XSS Vulnerabilities in Excalidraw Affecting Meta (CVE-2024-32472)

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Content

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Hello everyone,

In this post, I'll be discussing a cross-site scripting (XSS) vulnerabilities I discovered in **Excalidraw**, an open-source collaborative whiteboard tool that's used by various **Facebook assets**. Excalidraw has around **81,000 stars** on GitHub and is a popular choice for real-time collaboration.

The vulnerability lies in Excalidraw's **Web Embed** feature, which allows users to embed content from sites like YouTube, Vimeo, gist.github, etc. through this feature, I was able to inject JavaScript into a sandboxed iframe then escape the sandboxing and execute malicious javascript on Excalidraw.

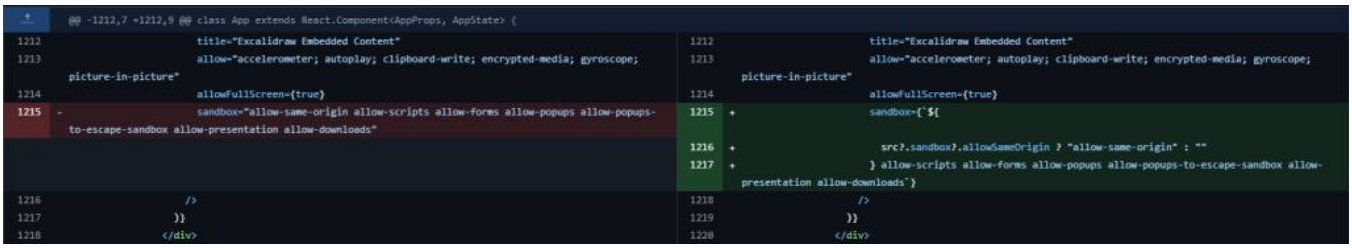
Background on Excalidraw

For those unfamiliar, **Excalidraw** is a real-time whiteboard tool used for drawing and collaboration. It's used in several Facebook assets, such as TheFacebook and Meta Careers.

The First Vulnerability within Web Embed

While investigating the Excalidraw **Web Embed** feature, I noticed that if a link from **gist.github.com** contains a `<script>` tag, the application creates a sandboxed iframe and sets the `srcdoc` attribute to that link. This iframe, however, has permissions like **allow-same-origin** and **allow-scripts**, which can be exploited.

With this setup, an attacker can craft a malicious embed that leads to **theft of private board data** and execution of malicious javascript on Excalidraw host.



How the Attack Works:

Here's how the vulnerability could be exploited:

- The attacker visits **https://excalidraw.thefacebook.com/** and uses the **Web Embed** feature.
- The attacker embeds a malicious Gist link containing JavaScript:

> https://gist.github.com/<script>console.log(document.domain)</script>

- Excalidraw creates a sandboxed iframe with that script.
- The attacker starts a **Live Collaboration** session and sends the collaboration link to the victim.
- When the victim opens the link, the script executes in their browser, and the attacker can execute arbitrary javascript code, exfiltrate their private board content.

The Second Vulnerability within Web Embed

After the vendor fixed the first vulnerability by removing **allow-same-origin** permission from **gist.github.com **iframes, I noticed another issue with the Web Embed feature. The library used to sanitize user input before appending it to `createSrcDoc` wasn't escaping double quotes.

This issue allows attackers to close the tag that user input is inside and then and execute arbitrary JavaScript within the iframe context.

While this might not seem like an issue due to the removal of **allow-same-origin** for **gist.github.com**, I discovered that when embedding content from domains like **Twitter** or **YouTube**, Excalidraw adds the `allow-same-origin` permission to the iframe. This makes it possible to escape the sandboxing and execute arbitrary JavaScript code on the Excalidraw host.

I brought this to the vendor's attention, and they acknowledged that their URL sanitization library, `@braintree/sanitize-url`, only prevents XSS attacks using certain protocols (like JavaScript). However, it doesn't handle all possible cases, like XSS via double quotes. Excalidraw team has fixed this issue by escaping double quotes before appending user input to createSrcDoc and and also released a CVE-2024-32472 for this vulnerability.

Conclusion

Facebook rewarded this vulnerability with $3,000, plus an extra $300 for the delay in response. Thanks to Facebook for the generous reward and also thanks to the Excalidraw Team for their quick and effective fixes.