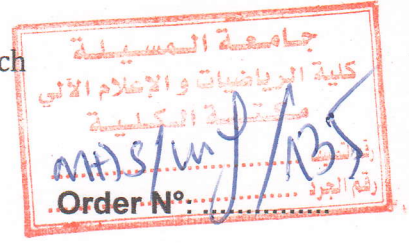


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**Information Communication Sciences and technology Department**

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**SUBJECT**

**Collaboration between Load Balancing  
Algorithms and Service Broker Policies  
In cloud Computing**

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## GENERAL INTRODUCTION

Cloud computing means providing all software and hardware services in remote servers instead of locally through a simple thin client. All these are ensured by basics concepts and technologies, the most famous is virtualization technology.

Performance is an important question in cloud computing especially that the cloud receives huge demands of services from clients around the world. Performing all these requests required a delicate organization and efficacy scheduling policy. The latter is performed at two levels; the service broker policies specify the more adequate datacenter that could satisfy the request. The second level; is to schedule the jobs within the datacenter itself by allotted them a specified virtual machine.

Service broker policies are the first level that treats the incoming requests. They ensure the selection of adequate datacenters which are dispersed around the world. There are three major policies: the Closest data center policy, the optimize response time policy, and the dynamic configuration policy; each one of the three engages a different method of selection.

Three scheduling algorithms are fundamentally specified to balance the load of the many requests within the datacenter; each one of them has its different way of managing the arrived requests to allot them to the best virtual machine. All proposed scheduling algorithms inspired their policy from the three basics algorithms: Round robin, Equally Spread Current Execution and Throttled algorithms.

We lunch a new study that has never been done before, which is investigating the collaboration between the two levels of selection policies. The objective, is to see, if there are any possible way to quantify the strength of this collaboration, and study, if there are a possible correlation between collaboration of these two levels policies and the cloud performance. The major question considered is whether the strength of collaboration between the two levels policies improves sensibly the performance of the Cloud computing.

Experiments are done on cloud analyst tool, which a standard simulator of analyzing cloud computing. Several simulations are sketched in a fashion to clearly show the effects of the two levels of policies on each other. To do so, we define some configurations; with some datacenters dispersed around the regions of the world; each one of them contains some virtual machines chosen respected to a specific logic.

The results will be collected in tables and presented by graphs to ease analyze and simplified the interpretation.

To achieve our study we passed through four chapters:

- Chapter I: where the state of the Art of Cloud Computing and its basics are presented and discussed.
- Chapter II: A Comparative Analysis between Grid, Cluster and Cloud Computing are done. This can make clear the evolution steps that reach to the cloud.
- Chapter III: service broker policies are presented followed by the Load balancing Algorithms of Cloud Computing, and describe the aim of our study.
- Chapter VI: The CloudAnalyst is described and configured to run simulations and the generated results are discussed and interpreted.

## GENERAL CONCLUSION

Cloud computing is an old idea backed to sixty, though by John MacCarty, but became new concept and an emergent technology today. This new paradigm attracts a big interest in community of users specially enterprises, because of its formula: pay only for what you need. There are a lot of characteristics, services, and architecture layers to make cloud computing better than Grid and Cluster computing, especially when we use Virtual Machine technology.

Performance is a fatal issue for cloud computing to ensure a high Quality of Service for the clients. Allotted an incoming request to a virtual machine is a central role in cloud computing; because this task can affect deeply the performance. This task is done through two levels: first; the service broker policies which engage a specific strategy to select the adequate datacenter. Second, the load balancing algorithms which work within the datacenter to decide which virtual machine has to satisfy the incoming request.

Our questioning is whether these two levels of policies are independent from each other or not. If they are not, try to see is there any form of collaboration between them; and if it is, investigate whether there is a correlation between the collaboration two the levels of policies and the increasing of the performance. To answer these questions we have engaged several simulations on the cloud analyst tool.

A specific logic is followed to choose configurations over which several simulations are done. The results of these experiments are well represented and analyzed. A surprising discovery come in light, a singular equilibrium point which is a specific special configuration which records a strange behavior of all load balancing algorithms collaborating with all service broker policies.

This mysterious point named SEP for singular equilibrium point seems to attract all the combined policies by two manners, a global minimum of deviator point, and this fashion of doing guarantee to it the decreasing of the overall response time parameter. So, the SEP is the special configuration where all load balancing algorithms working under the service broker policies are optimal.

We believe that this singular equilibrium point models and contains information that could gain us a kind of knowledge that lead us to a deep understanding of the

correlation between collaboration of the two engaged scheduling policies and the performance of the cloud computing. Serious experiments have to be done to collect more information about this singular equilibrium point SEP and perhaps some basic mathematics may express this mystery SEP.

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ملخص :

الحوسبة السحابية هي تكنولوجيا المهينة في وقتنا هذا. الاداء مسألة هامة. نقوم بدراسة جديدة للتعاون بين جميع خوارزميات موازنة التحميل مع سياسات وسيط الخدمة لمعرفة ما اذا كان لديه تأثير على الأداء. الكلمات المفتاحية : الحوسبة السحابية. الاداء. موازنة التحميل . وسيط الخدمة.

**Abstract:**

Cloud computing is an emerging technology now a day. The performance is an important issue. We launch a new study of the collaboration of all load balancing algorithms with the service broker policies to see if it has an impact on the performance.

**Key Words:** Cloud Computing, performance, collaboration, Load balancing, service Broker.

**Résumé:**

Le Cloud Computing est une technologie émergente de nos jours. La performance est une question importante. Nous lançons une nouvelle étude de la collaboration de tous les algorithmes d'équilibrage de charge avec les politiques de courtier de service pour voir si elle a un impact sur la performance.

**Mots Clés :** Cloud Computing, Performance, équilibrage de charge, courtier de service