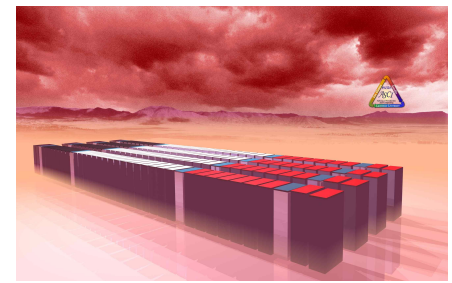


# CEA/SNL Benchmarking

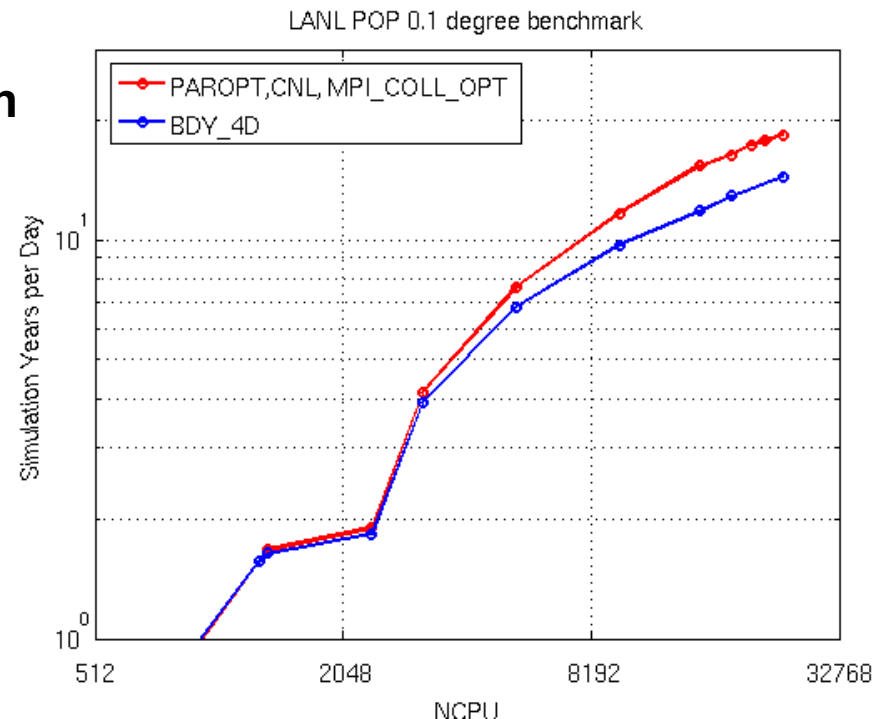
Joint comparison of CEA and SNL computers suggested at meeting between Tom Hunter and Daniel Verwaerde.

- **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:**
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  - CEA: Bertran Meltz  
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Performance of POP on



Sandia  
National  
Laboratories

# 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

