AV1 adoption in a RT streaming platform

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AV1 for RT Broadcasting

WHY??

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Benefits/Cost of RT AV1 SVC

- Pro: Higher compression rate
    - Business model is mostly based on bandwidth consumption, the savings can either be passed through for competitive advantage or kept to increase margin (depending on market situation)
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    - Even more savings on the delivery
    - no storage cost related to ABR / multiple resolutions
    - Improved network resilience (handle higher packet loss)
    - Simplification of the media infrastructure (no mixing, no transcoding, relay only)

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- Con: Increases CPU footprint
  - Less of a problem in live streaming, as
    - The broadcaster usually have powerful machines
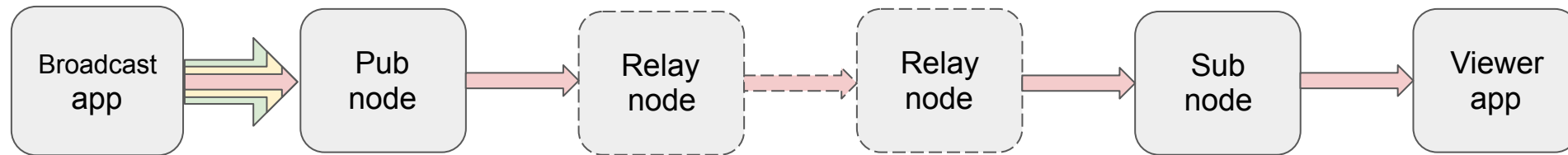   - Viewers will pull only one stream at a time

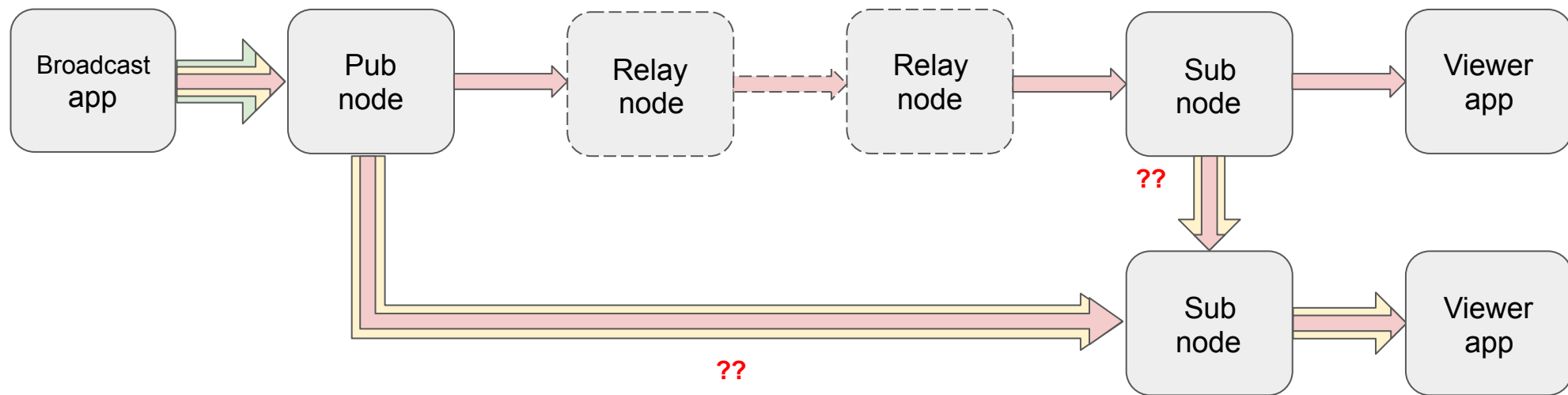millicast

Real-Time smart, on-Demand ABR 0

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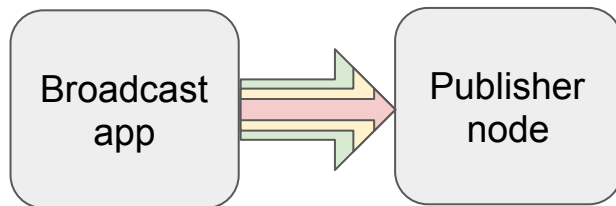
Real-Time smart, on-Demand ABR 1
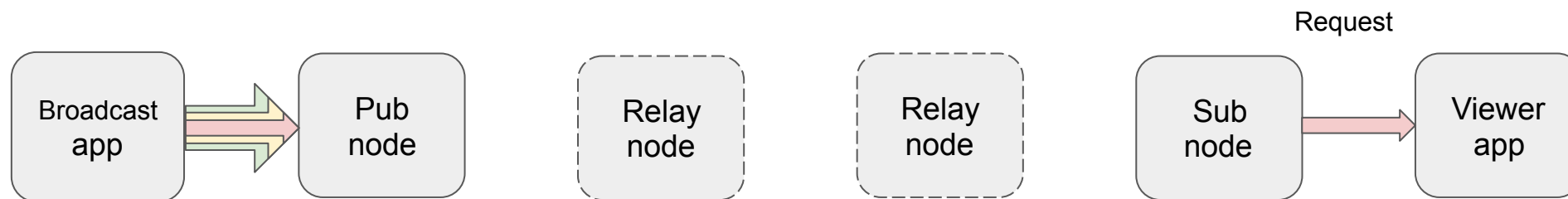
Real-Time smart, on-Demand ABR 2
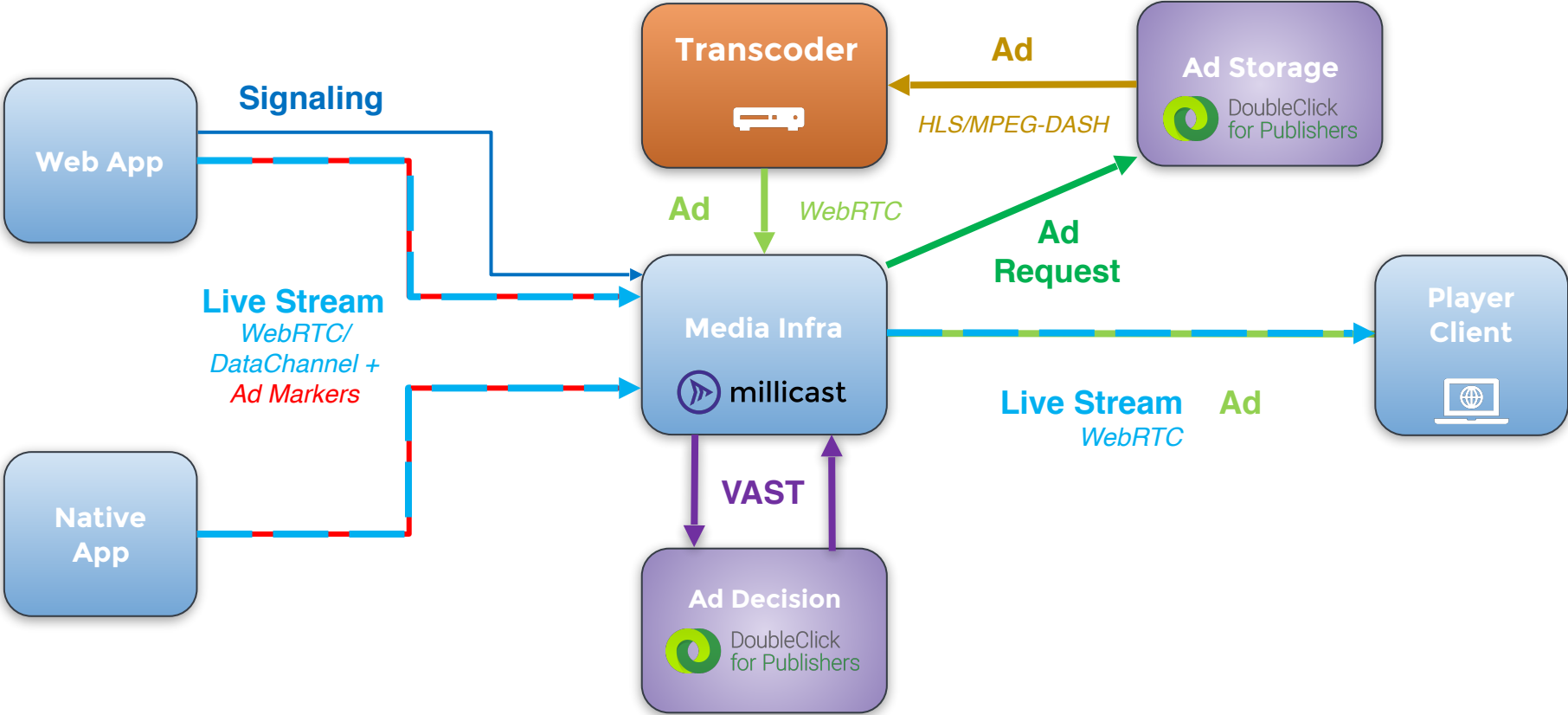

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Real-Time smart, on-Demand ABR 3

Real-Time smart, on-Demand ABR

- (Subscriber nodes) Load based

- Geographic distribution based

- Bandwidth cost based

- Topology based

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Other Research Challenges

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RT Advertising?

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Real Time Server-Side Ad-Insertion (RT SSAI)

RT Content Protection?

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Content protection
beyond DRM

- RT AV1 E2EME (SRTP)

- RT AV1 Forensic Watermarking

DIGITAL WATERMARKING OF VIDEO STREAMS: REVIEW OF THE STATE-OF-THE-ART

A PREPRINT

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Real-Time Recording

- PCAP-based

- Like copy-on-write: replay or transcode on play

- E2EME support + encrypted at rest

- Dual intent: Debug format with Wireshark

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"Real Time VMAF" – RT Video Frame Quality Assessment

- Goal: RT assessment

  - **no reference / blind** method

  - RT dataset (no netflix catalog)

  - Higher resolution (very sensitive)

  - Validate on common subset

- Use to e.g. adapt in real-time.
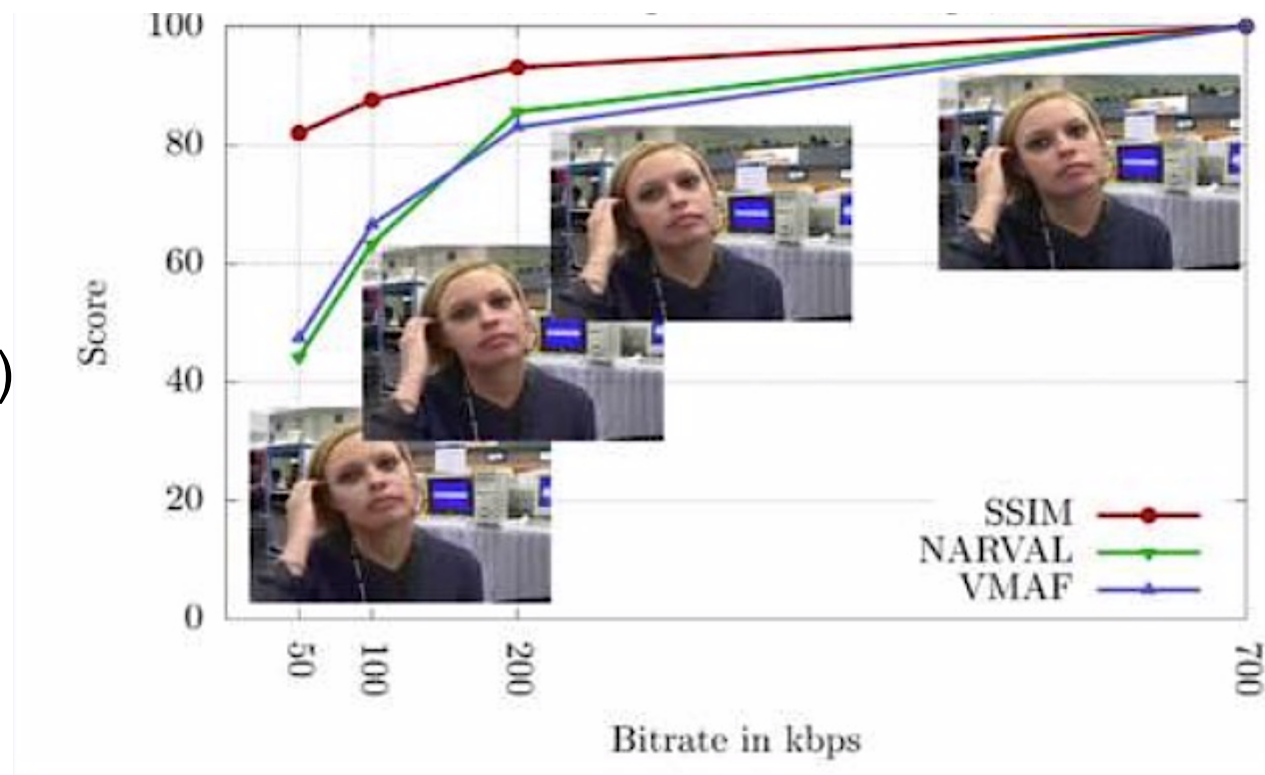
NARVAL, A No-Reference Video Quality Tool for Real-Time Communications,
Augustin Lemesle, Alexis Marion, Ludovic Roux and Alexandre Gouaillard
in Proceedings of Human Vision and Electronic Imaging, Burlingame, California, USA, January 2019

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Questions?

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