Flying Virtual Cloud Computing Integrated System (FVCIS)

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Abstract: Now a day's according to the continuous rising of computing resources overthe past few years, cloud computing has been established as a well-known researchtopic. This work is concentrated on the integrating of main three used advanced technologies in Internet, Mobile and Satellite. Anywhere, anytime, anything and any cloud are very important factors that implemented in the new virtual environment of the cyberspace. Flying Virtual Cloud Computing Integrated System (FVCIS) is proposed here to overcome of all arise challenges in any offered service of this virtual flying environment.This environment offers many benefits in information storage, retrieving, sharing, interchange and many other benefits.

Key words: cloud computing, grid computing, virtual computing, future computing environment, mobile computing, mobile cloud computing.

1. Introduction

It is clear that management is an important issue in any process. As virtual environment becomes a huge environment, so managing jobs in this environment is not a simple challenge but it is a big challenge that needs to understand all resources and factors that may involve in the process.
Cloud computing becomes one of important technology when you think about what information technology always requires: it is a method to increase their capacitiesand addingadditional power on the fly without go through in new structure, developing new personnel, or acquiring new software. Many applications are emphases with cloud computing to facilities their jobs, applying real time application over the Internet, empowerthecapability existing information technology [1].
Some simple examples of cloud computing are Yahoo email, Gmail, or Hotmail etc.In order to use these services you don't need and additional software. These services can be done only consumers start their connection to Internet then you can select your application. The Internet represent the global cloud that maintain the software of server and email management software is all on the cloud (Internet) thaton the other hand is managed by the cloud service provider of Yahoo, Google etc. The server benefits are offered to the consumer to their jobs.
In condition that the requirements of many organizations are the same, this leads that you can establish a public cloud that these organizations can use the same applications. In addition this approach can offer economic storage that can share the community [2].
In cloud computing approach the computing resources of service providers are existing online to offer these services to general public. Different resources are available to the users, these are; storage data, software applications and other software.
This is the cloud computing model where service providers make their computing resources available online for the general public. It allows the users to access various important resources on cloud, such as: Software, Applications or Stored data. The users of public cloud are performing specific jobs such as configuration of resources, installation of these resources and storage devices [3].

2. Internet, Mobile and Satellite

Now days Internet, mobile and satellite are complex technologies and are not easy to build in which that need special, complex and very expensive infrastructure to implement. These technologies are simply explained below in few words:

Internetenvironmentis a huge repository that required advanced mixed technology that represents a huge volume of stored information which gives an important support to business, education, industry and any other activity of the modern that you can access information anytime and anything. The Internet is evolving as a factor affecting business and socioeconomic development.
Mobiledeviceis a modern device that required advanced communication wireless technology that represents the main part and the nerve of our life that supports the ability of accessing information anywhere, anytime and anything. The new mobile generations such as fourth and fifth generations and

smart mobiles are integrated via Internet services and can carry all the services, applications and gaming.

Satellitesystem is a repeaterwhich used advanced wireless technology that represents a flying transceiver (transmitting and receiving) data over 24 hours a day and 7 days a week.

These three technologies can be integrated in a huge, complex and powerful system that facilitate data interchange, data sharing, data storage and data monitoring and searching. Among these systems, it is difficult to say which of these technologies is the most important and is the most effective of the system. So we can say that each one of these technologies can take its important and effective role in the overall system [4].

3. Cloud Computing Concept

There are differences and similarities between grid computing and cloud computing. In this paper they argued that cloud computing is overlap with grid computing but it is really exceeded of grid computing and relies the fundamental performance on grid computing. The evolution of advanced technology has been shifted related to infrastructure and devices that offers storage and computing resources (as in grid computing) to one that is economy that manage the world in which based on aiming to deliver more abstract resources, benefits and services [4].

The business models adopted by the application of grid environment and services providers in the market based on a wide discussion, study and analysis of Grid business cases. The main objective of this work is to give an overview of business models from the perspective of a potential business adopter in addition of a user of Grid technology environment. To go through this environment, this work goes briefly to explain how the Grid business model environment evolved from traditional ones. This paper explained how you can implement a business case to be established for Grid services environment. Then explanations between the relationship a business models and business plan are done [5].

Distributed computing structureis implemented via coordinates networked resources to enhance a common computational objective, this referred toGrid computing. Development and implementation of Grid computing is one of the important scientific applications which are usually intensive computation. Anyway, Grid computing and Cloud computing have the similar approach to achieve the objectives of application level viaapplyingand usingdistributed resources. However, in order to implement resource sharing and dynamic resource provisioning,cloud computing adding one step more by leveraging virtualization technologies at multiple levels as hardware and application platform[4].

Cloud computing technology is applied via Internet and central remote serversto maintain resources of data and applications.Individuals and businesses are used applications and servicesvia cloud computing in which not required installing and accessing their personal files at any computer with Internet access. Much more efficient computing and services by centralizing storage, memory, processing and bandwidth are achieved by applying cloud computing.

Cloud computing is a generallyindicated for anything that involves delivering hosted services over the Internet environment. These services are widely divided into three main classes [5,6]:

- Infrastructure-as-a-Service (IaaS)
- Platform-as-a-Service (PaaS)
- Software-as-a-Service (SaaS)

Cloud computing is defined by National Institute of Standards and Technology as the most attractive one that is anapproach for using ubiquitous, convenient, on-demand network access to a sharedpool of configurable computing resources ascomputer networks, computer servers, storage, applications, and services thatcan be implemented and applied with lesseffort of management or interaction of service provider. This model of cloud computing is composed of five principleperformances, three models of service, and four modelsof deployment [7,8].

A cloud computing system may be divided into two parts: the front end section and the back end section. These two sections are connected together through the Internet. The front end represents the client side of the end user. The back end user represents the cloud section of the system. The cloud computing environment architecture can be divided into four main layersas shown in figure (1) [9, 10, 11]:

- **Hardware layer**, the purpose this layer is used for managing the physical resources of the cloud environment, including networks, servers, routers, switches, hopes, nodes, links, power and cooling devices.
- **Infrastructure layer**, the purpose this layer adapt the visualization technology to implement pool of storage and computing resources viadividing the physical devices and resources.

- **Platform layer**, this layer consists of application frameworks and operating systems. The purpose of the platform layer is to deploy applications directly into virtual machine containers with minimum burden.
- **Application layer**, this layer consists of the actual cloud environment applications. Cloud applications differs from other applications, that can implement the automatic scaling feature to achieve better characteristics and performance, lower operating costand availability.

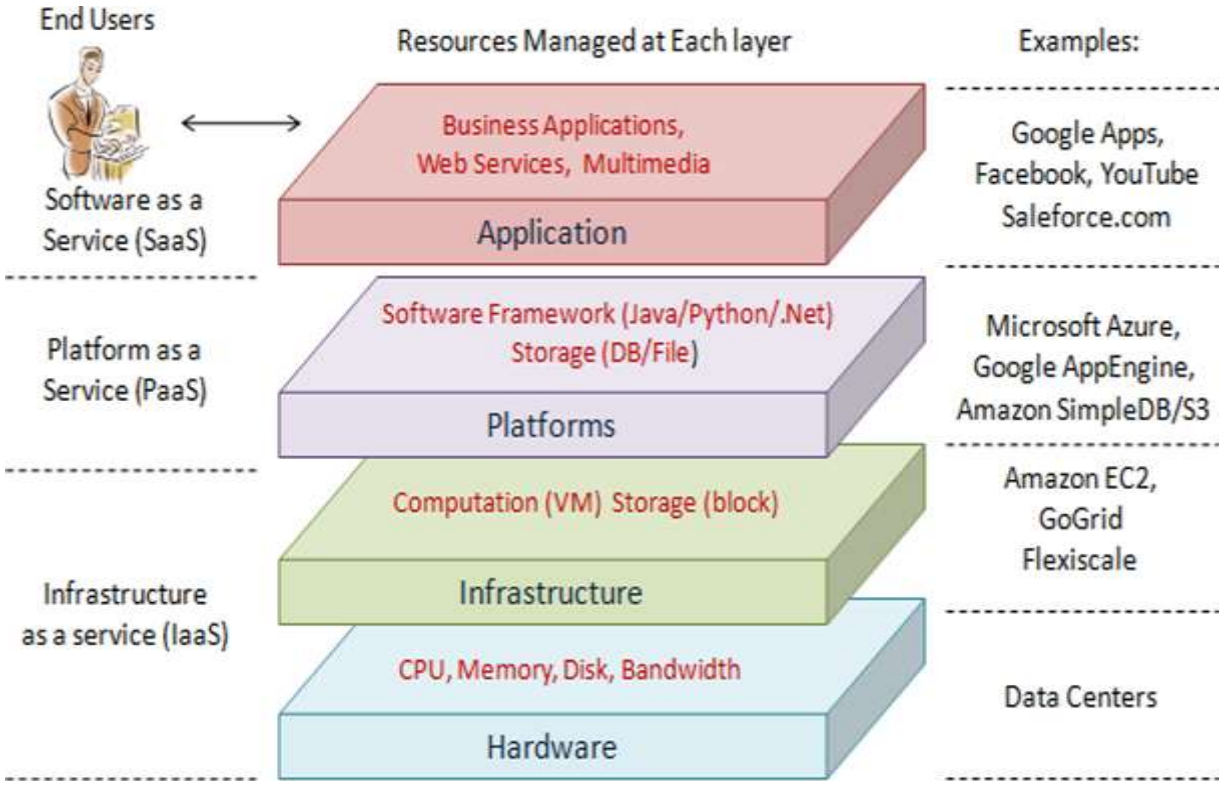


Figure (1) Cloud computing architecture

4. Related Works

Many works and researches related to cloud computing are published in the last few last years, below some of these works:

Urs Gasser and John Palfrey(2011) introducedan explanation to the concept ofinteroperability and then discuss its important aspects from a public policy perspective by exploring itsrelationship with creativity, innovation, competition, and spread economic growth. Then this paper goes throughthe interaction between interoperability and the legal system by analyzing its multifaceted andbi-directional character. This context introduced the concept of legal interoperability ingreater discussion and detail,then illustratesand implements these aspects using examples from European Union (EU) law [12].

Christopher S. Yoo(2011)studied cloud computing and analyzed the cloud computing economics in which aimsto reduce costs, transform capital expenditures in form of operating expenditures, aggregating demand, then increasethe reliability, and reducethe latency. Then explain the architectural implications of cloud computing for access networking (that focusing on bandwidth, reliability, quality of service, and ubiquity) and data center interconnectivity (that focusing on bandwidth, reliability, security and privacy, control over routing policies, standardization, and metering and payment) [13].

N. Meghanathan et al. (2011) described cloud computing in which that introduced as a key computingplatform for sharing resources for infrastructures, software,applications, and business processes. This paper also described how to adapt cloud computing in electronic government and applications in order to reduce infrastructure, and platform cost, to increase securityand scalability [14].

V. Snasel et al. (2011), designed and implementeda distributed multiple server system with Web-DB based servicesthat can give an important role to introduce an environment for cooperative learning, In addition,supports a function for emergency communication. These environments or functionscan be used to design as dedicated systems, that single purposecan be implemented only [15].

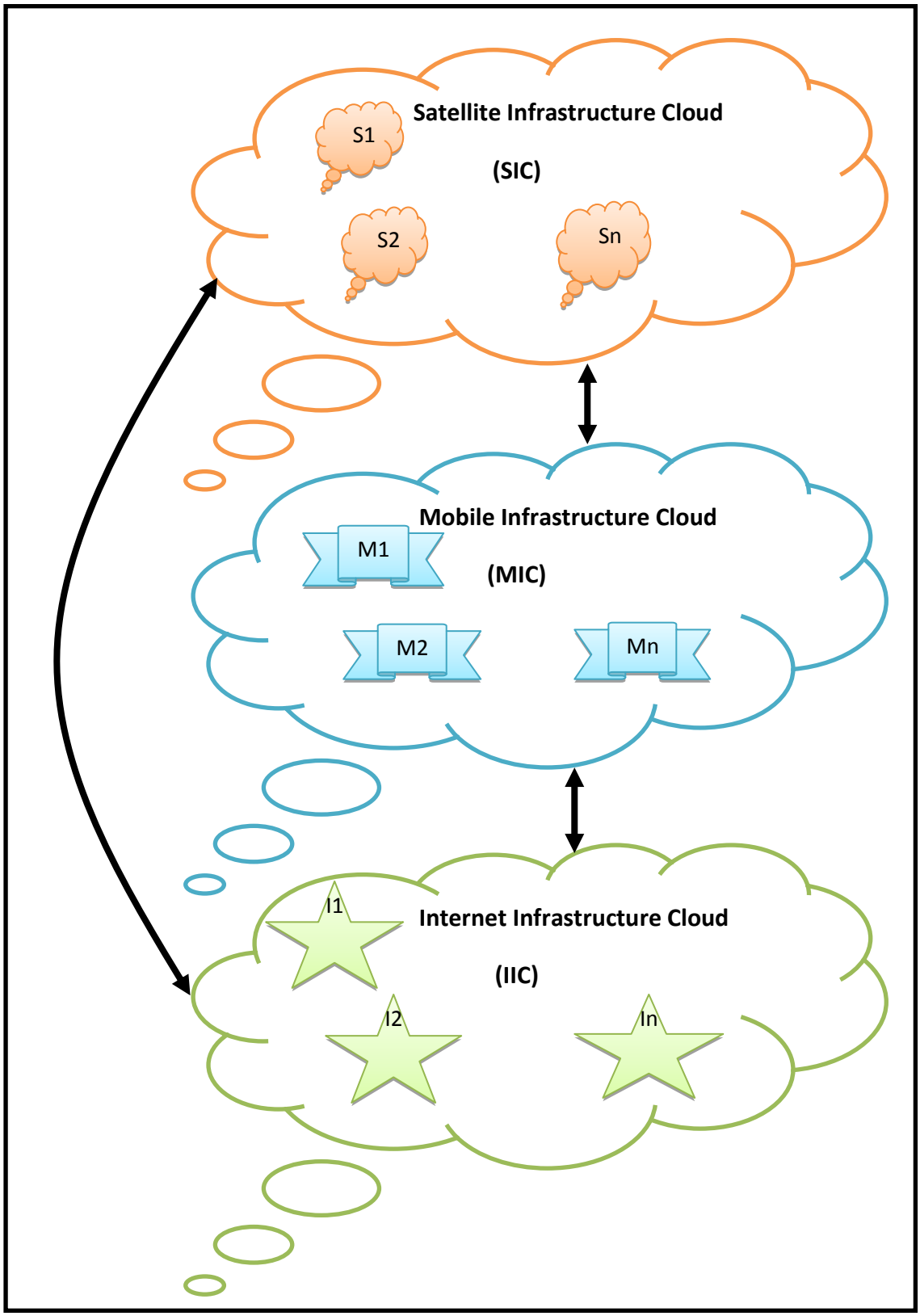
A. Mantri et al. (2011) explainedcloud services that become the leader of information technology innovation for the near future. Most companies are enforcing their ability to be a part of this environment either as enablers, vendors or service providers. According to this situation, it is expected cloud market to grow at a good rate, with large enterprises. Cloud security is an important part of enterprisesin which it will be overcome by the cloud benefits. Large companies will concentrateon private or hybrid cloud deployment, while small enterprises will concentrate on public clouds [16].

MuzhirShaban Al-Ani, et al. (2012) proposed an efficient solution of the ministry of higher education and scientific research in Iraq applying cloud environment. The proposed cloud environment solution based on classification of the environment into main three clouds: traditional governmental universities, traditional private universities and commissions and research centers. Theses cloud environmentwill be implemented at high speed processorsthat can operated at real time and can be replayed directly without any delay [17].

5. Flying Virtual Cloud Computing Integrated System

The wide extension of Information Technology (IT) and the huge broad penetration of Internet lead to Information and Communication Technologies (ICT) that integrate most existing advanced technologies such as telecommunications, networking, e-environment and m-environment … etc. Now a day the transition of all wireless communications to the virtual mobileenvironment is the aim of the near future. Internet, mobile andsatellite are the main three technologies that can be connected together to cover the most important features in a new virtual environment. These three technologiesneed to be transformed into economic activities, services, applications and content that create new efficient environments, new intelligent marketsthat reduce costs and efforts in addition increase productivity and efficiency.

The main idea of this work is to construct a Flying Virtual Cloud Computing Integrated System (FVCCIS) that raising all the benefits of these subsystems and technologies to reach efficient, accurate, smart, intelligent, secure, flexible, reliable and integrable system. Figure (2) shows the proposed system that can be divided into three main parts including Internet Clouding Infrastructure (ICI), Mobile Clouding Infrastructure (MCI) and Satellite Clouding Infrastructure (SCI). These three main systems are connected together in a simple virtual flying cloud environment to facilitate and offer all services to all customers.



implemented to represent each country services of Internet, satellite and mobile, and then these subclouds are integrated into an overall Global Cloud (GC), that is responsible of all services and applications over the world. To overcome this environment, it is important to perform a protocol that integrates all these subcloud into a global protocol with some privacy to each country, in which not affected the overall environment. This new structure is suitable to deliver all services and applications via all software and hardware systems and services.

The service access starts from the subscriber that need to apply some application, this implemented via his/her mobile (smart mobile and new generation mobile), this pass your request to the Internet via an indicated satellite; means you can flying from your country to the global system to access any information in the global cloud.

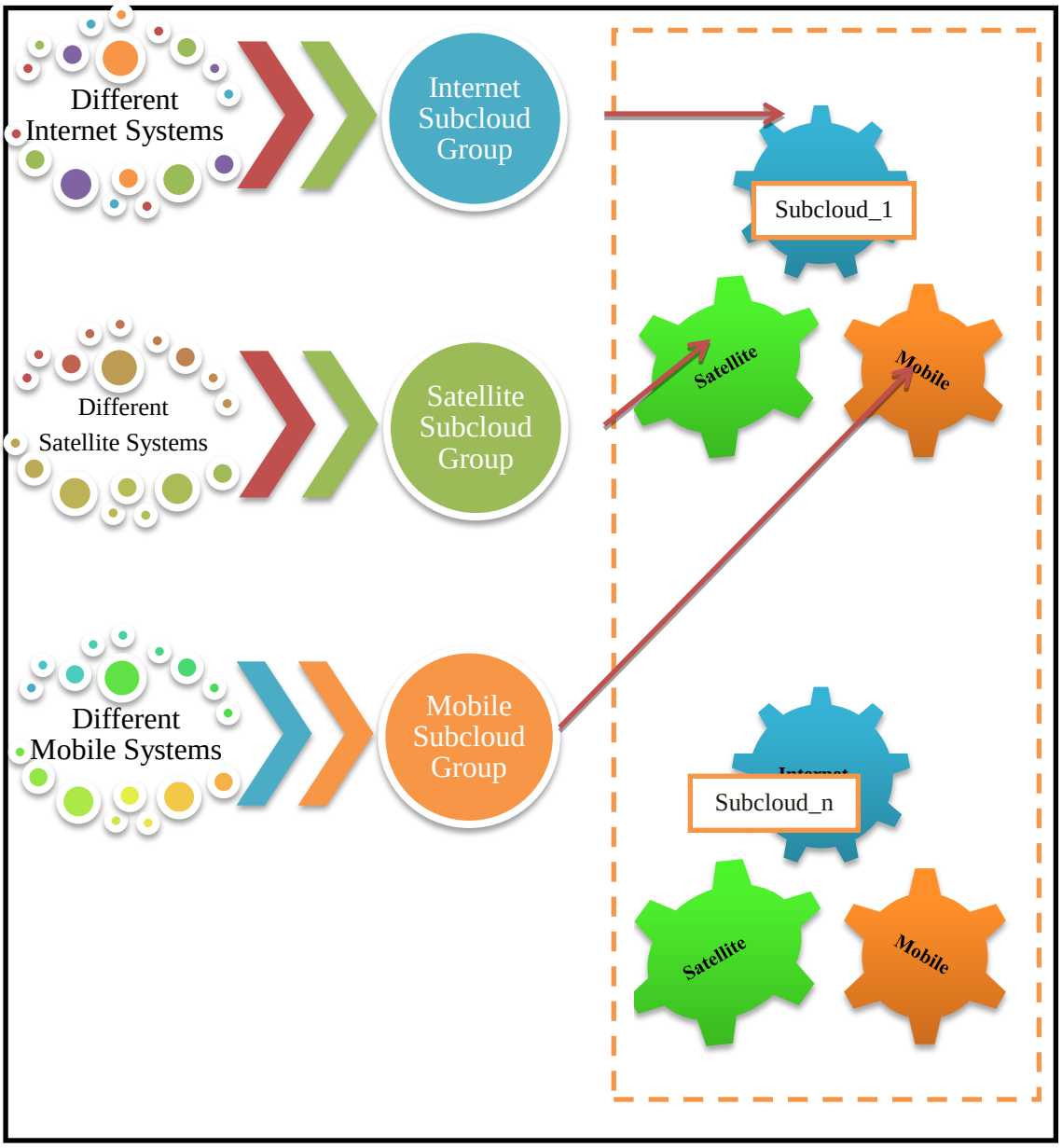


Figure (3) hybrid cloud infrastructure composition

Mobile strategies (hardware and software infrastructures) are the main factors of our life because their huge powerful applications especiallythose offer by smart phones. Government or public and private environments are integrated together to facilitate the delivery of services via an overall environment that offers an efficient and flexible management system. On the other hand this approach realizes and increases the potential of data and information via the implemented environment.

6. Conclusions

First of all it is clear to mention that management and control (electronic and traditional) are important issue in the life, and they are very important when we can get a sustainable issue. Internet, Mobile and Satellite are the dominant factors of the future. Internet offers the flexible environment anytime; mobile

offers the mobility of information anywhere and satellite offers the flying infrastructure to access the information. This new future powerful environment will be more efficient when it is integrated via virtual cloud computing system. The proposed environment offers advantages in cost and speed in which leads to innovation of cloud computing. It is very important to overcome the benefits and drawbacks while they adopt cloud computing in terms of cost and speed.There are many benefits stated by researchers via introducing cloud computing in different companies.The structure of cloud computing provides environments to getmany software and hardware advantages via Internet, mobile and satellite. Cloud computing here is the use of this cloud combined with a variety of technologies, such as software applications, servers, storage and networks and supporting devices.

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