

# PamApp: Building and scaling a fitness platform with 1M+ MAU

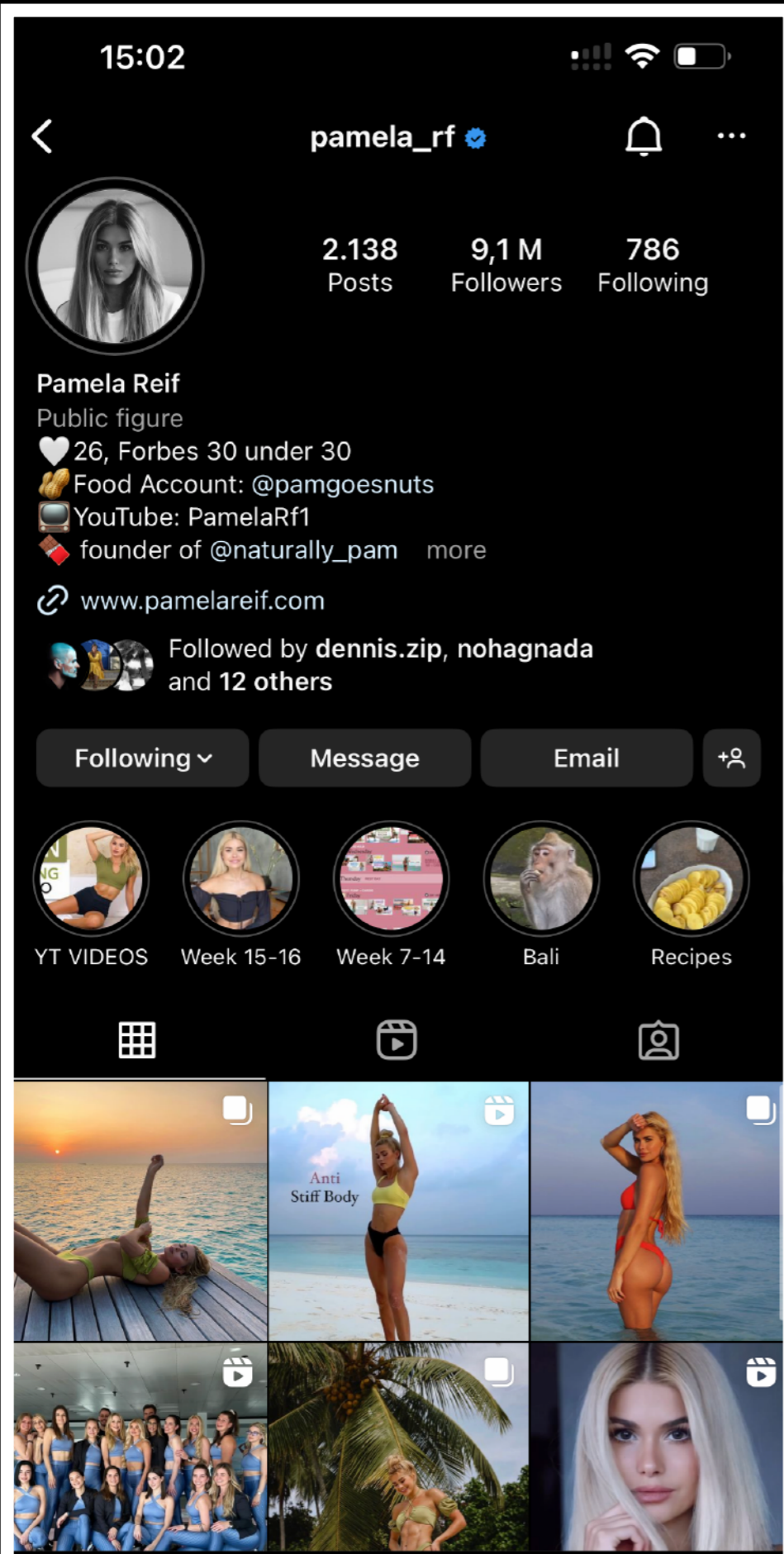
with a tiny team ;)

# ~\$ whoami



- Ardit Shala
- Tech Lead / Architect / Senior Backend Engineer
- Manager @ OpenReplyDE
- BSc. Comp Sci
- Swears at a rate of 100t/h





**9.1M**  
**FOLLOWERS**  
**@INSTAGRAM**


**9.5M**  
**SUBSCRIBERS**  
**@YOUTUBE**


**1.7B**  
**VIEWS**  
**@YOUTUBE**


# PamApp

15:42 5G

< Search

 **Pam Fitness & Food**  
PLR UG

**OPEN** 


6.4K RATINGS **4.7** ★★★★★  
AGE **4+** Years Old  
CHART **No. 25** Food & Drink  
DEVELOPER  PLR UG

**What's New** [Version History](#)




Version 1.9.3 6d ago

New things await and the old says goodbye  
Send your content and get featured  
You can now send images and text messages to th [more](#)


**Preview**



Train & cook with a fitness star

-  500+ Clean Recipes
-  5-45 Min Workouts
-  My Health & Fitness

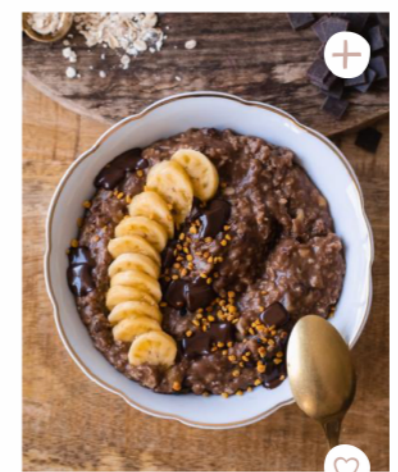
*Pamela Reif*  
*Weekly Highlights*



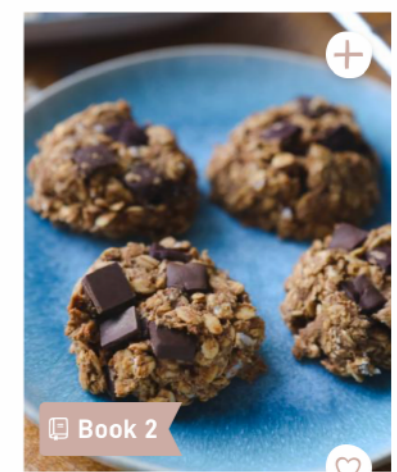
What would you like to eat?

FILTER

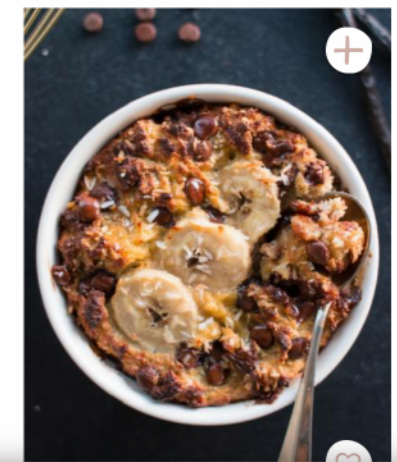
MOST POPULAR



Chocolate Porridge - easy & quick

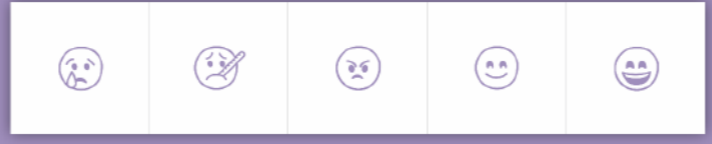


Chocolate Chip Cookies - Mom's recipe



WANT TO UNLOCK ALL CONTENT?

HOW ARE YOU FEELING TODAY?



SATISFACTION

Sweet ideas for cravings:



Baked Rice Paper Rolls - sweet & super crunchy

APP UPDATE

Our newest recipes:

NEW

TEAM ACTIVE - LAZY

Today, my muscle were heavily...

SQUEEEEZED

RELAAXED

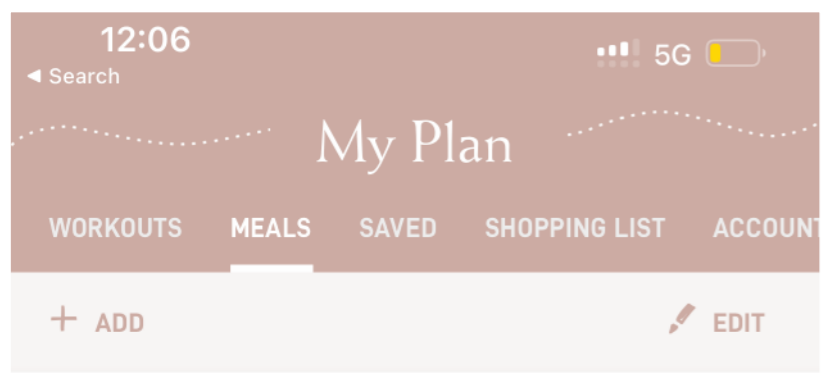
ON TODAY'S PLAN:

Don't forget to squeeeeeze



BOMBASTIC BOOTY

OPTION 1



**LOSE WEIGHT**  
2-WEEK PLAN  
pam

**LOOK TO**  
2-WEEK PL  
pam  
CURRENT P

WEEK 15

HIDE

Monday

Info



Coconut Chia Pudding & fried Banana - Maledives



Lettuce Wraps - High Protein Version



Fluffy Almond Cookie Dough - 20g Protein

Tuesday

Info



Home



Recipes



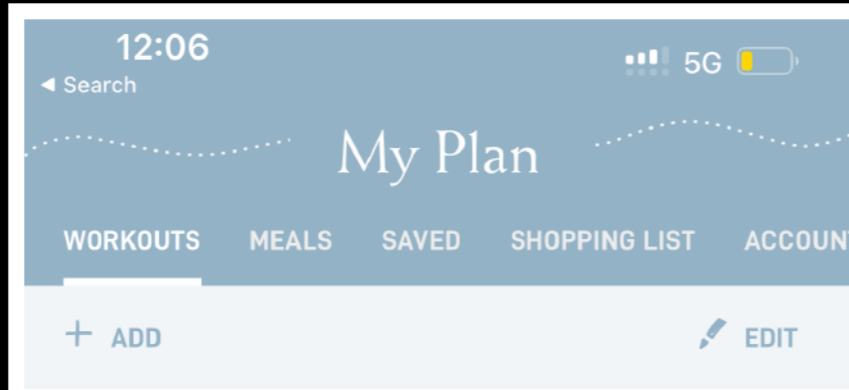
Blog



Workouts



My Plan



**LOSE WEIGHT**  
CLASSIC VERSION  
CURRENT PLAN

**LOSE WEI**  
DANCE VERS

WEEK 15

HIDE

HEAVY ABS + MOBILITY

Monday

190-340 Kcal



ABS WITH WEIGHTS



ABS + BOTTLE

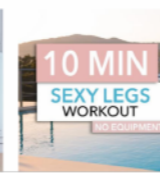
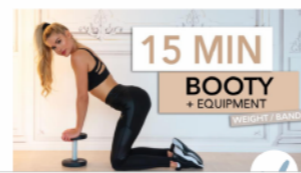


ABS + WEIG  
Circuit Style

DON'T FORGET TO SQUEEZE

Tuesday

235-365 Kcal



Home



Recipes



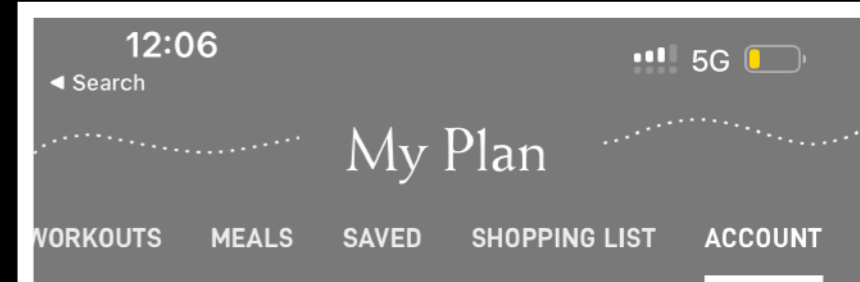
Blog



Workouts



My Plan



App settings

Measurement System >

Video display options >

My Cookbooks >

Notifications >

More

☆ Rate the app >

♡ My Subscription >

Disclaimers >

Terms & Conditions >

Privacy Policy >

🇬🇧 Language >

Profile access and control >

**Development**

# Onboarding backend



- *“We need some simple APIs”*
- *“Just make things work”*
- *“There is this influencer client thingy needing a small backend”*
- *“Doesn’t have to scale much”*
- *“No need for a lot of thought”*



# The needs back then

- Be able to serve content to clients worldwide
- Be able to subscribe
- Be able to protect premium content
- Be able to like
- Be able to configure clients
- And some more *“things”*

# What was there:

CMS

A local written  
cloud function

AWS  
Account

Good  
people

# AWS Services

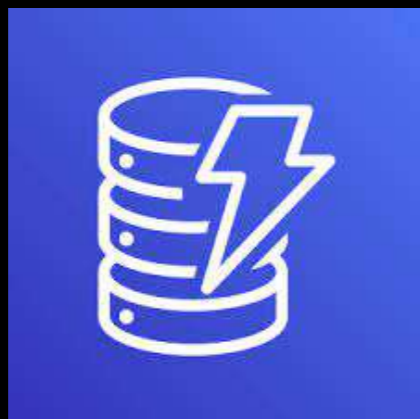
Compute:



Storage:



Database:



Queuing:

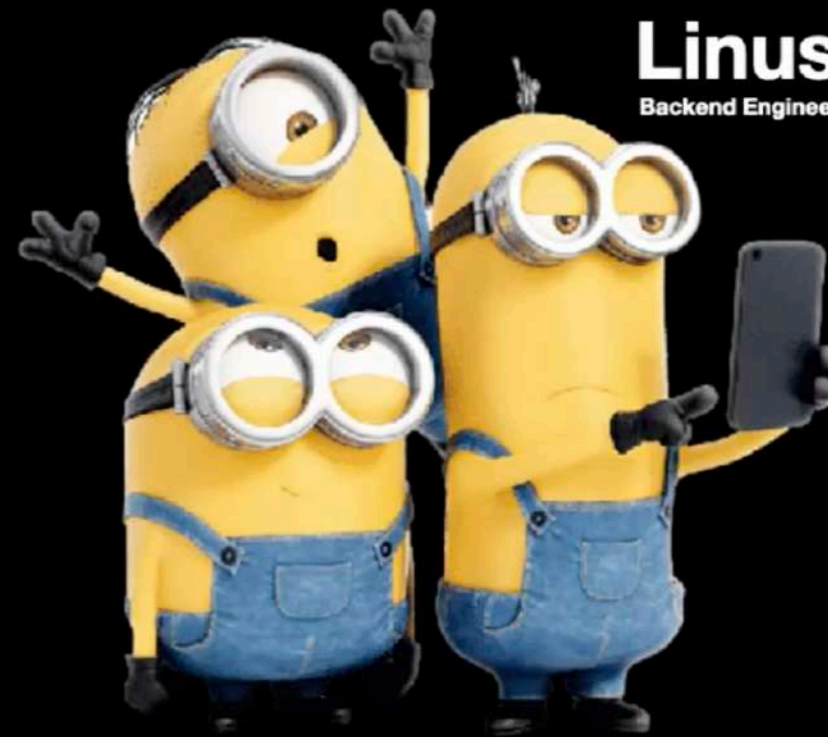


# The backend&infra team



**Ken**  
Software Architect

**Linus**  
Backend Engineer

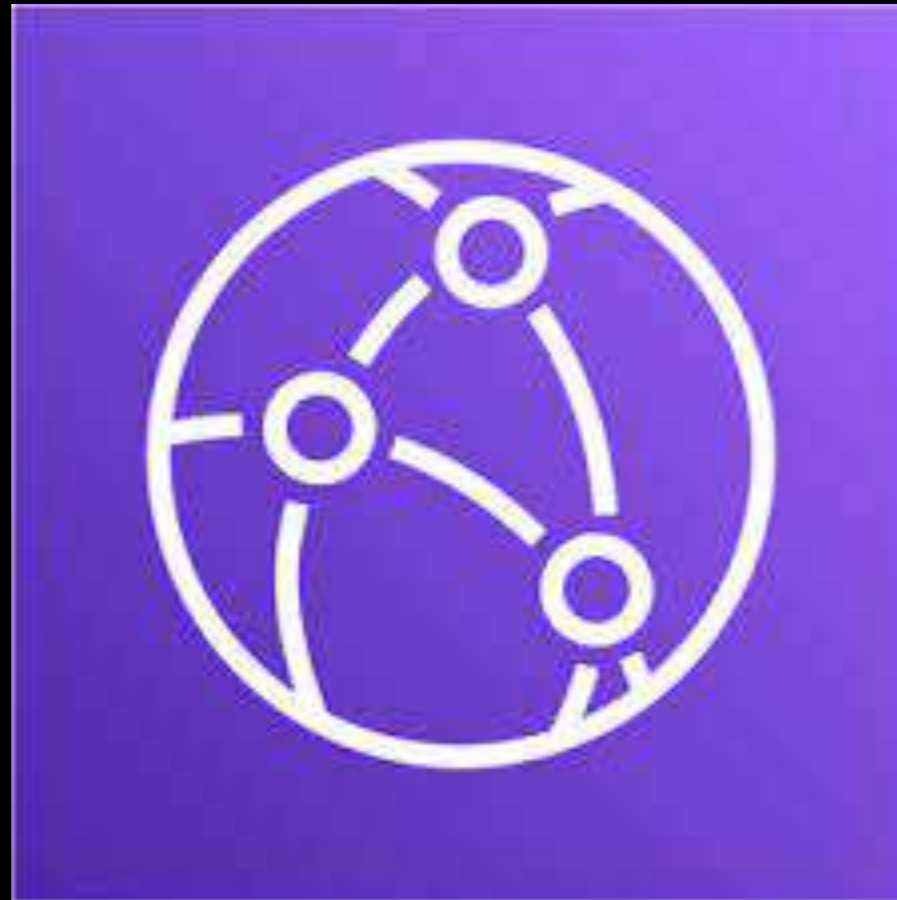


**Ritchie**  
Infra Engineer

in  
appreciation for their work:

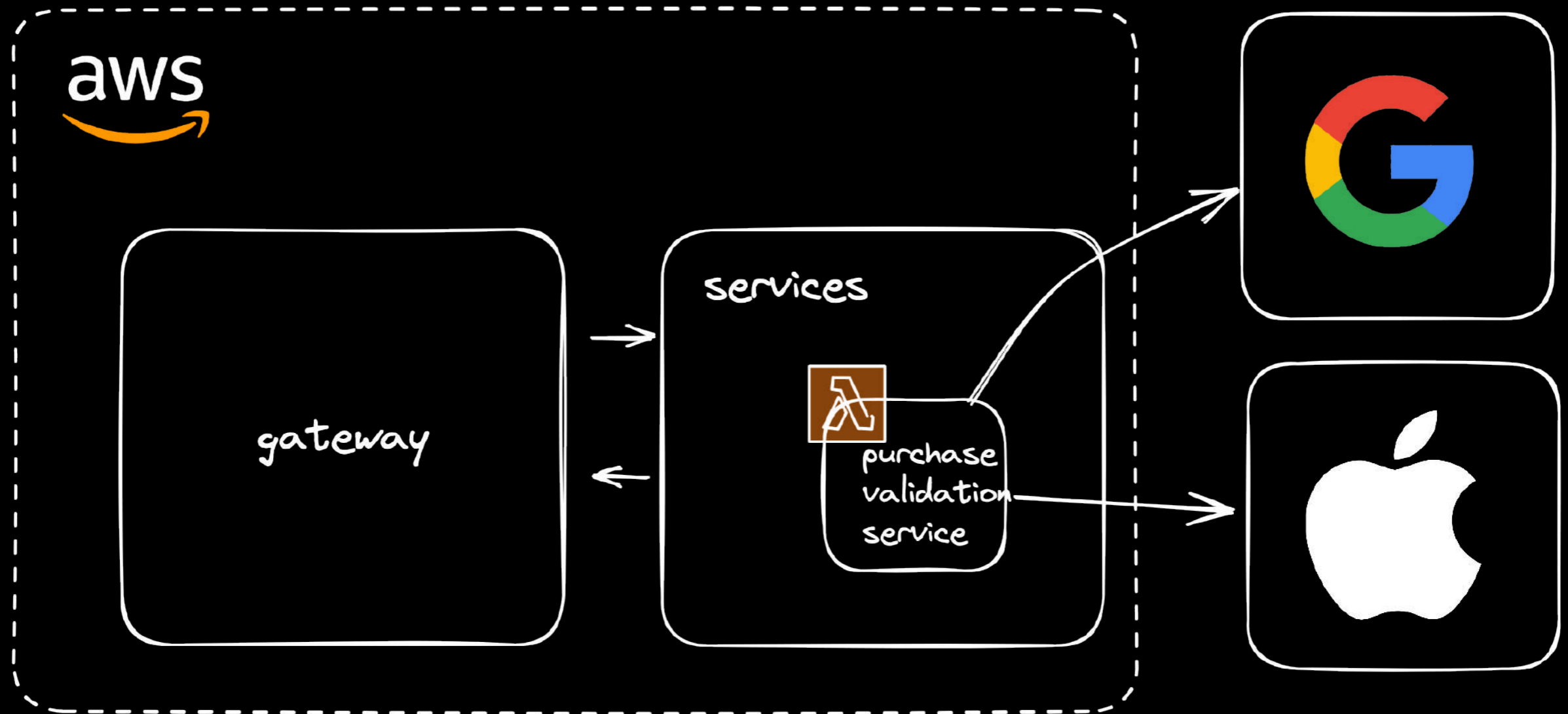
-  [https://en.wikipedia.org/wiki/Ken\\_Thompson](https://en.wikipedia.org/wiki/Ken_Thompson)
-  [https://en.wikipedia.org/wiki/Linus\\_Torvalds](https://en.wikipedia.org/wiki/Linus_Torvalds)
-  [https://en.wikipedia.org/wiki/Dennis\\_Ritchie](https://en.wikipedia.org/wiki/Dennis_Ritchie)

**“Be able to serve content to clients worldwide”**

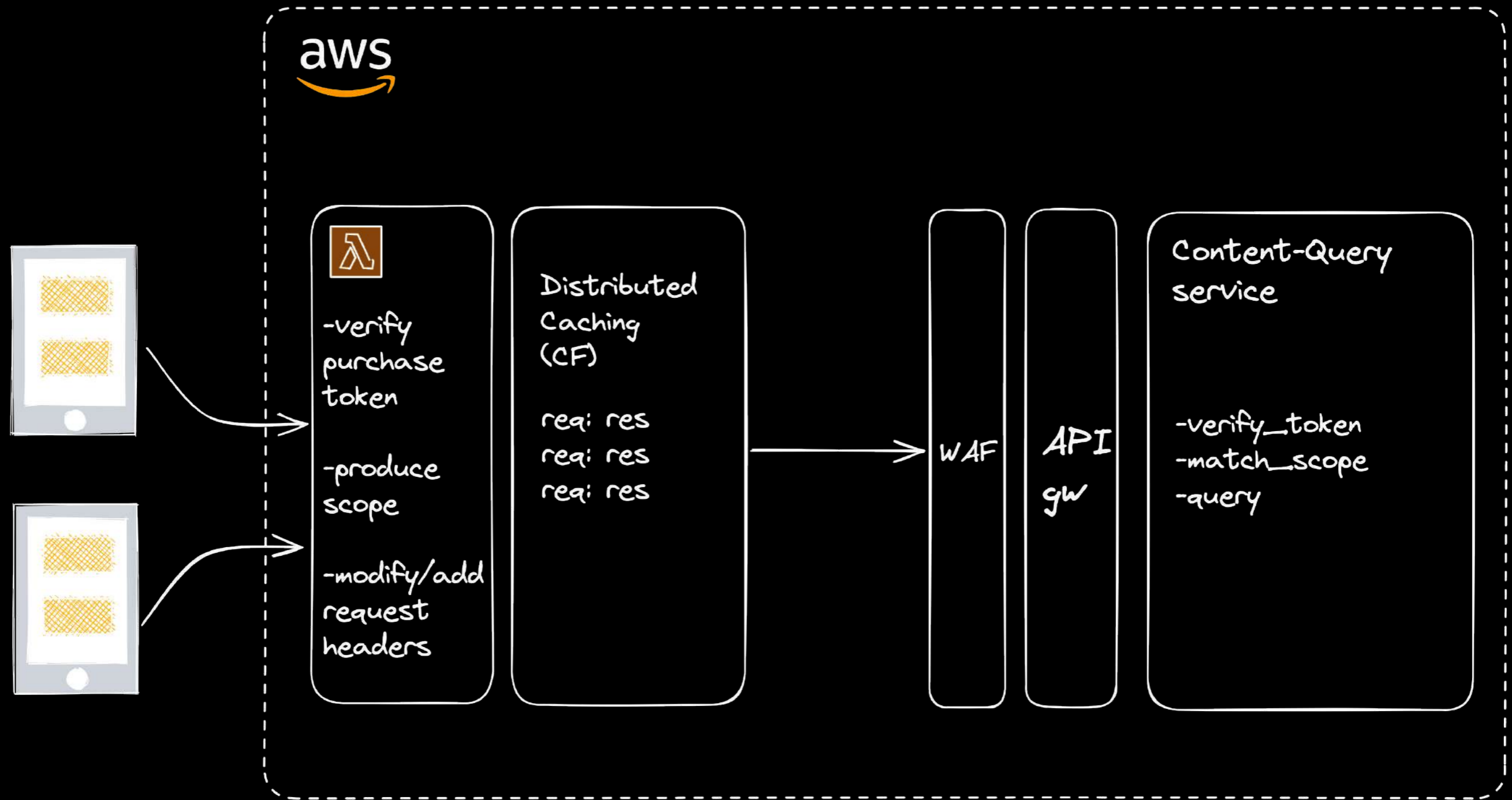


**AWS CloudFront**

# “Be able to subscribe”



# “Be able to protect premium content”



# Architecture/API needs & principles

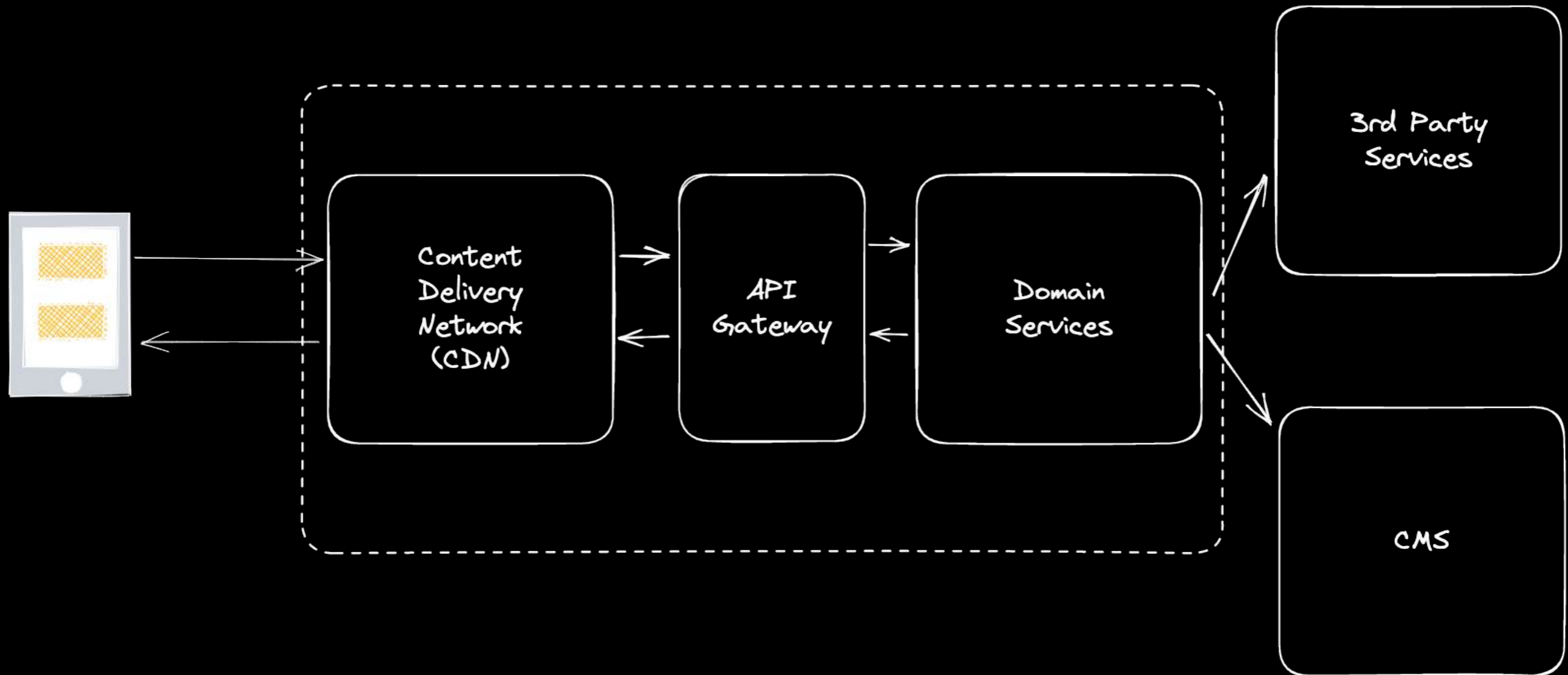
- Make the platform RESTful
- Clean Architecture principles
  - Separation of concerns
- Domain Driven Development
- API contracts
- Extendable



Robert Cecil Martin, colloquially called "Uncle Bob", is an American software engineer, instructor, and author. He is most recognized for promoting many software design principles and for being an author and signatory of the influential Agile Manifesto. Martin has authored many books and magazine articles. [Wikipedia](#)

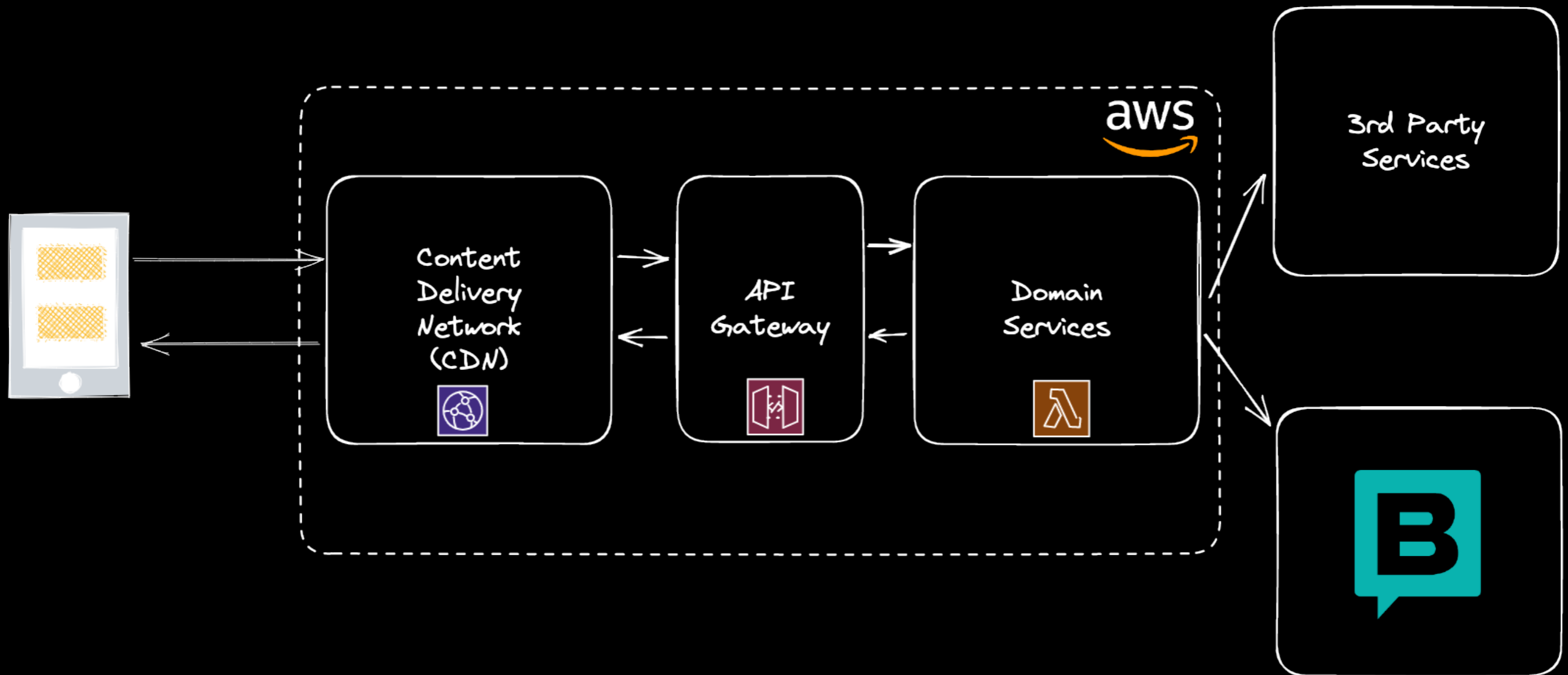


# High Level Architecture

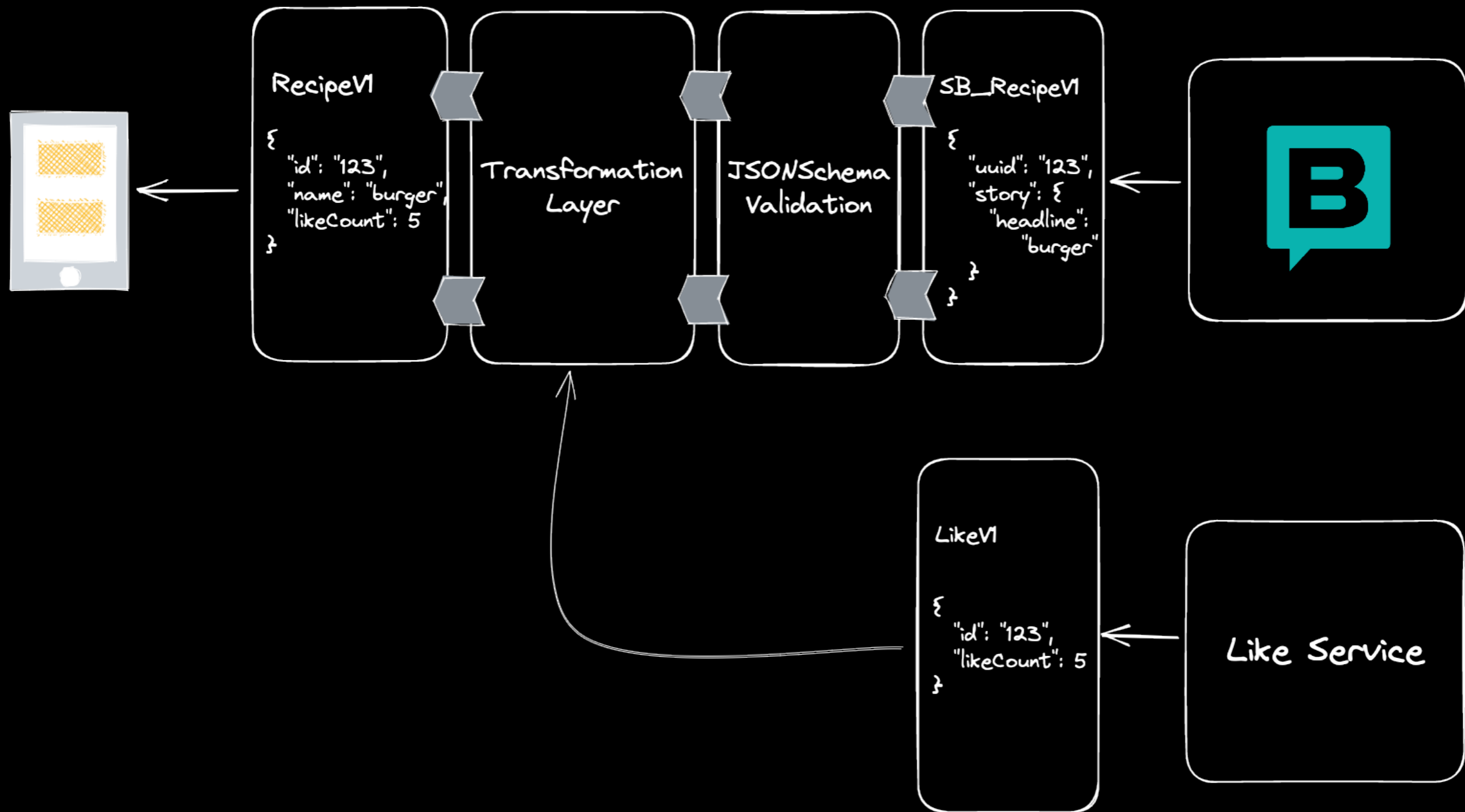


# High Level Architecture

With tech used

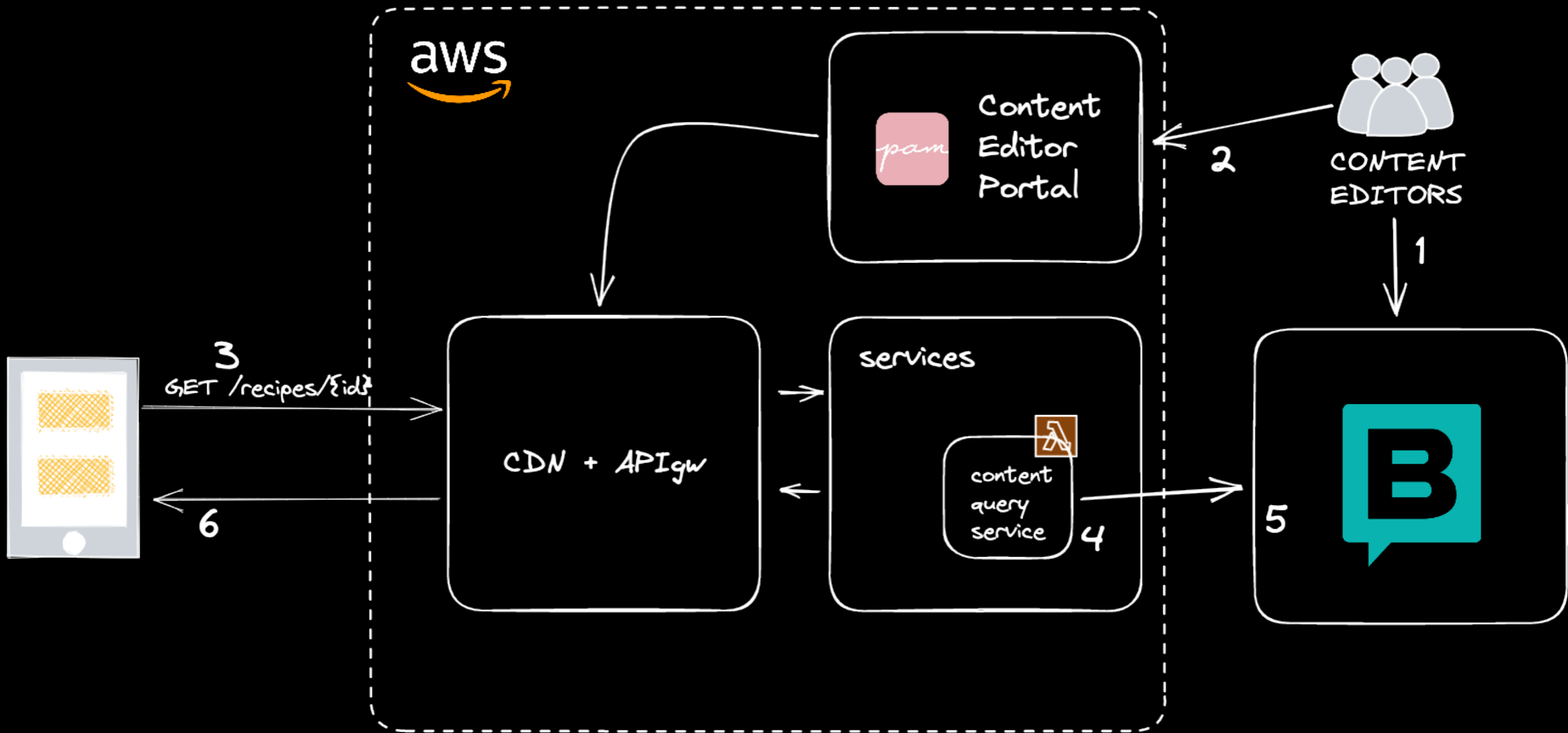


# On-the-fly transformation



# Architecture

## Content editing cycle



**Pre-Launch**

# Load Testing



 **StormForge**

**100% correct responses at 1k reqs/s**

# AWS Limits



[Redacted name]

Boys! Be ready. Just watched her insta story! This thing will really tear off the roof 😄😂  
Better remove all throttling on any lambda and give it 1000% auto scale 😄😄



**Ardit Shala** 10:18 PM

Throttling is all removed 4 sure. I also asked AWS to increase the limit in the Lambda@Edge.  
It would be nice if that happens before the actual release, just to be safer.



[Redacted name]

Yup 😄 really really excited for the launch 🚀



**Ardit Shala** 10:21 PM

She managed to bring PayPal down 2 times, so let's see 😄.

😄 1 🗨️+

I will be on call 24/7 for the next week 😂

👉 1 🗨️+

# Launch



# “Soft” launch party

23.01.2021 22:20



Es wird Ihnen der Bildschirm von Kaweh Kazemi angezeigt. Optionen anzeigen Ansicht

App Store Connect | Apps | Analytics | Trends | Reports | Users and Access | Agreements | Kaweh Kazemi | PLR UG (haftungsbeschränkt)

## Pam Fitness & Food

App Store | Features | TestFlight

iOS App | 1.0 Pending Developer Release... | [Release This Version](#)

**Version Information** | English (U.S.)

App Previews and Screenshots | [View All Sizes in Media Manager](#)

iPhone 6.5" Display | iPhone 5.5" Display | iPad Pro (3rd Gen) 12.9" Display | iPad Pro (2nd Gen) 12.9" Display

Promotional Text: Hi, I'm Pam! This is my new app, which helps you take care of your fitness & nutrition. Lots of recipes, helpful tips, meal & workout plans are waiting for you!

Keywords: Recipe,Cooking,Reif,Nutrition,Exercise,Workout,Training,Planner,Healthy,Calorie,I

Support URL: https://pam-app.de

⚠ Please do not share the app publicly yet as she will officially announce it tomorrow at 10am ⚠

*Some people found out  
the app is live :)*

*Alerts screaming 5XXs  
errors.*



**Florian Schaper** 🥁 2:44 AM

Another problem still?



**Ardit Shala** 2:44 AM

a weird one yes

**1st PROD incident:  
24.01.2021  
02:30 - 06:30**

# App incident with tokens

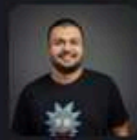
```
} catch (err) {
```

```
if (serviceProvider === 'google') {  
  const { validProductIds } = decodedPayload.data;  
  
  const generatedContentTypeHeader = tokenScopeToCFContentTypeHeader(validProductIds);  
  const generatedScopeHeader = tokenScopeToCFScopeHeader(validProductIds);  
  
  headers['content-type'] = generatedContentTypeHeader;  
  headers['x-pam-scope'] = generatedScopeHeader;  
} else {  
  return createUnauthorizedResponse(`${tokenType}TokenExpired`);  
}
```

**Sleep:**  
**24.01.2021**  
**06.30 - 09:00**

# “Real” launch

24.01.2021 10:00



**Ardit Shala** 10:08 AM

we have 140k requests a minute

fucking crazy 😄

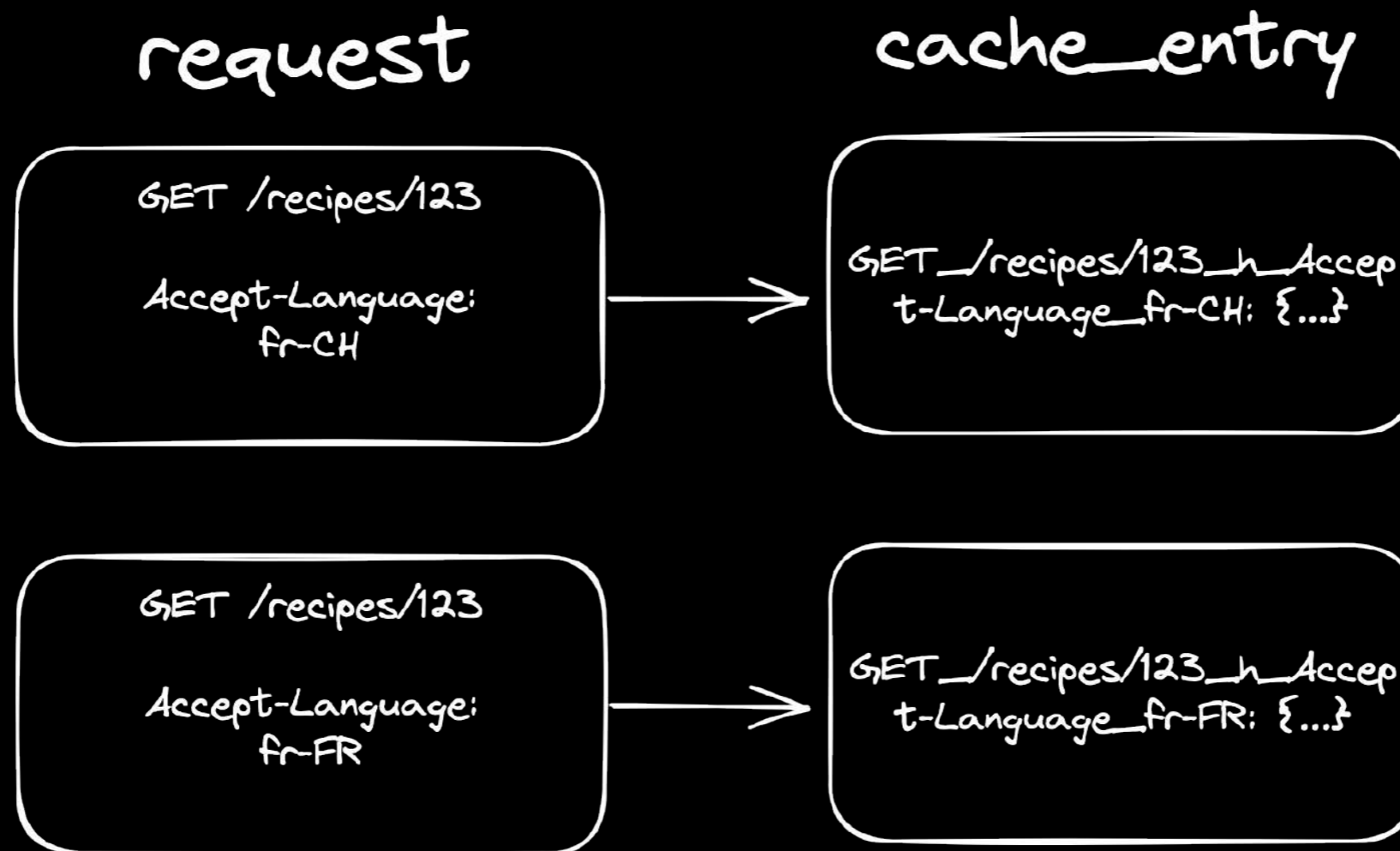
If we hit 600k reqs/minute we are going to reach our Lambda@Edge 10k req/s limit 😞

Spent the morning with AWS  
support team...

# Cache hit problem

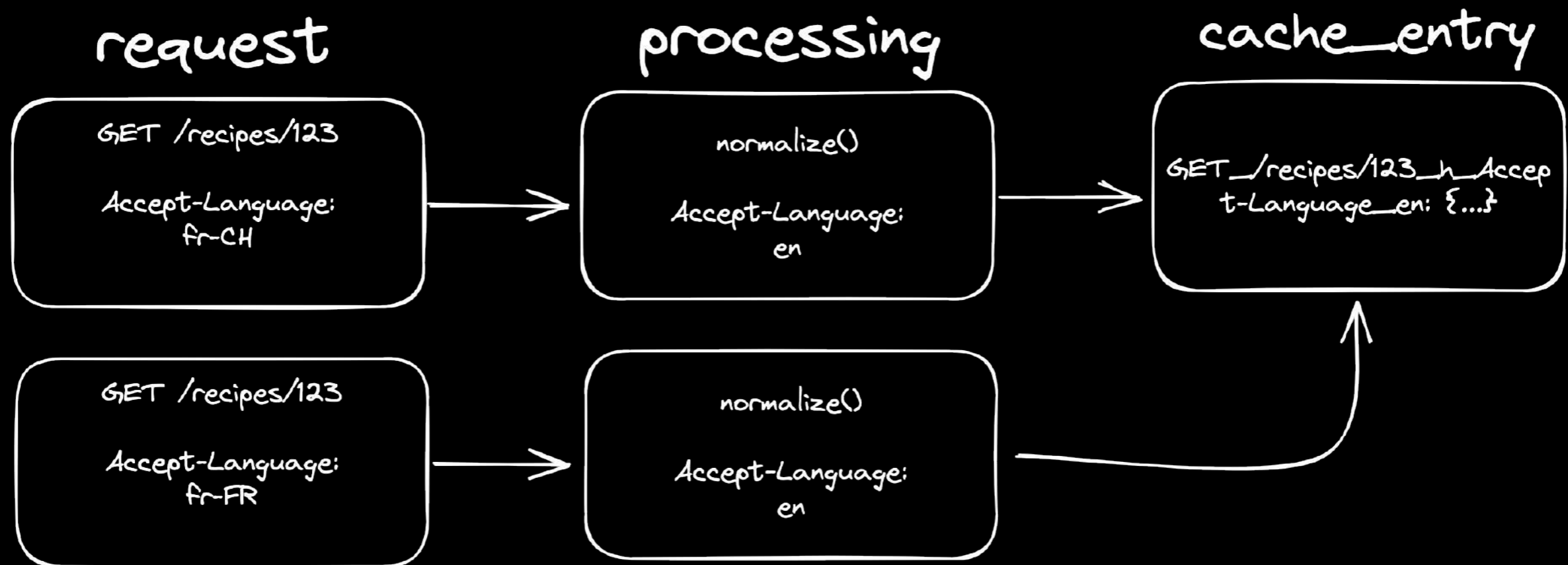
24.01.2021 12:00

Cache-Hit on ContentAPI was at ~80%



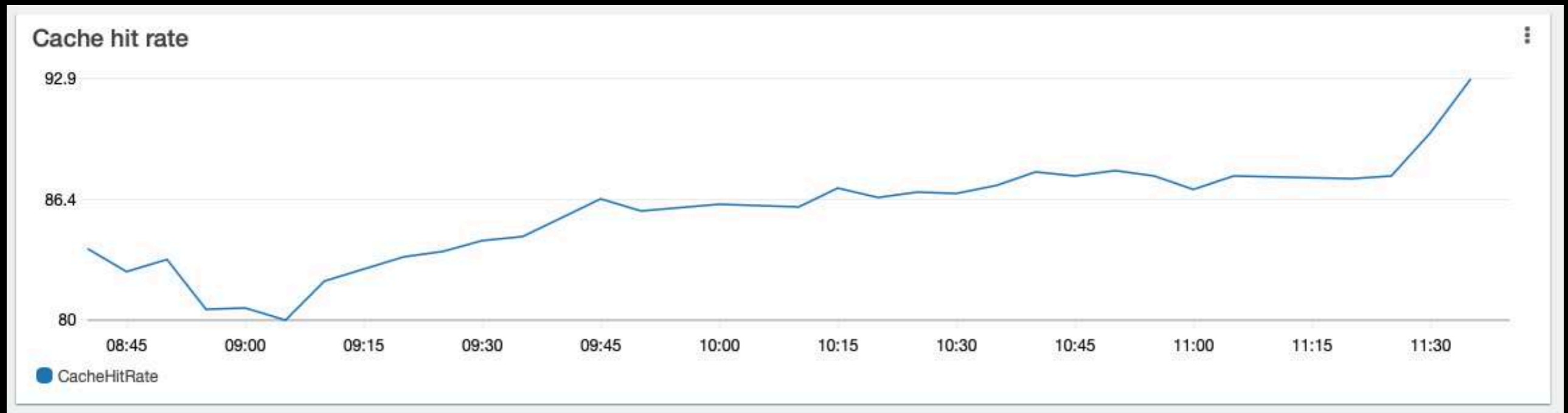
# Cache hit problem => solution

24.01.2021 12:30



# Cache hit problem solved

24.01.2021 12:40



Cache-Hit on ContentAPI was at 95%





# JANUARY 2021



# #1 APPSTORE DE

# >1M DOWNLOADS 1ST WEEK

# #numbers



**7M+ DOWNLOADS**

**20M+  
API CALLS  
PER DAY**

**2.5H  
AVG USER  
SESSION**

**1M+  
MONTHLY  
ACTIVE  
USERS**

**13  
DOMAIN  
SERVICES**

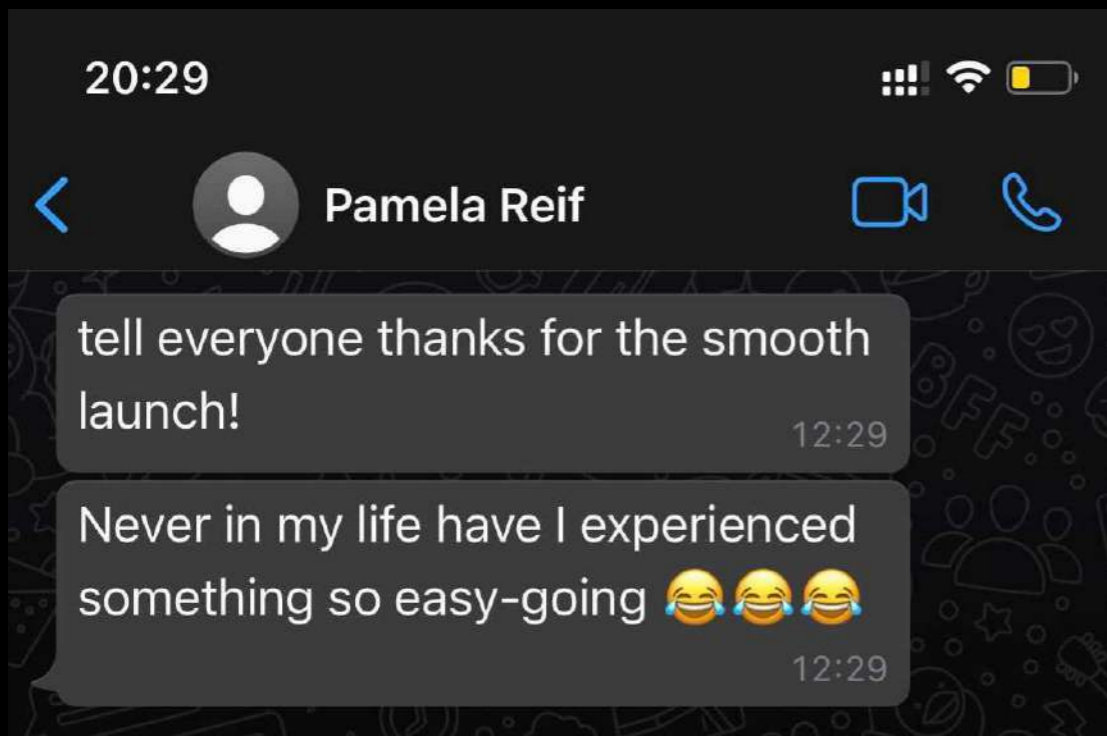
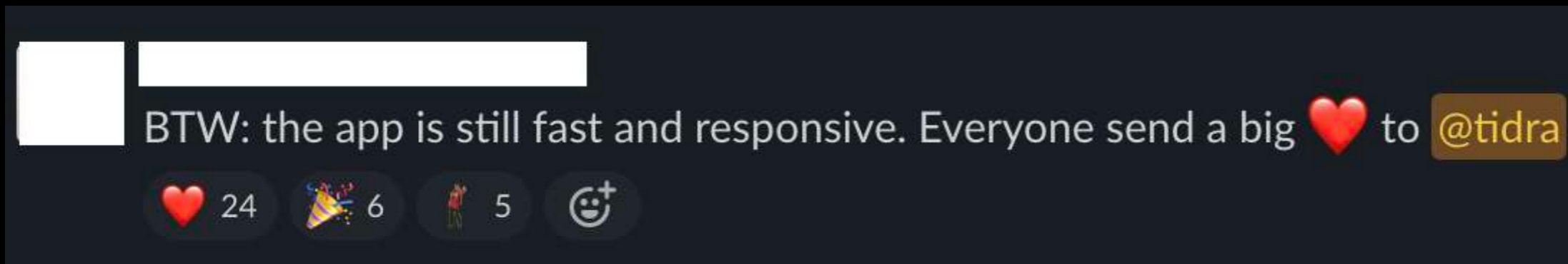
**10  
AWS  
REGIONS**

**24/7  
STEADY  
TRAFFIC**

**1.3M+  
SESSIONS  
A WEEK**

**150+  
COUNTRIES  
USE THE  
PRODUCT**

# Happy people ;-)

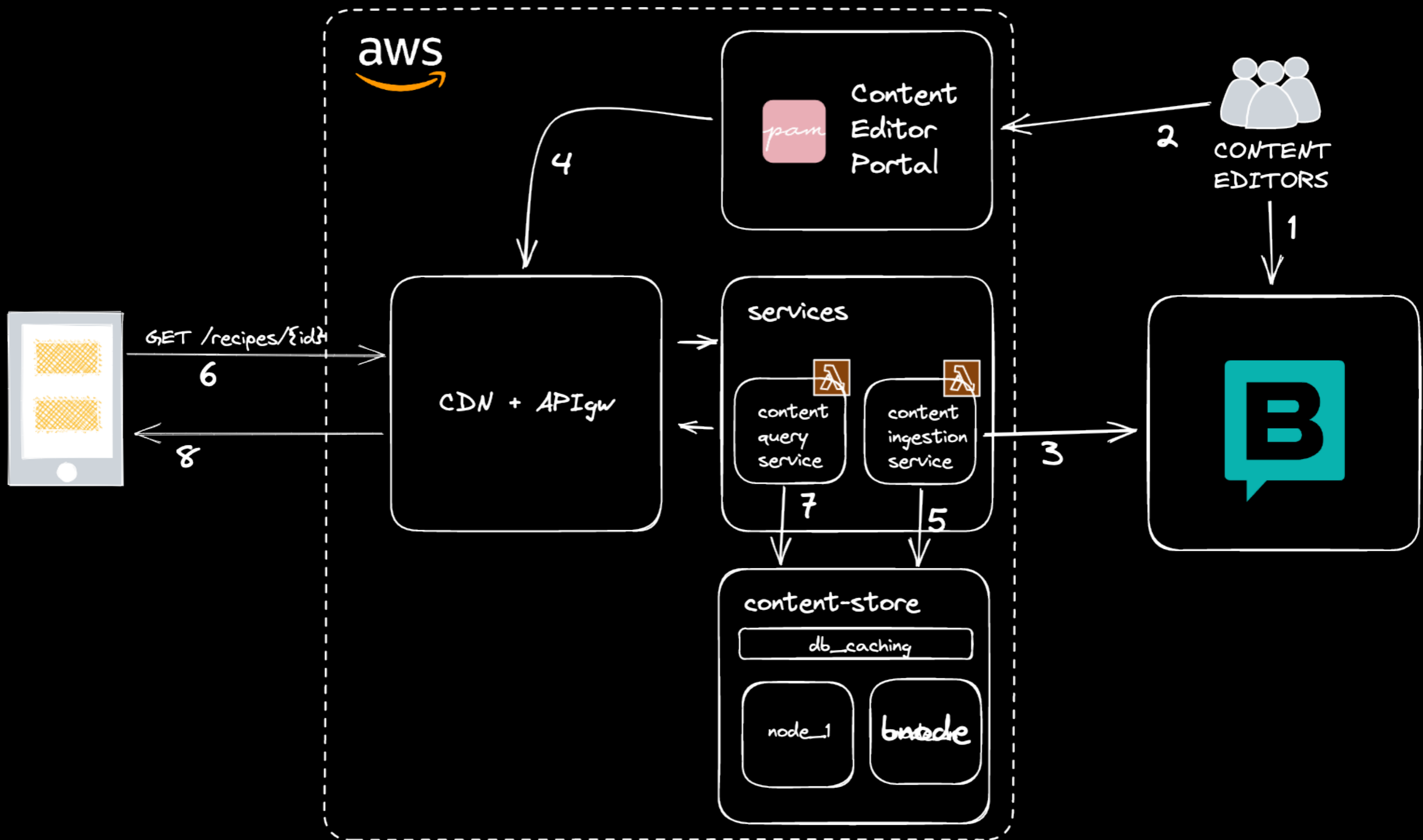


# Post-Launch Scaling

# ContentAPI Architecture v2

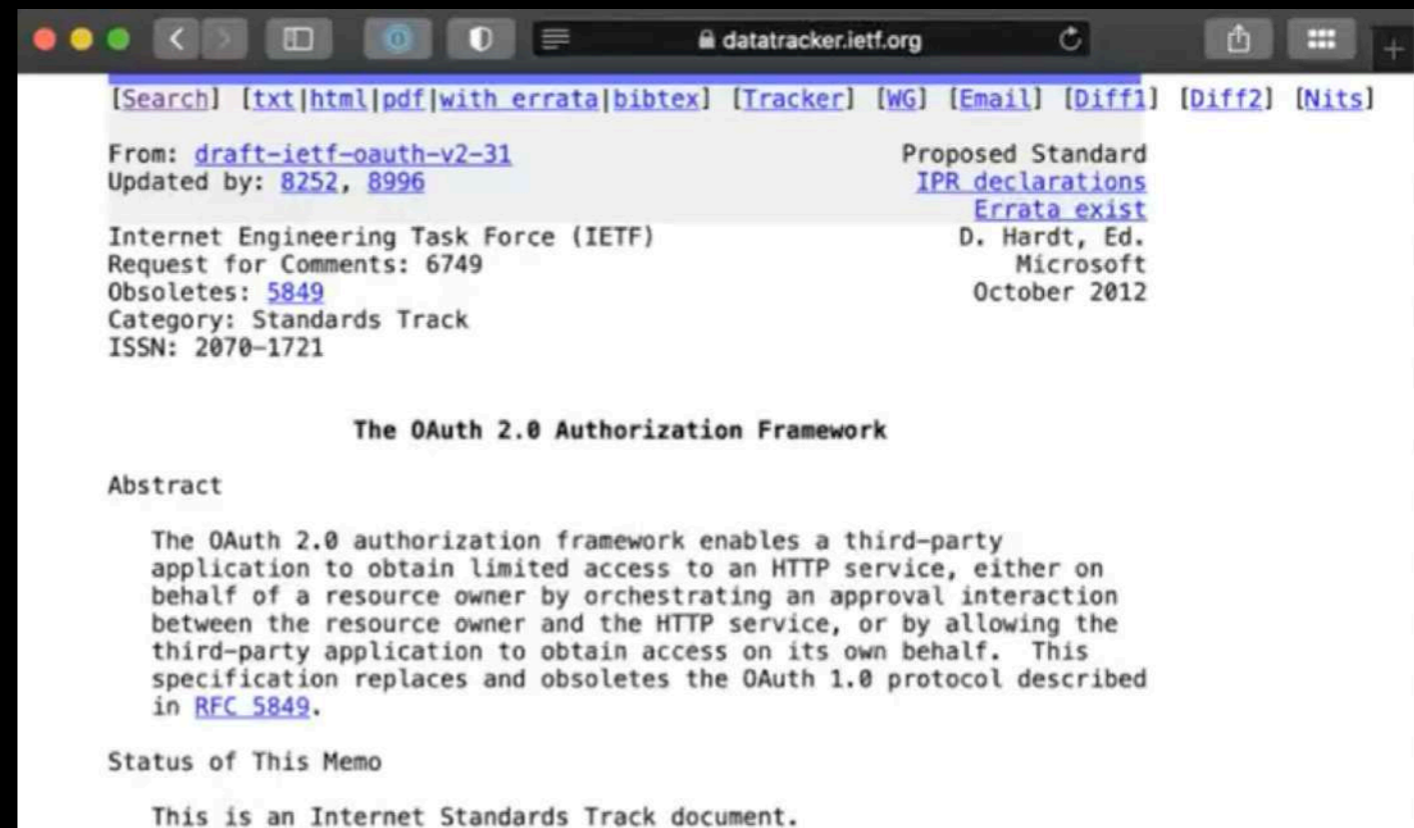
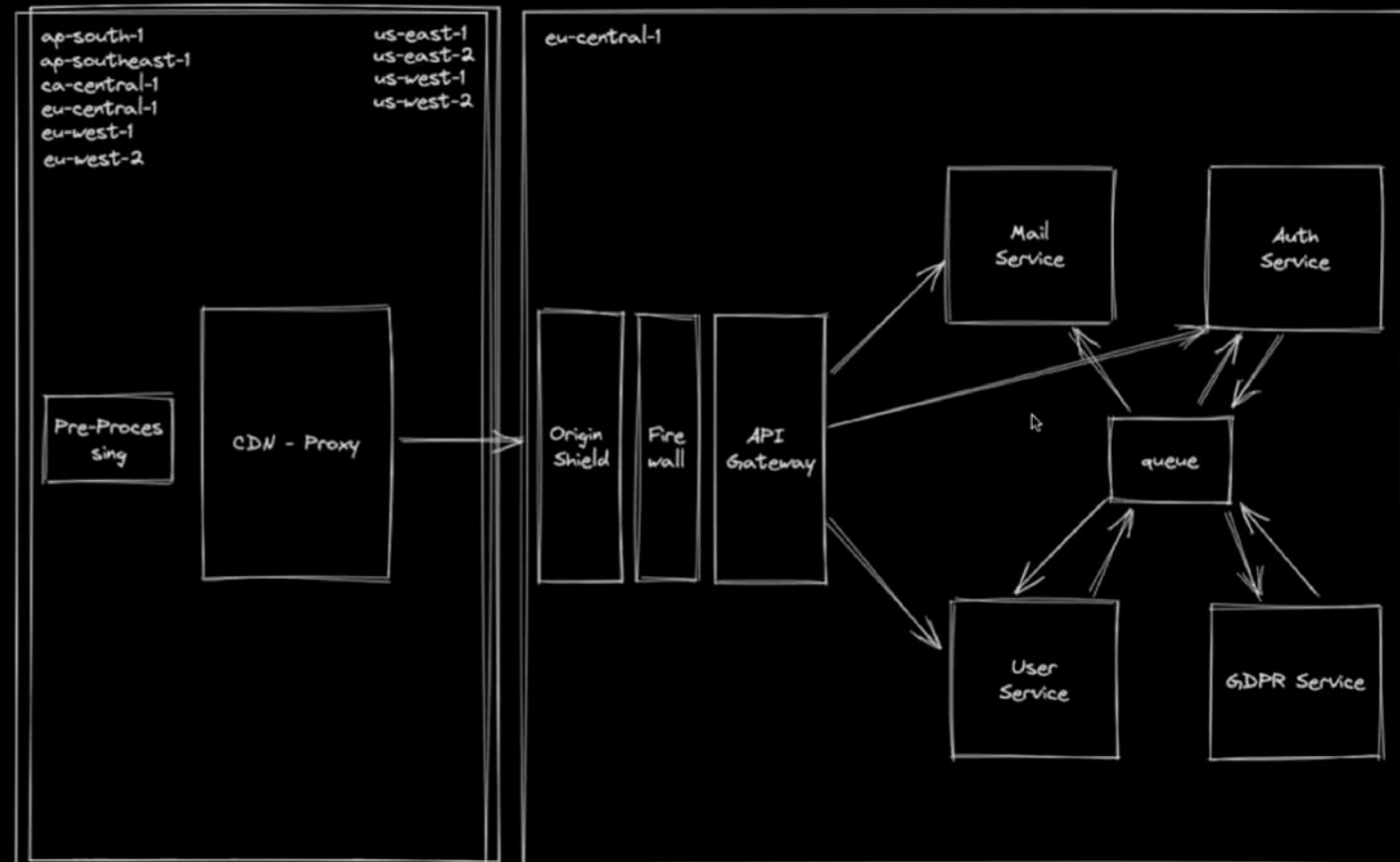


## Content flow

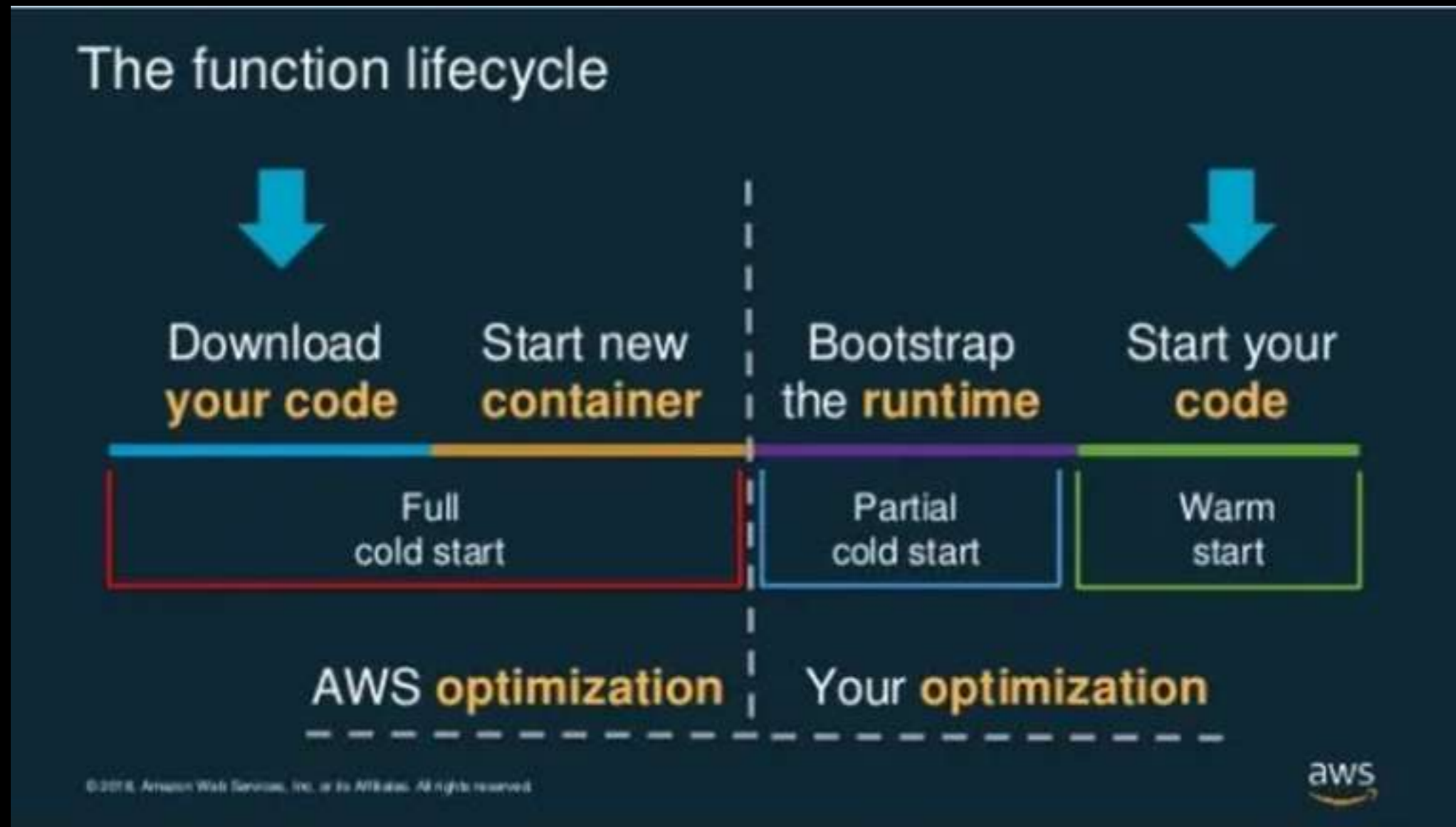


# User Accounts

- Offers:
  - Auth0: \$3M/year
  - Cognito: \$650k/yr
- Fully self-built
- Based on OAuth2.0
- Highly customized (content-wise)
- Identity Matching



# Lambda Optimization



# Q&A



**THANK  
YOU!**

**HAVE A GREAT EVENING AND KEEP ROCKING!**