

Distributed Acoustic Triangulation

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GStreamer Conf 2015
Dublin



Who am I?



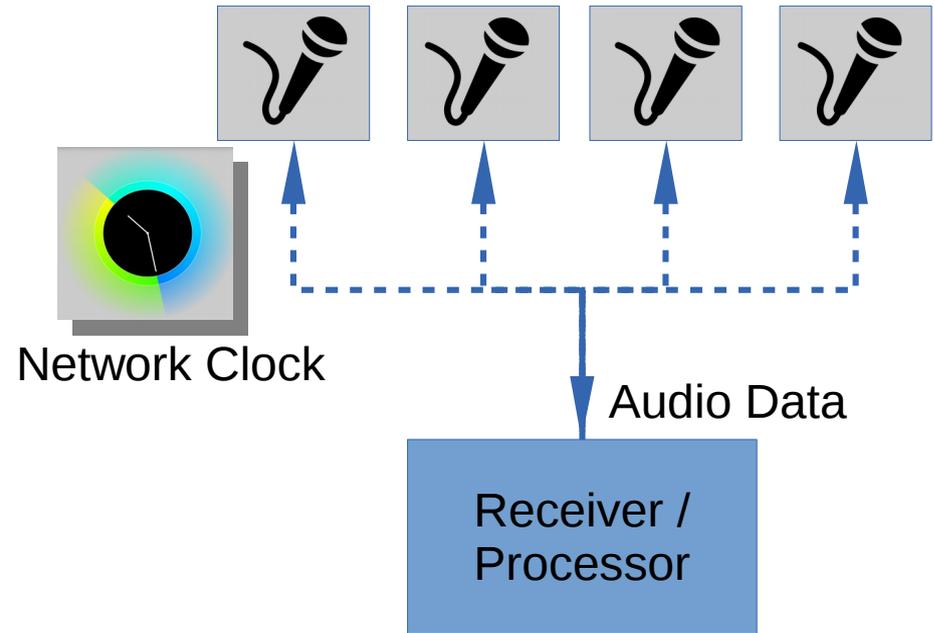
Concept

- Network Clock Improvements
 - Filtering, statistics output, better regression
 - A few milliseconds on noisy wifi
- Speed of sound
 - 340.29 m/s
 - Or 34.029 cm per millisecond
- Hmm... those are getting pretty close.



OK, so?

- Microphones + Senders
- Network clock synched
- Central Receiver
- Audio processing

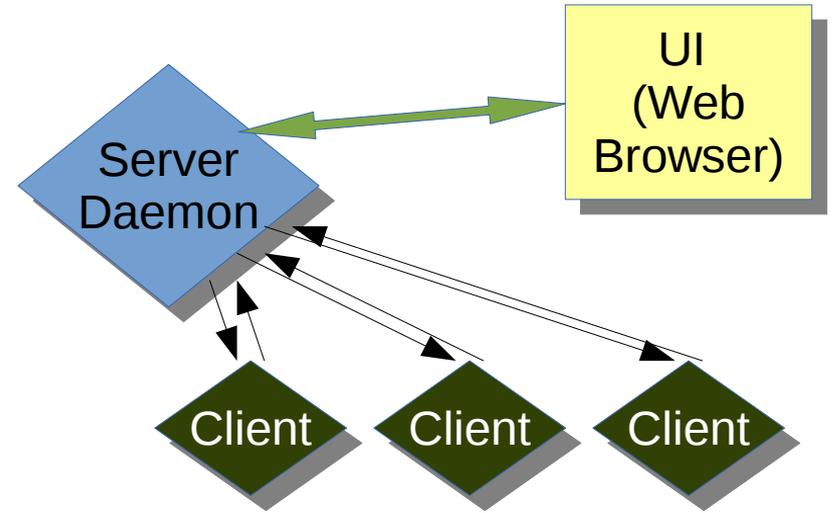


August 17th
(7 weeks)



Aurena

- Distributed audio playback
- Uses the network clock
- HTTP + RTSP
- JSON events / cmds



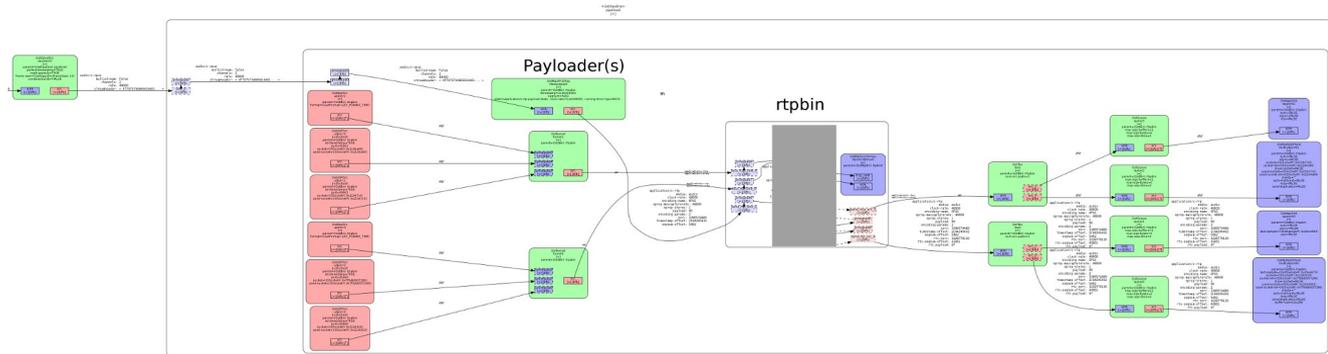
Sending Audio

- RTP
- HTTP
- RTSP
 - RTSP server in each client?
 - RECORD support



RTSP Sink

- New bin in gst-rtsp-server
- Request pads
- Auto-plug Payloaders
- Collect streams
- Build SDP, ANNOUNCE
- SETUP, Start recording
- RTX
- Bugs



<https://github.com/thaytan/gst-rtsp-server/tree/rtspsink>

RTSP Sync

- New RTSP features
- ntp-time-source, latency
- rtcp-sync-send-time,
- max-rtcp-rtp-time-diff





 **gstreamer**

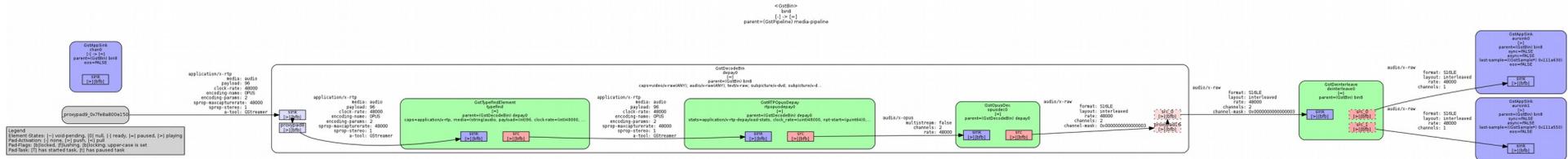
 **Centricular**

Receiver

- RTSP Server
- Ingest / deinterleave
- Interleave / store
- Process



Ingest



AppSrc

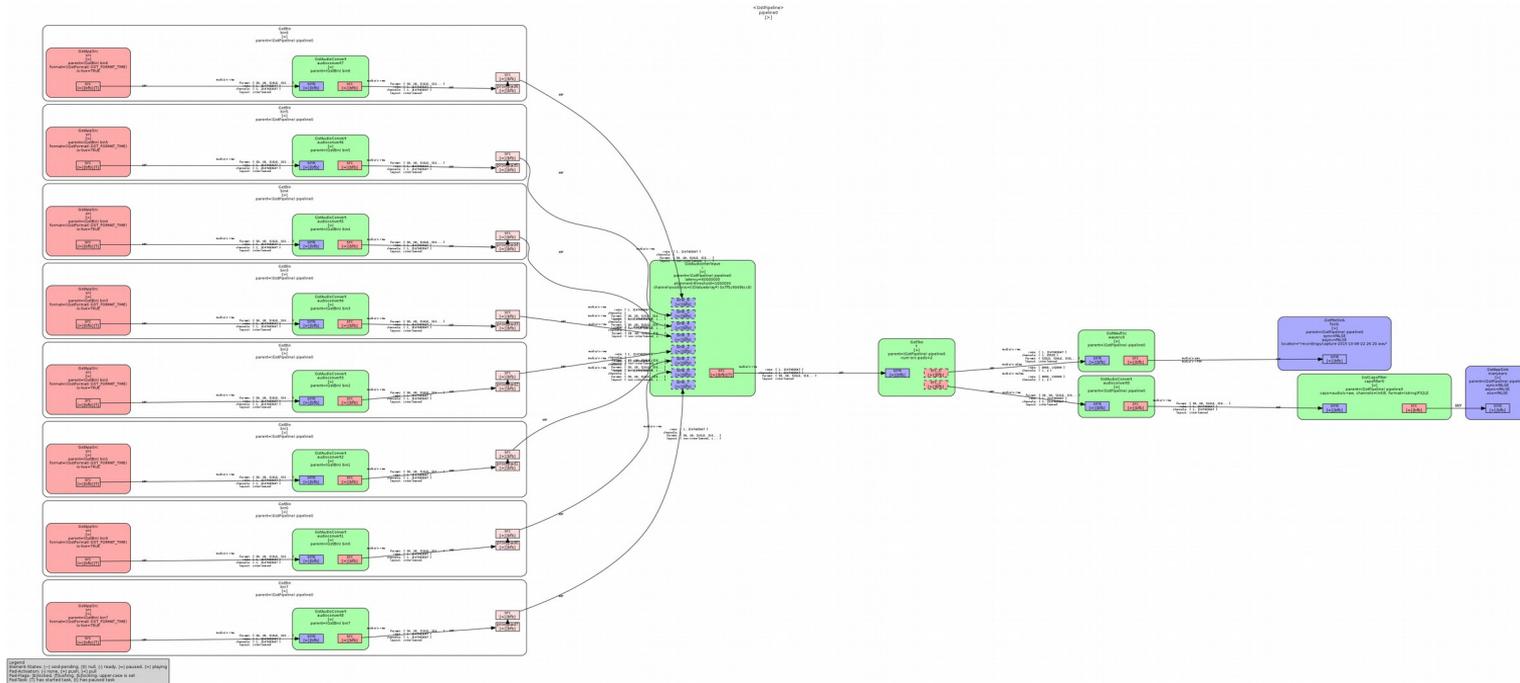
DecodeBin

Deinterleave

Appsinks



Processing



Appsrc -> audioconvert -> audiointerleave -> tee -> wavenc+filesink / appsink

Many Ears

- Real-time microphone array processing
- Robot audition
- 8 microphones in a fixed grid
- Localisation, tracking, source separation
- Qt GUI
- C Implementation



Android Audio! Arggh!



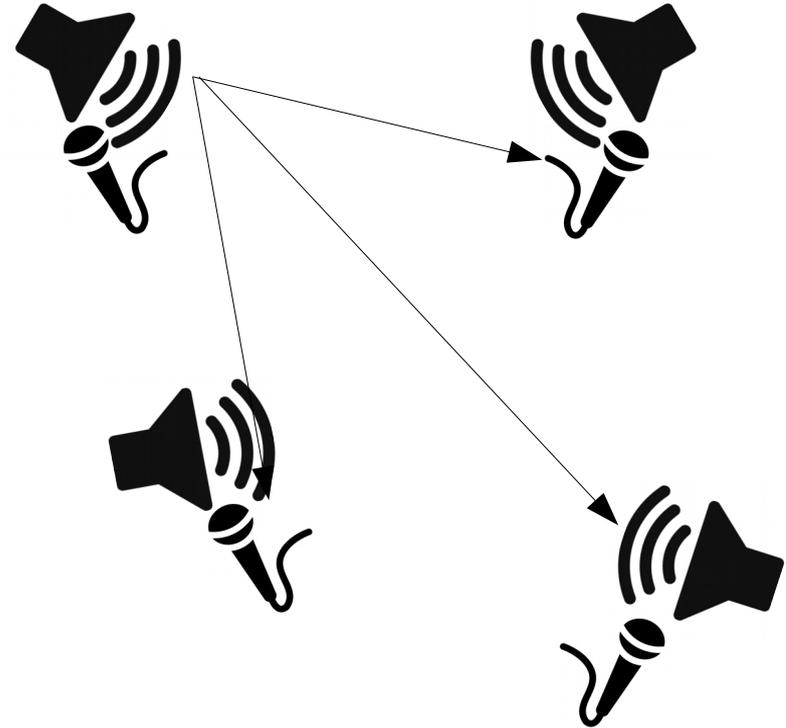
Android Audio

- Random audio delays / offsets
- 30-100ms, not predictable
- Drops bits when playback starts
- Not sure it's going to get any better



Calibration

- Play sounds
- Listen
- Correlate
- Solve for relative positions



Demos



Questions?

