Cloud Computing

What is it? Why do we use it?

Overview

- SaaS - We consume it.
- PaaS - We build on it.
- Iaas - We migrate to it.

Infrastructure as a Service (IaaS)

- Cloud service model where vendors provide pay-as-you-go access to hardware.
  - Saves users from having to purchase the hardware.
  - Users supply their own platforms and applications.
- Example:
  - AWS
  - Azure
  - GCP
- When to use:
  - When you need a data center but don't have a data center.
  - Research team needing to occasionally process large data sets.
    - Can rent hardware space to run tests as needed.

Platform as a Service (PaaS)

- Includes infrastructure - servers, storage, networking
    - Development tools, BI, DBMS, etc.
    - Server management done by Service Provider
    - Data still resides with vendor
- Customer can focus on the applications and services they develop
- It can be public, private, public
- Examples:
    - SAP Cloud/Business Technology Platform
    - Windows Azure
    - Heroku
    - Google App Engine

Software as a Service (SaaS)

- Cloud-based software that is hosted online by a 3rd party company
- Pay as you go, through license agreement
- Example:
  - Adobe Creative Cloud
  - Slack
  - Google Docs
- When to use:
  - Best for start-up companies as it provides for easy implementation and cheaper upfront cost
  - Short-term usage for minimal commitment
    - Subscription based lets you pay as you need the service
- Things to consider:
  - Less secure with transfer of business data, as you have to rely on the vender to properly secure your data
  - Due to lack of control of securing data, you can run into compliance issues
  - If something were to happen to the 3rd party service provider you may run into difficulties transferring you data to another provider
- If your company is looking to adopt a SaaS model:
  - Have a good software, which will be subscription based
  - Have an established customer base
  - Have a pricing plan in mind

Situation 1 - IaaS

- Game studio needs servers to run online game.
- Hybrid Cloud
  - Studio needs access to modify/update game.
  - Users need access to play game.
- Service Provider
  - The game studio.

Hybrid is best in this case as there is a mix of what users need access to. The game studio needs access to administrate the game and player base. Players shouldn't have access to these things but still need access to log in and play.

Situation 2 - PaaS

- Business needing to build bespoke auditing/analysis tools
- Private Cloud
  - Used for internal metrics
  - Only needed by company.
- Service Provider
  - Google: Google App Engine

Private cloud is best in this case because the metrics created are solely created by and used by the company. Metrics could reveal sensitive information about the company and should be kept private.

Situation 3- SaaS

- Company in need of email service
- Private Cloud
  - This email service will be needed for internal business communications
  - Only accessible by employees
- Service Provider
  - Google: Google Workspace

Private cloud is best in this case as internal communications could contain sensitive information about the company.

Service offered by MS Azure, AWS, GCP

- **(MS Azure) Microsoft Azure SQL Database**
  - **A (PaaS) is owned, hosted, and maintained by Microsoft.**

- **(AWS) Amazon Virtual Private Cloud**
  - **A (IaaS) a service that allows you to launch AWS in a logically remote virtual network. You have control over your virtual networking environment**

- **(GCP) Google Drive**
  - **A (SaaS) Google Drive allows users to store files and share files on their servers across multiple devices.**