CERN Openlab

Platform CC
Minor review

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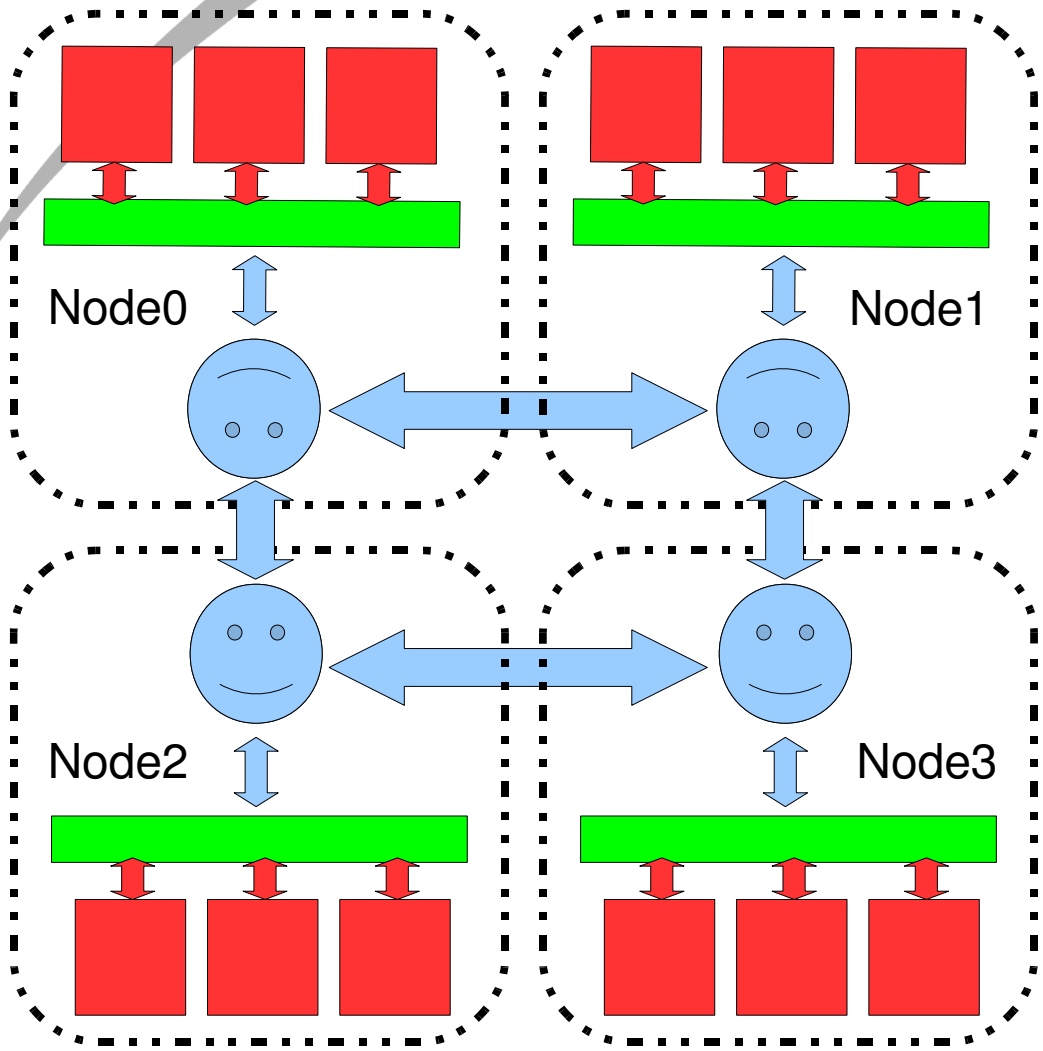
NUMA architecture

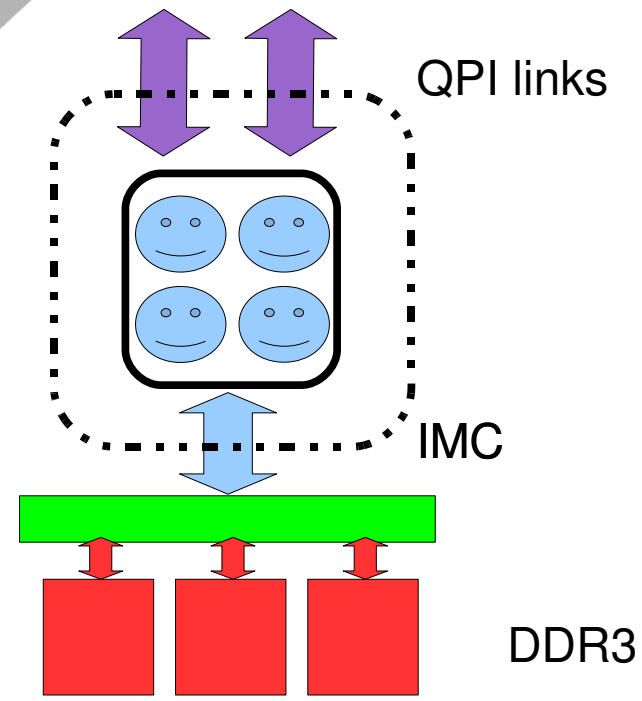


NUMA architecture divides in multiple nodes with access to local and remote memory, at a cost for remote memory.

Why NUMA now?

- Increasing performance now means more and more cores
- Both CPUs and memory don't see a boost in frequency anymore
- NUMA nicely solves these issues, offering a scalable design for future many-cores systems

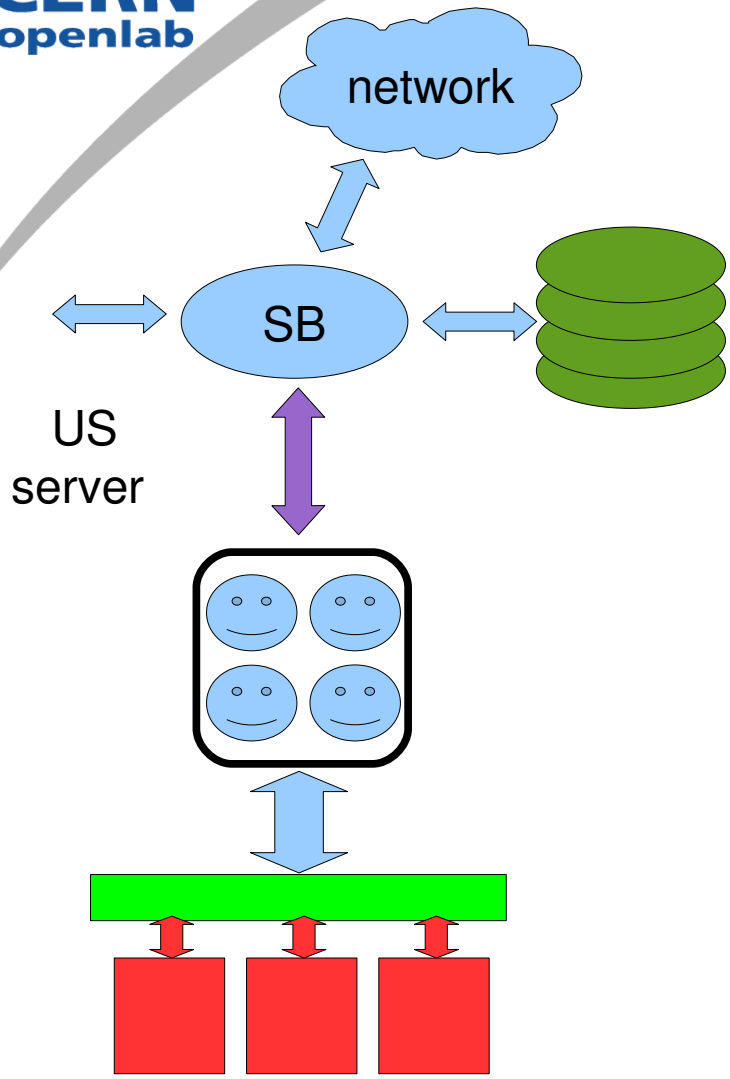
Nehalem microarchitecture

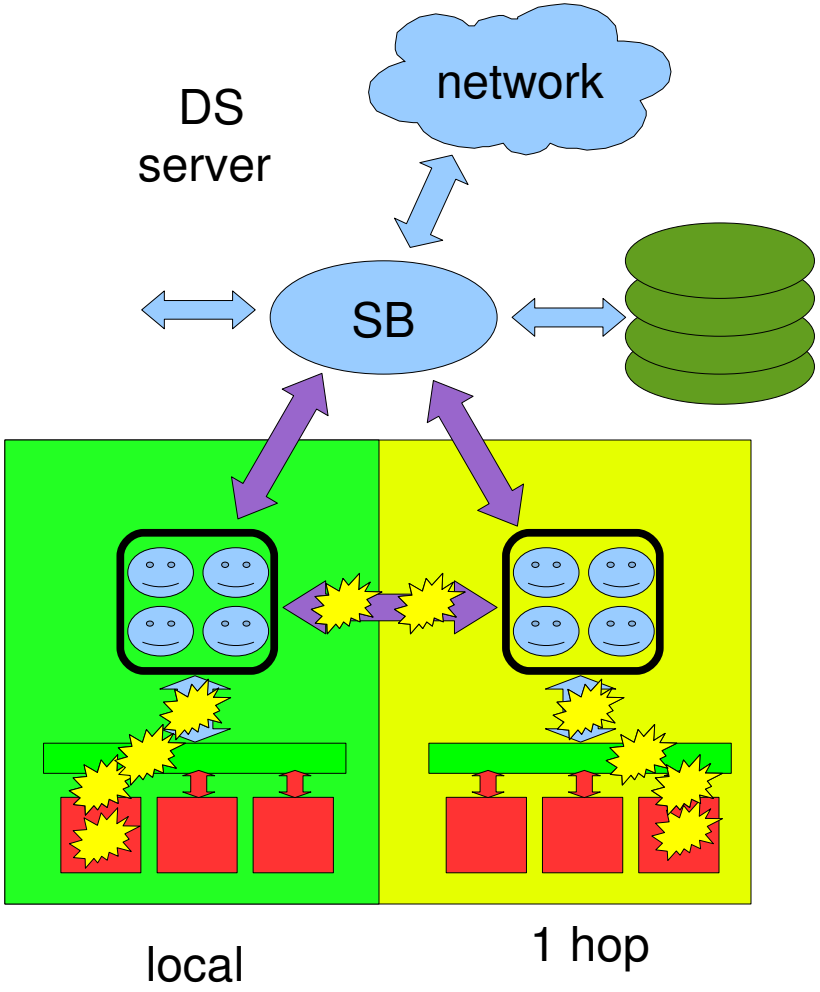


Dual Socket capable NHM

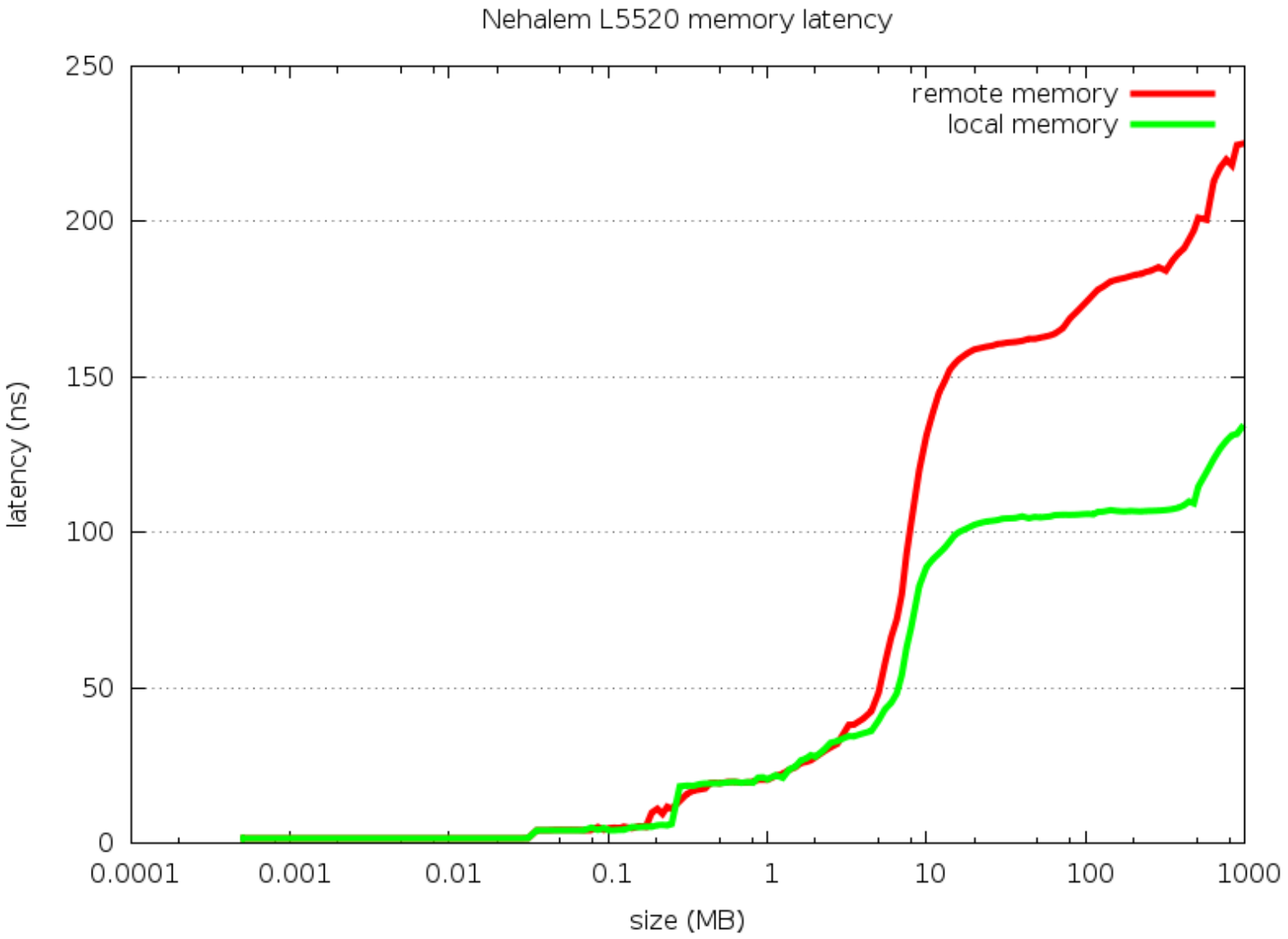
- Nehalem microarchitecture is equipped with an Integrated Memory Controller, and some QuickPath Interconnect links (1 for workstations, 2 for DS servers, 4 for MS servers)
- Microarchitecture allows scalable design for servers

Nehalem microarchitecture
Single and Dual Sockets designs





Memory latency measurements



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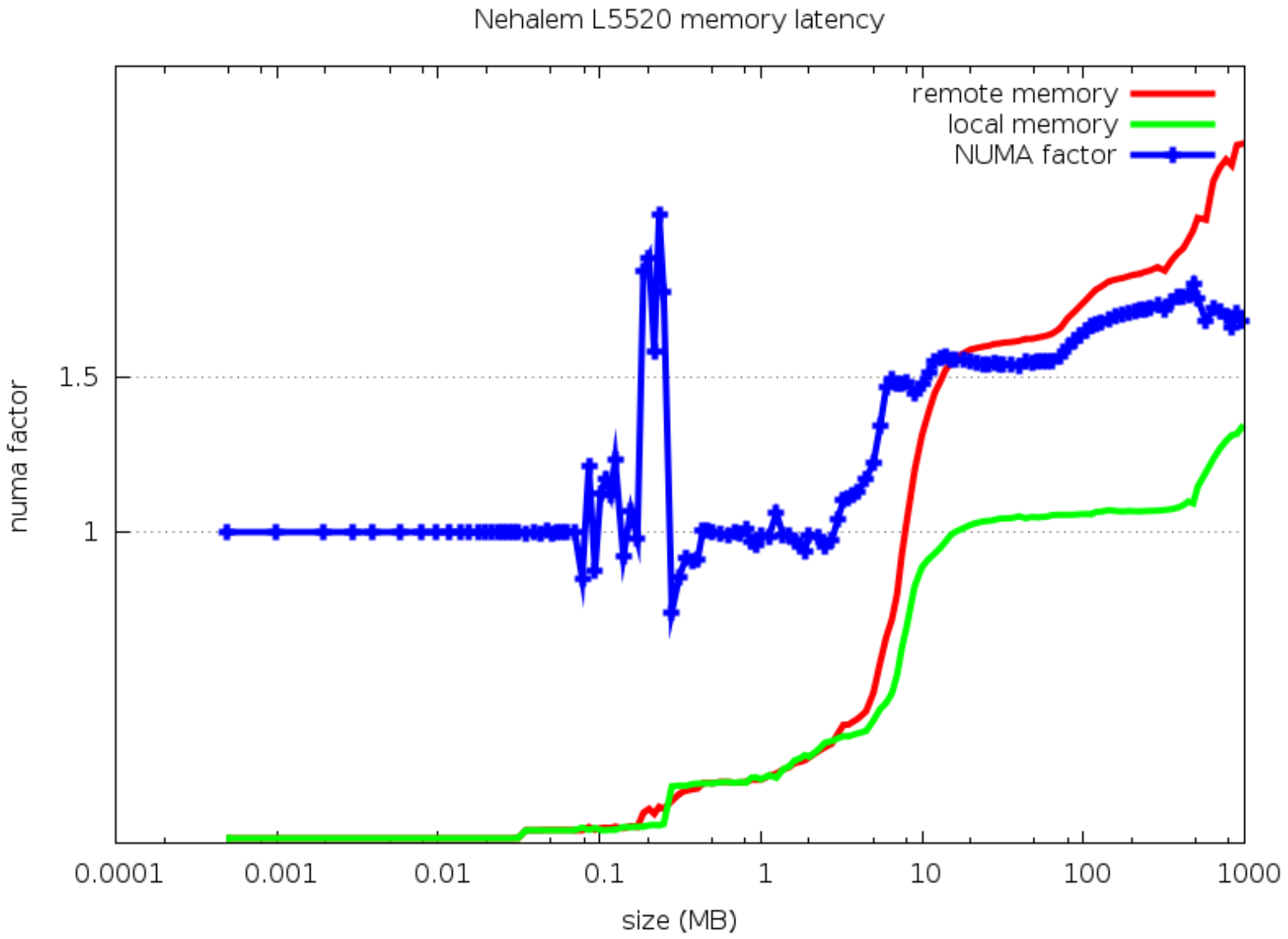
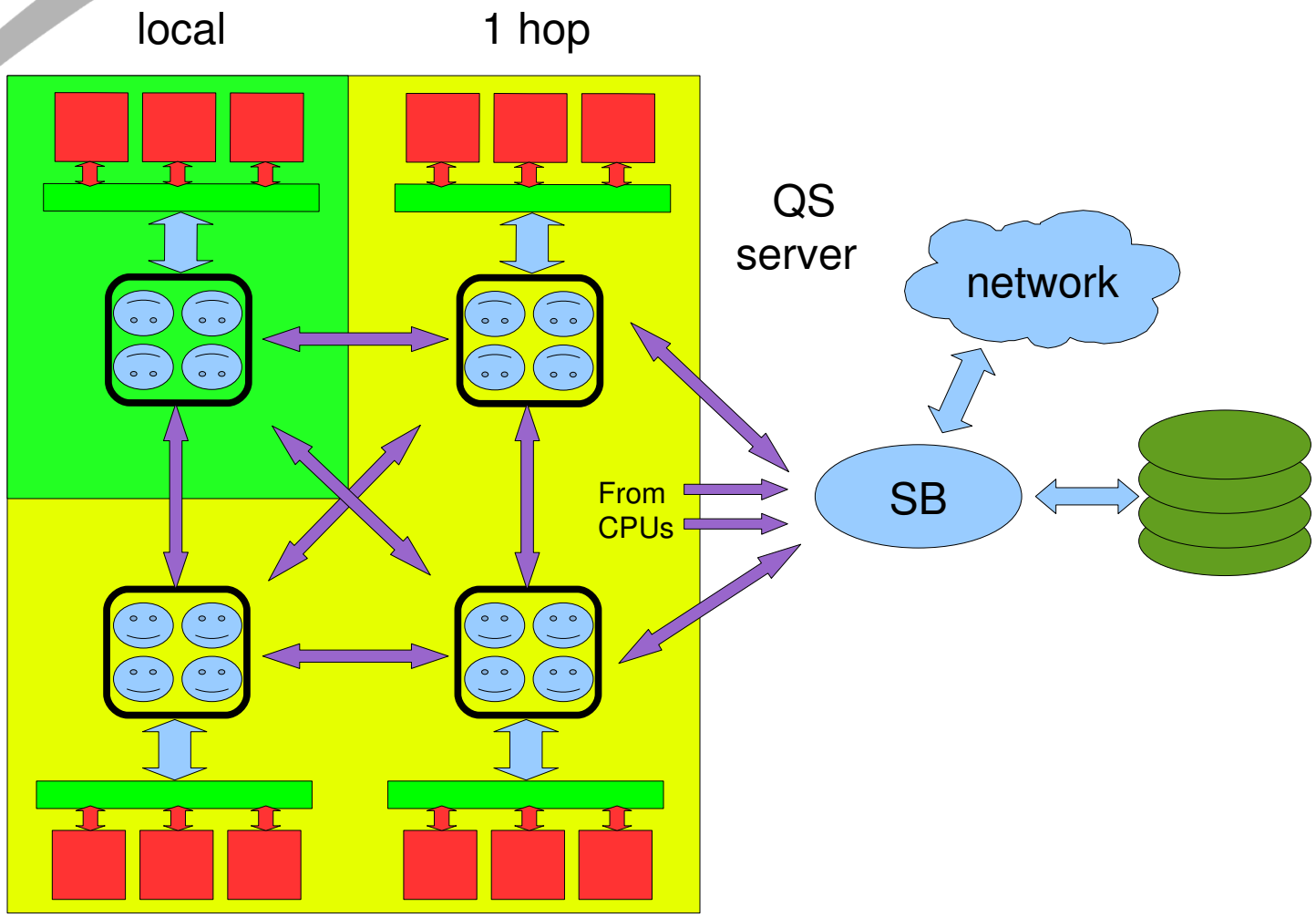


Nehalem microarchitecture
Quad Sockets design



CFD benchmarks

- Computational Fluid Dynamics benchmarks using StarCCM software on Nehalem EX
- Physical problem was a helium leak inside an underground tunnel
  - Compare performances between
    - Corei7 (SP NHM system)
    - NHM-EP (DP system)
    - NHM-EX (QP system)
  - Preliminary results have just been produced and need some investigations

Questions?