COTS Hardware Platform (Commercial Off-The-Shelf)

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Motivation

- In house parallel platform for learning, development, production runs

- Inexpensive (save 30% per box compared to a commercial PC, save 60commercial PC cluster)

- Maintenance (hardware, software) takes time (money)

- It's fun and students love to be able to break it and fix it

Parallel Computer System

- Computer performance steadily increase – Price decreasing
- Beowulf parallel computer systems: off–the–shelf PC components
- Performance comparable to commercial supercomputers
- Available in every networked computer environment (PCs, Macs, UNIX)
- GeoWulf at UC Davis (+ CML cluster + FatCat cluster)
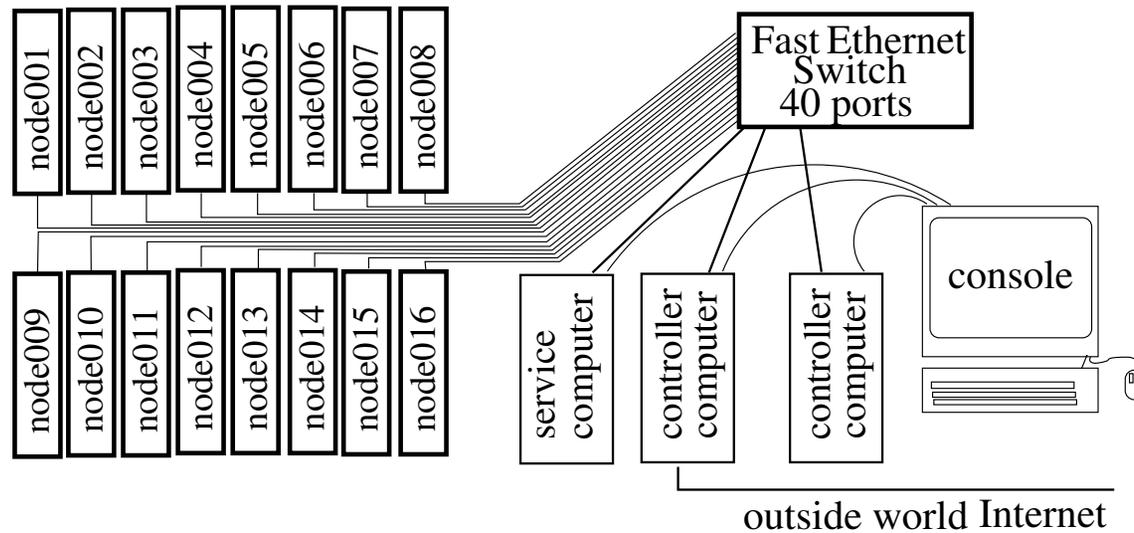
GeoWulf

- 2 Controller computers: dual AMD 2400 machine with 2GB RAM and 50 and 70GB disk space (recent upgrade)

- Service machine (large disk space (IDE) for backups, can do work as well...)

- Node computers (heterogeneous):
  - 8 x single PIII 400 machines with 128MB RAM and 7GB disks
  - 8 x single AMD 600 machines with 128MB RAM and 9GB disks

- Connection: fast Ethernet switch (100T, HP ProCurve 4000).

- Cost: $< \$500$ per node $+ \$50$ per switched port $+ \$3500$ per controller
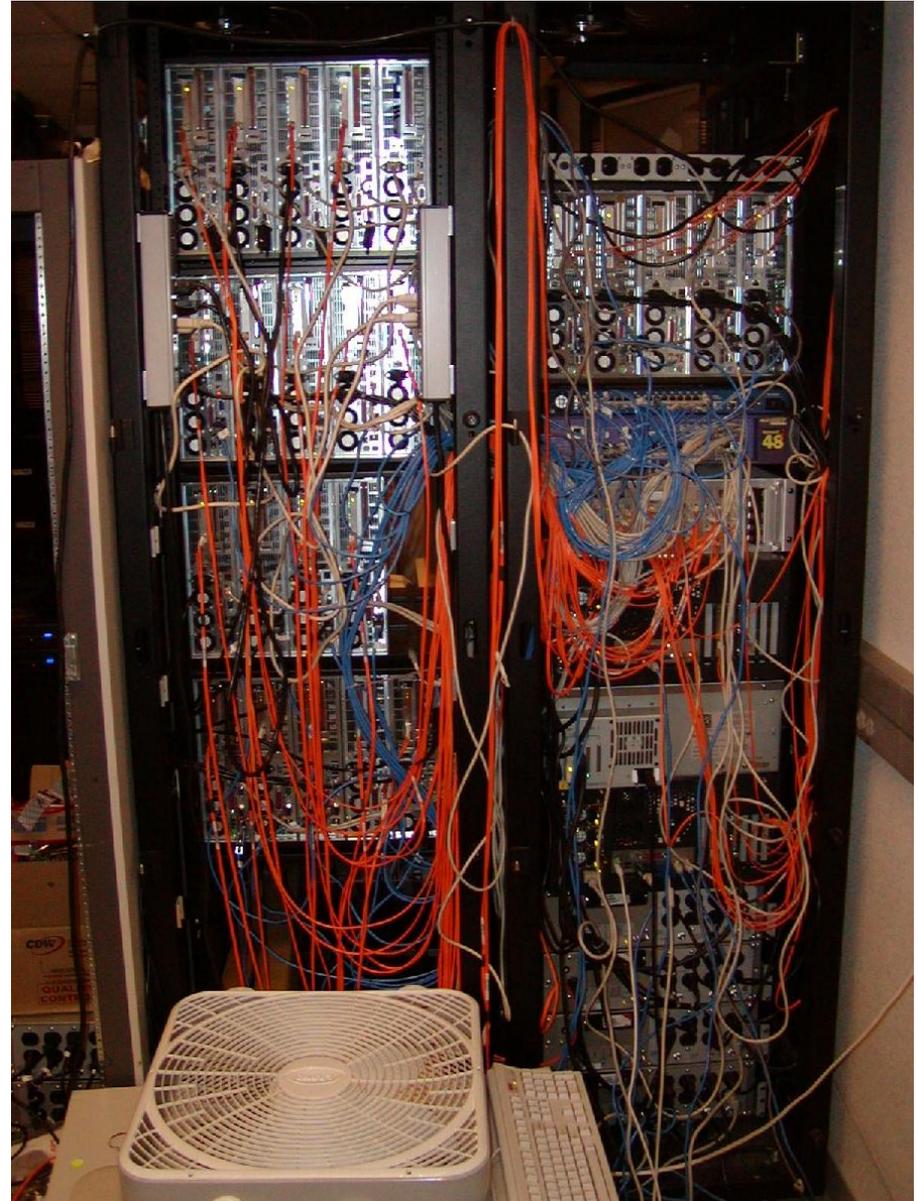
GeoWulf

- In house assembly
- space issues

GeoWulf: Maintenance
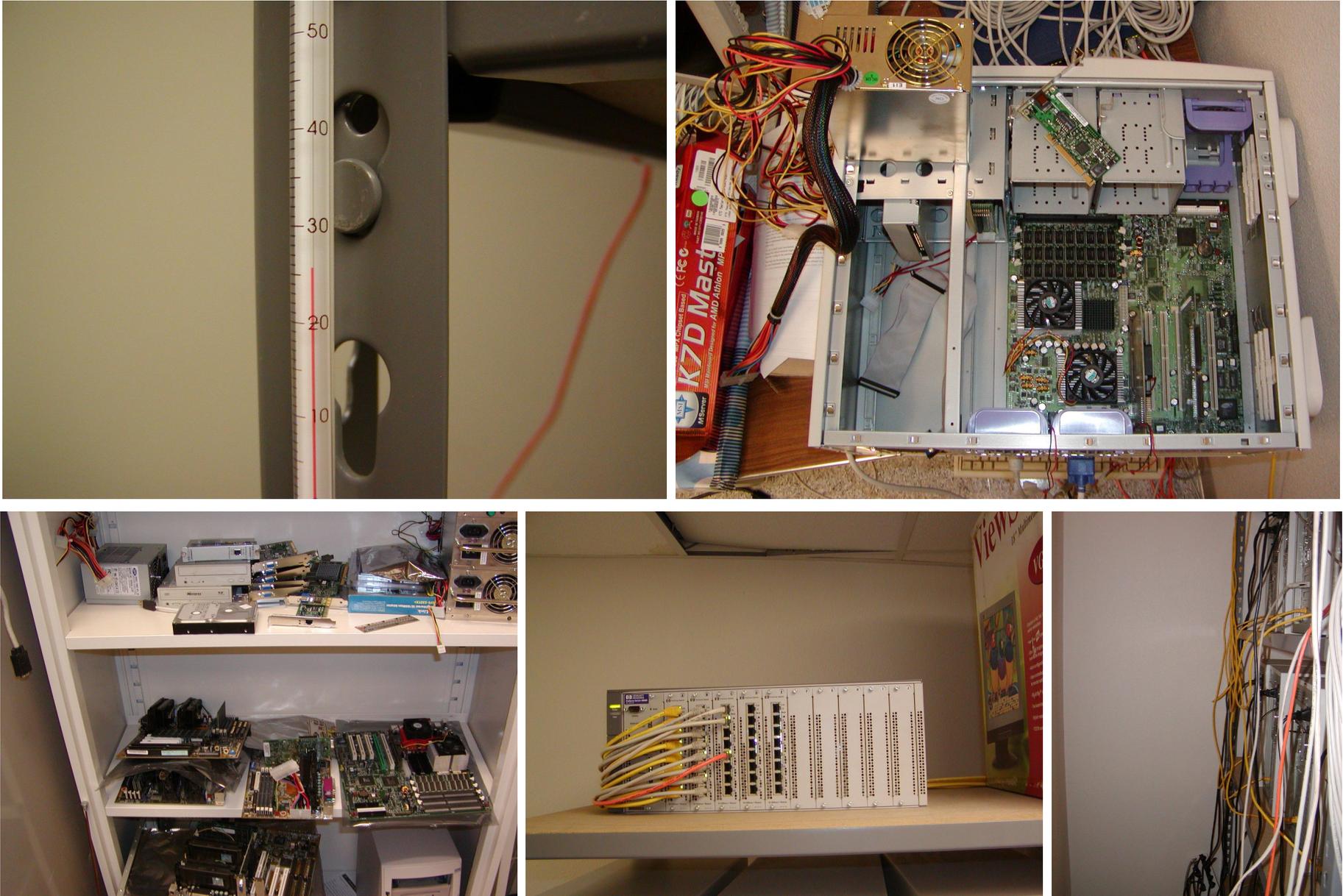
GeoWulf: Space Problem

Commercial Alternative

Summary

- It is worth the effort

- Source code compatible with large DMP machines (can be used for large scale runs)

- If funding permits, go for packaged deals (scyld, linux networx...)

- Always save some funds to build couple machines in house (for fun and to show students that there is nothing special about piece of hardware...)

References

[1] STERLING, T. L., SALMON, J., BECKER, D. J., AND SAVARESE, D. F. *How to Build a Beowulf: A Guide to the Implementation and Application of PC Clusters*. Scientific and Engineering Computations Series. The MIT Press, 1999. ISBN 0-262-69218-X ; QA 76.58.S854 1998.