

# High Performance Computing at Tulane

Tulane University Technology Services  
HPC Workshop  
8/20/2015

# Computational approach to science

- Theory
- Experiment—can be:
  - Costly
  - Slow
  - Hazardous
  - Unethical
- Computational science
  - Use supercomputers to simulate, using known physical laws and numerical algorithms

# Computing in practice

- materials design (batteries)
- n-body simulation (astronomy)
- pharmaceutical drug design (Indinavir)
- CFD analysis in manufacturing (automobiles)
- medical image processing

# High Performance Computing (HPC)

- Parallel computing—more cores
- Storage
- Network
  - high bandwidth
  - low latency
- Software, algorithms, libraries

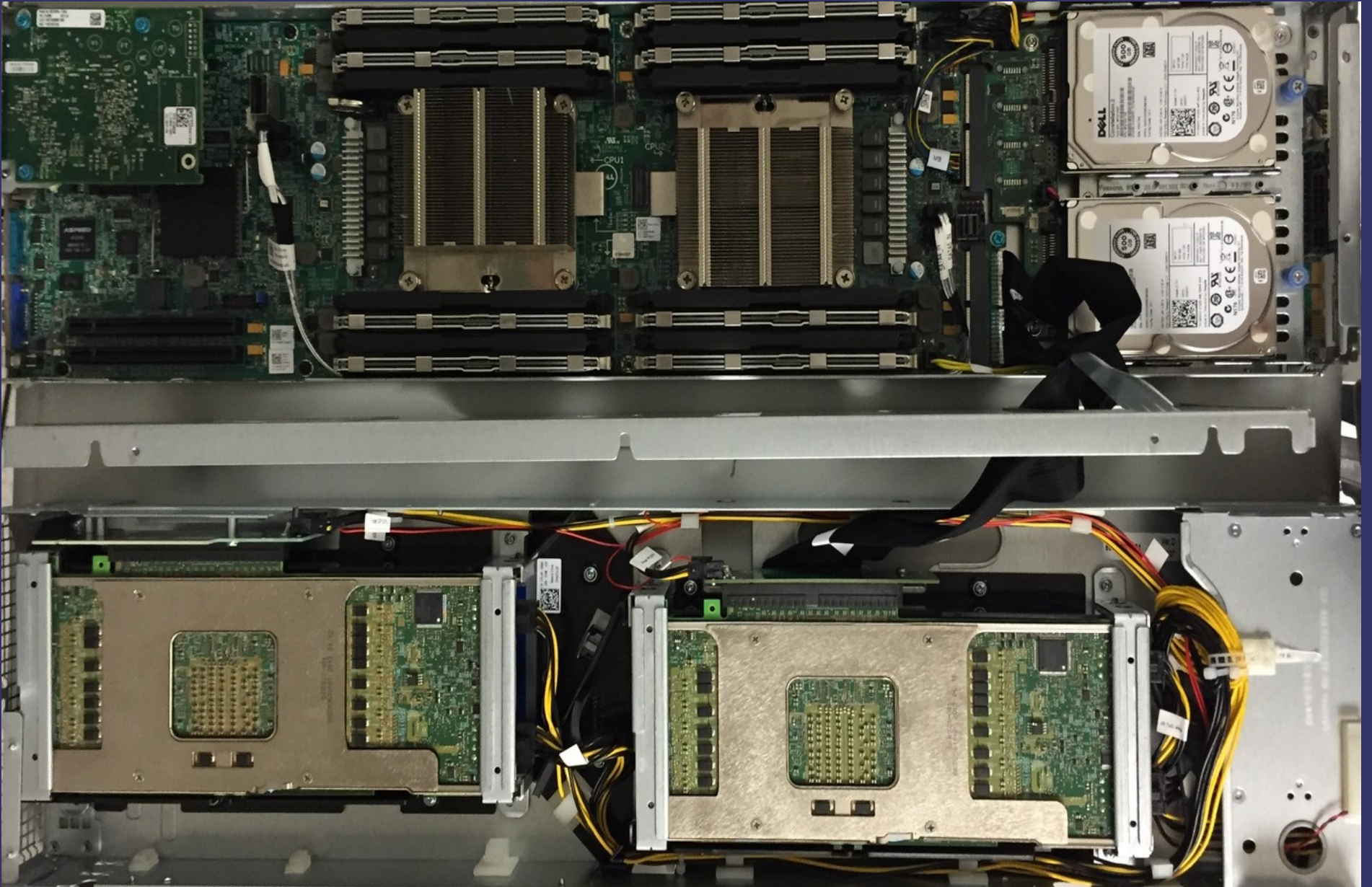
# Cypress at Tulane

- debuted at #271 on TOP500 supercomputer list
- 369 Tflops peak performance
- 124 Dell C8220X nodes
- 40 GbE networking
- CentOS
- Slurm workload manager
- free / open-source / commercial software

# Cypress node

- Intel Xeon E5-2680 v2 (10 cores) (x2)
- Xeon Phi 7120P coprocessor (61 cores) (x2)
- 64, 128, or 256 GB RAM
- 124 nodes

# Cypress node





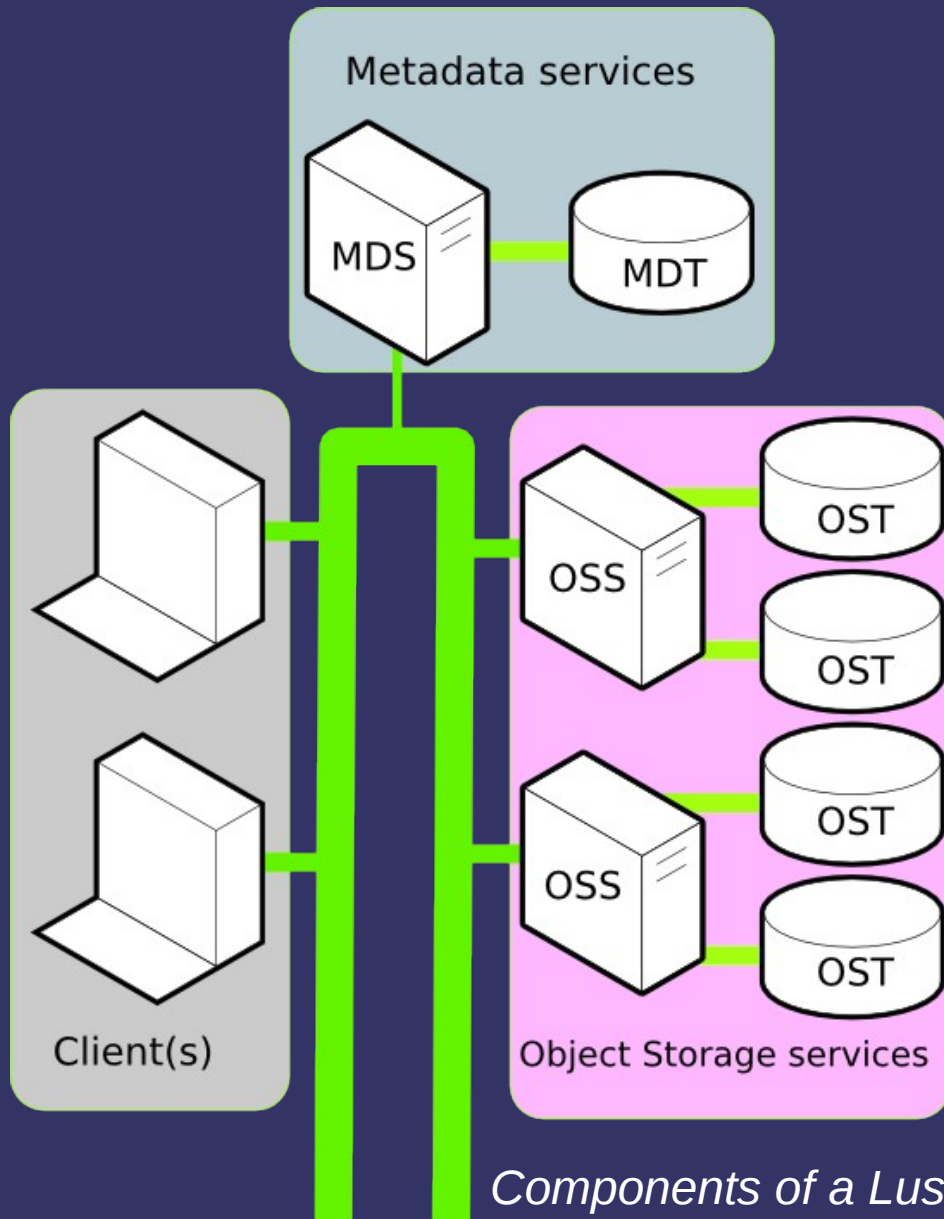
# Cypress

## Tulane HPC Cluster





# Lustre parallel filesystem on Cypress

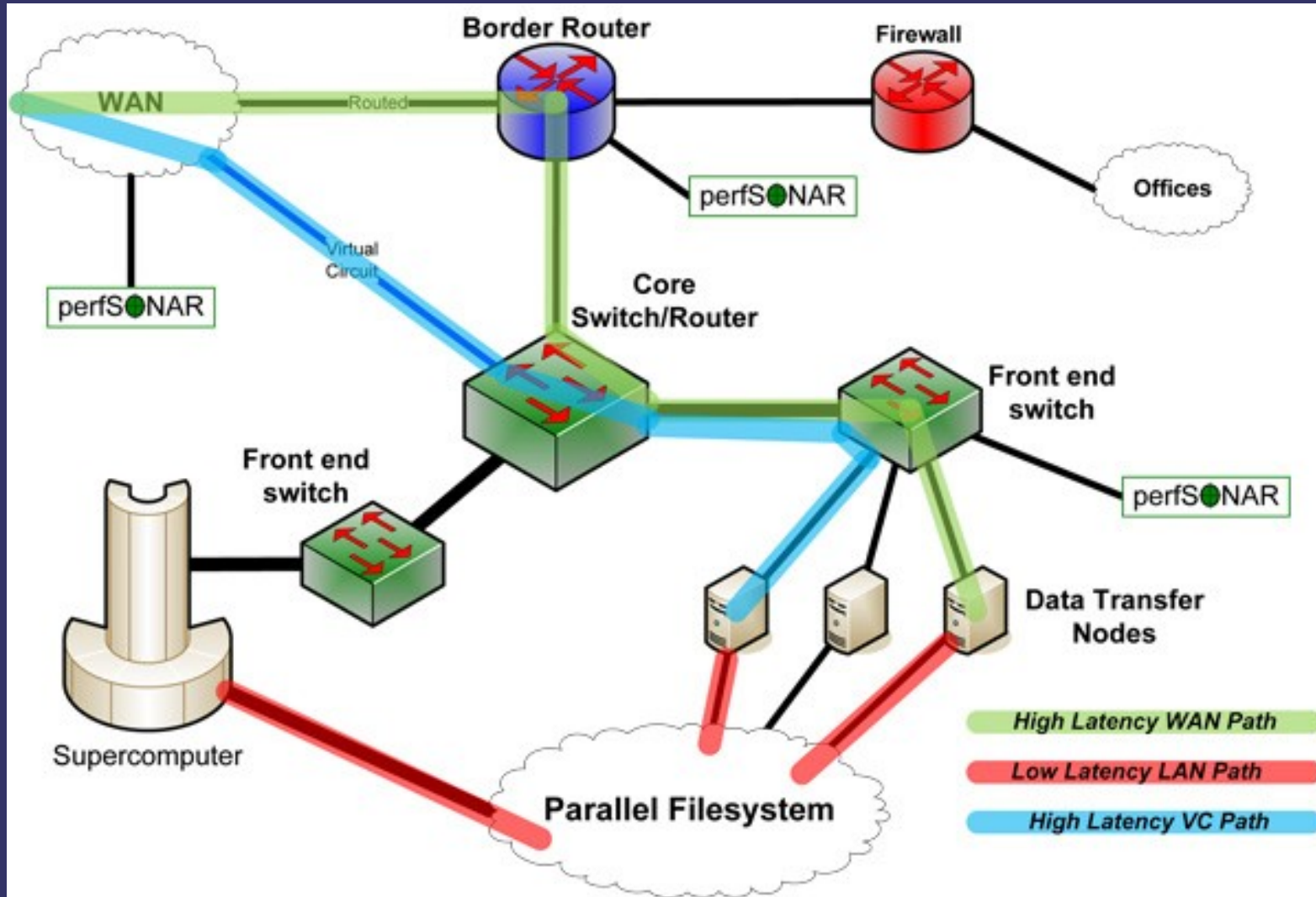


- ~1 PB raw disk
- Parallel access, high aggregate bandwidth
- Very large files

*Components of a Lustre Filesystem,*

Intel.com

# Science DMZ



*Science DMZ Architecture, es.net*

# Cypress resources

- <http://hpc.tulane.edu/>
- <http://wiki.hpc.tulane.edu/>
  - system information
  - account access
  - usage examples

Help?

[hpcadmin@tulane.edu](mailto:hpcadmin@tulane.edu)