



Multi-Post XSRF Web App Exploitation, total pwnage

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Introduction

- Web application vulnerabilities.
- What is XSRF?
- Code.
- Demo.

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Doing a pentest

- I enjoy performing penetration tests, I also enjoy teaching how to do penetration testing correctly.
- Never consider the vulnerabilities in isolation, using them in combination truly demonstrates the risk and impact.
- Pillage and pivot!
- The list of things that one application was vulnerable to was quite impressive!



Vulnerabilities

- Content can be framed.
- Cross Site Scripting XSS.
- Method interchange (POST and GET).
- Cross Site Request Forgery XSRF.
- User enumeration via forgot password function.
- Administrators can disable their own account.
- ... and many others...

XSS



- Cross Site Scripting, aka XSS, script injection.
- The application had a help desk function.
- Any user could create a trouble ticket.
- Ticket will be first viewed by administrator.
- Script executes in the administrator browser.
- Administrator can perform all of the functions vulnerable to XSRF.



XSRF

- Cross-Site Request Forgery is an attack that forces an end user to execute unwanted actions on a web application in which they're currently authenticated (OWASP).
- This attack takes advantage of the application trusting any transaction coming from a browser where a user has an existing and valid session, or where one can be established automatically (SSO).



XSS + XSRF

- XSS and XSRF are like cousins, that get along very well, sneaky mischievous cousins.
- Persistent Admin XSS within the application guarantees the attacker that the administrator will execute the code, the code will execute the XSRF transaction(s).
- We want more than one transaction, hence the multi-post.



Requirements for XSRF

- The user has an existing or can create automatically a valid session.
- The transaction has predictable parameters.
- The victim clicks on a link, or types in a URL, or XSS.
- The transaction is attractive to the attacker 😊
- The attacker has knowledge of the above, or is very lucky.



XSRF Functions

- All the interesting ones in this app are as admin.
 - Add a user.
 - Change user password.
 - Put user in group.
 - Enable user.
 - Disable user.
 - Logout.



What did we want to do?

- We needed a demo to show C-levels.
- Add a new user and in administrator group.
- Lockout the super-user account.
- Logout the super-user account.
- Did the functions in the correct order.
- Each function would wait for last to complete.
- Was all in one HTML page, one click shopping!
- Would force the administrator to view a certain Rick Astley video.

Rick Astley



OK, we didn't do the last one, that would be WAY too mean.





Google-Foo

- Needed to find multi-post XSRF code.
- Found Tim Tomes @lanmaster53

<http://www.lanmaster53.com/2013/07/multi-post-csrf/>

- We based our code on his. He and Ethan Robish based their code on

<http://ceriksen.com/2012/09/29/two-stage-csrf-attacks/>



Pseudo code

- HTML to inject in XSS.
- 1 form per transaction.
- 1 iframe per form.
- `<body onload="runme();">`
- JavaScript:
 - The runme submits the forms one by one, in order, waiting for each one to complete.



Needed a vulnerable app

- Back to Google.
- I needed an app that was vulnerable for the live demo -> Omeka.

<http://www.zeroscience.mk/en/vulnerabilities/ZSL-2014-5193.php>

- Free open source content management application.

<http://omeka.org/>

Omeka



- Is vulnerable to XSRF in admin functions.
- I could not use the application that I did the pen test for as a demonstration or public PoC.
- Omeka is easy to install and easy to exploit!



- Dashboard
- Items
- Collections
- Item Types
- Tags

Dashboard

A new version of Omeka is available for download. Upgrade to 2.2.2

0 items 0 collections 0 tags 0 plugins 3 users **Thanks, Roy** theme

Recent Items

[Add a new item](#)

Recent Collections

[Add a new collection](#)



* required field

Username* Username must be 30 characters or fewer.
Whitespace is not allowed.

Display Name* Name as it should be displayed on the site

Email*

Role* Roles describe the permissions a user has.
See [documentation](#) for details.

Add User



```
username=foo&name=bar&email=
foo%40intru-shun.ca&role=super&active=0
&active=1&submit=Save+Changes
```



Change Password

New Password*

Password must be at least 6 characters long.

Repeat New Password*

Save Password



```
new_password=password123&  
new_password_confirm=password123&submit  
=Save+Password
```

XSS



- The persistent XSS in Omeka is in the API keys function.

```
<form action="http://omeka/admin/users/api-keys/1" method="POST">
```

```
<input type="hidden" name="api_key_label" value='<script>location.href="http://omeka/xsrf-code.html"</script>' />
```

```
<input type="hidden" name="update_api_keys" value="Update+API+Keys" />
```

```
<input type="submit" value="Insert" /></form>
```



XSRF Multi-form attack onload - Mozilla Firefox

Browse Users (1 total) · ... × XSRF Multi-form attack... × Foo × +

evil.com/xsrf-onload.html

welcome to p0wned by XSRF!

Foo
Plugins Appearance Users Settings
Welcome, Super+User Log Out

Foo
Plugins Appearance Users Settings
Welcome, Super+User Log Out

Browser Users (2 total)

Edit User #1: "

All your base are belong to us

OK

The image shows a screenshot of a Mozilla Firefox browser window. The title bar reads "XSRF Multi-form attack onload - Mozilla Firefox". The address bar shows the URL "evil.com/xsrf-onload.html". The page content includes a header "welcome to p0wned by XSRF!" and two side-by-side panels, each displaying a user interface for "Foo" with options like "Plugins", "Appearance", "Users", and "Settings", and a welcome message for "Super+User". A modal dialog box is overlaid on the page, containing the text "All your base are belong to us" and an "OK" button.

SANS



CATS : ALL YOUR BASE ARE BELONG
TO US.

Demo showed the attack



- We used visible iframes for the demo.
- We didn't have to, could have easily made them invisible and have the happy victim watching a video.
- No not that one, rickrolling is mean, and unprofessional in this case.



OWASP ZAP



- The OWASP Zed Attack Proxy (ZAP) is an easy to use integrated penetration testing tool for finding vulnerabilities in web applications.
- I used the Zed Attack Proxy both to identify the XSRF issue and to create the PoC code.

XSRF Defences



- Add a random nonce/token to important forms. The only real defence, performance issues.
- referer HTTP header, Origin header, Captcha, reauth, OTP. UX!!!!
- Use multiple forms, easily bypassed by multi-post technique.

Demo



Now we cross our fingers

<https://isc.sans.edu/forums/diary/18507>



Note: no goats were harmed in the demo gods sacrifice!



Thanks!

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