Example
G	Highlights
Gadget classes	Methods/Verbs1–105-116, 1–122
Generalized Markup Language (GML)	Referer
GET	User-Agent1–120
URI Query Parameters	Response
Globally Unique Identifiers (GUID)2–103	Cache-Control
Google	Example
Directory Browsing	Set-Cookie
Google Dorks	Status Code
Google Hacking Database (GHDB)1–66-67	Security Headers3–14-17
GHDB-ID 48041–67	Semantics
Governance, Risk, and Compliance (GRC)5–116	Syntax
Grep1–48	Testing
	Methods
	URI Query Parameters
\mathbf{H}	
1.	т
Hashing	I
HCL AppScan1–35	_
HCL AppScan 1-35 HEAD 1-113	idempotent1–105
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161	idempotent
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67 iframe 3-15
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23	
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23 HMAC	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67 iframe 3-15 Incident Response 2-11 Information Gathering 1-59
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23 HMAC JWT Signature Cracking 2-76	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67 iframe 3-15 Incident Response 2-11 Information Gathering 1-59 Information Gathering (INFO) 1-28
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23 HMAC	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67 iframe 3-15 Incident Response 2-11 Information Gathering 1-59 Information Gathering (INFO) 1-28 Information Leakage 2-44
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23 HMAC JWT Signature Cracking 2-76 HPACK 1-98-99 HTML 1-98-99	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67 iframe 3-15 Incident Response 2-11 Information Gathering 1-59 Information Gathering (INFO) 1-28
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23 HMAC JWT Signature Cracking 2-76 HPACK 1-98-99 HTML Injection 4-20-21	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67 iframe 3-15 Incident Response 2-11 Information Gathering 1-59 Information Gathering (INFO) 1-28 Information Leakage 2-44 CVE search 2-48 Flaws 2-48
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23 HMAC JWT Signature Cracking 2-76 HPACK 1-98-99 HTML 1-98-99	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67 iframe 3-15 Incident Response 2-11 Information Gathering 1-59 Information Gathering (INFO) 1-28 Information Leakage 2-44 CVE search 2-48
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23 HMAC JWT Signature Cracking 2-76 HPACK 1-98-99 HTML Injection 4-20-21 HTTP Strict Transport Security (HSTS) 3-16	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67 iframe 3-15 Incident Response 2-11 Information Gathering 1-59 Information Gathering (INFO) 1-28 Information Leakage 2-44 CVE search 2-48 Flaws 2-48 Types 2-45
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23 HMAC JWT Signature Cracking 2-76 HPACK 1-98-99 HTML Injection 4-20-21 HTTP Strict Transport Security (HSTS) 3-16 Defined 3-14	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67 iframe 3-15 Incident Response 2-11 Information Gathering 1-59 Information Gathering (INFO) 1-28 Information Leakage 2-44 CVE search 2-48 Flaws 2-48 Types 2-45 Insecure Deserialization 3-44-47
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23 HMAC JWT Signature Cracking 2-76 HPACK 1-98-99 HTML Injection 4-20-21 HTTP Strict Transport Security (HSTS) 3-16 Defined 3-14 HTTPOnly 4-42 HttpOnly 3-11 Bypass 1-114	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67 iframe 3-15 Incident Response 2-11 Information Gathering 1-59 Information Gathering (INFO) 1-28 Information Leakage 2-44 CVE search 2-48 Flaws 2-48 Types 2-45 Insecure Descrialization 3-44-47 Exploitation 3-44-47 Java Example 3-49-57 RCE 3-58-59
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23 HMAC JWT Signature Cracking 2-76 HPACK 1-98-99 HTML Injection 4-20-21 HTTP Strict Transport Security (HSTS) 3-16 Defined 3-14 HTTPOnly 4-42 HttpOnly 3-11	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67 iframe 3-15 Incident Response 2-11 Information Gathering 1-59 Information Gathering (INFO) 1-28 Information Leakage 2-44 CVE search 2-48 Flaws 2-48 Types 2-45 Insecure Deserialization 3-44-47 Exploitation 3-48 Java Example 3-49-57
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23 HMAC JWT Signature Cracking 2-76 HPACK 1-98-99 HTML Injection 4-20-21 HTTP Strict Transport Security (HSTS) 3-16 Defined 3-14 HTTPOnly 4-42 HttpOnly 3-11 Bypass 1-114 HTTPS Authentication 1-130	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67 iframe 3-15 Incident Response 2-11 Information Gathering 1-59 Information Gathering (INFO) 1-28 Information Leakage 2-44 CVE search 2-48 Flaws 2-48 Types 2-45 Insecure Deserialization 3-44-47 Exploitation 3-48 Java Example 3-49-57 RCE 3-58-59 Insecure Direct Object Reference (IDOR) 2-125 Insecure Directo Object Reference (IDOR) 2-125
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23 HMAC JWT Signature Cracking 2-76 HPACK 1-98-99 HTML Injection 4-20-21 HTTP Strict Transport Security (HSTS) 3-16 Defined 3-14 HTTPOnly 4-42 HttpOnly 3-11 Bypass 1-114 HTTPS Authentication 1-130 Cipher Suites 1-130	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67 iframe 3-15 Incident Response 2-11 Information Gathering 1-59 Information Gathering (INFO) 1-28 Information Leakage 2-44 CVE search 2-48 Flaws 2-48 Types 2-45 Insecure Deserialization 3-44-47 Exploitation 3-48 Java Example 3-49-57 RCE 3-58-59 Insecure Direct Object Reference (IDOR) 2-125 Insecure Directo Object Reference (IDOR) 2-125 AuthZ attacks 2-123
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23 HMAC JWT Signature Cracking 2-76 HPACK 1-98-99 HTML Injection 4-20-21 HTTP Strict Transport Security (HSTS) 3-16 Defined 3-14 HTTPOnly 4-42 HttpOnly 3-11 Bypass 1-114 HTTPS Authentication 1-130 Cipher Suites 1-130 Confidentiality 1-130	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67 iframe 3-15 Incident Response 2-11 Information Gathering 1-59 Information Gathering (INFO) 1-28 Information Leakage 2-44 CVE search 2-48 Flaws 2-48 Types 2-45 Insecure Descrialization 3-44-47 Exploitation 3-48 Java Example 3-49-57 RCE 3-58-59 Insecure Direct Object Reference (IDOR) 2-125 Insecure Directo Object Reference (IDOR) 2-125 Integrated Windows Authentication 2-59
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23 HMAC JWT Signature Cracking 2-76 HPACK 1-98-99 HTML Injection 4-20-21 HTTP Strict Transport Security (HSTS) 3-16 Defined 3-14 HTTPOnly 4-42 HttpOnly 3-11 Bypass 1-114 HTTPS Authentication 1-130 Cipher Suites 1-130 Confidentiality 1-130 Integrity 1-130	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67 iframe 3-15 Incident Response 2-11 Information Gathering 1-59 Information Gathering (INFO) 1-28 Information Leakage 2-44 CVE search 2-48 Flaws 2-48 Types 2-45 Insecure Descrialization 3-44-47 Exploitation 3-49-57 RCE 3-58-59 Insecure Direct Object Reference (IDOR) 2-125 Insecure Directo Object Reference (IDOR) 2-125 Integrated Windows Authentication 2-59 Illustrated 2-60
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23 HMAC JWT Signature Cracking 2-76 HPACK 1-98-99 HTML Injection 4-20-21 HTTP Strict Transport Security (HSTS) 3-16 Defined 3-14 HTTPOnly 4-42 HttpOnly 3-11 Bypass 1-114 HTTPS Authentication 1-130 Cipher Suites 1-130 Confidentiality 1-130 Integrity 1-130 Public Keys/Certificates and Certificate Authori-	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67 iframe 3-15 Incident Response 2-11 Information Gathering 1-59 Information Gathering (INFO) 1-28 Information Leakage 2-44 CVE search 2-48 Flaws 2-48 Types 2-45 Insecure Descrialization 3-44-47 Exploitation 3-44-47 Exploitation 3-49-57 RCE 3-58-59 Insecure Direct Object Reference (IDOR) 2-125 Insecure Directo Object Reference (IDOR) 2-125 Integrated Windows Authentication 2-59 Illustrated 2-60 Issues 2-61
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23 HMAC JWT Signature Cracking 2-76 HPACK 1-98-99 HTML Injection 4-20-21 HTTP Strict Transport Security (HSTS) 3-16 Defined 3-14 HTTPOnly 4-42 HttpOnly 3-11 Bypass 1-114 HTTPS Authentication 1-130 Cipher Suites 1-130 Confidentiality 1-130 Integrity 1-130 Public Keys/Certificates and Certificate Authorities 1-132	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67 iframe 3-15 Incident Response 2-11 Information Gathering (INFO) 1-59 Information Leakage 2-44 CVE search 2-48 Flaws 2-48 Types 2-45 Insecure Deserialization 3-44-47 Exploitation 3-49-57 RCE 3-58-59 Insecure Direct Object Reference (IDOR) 2-125 Insecure Directo Object Reference (IDOR) 2-125 Integrated Windows Authentication 2-59 Illustrated 2-60 Issues 2-61 Integrity 1-130
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23 HMAC JWT Signature Cracking 2-76 HPACK 1-98-99 HTML Injection 4-20-21 HTTP Strict Transport Security (HSTS) 3-16 Defined 3-14 HTTPOnly 4-42 HttpOnly 3-11 Bypass 1-114 HTTPS Authentication 1-130 Cipher Suites 1-130 Confidentiality 1-130 Integrity 1-130 Public Keys/Certificates and Certificate Authorities 1-132 Testing	idempotent .1-105 Identifying Web Server Components .1-151 Identity Management (IDNT) .1-28 Identity Provider .2-67 iframe .3-15 Incident Response .2-11 Information Gathering .1-59 Information Gathering (INFO) .1-28 Information Leakage .2-44 CVE search .2-48 Flaws .2-48 Types .2-45 Insecure Descrialization .3-44-47 Exploitation .3-48 Java Example .3-49-57 RCE .3-58-59 Insecure Direct Object Reference (IDOR) .2-125 Insecure Directo Object Reference (IDOR) .2-125 Integrated Windows Authentication .2-59 Illustrated .2-60 Issues .2-61 Integrity .1-130 Integrity hashes .2-86
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23 HMAC JWT Signature Cracking 2-76 HPACK 1-98-99 HTML Injection 4-20-21 HTTP Strict Transport Security (HSTS) 3-16 Defined 3-14 HTTPOnly 4-42 HttpOnly 3-11 Bypass 1-114 HTTPS Authentication 1-130 Cipher Suites 1-130 Confidentiality 1-130 Integrity 1-130 Public Keys/Certificates and Certificate Authorities 1-132 Testing nmap 1-135	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67 iframe 3-15 Incident Response 2-11 Information Gathering 1-59 Information Gathering (INFO) 1-28 Information Leakage 2-44 CVE search 2-48 Flaws 2-48 Types 2-45 Insecure Descrialization 3-44-47 Exploitation 3-48 Java Example 3-49-57 RCE 3-58-59 Insecure Direct Object Reference (IDOR) 2-125 Insecure Directo Object Reference (IDOR) 2-125 Integrated Windows Authentication 2-59 Illustrated 2-60 Issues 2-61 Integrity 1-130 Integrity hashes 2-86 Interactive Application Security Testing (IAST) 1-13
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23 HMAC JWT Signature Cracking 2-76 HPACK 1-98-99 HTML Injection 4-20-21 HTTP Strict Transport Security (HSTS) 3-16 Defined 3-14 HTTPOnly 4-42 HttpOnly 3-11 Bypass 1-114 HTTPS Authentication 1-130 Cipher Suites 1-130 Confidentiality 1-130 Integrity 1-130 Public Keys/Certificates and Certificate Authorities 1-132 Testing nmap 1-135 Version and Cipher Suites 1-134	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67 iframe 3-15 Incident Response 2-11 Information Gathering (INFO) 1-28 Information Leakage 2-44 CVE search 2-48 Flaws 2-48 Types 2-45 Insecure Deserialization 3-44-47 Exploitation 3-48 Java Example 3-49-57 RCE 3-58-59 Insecure Direct Object Reference (IDOR) 2-125 Insecure Directo Object Reference (IDOR) 2-125 Integrated Windows Authentication 2-59 Illustrated 2-60 Issues 2-61 Integrity 1-130 Integrity hashes 2-86 Interactive Application Security Testing (IAST) 1-13 Interception Proxies 1-38, 4-91
HCL AppScan 1-35 HEAD 1-113 Heartbleed 1-161 Effect 1-162 Exploit Output 1-164 Hidden links 2-23 High-risk functions 2-23 HMAC JWT Signature Cracking 2-76 HPACK 1-98-99 HTML Injection 4-20-21 HTTP Strict Transport Security (HSTS) 3-16 Defined 3-14 HTTPOnly 4-42 HttpOnly 3-11 Bypass 1-114 HTTPS Authentication 1-130 Cipher Suites 1-130 Confidentiality 1-130 Integrity 1-130 Public Keys/Certificates and Certificate Authorities 1-132 Testing nmap 1-135	idempotent 1-105 Identifying Web Server Components 1-151 Identity Management (IDNT) 1-28 Identity Provider 2-67 iframe 3-15 Incident Response 2-11 Information Gathering 1-59 Information Gathering (INFO) 1-28 Information Leakage 2-44 CVE search 2-48 Flaws 2-48 Types 2-45 Insecure Descrialization 3-44-47 Exploitation 3-49-57 RCE 3-58-59 Insecure Direct Object Reference (IDOR) 2-125 Insecure Direct Object Reference (IDOR) 2-125 Integrated Windows Authentication 2-59 Illustrated 2-60 Issues 2-61 Integrity 1-130 Integrity hashes 2-86 Interactive Application Security Testing (IAST) 1-13

Interception proxies	Bugtraq	1–10
Internet	Full Disclosure	
Internet Explorer (IE)4–26	Man-in-the-middle (MITM)	
Invicti (formerly Netsparker)1–35	Manual Assessments	
,	Manual Inspection and Reviews	
<u>_</u>	MD5	2–87
\mathbf{J}	MediaWiki	
	META tags	
JavaScript	Metadata	
Browser Objects	Metasploit	
DOM Manipulation	Auxiliary modules	
Frameworks	BeEF	
AngularJS	db_import	
Bootstrap	Drupal	
jQuery 4–113	Integration	
ReactJS	Known Vulnerabilities	
Injection		
· ·	mediawiki_thumb5-	
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	Seeding Database	
	Spidering and Crawling	
Window 4–15	sqlmatp	
Server-side	Web Testing	
Web Page Interaction	Method Interchange	
JavaScript Object Notation (JSON) 4–118, 119	Method Tampering	
Advantages of XML4–118	Methodology	1–22
Attacks4–120-121	Micah Hoffman's OSINT MindMap	1-61
JSON Web Token (JWT)2-72-73	Michal Zalewski	1-9
Issues2–76	MITRE	$\dots 2-48$
Structure	Morris Worm	1-92
	MS SQL	
K	Databases/Tables/Columns enum	3-107
Λ	Multi-Factor Authentication (MFA)	
1 00 04	Bypass	3–8
Kali1–33-34	Multiplexing	
metapackages	Mutillidae	
Update Command	Hints	
Kerberos2–59, 1–92	Reset DB	
	Security Levels	
${f L}$	MySQL	
${f L}$	Databases/Tables/Columns enum	3-107
I : l- D t	mySQL	
Link Depth2–14	my 5 & 2	1 100
LinkedIn Open Networkers (LIONs)		
Local File Inclusion (LFI)	${f N}$	
Demonstrating Impact	1,	
Directory Traversal 3–38	Netcraft Sitereport	1-149
Logged Events and Sources2–9	Network Vulnerability Scanner	
Logging and Monitoring2–8	Nikto	
Centralized Logs2–10	NIST	1 00
Sources2–9	800-30	
Timestamping2-9	Appendix D	1 1/
logic bombs1–15		
Logic Flaws	NIST National Vulnerability Database	1-10
Manual Discovery5–20	Nmap	1 00
Workflow Tampering5–19	DNS NSE Scripts	
WSTG Guidance5–21	nmap 1	
	Node.js	
TA /T	nslookup	
${f M}$	NTML	
	NTP	
Mailing Lists	Nuclei Vulnerability Scanner	. 5–82-83

Command options 5–87	Communication Plans5–110-1	12
Interactsh	Debrief Presentation5-1	23
Nuclei Templates	Post Assessment Results5-1	14
Running Nuclei	Pre-Engagement Specifics5–105-1	09
	Backups5-1	09
	Filtering5-1	08
O	Permission	06
	Rules of Engagement5-1	.07
OAuth2–68	Scope5-1	
Flow2-69-71	Source Details5-1	
Offensive Security1–10	Test Accounts 5–1	
One-Time Password (OTP)	Preparation	
Bypass3–8	Reports	
Open-Source Intelligence (OSINT)1–60	Alternative Result Formats5–1	
For Web Application Testers1–62	Appendices	
Micah Hoffman's OSINT MindMap 1–61	Automation 5–1	
Search Engines	Executive Summary	
Dorking	Findings	
Google Dorks	Test Parameters	
Key Search Operators		
Social Media1–68	Skills and Practice	
LinkedIn	Toolkit	
	Penetration Testing Execution Standard (PTES) .1–	22
SpiderFoot	РНР	4.0
Suites	Expect module4–1	
OpenID/OAuth/SAML Authentication2–67	PHP Data Object (PDO)5-	
OpenSSL1–161	Ping3-	
Operational Controls	Pipelining1-	-98
Operational Security (OPSEC)1–71	Port	
OPTIONS1–116	3306/tcp1-1	
Oracle3–115	Port Scanning1–142, 1–1	51
Databases/Tables/Columns enum3-107	Tools	
Origin of Trust	Netcraft1-1	
Other software	Nmap1-1	43
Out-of-Band Application Security Testing1–13	Shodan1-1	43
OWASP1–24	Zenmap1-1	43
Top 10 $1-25-26$	POST1-1	.09
A08:2021-Software and Data Integrity Faulures	Parameters	10
3–44	Post-exploitation1–	-22
A09:2021-Security Loggin and Monitoring Fail-	Postman	28
ures	Private key1-1	
Cryptographic Failures 1–126	Privilege Escalation	
Web Application Penetration Testing Methodol-	Profiling1–1	
ogy1–27	Property-Oriented Programming3-	
Web Security Testing Guide (WSTG) .1–19, 1–22,	Pseudo-random number generators (PRNG) 2–1	
1–29	Public key	
Information Gathering1-59	Push Button Pen Testing1–	
Testing Categories	Push Promise1–	
Web Application Penetration Testing Methodol-	Python	
ogy1–27	2 vs. 35–	
°87 <u>2</u> 7	Availability5–	
	Basics5–	
P		
1	Data Types and if/elif/else Syntax5-	
p0f1–9	for Pentesters	
Paros Proxy	Lists and Dictionaries5–	
Password hashes	Loops5–	
PATCH	use 3, right?5–	
PBKDF22–87	Example5–	
Popular Testing 1 17	Web Libraries5—	33

Requests	Same Origin Policy (SOP)
why writre scripts?	Evading
_	Same-Origin Policy (SOP)4–100
\mathbf{Q}	Basics
•	Externally Sourced Scripts4–28-29
quality of protection (qop)2-56	Not Bypassing
Qualys SSL Labs1–137	Requirements
Qualys WAS1–35	Test Case
Quick UDP Internet Connection (QUIC) 1–100	Cookies
	DOM
${f R}$	SameSite
\mathbf{n}	Scanning
Rapid7 AppSpider1–35	Script Injection
Realm2–52	SecLists
Recon and Enum	Secure Attribute
Reconaissance	Security Information and Event Management (SIEM)
Referer	2–10
Relational Databases3–67	Security Posture1–14
Remote File Inclusion (RFI)3–40	Semantics
Reporting	Server
REST4–123	Configuration flaw
RESTful API4–125	Server-Side Request Forgery (SSRF)4–132-134
Return Oriented Programming (ROP)3-59	Impact
Reverse DNS1–76	Cloud 4–136
RFC	Session Analysis
2069 Digest OG2-56	Session Management (SESS)1–28
2617 Digest Auth	Sessions
6749 OAuth2-68	Abuse4-38-40
6750 Bearer AuthN2–72	Hijacking4-39-41
7231book 1114	Attacks2–110
1918	Fixation2–113
$1945 \dots 1-94-95$	Logout and Timeout2–114
22461–127	Predictability2–111-112
26161–97, 1–114	Confidential
26172–52	Expire
3986	Identifiers
5246	Management
5789	Testing
6265	Management Principles 2-102 Predicatbility 2-104
7231	Tamper Resistant
7232	Theft
7233	Unpredictable
7234	Set-Cookie
7235	Shellshock
7540	fuzzing2–94
7541	Payloads2–140
84461–127	Execution and Impact2–143
91141–100	Injection Explained2–141-142
Robot Exclusion Protocol2–15	Visualized
Robots.txt	Shodan1–146-148
robots.txt2–15	for Pentesters
Role Enforcement	Port Scanner1–148
RSA1–129	Side-Channel Attacks2–84
Runtime Application Self-Protection (RASP) 1–13	Practical2-85
	Timing2-86
	Practical 2–88

Single Page Applications (SPA) \rightarrow JavaScript Frame-	ORDER BY
works	Origin 3–66
Single Sign On (SSO)	Payloads3-76
Integrated Windows Authentication2–59	Binary/Boolean Inference Testing3–99
Slow hashing2–87	equivalent String Injections3–96-98
SOAP4-123	Potential Attacks3–123
Web Services 4–126-127	Tools3–129
SoapUI4–129	sqlmap3–130
SOCMINT1-68	UNION3–113-114
Software Development Lifecycle (SDLC) 1–17, 1–19	UNION+NULL3-117
Software Engineering Institute (SEI)1–14	Without Error Messages3–95
Source Code Review1–15	Write file -; Shell
Advantages 1–15	sqlmap
Disadvantages1–15	Data exfil3–120
SpiderFoot 1–71	Metasploit
Spidering2–14	SSL1–127
AJAX2–21	Static Application Security Testing (SAST) 1–13, 1–16
Analyzing Results2–23	Status Codes1–123
BurpSuite2–19	Symmetric 1–131
CEWL2–22	Syntax 1–93
Command-Line	
Manual and Automated2–17	${f T}$
Manual vs. Automated2–16	1
ZAP2–20	Target
SQL	Profiling1–141
Data Types	Tautology
Key Verbs	Testing Techniques
Query Modifiers	testssl.sh
Special Characters	The Tangled Web
SQL Injection (SQLi)	Threat Modeling1–13
Auth Bypass	Advantages
Balancing Act 3–78 Colmun Numbers 3–80	Disadvantages
DataType	NIST 800-30
Quotes	Tim Berners-Lee
Blind	time bombs1–15
Custom Error Messages3–92-94	Timing Attacks
Database Error Messages	Practical
Increasing Blindness3–100	Slow Hashing
Out-of-Band	Timing-based attack2–38
Timing Inferences	
	TLS1–127
Blind Data Exfil	TLS1–127 Handshake1–128-129
· · · · · · · · · · · · · · · · · · ·	TLS 1-127 Handshake 1-128-129 Token Authentiction 2-72
Blind Data Exfil	TLS 1-127 Handshake 1-128-129 Token Authentiction 2-72 Tookkit 1-32
Blind Data Exfil	TLS 1-127 Handshake 1-128-129 Token Authentiction 2-72 Tookkit 1-32 Tools
Blind Data Exfil 3-120-122 Cheat Sheets 3-125 Classes 3-85	TLS 1-127 Handshake 1-128-129 Token Authentiction 2-72 Tookkit 1-32 Tools 4-44-46
Blind Data Exfil 3-120-122 Cheat Sheets 3-125 Classes 3-85 Data Exfil 3-119-122	TLS 1-127 Handshake 1-128-129 Token Authentiction 2-72 Tookkit 1-32 Tools BeEEF 4-44-46 Issuing Commands 4-48
Blind Data Exfil 3-120-122 Cheat Sheets 3-125 Classes 3-85 Data Exfil 3-119-122 DB Fingerprinting 3-105	TLS 1-127 Handshake 1-128-129 Token Authentiction 2-72 Tookkit 1-32 Tools 8eEEF 4-44-46 Issuing Commands 4-48 Payloads 4-49
Blind Data Exfil 3-120-122 Cheat Sheets 3-125 Classes 3-85 Data Exfil 3-119-122 DB Fingerprinting 3-105 DB Meta Info 3-106-107	TLS 1-127 Handshake 1-128-129 Token Authentiction 2-72 Tookkit 1-32 Tools 8eEEF 4-44-46 Issuing Commands 4-48 Payloads 4-49 heartbleed.py 1-164
Blind Data Exfil 3-120-122 Cheat Sheets 3-125 Classes 3-85 Data Exfil 3-119-122 DB Fingerprinting 3-105 DB Meta Info 3-106-107 Determine Data Types 3-118 Discovering 3-83 DUAL 3-115	TLS 1-127 Handshake 1-128-129 Token Authentiction 2-72 Tookkit 1-32 Tools 8eEEF Issuing Commands 4-44-46 Issuing Commands 4-48 Payloads 4-49 heartbleed.py 1-164 Netcraft Sitereport 1-149
Blind Data Exfil 3-120-122 Cheat Sheets 3-125 Classes 3-85 Data Exfil 3-119-122 DB Fingerprinting 3-105 DB Meta Info 3-106-107 Determine Data Types 3-118 Discovering 3-83 DUAL 3-115 Examples 3-72-77	TLS 1-127 Handshake 1-128-129 Token Authentiction 2-72 Tookkit 1-32 Tools 4-44-46 Issuing Commands 4-48 Payloads 4-49 heartbleed.py 1-164 Netcraft Sitereport 1-149 Next level 5-92
Blind Data Exfil 3-120-122 Cheat Sheets 3-125 Classes 3-85 Data Exfil 3-119-122 DB Fingerprinting 3-105 DB Meta Info 3-106-107 Determine Data Types 3-118 Discovering 3-83 DUAL 3-115 Examples 3-72-77 FROMless SELECT 3-115	TLS 1-127 Handshake 1-128-129 Token Authentiction 2-72 Tookkit 1-32 Tools 4-44-46 Issuing Commands 4-48 Payloads 4-49 heartbleed.py 1-164 Netcraft Sitereport 1-149 Next level 5-92 nmap 1-144-145
Blind Data Exfil 3-120-122 Cheat Sheets 3-125 Classes 3-85 Data Exfil 3-119-122 DB Fingerprinting 3-105 DB Meta Info 3-106-107 Determine Data Types 3-118 Discovering 3-83 DUAL 3-115 Examples 3-72-77 FROMless SELECT 3-115 In-Band/Inline 3-86	TLS 1-127 Handshake 1-128-129 Token Authentiction 2-72 Tookkit 1-32 Tools 8eEEF 4-44-46 Issuing Commands 4-48 Payloads 4-49 heartbleed.py 1-164 Netcraft Sitereport 1-149 Next level 5-92 nmap 1-144-145 Shodan 1-146-147
Blind Data Exfil 3-120-122 Cheat Sheets 3-125 Classes 3-85 Data Exfil 3-119-122 DB Fingerprinting 3-105 DB Meta Info 3-106-107 Determine Data Types 3-118 Discovering 3-83 DUAL 3-115 Examples 3-72-77 FROMless SELECT 3-115 In-Band/Inline 3-86 Exploiting 3-108	TLS 1-127 Handshake 1-128-129 Token Authentiction 2-72 Tookkit 1-32 Tools 8EEF Issuing Commands 4-48 Payloads 4-49 heartbleed.py 1-164 Netcraft Sitereport 1-149 Next level 5-92 nmap 1-144-145 Shodan 1-146-147 sqlmap 3-130
Blind Data Exfil 3-120-122 Cheat Sheets 3-125 Classes 3-85 Data Exfil 3-119-122 DB Fingerprinting 3-105 DB Meta Info 3-106-107 Determine Data Types 3-118 Discovering 3-83 DUAL 3-115 Examples 3-72-77 FROMless SELECT 3-115 In-Band/Inline 3-86 Exploiting 3-108 Stacked Queries 3-109-112	TLS 1-127 Handshake 1-128-129 Token Authentiction 2-72 Tookkit 1-32 Tools 4-44-46 Issuing Commands 4-48 Payloads 4-49 heartbleed.py 1-164 Netcraft Sitereport 1-149 Next level 5-92 nmap 1-144-145 Shodan 1-146-147 sqlmap 3-130 Auth/Sessions/Proxies 3-135
Blind Data Exfil 3-120-122 Cheat Sheets 3-125 Classes 3-85 Data Exfil 3-119-122 DB Fingerprinting 3-105 DB Meta Info 3-106-107 Determine Data Types 3-118 Discovering 3-83 DUAL 3-115 Examples 3-72-77 FROMless SELECT 3-115 In-Band/Inline 3-86 Exploiting 3-108 Stacked Queries 3-109-112 Input Locations 3-84	TLS 1-127 Handshake 1-128-129 Token Authentiction 2-72 Tookkit 1-32 Tools 8eEEF Besuing Commands 4-44-46 Issuing Commands 4-48 Payloads 4-49 heartbleed.py 1-164 Netcraft Sitereport 1-149 Next level 5-92 nmap 1-144-145 Shodan 1-146-147 sqlmap 3-130 Auth/Sessions/Proxies 3-135 Beyond DB Data Exfil 3-142
Blind Data Exfil 3-120-122 Cheat Sheets 3-125 Classes 3-85 Data Exfil 3-119-122 DB Fingerprinting 3-105 DB Meta Info 3-106-107 Determine Data Types 3-118 Discovering 3-83 DUAL 3-115 Examples 3-72-77 FROMless SELECT 3-115 In-Band/Inline 3-86 Exploiting 3-108 Stacked Queries 3-109-112 Input Locations 3-84 Intro 3-65	TLS 1-127 Handshake 1-128-129 Token Authentiction 2-72 Tookkit 1-32 Tools 1-32 BeEEF 4-44-46 Issuing Commands 4-48 Payloads 4-49 heartbleed.py 1-164 Netcraft Sitereport 1-149 Next level 5-92 nmap 1-144-145 Shodan 1-146-147 sqlmap 3-130 Auth/Sessions/Proxies 3-135 Beyond DB Data Exfil 3-142 DB Data Exfil 3-141
Blind Data Exfil 3-120-122 Cheat Sheets 3-125 Classes 3-85 Data Exfil 3-119-122 DB Fingerprinting 3-105 DB Meta Info 3-106-107 Determine Data Types 3-118 Discovering 3-83 DUAL 3-115 Examples 3-72-77 FROMless SELECT 3-115 In-Band/Inline 3-86 Exploiting 3-108 Stacked Queries 3-109-112 Input Locations 3-84	TLS 1-127 Handshake 1-128-129 Token Authentiction 2-72 Tookkit 1-32 Tools 8eEEF Besuing Commands 4-44-46 Issuing Commands 4-48 Payloads 4-49 heartbleed.py 1-164 Netcraft Sitereport 1-149 Next level 5-92 nmap 1-144-145 Shodan 1-146-147 sqlmap 3-130 Auth/Sessions/Proxies 3-135 Beyond DB Data Exfil 3-142

Initial Targeting3–134	WSTG-IVPV-12:Testing for Command Injection
Post Exploitition & Priv Esc3–143	3-20
Proxies and Active Sessions3–136	WSTG-SESS-05:Testing for Cross-Site Request
Riding ZAP/Burp Sessions3–137-138	Forgery (CSRF)
When they fail	Web Servers
Research the flaw	Web Services
WPScan 5–42-43	Pentesting Methodology4–130
Total cost of ownership (TCO)2–83	Wget2–18
TRACE	Whitehat Sentinel
Transmission Security	Wordlists
Trojans	WordPress
110 3 410	World Wide Web
	World Wide Web (W3)
${f U}$	WPScan
Unlinked content2–27	WWW-Authenticate2-51
URI Query Parameters	${f v}$
User-Agent1–120	\mathbf{X}
Username Enumeration2-81-82	X-Frame-Options
Results to look for	•
Side-Channel Attacks	Defined
Username enumeration2–38	XML
Username Harvesting2-81-82	XML External Entity (XEE)4-142-143
Results to look for	Blind
Side-Channel Attacks	Example4-150
UTC	Example
0102 10	Access URL
T 7	Display Local File
\mathbf{V}	RCE via PHP4–148
W 1 m	PoC4-144-145
Verb Tampering1–112	SSRF4-135
Version Detection	XML Schema Definition (XSD)4-145
Virtual Host Discovery	XMLHttpRequest4-104
DNS1–74-75	Features and Limitations4–108
HTTPS Certificate1–87	Properties and Methods4-105-106
Vulnerability assessment1–22	•
vulnerability mailing lists1–10	\mathbf{Y}
Vulnerability Scans1–151	1
	ysoserial
${f W}$	y
**	${f Z}$
Web Application PenTester's Toolkit	$oldsymbol{L}$
Web Applications 1–8	ZAP Active Scan1-35
web client	Zed Attack Proxy (ZAP)1–38, 39
Web Security Testing Guide (WSTG)	AJAX
Information Gathering2–13	Attack Menu
Logic Flaws	Cookie Jar3–138-139
Review Webserver Metafiles for Information Leak-	CSRF Test Form
age	Discover Content
Test HTTP Methods	Encoding URLs4-61
Testing for Weak Transport Layer Security .1–132	Functions
WSTG-ATHN-04: Testing for Bypassing Authen-	Active Scan1–41
tication Schema2–118	Forced browsing
WSTG-CLNT-03:Test for HTML Injection 4–19	Fuzzing1–41
WSTG-CONF-04: Review Unreferenced Files for	Spider and AJAX spider1-41
Sensitive Information2–43	Fuzzer 2-41
WSTG-IDNT-04: Testing for Account Enumera-	Interface
tion $\dots 2-80$	Spidering2-20
WSTG-INPV-11:Testing for Code Injection:	Zero-Knowledge
LFI/RFI 3–36	Zone Transfer 1–74-75