

**Office of the Vice President and Chief Information Officer
Summary of Activities 2007-2008**

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In 2006, we began the process of reorganizing the IT-related critical functions around four themes: Collaboration; Access; Alignment; and Hardening and Securing Core Infrastructure Services. That organization continues to be useful and this year's annual report is again organized primarily around those four themes. For each theme, we provide a brief review of the theme, a report on major milestones that mark our progress, and identify the challenges and strategies that lie ahead. In addition, we identify areas of improvement/lessons learned that cut across all areas.

Collaboration

Universities that figure out how to incorporate collaboration into their institutional DNA will be the leaders going forward. The importance of collaboration takes several forms:

- Promoting collaborative learning
- Fostering collaboration between units
- Expanding collaboration with external partners

Goal: Create an environment that supports the full range of collaborative activities of U.Va. faculty, students, and the extended U.Va. community.

2007-2008 Milestones

- In the summer of 2007, the Collaborative Learning Advisory Committee recommended adoption of a Sakai-based course management/collaborative learning environment. To that end, ITC deployed "UVaCollab" in pilot mode for the 2007/2008 academic year. The response has been positive, with approximately 613 courses and 1437 collaborative web sites created to date. In addition, the Secretary of Technology continues to use UVaCollab to support approximately a dozen of his committees at significant savings to the Commonwealth.
- We continued to make investments in staff/organizational development and in creating an IT culture that is collaborative and change oriented. ISDS, the Library, and the President's Leadership group have all participated in organizational/professional development exercises lead by the consultants that we have been working with in ITC. The shared perspectives that come out of these exercises offer tremendous opportunity to work collaboratively across organizational boundaries. Of particular note, the collaborations between ITC and the Library around academic support and user services have accelerated as our staffs begin to share a common language and set of tools for working together effectively.
- During 2007-08 we made progress towards the goal of transforming public computing sites into more flexible collaborative spaces. We are currently testing a virtual desktop software loadset in the Alderman Library public computer lab. This is a step towards creating a system where software can be delivered in a virtual environment to anyone who is authorized and has access to a computer

with an Internet connection. As we are able to de-couple public computing sites from access to specialized software, we move closer to using these physical spaces to support collaboration as the curriculum becomes increasingly team and project based. ITC is collaborating with Libraries, the Office of the Provost, Facilities, and Housing on a Libraries-led pilot project to redesign the fourth floor of Clemons Library as a technology-rich collaboration space to be ready for Fall 2008.

- In partnership with HR, ISDS, the Library, and the Student System Project, we are developing a more integrated help desk environment. This environment will include a single help desk phone number and common call processing and trouble ticket infrastructure.

2008-2009 Forecast

- During the coming year, we will move UVaCollab into full production and will begin transitioning users from the Toolkit to UVaCollab. We anticipate running both systems through 2008/2009 academic year and retiring the Toolkit before the 2009/2010 academic year begins.
- We will continue to provide organizational support to foster cultures of collaboration within ITC and across Grounds.
- During AY2008, we will evaluate the successes and lessons learned from the Clemons Library fourth floor and virtual loadset pilot projects. We will determine what components of those pilots can be scaled and applied to other collaborative spaces.
- We will implement a new and improved help desk structure supporting ISDS, ITC, and SSP. In the process, we will re-evaluate and clarify what we do and do not support. One of our current help desk challenges is that we tend to want to support everything. That is not possible and interferes with our ability to provide support for core systems in a timely fashion.
- We will build closer collaborations with select peer institutions around key initiatives. Currently, we are working with Michigan, Duke, Stanford, and Emory on issues of digital archiving and scholarly communication. These partnerships are likely to extend to relevant foundations (e.g., Mellon) and corporations (e.g., Apple Inc.).
- We will continue to expand the opportunity for faculty, staff and students to learn about new technology and the impact it can have on teaching and research. In May, we held the second annual “New Horizons” conference. This series of workshops attracted over 150 participants attending more than 18 sessions. In 2009, we will likely expand the workshop to include a specific focus on advanced computing (a.k.a., cyberinfrastructure) in support of research and scholarship.

Access

Increasingly, faculty and students expect to live in a world in which they have access to information and tools anytime, anywhere. Our challenge is to enhance the infrastructure to allow us to meet these expectations in ways that are secure and within our financial means.

Goal: Create an environment of ubiquitous access to appropriate IT resources for all core activities.

2007-2008 Milestones

- Progress was made in bringing the library's on-demand digitizing service into the Academic Information Space (AIS) environment. Two groups in the Library, Digitization Services of Scholarly Resources and Inter-library Loan Services, have now been enabled to transfer their scanning output into a user's My Workspace in Collab. A third group, in the Health Sciences Library, will be enabled soon.
- Last year, we noted that the on again off again merger talks between Internet2 and NLR were complicating the research network landscape. Unfortunately, not much has changed. Despite having similar missions and ambitions, the merger failed to happen. Both organizations are now pursuing independent, and still overlapping, agendas. We have continued to be active in both communities and believe that the wise choice for the immediate future is to retain membership on a year-to-year basis as we see how things unfold.
- In June 2008, the BOV approved the engineering firm for the new ITC machine room facility. The current schedule for the building calls for 270 days from the award to final bid documents. We anticipate another 18 months for construction and commissioning.
- Planning and designing the next generation storage architecture in collaboration with the Library and academic and administrative partners from across Grounds is underway. We have started to look into the possibilities for a lower cost middle tier of storage based on open source software and hardware solutions such as low cost RAID arrays and possibly ATA over Ethernet.
- With the expansion of our virtualized Windows-based environment and an approved pricing model for this service, we are making increased use of computer virtualization technologies in order to improve reliability of services and decrease power and cooling requirements. We have also started to use this environment to host Linux-based services.

- For several years, ITC, in collaboration with athletics and housing, has been pursuing enhanced cell phone coverage for the arena, stadium, and dorm areas. The goal is to have a minimum of 2 carriers (and preferably 3+) finance the cost of the infrastructure that enhanced cell coverage requires (approx. \$4.5M). Negotiations with Alltel have concluded successfully and they are currently installing their equipment in our spaces. Negotiations with ATT and Verizon continue, though the pending merger of Verizon and Alltel complicates the picture, as does ATT's accelerated deployment of their 3G network. Depending on how Verizon and ATT play out, we may need to adjust the scope of the project.
- During the fall, we deployed Exchange support for faculty and staff. Exchange provides an integrated calendar, email, and document sharing environment and provides enhanced support for mobile devices. In January, we moved all calendar accounts to Exchange. This transition was, by any standard, rapid and intentionally so. We moved that majority of users in a 3-week period and we saw an adjustment period of a couple of months as the system and the users stabilized. Part of the reason for doing a rapid transition was driven by the need to have multiple users converge on a single calendar system. But another part was driven by the need to find efficient ways of deploying new systems. The exchange rollout was used as a way of testing tolerances and developing practices that enable quick deployment. It was far from a perfect transition, but it happened in one sixth the time we would normally expect for a transition of its magnitude.
- During the fall of 2007, we deployed an emergency text messaging system and made changes to our mass notification email system to facilitate the rapid (i.e., less than one hour) delivery of emergency emails. Both systems performed well in the May "active shooter exercise," though it is important to recognize the inherent limits of both technologies. Neither text messaging nor email is architected to provide guaranteed delivery in a specific time frame. They both rely upon "best effort" protocols.

2008-2009 Forecast

- In collaboration with Library staff and Fedora Commons, we have designed and initiated the next phase of the AIS which is a project to create a Scholar's Repository and Institutional Repository based on Fedora. The first year of this multi-year effort will produce an initial but usable environment for the following two high-level use cases: 1) scholars creating, managing, and using digital content in their research and teaching (i.e., a Scholar's Repository), and 2) libraries creating, managing, preserving, and distributing digital collections (i.e., an Institutional Repository).
- We will continue membership in both Internet2 and NLR. We will continue to participate in Internet2 planning activities and will take a more active role in NLR through our membership in MATP. We will continue to pursue owned/controlled

fiber as we still believe that institutions that have direct control over fiber assets will be insulated from the Internet2/NLR turmoil.

- Move the machine room project ahead on time and on budget. In addition, we are exploring interim machine room capacity with commercial providers in the area, both as a possible way of getting access to more fiber out of Charlottesville and as a possible solution to an acute shortage of machine room space/power.
- Examine, prototype, and evaluate several middle-tier storage scenarios as part of the storage architecture work.
- Harden our virtualization infrastructure across two physical locations. This work should provide greater reliability for the growing number of virtualized services.
- We will complete the enhanced cell phone coverage project for the areas that include the stadium and the arena. We will continue to negotiate with ATT and Verizon with the goal of securing contracts that allow us to finance the extension of enhanced cell coverage to other areas of Grounds
- We will continue to improve performance of Exchange services and we anticipate growth in demand, particularly when the next iPhone and Mac OS 10.6 are released. Both of these devices will ship with native support for Exchange services. As the demand for Exchange increases, we will examine the feasibility of supporting IMAP on the Exchange platform and retiring current IMAP service. We will also apply the lessons that we have learned from the rapid deployment to future service transitions.
- Continue to enhance and integrate our emergency notification systems.
- We are committed to retiring the mainframe once the new student system comes fully online and releasing the funds that maintain the mainframe back to the University. One of the challenges that we face is finding alternative ways to support key institutional services that are not related to the student system but that do reside on the mainframe. The Office of Institutional Research, for example, currently does all of its analysis on the mainframe. We have initiated a project to identify those other services and expect to move all non-student system related mainframe activities off of the mainframe by the end of this calendar year.

Alignment

Information—its creation, preservation, dissemination, and application—is at the core of the mission of the modern research university. As such, it is vital that the information technology environment at U.Va. be closely aligned with the academic mission and priorities of the University, fully informed by technology trends and market forces.

Goal Summary: Create new and more effective ways for faculty, students, and staff to participate as partners in creating the vision and ambition for technology-enabled teaching, learning, and research at U.Va.

2007-2008 Milestones

- Going forward, one of the challenges that we face is to better align revenue sources with cost drivers. Communication services provide an excellent example. Currently, we derive revenue to support communication services from phone line charges. As voice and data converge, phone lines will disappear but the need to fund communication services will remain. We have been working with the CFO and the COO to examine alternative models and are on target to implement a new funding model for communication services within Agency 207 during the 2008/2009 fiscal year and are working with the individual units to minimize the disruptions to their financial practices. The model replaces the telephone line charge with an FTE-based annual fee. The model is, in the aggregate, cost neutral to the units and revenue neutral to ITC. It should do a significantly better job of aligning revenues with actual cost (i.e., providing access as opposed to use).
- We are committed to developing expertise in sourcing discipline. Many of the essential services that we provide have either already commoditized (i.e., they are standards-based with price being the major differentiator among providers) or are on their way to commoditizing. Email, both web-based and IMAP, is an excellent example of a service that now has robust standards and unit pricing that approaches zero. In close cooperation with the Alumni Association, we have begun outsourcing student email to Google and Microsoft. Under the model, students keep their UVA-branded email for life, but we will no longer be in the business of running student email servers. The full migration will be completed before the end of the year.
- The Microsoft Campus Agreement is a good example of sourcing discipline. In each of the last three year's, we spent a minimum of \$500K buying MS products that are now covered under the campus agreement at a cost of \$350K. Cost recovery of the license was the challenge. This was resolved by moving to an FTE based fee and student fee.
- On January 1, 2008 ISDS began reporting to the VP/CIO.
- An initiative to advance computationally-intensive science at UVa is underway. A faculty governance structure to allocate existing resources is in place. The third High Performance Bootcamp will be held at Virginia Tech this summer. Tiger Teams are being established to help researchers use advanced computational techniques. Seed funding has been made available by the Office of the VP/CIO and staff have been assigned by ITC. Additional funding will figure into the COFU addendum process in the Fall.

- A similar initiative to re-invigorate the digital humanities at UVa is underway. Faculty leadership has been identified, seed funding, technical staff, and space are being provided by the Library and the VP/CIO. Additional funding will figure into the COFU addendum process in the Fall.

2008-2009 Forecast

- Complete the communication funding model transition within Agency 207 and work with Agency 209 to determine whether the model fits their cost structures with possible transition during 2009/2010 fiscal year.
- Finish migration of all student and alumni email to Google and Microsoft. Continue to look for other sourcing opportunities.
- We will likely see more software acquisitions move in the same direction as the Microsoft Campus Agreement and will put increased attention into site licensing possibilities.
- Work to better leverage the joint reporting lines of ITC, ISDS, and (forthcoming) SSP. Ensure successful implementation and smooth transition of SSP to ISDS for the production phase. Leverage the alignment of all of these units with new reporting line to Provost.
- Growth in the Computational Science and Digital Humanities initiatives to be measured by COFU metrics.

Hardening and Securing Core Infrastructure Services

The University's core computing and communications infrastructure and the services that it delivers are an enabling foundation for much of the University's teaching, research, and administration activity. As the world in general evolves to depend ever more heavily on technology for all aspects of its life, so too does higher education. The University must provide an information technology infrastructure that has a level of redundancy and resistance to threats that is appropriate for the ambitions of the University.

Goal: Ensure that the University's information technology systems and services address emerging risks of system compromise and data exposure while continuing to move the University toward its goals.

2007-2008 Milestones

- Major storage system upgrades and hardening were completed this year including those used for electronic mail and our virtualized services. This work also included the ability to automatically replicate data between physical locations.

These storage upgrades build the foundation for our hardening plans for FY2008-09 where more of our services will use the newly redundant storage to recover quickly from a variety of potential disaster scenarios. During 2007-08 key network components were replicated such that the main university web cluster is now hardened and operational from two physical locations.

- ITC has worked with IBM Global Services to review the commercial market for establishment of a large scale performance testing environment. We have purchased performance testing software from Hewlett Packard. We continue to work with IBM Global Services on installation and implementation of the performance testing software.
- A new university-wide SSN usage policy has been implemented and departments have identified if/why they use SSNs and developed remediation plans.
- University departments completed the first three-year cycle for conducting risk assessments and developing security plans. As of July 1, 2008 all allocated staff resources were in place to begin enhancements to the risk management program and to invest sufficient time on security awareness.
- We continued to work on elevating the security of networks and services, by adding security improvements to the More Secure Network, deploying a wireless More Secure Network, and consolidating user password management into a single Web application.
- New University ID cards have been issued to all staff and students. For Agency 207, we followed enhanced identity proofing principles recommended by federal agencies. For Agency 209, standard procedures were followed.
- We implemented a new policy on Electronic Storage of Highly Sensitive Data clarifying specific requirements that must be met by all who store highly sensitive University data on individual-use electronic devices or electronic media.

2008-2009 Forecast

- We expect to have the testing environment operational by Fall 2008. The first system to be tested will be NetBadge and its interface to the new Student System.
- We will continue working with units to eliminate use of SSN except where required by law.
- We will continue to strengthen the security of our networks. Specifically, Network Security hardware from Nitro Security is nearing production status and will first be used to provide additional security for the Student System Project and the More Secure Network. A Wireless LAN (WLAN) auto-setup tool that eases the complexity of configuring a secure WLAN connection has been developed

and is presently in testing. The first stages on a new VPN infrastructure that enables users to access more simultaneous secure services is in production testing and should move to full production support.

- We have already started Identity Proofing for the incoming class of new students. During FY 2008-09 we will work towards increasing the percentage of people at the university who have completed the whole process and set their security questions during the deployment of the next phase of NetBadge. We will also identify a long-term solution for Identity Proofing in the academic portions of the Health System.
- The enhanced identity proofing process that we use for Agency 207 is based on a federal standard that requires collection of a government-issued ID number. Going forward, a new State law will prohibit that practice by July 2009. If this law is not changed, U.Va. will be unable to continue participating in the federal government's formal e-Authentication Identity Federation Initiative, which will disadvantage certain students, faculty and staff. We will work proactively with government relations and General Counsel to modify and/or adapt to changing legal conditions.