

# Improving Efficiency of Cloud Applications in High End Cluster Computing

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**Abstract**—the cluster computing is much utilized as a part of our day by day programming life. Figuring changes from centralized server PCs to customer server foundation and cluster computing covers from framework registering, Banking processing, utility figuring and autonomic figuring into a propelled organization stage. Cluster framework depend on the cloud utilization. Hardware resources have play major role to reduce the delay factor. delay factor reduces when cluster available on less security mechanism or trusted platform.

**Index Terms**—Cloud Applications, Cluster Computing, VPN, Data Handling, Load Balancing, Security, Delay Factor

## 1. INTRODUCTION

All now advance idea of cluster computing has been seen in recent years. An extensive variety of VPN's such as computational stages, computational force, application and Capacity has been given to clients by means of web services.

Information in cloud can be in two structures, which are travel (when information is going along system from cloud and client) and rest (when information is spared at cloud) [2]. Substantial scale registering situations, mists are ready to a boundless gathering of some same manufacture devices. Cloud application access and circulated cluster comprising in an arrange hardware devices and use hypervisor layer powerfully open source bound together registering assets [1].

Time sharing mechanism was used by mainframe machines for proficient utilization of computing resources and their acceptable performance, in early 1960s. Of course, it was much difficult to scale and upgrade the hardware due to high costs [1]. Although single user doesn't have any control over the best performance and utilization of mainframe resources. It depends upon how many users are connected with machine at once. But as the personal computers introduced in the market the users love to have full control on all the resources of the machine, even if they are not able to utilize it effectively and efficiently.

Rest of the problem that when a software application works under some restrictions and followed by some protocol and the data layer may support but TCP/IP supports data transmission to another, some of security engineers plan to secure the transmission under public network. this technique is use worldwide known as VPN solution. All of above discussion a delay is recorded. The delay not the same at all time. As already identified my problem and my research question, it is now important to match the design and methods with the problem statement and the research questions, in other words, a research strategy.

Enterprises have been working to minimize computing costs, due to this the start of combination their IT works and adopting the load balancing technologies. For this purpose, a new

technology helps the enterprises is called Cluster Computing [9]. Cluster computing technology claims that by using this technology enterprises can divide their infrastructure, reduce administration and improving utilization of resources [7].

Inquiry is a procedure of neural systems development. There are two principal approaches. The first is to begin with a basic system and add additional hubs to the system until such an option does not enhance the system execution [5]. The second approach is to begin with a vast system and erase hubs from the system the length of the cancellation does not fall apart the system execution (regularly alluded to as the hub pruning technique) [11].

The first thing is considering in this research work. The research questions could be identified with three purposes as explanatory, descriptive or exploratory. The "what" questions leads to exploratory studies and "how" and "why" questions lead to explanatory studies. As question is to find the answer of what are the benefits and drawbacks of Cloud Computing and the factors that push the enterprises to shift to Cloud Computing technology [8][2]. The phenomena, Cloud Computing, information systems in enterprises, cost effect, security effect and how they affect the enterprises. This is the basic constructs, thus it answered to the questions and gathered as much data as possible. This is why the question began by "what" [2]. Also, intended to get the answer of how the Cloud Computing works, so this lead to exploratory study. Therefore, my question was both exploratory and this lead to case study approach. Along with that, as there is no control over behavioral events and wanted to focus on contemporary events [6].

## 2. CLUSTER COMPUTING

Introduced the vision, challenges also, structural components of administration level agreement oriented asset administration. The design underpins combination of business sector based provisioning approaches and virtualization innovations for adaptable portion of assets to applications. The execution results gotten from the working model framework demonstrates the possibility and viability of administration level agreement based provisioning in cloud frameworks [2].

developed an asset planning methodology in view of hereditary calculation to create best load balancing and lessens dynamic movement. To quantify the general burden adjusting impact of the calculation a normal burden separation strategy is presented. The technique takes care of the issues of burden unevenness and high relocation a great many framework virtual machine being planned [5].

Developed a work to start smart information reuse and work processing techniques to overcome the less booking time, lining, execution also, information links [8]. Using this methodology, critical enhancements in the general processing reversal time of a work process can be accomplished. This is assessed utilizing CMS Tier-0 (Cluster Computing) information handling work process and after that in can be monitor in server administration. Developed an errand booking advancement for the distributed computing framework in view of Fuzzy GA which settles on a planning choice by assessing the whole gathering of errand in work line. The fuzzy sets were demonstrated to lose planning parameters furthermore to speak to fulfillment evaluations of every goal. GA with different segments is created the diagram for errand level of implementation in cloud. To getting a better result processing time is high and the running of application regarding to request is less time to access on the cloud platform. This approach is the best approach to overcome the execute applications by the [7].

The security issues related to cloud computing in Map Reduced, Hadoop and Big Data environment. Cloud computing has a vital role in today's modern business industries [11]. They mainly discuss security issues related to network security, application security, middleware security and data security. They discuss mainly security issues and their possible solutions related to Hadoop distributed file system. Cloud computing has big security challenge is that the owner does not have adequate control on his data. His data is placed in unsecured environment; any malicious user can gain access to this data. Different solutions are developed to handle large amount of data. Google has developed the Map Reduced framework for handling large amount of data. Apache has developed Hadoop distributed file system using Google's open source Map reduces. Hadoop gives adequate control our large data but still security is great challenge. The author discusses the Big data and their properties. Big data is massive amount of data stored in structured and unstructured way. It is very difficult to handle Big data using ordinary databases and software technologies. Big data has characteristics like volume, variety, validity, complexity and velocity. The examples of Big data are handling of Credit card transactions worldwide, Facebook user's transactions etc. The discussed different Big Data handling frameworks and software's like Hadoop, MapReduce and Hadoop distributed file system. Hadoop is developed by Apache software foundation, it supports large amount of data handling. Hadoop cluster works on Master and Slave model. They developed some solutions to increase Cloud security. These include Network Encryption, File encryption, Logging, Nodes authentication and Layered framework to ensure secure cloud environment.

Delivering in their research that the utilization of cloud application assets for a class of versatile applications, where

cluster at high end does not participate in calculation which is required with settled time frame furthermore, asset spending plan the earlier work on enhancing the outline technique in distributed computing is audited. The versatile applications are augmented with Nature of Administrator extremely correctly and by progressively differing the versatile parameters the estimation of utilization particular advantage capacity is acquired. A multi-info multi-yield criticism control model based element asset provisioning calculation is created that embraces support figuring out how to modify versatile parameters to ensure the ideal application advantages inside the time requirements [12].

Explaining the wireless network vulnerability, threat and different security attack and their countermeasures. Security of wireless network is not just password enabling its properly placement of devices and then their configuration with strong passwords that should be changed on regular basis and the security policies and standards as mentioned which is really helpful for making home, office or any organization wireless transmission/ communication confidential over the air [16]. If a user or an organization implements a wireless network according to aforesaid technical measurement, then that organization can be avoiding the different types of network security threats and attacks. The infrastructure, architecture and components of WLAN and Ad hoc WLAN has been discussed in detail. Security threats, security vulnerabilities and security attacks are identifying and provide its possible solution to avoid or minimize the securities issues in wireless lan network. The usage of Firewall and its effect on network to avoid the security threat and ensure the network security discuss in detail. Wired Equivalent Privacy (WEP) Protocol, Wi-Fi Protected Access (WPA) protocol and Wi-Fi Protected Access 2 (WPA2) with IEEE standard for user authentication in wireless network [6].

### 3. METHODOLOGY

. The research strategy is the scientific method that helps answering the research questions. Firstly, observe an overall presentation of the strategy, with the research methods, the data collection analysis tools, investigating tools, ethics and so on. There are three conditions to choose any strategy experiment, survey, archival analysis. Below mention picture shows my work to overcome the delay factor of request.

The research aim to know the reason of why the cloud application having some delay in the transmission and my developed model is adopted? I have selected the Faisalabad all industry around 4000 companies registered in Faisalabad Chamber of Commerce and Industry.

Sampling is the process of selecting unit's. I has very huge population and very difficult to interviews and visits to the industry so I am selecting 5% of population as a sample

| City       | Total Industry | Percentage | Proportion Selected |
|------------|----------------|------------|---------------------|
| Faisalabad | 4000           | 5%         | 200                 |

| Question   | A   | B   | C   |
|--|-----|-----|-----|
| 1. Is cloud computing more effective, the biggest reason to move to cloud?   | 28  | 155 | 17  |
| 2. Which costing model are you using with cloud providers?   | 28  | 25  | 147 |
| 3. As you are big company, why didn't you go for   | 23  | 90  | 87  |
| 4. Do you see any issues in Cloud computing so far?  | 148 | 25  | 27  |
| 5. Are you aware with the delay factor involve in cloud?   | 40  | 158 | 2   |
| 6. High durability, high availability and fast access are provided in a bundle from many cloud providers but some applications don't them all. Did your application need them all? | 10  | 170 | 20  |
| 7. Your System administration has been well aware of cloud Technology about?   | 55  | 100 | 45  |
| 8. Have you implemented the security by in the enterprise?   | 0   | 60  | 140 |
| 9. What is Bandwidth used for data to travel?  | 0   | 0   | 200 |
| 10. What Security you use in Cloud?  | 155 | 20  | 25  |
| 11. What do you think are the benefits of cloud computing?   | 175 | 10  | 15  |
| 12. Are you satisfied with the cloud?  | 130 | 57  | 13  |

This research will conduct multiple case studies one in Hassan Limited (Cloud Computing user) and second in Multinet Pakistan (Pvt.) Limited (Cloud Computing provider) and will analyze the results on a specific framework or theory to check the benefits or drawbacks for enterprises adapting Cloud Computing in regards with cost, and data security. The reason to choose TEVTA, Best Exports and Hassan Group to conduct my case study because they are using Cloud Computing in their company. The reason not to choose more enterprises for the case study because of the lack of resources and difficult to find companies those are using cloud computing. Another reason to

choose Multinet was, because it is the well-known company that provides the cloud resources.

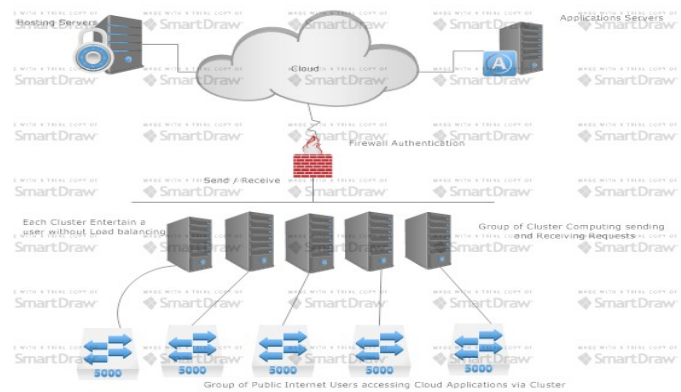


Figure: processing and accessing remote application

This method is developed model for processing and accessing remote application involving cluster block. For checking my developed model I have conduct survey. The population is all possible observations whether finite or infinite

Concerning the study, one of the first steps was to create a study protocol. The goal of a study protocol was to collect data from a single case or a single respondent. It showed step by step how the data was collected and helped anticipate problems. The study protocol included the context and the perspective of the specific study, the field procedure, and case study questions. It helped focus on the right questions related with the enterprise and their use of Cloud Computing, to get to right conclusions. I didn't want to get an answer on personal feelings about the way the information system of enterprise is working and about the usage of Cloud Computing in information system of the enterprise as my study is technical based so I focused on the real outcome of system rather than the feelings. This tool could be interpreted as a preparation for the data collection, but it was necessary for a guarantee of an accurate data collection. Moreover, I conducted interviews in my case study as interview helped me in getting the desired information. I gathered a great deal of information regarding my scope of Cloud Computing. An interview is a conversation that has a structure and a purpose [5]. There are four types of interviews structure: unstructured, structured, semi-structured and group interviews. The first three relate to how much control interviewer has on the conversation by following a predetermined set of questions, while the fourth consists of a small group which is guided by an interviewer who facilitates a discussion of a specified set of topics. To decide the most appropriate, approach the most important factors were evaluation goals, the questions to be addressed and the method of research adopted. If the goal was to gain an overall impression of a subject, then an informal, unstructured interview was often the best approach. However, if the goal was to get feedback about a specific issue then structured interview was better the data is analyzing and arrange in a tabular form with all possible outcomes. The data is calculating to percentage with this method

$$P = \frac{F}{N} \times 100$$

Where

P= Percentage  
F = Frequency  
N= Total Number

Chi-Square

Chi-square was applied to check the relationship between certain independent and dependent variables. The Chi-Square was calculated by this formula

$$\chi^2 = \sum \frac{(O - E)^2}{E}$$

Where

O = Observed values

E = Expected Values

#### 4. RESULTS AND DISCUSSION

The research is based on the Questioner that have two parts first is Performance Effect and the second is General. the results of questioner are mention in below table that shows the sample results from selected population.

Above mention Sample data is calculating to find whether my research is fulfilling the requirement

Chi-Square test is applied and Level of Significance is set to 0.05. Pearson Chi-Square Test = 4111.263, DF = 42, P-Value = 0.000. Likelihood Ratio Chi-Square = 4272.857, DF=42, P-Value = 0.000

According to the results there is a relation between Cloud Computing and Cluster Computing for factor of efficiency involved in Cloud Computing So, my developed model is applied and help full to remove some delay time.

The results, tackle the effects of Cluster computing with Cloud Computing in the enterprises. The specific areas I researched during my study were delay factor. I have found that Cloud Computing is a very hot topic now a day and many enterprises are interested in it and they improving their work they built cluster block. Most of the industry have no new idea about it but still there is confusion about the real definition of Cloud Computing over cluster computing. There is a confusion or disagreement about the boundaries of Cloud Computing as many organizations and even cloud services providers believe that cluster computing is a part of Cloud Computing. However, in my research I have found that Cloud Computing is the best with cluster computing and high end.

The organizations which are in the process of making a decision to adopt cluster computing in Cloud Computing environment as they hear positive suggestions from different sources. The first characteristic that tends organizations to think about Cloud Computing is efficient and reliable when we are working on a remote location. I have done a thorough research about efficiency of cloud application and then study about the

delay factor. There are many factors or characteristics which affect the speed of Cloud Computing for bigger size organizations like TEVTA Punjab. These factors include elasticity, flexibility, data center, pricing models and administration. The elasticity is the biggest factor to make Cloud Computing effective for enterprises and most of the enterprises move to cloud because of this characteristic of Cloud Computing. I have concluded that organization save their capital by not building their data servers. However, an important finding is that these benefits are only for medium sized or small organizations. The large industries can save their time by building big data center due their demand. In other words, cluster computing is the best approach in large enterprises.

#### 5. CONCLUSION

According to the results of research papers from various digital libraries about cloud computing work and cluster computing, there are many authors briefly described the issues of cloud computing and little touch of delay factor in their research. Cloud computing platforms, cloud application providers, cloud implementation techniques. Cluster computer is a distributed or we can say that some kind of load balancing technique of our task. Cluster is a collection of computers who works simultaneously on a single task this method is drive from supercomputing in bell laboratories. Internet encryption techniques, cloud structure, cloud security issue and how to solve these issues, cloud accessing techniques is mentioned.

#### ACKNOWLEDGMENT

The developed model may be enhancing and deploy on data centers.

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