Computação de Alto Desempenho
(High Performance Computing)

HERVÉ PAULINO

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Course Presentation

Main Info

Lecturer

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Web page

- CLIP (http://clip.unl.pt)

Program

Motivation

Fundamentals
- Parallel Computers
- Parallel Performance
- Parallel Programming Models

Parallel Algorithms (and their implementation for GPUs)
- Parallel Algorithm Design Techniques
- Graphs
- Linear Algebra

Distributed Memory Computing
- Programming Distributed Architectures
- Algorithms
- Hybrid Parallelism: Distributed and Shared Memory
- High Peformance Data Analytics

Labs

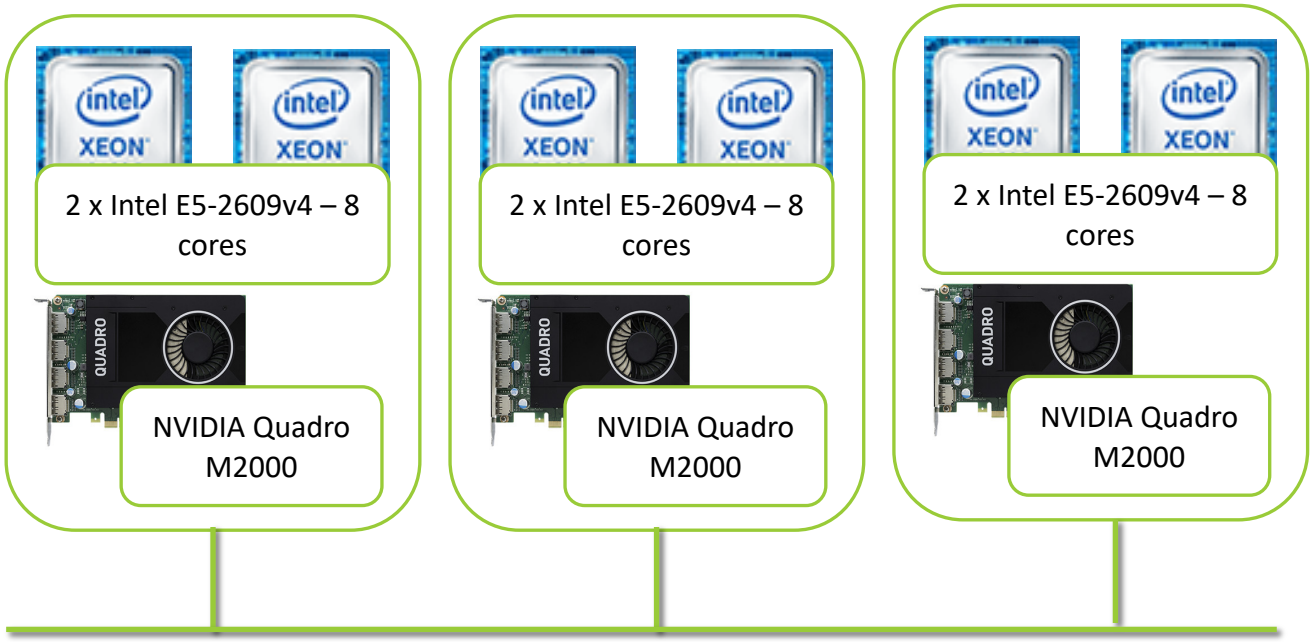
GPU programming

- CUDA (or OpenCL)

Distributed memory programming

- Apache Spark

Hardware



Bibliography

There is no textbook

The bibliography will be composed of:

- Chapters from different books:
  - Parallel Programming for Multicore and Cluster Systems (2nd edition), Thomas Rauber and Gudula Rünger. Springer, 2013
  - An Introduction to Parallel Programming, Peter Pacheco. Elsevier, 2011.
  - Introduction to Parallel Computing (2nd Edition) 2nd Edition, Ananth Grama, George Karypis, Vipin Kumar and Anshul Gupta. Pearson, 2003
- NVIDIA Documentation
- Reference papers in the area

Evaluation

Two components

- NT: two tests or final exam
  - Closed-book
  - NT = (Test1 + Test2) / 2 or NT = Final exam
- NP: Two laboratorial mini-projects in groups of 2
  - Frequency: NP >= 8
- Final Mark = NT < 8 ? NT : NT * 60% + NP * 40%

Evaluation Dates

1st test: April 29th (in lab class)

2nd test: June 11th

1st mini-project — GPU programming: due April 22nd

2nd mini-project — Cluster programming: due May 28th