

Multi-room playout (Home Area entertainment)



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Concept



- My cousin Levi



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Concept



- Music in every room
- Zones
- Remote control



Synchronisation



- Don't sound like a stadium
- Within a millisecond?



<http://www.flickr.com/photos/bbmexplorer/2954373489>



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Video



- Not much extra work – fundamentally the same



Bandwidth



- Unicast OK for audio
- Not so good for video – multicast is better





Sinks and synchs

- Playback synchronisation happens in the sink elements
- Requires a clock and a base time
- Audio resampling
- NTP
- PTP



GStreamer network clock



- Master: GstNetTimeProvider
 - Listens for UDP packets on a port, responds with the time
 - Wraps a GstClock
- Slave: GstNetClientClock
 - Correlates between observations of the remote time and the system clock
 - A normal GstClock



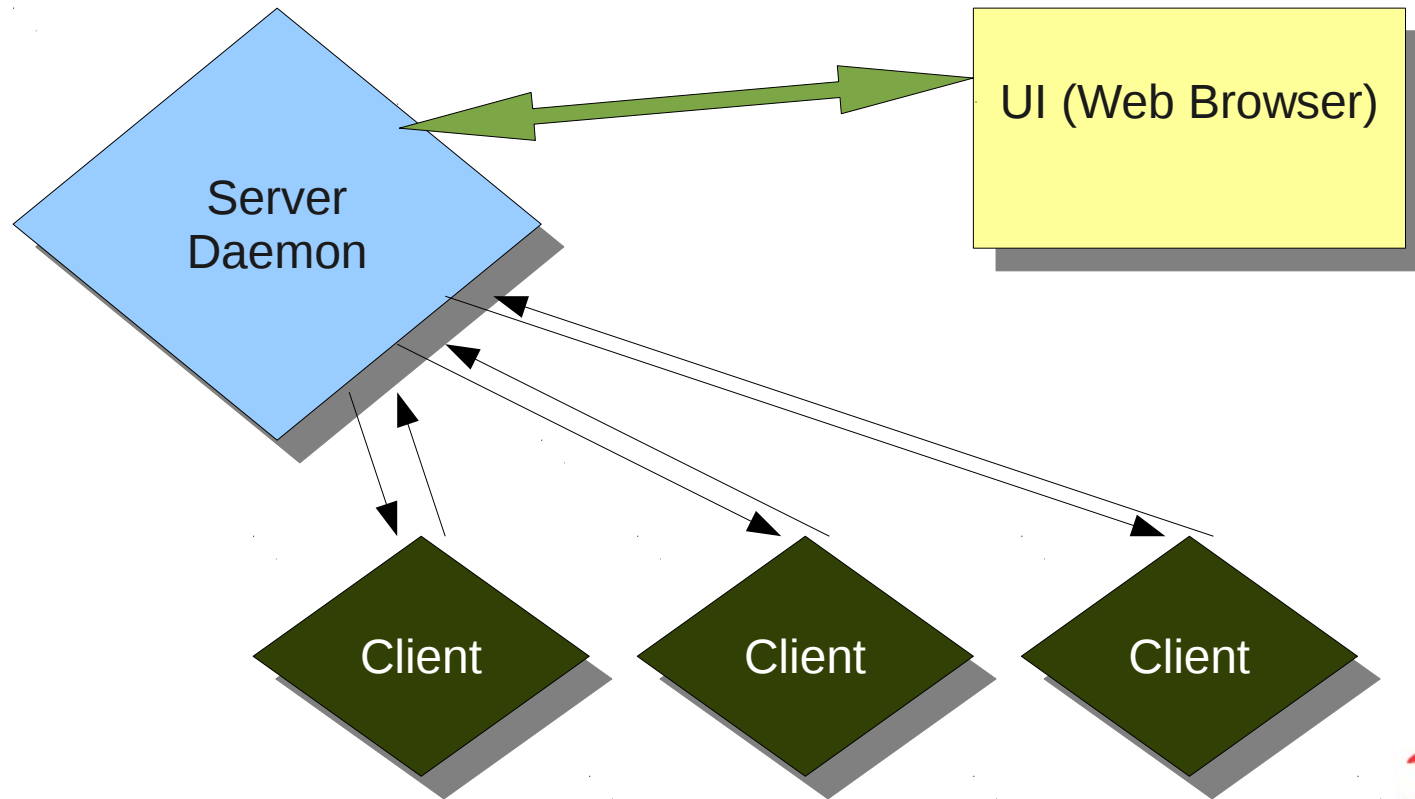


Aurena



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Implementation



Implementation



- Avahi for server discovery
- JSON event stream to clients - libjson-glib
- GstNetClock
- Media streams
- HTML/Javascript UI – libsoup
- Media library



Streaming – RTSP



- gst-rtsp-server makes it easy
- Problems with synchronisation
- Multicast possible



Streaming – HTTP



- Stream via libsoup
- Bandwidth concern



GSS



- Aurena duplicates big pieces
- Need to investigate integration



Communication



- Chunked HTTP
- WebSocket implementation
- GstStructure vs JSON-glib



UI



- AJAX is fun

A screenshot of a web interface titled "Aurena" with a "Connected" status in the top right. The interface includes a row of three buttons: "Play", "Pause", and "Next", followed by the text "Paused". Below this is a "Volume:" label and a horizontal slider bar with a white knob, showing a value of "10%". Underneath is the text "Now Playing None". A section titled "Connected outputs:" contains a list item with a checked checkbox and the text "Client 10.11.12.1". Below this list item is another horizontal slider bar with a white knob, showing a value of "100%".

Aurena Connected

Play Pause Next Paused

Volume: 10%

Now Playing None

Connected outputs:

- Client 10.11.12.1 100%



Demo



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Code



- Available on github:
 - <https://github.com/thaytan/aurena>





Next steps...

- media library with metadata (GstDiscoverer)
- Multiple zones, ability to move players between zones
- RTP multicast streaming
- Improve clock stability





Questions?



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Next steps...



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