Measurement Study of Netflix, Hulu, and a Tale of Three CDNs

Project Phase 1
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1   Abstract

The project provides a detailed and comparative analysis of how the top video streaming applications like Netflix and Hulu function and how different components present in the architecture interact with one another, executing tasks to run the application as a whole. Their performance in real time is also analysed. Alternative strategies are also proposed to improve the efficiency of the system.

2   Objective

To analyse architecture and service strategies employed by video streaming applications, netflix and hulu. The following aspects are covered in the analysis.

- The functionality of each and every element in both the architectures of Netflix and Hulu and their CDN (content distribution network) selection strategy.

- Interaction of the components in the architecture when the application is in action, and understand the workflow of how the service is delivered to the user and the background processes involved in it.

- A comparative study where the similarities and differences are highlighted and how they affect the functionality.

- Performance of the application with real time constraints.

To perform a measurement study of three CDN's considering the selection strategies, the constraints in which they are supposed to perform (Bandwidth etc) and do a comparative analysis of how these three CDN's work in various scenarios. also suggest alternative CDN selection strategies for improving their efficiency, resulting in more bandwidth.

3   Analysis of Architectures

The following components in architecture are analysed :

- Data centers and Amazon Cloud Units
- CDNs(Content distribution Network)
- Players employed for streaming on the client side.

When the application is running the web browser interacts with the web server and executes multiple tasks during the video playback process. The tasks are presented in the order they are executed which will be explained in detail:

- Video player download and user authentication
- Generation of manifest files to conduct the adaptive video streaming
- Bringing trick play into the scope where the user can forward or rewind the video

- Downloading audio and video chunks
- Periodic user experience Reporting

4 Comparative Analysis

Hulu also adopts the same architecture as Netflix and uses the three same CDN's. The components in which they differ include are the CDN selection strategy and Messaging Protocol.

5 Referances

- `https://en.wikipedia.org/wiki/Content_delivery_network`
- `MeasurementStudyofNetflix,Hulu,andaTaleofThreeCDNs-OfficialPaper`
- `https://www.cs.princeton.edu/courses/archive/fall14/cos561/papers/NetFlix12.pdf`
- `https://en.wikipedia.org/wiki/Over-the-top_media_service`