Port Mapping for retransmission

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Problem description (1)

- Retransmission RFC 4588 discuss retransmission for small multicast group. The example in RFC 4588 uses multicast groups for the main and retransmission streams. Unicast retransmission for multicast is mentioned but not explained.

- The single source multicast draft do not address retransmission.

- In unicast rapid acquisition of multicast RTP sessions, the unicast stream from the burst source is sent to the receiver. When using declarative SDP the receiver cannot provide the transport address for receiving the unicast stream. The unicast burst is initiated using RAMS-R RTCP feedback message

Problem description (2)

- The same problem with conveying the receiver IP address is relevant for general unicast retransmission when the main stream is announced as an SSM or small group multicast with unicast retransmission. The unicast retransmission is triggered by a NACK RTCP feedback message.

- The general case may happen when using declarative SDP for specifying a unicast stream to be received by the other side. It is not typical for unicast by itself but may happen if an RTP application will announce a multicast/SSM and unicast stream.

- When using offer/answer there is no problem since both sides can provide transport addresses.

Problem Summary

- The above flows are characterized as starting with a declarative SDP from the sender side and request to start receiving unicast stream from the receiver using either RAMS-R or NACK.

- The receiver in both flows may need to provide a transport addresses for receiving the unicast flow.

Proposed solutions

- Add an option to send the IP address to RAMS-R and a new optional NACK message in RFC 4588 (retransmission).
  - Advantage is the limited scope
  - May need to add this option to other FB messages in the future
- Define a new Publish Port RTCP FB message
  - Advantage - General solution using one message.
  - Issue: do we want to use RTCP FB to convey RTP transport addresses.
  - Note that the publish port message will need some relation to signal the relevant RTP session.
- The required parameters will be defined later.

example
w/o Muxing – PubPorts Signals Two Ports
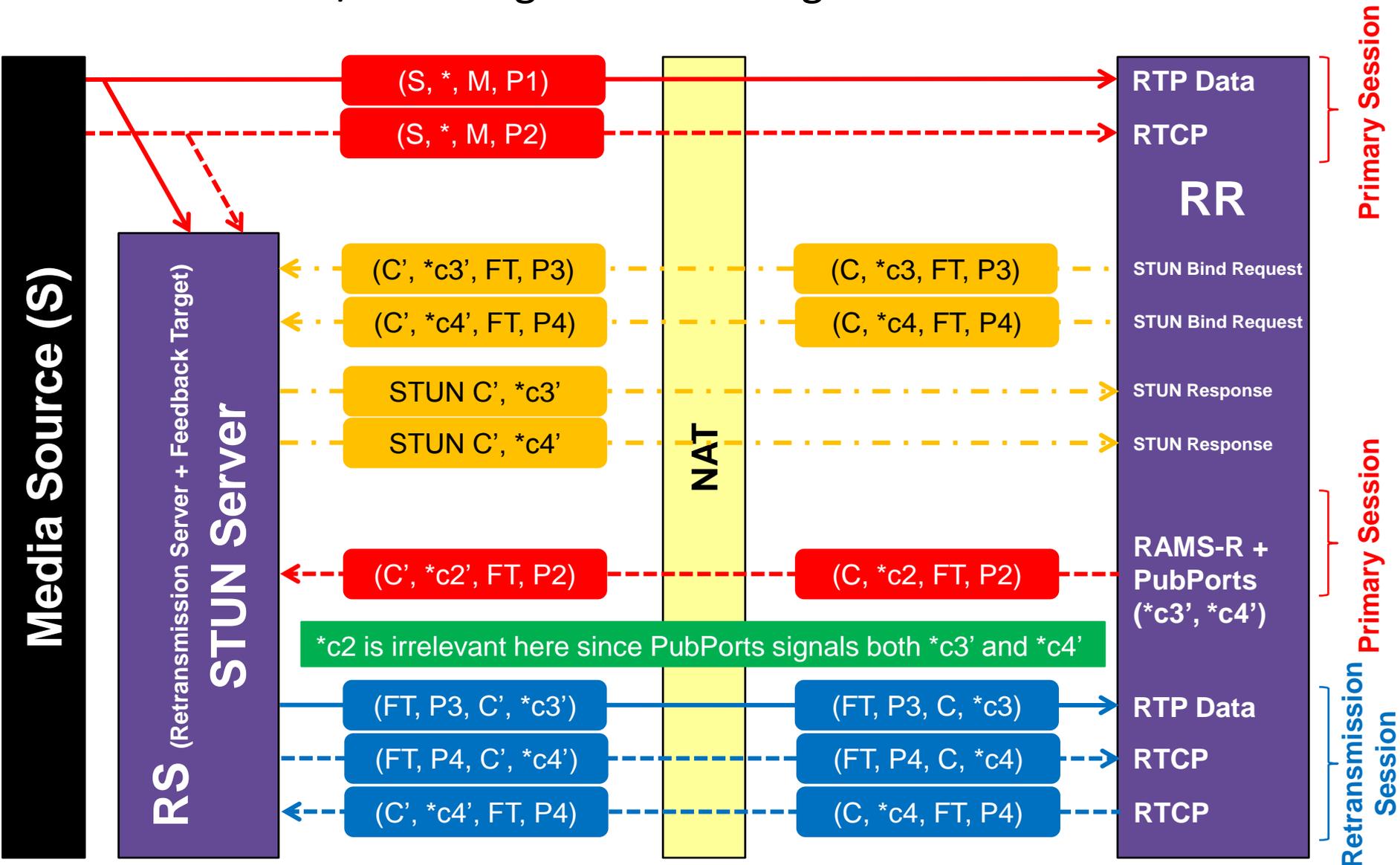
Parameters

- Primary multicast session (SSM packets)
    - S = Source address, M = Destination (multicast) address
    - $P1$ = RTP port, $P2$ = RTCP port
- Retransmission session (Retransmission and burst packets)
    - $P3$ = RTP port configured via SDP
    - $P4$ = RTCP port configured via SDP
    - $c3$ = RTP port dynamically chosen by RR
    - $c4$ = RTCP port dynamically chosen by RR
    - $c3'$ = RTP port learned via PubPorts message from RR
    - $c4'$ = RTCP port learned via PubPorts message from RR
- Others
    - FT = Feedback target IP address (same as RS' IP address)
    - C = IP address of RR (private/internal)
    - C' = IP address of RR as seen by RS (public)
    - $c2$ = Random port chosen by RR to send the PubPorts message (if sent separately from RAMS-R or RTCP NACK)
- Notes
    - $S, M, P1, P2, P3, P4, FT$ are all in SDP
    - RS learns C dynamically from the RAMS-R or RTCP NACK message
    - RR chooses $c2, c3$ and $c4$ dynamically
- Messages are (Src IP, Src Port, Dst IP, Dst Port)

w/ Muxing – PubPorts Signals "0"
"0" Means "Use port you get in recvfrom()"

Media Source (S)

RS (Retransmission Server + Feedback Target)

NAT

RR

(S, *, M, P1)

(S, *, M, P2)

RTP Data

RTCP

Primary Session

(C', *c4', FT, P2)

(C, *c4, FT, P2)

RAMS-R + PubPorts (0, 0)

PubPorts is required to explicitly indicate the retransmission session port – Due to P2/P4 mismatch, this may not work

(FT, P4, C', *c4')

(FT, P4, C, *c4)

RTP/RTCP

(C', *c4', FT, P4)

(C, *c4, FT, P4)

RTCP

Retransmission Session