

Handling Interleaved and Non Interleaved streams with GStreamer

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Outline

- ❑ Problem Statement – Playback issues of Interleaved and Non-Interleaved streams with GStreamer
- ❑ What is Interleaved, Non-Interleaved ?
- ❑ Interleaved Streams: Playback issues and push/pull mode design solution comparison
- ❑ Non-Interleaved Streams: Playback issues and push/pull mode design solution comparison

Problem Statement

The audio and video chunk layout of interleaved and non-interleaved streams imposes specific problems (Ex. Video buffers dropped, Playback fails) in implementing the media playback use cases such as play, seek and trick play in GStreamer.

What is interleaved and non-interleaved?

- ❑ It is a method of generating media streams to ensure smooth playback
- ❑ Interleaved: The procedure is to break the stream up in chunks and put chunks of video, audio that should be played more or less together, close to each other in the file.
- ❑ Non-Interleaved: The procedure is to copy all the Video data and append all the audio data after that in a single file.

For example,

Video Frames: V1 V2 V3 V4V5V6V7V8

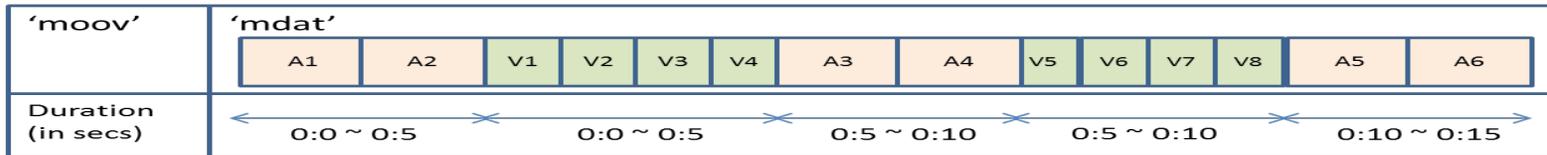
Audio Blocks: A1 A2 A3 A4 A5 A6A7A8

Interleaved: V1A1V2A2V3A3A4V4A5A6

Non Interleaved: V1 V2 V3 V4V5V6V7V8 A1 A2 A3 A4 A5
A6A7A8

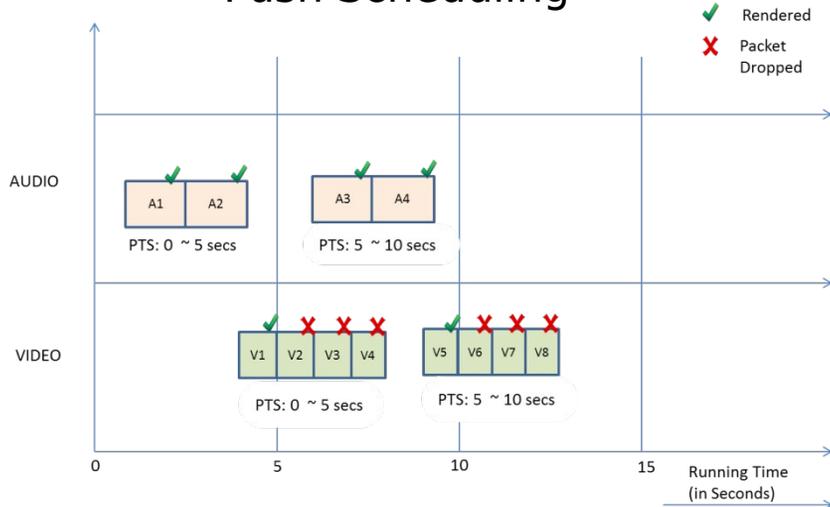
Interleaved Streams: Playback issues and push/pull mode design solution comparison

MP4 Stream Layout

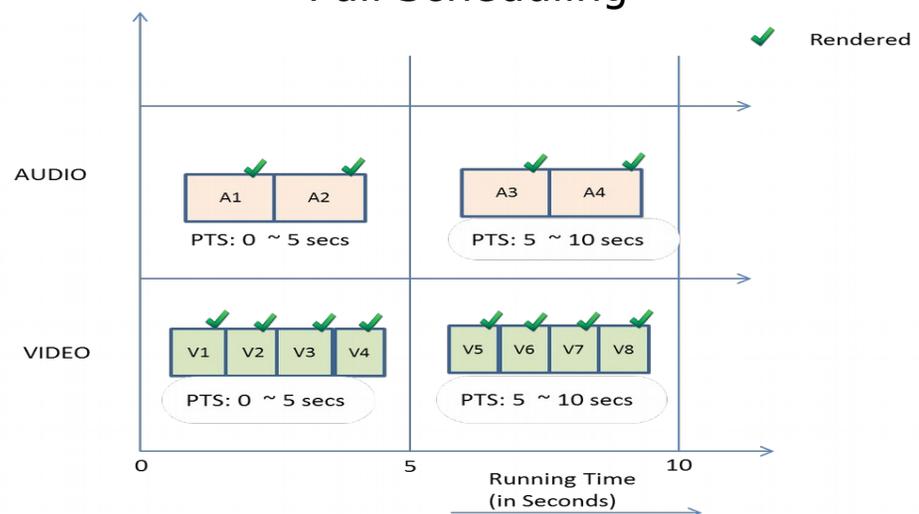


Sink Element Data Processing Representation

Push Scheduling



Pull Scheduling

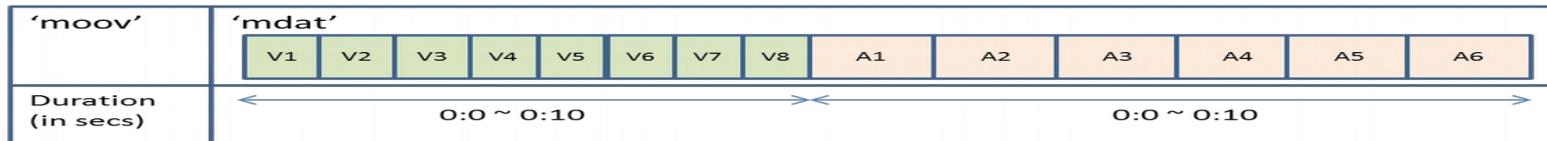


Summary (Streaming mode playback)

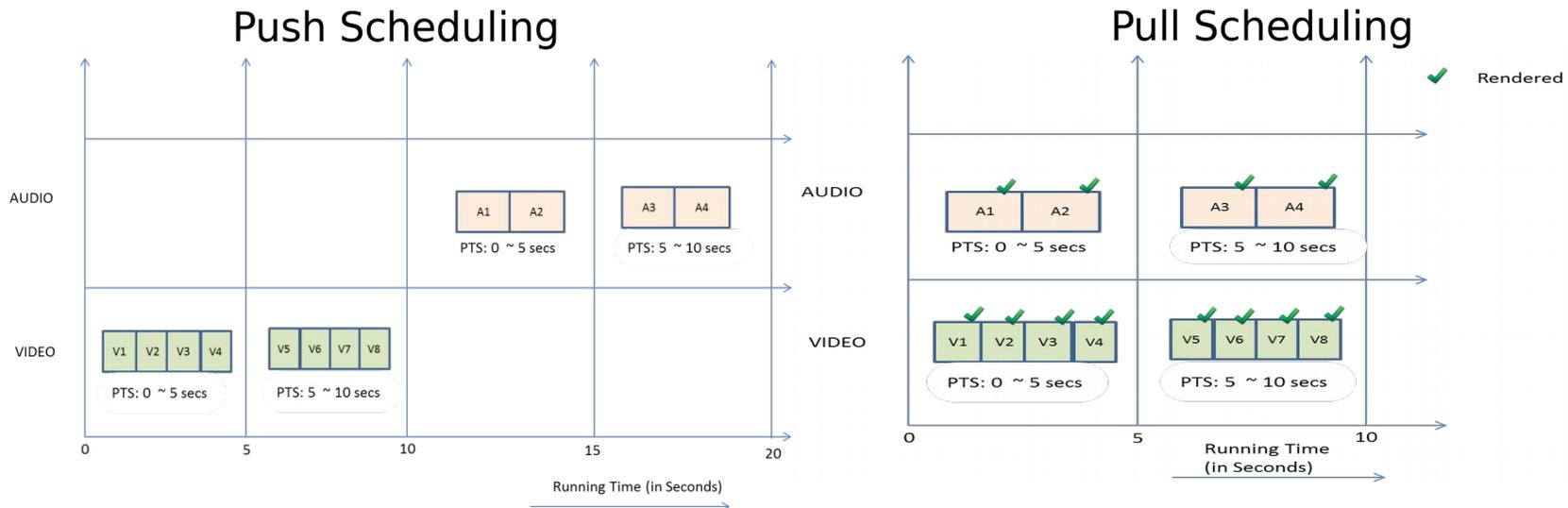
1. In Push mode, Video buffers dropping problem is observed. Only way to solve this problem is to increase the buffering size.
2. In Pull mode, there is no problem observed with available sink element buffering size.

Non-Interleaved Streams: Playback issues and push/pull mode design solution comparison

MP4 Stream Layout



Sink Element Data Processing Representation



Summary (Streaming mode playback)

1. In Push mode, there is no playback. We can enable playback for shorter media stream by increasing the queue size. But for longer stream, it is not possible to support.
2. In Pull mode, there is no problem observed as both audio and video data can be downloaded in parallel.

Thank You!