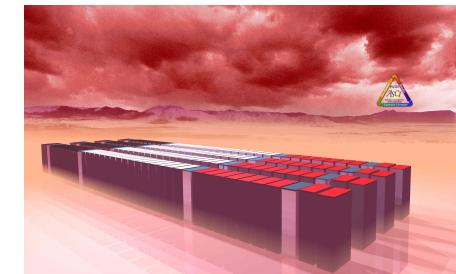




CEA/SNL Benchmarking

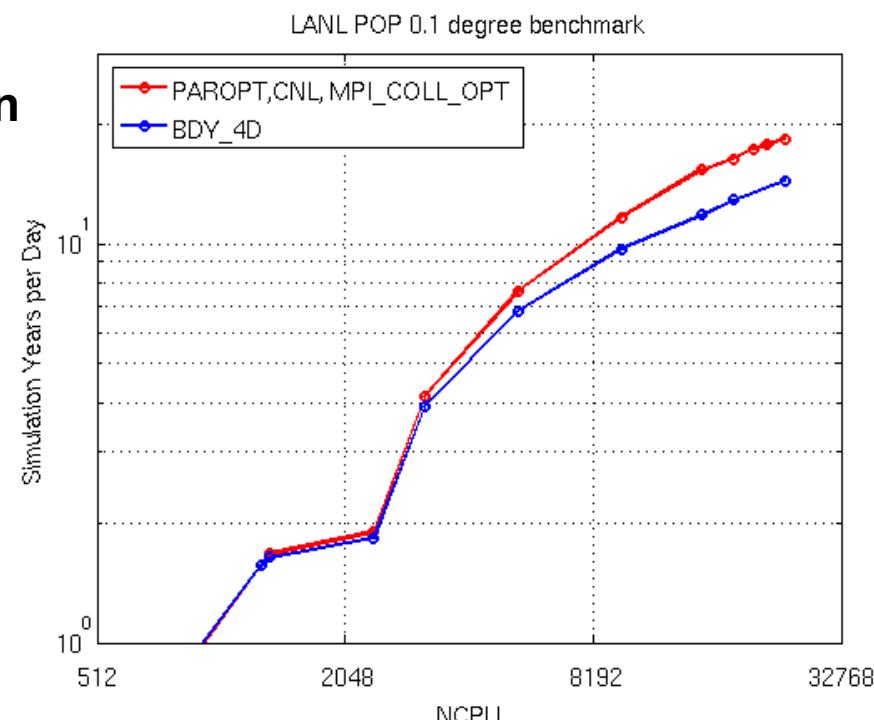
Joint comparison of CEA and SNL computers suggested at meeting between Tom Hunter and Daniel Verwaerde.

- Direct comparison using real applications
- Each lab selected two codes:
 - Characteristic of typical workloads
 - Pre-defined test cases
 - Easy to export to CEA and SNL
 - Easy to install and run
- Sandia:
 - POP: open source, performance footprint similar to CTH
 - MPSalsa: Allows testing of iterative solves used by many SNL applications. Exportable to CEA with license.
- CEA
 - ABINIT: open source. Mostly all-to-all communication
 - STAMP: open source. Developed and used extensively at CEA.
- Micro-benchmarks: CEA's TERA-TF



CEA/SNL Benchmarking

- **Progress to date:**
 - Completed paperwork (SNL side) for Government Use Notification (GUN) license to export MPSalsa to CEA
 - Completed POP benchmarks on Redstorm (on up to 24,000 cores)
 - Ported TERA-TF to Redstorm (will run at the next “jumbo” opportunity)
- **Contacts:**
 - SNL: Mark Taylor
mataylo@sandia.gov
 - CEA: Bertran Meltz
bertrand.meltz@cea.fr



CEA/SNL Benchmarking

- We looked at dozens of Sandia codes
 - Most would be difficult to export.
 - Sierra based codes: potentially too much work required to port Sierra to CEA.
 - Final selection: **POP** and **MPSalsa**
- **MPSalsa**
 - Can be licensed to CEA under existing Government Use Agreement (GUN)
 - Benchmarks will show performance of several iterative solvers (used by many other SNL codes) in a real application
- **POP: LANL's Parallel Ocean Program**
 - Similar “footprint” as Sandia's extensively used CTH code: Nearest neighbor communication with a few hundred small global sums per timestep
 - Short synchronization time stresses parallel interconnect

