Quiz 2

Cloud Computing Characteristics/ Benefits

- On demand self service
- Broad network access
- Very elastic
- scalable

What are performance issues in cloud computing? (Reliability and performance issues and concerns)

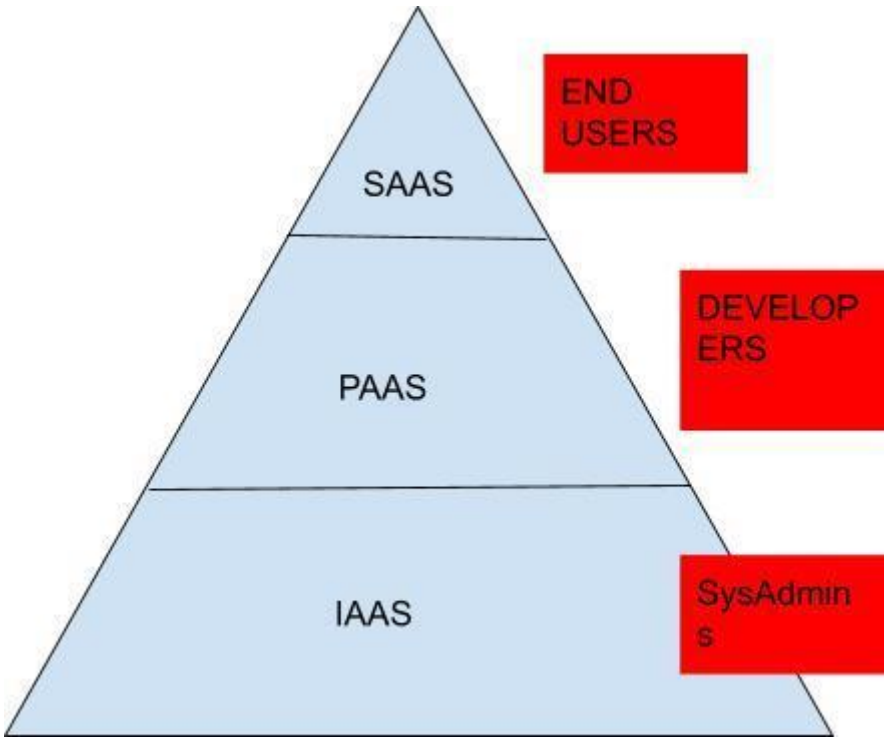
- Network latency
- Application processing delays
- Overall availability

- performance monitoring tools - help prevent potential problems.

Unforeseen Issues (cloud usage patterns , noisy neighbors) :

- Many companies tend to put their workload onto the cloud on the weekend when most of their employees are not in the office. This causes an excessive workload on the weekend compared to lets say wednesday (the middle of the workday week.
- Another issue is noisy neighbors. Noisy neighbors are neighbors that are using the same public cloud but are eating into your section of the cloud. This is problematic as it slows your automation and processing when your neighbor is taking most of the processing power.

The Cloud Computing Pyramid



At the top of the pyramid, we have S.A.A.S (Software as a Service) - They are also considered the end users. Examples of this include software like google doc, salesforce, and base camp. Software as a Service provides certain services that can fulfill a multitude of business needs.

At the middle of the pyramid, we have P.A.A.S (Platform as a Service) - They are also considered the developers. Examples of this include FORCE.COM and APP Engine. PaaS has a lot of similarities to IaaS. Its key difference is that its more advanced. For example, PaaS provides more than just infrastructure it also offers storage and cloud computing infrastructure combined with development tools that incorporate database management systems, Software development kits, and web servers. With all processes under one umbrella companies have a lower upfront software investment and have far less issues during testing and deployment

At the bottom of the pyramid we have IAAS (Infrastructure as a Service). Examples of this include AWS, Rackspace.com, and Go Grid. IAAS provides raw computing resources in a completely secured data center. The IAAS provides both hardware and software solutions that are ready to be used. In a majority of cases IAAS providers have the following features : data storage, managed development and/or hosting, pay as go options, easy scalability networking , and more.

Key differences of public, private, and hybrid cloud solutions:

- Cloud computing is the on-demand availability of computer system resources, especially data storage and computing power, without direct active management by the user. Different companies are using the cloud in different ways but overall most companies store their most crucial data in the cloud.
- At this point, most companies are migrating all their data and work to the cloud. The cloud is very beneficial in terms of backups [easier to store on the cloud bc you have more backup]
- Types of cloud - Public , Private, Hybrid
    - Private - used by government agencies mainly and data that companies want to keep very secret. The private cloud allows for more customization than the public cloud. With the private cloud we can use specified hardware with the specifications we need and this means less hardware cost and we aren’t paying for unutilized resources that we don’t actually need.a cloud infrastructure only for our dedicated customer or the organization so you can have a dedicated infrastructure for your clients or the organization and that would not be shared with the other users
    - Hybrid - hybrid cloud the hybrid cloud is basically the combination of the public and the private clocked it's based on the purpose and the requirements.during

high peak periods where workloads are much heavier it is best to switch to the hybrid cloud

- Public - most companies place their data in the public cloud as its much mor efficient and cost effective then having a private cloud. Public cloud has more sharing and syncing capabilities. It is more accessible and backing up data on the public cloud is much easier than on the private cloud.
  Over time companies are shifting from data centers to the cloud more and more Virtualization vs abstraction. Companies incorporate a combination of SaaS , IaaS, and PaaS.
  - SaaS - software as a service
  - IaaS - infrastructure as a service
  - PaaS - platform as a service Cloud computing trends and needs

1. Abstraction of network, storage, db, security, and computing infrastructure
2. A price model that is retail in its conception
3. Service-Level Agreements Historical evolution

History of the Cloud
- Idea phase (early 1960s)
- Pre - cloud phase (cloud started becoming prevalent in 2006 so this era was basically the 1990s - 2006)
- Cloud phase (2006 and after)

How did the cloud come to be?
Phase 1: Large system called “mainframes” located in back rooms that were accessed via terminals, had no local data processing, and utilized card-punching systems with job control language (a scripting language for mainframes).

Phase 2

- - 1980s
  - Stand-alone personal computers that could be connected via a modem
  - Users interacted on a one-to-one basis using a mouse, keyboard, and display terminal
  - Self - contained computing device that received additional software via floppy disk
  - Eventually resulted in laptops
  - This phase transitioned from terminal-based, single user-single job to GUI - based, single- user multiple jobs.

Phase 3
- Mid 1990s

● Development of web browsers to access the world wide web.
● Foundations of connecting users via the internet
● Utilization of TCP/IP protocol to make large sets of unreliable resources produce a reliable output.

Names of cloud providers: Amazon Web Services, Microsoft Azure, Google Cloud, etc.
Each cloud providers has different benefits.

Datacenters
- There are all kinds of datacenters around the world. Including underwater data centers that Microsoft has created
- Data centers require a large landmass and need to be at locations that don't have lots of natural disasters (california is a no go)
- College Station Data center name: FiberTown
- It is important to keep a data center cool and non dusty
- One security issue of data centers is that you don't want your data near another companies data as whoever comes to check that data may snoop into yours so a lot of big companies have their own data centers.

Unforeseen impacts - Companies need to distribute their data loads amongst different providers because they do not want to be locked to a specific vendor. This causes problems in the long run
- Wearables are increasing in popularity (Professor Lightfoot mentioned that the future is wearables during his first lecture) because of its use of the cloud.
- Zoom became very popular because it saved recorded meeting footage to the cloud which was above its time as many of its competitors did not utilize the cloud to their benefit (i.e. Cisco Webex & skype)
- Impacted the it and business industries in ways we could have never imaged. Way more data than we could ever imagine as been able to be stored and used due to the utilization of the cloud.
- Cybersecurity needs to be uptight because we no longer have local stores to store data if the public cloud is hacked millions more private information is leaked [the scale of things is much larger bc of how grand the cloud is] . Efforts in the cyber security sector have been increased