Web Application Hacking Lesson XSS Filter Evasion and Fuzzing

Lesson Objectives

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- Review lecture on the Cross Site Scripting(below)
- Complete lab on Cross Site Scripting(below)

Cross Site Scripting Lecture:

XSS Filter Evasion

Takeaway: Sometimes a site will employ filters to try to prevent the XSS strings you have learned so far. This lecture will cover some ways to try to evade these security measures..

Sometimes, website owner use XSS filters(WAF) to protect against XSS vulnerability.

For eg: if you put the <scirpt>alert("hi")</script> , the Filter will escape the "(quote) character , so the script will become

```
<script>alert(>xss detected<)</script>
```

Now this script won't work. Likewise Filters use different type of filtering method to give protection against the XSS. In this case, we can use some tricks to bypass the filter. Here i am going to cover that only.

1.Bypassing magic_quotes_gpc

The magic_quotes_gpc=ON is a PHP setting(configured in PHP.ini File) , it escapes the every ' (single-quote), " (double quote) and \ with a backslash automatically.

For Eg:

<scirpt>alert("hi");</script> will be filtered as <script>alert(\hi\)</script>.so the script won't work now.

This is well known filtering method, but we can easily bypass this filter by using ASCII characters instead.
For Eg: alert("hi"); can be converted to

```
String.fromCharCode(97, 108, 101, 114, 116, 40, 34, 104, 105, 34, 41, 59)
```

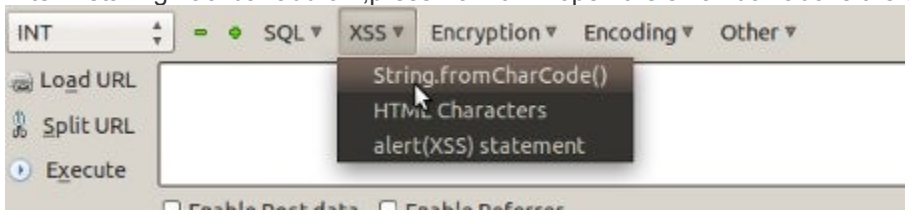
so the script will become <script>String.fromCharCode(97, 108, 101, 114, 116, 40, 34, 104, 105, 34, 41, 59)</script>. In this case there is no "(quotes) or '(single quotes) or / so the filter can't filter this thing. Yes, it will successfully run the script.

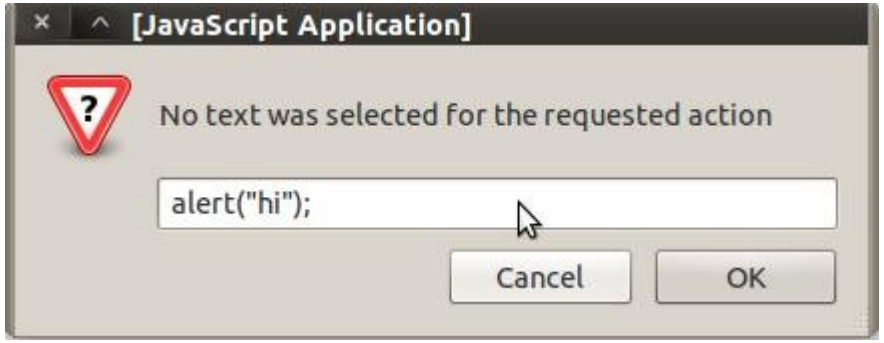
> String.fromCharCode() is a javascript function that converts ASCII value to Characters.

How to convert to ASCII values?

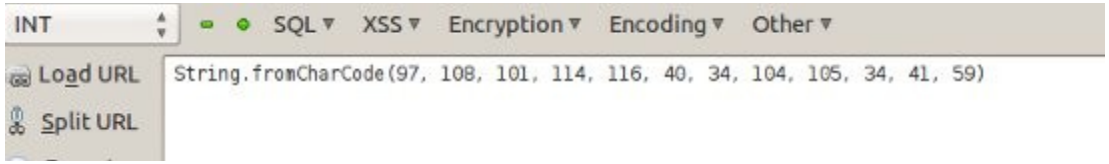
There are some online sites that converts to ASCII character. But i suggest you to use Hackbar Mozilla addon .

After installing hackbar add on ,press F9. It will open the small box above the url bar. click the XSS->String.fromCharCode()





Now it will popup small window. enter the code for instance alert("Hi"). click ok button. Now we got the output.



copy the code into the <script></script> inside and insert in the vulnerable sites

For eg:

```
hxxp://vulnerable-site/search?q=<script>String.fromCharCode(97, 108, 101, 114, 116, 40, 34, 104, 105, 34, 41, 59)</script>
```

2.HEX Encoding

we can encode our whole script into HEX code so that it can't be filtered.
For example: <script>alert("Hi");</script> can be convert to HEX as:

```
%3c%73%63%72%69%70%74%3e%61%6c%65%72%74%28%22%48%69%22%29%3b%3c%2f%73%63%72%69%70%74%3e
```

Now put the code in the vulnerable site request.
For ex:

```
hxxp://vulnerable-site/search?q=%3c%73%63%72%69%70%74%3e%61%6c%65%72%74%28%22%48%69%22%29%3b%3c%2f%73%63%72%69%70%74%3e
```

Converting to HEX:
This site will convert to hex code: http://centricle.com/tools/ascii-hex/

3.Bypassing using Obfuscation

Some website admin put the *script*,*alert* in restricted word list. so whenever you input this keywords, the filter will remove it and will give error message like "you are not allowed to search this". This can bypassed by changing the case of the keywords(namely Obfuscation).
For eg:

```
<ScRipt>ALeRt("hi");</sCRipT>
```

This bypass technique rarely works but giving trial is worth.

4. Closing Tag

Sometimes putting "> at the beginning of the code will work.

```
"><script>alert("Hi");</script>
```

This will end the previous opened tag and open our script tag.
Example:

```
hxxp://vulnerable-site/search?q="><script>alert("Hi");</script>
```

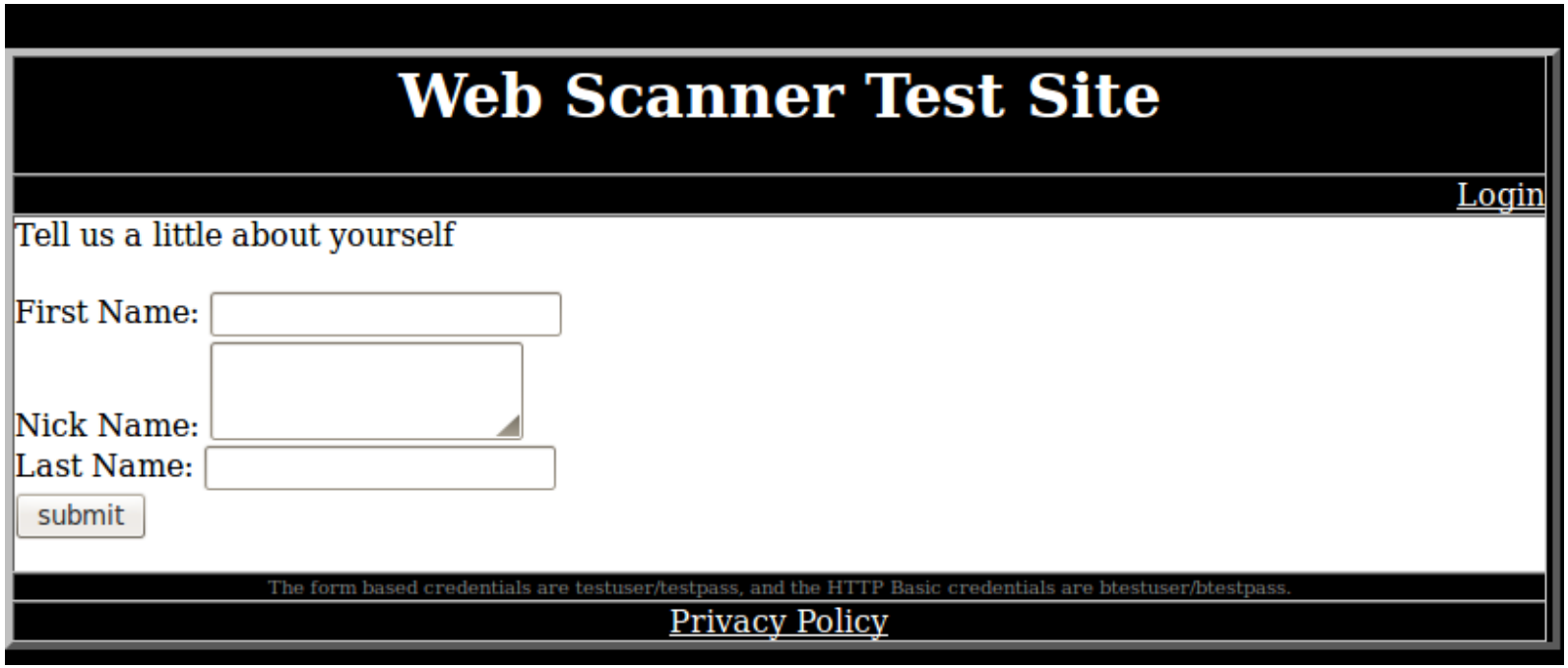
Conclusion:
From above article, it is clear that XSS filters alone not going to protect a site from the XSS attacks. If you really want to make your site more secure, then ask PenTesters to test your application or test yourself.

Also there are lot of different filter bypassing technique, i just covered some useful techniques for you.

Lab for Cross Site Scripting Introduction

Lab setup

- **Instructions**:
    1. Our target site is here http://webscantest.com

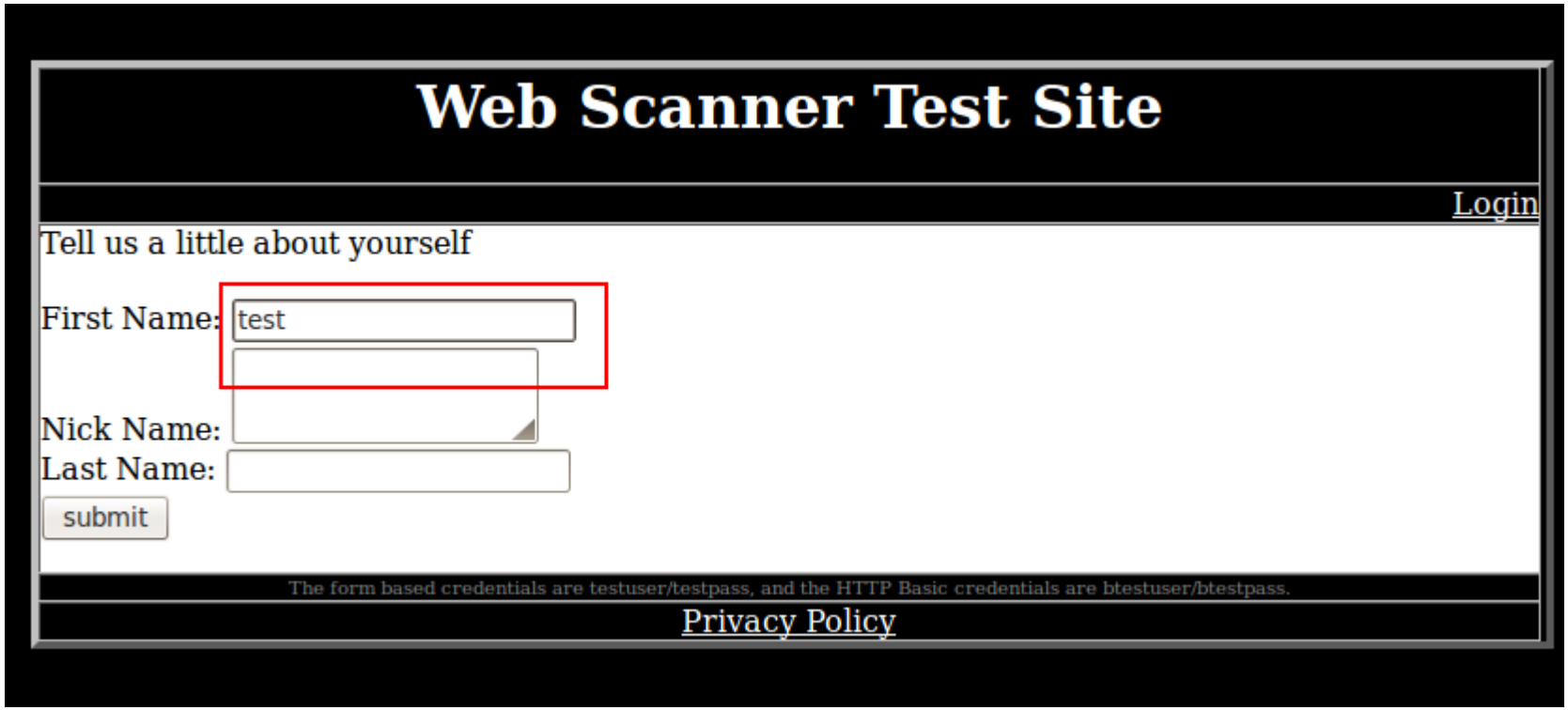


Lab – Automated XSS Scanning, and Fuzzing

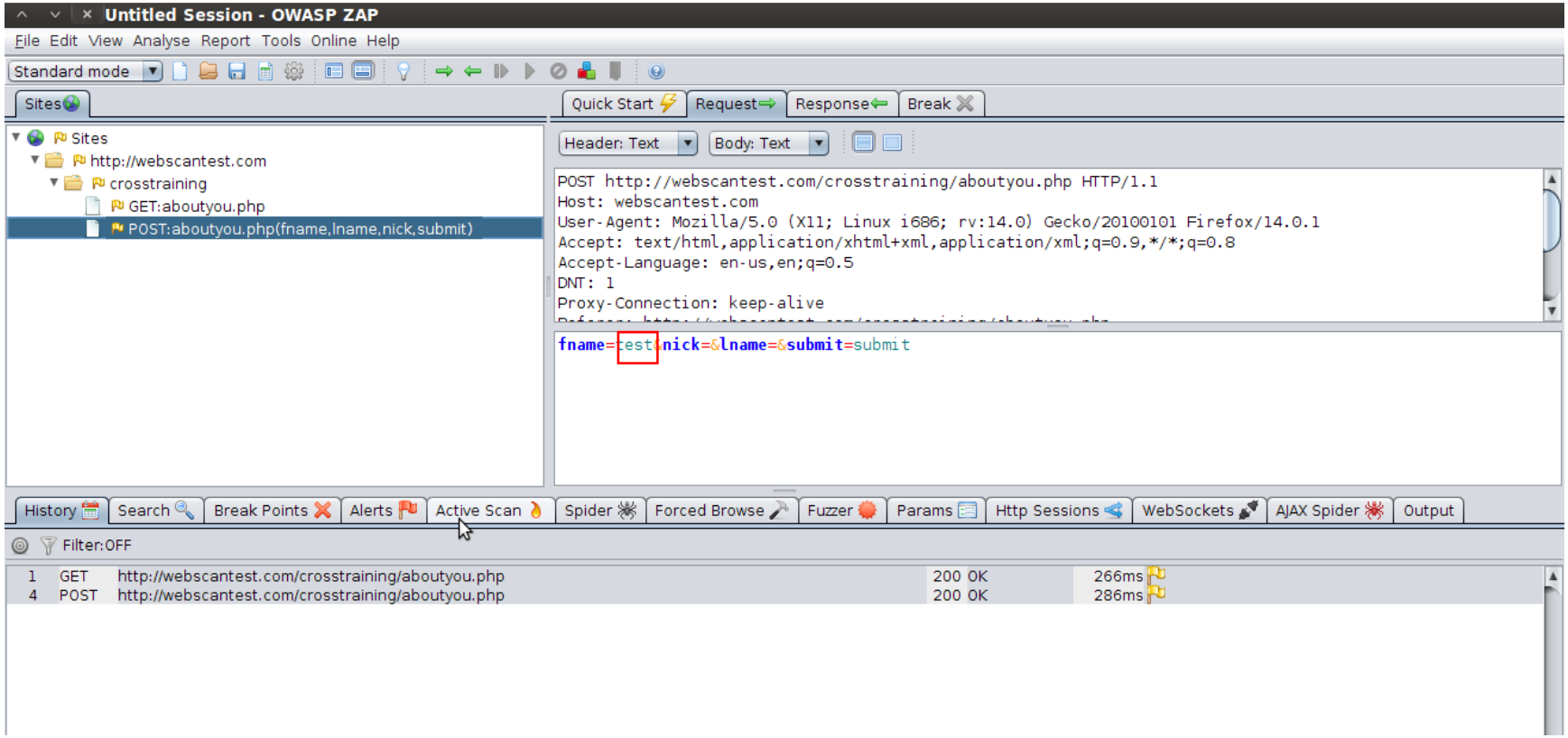
Fuzz testing or **fuzzing** is a software testing technique, often automated or semi-automated, that involves providing invalid, unexpected, or random data to the inputs of a web application The input is then monitored for exceptions such a an error message etc.

Launch ZAP 2.0

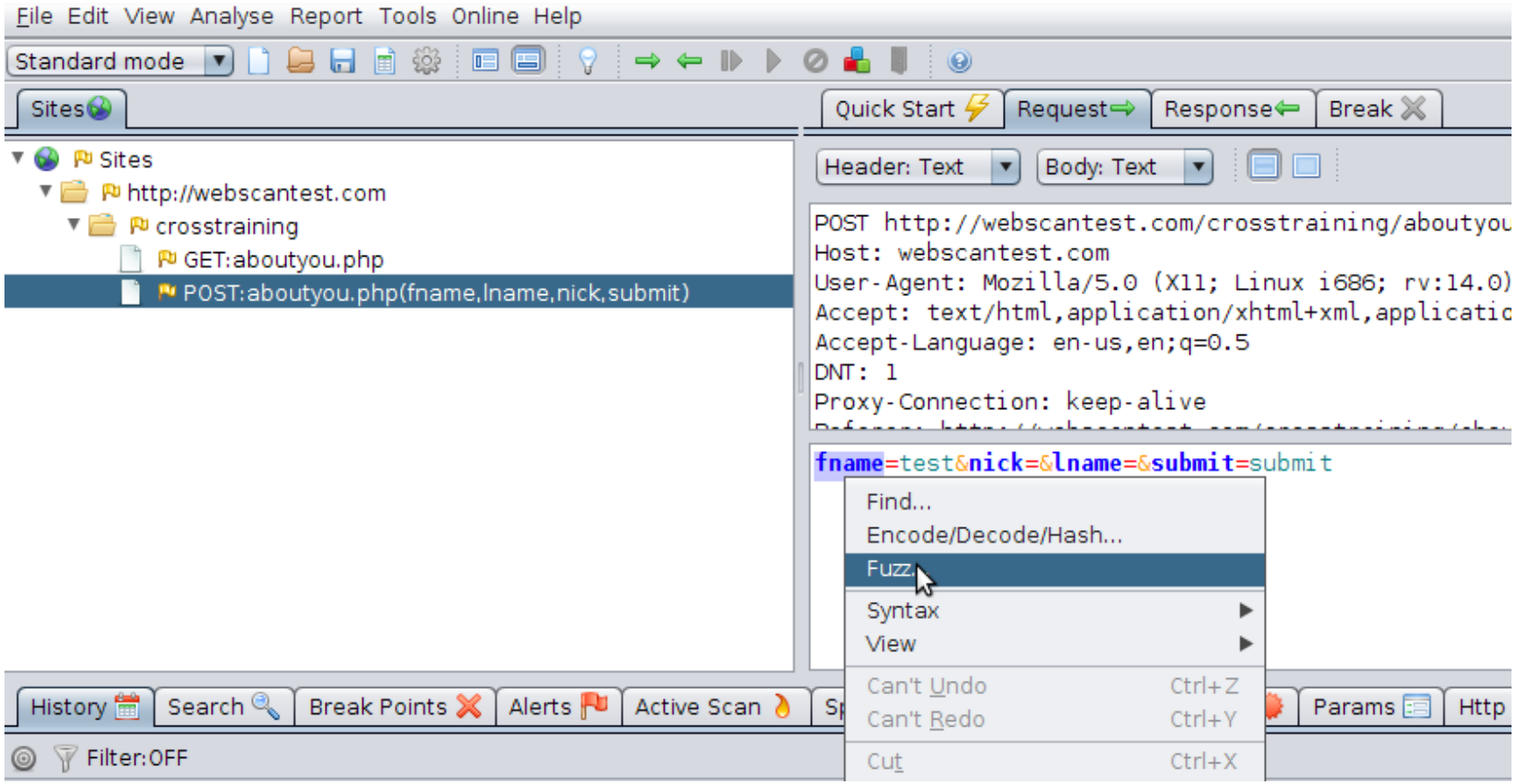
1. in the directory that holds the zap file, type: java -jar zap.jar
2. Open firefox and configure it to use the ZAP 2.0 Proxy http://www.youtube.com/watch?v=Xp_PBH7wjiw&list=PLEBitBW-Hlsv8cEIUntAO8st2UGhmrjUB&index=2
3. Open the link from Firefox http://webscantest.com/crosstraining/aboutyou.php
4. In the first name text box enter in the word “test”



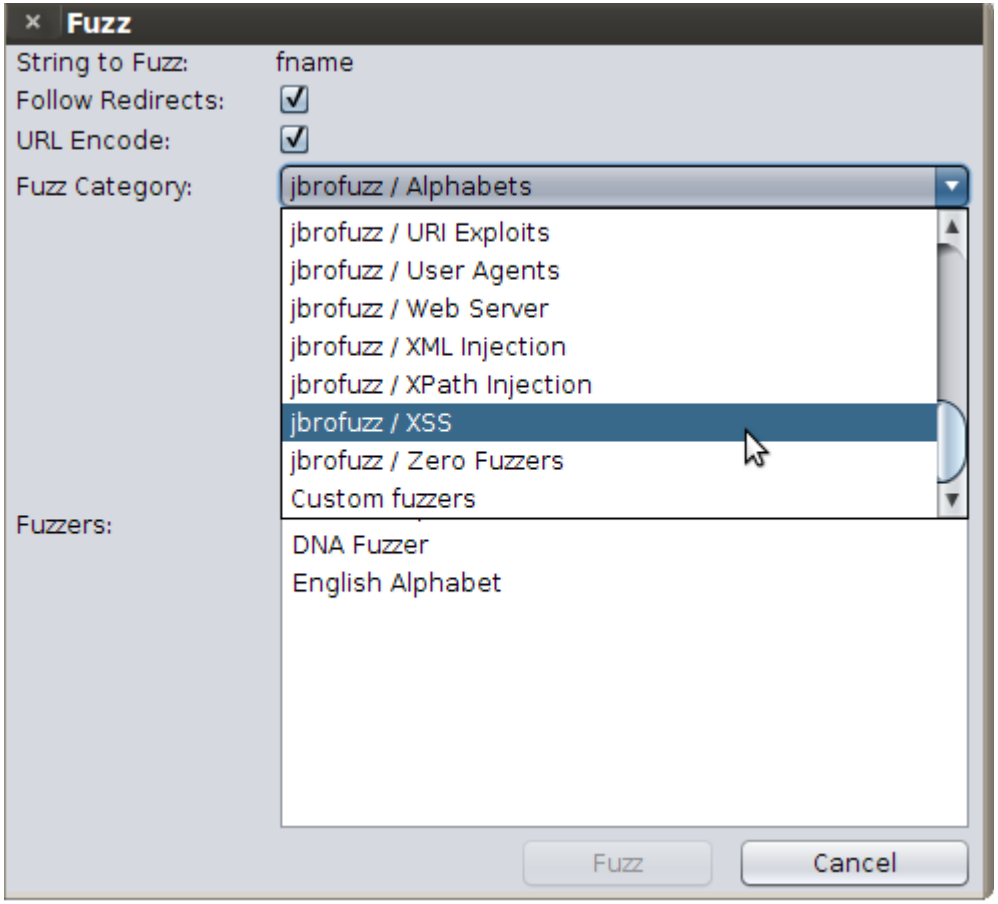
5 Switching to ZAP, notice which parameter was written with the word test



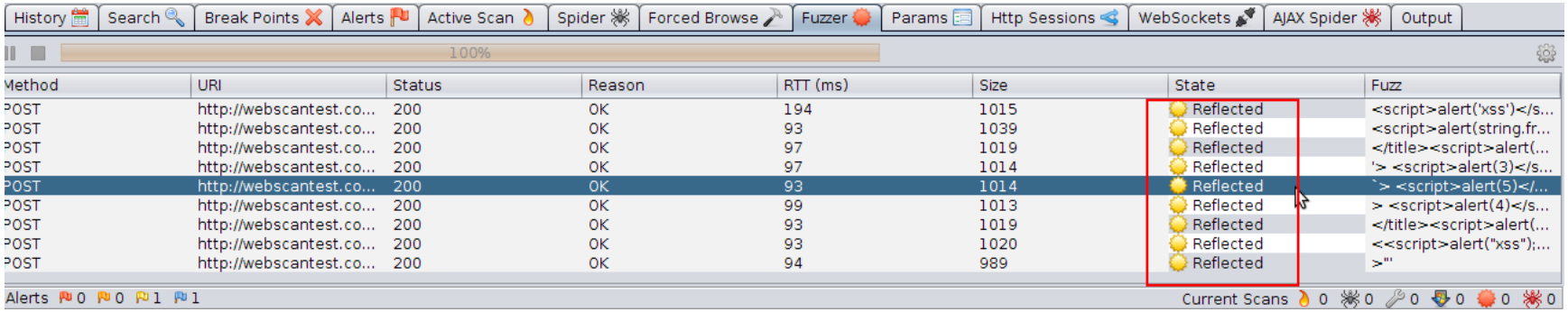
6. right click the parameter to be tested, (test in this case) and select fuzz


File Edit View Analyse Report Tools Online Help
Standard mode
Sites
Quick Start
Request
Response
Break
Sites
http://webscantest.com
crosstraining
GET:aboutyou.php
POST:aboutyou.php(fname,lname,nick,submit)
Header: Text
Body: Text
POST http://webscantest.com/crosstraining/aboutyou
Host: webscantest.com
User-Agent: Mozilla/5.0 (X11; Linux i686; rv:14.0)
Accept: text/html,application/xhtml+xml,applicatic
Accept-Language: en-us,en;q=0.5
DNT: 1
Proxy-Connection: keep-alive
fname=test&nick=&lname=&submit=submit
Find...
Encode/Decode/Hash...
Fuzz...
Syntax
View
Can't Undo Ctrl+Z
Can't Redo Ctrl+Y
Cut Ctrl+X
History
Search
Break Points
Alerts
Active Scan
Params
Http
Filter:OFF

7. Scroll down and select jbro/xss list. What this is , is the list of XSS Attack strings that we will automatically pass to the website. This is called “Fuzzing”



8. At the bottom, any instance where the word “reflected” is listed, means that the attack string to the right was successful against the tested parameter



Proof of Lab

- **Proof of Lab Instructions**:
  1. Do a <PrtScn> of all input, and results
  2. Paste into a word document
  3. Email to me
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Questions:

1. What is fuzzing?
2. What are two ways to defeat an XSS filter?
3. What command is used to launch ZAP?