

# Senior Software Engineer Opportunity

Playback Access Team

*Enabling Fast, Reliable & Secure Streaming of Netflix Content*

**NETFLIX**

# World's Leading Internet TV Network



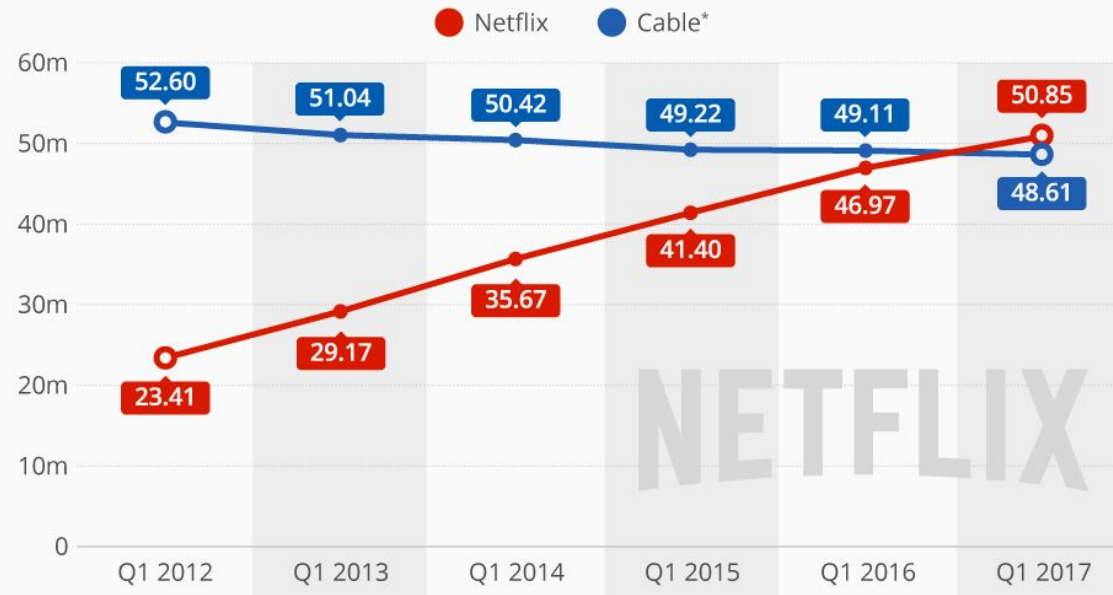
- Opportunity: > 700M Broadband Households
- 100M+ Members
- 190+ Countries
- 2000+ Device Types
- 125M+ Viewing Hours / Day
- Commercial Free
  - TV
  - Movies
  - Original Content



# With Continued Growth

## Netflix Surpasses Major Cable Providers in the U.S.

Number of Netflix subscribers vs. cable pay-TV subscribers in the U.S. (in millions)



@StatistaCharts

\* includes major cable providers accounting for roughly 95% of cable subscribers and slightly less than half of all multichannel pay-TV subscribers

Sources: Netflix, Leichtman Research Group

statista

# At Tremendous Scale



Upstream		Downstream		Aggregate	
BitTorrent	18.37%	Netflix	35.15%	Netflix	32.72%
YouTube	13.13%	YouTube	17.53%	YouTube	17.31%
Netflix	10.33%	Amazon Video	4.26%	HTTP - OTHER	4.14%
SSL - OTHER	8.55%	HTTP - OTHER	4.19%	Amazon Video	3.96%
Google Cloud	6.98%	iTunes	2.91%	SSL - OTHER	3.12%
iCloud	5.98%	Hulu	2.68%	BitTorrent	2.85%
HTTP - OTHER	3.70%	SSL - OTHER	2.53%	iTunes	2.67%
Facebook	3.04%	Xbox One Games Download	2.18%	Hulu	2.47%
FaceTime	2.50%	Facebook	1.89%	Xbox One Games Download	2.15%
Skype	1.75%	BitTorrent	1.73%	Facebook	2.01%
	69.32%		74.33%		72.72%



Table 1 - Top 10 Peak Period Applications - North America, Fixed Access

# Innovative Culture: Freedom & Responsibility



Every Netflix employee has the **freedom** to do their best work and the **responsibility** to achieve excellence.

## Values Are What We Value

- Judgment
- Communication
- Impact
- Curiosity
- Innovation
- Courage
- Passion
- Integrity
- Selflessness
- Diversity & Inclusion

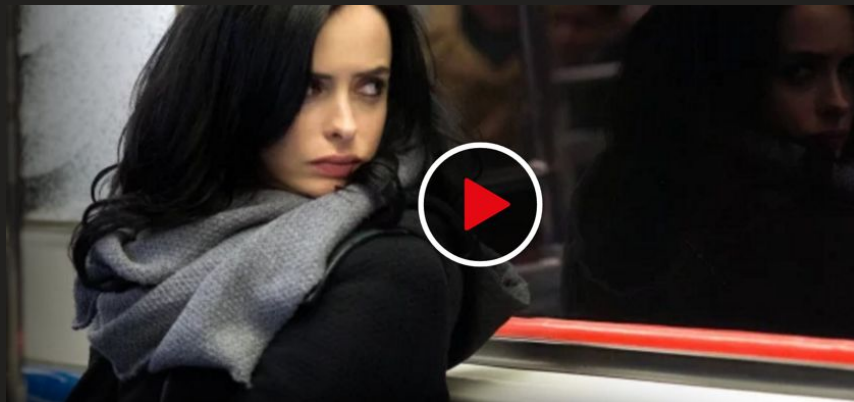


[Netflix Culture Slides](#)

# Playback Access Team

## Team's Mission

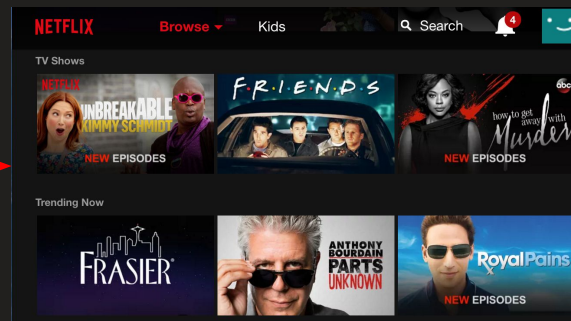
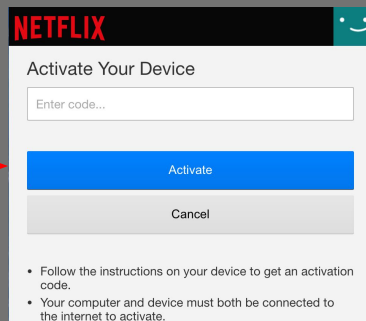
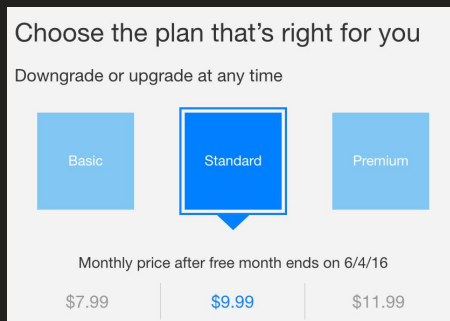
*Enable a secure viewing experience for our members and protect access to Netflix content*



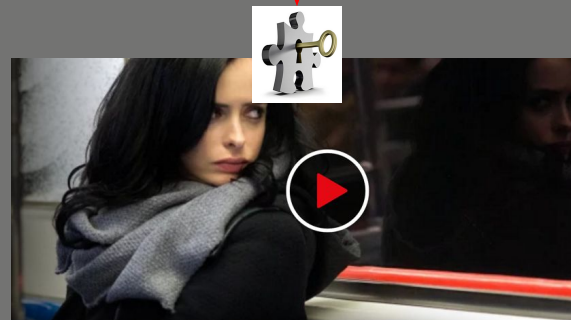
## Core Focus Areas

- Server-side Device Activation & Authentication
- User Authentication and Token Management
- Content Licensing via Digital Rights Management (DRM) server technologies
- License Accounting

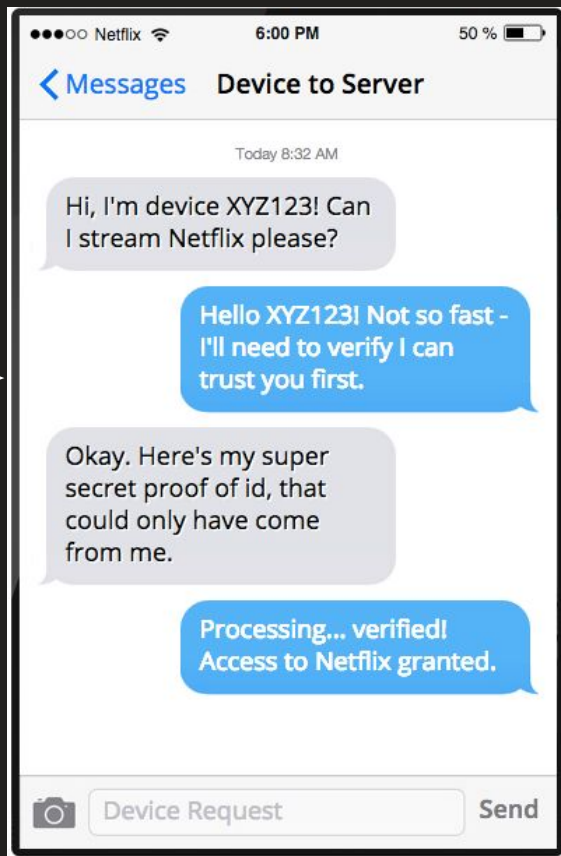
# Playback Access: Critical to Playback Experience



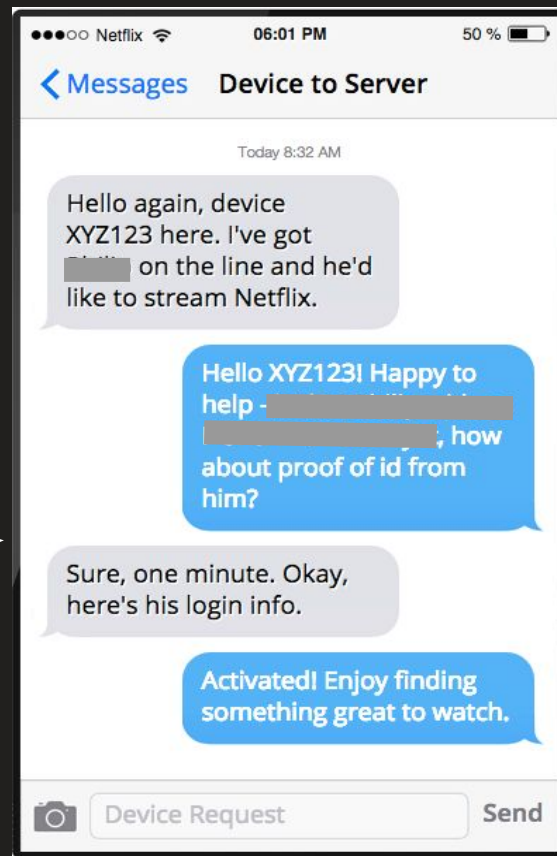
Playback  
Access Team  
Domain



# Device Activation & Authentication



?





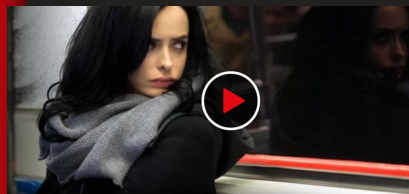
# For 2000+ Device Types (and growing)



<http://devices.netflix.com>

# Access to Protected Content

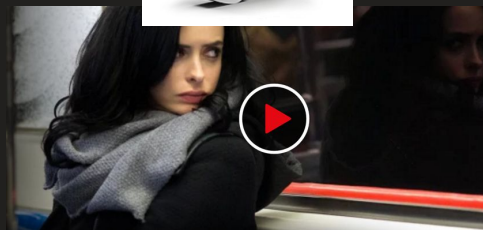
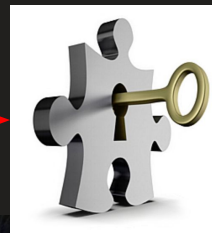
Or, what happens when you push PLAY?



- **This** user
- **This** device
- **This** content
- **This** resolution



**License!**



## Playback Access Services

- Valid user / device
- Content usage / resolution policies
- Plan / device limits enforcement
- DRM / License generation

**Microsoft**  
PlayReady

 **WIDEVINE**

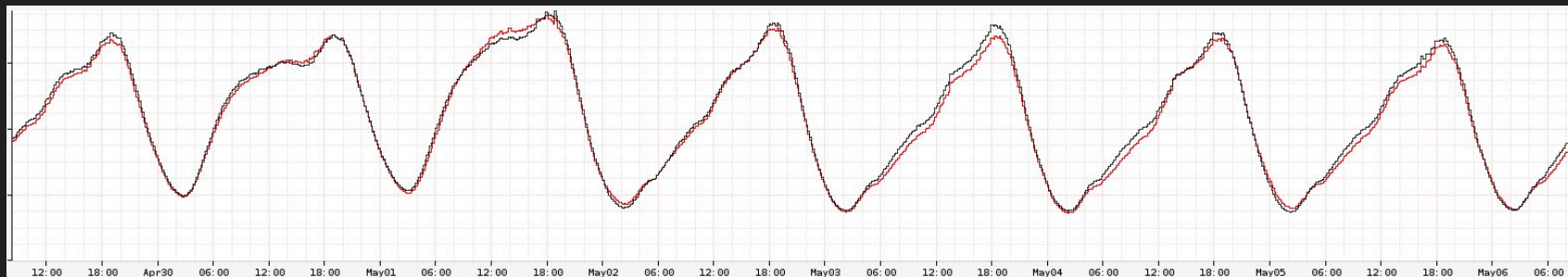
  
FairPlay



# Challenge: Performance / Scalability

Playback Access services are in the critical path for the Netflix user experience

- Services must be performant
- Services must be available with a 99.99% SLA
- Services must scale dynamically, to support Stream Starts per Second:



Using techniques like Predictive Auto Scaling (<http://techblog.netflix.com/2013/11/scryer-netflixs-predictive-auto-scaling.html>)

# Challenge: Resiliency

The Simian Army is a group of programs that intentionally introduce errors into our systems to proactively find problems that typically get detected during a production alert.

See <http://techblog.netflix.com/2011/07/netflix-simian-army.html> and related Netflix technical blog posts for more detail.



# DevOps Culture: Operate What You Build

Insights into our systems enables  
**Operational Excellence**

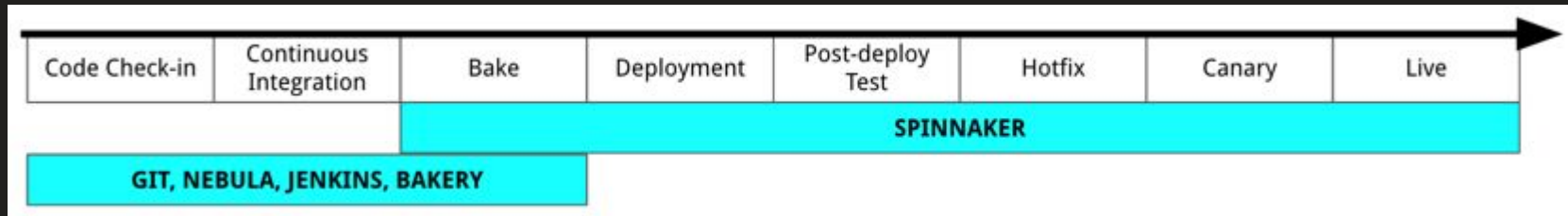
You Build It, You Run It



# Playback Access Technology Stack



# Developer Tools: Code, Build, Bake, Deploy



```
build.gradle
1 apply plugin: 'nebula'
2 apply plugin: 'war'
3 apply plugin: 'netflix.ospackage-tomcat'
4 apply plugin: 'nebula.dependency-lock'
5
6 dependencies {
7     compile 'netflix:base-server:latest.release'
8     compile 'javax.ws.rs:jsr311-api:1.1.1'
9     provided 'javax.servlet:javax.servlet-api:3.1.0'
10
11     testCompile 'junit:junit-dep:4.10'
12     testCompile 'org.mockito:mockito-all:1.9.5'
13 }
14
15 ospackage {
16     requires('apache-tomcat8')
17 }
```

The screenshot shows the Spinnaker web interface for the **janitormonkey** application. The **PIPELINES** tab is selected, showing a list of pipelines. The **Multi-region Bake** pipeline is highlighted, showing its execution details.

**Multi-region Bake Details:**

- Build #1463:** TRIGGERED BUILD, Status: SUCCEEDED, Duration: 16:11.
- Multi-region Bake Details:** Duration: 07:36.
- Steps:**

Step	Started	Duration	Status
Bake in us-east-1	2016-02-22 17:46:59 PST	07:36	SUCCEEDED
Bake in us-west-1	2016-02-22 17:46:59 PST	05:33	SUCCEEDED
Bake in us-west-2	2016-02-22 17:46:59 PST	06:04	SUCCEEDED
Bake in eu-west-1	2016-02-22 17:46:59 PST	06:37	SUCCEEDED

- Bake Config:** Provider: Amazon, Image: ami-..., Region: us-east-1, Package: cloudmonkey.
- Task Status:** Base OS: trusty, VM Type: HVM, Store Type: EBS, Label: release.

[View Bakery Details](#)



# What Will You Learn?

- Develop cloud-based device authentication and content access solutions that are useful for improving the Netflix user experience
- In partnership with device teams, develop new ways to stream Netflix
- Integrate enhanced DRM capabilities to securely enable faster playback, more HD content, etc.
- Take end-to-end ownership of major features and components
- Expand your knowledge, working quickly on cutting edge technologies
- Have fun!





# About YOU!

- Strong object oriented design and programming (Java, C# or C++) skills
- Experience delivering scalable distributed systems, preferably in the cloud
- **Bonus:** exposure to security concerns / technologies and protocols
  - *You don't need to be a security expert to be successful on our team!*
- **You:**
  - Love solving tough problems
  - Enjoy working collaboratively with other engineers
  - Like to ship and support solutions that you design and build
  - Are curious about technology and love to learn and grow as an engineer
  - Consider writing code your craft and you write code for fun

# Interested?

## Current Openings

- [Playback Licensing](#)
- [Playback & Edge Access Services](#)



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