# Network distribution in music applications with Medusa

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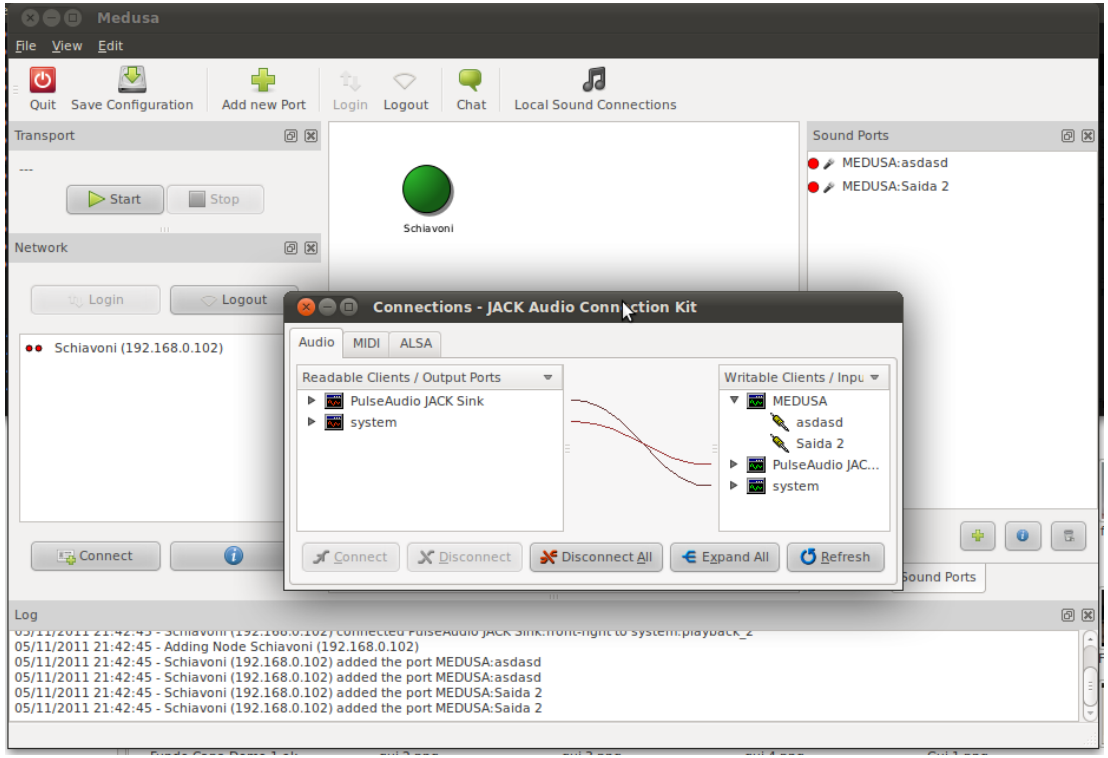
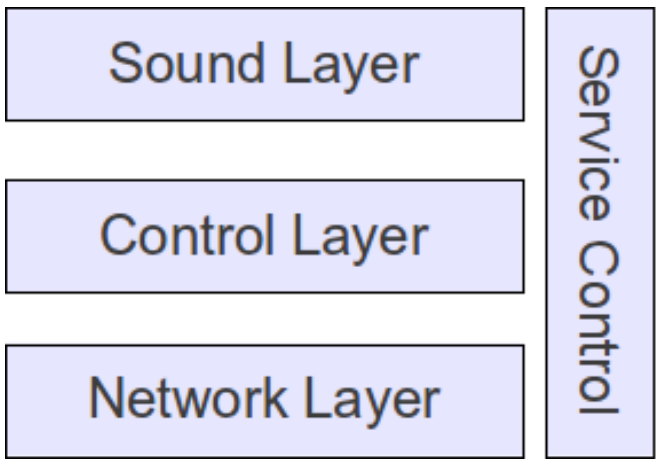
# What is Medusa?




- Distributed Audio Environment
- Focused in Usability

# Medusa Architecture




Service Control allows transparent connections using messages to publish / query networked resources.

# What is Medusa?

First Version:

- Jack as Audio API
- SCTP as network transport protocol
- Control Service to publish / query resources
- Transparency of resources and localization
- Qt GUI
- Monolithical development

# Networked Music

Scenarios:

- Recording
- Rehearsal
- Distributed DSP
- Spatialization
- **Performance**

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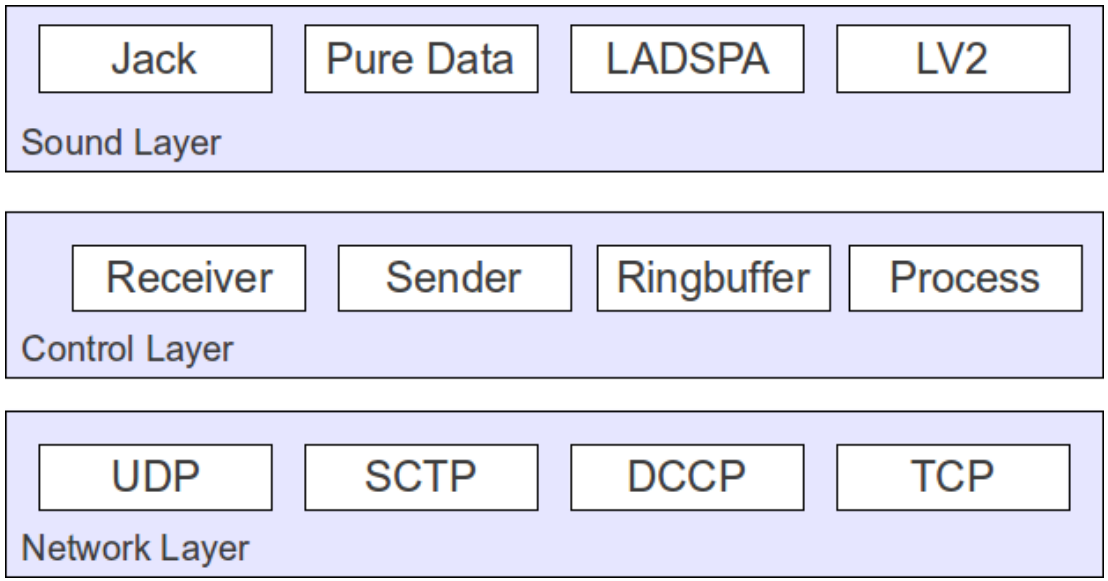
# Networked Music

Scenarios:

- Recording
- Rehearsal
- Distributed DSP
- Spatialization
- **Performance**

**Hypothesis 1:** End users can't deal with audio infrastructure lying below the application they are running.
**Hypothesis 2:** Different scenarios can need different approachs.

# Medusa Architecture




Audio API, processing and network transport protocols alternatives to different scenarios.

# Medusa Architecture

UDP : User Datagram Protocol is the classical unreliable (but faster) transport protocol.

TCP : Transmission Control Protocol is a reliable transport protocol, which ensures absence of packet losses.

SCTP : Stream Control Transmission Protocol is a connection-oriented transport protocol that provides a reliable full-duplex association. This protocol was not originally meant as a replacement for TCP, but was developed for carrying voice over IP (VoIP).

DCCP : Datagram Congestion Control Protocol is a transport protocol that combines TCP-friendly congestion control with unreliable datagram semantics for applications that transfer fairly large amounts of data.

# Medusa Architecture


Figure: LADSPA implementation

# Medusa Architecture

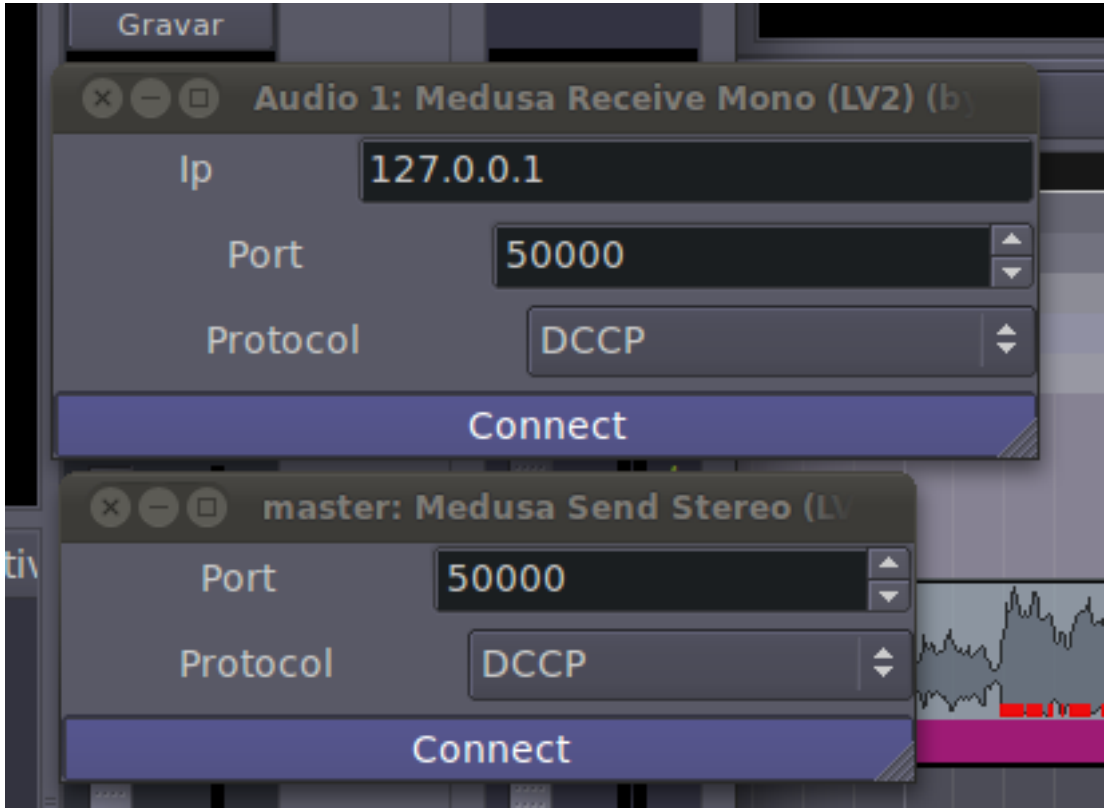



Figure: LV2 implementation

# Medusa Architecture

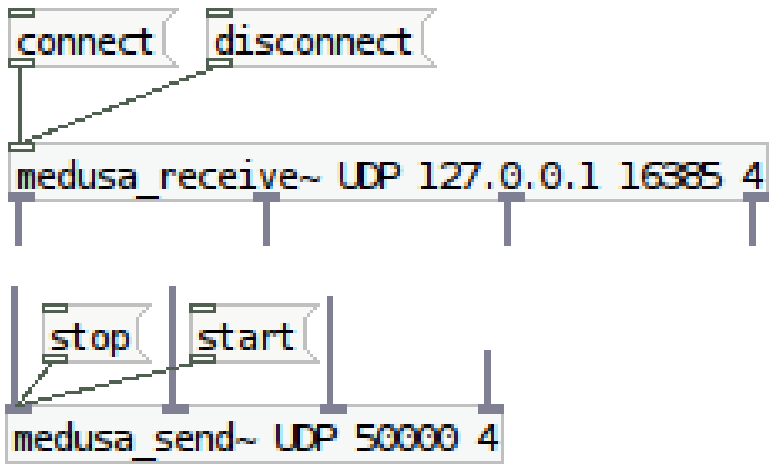



Figure: Pure Data implementation

# Medusa Architecture

Process:

- CELT
- Change sample rate
- Change bit depth
- Adjust worldclock drift

Can be integrated with Service control

# Implementation

- Control layer and network layer as a library
- The library provides a easy way to create senders and receivers
- Each audio API implementation creates senders ans receivers
- Each audio API can has it own user interface


Easy code maintenance and more connections alternatives.

# Results and Future works

- Extend the possibility of networked audio with Jack and UDP
- Try out new ways to do old things
- Better code with layered development

Future works

- Implement the service control as a separated server
- Integrate service control to implemented code
- MIDI streams
- Investigate other sounds API

# Acknowledgements

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# Thanks!

http://sourceforge.net/projects/medusa-audionet/
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Questions?

Thanks!