



VINDRAL

MoQ 2025



## Vindral

- From Swedish company RealSprint
- Vindral is our brand for media- and streaming related tech
- Two main products:
  - Vindral Composer
  - Vindral Live



Per Mafrost  
CTO

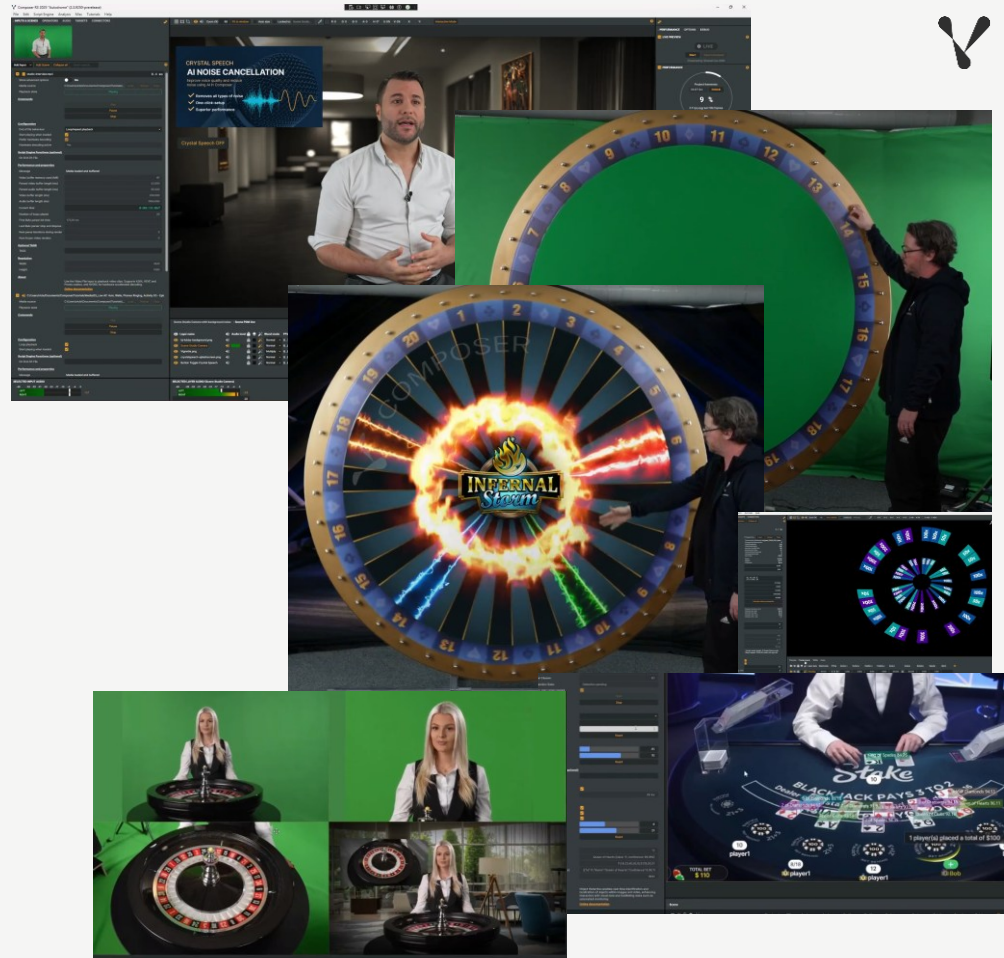


Mattias Bergström  
Tech-lead



## Vindral Composer

- Real-time studio software
- Video compositing, color correction, chroma key, visual effects, encoding
- Trackers, events, audio processing
- Multi-source, multi-target
- Built for 24/7 streaming
- MoQ support in progress





## Vindral Live

- Standalone components
- On-prem encoder, media gateway, transcoding, traffic routing, egress, monitoring, etc
- Forms a complete system for live streaming
- Originally launched as a self-hosted platform for integrators
- Introduced hosted services (Vindral Live CDN) in response to market demand



## Use cases

### 24/7 Linear Broadcasts

- Television networks & remote productions
- iGaming platforms
- Horse & greyhound racing

### Event-Based Streaming

- Live auctions
- Public safety & remote inspections
- Webinars & interactive broadcasts



## Tech Journey

2015 - needed to replace flash on (initially) mobile devices.

- 2s latency
- high quality
- synchronized across devices
- Timed metadata

WebRTC -> WebRTC Data Channels -> WebSockets -> MOQ



Why Media over QUIC

In production

Interop

Streaming format

Early adopter challenges



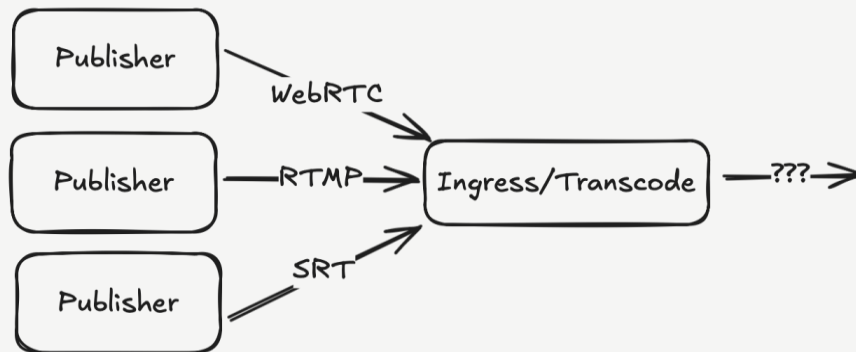
Part of an ongoing effort to simplify our media processing, reduce number of protocols

Multi-track, DRM, Subtitles, AV1, Opus, Thumbnails

WebTransport support for improved playout performance

Wanted to avoid proprietary solutions

MOQ met those requirements



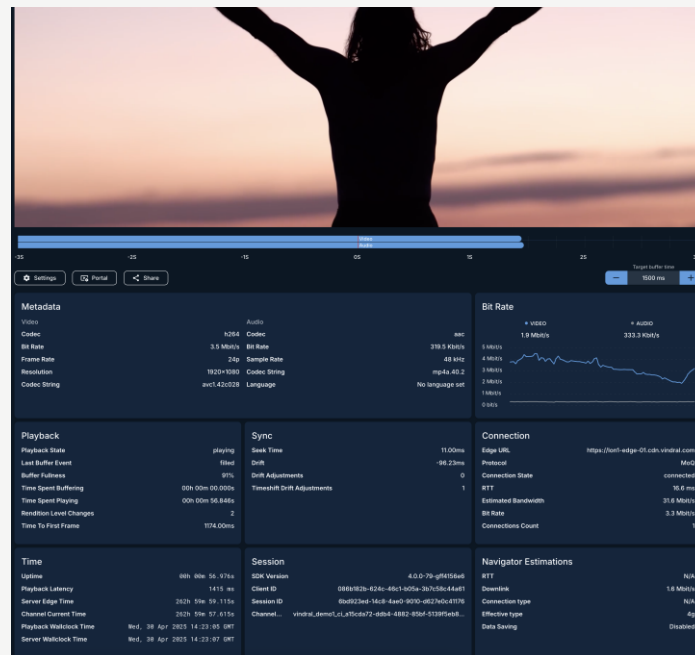


Running in production between ingress and edge

Rolling out to last-mile viewers

Integrated with our pre-existing platform

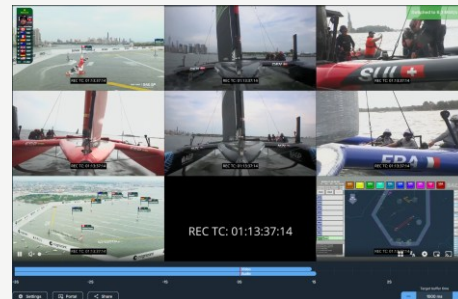
- MOQ from glass to glass
- Load balancing, traffic routing
- Transcode ABR Ladder, LL-HLS payout
- DRM, Channel switching
- QoS, Multiviewer, Embed player





## In the field

- Vindral Live CDN – our managed service
- Swedish public service TV - 150ms, multiviewer
- Hong Kong public service TV/radio – 2500ms (sync with satellite), subtitles, multi-audio, DRM
- Icelandair – in-flight entertainment/education, 500ms
- SailGP – 1000ms, medical teams, operations





Vindral Composer with MoQ support in development

Browser based MoQ publisher to replace our WebRTC app and SDK

More to be announced



Draft-07 compatible (with some caveats)

Successful interop against englishm/moq-rs

Interop isn't main focus at this moment

Vindral platform features need a specific streaming format

Would like to provide a "MOQ transport only" CDN offering at some point



Streaming format is a fork of WARP with CMAF instead of LoC

MediaSource browser APIs, DRM

Simple to convert into HLS

A lot of tooling around CMAF



## Challenges

Draft stage – some things simply aren't done

No CMAF based streaming format

ABR

Startup latency

Client stats



## ABR

How we currently work around it

- Relays expose a track with per-session stats
- Subscribers use that + more to select an appropriate media track
- Switching happens with SUBSCRIBE/SUBSCRIBE\_UPDATE, etc

What we hope to see

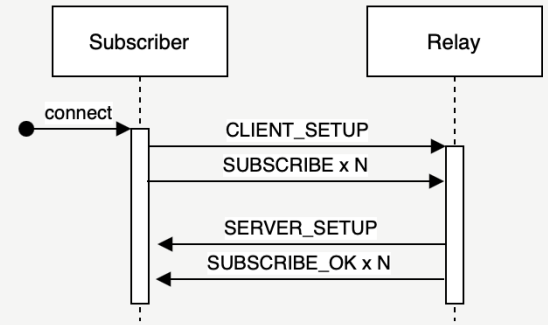
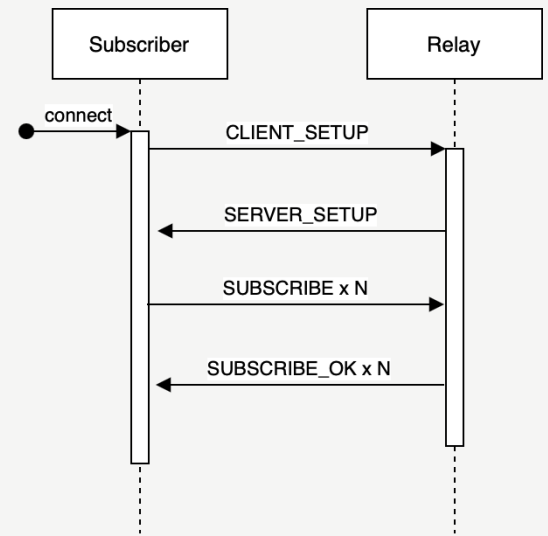
- Sender-side information/ABR



## Startup latency

We pipeline SETUP and SUBCRIBES messages if the server protocol version is known

ALPN, WT-Available-Protocols, PUBLISH





## Client Stats

CMCD?

Our current solution sends stats out of band from MOQ



Version 1.0

Will soon release a public 24/7 relay server with test streams

Thanks for listening, we'll be here for the rest of the day to listen in

