

Sri Lanka Institute of Information Technology



Assignment report 08

IT22357762

Web Security -IE2062

Web Security – IE2062

B.Sc. (Hons) in Information

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1 miro.com

Miro
Miro is the online collaborative whiteboarding platform that enables distributed teams to work effectively together
<https://miro.com>

Reports resolved: 153 | Assets in scope: 15 | Average bounty: \$300-\$500

Bug Bounty Program
Launched in Feb 2023
Managed by HackerOne
Includes retesting

Rewards

	Low	Medium	High	Critical
Tier1				
	\$250	\$500	\$1,500	\$1,000
Tier2				
	\$100	\$300	\$900	\$1,500

Rewards
Our rewards are based on severity per CVSS (the Common Vulnerability Scoring Standard). Please note these are general guidelines, and reward decisions are up to the discretion of Miro. We currently work with a tier based bounty reward table. In the overview below you can see which of our assets belong in each table.

From 1 APR 2021 bounties for High and Critical issues are increased up to \$1,500 and \$3,000 respectively.

Tier 1:
All in-scope assets excluding tier2

Tier 2:
• Jira Cards by Miro

Response Efficiency

2 days
Average time to first response

4 days
Average time to triage

2 days
Average time to bounty

94% of reports
Meet response standards
Based on last 90 days

Program Statistics
Updated Daily

\$115,650
Total bounties paid

\$300 - \$500
Average bounty range

1.1 Sub-domain list

Tool – amass

Command – amass enum -passive -d miro.com

```
File Actions Edit View Help
(tharu@kali)~$ amass enum -passive -d miro.com
blackbox.svc.us.miro.com
shapes.svc.miro.com
retention-system-public.svc.miro.com
notifications-overlay-public.svc.miro.com
comeover.miro.com
view.account.miro.com
iamservice.miro.com
app29.svc.miro.com
click.account.miro.com
learning-center-service-public.svc.us.miro.com
click.e.miro.com
156-s.miro.com
00.miro.com
template-metadata-service.svc.miro.com
app89.svc.miro.com
updates.miro.com
v4.miro.com
developers.miro.com
status.miro.com
prometheus.svc.us.miro.com
mta.account.miro.com
sll1kx85.miro.com
stickers-service-public.svc.miro.com
meet.miro.com
insights.svc.miro.com
@asaduturf.miro.com
mandrillapp.hello.miro.com
baipialexhuangxianhejishudafa.miro.com
mobile.us.miro.com
resources.miro.com
dam.miro.com
go.miro.com
www4b.miro.com
hcss.miro.com
hismelle.miro.com
hollande.miro.com
48dai.miro.com
homepage2.miro.com
dax-login.svc.us.miro.com
localhost.e.miro.com
template-metadata-service-static.miro.com
soda-slim.miro.com
www.community.miro.com
bid48k.marketing.miro.com
app3.svc.miro.com
access-request-management-public.svc.miro.com
team.miro.com
cloud.e.miro.com
vice.miro.com
app89.svc.miro.com
```

Sub domain list –

- blackbox.svc.us.miro.com
- shapes.svc.miro.com
- retention-system-public.svc.miro.com
- notifications-overlay-public.svc.miro.com
- comereaver.miro.com
- view.account.miro.com
- iamservice.miro.com
- app29.svc.miro.com
- click.account.miro.com
- learning-center-service-public.svc.us.miro.com
- click.e.miro.com
- 156-5.miro.com
- 00.miro.com
- template-metadata-service.svc.miro.com
- app83.svc.miro.com
- updates.miro.com
- v4.miro.com
- developers.miro.com
- status.miro.com
- prometheus.svc.us.miro.com
- mta.account.miro.com
- sni184365.miro.com
- stickers-service-public.svc.miro.com
- meet.miro.com
- insights.svc.miro.com
- 01asduturf.miro.com
- mandrillapp.hello.miro.com
- baijialezhuangxianhejishudafa.miro.com
- mobile.us.miro.com
- resources.miro.com
- dam.miro.com
- go.miro.com
- www4b.miro.com
- hcss.miro.com
- himmele.miro.com
- hollande.miro.com
- 40dai.miro.com
- homepage2.miro.com
- dex-login.svc.us.miro.com
- localhost.e.miro.com
- template-metadata-service-static.miro.com
- soda-slim.miro.com
- www.community.miro.com
- bid46k4.marketing.miro.com
- app3.svc.miro.com
- access-request-management-public.svc.miro.com
- team.miro.com
- cloud.e.miro.com
- vpce.miro.com
- app89.svc.miro.com
- app1.svc.miro.com
- api.eu01.miro.com
- notifications-email.svc.us.miro.com

- phone.miro.com
- r01.miro.com
- template-metadata-service-public.svc.miro.com
- m.b.hollande.miro.com
- e.miro.com
- humana.miro.com
- jrigwqfdrha847.miro.com
- ad.miro.com
- mandrillapp.miro.com
- www5f.miro.com
- app21.svc.miro.com
- sticker-beta.miro.com
- sni208637.miro.com
- mandrillapp.billing.miro.com
- template-social-service-public.svc.miro.com
- brandkit.miro.com
- board-recording-service-private.svc.miro.com
- image.e.miro.com
- test-esa.miro.com
- app23.svc.miro.com
- app82.svc.miro.com
- exclusivejeans.miro.com
- marketplace.svc.miro.com
- dex.svc.miro.com
- learns.miro.com
- template-metadata-service-public.svc.us.miro.com
- mwww.miro.com
- board-recording-storage.miro.com
- app32.svc.miro.com
- int-blog.miro.com
- insights-public.svc.miro.com
- marketplace-static.us.miro.com
- mona.miro.com
- n.m.b.hollande.miro.com
- externalapi.miro.com
- sign-in-public.svc.miro.com
- eventhub.eu01.miro.com
- sni225463.miro.com
- app43.svc.miro.com
- api.miro.com
- vendor-icons.svc.miro.com
- rc.meet.miro.com
- convidado.miro.com
- kratosdefense.miro.com
- developers.us.miro.com
- ai-proxy-service-public.svc.miro.com
- r01.us.miro.com
- cv-apps.svc.us.miro.com
- integrations.us01.miro.com
- pages.e.miro.com
- mandrillapp.notifications.miro.com
- demo.miro.com
- account.miro.com
- jessicas-senior--1.miro.com
- pages.account.miro.com
- admin.miro.com

- dex-login.svc.miro.com
- support.miro.com
- payment-public.svc.us.miro.com
- fe-rtm.eu01.miro.com
- svc.us.miro.com
- image.account.miro.com
- cloud.miro.com
- payment.svc.miro.com
- communitygroups.miro.com
- app52.svc.miro.com
- help.miro.com
- szkolamuzyczna.miro.com
- ww.miro.com
- com.miro.com
- r.miro.com
- ea.developers.miro.com
- app48.svc.miro.com
- sni41174.miro.com
- cutoff.svc.miro.com
- sierraspace.miro.com
- harborfreight.miro.com
- eu01.miro.com
- integrations.miro.com
- www.miro.com
- mta.e.miro.com
- roboticresearch.miro.com
- web.miro.com
- app15.svc.miro.com
- payment.svc.us.miro.com
- template-social-service.svc.miro.com
- svg-convert.eu01.miro.com
- svc.miro.com
- api.us01.miro.com
- brand.miro.com
- app47.svc.miro.com
- professionaltrainer.miro.com
- links.m.miro.com
- msbot.svc.miro.com
- lefleury.miro.com
- alertmanager.svc.us.miro.com
- cdn.miro.com
- identity-public.svc.miro.com
- app31.svc.miro.com
- msbot-public.svc.us.miro.com
- 04-events.miro.com
- marketplace.svc.us.miro.com
- internalapi.miro.com
- corp.miro.com
- template-social-service.svc.us.miro.com
- access-request-management-public.svc.us.miro.com
- cloud.account.miro.com
- app39.svc.miro.com
- xn--oqe.miro.com
- community-profiles-service-public.svc.miro.com
- fe-rtm.us01.miro.com
- otil2.miro.com

- debtcounselling.miro.com
- shapes.miro.com
- us01.miro.com
- sni253985.miro.com
- academy.miro.com
- goldilocks.svc.miro.com
- board-recording-service-1.svc.miro.com
- app7.svc.miro.com
- app20.svc.miro.com
- email.info.miro.com
- board-recording-service.svc.miro.com
- shop.miro.com
- app22.svc.miro.com
- _dmarc.miro.com
- cdt.miro.com
- 10730.miro.com
- learning-center-service.svc.us.miro.com
- info.miro.com
- app51.svc.miro.com
- email.miro.com
- help.us.miro.com
- dr-dbdr-euc1.dr.miro.com
- encore-2018-portail.miro.com
- xn--p1ai.miro.com
- coopersquare.miro.com
- hello.svc.miro.com
- baoimage.miro.com
- svc.eu01.miro.com
- org.miro.com
- msbot-public.svc.miro.com
- adm-marketplace.miro.com
- beta.miro.com
- sticker.miro.com
- blackbox.svc.miro.com
- zendesk2.miro.com
- app10.svc.miro.com
- zendesk1.miro.com
- notifications-email.svc.miro.com
- beta.developers.miro.com
- app38.svc.miro.com
- disabledtesla.miro.com
- mmankin.miro.com
- miro-us.miro.com
- alertmanager.svc.miro.com
- static-website.miro.com
- www.miro.com
- sni51763.miro.com
- sof1.miro.com
- vendor-icons.svc.us.miro.com
- app40.svc.miro.com
- svc.us01.miro.com
- bounces.miro.com
- b.hollande.miro.com
- trust.miro.com
- board-recording-service-public.svc.miro.com
- jira-cards.miro.com

- hello.miro.com
- app12.svc.miro.com
- app88.svc.miro.com
- learning-center-service.svc.miro.com
- cv-apps.svc.miro.com
- app81.svc.miro.com
- distributed.miro.com
- miskofinance.miro.com
- trcksplt.miro.com
- app14.svc.miro.com
- image-segmentation-public.svc.miro.com
- app46.svc.miro.com
- trial-community.miro.com
- app28.svc.miro.com
- zoom-app-backend.svc.us.miro.com
- dub2.miro.com
- app11.svc.miro.com
- adm-marketplace.svc.miro.com
- grosirkaosposlo.miro.com
- ext-blog.miro.com
- app19.svc.miro.com
- mobile.miro.com
- stickers-service-public.svc.us.miro.com
- r.us.miro.com
- integrations-internal.miro.com
- ftp.miro.com
- google-meet-integration.svc.miro.com
- gslink.miro.com
- app2.svc.miro.com
- zoom-app-backend.svc.miro.com
- app25.svc.miro.com
- esplorarebergamo.miro.com
- app42.svc.miro.com
- mta3.account.miro.com
- externalapi.us.miro.com
- admin.us.miro.com
- events.miro.com
- app26.svc.miro.com
- heb.miro.com
- learning-center-service-public.svc.miro.com
- sni117180.miro.com
- mandrillapp.updates.miro.com
- elb.miro.com
- adm-marketplace.svc.us.miro.com
- gmail.miro.com
- track.miro.com
- consultantcommunity.miro.com
- app41.svc.miro.com
- qa.miro.com
- agonizing.miro.com
- caramembuatjus.miro.com
- buf.miro.com
- staging.miro.com
- hello-pub.svc.miro.com
- apina21.miro.com
- view.e.miro.com

- app5.svc.miro.com
- m.miro.com
- dex.svc.us.miro.com
- eventhub-public.svc.miro.com
- _amazonses.miro.com
- www1.miro.com
- webctdev.miro.com
- mta2.account.miro.com
- retention-system-public.svc.us.miro.com
- billing.miro.com
- app24.svc.miro.com
- lubo.miro.com
- notifications-overlay.svc.us.miro.com
- hillsgrammar.miro.com
- 1e30a.miro.com
- learning-center-service-1.svc.us.miro.com
- lapedrera.miro.com
- test-org.miro.com
- bl.miro.com
- app4.svc.miro.com
- www.help.miro.com
- files.miro.com
- go2.miro.com
- us.miro.com
- integrations.eu01.miro.com
- enterpriseadvocates.miro.com
- zendesk4.miro.com
- bid46k4.3782705m.miro.com
- app37.svc.miro.com
- templates.miro.com
- zendesk3.miro.com
- eventhub.us01.miro.com
- cdcr.miro.com
- app91.svc.miro.com
- app9.svc.miro.com
- payment-public.svc.miro.com
- notifications.miro.com
- insights.svc.us.miro.com
- www.events.miro.com
- prometheus.svc.miro.com
- miro.com
- desktop.miro.com
- msbot.svc.us.miro.com
- richese.miro.com
- stage.meet.miro.com
- community.miro.com
- jaeger.svc.miro.com
- internal.miro.com
- shapes.svc.us.miro.com
- mail.miro.com
- jaeger.svc.us.miro.com
- segmentation-public.svc.miro.com
- marketplace-static.miro.com
- app13.svc.miro.com
- marketing.miro.com
- blog.miro.com

- identity-public.svc.us.miro.com
- app45.svc.miro.com
- notifications-overlay.svc.miro.com
- desktop2.miro.com
- app6.svc.miro.com

1.2 Firewall detection

Command – wafw00f <https://miro.com/>

```
(tharu@kali)-[~]
$ wafw00f https://miro.com/
```

W00f!

404 Hack Not Found

405 Not Allowed

403 Forbidden

502 Bad Gateway

500 Internal Error

~ WAFW00F : v2.2.0 ~

*** The Web Application Firewall Fingerprinting Toolkit ***

```
[*] Checking https://miro.com/
[+] The site https://miro.com/ is behind Cloudfront (Amazon) WAF.
[~] Number of requests: 2
```

1.3 IP scanning

Tool – nslookup

Command – nslookup miro.com

```
(tharu@kali)-[~]  
$ nslookup miro.com  
Server:      192.168.1.1  
Address:     192.168.1.1#53  
  
Non-authoritative answer:  
Name:   miro.com  
Address: 13.35.18.102  
Name:   miro.com  
Address: 13.35.18.78  
Name:   miro.com  
Address: 13.35.18.18  
Name:   miro.com  
Address: 13.35.18.54
```

1.4 Port scanning

Tool - nmap

Command – nmap -sV -sC -Pn 13.35.18.102 -A

```
(tharu@kali) ~$ nmap -sV -sC -Pn 13.35.18.102 -A
Starting Nmap 7.93 ( https://nmap.org ) at 2024-04-16 15:34 +0530
Nmap scan report for server-13-35-18-102.sin5.r.cloudfront.net (13.35.18.102)
Host is up (0.073s latency).
Not shown: 997 filtered tcp ports (no-response)
PORT      STATE SERVICE
25/tcp    open  smtp?
|_smtp-comands: Couldn't establish connection on port 25
|_fingerprint-strings:
|_GenericLines, GetRequest, HTTPOptions, RTSPRequest:
|_500 Syntax error, command unrecognized
|_Hello:
|_552 Invalid domain name in EHLO command.
80/tcp    open  http      Amazon CloudFront httpd
|_http-server-header: CloudFront
|_http-title: ERROR: The request could not be satisfied
443/tcp   open  ssl/https CloudFront
|_http-title: ERROR: The request could not be satisfied
|_http-server-header: CloudFront
1 service unrecognized despite returning data. If you know the service/version, please submit the following fingerprint at https://nmap.org/cgi-bin/submit.cgi?new-service :
SF-Port25-TCP:V=7.93I=7KD=4/16Time=661E4D53P=x86_64-pc-linux-gnu(Hell
SF:o:2A,"552Invalid\x20domain\x20name\x20in\x20EHLO\x20command\\.\r\n")
SF:~r(GenericLines,20,"500\x20Syntax\x20error,\x20command\x20unrecognized\
SF:r\n")~r(GetRequest,28,"500\x20Syntax\x20error,\x20command\x20unrecogniz
SF:ed\r\n")~r(HTTPOptions,28,"500\x20Syntax\x20error,\x20command\x20unreco
SF:gnized\r\n")~r(RTSPRequest,28,"500\x20Syntax\x20error,\x20command\x20un
SF:recognized\r\n");
Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 112.68 seconds
```

1.5 Nikto scanning

Tool – Nikto

Command - sudo nikto -h miro.com

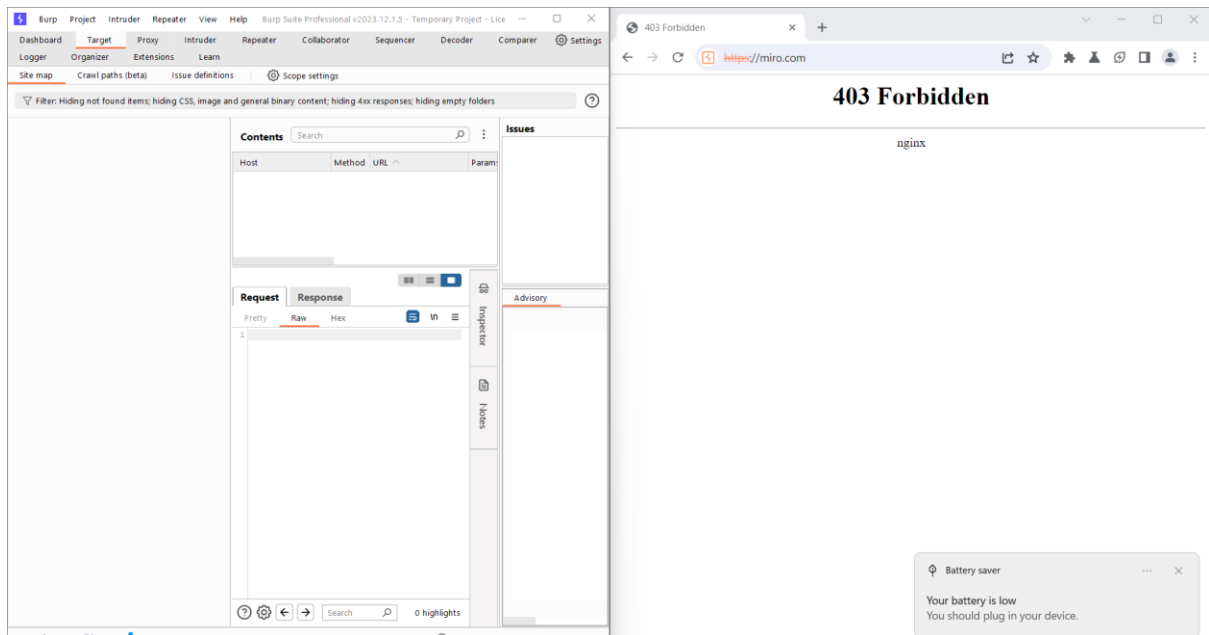
```
(tharu@kali) ~$ sudo nikto -h https://miro.com/
[sudo] Password for tharu:
- Nikto v2.5.0

+ Multiple IPs found: 13.35.18.78, 13.35.18.18, 13.35.18.102, 13.35.18.54
+ Target IP: 13.35.18.78
+ Target Hostname: miro.com
+ Target Port: 443

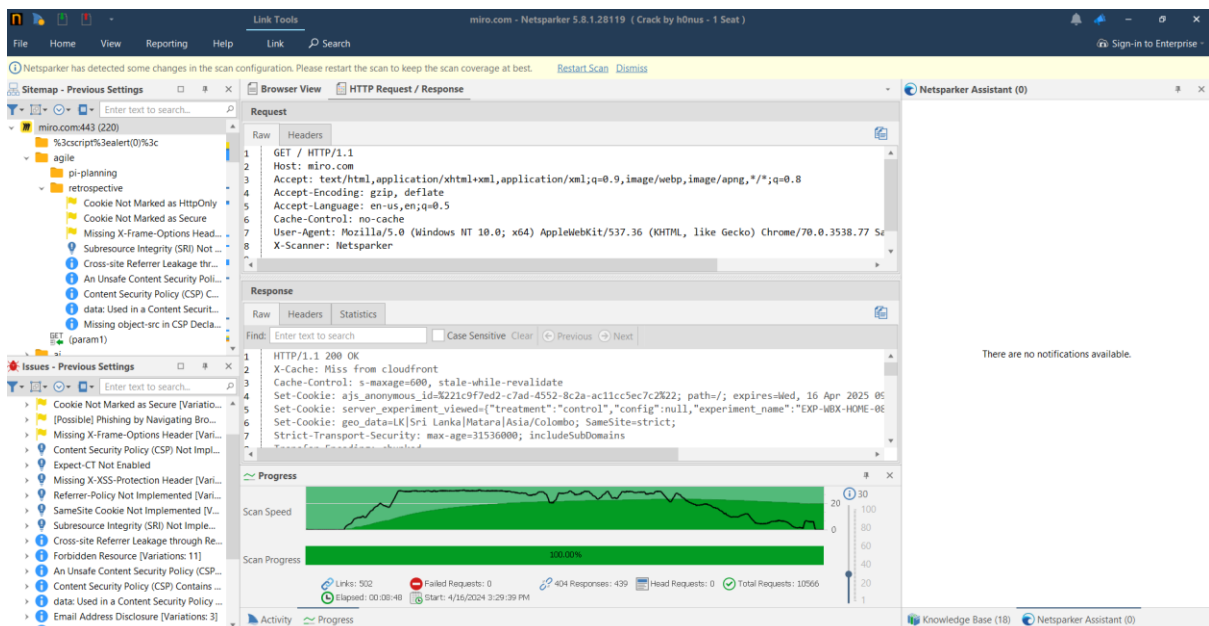
+ SSL Info: Subject: /CN=miro.com
Ciphers: TLS_AES_128_GCM_SHA256
Issuer: AC=US,O=Amazon,CN=Amazon RSA 2048 M03
+ Start Time: 2024-04-16 15:48:12 (GMT+5:30)

+ Server: nginx
+ /: Retrieved via header: 1.1.4/f0d89d9d5d7d899c2e467c7bf0b0e0.cloudfront.net (CloudFront).
+ /: The anti-clickjacking X-Frame-Options header is not present. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Headers/X-Frame-Options
+ /: The site uses TLS and the Strict-Transport-Security HTTP header is not defined. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Headers/Strict-Transport-Security
+ /: An alt-svc header was found which is advertising HTTP/3. The endpoint is: '443'. Nikto cannot test HTTP/3 over QUIC. See: https://developer.mozilla.org/en-US/docs/Web/HTTP/Headers/alt-svc
+ /: The X-Content-Type-Options header is not set. This could allow the user agent to render the content of the site in a different fashion to the MIME type. See: https://www.netsparker.com/web-vulnerability-scanner/vulnerabilities/mis-sing-content-type-header/
+ All CGI directories 'found', use '-c none' to test none
+ /: Server banner changed from 'nginx' to 'CloudFront'.
+ /: The Content-Encoding header is set to 'deflate' which may mean that the server is vulnerable to the BREACH attack. See: http://breachattack.com/
+ ERROR: Error lib() (26) reached for host, giving up. Last error: opening stream: can't connect: SSL negotiation failed: error:0A000410:SSL routines::sslv3 alert handshake failure at /var/lib/nikto/plugins/LW2.pm line 5254.
+ at /var/lib/nikto/plugins/LW2.pm line 5254.
+ Scan terminated: 26 error(s) and 7 item(s) reported on remote host
+ End Time: 2024-04-16 15:43:59 (GMT+5:30) (218 seconds)
```

1.6 Burpsuite scanning



1.7 Netsparker scan



1.8 Vulnerabilities

Vulnerability Title: Security Vulnerabilities in Cookie Handling

Vulnerability Description: The application possesses two crucial security flaws pertaining to the management of cookies. The application is vulnerable to potential cross-site scripting (XSS) attacks due to the presence of non-HTTPOnly cookies. Unsecured cookies provide a danger of exposing sensitive information when transmitted across unsecured channels.

Affected Components: geo_data cookie

Impact Assessment: Impact of vulnerability includes,

- Session hijacking
- Data interception
- Sensitive cookies theft

Steps to Reproduce:

1. Navigate to <https://miro.com/agile/retrospective/>
2. Inspect the HTTP headers exchanged during the request.
3. Identify the presence of the "geo_data" cookie without the HTTPOnly and Secure flags.
4. Note that the cookie can be accessed by client-side scripts and is transmitted over HTTP, respectively.

Proof of concept:

```
X-XSS-Protection: 1; mode=block
Connection: keep-alive
Referrer-Policy: strict-origin
Vary: Accept-Encoding
X-LPB-Version: production-2024.0415.115917-55ddb3
X-Amz-Cf-Pop: SINS-C1
Via: 1.1 91085d9a0810fca6dacd51dae7dd6a32.cloudfront.net (CloudFront)
Alt-Svc: h3=":443"; ma=86400
Content-Type: text/html; charset=utf-8
x-nextjs-cache: STALE
Content-Security-Policy: default-src 'unsafe-inline' 'unsafe-eval' data: blob: filesystem: about: miroa
pp: wss: ws: *; frame-src 'unsafe-inline' 'unsafe-eval' data: blob: miroapp: *; base-uri 'unsafe-inlin
e' about: data: *; form-action 'unsafe-inline' data: post-it-alpha: post-it: com.mmm.postit.miro: *; wo
rker-src 'unsafe-inline' data: blob: miroapp: *; report-uri https://s.realtimeboard.com/api/25/securit
y/?sentry_key=fb5e3001534f453e85d1771b1088b293&sentry_environment=production;
Date: Tue, 16 Apr 2024 10:00:22 GMT
ConHTTP/1.1 200 OK
X-Cache: Miss from cloudfront
Cache-Control: s-maxage=600, stale-while-revalidate
X-Cache-Status: MISS
Set-Cookie: geo_data=LK|Sri Lanka|Matara|Asia/Colombo; SameSite=strict;

Strict-Transport-Security: max-age=31536000; includeSubDomains
Transfer-Encoding: chunked
Server: nginx
X-Amz-Cf-Id: SiJfR984wY4X3bPo7F8NIS1q0kodzIsH7OCLpmlUzEoba--GkK8taA==
X-Content-Type-Option
```

Proposed Mitigation or Fix:

- Mark the "geo_data" cookie as HTTPOnly to mitigate XSS attacks.
- Mark all cookies used within the application as Secure to ensure they are transmitted only over secure channels.
- Regularly review and update the application's security policies and configurations to prevent similar vulnerabilities in the future

1.8.1 Other vulnerabilities

1. Missing X-Frame-Options Header.
2. Content Security Policy (CSP) Not Implemented
3. Expect-CT Not Enabled
4. Missing X-XSS-Protection Header
5. Referrer-Policy Not Implemented
6. SameSite Cookie Not Implemented
7. Subresource Integrity (SRI) Not Implemented
8. An Unsafe Content Security Policy (CSP) Directive in Use
9. Content Security Policy (CSP) Contains Out of Scope report-uri Domain
10. data: Used in a Content Security Policy (CSP) Directive
11. Email Address Disclosure
12. Generic Email Address Disclosure
13. Insecure Protocol Detected in Content Security Policy (CSP)
14. Missing object-src in CSP Declaration
15. Nginx Web Server Identified
16. Reverse Proxy Detected (Envoy)
17. Web Application Firewall Detected
18. Wildcard Detected in Domain Portion of Content Security Policy (CSP) Directive
19. Cross-site Referrer Leakage through Referrer-Policy
20. Forbidden Resource