RTCP Report Extension for Feedback Suppression

draft-wu-avt-retransmission-supression-rtp-06

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Status

- Submitted before IETF 77, Anaheim, drew some discussion on the list
- Presented in the IETF 78, Masstricht, rough consensus to support this work
- Changes since -02
  - Change the title to "RTCP Report Extension for Feedback Suppression "
  - Restructure the document with Dave Oran Help focusing on generic mechanism for Feedback suppression by defining new RTCP message dealing with Feedback Implosion including Retransmission implosion.
  - Discuss how Feedback Suppression work in various use cases described in RFC5117 and in RAMS case.
  - Keep the retransmission part as non normative text
  - Take out the use case of using dedicated Loss reporter for packet loss.
  - Simplify the abstract and introduction.
  - Remove the appendix.

Issues addressed

- Issue 1: why NOT use RTCP NACK FB to address Retransmission Suppression
  - Discussed in Maastricht with the conclusion to use a new message but was not captured in the meeting notes.
  - NACK does not define any semantics when sent from the server to the client.
  - Version 06 specifies the new message and how it is used in two use cases:
    - Retransmission suppression
    - Video fast update supression

- Issue 2: Should feedback suppression be used when FEC is available.
  - Clarification: when FEC is used, Feedback Suppression message can be sent indicating to the receiver that packets were lost enabling early usage of FEC.

Issues Addressed

- Issue 3: Ambiguous definition of loss detector and how it is used for suppression
  - Version 06 removed the loss detector definition from section 2 and removed the concept of using separate dedicated loss detectors in all the other sections.
  - Focus only on the case of using the middlebox to detects loss in the upstream direction.

- Issue 4: How to handle the case wherein loss detection functionality see different loss
  - This was relevant to the loss detector case which was removed from the document.

Issues addressed

- Issue 5: Why send unicast suppression message to the receiver in video switching MCU case?
    - Packet loss of video frames may cause all receiving terminal to ask for video fast update. The use of the suppression message can prevent them from sending fast update requests.

- Issue 6: How suppression mechanism works for the different RTP topologies
    - Version 6 adds MCU case, Translator case and RAMS case in section 6 of the draft.

Open Issue

- Is there need for a "announcement" in the SDP support for Feedback suppression.

  - Currently in the draft. This is an announcement from the sender. Not sure if there is value in this announcement.
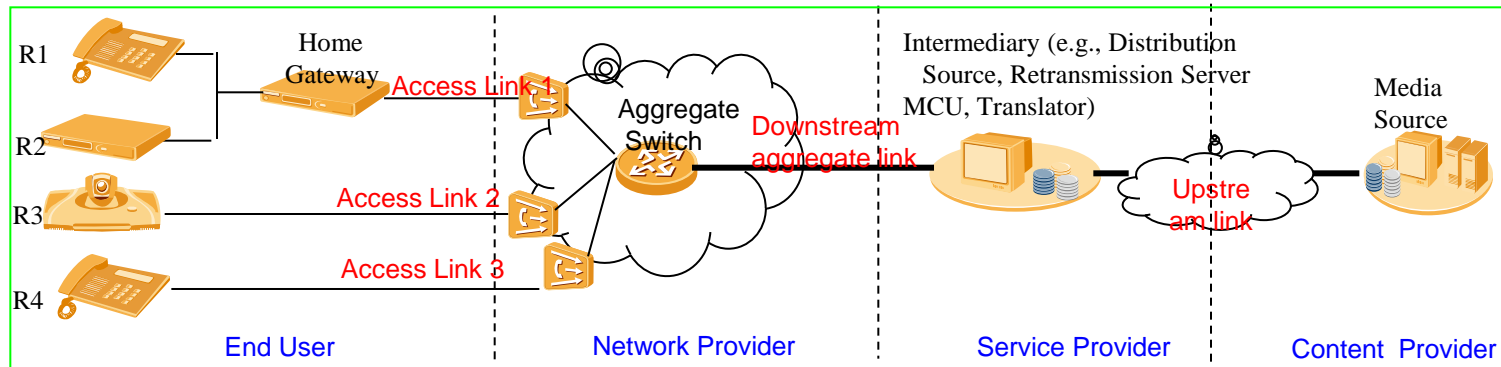
  - Comments and suggestion?

Next Step

- Request to accept draft as WG item
  - Had support in IETF 78 and on the list.

AVT IETF 79 Beijing

Use cases for Feedback Implosion

- Problem Statement
  - packet loss close to the media source or intermediary of the session
    is detected as a loss by a large number of receivers
  - large number of feedback requests used to ask for the lost RTP packets are all addressed to the same media source, or a designated feedback target
  - Result in Feedback Implosion or Feedback Storm

R1
R2
Home Gateway
Access Link 1
Aggregate Switch
Downstream aggregate link
Intermediary (e.g., Distribution Source, Retransmission Server MCU, Translator)
Upstream link
Media Source

R3   Access Link 2

R4   Access Link 3

End User   Network Provider   Service Provider   Content Provider

- Example use cases
  - Source Specific Multicast (SSM) Use Case
  - RTP Transport Translator Use Case
  - Multipoint Control Unit (MCU) Use Case
  - Unicast based Rapid Acquisition of multicast stream (RAMS) Use Case

Solution for Feedback Implosion

- Specifies an extension to the RTCP feedback messages used for feedback suppression

- This extension allows an intermediate node in the network (such as an distribution source) or media source inform downstream receivers that packet loss was detected and sending a feedback message concerning a specified set of RTP packets may be unnecessary, or even harmful.

How Feedback Suppression works

- ## On the Server (Source or Intermediary)
  - monitor for packet loss upstream of themselves just as receivers do.
  - Upon detecting an upstream loss, the intermediary may create and send Feedback Suppression message towards the receivers as defined in this specification.
  - Alternatively, the media source may directly monitor the amount of feedback requests it receives, and send feedback suppression messages to the receivers.
  - Intermediaries downstream of an

    intermediary may either simply forward the Feedback Suppression message received from upstream, or augment it with a feedback suppression message that reflects the loss pattern they have themselves seen.
  - Intermediaries downstream of an intermediary should not initiate their own additional feedback suppression messages for the same packet sequence numbers.

- ## On the Client
  - If the receivers understand feedback suppression message, the receivers should not themselves transmit feedback messages upon receiving Feedback suppression
  - A receiver may still have sent a Feedback message before receiving a feedback suppression message, but further feedback messages for those sequence numbers will be suppressed by this technique.
  - The receiver may send feedback messages if it did not understand this new message.