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Cloud Computing use In Technology

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ABSTRACT :Cloud computing is the latest effort in delivering computing resources as a service. It represents a shift away from computing as a product that is purchased, to computing as a service that is delivered to consumers over the internet from large-scale data centres – or "clouds". Whilst cloud computing is gaining growing popularity in the IT industry, academia appeared to be lagging behind the rapid developments in this field. This paper is the first systematic review of peer-reviewed academic research published in this field, and aims to provide an overview of the swiftly developing advances in the technical foundations of cloud computing and their research efforts. Structured along the technical aspects on the cloud agenda, we discuss lessons from related technologies; advances in the introduction of protocols, interfaces, and standards; techniques for modelling and building clouds; and new use-cases arising through cloud computing.Cloud computing technologies although in their early stages, have managed to change the way applications are going to be developed and accessed.

These technologies are aimed at running applications as services over the internet on a flexible infrastructure. Microsoft office applications, such as word processing, excel spreadsheet, access database and many more can be accessed through the internet, even though the files and applications are housed in the cloud. Cloud computing provides a low cost solution to academic institutions for their researchers, faculty and students. This setup provides an additional benefit because all these browser-based applications can also be accessed through mobile devices in addition to being available to a variety of laptop and desk top computers, provided internet access is available. In this paper we present a solution that is based on cloud computing and can be used for building a virtual environment both for teaching and learning

Key Words: Cloud computing, cloud technologies, review

1.INTRODUCTION

The increased use of technology for improved teaching and enhanced learning is going to be the future of education at all levels. Most of the colleges and universities, because of low enrollment in their onsite classes, now offer courses and in some cases the entire degree program through distance education or in online format as well as use various other teaching and learning models. The positive attitude towards the importance and influence of Cloud Computing resulted in optimistic Cloud-related market forecasts. In October 2008, IDC (2008b) forecasted an almost threefold growth of spending on Cloud services until 2012, reaching $42 billion. Same analyst firm reported that the cost advantage associated with the Cloud model becomes even more attractive in the economic downturn (IDC 2008b). Positive market prospects are also driven by the expectation that Cloud Computing might become the fundamental approach towards Green IT. Despite of the broad coverage of Cloud Computing in commercial press, there is still no common agreement on what exactly Cloud Computing is and how it relates to Grid Computing. To gain an understanding of what Cloud Computing is, we first look at several existing definitions of the term. Based on those definitions, we identify key characteristics of Cloud Computing. Then we describe the common architecture and components of Clouds in detail, discuss opportunities and challenges of Cloud Computing, and provide a classification of Clouds. Finally, we make a comparison between Grid Computing and Cloud Computing.

II . Methodology

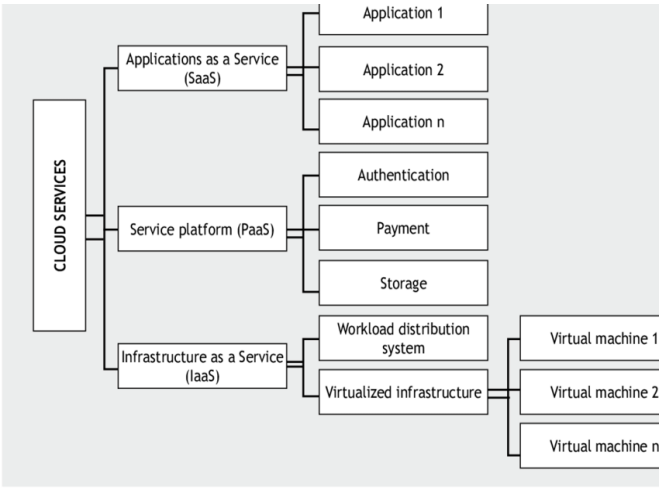
The cloud computing term means a set of servers such as Platform as a service (PaaS) and infrastructure as a service (IaaS) that provide the resources and processors to the user in an efficient environment [3]. Cloud computing and their related technologies can split into two categories of technologies used by clouds. Also, cloud technologies refer to execute many tools of software based on cloud servers as Hadoop and Dryad, also framework of communication as HDFS (Hadoop Distributed File System), Amazon S3, etc. [15],[18]. There are many cloud computing as Nimbus and Eucalyptus that allow the companies to make the development of their individual and unique clouds to provide the best efficiency of resources. On the other side, cloud technologies provide parallel computing [1]. There are several applications used in cloud computing technologies, and the large part of these applications and data are applied and used in particle physics fields, information retrieval, etc. However, there are various techniques used to increase the performance of cloud computing. The cloud term widely used in some companies but without useful and understand the cloud completely [19]. The cloud tries to use technologies that make cloud computing more accessible and reached by anyone at any time. There are many technologies used to increase the performance of cloud computing, but the most important of them are Hadoop, Dryad, CGL Map Reduce, MPI, and CAP3 [20].

A. Hadoop Technique Hadoop is one of the most common technologies used in cloud computing, and the Hadoop architecture is simple compared with other kinds of techniques. The main components of the HDFS are the master and slave architecture. Generally, the HDFS cluster has a single Name Node, Master-Slave, and many Data Nodes [15]. File system and the applications stored by HDFS separately. Each server connected by TCP protocols
The Hadoop Distributed File System consists of many components, each of these components designed in different architecture and for different work. Hadoop can handle terabytes or more of data, and the application of their techniques are different from other technologies [22]. Hadoop store information on different computers, maybe hundreds of computers with an inefficient method which decrease the losing risk of information.

The Hadoop is very beneficial when the data are distributed end executed on several servers [6]. B. Dryad Technique Dryad is another critical technology used by cloud computing.

The Dryad is a system and consists of a set of extensions of languages that can create new developing programming on a colossal scale for distributed cloud computing [23]. On the other hand, it mainly considered the language domain-specific that depended on C++ libraries. The primary purpose of Dryad is to distribute the execution of parallel applications on the cloud. Also, it combines channels and vertices to create a new develop graph of dataflow then runs the application by using vertices of a graph on the computers to provide communication among them using TCP[3].

Dryad is created and designed to be very expressive, and it beats many of other cloud technologies like Google's map-reduce [6]. Also, it processes several complex problems of developing distributing applications on the extensive range as monitoring, creating and managing jobs, visualizing jobs, accounting, fault tolerance, and transporting information among vertices of the graph. The Dryad consists of the build, which allows programmers to configure the resources of the cloud or information center of different parallel applications. Furthermore, it provides many computers that may be more than thousands of machines for programmers



Source: author's own work.

Fig 1. Flow of Cloud Computing

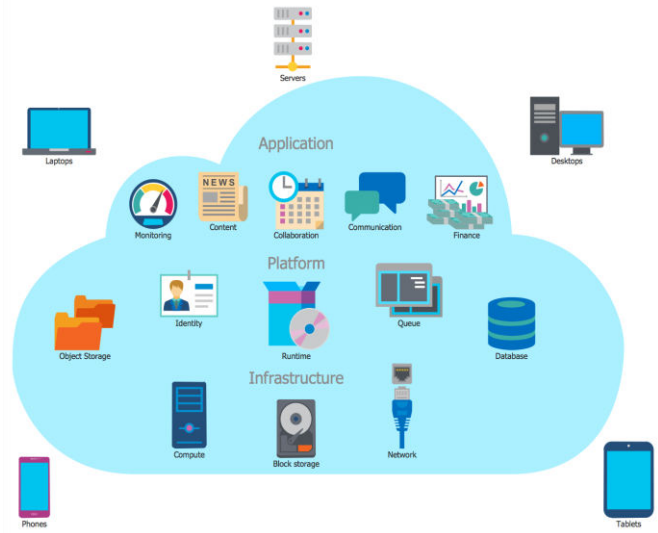


Fig 2. Cloud Computing Expanded Area

TYPES OF CLOUD COMPUTING :

The 4 Types of Cloud Computing Services

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

IAAS PROCESS

1. **Compute:** Computing as a Service includes virtual central processing units and virtual main memory for the Vms that is provisioned to the end- users.
2. **Storage:** IaaS provider provides back-end storage for storing files.

3. **Network:** Network as a Service (NaaS) provides networking components such as routers, switches, and bridges for the Vms.
4. **Load balancers:** It provides load balancing capability at the infrastructure layer.

PAAS PROCESS

Platform as a service (PaaS) is a cloud computing model where a third-party provider delivers hardware and software tools to users over the internet. Usually, these tools are needed for application development. A PaaS provider hosts the hardware and software on its own infrastructure. As a result, PaaS frees developers from having to install in-house hardware and software to develop or run a new application. As mentioned above, PaaS does not replace a company's entire IT infrastructure for software development. It is provided through a cloud service provider's hosted infrastructure. Users most frequently access the offerings through a web browser. PaaS can be delivered through public, private and hybrid clouds to deliver services such as application hosting and Java development.

Other PaaS services include:

- Development team collaboration
- Application design and development
- Application testing and deployment
- Web service integration
- Information security

SAAS PROCESS

Software-as-a-Service, or SaaS for short, is a cloud-based method of providing software to users. SaaS users subscribe to an application rather than purchasing it once and installing it. Users can log into and use a SaaS application from any compatible device over the Internet. The actual application runs in cloud servers that may be far removed from a user's location.

A SaaS application may be accessed through a browser or through an app. Online email applications that users access through a browser, such as Gmail and Office 365, are common examples of SaaS applications.

FUNCTIONS AS A SERVICES

FaaS (Function-as-a-Service) is a type of cloud computing service that allows you to execute code in response to events without the complex infrastructure typically associated with building and launching microservices applications.

Hosting a software application on the internet typically requires provisioning and managing a virtual or physical server and managing an operating system and web server hosting processes. With FaaS, the physical hardware, virtual machine operating system, and web server software management are all handled automatically by your cloud service provider. This allows you to focus solely on individual functions in your application code.

Fig -3: Cloud Computing Figure

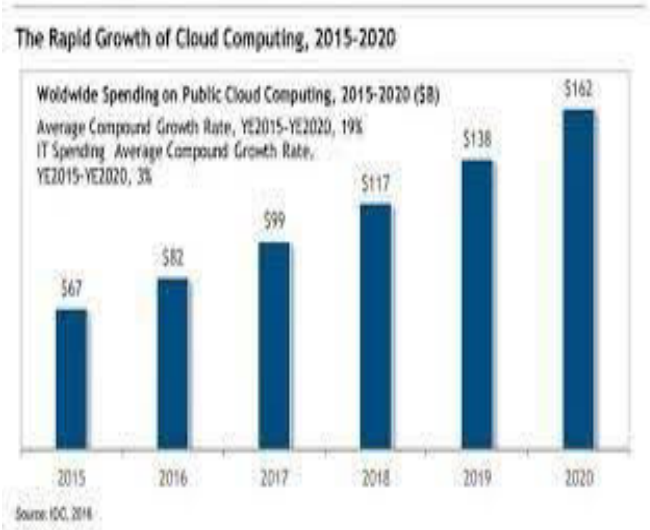


Fig-4 Growth Graph of cloud computing

3. CONCLUSIONS

cloud computing is recently new technological development that has the potential to have a great impact on the world. It has many benefits that it provides to it users and businesses. For example, some of the benefits that it provides to businesses, is that it reduces operating cost by spending less on maintenance and software upgrades and focus more on the businesses it self. But there are other challenges the cloud computing must overcome. People are very skeptical about whether their data is secure and private. There are no standards or regulations worldwide provided data through cloud computing. Europe has data protection laws but the US, being one of the most technological advance nation, does not have any data protection laws. Users also worry about who can disclose their data and have ownership of their data. But once, there are standards and regulation worldwide, cloud computing will revolutionize the future.

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REFERENCES

1. Baldonado, M., Chang, C.-C.K., Gravano, L., Paepcke, A.: The Stanford Digital Library Metadata Architecture. Int. J. Digit. Libr. 1 (1997) 108–121
2. Bruce, K.B., Cardelli, L., Pierce, B.C.: Comparing Object Encodings. In: Abadi, M., Ito, T. (eds.): Theoretical Aspects of Computer Software. Lecture Notes in Computer Science, Vol. 1281. Springer-Verlag, Berlin Heidelberg New York (1997) 415–438
3. van Leeuwen, J. (ed.): Computer Science Today. Recent Trends and Developments. Lecture Notes in Computer Science, Vol. 1000. Springer-Verlag, Berlin Heidelberg New York (1995)
4. Michalewicz, Z.: Genetic Algorithms + Data Structures = Evolution Programs. 3rd edn. Springer-Verlag, Berlin Heidelberg New York (1996)