

Upipe video pipelines for multimedia transcoders, streamers and players

Flexible data flow framework
<http://www.upipe.org/>

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What is Upipe?

- Handles flows of data in a « pipeline »
- Processes them using filters called « pipes »
- Defines APIs:
 - To configure and feed data into pipes
 - To get out-of-band events from pipes
 - To store data in an efficient manner with attributes
 - To interact with an event loop/threads
- Provides a set of basic pipes

Potential applications

- Transcoders
- Multiplexers
- Broadcast play-out systems
- Mosaics
- Embedded, lightweight, media players
- Embedded demonstration platforms

Why yet-another-multimedia-framework?

- Existing frameworks are 15 years old; new trends emerged since:
 - Super-scalar architectures
 - Event-driven loops (à la libevent)
- Maintenance made more difficult by:
 - Lack of modularity, complexity
 - Confusion between processing vs. decision
- Not suitable for professional applications:
Higher-level API access only

Starting Upipe two years ago

- Our policies:
 - Specified bottom-up, from the simplest to the most complicated, different API levels are possible
 - Keep modules as simple and autonomous as possible (UNIX philosophy)
 - Emphasis on documentation and unit tests (including memory leaks)
 - Follow standards – not “media players that should play every single poorly encoded file”
 - Core: MIT, modules: MIT, GPLv2+ or LGPLv2+

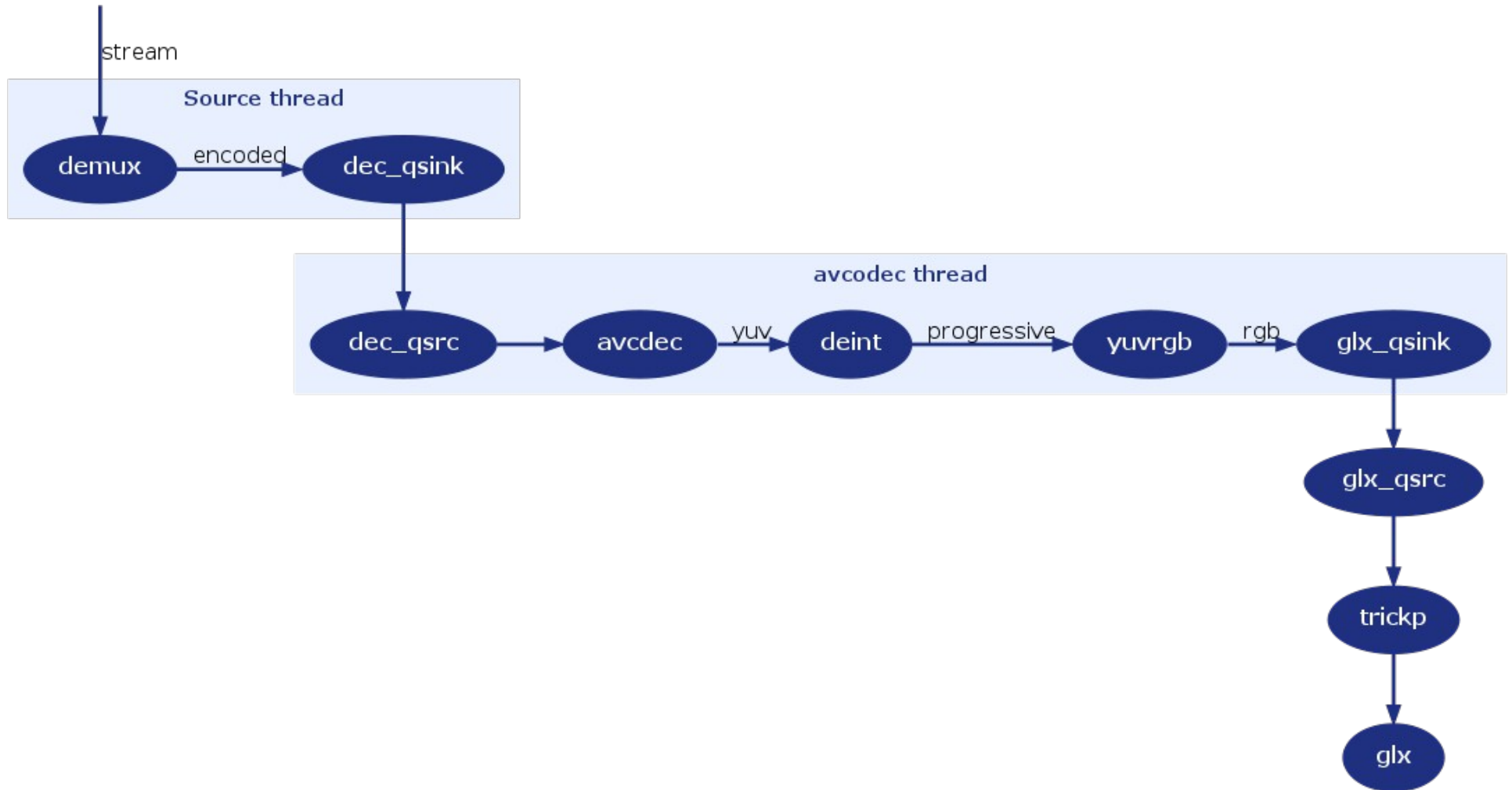
Upipe vs. existing frameworks

- Lower-level: application decides where to put queues and threads
- Unified API for sources/filters/sinks thanks to upump (asynchronous event loop)
- Lock-less or wait-less data structures
- Systematic reference counts on structures
- Zerocopy, copy-on-write buffer management
- Arbitrary attributes on buffers
- Dynamic pipeline construction when catching events thrown by pipes
- Younger project: fewer modules, fewer users

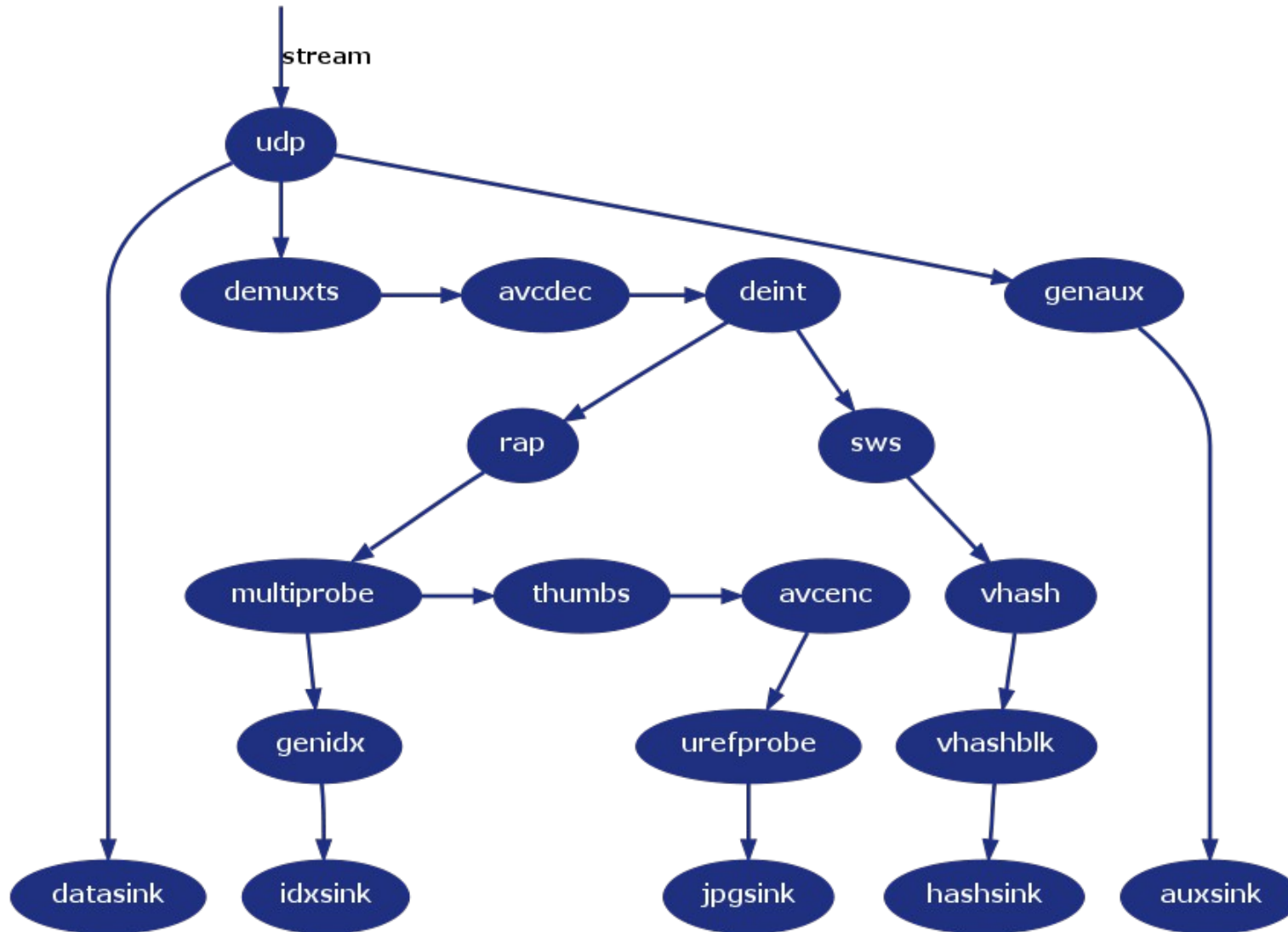
Status and development progress

- Upipe 0.2 just released, should be API-complete
- Many modules are already available:
 - Input/output: file, udp (multicast), http
 - Containers: native TS demux/mux + libavformat support
 - Codecs: libavcodec & x264 support
 - Filters: swscale, swresample, native deinterlacing
 - Display: GLX, ALSA
 - Other utility modules: Lock-less queue between threads, “dup” pipe, Trick play, dejitter

Example: glxplay pipeline



Example: urecordhash pipeline



Keep in touch!



<http://upipe.org/>

IRC: #upipe on freenode

Mailing-list: <http://upipe.org/support>

FOSDEM : meet-up in BoF room H.3.227 Sunday 14:00