Routing “Mono” audio in an Multi-Channel stream Environment

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IP SHOWCASE

Audio Engineering Society · AIMS Alliance for IP Media Solutions · AMWA Networked Media. Working. · EBU · SMPTE · VSF Video Services Forum

Why is Audio always the Problem?

- Audio is used in very different ways in different parts of the chain
  - Playout, Master Control, and Distribution (usually) organize the audio into a fixed arrangement of finished mixes (5.1, 2.0)
  - Production (usually) organizes the audio into groups of related sources – but it varies…
  - Both have exceptions and variations
  - Both need the ability to “fix errors” when they crop up

- IP did not create this headache, it’s been this way for years
  - With embedded audio, video routers can have dis-embedders on the way in, and embedders on the way out, and an audio matrix in between

  - What about the IP case?

The Audio Problem in IP

- In IP systems, audio is organized into streams
  - Streams usually contain multiple channels in order to manage complexity
- IS-04 lists the streams (senders)
- IS-05 connects the streams (to the stream receivers)
- But what if you want to manipulate it?
  - Shuffle, substitution, or even wild-mapping? How?

What Problem does IS-08 Solve?

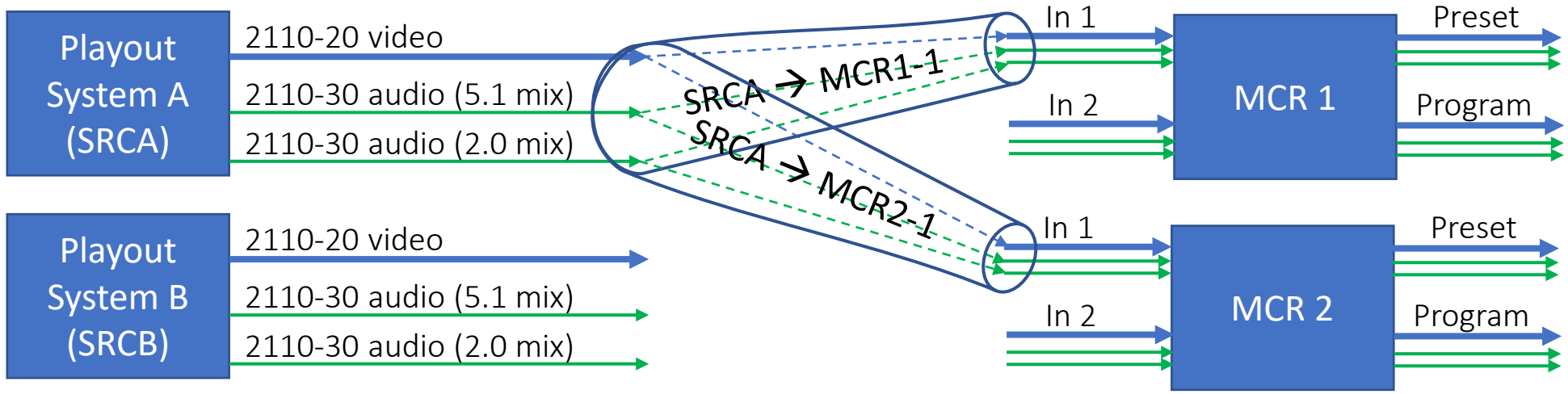
- IS-04 and IS-05 treat audio streams as monolithic essences – mixes or tracks to be kept together in the network, and switched together to the receiver
- Sometimes, operationally, there is a need to route the individual tracks more specifically – at the “mono” level
- IS-08 provides an open/public API for controllers to manipulate the individual tracks after the receivers, while retaining the general efficiency of keeping related tracks organized together into streams
- IS-08 also can control how channels map into the senders

Why not just make every mono channel into a separate multicast audio stream?

- Making each track its own stream is possible, except…
  - It creates a more complicated system overall because of the very large number of streams
  - Most receiving devices don't have a lot of separate audio stream receivers, so (not enough RX to do it)
  - Overall signal switching time can suffer because of the number of separate stream "joins" in every operation

Audio Stream Routing

- What is Stream Routing?
  - Its what 2110-30 + IS-05 does by default
  - Routes logical groupings of content easily



Audio Stream Routing

- What is Stream Routing? Its what 2110-30 + IS-05 does by default
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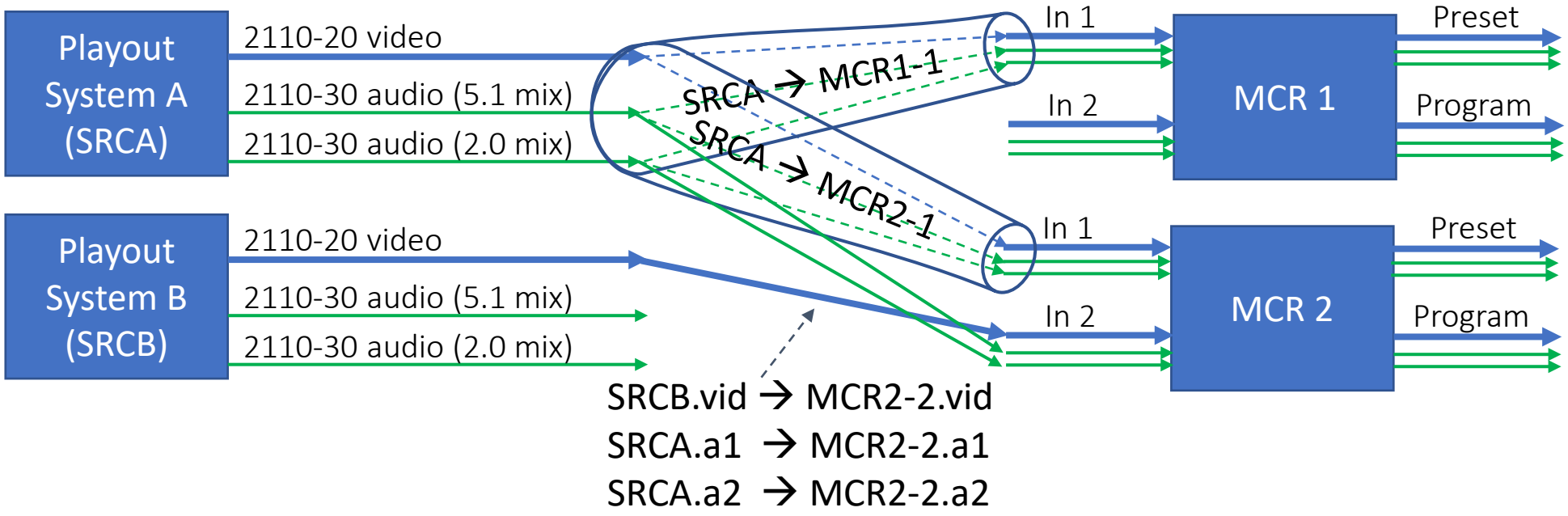
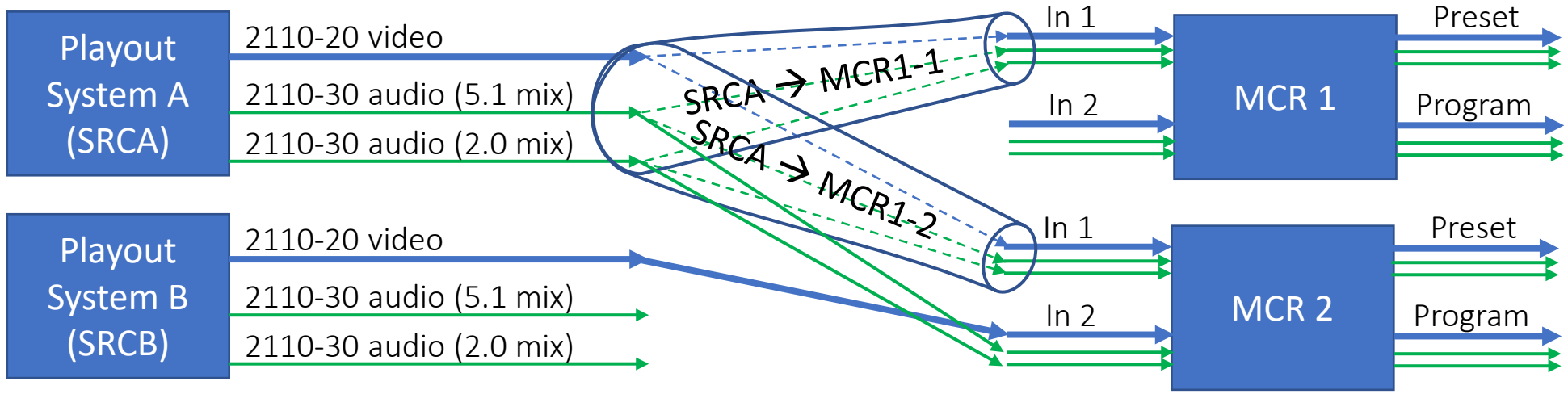
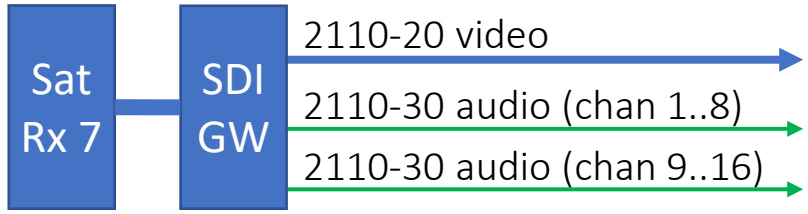
  - Break-away routing at the stream level works with IS-05 today



Audio Stream Routing

- What is Stream Routing? Its what 2110-30 + IS-05 does by default
  - Routes logical groupings, with Break-away routing at the stream level
  - But how do you integrate signals that are not consistent?

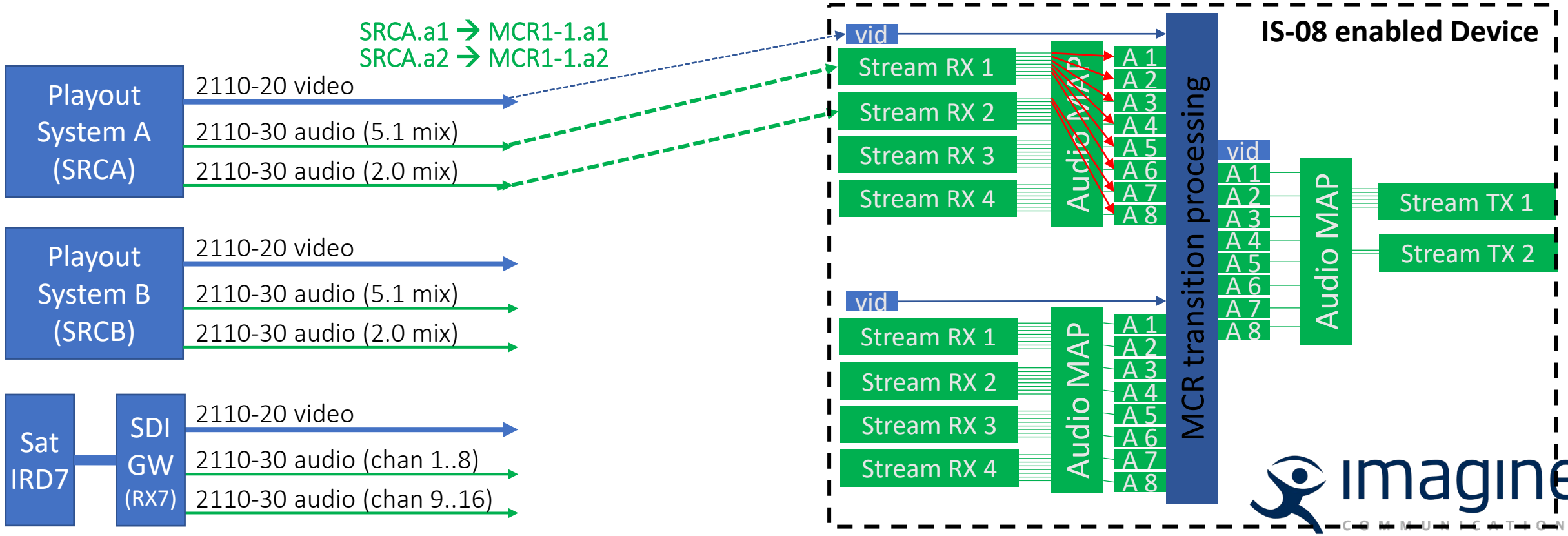




What do I do with these?
They are different for every show.
And they are not organized like the others.

Audio Stream Routing + Track Routing

- System can treat the internal audio channels as the routing destinations
  - Controller manages the device's stream receivers using **AMWA IS-05**
  - Controller manages the device's downstream mappings using **AMWA IS-08**
  - User can have *total control in a logical way* through control system using both



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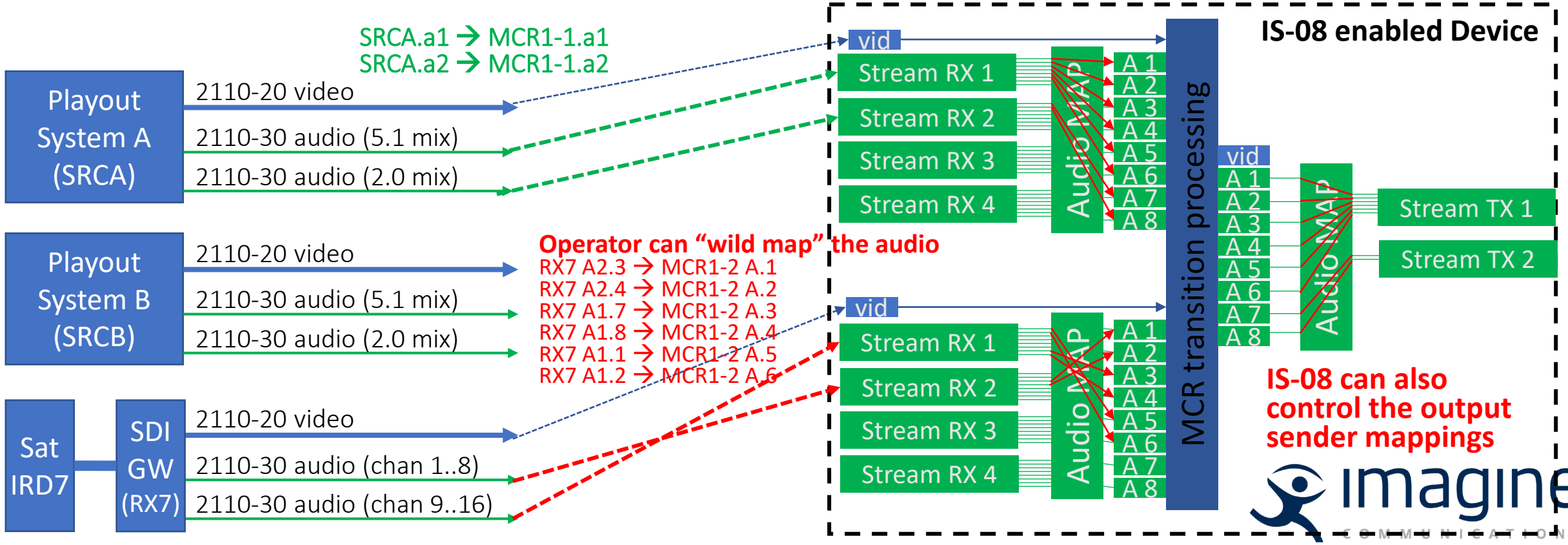
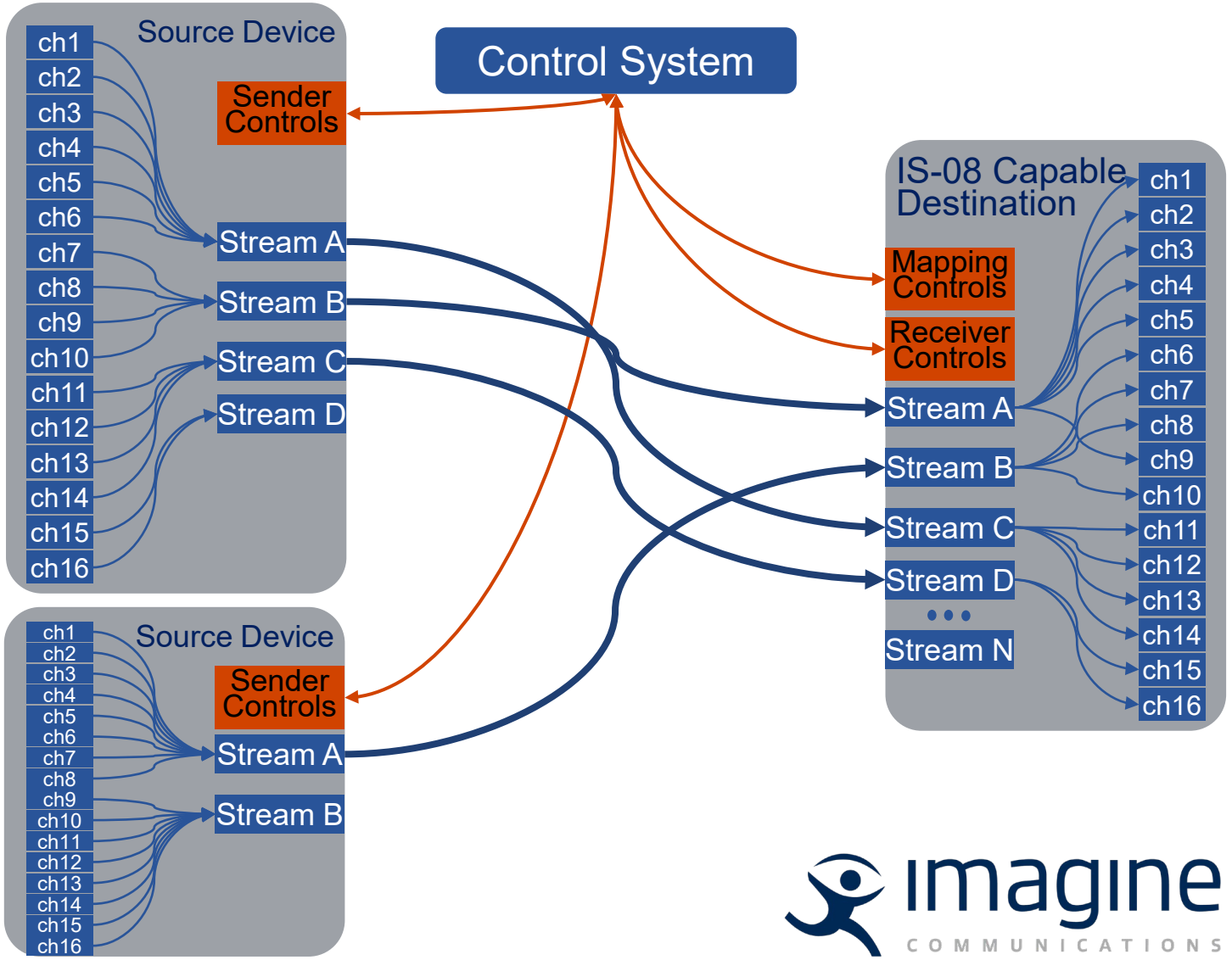


Did we really need IS-08?

- Audio Track Routing requires the controller to manipulate downstream of the receivers (and upstream of the senders).
  - Today, this is different on every device, and some devices don't support an API even though they internally have the capability to route the signals
  - So, the controller needs to create a driver for every different device
- Nobody likes writing new drivers for every new device
- IS-08 provides a common API that devices can implement, to enable this very necessary behavior

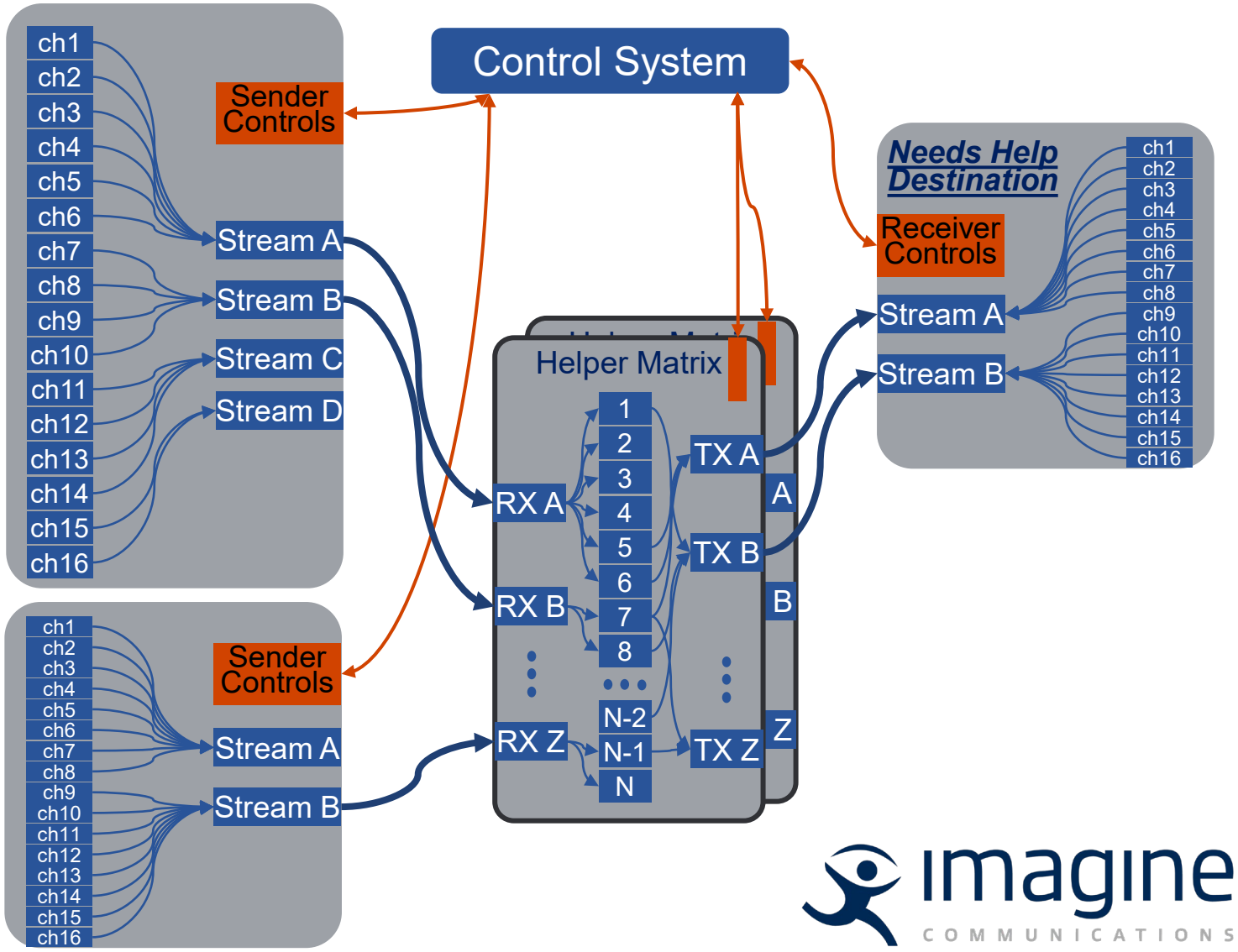
Hybrid Case – Devices that support IS-08

- IS-08 Capable Destinations
  - Need “Enough” Stream Receivers
  - Controllable internal mapping
- Control System manages the receivers, and sends the necessary streams to the end device
- Control System also manages the channel mapping inside the device
- Channel-level routing is supported including break-away cases between and across streams



Hybrid Case - Devices that *Need Help*

- Some Destinations need help
  - No Convenient API for mapping
  - Not enough stream receivers
- System Includes ***Helper Matrices***
- The Helper Matrices do mono channel routing for devices that can't do it themselves
  - Using standard audio matrix
- Channel-level routing is possible including break-away cases within and across streams
- ***Practical Systems will include both IS-08 and helper devices***



What is the Status of AMWA IS-08?

- The Specification has been approved by the AMWA Board and is a published AMWA Interface Specification, IS-08

- While devices adopt it, systems can be built using the hybrid method to get the job done

ALL AMWA Specifications are available for FREE at https://specs.amwa.tv/nmos/

Thank You ….. Or ….. Any Questions?

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Questions?

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