

University Services: Information Technology

STATE OF IT REPORT - 2017



4

Overview of US:IT

System Upgrades & Enhancements

12

15

Team Highlights

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From the Desk of the Chief Information Officer



David Demers, Ph.D.
Chief Information Officer

Hello and welcome to the University Services:Information Technology division's annual State of IT report. In this report, we hope to inform the University of Maine System community with an overview of the US:IT Organization, updates on major projects and service enhancements completed or undertaken this past year, partnerships facilitated and a vision of the future for the US:IT team.

Our division continues to strive to support the 'One University' concept by providing reliable, secure and robust technological solutions that enhance teaching and learning, create operational efficiencies and accommodate the business goals of each campus constituency. Information contained in this report was contributed by numerous staff within US:IT and the success metrics reported highlight the ongoing dedication and commitment of the entire US:IT team to deliver exemplary customer service to each campus we support. In this report we also outline the collaborations, partnerships and activities we will continue to pursue in order to enhance the technology and information services landscape for the University of Maine system.

It should also be noted that the past year was one of leadership transition for US:IT. Dick Thompson, who retired as CIO in September 2017, was the driving force behind the IT unification effort. This monumental task positioned US:IT to be on the leading edge for the University of Maine System to drive new efficiencies and realize savings in order to combat rising costs and shrinking budgetary allocations. Through his stewardship and leadership, US:IT emerged to serve as a model of success for other units to follow. I am grateful to Dick for his contributions and his strength in seeing this initiative through. It is my goal to continue to build upon this success. To do so will require continued collaboration and teamwork throughout the division as well as with the students, faculty and staff we serve on each campus. I truly look forward to working together as a group to achieve this goal.

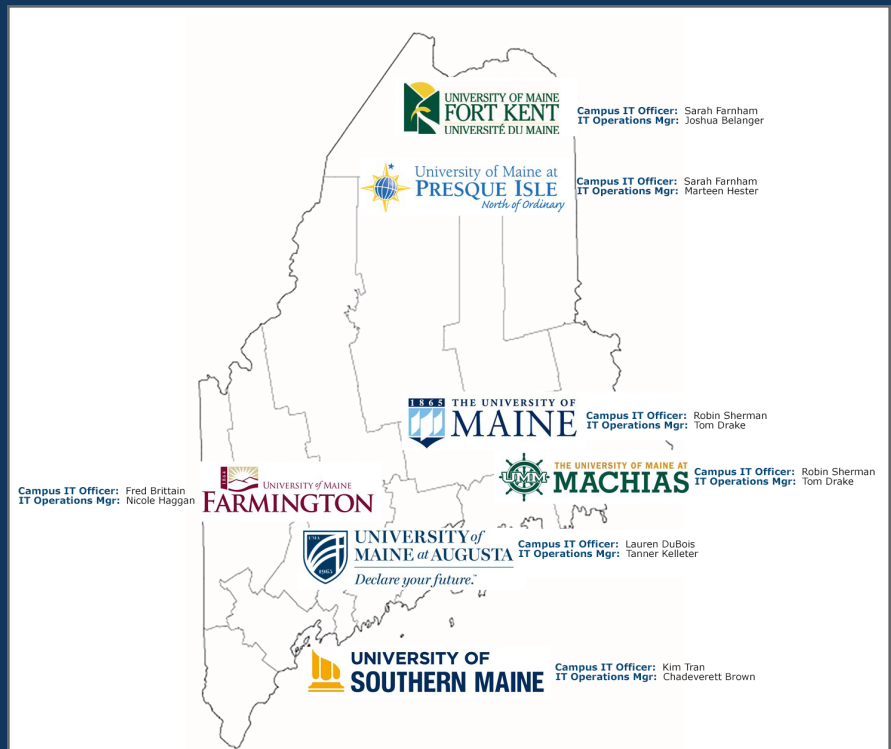
A handwritten signature in black ink, appearing to be 'DD' followed by a flourish.

OVERVIEW OF US:IT

Structure, Leadership and Staffing

The University Services: Information Technology division consists of more than 200 US:IT employees organized into the following functional areas:

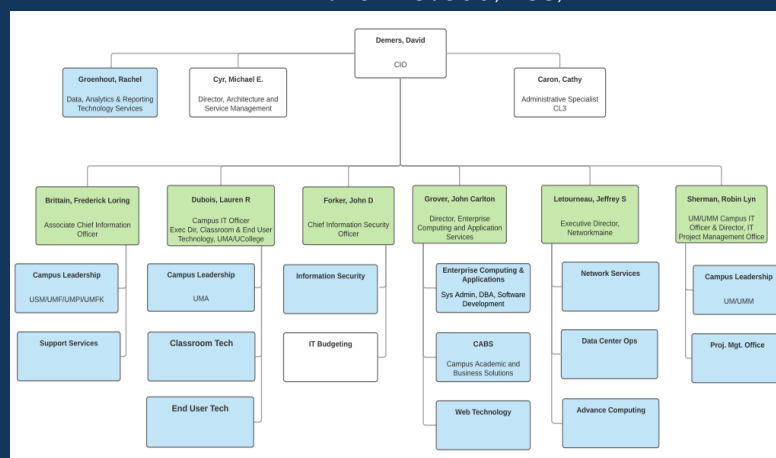
- Support Services
- Classroom Technology
- End User Technology
- Information Security
- Enterprise Computing and Applications
- Campus Academic and Business Solutions
- Web Technologies
- Network Services
- Data Center Operations
- Advanced Computing Group
- Project Management
- Data Analytics and Reporting Technology Services



In addition, each campus in the University of Maine System has a designated Campus Information Technology Officer as well as a Campus Operations Manager. These roles are charged with providing each campus with strategic and operational level IT support through collaboration and engagement.

A full organizational chart for US:IT is now available at:

www.maine.edu/its/



OVERVIEW OF US:IT

Support Services

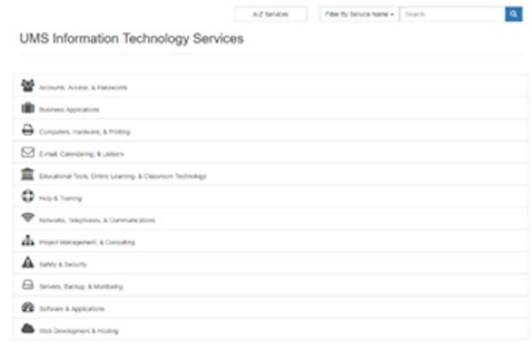
The University Services:Information Technology division supports greater than 100 unique services across a dozen categories:

- Accounts, Access, & Passwords
- Business Applications
- Computers, Hardware, & Printing
- E-mail, Calendaring, & Listserv
- Educational Tools, Online Learning, & Classroom Technology
- Help & Training
- Networks, Telephones, & Communications
- Project Management, & Consulting
- Safety & Security
- Servers, Backup, & Monitoring
- Software & Applications
- Web Development & Hosting

In 2016, US:IT formed a cross-disciplinary team entitled IT Portfolio Management chaired by Kim Tran, Campus IT Officer for USM. One of the goals for this group was the publication of a shared UMS Service Catalog. A service catalog is an industry standard offering that provides the client community a menu of services offered, self-service offerings, links to documentation and training, and contact information. In summer of 2017, this group released the very first Service Catalog for IT in the University of Maine System. Beyond providing customer-oriented access to IT Services, it also supports management of IT's portfolio of service as well as identification of duplicative services.

At this time there are 85 public-facing services in the catalog with numerous more internal to IT. The project will continue to be refined with documentation linked to services and incident response tracking as the product matures. From September through November 2017, the service catalog had 8,950 views from across all the campuses and the intensity of visits has been climbing as the university community becomes more familiar with the facility.

The service catalog is available at <https://itservices.maine.edu>

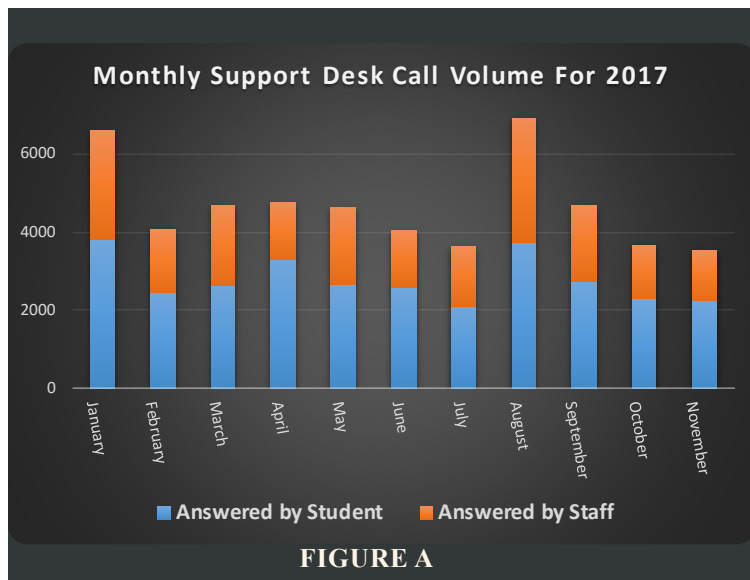


US:IT Service Catalog

Public Services
85

Service Catalog Views
(Sep'17-Nov'17)
8,950

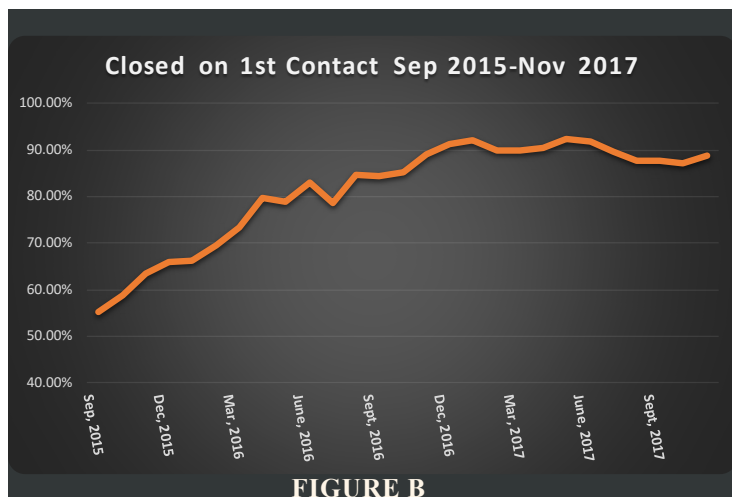
Help Desk



The US:IT operates multiple, integrated help desks across all the campuses and some additional locations. Telephones are managed such that the local help desk will receive the call first and if nobody is available, the client can opt to reach assistance from another location. The change to campus-first answering was made in summer of 2016 in response campus feedback about remote assistance not being as reliable. With the current model, approximately 93% of the total volume of 51,160 calls were answered locally over the past calendar year.

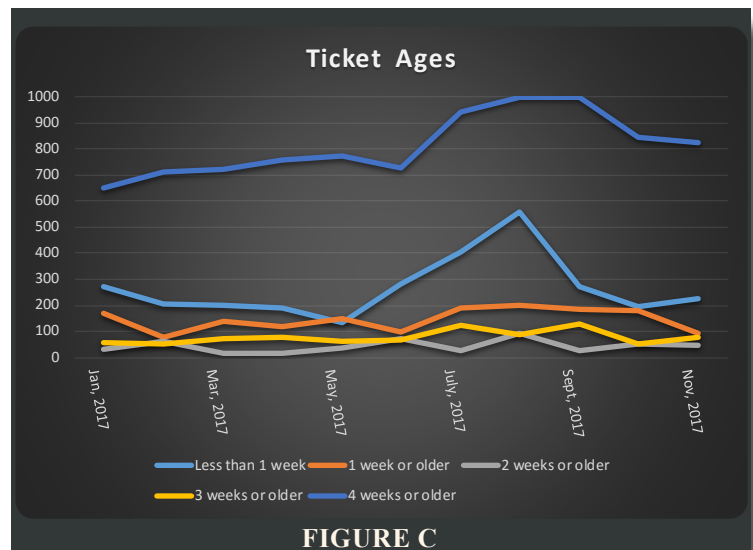
Student labor plays an integral part of the IT Support Services operation. In 2017, roughly 60% of calls placed to the IT Help Desk were handled by student workers (Figure A). Students, primarily located at UM, UMF and USM, play a significant role in after hours and weekend support as well.

A key metric for a robust Help Desk operation is the percentage of calls resolved on first contact. Training of support staff and the introduction of a statewide, real-time chat tool amongst support staff have steadily increased the



ability for issues to be resolved upon first contact. At present, roughly 90% of calls are resolved immediately (Figure B).

When tickets are unable to be resolved upon first contact, speed of resolution is an area where US:IT must continue to focus. With an increase in call volume in August in particular, the fall semester starts with a backlog of work before classes begin (Figure C). Various IT units will need to shift vacations to earlier times in the summer to ensure availability for an earlier peak period.



Through the initial State of IT report, seven new positions were created within IT Support Services. The purpose of these positions was to enhance quality of service and coverage. All of these positions are filled with six (6) at campuses and one (1) Analyst position charged with tracking effectiveness, process improvement, creating documentation and ensuring we are leveraging staff seamlessly from one campus to another. The result of these positions has resulted in extended support desk hours by adding second shift regular staffing to oversee existing student labor and making phone support available to all the campuses on weekends and until 9:00 PM during the week. This totals approximately twenty

Help Desk Calls

Total # Calls in 2017

51,160

% Answered by Students

59.9%

% Calls Resolved on First Contact

90%

four additional hours per week of service desk availability. The additional staff have also stabilized gaps where we have frequent turnover in entry-level positions, areas where staffing is limited, and illness and vacation has previously had a profound impact. Staff are regularly deployed to assist at other campuses as needed. These new staff have also provided assistance in moving legacy services to the appropriate enterprise teams and have facilitated support for computer desktop initiatives at the campus level.

As a trial, the help desk was made available 24x7 during the first two weeks of the spring semester of 2017. This was heavily advertised at all the campuses and yielded only six calls over the entire period after midnight and minimal volume between 9:00 PM and 12:00 AM. The experiment suggested the demand does not align with cost and the strategy will be re-evaluated.

Annual Budget

The US:IT budget is comprised of compensation and benefits for US:IT employees, non-compensation annual expenses and annual revenue offsets. The consolidated US:IT budget is almost entirely recharge-based, with the rational cost for services and support charged back to individual University of Maine System campuses. This arrangement provides a cost-effective model for delivering a blend of campus-specific and shared IT services for each member campus; this model is also leveraged by other UMS shared services organizations, including human resources, strategic procurement, general counsel, internal audit and finance.

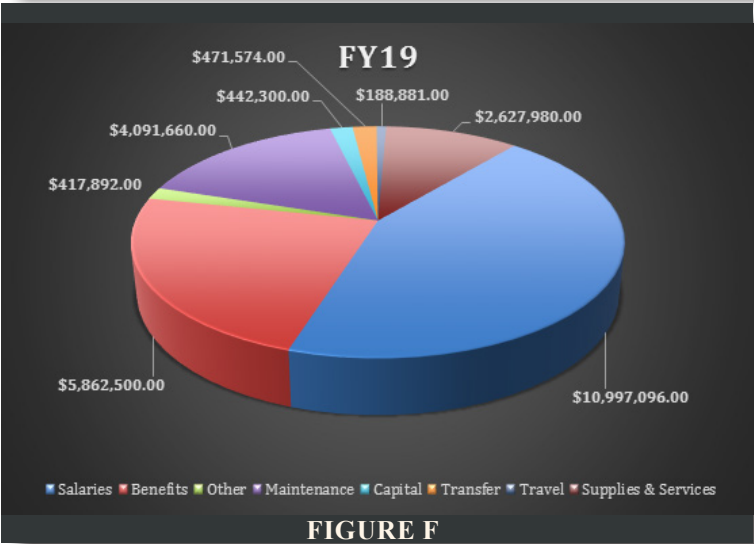
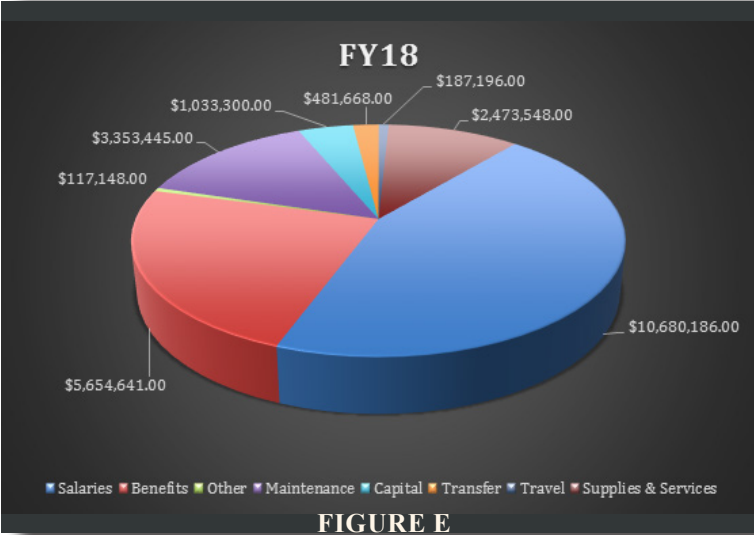
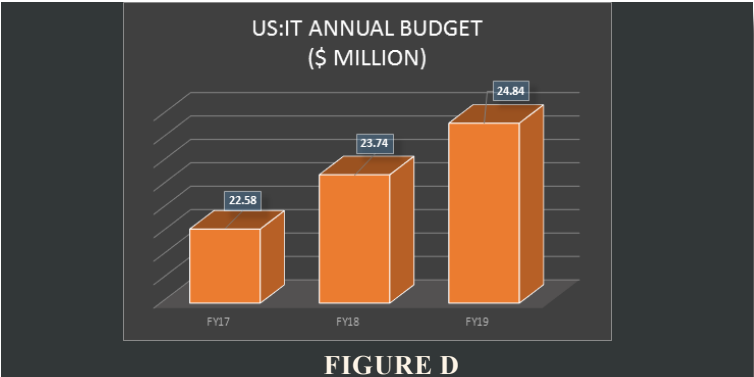
Since 2017, the US:IT budget has experienced modest growth to keep pace with contractually-mandated salary and annual licensing increases. As shown in Figure (D), the FY18 budget increased by a total of 5.1% to \$23.739M over the FY17 budget (\$22.580M). The projected FY19 budget includes a 4.5% increase over the FY18 budget for a total of \$24.843M.

The annual US:IT budget is allocated into several categories, including:

- 69% for compensation (salary & benefits)
- 31% for non-compensation expenses

Figure E provides the breakdown of the budget with the majority of non-compensation expenses allocated to ‘Supplies & Services’ and ‘Maintenance’.

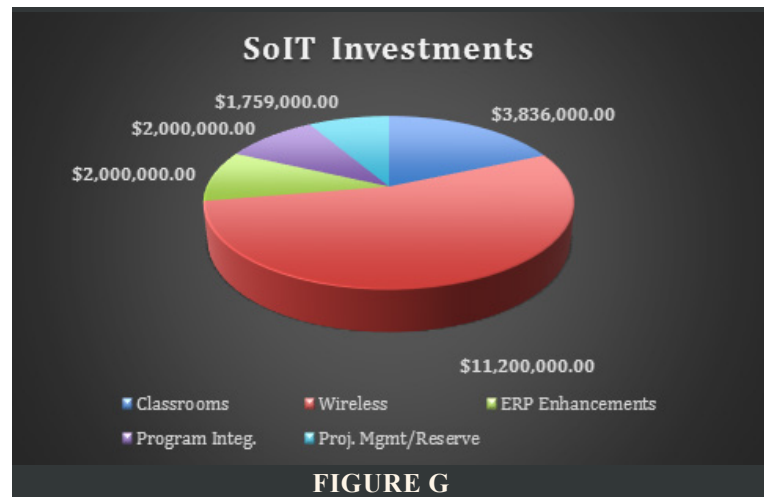
The projected FY19 budget has a similar allocation pattern (Figure F) to the FY18 budget. The \$1.104M increase includes allocations required to fund necessary support positions and negotiated salary increases (\$375K) and several non-compensation expenses which represent recently acquired software platforms as well as hardware and software expense reinstatements that were subsidized through other sources in the FY18 budget.



Capital Investments

In 2015, the State of IT Report presented to the Board of Trustees outlined several capital investment projects designed to enhance IT infrastructure, delivery systems and improved services to all University of Maine System constituencies in support of the One University initiative.

The Board of Trustees fully endorsed the initiatives presented and authorized \$20M in bond investments to support modernization of classroom technology, rebuilding wireless infrastructure and improvements in the MaineStreet ERP environment. Allocations were made to these projects as shown in Figure G. Updates on these projects are presented in the following sections of this report



PROJECT MANAGEMENT

Highlights and Metrics

The Project Management Office (PMO) continues to provide guidance to the UMS community throughout an IT project's lifecycle; from the initial project request through project completion. As the services the PMO delivers continue to mature, the value of applying project management methodology throughout the project lifecycle is fully realized, resulting in increased demand, support and adoption by project teams. Figure H demonstrates the increased reliance and demand for project management services for new initiatives from 2013 through 2017.

During 2017, the PMO completed fourteen (14) projects and initiated ten (10) new projects (Figure I). The following list represents some examples of the new projects.

New Projects

- *MaineStreet HRMS upgrade*
- *Blue (course evaluation system for UM, UMM, USM, and UMPI)*
- *EAB Campus/Guide (UMA, UMPI, and UMM)*
- *Taskstream (assessment, accreditation, and e-portfolio system for UM and UMA)*
- *UMF website upgrade*

Completed Projects

- *MaineStreet Financials upgrade*
- *Transfer Equivalency Guides*
- *UMA Website upgrade*
- *EAB SSC-Foundation*
- *learn.maine.edu website upgrade*
- *AiM upgrade*
- *Access Control*

FIGURE H Project Requests (By Category/Year)

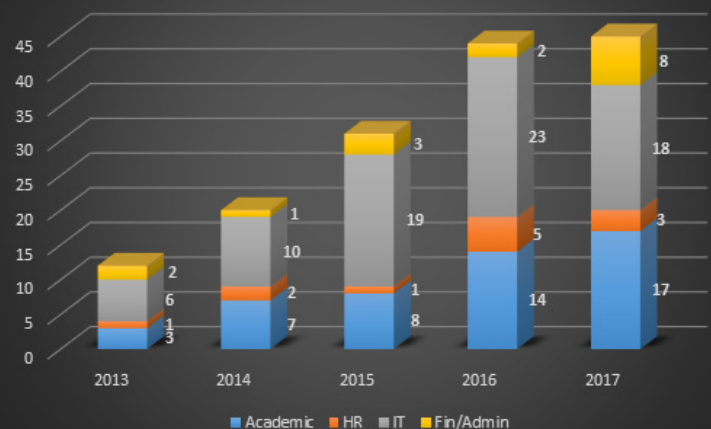
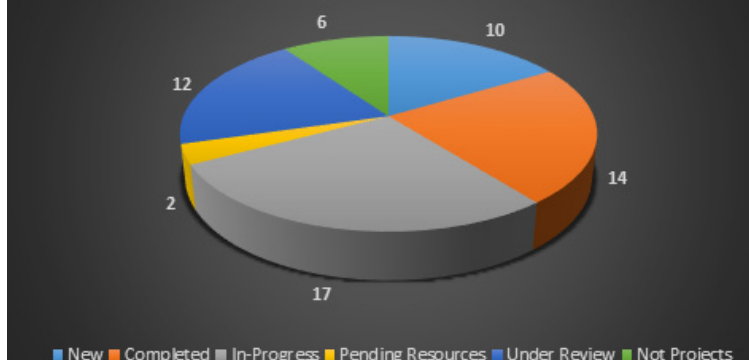


FIGURE I Project Requests 2017



In addition to providing project management services for projects requested at the campus and system levels, the PMO provided substantial support for the bond-funded Classrooms for the Future, Wireless Infrastructure, and MaineStreet Improvements projects.

2017 PROJECT UPDATES

CLASSROOMS FOR THE FUTURE

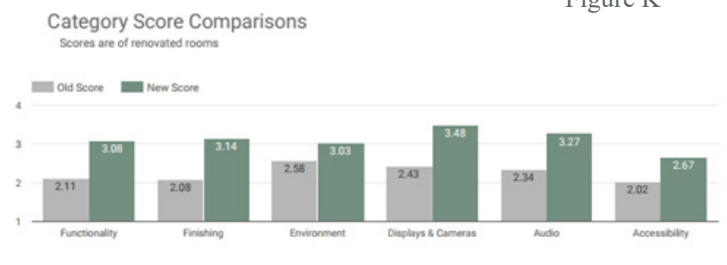
The US:IT Classroom Technology team assists in the design, installation, support and maintenance of audio visual technology in the classrooms, conference rooms, and event spaces for the University of Maine System. In the past year, the Classroom Technology team has been heavily involved in the 167 classroom installations and upgrade projects underneath the Classroom for the Future project. The team has also completed an additional 24 projects with campus based funding. There has been a concerted effort by the Classroom team with the Campus IT Officer's to change/shift the culture around using consistent, uniform technology in all campus spaces.

The work completed through the Classrooms for the Future project during the Summer of 2016 and 2017 has made a positive impact on the teaching and learning spaces. The funds provided allowed for coordinated efforts of the Classroom for the Future team, the Facilities staff on the various campuses, and the instructional designers, to significantly improve the classroom experience. A 4-point classroom assessment rubric was utilized to establish a baseline measure of teaching technology



capacity through evaluation of several practical categories including functionality, finishing, environment, displays & cameras, audio and accessibility. Prior to the upgrades performed over the past year, the average room scored 2.27 on the 4-point scale. Following upgrades completed over the past year, average room scores improved to 3.1. A breakdown of these improvements by campus are shown in Figure J. Additional breakdown of improvements in each of the functional categories are provided in Figure K.

Figure K



In addition to the quantitative measure of improvements made through the classroom investments, qualitative feedback obtained from students and faculty using these newly renovated spaces indicates the positive impact of the initiative. A sampling of feedback is provided below.

"Made me more focused on teaching instead of trying to get technology to work."

"I can teach while looking at the students not having to turn my back or to the side."

"Very versatile for group work."

"Much more pleasant environment."

"Make all classrooms like these rooms."

"I like that the projector and sound system can be controlled with one button. The projector provides a good quality picture."

"I like that this room has reliable equipment."

"Better teaching experience for myself and students."

Faculty Feedback

"It makes it feel more realistic and like you are sitting in the same room as everyone."

"more of a comfortable experience"

"I like how there are outlets on the table, it makes it easy to bring a laptop for work and not worry about where we are going to plug it in."

"This has made me realize how many opportunities are available to us students now compared to just a short time ago."

"Instant access to my Professors when I have questions."

"Easy to use remote and comfortable chairs."

Student Feedback



US:IT Classroom Technology 2017 Summary

149

Rooms Upgraded

2.27

Old Average Score
Upgraded Rooms

3.1

New Average Score of
Upgraded Rooms

Renovated Rooms Assessment Score Comparisons

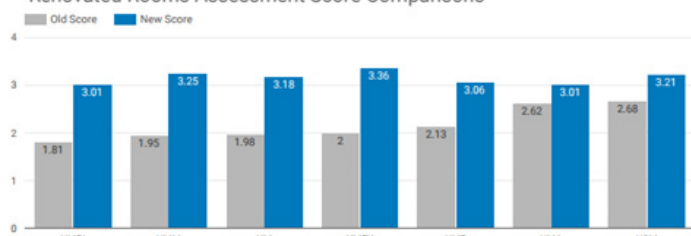


Figure J

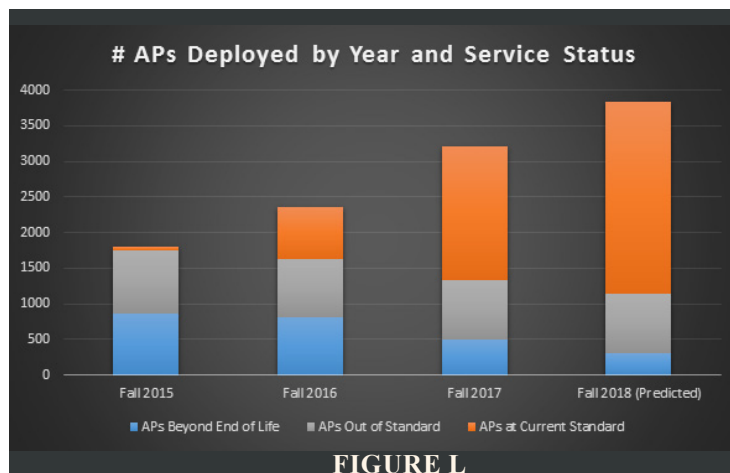
After Action Reviews (AARs)

AARs were completed on Summer 2017 classroom upgrades for all 7 campuses. Participants were eager to share positive feedback from faculty and students on updated classroom spaces. Areas for process improvement include enhancing communications with campus staff during the upgrade process, better coordination with Facilities to ensure timely completion of facilities related work, more detailed documentation on scope and addressing furniture and technology installation delays on campuses.

The CFTF team has modified processes as a result of feedback from the campuses. Facilities' tasks and timelines are now incorporated into the project plan. Campuses are now asked to provide room requests no later than January so quotes can be obtained and equipment/furniture orders can be placed earlier to avoid delays. The team is also working with campuses to identify a point person (project coordinator) on each campus who can be involved from the initial walk-through stage until room completion. These project coordinators will also be involved in a weekly update meeting to improve communication.

WIRELESS INFRASTRUCTURE

This project represents an effort to upgrade wireless service and associated cabling and equipment at all campuses to bring wireless capacity to gigabit speeds to support learning and living spaces. As shown in Figure L, in 2015, virtually all wireless access points deployed on UMS campuses were either beyond their serviceable lifespan or out of current standards. The goal of this project is to maximize the number of deployed access points that are at current standards. This past year, wireless infrastructure upgrades resulted in the majority of access points deployed system-wide being at current standards.



Over the past year, eleven residence halls were upgraded with new infrastructure and wireless networks. In addition, upgrades to nine classroom buildings have been completed since June 2017 or are currently in progress. Focus for this project is shifting from residence halls that needed to be completed during summer break to academic buildings on the larger USM and UMaine campuses as shown in Figure M.

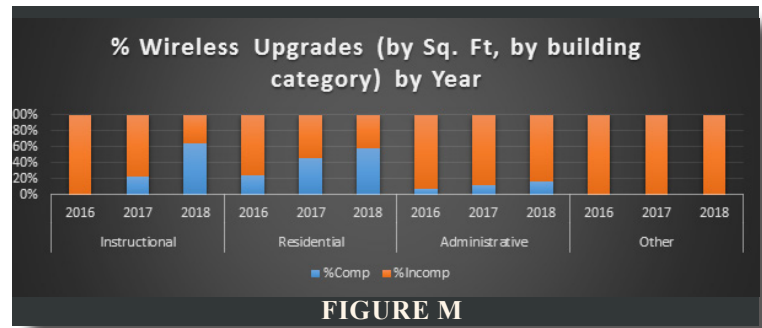


FIGURE M

The project team has worked with UMaine and USM leadership to prioritize classroom buildings. Major upgrades are underway in Bailey Hall at USM and Boardman and Bryand Global Sciences at UMaine. Estimates and project plans are underway for several other classroom buildings as indicated in Table N.

MAINSTREET IMPROVEMENTS

The primary goal of this project is to engage with stakeholders (staff, faculty and students) to identify ways to improve their MaineStreet experience. This includes bringing MaineStreet functions to mobile platforms as well as achieving support for the One University initiative by operationalizing business process improvements to create seamless, portable access to information.

To help ensure the project achieves its goals, the project team engaged with BerryDunn, inc. for business analysis services including the development of student and faculty surveys, conducting on-campus focus group sessions, peer institution consultations, and to catalog identified requirements.

Surveys were distributed to faculty and students in 2017 during June and September to collect input about MaineStreet functionality/requirements.

BerryDunn conducted focus groups at all campuses during the week of September 18, 2017. While focus group attendance was lower than anticipated, the discussions provided additional insights into the issues faced by faculty and students when working in MaineStreet. The results of these sessions were consolidated with the results of the two surveys.

STUDENT REQUIREMENTS	FACULTY REQUIREMENTS
<ul style="list-style-type: none"> • Mobile-friendly access • Improved navigation • Better grades, courses and schedule view • Simplified course enrollment • Push notifications for holds, billing, and grades • Dashboard view of relevant information 	<ul style="list-style-type: none"> • Improved navigation • Notifications of student activity • Ability to email all students • Add notes to advisee's profile • Streamline/simplify course catalog logic • Simplify grade uploads

Wireless Infrastructure Building Upgrades by Campus

Campus	Allocation	Buildings		
University of Maine	\$2,889,600	Fogler Library Shibles Bennett Rogers Jenness Bryand Global Boardman Aubert Crosby Lab	Little Nutting Fernald Neville Barrows Murray Hall ⁴ Donald P Corbett Estabrook Core	Sculpture Building Dunn Colvin Hall Murray Hall Class of 1944 Lord Hitchner Winslow
University of Maine at Machias	\$403,200	Science Torrey / Merrill Library	Kilburn Powers Reynolds	Dorward ³ Sennett ³
University of Southern Maine	\$5,017,600	Drawing Studio Print Studio Academy Building Wishcamper John Mitchell Cen Law Building Bailey	Payson-Smith Science Abromson Luther-Bonney Glickman Library Masterton Hall Corthell	Brooks Dining Costell Complex Woodbury Sullivan Complex Wishcamper JMC
University of Maine at Augusta	\$560,000	Lewiston Katz Jewett	Randall Eastport Camden Belfast	Civic Center College Center
University of Maine at Farmington	\$1,444,800	Mantor Library Dakin Black Mallett Lockwood	Purington Stone Scott North Scott West	Scott South Roberts Learning Center ³
University of Maine at Presque Isle	\$515,200	Park Emerson	Merriman Folsom-Pullen	
University of Maine at Fort Kent	\$369,600	Powell The Lodge	Crocker Old Model School ³	Cyr ³

TABLE N

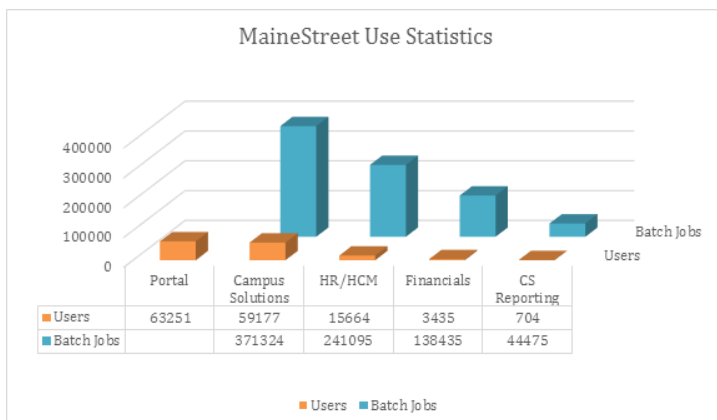
Notes:

³ Insufficient funding for entire building; minimal upgrades to support Classrooms for the Future

⁴ Partial upgrade due to building limitations

MAINSTREET IMPROVEMENTS (CONT'D)

There were two related developments during 2017 impacting the nature of the project. Campuses have engaged with EAB for their Guide mobile app which will address some of the needs expressed through the surveys for students. The second development is that Oracle is putting more effort into making their PeopleSoft product mobile friendly and now nearly all student self-service components are mobile friendly in the newest releases of their software. This improved support by Oracle most likely alleviates the need to invest in a product to provide mobile interfaces and will allow focus, instead, on accelerating testing and implementation of newer releases of PeopleSoft modules.



DATA CENTER SERVER MIGRATIONS

The consolidation of IT in 2012 offered a significant opportunity to streamline our operations and reduce costs by deduplicating services, reduce the number of servers and amount of storage needed for the university and to house those servers in well maintained, secure data centers.

Migrating servers from campus locations to the Orono datacenter has continued to be high priority work for the System Administration and Data Center Operations groups. In 2017, migration of all servers from University of Maine Farmington hardware to the Orono data center was completed. The Farmington IT Support Services, Web Technologies, System Administration, and Data Center Operations teams worked together to migrate 22 servers to the Orono data center and to decommission 27 other servers, for an 80% overall reduction in deployed servers.

Similar work is underway with USM and UMaine legacy servers.

SYSTEM UPGRADES AND ENHANCEMENTS

WEBSITES/PORTAL

A thrust of Web Technology has been to move campus websites from highly customized (but hard to support) website software, often hosted on aging campus infrastructure, to a robust and common framework hosted in a central data center. Such migrations come along with numerous support options, features and functionality sought by campuses for their external-facing websites, including enhanced campus branding, ADA compliance and mobile device friendliness.

Through 2017, Web Technologies partnered with campuses and departments in upgrade and redesign projects to ensure their web presences were up-to-date, performing well, meeting needs, and generating desired outcomes. Over the past year, the Web Technology team completed 5 major website projects including 3 full redesigns (UMM, UMA and University College), migration of USM's website framework to the Orono data center, and implementing a Web Accessibility tool. Web Technologies also participated in a number of upgrades to several other websites.

Web Technologies also manages the myCampus portal which has seen a nearly 30% growth in use over last year.



Campus Portal Usage # Distinct Users

59,877

Total # Pages

229,106

Sessions in 2017

5,684,239

Page Views

10,580,219

ACTIVE DIRECTORY

Migration of Windows computers to the new University Active Directory is almost complete on the UMF and UMFK campuses. Windows migration has begun at UMaine, UMM, and UMPI. Macintosh computer migrations are underway on the UMaine, UMM, UMF and UMA campuses and have been completed at the UMFK campus.

WINDOWS 10

In February 2018, US:IT's End-user Technology area will pilot, and shortly thereafter deliver, a standard and secure Windows 10 deployment for new computers including commonly-used software and services. This will free IT Support Services staff at campuses from maintaining separate Windows 10 development and support processes and tools.

MAINSTREET FINANCIALS

- Go-live: October 2016;
Post go-live tasks completed Jan. 2017
- Transaction Volume
 - Payment vouchers 164,886
 - Purchase Order docs 63,124
 - GL Journals 75,018
 - Employee Expenses 24,772
 - AP Payments 112,206
 - HR Journal postings 5,225
 - Chartfield combos 170,000(+)

IMAGENOW

- Upgrade: October 2017
(Version 7.1.5-1664)
- 2017 Documents Volume: 836,606
- Total Pages Stored: 7,658,757

BLACKBOARD

- Upgraded: July 2017
Release 3100.0.3-rel.51+917ccd3
- # Active Courses: 8,630
- # Enrollments: 100,901

KALTURA

- Go-live: April 2017.
- # Media Entries: 4,251
- # Media Files Played: 62,000
- # Minutes of Video: 17,000
- Monthly bandwidth: 2533 GB
- Storage Used 33,942GB

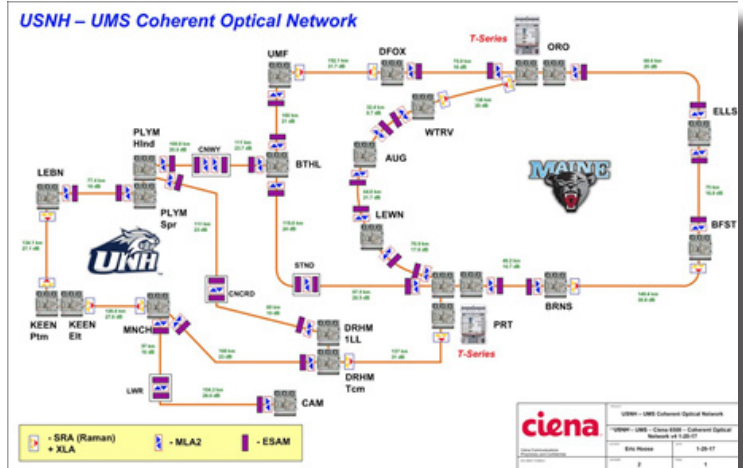
BOX

- Go-live: Jan 2017
- # of Files Stored: 5,400,000
- Storage Used: 23TB
- # Session Logins: 60,500

PARTNERSHIPS

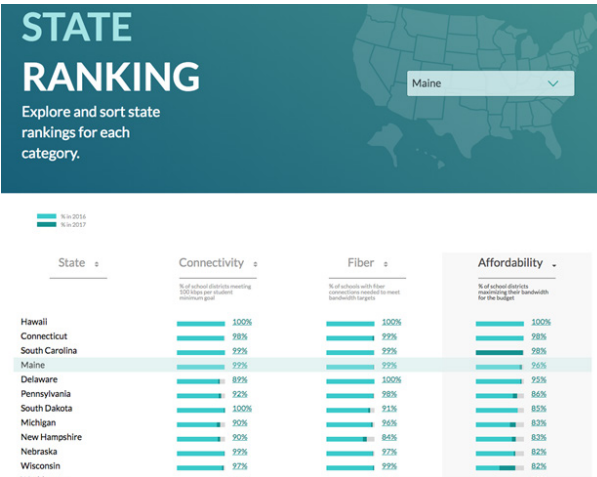
MAINEREN

As stated in the 2016 State of IT report, UMS and USNH released a joint RFP to replace much of the optical networks in Maine (MaineREN) and New Hampshire (I-Beam). The RFP was awarded to Integration Partners of NH with Ciena 6500 selected as the optical network platform. Throughout 2017, equipment was installed at twenty one (21) locations across Maine, New Hampshire and Massachusetts. While the project time-line has been delayed to some extent due to challenges with the quality of fiber cables UMS leases between Waterville and Portland, all equipment has been fully deployed and configured, successfully passed all tests both pre and post an extended burn-in period. The transition of production services to this new platform began during the Winter 2017 break with completion anticipated by the end of Spring 2018 break.



MSLN-MLTI WIFI

2017 proved to be a very productive year for the Maine School and Library Network (MSLN). Once again Maine has been rated among the top states for Internet connectivity for K-12 schools in terms of connectivity, fiber optic availability and affordability by Education SuperHighway. In late 2017 UMS released an RFP for



data transport (broadband) services for both UMS and MSLN locations throughout Maine. This RFP will result in the award of some 760 data transport circuits across multiple transport service providers. While awards will not be made until January 2018, it is already clear that the consortium-based contracting for services will once again yield benefits to the entire K-20 (and public library) community.

2017 also saw the passage of LD-256 which stabilizes state funding for MSLN. The bill received overwhelming support not only from the K12 schools and public libraries who receive direct benefit from MSLN, but also from much of the telecommunications industry, the Office of the Public Advocate, and the Maine State Library. Sponsored by Representative Martin Grohman of Biddeford, the final version of the bill changed the MTEAF's assessment from a percentage-of-retail-sales based to a fixed-surcharge based assessment. Modeled after how the E-911 system is funded, the MTEAF will restore state-level funding for MSLN to just under \$4.0M or roughly to the level available in 2011-2012.

Networkmaine's support of the WiFi networks at two hundred and fifty (250) middle and high schools as part of the Maine Learning Technology Initiative (MLTI) was scheduled to end in June 2017. We had hoped that discussions with the Maine Department of Education (MDoE) would lead to UMS and MDoE collaborating, much like we do with MSLN and Internet connectivity, to support the WiFi networks in Maine's K-12 schools moving forward. MDoE has decided to take another approach.

MDoE has decided that it will no longer provide WiFi networks as part of its learning technology initiative. Networkmaine has agreed to support the existing WiFi environments through FY19, under contract with Systems Engineering in Portland, to provide a transition period to schools so that they have time to explore, identify funding and deploy their own WiFi networks to replace what has been provided through the state for the past sixteen (16) years.

NEREN (NORTHEAST RESEARCH AND EDUCATION NETWORK)

NEREN is a consortium of non-profit organizations that provide a fiber-optic network connecting and unifying the research and education communities in New York and New England. NEREN owns and operates a regional Research and Education Network (REN) that ties together in-state fiber initiatives, like MaineREN, effectively creating an open network that links the members not only to one another but also to facilities throughout the region and globe. UMS continues its involvement and support of NEREN with Dr. Bruce Segee and Mr. Jeff Letourneau serving on its board of directors with Mr. Letourneau currently serving as the Chairman.

In 2017, NEREN has focused on expanding its footprint in response to the expressed needs of its members. The first, and by far the largest effort, expands the NEREN network into New York City to the Manhattan Landing (MAN LAN). MAN LAN is the largest peering point among regional, national and international research and education networks in the United States. By expanding to MAN LAN, NEREN is able to provide its member institutions, and their researchers, cost-effective high-performance interconnectivity with their collaborators around the world. Initially UMS will be sharing a 100 Gbps wave to MAN LAN with UNH, Dartmouth and UVM.

Similarly, NEREN has acquired dark fiber assets from its current point of presence in Cambridge, MA to One Summer Street in Boston. This location is the largest multi-tenant, mission-critical telecommunications and data center facility in New England at which more than 75 Internet content providers, access networks and cloud service providers co-locate. With a NEREN presence in this facility, its members will have very cost-effective direct network connections to some of the largest and most popular services on the Internet.

Participating in these initiatives is part of US:IT's strategy towards shielding UMS, along with MaineREN and MSLN participants, from any negative outcomes from the recent FCC order eliminating Network Neutrality protections in the US.

OTO FIBER

Initially formed through an inter-local agreement between the Town of Orono, the City of Old Town and the University of Maine System in 2015, Old Town - Orono Fiber Corporation (OTO Fiber) is incorporated as a non-profit public benefit corporation created to establish, design, install, maintain and make available an open and competitive basis telecommunications infrastructure within the City of Old Town and the Town of Orono that enables high speed Internet service in the two municipalities.

With the award of a Northern Borders Regional Commission grant in 2015, OTO Fiber set off to create a proof-of-concept open-access fiber to the premise (FttP) network of at least 6 miles spanning the two municipalities. In 2017 OTO Fiber received its 501(c)3 status from the IRS and shifted its attention away from these startup efforts to the creation of the envisioned FttP network.

In September 2017 OTO Fiber released an RFQ for a consultant to design up to twelve (12) miles of fiber optic infrastructure across the two municipalities. The RFQ resulted in four (4) respondents with a contract awarded to Tilson Technologies of Portland, ME. The network design effort is expected to be completed with construction of the network beginning in spring of 2018. OTO Fiber expects to have the pilot FttP network available to retail Internet Service Providers in the fall of 2018.

NNENIX

In late 2016, Northern New England Neutral Internet Exchange (NNENIX) was formed as a non-profit corporation to establish a neutral Internet eXchange Point (IXP) that enables its members, educational institutions, and the general public to benefit from the opportunity to voluntarily interconnect for the purpose of exchanging traffic between the users of each network. While over 850 IXPs exist across the globe, the closest IXP to Maine, and the rest of northern New England, is in Boston.

Over the past year, through the generous donation of equipment and services from various companies, NNENIX has established its first point of presence (PoP) in Portland, ME. UMS and Bowdoin College are charter members of NNENIX with a number of Maine based ISPs and national entities including Akamai, Google, Netflix, and Hurricane Electric committed to participate. With the aggregation of demand that an IXP creates, it is expected that NNENIX will help create opportunities, price points, and options in Maine's broadband marketplace previously unavailable north of Boston.

TEAM HIGHLIGHTS

INFORMATION SECURITY OFFICE

Information Security continues to be in the forefront of US:IT activities. The Information Security Office (ISO) maintains a detailed report on the state of the UMS information security, which examines threats and measures US:IT employs to reduce the risk to the UMS and its Universities. That report provides a set of strategies to continue improvement.

While the overall number of breaches to higher education institutions has declined in the past few years, the threat continues. Most higher education attacks are aimed at personal information, with a growing trend toward more espionage. Phishing continues to be a leading means to gain access, specifically to steal credentials.

To address Information Security threats, members throughout US:IT are engaged in activities every day that keep attacks in check. At the center of the efforts, four individuals in the ISO work to keep security practices honed. This office is responsible for policy, standards and practices; awareness and training; and consulting with departments to meet compliance standards (including, but not limited to FERPA, HIPAA, and PCI). Several major functions and services have been routinized in the past few years. Information Security analysts review threats from several sources including reports from a 24-7 intrusion detection system. The team regularly scans systems for vulnerabilities and alerts US:IT staff of needed patching. The team responds to incidents appropriately using in-house diagnostics to analyze the extent of any security breach as well as contracted support for external investigations that may exceed our capabilities. The ISO has developed a security awareness program, participates in UMS compliance programs and provides a set of services to meet established requirements as well as increase the security posture.

To provide the most efficient and effective information security program, the Information Security Office in conjunction with their US:IT colleagues applies controls and protections commensurate with the risk. An iterative approach is applied such that higher risk assets are identified by data or criticality and then assessed against foreseeable threats

Information Security Controls			
	Prevention	Detection	Response
People	Background Checks Confidentiality Agreements Training & Awareness Phishing Exercises	Self-Reporting i.e. phish@maine.edu	Incident Response Teams
Technology	Firewalls Antivirus Access Controls Vulnerability Scanning	Intrusion Detection Systems Central Logging and Alerting Network Tools	Forensic Tools
Process	Control Consulting Contractor review	Threat Advisories (REN-ISAC, MS-ISAC, Infragard, FBI, Homeland Security, etc)	Incident response program

based on vulnerabilities. Controls are then applied to manage the risk and the assets are reassessed. A combination of controls employ a mix of people, technology and process. An appropriate balance is required to maintain the strategy of “defense in depth.”

We have identified a number of strategic improvements aimed to suitably enhance current efforts. Among these, we propose better phishing mitigation approaches, a comprehensive revision of the Information Security Policy and Standards, and staff augmentation. In-depth technical defense strategies are also actively being explored.

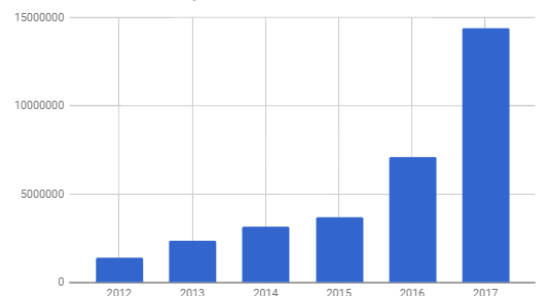
ADVANCED COMPUTING GROUP

The Advanced Computing Group at the University of Maine was established in 2013 to provide computing infrastructure and support for the research needs of the state of Maine. The ACG provides complete computing power packages to advance research, education, and Maine into the 21st century. Services include: High Performance Computing (HPC), Cloud Computing with virtual machines (VM), data storage and high resolution visualization technology (vWALL).

In 2017, 20 new compute nodes were purchased resulting in the addition of 560 cores to the HPC cluster and a 29% increase in processing power. Additionally, 512 GB of high speed memory was purchased to boost overall memory capacity for nodes utilized for genomics research. 2 new file servers were purchased to test a new 672 TB Ceph Storage cluster.

Over the past year, ACG completed a successful pilot of a new Virtual Computer Laboratory service for classes at the University of Maine and the University of Maine at Augusta. This initiative is designed to provide remote access to virtualized workstations through a regular web browser. Additional testing of this platform will continue into the Spring 2018 term. Additionally, a collaboration between ACG and the UMaine Forestry Department culminated in a forestry mapping program that was featured as part of the NSF-funded Northeast Cyber Team Program.

Cluster Core-Hours Used by Year



****Total HPC usage doubled in 2017 going from 7,135,175 hours in 2016 to 14,421,763 hours in 2017**

SCHOLARSHIP AND DEVELOPMENT

Presentations and Professional Development



US:IT promotes ongoing professional development and training and encourages staff to accept and seek out opportunities to represent UMS at conferences and other events. The lists below represent some of these opportunities in 2017.

Staff Professional Development Opportunities

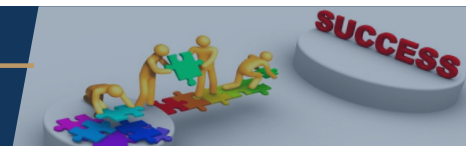
Event	Description
NERCOMP	Classroom Design for Teaching and Learning, Rethinking Academic Technology
Extron	AV Associate Training
Microsoft Higher Education Conference	Education Initiatives and Networking
Windows10 Deployment Workshop	Training on servicing model and deployment for IT staff and administrators.
JAMF	User Conference
Trainings	How To: Configuration Management for Macs in the Enterprise, Introducing: Centralized Apple TV Mgmt, Why DEP is Replacing Imaging (and Why it's a Good Thing), Managing iOS11 and macOS High Sierra Upgrades, Collaborating with Git, JavaScript: The Good Parts Master Class, Windows 10 Deployment Best Practices: Upgrade App Integration & Network Security, AT and APPS to Support Students in Higher Ed, iOS and Google
USM Class	Python Programming COS/ITT184
Boston Academy	Smartsheet Essentials
RMC Project Management Learning Solutions	Crash Course for IT Professionals
Project Management Institute	Conflict, Collaboration and Consciousness, Managing Remote Teams for Success, Gravitas: Making a Powerful Impact, How to Manage Conflict with Product Owners, Agile Requirements Gathering, PMP Exam Prep
Husson University PM Program	Building and Improving Your Organization's Agility
Educause	Annual Conference 2017, Security Professionals Conference 2017
UMS Office of Organizational Effectiveness	Facilitator Training
SIGUCCS Mentoring Program	Mentor
North America Network Operators Group	Gathering of network operator peers.
Internet2	Global Summit, Regional Principals Meeting
2017 MLTI Student Conference	STEM Related Workshops
New England Peering Forum	Internet Peering Collaboration
NetApp Insight	Customer conference related to data storage solutions.
National Science Foundation	Campus Cyberinfrastructure PI and Cybersecurity for Cyberinfrastructure PI Workshop
State E-Rate Coordinators Association	Fall Meetings
USAC	Fall E-Rate Training
Internet2	TechEx Conference
NEREN	Advancing Regional Collaboration and Research IT Collaboration Seminar
Juniper	Informational Event
Cisco	Connect New England
Bangor Information Security Professionals	Multiple Sessions
National Electrical Code	Recertification Course

Staff Presentations & Publications

Event	Description
Educause	Classrooms for the Future Sessions
University College Annual Faculty Institute	Active Learning Simulator/Space
New England Celebration of Women in Computing Conference	Git Control
ITSS Staff Training	UAD Training (packaging, management, imaging, admin)
The Quilt	Executive Committee Retreat, Visit to FCC, Winter Members Meeting, CEO Roundtable
FCC's Broadband Deployment Advisory Committee	Nominated by State Educational Technology Directors Assoc.
FocusMaine Initiative	Interview on how to make Maine's economy more competitive with high-speed broadband infrastructure.
American Library Association Legislative Day	Met about library policy priorities including Network Neutrality.
Cisco Blog Article	Interview regarding MLTI Wireless
SuperComputing 2017	Volunteer, Social Media Communications Director
Assoc. of Computer Technology Educators of Maine (ACTEM)	Presented on Maine Learning to Mod Through Minecraft Project
ACTEM and Maine Technology Directors Meeting	Presented on E-Rate and WiFi
ACTEM	Exhibitors
Educause	Presentation at Annual Conference - Centrally Led, Widely Dispersed: Creating an Identity and Approach for a Unified IT Organization That Propels the Mission, Annual Conference Proposal Reviewer
Penn State College of Liberal Arts	Customer Experience Framework Development and Training Delivery to the IT Department

FUTURE DIRECTIONS

Governance and Strategic Planning



SHARED GOVERNANCE

As noted in the Educause “Higher Education IT Governance Checklist” (March, 2017), IT Governance serves as an essential organizational process which facilitates robust, effective IT strategy to best meet the needs of the academy. This is accomplished by aligning decisions with institutional mission and needs, improving communication within the IT organization as well as with the larger community, ensuring stakeholder input and buy-in for policy, budget and project decisions and by integrating risk management into the decision making process.

In establishing a revised IT Governance structure for the University of Maine System, several key principles and goals have been defined. These principles and goals are aligned with an overall vision for US:IT Governance which is:

- *US:IT Governance will facilitate communication to further stakeholder engagement resulting in greater collaboration and consensus for IT project prioritization.*

The key outcomes for successful US:IT Governance are:

- *Greater Transparency: through enhanced information dissemination and dialogue with stakeholders*
- *Greater Accountability: US:IT assumes responsibility for supporting and executing decisions endorsed and/or derived through governance*
- *Greater Stewardship: US:IT ensures efficient and responsible use of technology resources supporting the University of Maine system and member campuses*

A revised US:IT Governance structure will be established in 2018 and the various committees will be charged to achieve the following goals:

- *Balance needs of campuses with cost-effective technology solutions*

- *Provide robust communication to clarify system-wide IT vision for supporting the University and the mission of member campuses*
- *Create opportunities for enhanced collaboration to improve efficiency and impact of technology solutions and services*
- *Establish policies and practices to ensure effective Information Technologies and Services are afforded to all members of the University of Maine system and community*
- *Create evaluation criteria for new services and solutions to be offered to member campuses*
- *Provide mechanisms to encourage and support innovation*
- *Provide robust analysis for total cost of service delivery*
- *Provide consistent, predictable project request cycle coordinated with annual University budget cycle*

The basic framework of the US:IT Governance structure will encompass various cross-disciplinary teams, all working and communicating together to fulfill the core outcomes of the governance initiative. The basic structure is depicted in Figure O.

The Executive Information Services Council serves as the final decision-making authority for IT-supported initiatives. This group will serve to ensure strategic alignment of IT initiatives and services with the University of Maine System mission. The EISC will receive recommendations and proposals for consideration from two Strategic Councils:

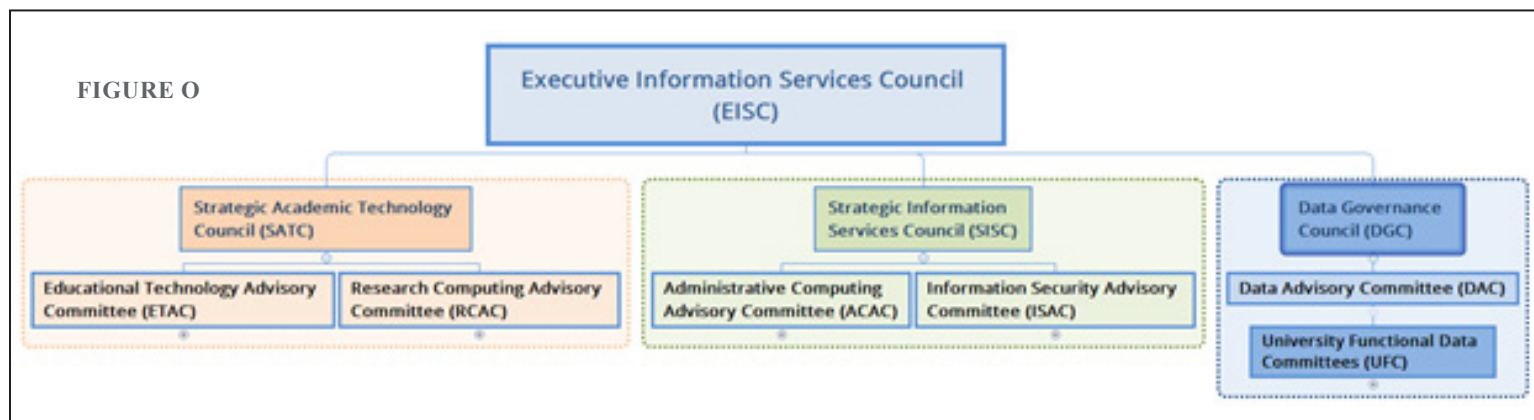
Strategic Academic Technology Council

- *Defines and recommends strategic approaches to leveraging IT resources to support the Academic and Research needs of the University of Maine System and member campus*

Strategic Information Services Council

- *Defines and recommends strategies and approaches to key IT-related issues and services to best serve and support the needs of the University of Maine System and member campuses*

FIGURE O



Each Strategic Council will be responsible for receiving, reviewing and endorsing project proposals from supporting advisory committees. The advisory committees supporting the Strategic Academic Technology Council include:

Educational Technology Advisory Committee

- *Provide strategic direction and plan for meaningful and innovative use of technology solutions with broad benefit to member campuses; Identify opportunities for collaboration to enhance teaching, learning and assessment through technology*

Research Computing Advisory Committee

- *Provides strategic direction and planning to provide robust research computing infrastructure to meet the needs across the University of Maine System and member campuses. Identifies collaboration opportunities to promote and leverage existing and emerging research computing infrastructure throughout the state.*

The advisory committee supporting the Strategic Information Services Council include:

Administrative Computing Advisory Committee

- *Recommends and endorses standards for IT architecture and identifies opportunities for shared business processes to drive efficiency and efficacy across the University of Maine System for supported platforms and applications.*

Information Security Advisory Committee

- *Provides leadership and direction for the University of Maine System Information Security Program; recommends initiatives, strategies and establishes priorities for Information Security infrastructure and compliance needs of the University*

US:IT will seek full implementation of this revised governance structure during the Spring and Summer 2018 months to coincide with and inform the annual budget planning cycle.

STRATEGIC PLANNING

US:IT has established a goal of developing a comprehensive strategic plan prior to the start of the Fall 2018 semester. It is anticipated that the US:IT strategic plan will provide a 3-5-year roadmap designed to enhance the technology and information support and services the unified US:IT division provides to the campus and system communities. The plan will also serve to inform effective budget and resource planning while providing US:IT teams with discrete, annual deliverables.



The strategic planning development cycle will include defining shared mission, vision and values statements for the US:IT organization, preliminary analysis of existing services and assessment of efficacy, identification of new opportunities, defining goals & key performance indicators, and determining resource needs for accomplishing each goal. Objectives incorporated into the strategic plan will be defined according to the 'SMART' framework (Specific, Measurable, Attainable, Relevant and Time-bound).

To support the development of the strategic plan, several US:IT task forces have been established to conduct preliminary analysis and assessment of current service and support efforts. These task forces include:

- **US:IT Mission, Vision, Values Task Force:** *To define the shared mission and vision for US:IT and the core values to which we aspire.*
- **US:IT Core Services Task Force:** *To catalog and review all supported services; categorize each service by use and adoption at each campus.*

ENHANCED COMMUNICATION

During the latter half of 2017, US:IT Leadership has embraced the concept of fostering enhanced internal communication as well as communication and dissemination with the wider UMS community. To this end, several venues and initiatives have been devised to provide greater opportunity for US:IT staff to engage with colleagues, peers and campus stakeholders to build upon previously established foundations for professional development and training. These include, but are not limited to:

- **US:IT Summit:** annual division-wide training and professional development day for US:IT Staff
- **Lunch and Learn Series:** weekly series offering opportunity for US:IT staff to share learning opportunities with colleagues.
- **CIO Open Forum:** monthly all US:IT staff meeting to provide updates on current projects as well as address current issues facing US:IT
- **US:IT Website Enhancement Task Force:** Provide recommendations and suggestions on essential services, features and information to be included on the US:IT Website
- **US:IT Service Outage Task Force:** Provide recommendations on strategies and best practices for informing the UMS community on planned and unplanned system outages.

Summary

Overall, 2017 proved to be a highly productive and effective year as the unified US:IT team continued its ongoing evolution. Based on the success experienced over the past year, US:IT is well positioned to promote and provide transformative, strategic leadership in the use of technology and information to support the mission of the University of Maine System and each campus community. We value and appreciate the ongoing support of our colleagues throughout the University of Maine System and look forward to serving the entire community in the years to come.