A deactivated user can access data through GraphQL

HackerOne report #1192460 by joaxcar on 2021-05-11, assigned to @dcouture:

Report | How To Reproduce

Report

A deactivated user should not be able to access information through the API. This rule is not enforced when making requests through the GraphQL

When reading through the changelog for 13.11.2 i noticed that the rule for a deactivated user allows for :log_in (as it should) but it is restricted from :access_api(as it should) link. The GraphQL endpoint does not seam to use this rules when authorizing a user. I guess GraphQL only checks for api scope on

- A user using its account through the GraphQL API (through some script or similar) would not get a warning that the account is deactivated. This
 could lead to the account being removed if the entities controlling the Gittab instance has any automatic procedures deleting accounts. When
 reading about the deactivation feature I got the impression that most admirs requesting the feature would use it in automated "cleanings" of their
 user base. I could see how an admir could implement a "deactivate after 90 days inactivity" and "delete after 180 days inactivity" rule or similar. This
 could lead to an account being "in use" through GraphQL could get deleted without proper warnings.
 An admir ould use deactivated accounts as "bots" reservice accounts" by passing the billing of these accounts, an admir can create users and
 deactivate them directly, before ever using the account).
 The first effective passing the billing of these accounts, an admir can create users and
- The fact that the account should not be able to do this. An admin reading the docs are under the assumption that a deactivated account is blocked from using the API. An inactive user could have left some form of scripts running that would keep on using resources on the GitLab instance, which I guess the admin would like to remediate by deactivating the account.

as of 13.10.4: A deactivated user can (without activating its account) use read queries on the GraphQL endpoint. The latest security patch removes the ability to use mutations due to the fact that

```
rule { deactivated }.policy do
prevent :access_git
prevent :access_api
prevent :receive_notifications
prevent :use_slash_commands
end
```

prevents :access api, and

rule { ~can?(:access_api) }.prevent :execute_graphql_mutation

prevents from using mutations if I understand the code correctly.

tested on 13.11.1: (Prior to latest security patch 13.11.2) A deactivated user can (without activating its account) use queries and mutations on the GraphQl

Unlimited service accounts

- 1. Login as admin
- 2. Create a user
- 3. Deactivate the user
- 5. Use the token in GraphOL requests such as (replacing url and token)



User with deactivated account

1. Use any old token from your deactivated account in requests such as



or on servers prior to 13.11.2 (tested on 13.11.1)

- Create a user
 Deactivate the use
- Create an api token for the deactivated user
- 5. Add the user to a project with (use admin token, and a real project id)



6. Then perform a mutation with the disabled account



Impact

For users. Running the risk of missing warnings about disabled accounts. Could lead to deletion of account if admins does not notice that the account is

Examples

I would guess that this is affecting GitLab.com but can not create a disabled accou

What is the current bug behavior?

With a token from a disabled account the REST API gives:



curl 'http://gitlab.joaxcar.com/api/graphql' -H 'Accept: application/json' -H 'Content-Type: application/json' -H 'Authoriz {"data":{"currentUser":{"id":"gid://gitlab/User/15"}}} ◀.

What is the expected correct behavior?

```
Using RVM:
      Ruby Version: 3.0.1p64
                                                 /usr/lib/rubv/2.7.0/bundler/spec set.rb:86:in `block in materialize': Could not find rake-13.0.3 in any of
                        rsion: /usr/lb/ruby/2.7.0/bundler/spac_set.rb:86:in 'block in materialize': C
from /usr(lb/ruby/2.7.0/bundler/spac_set.rb:86:in 'mapt'
from /usr(lb/ruby/2.7.0/bundler/spac_set.rb:86:in 'mapt'
from /usr/lb/ruby/2.7.0/bundler/definition.rb:170:in 'spacs'
from /usr/lb/ruby/2.7.0/bundler/definition.rb:237:in 'spacs'
from /usr(lb/ruby/2.7.0/bundler/definition.rb:235:in 'spacs'
from /usr(lb/ruby/2.7.0/bundler/definition.rb:236:in 'requested_spacs'
from /usr(lb/ruby/2.7.0/bundler/rumite.rb:181:in 'block in definition_method'
from /usr(lb/ruby/2.7.0/bundler/rumite.rb:20:in 'setup'
from /usr(lb/ruby/2.7.0/bundler/rumite.rb:20:in 'setup'
                           from /usr/lib/ruby/2.7.0/bundler.rb:149:in `setup'
                          from /usr/lb/ruby/2.7.0/bundler.rb:109:in 'setup'
from /usr/lb/ruby/2.7.0/bundler/setup.rb:20:in 'block in <top (required))'
from /usr/lb/ruby/2.7.0/bundler/us/shell.rb:136:in 'with_level'
from /usr/lb/ruby/2.7.0/bundler/us/shell.rb:136:in 'with_level'
from /usr/lb/ruby/2.7.0/bundler/us/shell.rb:136:in 'stene'
from /usr/lb/ruby/2.7.0/bundler/us/shell.rb:100:in 'cop (required)>'
from cinternal/usr/lb/ruby/3.0.0/rubyges/core_ext/kernel_require.rb:85:in 'require'
from cinternal:/usr/lb/ruby/3.0.0/rubyges/core_ext/kernel_require.rb:85:in 'require'
Numerior windows.
      Bundler Version:unknown
    Rake Version: 13.0.3
Redis Version: 6.2.3
Git Version: 2.31.1
      Git Version: 2.31.1
Sidekiq Version:5.2.9
                                             go1.16.4 linux/amd64
     Revision:
                                                 e11cc45d596
     Directory:
                                                 /usr/share/webapps/gitlab
                                                PostgreSQL
    URL: http://gitlab.joaxcar.com
HTTP Clone URL: http://gitlab.joaxcar.com/some-group/some-project.git
SSH Clone URL: gitlab@gitlab.joaxcar.com:some-group/some-project.git
USing LDap: no
    Using Omniauth: yes
Omniauth Providers:
     GitLab Shell
     Version:
                                                13.17.0
    version:
Repository storage paths:
- default: /war/lib/gitlab/repositories
Gittab Shell path: /usr/share/webapps/gitlab-shell
Git: /usr/bin/git
         \blacktriangleleft
Impact
```

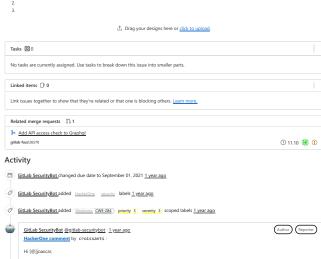
A user with a disabled account can access the GraphQL API without activating the account. Running the risk of missing warnings about disabled acc Could lead to deletion of account if admins does not notice that the account is being used. Or accessing data without admins knowing the account

An admin could create accounts that are not billable but "usable", By creating disables accounts and use them through GraphOL

I put it at medium due to the risk of data loss if not getting proper warnings and the fact that it has access to the API even if explicitly told that it should not in the documentation. But feel free to lower the severity if you disagree.

How To Reproduce

Please add reproducibility information to this section:



Thank you for your submission. I hope you are well. Your report is currently being reviewed and the HackerOne triage team will get back to you once there is additional information to share. Have a great day! Author Reporter GitLab SecurityBot @gitlab-securitybot · 1 year ago HackerOne comment by croissants Please provide more information about the impact of the reported behavior. How can an attacker benefit from this? How does this affect end-users or the application infrastructure? The GraphQL query you showed only shows your own ID, nothing sensitive gets leaked. Thank you in advance for your help! Regards, [@]croissants Author Reporter

Hi [@]croissants

GitLab SecurityBot @gitlab-securitybot - 1 year ago
HackerOne comment by joaxcar:



Thanks for taking the time to review my report! I'm new to bug hunting, so maybe I misunderstand what could count as a vulnerability. I will try

1 First there is the possibility of using the API and thus accessing all information in scope (internal projects, issues, merge requests, code and so on) while still being listed as an inactive user. There might be scenarios where an admin keeps track of active users by calls to

curl --header "Authorization: Bearer <ADMIN_TOKEN>" "http://gitlab.domain.com/api/v4/users?active=true"

2 I don't know exactly how GitLabs priced tiers work. But as I understand it there are no way to create accounts to use as service accounts other than the new "project token" bots. All other accounts are counted as "Billiable", see list billiable users and what users are counted. This bug makes it possible for an admin account to create "free" service accounts to be used through GraphQL (deactivated accounts does not count as billiable).

But I see the point of this being quite minor. It kind of depends on how GitLab views the ability to create these "free" accounts I guess. If this is not enough for at least a LOW severity then feel free to drop the report and I will keep on hunting:)



GitLab SecurityBot @qitlab-securitybot · 1 year ago

HackerOne comment by croissants



Author Reporter

Thank you for your report!

Unfortunately, this was submitted previously by another researcher, but we appreciate your work and look forward to additional reports from

For transparency, we have invited you to the original report. Please do not comment on the original submission. If you have any further questions or concerns, please post it on this report instead.

Have a great day ahead!

Best regards, [@]croissants





GitLab SecurityBot @gitlab-securitybot · 1 year ago

Hello again [@]croissants thanks for the reply! I think that you might have misunderstood the report. The report you linked as a duplicate is mine as well. The other report (#1186729) is about any user listing information about a user with "private user" activated on its account. This report is about a "deactivated user" see https://docs.gitlab.com/ee/user/admin.area/moderate users.html#deactivating-a-user

As stated in the docs a deactivated user: "Cannot access Git repositories or the API."

Which I have shown they can through GraphQL (a deactivated user is a light version of a blocked user, but should still be blocked from API

I would like to open up the report again to have a closer look at the difference between "private user" and "deactivated user". As far as I can tell the reports are not related



GitLab SecurityBot @qitlab-securitybot · 1 year ago

HackerOne comment by joaxcar



There is an additional bug caused by the same underlying bug to the one presented in the initial report. As their mitigation are the same I think that it's better to treat them as one report. I would suggest a change of title to reflect the broader scope but can't change it. Se suggestion for mitigation below.

If an administrator on a GitLab instance activates a requirement of all users to accept a "terms of service" (see documentation in link) all current users will get a popup stating that the user need to accept the terms to continue using the service. A user who have not accept the terms or who declines the terms should be logged out from Gittab and denied from usage of the APIs. This blockage works for the REST API but is not enforced on the GraphQL endpoint. If the user have an active access token the user can use it to access the service without accepting the terms of service.

A terms of service can be used by organizations to enforce rules and agreements on their users. The terms of service could also be used as a legal contract towards the users/some info <u>link</u> and <u>link</u>). A user that can access the service despite declining the terms could use this to dispute disciplinary or legal actions taken toward the user if the terms are broken. And the bug can render these terms "non enforceable" (see the same link).

Steps to recreate

- Go to https://qitlab.domain.com/admin/application_settings/qeneral
 Make sure "Terms of Service and Privacy Policy" is disabled
- 4. Log in as any normal user
- 5. Go to https://gitlab.domain.com/-/profile/personal access tokens and create an api token (take a note of the token)
 6. Login as admin
- 7. Go to https://qitlab.domain.com/admin/application_settings/general again

 8. Now activate "Terms of Service and Privacy Policy" (if the normal user is still logged in in another browser window, click "decline and log
- 8. Now activate "Terms or Service aftur Five-y 1 only 1 o

```
curl --header "Authorization: Bearer <TOKEN>" "https://gitlab.domain.com/api/v4/user"
```

and he presented with the answer

◀.

"message": "403 Forbidden - You ([@lunwilling) must accept the Terms of Service in order to perform this action.

10. Make a request to the GraphQL API with the same token.

```
curl 'https://gitlab.domain.com/api/graphql' \
curl 'https://gitlab.domain.com/api/graphq1 \
-H 'Content-Type: application/json' \
-H 'Authorlization: Bearer (TOKBN) \
--data '{"query": "query {\n urrentUser {\n id\n username\n name\n }\n}\n"}'
```

And be presented with real data and no warning:

```
"data": {
  "currentUser": {
    "id": "gid://gitlab/User/61",
      "username": "unwilling",
"name": "Unwilling User"
```

11. Make a more fun request listing all projects

```
curl 'https://gitlab.domain.com/api/graphq1' \
-H 'Content-Type: application/json' \
-H 'Authorization: Bearer 'Cifetbi' \
--data '{"query": "query {\nprojects {\n nodes{\n id\n name\n }\n}\n}\n")\n")
```

What is happening

As reported in this issue on GitLab #255334 (comment 424042116) there is a discrepancy in how REST and GraphQL validates users. When sending requests through the GraphQL endpoint the user has to have the permission to log in, see /appr/policies/global-policy/rb where the default policy is

```
rule { default }.policy do
  vule { default }.policy do
enable :log_in
enable :access_api
enable :access_git
enable :receive_notifications
enable :use_quick_actions
    enable :use slash commands
    enable :execute graphal mutation
```

For a user to be able to use GraphQL it seems that only:log_in is needed and:access_api have no effect. So when restricted by either rule { deactivated }.policy do rule { deactivated }.policy do
prevent :access_git
prevent :access_api
prevent :receive_notifications
prevent :use_slash_commands
end rule { required_terms_not_accepted }.policy do prevent :access_api prevent :access_git The user still have log in capabilities (as it should) but the "prevent access api" does not restrict the access to GraphQL. Prior to the security patch in 13.11.2 to "Require" api" scope to execute mutations". These users could use both mutations and queries. After the patch the line rule { ~can?(:access_api) }.prevent :execute_graphql_mutation effectively blocks mutations for these account while read queries are still possible post 13.11.2. A side effect of how authentication is handled at the GraphQL endpoint is that a "project access token" cant be used. This is related to the implementation of these access tokens being connected to bot users. And as stated in the same file rule { project_bot }.policy do
 prevent :log_in
 prevent :receive_notifications
end A bot user have no login permission and can thus not access GraphQL despite having :access_api enabled (Author) (Reporter) GitLab SecurityBot @gitlab-securitybot · 1 year ago Hi again [@]croissants any updates on this issue? I still feel that this is not a duplicate, especially now with the added example. I could write a more detailed comparison between the two reports if needed. Author Reporter GitLab SecurityBot @gitlab-securitybot · 1 year ago HackerOne comment by joaxcar: If you are not going to consider this as a valid report I would like to have it disclosed to be able to use the information in a student report at my university. As the report that is referenced as the "original" of this one was considered "not a bug" (closed as informative) and thus is considered open as of Gittabs policy Informative or self-closed reports that are determined to be bugs or new feature requests with no current security impact may be imported as public issues in our issue tracker at $\frac{https://qitlab.com/qitlab-orq/qitlab/issues.}{https://qitlab.com/qitlab-orq/qitlab/issues.}$ I would assume that this report could also be disclosed. (Author) (Reporter) GitLab SecurityBot @qitlab-securitybot · 1 year ago HackerOne comment by joaxcar: Just checking in after another week of silence. No updates on this? Author Reporter GitLab SecurityBot @qitlab-securitybot - 1 year ago HackerOne comment by dcouture : Hi [@]joaxcar, I reopened the report and will look into it. For the future in situations like this where you add so much details that it's basically describing a new bug I'd suggest simply opening a new report. Messages on closed reports can sometimes get lost through the noise as you have unfortunately noticed here. 3 Thanks for your patience, Dominic GitLab Security Team Author Reporter GitLab SecurityBot @qitlab-securitybot - 1 year ago HackerOne comment by joaxcar: Hi [@]dcouture, thank you for looking into the report! I was hesitant to create a separate report as the underlying bug generating both vulnerabilities probably stem from the same root cause and this one got closed. I have since understood that it is usually preferred to split reports containing multiple vulnerabilities anyways and will do that in the future. Do you want me to create a separate report for the "Terms of Service"-bug or can I leave it as is? (there is also the problem that my "signal" is not high enough as my account is new, so at the moment I can't create new reports for GitLab.
When my "trail reports" gets generated I will submit some more findings and could also post the ToC one if necessary) /Johan Author Reporter GitLab SecurityBot @gitlab-securitybot · 1 year ago It's OK we'll handle this one here thanks! <u>Dominic Couture</u> <u>@dcouture</u> · 1 <u>year ago</u> I imported this one a little too quickly, I need to test a few things still Developer GitLab SecurityBot added security-triage-appsec label 1 year ago @gweaver @jlear Hello folks! It seems like the GraphQL API doesn't do as many checks on the user as the REST API does. Some examples of account "states" that are able to use the API and probably shouldn't (they can't use the REST API at least) A disabled user (with a PAT and possible an OAuth token as well) A unsuled user (universal any state place) and a reversal and a reversal and a reversal any state place and a reversal and a rev I'm not sure if all those things are the same fix or not. Please let me know if you'd like me to split this in several issues Jake Lear @jlear · 1 year ago <u>@cablet:</u> <u>@digitalnoksha</u> - I could use some help understanding if these is something that we could fix in one go or if we're three individually. Brett Walker @digitalmoksha · 1 year ago I haven't looked at the REST code yet. But it might be as simple as checking if the user has api_access privs for all graph charlie ablett @cablett · 1 year ago Yea we have https://qitlab.com/qitlab-org/qitlab/-/blob/e5c04dd74419c9d0872849e208cc570 the REST API. I wonder if we can easily apply it in GraphQL as well charlie ablett @cablett · 1 year ago Yea, we have policy :access_ap1 which is set to prevent for blocked | internal as well as inactive.But our GraphQL controller checks for can?(current_user, :access_api ... Edited by charlie ablett 1 year ago charlie ablett @cablett · 1 year ago What's the difference between a blocked user using our API and an anonymous user doing the same? I suppose we can block the uentirely and they'd have to logout or use no PAT (etc) in order to access a GraphQL query.

Edited by charlie ablett 1 year ago Jake Lear @jlear - 1 year ago Yea, we have policy :access_api which is set to prevent for blocked | internal as well as inactive. But our GraphQL controller checks for can?(current_user, :access_api https://aitab.com/qilabi-ora/qilabi-/blob/e/sOldd74419-0d0872848e208cc570419e7ca58/lb/pap/ain_quard rb#L103-105_and I'm wondering why the REST API properly rejects deactivated users and the GraphQL doesn't it seems like the checks are the same? I tak the point of your other question with regard to anonymous users, but I'd like to get to the bottom of why these exhibit different charlie ablett @cablett · 1 year ago What's the difference between a blocked user using our API and an anonymous user doing the same? I suppose we can block the user entirely and they'd have to logout or use no PAT (etc) in order to access a GraphQL query. To answer my own question, if the deactivated user could access any private projects, that would be denied and being an anonymous charlie ablett @cablett · 1 year ago I'm wondering why the REST API properly rejects deactivated users and the GraphQL doesn't, it seems like the checks are the same? I did some digging using the DeclarativePolicy debugger and here's what I came up with. Reproducing as above with a deactivated user and an API token and the following bit of code: diff --git a/app/controllers/graphql_controller.rb b/app/controllers/graphql_controller.rb index 725d8b62c77..952b423007c 100644
--- a/app/controllers/graphql_controller.rb
+++ b/app/controllers/graphql_controller.rb @@ -130,6 +130,7 @@ def multiplex? def authorize_access_apii

pp "GraphQt: CAN ACCESS API?? #{can?(current_user, :access_api)}"

access_denied!("API not accessible for user.") unless can?(current_user, :access_api)

end diff --git a/app/models/ability.rb b/app/models/ability.rb index a185448d5ea..d5583196522 100644 pp "user" pp user pp "subject" pp subject policy = policy_for(user, subject) @@ -76,6 +80,7 @@ def allowed?(user, ability, subject = :global, opts = {}) DeclarativePolicy.subject_scope { policy.allowed?(ability) } pp policy.debug(:access_api) if ability == :access_api oolicy.allowed?(ability) [0] enable when default ((<anonymous> : :global)) + [0] emable when default ((canonymous: :global))
- [0] prevent when inactive ((canonymous: :global))
- [0] nervent when blocked ((canonymous: :global))
- [0] prevent when internal ((ranonymous: :global))
- [0] prevent when deactivated ((canonymous: :global))
- [0] prevent when required terms_not_scepted ((ranonymous: :global))
- [0] prevent when passunde regired ((ranonymous): :global))
- [0] prevent when inction ((ranonymous): :g "GraphQL: CAN ACCESS API?? true" <snip> Looks like the user becomes anonymous sometime before this policy check is made, but only in the case of the GraphQL API. charlie ablett @cablett : 1 year ago
In the GraphQL controller itself, current_user returns n11. I'm just figuring out why that is. But there's the difference for Maintainer charlie ablett @cablett · 1 year ago I was able to get an Unauthorized response by doing the following: diff --git a/app/controllers/application_controller.rb b/app/controllers/application_controller.rb index 34bad74a9fc..20e0e28d853 100644 --- a/app/controllers/application_controller.rb +++ b/app/controllers/application_controller.rb ### 0/app/controllers/application_c
@@ -163,6 +163,8 @@ def auth_user
strong_memoize(:auth_user) do
if user_signed_in? current_user
elsif current_user && current_user.deactivated? current_user else trv(:authenticated user) It's a bit hamfisted but it illustrates that we're using different methods to get the authorised user depending on the API controller (REST vs GraphQL). Should they be consistent? I feel like --"group:access" is probably the best placed to answer this. <a href="mailto:memoring-memo @dblessing @alexpooley @ifarkas WDYT? Imre Farkas @farkas - 1 year ago
@cablett_ user_stgned_in? is a devise helper. I would be worried about the side-effects of setting a user in #aurth_user
are not able to successfully log the user in @ Can we override it in GraphqlController to limit the sope of the change? Another idea: is the endpoint publicly available? So when the token (and thus the user) fails to authenticate, maybe the request Gosia Ksionek @mksionek · 1 year ago Developer ©ilear @calett the difference between GraphQI controller and rest api is visible here: https://qitlab.com/qitlab-orq/qitlab/-fblob/master/lib/api/api_quard.rb#L54 In the REST api we first check if user exists, then we check if they are allowed to access api :). charlie ablett @cablett · 1 year ago Maintainer Thanks everyone I've asked in the \$f_graphq1 but I see that <u>@felipe_artur_@smcqivem_@reprazent_@nick.th</u>
insight here. Original issue: gitlab-foss#58547 (closed) MR: gitlab-foss!26570 (merged) Bob Van Landuyt @reprazent · 1 year ago

