

YAHOO!

Proactive Playlist Push

Sudheer Vinukonda

Introduction

HTTP Live Streaming

- Typical Video CDN consists of an Ingest Layer and a Delivery Layer
 - Encoders may push HLS content to the Ingest point (Live Origin)
 - Ingest point may pull HLS content from the Encoders
- Content not made available at the Delivery Cache as soon as it's at the Ingest Layer (Origin)
 - Typically relies on the first client (video player) request to pull the content from Origin
- Increased Latency on a Cache miss
 - Distributed Edge layer, multiple cache layers (e.g Edge, mid etc) makes latency worse

How the PUSH can help..

- Content typically available sooner at the ingest point
- 95% requests for new segments arrive after 4 sec at the live origins
- Pushing the content down to Edge as soon as it's at the ingest (Origin) can improve latency
- Solves the “Thundering Herd” problem (by avoiding Cache misses at Edge)

ATS HTTP PUSH method

- ATS supports (non-standard) HTTP PUSH to push objects into cache
 - Origin to PUSH HLS playlist files down to the Edge layer
 - Edge identifies the new segments in the playlist and initiates a PULL (GET)
 - Edge delays pushing playlists into cache until segment is available
- Subscription between Edge and Origin
 - Edge nodes subscribe with the Origin for a PUSH
 - Origin to PUSH playlist files to all subscribed Edge nodes
 - Edge node may cancel subscription any time
- Race condition with GET
 - GET still supported as normal

Summary

- Improves latency by pre filling Edge caches before first client request
- Works better for longer segment durations
- Provides latency improvement for long distance (e.g across countries) live video streaming
- Implementation in progress, plan to get benchmarking data