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**Roy Tennant** Senior Program Officer, OCLC Research

# **Cloud Computing 101**

### Roy Tennant OCLC Research



## **Cloud Computing**

• Wikipedia definition:

"Cloud computing is Internet-based computing, whereby shared resources, software and information are provided to computers and other devices on-demand, like electricity."





## What Does it Offer?

- The ability to acquire computing power at will
- The chance to pay only for what you use
- The opportunity to stop at any time without financial penalty
- Access to your data or service from anywhere on the Internet

## How Does It Work?

- Basic Computing Concepts
- Cloud Computing Service Layers:
  - Software as a Service
  - Platform as a Service
  - Infrastructure as a Service
- Consumer vs. Enterprise cloud computing
- Enabling Technologies

## **Computer Systems are Layered**

Applications MS Office, Adobe Photoshop

#### Infrastructure Tools

Programming languages, printer drivers

#### **Operating System**

Windows, Mac OS X, Unix

#### Hardware

Computers, storage, networking

## **Service Layers**

- Software as a Service (SaaS)
  - Software that can be accessed and used on the Internet
  - Examples: Google Docs, Flickr, Gmail, etc.
- Platform as a Service (PaaS)
  - Everything but the end-user software provided as a service
  - Example: Google App Engine
- Infrastructure as a Service (IaaS)
  - Only the physical infrastructure provided as a service
  - Example: Amazon's suite of Web Services

### **Consumer vs. Enterprise Service**

- Consumer Cloud Computing:
  - Cloud services aimed at end-users
  - Examples: Gmail, Flickr, Zoho, Google Docs (SaaS)
- Enterprise Cloud Computing:
  - Cloud services for organizations
  - Examples: Amazon Web Services, RackSpace (IaaS);
     Yahoo Pipes (PaaS); SalesForce.com (SaaS)

# **Enabling Technologies**





# Virtualization





## **Application Stacks**

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# What This All Means

# 1) Infinite, immediately available computer power





# 2) Easy come, easy go





http://www.flickr.com/photos/amagill/3366720659/



# **3)** Ubiquitous information



# 4) The cost of innovation is forever lowered

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## **Potential Drawbacks**

- Security and Privacy
- Network Latency
- Usage-based pricing (unpredictability)
- Integration with local systems

# Cloud Computing in Libraries

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## **Case Study: Digital Resource Cor**

- Created their own "application stack" for digital repository software
- Any member institution could get up and running in minutes via Amazon Web Services

"The results of the DRC cloud project thus far," writes Davison "have been a cost-effective, agile response to seemingly insurmountable delays in hardware provision and staffing; a rapid development of technical proficiency that can be shared throughout the state and with the DSpace community at large; and a compelling model for more independent institutional control and access to site administration."



### **Questions to Consider**

- Can you avoid having to buy new hardware by using a cloud service?
- Can you reassign staff previously charged with managing your servers?
- Are there any laws or policies that prevent you from having data off-site?
- How do the relative costs pencil out?
- Does your potential use require massive amounts of data to be transferred? (cloud services may charge for data throughput)

## Where To Go From Here

- Ed & Heather's book —>
- Current Cites, currentcites.org
- LITA programs and workshops at ALA and LITA National Forum
- Other professional conferences
- Blogs, twitter, etc. for current awareness



The usual set of magazines and journals

# Questions? Comments?

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