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Evaluation of Job Scheduling Algorithms on
Cloudsim Environment

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Abstract

Cloud computing emerged to satisfy the high demand for computational power and storage resources. Scheduling is used to allocate particular resources for a certain tasks in particular time. Job scheduling problem is a core and challenging issue in cloud computing. The purpose of scheduling is to increase the utilization of resources and to minimize the response time. There are many scheduling algorithm for cloud computing with different characteristics. The main challenge is how to choose the effective and efficient one. This research aims to evaluate the current used scheduling algorithm for cloud computing. To evaluate the performance of the algorithms this research conducted a simulation using CloudSim. The results show that, the short job first (SJF) scheduling mechanism is more efficient than first come first service (FCFS) and RoundRobin in many scheduling scenarios.



المستخلص

استخدام حاسبات الغيمة ظهر لإرضاء المطلب العالي للقوة الحسابية ومصادر الخزن. الجدولة تستخدم لتخصيص المصادر المعينة لبعض المهام بشكل خاص في وقتها. القضية الرئيسية وصعبة في استعمال حاسبات الغيمة هي الجدولة. إن الغرض من الجدولة أن يزيد من استخدام المصادر وتقليل وقت الرد. هنالك العديد من خوارزميات الجدولة بالخصائص المختلفة. إن التحدي الرئيسي كيفية اختيار خوارزمية ذات كفاءة وفعالية. هذا البحث يهدف لتقييم خوارزميات الجدولة المستخدمة حالياً في حاسبات الغيمة لتقييم الاداء تم استخدام محاكاة كلاودسم. النتائج اظهرت بان خوارزمية المهمة ذات الزمن الاقل اولا هي اكثر كفاءة من خوارزمية القادم اولا يخدم اولا و الراوندروبين في جميع السيناريوهات.



1.1 Introduction

This chapter at hand will introduce the background of the research topic and provide information about the problem, define the objectives and contributions.

1.2 Problem background

In this section we throw some light on cloud computing job scheduling problem.

1.2.1 Cloud Computing

Cloud computing is everywhere. Today's most popular social networking, email, document sharing and online gaming sites, are hosted on a cloud. More than half of Microsoft developers are working on cloud products. It allows to access services that reside in a distant datacenter, other than local computers or other Internet-connected devices. Cloud services are charged according to the amount consumed by worldwide users. Datacenters The datacenter is the collection of servers where the application to which you subscribe is housed. It could be a large room in the basement of your building or a room full of servers on the other side of the world that you access via the Internet. A growing trend in the IT world is virtualizing servers. That is, software can be installed allowing multiple instances of virtual servers to be used. In this way, you can have half a dozen virtual servers running on one physical server. A wide range of IT companies including Amazon, Cisco, Yahoo, Salesforce, Facebook, Microsoft and Google have their own datacenters and provide pay-as-you-go cloud services[1]. Three different types of cloud service should be distinguished first Software as a Service (SaaS) also referred to as "software on demand," this service model involves outsourcing the infrastructure, platform, and software/applications. Platform as a Service (PaaS) A service model that involves outsourcing the basic infrastructure and platform (Windows, Unix). Hardware as a Service (HaaS) or Infrastructure as a Service

(IaaS) a service model that involves outsourcing the basic infrastructure used to support operations--including storage, hardware, servers, and networking components[2].

The above three types of cloud services classify cloud computing into three distinct deployment models: public , private and hybrid. A public cloud sells services to anyone on the Internet. (Currently, Amazon Web Services is the largest public cloud provider.).A private cloud is a proprietary network or a data center that supplies hosted services to a limited number of people.

A hybrid cloud mix between public cloud and private cloud[3].

Therefore, virtualization is an essential characteristic of cloud computing, through which applications can be executed independently without regard for any particular configuration. Applications in cloud computing have varying demand, configuration and resource utilization[4].

1.2.2 Job Scheduling

Job scheduling is one of the major activities performed in all the computing environments. Cloud computing is one the upcoming latest technology which is developing drastically. To efficiently increase the working of cloud computing environments, job scheduling is one the tasks performed in order to gain maximum profit[5].

There has been various types of scheduling algorithm existing in cloud computing , and job scheduling is one of them. The main advantage of job scheduling algorithm is to achieve a high performance computing and the best system throughput. Scheduling manages availability of CPU memory and good scheduling policy gives maximum utilization of resource[6].

1.3 Problem Statement

There are important scheduling algorithm used on cloudsims environment namely Round Robin ,First Come First Service ,Short Job First.The main challenge is how to choose the effective and efficient one .

1.4 Research Objectives

The objective of this research is to evaluate the performance of current used scheduling algorithms on cloudsims environment .

1.5 Research contributions

- Providing critical analysis for cloud scheduling algorithm.
- Evaluation current scheduling algorithm and determine characteristics.

1.6 Scope

Evaluation of scheduling algorithm (First Come First Service ,Round Robin, Short Job First) using cloudsims environment.

1.7 Thesis Structure

Chapter 2 gives a general introduction of cloud computing, including definition, architecture, deployment models cloud services and scheduling algorithm.

Chapter 3 describe research methodology .

Chapter 4 presents the selected scheduling algorithm details.

Chapter 5 describes the simulation results and performance of different scheduling algorithm.

Chapter 6 This chapter concludes and indicates future research directions.