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BOUT: CHRONOLOGICAL BASED ABSOLUTE ERA IMPLICIT CLOUD

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Abstract:

The Cloud computing makes an increasing number of absolute-time applications run in the cloud. Meanwhile, Chronology for absolute-time tasks is playing an essential role for a cloud provider to maintain its quality of service and enhance the system's performance. We devise a mechanism in a cloud computing environment to allocate absolute-time tasks and dynamically provide resources. The collaborative process consists of three phases, i.e., basic matching phase, forward announcement-bidding phase and backward announcement-bidding phase. Moreover, the elasticity is sufficiently considered while scheduling by dynamically adding virtual machines to improve scalability. Furthermore, we design calculation rules of the bidding values in both forward and backward announcement-bidding phases and two heuristics for selecting contractors. On the basis of the bidirectional announcement-bidding mechanism, we propose a bout-based dynamic scheduling algorithm named BOUT for absolute - time, independent and periodic tasks in clouds. Extensive experiments are conducted on the Clouds platform by injecting random synthetic workloads and the workloads from the last version of the Google cloud trace logs to evaluate the performance of our BOUT. The experimental results indicate that BOUT can efficiently solve the absolute-time task scheduling problem with virtualized clouds

Index Terms: Agent-Based Scheduling, Real-Time, Bidirectional Announcement-Bidding Mechanism & Virtualized Cloud

1. Introduction:

In the Cloud computing, shared resources, software, and information are provided to computers and other devices on demand. Details are abstracted from the users, who no longer need to have expertise in, or control over, the technology infrastructure "in the cloud" that supports them. This frequently takes the form of web-based tools or applications that users can access and use through a web browser as if it was a program installed locally on their own computer. As cloud computing promises the pay-as-you-go flexible charging style, the resource demand becomes more volatile than that in traditional IT environments. Under such a circumstance, the aspects of effective cloud capacity planning and instant on-demand provisioning face new challenges.

Cloud provides a wide range of options for selecting the right kind of tool depending on the product that needs to be tested. The service provider is supposed to ensure that the latest version of the tool is provided. This saves the huge sums for buying the tool license. Also it saves the effort on maintaining the tool with latest upgrades and fixes. For the cloud providers; hardware resources still require long acquisition and deployment process. If the actual demand is higher than the existing capacity, the cloud has to postpone serving new customers and lose the potential revenue. If the shortage is severe, even provisioning requests from existing customers

has to be rejected, which defeats the promise that application in the cloud can scaling-up whenever workload increases.

2. Related Works:

Up to now, a great deal of scheduling strategies has been developed in a wide range of application domains. Scheduling algorithms can be either static (i.e., off-line) or dynamic (i.e., on-line). In static scheduling algorithms, assignments of tasks and the time at which the tasks start to execute are determined a priori. They are usually developed for periodic tasks. Whereas the arrival time of periodic tasks is not known a priori and with timing requirements (i.e., real-time), the tasks must be scheduled by dynamic scheduling strategies. Specially, there exist many scheduling algorithms that were designed for cloud computing environment. For example, Zhang et al.developed a heterogeneity-aware framework that dynamically adjusts the number of machines to strike a balance between energy savings and service delay. He et al. investigated the reduction of resource consumption by VM consolidation, and employed the Genetic Algorithm (GA) to solve the issue. Konget al. concentrated on the uncertainties of both the availability of virtualized servers and workloads, and utilized the type-I and type-II fuzzy logic systems to predict the Resource availability and workloads to enhance the system's availability and responsiveness performance. Calheiros and Buyya suggested a resource provisioning and scheduling strategy for real-time workflow on IaaS cloud, in which the particle swarm optimization technique was employed to minimize the overall workflow execution within timing constraint. Malawski et al.

Presented several static and dynamic scheduling algorithms to enhance the guarantee ratio of real-time tasks while meeting QoS constraints such as budget and deadline. Besides, they took the variant of tasks' execution time (ET) into account to enhance the robustness of their methods. Goiri et al. proposed an energy-efficient and multifaceted scheduling policy, modeling and managing a virtualized cloud, in which the allocation of VMs is based on multiple facets to optimize the provider's profit. Graubner et al. 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. However, the aforementioned algorithms cannot efficiently address the large-scale dynamic scheduling issue.

It should be noted that in clouds, both tasks and resources are dynamically varied. To be specific, most of tasks arrive in a periodic mode and resources changed with the variation of system Workload. Thus, the scheduling algorithms that are used to allocate tasks and adjust resources are very essential to enhance the system's schedulability and utilization in dynamic cloud environment. In agent-based scheduling, each agent can directly represent a physical object such as a machine, a task, and an operator. Thus, agent-based scheduling algorithms have the ability to allocate tasks through negotiation, which brings great advantages for dealing with dynamically arrived tasks in distributed systems (e.g., the cloud computing systems).

The agent-based scheduling 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 the threshold model in insect colonies. For example, Price evaluated the adaptive nature inspired task allocation against decentralized multi-agent strategies. Campos et al. investigated the dynamic scheduling and division of labors in 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 is the mostly used market-

based mechanisms where groups of individuals employ market-like approaches i.e., auction, to decide who realizes these goals, with bids based on the individual's desire and the ability to finish their goals. For example, Owliya et al.

3. Proposed Work:

The Proposed algorithm takes advantage of the data which is common between users to increase the speed of backups, and reduce the storage requirements. A new efficient system has been developed with the help of scheduling algorithm. The task has been scheduled with the priority level with the task information. If the task has heavy work, the system will work on the higher priority task. Each bout has a separate algorithm so it will work efficiently and it is reliable. An algorithm is proposed with the scheduling based on network traffic. It applies the network and access traffic with the help of scheduling algorithm. Using the scheduling algorithm. Network collision will be avoided. A detailed algorithm has been introduced with respect to manager, task, and VM Agent.

The protection of computer based resources that include hardware, software, data, procedures and people against unauthorized use or natural Disaster is known as System Security. System Security can be divided into four related issues:

System Security refers to the technical innovations and procedures applied to the hardware and operation systems to protect against deliberate or accidental damage from a defined threat.

Data Security is the protection of data from loss, disclosure, modification and destruction.

System Integrity refers to the power functioning of hardware and programs, appropriate physical security and safety against external threats such as eavesdropping and wiretapping.

Privacy defines the rights of the user or organizations to determine what information they are willing to share with or accept from others and how the organization can be protected against unwelcome, unfair or excessive dissemination of information about it.

Confidentiality is a special status given to sensitive information in a database to minimize the possible invasion of privacy. It is an attribute of information that characterizes its need for protection.

4. Experimental Analysis and Results:

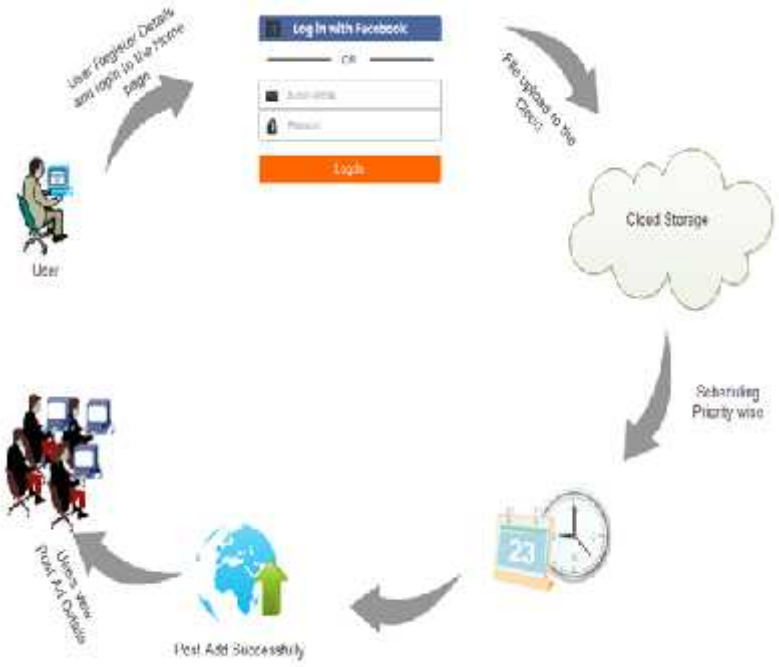
BOUT is one of a class of computational models for simulating the actions and interactions of autonomous bouts with a view to assessing their effects on the system as a whole. It combines elements of game theory, complex systems, emergence, computational sociology, multi-bout systems, and evolutionary programming. Monte Carlo Methods are used to introduce randomness. A review of recent literature on individual-based models, bout-based models, and multi boot systems shows that ABSs are used for non-computing related scientific domains including biology, ecology and social science. Bout-based modeling is related to, but distinct from, the concept of multi-bout systems or multi-bout simulation in that the goal of ABS is to search for explanatory insight into the collective behavior of bouts obeying simple rules, typically in natural systems, rather than in designing bouts or solving specific practical or engineering problems.

Bout-based models are a kind of micro scale model that simulate the simultaneous operations and interactions of multiple bouts in an attempt to re-create and predict the appearance of complex phenomena. The process is one of emergence from the lower (micro) level of systems to a higher (macro) level. As such, a key notion is that simple behavioral rules generate complex behavior. This principle, known as K.

I.S.S. ("Keep it simple, stupid") is extensively adopted in the modeling community. Another central tenet is that the whole is greater than the sum of the parts. Individual bouts are typically characterized as bounded rational, presumed to be acting in what they perceive as their own interests, such as reproduction, economic benefit, or social status, using heuristics or simple decision-making rules. ABS bouts may experience "learning", adaptation, and reproduction.

When a Lagrange multiplier λmt denotes the price of using a time slot on machine m, the sub gradient search procedure can be transformed into a combinatorial auction, in which bidders demand a set (or a combination) of objects with a single bid. In such combinatorial auction, each job and each machine is an agent; each job is also a bidder; and a bidder demands set of time slots with a single bid. An auctioneer proposes prices for using each time slot of machines with the objective of maximizing their profits; and bidders construct their bids of the wanted time slots with the objective of minimizing their costs.

Architecture Diagram:



5. Conclusion and Future Enhancement:

In conclusion, I think that the first five minutes of an interview are important and can be considered as the first impression that the interviewer gets about you. Because of that, I think that interviews need to focus on these five minutes by following the points described above and in my previous blog posts. If you follow the points I mentioned, you should end up with a great job interview and hopefully the job you applied for. The system has reached a steady state as far as the basic framework is concerned. The system is operated at a high level of efficiency and its advantage is quite understood. Also if time and resource constraints are eliminated, this system can be adapted to a full-fledged Knowledge Portal, wherein a personalized environment for each user who is a part of it can be created.

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