

SGI OpenFOAM Cloud Benchmark

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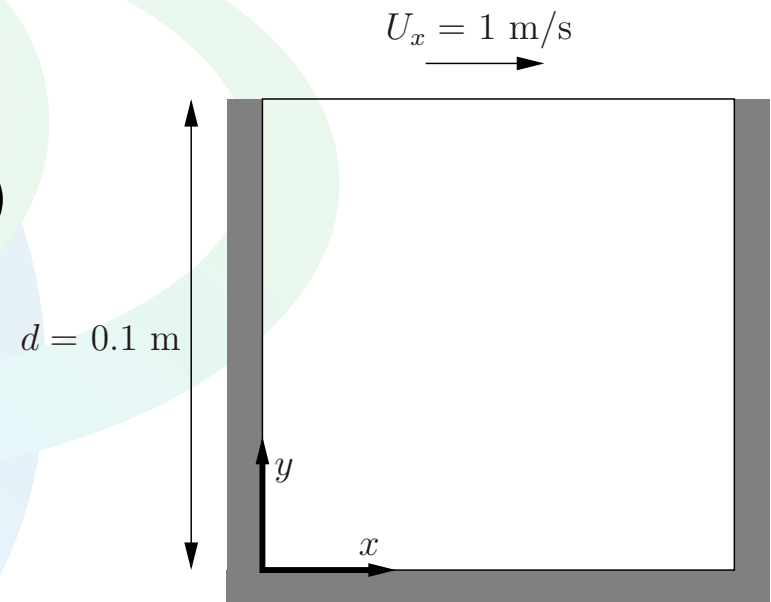
Test cluster conditions

- **Hardware:** SGI Altix ICE8200
- **CPU:** Intel Xeon X5365 3.00GHz 4cores x 2
- **Node:** 16 nodes
- **Memory:** 16GB/node (No swap memory)
- **Interconnect:** InfiniBand DDR
- **OS:** SUSE LINUX ENTERPRISE SERVER 10.3
- **MPI:**
 - ✓ SGI MPT (1.2.6)
 - ✓ OpenMPI
(ThirdParty package distributed with OpenFOAM)



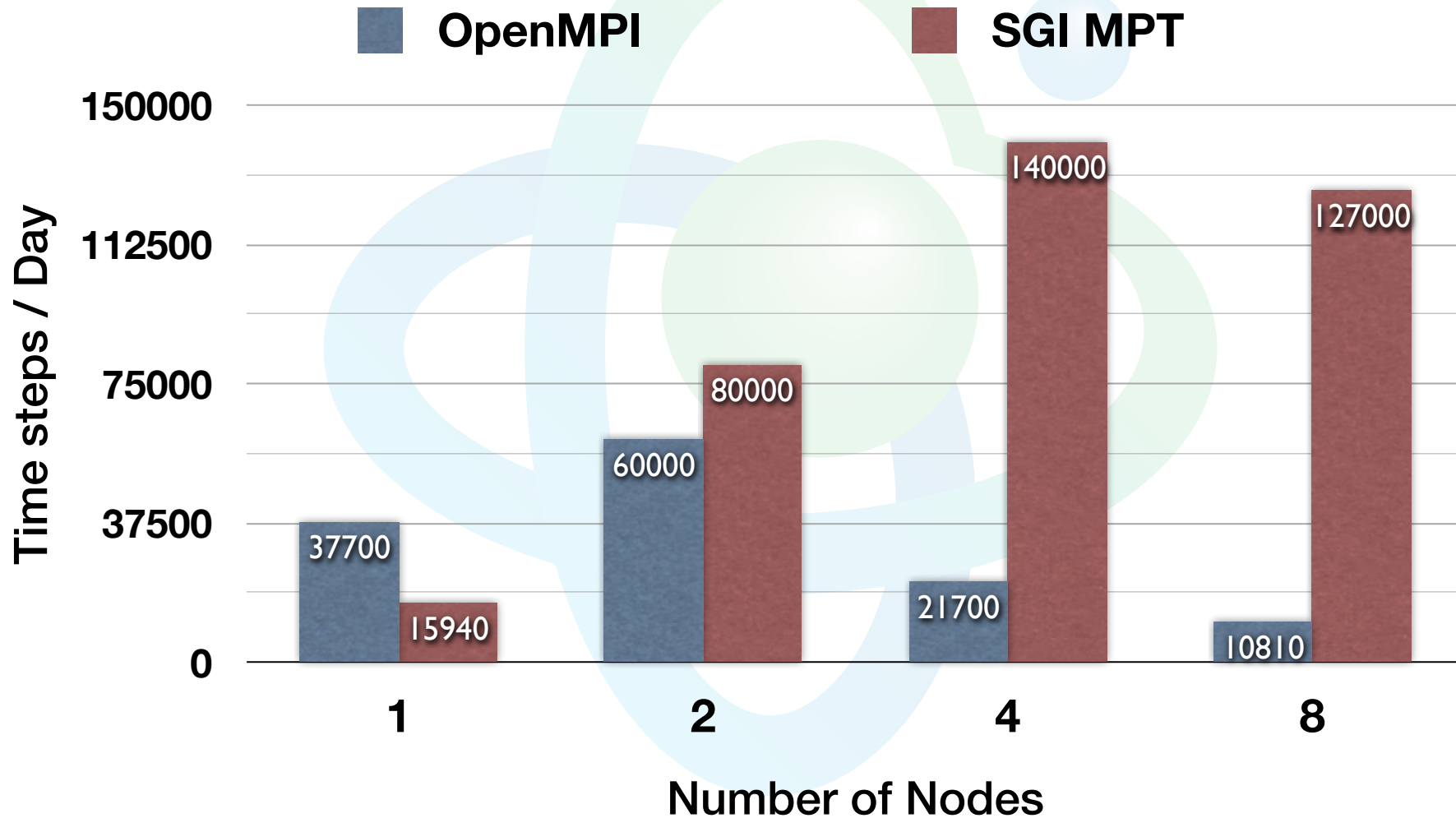
Calculation conditions

- **OpenFOAM versions:** 2.1.x
- **MPI:**
 - ✓ OpenMPI (Ver. 1.5.3, mpirun options: --mca btl openib,self,sm)
 - ✓ SGI MPT (Ver.1.2.6)
- **Benchmark problem**
 - ✓ **Flow:** Lid-driven 2D cavity (tutorials)
 - ✓ **Re:** 100 (laminar)
 - ✓ **solver:** icoFoam (piso)
 - ✓ **Linear solver:** AMG (p), PBiCG (U)
 - ✓ **Mesh:**
S(500², Δt :5x10⁻⁵ s), **M**(1000², Δt :10⁻⁵ s), **L**(2000², Δt :10⁻⁵ s)



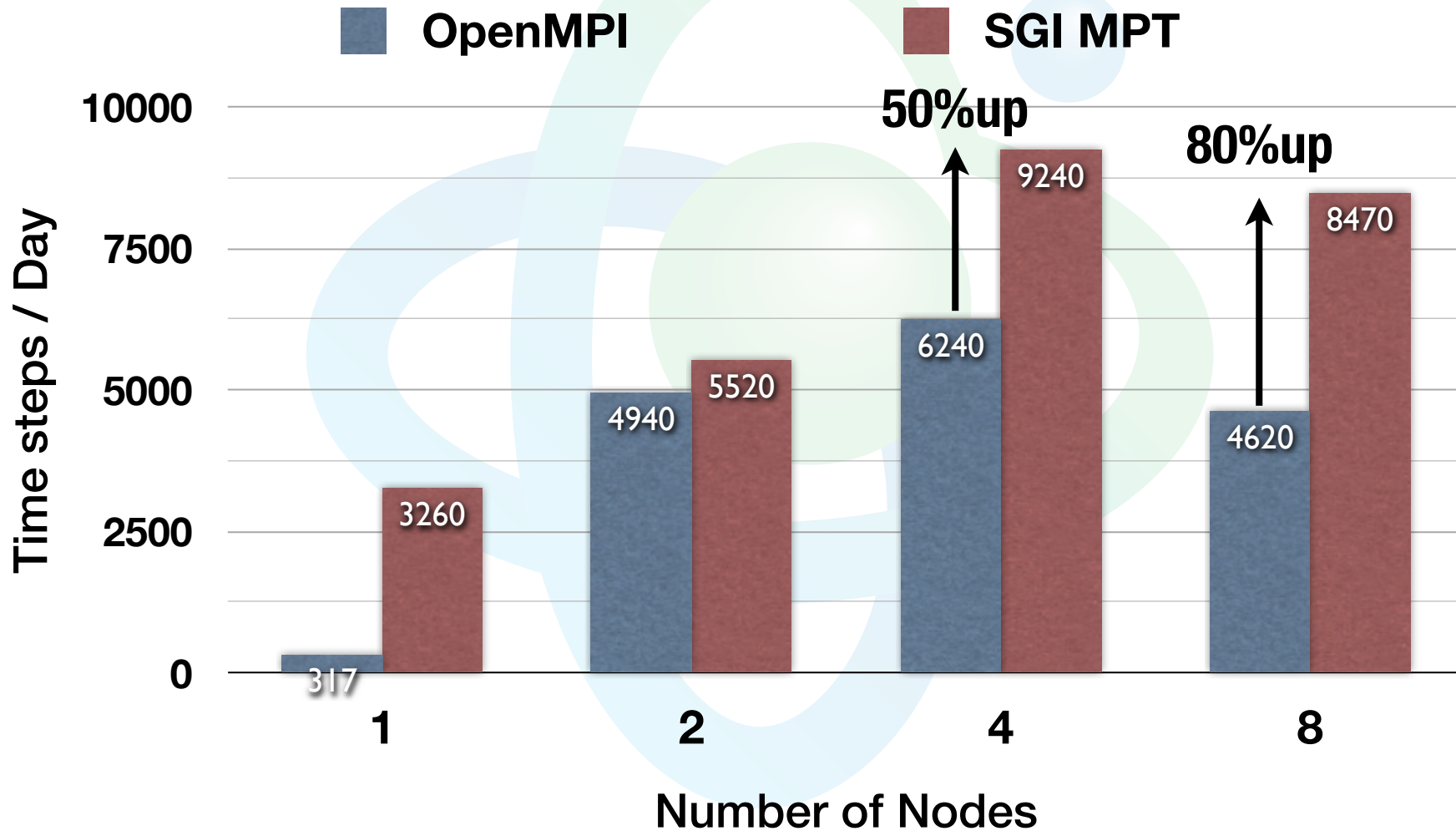
Benchmark results

Mesh: S ($500^2 = 1/4$ Millions)



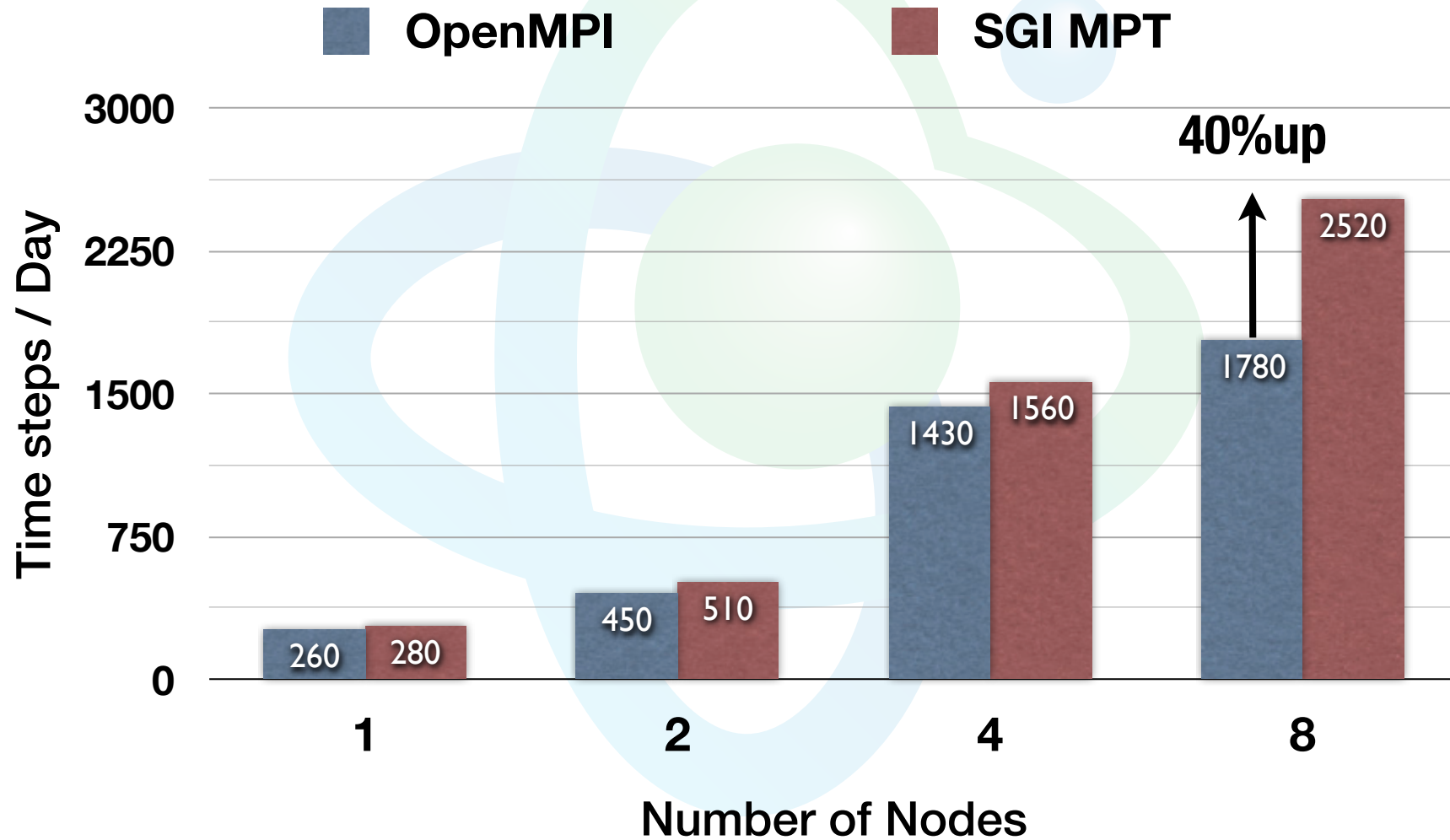
Benchmark results

Mesh: M ($1000^2 = 1$ Million)



Benchmark results

Mesh: L ($2000^2 = 4$ Millions)





Any Questions?