BAT Introduction

Created   Sep 24th 2015
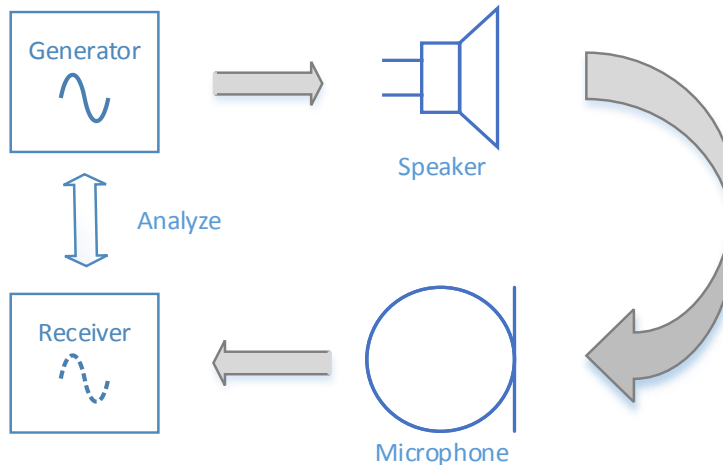
Agenda

- ❏ WHAT is BAT?
- ❏ Infrastructure
- ❏ WHY BAT?
- ❏ Project Status
- ❏ Supported features
- ❏ Potential future features (1)
- ❏ Potential future features (2)
- ❏ Potential future features (3)
- ❏ Potential future features (4)
- ❏ Backup
- ❏ Q & A

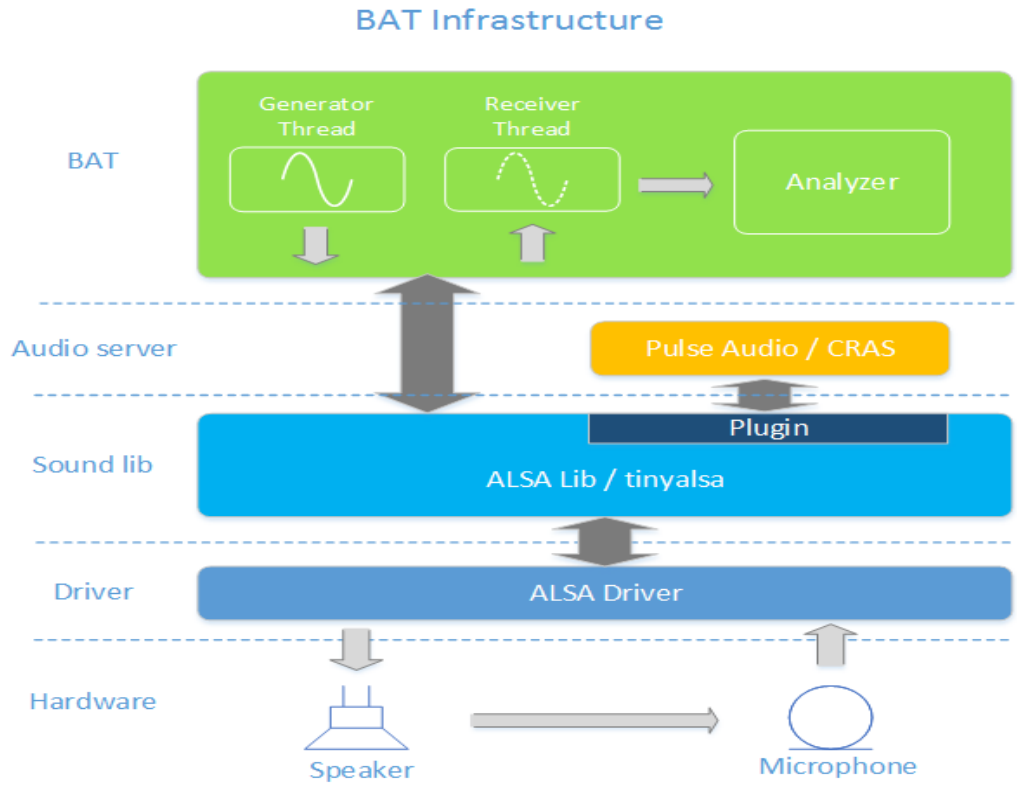# What is BAT?

❑ BAT (Basic Audio Tester) is Audio Automation Test Solution

  ❑ Cover Analog/Digital Domain

  ❑ Frequency detect

  ❑ Latency detect

  ❑ Gain detect

  ❑ Linux OS Agnostic

Generator — Speaker — Microphone — Receiver — Analyze

Infrastructure

BAT Infrastructure

WHY BAT?

❑ Enable Audio Test Automation to save QA time and resource

❑ Enable LKP(Linux Kernel Performance) on audio for auto bisect

❑ Enable general feature testing and stress testing of audio

Project Status

❑ A stable repo is available on github

  ▪ Repo: https://github.com/01org/bat

  ▪ Wiki: https://github.com/01org/bat/wiki

❑ Upstreaming to alsa-utils

❑ Scheduling for potential future features development

Supported features

❑ Support frequency analysis on playback-capture loopback mode

❑ Support frequency analysis on single-line capture mode

❑ Support playback from either sine wave generator or RIFF WAV file

❑ Support configurable parameters

- PCM format (U8, S16_LE, S24_3LE, S32_LE)

- Sample rate (any sample rate supported by hardware)

- Sound clip length (0 to 10M frames)

- Channel number (1 or 2)

- Frequency in each channel (value from 7Hz to 40% * sample_rate)

❑ Support ALSA / tinyalsa APIs (tinyalsa is not supported by default)

❑ Store playback/recorded signal into RIFF WAV file for debug

Potential future features(1)

❑ Ramp test

    ❑ Simple and bit-perfect test on Digital loopback, check latency

❑ Impulse test

    ❑ Check frequency/phase response and latency

❑ Time domain test

    ❑ Use software PLL to lock on to received sine wave to check single/few sample defects in system

❑ Negative test

    ❑ Add shell script to run stress test with incorrect parameter inputs

Potential future features(2)

❑ Silent input

   ❑ Generate, capture and analyze silent entry to check noise level on sound path

❑ Pause/resume test

   ❑ Pause/resume during playback. Check if playback recovers, and measure latency

❑ Suspend/resume test

   ❑ Suspend/resume from S3, or Hibernate/resume from S4 during playback. Check if playback recovers, and measure latency

❑ GFX mode change test

   ❑ Change mode and pipe during HDMI/DP playback. Check if playback recovers, and measure latency

intel Software

OpenSource
TECHNOLOGY CENTER

Potential future features(3)

❑ Pulse Audio plugin

   ❑ Full support under -Dpulse parameter

❑ Cras plugin

   ❑ Full support under -Dcras parameter

❑ Multiple streams

   ❑ Support multiple playback and capture streams meanwhile. Now support 1/1

❑ HDMI 5.1 channels

   ❑ Support 5.1 channel HDMI audio playback test

Potential future features(4)

❑ Vary periods

   ❑ Launch bat with varying ALSA periods

❑ Gain detect

   ❑ Set volume and read back signal strength

❑ Sweep test

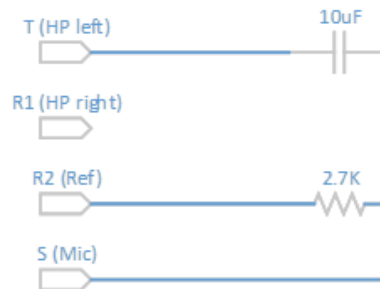   ❑ Sweep through frequencies from low to high in steps to test audio performance

Backup

❑ Cable connection example

combo port (TRRS) loopback connection

a. Line-out to Line-in direct connect, dual

b. Combo port loopback connect, mono

❑ Command example

$ ./bat -P plughw:0,3 -C plughw:0,0 -r 48000 -c 2 -f S16_LE -n 1s -F 250,500 --saveplay /tmp/play.wav

Backup

- Repo: https://github.com/01org/bat

- Wiki: https://github.com/01org/bat/wiki

- Release notes: https://01.org/basic-audio-tester

Q & A