

Synchronized Playback in RAMS

draft-yang-avt-rtp-synced-playback-02

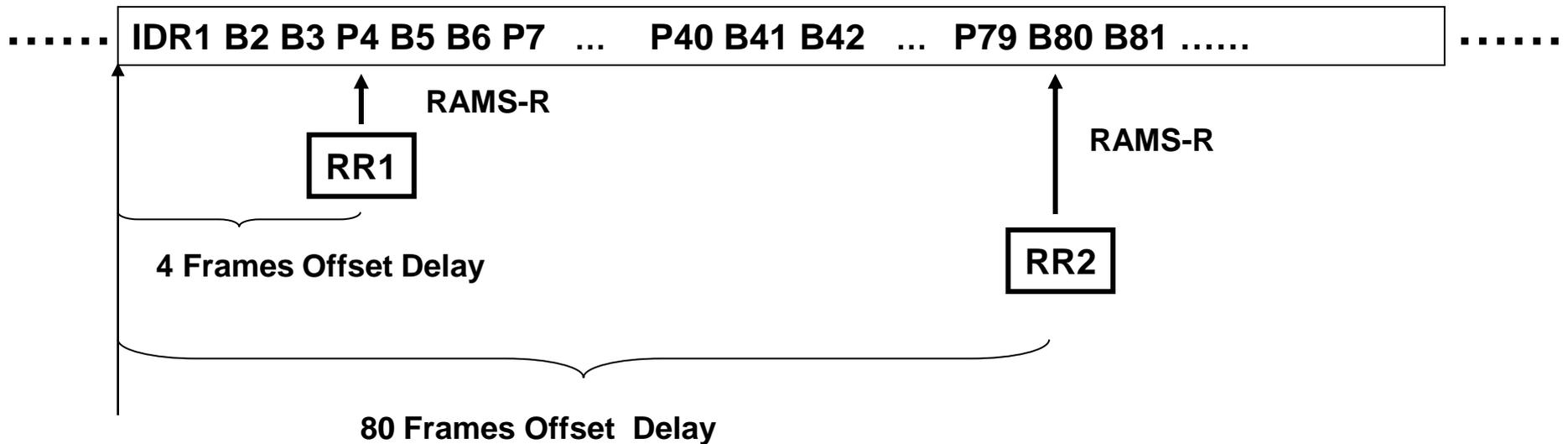
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The issue induced by RAMS: Increasing inter-user playback delay

Media streaming →

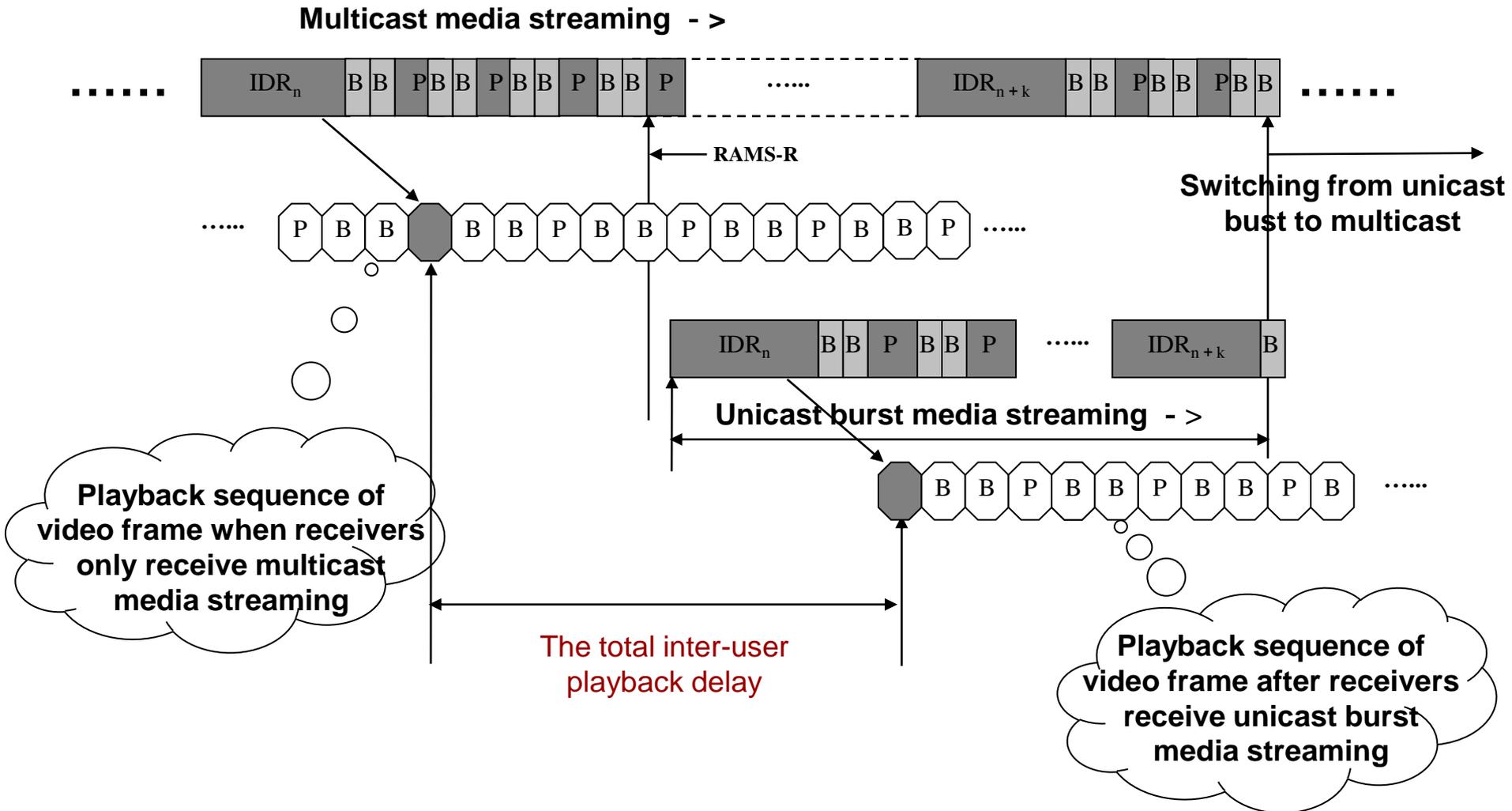


**Different Receivers will have different delay due to different offsets
caused by Rapid Acquisition of Multicast RTP Session**

Other delays-Common End-to-End Delay (CED)

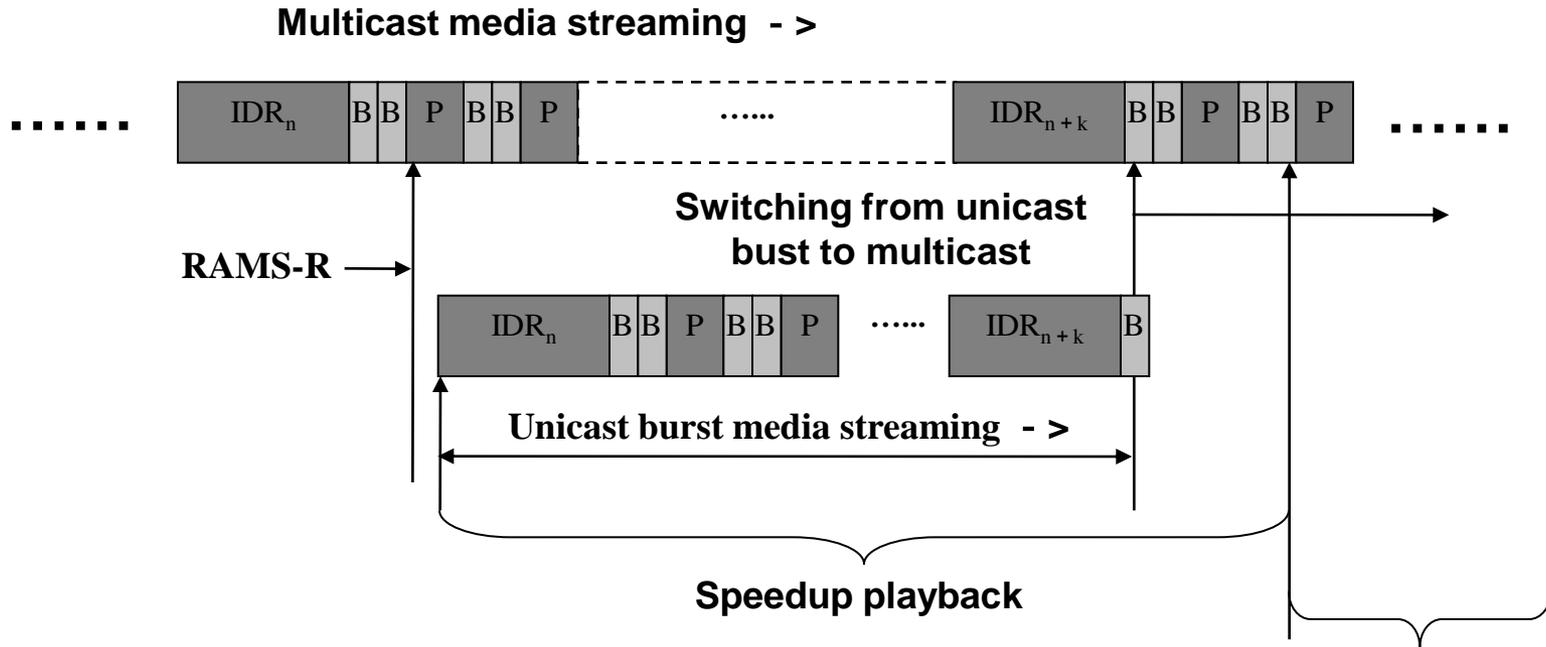
- **End-to-end transmission delay**
- **Receiving buffer delay (which also absorbing transmission jitter)[Typical buffers storing 100-500 ms]**
- **Decoding buffer delay**
- **Output buffer delay**
- **Other processing delays**

The inter-user playback delay (IUPD)



Reducing the playback delay

----Speedup of media rendering



RRs receive two additional information from RAMS-I:

- ❑ N - the playback delay reduction target in number of frame durations;
- ❑ V - recommended interval, in frames, between two continuous events for skipping of one frame.

The method of the speedup playback is that, after each V frames, one frame is skipped as if it was not present, and the presentation time of each remaining frame is shifted earlier by one frame duration, until totally N frames have been skipped.

The value N and V

- **The value N : is equal to the frame difference between the latest video frame of primary multicast packets buffered in the RS when the unicast burst starts and the video intra-frame of the starting point of the unicast burst.**
- **The value V : is a recommended skip frame interval and the value must be chosen such that there is no noticeable audio distortion. For a video frame rate of 30 frames per second, typically when V is greater than 15 there is no noticeable audio distortion.**

Independent of the number of RRs

- **Each RR utilizes Primary Multicast Stream as a reference point of the synchronization and synchronizes with Primary Multicast Stream**
- **Be independent of the number of RRs**
- **Tolerable imprecise synchronization**

Selective transmission

- **Besides the above mechanism, RS can use selective transmission of packets in the beginning of the unicast burst, by taking advantage of the temporal scalability of video bitstreams.**

Advantages of the proposal

- **Reduce inter-user playback delay**
- **Allow the use of long random access period length for improved compression efficiency when RAMS is in use**
- **Preventing receiving buffer overflow due to possible long RAMS offset delay more than buffer size**

Thank you

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