Extensions to RTCP Feedback Mechanism for Burst Streaming

draft-levin-avt-rtcp-burst-00

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Introduction

- Problem: Synchronization with multicast stream
- RTP packets' format: RFC4588
- RTCP Framework: RFC4588 & ietf-avt-rtcpssm
- Mechanism: Media Type & CODEC Agnostic
- State Machine: Client-driven & Scalable

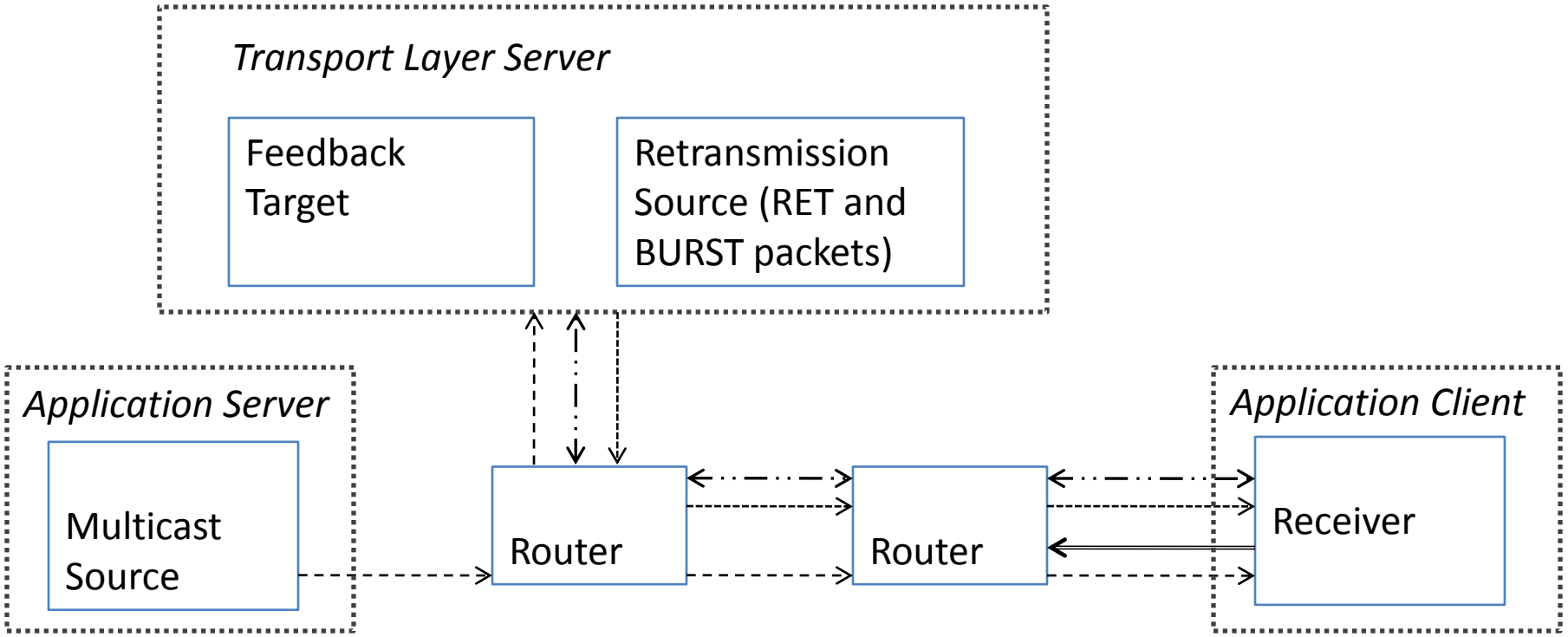
Transport Layer Mechanism

- The defined mechanism is 100% media type and CODEC agnostic
- It works “as is” for MPEG-2 TS over RTP
  - For further optimization, the MPEG-2 structures can be (re)arranged by the server(s), but this is transparent both to the defined mechanism and to the Receiver
  - Note that the proposed “TLV extensions mechanism” is not meant to be used for media/CODEC specific information
- It MAY be augmented by RTP/RTCP media and/or CODEC specific extensions

Variations in Network Topologies and Constraints

- The mechanism could be implemented by both end-to-end applications and transport layer entities (e.g., gateways & routers)
- Application logic may be known to an application server (“a server”) and/or a receiver (“a client”)
- Local bandwidth constraints may be known to a gateway/router (“a server”) and/or to a receiver (“a client”)
- *Therefore the proposed mechanism*
  - *Is Client-Driven*
  - *Supports burst termination both BEFORE and AFTER the multicast Join*

Example Topology



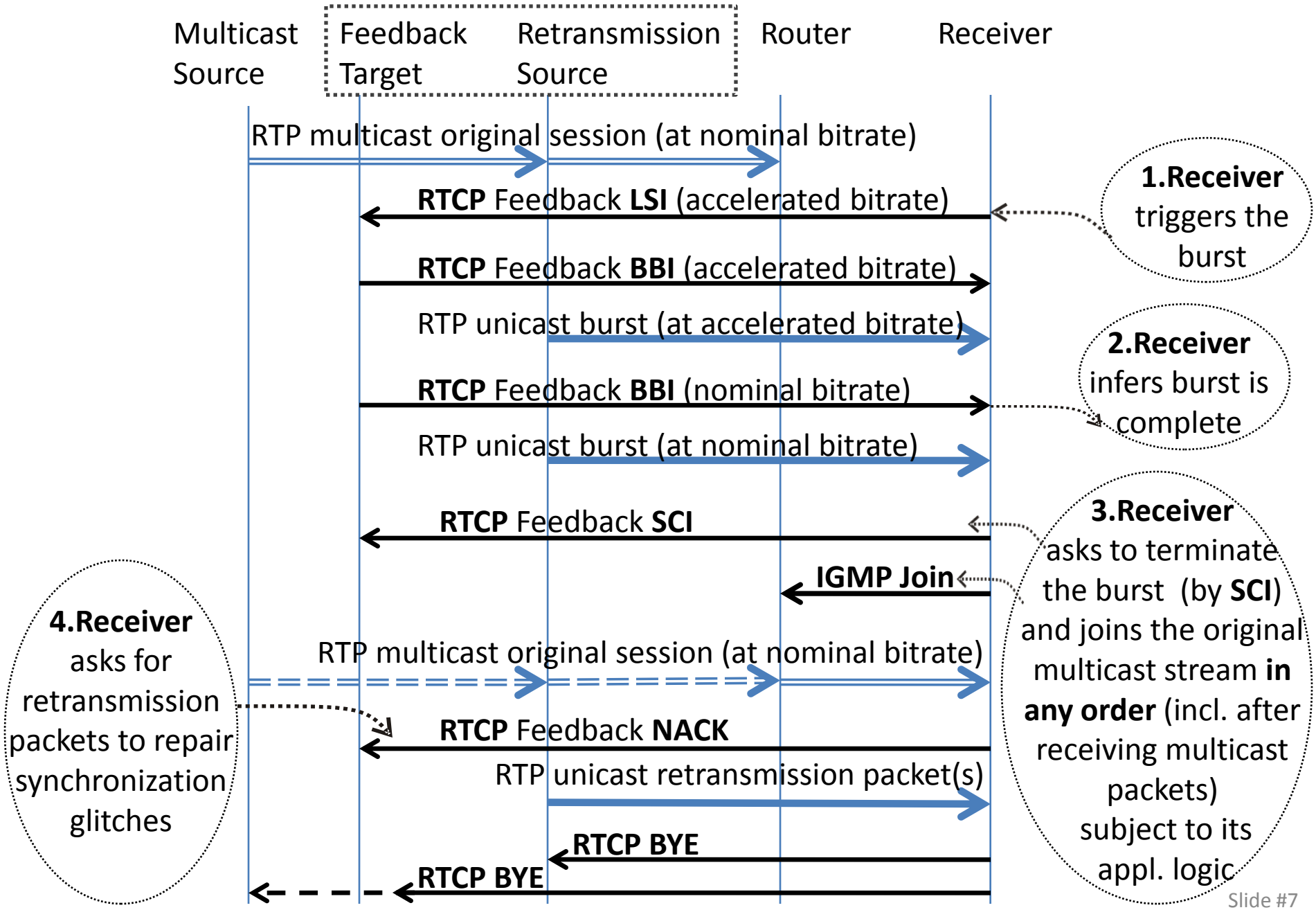
Key:

- Multicast RTP
- Unicast RTCP
- Unicast RTP
- IGMP

Scalability and Efficiency

- Simple server state machine
- Uses compact signaling primitives (exchanges bitrates instead of buffer sizes and/or timers)
- Applying *a priori* heuristically acquired intelligence about network behavior by each entity independently proved to provide best results

Receiver Driven Burst Mechanism



Why using RTCP BYE is NOT a good idea to signal the Burst Termination

- Burst and retransmission MAY be interleaved
  - Lack of a clear “burst termination request” (and, instead, overloading the RTCP BYE) would significantly complicate server’s state machine
- When burst termination happens before Join, retransmission would most likely be activated to repair the glitches
  - Sending BYE followed by sending NACK would cause the server to destroy and right away reestablish the state machine… before the retransmission packets can be sent… in the most crucial sync moment!

	draft-levin-avt-rtcp-burst-00			draft-versteeg-avt-rapid-synchronization-for-rtp-01		
1.	RTPFB "Lack of Sync Indication" (**LSI**)	•Max Client Rcv Bitrate	**1.**	RTPFB "Rapid Multicast Sync Request" (**RMS-R**)	•Min Server Buffer Fill Requirement •Max Server Buffer Fill Requirement •Max Client Rcv Bitrate	
2.	RTPFB "Burst Bandwidth Indication" (**BBI**)	•Actual Burst Bitrate	**2.**	RTPFB "Rapid Multicast Sync Information (**RMS-I**)	Option 1* •Seq. Number •IGMP Join Time •"Join Time" Fill •Burst Duration •Resultant Fill	Option2** •Join-Now Flag •Report-Join Indic. •Burst Seq. Num •IGMP Join Time •Burst End Time
				* Server determines *a priori* the size of the burst and multicast join time ** Server signals in real-time when the client should join multicast		
3.	RTPFB "Sync Completed Indication" (**SCI**)	*none*	**3.**	RTPFB "Rapid Multicast Sync Termination" (**RMS-T**)	•Seq. Number of the First Rcv Multicast	
			4.	XR Multicast Join Report Block	•SSRC of the Multicast Session •Seq. Number of the First Rcv Multicast •IGMP Join Time	
			5.	PSFB "MPEG2-TS TSRAP"	*tbd*	

"Channel Change Times for IPTV are Faster than Satellite"

Report by **inform*itv*** from Oct 22, 2008:

> **"An international study of 30 operators suggests that the channel change time on internet protocol television services can be faster than on traditional platforms such as satellite. The average channel change time across various platforms was just under two seconds, while for Microsoft Mediaroom it was around 0.6 seconds."**

Next Steps

- Is there (still) interest in the WG to work on this problem?
- Is there enough information to become a WG Item based on the two drafts?
- We propose to hold an Ad-hoc meeting this week to explore the open issues and to harmonize the differences between the two (or more) approaches