RADICALLY OPEN SECURITY

Penetration Test Report

Open Technology Fund

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Public

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Authors	Stefan Vink, Abhinav Mishra
Reviewed by	Abhinav Mishra
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Contact

For more information about this document and its contents please contact Radically Open Security B.V.

Name	Melanie Rieback
Address	Science Park 608 1098 XH Amsterdam The Netherlands
Phone	+31 (0)20 2621 255
Email	info@radicallyopensecurity.com

Radically Open Security B.V. is registered at the trade register of the Dutch chamber of commerce under number 60628081.

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1 Executive Summary

1.1 Introduction

Between August 4, 2021 and August 23, 2021, Radically Open Security B.V. carried out a penetration test for Open Technology Fund.

This report contains our findings as well as detailed explanations of exactly how ROS performed the penetration test.

1.2 Scope of work

The scope of the penetration test was limited to the following target(s):

- Hypha web application (https://github.com/HyphaApp)
- opentech.fund
- apply.opentech.fund

The scoped services are broken down as follows:

- Frontend and backend pentest of the Hypha web app including testing of the user roles. : 7-9 days
- Retest and fix verification before publication of report: 0-1 days
- Project management and review of report.: 1 days
- **Total effort: 8 - 11 days**

1.3 Project objectives

ROS will perform a penetration test of the Hypha web application with OTF in order to assess the security of this. To do so ROS will access the web application and guide OTF in attempting to find vulnerabilities, exploiting any such found to try and gain further access and elevated privileges.

1.4 Timeline

The Security Audit took place between August 4, 2021 and August 23, 2021.

1.5 Results In A Nutshell

During this crystal-box penetration test we found 1 Elevated, 5 Moderate and 13 Low-severity issues.

One Elevated issue (which has been resolved) OTF-010 (page 16) was found that would allow an unauthenticated or low privileged user to send a malicious XSS payload (e.g. containing session hijacking, credential stealing, malware) to high privileged users (e.g. staff members and admins). This could result in gaining access to high privileged accounts which would lead to accessing restricted data.

The Moderate and Low issues found were mainly related to TLS Misconfiguration OTF-001 (page 19) OTF-002 (page 32) OTF-003 (page 21) , Open Redirect OTF-004 (page 34), Insecure Password Reset OTF-005 (page 36), Lack of Anti Automation OTF-006 (page 37), Unverified Email and 2FA Change OTF-007 (page 26) OTF-013 (page 28), Broken ACL OTF-009 (page 41), User Enumeration OTF-014 (page 48), Weak Configuration OTF-016 (page 53) , Arbitrary File Upload OTF-017 (page 55), Outdated software OTF-019 (page 58) and Improper Input Validation OTF-008 (page 39) OTF-010 (page 16) OTF-011 (page 43) OTF-012 (page 46) OTF-015 (page 50) OTF-018 (page 29) resulting in XSS.

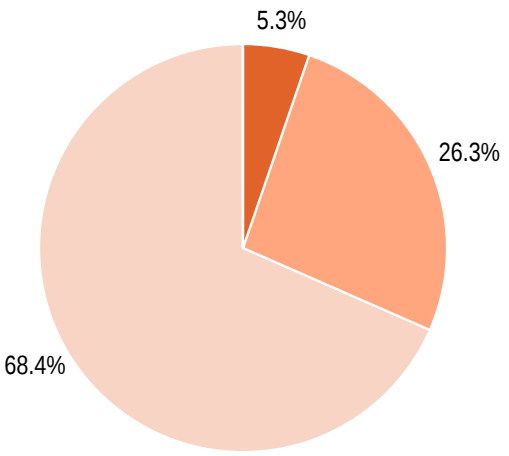
The Moderate and Low issues did not have a major immediate risk but when resolved would make it harder for adversaries to succeed to launch attacks against the application, infrastructure and users.

1.6 Summary of Findings

ID	Type	Description	Threat level
OTF-010	XSS	Several form fields that use TinyMCE allow the input of dangerous characters resulting in XSS when editing a form.	Elevated
OTF-001	TLS Misconfiguration	opentech.fund and apply.opentech.fund accept connections encrypted using TLS 1.0 and/or TLS 1.1. TLS 1.0 has a number of cryptographic design flaws. Modern implementations of TLS 1.0 mitigate these problems, but newer versions of TLS (TLS 1.2) are designed against these flaws and should be used whenever possible.	Moderate
OTF-003	TLS Misconfiguration	Opentech.fund and Apply.opentech.fund support insecure 3DES Ciphers.	Moderate
OTF-007	Unverified Change	There are no additional authentication checks, such as requiring a password or two-factor token, preventing logged in users from changing their email address. Email addresses are used for account recovery operations that can be abused by attackers.	Moderate
OTF-013	Unverified Change	Two-factor authentication (2FA) can be disabled without providing the current password.	Moderate
OTF-018	Insufficient Input Validation	The application incorrectly validates input that can affect the control flow or data flow of a program.	Moderate
OTF-002	TLS Misconfiguration	Opentech.fund and Apply.opentech.fund are configured to support Cipher Block Chaining (CBC) encryption.	Low
OTF-004	Open Redirect	The Subscribe Newletter is vulnerable to Open Redirection.	Low

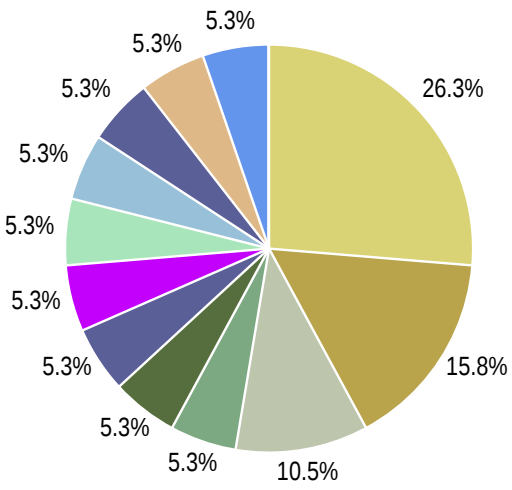
OTF-005	Insecure Password	The password reset functionality is by default set to 8 days and the reset token remains the same until it has been changed.	Low
OTF-006	Missing Anti-Automation	The application does not contain proper anti-automation to stop someone maliciously using functionality such as the Password Reset, Two-Factor-Authentication, Two-Factor-Authentication Backup Login, Newsletter subscription, Apply Forms and User Login.	Low
OTF-008	XSS	The Footer incorrectly validates input that results in Cross-Site-Scripting (XSS).	Low
OTF-009	Broken ACL	Low privileged users are able to Purge CDN and Cache.	Low
OTF-011	XSS	The Used By field incorrectly validates input that results in Cross-Site-Scripting (XSS).	Low
OTF-012	XSS	Cross-Site-Scripting (XSS) was found in Reviewer Role.	Low
OTF-014	User Enumeration	Valid users can be found by abusing the Profile Change Email address functionality.	Low
OTF-015	XSS	Cross-Site-Scripting (XSS) was found in the Review Forms.	Low
OTF-016	Security Misconfiguration	The Django SECRET_KEY is hardcoded and using a default value.	Low
OTF-017	Arbitrary File Upload	Arbitrary files can be uploaded using the Document File Upload functionality since there are no restrictions configured.	Low
OTF-019	Outdated Software	Outdated Packages which contain known vulnerabilities are in use.	Low

1.6.1 Findings by Threat Level



- Elevated (1)
- Moderate (5)
- Low (13)

1.6.2 Findings by Type



- XSS (5)
- Tls misconfiguration (3)
- Unverified change (2)
- Insufficient input validation (1)
- Open redirect (1)
- Insecure password (1)
- Missing anti-automation (1)
- Broken acl (1)
- User enumeration (1)
- Security misconfiguration (1)
- Arbitrary file upload (1)
- Outdated software (1)

1.7 Summary of Recommendations

ID	Type	Recommendation
OTF-010	XSS	All user input as well as output to users must be strictly filtered. Within these checks it is necessary to implement filter mechanisms that operate on a white list basis instead of a black list basis. It is recommended that parameters or input fields that can only consist of numerical values are only accepted by the server if they are in fact numeric. All checks have to be performed on the server and not on the client-side. To avoid cross-site scripting it is necessary to substitute special characters like [;()"´`,<>/] for their HTML equivalents. It is not sufficient to only filter special HTML tags like "script" because there exist countless alternatives to successfully exploit cross-site scripting vulnerabilities. More information can be found at: https://www.owasp.org/index.php/Cross_Site_Scripting
OTF-001	TLS Misconfiguration	Disable support of TLS 1.0. If possible also disable TLS 1.1. TLS 1.1 lacks support for current and recommended cipher suites. Ciphers that support encryption before MAC computation, and authenticated encryption modes such as GCM cannot be used with TLS 1.1. It is strongly recommended to use TLS 1.2 and higher.
OTF-003	TLS Misconfiguration	Disable the use of the insecure 3DES ciphers.
OTF-007	Unverified Change	Ensure the current password or a two-factor authentication token is required whenever a user attempts to change their email address.
OTF-013	Unverified Change	Require the user to provide their current password or token before 2FA can be disabled to add an additional layer of security.
OTF-018	Insufficient Input Validation	Preventing any dangerous characters in the first place could stop a lot of potential attacks. • Assume all input is malicious. Use an 'accept known good' input validation strategy i.e. use a whitelist of acceptable inputs that strictly conform to specifications. Reject any input that does not strictly conform to specifications, or transform it into something that does. • When performing input validation, consider all potentially relevant properties, including length, type of input, the full range of acceptable values, missing or extra inputs, syntax, consistency across related fields, and conformance to business rules. • Do not rely exclusively on looking for malicious or malformed inputs (i.e. do not rely on a blacklist). A blacklist is likely to miss at least one undesirable input, especially if the code's environment changes. This can give attackers enough room to bypass the intended validation. However blacklists can be useful for detecting potential attacks or determining which inputs are so malformed that they should be rejected outright. • For any security checks that are performed on the client side, ensure that these checks are duplicated on the server side. Attackers can bypass the client-side checks by modifying values after the checks have been performed, or by changing the client to remove the client-side checks entirely. Then these modified values would be submitted to the server. • Even though client-side checks provide minimal benefits with respect to server-side security, they are still useful. First, they can support

		intrusion detection. If the server receives input that should have been rejected by the client, then it may be an indication of an attack. Second, client-side error-checking can provide helpful feedback to the user about the expectations for valid input. Third, there may be a reduction in server-side processing time for accidental input errors, although this is typically a small savings. • When your application combines data from multiple sources, perform the validation after the sources have been combined. The individual data elements may pass the validation step but violate the intended restrictions after they have been combined. Inputs should be decoded and canonicalised to the application's current internal representation before being validated. • Make sure that your application does not inadvertently decode the same input twice. Such errors could be used to bypass whitelist schemes by introducing dangerous inputs after they have been checked. • Consider performing repeated canonicalisation until your input does not change any more. This will avoid double-decoding and similar scenarios, but it might inadvertently modify inputs that are allowed to contain properly-encoded dangerous content.
OTF-002	TLS Misconfiguration	Disable the use of TLS CBC ciphers. De-prioritizing these ciphers can also help minimize successful exploitation of real-world attacks. The attacker typically cannot force the selection of a specific cipher and therefore can only execute a CBC padding oracle attack if the client/server normally negotiates a vulnerable cipher.
OTF-004	Open Redirect	• Do not use user input for URLs. • If dynamic URLs are required, use whitelisting. Make a list of valid, accepted URLs and do not accept other URLs.
OTF-005	Insecure Password	Configure the password reset timeout to a maximum of 1 hour by using the `PASSWORD_RESET_TIMEOUT`
OTF-006	Missing Anti-Automation	Apply an anti-automation on the Password Reset, Two-Factor-Authentication, Two-Factor-Authentication Backup Login, Newsletter subscription, Apply Forms and User Login request. One of the common ways to do it would be implementing a Captcha (hCAPTCHA is very effective) on those pages and only show and enforce the use of it after a certain amount of requests per IP.
OTF-008	XSS	This appears to be by design (functionality is only accessible as a high priv user) but allowing dangerous tags in the first place is not best practice. In this case it is better to use a whitelist with accepted tags and attributes to limit the attack vector.
OTF-009	Broken ACL	Verify whether the current user is allowed to access the requested resource and deny access if this is not the case.
OTF-011	XSS	All user input as well as output to users must be strictly filtered. Within these checks it is necessary to implement filter mechanisms that operate on a white list basis instead of a black list basis. It is recommended that parameters or input fields that can only consist of numerical values are only accepted by the server if they are in fact numeric. All checks have to be performed on the server and not on the client-side. To avoid cross-site scripting it is necessary to substitute special characters like [;()"ˆ`,<>/] for their HTML equivalents. It is not sufficient to only filter special HTML tags like "script" because

		there exist countless alternatives to successfully exploit cross-site scripting vulnerabilities. More information can be found at: https://www.owasp.org/index.php/Cross_Site_Scripting
OTF-012	XSS	All user input as well as output to users must be strictly filtered. Within these checks it is necessary to implement filter mechanisms that operate on a white list basis instead of a black list basis. It is recommended that parameters or input fields that can only consist of numerical values are only accepted by the server if they are in fact numeric. All checks have to be performed on the server and not on the client-side. To avoid cross-site scripting it is necessary to substitute special characters like [;()"´`,<>/] for their HTML equivalents. It is not sufficient to only filter special HTML tags like "script" because there exist countless alternatives to successfully exploit cross-site scripting vulnerabilities. More information can be found at: https://www.owasp.org/index.php/Cross_Site_Scripting
OTF-014	User Enumeration	Modify the functionality to return only a generic response making it impossible to distinguish between a valid username and an invalid username and implement a Captcha (see also finding OTF-006) .
OTF-015	XSS	All user input as well as output to users must be strictly filtered. Within these checks it is necessary to implement filter mechanisms that operate on a white list basis instead of a black list basis. It is recommended that parameters or input fields that can only consist of numerical values are only accepted by the server if they are in fact numeric. All checks have to be performed on the server and not on the client-side. To avoid cross-site scripting it is necessary to substitute special characters like [;()"´`,<>/] for their HTML equivalents. It is not sufficient to only filter special HTML tags like "script" because there exist countless alternatives to successfully exploit cross-site scripting vulnerabilities. More information can be found at: https://www.owasp.org/index.php/Cross_Site_Scripting
OTF-016	Security Misconfiguration	• Automatically generate Strong Random Secret key instead of using a static key. • An alternative (but less secure) is to show a warning message to the administrator and prevent the application to (fully) work until the SECRET_KEY has been changed to something more secure.
OTF-017	Arbitrary File Upload	Verify all upload functionality and make sure that arbitrary upload is not allowed. In general, proper mitigation for insecure file upload usually involves a combination of various approaches: • Blacklisting of dangerous file extensions • Whitelisting of acceptable file types • Content-Type entity in the header of the request indicates the Internet media type of the message content • Using file recognizer that verifies file is of correct type • Adding the “Content-Disposition: Attachment” and “X-Content-Type-Options: nosniff” headers to the response of static files will secure the website against Flash or PDF-based cross-site content-hijacking attacks. It is recommended that this practice be performed for all of the files that users need to download in all the modules that deal with a file download. Although this method does not fully secure the website against attacks using Silverlight or similar objects, it can mitigate the risk of using Adobe Flash and PDF objects, especially when uploading PDF files is permitted.

		• Instant anti-virus checking with a back-end script or service A specific combination of approaches should consider technical and process constraints, also limitations imposed by the application design. More info can be found at OWASP Unrestricted File Upload.
OTF-019	Outdated Software	It is still recommended to always use the latest version where possible.

2 Methodology

2.1 Planning

Our general approach during penetration tests is as follows:

1. **Reconnaissance**
   We attempt to gather as much information as possible about the target. Reconnaissance can take two forms: active and passive. A passive attack is always the best starting point as this would normally defeat intrusion detection systems and other forms of protection afforded to the app or network. This usually involves trying to discover publicly available information by visiting websites, newsgroups, etc. An active form would be more intrusive, could possibly show up in audit logs and might take the form of a social engineering type of attack.
2. **Enumeration**
   We use various fingerprinting tools to determine what hosts are visible on the target network and, more importantly, try to ascertain what services and operating systems they are running. Visible services are researched further to tailor subsequent tests to match.
3. **Scanning**
   Vulnerability scanners are used to scan all discovered hosts for known vulnerabilities or weaknesses. The results are analyzed to determine if there are any vulnerabilities that could be exploited to gain access or enhance privileges to target hosts.
4. **Obtaining Access**
   We use the results of the scans to assist in attempting to obtain access to target systems and services, or to escalate privileges where access has been obtained (either legitimately though provided credentials, or via vulnerabilities). This may be done surreptitiously (for example to try to evade intrusion detection systems or rate limits) or by more aggressive brute-force methods. This step also consist of manually testing the application against the latest (2017) list of OWASP Top 10 risks. The discovered vulnerabilities from scanning and manual testing are moreover used to further elevate access on the application.

2.2 Risk Classification

Throughout the report, vulnerabilities or risks are labeled and categorized according to the Penetration Testing Execution Standard (PTES). For more information, see: http://www.pentest-standard.org/index.php/Reporting

These categories are:

- **Extreme**
  Extreme risk of security controls being compromised with the possibility of catastrophic financial/reputational losses occurring as a result.

- **High**

  High risk of security controls being compromised with the potential for significant financial/reputational losses occurring as a result.
- **Elevated**

  Elevated risk of security controls being compromised with the potential for material financial/reputational losses occurring as a result.
- **Moderate**

  Moderate risk of security controls being compromised with the potential for limited financial/reputational losses occurring as a result.
- **Low**

  Low risk of security controls being compromised with measurable negative impacts as a result.

3 Reconnaissance and Fingerprinting

We were able to gain information about the software and infrastructure through the following automated scans. Any relevant scan output will be referred to in the findings.

- nmap – http://nmap.org
- testssl.sh – https://github.com/drwetter/testssl.sh

4 Findings

We have identified the following issues:

4.1 OTF-010 — XSS in TinyMCE

Vulnerability ID: OTF-010 **Status:** Resolved

Vulnerability type: XSS

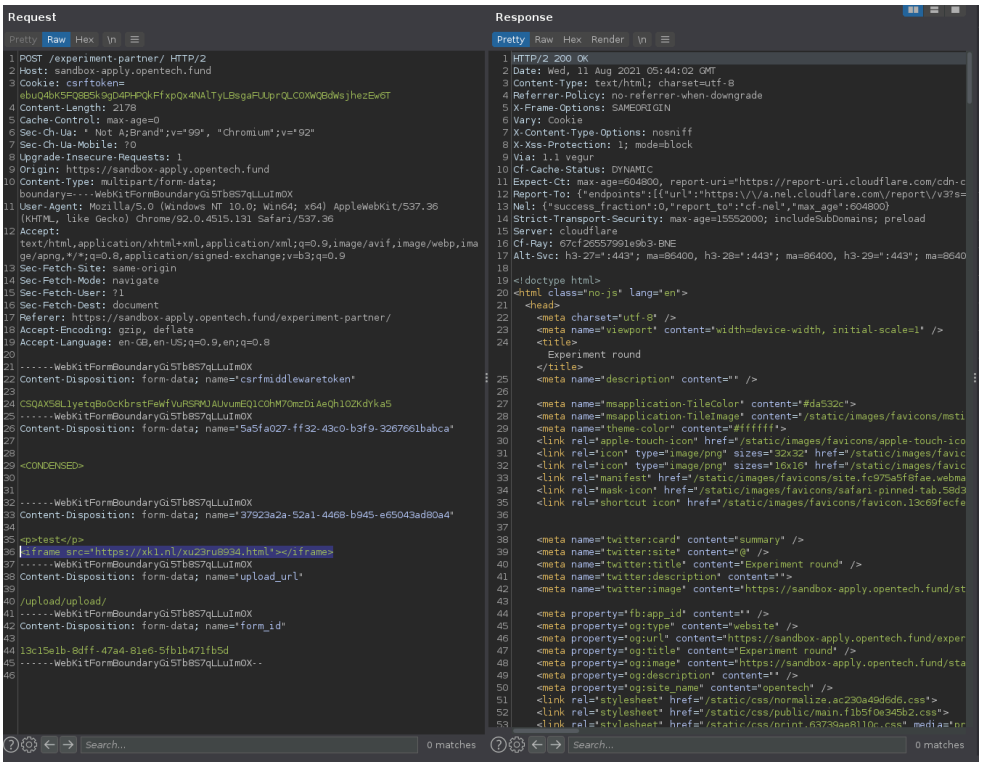
Threat level: Elevated

Description:

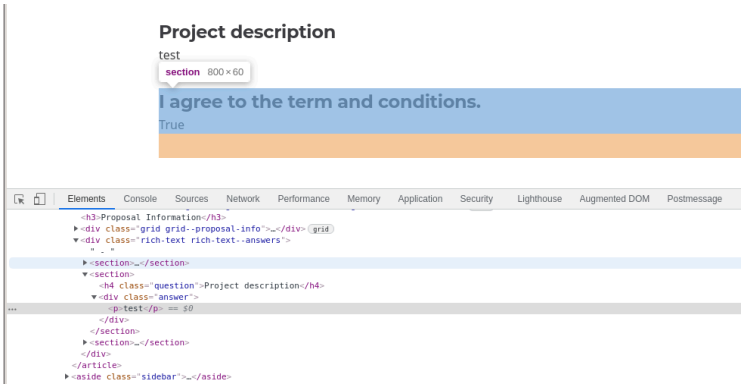
Several form fields that use TinyMCE allow the input of dangerous characters resulting in XSS when editing a form.

Technical description:

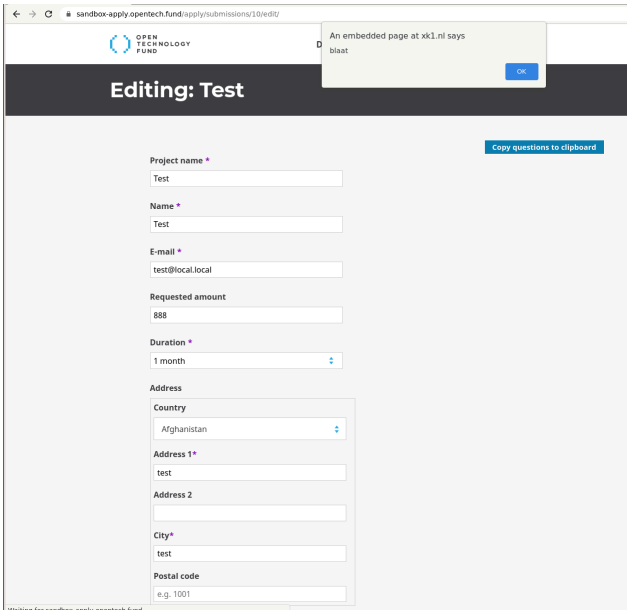
Send the following XSS payload:



This payload is accepted. When opening the actual submission (e.g. /apply/submissions/10/) the XSS has been stripped from the output:

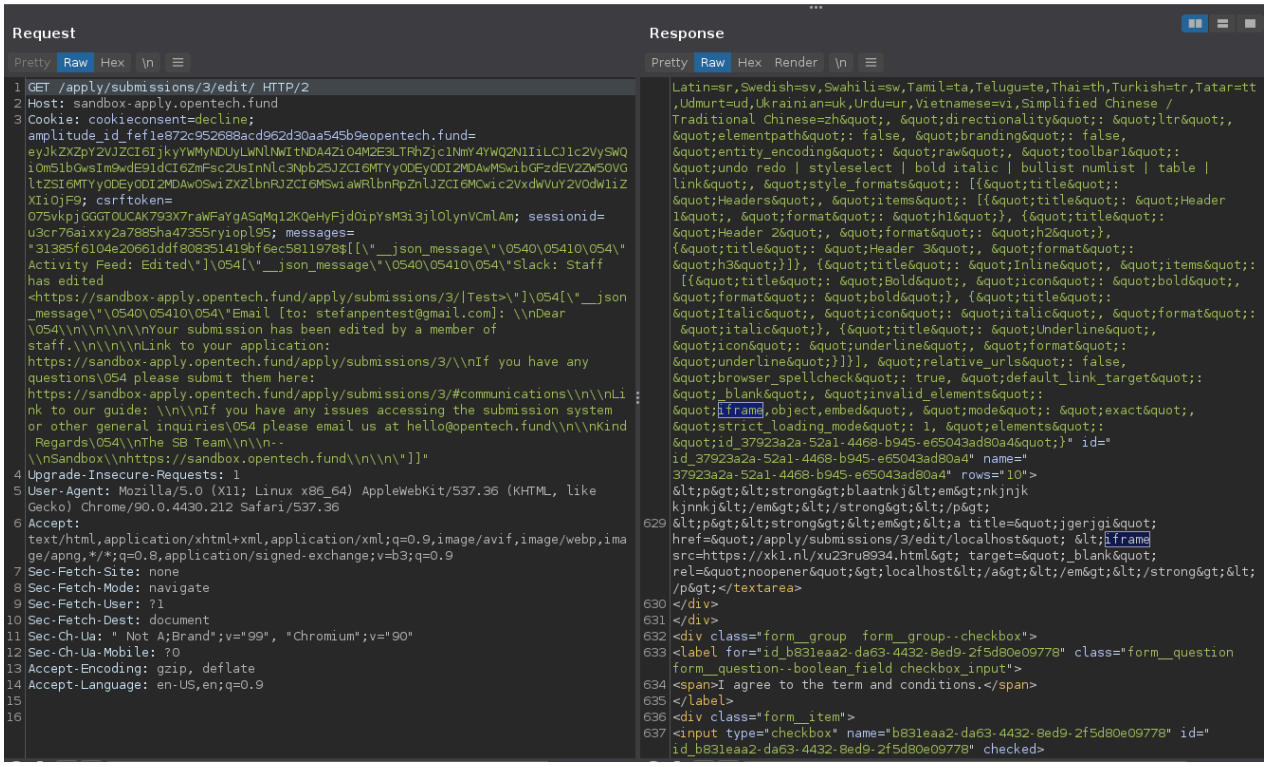


However when editing using TinyMCE (e.g. by staff member or admin) the XSS is shown:



Retest update:

This has been resolved:



Impact:

An unauthenticated user or low-privileged user (since everyone can register an account) is able to create a malicious XSS payload which could result in session hijacking, credential stealing, or infecting staff members with malware.

Recommendation:

All user input as well as output to users must be strictly filtered. Within these checks it is necessary to implement filter mechanisms that operate on a white list basis instead of a black list basis. It is recommended that parameters or input fields that can only consist of numerical values are only accepted by the server if they are in fact numeric. All checks have to be performed on the server and not on the client-side. To avoid cross-site scripting it is necessary to substitute special characters like [;()”´`,<>/] for their HTML equivalents. It is not sufficient to only filter special HTML tags like "script" because there exist countless alternatives to successfully exploit cross-site scripting vulnerabilities.

More information can be found at: https://www.owasp.org/index.php/Cross_Site_Scripting

4.2 OTF-001 — Support for Weak TLS 1.0 and TSL 1.1

Vulnerability ID: OTF-001	**Status:** Resolved
Vulnerability type: TLS Misconfiguration	
Threat level: Moderate	

Description:

`opentech.fund` and `apply.opentech.fund` accept connections encrypted using TLS 1.0 and/or TLS 1.1. TLS 1.0 has a number of cryptographic design flaws. Modern implementations of TLS 1.0 mitigate these problems, but newer versions of TLS (TLS 1.2) are designed against these flaws and should be used whenever possible.

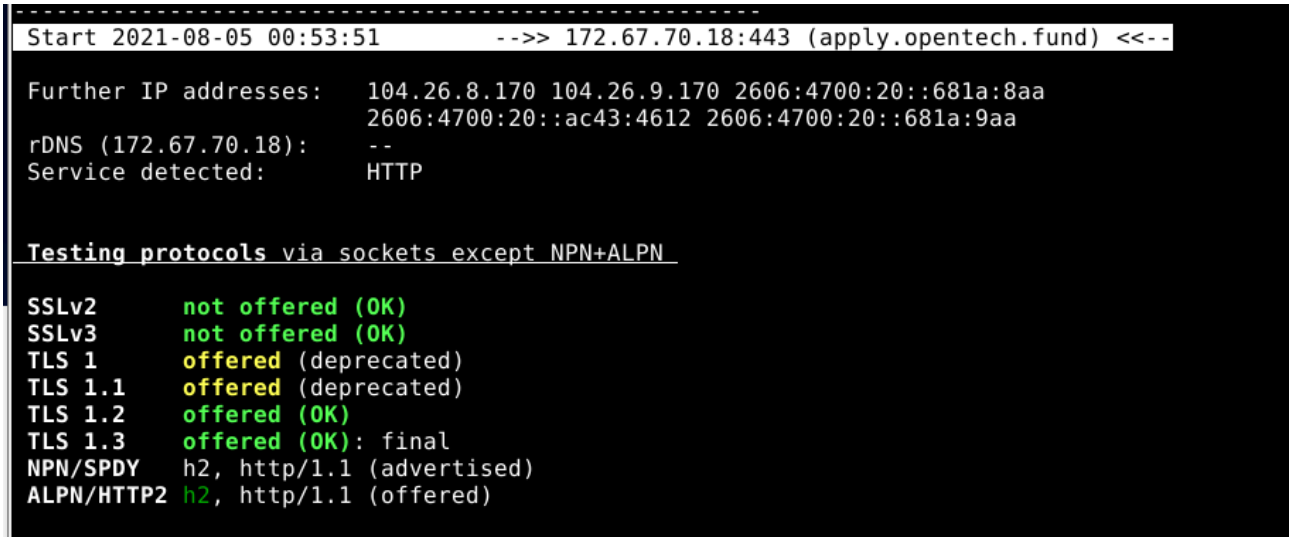
Technical description:

The PCI Council mandated that organizations migrate from TLS 1.0 to TLS 1.1 or higher before June 30, 2018, or risk being considered in breach of PCI DSS.

Since March 2020 Apple, Google, Microsoft, and Mozilla have disabled the use of TLS 1.0 and 1.1 in their browsers.

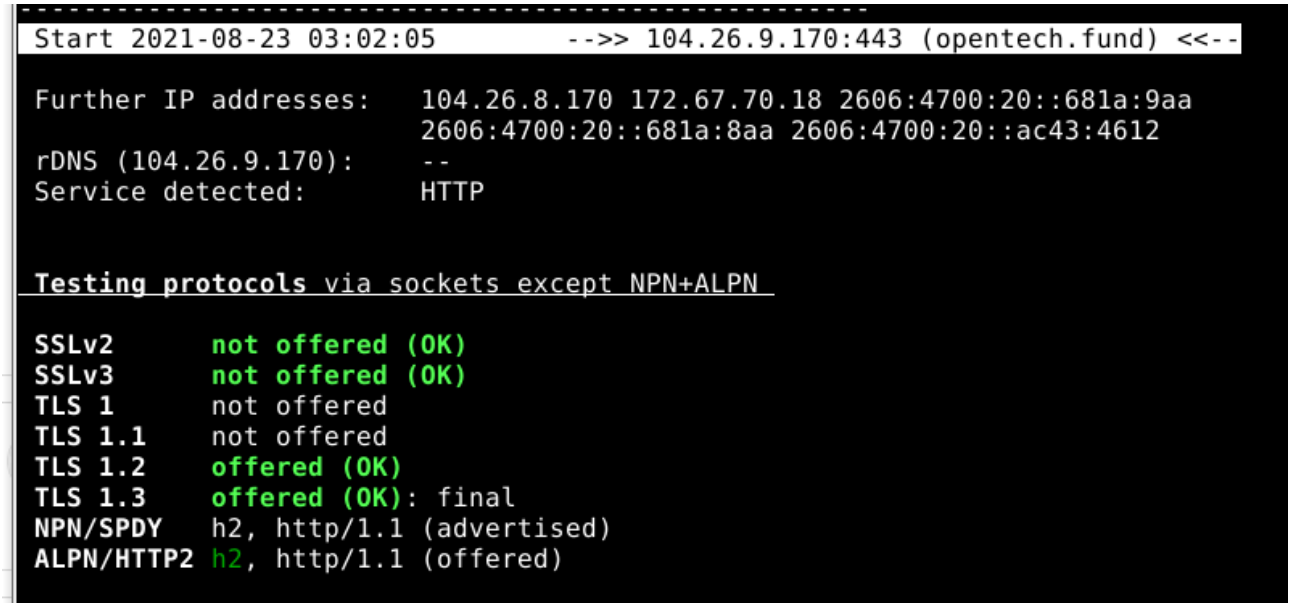
We tested the SSL configuration using testssl.sh:

```
--------------------------------------------------------
 Start 2021-08-05 00:56:39        -->> 104.26.9.170:443 (opentech.fund) <<--

 Further IP addresses:   104.26.8.170 172.67.70.18 2606:4700:20::681a:8aa
                         2606:4700:20::ac43:4612 2606:4700:20::681a:9aa
 rDNS (104.26.9.170):    --
 Service detected:       HTTP


 Testing protocols via sockets except NPN+ALPN

 SSLv2      not offered (OK)
 SSLv3      not offered (OK)
 TLS 1      offered (deprecated)
 TLS 1.1    offered (deprecated)
 TLS 1.2    offered (OK)
 TLS 1.3    offered (OK): final
 NPN/SPDY   h2, http/1.1 (advertised)
 ALPN/HTTP2 h2, http/1.1 (offered)
```



Retest update:

This has been resolved:



```
 Start 2021-08-23 03:03:05        -->> 104.26.8.170:443 (apply.opentech.fund) <<
--

 Further IP addresses:   104.26.9.170 172.67.70.18 2606:4700:20::681a:8aa
                         2606:4700:20::ac43:4612 2606:4700:20::681a:9aa
 rDNS (104.26.8.170):    --
 Service detected:       HTTP


 Testing protocols via sockets except NPN+ALPN

 SSLv2      not offered (OK)
 SSLv3      not offered (OK)
 TLS 1      not offered
 TLS 1.1    not offered
 TLS 1.2    offered (OK)
 TLS 1.3    offered (OK): final
 NPN/SPDY   h2, http/1.1 (advertised)
 ALPN/HTTP2 h2, http/1.1 (offered)

 Testing cipher categories
```

Impact:

Accepting TLS 1.0 and TLS 1.1 makes the data in transit vulnerable to attacks in which an attacker can capture the encrypted data and decrypt it.

Recommendation:

Disable support of TLS 1.0. If possible also disable TLS 1.1. TLS 1.1 lacks support for current and recommended cipher suites. Ciphers that support encryption before MAC computation, and authenticated encryption modes such as GCM cannot be used with TLS 1.1. It is strongly recommended to use TLS 1.2 and higher.

4.3 OTF-003 — Insecure 3DES Ciphers in use

Vulnerability ID: OTF-003	**Status:** Resolved
Vulnerability type: TLS Misconfiguration	
Threat level: Moderate	

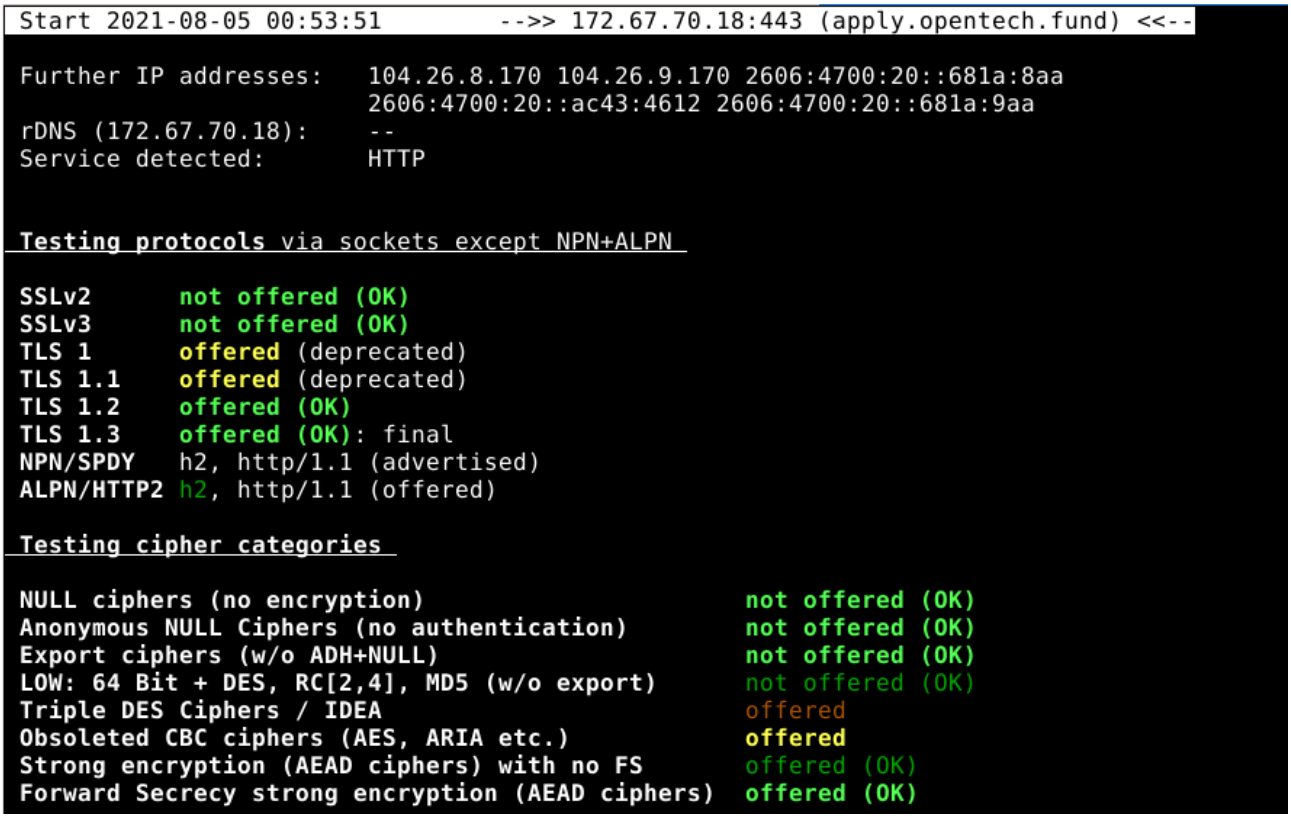
Description:

Opentech.fund and Apply.opentech.fund support insecure 3DES Ciphers.

Technical description:

The following webservers are configured to support insecure Triple DES (3DES).

Output from the testssl.sh tool:

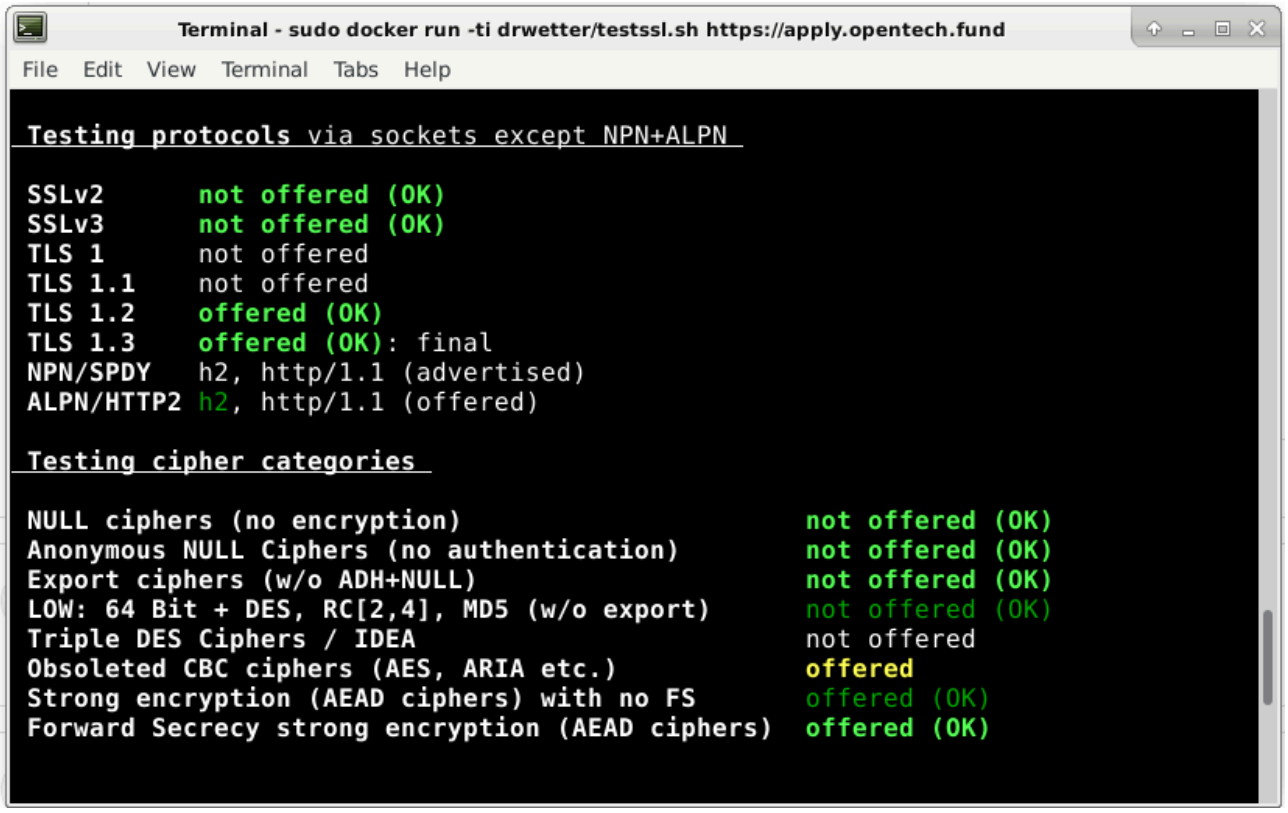


```
------------------------------------------------------
 Start 2021-08-05 00:52:37        -->> 104.26.8.170:443 (opentech.fund) <<--

 Further IP addresses:   104.26.9.170 172.67.70.18 2606:4700:20::681a:8aa
                         2606:4700:20::ac43:4612 2606:4700:20::681a:9aa
 rDNS (104.26.8.170):    --
 Service detected:       HTTP


 Testing protocols via sockets except NPN+ALPN

 SSLv2      not offered (OK)
 SSLv3      not offered (OK)
 TLS 1      offered (deprecated)
 TLS 1.1    offered (deprecated)
 TLS 1.2    offered (OK)
 TLS 1.3    offered (OK): final
 NPN/SPDY   h2, http/1.1 (advertised)
 ALPN/HTTP2 h2, http/1.1 (offered)

 Testing cipher categories

 NULL ciphers (no encryption)                      not offered (OK)
 Anonymous NULL Ciphers (no authentication)        not offered (OK)
 Export ciphers (w/o ADH+NULL)                     not offered (OK)
 LOW: 64 Bit + DES, RC[2,4], MD5 (w/o export)      not offered (OK)
 Triple DES Ciphers / IDEA                         offered
 Obsoleted CBC ciphers (AES, ARIA etc.)            offered
 Strong encryption (AEAD ciphers) with no FS       offered (OK)
 Forward Secrecy strong encryption (AEAD ciphers)  offered (OK)
```

```
Hexcode  Cipher Suite Name (OpenSSL)       KeyExch.   Encryption  Bits     Cipher Suite Name (IANA/RFC)
-----------------------------------------------------------------------------------------------------------------------------
SSLv2
 -
SSLv3
 -
TLSv1 (server order)
 xc013   ECDHE-RSA-AES128-SHA              ECDH 256   AES         128      TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA
 x2f     AES128-SHA                        RSA        AES         128      TLS_RSA_WITH_AES_128_CBC_SHA
 xc014   ECDHE-RSA-AES256-SHA              ECDH 256   AES         256      TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA
 x35     AES256-SHA                        RSA        AES         256      TLS_RSA_WITH_AES_256_CBC_SHA
 x0a     DES-CBC3-SHA                      RSA        3DES        168      TLS_RSA_WITH_3DES_EDE_CBC_SHA
TLSv1.1 (server order)
 xc013   ECDHE-RSA-AES128-SHA              ECDH 256   AES         128      TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA
 x2f     AES128-SHA                        RSA        AES         128      TLS_RSA_WITH_AES_128_CBC_SHA
 xc014   ECDHE-RSA-AES256-SHA              ECDH 256   AES         256      TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA
 x35     AES256-SHA                        RSA        AES         256      TLS_RSA_WITH_AES_256_CBC_SHA
TLSv1.2 (server order)
 xcc14   ECDHE-ECDSA-CHACHA20-POLY1305-OLD ECDH 253   ChaCha20    256      TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SH
 xcca9   ECDHE-ECDSA-CHACHA20-POLY1305     ECDH 253   ChaCha20    256      TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SH
 xc02b   ECDHE-ECDSA-AES128-GCM-SHA256     ECDH 253   AESGCM      128      TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256
 xc009   ECDHE-ECDSA-AES128-SHA            ECDH 253   AES         128      TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA
 xc023   ECDHE-ECDSA-AES128-SHA256         ECDH 253   AES         128      TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256
 xc02c   ECDHE-ECDSA-AES256-GCM-SHA384     ECDH 253   AESGCM      256      TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384
 xc00a   ECDHE-ECDSA-AES256-SHA            ECDH 253   AES         256      TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA
 xc024   ECDHE-ECDSA-AES256-SHA384         ECDH 253   AES         256      TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA384
 xcc13   ECDHE-RSA-CHACHA20-POLY1305-OLD   ECDH 253   ChaCha20    256      TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA2
 xcca8   ECDHE-RSA-CHACHA20-POLY1305       ECDH 253   ChaCha20    256      TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA2
```

Retest update:

This has been resolved.


Terminal - sudo docker run -ti drwetter/testssl.sh https://apply.opentech.fund
File Edit View Terminal Tabs Help
Testing protocols via sockets except NPN+ALPN
SSLv2 not offered (OK)
SSLv3 not offered (OK)
TLS 1 not offered
TLS 1.1 not offered
TLS 1.2 offered (OK)
TLS 1.3 offered (OK): final
NPN/SPDY h2, http/1.1 (advertised)
ALPN/HTTP2 h2, http/1.1 (offered)
Testing cipher categories
NULL ciphers (no encryption) not offered (OK)
Anonymous NULL Ciphers (no authentication) not offered (OK)
Export ciphers (w/o ADH+NULL) not offered (OK)
LOW: 64 Bit + DES, RC[2,4], MD5 (w/o export) not offered (OK)
Triple DES Ciphers / IDEA not offered
Obsoleted CBC ciphers (AES, ARIA etc.) offered
Strong encryption (AEAD ciphers) with no FS offered (OK)
Forward Secrecy strong encryption (AEAD ciphers) offered (OK)

```
------------------------------------------------------
 Start 2021-08-23 03:36:48        -->> 104.26.9.170:443 (opentech.fund) <<--

 Further IP addresses:   104.26.8.170 172.67.70.18 2606:4700:20::681a:9aa
                         2606:4700:20::681a:8aa 2606:4700:20::ac43:4612
 rDNS (104.26.9.170):    --
 Service detected:       HTTP


 Testing protocols via sockets except NPN+ALPN

 SSLv2      not offered (OK)
 SSLv3      not offered (OK)
 TLS 1      not offered
 TLS 1.1    not offered
 TLS 1.2    offered (OK)
 TLS 1.3    offered (OK): final
 NPN/SPDY   h2, http/1.1 (advertised)
 ALPN/HTTP2 h2, http/1.1 (offered)

 Testing cipher categories

 NULL ciphers (no encryption)                     not offered (OK)
 Anonymous NULL Ciphers (no authentication)       not offered (OK)
 Export ciphers (w/o ADH+NULL)                    not offered (OK)
 LOW: 64 Bit + DES, RC[2,4], MD5 (w/o export)     not offered (OK)
 Triple DES Ciphers / IDEA                        not offered
 Obsoleted CBC ciphers (AES, ARIA etc.)           offered
 Strong encryption (AEAD ciphers) with no FS      offered (OK)
 Forward Secrecy strong encryption (AEAD ciphers) offered (OK)


 Testing server's cipher preferences
```

Impact:

An attacker with a MitM (Machine in the Middle) position can potentially capture and intercept communication between server and clients.

Recommendation:

Disable the use of the insecure 3DES ciphers.

4.4 OTF-007 — Unverified Email Change

Vulnerability ID: OTF-007

Vulnerability type: Unverified Change

Threat level: Moderate

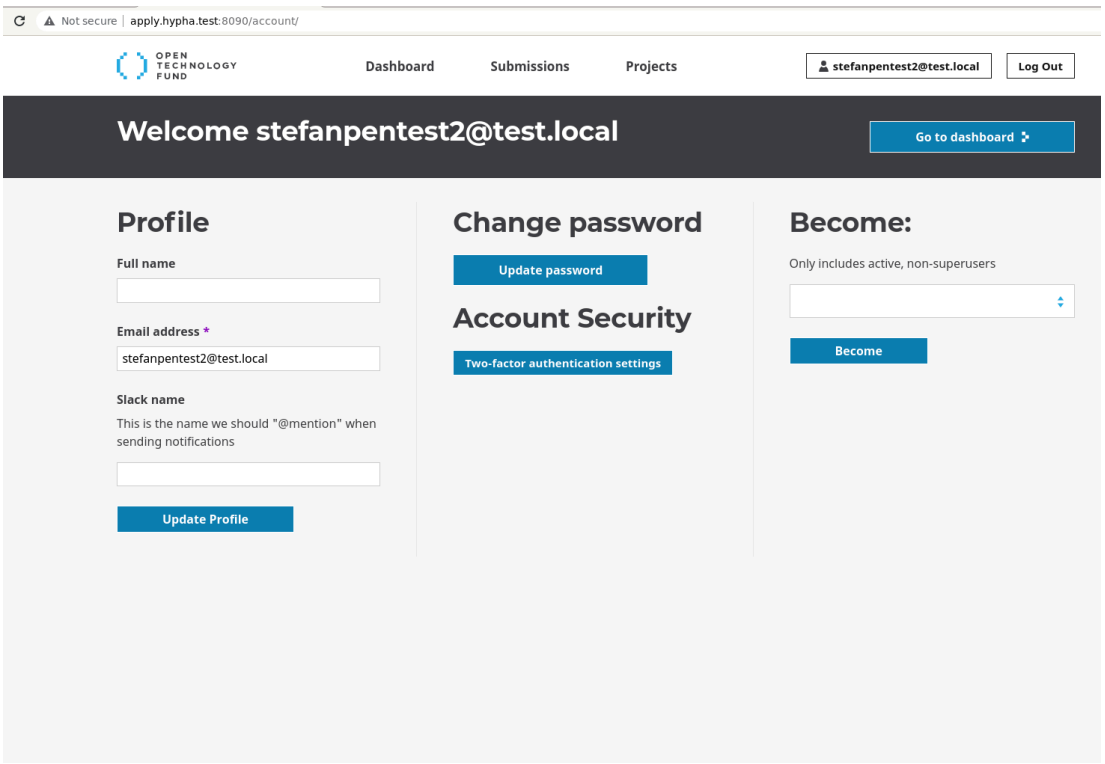
Description:

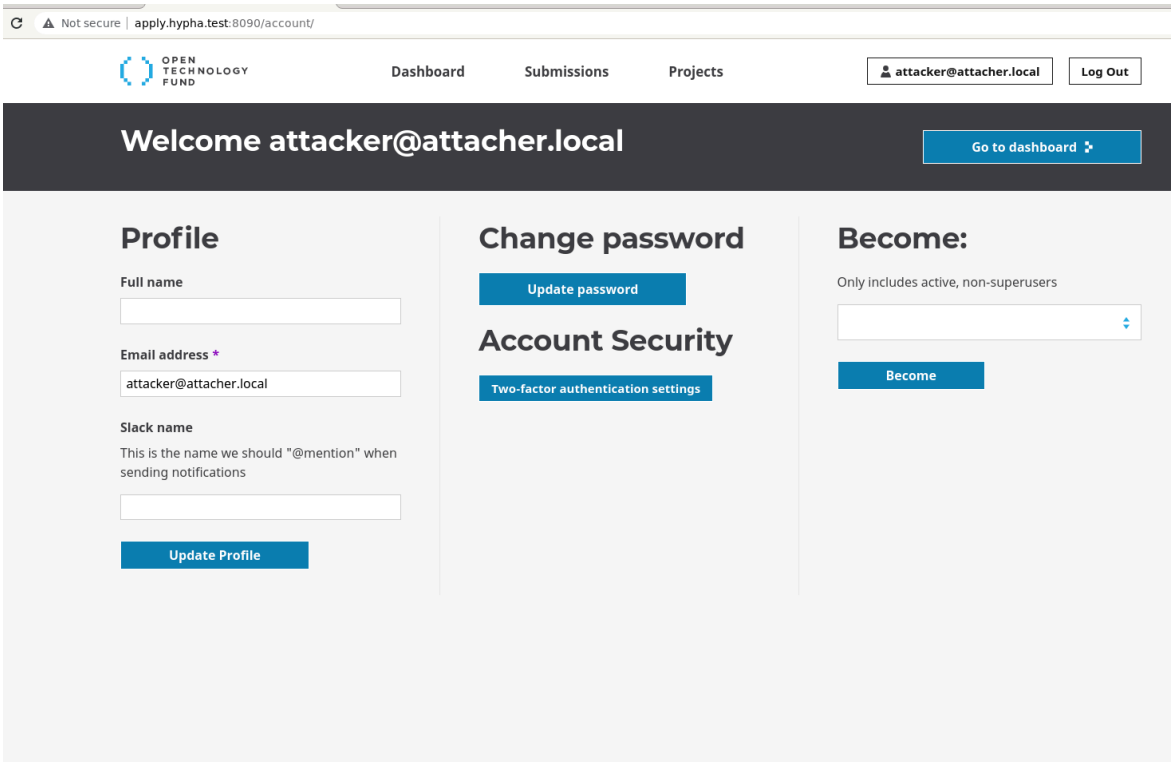
There are no additional authentication checks, such as requiring a password or two-factor token, preventing logged in users from changing their email address. Email addresses are used for account recovery operations that can be abused by attackers.

Technical description:

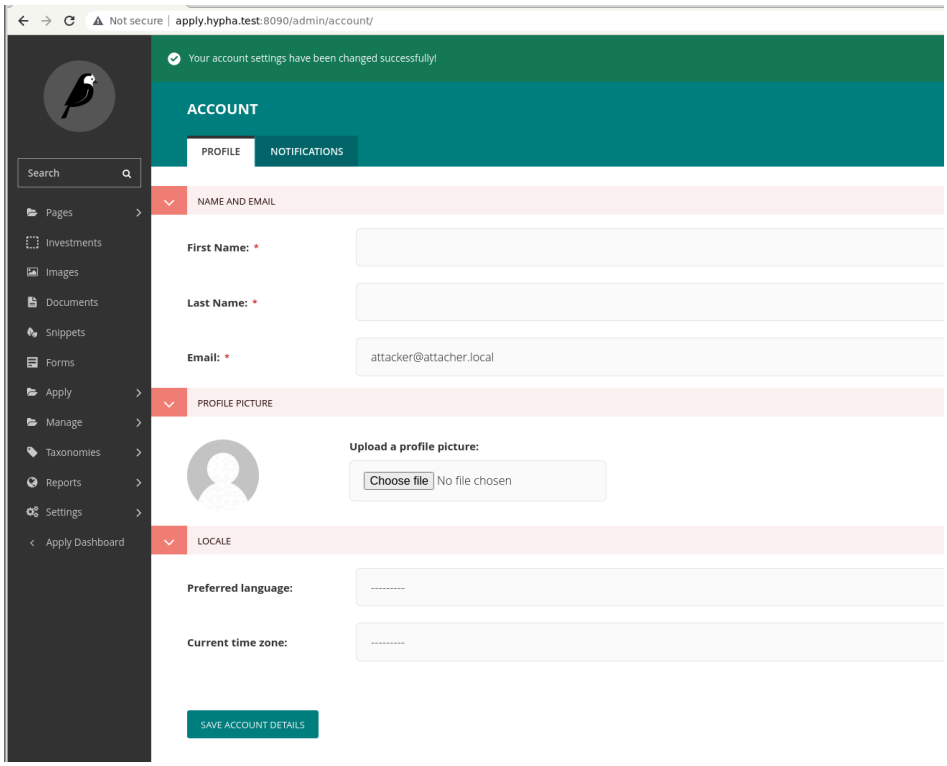
The Email address can be changed in Hypha and in Wagtail.

Changing the Email address in Hypha:





Changing the Email address in Wagtail:



Impact:

An attacker who gains temporary access to a victim's account (be it by exploiting a different vulnerability or by gaining physical access to the victim's machine, a common scenario in office settings) can change the victim's email address to a different address controlled by the attacker, enabling them to take full control of the victim's account by using the forgot password functionality.

Recommendation:

Ensure the current password or a two-factor authentication token is required whenever a user attempts to change their email address.

4.5 OTF-013 — Unverified 2FA change.

Vulnerability ID: OTF-013

Vulnerability type: Unverified Change

Threat level: Moderate

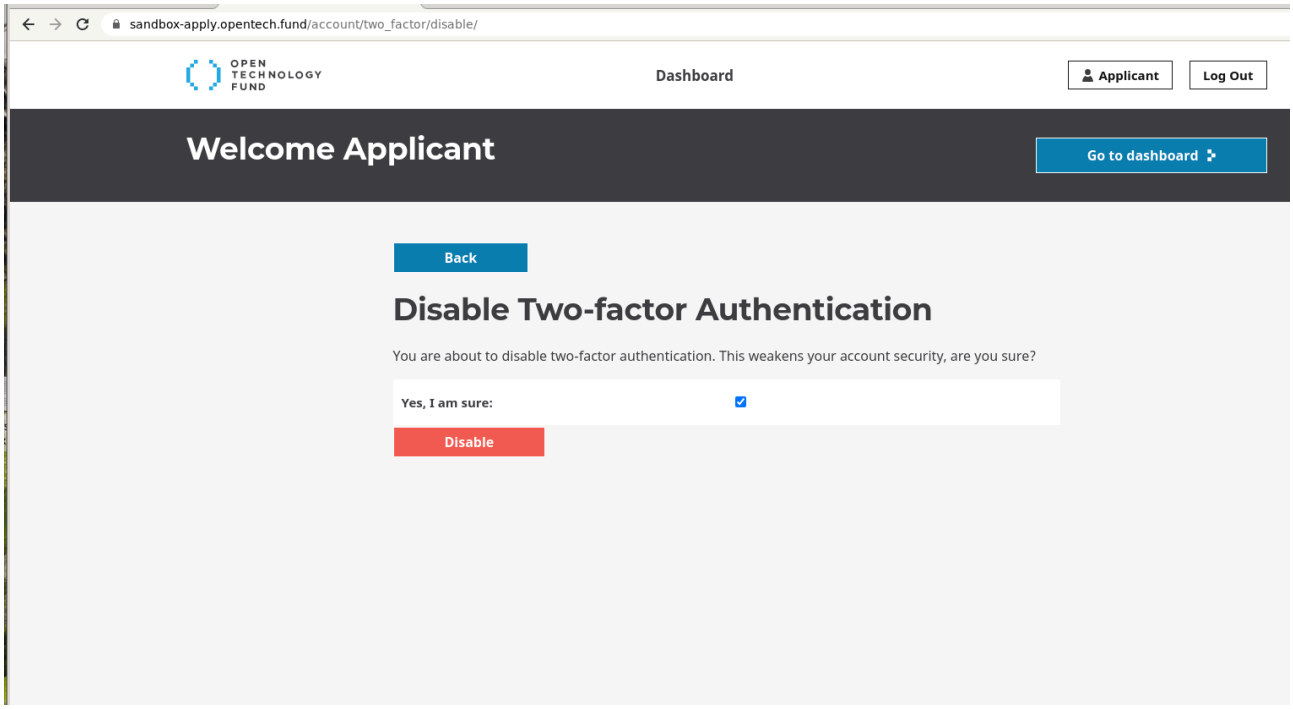
Description:

Two-factor authentication (2FA) can be disabled without providing the current password.

Technical description:

Two-factor authentication (2FA) is an electronic authentication method in which a user is granted access to a website or application only after successfully presenting two pieces of evidence to an authentication mechanism, for instance a password and a One-Time-Password.

It was found that 2FA can be disabled without providing the current user's password:



Impact:

This could allow an adversary to disable the user's 2FA, for instance by using a XSS attack or other attack.

Recommendation:

Require the user to provide their current password or token before 2FA can be disabled to add an additional layer of security.

4.6 OTF-018 — Improper Input Validation

Vulnerability ID: OTF-018

Vulnerability type: Insufficient Input Validation

Threat level: Moderate

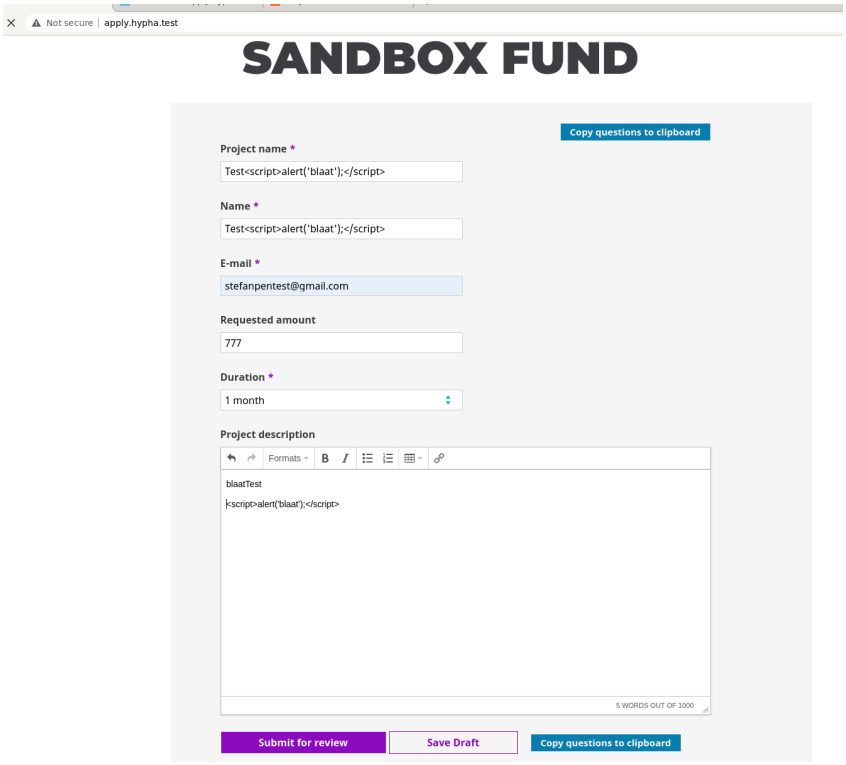
Description:

The application incorrectly validates input that can affect the control flow or data flow of a program.

Technical description:

Through the application dangerous input is accepted which resulted in several XSS vulnerabilities. It is important to not allow dangerous input in the first place by rejecting it. This can be done by first clientside - and secondly using server side validation.

The following form was sent containing dangerous characters and payload:



This results in the following data added to the database:

```
8190    {"email": "stefanpentest@gmail.com", "title": "Test<script>alert('blaat');</script>",
 "value": "777", "form_id": "654b9c40-fcbf-4c07-9e75-c9d85c093682", "duration": "1", "full_name":
 "<blaat>", "upload_url": "/upload/upload/", "baf64df2-33bd-47df-af4a-ec2033186447": "<p>blaat</
p>Test<script>alert('blaat');</script>"}  2021-08-23 16:47:45 17  19  7   in_discussion   double
  [{"type": "title", "value": {"field_label": "Project name", "help_text": "", "help_link": "",
 "info": null}, "id": "9de92dc4-7941-4a59-a96c-a59f1906c901"}, {"type": "full_name", "value":
 {"field_label": "Name", "help_text": "", "help_link": "", "info": null}, "id": "bdd9d0f3-
a3db-4951-8d4b-64a54d8eefbf"}, {"type": "email", "value": {"field_label": "E-mail", "help_text":
 "", "help_link": "", "info": null}, "id": "81c2d467-9bb7-4e33-8cf6-29131afe8a3c"}, {"type":
 "value", "value": {"field_label": "Requested amount", "help_text": "", "help_link": "", "required":
 false, "info": null}, "id": "632db418-54e1-4a73-b426-7f66d488c934"}, {"type": "duration",
 "value": {"field_label": "Duration", "help_text": "", "help_link": "", "duration_type": "months",
 "info": null}, "id": "68d21e58-d459-49ac-b0e8-45c81c56b361"}, {"type": "rich_text", "value":
 {"field_label": "Project description", "help_text": "", "help_link": "", "required": false,
 "default_value": "", "word_limit": 1000}, "id": "baf64df2-33bd-47df-af4a-ec2033186447"}]
 blaatTestalert('blaat'); Test<script>alert('blaat');</script> <blaat> stefanpentest@gmail.com 777 1
 <blaat> stefanpentest@gmail.com Test<script>alert('blaat');</script>    6          8225    8225
```

The output shows that most of the malicious input has been accepted by the application while it is recommended to not accept the input of potential malicious data in the first place to reduce the attack vector. For most payloads used in the

application the Django internal XSS protection does a good job but this does not stop all XSS attacks as was shown in several findings:

- OTF-008 (page 39)
- OTF-010 (page 16)
- OTF-011 (page 43)
- OTF-012 (page 46)
- OTF-015 (page 50)

This behavior has been found in most parts of the application as well and we would recommend the developer to implement additional security to reduce the attack vector.

Impact:

Allowing dangerous input could lead to XSS.

Recommendation:

Preventing any dangerous characters in the first place could stop a lot of potential attacks.

- Assume all input is malicious. Use an 'accept known good' input validation strategy i.e. use a whitelist of acceptable inputs that strictly conform to specifications. Reject any input that does not strictly conform to specifications, or transform it into something that does.
- When performing input validation, consider all potentially relevant properties, including length, type of input, the full range of acceptable values, missing or extra inputs, syntax, consistency across related fields, and conformance to business rules.
- Do not rely exclusively on looking for malicious or malformed inputs (i.e. do not rely on a blacklist). A blacklist is likely to miss at least one undesirable input, especially if the code's environment changes. This can give attackers enough room to bypass the intended validation. However blacklists can be useful for detecting potential attacks or determining which inputs are so malformed that they should be rejected outright.
- For any security checks that are performed on the client side, ensure that these checks are duplicated on the server side. Attackers can bypass the client-side checks by modifying values after the checks have been performed, or by changing the client to remove the client-side checks entirely. Then these modified values would be submitted to the server.
- Even though client-side checks provide minimal benefits with respect to server-side security, they are still useful. First, they can support intrusion detection. If the server receives input that should have been rejected by the client, then it may be an indication of an attack. Second, client-side error-checking can provide helpful feedback to the user about the expectations for valid input. Third, there may be a reduction in server-side processing time for accidental input errors, although this is typically a small savings.

- When your application combines data from multiple sources, perform the validation after the sources have been combined. The individual data elements may pass the validation step but violate the intended restrictions after they have been combined. Inputs should be decoded and canonicalised to the application's current internal representation before being validated.
- Make sure that your application does not inadvertently decode the same input twice. Such errors could be used to bypass whitelist schemes by introducing dangerous inputs after they have been checked.
- Consider performing repeated canonicalisation until your input does not change any more. This will avoid double-decoding and similar scenarios, but it might inadvertently modify inputs that are allowed to contain properly-encoded dangerous content.

4.7 OTF-002 — Obsoleted CBC ciphers

Vulnerability ID: OTF-002 **Status:** Unresolved

Vulnerability type: TLS Misconfiguration

Threat level: Low

Description:

Opentech.fund and Apply.opentech.fund are configured to support Cipher Block Chaining (CBC) encryption.

Technical description:

In cryptography, a padding oracle attack is an attack which uses the padding validation of a cryptographic message to decrypt the ciphertext.

Padding oracle attacks are mostly associated with CBC mode decryption used within block ciphers.

In symmetric cryptography, the padding oracle attack can be applied to the CBC mode of operation, where the 'oracle' (usually a server) leaks data about whether the padding of an encrypted message is correct or not. Such data can allow attackers to decrypt (and sometimes encrypt) messages through the oracle using the oracle's key, without knowing the encryption key.

The web-server is configured to support Cipher Block Chaining (CBC) encryption:

```
Start 2021-08-05 00:53:51        -->> 172.67.70.18:443 (apply.opentech.fund) <<--

Further IP addresses:   104.26.8.170 104.26.9.170 2606:4700:20::681a:8aa
                        2606:4700:20::ac43:4612 2606:4700:20::681a:9aa
rDNS (172.67.70.18):    --
Service detected:       HTTP


 Testing protocols via sockets except NPN+ALPN

 SSLv2      not offered (OK)
 SSLv3      not offered (OK)
 TLS 1      offered (deprecated)
 TLS 1.1    offered (deprecated)
 TLS 1.2    offered (OK)
 TLS 1.3    offered (OK): final
 NPN/SPDY   h2, http/1.1 (advertised)
 ALPN/HTTP2 h2, http/1.1 (offered)

 Testing cipher categories

 NULL ciphers (no encryption)                     not offered (OK)
 Anonymous NULL Ciphers (no authentication)       not offered (OK)
 Export ciphers (w/o ADH+NULL)                    not offered (OK)
 LOW: 64 Bit + DES, RC[2,4], MD5 (w/o export)     not offered (OK)
 Triple DES Ciphers / IDEA                        offered
 Obsoleted CBC ciphers (AES, ARIA etc.)           offered
 Strong encryption (AEAD ciphers) with no FS      offered (OK)
 Forward Secrecy strong encryption (AEAD ciphers) offered (OK)
```

```
--------------------------------------------------------
 Start 2021-08-05 00:52:37        -->> 104.26.8.170:443 (opentech.fund) <<--

 Further IP addresses:   104.26.9.170 172.67.70.18 2606:4700:20::681a:8aa
                         2606:4700:20::ac43:4612 2606:4700:20::681a:9aa
 rDNS (104.26.8.170):    --
 Service detected:       HTTP


 Testing protocols via sockets except NPN+ALPN

 SSLv2      not offered (OK)
 SSLv3      not offered (OK)
 TLS 1      offered (deprecated)
 TLS 1.1    offered (deprecated)
 TLS 1.2    offered (OK)
 TLS 1.3    offered (OK): final
 NPN/SPDY   h2, http/1.1 (advertised)
 ALPN/HTTP2 h2, http/1.1 (offered)

 Testing cipher categories

 NULL ciphers (no encryption)                     not offered (OK)
 Anonymous NULL Ciphers (no authentication)       not offered (OK)
 Export ciphers (w/o ADH+NULL)                    not offered (OK)
 LOW: 64 Bit + DES, RC[2,4], MD5 (w/o export)     not offered (OK)
 Triple DES Ciphers / IDEA                        offered
 Obsoleted CBC ciphers (AES, ARIA etc.)           offered
 Strong encryption (AEAD ciphers) with no FS      offered (OK)
 Forward Secrecy strong encryption (AEAD ciphers) offered (OK)
```

```
-
TLSv1 (server order)
 xc013   ECDHE-RSA-AES128-SHA              ECDH 256   AES         128      TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA
 x2f     AES128-SHA                        RSA        AES         128      TLS_RSA_WITH_AES_128_CBC_SHA
 xc014   ECDHE-RSA-AES256-SHA              ECDH 256   AES         256      TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA
 x35     AES256-SHA                        RSA        AES         256      TLS_RSA_WITH_AES_256_CBC_SHA
 x0a     DES-CBC3-SHA                      RSA        3DES        168      TLS_RSA_WITH_3DES_EDE_CBC_SHA
TLSv1.1 (server order)
 xc013   ECDHE-RSA-AES128-SHA              ECDH 256   AES         128      TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA
 x2f     AES128-SHA                        RSA        AES         128      TLS_RSA_WITH_AES_128_CBC_SHA
 xc014   ECDHE-RSA-AES256-SHA              ECDH 256   AES         256      TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA
 x35     AES256-SHA                        RSA        AES         256      TLS_RSA_WITH_AES_256_CBC_SHA
TLSv1.2 (server order)
 xcc14   ECDHE-ECDSA-CHACHA20-POLY1305-OLD ECDH 253   ChaCha20    256      TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256_OLD
 xcca9   ECDHE-ECDSA-CHACHA20-POLY1305     ECDH 253   ChaCha20    256      TLS_ECDHE_ECDSA_WITH_CHACHA20_POLY1305_SHA256
 xc02b   ECDHE-ECDSA-AES128-GCM-SHA256     ECDH 253   AESGCM      128      TLS_ECDHE_ECDSA_WITH_AES_128_GCM_SHA256
 xc009   ECDHE-ECDSA-AES128-SHA            ECDH 253   AES         128      TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA
 xc023   ECDHE-ECDSA-AES128-SHA256         ECDH 253   AES         128      TLS_ECDHE_ECDSA_WITH_AES_128_CBC_SHA256
 xc02c   ECDHE-ECDSA-AES256-GCM-SHA384     ECDH 253   AESGCM      256      TLS_ECDHE_ECDSA_WITH_AES_256_GCM_SHA384
 xc00a   ECDHE-ECDSA-AES256-SHA            ECDH 253   AES         256      TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA
 xc024   ECDHE-ECDSA-AES256-SHA384         ECDH 253   AES         256      TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA384
 xcc13   ECDHE-RSA-CHACHA20-POLY1305-OLD   ECDH 253   ChaCha20    256      TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA256_OLD
 xcca8   ECDHE-RSA-CHACHA20-POLY1305       ECDH 253   ChaCha20    256      TLS_ECDHE_RSA_WITH_CHACHA20_POLY1305_SHA256
 xc02f   ECDHE-RSA-AES128-GCM-SHA256       ECDH 253   AESGCM      128      TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256
 xc013   ECDHE-RSA-AES128-SHA              ECDH 253   AES         128      TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA
 xc027   ECDHE-RSA-AES128-SHA256           ECDH 253   AES         128      TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256
 x9c     AES128-GCM-SHA256                 RSA        AESGCM      128      TLS_RSA_WITH_AES_128_GCM_SHA256
 x2f     AES128-SHA                        RSA        AES         128      TLS_RSA_WITH_AES_128_CBC_SHA
 x3c     AES128-SHA256                     RSA        AES         128      TLS_RSA_WITH_AES_128_CBC_SHA256
 xc030   ECDHE-RSA-AES256-GCM-SHA384       ECDH 253   AESGCM      256      TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384
 xc014   ECDHE-RSA-AES256-SHA              ECDH 253   AES         256      TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA
 xc028   ECDHE-RSA-AES256-SHA384           ECDH 253   AES         256      TLS_ECDHE_RSA_WITH_AES_256_CBC_SHA384
 x9d     AES256-GCM-SHA384                 RSA        AESGCM      256      TLS_RSA_WITH_AES_256_GCM_SHA384
 x35     AES256-SHA                        RSA        AES         256      TLS_RSA_WITH_AES_256_CBC_SHA
 x3d     AES256-SHA256                     RSA        AES         256      TLS_RSA_WITH_AES_256_CBC_SHA256
TLSv1.3 (no server order, thus listed by strength)
 x1302   TLS_AES_256_GCM_SHA384            ECDH 253   AESGCM      256      TLS_AES_256_GCM_SHA384
 x1303   TLS_CHACHA20_POLY1305_SHA256      ECDH 253   ChaCha20    256      TLS_CHACHA20_POLY1305_SHA256
 x1301   TLS_AES_128_GCM_SHA256            ECDH 253   AESGCM      128      TLS_AES_128_GCM_SHA256
```

Impact:

An attacker properly positioned between a user and the server, for example in the same network segment as the victim, may be able to obtain unencrypted network traffic between the user and the server.

Recommendation:

Disable the use of TLS CBC ciphers. De-prioritizing these ciphers can also help minimize successful exploitation of real-world attacks. The attacker typically cannot force the selection of a specific cipher and therefore can only execute a CBC padding oracle attack if the client/server normally negotiates a vulnerable cipher.

4.8 OTF-004 — Open Redirect in Subscribe Newletter

Vulnerability ID: OTF-004

Vulnerability type: Open Redirect

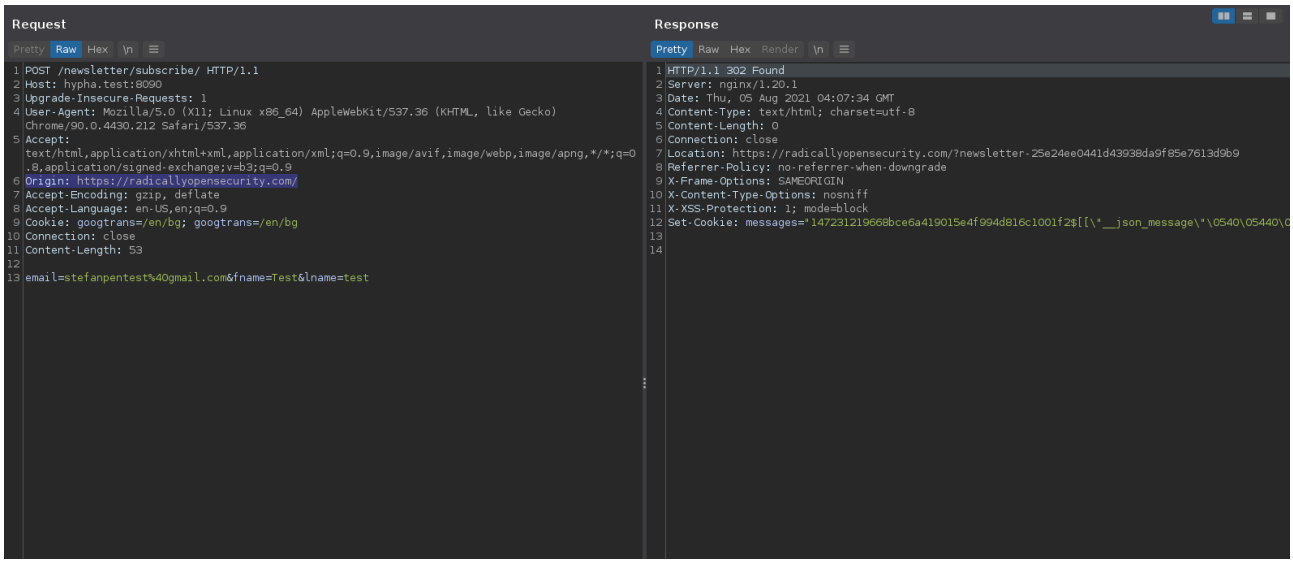
Threat level: Low

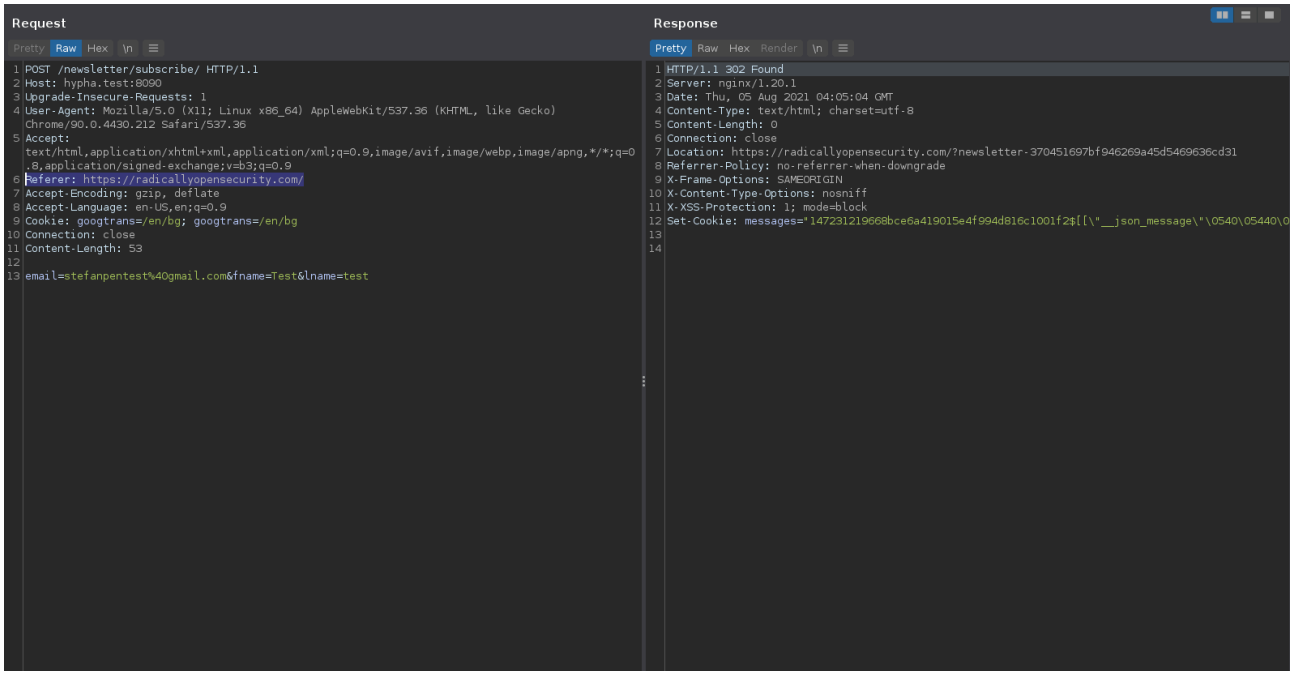
Description:

The Subscribe Newletter is vulnerable to Open Redirection.

Technical description:

The Referer and Origin, which the user is able to control, are used for the URL. In the examples below the user will be redirected to radicallyopensecurity.com instead of the Hypha web-application:





Impact:

Because the vulnerability can be only exploited via POST requests, its impact is very limited and it cannot be directly used for common Open Redirect attacks such as phishing.

Recommendation:

- Do not use user input for URLs.
- If dynamic URLs are required, use whitelisting. Make a list of valid, accepted URLs and do not accept other URLs.

4.9 OTF-005 — Insecure Password Reset

Vulnerability ID: OTF-005

Vulnerability type: Insecure Password

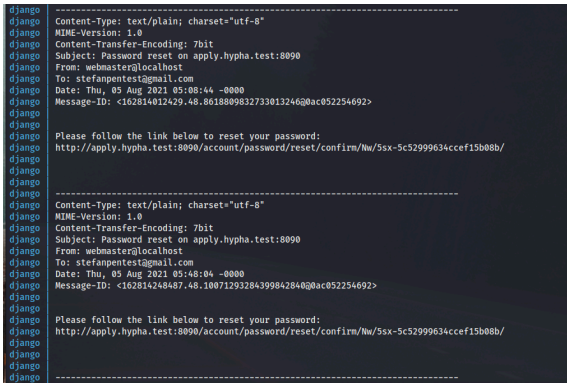
Threat level: Low

Description:

The password reset functionality is by default set to 8 days and the reset token remains the same until it has been changed.

Technical description:

Password link remains the same:



The link does change after the password (including using the same password) has been reset.

Default set to 8 days:

base.py

```
WAGTAIL_CACHE_BACKEND = 'wagtailcache'

# Cloudflare cache invalidation.
# See https://docs.wagtail.io/en/v2.8/reference/contrib/frontendcache.html
if 'CLOUDFLARE_BEARER_TOKEN' in env and 'CLOUDFLARE_API_ZONEID' in env:
    INSTALLED_APPS += ('wagtail.contrib.frontend_cache', )  # noqa
    WAGTAILFRONTENDCACHE = {
        'cloudflare': {
            'BACKEND': 'wagtail.contrib.frontend_cache.backends.CloudflareBackend',
            'BEARER_TOKEN': env['CLOUDFLARE_BEARER_TOKEN'],
            'ZONEID': env['CLOUDFLARE_API_ZONEID'],
        },
    }


# Search

WAGTAILSEARCH_BACKENDS = {
    'default': {
        'BACKEND': 'wagtail.contrib.postgres_search.backend',
    },
}


# Password validation
# https://docs.djangoproject.com/en/stable/ref/settings/#auth-password-validators

AUTH_PASSWORD_VALIDATORS = [
    {
        'NAME': 'django.contrib.auth.password_validation.MinimumLengthValidator',
        'OPTIONS': {
            'min_length': 12,
        }
    },
    {
        'NAME': 'django.contrib.auth.password_validation.UserAttributeSimilarityValidator',
    },
    {
        'NAME': 'django_pwned_passwords.password_validation.PWNEDPasswordValidator',
    },
]

# Number of days that password reset and account activation links are valid (default 3).
PASSWORD_RESET_TIMEOUT_DAYS = 8
```

Impact:

If the email of a user gets compromised, even if the user changes the associated email address, an attacker can still hack into the victim's account using a password reset link sent to the older email.

Recommendation:

Configure the password reset timeout to a maximum of 1 hour by using the `PASSWORD_RESET_TIMEOUT`

4.10 OTF-006 — Lack of Anti Automation

Vulnerability ID: OTF-006

Vulnerability type: Missing Anti-Automation

Threat level: Low

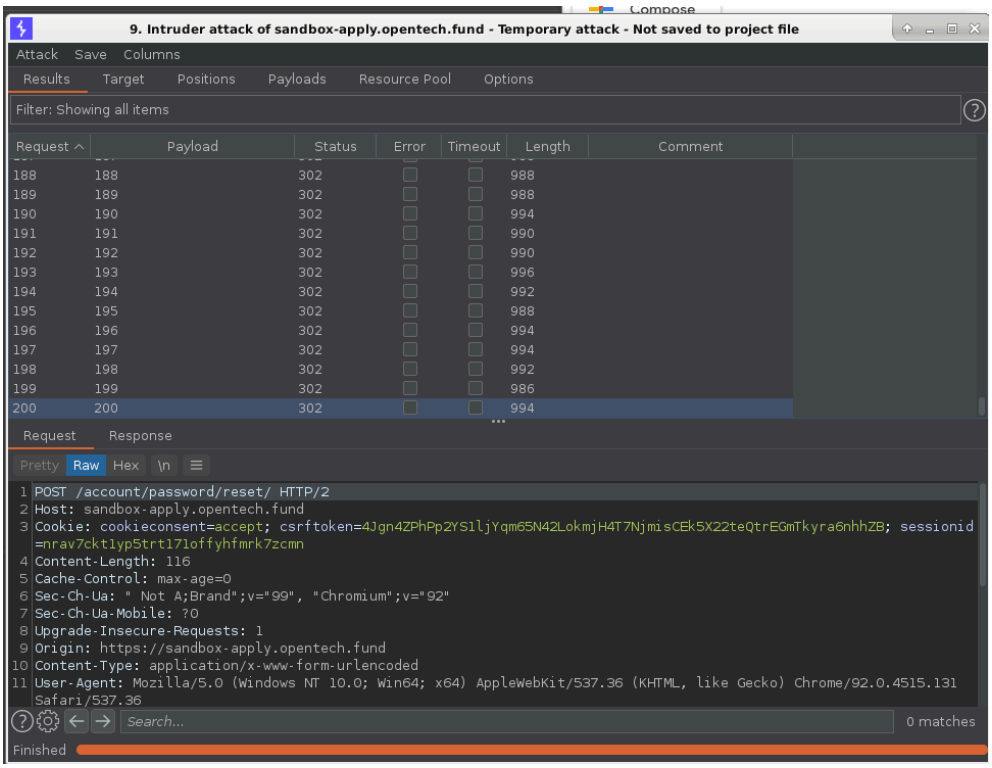
Description:

The application does not contain proper anti-automation to stop someone maliciously using functionality such as the Password Reset, Two-Factor-Authentication, Two-Factor-Authentication Backup Login, Newsletter subscription, Apply Forms and User Login.

Technical description:

Example of abusing the password reset functionality.

200 password requests were issued within 5 seconds:



Result a flooded mailbox:

Note that the client mentioned that they are using strong passwords and that high privileged accounts are using mandatory 2FA. Passwords are checked against the Haveibeenpowned database as well. This makes successfully brute-forcing account access not feasible but other attacks remain feasible.

Impact:

It is possible to automate the submission of this request with random data and flood the application's database with huge data. It may (technically) also lead to DOS attack on the application/database.

Recommendation:

Apply an anti-automation on the Password Reset, Two-Factor-Authentication, Two-Factor-Authentication Backup Login, Newsletter subscription, Apply Forms and User Login request. One of the common ways to do it would be implementing a Captcha (hCAPTCHA is very effective) on those pages and only show and enforce the use of it after a certain amount of requests per IP.

4.11 OTF-008 — XSS in Footer

Vulnerability ID: OTF-008

Vulnerability type: XSS

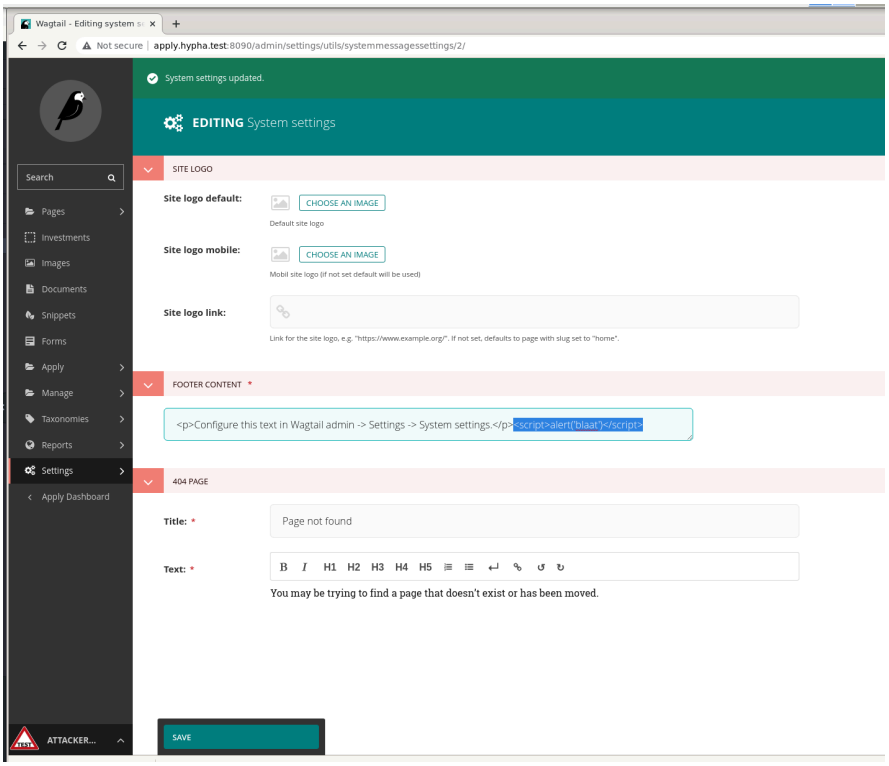
Threat level: Low

Description:

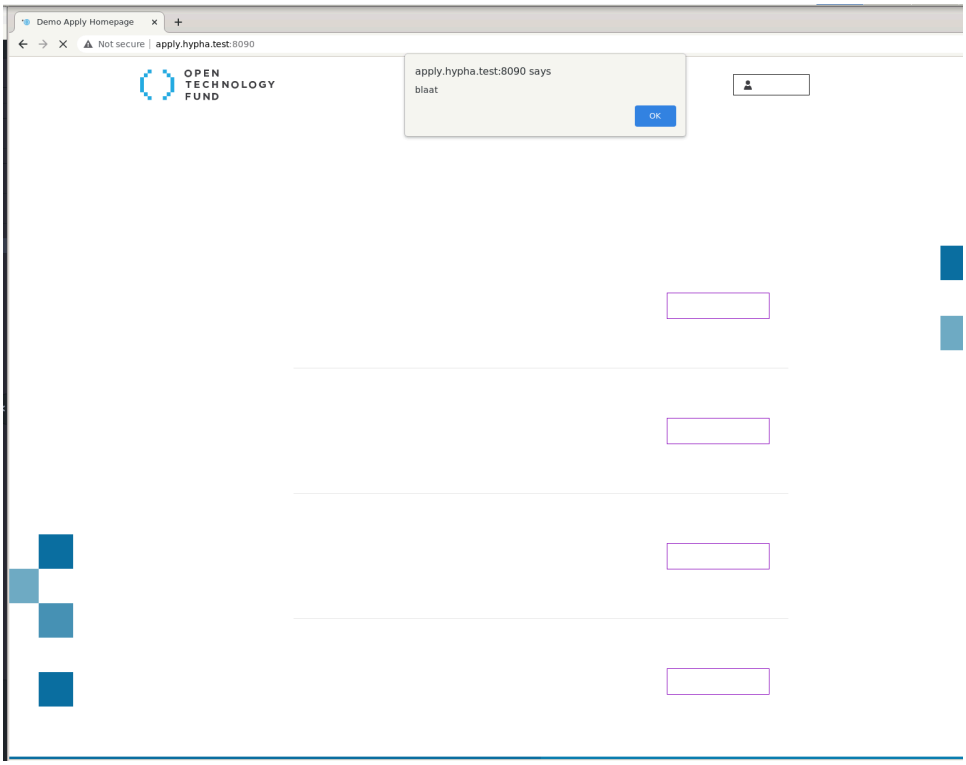
The Footer incorrectly validates input that results in Cross-Site-Scripting (XSS).

Technical description:

Add XSS Payload to footer:



Results in XSS:



Impact:

This XSS can only be created and triggered by high privileged users (e.g staff and admin) making it a Low impact. However it is still recommended to not allow XSS in the first place since a successful attack could lead to session hijack, credential stealing, or infecting systems with malware.

Recommendation:

This appears to be by design (functionality is only accessible as a high priv user) but allowing dangerous tags in the first place is not best practice. In this case it is better to use a whitelist with accepted tags and attributes to limit the attack vector.

4.12 OTF-009 — Low privileged user able to Purge CDN and Cache.

Vulnerability ID: OTF-009

Vulnerability type: Broken ACL

Threat level: Low

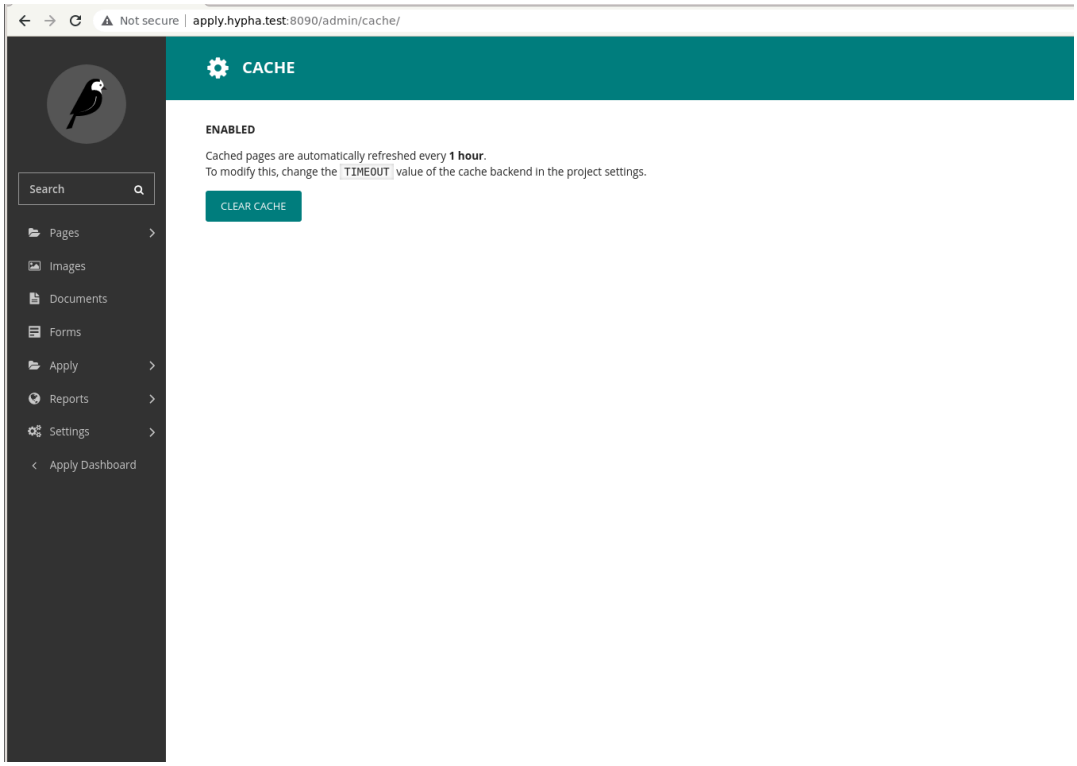
Description:

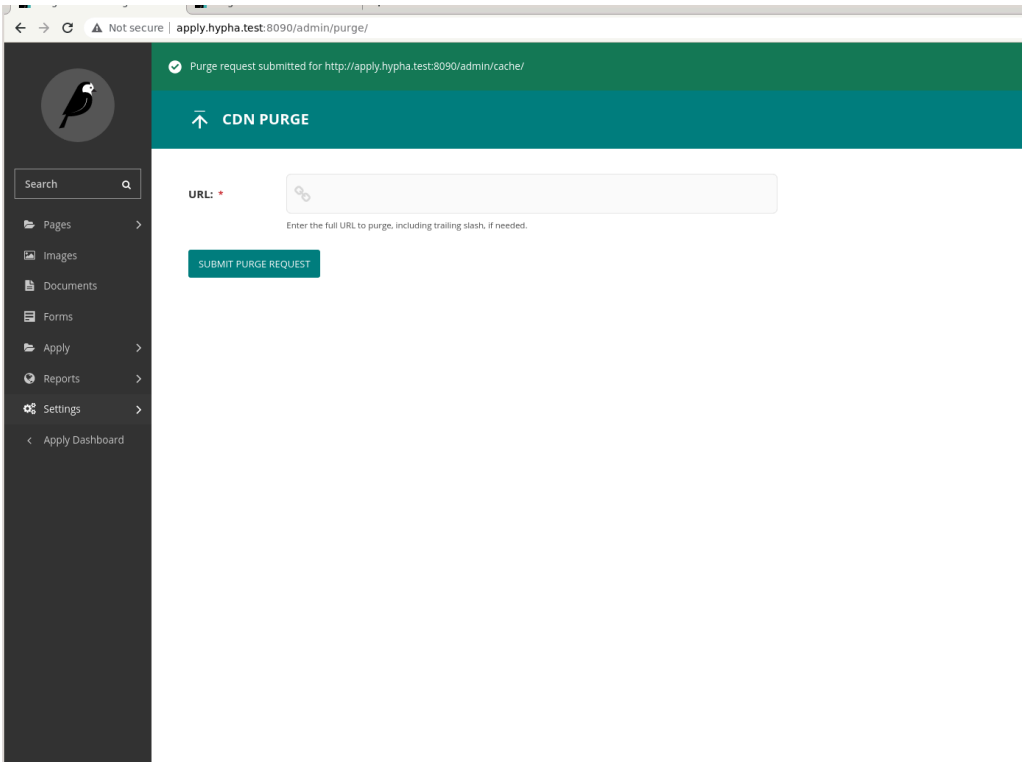
Low privileged users are able to Purge CDN and Cache.

Technical description:

Staff members (high privileged users), Editors and Moderators do not see the Purge CDN and Cache functionality in the User Interface but are still able to access and use the functionality by using the following URL's:

```
http://apply.hypha.test:8090/admin/cache/
http://apply.hypha.test:8090/admin/purge/
```


Not secure | apply.hypha.test:8090/admin/cache/
CACHE
ENABLED
Cached pages are automatically refreshed every 1 hour.
To modify this, change the TIMEOUT value of the cache backend in the project settings.
CLEAR CACHE
Search
Pages
Images
Documents
Forms
Apply
Reports
Settings
Apply Dashboard


Not secure | apply.hypha.test:8090/admin/purge/
Purge request submitted for http://apply.hypha.test:8090/admin/cache/
CDN PURGE
URL: *
Enter the full URL to purge, including trailing slash, if needed.
SUBMIT PURGE REQUEST
Search
Pages
Images
Documents
Forms
Apply
Reports
Settings
Apply Dashboard

Impact:

Impact is low since no possibility of abuse was found during testing, but new introduced functionality could make this issue more severe. In general it is recommended to prevent users accessing functionality they should not have access to.

Recommendation:

Verify whether the current user is allowed to access the requested resource and deny access if this is not the case.

4.13 OTF-011 — XSS in Used By

Vulnerability ID: OTF-011

Vulnerability type: XSS

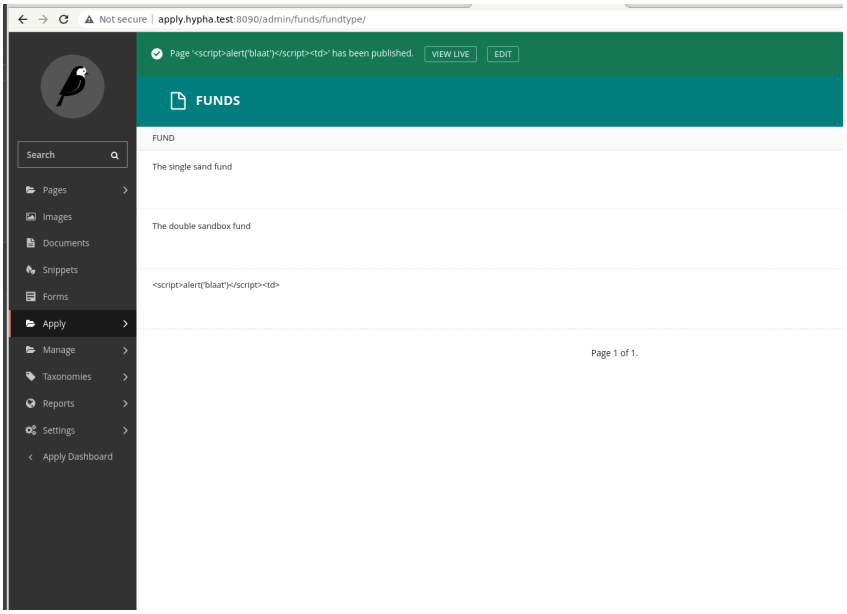
Threat level: Low

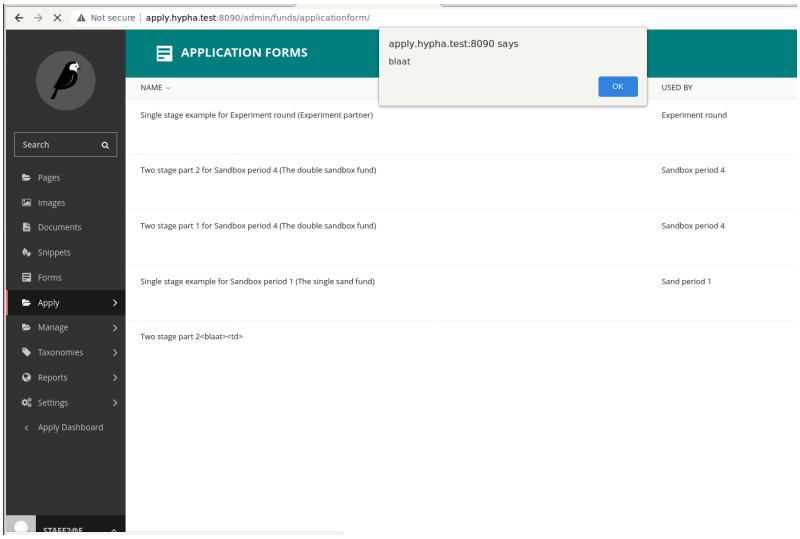
Description:

The Used By field incorrectly validates input that results in Cross-Site-Scripting (XSS).

Technical description:

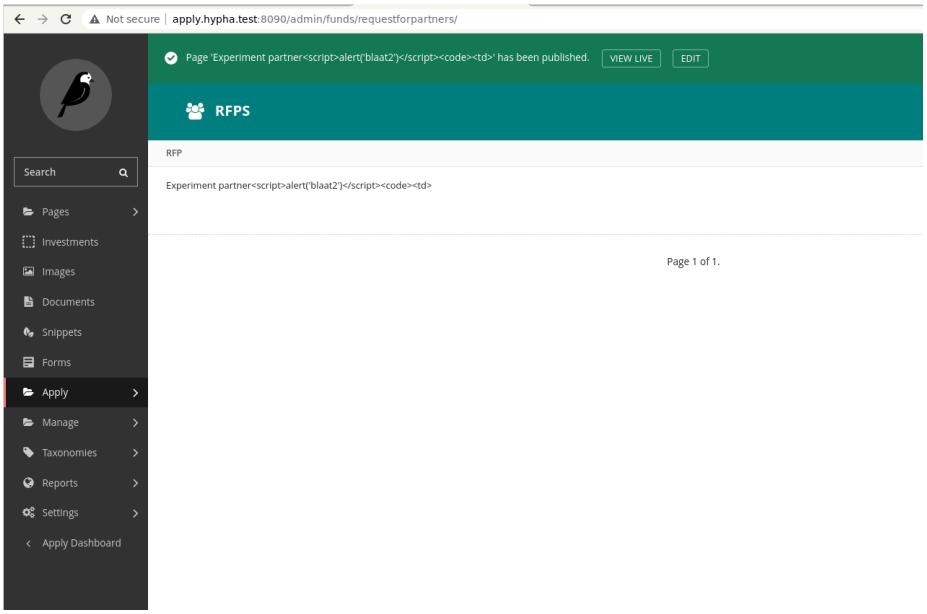
Add XSS payload to Fundtype:

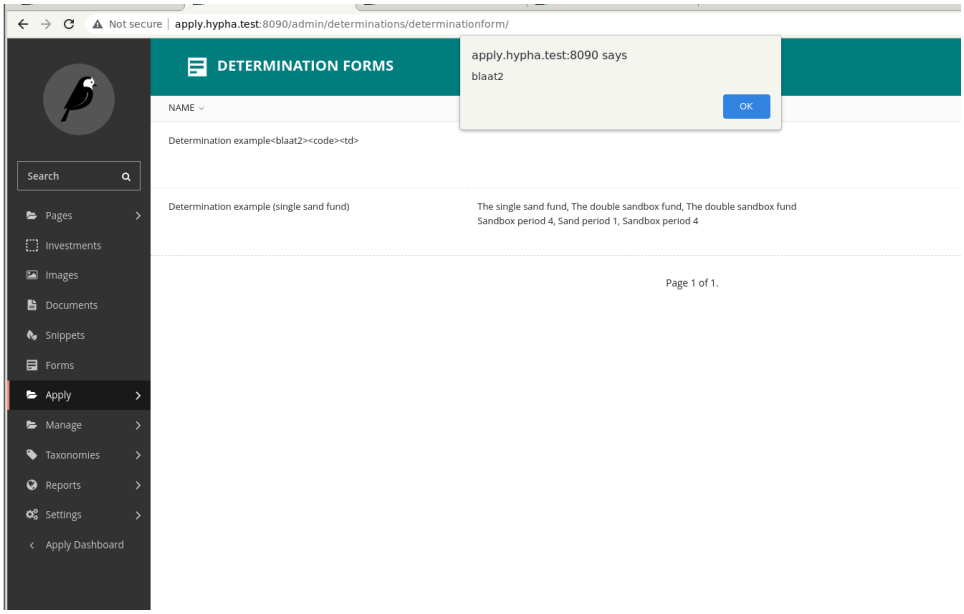


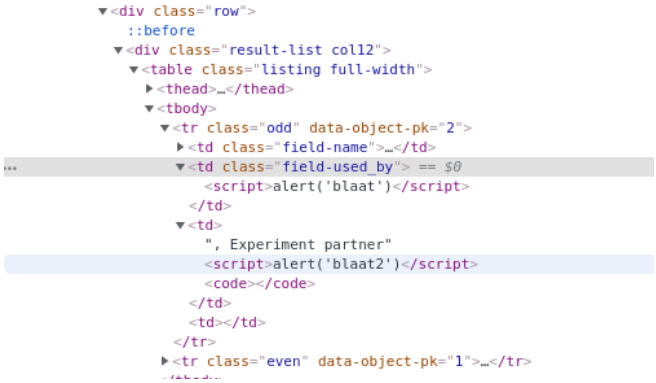



```
▼<tbody>
  ▶<tr class="odd" data-object-pk="7">…</tr>
  ▶<tr class="even" data-object-pk="6">…</tr>
  ▶<tr class="odd" data-object-pk="5">…</tr>
  ▶<tr class="even" data-object-pk="4">…</tr>
  ▼<tr class="odd" data-object-pk="3">
    ▶<td class="field-name">…</td>
    ▼<td class="field-used_by"> == $0
        <script>alert('blaat')</script>
      </td>
      <td>, The double sandbox fund</td>
    </tr>
```

Or add XSS payload to RFPs:







The XSS can also be added to the following forms:

- Determinationform (/admin/determinations/determinationform/)
- Reviewform (/admin/review/reviewform/)

Impact:

This XSS can only be created and triggered by high privileged users (e.g staff and admin) making it a Low impact. However it is still recommended to not allow XSS in the first place since a successful attack could lead to session hijack, credential stealing, or infecting systems with malware.

Recommendation:

All user input as well as output to users must be strictly filtered. Within these checks it is necessary to implement filter mechanisms that operate on a white list basis instead of a black list basis. It is recommended that parameters or input

fields that can only consist of numerical values are only accepted by the server if they are in fact numeric. All checks have to be performed on the server and not on the client-side. To avoid cross-site scripting it is necessary to substitute special characters like [;()”´`,<>/] for their HTML equivalents. It is not sufficient to only filter special HTML tags like "script" because there exist countless alternatives to successfully exploit cross-site scripting vulnerabilities.

More information can be found at: https://www.owasp.org/index.php/Cross_Site_Scripting

4.14 OTF-012 — XSS in Reviewer Role.

Vulnerability ID: OTF-012

Vulnerability type: XSS

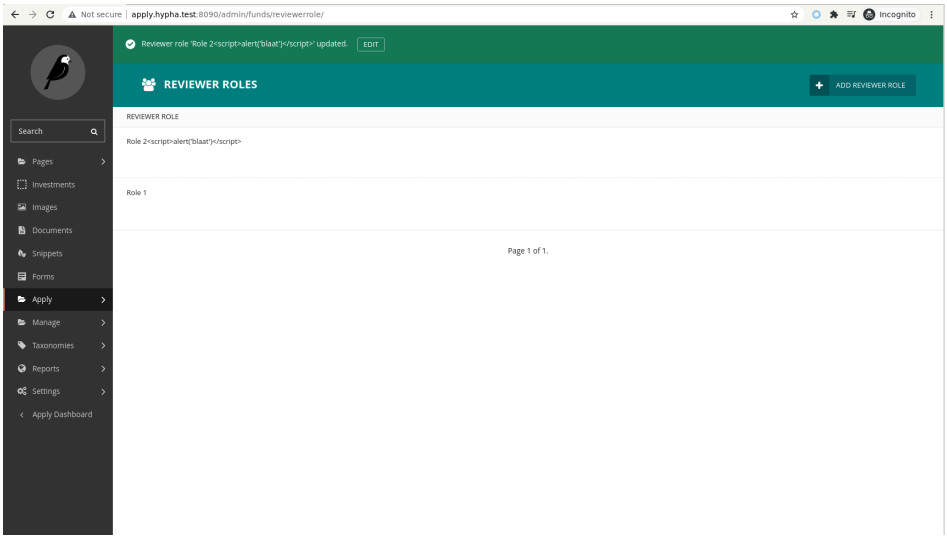
Threat level: Low

Description:

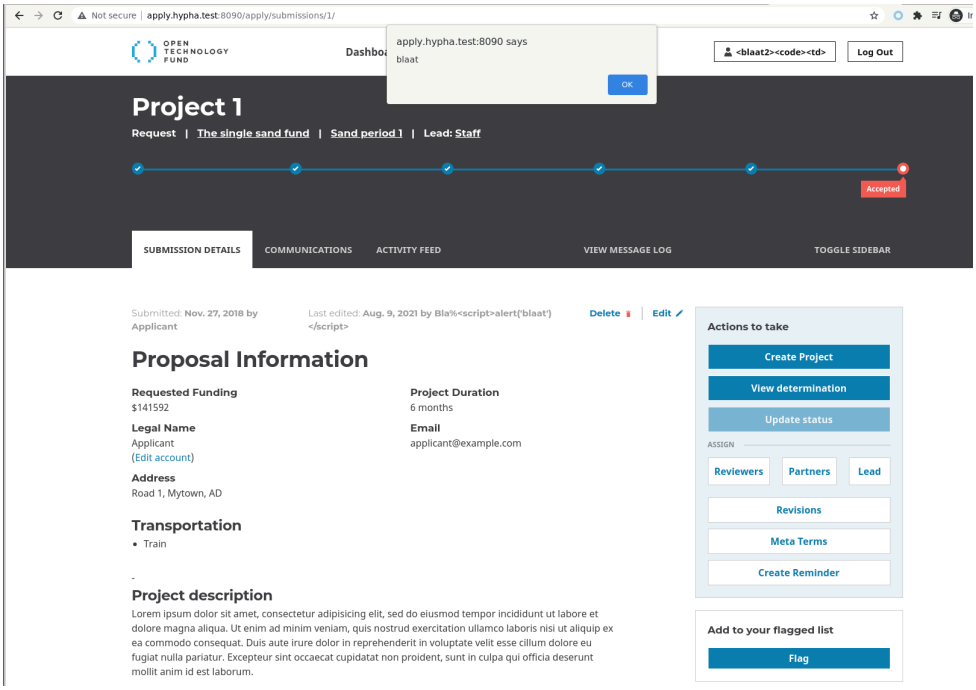
Cross-Site-Scripting (XSS) was found in Reviewer Role.

Technical description:

Add XSS Payload to Reviewer Role:



Result XSS:




```
<div class="form__group ">
        <label for="id_role_reviewer_role-2scriptalertblaatscript" class="form__question form__question--model_choice_field select2_widget" >
            <span>Role 2<script>alert('blaat')</script> Reviewer</span>
        </label>


    <div class="form__item">

        <div class="form__select">
    <select name="role_reviewer_role-2scriptalertblaatscript" data-minimum-input-length="0" data-allow-clear="true" data-placeholder="Select a r

                <option value=""></option>


                <option value="">---------</option>
```

Impact:

This XSS can only be created and triggered by high privileged users (e.g staff and admin) making it a Low impact. However it is still recommended to not allow XSS in the first place since a successful attack could lead to session hijack, credential stealing, or infecting systems with malware.

Recommendation:

All user input as well as output to users must be strictly filtered. Within these checks it is necessary to implement filter mechanisms that operate on a white list basis instead of a black list basis. It is recommended that parameters or input fields that can only consist of numerical values are only accepted by the server if they are in fact numeric. All checks have to be performed on the server and not on the client-side. To avoid cross-site scripting it is necessary to substitute

special characters like [;()”´`,<>/] for their HTML equivalents. It is not sufficient to only filter special HTML tags like "script" because there exist countless alternatives to successfully exploit cross-site scripting vulnerabilities.

More information can be found at: https://www.owasp.org/index.php/Cross_Site_Scripting

4.15 OTF-014 — User Enumeration with Email Address Change

Vulnerability ID: OTF-014

Vulnerability type: User Enumeration

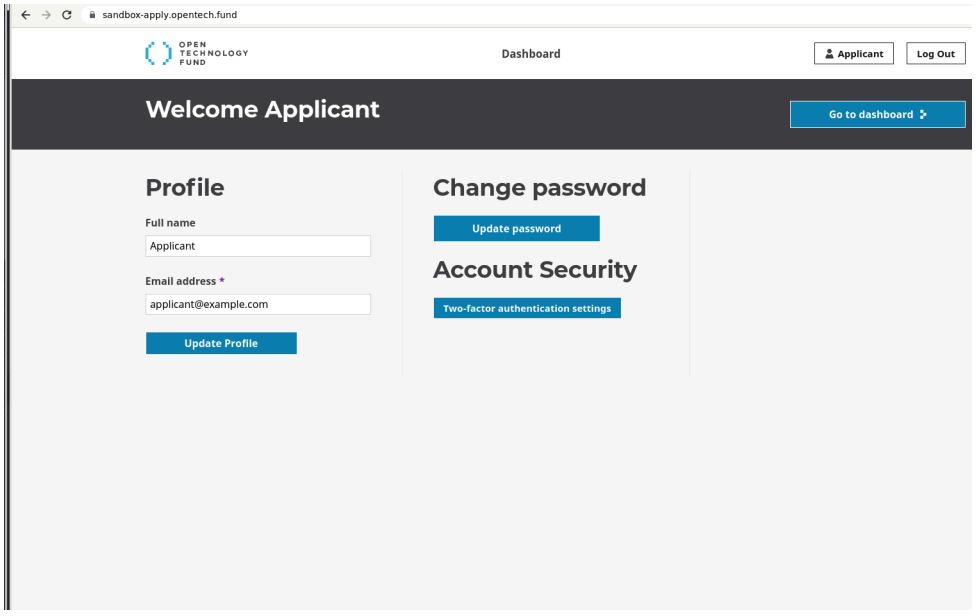
Threat level: Low

Description:

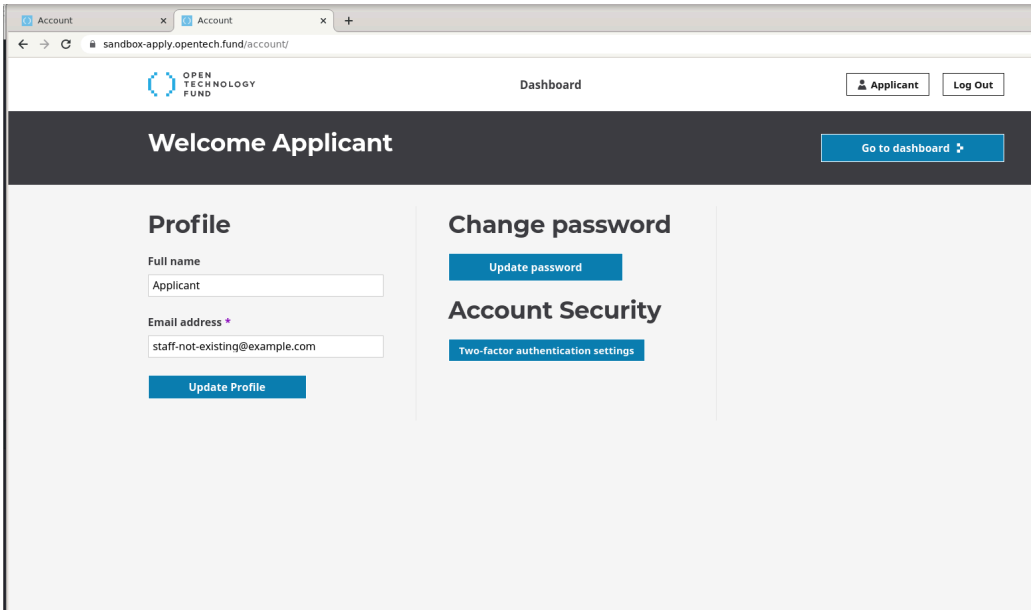
Valid users can be found by abusing the Profile Change Email address functionality.

Technical description:

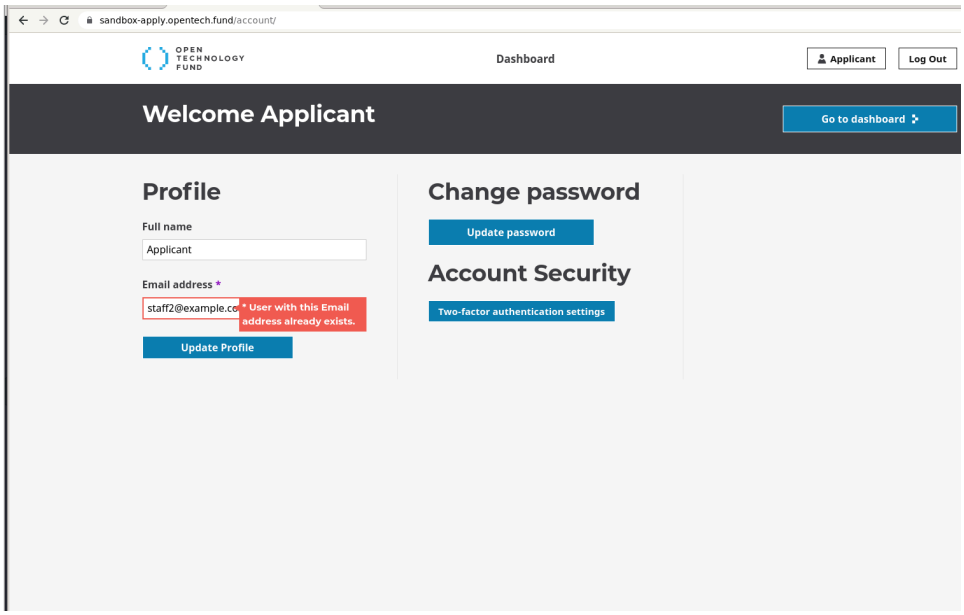
Example of current logged in user:

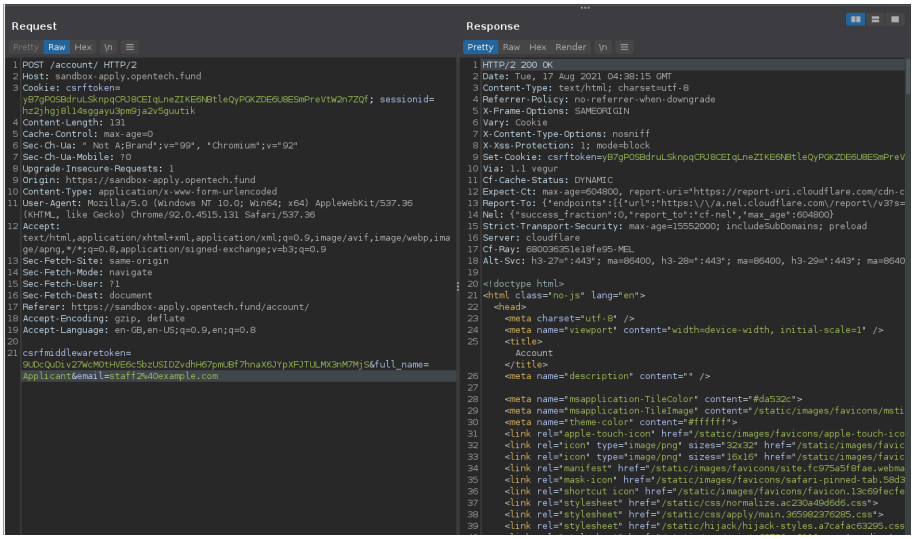


No error is shown (which is expected behavior) when changing to a non-existing user :



However, when changing to an existing user an error is shown which indicates that a user with this Email address already exists:





Impact:

Valid usernames can be enumerated and used in further attacks.

Recommendation:

Modify the functionality to return only a generic response making it impossible to distinguish between a valid username and an invalid username and implement a Captcha (see also finding OTF-006 (page 37)) .

4.16 OTF-015 — XSS in Review Form

Vulnerability ID: OTF-015

Vulnerability type: XSS

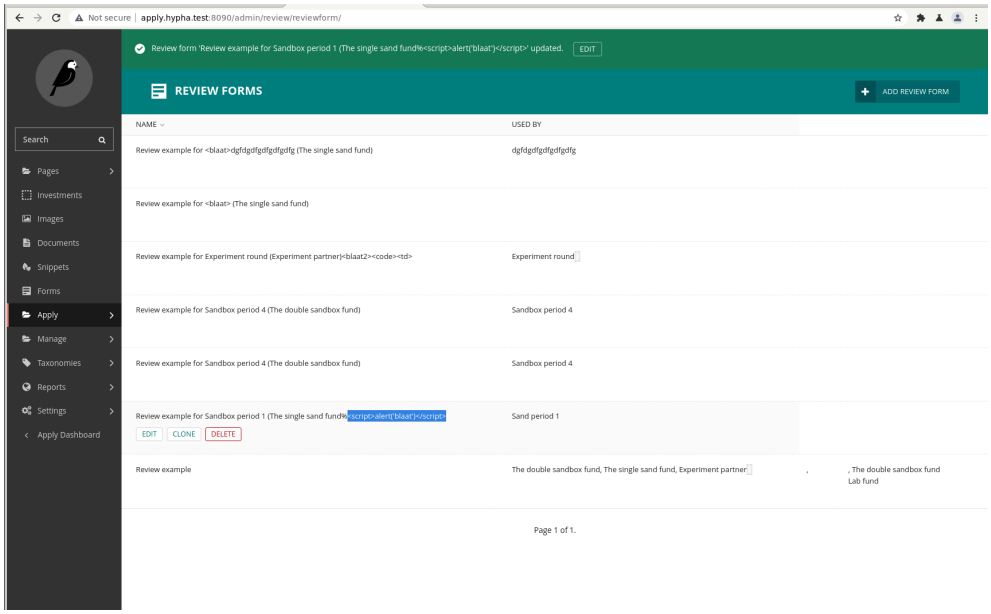
Threat level: Low

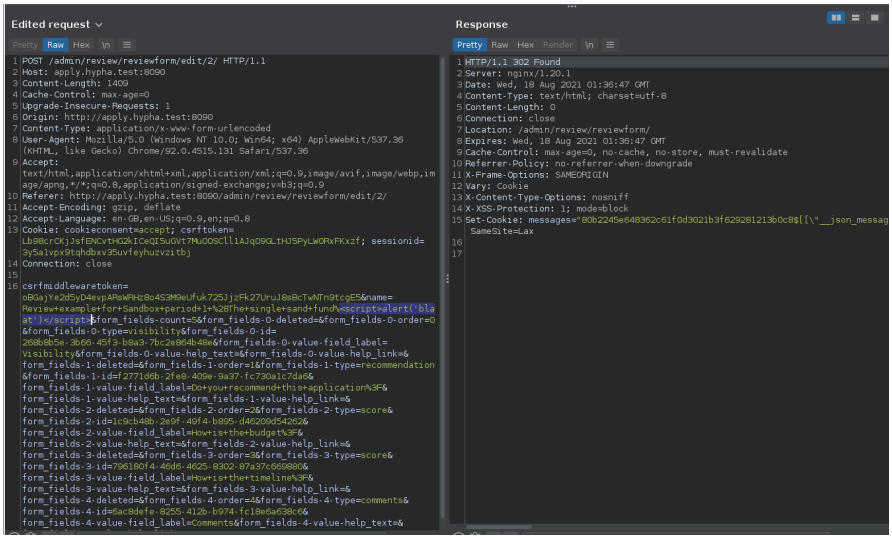
Description:

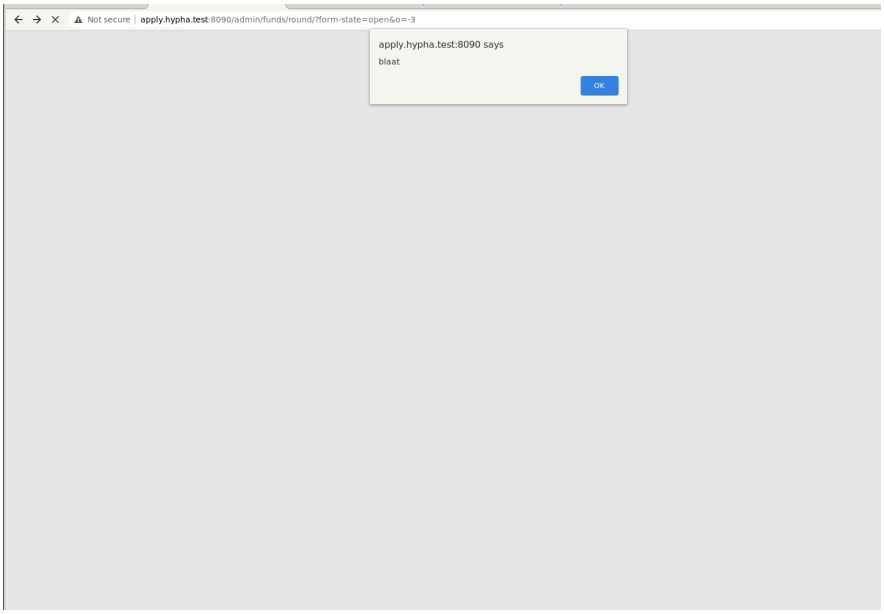
Cross-Site-Scripting (XSS) was found in the Review Forms.

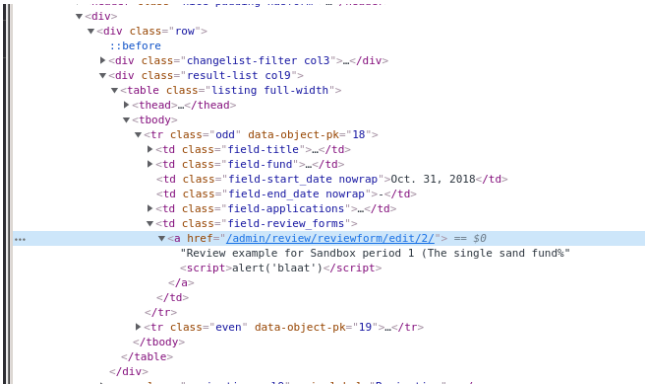
Technical description:

Add XSS payload to Review Form:


Not secure | apply.hypha.test:8090/admin/review/reviewform/
Review form 'Review example for Sandbox period 1 (The single sand fund%<script>alert('blaat')</script>' updated.
EDIT
REVIEW FORMS
ADD REVIEW FORM
Search
Pages
Investments
Images
Documents
Snippets
Forms
Apply
Manage
Taxonomies
Reports
Settings
Apply Dashboard
NAME
USED BY
Review example for <blaat>dgfdgdfgdfgdfgdfg (The single sand fund)
dgfdgdfgdfgdfgdfg
Review example for <blaat> (The single sand fund)
Review example for Experiment round (Experiment partner)<blaat2><code><td>
Experiment round
Review example for Sandbox period 4 (The double sandbox fund)
Sandbox period 4
Review example for Sandbox period 4 (The double sandbox fund)
Sandbox period 4
Review example for Sandbox period 1 (The single sand fund%<script>alert('blaat')</script>
Sand period 1
EDIT
CLONE
DELETE
Review example
The double sandbox fund, The single sand fund, Experiment partner
, The double sandbox fund
Lab fund
Page 1 of 1.


Edited request
Pretty Raw Hex \n
1 POST /admin/review/reviewform/edit/2/ HTTP/1.1
2 Host: apply.hypha.test:8090
3 Content-Length: 1409
4 Cache-Control: max-age=0
5 Upgrade-Insecure-Requests: 1
6 Origin: http://apply.hypha.test:8090
7 Content-Type: application/x-www-form-urlencoded
8 User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/92.0.4515.131 Safari/537.36
9 Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.9
10 Referer: http://apply.hypha.test:8090/admin/review/reviewform/edit/2/
11 Accept-Encoding: gzip, deflate
12 Accept-Language: en-GB,en-US;q=0.9,en;q=0.8
13 Cookie: cookieconsent=accept; csrftoken=
LbGBcrCKjJsfENCvtHG2IceQI5uGVt7MuOOSCll1AJqO9GLthJ5PyLWORxFKxzf; sessionid=
3y5a1vpx9tqhdbxv35uvfeyhuzvzitbj
14 Connection: close
15
16 csrfmiddlewaretoken=
oBGajYe2d5yD4evpARaWRHz8o4S3M9eUfuk72SJjzFk27UruJ8sBcTwNTn9tcgE5&name=
Review+example+for+Sandbox+period+1+%28The+single+sand+fund%<script>alert('bla
at')</script>&form_fields-count=5&form_fields-0-deleted=&form_fields-0-order=0
&form_fields-0-type=visibility&form_fields-0-id=
268b8b5e-3b66-4513-b8a3-7bc2e0640406&form_fields-0-value-field_label=
Visibility&form_fields-0-value-help_text=&form_fields-0-value-help_link=&
form_fields-1-deleted=&form_fields-1-order=1&form_fields-1-type=recommendation
&form_fields-1-id=f2771d6b-2fe8-409e-9a37-fc730a1c7da6&
form_fields-1-value-field_label=Do+you+recommend+this+application%3F&
form_fields-1-value-help_text=&form_fields-1-value-help_link=&
form_fields-2-deleted=&form_fields-2-order=2&form_fields-2-type=score&
form_fields-2-id=1c9cb48b-2e9f-49f4-b895-d46209d54262&
form_fields-2-value-field_label=How+is+the+budget%3F&
form_fields-2-value-help_text=&form_fields-2-value-help_link=&
form_fields-3-deleted=&form_fields-3-order=3&form_fields-3-type=score&
form_fields-3-id=79618074-40d6-4625-8302-87a37c66986&
form_fields-3-value-field_label=How+is+the+timeline%3F&
form_fields-3-value-help_text=&form_fields-3-value-help_link=&
form_fields-4-deleted=&form_fields-4-order=4&form_fields-4-type=comments&
form_fields-4-id=6ac8defe-8255-412b-b974-fc18e6a638c6&
form_fields-4-value-field_label=Comments&form_fields-4-value-help_text=&
Response
Pretty Raw Hex Render \n
1 HTTP/1.1 302 Found
2 Server: nginx/1.20.1
3 Date: Wed, 18 Aug 2021 01:36:47 GMT
4 Content-Type: text/html; charset=utf-8
5 Content-Length: 0
6 Connection: close
7 Location: /admin/review/reviewform/
8 Expires: Wed, 18 Aug 2021 01:36:47 GMT
9 Cache-Control: max-age=0, no-cache, no-store, must-revalidate
10 Referrer-Policy: no-referrer-when-downgrade
11 X-Frame-Options: SAMEORIGIN
12 Vary: Cookie
13 X-Content-Type-Options: nosniff
14 X-XSS-Protection: 1; mode=block
15 Set-Cookie: messages="80b2245e648362c61f0d3021b3f629281213b0c8$[[\"__json_messag
SameSite=Lax
16
17





Impact:

This XSS can only be created and triggered by high privileged users (e.g staff and admin) making it a Low impact. However it is still recommended to not allow XSS in the first place since a successful attack could lead to session hijack, credential stealing, or infecting systems with malware.

Recommendation:

All user input as well as output to users must be strictly filtered. Within these checks it is necessary to implement filter mechanisms that operate on a white list basis instead of a black list basis. It is recommended that parameters or input fields that can only consist of numerical values are only accepted by the server if they are in fact numeric. All checks have to be performed on the server and not on the client-side. To avoid cross-site scripting it is necessary to substitute special characters like [;()”´`,<>/] for their HTML equivalents. It is not sufficient to only filter special HTML tags like "script" because there exist countless alternatives to successfully exploit cross-site scripting vulnerabilities.

More information can be found at: https://www.owasp.org/index.php/Cross_Site_Scripting

4.17 OTF-016 — Django SECRET_KEY not random

Vulnerability ID: OTF-016

Vulnerability type: Security Misconfiguration

Threat level: Low

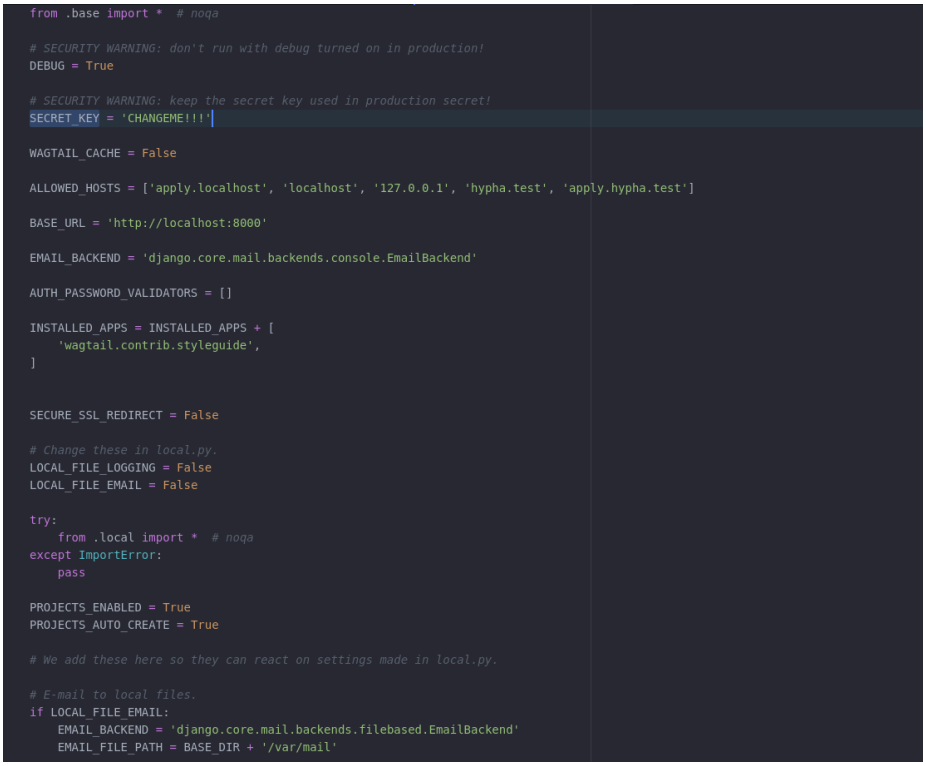
Description:

The Django SECRET_KEY is hardcoded and using a default value.

Technical description:

The secret key is used for:

- All sessions if you are using any other session backend than django.contrib.sessions.backends.cache, or are using the default get_session_auth_hash().
- All messages if you are using CookieStorage or FallbackStorage.
- All PasswordResetView tokens.
- Any usage of cryptographic signing, unless a different key is provided.



```
from .base import *  # noqa

# SECURITY WARNING: don't run with debug turned on in production!
DEBUG = True

# SECURITY WARNING: keep the secret key used in production secret!
SECRET_KEY = 'CHANGEME!!!'

WAGTAIL_CACHE = False

ALLOWED_HOSTS = ['apply.localhost', 'localhost', '127.0.0.1', 'hypha.test', 'apply.hypha.test']

BASE_URL = 'http://localhost:8000'

EMAIL_BACKEND = 'django.core.mail.backends.console.EmailBackend'

AUTH_PASSWORD_VALIDATORS = []

INSTALLED_APPS = INSTALLED_APPS + [
    'wagtail.contrib.styleguide',
]


SECURE_SSL_REDIRECT = False

# Change these in local.py.
LOCAL_FILE_LOGGING = False
LOCAL_FILE_EMAIL = False

try:
    from .local import *  # noqa
except ImportError:
    pass

PROJECTS_ENABLED = True
PROJECTS_AUTO_CREATE = True

# We add these here so they can react on settings made in local.py.

# E-mail to local files.
if LOCAL_FILE_EMAIL:
    EMAIL_BACKEND = 'django.core.mail.backends.filebased.EmailBackend'
    EMAIL_FILE_PATH = BASE_DIR + '/var/mail'
```

A random key can be created for instance with `get_random_secret_key()`

Client feedback:
The secret key in production is normally set as an environment variable. OTF has it set to a long random string, different for each of the dev/test/sandbox/live environments.

The "CHANGEME" comes from the `locale.py.example` . This is a template, you need to copy it to `locale.py` for it to be loaded by the system.

It is mostly for developers but it can be used on a production setup as well if you run your own server. But we strongly recommend settings in production to be environment variables.

Impact:

Knowing the SECRET_KEY allows adversaries to generate their own signed values.

Recommendation:

- Automatically generate Strong Random Secret key instead of using a static key.
- An alternative (but less secure) is to show a warning message to the administrator and prevent the application to (fully) work until the SECRET_KEY has been changed to something more secure.

4.18 OTF-017 — Arbitrary Document File Upload

Vulnerability ID: OTF-017

Vulnerability type: Arbitrary File Upload

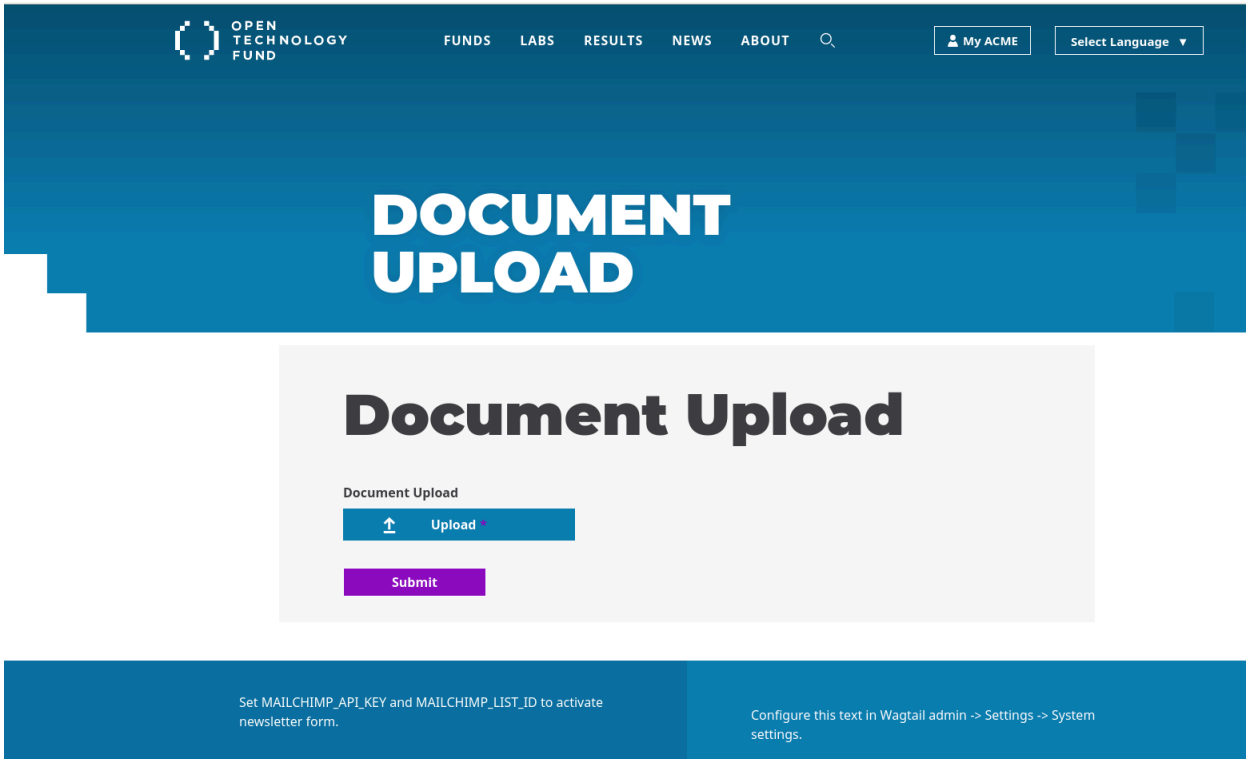
Threat level: Low

Description:

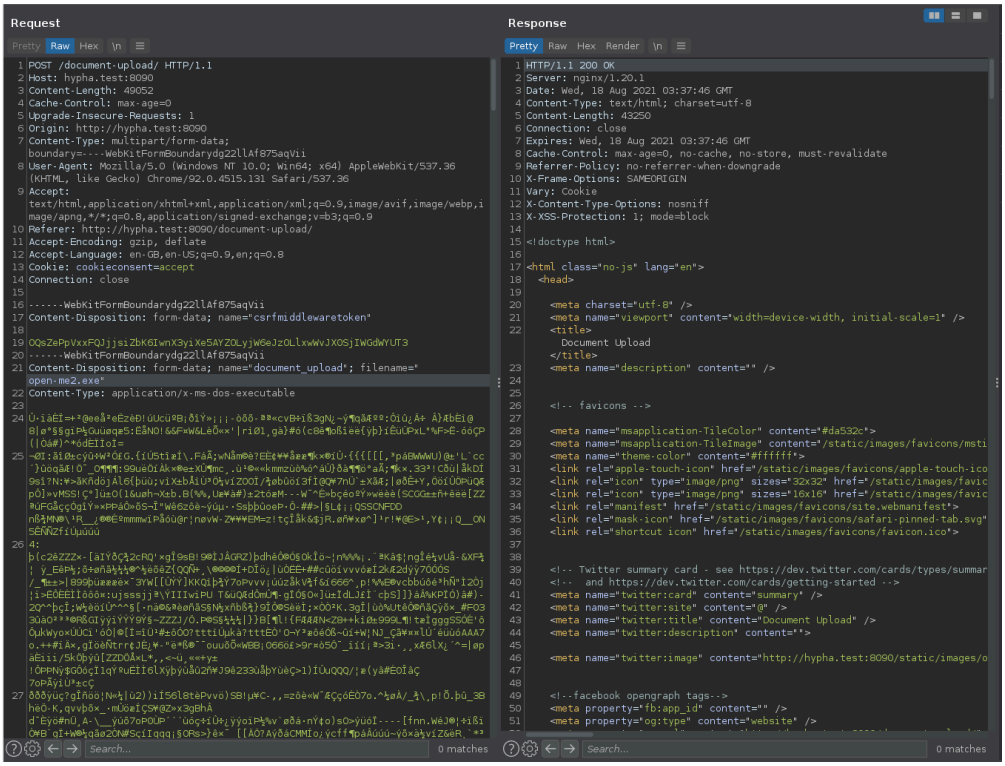
Arbitrary files can be uploaded using the Document File Upload functionality since there are no restrictions configured.

Technical description:

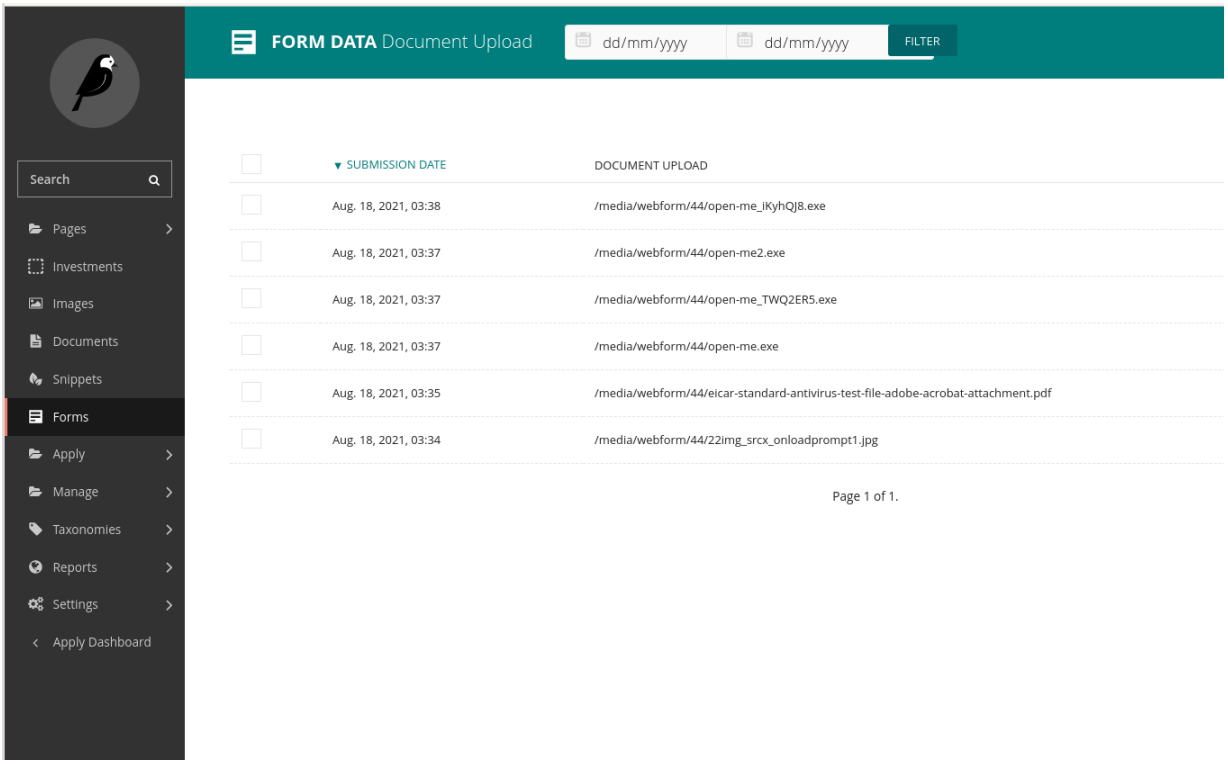
Upload Form:



Uploading a malicious executable:



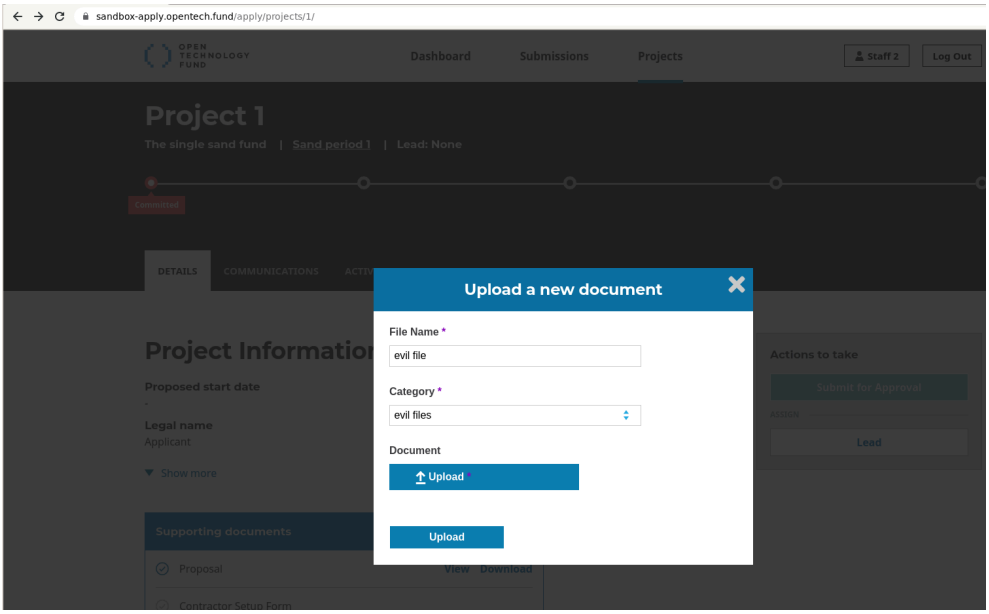
File can be seen in the backend:



Or accessed by browsing the filesystem:

```
svkal :: ~/Desktop/docker » ls media/webform/44
22img_srcx_onloadprompt1.jpg
eicar-standard-antivirus-test-file-adobe-acrobat-attachment.pdf
open-me2.exe
open-me.exe
open-me_iKyhQJ8.exe
open-me_TWQ2ER5.exe
```

Example of the Upload Functionality used in Project Support Documents:



Impact:

A staff member could open the arbitrary file and their pc could get infected with malware.

Recommendation:

Verify all upload functionality and make sure that arbitrary upload is not allowed.

In general, proper mitigation for insecure file upload usually involves a combination of various approaches:

- Blacklisting of dangerous file extensions
- Whitelisting of acceptable file types
- Content-Type entity in the header of the request indicates the Internet media type of the message content
- Using file recognizer that verifies file is of correct type

- Adding the “Content-Disposition: Attachment” and “X-Content-Type-Options: nosniff” headers to the response of static files will secure the website against Flash or PDF-based cross-site content-hijacking attacks. It is recommended that this practice be performed for all of the files that users need to download in all the modules that deal with a file download. Although this method does not fully secure the website against attacks using Silverlight or similar objects, it can mitigate the risk of using Adobe Flash and PDF objects, especially when uploading PDF files is permitted.
- Instant anti-virus checking with a back-end script or service

A specific combination of approaches should consider technical and process constraints, also limitations imposed by the application design. More info can be found at OWASP Unrestricted File Upload.

4.19 OTF-019 — Outdated Packages are in use.

Vulnerability ID: OTF-019

Vulnerability type: Outdated Software

Threat level: Low

Description:

Outdated Packages which contain known vulnerabilities are in use.

Technical description:

Results of the NPM audit report

```
# npm audit report

braces  <2.3.1
Regular Expression Denial of Service - https://npmjs.com/advisories/786
fix available via `npm audit fix --force`
Will install jest@27.0.6, which is a breaking change
node_modules/jest-haste-map/node_modules/braces
node_modules/jest-message-util/node_modules/braces
node_modules/jest-runtime/node_modules/braces
node_modules/jest/node_modules/braces
node_modules/test-exclude/node_modules/braces
  micromatch  0.2.0 - 2.3.11
  Depends on vulnerable versions of braces
  Depends on vulnerable versions of parse-glob
  node_modules/jest-haste-map/node_modules/micromatch
  node_modules/jest-message-util/node_modules/micromatch
  node_modules/jest-runtime/node_modules/micromatch
  node_modules/jest/node_modules/micromatch
  node_modules/test-exclude/node_modules/micromatch
    jest-cli  12.1.1-alpha.2935e14d || 12.1.2-alpha.6230044c - 24.8.0
```

```
    Depends on vulnerable versions of jest-haste-map
    Depends on vulnerable versions of jest-message-util
    Depends on vulnerable versions of jest-runner
    Depends on vulnerable versions of jest-validate
    Depends on vulnerable versions of micromatch
    Depends on vulnerable versions of yargs
    node_modules/jest/node_modules/jest-cli
      jest  18.5.0-alpha.7da3df39 - 22.4.4 || 23.4.0 - 23.6.0
      Depends on vulnerable versions of jest-cli
      node_modules/jest
    jest-haste-map  16.1.0-alpha.691b0e22 - 24.0.0
    Depends on vulnerable versions of micromatch
    Depends on vulnerable versions of sane
    node_modules/jest-haste-map
      jest-runtime  12.1.1-alpha.2935e14d - 24.8.0
      Depends on vulnerable versions of babel-jest
      Depends on vulnerable versions of babel-plugin-istanbul
      Depends on vulnerable versions of jest-haste-map
      Depends on vulnerable versions of jest-util
      Depends on vulnerable versions of jest-validate
      Depends on vulnerable versions of micromatch
      Depends on vulnerable versions of yargs
      node_modules/jest-runtime
    jest-message-util  18.5.0-alpha.7da3df39 - 23.1.0 || 23.4.0 - 24.0.0-alpha.16
    Depends on vulnerable versions of micromatch
    node_modules/jest-message-util
      expect  21.0.0-beta.1 - 22.4.3 || 23.4.0 - 23.6.0
      Depends on vulnerable versions of jest-message-util
      node_modules/expect
        jest-jasmine2  18.5.0-alpha.7da3df39 - 22.4.4 || 23.4.0 - 23.6.0
        Depends on vulnerable versions of expect
        Depends on vulnerable versions of jest-message-util
        Depends on vulnerable versions of jest-util
        node_modules/jest-jasmine2
          jest-config  18.5.0-alpha.7da3df39 - 22.4.4 || 23.4.0 - 23.6.0
          Depends on vulnerable versions of jest-jasmine2
          Depends on vulnerable versions of jest-util
          Depends on vulnerable versions of jest-validate
          node_modules/jest-config
            jest-validate  22.4.0 - 22.4.4
            Depends on vulnerable versions of jest-config
            node_modules/jest-validate
      jest-runner  21.0.0-alpha.1 - 22.4.4 || 23.4.0 - 23.6.0
      Depends on vulnerable versions of jest-message-util
      node_modules/jest-runner
      jest-util  18.5.0-alpha.7da3df39 - 22.4.3 || 23.4.0
      Depends on vulnerable versions of jest-message-util
      node_modules/jest-util
        jest-environment-jsdom  18.5.0-alpha.7da3df39 - 22.4.3 || 23.4.0
        Depends on vulnerable versions of jest-util
        node_modules/jest-environment-jsdom
        jest-environment-node  18.5.0-alpha.7da3df39 - 22.4.3 || 23.4.0
        Depends on vulnerable versions of jest-util
        node_modules/jest-environment-node
    test-exclude  <=4.2.3
    Depends on vulnerable versions of micromatch
    node_modules/test-exclude
      babel-plugin-istanbul  <=5.0.0
      Depends on vulnerable versions of test-exclude
      node_modules/babel-plugin-istanbul
        babel-jest  14.2.0-alpha.ca8bfb6e - 24.0.0-alpha.16
```

```
        Depends on vulnerable versions of babel-plugin-istanbul
        node_modules/babel-jest
        node_modules/jest-runtime/node_modules/babel-jest

glob-parent  <5.1.2
Severity: moderate
Regular expression denial of service - https://npmjs.com/advisories/1751
fix available via `npm audit fix --force`
Will install webpack-dev-server@1.16.5, which is a breaking change
node_modules/glob-base/node_modules/glob-parent
node_modules/glob-parent
  chokidar  1.0.0-rc1 - 2.1.8
  Depends on vulnerable versions of glob-parent
  node_modules/chokidar
    glob-watcher  >=3.0.0
    Depends on vulnerable versions of chokidar
    node_modules/glob-watcher
      gulp  >=4.0.0
      Depends on vulnerable versions of glob-watcher
      node_modules/gulp
    watchpack-chokidar2  *
    Depends on vulnerable versions of chokidar
    node_modules/watchpack-chokidar2
      watchpack  1.7.2 - 1.7.5
      Depends on vulnerable versions of watchpack-chokidar2
      node_modules/watchpack
        webpack  4.44.0 - 4.46.0
        Depends on vulnerable versions of watchpack
        node_modules/webpack
    webpack-dev-server  2.0.0-beta - 3.11.2
    Depends on vulnerable versions of chokidar
    node_modules/webpack-dev-server
  glob-base  *
  Depends on vulnerable versions of glob-parent
  node_modules/glob-base
    parse-glob  >=2.1.0
    Depends on vulnerable versions of glob-base
    node_modules/parse-glob
      micromatch  0.2.0 - 2.3.11
      Depends on vulnerable versions of braces
      Depends on vulnerable versions of parse-glob
      node_modules/jest-haste-map/node_modules/micromatch
      node_modules/jest-message-util/node_modules/micromatch
      node_modules/jest-runtime/node_modules/micromatch
      node_modules/jest/node_modules/micromatch
      node_modules/test-exclude/node_modules/micromatch
        jest-cli  12.1.1-alpha.2935e14d || 12.1.2-alpha.6230044c - 24.8.0
        Depends on vulnerable versions of jest-haste-map
        Depends on vulnerable versions of jest-message-util
        Depends on vulnerable versions of jest-runner
        Depends on vulnerable versions of jest-validate
        Depends on vulnerable versions of micromatch
        Depends on vulnerable versions of yargs
        node_modules/jest/node_modules/jest-cli
          jest  18.5.0-alpha.7da3df39 - 22.4.4 || 23.4.0 - 23.6.0
          Depends on vulnerable versions of jest-cli
          node_modules/jest
        jest-haste-map  16.1.0-alpha.691b0e22 - 24.0.0
        Depends on vulnerable versions of micromatch
        Depends on vulnerable versions of sane
        node_modules/jest-haste-map
```

```
          jest-runtime  12.1.1-alpha.2935e14d - 24.8.0
          Depends on vulnerable versions of babel-jest
          Depends on vulnerable versions of babel-plugin-istanbul
          Depends on vulnerable versions of jest-haste-map
          Depends on vulnerable versions of jest-util
          Depends on vulnerable versions of jest-validate
          Depends on vulnerable versions of micromatch
          Depends on vulnerable versions of yargs
          node_modules/jest-runtime
        jest-message-util  18.5.0-alpha.7da3df39 - 23.1.0 || 23.4.0 - 24.0.0-alpha.16
        Depends on vulnerable versions of micromatch
        node_modules/jest-message-util
          expect  21.0.0-beta.1 - 22.4.3 || 23.4.0 - 23.6.0
          Depends on vulnerable versions of jest-message-util
          node_modules/expect
            jest-jasmine2  18.5.0-alpha.7da3df39 - 22.4.4 || 23.4.0 - 23.6.0
            Depends on vulnerable versions of expect
            Depends on vulnerable versions of jest-message-util
            Depends on vulnerable versions of jest-util
            node_modules/jest-jasmine2
              jest-config  18.5.0-alpha.7da3df39 - 22.4.4 || 23.4.0 - 23.6.0
              Depends on vulnerable versions of jest-jasmine2
              Depends on vulnerable versions of jest-util
              Depends on vulnerable versions of jest-validate
              node_modules/jest-config
                jest-validate  22.4.0 - 22.4.4
                Depends on vulnerable versions of jest-config
                node_modules/jest-validate
          jest-runner  21.0.0-alpha.1 - 22.4.4 || 23.4.0 - 23.6.0
          Depends on vulnerable versions of jest-message-util
          node_modules/jest-runner
          jest-util  18.5.0-alpha.7da3df39 - 22.4.3 || 23.4.0
          Depends on vulnerable versions of jest-message-util
          node_modules/jest-util
            jest-environment-jsdom  18.5.0-alpha.7da3df39 - 22.4.3 || 23.4.0
            Depends on vulnerable versions of jest-util
            node_modules/jest-environment-jsdom
            jest-environment-node  18.5.0-alpha.7da3df39 - 22.4.3 || 23.4.0
            Depends on vulnerable versions of jest-util
            node_modules/jest-environment-node
        test-exclude  <=4.2.3
        Depends on vulnerable versions of micromatch
        node_modules/test-exclude
          babel-plugin-istanbul  <=5.0.0
          Depends on vulnerable versions of test-exclude
          node_modules/babel-plugin-istanbul
            babel-jest  14.2.0-alpha.ca8bfb6e - 24.0.0-alpha.16
            Depends on vulnerable versions of babel-plugin-istanbul
            node_modules/babel-jest
            node_modules/jest-runtime/node_modules/babel-jest
  glob-stream  >=5.3.0
  Depends on vulnerable versions of glob-parent
  node_modules/glob-stream
    vinyl-fs  >=2.4.2
    Depends on vulnerable versions of glob-stream
    node_modules/vinyl-fs

mem  <4.0.0
Denial of Service - https://npmjs.com/advisories/1084
fix available via `npm audit fix --force`
Will install jest@27.0.6, which is a breaking change
```

```
node_modules/mem
  os-locale  2.0.0 - 3.0.0
  Depends on vulnerable versions of mem
  node_modules/jest-runtime/node_modules/os-locale
  node_modules/jest/node_modules/os-locale
    yargs  4.0.0-alpha1 - 12.0.5 || 14.1.0 || 15.0.0 - 15.2.0
    Depends on vulnerable versions of os-locale
    Depends on vulnerable versions of yargs-parser
    node_modules/jest-runtime/node_modules/yargs
    node_modules/jest/node_modules/yargs
    node_modules/yargs
      gulp-cli  >=2.0.0
      Depends on vulnerable versions of yargs
      node_modules/gulp/node_modules/gulp-cli
      jest-cli  12.1.1-alpha.2935e14d || 12.1.2-alpha.6230044c - 24.8.0
      Depends on vulnerable versions of jest-haste-map
      Depends on vulnerable versions of jest-message-util
      Depends on vulnerable versions of jest-runner
      Depends on vulnerable versions of jest-validate
      Depends on vulnerable versions of micromatch
      Depends on vulnerable versions of yargs
      node_modules/jest/node_modules/jest-cli
        jest  18.5.0-alpha.7da3df39 - 22.4.4 || 23.4.0 - 23.6.0
        Depends on vulnerable versions of jest-cli
        node_modules/jest
      jest-runtime  12.1.1-alpha.2935e14d - 24.8.0
      Depends on vulnerable versions of babel-jest
      Depends on vulnerable versions of babel-plugin-istanbul
      Depends on vulnerable versions of jest-haste-map
      Depends on vulnerable versions of jest-util
      Depends on vulnerable versions of jest-validate
      Depends on vulnerable versions of micromatch
      Depends on vulnerable versions of yargs
      node_modules/jest-runtime

merge  <2.1.1
Severity: high
Prototype Pollution - https://npmjs.com/advisories/1666
fix available via `npm audit fix --force`
Will install jest@27.0.6, which is a breaking change
node_modules/merge
  exec-sh  <=0.3.1
  Depends on vulnerable versions of merge
  node_modules/exec-sh
    sane  1.0.4 - 4.0.2
    Depends on vulnerable versions of exec-sh
    Depends on vulnerable versions of watch
    node_modules/sane
      jest-haste-map  16.1.0-alpha.691b0e22 - 24.0.0
      Depends on vulnerable versions of micromatch
      Depends on vulnerable versions of sane
      node_modules/jest-haste-map
        jest-cli  12.1.1-alpha.2935e14d || 12.1.2-alpha.6230044c - 24.8.0
        Depends on vulnerable versions of jest-haste-map
        Depends on vulnerable versions of jest-message-util
        Depends on vulnerable versions of jest-runner
        Depends on vulnerable versions of jest-validate
        Depends on vulnerable versions of micromatch
        Depends on vulnerable versions of yargs
        node_modules/jest/node_modules/jest-cli
          jest  18.5.0-alpha.7da3df39 - 22.4.4 || 23.4.0 - 23.6.0
```

```
          Depends on vulnerable versions of jest-cli
          node_modules/jest
        jest-runtime  12.1.1-alpha.2935e14d - 24.8.0
        Depends on vulnerable versions of babel-jest
        Depends on vulnerable versions of babel-plugin-istanbul
        Depends on vulnerable versions of jest-haste-map
        Depends on vulnerable versions of jest-util
        Depends on vulnerable versions of jest-validate
        Depends on vulnerable versions of micromatch
        Depends on vulnerable versions of yargs
        node_modules/jest-runtime
    watch  >=0.14.0
    Depends on vulnerable versions of exec-sh
    node_modules/watch
  sass-lint  *
  Depends on vulnerable versions of gonzales-pe-sl
  Depends on vulnerable versions of merge
  node_modules/sass-lint
    gulp-sass-lint  *
    Depends on vulnerable versions of sass-lint
    node_modules/gulp-sass-lint

minimist  <0.2.1 || >=1.0.0 <1.2.3
Prototype Pollution - https://npmjs.com/advisories/1179
No fix available
node_modules/gonzales-pe-sl/node_modules/minimist
  gonzales-pe-sl  *
  Depends on vulnerable versions of minimist
  node_modules/gonzales-pe-sl
    sass-lint  *
    Depends on vulnerable versions of gonzales-pe-sl
    Depends on vulnerable versions of merge
    node_modules/sass-lint
      gulp-sass-lint  *
      Depends on vulnerable versions of sass-lint
      node_modules/gulp-sass-lint

yargs-parser  <=13.1.1 || 14.0.0 - 15.0.0 || 16.0.0 - 18.1.1
Prototype Pollution - https://npmjs.com/advisories/1500
fix available via `npm audit fix --force`
Will install jest@27.0.6, which is a breaking change
node_modules/jest-runtime/node_modules/yargs-parser
node_modules/jest/node_modules/yargs-parser
node_modules/yargs-parser
  yargs  4.0.0-alpha1 - 12.0.5 || 14.1.0 || 15.0.0 - 15.2.0
  Depends on vulnerable versions of os-locale
  Depends on vulnerable versions of yargs-parser
  node_modules/jest-runtime/node_modules/yargs
  node_modules/jest/node_modules/yargs
  node_modules/yargs
    gulp-cli  >=2.0.0
    Depends on vulnerable versions of yargs
    node_modules/gulp/node_modules/gulp-cli
    jest-cli  12.1.1-alpha.2935e14d || 12.1.2-alpha.6230044c - 24.8.0
    Depends on vulnerable versions of jest-haste-map
    Depends on vulnerable versions of jest-message-util
    Depends on vulnerable versions of jest-runner
    Depends on vulnerable versions of jest-validate
    Depends on vulnerable versions of micromatch
    Depends on vulnerable versions of yargs
    node_modules/jest/node_modules/jest-cli
```

```
      jest  18.5.0-alpha.7da3df39 - 22.4.4 || 23.4.0 - 23.6.0
      Depends on vulnerable versions of jest-cli
      node_modules/jest
    jest-runtime  12.1.1-alpha.2935e14d - 24.8.0
    Depends on vulnerable versions of babel-jest
    Depends on vulnerable versions of babel-plugin-istanbul
    Depends on vulnerable versions of jest-haste-map
    Depends on vulnerable versions of jest-util
    Depends on vulnerable versions of jest-validate
    Depends on vulnerable versions of micromatch
    Depends on vulnerable versions of yargs
    node_modules/jest-runtime

43 vulnerabilities (23 low, 13 moderate, 7 high)

To address issues that do not require attention, run:
  npm audit fix

To address all issues possible (including breaking changes), run:
  npm audit fix --force

Some issues need review, and may require choosing
a different dependency.
```

Impact:

Low, since it appears that no functionality is used in the current code that could exploit any of the vulnerabilities.

Recommendation:

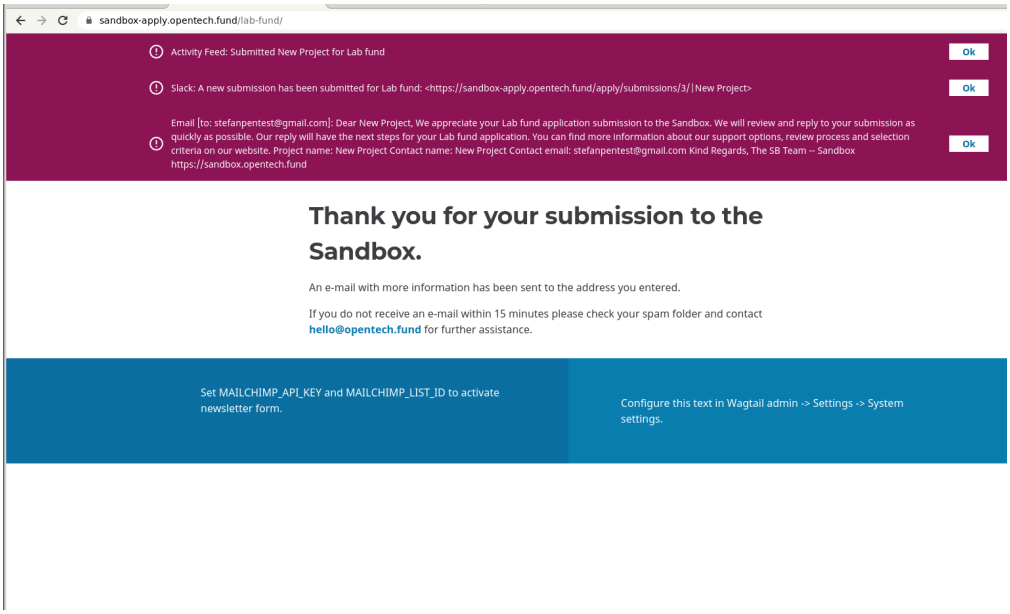
It is still recommended to always use the latest version where possible.

5 Non-Findings

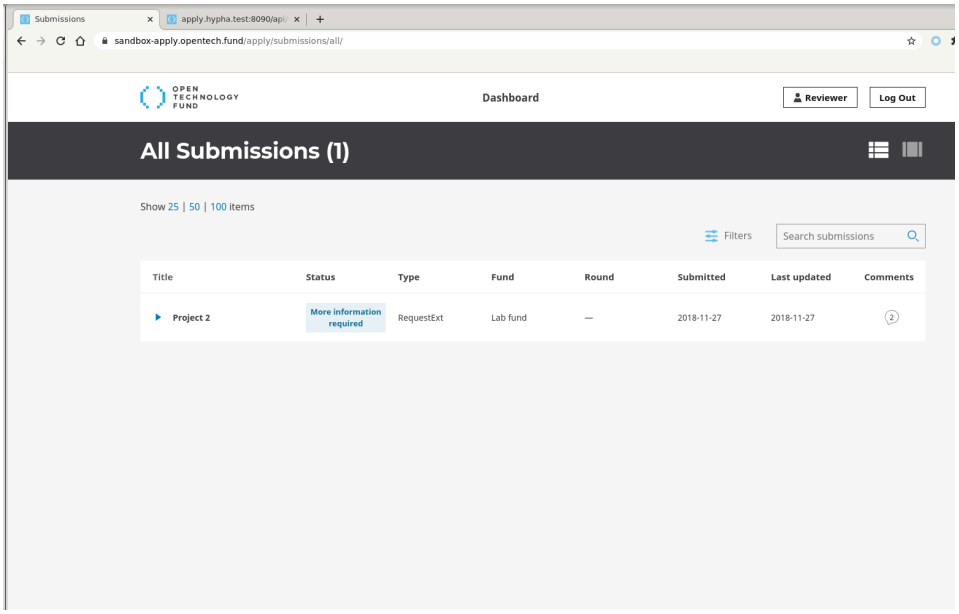
In this section we list some of the things that were tried but turned out to be dead ends.

5.1 NF-020 — Reviewers are able to see all submissions.

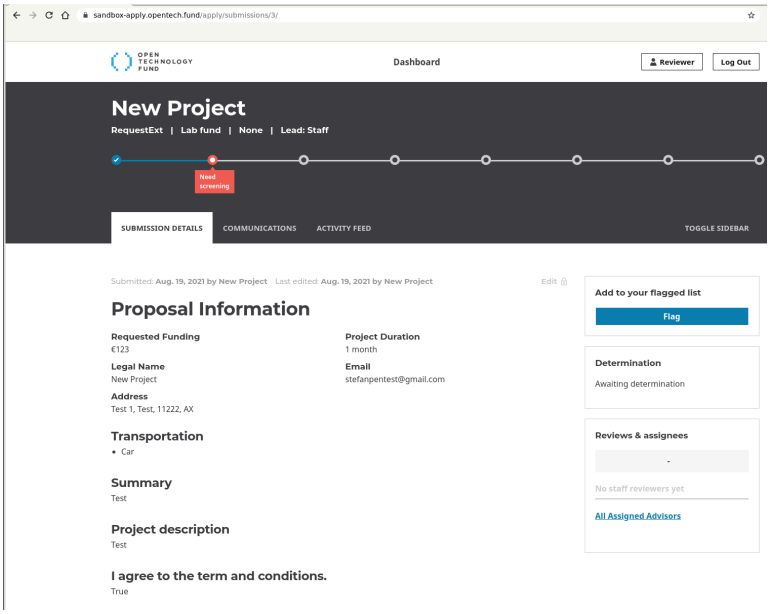
Applicant submits a submission:



Reviewer does not see this submission in the All Submission Overview:



However, by changing the submission id in the URL, access is still allowed.



Note that the user with the reviewer authorisations was not able to make any changes such as updating the status, assign users, check revisions, add to staff flagged list/determination/review or change the screening status.

Client feedback:

By default reviewers can view all submissions. The assigning part was only to direct reviewers.

We have added a setting to change this default at "/admin/settings/funds/reviewersettings/".

6 Future Work

- **Retest of findings**
  When mitigations for the vulnerabilities described in this report have been deployed, a repeat test should be performed to ensure that they are effective and have not introduced other security problems.
- **Regular security assessments**
  Security is an ongoing process and not a product, so we advise undertaking regular security assessments and penetration tests, ideally prior to every major release or every quarter.

7 Conclusion

We discovered 1 Elevated, 5 Moderate and 13 Low-severity issues during this penetration test.

The Elevated issue (which has been resolved) OTF-010 (page 16) did allow an unauthenticated or low privileged user to send a malicious XSS payload to high privileged users. This could have resulted in gaining access to high privileged accounts which would have lead to accessing restricted data.

The Moderate and Low issues do not have a major immediate risk but when resolved would make it harder for adversaries to succeed in getting access to the privileged information.

We recommend fixing all of the issues found and then performing a retest in order to ensure that mitigations are effective and that no new vulnerabilities have been introduced.

Finally, we want to emphasize that security is a process – this penetration test is just a one-time snapshot. Security posture must be continuously evaluated and improved. Regular audits and ongoing improvements are essential in order to maintain control of your corporate information security. We hope that this pentest report (and the detailed explanations of our findings) will contribute meaningfully towards that end.

Please don't hesitate to let us know if you have any further questions, or need further clarification on anything in this report.

Appendix 1 Testing team

Stefan Vink	Stefan is an IT professional with a passion for IT security and automation. With 20 years hands-on experience in a diverse range of IT roles such as automation / scripting / monitoring / web development / system and network management in Windows and Linux environments. He has worked for organisations such as the Central Bank of the Netherlands (DNB), is MCITP, CCNA, LPIC, OSCP certified, and has passed the CISSP exam. He loves to travel, hike, play tennis & chess, automation, and lives with his wife and kids in Melbourne, Australia.
Melanie Rieback	Melanie Rieback is a former Asst. Prof. of Computer Science from the VU, who is also the co-founder/CEO of Radically Open Security.

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Image styling by Patricia Piolon, https://creativecommons.org/licenses/by-sa/2.0/legalcode.