

A review on Cloud Computing Architectures and Applications

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Abstract

In current time the IT based services demands , services deployment cost , scalability issues and many more constraints have paved the way for focusing on cloud computing. Cloud computing is the structure of a central server resources distributed on the platform scalable environment to provide "on demand" computing resources. In this research in detail the various structures of cloud computing are reviewed. The applications of these architectures are discussed for different areas of life. Also the different working domains of cloud computing architectures are summarized . The purpose of this research is to provide understanding to the students , professionals, developers and researchers about cloud computing.

Keywords: Survey, Cloud Computing

1. Introduction

Cloud computing refers to computing resources provided by some virtual system on demand, which is done through computer networks. The definitions from internet sources mentioned in references stated that, the software data contained in the user's computer is assumed in the cloud. In other words, the computer may contain almost no software or data (e.g it may be a small operating system or Web browser), because it shows the occurrence of the terminal computer network. In the cloud computing users need the bandwidth and server resources, which can use from any part of the world's using bandwidth and server resources through the Internet. One can understand cloud computing by considering it as a utility not a product. In addition, the cloud-computing system has significant workload changes. Local computer does not do all the heavy work of running applications. Load is handled by the computer on the network . Cloud computing architecture, can be expressed with the help of Figure 1.

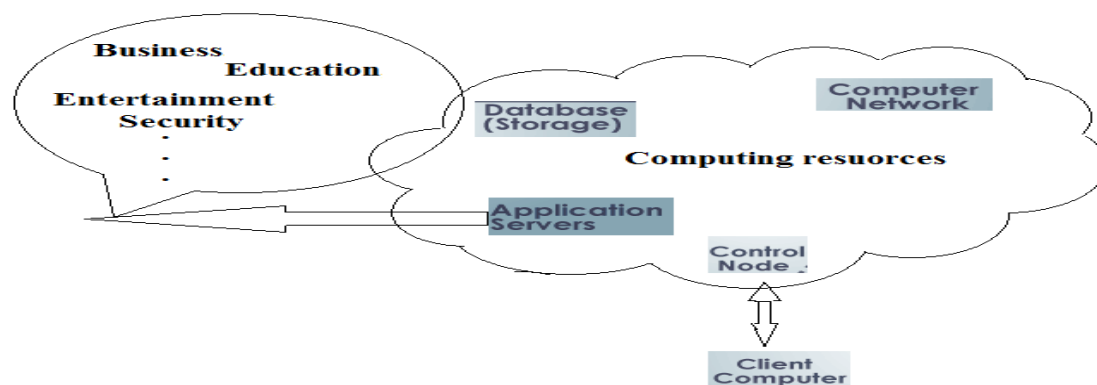


Figure 1. Cloud computing an abstract View

The figure 1 shows the workings of cloud computing which shows how storage software of many services in any field of life are linked with cloud and complete computing resources are in the cloud. The only thing which is required the ability to run the software on the client computer, the system of cloud computing interface that can be as simple as a Web browser and a network of clouds which makes the rest of the process. Also Cloud computing is a type of Internet services provided by some of the system which hosted these provided services. The rest of the articles is organized as in Section 2 different contributors working in the field of cloud computing is expressed and in section 3 some of the applications of cloud computing are highlighted.

2. Survey of different works in the domain of cloud computing

(Wassim Itani et al 2009) expresses that cloud computing architecture is related to the security and protection. It seems as a framework for privacy protection as a service through cloud computing. It gives the user's privacy and protect user data. In it different definitions to the user's privacy protocols are given. Users can store and use it to change its own data. It eliminates the security risk, so that cloud computing could be more reliable. In (Roger Clarke 2010) the architectural requirements for cloud computing and users are defined. This architecture describes the different security risks which user faces. It provides the security needs from different aspects to cloud computing. It explains the different needs which user want from cloud computing. Also it describes how cloud computing can be more attractive and provides the requirements which makes the better relationship between user and cloud computing provider.

(Erik Elmroth and Lars Larson 2009) expresses about the architecture which provides placement, migration, virtual machines, cloud monitoring interface and management control descriptors. It explains management of virtual machine migration between the source and destination of the transfer. The name of the reservoir (Wei-Tek Tsai et al 2010) was proposed to create a federation of multiple cloud providers. The architecture of this reservoir is composed of, a virtual execution environment in the site computing resources which has been demarcated by the virtualization layer. In it service application is decomposed into a set of software components. (Liang jie Zhang and Qun Zhou 2009) presented the architecture which describes the design and service provisioning solutions. It shows how it may rely different technologies, such as virtualization technologies and service oriented architecture. It expresses virtualization technology, operating system, middleware and application image which covers how to assign a physical machine or a slice of the stack on the server and the right created by a professional.

The Google cloud computing architecture describes the differences between its technology and traditional IT system (Jia Xiaojng 2010). It describes that how Google cloud computing platform gives low cost computing and storage from others. It explains the techniques used in Google cloud computing for data storage, data management and programming model which makes its architecture low cost. Developing cloud computing in a software platform, the Aneka is a customizable and scalable service-oriented runtime environment, which enables developers to build. NET application API that supports multiple programming models (Liang Zhong et al 2010).

In (Rocco Aversa et al 2010) the architecture for cloud computing with a mobile agent platform is proposed. It gives full virtually administrative control to user. It consists of technologies of GRID, cloud mobile agents, layers of infrastructure and virtual machine. It describes how mobile agent can provide reactivity, proactively, communication and move services through different virtual machines and in different cloud. Using it user can manage the offered services. The description of essential characteristics of cloud computing including three service models and four development models and cloud model for development in private and community sector are given in (Bashkar Prasad et al 2009 and Irena Bojanova et al 2011). In (Zhang et al 2011) layered architecture is proposed for cloud computing. In it several layers are presented. The first and the bottom of this tier is the "hardware as a service" layer which is basically the backbone and it holds cloud computing and processing capabilities of the hardware. The second layer is the "infrastructure as a service" layer which deals the processing structure of the cloud, its network capabilities and storage problems. It also provides functions to upper layer. The third layer is the "platform as a service" layer, which provides a variety of application platforms for cloud computing. The uppermost layer is the

"software as a service" layer which provides the software needed for cloud computing. In (Keijiang et al 2010) the presented architecture is divided into four modules that are virtualization module, monitoring module, management module and cloud service module. Virtualization module provides dynamical, scalable virtual resources to users on demand. Monitoring Module is responsible for monitoring both virtual machines and physical machines including resource utilization, power consumption and virtual machine status, etc. Management module implements all the management issues in the data center cloud. Cloud server module plays an important role in cloud computing which manages and serves all the resources that are provided to the users with services via Internet.

3. Review of Cloud computing applications

Today's e-learning is the important mode to create a good learning environment with personalized. E-learning capability using the Internet. E-learning requires the key factor which is the sharing of resources. The architecture for E-Learning proposed in (Zhang Guoli 2010) which is divided into three levels, the corresponding layer management system, shared service interface layer and access layer. Access layer is used to implement some applications, such as office software, services, personal services and e-commerce customers.

In (Ratko Mutaydzi et al 2010) the architecture for managing budgets , satisfying citizens, resource sharing and for interoperability the enterprise architecture was introduced. The enterprise architecture was based on service provider and service receiver. This architecture was very popular and matured in providing services to its authorized users. The authors explain in (Nathan Botts et al 2010) the impact of network infrastructure for medical services. This also explains the detailed architectural design for the personal health record system, known as the ATM. It is an integrated service, from the Google cloud computing environment. It provides users with ability to use ATM-style interface for customers and service providers of health management. The basic advantage of this is that as it provides better health management for the population with the ultimate goal of better health outcomes in the future. Biomedical research often relies on having access to vast amounts of sensitive information. As Patient data in electronic form are held in medical databases and all this information has been migrating to the cloud making access easier for all interested parties. The architecture is presented with description of preliminaries, distributed access control, scalability, privacy and cryptographic tools (Vasiliki Danilaton and SotivisbIoannidis 2010) .

In (Viktor V Brizgolov et al 2010) describes that the traffic management systems using cloud computing can help to solve the environmental pollution, central locking, theft and road safety issues. The main purpose of this paper is to analyze the traffic management system to use cloud computing infrastructure. The proposed cloud architecture consists of several layers as the the client layer, cloud application services platform layer, a layer of infrastructure and the server layer.

In (Xiaopeng Lin et al 2010), the architecture provides the Web-EDA (Electronic Design Automation) system and applications for IC design using cloud computing. It consists of web server, an EDA tool server, a database server and an application server. It provide the collaboration between different engineers around the world to design of an IC through internet using cloud computing. In (Feng- Cheng Lin et al 2009) the software integration model of service component architecture was proposed for use in vending industry. It can be used to integrate related services and to reduce development costs. The vending industry includes beverages, snacks etc. This architecture is based on shared memory between service server which is distributed and registered to Service Crawler. This architecture can be applied to different domain file and it can help to decrease server overloading.

From above discussion it can be seen that different architectures have different features and each architecture is used for a specific purpose. Every architecture is having a different technique from others. Summarizing the discussion about work in cloud computing and applications of clod computing the table 1 gives the true picture.

Table 1. Summarizing the working domains of Cloud Computing

Sr. no	Domains of Cloud computing
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1	Providing security framework in cloud computing
2	Virtual computing environments over cloud computing.
3	Enterprise level services developments
4	Cloud computing in Education, medical and business
5	Cloud computing in Traffic control
6	Industrial manufacturing using cloud computing as IC design discussed above.

4. Conclusion

Cloud computing is a vast technique that consists of different architectures. Every architecture has its unique importance which makes work essay and fast. Cloud computing provides availability of data, applications and different services from around the world through internet without purchasing software and hardware. The research community is presenting different architectures of cloud computing for different purposes. The researchers and developers could use cloud computing methodologies for providing solutions in different fields of life as education, medical, traffic control, IC design etc.

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