

Pinos

Wim Taymans
Principal Software Engineer
October 8, 2015

Pinos... what

- Daemon that manages access to multimedia streams
 - Capture streams (from v4l2, pulseaudio,...)
 - Upload streams

- GStreamer conference 2014
 - William Manley ideas for stb-tester
 - Multiplexing of v4l2 between processes
 - Socketsrc, multifdsink, metadata, fdpay, fddepay
 - 'pulsevideo' name was coined
- We had a long talk

- Gstreamer Hackfest March 2015
 - Merged pending patches into main GStreamer branch
 - Part of upcoming 1.6 release

- Meanwhile...
 - Thinking about giving access to v4l2 devices in sandboxed applications
 - Patches to pulseaudio to implement security framework

- First attempts in April 2015
 - DBus API design
 - prototypes

- Renamed to Pinos in June 2015
 - First announcement

- Design goals
 - High performance
 - Extensible, use properties in the API
 - Reuse existing components
 - Capture of video for now

- DBus for client ↔ daemon interaction
 - org.pinos
 - Connection of client
 - Selection of source
 - Negotiation of formats
 - Start/stop streaming of media
 - Introspection with ObjectManager

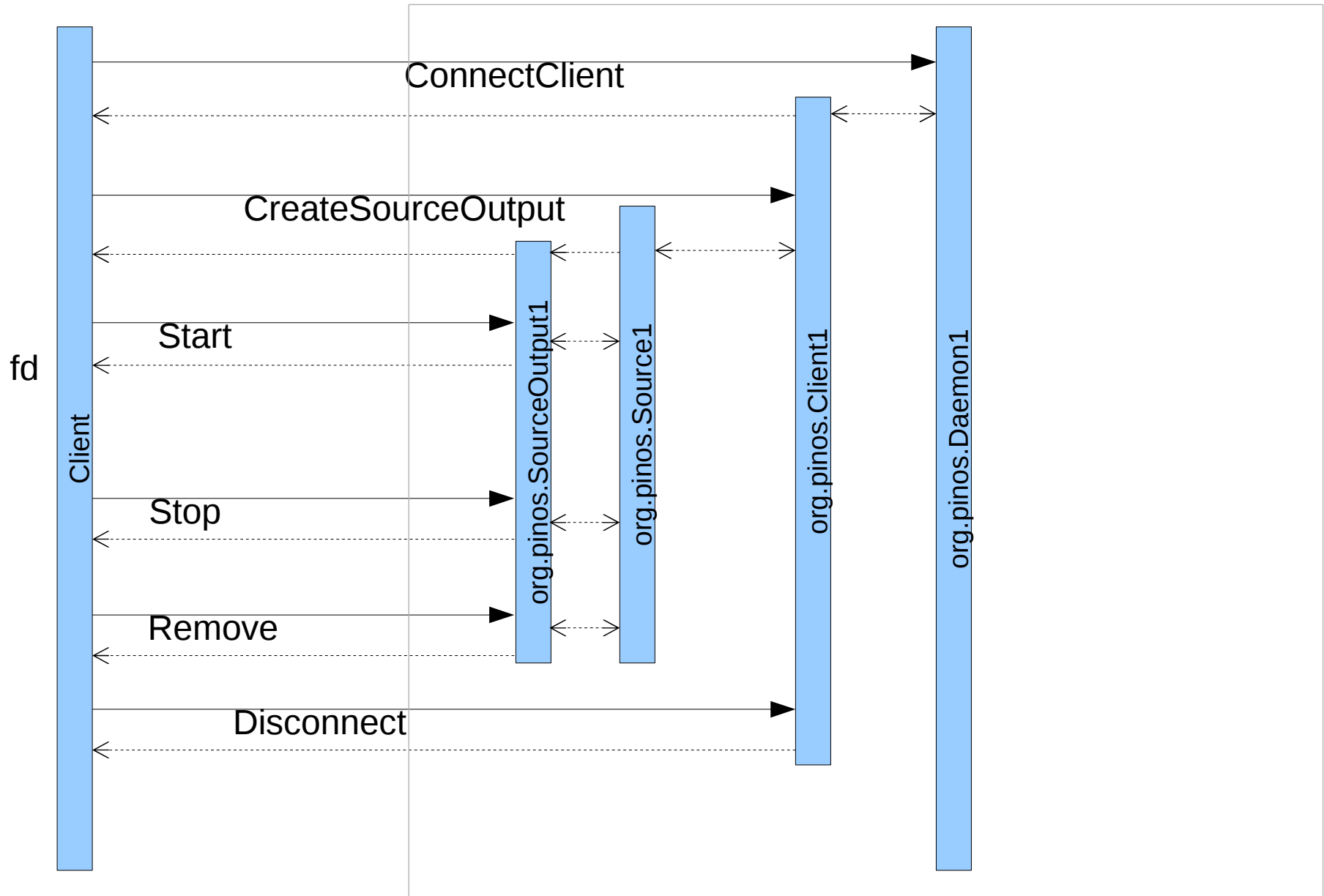
Pinos... components

- Socket for media transfer
 - Metadata is written to/read from socket
 - Media is passed as file descriptor in ancillary data
 - Protocol also supports passing metadata via shared memory

Pinos... components

- GStreamer
 - As module providing the v4l2 devices
 - Pinospay to convert stream to pinos protocol and fd in metadata
 - Multisocketsink to send media to clients
 - Media formats described using GStreamer caps
 - For server/client clock slaving

- Powerful client API
 - Inspired by pulseaudio
 - Asynchronous
 - Gio/Glib/Gobject based
 - GDBus internally
 - Threadsafe/threadaware



(2) Header

- Flags, PTS, DTS, seqnum

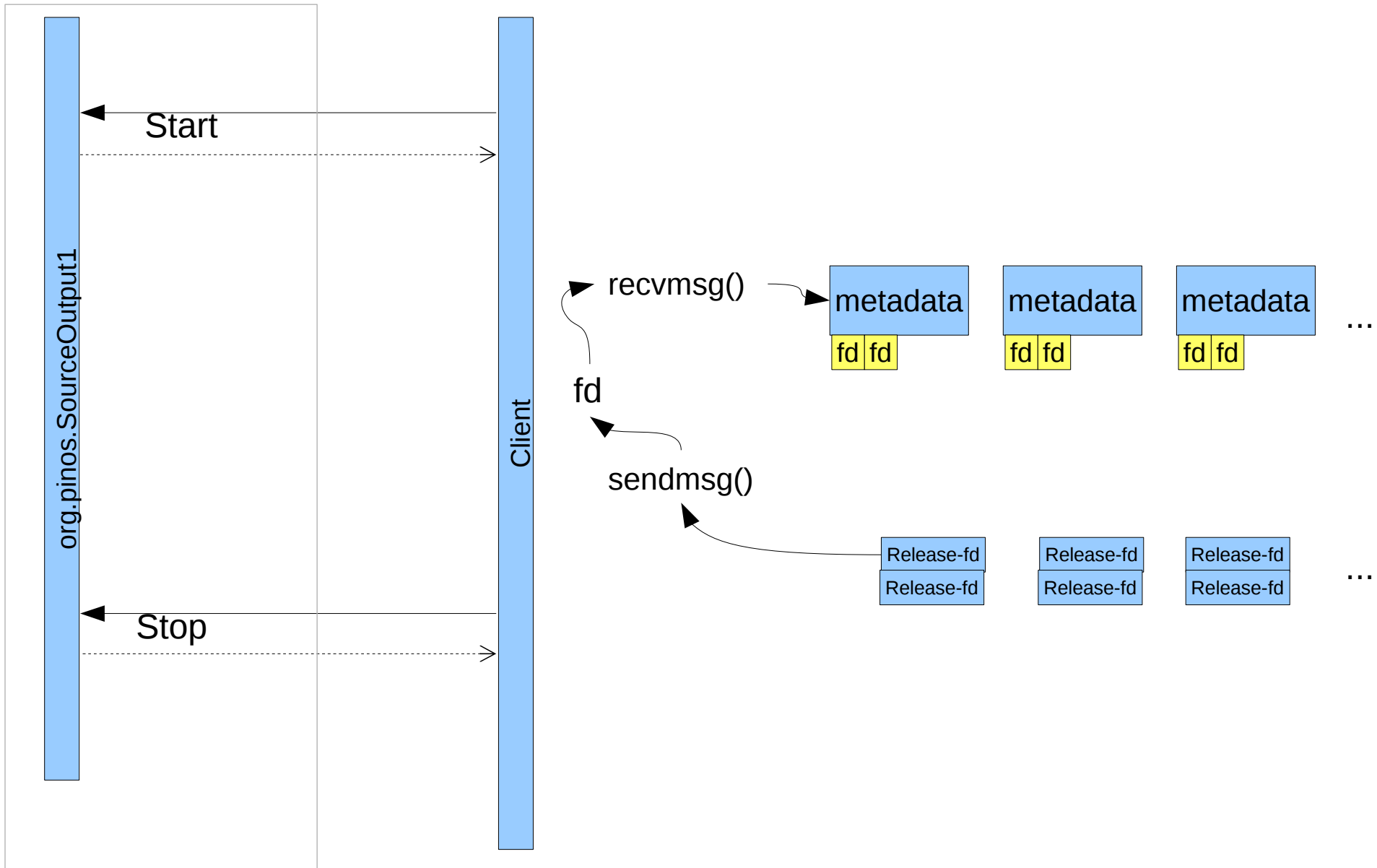
(3) Fd-payload

- Id, offset, size, fd-index

(4) Release fd-payload

- Id

Pinos... client part



(1) Continuation

- Type-len-value in shared memory at offset/size

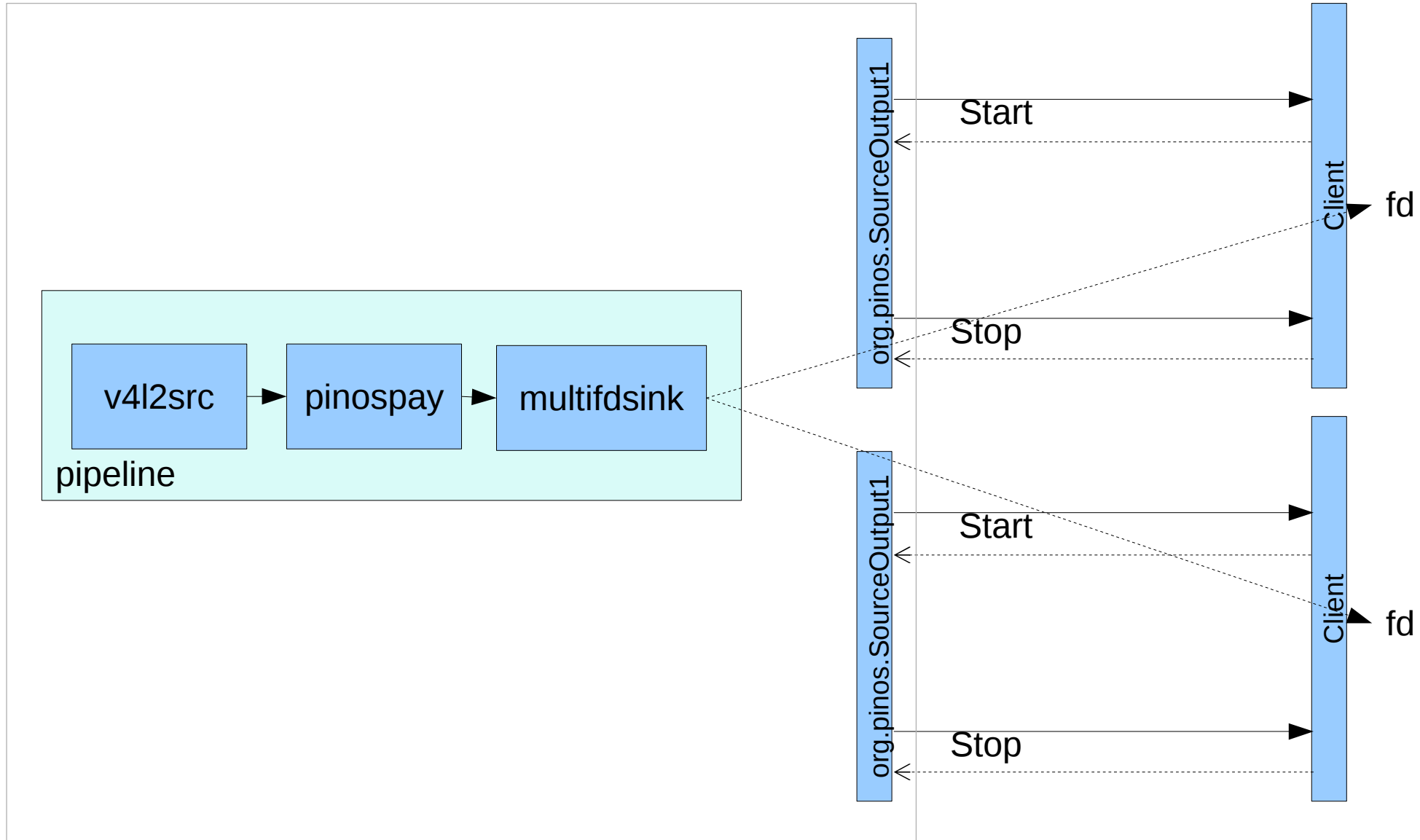
(5) Format change

- In-band format change

(6) Property change

- Key/value

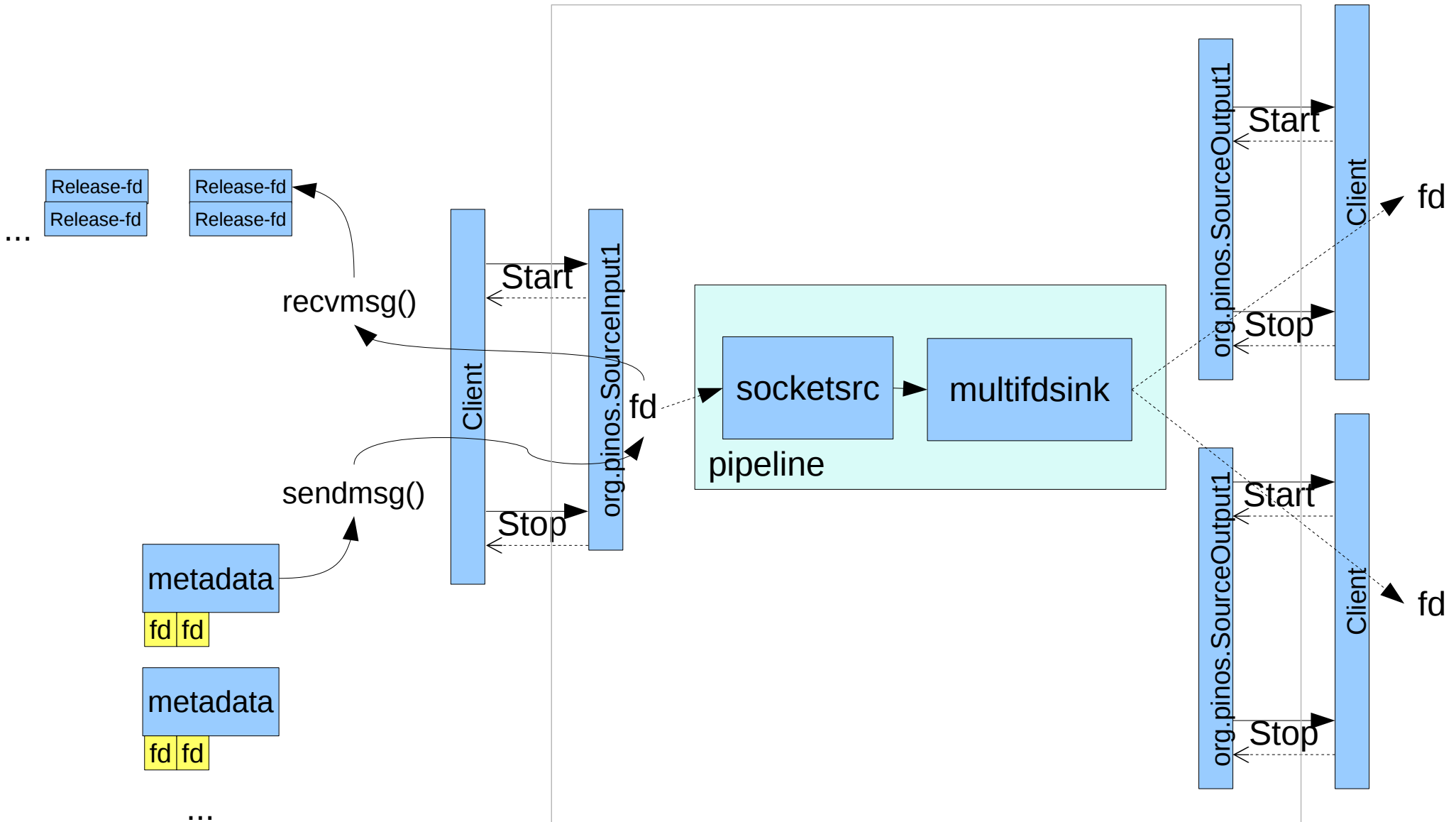
Pinos... server part



Pinos... stream upload

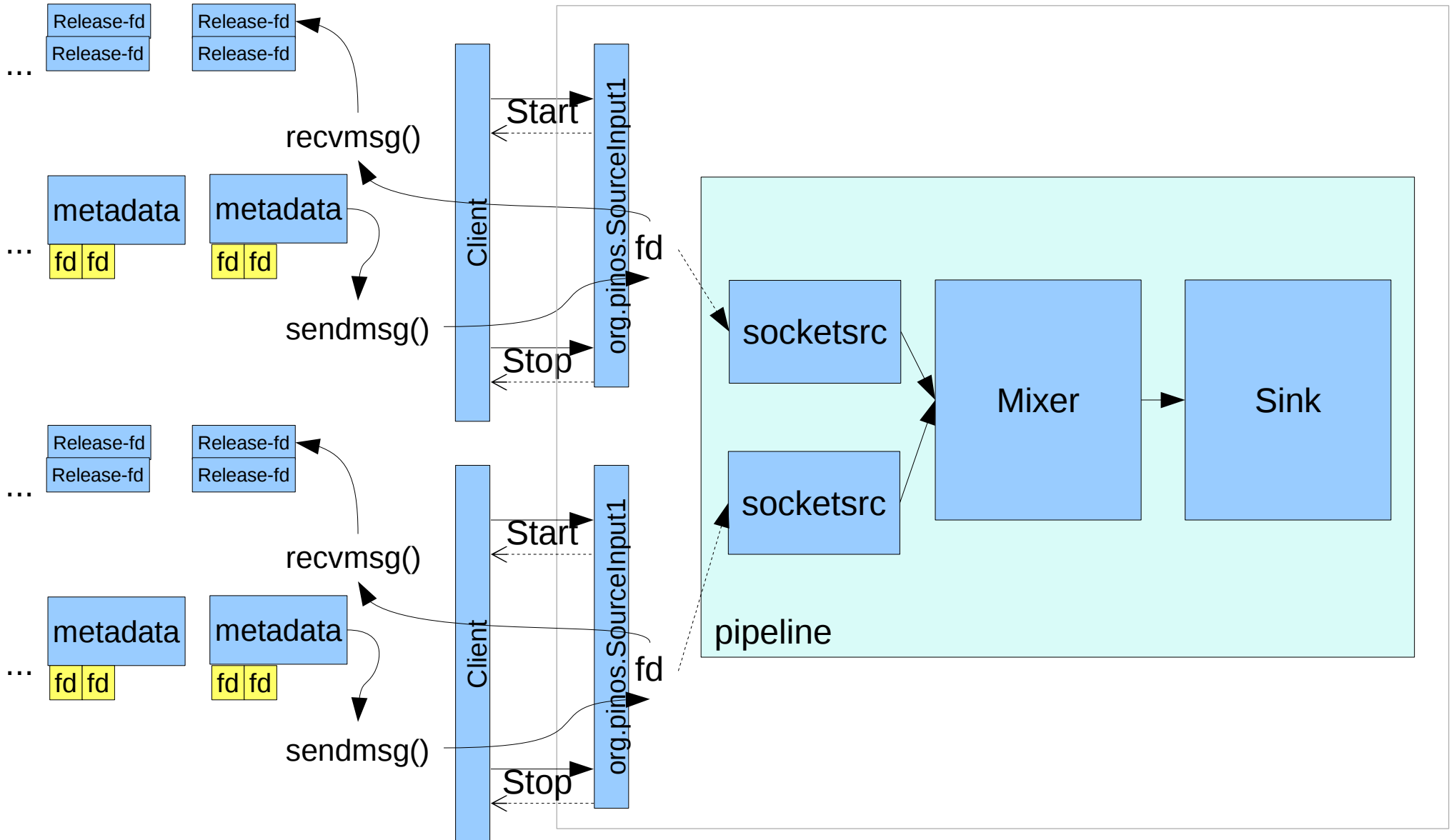
- Client can also provide buffers to pinos
- Other clients can see and capture from this stream
- Use loopback to do interesting things

Pinos... upload server part



- GStreamer integration
 - Pinossrc, pinossink
 - pinospay, pinosdepay when dealing with raw sockets
 - Device monitor

Pinos... crazy ideas



- API unstable
- GStreamer device manager for Pinos
 - Lists devices exported by pinos
 - Needed some GStreamer infrastructure to hide duplicates (in 1.6)
- Ported cheese to device manager
 - Cheese can capture from Pinos
- Fedora package pending

Pinos... next

- Get it used in distros
- Config files..
- Work on zero-copy
- ...

<http://cgit.freedesktop.org/~wtay/pinos>