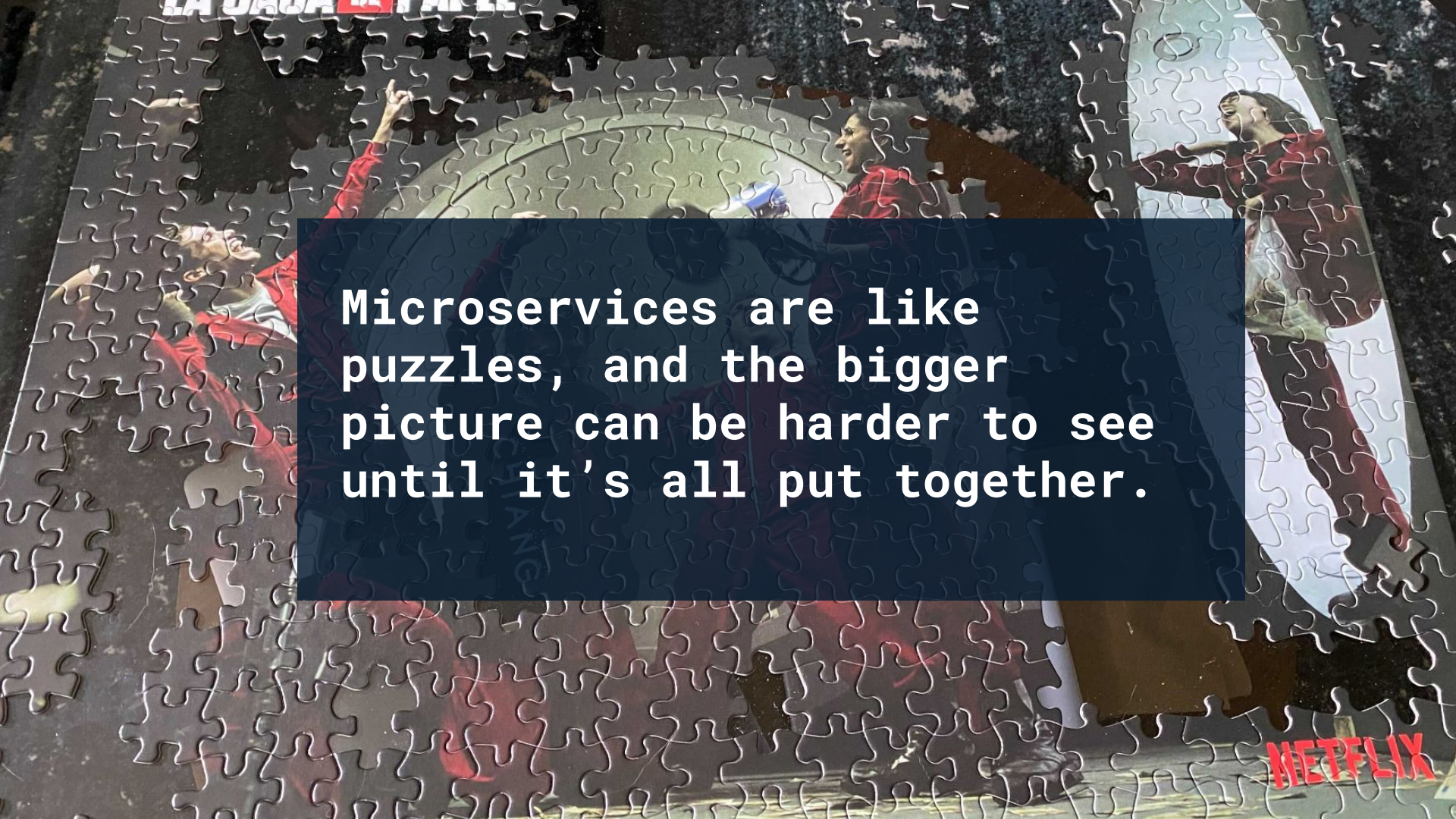
Unwinding a Decade of Assumptions Architecting New Experiences

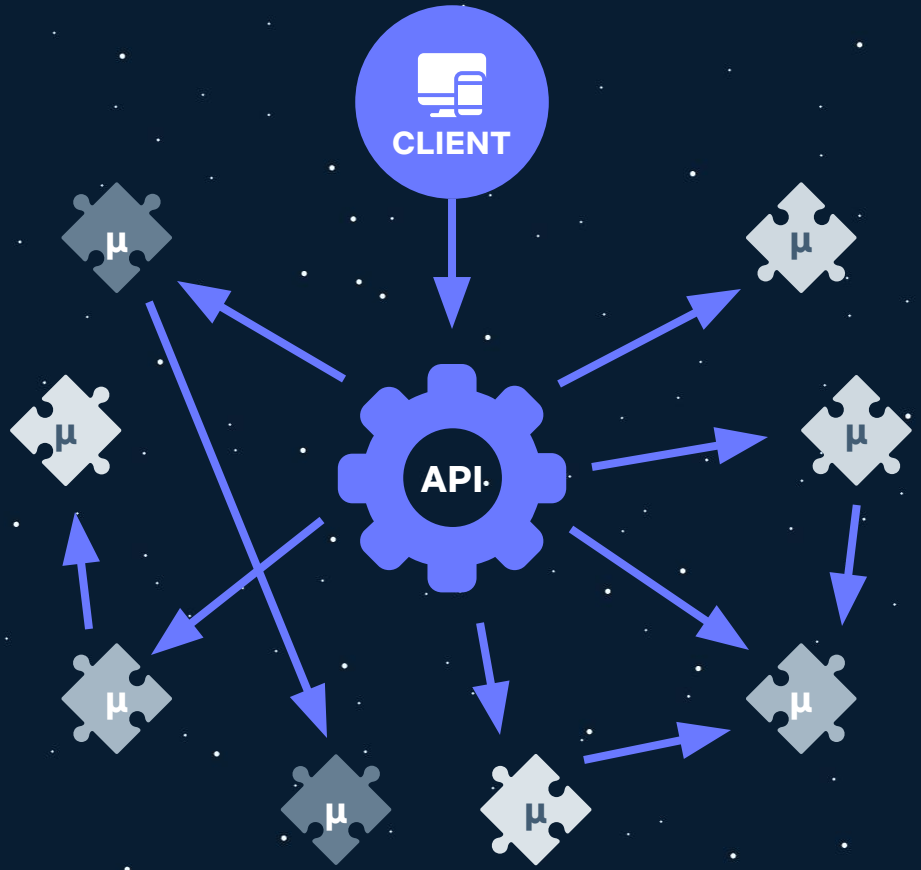
Cole Turner, QCon Plus 2021


Microservices are like puzzles, and the bigger picture can be harder to see until it’s all put together.
NETFLIX

Hi, I'm Cole

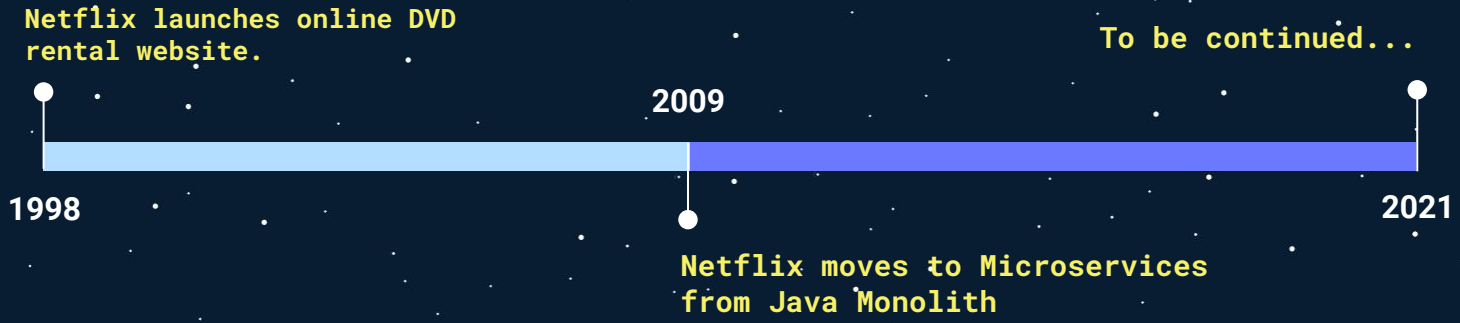
Senior Software Engineer
User Interface @ Netflix

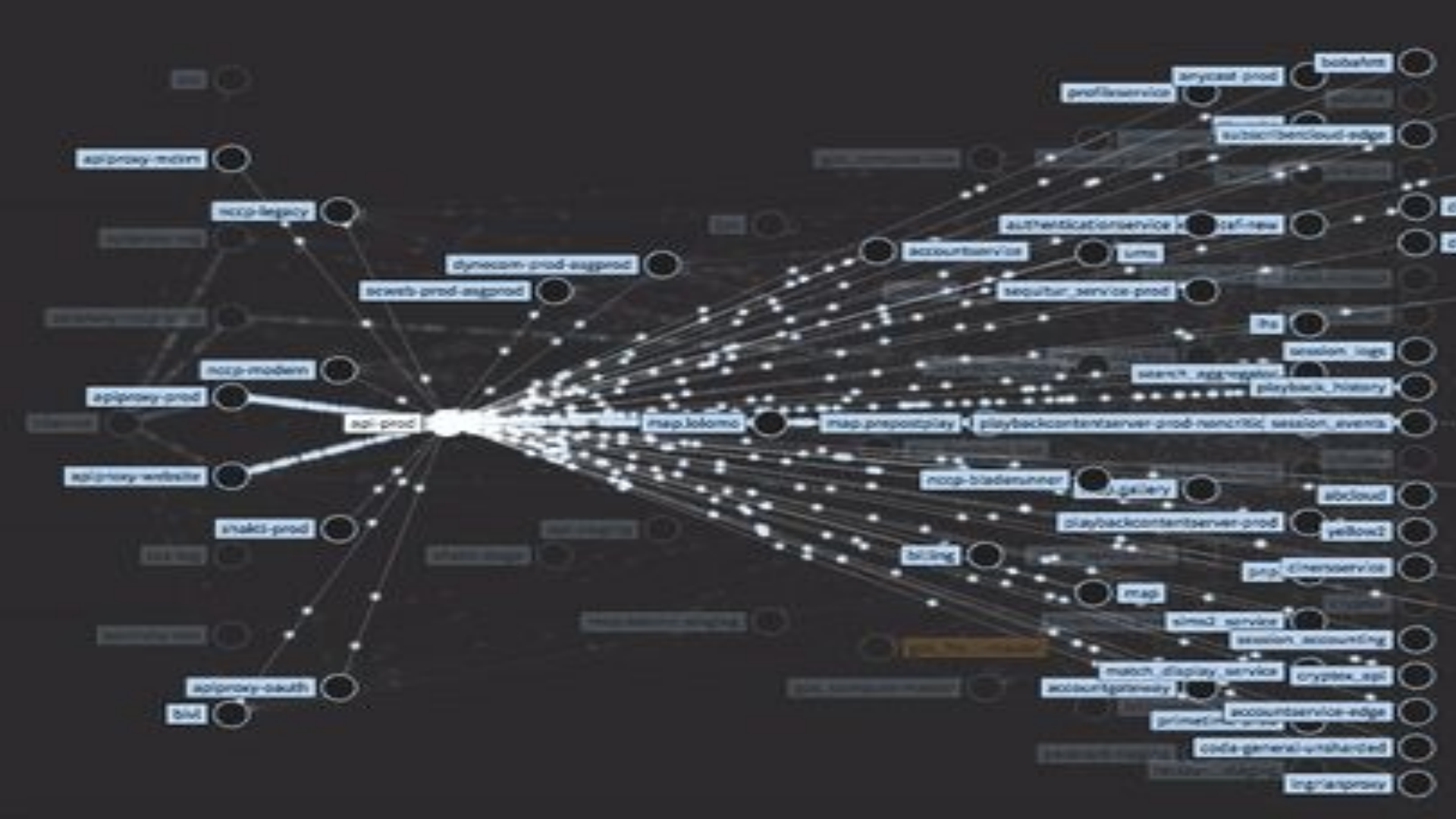
Application



Netflix + Microserivces =

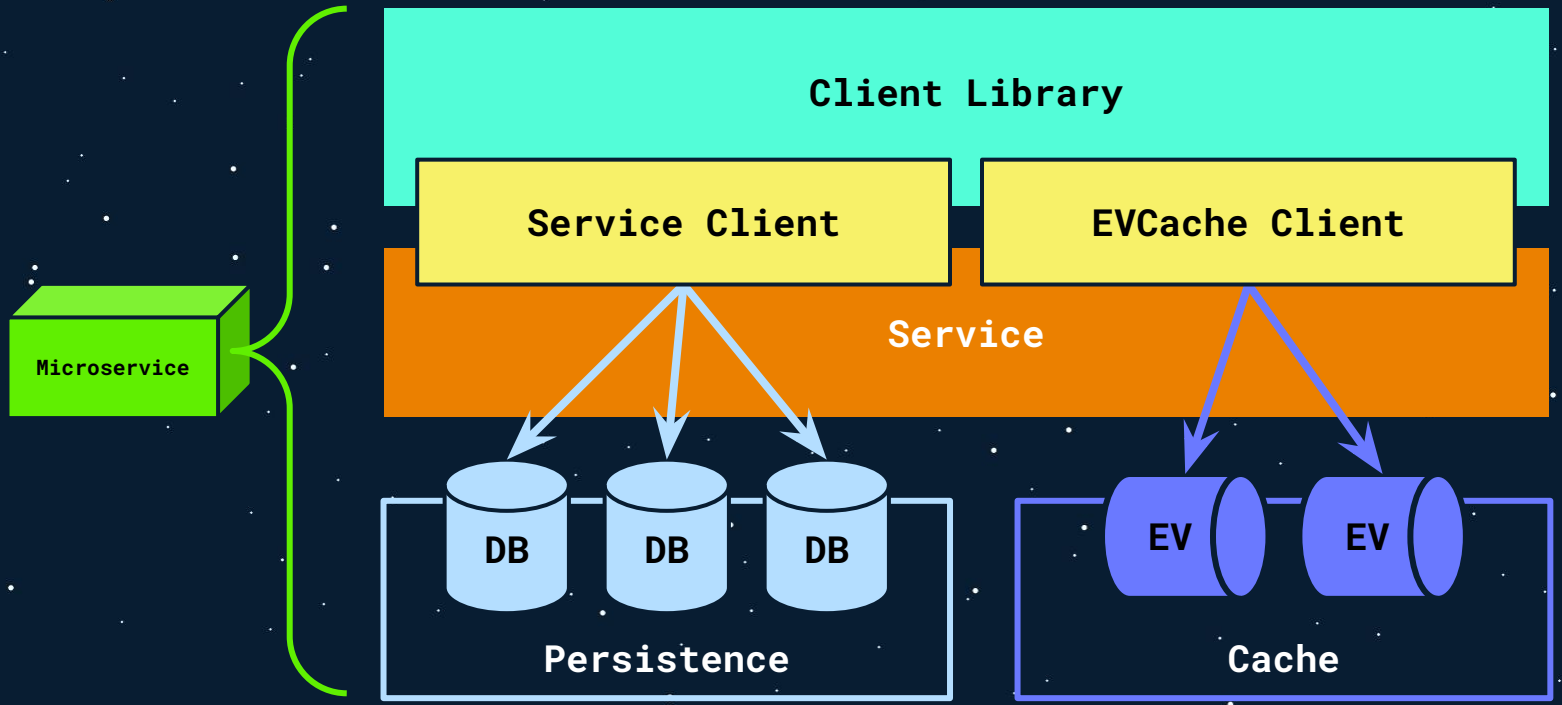
A Brief History of Microservices @ Netflix





bobafint
anycast-prod
profileservice
subscribercloud-edge
apiproxy-mdim
nccp-legacy
authenticationservice
caf-new
accountservice
ums
dynecom-prod-asgprod
scweb-prod-asgprod
secutur_service-prod
lhs
session_logs
search_aggregator
playback_history
nccp-modern
apiproxy-prod
api-prod
map.lolomo
map.prepostplay
playbackcontentserver-prod-noncritic_session_events
apiproxy-website
nccp-blademinner
gallery
abcloud
playbackcontentserver-prod
yellow2
shakti-prod
billing
cinerservice
map
simo2_service
session_accounting
match_display_service
cryptex_api
accountgateway
accountservice-edge
apiproxy-oauth
bivt
coda-general-unsharded
ingrianproxy

Netflix Microservices Explained



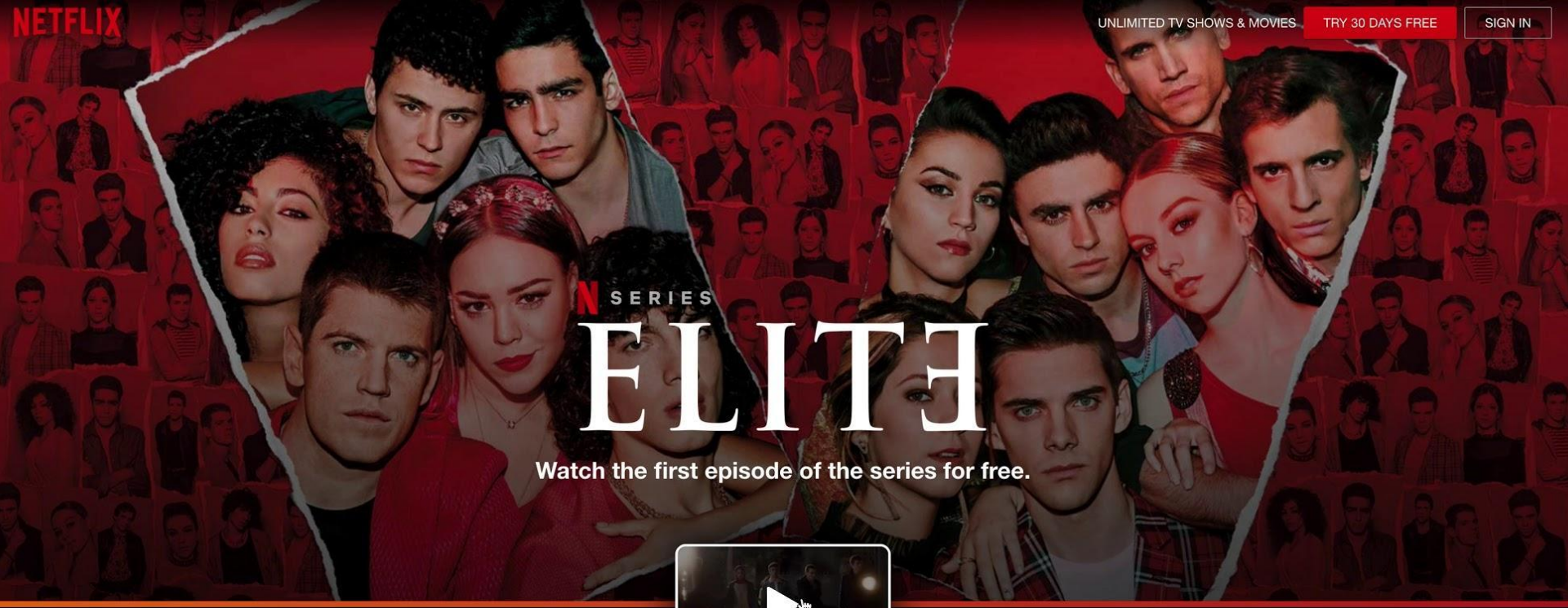
The hidden cost of "simple" assumptions when it comes to microservice architecture

NETFLIX

UNLIMITED TV SHOWS & MOVIES

TRY 30 DAYS FREE

SIGN IN



PLAY NOW

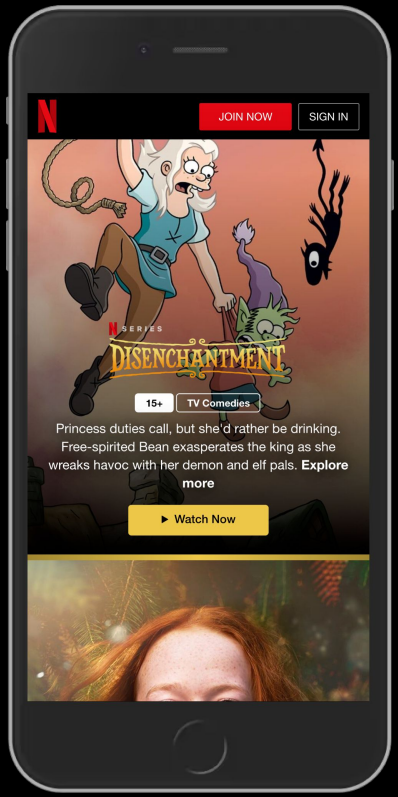
El siguiente episodio puede incluir contenido para adultos y herir la sensibilidad de los espectadores.

Elite

2018 | TV-MA | 1 Season | Crime TV Shows

When three working-class teens enroll in an exclusive private school in Spain, the clash between them and the wealthy students leads to murder.

//develop.test.web.netflix.com/watch/80201009



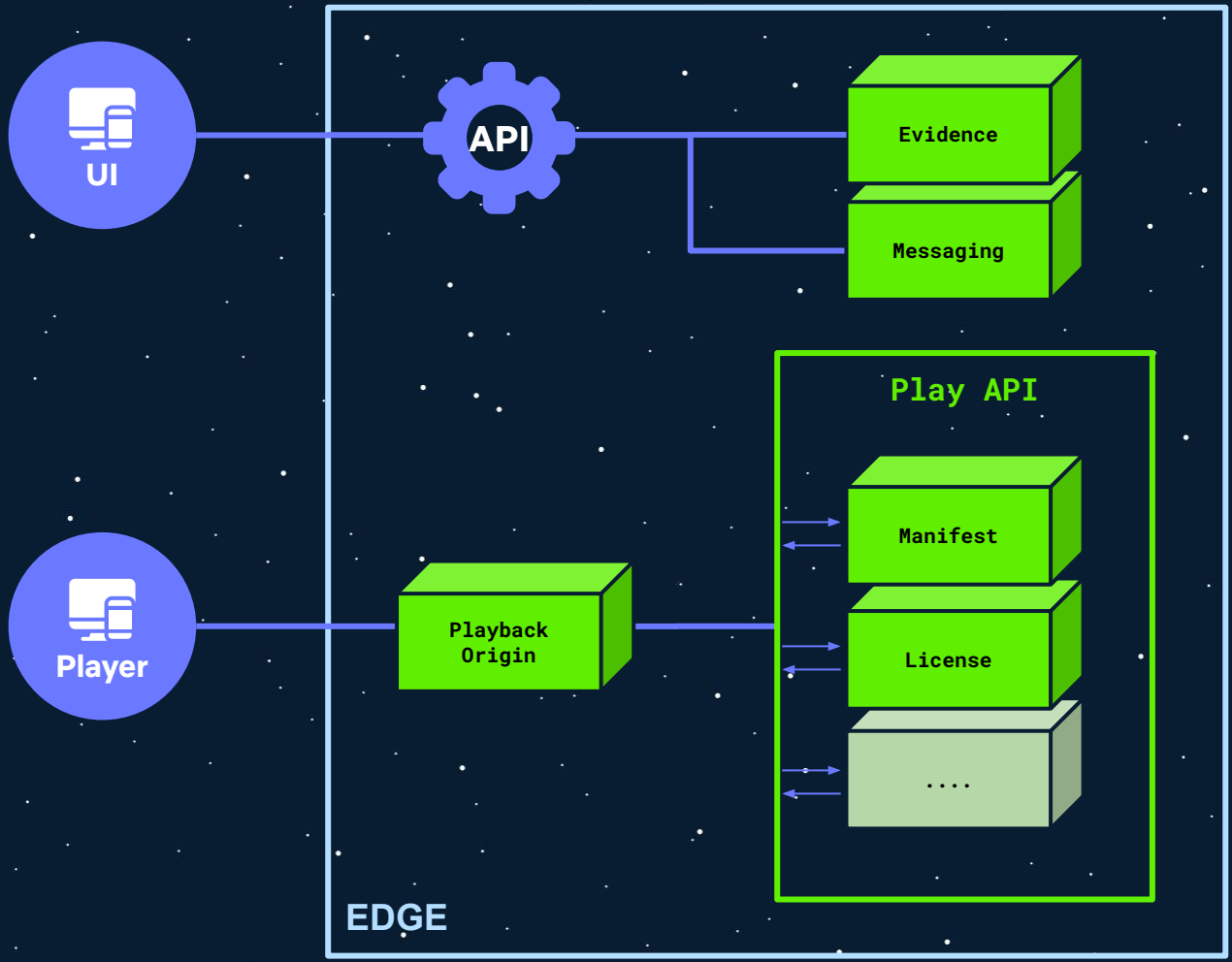
Without signup or login. No plan required!

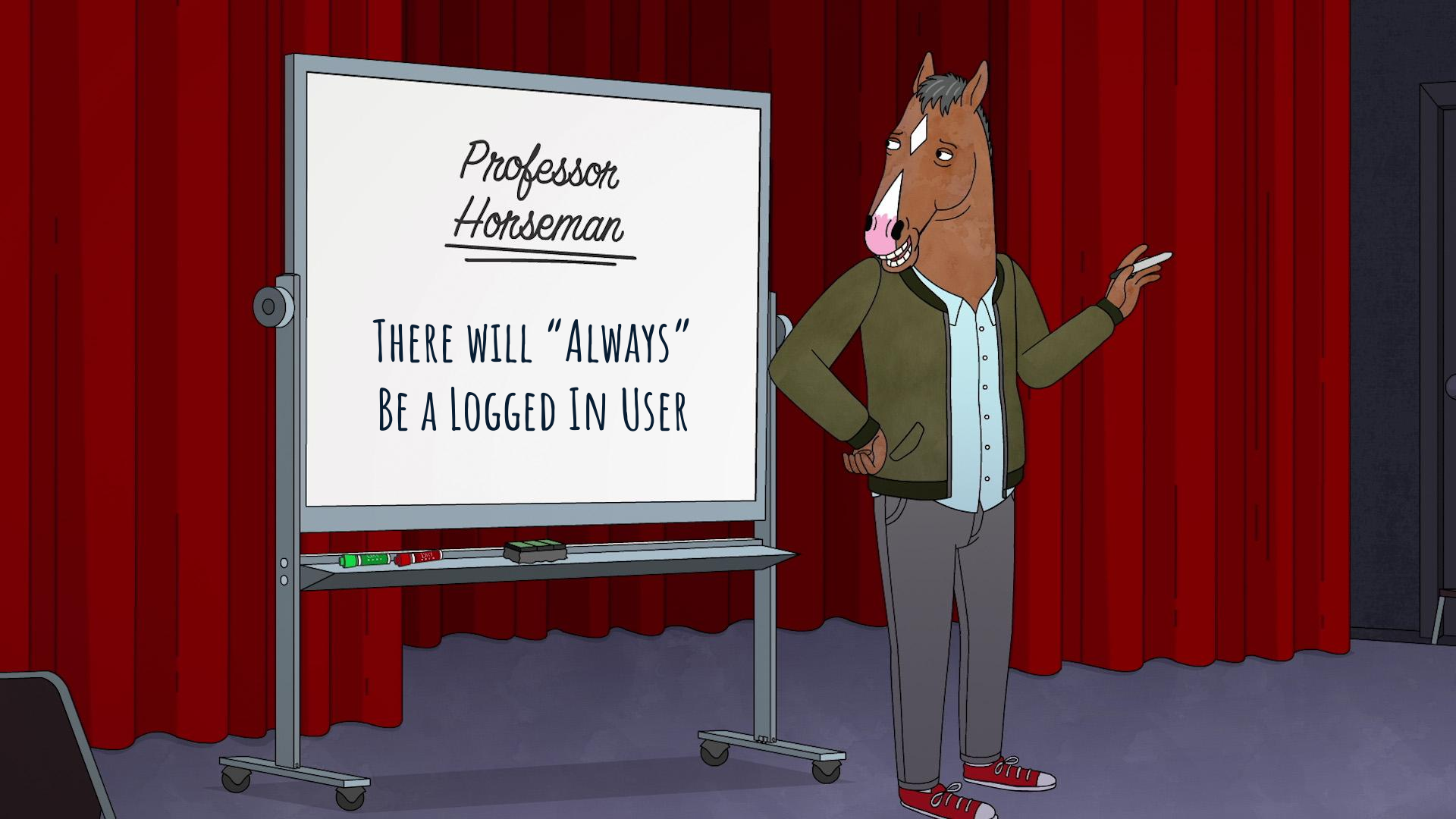
15 years of Netflix history

It Sounds Easy, Right?

But it’s complicated, because microservices are great at hiding assumptions. We need answers to questions we don’t know to ask.
Hans-Peter Gauster (@sloppyperfectionist) on Unsplash

1. How the pieces fit together
2. What assumptions we were making
3. Which teams to talk to


UI
API
Evidence
Messaging
Play API
Manifest
License
....
Player
Playback Origin
EDGE


Professor
Horseman
There will "Always"
Be a Logged In User

How to get around the "User" Problem

Create a User

- Expensive
- Wasteful

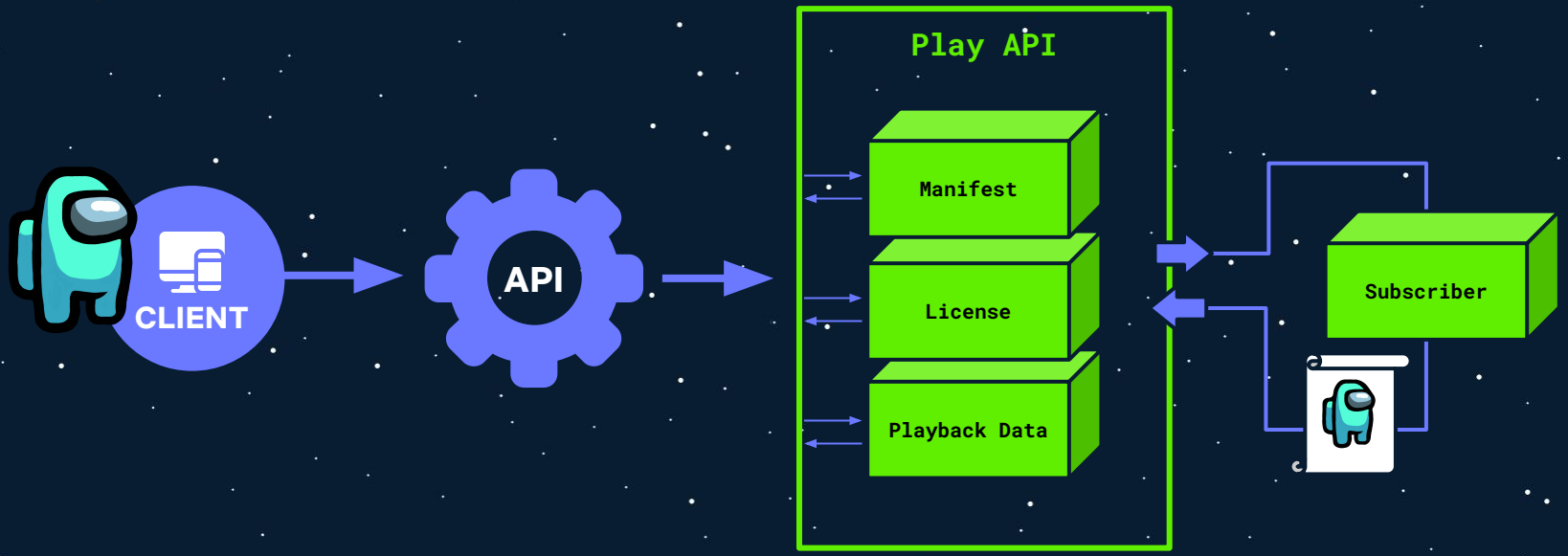
Go Userless

- Expensive
- Too Risky

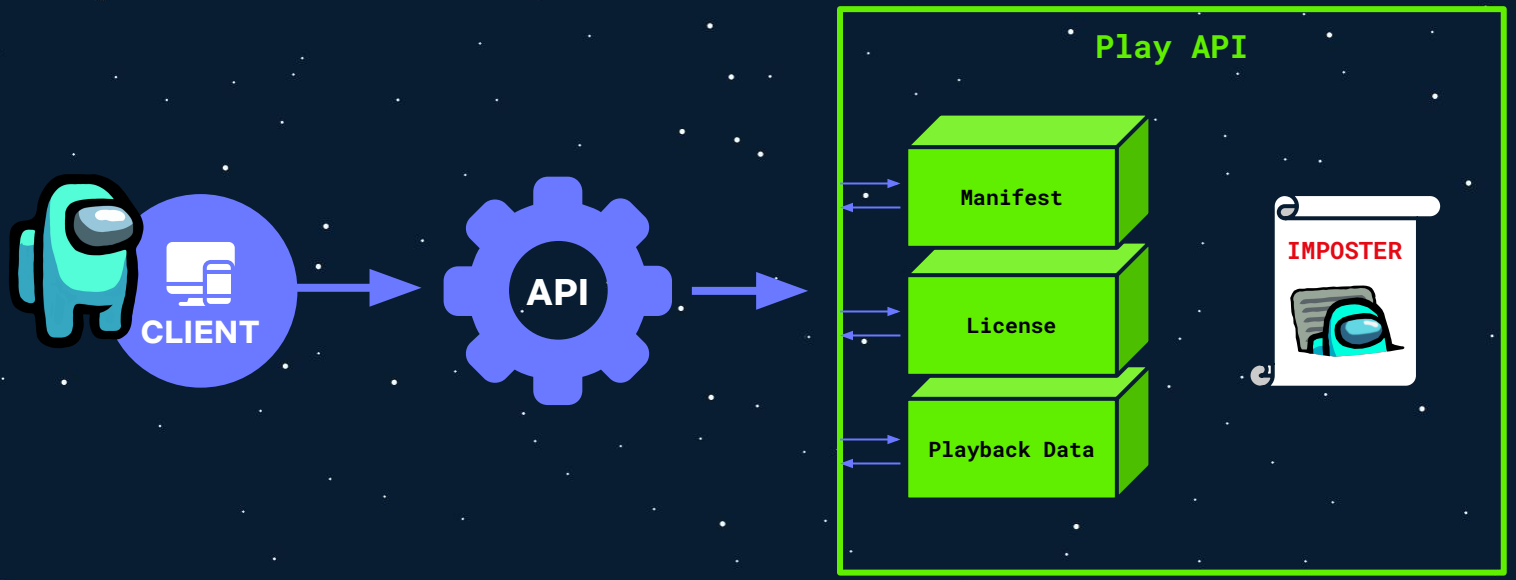
Mock a User

- Inexpensive
- Shortcut

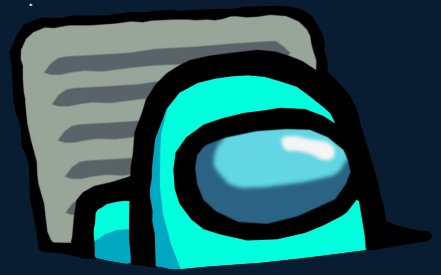
Netflix Playback Microservices



Playback For Non-Members



AIM
ACCESS & IDENTITY
MANAGEMENT



Role-Based Access Control (RBAC)

Pros

- Clear boundaries
- Good for small number of roles

Cons

- Ambiguity
- Difficult to scale

Role: Member

Membership Type

Subscription Plan

Attribute-Based Access Control (ABAC)

Can Playback?

- Membership Type
- Subscription Plan
- Device Type
- Region

Can Playback?

- Membership Type
- Subscription Plan
- Device Type
- Region
- A/B Allocation
- ...

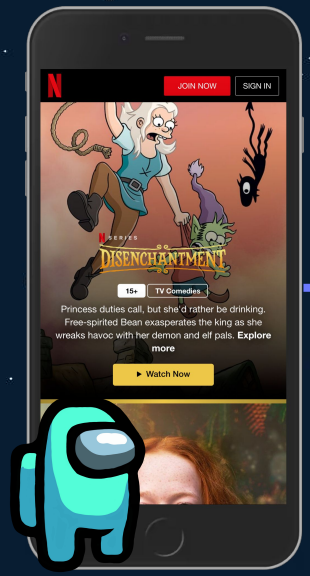
Role-Based Access Control

- Simple

Attribute-Based Access Control

- Granular
- Flexible
- Scalable

User Friction with Permissions



User and Device Context

API

Play API

Manifest

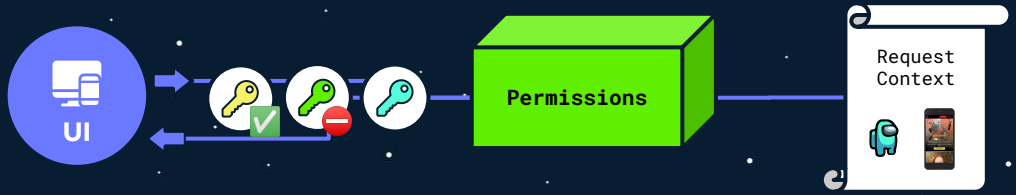
License

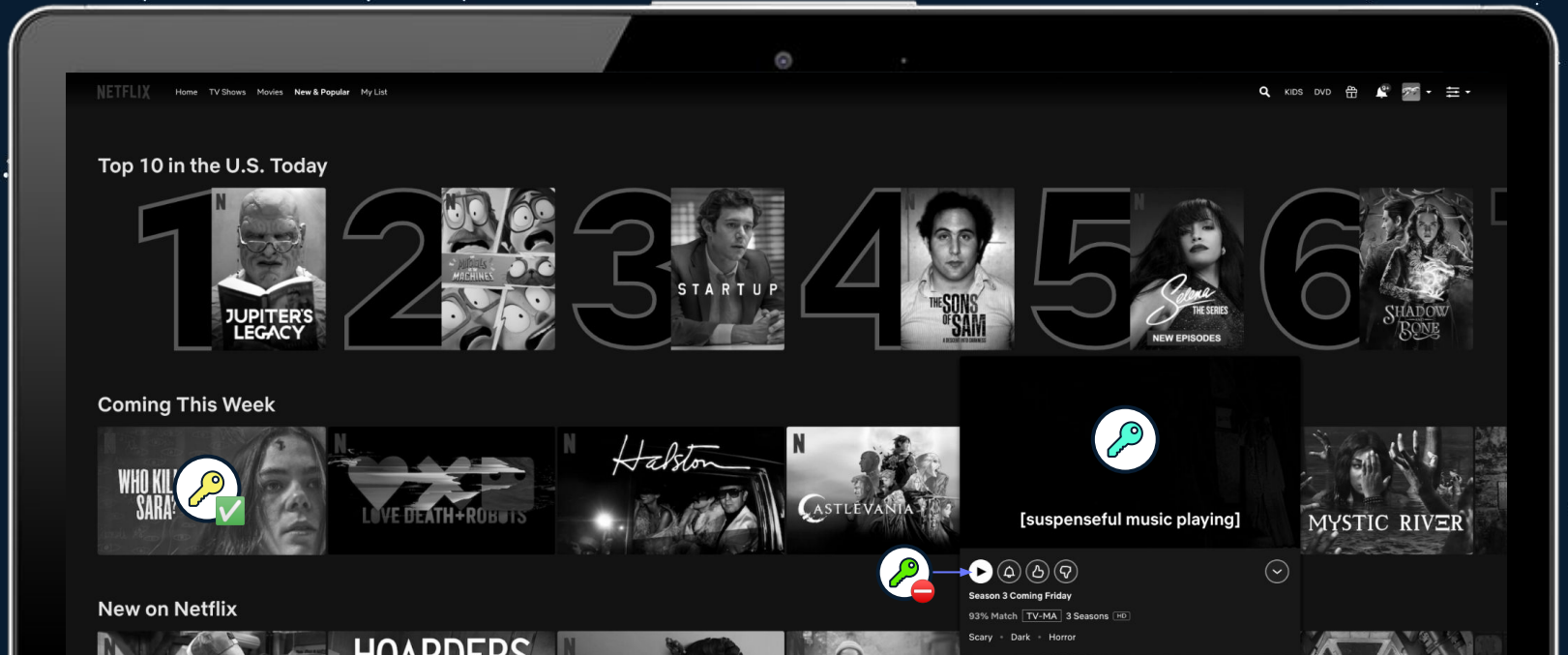
Playback Data

Request Context

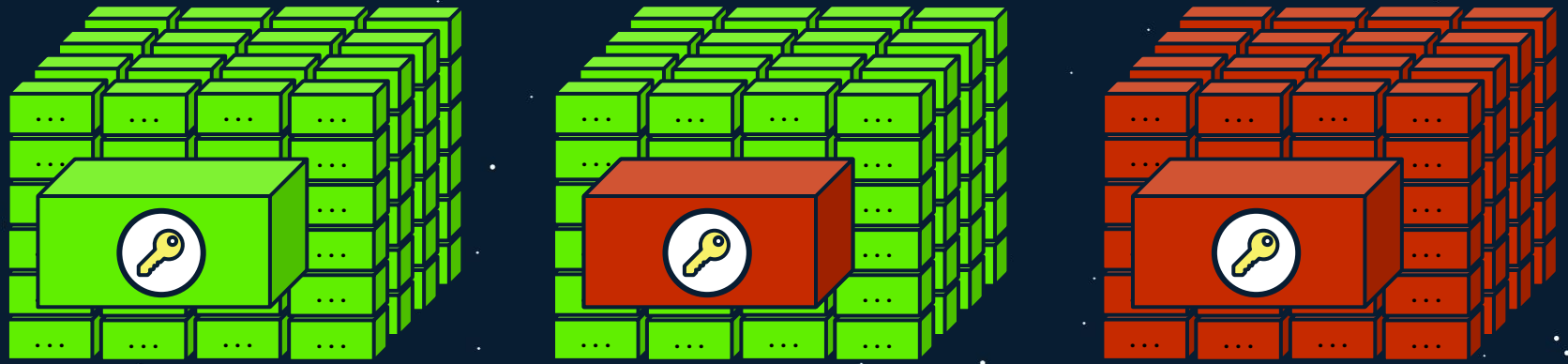
Permissions

User Friction with Permissions





Preventing Single Point of Failure (SPOF)



The Future of Microservice Permissions: Service-Driven Attributes

Professor
Horseman
Microservices "Always"
Speed Up Innovation

3 Key Takeaways

1

Assumptions are natural, and it's our job to unwind them, together.

Especially the assumptions that are deeply embedded in your services.

2

Invest in long-term strategies that can be paid off over time.

Anticipate how the solution will continue to evolve, by understanding the needs of your customers.

3

Size your efforts by risk and reward.

Plan for the short term and which solutions help us to get there. Perfect is the enemy of good.

Engineering problems always have non-technical dimensions.

Thanks For Joining!

Cole Turner (@coleturner)
User Interface @ Netflix

Special thanks:
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Chris Saint-Amant, Jacques Favreau