

# **Proposal for an extension to RTCP for Feedback Storm Suppression**

draft-wu-avt-retransmission-supression-rtp-02

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# Status

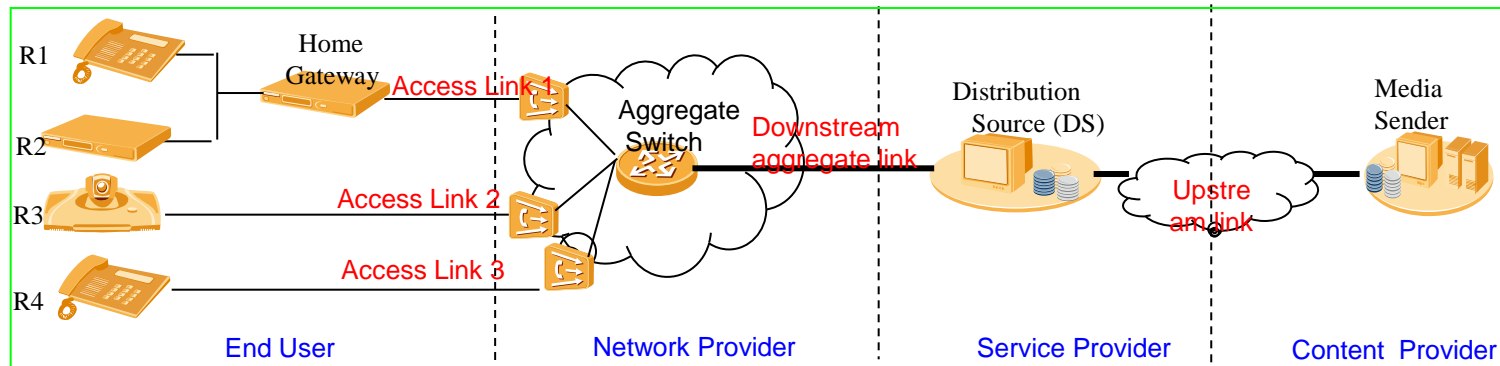
- First presentation in the AVT
- Changes since -01 (miss presentation in Anaheim)
  - Add two new RTCP Feedback Reports
  - Add new behaviors of distribution source to deal with suppression message.

# Proposal for an extension to RTCP for Feedback Storm Suppression

- Objective
  - Define a one generic RTCP receiver reports designed to suppress massive NAK implosion or Fast update implosion.
- Motivation
  - Prevent or reduce NACK implosion or Update request implosion occurring in upstream link of intermediate node or downstream aggregate link of intermediate node
  - Compliance with Simple Feedback and in Distribution Source Feedback Summary Models defined in [RFC5760].
  - NACK Lacks semantics for suppression indication in the SSM scenario.
  - No behavior of Distribution Source defined to handle NACK message used for suppression indication

# Problem description

- NACK implosion (Retransmission Storm)
  - Packet loss occurring upstream link of DS sat between the media sender and the receivers may cause mass retransmission request for the same lost packet.
  - Packet loss occurring aggregated downstream link of DS sat between the media sender and the receivers may cause mass retransmission request for the same lost packet.
  - Packet loss occurring downstream access link of DS sat between the media sender and the receivers should not cause mass retransmission request for the same lost packet.



# Problem description

- NACK Suppression
  - NACK lacks semantics for suppression indication.
    - NACK is designed to request sender to compensate the missing packet
    - NACK is unidirectional message sent from receiver to the sender.
    - However in NACK suppression, one message used for suppression indication need to be sent from sender (i.e., DS) to the receiver.
  - Even NACK is compulsively used for suppression indication,
    - Distribution Source does not define the behavior for handling this NACK suppression indication message
      - In Simple Feedback Model, DS does not know NACK used for suppression indication. NACK sent from receiver may be forwarded directly to media sender.
      - In Feedback Summary Model, DS also does not know NACK used for suppression indication and may just forward NACK to the media sender.
    - The receiver can not understand this NACK message is used for suppression indication.
      - Even the receiver can receive the NACK, the receiver may just drop it.

# Proposal for an extension to RTCP for Feedback Storm Suppression

- Define one new RTP receiver report used for Retransmission Suppression
- Define new behavior for handling Retransmission Suppression.
  - Network side operation (Distribution Source behavior)
    - Send one new RTCP receiver report to make receiver know packet loss request (e.g., NACK, fast update request) is not needed
    - Packet loss detected by network before hosts send out packet loss request
      - The Intermediate node may send this new RTCP receiver report to the receivers when detecting a loss on its incoming link while send a packet loss request to the media sender.
    - Packet loss detected by network after hosts send out packet loss request
      - The Intermediate node may receive packet loss request (e.g., NACK or Fast update request) messages from the receivers and may filter them out if it already sent a packet loss request for the requested packet to the media source.
  - Receiver operation (Receiver behavior)
    - If the receiver understands this message it will not send packet loss request for the missing packets reported in the message and will accept a retransmission stream.
    - The receiver may send packet loss request messages if it did not understand this new message.

# Mailing List Discussion

## Summarization

- Using NACK sent from sender for suppression
  - why bother to invent a whole new packet format when NAK does exactly what you want.
  - require to add the semantics of suppression when sent by the media sender
  - Need to distinguish NACK sent from receiver and NACK sent from sender
  - Using NACK as Upstream receiver report, Forward upstream receiver report by Retransmission server to all the receivers
  - can be mentioned but I assume that it does not require any specific protocol on top of the NACK suppression message, and is just an implementation example.
- Downstream receiver report
  - Using signaling for configuring part of the RTP receivers to act as reporters
  - A small subset of RTP receivers are "immediate" (packet loss) reporters
  - Based on SSRC of the RTP receiver to distinguish whether it is immediate reporter
  - we can look at it, we may need to verify if it can be done in AVT
- Which network segment is packet loss happening most
  - network segment between DS and the RTP\_Rxs represent largest part of network where Packet loss occurs most
  - Question on this segment is covered, otherwise it is weak part
  - NACK Storm happening between DS and RTP\_Rx is also covered
  - But need to distinguish downstream aggregate link and downstream access link

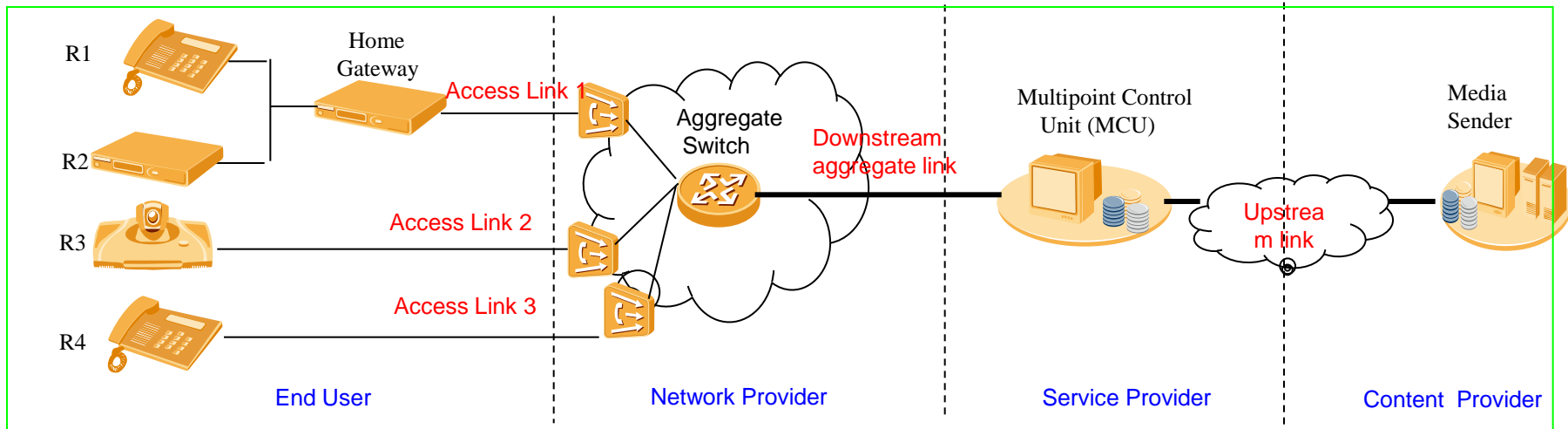
# Proposal

- Request to accept draft as WG item
  - Got already supporter in the list
- Encourage more review of draft and early feedback



# Appendix: Additional scenarios for Fast Update request Implosion

- Packet loss occurs upstream link and downstream aggregated link of MCU between the media sender and the receivers due to oversaturated network link, faulty networking hardware or corrupted packets rejected in-transit.



- Massive fast update request for the same RTP packets to the same multicast sender may result in Fast update request implosion
- As described in RFC 5104, Fast update request is known as Full intra request (FIR).