Trace visualization based on time aggregation

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SoC-Trace Operational Committee

Reminder : Task 4 objectives

Provide an execution trace visualization

- **Synthetic** representation using aggregation
- Show **causality**, topology
- Details on demand

Main issues

- Time and space dimension
- Efficient **aggregation**
- Which **information** to represent?
- Reasonable **performance**

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Our proposition : Ocelotl

Principle

- Trace is divided in **time slices**
- **Variable parameter** enables to aggregate **consecutive slices**
- **Aggregates** are related to phases, disruptions

Theoretical aspects

- Trace time-slicing (Schnorr)
- **Best-Cut partition** algorithm (Lamarche-Perrin)

Implementation

- C++ library (best partition algorithm)
- FrameSoC module/Java (GUI, database queries, time-slicing)

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Tracing video execution: summary

Context

- GStreamer application playing a video, traced with `GST_DEBUG`
- Perturbation by *stress* program
- Trace converted into Pajé trace format
- Pajé trace imported to FrameSoC Data-Model

Use Case	Behavior	Duration	Trace Size	E.P. Number	Event Number
0 (ref)	Normal	20s	159 MB	1500	944303
1	Light Perturbation (@ 15s)	21s	166 MB	1500	985003

Analysis with FrameSoC module

Publications

Visualization Technique Survey (January 2013)

- D. Dosimont, G. Huard et J.-M. Vincent - *La visualisation de traces, support à l'analyse, déverminage et optimisation d'applications de calcul haute performance* (VIF-EGC'2013)

FrameSoC + Visualization (September 2013)

- G. Pagano, D. Dosimont, G. Huard, V. Marangozova-Martin and J-M. Vincent - *Trace Management and Analysis Infrastructure for Embedded Systems* (MCSoC'13)

Summary

Objectives reached

- **Synthetic** visualization
- **Time** dimension management

What remains to do

- **Space** dimension management
- Link with **more detailed** representation (ex: Gantt)

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Future Works

New features

- **Gain/loss** curve
- Discontinue parts **similarity**
- **Hierarchical** aggregation
- Aggregation **metrics**
- **More information** with aggregates
- User **interaction**

Merci de votre attention!

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