

# Using Simulcast in RTP Sessions

draft-westerlund-avtcore-rtp-simulcast-03

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# IPR Disclosure

- › For referred draft-westerlund-avtcore-rtp-simulcast
  - <http://datatracker.ietf.org/ipr/1637/> (Ericsson)
  - <https://datatracker.ietf.org/ipr/1931/> (Microsoft)
  - <https://datatracker.ietf.org/ipr/2157/> (Microsoft)

# Presentation Goal

- › Establish consensus on what simulcast means in terms of signaling
  - Express Simulcast capability
  - Negotiate and configure Simulcast versions of a Media Source
- › RTP level discussion taken separately in AVTCORE

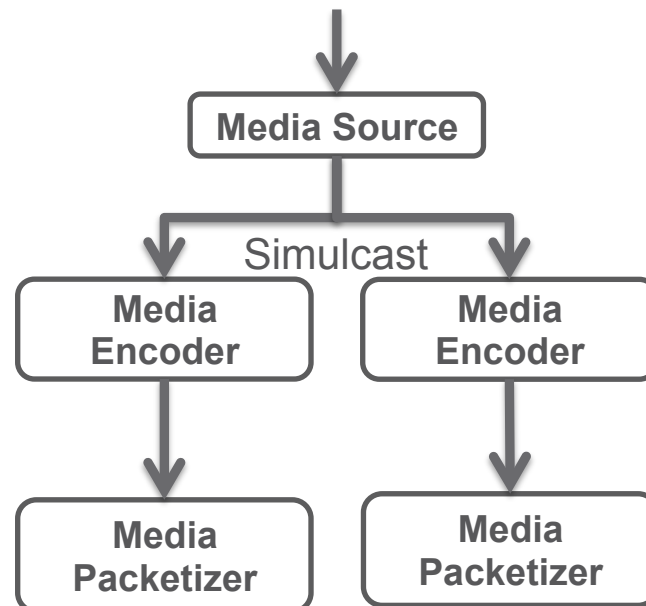
# Current Situation

- › Signaling Simulcast is inherently complex:
  - Support multiple quality dimensions such as bandwidth, codec specifications and sampling variations (temporal and spatial)
  - Need a way to associate multiple RTP Packet Streams with an originating Media Source
  - Handle the dynamic nature of multi-party conferences – participants join and leave
  - Enable media path stream control – pause/resume to minimize session level signaling
- › Proprietary solutions already deal with this today
- › Need a standardized approach for multi-vendor interop
- › Emerging standards like WebRTC and CLUE are driving the need for standardized solutions

# Simulcast PRIMER

# Simulcast Definition

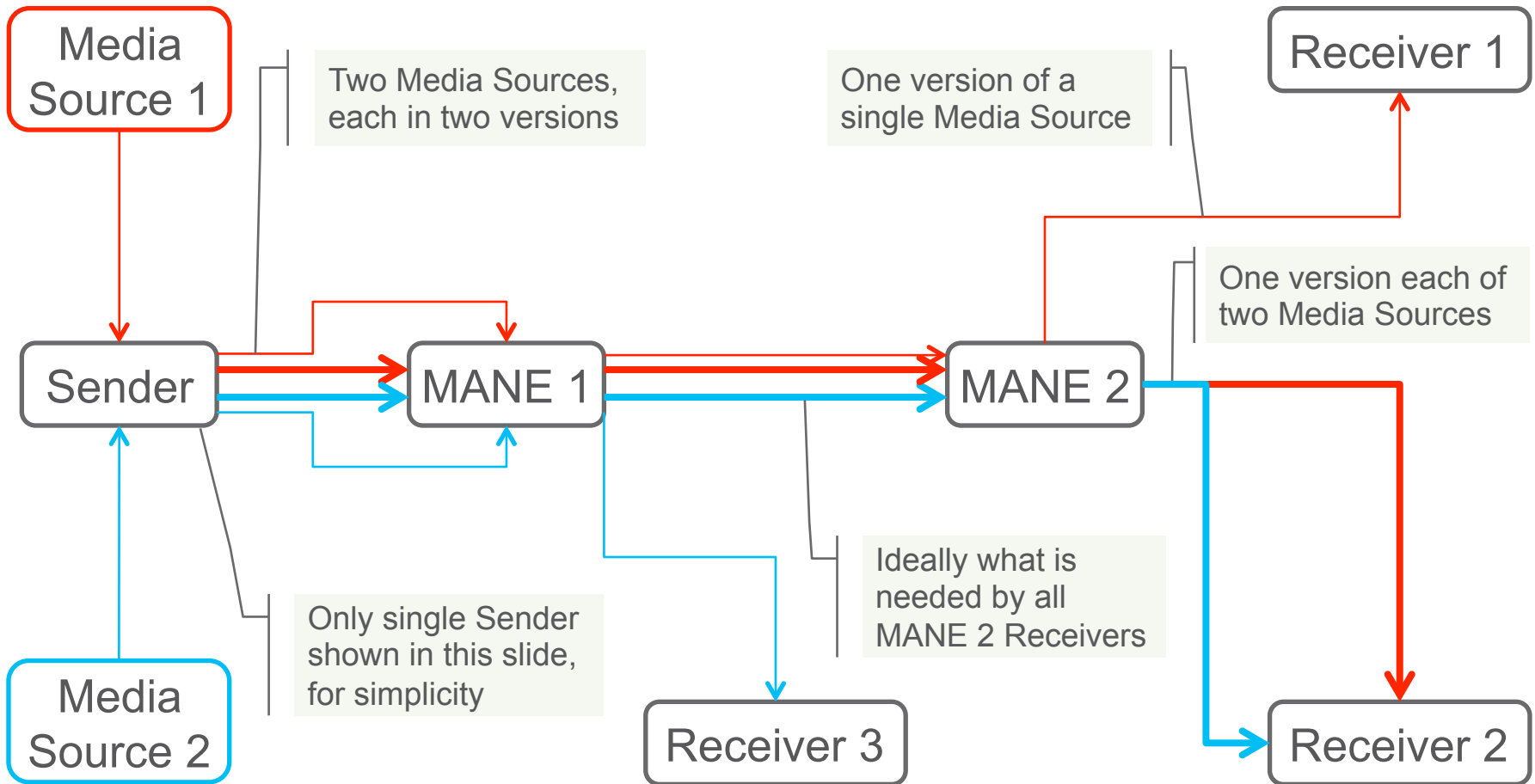
- › Simulcast is simultaneous transmission of multiple different and independent Encoded Streams originating from the same Media Source
  - Terms from RTP Taxonomy draft



# Overall Simulcast Targets

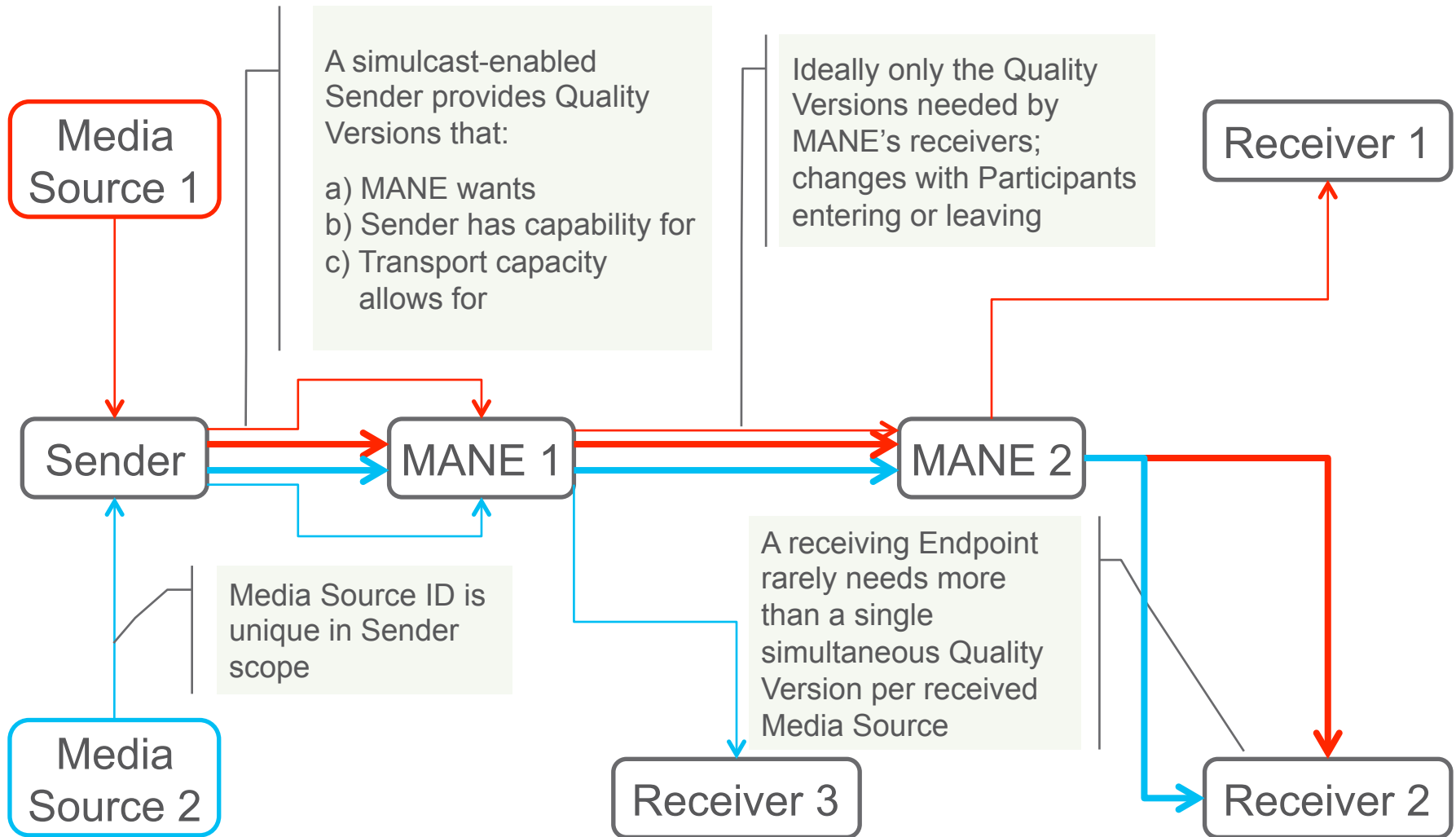
- › Enable Media Aware Network Elements (MANEs) to avoid media transcoding to the furthest extent possible
- › Enable diversity in media capability across receivers
  - Endpoint capability
  - Transport capability
- › Limit amount of needed signaling when a Participant enters or leaves a Communication Session

# Sample Topology





# Quality Version



# Solution Requirements/Goals

# Solution Requirements

- › Lets you enumerate potential configurations to send/receive as Simulcast
- › Grouping of the configurations that you will use as Simulcast
- › Something to express the values or ranges of the various parameters, such as bitrates, payload types, resolution etc
- › The ability to establish this asymmetrically (send / receive)

# Solution Goal 1

## Support for Unified Plan

› Each m= line captures:

- One Media Source
- All Encodings / Simulcast versions for a given Media Source
- Corresponding FEC/RTX Streams, if any

# Solution Goal 2

## Encoding Flavors

Flavor	Description
Codec	This includes codec type (such as SDP MIME type) and can include codec configuration options (e.g. SDP fntp parameters)
Sampling	This relates to how the Media Source is sampled, in spatial as well as in temporal domain
Bitrate	This relates to the amount of bits spent per second to transmit the Media Source as an Source Packet Stream, which typically also affects the Quality of Experience (QoE) for the receiving user

# Solution Goal 3

## Deal with limited PT space

- › SDP m-line format, RTP Payload Type, captures quality parameters – Codec configuration, Image resolution, ...
- › One PT per quality might exhaust PT space, especially when combined with FEC / RTX per quality
- › Not all desirable aspects of quality can be expressed per PT in SDP – e.g. bandwidth
  
- › **Need a way to conserve PT space**
  - Re-use single PT to express multiple quality levels
  - Sub PT type mechanism is needed

# Solution Goal 4

## Minimize Signaling

- › SSRCs as Media Source identifiers are problematic:
  - SSRC collisions imply re-signaling
  - SSRC based switching isn't optimal
  - Ties application layer logic to the RTP Layer
- › Need a way to support application based roles (like active speaker) to be SSRC agnostic
- › Need a way to identify Media Source and its' corresponding Simulcast streams
- › Avoid having to re-signal SSRC when Participants leave/join a conference

# Solution Proposal



# Solution Proposal

- › PT identifies a Codec
- › New Identifier to map PT to multiple quality levels
  - config-id, applId
- › Identifier in RTP packet that maps content quality level back to SDP media block and PT
  - config-id
- › Mechanism to associate a Media Source and its Simulcast streams
  - SRCName association
- › Mechanism to enable asymmetric capabilities of the Simulcast participants

# Next Steps

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- › Propose SDP solution based on the proposal to the mailing list
- › Prepare next version of the draft