

## **A Review on Cloud Computing and Its Applications.**

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### **ABSTRACT:**

Now Cloud computing is evolved as a method to add capabilities to applications without licensing new software, investing in new hardware or infrastructure or training new personnel. It provides common business applications online that are accessed from a web browser, while the software and data are stored on the servers.

This paper explores different research papers published in different Journals based on cloud computing. A review is carried out and selected papers are presented here by arranging them in scenario that helps to understand a concepts of Cloud Computing, its services and applications in different sectors.

**KEY WORDS:** Cloud computing, Network cloud, Web applications, Cloud Applications,SaaS.

### **INTRODUCTION:**

Cloud computing is the new era of computer world. It is changing existing way of computerization very rapidly. It is being applied in different sectors. To understand cloud computing, we can divide it in two categories

1. Understanding Architecture (Hardware setup)
2. Understanding its applications (Resource sharing)

A huge research is going on cloud computing and its applications. Basically cloud computing provides everything in the form of service. It is divided in three parts

1. IAAS (Infrastructure as a Service): It provides hardware resources as a service when required. e.g. Storage space.
2. PAAS (Platform as a Service): It provides Operating Systems as a service when required. e.g. Widows hosting service
3. SAAS (Software as a Service): It provides application software as a service when requested. e.g. Google Adds

A review is conducted for understanding cloud computing and its applications in different sectors. Following are some selected research papers published in relation with Cloud Computing and its applications.

### **RESEARCH PAPERS:**

#### **1 . WINDOWS AZURE PAAS CLOUD: AN OVERVIEW**

**Rabi Prasad Padhy**, Oracle Corporation, Bangalore, India, **Manas Ranjan Patra**, Berhampur University, Odisha,

**Suresh Chandra Satapathy**, ANITS, Sanivasala, A. P., India

Cloud Computing is an emerging technology in which the research community and industries have recently embarked. However, the infrastructures of most cloud computing systems today are invisible to the research community, or are not explicitly designed to the researchers interested in cloud computing systems. Windows Azure is Microsoft's PaaS (Platform as a Service) Cloud offering to help its customers realize the benefits of cloud computing. It is the platform of Microsoft implementation of cloud computing. This paper covers detailed introduction to Windows Azure Platform, its components,

Architecture and provides insights into different aspects of Azure based development especially for those who are interested in adopting Windows Azure within their Enterprise IT landscape. This paper also described the latest development of the windows azure, that is used the cloud computing platform.

## **2. Cloud Computing and Agricultural Development of China: Theory and Practice**

**Yanxin Zhu**, School of Mechanical Engineering, University of Science & Technology Beijing, Beijing, China. **Di Wu**, School of Business, Shijiazhuang University of Economics, Shijiazhuang, China

**Sujian Lil**, School of Business, Shijiazhuang University of Economics, Shijiazhuang, China

Cloud computing technology has brought great opportunities to the development of China's agriculture; however it is also facing lot of challenges. According to the advantages of cloud computing, based on the status quo of China's agricultural development, the paper first discussed the impacts of cloud computing for China's agricultural development; and analyzed the field and the prospects of its possible applications in agriculture; then presented the application and promotion of cloud computing technology is a long-term system works, not only need to build the data center, integrate resources, enhance service capabilities, and also need to make information security .

## **3. Towards a next generation of scientific computing in the Cloud**

**Yassine Tabaa & Abdellatif Medouri**

Designing new types of highly scalable data intensive computing is needed to qualify the new generation of scientific computing and analytics effectively perform complex tasks on massive amounts of data such as clustering, matrix computation, data mining, information extraction etc. MapReduce, put forward by Google, is a model for programming computer clusters to perform large scale data processing. Hadoop is the most popular open-source implementation of the MapReduce model which provides a simple abstraction for large-scale distributed algorithm; it has become a popular in recent years. While, Hadoop, MapReduce suits well for embarrassingly parallel problems, it suffers significant troubles when dealing with iterative algorithms; as a consequence, many alternative frameworks that support this class of algorithms were created. This paper, proposed architecture for such configuration implemented in an SPC (Scientific Private Cloud) prototype, using the Hadoop 2.0 next generation platform to allow the use of alternative programming frameworks respecting a hybrid approach, while retaining the scalability and fault tolerance of Hadoop MapReduce. By adapting scientific problems to execute them in our Scientific Cloud, experiments conducted show the effectiveness of the proposed model and its impact on the ease of frameworks handling.

## **5. On Web Services Based Cloud Interoperability**

**Devi Prasad Bhukya**, New Delhi, India

**Reeta Sony A.L**, National Law University, New Delhi, India

Paper initially focuses on concept of web services & then shows Cloud Computing is a paradigm shift in the field of Computing It consist set of technology and service models that concentrates on the internet base use and delivery of IT applications, processing capability, storage and memory space. There is a shift from the traditional in-house servers and applications to the next generation of cloud computing applications. With many of the computer giants like Google, Microsoft, etc. entering into the cloud computing arena, there will be thousands of applications running on the cloud. Eventually this will lead to a multitude of standards, technologies and products being provided on the cloud. Consumers will need certain degrees of flexibility to use the cloud application/services of their choice and at the same time will need these applications/services to communicate with each other. This paper emphasizes cloud computing and provides a solution to achieve Interoperability, which is in the form of Web Services. The paper will also provide a Live Case Study where interoperability comes into play – Connecting Google App Engine and Microsoft Windows Azure Platform, two of the leading Cloud Platforms available today. Paper explores working of existing cloud solutions.

## 6. A Framework for Secure Cloud Computing

**Ahmed E. Youssef**, Dept. of Information Systems, King Saud University, Riyadh, 11543, KSA  
**Manal Alageel**, Dept. of Information Systems, King Saud University, Riyadh, 11543, KSA

This paper shows basic concepts of cloud computing. Cloud computing is one of the most discussed topics today in the field of information technology. It introduces a new Internet-based environment for on-demand, dynamic provision of reconfigurable computing resources. The biggest challenge in cloud computing is the security and privacy problems caused by its multi-tenancy nature and the outsourcing of infrastructure, sensitive data and critical applications. In this paper, we propose a framework that identifies security and privacy challenges in cloud computing. It highlights cloud-specific attacks and risks and clearly illustrates their mitigations and countermeasures. Paper also proposes a generic cloud computing security model that helps satisfy security and privacy requirements in the clouds and protect them against various vulnerabilities.

## 7. Cloud Databases: A Paradigm Shift in Databases

**Indu Arora**, Dept. of Comp. Sci. & Application, MCM DAV College for Women, Chandigarh  
**Dr. Anu Gupta**, Dept of Comp. Sc. & Application, Panjab University, Chandigarh

The goal of this paper is to review the state of the art in the cloud databases. Stand alone applications have been replaced with web-based applications, dedicated servers with multiple distributed servers and dedicated storage with network storage. Cloud computing has become a reality due to its lesser cost, scalability and pay-as-you-go model. It is one of the biggest changes in IT after the rise of World Wide Web. Cloud databases such as Big Table, Sherpa and SimpleDB are becoming popular. They address the limitations of existing relational databases related to scalability, ease of use and dynamic provisioning. Cloud databases are mainly used for data intensive applications such as data warehousing, data mining and business intelligence. These applications are read-intensive, scalable and elastic in nature. Transactional data management applications such as banking, airline reservation, online ecommerce and supply chain management applications are write intensive. Databases supporting such applications require ACID (Atomicity, Consistency, Isolation and Durability) properties, but these databases are difficult to deploy in the cloud.

## 8. Challenges Involved in Implementation of ERP on Demand Solution: Cloud Computing

**Dr. G.N. Purohit**, Banasthali University, Rajasthan, India Pin: 304022  
**Dr. M.P. Jaiswal**, Management Development Institute (MDI), Gurgaon, India, Pin : 122 007  
**Ms. Surabhi Pandey**, Army Inst. of Management & Tech. (AIMT), Greater Noida, U.P. , India

As the world is beginning towards the cloud where speed and scalability are critical; and the many software is taking over to one another even more intrinsic role in this period the Cloud ERP would play the vital role in organization specially in SME (i.e. Small Medium Enterprises). Organizations are increasingly seeking realizable benefits from their IT asset based investments. Due to this, a new deployment model of ERP Software has emerged in the Industry i.e. ERP on SaaS Model. Cloud computing is a set of services that provide infrastructure resources using internet media and data storage on a third party server (i.e. Datacenters). SMEs are said to be the lifeblood of any vibrant economy. They are known to be the silent drivers of a nation's economy. SMEs of India are one of the most aggressive adopters of ERP Packages. Most of the SMEs have adopted the traditional ERP Systems and have incurred a heavy cost while implementing these systems. This paper presents what are the challenges while implementing the ERP cloud on demand solution in an organization.

## 9. A Proposed Architecture of Cloud Computing for Education System in Bangladesh and the Impact on Current Education System

**Shahid Al Noor**, **Golam Mustafa**, **Shaiful Alam Chowdhury**, **Md. Zakir Hossain**, **Fariha Tasmin Jaigirdar**

This paper presents a comparative analysis of proposed architecture with the existing one to demonstrate the advantages of the proffered architecture over the current one. Proposed architecture is very basic and focuses on delivering small videos of lectures from cloud.

The architecture is designed for both online and offline usage. It covers only primary and secondary education. This paper also covers impact of its application on current education system.

#### **10. Media Cloud: An Open Cloud Computing Middleware for Content Management**

**Daniel Díaz-Sánchez**, *Member*, IEEE, Florina Almenarez, *Member*, IEEE, Andrés Marín, *Member*, IEEE

**Davide Proserpio**, *Member*, IEEE, and Patricia Arias Cabarcos, *Member*, IEEE

Cloud computing allows accessing resources across Internet transparently: requiring no expertise in, or control over the underlying infrastructure. There is an increasing interest in sharing media files with family and friends. However, some files are not designed for media distribution beyond the boundaries of a local network and manage media files through web applications can be tedious. To overcome this problem, this paper propose Media Cloud, a middleware for Set-top boxes for classifying, searching, and delivering media inside home network and across the cloud.

#### **11. PRIVATE CLOUD INITIATIVES USING BIOINFORMATICS RESOURCES AND APPLICATIONS FACILITY (BRAAF)**

**Bhagyashri Pathak, Rajesh SR, Sankalp Jain, Amit Saxena, Rashmi Mahajan & Rajendra Joshi**

In this paper summarize implementation of a virtualized private cloud environment using Eucalyptus. The bioinformatics research community has a demand of enormous compute resources to run bioinformatics tools. Next generation sequencing technologies have further increased the overall demand for computational analysis. The traditional Cluster and Grid computing are having their own complexities to program and use while there is a silver-line in cloud for on-demand high-performance infrastructures with the advent of cloud computing era and its advantages. We have adopted the technology so that it can prove its mandate with more benefits to the community. We are able to bring out a private cloud which is a high end cluster facility dedicated for bioinformatics. Open source equivalents to prominent commercially available solutions are used as the cloud middle-ware stack. In this paper, Eucalyptus is shown as useful cloud tool for implementation.

#### **12. An architecture for integrated intelligence in urban management using cloud computing**

**Zaheer Khan, David Ludlow, Richard McClatchey and Ashiq Anjum**

This paper advocates the application of cloud technologies to support the information, communication and decision making needs of a wide variety of stakeholders in the complex business of the management of urban & regional development. With the emergence of new methodologies and technologies it has now become possible to manage large amounts of environmental sensing data & apply new integrated computing models to acquire information intelligence. The complexity is evident in the socio-economic and environmental interactions and impacts embodied in the concept of the urban-ecosystem. This highlights the need for more effective integrated environmental management systems. This paper offers a user-oriented approach to the specification of requirements for the effective management of urban areas and the potential contributions that can be supported by cloud computing & offers the opportunity for the cloud computing community to develop generic solutions. This paper proposes a model for SaaS for business Management in urban region.

#### **13. A study on the effectiveness of virtual lab in E-learning**

**Lavanya Rajendran, Ramachandran Veilumuthu, Divya.**

The research aims to identify the effectiveness of virtual lab in E-learning suite. The study aims to analyze the increase in learning skills and the understanding level of concepts by implementing virtual lab among school students in Chennai. The study also focuses on identifying whether the virtual lab helps the students to increase the self-paced learning. The research methods adopted are Survey and Experts Interview. The findings of the study shows that majority of the students are aware of the virtual labs and are highly appreciated by them. Students prefer computer assisted tools than the text books for learning purpose. The study suggests that the virtual labs have to be adopted in schools for making their students think out of the box.

**14. Investigation on Efficient Management of workflows in cloud computing Environment****M.Sudha**, Assist. Prof., School of IT & Engineering, VIT University Vellore, Tamil Nadu, India

Cloud computing is an on-demand service model often based on virtualization technique and this paper explores the use of cloud computing for scientific workflows, focusing on a widely used application. The approach is to evaluate from the point of view of a scientific workflow the tradeoffs between running in a local environment, if such is available, and running in a virtual environment via remote, wide-area network resource access. Our results show that a workflow with short job runtimes, the virtual environment can provide good compute time performance but it can suffer from resource scheduling delays and wide area communications.

**15. A Rule-based Approach for Effective Resource Provisioning in Hybrid Cloud Environment****Rajkamal Kaur Grewal & Pushendra Kumar Pateriya**

Computer Science, L P University, Phagwara, India

Resource provisioning is important issue in cloud computing and in the environment of heterogeneous clouds. The private cloud with confidentiality data configure according to users need. But the scalability of the private cloud limited. If the resources in private clouds are busy in fulfilling other requests then new request cannot be fulfilled. The new requests are kept in waiting queue to process later. It take lot of delay to fulfill these requests and costly. In this paper Rule Based Resource Manager proposed for the Hybrid environment, which increase the scalability of private cloud on-demand and reduce the cost. Also set the time for public cloud and private cloud to fulfill the request and provide the services in time. The Evaluated the performance of Resource Manager on the basis of resource utilization and cost in hybrid cloud environment is better with rule based approach.

**16. MULTI-DIMENSIONAL PASSWORD GENERATION TECHNIQUE FOR ACCESSING CLOUD SERVICES****Dinesha H.A.**, PES Institute of Technology, Bangalore, India**Dr.V.K. Agrawal**, PES Institute of Tech., Bangalore, India.

Cloud computing is drastically growing technology which provides an on-demand software, hardware, infrastructure and data storage as services. However, to utilize these services by intended customer, it is necessary to have strong password authentication. At present, cloud password authentication can be done in several ways, such as, textual password, graphical and 3D password. This paper proposed the strong password generation technique by considering multiple input parameters of cloud paradigm referred as a multidimensional password. This paper presents the multidimensional password generation technique along with architecture, sequence diagrams, algorithms and typical user interfaces. At the end, we derive the probability of breaking our authentication system.

**17. A Model for User Trust in Cloud Computing****Ahmad Rashidi, Naser Movahhedinia**, University of Isfahan, Isfahan, Iran

Cloud has proved to be a suitable choice for providing computing and storage resources especially for small and medium sized businesses in recent years. The “pay per usage” cost model, on demand computing, large scale storage resource with easy access, and freeing users from managing and maintaining resources are among the important factors that have made cloud an attractive choice for such services. The issue of low trust on cloud computing is an obstacle, one of the major obstacle to its pervasive deployment, particularly in case of critical data storage on the provider’s datacenter. This paper presents a model for trust in cloud computing, accounting for important elements which shape the users trust and a way of evaluating each element’s importance.

**18. Intensification Of Educational Cloud Computing And Crisis Of Data Security In Public Clouds****P.Shanthi Bala**, Lecturer, Pondicherry University, Podicherry.

This paper explores Cloud computing as an emerging technology that access remote servers through Internet to maintain data and applications. It incorporates the advantages of grid and utility computing.

This paper expresses the importance of cloud computing and various security crisis related to data management. It also includes various tools for developing cloud computing and services performed by cloud computing with their key components. The cloud is a virtualization of resources that maintains and manages itself. Furthermore, it deals about how the user can securely access data, resources and services to fulfill their dynamically changing needs. In this paper, guidelines to develop cloud computing for education are provided.

### CONCLUSION:

After this review, it is clear that huge research is going on cloud computing and its applications in various sectors. For new researchers application of cloud computing in Service Industry like Insurance, Education, Urban or rural information transfer etc. are the fields for developing a cloud based models to cater the need of society.

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