FEC Grouping Semantics in SDP

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Ali C. Begen

abegen@cisco.com

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 | FEC FRAMEWORK INSTANCE #2
| R2: Repair Flow
```

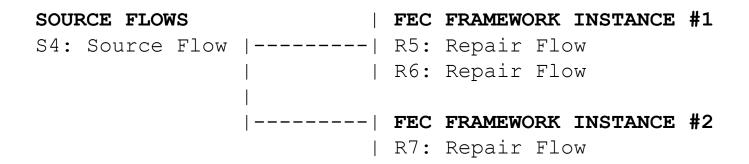
- RFC 3388: An "m" line identified by its 'mid' attribute **MUST NOT** appear in more than one "a=group" line using the same semantics
- RFC 4756 (based on RFC 3388) would require us to write

```
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 | FEC FRAMEWORK INSTANCE #1
S4: Source Flow |------| R5: Repair Flow | R6: Repair Flow |
|-----| FEC FRAMEWORK INSTANCE #2
| R7: Repair Flow
```

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

```
SOURCE FLOWS | FEC FRAMEWORK INSTANCE #1
S4: Source Flow |-----| R5: Repair Flow | R6: Repair Flow |
|-----| FEC FRAMEWORK INSTANCE #2
| R7: Repair Flow
```

Association

a=group:FEC-XR S4 R5 R6

a=group:FEC-XR S4 R7

- Prioritization: Priority may be indicated by the order of the 'mid' values of the repair flows
 - For the example above \rightarrow 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?

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