

A Day in the Life of a Media Plumber

Sanchayan Maity

Who

- ▶ Who am I?

Who

- ▶ Who am I?
 - ▶ Embedded Systems background

Who

- ▶ Who am I?
 - ▶ Embedded Systems background
 - ▶ Prefer C, Haskell and Rust

Who

- ▶ Who am I?
 - ▶ Embedded Systems background
 - ▶ Prefer C, Haskell and Rust
 - ▶ Organize and speak at Rust and Haskell meet-ups in Bangalore

Who

- ▶ Who am I?
 - ▶ Embedded Systems background
 - ▶ Prefer C, Haskell and Rust
 - ▶ Organize and speak at Rust and Haskell meet-ups in Bangalore
- ▶ Work?

Who

- ▶ Who am I?
 - ▶ Embedded Systems background
 - ▶ Prefer C, Haskell and Rust
 - ▶ Organize and speak at Rust and Haskell meet-ups in Bangalore
- ▶ Work?
 - ▶ Software Engineer @ **asymptotic**

Who

- ▶ Who am I?
 - ▶ Embedded Systems background
 - ▶ Prefer C, Haskell and Rust
 - ▶ Organize and speak at Rust and Haskell meet-ups in Bangalore
- ▶ Work?
 - ▶ Software Engineer @ **asymptotic**
 - ▶ Open source consulting firm based out of Bangalore and Toronto

Who

- ▶ Who am I?
 - ▶ Embedded Systems background
 - ▶ Prefer C, Haskell and Rust
 - ▶ Organize and speak at Rust and Haskell meet-ups in Bangalore
- ▶ Work?
 - ▶ Software Engineer @ [asymptotic](#)
 - ▶ Open source consulting firm based out of Bangalore and Toronto
 - ▶ Work on low level systems software centred around multimedia

Who

- ▶ Who am I?
 - ▶ Embedded Systems background
 - ▶ Prefer C, Haskell and Rust
 - ▶ Organize and speak at Rust and Haskell meet-ups in Bangalore
- ▶ Work?
 - ▶ Software Engineer @ [asymptotic](#)
 - ▶ Open source consulting firm based out of Bangalore and Toronto
 - ▶ Work on low level systems software centred around multimedia
 - ▶ GStreamer, PipeWire, PulseAudio

Who

- ▶ Who am I?
 - ▶ Embedded Systems background
 - ▶ Prefer C, Haskell and Rust
 - ▶ Organize and speak at Rust and Haskell meet-ups in Bangalore
- ▶ Work?
 - ▶ Software Engineer @ [asymptotic](#)
 - ▶ Open source consulting firm based out of Bangalore and Toronto
 - ▶ Work on low level systems software centred around multimedia
 - ▶ GStreamer, PipeWire, PulseAudio
 - ▶ Language Polyglots

Open source contributions

- ▶ GStreamer

Open source contributions

- ▶ GStreamer
- ▶ gst-plugins-rs

Open source contributions

- ▶ GStreamer
- ▶ gst-plugins-rs
- ▶ PipeWire

Open source contributions

- ▶ GStreamer
- ▶ gst-plugins-rs
- ▶ PipeWire
- ▶ PulseAudio

Open source contributions

- ▶ GStreamer
- ▶ gst-plugins-rs
- ▶ PipeWire
- ▶ PulseAudio
- ▶ Linux

Open source contributions

- ▶ GStreamer
- ▶ gst-plugins-rs
- ▶ PipeWire
- ▶ PulseAudio
- ▶ Linux
- ▶ u-boot

GStreamer

- ▶ Multiplatform Pipeline based multimedia framework

GStreamer

- ▶ Multiplatform Pipeline based multimedia framework
- ▶ Bindings for various languages

GStreamer

- ▶ Multiplatform Pipeline based multimedia framework
- ▶ Bindings for various languages
- ▶ Allows building complex media processing workflows

GStreamer

- ▶ Multiplatform Pipeline based multimedia framework
- ▶ Bindings for various languages
- ▶ Allows building complex media processing workflows
- ▶ Some applications

GStreamer

- ▶ Multiplatform Pipeline based multimedia framework
- ▶ Bindings for various languages
- ▶ Allows building complex media processing workflows
- ▶ Some applications
 - ▶ PiTiVi (Video Editor)

GStreamer

- ▶ Multiplatform Pipeline based multimedia framework
- ▶ Bindings for various languages
- ▶ Allows building complex media processing workflows
- ▶ Some applications
 - ▶ PiTiVi (Video Editor)
 - ▶ amaroK, Banshee, Clementine (audio players)

GStreamer

- ▶ Multiplatform Pipeline based multimedia framework
- ▶ Bindings for various languages
- ▶ Allows building complex media processing workflows
- ▶ Some applications
 - ▶ PiTiVi (Video Editor)
 - ▶ amaroK, Banshee, Clementine (audio players)
 - ▶ Empathy (VOIP and video conferencing)

GStreamer

- ▶ Multiplatform Pipeline based multimedia framework
- ▶ Bindings for various languages
- ▶ Allows building complex media processing workflows
- ▶ Some applications
 - ▶ PiTiVi (Video Editor)
 - ▶ amaroK, Banshee, Clementine (audio players)
 - ▶ Empathy (VOIP and video conferencing)
 - ▶ GstLAL (gravitational wave data analysis)

GStreamer

- ▶ Multiplatform Pipeline based multimedia framework
- ▶ Bindings for various languages
- ▶ Allows building complex media processing workflows
- ▶ Some applications
 - ▶ PiTiVi (Video Editor)
 - ▶ amaroK, Banshee, Clementine (audio players)
 - ▶ Empathy (VOIP and video conferencing)
 - ▶ GstLAL (gravitational wave data analysis)
 - ▶ Rygel (DLNA streaming server and renderer)

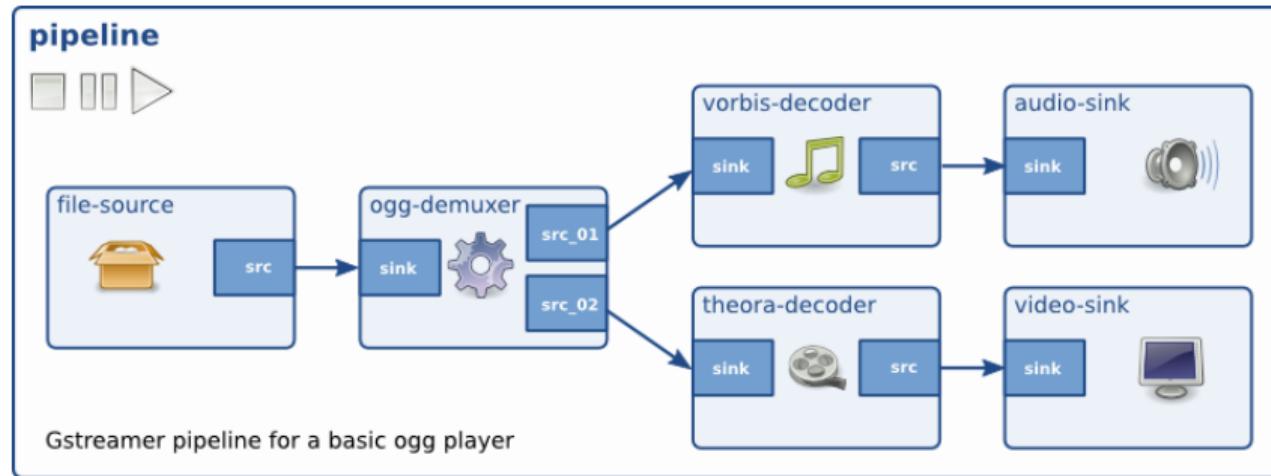
GStreamer

- ▶ Multiplatform Pipeline based multimedia framework
- ▶ Bindings for various languages
- ▶ Allows building complex media processing workflows
- ▶ Some applications
 - ▶ PiTiVi (Video Editor)
 - ▶ amaroK, Banshee, Clementine (audio players)
 - ▶ Empathy (VOIP and video conferencing)
 - ▶ GstLAL (gravitational wave data analysis)
 - ▶ Rygel (DLNA streaming server and renderer)
 - ▶ Totem (movie player for the GNOME desktop)

Simple pipeline

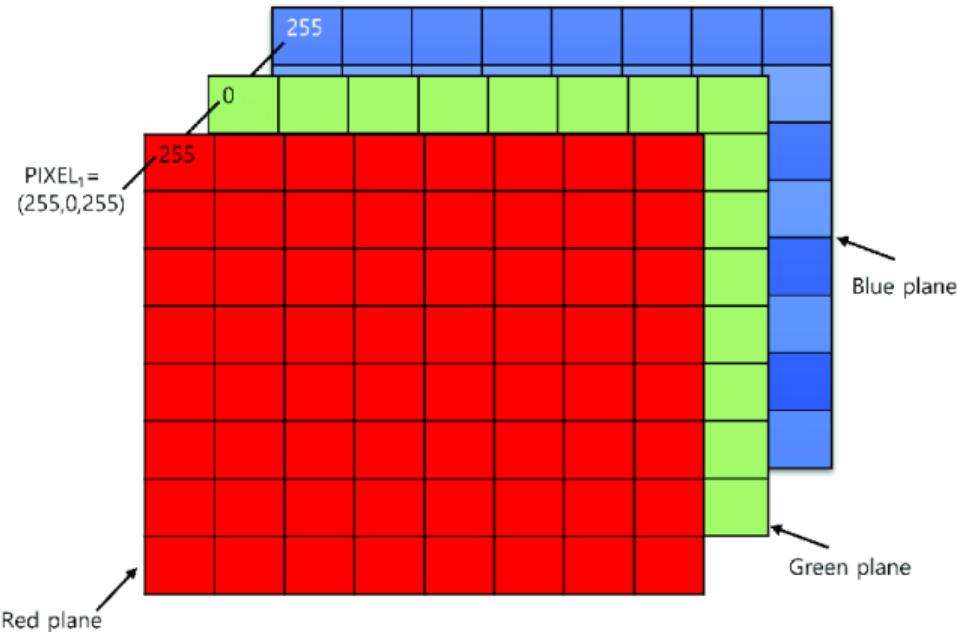
```
gst-launch-1.0 videotestsrc ! autovideosink  
gst-launch-1.0 audiotestsrc ! autoaudiosink
```

Media pipeline¹



¹Dynamic Pipelines

Internals²



Alpha compositing³

- ▶ How does it look?

³Alpha Compositing - Bartosz Ciechanowski

Demo

- ▶ Using Cairo⁴⁵

⁴ GStreamer Cairo example

⁵ GStreamer Cairo example project

Rounded corners



```
gst-launch-1.0 filesrc location=bunny.mp4 ! decodebin ! videoconvert !
roundedcorners border-radius-px=100 ! videoconvert ! gtsksink
```

Getting started

- ▶ [GStreamer Basic Tutorial](#)

Getting started

- ▶ GStreamer Basic Tutorial
- ▶ GStreamer Application Development

Questions

- ▶ Reach out on

Questions

- ▶ Reach out on
 - ▶ Email: sanchayan@sanchayanmaity.net

Questions

- ▶ Reach out on
 - ▶ Email: sanchayan@sanchayanmaity.net
 - ▶ Mastodon: <https://sanchayanmaity.com/@sanchayan>

Questions

- ▶ Reach out on
 - ▶ Email: sanchayan@sanchayanmaity.net
 - ▶ Mastodon: <https://sanchayanmaity.com/@sanchayan>
 - ▶ Telegram: <https://t.me/SanchayanMaity>

Questions

- ▶ Reach out on
 - ▶ Email: sanchayan@sanchayanmaity.net
 - ▶ Mastodon: <https://sanchayanmaity.com/@sanchayan>
 - ▶ Telegram: <https://t.me/SanchayanMaity>
 - ▶ Blog: sanchayanmaity.net