Pandit Deendayal Energy University, Gandhinagar
School of Technology
Department of Computer Science & Engineering
B.Tech-Computer Science & Engineering (Sem-VI)
Cloud Computing Lab(20CP322P)

- **19BCP091**
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Part A

Aim:

Study of Load Balancing using CloudAnalyst

Prerequisite: Nil

Outcome:

To impart knowledge of Cloud computing technology

Theory:

Load Balancing is a very important topic in Cloud Computing as it used to distribute total workload of multiple network links to achieve maximum throughput, minimize response time and avoid overloading. There are mainly three algorithms used to distribute the load keeping in mind the performance, time and cost.

Cloud Analyst is a tool developed at the University of Melbourne whose goal is to support evaluation of social networks tools according to geographic distribution of users and data centers. In this tool, communities of users and data centers supporting the social networks are characterized and, based on their location; parameters such as user experience whileusing the social network application and load on the data center are obtained/logged. CloudAnalyst is used to model and analyse real world problems through case studies of social networking applications deployed on the cloud.

Procedure:

1. Download Cloud Analyst from the following link
   http://www.cloudbus.org/cloudsim/CloudAnalyst.zip

2. Configure the Datacentres and Userbases according to the requirements-

Scenarios to be completed:

R0 – North America
R1 – South America
R2 – Europe
R3 – Asia
R4 – Africa
R5 – Australia

Exercise 1

02 Datacentres in R0 and R1 and Userbases in R3, R4 and R5. Plot the graphs as shown above

Exercise 2

02 Datacentres in R4 and R5 and Userbases in R0, R1 and R2. Plot the graphs as shown above

Exercise 3

Find out the Best Case for the following setup (scenario1 - avg time should be less, scenario2-Min time taken should be least, scenario 3-Max time should be minimal)

(Graph plot not needed)
User Bases – R0 to R5
Applications - 10 Applications in each UB
Data Centers – Minimal (2)
Load Balancing – Out of the available choices.

Instructions:

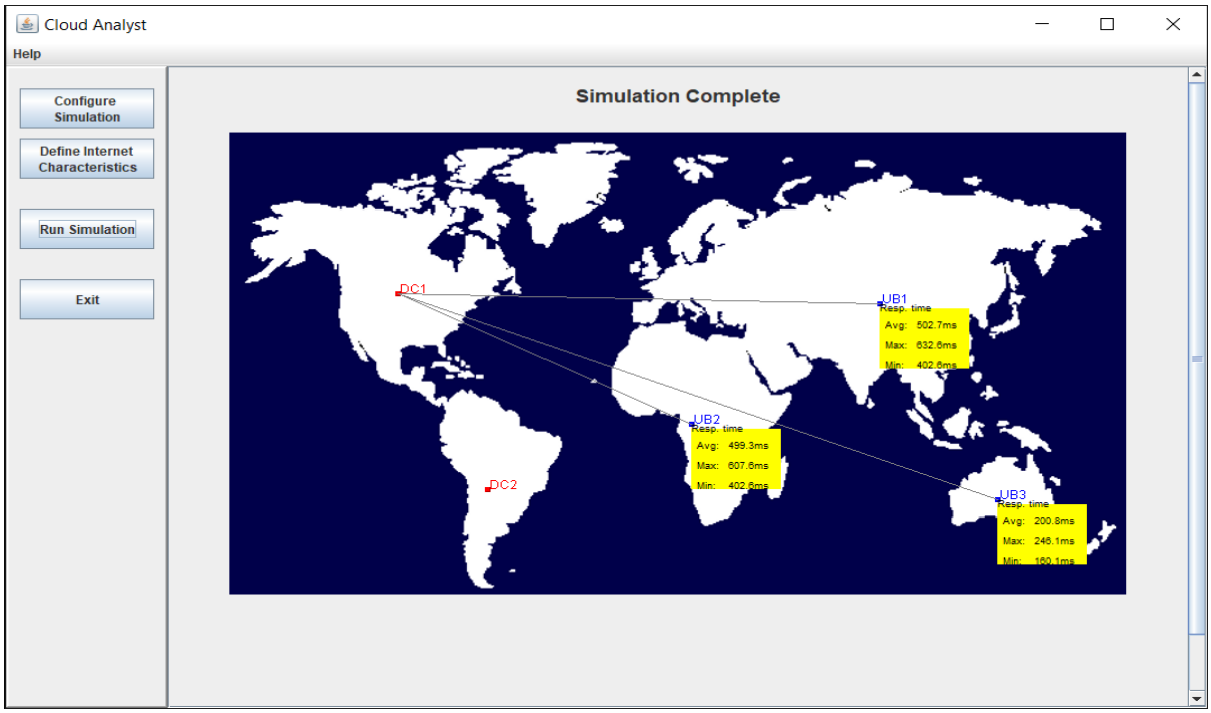
Configure the environment as suggested above and simulate the results..

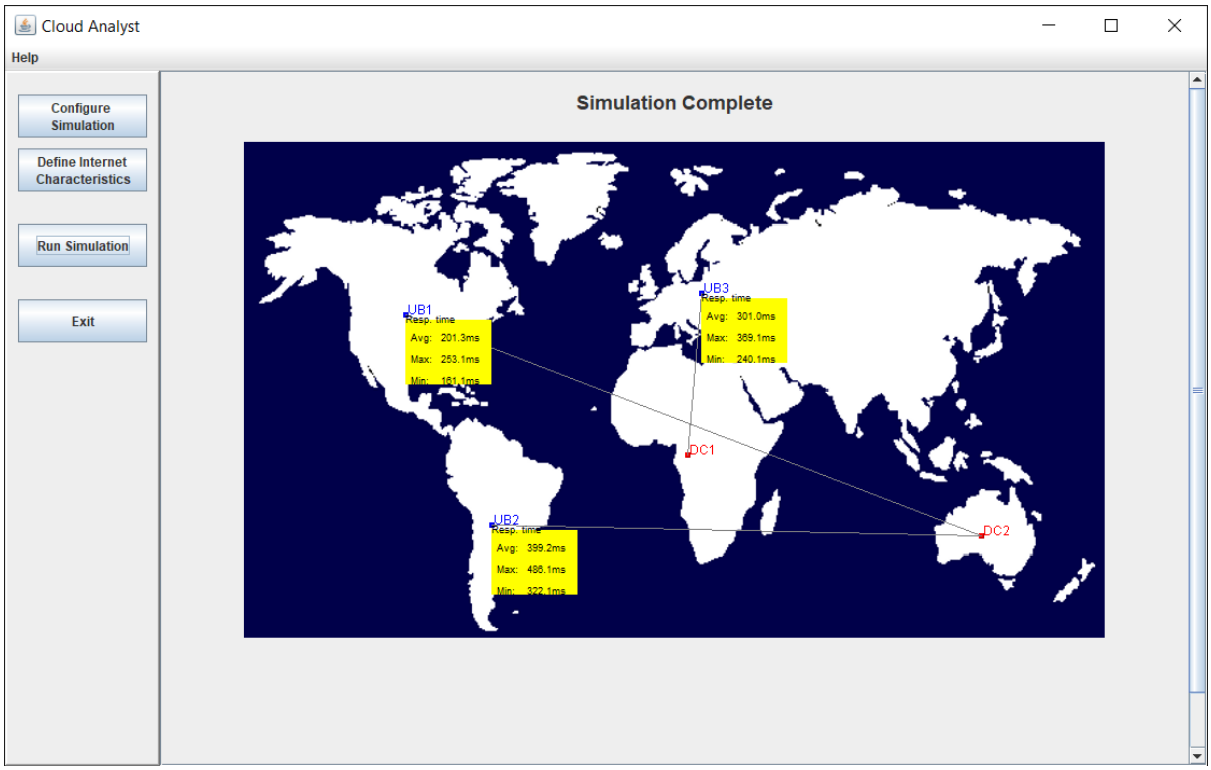
Part B

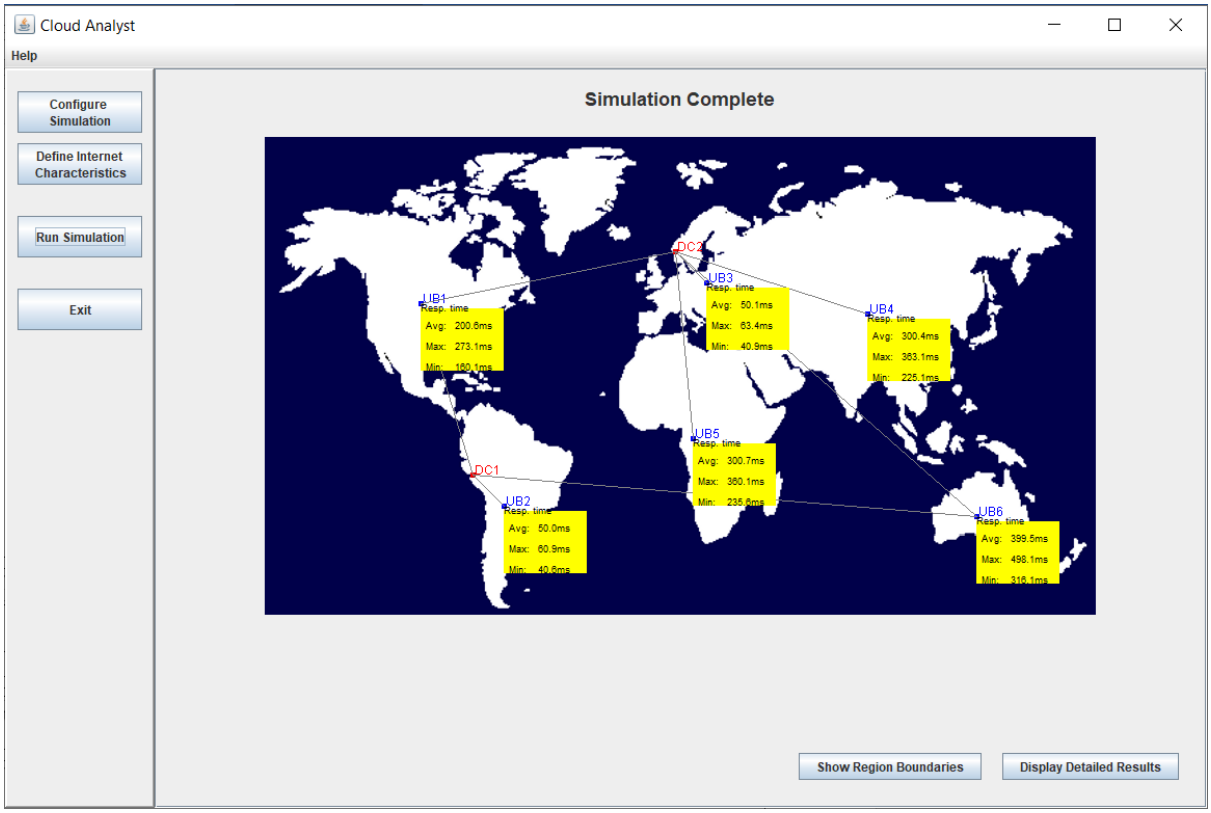
Steps:

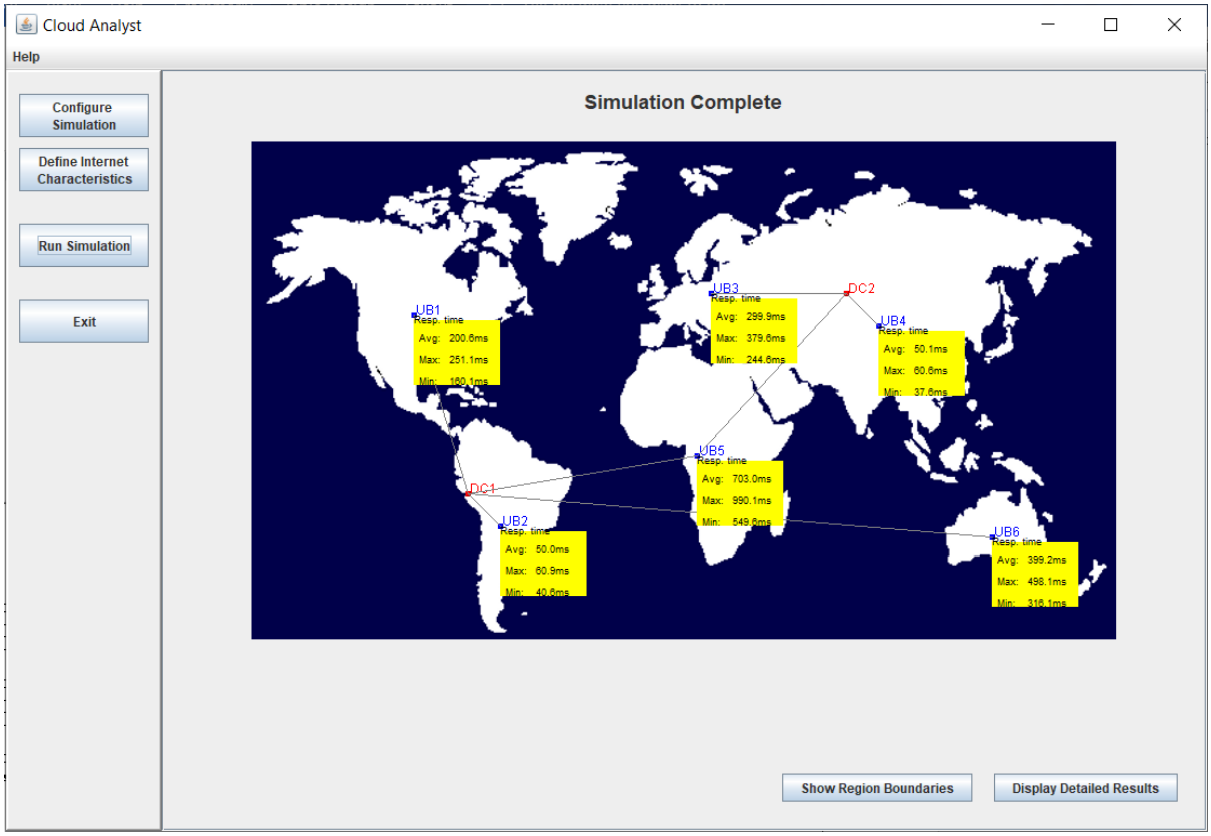
- First of all, download the file from the above link and unzip the file.
- If you are a windows user and java is installed in your system the run “run.bat” file.
- If you are a Linux user and java is installed run “java -cp jars/simjava2.jar;jars/gridsim.jar;jars/iText-2.1.5.jar;classes;. cloudsim.ext.gui.GuiMain” from the command line.
- In “Define internet characteristics” you know about ping and bandwidth between all regions.
- Now if you want to configure all information about your server and user database then click on “Configure Simulation”. There is 3 section in that option.
- 1st section is “main Configuration”. In which you can add and edit information about the userbase and datacenter.
- 2nd section is “Data Center Configuration”. In which you can edit information about data center. You can add VM, increase or decrease RAM, storage, etc. of VM.
- 3rd section is “Advanced”. Here you can mainly select load balancing policy across VM’s in a single data center.
- Now save all the Configuration to a file and click done.
- Now if you click on “Run Simulation” you can show the answer as shown below

Output:




Cloud Analyst
Help
Configure Simulation
Define Internet Characteristics
Run Simulation
Exit
Simulation Complete
UB1
Resp. time
Avg: 201.3ms
Max: 283.1ms
UB3
Resp. time
Avg: 301.0ms
Max: 369.1ms
Min: 240.1ms
DC1
UB2
Resp. time
Avg: 399.2ms
Max: 486.1ms
DC2


Cloud Analyst
Help
Configure Simulation
Define Internet Characteristics
Run Simulation
Exit
Simulation Complete
DC2
UB1
Resp. time
Avg: 200.6ms
Max: 273.1ms
UB3
Resp. time
Avg: 50.1ms
Max: 63.4ms
Min: 40.9ms
UB4
Resp. time
Avg: 300.4ms
Max: 383.1ms
UB5
Resp. time
Avg: 300.7ms
Max: 360.1ms
DC1
UB2
Resp. time
Avg: 50.0ms
Max: 60.9ms
UB6
Resp. time
Avg: 399.5ms
Max: 498.1ms
Show Region Boundaries
Display Detailed Results



Observation & Learning:

In this practical, We learn how to use CloudAnalyst software, For this learning purpose we download CloudAnalyst from http://www.cloudbus.org/cloudsim/CloudAnalyst.zip and to use this software we must have java package

It helps developers with insights in how to distribute applications among Cloud infrastructures and value added services such as optimization of applications performance and providers incoming with the use of Service Brokers.

Conclusion:

CloudAnalyst is simple to install and easy to use with little bit of understanding we can use easily we can design hardware and software that work on the concept of cloud computing and also help to monitor the performance of the system

Questions:

1. **What are regions and zones in cloud?**

   Regions are independent geographic areas that consist of zones. Zones and regions are logical abstractions of underlying physical resources provided in one or more physical data centres.

2. **What are availability zones in cloud?**

   Availability zones (AZs) are isolated locations within data centre regions from which public cloud services originate and operate**.**

3. **What are colocation facilities in cloud?**

   A colocation facility, is a data centre facility in which a business can rent space for servers and other computing hardware**.**

4. **What is zone depreciation?**

   The term depreciation refers to an accounting method used to allocate the cost of a tangible or physical asset over its useful life or life expectancy.