



Campus Research and Education Technology Assessment Report

California State University at Dominguez
Hills

August 2011

Prepared by:

The Minority Serving Institutions Cyberinfrastructure Empowerment Coalition
(MSI-CIEC)

Minority Serving Institutions
Cyberinfrastructure Empowerment Coalition
Center for Computational Science and
Advanced Distributed Simulation
University of Houston Downtown
One Main Street, Suite South 722
Houston, TX 77002
Phone: 713-221-8207 Fax: 713-226-5290

TABLE OF CONTENTS

1.	Introduction	3
1.1	Cyberinfrastructure Defined	3
1.2	Campus Profile	4
1.3	MSI-CIEC	4
1.4	Profiles of Participating Organizations.....	5
1.4.1	American Indian Higher Education Consortium (AIHEC).....	5
1.4.2	Alliance for Equity in Higher Education	6
1.4.3	Hispanic Association of Colleges and Universities (HACU).....	6
1.4.4	National Association for Equal Opportunity in Higher Education (NAFEO)	6
1.4.5	San Diego Supercomputing Center (SDSC)	7
1.4.6	University of Houston Downtown (CSUDH) Center for Computational Science and Advanced Distributed Simulation (C ² SDS or CCSDS)	7
1.4.7	Indiana University (IU)	8
1.5	Site Assessment Team	8
1.6	Assessment Methodology.....	10
2.	Subject Area Assessments	12
2.1	Campus-wide Infrastructure.....	12
2.2	Administration/Support.....	14
2.3	Staff Development/Training	16
2.4	Curriculum Development.....	16
2.5	Research and Education.....	17
3.	Conclusions/Recommendations	19

1. Introduction

As an activity of National Science Foundation (NSF) project #063652, the Minority Serving Institutions Cyberinfrastructure Empowerment Coalition (MSI-CIEC) has conducted an assessment of the cyberinfrastructure (CI) capabilities relative to furthering research and education at California State University at Dominguez Hills (CSUDH), MSI-CIEC solicited the assistance of several technology experts in the field with specific expertise in computing and networking infrastructure, applications, CI research, CI education, and strategic planning. This report contains the results of the site visit team's findings concerning CI-enabled opportunities for strengthening STEM research and education programs. It is the intention that these recommendations will facilitate CI-focused strategic planning by CSUDH. The site visit team will continue to provide on-site and written recommendations on strategies for improvement, reference material, and ongoing assistance, as needed.

1.1 Cyberinfrastructure Defined

The National Science Foundation's (NSF) 2003 report of the Blue Ribbon Panel on Cyberinfrastructure, *Revolutionizing Science and Engineering through Cyberinfrastructure*, or the Atkins Report, coined the term "cyberinfrastructure" as they reviewed the recent radical advancements in science and engineering that have an IT basis. The report put the term in context as follows:

"The term infrastructure has been used since the 1920s to refer collectively to the roads, power grids, telephone systems, bridges, rail lines, and similar public works that are required for an industrial economy to function.... The newer term 'cyberinfrastructure' refers to infrastructure based upon distributed computer, information, and communication technology. If infrastructure is required for an industrial economy, then we could say that cyberinfrastructure is required for a knowledge economy. (p. 1.2)"¹¹

More recently the NSF Office of Cyberinfrastructure developed a strategic plan for CI and defined CI below as:

"The comprehensive infrastructure needed to capitalize on dramatic advances in information technology has been termed cyberinfrastructure (CI). Cyberinfrastructure integrates hardware for computing, data and networks, digitally-enabled sensors, observatories and experimental facilities, and an interoperable suite of software and middleware services and tools. Investments in interdisciplinary teams and cyberinfrastructure professionals with expertise in algorithm development, system operations, and applications development are

¹Atkins, Daniel, E., Kelvin K. Droegeimer, Stuart I. Feldman, Hector Garcia-Molina, Michael L. Klein, David G. Messerschmitt, Paul Messina, Jeremiah P. Ostriker, Margaret H. Wright, *Revolutionizing Science and Engineering Through Cyberinfrastructure: Report of the National Science Foundation Blue-Ribbon Advisory Panel on Cyberinfrastructure*, National Science Foundation, January 2003.

also essential to exploit the full power of cyberinfrastructure to create, disseminate, and preserve scientific data, information and knowledge (p. 6).”²

The Atkins report briefly reviews the impact of CI on the sciences and its capability for broadening the participation of institutions mentioning minority-serving institutions (MSIs) specifically and serves as a beneficial reference. The report may be found at <http://www.nsf.gov/cise/sci/reports/atkins.pdf>. The CI strategic plan, “*Cyberinfrastructure Vision for 21st Century Discovery*,” is also an excellent reference for understanding the general notion of CI. There have been numerous other reports on CI as it applies to a variety of sciences, including the social sciences and the humanities. A compendium of such reports may be found at <http://www.nsf.gov/od/oci/reports.jsp>.

1.2 Campus Profile

California State University at Dominguez Hills (CSUDH) is a public university located in the South Bay region of Los Angeles County and was founded in 1960. The university is part of the California State University system and as of 2011, is classified as a Hispanic Serving Institution (HSI). CSUDH has an enrollment of approximately 14,000 students. CSUDH offers 45 undergraduate majors, 24 master's degrees, and a number of certificate and credential programs. It is accredited by the Western Association of Schools and Colleges, the Association of Collegiate Business Schools and Programs, the National Association of Schools of Public Affairs and Administration, the National Association of Schools of Music, and the National Association of Schools of Theatre. It is the administrative headquarters of the California State University's Statewide Nursing Program.³

1.3 MSI-CIEC

The three organizations that comprise the Alliance for Equity in Higher Education (AEHE) -- the American Indian Higher Education Consortium (AIHEC), the Hispanic Association of Colleges and Universities (HACU), and the National Association for Equal Opportunity in Higher Education (NAFEO) -- have established the Minority Serving Institutions (MSI)-Cyberinfrastructure (CI) Empowerment Coalition (MSI-CIEC) that is fostering a CI-enabled distributed education and research network providing e-science education and research opportunities to MSI faculty and students. Based in large part on lessons learned from the MSI CI Institute pilot project (NSF project # #0537498), MSI-CIEC is providing the “human middleware” – the social and technological mechanisms facilitating the necessary communication and support linkages between MSI faculty and students, and researchers associated with e-science and CI initiatives. This effort is intended to ensure that MSI institutions emerge as full partners in the national CI-enabled research and education infrastructure.

MSI-CIEC has a number of highly-respected individuals in the high-performance computing field on its advisory board including:

² National Science Foundation Cyberinfrastructure Council. *Cyberinfrastructure Vision for 21st Century Discovery*. National Science Foundation, March 2007.

³ Wikipedia, *California State University, Dominguez Hills*, <http://www.wikipedia.com>, July 2011.

- Malcolm Atkinson, National e-Science Center - United Kingdom, International Collaboration to Extend and Advance Grid Education (European Union Grid Education)
- Fran Berman, San Diego Supercomputing Center (SDSC)
- Jay Boisseau, Texas Advanced Computing Center (TACC)
- Charles Catlett, Argonne National Lab – formerly Executive Director of the TeraGrid
- Kelvin Droegemeier, University of Oklahoma
- Tom Dunning, National Center for Supercomputing Applications (NCSA)
- Mark Ellisman, SDSC, BioInfomatics Research Network (BIRN)
- Ian Foster, University of Chicago, Open Science Grid
- Juan Meza, Lawrence Berkeley National Laboratory (LBNL)
- Dan Reed, Microsoft Corporation – formerly from the University of North Carolina, Renaissance Computing Institute
- Richard Tapia, Rice University
- Larry Smarr, University of California at San Diego, Cal(IT)²

1.4 Profiles of Participating Organizations

MSI-CIEC is designed to develop the MSI capacity to participate in e-Science and cyberinfrastructure, and to prepare underrepresented minority students for a future in CI-facilitated science and the knowledge-based economy, possibly joining the next generation of the professoriate. Through AEHE and the three member organizations (HACU, NAFEO, and AIHEC), represent at least 335 MSIs, the vast majority of MSIs, and could eventually impact the entire MSI community.

1.4.1 American Indian Higher Education Consortium (AIHEC)



(From the organization web site at <http://www.aihec.org>)

The American Indian Higher Education Consortium (AIHEC) was founded in 1972 by the presidents of the nation's first six Tribal Colleges, as an informal collaboration among member colleges. Today, AIHEC has grown to represent 37 colleges in the United States and one Canadian institution. Unlike most professional associations, it is governed jointly by each member institution. AIHEC provides leadership on American Indian higher education issues; influences public policy through advocacy, research, and program initiatives; and promotes and strengthens Native American languages, cultures, and communities.

1.4.2 Alliance for Equity in Higher Education



(From the organization web site at <http://www.ihep.org>)

The Alliance for Equity in Higher Education, a program managed by the Institute for Higher Education Policy (IHEP), was established in 1999 by the American Indian Higher Education Consortium (AIHEC), the Hispanic Association of Colleges and Universities (HACU), and the National Association For Equal Opportunity in Higher Education (NAFEO) to represent the shared interests of Tribal Colleges and Universities, Hispanic-Serving Institutions, and Historically Black Colleges and Universities. Combined, these minority-serving institutions (MSIs) represented by AIHEC, HACU and NAFEO, educate more than one-third of all students of color in the United States. MSIs disproportionately address the needs of low-income, minority students while contributing significantly to generating a highly skilled workforce, developing civic and community responsibility, and producing citizens who are exceptionally attuned to the increasingly diverse country in which we live.

1.4.3 Hispanic Association of Colleges and Universities (HACU)



(From the organization web site at <http://www.hacu.net>)

The Hispanic Association of Colleges and Universities (HACU) was established in 1986 with a founding membership of eighteen institutions. Because of HACU's exemplary leadership on behalf of the nation's youngest and fastest-growing population, the Association rapidly grew in numbers and national impact.

Today, HACU represents more than 450 colleges and universities committed to Hispanic higher education success in the U.S., Puerto Rico, Latin America, Spain and Portugal. Although our member institutions in the U. S. represent less than 10% of all higher education institutions nationwide, together they are home to more than two-thirds of all Hispanic college students. HACU is the only national educational association that represents Hispanic-Serving Institutions (HSIs).

1.4.4 National Association for Equal Opportunity in Higher Education (NAFEO)



(From the organization web site at <http://www.nafeo.org>)

The mission of the National Association for Equal Opportunity in Higher Education (NAFEO) is as follows: to champion the interests of historically black colleges and universities (HBCUs) and predominantly black institutions (PBIs) with the executive, legislative, regulatory and judicial branches of federal and state government and with corporations, foundations,

associations and non-governmental organizations; to provide services to NAFFEO members; to build the capacity of HBCUs, their executives, administrators, faculty, staff and students; and to serve as an international voice and advocate for the preservation and enhancement of historically and predominantly black colleges and universities and for blacks in higher education.

NAFFEO was founded in 1969 by a group of HBCU presidents as the professional association of the presidents and chancellors of the nation's historically and predominantly black colleges and universities. NAFFEO represents approximately 500,000 students and their families. NAFFEO member institutions are public and private, 2- and 4-year, community, regional, national and international comprehensive research institutions, located in twenty-five states, the District of Columbia, the Virgin Islands and Brazil.

1.4.5 San Diego Supercomputing Center (SDSC)



(From the organization web site at <http://www.sdsc.edu>)

The San Diego Supercomputing Center (SDSC) was founded with a \$170 million grant from the National Science Foundation's (NSF) Supercomputer Centers program. From 1997 to 2004, SDSC extended its leadership in computational science and engineering to form the National Partnership for Advanced Computational Infrastructure (NPACI), teaming with approximately 40 university partners around the country. Today, SDSC is an organized research unit of the University of California, San Diego primarily funded by NSF with a staff of talented scientists, software developers and support personnel.

1.4.6 University of Houston Downtown (CSUDH) Center for Computational Science and Advanced Distributed Simulation (C²SDS or CCSDS)



(From the university web site at <http://www.CSUDH.edu/academic/colleges/sciences/ccsds/>)

The major goal of the CCSDS is to produce human resources in Computational Science - the science of man's problems using High Performance Computers. Another goal is to serve as a focal point for activities that will help produce a pipeline of better-qualified students to enter all programs offered at CSUDH. The Center assists the Computer and Mathematical Sciences Department in improving remediation and retention of Developmental Mathematics students. CCSDS also has programs to involve undergraduates in projects stemming from CCSDS research activities in the field of Advanced Distributed Simulation as well as internships and graduate school scholarships to selected students.

1.4.7 Indiana University (IU)



(From the university web site at <http://www.indiana.edu>)

Indiana University (IU) is internationally known for the quality of its academic programs and attracts students from all over the world. At the same time, IU plays a key role in the economic and social well-being of Indiana residents, offering educational, cultural, and financial benefits to the state. IU is home to one of the largest university-owned supercomputers in the nation, is known for its innovative leadership in high-performance computing and networking. IU's supercomputers support the university's efforts in the Indiana Life Sciences Initiative, as well as research in areas such as astronomy, business, chemistry, economics, earth sciences, and physics.

1.5 Site Assessment Team

Geoffrey Fox received a Ph.D. in Theoretical Physics from Cambridge University and is now professor of Computer Science, Informatics, and Physics at Indiana University. He is director of the Community Grids Laboratory of the Pervasive Technology Laboratories at Indiana University. He previously held positions at Caltech, Syracuse University and Florida State University. He has published over 550 papers in physics and computer science and been a major author on four books. Dr. Fox has worked in a variety of applied computer science fields with his work on computational physics evolving into contributions to parallel computing and now to Grid and multicore chip systems. His interest in education includes Internet delivery of courses and development of new curricula for interdisciplinary studies. He has worked on the computing issues in several application areas – currently focusing on Defense, Earthquake and Ice-sheet Science and Chemical Informatics. Parallel computing on multicore chips is a major research focus. He is currently Vice President of the Open Grid Forum responsible for eScience. He is involved in several projects to enhance the capabilities of Minority Serving Institutions (MSIs) including three funded by National Science Foundation (NSF) CI-TEAM playing a lead role in the MSI Cyberinfrastructure Empowerment Coalition (MSI-CIEC). His role in these is linking MSI's to the international Grid and computational science communities.

Russ Hobby is the Chief Technical Architect of the End-To-End Performance Initiative for Internet2. Russ has long been active in the research and application of networking participating in the development of the Internet from its early days. He was one of the primary network architects that developed the Bay Area Regional Research Network (BARRNet), the NSF funded regional network serving Northern California in the late '80s and early '90s. In the Internet Engineering Task Force (IETF) Russ formed and chaired the Working Group responsible for the Point-to-Point Protocol (PPP). He served on the first IETF Internet Engineering Steering Group (IESG) as the Applications Area Director. Under his direction on the IESG, Internet standards were developed for multimedia email (MIME), real-time protocols to support applications such as desktop conferencing and some of the framework for what has become the World Wide Web. Russ worked with the group that led to the creation of the Internet2 Project. He participated in the formal creation of Internet2 and

co-authored the Internet2 Architecture and Engineering documents. He has continued to work closely with the Internet2 Project and is currently on assignment to Internet2 from his home campus, the University of California, Davis, to help with Working Group procedures and to assist the Engineering Area. He has helped lead California's part of Internet2 through his role in the Corporation for Education Network Initiatives in California (CENIC) and its CalREN-2 network.

Karl Barnes was formerly the Director for Information Technology for the National Association for Equal Opportunity in Higher Education (NAFEO) and currently works as a consultant representing NAFEO as a co-PI on the Minority Serving Institutions Cyberinfrastructure Institute (MSI-CI²), and the Minority Serving Institutions Cyberinfrastructure Empowerment Coalition (MSI-CIEC) grants. Mr. Barnes has worked in the information technology field for over twenty (20) years for various private sector companies including International Business Machines (IBM), General Electric (GE), the MITRE Corporation, and the Telvent Corporation. Karl holds a bachelors degree in electrical engineering from Howard University, and masters degrees in computer engineering and computer science from Syracuse University and Johns Hopkins University respectively.

Richard Aló is the Executive Director of the Center for Computational Sciences and Advanced Distributed Simulation and Executive Director for Grants and Contracts in the College of Sciences and Technology at the University of Houston-Downtown. He has held these positions since 1995. He earned his MA and Ph.D. in Mathematics with minor in Computer Science from the Pennsylvania State University in 1965. He has held his current position of Professor of Computer and Mathematical Sciences at the University of Houston-Downtown since 1982. From 1982 to 1995, he was Chair of the Department of Computer and Mathematical Sciences at UHD. He has served on several advisory and executive boards, including the Mathematical Association of America's SUMMA Committee (Support for Undergraduate Minority Mathematics Awareness), Association of Departments of Computer and Information Science and Engineering at Minority Institutions (founding member), Coalition for Diversity in Computing (Chair and also founding member), National Science Board NSF GRPA Committee and Multi Sector Crises Management Center, Board of Directors, Washington. He chaired two national conferences for ADAMI and co chaired the Richard Tapia Celebration of Diversity in Computing Symposium, Houston, 2001 and the Education Committee for Supercomputing 2002. Dr. Aló was selected as the 2002 Educator of the Year by the Hispanic Engineer National Achievement Awards Conference (HENAAC). He has published over 200 research papers and graduate text, Cambridge University Press. Recent areas of investigation include Automatic Decision Making (Artificial Intelligence), Object Recognition (Facial Expression and Gesture Analysis), and Fuzzy Logic. His primary research and educational interests are computational science applications, grid computing and cyber infrastructure tools, automated reasoning and decision making. He is currently PI on the NSF CI-TEAM Implementation award Minority Serving Institutions – CyberInfrastructure Empowerment Coalition (MSI-CIEC), co PI on the NSF Broadening Participation award, Computing Alliance for Hispanic Serving Institutions, and co PI on NSF Broadening Participation in Computing award, Advancing Females to Professoriate in Computing (FemProf).

Ongard Sirisaengtaksin is an Associate Director of the Center for Computational Sciences and Advanced Distributed Simulation since 1995. He is also a Co-Director of Grid computing Laboratory at the University of Houston-Downtown. He received a Ph.D. in Applied Mathematics from University of Texas at Arlington. He has held his current position of Professor of Computer and Mathematical Sciences at the University of Houston-Downtown since 1986. His research areas of interests include artificial neural networks, fuzzy sets, intelligent control systems, multi-agent systems, parallel computing, 3D modeling and visualization, singular perturbations, and stochastic differential systems. He has published over 60 research papers. He currently serves as PI on the NSF CI-TEAM Implementation award Minority Serving Institutions – Cyber-Infrastructure Empowerment Coalition (MSI-CIEC), Co-PI on the NSF S-STEM award, Undergraduate/Graduate Student Immersion in Computer Science, Technology and Mathematics, Co-PI on the NSF Major Research Instruments award, Acquisition of a Computational Cluster Grid for Research and Education in Science and Mathematics, and co PI on NSF OCI- SDCI award, From Desktops to Clouds -- A Middleware for Next Generation Network Science.

Ray Lopez is the Chief of Technology and Innovation for the Hispanic Association of Colleges and Universities (HACU). He has held the position since 2009. Prior to joining HACU, he worked as lead system engineer at a large financial institution, a senior consultant with IBM and EDS, and as a technology director for two startup companies. As a consultant, he worked on a very wide variety of projects with corporate, government, and military clients across the globe. These projects included designing and deploying systems for document management, knowledge management, enterprise resource planning, and collaboration, as well as change management consulting. As a technologist, he possesses extensive knowledge and experience on network architectures, server and workstation administration, software engineering, open source software, and mobile computing. Prior to entering the consulting business, he was a research scientist in pharmacology, studying the neurochemistry of depression and anxiety, behavioral genetics of Alzheimer's disease, and neurochemistry of pain and analgesia. He holds Ph.D. and M.S. degrees in behavioral neuroscience from the University of Texas at Arlington, and a B.A. degree in psychobiology from The University of Texas at Austin.

1.6 Assessment Methodology

The assessment was conducted via the assistance of several technology experts with specific expertise in computing and networking infrastructure, applications, CI research, CI education, and strategic planning. On June 23, 2011, these subject matter experts (SMEs) conducted an on-site survey. The tools used by assessment team included:

- On-site Interviews with key personnel in different usage categories (i.e. administrators, educators, students, support personnel, outside contractors)
- Tours of relevant facilities

Through tours of campus facilities and interviews with principal administrative personnel and faculty, the SMEs gathered information concerning the college/university's readiness for implementation of cyberinfrastructure strategies for research in the following areas:

- Computing capacity
- Information Technology infrastructure/security
- Faculty and Staff Development/Training
- Curriculum Development
- Research and Education Collaboration

The site visit team used the information gathered to make strategic recommendations to the campus that are documented in this report.

2. Subject Area Assessments

The following sections contain greater detail of the assessment team's findings.

2.1 Campus-wide Infrastructure

CSUDH uses a mixture of CAT5e, CAT6, and fiber optic connections for their campus network. The campus has a 1 GB ring topology with 100 MB connectivity to each desktop. The campus also features a 40 MB wireless Aruba network servicing approximately 10,000 wireless devices many of which are laptops provided to faculty by the university. Interviews with staff indicated a major concern with eliminating security vulnerabilities arising from the use of mobile devices. LAN security is currently provided by the open source directory services product OpenLDAP. CSUDH is currently in the process of outsourcing much of its LAN services to a Microsoft Active Directory based LAN that includes Microsoft Exchange email services that resides within the infrastructure of a SAAS provider.

CSUDH recently completed an ambitious project funded in part by their electric utilities provider to consolidate over 100 servers in their on-campus data center to a VMWare-based virtualized infrastructure requiring only three (3) blade chassis, and a single storage area network (SAN). This project has drastically reduced the power and cooling requirements of the on-campus data center, and has paved the way for CSUDH to replicate their servers to a Stanislaus, California data center facility, allowing for rapid re-deployment of essential campus services in the event of a disaster. Moving to virtual servers has also allowed the CSUDH IT department to generate revenue by allowing other university concerns that would normally purchase hardware directly from a tier-one vendor to purchase an equivalent virtual server from the CSUDH IT department without purchasing any actual new hardware. All university faculty members have VPN access to university resources from outside the campus. CSUDH recently replaced their Cisco PIX border firewalls with the Juniper appliances and have also replaced their anti-SPAM software product with an IronPort appliance to combat an increase in spam-related emails. The campus uses a traditional PBX-based phone system that, according to campus administrators, is expensive to maintain due to the lack of companies able to provide support to older systems.

According to several campus administrators, many of the students who attend CSUDH do not have access to their own computers. The university compensates for this by making an unusually large number of university computers available to students in several computer labs.

Table 1: CSUDH Computer Labs as of 2007⁴

Lab Locations	Number and Type of Equipment
WH D160 (Open Lab)	108 Dell computers, 6 iMacs
WH C155 (Classroom Lab)	50 Dell computers
WH F144 (Classroom Lab)	41 Dell computers
WH F146 (Classroom Lab)	24 Apple Macintosh workstations
WH F154 (Classroom Lab)	27 Dell computers



Figure 1: CSUDH Computer Lab
(Photo Courtesy of CSUDH)

CSUDH has approximately 200 smart classrooms referred to as Enhanced Technology Classrooms (ETCs). Each room may include an Extron switching system control panel, a flat screen monitor on a movable arm and/or ceiling mounted LCD projector, an on-board computer in a secure podium with connections for laptop, an Epson high-resolution projector, wireless internet access, document camera, audio system with amplified speakers, and VHS/DVD playback capability.



Figure 2: CSUDH Enhanced Technology Classroom
(Photo Courtesy of CSUDH)

⁴ Bergmann, Ronald, F., Ed.D., *Department of Information Technology Status Report Jul-Dec 2007*, California State University, Dominguez Hills, January 4, 2008.

2.2 Administration/Support

Dr. Mildred Garcia became president of the university in August 2007. The key priorities under her leadership are:

- Prepare students to live, work and learn as active and contributing members of a global society, within an urban context.
- Improve our community's quality of life through interdisciplinary programs that explore culture and diversity, anticipate and meet future educational demands, and create intellectual capital.
- Build a solid educational foundation in the Arts and Sciences with the goal of meeting our students' and the South Bay's urgent needs.
- Develop innovative programs that stimulate economic vitality across the region and California.
- Develop and support programs that address the health and welfare of California specifically and of society in general.
- Develop under-represented students' skills and knowledge in critical science, technology, engineering and mathematics (STEM) areas key to competing in the 21st century.
- Partner with diverse communities to improve access to and preparation for quality education and academics.
- Explore green initiatives, commit to the use of renewable resources, and develop sustainable programs that meet local and state needs.⁵

The goal of developing the STEM skill set of under-represented students carries particular importance because interviews with staff indicated that remediation of students at CSUDH is a problem particularly in the subjects of English and mathematics.

An organization chart of the Office of Information Technology is below.

⁵ *California State University Dominguez Hills, Honoring our History, Forging our Future, Strategic Plan 2010-2015*, California State University Dominguez Hills, 2010.

Office of Information Technology Organization Chart

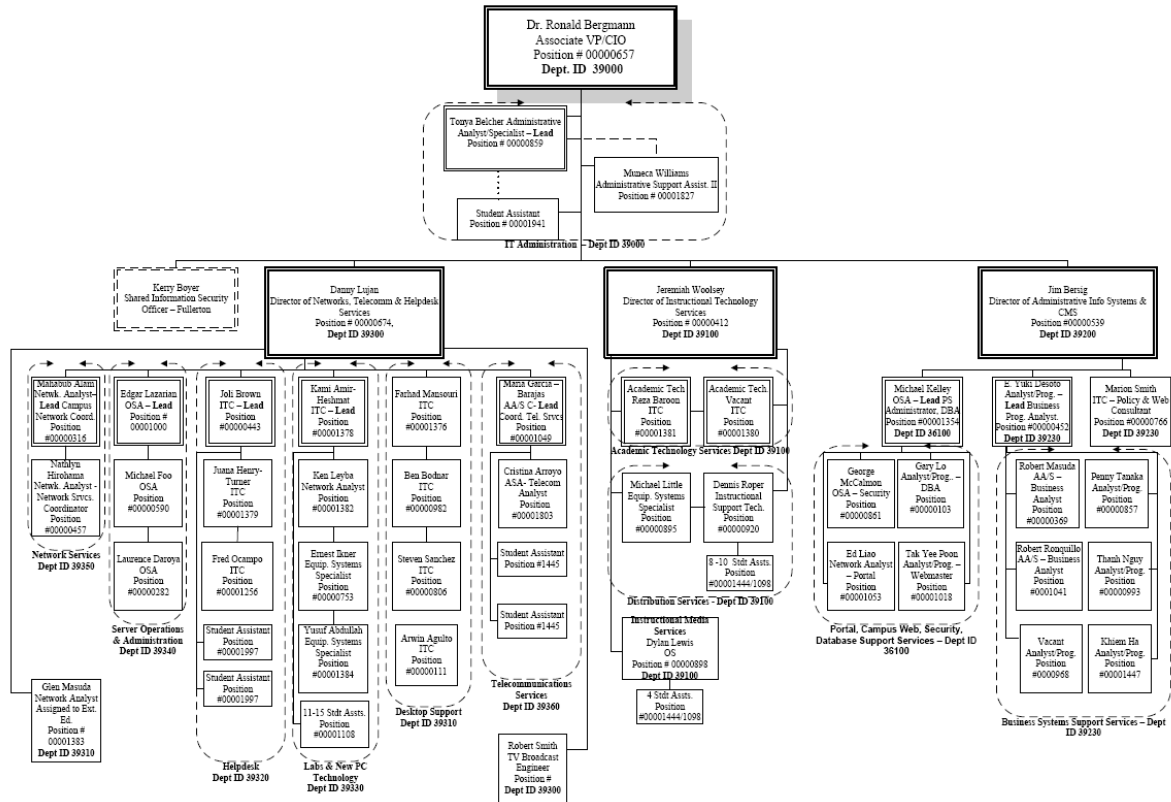


Figure 3: Office of Information Technology Organization Chart

Dr. Ron Bergmann has assumed the position of Associate Vice President of Information Technology/Chief Information Officer. Dr. Bergmann organized an Infrastructure Services Group that offers campus-wide email, telephone, lab, and network services. Six (6) units comprise the group:

- The IT Help Desk provides assistance for students, faculty, and staff to configure personal equipment for accessing university resources. This is a rare resource for most universities but represents forward thinking on behalf of campus leadership in recognizing the inevitable convergence of devices for both work and personal use and the potential security vulnerabilities incurred.
- The Desktop Support group supports only state-owned devices used by faculty and staff.
- The Labs Technology group supports students using the university’s lab equipment.
- The Network Services group supports both the university enterprise network and the campus wireless network.

- The Server Administration group supports the university's administrative servers (i.e. PeopleSoft, database, website, email).
- The Telephone Systems group supports the university's PBX infrastructure.

CSUDH uses a Help Desk Automatic Call Distributer (ACD) telephone system to accommodate multiple service call requests. Also in use is an On Call Program (OCP) that provides after-hours enterprise support for major system outages requiring escalation such as the Blackboard, email, website, and PeopleSoft systems. Multiple departments are trained to respond to help desk requests which helps provide timely service. Help desk staff are also provided with Blackberry mobile phones to allow for rapid notification of problems.

2.3 Staff Development/Training

Professional development, training and faculty support is a key component of the IT of any institution. It is of limited benefit to have the hardware and software available if faculty and staff do not know how to use them in ways that span the range from mundane to novel. It is when the staff and faculty are trained and experienced with the technology that they can begin to see how the technology can assist with transforming the way they do things, and to identify innovative new applications. The campus then stands to gain significantly from the technology - in making an administrative process more efficient, improving how faculty teach or conduct research, or providing new ways for students to learn.

CSUDH appears to have a robust training initiative aggressively conducted primarily through the IT department. Monthly and bi-weekly technology meetings are common at the university in addition to the annual "Technology Days" event. Examples are:

- The annual "Technology Days" event that involves the entire university.
- Bi-weekly meetings between IT directors representing all the entire California State University system.
- Monthly Blackboard user group meetings
- Annual technology best practices pedagogy workshop

An online academy was created to disseminate teaching best practices. One problem mentioned was that faculty attendance at training sessions is at times sparse.

2.4 Curriculum Development

Curriculum development at CSUDH as at most universities and colleges is primarily the purview of the campus faculty with direction from the administration and assistance from support staff. In general, there are three types of curriculum development with technology, (1) technology to enhance or broaden current courses, (2) complete online adaptation of current courses for distance education courses, and (3) original curriculum developed

specifically with content on topics about or requiring the use of technology, e.g., computational science courses. CSUDH uses the Blackboard eEducation Academic Suite Learning Course Management System (LMS), to provide in-classroom (web-enhanced) and distance education capability for online course support. Data on the number of online courses offered was unavailable however approximately 12% of both full- and part-time students perform either some or all of their coursework online. The business and arts departments were mentioned as being leaders in online teaching with other departments lagging behind. The arts department was emphasized as having significant growth due to the lucrative entertainment industry in nearby Los Angeles.

A recent national survey of campus computing departments indicated that an estimated 50% of courses at four-year public institutions use such web resources. These resources enhance course delivery by providing course information, syllabus, lecture notes, assignments, office hours, class cancellations, etc., and email communication with the instructor. Full online courses are much more difficult to implement.

Entirely new curriculum using technology may be developed to expand course offerings perhaps to provide students with a new aspect of the field or to insert a new topic into an existing course. This is often the case for developing computational science or other curriculum following an active and inquiry-based learning pedagogy. Here the students learn by doing, by using the technology, such as simulation, modeling or analysis tools.

The Instructional Technology unit provides instructional design work and assistance creating course materials. It was also reported that CSUDH makes use of the MERLOT portal for development of online and hybrid courses. CSUDH has also retained the services of an educational consulting organization to investigate how to integrate the Elluminate/Blackboard Collaborate system to build an online virtual campus.

2.5 Research and Education

The university's Office of Research and Funded Projects provides support for faculty who are able to obtain grant funding for research. The office helps faculty find funding for their research suggestions, assists with formulating and submitting applications, proposals, project schedules, and budgets, as well as identifying needed technologies. Once funding is obtained, the office assists faculty in managing their grants by pro-actively monitoring the project schedule and budget to ensure compliance with milestones and prevent budgetary overages. During interviews, it was mentioned that it would be beneficial for the research office to provide more assistance in grant writing. Also, faculty mentioned having little time for searching for grant opportunities, and that the university provides little additional funding for grant recipients.

CSUDH has research grants from the National Science Foundation and National Institutes of Health as well as indirect funding from the Department of Energy. Research staff includes our five full time faculty members, one emeritus faculty member, one part time faculty member, and two full time Research Physicists. CSUDH is a member institution of the BOOMERANG (cosmic microwave background), Super-Kamiokande (neutrino observatory

and nucleon decay experiment), K2K and JHF-SK long baseline neutrino oscillation experiments, the Laser Interferometer Gravitational Wave Observatory (LIGO), and CHICOS (Ultra-High Energy Cosmic Ray) collaborations.⁶

Much of CSUDH's research activities center around student involvement. As an example, the College of Natural and Behavioral Sciences at CSUDH has instituted a Minority Biomedical Research Support program (MBRS) with the goal of infusing a biomedical research culture into the science departments at CSUDH thereby making biomedical research an important component of research culture at the institution. This grant funds twelve (12) undergraduate research assistant positions. On admission to the program, MBRS RISE students are integrated as research assistants into active research laboratories at CSUDH, Los Angeles Biomedical Research Institute at Harbor-UCLA, and Charles R. Drew University of Medicine and Science. Students select a research mentor who will establish a nature and scope of the research project best suited to the student's level and interests.⁷

CSUDH also sponsors many opportunities for students to present their research activities both on-campus and statewide.

⁶ *Research Projects*, College of Natural and Behavioral Sciences Physics Department, California State University Dominguez Hills, <http://www.nbs.csudh.edu/physics/projects.html>, July 2011.

⁷ *Minority Biomedical Research Support Program*, College of Natural and Behavioral Sciences, California State University Dominguez Hills, <http://www.nbs.csudh.edu/mbrs/mbrs.htm>, July 2011.

3. Conclusions/Recommendations

CSUDH has one of the more advanced MSI campuses that have been surveyed by MSI-CIEC. The virtualization technology introduced by Dr. Bergmann has placed the university in an advantageous position for reducing maintenance costs and advancing disaster preparedness. The new library facility is impressive for a university of any size.

Based on the results of the assessment, MSI-CIEC makes the following recommendations:

- Replace the current PBX phone system with an VoIP-based system. This will reduce maintenance costs due to the elimination of the redundant dedicated phone network, as well as eliminate the need for a separate service provider to maintain the system. Also, staff assigned to provide on-site support may be reassigned to other support functions to decrease the workload on the existing help desk and support staff.
- The on-campus CI Day event was sparsely attended, which is typical of events held during the summer. MSI-CIEC recommends that an additional event be held during an academic semester in order to involve more faculty and students.
- MSI-CIEC supports Dr. Bergmann's suggestion of creating a program to instruct and give certificates in IT support to liberal arts students. These certificates can be awarded based on industry-standard certificates, such as CompTIA A+. Graduates holding such certificates would be valuable to the many high-tech firms in the Southern California region.
- Encourage talented STEM students to apply for the NSF Robert Noyce Teacher Scholarship Program which provides funds to institutions for providing scholarships for applicants wishing to pursue STEM faculty positions at K-12 institutions. Consult the website http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5733 for more information.
- Extend the use of adjunct faculty to conduct courses remotely. As an example, MSI-CIEC helped pair Elizabeth City State University (ECSU) with Indiana University (IU) in order to allow IU to remotely conduct classes on the ECSU campus in cloud computing.
- Enhance the campus curriculum to encourage faculty and student development and participation in CI, such as, having a faculty member or team develop a course in CI or e-Science tools and technology (see Dennis Gannon's, Indiana University, course at <http://www.extreme.indiana.edu/~gannon/b649/649-gannon.htm> for an example). The TeraGrid High-Performance Computing (HPC) University activity and several summer schools in Grids/CI may also be very valuable. The MSI-CIEC team can help make connections with other academics and organizations, e.g., TeraGrid, to assist in this matter.

- Explore ways to increase faculty time for engaging in research, grant development and professional development; perhaps through the use of part-time faculty and teaching and/or graduate student assistants to lessen the teaching load.
- Promote and support more on- and off-campus research and education collaborations, particularly interdisciplinary collaborations between computer scientists and other scientists and scholars in order to raise the profiles of campus principal investigators.
- Promote and support attendance at national conferences and participation in national associations for faculty and staff professional development, particularly for those who are willing to be a campus resource and present back to the campus what new information or knowledge was obtained.
- Expand use of project collaboration tools such as Wikis, WebEx desktop sharing, and other types of web portals. These tools promote document collaboration and configuration management in a superior manner to shared network drives and email. These tools can also be used to organize document repositories for past and sample work products (e.g. proposals, budgets, work breakdown schedules, etc.) as well as build management workflows based on best practices.
- Schedule demonstrations (preferably interactive or hands-on) of existing on-campus tools to promote awareness of these resources.
- MSI-CIEC encourages CSUDH to select a “CI Champion(s)” – persons who can provide ideas and expertise to faculty, researchers, and students across the continuum of partner institutions. Dr. Mohsen Beheshti would make an excellent candidate for this role.

A. Cyberinfrastructure Day Report

The following report was prepared by Dr. Julie Foertsch, evaluator for the MSI-CIEC project.

Evaluation of the California State University-Dominguez Hills CyberInfrastructure Day

Held on June 24, 2011

Summary by Julie Foertsch, Leading Edge Evaluation & Consulting

One June 24th of 2011, the Minority Serving Institutions Cyberinfrastructure Empowerment Coalition (MSI-CIEC) hosted a CyberInfrastructure Day at California State University-Dominguez Hills, the goals of which were to:

- 1) Increase interest among CSU-DH faculty and staff in using CI applications in teaching and research;
- 2) Provide them with information on various CI resources and applications available to them;
- 3) Increase their interest in writing or collaborating on CI-related proposals.

The CI Day event had 17 attendees from CSU-DH of whom 13 responded to our online evaluation survey, for a response rate of 76%. The relatively low attendance for this event is likely because it occurred during the summer when many faculty and staff were absent. This report summarizes the feedback we received from respondents about CI Day and their cyberinfrastructure interests.

1. Respondents' background and the impact of the 2011 CI Day on their CI awareness and interest:

The 13 respondents whose feedback is presented here include 4 tenure-track faculty (33% of the total) and 1 non-tenure-track instructors (8%), 3 IT/computer support staff (25%), 4 other administrative staff (33%), and 3 students (25%). When asked, "Before attending CI Day, what was **your level of experience with cyberinfrastructure and high performance computing,**" the responses were the following:

- 53.8% (7) = I had never explored using CI in research or teaching. (1 pt)
 - 15.4% (2) = I had explored using CI in teaching or research but hadn't implemented it yet. (2 pts)
 - 15.4% (2) = I had used some CI in teaching or research but am a relative novice. (3 pts)
 - 15.4% (2) = I consider myself fairly experienced at using CI in teaching or research.(4 pts)
 - 0.0% (0) = I am an expert at using CI in teaching or research. (5 pts)
- average = 1.92

Survey respondents were then asked, "After attending this event, which statement best describes your position on the relevance of cyberinfrastructure to the work/teaching/research that *you* do?"

The 29 responses seen below show that a clear majority of respondents are ready and willing to work with others in developing CI usage within their department or research group:

61.5% (8) = I can see a lot of relevance and am willing to work with others on finding resources or developing applications. (3 pts)

38.5% (5) = I can see some relevance, but don't have the time/resources to pursue it. (2 pts)

0.0% (0) = It doesn't seem relevant now, but it might be in the future. (1 pt)

0.0% (0) = I cannot see how it will ever be relevant. (0 pts)

average = 2.62

Comments:

- I was only able to participate in the Friday afternoon sessions.

2. Responses to particular CI Day sessions:

Survey respondents were asked to indicate which CI Day sessions they attended and their interest in learning more about or getting involved in the efforts and programs described. Table 1 shows their responses.

Table 1: How respondents to the CSU-DH 2011 CI Day Survey described their **attendance at and interest in particular CI Day sessions.**

CI Day session	I attended this	I found this helpful	I want to know more	I want to get involved in this ASAP	Total N
Opening Keynote by Geoffrey C. Fox: Overview of Cyberinfrastructure and the Breadth of Its Application	81.8% (9)	36.4% (4)	9.1% (1)	9.1% (1)	11
Computational Science Education, by Bob Panoff	63.6% (7)	45.5% (5)	18.2% (2)	9.1% (1)	11
GIS and Geo-referenced Data and Education, by Jeff Sale/Diane Baxter,	72.7% (8)	27.3% (3)	27.3% (3)	0.0% (0)	11
TeraGrid, by Scott Lathrop	63.6% (7)	45.5% (5)	27.3% (3)	9.1% (1)	11
OptiPortal, by Greg Hidley	72.7% (8)	45.5% (5)	27.3% (3)	18.2% (2)	11
Strategies, Initiatives & Research Opportunities at the National Science Foundation, by Richard Aló	83.3% (10)	33.3% (4)	0.0% (0)	8.3% (1)	12
Cluster Computing, by Henry Neeman	61.5% (8)	61.5% (8)	15.4% (2)	0.0% (0)	13
Desktop Virtualization, by Ron Bergmann	66.7% (8)	50.0% (6)	33.3% (4)	8.3% (1)	12

CSUDH Faculty Presentations	81.8% (9)	18.2% (2)	9.1% (1)	0.0% (0)	11
Open Discussion on a strategic plan for CI that meets CSUDH student & faculty goals	80.0% (8)	20.0% (2)	0.0% (0)	10.0% (1)	10

Comments:

- I found the noontime presentation by Dr. Alo most helpful.
- Regrettably I could not attend all sessions. These presentations were informative and would be outstanding for faculty members during the academic year.
- Great presentations and was very informative
- I thought this was a very rewarding day. I had the opportunity to learn quite a few things that I was not aware of about Cyber Infrastructure

When asked for **suggestions for how to make events like this more useful**, the responses were the following:

- To be held during academic year. This one was held during summer and we could have more faculty members involved
- They should be offered during the academic year,
- Make it available during the academic year.
- Have more presentations.
- Have them more often.
- It's OK as it is

3. Follow-up opportunities in CI:

When asked, **“What do you see as the main obstacles to people in your department or college moving forward in exploring or developing the use of cyberinfrastructure?”** most respondents, as usual, emphasized time and money. All responses are below:

- Time
- Time
- Too much workload
- There is not enough faculty commitment to contribute to the development of new ideas.
- Budget
- Resources
- It would be beneficial for faculty to hear the presentations and learn how the use of cybertechnology could advance their research efforts as well as provide state-of-the-art opportunities for students. Also, create "new" learning models.
- Lack of knowledge about what cyber-infrastructure is.

In spite of these challenges, 8 of 13 survey respondents indicated that they could “see a lot of relevance for CI and am willing to work with others on finding resources or developing applications.”