

Exploratory Project: State of the Cloud, from University of Michigan and Beyond

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Goals

- Who is already in the cloud?
 - Excluding VMWare and HPC Services
 - Why?
 - Agility
 - Automation
 - Scalability
- Why not the cloud?

Results

Inter-University Consortium for
Political and Social Research
(ICPSR)

Cloud: Amazon EC2

Usage: Social Data
Management and Presentation

College of Engineering / School of
Information

Cloud: Yahoo M45

Usage: Hadoop Research

Commonalities:

- Lack of local resources
- Usage model works well with cloud architecture

Barriers to Entry

- Security & Regulation
 - Firewalls
 - Encryption
 - FDA, HIPAA, SAS70,...
- Data Transfer
 - Connectivity
 - Large data sets
 - Frequency
- Reliability
 - Uptime
 - Disaster Recovery
- Performance
 - Architecture
- Procurement

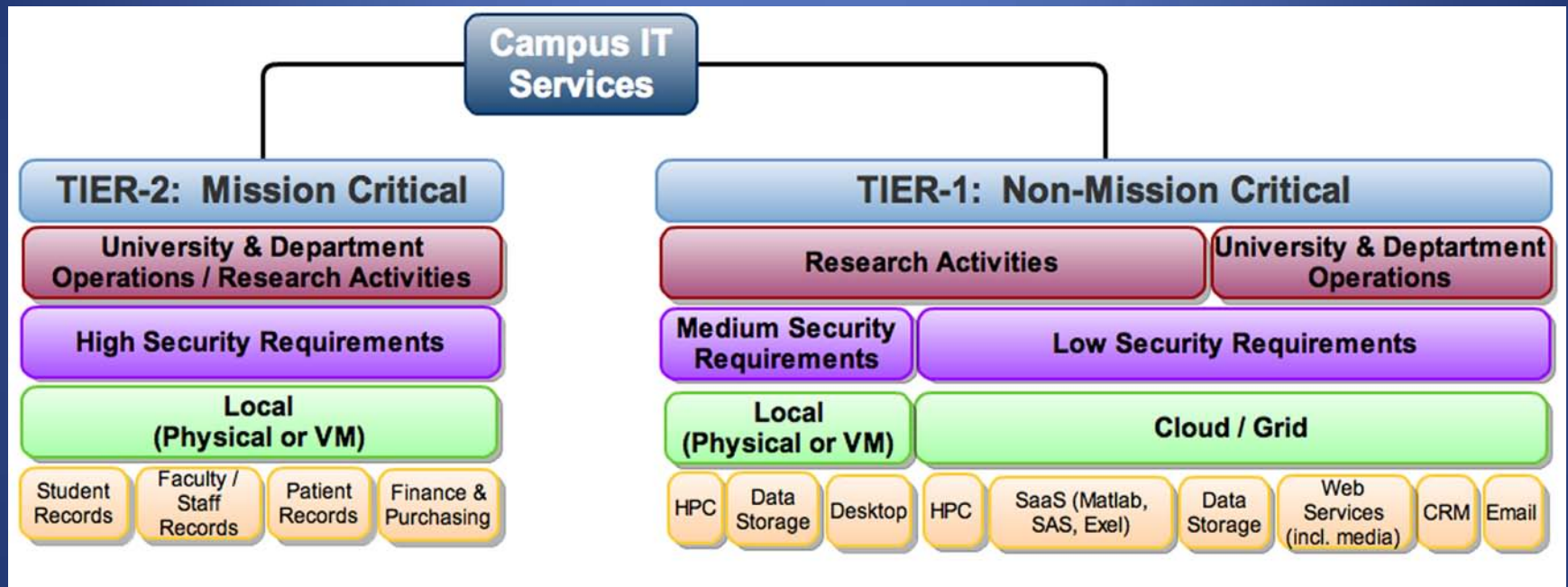
Unrealized Benefits

- Scientists, not Systems Administrators
- Efficient tools for IT organizations

Recommendations

- Categorization
- Security and Regulation
- Data Transfer
- Procurement
- Long-Term Development

Recommendations: Categorization



Recommendations: Categorization

(Current) General Requirements

- Smaller data sets (< 5TB approx.)
- Data is not highly regulated by government policy
- Workflow does not require data transfer in/out of cloud storage on a regular basis
- Primary data access can be accomplished through cloud-hosted applications

IaaS

User / System Administration requires access to operation system level configuration.

User / System Administration does not have local datacenter space to host servers.

Server requirements for performance can be met by cloud providers.



PaaS

User does not require system administrator access, but only requires a development platform.

Development platform requirements can be fulfilled by cloud provided platform services.

















SaaS

User is not interested or does not need to develop or administer software.

Software required by user can be provided by cloud vendor software services.



Recommendations: Categorization

UM Cyberinfrastructure	SaaS					
	PaaS				 Windows Azure SQL / .NET	 Google App Engine 
	IaaS		 redhat. Network Satellite			

Recommendations: Security & Regulation

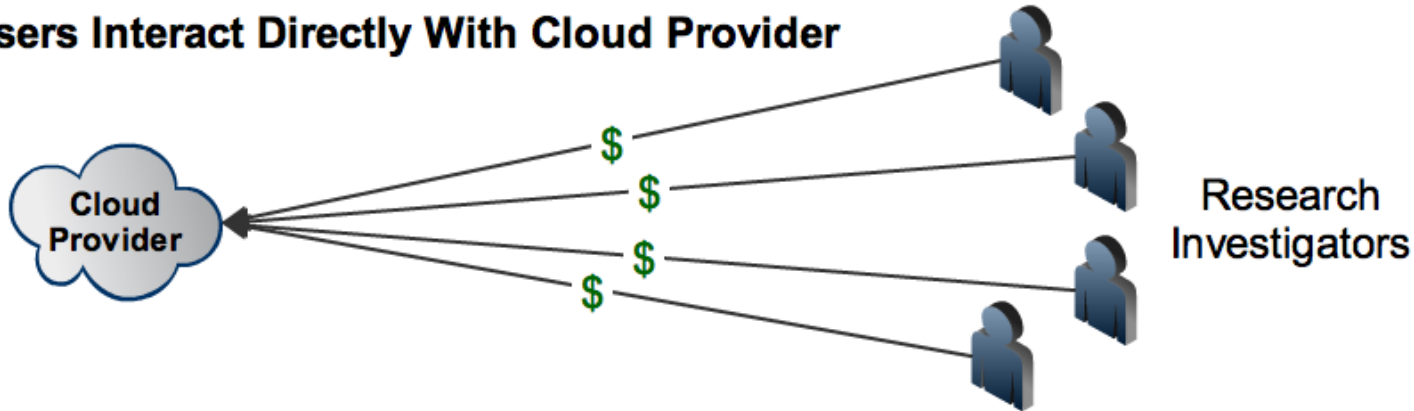
- Policy and SLA
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Recommendations: Data Transfer

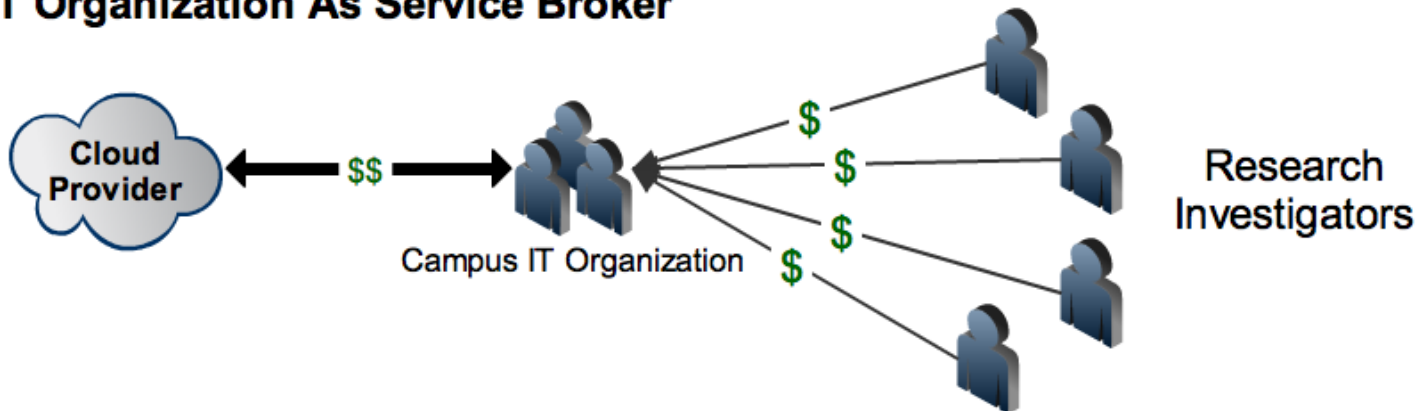
- Any volunteers?
- Current pioneers:
 - Globus Online
 - Internet 2
 - SDSC

Recommendations: Procurement

Users Interact Directly With Cloud Provider



IT Organization As Service Broker



Recommendations: Long-Term Development

- Partnerships
 - Academic with Academic
 - Academic with Industry
- Software strategy instead of hardware strategy
 - Holistic and appears simple to users

Conclusion

- The cloud is a solution, not the only solution.
- User need must fit architecture.
- Technical and social issues