1. Oak Ridge National Laboratory

Computer Facilities. The Oak Ridge National Laboratory (ORNL) hosts three petascale computing facilities: the Oak Ridge Leadership Computing Facility (OLCF), managed for the U.S. Department of Energy (DOE); the National Institute for Computational Sciences (NICS) computing facility operated for the National Science Foundation (NSF); and the National Climate-Computing Research Center (NCRC), formed as collaboration between ORNL and the National Oceanographic and Atmospheric Administration (NOAA) to explore a variety of research topics in climate sciences. Each of these facilities has a professional, experienced operational and engineering staff comprising groups in high-performance computing (HPC) operations, technology integration, user services, scientific computing, and application performance tools. The ORNL computer facility staff provides continuous operation of the centers and immediate problem resolution. On evenings and weekends, operators provide first-line problem resolution for users with additional user support and system administrators on-call for more difficult problems.

Other Facilities. The Oak Ridge Science and Technology Park at ORNL is the nation's first technology park on the campus of a national laboratory. The technology park is available for private sector companies that are collaborating with research scientists. Laboratory officials anticipate that the new park will be used to help create new companies from technologies developed at ORNL.

1.1 Primary Systems

Jaguar is a Cray XK6 system consisting of 18,688 AMD sixteen-core Opteron processors providing a peak performance of more than 3.3 petaflops (PF) and 600 terabytes (TB) of memory. A total of 384 service input/output (I/O) nodes provide access to the 10 PB "Spider" Lustre parallel file system at more than 240 gigabytes (GB/s). External login nodes (decoupled from the XK6 system) provide a powerful compilation and interactive environment using dual-socket, twelve-core AMD Opteron processors and 256 GB of memory. Jaguar also includes 960 NVIDIA Tesla M2090 graphics processing units (GPUs) designed to accelerate calculations. Jaguar is the Department of Energy's most powerful open science computer system and is available to the international science community through the INCITE program, jointly managed by DOE's Leadership Computing Facilities at Argonne and Oak Ridge National Laboratories.

Titan will be an upgrade to Jaguar in late 2012. Titan will add next generation NVIDIA GPUs to the nodes of Jaguar resulting in a system with a peak performance of between 10 and 20 PF. The Spider disk subsystem will be upgraded to provide up to 1 TB/s of disk bandwidth and up to 30 PB of storage.