National College of Ireland

Delay vs power consumption in edge/fog computing

MSc Research Project
MSc in Cloud Computing

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Project Submission Sheet
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Delay vs power consumption in edge/fog computing

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1 Introduction

Information and operating procedures used throughout from the inception of the idea to the development of code are listed in this document. To run the code and how to run, where to run etc are mentioned step by step in this document as part of the Msc Research Project. The entire code is written in java language, python and Matlab scripts.

2 Prerequisites

Prerequisites required by a user are working or basic programming knowledge of java as a language.

Should know how to use one IDE (Integrated development environment) for java such as Eclipse.

Need to understand the script written in matlab scripts ".m" files. Using GNU octave which is a open source free tool for running matlab files.

Used a simulation tool written in java called EdgeCloudSim, so should understand code from this tool/application.

3 Installations and initiation

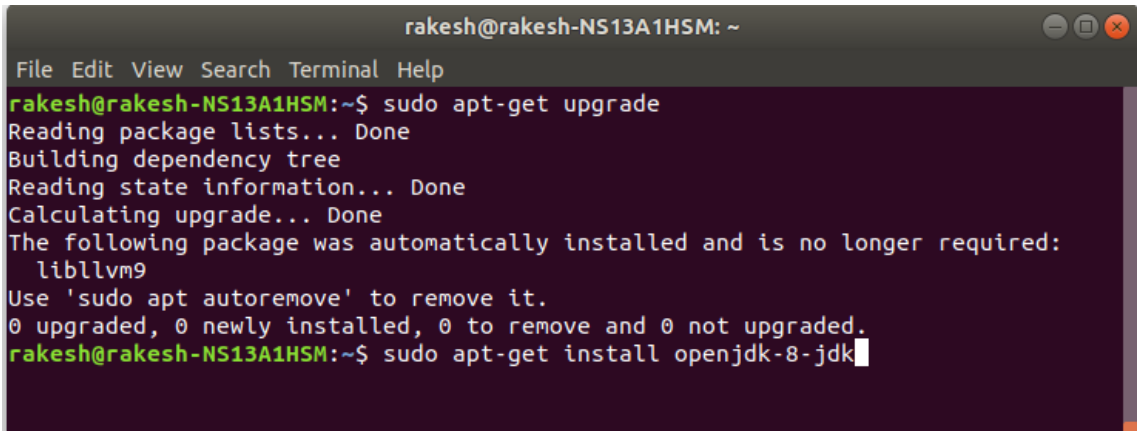

Figure 1: Upgrade and update and install java

Installing java step
Check java installed version later by using the command "java -version".
Installing Eclipse step
Run Eclipse
Install Octave
Run octave

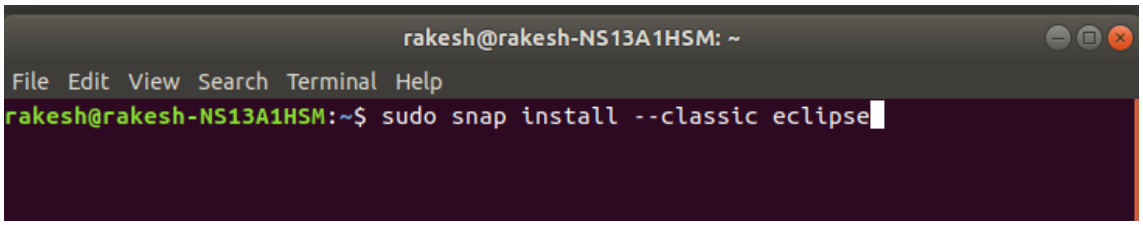

Figure 2: Upgrade and update and install java

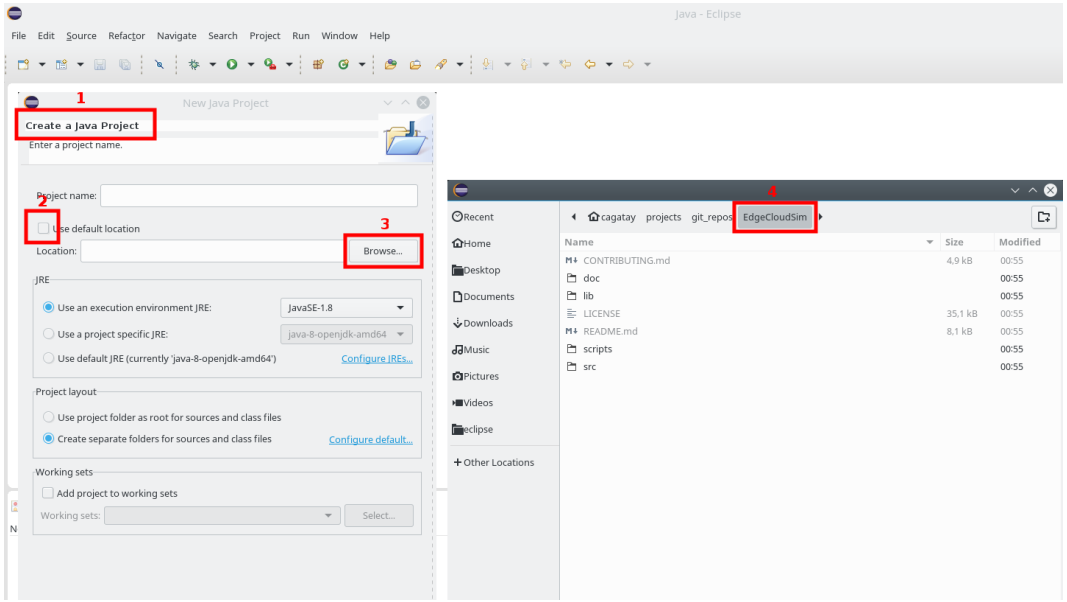

Figure 3: open app in Eclipse

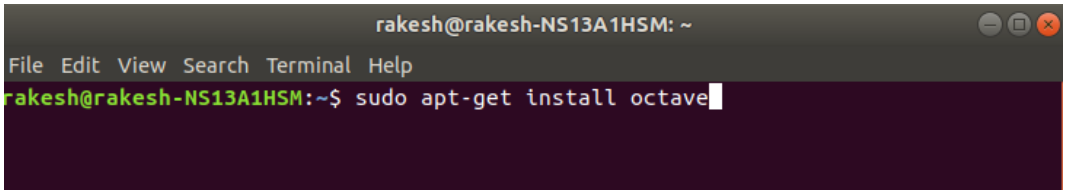

Figure 4: Installing GNU Octave

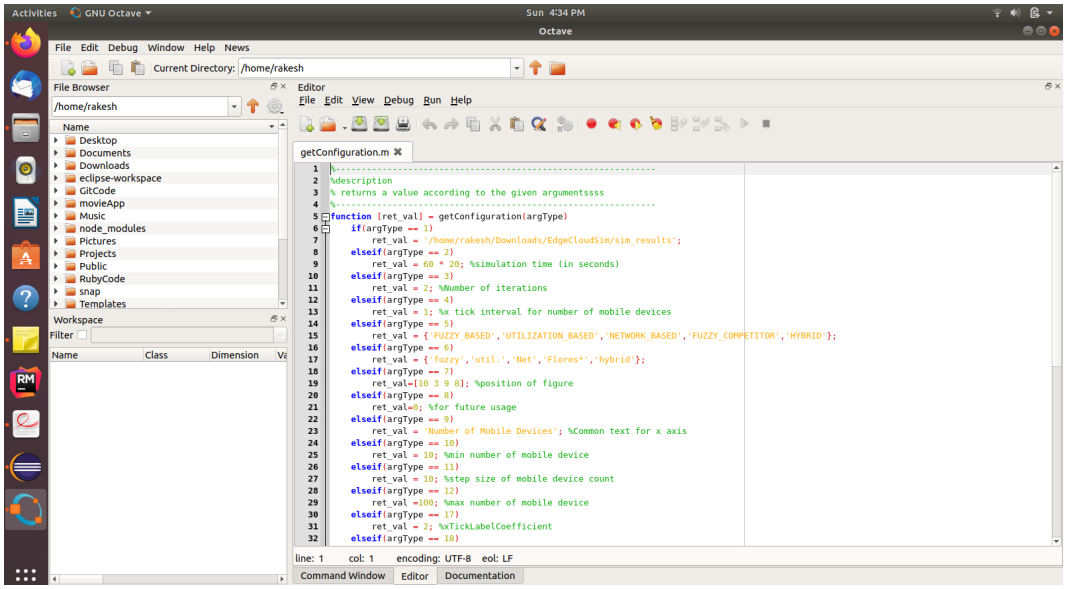

Figure 5: Application view of octave

4 Additional scripts to run the code

After all installation are done we had modified the java code files in the EdgeCloudSim application as per our need, also I changed the matlab files script to generate the graphs as per need. Changes in XML files for configurations was done too.
We are running a python compile script which will build the java code here. Later we will run scenarios by passing parameters with it for number of simulations and number of parallel processes allowed.
1)compile.sh
1)run_scenarios.sh

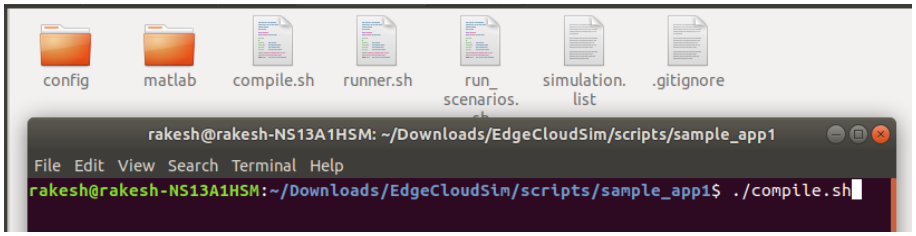

Figure 6: Compile the code here by running python script

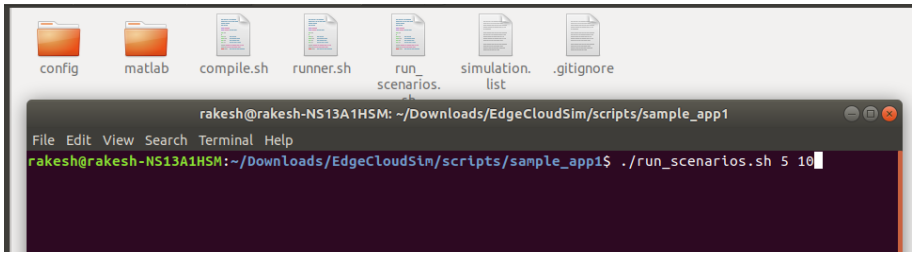

Figure 7: Run the code here by running python script

5 Get Simulation results

We get different folder with simulation numbers in detail. Also log file for each simulation number is there. Files with names related to the type of simulation is there too.

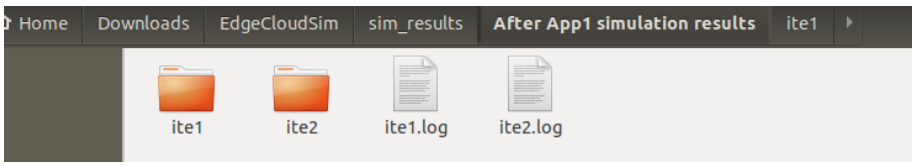

Figure 8: Iterations and log folders

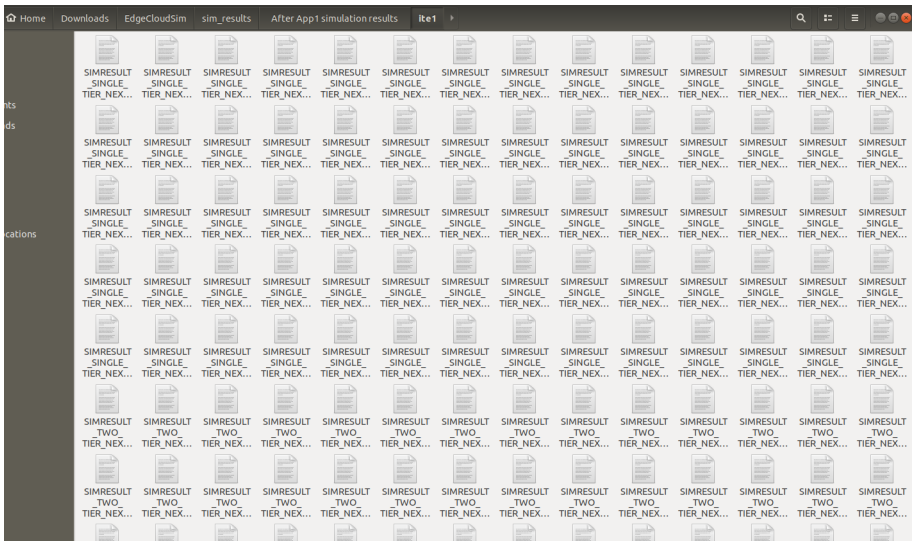

Figure 9: Multiple types of simulations files

6 Graph the simulation results

Results with the three experiments shows the use of priority marker algorithm, also use of RMDPP with priority marker algorithm is shown too. So the proposed algorithms shows a downfall of critical health application failure rate.

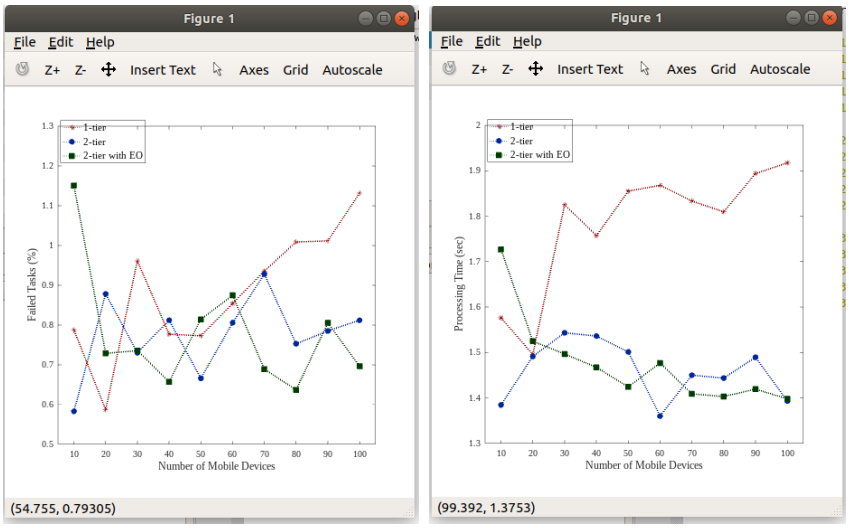

Figure 10: Failed tasks AND Average Processing time over different tiers

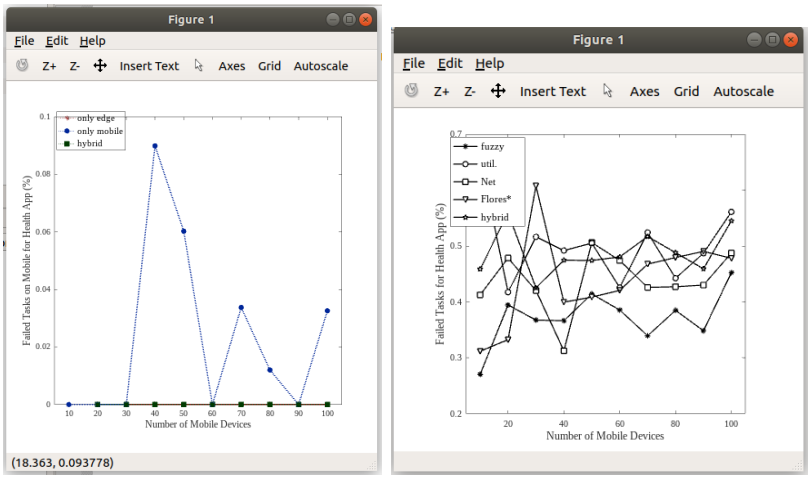

Figure 11: Failed health tasks over mobile and over different algorithms

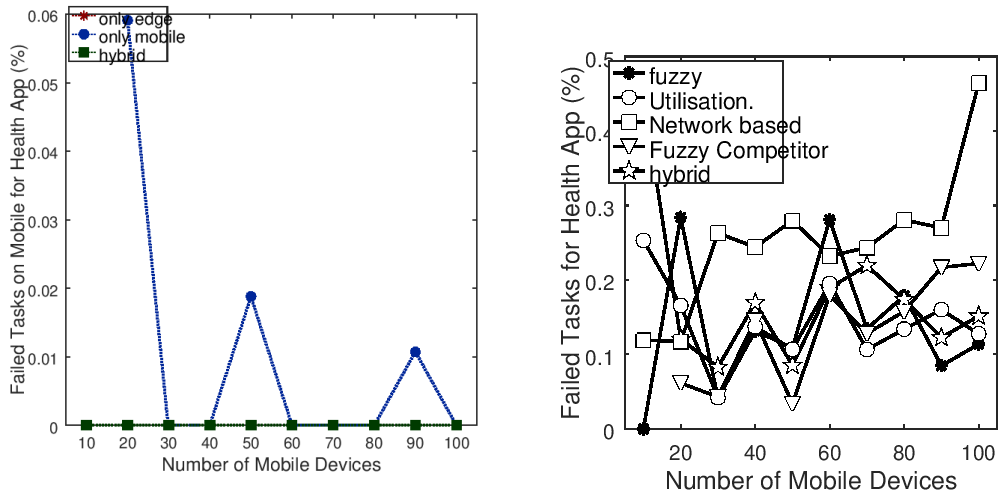

Figure 12: Failed health tasks over mobile and over different algorithms with RMDPP and priority algorithm