

Evolution music engine

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TOC

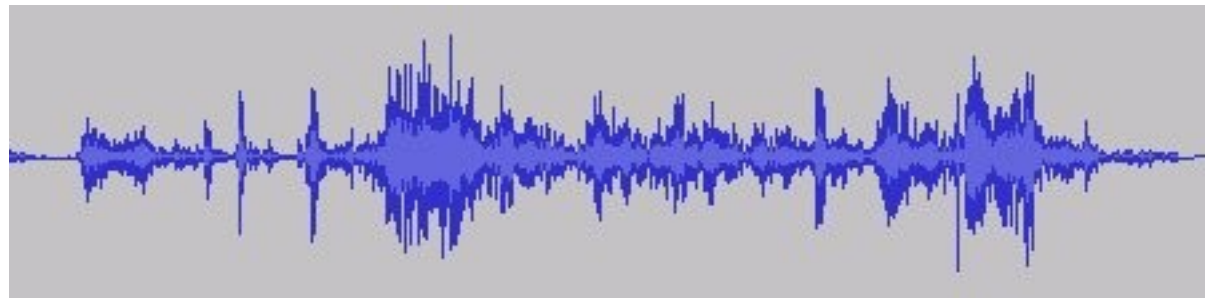
- OPLUG
- Sound theory
- Evolution ABC
- P2P Networking
- The idea
- Discussion

OPLUG

- Oslo Pils and Linux User Group
- Founded october 2002 by richard and alfredh
- Meets 1st Wednesday every month in a pub
- Open forum for creative ideas
- No political agenda, no budget ;)
- More info at www.oplug.org

Sound theory

- Sound waves
- Sine waves, square waves, triangular waves
- Tones: sine waves of different frequency
- Digital music: N-samples of varying amplitude
- CD quality is 44.1 kHz 16-bit



Sound theory

- Basic two types:
 - raw sound (samples)
 - synthesized sound (e.g. midi)
- Raw sound
 - large files with samples (low-level)
 - can describe anything !!!
- Synthesized sound
 - smaller files describing tones (high-level)
 - limitation to what can be described (e.g. speech)

Evolution

- Charles Darwin theory
- Survival of the fittest
- Genetic fingerprint (DNA) describe building blocks
- DNA passed on to next generation (iterations)
- Mutations lead to variations
- Is evolution global or universal?
- Can it be applied to other fields?

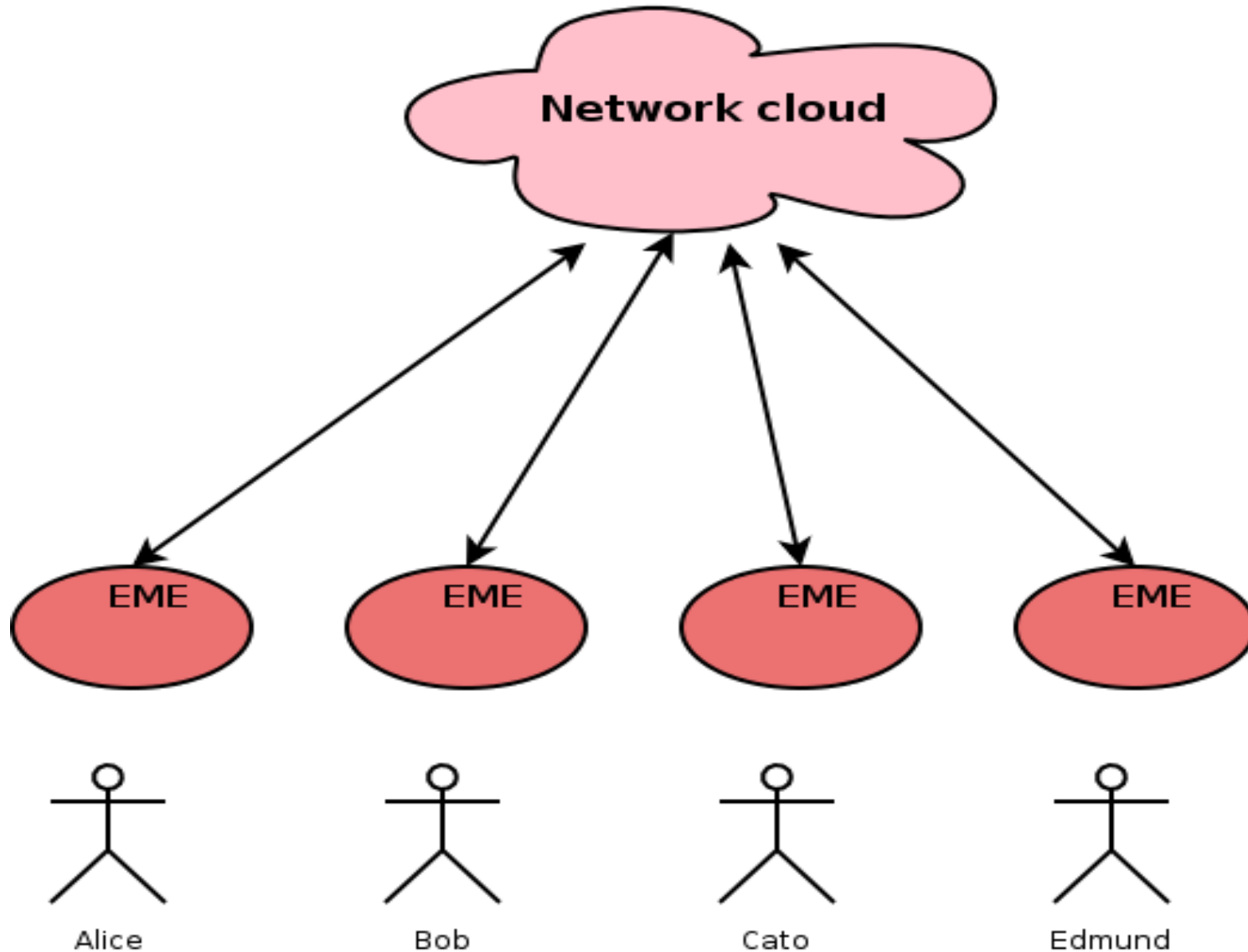
P2P networking

- Distributed networks
- Direct client-to-client communication
- No centralized server
- NAT issues?
- Data storage

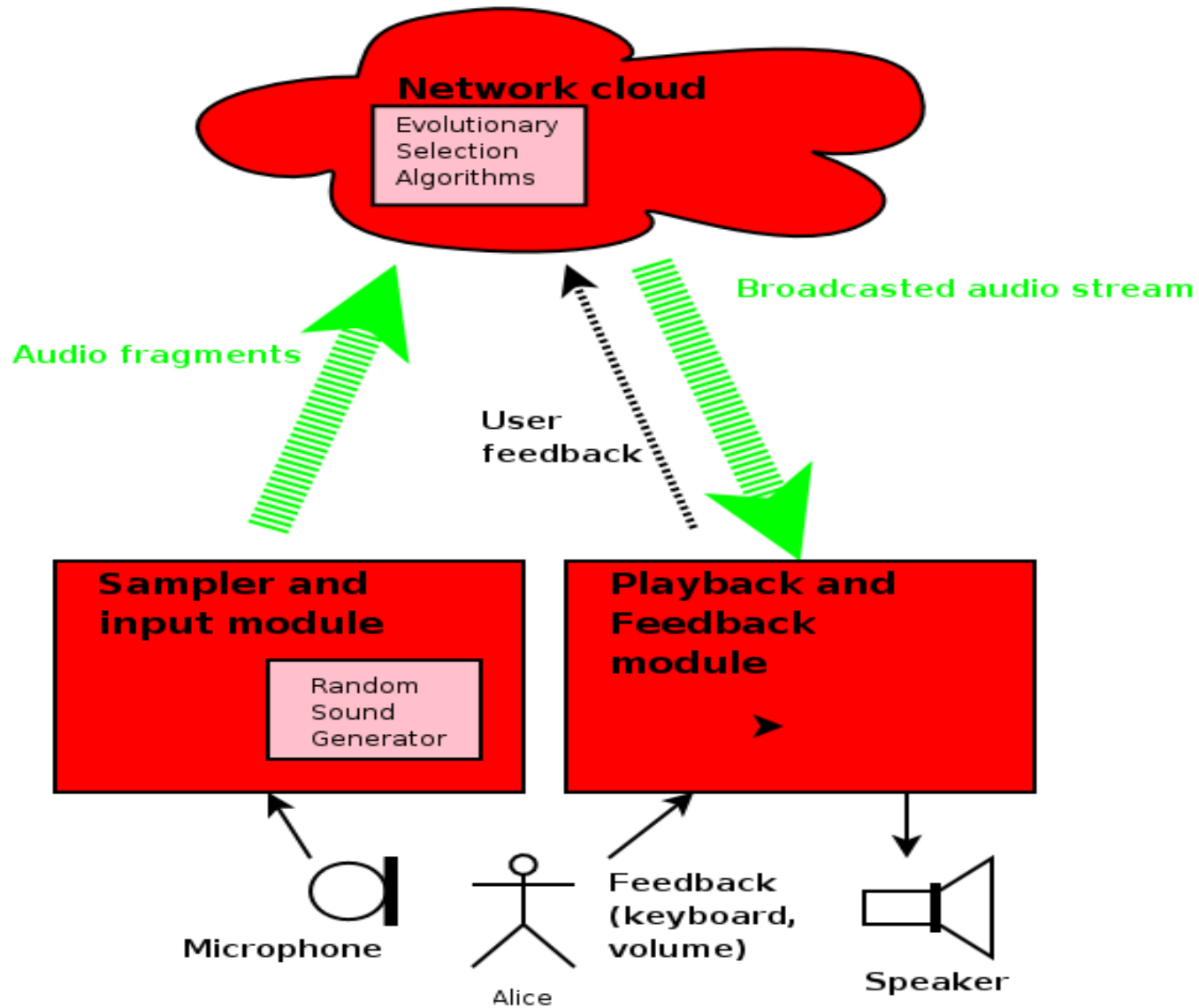
Combine these: The idea

- Evolution music engine...
- An application or device
- Communicates with other peers through TCP/IP
- Bi-directional sound streaming with feedback
- Adaptive algorithms for evolutionary selection
- General statistics and information

Architecture



Architecture - details



Modules - sampler

- Samples audio from microphone in real-time
- Length is up to the user
- Audio fragment gets a global unique ID and descr.
- Sent uplink to network cloud

Modules – audio generator

- Generates random audio of varying length
- Audio fragment sent uplink to network cloud
- Can also be located in network
- What about a random MIDI generator?

Module – playback

- Very simple playback module!
- Plays the audio broadcast on your speaker
- Compressed broadcast (ogg vorbis?)
-

Module – feedback module

- Provide feedback from user to network
- Feedback sources:
 - keyboard (e.g. Space=good ESC=bad)
 - mouse
 - volume control (up=good, down=bad)
 - no feedback (listener fell asleep...zzz...)
- Feedback on current broadcast

Concepts

- Mixing and source selection is done in network
- Design should not limit client implementation:
 - new adaptive algorithms can be implemented on the client
- Audio stream fragments are stored and reused:
 - tagged with global unique ID
 - genetic mixing and feedback
 - iterative rounds in evolutionary cycles

Issues

- Storage
 - after some time the amount of data accumulated will be immense!
- Audio formats?
- Real-time encoding?
- Copyright? (DRM!)

Extending features

- Multiple channels (profiles)
- User identity distribution
- Financial reward – click to pay NOK 1,-
-

Use cases

- Party function
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Other fields

- Evolutionary recipes?
 - generate a random recipe
 - make the food
 - send feedback to system

Discussion

- thanks for listening...

.... the whole talk was recorded and broadcasted
via EME ...