Updates on HPC development

Arnaud Fiorini

Polytechnique Montréal
Laboratoire DORSAL

Introduction

- High Performance Computing (HPC) has specific constraints:
  - Dedicated hardware
  - Intense workloads
  - Scalability
  - ...

- These constraints ask for a dedicated set of tools to:
  - Debug
  - Instrument
  - Analyze
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Agenda

1. Development environment
   - ROCgdb
   - Theia and Trace Compass

2. Performance analysis
   - MPI and GPU tracing
   - New Performance counters
   - Software counters

Development environment – ROCgdb

- GDB adapted to GPUs

- End goal to provide same features as on CPU

- One major constraint is the number of Threads

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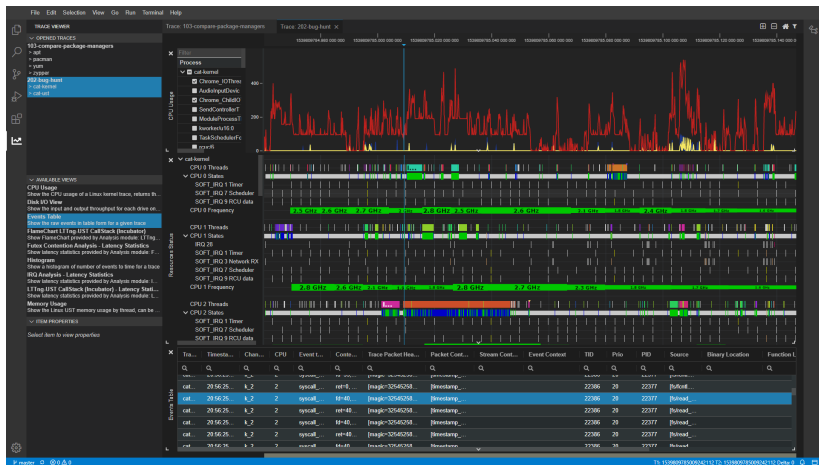
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Development environment – Theia and Trace Compass

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- Theia is a framework to build IDEs

- It is possible to build your own IDE to fit your constraints

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Demo

Performance analysis – MPI and GPU tracing

- The latest features of the ROCm plugin are available

- Score-p traces (MPI) can be converted to CTF

- GPU transfers with MPI are supported

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- AMD has made public new performance counters

- These counters allow for more in-depth analysis of GPU kernels

- Sébastien's work even provides more granularity

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References

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