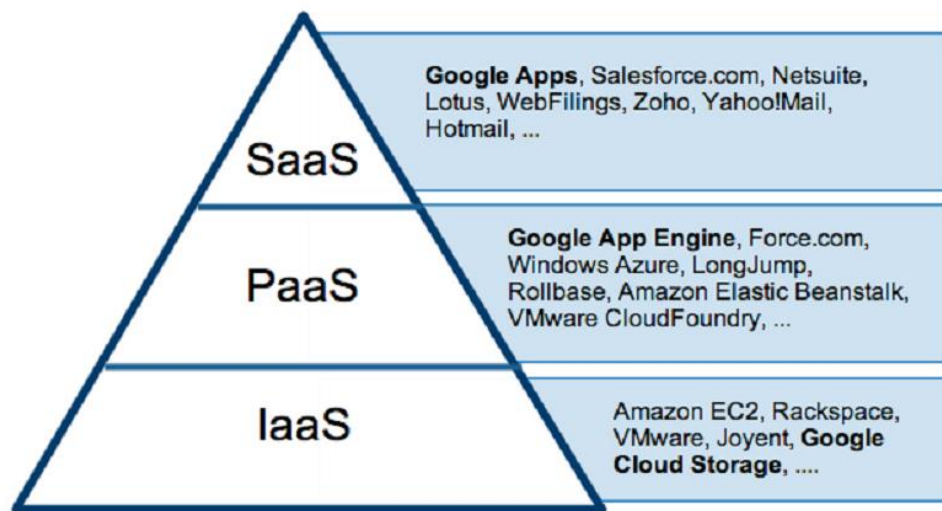


1. How can you define cloud service? Describe the characteristic of a cloud service.

The “cloud” in cloud computing can be defined as the set of hardware, networks, storage, services, and interfaces that combine to deliver aspects of computing as a service. Cloud services include the delivery of software, infrastructure, and storage over the Internet. A cloud service is any service made available to users on demand via the Internet from a cloud computing provider's servers as opposed to being provided from a company's own premises servers explained before, the most common cloud service is that one offering data storage disks and virtual servers, i.e. infrastructure. Examples of Infrastructure-as-a-Service (IaaS) companies are Amazon, Rackspace, and Flexi scale.

If the cloud offers a development platform, and this includes operating system, programming language execution environment, database, and web server, the model is known as Platform-as-a-Service (PaaS), examples of which are Google App Engine, Microsoft Azure, Sales force. Operating system can be frequently upgraded and developed with PaaS, services can be obtained from diverse sources, and programming can be worked in teams (geographically distributed). Software-as-a-Service (SaaS), finally, means that users can access various software applications on a pay-per-use basis. As opposed to buying licensed programs, often very expensive. Examples of such services include widely used GMail, or Google Docs.



Characteristics of Cloud Computing

Service Oriented: The defining characteristic of cloud computing is the service oriented feature. All the IT related services are hosted in cloud infrastructure. Companies should not have to buy expensive servers; network equipment's and invests on expensive manpower.

On Demand: A consumer can provision computing capabilities, such as server processing and network storage, as needed automatically without requiring human interacting with each service's provider.

Reliability, Elasticity and scalability: The cloud is reliable in the sense that the infrastructure setup for cloud is robust and backed up for high availability

The cloud is **elastic**, meaning that resource allocation can get bigger or smaller depending on demand. Elasticity enables **scalability**, which means that the cloud can scale upward for peak demand and downward for lighter demand.

2. Differentiate between each of private public and hybrid cloud models with explain.

Private Cloud: Private cloud computing systems emulate public cloud service offerings within an organization's boundaries to make services accessible for one designated organization. Private cloud computing systems make use of virtualization solutions and focus on consolidating distributed IT services often within data centers belonging to the company. The chief advantage of these systems is that the enterprise retains full control over corporate data, security guidelines, and system performance. This model doesn't bring much in terms of cost efficacy: it is comparable to buying, building and managing your own infrastructure.

Public Cloud: This is the deployment model that most commonly described as cloud computing. In this model, all of the physical resources are owned and operated by a third party cloud computing provider. The provider services multiple clients that may consist of individuals or corporations utilizing these resources through the public Internet. Services can be dynamically provisioned and are billed based on usage alone. This model provides the highest degree of cost savings while requiring the least amount of overhead

Hybrid Cloud: This can be a combination of private and public clouds that support the requirement to retain some data in an organization, and also the need to offer services in the cloud. A company may use internal resources in a private cloud maintain total control over its proprietary data. It can then use a public cloud storage provider for backing up less sensitive information. At the same time, it might share computing resources with other organizations that have similar needs. By combining the advantages of the other models, the hybrid model offers organizations the most flexibility.

3. What is role of Early Detection and Intelligent log Centralization and analysis services in Monitoring as services Model?

Monitoring-as-a-Service is an outsourced service to provide security mainly to platforms that are run on the Internet for conducting business. Maas became highly popular in the last decade. An early detection service detects and reports new security vulnerabilities shortly after they appear. Generally, the threats are correlated with third-party sources, and an alert or report is issued to

customers. This report is usually sent by email to the person designated by the company. Security vulnerability reports, aside from containing a detailed description of the vulnerability and the platforms affected, also include information on the impact the exploitation of this vulnerability would have on the systems or applications previously selected by the company receiving the report. Most often, the report also indicates specific actions to be taken to minimize the effect of the vulnerability, if that is known.

Intelligent Log Centralization and Analysis

Intelligent log centralization and analysis are a monitoring solution based mainly on the correlation and matching of log entries. Such analysis helps to establish a baseline of operational performance and provides an index of security threat. Alarms can be raised in the event an incident moves the established baseline parameters beyond a stipulated threshold. These types of sophisticated tools are used by a team of security experts who are responsible for incident response once such a threshold has been crossed and the threat has generated an alarm or warning picked up by security analysts monitoring the systems.

4. What are the benefits of using Software as a service model? Briefly describe about the maturity levels of SaaS Architecture.

Software as a service, sometimes referred to as "on-demand software", is a software delivery model in which software and associated data are centrally hosted on the cloud. SaaS is typically accessed by users using a thin client via a web browser. In this model, the software is not hosted on the customers' individual computers.

Benefits of SaaS (Hope now you can explain all):

- Save money by not having to purchase servers or other software to support use.
- Focus Budgets on competitive advantage rather than infrastructure.
- Monthly obligation rather than up front capital cost.
- Reduced need to predict scale of demand and infrastructure investment up front as available capacity matches demand.
- Multi-Tenant efficiency
- Flexibility and scalability
- Security

5. What do you mean by Service Oriented Architecture (SOA)? How could services get benefited by SOA?

A service-oriented architecture is essentially a collection of services. These services communicate with each other. The communication can involve either simple data passing or it could involve two or more services coordinating some activity. Some means of connecting services to each other is needed. A service-oriented architecture is essentially a collection of services. These services communicate with each other. The communication can involve either simple data passing or it could involve two or more services coordinating some activity. Some means of connecting services to each other is needed. SOA defines how to integrate widely

disparate applications for a Web-based environment and uses multiple implementation platforms. **Rather than defining an API**, SOA defines the interface in terms of protocols and functionality.

In SOA, Services should be **independent** of other services. Altering a service should not affect calling service.

- Services should be **self-contained**. When we talk about a Register Customer service it means, service will do all the necessary work for us, we are not required to care about anything.
- Services should be able to **define themselves**. Services should be able to answer a question what it does? It should be able to tell client what all operations it does, what all data types it uses and what kind of responses it will return.
- Services should be **published** into a location (directory) where anyone can search for it.
- As said, SOA comprises of collection services which communicate via **standard Messages**. Standard messages make them platform independent. (Here standard doesn't mean standard across Microsoft it means across all programming languages and technologies.)
- Services should be able to communicate with each other **asynchronously**.
- Services should support **reliable messaging**. Means there should be a guarantee that request will be reached to correct destination and correct response will be obtained.
- Services should support **secure communication**.

6. What is the Managed Service Providers (MSP)? Discuss the evolution of MSP Model to Cloud Computing.

A managed service provider (MSP) is a third-party contractor that delivers network-based services, applications and equipment to enterprises, residences or other service providers. Managed service providers can be hosting companies or access providers that offer IT services such as fully outsourced network management arrangements, including IP telephony, messaging and call center management, virtual private networks (VPNs), managed firewalls and monitoring/reporting of network servers. Most of these services can be performed from outside a company's internal network with a special emphasis placed on integration and certification of Internet security for applications and content. MSPs serve as outsourcing agents for companies, especially other service providers like ISPs, that don't have the resources to constantly upgrade or maintain faster and faster computer networks.

Managed service providers are feeling a bit of pressure from cloud computing. After years of investing in infrastructure and business model changes to deliver remote managed services, MSPs are seeing the cloud as a threat to their livelihood. In many cases, the cloud requires no remote infrastructure or on premise equipment. The fear is the cloud could render MSPs obsolete. Cloud computing could also be a managed service. Cloud computing consists of security monitoring, storage management, network administration and the all managed services need not necessarily be cloud computing. Cloud computing puts its efforts in creating a technical solution. It is a technical model that delivers technical access to the computing resources. Thus, cloud computing can be defined as a technical solution. There are, however a lot of similarities that exist between a managed service and cloud computing. While cloud computing is generally a technical implementation that decides how the infrastructure and applications are to be delivered over the private and public networks, it can also be a business model.

The same contract agreement holds ground in a cloud computing relationship. Managed services can also be a technical implementation.

7. What is the need for data center virtualization? What are the benefits of data center virtualization?

Data center virtualization is the process of designing, developing and deploying a data center on virtualization and cloud computing technologies. It primarily enables virtualizing physical servers in a data center facility along with storage, networking and other infrastructure devices and equipment. Data center virtualization usually produces a virtualized, cloud and collocated virtual/cloud data center. Data center virtualization is a method of moving information storage from physical servers to virtual ones, often in a different location. In the past, large companies would keep physical servers on site that held huge amounts of corporate information. These servers were expensive, both to purchase and maintain. With data center virtualization, it became possible to separate both the hardware and location from the data. This cuts costs and increases the data's availability. Data center virtualization actually comes from a combination of two different technologies; high-speed data transfer and server virtualization. Without both of these components, data center virtualization becomes highly impractical.

Benefits of Data Center Virtualization

In addition to the cost savings that result from reducing the number of servers, the following benefits are typically realized as well:

- Enables the consolidation of physical servers, slashing the costs of operating a data center. This includes reducing the costs of server upgrades, management, power, space, and storage.
- Reduction in data center space and in data center equipment such as PDUs, air conditioning units, etc.
- Reduction in the number of network, HBAs and SAN switches.
- Provides true high-availability for all servers without requiring duplicate hardware and clustering software.
- Integrates the test/development and production environments while significantly enhancing the test/development process.
- Facilitates true disaster recovery for all servers.
- Eliminates the need for maintenance windows for physical server troubleshooting or upgrades and enables faster server provisioning.
- Enhances security and provides regulatory compliance benefits.

8. Explain the different approaches for enforcing host security in a cloud environment.

9. What do you mean by disaster recovery? How recovery point objective differs from recovery time objective?

A Disaster Recovery Plan (DRP) is a business plan that describes how work can be resumed quickly and effectively after a disaster. Disaster recovery planning is just part of business continuity planning and applied to aspects of an organization that rely on an IT infrastructure to function. The overall idea is to develop a plan that will allow the IT department to recover enough data and system functionality to allow a business or organization to operate - even possibly at a minimal level.

A **disaster recovery plan (DRP)** documents policies, procedures and actions to limit the disruption to an organization in the wake of a disaster. Just as a disaster is an event that makes the continuation of normal functions impossible, a disaster recovery plan consists of actions intended to minimize the negative effects of a disaster and allow the organization to maintain or quickly resume mission-critical functions.

RTO

The recovery time objective (RTO) is the maximum amount of time allocated for restoring application functionality. This is based on business requirements and is related to the importance of the application. Critical business applications require a low RTO.

RPO

The recovery point objective (RPO) is the acceptable time window of lost data due to the recovery process. For example, if the RPO is one hour, you must completely back up or replicate the data at least every hour. Once you bring up the application in an alternate datacenter, the backup data may be missing up to an hour of data. Like RTO, critical applications target a much smaller RPO.