

# Perceptive Education System on Cloud Computing

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**Abstract**—The Combination Edu Cloud Computing and, Mobile learning will Promote mobile learning to content reacher more widely applied and more powerful. Educloud help Education will help the student staff, trainer,institutions, and also the learner to a very height extended and mainly student from rural parts of the world .the relevance's of Educloud computing for the global education sector in the context of the campus of the future. new perspective in the application of Mobile Educloud education with in the next generation intelligent campus environment has also been introduces .the mobile learning plays an important role in the information education ,and became to a major choice in the school teaching ,it also need the education technology worker to further research and discussion

**Keywords-** Cloud Computing ,Education,SAAS,Quality Teaching ,Cost effective,mobilephone,Mobile Cloud

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## I. INTRODUCTION

In a limited budget, cloud computing can help educators in many ways. Cloud computing provide services and storages over internet. It can involve memory, processing, bandwidth and applications for students and teachers. In this method, the service is free and no software needs to be installed because thprograms run on the internet and the storage of files is

on the internet. Applications and data are stored on multiple servers that can be accessed from the internet. These services can be provided to the clients located all over the world. Main benefits of cloud computing in E-learning are flexible and scalable infrastructure, increased mobility and global

## II. WHAT IS CLOUD COMPUTING

Cloud Computing is a model for enabling convenient, on-demand network access to a shared pool of configurable computing resources (e.g., network servers, storage, applications, and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction. It is a recent trend in IT that moves computing

and data away from desktop and portable PCs into large data centers. It refers to applications delivered as services over the Internet as well as to the actual cloud infrastructure namely, the hardware and systems software in data centres that provide theseservices. The key driving forces behind cloud computing are the ubiquity of broadband and wireless networking, falling storage costs, and progressive improvements in Internet computing software. Cloud-service clients will be able to add more capacity at peak demand, reduce costs, experiment with new services, and remove unneeded capacity, whereas service providers will increase utilization via multiplexing, and allow for larger investments in software and hardware.

Cloud computing is of three different types like:

- Public Cloud

- Private Cloud
- Hybrid Cloud

## III. CLOUD COMPUTING FOR EDUCATION

Many universities recognized the efficiency of using cloud computing. This technology will let educators to focus on teaching and researching rather than on complex computer configuration and systems. Complexity can be reduced with cloud computing. Cloud computing has many benefits for ELearning and education by providing the platform, Virtualization, centralized data storage, and educational services.

### A. Benefits and Limitations of Using Cloud Computing in Education:

Cloud computing in E-Learning and education has both benefits and risks and limitations.

It can help the access to applications from anywhere but also not all applications run in cloud. The software is free or pay-per-use but it doesn't have an organized support.

It has 24 hours access to the services but also dispersion of policies can be a problem. It can be open to business environments and researches but also it can have security problems and safety issues for sensitive data. It is a green technology and can help the environment and the planet but also the solutions are not completed yet. It can increase the functional capabilities

## IV. CLOUD COMPUTING ARCHITECTURE FOR EDUCATION

Cloud computing will let all kind of users from any where, to access to databases and applications

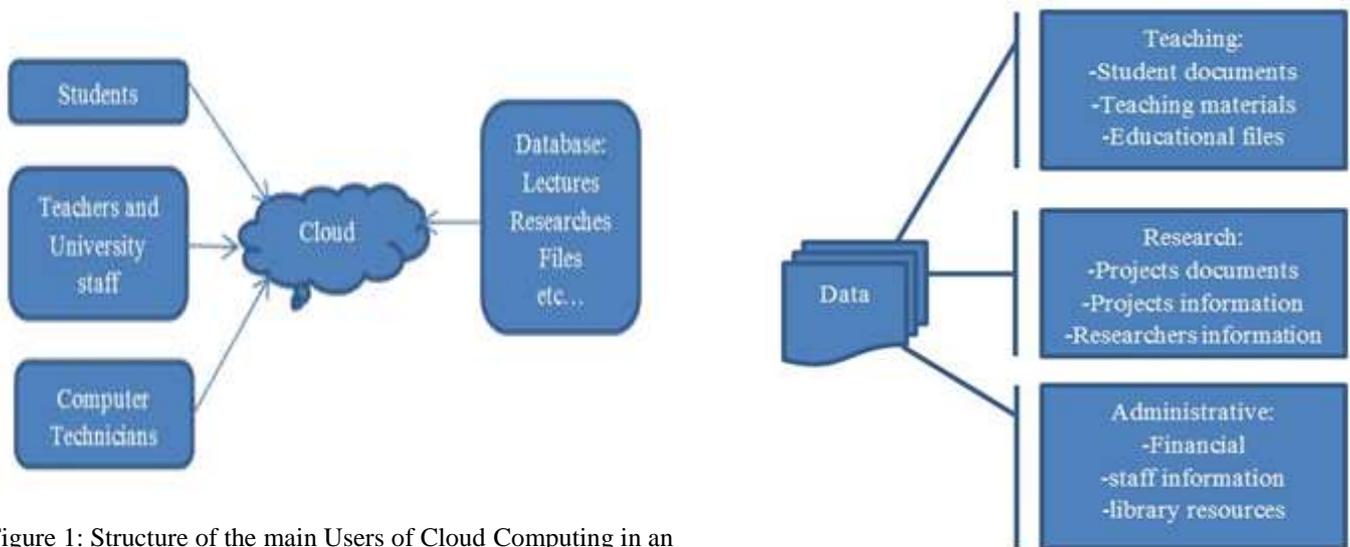


Figure 1: Structure of the main Users of Cloud Computing in an educational environment.

Students and University staff use many of technologies in their personal life, so using cloud computing services such as applications based on cloud can improve their communicating while saving time. Teachers can prepare and upload and manage their teaching materials, (e.g. presentations, articles, documents, courses etc) into the cloud using the latest technologies. Computer technicians can provide, build and test cloud based applications directly on the cloud infrastructure and the servers. They will benefit from services 24/24, from everywhere at low costs.

#### A. Differences between private cloud and public cloud in an educational environment

The main differences between public and private Cloud in an educational environment are in Management, access and controlling features. In a public model, the main manager is the service Provider while in a private model; university owns And manages the cloud. Accessing to a public cloud is by subscription but In a private cloud, it is limited to students, teachers And staff of the university. Customization and controlling is allowed in a Private cloud while it is not allowed in a public cloud.

#### B. Which Cloud Computing model to choose

Educational places should first identify the type of their main data and applications .

There are three main categories:

- Teaching
- Research
- Administrative

The next step is to select the important characters of their data, such as mission, sensitivity, confidentiality, integrity and availability.

The last step is choosing the Cloud model (private, public and hybrid) for each application, function and process. Each model contains specific objectives, and can change according to the organization policy and security.

## V. MOBILE CLOUD COMPUTING

As an inheritance and development of cloud computing, resources in mobile cloud computing networks are virtualized and assigned in a group of numerous distributed computers rather than in traditional local computers or servers, and are provided to mobile devices such as smartphones, portable terminal, and so on. Meanwhile, various applications based on mobile cloud computing have been developed and served to users, such as Google's Gmail, Maps and Navigation systems for Mobile, Voice Search, and some applications on an Android platform, Mobile Me from Apple, Live Mesh from Microsoft, and Moto Blur from Motorola. According to the research from Juniper, the cloud computing based mobile software and application are expected to rise 88% annually from 2009 to 2014, and such growth may create US 9.5 billion to our daily lives, it will also, however, bring numerous challenges and problems. In short, the core of such challenges and problems is just how to combine the two technologies seamlessly. On one hand, to ensure that mobile devices adequately make best use of advantages of cloud computing to improve and extend their functions. On the other hand, to overcome the disadvantages of limited resources and computing ability in mobile devices in order to access cloud computing with high efficiency like traditional PCs and Servers. Thus, in order to solve the mentioned challenges and point out further research, getting a thorough understanding of the novel computing paradigm - mobile cloud computing, is necessary. This paper introduces the basic model of mobile cloud computing, its background, key technology, current research status, and its further research perspectives as

well.

### A. Mobile Computing

Mobility has become a very popular word and rapidly increasing part in today's computing area. An incredible growth has appeared in the development of mobile devices such as, smartphone, PDA, GPS Navigation and laptops with a variety of mobile computing, networking and security technologies. In addition, with the development of wireless technology like

WiMax, Ad Hoc Network and WIFI, users may be surfing the Internet much easier but not limited by the cables as before. Thus, those mobile devices have been accepted by more and more people as their first choice of working and entertainment in their daily lives. So, what is Mobile computing exactly is described as a form of human-computer interaction by which a computer is expected to be transported during normal usage. Mobile computing is based on a collection of three major concepts: hardware, software and communication. The concepts of hardware can be considered as mobile devices, such as Smartphone and laptop, or their mobile components.

Software of mobile computing is the numerous mobile applications in the devices, such as the mobile browser, anti-virus software and games. The communication issue includes the infrastructure of mobile networks, protocols and data delivery in their use. They must be transparent to end users.

1) *Features*: the features of mobile computing are as follows: a) *mobility*: mobile nodes in mobile computing network

can establish connection with others, even fixed nodes in wired network through Mobile Support Station (MSS) during their moving.

b) *Diversity of network conditions*: normally the networks using by mobile nodes are not unique, such networks

can be a wired network with high-bandwidth, or a wireless Wide Area Network (WWAN) with low-bandwidth, or even in status of disconnected.

c) *Frequent disconnection and consistency*: as the limitation of battery power, charge of wireless communication, network conditions and so on, mobile nodes will not always keep the connection, but disconnect and consistent with the wireless network passively or actively.

d) *Dis-symmetrical network communication*: servers and access points and other MSS enable a strong send/receive ability, while such ability in mobile nodes is quite weak comparatively. Thus, the communication bandwidth and overhead between downlink and uplink are discrepancy.

e) *Low reliability*: due to signals is susceptible to interference and snooping, a mobile computing network system has to be considered from terminals, networks, database platforms, as well as applications development to address the security issue.

2) *Challenges*: Compared with the traditional wired network, mobile computing network may face various problems and challenges in different aspects, such as signal disturbance, security, hand-off delay, limited power, low computing ability, and so on. due to the wireless environment and numerous

mobile nodes. In addition, the Quality of Service (QoS) in mobile computing network is much easier to be affected by the landforms, weather and buildings.

## VI. CLOUD COMPUTING SERVICES

a) *Infrastructure layer*: it includes resources of computing and storage. In the bottom layer of the framework,

physical devices and hardware, such as servers and storages are virtualized as a resource pool to provide computing storage and network services users, in order to install operation system (OS) and operate software application. Thus it is denoted as Infrastructure as a Service (IaaS). Typically services in this layer such as Elastic Computing Cloud of Amazon.

b) *Platform layer*: this layer is considered as a core layer in the cloud computing system, which includes the environment of parallel programming design, distributed storage and management system for structured mass data, distributed file system for mass data, and other system management tools for cloud computing. Program developers are the major clients of the platform layer. All platform resources such as program testing, running and maintaining are provided by the platform directly but not to end users. Thus, this type of services in a platform layer is called Platform as a Service (PaaS). The typical services are Google App Engine and Azure from Microsoft

c) *Application layer*: this layer provides some simple software and applications, as well as customer interfaces to end users. Thus we name this type of services in the application layer as Software as a Service (SaaS). Users use client software

or a browser to call services from providers through the Internet, and pay costs according to the utility business model (like water or electricity). The earliest SaaS is the Customer Relationship Management (CRM) from Sales force, which was developed based on the force.com (a PaaS in Salesforce).

Some other services provided by Google on-line office such as documents, spreadsheets, presentations are all SaaS.

2) *Features*: the features of Cloud Computing are as follows: a) *Virtualization*: the 'Cloud' can be considered as a

virtual resource pool where all bottom layer hardware devices is virtualized. End users access desired resources through a browser and get data from cloud computing providers without maintaining their own data centres. Furthermore, some virtual machines (VMs) are often installed in a server in order to improve the efficiency to use resources; and such VMs support load migration when there is a server over-load.

b) *Reliability, usability and extensibility*: cloud computing provides a safe mode to store user's data while users do not worry about the issues such as software updating, leak patching, virus attacks and data loss. If failure happens on a server or VM, the cloud computing systems transfer and backup those data to other machines, and then delete those

failure nodes from the systems automatically in order to make sure the whole system has normal operation .

cloud can be extended from horizontal and vertical in a large-scale network, to process numerous requests from thousands of nodes and hosts.

c) *Large-scale*: in order to possess the capability of supercomputing and mass storage, a cloud computing system normally consists of thousands of servers and PCs. Google Cloud Computing, for example, has already controlled 2% of all servers or about 1 million servers located in two hundred different places in the world, and will move upward to 10 million servers in the next decade.

d) *Autonomy*: a cloud system is an autonomic system, which automatically configures and allocates the resources of hardware, software and storage to clients on-demand, and the management is transparent to end users.

3) *Challenges*: first of all, cloud computing needs an improved mechanism to provide a safe and high efficiency service as the numerous invoked third-party software and infrastructures are implementing in computing. In addition, due to data centres of resource using a mass of electricity, efficient resource scheduling strategy and methods are required in order to save energy. Furthermore, as a Service Level Agreement (SLA) is established between users and service providers in cloud computing, so the performance and analysis of services are necessary to be monitored. Last but not least, simple and convenient application interfaces are indispensable for service providers in cloud computing, thus a uniform standard is required eagerly.

## VII. MOBILE CLOUD COMPUTING

Nowadays, both hardware and software of mobile devices get greater improvement than before, some smartphones such as iPhone 4S, Android serials, Windows Mobile serials and Blackberry, are no longer just traditional mobile phones with conversation, SMS, Email and website browser, but are daily necessities to users. Meanwhile, those smartphones include various sensing modules like navigation, optics, gravity, orientation, and so on. which brings a convenient and intelligent mobile experience to users. In 2010, Google CEO Eric Schmidt described mobile cloud computing in an interview that 'based on cloud computing service development, mobile phones will become increasingly complicated, and evolve to a portable super computer'. In the face of various mobile cloud services provided by Microsoft, Apple, Google, HTC, and so on, users may be confused about what mobile cloud computing exactly is, and what its features are.

### A. Concept and principle

Similar with Cloud Computing, there are a lot but no consensual definitions on what mobile cloud computing is. In this paper, we consider it is a novel computing mode consisting of mobile computing and cloud computing, which provide cloud based services to users through the Internet and mobile devices. On one hand, the mobile cloud computing is a development of mobile computing, and an extension cloud computing. In mobile cloud computing, the previous

mobile device-based intensive computing, data storage and mass information processing have been transferred to 'cloud' and thus the requirements of mobile devices in computing capability and resources have been reduced, so the developing, running, deploying and using mode of mobile applications have been totally changed. On the other hand, the terminals which people used to access and acquire cloud services are suitable for mobile devices like smartphone, PDA, Tablet, and iPad but not restricted to fixed devices (such as PC), which reflects the advantages and original intention of cloud computing. Therefore, from both aspects of mobile computing and cloud computing, the mobile cloud computing is a combination of the two technologies, a development of distributed, grid and centralized algorithms, and have broad prospects for application. mobile cloud computing can be simply divided into cloud computing and mobile computing. Those mobile devices can be laptops, PDA, smartphones, and so on. which connects with a hotspot or base station by 3G, WIFI, or GPRS. As the computing and major data processing phases have been migrated to 'cloud', the capability requirement of mobile devices is limited, some low-cost mobile devices or even non-smartphones can also achieve mobile cloud computing by using a cross-platform middleware. Although the client in mobile cloud computing is changed from PCs or fixed machines to mobile devices, the main concept is still cloud computing. Mobile users send service requests to the cloud through a web browser or desktop application, then the management component of cloud allocates resources.

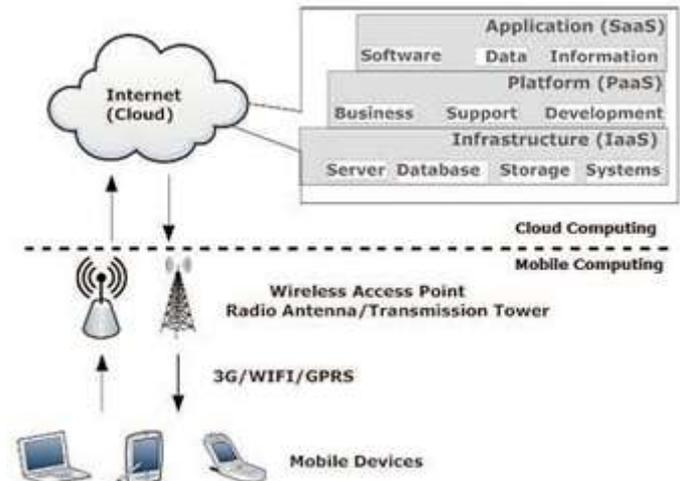


Fig. 3: Architecture of Mobile Cloud Computing

The main objective of mobile cloud computing is to provide a convenient and rapid method for users to access and receive data from the cloud, such convenient and rapid method means accessing cloud computing resources effectively by using mobile devices. The major challenge of mobile cloud computing Comes from the characters of mobile devices and wireless networks, as well as their own restriction and limitation, such challenge makes application designing,

programming and deploying on mobile and distributed devices more complicated than on the fixed cloud devices. In mobile cloud computing environment, the limitations of mobile devices, quality of wireless communication, types of application, and support from cloud computing to mobile are all important factors that affect assessing from cloud computing.

#### [A] MOBILE CLOUD COMPUTING.

1) *Limitations of mobile devices:* While discussing mobile devices in cloud the first thing is resource-constrain.

Though smartphones have been improved obviously in various aspects such as capability of CPU and memory, storage, size of screen, wireless communication, sensing technology, and operation systems, still have serious limitations such as limited computing capability and energy resource, to deploy complicated applications. By contrast with PCs and Laptops in a given condition, these smartphones like iPhone 4S, Android serials, Windows Mobile serials decrease 3 times in processing capacity, 8 times in memory, 5 to 10 times in storage capacity and 10 times in network bandwidth. Normally, smartphone needs to be charged everyday as dialling calls, sending messages, surfing the Internet, community accessing, and other internet applications. According to past development trends, the increased mobile computing ability and rapid development of screen technology will lead to more.

#### [B] 3G TECHNIQUE AND CLOUD COMPUTING

##### ACCELERATING MOBILE EDUCATION DEVELOP NEED TO WORK OUT SOME REALISTIC PROBLEMS

The presence of 3G technique and Cloud Computing, greatly push the fusion of mobile correspondence and the bond of mobile correspondence and Distant Education, and promote the development of the fourth generation distant education, and will show an endless bright future for the development of Mobile Education. In current social milieu, if we want to better put 3G techniques, Cloud Computing and Mobile Education together so as to realize efficient Learning anywhere at any time in the biggest degree, some realistic hard nut to crack as follows need to be clinched :

Technique problem. The bonding of 3G technique, Cloud Computing and Mobile Education, actually is the technical application of realizing network fusion. It needs the fusion of mobile network and "fixed network", supervision and traffic and the fusion of the loading internet itself. It also needs great quantity of education resource and technique assurance for a continuous network. So technique questions like system structuring, movement education platform building and Mobile Education resource tapping, etc are the key factors that affect Mobile Education development. At the same time, network safety, the steady technique guarantee, the compatibility of 2G, 3G and future 4G technique, the contradiction of the easy to carry character of intelligence mobile phone and the screen expressing function, are all technique hard nut to crack that are very difficult to be settled in a short run by mobile education. Market problem of movement education. Currently, the advanced network technique and hardware

Equipment, mostly are used in non-education aspects, like commerce, amusement, few to be used in the education research, investing and application. Its main factor lies in, merchants of distant correspondence think that there is no profit in Mobile Education, an effective running mode was not be established up to now, and there are some disorders in the market. To realize mobile education, it has high request for technique and throws in greatly, merchants' profit is little, and so they wouldn't like to take part in. At the same time, whether a small mobile phone or portable computer can start to take the heavy duties of helping people accomplish study task or not, it is still being universally queried by people. Economy and fund question. In the practice of mobile teaching, the economy and supporting fee of the student buying and using mobile equipment is a realistic question. The price of an intelligence mobile phone with excellent performance is still high currently; common learners also can hardly to accept. In addition, the charges of 3G network are still expensive so far, sending short messages and getting to the Internet to browse information all bear the cost; both of them greatly limit the generalization of the Mobile Education and learning. Every time the coming of new technique arrival will bring impact and change people's thought, work, study and life style, mobile learning's arrival is exactly along with the development of mobile correspondence technique and the extension of mobile correspondence traffic. For the profound effect of 3G technique and cloud computing to Mobile Education, we should neither be at a standstill because of various worries and uncertainties nor do nothing but let Mobile Education develop naturally. The huge worth of 3G technique and Cloud Computing for Mobile Education development naturally can be proved definitely, as long as the realistic problems which the Mobile Education face in the practice can be settled.

#### VIII. BENEFITS OF CLOUD COMPUTING IN MOBILELEARNING

Users have to download special applications and install on their personal PDAs or mobile phones. They have to connect to the cloud network through services like Wi-Fi and Bluetooth and download the selected material, from the cloud center.

Following are some of the important merits with Cloud computing in Mobile-Learning.

- Lower costs
- Improved performance
- Reduced software costs
- Instant software updates
- Improved document format compatibility
- Increased data reliability
- Universal document access
- Device independence

## IX CONCLUSION

With the high increasing of data computation in commerce and science, the capacity of data processing has been considered as a strategic resource in many countries. Mobile cloud computing (MCC), as a development and extension of mobile computing (MC) and cloud computing (CC), has inherited the high mobility and scalability, and become a hot research topic in recent years. We conclude that there are three main optimization approaches in MCC, which are focusing on the limitations of mobile devices, quality of communication, and division of applications services. Firstly, using virtualization and image technology can address it effectively, and immigrate task from terminal to cloud is also a good way to achieve better results. Secondly, as we know the quality of communication in wired network is better than in wireless network, so reducing the proportion of data delivery in wireless environment is an effective way to improve the quality. In addition, upgrading bandwidth is envisaged to be a simple way to increase performance but it incurs additional cost to users. Deploying an effective elastic application division mechanism is deemed to be the best solution to guarantee the application service in MCC.

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