Advanced Programming of Multicore Architectures

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Multicore architectures

Multicore architectures are today everywhere
- Large multicores in data centers (up to 64/128 cores)
- Small multicores in desktops or smartphones (up to 8/16 cores)

Goal of the course: understand how we can program at low level a modern multicore architecture

arya.int-evry.fr
4 sockets with 12 cores in each socket
=> 48 cores in total
Organization

6 weeks with
- 1h to 2h of theory
- 4h to 5h of practice during labs
- 1h in average of homework each week

One subject each week
- Threads and synchronization (mutex/varcond in course 1)
- Lock algorithms (course 2)
- Non-blocking algorithms (course 3)
- Transactional memory (course 4)
- Non-uniform memory architectures (course 5)
- Non-volatile memory (course 6)
Prerequisites

- Good programming skills in C
  - Pointers, memory management

- Some background in systems
  - Notion of process and inter-process communication