SCC
Strategic Computing Complex

The Strategic Computing Complex (SCC) is a secure supercomputing facility that supports the calculation, modeling, simulation, and visualization of complex nuclear weapons data in support of the Stockpile Stewardship Program.

Facility

The 300,000-square-foot, vault-type building, completed in 2001, features an unobstructed 43,500-square-foot computer room, which is an open room about three-fourths the size of a football field. The main computer floor houses classified high-performance supercomputing resources used by the Advanced Simulation and Computing Program, including Trinity, Fire, and Ice.

The SCC also has over three hundred office spaces for high-performance computing and weapons designers staff. The facility has a large auditorium, several conference rooms, classrooms, break areas, visualization theaters, and collaboration laboratories. All aspects of the SCC facility design were specifically aimed at providing the Laboratory with the most current technologies to support secure, high-performance computing.

To power the SCC, the facility depends on 40 megawatts of power—far more than the town of Los Alamos. This power runs the facility and supercomputers, as well as the computer cooling systems. Due to increasing circuit densities the supercomputers are transitioning from air to water cooling, the SCC has both types of cooling available. The largest systems, such as Trinity, are cooled by the facility's 4,200 ton water cooling system. Auxiliary systems such as file systems and networks, as well as the smaller supercomputers Fire and Ice, are cooled by a 4,800 ton air cooling system. An additional 5,040 tons of water cooling capability is being added to the facility by the Exascale Class Computer Cooling Equipment project to house future supercomputers.

Computing and Visualization Capabilities

For over 60 years, advanced scientific computing has been a highly visible and indispensable part of the work at LANL. The SCC hosts two interconnected capabilities: high-performance computing, and visualization technologies. The SCC is designed to scale with the increasingly powerful computer resources to deliver required services for users. Today it houses the Trinity supercomputer that has 2 petabytes of memory and a peak performance of 40 petaflop/second, one of the largest supercomputers in the world that is utilized by all three nuclear weapons laboratories.

To view models and simulations calculated by supercomputers, the SCC Data Visualization Corridor was developed to enable detailed visual inspection, analysis, verification and validation of petascale computing simulations. The Visualization Corridor features a Power-Wall Theater and a five-sided CAVE Immersive Laboratory, as well as desktop visualization and collaborator capabilities.
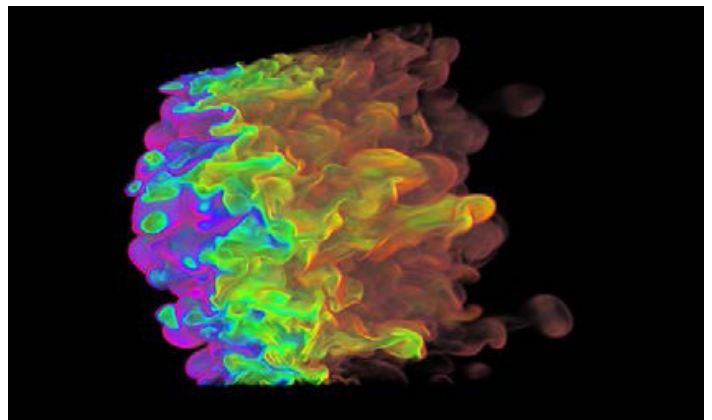
Simulation of the turbulent flow of a shocked liquid.

The computational capabilities housed by the SCC have and continue to play critical roles in Stockpile Stewardship, including use by the Lifetime Extension Projects for the W76-1 and the B61-12, and by the W88 Alteration 370.