

Parallel and Distributed Algorithms and Programs

TP n°5 - Simulation & benchmarking using Simgrid (2)

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All documents are available on my website : <http://hadriencroubois.com/#Teaching>

Perfect scaling

First things first, we are going to evaluate the scaling of our algorithms.

Question

- How would you configure SimGrid in order to evaluate the theoretical scaling, free from any communication cost ?
- Evaluate the runtime of you algorithms for different problem size and different number of processes.
- Generate graphs which you result. Gnuplot is you friend.
- Comment those results.

Communication bottleneck

As you know, communication time can have a huge influence on the global efficiency of distributed algorithms. In this section we will try evaluate how communication reduces the performances.

Question

- What result do you get by running you protocol from the first section with limited bandwidth ?
- What result do you get by running you protocol from the first section with communication latency ?
- Comment on the limit of scalability.

Topology

While communication cost can be a limitation to any distributed algorithm efficiency, this is particularly true when considering specific network topology that would not match the structure of you algorithm.

Question

- Describe the minimal network topology needed for each of you algorithms to run efficiently.
- Evaluate the performance variation of one of you algorithms on different topology to demonstrate the influence of the network topology on the runtime.