

# **Practical 1**

## **Cloud Computing**

2CSDE67

**Mistry Unnat**

20BCE515

**Date**

January 27, 2022



Department of Computer Science and Engineering

Institute of Technology

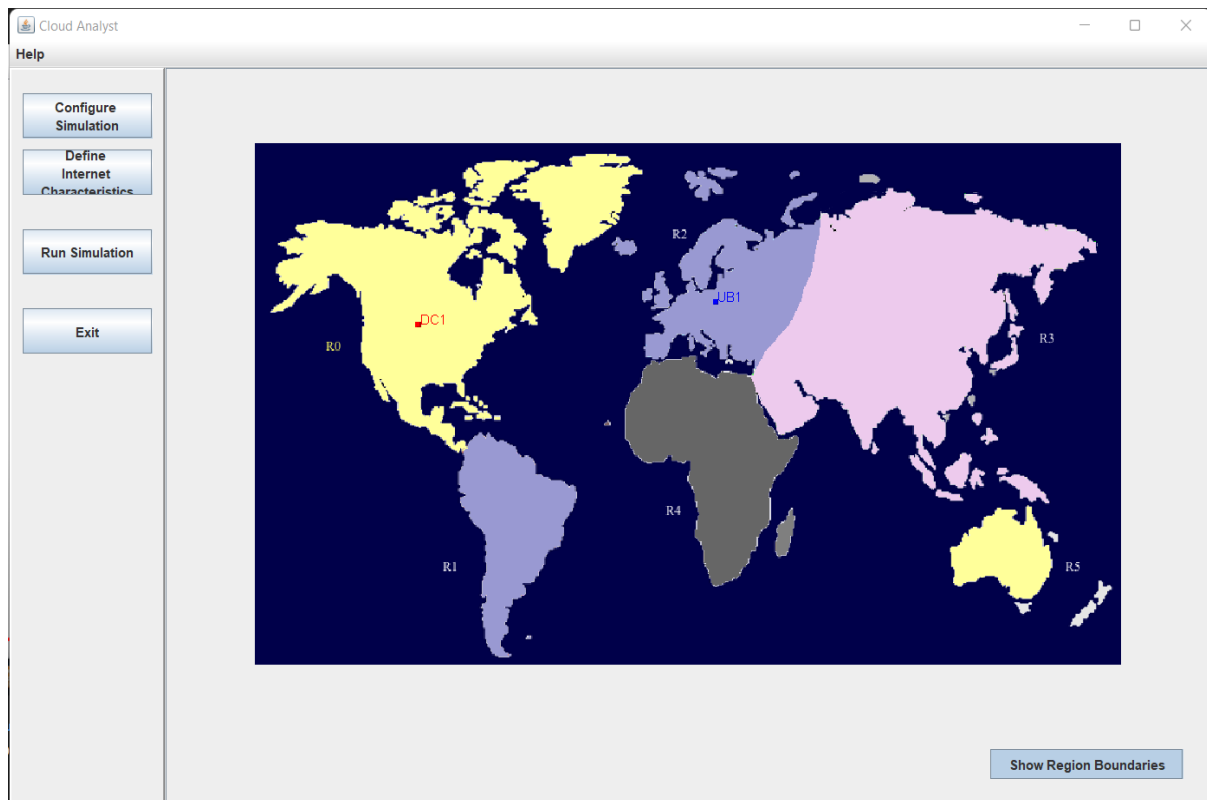
Nirma University

Ahmedabad

## AIM:

Getting acquainted with the simulator such as cloud analyst and cloud report, to analyse its result based on the response time, scheduling, tasks and number of data centre available and its distance.

## Cloud Analyst software:



- R : Region
- DC : Data Center
- UB : User Base

## Configuring Simulation

### Main configuration window :

**Main Configuration** | Data Center Configuration | Advanced

Simulation Duration:  min

**User bases:**

Name	Region	Requests per User per Hr	Data Size per Request (bytes)	Peak Hours Start (GMT)	Peak Hours End (GMT)	Avg Peak Users	Avg Off-Peak Users
UB1	1	60	100	3	9	1000	100
UB2	2	60	100	3	9	1000	100
UB3	3	60	100	3	9	1000	100

**Add New** **Remove**

**Application Deployment Configuration:**

Service Broker Policy: **Closest Data Center**

Data Center	# VMs	Image Size	Memory	BW
DC1	5	10000	512	1000
DC2	4	10000	512	1000
DC3	3	10000	512	1000
DC4	4	10000	512	1000
DC5	7	10000	512	1000

**Add New** **Remove**

**Cancel** **Load Configuration** **Save Configuration** **Done**

### Data Center Configuration :

**Main Configuration** | **Data Center Configuration** | Advanced

**Data Centers:**

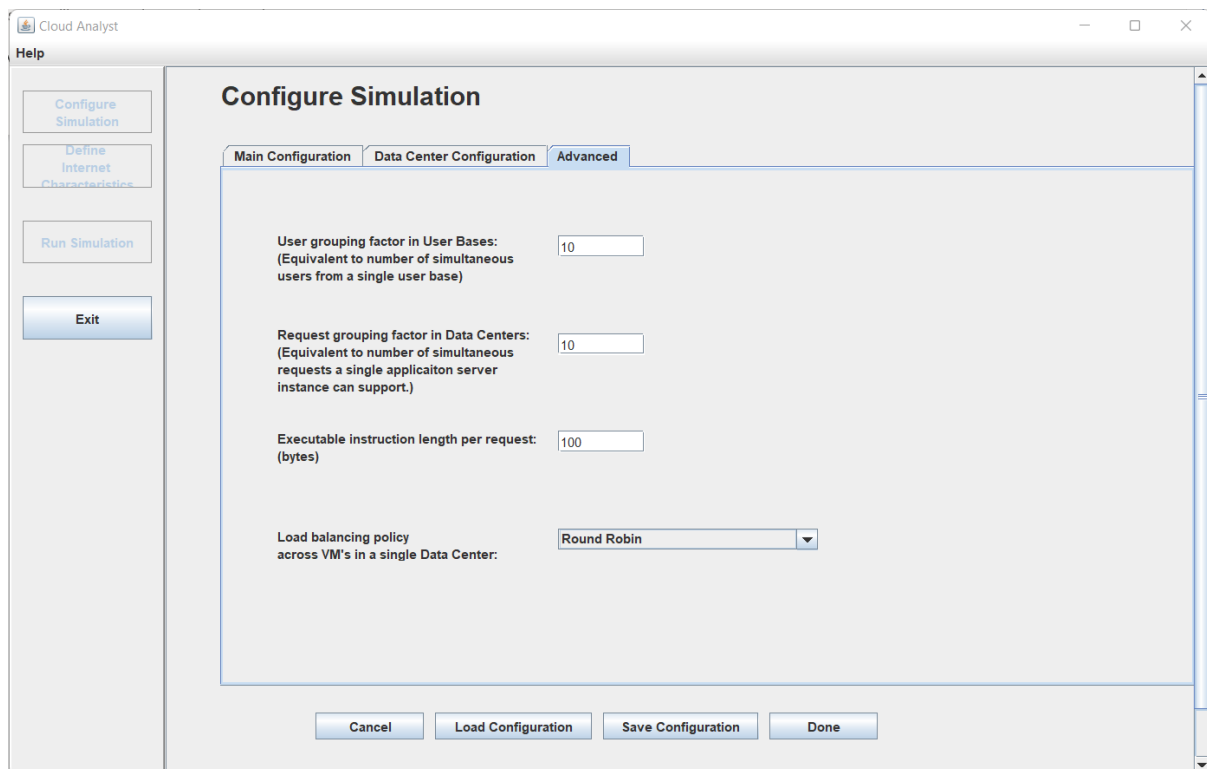
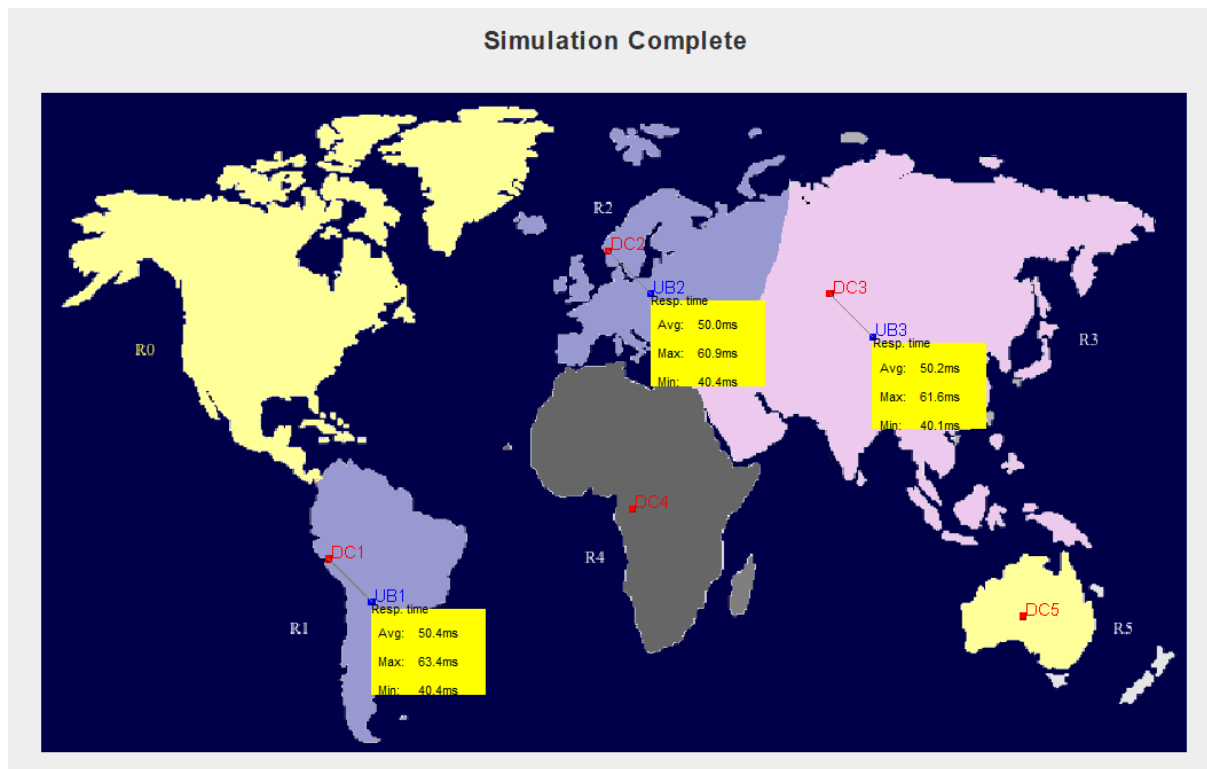
Name	Region	Arch	OS	VMM	Cost per VM \$/Hr	Memory Cost \$/s	Storage Cost \$/s	Data Transfer Cost \$/Gb	Physical HW Units
DC1	1	x86	Linux	Xen	0.1	0.05	0.1	0.1	3
DC2	2	x86	Linux	Xen	0.1	0.05	0.1	0.1	4
DC3	3	x86	Linux	Xen	0.1	0.05	0.1	0.1	5
DC4	4	x86	Linux	Xen	0.1	0.05	0.1	0.1	6
DC5	5	x86	Linux	Xen	0.1	0.05	0.1	0.1	6

**Add New** **Remove**

**Physical Hardware Details of Data Center : DC5**

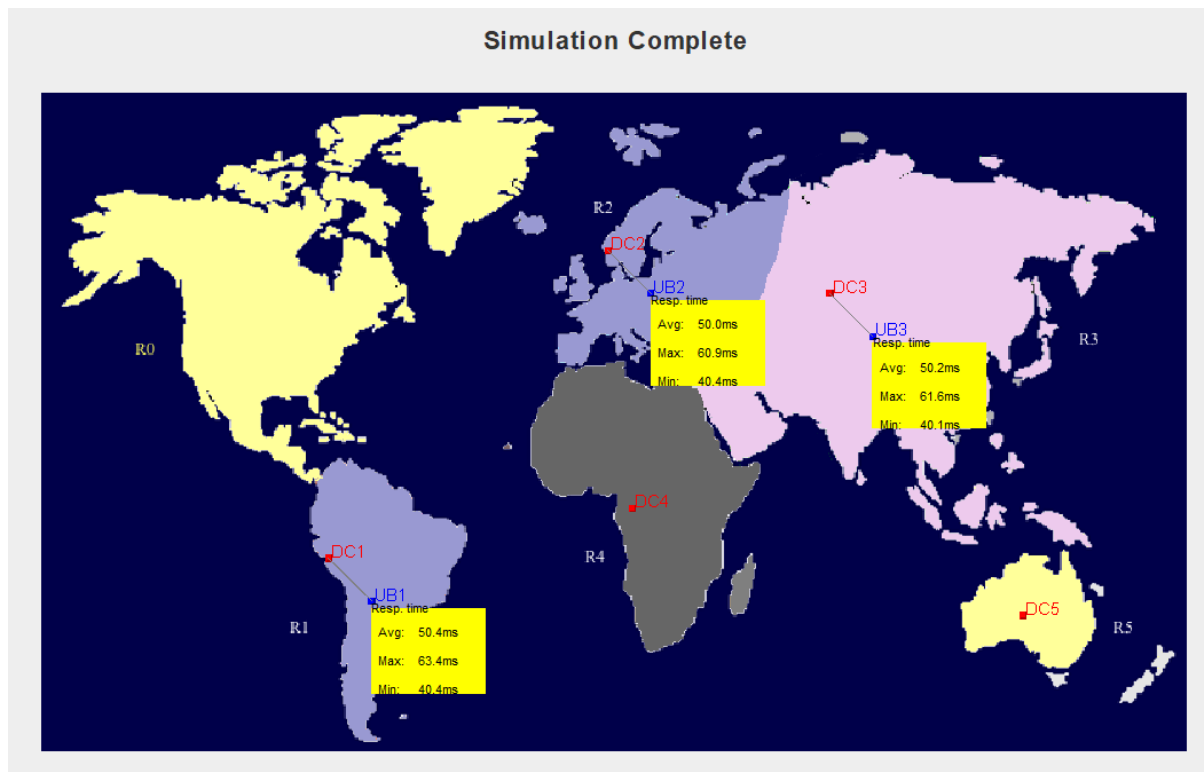
Id	Memory (Mb)	Storage (Mb)	Available BW	Number of Processors	Processor Speed	VM Policy
0	204800	100000000	1000000	4	10000	TIME_SHARED
1	204800	100000000	1000000	4	10000	TIME_SHARED
2	204800	100000000	1000000	4	10000	TIME_SHARED
3	204800	100000000	1000000	4	10000	TIME_SHARED
4	204800	100000000	1000000	4	10000	TIME_SHARED

**Add New** **Copy** **Remove**

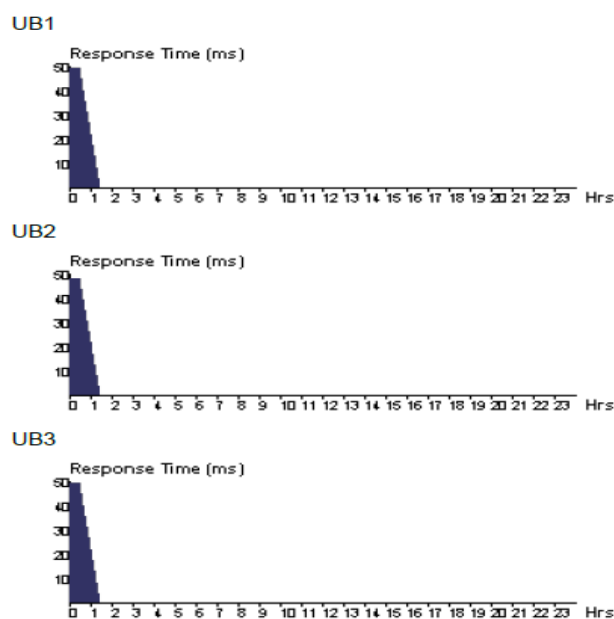
**Advanced :****Region Boundaries after adding user bases and data centers :**

## Run Simulation with different service broker policies and load balancing policies

### 1. Service broker policy: Closest Data Center Load Balancing policy : Round Robin



### User Base Hourly Response Times



**Data Center Request Servicing Times :**

<b>Data Center</b>	<b>Avg (ms)</b>	<b>Min (ms)</b>	<b>Max (ms)</b>
DC1	0.49	0.02	0.86
DC2	0.47	0.01	0.85
DC3	0.47	0.01	0.96
DC4	0.00	0.00	0.00
DC5	0.00	0.00	0.00

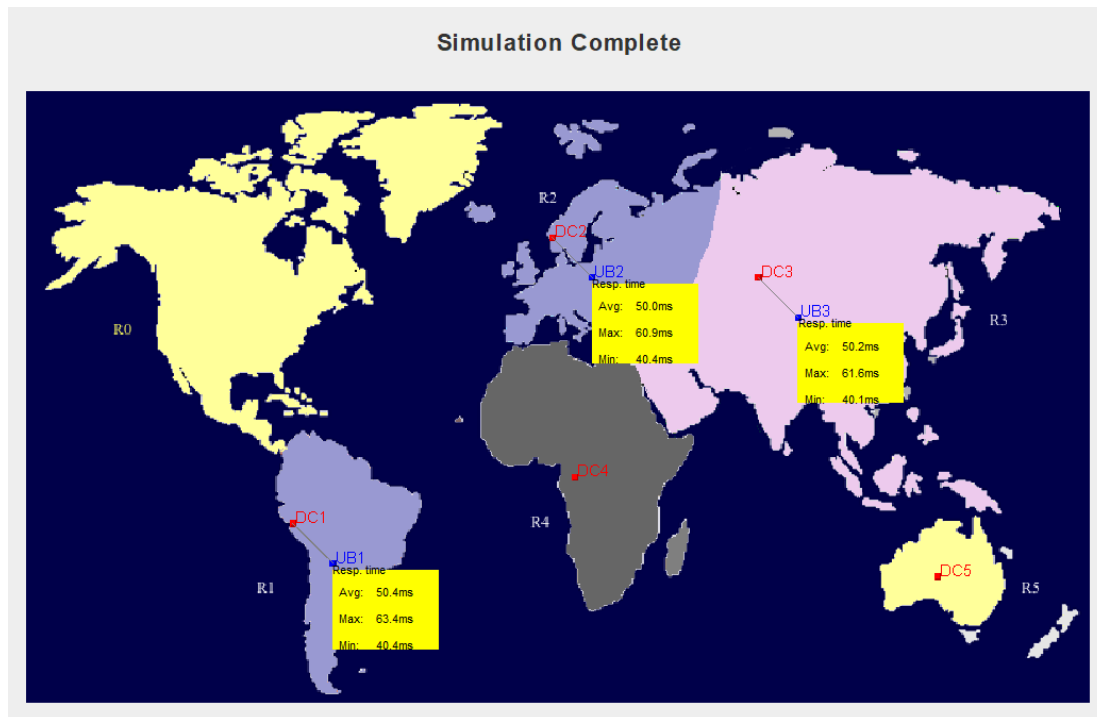
**Cost :**

Total Virtual Machine Cost (\$):	2.11
Total Data Transfer Cost (\$):	0.19
Grand Total: (\$)	2.30

<b>Data Center</b>	<b>VM Cost \$</b>	<b>Data Transfer Cost \$</b>	<b>Total \$</b>
DC2	0.40	0.07	0.47
DC1	0.50	0.06	0.57
DC4	0.30	0.00	0.30
DC3	0.30	0.06	0.36
DC5	0.60	0.00	0.60

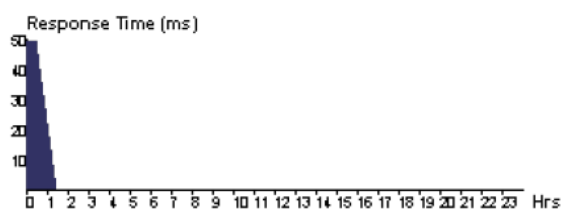
## 2. Service Broker: Closest Data Center

### Load Balancing: Equally Spread Current Execution Load

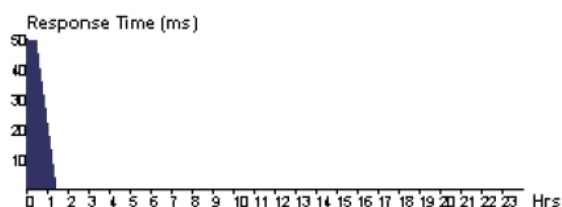


### User Base Hourly Response Times

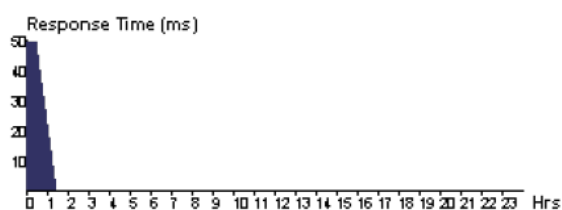
UB1



UB2



UB3



**Data Center Request Servicing Times :**

<b>Data Center</b>	<b>Avg (ms)</b>	<b>Min (ms)</b>	<b>Max (ms)</b>
DC1	0.49	0.02	0.86
DC2	0.47	0.01	0.85
DC3	0.47	0.01	0.96
DC4	0.00	0.00	0.00
DC5	0.00	0.00	0.00

**Cost :**

Total Virtual Machine Cost (\$): 2.11

Total Data Transfer Cost (\$): 0.19

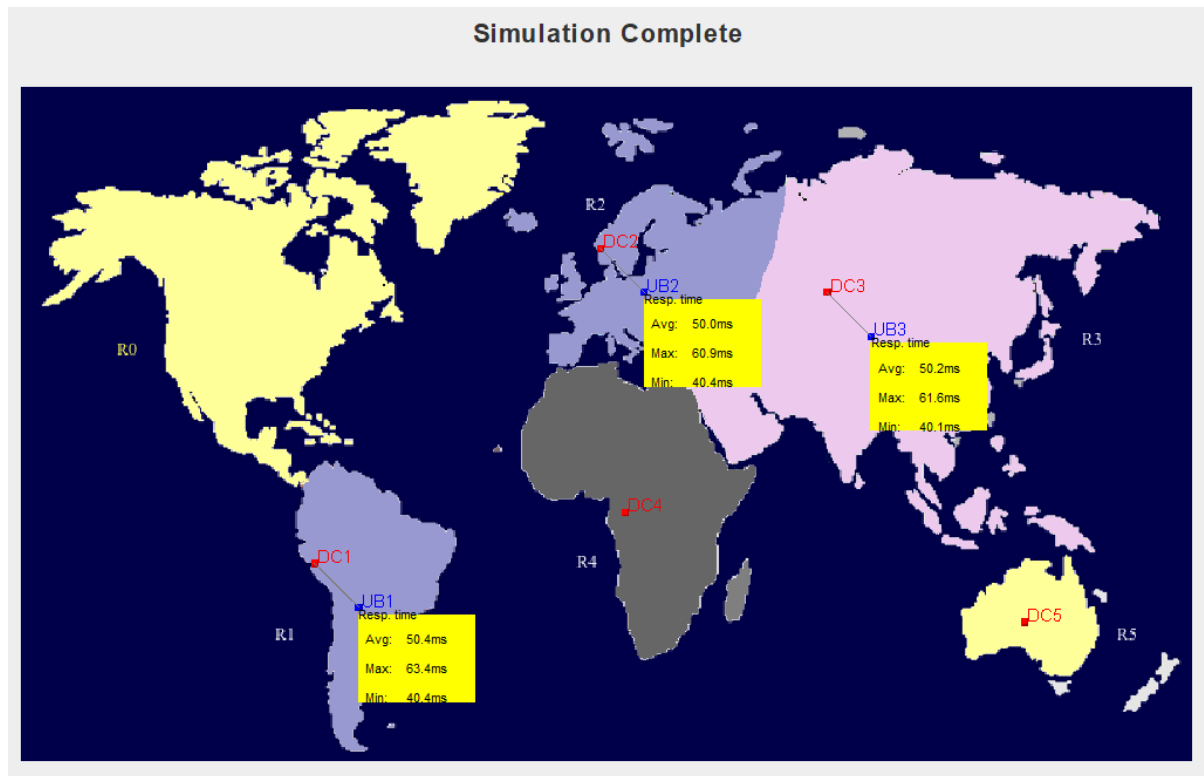
Grand Total: (\$) 2.30

<b>Data Center</b>	<b>VM Cost \$</b>	<b>Data Transfer Cost \$</b>	<b>Total \$</b>
DC2	0.40	0.07	0.47
DC1	0.50	0.06	0.57
DC4	0.30	0.00	0.30
DC3	0.30	0.06	0.36
DC5	0.60	0.00	0.60



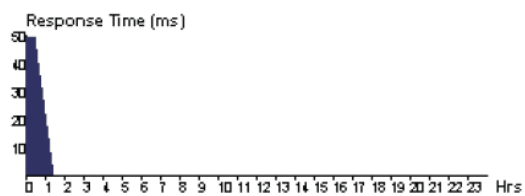
### 3. Service Broker: Closest Data Center

#### Load Balancing: Throttled

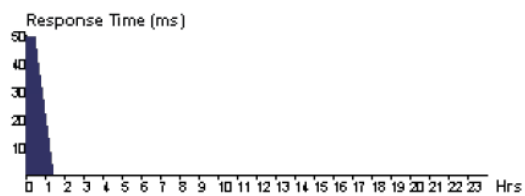


#### User Base Hourly Response Times

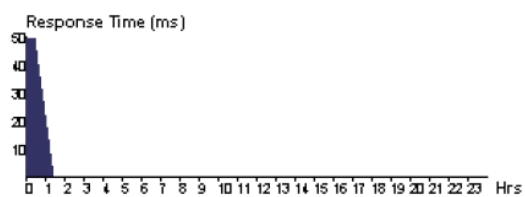
UB1



UB2



UB3



**Data Center Request Servicing Times :**

<b>Data Center</b>	<b>Avg (ms)</b>	<b>Min (ms)</b>	<b>Max (ms)</b>
DC1	0.49	0.02	0.86
DC2	0.47	0.01	0.85
DC3	0.47	0.01	0.88
DC4	0.00	0.00	0.00
DC5	0.00	0.00	0.00

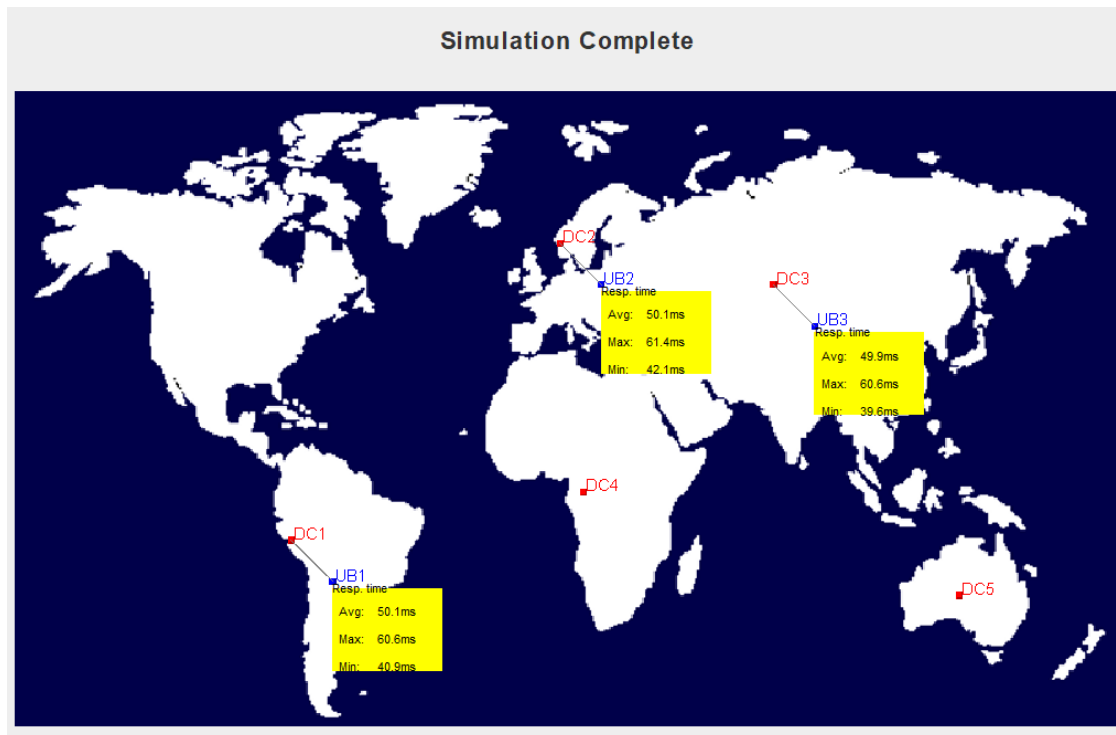
**Cost :**

Total Virtual Machine Cost (\$):	2.11
Total Data Transfer Cost (\$):	0.19
Grand Total: (\$)	2.30

<b>Data Center</b>	<b>VM Cost \$</b>	<b>Data Transfer Cost \$</b>	<b>Total \$</b>
DC2	0.40	0.07	0.47
DC1	0.50	0.06	0.57
DC4	0.30	0.00	0.30
DC3	0.30	0.06	0.36
DC5	0.60	0.00	0.60

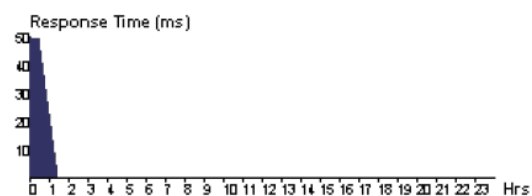
## 4. Service Broker: Optimised Response Time

### Load Balancing: Round Robin

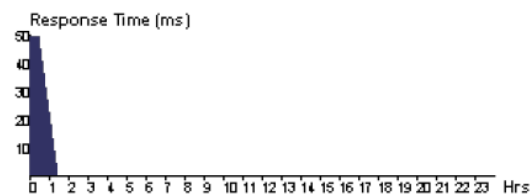


### User Base Hourly Response Times

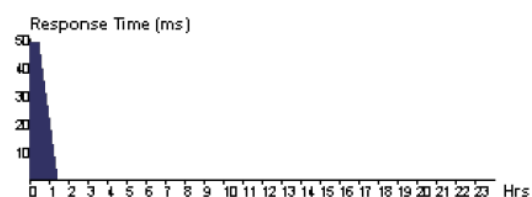
UB1



UB2



UB3



**Data Center Request Servicing Times :**

<b>Data Center</b>	<b>Avg (ms)</b>	<b>Min (ms)</b>	<b>Max (ms)</b>
DC1	0.47	0.03	0.87
DC2	0.47	0.01	0.85
DC3	0.47	0.02	0.86
DC4	0.00	0.00	0.00
DC5	0.00	0.00	0.00

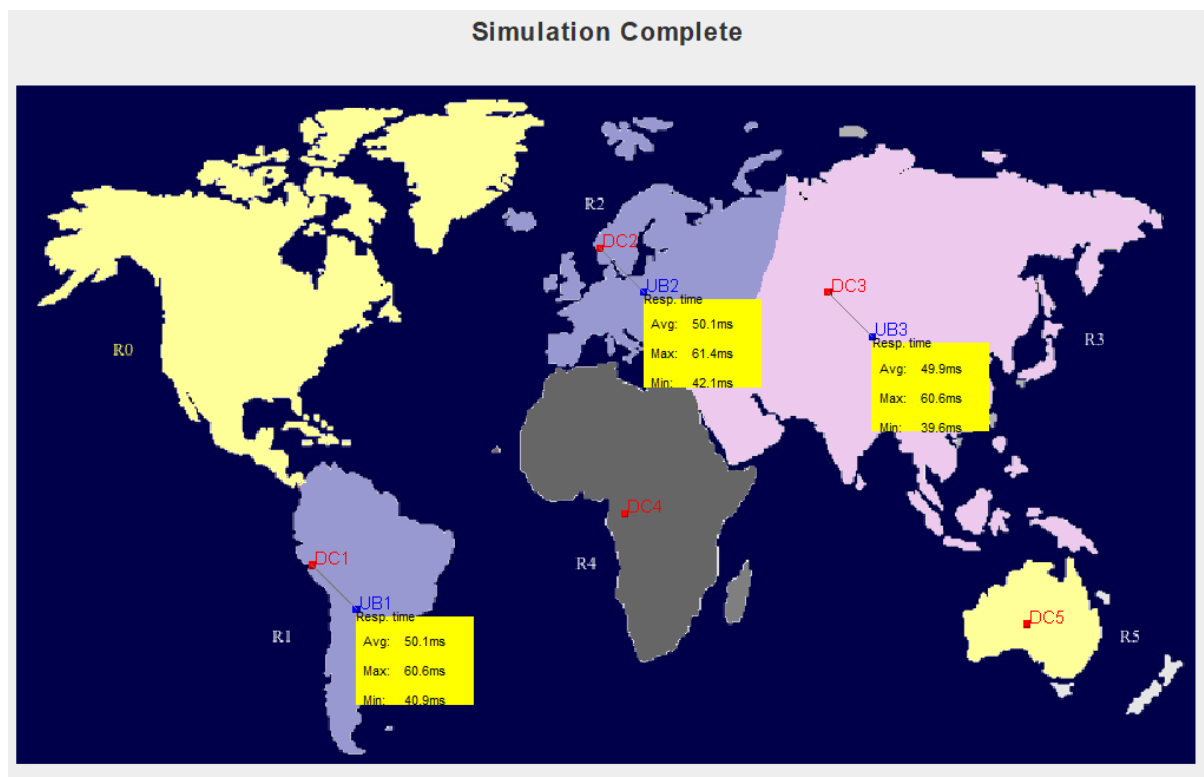
**Cost :**

Total Virtual Machine Cost (\$):	2.11
Total Data Transfer Cost (\$):	0.19
Grand Total: (\$)	2.30

<b>Data Center</b>	<b>VM Cost \$</b>	<b>Data Transfer Cost \$</b>	<b>Total \$</b>
DC2	0.40	0.07	0.47
DC1	0.50	0.06	0.57
DC4	0.30	0.00	0.30
DC3	0.30	0.06	0.36
DC5	0.60	0.00	0.60

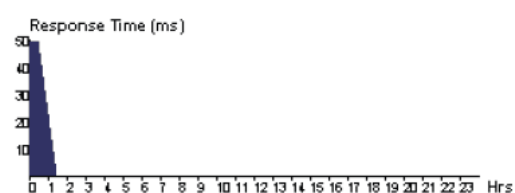
## 5. Service Broker: Optimised Response Time

### Load Balancing: Equally Spread Current Execution Load

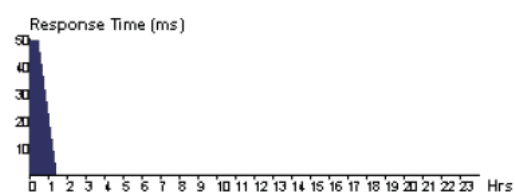


## User Base Hourly Response Times

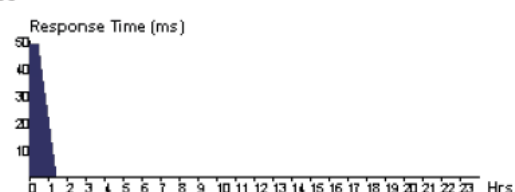
UB1



UB2



UB3



**Data Center Request Servicing Times :**

<b>Data Center</b>	<b>Avg (ms)</b>	<b>Min (ms)</b>	<b>Max (ms)</b>
DC1	0.47	0.03	0.87
DC2	0.47	0.01	0.85
DC3	0.47	0.02	0.86
DC4	0.00	0.00	0.00
DC5	0.00	0.00	0.00

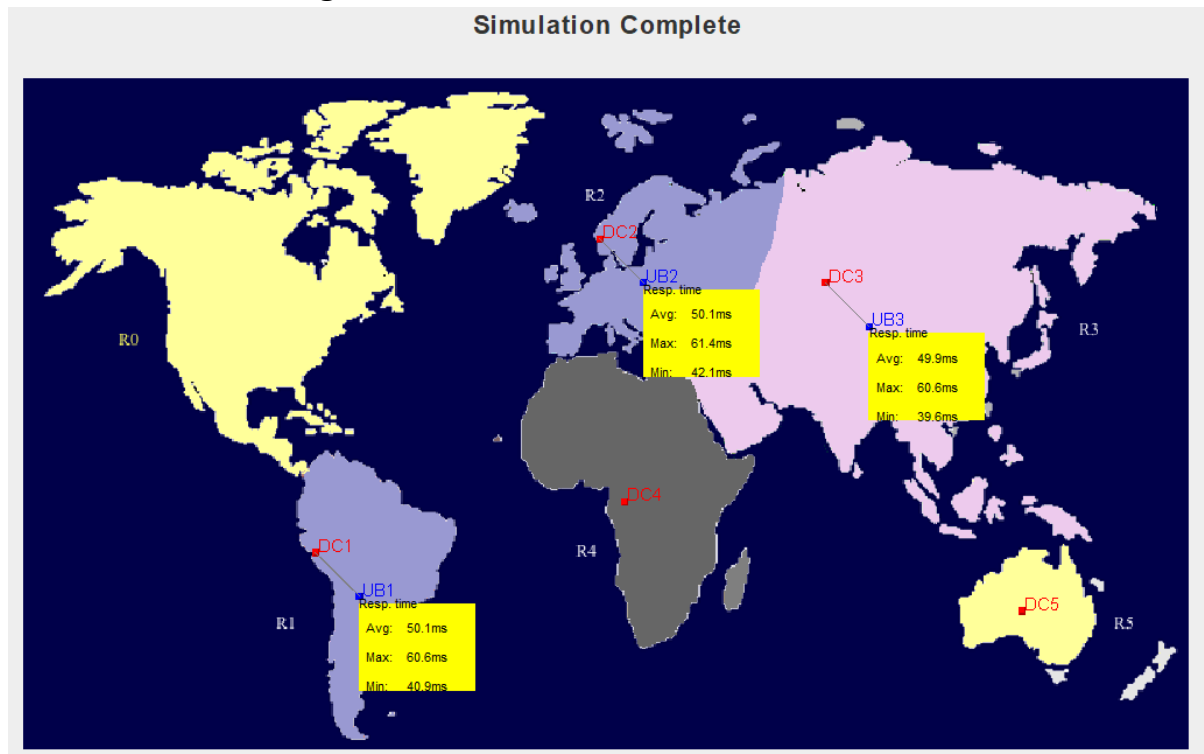
**Cost :**

Total Virtual Machine Cost (\$):	2.11
Total Data Transfer Cost (\$):	0.19
Grand Total: (\$)	2.30

<b>Data Center</b>	<b>VM Cost \$</b>	<b>Data Transfer Cost \$</b>	<b>Total \$</b>
DC2	0.40	0.07	0.47
DC1	0.50	0.06	0.57
DC4	0.30	0.00	0.30
DC3	0.30	0.06	0.36
DC5	0.60	0.00	0.60

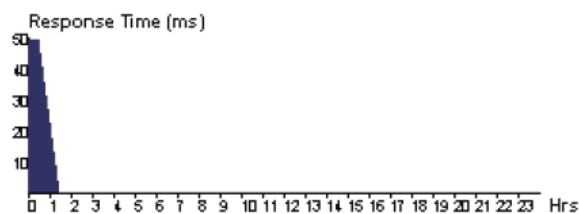
## 6. Service Broker: Optimised Response Time

### Load Balancing: Throttled

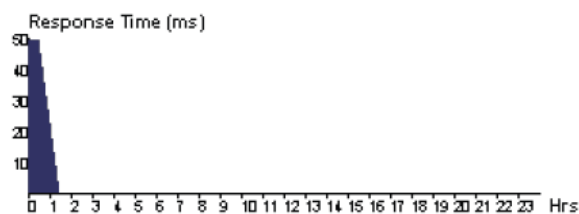


### User Base Hourly Response Times

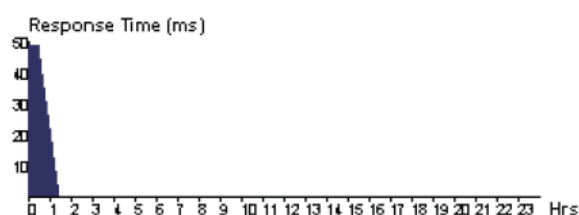
UB1



UB2



UB3



**Data Center Request Servicing Times :**

<b>Data Center</b>	<b>Avg (ms)</b>	<b>Min (ms)</b>	<b>Max (ms)</b>
DC1	0.47	0.03	0.87
DC2	0.46	0.01	0.85
DC3	0.47	0.02	0.86
DC4	0.00	0.00	0.00
DC5	0.00	0.00	0.00

**Cost :**

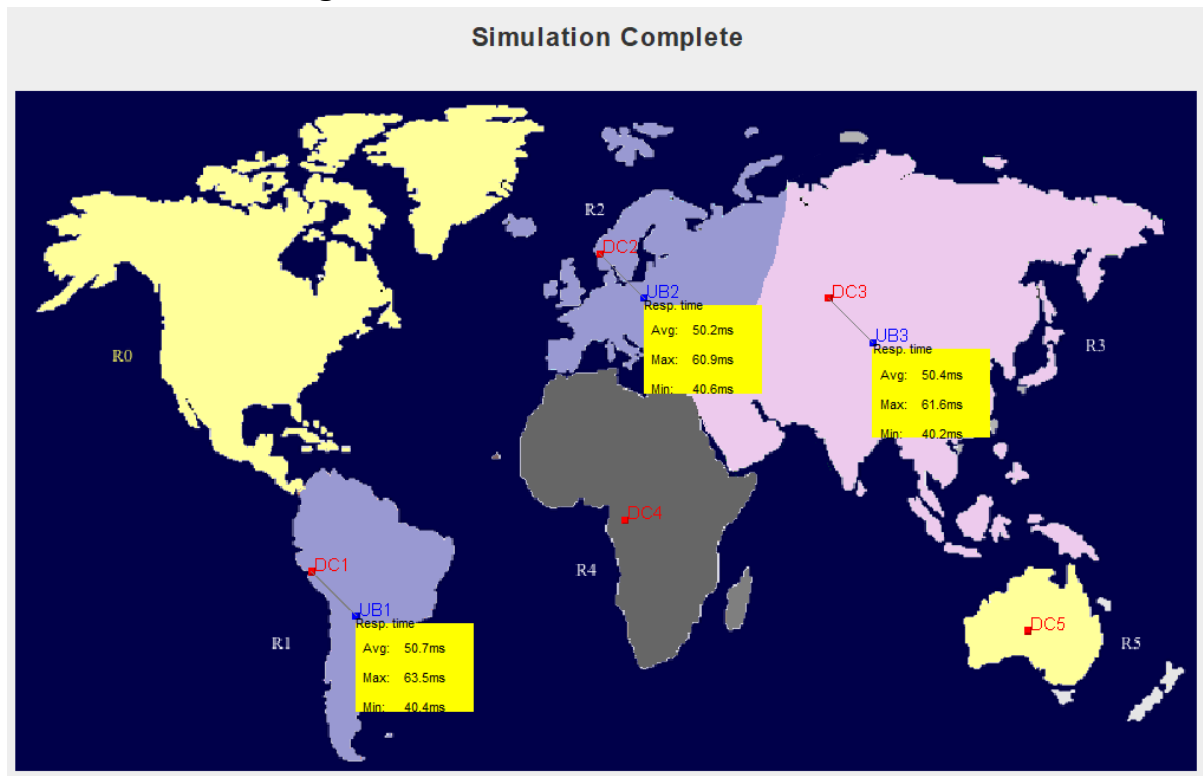
Total Virtual Machine Cost (\$):	2.11
Total Data Transfer Cost (\$):	0.19
Grand Total: (\$)	2.30

<b>Data Center</b>	<b>VM Cost \$</b>	<b>Data Transfer Cost \$</b>	<b>Total \$</b>
DC2	0.40	0.07	0.47
DC1	0.50	0.06	0.57
DC4	0.30	0.00	0.30
DC3	0.30	0.06	0.36
DC5	0.60	0.00	0.60



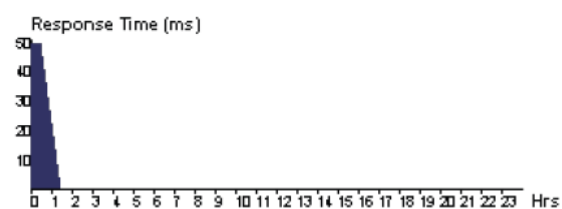
## 7. Service Broker: Dynamically Reconfiguring

### Load Balancing: Round Robin

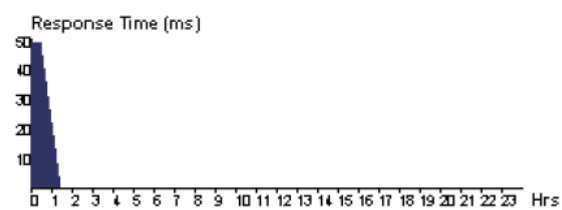


### User Base Hourly Response Times

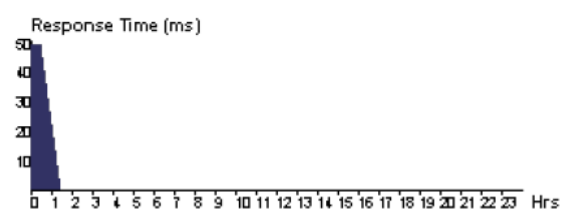
UB1



UB2



UB3



**Data Center Request Servicing Times :**

<b>Data Center</b>	<b>Avg (ms)</b>	<b>Min (ms)</b>	<b>Max (ms)</b>
DC1	0.83	0.03	2.67
DC2	0.62	0.01	2.28
DC3	0.58	0.01	1.76
DC4	0.00	0.00	0.00
DC5	0.00	0.00	0.00

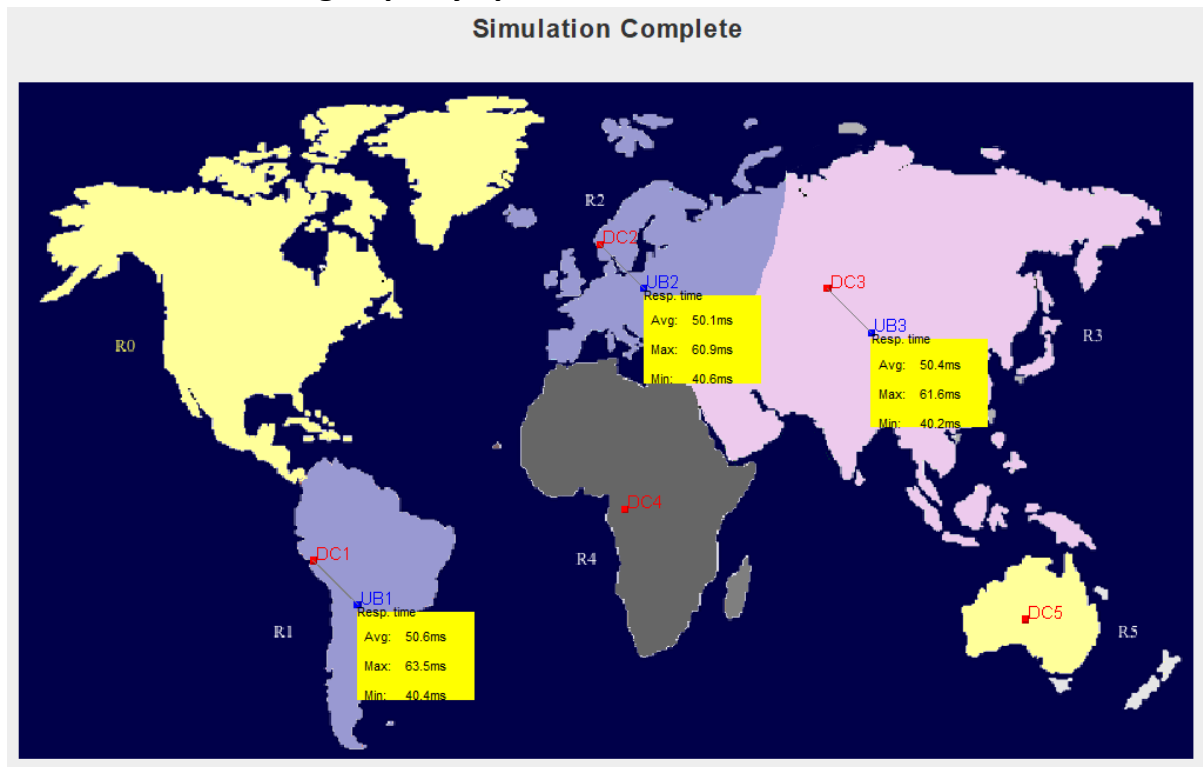
**Cost :**

Total Virtual Machine Cost (\$):	9.94
Total Data Transfer Cost (\$):	0.19
Grand Total: (\$)	10.13

<b>Data Center</b>	<b>VM Cost \$</b>	<b>Data Transfer Cost \$</b>	<b>Total \$</b>
DC2	2.71	0.07	2.77
DC1	3.35	0.06	3.42
DC4	0.30	0.00	0.30
DC3	2.98	0.06	3.04
DC5	0.60	0.00	0.60

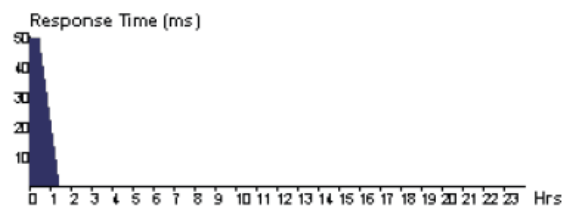
## 8. Service Broker: Dynamically Reconfiguring

### Load Balancing: Equally Spread Current Execution Load

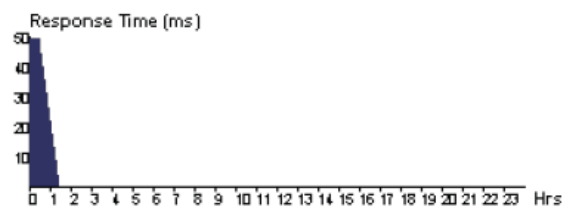


### User Base Hourly Response Times

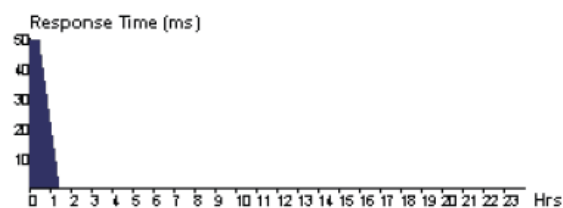
UB1



UB2



UB3



**Data Center Request Servicing Times :**

<b>Data Center</b>	<b>Avg (ms)</b>	<b>Min (ms)</b>	<b>Max (ms)</b>
DC1	0.68	0.03	1.98
DC2	0.56	0.01	1.10
DC3	0.53	0.01	1.24
DC4	0.00	0.00	0.00
DC5	0.00	0.00	0.00

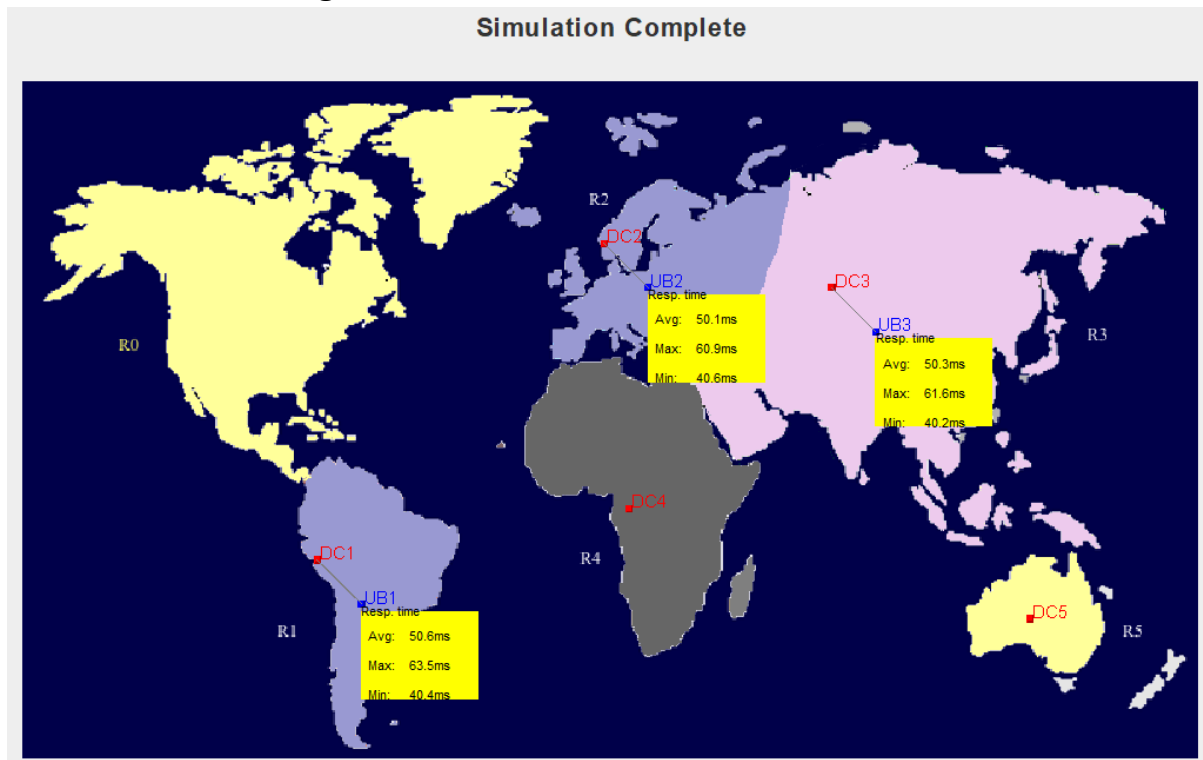
**Cost :**

Total Virtual Machine Cost (\$):	9.84
Total Data Transfer Cost (\$):	0.19
Grand Total: (\$)	10.03

<b>Data Center</b>	<b>VM Cost \$</b>	<b>Data Transfer Cost \$</b>	<b>Total \$</b>
DC2	2.71	0.07	2.77
DC1	3.35	0.06	3.42
DC4	0.30	0.00	0.30
DC3	2.88	0.06	2.95
DC5	0.60	0.00	0.60

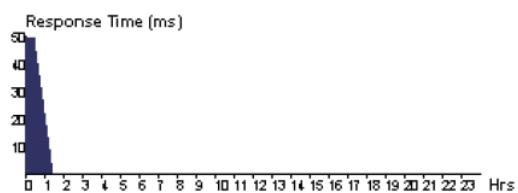
## 9. Service Broker: Dynamically Reconfiguring

### Load Balancing: Throttled

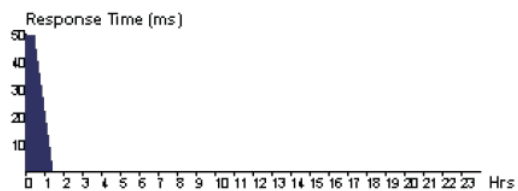


### User Base Hourly Response Times

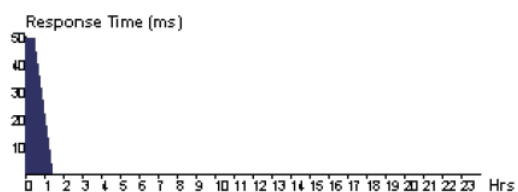
UB1



UB2



UB3



**Data Center Request Servicing Times :**

<b>Data Center</b>	<b>Avg (ms)</b>	<b>Min (ms)</b>	<b>Max (ms)</b>
DC1	0.67	0.03	1.29
DC2	0.56	0.01	1.10
DC3	0.53	0.01	1.24
DC4	0.00	0.00	0.00
DC5	0.00	0.00	0.00

**Cost :**

Total Virtual Machine Cost (\$):	9.84
Total Data Transfer Cost (\$):	0.19
Grand Total: (\$)	10.03

<b>Data Center</b>	<b>VM Cost \$</b>	<b>Data Transfer Cost \$</b>	<b>Total \$</b>
DC2	2.71	0.07	2.77
DC1	3.35	0.06	3.42
DC4	0.30	0.00	0.30
DC3	2.88	0.06	2.95
DC5	0.60	0.00	0.60

**Conclusion:**

From this practical, we got acquainted with the simulator such as cloud analyst and cloud report and learnt how to analyse its result based on the response time, scheduling, tasks and number of data centre available and its distance.