National College of Ireland

Configuration Manual

MSc Research Project
Cloud Computing

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Project Submission Sheet
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Configuration Manual

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1 Introduction

The configuration manual consists of the process for implementing the energy aware load balancing algorithm. It also consists of the general set up used for installing the necessary tools required for the project. This configuration manual will aid academic students and other researchers to have a deeper understanding on the method involved in implementing this research project.

2 Software Tools Used

The software tools used for this prject are:

- Eclipse IDE - This was used in the project to code the implementation in Java.
- IfogSim: It is a java file that consists of cloudsim framework.
- Excel - It was used to visualize and study the results.
- JDK 14.0.1 - It contains Java libraries needed to run the Java program.

3 Hardware Specification

- Operating system - Windows/ Linux/ Mac) (Any Operating System is fine).
- RAM: More than 8GB is requred
- Processor: Any CPU from Intel Core.

4 Software Installation

This is step by step process for the implentation.

4.1 Java Development KiT (JDK) installation

- Download the JDK 14.01 from the following link JDK (n.d.). [1]

[1] `www.oracle.com/java/technologies/javase/14-0-1-relnotes.html`

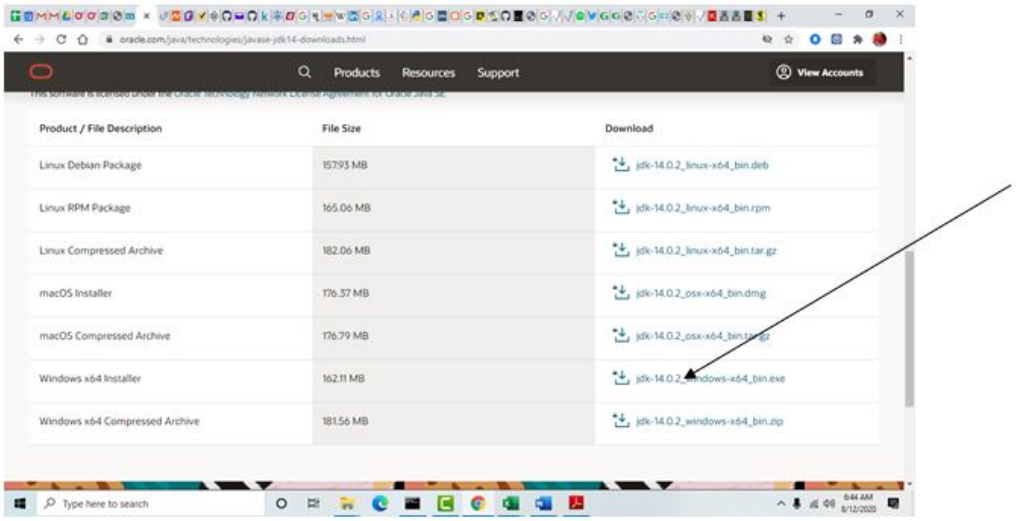

Figure 1: JDK Download

- Install Java JDK 14.0.1 on your system

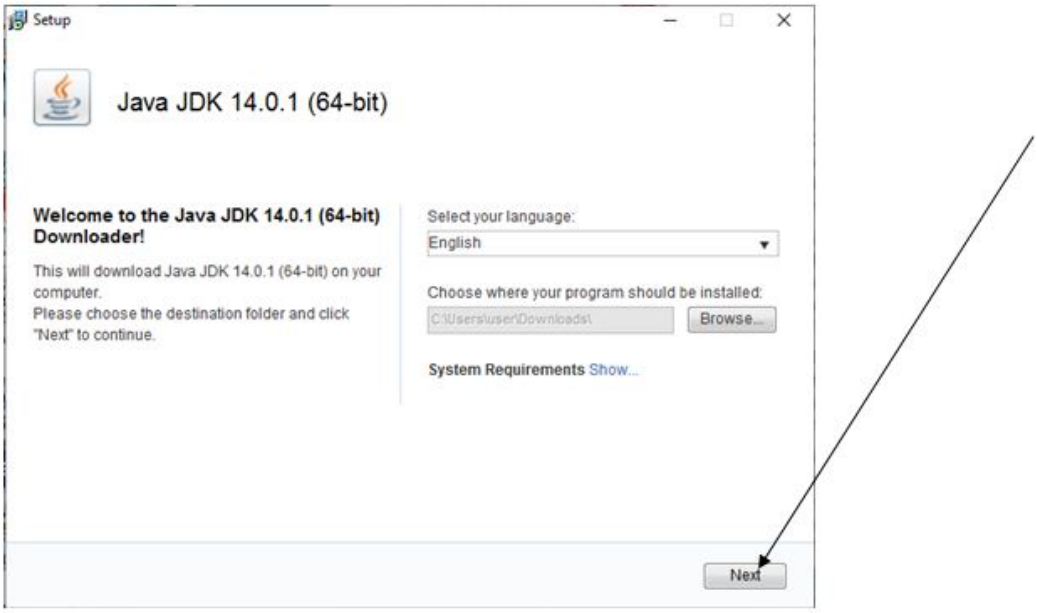

Figure 2: JDk Installation

4.2 Eclipse Integrated Development (IDE) Installation

- Download Eclipse IDE 2020 -06 from this link 2020-06 (n.d.)
[2]

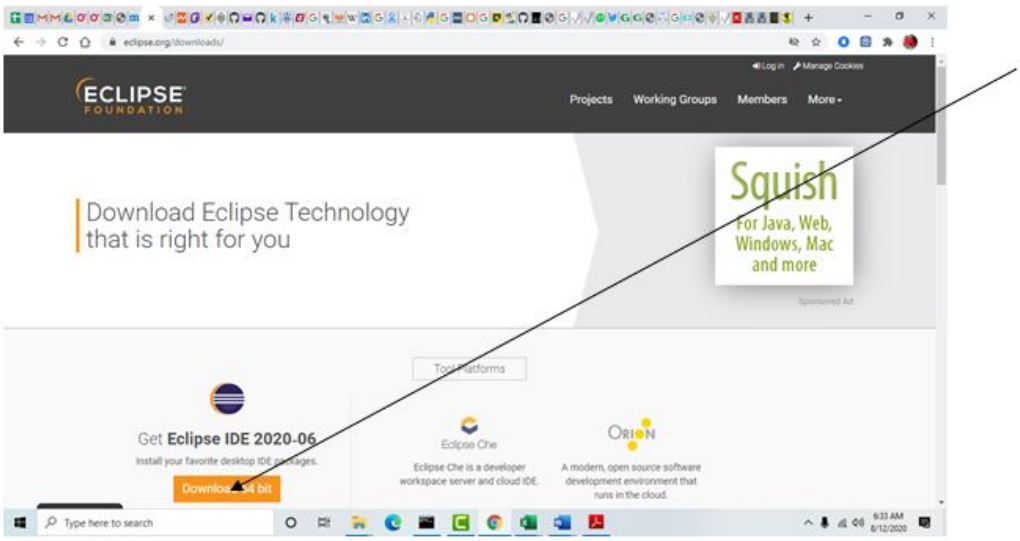

Figure 3: Eclipse Download

- Install Eclipse IDE 2020 -06 on your system

[2] www.eclipse.org/downloads/packages/release/2020-06/r/eclipse-ide-java-developers

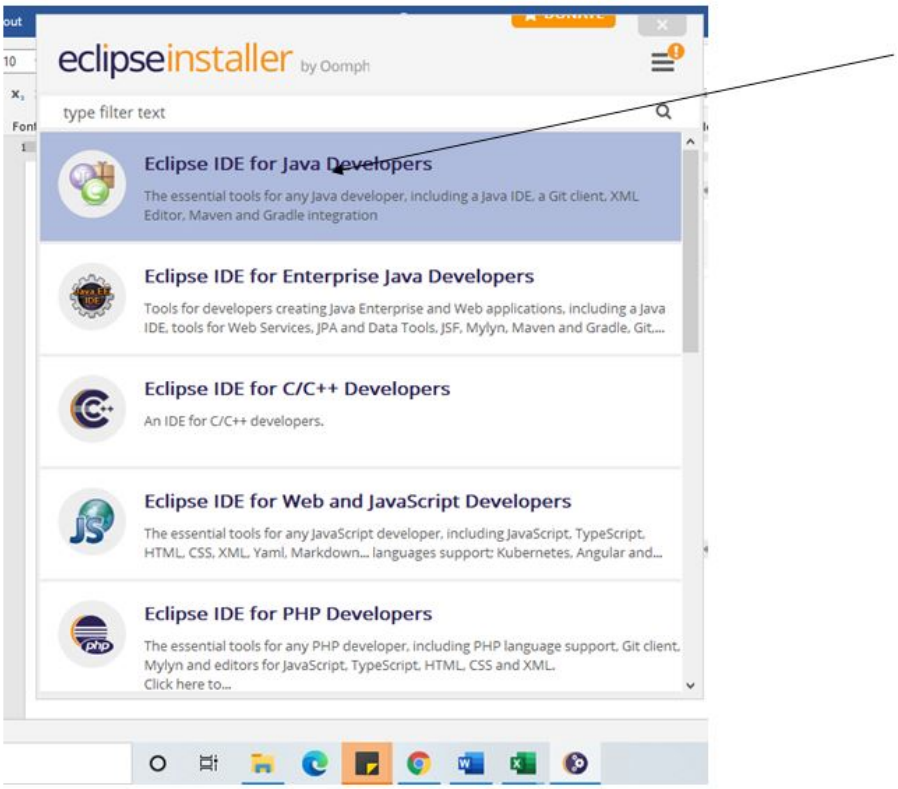

Figure 4: Eclipse Installation

- Open eclipse and create a new java project

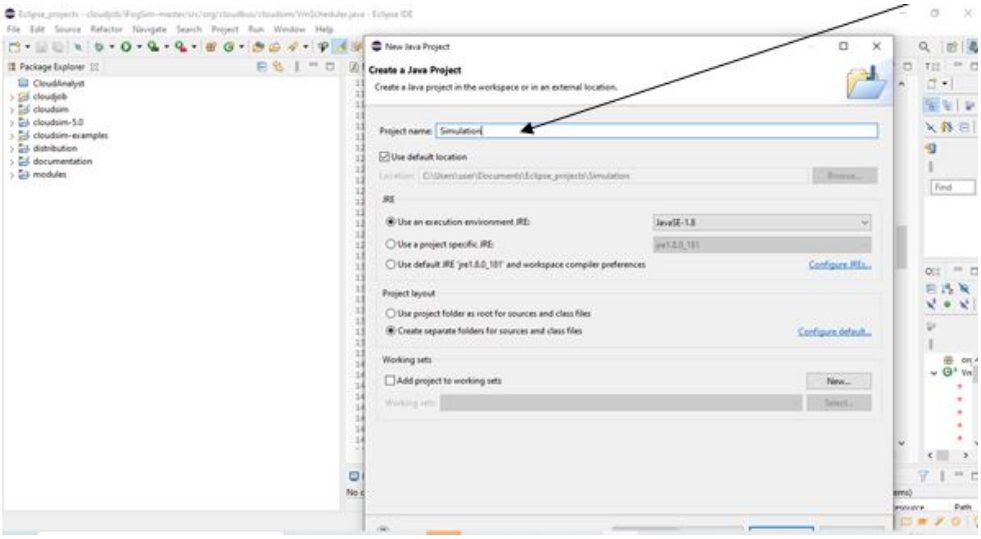

Figure 5: Creating a new project in Eclipse IDE

4.3 iFogSim Installation

- Download the .zip file from iFogSim (n.d.) [3]

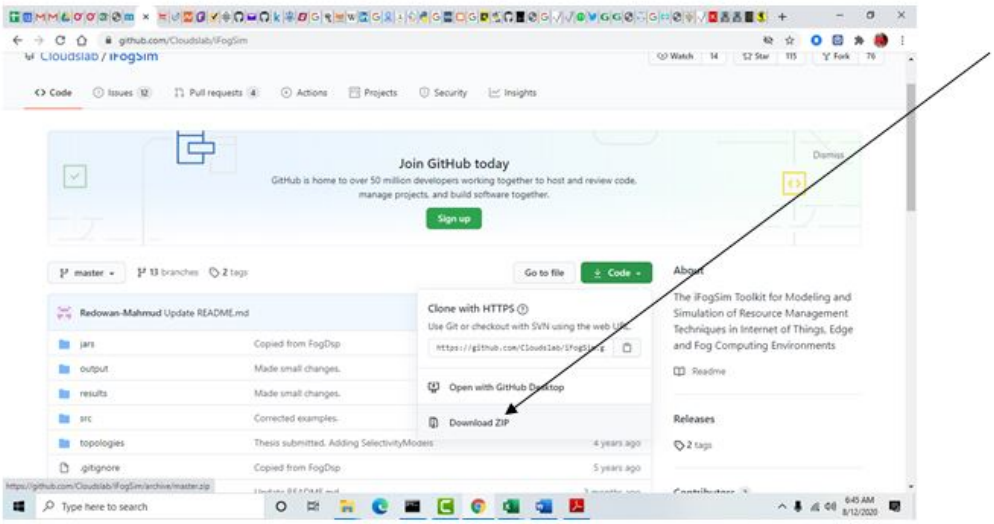

Figure 6: IFogSim Download

[3] `github.com/Cloudslab/iFogSim`

- import the iFogsim into Java project

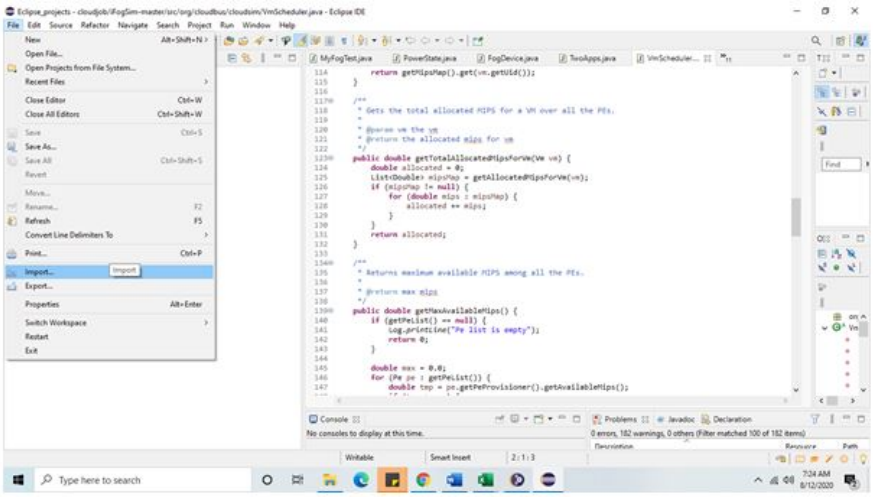

Figure 7: Importing the iFogSim into Eclipse IDE

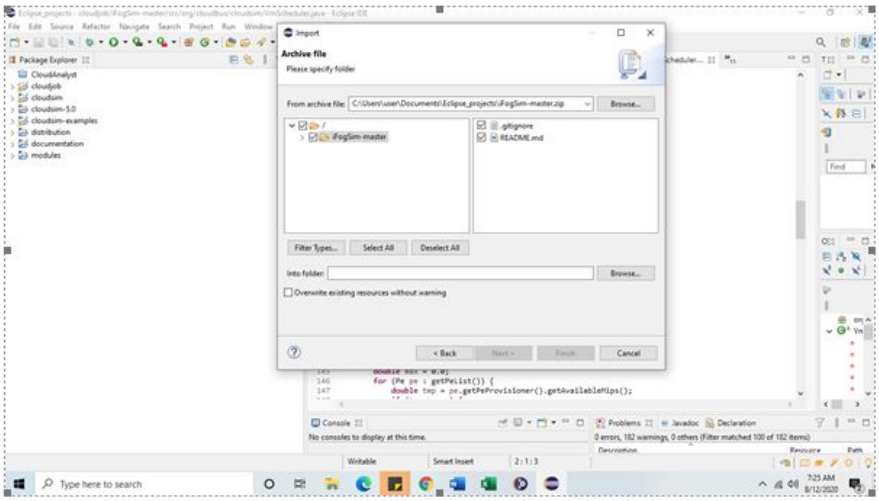

Figure 8: Importing the iFogSim into Eclipse IDEt

5 Project Development

Our project development is done using the following steps

5.1 Creating a Fog environment

- Run FogGUI.java to show the graphical user interface for creating the network topology.

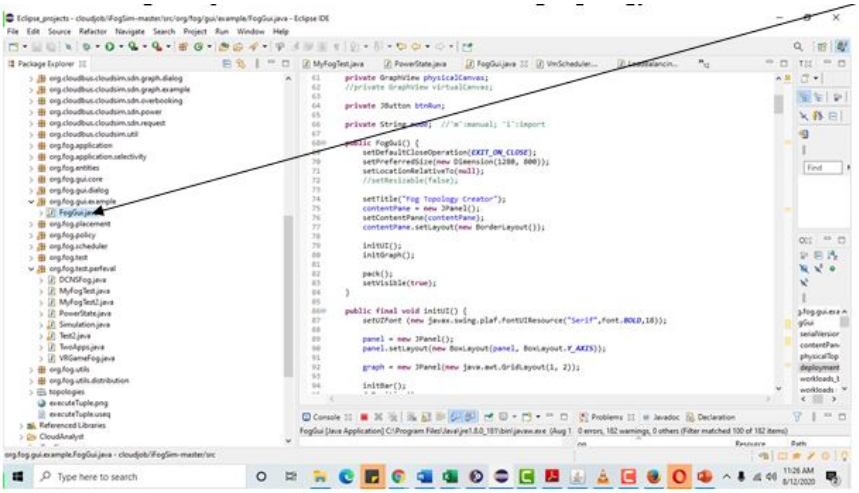

Figure 9: Run FogGUI.java to show GUI for creating a network topoology

- Designed Topology

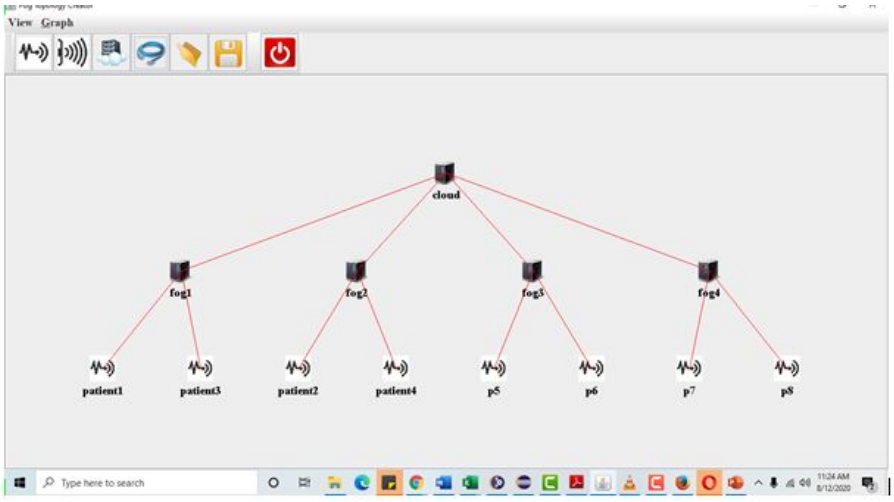

Figure 10: Designed Network Topology

5.2 Creating the Power Recharge Simulation

This shows the code for power state of the fog device that notifies the system if the device is low or charged. It also tells the device to connect to an energy source if it detects the weather condition when low.

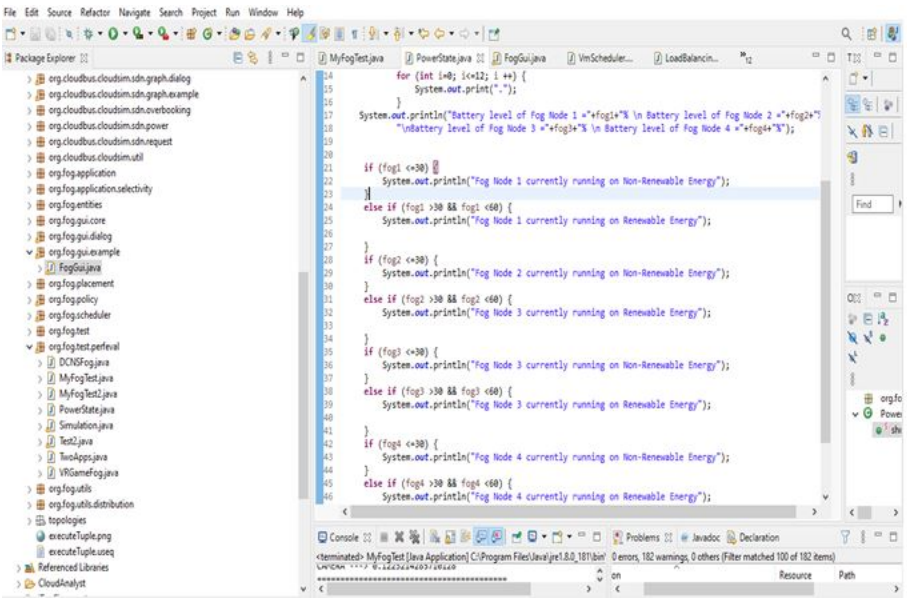

Figure 11: Java Code for Power Management

5.3 Creating the Code for the Implementation

Attached below shows the code for the developing the energy aware load balancing algorithm.

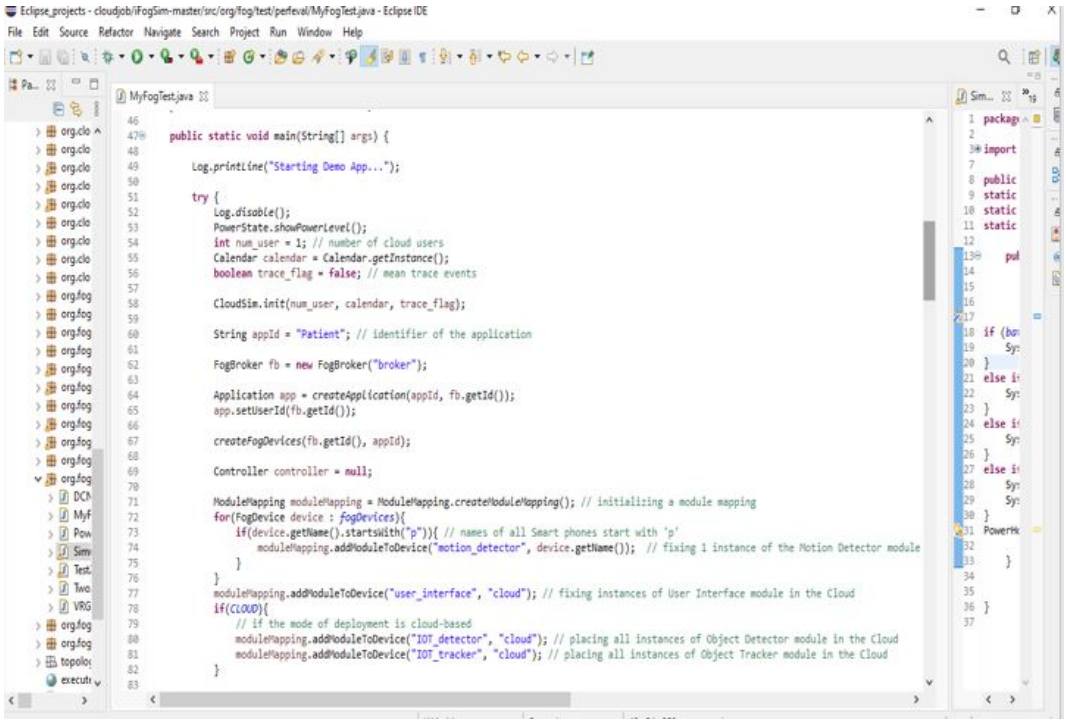

Figure 12: Java Code for the Implementation

5.4 Simulation Output

This snapshot shows the output simulation of the designed network topology.

Figure 13: Simulation Output

5.5 Performing the test

- Run the code the simulation.

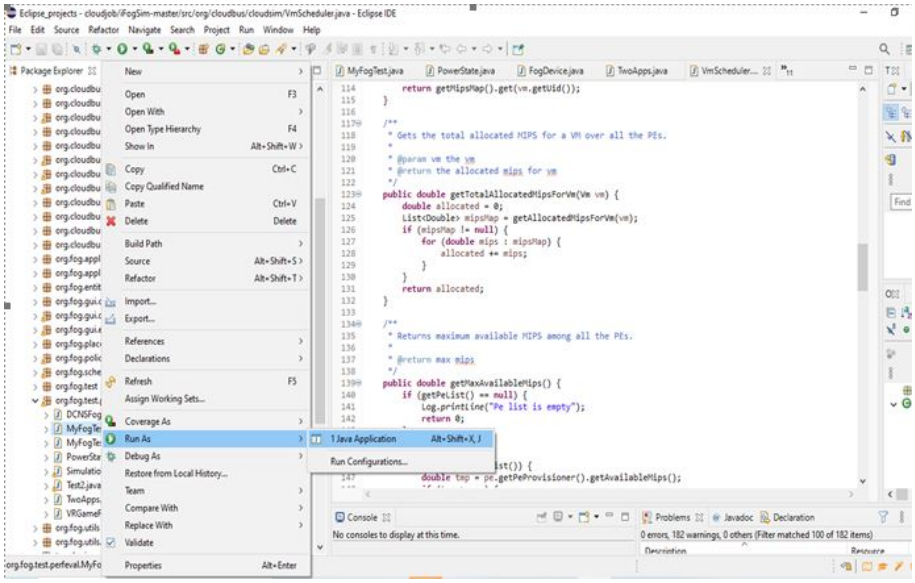

Figure 14: Running the Simulation Code

- Test Results After running the .java file. Shown below is the output that is generated in the console.

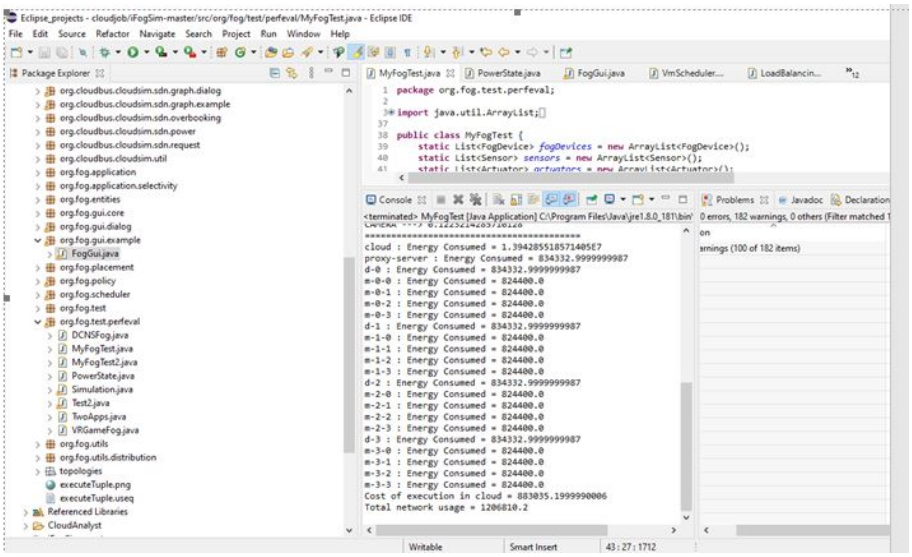

Figure 15: Test Result from the Console

6 Conclusion

This configuration manual illustrates the guidelines to reproducing the energy aware load balancing algorithm associated with the research. The process of installing Eclipse IDE,JDK,iFogSim, creating the task allocation are described.

References

2020-06, E. (n.d.). Eclipse ide for java developers.
URL: *www.eclipse.org/downloads/packages/release/2020-06/r/eclipse-ide-java-developers*

iFogSim (n.d.). ifogsim download.

JDK (n.d.). Java developent kit 14.0.1.
URL: *www.oracle.com/java/technologies/javase/14-0-1-relnotes.html*