

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

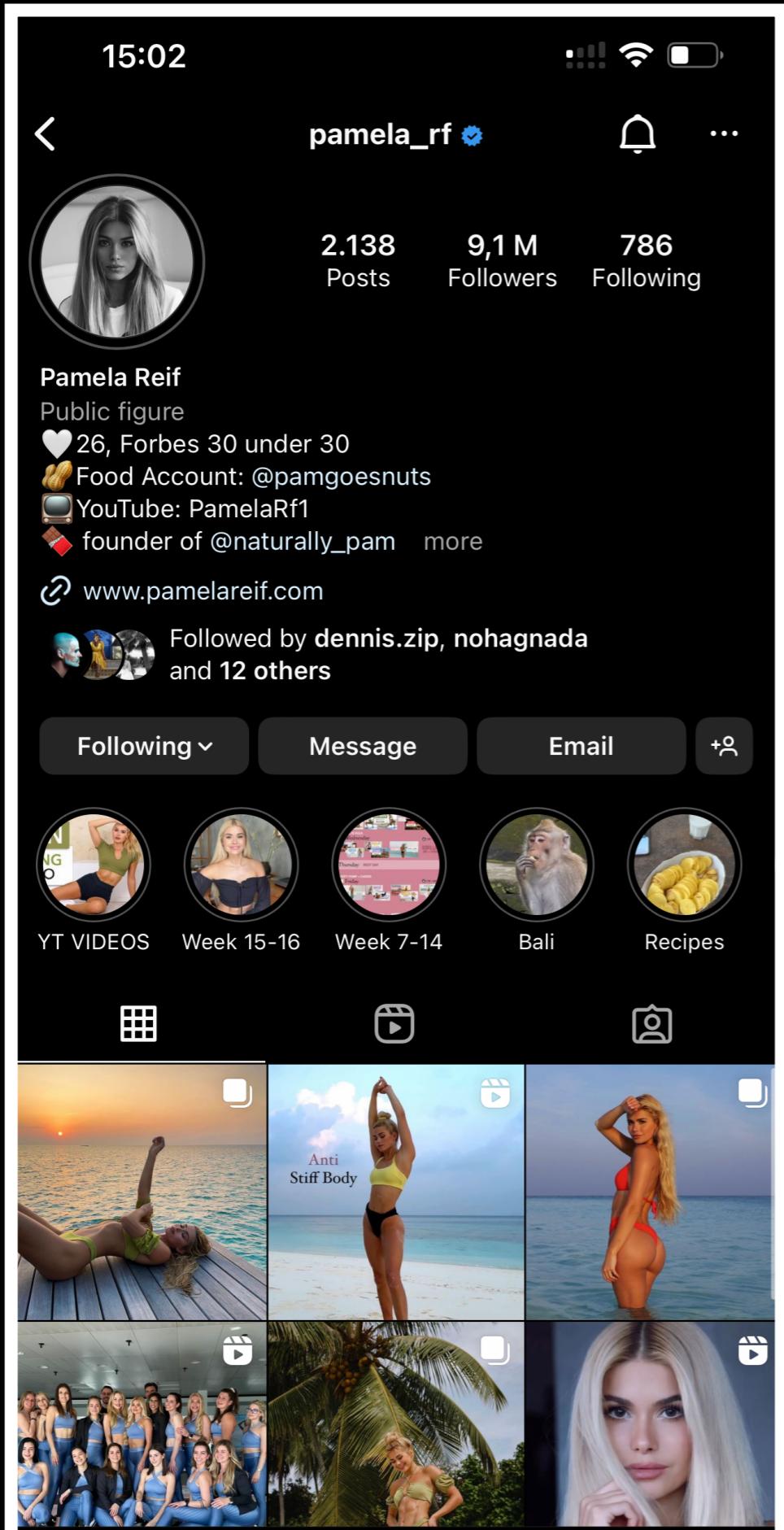
with a tiny team ;)

~\$ whoami



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



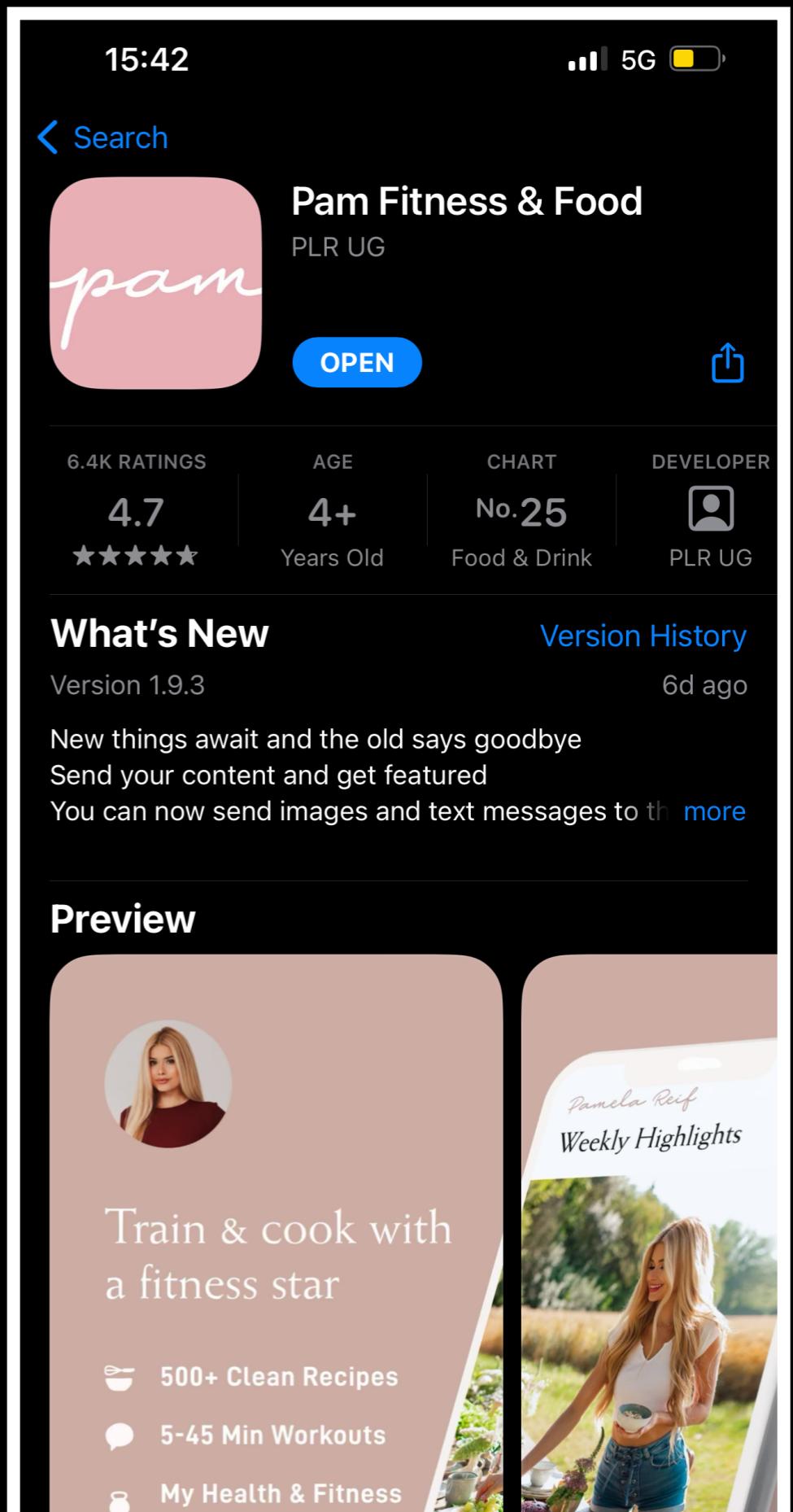


**9.1M
FOLLOWERS
@INSTAGRAM**

**9.5M
SUBSCRIBERS
@YOUTUBE**

**1.7B
VIEWS
@YOUTUBE**

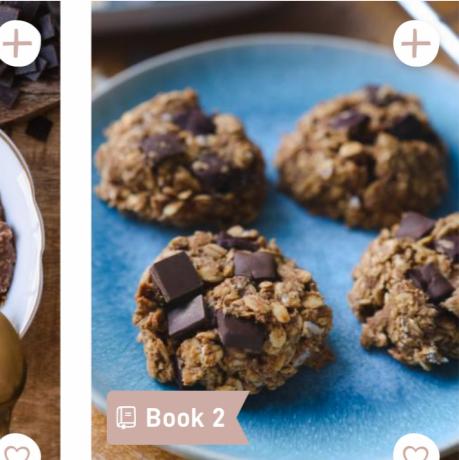
PamApp



What would you like to eat?

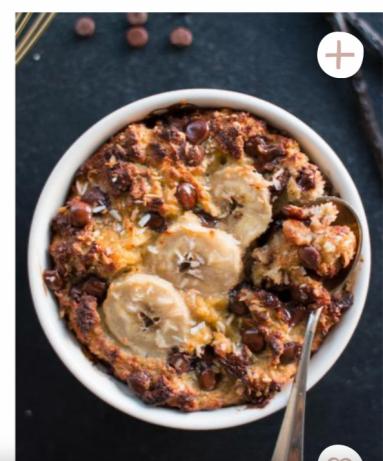
FILTER

MOST POPULAR



191K
Chocolate Porridge - easy & quick

188.9K
Chocolate Chip Cookies - Mom's recipe



WANT TO UNLOCK ALL CONTENT?



TEAM ACTIVE - LAZY

Today, my muscle were heavily...

SQUEEEZED

RELAAAXED

ON TODAY'S PLAN:

Don't forget to squeeeeze



BOMBASTIC BOOTY

OPTION 1

HOW ARE YOU FEELING TODAY?



SATISFACTION

Sweet ideas for cravings:



Baked Rice Paper Rolls - sweet & super crunchy

35MIN

APP UPDATE

Our newest recipes:

Home

Recipes

Blog

Workouts

My Plan

12:06

5G

My Plan

WORKOUTS MEALS SAVED SHOPPING LIST ACCOUNT

+ ADD EDIT

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

Home Recipes Blog Workouts My Plan

12:06

5G

My Plan

WORKOUTS MEALS SAVED SHOPPING LIST ACCOUNT

+ ADD EDIT

LOSE WEIGHT
CLASSIC VERSION
CURRENT PLAN

LOSE WEI
DANCE VERS
pam

WEEK 15

▲ HIDE

HEAVY ABS + MOBILITY

Monday

190-340 Kcal


ABS WITH WEIGHTS


ABS + BOTTLE


ABS + WEIGHT Circuit Style

DON'T FORGET TO SQUEEZE

Tuesday

235-365 Kcal


10 MIN BOMBASTIC BOOTY + BAND


15 MIN BOOTY + EQUIPMENT WEIGHT/BAND


10 MIN SEXY LEGS WORKOUT NO EQUIPMENT

Home Recipes Blog Workouts My Plan

12:06

5G

My Plan

WORKOUTS MEALS SAVED SHOPPING LIST ACCOUNT

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

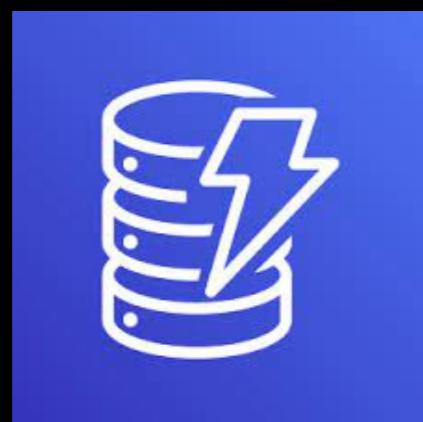
Compute:



Storage:



Database:



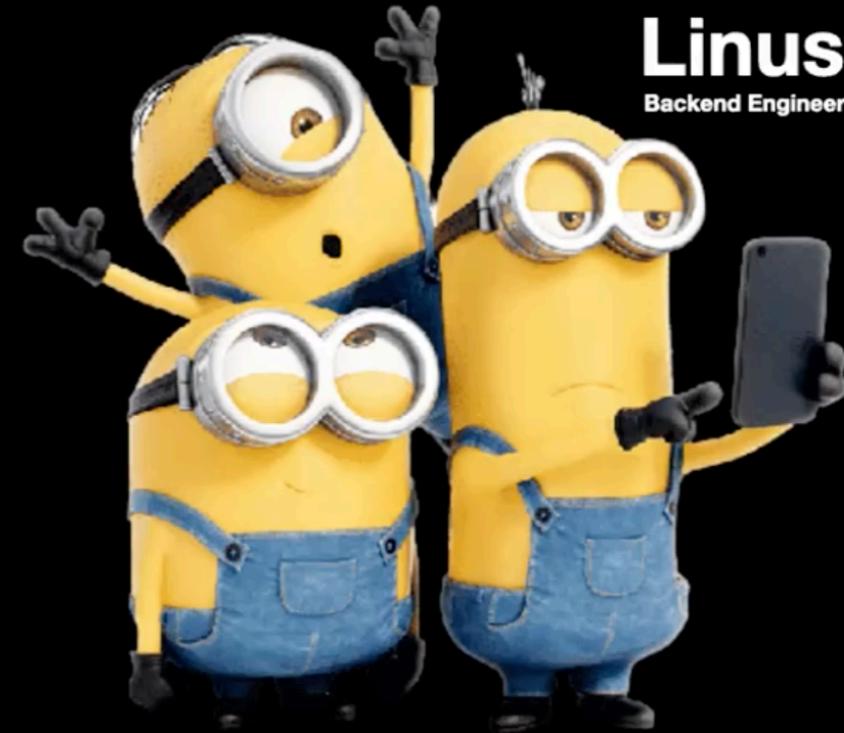
Queing:



The backend&infra team



Ken
Software Architect



Linus
Backend Engineer

Ritchie
Infra Engineer

in
appreciation for their work:

1 [https://en.wikipedia.org/wiki/
Ken_Thompson](https://en.wikipedia.org/wiki/Ken_Thompson)

1 [https://en.wikipedia.org/wiki/
Linus_Torvalds](https://en.wikipedia.org/wiki/Linus_Torvalds)

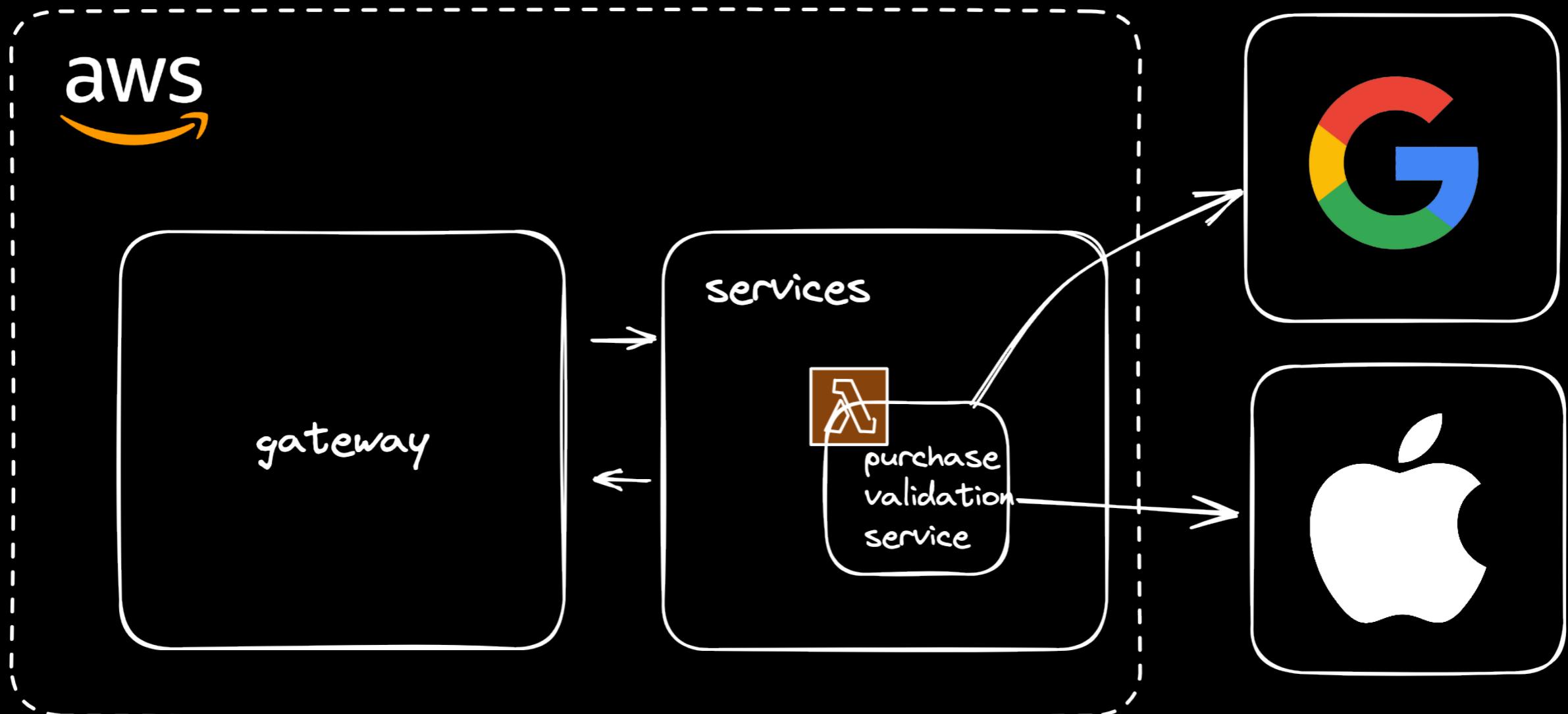
1 [https://en.wikipedia.org/wiki/
Dennis_Ritchie](https://en.wikipedia.org/wiki/Dennis_Ritchie)

“Be able to serve content to clients worldwide”

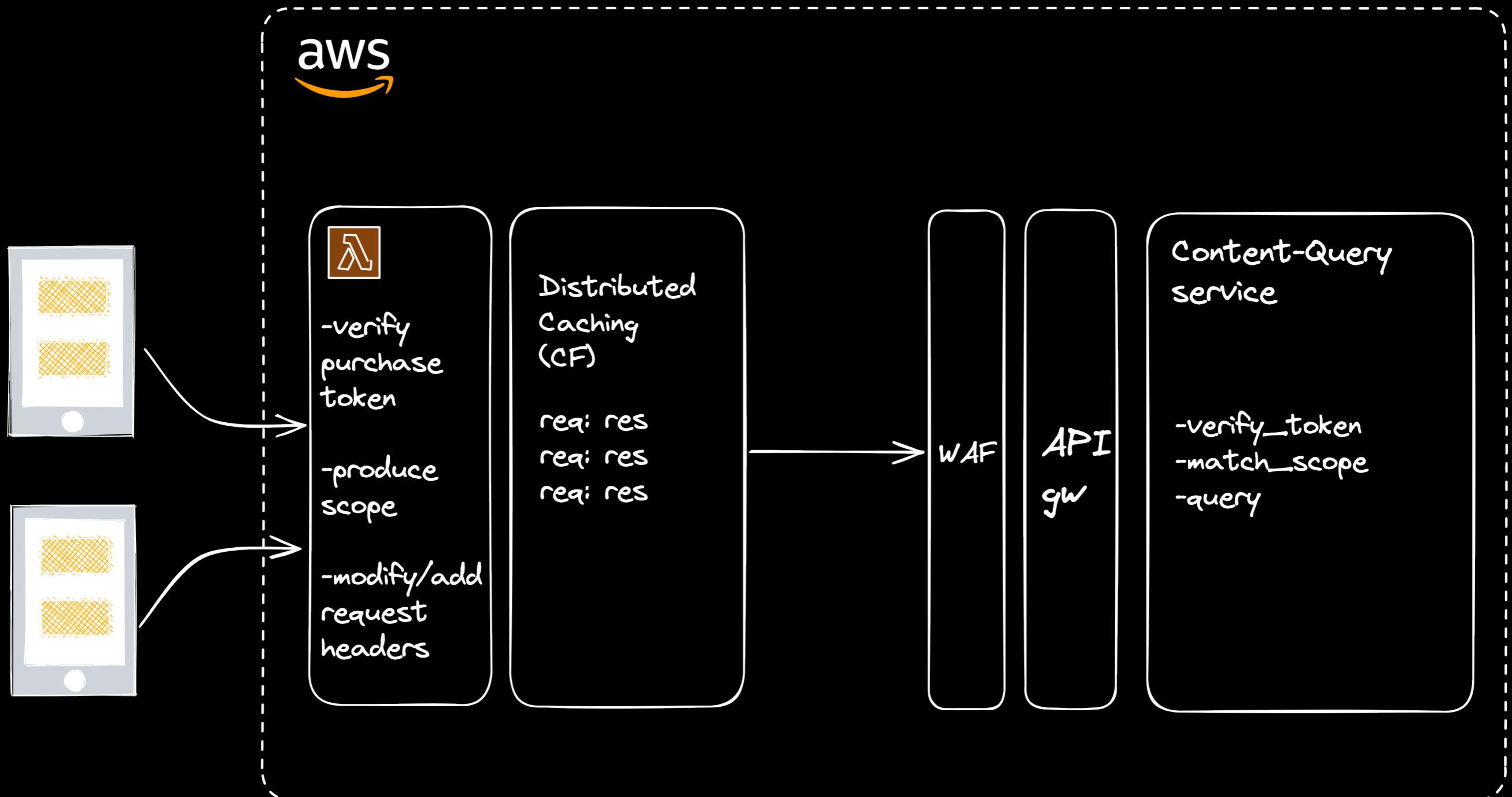


AWS CloudFront

“Be able to subscribe”



“Be able to protect premium content”



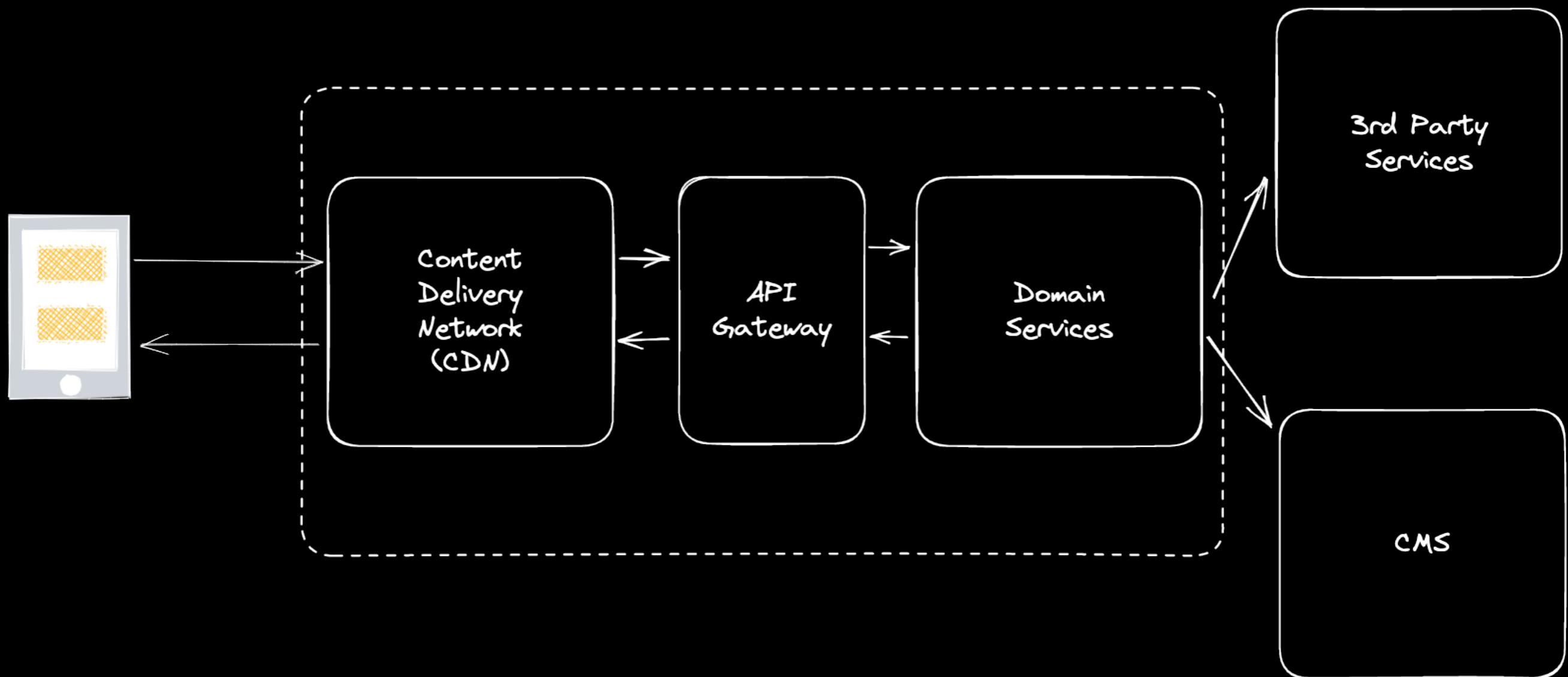
Architecture/API needs & principles

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



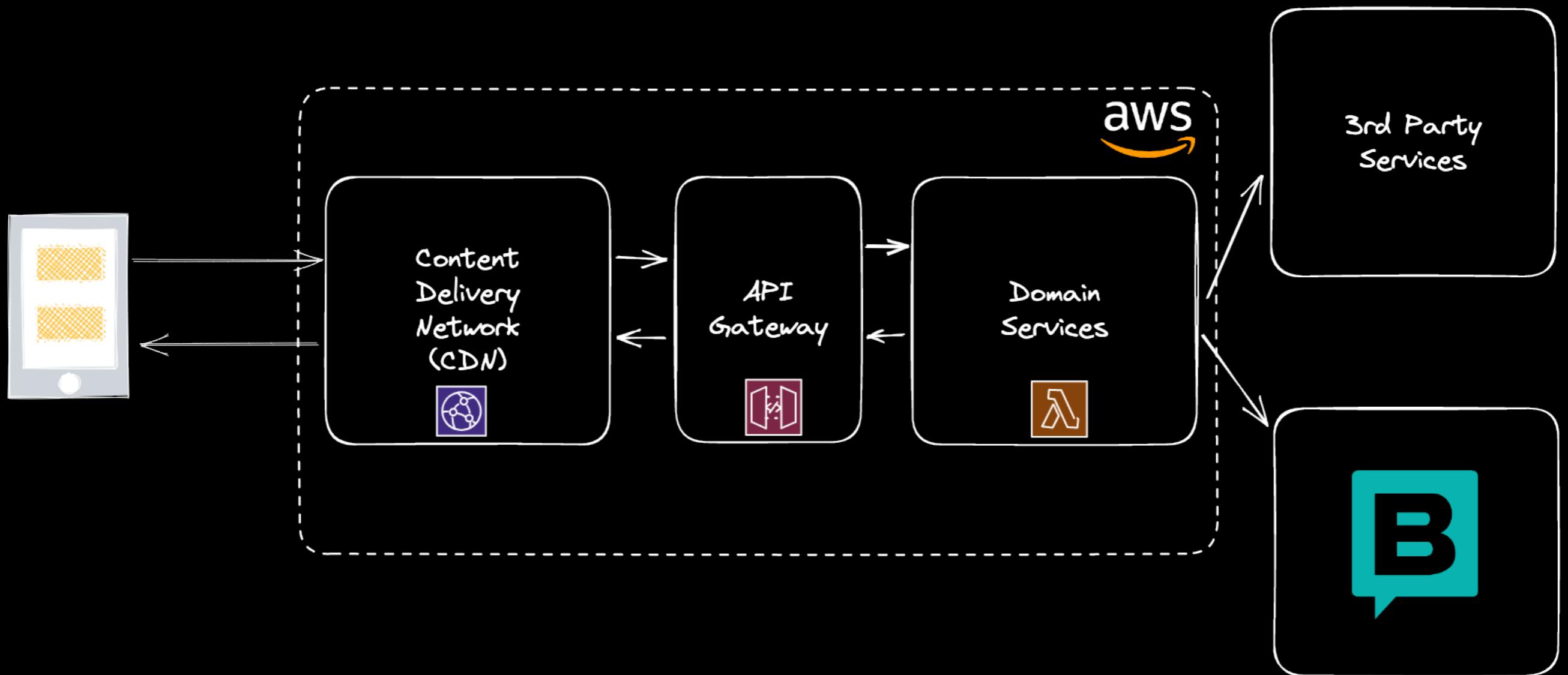
Robert Cecil Martin, colloquially called "Uncle Bob", is an American software engineer, instructor, and author. He is most recognized for promoting many software design principles and for being an author and signatory of the influential Agile Manifesto. Martin has authored many books and magazine articles.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

High Level Architecture

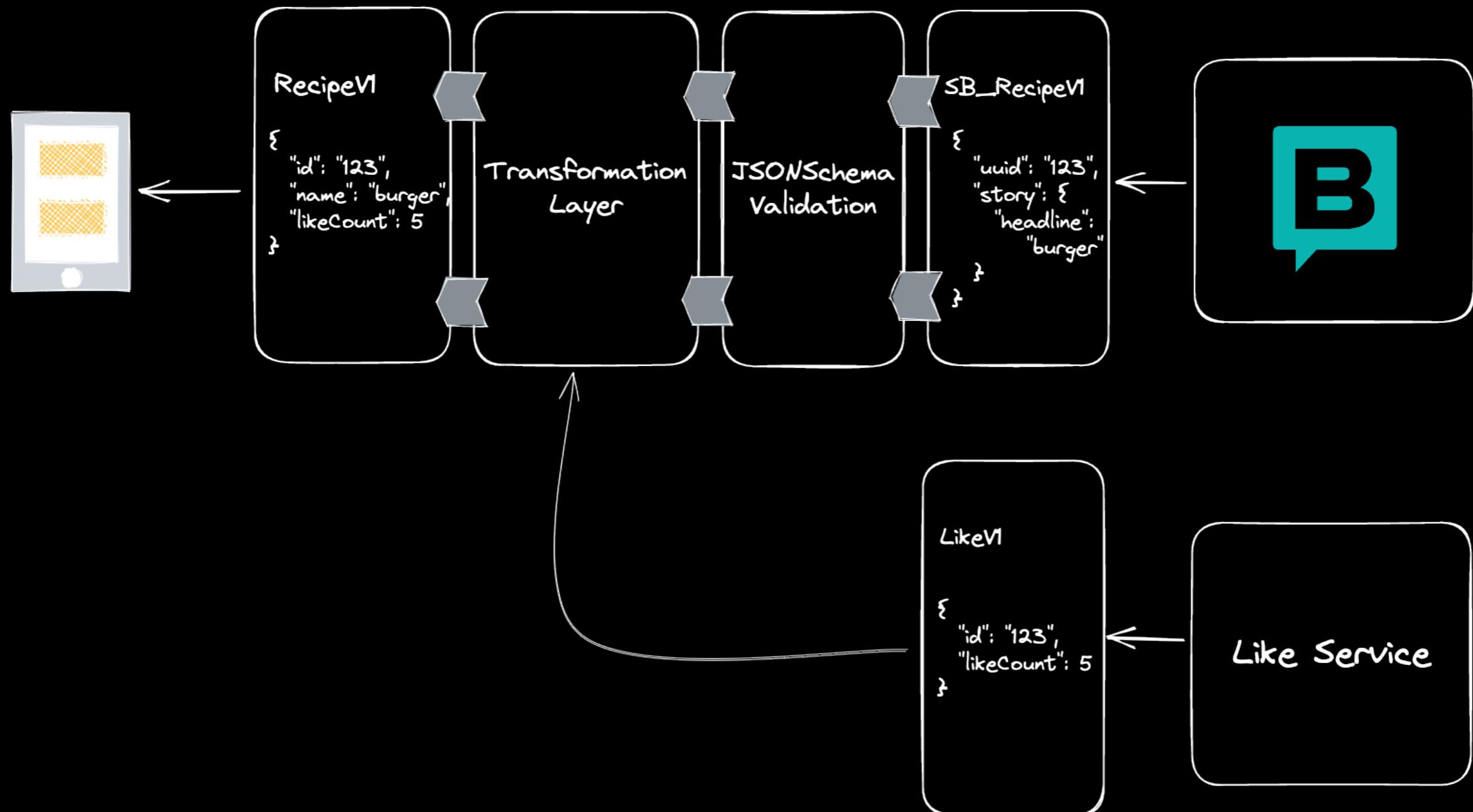


High Level Architecture

With tech used

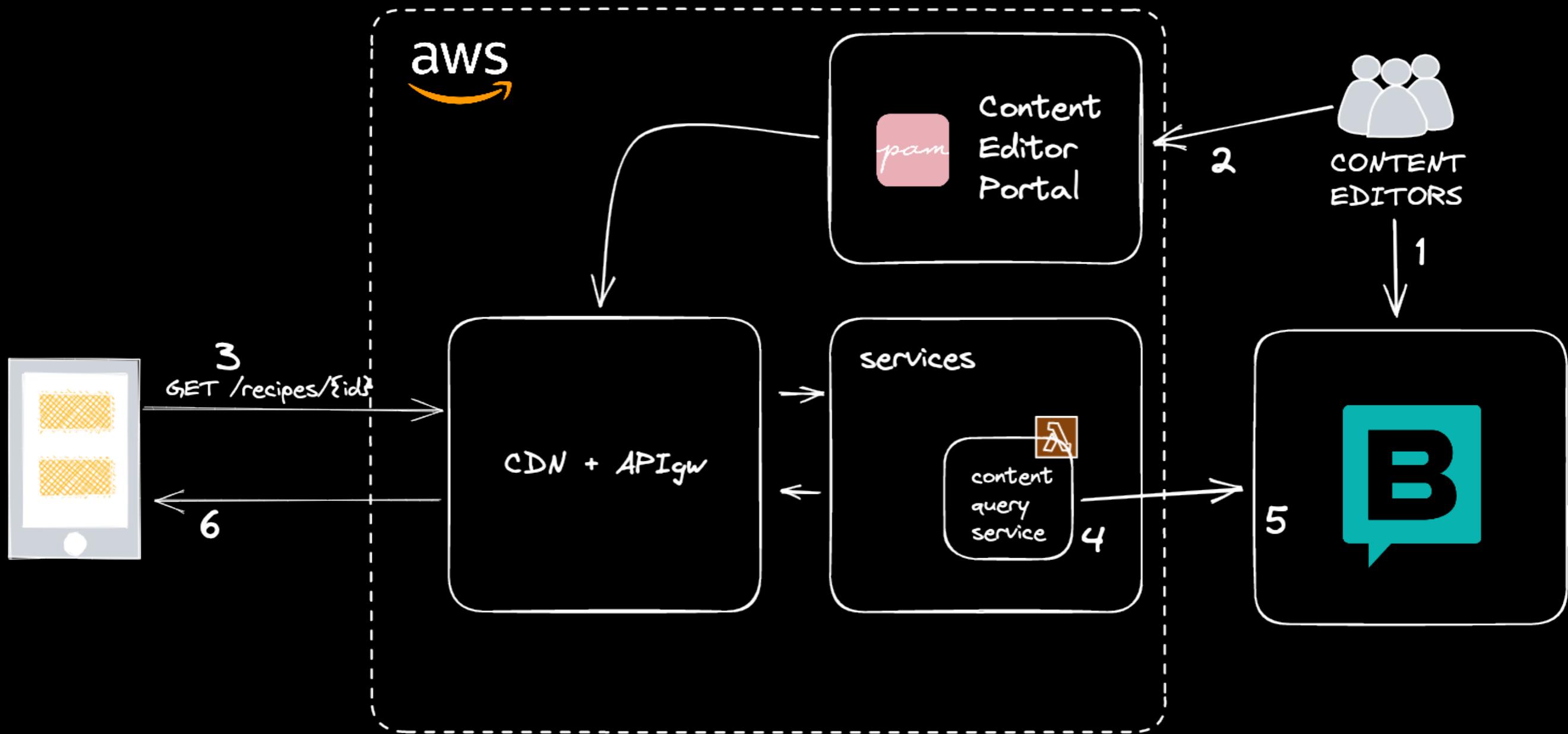


On-the-fly transformation



Architecture

Content editing cycle



Pre-Launch

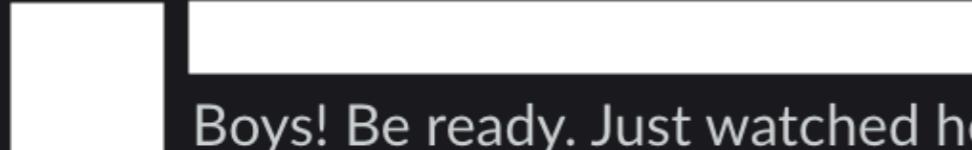
Load Testing



 **StormForge**

100% correct responses at 1k reqs/s

AWS Limits



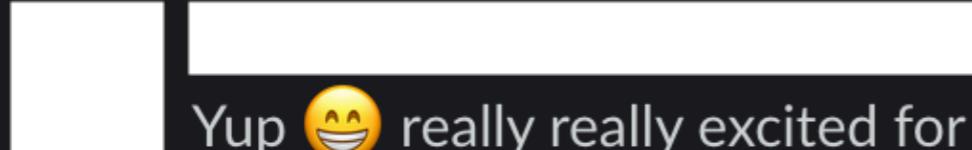
Boys! Be ready. Just watched her insta story! This thing will really tear off the roof 😊😂
Better remove all throttling on any lambda and give it 1000% auto scale 😊😊



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.



Yup 😊 really really excited for the launch 🚀



Ardit Shala 10:21 PM

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



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



Launch

“Soft” launch party

23.01.2021 22:20



A screenshot of the App Store Connect interface for the 'Pam Fitness & Food' app. On the left, the app's landing page shows its name, a green checkmark, and a 'Release This Version' button. To the right, a grid of 12 video frames shows various people smiling and interacting during a virtual launch party. The background for the video frames features a pink banner with the text 'pam RELEASE PARTY' and 'REPLY'. The video frames are arranged in three rows of four.

⚠ 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;

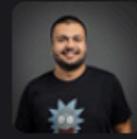
  const generatedContentTypeHeader = tokenScopeToCFContentTypeHeader(validProductIds);
  const generatedScopeHeader = tokenScopeToCFScopeHeader(validProductIds);

  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 😊

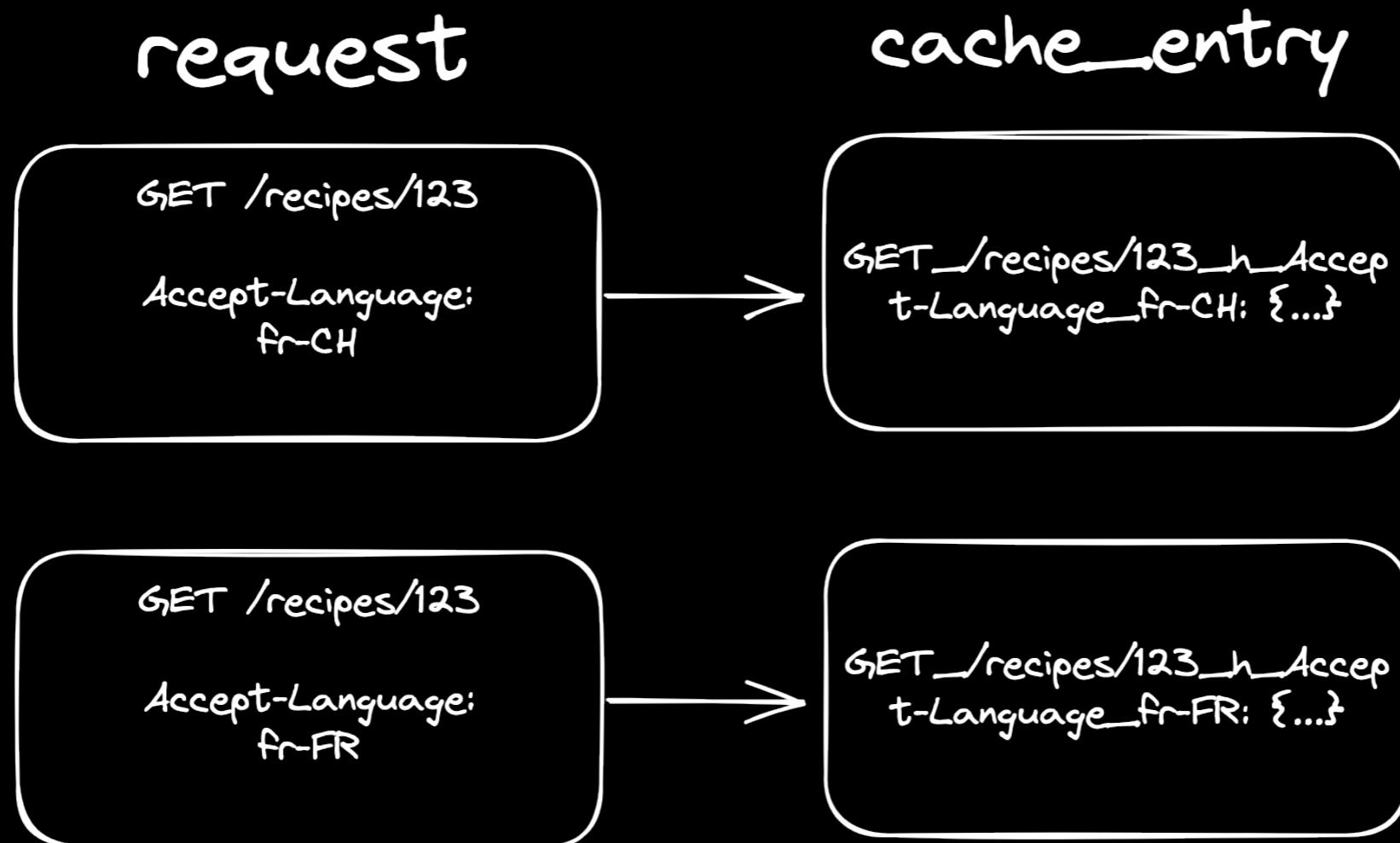
If we hit 600k reqs/minute we are going to reach our Lambda@Edge 10k req/s limit 😞

Spent the morning with AWS support team...

Cache hit problem

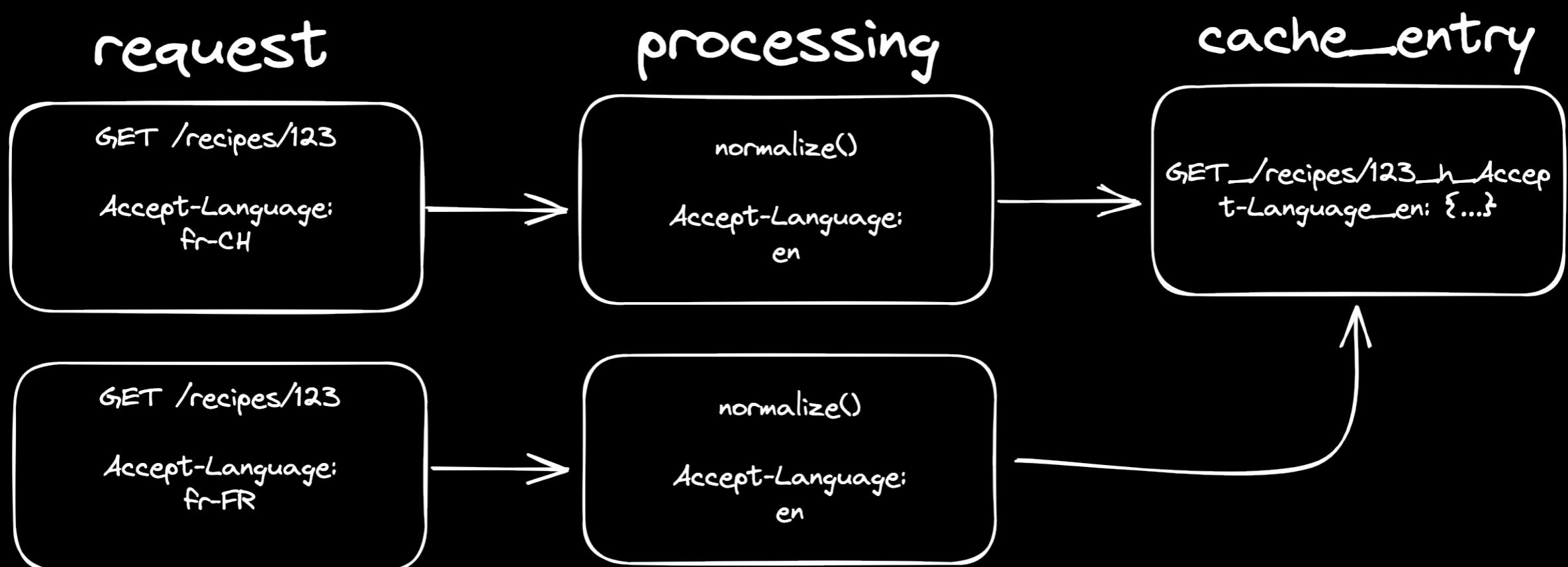
24.01.2021 12:00

Cache-Hit on ContentAPI was at ~80%



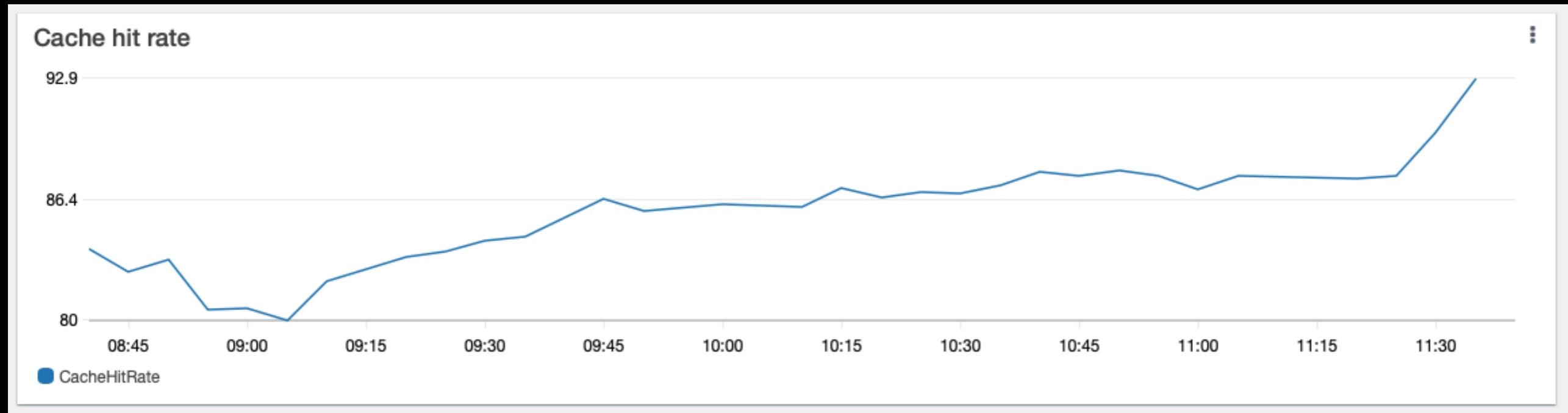
Cache hit problem => solution

24.01.2021 12:30



Cache hit problem solved

24.01.2021 12:40



Cache-Hit on ContentAPI was at 95%

15:40 ↗

Alle Apps

< Apps

Charts

Gratis Gekauft

	1 Pam Gesunde Rezepte & Workouts	ÖFFNEN
	2 Clubhouse: Drop-in audio chat Soziale Netze	LADEN
	3 Signal – Sicherer Messenger Sag »Hallo« zu Privatsph...	LADEN
	4 Reddit Nachrichten	LADEN <small>In-App-Käufe</small>
	5 ZOOM Cloud Meetings Wirtschaft	ÖFFNEN
	6 Vinted – Secondhand verkaufen Ex. Kleiderkreisel Mamikr...	LADEN

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

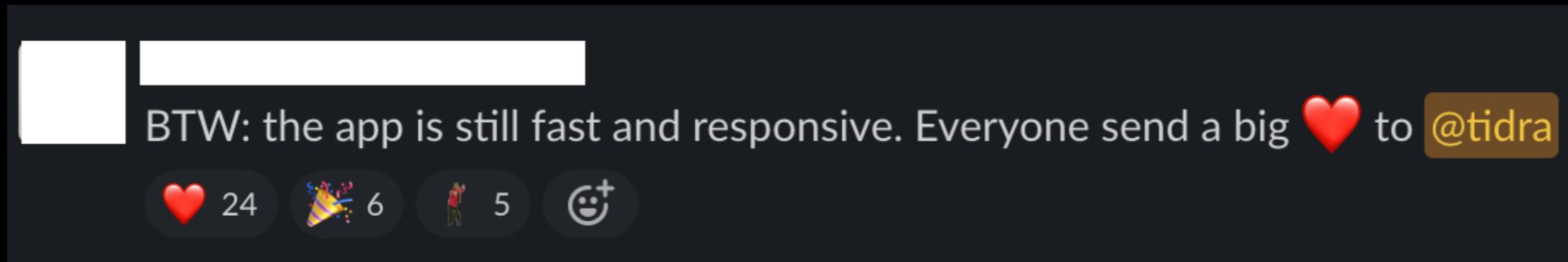
24/7
STEADY
TRAFFIC

1.3M+
SESSIONS
A WEEK

150+
COUNTRIES
USE THE
PRODUCT

Happy people ;-)

REPLY
OPEN

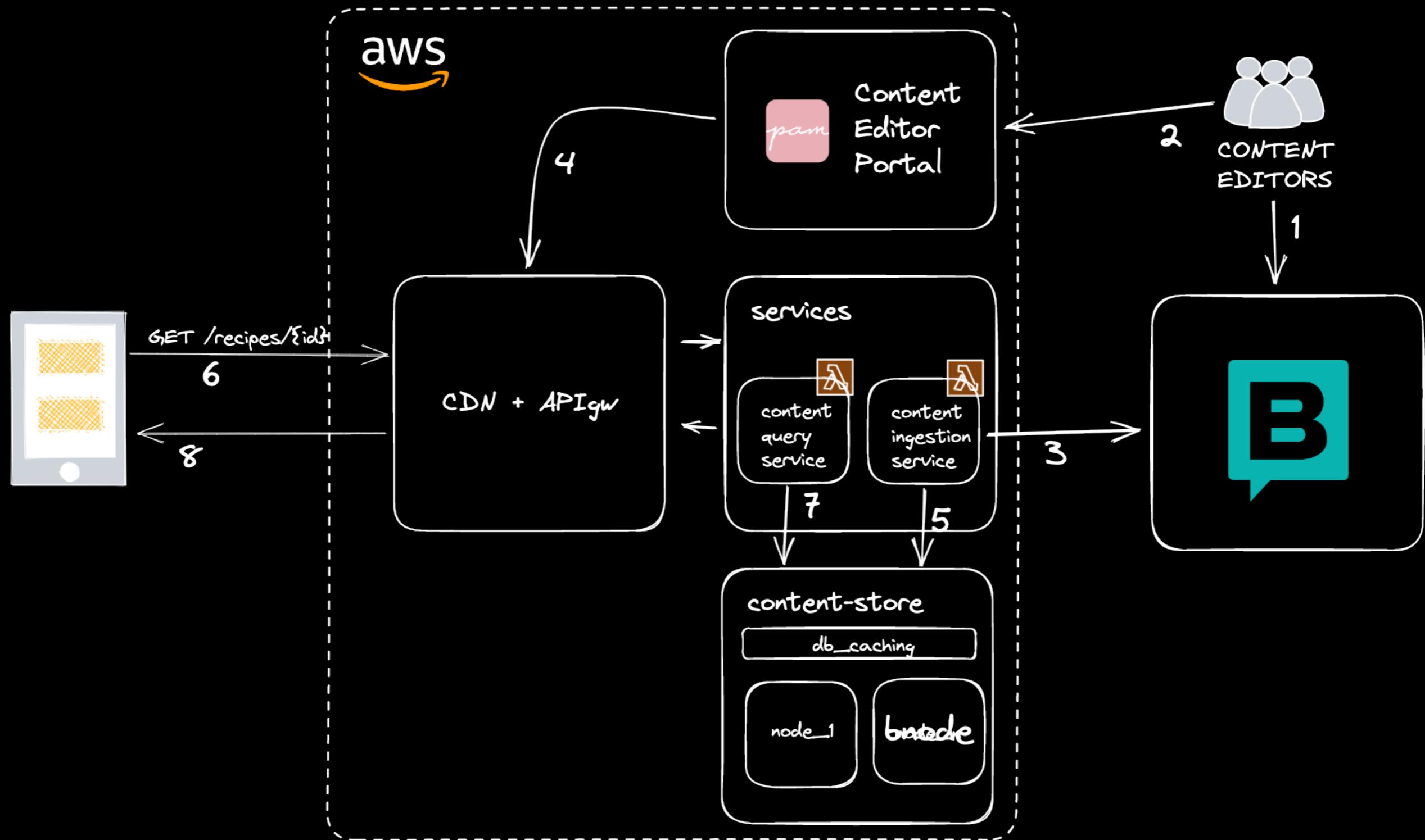


Post-Launch Scaling

ContentAPI Architecture v2

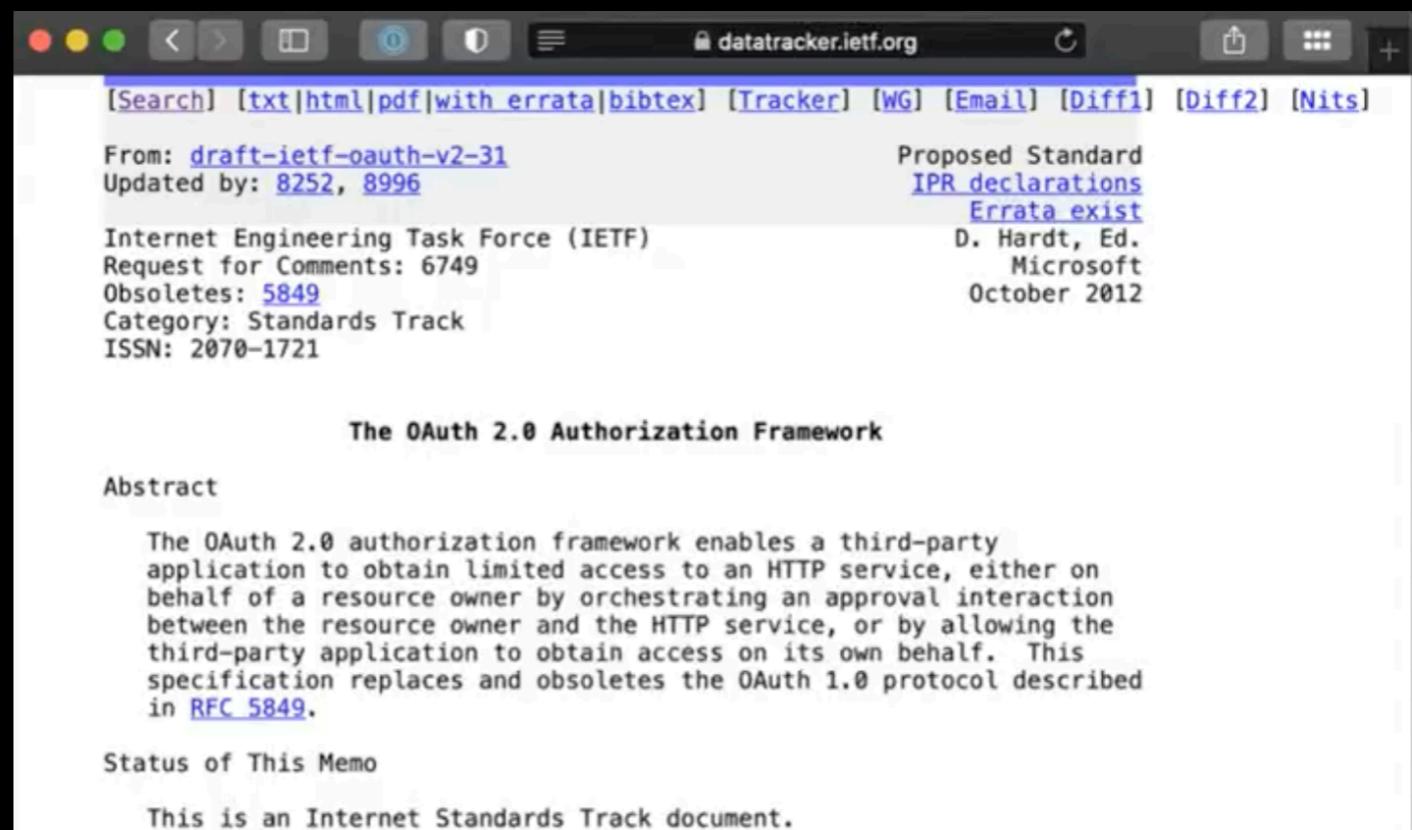
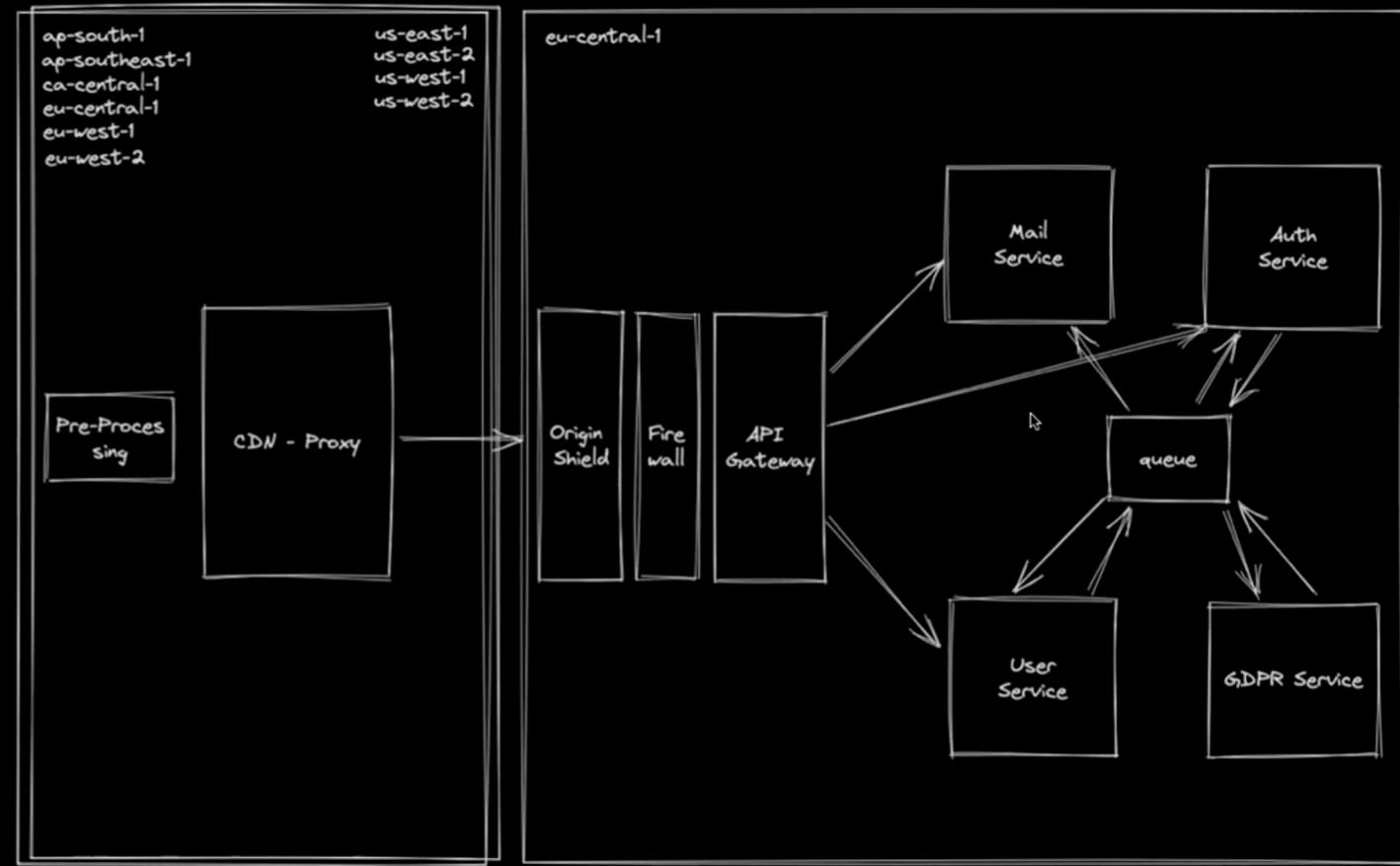
REPLY
OPEN

Content flow ↗

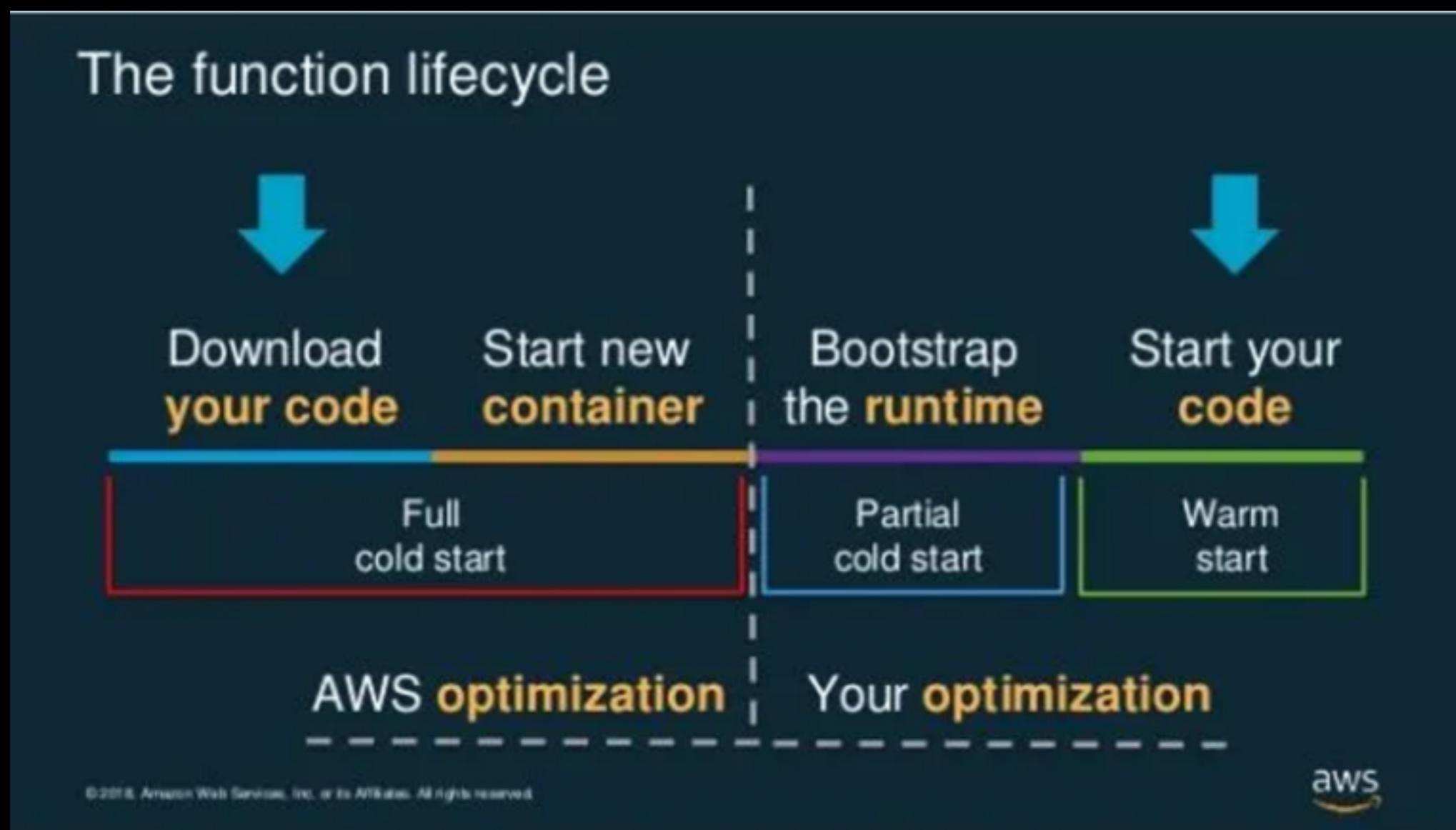


User Accounts

- 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!