

DAW Design & Implementation

Time

Agenda

- Frank Schultz / Generalized dynamics plugin
- Timelines (audio, music, video, system, world)
 - !!!
 - Possible complete mental breakdown
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 - Synchronization
 - Using DLL's
 - Latency Compensation

Timelines

- Not used by: synthesis, most real-time FX, simple playback engines, most recording
 - Used by: editors, real playback engines, destructive recording
- A way to define a position within a given time range

Timelines 2

Mins:Secs	00:00:05.000		00:00:10.000		00:00:14.000	
Timecode	00:04:00	00:00:06:00	00:00:08:00	00:00:10:00	00:00:12:00	00:00:14:00
Samples	207285	303285	399285	495285	591285	
Bars:Beats	4	5	6	7	8	

- Defined by a zero point and a clock
 - Audio sample clock (e.g. 48kHz)
- Minutes/seconds – what clock? Audio!
 - Timecode – video clock (e.g. 25 fps)
- Musical time – tempo map (tempo & meter)

Timelines 3

- Audio, video, min:sec are absolute timelines, because they are clocked at a constant rate
- Any given distance in time is always the same distance on these timelines
 - e.g. we move 48000 samples, or 1 second
 - Or, we move 1 second, or 48000 samples
 - Err, not quite.
 - Video drop-down/pull-up

Timelines 4

- Musical timeline is not absolute
- Moving 1 second or 48000 frames might move us 2 beats in one part of the timeline, and 8 beats in another
 - There is no obvious reference clock
- Musical time is way of dividing some other idea of temporal flow
 - Therefore, musical time is based on audio samples or video frames but computed using a tempo map
- Tempo map defines transitions between tempo and meter at points on the reference timeline

Timelines 5

- What about wallclock time?
- Not when 48000 samples have passed, but when 1 second on the clock on the wall has elapsed?
 - May not be the same!

Synchronization

