MUSLIN: A Multi-Source Live Streaming System
Towards a higher quality of experience, fairly shared, without any extra infrastructure cost
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PROGRESS

State of the Art - How is video content currently streamed and consumed?

Contents consumption schemes evolve...

Delivering content: Dynamic Adaptive Streaming over HTTP
The DASH standard aims at delivering uninterrupted video content through HTTP traffic. During the streaming session, the client dynamically changes video quality to adjust to the network available bandwidth.

Making content available: Content Delivery Networks
The CDN paradigm is to provision replica content servers near end-users to withstand the demand. Then, clients are routed to the nearest server, which minimizes latency and lowers the congestion. However, servers can get overloaded, and some clients might receive a poor QoE or not have access to the content.

Background - MS-Stream: Multi-Source Adaptive Streaming over HTTP
MS-Stream protocol extends the DASH standard by enabling the use of multiple servers to aggregate bandwidth over various links while being resilient to impairments. It was published in several journals and conferences, and won many prizes such as IEEE ICME DASH-IF Grand Challenge.

MUSLIN: A Multi-Source Live Streaming System
Muslin relies on clients feedbacks to provision and advertise servers to the users in real-time.
1. Content replication
2. Server advertising
3. Content delivery
4. Clients feedbacks

Muslin assigns servers to clients using a Ranking Score $RS_c$, computed for each client and server, based on feedbacks.

Results
Figure:Displayed bitrate (Mbps)

Table: QoE fairness (F index)

Figures:

- Compressed bitrate (Mbps)
- Quality changes (per minute)
- Network overhead (%)

Table:

- Quality changes fairness
- Rebuffering fairness
- Video fairness
- Network overhead

Evaluation methodology
Provisioning: Muslin vs Geographical oracle (aware of the exact audience and their locations)
Selection: Muslin vs CDN (closest), Random and Round Robin
Delivery: MS-Stream
- 16 servers (30 Mbps bandwidth)
- 3 servers (200 Mbps bandwidth)
- 21 client pools locations

A real audience trace was used to re-stream a one-day event multiple times (over 10,000 h of evaluations).