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# THE ORGANIZING OF CLOUD COMPUTING AS INTERNET IN THE WEB APPLICATION

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**Abstract:** Cloud computing emerges as one of the hottest topic in field of Computer Science and information technology through which Client can shared and access data and information via a web browser. The emergence of cloud computing is the computing equivalent of the electricity revolution of a century ago. It is the time and trend of cloud computing and definitely upcoming 20-25 years it will be bring the revolution in the business as well as Information technology industry. Generally Cloud Computing is analogy of internet. Cloud computing is based on several other computing research areas such as HPC, virtualization, utility computing and grid computing. Cloud computing refers to the delivery of computing resources over the Internet. Instead of keeping data on your own hard drive or updating applications for your needs, you use a smart service over the Internet, at another location, to store your information or use its applications. Doing so may give rise to certain privacy Implications. Cloud computing provides a shared pool of resources, including data storage space, networks, computer processing power, and specialized corporate and user applications. Cloud Computing have many property that is why it is growing and cover all web application over the Internet. In this paper we will study evolution of cloud computing ,service providing by it, deployment model of cloud computing ,where it will be use ,what is main problem to implementing it and various characteristics which is different to all other computing over Internet. Currently we are starting time of cloud computing where it starts and it will grow to implement many to many wonderful and attracting application which are still in development .This paper also describe some key point which is beneficial and helps to implementing vast feature of cloud computing.

**Keywords:** Cloud Computing, SAAS, IAAS, PAAS, Virtualization, ASP, GAD.

## I. INTRODUCTION OF CLOUD COMPUTING

Cloud computing has as its antecedents both client or server computing and peer-to-peer distributed computing. It's all a matter of how centralized storage facilitates collaboration and how multiple computers work together to increase computing power. It is interconnection of evolution of cloud computing is not very old, Last of 2007 the concept of cloud computing is represented by IBM company in its technical white paper and mention that the virtualization of computer system resource is called as cloud and it can access the web application via Internet means without Internet we cannot think about cloud computing concept. Cloud computing is a computing paradigm that involves outsourcing of computing resources with the capabilities of expendable resource scalability, on-demand provisioning with little or no up-front IT infrastructure investment costs.

The definition of cloud computing is given different by different organization Cloud computing is best described as 'a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources that can be rapidly provisioned and released with minimal management effort or service provider interaction. National Institute of Standards and Technology (NIST).

Cloud Computing is group of large interconnected computer or network ,whether these network or system can be private or public. The main concept behind the cloud computing is that the data served and service are existing for broad group of user but they cannot see the technology and infrastructure behind the cloud. Cloud is just like the real cloud in sky ,means where the cloud is well structured bond of the water same this cloud is also well infrastructure and interconnection of system which provides

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Figure 1 Architecture of Cloud Computing

different service to different organization according to application. It does not hosts scalable Information and Technology resource locally such as college or university network but globally. We use the cloud computing as metaphor for Internet. The emerging super model of Internet is represented by cloud computing. Generally Cloud Computing represents power to shift the load rapidly across Internet. The resource of the cloud extends the advantage to global application delivery to smallest of organizations.

We use the cloud computing as metaphor for Internet. The system in Cloud find a wide range of application in varying scenarios like Web megaservice, E science ,traditional it replacement, internet of service, internet of things, real time service etc.When a user want to use cloud computing then he should be know the important factor ,some of them are Cost/Benefit ratio, speed of delivery, user requirement capacity, user organization infrastructure etc.In some case there is match the requirement between user and cloud. but in some case not.

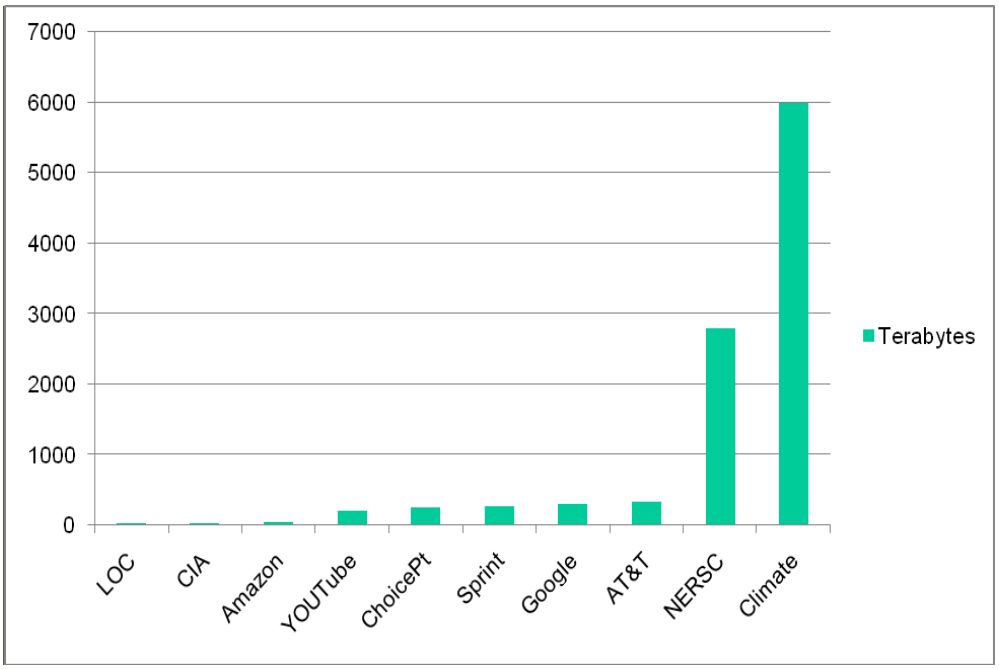


Figure 2 Top Ten Largest Database in Cloud and Size

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## II. THE SPECIFIC CAPABILITY OF CLOUD COMPUTING

In the traditional organization computing the department of information and technology forecast the capacity and demand for application and spend money and time to developed those resources in house or purchases them from others .on the another hand in the cloud computing the resource can be accessed remotely in global manner.The service provided by ASP means Application Service Provider. The cloud service are based on the protocol of internet as well as technology like HTTP,XML,JAVA ,XML,HTML.Here we will discuss the capability related to cloud computing ,which is necessary to evaluation its use in the future. We describe why the cloud computing is adoptable in web application. There is 3 aspect of cloud computing capability.

- **Non Functional Aspects:** It represent property or quality of a system.It pointed out why the "clouds" differ so strongly in their interpretation. Some non functional aspects are Elasticity,Relibility,Quality of service ,availability and adaptability.

- **Economical Aspects:** When we talk about economical aspects then we connect to cloud computing in business environment means there are all key issue and strategy which is important to any business like reduction of cost, resource management ,utilization of system and related sevice,reduction of effort through outsourcing means strategy which is not constrain between business and client requirement means with respect to hosting private cloud there should be carefully balance between increased effort to build and run such a system and to gain the profit through cost reduction. Some of aspects are pay for use, return of investment, turning capex into opex.

- **Technology Aspects**: Technology challenge is composing factor of both non functional and economical aspects. It typically imply a specific realization means it is not static but change time to time.Some of Technology aspects are Multy- tendency,adaptability,virtulisationsecurity,independently of infrastructure etc.

From the perspective of Google there are six possessions of cloud computing which are given below
.

- **User Centric**: when user connect to cloud via internet he can stored data and information as well as shared the data between different cloud or within the same cloud .
- **Task Centric**: It focussed what the user need done and how and what procedure is useful can do it for user.
- **Powerful**: The affluence of computing power impossible with a single desktop pc ,when many system interconnects in the cloud.
- **Intelligent**: Data analysis and Data mining is necessary for access the data from different cloud in intelligent manner.
- **Programmable**: The task necessary with cloud computing should be preset means the data and information should be replicated over many system in cloud for the integrity of data and information.
- **Accessible**: the user not only have single source of data they retrieve more information from different or in the same cloud instantly.

## III. THE INFRASTRUCTURE OF CLOUD COMPUTING

**1. The architecture of cloud**: when we talk about the cloud computing then we have to study it's architecture in great volume .The cloud is nothing but massive network of server or interconnection of pc and work station in a grid or cluster structure. These system runs parallel to obtain the more utilization of system resource and supercomputing like power. The cloud computing architecture have two component which are "Front End" and "Back End". The Front End of the cloud computing covers the whole client device and related service which is useful to accessing cloud computing system. Back End is nothing but itself cloud ,which encompass various computer technology, server and data storage system.

In this way the group of various cloud make the cloud computing and runs parallel to fulfil the requirement of the clients. Cloud computing also include a special type of software called as a middleware ,which is used for connecting the system of user to cloud for flexibility purpose. Replication of client data and information is also provided by cloud computing for integrity of message. As shown in the fig. We observe that user connect to specific cloud from it's own network and can access the data or service independently, after using the service he can terminate the connection and connect to another cloud or in the same time he can connect more than cloud and in this he can share the information but in the whole scenario he cannot see the hardware structure of the cloud.

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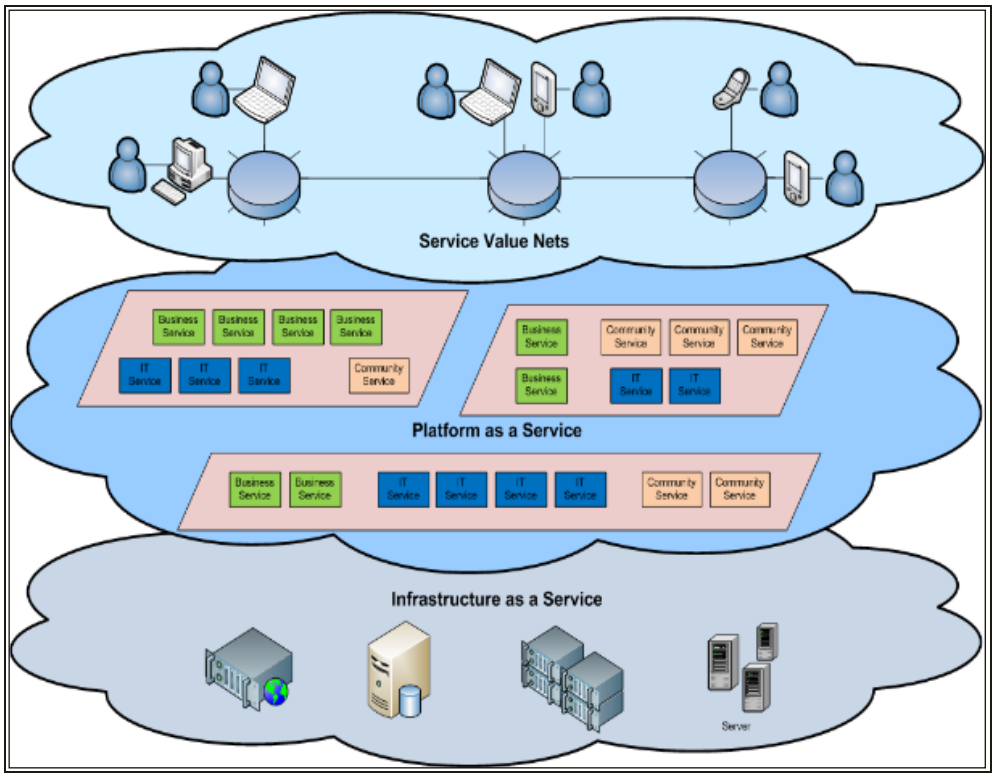


Figure 3 Cloud Computing Hardware Structure

**2. Deployment of cloud**: Deployment of cloud means formation of cloud ,what is the interconnected bond structure which combine to form cloud. The cloud service is delivered over the following four models.

- **Private Cloud**: private cloud means there is own network where communication and accessing service exist, and service are owned on-site by user or it's organization. The communication or accessing of formation should private network. Private cloud consists of application or virtual machine in a organization own set of hosts. It provides lot of facility like the capability to recover from the failure means replication ,ability to scale up or down depending upon demand as well as some utility computing etc.

- **Public Cloud**: public cloud means external cloud .It is used for traditional purpose means this type of cloud is used for business purpose where two or more organization share data and information. Here the computer resource or service are provided on a fine grained ,self service over the internet or there is third party who provides service and bills on a fine grain basic. In this way the cloud vendors provides data security and integrity of data.

- **Hybrid Cloud**: Hybrid Cloud is combination of private and public cloud, means there is atmosphere where the client has requirement for committed server and cloud hosting. There is a option in front of user or organization that they can store some useful and more sensitive data in it's dedicated server and store some less important or sensitive data in cloud. It also saves processing power .The use of this type of cloud is important in that environment where user want to move entirely from private to public or vice versa.

- **Community Cloud**: Community cloud is used in that environment where limited number of customer and two or more organization have same requirement and look for share infrastructure to realize the advantage of cloud service. This type of cloud formation is economical than single tenant pact because the cost of service are divided to the customer according to their application. In this way it increase security and privacy of data and information.

## IV. DEVELOPMENT OF CLOUD SERVICE DELIVERY MODEL

The service delivery in cloud refer to use reusable fine grained component across vendors environment. There is 3 layers in the cloud computing which provides service.

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These 3 layer existing both data and information required by client as well as it define new process and development model .There is following way that any organization can use cloud computing to develop it's own business.

**1. Software As A Service:** SAAS has it's base in 1960 with ASP. Software as a service is most adoptable cloud service exploitation, it is a model of deployment of software where the application is licensed for providing service to customer according to their requirement. SAAS is basically developed to use web tools, which apart it from earlier distributed computing. Customer who want to high power application can use SAAS. some service existing in SAAS which is very important are CRM,Web ContentManagement,ITServiceManagement. It refer to provision of software application in cloud infrastructure. In this type of service vendors distribute single service to many user from it's own server and there is not provision for customer to pay for owing the software. Through the Application program interface via internet, the user can access the application. One thing should note that capability to change of service is in the hand of vendors not client The one benefit for cloud vendors that they have not invest lot of money in server also maintaining lot ,they have one application have to maintain for many clients. There is many company which provides service as SAAS like GOOGLE. Today approximate 40-60% software is delivering by SAAS.

**2. Platform AS A Service:** PAAS is second layer and second delivery model of application. PAAS is outgrowth of SAAS It provides all facility to build the web application and service to vendors It offers all the resource needed to build application and service via internet without install or downloading any software. It has to need web programming language like JAVA SCRIPT and HTML and software tools for proper deployment of service to the customer. In this model the operating system of user is hosted in "cloud". The PAAS layer provide advance on line service with vendors can develop top level of infrastructure. Many type of service come under the PAAS ,like application design, testing ,implementing and properly deployment to customer as well as other application service like data base integration, security, persistency etc .in this way the other name of PAAS is "cloudware".The downside of PAAS is that when a vendor are afraid to one client or organisation then he has to move the application from one cloud provider to another cloud provider then it will so costly because vendor have to pay lot of price for it.

**3. Infrastructure AS A Service:** It is third layer of delivery of service model in cloud where SAAS and PAAS providing service to customer. In the IAAS infrastructure client can install any legal or useful software in the server and enable to access the web application which are created by client or another vendors. It provides the service as a part of hardware, like processing power Network structure, Storage space which make capable to user to run and execute their own application in their own infrastructure in cloud, So it is also called HAAS(Hardware As A Service).Rather than purchasing servers, data centre space, or the network equipment clients buy these service as fully outsourced service. The service is billed on a utility computing basis, so the service provider charged to customer according to type of application and how many resource is consume by them. Different parcel or package offered by vendors of cloud service in different level of integration. IAAS include many element like service level agreement, Network, Internet Connectivity, Platform virtualization ,utility computing bill and they have their own definition in cloud. The layered component of cloud is computer hardware, computer network, internet , connectivity, Service level agreement. The client of Iaas have to pay those resource which is fully outsource rather than purchase server ,software ,data centre or any network equipment.

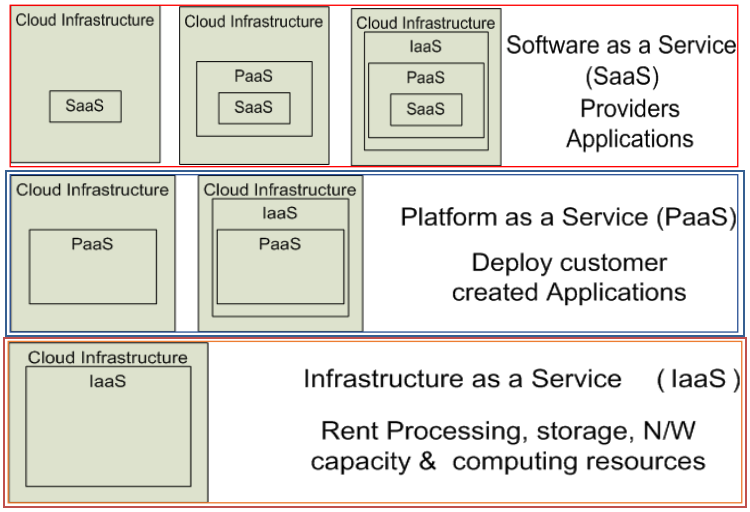


Figure 4 Cloud Computing Service Model

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In above we have already study service model of cloud computing and analysis that Today many of organization is moving toward SAAS ,where they have not need to spent money to buy software but rented as a service from cloud vendors. The further concept of SAAS is ITAAS which is very important in future due to distributed structure of organization. According to Forbes magazine the global market adopted cloud based service will increase from $ 12.1 billion in 2010 to $ 36 billion in 2015.SAAS is superset of PAAS and IAAS virtue of outsourcing of service ,means IAAS outsource only hardware infrastructure ,PAAS outsource development platform as well as infrastructure Microsoft Azure, Google Application Engine and SAAS outsource whole software from cloud vendors .

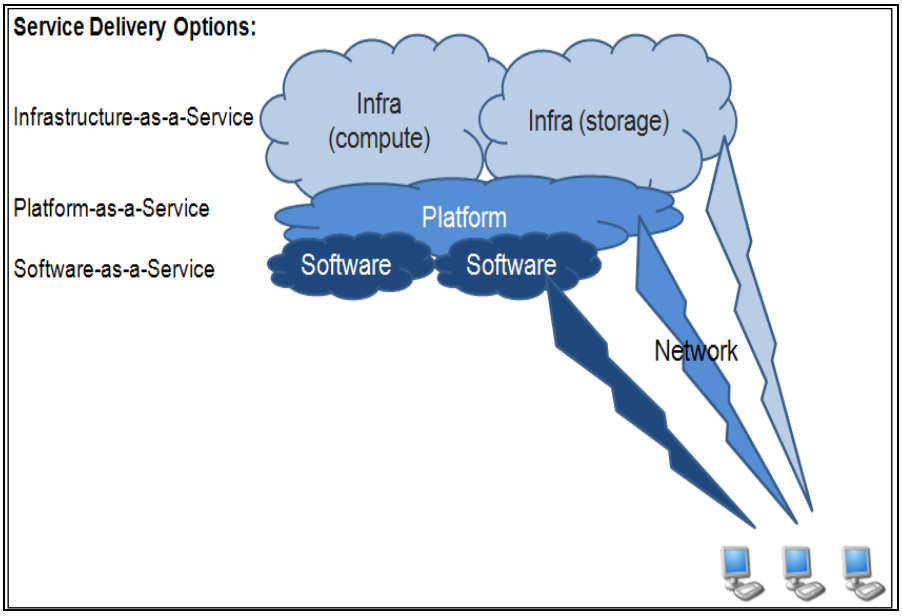


Figure 5 Overlapping Service of Cloud Computing Model

## V. THE REQUIRE OF WEB BASED OF APPLICATION IN CLOUD

We cannot think cloud computing without the internet. So definitely there have to need programming language to develop web based service. According to Informa Telecom and informa study ,in 2008 there is 4 billion connection to mobile device worldwide ,also the market of 3G market is also growing rapidly to access the application of cloud computing. Most organizations will not jump to the cloud all at once. Most cases will start as a hybrid model, moving some business applications to the cloud while retaining a majority “in-house”

One way to become familiar with cloud computing concepts and benefits without the outsourcing commitment is to bring the cloud as close as possible by building your own cloud for your business. The Internet is named after the Internet Protocol, the standard communications protocol used by every computer on the Internet.

Today any organization have distributed structure ,they have to deliver data storage and computing power to all clients within a organization under the economical way and to add capacity for new user can often send an IT budget elevated. Cloud services, in the form of centralized web-based applications, also appeal to the IT professional. One instance of an application hosted in the cloud is cheaper and easier to manage than individual copies of similar software installed on each user’s desktop PC. Upgrading a cloud app only has to be done one time, where upgrading traditional software has to be done for each system on which software is installed. So user has the promise of cloud enabled cooperation which is impossible in offline desk top application.

The benefit of cloud based service is worth for small business organization who has not money to develop large scale application software. Although they could outsource their software development and hosting, moving those applications to the cloud, companies don’t have to invest in locally hosted systems, freeing up their staff and resources to focus on the day-to-day running of their own business. In briefly A organization that develops their own we based application obtains functionality while reducing expense. There is also many barrier to using web based service which are falling in different group described in following.

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A. Technical Issue
B. Business model Issues
C. Internet Issue
D. Security Issue
E. Compatibility Issue
F. Social Issue

These are issue which are obstacle to proper implement the web service. An API is (as the acronym says) an interface that defines the way in which two things will communicate. With APIs, the calls back and forth are managed by web services. Web services are a collection of standards including XML, the programming language that allows applications to communicate over the Internet. XML is a general-purpose markup language. It describes structured data in a way that both humans and computers can read and write. There is many API which gives the vital role in cloud computing application in various paradigm. Let's face it, cloud computing is a troublesome technology. Many users and organizations will be slow to change, and many on hand software and hardware companies will be downright intimidating to the concept. It's interesting that Microsoft has finally embraced cloud computing, in its Live Mesh initiative. After all, it has perhaps the most to lose in the computer industry from the shift from the desktop to the cloud. In a world where Microsoft owns the desktop, there's no guarantee that it will own the cloud—which might be reason enough for Microsoft competitors to go full-bore with the new technology.

## VI. THE CLOUD SERVICE DEVELOPMENT AND TOOLS

There is many organization which provides cloud computing service both large and small. There is lot of application come under cloud computing ,the user of much of decision making process come down to vendor what he offer .In a high CMM level company large company sit in center and small player eventually fall by the way side.

**1. Organization**: So there is following company which provides tools to implement service.

**A. Amazons:** Amazon is one of them of lager retailer on internet. It spend lot of money and time to service it's famous and popular website. It is depend to customer ,whether he initiated, launch and close the server basis of requirement in elastic way. The service provided by it's also called EC2 means Elastic compute cloud. There is three size of virtual implement under the Amazon service. First is small size which has 1.7 GB RAM ,160 GB storage ,Large virtual server has 7.5 GB RAM,850 GB storage and Last is Extra large which have 15 GB memory and 1.7 TB hard disk also 2 dual 64 bit core processor.

**B. Google APP Engine**: Today lot of many web application is handled by Google. Google provide it's service in form of Google App Engine which offers complete integrated application environment. It is more adoptable due to easy to build ,easy to maintain ,easy to scale etc.There are some interesting feature of Google application engine which provide high security ,like Automatic Scaling and load balancing, persistent storage with query, Application program interfacing for authenticate user etc.some of the Google app engine service is Gmail webmail service, Google talk instant message over internet protocol, Google Calendar shared calendaring.

**C. IBM:** IBM is first company which provide the cloud computing solution which also offer cloud based on demand service for small and medium type business organization. It provides Hardtop which is open source workload software for managing the cloud hardware.

**D. Salesfource.Com :** It is also very important service provider website chief in cloud computing development. There is supplementary force.com which is provided by salefource ,is APPEXCHANGE directory of on line web application. There is also some small organization which offer cloud service development tool like 3tera, 10gen,joyent,Mosso ,sky tap,StrikeIron, Nirvanix etc.They give different service for different part of cloud .

**1. Simulator Tool :** The cloud computing encompass 80-90 % whole web application and performance of different model of cloud will be different according to their application ,the evaluation of performance is very challenging. Generally organization use the benchmark under variable condition ,but obstacle by the rigidity of infrastructure ,so there has to need suitable simulator tool which evaluate correct performance and efficiency. There is some simulator which has been designed in different high level language is given following

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**A. CloudSim:** CloudSim is Researched by the faculty of university of Melborn ,which hold up component of cloud system. CloudSim is an open source web application that launches preconfigured machines designed to run common open source robotic tools, robotics simulator Gazebo. In the CloudSim simulator tool ,object of simulation represented by animated Icons dynamically.

**B. CDOSIM:** CdoSim means cloud development option means has capability to characterize user perspective not provider. It is used for simulating the response time also integrated fine grain model to make the coarse grain model. It is very beneficial to know the trade-off between performance and cost of system. It is more beneficial than other cloud simulator in matter like Independency of programming language, monitoring workload profile.

**C. Teach Cloud:** Teach cloud is very useful simulator tool in view of experimental purpose ,which also provide wonderful graphical user interface by which the experimenters can easily modify the cloud configuration and continue their experiment in new way.

**D. IcanCloud**: Icancloud is also very important cloud simulator tool, which is also full graphical user interface environment and use for experimental purpose. It can forecast the trade-off between cost and performance of cloud. There is also a great advantage of this simulator is that it adopt parallel programming where one experiment can be execute in different machine to obtain the flexibility.

## VII. THE ADVANTAGE AND DISADVANTAGE OF CLOUD

Today cloud computing encompass 80% web application ,so what is the reason that many organization adopt this . Cloud computing presents IT organizations with a fundamentally different model of operation, one that takes advantage of the maturity of web applications and networks and the rising interoperability of computing systems to provide IT services. The benefit of cloud computing is given following .

1. **Resource Accessing**: The main benefit of cloud computing that user can access the resource online ,he can connect to any cloud and take a service and billed it. In this way it saves money as well time .
2. **Easily Scalable:** Both the monthly subscription and 'pay as you use' charging models make it easy for the amount of service being provided to be increased or decreased. The vendors can fulfil requirement of extra user who want to take service. This is very important to grow the size of organization with increase demand of computer resource in different level.
3. **Security:** Cloud is also use of storing the data and information in various level of paradigm offered by data centre. By the data mining data can be obtain from different cloud. It provide high security in lesser cost comparable to all business oriented application.
4. **Mobility:** The user can use the cloud service from anywhere because cloud application is web application. It allow to organization to focus the core business So it is location independent ,in this way user can access important business tool which he is moving.
5. **Simplicity**: Again, not having to buy and configure new equipment allows you and your IT staff to get right to your business. The cloud solution makes it possible to get your application started immediately, and it costs a fraction of what it would cost to implement an on-site solution. The application of cloud computing can be maintain easily because there is no need to install any software in user side.
6. **Instant Software updates:** There is a advantage of cloud computing is that user has not need to choose between agile software with high cost. When he access the web based application then the user get the latest version without needing to pay for or download an upgrade.

There is many merits of cloud computing but also some problem or demerits which arise to implement the cloud computing. some of them are following.

1. **Application Not Ready:** It can be possible that in some glasses case application is not ready due to lot of bandwidth to communicating ,lot of effort to integration with other application in same or different cloud or less secure environment.

2. **Data and Information protection:** Integrity and protection of data is very necessary in cloud .For the security purpose there is need to encryption the data ,there is some program like PGB or open source is used to encrypt the file so that only authenticate user can access the file. But there is also some application where encryption of data not occur ,for example suppose user use word-processing files or spreadsheets that are edited online rather than just stored on the Web, then the data, when saved to the cloud, may not be encrypted.

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**3. Reliability of internet:** Cloud computing is totally depend to internet. Without the internet the user can not access the application of cloud computing online. There is problem to lack of internet access or slow connection, also there is no guaranty that all web application in internet should be uninterrupted or bug free.

**4. Dependency on The Supplier:** In the cloud computing the customer is depending to vendor which provide the cloud application. It can be possible that the provider is reliant on an unstable subcontractor or struggling to financial problem ,so in this way they may provide affected service .

In this way we can see the merits and demerits of cloud computing. However the market of cloud computing is increasing day by day .So there is need to remove the demerits of cloud computing to full enjoy it's in web application.

## VIII. CONCLUSION AND FUTURE WORK

In this paper we have studied about cloud computing and relate to it internet. Lot of experiment are going on to optimize the resource, fully utilization of application in cloud. There is many simulator tools existing to detect the performance of the cloud. Our list of cloud computing decision problems may not be all inclusive, and new technology is sure to give rise to further interesting decision-making questions. There is also some problem arise in front of cloud computing like load balancing ,protection and data security ,so there need to implement best algorithm which could be useful to remove the cloud problem. There is also many challenge in front of cloud that security of data, high speed access to internet and standardization. There is also very interesting and hot topic ,where research are going on like load balancing in cloud, virtualization in cloud.

## IX. BIOGRAPHY

**Mr. Sunil Kumar Pandey** is Assistant Professor in Computer Science in Century Cement College. He has been completed B.E and M.Tech and currently he is doing P.hd in computer Science & Engineering. His interested area is Machine Learning, Data science and Cloud Computing.

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