

New Mexico Computing Applications Center

NMCAC Newsletter November 16, 2008

It has been an extremely busy 8 months since the 2008 regular session of the Legislature ended. The supercomputing center (NMCAC) has made significant progress and we have exceeded our expectations in some areas while we still faces challenges in others. We have developed extremely productive relationships with SGI (who built the supercomputer) and Intel (where it is housed).

A list of highlights of NMCAC is attached that shows our progress and plans. A significant milestone was reached last month when we issued the RPF for equipment for the gateways. This took considerably longer than we had anticipated for two reasons: first, our only full-time person working on the initiative (Bill Feiereisen, on assignment from LANL) accepted a position at the end of March as Director of a consortium of 5 DoD supercomputing centers and we were not able to replace him. Second, we had requested (but did not get) legislation during the regular session that would have created the Center and provided a transparent means of providing state funding to the Center.

In the absence of directed legislation, we worked with UNM, NMT, and NMSU to have their regents create the Center under the Research Parks Act. We then worked with UNM to get an MOU in place between the Department of Information Technology DoIT), UNM, and NMCAC that provides a means for state funding to be used by NMCAC. That overall effort involved a team of 8 lawyers and took 8 months to complete.

The efforts of the staff working on the supercomputing initiative (all of whom were supported by the institutions of the founding members) were largely consumed by this

activity. At any rate, by mid-October we were finally able to access the funds that had been appropriated and are now able to increase the pace of activities. The Center budget has been very constrained as we received \$2.855M in appropriations compared to the \$4.2M request. Since \$2.1M is required just for computer operations, there has been little left to support business and education development activities.

Fortunately, Intel provided \$45K for scholarships for Supercomputing Challenge students and we have recently entered into an agreement with a digital media firm.



These provide additional resources into the Center of \$740K. In addition to anticipated cost offsets of \$700K (from free space at Intel and staff support from the founding members) we have also accrued an additional \$110K in cost offsets from free office space provided by UNM and Mesa del Sol and free membership in a national biotech firm that provides us with access to their business partners.

Thus, we have already substantially exceeded our projected external income of \$440K in FY09. However, our total income (cash plus cost offsets) is ~\$4.4M, which is \$1.0M below our projected budget. Since we now have access to

the state appropriations, we have additional resources we can draw on to aggressively pursue other sources of funding to make up the shortfall.

Center Operations

The Center has as its primary computing platform an Altix 8200 ICE cluster consisting of 14,336 3.0 GHz Intel cores that was procured from Silicon Graphics Inc. (SGI). The computer has a peak theoretical speed of 172 Teraflops (133 Teraflops sustained speed based on LINPACK tests) and was the third fastest computer in the world when it was procured. UNM, NMT, and NMSU have 2.1 Teraflop "exemplars" with the same architecture procured from SGI.

We have been providing free time on the system (named *Encanto* by Governor Richardson) to the founding member institutions (NMT, NMSU, UNM, LANL, SNL) since May. Each of the founding members can use 10% of the time available, state agencies and other public institutions have access to 10%, and the remaining 40% is competed. As we bring business collaborations on board, the amount of competed time available will be reduced.

Simulations encompassing a wide range of R&D have been carried out and several papers are in preparation for submission. Usage of *Encanto* has been running at around 98%.

The Center will be moving into offices later this month at the UNM Science and Tech Center (provided free of charge by the STC) for a few months before moving into new offices at Mesa del Sol (provided free of charge until Jan 2010). We will be contracting for a full-time admin. We are also standing up a website (see www.newmexicosupercomputer.com).

In education, four Supercomputing Challenge students supported by Intel have been working on simulation projects using *Encanto* under the supervision of graduate students and faculty at

NMT, NMSU, and UNM. We are also working closely with IDEAL, GUTS, Supercomputing Challenge, NM Project 2012, and other state educational efforts. We will shortly be contracting for an assistant to work with the education director in developing programs at NMCAC that support the activities and goals of STEM education efforts in New Mexico.

Development of potential prospects for collaborating with market segments that would provide mutual benefit has been underway since the inception on the center. The target market areas are based on an assessment of the resident strengths of the affiliate members, markets that benefit from High Performance Computing solutions and markets that are strategically relevant to the state. The markets identified are: Energy, Environment and Water; Bio Med, Bio Tech and Health; and Digital Film Media. Several private sector companies have initiated contact with the NMCAC regarding capabilities they desire to have developed in the Energy markets. The NMCAC has signed two MOUs with institutions where we will be marketing our joint capabilities in the Health markets. In addition to partnering on several bids with the National Center for Genomic Research (where decisions are still pending), the NMCAC has also partnered with our founding members on bids for National Science Foundation grants whose decisions are also pending.

The next major effort of the Center is establishing gateways at the university and college campuses across the State. We ultimately plan (pending sufficient appropriations) to standup gateways at every public institution of higher education in New Mexico, including community colleges and branch campuses. The attached map shows the anticipated gateway sites. At present we expect that existing appropriations will be sufficient to stand up 20 or more of the 40+ sites around the state. We will be requesting additional capital appropriations in the next two years to stand up the remaining sites.

Gateway locations in New Mexico

The RFP for equipment at the gateways was issued on October 31, 2008. We anticipate that one or more price agreements will be awarded on 1/12/09. Under the price agreements, the Dept of Information Technology (DoIT) will procure equipment for each gateway that includes a one-blade (16 core) microcluster server that is identical in architecture to Encanto, hardware and software systems including collaboration capabilities across the system through the provision of high-definition teleconferencing and videoconferencing with 3-D stereo visualization capability along with desktop computing and software. These systems will interface with both Encanto and the local blade servers. These computers form the basis for a distributed computing and collaboration infrastructure for the NMCAC.

Three different systems will be part of the pricing agreement: a front (overhead) projection system, a rear projection system, and a dual-display system composed of flat-screen displays (e.g., 3-D ready plasma or LCD). The dual screen systems offer greater flexibility, require less maintenance, and likely offer some cost savings. A diagram of a typical dual display system is shown below. For most of the gateway sites, we anticipate installing a dual-screen system, which offers the ability to use one of the screens for high-definition videoconferencing while the second screen is used for 3-D stereo visualization. The pricing agreement will allow public entities to procure additional systems for use in other venues. The RFP is posted at <http://www.generalservices.state.nm.us/spd/rfp9000000022.html> where more detailed information can be found.

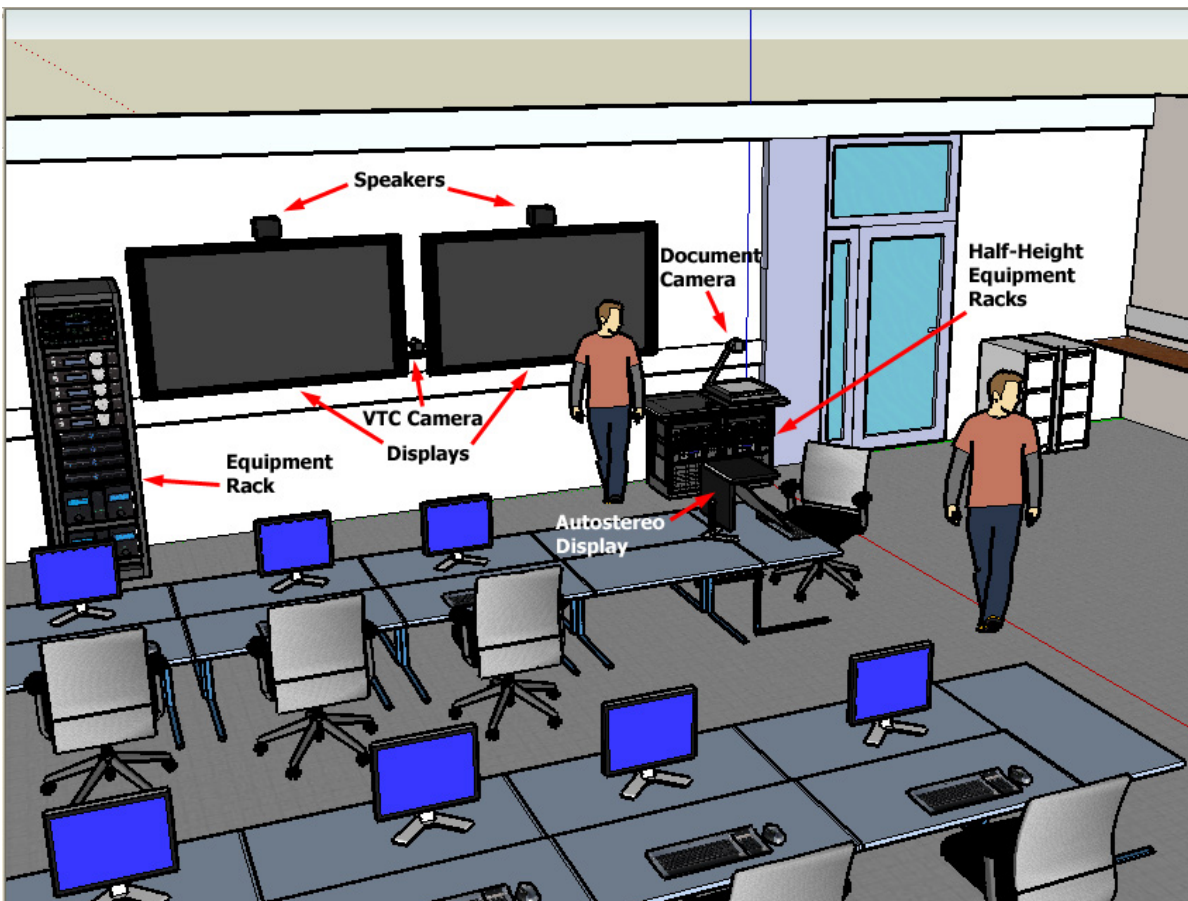


Diagram of dual display visualization/collaboration system

Center Staffing

At present, the Center has the following people involved in its efforts:

Edmundo Gonzales as Chief Operating Officer:

Edmundo is a lawyer by training, has experience in overseeing R&D efforts in the health sector, served as the Chief Financial Officer of the U.S. Dept. of Labor under the Clinton Administration, and runs his own consulting company. Edmundo works half time for the Center.

Lorie Liebrock as the Interim Education Director:

Lorie is a professor at New Mexico Tech in the computer science department and has had a great deal of experience locally and nationally in developing and promoting STEM education. Lorie serves half time at the Center.

Stephan Helgesen as the Client Services and Outreach Director:

Stephan has 20 years of worldwide experience with the U.S. Commerce Department having lived and worked in Asia, the Caribbean, and Europe assisting U.S. high-tech companies develop a presence, internationally. Stephan is also the Director of the Science and Technology Division of the NM Dept of Economic Development. Stephan spends a significant portion of his time working with the Center.

Lenny Martinez as the Market Development Advisor:

Lenny is a VP of Market Development at Sandia National Laboratories on assignment to Gov. Richardson as his advisor on rural economic development. Lenny has experience in the private sector and serves part-time advising the Center on potential collaborations with business.

Tom Bowles as the Science Advisor

Tom was the Chief Science Officer at Los Alamos National Laboratory and is on assignment to Gov. Richardson as his science advisor. He is Gov. Richardson's lead on the supercomputing initiative, serves part time

advising the Center on R&D efforts, and is the Chair of the NMCAC Board of Directors.

Tom Mills as legal counsel:

Tom served as legal counsel to the NM Dept of Economic Development prior to forming his own law firm and has extensive experience in working with government, business, and academia. Tom serves on a contract basis providing legal counsel to the Center.

We also have a Board of Directors of NMCAC and the members are listed below. We have contracted with SGI for systems administration and user support. Those positions work closely with staff, faculty, and students at the member institutions and will be supporting collaborations with businesses and educational groups. In setting up the Gateways, we will be bringing additional help on board. We are now in the process of bringing on a full-time office administrator, a part-time education assistant, and a part-time gateway technical assistant. In the future, as we bring in more financial resources, we plan to increase the level of staffing to provide more support for development of materials and capabilities in collaboration with all the member institutions. In particular, we plan to provide increasing financial support for joint appointments between the Center and the member institutions for work on specific projects to develop and deliver new capabilities needed to support collaboration with businesses, education, and communities.

As part of our effort in setting up the Gateways, some of the Center staff will be visiting gateway sites in late November through mid-January. While we want to meet to provide personnel at the Gateways with more detailed information on Center activities, we also need to get MOUs in place that allow all member institutions access to Encanto and to collaborate on Center activities. We also want to discuss the specifics of where the Gateways will be located on each campus and address any issues associated with installing the equipment. We look forward to seeing you soon.

CY08 Update on New Mexico Computing Applications Center
11-05-08

- Encanto installed and operation (1/12/08) in world-record time.
 - Intel providing space, building maintenance, lighting, security, access to conference room, and operations interface support free of charge to NMCAC.
- Funding appropriated by legislature (2/08):
 - \$2.855M in general operating funds + \$1.8M capital
- Requested legislation failed to provide creation, funding, and oversight of NMCAC.
 - Alternate process developed to have Regents of UNM, NMT, and NMSU create the NMCAC as a nonprofit under the Research Parks Act.
 - Separately developed MOU between DoIT, UNM, and NMCAC to provide funding to NMCAC.
- Users from founding institutions provided full-time access to Encanto (5/08)
- Crated as a nonprofit (6/08) by Regents of UNM, NMSU, and NMT.
 - Incorporated by PRC (7/08)
 - Board of Directors and Executive Committee formed (7/08)
- Intel provided \$45K (7/08) for scholarships to NMCAC for Supercomputing Challenge.
- Contract signed (7/08) with SGI for Encanto support and services for Encanto.
- Personal services agreement (PSA) with Tom Mills (7/08) as interim legal counsel.
- MOU signed (9/08) between DoIT, UNM, and NMCAC (9/08) providing NMCAC with exclusive access to Encanto and transfer of operating funds from DoIT to UNM.
 - UNM will provide all financial services for NMCAC for an annual fee of \$50K.
- PSA signed (9/09) with Edmundo Gonzales as Chief Operating Officer for NMCAC.
- Contract with SGI (10/08) for user support services.
- LOI signed (10/08) with a national health innovation center for free 3-year membership with access to their business partners to develop specific computing applications.
- Agreement signed (10/08) with Forest City Covington NM in October providing free office space in the Mesa del Sol Town Center Building from 10/08 to 1/10.
- MOU signed (11/08) with digital media company providing development support and student scholarships to the NMCAC and also identifies two directed projects.

Actions in Progress

- RFP for gateway equipment issued October 31.
 - Expect to have first gateway installed 3/09 with ~20 others installed by 9/09
- General partnering MOUs between member institutions and NMCAC.
- Joint appointment MOUs with individual member institutions and NMCAC
- Transfer SGI contracts from DoIT to NMCAC for power, cooling, sys admin, and connectivity.
- Personnel Services Agreement (PSA) with Lorie Liebrock as interim education director.
- PSA agreements for admin, education support, and gateway support.
- Joint proposals submitted to NSF for EPSCoR IIE and DataNetOne.
- Business development with national firms in energy, biotech, and digital media.

Future Plans

- Support STEM education activities of IDEAL, GUTS, and NM Project 2012.
- Support State Technology-Based Economic Development initiatives (e.g., Green Grid)
- Deliver initial decision-making aids to Gateway municipalities
- Obtain additional state support for years 3-6.
- Move toward self-sustaining operations

New Mexico Computing Applications Center
Board of Director Members

<u>Name</u>	<u>Affiliation</u>
Tom Bowles	Governor's Science Advisor
Marlin Mackey	Secretary of Information Technology
Fred Mondragón	Secretary of Economic Development
Reed Dasenbrock	Secretary of Higher Education
Veronica Garcia	Secretary of Public Education
Bob Mayer	Dir. Telehealth Commission
Vimal Chaitanya	NMSU VP for Research, Grad. Studies, and Int'l Programs
Van Romero	NMT VP for Research and Economic Dev
Julia Fulghum	UNM VP for Research and Economic Dev
Terry Wallace	LANL Principal Associate Director for
Rick Stulen	SNL VP for Science and Technologies and Research Foundations

New members approved by Board, awaiting confirmation by Regents

Dr. Stephen Gamble	ENMU President
Tad Powers	Hidalgo County Economic Development Coordinator
Jami Grindatto	Intel
Bill Garcia	Cerelink

NMCAC Officers of the Corporation

Tom Bowles	Chairman and President
Reed Dasenbrock	Vice-President for Education
Van Romero	Vice-President for R&D
Edmundo Gonzales	Chief Operating Officer
Rick Stulen	Secretary
Fred Mondragón	Treasurer