

Cloud Computing: An Overview

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ABSTRACT

Cloud Computing came into existence in 1960 by Joseph Carl Robnett Licklider by his work on ARPANET. It is a technology which is based on distributed computing, web services and networking technologies. In this paper we will be focusing on various aspects of cloud computing and the different issues involved in cloud computing. We will also be comparing cloud computing and grid computing and analyze which is the best. We will also try to focus on latest trends in Cloud Computing along with its impact on Techmarket.

Keywords: Grid computing, Utility computing, SaaS, PaaS, IaaS, Cyber infrastructure.

Introduction

“Cloud computing” is the next step in the revolution of on-demand information technology services and products. Most of cloud computing concept is based on the virtualized resources. The term became “popular” around in October 2007 when Google and IBM make a collaboration in the domain of cloud computing. It can be defined as paradigm where a huge pool of systems are connected to one another in a private or global networking order to provide a scalable infrastructure which can be used by and for an application, data and storage. Cloud computing makes reuse of IT resources based on the concept of reusability.. The Internet is the backbone to utilize the resources available on a particular cloud. There is an agreement between the providers and consumers of the resources called service level agreement (SLAs). In cloud computing platforms the resources may be dynamically reconfigured and aggregated through virtualization. The changes may be implemented according to the need of the consumer.

1.1 Cloud Models

The services provided by the cloud computing may be seen from different viewpoints:

Software-as-a-Service (SaaS): In this it provides the host and manages a complete application in their own data center and ensures it availability to all users present on web. The Internet is used to serve the different types of applications to the user, For Example Google Docs.

Platform-as-a-Service (PaaS): (SPI) Special Application Programming interfaces for building different types of applications over the Internet, For example Force.com (Force.com is a suite of point-and-click tools that make creating custom employee-facing apps)

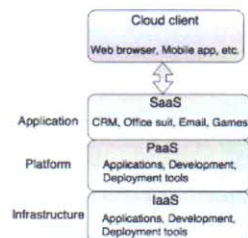


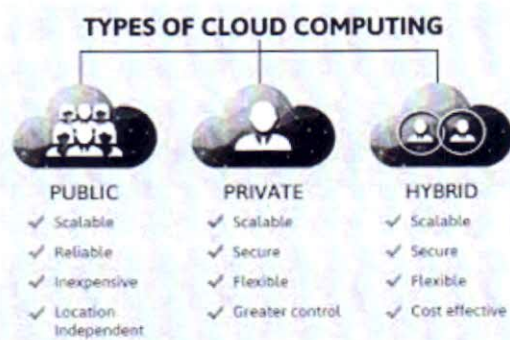
Fig. - Categories of Cloud Computing

Infrastructure-as-a-Service (IaaS): In general as the name suggest it provides the services that are used for basic storage and computing. The different services now available are: Amazon web services, Google compute engine, GoGrid etc.

The grid computing is also the related term concerned with high performance computing over the internet.

Grid computing is the collection of computer resources and related devices from multiple locations to reach a common goal. The grid can be thought of as a distributed system with non-interactive workloads that involve a large number of files.

1.2 Category of Cloud



Benefits of Cloud Computing

- Cost Reduction
- Increased Storage
- Flexibility
- Elasticity
- Resource Utilization

Another term called **utility computing** is concerned with the services sold by the cloud provider, if a cloud is available as pay and go manner to the general users then it is called a public cloud, if the cloud is not available for the general user then it is called a private cloud, it consists of the internal data centers of an organization. So we can say that cloud computing consists of the SaaS and utility computing.

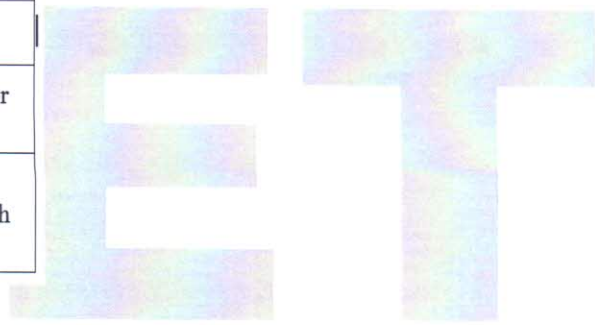
Utility computing usually conceive of some form of virtualization so that the amount of storage or computing power available is considerably larger than that of a single time-sharing computer. Multiple servers may be used on the back end to make this possible. These might be a dedicated computer cluster specifically built for the purpose of being rented out, or even an under-utilized supercomputer

Different utility computing software are available in the marketplace, one may be differentiated from another on the basis of level of abstraction and management of the available resources for a particular cloud. Every application needs a model of communication, storage and computation, the thing which is of utmost importance is how to automatically fulfill the demand of the user, however the infinite capacity resources are available on demand.

Another term called **cyber infrastructure** is useful for the construction and deployment of the applications. We can reduce the efforts made by scientists and engineers for the development of different programs by using cyber infrastructure. Cyber infrastructure increases efficiency, quality and reliability by capturing the common needs for any application by the user for different equipments and services.

Comparative Analysis between Grid and Cloud Computing

CLOUD COMPUTING	GRID COMPUTING
Client-server computing architecture.	Distributed computing architecture.
Centralized Executive.	Decentralized Executive.
Resources used in centralized pattern.	Resources used in collaborative pattern.
More flexible	Less Flexible
Users pay for the use.	Users do not pay for use.
Accessed through standard web protocols.	Accessible through grid middleware.



2. Hopes and Hurdles in the Growth of Cloud Computing

Google Search has very good reputation in the availability of cloud resources; however organizations have fear whether the computing services are available easily or not. So there is a number of technical and non technical issues in the growth of cloud computing. We are trying to address some of these issues in the following points.

2.1 Non Technical issues

The large business organizations and customers generally not rely on the cloud providers they believe on the independent software stacks may be provided by different companies, because a cloud provider may be out of service due to non technical reasons also (may be due to some government policies or less number of customers/users). Although this is generally not true the cloud provider always tries to provide the high availability and reliability at lesser prices. The mantra for high availability computing community is “no single point of failure”. Due to this reason large internet service provider use a number of providers in order to remove the chances of failure due to a single company.

2.2 Confidentiality of data

The security is the most critical threat on the cloud computing, the companies ask to the cloud provider that how we can make trust upon the confidentiality of important data, the

