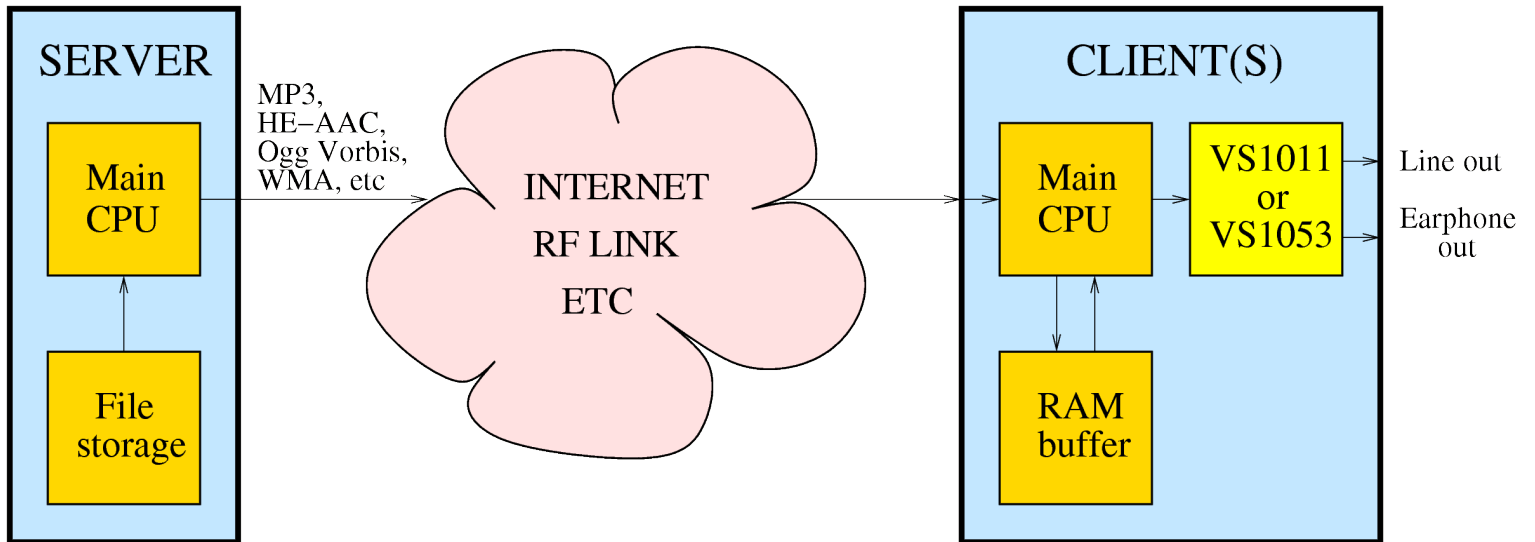


VLSI Solution Oy Internet Radio Presentation

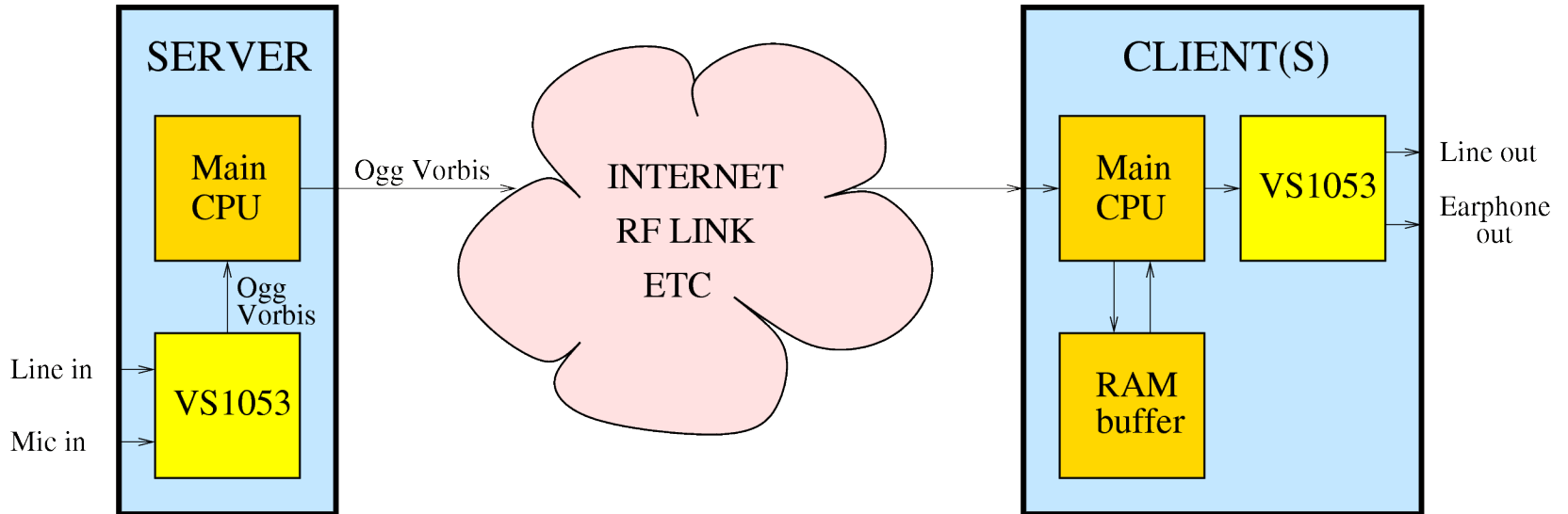


August 2008

Streaming – File based server / client(s)



Streaming – Real-time server / client(s)



Technical Challenges

CHALLENGE	SOLUTION
speed of streaming medium	use of high quality codecs such as HE-AAC and Ogg Vorbis
variable latency of streaming medium	client buffer memory
sample rate skew	decoder adjusts the sample rate to match with the server
bit errors of streaming media	robust audio decoder
low power consumption	dedicated low-power hardware (not PC!)

Our offering for Streaming

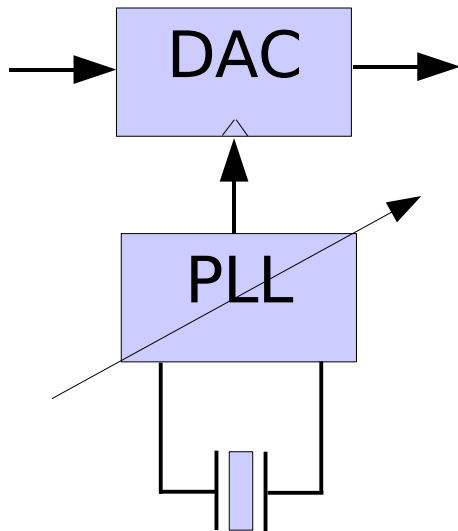
VS1011

- Mp3 decoder
- 5 KiB customization IRAM

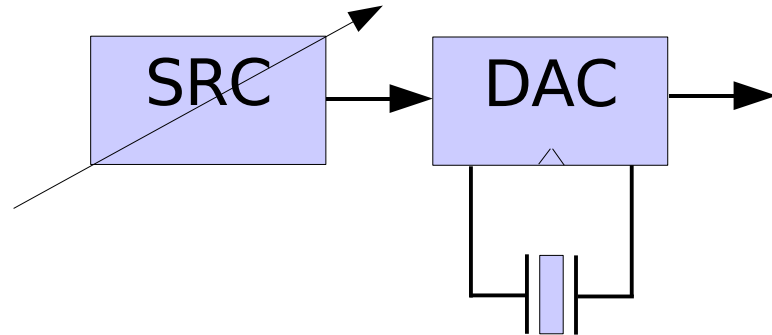
VS1053

- Multi-format decoder
- ADC + Ogg Vorbis encoder
- 16 KiB customization IRAM
- EarSpeaker technology

Streaming Highlights – Sample rate conversion



Conventional way to tune sample rate
=> **audible jitter**
from **PLL**



VS10XX uses finely adjustable Sample Rate Converter (SRC) and constant sample rate DAC
=> **crystal clear sound**

Streaming Highlights – EarSpeaker Technology

DSP simulates
Room and Head
Transfer Functions
to move
headphone sound
outside the
listener's head =>

- Natural 3-dimensional sound
- Realistic stereo image
- No listening fatigue
- VS1053



Streaming Highlights – Ogg Vorbis Recording

- **Input from microphone or line-in (stereo)**
- **Line input typ. SNR > 90 dB and THD < 0.005%**
- **Supports 11 quality settings:**
 - Voice: mono 15kbit/s @ 8kHz
 - Wide band voice: mono 28kbit/s @ 16kHz
 - HiFi voice: mono 87kbit/s @ 44.1kHz
 - Music: stereo 135kbit/s @ 44.1 kHz
- VS1053

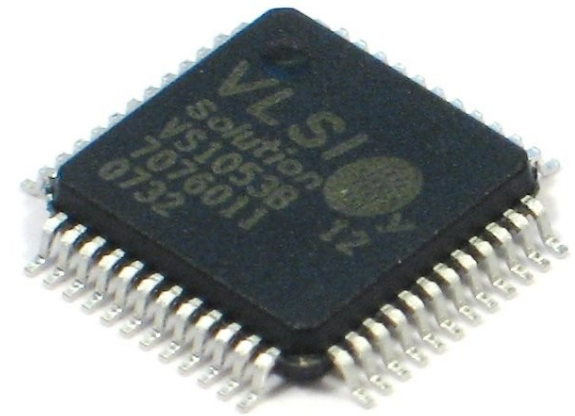
Streaming Highlights - Summary

- **Easy to use**
 - Designed as slave processor
 - Flexible external clock range
 - SPI interface for communication
- **High performance analog hardware**
 - Integrated DAC, ADC*), Headphone driver
- **Special Technology**
 - EarSpeaker*)
- **Customization**
 - Plugins, applications, KITs and Boards
 - Free technical support

*) VS1053 only

Features of VS1053

- Decodes **HE-AAC+**, **Ogg Vorbis**, LC-AAC, WMA, MP3, WAV, GM1
- Encodes **Ogg Vorbis**, WAV
- EarSpeaker
- Stereo line in SNR >90dB
- DAC dynamic range >100dB
- Low power consumption
- 7x7 mm LQFP48 package



Additional information

- support@vlsi.fi

VLSI Solution Oy

The New Technology Creator

VLSI Solution is an innovative new technology creator. We apply our system level experience in digital signal processing to very large scale integrated circuits. Our competence includes integration of analog and digital functions.

A multi-format high performance audio codec

VS1053 is advanced slave audio processor. In addition to being able to decode MP1, MP2, MP3, WMA, WAV, IMA ADPCM, General Midi 1, Ogg Vorbis, LC-AAC and HE-AAC file formats, it can also record CD-quality license-free Ogg Vorbis file format. Device includes high quality analog interfaces. Device is ideal for streaming applications because sample rate converter can be fine tuned "on fly" to synchronize the sample rates.

- See VS1053 product page
- Download NEW version of the Ogg Vorbis encoder
- Read how to implement your own signal processing algorithm
- Read more about Ogg Vorbis

Build VoIP Speaker Phone by using VS1003 and VS1000

- See presentation (updated)
- See VoIP Speaker Phone support page

TinyPlayer

VS1000 TinyPlayer is an example of a product that uses VS1000 device. TinyPlayer is the simplest and probably the lowest cost license-free audio player ever done. It features three in-one functionality: USB memory stick, USB headphones and simple music player.

- See TinyPlayer presentation
- See TinyPlayer support page

Customize your Ogg Vorbis application

VS1000 Developer Board has all necessary hardware for writing and testing your application specific software by using VS1000 Ogg Vorbis player IC.

- See VS1000 Datasheet
- See VS1000 Developer Board support page
- See Programmer's Guide
- See how to convert mp3 files to Ogg Vorbis format

Press Releases

- High quality Ogg Vorbis recorder
- A Multi-Format High Performance Audio Codec
- Ogg Vorbis Player Circuit
- New office

Do you want an ASIC?

- See our Design and Manufacturing Services

Distributor Wanted

- We are looking for a distributor in USA

Recently updated pages

- Application Notes
- VS10XX Plugins

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Last update: 04-Jun-2008

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