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PROLOGUE OF CLOUD COMPUTING

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Cloud computing is a type of computing that relies on shared computing resources rather than having local servers or personal devices to handle applications.In its most simple description, cloud computing is taking services ("cloud services") and moving them outside an organization's firewall. Applications, storage and other services are accessed via the Web. The services are delivered and used over the Internet and are paid for by the cloud customer on an as-needed or pay-per-use business model.

1. Introduction

NIST Cloud Computing Introduction and Definition

The National Institute of Stands and Technology (NIST) has a more comprehensive definition of cloud computing. It describes cloud computing as "a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (e.g., networks, servers, storage, applications and services) that can be rapidly provisioned a released with minimal management effort or service provider interaction."

Characteristics of Cloud Environments

According to the NIST, all true cloud environments have five key characteristics:

1. On-demand self-service: This means that cloud customers can sign up for, pay for and start using cloud resources very quickly on their own without help from a sales agent.
2. Broad network access: Customers access cloud services via the Internet.
3. Resource pooling: Many different customers (individuals, organizations or different departments within an organization) all use the same servers, storage or other computing resources.
4. Rapid elasticity or expansion:
5. Cloud customers can easily scale their use of resources up or down as their needs change.
6. Measured service: Customers pay for the amount of resources they use in a given period of time rather than paying for hardware or software upfront. (Note that in a private cloud, this measured service usually involves some form of chargeback's where IT keeps track of how many resources different departments within an organization are using.)

Breed of cloud

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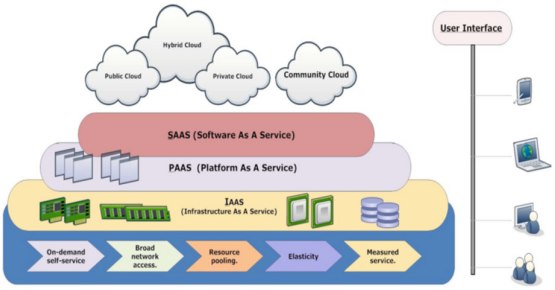


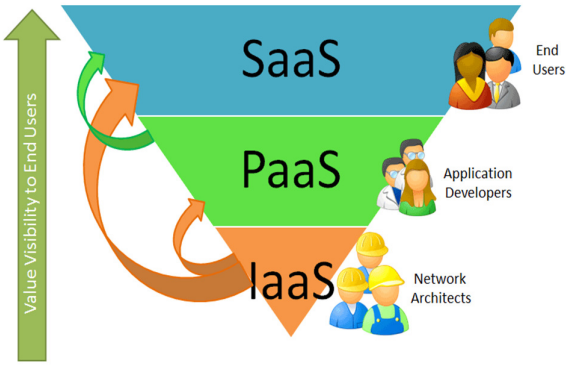
Public cloud vendors offer their computing services to anyone in the general public. They maintain large data centers full of computing hardware, and their customers share access to that hardware.

private cloud is a cloud environment set aside for the exclusive use of one organization. Some large enterprises choose to keep some data and applications in a private cloud for security reasons, and some are required to use private clouds in order to comply with various regulations.

Organizations have two different options for the location of a private cloud: they can set up a private cloud in their own data centers or they can use a hosted private cloud service. With a hosted private cloud, a public cloud vendor agrees to set aside certain computing resources and allow only one customer to use those resources.

A hybrid cloud is a combination of both a public and private cloud with some level of integration between the two. For example, in a practice called "cloud bursting" a company may run Web servers in its own private cloud most of the time and use a public cloud service for additional capacity during times of peak use.A multi-cloud environment is similar to a hybrid cloud because the customer is using more than one cloud service. However, a multi-cloud environment does not necessarily have integration among the various cloud services, the way a hybrid cloud does. A multi-cloud environment can include only public clouds, only private clouds or a combination of both public and private clouds.Here the platform is outsourced in place of a company or data center purchasing and managing its own hardware and software layers. Most PaaS are designed for developers and aim to simplify the process of creating and deploying software. For example, a Web developer might use a PaaS that includes operating system software, Web server software, a database and related Web development tools. The leading PaaS vendors include Amazon Web Services, Microsoft Azure, IBM and Google Cloud Platform.

Proverbial Cloud Service Models



Cloud services are typically deployed based on the end-user (business) requirements. The primary services include the following:

1. Software as a Service (SaaS)

SaaS is a software delivery method that provides access to software and its functions remotely as a Web-based service. Instead of paying an upfront fee to purchase and/or license software, SaaS customers pay a recurring (often monthly or annual) fee to subscribe to the service. In general, they can access the SaaS from any Internet-

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connected device, any time day or night. Well-known examples of SaaS include Salesforce.com, Microsoft Office 365, Google G Suite, Dropbox, Adobe Creative Cloud and others.

2. Platform as a Service (PaaS)

PaaS is a computing platform being delivered as a service. Here the platform is outsourced in place of a company or data center purchasing and managing its own hardware and software layers. Most PaaS are designed for developers and aim to simplify the process of creating and deploying software. For example, a Web developer might use a PaaS that includes operating system software, Web server software, a database and related Web development tools. The leading PaaS vendors include Amazon Web Services, Microsoft Azure, IBM and Google Cloud Platform.

3. Infrastructure as a Service (IaaS)

Computer infrastructure, such as servers, storage and networking delivered as a service. IaaS is popular with enterprises that appreciate the convenience of having the cloud vendor manage their IT infrastructure. They also sometimes see cost savings as a result of paying only for the computing resources they use. The leading IaaS vendors include Amazon Web Services, Microsoft Azure, IBM and Google Cloud Platform.

While SaaS, PaaS and IaaS are the three most common types of cloud services, cloud computing vendors sometimes also use other "as a service" labels to describe their offerings. For example, some offer database as a service (DBaaS), mobile back-end as a service (MBaaS), functions as a service (FaaS) or others.

Benefits of Cloud Computing

Consumers and organizations have many different reasons for choosing to use cloud computing services. They might include the following:

Convenience, Scalability, Low costs, Security, Anytime, anywhere access, High availability)

iSCSI (Internet Small Computer System Interface)

iSCSI, which stands for Internet Small Computer System Interface, works on top of the Transport Control Protocol (TCP) and allows the SCSI command to be sent end-to-end over local-area networks (LANs), wide-area networks (WANs) or the Internet. IBMdeveloped iSCSI as a proof of concept in 1998, and presented the first draft of the iSCSI standard to the Internet Engineering Task Force (IETF) in 2000. The protocol was ratified in 2003.

iSCSI exertion

iSCSI works by transporting block-level data between an iSCSI initiator on a server and an iSCSI target on a storage device. The iSCSI protocol encapsulates SCSI commands and assembles the data in packets for the TCP/IP layer. Packets are sent over the network using a point-to-point connection. Upon arrival, the iSCSI protocol disassembles the packets, separating the SCSI commands so the operating system (OS) will see the storage as a local SCSI device that can be formatted as usual. Today, some of iSCSI's popularity in small to midsize businesses (SMBs) has to do with the way server virtualization makes use of storage pools. In a virtualized environment, the storage pool is accessible to all the hosts within the cluster and the cluster nodes nodes communicate with the storage pool over the network through the use of the iSCSI protocol.

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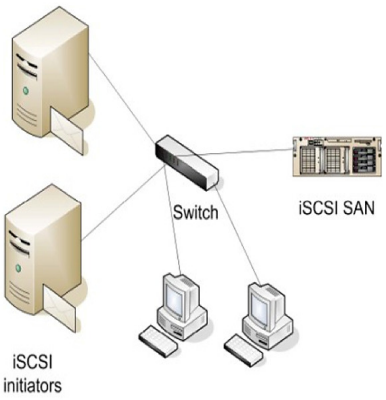

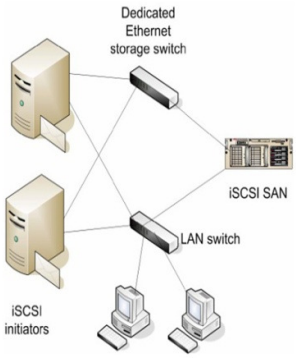

iSCSI protocol limitations

The iSCSI protocol (internet Small Computer Systems Interface) [12] is used to facilitate the data transfer on the intranets and to manage storage on long distances. it also can be used to transmit data on any network (local, wide or internet) and it is independent on the locality of physical storage. iSCSI rebuke the Client Server architecture of its original SCSI [13] with a new nomination initiator ITarget, where the initiator is a client who sends the SCSI commands to the storage device, and the Target is a device that receives and treats the commands, so it is a storage device. The iSCSI communications proceed in three phases: The first phase constitutes in the sending Command from the initiator to the Target. This command can be READ, WRLTE or any other command. Then, the data exchange starts, this phase is option al and it takes place only in READ or WRLTE commands. In the READ case, the Target sends data to the initiator, and in the WRlTE case, it's the initiator who sends data to Target. Finally, the Target sends the operation result to the initiator. One of the performance problems of iSCSI is the use of TCP protocol, the main objective of this protocol is that the operation system can ensure that any lost packet is treated by the pile of TCP/IP in OS; the application can rid simply data to the pilot of network which will guarantee the delivery of the packet. However, the use of TCP requires an intensive treatment because the tampons, order counting and checksum are carried out, which is not necessary considering data centers network are very reliable, this can it be added to the TCP challenge mentioned above. So the question is why not to develop or exploit a new protocol, wh ich uses only IP for iSCSI protocol to storing data? Or why not using iSCSI without TCP? Many simulations work of iSCSI protocol have been proposed for storage area network. The result shows the performance characteristics of the iSCSI over TCP/IP, considering some parameters and characteristics. In [14], the authors test the performance on iSCSI in term of Throughput and Response time and, the result analysis shows that both throughput and response time increases with the increase in the size of requested data. Throughput increases as size of data requested increases because the assigned bandwidth is better utilized. For Response time, it increases because more data is being sent for the increased data size.

2. New iSCSI Model

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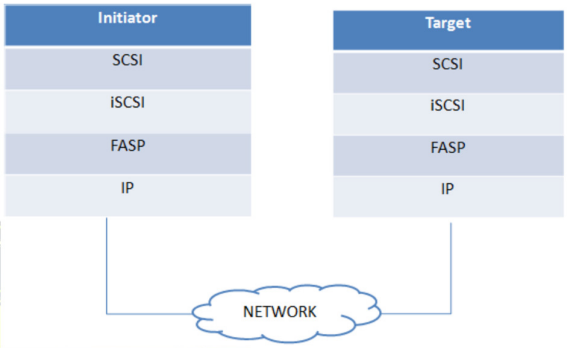
Our model consists to use iSCSI with the Transport protocol F ASP, so our work is the proposition of new version of iSCSl. The new-Iayered pile of our new model suggested. The iSCSI session between an initiator and a Cloud Storage server is established via a login process, which is called iSCSI login. This phase is used in order to negotiate variable parameters between two iSCSI entities and can invoke a security policy for authentication. This login step takes place relying a series of key parameters, which are exchanged between the two entities; these parameters include the security protocol, the size of the payload data field and the timeout value. When an initiator establishes an iSCSI session with a target, the session IDs are generated to ensure that the discussion is unique between the interlocutors. After this phase, the iSCSI session move to another step named "full feature" to start the transaction.



3. Conclusion

Cloud computing is changing the way IT departments buy IT. Businesses have a range of paths to the cloud, including infrastructure, platforms and applications that are available from cloud providers as online services. Many people may be confused by the range of offerings and the terminology used to describe them and will be unsure of the risk and benefits, There are many more players in the on-demand market that many reports acknowledge, These range from basic infrastructure offerings (IaaS), through platform support (PaaS) to full applications (SaaS), The long term cost of ownership may at first not seem to add up, but take into consideration other factors such as reduced risk and added value and for many organizations on-demand services make a lot of sense.

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