PajeNG Multi-trace File Parallelization Strategy

Jonas H. M. Korndorfer, Lucas Mello Schnorr
Instituto de Informática
Universidade Federal do Rio Grande do Sul
jhmkorndorfer@inf.ufrgs.br, schnorr@inf.ufrgs.br

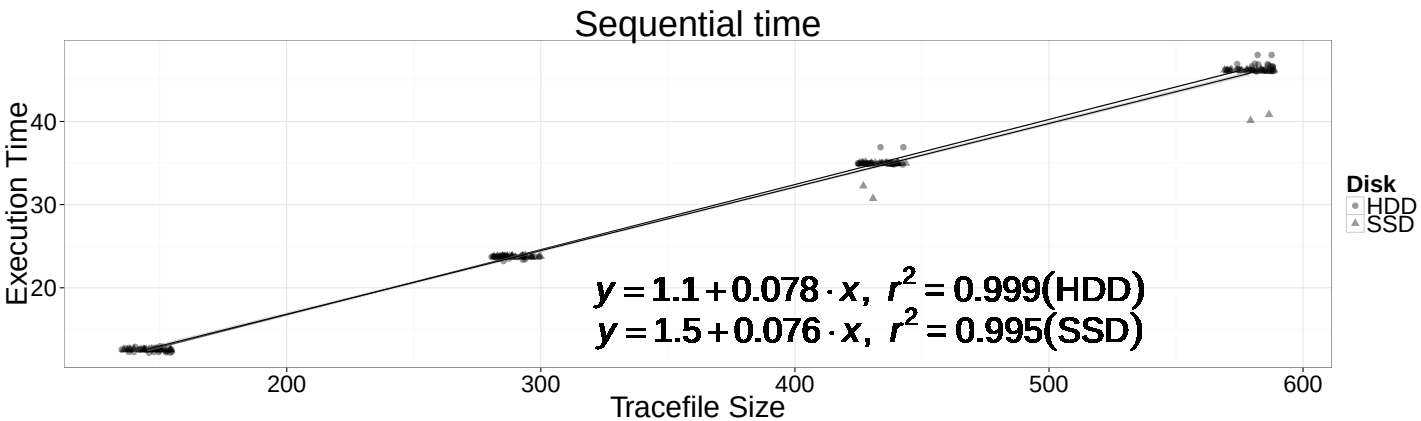
Outline

PajeNG Features

- PajeNG is a performance analysis tool
  - Simulates the behavior of parallel applications
  - Paje trace file format
    - Dynamism
    - Execution traces without semantics associated
    - Traces are divided in 5 generic types of objects: Containers, Events, States, Variables and Links

PajeNG Failures

- PajeNG works sequentially
  - Low performance for large trace files as shown the following plot
- Intel X7550 2GHz – RAM 128 GBytes



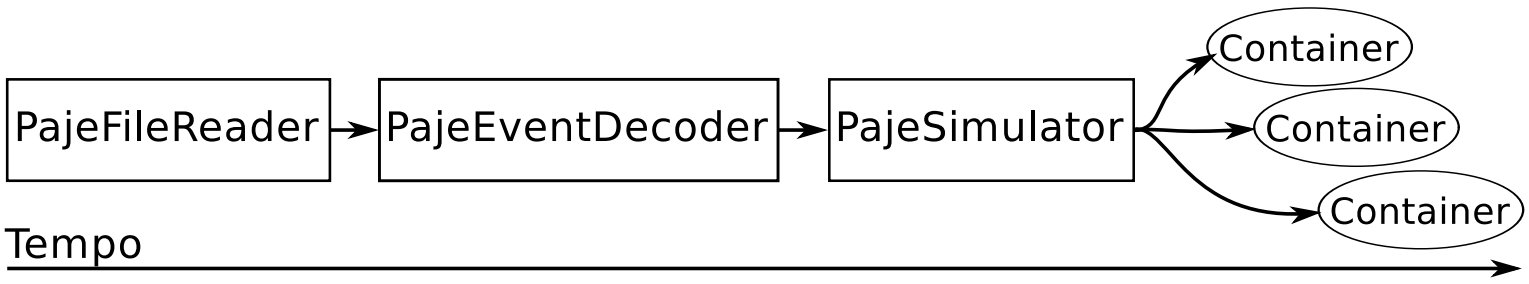
- How to optimize it?

Work Features

- This work presents the progress of the PajeNG parallelization project
  - Multi-trace file strategy

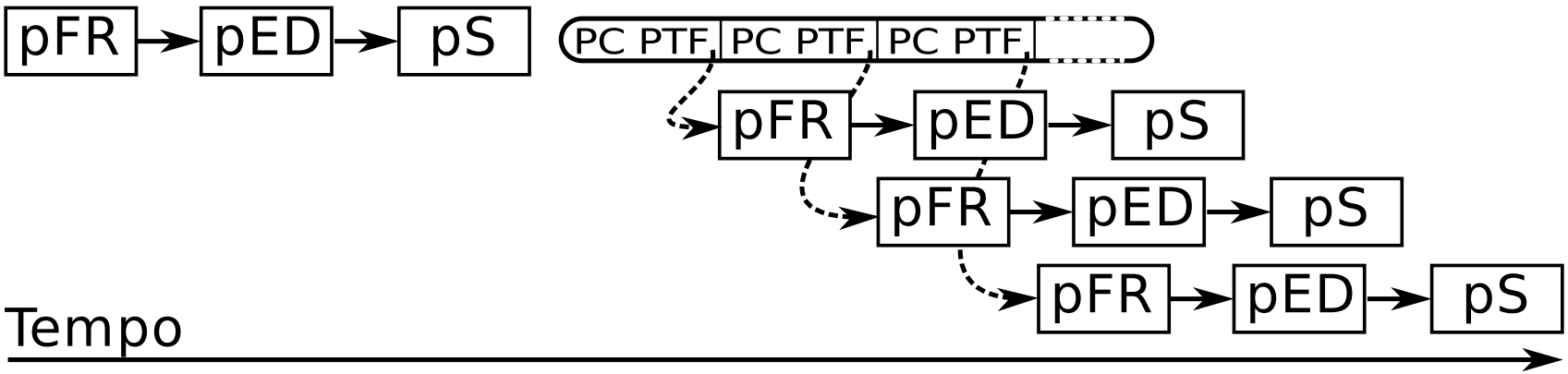
PajeNG Workflow

- The workflow of PajeNG can be basically divided in three steps
  - First, the PajeFileReader class
  - Second, the PajeEventDecoder class
  - Third, the PajeSimulator class



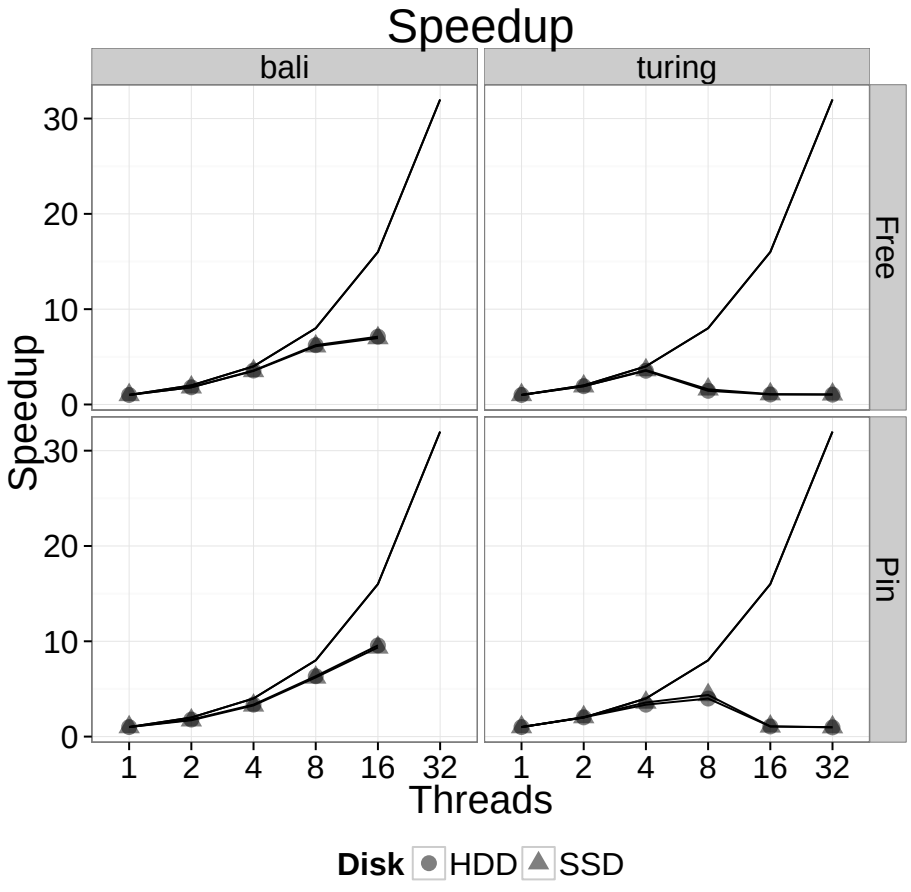
Multi-trace file Strategy

- Create a new event type and multiple execution flows
  - New event type - PajeTraceFile
    - Contains the location of another part of the trace file and its respective container



Speedup

Bali 1.2Ghz - 64GBytes RAM
Turing 2GHz - 128GBytes RAM



Conclusions

- The reading of the file limits the speedup
- The multi-trace file strategy allows several simultaneous execution flows to read and process the files in parallel
- The first results are very optimistic with linear scaling PajeNG up to four threads

Thank you

Questions?

Contact: jhmkorndorfer@inf.ufrgs.br / jonas.korndorfer@gmail.com

INSTITUTO DE INFORMÁTICA UFRGS