

# A Model based on Cloud Computing for the implementation and management IT services in Banks

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## ABSTRACT

In recent years, the banking industry has made significant changes in technology and communications. The expansion of electronic communications and a large number of people around the world access to the Internet, appropriate to establish trade and economic exchanges provided but high costs, lack of flexibility and agility in existing systems because of the large volume of information, confidentiality of data, the need for high computational processing and also the high cost of change or development of information technology is one of the problems facing the industry in many cases, have had many complaints from customers. Cloud computing is a new IT investment projects in information technology and new architectural development, deployment, implementation, and service and is in addition to cost reduction, flexibility, high availability and cost money being brought. For this purpose, GreenCloud simulation is used and presents graphs of monitoring, resource allocation, workload scheduling as well as optimization of communication protocols and network infrastructures in the new model infrastructure of Iranian bank and it is compared the current model and the new model for the applicability of cloud computing technology in the banking industry will be discussed.

## Keywords

Cloud computing, information technology, electronic banking, reduce the cost of banking services, the development of banking services, information technology management.

## 1. INTRODUCTION

In modern societies, information technology and the Internet is an integral part of people's lives and change the way people live and along with it, the expansion of needs such as information security, processing speed, instant access to information and most importantly, save money and

organization and those needs are quite different than in the past in the field of electronic services. In such a case, users try on the basis of need and regardless of whether a service is delivered where it is or how to access it. In the world of computing and software development services goes that instead of running on individual computers as are the services available to millions of consumers. With regard to the issue of cloud computing from the perspective of end users which is structurally similar to a cloud mass through, which they can access applications from anywhere in the world. So serious look into this category, while creating good interaction between the banks in the banking system to the potential for the development of modern banking services of high quality and affordable costs to be achieved.

## 2. Literature review

The introduction of cloud computing in 2007 with styles and techniques, such as software, platform and infrastructure as a service brings with emphasis on financial savings when the organization suggested to use this type to do their business. Gartner Research has predicted that by 2017 a third of the world's corporate email systems and users, their activities based on the cloud computing space will do. Companies such as BTPN Bank of Indonesia, Siam City Bank of Thailand, WSFS Bank America use this technology in various domains such as resource sharing, data storage, access channels, development of infrastructure have used.

### 2.1 Cloud Computing definition

Cloud Computing is a model to provide access based on user demand through the network to a set of flexible and configurable computing resources such as networks, servers, storage resources, applications and services that it can be accessed with minimal need to manage resources or the need for direct intervention services provided or delivered quickly.

## 2.2 Service models of cloud computing

Literature is split on the service models for cloud computing with SaaS being mentioned as one of the first service models and Infrastructure as a Service (IaaS) and Platform as a Service (PaaS).

### Software as a Service (SaaS)

Access to software hosted through a thin client by the cloud vendor, where the vendor has complete control over the application which includes capabilities, updates and maintenance of the application.

### Platform as a Service (PaaS)

This is a model in which the cloud vendor provides the platform for creation and deployment of applications and service which is then accessed by the organization through the Web/Internet.

### Infrastructure as a Service (IaaS)

Servers, storage and connectivity provided by the cloud vendor and the client being charged based on usage

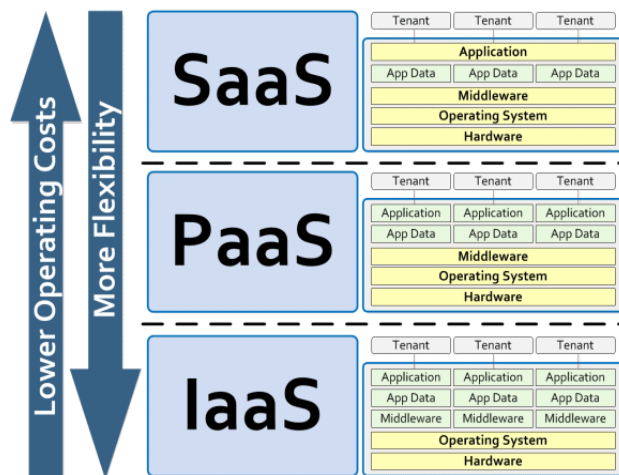


Figure 1. Service models of cloud computing.

## 2.3 Deployment models of cloud computing

There are different kinds of clouds that are shown below:

### Public Clouds

The main idea of public cloud represents the traditional concept of cloud computing is the primary source by which a web application or web service group to be offered on the Internet or as a platform or hardware to be placed in the hands of users.

### Community Clouds

Those clouds are community infrastructure between several organizations that are part of a group and share the same concerns and needs. Management and hosting can be done at home or abroad by a third.

### Hybrid Clouds

A combination of two or more public cloud, an association, is dedicated to a single entity offered but in fact, the connections of several different types of cloud to come and offers multiple features a model of development.

### Clouds Private

Infrastructure that only one organization, and can be managed internally or by a third party and the host can be internal or external. This type of cloud, because of the user will still have to buy it, the production and management is critical. The model is based on the extent to which costs so much and is less user.

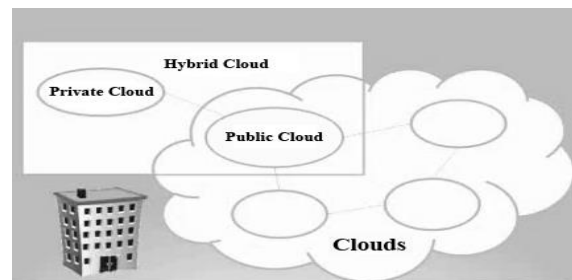


Figure 3. Deployment models of cloud computing.

## 3. Issues/Concerns with cloud computing

### Flexibility

The storage resources in this way, hardware devices, data centers and integrated processors are ready to use, and users can quickly have the resources needed. The Bank may, at any time, increase or reduce their use of resources and thus have flexibility in providing resources.

### Increase Efficiency

Better performance IT professionals using cloud computing technology, the task only, installation and maintenance of hardware and software will be on the banks. As a result, IT professionals can spend their time with other banks, as well as any special operation required more resources can be managed and reduced the need to attract more experts.

### Increase Agility

Software as a service is prepared to take advantage of software services to the bank, the bank can privatize these services and create new services. This case, the change improves and helps deliver products to market faster.

### Scalability

Without permission during the process of setting up various hardware and software industry, with a choice from thousands of different cloud services, cloud computing tools and features to help organizations to quickly scale their goal to promote their business.

## 4. Virtualization structures in banks

One of the biggest problems facing IT managers, more than the size of the server hardware is single purpose server. The main reason for the increasing number of such hardware

incompatibilities for applications that run on different servers as a result, system administrators prefer to run separate applications on servers. Increasing the number of servers is not considered a great problem over time is a heavy secret to increase costs must be paid servers. Hardware costs, power consumption for servers, cooling equipment in data centers, where servers should be kept and the most important news experts whose task management systems, both hardware and software terms, are responsible managers convinced that the combination of servers as a matter of principle to accept. Virtualization is a technology that allows hardware resources (CPU, memory, space, network card, etc.) to provide multiple operating systems. Refers to the virtual machine software, which is responsible for implementing virtualization. Each virtual machine can include operating systems, hardware and software is proprietary. Virtual machines independent of the hardware platform or operating system first to continue its activities. For most virtual instrument systems, a separating layer between the observers to the guest operating system (virtual) hardware or physical resources are available. Therefore, using the following benefits for the use of this technology will result in the bank:

- create a private cloud to optimize the allocation of resources, banks
- connect to public cloud applications in the use of bank
- integrated hardware structures
- integration of software systems in banks

### 5. Methods

To implement and manage IT services in a bank, many studies were conducted. Official correspondence with experts in the field of information and communication technology 10 Bank Melli Iran, to communicate and receive information and informatics research has been done on the bank's activities. Collecting information from experts in the field of ICT National Bank distributed questionnaires and interviews with various experts of hardware, networks, security has been taken. After conducting research, providing classified information to model and simulator will be achieved. The main characteristic of this study is to save energy, reduce costs and increase performance and energy efficiency in the new model compared to old model that is use the GreenCloud Simulator software is used for simulation results.

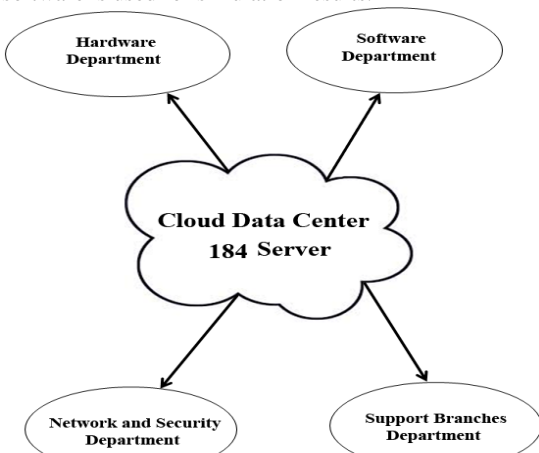


Figure4. New model with cloud computing

### 6. About Green Cloud Simulator

Green Cloud simulator for data centers of cloud computing with a focus on cloud communications. This simulator is an exact model of energy consumption by data centers and IT equipment such as computing servers, network switches and communication links offers. This application is a tool for measuring the performance of the cloud in different areas. Clouds monitored for efficiency and saving resources is another feature of this simulator. This simulation software licensed under the General Public License Agreement release and in the extended version of the network simulator (NS2) is. It should be noted that about 80% of the software source code in C ++ run production and the remaining 20% is in the form of Tool Command Language Scripts.

### 7. Simulation Results

Sample data center cloud simulation to help Green Cloud Simulator is shown. The results obtained in the period from 60 seconds to 184 servers and a number of switches in three different layers were used. With the help of this software after determining and setting the parameters of hardware and applications, such as power consumption in servers, switches of different layers, the different lines and achieved. Figure 5 is a summary of input and output display simulation. As specified in the simulation of 184 server is used.

#### Summary for simulation

Simulation Duration (sec.): 65.0	
<hr/>	
Datcenter Architecture:	three-tier debug
Switches (core):	2
Switches (agg.):	4
Switches (access):	4
Servers:	184
Users:	1
Power Mgmt. (servers):	DVFS DNS
Power Mgmt. (switches):	DVFS
task.mips:	300000
task.memory:	1000000
task.storage:	0
task.size:	8500
task.outputsize:	250000
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Average Load/Server:	0.3
Datcenter Load:	26.2 %
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Total Tasks:	41670
Average Tasks/Server:	226.5
Tasks Rejected by DC:	0
Tasks Failed by Servers:	0
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Total Energy:	516.9 W*h
Switch Energy (core):	103.9 W*h
Switch Energy (agg.):	207.9 W*h
Switch Energy (access):	22.5 W*h
Server Energy:	182.6 W*h

Figure5. Summary simulate conditions.

Figure 6, the simulation results to show. This summary contains an overview of text and a pie chart of the total energy consumed by data center IT show.

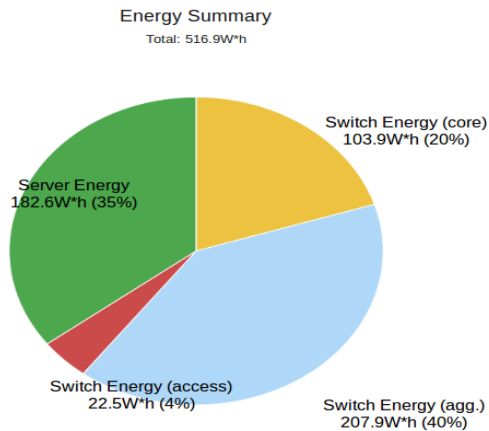


Figure6. Graphs of simulation results.

Figure 7, the data center that shows the status of data center components. The data center consists of three main criteria loading, write things and write things unsuccessful. Upload, as a value between one and zero simulation time (for an average load of the data center) or any number Server Number / VM, is designed. Plans, successful and unsuccessful work in any Server Number / VM with similar behavior is displayed.

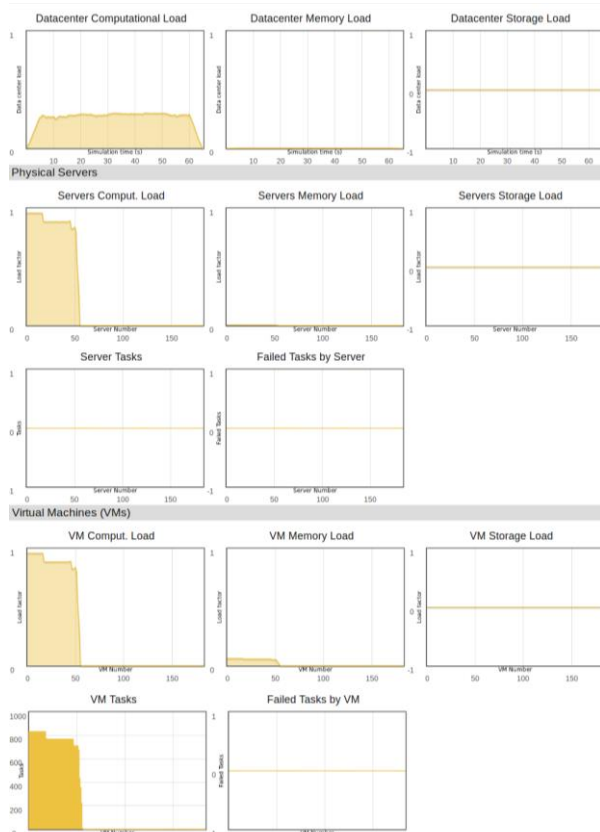


Figure7.Chart of data center.

Figure 8, which describes the data center network link load, the queue size of the data center network is links. Statistics of uplink and down on each section is relevant.

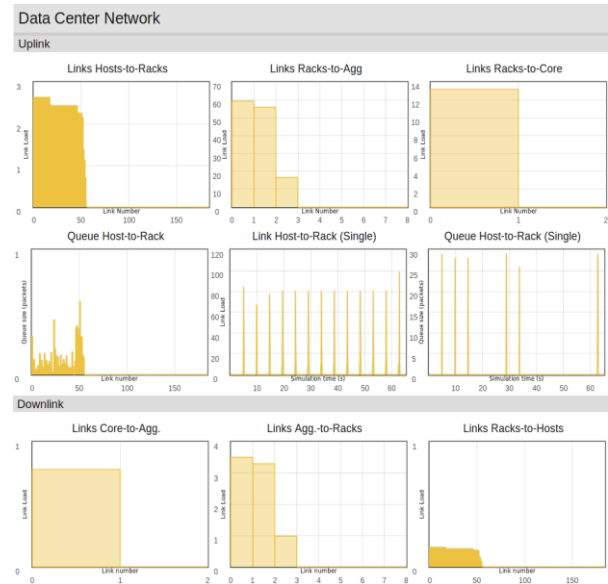


Figure8. Graphs of the data center network.

Figure 9, Statistics on energy consumption as total consumption per server and switch provides.



Figure9. Energy Charts.

## 8. Conclusion

The aim of this study was the use of cloud computing in the banking industry in order to provide a model for the implementation of cloud computing technology was in the bank and use it in the bank were investigated in order to increase efficiency, reduce costs and save energy improvement in how the IT department of the bank to be established. Provide a comprehensive model based on cloud computing for the implementation and management of banking services, and most important objective is to evaluate the application of this technology in the banking industry. For this reason, following the introduction of the basic concepts, the necessity for and objectives of the study and explained how to collect information.

To illustrate the proposed method and the results of the first analysis of statistics and information acceptability and appropriateness of the Bank to implement the model form. The study, to help document the experiences of experts and previous related articles and ultimately provide a model after a comparison between the old and new banks were given. All data, documents and information from the surveys and technical expertise, as well as quantify and localize many different parameters by officials and experts of ICT banks took place.

The future work will focus on review of internal and external stimuli to move faster toward the cloud of bank and Factors contributing to the culture of the society is to embrace cloud computing technology that has a lot of influence in the process of doing successful business projects.

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