Clusters to Supercomputers

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Outline

- Motivation
  - My other computer is a …
- Parallel Computing
  - Processors
  - Networks
  - Storage
  - Software
- Grid Computing
  - Software
  - Platforms

James Demmel's Reasons for HPC

- Traditional scientific and engineering paradigm
  - Do theory or paper design
  - Perform experiments or build system

- Replacing both by numerical experiments
  - Real phenomena are too complicated to model by hand
  - Real experiments are:
    - **too hard**, e.g., build large wind tunnels
    - **too expensive**, e.g., build a throw-away passenger jet
    - **too slow**, e.g., wait for climate or galactic evolution
    - **too dangerous**, e.g., weapons, drug design