FEC Grouping Semantics in SDP
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FEC Framework Flexibility

• Framework Requirements:
  – Source and repair flows are carried in different flows
  – Each FEC scheme requires a different FEC Framework instance

• We’d like to support flexible source/repair flow grouping
  – A source flow MAY be protected by multiple instances
  – Within an instance, multiple repair flows MAY exist
  – Source flows MAY be grouped (combined) prior to FEC protection

• If multiple repair flows are associated with a source flow, we’d like to support
  – Additive repair flows that may be decoded jointly for better recovery chances
  – Prioritization among the repair flows
Source and Repair Flow Association

SOURCE FLOWS | FEC FRAMEWORK INSTANCE #1
----------|------------------
S1: Source Flow | R1: Repair Flow

S2: Source Flow

R2: Repair Flow

• RFC 3388: An “m” line identified by its ‘mid’ attribute MUST NOT appear in more than one “a=group” line using the same semantics

• RFC 4756 (based on RFC 3388) would require us to write

    a=group:FEC S1 S2 R1 R2

    ➔ No particular association

• I-D.ietf-mmusic-rfc3388bis removed this requirement
Support for Additivity/Prioritization

- **Additivity**
  - Multiple repair flows may be decoded jointly to improve the recovery chances
  - Additive repair flows can be generated by the same or different FEC schemes

- **Prioritization**
  - Prioritization lets receivers know in which order they **MUST** receive/decode the repair flows
  - The repair flows that are assigned a priority may or may not be additive

- **Currently, there is no SDP semantics for additivity/prioritization**
New Semantics (FEC-XR) – Examples

**SOURCE FLOWS**

S4: Source Flow |---------| R5: Repair Flow
| R6: Repair Flow
| R7: Repair Flow

**FEC FRAMEWORK INSTANCE #1**

a=group:FEC-XR S4 R5 R6

a=group:FEC-XR S4 R7

**FEC FRAMEWORK INSTANCE #2**

**Association**

- a=group:FEC-XR S4 R5 R6
- a=group:FEC-XR S4 R7

**Additivity**

- a=group:FEC-XR S4 R5 R6 → R5 and R6 are additive
- a=group:FEC-XR S4 R7 → R7 is not additive
New Semantics (FEC-XR) – Examples

- **Association**
  
  \[a=\text{group:FEC-XR } S4 \text{ R5 R6}\]
  
  \[a=\text{group:FEC-XR } S4 \text{ R7}\]

- **Prioritization:** Priority may be indicated by the order of the ‘mid’ values of the repair flows
  
  - For the example above \( p(R5) > p(R6) > p(R7) \)
  
  - **Open Issue:** How do we signal equal priorities?
Repair Flow SDP Descriptor

fec-repair-flow-line = "a=fec-repair-flow:" fec-encoding-id
[";" SP flow-priority]
[";" SP sender-side-scheme-specific]
[";" SP scheme-specific] CRLF

flow-priority = "priority=" priority-of-the-flow
priority-of-the-flow = *DIGIT (OPTIONAL)

• Exact usage and rules MAY be defined by the FEC scheme or the CDP
• Open Issue: How do we signal equal cross-scheme priorities?
Comments/Feedback

• Suggestions for going forward?