GStreamer embedded state of the union

2019 edition

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
What kind of embedded devices use GStreamer?
Smart TVs & Set-top Boxes
In-flight entertainment
Space Station
The features
Video4Linux codecs

- Improved encoding support
- More encoders: HEVC, JPEG, vicoddec 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
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
GStreamer embedded state of the union

Any questions?