



## Future Aspects of Cloud Computing

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**Abstract:** Cloud computing is a logical evolution and innovated version of Information Technology delivered from a popular Internet based world to information support systems, business world, public sector organizations, social community and Individuals. Technology and business work hand in hand for each other in many ways. Cloud allows businesses and users to access applications from anywhere in the world on demand. The paper focuses on the implications of cloud computing for Information Technology, Agriculture, Businesses, Education and Personal Use. Use of cloud services creates a growing interdependence among both public and private sector entities and the individuals served by these entities.

**Keywords:** Cloud Computing, Information Technology, Agriculture, Business, Education

### I. INTRODUCTION

Cloud computing means that instead of all the computer hardware and software being used sitting on desktop, or somewhere inside some company's network, it's provided as a service by another company and accessed over the Internet, usually in a completely seamless way. Most of us use cloud computing all day long without realizing it. When we sit at our computer and type a query into Google, the computer on our desk isn't playing much part in finding the answers we need. The words we type are swiftly shuttled over the internet to one of Google's hundreds of thousands of clustered computers, which dig out our results and send them promptly back to us. Clouds are of particular commercial interest not only with the growing tendency to outsource IT so as to reduce management overhead and to extend existing, limited IT infrastructures, but even more importantly, they reduce the entrance barrier for new service providers to offer their respective capabilities to a wide market with a minimum of entry costs and infrastructure requirements – in fact, the special capabilities of cloud infrastructures allow providers to experiment with novel service types whilst reducing the risk of wasting resources [1]. The new trend in innovations will bring in lot of maturity and reliability in cloud computing along with better governance and security models once technologies start functioning seamlessly and reliably. With drastic improvements in WAN speed, the future trend will increasingly see the front end of applications separated from the backend which has scalable databases [2].

### II. CLOUD COMPUTING FOR INFORMATION TECHNOLOGY

Cloud Computing is a paradigm in which information is permanently stored in servers on the internet and cached temporarily on clients that include desktops, entertainment centers, table computers, notebooks, wall computers, handhelds, sensors, monitors, etc [3]. Cloud Computing is

spreading and impacting business models of IT companies already established. The strategies adopted vary according to size and maturity of the IT areas of business. Large corporations are taking their first steps toward adopting Cloud Computing private clouds, while small firms choose public clouds [4]. Cloud Computing, the long-held dream of computing as a utility, has the potential to transform a large part of the IT industry, making software even more attractive as a service and shaping the way IT hardware is designed and purchased [5].

### III. CLOUD COMPUTING FOR AGRICULTURE

The combination of progress in system software, computing hardware, and Internet communications has now enabled the construction of general-purpose data centers that can be reconfigured by command to support any software application in minutes. There are already data services that allow a user to have many hundreds of computers at their command, and yet pay for them by the hour or minute, without owning or operating the hardware themselves. The data center is acting like a utility that provides as much computing as requested and when needed. These data centers are sometimes called computing in the cloud. Commercial "cloud providers" like Amazon, Google, and Microsoft already offer service, and some government-run research clouds exist that are extremely cost-effective. They employ a relatively small staff of system managers, keep a low budget for electric power, can survive routine equipment failure without service interruption, and adopt continuous modular upgrades of new types of hardware. There are choices in many countries, which allow for flexibility where there are legal restrictions. Cloud computing will soon be the lowest-cost option for all types of data center computing. The research centers in agriculture can have accounts on several cloud providers, and can select them at different times for different purposes. The shift to cloud computing can cut down the total cost of scientific computing. It can also bring new opportunities for international agriculture. It completely separates the utilization from the operation of computing facilities. The users of data centers no

longer need the capacity to procure and operate them. As long as one has a browser on the Internet, one can "order up" essentially any computer software at any scale, and pay only for what is used. As a result, many more organizations will be able to take advantage of large-scale advanced computing [6]. Cloud computing is an increased impetus to share data among researchers. Cloud data centers are a natural repository for public information goods like shared data sets, so that users in any location or institution can instantly access, analyze and interpret data without the need to move it to their own facilities. This reduces the need for high-speed or high-capacity network connections, since much less data moves between the users and the source of the data. A researcher with a moderate-speed connection to the Internet can work with data as well as other researchers regardless of location. In addition, researchers will normally leave the results of a cloud analysis at the cloud data center, allowing potential reuse by others [6].

Climate data is used in agricultural simulation studies for estimation of production potential and strategic management decisions. Soil erosion prediction using climate data can be used for geospatial simulations. For this purpose considerable computing resources would be required as the spatial resolution of the simulation increases. A number of ensemble members could be used to minimize uncertainties in the simulation, that demands increased computing resources. Thus cloud computing provides computing resources on demand. In a study, Amazon Web Service – Elastic Compute Cloud (EC2) was used to process daily sets of climate projection data, which were about 70 gigabytes in total, using virtual machines with a customized database transaction application. The application was used to retrieve daily precipitation data from an internet database, and calculate and store monthly rainfall frequency into a local database in a cloud computing system. Using one server and 10 clients in the cloud computing system, it took about 32 hours to process 17 billion rows of daily precipitation data on a global scale over the 21st century. The study showed that cloud computing would provide the high level of performance for agricultural simulations that requires massive amount of climate data [7].

#### IV. CLOUD COMPUTING FOR BUSINESSES

Cloud Computing can help businesses reduce costs as we don't have to invest in hardware and other physical infrastructure, our data is stored on a secure location and there is a need to pay for only that we use. Continually-evolving technologies, data security threats and policy and regulatory requirements can make managing a messaging and collaboration system costly and complicated. This is a challenge when budgets and headcounts are limited. When there is a need to limit the operating expenses of applications, companies can save money by moving services to the cloud. There is no longer need to pay for data center space, the power needed to run servers and storage arrays, hardware and software maintenance fees, and the salaries of employees that manage, maintain, and upgrade internal applications. Cloud computing seeks to increase end-user productivity by giving people access to their data anytime, regardless of their physical location. Customers pay a per-user fee to access these applications. This makes it possible for organizations to license applications as a service on demand, thus avoiding the need to purchase and maintain software installations across

their business. the cloud is a form of utility infrastructure. The primary attraction is that an enterprise can get all the computing capacity it needs for vital business applications without having to design, acquire, build, and manage an underlying infrastructure. When the demand for computing increases, the amount of processing power and data storage required to support important enterprise applications can be added. Companies can also eliminate capital investments like purchasing state-of-the-art servers for storing their client data and service applications. Rather cloud servers can handle these tasks thus freeing the companies to concentrate on providing best quality services to their clientele.

#### V. CLOUD COMPUTING FOR EDUCATION

The benefits of cloud computing and virtualization are being embraced by many sectors of business and industry and now are slowly being adopted by education establishments. Cloud computing delivers services autonomously based on demand, provide ample network access, resource reservoir and effectual flexibility. Computer Education is now indispensable for everyone but due to the poor economic condition many countries are unable to introduce their inhabitants with rich technologies and innovation developed by computer system. Thus cloud computing offers a shared based system for uniform distribution of resources between people of every stratum [8].

Cloud computing technology binds the resources into a single domain; therefore this technology can be a prominent solution for solving the problem of improper distribution of educational resources such as teaching tools, stuffs and lack of monitoring as well as inefficiency.

Cloud has generated many resources which can be used by various educational institutions and streams where their existing web based learning systems can be implemented at low cost. Cloud computing allows dynamic scalability as demands fluctuate. The cloud computing has the significant scope to change the whole education system. The cloud computing will surely help in the development of the education offered to poor people which will increase the quality of education offered to them. Cloud based education will help the students, staff, Trainers, Institutions and also the learners to a very high extent and mainly students from rural parts of the world will get an opportunity to get the knowledge shared by the professor on other part of the world [9].

#### VI. CLOUD COMPUTING FOR PERSONAL USE

Cloud computing is rapidly diffusing among individuals for personal use. One may use cloud computing only if it is perceived to be more efficient in terms of performance and costs as compared to packaged software. Cloud computing promises easier integration and lower costs which should increase the perceived usefulness of that technology leading to its increased adoption and usage among users [10]. The cloud computing for personal use can be used for online storage, online desktop, and Web-based applications. This helps in freeing up resources, either in processing power, as in the case of Web-based applications, or in the case of an Internet-based desktop in which any computer with an Internet connection can become personal computer with the help of a Web browser. Clouding computing supports personal knowledge management by providing users with all kinds of scalable

services, such as channels, tools, applications, social support, for users personal knowledge amplification, personal knowledge use/reuse, and personal knowledge sharing [10].

Cloud computing is beneficial to everyone. One can keep costs down by storing most of their resources like applications and data in the cloud. Research projects can be sped up by accessing online libraries and collecting and editing reports in the cloud itself. This not only results in saving money as there is no need to buy costly software, but it also saves time and provides flexibility in terms of access and availability. The user need not to have knowledge of complex cloud computing technologies rather the implementation details are best handled by the cloud providers and individual users can use the cloud services at their convenience on pay-per use basis. In future cloud computing will enable users to run operating systems from the cloud on the go rather than from their desktops.

## VII. BENEFITS OF CLOUD COMPUTING

The popularity of cloud computing gained a constant growth in the past few years. Professional individuals and business firms are analyzing it carefully as technological options for improving their operation and transactions. The concept of cloud computing is to use the internet to perform normal individual or business activities through online infrastructures accessible to any geographical locations. Cloud computing creates a shared network between major corporations like Google, Microsoft, Amazon and Yahoo.

1. Cloud computing is beneficial for both small and medium sized businesses. They can instantly obtain the benefits of the enormous infrastructure without having to implement and administer it directly. This means that as the need for resources increases, companies can add additional service as and when needed from the cloud computing vendor without having to pay for additional hardware.
2. Cloud computing provides a lot of flexibility. A company can easily change the amount of bandwidth, the number of users connected to the cloud, and the number of applications available to them at any time as per their convenience.
3. Cloud computing appears to be more eco friendly because general consensus says that reducing the number of hardware components and replacing them with remote cloud computing systems reduces energy costs for running hardware.
4. Organizations can store more data than on private computer systems.
5. Cloud computing is a powerful alternative in providing benefits of centralized resources in financial service sector. Any company or individual can now access any software or hardware as an online utility.
6. Cloud computing helps in faster development of prototypes and is very useful in testing and validation services, especially for research and development projects, or where collaboration between two or more users is required.

## VIII. CONCLUSION

Cloud computing builds upon decades of research in virtualization, distributed and utility computing, networking,

web and software services. It implies service oriented architecture, and reduces information technology overhead for the end-user. It provides greater flexibility and reduces the total cost of ownership, on demand services and many other things. Cloud Computing is spreading and impacting business models of IT companies already established. Cloud services can make a genuine contribution to agriculture by revising approaches and using latest technologies available at reasonable costs. Cloud computing represents a sea change in the way computing is done in corporations. Cloud computing helps academia in the current tight funding situations by providing a low cost option to high end computing and Offers an easy way to scale up and down based on their needs.

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