



eyevinn
technology

livesim2

A new modern livesim server

Torbjörn Einarsson

Mar 10 2023

www.eyevinntechnology.se

Proud organizer of
STREAMING TECH SWEDEN

CONTENTS

- About me
- Livesim background
- Livesim future?
- livesim2
- Current Status
- Demo
- Needs, proposals, next steps?



About me



Torbjörn Einarsson
Eyevinn Technology

- Expert on Video codecs and protocols
 - Ericsson Research, MobiTV, Edgeware, Eyevinn
- Open source projects
 - DASH-IF live-source-simulator
 - DASH-IF cea608.js library in dash.js
 - mp4ff – mp4 library in Go
 - dash-mpd – new library in Go
 - DASH-IF: livesim2
- Now a consultant at Eyevinn:
torbjorn.einarsson@eyevinn.se

Livesim background

- livesim1 (dash-live-source-simulator) started almost 10 years ago
- I had a need to make live DASH timing work properly, and it was hard to test
- livesim1 changes manifests and segments on request
 - VoD source gives base MPD and segments => live variation
 - => possible to have very many parameter combinations
 - => very stable since it is stateless
 - => green, much less power needed compared to live encoder
- Contributed to DASH-IF in 2015.
- livesim1 has been used a lot by dash.js, shaka-player, DVB, etc and has helped hammer out quite a few issues. Included in test suites
- DASH-IF funded streaming on AWS at <https://livesim.dashif.org>
- Open source on Github



Livesim future?

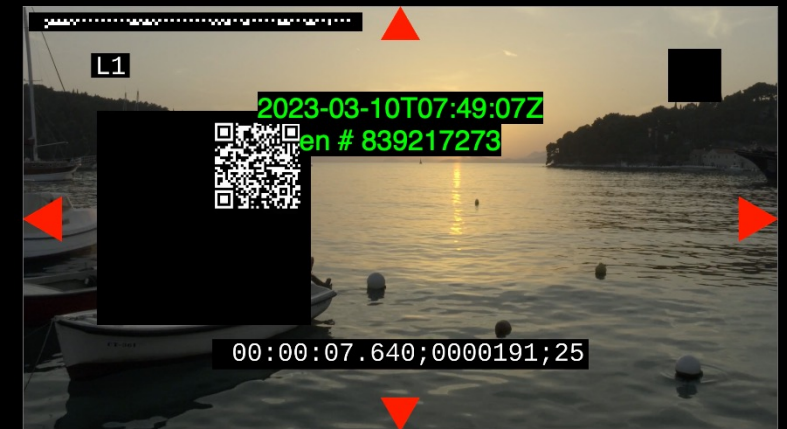
- DASH evolves and there are always new features to test
- Current livesim software is limited by its design around a specific asset
 - CTA-WAVE test vectors are not compatible
 - Many features are not yet available like patch, content with stitched ads etc
 - Hard to deploy
 - Hard to keep up to date
- Current traffic limiter using sessions is not enough
 - Traffic bills for livesim on AWS are high (up to \$2000/month)
- Discussions on funding to evolve livesim started in DASH-IF last fall
- In my view, it is hard to continue patching => a restart is needed
- Can we get funding for a new platform?
 - Probably not, but hopefully for extensions once there is a new platform...

livesim2

- New livesim platform written in Go
- Easy to deploy
 - Single binaries that can run on Linux, MacOS, Windows
 - No need for other HTTP(S) server
 - Easy for anyone to run locally
- Includes dashfetcher tool to fetch CTA-WAVE test content
- No special preparation of content is needed
 - Content file tree is scanned at start
 - Server provides information about available assets
 - livesim2 can stream both VoD and simulated live
- Code owned by DASH-IF
 - MP4 and DASH-MPD in separate packages
 - <https://github.com/Eyevinn/mp4ff> and <https://github.com/Eyevinn/dash-mpd> (MIT)

Current status

- First public release this week: v 0.5
 - <https://github.com/Dash-Industry-Forum/livesim2>
- Useful functionality in place
 - Live output with SegmentTimeline + \$Time\$ and SegmentTemplate with \$Number\$
 - Low-Latency DASH output with on-the-fly chunking
 - On-the-fly generated subtitles
 - Configurable Rate limiter for public deployment
 - Max requests/IP address/24h
 - Header: Livesim2-Requests: 26 (max 200) => HTTP 429 Too Many Requests
- You can download and run locally today



Demo

Welcome to livesim2

The following URLs should work on this server

[/assets](#) to get a list of assets (each can have multiple MPDs)

/vod/... to stream any of the VoD assets directly

`/livesim2/...` to stream the VoD assets as they are converted to "live" with parameters

/healthz to check if server is running

`/config` to get the current config of the server

```
{
  "MPDs": [
    "WAVE/vectors/cfhd_sets/12.5_25_50/t1/2022-10-17/stream.mpd",
    "WAVE/vectors/cfhd_sets/12.5_25_50/t3/2022-10-17/stream.mpd",
    "testpic4_8s/A48/A48_dash.mpd",
    "testpic4_8s/Manifest.mpd",
    "testpic4_8s/Manifest300.mpd",
    "testpic4_8s/Manifest600.mpd",
    "testpic4_8s/V1200/V1200_dash.mpd",
    "testpic4_8s/V2400/V2400_dash.mpd",
    "testpic4_8s/V300/V300_dash.mpd",
    "testpic4_8s/V600/V600_dash.mpd",
    "testpic_2s/Manifest.mpd",
    "testpic_8s/Manifest.mpd"
  ],
  "Assets": [
    {
```

Parameters implemented in livesim1 and livesim2

The following table should include all URL parameters in both livesim1 and livesim2.

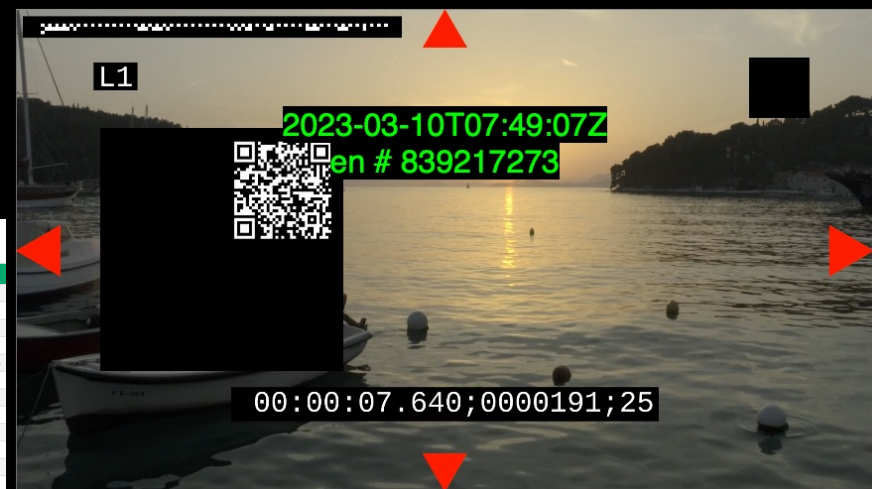
Parameter	Values	Description
nod	int	TimeShiftBufferDepth in seconds
segmentine	1 (=true)	Generate live MPD using SegmentTimeline with \$Time\$
alo	float or "inf"	availabilityTimeOffset in seconds (inf = infinity, all segments available)
chunkdur	float	Chunk duration for on-the-fly chunking
timesubstpp	string	List of hyphen-separated languages with auto-generated stpp subtitles
timesubsdur	int	Cue duration of generated time subtitles in ms (default 900)
timesubnseg	0 or 1	TTML region 0 (bottom) or 1 (top) for time subtitles
start or ast	int >= 0	Sets the availabilityStartTime
stop	int > 0	Sets the stop time (for time-limited events)
startrel	int	Sets a relative startTime via Location
stoprel	int	Sets a relative stopTime via Location
dur	int	Sets a presentation duration for multiple periods
timeoffset	int	Sets time offset in second vs NTP
int	int >= 0	Offset time for early init segment availability
max	int	Maximum index of live segments

	livesim1	livesim2
Features comparison between livesim1 and livesim2		
number of time-limited sessions every hour	No	Yes
!tot (needs more recent availabilityStartTime)	No	Yes

This is a partial comparison of features in livesim1 and livesim2. It is intended as an introduction and inspiration for future work on livesim2.	!tot (needs more recent availability!StartTime)	No	Yes
	is update of MPD AST and segNr	No	Yes
	number of periods per hour	No	Yes

Feature	Description	livesim2	livesim1	
STPP time subtitles	Generate stpp timestamps subtitles	Yes	No	number of xlink periods per hour No Yes
STPP update subtitles	Update timestamps in VoD contents stpp segments	No	Yes	number of early terminated periods per hour No Yes
SessionID	Individual sessionIDs with timeout via Location	No	Yes	presentation duration for multiple periods No Yes
Max nr requests	Maximum number of requests per 24h/IP address	Yes	No	ad via xlink No Yes
Non-integral segment duration	Average segment duration not an integral number of seconds	Yes	No	od continuity signaling (only valid when periods_per_hour is set) No Yes
SegmentTimeline input	Support SegmentTimeline Vod content	Yes	No	live MPD using SegmentTimeline with \$Number\$ No Yes
Support for 29.97Hz video	Allow non-matching audio/video durations	No	No	xp-level BaseURL in all configurations No Yes
MPD Patch	Deliver MPD patch as an alternative to full MPD	No	No	set in seconds No Yes
Insert Ad content	Insert a second video and mark as ads	No	No	many SCTE-35 splice insert periods every minute No Yes
				separated list of UTCTiming methods and make into list No Yes
				umber in MPD -1 translates to no value in MPD (i.e. default = 1) Yes Yes
				PresentationDelay in seconds Yes Yes
				box in every segment No Yes

It may be good to move this to a wiki or project page for planning of future work.

[illegible]

How run

- Fetch WAVE content like:

- `cd assets`
- `dashfetcher -a https://dash.akamaized.net/WAVE/vectors/cfhd_sets/12.5_25_50/t1/2022-10-17/stream.mpd`

- Start livesim2 server

- `livesim2 -vodroot assets`

- Access on localhost:8888

- `http://localhost:8888/`
- `http://localhost:8888/livesim2/WAVE/.../stream.mpd`
- `http://localhost:8888/livesim2/ato_1.5/chunkdur_0.5/WAVE/.../stream.mpd`
- ...

- Deployed under <https://livesim.dashif.org/livesim2>

- With traffic limiter

Needs and possible test cases

- DASH-IF and other organizations/companies have interop & test needs
- livesim2 can be extended to handle a lot of different test cases
- Examples:
 - Handle content where audio and video duration don't match
 - including 29.97Hz video
 - Ad insertion/SCTE-35
 - Variations in delivery characteristics
 - Events
 - Low-latency subtitles
 - MPD patch
 - Essential livesim1 functionality?

Next Steps

- Gather needs from organizations
- Livesim community?
 - Github, DASH-IF Slack group, mailing list?, contribution agreement?
- Make prioritized feature list
 - Estimate implementation efforts/cost
- Funding?
 - General for managing the project?
 - Specific features?
- Work force
 - Eyevinn
 - ... ?
- Follow-up meeting?

Contact



Torbjörn Einarsson

torbjorn.einarsson@eyevinn.se



<https://www.eyevinn.se>



THANK YOU!