Owning A Data Center Is So Last Century!

Pam McQuesten Occidental College | October 14, 2010

WHY A NEW DATA CENTER

- Building being demolished
- Green mandate
- Out of room
- Magnet for consolidation
- Funds available
- Why Not…

EVERYBODY WINS

- Free up scarce financial resources for your core mission.
- Reclaim space for academic needs.
- Choose from numerous options for servers and additional services.
- Increase the physical and information security of your IT resources.
- Take advantage of a reliable infrastructure with improved uptime.
- Support sustainability by using greener computing facilities.

http://www.cc.utexas.edu/its/udc/index.php

20TH CENTURY OR 21ST CENTURY?

Emerging Trend	Traditional Solution	Disruptive Solution
Reduced, Frozen, Insufficient Budgets	Cuts Budgets, Layoffs, Reduced Projects	Change Business Model, Institutional Efficiency
Frozen Skill Sets, Limited Skills	Grow Staff, Training, Develop a "no" Culture to New Projects	85% Rule, Work with Smart Disruptive Partner
Complexity of Infrastructure	More Redundancy	Eliminate Infrastructure
Emergence of Mobile	Ignore, Provide Adequate Support	Architect Network for Mobile Device First, Minimize Port Strategy
Emergence of SAAS, Cloud	Ignore, Replicate w/ Internal Systems	Embrace while Researching Access and Security Questions
Rising Cost for Power	Refresh w/ Energy Efficient Equipment	Eliminate Infrastructure

21ST CENTURY: THE NEW WORLD

- Remote hosting
- Virtualization
- Cloud computing
- Commoditization of technology
- Consumerization of technology
- Economies of scale

LOTS OF NEW THINKING

- CSU Hosting PS (see ECAR 2002)
- Rackspace
- Google Apps and Microsoft Live
- Salesforce
- Sakai and Kuali
- LabStor and VCL
- WorldCat
- Amazon EC2 and web services in education

But I Want My Own Bricks and Mortar

- 147,000 sq ft $188 million

http://gigaom.com/2010/01/21/facebook-matures-will-build-its-own-data-center/

But I Want My Own Bricks and Mortar

- 147,000 sq ft $188 million
- “Now Facebook has the cachet that comes with owning its own data center…
- Much like buying your own home rather than renting, becoming large enough to build your own data center is a big step in the life of a tech firm.”

http://gigaom.com/2010/01/21/facebook-matures-will-build-its-own-data-center/

TWO SCHOOLS, MILLION$, SQ FT

- Designed to ensure the safety and security of the most prized networking, computer processing, and data storage equipment.
- In general, the physical life expectancy of a data center building is different from its useful life expectancy as a data center. … With the current trajectory, we would project that the data center would not reach capacity for approximately 3-5 years.
- Will withstand flooding, power outages or an F5 tornado

STATUS: GEEKS ALWAYS ENVY THE JOCKS

GEEKS CAN HAVE BIG MONUMENTS TOO

JOCKS HAVE FAN WEB SITES

GEEKS NOW HAVE FAN SITES TOO

INDIANA UNIVERSITY DATA CENTER

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Data Center dedication marks step forward for IT infrastructure at IU

President McRobbie speaks at the IU Data Center dedication ceremony

The Indiana University Data Center was formally dedicated on Thursday, November 5. This $32.7 million facility is designed to ensure the safety and security of IU's most prized networking, computer processing, and data storage equipment. The ceremony included remarks by IU president Michael McRobbie and IU vice president for information technology Brad Wheeler.

The 82,700-square-foot IU Data Center - Bloomington features a low-profile, single-story bunkered design to protect the university's critical computers and networking equipment. The design protects from possible electrical damage, power outages, and even an F5 tornado. It has an advanced fire suppression and security system.

The Data Center provides almost four times the space and 10 times the electrical capacity of the previous facility. It serves all IU campuses via I-Light, Indiana's high-speed fiber optic network, and eliminates the need for similar facilities on other campuses.

Equipment in the IU Data Center

Three 11,000-square-foot machine rooms will house IU's supercomputers, massive data storage systems, and thousands of virtual servers. Supercomputers Big Red and Quarry are two of the best-known occupants to IU's researchers, and with the NSF FutureGrid award, they will soon be joined by additional supercomputers.

The Data Center, along with its smaller peer facility on the IUPUI campus, hosts the computers that make all of IU's educational and administrative systems work. Email, telephone systems, and other essential services are also in the Data Center along with important parts of the I-Light network equipment.

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University Data Center

Overview | Project Information | Governance | Forms | SLA

New Facility: Project Information

An existing campus facility is being renovated to construct a new, state-of-the-art data center. This facility will address immediate needs for a reliable data center capable of supporting co-location of currently decentralized departmental servers. It will also house enterprise-wide services critical to students, faculty, and staff, including Blackboard, WebSpace, UT Direct, e-mail, Web Central, and all mainframe functions (Admissions, Registration, HR, Payroll, Benefits, etc.).

Cost of Service

Rates for server co-location and virtual servers have been established using the university's rate review process. Refer to the Financial Guiding Principles to see what costs are included in the rates. Use the Co-Location Cost Estimator to help plan for different types of equipment.

IT Governance groups also reviewed and endorsed these rates. Please refer to the meeting notes from the following governance meetings for more information:

- Architecture and Infrastructure Committee (April 9, 2010)
- Operational IT Committee (April 28, 2010)
- Strategic IT Accountability Board (May 3, 2010)

Documentation

Frequently Asked Questions

Service Level Agreement

System Standards

Data Storage

Site Photos

See recent photos of the construction site.

Stay up-to-date on our progress

Biweekly progress reports will be posted every other week during the project. You can also subscribe to the UDC Updates mailing list.

Project Schedule*

- **Building Construction Complete** May 2009 - July 2010
- **Internal Testing and Startup Procedures** August - September 2010
- **Network Installation** September 2010
- **Migration of ITS Services** October - December 2010
- **Migration of Co-location Customers** January - June 2011

*Estimated, as of July 21, 2010

JOCKS HAVE IMPACT

The gridiron culture has brought name recognition to institutions, but it has placed heavy burdens on their administrators as well as their academic credibility. *(College Football: History, Spectacle, Controversy*; John Sayle Watterson September 2002: Johns Hopkins University Press)

GEEKS HAVE IMPACT

The data center culture has brought name recognition to IT organizations, but it has placed heavy burdens on their institutions as well as their service credibility (*Owning Your Own Data Center is So Last Century*; Pam McQuesten October 2010: EDUCAUSE)

BACK TO LIVING IN THE 21ST CENTURY

- Developers with innovative ideas for new interactive Internet services no longer require the large capital outlays in hardware to deploy their service or the human expense to operate it.
- They need not be concerned about over-provisioning for a service whose popularity does not meet their predictions, thus wasting costly resources, or under-provisioning for one that becomes wildly popular.

Above the Clouds: A Berkeley View of Cloud Computing: February 10, 2009
http://www.eecs.berkeley.edu/Pubs/TechRpts/2009/EECS-2009-28.pdf

OBSTACLES TO AND OPPORTUNITIES FOR ADOPTION AND GROWTH OF CLOUD COMPUTING.

Top 10	Obstacle	Opportunity
1	Availability of Service	Use Multiple Cloud Providers to provide Business Continuity; Use Elasticity to Defend Against DDOS attacks
2	Data Lock-In	Standardize APIs; Make compatible software available to enable Surge Computing
3	Data Confidentiality and Auditability	Deploy Encryption, VLANs, and Firewalls; Accommodate National Laws via Geographical Data Storage
4	Data Transfer Bottlenecks	FedExing Disks; Data Backup/Archival; Lower WAN Router Costs; Higher Bandwidth LAN Switches
5	Performance Unpredictability	Improved Virtual Machine Support; Flash Memory; Gang Scheduling VMs for HPC apps
6	Scalable Storage	Invent Scalable Store
7	Bugs in Large-Scale Distributed Systems	Invent Debugger that relies on Distributed VMs
8	Scaling Quickly	Invent Auto-Scaler that relies on Machine Learning; Snapshots to encourage Cloud Computing Conservationism
9	Reputation Fate Sharing	Offer reputation-guarding services like those for email
10	Software Licensing	Pay-for-use licenses; Bulk use sales

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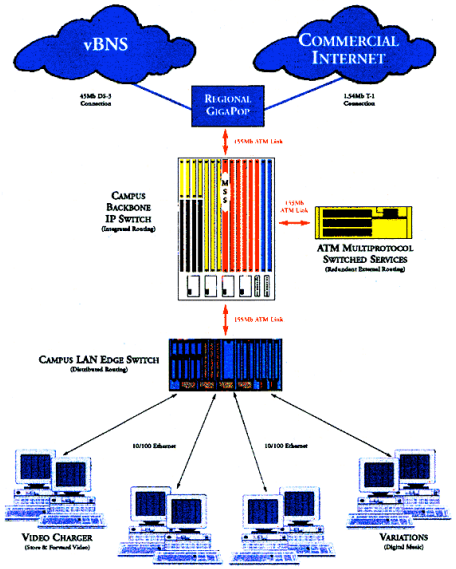
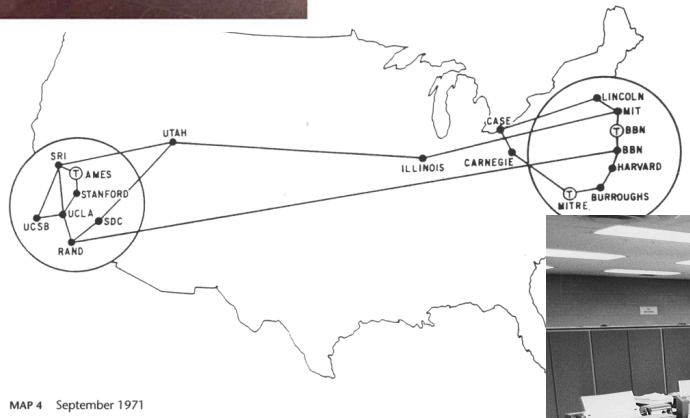
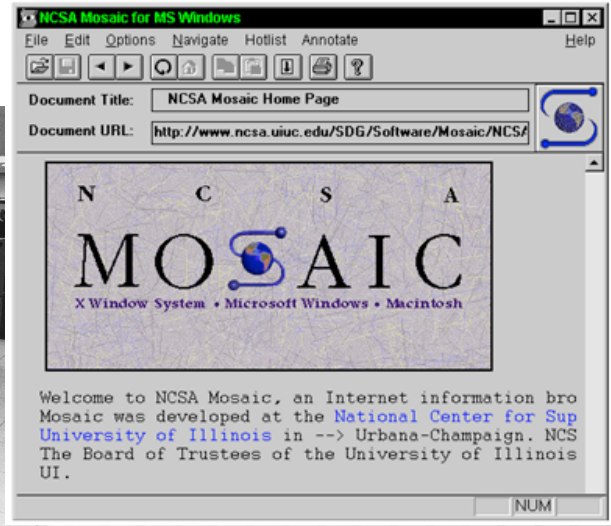
HIGHER ED AND IT INNOVATION





MAP 4 September 1971



WHEN WE THINK ABOUT DATA CENTERS…

- Keep building and preserving geek monuments of jock envy
  - (so last century)

WHEN WE THINK ABOUT DATA CENTERS…

- Building real accomplishments through innovating with what we use but don’t own
  - (the century we’re actually in)

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THANK YOU