

Usage & Issues of Cloud Computing Techniques in Small & medium Business Organizations

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Abstract— This paper presents the review work of Cloud Computing techniques in small and medium business organizations. The detail work of Trends and issues, Cloud computing: Challenges and future directions, Cloud Computing: Today and Tomorrow, Where are we at with Cloud Computing? A Descriptive Literature Review. Where are we at with Cloud Computing?, The Utility of Cloud Computing as a New Pricing – And Consumption - Model for Information Technology, Cloud Computing – Issues, Research and Implementations, Cloud Computing and Information Policy: Computing in a Policy Cloud? Journal of Information Technology & Politics, Cloud computing: state-of-the-art and research challenges, Implementation Issues of A Cloud Computing Platform, cloud computing, Special section: Federated resource management in grid and cloud are presented in this paper.

Index Terms— cloud computing, cloud Infrastructure, data centers, Information technology, information policy, security, utility and virtualization.

1 INTRODUCTION

During last five years the extensive work has been done in the for the usage of cloud computing techniques and issues related with this field.

In cloud computing large accessible computing resources are provided “as a service” to users on internet because it is “it is internet based system development”. It includes SaaS, web infrastructure, web and other technologies. Industry and research community are attracting towards it. In this paper construction and the problems that arise during the construction of cloud computing platform is explained. The compatible GFS file system is designed with many chunks of different sizes to help huge data processing. It also introduce implementation enhancements on map reduce to improve the output of system. Some issues are also discussed. The implementation of platform for some specific domain in cloud computing services, it also implement large web text mining as final application. [1]

Cloud computing is a new model for delivering and hosting services on the internet. Cloud computing eliminates the user requirements to plan for provisioning, that is why it is attractive for the business community. It has the ability that it can be started from very small scale and can be increased as the resourced increases. Cloud computing provides many opportunities for IT industry for still there are many issues relate to it. In this paper cloud computing is defined and the key concepts, state of art implementation and architectural principles

are highlighted. This paper provides better understandability of challenges related to design of cloud computing. [2]

Data, operating system and applications related to computer are typically stored and installed in the traditional computing environment. Individuals and businesses work by using applications and stored data and the shared machines are maintained in a web based environment in a cloud computing environment. The movement of application services on internet and the use of internet access provide wide variety of services. This is all explained by Lew Tucker, Vice President and Chief Technology Officer of cloud computing at Sun Microsystems. A growing interdependent is created by using cloud services in public as well as private sector. [3]

For research cloud computing is an exciting area because of its exploding growth and relative originality. Last year a lot of research has been conducted on cloud computing. There are four main categories that are classified in this article: business issues, applications, technical issues and general. Cloud computing research is slanted towards many technological issues like network, performance and data management. Many new research themes related to organizational and social implications are emerging in cloud computing. [4]

Cloud computing is a new path in computer science. It produces great results in distributed computing, networking, utility computing and virtualization. Cloud computing involves an architecture that is service oriented through offering platforms and software as services. It also offers reduced overhead in information technology for the users. It also provides reduces ownership total cost, great flexibility, services on demand and others. [5]

A computing platform that exists in large data center is cloud computing. Cloud computing is dynamically able to provide servers the ability to address wide range of needs in almost every field. Many problems are involved to deliver cloud computing resources if they were utilities like electricity, privacy issues, security, and access, regulations, reliability and

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information policy. In this article cloud computing nature and potential, policy, cloud computing research questions, policy issues are explored. Policy issues with respect to cloud computing are examined as public policy that responds to technological evolution. [6]

Cloud computing and grid provides a significant benefits in federated management. These are (i) to meet SLA compliance the resource provider's ability to improve. [13] It is improved by optimizing service placement and output according to QoS of users need. (ii) It enhances the handling of peak-load and expansion capacity of dynamic system of every cloud domain through federation. There is no need to new hardware or new software for each location. (iii) The only failure is natural disasters and the system is maintained regularly. The system can be easily migrated to new domain, this will avoid SLA violation. Federated management ensures business continuity and also enhances the reliability of participating resource providers. [7]

Cloud computing builds for the following purposes: distributed computing, virtualization, utility computing and recent web services, networking and software services. A service base architecture, for end user reduced overhead of technology, ownership total reduces cost, services on-demand, great flexibility and many other things are involved in cloud computing. In this paper some of the concepts of cloud computing, issues related to it are discussed. [9]

Cloud computing has become a key IT exhortation during last few years. Cloud computing is called as cloud computing vendors and report on issued and services by bloggers and trade press. Cloud computing in terms of market adoption is in the beginning stage. Cloud computing is a megatrend that will flourish. The adoption issues, status and definition are discussed in this article. It also provide glimpse of discussion on technical issues and future that may addressed. [10]

In this paper cloud computing concepts, its impact on IT will be discussed. It starts with what is cloud computing and how it is rapidly evolved and how it has taken control on everyday lives. Cloud computing has also become a demand with other services like electricity and telephony that are utilities. What are the challenges that traditional model face for pricing and obtaining information technology. [11]

2 STRUCTURAL DISCUSSION AND ANALYSIS

- 1) **Choo, K.-K. R. (2010, october). trends and issues. *Cloud computing: Challenges and future directions* , p. 6.**

Data and applications are stored and installed traditionally in the computing environment in computer OS. The data and applications or data that are used for business purpose and by

individuals in cloud computing are typically shared on another machine and is also maintained by shared machine. It is not physically present in user's home or business environment. Cloud services are made by Infrastructure as a Service (IaaS). In IaaS clients can access storage, server hardware, bandwidth and other basic computing resources. It's architecture is designed in such a way in cloud computing environment (CCE) high speed performance is provided to clients so that in high work load there will be no impact on the system performance. Cloud computing is reasonable to small and medium business because they do not have human resources and finance to invest in infrastructure of IT and it provides potential and economy of scale. Amazing EC2 services are examined by computer scientists' team from San Diego, University of California and Massachusetts Institute of Technology. Internal Cloud infrastructure is possible to atlas. Identify where to place a specific target VM and then continue with the new VMs unless target takes its proper place. It helps the researchers to load there software on targeted website that is present on host's server. There is a flaw in this service is that if target VMs is identified by attackers then the cache can be monitored by them and they can easily steal any data from physical machine that is shared by many. This attack is called side channel attack. Lot of attackers attacks the shared data in CCE. The architecture of CPU caches, Disk Partitions and many shared elements was not designed for compartmentalization. This may cause attackers to have unauthorized access to client data.

- 2) **Won Kim, S. S. (2009). Cloud Computing: Today and Tomorrow. *JOURNAL OF OBJECT TECHNOLOGY* , 8.**

There are many main modules in cloud architecture: system resource management (SRM) module with catalog of services, user interface and module of resource provisioning. Complex network of servers that is operating in parallel is managed by SRM. To allocate and deallocate resources of computer SRM often uses virtualization techniques. Managed service is trying to deliver any application directly to enterprise instead of giving it to end user. Many services are provided by them such as email scanning for virus services using internet, service of spam filtering, security services. They include security, availability, support, compliance and interoperability. Compliance is relevant to business. On premises computers users have the same concerns. The user is more conscious in cloud computing because the data and other computer resources are not under the control of user. The user need to gather data from different clouds because he is getting services from many cloud service providers. This is called cloud integration service and it is bringing out new structures of cloud computing services. Different technologies will influence by integration technology such as EAI, EII, ESB. In the field of instant messaging and chat it will need a further research with respect to cloud computing system. Phone calling by internet is added to many popular applications.

3) Haibo Yang, M. T. (2009). Where are we at with Cloud Computing?: A Descriptive Literature Review. *Where are we at with Cloud Computing?*, (p. 13). Melbourne.

For research cloud computing is stimulating area because of its originality and report growth. There are four main categories on the basis of which articles are classified. These are business issues, technological issues, applications and general. Cloud computing organizational and social implications are emerging using new themes of research. With respect to Grid computing evolution the cloud computing is considered to some degree. Using scientific purposes grid framework is driven. It also coordinates resources that has no centralized control, general purpose protocols, open and interfaces. For general services and commercial purposes cloud computing is used. Cloud computing is based on centers that has centralized data. The interfaces and protocols are different around clouds providers.

4) Wyld, D. C. (2009). THE UTILITY OF CLOUD COMPUTING AS A NEW PRICING - AND CONSUMPTION - MODEL FOR INFORMATION TECHNOLOGY. *International Journal of Database Management Systems (IJDMS)* , 20.

In computing anything which is done whether it is on individual PC or business data center, from communicating to sharing or storing data using email to work together on documents or munch numbers on huge data sets. These all can be shifted to cloud computing. Cloud computing allows the users to communicate with one another and also with the main system. This decreases the interaction of the system with the original layers of stack of technology. This is also the characteristics of cloud computing. Cloud computing proposal describes that, "The key characteristics of the cloud are the ability to scale and provision computing power dynamically in a cost efficient way and the ability of the consumer (end user, organization or IT staff) to make the most of that power without having to manage the underlying complexity of the technology". By moving computing fifth utility it should be moved to cloud model. People believe that they are in middle of major transformation for centralized cloud computing. Jackson notified that there is a lot of confusion between personalized and centralized computing. Centralized platform held data, programs and computing power. It also happens that power resides on personal desktop. In computing horizontal model it is very important to discriminate between software, support services, hardware, and networking. To see how organizations are increasing the cloud computing is shifted "turning to new technologies to cut costs, rather than cutting back on their technology uptake".

Table 1: User Level, Developer Level, IT Level

Level	Label	Description
User level	SaaS "Software as a Service"	Companies host applications in the cloud that many users access through Internet connections. The service being sold or offered is a complete end-user application.
Developer Level	PaaS "Platform as a Service"	Developers can design, build, and test Applications that run on the cloud provider's infrastructure and then deliver those applications to end-users from the provider's servers.
IT Level	IaaS "Infrastructure as a Service"	System administrators obtain general processing, storage, database management and other resources and applications through the network and pay only for gets used.

5) Vouk, M. A. (2008). Cloud Computing - Issues, Research and Implementations. *Journal of Computing and Information Technology* , 12.

Cloud computing is holding a cyber infrastructure. It takes a decade to build research in distributed computing, utility computing, virtualization, networking, and web, software services and grid computing. It involves the service based architecture. It reduces the overhead for information technology for end user. It provides flexibility and reduced total ownership cost. It also provides services on demand and also provides many other things. Using service oriented architecture (SOA), the powerful fundamental and possible concept is computing. The delivery of organize and integrated function collection to end user is made possible through the composition of tightly and loosely coupled function and services. It is often network based. All the concepts that are related to cloud computing are component based systems engineering. It is collection of many different services that shows the virtualization and workflows.

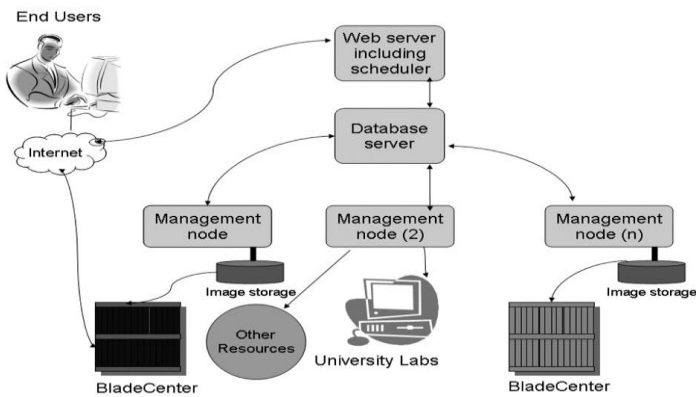


Fig 1: NC State "Cloud"

The end user in SOA environment requests the IT services when he required the desired functions, capacity level and quality and he receive it at the same time or when the services are available for him at later time. Service reliability, brokering and discovery are important. The services are designed to operate and are composite made f these services. In few years it is expected that service based solutions for information delivery. The major part of SOA framework that helps to support workflow is services componentization. It is an ability to support coupling range between building blocks framework, how much the system is fault tolerant in the data processing and it also has the ability to audit the processes, results and data. Virtualization allows isolation and abstraction of functionalities that of lower level and the underlying hardware. This allows the portability of functions that are of high level and allow sharing of physical resources.

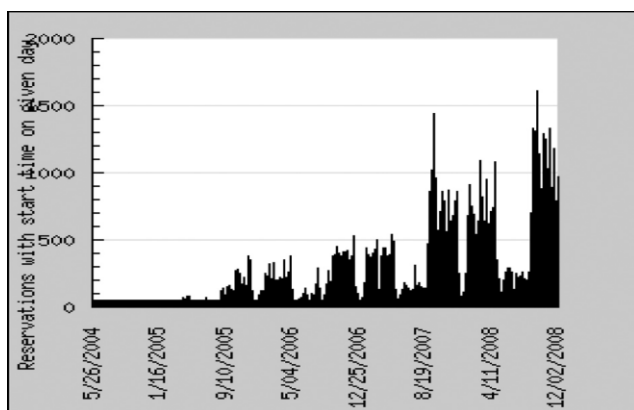


Fig 2: reservations

6) Paul T. Jaeger, J. L. (2008). Cloud Computing and Information Policy: Computing in a Policy Cloud? *Journal of Information Technology & Politics* , 17.

Cloud computing is a computing platform which dynamically configure, reconfigure and provide servers to deal with the needs of user. This need ranges from e-commerce to scientific research. Cloud computing is rapidly growing. There are

many policy issues related to cloud computing. Cloud computing is mostly used in commercial enterprise but there is a lack of policies and many other problems related to cloud computing. Cloud computing resides at different junction of new information policy and computing concepts. Cloud computing raise major issues like security, telecommunications capacity, reliability, existing laws, privacy and liabilities. This situation is analytical of a growing problem in which technology so far outpaces information policy that the developers and users of an important new technology create, implement, and use it, hoping that the law will ultimately catch up to their activities. In this article origin of cloud computing and nature and technical characteristics and benefits of users are discussed. The policy issues of cloud computing are discussed with policy gaps. This article also describes the policies of how to facilitate to develop the cloud computing for the benefit of corporate, individuals and government computer users.

All type users may be less comfortable with both providers and third party monitoring or the information used by them. The goal of these methods is to establish the cloud computing environment that is acceptable

- Basic thresholds for reliability
- Assignment of liability for loss or other violation of the data
- Expectations for data security
- Protections of privacy
- Any potential expectations for anonymity
- Access and usage rights
- International standardization to promote transformed data flows in clouds

7) Boutaba, Q. Z. (2010). Cloud computing: state-of-the-art and research challenges. *J Internet Serv Appl* , 12.

Cloud computing is not a new technology and that is why there are different perceptions of it. To run different businesses in many ways there are many operation models technologies. Virtualization and utility based pricing is not a new technology with respect to cloud computing. These technologies are used to meet economic requirements and demands. Grid computing is distributed computing model that organized network resources to attain common computational objectives. Cloud applications are present on application layer in the highest level of hierarchy. To achieve better availability, lower operating cost and performance cloud computing control automatic scaling feature. The resources are provided as services to public by service providers in the cloud. This cloud is known as internal cloud. Private clouds are made for single organizations to use. Hybrid cloud is the combination of private and public cloud models that tries to deal with limitations of each approach. A hybrid cloud is more flexible than private and public clouds.

8) Bo Peng, B. C. (2009). Implementation Issues of A Cloud Computing Platform. IEEE , 8.

In this article implementation and components of cloud computing platform are introduced. The name of that platform is Tplatform. Tplatform consists of three layers PC cluster, data processing application layer and infrastructure for cloud computing platform. PC cluster provides storage devices and hardware for large scale data processing. Application layer provides services to users and the users can develop their own applications like web data analysis, cluster, processing and classification. The second layer consists of file system TFS, distributed data storage mechanism big table and map Reduce programming model. In TFS files are divided into chunks of variable size. Each chunk is identified by an absolute and globally unique 64 bit chunk handle assigned by master when the chunk is being created. Chunks are stored on local disk by chunk servers. Chunk servers also specify the read and write chunk data specified by chunk handle and byte range. Each chunk is replicated to multiple chunk servers for reliability of data. Three replicas are maintained in the system by default. Different replication levels can be assigned by users for different files. The metadata of file system is maintained by master. This maintenance includes the access control information, chunk current location, namespace and mapping from files to chunks.

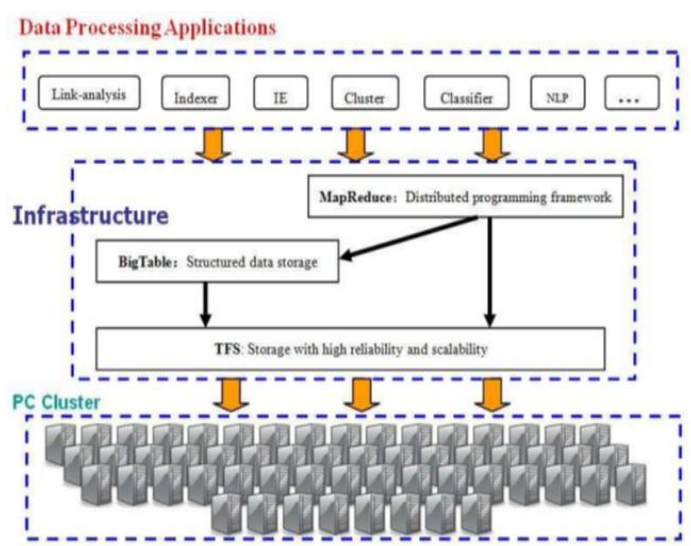


Fig 3: shows the overall system framework of the "Tplatform"

Different file operations are designed for TFS such as read, append, record and write. In reduce stage data transfer between participatory nodes can be made schedulable instead of

uncontrolled. To avoid network congestions that degrade performance, the new mechanism can be used. Local data can be effectively serialized in map for data access and reduce functions which most probably improve performance in some cases.

9) Mirzaei, N. (2008). cloud computing. 12.

In style computing system the users are allowed to access services that are technology enabled internet facility. These IT related capabilities are given in the form of "as a service". This internet facility is cloud computing. These are implemented without knowing the control over, knowledge and technology infrastructure. On clouds the first service is email. The number of clouds platform increases because the computing industry is shifting to Platform as a service (PaaS), and software as a Service (SaaS). These platforms are used for enterprises and consumers. To consider IT assets as service components and to establish software architectural approach to build those applications that are related to business are offered by service oriented architecture (SOA). SOA approach is based on creating standalone, task specific reusable software parts that perform some function and that are available as services.

To shift to cloud computing from the programs that are installed locally is a big task. The shrink wrap software's are still governing the market and will not disappear in near future but the use of cloud computing is still increasing. Large fractions of computing activities are migrating from desktop and organization server. This change will influence computational system of all levels from users to IT manager, software developers and hardware manufacturers. This will cause reduce cost, increased storage capacity, highly automated, more reliable and allows IT to shift focus.

Services from cloud are used by ordinary people and they do not change it. The academia is developing its own cloud upon the current cyber infrastructure. In cloud environment the present grid middleware can be organized. In image distances the grid services are running. From a single image the work of multiple agents are generating. In industry cloud computing has a great influence. Virtual datacenters are used by many enterprises to facilitate infrastructure.

10) Rajkumar Buyya, R. R. (2010). Special section: Federated resource management in grid and cloud. elsevier , 3.

The grids and clouds that are distributed administratively by federated management offer many benefits such as (i) To meet SLA compliance the ability of resource providers improves for clients. (ii) It also offers improved services by optimizing the service placement and throughput according to users need. (iii) It enhances the handling of peak load and the dynamic

system expansion capacity of each grid or cloud domain through federation. There is no need to install a new software and hardware infrastructure.(iv) The system is very much adaptive to failure which includes maintenances of system on regular basis and natural disasters, so it will avoid SLA infringement and resulting penalties.Federated management enhances reliability of those resource providers that are participating and ensures business continuity. In decentralized distributed system that is on large scale the major performance issue is grid. Another issue is that how to make it sure that the within in estimated times the jobs finish execution when the resource performance fluctuations are present. Some older techniques such as reservation, migration and rescheduling has been adopted to resolve the issue. From clouds taking additional resources is good alternative instead of using these old techniques, because in clouds the resources are more reliable than those in grid. In cloud workflow, applications large amount of data is stored in distributed data centers. Data manager must wisely select to store data which data center is used. Some of the stored data does not have fixed location. To move large amount of data that is located in different data centers is very difficult. For accounting and usage tracking in overlapping and federated grid environment the shares logging is an important problem. This problem can be solved by using three usage scenarios of I) Mutual cross grid resource utilization II) Federated cloud computing infrastructures III) Hierarchical grid

3 CONCLUSION AND FUTURE WORK

In that work author choo concluded that for future work to find ways to alleviate existing and new security problems in cloud computing need more research. In near future a shift will be developed for "security as a service" to compete with new security threats scenarios at public and private level. The IT infrastructure virtualization is also done. To improve these new issues and threats related to security need improvements. This is said by a team of researchers from Xerox's PARC and Fujitsu Laborites of America. The new architecture is designed that understand privacy leaks, guarantee availability and perform authentication. The example is: the data in encrypted form is stored ensures data confidentiality. This prevents cloud service providers from executing services.

In that work author Won kim concluded definition, forms of cloud computing and major advantages are mentioned. Adoption status and issues related to them are discussed. Due to its many advantages cloud computing will become a major paradigm in next few years. It is providing many facilities to small and medium businesses to offer new services.

In that work author Haibo Yang concluded that Cloud computing in nature is basically industry driven. Many professional articles hold this phenomenon. Advancements in this direction show the technological components of cloud computing and lessens the confusion. IS researchers can help the enterprises in decision making for the adoption of cloud computing. This

paper provides description about state-of-the-art. Paper descriptive review provides reference and snapshot for academics, business organizations and practitioners who are interested in cloud computing.

In that work author Wyld concluded that Computing resources and centralization of resources is represented by cloud computing. It is easy to handle centralized resources by corporations. It is said that in near future there will be fewer mega computers present and single "Planetary computer" that anyone can use. We are moving towards "worldwide computers". Some companies are both users and providers of cloud services. They manage to fulfill the requirements of users.

In that work author Vouk concluded that a lot of research is being done in cloud computing related to distributed computing, virtualization, networking, web services, software services and utility computing. It indicates a service oriented architecture, great flexibility, on demand service, IT overhead for users and ownership reduced cost. In this paper concepts of cloud computing and issues related to it is mentioned. VLC technology is better for construction of cloud framework.

In that work author Paul concluded that many questions related to policy are presented and issues related to cloud computing. It also focuses on the widening gaps between capacity of technology and focus of policy. Cloud computing completes its cycle toward centralizes source. According to the factors of economics of scale, network effect, path dependency and first mover advantage, the cloud computing providers are supported by this. The first mover advantage is given to those who develop the platform first and that would also be supported by network effect.

In that work author Boutana concluded that to deliver and manage the services over the internet cloud computing is and exciting paradigm. The landscape of IT is changing due to cloud computing and turning the utility computing into reality. Current technologies are not able to realize the full potential of cloud computing. There are many challenges in this domain including power management, security management and automatic resource provisioning. There are still many opportunities for researchers to improve cloud computing. In this paper state-of-art of cloud computing, architecture and prominent characteristics are described.

In that work author Bo Peng concluded that to follow Google model cloud computing Tplatform is designed. There are many issues related to this work like chunk size of file is variable and not fixed. Data transfer between participatory nodes is decreased to made "schedulable" not "uncontrolled". The native type data is taken as serialized for data access. The completed parts of this Tplatform are already in use. Many applications have shown the advantages and feasibility of this platform. The source code is also available. [12]

In that work author Mirzae concluded that Cloud computing is the emerging paradigm. Many big companies are develop-

ing their own cloud computing versions. But still the security is the big issue. The question is what will happen if smaller companies start offering cloud computing services and do not use it?

In that work author Rajkumar concluded that there are many issues related to fault tolerance, network congestion and scalability. To solve them highly scalable resource discovery approach is used. The advantage of this approach is to provide efficient proximity searching, in built tolerance and robustness and also low network overhead.

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