

# STATE OF THE UNION

GStreamer Conference

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# **INTRODUCTION**

**WHO AM I ?**

# **WHAT IS GSTREAMER ?**

Most of you know this, so key points only.

Framework for multimedia processing.

Cross-platform, toolkit agnostic.

Any and all use cases.

Set of libraries and plugins.

Abstract API, very extensible.

We often wrap other libraries.

Low-level API and high-level API:  
playbin, encodebin, RTSP server,  
non-linear editing, VoIP etc.

Integration with other frameworks and projects

e.g. WebKit/Blink, Clutter, Cogl, OpenGL,  
Windows, OS X, Android, iOS

Goal is to adapt to and integrate with  
other platforms and frameworks  
(inputs, outputs, decoders, DSPs/GPUs..)

**SO, WHAT HAVE WE BEEN UP TO ?**



# RELEASES!

- 6-monthly(ish) release schedule
  - still going strong(ish)
    - 1.10: Nov 2017
    - 1.12: May 2017
    - 1.14: ???

- sticking to the 6-monthly schedule
  - but shifting it a little
  - 1.14: ~January 2017
    - 1.16: ~July 2018

**SOME THINGS THAT LANDED IN 1.12 ...**

New msdk plugin for Intel's Media SDK  
(in gst-plugins-bad)

Also: gst-mfx

## **X264ENC**

Support for multiple bit depths.

Dynamically chosen at runtime.

# **VIDEOSCALE + VIDEOCONVERT**

Multi-threaded scaling and conversion.

# RTPBIN

Bundle support  
for incoming streams  
(WebRTC)

# TIMED TEXT MARKUP LANGUAGE (TTML)

New ttml plugin.

Supports the EBU-TT-D profile for now.

Has potential as general intermediary representation for text subtitles.



# SPLITMUXSINK

Buffer collection and scheduling rewritten.

Splitting should be deterministic now.

New "format-location-full" signal allows file name to be based on metadata of first buffer in chunk.

Can also split based on time code meta.

Automatically starts new chunk if caps change.

# **DASH TRICK MODE PLAYBACK**

# **GSTREAMER OPENGL INTEGRATION**

Supports Vivante EGL FB windowing system now:

--> better perf with the proprietary driver on Freescale  
iMX.6

# **GSTREAMER VA-API**

New features.

Lots of fixes.

Encoders now have a rank and are autoplugged.

# KMSSINK

Proposes dmabuf-based bufferpool now.

More formats.

More devices.

More stability.

# DMABUF SUPPORT EVERYWHERE

--> Zero copy.

**SOME COOL THINGS THAT WILL LAND IN  
1.14 ...**

# IPCPIPELINE

Split pipelines across multiple processes!

Isolate demuxers, parsers, decoders.

--> lightning talk later!



# **GSTREFERENCETIMESTAMPMETA**

Attach alternative timestamps to buffers.

# **RING BUFFER FOR DEBUG LOGS**

Useful for long running tasks.

Or disk space constrained environments.

Retrieve log lines when things fail.

# TEE

Allocation query aggregation:

Aggregates allocation params, pool and will keep all metas without parameters.

# **TRACING FRAMEWORK IMPROVEMENTS**

## LEAK TRACER:

- more reliable (wasn't 100% thread-safe)
- new ref/unref hooks to get stack traces
- snapshotting
- dump list of live objects
- need to make this all work properly on Windows too!

**LATENCY TRACER IMPROVEMENTS ARE ALSO IN THE  
PIPELINE**

# VIDEO4LINUX

Much faster webcam probing with v4l2src

Video Encoder support

Fixed element names now, no longer random

dmabuf support

## **HLSSINK2**

Takes elementary streams as input

Uses splitmuxsink internally

Can handle transmuted files, without encoder.



# RTSP 2.0

Client + server.

--> lightning talk

# **GSTREAMER OPENMAX WRAPPER**

gst-omx has seen a fair bit of work.

Esp. for Tizonia + Xilinx UltraScale+

# QUALITY ASSURÄNCE

Much improved coverage in validation test suite.

Especially for DASH + RTSP

# **MISSION: PLUGIN MOVES AND MODULE CONSOLIDATION ...**

Ongoing effort to move things from -bad into other  
modules.

Going strong!

**DATAURISRC HAS MOVED TO CORE**

**MAD MP3 DECODER WAS REMOVED**

(GPL + unmaintained)

# **MP3 PATENTS HAVE EXPIRED!**

mpg123 mp3 decoder -> good

LAME mp3 encoder -> good

twolame mp2 encoder -> good

# **AC-3 PATENTS HAVE EXPIRED!**

a52dec has to stay in -ugly

liba52 is GPL :(



## COMING SOON (HOPEFULLY!)

- aggregator base class -> core
- audiomixer + audioaggregator -> base  
incl. audiomixer conversion support
- compositor + videoaggregator -> base

**LET'S MOVE OPENGL INTEGRATION TO -  
BASE !**

(libs and plugins)

## **MISSION: IMPO^HDOCS**

Docs consolidation into single module ongoing.

Manual, Plugin Writer's Guide, Tutorials: DONE

API reference manuals, plugin docs: TODO

## **ALSO**

Let's add 'bad-reason' tags to all -bad elements !

Let's add skeleton docs to all -bad elements !

**THE FUTURE ...**

# WEBRTC

("How do I stream to my web browser?")

\o/ \o/ \o/

# **GSTPLAYER**

High-level player abstraction API.

Continues to be fleshed out.

Stabilise once it has everything GNOME Video Player  
needs ?

# **KLV METADATA SUPPORT**

Generic per-frame KLV metadata

Muxing / demuxing KLV meta per frame



# **PERFORMANCE OPTIMISATIONS..**

Everywhere, of course.

Lots of things in the pipeline.

# **BETTER RTMP ELEMENTS ?**

--> lightning talk

# **SRT - "SECURE, RELIABLE, TRANSPORT"**

Elements in bugzilla.

Seems well-placed to replace RTMP.

**WHAT ELSE ?**

# MESON BUILD SYSTEM STATUS UPDATE:

Mostly complete, a few things still missing:

- full set of options
- static build untested
- iOS/Android untested
- cerbero integration

We *will* move away from autotools  
once the Meson build is ready.

There will be a transition period.

But it won't be forever.

Be prepared.

# **RUST**

Let's talk about Rust !

("Fast, safe and productive - pick three.")

# RUST

No plans to switch to it in the short run.

No plans to make it a hard dep in core components.

We can do a lot without breaking GStreamer backwards compat.

We're playing with it, experimenting, gaining experience.

Something for the longer term.



# **GSTREAMER RUST BINDINGS**

Should be in pretty good shape now.

--> Sebastian's talk tomorrow

# **GSTREAMER C# BINDINGS**

Have also been resurrected and updated.

--> Lightning talk later

**ROOM FOR IMPROVEMENT ?**

# **ADAPTIVE STREAMING (DASH, HLS, ETC.)**

Really need to improve our creation story!

# MAKE IT EASIER TO WRITE "SIMPLE SERVERS"

- `souphttpserversink`
  - `rtspserversink`

# **STREAM API**

Implement in all / more demuxers !

Support stream deactivation.

# WINDOWS, IOS, ANDROID

More sink elements that work  
with the native UI toolkits  
like qmlglsink/gtksink etc.

Windows: should move to newer APIs  
(no more need to support XP \o/)

# **ANDROID + IOS + MACOS NEED SOME LOVE**

Catch up with latest versions.



# WHAT ELSE SHOULD BE ON OUR RADAR?

- SDI-over-IP standards
- ONVIF RTSP extensions (audio back channel, special modes)
  - OpenCV integration
    - VR

**HOW CAN WE BETTER ENGAGE WITH  
OUR USERS ?**

**PULL REQUESTS INSTEAD OF PATCHES?**

--> Gitlab ?

**SHOULD WE HAVE A PROPER FORUM ?**

Not just mailing lists and IRC.

**NIGHTLY BUILDS (SOON HOPEFULLY!)**

**THAT'S ALL FOLKS**  
**THANK YOU AND ENJOY THE**  
**CONFERENCE !**  
**QUESTIONS? COMMENTS?**