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Demand Side Management Using Optimized Resource Allocation in Cloud Platform

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ABSTRACT

With the rapid increase in the observation devices and governable facilities within the demand of people(customers), additional solid data and communication technology (ICT) resources are needed to support the event of demand side management(DSM) [1].Totally different from ancient computation in power systems that customizes ICT resources for mapping applications on an individual basis, DSM particularly asks for quantifiability and economic potency, as a result of there are more and more stakeholders involving within the computation method. This paper proposes a unique cost-oriented improvised approach for a cloud based ICT infrastructure to apportion cloud computing resources during a versatile and efficient means. Unsure factors as well as inexact computation load prediction and inconvenience of computing instances may also be thought-about within the projected model. A changed priority list formula is specially developed so as to with efficiency solve the projected improvement model.

Keywords: DSM, ICT, Stakeholders.

I. INTRODUCTION

Cloud computing is an increasingly popular paradigm of offering subscription-oriented services to enterprises and consumers. The provided services refer to Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS), which are all made available to the general public in a pay-as-you-go manner. To support services, more and more cloud centers are equipped with thousands of Computing nodes, which results in tremendous energy cost. It is reported that about 50% management budget of Amazon's data center is used for powering and cooling the physical servers. There are also researchers who have studied the cost of data centers and concluded that around 40% of the amortized cost of a data center falls into power related categories. Hence, it is important to reduce energy cost for improving the profit of a cloud provider. However, it can often be seen that there are many under-utilized servers in cloud centers, or on the contrary, cloud providers provide less processing capacity and thus dissatisfy their users for poor service quality.

OBJECTIVE:

Demand side computations are different from traditional computations in power systems, which particularly ask for scalability and economic efficiency due to that there are a large number of participators requesting economic and flexible computation resources. However, the current solution that customizes ICT resources for mapping applications separately would cause high investments, expensive and inefficient maintenances, and lack of scalability, which is no longer suitable for future's demands. In general, most studies about cloud computing applications in power systems are

from the technical performance perspectives. It has been widely agreed that cloud computing can significant improve the operation performances of power systems.

II. LITERATURE SURVEY

For most (DSM) applications the computing requirements fluctuate significantly due to diversity of customer behaviors. The main challenge is how to provide the (ICT) resources such as storage devices with dynamic availability and flexibility to the customers to support (DSM).

The following are the systems that help to overcome the challenges listed below.

SMART GRID[2]

The fast development in the smart grids is to facilitate real-time control and monitoring with bidirectional communication. Future smart grids are with the implementation of distributed architecture are expected to have reliable, efficient, secured .To focus on these requirements, many smart grid architecture for cloud computing helps , in three different areas like energy management, information management, and security. In these areas, the utility of cloud computing applications is discussed, while giving directions on future opportunities for the development of the smart grid.

COST BENEFIT OF USING CLOUD COMPUTING [3]

Using of Cloud Computing providers to increase the computing capacity of their local infrastructure. Evaluating the cost of seven scheduling strategies used by an organization that operates a cluster managed by virtual machine technology and seeks to utilize resources from a remote Infrastructure as a Service (IaaS) provider to reduce the response time of its user requests. Requests for virtual machines are submitted to the organization's cluster, but additional virtual machines are instantiated in the remote provider and added to the local cluster when there are insufficient resources to serve the users' requests.

OPTIMIZATION OF RESOURCE PROVISIONING [4]

Two provisioning plans for computing resources given such as reservation and on-demand plans which are provided by the cloud provider to cloud consumers. Comparatively cost of utilizing computing resources provisioned by reservation plan is cheaper than that provisioned by on-demand plan, so cloud consumer has to pay to provider in advance. Coming to reservation plan, the consumer can reduce the total resource provisioning cost. However advance reservation method of resources is difficult to be achieved due to uncertainty of consumer's future demand and providers' resource prices. To overcome the above uncertainties optimal cloud resource provisioning (OCRP) algorithm can be used. Stochastic programming mode is used for formulating this algorithm .The OCRP algorithm can provision computing resources for being used in multiple provisioning stages. In OCRP, demand and price uncertainty is considered.

MINIMUM DATA SETS [5]

Massive storage capacity and resource allocation allows to deploy data and computation intensive applications without investing in the infrastructure, where cloud

stores application data sets . Pay-as-you-go model, storage strategies and benchmarking approaches are developed for cost effective storage of data sets.

III. PROPOSED SYSTEM

The tariff of cloud computing services, which obviously has influences on user behaviors of requesting cloud resources A cloud computing platform acts just like a "computing resource pool" to DSM users who are able to request for renting any CI with different computing power from the pool. This kind of "multitasking" feature has been supported by

most of the commercial operating systems, which is called as the "divisibility" of a CI in this paper.

ADVANTAGES OF PROPOSED SYSTEM

1) Allocating the cloud resources and the validity of the proposed optimization algorithm.2) Cost Optimization.

IV. SYSTEM ARCHITECTURE

The above figure is very important to understand the overall concept of system.

Human makes a request to the server via network using internet. At the same time there are 'n' of clients who use the network to make request to the server. In the server side the data's gathered from the network through the user request, hence data mining occurs based on the user requests.

The response from the web server is handled and shown through display.

V. CONTRIBUTIONS

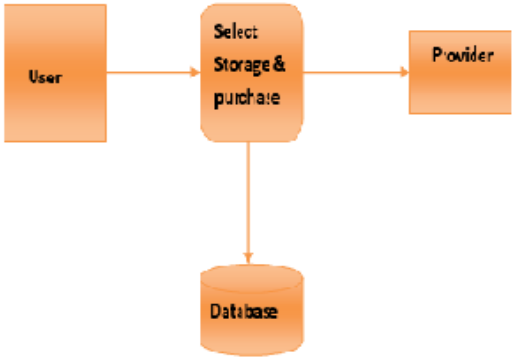
The main contributions of this paper include:

1) Optimal cloud computing resource allocation for demand side management is achieved in the study based on the proposed cost-oriented optimization model. 2) Uncertainties Of DSM applications, such as computation loads prediction errors as well as potential failures of computing instances, are considered in the proposed (COM) model in this paper. 3) Two algorithms simulated annealing (SA) and modified priority list (MPL) are developed to solve the optimization problem. The model and algorithm performances are further verified by comprehensive numerical cases based on an actual pricing system of public cloud of Amazon.

VI. ALGORITHMS

a) SIMULATED ANNEALING REGISTRATION

This algorithm is used to dynamically increase or decrease the storage .If a new user register into the application, memory is allocated according to his requirement and designation. Here memory is allocated in the server.



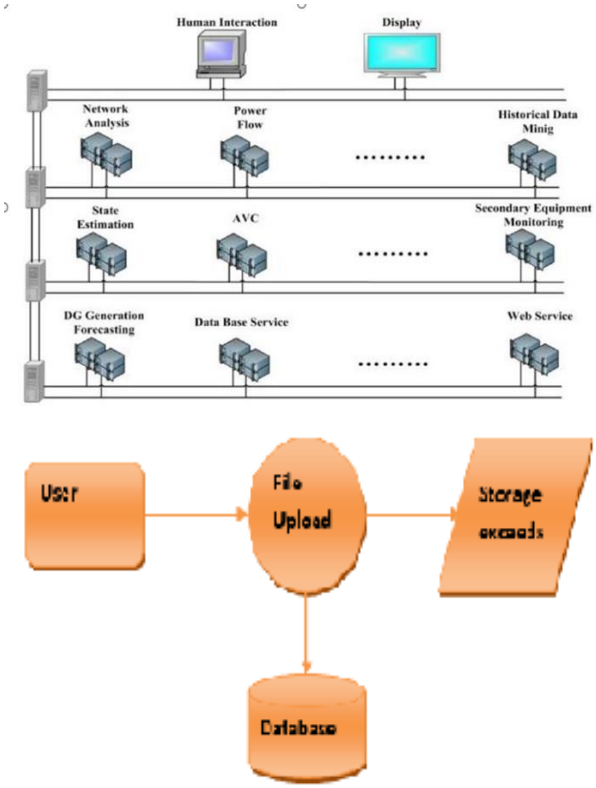
Algorithm 1 : Registration and Authentication process using SA

Pseudo Code:

```
Set x as type of users;
    Set z as register for user;
if( add account)
        x -> x + z;
If(delete account)
        x -> x - z;
```

b) MODIFIED PRIORITY LIST STORAGE SELECTION AND FILE UPLOADING

Storage for users is allocated based on the modified priority algorithm where usage of memory will vary depending on the user's designation. Doing this will increase the proper utilization of total memory. Here storage selection is done by analyzing of utilization of different users.



Algorithm 2: Storage Selection using MPL

Pseudo Code:

```
Set x as student space;
      Set y as officers space;
            Set z as scholars space;
  Get profession;
      Profession = in.nextLine();
switch(Profession){
            Case 1: "Student"
            Al  -> al + x;
            Initiate payment;

            Case 2: "officer"
            Al -> al + y;
            Initiate Payment;

            Case 3: "Scholar"
            Al -> al + z;
            Initiate Payment;
                  }
```

File uploading is done once the provider accepts the registration form of the user. User based on his designation will select storage.

After confirmation user will be able to add his files which supports all file formats. If the allocated space is full then comes the demand for memory, then user is given temporary memory for few days. Before expiry date user has to be make payment for extra allocated memory or else it gets deleted with intimation.

Algorithm 2: File Upload using MPL

Pseudo Code:

```
  Set x as remaining space;
        Set y as file upload space;
     Set z as total space;
if(x!= 0 & z-y ! = 0)
        add Files;
else
{
        Get temporary space and add files;
        Validity of file stored;
        Intimate payment of temp space;
  }
```

VII. FUTURE ENHANCEMENT

In this paper, we revised the architecture of the previous idea by investigating the design philosophy, examining the security models, and comparing the efficiency of existing schemes. Furthermore, the potential application and extensions of PRE have also been discussed. There are some possible interesting problems in this research field that need further investigation.

VIII. CONCLUSION

In this paper, a novel cost-oriented model is proposed to optimally allocate the cloud computing resources for demand side management considering the load profile of computing applications and the characteristics of cloud computing instances. A MPL algorithm is developed to solve the complex optimization problem of the proposed model. A basic scenario is investigated to demonstrate the effectiveness of the proposed models allocating the cloud resources and the validity of the proposed optimization algorithm. Different studies with fixed computation loads but varying peak-valley differences indicate that the larger the peak-valley difference, the more cost reduction the method can achieve. In addition, an extended case is studied to show the scalability and effects on reducing cost by using the model proposed in this paper. Compared with SA algorithm, the MPL algorithm can be used

to solve the (COM) model with and without considering uncertainties much more efficiently, while maintain the comparable results. In general, the proposed (COM) model has high potential in the context of smart grid.

IX. REFERENCES

[1]. Zijian Cao, Jin Lin, Member, IEEE, Can Wan, Member, IEEE, Yonghua Song, Fellow, IEEE, Yi Zhang, and Xiaohui Wang," Optimal Cloud Computing Resource Allocation for Demand Side Management".

[2]. S. Bera, S. Misra, and J. J. P. C. Rodrigues, "Cloud computing applications for smart grid: A survey," IEEE Trans. Parallel Distributed System.vol. 26, no. 5, pp. 1477-1494, May 2015.

[3]. M. D. de Assuncao, A. di Costanzo, and R. Buyya, "Evaluating the cost-benefit of using cloud computing to extend the capacity of Clusters," in Proc. 18th ACM Int. Symp. High Perform. Distributed. Computer. Garching bei Munchen, Germany, 2009, pp. 141-150.

[4]. S. Chaisiri, B.-S. Lee, and D. Niyato, "Optimization of resource provisioning Cost in cloud computing," IEEE Trans. Services Computer., vol. 5, no. 2, pp. 164-177, Apr./Jun. 2012.

[5]. D. Yuan et al., "A highly practical approach toward achieving minimum data sets storage cost in the cloud," IEEE Trans. Parallel Distribed. System.,vol. 24, no. 6, pp. 1234-1244, Jun. 2013.Workshop, Austin, TX, USA, Nov. 2008, pp. 1-10.