Digital Records Curation Programme

Week 5:
Cloud Computing

Learning Outcomes

At the end of this class, students should be able to:

- understand what cloud computing is
- explain how cloud computing can be deployed in record-keeping
- understand the record-keeping issues (benefits and risks) associated with cloud computing
- effectively plan for a transition to records storage and management in the cloud

Cloud Computing

Cloud computing is a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g. networks, servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or services provider interaction.
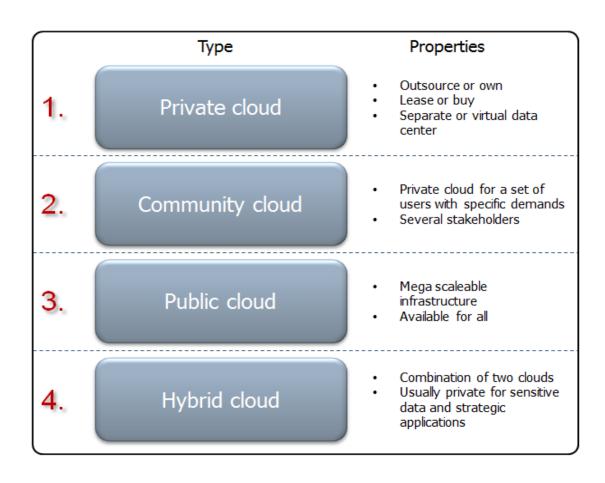
National Institute of Standards and Technology

Cloud Computing

Essential Characteristics

- **On-demand self-service**: users can provision computing capabilities (e.g. server time and network, storage, etc.) as required without assistance from service provider

- **Broad network access**: availability over the network with access via standard internet-accessible devices (e.g. mobile phones, laptops, etc.)

- **Resource pooling**: a multi-tenant model that pools resources between users

- **Rapid elasticity**: ability for users to rapidly increase or decrease cloud capabilities on-demand

- **Measured service**: resource use is monitored, controlled and reported, allowing users are charged based on their usage for each type of service (e.g. storage, processing, bandwidth, etc.)

Cloud Computing Deployment Models

Type	Properties
1. **Private cloud**	• Outsource or own • Lease or buy • Separate or virtual data center
2. **Community cloud**	• Private cloud for a set of users with specific demands • Several stakeholders
3. **Public cloud**	• Mega scaleable infrastructure • Available for all
4. **Hybrid cloud**	• Combination of two clouds • Usually private for sensitive data and strategic applications

Cloud Computing Deployment Models (Continued)

For advantages and disadavntages of each deployment model consult the following:

Rouse, M. (2017). *Cloud computing*. Retrieved from http://searchcloudcomputing.techtarget.com/definition/cloud-computing

Cloud Computing Service Models

Software as a Service (SaaS): Use the provider's applications running on a cloud infrastructure. The applications are accessible from various client devices through a client interface such as a web browser (e.g. web-based email). The consumer does not manage or control the underlying cloud infrastructure including network, servers, operating systems, storage, or even individual application capabilities, with the possible exception of limited user-specific application configuration settings.

Cloud Computing Service Models

Platform as a Service (PaaS): Deploy onto the cloud infrastructure consumer created or acquired applications created using programming languages and tools supported by the provider. The consumer does not manage or control the underlying cloud infrastructure including networks, servers, operating systems, or storage, but has control over the deployed applications and possibly application hosting environment configurations.

Cloud Computing Service Models

Infrastructure as a Service (IaaS): Provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, deployed applications, and possibly limited control of select networking components (e.g. host firewalls).

Poll activity

What are the record-keeping issues?

Group Work - Cloud Service Contracts

- InterPARES Trust has developed a checklist of issues that should be addressed in cloud service contracts, including:
  - Data ownership
  - Availability, retrieval and use
  - Data storage and preservation
  - Data retention and disposition
  - Security, confidentiality and privacy
  - Data location and cross-border data flows
  - End of Service - Contract termination
- Use the InterPARES Cloud Service Provider Contracts Checklist to assess the terms of service for:
  - Dropbox (Group 1)
  - Google Drive (Group 2)

Decision Making Framework

- The InterPARES Digital Records Pathways primer on cloud computing sets out a decision-making framework.

- In groups, work through the framework considering an organisation that one of you has worked for.

- The framework starts on page 19 of the primer, at http://interpares.org/ip3/display_file.cfm?doc=ip3_canada_gs12_module_8_july-2012_DRAFT.pdf

Any questions?