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ARTICLE

Representing Increasing Virtual Machine Security Strategy in Cloud Computing Computations

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ABSTRACT

This paper proposes algorithm for Increasing Virtual Machine Security Strategy in Cloud Computing computations. Imbalance between load and energy has been one of the disadvantages of old methods in providing server and hosting, so that if two virtual severs be active on a host and energy load be more on a host, it would allocated the energy of other hosts (virtual host) to itself to stay steady and this option usually leads to hardware overflow errors and users dissatisfaction. This problem has been removed in methods based on cloud processing but not perfectly, therefore, providing an algorithm not only will implement a suitable security background but also it will suitably divide energy consumption and load balancing among virtual severs. The proposed algorithm is compared with several previously proposed Security Strategy including SC-PSSF, PSSF and DEEAC. Comparisons show that the proposed method offers high performance computing, efficiency and consumes lower energy in the network.

1. Introduction

The concept of cloud computing dates back to 1961s. When Professor. John McCarthy one of the founders of AI[1] maintained that one day computing will be organized as a public industry. Then, Douglas F. Parkhill (1966) in his book "The Challenge of Computer Utility" mentioned items like the illusion of unlimited access, elastic computing, representing facilities as public industry privately, governmentally and associatively. But none of the terms used in 1961s, didn't mean the present concept of cloud and it was used verbally as public industry. The idea of galactic computer network or intergalactic computer network which is now called internet expressed in 1969 by J.C.R. Licklider and then it was developed and activated by The ARPANET[2] to let everyone have access to these programs and information throughout this network.

Cloud computing uses the sources at most and includes the highest benefit from the shared sources by server in its planning [1]. A cloud may be like an automation, website and even a Gmail and or it may be infrastructural and based on the rules that you have defined [2]. Previous studies have made so many attempts to defend against co-resident attack which they have proven the strategy of allocating virtual machine with the probability of reducing co-residency [3-5] and it is seen as a process of mapping virtual machines to a physical machine [6]. Yi and colleagues [7] have suggested the strategy of allocating virtual

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1 Artificial Intelligence

2 Advanced Research Projects Agency Network

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machine called Personalized Service-Side spam Filtering (PSSF) which not only focuses on security but also it considers the balance between work volume and hosts power consumption. They also control the quality of performing hosts to decrease power consumption. However, benefitting from CPU sources highly influences power consumption [7]. Consequently, the number and the use of CPU must be focused on to reduce power consumption.

Then, a new strategy of allocating virtual machine called selecting the minimum number of virtual machines based on PSSF (SC-PSSF) which reduces power consumption. Finally, SC-PSSF method has been implemented on ns2 software and its efficiency was investigated by the criteria of evaluating resident attack and attack coverage. According to the opinion of cloud server, reducing energy consumption is an important issue. Yi and colleagues [8-10] suggest reducing performing hosts. This matter is considerable that why energy consumption by CPU has allocated 91% of the whole energy consumption in a cloud center to itself. Therefore, CPU consumption is considered as the whole consumption. Clark and colleagues [11-13] suggested that if a host is unemployed, it consumes power around 71% of the whole volume of work.

Considering that some researchers have managed to increase security among process-based virtual servers by PSSF algorithm so far, therefore, besides increasing the level of security of a dedicated server tenants, this study is going to apply load balancing, managing energy level, taking advantage of the nearest neighbor node and network smart monitoring by representing SC-PSSF algorithm besides security.

Two environments have been considered in this study. Dedicated servers based on cloud processing: providing hosting services and dedicated servers based on cloud processing: providing process and computation servers.

In the first method, a dedicated server based on cloud processing has been divided into several virtual servers which is serving host and domain and in the second method; a dedicated server with the same power which has been divided into several virtual severs with the same number as the first method is processing computations and process data. These two servers in this study which naturally tolerate maximum and minimum loads during different times divide load balancing, security and energy consumption and after saving report and observations, the considered algorithm is implemented on both severs and then load balancing and the consumed energy are saved based on the same consumed load and finally they are compared with each other. The purpose is comparison during different times. The current study aims at providing suitable methods to maintain security besides load balancing and suitable energy consumption in virtual servers based on cloud processing.

2. The Suggested Protocol

Sensor infrastructures for setting up cloud servers are among the most important factors to improve lifetime and security. The inserted algorithm will be described in this part of study. There is a supplementary method called HEBM which uses compatible clustering which is known as clustering design. In fact, it is a comparative design whose number of clusters and nodes membership have evolved through time which has been supposed in HEBM-BS. Also it is supposed that BS is is in constant location or far from sensor field. In this state, node may act with special condition (Pch) as CH[10] to tolerate data transfer.

After stimulation and physically setting up network, probable abuses and attacks are prevented using an accurate and smart monitor. Besides these, items existing in basic algorithm also stabilize and as a result secure the network.

3. Performing ns2 Stimulator and Output Diagrams

Stimulation algorithm has several parameters that these parameters have been implemented in different stages. These parameters are created and called one by one after defining initial data and making nodes. They aim at stabilizing network and maintaining data security. This algorithm in the present study has aimed at achieving the following items according to the defined parameters:

a. Maintaining nodes in the range of a well activity;
b. Nodes awareness of neighbor nodes based on energy level and the remained lifetime;
c. Dead nodes fast exit and transferring data related to it to the nearest neighbor node with the most remained energy;
d. Transferring nodes to the nearest and the most active well in the case of disturbance in a well;
e. Maintaining network stability and serving other parts in the case of destruction and or stopping the activity of neighbor wells.

Stimulation Constant Parameters

Routing protocols based on clustering through dividing neighbor nodes into separated clusters and selecting local cluster-heads to combine and send information of each cluster to the base station and trying to consume energy equally by network nodes in the networks of wireless sensor achieve the best efficiency considering increasing lifetime and maintain network coverage compared with other

routing methods. Various algorithms have been discussed in this part that LEACH, DEEAC and PADCP algorithms are among these ones.

Table 1. the table of defining initial parameters for stimulation

Value	Parameter
200 m × 200	Area
4000 bits	Data pack size
512 bits	Control package size
100/200/…/800	The number of sensor nodes
2 J	Initial energy
(50.50)	The place of base station
87 m	Distance d_0
50nj/bit	

4. Findings

How much energy is remained in the nodes is among the important and exiting parameters in algorithm which not only influence security but also it influences speed and all network infrastructures. This leads to speed loss, security decrease, not managing sources correctly and many other events. The following Figure 1 has defined nodes between 1 and 311 and energy level between 1 and 1611. The algorithm suggested by the study has had suitable performance compared with the bests. It has maintained the remained level around 111 at different levels almost like SC-PSSF almost equal and even when the number of nodes reaches 1611. Each algorithm which has extended output and activity at the beginning of its activity due to low load on nodes shows its weaknesses and the time of network activity increases through time and its activity expands. Fortunately, the suggested algorithm has had trustworthy tolerance in both output and pressure states.

The following Figure 2 has had suitable energy consumption when network lifetime has been investigated from 1 to 711 and it has progressed almost equally with its most serious competitor SC-PSSF.

The number of living nodes has been investigated from 1 to 111 in the following Figure 3 in a 7-number network.
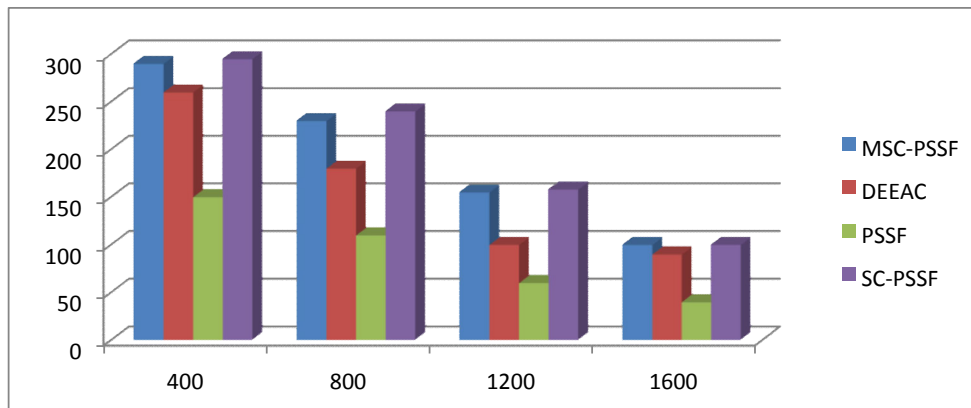

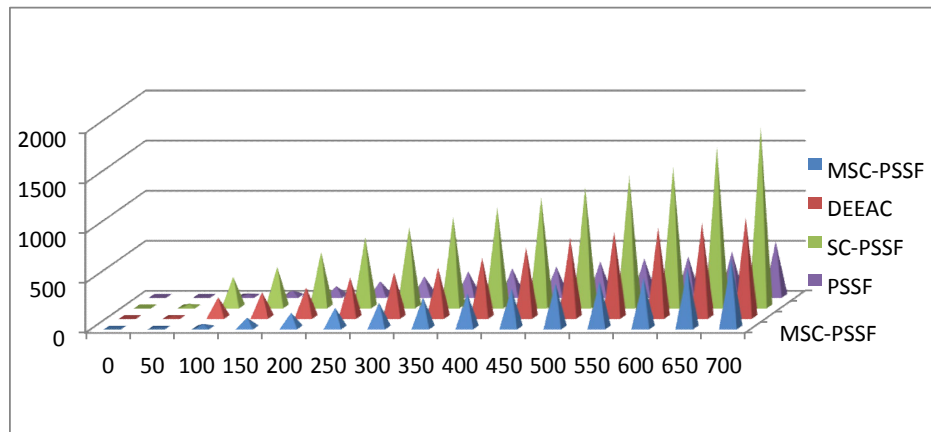**Figure 1.** the mean of remained energy

Figure 2. comparing energy consumption

After PSSF and almost equal to SC-PSSF, the suggested algorithm has had the best performance.

According to the experiences of the other algorithms, the method suggested by this study has ranked second in the following Figure 4. Network lifetime has been regulated from 1 to 711 and stability from 1 to 211 in the Figure 4.

This algorithm has had the least delay after DEEAC algorithm in the Figure 5 based on the number of nodes and sent pack. As a result, such a suitable performance in this algorithm may increase the efficiency to inform base station and observing the fastest momentary reports.

The following Figure 6 has defined 64 to 512 packs
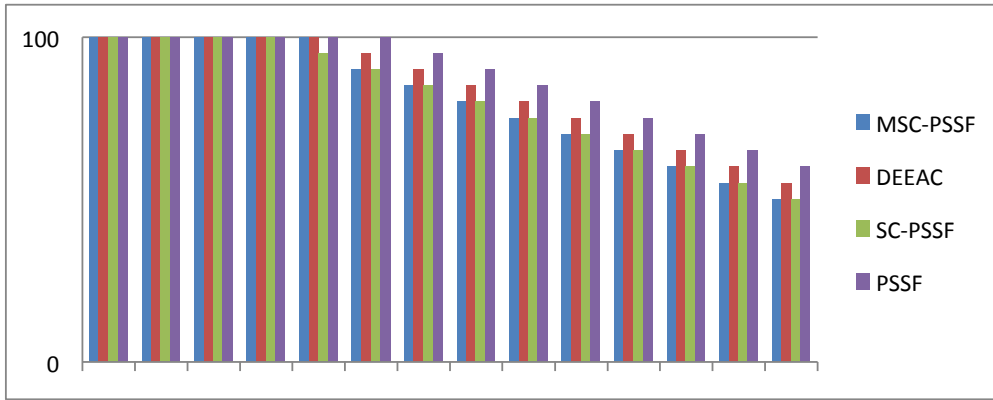
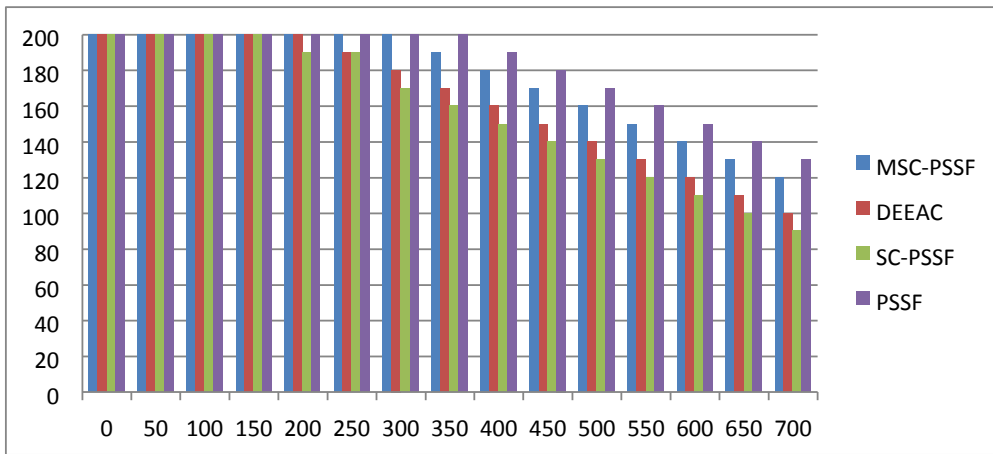**Figure 3.** network lifetime (based on the number of living nodes)

Figure 4. comparing stability and security of network in 111 node scale
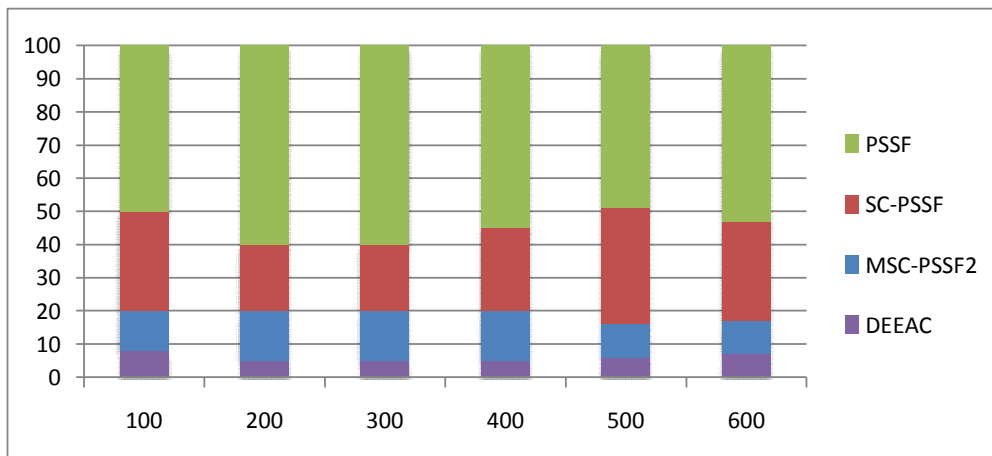

Figure 5. delay in each pack in more nodes scale

which have been investigated during 1 to 6 seconds.

Two ddos and backdoor methods are among the most important attacks which have targeted virtual and even main hosts during recent years. These two methods are usually used in targeting information theft and turning off servers to disturb network efficiency. This study focuses on DDoS attacks. These attacks are usually contemporary and the attacking IP class is finally recognized by firewall and the attacking IPs are blocked before connecting to server. But when firewall is going to identify IP class, this is network which has activated its state by stability and optimality.

The algorithm suggested by this study has had suitable performance in the competition among dead nodes at the beginning, middle and the end of time and since it manages fast displacement of living nodes with the dying ones, it has minimized this possibility due to energy managed consumption.

It is surprising but one of the important parameters during attack is the suitable location of well to manage the motion of nodes. The only factor which may be effective is algorithm correct definition from nodes activity. After PSSF, this algorithm has shown the best performance besides SC-PSSG.
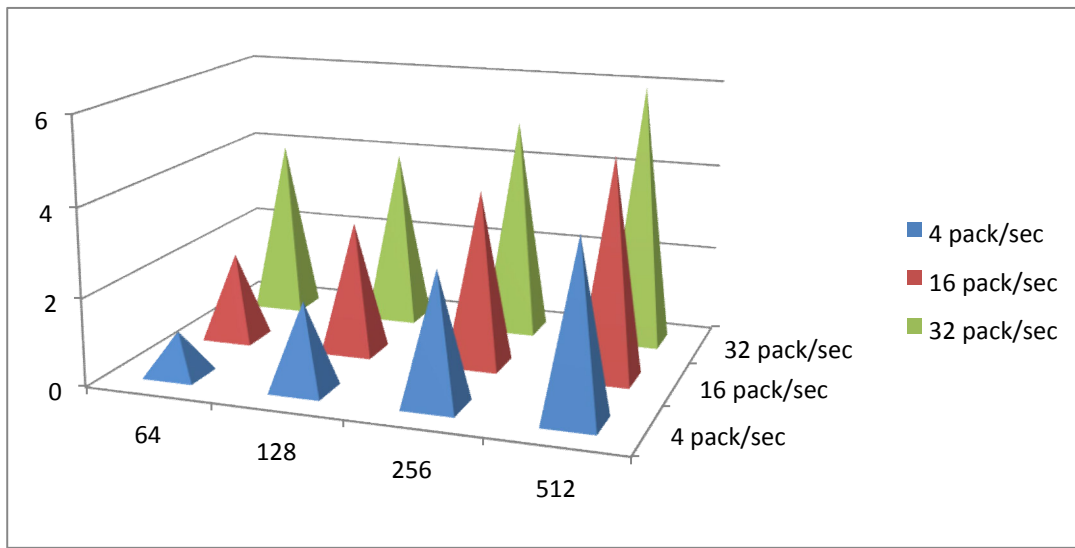

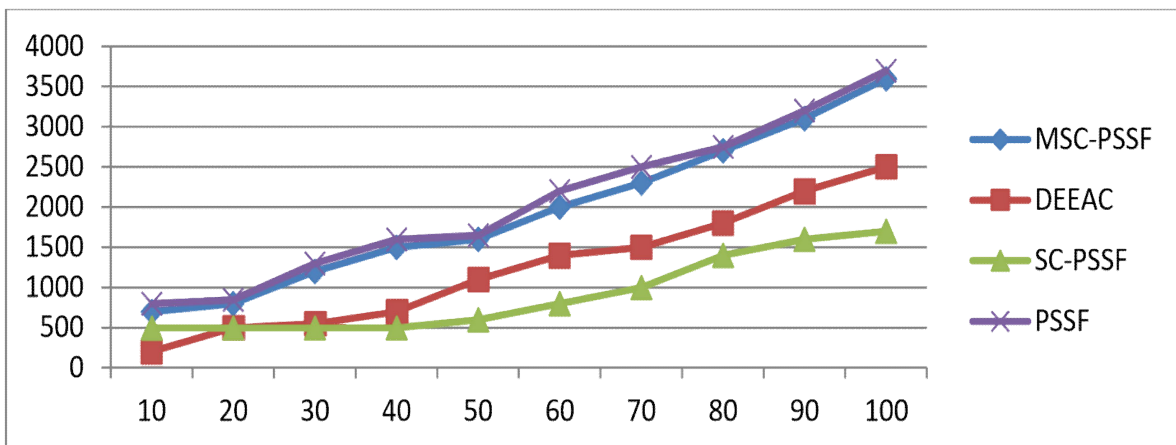**Figure 6.** transfer time with packs different values (data).

Figure 7. the percent of network dead nodes based on stimulating DDoS attacks
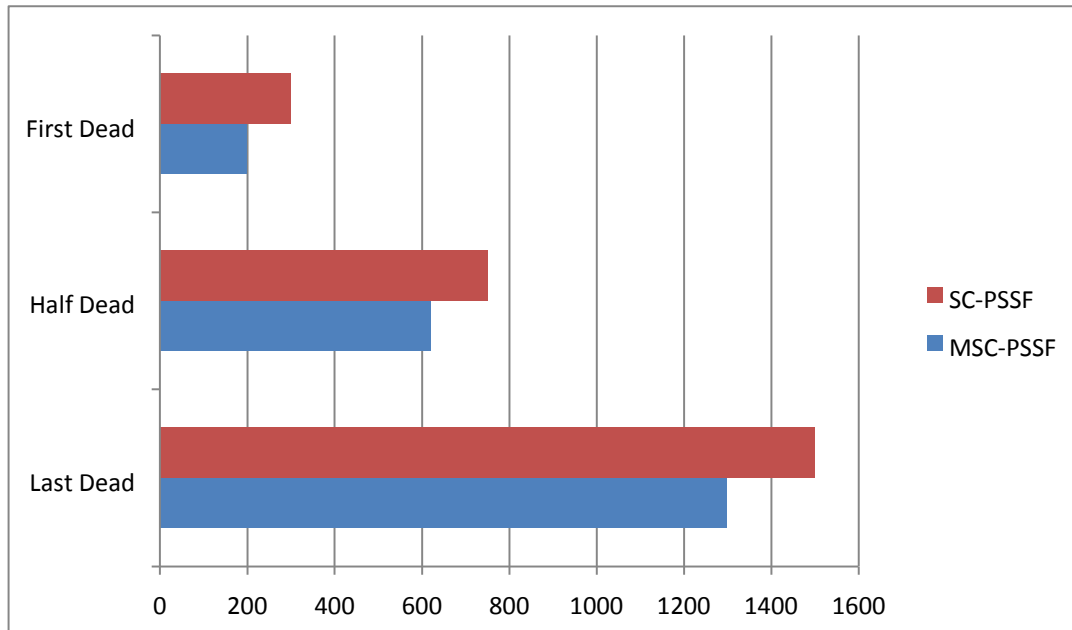
Figure 8. competition among dead nodes at the beginning, middle and the end
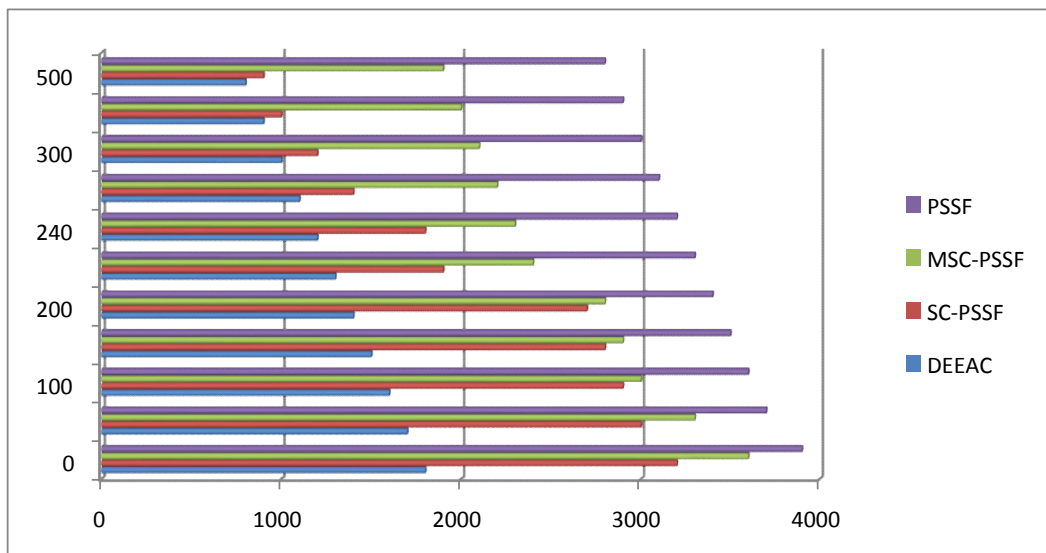

Figure 9. the location of well against normal time and under network attack.

5. The Time of Performing Insertion Transactions during Processing High Performance System

Transaction performed in this study constantly using one order in two types of server and performance time shown in multithreading and rounded form based on second. This trend is done when software like Billing is pressing server. Also, traditional servers are turned off and reset in doing a part of test due to load increase.

The results are juxtaposed with each other and com-

pared in the following diagram. It is obvious that virtual servers based on cloud token have more suitable performance rather than traditional servers.

The Figure 13 is related to comparing the time of searching in two common and cloud servers. Unlike orders like insertion, removal and or updating, much difference is observed in searching. New algorithms, tokening and query banks based on cloud server have made messaging platforms and social networks have activity in massive volume of stable data and with high speed.

Table 2. the time of performing recording order in physical server with diagram

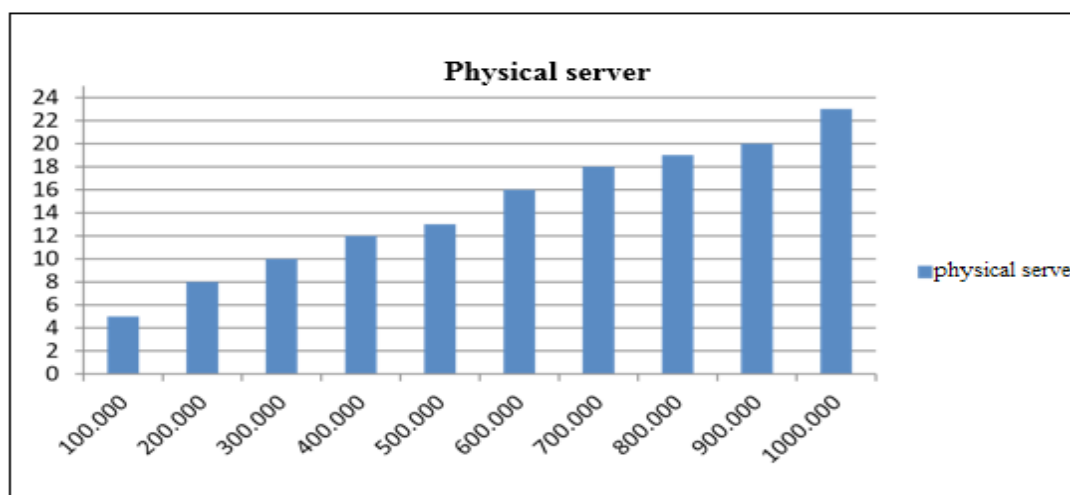| The time of performance/ rounded	The number of records	The type of action	Row
5 sec	111.111	Insertion	1
8 sec	211.111	Insertion	2
11sec	311.111	Insertion	3
12 sec	411.1111	Insertion	4
13 sec	511.111	Insertion	5
16 sec	611.111	Insertion	6
18 sec	711.111	Insertion	7
19 sec	811.111	Insertion	8
21 sec	911.111	Insertion	9
23 sec	1111.111	Insertion	11

Figure 10. Physical server.

Table 3. the time of performing recording order in cloud server with diagram.

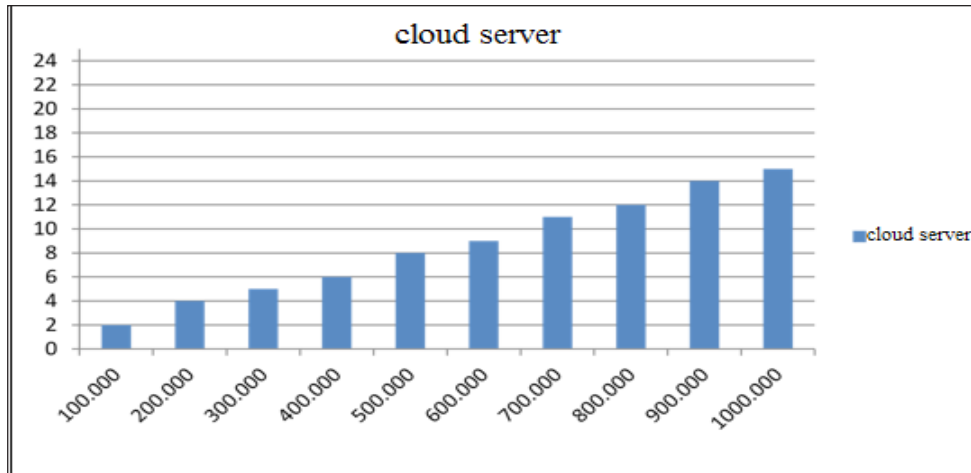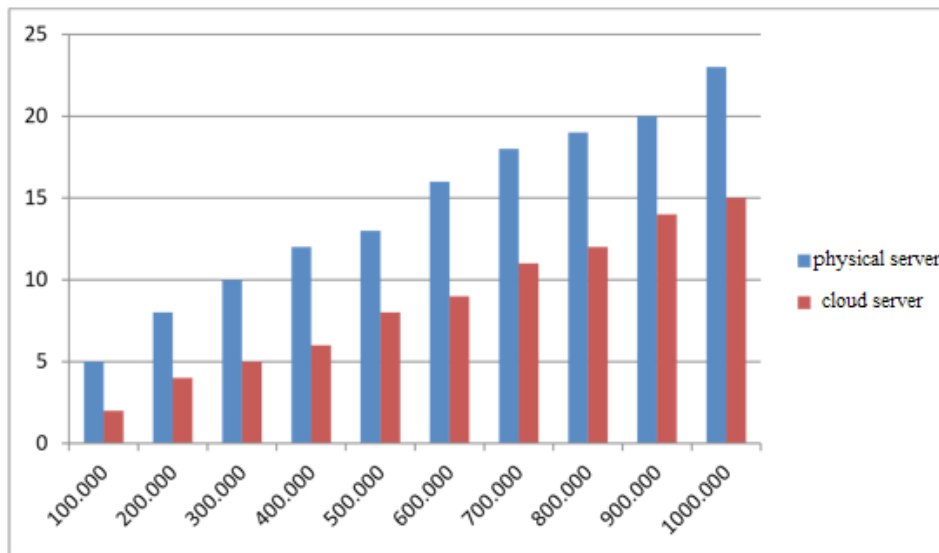| The time of performance/ rounded	The number of records	The type of action	Row
2 sec	111.111	Insertion	1
4 sec	211.111	Insertion	2
5 sec	311.111	Insertion	3
6 sec	411.1111	Insertion	4
8 sec	511.111	Insertion	5
9 sec	611.111	Insertion	6
11 sec	711.111	Insertion	7
12 sec	811.111	Insertion	8
14 sec	911.111	Insertion	9
15 sec	1111.111	Insertion	11

Figure 11. Cloud server.

Figure 12. comparing physical server and cloud server in insertion transactions
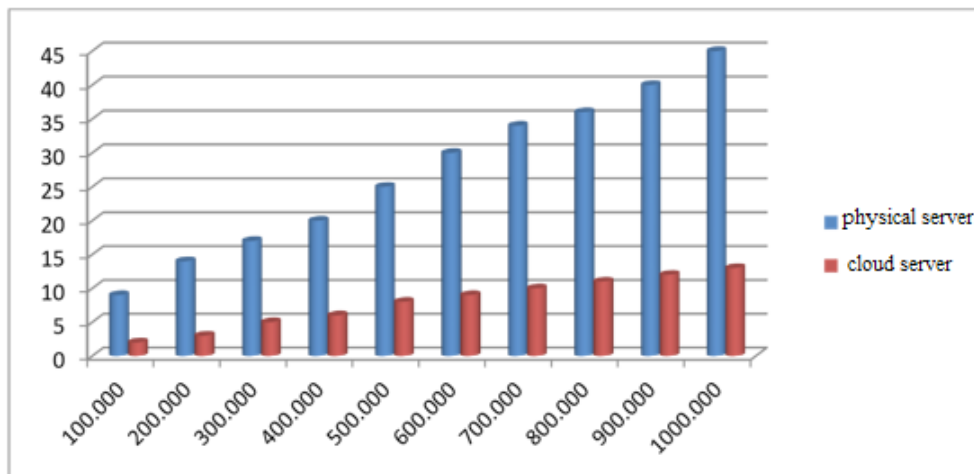

Figure 13. comparing physical server and cloud server in searching.

6. Conclusions

Making a cloud processing platform is easy as far as one of its sources is common. Although making a scalable, reusable and developed cloud processing architecture for sharing all types of sources still faces with obstacles. No matter what you want, cloud processing will finally work for you. If you cannot perfectly use cloud processing service, but you have a part of it. You can save your data during the least possible time in the servers instead of your hard disc. Although, we are still cautious about our personal information, the number of people who save their personal information in servers accessible from internet is increasing. Millions of people upload their personal information including emails, images and even their working data in the third party company like Google. A main reason for not using web-based programs is that you do not control it. Using a web-based program may be as dangerous as a dedicated program. Do your works with your PC by the program which give you freedom of action.

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