Conceptual View on Cloud Computing

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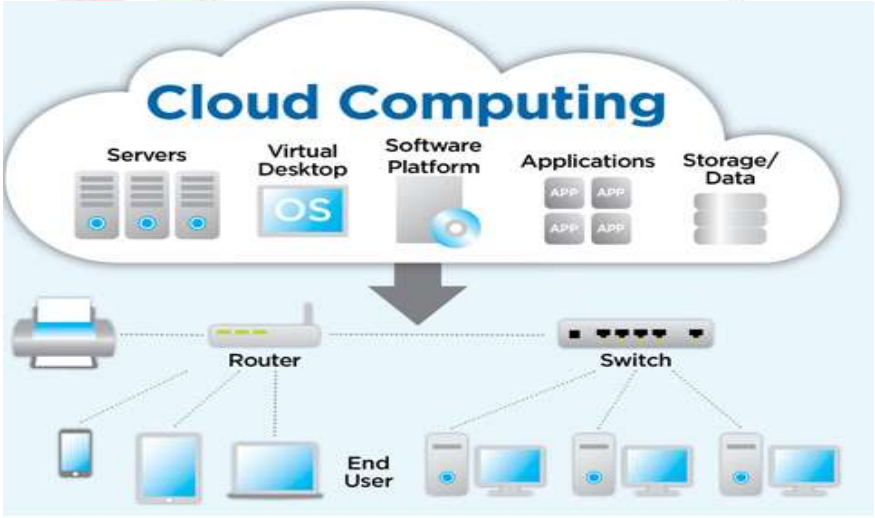
Abstract:- Cloud computing is the latest type of the computing paradigms. It commit to change the way of the users to use computing resources. It provide services to all kind of users such as single user or multiple users . This computing is based on the grid computing. It is used for business computing and It is a very popular enterprise model which make the computing resources available anywhere on the user demand. In cloud computing we can access the thing we want from anywhere in the computer without having worry about the cost, storage and management. This paper is for one who newly detected the cloud computing and get the desired knowledge on the cloud computing. In this paper we provide a detailed knowledge on the cloud computing.

Keys terms: - cloud computing , history of cloud computing , component of cloud computing , architecture cloud computing, building block of cloud computing, characterstics of cloud computing , application of cloud computing, cloud computing platform.

I. Introduction: -

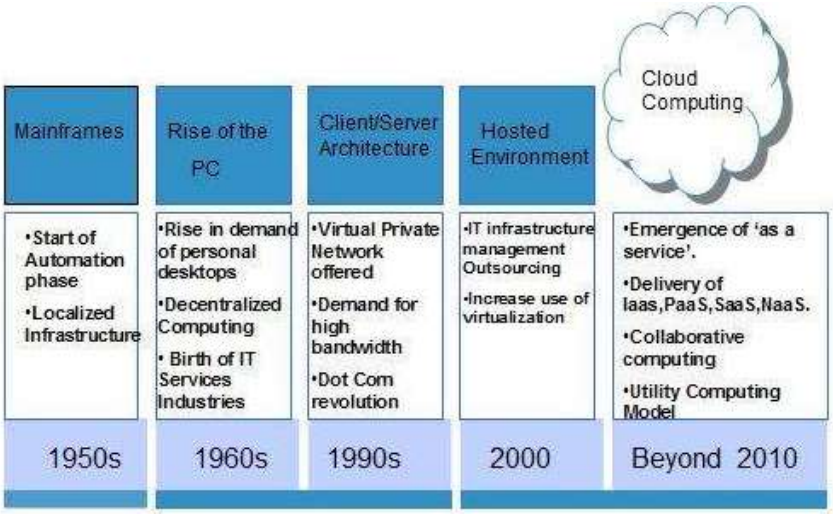
Cloud computing is the term that relate with the network. It provide both the services of hardware and software on the internet. It also provide to access the application over the internet. It helps us to create, configure and customize the application. In other word it refer to the manipulating configuring and accessing the hardware and software resources. Cloud computing give us the online storage, applications and the infrastructure. This computing help us to reduce the overall cost of creating an organization and the resources are managed by the service providers. If the organization wants to access the resources they have to pay a small amount of money to the service provider.

It is designed in such a way to make the internet as the ultimate house for all the computing resources. It also act as provision store for all the computing resources to fulfill the requirement of the user . They cost there services as pay per use basis or as rental basis. Cloud computing help us to increase the profitability by improving the resource utilization. Now a days it comes in use to build a complex infrastructure , user have to manage the different software installation and updates. As shown in the figure.



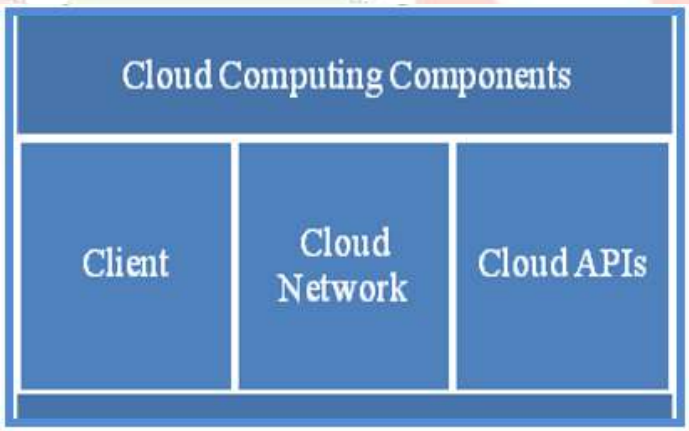
II. History of Cloud Computing :-

In 1950, this concept is came into existence with mainframe computer. Previously it can only accessible with the static clients , but now a days it transformed the static client into the dynamic client. In the below figure show the evolution of the cloud computing.



III. Component of Cloud Computing :-

The cloud computing holds the virtual pool of resources and application that can be used by the users. According to the user the component of cloud computing are explained in the below diagram.



A. Client :- A Client is a device or software that access a services made available or provide by the server. In other words a client is a software or device that user can use as an interface to access the service related to the cloud.

B. Cloud Network :- It is a connection between the client and the service provider on the network . It play a very role for accessing services on the network . In other word it is describe the accessing the network resources from a services provider used wide area network (WAN).

C. Cloud Application Programming Interfaces(APIs) :- It consist a set of instruction that help in execution of the cloud services by the users. In other words it is type of API that enable the implementation of the application and services used for the provision of cloud hardware , software and platform.

IV. Architecture Of Cloud Computing :-

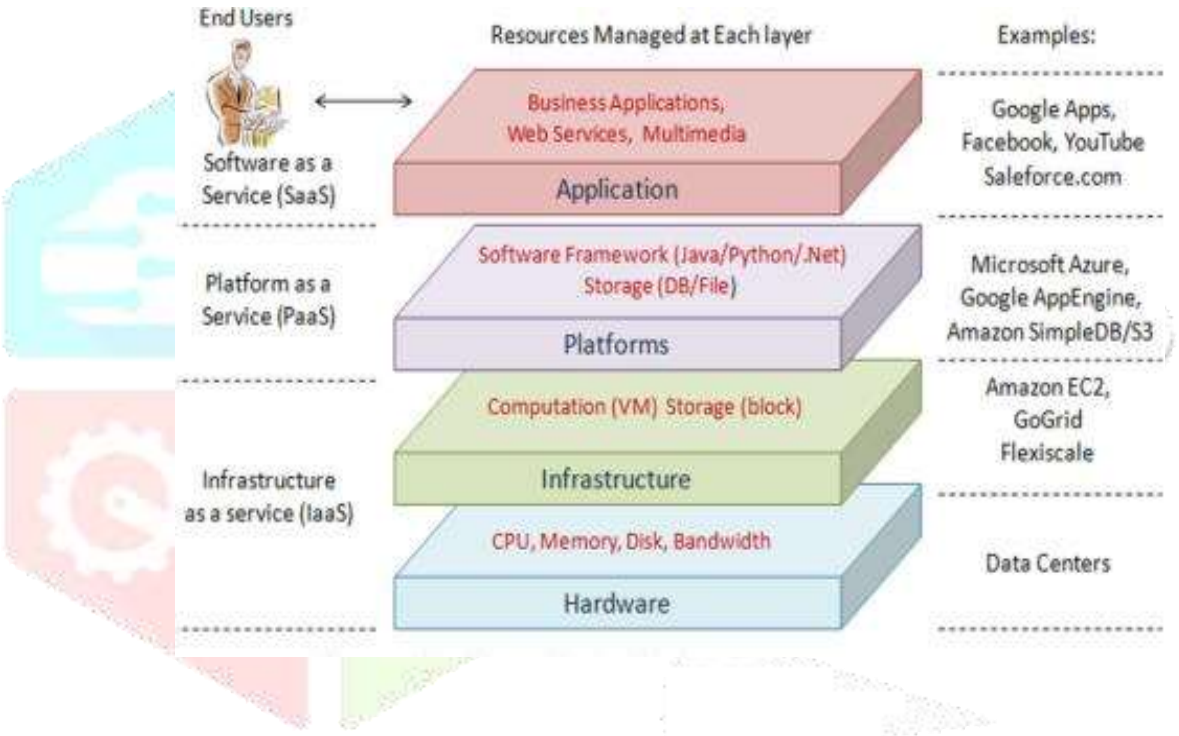
Cloud computing system can be categories in two parts: front end and back end. Both are connected with each other through a network , sometimes through net.

Architecture layer of cloud computing :-

The architecture of cloud computing consist of 4 layers they are :-

1. Physical layer.
2. Infrastructure layer.
3. Platform layer.
4. Application layer.

As shown in the figure:-



1. Physical layer :- This layer is responsible for dealing with the physical assets of cloud such as router, server, cooling system and power.
2. Infrastructure layer :- This layer is also known as virtualization layer. This layer act as a pool of storage capacity and computing resources using virtualization techniques such as VM ware and KVM.
3. Platform layer :- This layer is based on the top of infrastructure layer and it includes operating system and requirement structure.
4. Application layer :- This layer includes the actual provision of cloud for ex:- Business applications and web services etc.

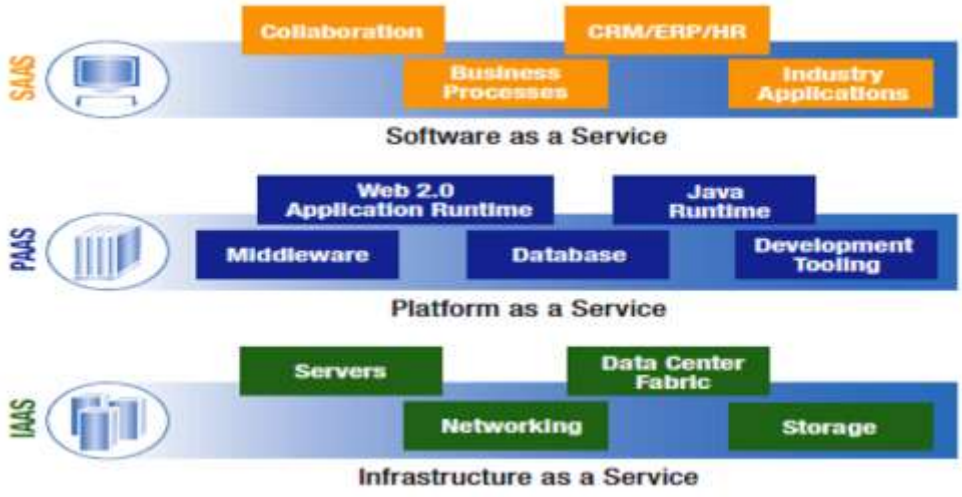
V. Building block of cloud computing :-

There are two type building block of cloud computing are :-

1. Service Model.
2. Development Model.

1. Service Model :- According to the service provided by the cloud computing can be consist of three layer they are :-
    1. SaaS.
    2. PaaS.
    3. IaaS.

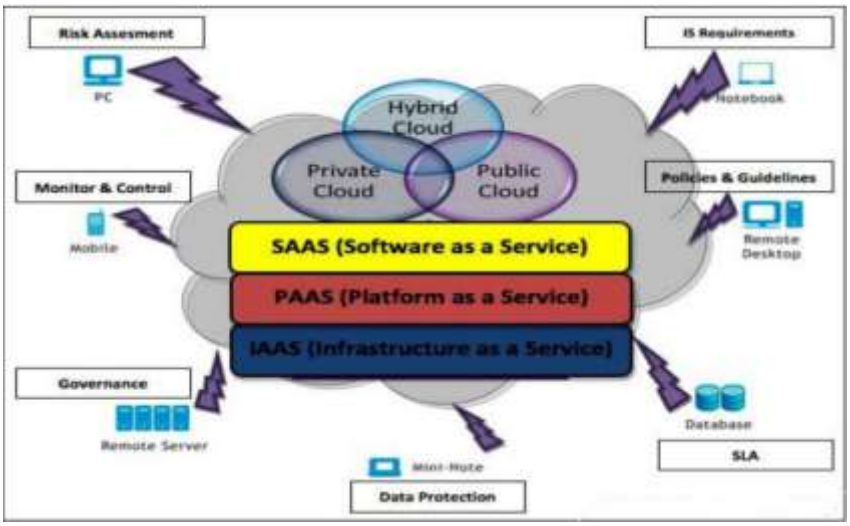
As shown in figure.



1. SaaS :- It stands for Software as a Service. It is the top most layer which consist a complete feature of application provide as on service demand. In this the cloud service providers provides services to the user.
   For ex:- Gmail is a SaaS where google is the provider and we are consumer.
2. PaaS :- It stand for Platform as a Service. It is the middle layer which provide the platform oriented services. It also provide the runtime environment to the user. This model is completely dedicated to the application developer, tester and administrator.
   For ex:- Goggle App Engine (GAE), IBM smart cloud and so on .
3. IaaS:- It is stand for Infrastructure as a Service. It is the lowest layer that provides basic infrastructure support services. It also provide the hardware services to the user. These services include the processing power, storage, network bandwidth etc. To access these services the user just need to install their operating system on the given hardware.
   For ex :- Storage services provided by AmazonS3 and Amazon EBS , Computation services by AmazonEC2 and so on.

2. Development Model :- Generally the cloud is developed according to the owner of the cloud data centers. A cloud atmosphere consist either a single cloud or multiple clouds. The cloud computing model consist of 4 main development model they are :-
    1. Public cloud.
    2. Private cloud.
    3. Hybrid cloud.
    4. Community cloud.

As shown in the figure.



1. Public cloud :- It is also known as external cloud. These cloud allow the cloud environment freely or openly or publically accessible. These cloud is typically based on the pay-per-use model. These cloud is less secure than other clouds models. The best example of public cloud is Microsoft Azure.

2. Private cloud :- It is also known as internal cloud. These cloud is build to provide services such as security and privacy within a organization. These cloud is more secure than the public cloud. The best example of private cloud is Eucalyptus system.

3. Hybrid cloud :- It is also knowns as virtual private cloud. These cloud is the combination of two or more cloud. These cloud has a open architecture that allow the interface with other management system. The best example of hybrid cloud is AWS(Amazon Web Services).

4. Community cloud :- These cloud is typically based on an agreement between related business organization. These cloud allow the cloud computing environment is managed by the group of related organization. The best example of community cloud is Facebook.

VI. Characteristics of Cloud Computing :-

Following are the five essential characteristics of cloud computing are:-

1. On demand self-service.
2. Broad network access.
3. Resources pooling.
4. Rapid elasticity.
5. Measured services.

1. On demand self-service :- One of the most important Characteristics of Cloud Computing is on demand self-service it provide computing capabilities to the user such as network storage and server time.
2. Broad network access :- Capability are available over the network can be accessed through standard techniques use by thick client platform. For example – tablets, laptops and mobile phones.
3. Rapid elasticity :- For the consumer ,the capacity available for providing unlimited services and quantity is appropriate at any time.
4. Resource pooling :- It dynamically assigned and reassigned the virtual resources on the demand of user.

5. Measured services :- In this the resources are monitored, controlled and reported for the both the consumer and the service provider for the utilization of services.

VII. Application of cloud computing

Below mention application are provided by the software as a service(SaaS). They are standard desktop application. In SaaS the processing of the application is done in the data center of the organization. The following are the some application of cloud computing :-

1. Online file storage.
2. Photo editing software.
3. Digital video software.
4. Word processing software.
5. Web application for antivirus.
6. Presentation software.
7. E-commerce software.
8. Finding way on map.

1. Online file storage :- This application are easy to use and user can easily upload and download files from the sites such as hot file, mega upload and rapid share are the example of online file storage. In this user utilize 200 gb space for storage and 2 gb is file size.
2. Photo editing software :- This software has a feature like cropping of image, rotation based on degree, resizing, special effect and editing feature also include a graphical user interface format. It has a various high level feature but still it is easy to use.
3. Digital video software :- In this cloud user can download popular movies ,shows and documentaries and we can watch them in web browser. There are some popular video sites are you tube, google video etc. Hulu is a free application in which we found free online video.
4. Word processing application :- Write board is the online word processing and document editing application and it unique feature that is at the same time multiple user can access same document in the application. It does not give permission to import the word files.
5. Web application for antivirus :- One of the best example of this application is panda security. It help us to keep virus away from our system and also help us to detect and fixed them.
6. Presentation software :- It is web based cloud application in this we can accessed our presentation anywhere within the world. It does not allow user to edit presentation offline. The best example of online free application to create presentation is slide rocket.
7. E-commerce software :- It one of the important application of cloud computing. It is based on e-application which help the user to give quick reply on market opportunities and challenges faced by e-commerce.
8. Finding way on map :- It is another area in which cloud application became popular way on finding direction and location on the web. It is most useful free online application help to find various way. The best example of this software is google map and yahoo map.

VIII . Cloud Computing Platform

Some of the most popular cloud computing platforms are describe below :-

1. Abi cloud.
2. Eucalyptus.
3. Nimbus.
4. Open Nebula.

1. Abi cloud:- It is a cloud computing platform and it is used to build integrate and manage public as well as private cloud in the homogenous environment. Using these cloud computing platform user can use new services by just dragging with the mouse in the virtual machine.

2. Eucalyptus :- It is an elastic computing model which is used to connect the user program with a useful system. The standard of these cloud computing platform is based on service level protocal. It support more client with minimum modification and extension.

3. Nimbus :- It is a cloud computing solution provide by IaaS. It is an open tool set. It allow the user to build the required type of environment through the deployment of virtual machine.

4. Open Nebula :- It is an open source cloud service frame work . It allow the user to manage and deploy virtual machines on physical resources. Open Nebula is an open and flexible virtual infrastructure management tool. The environment of open nebula data center allow the user to easily deploy any type of cloud.

Conclusion

Cloud computing is a new concept in the computing technology. It has a several benefit over a non-cloud environment and have a great capability to handle most sudden and temporary change in application on demand of cloud infrastructure. Cloud computing make it possible to became a front runner in making a secure, virtual and economically viable IT solution in the future. As the development of cloud computing technology is still in early stage, this research help us to understand the term cloud computing in a better and effective way with the key terms such as definition of cloud computing, history of cloud computing, component of cloud computing, architecture of cloud computing, building block of cloud computing, characterstics of cloud computing, application of cloud computing and the various platform of cloud computing.

Reference

[1] Mohsin Nazir; "Cloud Computing: Overview and Current Research Challenges " in proceeding of IOSR Journal of Computer engineering,2012, pp. 14-22, Nov-Dec 2012.

[2] Santosh Kumar, R.H.Goudar, "Cloud Computing- Research Issues, Challenges, Architecture, Platform and Application : A Survey " in proceeding of International Journal of Future Computer and Communication,2012, pp.356-360, Decmber2012.

[3] Palvinder Singh, Er. Anurag Jain, "Survey Paper on Cloud Computing " in proceeding of International Journal of Innovations Engineering and Technology (IJIET),2014, pp. 84-89, August 2014.

[4] Suruchee V.Nandgaonkar, prof. A.B.Raut, "A Comprehensive Study on Cloud Computing "in proceeding of International Journal of Computer Science and Mobile Computing, 2014, pp.733-738, April 2014.

[5] Kiran Gupta, Rydhm Beri, Veerawali Behal, "Cloud Computing : A Survey on Cloud Simulation Tools" in proceeding International Journal for Innovative Research in Science & Technology,2014, pp. 430-434, April 2016.

[6] Khairunnisa, M. Nazreen Banu, "Cloud Computing Simulation Tools: A study, International Journal of Fuzzy mathematic Archive", January,2015.

[7] Rydhm Beri, Veerawali Behal, "Descriptive Study of Cloud Computing: An Emerging Technology", IJRITCC, March, 2015.

[8] Cloud Computing. Wikipedia. Available at http://en.wikipedia.org/wiki/Cloud_computing.

[9] Cloud Computing w3school. Available at https://www.w3school.in.

[10] B.P. Rimal, Choi Eunmi, I. Lumb, "A Taxonomy and Survey of Cloud Computing Systems", Intl. Joint Conference on INC, IMS and IDC, 2009, pp. 44-51,Seoul, Aug, 2009.

[11] B. R. Kandukuri, R. Paturi V, A. Rakshit, "Cloud Security Issues", In Proceedings of IEEE International Conference on Services Computing, pp. 517-520, 2009.

[12] Shyam Patidar; Dheeraj Rane; Pritesh Jain "A Survey Paper on Cloud Computing" in proceeding of Second International Conference on Advanced Computing & Communication Technologies, 2012.

[13] Adem TEPE, Güray YILMAZ, "A Survey on Cloud Computing Technology and Its Application to Satellite Ground Systems".

[14] Yashpalsinh Jadeja; Kirit Modi, "Cloud Computing - Concepts, Architecture and Challenges" in Proceeding of International Conference on Computing, Electronics and Electrical Technologies [ICCEET], 2012.

[15] Tharam Dillon, Chen Wu and Elizabeth Chang, "Cloud Computing: Issues and Challenges" in Proceeding of 2010 24th IEEE International Conference on Advanced Information Networking and Applications, pp. 27-33, 20-23 April 2010.

[16] Buyya R, "Market-Oriented Cloud Computing: Vision, Hype, and Reality of Delivering Computing as the 5th Utility," 9th IEEE/ACM International Symposium on Cluster Computing and the Grid, 2009.

[17] J. J. Peng, X. J. Zhang, Z. Lei, B. F. Zhang, W. Zhang, and Q. Li, "Comparison of Several Cloud Computing Platforms," *2009 Second International Symposium on Information Science and Engineering (ISISE '09)*. IEEE Computer Society, Washington, DC, USA, pp. 23-27, DOI=10.1109/ISISE.2009.94.