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AGENT–BASED SCHEDULING PROCESS IN CLOUDS

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Abstract--Cloud computing processing an increasing number of real time applications.Real time tasks are playing an essential role for cloud provider. We employ a bidirectional announcement-bidding mechanism and the collaborative process consist of three phases.Basic matching phases,forward announcement-bidding phases and backward announcement-bidding phases.On the basis of the bidirectional announcement-bidding mechanism.Extensive experiments are conducted on cloud platform by injecting random synthetic workloads and the workloads from the last version of the GOOGLE Cloud tracelogs to evaluate the performance of our task.
Keywords-scheduling for bidirectional announcement-bidding mechanism,virtualized clouds.

I. INTRODUCTION

This Developed Worlds Are Most Using Cloud Computing .Meantime,the virtualization technology is commonly employed in clouds,e.g.,the amazon's elastic compute cloud (EC2),o provide flexible and scalable services, which gives users the illusion of infinite resources. Running applications on virtual machines (VMs)has become an effective solution. Leveraging the server virtualization technology,asingle host can simultaneously run multiple virtual machines (VMs).The agent- based technology is derived from distributed artificial intelligence(DAI)domain.Agent-based scheduling is to employ these operations so as to finish task allocation on cloud resources.

CONTRIBUTIONS

The contribution of this work are summarized as follows:
We designed a bidirectional announcement –bidding mechanism based on an improved contract net protocol.We developed an agent –based scheduling algorithm in virtualized clouds for independent,real-time tasks.We designed twoselection strategies-MAX strategyandP strategy to determine the contractors.

II.RELATED WORK

The agent basedscheduling algorithms can be classified into two categories,i.e., threshold-based algorithms and market-based algorithms.In the first category,scheduling algorithms are developed from thethreshold model in insect colonies forexample, price evaluated the adaptive nature inspired task allocation against decentralized multi-agent strategies. Graubner [1] suggested an energy efficient scheduling algorithm that was based on performing live migrations of virtual machines to save energy and the energy costs of live migrations including pre-processing and post processing phases were considered.
Campos [2] investigated the dynamics scheduling and division of labors n social insects. Generally,the complexity of this kind of algorithms is high.Another category of agent-based scheduling algorithms derives from market-based mechanism,in which the contract net protocol(CNP)is the mostly used market-based mechanism where groups of individuals employ market-like approaches i.e.,action to decide who realizes these goals with bids based on the individual's desire and the ability to finish their goals. Later, Owliya [3] proposed four agent based models for task allocation in manufacturing shop floor in which two of them employed the CNP.

III.MODELS ANDPROBLEM FORMULATION

Inthis section,we introduce the system model, notation, and terminologies used through in this paper.For future reference.

3.1 DESIGN OF BIDIRECTIONAL-BIDDING ANNOUNCEMENT MECHANISM

To facilitate understanding the bidirectional announcement-bidding mechanism,we firstly give two important definitions used.

- Forward Announcement-Bidding
- Backward Announcement-Bidding

3.1.1 FORWARD ANNOUNCEMENT

An Announcement that is from the task's perspective, namely,the task information is treated as the announcement information to announce towards VMs bidding.

3.1.2 BACKWARD ANNOUNCEMENT

An Announcement that is form the VMs point of view,i.e., the VMs information is treated as the announcement information to tasks bid to VMs.

3.2 AGENT BASED SCHEDULING ALGORITHM

In this section we present a novel agent based scheduling algorithm n virtualized clouds –AGENT on the basis of our agent-based scheduling model for independent,aperiodic,real –time tasks. Specifically, the ANGEL integrates the aforementioned bidirectional announcement-bidding mechanism and the MAX&P strategies.The ANGEL is detailed described as follows.The pseudo code of the algorithm for manager agent is presented in Algorithm1.The manager agent schedules the tasks that arrive at the same time instant as one batch. Algorithm1 represent that the manager agent chooses those VMs that satisfy basic requirements of task agents, and sends the selected VMs information to those corresponding task agents.

3.3 SELECTION STRATERGY

Both in the forward and backward announcement-bidding phases,an announcer is responsible for selecting a bidder to award contract if the bidder has the ability to execute this task.It is noted that different strategies may lead to distinctive performances. In this study we design two kinds of selection strategy.

- MAX Strategy
- P Strategy

3.3.1 MAX STRATEGY

When more than one bidder simultaneously bid to one announcer, the announcer will choose the bidder with maximal bidding value.

3.3.2 P STRATEGY

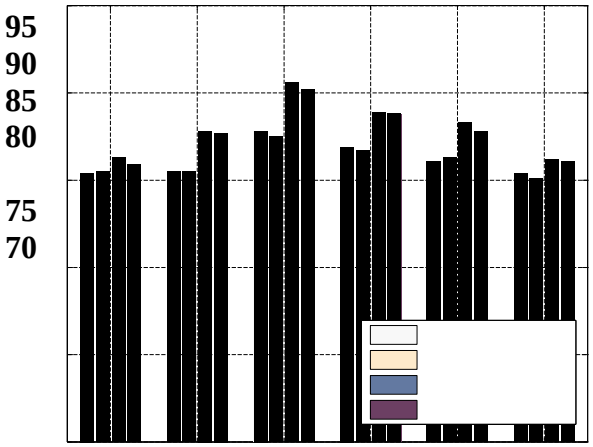
P strategy means probability selection strategy. When there exist more than one bidder bid to announcer in the same round, the announcer will select a bidder according to probability policy.

Algorithm 1:The Algorithm for Manager Agent

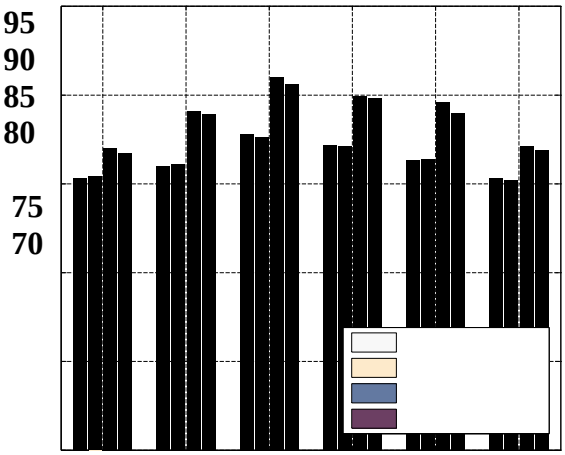
1 $T_{waiting}$ ← the tasks that arrive at the same time instant;
2 **foreach** t_i^A in $T_{waiting}$ **do**
3 v_i^A ← the VM agents that satisfy the basic requirements of t_i^A;
4Send the V_i^A to task agent t_i^A;
5 **While** $T_{waiting}=\emptyset$ **do**
6 The task agents start the forward announcement-bidding phase using Algorithm 2;
7 The VM agents start the backward announcement-bidding phase using Algorithm 3;

IV.PERFORMANCE IMPACT OF TASK COUNT IN ONE BATCH

The parameter batch size lower varying from 100 to 1100 with an increment is 200 is used to determine the number of task in the batch. Demonstrate that when we increase the batch size lower from 100 to 500. Thus, the TGR is improved correspondingly.



(a) Batch size lower



(b) Batch size lower

4.1 PERFORMANCE ON A REAL WORLD TRACE

The aforementioned groups of experiments demonstrate performance of the different algorithms in various random synthetic workloads. To further evaluate the practicality and efficiency of our proposed algorithm in practical use, in this subsection, we carry out experiments on a real world trace deriving from the lost version of GOOGLE Cloud trace logs.

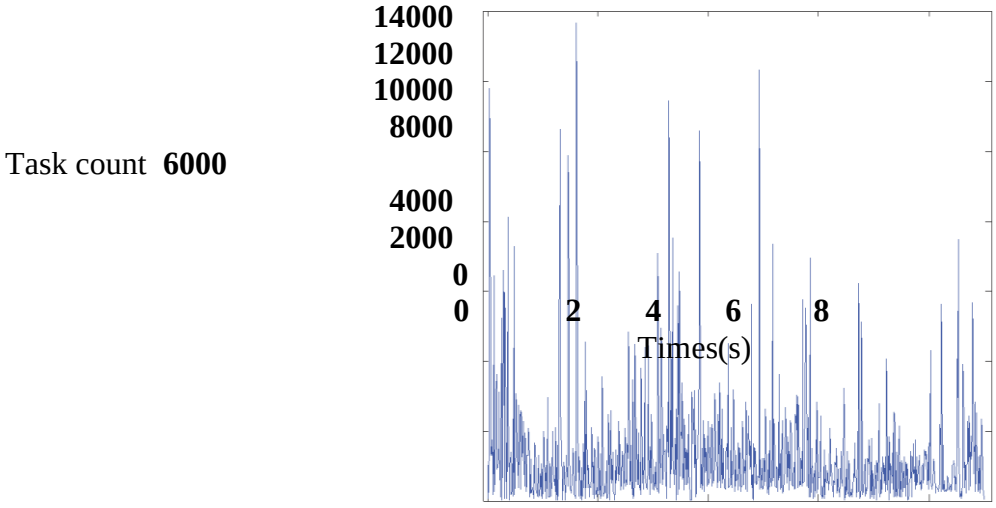


Fig. The count of task submitted to the system

Based on the task information in the day 18, the mean value of the execution time(ET) of the task is 1, 076 seconds, and the majority of the task execute in less than 1,000 seconds. Additionally, we can observe. The distribution of response time(RT), i.e., the time span from a task's submission to task's completion. On average, the ratio between a task's response time and execution time is 2.75.

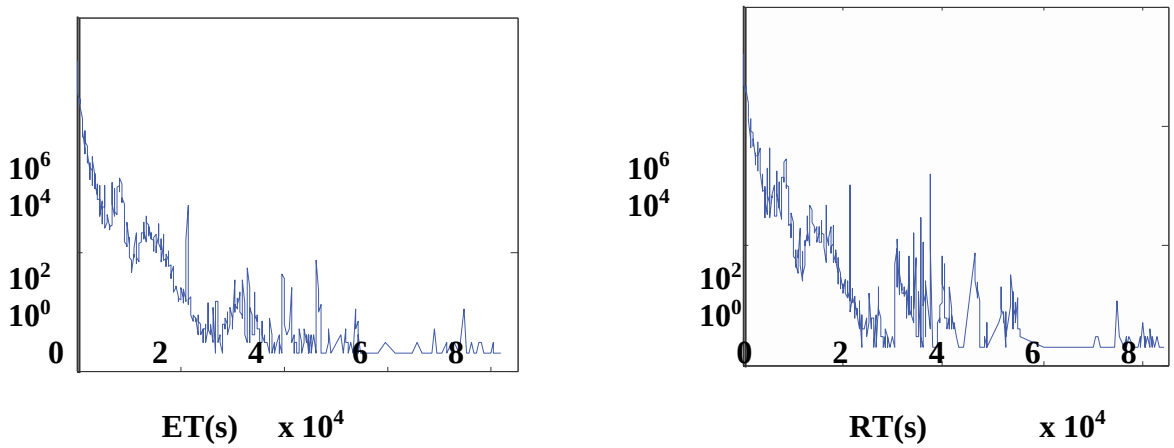


Fig. The Distribution of Execution Time (ET in short) and Response Time(RT in short)

Employing the MAX strategy in the forward announcement bidding phase can efficiently use the laxity equation.

V.MODULE DESCRIPTION

- Salary info module
- Client info module
- Reports

5.1 SALARY INFO MODULE

This module deals with the management of the salary information of each employee in the organization. It contains all necessary details like basis salary, HRA, TDS etc., Each employee has auto generated unique Account Id.

5.2 CLIENT MANAGEMENT MODULE

This module deals with the management of the client information such as client name, unique client Id, office and residential address, project given by client.

5.3 REPORTS

This module is specified for the purpose of the report generation for the HR on desired requests.

VI.CONCLUSION AND FUTURE WORK

The AGENT employs a new bidirectional announcement-bidding mechanism, in which our contributions include designing the basic matching policy, forward announcement-bidding and backward announcement- bidding, as well as their process flows. Besides, we devised the calculation of bidding values in forward bidding and backward bidding. What is more, two selection strategy, i.e., MAX strategy and P strategy were put forward to determine contractors.

The extensive simulation studies by using random synthetic workloads as well as the workload from the last version of the GOOGLE cloud tracelogs indicate that AGENT is a feasible scheduling algorithm designed for real-time tasks in virtualized clouds

Our AGENT is the first of its kind reported in the literature,because AGENT employs the agent-based approach and comprehensively addresses the issue of schedulable, priority, scalability, real-time in virtualized cloud environment. In this future studies, we plan to address the following issues:firstly, we will integrate the scaling down policy with our AGENT to improve the resource utilization. Finally, we plan to run our AGENT in real cloud environment.

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