

# Sofia-SIP, Telepathy Communication Framework, and Adding SIP to Telepathy

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# *Introducing Sofia-SIP and Telepathy*

# Sofia-SIP Library

- A feature rich **SIP user-agent library**, providing functionality needed to implement SIP clients.
- The library is written in **ANSI C**, and is licensed under **LGPL**. It has a rich set of features while still a relatively small memory footprint and requires little processing power.
- The code has been originally developed at the Nokia Research Center, where it has been used to support SIP related standardization work at IETF.
- Sofia-SIP was released under LGPL in August 2005, and has been run as an **open community project** since then.
- First **stable release 1.12.0**, release on 16<sup>th</sup> June 2006. Most recent release is 1.12.5 on 9<sup>th</sup> Feb 2007.

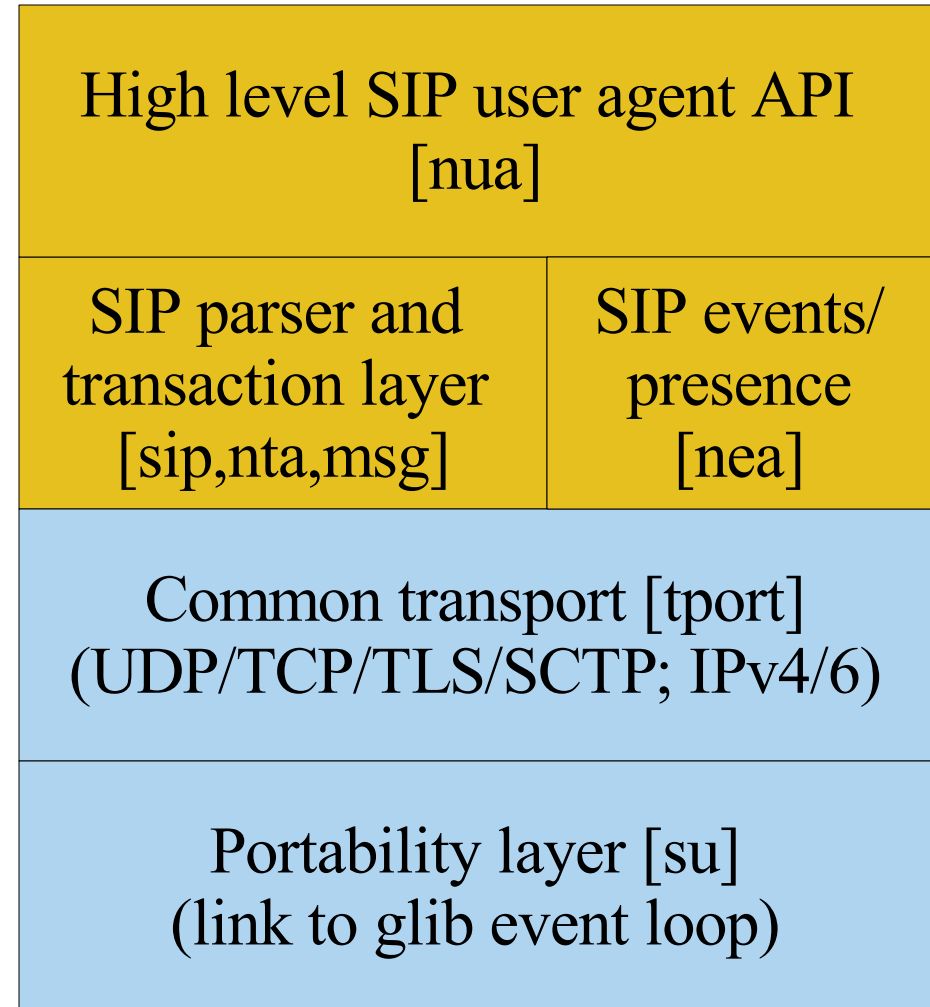
# Telepathy Framework

- *Communication framework for real-time, person to person services such as instant messaging, voice and video calls, etc*
- *Consists of D-Bus/IPC interfaces which allow all of the functionality of various IM/VOIP protocols to be exposed by background processes which maintain connections to your accounts.*
- *A freedesktop.org project with implementations under way for GNOME, KDE (Decibel) and Maemo (Nokia Internet tables), GNOME and KDE.*

# *Dive into Sofia-SIP library*

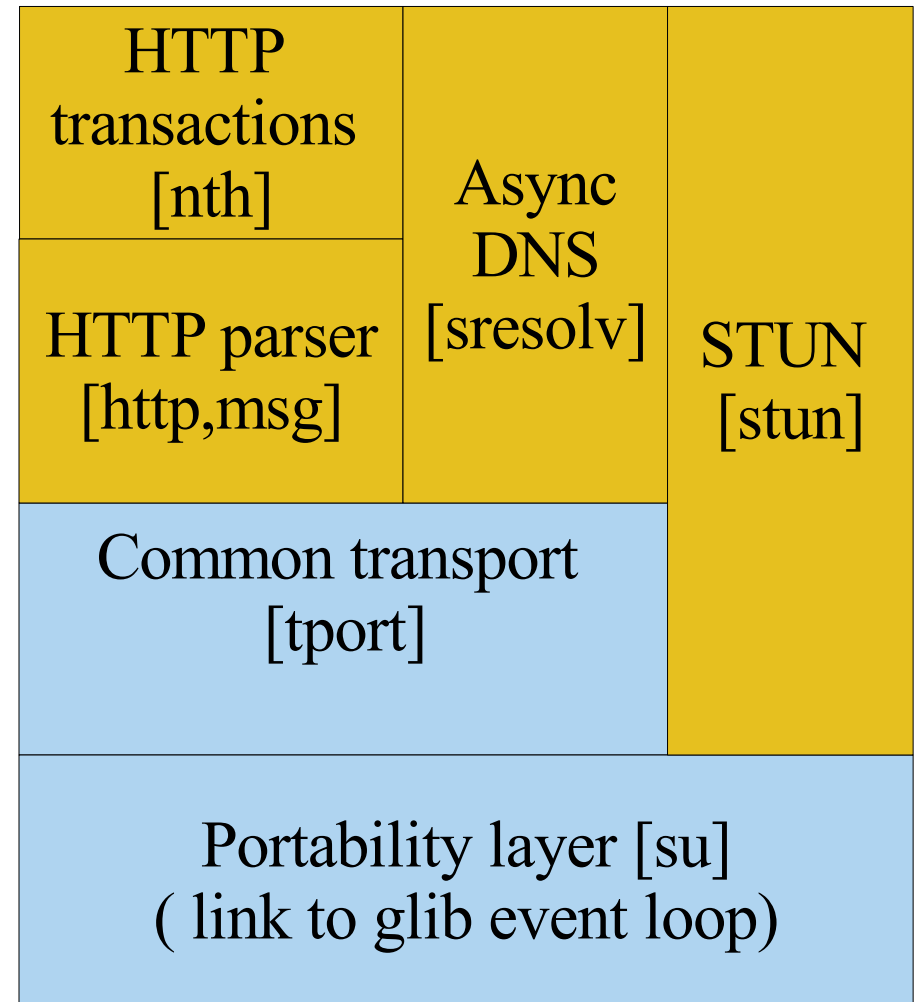
# Sofia-SIP Architecture

- *Not just a protocol parser but a full stack from transport support to a high-level user-agent API.*
- *Application developers can choose the level of abstraction to use: use the high-level 'nua' interface, or to get more flexibility, directly implement the client on top of the transaction layer 'nta'.*
- *A feature-rich network transport layer.*



# Sofia-SIP Architecture – Support APIs

- *HTTP client library that reuses the message parser (msg) and network transport code (tport) with SIP. HTTP is needed for group and authorization management in SIP (the XCAP protocol).*
- *A complete asynchronous DNS interface (with SRV/NAPTR support). SIP stack requires an efficient DNS resolver and Sofia-SIP provides one of its own.*
- *A STUN protocol component for NAT traversal and keepalives.*

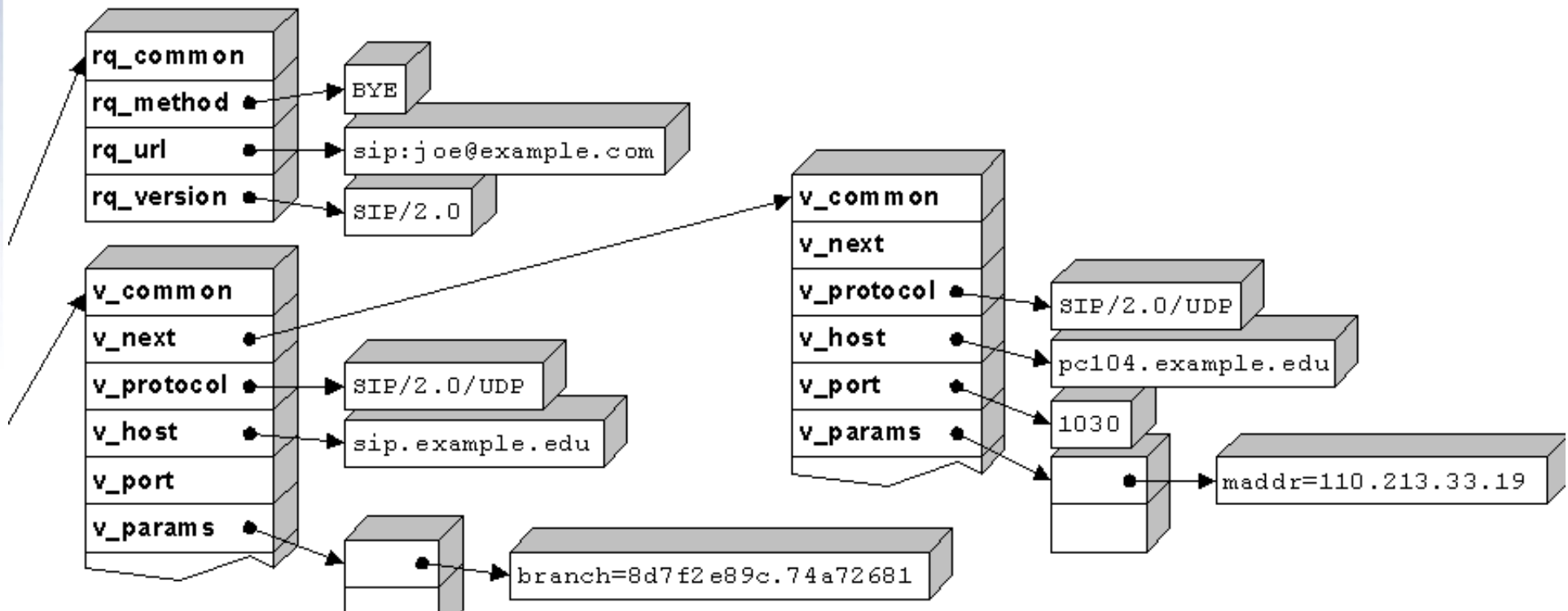


# Sofia-SIP Spotlight #1 – SIP/SIMPLE features

- *SIP related RFCs implemented: 3261, 2617, 3262, 3263, 3265, 2806, 2976, 3311, 3313, 3323, 3326, 3325, 3327, 3329, 3361, 3420, 3428, 3486, 3515, 3608, 3680, 3824, 3840, 3841, 3842, 3856, 3857, 3858, 3891, 3892, 3903, 4028, 2327, 3264, 3266, 3312, 3388, 3407, 3524, 3556, 3605, 3890, plus numerous Internet Drafts. ... so in other words, **quite many things**. :)*
- *Some highlights:*
  - *All the basic building blocks for media session setup: call setup, call services with REFER method, ...*
  - **SIMPLE presence/IM** with MESSAGE, PUBLISH and SUBSCRIBE methods
  - A complete **SDP offer/answer engine**
  - NAT traversal support: rport, persistent TCP, STUN contact discovery, initial sip-outbound support, etc
  - Support for multiple call models (IETF, 3GPP, ...)

# Sofia-SIP Spotlight #2 – Parser technology

- *Sofia-SIP provides an efficient recursive descent parser for SIP and HTTP.*
- *The parsing results can be accessed via C structs. The parser is designed to avoid unnecessary memory copying.*

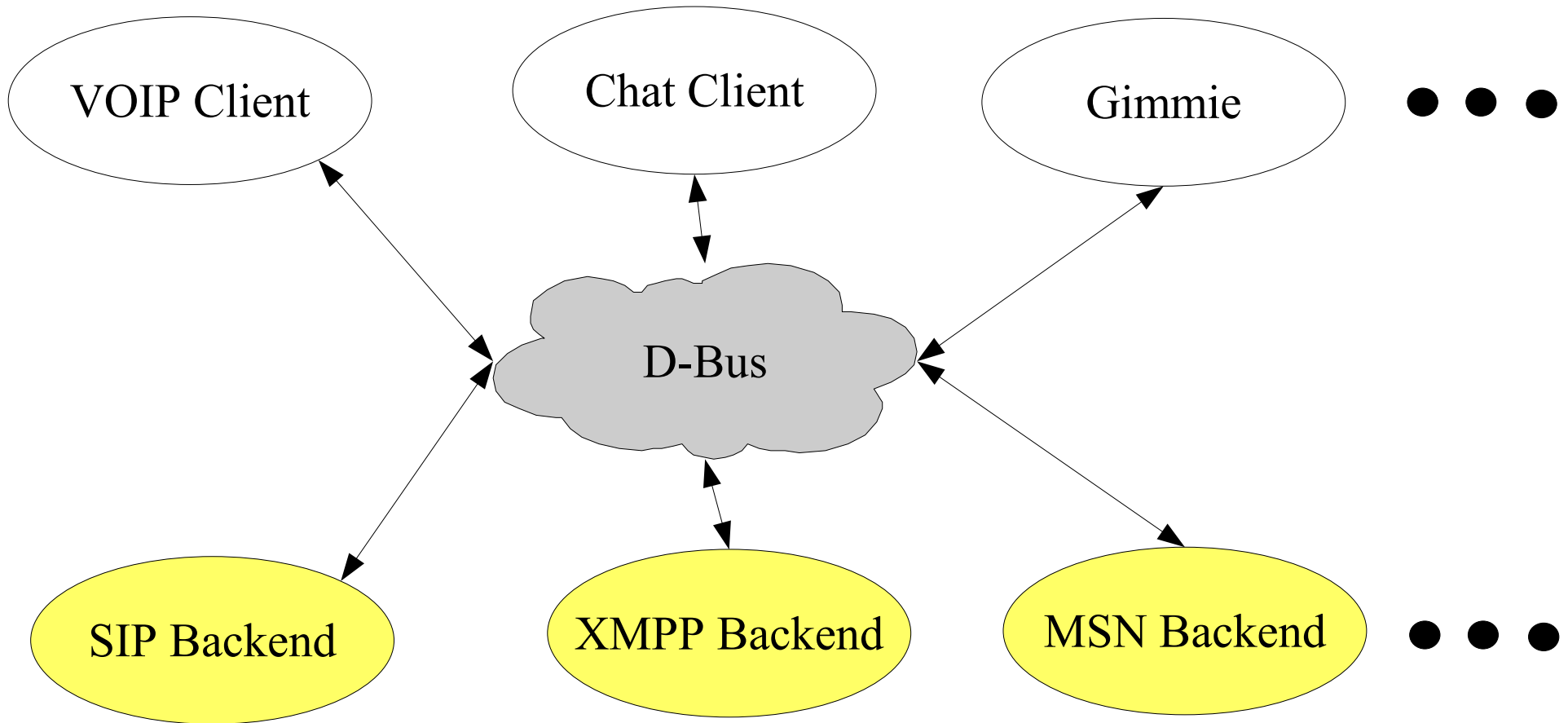


# *Telepathy Framework*

# The Big Idea

- Move away from the monolithic client
- Create a standard set of D-Bus interfaces
- Abstract common messaging, presence & multimedia services
- Separate the protocol code backends from the UI programs that use them

# The Big Idea (2)



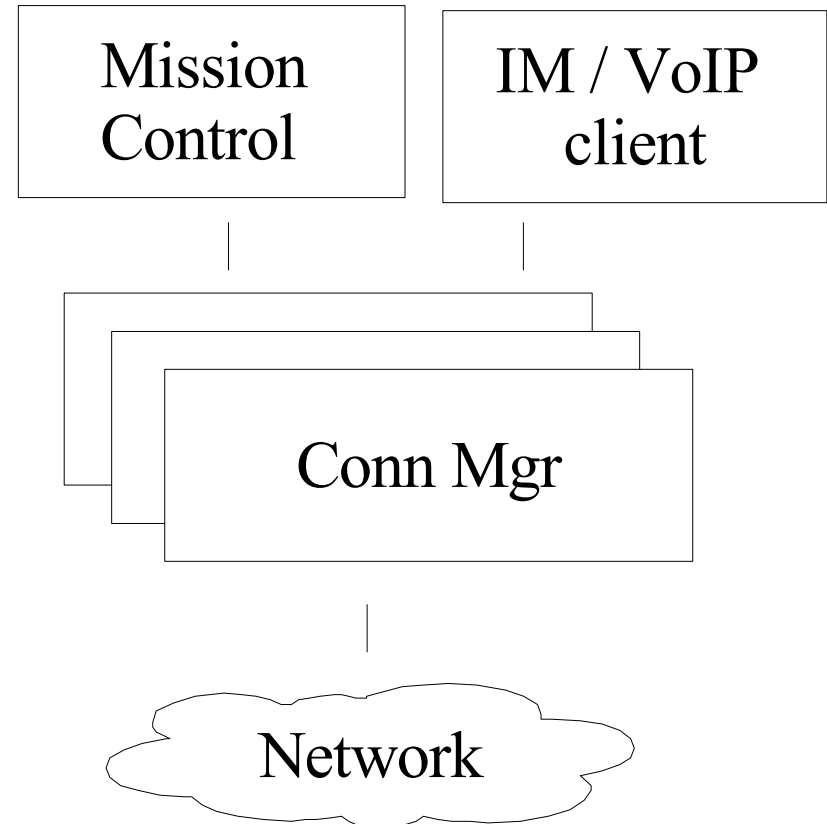
# Telepathy Framework

- *Ubuntu is planning to adopt Telepathy for IM and VoIP*
  - *Design paper is available at*  
<https://wiki.ubuntu.com/MOTUIM/DesktopIntegrationSIPIM>
- *Decibel is working on KDE middleware implementing Telepathy*
  - <http://decibel.kde.org>
  - <http://tapioca-voip.sourceforge.net/wiki/index.php/Tapioca>
- *Used in Nokia Internet Tablets (770, N800)*
- *Lots of smaller projects and available components at*
  - <http://telepathy.freedesktop.org/wiki/FrontPage>

*Telepathy-Sofiasip component*  
*“A SIP plugin to Telepathy”*

# Telepathy Connection Manager

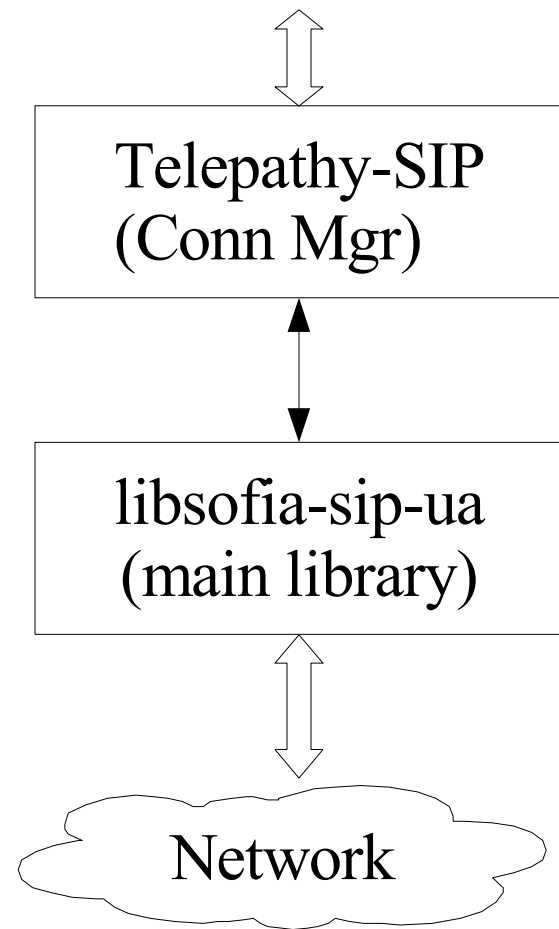
- *A component that is launched (by Telepathy Mission Control) when the user wants to login to a VoIP/IM network.*
- *The correct connection manager is selected based on protocol type associated with the account.*
- *Connection manager does:*
  - *Maintains registration(s)*
  - *Creation of communication channels (voice, video, chat, data, etc).*
  - *Maintains presence state*



# Telepathy-SIP – The implementation challenges

- *Mapping SIP concepts to the Telepathy interfaces.*
  - *Differences: session negotiation details, group handling, presence.*
- *Distributed media subsystem*
- *Protocol independent media API*
  - *Both Jabber/Jingle and SIP have support for IETF ICE framework (on which current Telepathy interfaces for media are based).*
  - *Hopefully both SIP and XMPP will end up using IETF ICE which allows to share the ICE/media engine between the protocols.*

Mission Control (via DBus)



# Telepathy-SIP – And some cool benefits!

- Ability to add SIP **support to a lot of applications at once.**
  - Any client that uses Telepathy (well, at least in theory :) ...)
- Makes **writing a new SIP client very easy.**
  - Develop in any language with Dbus bindings (which are many)
  - And as a bonus, your app will support other protocols as well.
- Really **robust NAT traversal.**
  - The ICE/libjingle implementation of telepathy-stream-engine, is really good at traversing NATs.

# Telepathy-Sofiasip – Status now

- *First public release of tp-sofiasip on 9<sup>th</sup> Mar 2007.*
- *Support audio/video calls and basic SIP instant messaging (with MESSAGE method).*
- *Future ideas*
  - *Adding ICE support (shared with XMPP/Telepathy-Gabble)*
  - *Extending SIP presence and instant messaging support*
  - *Continue working with the Telepathy interfaces to exposes as many services as possible in a distributed and protocol agnostic way (things like file transfer, whiteboard sharing, etc)*

# Closing words

- *Websites*
  - <http://sofia-sip.sourceforge.net>
  - <http://telepathy.freedesktop.org>
- *Mailing list*
  - [sofia-sip-devel@lists.sourceforge.net](mailto:sofia-sip-devel@lists.sourceforge.net)
  - [telepathy@lists.freedesktop.org](mailto:telepathy@lists.freedesktop.org)
- *IRC*
  - *#sofia-sip at freenode*
  - *#telepathy at freenode*