SGI OpenFOAM Cloud Benchmark Part 2

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Test cluster conditions

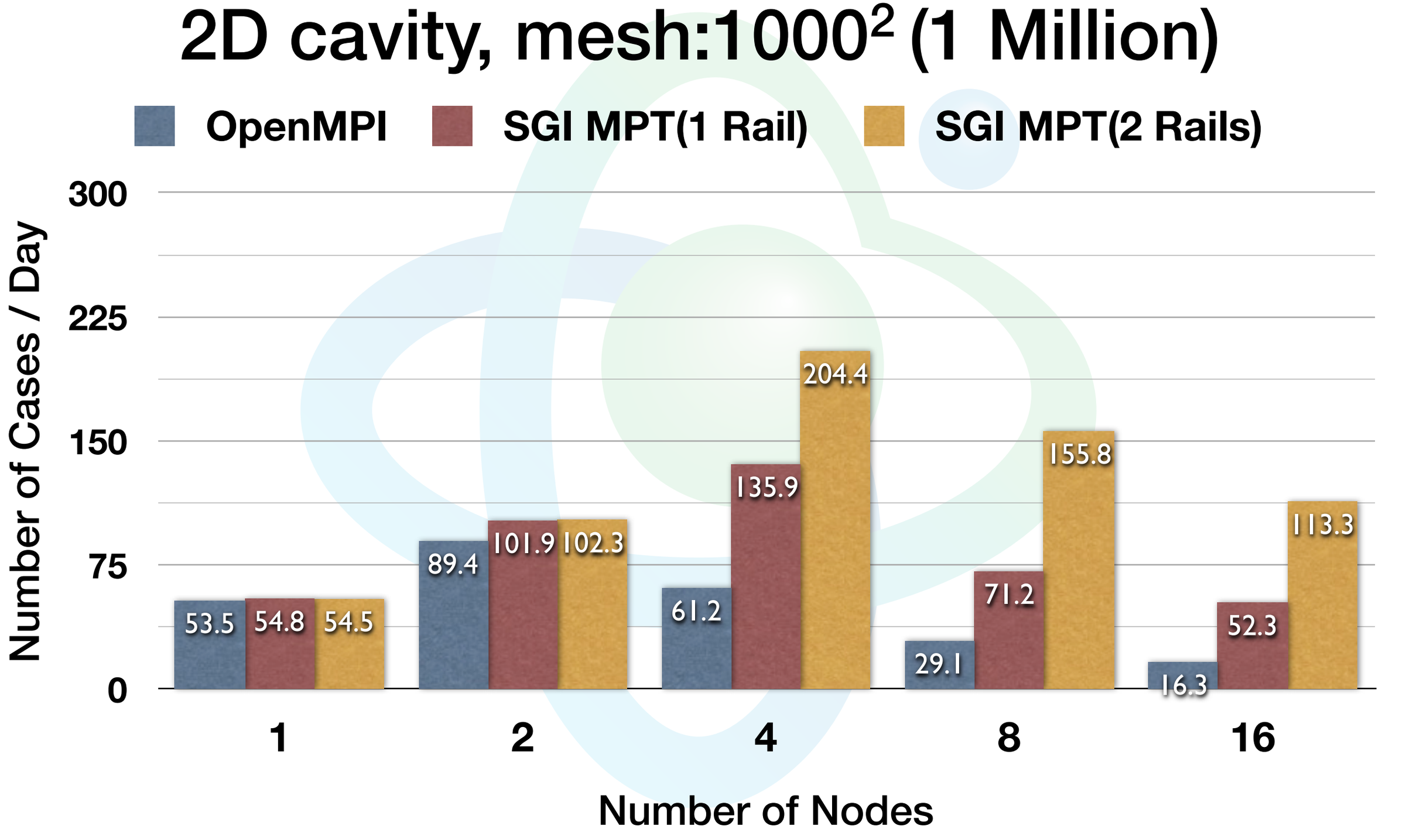
- **Hardware:** SGI Altix ICE8200
- **CPU:** Intel Xeon X5365 3.00GHz 4cores x 2
- **Node:** 16 nodes
- **Memory:** 16GB/node (No swap memory)
- **Interconnect:** InfiniBand DDR
- **OS:** SUSE LINUX ENTERPRISE SERVER 10.3
- **MPI:**
  - ✓ SGI MPT (1.2.6)
  - ✓ OpenMPI

  (ThirdParty package distributed with OpenFOAM)

Calculation conditions

- **OpenFOAM versions:** 2.1.x
- **MPI (interconnect: InfiniBand):**
  - ✓ OpenMPI (Ver. 1.5.3), mpirun options: --mca btl openib,self,sm
  - ✓ SGI MPT (Ver.1.2.6)
    - Number of InfiniBand rails(MPI_IB_RAILS): **1, 2**
- **Benchmark problem**
  - ✓ **Flow:** Lid-driven 2D cavity(tutorials), 3D cavity
  - ✓ **Re:** 100 (laminar)
  - ✓ **solver:** icoFoam (piso)
  - ✓ **Linear solver:** p(AMG), U(PBiCG)
  - ✓ **Mesh:**
    - 2D ($\Delta t=10^{-6}$ s, 100 steps): **1000^2, 2000^2, 4000^2**
    - 3D ($\Delta t=10^{-5}$ s, 50 steps): **100^3, 200^3**

Benchmark results



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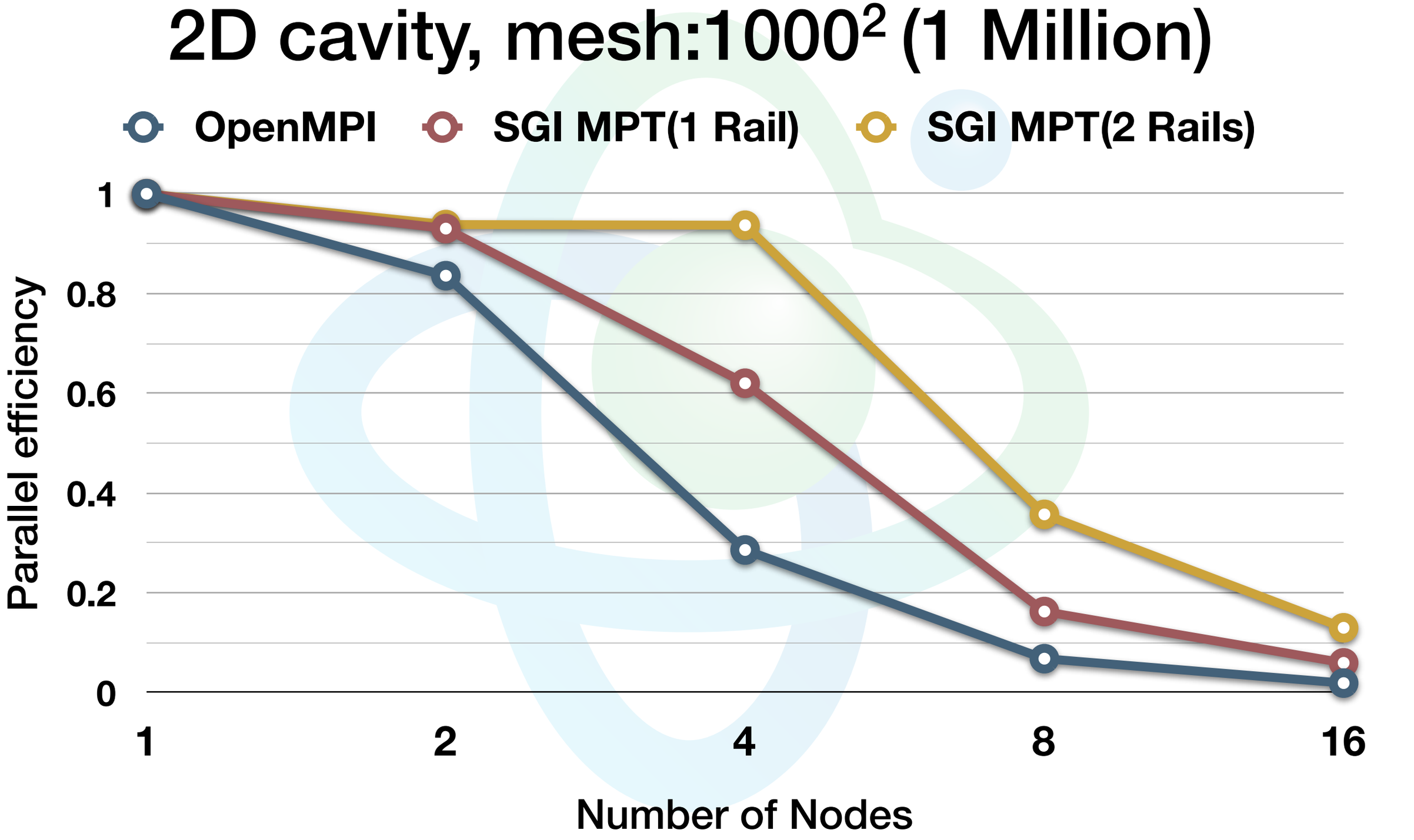

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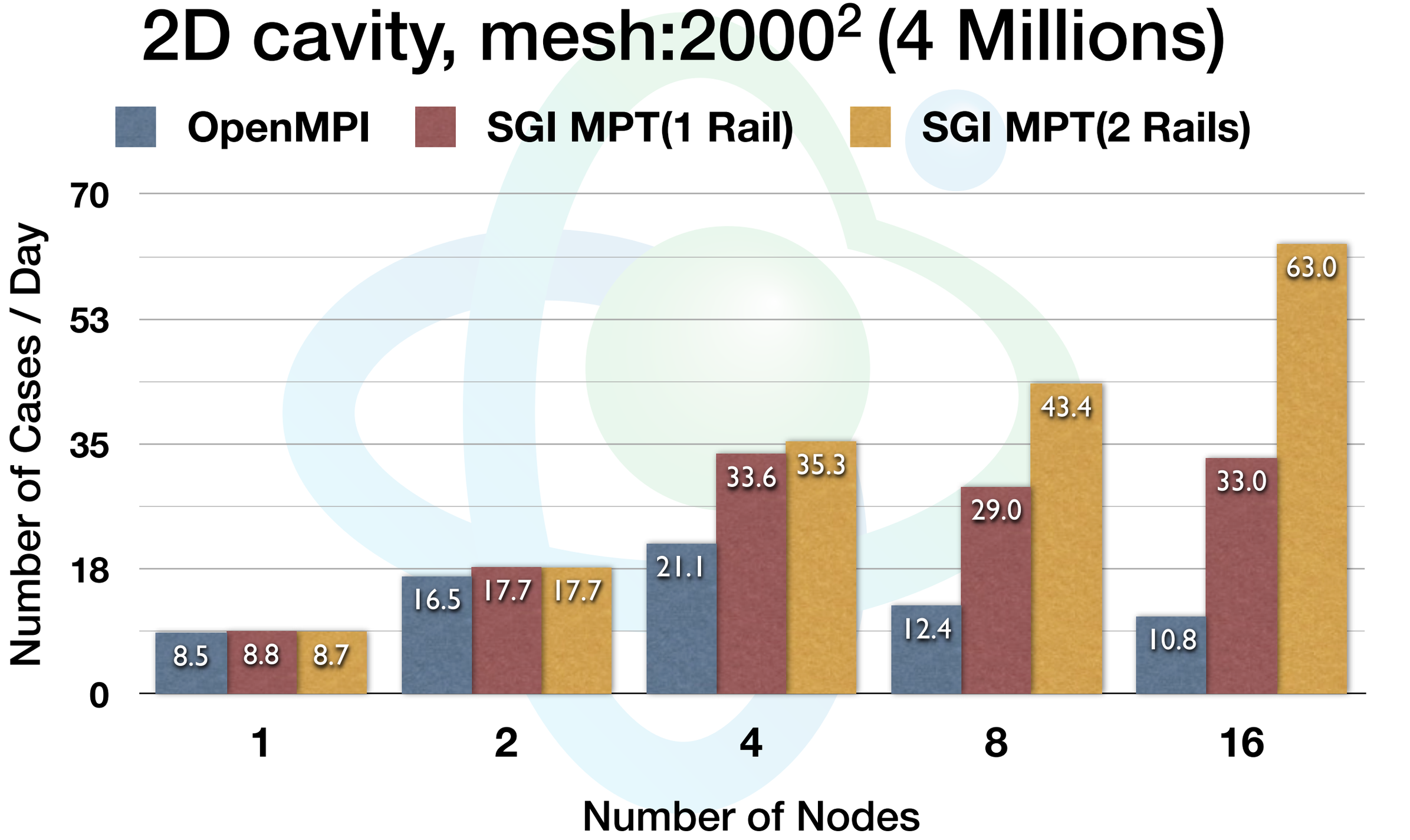

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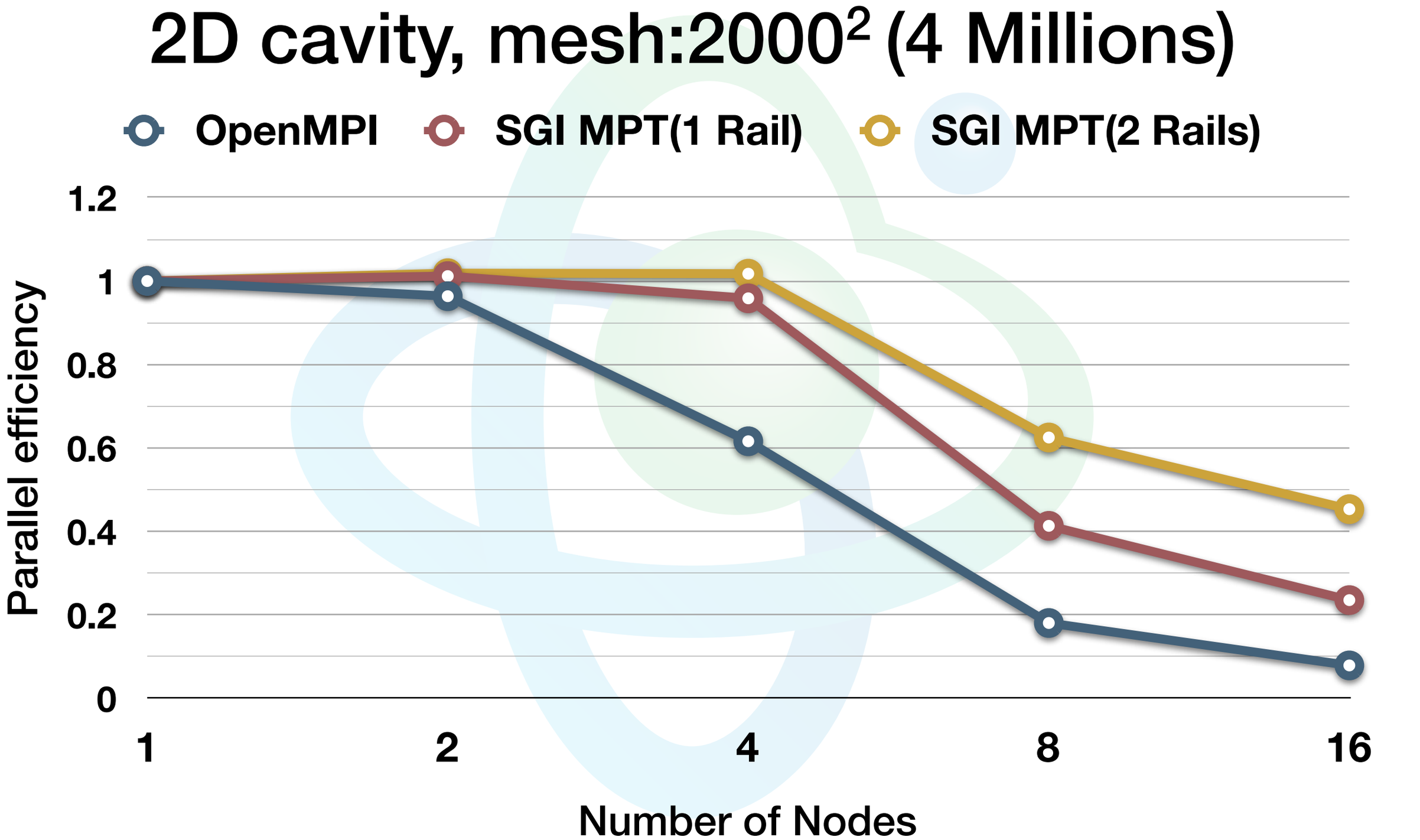

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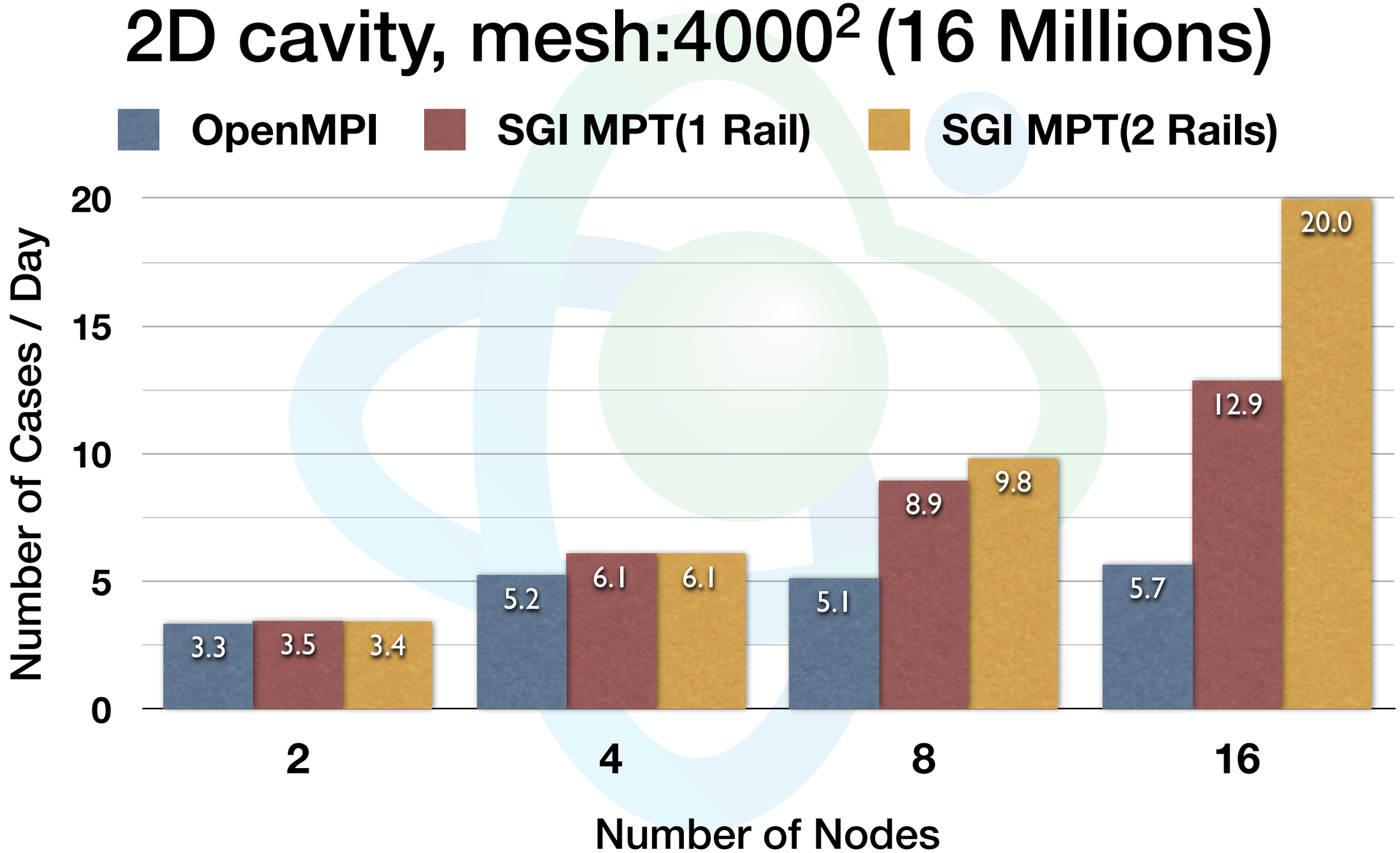

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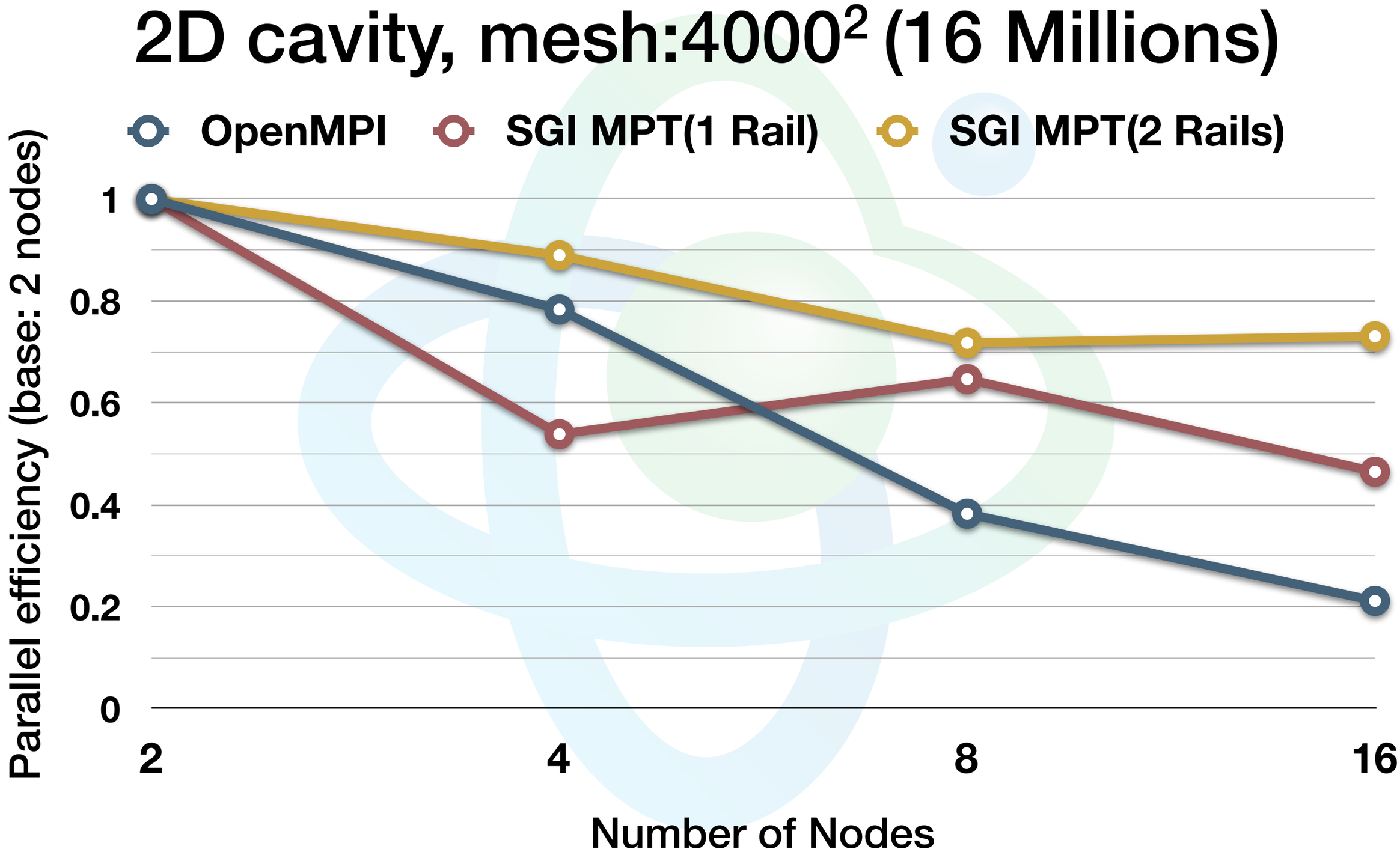

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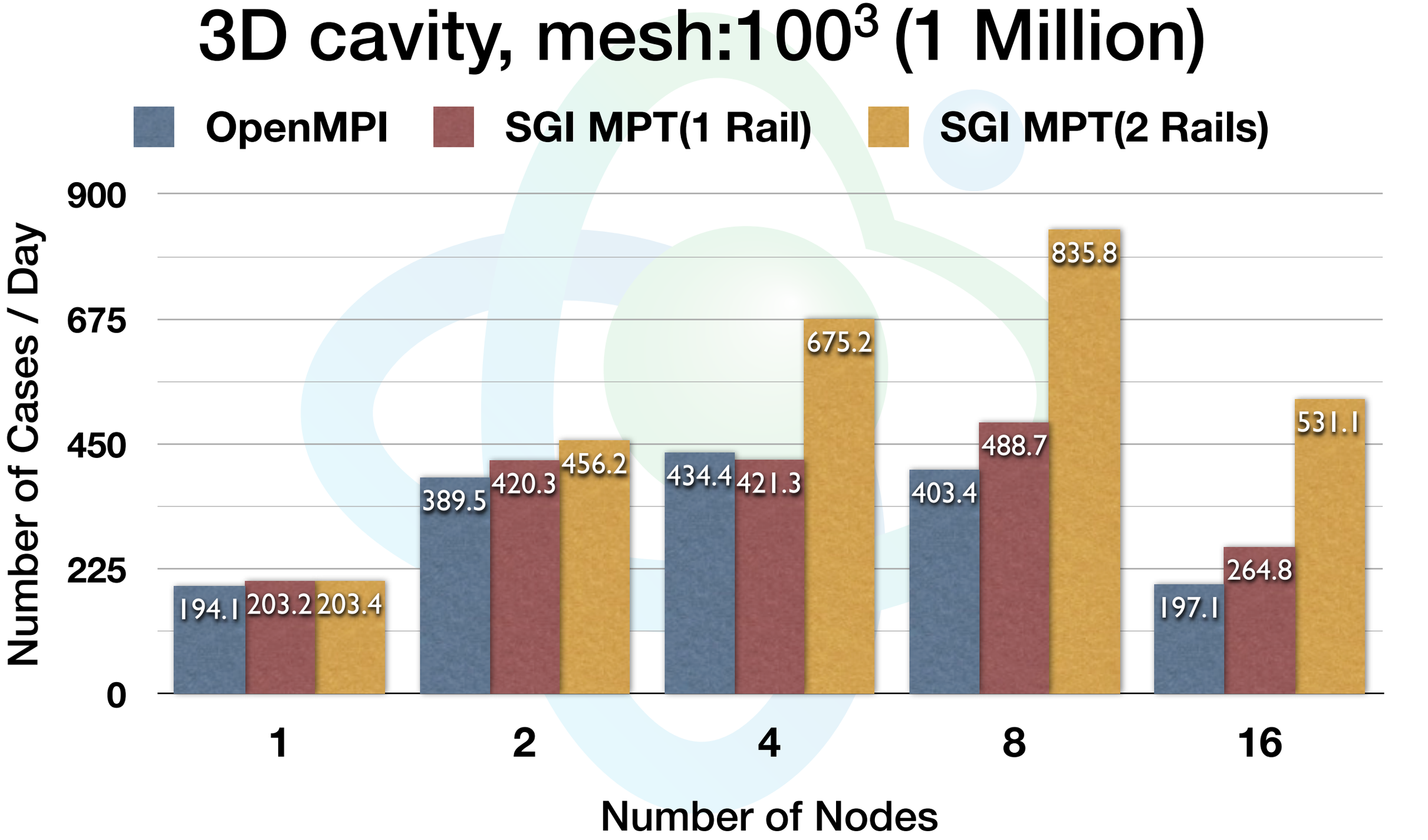

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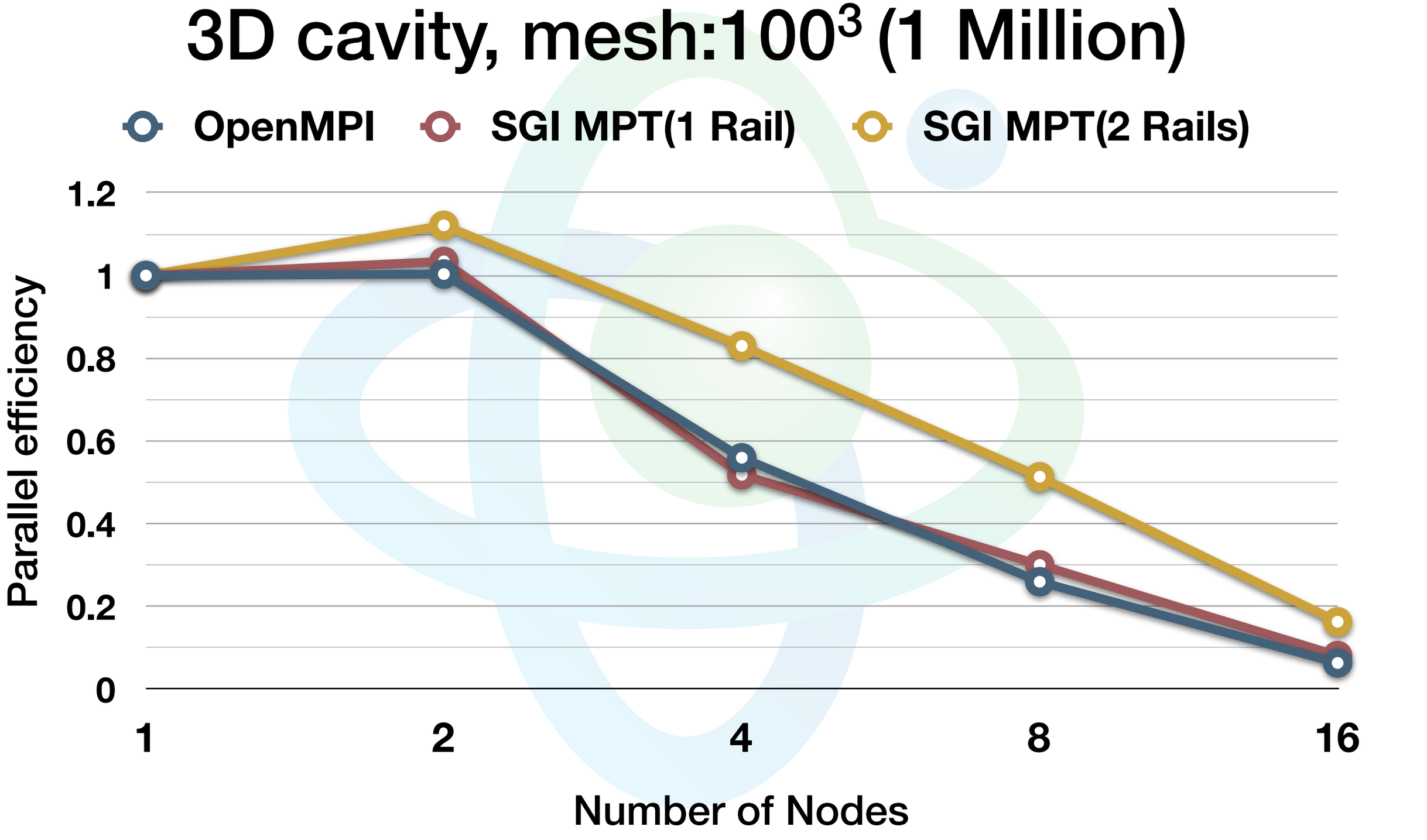

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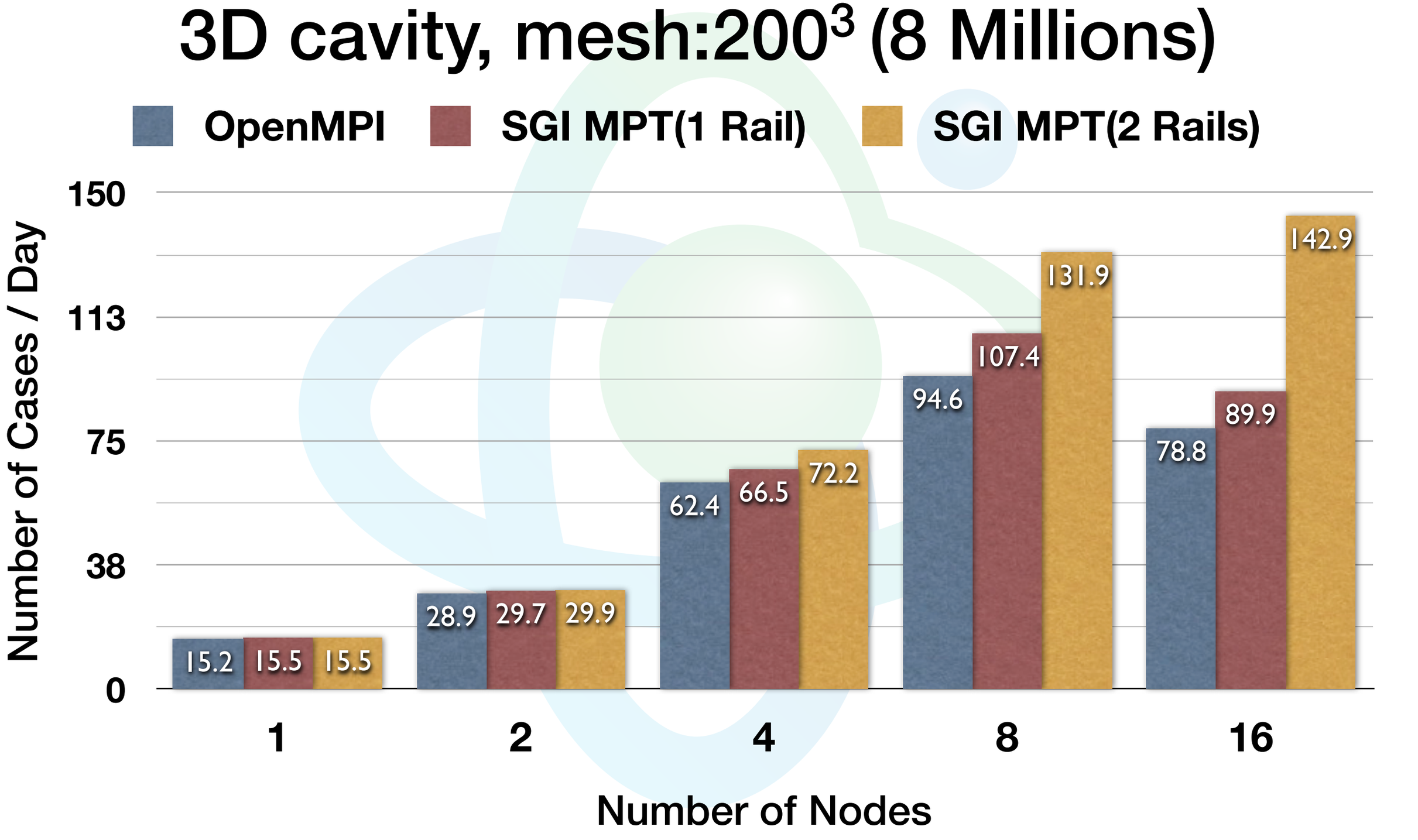

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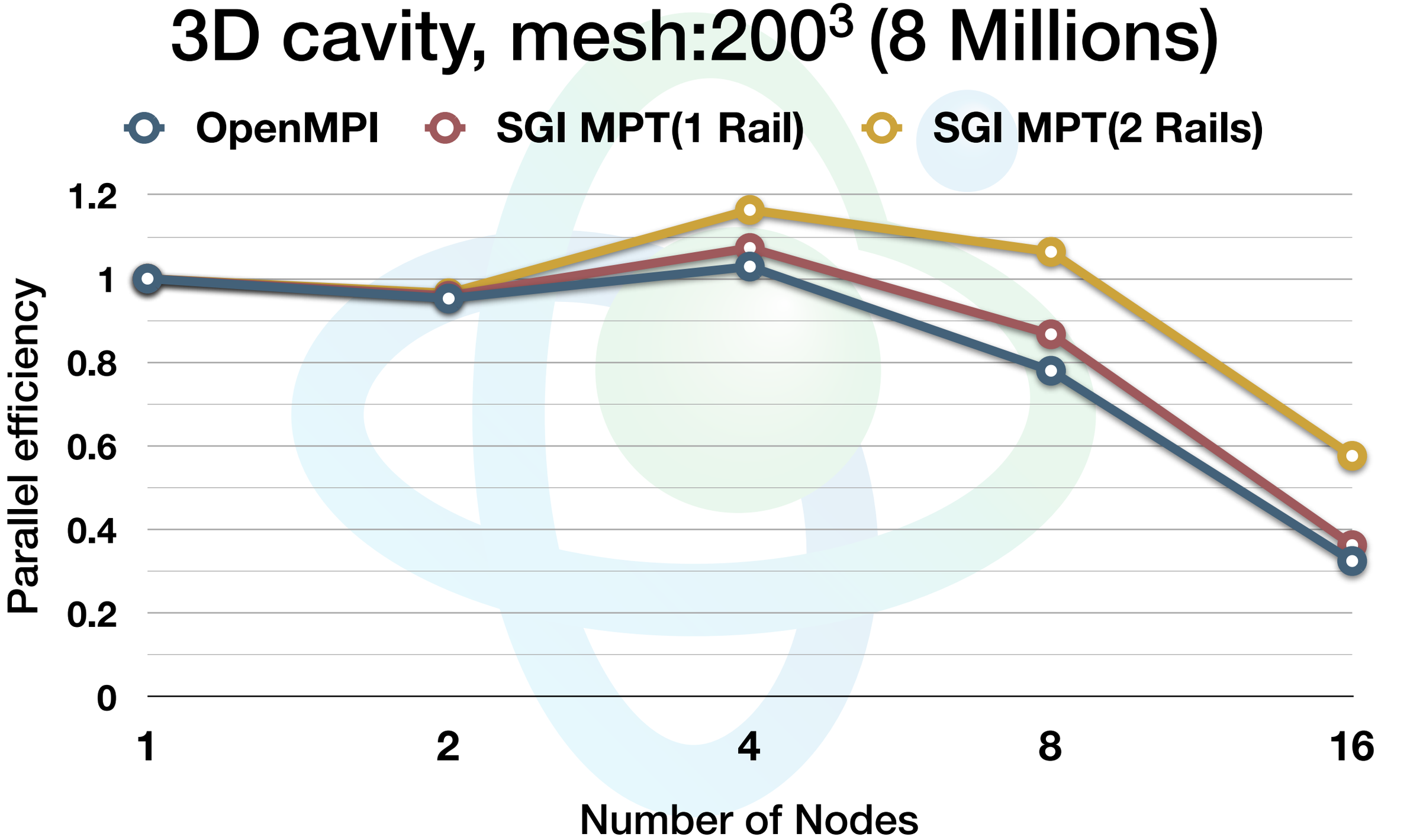

Any Questions?