



NORTHWESTERN  
UNIVERSITY

## **FY16 Information Technology Planning Document**

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### **Supplemental Appendices**

Prepared for

the Information Technology community  
at Northwestern University (IT@NU)

Prepared by

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## Appendix I: Educational Technology Expanded Roadmaps

### *What have we just done? FY14 in review*

2014 was a year of significant change on many fronts. Blackboard was replaced after 15 years of use, MOOCs were launched, the Semester Online consortium was tried and ended, faculty engagement was high, and new support partnerships were developed.

*Engage with faculty and senior academic administration, fostering their innovative agenda and helping to shape the teaching and learning environment, to meet their identified needs.*

- In April 2014, the LMS Review Committee and ETAC finished an 18-month study, recommending the adoption of Canvas by Instructure as the University's primary educational platform. The successful planning by faculty, staff, and students has resulted in the ambitious one-year plan to transition from Blackboard Learn (on servers at NU) to Canvas (in the cloud) being ahead of schedule, with 59% of fall quarter classes having course sites on Canvas.
- In support of new investigations into online education, the Provost sponsored an initiative that supports faculty efforts with Coursera MOOCs. Since September 2013, 8 unique [Northwestern MOOCs](#) were launched on Coursera with 4 subsequent runs; 3 more new MOOCs and 3 reruns are slated for production and launch in 2015.
- Northwestern participated in 2U's Semester Online consortium program, providing synchronous, online, credit courses before the initiative ended.
- The Office of the Provost led the Distance/Online/Blended Learning Service Center Group effort, resulting in the development of a cross-unit Coordinated Service Center that brought resources together from different parts of the University (in instructional design, learning content production, information technology, Intellectual Property, and assessment) to support these faculty-driven projects.
- The Faculty Distance Learning Workgroup has recommended an expansion of investigations in blended learning at the University, focusing on experiments that serve Northwestern students.
- ETAC and the Northwestern Classroom Committee were active in planning and engaging faculty and students in the area of educational technology. Joint planning meetings have been occurring quarterly between ETAC and the Northwestern Classroom Committee. In FY15 these will lead to investigations for enriching services in NU's largest lecture classrooms.

*Continue to enhance the core learning platforms, both virtually and physically.*

- A dozen third-party educational applications have been licensed and integrated into the Northwestern instance of Canvas. The ease of integration of third-party applications into Canvas provides important benefits for the tailoring of our educational platform to the needs of various Northwestern learning communities.
- An initial learning analytics toolset has been developed for our faculty in Coursera MOOCs. This toolset has been designed (with the help of SOA principles) for repurposing to other educational platforms such as Canvas.
- Several of the early MOOC experiments have led to repurposing of the learning content and rethinking of classroom practices for on-campus Northwestern courses, with encouraging results. These efforts should continue with structured support provided by IT@NU.

- New classroom designs to encourage different interaction within class continue to be built. For example, SESP opened an active engagement classroom, and the Law School is constructing a hybrid learning classroom.
- A base set of WiFi services has now been provided to all 120 Registrar-scheduled classrooms on the Evanston Campus. Continued attention is needed in this area, as the number of devices and their possible uses expands rapidly.
- NUIT A&RT and staff from the University Library reviewed requirements for existing media management systems, and then targeted the in-house development system, MediaSpace, for retirement in FY15 in favor of a third-party product, Mediasite, and the Library’s Avalon systems.

*Transform the support network to align with the new pedagogical needs.*

- NUIT A&RT has redefined roles and expanded staffing for support of blended learning. Two Blended Learning Support Specialists were hired in FY14/15, and a Blended Curriculum Project Lead is being recruited this fall. The University provided new funding for the hiring of two Canvas Support Specialists, who came aboard in time for the big push from Blackboard to Canvas. Videographers in NUIT’s advanced media production studio (NUAMPS) led successful work in support of all of the Coursera MOOCs at Northwestern.
- The Coordinated Service Center actively supported the development of MOOC’s in a collaborative fashion across the activities of planning, production and support.

***What are we doing next? Expanded roadmap for FY15/FY16***

The educational landscape around us is still changing, the community is not unanimous in judgment of online opportunities, and the University’s response to it will continue to evolve, but we benefit today from the sharpening of a shared vision among many of our stakeholders. Our top priority is moving from the transition to Canvas to the larger task of supporting the transformation of Teaching and Learning at Northwestern: supporting faculty in instructional design and pedagogical experiments, adding new tools around Canvas, and prioritizing seamless access to resources. The following recommendations, which assume continued movement in current directions and tendencies, empower our faculty to experiment with and refine their commitments to blended learning, and they represent progress towards “digital integration [for learning] whereby the physical and the virtual worlds become seamless.”

*Engage with faculty and senior academic administration, fostering their innovative agenda and helping to shape the teaching and learning environment, to meet their identified needs.*

- Expand the existing Office of the Provost program in digital education, overseen by the Faculty Distance Learning Workgroup and the Coordinated Service Center, to include the support of faculty proposals for blended learning. Build partnerships with key faculty or programs in this next phase of program development; measure the learning outcomes for Northwestern students of these next-step experiments.
- Support a process to engage faculty in discussing and determining directions, priorities, and services in the area of learning analytics. Possible directions include individual systems to identify academic progress issues, course content engagement, and mapping of student team dynamics.
- Launch a joint workgroup to support investigation and pilots for improved designs for lecture halls.

*Continue to enhance the core learning platforms, both virtually and physically.*

- Canvas becomes the next-generation hub for NU's educational technology efforts. Plans include:
  - Retire Blackboard from use in Northwestern courses in August 2015.
  - Continue to look to expand the toolset of supplemental applications for Canvas to provide a broader but coordinated set of educational technology services to our community. Encourage faculty and student experimentation by allowing access to data and Canvas APIs for approved developers.
  - Advocate with our higher education peers and directly to Instructure for continued improvements and critical additions to the existing Canvas platform.
  - Our priorities include comprehensive mobile services, improved media management services, and an improved open-services framework for learning analytics.
  - Continue to support the Coursera MOOC effort, for its lessons in teaching at scale and for University outreach to a global community of students.
  - Establish a program to work with MOOC instructors to repurpose learning content and methodologies for their face-to-face classes. Investigate and report on archiving options for learning content.
- Work with faculty to understand University priorities for learning analytics. Individual warning systems, course level engagement, etc. are possible directions.
  - In FY15, develop an initial learning analytics dashboard based on Canvas at the department and school level that can be used by Northwestern administrators.
  - In FY16, identify priorities for course analytics (tools for instructors to use in individual courses).
  - Identify priorities for program analytics (tools that cross programs, departments, and schools) for a comprehensive view of teaching and learning activities.
- Identify opportunities to coordinate data integration with other units.
- Improve NU's capacity for creating and managing rich media content for instruction.
  - Report to the Northwestern community on FY15 pilots with Northwestern faculty regarding their use of the Avalon system from the Library and Mediasite for support of instructional efforts in Northwestern courses.
  - Develop a master plan for better long-term management, sharing and repurposing of rich media content. The plan should consider the benefits and risks of internal development, shared developments with other universities, and the adoption of commercial offerings.
- Continue to expand wireless capabilities to the campus to support blended learning efforts.
- Identify teaching and learning needs that should be better supported by a suite of mobile applications.
  - In conjunction with the learning app expansion for Canvas, review the needs presented by the working group, identify candidate apps, review and adopt those that pass muster.
  - Review adopted apps to ensure continued relevance. Establish education efforts to help faculty and students learn best practices in using these apps in hybrid courses at Northwestern.

- Begin to support active learning experiments in traditional classrooms, while working to align physical space transformations with changes in pedagogy on campus.

*Transform the support network to align with the new pedagogical need*

- Augment blended learning support.
- Complete the training of faculty in the basics of Canvas and support their migration of learning content out of Blackboard when this is the most appropriate transition step.
- Evolve faculty training in Canvas from the current “Canvas Mechanics” to higher-order features and to creating paths towards blended learning practices.
- Strengthen consulting resources available to faculty for instructional design and assessment.
- Re institute advanced boot camp offerings for faculty and TA's on curriculum investigations and educational technologies (summer 2015) as a joint effort with the Searle Center and academic departments. In FY16, expand the boot camps to include the use of learning analytics.
- Develop a distributed service offering for the production of video course nuggets for Northwestern faculty, whether conducted at the high end with NUIT staff in the NUIT video studio(s), or on the low end with office-based workstations and consumer AV equipment. Explore a cooperative service portfolio with school-based support teams.

## Appendix II: Research Technology Expanded Roadmaps

### *Completed Outreach and Training Events for FY14+*

- Software Carpentry boot camp with a focus on R software for statistical computing and graphics. This collaboration with Kellogg provided faculty and graduate students with a two-day boot camp, covering bash shell, version control, and R.
- “The Researcher's Toolkit” is a joint effort with NUL to assist with the development of new training series. The program offers researchers actionable takeaways through targeted training for tools and practices.
- Virtual School for Computational Science and Engineering Data Intensive Summer School: - Partnered with the University of Chicago to cohost this event.
- Big Data: Involved in the planning of a faculty organized Big Data workshop. Participated on a panel on Big Data and other research computing topics.
- In partnership with Feinberg, developed a Chicago campus presence for consulting on central research computing services.
- R User Group: Bridged faculty and students across Kellogg, Psychology, and Economics to kick start a campus-wide R User Group, which will regularly present tutorials on different aspects and tools in R.
- Computation social sciences survey and focus groups: Conducted outreach with social sciences community to better understand and support their computational research needs.

### *What are we doing next? Expanded roadmap for FY15/FY16*

*Continue to refresh and build out core research computing services, while looking for external opportunities where appropriate.*

- Gather requirements for facilities, computing cycles, and research networking. (FY15 – FY16)
  - In coordination with the Execution Committee and the RTAC:
    - Evolve Full Access practices for Quest that motivate Northwestern faculty to co-fund central research computing services. (FY15+)
    - Explore funding models that would enable the University to provide HPC as a service (FY15 – FY16)
    - Explore and possibly recommend new research services, such as Large-scale/Big Data analysis solutions, to meet emergent needs of the Northwestern research community. (FY16+)
- Increase support for use of national facilities, cloud computing services, and other platforms (FY15+)
- Continue participation in the Advanced Computing Innovation Partnership, an exploratory effort among regional institutions with the goal of enabling research across a diversity of computing and storage platforms. (FY15-FY16)
- Educate on use of alternative and emerging HPC technologies (e.g., Super Dense Core Count: GPGPU, Intel PHI, Intel MIC; Large Memory: Shared Memory Processing, Large Memory; Burst

workloads: cloud computing) for scientific investigation by the Northwestern research community. (FY15 – FY16+)

- Increase support for researchers needing to develop comprehensive computational resource plans that use national Terascale and Petascale computing facilities, cloud computing services (such as Amazon AWS), and other platforms. (FY15+)
  - Continue consulting and awareness activities, and conduct consulting projects with Northwestern research groups to assess augmenting their research computing practices with national facilities such as XSEDE, Blue Waters, and Mira.
  - Look to quantify the science achievements that were made possible through these resources and services.

### Computational Services

- Action Phase 2 (FY15) and Phase 3 (FY16) lifecycle refreshes of Quest.
- Evaluate Quest for support in analyzing regulated data. (FY16)
- Investigate options for enabling hybrid cloud/HPC solution for research workflows. Explore challenges in research data movement to external solutions. (FY16)
- Evaluate current technologies to improve the scheduler -related accounting workflow with the goal of allowing users to have integrated, better access to computational hours consumed, account expiration, and storage quota usage. (FY16)

### Data Storage Services

- Provide new, secure desktop mountable research storage services. (FY15)
  - Expand desktop mountable research storage services to meet expanding requirements of the research community. (FY16+)
- Evaluate the ongoing fit of Vault collaborative storage alongside Box.net. (FY15 – FY16)
- Continue to provide services offered by Vault Collaborative research storage services to accommodate the need for sharing and storing research data and aggregation of existing data from researchers' local environments. (FY15+)
- In concert with the Library, the Office for Research, and other University partners, identify and develop a model for preservation, archiving, and curation services. (FY16-FY17)

### Research Networking Services

- Complete deployment of the core research network infrastructure and an initial set of approximately forty 10Gbps access ports in both Evanston and Chicago. (CC-NIE NSF Grant) Complete deployment of several hundred 1Gbps access ports across the campus. (Illinois Gigabit Communities Grant) (FY15)
- Expand deployment of research network ports, enable Software Defined Networking (SDN) and add redundancy as needed. (CC-NIE NSF Grant) (FY16)
- Evaluate if the emerging Science DMZ research networking model is a fit for Northwestern research. (FY15)



- Transition Globus Online from a pilot to production service to support Big Data researchers. (FY16)
  - Investigate expansion of Globus Online services to support research data movement among multiple endpoints both locally and nationally.
  - Recommend investment in Globus Online services that meet the University community needs.

#### Visualization Services

- Raise awareness of emerging visualization services and domain-specific solutions. (FY15+)
  - Extend visualization services in production animation, interactive toolsets, and illustration to broader research communities on the Evanston and Chicago campuses.
  - Work with the Center for Advanced Molecular Imaging to extend the tiled wall display facility to a more diverse research community.
- Expand visualization services to cover a broader range of needs. (FY16+)
  - Explore new distribution channels for visualization services such as e/iBooks and web-based platforms.
  - Explore how we can improve access to visualization tools for Quest users.
  - Look into cost-sharing opportunities with faculty in need of computational visualization hardware and determine how these collaborations fit into the visualization recharge model.
- Plan for necessary supporting visualization infrastructure (FY15 – FY16) and staff. (FY16 – FY17)
- Investigate GPU's to assist in reducing turn-around time for production animation and digital illustration. (FY15)
- Provide for an introductory visualization presence in Chicago that will enable the University to direct researchers to existing services and better understand the needs of life scientists in the Feinberg School of Medicine. (FY16+)

#### *Consolidate research onto centralized infrastructure where it is available and appropriate.*

- Complete removal of interior wall within the University Datacenter to allow for expanded UPS and rack capacity in support of research growth. (FY15)
- Addition of research racks to provide for growth in research co-location. (FY16)
- Complete power and cooling expansion and remediation in the Evanston and Chicago datacenters. (FY16)
- Clarify and promote the value proposition of central research services. (FY15 – FY16)
- Transition people on individual servers into clustered environments, where appropriate. (FY15+)
- Continue to support and grow features that users need and prefer from central services. (FY15+)
- Explore provisioning of firewall capabilities to improve co-location facilities. (FY16)
- Explore provisioning of research network services to improve co-location facilities. (FY16)

*Develop a shared vision for a new model of delivery and support of research cyberinfrastructure.*

- Charter a formal governance committee in the ITGOV structure. (FY15)
- Continue to improve outreach, connectedness, and awareness. (FY15+)
  - Develop a strategy for sustainable learning for research computing. (FY16)
- Assist in the growth of research skills within the research community.
  - Expand hosting of networking events, boot camps, workshops, and tutorials to strengthen relationships and knowledge in our research community. (FY15+)
  - Continue “The Researcher's Toolkit.”
    - Plans include Endnote, data visualization, bash scripting, grant proposals and opportunities, resources on campus, etc.
    - Evaluate the program’s success, and chart new tutorial opportunities.
  - Galaxy Boot Camp – Scheduled for February 27, 2015 on the Chicago campus with NUCATS and the Galter Health Sciences Library.
  - Data Visualization Challenge
    - Planned to be in conjunction with Computational Research Day 2015.
    - Will involve a hack-a-thon type event, and competition for data visualizations and data visualization proposals.
  - Be involved in planning a faculty-organized programming boot camp for undergrads for spring 2015.
  - Expand Software Carpentry boot camps with an R statistical software focus to more faculty and students.
  - Continue monitoring and guiding development and growth of the R User Group to include users from other areas of research.
  - Seek additional communities of practices to encourage growth of learning and training opportunities.
- Continue to strengthen the institutional partnership with the Library.
  - Continue to build on partnerships with Northwestern Library, Galter, and others to provide targeted opportunities for learning and community engagement.
  - Promote and employ research data management consulting services with the Northwestern Library (FY15 – FY16).
  - In cooperation with the Northwestern Library, better understand and promote available consulting services, establish Mudd Library as a drop-in point for data lifecycle management services, and continue to implement joint outreach and community development opportunities.
- Increase the range of NUIT involvement across the research life cycle.
  - Increase discussions with the Office for Research Development, the Office for Sponsored Research, and school research administrators to better understand deadlines, requirements, and priorities. (FY15+)
  - Improve assistance in grant preparation.

- More actively promote the availability of NUIT staff to collaborate on proposals. (FY15+)
- Encourage engagement with central research computing services through expanded effort in the design of computational elements, data management, and budget development assistance. (FY14+)
- Continue to evolve the organizational and support model for research computing.
  - Explore a new training model that identifies experts within schools and departments to provide targeted training on tools and methodologies of interest to the broader HPC user community.
  - Expand the support model for users of shared research computing services. (FY15+)
  - Cultivate a new peer-to-peer network of research consultants to improve support and training, and to reduce time-to-resolution. (FY15 – FY16)
  - Evaluate needs related to increased support and services for across-the-board research activity such as statistical computing, survey tools, and the digital humanities. (FY16)
  - Explore a tiered support model that more fully involves students in the active support and triage of NUIT research computing services. Help recruit student interns who can be involved in technical support. (FY16)
- Assist in the exploration of new means of domain-specific research support.
  - In cooperation with the Feinberg School of Medicine, continue to explore the Galaxy Project, an open web-based platform that might aid Northwestern researchers in performing, reproducing, and sharing data-intensive biomedical research. (FY15)
  - Conduct discussions on funding (with NUBIC, Physical Sciences, Oncology) for deploying a production-level instance of Galaxy on Quest. (FY16)
- Communications
  - In conjunction with the Office for Research and other strategic partners, explore and recommend mechanisms and frequency for gathering and disseminating qualitative and quantitative metrics on the impact of NUIT Research Computing efforts in support of obtaining grant funding and developing scientific output of the University. (FY15-FY16)
  - Continue improvements to the Research Computing website by developing new story-driven content, expanding services represented, and incorporating tools to increase education and outreach. Develop the website to help recruit top-notch researchers, and to increase awareness of IT research-related services of Research Computing among students, faculty, researchers, external research collaborators, and industry partners. (FY15-FY16)
  - Explore ways of increasing information from the Research Computing staff that demonstrate service improvements, community building, training opportunities, service-level changes, and other outreach opportunities. (FY15)
  - To increase community engagement, explore the viability of periodic research computing newsletters that will showcase user research and announce future plans (e.g., Quest refresh, storage purchase plans etc.). (FY15-FY16)
  - Explore options to increase internal tracking and sharing of emergent information and requirements of the broader research community. (FY16)

## Appendix III: Administrative Systems Expanded Roadmaps

### *What have we just done? FY14 in review*

FY14 was a year focused on creating foundational elements in technology, people, and process. New strategic visions for [enterprise architecture and administrative systems](#), and for [Identity and Access Management \(IAM\)](#), were articulated in strategy documents. Web services were emphasized via the Service Oriented Architecture initiative. ASAC created seven functional area subcommittees to bring the pre-existing, fragmented, system-oriented oversight within the IT Governance framework, including the Information Management Committee, which is actively addressing the need for improved data integration and access.

### *Enabling Technologies*

- SOA (Service Oriented Architecture) Initiative begun to provide web services, which will be the bedrock underneath the enterprise application architecture and its parts, including information management, IAM, workflow, cross-system automated processes, and portal technology.

In FY14, an IT@NU SOA Initiative steering group was formed, and they developed a roadmap of activities to build expertise with this enabling technology across the University while building core reusable services as part of existing business projects.

- SOA Proof of Concept completed successfully
- SOA Initiative steering group formed with representatives from across the IT@NU community; initiative roadmap developed.
- Core, reusable services begun to be developed via already identified business projects.
- Kickoff forum held, with over 250 people attending.
- Campus SOA training vendor identified.
- Implementation of the SOA enterprise middleware architecture begun.
- A strategy whitepaper on Identity and Access Management (IAM) was released, detailing a vision and beginning roadmap for re-architecting Northwestern's fragmented IAM systems. Multiple identity authentication projects progressed, each designed to more appropriately target the level of identity assurance needed for the online functionality being accessed.
  - IAM strategy whitepaper released. Beginning roadmap identified.
  - Federated identity authentication implemented for OurNorthwestern, to remove requirement that alumni use a Northwestern identity to log in.
  - Proof of concept on multi-factor authentication (MFA) successfully completed for FASIS self-service, where second verification of access request is required via cell phone to access FASIS self-service.
  - Preliminary, independent, system-based investigations undertaken to look at the possibility of defining broad roles for basic access within enterprise systems.

### *Information Management*

- Information Strategist hired by NUIT.
- ASAC chartered an Information Management subcommittee to function as a working committee charged with guiding improvements to the information management domain at Northwestern, and serve as an advisory governance body for the Enterprise Reporting and Analytics (ERA) unit.
  - First principles for information management at Northwestern were drafted by the committee and reviewed by ASAC.
  - Multiple working groups are active under the committee’s oversight regarding duplicate IDs, enterprise data dictionary, and the process for requesting access to enterprise systems.

### *Unifying Applications*

- Workflow
  - Organic growth of workflows continues around the University.
    - WCAS led a federated approach to providing online services in the area of student academic administration. They created a forms/workflow engine, engaged the community around using it for moving student academic forms online. Inter-school Transfer and Dual Degree Application forms created and deployed.
    - Kellogg School of Management worked with the Office of the General Counsel to define a workflow for contract review and approval within OnBase, and began using it.
- Portal Technology
  - A series of initial interviews was conducted with researchers and research administrators as part of an initial envisioning effort in response to requests for a research-focused information portal.
- Reporting and Analytics
  - The NUIT Business Intelligence and Project Café reporting teams were merged to create the Enterprise Reporting and Analytics (ERA) team. Developed an eighteen month plan for building out an integrated data environment per [the Data Warehouse and Analytics paper](#).
  - ERA led an interdepartmental working group to evaluate the fit of the Tableau analytic tool to enterprise data needs. Found promise in the software for building dashboards and visualizing data, but found the server version and the analytic community both needed to mature before recommending an institutional investment in this software.

### *Engagement*

- The Administrative Systems Advisory Committee (ASAC) chartered seven functional area-focused subcommittees (Alumni, Facilities, Finance, HR, Information Management Research Admin, and the Student Experience) designed to replace the pre-existing, isolated, system-focused advisory committees and integrate this oversight role in with IT Governance.
- The NUIT Project Management Office was established, and one of their goals was to improve customer service by enabling cross-functional-area assistance for administrative systems more efficiently.
- Mobile Meet-ups continued, and the IT@NU Agile community of practice was established to provide a forum to support growing awareness and adoption of agile methodologies in software

development and service delivery.

### ***What are we doing next? Expanded roadmap for FY15/FY16***

These two years will include increased activity in system and tools upgrades. Within this context of a heightened allocation of resources to keeping systems running, enabling technologies will remain a priority. The SOA initiative needs to continue in order to enable fundamental changes in all aspects of the University's portfolio of online services. The IAM redesign will provide more timely access to online resources and the ability to improve security around identities. The Information Management effort will show tangible progress in making data more integrated and appropriately accessible. The pace of change shown in this roadmap projects the current pace forward, without a fundamental shift in emphasis. These two years are projected to also include increasing interest in improving workflows/automated business processes, and more attention on disaster recovery/business continuity.

#### ***Enabling Technologies***

- ***Service Oriented Architecture*** – With the establishment of the services infrastructure, initial services being developed by the enterprise system teams, and training in place for the University, the SOA initiative focus will shift to getting wider involvement in the community, and from developing services for “first out of the box” projects to identifying services of highest value and getting them prioritized.
  - FY15
    - Web services registry configured and released.
    - Training of the IT@NU community begins.
    - Administrative approval processes for services approved and enhanced during first usage.
    - Initial reusable services developed via tactical projects, and made available for wider use.
    - SOA Community of Practice will begin. Should become focus on development framework-focused community-led training.
    - Begin to identify high-value data services that have not been included in tactical projects.
  - FY16
    - Continue build out of services.
    - Transition initiative oversight more directly to IT Governance, possibly via an Enabling Technologies Committee.
- ***Identity and Access Management*** – High-level requirements identified for the replacement of NUValidate in FY15 will allow a solution to be chosen and work to commence on this multi-year project. Parallel work will also proceed on such projects as Identity Federation, multi-factor authentication, and single sign-on.
  - FY15
    - Working group formed to envision foundational requirements for NUValidate replacement.
    - Select replacement product(s) for NUValidate.
    - Began three-year commitment to participate in Internet 2's collaborative community TIER (Trust and Identity in Education and Research) initiative, which is looking to integrate and

develop IAM tools that specifically address the unique qualities of the higher education environment.

- Improve data quality and processes that will be required for the conversion to new IAM tools. Projects include reducing reliance on manually asserted NetIDs and disambiguating identities between FASIS and SES.
- Phase I of WebSSO integration of SES - Academic Advisors (and others TBD).
- Build integration between WebSSO and DUO. Offer multi-factor authentication to applications using WebSSO.
- Migrate OurNorthwestern's identity federation service to NUIT as a precursor to wider enterprise deployment. NetIDs will remain the University's primary means of providing access to University systems, but in situations where it is appropriate to use other identity credentials, this service will allow it to be done in a managed framework. The first additional unit to take advantage of this service will be the Library for providing access to external library patrons for their new cloud-based administrative application, ALMA.
- Review enterprise system security models in light of data integration efforts.
- FY16
  - Begin work on replacement of NUValidate.
  - Deploy additional IAM tools to support group management and a central person registry.
  - Migrate additional enterprise systems to WebSSO (perhaps as part of planned software upgrades), to enable their inclusion in an enterprise-level capability to provide multi factor authentication (DUO) and to eliminate the need for separate identities for staff with elevated privileges in several of these systems.
  - Continue participation in TIER.
  - Define a common security model for multiple enterprise systems.
- *PeopleTools* upgrades are planned for FY15/16 for FASIS, SES, and NUFinancials. The upgrades can enable tools that can improve the user experience of the applications in a variety of ways. For example, by enabling responsive web pages to be used across multiple devices, publishing / consuming RESTful web services (the more prevalent method in use at the University), creating homepages and work centers for users to access features used repeatedly by people with their role, or enabling search features that reduce the number of clicks required to find desired information.

### *Information Management*

- FY15
  - Information Management Committee priorities.
    - Access Process Assessment Working Group formed to analyze access methods to enterprise systems and make recommendations for making the process more user friendly. Implement some of the phase 1 recommendations. Implementation may carry over into 2016.
    - Data Dictionary Working Group formed to develop a recommendation for an enterprise data dictionary which will help information consumers understand where a data item fits in the enterprise context, what values it may contain and, in essence, what the data item means in real - world terms.

- Begin data classification process. Data classification will help the institution to apply appropriate levels of oversight, security, backup and access to their data assets.
- Review and update Data Use Policy as appropriate.
- FY16
  - Assess the 2015 access process assessment work to determine whether there are some common functional roles that could be incorporated into a simplified security model.
  - Data Dictionary: Design and implement processes for ongoing data definition and governance. Implement a data dictionary tool. Begin to collect and compile existing data definitions from administrative systems.
  - Continue data classification and associated guidance for appropriate treatment of data by classification level.
  - Data Retention: develop a data archive/purge policy for administrative systems.

### *Unifying Applications*

- Reporting and Analytics - ERA will prioritize foundational work in FY15 and FY16, building significant portions of an integrated enterprise data warehouse environment, migrating current data marts and independent processes into a unified environment.
  - FY15
    - Integrated enterprise data warehouse environment - Phase I.
    - Streamline endowment reporting process by integrating data from multiple source systems into a single business intelligence system.
    - Introduce student admissions and lifecycle self-service reporting for Kellogg. This work will allow analyses of student outcomes and engagement to drive admissions decisions.
  - FY16
    - Integrated enterprise data warehouse environment - Phase II.
    - Building on the SOA Initiative, ERA will explore real-time reporting and data-as-a-service model.
    - Expand the Alumni Relations and Development data mart to include student activities and events information. This data will reduce reliance on manual processes and produce analyses in support of campaign activities.
- Workflow - There is interest in implementing cross-system workflows to streamline the completion of administrative tasks (e.g., as articulated in the working group document "[A New Vision for Research Administration](#)" released in FY14). But that work is not likely to begin until staff are more available to identify critical business processes to be brought online, choose a workflow engine, and build the workflows. Until that time, NUIT will continue to monitor and support solutions being developed in the schools.
  - FY15
    - WCAS issued first call for improvements to their federated service forms/workflow engine, and have begun work on enhancing the email notifications created by the engine. The Application for Credit for a Non-Northwestern Course (which required involvement of 100+



units in mapping out the business process) was just released. A Study Abroad Credit form will be released next. Weinberg IT is extending the form engine's capability to interact with University and external web services to programmatically update applications such as SES (with whom technical conversations have begun) and the Box file storage/sharing application.

- Contracts review and approval workflow project continues with Office of General Counsel, Risk Management, and the Kellogg School of Management.
- NUFinancials moves to a paperless expense report approval (both supervisor and financial) process.
- Northwestern University Clinical and Translational Sciences Institute hears about their CTSA funding application, which has workflow as a central part of its proposed work.
- FY16
  - If a business need has not been identified that will naturally carry these efforts from organic developments to strategically focused, coordinated efforts, a more focused conversation on their priority should be engaged.
- Portals - Two significant requests for portal projects have come forward: for a research PI Portal, and for a school-level institutional dashboard that aggregates management data for business decision making. Preliminary work is slated in FY15 for the PI portal. The school dashboard is not yet prioritized.
  - FY15
    - Following on interviews conducted in FY14, the NUIT Project Management Office will lead project specification work for a PI Portal.
    - School-level institutional dashboard requested from ERA to aggregate management data for business decision-making. Not yet prioritized.
  - FY16
    - Follow-up work to previous year's work as appropriate.

### *Engagement*

- NUIT Project Management Office (PMO).
  - FY15: Staffing in place. Define service offerings and socialize with the IT community. Begin initial projects, including:
    - Assisting The Graduate School with analysis of tuition and stipend processes, to ensure graduate students are paid in a timely fashion and from the appropriate funding source(s).
    - Conducting an exploratory effort to determine the desired features of a PI Portal, a platform that could serve as a unifying layer to the many administrative tasks required of our researchers and their staffs.
    - Learning more enterprise systems in relation to employee onboarding, and identifying improvements to the onboarding processes, particularly those related to obtaining access to enterprise systems and data.

- Coordinating IAM projects beyond the replacement of NUValidate, including integration of multi-factor authentication with single sign-on and use of external/federated identities where appropriate.
  - FY16: Develop global project intake process, continue projects.
- Communities of Practice
  - FY15
    - Continue to foster the development of Communities of Practice, where skills and knowledge can be shared, and common practices and tools can be identified.
      - Areas that have shown interest in this include: web services, software development (DevIT), analytics, and marketing.
    - Pilot Yammer as an online collaboration tool for Communities of Practice.
  - Continue engagement with students around their interest in developing student-oriented mobile applications.

#### *Disaster Recovery/Business Continuity*

- FY15: Topics of interest include acceptable levels of data loss and time to restore in the event of outages, and the priorities for restoration of services.

## Appendix IV: Infrastructure Expanded Roadmaps

### *What have we just done? FY14 in review*

FY14 was a year of significant progress on the IT infrastructure front. Expanded use of the shared data centers continued to grow. A new technology approach was taken for infrastructure storage by augmenting our existing solutions with the cloud-based Box.com file-sharing solution. Consolidation occurred in the collaborations environment, with multiple individual Microsoft collaboration instances migrated to the University's enterprise offering. Integration of support systems and services was initiated (e.g., Footprints and Tier 1 support for the Feinberg School of Medicine was shifted to the NUIT Support Center). Progress was made on communications infrastructure development and planning (e.g., selecting a vendor for a new Voice Platform and finding a viable solution for indoor cellphone coverage).

### *Maintain the existing common infrastructure.*

- Network
  - FY14 WiFi Expansion – Increased campus coverage to 85% of indoor space.
  - Received funding and began building out a research computing network, which will preserve the bandwidth available on the community network
- Data center
  - Addressed two major infrastructure needs: began electrical infrastructure work to remediate an electrical safety risk in the data center when it was identified as a result of new building codes, and replaced the emergency diesel generator with a larger (1.5MW) one to address growth and reliability requirements. SharePoint 2013 – Deployed SharePoint 2013 for all faculty and staff.

### *Reduce duplicate IT infrastructure.*

- Kellogg Exchange Migration – Consolidated Kellogg faculty and staff into the central Exchange environment.
- NUCloud – Obtained full subscription of additional units to the Phase II expansion of NUCloud.
- Research Storage – developed a research storage shared service offering in cooperation with WCAS, Feinberg, SESP and NUL.

### *Look to incorporate the use of new technologies that provide new opportunities for the University.*

- Box.com – Deployed the Box.com cloud service for web-based, cross-platform, secure file sharing for faculty, staff, and graduate students.
- Voice platform replacement – Released a bid for a replacement system, narrowing down the field of vendors to three. University-wide engagement process to gather specific business requirements and general input for the new Voice Platform.
- Distributed Antenna System (DAS) – Entered into an agreement with an integrator to move the DAS project forward, completing initial carrier contract and identification of a location for centralized head end equipment.

- Comcast Xfinity on campus – Launched a cloud-based IPTV service after engaging with Student Affairs to conduct trials during spring 2014. This service enables residential students to access live and on-demand television content across multiple platforms.

*Prioritize support, remove process hurdles, and reduce fragmentation duplication in support.*

- Continued the expansion of integrated IT support and the IT Service Management platform, FootPrints; shifted tier 1 support for the Feinberg School of Medicine to the NUIT Support Center.
- Service management – Created a dedicated permanent staff position to focus NUIT efforts in this area.
- Lynda.com – Worked collaboratively with Northwestern Purchasing Services, Human Resources, and other stakeholders to deploy a cloud-based online training solution.
- Office365 – Deployed the cloud-based version of Microsoft Office to enable software distribution to all eligible students.
- Service provisioning – Created a new hosting request form to streamline the process used to deploy and deliver new virtual servers to customers.

*Actively address prioritized risks and compliance requirements.*

- Splunk – Deployed a shared centralized log file aggregation tool for improving the analysis and correlation of logged events across multiple infrastructure systems and applications.
- NMFF/FSM secure network initiative – In partnership with Northwestern Medical Faculty Foundation (NMFF) and the Feinberg School of Medicine (FSM), deployed a set of firewalls that provides secure access to NMFF clinical resources and protects FSM computers from external connections.

***What are we doing next? Expanded roadmap for FY15/FY16***

Many of the foundational projects begun in FY14 will continue in FY15/FY16 (e.g., new Voice Platform, Distributed Antennae System, research networking build out). Successful projects in FY13 and FY14 need roadmaps developed beyond their current incarnations. For example, NUCloud needs to be positioned on a solution path that will take more cloud-based technologies into account; the SMB (desktop mountable) storage solution for research data was a good next step in the development of a qualitatively broader solution; and the common usage of the Dell KACE service management software needs to be leveraged so that people and process are shared in addition to the technology. This last example needs to be part of a broader discussion about how to streamline Tier I support.

*Maintain the existing IT infrastructure.*

- WiFi network
  - FY15: Ongoing WiFi Expansion – Work with the community through the IAC wireless working group to determine which of the remaining areas of campus to address.
  - FY16: Work with the community through the IAC wireless working group to develop a strategy and plan to proactively address the expected growth of classroom wireless needs as they relate to the changing teaching and learning opportunities provided by the campus Learning Management System (Canvas).

- Wired network
  - FY16: Increase off-campus network capacity with 100Gbps links to support high speed research/education needs; continue build out of separate research computing network.
- Microsoft collaboration suite
  - Exchange
    - FY15: Upgrade to Exchange 2013 for improved collaboration capabilities, including tighter integration with Microsoft Lync, SharePoint and the cloud-hosted offering, Office 365.
    - FY16: Build out a hybrid Exchange environment with Microsoft's cloud-hosted offering, Office 365, and begin testing campus use cases. Migrate select users to Office 365. Upgrade to Exchange Service Pack 3.
  - SharePoint
    - FY15: Build out a hybrid SharePoint environment with Microsoft's cloud-hosted offering, Office 365.
    - FY16: Upgrade to SharePoint 2016.
  - Lync
    - FY16: Upgrade Lync to Skype for business.
- Data center
  - FY15:
    - Begin work to address aging power and cooling systems in the Chicago datacenter and also begin the expansion of power and cooling in the Evanston data center in support of ongoing research needs.
    - Develop the long term data center strategy, considering the projected changes in technology, business and research projections, and tolerance for geographic separation.
  - FY16:
    - Complete power and cooling expansion and remediation in the Evanston and Chicago data centers.
    - Complete the development of the long-term data center strategy and begin addressing identified priorities.

*Develop dynamically defined services.*

- FY15: Develop an overall cloud services strategy, considering the overall speed to provision services from an end-to-end perspective. Such a strategy will consider full-service provisioning, including the overall VM and firewall architectures. (See also the discussion of Platform as a Service in the "Incorporate New Technology" section below.)
- FY16: Working with the IAC and the Service Platform L3 committee, identify needs, and timing for Platform as a Service (PaaS) based campus services (e.g., storage, database, development).

*Reduce duplicate infrastructure.*

- Collaboration suite
  - FY15:
    - Evaluate with Kellogg the feasibility of migrating the Kellogg student community to the Northwestern Exchange environment.
    - Migrate the existing Feinberg and Qatar SharePoint environments into NU's central SharePoint environment.
  - FY16:
    - Migrate from Microsoft's Threat Management Gateway (TMG) to F5's Access Policy Manager (APM), reducing duplicate technology within the data center.
- NUCloud
  - FY15: In collaboration with the existing tenants of NUCloud, develop a plan for the next stage of service development. Continue to work with units across campus to identify opportunities for migration into NUCloud.
  - FY16: Continue to work with schools and units across campus to identify opportunities to leverage Northwestern Cloud. Deploy the next iteration of NUCloud as it is defined in the FY15 planning phase.
- Storage
  - FY15: Complete the research SMB storage service definition and trial deployment and move service fully into production. Work with the IT@NU community to identify and prioritize other storage use cases.
  - FY16: Review the service and technology supporting the research SMB storage solution to determine how well the service is meeting the needs of the community. Begin deployment of additional storage solutions per the planning done in FY15.

*Look to incorporate new technologies that provide new opportunities for the University.*

- Voice platform replacement
  - FY15: Building on the work of the voice services working group, complete a proof of concept with the top two voice service providers and make final selection of next voice platform. Begin rollout of the new service across campus.
  - FY16/17: Complete deployment.
- Distributed antennae systems (DAS) for cellular coverage
  - FY15: Continue to work with the cellular carriers to finalize engineering plans and the head-end to be installed.
  - FY16: Continue to work with cellular carriers to provide campus-wide cellular coverage across the Evanston and Chicago campuses. Provide managed oversight and prioritization of service rollout.

- Collaboration suite
  - FY15
    - Email encryption: Investigate the expansion of this service from the Feinberg School of Medicine only to all users in the Exchange environment.
    - Yammer integration for SharePoint – Evaluate an integration of Yammer software within SharePoint to provide an online environment that is more appropriate for supporting the Communities of Practice that are emerging across Northwestern.
- Cloud collaboration
  - FY15
    - Investigate cloud services such as Office365 and OneDrive to potentially reduce local infrastructure demands.
    - Platform as a Service (PaaS) – In collaboration with other campus IT groups and working with the IAC Service Platform L3 committee, investigate the core technologies and processes needed for dynamic service delivery. (See also the entry on developing an overall cloud strategy in the section above on Developing Dynamically Defined Services.)
- Comcast Xfinity – after the successful rollout of Xfinity to the undergraduate residence halls, work with Student Affairs to expand service to graduate residences on campus. (FY15)

*Prioritize support, remove process hurdles, and reduce fragmentation and duplication of support.*

- Service management
  - Continue to extend ITIL Service Management best practices throughout NUIT with the development of a shared Service Catalog and fully populated Configuration Management Database (CMDB). (FY15/FY16)
- Monitoring and Management
  - Continue consolidation and unification of infrastructure monitoring and management applications to reduce costs and realize operational efficiencies. (FY15/FY16)
- Support models
  - FY15
    - Working with the IT@NU community, develop a plan for expanding support hours, including the definition of appropriate support models and service level agreements.
    - Review existing support models across campus, and develop a roadmap for scaling support capabilities in the center to reduce redundancies in distributed units.
    - Tighten integration of NUIT Cyber Infrastructure and enterprise system operations and support models.
- Security vulnerability response
  - Develop processes to more quickly address emergent issues such as security vulnerabilities, patching and software updates across the infrastructure. (FY15/FY16)

*Actively address prioritized risks and compliance requirements.*

- Disaster Recovery/Business Continuity
  - Participate in DR/BC discussions in IT Governance, and articulate options for sustaining system availability and reducing recovery time.
  - Continued focus on building more “automated” resiliency into the architecture of new services and migration of existing services to new deployment models as appropriate. Begin discussions about a tighter connection between application and infrastructure upgrades.
  - Present options for off-campus network redundancy that do not require services from or through Chicago. Physical pathways to Milwaukee or other metropolitan areas will be considered.
- Monitoring
  - FY15: Develop a plan for incorporating the present centralized network activity logging facility (Splunk) as part of an Information Security Management System to help identify malicious activity on the network. The needs span audit control, security, and improved operations.
  - FY16: Expand use of centralized logging of network activity, as appropriate.
- Collaboration suite
  - FY15
    - Deploy automated patching across Collaboration services
    - Complete the vendor investigation and proof-of-concept testing for a replacement SPAM solution with a solution that can address SPAM and improves our ability to address phishing.
  - FY16
    - Based on feedback and the results of the investigation, propose solution for expanding manual email encryption functionality that is presently FSM-only, to all Exchange users
    - Deploy a replacement SPAM/phishing solution that addresses the campus SPAM requirements and improves our ability to address phishing.
- Networking
  - Firewall
    - FY15: Review data center firewall architecture and associated change management process.
    - FY16: Implement a new data center firewall architecture and change process.
  - Tiered network security architecture
    - Investigate the potential for deploying a tiered network architecture similar to what was developed for FSM across other portions of the campus network. (FY16)



## Appendix V: Information Security Roadmaps

### *What we have just done? FY14 in review*

In FY14, our approach to information security focused on two overarching goals: 1) to become more structured to insure we're working on our most important risks, and 2) to employ a new, more community-based approach to information security. An initial structured survey of risk was undertaken, IT Governance was positioned more centrally to the risk identification/mediation process to help engage the broader community in the security process, the need to reduce risks around some of our most sensitive data was emphasized, key preventive processes and monitoring were broadened, and our ability to respond to breaches was improved.

### *Structured collaborative approach to Information Security*

- Adopted the Information Security Management System (ISMS) – a structured approach to information security based on international standards -- and published the Information Systems Security Plan/Practice (ISSP/P), a compilation of all IT security policies.
- Risk Assessment Survey undertaken as a required beginning step in framework. A report of the results was released to the IT Governance and Risk Assessment communities in May 2014.
- Worked with Audit & Advisory Services to prioritize additional risks identified via audit processes.
- Launched the Security/Risk Advisory Committee, a Level 3 subcommittee under the IT Governance Infrastructure Advisory Committee. Both committees will integrate security practices and direction-setting more closely with other IT units at the University via advisory feedback and working groups regarding information security guidelines, standards, policies, and services.

### *Preventive Controls*

- Worked with Enterprise System Directors to develop a patch management process guidelines document for enterprise systems.
- Discussed with distributed security support teams the possibility of expanding use of the University's solutions for endpoint management (Dell KACE) to remediate risks identified in the Risk Assessment Report.
- The Feinberg School of Medicine implemented hard drive encryption on 600+ laptops.
- Conducted a multi-factor authentication proof of concept where NUIT and Human Relations staff used DUO to access FASIS self-service pages.
- Implemented procedures calling for enhanced blocking of malicious traffic using Palo Alto firewalls.

### *Activity Monitoring*

- Implemented enhanced analysis and reporting capabilities of activity at the borders of the University's network via the Palo Alto firewall.
- Modified the Exchange email system so it appends a warning banner to email messages that meet specific criteria, warning of possible phishing or otherwise malicious functionality.

### *Education and Engagement*

- Published the HIPAA/ISO User’s Guide to help business units establish compliant security practices and to promote compliant end-to-end processing of regulated data.
- Introduced a recently acquired HIPAA Security and Privacy training video. Trained staff in several NUIT units who have access to electronic Protected Health Information (ePHI).
- Increased the number of University sites that use assessment services by 23% (1,700 to 2,100) through greater promotion of these services to the user community.

### *Incident and Vulnerability Response*

- Implemented network access control (NAC) on wireless and wired networks, which provided the capability to “quarantine” compromised devices, thereby limiting the access privileges of that device, instead of turning off a NetID or disabling a network port.
- Executed remediation programs for multiple wide-scale vulnerabilities – e.g., Heartbleed, OpenSSL -- providing University-wide scanning activities and reports.
- Provided guidance in remediation of incidents where personally identifiable information was exposed.

### ***What are we doing next? Expanded roadmap for FY15/FY16***

As the threat landscape continues to increase with multiple wide-scale vulnerabilities being identified and the nature of hacking continuing to intensify, we need to: address the highest risks identified in the risk survey, continue to increase our interaction with the community in order to address the risks associated with a decentralized environment, increase participation in our vulnerability testing and improve our monitoring capability, improve our ability to respond to breaches and vulnerabilities, and continue to focus on our most sensitive data.

### *Structured collaborative approach to Information Security*

- Working with the business units and IAC, focus on mitigation efforts with the greatest risk reduction potential that were identified via the Risk Assessment survey, including patch management, end-user device encryption and management, an expanded use of multi-factor authentication, and controls around administrative access to systems with sensitive information.
- Continue to vet priorities, activities, and content with IT Governance bodies.
  - Work with the IAC and the other IAC Level 3 subcommittees to broaden the input into information security priorities and practices.
- Establish the ISMS as the authoritative source of NU’s information security practice.
  - As part of the next policy development efforts, be more structured in policy creation, removing all references to standards and guidelines so their maintenance does not clog the policy development and review process.
- Stay current with work being done in the Service-Oriented Architecture (SOA) and Identity and Access Management (IAM) initiatives to identify new areas that require new policies, standards, or guidelines.

## *Preventive Controls*

- Network access control
  - FY15: Evaluate feasibility of expanding network access control (NAC) to more devices on the wired network.
  - FY16: Identify appropriate places to begin using features of the NAC solution to determine the “security posture of a device” before allowing it to connect to the network (e.g., where legally/contractually restricted data is known to be stored/processed). Should the computer fail the check, it would be placed in a quarantine condition that allows for remediation but restricts overall network access.
- End-user device management
  - FY15: Work with the IAC and individual schools and units to promote the use of Dell KACE and other configuration management solutions as risk containment/mitigation tools.
  - FY16: Draft a policy for the use of configuration management software to manage end-user devices (e.g., Dell KACE), particularly in instances where legally/contractually restricted data is processed/stored. Use the draft of the policy to work with the IT@NU community to develop operational guidelines and standards that will achieve the objectives of the policy.
- File sharing and storage
  - Develop process standards for using Box.com for storage of sensitive research and administrative data.
- Patch management
  - FY15: Adapt the enterprise system patch management guidelines for application in distributed IT units.
  - FY16: Revise the patch management practice to make it mandatory for all applications, and systems, servers, underlying operating systems (where feasible).
- Identity management
  - Federation
    - FY16: Develop guidelines, standards, and policies around using federated identities (e.g., via InCommon) for vendor-hosted applications.
  - Multi-factor authentication
    - FY15: Multi-factor authentication (DUO) pilot has been deployed in production use for FASIS self-service with 6,200+ participants. A more scalable architecture needs to be implemented so it can be deployed more broadly within the University.
    - FY16: Identify other high-value locations for DUO’s implementation. Some units have already expressed interest in using DUO for system administrator functions, Travel Services, and other enterprise systems. Once a scalable enterprise architecture is in place for this, begin assisting in a wider implementation of DUO.
- Vulnerability assessment
  - FY15: Increase the number of new sites that use vulnerability assessment services on production systems by 20%. Embed the use of vulnerability assessment services within the system and application development processes, starting with teams within NUIT.

- FY16: Continue to expand the number of devices using the vulnerability assessment service. Increase the number of University sites targeted for scanning by 40% over the current number.
- Service Provider Security Assessment (SPSA)
  - FY15: Revise the SPSA form/process (used to establish the security maturity of third parties providing services to the University) to increase its agility and value. For example, revise the questions to reflect current security controls and compliance requirements, adjust the weighting factors for responses to different questions to more accurately represent the risks associated with each type of situation (e.g., public data vs sensitive data), evaluate ways to streamline the form (e.g., if a service provider is using the services of another vendor with whom Northwestern already has a review on file, such as a vendor is using Amazon Cloud services to house Northwestern data).
  - FY16: Implement the newly revised SPSA process.
- Control of malicious activity identified on the University’s internal network
  - FY15: The third generation firewall solution (Palo Alto) has effectively monitored and controlled network traffic traversing the borders of the University’s network. Given these positive results, we will look at using these devices to better secure NU’s internal network.
- Encryption
  - End-user devices
    - FY15: Review the continued use of the University’s current encryption solution and its effectiveness and applicability to the environment.
    - FY16: Investigate the feasibility of using Active Directory policies to enforce encryption where legally/contractually restricted data is processed/stored.
  - Email – Investigate expanding manual email encryption functionality that is presently FSM-only, to all Exchange users.
- Credit card processing guidelines
  - FY15: Participate in the University’s Payment Card Industry/Data Security Standard (PCI/DSS) Council to design, implement, and maintain a PCI/DSS infrastructure with documented processes for payment card processing at the University.
  - FY16: Guided by the PCI/DSS workgroup, establish policy and procedures to support PCI/DSS data handling requirements, including expansion of vulnerability assessment services for sites subject to PCI/DSS compliance.

### *Activity Monitoring*

- Security Information and Event Management (SIEM)
  - SIEM is an acronym for the real-time logging, reporting, and analysis of security alerts generated by network hardware and applications. One can do SIEM by purchasing software, appliances, or managed services.
  - FY15: With NUIT departments, develop business requirements and conduct a feasibility study of SIEM.
  - FY16: Adopt and implement SIEM solution as determined by the feasibility study.

- Monitoring of traffic on the University's internal network
  - FY15: Investigate the addition of Palo Alto firewall appliances to assist in the identification, control, and monitoring of traffic on the University's internal network. This will complement the information available from the devices currently installed at the network borders.
  - FY16: If funded, install additional Palo Alto firewall appliances to assist in the identification, control, and monitoring of traffic on the University's internal network.

### *Education and Engagement*

- Documentation and reporting
  - FY15: Identify missing documentation that would help mitigate the highest risks identified for the University. Engage the community to ascertain needs for security reporting.
  - FY16: Develop and produce information security reporting to reflect the requests of the community; revise as needed to keep abreast of customer demands.
- Information Security Coordinator (ISC) program
  - Originally conceived as a guided program to organize designated school and department technical support personnel into a "grass roots" community of security coordinators, the ISC program lacked adequate support and languished. But it may be worth revitalizing.
  - FY15: Revisit the ISC program with the Infrastructure Advisory Committee (IAC).
  - FY16: Execute on the decision of the IAC to either revive or disband the program.
- Formal security training
  - FY15: Investigate the feasibility of providing formal information security training to interested practitioners within the community.
- Phishing test
  - FY16: Develop and perform a phishing test of the user community (where feasible). The testing would include phishing emails created and delivered by Northwestern security staff to challenge users' knowledge and awareness of phishing attempts. Users responding to such an email by clicking on a link would be sent to a predefined site where information on phishing is available to help educate them.
- HIPAA/HITECH compliance
  - Promote adoption of regulatory guidance (e.g., HIPAA/ISO Guidance document) to help ensure compliance, and develop additional documentation as required.
  - Conduct annual training of NUIT units, as required (e.g., HIPAA/HITECH training).
  - Expand vulnerability assessment activities to assist the Feinberg School of Medicine (FSM) IT and Information Security units in establishing scheduled scanning of FSM sites.

### *Incident and Vulnerability Response*

- Execute the University's remediation program for multiple wide-scale vulnerabilities. (Bash/Shellshock and SSLv3/Poodle both occurred last fall.)

- Review and revise the Incident Response Protocol to improve its agility and applicability, test its new steps, and communicate the changes and the existence of the protocol within the community.
  - Within the Incident Response Protocol, establish a process to capture information on resources required to respond to and resolve security incidents.
- Vulnerability assessments
  - FY15: Expand the vulnerability assessment process so it can be a more valuable tool for responding to widespread vulnerabilities, such as Heartbleed. This will entail a more structured and comprehensive approach to scanning, including maintaining an inventory of existing system and application ownership assignments.
  - FY16: Develop tracking and escalation processes to insure highest level vulnerabilities are remediated once they've been identified.

## Appendix VI: IT Governance Committee Annual Reports

### Educational Technology Advisory Committee (ETAC)

#### Report to the IT Executive Committee: 2013-2014

Educational Technology Advisory Committee Members:

Gad Allon, *Managerial Economics and Decision Sciences, Kellogg*  
Ron Braeutigam, *Office of the Provost (co-chair)*  
Stephen Carr, *Office of the Dean, McCormick School of Engineering*  
Tom Collinger, *IMC, Medill School of Journalism, Media, and Integrated Marketing Communications*  
Tracy Davis, *Office of the Dean, The Graduate School*  
Vicky Getis, *Academic and Research Technologies, Information Technology*  
Michael Hannen, *School of Education and Social Policy*  
Jennifer Hobbs, *Graduate Students representative*  
Greg Light, *Searle Center for Advancing Learning and Teaching*  
Franziska Lys, *Department of German, Weinberg College of Arts and Sciences*  
Rene Machado, *Office of the Dean, Bienen School of Music*  
Bryan Libbin, *School of Communication*  
Sofia Sami, *Associated Student Government*  
Geoff Swindells, *University Library*  
Sean Reynolds, *CIO, Information Technology*  
Joel Shapiro, *Office of the Dean, School of Continuing Studies*  
Bob Taylor, *Academic and Research Technologies, Information Technology (co-chair)*  
Emerson Tiller, *Office of the Dean, School of Law*  
Jay Thomas, *Office of the Dean, Feinberg School of Medicine*

## *Executive Summary*

- The Educational Technology Advisory Committee (ETAC) was launched in May 2012 as one of the initial governance committees in a federated framework for Information Technology planning at the University. This annual report summarizes ETAC accomplishments during its second full year of activities, from September 2013 through August 2014.
- The full governance committee met eight times during the 2013-2014 Academic Year. The agendas for this year's meetings included reports and discussions regarding social media, new classroom designs, mobile practices, media management services, Northwestern's Semester Online, Coursera MOOCs, and the general topic of blended learning. But the dominant investigation and the recurring discussions for ETAC throughout the 2013-2014 year were centered upon the effort to chart a replacement for the Blackboard course management system, which had been in use at the University since 1999. ETAC created a Learning Management System (LMS) Review Group in January 2013 with representation from all of the Northwestern schools. This Review Group supported course pilots and performed assessments during the 2013-2014 school year of alternative educational platforms to Blackboard.
- The 25 faculty and staff members of the LMS Review Group brought a unanimous recommendation to ETAC in April 2014 for a change by the University from Blackboard to Canvas (a product of Instructure). The Review Group urged the transition to begin immediately, if funding and contract matters for Canvas could be quickly addressed. ETAC accepted the LMS Review Group's recommendations and shared the decision about the move to Canvas with the Office of the Provost and (later in the summer) with the Board of Trustees. Funding was secured for the move to the new educational platform, including the addition of two staff in Academic and Research Technologies for an expanded training effort of Northwestern faculty in Canvas during FY2015 and FY2016. A three-year contract for Canvas service was signed in June using the framework of the Internet2 NET+ streamlined contract agreement with Instructure. Northwestern's contract includes 24/7/365 Support Desk services from Instructure for all faculty, staff, and students.
- With the completion of the work of the LMS Review Group in April 2014, ETAC formed a Canvas Transition Committee in May to guide the successful adoption of Canvas by the University community. The Canvas Transition Committee has representatives from each Northwestern school and it is co-chaired by Tom Collinger and Vicky Getis. The Committee has set aggressive adoption rate goals for Canvas during FY2015 and FY2016, including the retirement of Blackboard Learn from any further course use in August 2015. The Committee also recommended the adoption of the TurnItIn anti-plagiarism tool with Canvas by the start of fall quarter 2014 classes, and it began turning attention to development of a framework for guiding the adoption of third party educational apps into the Canvas ecosystem of services.
- Beyond the move to Canvas, ETAC ranked topics that await its attention during FY2015. The top issues include: supporting faculty in their interests in active learning models of education; investigating and tracking the opportunities with learning analytics; coordinating the development of new classroom designs with the Northwestern Classroom Committee; and improving media management services that are critical to advances in our teaching and learning environment.
- ETAC co-chairs continued quarterly, joint planning meetings with the leadership from the University Classroom Committee during 2013-2014.



## ***2013-2014 ETAC Meeting Summaries***

### ***September 24, 2013 ETAC Meeting (Learning Management System Review Group's Activities)***

Greg Light (LMS Review Group chair), Susie Calkins, Vicky Getis and Bob Taylor presented on the 16 fall course pilots that are being conducted in Canvas. Calkins and Light summarized an all-faculty survey that will be conducted this fall concerning faculty perceptions of the educational technology environment at Northwestern. Getis gave a tour of the new LMS Review web site and blog, which is intended to keep the University community informed about the findings from this year's pilot courses.

Shehzad Amin presented on the WiFi expansion efforts for Northwestern classrooms. As of the start of fall quarter classes in 2014, 60% of the Northwestern Registrar classrooms in Evanston have satisfactory WiFi service from a capacity and coverage perspective. It is expected that WiFi access point expansions that are on-deck for completion during FY2014 will result in practically all Northwestern Registrar classrooms having basic WiFi coverage by the start of classes in 2014.

### ***November 18, 2013 ETAC Meeting (The Use of Social Media in SESP Learning Communities)***

Jeff Merrell and Keeley Sorokti shared an update about the first full year of use of the Jive social media tool for SESP's Masters Program in Learning and Organizational Change. The goals of the effort have been to develop a social learning community for this Masters Program that goes beyond the individual course experiences. The findings in SESP are that the use of Jive helps to model a modern workplace learning environment, and it helps to integrate the experiences of the online students in the program with those of the on-campus students.

### ***December 17 ETAC Meeting (FY2015 Information Technology Discussion Document)***

David Keown and Sean Reynolds guided ETAC members through the Administrative Systems and Information Security sections of the FY2015 Information Technology Discussion Document. This was followed by a brief overview of the introductory section, a summary of the overarching intent of the discussion document, and a request for feedback. Bob Taylor walked ETAC members through the Research Technology and Educational Technologies for Teaching and Learning sections. A general strategy for IT@NU was identified during meeting discussion: NUIT wants to embrace the distributed environment while also introducing a new level of coordination in order to manage priorities, allow central IT the time it needs to build a foundation to support agile development, and manage resources by avoiding duplication of effort across units.

### ***January 10, 2014 ETAC Meeting (LMS Review Group updates; Mobile Practices at NU)***

Vicky Getis, Gad Allon, Emerson Tiller, and Les James shared survey results from the fall quarter Canvas pilot with committee members. A high level of satisfaction was evident in both faculty and student experiences in the 16 fall pilot courses conducted in Canvas. The Canvas pilot program is expanding for the winter quarter. Very little interest has been expressed by Northwestern faculty in piloting either Desire2Learn or the New Blackboard system.

Harlan Wallach briefly walked committee members through the document "A Progress Report, One Year Out: Identifying Improved Mobile Practices and Mobile Infrastructure for Northwestern University." Surveyed students participating in the Canvas pilot indicated that mobile access to the LMS was the top reason to switch from Blackboard to Canvas. Students are increasingly using their mobile devices to access many institutionally provided services and applications, but satisfaction with their experience in

that engagement is decreasing. This signals to the University where and in what ways Northwestern should be addressing delivery and the user experience for mobile devices.

***February 20, 2014 ETAC Meeting (Media Management Landscape at NU)***

Bill Parod and Stu Baker presented on current challenges and emerging strategies for providing a coherent set of media management services for support of teaching, learning, research projects and curated collections at Northwestern. There are too many fragmented solutions at play in this landscape at Northwestern right now, and this reflects the general conditions of the marketplace beyond campus. Three major on-campus commitments to media management are Mediasite (from Sonic Foundry), Avalon (an audio and video repository development led by the Northwestern Library and the Indiana University Libraries), and MediaSpace3 (a media management service with a bias for delivery of content into Blackboard, developed by NUIT). Parod and Baker discussed general goals of better integration of critical features across these three platforms, as well as a desired shift towards a Service Orientated Architecture for these efforts. Parod and Baker promised to come back to ETAC later this year with concrete recommendations for the media services that will be available to Northwestern faculty for the start of FY2015 classes.

***April 21, 2014 ETAC Meeting (Recommendations from the LMS Review Group; ETAC's Future Priorities)***

The LMS Review Group made the following four recommendations to ETAC: (1) that Northwestern switch from Blackboard to Canvas by Instructure for its primary LMS; (2) that the transition should commence immediately; (3) that Blackboard be decommissioned in August 2015; and (4) that ETAC establish a transition steering group to facilitate the changeover. All ETAC members voted in favor of the LMS Review Group's recommendations. Discussion turned to the establishment of a Canvas Transition Committee, to guide the successful adoption of the new educational platform among all Northwestern schools. ETAC members also advised on impending announcements to the campus community about the change from Blackboard to Canvas.

Bob Taylor reviewed the ten topics under consideration for prioritized further investigation by ETAC during 2014 and 2015. The two topics that received the highest scores from ETAC members for both being strategic and also an acute priority for ETAC were "support for blended learning and online education at Northwestern" and "support for faculty as Northwestern transitions from Blackboard to Canvas." Three ballot topics scored higher than 3.5 out of 5 in the voting in terms of being acute for ETAC's attention: blended learning and online education, support for the transition to Canvas, and flexible classroom designs.

***June 27 ETAC Meeting (First Updates from the Canvas Transition Committee)***

Co-chairs Tom Collinger and Vicky Getis presented on the first action steps of the newly formed Canvas Transition Committee (CTC). The CTC is in the process of designing a communications plan and awareness campaign for the Transition. By late summer, a "Canvas is Here" campaign will move forward. The CTC has also overseen a successful connection between Canvas and the Northwestern Student Enterprise System (SES). The CTC would like to see 15 percent of all Northwestern courses on the Canvas platform by summer 2014, and 25 – 50 percent of courses for fall 2014. By winter 2015, about 75 percent of all courses should be in Canvas. The Committee is shooting for 100 percent to be on the platform as the (aggressive) goal for spring quarter 2015. Summer 2015 would be devoted to cleaning up Blackboard course data transfers before its retirement.

***July 14, 2014 ETAC Meeting (Media management services for the 2014-2015 academic year)***

Bill Parod and Stu Baker returned to ETAC, to follow up on the investigations they first outlined at their February presentation regarding emerging media management services, particularly for support of teaching and learning. Their presentation focused on the Library and NUIT's short-term pedagogical media management recommendations for the upcoming academic year. "News that you can use," if you will, for Northwestern faculty preparing for FY2015 classes. The presenters had three application recommendations for streaming media management for the coming year. For fall 2014, the recommended path for faculty authors of video content within Canvas is to use Canvas Managed Media. Avalon should be used when media preservation is important. Mediasite will continue to be Northwestern's primary lecture capture system. Parod noted that MediaSpace3, a local invention for managing media primarily into Blackboard, is now deprecated and NUIT will no longer be accommodating requests for new users onto MediaSpace3 or for content ingestion into that application. Parod also noted that Instructure has begun development of a media management system with a bias towards supporting teaching and learning activities. Northwestern has been approached by Instructure to be an early test case for use of this impending media management system. Finally, Claire Stewart and David Keown are leading efforts to investigate broader-based media management requirements at Northwestern and to recommend a way forward for the University.

## Administrative Systems Advisory Committee (ASAC)

### 2013-2014 Administrative Systems Advisory Committee Members:

Pam Beemer, *Human Resources*  
Heather Campbell, *Feinberg School of Medicine*  
Simon Greenwold, *Weinberg College of Arts and Sciences*  
Jim Hurley, *Office of Budget and Planning*  
Alice Kelley, *McCormick School of Engineering*  
Meg McDonald, *Office for Research*  
Sarah McGill, *The Graduate School*  
Mike Mills, *Office of the Provost*  
Ron Nayler, *Facilities Management*  
Julie Payne-Kirchmeier, *Student Affairs*  
Brian Peters, *University Services*  
Karyn Reif, *Alumni Relations and Development*  
Roxanne Sellberg, *University Library*  
Jean Shedd, *Office of the Provost (Chair)*  
Ingrid Stafford, *Office of Financial Operations*

David Keown, *Northwestern University Information Technology*  
Andrew Ludington, *Northwestern University Information Technology (administrative support)*  
Sean Reynolds, *Northwestern University Information Technology*  
Jason Schober, *Northwestern University Information Technology*

### *FY14 Year in Review*

The Administrative Systems Advisory Committee (ASAC) continued its activities into its second year with the goals of surfacing conversations, familiarizing ourselves with the institutional landscape, and identifying strategic initiatives and enterprise priorities across major business areas supported by enterprise administrative systems. Key activities have included: the creation of multiple level 3 committees to advise line-of-business systems teams; targeted discussions of proposed initiatives and major reports from working groups; discussions about the alignment of IT and business priorities; and CIO updates. (A summary of the ASAC meetings is included as the last page in this section.)

- In the course of the year, ASAC chartered seven Level 3 advisory committees. Each committee focuses on a functional area (e.g., Research, the Student Experience), and is charged with advising the systems teams that support enterprise applications in their area. In some areas, the scope of interest was deemed too big or too disparate for a single committee to govern. In those cases, level 4 subcommittees were also created. The ASAC subcommittees are:
  - Alumni Relations and Development (est. Fall 2013; Karyn Reif, ARD, chair; Stu Baker, IT lead)
    - Alumni Relations (Heather Ruggio, chair; Stu Baker, IT lead)
    - Development (Heather Ruggio, chair; Stu Baker, IT lead)
  - Facilities (est. Winter 2013; Joel Trammell, WCAS and Eric Boberg, FSM, co-chairs; Kris O'Brien, IT lead)

- Finance (est. Fall 2013; Karl Turro, Financial Operations, chair; Kris O'Brien, IT lead)
- Human Resources (est. Fall 2013; Pam Beemer, HR, chair; Kathy Tessendorf, IT lead)
- Information Management (est. Spring 2014; Andrew Ludington, IT, Chair; Luna Rajbhandari, IT lead)
- Research Administration (est. Spring 2014; Ellen Feldman, OR, and Kim Griffin, OSR, co-chairs; Kris O'Brien, IT lead)
- Student Experience (est. Spring, 2014; Jaci Casazza, Chair; Ann Dronen, IT lead)
  - Undergraduate Experience (TBD chair; Jennifer Bivens, IT lead)
  - Graduate Experience (TBD chair; Jody Reeme, IT lead)
  - Student Life (TBD chair; Jeff Wilson, IT lead)

These committees are still very new, and are therefore still learning the landscape of their functional responsibilities and how to operate as advisory committees in the IT governance structure. To assist in that development, ASAC provided a model for structuring governance activities to coincide with the University's annual planning and budget cycle. Level 3 committees were asked to surface, document, and communicate system priorities from their line of business to the Level 2 parent committee, ASAC. FY2014 is acknowledged to be a transition year – the committees are just beginning, the prioritization process was structured late in the process with a resulting compressed time frame, and ASAC does not yet have experience in processing this type of input. Thus, the output of this process will likely need refinement. However, the exercise will yield valuable lessons which can be applied to next year's process; the prioritization of administrative work in each functional area and sharing of the compiled information has proven valuable.

- In FY2013 and FY2014, ASAC chartered several working groups charged with investigating areas of interest to the committee. Workgroups are focused on a single task, generally to produce a formally documented recommendation in the form of a white paper and presentation to ASAC. Workgroups that presented their findings in FY2014 included:
  - Research Administrative Systems
    - Membership: Tom Board, David Keown, Warren Kibbe, Andrew Ludington, Steven Moyano, Luna Rajbhandari, Jason Schober
    - The workgroup articulated a vision for the enterprise IT architecture and a recommendation to re-architect the niche focused research administrative systems into an integrated portfolio which would support the business of sponsored research more holistically. While focused on research administration, the recommendations in this report can be applied more broadly to all administrative systems and have served as the source of many of ASAC's prioritized initiatives.
  - Enterprise Content (ECM) and Business process Management (BPM)
    - Membership: Chris Comerford, David Keown, Scott Pitts, Michael Satut
    - The workgroup produced a recommendation to consolidate and invest at the institutional level in both ECM and BPM, with the goal of better coordinating and supporting the ECM solutions deployed on campus.

- Identity and Access Management (IAM)
  - Membership: James Rich, Michael Satut, Ken Woo, Kristen Yehl, Stu Baker, Serena Christian, Kristin McLean, Jody Reeme, Tom Board, David Keown, Phil Tracy
  - The workgroup produced a recommendation for re-architecting the IAM environment into a more integrated package on a real-time basis, connecting the identity management systems with each other, linking the surrounding business applications more tightly with the identity management systems, and being able to tailor identity assurance requirements to ameliorate risks associated with different online services. These changes will enable the University's collection of IT systems to return much higher value for the University by increasing the institution's ability to more nimbly integrate new systems, and to serve our increasingly diverse and distributed community better by providing more easily accessible online services.

Recommendations from these workgroups have formed the basis of strategic priorities that ASAC supports.

### *FY15 Priorities*

- The common thread in these discussions and priorities is a shift away from focusing on work that solely addresses a single line of business need, and includes more foundational work that will create an environment that is ultimately more conducive to rapid and reusable development, and which better supports federated and cloud-based solution integration.

The major areas of focus for this foundational work for FY2015 are:

- Service Oriented Architecture
- Identity and Access Management
- Information Management
- Governance

## ASAC Meeting Review for FY14

<p>September 2013</p> <ul style="list-style-type: none"> <li>- Unit Report: Student Affairs</li> <li>- Goals for Level 3/4 Committees</li> <li>- Level 3 Committee Proposal: The Student Experience</li> </ul>	<p>March 2014</p> <ul style="list-style-type: none"> <li>- NUIT Administrative Systems re-organization</li> <li>- FY15 Priorities Roundtable (ARD, TGS, University Services, TGS, HR, Financial Operations)</li> </ul>
<p>October 2013</p> <ul style="list-style-type: none"> <li>- CIO Update</li> <li>- Level 3 Committee Proposal: Human Resources</li> </ul>	<p>April 2014</p> <ul style="list-style-type: none"> <li>- Service Oriented Architecture Update</li> <li>- FY15 Priorities Roundtable continued (NUL, OR, McCormick, FSM, Budget, WCAS)</li> </ul>
<p>November 2013</p> <ul style="list-style-type: none"> <li>- Research Administrative Systems Report</li> <li>- Level 3 Committee Proposals: <ul style="list-style-type: none"> <li>o Facilities Management</li> <li>o Student Experience</li> <li>o Information Management</li> </ul> </li> </ul>	<p>May 2014</p> <ul style="list-style-type: none"> <li>- No Meeting</li> </ul>
<p>December 2013</p> <ul style="list-style-type: none"> <li>- Enterprise Content and Business Process Management Report</li> <li>- FY15 IT Discussion Document</li> </ul>	<p>June 2014</p> <ul style="list-style-type: none"> <li>- SOA Forum Recap</li> <li>- FY15 Priorities Roundtable conclusion (Facilities, Undergraduate Enrollment, Provost's Office)</li> <li>- What was learned from the Priorities Roundtable</li> <li>- L3 Committees: how to help them help ASAC</li> </ul>
<p>January 2014</p> <ul style="list-style-type: none"> <li>- Summary of responses to Provost's FY15 planning and budget letter</li> <li>- Data Warehouse and Analytics Discussion Report</li> </ul>	<p>July 2014</p> <ul style="list-style-type: none"> <li>- Conclusion of "What's Next?" discussion</li> <li>- L3 Committee (feedback from participants, draft templates for reporting)</li> <li>- Multi-factor authentication update</li> </ul>
<p>February 2014</p> <ul style="list-style-type: none"> <li>- No Meeting</li> </ul>	<p>August 2014</p> <ul style="list-style-type: none"> <li>- No meeting</li> </ul>

## Infrastructure Advisory Committee (IAC)

### *FY14 Year in Review*

- The Infrastructure Advisory Committee (IAC) continued its activities into its second year. As in the first year, we intended to **surface conversations, familiarize ourselves with the institutional landscape, identify priorities, and coordinate efforts** across IT organizations. Key activities have included unit presentations from committee members, periodic roundtable updates, regular CIO Updates, and targeted discussions on infrastructure priorities. (A summary of the IAC meetings is included as the last page in this section.)
- The year began with a half-day retreat in September 2013, and one of the most explicitly expressed needs from the committee was to more directly turn discussions into meaningful and realizable actions. Addressing this need has continued to prove both important and challenging as we further refine the roles of advisory committees, cross-institutional working groups, and unit-internal project teams.
- The committee identified service-oriented architecture (SOA) as its top recommendation for University-wide effort, as it enables far greater collaboration and federation of services across the IT@NU community. A SOA working group was established in early 2014, including representatives from NUIT, enterprise systems, and schools.
- It also became clear that the IAC would benefit from the Level 3 structure already used by the Administrative Systems Advisory Committee, which enabled more targeted explorations of emerging topics by subject matter experts. In the course of the year, we created four new Level 3 advisory committees. Each committee focuses on a functional or technical area and is charged with identifying projects to pursue and developing recommendations for broader consideration by the IAC and IT Executive Committee. These committees are:
  - Service Platforms (est. Fall 2013; Michael Hannen, SESP, chair; David Carr, NUIT lead)
  - Security/Risk (est. Winter 2014; Carl Cammarata, FSM, chair; David Kovarik, NUIT lead)
  - Collaboration and Communications (est. Spring 2014; Michael Satut, TGS, chair; Scott Pitts, NUIT lead)
  - End User Support (est. Summer 2014; Christel Bridges, Law, chair; Bob Davis, NUIT lead)

While these committees are still very new and are therefore still learning the landscape of their functional responsibilities and how to operate as an IT Governance advisory subcommittee, we have already benefitted from them. For example, the Security/Risk subcommittee has reviewed, and will be forwarding to the IAC, policies on IT Required Conduct and patch management, and the Service Platforms committee has helped to refine a shared service offering for research storage space.

- We have now begun to establish a stronger connection to the University's annual budget and planning cycle. In summer 2014, the IAC identified its key priorities for FY2015, as outlined in the next section of this document. These priorities serve as input to the IT Executive Committee, NUIT, and school/departments for their priorities and budget asks. In addition, it is intended that these priorities will inform the next IT planning document in fall 2014. The IAC and Level 3 committee agendas for the following year will be based on the IT planning document, creating a virtuous cycle that results in a more cohesive voice for IT investment and execution.



## *FY15 Priorities*

- The past year has seen a significant increase in the University-wide adoption of public cloud services. Most notable among the many new services now in use by Northwestern are Instructure's Canvas learning management system and the Box file synchronization and sharing solution. These new services offer the opportunity to combine the functionality and technology end-users now expect, and even demand, with institutional governance and protection.

Recent discussions in the IAC have surfaced the need to address the area of cloud services more systematically, so that the possibility of using this platform can be more of a normal operation, instead of a series of one-off exceptions. To make this transition, a comprehensive set of guidelines needs to be developed for identifying, assessing, purchasing, deploying, using, and retiring cloud services by a department, school, or the University as a whole. Such a framework would enable units to pursue innovative technologies within an appropriately pre-defined context of policy, risk management, and operational readiness.

**The IAC has defined creating cloud service guidelines as its top priority for the 2015 fiscal year.**

The committee believes this accomplishment would serve as a foundation for future innovations in research, educational, and administrative computing, and extend IT@NU's capabilities to deliver needed technical solutions more quickly. The scope and scale of this endeavor is anticipated to be large enough to consume the time not only of the IAC itself, but also of its four Level 3 committees.

This framework would include not only the governance and management of in-house technologies, such as NUcloud, but also how we as a University approach the public cloud. One particular area we anticipate exploring is the set of common providers underpinning cloud services. For example, understanding Coursera's technology environment would include research on Amazon Web Services, which Coursera uses for its infrastructure.

- Other IAC priorities and in-flight efforts that will be addressed in FY15 include the continuation of the SOA initiative, Identity and Access Management (IAM), the voice platform replacement project, desktop virtualization for improved security and management, endpoint management, business continuity/disaster recovery, and expanded data storage capacity for academic and administrative use.

## *IAC Meeting Review for FY14*

<p>September 2013</p> <ul style="list-style-type: none"><li>- IAC half-day retreat</li></ul>	<p>March 2014</p> <ul style="list-style-type: none"><li>- SOA presentation</li><li>- Level 3 Update: Service Platforms</li></ul>
<p>October 2013</p> <ul style="list-style-type: none"><li>- Unit profile: Law, Office for Research</li><li>- IAC priorities for FY14</li></ul>	<p>April 2014</p> <ul style="list-style-type: none"><li>- No Meeting</li></ul>
<p>November 2013</p> <ul style="list-style-type: none"><li>- Unit profile: NUIT ISS/C</li><li>- CIO update</li><li>- IAC FY2014 Agenda</li><li>- Level 3 update: Service Platforms</li></ul>	<p>May 2014</p> <ul style="list-style-type: none"><li>- Unit profile: Student Affairs</li><li>- CIO update</li><li>- Level 3 update: Collaboration and Communications</li></ul>
<p>December 2013</p> <ul style="list-style-type: none"><li>- FY15 IT discussion paper</li></ul>	<p>June 2014</p> <ul style="list-style-type: none"><li>- Unit profile: Audit and Advisory Services</li><li>- Call for Participation: End User Support Advisory Committee</li><li>- IAC priorities for FY15</li></ul>
<p>January 2014</p> <ul style="list-style-type: none"><li>- Unit profile: Feinberg</li><li>- SharePoint/Box adoption</li><li>- Workflow/ECM paper presentation</li><li>- Call for Participation: Collaboration and Communications Advisory Committee</li></ul>	<p>July 2014</p> <ul style="list-style-type: none"><li>- IAC priorities for FY15</li><li>- Level 3 update: Security/Risk</li></ul>
<p>February 2014</p> <ul style="list-style-type: none"><li>- Unit profile: NUIT Emerging Technologies</li><li>- Provost's questions on IT, specifically question #4 on federation</li><li>- Research Administration Systems paper presentation</li><li>- Level 3 update: Security/Risk</li></ul>	<p>August 2014</p> <ul style="list-style-type: none"><li>- Unit profile: Kellogg</li><li>- Identity and Access Management report presentation</li><li>- Converged Communications projects presentation</li></ul>