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FAST FORWARD 2021
ATLANTA, GA
OCTOBER 11-14
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2021 Fall Technical Forum
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Video Services

Enabling Automation for Mapping Linear Channel Feeds and VOD Files into DASH Structures

Alex Giladi

Fellow
Comcast

2021 Fall Technical Forum
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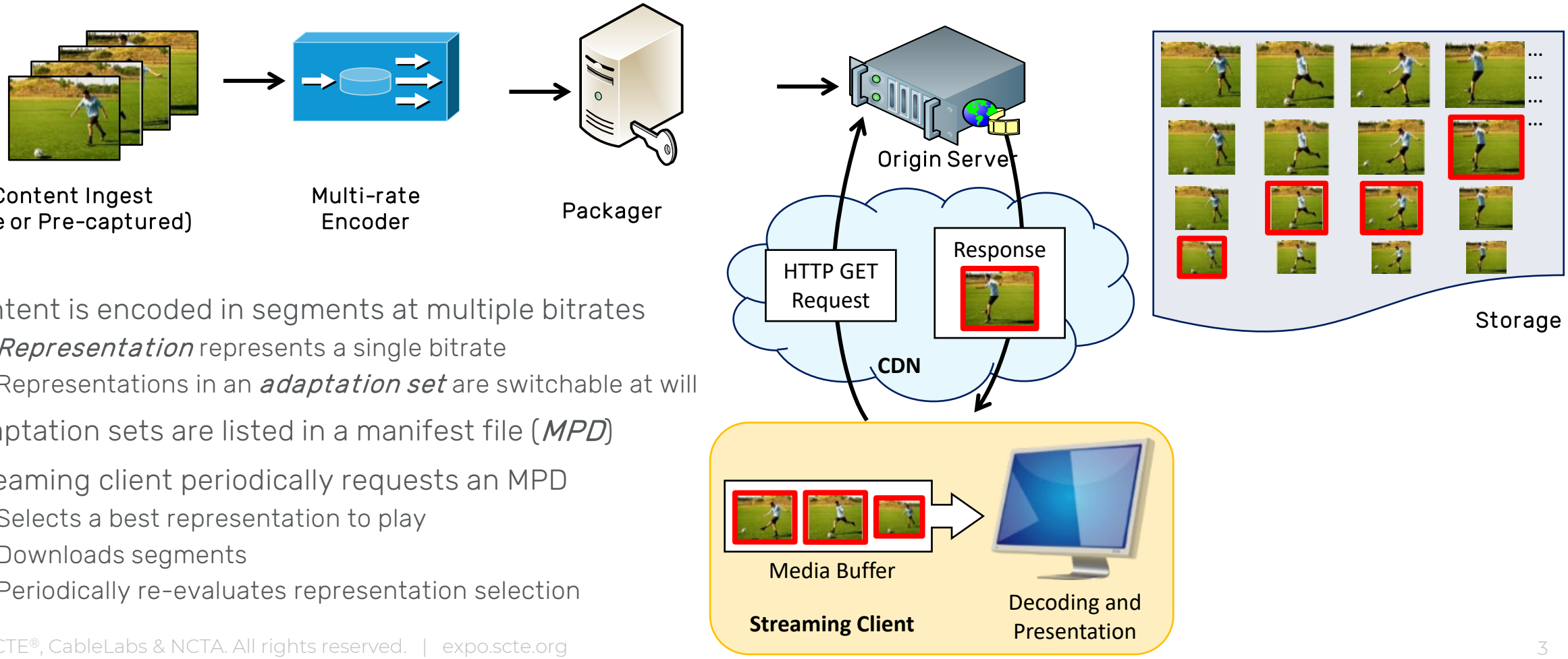

- Content is encoded in segments at multiple bitrates
  - *Representation* represents a single bitrate
  - Representations in an *adaptation set* are switchable at will
- Adaptation sets are listed in a manifest file (*MPD*)
- Streaming client periodically requests an MPD
  - Selects a best representation to play
  - Downloads segments
  - Periodically re-evaluates representation selection

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New in ABR: late binding

- Content has different purposes
  - Main: primary video and audio
  - Accessibility: closed captioning, audio description, sign language, dialog enhancement
  - Translation: alternative audio and subtitles
- Traditional distribution methods (QAM/DBS, et al) allow limited number of purposes
  - Simulcast required for all content
  - Limited number of closed captioning languages and usable channels
- Late binding in adaptive streaming
  - MPD lists and describes all available content
  - Client decides which subset of primary and/or alternative content to download
- DASH roles used to describe the purpose of an adaptation set
  - Essential for enabling late binding
- … the role information needs to be sourced from somewhere

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Contribution and Mezzanine Delivery

- Linear and (in many cases) VOD mezzanine delivery done in MPEG-2 TS
  - PMT descriptors typically used for metadata on content components in a multiplex
    - ISO 639-2 language descriptor
    - AAC and AC-3 audio descriptors
    - Caption service descriptor (ATSC)
- Many deployments rely on ad-hoc workarounds for expressing purpose
  - Assigning static PIDs
  - Lowest audio PID as default audio
  - Overloading the ISO 639 language value to express purpose
    - Does ‘ori’ stand for “original” or the Odia language (spoken by >35m in India)?
    - Is ‘nar’ “narration” or Iguta language (spoken by 100K in Nigeria)?
    - Doon ye speak middle english?

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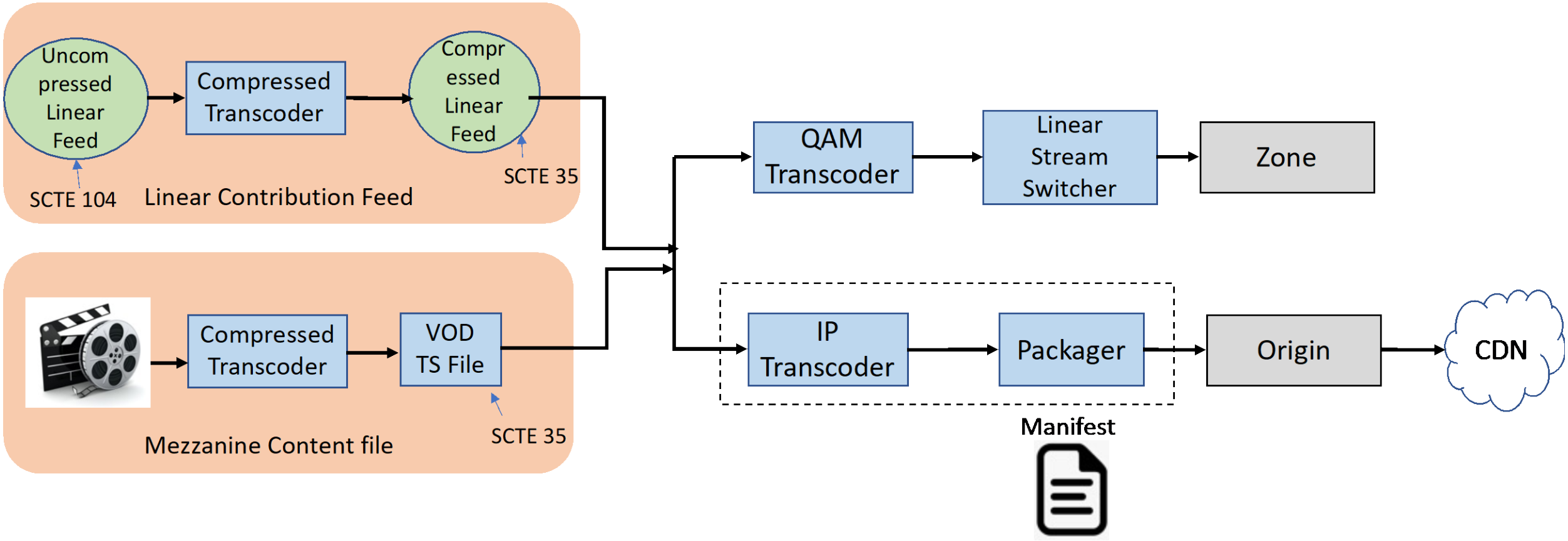
Source Content Workflows for Contribution & Mezzanines



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ISO 639 Language Descriptor

- PMT descriptor used to describe language
  - Allows expressing number of audio types
  - List of types expanded in the 8th edition of the MPEG Systems spec (ISO/IEC 13818-1:2021)
- Shortcomings
  - Describes audio, not video (e.g. sign language) or text (e.g. closed captioning / subtitles in TTML)
  - Uses ISO 639-2 which lacks some useful language codes and features
    - Multi-language ('mul') and sign language codes are in ISO 639-3, multiple codes for some languages

Pre-2021 audio_type values	ISO/IEC 13818-1:2021 audio_type values	
Undefined	Undefined	**Primary**
Visually impaired	Visually impaired	**Native**
Hearing impaired	Hearing impaired	**Emergency**
Clean effects	Clean effects	**Primary commentary**
		Alternate commentary

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Mapping Descriptors to Roles

Table 1 – audio_type values in language descriptor for audio services

Type	Role@value	Accessibility@value
Audio default (audio_type = 0x00 | bsmod [ST] = 000)	main	N/A
Clean effects (audio_type = 0x01 | bsmod [ST] = 001)	SCTE: Music & Effects	N/A
Primary Audio (audio_type = 0x80)	main[1]	N/A
Native Audio (audio_type = 0x81)	absence of dub	N/A
Emergency (audio_type = 0x82 | bsmod [ST] = 110)	emergency	N/A
Primary Commentary (audio_type = 0x83 | bsmod [ST] = 101)	main[2], commentary	N/A
Alternate Commentary (audio_type = 0x84)	alternate, commentary	N/A
Bsmod [ST] = 100 or 111	TBD	N/A

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- Includes (E-)AC-3 bsmod values used in AC-3 descriptors and bitstreams

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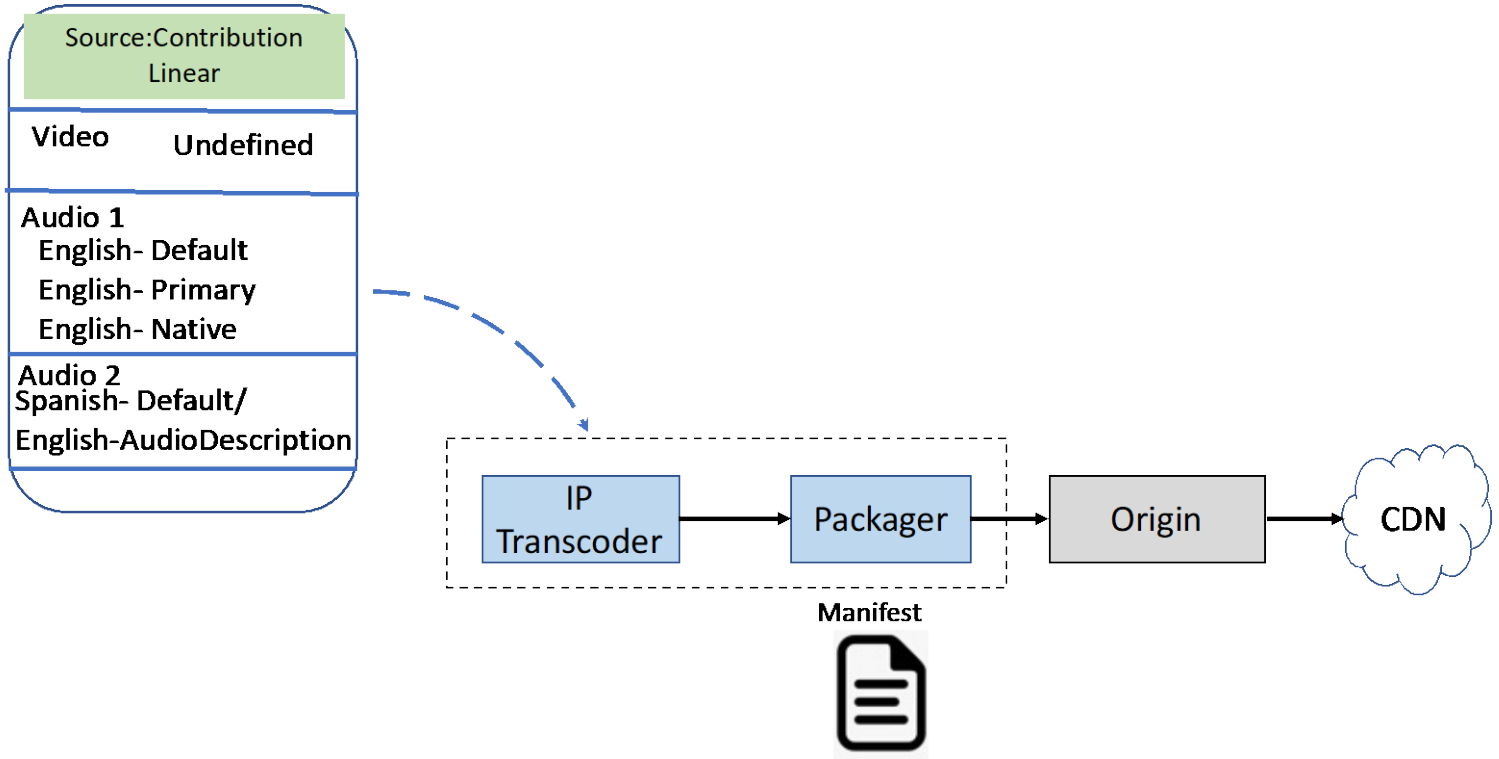
Contribution Configuration and Resulting Player Experiences



- Channel limited to 1 Video and 1+2 Audio
- DASH mapping can create several user experiences
- Experiences can change on a program-to-program basis

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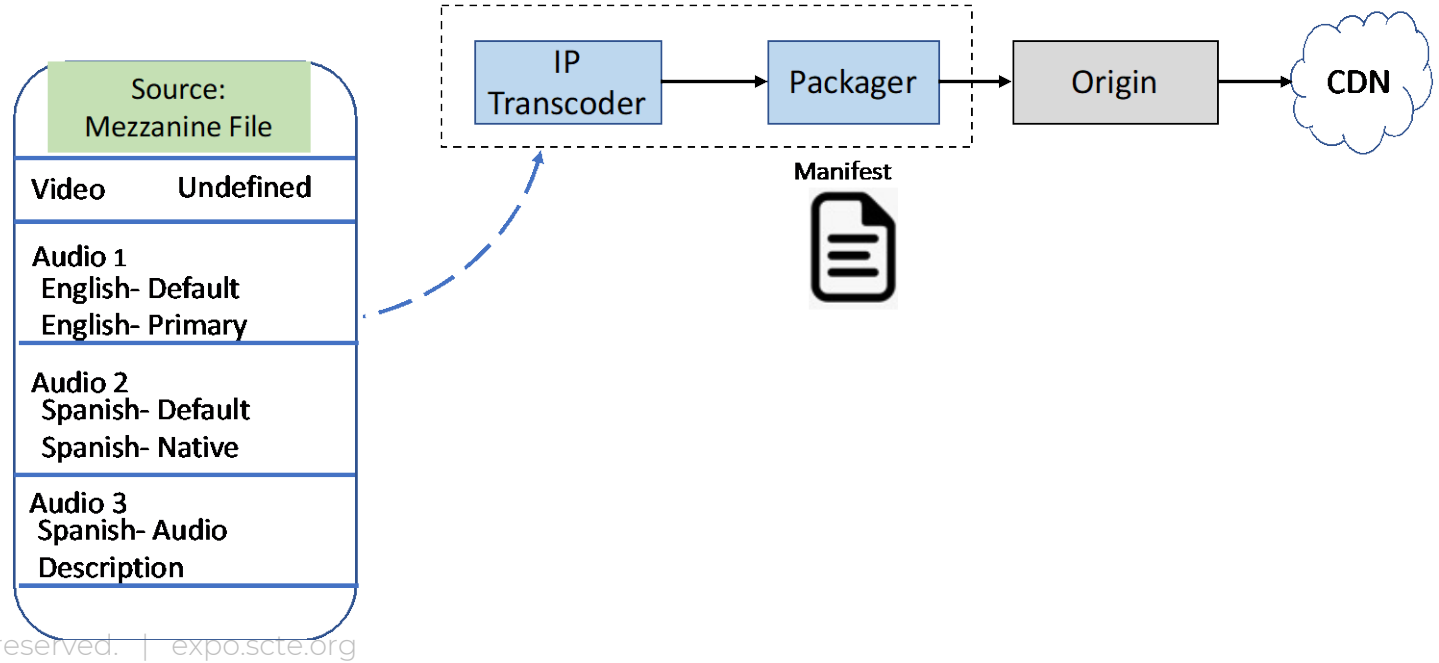
Mezzanine Configuration and Resulting Player Experiences

- VOD has a wider number of audio tracks
- DASH mapping can create several user experiences



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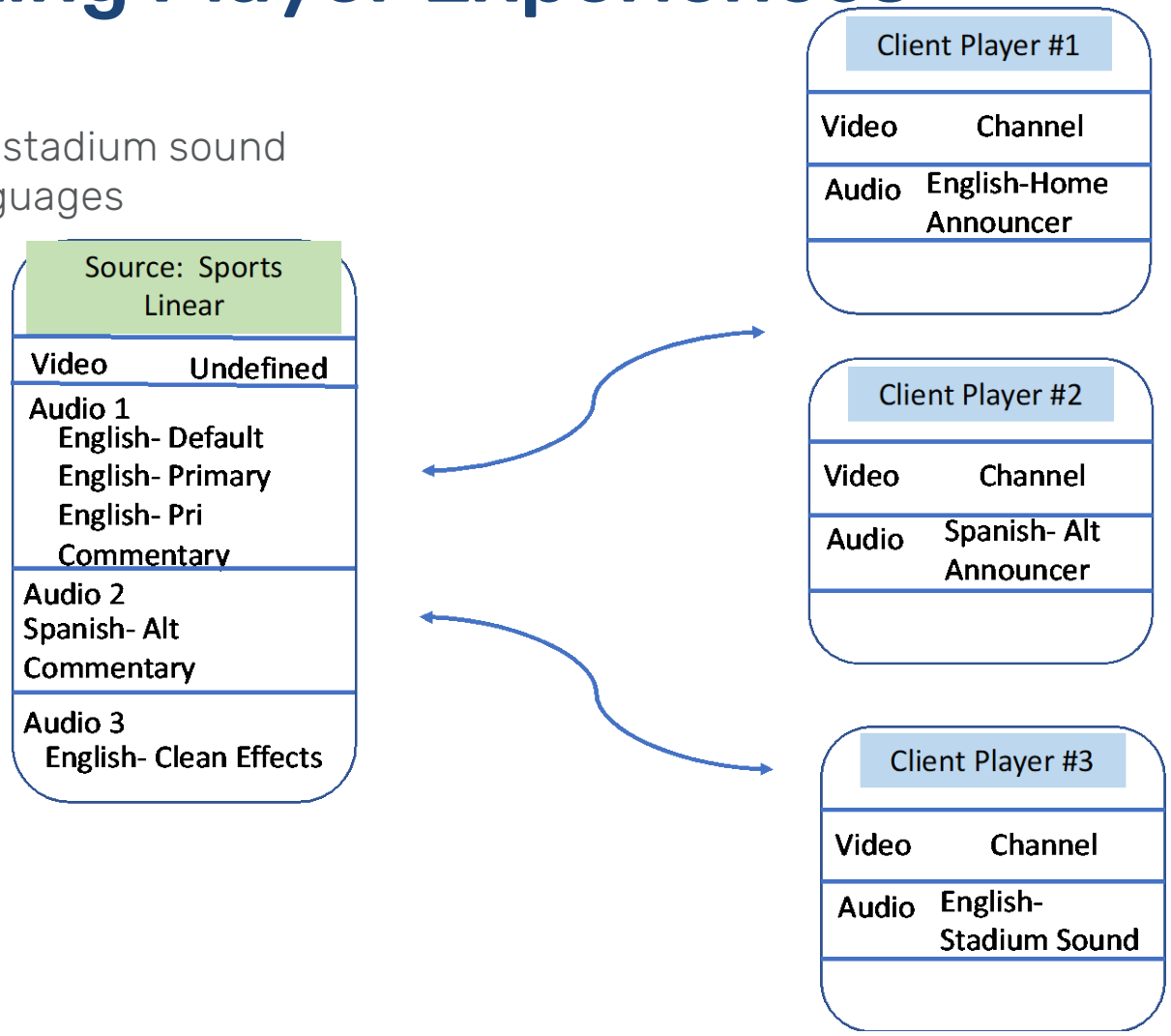
Sporting Events and Resulting Player Experiences

- New customer experiences can be created
- Sporting event with a home, away announcer, or just stadium sound
- Announcers can have the option of two different languages



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Customer experience across ads

- Ads may not have the same language options as the main program
- Players may also have a default language option setting
- Need to have a deterministic way to preserve the customer experience through the ad break
  - SCTE 214-1 2022 will contain default language (for program and period)

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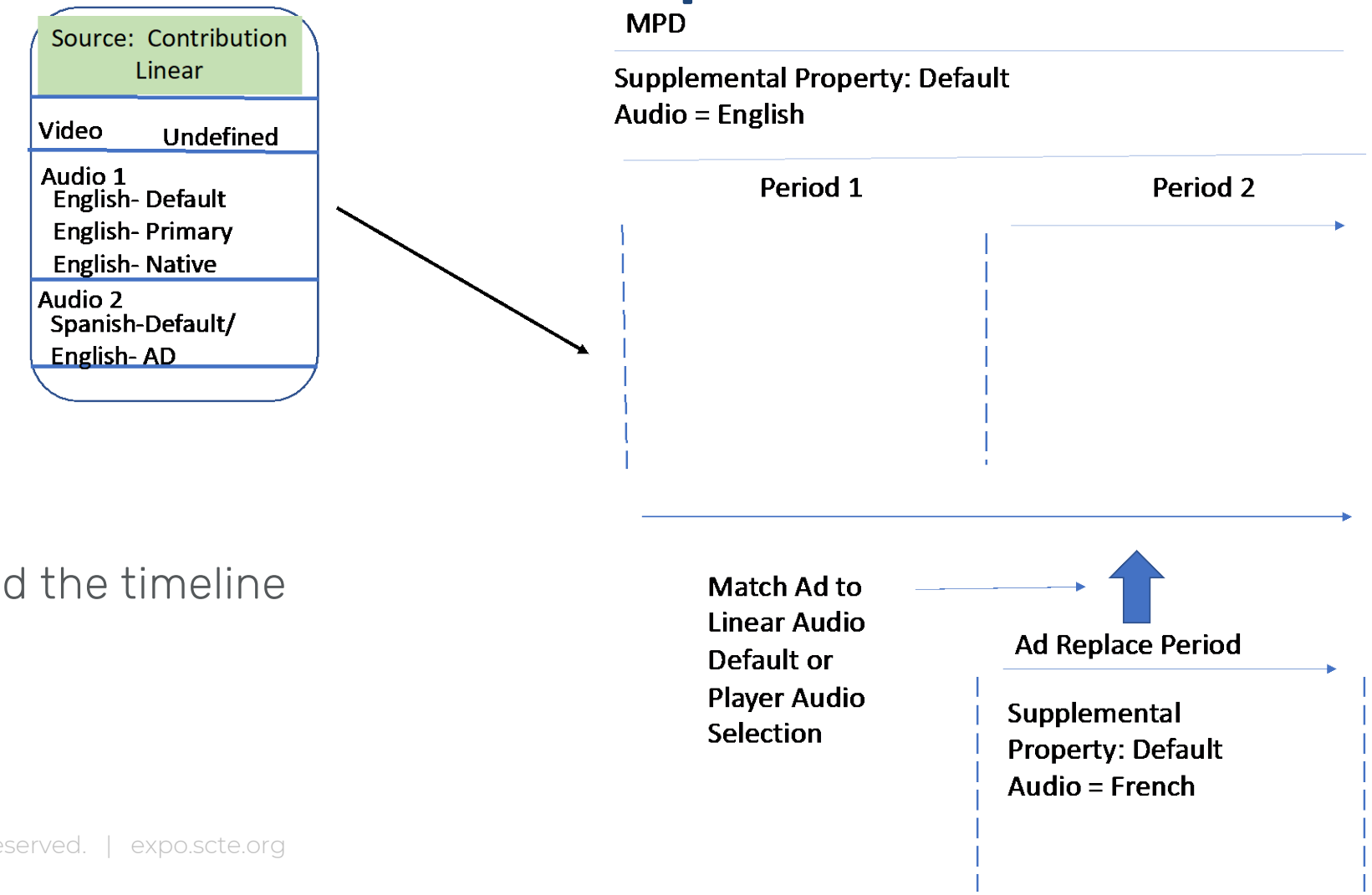
Customer Experience across Ad Replacement on Linear



- Ad insertion can extend the timeline

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What's Next?

- Upcoming Media Service Kind descriptor expands to video and text as well
  - New amendment to MPEG-2 Systems
  - Extends language set to BCP 47
  - Can handle the separate media component delivery of source content
- Transition plan
  - Language and Media Service Kind descriptor may co-exist as long as they do not contradict each other
- Handling description of contents asset with multiple video media components

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Thank You!

Alex Giladi

Fellow
Comcast
alex_giladi@comcast.com

Yasser Syed, Distinguished Architect, Comcast

Ali C. Begen, Professor, Özyeğin University

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