**On the Management and Efficiency of Cloud Based Services (236365)**

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Distributed Oblivious Load Balancing Using Prioritized Job Replication Simulation

### Project Report

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### Table of contents:

[1 Project Description 3](#_Toc255069077)

[1.1 Purpose 6](#_Toc255069078)

[1.2 Main Goals 6](#_Toc255069079)

[2 Detailed Description 14](#_Toc255069090)

[2.1 Class Diagram 14](#_Toc255069091)

[2.2 Configuration 14](#_Toc255069092)

[2.3 Event Generator 16](#_Toc255069098)

[2.4 Server 16](#_Toc255069099)

[2.5 Statistics Collector 17](#_Toc255069100)

[3 Results 14](#_Toc255069090)

[4 Conclusions 14](#_Toc255069090)

# Project Description

## Purpose

The purpose of this project is to conduct a study regarding the behavior of distributed oblivious load balancing using prioritized job replication with bounded queues. Create a simulator and draw conclusions regarding the difference between the behavior of a system with infinite and finite queues.

## Main Goals

We have several goals.

1. **Create a simulator for distributed** **oblivious load balancing using prioritized job replication:**

The simulator should be configurable using a configuration file (XML based). The configuration enables to trigger the queues, high priority (HP) and low priority (LP) bounds, the number of jobs, the number of servers and the load on the system. Also, it’ll be possible to extract information of the simulation in an easily meaner into a CSV and XML files. Moreover, it’ll be possible to conduct several experiments with on run of the simulator.

1. **Conduct a study of the results:**

First, we’ll simulate different loads, with different number of servers, having infinite queues in order to investigate the scenario of M/M/2 and see if our results agree with the results of Amir Nahir studies.

Simulate the systems behavior with bounded queues and different loads with different number of servers. Understand and present the key differences between the behavior of the system with infinite queues and a system with bounded queues.

# Detailed Description

## Class Diagram [Asi]

## Configuration[Assaf]

## Event Generator[Assaf]

## Server[Asi]

## Statistics Collector

Statistics Collector (SC) is a module that is responsible for accumulating the statistics of the system.

Each server reports the termination of jobs and the changes in the length of the queues to a local SC. At the end of the simulation each SC reports its statistics to a global SC (GSC) that calculates the statistics of the entire system.

Thus, it is possible to receive detailed statistics of a simulation regarding each individual sever the whole system.

This module gives functionality of generating a report into a CSV and XML based files.

The statistics collector collects the following statistics:

HP Queue max length, LP Queue max length, HP Queue average length, LP Queue average length, HP Jobs average time in system, LP Jobs average time in system,

Also it provides statistics regarding the scenarios when a job, either LP or HP, is dropped due to sibling completion or full queue.

# Results[Assaf]

# Conclusions