Implementing CLUE encoding provider advertisements in SDP

draft-romanow-clue-sdp-usage-01

IETF - 83

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What we did

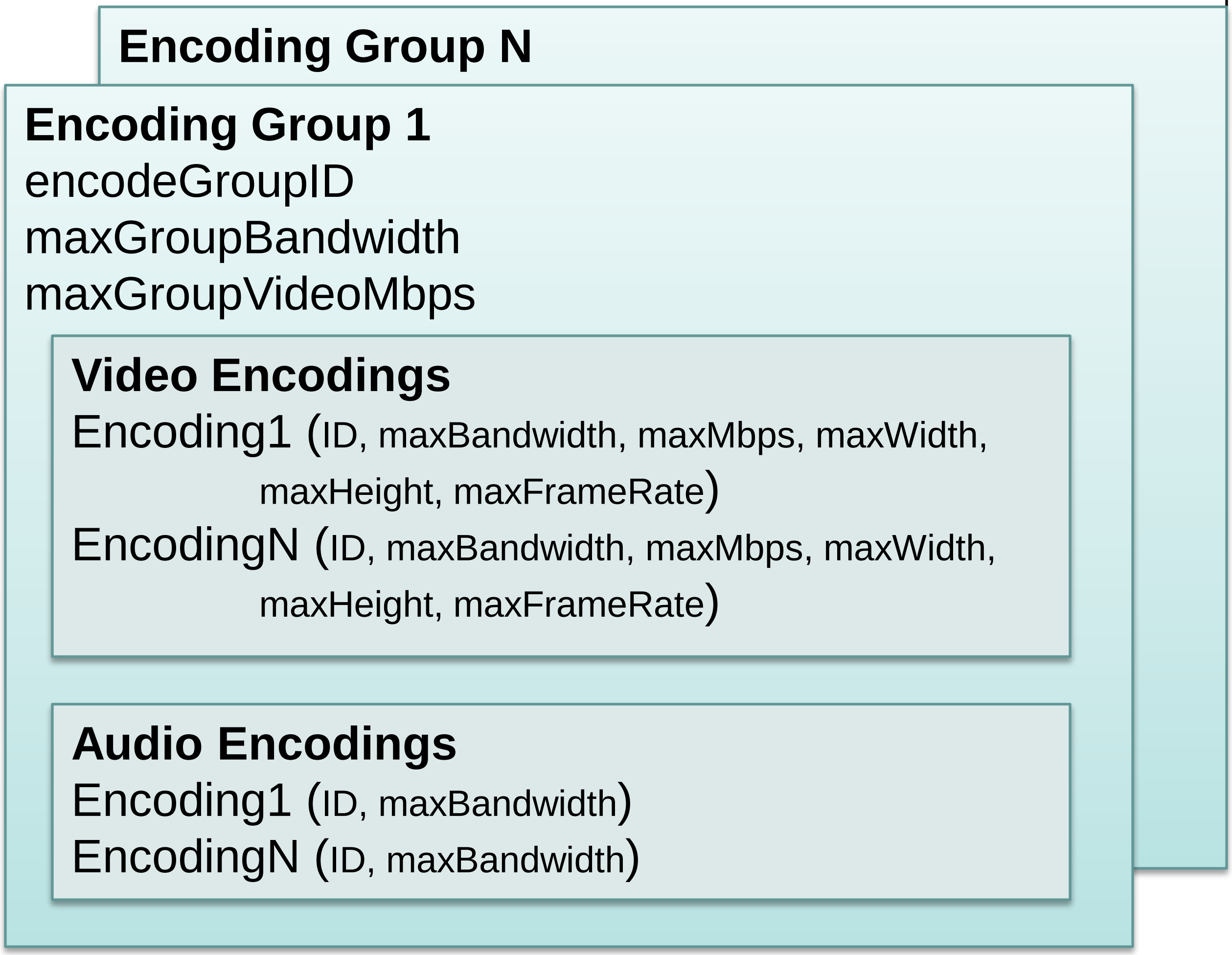
- Used SDP offer/answer to communicate CLUE provider advertisements for encodings and encoding groups

- Note:
  - I-D is based on -03 version of the framework document; current framework version is now -04:
  - Terminology clarifications and Capture Set/Scene change
  - **Purpose:** {main, presentation} changed to **Content:** {slides, speaker, sl, main, alt} [RFC4796]

Why we did it

- SDP is the preferred way to carry encoding information
- Intermediaries can make use of the encoding information and it’s easy for them if the values are in SDP

Encoding groups and encodings



Encoding Group N

Encoding Group 1
encodeGroupID
maxGroupBandwidth
maxGroupVideoMbps

Video Encodings
Encoding1 (ID, maxBandwidth, maxMbps, maxWidth,
maxHeight, maxFrameRate)
EncodingN (ID, maxBandwidth, maxMbps, maxWidth,
maxHeight, maxFrameRate)

Audio Encodings
Encoding1 (ID, maxBandwidth)
EncodingN (ID, maxBandwidth)

Assumptions

- Use a non-SIP signaling protocol for captures
- Use a non-SIP signaling protocol for consumer requests
- Use SDP for stream attributes typically handled by SDP

The issue

- CLUE model not a perfect fit with offer/answer
- Both sides don’t agree on a value, but rather
  - A as provider advertises its set of values to B as a consumer
  - B as provider advertises its set of values to A as a consumer
  - These are not necessarily the same or even subsets of each other

Two approaches explored

- Advertisements in initial offer/answer
  - Bidirectional
  - Unidirectional
- Advertisements in multiple offer answers coupled with CLUE signaling

Initial offer/answer bidirectional

- A offer sends provider advertisement for A’s encodings and encoding groups
- B answer sends provider advertisement for B’s encodings and encoding groups

Issue with bidirectional approach

- B cannot respond with a type (purpose) not in A’s offer
- Example:

  A offers 2 SDP streams- video-main and audio

  B wants to offer 3 SDP streams- video-main audio, and presentation

Possible solution

- The initial offer always includes all purposes
- Example:

A offers

audio sendrecv, {A encodings}
video (main) sendrecv, {A encodings}
video (presentation) recvonly, {A encodings}

B answers

audio sendrecv, {B encodings}
video (main) sendrecv, {B encodings}
video (presentation) sendonly, {B encodings}

- Issues: Asymmetric values (codecs, etc.), intermediary value changes

Unidirectional approach

- A offers
  - Audio-sendonly, {A encodings}
  - Video-sendonly (video-main), {A encodings}
  - Video-inactive (video presentation)
  - Audio-recvonly
  - Video-recvonly (video-main)
  - Video-recvonly (video presentation)
- B answers
  - Audio-recvonly
  - Video-recvonly (video-main)
  - Video-inactive (video presentation)
  - Audio-sendonly, {B encodings}
  - Video-sendonly (video-main), {B encodings}
  - Video-sendonly (video presentation), {B encodings}
- Issues: Intermediary value changes

Multiple offer/answers

- Advantage – don’t advertise incorrectly
- Disadvantage – multiple offer answers
- Scheme:
  - Initial o/a sets up call and establishes CLUE
  - 2nd o/a Alice sends provider advertisement, B answers as consumer
  - 3rd o/a Bob sends provider advertisement, A answers as consumer
  - CLUE protocol – configure advertisements, B consumer request
  - 4th o/a B renegotiates TIAS based on CLUE outcomes
  - CLUE protocl – A consumer request
  - 5th o/a A renegotiates TIAS based on CLUE outcomes

Representation of Encodings

3 new SDP attributes

- Encgrp - encoding group ID, list of encodings, list of eng grp params

  a=encgrp:<encgrp-number> <list of enc nums> <list of group params>

- Enc – encoding ID, list of params and values

  a=enc: <enc-number> <list of clue nums>

- Clue – CLUE encoding params – max-fps, max-mbps, max-bitrate, imageattr

  a=clue:<clue-number> <clue attribute=value>

Example of 2 Video Encodings

a=clue:1 imageattr[w=1920, y=1088]
a=clue:2 max-fps=60
a=clue:3 max-mbps=244800
a=clue:4 max-br=4000
a=clue:5 imageattr[x=960, y=554]
a=clue:6 max-fps=30
a=clue:7 max-mbps=61200

a=enc:1 clue=1,2,3,4	Encoding 1 and its clue attributes
a=enc:2 clue=5,6,7,4	Encoding 2 and its clue attributes

2 video encoding groups

a=encgrp:1 enc=1,2,3 grpparm=3,4,5
a=encgrp:2 enc=4,5,6,7 grpparm=2,4,5

Issues CLUE parameters in SDP

- Is it worthwhile making the provider encoding advertisements available in SDP?
  - Too much info?
  - Too little info?
- Possible delays (SIP record-route)
- Advertisements large – expand SDP size- further work
- Mixed CLUE/non-CLUE - initial invite to set up CLUE only

END