

Minimum Spawning Tree

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DPHPC

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Problem definition



The MST problem



Concepts



(Somewhat) realistic use-cases and input sets?

- $G(n, p)$
- Preferential attachment
 - Social networks



Algorithms



Prim



Kruskal



Borůvka (Sollin)



A few ideas



Correctness

How to verify correctness of the parallelization?



Environment



Architecture



EULER Cluster

Xeon Ex, $x \in \{3, 5, 7\}$
x86_64 architecture

Source : <https://scicomp.ethz.ch/wiki/Euler>



Tools



- CMake
v3.3+
- C++11
GCC v4.9.2+
- OpenMPI (shared memory)
v1.6.5+



Benchmarking



Tools

- Measures : LibSciBench library
- Interpretation :
 - LibSciBench's R scripts
 - (Custom python scripts)

Ref : <https://spcl.inf.ethz.ch/Research/Performance/LibLSB/>

Baseline



https://en.wikipedia.org/wiki/Otakar_Bor%C5%AFvka

Borůvka's serial algorithm
 $O(E \cdot \log(V))$

