International Journal of Multidisciplinary Research and Development

Volume: 2, Issue: 10, 518-521
Oct 2015
www.allsubjectjournal.com
e-ISSN: 2349-4182
p-ISSN: 2349-5979
Impact Factor: 5.742

**Subir Saha**
Department of Computer Science and Engineering, Pabna University of Science and Technology
Pabna 6600, Bangladesh.

**Tonmoy Ghosh**
Department of Electrical and Electronic Engineering, Pabna University of Science and Technology
Pabna 6600, Bangladesh.

**Sarfaraz Newaz**
Department of Computer Science and Engineering, Bangladesh University of Engineering and Technology
Dhaka 1000, Bangladesh.

**Correspondence**
**Subir Saha**
Department of Computer Science and Engineering, Pabna University of Science and Technology
Pabna 6600, Bangladesh.

# Use of cloud computing: Perspective of computer science and engineering laboratory

**Subir Saha, Tonmoy Ghosh, Sarfaraz Newaz**

**Abstract**
Cloud computing in education is a new area of research for the researcher. Technology is growing very fast. To cope with technology is very important for the teachers and students. It is not only important for engineering students but also important for the students of different section of interest (e.g: science, arts, commerce). Laboratory works is a mandatory task for the engineering students. In laboratory work they are to handle different types of data. Dealing with different types of data is very important specifically for the students of Computer Science and Engineering (CSE). Though CSE works with variety of data and instruments for example the researcher of bioinformatics section works with DNA, RNA, Protein etc data on the other hand researcher of graph theory section works with various types of real and simulated network data; the researcher of image processing section works with different types image data. So, as the section varies the type of data use are being different. But all of them use some same type's technique like mining, data manipulation, data aggression. On the other hand some of the section may use hybrid type data like the researcher of graph theory may use DNA data for graph coloring or image data may be used by the researcher of bioinformatics the other research filed of CSE are also inter related by some means. In this paper we propose a new and innovative model where using cloud data as a tool of research among various section of researcher in the department of CSE.

**Keywords**: Cloud Computing; Information Technology; Education Chain; Data Integration; Internet Security; Dead lock

## Introduction
Cloud computing is a new technology introduced by Google in 2007. After the inclusion of cloud computing research grasp it as an aided technology and integrated it to their research. The use of cloud computing technique in higher studies is also an emerging era of invention. The developing countries are now using various techniques to make secured, easy, cost effective and efficient method in their research laboratory [1]. Cloud computing is one of the technique in which numerous data can be used by the same research group. In case of using data from a source, data must communicate in such a way that data must be stored to the researcher in a safe and secured manner. On the other hand the researcher who is using data is not manipulated by the other user. So, in the research we are to work with multiple data communication technique is very important [2]. Data are being outsourced from various sources. If in the research group comprise with three or four different sections work together with same data produced by them means data of one research group is need by the another research group or if they need same data from a cloud source then outsource is must. There are many obstacles in data outsourcing in cloud computing technique first business continuity and service availability; to maintain a cloud is costly, if a cloud is formed for business purpose then it must have some valuable aspects for the clients. The must have some clients and the number of clients must be increased by periodically in a certain period of time span. Assume a large data section service providers use multiple copy of same data section at a time though the data section service providers service so that failure by a single data holder will not take them off while using, we believe the only plausible solution to very high availability is multiple cloud computing providers and the service is very costly. Second, data lock-in; the data that we are using must a security systems. Assume some one use a training dataset for a particular experiment. The researcher wants to use the same dataset for the whole experiment. But the data outsourced from a cloud. If the cloud data changing while the running time of the experiment then it will produce unexpected results. To solve the problem it must be kept lock while using. But it is not very easy because the experiment can take a large span of time and for all the time the cloud is associated with the same researcher and it is very costly. There is a solution for the problem that when a user is associated with some data then first of all he/she has to download the whole data from the cloud

server and then use it also create a problem that if the data size is huge than the size of researcher storage size. To solve the problem cloud can classify the data by executing independent sequences and provide some sequence at a time to one user. And the rest sequences may be used by some other users. Third, Data confidentiality and data audit ability is also a problem for data outsourcing so data warehouse and cloud data are eagerly find the way to solve the problem. The solution of such problem is also very costly. But is can be minimized by taking some measures. First of all cloud only provide the requested data to the controller and controller works on it to send the user who is requested for data. Controller is associated with all clouds and any sorts of cloud only responds for controller's request. All clients must go through via a controller so that client cannot able to change the content of cloud. Because client are associated with controller and it's a one to one relationship. Similarly, audit ability is just added an extra one steps for outsourced data communication. Assume we have a media to access an operating system we think the media as an extra layer/step by which means we can stop the unwanted use from the user to cloud data. Such a new feature reinforces the cloud computing perspective of changing our focus from outsourced data to virtualized capabilities being provided. Fourth, is data transfer through bottleneck portion. This is a very common problem for working with clouds. Because cloud data is distributed in various machine and all the system is maintained by the remote system. So, transferring data from one machine to other machine or data transferring among machines is very important. While transferring we have to count the situation when large data is transmitted, the link speed must be taken into the account but to take the dedicated connection between two links is very costly so in the case of large data transmission any link can use some protocol in network, data link layer and physical layer. One of the protocols may be used in priority based scheduling. When a particular amount of data is requested then the link will follow priority of the data to pass in the network but it must be taken into the account that, for priority scheduling no data or connection link will go for dead lock. Fifth is Bugs in Large-Scale Distributed Systems. When there are many clouds of data associated with a single system like one research group of graph theory working with the data of bioinformatics, graph theory and image processing so, there need a huge scale of data integration and data manipulation. Large data integration is not only the challenging task for the clouds as well as the user network. There are also some other problems like Performance Unpredictability, Scalable Storage, Scaling Quickly, Reputation Fate Sharing, Software Licensing [3, 5, 6]. There is another aspect of cloud computing that we taken into account that cloud used as an e-Learning technique for upgrading the method of distance learning. In e-Learning we need huge data to transfer and consume for distance learning. The main concept used in e-Learning based on dataset and data model. If we are able to integrate an appropriate data model in remote server then it is easy to access data from cloud. It is very important for the people who are in remote area [4]. The initial cost of e-Learning is high but as the time goes it costs are stepping low. We re-use data when one system is closed. For example, a website use cloud data for distance learning of class five (standard five) in a certain remote area in Bangladesh. After the end of the program, the same cloud data is used for distance learning of class five (standard five) in another area. In the thesis we work on how CSE laboratory use data from different source and how we can make it more cost effective. In our research we try to integrate the cloud in same platform though any group associated with it are able to access data easily. We propose a model in which all clouds and research groups communicated through a same controller.

**Model Overview:** In this paper we introduce a model based on the various research groups in CSE, work on various types of data and they can also utilize the data and result from another group [Fig: 1]. First of all we divide our model in three types of entity like (I) cloud (II) research group (III) Controller. In our model cloud represents the data set from various fields. The homogenous data are in same cloud, the cloud may divide into sub clouds. For every types of cloud there is different entity, for example data of graph network are in same cloud network, data of bioinformatics are in different clouds [Fig: 2]. Clouds are associated with a system named controller. Cloud receives request bi-directionally from the controller and serve for the request through controller. This model describe research group don't like a single user. Because every user in a group may work with different sorts of data and they need to use different cloud at a time for this every research group are divided by many group member. If they work in same environment then the controller helps to account them in same group. On the other hand, when the member of a particular research group works with the same data of a member of another research group then it must be accounted as a different use to hold the data integrity constraints. So, in types of use we can divide the use in two types (a) different user in different research group request same types of cloud (b) user in same research group request data for different types of cloud (c) one research group want to access data of another research group. These three types of communication in our model are performed by a same platform, controller.

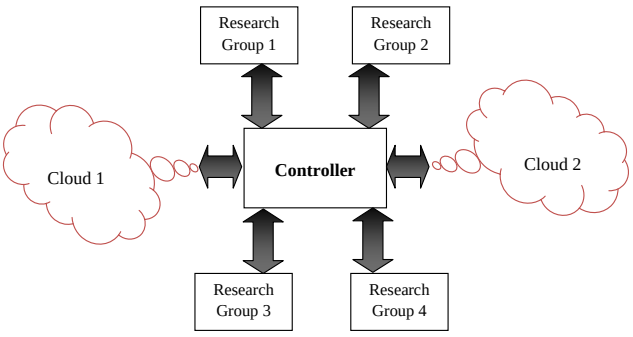


**Fig 1:** Proposed Model

Controller is associated with both section of research group and cloud. Controller communicated with each member of research group and each element of the cloud. Controller maintains a log file in which it holds the information of research group as well as the data access record performed by every user. Controller works with small data block in the cloud end. Small data block are the prime data unit in which cloud are being arranged.

**Model Efficiency:** Our designed model is working with a simple idea, but it is efficient in using. When large amount of cloud are used then it is very important to take into account that how efficiently it works. In our model we are able to stop using redundant data. For example, research group 1, want to access data from (I) research group 2, 3 and (II) cloud 1, 2. In the first case when research group 1 trying to access data from research group 2,3; in the conventional system research group 1 first try to make a connection with research group 2. If research group 2 is free then and it doesn't have any priority work then it accepts the connection of research group 1. In case of establishment of connection for research group 3 to 1 it also does the same. When data transferred from 2 to 1, research group 3 wait idle. It will not even running on its process because it is connected with group 1 and vice-versa. When it is time to stop transmission then it also use a three way handshake method for stopping data transmission. Apparently, it seems that it is very normal for multi-way transmission but it causes several serious erroneous problems. The conventional system may be in data deadlock situation discussed in above. In the example research group 1, 2 and 3 may cause circular dead lock and we know in case of dead lock system is being stopped in a particular condition and isn't go ahead. The system may cause data redundancy.

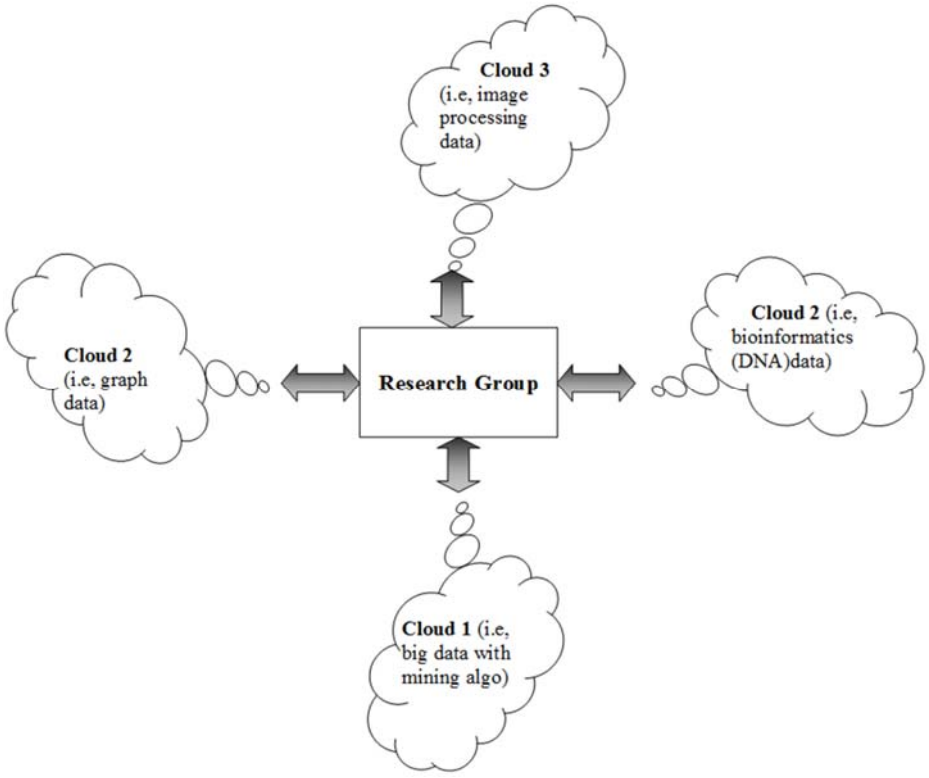


**Fig 1:** Proposed Model

When research group 1 want to communicate with research group 2 it uses three way handshakes and also use the same method for release connection; do the same for establishment of connection with research group 3 and vice-versa. Same types of authentication is used for all connection if we make it common through a controller then it will be easy to handle and huge number of same tasks is reduced we do the same in our proposed model. Data security is a very important part of cloud communication, in the conventional system though research group 1 has the access of data directly from research group 2 and 3 then there must arise a question of data security but in our proposed model we used some authentication technique thus we are able to hold data security very tightly. In the proposed model no research group are able to access data directly from any source. Any types of communication are maintained by a well-defined controller. The controller restricts any sorts of data mutation, data manipulation and data access. When research group 1 want to communicate with cloud 1 or/and 2 it also go through the above mentioned procedure. Additionally, In case of cloud huge size of data is transferred, in conventional system every entity use some buffer to transmit data, which is not cost efficient; but in our proposed model we use only a buffer in controller. Apparently it seems only one buffer may restrict the speed of data rate but actually when we re-use it for different user then it becomes speedy and on the other hand we use storage between the two hosts which makes it speedy.

**Future Work and Conclusion**

Cloud computing is becoming more and more popular in every practical world where outsourced data and instruments are used. In this paper we propose a model to efficient and effective the laboratory works among CSE students with data clouds. Our model only describe the research group in CSE based works, the same experiment also applicable for different laboratory with some modifications; our next target is to design a generic model in which any sort of data access through cloud is possible. The model is only developed for the unit of a group. But in many research; hybrid researcher (researcher from different field) work together for a particular experiments. In near future researcher should work on this. We propose a strong controller while connection establishment, release and data transmission. Controller is powerful in our description not in our model. The controller should be more calculative in our future experiment.

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