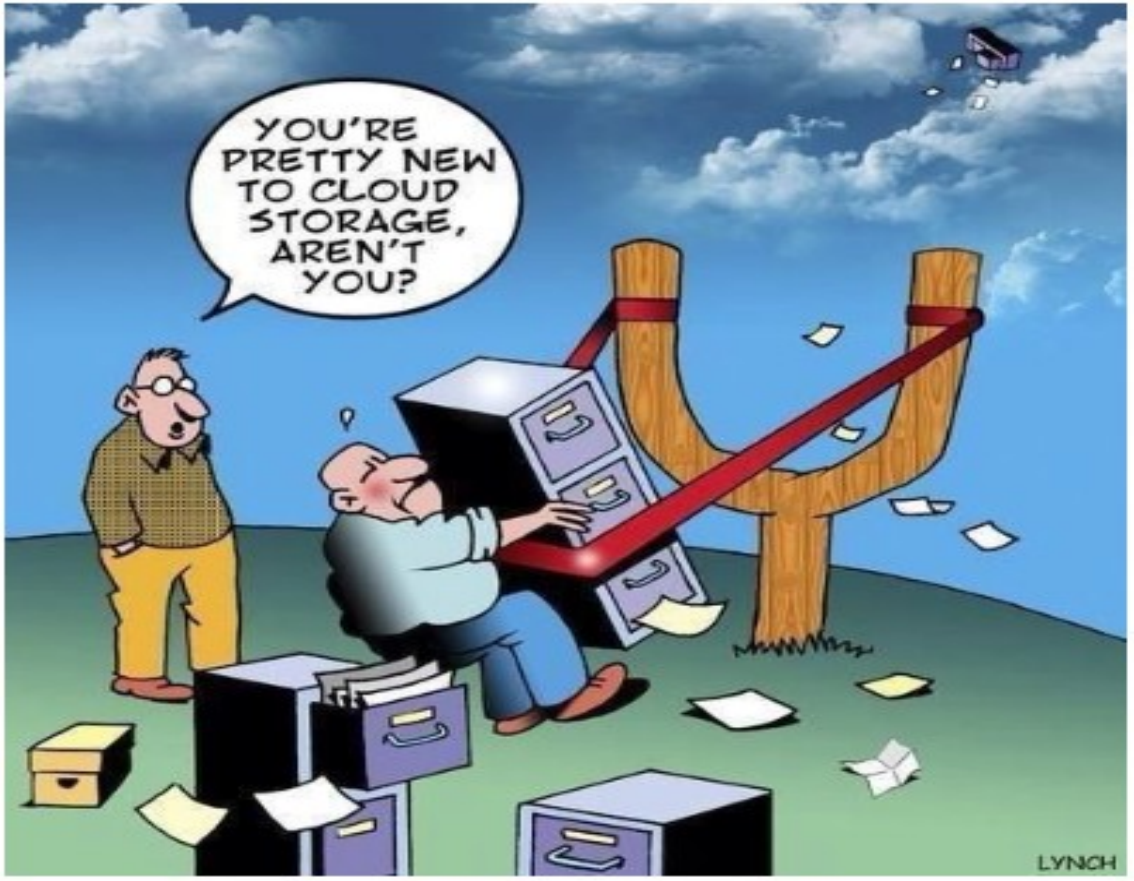
Cloud Computing

ITEC313

… in the name of cloud

Lumpyone Sep 21, 2018 at 5:47 PM



Evolution of the Cloud

- 1960s:
  - Professor Joseph Licklider, of MIT, described the idea of cloud computing and resource sharing.
  - Professor John McCarthy, at MIT and Stanford focused on the concepts of timesharing, computing power, and applications being used and sold as a utility and online social networking.
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- Still in the 1960s:
  - In 1966, Douglas F. Parkhill, published a book on The Challenge of Computer Utility wherein he described the utility-like features of cloud computing such as dynamic provisioning, illusion of infinite supply, and being always online.

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- In the 2000s:
  - In 2001, the SIIA (Software and Information Industry Association) used the acronym SaaS and compared it with ASP (Application Service Provider).
  - In 2002, Amazon launched its web services to permit users to integrate their websites with Amazon’s online content. This later became IaaS, EC2 (Elastic Compute Cloud) and S3 (Storage-as-a-Service). They actually introduced pay-per-use pricing and very quickly it became a standard with other companies.

- In 2003, Nicholas Carr, published a research paper in the Harvard Business Review called “IT Doesn’t Matter” wherein he described that corporate will start purchasing IT resources as and when needed from external resources only.
- 2008: Gartner declared cloud computing as an emerging technology that was still at the infancy level

Main goal of cloud computing

- Saving money and time
- Creating assurance with a Service Level Agreement (SLA). Boosts client’s confidence
- SLA-specified level of uptime. 99.999%

Properties and Characteristics of Cloud Computing

- Provision of on-demand self services
- Broader network access. Mobile devices
- Resources shared on-the-go.
- Elastic
- Pay-as-you-go

- Multi-tenancy. Difference organizations share same underlying resources
- Features of service-oriented architecture (SOA)
- Virtualization concept with a client-server model
- Requires considerable thought before implementing
- Strong foundation of best practices
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- Different from network computing and the traditional outsourcing
- Shift from remote to current data
- Powerful when used in coordination other than in isolation
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Cloud Computing Service Models

- Cloud computing service models refer to the different types of services or functionalities offered by cloud providers over the internet.
- The three primary cloud service models are Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS):

Reference Model for CC

Infrastructure-as-a-Service (IaaS)

- Customer gets resources like storage, network bandwidth, processing power, etc.
- Having secured the infrastructure, user controls OS, services, data applications, security, etc
- E.g: RackSpace, Amazon Web Services, MS Azure

- PaaS:
  - Customer provided with the hardware infrastructure, network, OS, to form a hosting environment. User can install applications and activate services from a hosting environment

- SaaS:
  - User given access to application(s) with no control over hardware, network, security, OS.
  - E.g: Salesforce,Ramco, MS, Zoho, etc
- More details on the services later
- XaaS?

- Cloud services are made available via public, private or hybrid clouds

Public Cloud/:

- Aka External Cloud: Generally offer services over the Internet.

  Owned and operated by a cloud provider. For example, email services, social networking sites, and so on, are all aimed at the general public.

Characteristics of Public Cloud

- Services offered to users on the principle of pay-by-use (explained earlier).
- Run by third parties because they require a huge investment to build.
- Applications from different customers are mixed together on storage systems, cloud servers, and other infrastructures within the cloud

- The customers can choose a location to deploy the application. This mitigates latency, risks, time, and costs for the users.
- Data control and security are important tasks here.
- Always larger than an organization’s cloud. Scaling up and down. Transfers risk to provider
- CSP owns and hosts resources
- No direct connectivity provided by CSP

Private Cloud

- Alias-Internal Cloud: If a public cloud is thought of as Internet, a private cloud can be thought of as an intranet.

Characteristics of Private Cloud

- used when the data center in the cloud is to be operated only for a specific business.
- It serves the client with maximum security, quality of service, and data control.
- The infrastructure is owned by the company and it has power over how applications are deployed on it.
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- With private clouds, the IT infrastructure of organizations can be merged, thereby mitigating the electricity bill.
- They are limited to the organizational boundary
- used when the security of the organization is of paramount importance.
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- The organization has so much potential, in terms of money,capable of running even a next generation cloud data center most efficiently and effectively.
- The cloud computing infrastructure that is designed only for a single company cannot be shared with other organizations.

- They are more expensive and secure.
- The main objective of a private cloud is not to sell cloud services to external organizations but to exploit the benefits of a cloud architecture by denying the rights to manage your data center to outsiders.

- Private clouds are virtual distributed systems that depend only on private infrastructure.
- Security concerns are less critical here as they provide internal users with dynamic provisioning of computing resources.
- Testing a private cloud is cheaper than testing a public cloud.

- A problem with private cloud; cannot scale out easily in case of heavy (peak) demands
- Solution?:
- Hybrid Cloud
- Next