IT Service Investment Board

January 23, 2015
Agenda

- Call to order
- Teaching and Learning Initiatives Update
- IT Research Support
  - Future of networking and Data Center
  - Cyberinfrastructure support
  - Cloud initiatives for researchers
  - Response to Climate Action Plan
- UW-IT Portfolio Review Process FY 2016
- Technology Recharge Fee FY 2016 Update
- Wrap Up
Teaching and Learning Initiatives Update
MyPlan Adoption Metrics
MyPlan – Online Academic Planning

- Progress Tracking
- Academic Planning
- Registration
MyPlan: Metrics

- 37,000+ students have created a plan
- Adoptions Rates
  - 54% Overall
  - 66% for Undergrads
  - 82% for First-year students (!)
- User profile
  - Enrolled at UW Seattle (~87%)
  - Female (~60%)
  - Undergraduate (~88%)
    - Slightly more Pre-Majors than Majors
MyPlan Users/Month
Nov 2013 – Nov 2014

Registration Handoff
MyPlan page views per month
Nov 2013 – Nov 2014

Registration Handoff
Classroom Technology Upgrades
Classroom Upgrades: Initial State

Reflects the previous 22-year technology refresh cycle
Classroom Technology and Events: Leaner and Meaner

- Reorganized and reprioritized staff to support classroom technology upgrades
  - Added 2 full-time integration and installation professional staff positions
  - Prioritized work of staff to enhance new technology installations
  - Phased out work not central to new CTE Mission
  - Successfully hired outside contractor to work under CTE direction to supplement permanent staff

- Created new Evening Preventative Maintenance team (aka, the “Tiger Team”)
  - Added full-time professional Evening Manager
  - Added 2 full-time maintenance staff for the evening shift (M-F 3pm to midnight)
  - Hired additional student maintenance staff

- Reorganized the CTE Help Desk
  - Hired full-time professional Help Desk Manager
  - Prioritized work of staff to enhance Help Desk
  - Hired additional student Help Desk staff and additional student media assistants staff

- New initiatives
  - Create ‘sandbox’ classroom for experimentation by instructors (MGH 058)
  - Become design consultants and installation subcontractor for Capital Projects Office on major building renovations
  - Draft UW Principles of Design for Learning Spaces
Technology Upgrade: Progress to Date

On pace to have refreshed 84 classrooms in 18 months!
In addition, 47 classrooms will undergo a technology refresh.
Tech Upgrade General Costs

- Small Classroom
  - AV System: $4,500 to $7,500
  - Projector: $1,000-$3,000
  - $3,500

- Small to Medium Digital Media Classroom
  - AV System: $14,000 to $16,000
  - Projector: $8,000-$10,000
  - $3,500
  - Optional Podium: $2,500

- Medium Digital Media Classroom
  - AV System: $21,000 to $40,500
  - Projector: $15,000-$25,000
  - $3,500-$13,000
  - Optional Podium: $2,500

- Lecture Hall
  - AV System: $60,500 to $104,500
  - Projector: $45,000-$60,000
  - $13,000-$30,000
  - Split Screen: $12,000
  - Optional Podium: $2,500

- Premium Lecture Hall
  - AV System: $70,500 to $107,500
  - Projector: $55,000-$75,000
  - $13,000-$30,000
  - Optional Podium: $2,500

UNIVERSITY of WASHINGTON
Civitas: Analytics for Student Success
Personalization of the Student Experience

MyUW

MyPlan/Academic Explorer

“Super-Resolution” Services

Civitas

UNIVERSITY of WASHINGTON
Civitas: Analytics for Student Success

**ILLUME**
for
INSTITUTIONAL LEADERSHIP & RESEARCH

**DEGREE MAP**
for
ADVISORS, STUDENTS & FACULTY

**INSPIRE**
for
ADVISORS, STUDENTS, FACULTY & ADMINISTRATORS

**CIVITAS PLATFORM**
DATA PROCESSING, DATA VALIDATION, PREDICTIVE MODELING, APP STACK
Modern Advising Tools

- Analytics engine used to define students at risk
- Provides advisors with information needed for effective intervention.
- Tracks interventions and evaluates effectiveness to learn what works and what doesn’t—and for which students
- Workflow based tool—can be delivered through integration with existing advisor CRM or through Web interface
IT Research Support: Future of Networking and Data Center
UW-IT Networks and Data Centers: Recent Major Investments

- Campus network upgrades
  - 40G campus backbone
  - Tech Refresh; WiFi, IPS, Ethernet switches

- Research support
  - 100G connection to Internet2
  - Science DMZ construct
  - Virtualized network overlay

- Consolidated, energy efficient data centers
Campus Network Investments (2 yrs)

- Increased campus backbone capacity from 10G to 40G ($1.2M)

- Tech Refresh
  - WiFi Access Points (APs): replaced 3000, added 3000 for total 9000 APs ($3M + $3.2M Aruba concessions*)
  - Intrusion Protection System upgrade, doubling capacity ($1M)
  - Switches with power resiliency ($1.5M)

* Aruba CONFIDENTIAL information
Research Networks Support (2 yrs)

- 100G connection to Internet2
- Science DMZ construct
- Virtualized network overlay
- Funding provided by a mix of sources:
  - NSF grants (CC-NIE $460K, EAGER $300K)
  - PNWGP donation of 100G link UW to Internet2 (est. $200K)
University of Washington Network
Campus Research Environment
Network circa 2012

UW Campus Policy Device
Perimeter

UW Campus network allows traffic isolation and individualized security policies. The Science DMZ bypasses typical campus policy devices.

Internet +R&E

UW Campus
10G MPLS Network

Typical campus user

Campus Researcher

10G to campus research labs
University of Washington Network
Campus Research Environment
Projected Completion Sep 2014

Internet +R&E

Pacific Rim R&E Networks

Pacific Northwest Gigapop via Pacific Wave

US R&E Networks

Co-Located in the two central datacenters with the HSRN equipment: centralized compute (Hyak), storage (lolo), and network management.

High Speed Research Network (HSRN)

HPC Storage

HPC Compute

PerfSonar

Co-Located Research Equipment Nx10G/40G/100G

Campus based researchers utilize the Science DMZ to access the 100G path to R&E networks via the campus 40G backbone and HSRN.

The Science DMZ allows traffic isolation to bypass typical campus policy devices and utilize the 100G path provided by the HSRN.

The Science DMZ has two components: Local “in datacenter” connectivity to the two router/switches (HSRN) and a “Science DMZ” VRF that allows campus researchers access to the 100G path direct from their labs.

NSF CC-NIE funding supports 10G/40G/100G interconnect components in the green devices.

Typical campus user

Campus Researcher

UW Campus 40G MPLS Network

Nx10G/40G to campus research labs

UW Campus Traffic traversing the Policy Device Perimeter
Benefits of Network Virtualization

- Virtual overlay of “research networks” now possible
- Allows for high capacity pathways to support specific research goals
- Developing campus policy regarding level of review and approval over requests for bypassing network security appliances
Data Center changes (3 yrs)

- Consolidated from 5 DCs to 3 (invested less than $100K, realized annual savings of $940K)
- Upgrade of aging UPS and PDUs (invested $2.6M, annual savings $150K/year + 180 tons of carbon/year)
- Increased energy efficiency results in EPA certification
Data Center CO$_2$ emissions reductions (CY-14)

4545 carbon savings

Month in 2014

Cumulative carbon savings

Tons of carbon saved

January, February, March, April, May, June, July, August, September, October, November, December
Energy Star Certification

- 2013 Certification from U.S. Environmental Protection Agency (EPA) for UW Tower data center, renewed again in 2014
- One of two university campus data centers in the country to achieve this certification
- Of 50 data centers with this certification, UW data center rank 5th in EPA scoring (95 out of possible 100)
IT Research Support: Cyberinfrastructure Support
UW-IT Cyberinfrastructure Strategy

- Enable students, faculty and staff to be more effective
- Help UW researchers manage risks and resources
- Encourage collaboration, creativity, and competitiveness

...by developing UW-IT Services which provide...

- Matchmaking of choices for solutions
- Easy access and elastic growth
- Curated standard toolbox
## Continual Improvements

Improving all levels of the infrastructure “stack”

<table>
<thead>
<tr>
<th>Data Center</th>
<th>Shared Use. Maximum Density Design</th>
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</thead>
<tbody>
<tr>
<td>Network</td>
<td>High Speed Research Network</td>
</tr>
<tr>
<td>Computing</td>
<td>Hyak Refresh and Next Generation</td>
</tr>
<tr>
<td>Storage</td>
<td>Large Scale Storage Infrastructure, SAN, Tape Silos</td>
</tr>
<tr>
<td>Software and Tools</td>
<td>Matlab, Mathematica, Fluent, Abaqus, SQLShare, etc.</td>
</tr>
<tr>
<td>Expert Consultants</td>
<td>Matchmaking, Pipelines, SDN</td>
</tr>
</tbody>
</table>
| Service Model        | - F&A Waiver for Research Services  
                        - No Fee for Consulting |
Research Business Cases

FY15
- Storage, Consulting and Tools for Researchers
- 40G Campus Upgrade

FY16
- Harnessing Idle Computers Worldwide for Science
- Big Data Web Services for Researchers
- NextGen Hyak - Initial Deployment
- Assist with eScience Incubator (0.5FTE)
Hyak - Full Cost Recovery

<table>
<thead>
<tr>
<th></th>
<th>OR/eScience</th>
<th>UWIT</th>
<th>Total</th>
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<tbody>
<tr>
<td>Office of Research</td>
<td>400,000</td>
<td>-</td>
<td>600,000</td>
</tr>
<tr>
<td>Arts &amp; Sciences</td>
<td>-</td>
<td>200,000</td>
<td>200,000</td>
</tr>
<tr>
<td>College of Engineering</td>
<td>-</td>
<td>200,000</td>
<td>200,000</td>
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<tr>
<td>College of Environment</td>
<td>-</td>
<td>500,000</td>
<td>-</td>
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<tr>
<td>UW Tower Data Center Capital</td>
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<td>102,094</td>
<td>295,599</td>
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<td>eScience</td>
<td>295,000</td>
<td>275,740</td>
<td>183,000</td>
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<tr>
<td>Clean Energy Institute</td>
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<tr>
<td>Colo Data Center Support</td>
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<td>55,347</td>
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<td>CoLo UWIT Subsidy</td>
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<td>Sponsorships</td>
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<td>-</td>
<td>-</td>
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<tr>
<td>UFIO (10% Node Tax)</td>
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<td>-</td>
<td>-</td>
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<tr>
<td><strong>Total INCOME</strong></td>
<td>$695,000</td>
<td>$1,057,441</td>
<td>$1,721,339</td>
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<tr>
<td>OR/VP Loan Repayment</td>
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<td>-</td>
<td>-</td>
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<tr>
<td>eScience (06-3600)</td>
<td>295,000</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Hyak (65-8007)</td>
<td>211,615</td>
<td>1,943,031</td>
<td>(1,404,281)</td>
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<tr>
<td>Hyak RCR (75-3614)</td>
<td>-</td>
<td>500,000</td>
<td>-</td>
</tr>
<tr>
<td>UW Tower Data Center</td>
<td>-</td>
<td>102,094</td>
<td>295,599</td>
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<tr>
<td>Colo Data Center Expense</td>
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<td>-</td>
<td>-</td>
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<tr>
<td>System Administration</td>
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<td>275,740</td>
<td>183,000</td>
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<tr>
<td><strong>Total EXPENSES</strong></td>
<td>$506,615</td>
<td>$2,045,125</td>
<td>($204,973)</td>
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| Annual Surplus/(Deficit) | $188,385    | ($987,684) | $1,926,312  | ($287,231)  | ($232,056)  | ($172,966)  |
| Cumulative Surplus/(Deficit) | $188,385 | ($799,299) | $1,127,013  | $839,782    | $607,726    | $434,760    |
Service Models

**F&A Waiver** - in approval process. Will allow central research services (including cloud) to have same ‘no tax’ cost model as locally purchased equipment.

**Research Computing Consulting** - no fee. Will focus efforts on highest value opportunities.
Discussion Questions

- Are there any questions, concerns or suggested adjustments with the focus of our investments across the research infrastructure stack?
- What metrics would you like to see for measuring performance?
  - Faculty recruited/retained (>12)?
  - Academic units participating (>30)?
  - $$ invested by academic units (>$$7M)?
  - Total use? CPU hours (>150,000 years)?
IT Research Support: Cloud Initiatives for Researchers
Commercial IaaS Services

- **Azure** - *contract in place*
  - 30% discount
  - Data egress waiver for research
  - BAA

- **Amazon Web Services** - *contract coming soon*
  - 7-10% discount
  - UW employees only
  - Data egress waiver for research
  - BAA anticipated
Commercial IaaS Services

- **Google** - *no contract in place at this point*
  - No discount
  - No data egress waiver
  - No BAA or FERPA
  - But available, and used
Commercial Cloud - Research Support Programs

- **AWS**
  - Research grant programs - *expansion anticipated*
  - Solutions architect

- **Azure**
  - Research grant programs - *expansion anticipated*
  - Technical support

- **UW**
  - F&A waiver – *removes a significant disincentive to utilizing cloud*
eScience Institute

- **SQL Share** - simplified SQL; spreadsheets to database
- **GraphLab** - high performance data mining for Big Data
- **Myria** - support for data mining
- **Haloop** - “loop-enhanced” Hadoop / Map-Reduce
- **workshops** - use of AWS, Azure
- **consulting** - custom assistance
Questions and Discussion
Response to UW Climate Action Plan (CAP)
Climate Action Plan Policy Committee – FY14

- Reviewed more than 80 greenhouse gas reduction strategies
- One of top 3 strategies – Server relocation and virtualization
- Why? Local server rooms are not efficient and have significant costs
In support of the UW’s efforts to meet its climate goals and objectives, **no new server rooms or upgrades are to be designed into new or existing buildings on any of the campuses of the University of Washington.**

- A server room is defined as a separate or shared space to store, power, and operate computer servers and their associated components in support of business functions. Business functions are all of the activities that support the work of the University, be they academic, administrative, research, or clinical in nature.
A Spectrum of Possible Solutions

- Status Quo – rely on operational life cycle
- Scheduled refresh
- Aggressive virtualization and pooling
- Review purchases to optimize location, density, etc.
- Restrict new hardware purchases – use services only
Strategy Applied to CAP Policy

- Increase Density per Rack
  - Virtualization and HPC services share infrastructure
  - Co-location services offer shared rack space
- Increase use of Cloud Services
  - Admin systems (SaaS)
  - F&A Waiver to improve cost model
  - HIPAA BAA agreements with Amazon and Microsoft

Affirmed by IT Strategy Board
Additional Needs for Policy

- Computing as a commodity
- Increasing research computing
  - Big Data
  - Highest network connectivity (HSRN)
Encourage use of CAP-aligned services

- Incentives to take advantage of enterprise virtualization services and co-location?
  - discount for initial period?
  - “cash for clunkers”?

- Other ??
UW-IT Portfolio Review Process
FY 2016
Project Prioritization - Why?

- 58 projects proposed initially
  - 215,000 hours
  - All important
  - And... far greater than our capacity

- Abstracts -
  - Held or merged 14 proposals
  - 189,000 hours (net)
  - Still far greater than our capacity
FY 2015 Portfolio Review

Outcomes

- Decision to hold, or reconsider scope
  - Network-based Collaboration Tools
  - MyHusky Implementation
  - EBS Startup
FY 2015 Portfolio Review Outcomes (cont.)

- Use ranking process priorities to guide project resource allocations when conflicts arise
- Improved transparency and understanding of UW-IT capacity and resource challenges
- Improved ability to identify dependencies and synergies across projects
- **Evaluation informed and influenced the UW-IT budgeting process for FY15, and influenced project initiation**
- Lessons learned have improved and streamlined FY 2016 prioritization process
FY 2016 Portfolio Review Process

- Improved UW-IT internal processes
  - Start in October 2014 to provide more time for business case development
  - Abstracts to help streamline the process
  - New PPM system - Innotas
  - Streamlined proposal intake and workflow
  - Improved portfolio management
  - Refined the “Likelihood of Success” criteria

- Rank by Strategic Categories
  - Strategy Board to identify reallocations at Feb. meeting

- Plan to do “continuous” proposal intake
# FY 2015 Portfolio Prioritization

## Timeline

<table>
<thead>
<tr>
<th>Date</th>
<th>Duration</th>
<th>Activity</th>
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<tbody>
<tr>
<td>March 17</td>
<td>meeting</td>
<td>Sponsor presentations</td>
</tr>
<tr>
<td>March 9 to March 30</td>
<td>3 weeks</td>
<td>Scoring of 10-12 proposals</td>
</tr>
<tr>
<td>March 30</td>
<td>(Monday)</td>
<td>Scoring DUE</td>
</tr>
<tr>
<td>April 14</td>
<td>meeting</td>
<td>Review &amp; discussion of scoring results</td>
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<tr>
<td></td>
<td></td>
<td>Finalize rankings and make recommendations</td>
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</table>
Project Proposals - from 30,000 feet

- 44 proposals, after holding 14 in Abstract phase (down from 63 last year ==> 30%)
- 7 Service Categories, aligned with UW-IT goals

<table>
<thead>
<tr>
<th>Service Category</th>
<th># proposals</th>
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<tr>
<td>Teaching &amp; Learning</td>
<td>8</td>
</tr>
<tr>
<td>Research</td>
<td>4</td>
</tr>
<tr>
<td>Administrative</td>
<td>5</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>7</td>
</tr>
<tr>
<td>Collaboration</td>
<td>2</td>
</tr>
<tr>
<td>Enterprise Risk</td>
<td>7</td>
</tr>
<tr>
<td>IT Management</td>
<td>11</td>
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</table>
Scoring Process Overview

- Essentially unchanged
- Presentations before scoring
- 3 weeks to review and score
- Review and prioritization decisions
Strategic Importance Criteria

- **Strategic Value**
  - Does this project improve the University’s academic or research excellence?
  - Does it improve the UW’s competitiveness by helping to attract the best students, faculty, and staff or by increasing and diversifying funding?
  - Does it enhance interdisciplinary ...

- **Impact**
  - Does this project improve the personal productivity or experience of students, faculty, or staff (i.e. individual end user of system or service)?
  - Does it benefit a large number of UW students, faculty, or staff?
  - Does it improve administrative efficiency or reduce overall administrative costs for the University (and not by shifting costs to units)?

- **Risk**
  - Does this project help sustain and strengthen core IT operations, mitigate operational risk, or ensure key services are resilient?
  - Does this project address compliance, financial, or information security and privacy risk?
Revised Criteria - Likelihood of Success

- **Resource Capacity**
  - Does the sponsoring division have staff resources available to support this project?
  - Does this project require significant contributed resources from other UW-IT units?

- **Vendor and Technical Risks and Alignment**
  - Does this project carry significant risks related to a vendor or contractor?
  - Does this project align with UW-IT’s enterprise architecture strategy?

- **Financial Risks**
  - Identify the source(s) of funding for this project (existing UW-IT, UW central, self-sustaining, grant or other)
  - If any new funding is required, has it been committed?
Questions?
Technology Recharge Fee
FY 2016 Update
Technology Recharge Fee – FY 2016

A per capita rate applied to all UW to support a basic bundle of services

**IT Service Investment Board Recommendation for FY 2016**

- Maintain fundamental cost allocation methodology used for prior TRF
- Increase the TRF by under 2% for FY 2016 to help offset rising cost of operations
TRF Recommendation for FY 2016
Approved by the Provost January 13, 2015

<table>
<thead>
<tr>
<th>Rate</th>
<th>FY15</th>
<th>FY16</th>
<th>Change</th>
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</thead>
<tbody>
<tr>
<td>Campus Rate*</td>
<td>$54.50</td>
<td>$55.51</td>
<td>1.9%</td>
</tr>
<tr>
<td>Medical Center Rate**</td>
<td>$50.00</td>
<td>$50.91</td>
<td>1.8%</td>
</tr>
</tbody>
</table>

* Supplements existing GOF/DOF resources to provide Basic Services
** Excluded from GOF/DOF Subsidy, Network & Telecom billed separately.
Medical Center - Effective Rate: $83.69
Questions & Discussion