

University at Albany Information Technology Services

Information Technology Services (ITS) provides centralized computing and communications services to faculty, staff and students. Approximately 130 full-time staff are employed in ITS.

Campus Network Infrastructure: The University at Albany has installed, operates and maintains a robust fiber optic network which spans its four campuses, connecting over 130 fiber optic-attached Ethernet segments supporting more than 19,000 ports or connections. The campus network consists of a collapsed backbone router with a combination of 100 and 1000 Megabit (Mbps) links to buildings. Distribution to the desktop is a combination of switched 10/100/1000-Mbps Ethernet.

The network includes interconnections with several local, regional and national networks including NYSERNet, SUNYNet, Commodity Internet and Internet 2 via a NYSERNet connection to Abilene. The campus Internet (I1) is composed of two diverse paths; the primary at 200 Mbps and the secondary link at 100 Mbps. The Internet2 (I2) link is 250 Mbps.

Construction of a regional fiber optic infrastructure connecting the four UAlbany campuses (Uptown, Downtown, Nanofab and East campuses) to each other and to Internet2 and the commodity Internet was completed in September 2005.

Wireless Access. There are currently 500+ Cisco wireless access points deployed throughout the podium, libraries and in the Campus Center uptown. The Downtown and East campuses are completely wireless. All new installations are 802.11n compliant which augment our previous 802.11a/b/g deployment. All academic departments are wireless.

Residence Halls Network. All residence halls have wired and wireless connectivity to the Internet at 500 Mbps.

Remote Access. UAlbany provides remote access to off-campus users via a VPN appliance and SSL VPN client. The user must have an ISP connection. UAlbany does not support dial-up service for access.

Telephony. Voice services are provided through 18 NEC distributed IP-PBX's with over 15,000 active ports for faculty and staff. Voicemail is provided by NEC UM8500. The university supports over 14,000 DID unique numbers. Local and long distance is provided under the NYS OGS contract by Paetec. E911 service to resident students, faculty and staff is provided to our University Police Department. VoIP is provided in University Hall and all new locations.

Centralized Hardware Systems. The University at Albany deploys and manages over 200 servers in two data centers located in CS-9 and the Management Services Center. These servers run a variety of operating systems (IBM AIX, Sun Solaris, Microsoft Windows Server and Linux) and house all University-wide development and production applications used by students, faculty and staff. The majority of these servers run in a virtualized VMWare server environment and all servers make use of a centralized NetApp disk storage system.

Information Commons/Virtual Information Commons. Library information services and technology come together in the University's Information Commons (IC). Located in the University Library, Science Library and Dewey Graduate Library, the IC is the result of a collaboration between the University Libraries and ITS. The IC provides a rich array of resources and finding tools, computer hardware and software, as well as research and technical assistance. A common image of the University's licensed

academic software is available to students, faculty and staff. This allows the community to access the programs they need from any of the three University Libraries, or from off-campus locations using the Virtual Information Commons. A new service still in its early stages, the Virtual Information Commons provides members of the campus community with access to most of the same software programs available in physical locations from anywhere with an Internet connection.

The ICs are staffed with ITS Student Technology Consultants who provide technical assistance; reference librarians are available in all three locations. Both wired and wireless access is available in all libraries, and laptop computers can be borrowed from the Circulation Desk. These innovative spaces provide a learner-centered environment composed of individual workstations and areas for group work, as well as breakout rooms equipped with technology tools for practicing presentations or engaging in group study projects.

See <http://library.albany.edu/infocommons/> for additional information.

High-tech Multimedia Classrooms. The University at Albany has more than 100 centrally scheduled state-of-the-art, high-tech, multimedia classrooms, located on the Uptown and Downtown campuses. The podiums provide touch screen control of video and sound systems and contain computers, VCR/DVD and projection facilities. The capability also exists to plug-in an instructor's laptop. Many of the larger rooms contain document cameras. In addition, all of UAlbany's classrooms are wired for faculty Internet access. Numerous departmentally scheduled classrooms, including those on the East Campus are similarly equipped. UAlbany has videoconferencing capability in Humanities 290, the Life Sciences Research Building and University Hall. Videoconferencing capabilities will soon be available in Husted Hall on the Downtown Campus.

Applications Development. The University at Albany maintains both custom and commercial applications to support the administrative needs of the University. The Oracle/PeopleSoft Student Administration package provides support for Admissions, Student Records, Student Financials and Financial Aid. The Oracle/PeopleSoft Human Resources module is also in use. Other commercial packages supported by ITS include DARwin for degree audits, Resource 25 for classroom and event scheduling, and Datatel Colleague to support the Development Division and the University at Albany Foundation. Nolij Web is used to image documents that are received in the Graduate and Undergraduate Admissions offices and then are electronically shared with Advisement Services and the Registrar. The University has contracted with TouchNet to provide electronic payment capabilities to students as well as enabling offices to have an electronic "store" allowing them to take payments for tickets and/or events. In addition, we have custom applications for many other offices most notably Parking Management, the Student Loan Service Center, IFR Financials and All Funds Reporting. An open source portal, LifeRay has been implemented to allow students, faculty and staff seamless access to many of their IT applications using single sign-on.

Web Support. ITS provides support and services to the University's web builders in academic departments, research centers, and administrative offices. RedDot Content Management System has been deployed to many departments to allow non-technical staff in departments to easily maintain their web pages.

Research IT Group. The mission of Research IT is to develop core services in support of research, including high-performance computing, for grant seeking and funded researchers. The Research group works closely with each of the other ITS units, and with school and departmental-based research IT staff, to fulfill its mission.

The group is charged with supporting the entire research IT life-cycle: Early in the process, pre-grant, the group serves as a resource during grant discovery by providing IT consulting, assisting in IT impact assessment, overseeing integration into the existing infrastructure and serving as an external IT interface coordination resource. Upon award, the group assists in facilities setup and configuration by managing the coordination of IT resources, assisting in software acquisition, licensing, porting, and integration as well as providing setup, integration and testing services. During the production phase of the grant lifecycle full service systems management and ongoing software consulting and porting is provided. At the end of the grant cycle decommissioning services are available to assist in sun-setting systems, software and other IT infrastructure and recycling of central research IT resources into discovery or other grants.

Currently the following resources are directly involved in support of investigative activities:

Prometheus - Dell x86_64 Linux Cluster: x86_64 Linux cluster that consists of 10 Dell PowerEdge 1850 servers each of which have two 3.2Ghz EM64T "Irwindale" processors with 2MB of L2 cache and 4GB of main memory and are connected to the main computational network segment with gigabit Ethernet connection for shared storage and internet access. This cluster provided the University's initial OSG presence and serves as a general compute resource for various disciplines. More specifically, it is used for research in nanoscience in the use of large-scale computer calculations to study matter at the atomic scale. These calculations are based on the Density Functional Theory of electronic structure which is a methodology for solving the quantum mechanical equations for the many-electron problem. One important application area is to problems in molecular transport. Studies in this area are closely tied to experimental efforts aimed at developing electrical interconnects consisting of molecular wires. The use of theoretical calculations serves to guide and interpret experimental results. As such, calculations serve as a "virtual laboratory" in which information can be gained which may be difficult or impossible to obtain experimentally.

Genesis - Dell x86_64 Linux Cluster: Gen*NY*sis' x86_64 Linux cluster consists of 17 Dell PowerEdge 1850 servers each of which have two 3.4Ghz EM64T "Irwindale" processors with 2MB of L2 cache and 4GB of main memory and are connected to the main computational network segment with gigabit Ethernet connection for shared storage and internet access. In addition the RIT Group manages several deep compute quad-cpu systems and web application servers for the center. The Gen*NY*sis Cancer center at SUNY - Albany nurtures a wide variety of research areas in bioinformatics that can be broadly grouped under Algorithm development, Data mining and knowledge discovery and the development of web-based bioinformatics applications. Computational methods are essential tools for efficient data mining from the vast amount of genomic data. The primary research focuses on developing such tools and using them for knowledge-discovery in the center's own research, and also making them accessible to the biomedical research community via web-based applications.

Balrog - Dell x86_64 Linux Cluster: Albany's x86_64 Linux cluster consists of 17 Dell PowerEdge 1850 servers each of which have two 3.4Ghz EM64T "Irwindale" processors with 2MB of L2 cache and 4GB of main memory and are connected to the main computational network segment with gigabit Ethernet connection for shared storage and internet access. This cluster supports the research of Dr. Kevin Knuth. Research on this system focuses on several research areas including applying Bayesian methods to characterize and model Planetary Nebulae. These models are essential for obtaining gas density, which is relevant to the generation of organic molecules; developing Bayesian Source Separation algorithms to identify and characterize the many species of organic molecules now known to populate interstellar clouds.

Athena - Dell x86_64 Linux Cluster: Albany's x86_64 Linux cluster consists of 9 Dell PowerEdge 1850 servers each of which have two 3.4Ghz EM64T "Irwindale" processors with 2MB of L2 cache and 4GB of main memory and are connected to the main computational network segment with gigabit Ethernet

connection for shared storage and internet access. This cluster is dedicated to the NYSGrid consortium pilot project as well as the Open Science Grid.

Apple G4 OS X Cluster: Albany's Apple G4 cluster consists of 73 Apple Xserve nodes each containing 2 G4 processors. This cluster is attached to a dedicated switch via gigabit Ethernet and has multiple 100Mbps connections to the university backbone. This system primarily supports research in bioinformatics and protein folding.

Hermes – Dell x86_64 Cluster: Albany's latest cluster consists of 12 Dell PowerEdge 1950 servers each with dual quad core E5320 1.86Ghz "Clovertown" processors with 8MB of L2 cache and 16GB of main memory. This cluster adds to the general-purpose computational cluster resource pool and is used by several disciplines. An example of the type of computation is statistical modeling of infant mortality using population based parametric mixtures of logistic regression.

The RIT group also manages several individual research group servers that are used for specialized computation or web delivered applications. The group also supports virtual servers for those researchers that need a dedicated server for smaller applications.

Online Storage: Research group storage is backed on two Dell MD3000i iSCSI disk arrays each providing 22TB of raw disk storage. File services are provided by 3 Dell 1950's which provide NFS, Windows sharing, and backup services to our systems and clients. Storage backups are also run in parallel to disk and LTO3 tape for disaster recovery. These file services are utilized by 233 of our own systems, 300 research clients, and 75 research groups.

Computational Data Network: The data network supporting the Research IT systems consists of three stacked 24 port Cisco gigabit Ethernet switches that have an aggregate bandwidth of 4Gbps back to the university core router. All of the research computational resources are attached directly to this network for optimal performance.

Information Security: The University maintains an active information security program modeled on ISO/IEC 27002. The program is authorized by the President of the University and is outlined in the University's Information Security policy <<http://www.albany.edu/its/Security.htm>>.

The program is under the direction of a dedicated Information Security Officer who reports to the OCIO. The current ISO holds the following professional certifications: CISSP, GIAC GSEC and GCWN.

The program consists of governance and operations activities. On the governance side, the campus Information Security Council meets quarterly to review information security issues from an institutional perspective. Members are drawn from major data owners and stakeholders, such as the Office of Human Resources, the Registrar, Accounts, Office of University Counsel, as well as others. The Council is active in policy development and issues reports and recommendations concerning the University's information security posture.

Information security operations derive from policy and consist of a wide range of technical, administrative, and physical controls designed to prevent and detect loss, damage or exposure of campus information assets while preserving the confidentiality, availability and integrity of these critical resources.

University at Albany Computer Science Department

The Computer Science Department provides individualized services to faculty and graduate assistants in support of teaching and research. There are two departmentally managed hands-on teaching labs (one graduate and another for undergraduate class use) and numerous individually-managed rooms for faculty and graduate student research work. Information Technology Services provides additional computational access and computing resources in the Information Commons.

Servers of the CS department provide remote file sharing and centralized accounts management, departmental email, faculty and student web pages, remote access gateways to computational and document processing and printing resources and domain name service for two class B subnets. Server images and filesystem snapshots are staged on disk storage or are backed up to DLT and/or LTO tape. These services may be run natively or in a Solaris zone or in a VirtualBox image and hosted on any of the following hardware: three HP dx2000 PC's, four quad-CPU Sun E450's, a dual-CPU Sun E250, three dual-CPU SunFire 280R's, a SunFire v20z or two quad-CPU SunFire v40z's. Storage is available from four Sun StorEdge 3500's.

Departmentally-managed faculty desktop computers are either SunBlade 150 workstations or HP dx2000 MT PC's. Twenty five adjunct instructor and student teaching assistant desktops are configured using SunBlade 100 workstations and Dell Optiplex Gx260 PC's. Administrative support is provided using two Dell Optiplex 755 PC's running MS Windows XP professional. System management involves the use of a Dell Precision 330 PC and a Sun Ultra 30 and a Sun Ultra 60 workstation. Systems support staff have additional PC's, workstations and servers for experimentation and system service redundancy.

The graduate student lab has 30 dual core 3Ghz Pentium 4 PC's running Linux (and including a VirtualBox MS Windows XP image). The undergraduate lab has 27 1.8Ghz Pentium 4 IBM NetVista 6790 PC's that provide simple, graphical remote access to central ITS servers. Eight similar NetVista PC's running Linux provide a "kiosk" like browser environment for post-advisement online student registration.

Black and white network printing is available from an HP 4250, an HP 4100, two HP 4050's, an HP 4000, a multifunction HP 3055 and a Lexmark Optra T-612 laser printer; all with duplex capability. Color printing is available from an HP 4550 networked laser printer. Two flatbed scanners are accessible for imaging.

The Department has two portable projectors for classroom instruction and colloquium presentations. Three Intel based laptops and an Apple Powerbook provide miscellaneous mobile computing. To promote distance collaboration, a Polycom teleconferencing station is available.