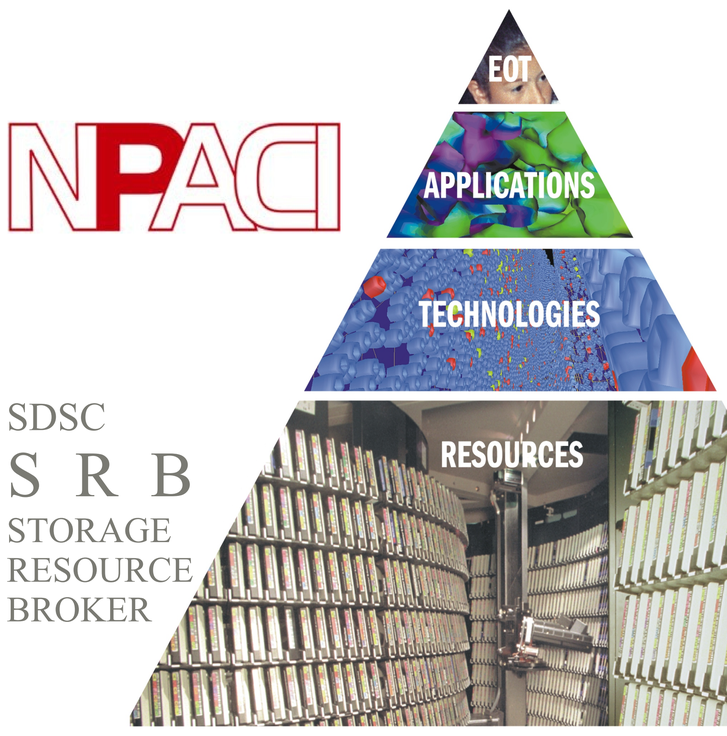
CIS and SDSC: Partners in Supercomputing

Center For Imaging Science
http://www.cis.jhu.edu

Jeff Homer, Michael I. Miller, and J. Tilak Ratnanather

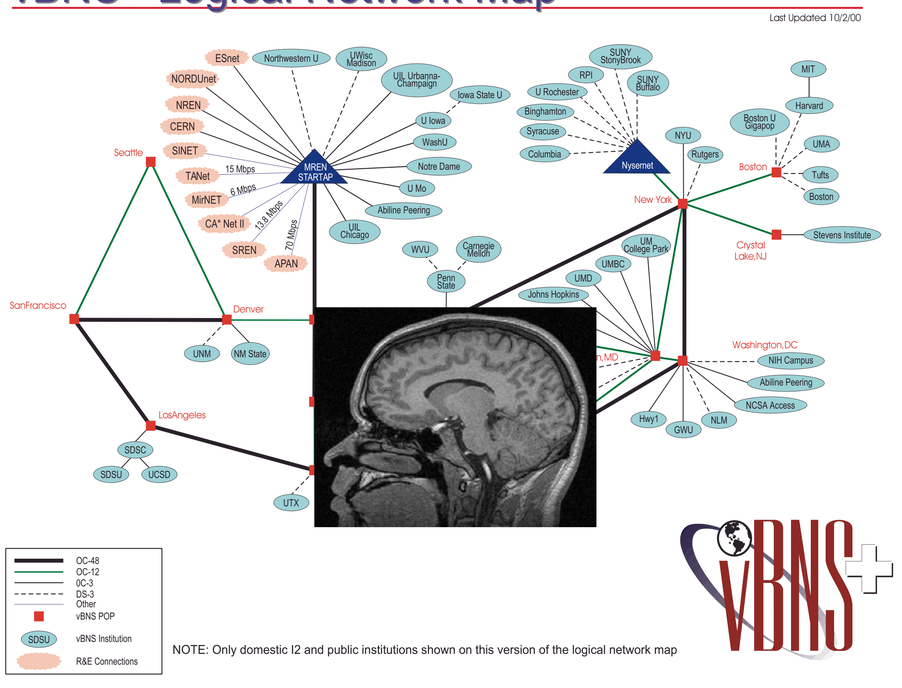
The Center for Imaging Science (CIS) is a center for computation and supercomputing. The IBM RS/6000 SP, Zeus, currently consists of 6 high nodes, 5 outfitted with 16 375Mhz Power3 processors, 1 with 8 (88 total) with a 1280-bit memory bus addressing 512MB of RAM per processor (48GB total, 1GB/proc on Interactive 8 CPU node) and an SSA disk array of 300G, to be upgraded to 1 Terabyte. The nodes are interconnected via a colony switch with a bandwidth of 400MB/second. Zeus is slated for upgrading to the Power4 processor, and more RAM, reaching a configuration of 128 processors, and a performance rating of 100+ Gigaflops of computation.



CIS is a member of the National Partnership for Advanced Computational Infrastructure (NPACI) and the Strategic Applications Collaboration (SAC) program. The principal research thrust for CIS is computational anatomy. SAC enhances computing for NPACI users; it is highly competitive, allowing only 3-6 projects a year. SAC projects have realized great benefits including heart simulation (Charles Peskin, NYU), formation of galaxies and large-scale structures (Lars Hernquist, Harvard), theoretical study of lepton anomalous magnetic moments (Toichiro Kinoshita, Cornell), lattice gauge theory on MIMD parallel computers (Bob Sugar, UCSB), and molecular dynamics in large biomolecular systems (Peter Kollman, UCSF and Dave Case, Scripps Research Institute). As a SAC member CIS is allowed to use up to 1,000,000 hours per month of CPU time.

The CIS SP is a sister to Blue Horizon, the San Diego Supercomputing Center (SDSC) Teraflop SP, which consists of 1152 RS/6000 Power3 processors running at 222Mhz. SDSC has developed programs that help advance supercomputing. CIS is developing applications that take advantage of Storage Resource Broker (SRB), a client-server interface for connecting to data resources over a network based on their attributes as opposed to merely on names and locations. SRB, a project of SDSC, has a programming API that allows in-house software access to the data resources over high speed networks such as the very high speed Backbone Network Services (vBNS). SRB was used to access the brain image (on the right) from Washington University St. Louis via the vBNS. The National Science Foundation (NSF) and WorldCom have entered into a cooperative agreement to provide high bandwidth networking that allows NSF supercomputing centers high connectivity for research.

vBNS+ Logical Network Map



NOTE: Only domestic I2 and public institutions shown on this version of the logical network map