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SRT Introduction

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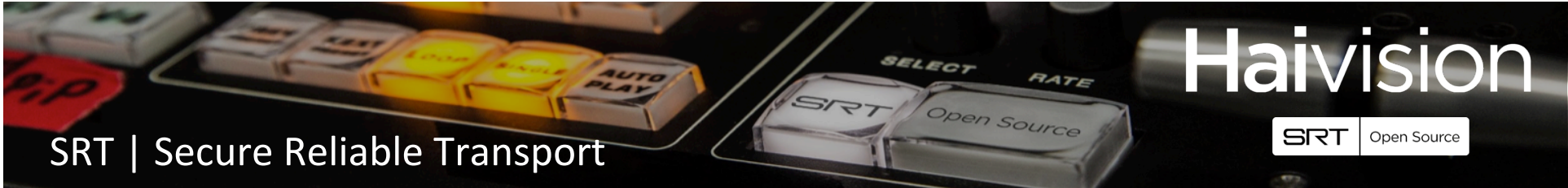


Agenda

- Overview and a Brief History
- SRT Protocol Fundamentals
- SRT Development Update & Plans
- Engagement Community Growth
- Q&A



*Enabling **low-latency video** contribution & distribution and **fast file transfer** over unpredictable networks.*



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SRT | Open Source

SRT | Secure Reliable Transport



Pristine Quality

Protect against jitter, packet loss and bandwidth fluctuation, so your viewers get the best viewing experience.



Low Latency

Configurable control to deliver low latency video while overcoming network challenges.



Firewall Friendly

Establish quality streams from event centers and unknown locations without IT involvement.



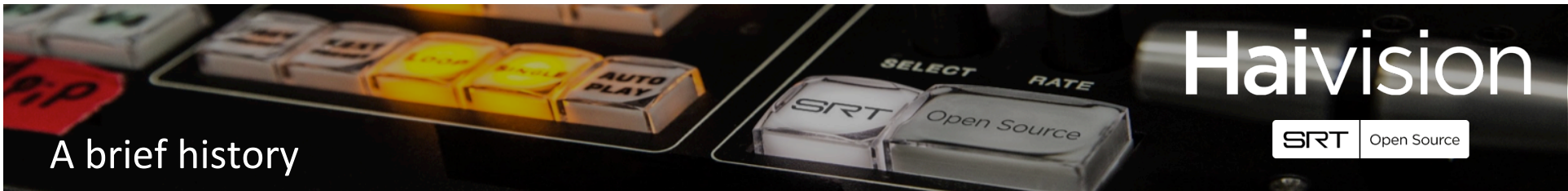
Secure

End-to-end 128/256 bit AES encryption makes sure your content is protected from contribution to distribution.



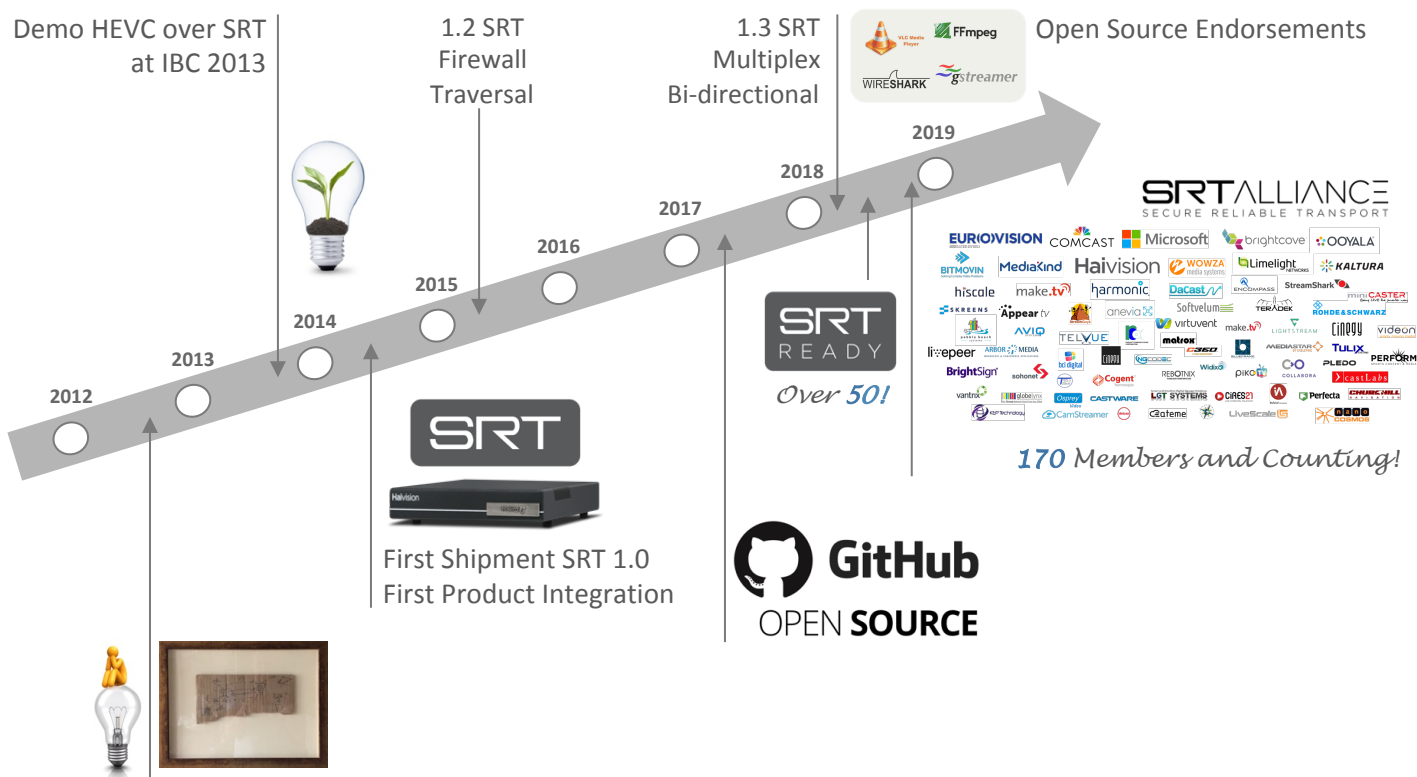
Open Source

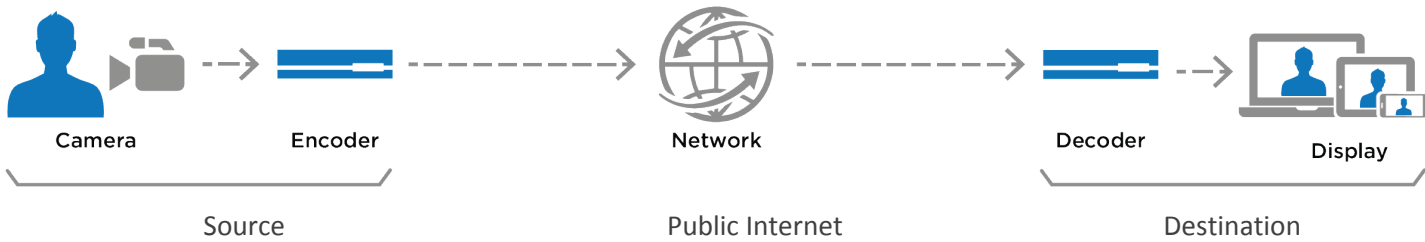
Wide adoption assuring interoperability and longevity, a strategic networking partner for the top clients.

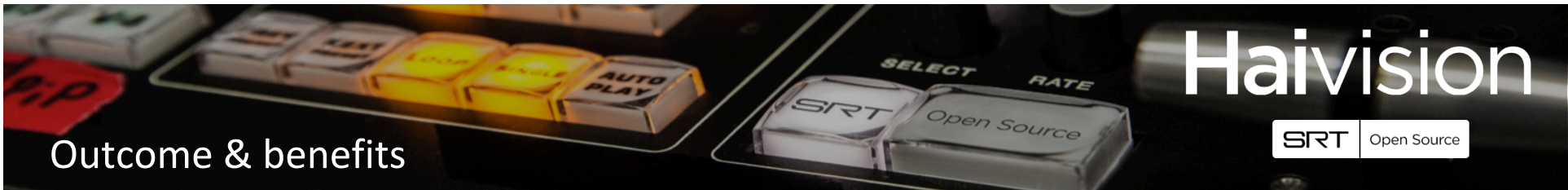


A brief history

SRT Open Source



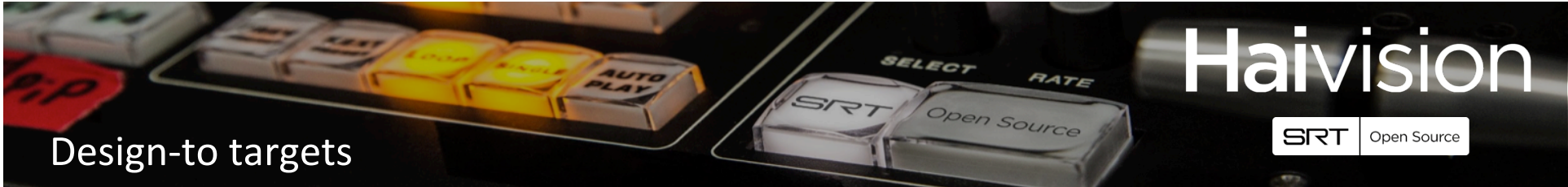




Correct for unpredictable network impairments that hinder real-time audio, video, and metadata

- **Packet loss** – packets being discarded by routers
- **Jitter** – packets arriving at different times than expected
- **Delay** – the time from sender to receiver
- **Bandwidth** – the fluctuating capacity between points



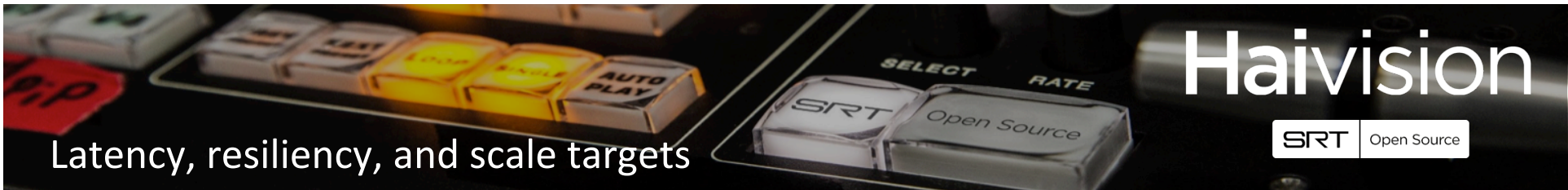


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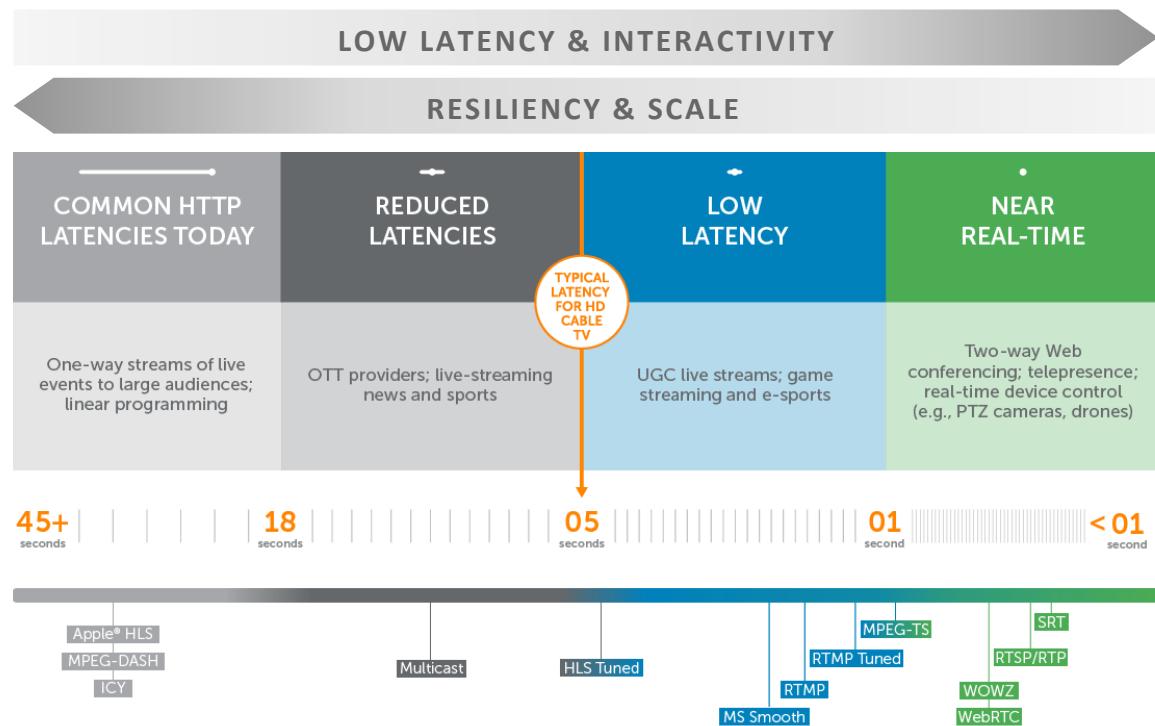
Design-to targets

- ✓ Video
- ✓ Audio
- ✓ Metadata
- ✓ Control data
- ✓ Any type data
- ✓ Content agnostic
- ✓ Format agnostic
- ✓ Stream integrity
- ✓ Data integrity
- ✓ Secure
- ✓ Live Streaming
- ✓ File transfer
- ✓ Real-time
- ✓ Non-real-time
- ✓ IT-friendly
- ✓ Transport layer
- ✓ Multiplexed
- ✓ Bi-directional
- ✓ Low-latency <1s
- ✓ Tuned latency

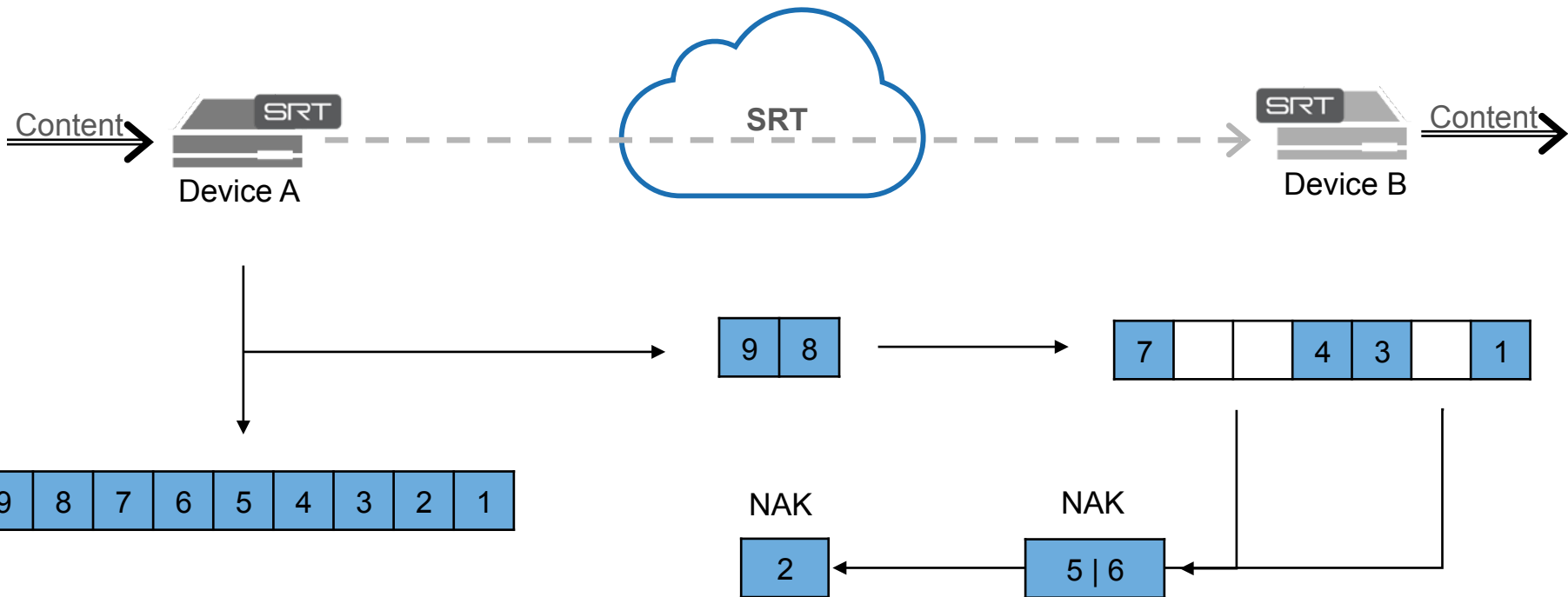


SRT Attributes & Targets

- Unicast only
- UDP with ARQ
- Fast retransmission
- Selective retransmission
- Sub-1s tunable and fixed latency
- Real-time, no chunking
- FEC compatible (for unidirectional and multicast support)
- Not focused on consumer delivery
- Scale to thousands not millions
- SDI to IP/TS over WAN workflows
- Minimal compute overhead and memory footprint

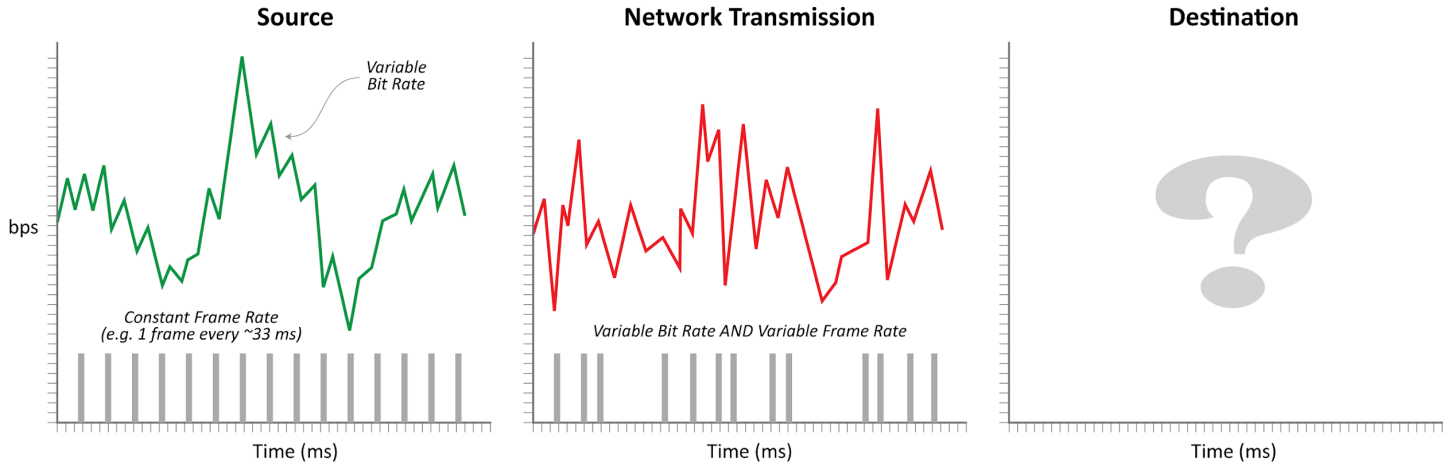


Source: Wowza streaming blog





Stream Integrity & Timing

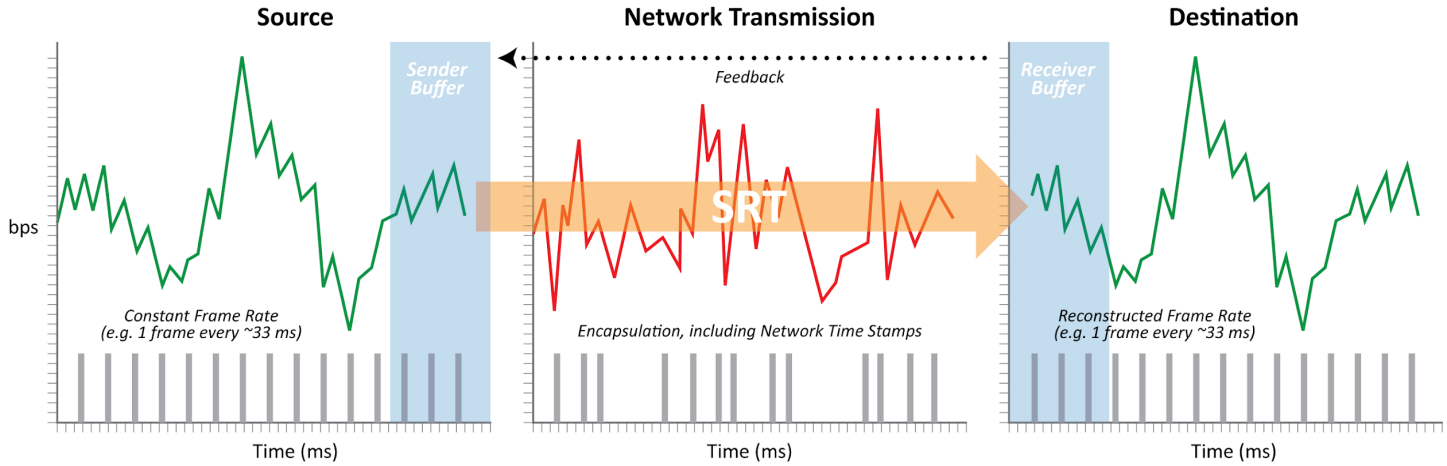


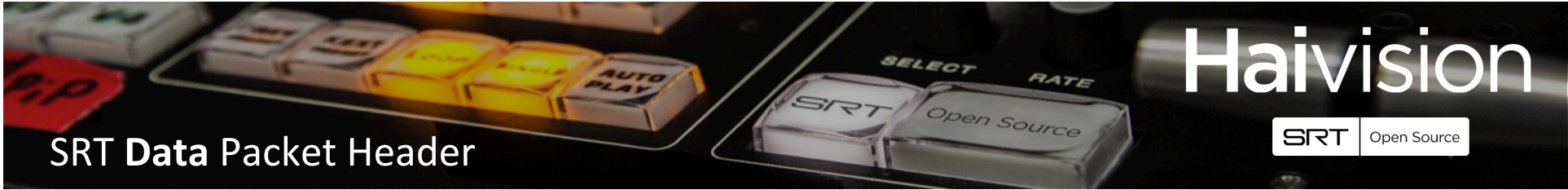


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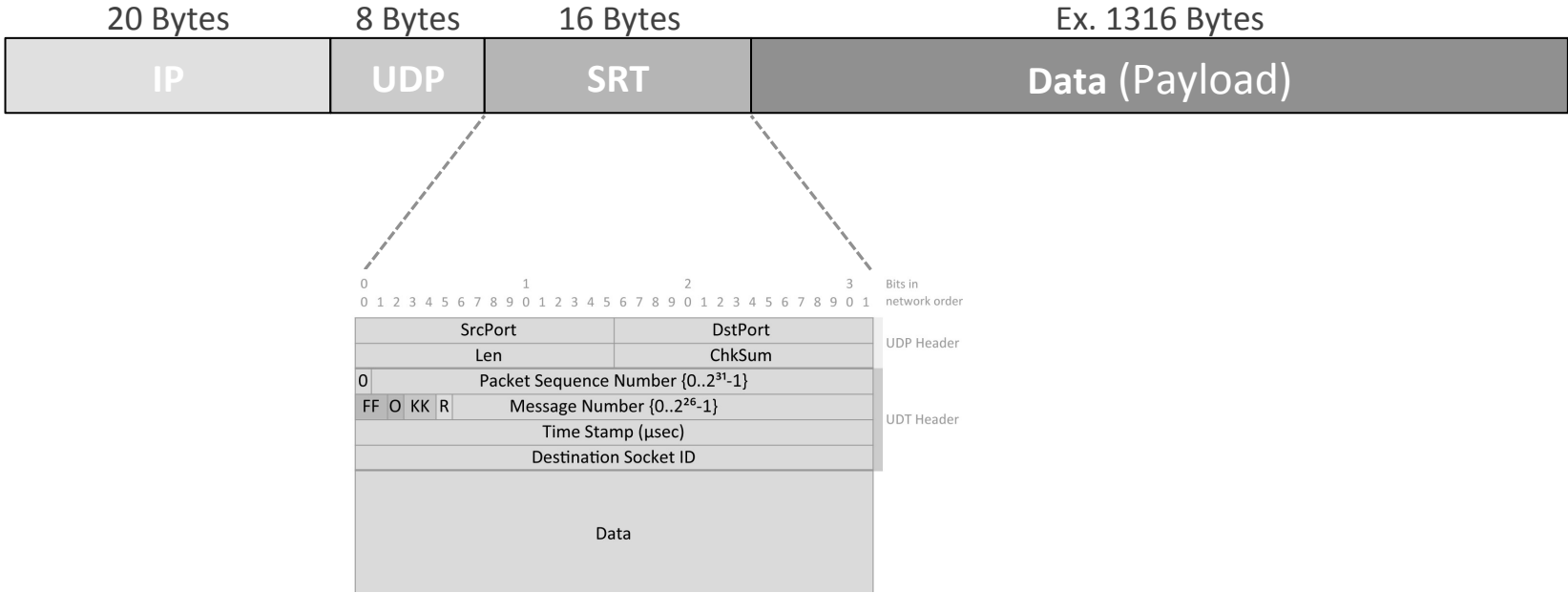
SRT Open Source

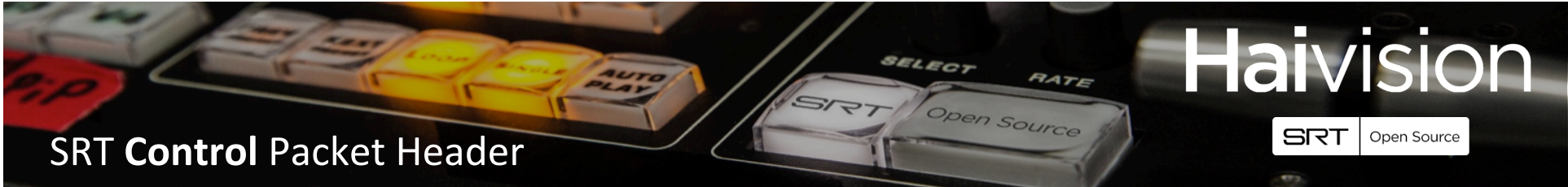
Stream Integrity & Timing



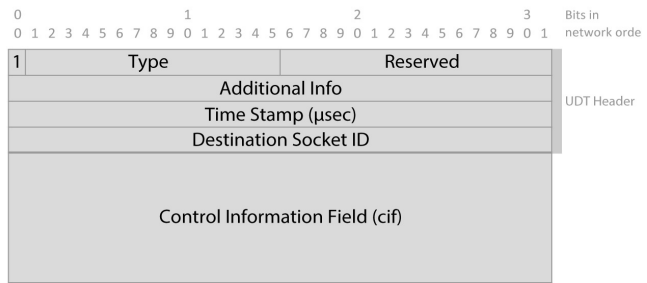


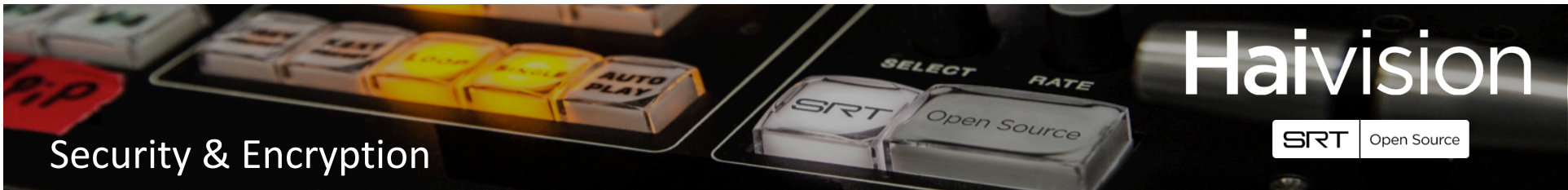
SRT Data Packet Header



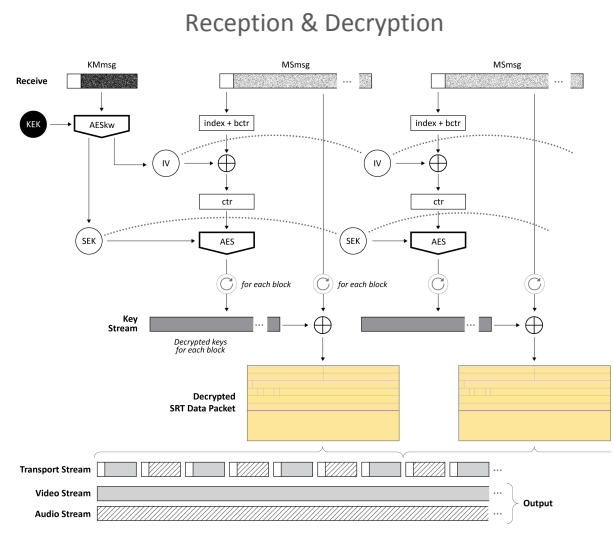
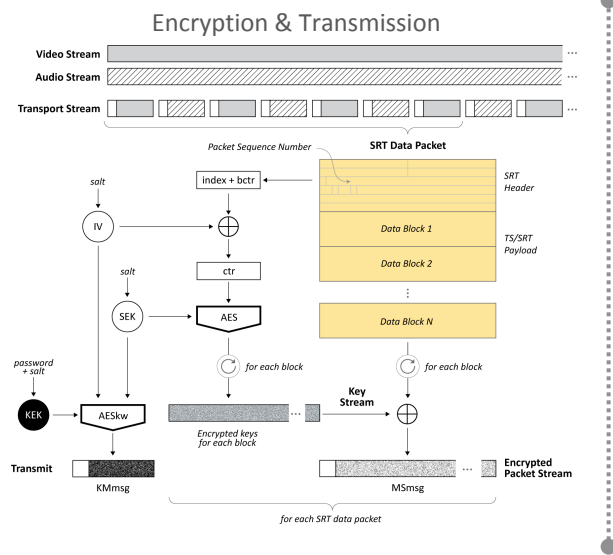


SRT Control Packet Header



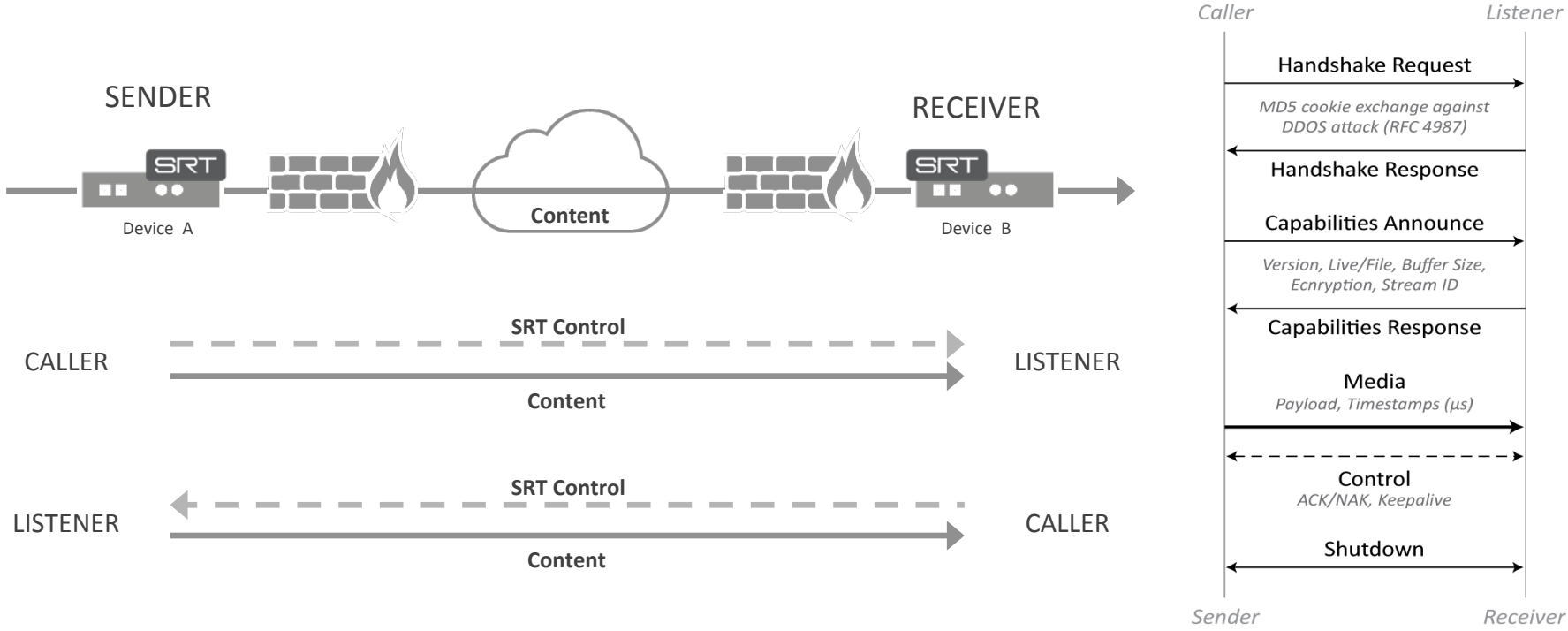


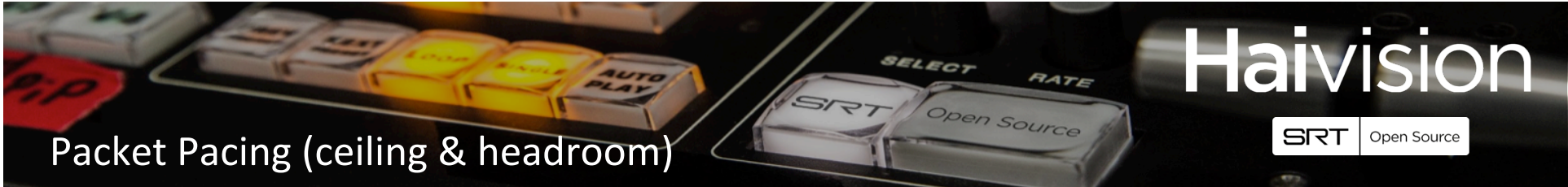
- DDOS attack prevention
- AES 128/192/256-bit encrypted
- Payload encrypted with cipher in AES-CTR mode
- Secret/pass-phrase is not part of the protocol (application layer)





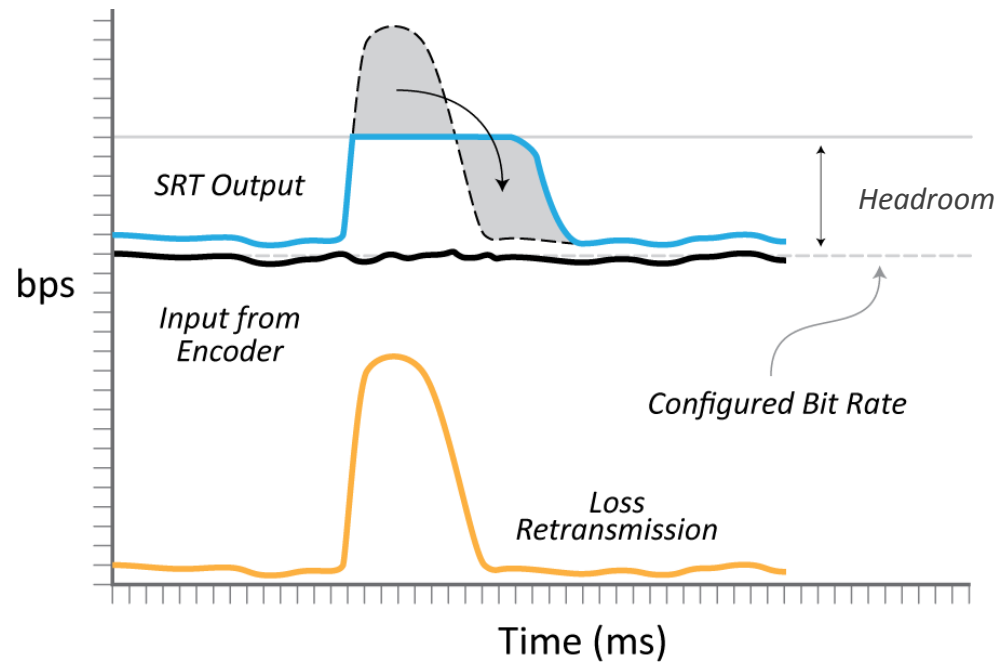
Data & Control Flow





Packet Pacing (ceiling & headroom)

- Headroom for possible retransmission
- Packet recovery pacing
- Maintain a ceiling to avoid snowball effect





SRT Roadmap

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SRT Open Source

LATEST RELEASE

- SRT 1.3.2
 - Stability, Security & bug fix release
- Recap of new 1.3 features
 - Fully bi-directional transport & encryption
 - UDP layer stream multiplexing
 - Encrypted fast file transfer

COMING SOON

- SRT 1.4
 - Plugin (filter) API
 - FEC plugin
- SRT 1.5
 - SRT Socket group redundancy
 - Improved congestion control for raw data mode



SRT Roadmap

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SRT Open Source

PROTOCOL DOCUMENTATION

- Now available
 - Protocol implementation
 - Data structure layout
 - Handshake and data flow
- github.com/Haivision/srt/issues/479
- Target: Specification (RFC)



Engagement & Community Growth

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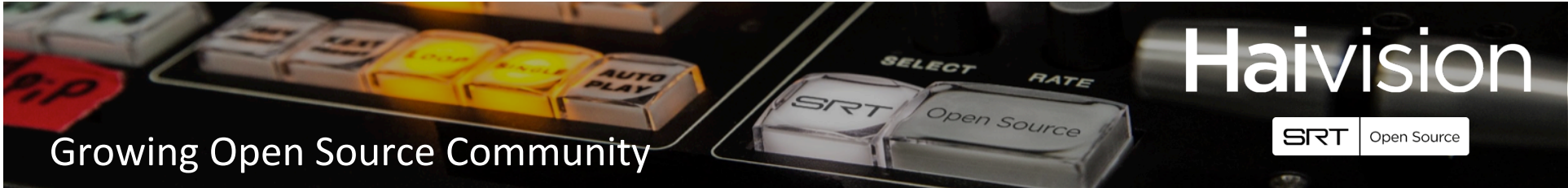
SRT Open Source

SRT VIRTUAL PLUGFEST

- May 15-16, 2018 plugfest – A success!
 - 57 successful interoperability tests!
 - 15 SRT Alliance members participated
- Next plugfest – After NAB 2019
 - Stay Tuned!

TECHNICAL ADVISORY BOARD

- Reaching out to the most active Individuals in the community
- Establish regular communication
- Goal is to steer the SRT development according to industry trends & requirements



Open Broadcaster Software

Free, open source software for live streaming and recording



170 Members to date!

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SRT | Open Source

A large grid of logos for various member companies of the SRT Alliance. The logos are arranged in approximately 10 rows and 10 columns. The companies represented include:

- EUROVISION (CREATED BY YOU)
- COMCAST
- Microsoft
- brightcove
- OOYALA
- BITMOVIN (Solving Complex Video Problems)
- MediaKind
- Haivision
- WOWZA media systems
- Limelight NETWORKS
- KALTURA
- hiscala
- make.tv
- harmonic
- Dacast
- ENCOMPASS
- StreamShark
- miniCASTER (Going LIVE the smarter way)
- SKREENS
- Appear tv
- StreamGuys
- anevia
- Softvelum
- TERADEK
- ROHDE & SCHWARZ
- pebble beach systems
- AVIQ SYSTEMS
- virtuvent
- make.tv
- LIGHTSTREAM
- Cinegy
- videon (simply movina media)
- livepeer
- ARBOR MEDIA (BROADCAST & CONFERENCE APPLICATIONS)
- TEL VUE
- RADIANT COMMUNICATIONS CORPORATION
- matrox C360 (A VIDEO REVOLUTION)
- BLUEFRAME
- MEDIASTAR BY CABLETIME
- TULIX SYSTEMS
- BrightSign
- sohonet
- bci digital
- Cinegy
- NGCODEC
- Widix
- PIKO TV
- COLLABORA
- PLEDO
- PERFORM (SPORTS CONTENT & MEDIA)
- vantrix
- globelynx (The IP Ready Network Direct From Your Office)
- Osprey Video
- CASTWARE
- LGT SYSTEMS (Smart and Intuitive Digital Signage Solutions)
- REBOTNIX (TECHNOLOGY FOR MOVIE PICTURE)
- Widix
- PIKO TV
- COLLABORA
- castLabs
- KEP Technology
- CamStreamer
- deluxe
- eateme
- LiveScale
- Perfecta
- CHURCH HILL NAVIGATION
- nano COSMOS



SRT ALLIANCE
SECURE RELIABLE TRANSPORT

170 Members to date!

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Call to action!

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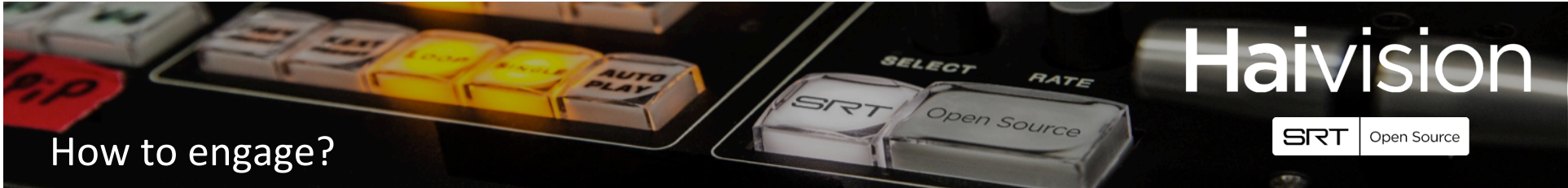
**BETTER
TOGETHER!**

Understand industry challenges

Maintain interoperability

Provide balanced feedback

Help steer future direction



SRTALLIANCE
SECURE RELIABLE TRANSPORT

SRTalliance.org



github.com/Haivision/srt



**SRT Virtual
Plugfest**



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