How Netflix Works
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#netflixeverywhere

No ads | Uninterrupted entertainment | All episodes at once
Watch When You Want.
How You Want.
Where You Want.
The Netflix journey

1997: Netflix Starts
2007: Streaming video service begins in the US
2008: Canada expansion - first launch outside the US
2013: Original Series *House of Cards* launched
2016: 130 countries, including Korea

Netfix in 190+ countries since then
What about today?
More Than 190 Countries

Over 151 Million Paid Memberships

60+% from Outside of the U.S.
1,700+ Different types of devices

518M+ Unique devices globally
Bringing great stories from around the world to audiences the world over.
How Do We Deliver a Great Netflix Experience to Everyone?
What makes a great streaming experience:

- Start quickly
- Great quality
- No interruptions
Diverse networks and devices

3G, LTE, 5G, Cable, Satellite, Fibre, Wi-Fi, 4K, HDR, HD, SD
The building blocks of the Netflix streaming experience

All of these are continually optimized to improve user experience
The building blocks of the Netflix streaming experience
통합 인코딩 방식 적용

One-size-fits-all encoding

1050kbps 스탠다드 화질 (SD)

Standard Definition (SD) at 1050 kbps
타이틀 별 인코딩 방식 구분
Per-title encoding

640 kbps 710 kbps 910 kbps
장면당 인코딩 구분
Per-shot encoding
Select the best encoding recipe per-shot

Allocate the bits optimally to achieve the best overall quality

64% less bandwidth for the same quality
64% less bits for the same quality
Hours of Netflix content in 1GB of data

2011: 1.5 Hours
2015: 2.5 Hours
Today: 6.5 Hours

8 episodes!

Coming soon …
The building blocks of the Netflix streaming experience

Production

Encoding

Deployment

Streaming
The building blocks of the Netflix streaming experience
1. OCAs report health status, routability, and available assets.

2. "Play" request.

3. Determines required assets.

4. Picks OCA, generates URL.

5. Device gets OCA URL from Playback Apps, video streams from OCA to Device.
servers (OCA)

networks
accessing long-haul capacity is expensive for both content provider and ISP. Use this as little as possible.
Order of 100 globally

Order of 10,000 globally
caches fill while you sleep
Networks are dimensioned for peak capacity.

Off-peak cache fill means no need for additional capacity.
85 internet exchange locations in 26 countries
3,546 ISP locations in 140 countries
105,000 network miles
(4.2x around the earth)
The building blocks of the Netflix streaming experience
The building blocks of the Netflix streaming experience
Network conditions change

Bandwidth (kb/s)

Time (seconds)
adaptive streaming engine

playdelay

video quality
rebuffer risk
Adapt video quality based on changing conditions

High quality

Segment 1  
Segment 2  
Segment 3  
Segment 4  
Segment 5  
...

Mid quality

Segment 1  
Segment 2  
Segment 3  
Segment 4  
Segment 5  
...

Low quality

Segment 1  
Segment 2  
Segment 3  
Segment 4  
Segment 5  
...

Time
Adapt video quality based on changing conditions.

- High quality
  - Segment 1
  - Segment 2
  - Segment 3
  - Segment 4
  - Segment 5
  - ...

- Mid quality
  - Segment 1
  - Segment 2
  - Segment 3
  - Segment 4
  - Segment 5
  - ...

- Low quality
  - Segment 1
  - Segment 2
  - Segment 3
  - Segment 4
  - Segment 5
  - ...

Time

- Video quality adaptation based on changing conditions.
Adapt video quality based on changing conditions

Resulting experience

Segment 1  Segment 2  Segment 3  Segment 4  Segment 5

Time
tips and tricks
Your Internet speed is

210 Mbps

Latency
Unloaded 18 ms
Loaded 190 ms

Upload Speed
9.3 Mbps
questions?
고맙습니다!

Thank you!