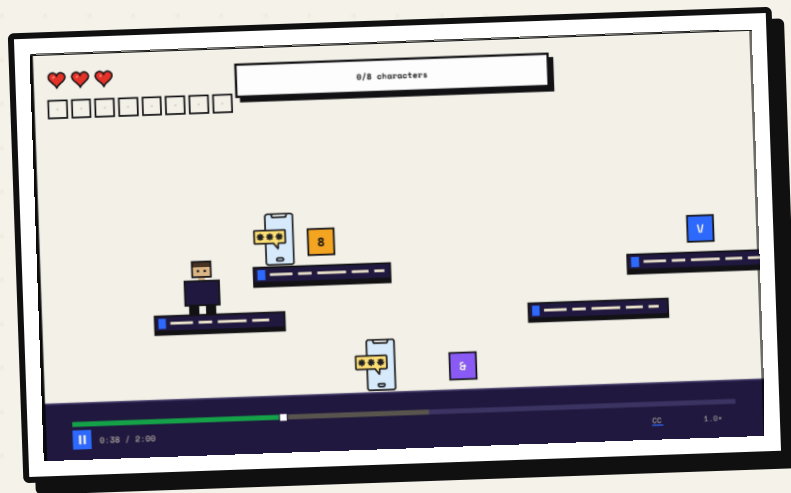


AUTHENTICATION HELL

A browser-based game built with Ruby • RubyConf • Mike Dalton

authenticationhell.com



PLAY ALONG!

Feel free to **play the game** during the **talk**.

Sign up, then dive into Authentication Hell on your laptop.

authenticationhell.com





HI, I'M MIKE



ENGINEER AT TRIUMPH



Calendar Vision



Broadside

LOVE TO BUILD SIDE PROJECTS



GAME STATS AI



RUNESHARE

"AUTHENTICATION HELL"

I LIKE MY JOB

BUT THERE'S ONE THING...

okta



TIME SENSITIVE

now

Did You Just Try to Sign In?

Near Las Vegas, Nevada, United States



TIME SENSITIVE

now

Did You Just Try to Sign In?

Near Las Vegas, Nevada, United States



TIME SENSITIVE

now

Did You Just Try to Sign In?

Near Las Vegas, Nevada, United States



TIME SENSITIVE

Did You Just Try to Sign In?

Near Las Vegas, Nevada, United States



TIME SENSITIVE

now

Did You Just Try to Sign In?

Near Las Vegas, Nevada, United States



TIME SENSITIVE

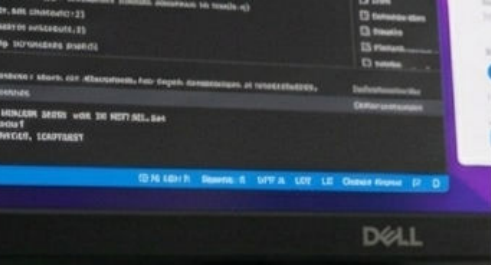
now

Did You Just Try to Sign In?

Near Las Vegas, Nevada, United States





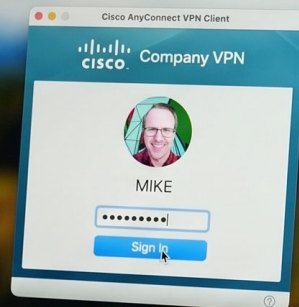


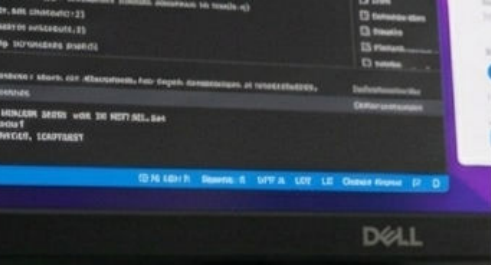
Remote server status or these conditions.

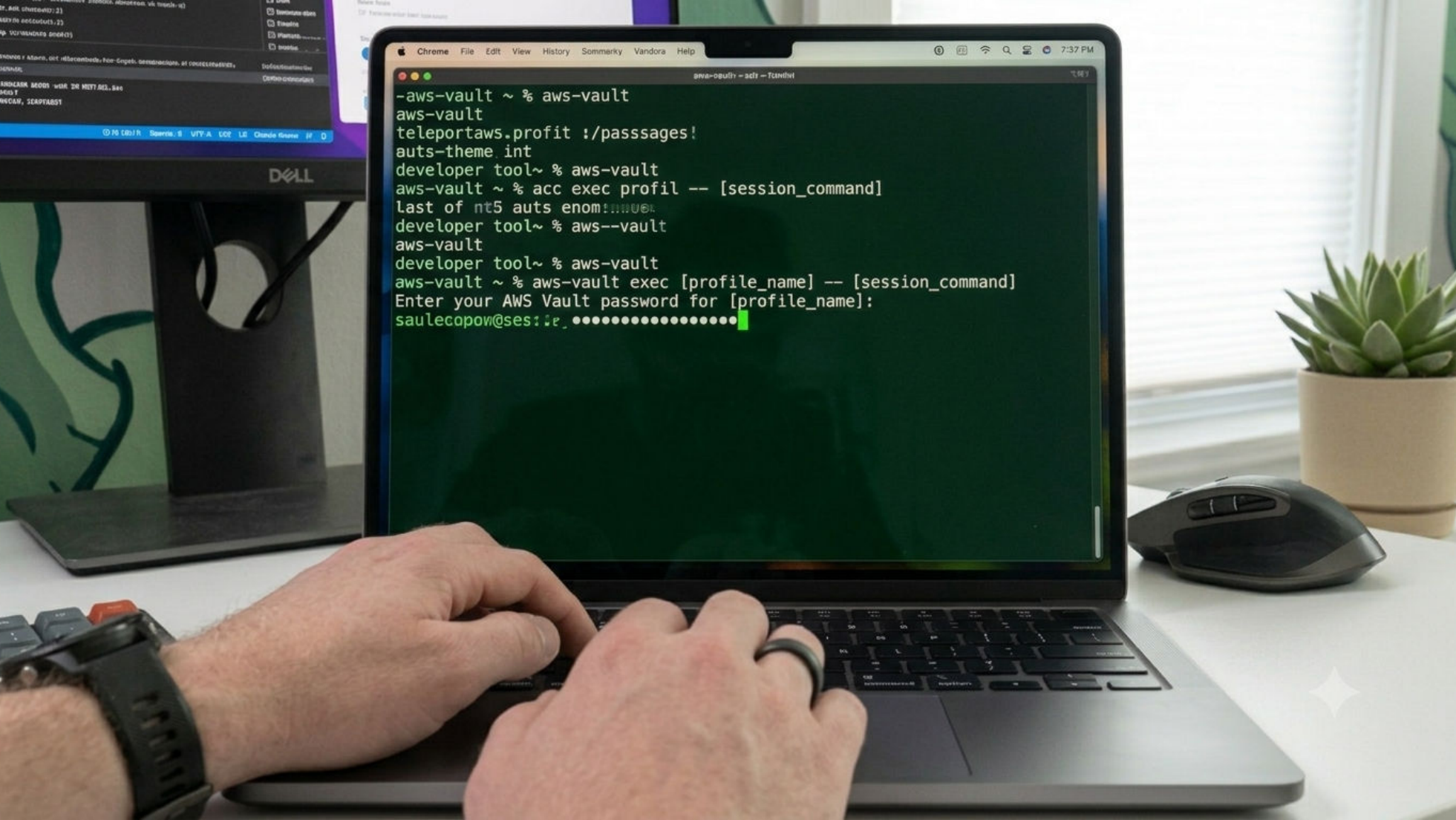
Remote Status

Remote Server 102 P3 018104	✓	Passcode
Remote Server Unknted...	✓	Passcode
Updates	✓	Passcode

Copyright © 100 2022 version - Cisco AnyConnect



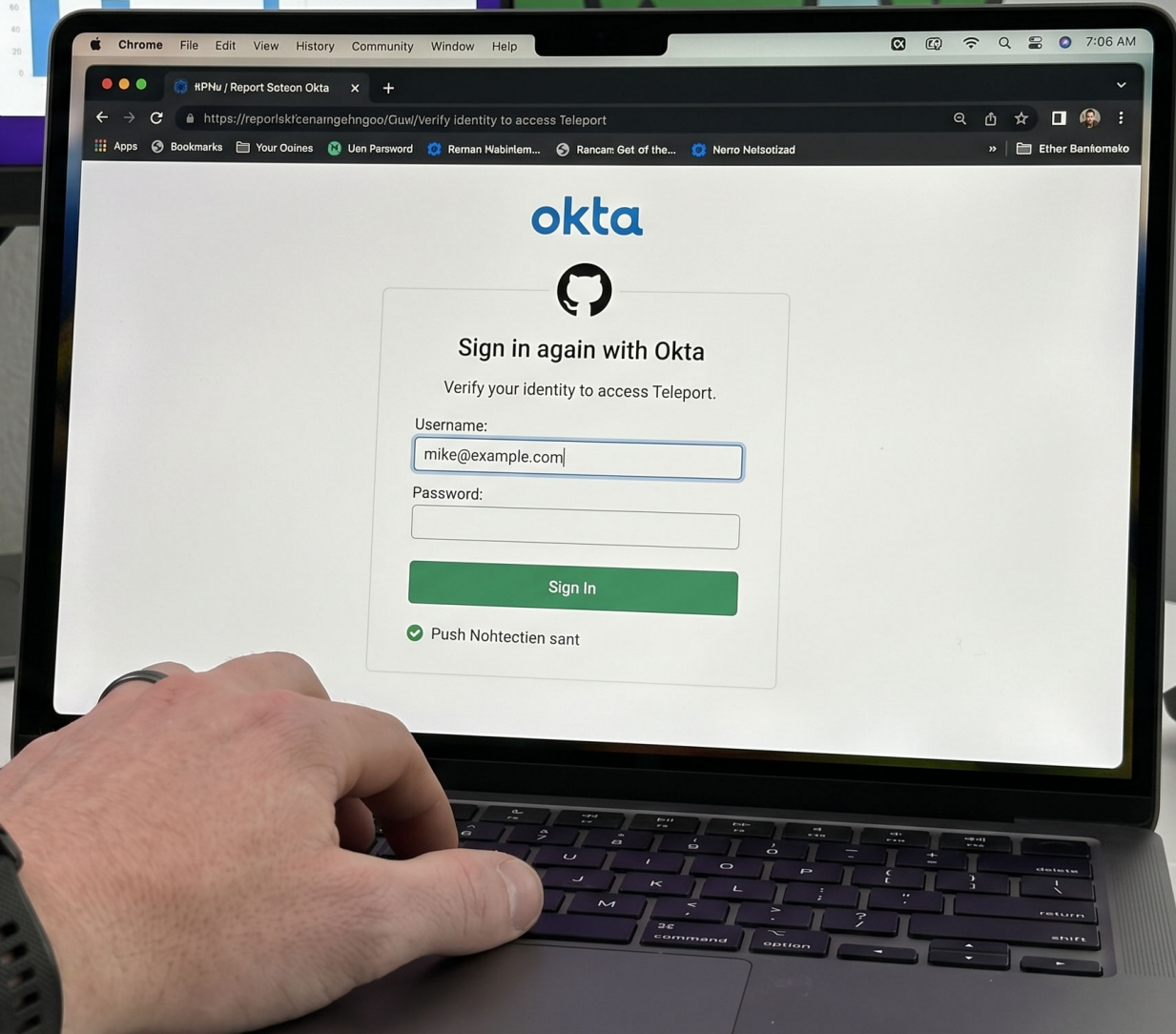


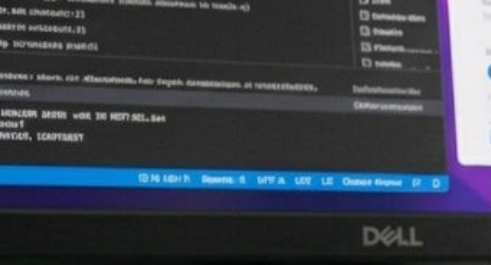


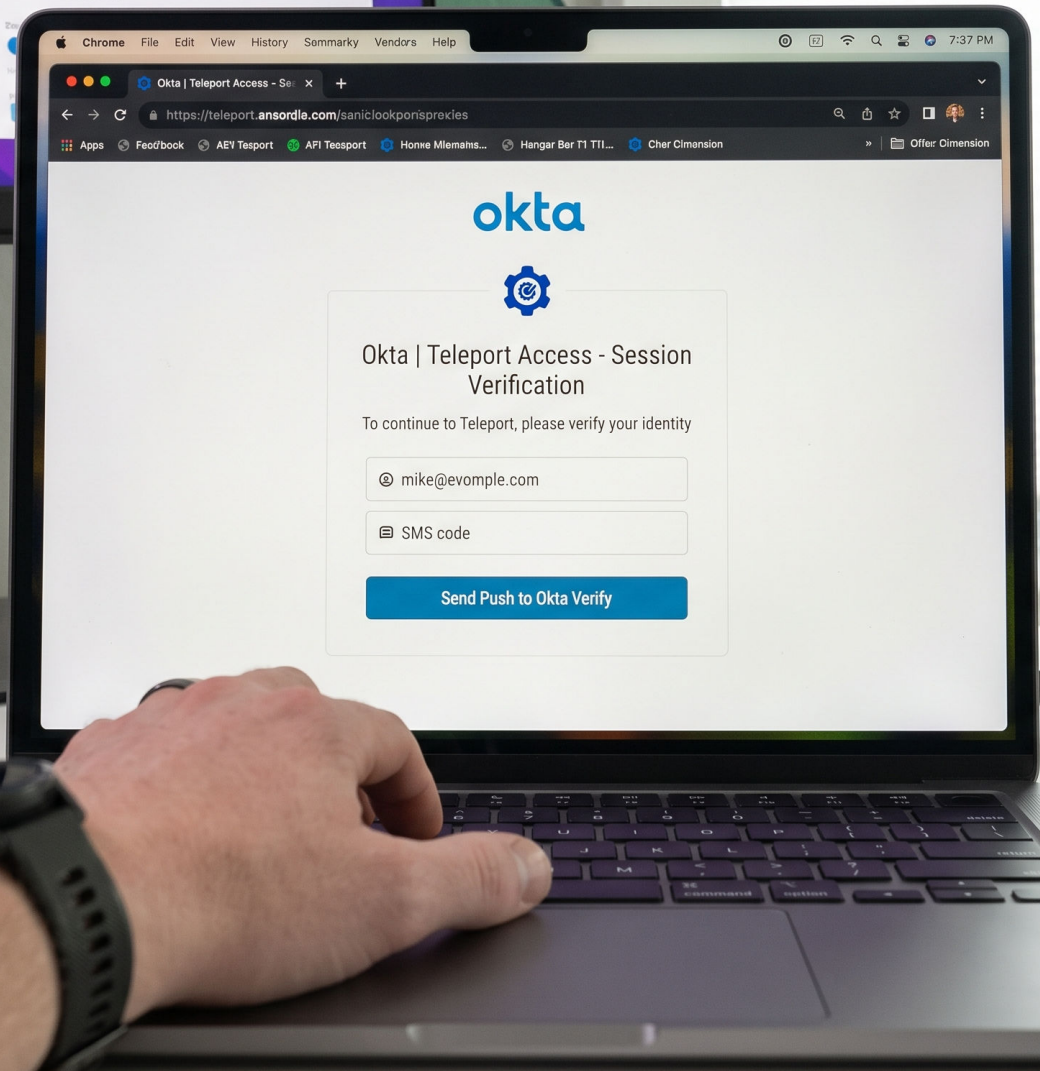
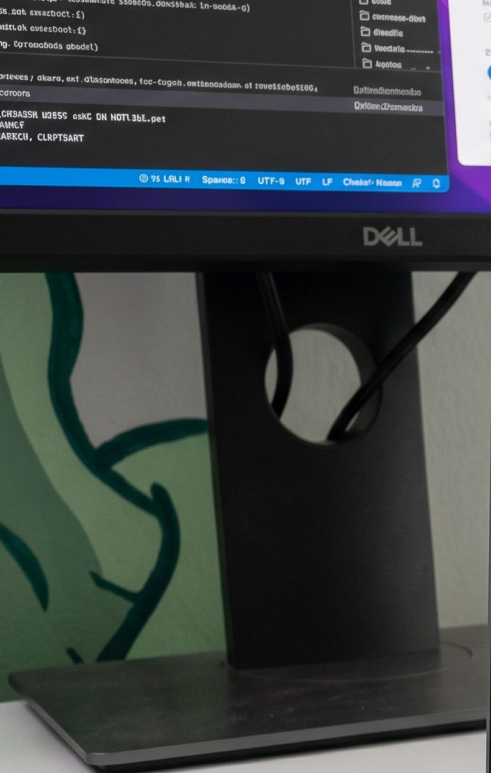
```
Chrome File Edit View History Sommarky Vandora Help 7:37 PM
aws-vault ~ % aws-vault
aws-vault
teleportaws.profit :/passages!
auts-theme int
developer tool~ % aws-vault
aws-vault ~ % acc exec profil -- [session_command]
last of nt5 auts enom!!!!!!
developer tool~ % aws--vault
aws-vault
developer tool~ % aws-vault
aws-vault ~ % aws-vault exec [profile_name] -- [session_command]
Enter your AWS Vault password for [profile_name]:
saulecopow@ses:~$ .....
```

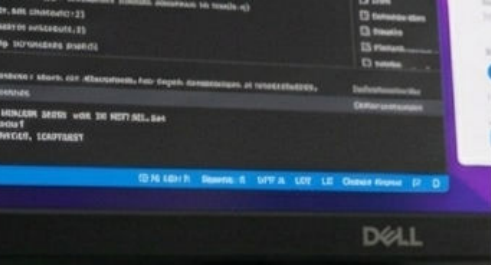
```
PROBLEMS OUTPUT TERMINAL RUNSUT
27 newatets; bendve.Sept5oe{eturloek);
28 },
29 } else {
30 }
31 return immete SnameBts(e);
32 }
33 }
```

DELL











WELCOME TO AUTHENTICATION HELL



Aladdin



Crash Bandicoot: Warped



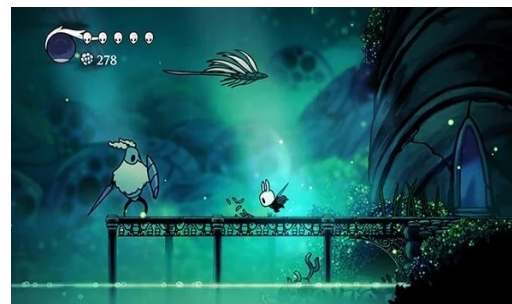
Ori and the Blind Forest



Sonic the Hedgehog 2



Spyro the Dragon



Hollow Knight

WHAT IF THERE WAS A GAME?

CALL FOR SPEAKERS

RUBYCONF

july 14-16 2026

RubyConf Las Vegas 2026

event starts

14 Jul 2026

event ends

16 Jul 2026

location

Red Rock Casino Resort & Spa
Las Vegas, Nevada, United States

Call for Speakers

Call opens at 12:00 AM

10 Feb 2026

Call closes at 11:59 PM

15 Mar 2026

Call closes in **Pacific Daylight Time (UTC-07:00)** timezone.

Closing time in your timezone (America/New_York) is **16 Mar 2026 2:59 am**.

"WEIRD RUBY" TRACK

...A program which absolutely should not exist, yet, defying all reason and good taste, does....And we want you to do it in Ruby.

AUTHENTICATION HELL: THE GAME

AUTHENTICATION HELL



click or tap to begin onboarding

AUTHENTICATION HELL



5 watched · 5 videos



0:45

CH 1 · WELCOME

✓ Watched · ⌵ Rewatch



1:30

CH 2 · PASSWORD COMPLEXITY

▶ NOW PLAYING



1:15

CH 3 · API KEYS

✓ Watched · ⌵ Rewatch



3:20

CH 4 · TIME-BASED ONE-TIME ...

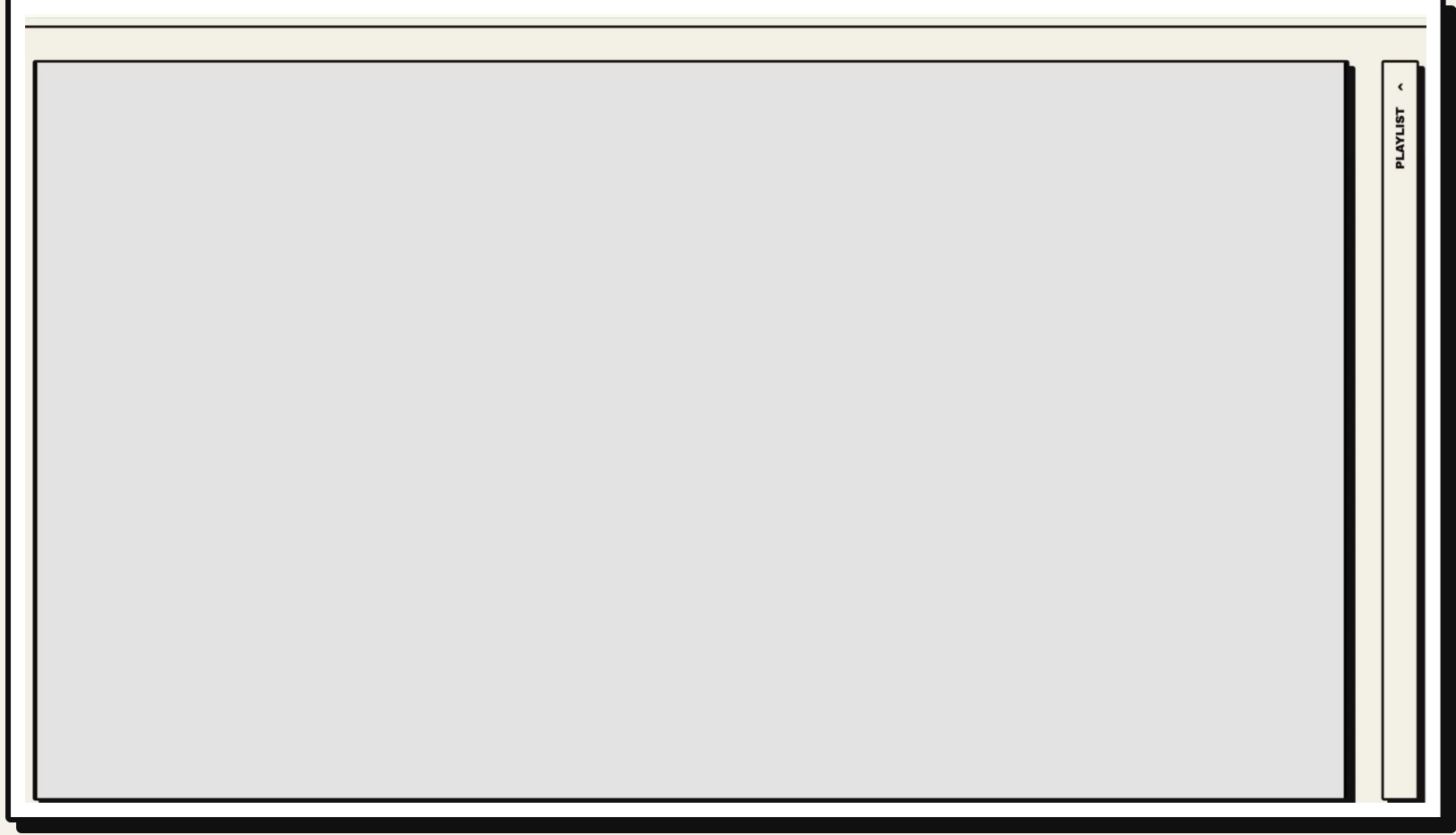
✓ Watched · ⌵ Rewatch



2:00

CH 5 · RUBYCONF FIELD TRIP

✓ Watched · ⌵ Rewatch



SECURITY TRAINING COURSE

The image shows a web interface for a security training course titled "AUTHENTICATION HELL". The interface includes a header with the course logo, a user profile, and a main content area with a video player and a list of topics. Two callout boxes with red arrows point to specific elements: "Start the course" points to a button, and "What you'll learn" points to a list of topics.

Start the course

AUTHHELL

kedragon

AUTHENTICATION HELL

The security course every new hire has to clear before their accounts go live. Get up to speed on how we protect logins here — paskeys, two-factor codes, passwords, and the rest — then press play and work through it at your own pace.

6 modules · ~4 min total · Beginner · Self-paced

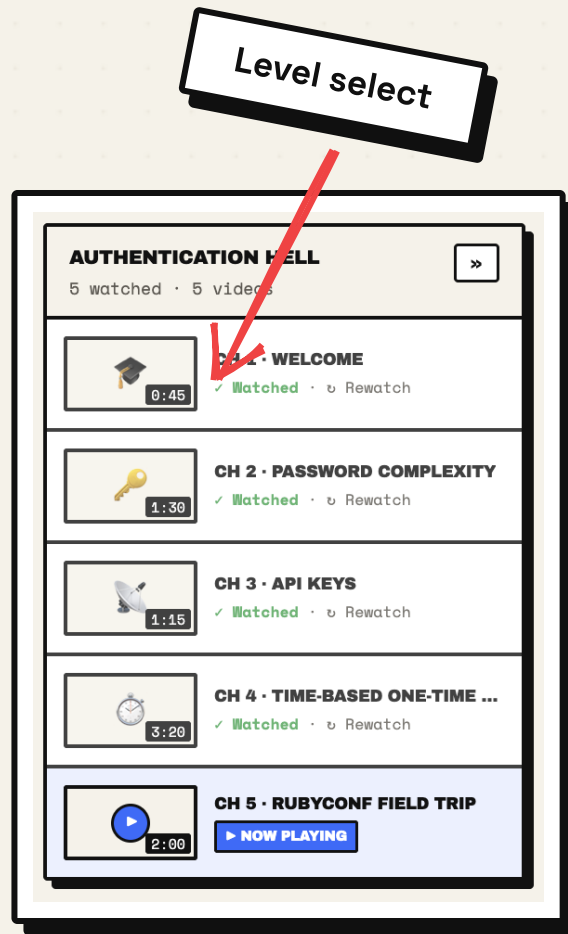
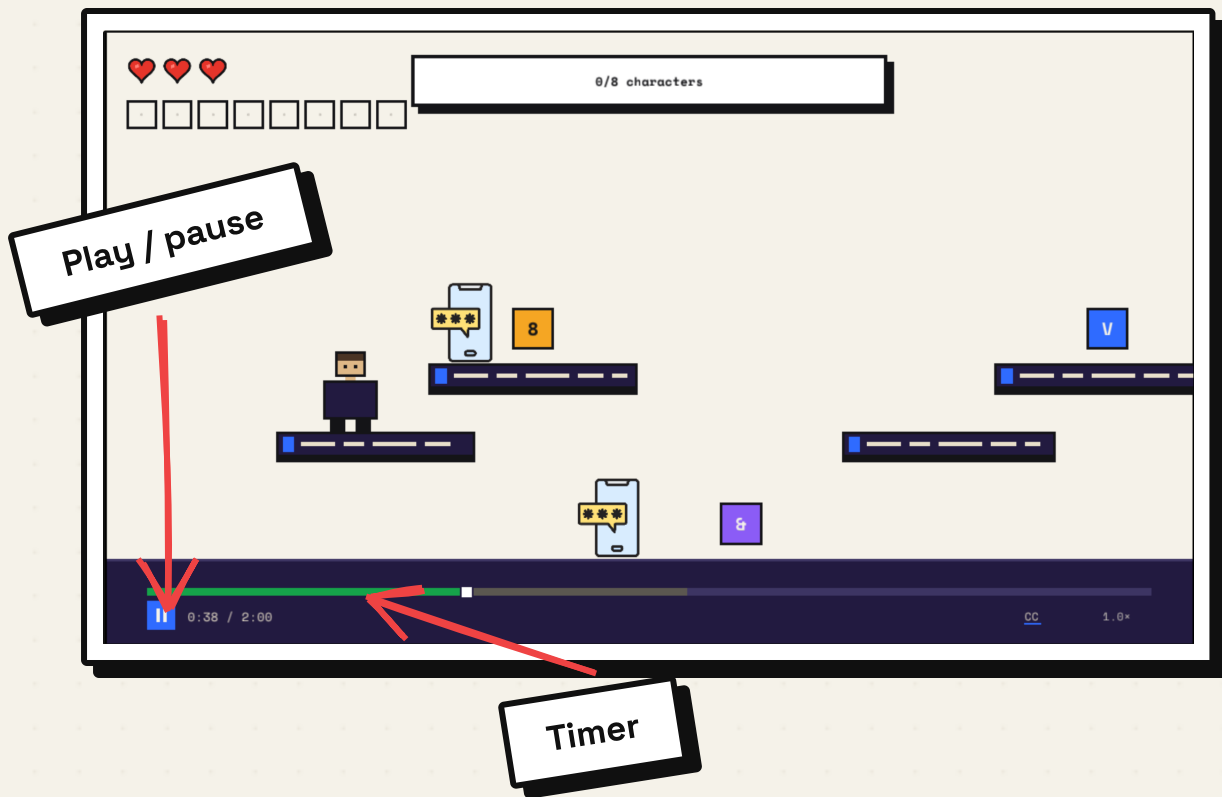
Start the course

WHAT YOU'LL LEARN

- ✓ Sign in with a passkey instead of a password
- ✓ Pick a strong password — and recover it without the panic
- ✓ Set up two-factor authentication that actually sticks
- ✓ Spot a suspicious sign-in before it becomes a problem

What you'll learn

EACH LEVEL IS A VIDEO



ENEMIES ARE AUTHENTICATION

 Game scene with three enemies on platforms — a password phone, a passkey cloud key, and a locked password field — each representing an authentication challenge

Passkey

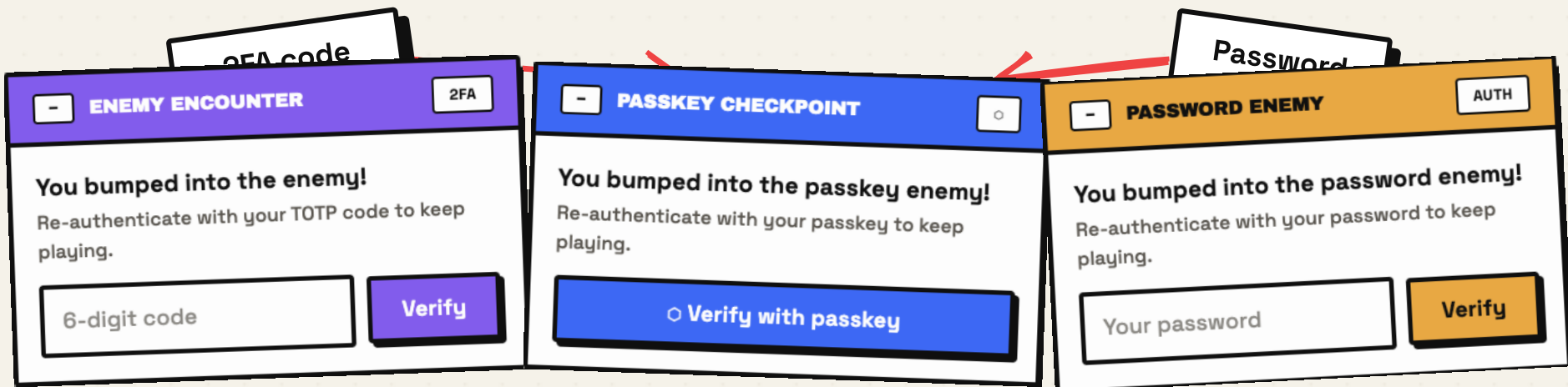
2FA code

Password

ENEMIES ARE AUTHENTICATION

 Game scene with three enemies on platforms — a password phone, a passkey cloud key, and a locked password field — each representing an authentication challenge

Passkey



The diagram illustrates three authentication challenges presented as game enemy encounters. A red arrow points from the 'Passkey' label to the 'Passkey Checkpoint' screen.

- ENEMY ENCOUNTER (2FA)**
You bumped into the enemy!
Re-authenticate with your TOTP code to keep playing.
Input: 6-digit code
Action: Verify
- PASSKEY CHECKPOINT**
You bumped into the passkey enemy!
Re-authenticate with your passkey to keep playing.
Action: Verify with passkey
- PASSWORD ENEMY (AUTH)**
You bumped into the password enemy!
Re-authenticate with your password to keep playing.
Input: Your password
Action: Verify

EARN A CERTIFICATE

 Course complete page: 'You beat Authentication Hell' above a Certificate of Completion awarded to kcdragon, with a QR code, Download PDF and Back to the game buttons, and share links

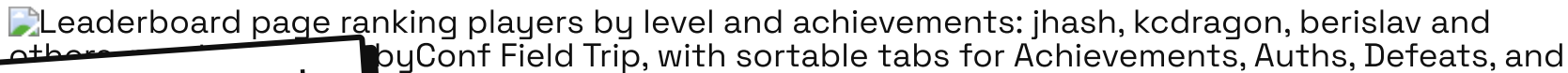
Prove you passed



Share to social



LEADERBOARD

 Leaderboard page ranking players by level and achievements: jhash, kcdragon, berislav and others. The page includes a byConf Field Trip, with sortable tabs for Achievements, Auths, Defeats, and

**Jake is beating me at
my own game**



INTRODUCTION TO DRAGONRUBY

DRAGONRUBY GAME TOOLKIT

- Cross-platform 2D game engine
 - Desktop
 - Console
 - Steam Deck
 - Mobile
 - Web
- Write games in Ruby!



DRAGONRUBY IS RUBY

- Custom Ruby runtime
- Based on [mruby](#)
- Smaller memory footprint
- Subset of Ruby language specification
 - Missing some standard library like `fileutils`, `json` and `net/http`
 - No Gem support
 - Restricted reflection (i.e. no `defined?`)
 - Other limitations



SIMPLE DIRECTMEDIA LAYER

- DragonRuby wraps SDL
- Provides low-level access to graphics, audio, and input
- Supports all platforms



TICK

main.rb

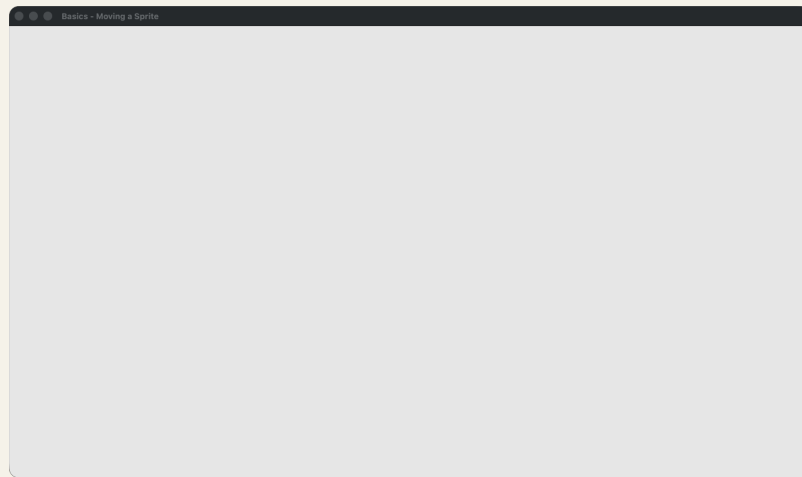
```
def tick(args)
end
```

- The entry point for your game's code
- `args` gives you everything you need:
 - `args.inputs` - read keyboard, mouse, and controller input
 - `args.outputs` - draw sprites and labels
 - `args.state` - store game state across ticks
- Called **60 times per second** - that's 60 FPS

MOVEMENT

main.rb

```
def tick(args)
  args.state.player ||= {
    x: 100, y: 100,
    w: 50, h: 50,
    path: 'sprites/square/green.png'
  }
end
```



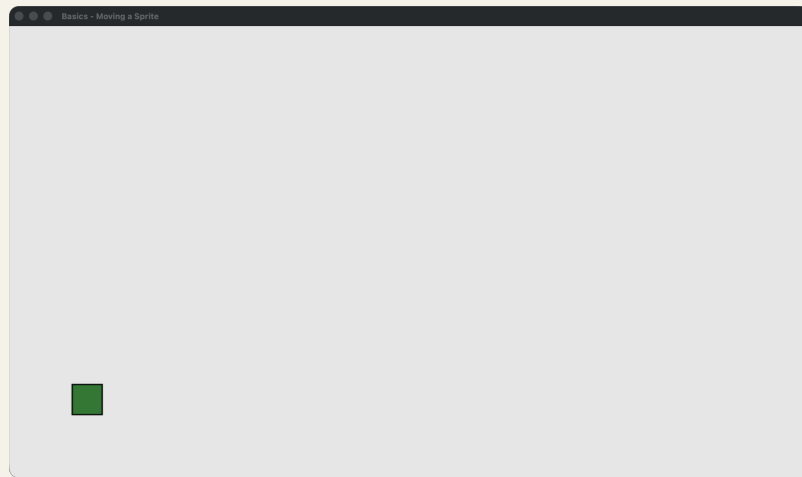
Player defined — nothing drawn yet

MOVEMENT

main.rb

```
def tick(args)
  args.state.player ||= {
    x: 100, y: 100,
    w: 50, h: 50,
    path: 'sprites/square/green.png'
  }

  args.outputs.sprites << args.state.player
end
```



Player drawn as a green square

MOVEMENT

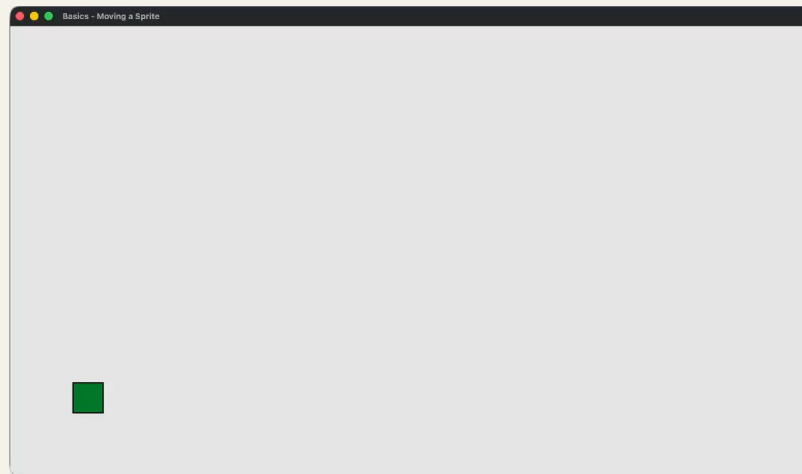
main.rb

```
def tick(args)
  args.state.player ||= {
    x: 100, y: 100,
    w: 50, h: 50,
    path: 'sprites/square/green.png'
  }

  if args.inputs.up
    args.state.player.y += 10
  elsif args.inputs.down
    args.state.player.y -= 10
  end

  if args.inputs.left
    args.state.player.x -= 10
  elsif args.inputs.right
    args.state.player.x += 10
  end

  args.outputs.sprites << args.state.player
end
```



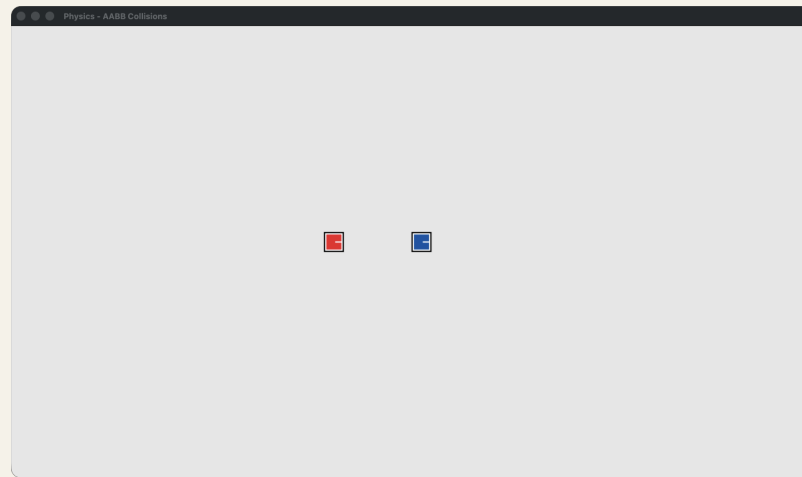
Arrow keys move the square

COLLISIONS

main.rb

```
def tick(args)
  args.state.terrain ||= [...]
  args.outputs.sprites << args.state.terrain

  args.state.player ||= {...}
  args.outputs.sprites << args.state.player
end
```



Red player and blue terrain, apart

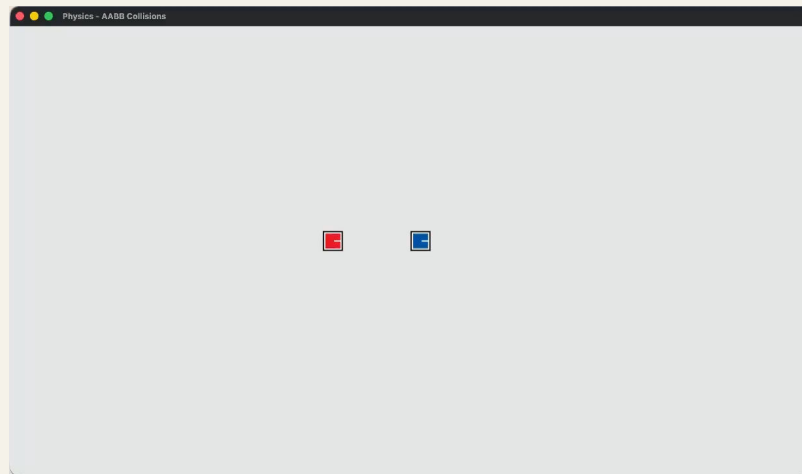
COLLISIONS

main.rb

```
def tick(args)
  args.state.terrain ||= [...]
  args.outputs.sprites << args.state.terrain

  args.state.player ||= {}
  args.outputs.sprites << args.state.player

  args.state.player.dx = args.inputs.left_right * 2
  args.state.player.x += args.state.player.dx
end
```



Player moves right, through the terrain

COLLISIONS

main.rb

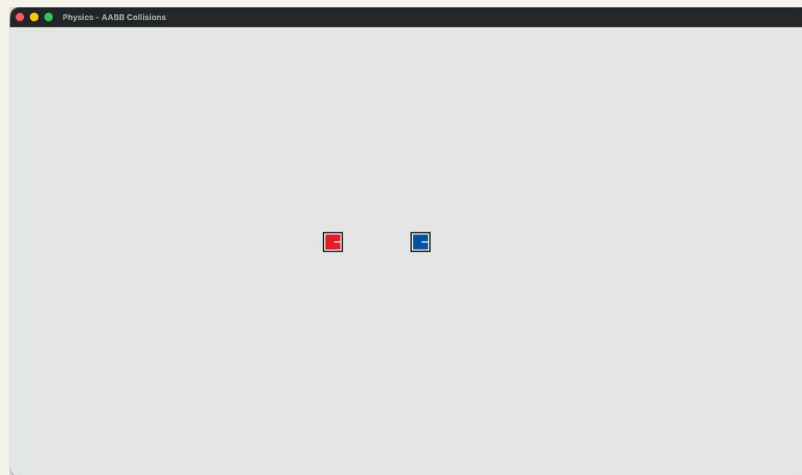
```
def tick(args)
  args.state.terrain ||= [...]
  args.outputs.sprites << args.state.terrain

  args.state.player ||= {}
  args.outputs.sprites << args.state.player

  args.state.player.dx = args.inputs.left_right * 2
  args.state.player.x += args.state.player.dx

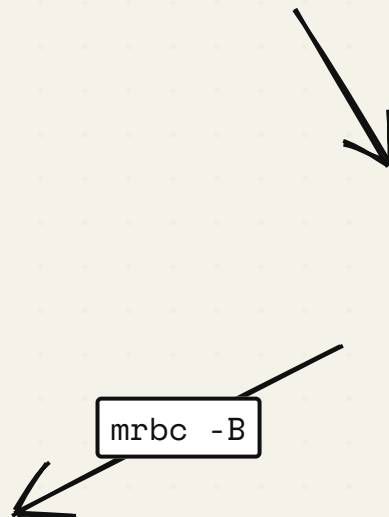
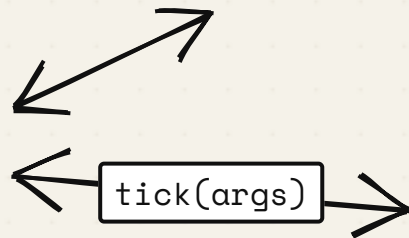
  collision = args.state.terrain.find do |t|
    t.intersect_rect?(args.state.player)
  end

  if collision
    args.state.player.x -= args.state.player.dx
  end
end
```

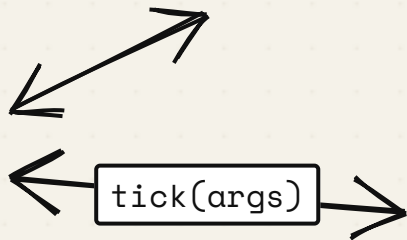


Collision detected — player stops at the edge

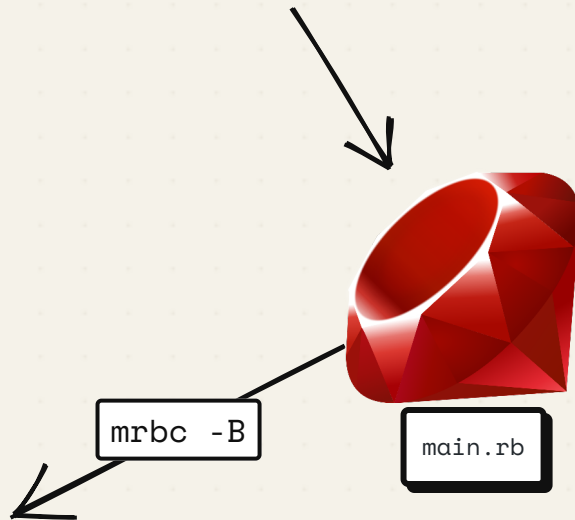
👋 ARCHITECTURE 👋



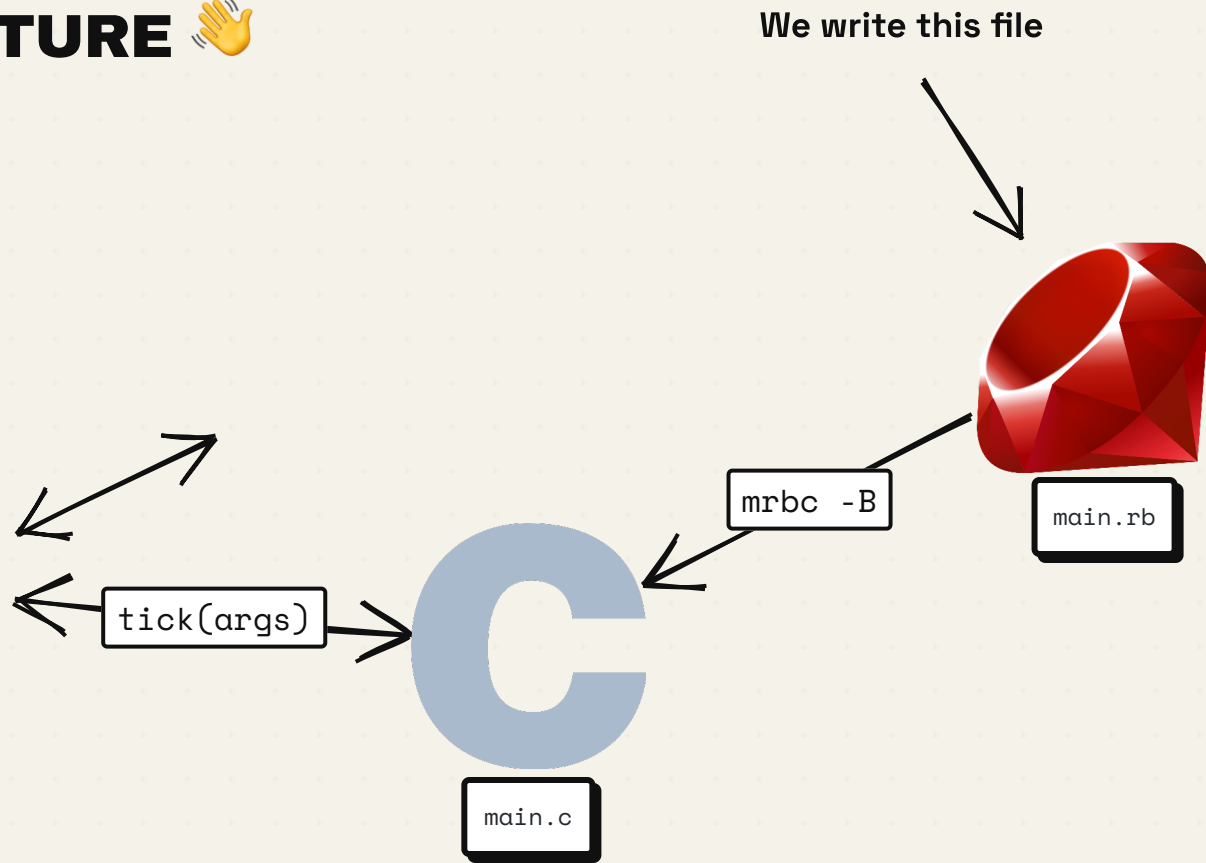
👋 ARCHITECTURE 👋



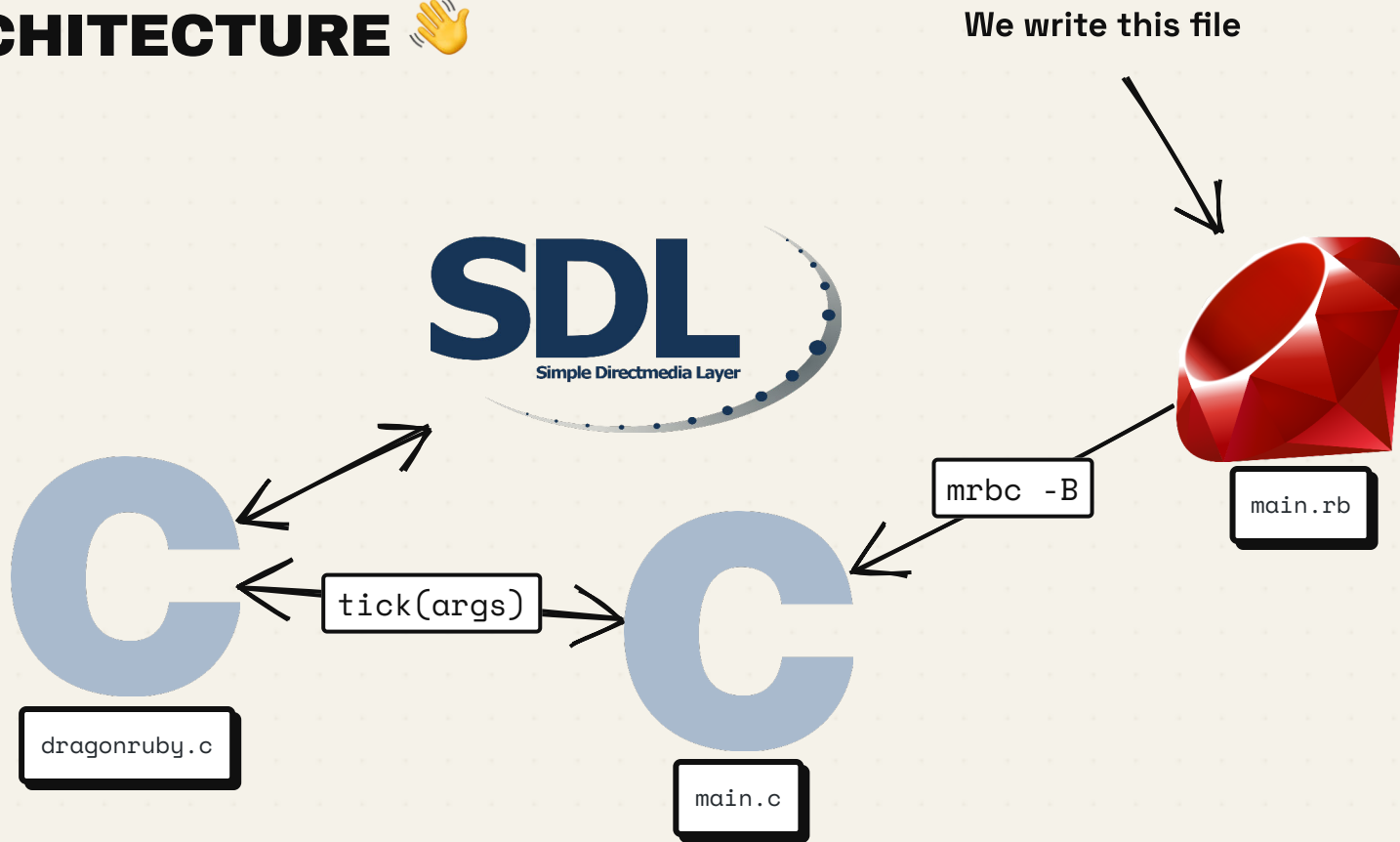
We write this file



👋 ARCHITECTURE 👋

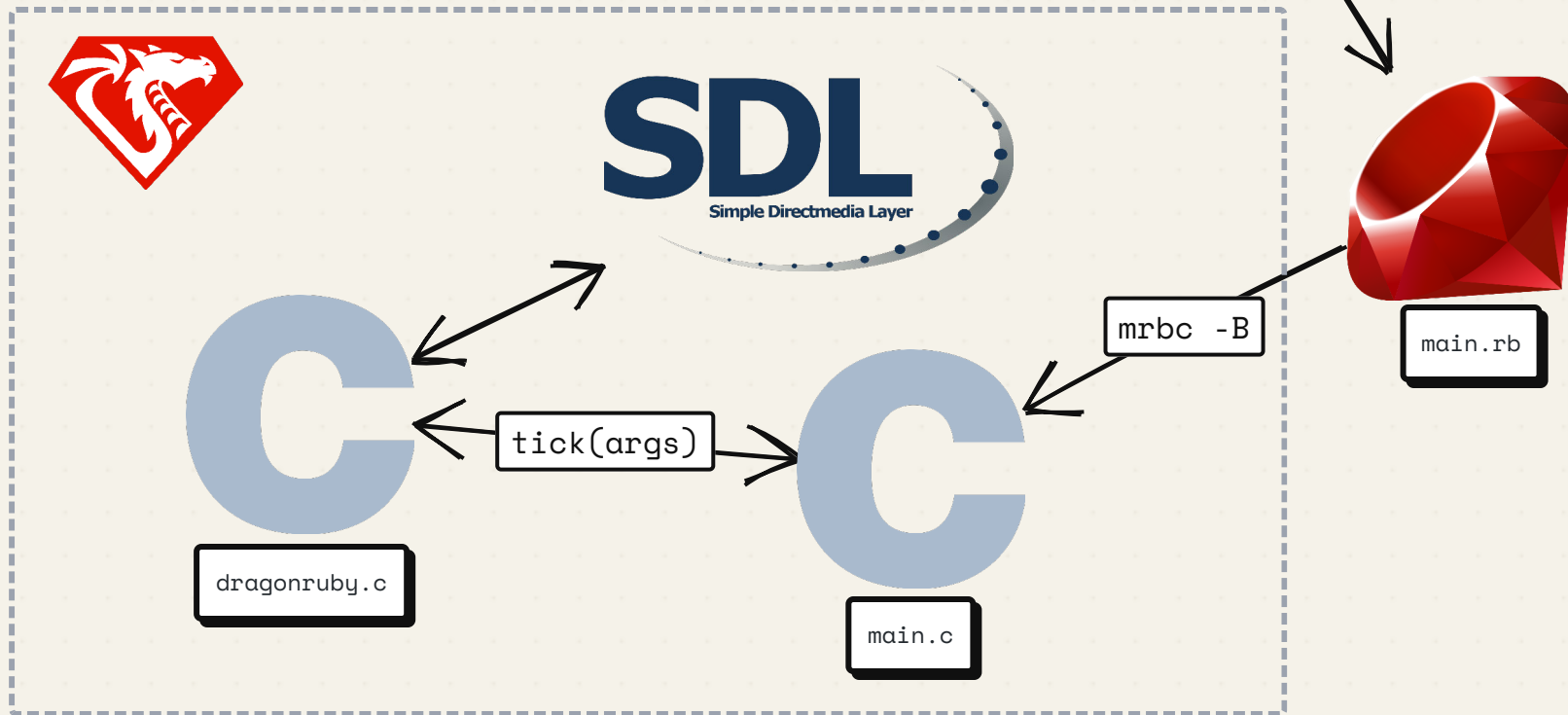


👋 ARCHITECTURE 👋



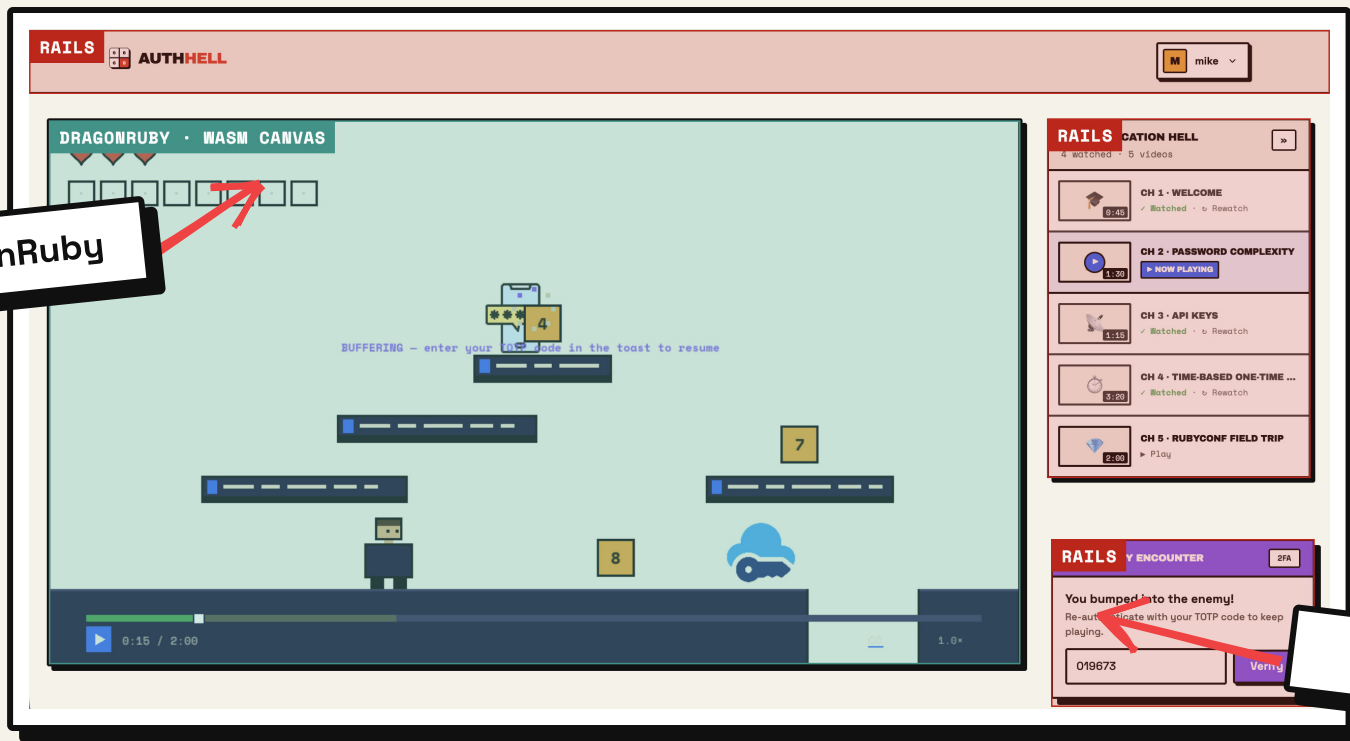
👋 ARCHITECTURE 👋

We write this file



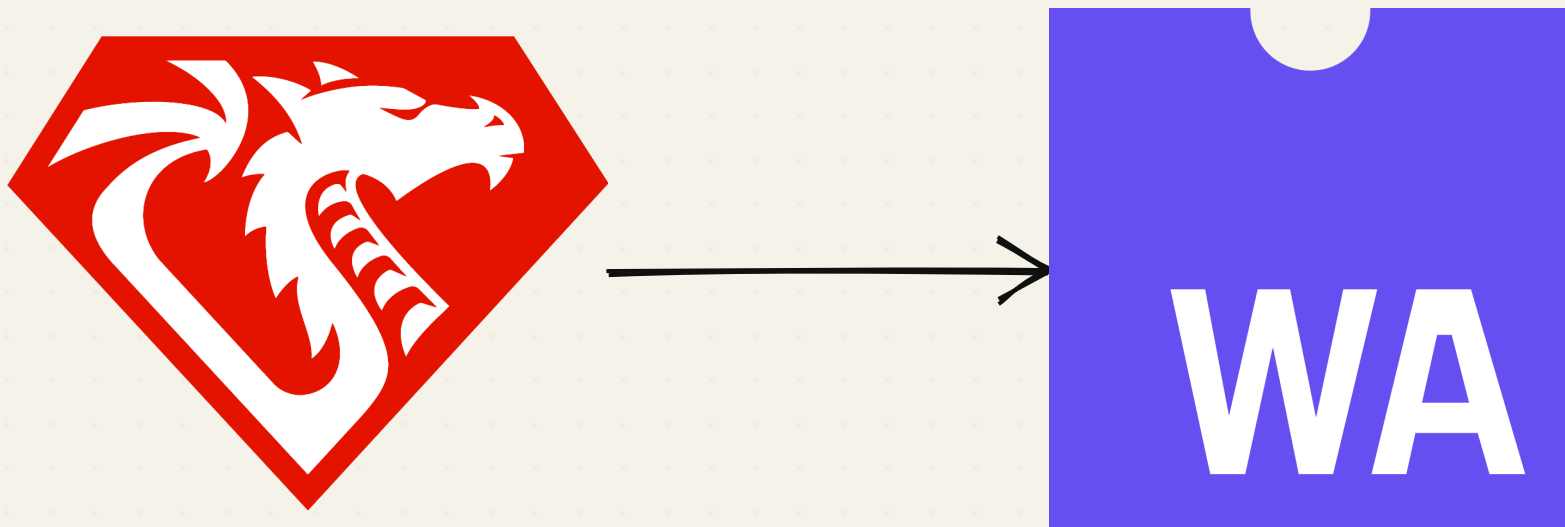
BUILDING THE GAME

PAGE STRUCTURE



WEBASSEMBLY (WASM)

- Binary instruction format for the web
- Run any language in the browser
- Including DragonRuby!

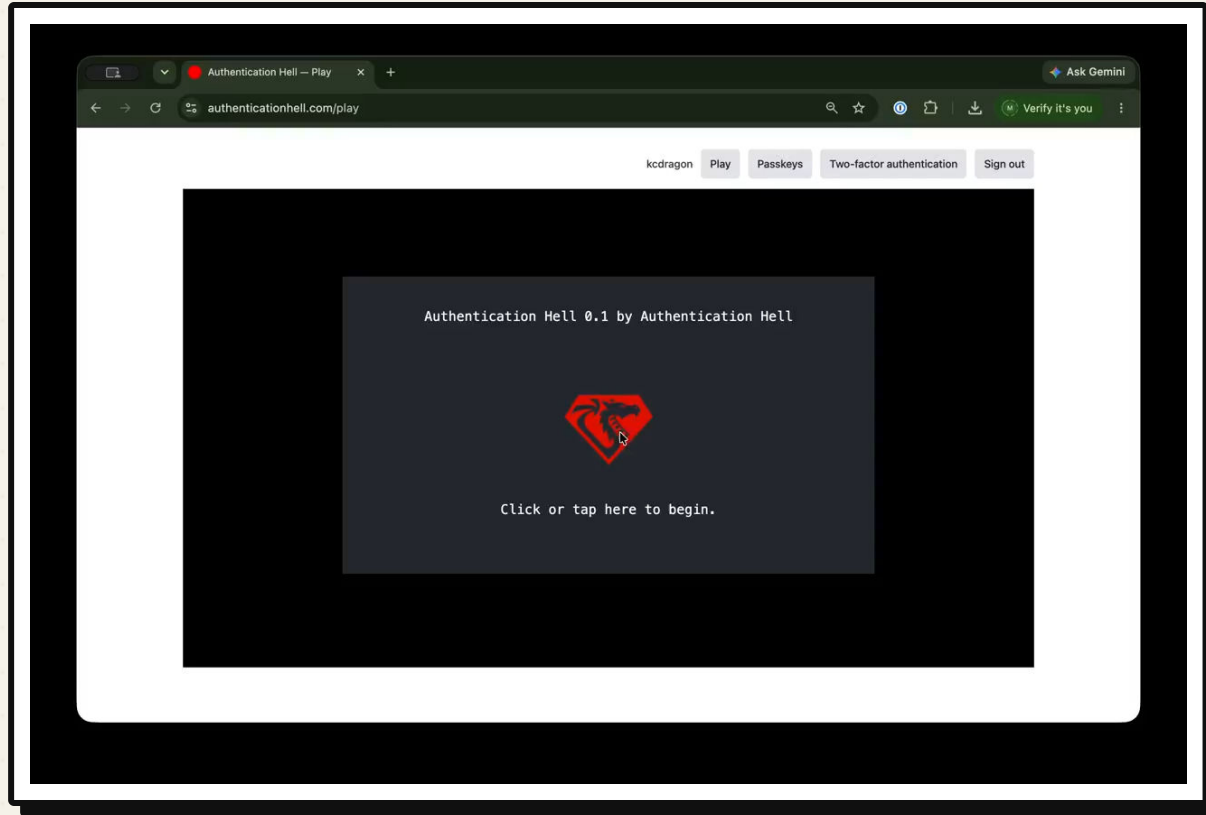


WHY RAILS?

- DragonRuby can be stand-alone
- Rails allows for authentication methods players are used to



PROOF OF CONCEPT



DISCORD TO THE RESCUE

June 8, 2026



kcdragon 6/8/26, 12:44 AM

I'm still getting the same error in the Chrome console with the unauthenticated endpoint. I updated [the PR](#) with the unauthenticated endpoint. The Rails server does get called and it does return a 200. Maybe I'm not compiling the dragonruby project properly? It seems like something called `Module.HEAPU8` is undefined.

```
.nreads.  
[Game] [username] GET dragonruby-html5-loader.  
ip://localhost:3000/play/me  
[Game] [username] http_get dragonruby-html5-loader.  
turned: {:complete=>false, :http_response_code=>0,  
:request_written=>0, :request_total=>0, :response_rea  
:response_total=>0, :cancel=>false, :response_headers  
:response_data=>""}  
Uncaught TypeError: Cannot read  
properties of undefined (reading 'set')  
    at dragonruby-wasm.js:1:281771  
    at Map.forEach (<anonymous>  
    at 1324141 (dragonruby-wasm.js:1:281385)  
    at runEmAsmFunction (dragonruby-wasm.js:1:133751)  
    at _emscripten_asm_const_int (  
    at dragonruby-wasm.js:1:133914)  
    at dragonruby-wasm.wasm:0x1c92e3  
    at dragonruby-wasm.wasm:0x1c92e3  
    at callUserCallback (dragonruby-wasm.js:1:122174)  
    at Object.runIter (dragonruby-wasm.js:1:137938)  
    at MainLoop_runner (dragonruby-wasm.js:1:136561)  
md ⓘ to turn on code suggestions. Don't show again
```

play/me" for
uesControl
in 2ms (



@kcdragon I'm still getting the same error in the Chrome console with the unauthenticated endpoint. I updated [the PR](#) with t...

Konnor Rogers 6/8/26, 12:33 PM

this is a bug introduced in DragonRuby 7+ it seems

CLAUDE DESIGN

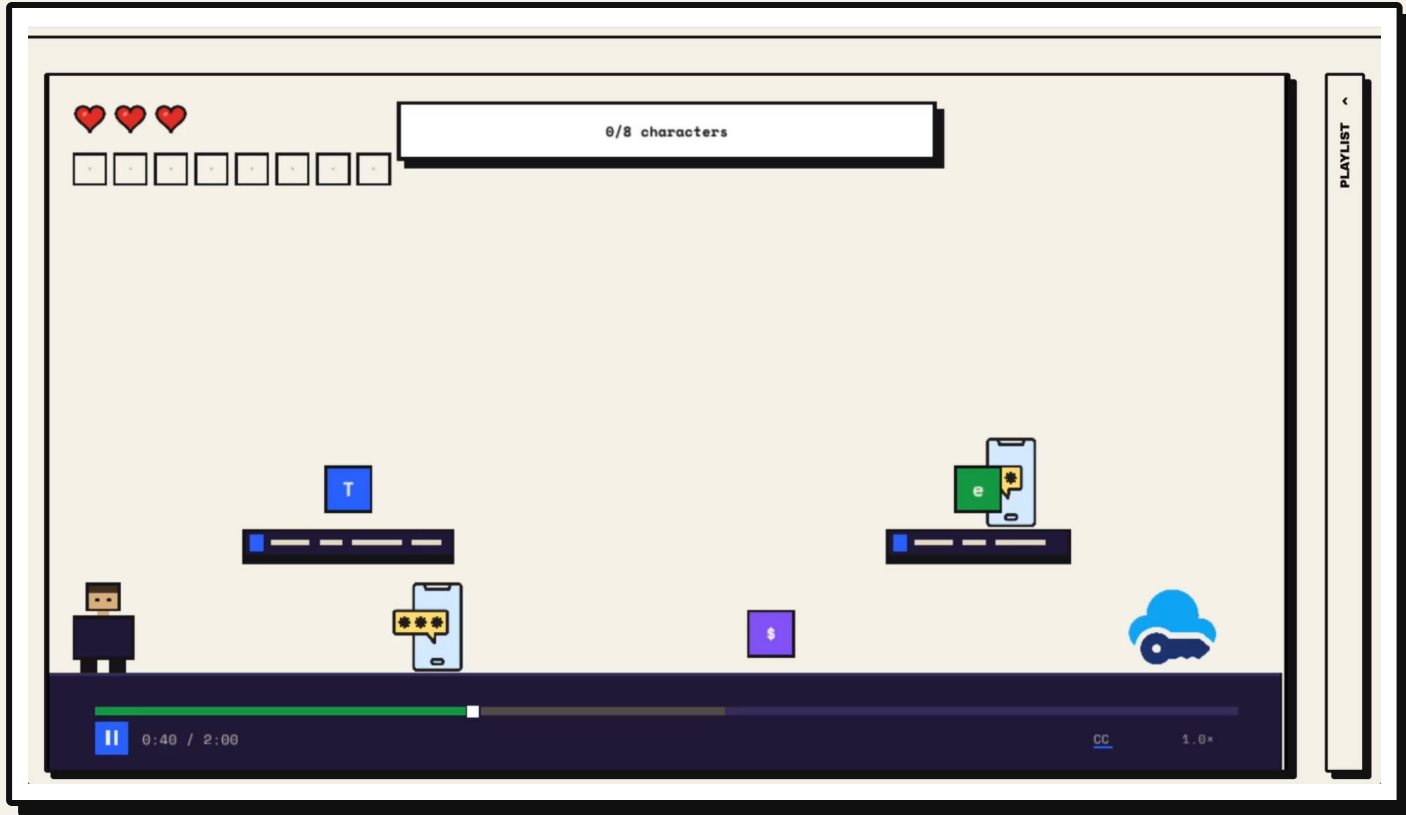


Claude Design canvas redesigning the game screens

CLAUDE CODE

 Claude Code proposing a plan for a space-bar jump in the /play game, with context, approach, and jump physics constants

AUTHENTICATE IN GAME

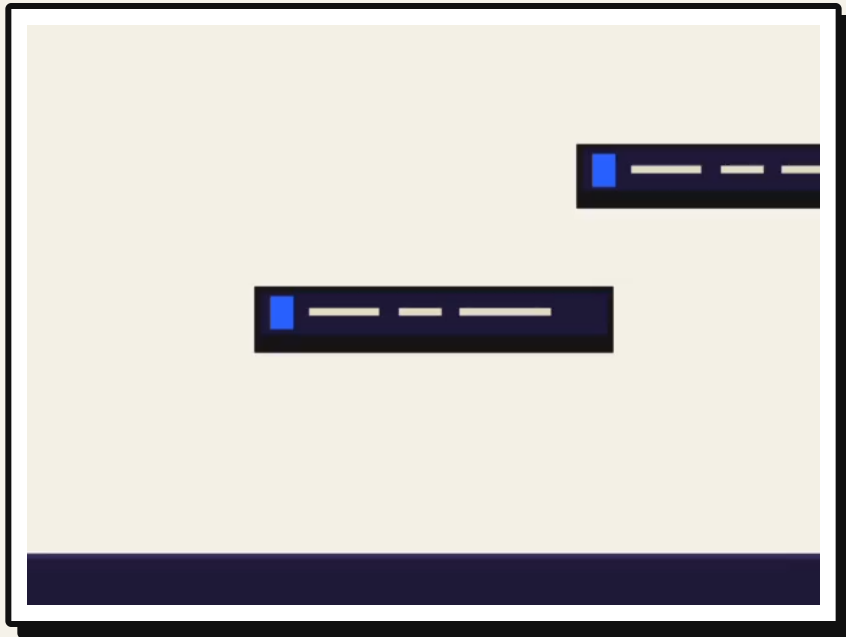


PLAYER HIT BY TOTP ENEMY

main.rb

```
def tick(args)
  ...

  if collision?(args)
    args.state.collision_request = DR.http_post(
      "/games/totp/start"
    )
  end
end
```



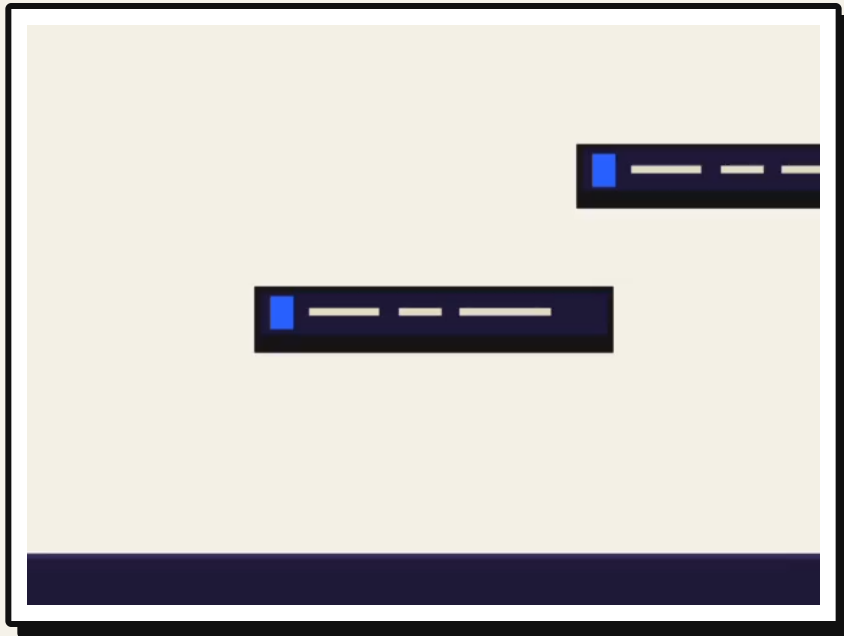
PLAYER HIT BY TOTP ENEMY

main.rb

```
def tick(args)
  ...

  if collision?(args)
    args.state.collision_request = DR.http_post(
      "/games/totp/start"
    )
  end

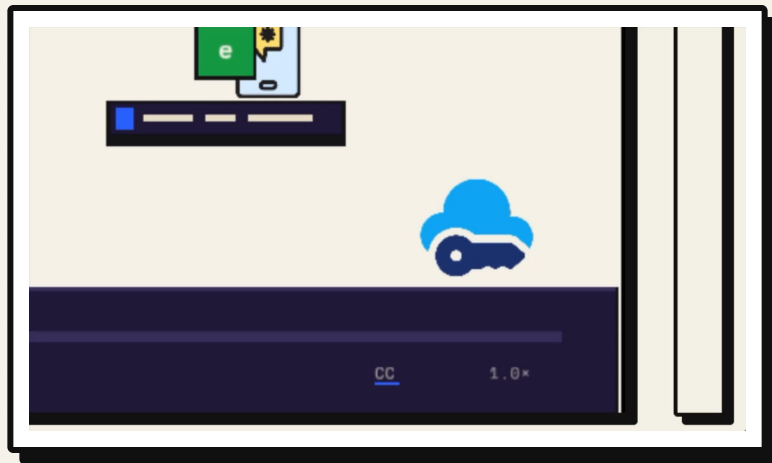
  if args.state.collision_request[:complete]
    args.state.collision_request = nil
    args.state.player.frozen = true
  end
end
```



PRESENT TOTP CHALLENGE TOAST

totp_challenge_controller.rb

```
class Games::TotpChallengeController < ApplicationController
  def start
    Current.session.start_totp_game_challenge!
  end
end
```



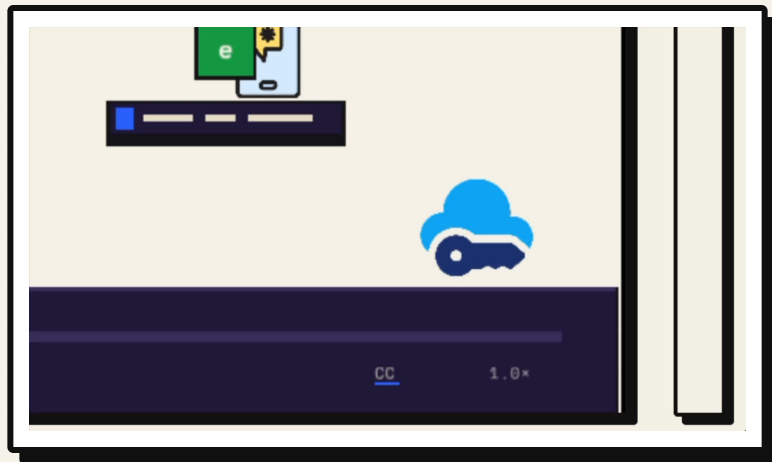
PRESENT TOTP CHALLENGE TOAST

totp_challenge_controller.rb

```
class Games::TotpChallengeController < ApplicationController
  def start
    Current.session.start_totp_game_challenge!

    Turbo::StreamsChannel.broadcast_append_to(
      Current.user, :toasts,
      target: "toasts_container",
      partial: "games/totp_challenge",
      locals: { user: Current.user }
    )

    head :no_content
  end
end
```

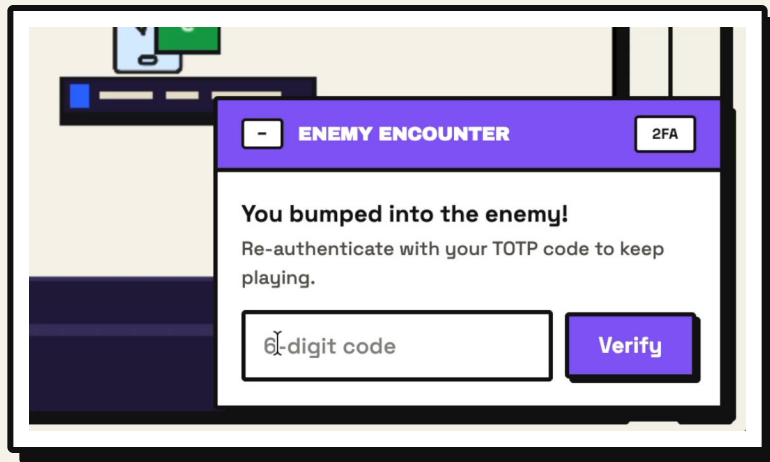


AUTHENTICATE IN TOAST

totp_challenge_controller.rb

```
class Games::TotpChallengeController < ApplicationController
  def complete
    if Current.user.verify_totp(params[:code])
      Current.session.complete_totp_game_challenge!
      render turbo_stream: turbo_stream.remove(toast_id)
    end
  end

  def toast_id = dom_id(current_user, :totp_challenge)
end
```

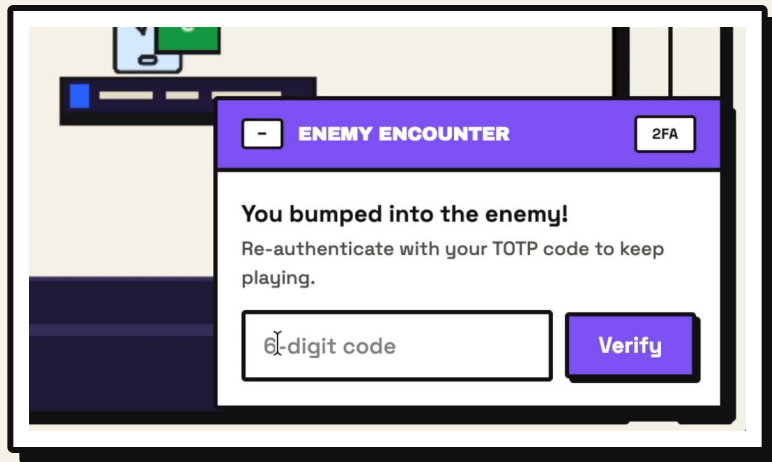


AUTHENTICATE IN TOAST

totp_challenge_controller.rb

```
class Games::TotpChallengeController < ApplicationController
  def complete
    if Current.user.verify_totp(params[:code])
      Current.session.complete_totp_game_challenge!
      render turbo_stream: turbo_stream.remove(toast_id)
    else
      render turbo_stream: turbo_stream.replace(
        toast_id,
        partial: "games/totp_challenge",
        locals: { error: "Invalid password. Try again." }
      )
    end
  end

  def toast_id = dom_id(current_user, :totp_challenge)
end
```

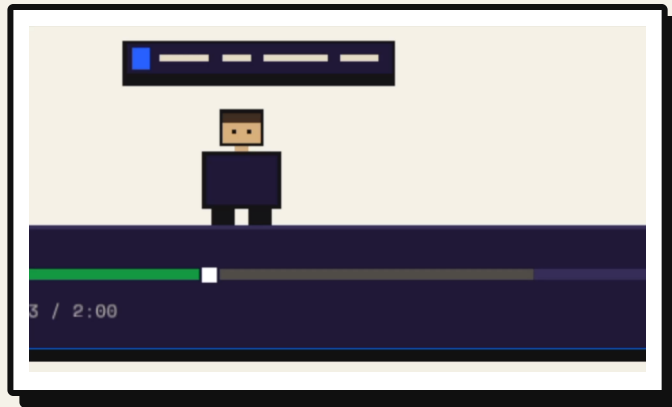


UNFREEZE PLAYER

main.rb

```
def tick(args)
  ...

  if args.state.player.frozen
    if !args.state.status_request
      args.state.status_request = DR.http_get("/games/totp/status")
    end
  end
end
```

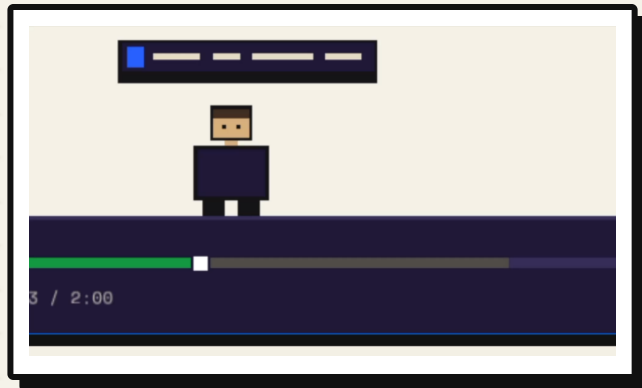


UNFREEZE PLAYER

main.rb

```
def tick(args)
  ...

  if args.state.player.frozen
    if !args.state.status_request
      args.state.status_request = DR.http_get("/games/totp/status")
    elsif args.state.status_request[:complete]
      data = DR.parse_json(args.state.status_request[:response_data])
      if data && data["frozen"] == false
        args.state.player.frozen = false
      end
    end
    args.state.status_request = nil
  end
end
```



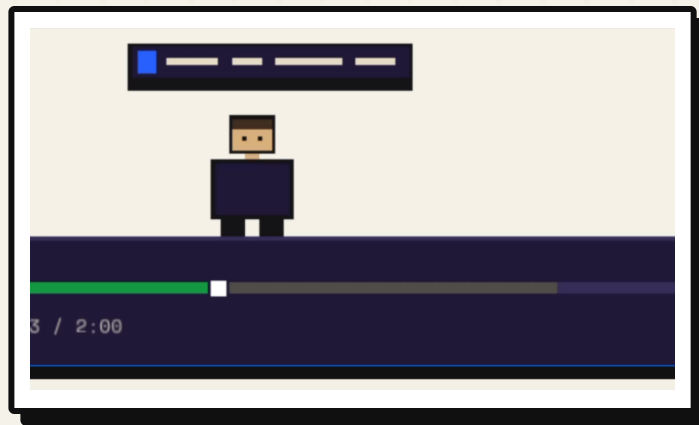
CHECK CHALLENGE STATUS

totp_challenge_controller.rb

```
class Games::TotpChallengeController < ApplicationController
  def status
    render json: { frozen: !completed? }
  end

  private

  def completed? = Current.session.totp_game_challenge_completed?
end
```



TIME-BASED ONE TIME PASSWORDS

Gemfile

```
gem "rotp"      # One Time Passwords  
gem "qrqrcode" # QR Codes
```

TEMPORARY 2FA

TOTP

Link a temporary authenticator

Scan this QR with your authenticator app, then enter the current code to link it.



RLMVATNCGGVESK5W4LLCQ2LCRJBLHKZL

Link

ENEMY ENCOUNTER

2FA

You bumped into the enemy!

Re-authenticate with your TOTP code to keep playing.

Verify

PASSKEYS

Gemfile

```
gem "webauthn"
```

 cedarcode

Save a passkey?

"localhost" supports passkeys, a stronger alternative to passwords that cannot be leaked or stolen. A passkey for "test@example.com" will be saved in "Passwords".

Save In

 Passwords



Touch ID to Save Passkey

Cancel



PASSKEY CHECKPOINT



You bumped into the passkey enemy!

Re-authenticate with your passkey to keep playing.

 Verify with passkey

TAKEAWAYS

- You can develop your own game... in Ruby!
- You can easily add better authentication methods, like Passkeys, to your app

QUESTIONS OR FEEDBACK?

authenticationhell.com



[kcdragon/authentication-hell](https://github.com/kcdragon/authentication-hell)



mikedalton.co/socials

