

Sync on Web, now and next of realtime media services on web

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What “**Sync on Web**”?

In this session...

“**Time alignment**” for **Media synchronization** use case

- e.g. “lip sync”

Not global clock sync use case (e.g. NTP).

Not data sync use case (e.g. storage service).

MoQ : Media over QUIC



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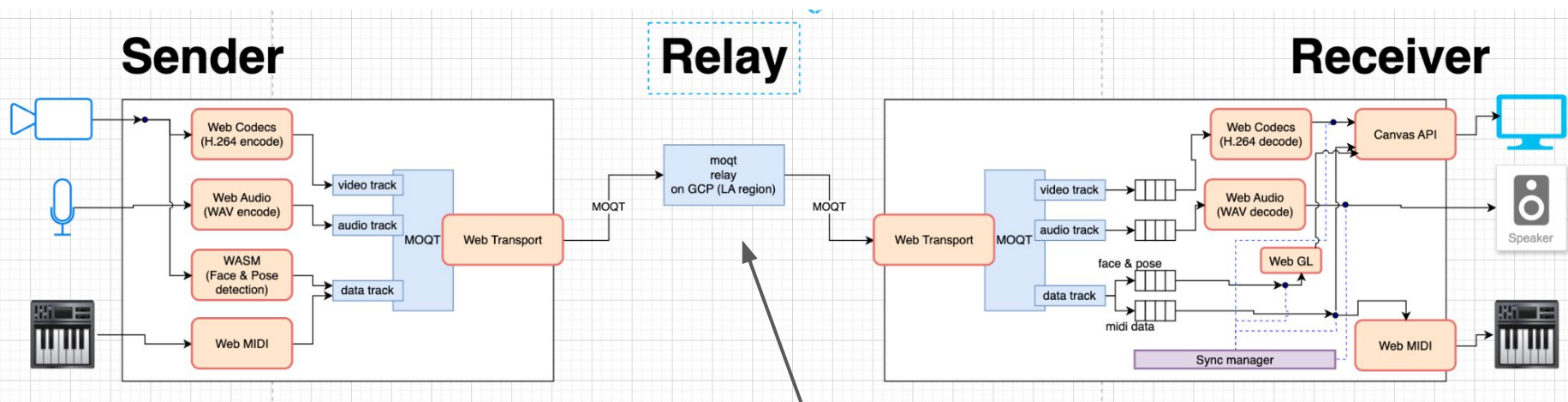
- **QUIC**

- **TCP alternative. First motivation is for HTTP3**
- **QUIC streams are multiplexed in single QUIC session**
- **no “Head of Line Blocking” among each QUIC streams**

- **Media over QUIC**

- **Send each video frames via independent QUIC streams**
- **Duration of each streams are under 34msec**
- **First motivation : Low Latency with flexibility likewise HLS, DASH etc.**
- **Moreover : Synchronize AV data and Arbitrary data w/ captured timestamp.**

LIVE DEMO



at LA region in GCP
(moxxygen)

Diagram : **Sender**

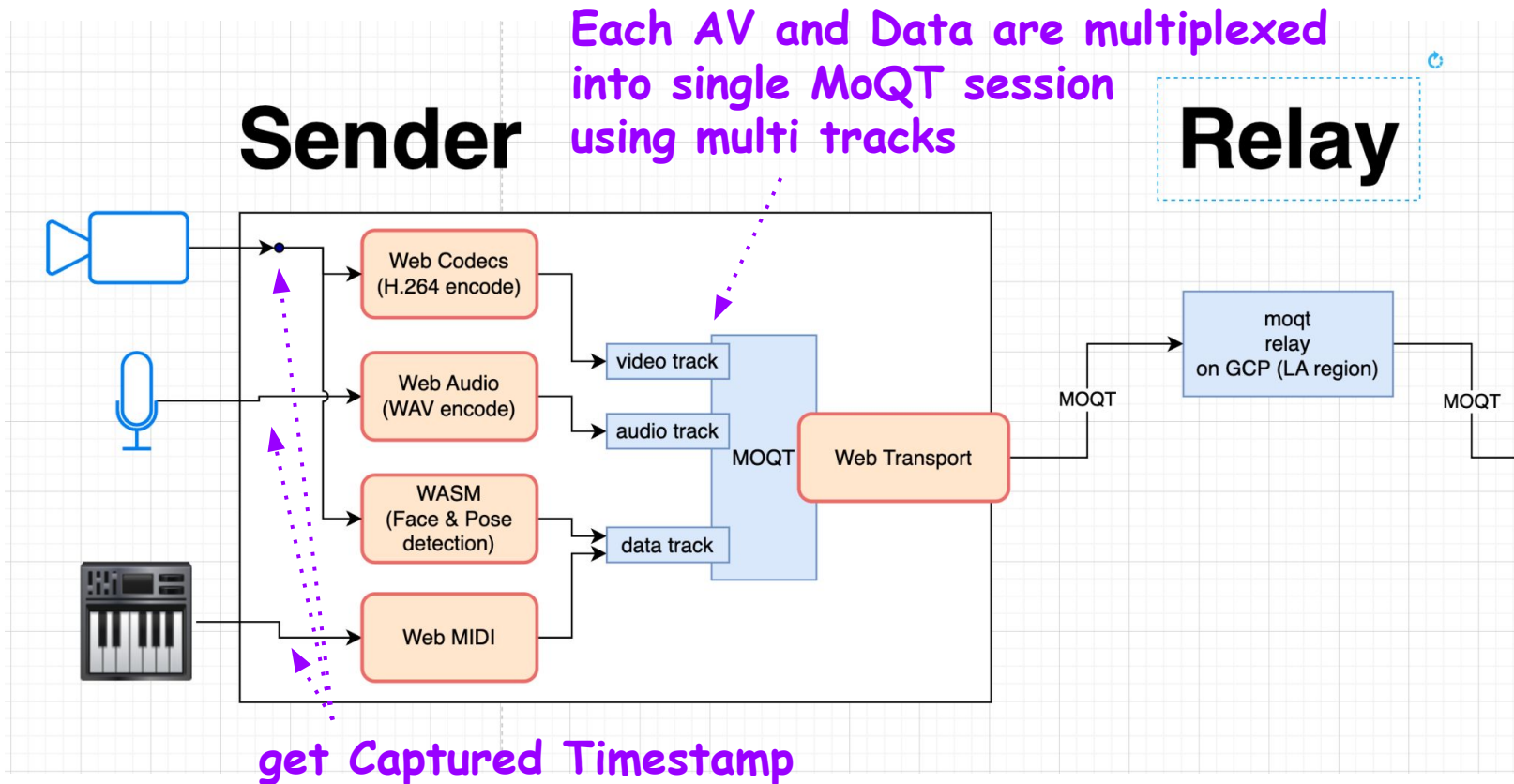
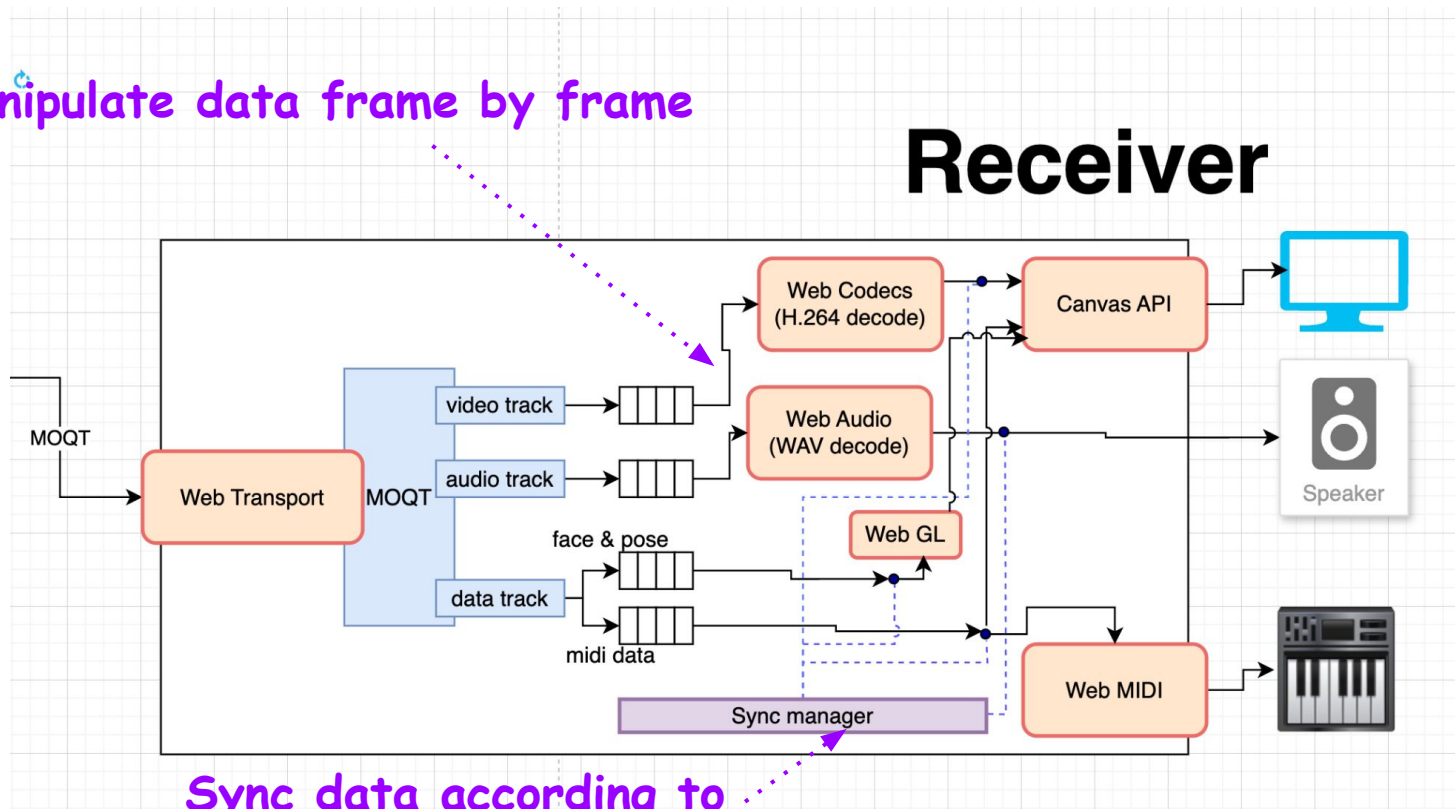


Diagram : Receiver

Manipulate data frame by frame

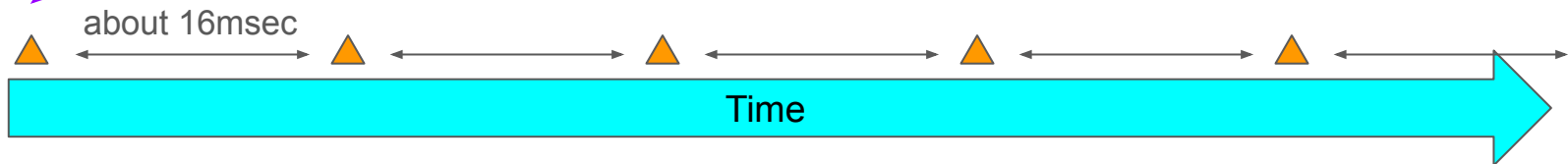


Sync data according to
Captured Timestamp at Sender

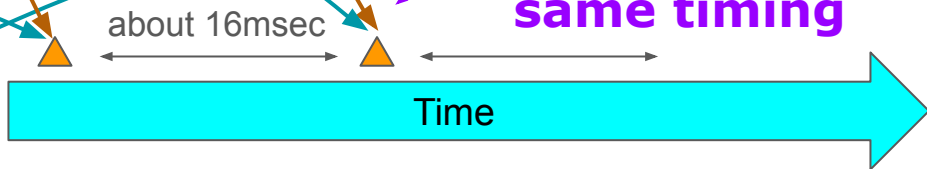
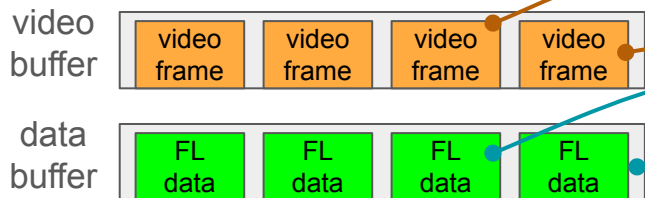
▲ : requestAnimationFrame

In case Landmarks

Sender getting **Video image** and detecting **Landmarks** at each clock of **requestAnimationFrame()**,



Receiver



Video image and Landmarks are rendered at the same timing

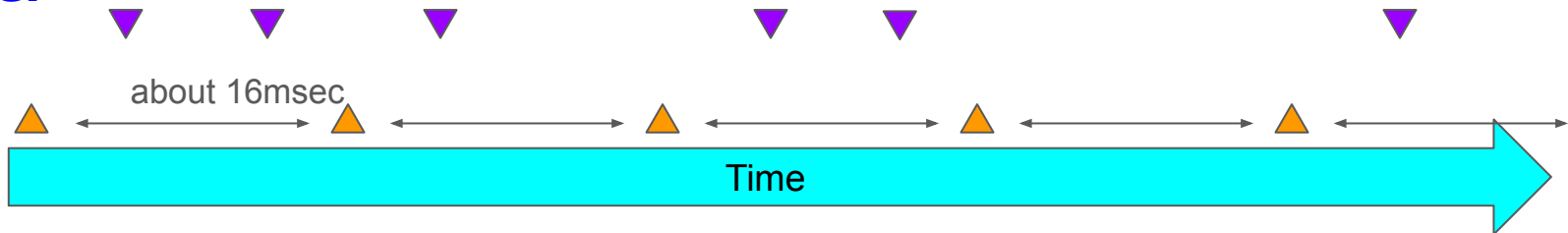
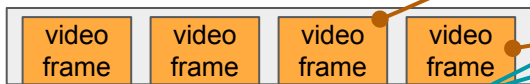
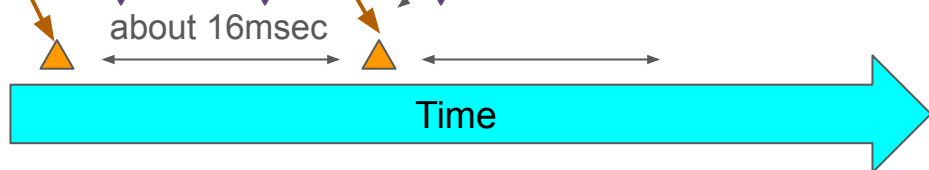
➡ This use case works well

▲ : requestAnimationFrame

In case of MIDI **Video Image** and **MIDI** data are **asynchronous**

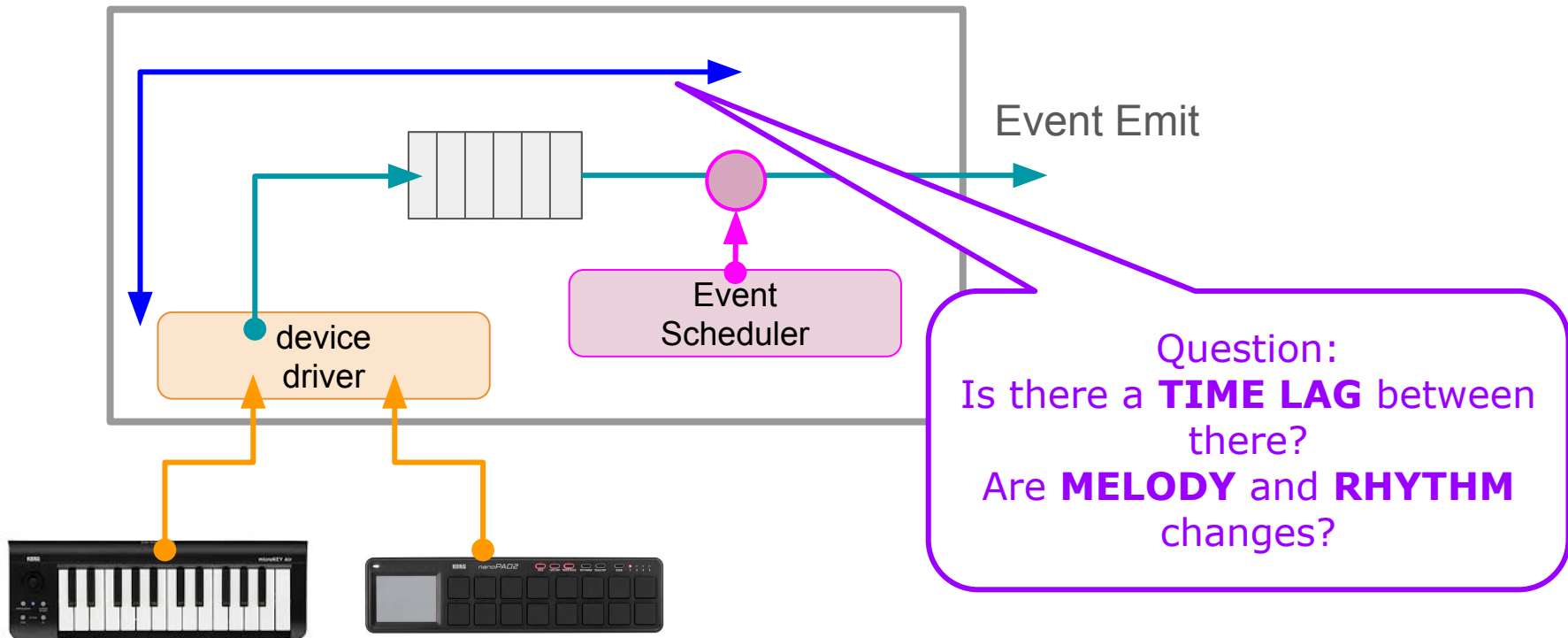
Sender

MIDI data

**Receiver**video
bufferdata
bufferMIDIOutput#
send(data, **interval**)

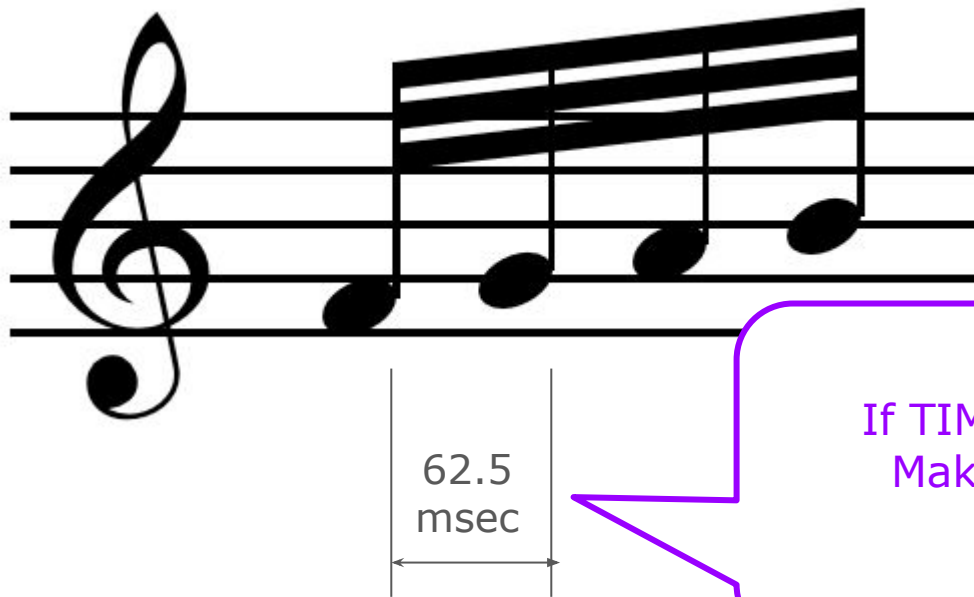
Though Video Image and MIDI are **asynchronous**, by **indicating time interval** in **MIDIOutput#send()**, it works.

Concern : **Time Lag** of MIDIInput



Does it a problem? (e.g. 32nd Note)

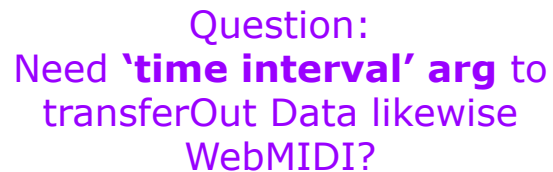
bpm=120



If TIME LAG is 3msec.
Makes about 6% of
fluctuation.

Other Use Case ?

- Remote Gaming
 - TIME LAG of GamePad API
- Remote Robot Control
 - WebUSB
- Remote drawing
 - Pressure and Speed of Pen?
- Smart City
 - Control and Sync for Digital Twin



Question:
Need **'time interval' arg** to
transferOut Data likewise
WebMIDI?

What We wanna here.

- Do you think “time alignment” is important for next web?
- Does it a really problem for web and each use case?
- What use cases are good for considering?
- Do you think it is worth to discuss?
- Are there any related topics to “Sync on Web”?