Telepathy

Writing a IM/Voip client in 20 lines of python

Raphaël Slinckx

GNOME Communication stack

A good client only needs...

A good client only needs...

...a few simple things

A good client only needs...

Link Local

...a few simple things

A good client only needs...

Link Local

File Transfer

...a few simple things

A good client only needs...

Link Local

Video Calls

File Transfer

...a few simple things

A good client only needs...

Link Local

Video Calls

NAT Traversal

File Transfer

...a few simple things

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Link Local

OSCAR/AIM

Video Calls

MSN

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...a few simple things

A good client only needs...

Link Local

OSCAR/AIM

Presence

Video Calls

MSN

Contact List

Smileys

NAT Traversal

File Transfer

...a few simple things

A good client only needs...

Link Local

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SIP

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Voice Calls

Jabber

Yahoo!

File Transfer

...a few simple things

A good client only needs...

Link Local

OSCAR/AIM

Presence

Video Calls

MSN

Contact List

SIP

Smileys

NAT Traversal

Voice Calls

Jabber

Yahoo!

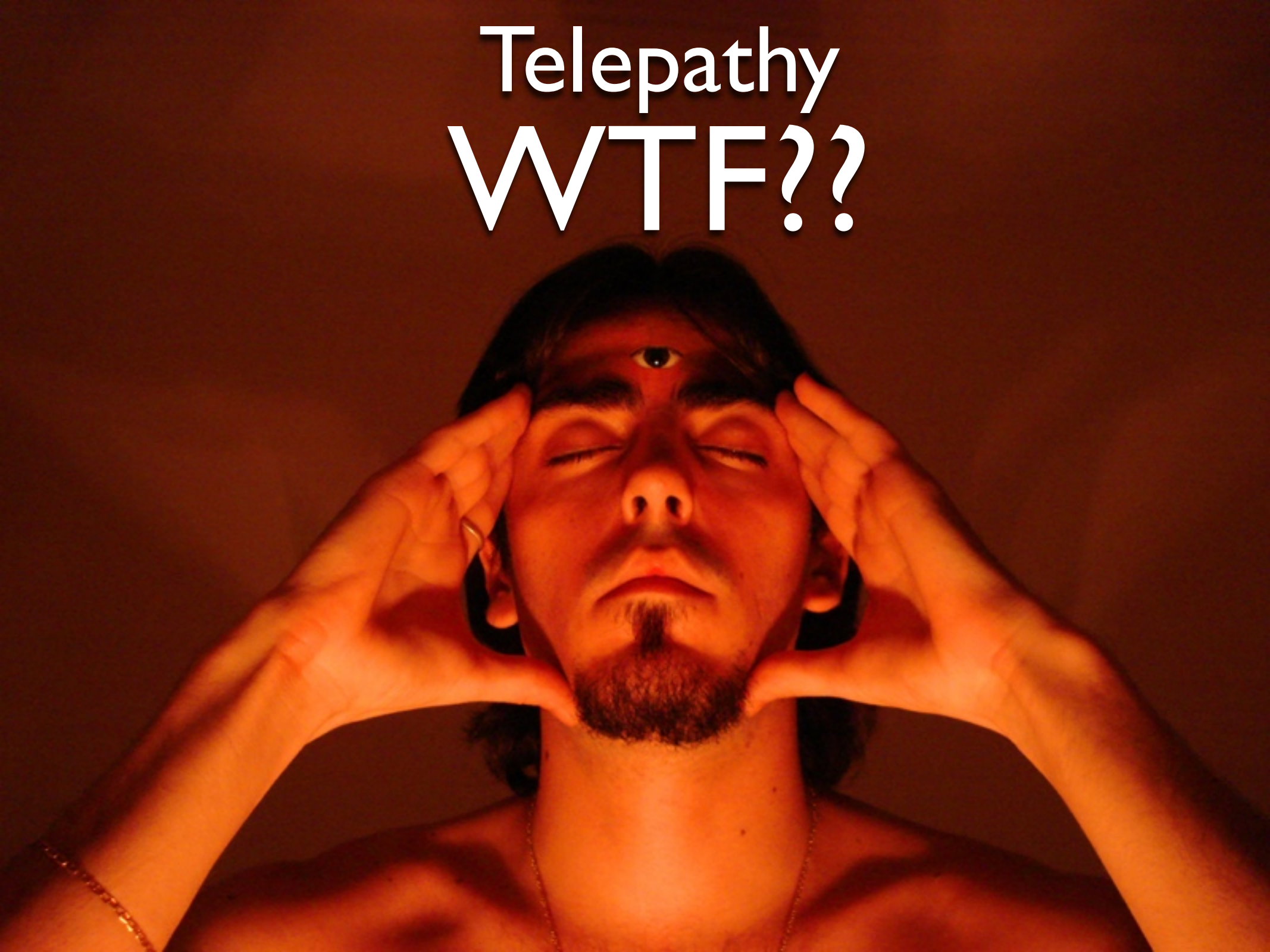
Nudges!!

File Transfer

...a few simple things

Each project
reinvents the wheel.

Each client lives in its own tiny world.

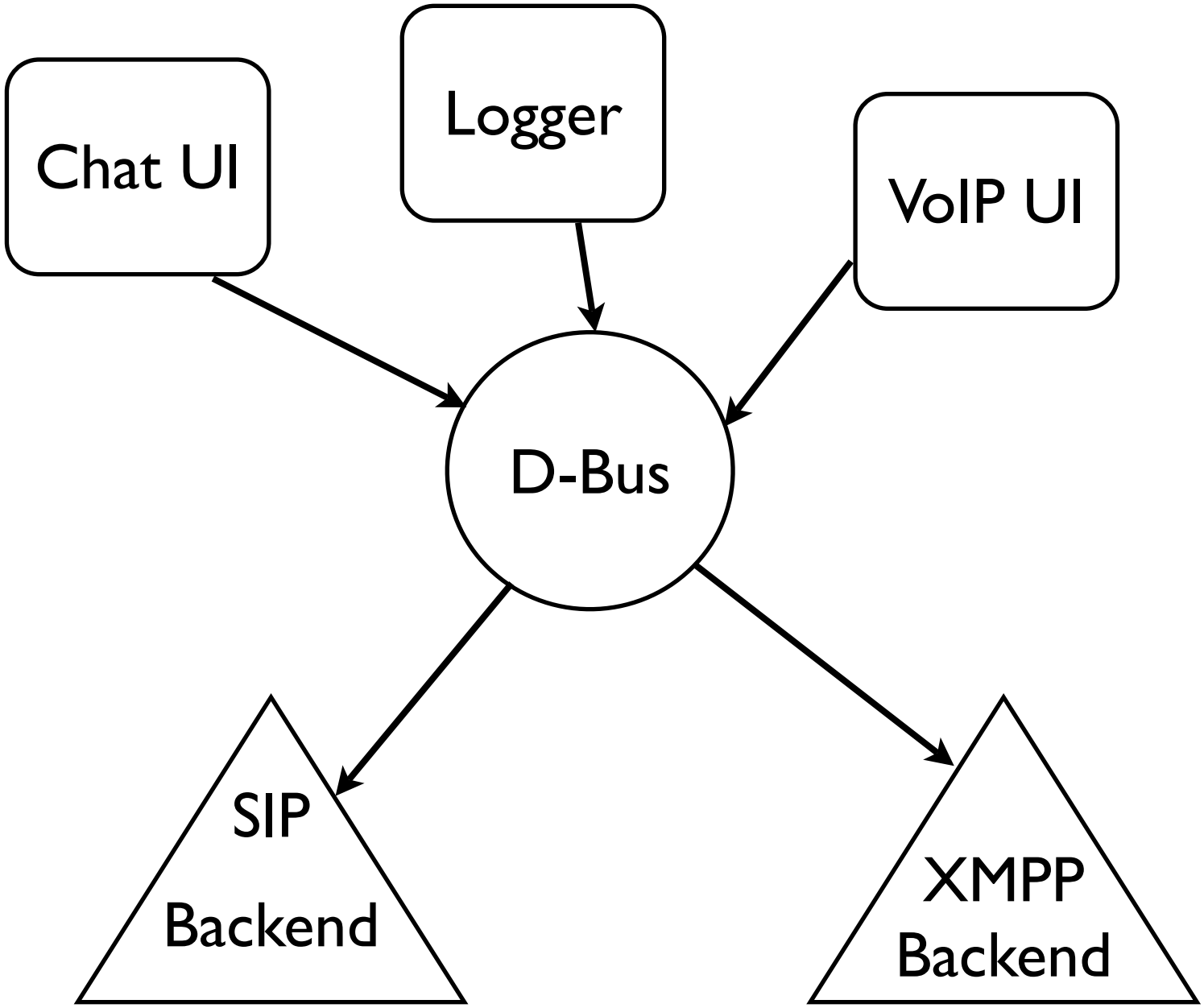

Telepathy
WTF??

Telepathy

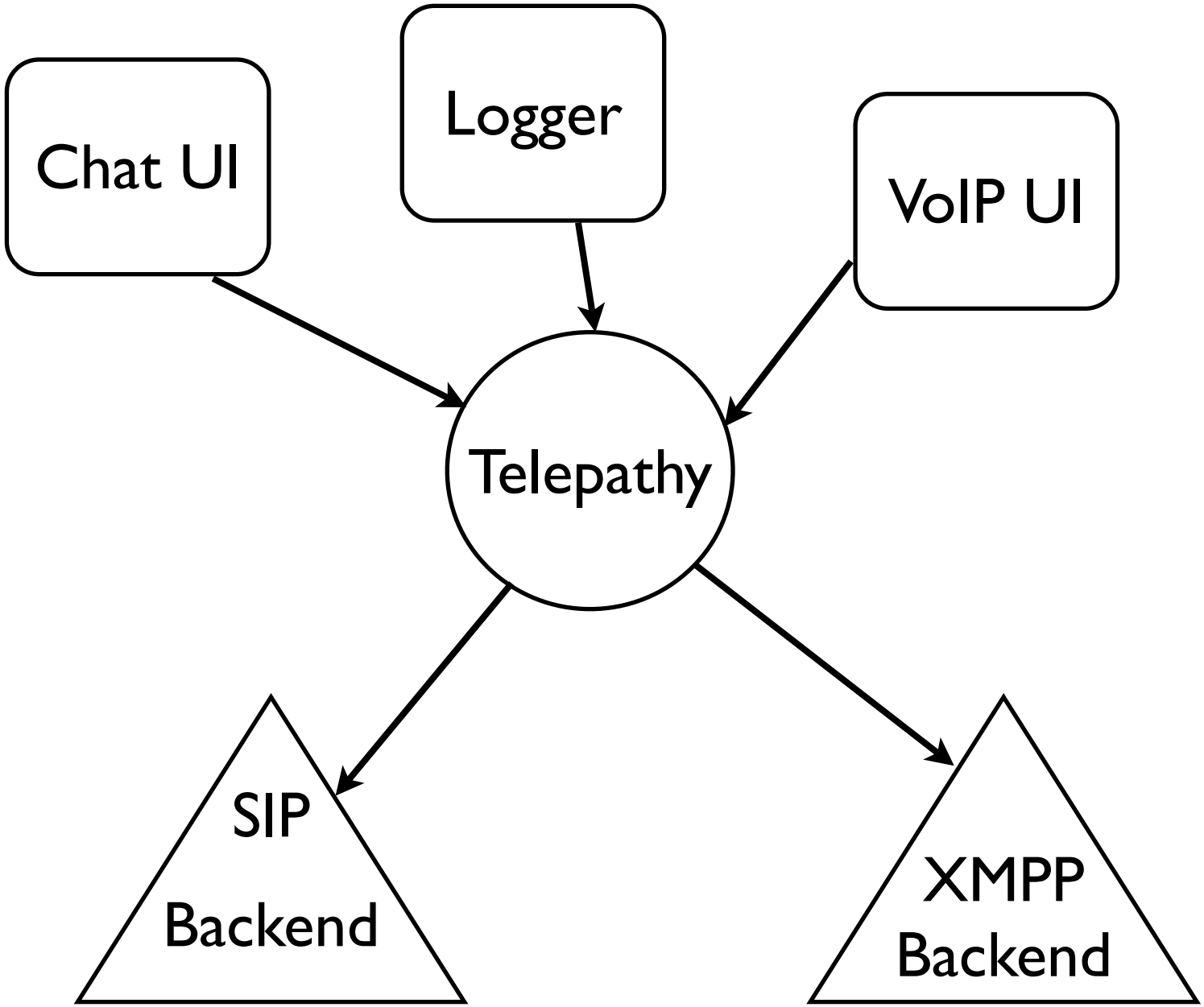
1. D-Bus API specification

2. An ecosystem

The big picture

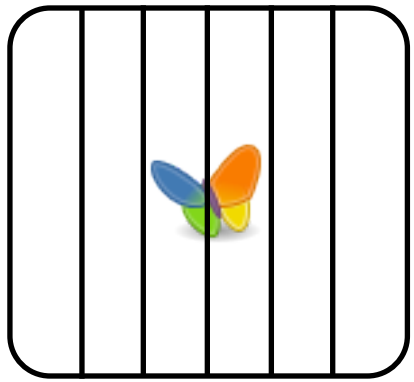


The big picture

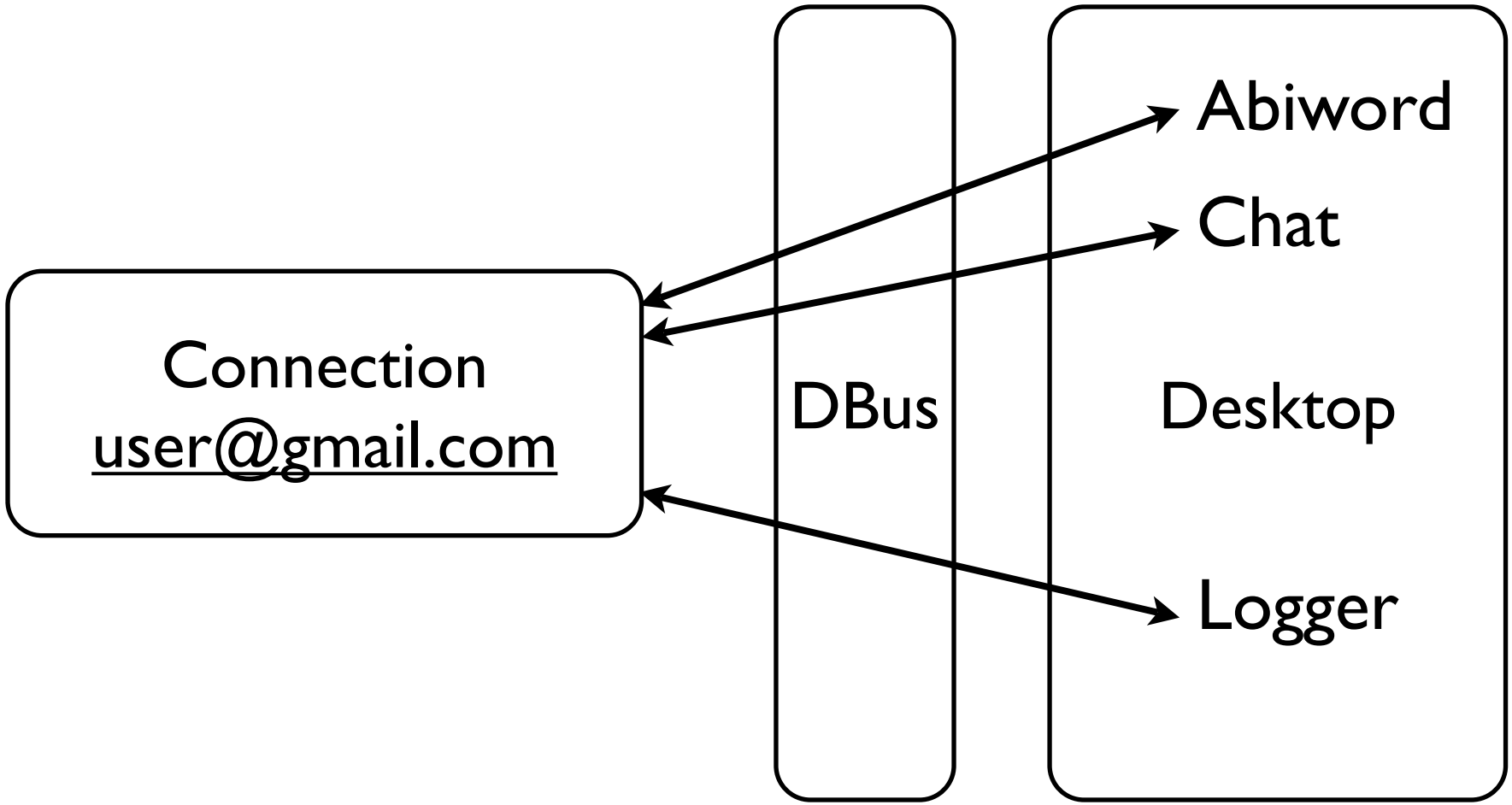


Advantages

Keep the butterfly trapped



Connections are shared



Do one thing and do it well

Language independence

Keeps the programmers happy

Language independence

Keeps the programmers happy

License independence

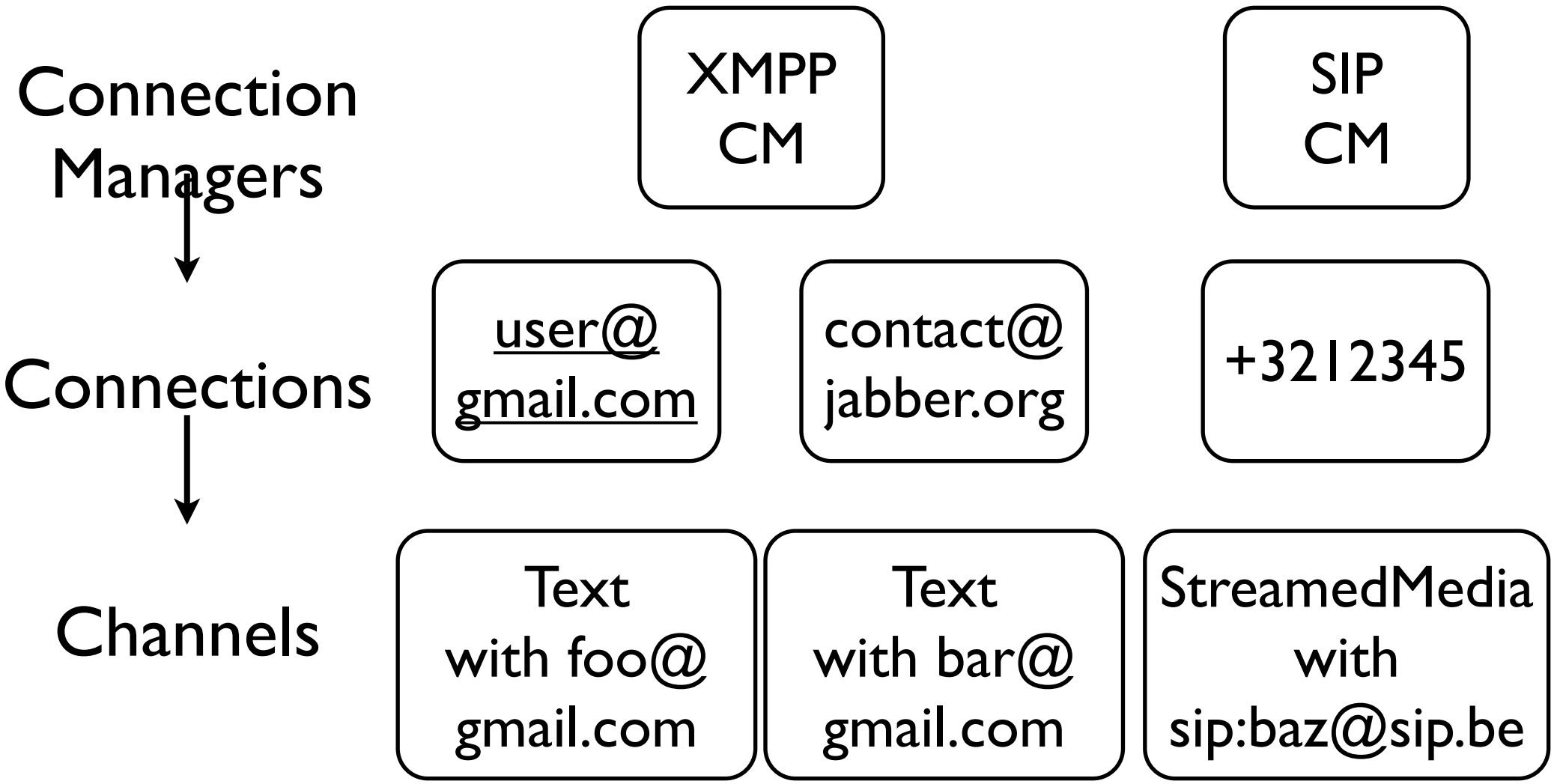
Keeps the lawyers happy

Object-oriented specification

Telepathy

1. The spec

Object hierarchy



Connection Manager

Connection

user@gmail.com connected on Google Talk

Presence Interface

Get / Set own presence. Get contacts' presence.

Capabilities Interface

Set own capabilities. Has video? Has voice?

Channels

user@gmail.com chatting with contact@gmail.com

Contact List Channel

Group Interface

Get / Add members. Members changed signal

Text Channel

Password Interface

Join password protected IRC chatrooms

StreamedMedia Channel

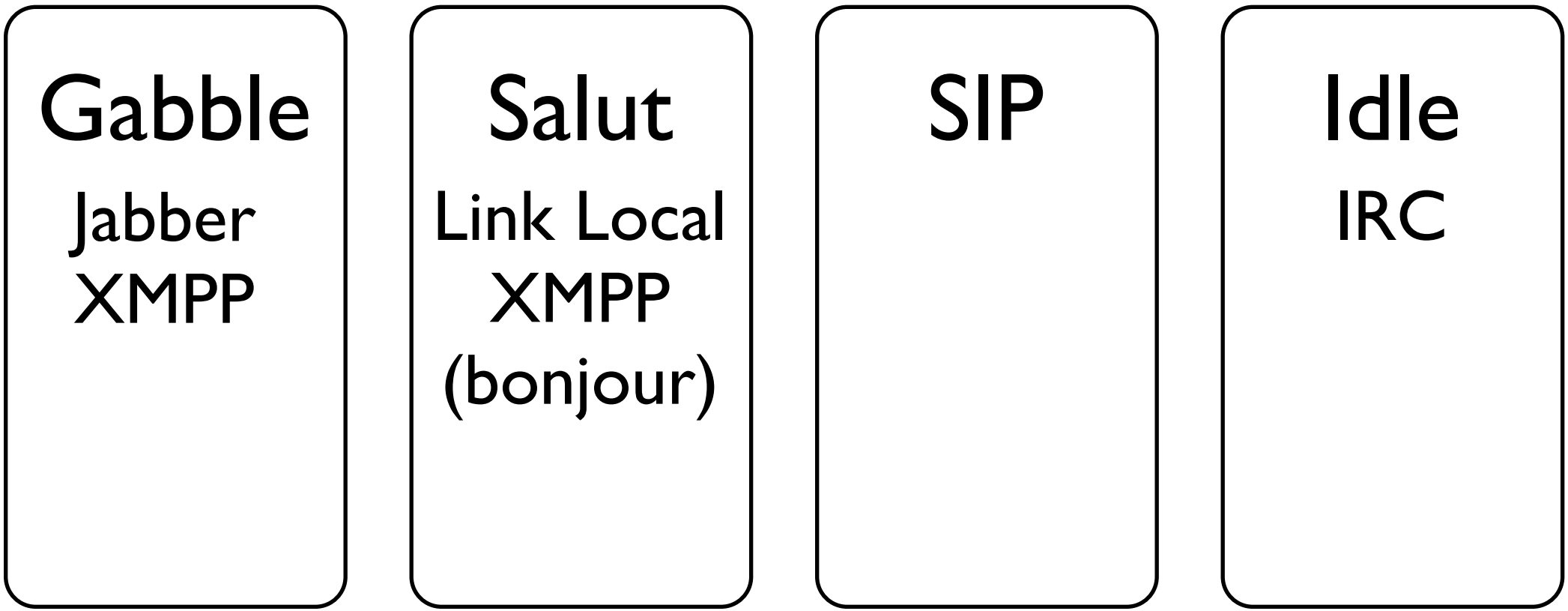
DTMF Interface

Emit key tones on a SIP conversation

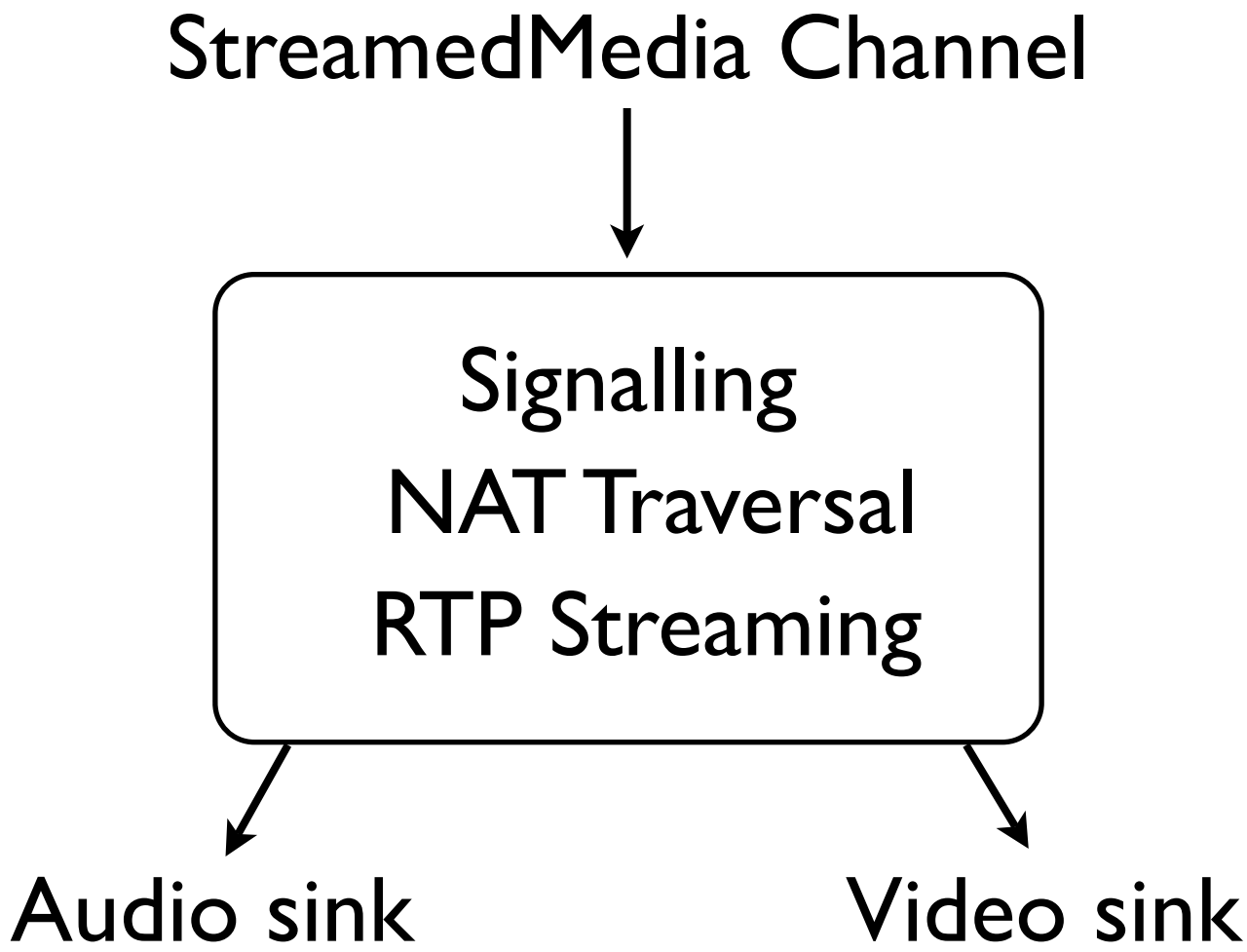
Telepathy

2. The ecosystem

Connection Managers



Stream Engine



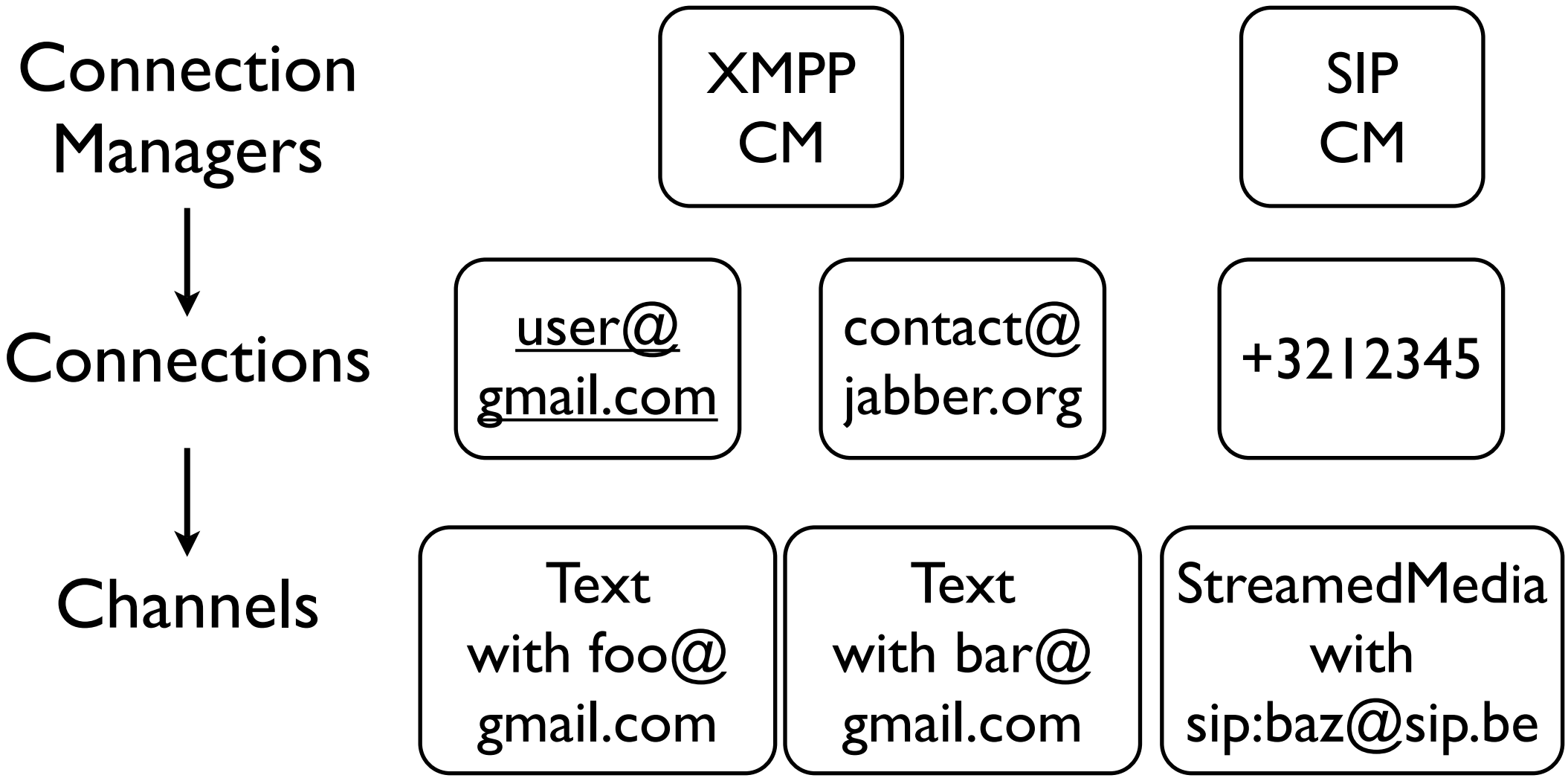
Libraries

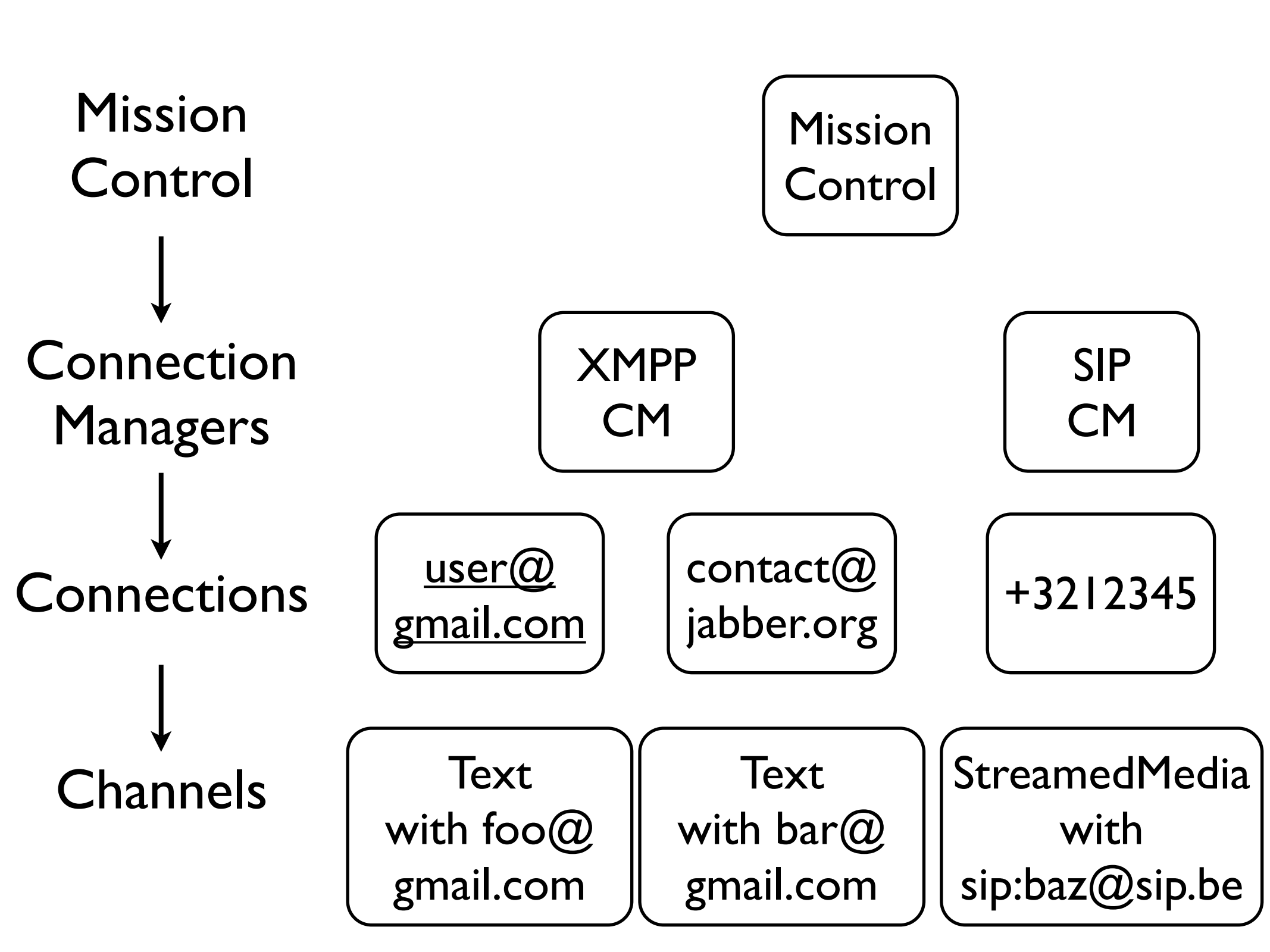
telepathy-python Implement CM and clients in python
libtelepathy Implement clients in C+glib
telepathy-glib Implement CM in C+glib
libempathy Higher level objects to build clients
libempathy-gtk GTK widgets to build graphical clients

Desktop integration

Desktop integration

Mission Control


Connection Managers
Connections
Channels
XMPP CM
SIP CM
user@ gmail.com
contact@ jabber.org
+3212345
Text with foo@ gmail.com
Text with bar@ gmail.com
StreamedMedia with sip:baz@sip.be


Mission Control
Connection Managers
Connections
Channels
Mission Control
XMPP CM
SIP CM
user@gmail.com
contact@jabber.org
+3212345
Text with foo@gmail.com
Text with bar@gmail.com
StreamedMedia with sip:baz@sip.be

Connection aggregation

Change my presence from offline to online

Account management

Store account credentials centrally.
Clients can connect without asking for config

Channel dispatch

Open a chat window talking to user@gmail.com

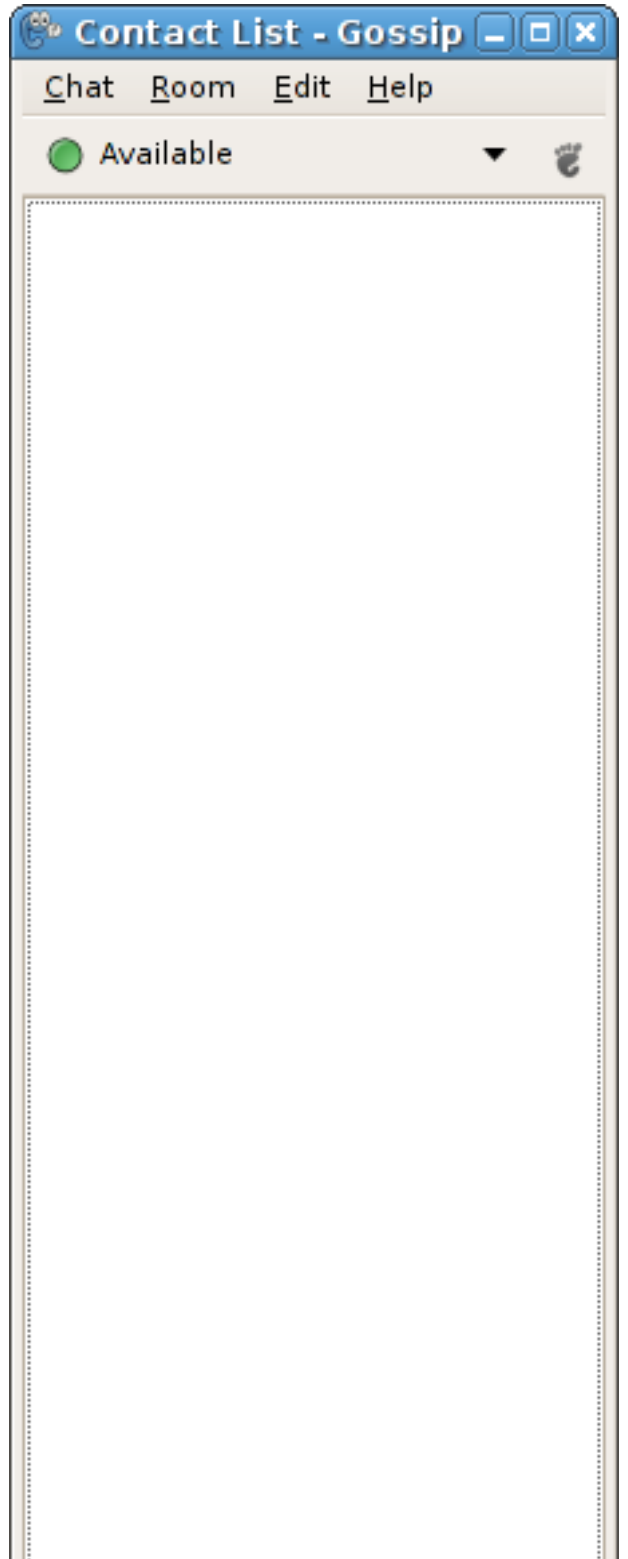
Desktop integration

Empathy

Gossip

Jabber-only

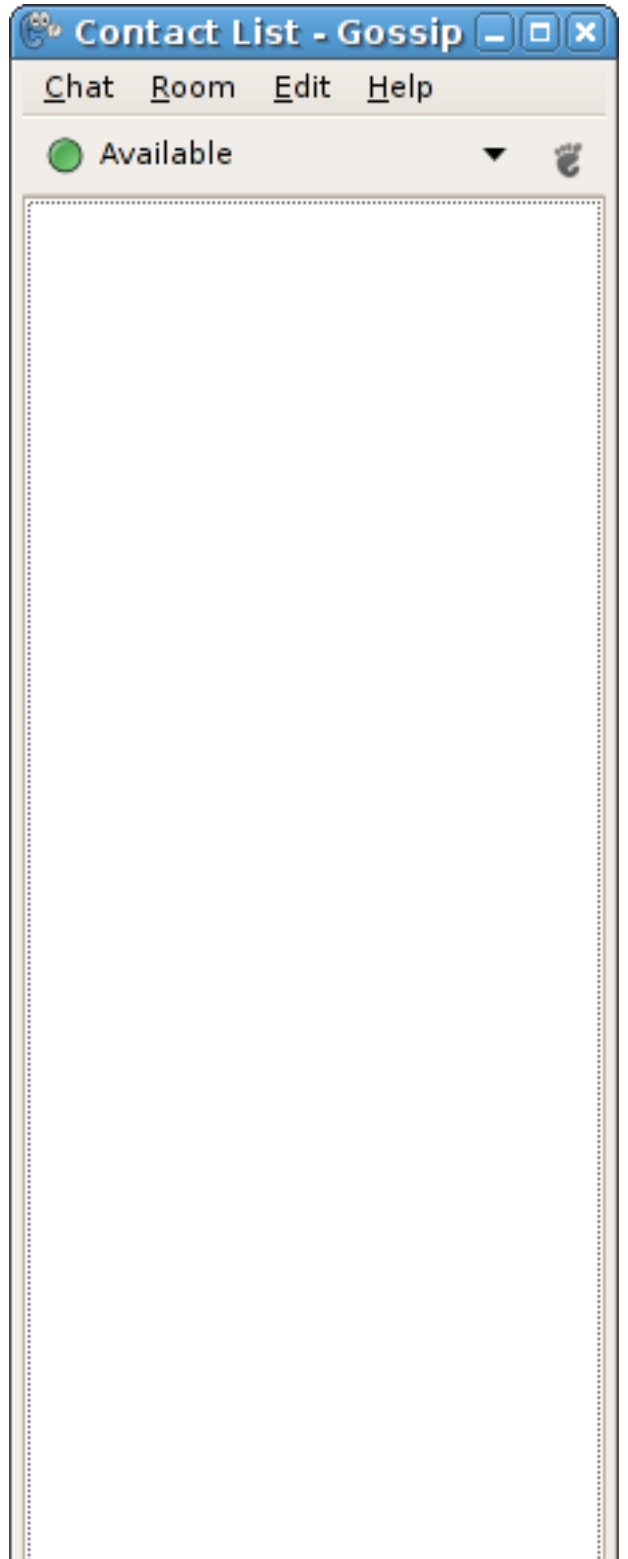
Monolithic


Contact List - Gossip
Chat
Room
Edit
Help
Available

Gossip Telepathy

Any Telepathy protocol
Monolithic

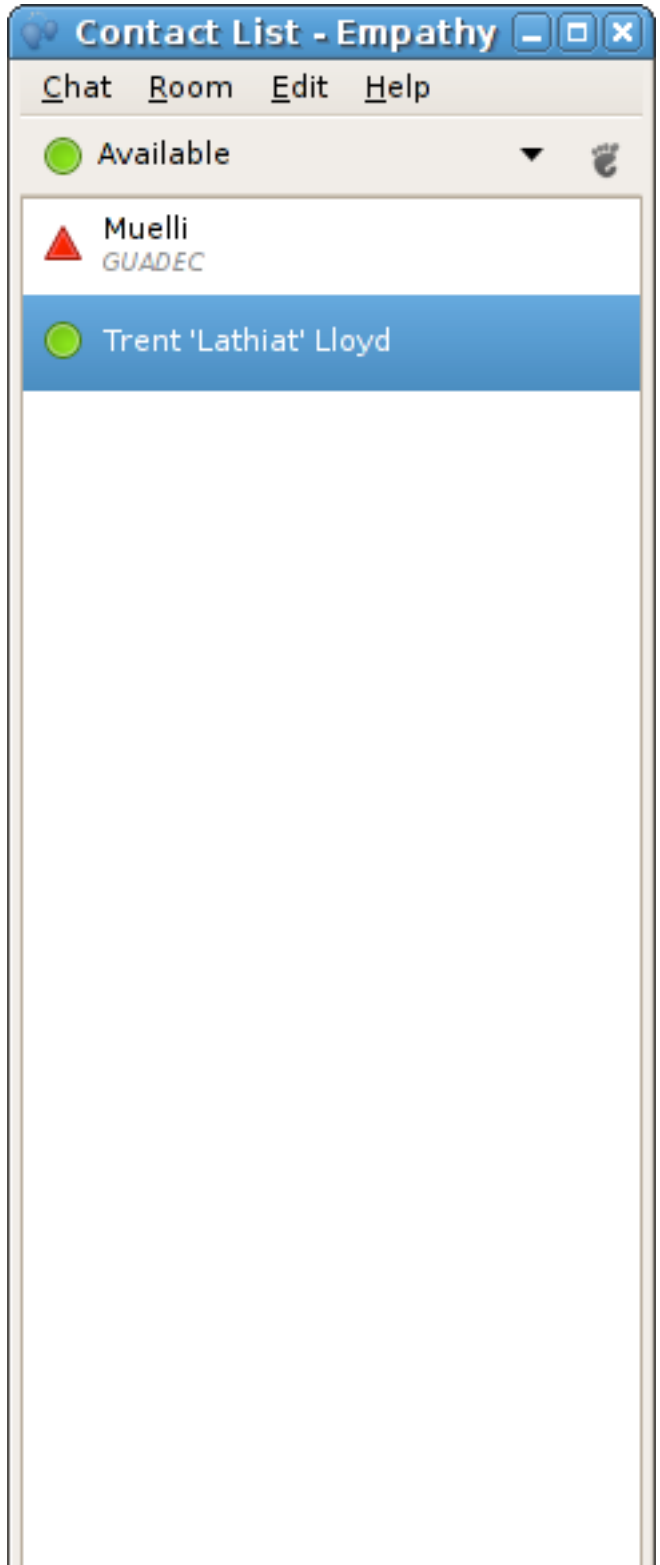
+VoIP support


Contact List - Gossip
Chat
Room
Edit
Help
Available

Gossip
Chat Room Edit Help
Available
Raphael Slinckx
Can Talk / Has Video
Buddies
Twitter
FSA
Antoine Perdaens
Gnome
Baptiste Millemathias
Danilo Segan
ikke
Ikke
Nicolas Trangez
KTH
Spicy Korv
Conversation with Raphael Slinckx
Talk
Outgoing Call
Talking
Volume Settings

Empathy

Any Telepathy protocol
Small components


Contact List - Empathy
Chat
Room
Edit
Help
Available
Muelli
GUADEC
Trent 'Lathiat' Lloyd

Same great UI.
A lot less hairy code.

Desktop integration

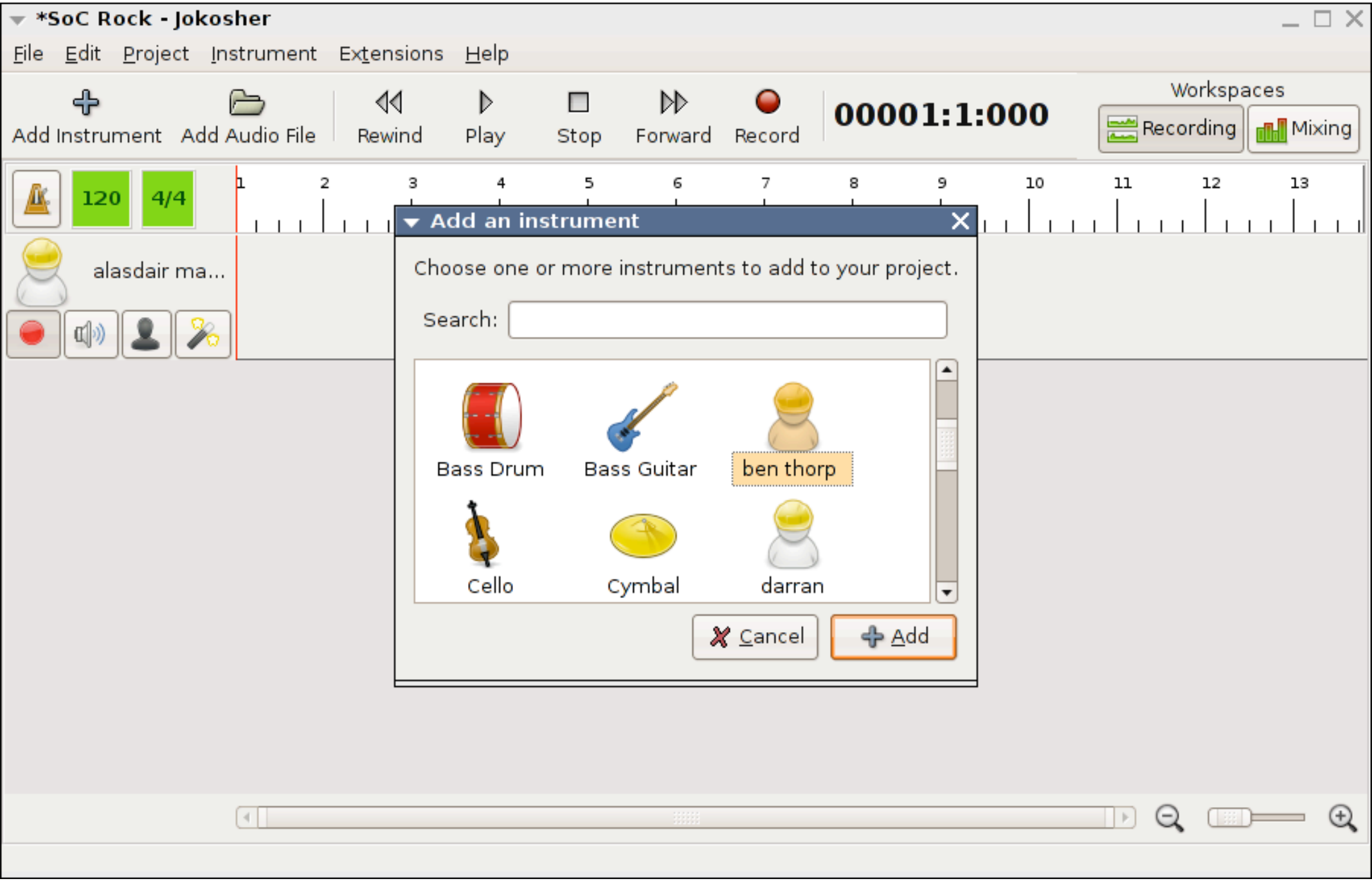
Summer of Code

Jokosher Integration

Contacts as instruments

Live radio interviews with VoIP

Michael Sheldon


*SoC Rock - Jokosher
File Edit Project Instrument Extensions Help
Add Instrument
Add Audio File
Rewind
Play
Stop
Forward
Record
00001:1:000
Workspaces
Recording
Mixing
120
4/4
alasdair ma...
Add an instrument
Choose one or more instruments to add to your project.
Search:
Bass Drum
Bass Guitar
ben thorp
Cello
Cymbal
darran
Cancel
Add

VoIP/Video Widgets

Augment libempathy(-gtk) with VoIP related widgets

Elliot Fairweather

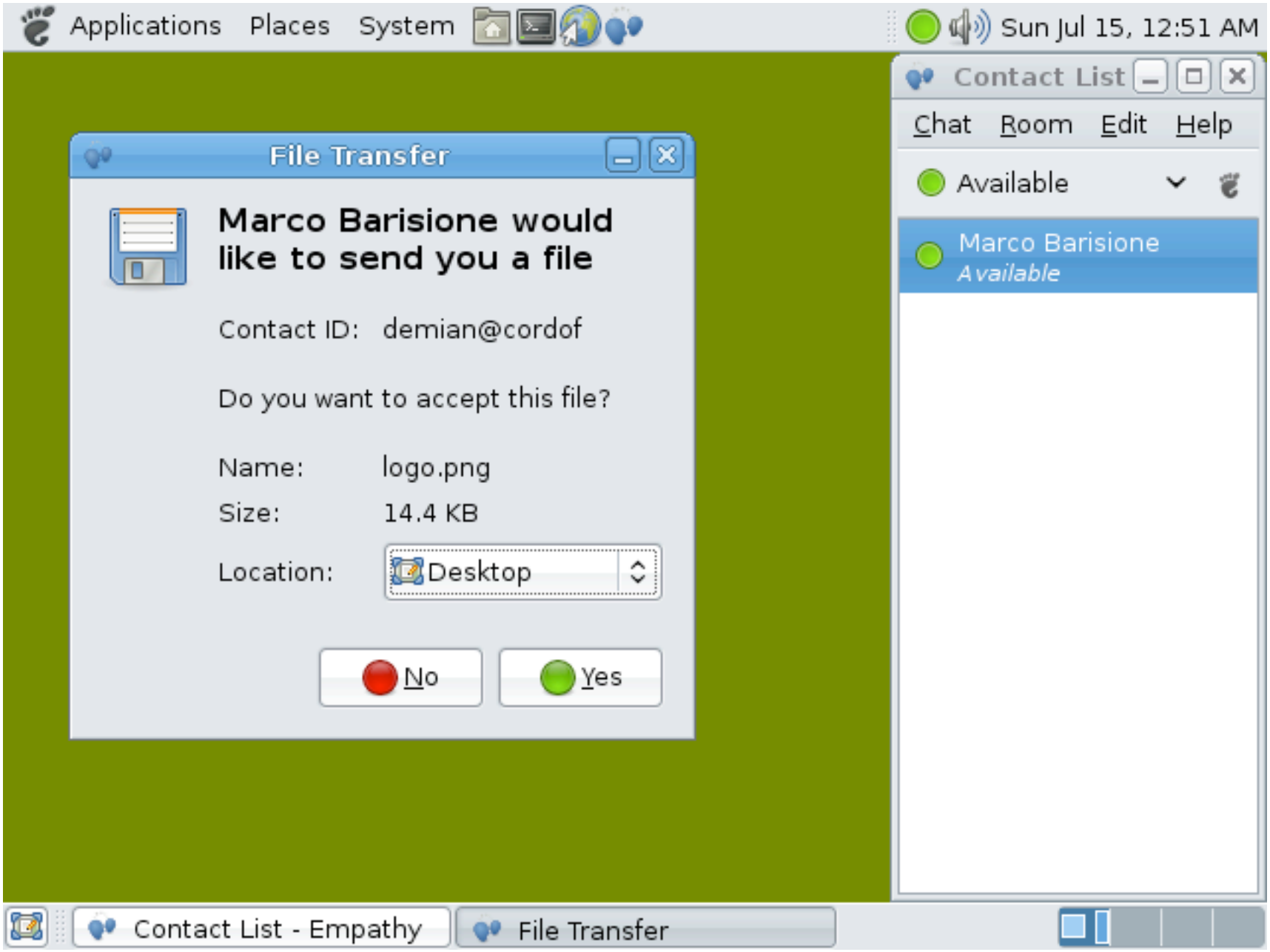
File Transfer

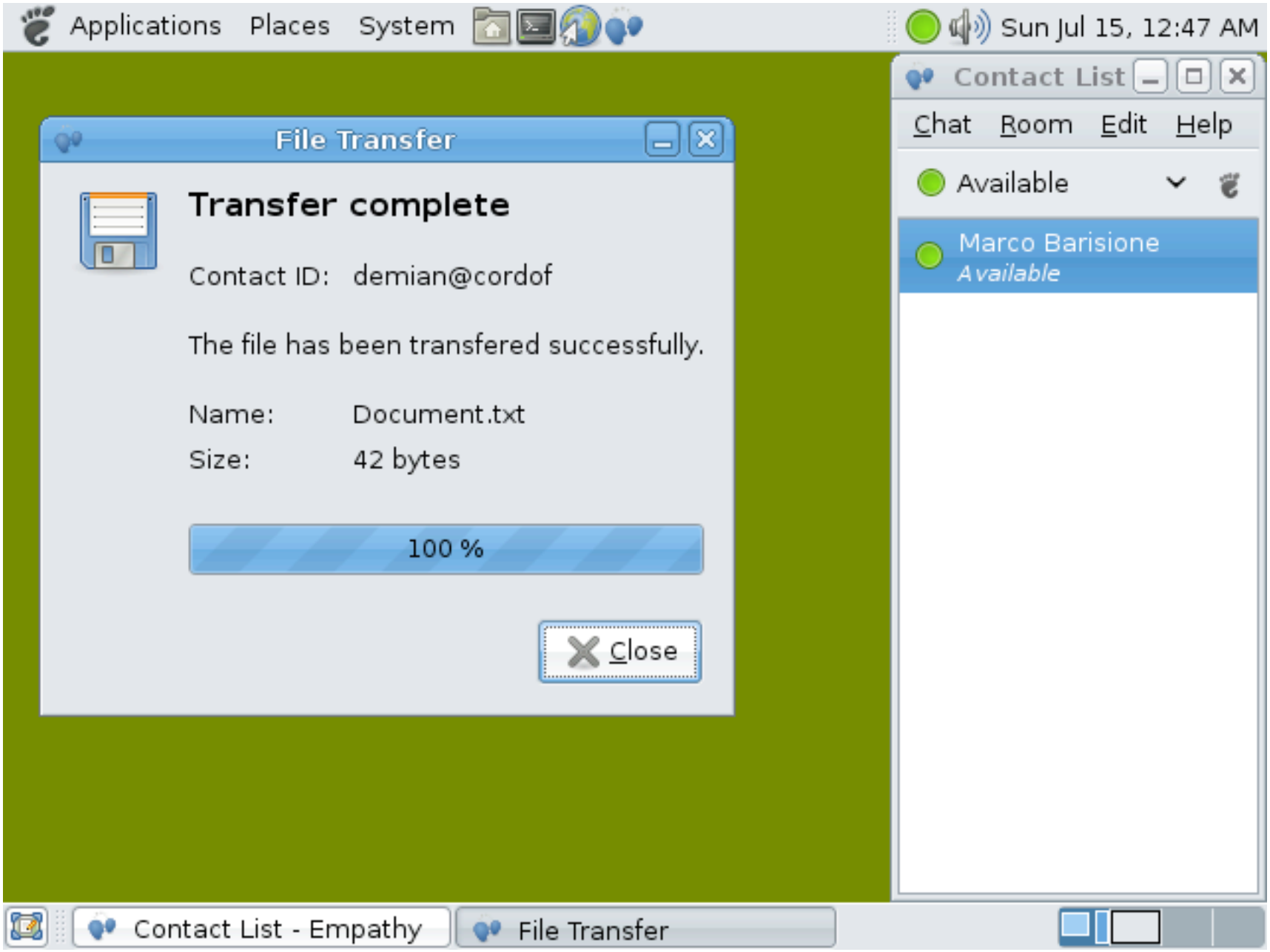
Add link-local file transfer to empathy

Marco Barisione

Telekinesis

Easy file transfers over a local network


Applications
Places
System
Sun Jul 15, 12:51 AM
Contact List
Chat
Room
Edit
Help
Available
Marco Barisione
Available
File Transfer
Marco Barisione would like to send you a file
Contact ID: demian@cordof
Do you want to accept this file?
Name: logo.png
Size: 14.4 KB
Location: Desktop
No
Yes
Contact List - Empathy
File Transfer


Applications
Places
System
Sun Jul 15, 12:47 AM
File Transfer
Transfer complete
Contact ID: demian@cordof
The file has been transfered successfully.
Name: Document.txt
Size: 42 bytes
100 %
Close
Contact List
Chat
Room
Edit
Help
Available
Marco Barisione
Available
Contact List - Empathy
File Transfer

Collaborative applications

Telepathy Tubes

If I can chat with a contact, why can’t applications?

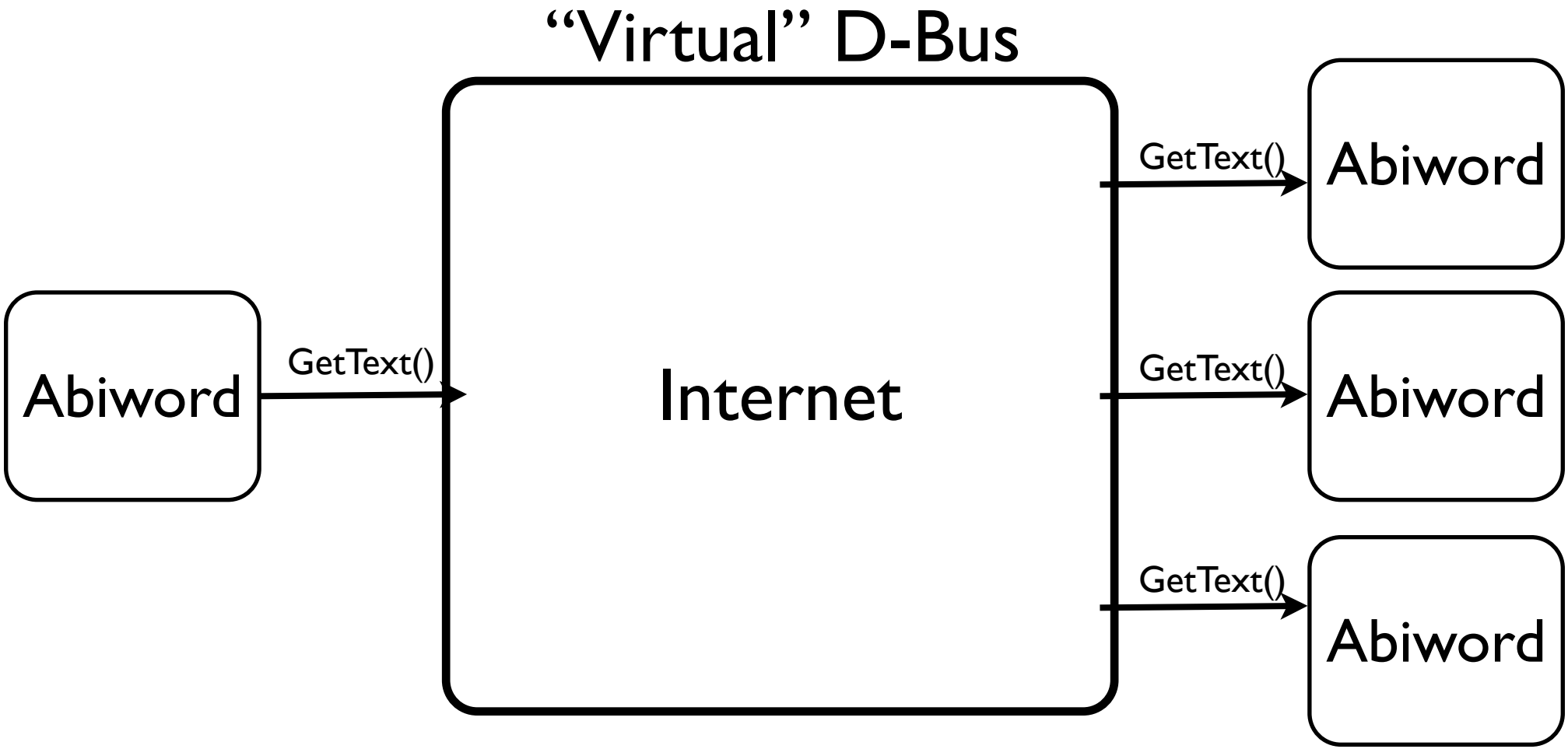
What's a tube?

Arbitrary data exchange

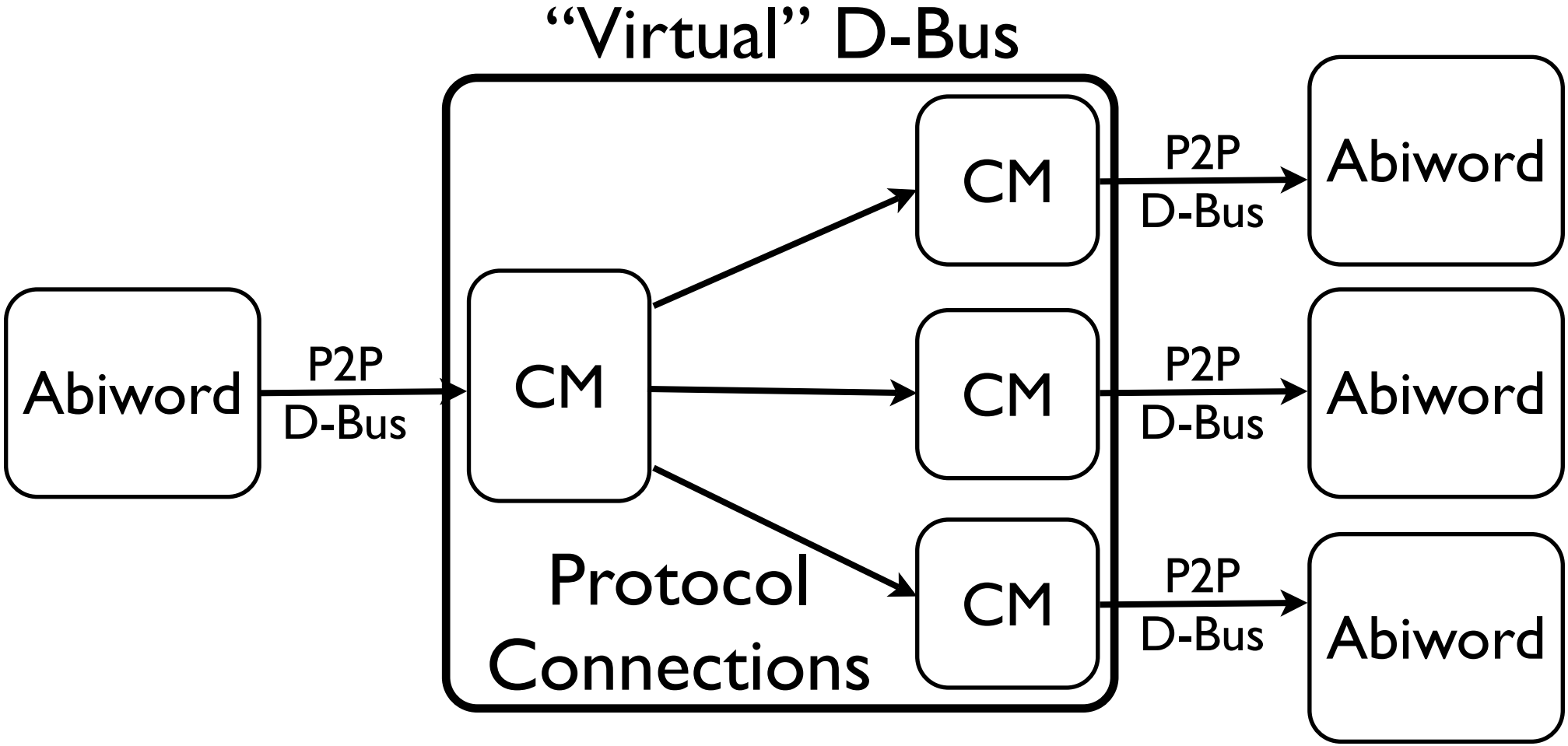
TCP/UDP/D-Bus behavior

Perform NAT traversal

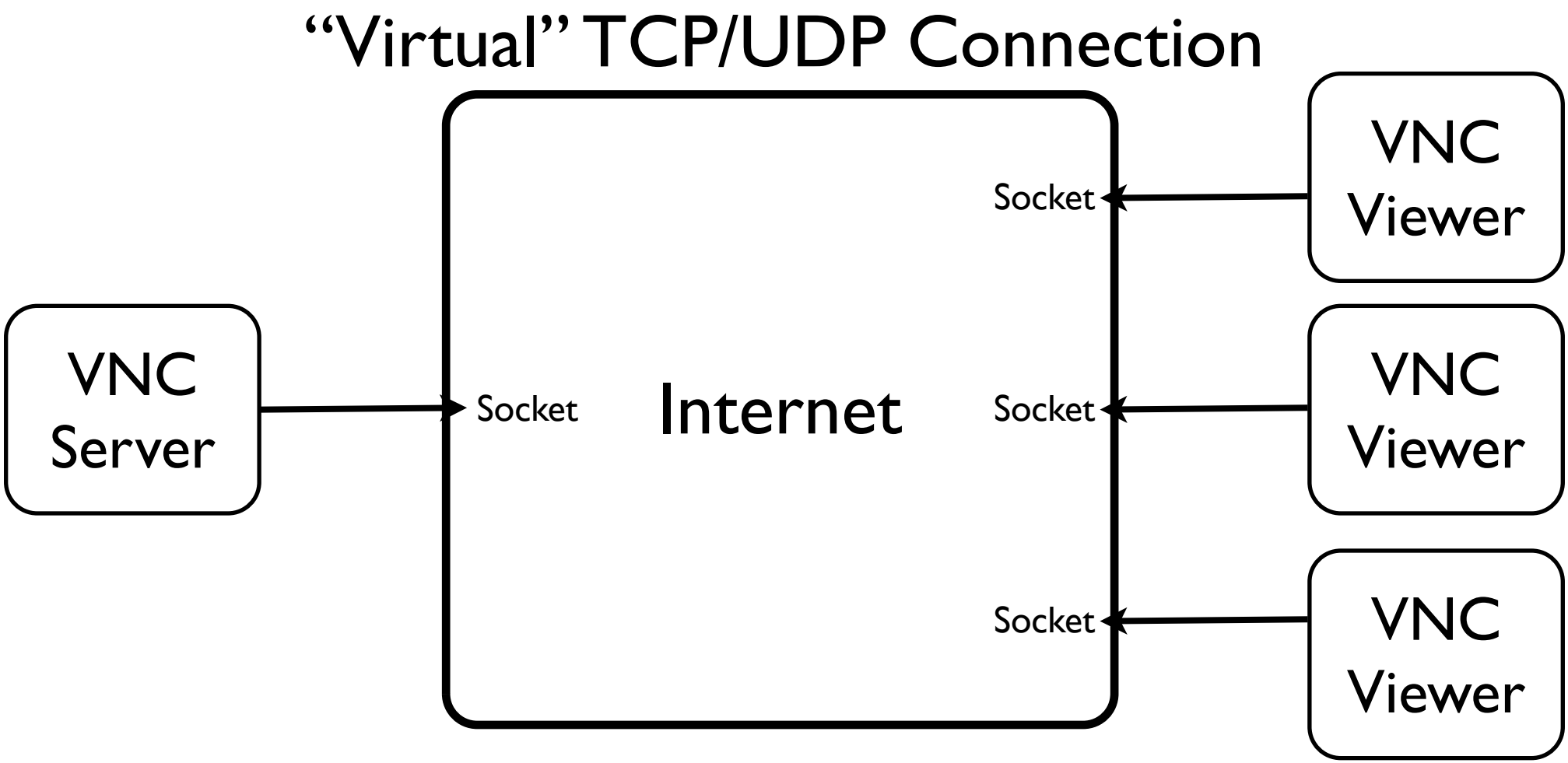
D-Bus Tubes


"Virtual" D-Bus
Abiword
GetText()
Internet
GetText()
Abiword
GetText()
Abiword
GetText()
Abiword

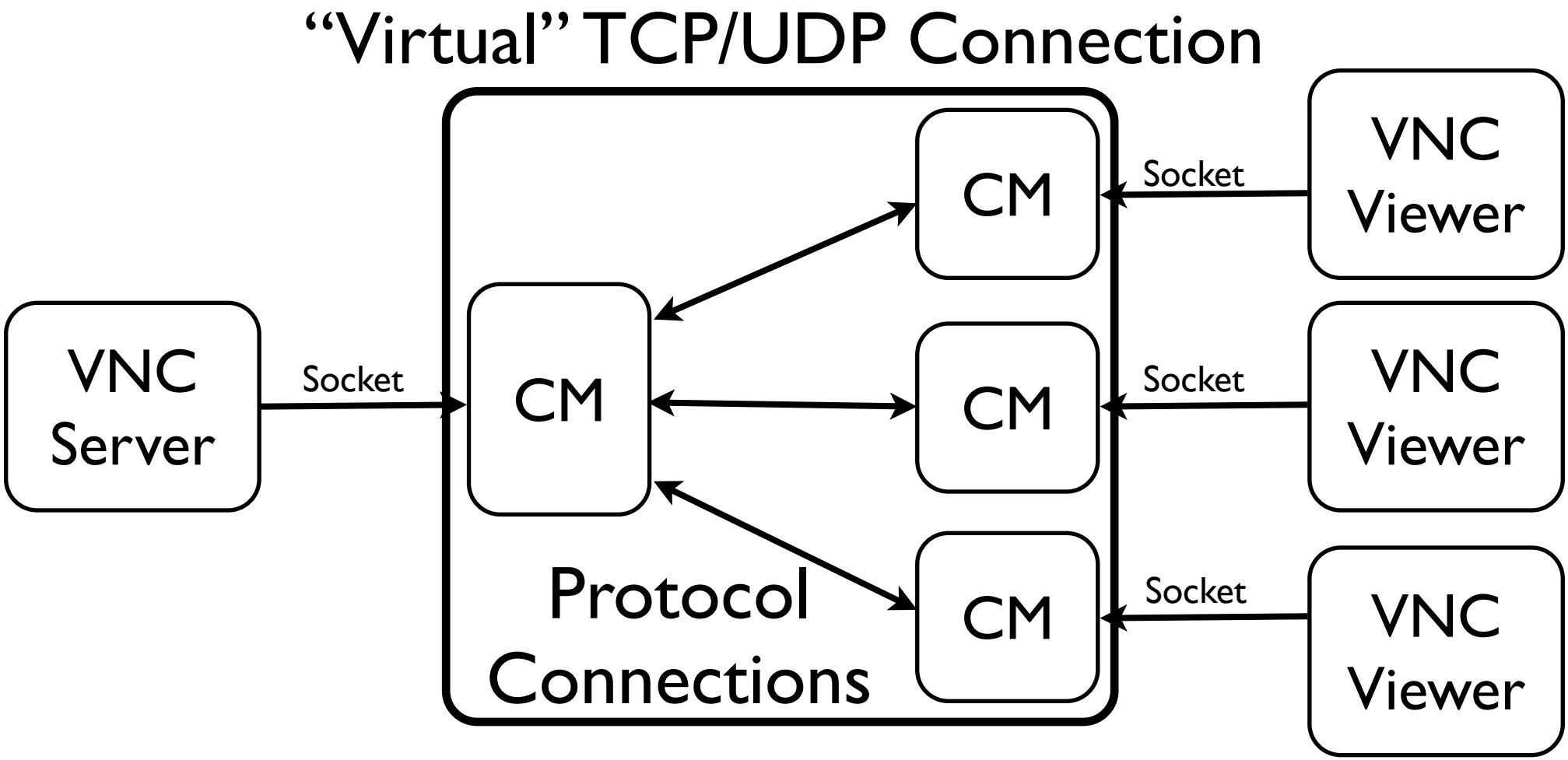
D-Bus Tubes


"Virtual" D-Bus
Abiword
P2P
D-Bus
CM
CM
CM
CM
P2P
D-Bus
P2P
D-Bus
P2P
D-Bus
Abiword
Abiword
Abiword
Protocol
Connections

Stream Tubes



Stream Tubes



Where to use Tubes?

If an application can be used through a D-Bus API

Where to use Tubes?

If an application can be used through a D-Bus API

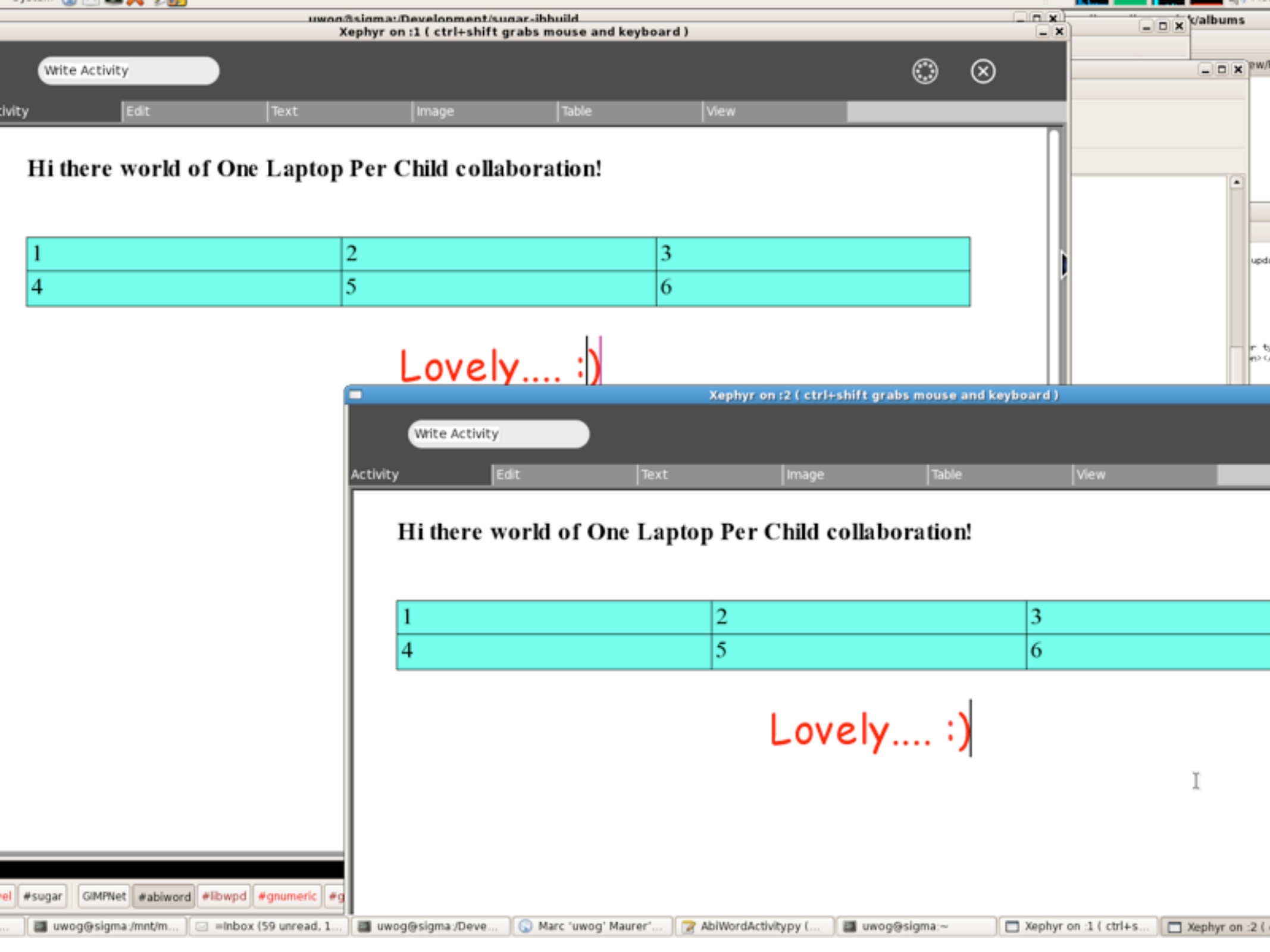
It can be shared by exposing the API on a D-Tube

Where to use Tubes?

If an application can be used through a D-Bus API

It can be shared by exposing the API on a D-Tube

Pick a contact, start collaborating!


Xephyr on :1 (ctrl+shift grabs mouse and keyboard)
Write Activity
Edit
Text
Image
Table
View
Hi there world of One Laptop Per Child collaboration!
1
2
3
4
5
6
Lovely.... :)
Xephyr on :2 (ctrl+shift grabs mouse and keyboard)
Write Activity
Activity
Edit
Text
Image
Table
View
Hi there world of One Laptop Per Child collaboration!
1
2
3
4
5
6
Lovely.... :)
#sugar
GIMPNet
#abiword
#libwpd
#gnumeric
uwog@sigma:/mnt/m...
=Inbox (59 unread, 1...
uwog@sigma:/Deve...
Marc 'uwog' Maurer'...
AbiWordActivitypy (...
uwog@sigma:~
Xephyr on :1 (ctrl+s...
Xephyr on :2 (

Code Samples

libempathy

```
import gtk, empathy

def on_contact_notify(contact):
  print "Alias:", contact.get_name()
  print "Presence:", contact.get_status()

def on_contact_added(manager, contact):
  contact.connect('notify', on_contact_notify)

manager = empathy.ContactManager()
manager.setup()
manager.connect("contact-added", on_contact_added)
contacts = manager.get_members()
for contact in contacts:
  on_contact_added(manager, contact)

gtk.main()
```

Code Samples

libempathy-gtk

```
import gtk, empathy, gtkempathy

manager = empathy.ContactManager()
manager.setup()

store = gtkempathy.ContactListStore(manager)
view = gtkempathy.ContactListView(store)
view.show()

w = gtk.Window()
w.add(view)
w.show()

gtk.main()
```

Code Samples

libmission-control / Presence applet

```
import telepathy, dbus

bus = dbus.Bus()
mc = bus.get_object(
  'org.freedesktop.Telepathy.MissionControl',
  '/org/freedesktop/Telepathy/MissionControl')

mc_presence = dbus.Interface(mc,
  'org.freedesktop.Telepathy.MissionControl')

def on_presence_changed(presence):
  print "Presence changed to:", presence

mc_presence.connect_to_signal("PresenceStatusActual",presence_changed)
mc_presence.SetPresence(PRESENCE_AVAILABLE, "At GUADEC")
```

Code Samples

telepathy-python / VoIP and Video call

```
import telepathy, dbus
bus = dbus.Bus()
reg = telepathy.client.ManagerRegistry()
reg.LoadManagers()

mgr = reg.GetManager("gabble")
name, path = mgr[CONN_MGR_INTERFACE].RequestConnection(
  "jabber", "user@gmail.com")
connection = telepathy.client.Connection(name, path)
connection[CONN_INTERFACE].Connect()

contact = connection[CONN_INTERFACE].RequestHandles(
  CONNECTION_HANDLE_TYPE_CONTACT, ["user@gmail.com"])[0]
```

telepathy-python / VoIP and Video call

```
path = connection[CONN_INTERFACE].RequestChannel(
  CHANNEL_TYPE_STREAMED_MEDIA, CONNECTION_HANDLE_TYPE_NONE, 0, True)
channel = Channel(conn.service_name, path)

se = bus.get_object(
  'org.freedesktop.Telepathy.StreamEngine',
  '/org/freedesktop/Telepathy/StreamEngine')
se_handler = dbus.Interface(se,
  'org.freedesktop.Telepathy.ChannelHandler'

se_handler.HandleChannel(
  connection.service_name, connection.object_path,
  CHANNEL_TYPE_STREAMED_MEDIA, channel.object_path,
  CONNECTION_HANDLE_TYPE_NONE, 0)

channel[CHANNEL_INTERFACE_GROUP].AddMembers([contact], "")

channel[CHANNEL_TYPE_STREAMED_MEDIA].RequestStreams(
  contact, [MEDIA_STREAM_TYPE_AUDIO, MEDIA_STREAM_TYPE_VIDEO])
```

telepathy-python / VoIP and Video call

```
# When connected
connection[CONN_INTERFACE_CAPABILITIES].AdvertiseCapabilities(
  [(CHANNEL_TYPE_STREAMED_MEDIA, CREATE|INVITE)], [])

# On incoming channel of type StreamedMedia
pending = channel[CHANNEL_INTERFACE_GROUP].GetLocalPendingMembers()
channel[CHANNEL_INTERFACE_GROUP].AddMembers(pending, "")
```

Code Samples

telepathy-python / Tubes

```
room = conn.RequestHandles(
   CONNECTION_HANDLE_TYPE_ROOM,
   ["test@conference.olpc.collabora.co.uk"])[0]

tube = conn.request_channel(
   CHANNEL_TYPE_TUBES, CONNECTION_HANDLE_TYPE_ROOM,
    room, True)

id = tube[CHANNEL_TYPE_TUBES].OfferTube(
   TUBE_TYPE_DBUS, "org.freedesktop.Telepathy.Tube.Connect4", {})

addr = tube[CHANNEL_TYPE_TUBES].GetDBusServerAddress(id)
p2pbus = _dbus_bindings.Connection(addr)
```

Telepathy