

## Vice President for Information Services and Technology

Information Services and Technology (IS&T) was formed out of a merger of Information Systems (IS) and Financial Systems Services (FSS) in November 2003, after the retirement of Professor James D. Bruce as vice president for information systems, a position he held for the past 20 years. At that time, Dr. Jerrold M. Grochow was hired as MIT's vice president for information services and technology. With the merger of the two departments came not only a new leader and department name, but also an expanded focus on service in consultation with the community and collaboration with the many other groups on campus providing computer facilities and support.

IS&T supports MIT's core mission—to advance knowledge and educate students in science, technology, and other areas of scholarship that will best serve the nation and the world in the 21st century—by working in partnership with the Institute's faculty, students, and staff to maximize the value of information technology to their work. IS&T focuses its activities through the lens of the following strategic themes:

- Service orientation: understanding the goals and missions of the people and organizations at MIT to foster a collaborative environment for solving problems and planning for future information technology needs;
- Technological innovation and leadership: generating the ideas and experiments that will lead to the next generations of IT services;
- Excellence in project execution and management: on-schedule, on-budget delivery of hardware and software systems that meet or exceed client expectations;
- A high degree of fiscal responsibility coupled with sound financial management;
- Personnel development: giving each member of the IS&T community the opportunity to contribute to the full extent of his or her capabilities.

Computer and information technology services at MIT are provided by many different groups, and IS&T's responsibilities as the centrally funded organization in this environment are many and varied. IS&T provides "commons" services such as the cross-campus data network and connectivity to the internet, high-capacity data storage and backup, server hosting and operations, the primary MIT email and calendar systems, third-party software acquisition and support, the Athena computing environment including software and hardware, cable television, and the MIT telephone system. IS&T staff are also responsible for the development and operation of major "enterprise systems" such as Systems, Applications, and Products in Data Processing (SAP) financial and human resources systems, payroll, and underlying e-commerce capabilities. IS&T provides support to many individual faculty and students in the use of information technology in teaching and learning. In general, IS&T activities range from strategic planning at the MIT-wide level to operational support at the departmental and individual levels. Many products and services are provided with no "chargeback" to departments, laboratories, and centers (DLCs). Others, such as telephone and network services, are provided on a cost-recovery basis following government accounting rules. Several services, such as web development, training, and

some third-party software delivery, are charged directly at prices designed to recover the accounting costs of these services.

For many members of the MIT community, their first contact with IS&T is through a request for support or service. In a typical week, IS&T receives over 2,000 requests for help and service changes. These requests range from upgrading telephone and network service to installing a new office computing environment, assisting faculty in using computers in their teaching, and supporting major MIT strategic initiatives such as OpenCourseWare and the HR/Payroll Project. Faculty, students, and staff in DLCs interact with IS&T in many obvious ways each day: They call the Computing Help Desk with Macintosh, PC, Linux, and UNIX hardware or software questions, or with questions about business applications. Members of the community also rely on IS&T in more intrinsic ways. When anyone at MIT turns on a computer—in an office, in an Athena cluster, in a lab, or in a dormitory room—and sees the network; when anyone enters a transaction into the Institute’s financial system; when someone picks up a telephone receiver and hears a dial tone; when someone backs up the documents and data on their computer to storage systems in the data centers in Buildings W91 and W92 or otherwise uses the servers in these data centers, they are interacting with IS&T.

Two major events on campus are noteworthy because of the participation of IS&T. The Genome Center of the Whitehead Institute was integrated into MIT and renamed the Broad Institute. The Stata Center for Computer, Information, and Intelligence Sciences was opened as the new home of the Computer Science and Artificial Intelligence Laboratory, the Linguistics Department, and the Laboratory for Information and Decision Systems. IS&T staff from several different disciplines participated in the success of these projects in the areas of network connectivity, telephony, software licensing, financial systems conversion (from Oracle to SAP), and desktop support.

IS&T also faced a different kind of challenge this year. In January 2004, as part of a significant administrative staff reduction throughout the campus, IS&T initiated the single largest layoff at MIT—over 60 staff members at all levels—to achieve an almost 20 percent FY2005 budget reduction versus FY2004. This began a reorganization process that continued through the remainder of the fiscal year. The IS&T Competency Group worked closely with IS&T leadership and the Human Resources Department to design and implement a process that focused on institutional as well as individual needs for both laid-off and retained staff. In conjunction with budget reductions, layoffs, and change in leadership, IS&T reorganized its operating units from a matrix structure to that of a more traditional hierarchy. This reorganization included realignment of service areas, process changes, intense communication with staff and clients, and staff training. The goal is a more efficient organization that provides even better service in the future, albeit with fewer resources.

In addition to Dr. Grochow, IS&T leadership is provided by five directors with direct responsibility for key activities:

- Academic Computing: Dr. M. S. Vijay Kumar
- Administrative Computing: Wayne T. Turner

- Client Support Services: Greg Anderson
- Operations and Infrastructure Services: Theresa M. Regan
- Telephony Services and IS&T Shared Services: Allison F. Dolan

The first two groups provide expertise and applications for two major activities on campus: academic applications and consulting, and enterprise-scale administrative applications. Although IS&T does not directly provide research-oriented applications, the Operations and Infrastructure Services group runs MIT's common computing and network infrastructure, which is critical for academic, administrative, and research activities. That group also operates central applications systems such as Payroll, SAP, and the Stellar course management system. The Client Support Services group helps members of the MIT community resolve day-to-day issues with information technology via the Help Desk, publications, and training. The Telephony Services group operates MIT's telephone system and will be providing additional telephony services such as integrated cell phone services and "voice over IP" service. All the IS&T groups will work with their counterparts in departments, laboratories, and centers to ensure an integrated approach to providing information services and technology across the campus.

This introduction provided just a few examples of the work done by IS&T staff during the past year to deliver high-value information technology services to the MIT community. Additional information about this work as well as highlights of other accomplishments follow. It is organized around five operational themes—client orientation, collaboration, sustainability, accountability, and professionalism—originally suggested by the executive vice president.

### **Client Orientation**

Client orientation is defined as listening to and understanding the service needs of the community and working with colleagues in the DLCs to resolve problems and streamline processes in support of the Institute's primary academic and research missions. Much of IS&T's work is aligned with this theme as we strive to create clear lines of sight between IS&T service providers and our clients. Major accomplishments within this focus are discussed in the following paragraphs.

As part of a multiyear plan to capitalize on MIT's investment in the SAP "enterprise" system, the following additional subsystems were implemented: a fully integrated human resources module to replace a stand-alone legacy system; payroll processing for pension plan members that integrated payroll with benefits information; a training and events management module that will be an integral component of MIT's expanded environmental health and safety management system; and, with sponsorship by the Provost's Office, a system used by the deans' offices in each school to centrally store human resources and financial information on faculty chair appointments.

IS&T continued to improve its frontline support for the MIT community. During fiscal year 2004, Help Services created over 64,000 cases in Casetracker, an increase of almost 14,000 from the previous year. On average, phone calls were answered in well under a

minute, and approximately two-thirds of the cases were resolved in less than one day. Based on weekly satisfaction survey samples, clients rated their Help Desk experience at 4.55 on a scale of 1 to 5.

We continued to revise, update, and migrate IS&T web pages to provide a client-centered approach. During the year, there were over 1.3 million hits to the IS&T web pages, a 15 percent growth over last year.

Tablet PCs (11) were evaluated as teaching tools by faculty in Civil and Environmental Engineering, Architecture, Urban Studies and Planning, Materials Science, Math, Brain and Cognitive Sciences (BCS), Foreign Languages and Literatures, and Chemistry. In addition, support was provided to BCS for the introduction of tablet PCs into their curriculum.

The Spatial Data Project was particularly active, providing services such as server configuration and tuning to support ArcGIS tools; the opening of a joint MIT Library/IS&T GIS lab in Barker Library; teaching GIS in 1.963, 11.423, 12.000, 12.114 EAPS, 12.114 EECS, and 21H.580 (web mapping); and consulting on a newly released campus map.

The *Ed Tech Times*, an electronic newspaper (<http://edtech.mit.edu/times/>), replaced the paper *Insider* to provide a forum for the MIT academic community to announce and discuss these developments whenever and wherever they occur throughout MIT.

During the year, the Departmental IT Resources team provided local IT support for 26 service-level agreements and deployed 773 desktops, 66 laptops, 22 servers, and 54 printers as part of the renewal and deployment program for administrative computer users. In addition, the team is now providing preventative maintenance services for 27 departments and 350 users.

The publications group coordinated the publication of a new column in *Tech Talk* called *Digitalk*, containing IT tips and news for the community.

IS&T Usability Services made great strides this year, working with 31 different groups, many of these involving repeat consultations and several different projects.

IS&T presented 480 training session events attended by 2,712 members of the community.

The Adaptive Technology for Information and Computing team provided services to almost 150 new customers in FY2004 and loaned a total of over 250 devices to clients.

Mail service upgrades included an improved spam screening solution with Bayesian filtering technology as MIT continues to deal with the ever-increasing spam problem; a Citrix service to provide migration paths for Macintosh clients moving to OSX from MacOS 9 (Citrix provides a method for Macintosh OSX customers to use the key applications currently unavailable under the latest Macintosh operating environment);

new functionality and performance improvements to the upgraded Webmail service; integration of MIT's enterprise calendaring service with Microsoft's Outlook product.

IS&T maintained the systems running the VM/ESA operating system to support administrative clients such as Payroll, Admissions, and Property with only one unplanned VM outage all year. It also maintained the Tivoli Storage Manager (TSM) product for desktop backup, supporting almost 4,000 machines and approximately doubling the amount of data stored from the previous year.

We continued the development of Request Tracker, the open source trouble ticket system replacement for the home-grown Casetracker system and began development of a frequently-asked-questions knowledge base that is tied to the Request Tracker trouble ticket management system.

In Q3, the Software Release Team reported almost 9,000 software downloads per month and the production of over 20 software releases during the year. Visits to the Software download site continued to increase by almost 20 percent over the previous year. Approximately 20 software licenses were negotiated during the year, including the Google search engine agreement, renegotiating the Network Associates virus protection software agreement and Matlab (1,342 licensed users, plus distribution to all Athena users).

The IS&T Academic Computing group continued to provide students and faculty with a modern computing environment for their educational needs: 160 Athena workstations were replaced during the year; 24/7 access to hardware and software resources for education was provided in 15 Athena spaces and four computer classrooms. Several traditional Athena clusters were redesigned to pilot different approaches to support student computing needs. Selected locations include the [W20-575D](#), [56-129](#), 51-075, and Hayden Library clusters.

We continued the laptop loaner programs, supporting several classes and serving 183 students. Professor Ian Hunter, Hatsopoulos professor of mechanical engineering, and Dr. Barbara Hughey reported that the Laptop Loaner support provided to their course [2.671 Measurement and Instrumentation](#) helped them win the Bose Award for Excellence in Teaching and an Infinite Mile Award, respectively.

The Language Laboratory and Hyperstudio in the School of Humanities and Social Sciences Equipment Grant also received \$30,000 toward new equipment acquisition to upgrade and expand these facilities for providing support to faculty and students in developing and using rich media material for courses.

The TEAL project received approximately \$30,000 for hardware needed to "iLab enable" introductory physics labs for 8.02 and 8.01.

Software developer support was provided to the Metamedia project in the School of Humanities and Social Sciences for using Open Knowledge Initiative (OKI) interfaces to make the project available as a service to the MIT community. This effort is seen as a first

step toward a service transition strategy for select Institute-funded faculty educational technology projects.

The Telephony Services team negotiated new carrier contracts for local, long-distance, international services, and calling cards. This will result in savings for MIT departments as well as an improvement in services.

All staff and faculty were added to the NameConnector, an automated voice-response operator assistance tool from Parlance Corporation, a company founded by MIT graduates.

The Data Warehouse team continued to broaden, deepen, and further integrate the data available to the MIT Community. Major additions this year included the new SAP/HR data, additions to Environment, Health and Safety (EHS) Lab Management data and EHS Training Registration data, student cumulative GPA, student required and completed units and subjects, Student Advisor Data, Financial Aid Federal Work Study data that included off-campus work time sheet records, federal work-study positions, jobs, and organizations.

The Stellar course management system, developed by the Academic Media Production Services (AMPS) department and supported by IS&T, continues to grow in popularity, supporting 4,000 students with 364 sites (284 classes, 24 SMA, 63 MUST) as of spring 2004. Direct feeds have been implemented to move data from the Registrar's Office and Data Warehouse (class lists, student photographs) into Stellar.

Many other IS&T projects and activities also reflect our client orientation and response to specific client needs. The following are examples of initiatives and services implemented with substantial input from the client community: HPC—Computationally Intensive Computing; the Teaching with Technology Web Page; Direct Broadcast Satellite on MIT Cable with connections to dormitory housemasters and common areas; Emergency Alert System remote terminals in Campus Police and Facilities dispatch areas; agreement with MTV to carry MtvU, a new free MTV service for universities; enabling student groups and campus organizations to accept payment via credit card; initiating Request Tracker (RT) hosting, to pilot the Libraries' "Ask Us" help service; and now offering automated software update services (vendor-released patches) for Windows and Linux—Red Hat Enterprise.

## **Collaboration**

Collaboration is teamwork across organizational units within the institution as well as across institutional boundaries. IS&T's goal to be viewed as a partner and collaborator to all IT groups on campus and with colleagues on other campuses is evidenced by the activities discussed in the following paragraphs.

The SAP team worked with business and technical staff at Lincoln Lab, the Controller's Office, Human Resources, Institutional Research, the Dean's Office, MIT Medical, and other DLCs to develop and expand the usefulness of SAP applications.

IS&T continued work with other academic institutions and SAP AG to develop solutions for deferred pay and human resources workflow functionality within SAP.

In partnership with Student Systems Information and Technology, IS&T provided a new web-based system for graduate student appointments and financial aid that is used by academic departments across the Institute.

IS&T staff implemented e-commerce initiatives with Purchasing/CAO (Apple in pilot, GovConnection catalog upgrade; and electronic invoicing for Dell and Minuteman Press), Sloan Management Review, Professional Institute, Deshpande Center, AMPS, Center for Real Estate, Copy Technology Centers, Alumni Association, the Libraries, and several student activities.

In cooperation with the HR Benefits Office, we completed the development and testing of the benefits enrollment data format for electronic submissions to the Tufts Health Plan.

We collaborated with leading technology vendors such as Microsoft, Sun, and Apple to improve the Kerberos standard and introduce new features in the MIT Kerberos implementations for all major platforms (Windows, Mac OS X, and Unix/Linux).

In collaboration with Student Information Services and the Department of Athletics, Physical Education, and Recreation, the Data Warehouse team automated a process to integrate records of student athletes.

IS&T's web consulting and publishing teams are working with Academic Media Production Services and the Publishing Services Bureau to create a collaborative model for information sharing, resource allocation, and consistent client interactions in web design and development.

IS&T had over 70 web consulting projects, including 40 projects with units across campus on improved websites, operational management of web pages, and new services. Of particular note are the new Sloan Management Review site and MIT World; the Medical website won a national award, and the Procurement and Parking websites were recognized for excellence on campus.

We participated in and facilitated the move of on-campus training out of the W89 Professional Learning Center into W92 and the move of key client-facing IS&T services out of W20 into N42—the creation of a consolidated service center for the client community.

IS&T Training teamed with Human Resources Organizational and Employee Development to create an Institute-wide training advisory group, Employee Development and Training.

We continued the IT benchmarking effort on campus with the Help Desk Benchmarking initiative with Stanford University. This project moved to an operational status with ongoing conversations with Stanford counterparts.

IT Security staff worked closely with Human Resources, Audit, and Procurement to respond to the exposure of social security numbers in March and to assist members of the community with infrastructure security issues.

Telephony Services, working with CAO/Procurement, negotiated the first MIT contracts with cell phone providers. Departments will now have the opportunity to save money by aligning their staff with the right plans.

IS&T coordinated and supported the work of 28 IT user groups across campus, including 6 new user groups created during FY2004. Almost 350 user group meetings were held during the year, and we continued to partner with and support the work of MIT IT Partners.

Sakai course management system collaboration with the University of Michigan, Indiana University, and Stanford University leverages the work of OKI and provides direction for the ongoing work of Stellar. Mellon Foundation funding for Sakai was approved in December.

Interaction with the MIT Libraries DSpace project in their policy committee, architecture design, and OKI OSID integration was funded by the Mellon Foundation.

The OKI team has participated in industry standards setting via IMS (<http://www.imsproject.org/>) and in other individual educational technology initiatives, including Penn State's LionShare (Peer to Peer Collaboration tool; Stanford/IU/UMich Navigo (web-based assessment tools); Canada Edusource (Distributed Learning Object repositories), and the University of Virginia Fedora Project (Digital Library system). Some of these initiatives will become part of MIT's suite of educational applications. Other noncommercial groups with whom OKI has engaged include the JISC/CETIS eLearning Infrastructure Initiative; Australia's DEST eLearning Infrastructure Initiative; the Open Source Portfolio Initiative; the Middlebury College Harmoni project (PHP bindings of OSIDs). Commercial engagements with OKI include Sun Microsystems, Apple Computer Corporation, Giunti Interactive Labs, and Microsoft Corporation.

Many IS&T staff participated in MIT's planning of emergency plans and security with Campus Police and other MIT departments.

## **Sustainability**

IS&T is committed to maintaining an information technology infrastructure that provides the foundational capabilities needed to support the changing teaching, learning, research, and business needs of the Institute. IS&T's goal is to ensure that the MIT infrastructure is reliable, sustainable, and secure, and that it does indeed "stay the course," which is a key descriptor of the operational theme of sustainability. Much of

IS&T's ongoing work centers on keeping the Institute's IT services running, as well as renewing and improving those services. Key accomplishments are discussed in the following paragraphs.

We completed the new single mode fiber plant in early spring 2004. It is providing service across the entire campus and vastly increases the ability to deliver high-bandwidth, diverse communication services across the campus.

Continued improvements to campus network infrastructure include the following: rewired existing buildings and connecting additional buildings to the MIT network (Building 48 rewired; East Campus dormitory rewired; Bexley dormitory rewired; Building NE47 wired to MITnet; Stata Center wired and connected to MITnet); converted Chemistry private network to standard MITnet service; installed gigabit free space optics technology units between E19 and NE20, NE25 upgrading their MITnet connectivity from a 1.5Mb/s to 1Gb/s; expanded MITnet wireless coverage on main campus to include buildings 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 16, 18, 56, and 66; added partial MITnet wireless connectivity to the public spaces in Random Hall, Ashdown, Burton-Conner, MacGregor, New House, and Next House; upgraded the first MITnet backbone link to 10Gb/s as part of the effort to completely upgrade MITnet backbone to 10Gb/s; and added a VPN service to support MIT users accessing MITnet from off campus and needing a consistent set of policies to their network accesses.

IS&T made major strides in our commitment to the users of Microsoft Windows at MIT, including the following: grew the central WIN.MIT.EDU Windows 2000 domain to include over 40 DLCs and nearly 1,000 member workstations and servers; worked with the community to identify early WIN.MIT.EDU deployment problems and developed solutions to facilitate clients migrating to the central windows domain in seven departmental labs (Department of Urban Studies and Planning, Department of Architecture, the Sloan School, MIT Libraries, Department of Mechanical Engineering, the Materials Laboratory, and Department of Chemical Engineering) and one student residence lab (Sidney and Pacific) on 151 machines. Several IS&T teams helped Institute offices migrate to Windows 2000 from 148 Windows NT4 servers, with 40 still requiring action.

We completed migration of the TSM backup service from the VM system to UNIX servers, removing dependency on the mainframe and improving performance and functionality.

A campuswide telecommunications room study was completed in collaboration with MIT's Facilities Department and Western Telecommunications Consulting.

IS&T business recovery capability was reviewed in detail, resulting in a number of action items to be addressed in the coming year.

Also, as part of its work to sustain the MIT computing environment, IS&T maintained 250 centrally managed servers in three on-campus data centers to support academic and administrative computing with central print services, colocation facilities, and

production job support for mainframe application while reducing per-server support costs by about one-third, deployed 860 computers to keep administrative systems users across campus operating effectively, and supported over 100 databases for administrative and academic customers.

## **Accountability**

Accountability is necessary to hold everything together. Accountability exists only when deviation from standards, obligations, and commitments is measured, and when it is both organizational and personal. Significant IS&T work in this thematic area follows.

IS&T leadership focused on how to meet client needs given the financial constraints that the organization and the Institute are facing in the coming year.

IS&T management at all levels has initiated efforts to improve project management methods, discipline, and training across IS&T.

The “Six Conversations” Performance Management process is being introduced to better align management and staff work objectives.

Central Authorizer services added authorizations for DLC HR administrators, EHS, and Web Grad Aid as well as reviewing Primary Authorizers, staff department changes, and termination notices for staff.

The Environmental Protection Agency Consent Decree deadline of June 18, 2004, was met by providing the Management System website and manuals on time.

We continued to produce weekly help services “dashboards” to provide at-a-glance measures on performance as an outgrowth of the Help Desk Benchmarking initiatives.

The telephone and network pricing project was initiated, primarily to review and set rates for FY2006. In addition to reviewing actual prices, pricing strategy is being reconsidered by looking at how various services are packaged and who is charged for those services. Commercial competitive services and other higher education pricing strategies are being considered, as well as internal costs. A User Pricing Committee, bringing together key users from across the campus, has been formed to work with the internal IS&T team in developing a revised strategy.

## **Professionalism**

By professionalism we mean striving for leadership across all the professions that define us beyond our roles at MIT. IS&T staff serve as professional leaders in many ways and in many organizations.

IS&T has always presented itself as a technological leader in the higher education community. IS&T staff participate in, contribute to, and often play key formal and informal leadership roles in various professional and industry organizations, such as

IVY+ groups, Internet2, EDUCAUSE, the Common Solutions Group, NERCOMP, College and University Information Security Professionals, the Boston Consortium, the Internet Engineering Task Force security and calendaring standards groups, Syllabus, SIGUCCS, ACM/SIGDOC, the New England Information and Technology Managers Group, the 5E Private Owners Association, the SAP International Higher Education and Research Conference, the Human Resources College and University Personnel Administration Conference, and the Association for Telecommunications Professionals in Higher Education, among others. In addition, staff provide advice on a regular basis to corporations such as Microsoft, Apple, Dell, Sun, Lucent, and Oracle via membership on corporate advisory boards or through ongoing consulting relationships, and they collaborate with a wide range of other vendors and outside groups.

We worked with members of the ITAG and ROLES Administration teams, presented on “MIT’s Centralized Authentication and Authorization Systems” in a teleconference that included SAP and members of Americas’ SAP Users’ Group.

IS&T hosted the data warehouse for Association of American Universities Data Exchange, a consortium of research universities.

The *Educause Quarterly* magazine named the article “Management by Fact: Benchmarking University IT Services” as its Contribution of the Year. This article is based upon the MIT/Stanford Help Desk Benchmarking effort.

IS&T Academic Computing group staff presented to national and international audiences interested in eLearning and educational technology initiatives about MIT educational technology strategy, OKI, OCW, and so on.

IS&T is proud of its achievements over the past year and is committed to moving forward and continuing to improve in each of these areas in the coming year.

**Jerrold M. Grochow**  
**Vice President for Information Services and Technology**

*More information about Information Services and Technology can be found on the web at <http://web.mit.edu/ist/>.*