

These slides will be displayed on video screens in the DOE booth for visitors wanting more information about artifacts displayed in the booth.

# ASCI Red – First Teraflop System, Sandia National Laboratories, Installed 1996

ASCI Red was a collaboration between Sandia and Intel beginning in 1995, and the first computer to be built under the Accelerated Strategic Computing Initiative (ASCI) program. The system was operational from 1997 to 2005. Three quarters of ASCI Red was the first supercomputer to exceed one teraflops at 1.06 TFLOPS on the LINPACK benchmark.. After memory and processor upgrades in 1999, it achieved 2.38 TFLOPS. Further upgrades to Pentium II Xeon processors brought performance to a maximum of 3.1 TFLOPS.

ASCI Red was the #1 system on the Top 500 list for 4 consecutive years, from 1997 to 2000, achieving seven consecutive #1 positions.



# SANDAC IV – Sandia Airborne Computer

The Sandia Airborne Computer (SANDAC) was a multiple-instruction-multiple-data (MIMD) embedded computer hardware and software.

The earliest SANDAC were custom-built, bit-sliced processors designed for high-speed navigation prior to the availability of microprocessors. The SANDAC IV was one of the first parallel computers and the first parallel machine flown on a missile, research that ultimately led to ASCI Red.

This machine stands between the earliest parallel computer and the explosion of parallel machines. This work won the [Karp Prize](#) and the [Gordon Bell Award](#) for showing how extreme-scale parallel processing could be realized for scientific computations. Previously it was widely held that Amdahl's Law presented a mathematical proof that parallel computing would not be useful.



## SANDAC-IV

The earliest Sandia Airborne Computers (SANDAC) were custom-built, bit-sliced processors designed for high-speed navigation prior to the availability of microprocessors. The SANDAC-IV was one of the first parallel computers and the first parallel machine flown on missile, research that ultimately led to ASCI Red. This is the last extant SANDAC-IV.

- Donated by Bruce Hendrickson and George Davidson

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0-H006X-05-G-X-4.8V

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## Red Storm Cray SeaStar Interconnect

A collaboration between Cray, Inc., and Sandia, Red Storm with its SeaStar Interconnect was designed for the National Nuclear Security Administration (NNSA) Advanced Simulation and Computing Program. Red Storm led to the Cray XT3 commercial product.

Red Storm was installed in 2005 and was expanded and upgraded in 2006 and 2008. It was in the Top 10 of the TOP500 List for three years, from 2006 to 2008. It remained in production until 2012.

Red Storm helped the very highest levels of US leadership during a missile intercept of a failing U.S. satellite, rapidly completing important simulations of the satellite shoot-down event.

“Without Red Storm I wouldn’t be here in front of you today,” Peter Ungaro said. “Virtually everything we do at Cray - each of our three business units - comes from Red Storm. It spawned a company around it, a historic company struggling as to where we would go next. Literally, this program saved Cray.”



National Nuclear

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