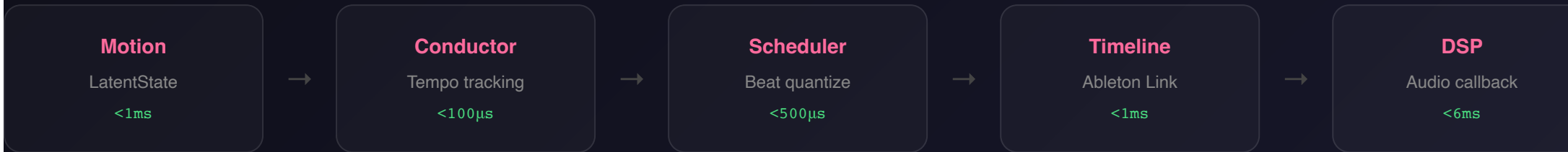


Audio Engine: Beat Scheduling & DSP

cc-conductor: Real-Time Audio Processing Pipeline



cc-conductor

TempoTracker

Estimates BPM from periodicity

range: 60-180 BPM

PhaseEstimator

Beat phase [0, 1] from motion

precision: ±10ms

EnergyMapper

Latent energy → intensity

smoothing: EMA $\alpha=0.1$

Beat Scheduler

ScheduledAction

Target beat + callback

`schedule(beat, action)`

QuantizeMode

Off / Beat / Bar / Phrase

`quantize_to(mode)`

BeatTimeline

Ableton Link sync

`link.beat_at_time()`

Audio DSP

AudioEngine

Real-time callback

48kHz / 128 samples

Lock-Free

No allocations in callback

ring buffer messaging

Priority

Real-time thread priority

SCHED_FIFO 99

Quantization Modes

Off

Immediate execution

Beat

Next beat boundary

Bar

Next bar (4 beats)

Phrase

Next phrase (8/16 bars)