Edge Hill University

Cloud Computing

Topic 8A, Session 2

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Clouds Timeline

Started in the 1950s with **mainframe computing** and shared access.

Around 1970, the concept of **virtual machines** (VMs like VMware) was created.

In the 1990s, telecommunications companies started offering virtualized private network connections.

Currently, the platforms created include private, public and hybrid cloud solutions like IBM SoftLayer, Amazon AWS, which guarantees a comprehensive Infrastructure as a Service (IaaS).

https://www.ibm.com/blogs/cloud-computing/2014/03/a-brief-history-of-cloud-computing-3/

Evolution of Cloud Computing

Grid Computing: Solving large problems with parallel computing

Utility Computing: Offering computing resources as a metered service

Software as a Service (SaaS): Network-based subscriptions to applications

Cloud Computing: Anytime, anywhere access to IT resources delivered dynamically as a service

Cloud Computing - Overview

- It brings the user access to ***data, applications and storage*** that are not stored on their computer.
- It can be understood as a ***delivery system*** that delivers computing the same way a power grid delivers electricity.
- To the average computer user it offers the advantage of delivering IT without the user having to have an in depth knowledge of the technology.
- Similar to the way a consumer can access electricity without being an electrician.

Cloud Computing - Definition

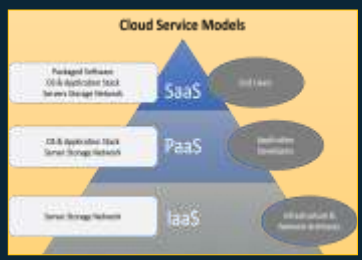
What is cloud and how is it different from the distributed computing based data centres , grids and clusters?

- Your thoughts?

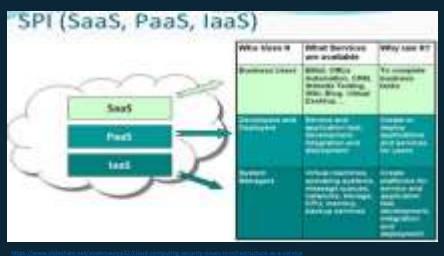
Definition

The National Institute of Standards and Technology (NIST) defines ***Cloud Computing*** as "a Model for enabling convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management or service provider interaction."

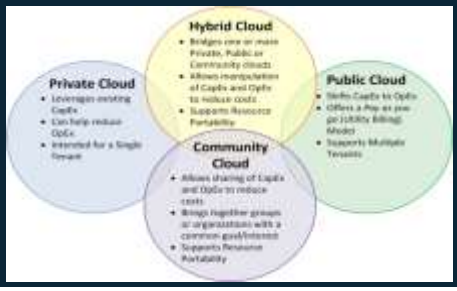
Cloud Service Models



Software, Platform, Infrastructure (SPI) and Deployment Models



Deployment Models



Benefits of Clouds

- ***Cost*** – Typically less expensive/more cost effective
- ***Networked*** – Value added service through the Internet connection on a broad range of devices (PC, tablets, smart-phones etc.)
- ***On-demand***- Acquire computing capabilities as and when needed with little or no human intervention
- ***Elasticity*** – Resources can expand and retract depending on requirements

Benefits of Clouds Contd.

- ***Speed of Implementation*** – No need to buy hardware/OS to get up and running
- ***Service Metric*** - Offer metering of services thereby optimizing the utilization of resources through constant monitoring, control and report in a way that is beneficial to both the provider and consumer of the utilized service.
- ***Green Credentials*** - Qualities protecting the natural environment

Disadvantages of Clouds

- ***Security*** – Solutions in the cloud are not mature and/or fully trusted; vulnerability to attack
- ***Control*** – Management of infrastructure in the hands of a third party; limited control & flexibility
- ***Openness*** – Vendor lock-in; platform dependency; difficult to migrate from one platform to another
- ***Compliance*** – e.g. With regulatory bodies (such as the Financial Services Authority FSA)

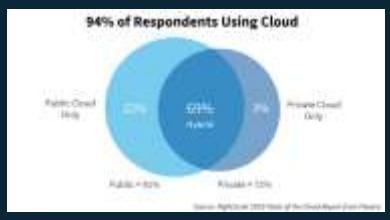
Cloud Computing Trends

- A narrowing race among public cloud providers
- Decrease in private cloud adoption
- A renewed focus among enterprises on optimizing cloud costs
- Strong growth in Docker (open-source system of software containers)

https://www.rightscale.com/blog/cloud-industry-insights/cloud-computing-trends-2017-state-cloud-survey

Cloud Computing Trends

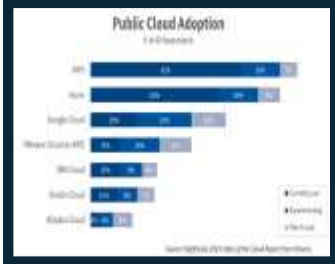
- In January 2019, ***RightScale*** conducted its eighth annual State of the Cloud Survey. The survey asked 786 IT professionals about their adoption of cloud infrastructure and related technologies.



Cloud Computing Trends

Top cloud challenges in 2019 are ***governance, expertise, and spend***.

Cloud Computing Trends



Amazon Web Services (AWS) and ***Microsoft Azure*** are the two most adopted public cloud platforms.

Thank You