

SuperMIC System Overview

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SuperMIC

8 of
16
racks



Background

- SuperMIC is funded by LSU and NSF MRI. 40% of the SU's allocatable through XSEDE.
 - 1 SU = 1 CPU core used for 1 wall clock hour.
 - 6.3 MSU available to XSEDE per quarter.
 - Accelerators come for "FREE".
- Operational October 1st, 2014. Now open for general use.
- Dell/Intel x86_64 based system providing 925 TF of peak performance capability.



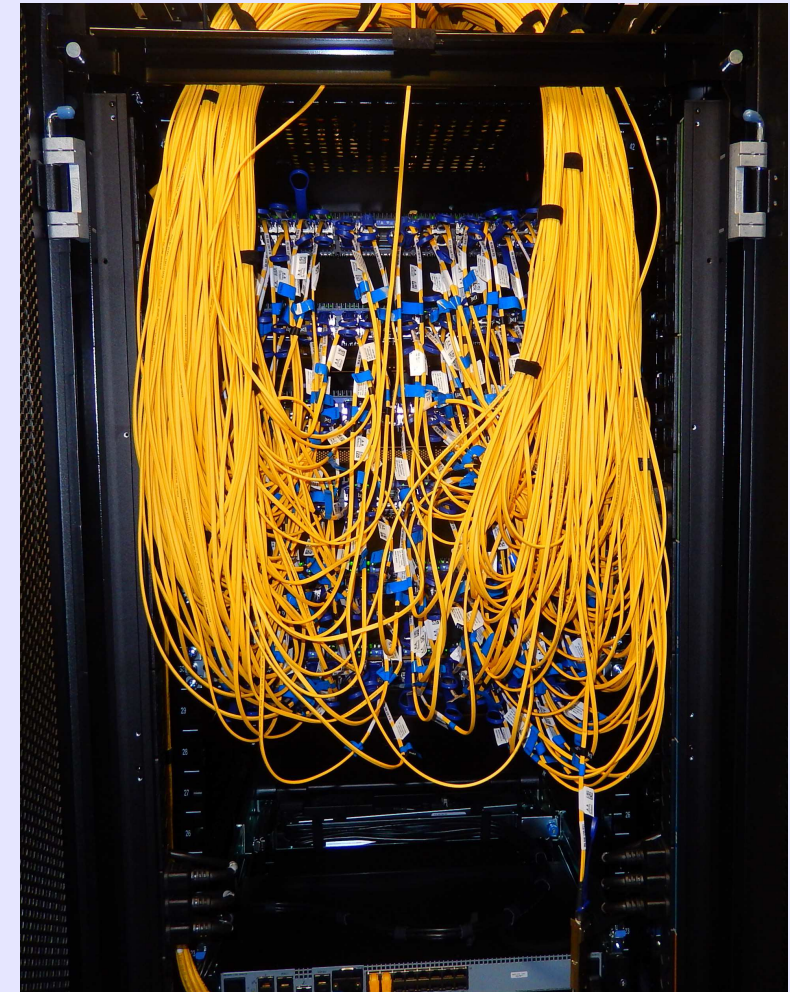
System Hardware

- Dell/Intel x86_64 system
 - 925 TF peak, 557 TF achieved - 65'th on Jun 2014 Top500 list:
 - 2 head nodes.
 - 360 compute nodes with dual 7120P Xeon Phi's
 - 20 computes nodes with Xeon Phi + K20x (sorry, no XSEDE access.)
 - 840TB Lustre parallel storage system.



Common Node Configuration Elements

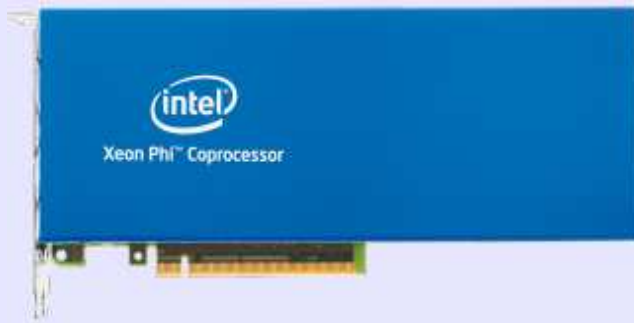
- Two 2.8GHz 10-Core Ivy Bridge-EP E5-2680 Xeon 64-bit Processors
- FDR InfiniBand (2:1 FatTree)
- GbE Ethernet (management)
- Red Hat Enterprise Linux 6



Head Nodes

- In addition to common elements:
 - 128 GB memory
 - 1 TB HDD.
 - And *either*:

1 Intel Xeon Phi - 7120P



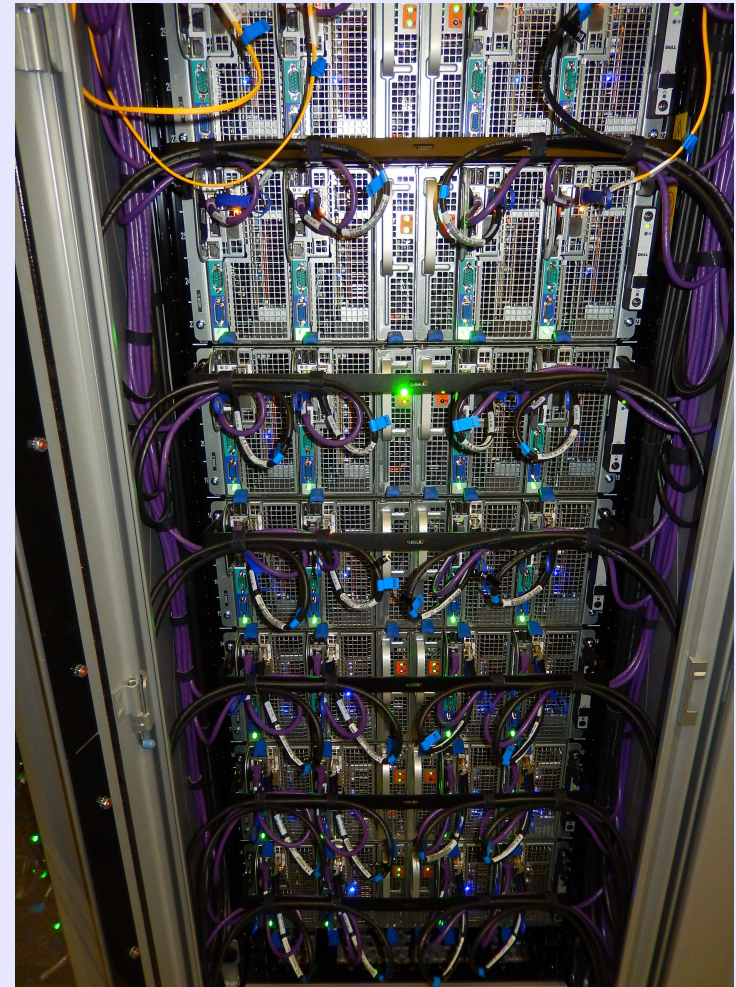
or

1 NVIDIA Tesla K20x



Compute Nodes

- Common elements, plus:
 - 64 GB 1866 MHz DDR3 RAM
 - 500 GB HDD
 - 360 nodes have 2 Intel Xeon Phi 7120P's with:
 - 61 cores, 16 GB each.
 - 20 nodes have 1 Xeon Phi plus 1 NVIDIA K20x with:
 - 2688 CUDA cores
 - Not available to XSEDE users.



Intended Use

- Applications scalable to 10,000 or more cores. For example:
 - Molecular dynamics
 - Adaptive sparse grids
 - Monte Carlo/Black-Scholes stated preference analysis
 - Coarse grained multi-threading.
- Heterogeneous nodes support research in mixed programming methodologies.



User Notes

- Xeon Phi's supported in Native, Off-load, and Symmetric modes.
- Requires use of Intel compiler and Intel MPI to achieve maximum performance via Intel's MKL library.
- 7120P's are different from Stampede's pre-production Knights Corner devices, some tweaking may be required.



Resources

- SuperMIC User Guide:
 - <http://www.hpc.lsu.edu/docs/guides.php?system=SuperMIC>
- XSEDE Home Page:
 - <https://www.xsede.org/>

