

# LTTNG Parser for FrameSoC

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## 1 Description

This document describes a parser for the *Linux Trace Tool new generation* (LTTng) [1] trace format: *Common Trace Format* (CTF) [2]. This parser is integrated in the FrameSoC framework for SoC trace analysis and converts the trace generated by LTTng to the trace format of FrameSoC.

The parser reuses several tools from the LinuxTool Eclipse plugin [3]. It uses the *Tracing Monitoring Framework* (TMF) [4] plugin to convert the trace events from their binary format. Along getting punctual events, it also builds other categories of events:

- Process state events represent the state of a given process at a time. The possible states are: waiting, running in user mode, run after a system call, interrupted, waiting for CPU or unknown.
- CPU state events represent the state of a CPU at a given time. The possible states are: idle, running in user mode, running a system call, IRQ and soft IRQ.
- The link events show the succession of the executing processes by linking the process that stopped executing to the newly executing process.

To build these states, we use a modified version of the TMF State Builder which identifies the events that modify the state of the process or CPU and update them accordingly. When that happens, we modify it to also generate a state event in the FrameSoC format.

One limitation of TMF is that it does not keep the type of the event parameters in its representation, consequently we also used the CTF parser to obtain them. This solution however is not very efficient since it forces to read all the events twice.

### 1.1 Getting the parser

The source of the plugin can be obtained using the following command:

*git clone git+ssh://[username]@scm.gforge.inria.fr//gitroot/soctrace/moais.git*

It must then be imported in Eclipse using *File->Import->Import Existing projects into Workspace...*

## 1.2 Input

The parser is integrated in FrameSoC as a possible trace importer. It takes as input a directory path. That directory contains the binary files containing the event and the file describing the metadata. Since the browser in the Trace importer GUI in FrameSoC allows to only select files, the choice of the directory is done by selecting one or several files in the trace directory. The parser then automatically extracts the directory path from the selected file path.

## 2 Results

The parser was tested using the CTF traces provided by the LTTng team on their website [5].

An empirical validation was performed by comparing the Gantt chart from the LTTng Eclipse plugin and the FrameSoC Gantt chart, which shows that they were similar.

## References

- [1] LTTng Website. <https://lttng.org/>. Accessed: 2014-05-19.
- [2] CTF format guide. [http://wiki.eclipse.org/Linux\\_Tools\\_Project/TMF/CTF\\_guide](http://wiki.eclipse.org/Linux_Tools_Project/TMF/CTF_guide). Accessed: 2014-05-19.
- [3] LinuxTool in Eclipse. <http://www.eclipse.org/linuxtools/>. Accessed: 2014-05-19.
- [4] TMF User Guide. [http://wiki.eclipse.org/Linux\\_Tools\\_Project/TMF/User\\_Guide](http://wiki.eclipse.org/Linux_Tools_Project/TMF/User_Guide). Accessed: 2014-05-19.
- [5] Sample CTF Files. <https://lttng.org/files/samples/sample-ctf-trace-20120412.tar.bz2>. Accessed: 2014-05-19.