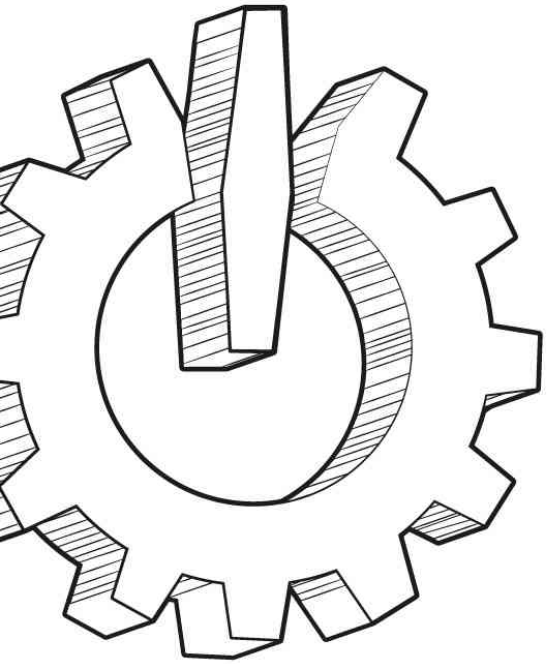
COLLABORA



GStreamer embedded state of the union

2019 edition

FOSDEM 19

Olivier Crête
olivier.crete@collabora.com
02/02/2019

What did I do?

- GStreamer at Collabora since 2007
- Started with VVoIP: Telepathy & Farstream
- Helps our customers use GStreamer
- Many embedded projects

COLLABORA

What kind of embedded devices use GStreamer?

COLLABORA

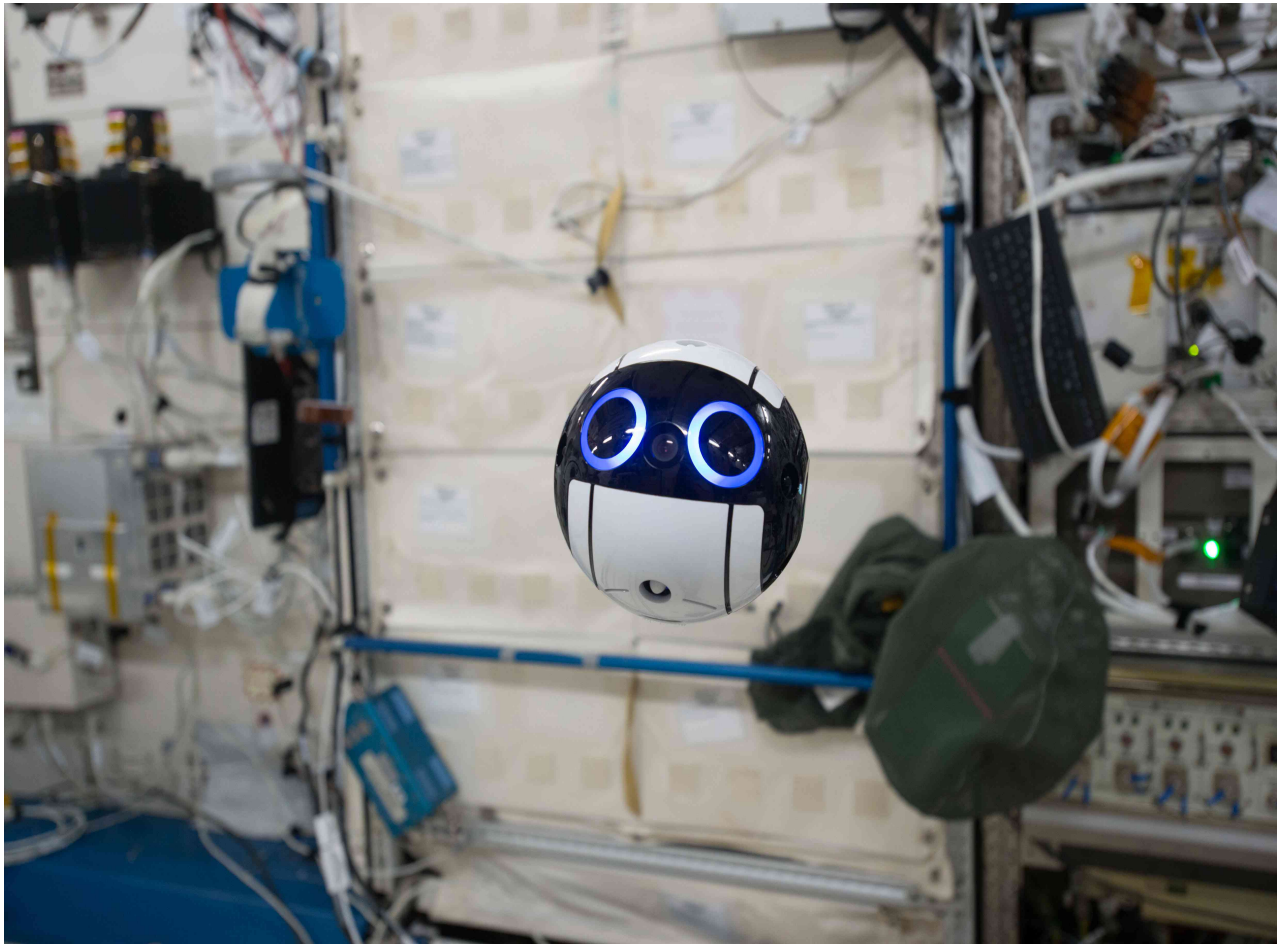
Smart TVs & Set-top Boxes

COLLABORA

In-flight entertainment

COLLABORA

Space Station



COLLABORA

The features

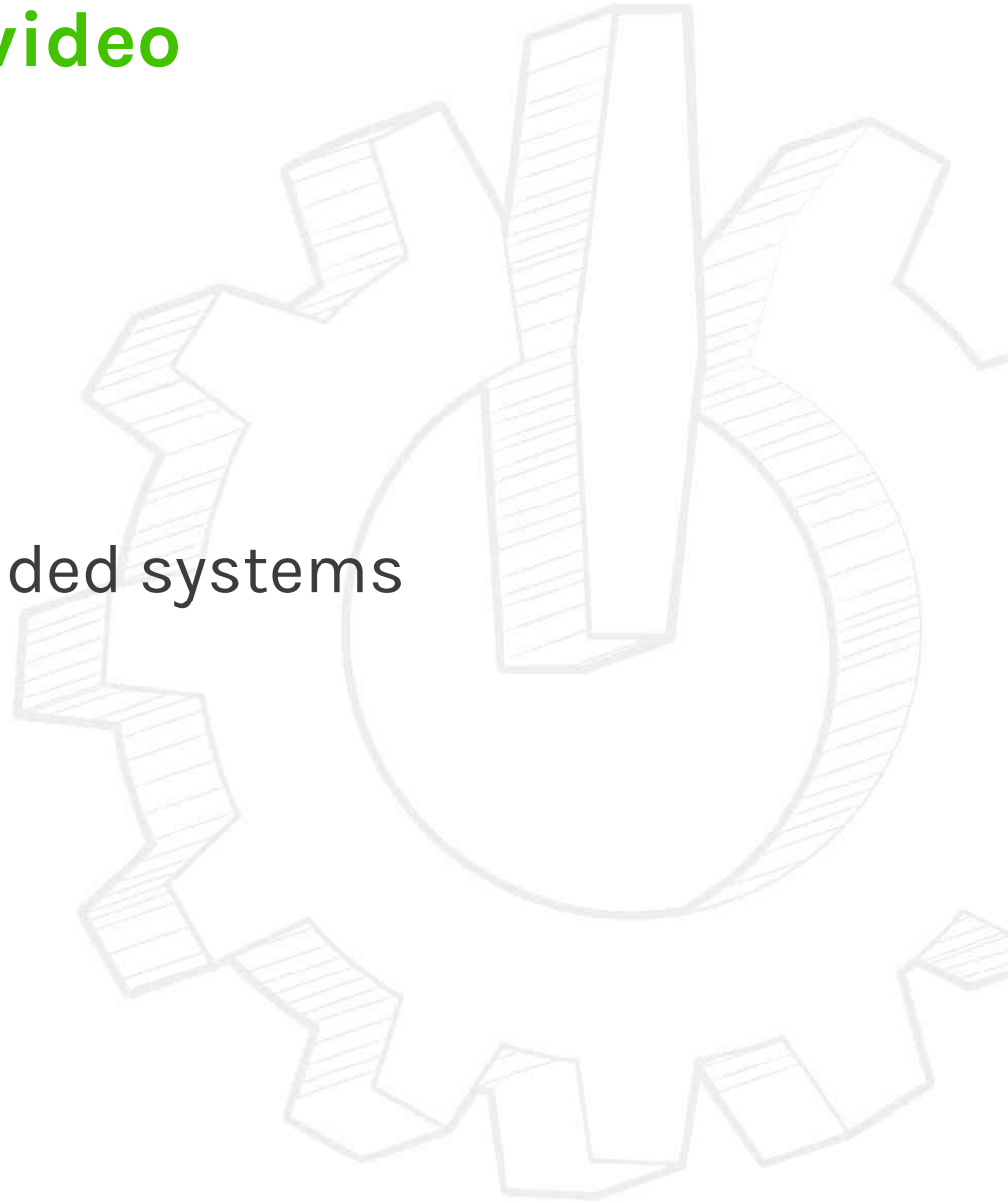
Video4Linux codecs

- Improved encoding support
- More encoders: HEVC, JPEG, vicodec fake codec
- More decoders: HEVC
- Faster device probing
- Stable element names for transform elements too
- Stateless codecs in the future? Waiting on kernel

IPC Pipeline

- Split a pipeline across separate processes
- Isolate network from demuxer/parsers from hardware codecs
- When security matters

Alternate field interlaced video

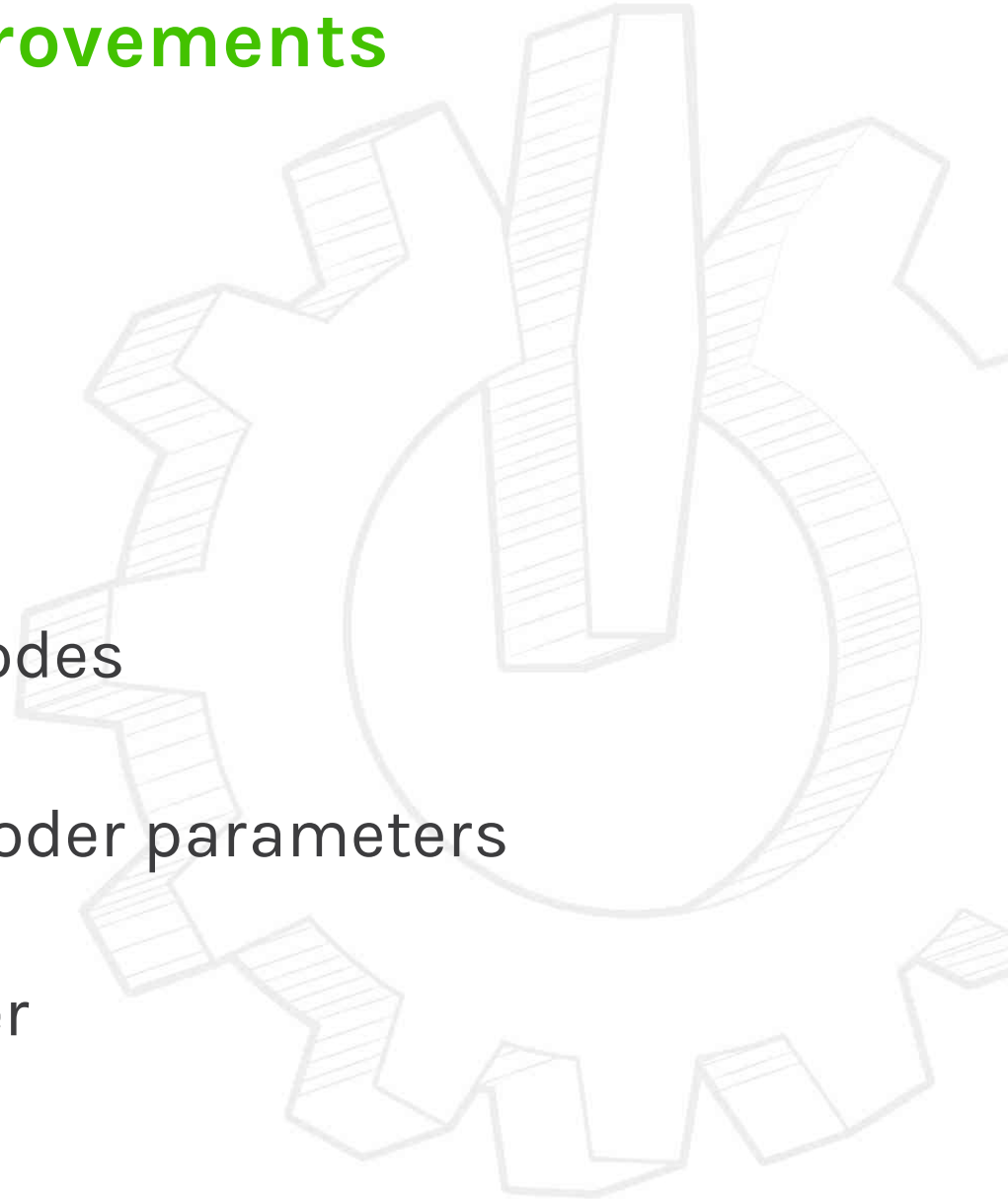


- One field per buffer
- Native format of some embedded systems
- In particular for H.265

Reducing latency in RTP pipelines

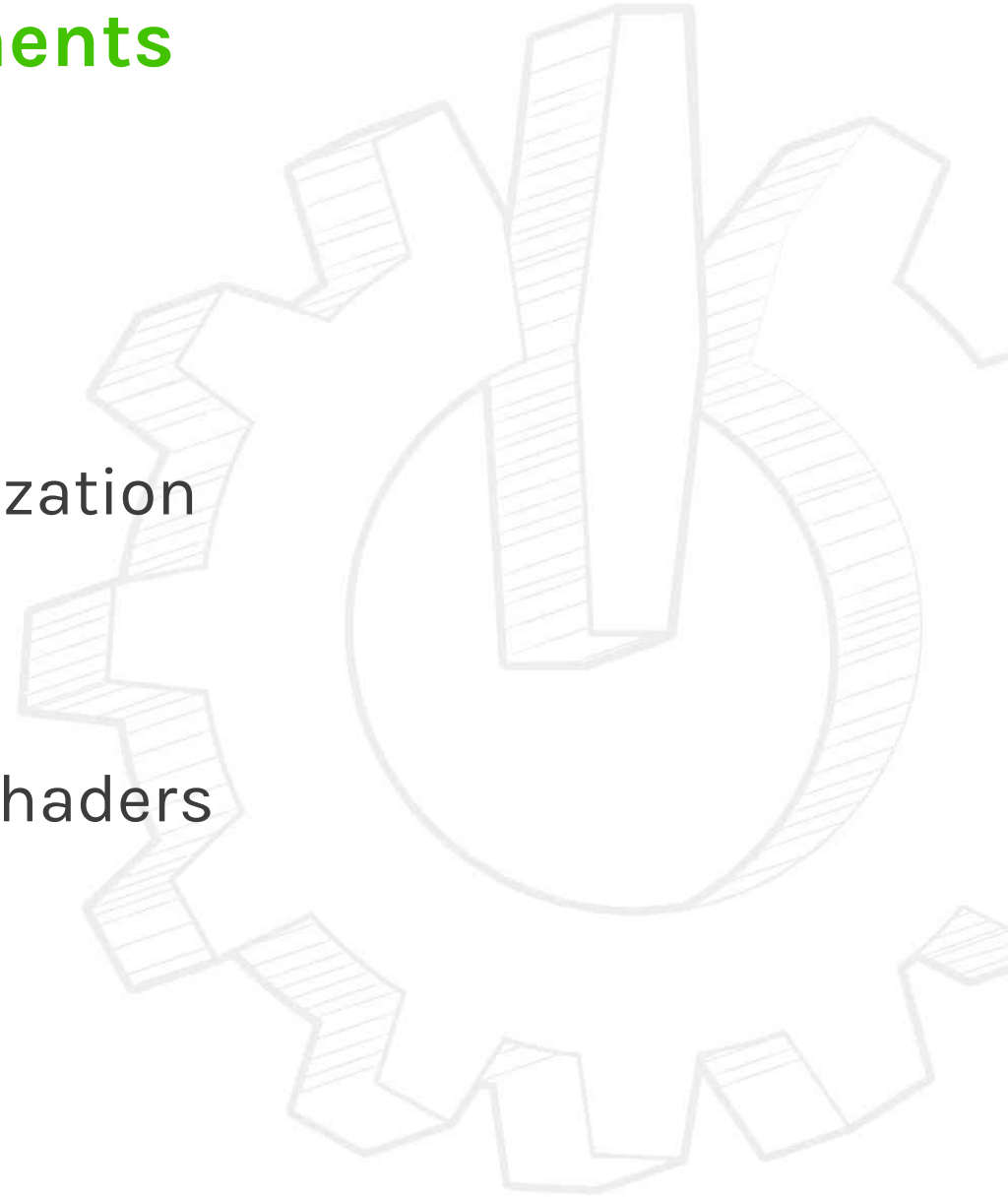
- Fixed a number of bugs
- In h264parse and h265parse
- In RTP H.264 & H.265 parsers

GStreamer-OpenMAX improvements



- Fixed a number of bugs
- Support 10 bit video formats
- More dmabuf & zero-copy modes
- Region of Interest to vary encoder parameters
- Dynamic framerate in encoder

DMAbuf related improvements



- Do explicit DMAbuf synchronization
- GL direct DMA uploader
  - For Vivante, avoids some shaders

COLLABORA

The future

Neural network accelerators

- GPUs: CUDA, OpenCL
- Next gen
  - Specialized hardware
  - Integration with AI frameworks

Android Camera2 API

- Modern features
- Branch exists
- No JNI, all native code

Remote tracer

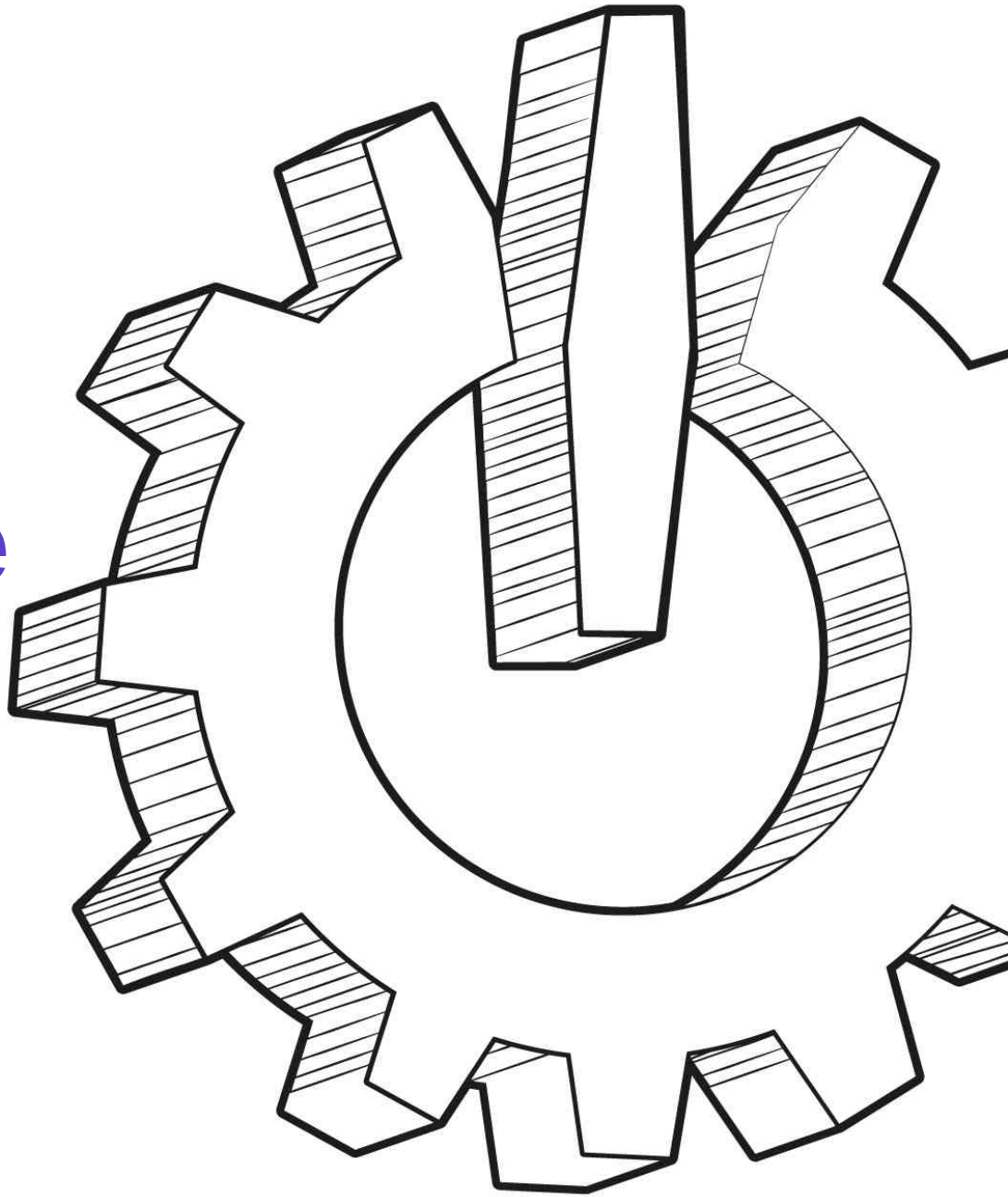
- A tracer to forward tracer results
- Could be built-in devices
  - Remote performance debugging?

Embedded Continuous Integration

- Step 1: Build for embedded platform
- Step 2: Test on embedded hardware

- Prototype with Jenkins + LAVA
- Questions: How to integrate with GitLab CI with LAVA

FOSDEM 19

GStreamer embedded state of the union

Any questions?