

Case Studies, Netflix, Kindle, GitHub

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Netflix

- Netflix statistics for 2017.
 - Netflix has more than 110 million subscribers.
 - Netflix operates in more than 200 countries.
 - Netflix has nearly \$3 billion in revenue per quarter.
 - Netflix adds more than 5 million new subscribers per quarter.
 - Netflix plays more than 1 billion hours of video each week. As a comparison, YouTube streams 1 billion hours of video every day while Facebook streams 110 million hours of video every day.
 - Netflix played 250 million hours of video on a single day in 2017.
 - Netflix accounts for over 37% of peak internet traffic in the United States.
 - Netflix plans to spend \$7 billion on new content in 2018.



Netflix 2024 Key Statistics

Metric	Value
Total Subscribers (Q1 2024)	269.6 million
New Paid Subscriptions (Q1 2024)	9.3 million
2023 Revenue	\$33.7 billion
2023 Net Income	\$5.4 billion
Q1 2024 Operating Income	\$2.6 billion

- North America revenue contribution: \$14 billion
- Significant growth in ARPU in the US & Canada: \$16.64 in Q4 2023
- Strategic initiatives: ad-supported tier, password sharing crackdown



Netflix

- Moving to AWS in 2009
 - In 2007, Netflix started on-demand video streaming using Netflix's own data center
 - For three days in August 2008, Netflix could not ship DVDs because of corruption in their database. This was unacceptable. Netflix had to do something.
 - Netflix moved to AWS because it wanted a more reliable infrastructure.
 - It took more than eight years for Netflix to complete the process of moving from their own datacenters to AWS.



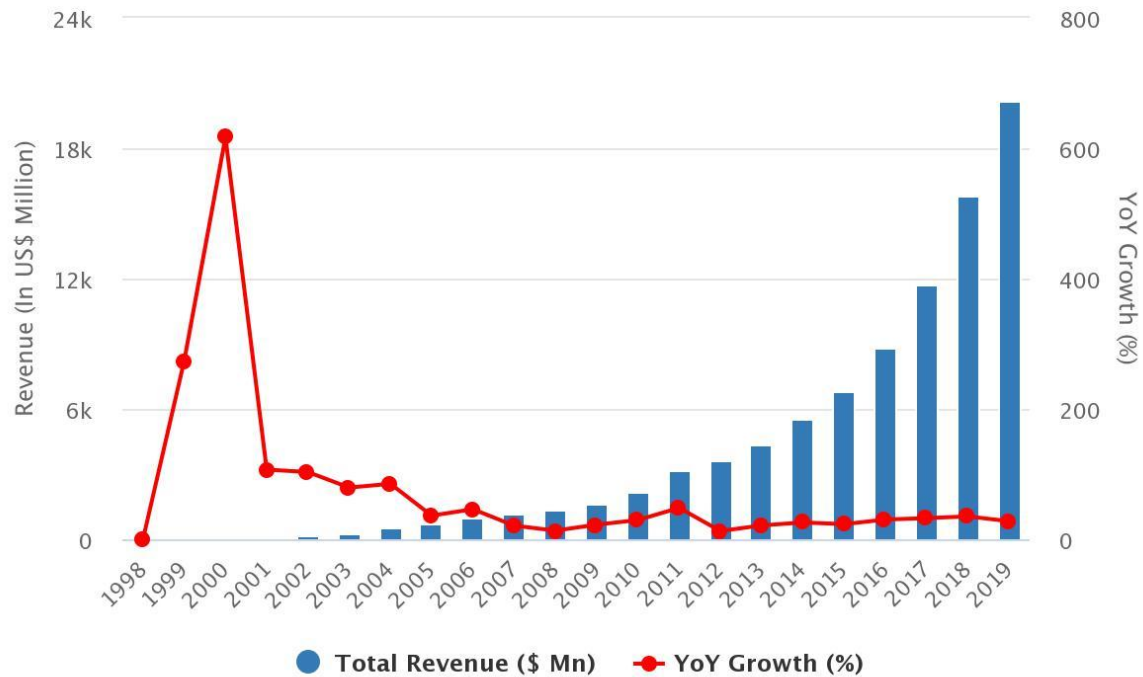
Netflix

- Moving to AWS in 2009
 - Didn't want to do any undifferentiated heavy lifting.
 - Undifferentiated heavy lifting are those things that have to be done, but don't provide any advantage to the core business of providing a quality video watching experience.
- It took more than eight years for Netflix to complete the process of moving from their own datacenters to AWS.
- During that period Netflix grew its number of streaming customers eightfold.



Statistics Revenue and Share Price

Netflix Global Revenue by Year



© Dazeinfo / Data Source: Netflix, Inc.

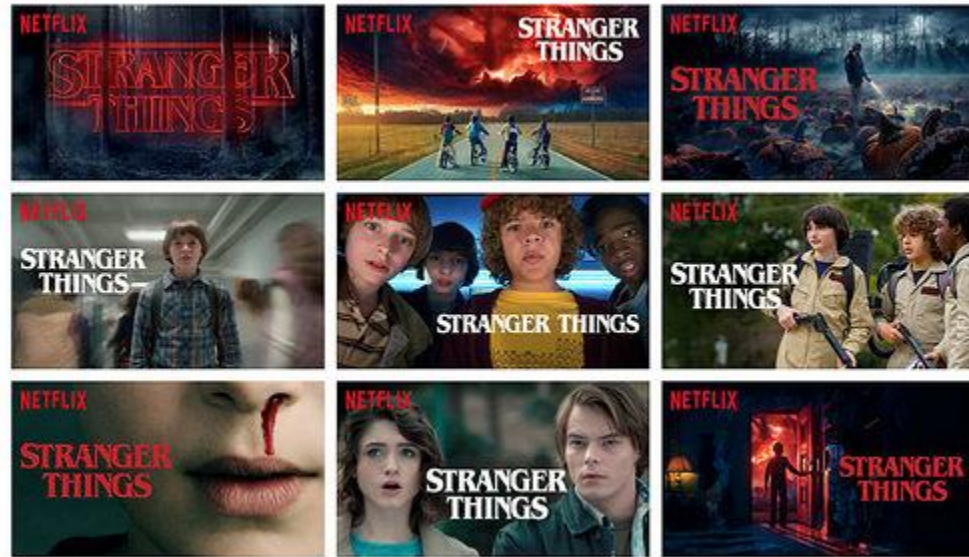
Netflix share price



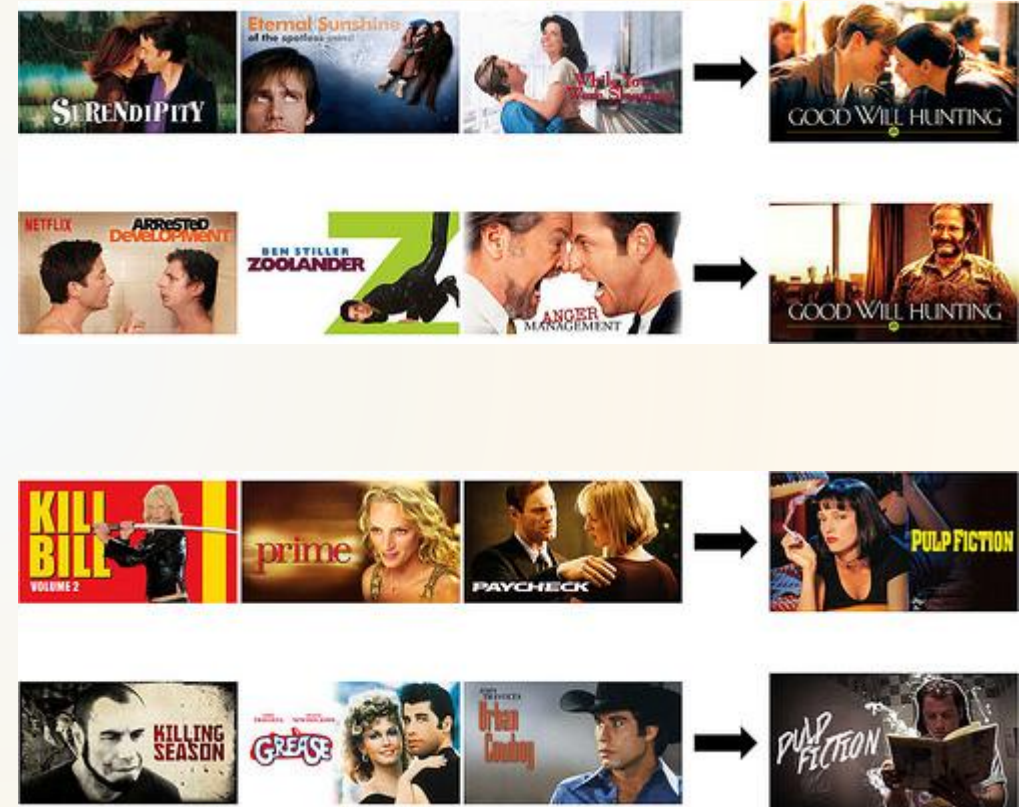
Source: Bloomberg

BBC

Netflix - UI and UX



Machine Learning



Processing the contents according to profiles

- Transcoding
 - Converts a video file from one format to another,
 - to make videos viewable across different platforms and devices
 - Encodes all its video in AWS on as many as 300,000 CPUs at one time.
- HD Video Size – Many terabytes
- Procedures
 - Validating Video → Media Pipeline which consists of 70 steps → transferring to CDN
 - 70 Steps → Parallel Processing using EC2
 - Encoding video for 2200 numbers of profile
 - Bandwidth and screen size
 - Audio and subtitle files for videos
 - 1200 number of files for a movie



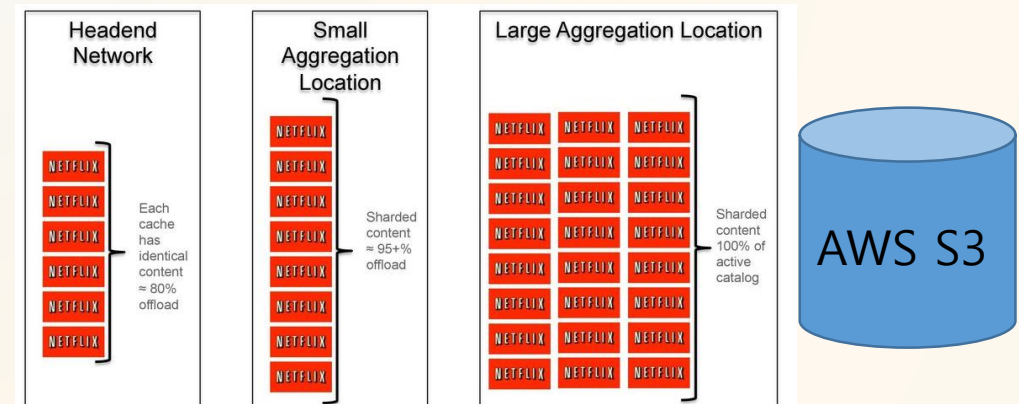
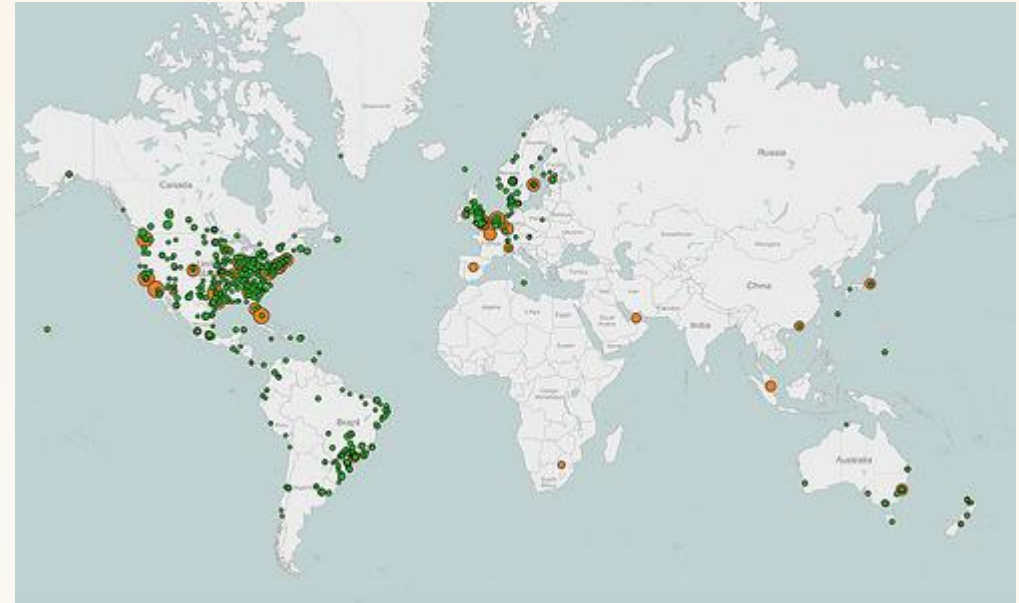
CDN for Netflix (not in the AWS)

- Netflix built its own simple CDN in five different locations within the United States in 2007
 - 36 Million Members in 50 different countries
- Started 3rd party CDN in 2009
 - Focusing on user satisfaction and experience
- Open Connect – Netflix's CDN(2011-2)
- A dedicated CDN solution to maximize network efficiency
- Cut the cost, service quality enhancing (transcoding, CDN, clients control)
- It is possible because Netflix knows about users – preference and location
- Locating OCA all around the world near to the users
 - Large OCA - store Netflix's entire video catalog
 - Smaller OCA - filled with video every day, during off-peak hours, using a process Netflix calls *proactive caching*



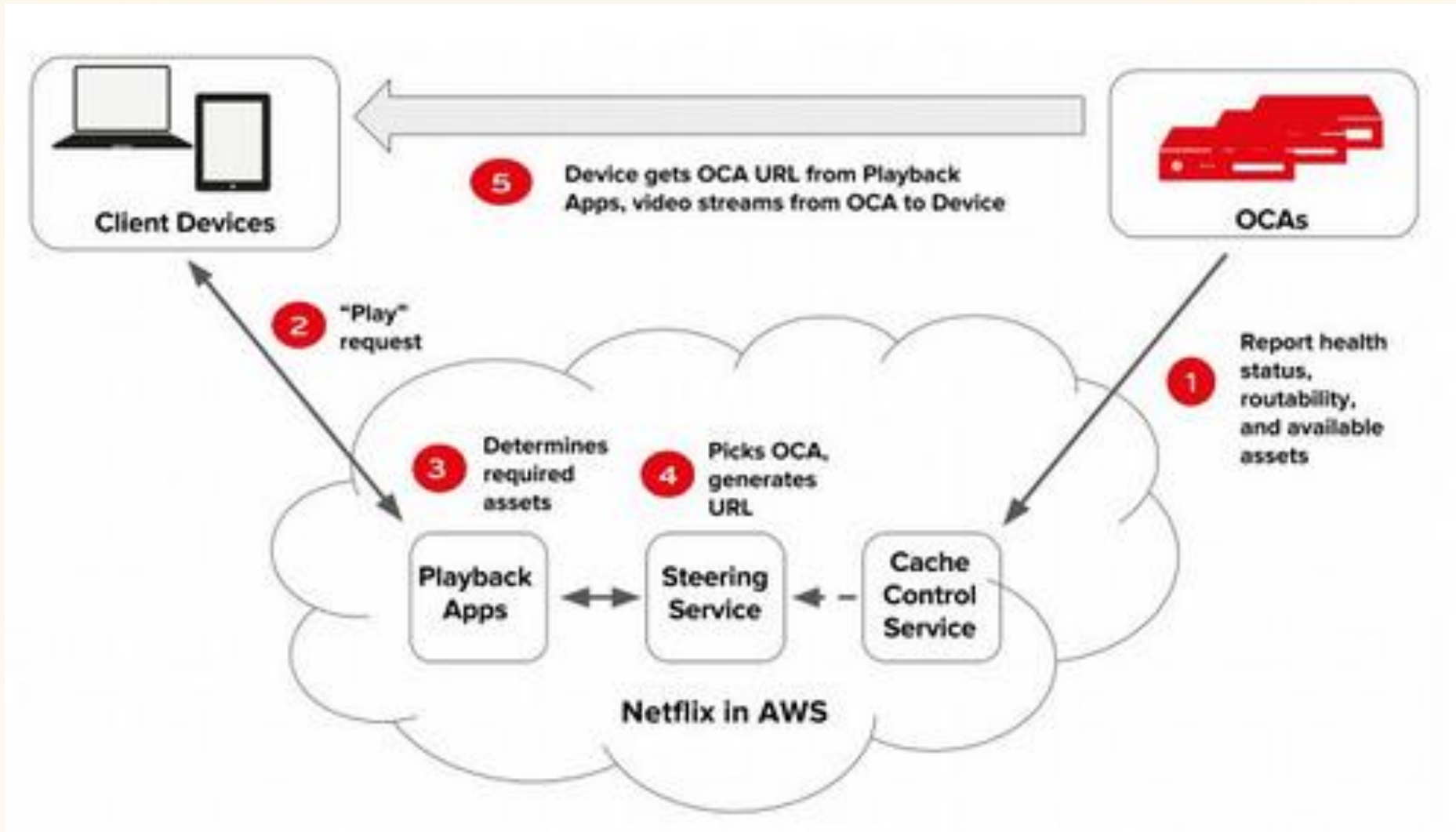
OCA and Content Caching

- Locating OCA all around the world
 - More than 1000 location
 - Does not operate Netflix's own backbone network
 - Locate OCA in ISPs or IXPs
- Netflix is the data-driven company
 - Popularity of the content in a certain location
 - The OCA works as the cache of the contents
 - Proactive Caching OCA to large OCA, Large OCA to Smaller OCA
 - Every night OCA prepares the content for the users before they click the content

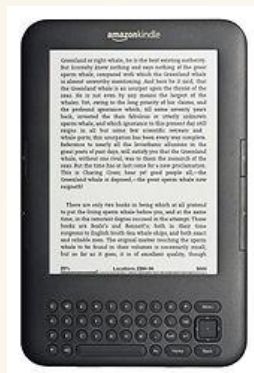


Proactive Caching

When you click a play button



Amazon Kindle - since 2008



Amazon Kindle - since 2008

