

# Netflix APIs

*An Unexpected Journey*

May, 2022

Bruce Wang

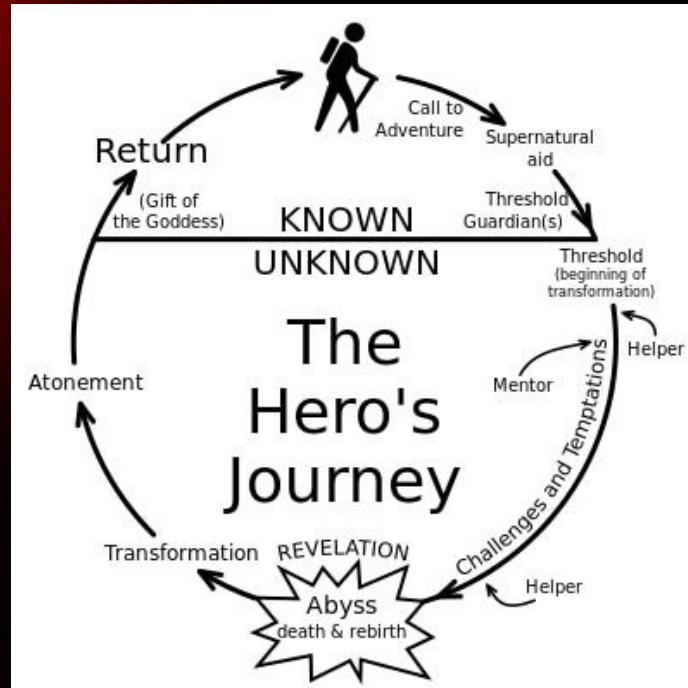
Director of Engineering, API Systems

# a little about me



- Live in San Francisco, with my family
- 22+ years of industry experience (mostly B2B)
- 15 years as a software developer (Java, Python, Ruby, Elixir, Golang)
- 10 years as Engineering Leader / “humble gardener”
- 2x Founder (one exit, one failure)
- Been at Netflix for 2+ years

# Telling a good story



- Act 1 {
  1. A character is in a zone of comfort
  2. But they want something
  3. They enter an unfamiliar situation
  4. Adapt to it
- Act 2 {
  5. Get what they wanted
  6. Pay a heavy price for it
- Act 3 {
  7. Then return to their familiar situation
  8. Having changed

# Opening Scene

API Systems manages **5 4 generations,**  
spanning **14 years** of API Stacks at Netflix

*This is our story*

# The Netflix API story

## Act 1

# Netflix in 2007



**~8 million** subscribers,  
**1.25B** in Revenue

# We announce streaming and move to the cloud!

NETFLIX

Welcome | How It Works | Browse Selection | Sign Up Now | Buy / Redeem Gift | Member Sign In

## Browse Selection

We have virtually every DVD published - from classics and new releases to TV and cable series. You'll be able to choose over 80,000 DVD titles. In addition, you'll be able to stream over 2,000 movies and TV shows (such as The Matrix, NBC's The Office, and Super Size Me) to watch instantly on your PC.

**New Releases (see more)**

Wild Hogs | Are We Done Yet? | Fracture | Lonely Hearts | Perfect Stranger

**Action & Adventure (see more)**

Blood Diamond | Casino Royale | Pirates of the Caribbean: Dead Man's Chest | Superman Returns | Mission: Impossible III

**Drama (see more)**

The Queen | The Pursuit of Happyness | Raoul | The Prestige | The Departed

**Independent (see more)**

Friends with Money | The Soul and the Whale | Junebug | Hustle & Flow | Broken Flowers

**Sign Up Now**

**SEARCH FOR MOVIES**

**80,000+ Titles** **200+ DVD Genres**

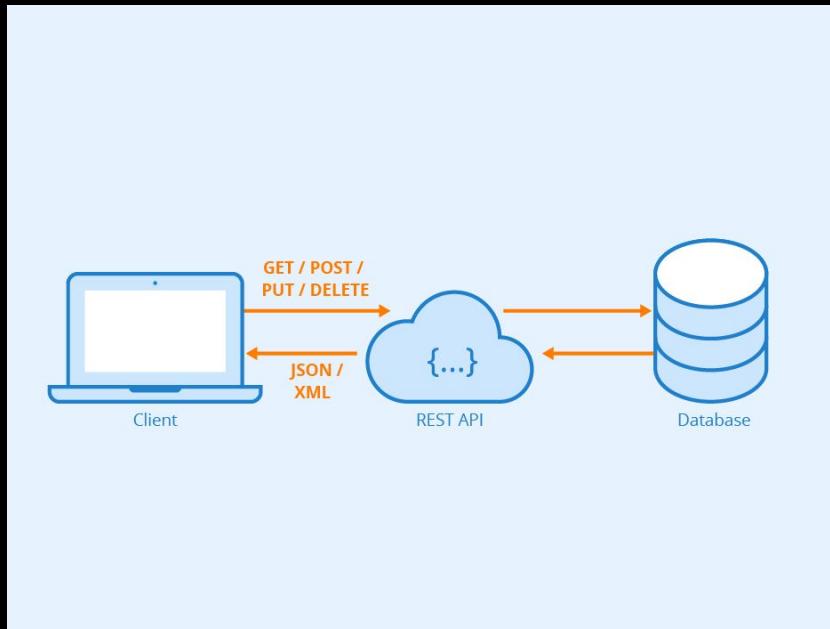
Browse Our Selection  
New Releases  
Action & Adventure  
Anime & Animation  
Blu-ray  
Children & Family  
Classics  
Comedy  
Documentary  
Drama  
Faith & Spirituality  
Family  
Gay & Lesbian  
HD DVD  
Horror  
Independent  
Music & Musicals  
Romance  
Sci-Fi & Fantasy  
Social Interest  
Sports & Fitness  
Television  
Thrillers

Welcome | How It Works | Browse Selection | Sign Up Now |

Gift Subscriptions | About Us | Contact Us | Affiliates | Media Center | Investor Relations  
Use of the Netflix service and this Web site are governed by our Terms of Use and Privacy Policy.  
© 1997-2007 Netflix, Inc. All rights reserved. U.S. Patent No. 7,224,381 and U.S. Patent No. 6,584,459. (194) USA



# Our API Journey begins in 2008, “Open API”



instantwatcher.com | Netflix Amazon

Search Netflix Titles Go

Netflix Search Random Popular New Popular Highest Rated Countries About

Trending IW Netflix US  
See new Netflix titles

Rank	Title	Rating	Details
1	Like a Rolling Stone: The Life... 2022	3.5 / 5 (450)	Biographical... Ben Fong-Torres Play: Netflix Page IMDB 0.0 / 10 (19)
2	Saladin 1963	4.0 / 5 (134)	Action & Adventure Ahmad Mazhar Play: Netflix Page IMDB 7.6 / 10 (15)
3	Meltdown: Three Mile Island /... 2022	4.0 / 5 (181)	Documentaries Play: Netflix Page trailer
4	Clark / Season 1 2022	4.0 / 5 (1.1k)	Crime TV Shows Bill Skarsgård Play: Netflix Page IMDB 4.9 / 10 (11)
5	Along for the Ride 2022	2.0 / 5 (95)	Dramas Emma Pescarow Play: Netflix Page IMDB 6.8 / 10 (286)

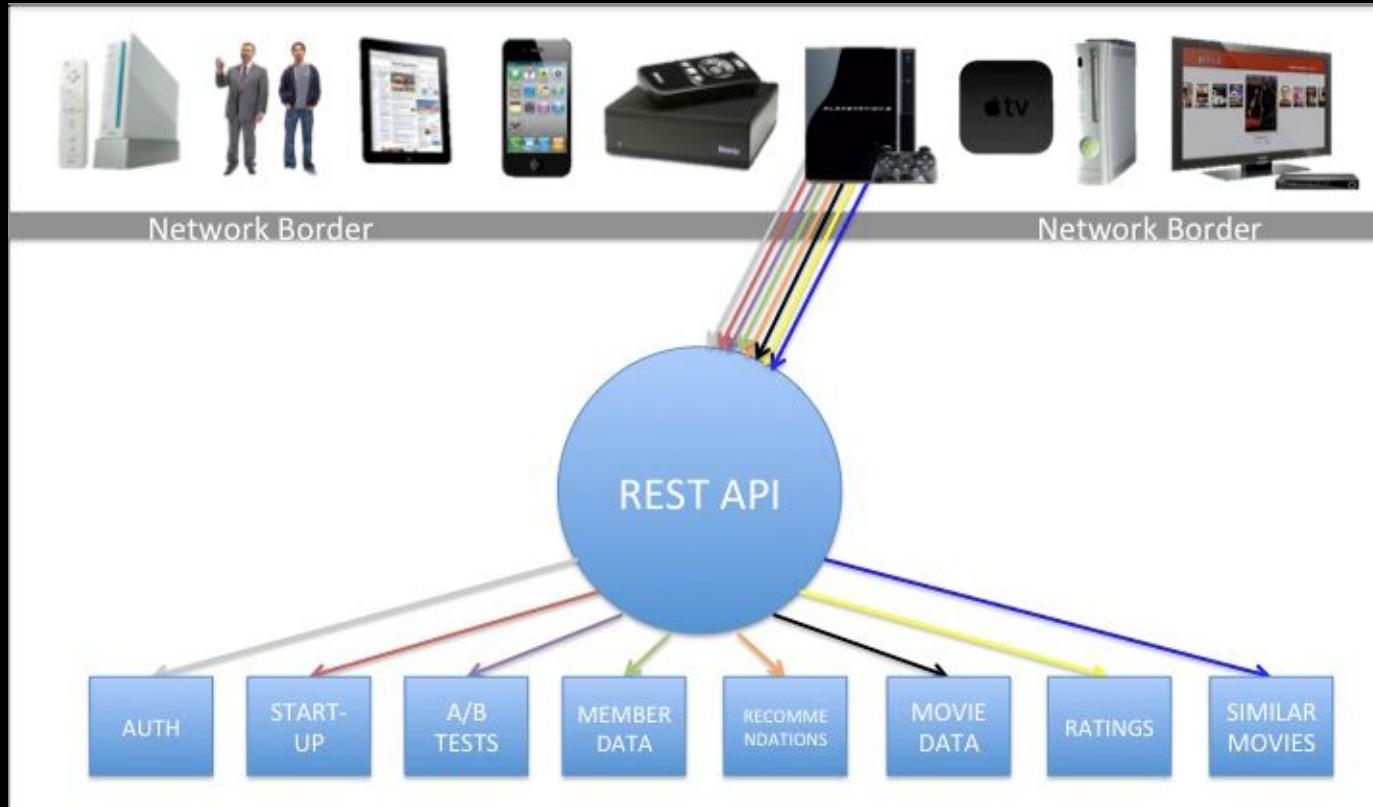
Trending IW Amazon Prime  
See new Prime titles

Rank	Title	Rating	Details
1	Cold Skin 2018 PG-13	4.0 / 5 (134)	Horror Ray Stevenson Samuel Goldwyn Films, LLC
2	Cosmoball 2021 TV-PG	4.0 / 5 (181)	Action & Adventure Viktoria Agalakova Well Go USA
3	The Selling 2021	4.0 / 5 (181)	Thrillers Gabriel Diani Filmhub
4	Stories We Tell 2013 PG-13	4.0 / 5 (1.1k)	Documentaries Pixie Biegow Lionsgate
5	2025 - The World enslaved by a Virus 2021	2.0 / 5 (95)	Science Fiction Joshua Wesely Wesely Bros

Recent Netflix Picks

- Thar
- War of the Worlds (2005)
- Hoops / Season 1 / The Plot
- The Blue Elephant 2
- Along for the Ride
- Sammy and Co / Season 1 /
- Ella's Ego
- Mystic Whispers / Season 1 /
- Episode 13
- Mystic Whispers / Season 1 /
- Episode 12
- Mystic Whispers / Season 1 /
- Episode 11
- Mystic Whispers / Season 1 /
- Episode 10
- Mystic Whispers / Season 1 /
- Episode 9
- Mystic Whispers / Season 1 /
- Episode 8
- Mystic Whispers / Season 1 /
- Episode 7
- Mystic Whispers / Season 1 /
- Episode 6
- Mystic Whispers / Season 1 /
- Episode 5
- Hold Your Breath: The Ice Dive
- Mystic Whispers / Season 1 /
- Episode 4
- Mystic Whispers / Season 1 /
- Episode 3
- Mystic Whispers / Season 1 /
- Episode 2
- Mystic Whispers / Season 1 /
- Episode 1

# By 2011, 99% of “Open” API is internal



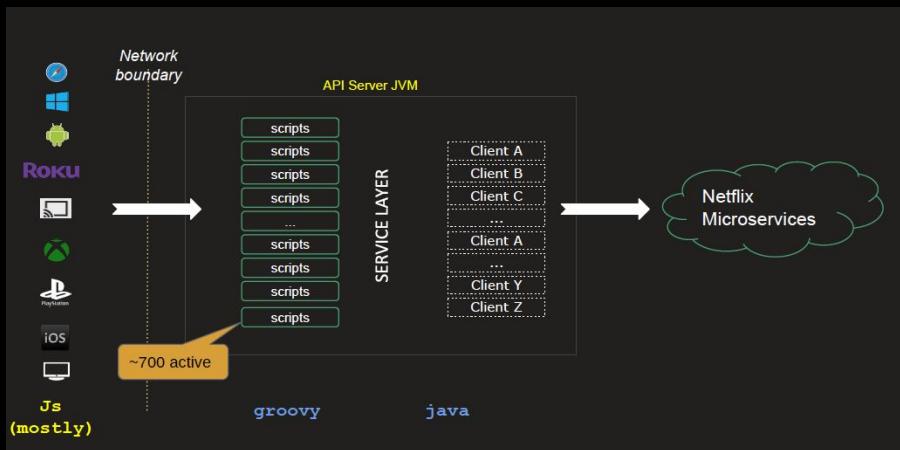
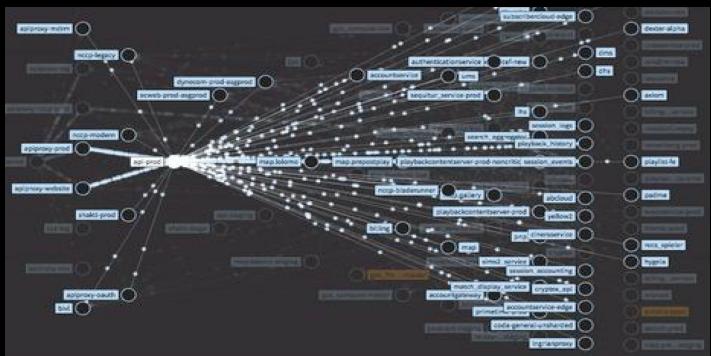
The **true value** of your APIs may be hidden

UI Agility at a **single layer** is challenging

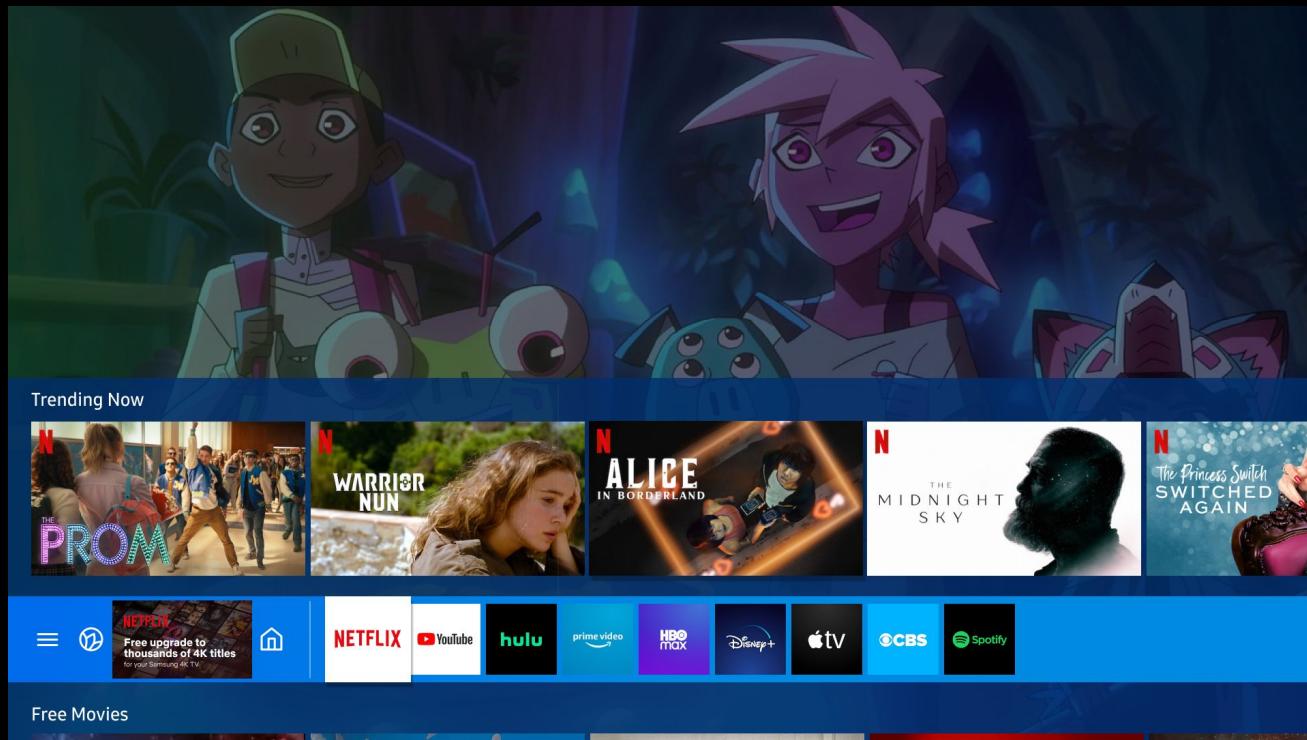
# The Netflix API story

## Act 2

# Adapting to the new challenges: API.NEXT



# Side quest: Catalog Feeds



Now part of the “Device Experience Tools” aka DET

# By 2015 - we've hit a wall



- Thousands of device types, form factors, hardware constraints
- Experimentation-driven product evolution
- Content innovation e.g. Netflix Originals and Interactive content
- #netflixeverywhere
- **From lightweight UI scripts to microservices**

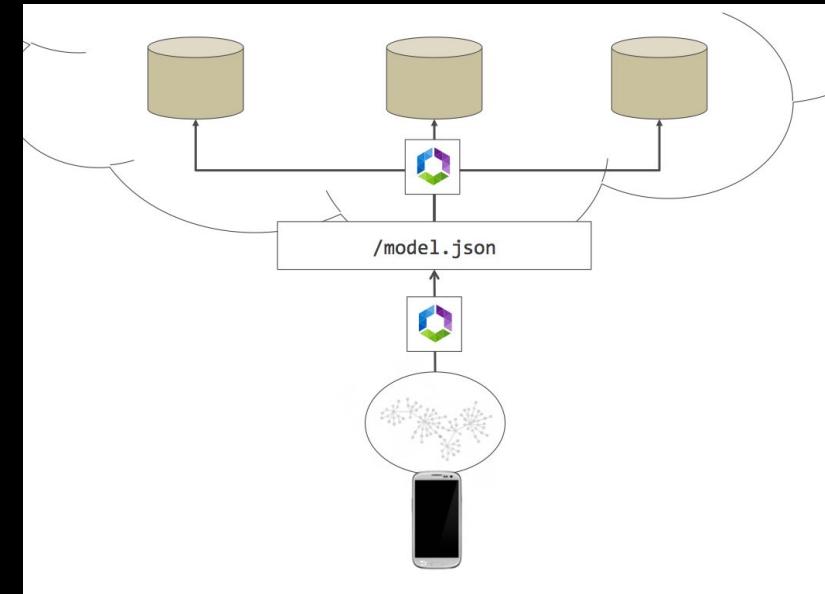
**Empowering engineers through  
consistency & resiliency**

**Unintended consequences of a *very*  
*flexible API Layer* *abstracted* away**

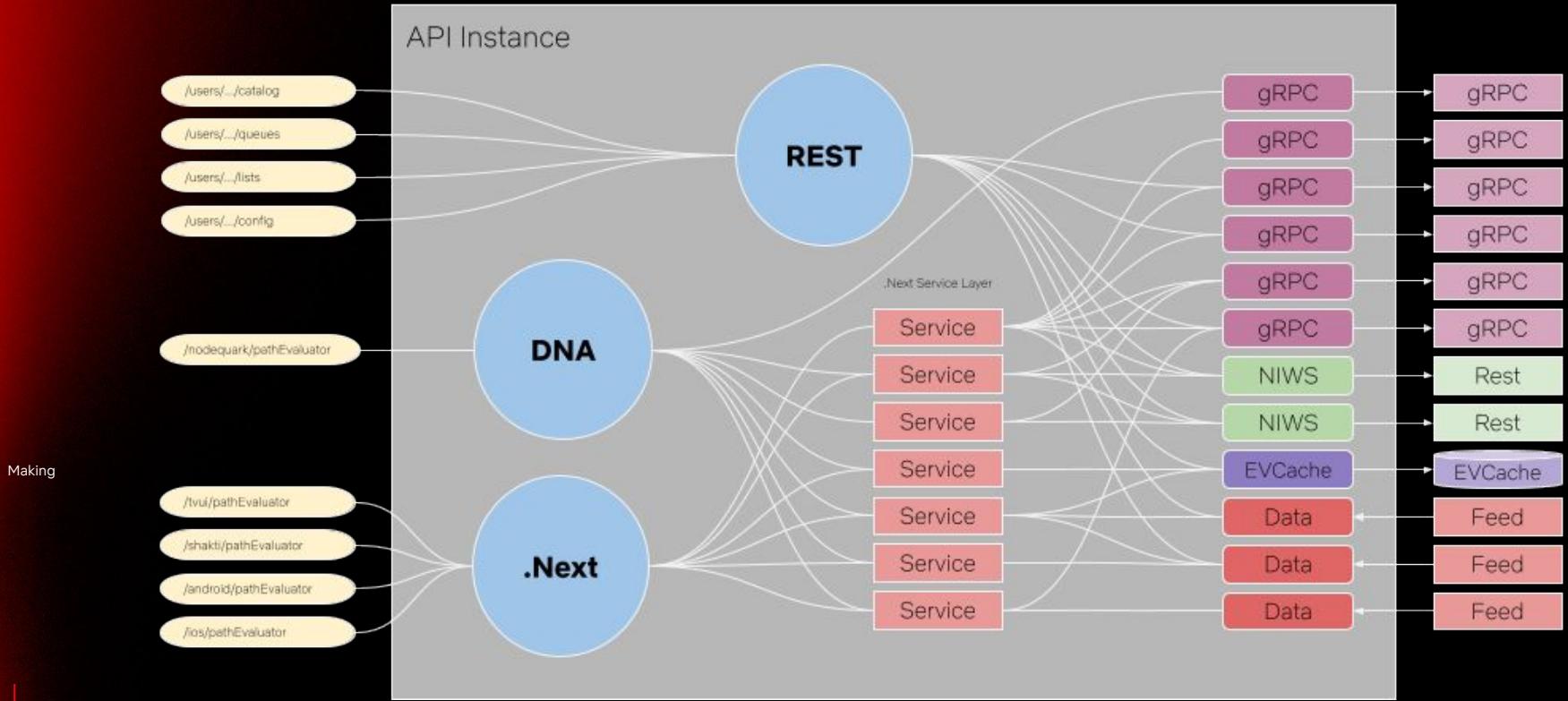
# The Netflix API story

## Act 3

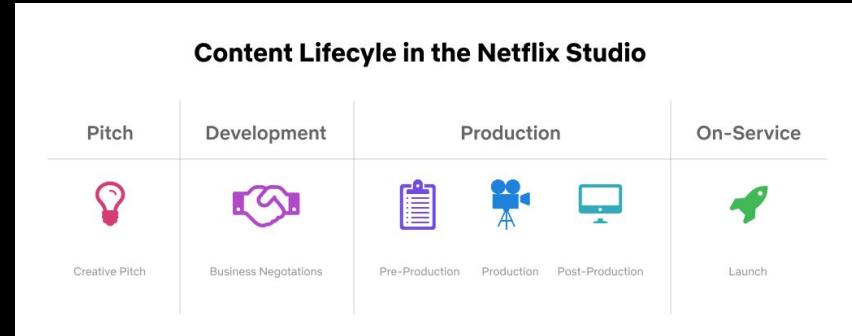
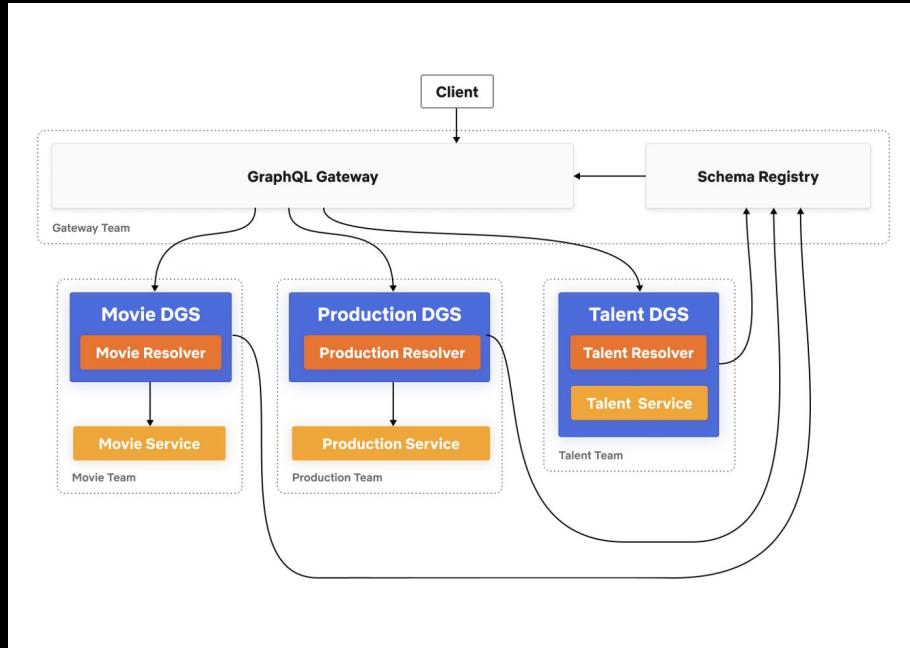
# We need to innovate again: EdgePaaS



# API Monolith



# Studio Edge Architecture



**API Developer Experience** (*producer and consumer*) really matters 

**Be aware of what the monolith **really provided** before dismantling it**

# The Netflix API story

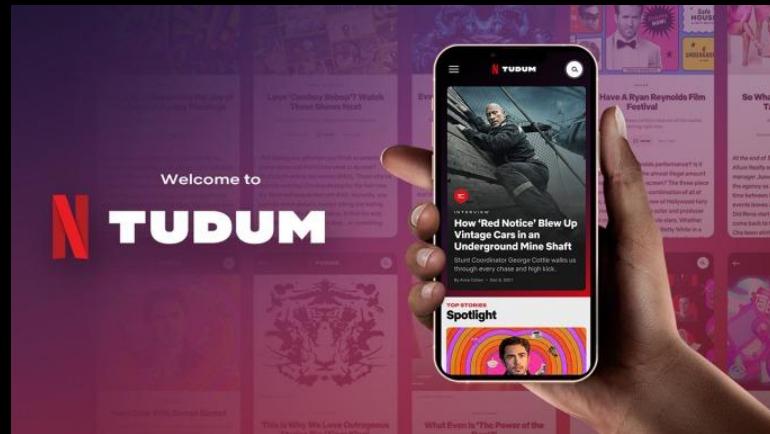
# The Sequel

# Netflix in 2021

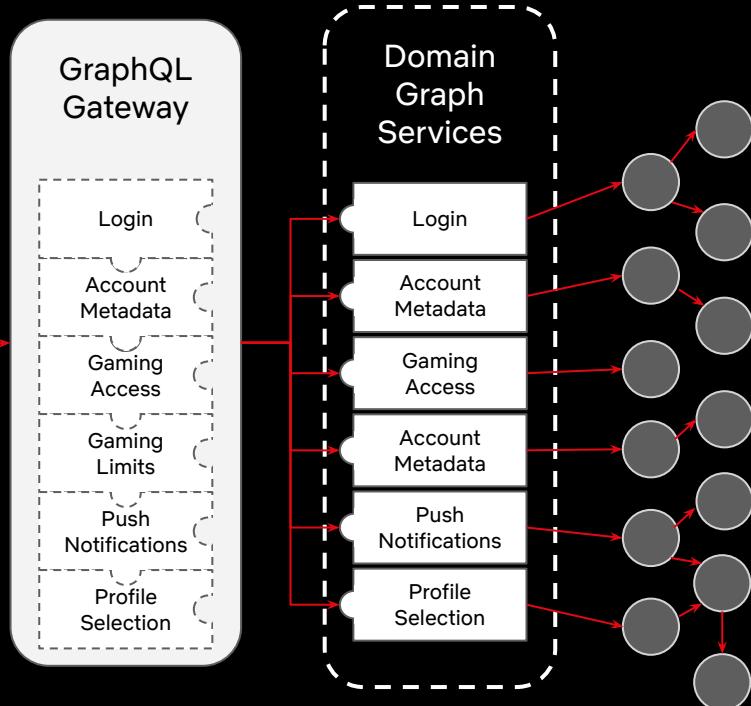
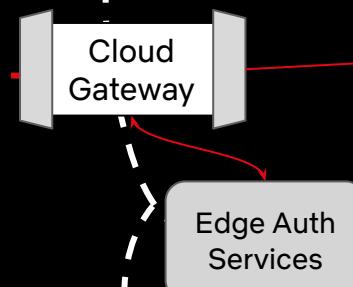


**200 million subscribers (25x)**  
**25B in Revenue (20x)**

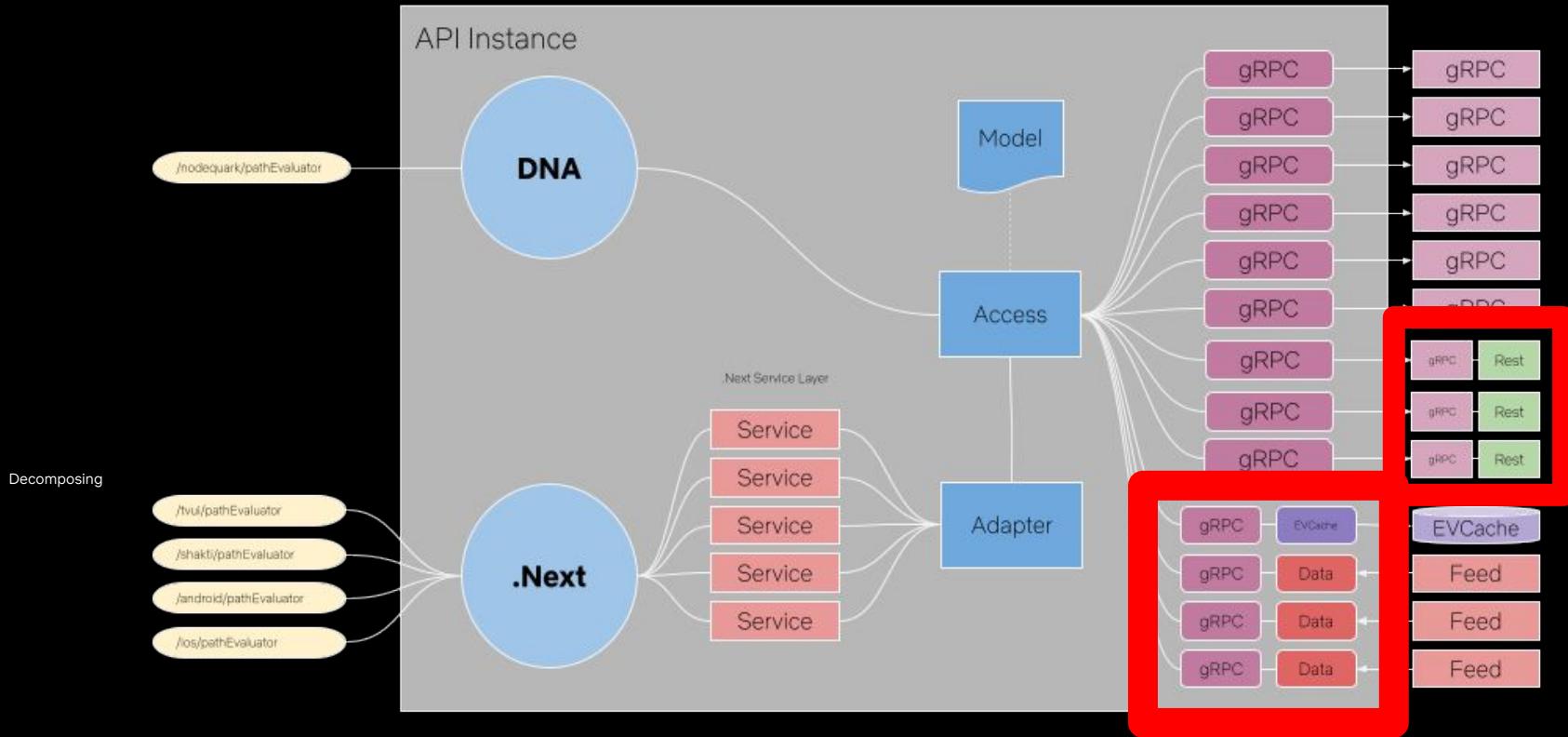
# We want something new again



# Games Edge API



# Learning our lesson: Uniform Service Tier (UST)



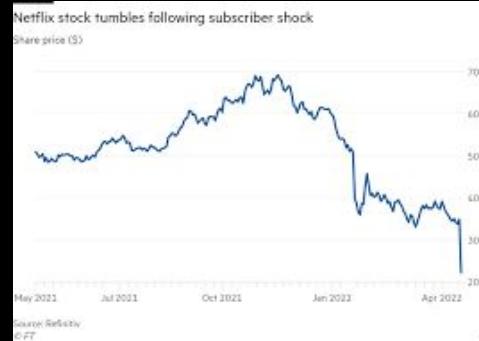
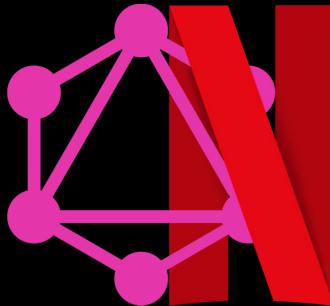
***Winning now and winning later*** is a “winning”  
😂 strategy because tech debt is ***inevitable***

**Schema-driven** is powerful

Don’t underestimate **organizational** barriers



# Ready for our next adventure?



- The **true value of your APIs** may be hidden
- Empowering engineers through **consistency & resiliency**
- API **Developer Experience** (*producer and consumer*) really matters
- **Winning now and winning later** is a “winning” 😊 strategy because tech debt is **inevitable**
- **Schema-driven** is powerful
  
- UI Agility at a **single layer** is challenging
- Unintended consequences of a **very flexible API Layer** **abstracted** away
- Be aware of what the monolith **really provided** before dismantling it
- Don’t underestimate **organizational barriers** 🛡

# Build a **learning** culture

*trusting teams, seeking excellence, driving customer delight*

# Thank You.

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