Quickstream

Technology for Secure and Reliable Delivery of Professional Audio/Video Contribution Live Transmissions With Lowest Possible Latency

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Project Abstract

» Every year more and more professional audio and video live transmissions being organised around world:
  » Sports events
  » Conferences
  » Transmissions of:
    » Events
    » Meetings
  » Even remote surgeries
» Especially now during coronavirus pandemic exceptional meaning of multimedia technologies that deliver interactive:
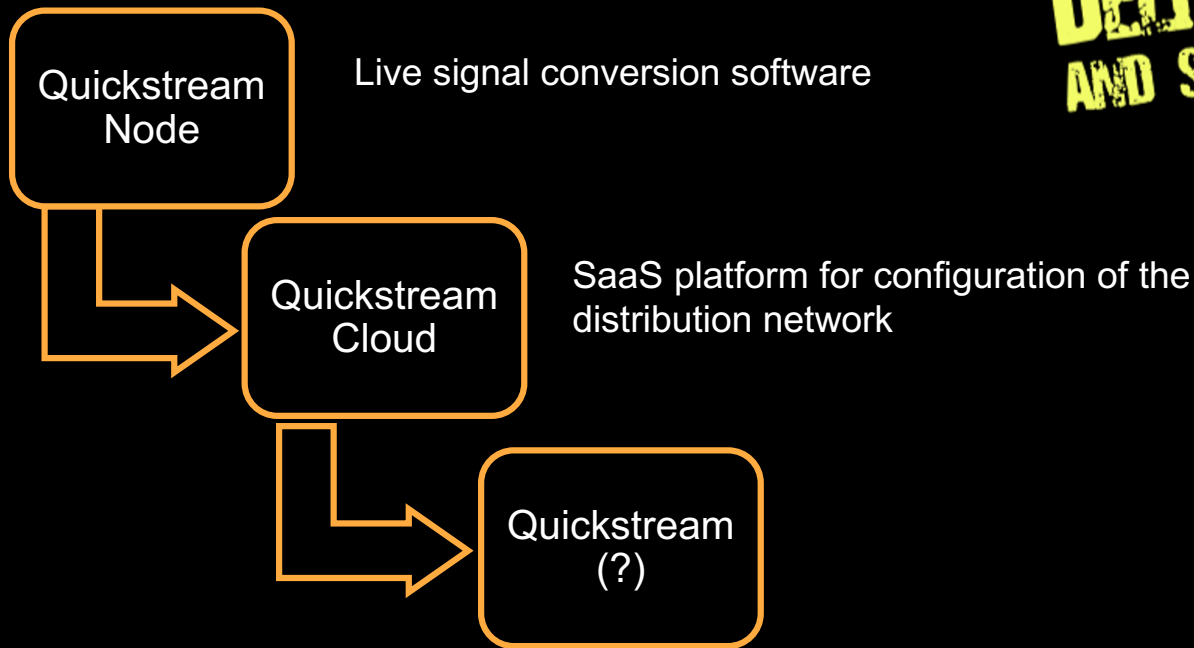 » Audio, and
  » Video

Project Abstract

» Professional entities in market such as TV broadcasters, digital platforms operators, content producers using so-called contribution having need to keep low latency while realising high quality live content transmissions in:
  » HD
  » 4K
  » 8K
» Traditional methods of contribution like satellite broadcasts or IP transmissions in guaranteed quality webs, for instance, IP leased lines or MPLS connections - not:
  » Flexible enough
  » Cost-effective enough
» Internet:
  » Usable to signal contribution, but
  » Not guaranteeing sufficient, constant connection quality parameters

Project Abstract

» Developing new technology realising contribution transmissions through connecting:

  » Latest methods generation of single and multi-way video encoding, with

  » New protocols providing:

    » Transmissions reliability, and also

    » Low latency

» In addition, new adaptive routing algorithms of connections between network nodes to be developed

» Technology to be used to build CDN specialised in contribution transmissions in global Internet network

Quickstream

Quickstream Node → Live signal conversion software

Quickstream Cloud → SaaS platform for configuration of the distribution network

Quickstream (?)

DELIVERED AND SELLING

DELIVERED AND SELLING

PLANNED IN 2022

Da Vinci

Network 18

SPI INTERNATIONAL

Discovery

tvn

AGH Research/Technological Problems

» Use of optimal video codecs for given type of content

» Selection of optimal settings of video codecs depending on:

   » Type of content, as well as

   » Changing transmission conditions

» Selection of codec work at JND (Just Noticeable Distortion) point, controlled by QoE (Quality of Experience)

Novelty of Project Results -
High Quality of Transmission

» Representative and standard (in visual quality research) set of reference video sequences selected and maintained

» Collections from test plans of the VQEG taken into account

» All parameters of achieved reduction of stream bit rate calculated against maintenance of statistically insignificant decrease in value of VMAF metric

Stream Compression Improvement

» Baseline: H.264/MPEG-4 AVC

» Newer codecs:

  » H.265/HEVC

  » VP9

  » AV1

  » MPEG5-(LC)EVC

  » H.266/VVC (subject to availability of fast, production versions of codecs)

» In addition, planned functionality of dynamic optimisation of compression parameters planned, applied when compressing video streams

First Major Milestone Ahead

» Maximum QP level for occurrence of JND as determined:

  » By visual inspection, and

  » Using statistical significance of VMAF quality standard measure

» Determination of PoC, by demonstrating min. of 1 set of H.264 codec compression and single-path streaming parameters, offering stat. significantly lower stream bit rate than standard encoding/streaming using ffmpeg/ffplay/x264 toolkit for default settings

All Your References, Ideas, Discussion Are Welcome!

https://qoe.agh.edu.pl

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One more thing…

13th Workshop on Multimedia & Network Information Systems
MISSI 2022

- Part of ACIIDS 2022:

    - Included in proceedings

    - Class B in CORE ranking

- Deadline: 31 Dec 2021*

- Conference: 6-9 Jun 2022

- Place: Almaty, Kazakhstan or online

- https://missi.pwr.edu.pl/