Awwwwww

Advanced Wibbly-Wobbly World Wide Webserver Wizardry

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#lww17

@leyrer

@MacLemon

Awwwwww

Advanced Wibbly-Wobbly World Wide Webserver Wizardry

Status Quo

1.13 mainline

httpd 2.4

LibreSSL

OpenSSL

HTTP/2

Transportverschlüsselung

TLS 1.3

TLS 1.2

TLS 1.1

TLS 1.0

~~*SSLv3*~~

~~*SSLv2*~~

SSL Report: linuxwochen.at (195.230.168.88)

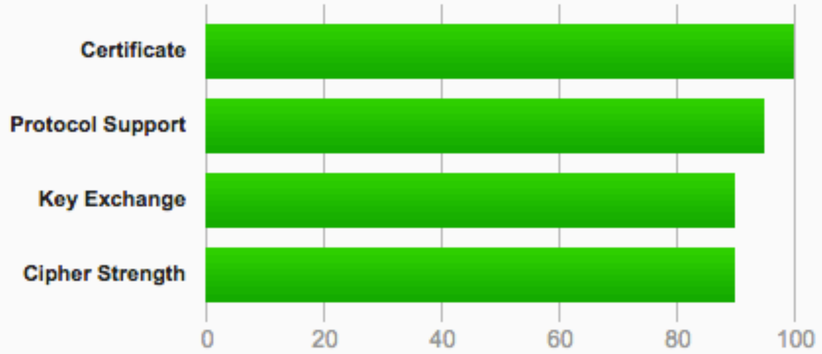
Assessed on: Fri, 05 May 2017 09:15:22 UTC | Hide | Clear cache

Scan Another »

Summary

Overall Rating

F

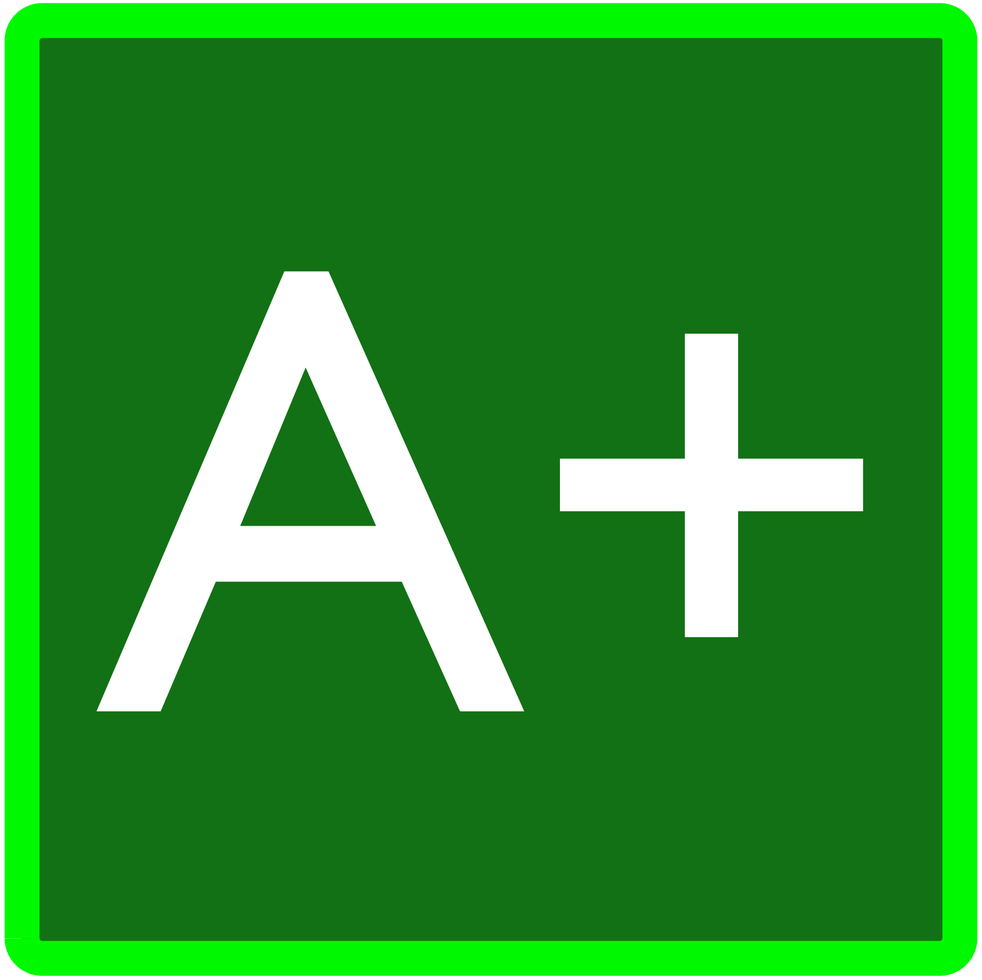


Visit our documentation page for more information, configuration guides, and books. Known issues are documented here.

This server is vulnerable to the DROWN attack. Grade set to F. MORE INFO »

The server does not support Forward Secrecy with the reference browsers. MORE INFO »

This site works only in browsers with SNI support.


A+

Modulare Config

/ Status Quo

Sichere Transportverschlüsselung

Ist TLS schnell?

Ist TLS schnell?

Ja!

Ist *Dein* TLS schnell?

```
seq 10 |

xargs -I@ -n1

curl -kso /dev/null -w "tcp:%{time_connect},
ssldone:%{time_appconnect}\n"

https://linuxwochen.at/
```

```
tcp:0.055579, ssldone:0.115298
tcp:0.015132, ssldone:0.079048
tcp:0.015066, ssldone:0.078038
tcp:0.015576, ssldone:0.073277
tcp:0.015558, ssldone:0.085817
tcp:0.014850, ssldone:0.072564
tcp:0.014518, ssldone:0.071202
tcp:0.016096, ssldone:0.073199
tcp:0.017248, ssldone:0.074969
tcp:0.016756, ssldone:0.071830
```

TLS Session Tickets


NGINX

common/tls_tickets.conf

```
keepalive_timeout   70;
ssl_session_tickets on;
ssl_session_cache   shared:SSL:10m;
ssl_session_timeout 10m;
ssl_buffer_size     2k;
```


THE
APACHE®
SOFTWARE FOUNDATION

```
$ sudo a2enmod socache_shmcb
```

```
/etc/apache2/mods-enabled/ssl.conf
...

SSLSessionCache shmcb:$
  {APACHE_RUN_DIR}/ssl_scache(512000)
SSLSessionCacheTimeout 300
```

Reconnect Test

```
openssl s_client -connect linuxwochen.at:443
  -reconnect 2>&1 </dev/null
  | egrep -i "(new|reused|conn)"
```

```
CONNECTED(00000003)
New, TLSv1/SSLv3,
  Cipher is ECDHE-RSA-AES256-GCM-SHA384
drop connection and then reconnect
CONNECTED(00000003)

Reused, TLSv1/SSLv3,
  Cipher is ECDHE-RSA-AES256-GCM-SHA384
drop connection and then reconnect
```

Lifetime?

```
openssl s_client -connect linuxwochen.at:443
-tlsextdebug -status
< /dev/null 2>/dev/null
| grep lifetime
```

TLS session ticket lifetime hint: 300 (seconds)

Lifetime Test

```
openssl s_client -connect linuxwochen.at:443
-sess_out /tmp/ssl_s </dev/null 2>/dev/null
  | egrep -i "(new|reused|conn)" ;

sleep 298 ;

openssl s_client -connect linuxwochen.at:443
-sess_in /tmp/ssl_s </dev/null 2>/dev/null
  | egrep -i "(new|reused|conn)"
```

```
CONNECTED(00000003)
New, TLSv1/SSLv3,
  Cipher is ECDHE-RSA-AES256-GCM-SHA384

CONNECTED(00000003)
Reused, TLSv1/SSLv3,
  Cipher is ECDHE-RSA-AES256-GCM-SHA384
```

Revocation

OCSP Stapling

common/letsencrypt_ocsp.conf

```
ssl_stapling on;
ssl_stapling_verify on;
ssl_trusted_certificate \
            trusted_CAs.pem;
```

/etc/apache2/sites-enabled/example.com-ssl.conf

```
SSLUseStapling on
```

```
# Optional

SSLStaplingResponderTimeout 5
SSLStaplingReturnResponderErrors off
```

```
SSLStaplingCache
        shmcb:/var/run/ocsp(128000)
```

/etc/apache2/sites-enabled/example.com-ssl.conf

```
<IfModule mod_ssl.c>
  # Specify cached response location (must be
outside <VirtualHost>)
  SSLStaplingCache shmcb: /var/run/ocsp(128000)

  <VirtualHost *:443>
    ServerAdmin admin@example.com
    ServerName example.com
    DocumentRoot /var/www
```

```
# Enable SSL & OCSP Stapling
  SSLEngine on
  SSLUseStapling on

# Configure Stapling Options
  SSLStaplingResponderTimeout 5
  SSLStaplingReturnResponderErrors off
```

OCSP Test

```
openssl s_client
  -connect linuxwochen.at:443
  -tlsextdebug -status
  < /dev/null 2>/dev/null

| egrep "(OCSP|Cert Status)"
```

```
OCSP response: no response sent
```

```
OCSP response:
OCSP Response Data:
    OCSP Response Status: successful (0x0)
    Response Type: Basic OCSP Response
    Cert Status: good
```

/ TLS Session Tickets

Content Compression

common/compression.conf

```
gzip on;
gzip_http_version 1.0;
gzip_vary on;
gzip_comp_level 1;
gzip_min_length  50;
gzip_buffers 16 8k;
gzip_proxied any;
```

common/compression.conf

```
gzip_types text/plain text/css
  application/json application/x-javascript
  text/xml application/xml
  application/xml+rss text/javascript
  application/javascript text/x-jsi
  image/svg+xml;
```

common/compression.conf

```
# --with-http_gzip_static_module
gzip_static on;
```

```
apachectl -t -D DUMP_MODULES | grep deflate
```

```
sudo a2enmod deflate
sudo a2enmod headers
sudo a2enmod rewrite
sudo a2enmod filter
```

/etc/apache2/mods-enabled/deflate.conf

```
DeflateCompressionLevel 1
DeflateMemLevel 8
DeflateWindowSize 15
```

/etc/apache2/mods-enabled/deflate.conf

```
<IfModule mod_deflate.c>
   <IfModule mod_filter.c>

   # these are known to be safe with MSIE 6

   AddOutputFilterByType DEFLATE text/html text/plain text/xml

   # everything else may cause problems with MSIE 6

   AddOutputFilterByType DEFLATE text/css
   AddOutputFilterByType DEFLATE application/x-javascript
            application/javascript application/ecmascript
   AddOutputFilterByType DEFLATE application/rss+xml
   AddOutputFilterByType DEFLATE application/xml

   </IfModule>
</IfModule>
```

```
AddOutputFilterByType DEFLATE application/atom+xml
AddOutputFilterByType DEFLATE application/atomcat+xml
AddOutputFilterByType DEFLATE application/javascript
AddOutputFilterByType DEFLATE application/json
AddOutputFilterByType DEFLATE application/octet-stream
AddOutputFilterByType DEFLATE application/x-javascript
AddOutputFilterByType DEFLATE application/xhtml+xml
AddOutputFilterByType DEFLATE application/xml
AddOutputFilterByType DEFLATE text/css
AddOutputFilterByType DEFLATE text/html
AddOutputFilterByType DEFLATE text/javascript
AddOutputFilterByType DEFLATE text/plain
AddOutputFilterByType DEFLATE text/xml
AddOutputFilterByType DEFLATE text/xsl
```

```
/etc/apache2/sites-enabled/example.com-ssl.conf

# AddEncoding allows you to have certain browsers
uncompress information on the fly.
AddEncoding gzip .gz

RewriteEngine on
#Serve gzip compressed CSS files if they exist and
the client accepts gzip.
RewriteCond %{HTTP:Accept-encoding} gzip
RewriteCond %{REQUEST_FILENAME}\.gz -s
RewriteRule ^(.*)\.css $1\.css\.gz [QSA]
```

```
/etc/apache2/sites-enabled/example.com-ssl.conf

# Serve gzip compressed JS files if they exist and
the client accepts gzip.
  RewriteCond %{HTTP:Accept-encoding} gzip
  RewriteCond %{REQUEST_FILENAME}\.gz -s
  RewriteRule ^(.*)\.js $1\.js\.gz [QSA]

# Serve correct content types, and prevent
  mod_deflate double gzip.
  RewriteRule \.css\.gz$ - [T=text/css,E=no-gzip:1]
  RewriteRule \.js\.gz$ - [T=text/javascript,E=no-gzip:1]
```

/ Content Compression

Client Caching

ETag
Expires
Cache-Control

common/caching.conf

```
location ~* \.(?:jpg|jpeg|gif|png|ico|
gz|svg|svgz|mp4|mp3|ogg|ogv|webm|woff|
eot)$ {
  expires 7d;
  add_header Cache-Control "public";
}
```

common/caching.conf

```
# Web Feeds
location ~* \.(?:rss|atom)$ {
  expires 1h;
  add_header Cache-Control "public";
}
```

/etc/apache2/sites-enabled/example.com-ssl.conf

```
<Directory /var/www>
    FileETag MTime Size
</Directory>
```

FileETag

- INode
- MTime
- Size
- All
- None

```
sudo a2enmod expires
sudo a2enmod headers
```

/etc/apache2/sites-enabled/example.com-ssl.conf

```
  <VirtualHost *:443>
    ServerAdmin admin@example.com
    ServerName example.com
  DocumentRoot /var/www

  <Location />
    ExpiresActive on
    ExpiresDefault "modification plus 2 weeks 3 days 1 hour"
    ExpiresByType image/png "modification plus 7"
    Header merge Cache-Control public
  </Location>
```

Cache Tests

```
curl -sI https://linuxwochen.at/css/
lightbox.css
| egrep -i "(etag|cache|expires)"
```

ETag: "f22-5177952f7b380"

```
curl -sI https://linuxwochen.at/css/
lightbox.css
  --header 'If-None-Match:
     "f22-5177952f7b380"'
```

```
HTTP/1.1 304 Not Modified
ETag: "f22-5177952f7b380"

Date: Fri, 05 May 2017 14:44:07 GMT
Server: Apache/2.4.10 (Debian) PHP/
5.6.27-0+deb8u1 mod_python/3.3.1 Python/2.7.9
OpenSSL/1.0.1t
```

```
etag: "590252f9-444"
expires: Sun, 28 May 2017 00:38:27 GMT
cache-control: max-age=2592000
cache-control: public
```

/ Client Caching

Security Headers

Simpel

HTTPS und HTTP

```
# For HTTPS and HTTP

    add_header  X-Frame-Options DENY always;
    add_header  X-Content-Type-Options "nosniff" always;
    add_header  X-XSS-Protection "1; mode=block" always;
```

```
# For HTTPS and HTTP

    Header always set  X-Frame-Options DENY
    Header always set  X-Content-Type-Options "nosniff"
    Header always set  X-XSS-Protection "1; mode=block"
```

HSTS

HTTPS

```
# HSTS

add_header strict-transport-security
  "max-age=31104000;
  includeSubDomains; preload" always;
```

```
# HSTS

Header always set
  strict-transport-security
  "max-age=15768000"
```

Content-Security-Policy

HTTPS und HTTP

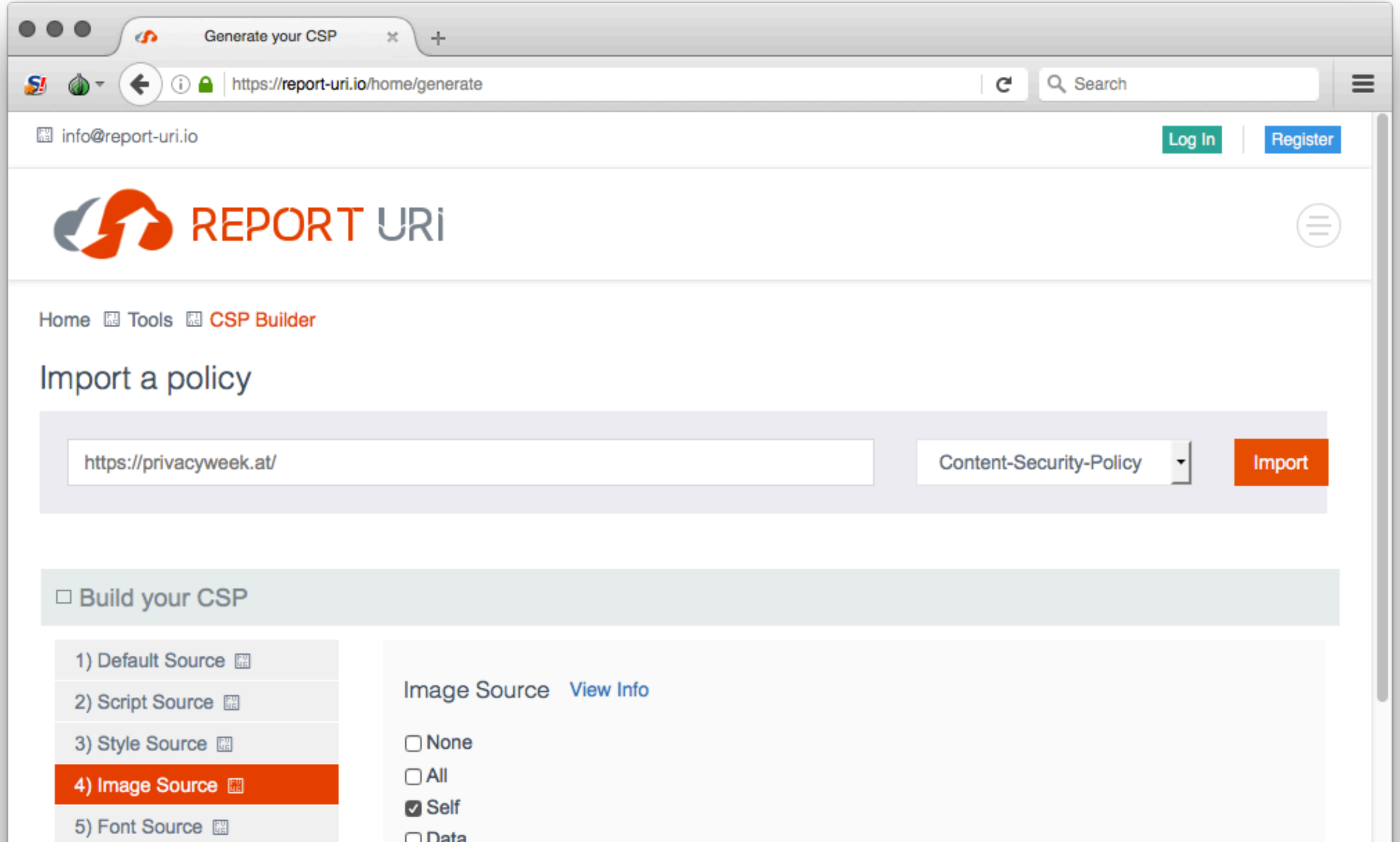
```
add_header Content-Security-Policy
"default-src none; upgrade-insecure-
requests; block-all-mixed-content;
reflected-xss block; referrer no-
referrer;" always;
```

```
add_header Content-Security-Policy "default-src
'self' 'unsafe-inline' 'unsafe-eval'; script-src
'self' 'unsafe-inline' 'unsafe-eval'; style-src
'self' 'unsafe-inline'; img
-src 'self'; font-src 'self'; connect-src 'self';
media-src 'self' blob:; object-src 'none'; child-
src 'self' blob:; frame-src 'self' blob:; worker-
src 'none'; frame-ancestors 'non
e'; form-action 'self'; upgrade-insecure-
requests; block-all-mixed-content; reflected-xss
block; referrer no-referrer;" always;
```

```
Header always set Content-Security-Policy "default-src 'self' https://www.goodreads.com; script-src 'self' 'unsafe-inline' 'unsafe-eval' https://www.goodreads.com/; object-src 'none'; style-src 'self' 'unsafe-inline'; media-src 'self'; child-src 'self' https://www.youtube.com; connect-src 'self' https://www.youtube.com/"
```

CSP Generator

https://report-uri.io/home/generate

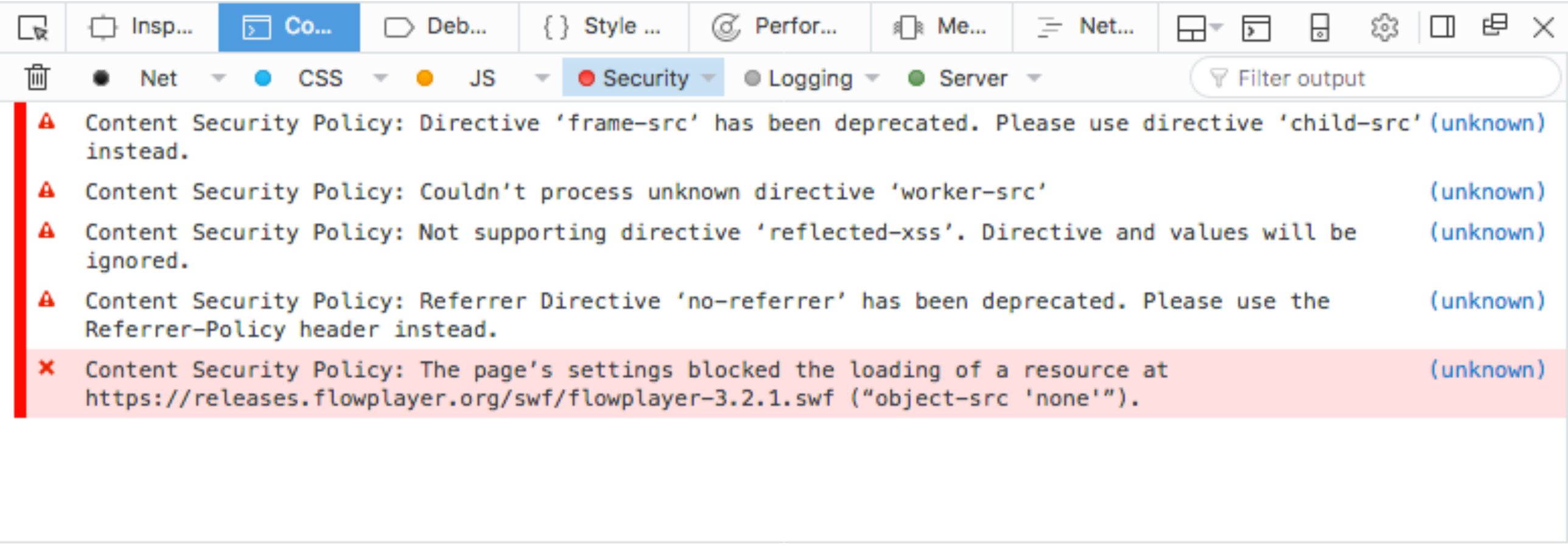

Generate your CSP
https://report-uri.io/home/generate
Search
info@report-uri.io
Log In
Register
REPORT URI
Home
Tools
CSP Builder
Import a policy
https://privacyweek.at/
Content-Security-Policy
Import
Build your CSP
1) Default Source
2) Script Source
3) Style Source
4) Image Source
5) Font Source
Image Source
View Info
None
All
Self
Data

Testen…

Testen… Testen…

Mehr Testen…

und noch mehr testen…


Insp...
Co...
Deb...
Style ...
Perfor...
Me...
Net...
Net
CSS
JS
Security
Logging
Server
Filter output
Content Security Policy: Directive 'frame-src' has been deprecated. Please use directive 'child-src' instead.
(unknown)
Content Security Policy: Couldn't process unknown directive 'worker-src'
(unknown)
Content Security Policy: Not supporting directive 'reflected-xss'. Directive and values will be ignored.
(unknown)
Content Security Policy: Referrer Directive 'no-referrer' has been deprecated. Please use the Referrer-Policy header instead.
(unknown)
Content Security Policy: The page's settings blocked the loading of a resource at https://releases.flowplayer.org/swf/flowplayer-3.2.1.swf ("object-src 'none'").
(unknown)

/ Security Headers

The Future…

TLS 1.3

OCSP Expect-Staple

OCSP Must-Staple

DNS CAA RR

Expect-CT Extension for HTTP

/ The Future…

Fragen?

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Danke