

**RESOURCE OPTIMIZATION TECHNIQUE FOR
SCHEDULING IN CLOUD BASED APPLICATIONS**

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Abstract: Cloud computing explains a various of computing ideas that are involved in a mammoth size of network of computers connected in course of development of technology that spanned through time such as internet, web etc. Cloud offers several services all most all the services like web hosting, database support and much more. Still the scarcity of resources requires the best scheduling technique or algorithm to schedule the task in effective manner by utilize the resource properly, so that scheduling algorithm is important. Though many scheduling mechanisms such as Profit maximization algorithm, Multi-objective scheduling an ant colony optimization algorithm etc., are designed by the proponents of algorithm. An optimization algorithm based on fuzzy has been proposed to set right scheduling decisions through assessment of the jobs in the queue.

Keywords: Cloud Computing, Scheduling Algorithms, resource utilization, jfuzzy.

1. INTRODUCTION

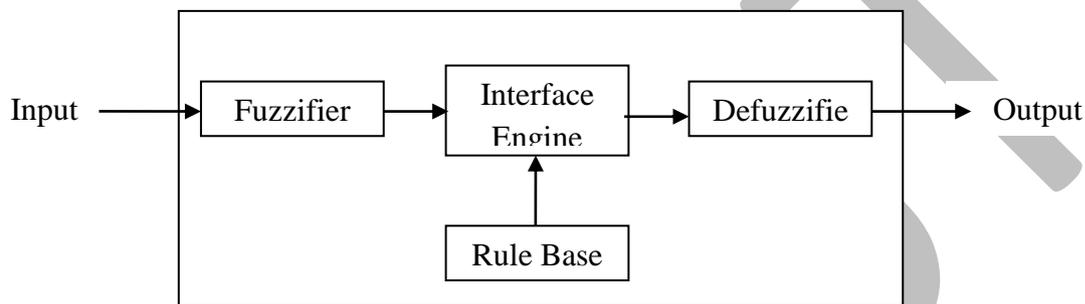
Cloud Computing is service oriented. If some want to buy anything, which can be get it for rent. For example, if user want to storage huge volume of data for few months, instead of buying new storage device user can uses cloud resource for rent. Cloud computing is a centralized model. Running program over internet instead of local computer. Storing or retrieve data over internet. The five important characteristics of cloud computing are On-Demand Self-Service, Resource Pooling ,Broad Network Access, Rapid Elasticity, Measured Service. Cloud providers offers services that can be grouped into three categories. Software as a service (SaaS), Platform as a Service (PaaS) and Infrastructure as a Service (IaaS).

Fuzzy logic: The proposed fuzzy controller uses fuzzy logic introduced by Zadeh in 1965. Fuzzy Logic has no strict assignment of elements to sets like binary logic. Instead, every elements has a degree of membership to a set. This degree is represented by a value between 0 and 1. To be able to apply Fuzzy Logic to a specific problem such as the scheduling between cloudlets or virtual machines, a fuzzy system must be constructed. The construction consists of three steps:

Fuzzyfication: In this level, the degree of membership of the input values is assigned to Fuzzy sets. The degree of membership is given by $\mu: X \rightarrow [0, 1]$, where X is the set of input values. So every input value is mapped to a value between zero and one.

Inference engine: This system is a rule based system which is mapping input spaces to output spaces based on rule sets.

De-Fuzzyfication: In this level, a numerical output value is generated from the output set.



The difference between these logics is that Fuzzy set theory provides a form to represent uncertainties; that is, it accepts conditions partially true or partially false. Fuzzy Logic is a good logic to treat random uncertainty, i.e., when the prediction of a sequence of events is not possible. A Fuzzy Control System is a rule-based system, which a set of so-called Fuzzy rules represents a control decision mechanism to adjust the effects of certain causes coming from the system. The aim of the Fuzzy Control System is normally to substitute for or replace a skilled human operator with a Fuzzy rule based system. Specifically, based on the current state of a network an inference engine equipped with a Fuzzy rule base determines an online decision to adjust the system behavior in order to guarantee that it is optimal in some certain senses. The first step in Fuzzy Control is to define the input variables and the control variables. Each variable must be quantified. Then each quantification of the variable is assigned a membership function. Then a Fuzzy rule base must be design, this rule base determines what control action take place under what input conditions. The rules are written in an if-then format. An implication formula is used to evaluate the individual if-then rules in the rule base. A composition rule is used to aggregate the rule results to yield a Fuzzy output set.

Fuzzy Inference System: Fuzzy set theory is a suitable system for modeling uncertainty arising from mental phenomena, which are neither random nor stochastic. In this paper, we use Fuzzy Inference System (FIS) to evaluate the cloud computing user's satisfaction. A Fuzzy Inference System is a rule based system with concepts and operations associated with Fuzzy set theory and Fuzzy Logic.

2. EXISTING SYSTEM

Cloud Computing is the next generation in computation. Probably people can have everything they need on the cloud. Cloud computing is the another natural step in the evolution of on-demand information technology services and products. Cloud Computing is an emerging computing technology that is rapidly consolidating itself as the next big step in the development and deployment of an increasing number of distributed applications. Cloud Computing emerges for varieties of internet businesses, many computing frameworks are proposed for the huge data store and highly parallel computing needs, such as Google Map Reduce. Hadoop Map Reduce running on top of Hadoop Distributed File System (HDFS) is inspired by Google Map Reduce. Hadoop breaks jobs with a Map function and a Reduce function into map tasks and reduce tasks.

2.1 Disadvantages of Existing System

- Resources mapping requires high Computing power preference.
- Its require updating on System information.
- Dynamic load balance has higher overhead compare to static load balance.
- Certain optimization problems (they are called variant problems) cannot be solved by means of genetic algorithms.

There is no absolute assurance that a genetic algorithm will find a global optimum. It happens very often when the populations have a lot of subjects.

3. PROBLEM DEFINITION

In any environment, the availability of resources is finite. So effective utilization of resources is very important for the fulfillments of requirements of human beings. Thus effective usage comes into picture. To achieve required the optimal mechanism for effective management of the available resources in a scalable environment. Scheduling techniques plays major role. To achieve required the optimal mechanism for effective management of the c resource utilization in a scalable environment. In order to do this, choosing of scheduling algorithm is important. The right way of choosing an algorithm for Application execution is a major task in today's world requirement of utilizing available computational resources. The scheduling techniques should selected in such a way that the various user demands are satisfied. An optimization algorithm based on Fuzzy has been proposed to optimize scheduling decisions.

4. PROPOSED SYSTEM:

The System is designed based on these components of fuzzifier, de-fuzzier and FSI. According to rules set to arrive a solution which is optimal to the availability of the computational resources in the system.

4.1 Advantages of proposed system

In real-time, taking right decision is not a simple task as people consider. Because uncertainties are part of the current world. To avoid such problem , we are going to use jfuzzy logic. This would handle the situation based on the current availability of input parameters. It has the following features which have advantage over the previous existing system:

1. Standardization reduces programming work.
2. It follows the object-oriented approach.
3. Its platform-independent language.

5. SYSTEM ARCHITECTURE

The System architecture is shown below shows the entire process of system design. The choosing of algorithm for scheduling has been decided based on the input and output requirements of the jFuzzy Logic system. The system flow diagram clearly explains the entire system of working principle of choosing of right algorithm based on the given input variables like cost of execution. As explained earlier the IF-ELSE framework is being used to decide what kind of algorithm has to be opted from the given four algorithm based on the rule sets .Based on the variables along with the jFuzzy rules set the right decision is taken to choose the algorithm for scheduling.

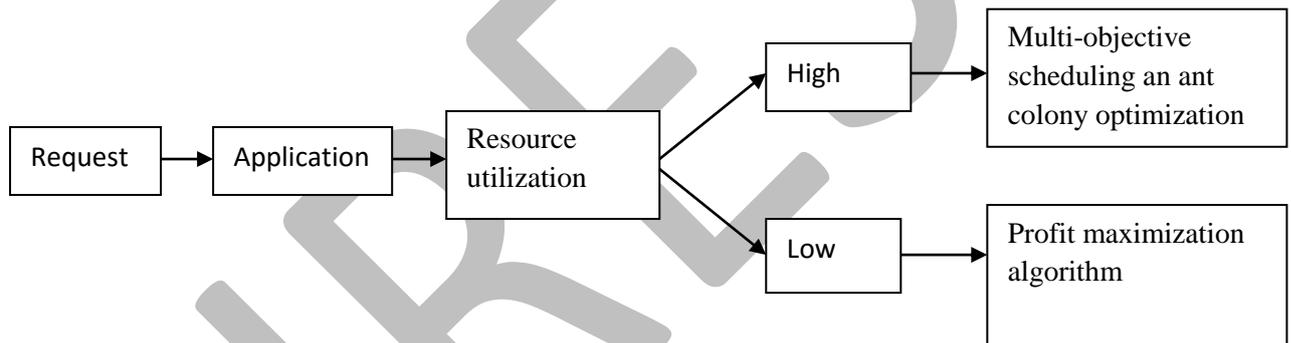


FIGURE 1: SYSTEM ARCHITECTURE



FIGURE 2: FLOW DIAGRAM WITH FUZZY ARCHITECTURE

CONCLUSION AND FUTURE WORK

Uncertainty is a major problem in the computational process right from the development of the computer system. Cloud computing is not exception in the resource constrained world of information technology. In such a case, a system has been designed which helps in the way of choosing right algorithm that would aid in less cost of execution in the computation system based on rules' sets. The rules determine what kind of algorithm must be chosen during the on-fly situation. In this work, only one variable are consider such as resource utilization based on predetermined cases. A large number of parameters can be included in the future for satisfying the needs of the user.

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LIST OF FIGURES

FIGURE 1: SYSTEM ARCHITECTURE

FIGURE 2: FLOW DIAGRAM WITH FUZZY ARCHITECTURE