

NW-ICE

A supercomputer using evaporative cooling

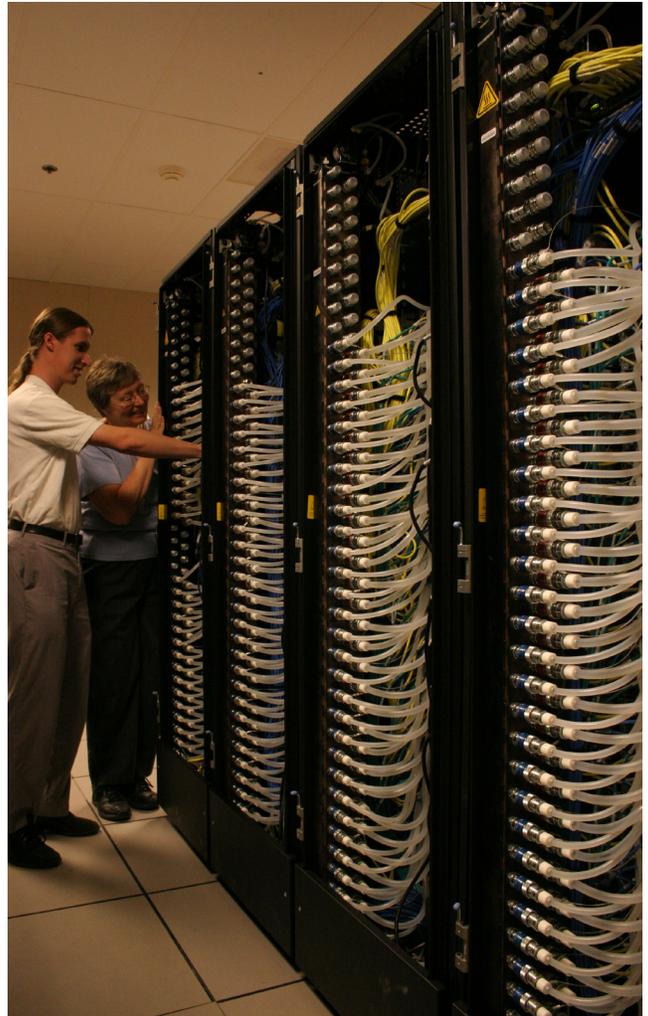
The Pacific Northwest National Laboratory's Energy Smart Data Center uses state-of-the-art technology and equipment to conduct a variety of scientific research in addition to continuously studying data center energy consumption and emerging cooling technologies.

About the Supercomputer

The supercomputer, NW-ICE, is housed within the Energy Smart Data Center. It has seven compute racks, five of which are cooled using advanced evaporative cooling modules that replaced the manufacturer's processor heat sinks. The remaining two racks have been left in their original air-cooled configuration for testing and comparison purposes. Interconnect switching gear is housed in an eighth (air-cooled) rack. Information is collected by sensors located through the racks for monitoring air temperature, fluid temperature, and flow rate. The information is monitored and analyzed to develop performance and operational efficiency models.

Current Technical Specifications

- IBM System Cluster 1350 using SprayCool™ technology
- x3550 1U high performance computing rack drawer
- Dual Quad-Core Intel® Xeon® E5345 "Clovertown" processors implemented in 65nm process technology running the Linux SLES 10 operating system
- Dual integrated Gigabit Ethernet controllers with TOE (Transmission Control Protocol [TCP] Offload Engine) and Jumbo Frame support with Cisco switches provide separate interconnects for data and management
- 192 compute nodes each with 16 GB (8x2 GB) of fully buffered DDR2 667 MHz DIMMs (dual in-line memory module) with Chipkill™ ECC (Error Checking and Correcting) protection. Each node also has two 160 GB local disks.
- The Intel Xeon E5345 is a 2.33 GHz quad-core processor with dual 4 MB L2 caches and is connected to the 1333 MHz front-side bus with a peak bandwidth of 21 GB/s. The E5345 is more energy efficient (80 W) than its faster 2.66 GHz cousin, the X5355 (120 W).
- Software includes Intel C, C++, and Fortran compilers and the Intel Math Kernel Library.



For more information

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