

Multicast Join Time Determination in RAMS

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Introduction

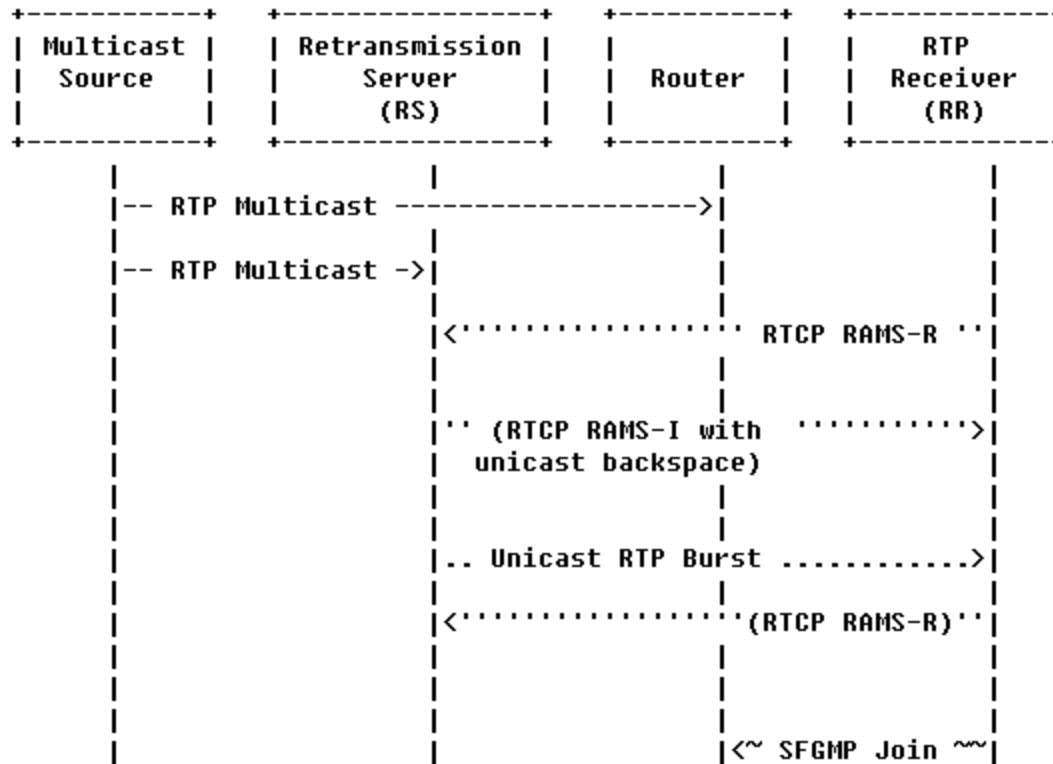
- Per RAMS, when burst rate changes, revised multicast join time may be conveyed in RAMS-I; but RAMS-I may get lost, increasing the chance and amount of overlap or gap between the unicast burst and primary multicast stream.
- For more robust determination of multicasst join time, we propose to convey a parameter called “unicast backspace” in the first RAMS-I message which is the response to the first RAMS-R message.
- RR MAY use this parameter to deduce when to join the primary multicast session.
- This way, the amount of protocol signaling interaction is also reduced, and so is the burden of revising multicast join time for RS

The Unicast Backspace Field

- Optional TLV element in RAMS-I message. This field gives the RTP timestamp difference between the first unicast burst packet to be sent and the latest primary multicast packet in the RS buffer. The RTP timestamps values for these packets are taken from the primary multicast stream.
- This field SHOULD be conveyed in the first RAMS-I message and MAY be conveyed in other RAMS-I messages.
- The parameter is a **constant** once RS chooses a starting point for the unicast burst.
- The parameter can be used by RR to heuristically determine when to launch multicast join process by sending a SFGMP join message.

Example Messge Flow

- This way, RR would not rely on RAMS-I to revise the earliest multicast join time after the burst rate is changed by RS



Example Message Flow

1. RR sends an RTCP RAMS-R message to RS to request a rapid acquisition process.
2. Upon accepting of the RAMS-R request, RS sends an RTCP RAMS-I message with unicast backspace field to RR.
3. During the burst, RR (periodically) estimates the buffer used in terms of media timestamp offset between the first and the last RTP packets in the buffer (called B for example).

If $\text{unicast_backspace} - B \leq \text{a threshold value}$

RR begins to join the multicast session. Unicast backspace is a determinate value and is always fixed during the burst. The threshold value can be derived as equal to

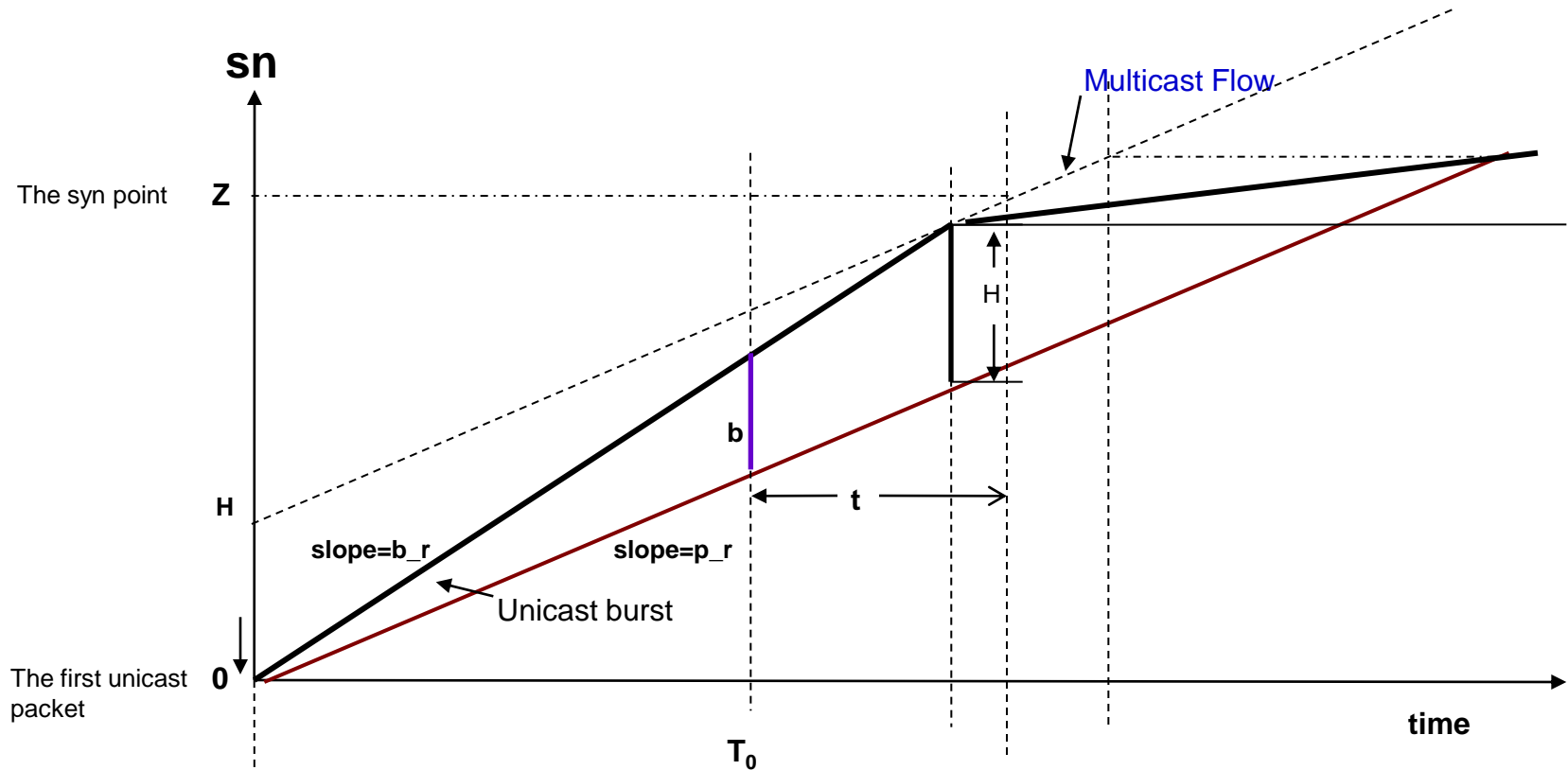
$$((b_r - p_r) / p_r) * \text{multicast_join_latency}$$

Where b_r is the burst rate, p_r is the playback rate, and $\text{multicast_join_latency}$ is the delay between RR sending SFGMP join message and RR getting the first primary multicast packet.

Conclusion

- This document proposes an optional RAMS-I TLV parameter called “unicast backspace” for heuristic determination of multicast join time.
- WG Item?

Appendix



t : The time taken by RR for joining the multicast group

b_r : Unicast Burst rate

p_r : Playback rate

T_0 : The multicast join time of RR

b : RR buffer occupation in Sequence offset. In the example, it is "B" in timestamp offset

H : The seqno offset between the latest primary multicast packet and the first unicast packet. In our proposal, it is "unicast backspace" in timestamp offset