

# MIT IT Leaders Meeting

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May 16, 2016

Future  
of IT  
@MIT

# Agenda

- Welcome – John Charles, Vice President, Information Systems and Technology
- Sloan Technology Services – John Letchford, Sloan School of Management
- IS&T Cloud Migration Efforts
  - David LaPorte, Director, Infrastructure Design & Engineering
  - Nathan Thaler, Senior Manager, Cloud Platforms
- Update on IS&T Transformation– John Charles

# Welcome

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John Charles

Vice President of Information Systems and Technology

# SLOAN TECHNOLOGY SERVICES

**MAY 2016**



**JOHN LETCHFORD**

Chief Information Officer  
Sloan School of Management  
[jletchfo@mit.edu](mailto:jletchfo@mit.edu)

# MIT SLOAN SNAPSHOT

**MISSION: TO DEVELOP PRINCIPLED, INNOVATIVE LEADERS WHO IMPROVE THE WORLD AND TO GENERATE IDEAS THAT ADVANCE MANAGEMENT PRACTICE.**

**Master's Students:** 1,350

**PhD Students:** 87

**Undergraduate Major:** 44

**Faculty:** 118

**Other Academic Staff:** 66

**Staff:** 355

**Action Learning Labs:** 15

**Executive Education Participants:** 5000+/yr

**MIT Sloan Alumni:** 30,000 in > 90 countries

**Companies founded by MIT Sloan Alumni:** >650

11 Academic Programs

16 Research Centers



# SLOAN CULTURE

- *“Innovation, entrepreneurship and experimentation are core to the culture.”*
- *“Our database tables have more columns than rows...”*
- *“...Highly customized and white glove service...”*
- *“...Grass-root innovation traditionally trumps school-wide coordination/governance...”*
- *“Why use something that exists when you can build something better?..”*
- *“... Sloan is a microcosmic ecosystem that proudly reflects how things get done in the real world”*

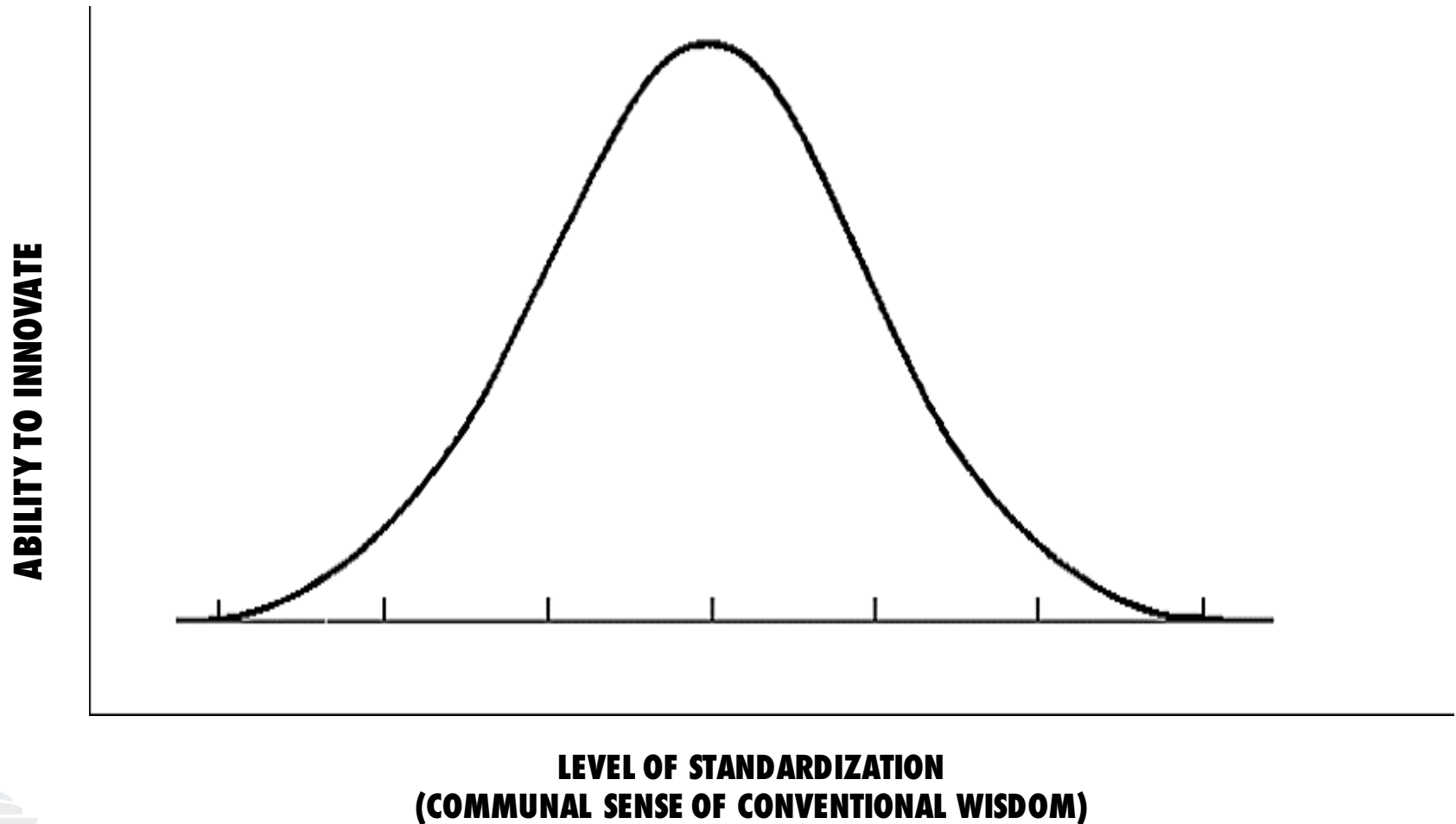


# TECHNOLOGY AT SLOAN

- **A great foundation has been built over the past few years**
- **STS is seen as a responsive customer service organization**
- **The MySloan portal is solid and continues to improve levels of personalization and usability**
- **Research Computing services continue to evolve**
- **Classroom technology works well but current distributed support model is ineffective**
- **Technology management is very distributed across the school**
- **Demand for STS time outstrips available resources**
- **STS could and needs to do a better job in managing perceptions and communicating its message to the school**
- **Users have very high expectations around usability of applications but systemic issues go beyond technology and platform challenges**



# STRUCTURE vs INNOVATION





# STS PURPOSE STATEMENT

**TO ENABLE THE SCHOOL TO  
EXCEL IN ITS MISSION BY  
TRANSFORMING THE  
RESEARCH, ACADEMIC AND  
ADMINISTRATIVE  
INFORMATION LANDSCAPE**



**John Letchford**  
**Sloan Technology Services**  
 Executive Director

**Patti Shaughnessy - IT Administration**  
 Coordinator

- IT Finance
- Procurement
- Temps & Consulting
- Prof. Development
- Office Management
- Supplies & Services

**Wes Esser**  
**Client Consulting & Support**  
 Senior Director

IT Helpdesk	Instructional Technology	Research Computing
<b>Jean Reale</b> Manager	<b>Jason Alvarez</b> Sr. Associate Director	<b>Wesley Harrell</b> Associate Director
6 FTE 1 Year-Up Intern	4 FTE	1 FTE + Platform Support from IOS
<ul style="list-style-type: none"> <li>• End User Computing Support</li> <li>• Front Line for IT questions</li> <li>• Managed Device Deployments</li> </ul>	<ul style="list-style-type: none"> <li>• Presentation Support</li> <li>• Conferencing</li> <li>• Video Streaming and Recording</li> <li>• Teaching and Learning Tools</li> <li>• Qualtrics</li> </ul>	<ul style="list-style-type: none"> <li>• Shared Research Computing Grid</li> <li>• Research Support</li> <li>• Commercial Research Data</li> </ul>
<ul style="list-style-type: none"> <li>• 1100 Managed devices</li> <li>• Support ~3,300 people</li> <li>• 1200+ requests per month</li> <li>• 30 computer deploys per month</li> </ul>	<ul style="list-style-type: none"> <li>• 28 classrooms</li> <li>• 53 Student study rooms</li> <li>• 64 Conf rooms</li> <li>• 9 Open spaces</li> <li>• 207 classes per month</li> <li>• 2,195 devices managed</li> <li>• ~2000 Surveys</li> </ul>	<ul style="list-style-type: none"> <li>• 200+ regular grid users</li> <li>• Grid Nodes: 21</li> <li>• Grid Cores: 564</li> <li>• Grid RAM: 4.2 TB</li> <li>• ~40 commercial research datasets</li> </ul>

**Infra., Ops & Security (IO&S)**

**Will Hedglon**  
 Associate Director

5 FTE

- Infrastructure Platforms
- MITSloan website infrastructure
- Information Security
- Monitoring

- 2 Data Centers
- 11 Racks of Equipment
- 105 Physical Pieces of Equipment
- 511 Systems total
- 673 TB Storage
- 99.9% MITSloan Web Hosting Uptime (YTD)

**Tanuja Gopal**  
**Applications & Data Services**  
 Director

Application Development	Project Management
<b>Jay Duda</b> Associate Director	<b>Hasmik Kouchakdjian</b> Associate Director
5 FTE (2 remote)	2 FTE
<ul style="list-style-type: none"> <li>• Application Development &amp; Support</li> <li>• Cloud Services</li> <li>• Tools</li> <li>• Databases</li> <li>• Integration</li> <li>• Data Reporting</li> </ul>	<ul style="list-style-type: none"> <li>• Project Management</li> <li>• Business Analysis</li> <li>• Cloud Services</li> </ul>
<b>MySloan</b> <ul style="list-style-type: none"> <li>• 572 visitors per day</li> <li>• 1.5 million page views per year</li> <li>• 465 collaboration sites</li> </ul> <b>Sloan People Database</b> <ul style="list-style-type: none"> <li>• 65,000 people</li> <li>• 241 database tables</li> </ul>	<b>SloanGroups:</b> <ul style="list-style-type: none"> <li>• 5,500 users</li> <li>• 850+ events since July</li> </ul> <b>Slate:</b> <ul style="list-style-type: none"> <li>• 8,500 Applications submitted (since July 1)</li> </ul> <b>Project Management</b> <ul style="list-style-type: none"> <li>• 15-20 ongoing mid-large scale projects</li> </ul>

**Enable Sloan to excel in its mission by transforming the research, academic and administrative information landscape**

**SLOAN TECHNOLOGY SERVICES – GOALS FRAMEWORK**

**Success of Research & Academic Programs**

- Support revolutionary **research computing** through platforms, tools, consultative services and access to world-class research data
- Create an **instructional technology** environment that is reliable, intuitive, and enables innovation in teaching and learning across the School

**Streamlined IT Delivery**

- Drive **IT efficiencies**
- Leverage **cloud and other service partners** to improve agility, scalability, resilience, and to increase staff productivity
- Simplify and personalize the online **user experience**

**Usage of Data as a Strategic Asset**

- Enable the School to **identify and protect** sensitive information
- Catalyze **data sharing** and collaboration across the School, Institute and beyond
- Develop **visualizations and analytics** to stimulate innovative approaches to challenges

**High-Performance Work Culture within STS**

- Generate and use data to **inform decision making**
- Demonstrate and **promote the value** of technology
- Cultivate an **engaging work** environment
- Encourage **exploration and experimentation**

# SOME FOCUS AREAS FOR FY17

IT Helpdesk	Instructional Technology	Research Computing
<ul style="list-style-type: none"><li>• Publish a formal STS Service Catalog</li><li>• Formalize service management practices across STS</li><li>• Pilot Partner Solutions to streamline workload (e.g. have vendors take on routine device imaging activities)</li></ul>	<ul style="list-style-type: none"><li>• Stabilize Service Delivery</li><li>• Complete Annual Classroom AV Maintenance &amp; Upgrades</li><li>• Implement new Staffing and Service Model</li><li>• Develop better model for engaging faculty in relation to technology needs for teaching and learning</li></ul>	<ul style="list-style-type: none"><li>• Begin transition from existing research grid to more modern grid at the Massachusetts Green High Performance Computing Center (MGHPCC)</li><li>• Enhance level of research support consultative services</li><li>• Increase access to commercially available datasets for faculty, students and researchers</li></ul>
Infrastructure, Operations & Security (IO&S)	Application Development	Project Management
<ul style="list-style-type: none"><li>• Implement Tools to enhance situational awareness</li><li>• Work through backlog of upgrades</li><li>• Start migrating services to the Cloud</li><li>• <b>Implement a Cybersecurity program</b></li></ul>	<ul style="list-style-type: none"><li>• Integration of A&amp;DS and PPMO into a new single team</li><li>• Implement new Agile project management processes &amp; tools</li><li>• Pilot new business process mapping/user story methods with departments across School</li><li>• Do comprehensive evaluation of Salesforce.com as a school wide platform</li><li>• Upgrade MySloan Sharepoint environment</li></ul>	

# SPOTLIGHT ON CYBERSECURITY

## IDENTIFY

Develop the organizational understanding to manage cybersecurity risk to systems, assets, data and capabilities



- Asset Management
- Business Environment
- Governance
- Risk Assessment
- Risk Management Strategy

## PROTECT

Develop and implement the appropriate safeguards to ensure the delivery of critical services



- Access Control
- Awareness & Training
- Data Security
- Data Protection Processes and Procedures
- Maintenance
- Protective Technology

## DETECT

Develop and implement the appropriate activities to identify the occurrence of a cybersecurity event



- Anomalies & Events
- Security Continuous Monitoring
- Detection Process

## RESPOND

Develop and implement the appropriate activities to take action regarding a detected cybersecurity event



- Response Planning
- Communications
- Analysis
- Mitigation
- Improvements

## RECOVER

Develop and implement the appropriate activities to maintain plans for resilience and to restore any capability or services that were impaired due to a cybersecurity event



- Recovery Planning
- Improvements
- Communications

# SPOTLIGHT ON CYBERSECURITY

## 1. General Training & Awareness Program

- IS&T SANS training materials
- Sloan security website & community page
- Brown bag lunches
- STS attend departmental meetings
- Digital Signage content
- Bling!

## 2. Targeted Discovery & Risk Mitigation

- Pilot new Discovery & Assessment process with initial groups to develop WISPs and Action Register
- Expand pilot across school and make adjustments
- Develop scale up strategy
- Rollout Broadly (with 3<sup>rd</sup> party?)

## 3. Technology Solutions

- Develop Technical Solutions within each of the 5 NIST areas
- Examples:
  - Identity Finder
  - Deploy Endpoint Management
  - Implement Enhanced Monitoring & Data Aggregation Tools

## 4. Policy

- Develop Policy Framework (e.g. approval processes) and Templates
- Develop School specific policies around managing data



**THANK YOU.**

**QUESTIONS?**



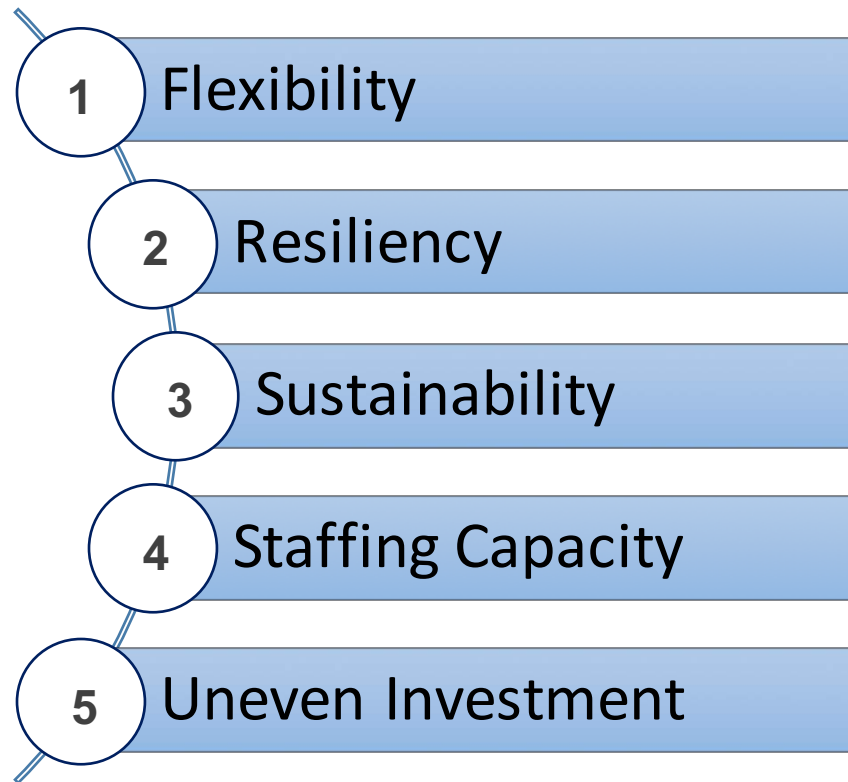
# IS&T Cloud Migration Efforts

Nathan Thaler, Senior Manager, Cloud Platforms

Dave LaPorte, Director, Infrastructure Design & Engineering



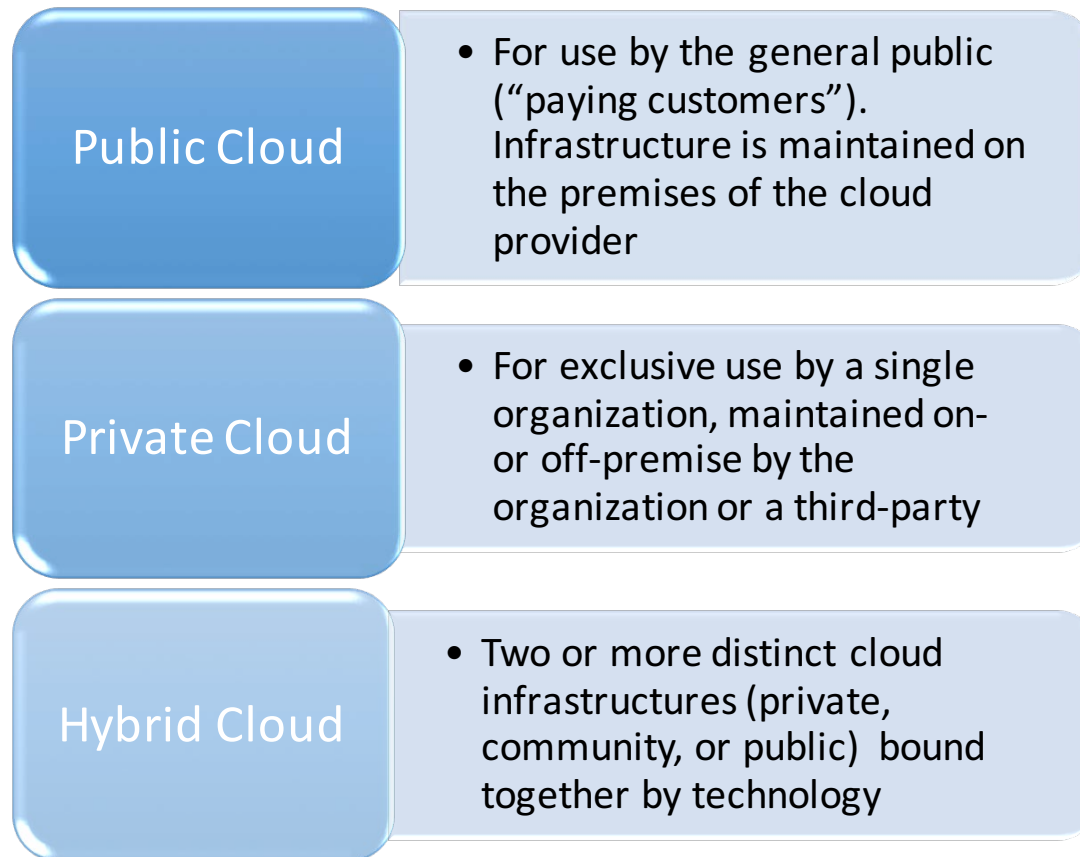
# On-Prem Pain Points



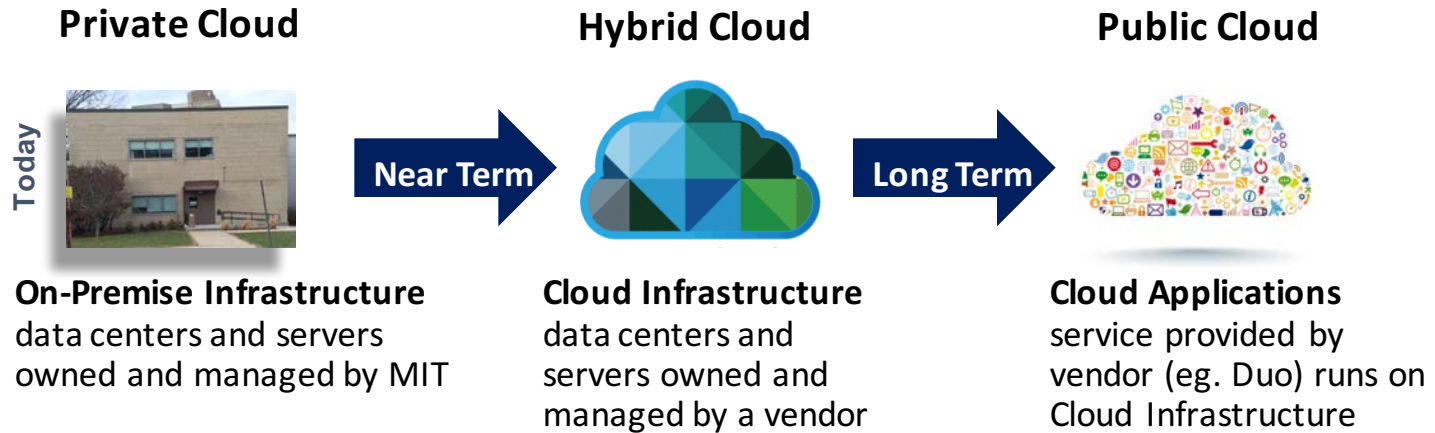
# Why Cloud?

- Increases agility, decreases time to deployment
- Better orchestration/scalability, infrastructure is code
- Allows staff to concentrate on more interesting problems

# Cloud Taxonomy



# IS&T's Cloud Journey



## Benefits of Cloud

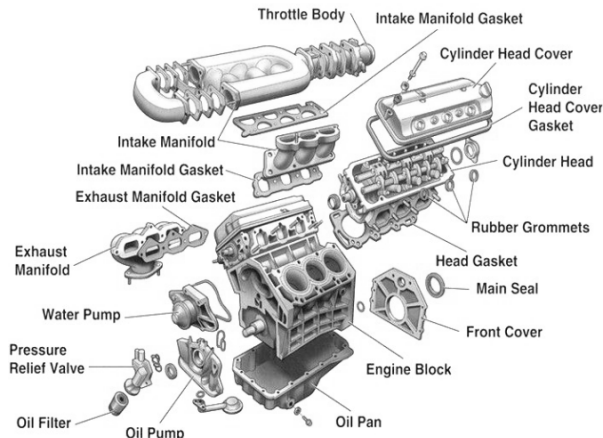
- **Flexibility**
- **Time to deployment**
- **Scalability**
- **Elimination of deferred maintenance**
- **Consistent, predictable costs**
- **Increased capacity**
- **Sustainability**
- **Reduced on-premise footprint**

# IS&T's Cloud Journey

- Deploying new servers to a cloud infrastructure environment is common in industry
- But, large institutions have decades of existing servers that can't be easily moved.
- Two strategies have emerged, Lift-and-Shift and Refactoring

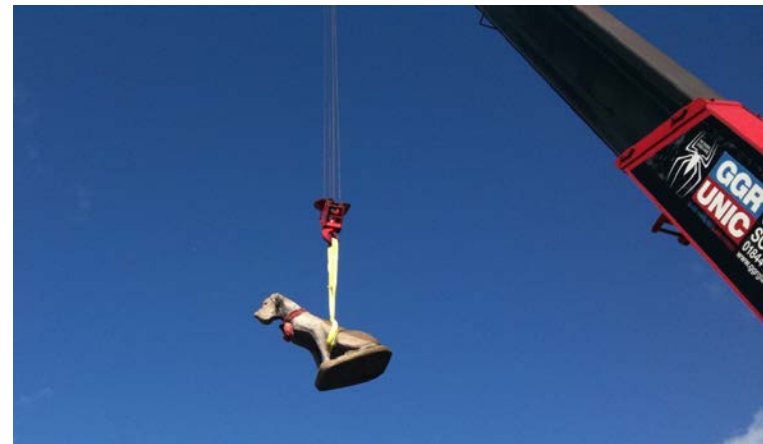
## Refactoring

- Reducing application to component parts and re-architecting to take maximum advantage of Cloud Infrastructure environment
- Like rebuilding an engine



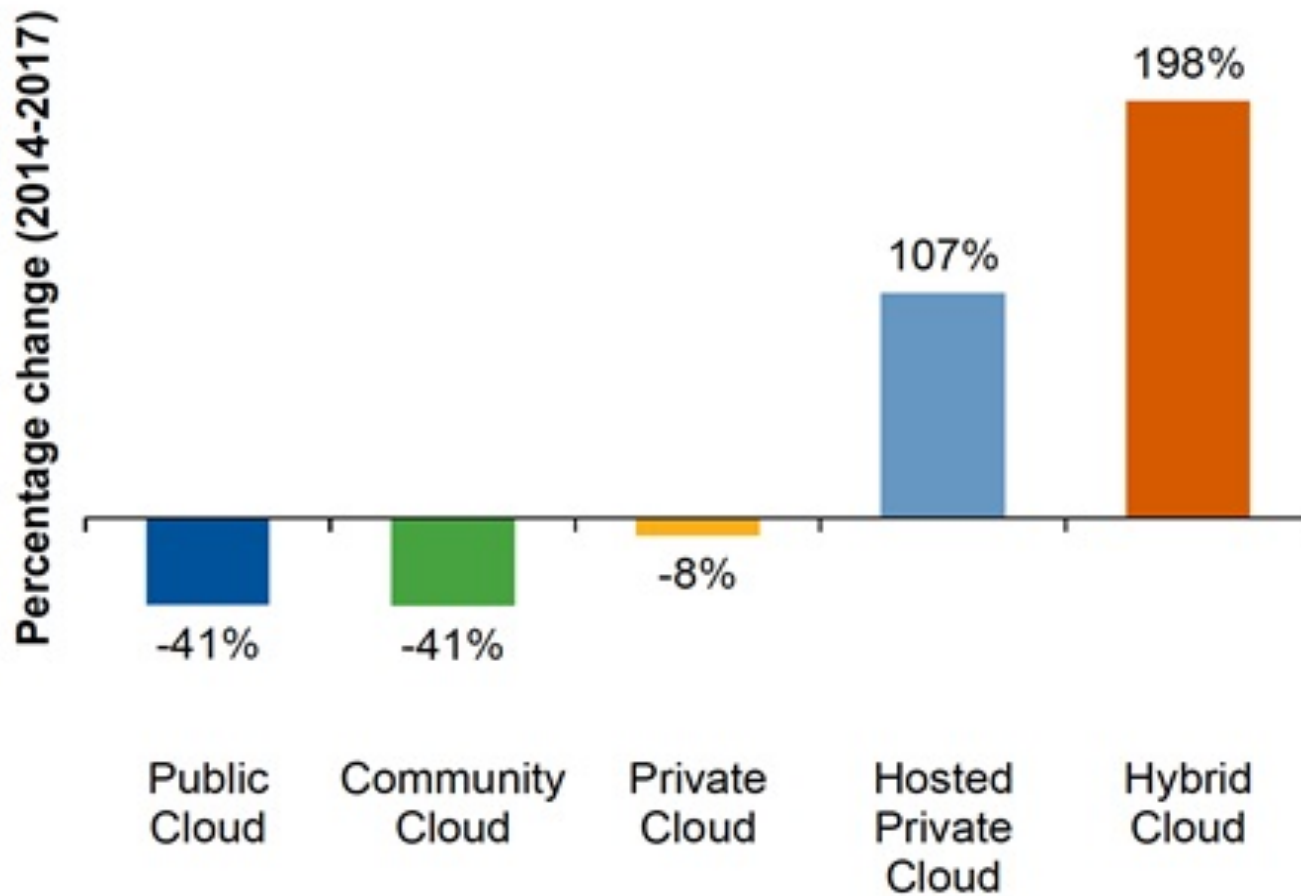
## Lift-and-Shift

- Moving an application or server as-is to a Cloud Infrastructure environment
- MIT has been a leader in pushing the boundaries of this migration strategy



Hybrid Cloud is the **fastest growing** cloud deployment model

What is the primary cloud model your organization will deploy in 3 years?

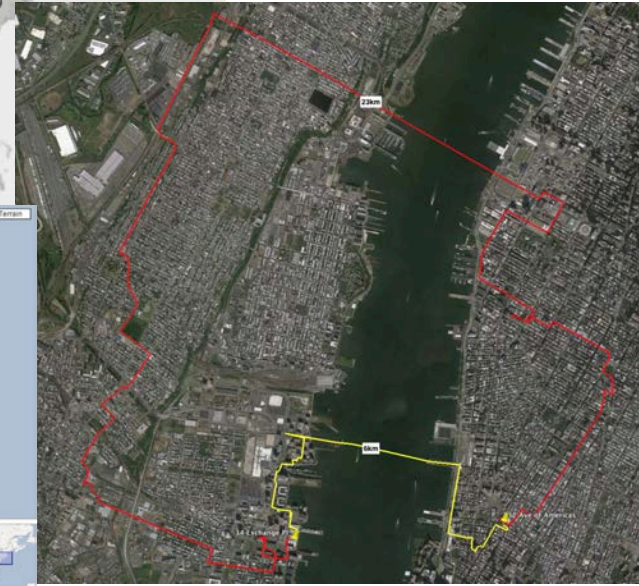
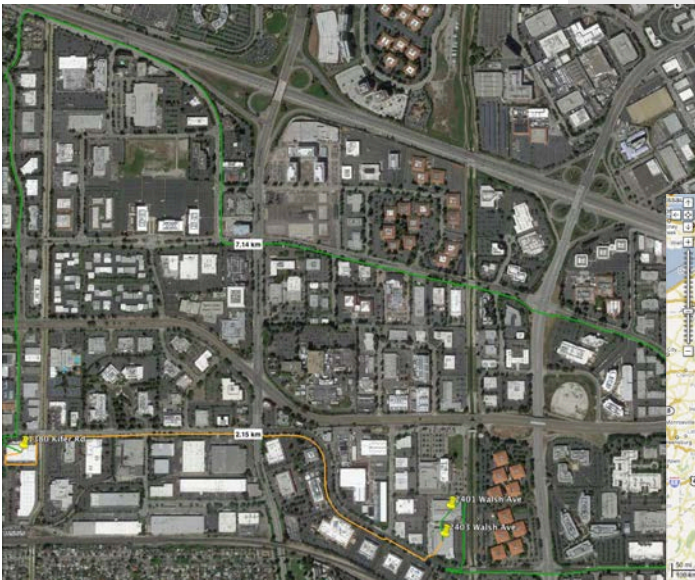
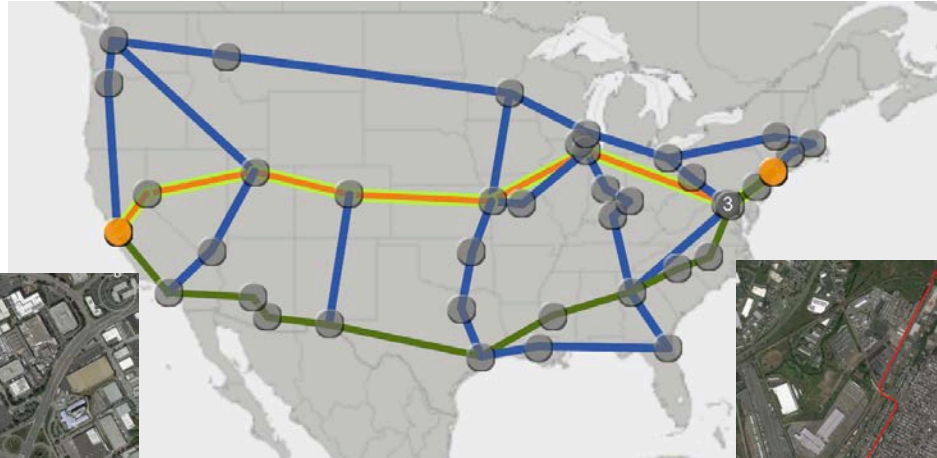


# Why vCloud Air?

- Leverages existing knowledge and skills
- Partnership relationship and ability to shape offering
- Success through rapid, incremental improvements
- Unique hybrid capabilities
- No business continuity disruption or vendor lock-in

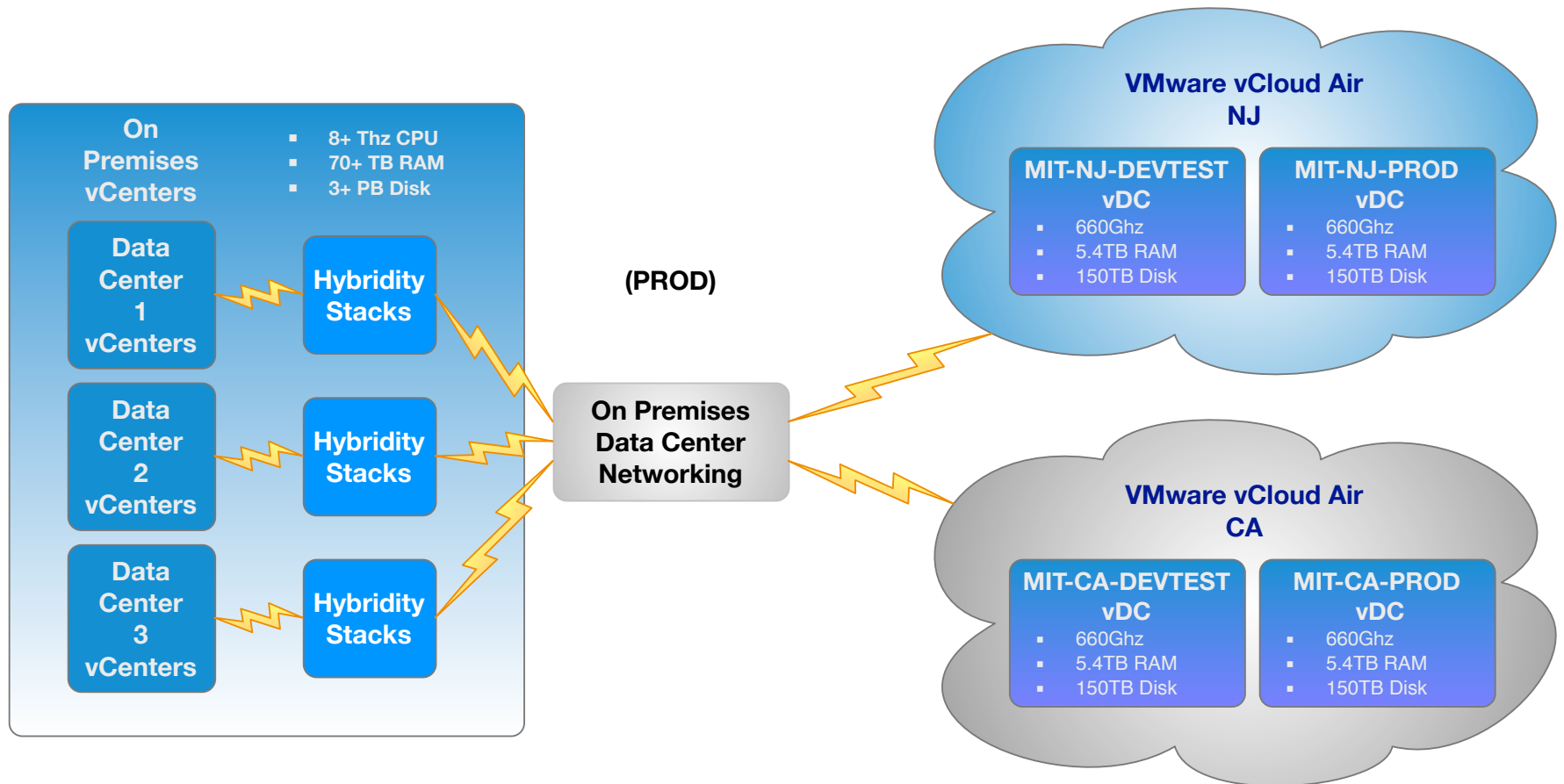
# vCA Connectivity - Physical

NYC->Philadelphia->DC->Ashburn VA->Chicago->Kansas City->Denver->Salt Lake City->Reno->Sunnyvale





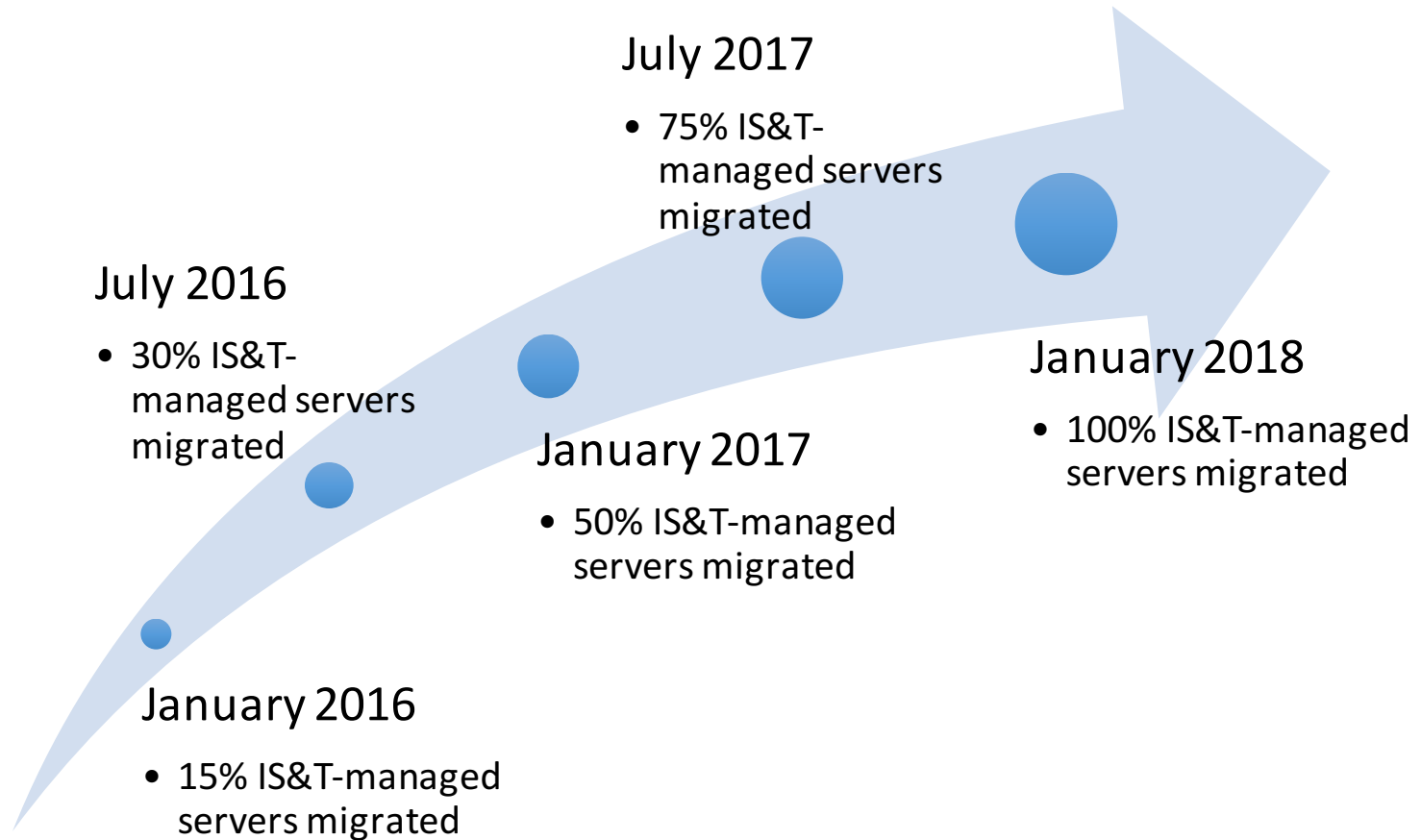
# vCloud Air Connectivity - Logical



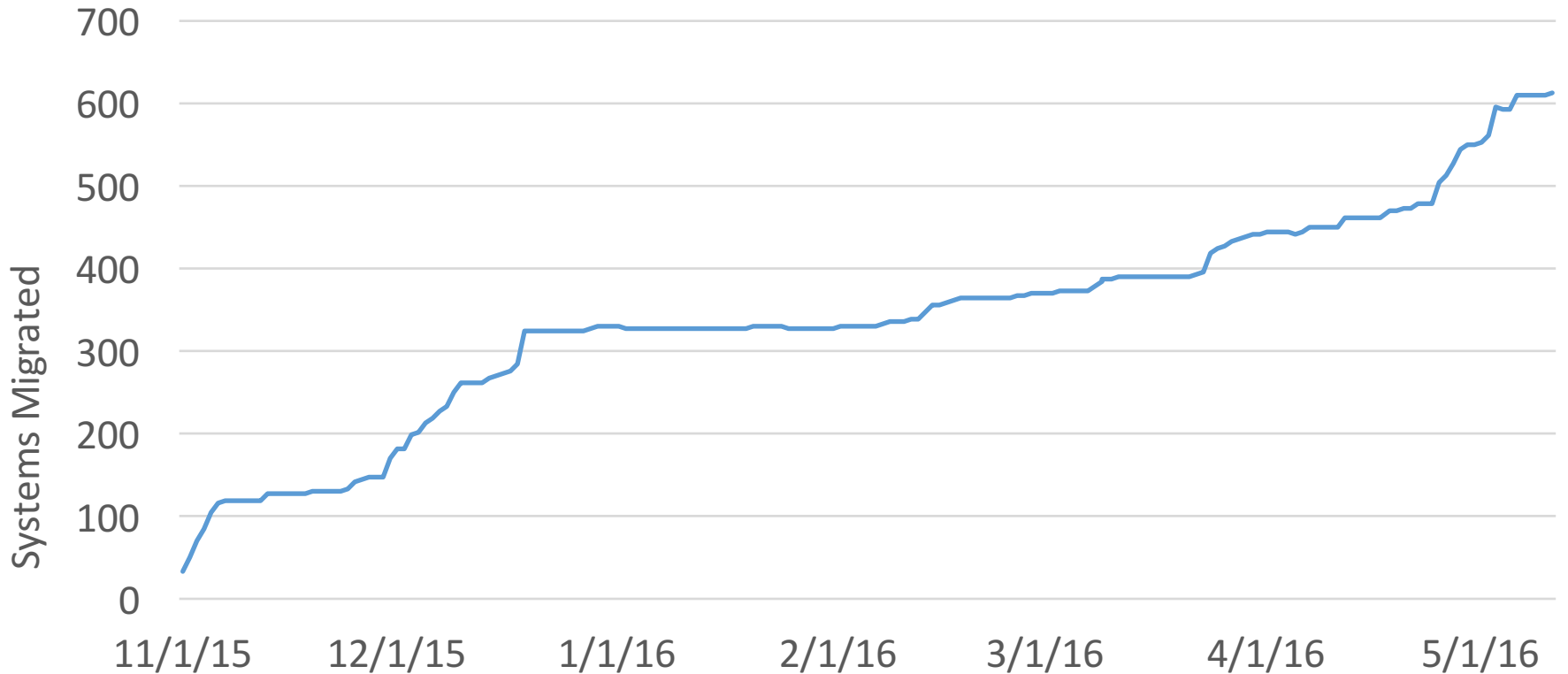
# Scale, Speed, and Progress

- Migrated 70 VMs with 8TB of disk space in 26 hours
- Moved 23% of total VMs in six months, goal to reach 30% by 07/01
- Re-purposed development hardware for production workloads allowing production growth without additional spend
- Customers haven't noticed a difference between on-prem and cloud!

# vCloud Air Migration Timeline



# Cloud Migration Progress



# IS&T Cloud Accomplishments

- **New SaaS Offerings**
- **Founding participant in Internet2 NET+ AWS service offering**
  - Discounted AWS services to the MIT community
  - PO billing capability (a real pain point!)
  - Institute-wide view of **consumption**
- **Exploring similar agreement for Microsoft Azure**



Questions?

# IS&T Transformation Update

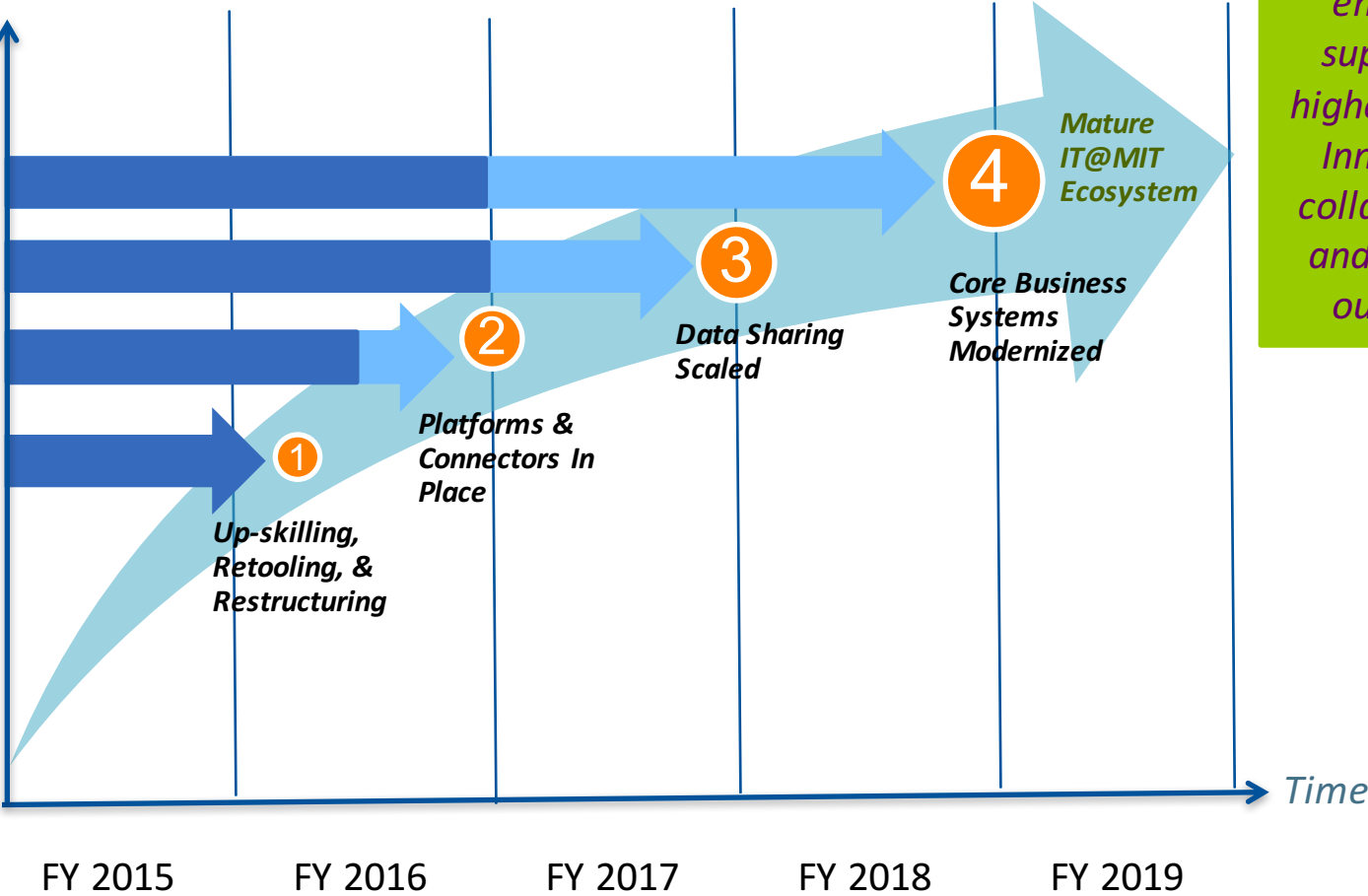
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John Charles

Vice President of Information Systems and Technology

# Transformation Milestones

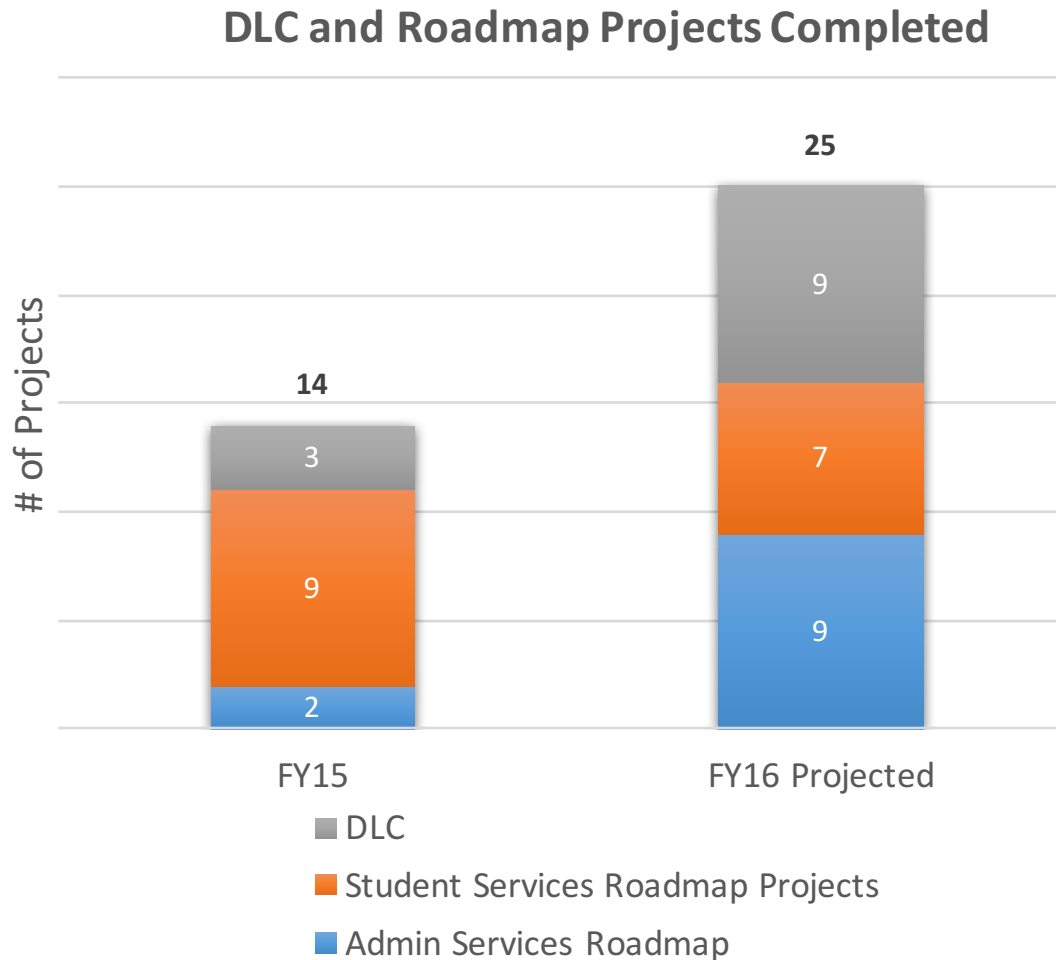
Responsiveness  
of IS&T and  
IT@MIT



Significantly enhanced support for higher-velocity innovation, collaboration, and learning outcomes



# Projected Completion of Projects for FY16



# Accomplishments



labarchives



rideamigos



CROWDSTRIKE



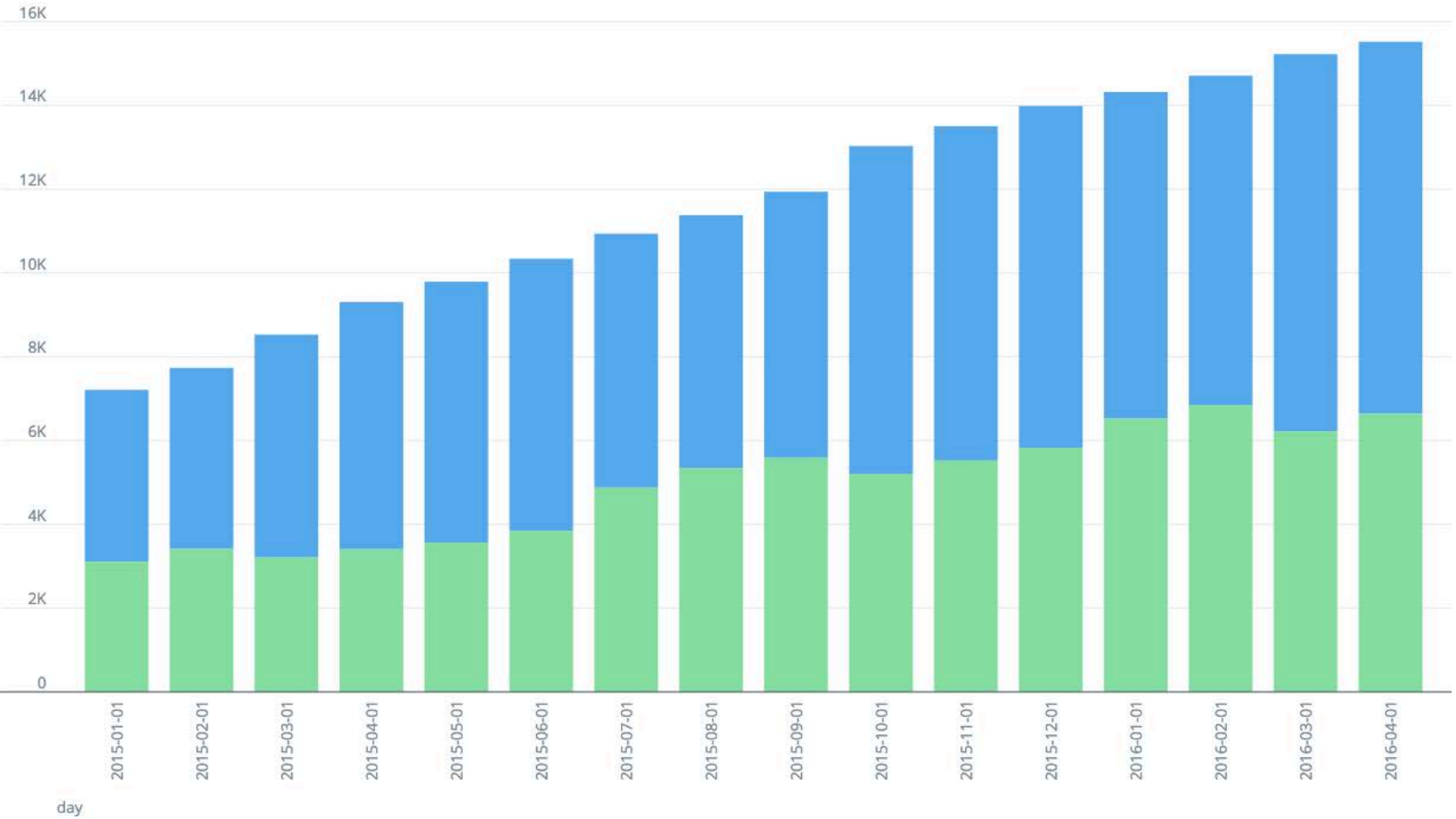
decisions.mit.edu



# Dropbox Use is Climbing

user\_type | power\_users | non\_power\_users

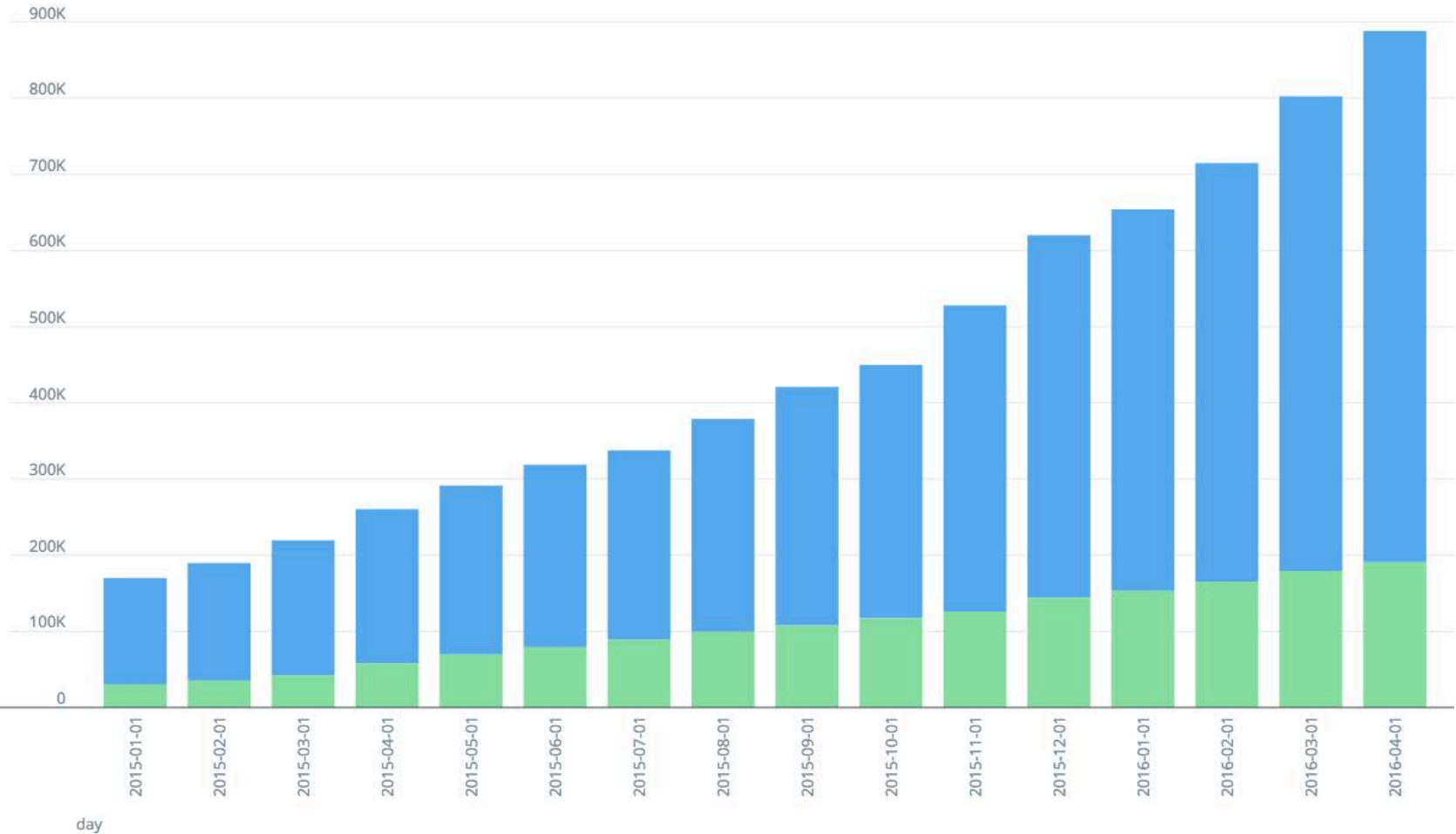
Average users



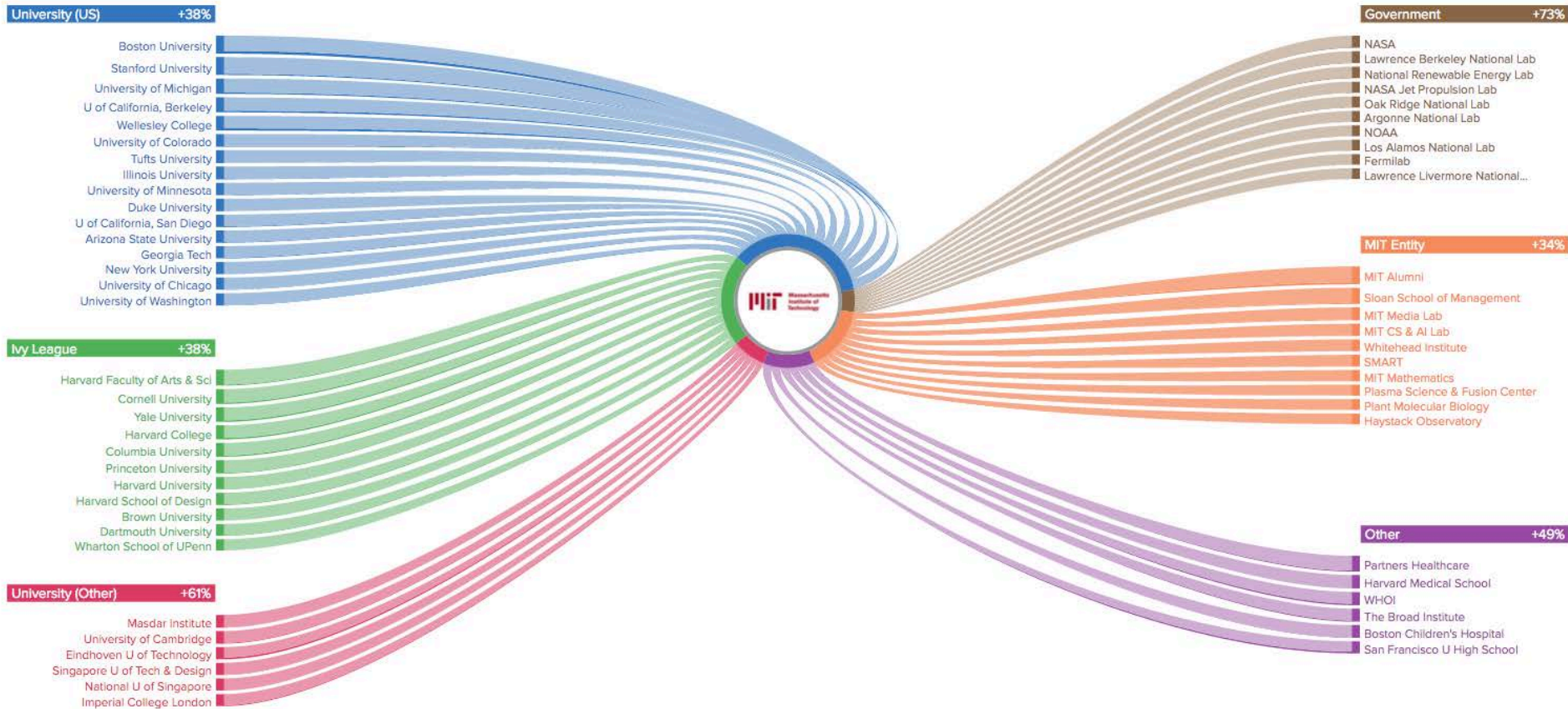
# Dropbox Storage Volume (GB) is rising

storage\_type unshared\_gb shared\_gb

Average gb\_used



# MIT Collaboration Is Increasing



**On average 48% increase in collaboration/sharing over the past 2 years**

2016-04-01

# MIT Dropbox Global Sharing Network

Dropbox global sharing network



# Quick Glance



- MIT ported 9 SAP systems from MIT data centers to SAP's HANA database in the HANA Enterprise Cloud (HEC)
- Cutover on 12/13/15, with outreach to ~ 2100 SAP GUI users
- Lays the foundation for remaining current, and possible future migration to SAP's S/4 version
- Will improve MIT's Data Warehousing and Reporting environment with the addition of real-time analytics

## decisions.mit.edu

- Admissions decisions announced 6:28pm on March 14.
- Engine behind decisions.mit.edu rebuilt over 9 months by team of 10 IS&T staff members.
- Technical tools used: GitHub, Puppet, Travis CI, New Relic, BlazeMeter and RabbitMQ.
- 11,486 decisions were served, at a rate of just under 35 decisions per second.



- Atlas 8: Bug fixes and new enhancements, including end-user facing, administrator-facing, and back-end SAP.
- Number of Enhancements: Learning Center (24), Events Registration (14), Journal Vouchers (4), Commuting Benefits (30), Charitable Giving (8), New Hire (6).
- Moved many legacy apps off of certificate authentication and over to Touchstone

# Quick Glance



- Since May 2015, 1935 new surveys were produced.
- Total of 547 MIT community users in the last 12 months.



- In the past 12 months, 47 MIT community members used the product.
- 400 envelopes were sent.
- VPF is using DocuSign to collect information from vendors.

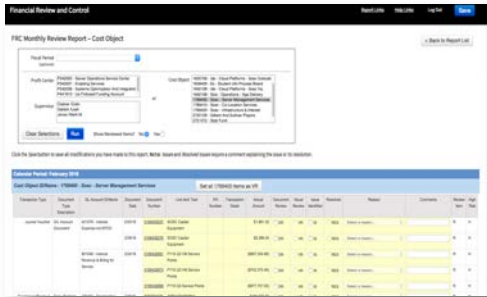


- Available since November 2015
- Tool to help people interactively explore, visualize, understand and share data securely
- ~90 reports run/month

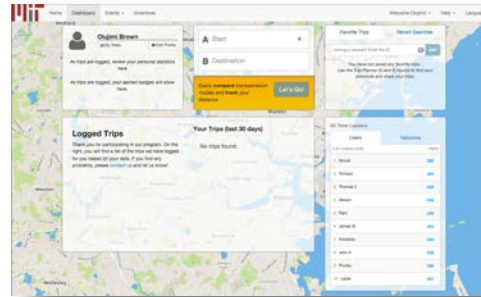


# Data & Information Access

## Financial Review & Control (FRC) [August 2015]



## AccessMyCommute / Ride Amigos Dashboard [February 2016]



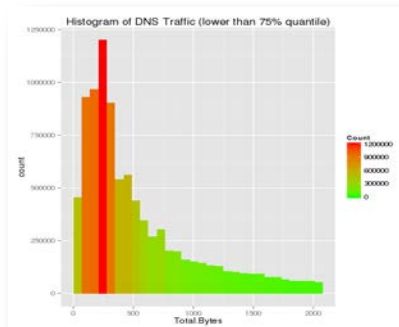
## SANDI Pilot [February 2016]



## Sustainability

- Joint sustainability data analysis committee with research faculty
- Development of a sustainability application to display MIT KPI metrics
- Analyze commuting data for options in reducing individual car use

## IT Security Network Anomaly Detection

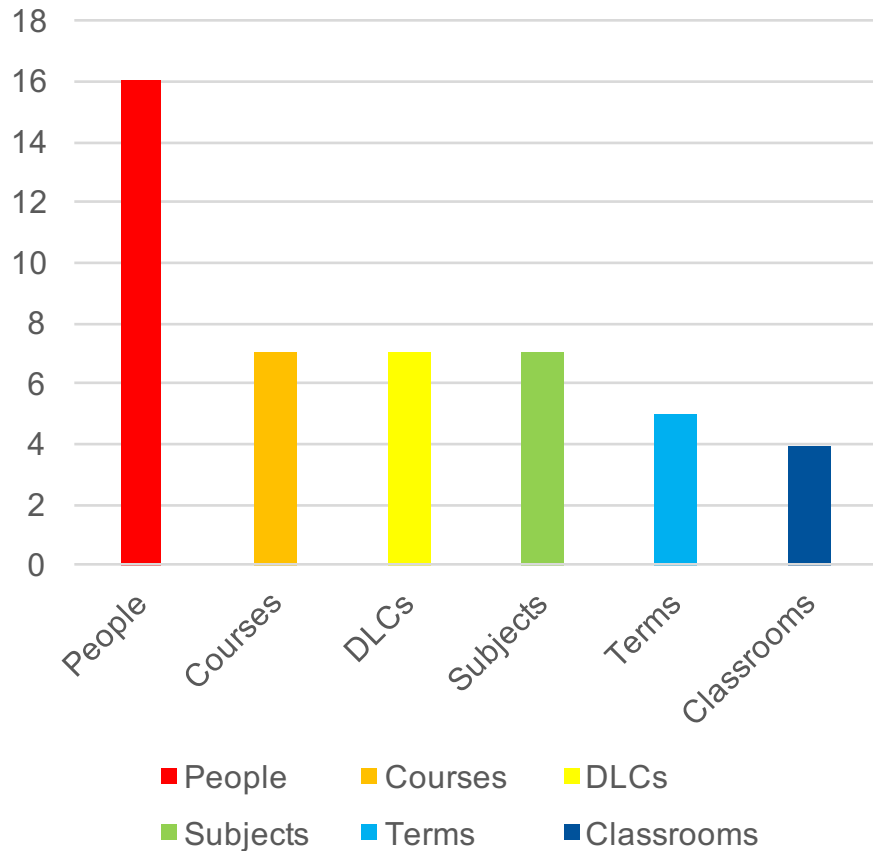


## Interactive Dashboards

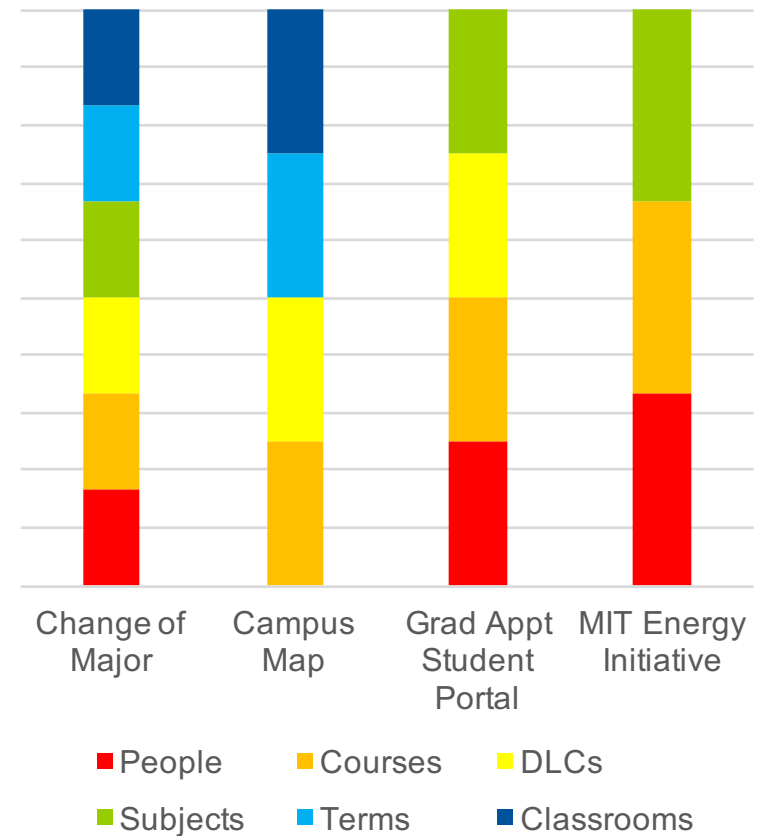


# The API Trend

## IS&T APIs Users



## Applications Using APIs



## Closing Remarks

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