

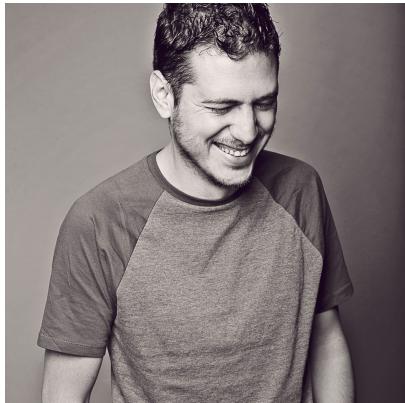
# Back to front

Backend technologies for the frontend developer



@geeky\_android@androiddev.social

# Who am I?



# Savvas Dalkitsis

(he/him)

Principal Software Engineer  
@ASOS

# ASOS



# Why am I here?



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A circular arrangement of various Android development and design terms, including:

- gradle
- adb
- Firebase
- Android
- Material
- Coroutines
- SQLite
- Google Play
- UI
- MVVM
- Retrofit
- MVP
- Bauer
- Hilt
- Room
- RxJava
- Jetpack
- Compose
- Studio



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A circular word cloud diagram centered on the term "edge-workers". The words are arranged in concentric circles around the center, with the size of each word indicating its frequency or importance. The words include:

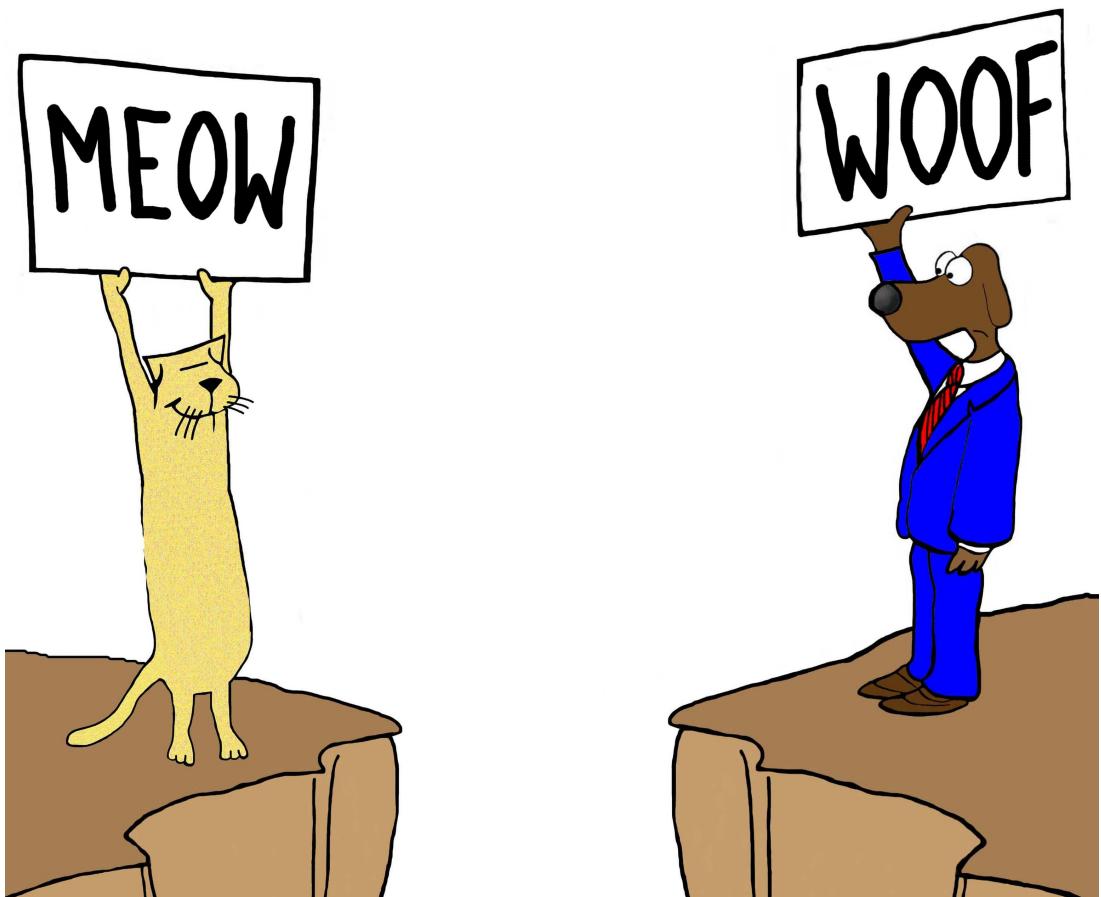
- cookies
- etag
- Round-robin
- functions
- message~queues
- chaos~monkey
- non-blocking~io
- ingress~controller
- sail
- edge~workers
- clusters
- inference
- optimistic~locking
- containers
- dns
- cdn
- jwt
- oauth
- aws
- dns
- server-side~rendering



# So what?



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**Language barriers are real in tech too.**

Progressing your career means being able to have meaningful discussions with people outside your domain and comfort zone.

A basic understanding of their language is paramount.

Source: [cartoonresource/Adobe Stock](#)

# Let's start



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# Caching

There are only two hard things in Computer Science: cache invalidation and naming things.

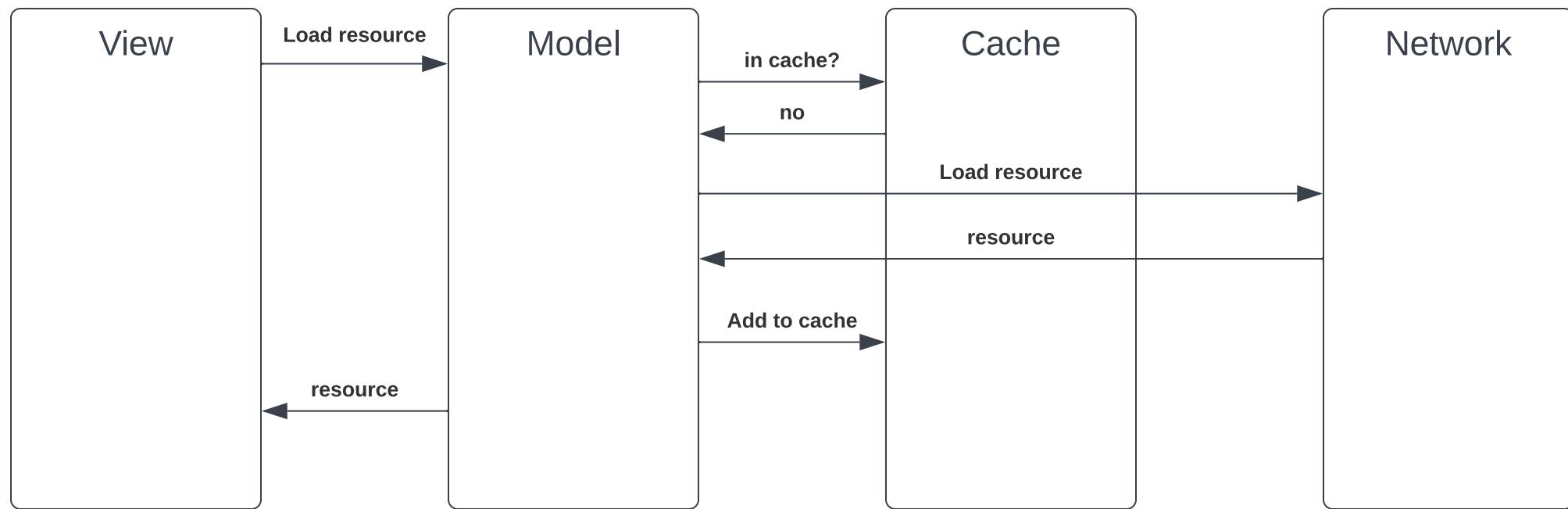
| Phil Karlton

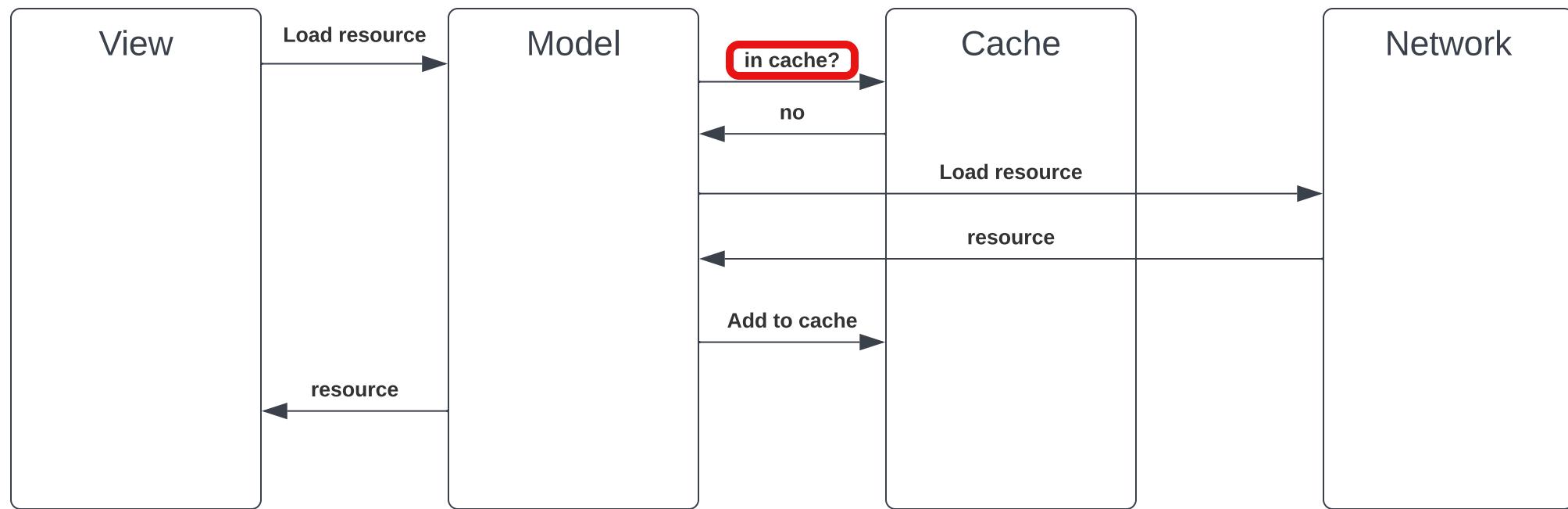
Caching

# Expiry headers



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Caching

# Server side controlled expiry



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## Caching

# Server side controlled expiry

### **Expires** header

Example Expires: Wed, 21 Oct 2015 07:28:00 GMT



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## Caching

# Server side controlled expiry

### **Cache-Control** header

Example Cache-Control: max-age=604800



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The following table lists the standard Cache-Control directives:

Request	Response
max-age	max-age
max-stale	-
min-fresh	-
-	s-maxage
no-cache	no-cache
no-store	no-store
no-transform	no-transform
only-if-cached	-

Request	Response
-	must-revalidate
-	proxy-revalidate
-	must-understand
-	private
-	public
-	immutable
-	stale-while-revalidate
stale-if-error	stale-if-error

<https://developer.mozilla.org/en-US/docs/Web/HTTP/Headers/Cache-Control>

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# Caching

# ETags



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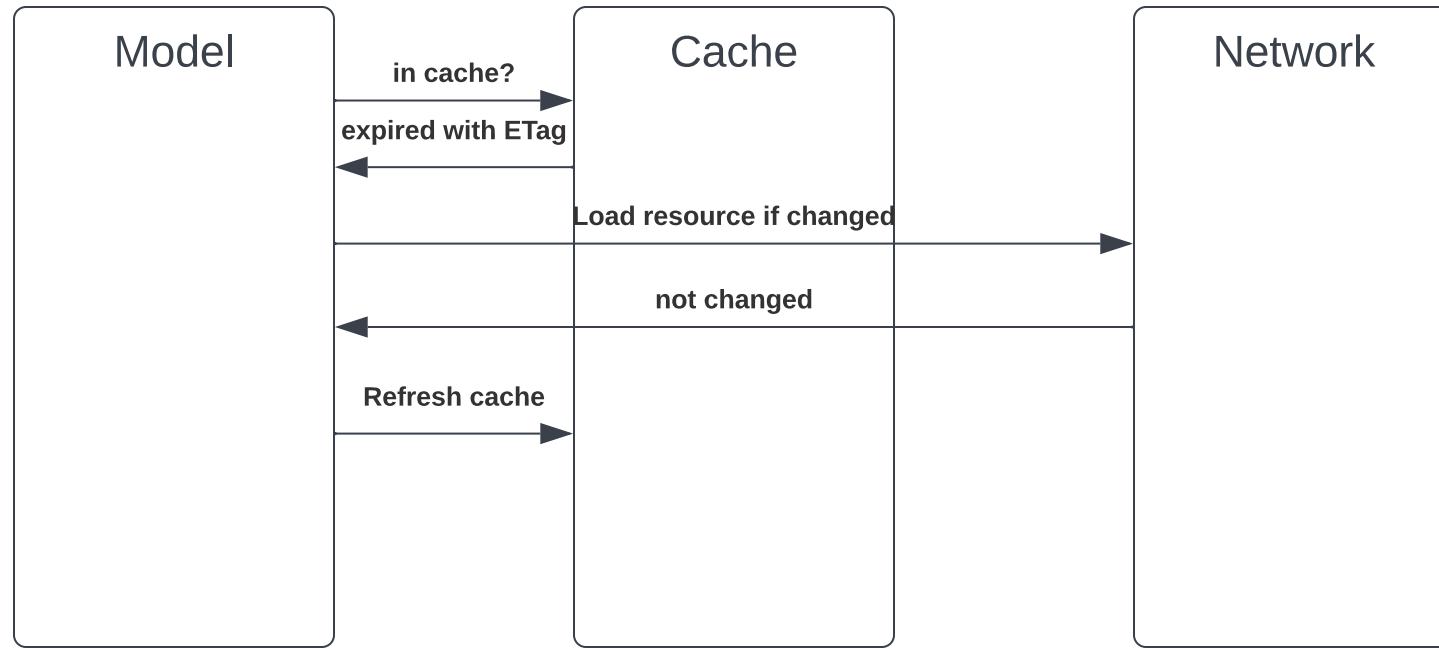
## What is an ETag?

The ETag (or entity tag) HTTP response header is an identifier for a specific version of a resource. It lets caches be more efficient and save bandwidth, as a web server does not need to resend a full response if the content was not changed.

<https://developer.mozilla.org/en-US/docs/Web/HTTP/Headers/ETag>

# ETag = Unique Resource ID

| Example ETag: "33a64df551425fcc55e4d42a148795d9f25f89d4"



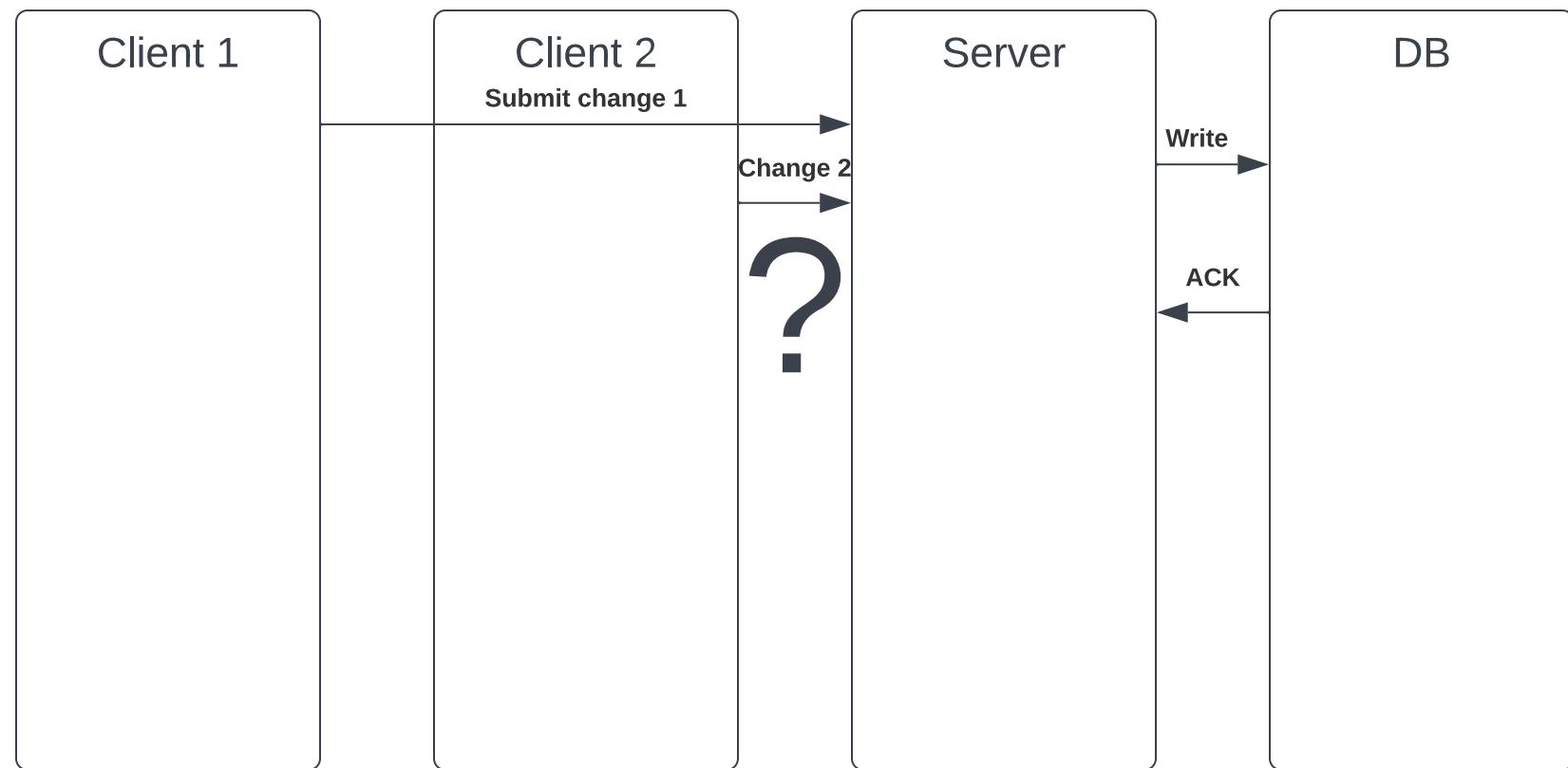
| Example If–None–Match: "33a64df551425fcc55e4d42a148795d9f25f89d4"

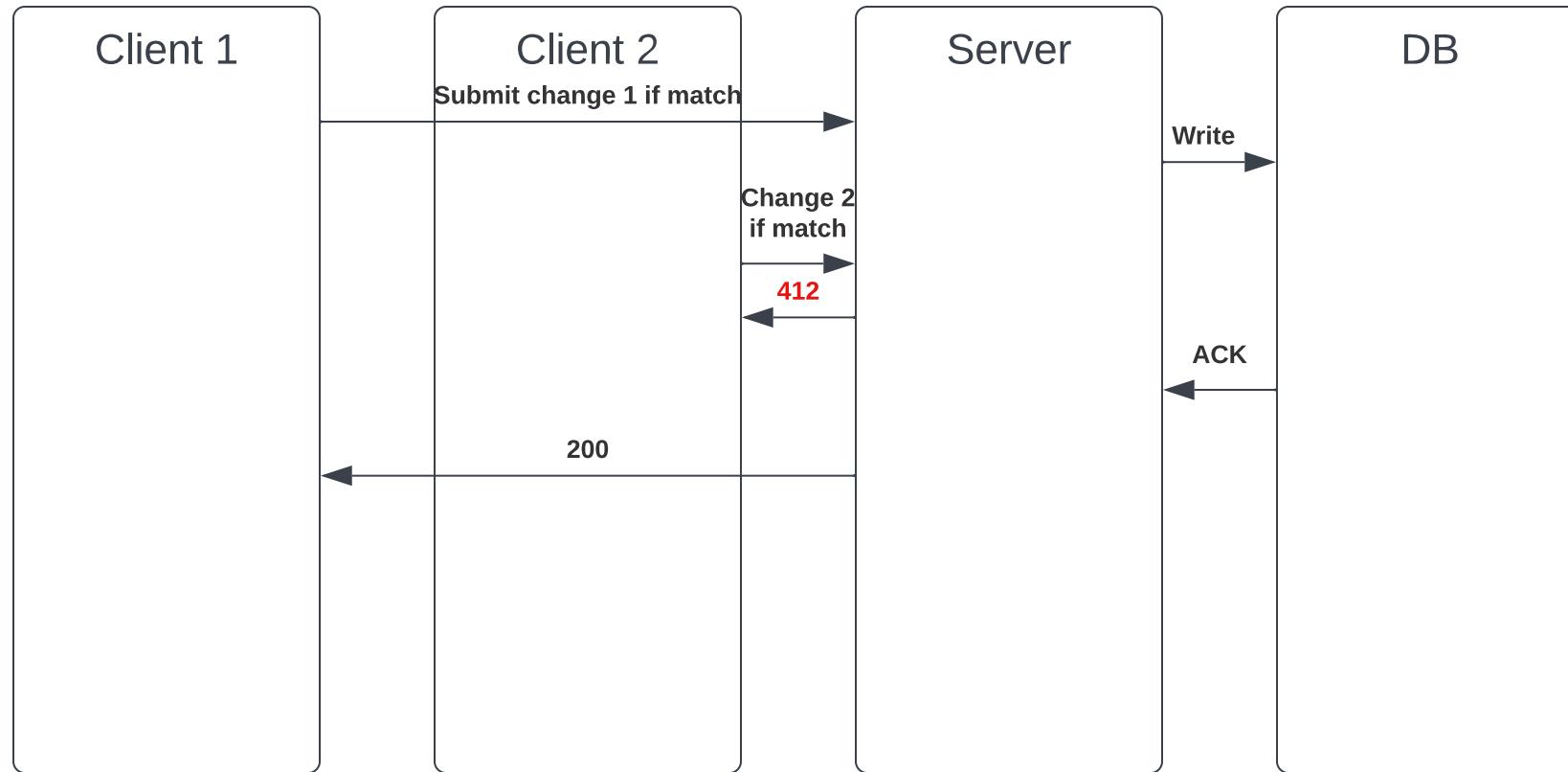
ETag

# Mid air conflicts



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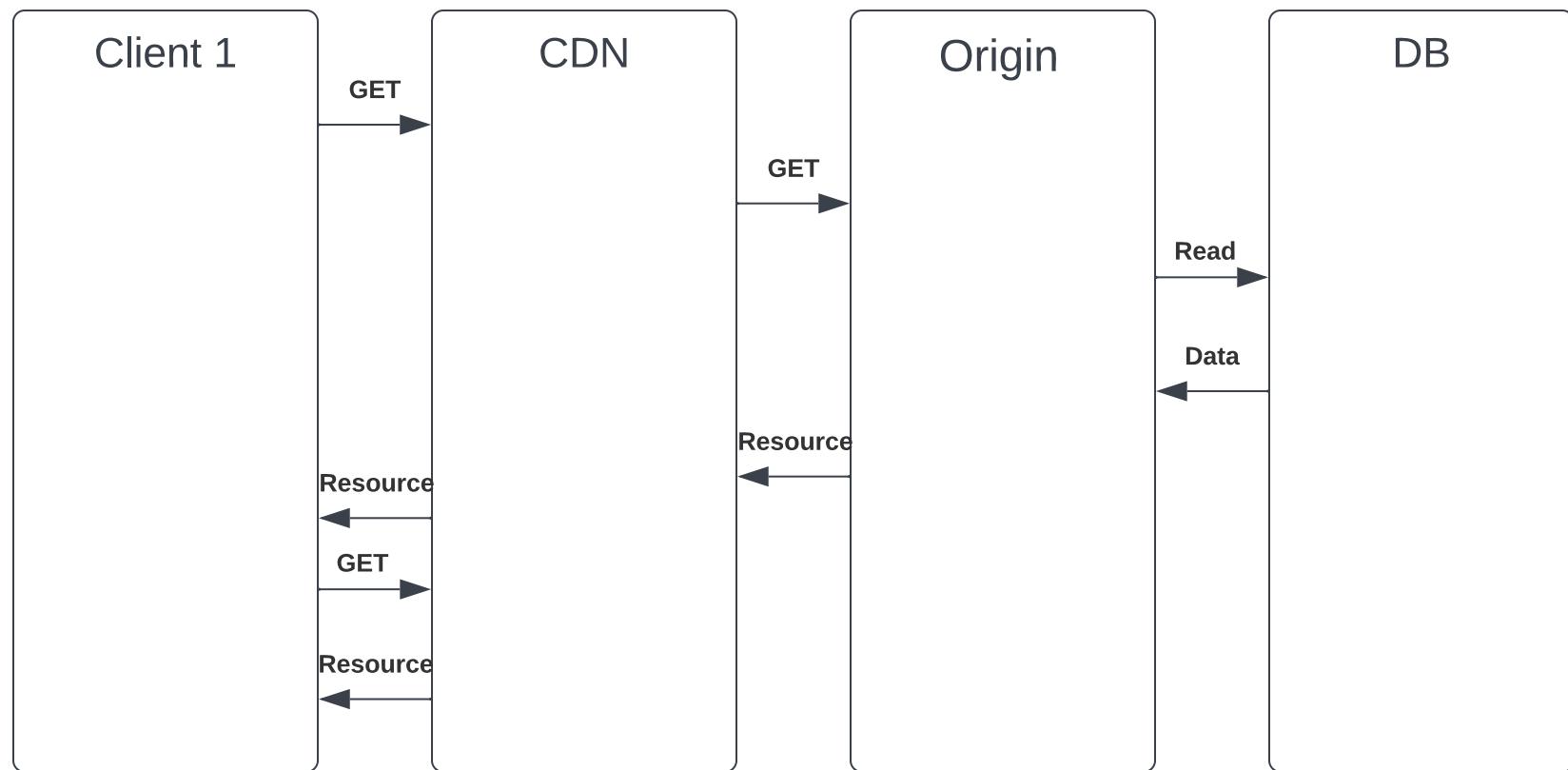
Example: If-Match: "33a64df551425fcc55e4d42a148795d9f25f89d4"

Caching

CD-eh?



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Caching

# Server side rendered pages



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ASOS WOMEN MEN Search for items and brands   

Sale New in Clothing Shoes Sportswear Accessories Autumn Trending now Topman Face + Body Brands **Outlet** Marketplace

**WOMEN** **20% OFF ALMOST EVERYTHING!** With code: GOREGEOUS **MEN**

Home > Search results for jeans

Your search results for:  
**"Jeans"**

Sort Sale/New Season Gender Product Type Style Brand Colour Body Fit Size Discount % Price Range

9,565 styles found



-14%

ASOS DESIGN spray on jeans with power stretch in washed black

£25.00 **£21.50**



EXTENDED SIZING

ASOS DESIGN classic rigid jeans in mid wash blue

£25.00



Pull&Bear basic carrot fit jeans in black

£22.99



EXTENDED SIZING

ASOS DESIGN stretch slim jeans in black

£25.00



-30%





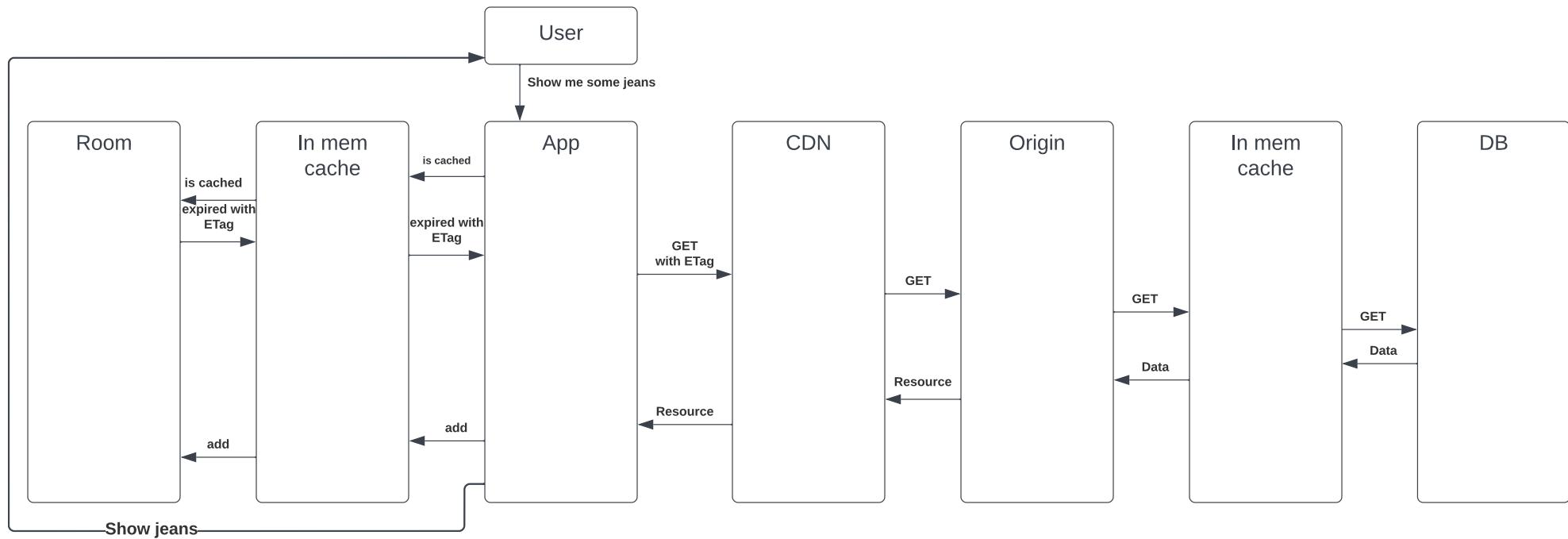
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Caching

# Multilayered caching



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# Web Application/API Design



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# Web Application/API Design

## REST

Give it a REST



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**REST is a set of architectural constraints, not a protocol or a standard. API developers can implement REST in a variety of ways.**

| <https://www.redhat.com/en/topics/api/what-is-a-rest-api>

## Web Application/API Design

# HTTP Verbs

| Oh CRUD

# Does this look familiar?

`https://my.awesome/api/people/1/addAddress`

`https://my.awesome/api/people/1/getAddress`

`https://my.awesome/api/people/1/changeAddress`

`https://my.awesome/api/people/1/deleteAddress`





`https://my.awesome/api/people/1/ add Address`

`https://my.awesome/api/people/1/ get Address`

`https://my.awesome/api/people/1/ change Address`

`https://my.awesome/api/people/1/ delete Address`



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## HTTP **verbs**, REST resources **nouns**

**POST** https://my.awesome/api/people/1/ address

**GET** https://my.awesome/api/people/1/ address

**PUT** https://my.awesome/api/people/1/ address

**DELETE** https://my.awesome/api/people/1/ address



## Web Application/API Design

# Query parameters

| <http://i.already/know?about=those>

TL;DR;

If you ever see this in your api:

| <https://something.or.other/login?username=rick&password=pickle>

👑 from the mountaintops

# Web Application/API Design

# JWT

| wtj?

## Encoded

PASTE A TOKEN HERE

```
eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJzdWIiOiIxMjM0NTY3ODkwIiwibmFtZSI6IkpvaG4gRG9lIiwiaWF0IjoxNTE2MjM5MDIyfQ.SflKxwRJSMeKKF2QT4fwpMeJf36P0k6yJV_adQssw5c
```

## Decoded

EDIT THE PAYLOAD AND SECRET

HEADER: ALGORITHM & TOKEN TYPE

```
{  
  "alg": "HS256",  
  "typ": "JWT"  
}
```

PAYOUT: DATA

```
{  
  "sub": "1234567890",  
  "name": "John Doe",  
  "iat": 1516239022  
}
```

VERIFY SIGNATURE

```
HMACSHA256(  
  base64UrlEncode(header) + "." +  
  base64UrlEncode(payload),  
  your-256-bit-secret  
)  secret base64 encoded
```

<https://jwt.io>



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## Web Application/API Design

# OAuth

| oh oh ffff...

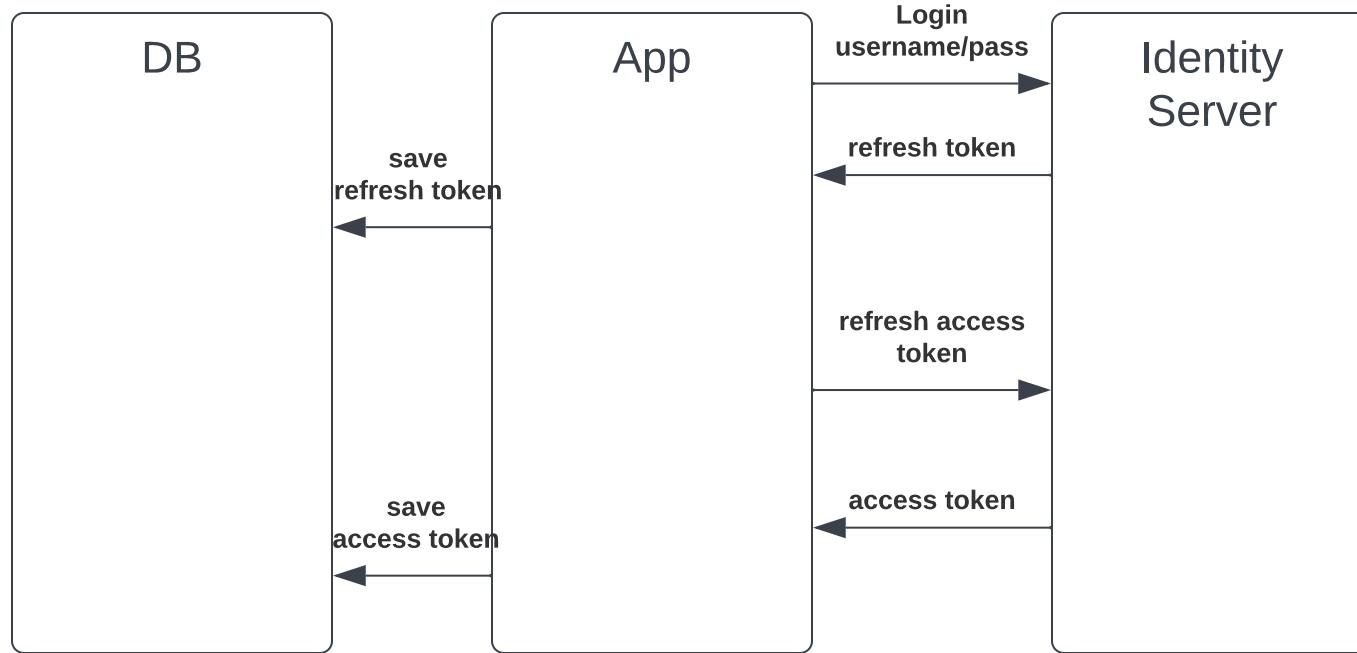


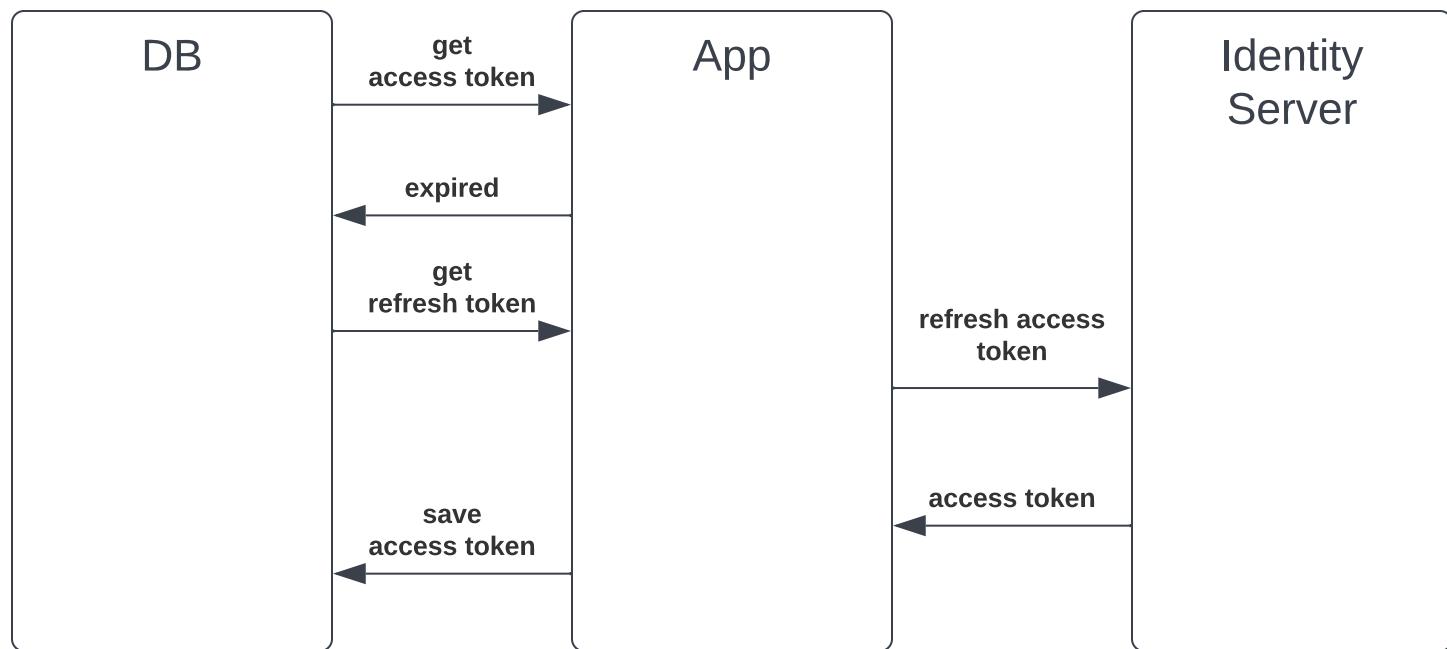
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# Why OAuth?

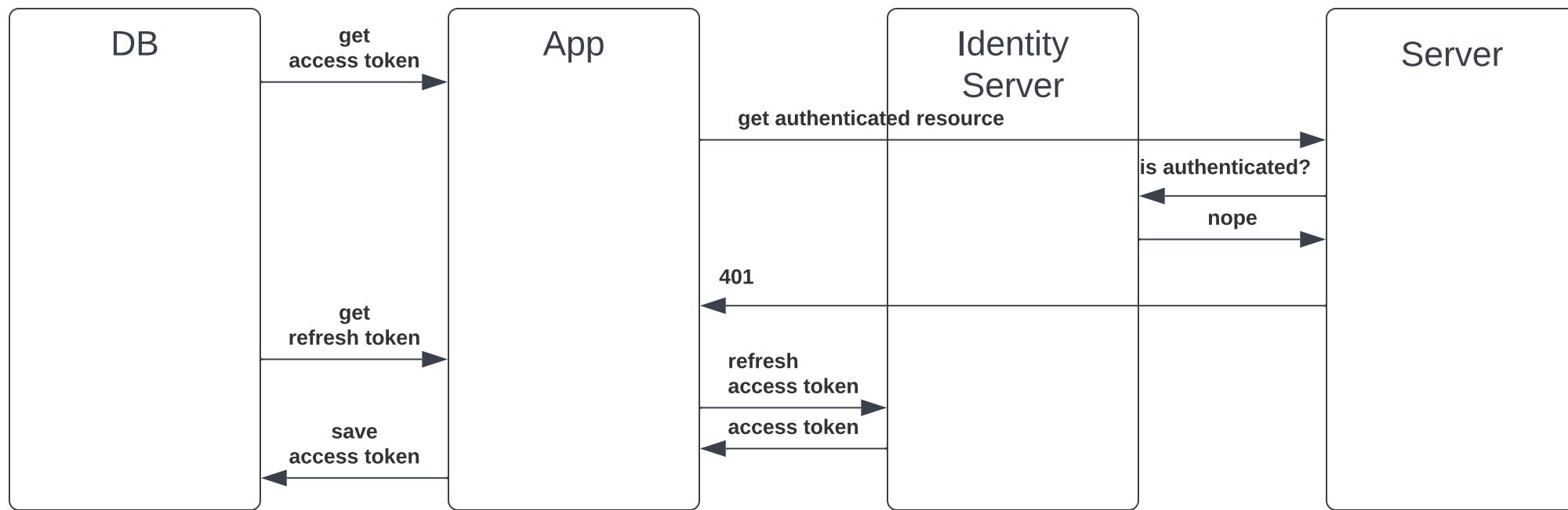
Remember this?

`https://something.or.other/login?username=rick&password=pickle`





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Web Application/API Design

# Idempotency



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## ETags 2 - Return of the UUID?

If we follow the REST principles in designing our APIs, we will have automatically idempotent REST APIs for GET, PUT, DELETE, HEAD, OPTIONS, and TRACE methods. Only POST APIs will not be idempotent.

POST is NOT idempotent.

GET , PUT , DELETE , HEAD , OPTIONS and TRACE are idempotent.

<https://restfulapi.net/idempotent-rest-apis/>

# Service topology



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# Containers!

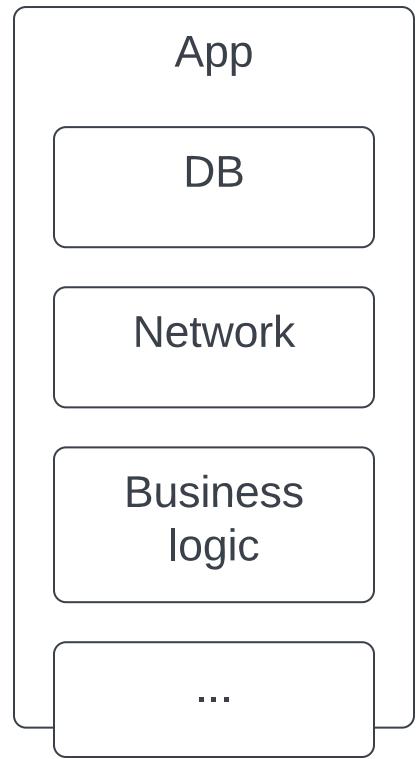


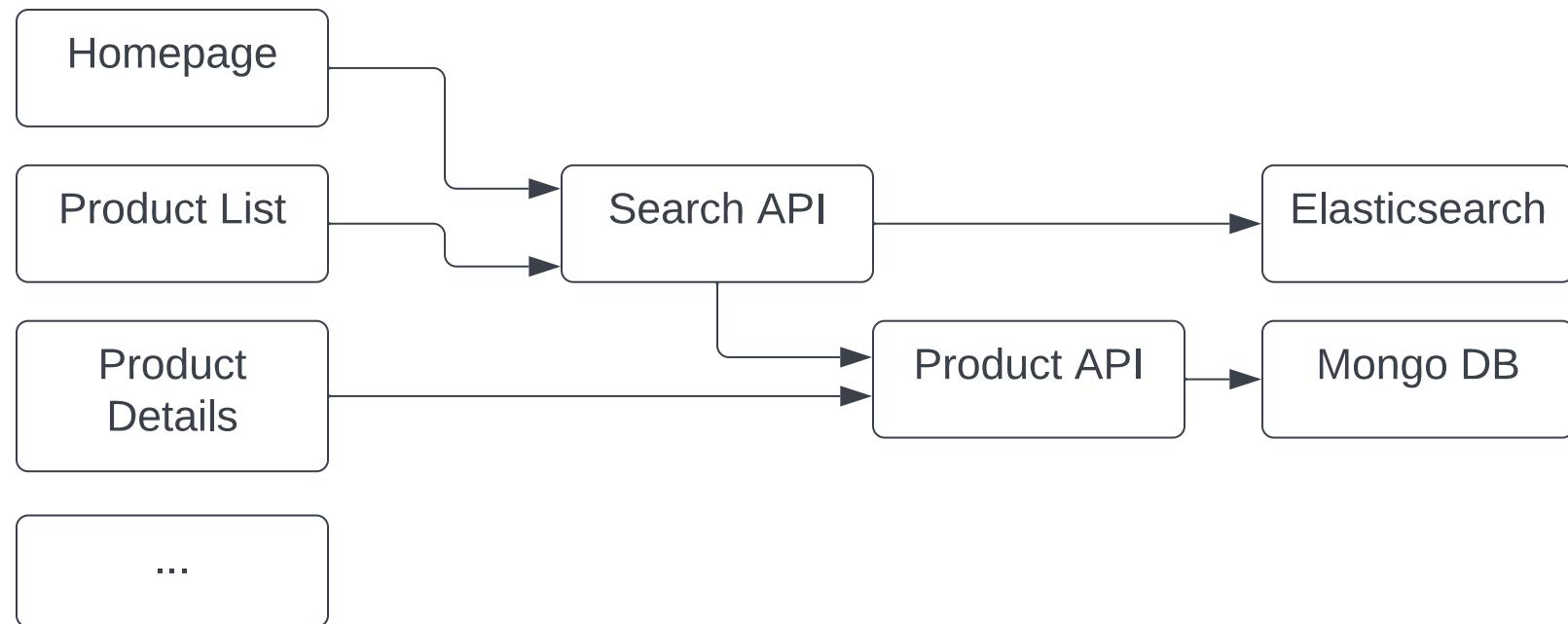
containerd

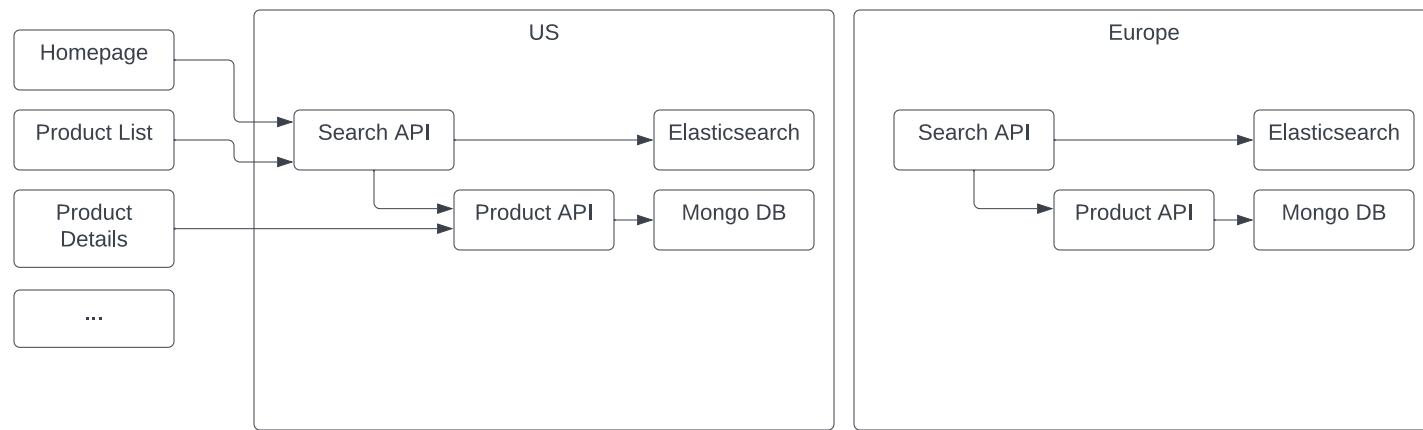
The Kubernetes logo, which is a blue hexagon containing a white steering wheel icon, followed by the word "kubernetes" in a large, bold, black sans-serif font.

Service topology

# Microservices







# Service topology

# DNS



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Service topology

Clusters



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Service topology

# Traffic Managers / Ingress controllers

`https://my.awesome.service/home`

`https://my.awesome.service/product/123`

`https://my.awesome.service/search?q=jeans`



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# Load balancers



| Image by [Peggy und Marco Lachmann-Anke](#) from [Pixabay](#)

Service topology

# Multi-primary replication

# Chaos



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# Honorable mentions

- Edge workers
- Functions
- Message queues - Event Driven Architecture
- Optimistic Locking
- Eventual Consistency
- NoSQL
- Non blocking sysIO
- Round Robin
- Encryption at rest/In transit - End to End Encryption
- Salting
- Eventual Consistency

# Q&A

## Slides



 [@geeky\\_android@androiddev/social](https://github.com/Android/samples/presentation-back-to-front)