

Creating LV2 plugins with Faust

Albert Gräf

Department of Music Informatics

Johannes Gutenberg University Mainz



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faust-lv2 on the web: <http://faust-lv2.googlecode.com>

faust-lv2 is supported by the **online compiler:**
<http://faust.grame.fr>



Why LV2?

- New Linux plugin standard, “LADSPA version 2”
- More capable (but also more complicated) than LADSPA
- **Both** audio and instrument (MIDI) plugins, and more (extensions)
- 4/2012: version 1.0, current: 1.4
- Supported by Ardour, Qtractor
- Plugins supporting LV2: Calf, CAPS, TAL, drowAudio, Loomer, linuxDSP

Why Faust?

- Makes DSP programming much easier
- Good output code (in many cases)
- Supports many plugin standards on different platforms (Linux, Mac, Windows, Web)
- Online compiler
- Great library of Faust codes
- Needed an LV2 architecture!
- Under development since 2012

The Faust LV2 architecture



- Audio/control inputs and outputs
- Meta data about plugin (name, author, ...) and controls (units, scale points, ...)
- MIDI control input (`midi:ctrl`), all notes off, channel tuning (RPN)
- MIDI note input (freq, gain, gate), automatic polyphony + voice stealing
- MIDI tuning standard (MTS, octave-based)

A bare-bones Faust organ

MIDI
controls

controls

voice
controls

main dsp
function

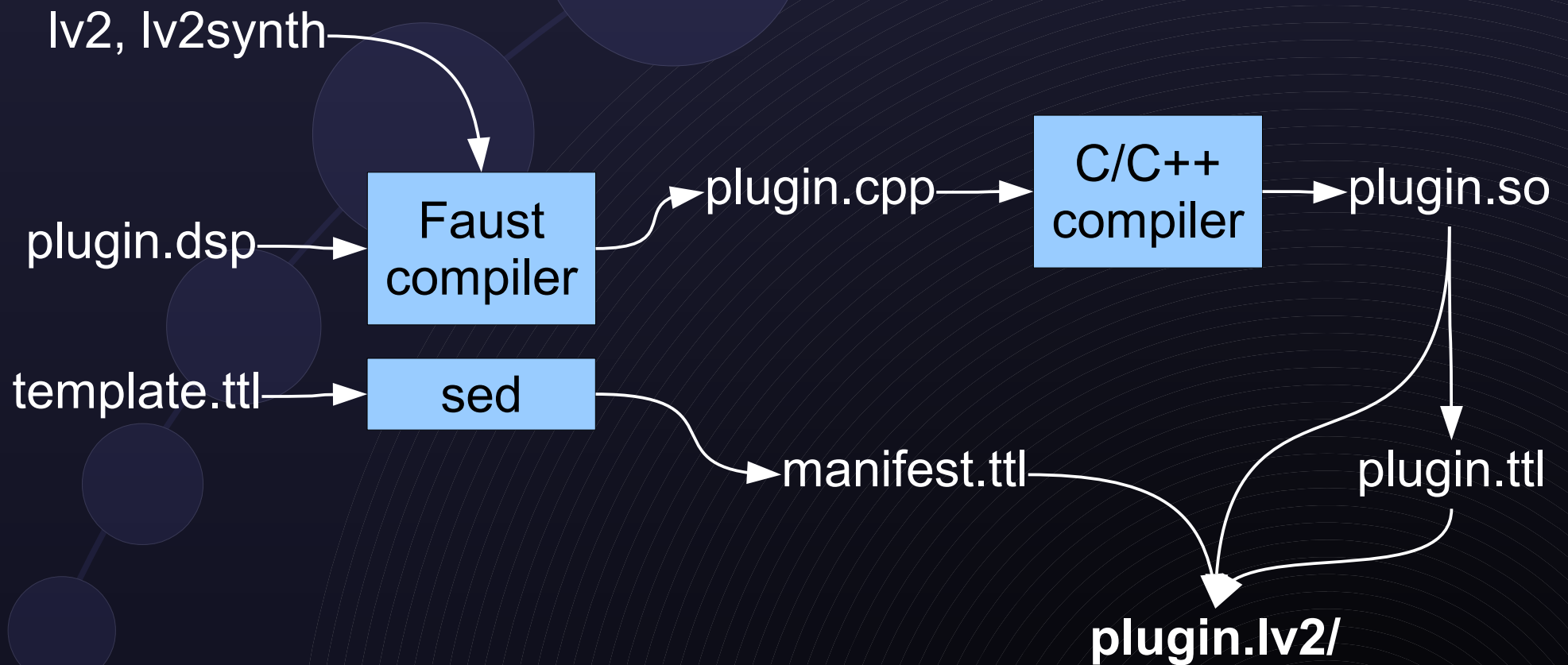
```
import("music.lib");

vol = hslider("vol [midi:ctrl 7]", 0.3, 0, 1, 0.01);
pan = hslider("pan [midi:ctrl 10]", 0.5, 0, 1, 0.01);

freq = hslider("pitch", 440, 20, 2000, 0.01);
gain = nentry("gain", 0.3, 0, 10, 0.01);
gate = button("gate");

process = osci(freq) : * (gate : adsr(a, d, s, r)) * gain
          : *(vol) : panner(pan);
```

Faust → LV2



The compilation process

- ... is complicated, **but** ...
- ... can be automatized with make, waf etc.
- ... or build scripts: faust2lv2, faust2lv2synth
- Also available in the online compiler!
- Build scripts and online compiler only provide basic options; check the faust-lv2 online documentation if you need full control.

Demo

LAC 2013 faust-lv2 organ demo

ADSR chorus freeverb harmonics

pan volume

<http://faust-lv2.googlecode.com>

5:40

Future Work

- Smoother polyphony control
- Plugin GUIs (GTK/Qt/GL or external)
- Updates for latest LV2 versions (atom-based event interface?)
- Support for the LV2 Time extension
- MIDI output for passive Faust controls?

Give it a whirl: <http://faust-lv2.googlecode.com>

<http://faust.grame.fr>