Cloud Strategy

ITS Cloud Strategy

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Background

Cloud computing is maturing to offer services that present attractive alternatives to running computing services on campus. At their best, cloud services offer real advantages over on-premise computing: the ability to dynamically and rapidly change the scale of a service in response to shifting demand; geographic redundancy across different regions; global presence for the increasing global face of the University; and taking advantage of operations on a far larger scale than our on-campus presence. Cloud computing can offer a serious alternative to continuing to build physical facilities in a space-constrained campus environment.

At the same time, the shift to cloud computing presents some challenges that the institution needs to overcome to operate efficiently within the new realities. Protections for University intellectual property, legal adherence to compliance requirements, security of accounts and data, a change in funding models from capital expenses to operating costs, and training of technical staff all represent issues that need to be acknowledged and accommodated as cloud-computing alternatives are evaluated. The ability of the institution to develop effective and efficient processes for overcoming these challenges will play a large role in determining the success of cloud computing efforts at UChicago.

Principles

The following principles are intended to apply when considering information technology services for the University.

- Consider cloud services for any new services or when evaluating alternatives or revisions to current services.
- When evaluating applications or platforms favor those that can be run on cloud infrastructure (run by ITS or administered by cloud providers), even if the initial implementation will be run on premise.
- When evaluating cloud services, aim to select services that run as high up the stack as possible, if all other considerations are met. This means selecting Software as a Service (SaaS) over Platform as a Service (PaaS) and PaaS over Infrastructure as a Service (IaaS). This enables the most effective use of scarce IT staff resources and allows for taking full advantage of vendor architectures and support.
- Proper procedures must be taken for ensuring the security of University information and compliance with all applicable regulations. University counsel and procurement services should be involved in all cloud service agreements for University services, even in cases where no payment is involved.
- Consideration should be given to integration with existing systems, including identity management, networking, storage, etc. Not all cloud implementations require integration, but decisions to not integrate should be made deliberately. Preference should be given to systems that have common functional integration capabilities, such as web service APIs.

Enablers

Legal & Policy

ITS works along with University Counsel’s office and Procurement and Payment Services to ensure appropriate attention is paid to managing the University’s exposure and risk, and to obtain the best possible terms for cloud services.

ITS works across the University to set and document policies and guidelines for the appropriate uses of cloud services for University data and functions, including security and compliance guidelines and best practices.

The legal & policy goal for FY2015 is to successfully conclude agreements for the use of cloud infrastructure and platform providers for use by ITS and the campus, and to use those agreements for creation of models for future University cloud service agreements.

These types of agreements should include our right to view audit reports such as SSAE-16, at least annually, and require the vendor to address the impact to the University when findings are present. The agreements should also incorporate bulk data extraction assistance for contact end-of-life needs.

Finance

The model of subscription or usage-based pricing used in cloud services is different from the capitalized expenses model historically used for IT systems acquisitions. This will require a shift in the balance between capital and operational funding within ITS and to a certain extent across the institution. An assessment of this shift should be conducted comparing the impact to depreciation advantages versus increases in operating

expenses over time. Consideration to help maintain visibility into usage and control costs should also be deliberated.

The financial and billing arrangements for cloud services can be complex. Within ITS it is important to understand how to budget and pay for services, and how to make usage data available to the service owners and managers responsible for the usage. For services made available to campus, the general approach will be to have the provider bill the using department directly when possible.
Integration
The growing demand for access to University information, used to fuel applications from cell phone apps to decision support systems, is complicated by the disparate nature of the systems that hold the information. That complexity is not resolved (and may grow) as a result as some of those systems reside in the cloud.

One approach to reducing the complexity of multiple systems is to provide a common integration layer for defining and offering programmatic access to data from heterogeneous systems. This approach is gaining traction among corporate and academic institutions alike. There are multiple methods for offering an integration layer, ranging from lightweight API managers to more complex Enterprise Service Buses.

ITS' FY2015 goal for integration as part of the Cloud Strategy is to investigate the feasibility of using cloud-based integration services at the University. This investigation will include testing one or more cloud integration platforms for applicability and reporting on the results.

Work Streams

The adoption of cloud computing is already taking place at UChicago in many places across the institution. Within ITS, this strategy and its associated roadmap are intended to track the multiple efforts to reduce complexity and ensure appropriate transparency and oversight of the ongoing and planned work. The following work streams represent the major categories of cloud work within ITS.

Infrastructure

ITS infrastructure work will proceed on three fronts:

- Using cloud technology for infrastructural components for specific situations, such as storage or compute power to provide surge capacity for an individual application during peak times.
- Creating a "virtual data center" architecture in the cloud as an extension to the on-premise ITS data centers.
- Offering multiple cloud infrastructure providers to the University, allowing units to take advantage of appropriate contractual agreements and advantageous arrangements such as streamlined billing or better pricing.

Infrastructure goals in FY2015 include:

- Offering multiple IaaS providers to the campus, including some or all of: Amazon Web Services, Google Cloud Platform, Microsoft Azure, and IBM SoftLayer.
- Creation of an initial cloud infrastructure architecture for the "virtual data center".
- Training of ITS technical staff in cloud infrastructure technology.
- The successful operation of at least one production service (the University home page) on that cloud infrastructure architecture.

Platforms

Cloud platforms (Platforms as a Service, or PaaS) provide facilities to enable the building of applications and services, providing common components such as workflow, messaging, content management, or code libraries.

Platform goals for FY2015 include:

- Initial implementation of Box storage services across the institution.
- Making Acquia's Drupal platform services available for the campus.
- Investigation into the use of Salesforce's force.com platform.
- Small-scale pilot projects demonstrating possible uses of force.com and/or other PaaS offerings.

Applications

The use of externally hosted applications is not new to the University but the advent of cloud computing as a widely accepted alternative is multiplying the possibilities for applications hosted elsewhere. The following broad classes of cloud applications are either underway or under consideration at UChicago.

Collaborative

These are applications used widely by the University community for a variety of work purposes (e.g. UChicago Google Apps). Collaborative Apps usually require a high degree of integration with University systems and support and documentation for users. FY2015 goals include a phase 1

implementation of Microsoft's Office 365 service.

Academic

Academic applications support the direct work of learning, teaching, and research (e.g. the use of Coursera for MOOCs or Kaltura for course videos). Large-scale academic applications are typically supported by ITS, but individual units may be acquiring and supporting cloud-based applications for their specific academic programs. FY2015 goals include continued MOOC implementations on Coursera, pilot MOOCs hosted on EdX, and a Canvas LMS pilot.

Administrative

Administrative applications are provided for accomplishing the business functions of the University (e.g. Workday for HR, or Salesforce for CRM in Alumni Relations & Development). Like academic applications, these may be supported centrally by ITS or provided to an individual unit.

Administrative application activities in the cloud in FY2015 include work on the first phase implementation of Workday for Human Resources.