FEC Grouping Issues in SDP

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Forward Error Correction (FEC)

Sender Side:

Receiver Side:

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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 to improve the recovery chances
  – Prioritization among the repair flows

• Can we support these features with existing tools?
Source and Repair Flow Association

- 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) cannot handle the example above.
- We could write as below, but it would not make any sense:
  
  \[
  \text{a=group:FEC S1 S2 R1 R2}
  \]

  → No particular association.
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**
  - The sender uses prioritization to let the 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**
Solution Approaches

- **New Grouping Attribute (One “a=gengroup” line per instance)**

  \[a=gengroup:FEC\ S1\ R1\]
  \[a=gengroup:FEC\ S1\ S2\ R2\ →\ \text{Associations are completely defined}\]
  - Additivity
    \[a=gengroup:FEC\ S4\ R5\ R6\ →\ \text{Repair flows R5 and R6 are additive}\]
    \[a=gengroup:FEC\ S4\ R7\ →\ \text{Repair flow R7 is not additive}\]
    - Prioritization: Priority may be indicated by the order of the ‘mid’ values of the repair flows (e.g., \(p(R5) > p(R6) > p(R7)\) in the example above)

- **New Grouping Semantics**

  \[a=group:genFEC\ S1\ R1\]
  \[a=group:genFEC\ S1\ S2\ R2\ →\ \text{Associations are completely defined}\]
  - Additivity and prioritization are handled in the same way as above

- Both approaches are backward compatible
  - New grouping attribute is safer, though
Comments/Feedback

• Anybody else having issues with RFC 3388?

• Should we come up with a more general solution?
  – Obsolete RFC 3388?
  – Define something new (e.g., “a=gengroup”) that is still backward compatible with RFC 3388?

• Or, should we leave RFC 3388 as it is and propose an FEC-specific solution?