

Round Robin CPU Scheduling Using Dynamic Time Quantum with Multiple Queue

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Abstract: Scheduling is the central concept used in operating system. It is help to choosing the processes for execution. There are many scheduling algorithms available in operating system like SJF, Priority, FCFS, Round Robin, multilevel queue etc. We mainly focused on Round Robin and multilevel queue scheduling algorithm. Performance of Round Robin algorithm depends upon the size of Fixed or Static Time Quantum (TQ). If TQ is very large then Round Robin algorithm approximate to First Come First Served. If Time Quantum is too small then there will be many context switching between the processes. If we use only FCFS then turnaround time is unpredictable and waiting time is large. To solve these types of problem we proposed a new algorithm as titled "Round Robin CPU Scheduling using Dynamic Time Quantum with Multiple Queue".

Keywords: Scheduling, Waiting Time, Context Switch, Turnaround Time.

1. Introduction

Operating system is one type program that controls the execution of application programs and it's also interface between the user of a computer and the computer hardware [8]. Operating system provides a platform in which user can interact with hardware and execute programs in an efficient manner. Operating system provides various types of services like program execution, I/O operation, file system manipulation, communication and error detection [2]. Modern operating system and time sharing system are more complex, they have involved from multitasking environment in which processes run in synchronized manner [5]. Multiprogramming and multitasking operating system allows more than one process to be loaded into the executable memory at a time and for the loaded process to share the CPU using time multiplexing. The scheduling mechanism is the part of the process manager that handles the removal of the running process from the CPU and the selection of another process on the basis of a particular strategy. Selection of processes is done by the "scheduler" [6]. Many parameter effect the scheduling process such as,

1.1 CPU Utilization

This is measure of how much busy the CPU is. Usually, the goal is to maximize the CPU utilization. Actual CPU utilization varies depending on the amount and type of managed computing tasks [6].

1.2 Throughput

Number of processes that complete their execution per time unit. Throughput is defined as the amount of information passed put through or delivered in a specific period of time [6].

1.3 Waiting time

Amount of time a process has been waiting in the ready queue [1]. It is the time between start time and read time. Usually, the goal is to minimize the waiting time.

1.4 Response time

Amount of time it takes from when a request was submitted until the first response is produced that means time when task is submitted until the first response is received [5].

1.5 Turnaround time

Amount of time to execute a particular process. In other words it is the mean time from submission to completion of a process.

1.6 Fairness

In the absence of user or system supplied criteria for selection, the scheduler should allocate all process must be given equal opportunity to execute [6].

2. Background Work

RR scheduling algorithm working with the many strategy. We discuss different strategy working with dynamic time quantum.

2.1 Round Robin Strategy

In this strategy Round Robin scheduling algorithm working with static time quantum. In Round Robin scheduling algorithm the time quantum is fixed and this time quantum given to every process.

2.2 Min Max Round Robin Strategy

In this strategy, RR scheduling algorithm working with Dynamic Time Quantum rather than Static Time Quantum. In this technique time quantum is a difference between maximum and minimum burst time of processes. This time quantum taken as a dynamic time quantum and applying to each process.

algorithm studies and final we are make „round robin cpu scheduling using dynamic time quantum with multiple queue“. Its algorithm gives better output compare to round robin algorithm. Its efficient to the another algorithm.

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