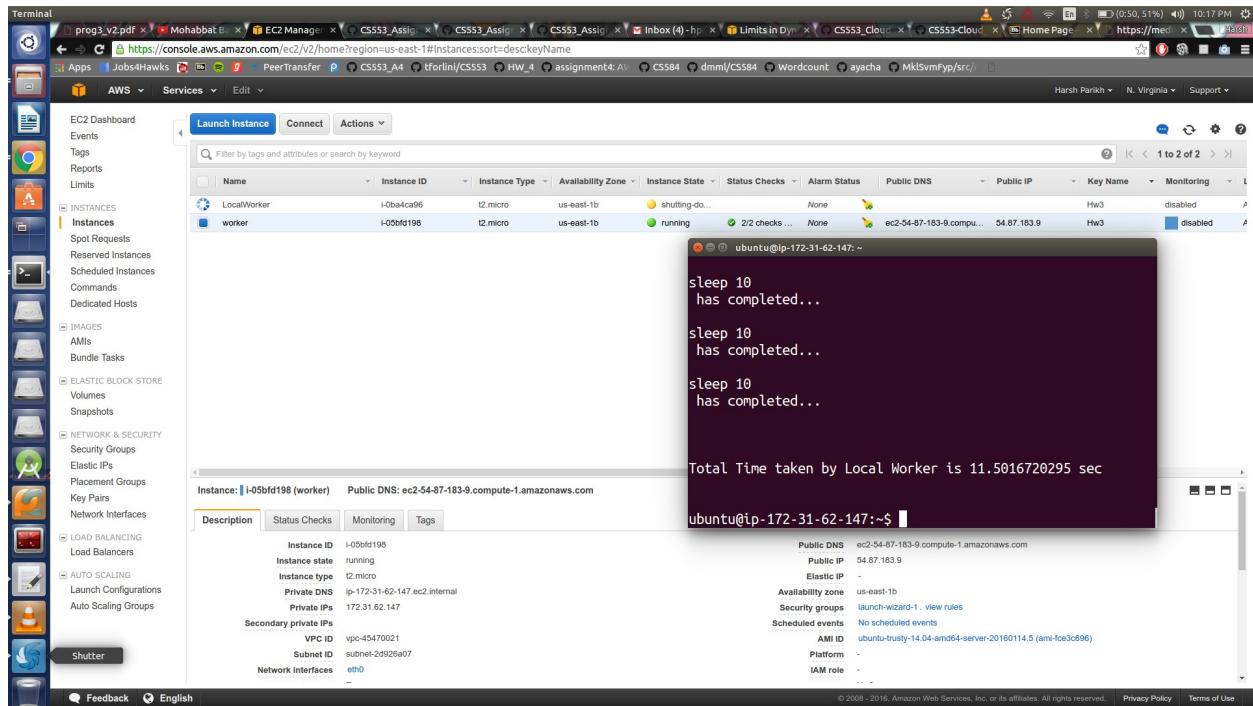


## Screen Shots

### 1. Local Worker:

#### a. Efficiency:

- 1 thread-10 ms:



The screenshot shows the AWS EC2 Dashboard. On the left sidebar, under 'INSTANCES', 'Instances' is selected. In the main pane, there are two instances listed: 'LocalWorker' (shutting-down) and 'worker' (running). The 'worker' instance's details are shown in a modal. The terminal window on the right shows the following output:

```
sleep 10
has completed...

sleep 10
has completed...

sleep 10
has completed...

Total Time taken by Local Worker is 11.5016720295 sec

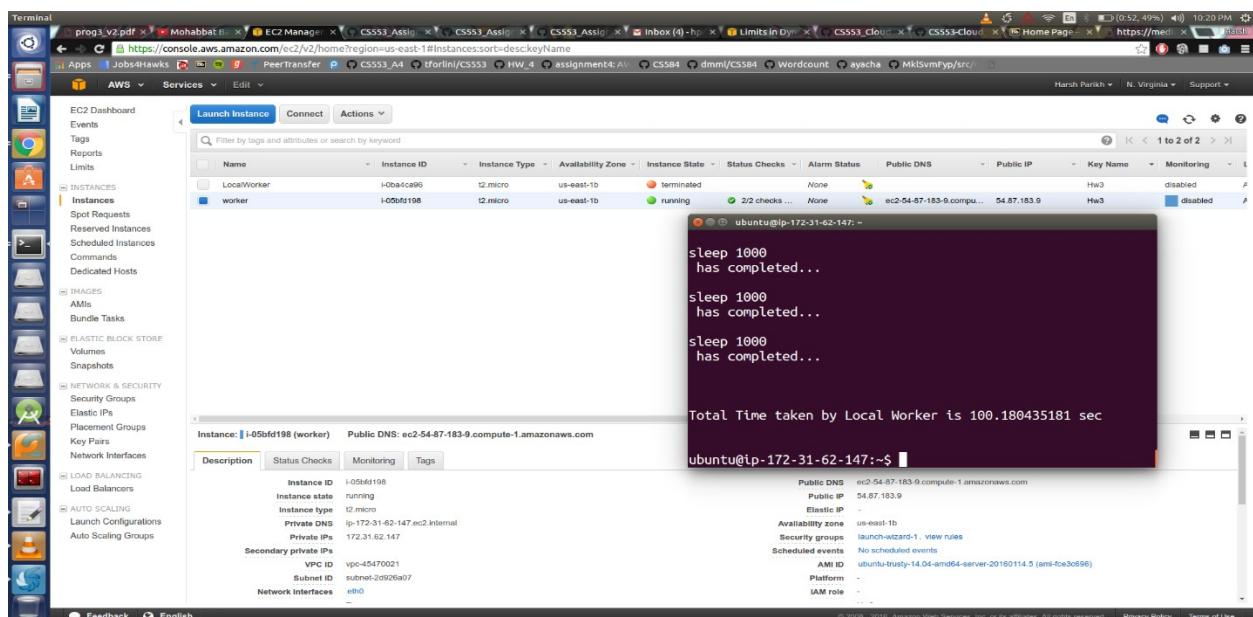
ubuntu@ip-172-31-62-147:~$
```

Below the terminal, the instance details for 'worker' are displayed:

Description	Status Checks	Monitoring	Tags
Instance ID: i-05bfd198	running		
Instance state			
Instance type	t2.micro		
Private DNS	ip-172-31-62-147.ec2.internal		
Private IPs	172.31.62.147		
Secondary private IPs			
VPC ID	vpc-45470021		
Subnet ID	subnet-2d926a07		
Network Interfaces	eth0		

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- 1 thread-1 Sec:



The screenshot shows the AWS EC2 Dashboard. The left sidebar and instance selection are identical to the previous screenshot. The terminal window on the right shows the following output:

```
sleep 1000
has completed...

sleep 1000
has completed...

sleep 1000
has completed...

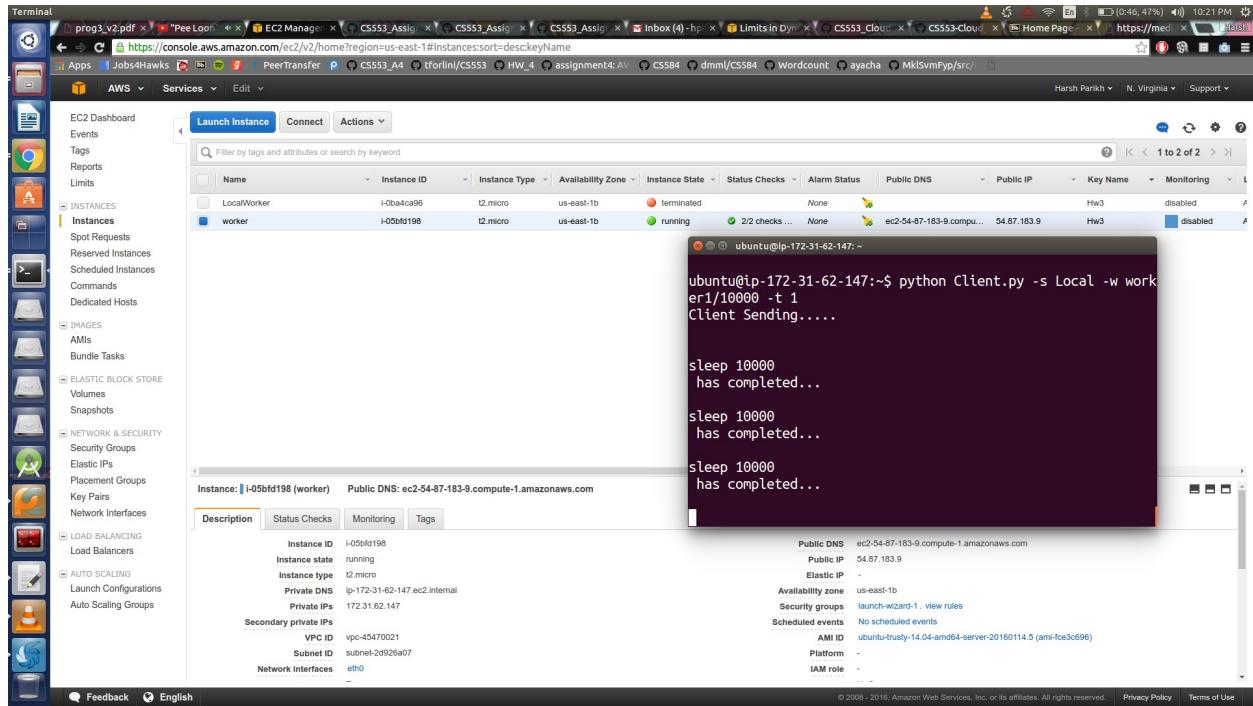
Total Time taken by Local Worker is 100.180435181 sec

ubuntu@ip-172-31-62-147:~$
```

The instance details for 'worker' are identical to the previous screenshot.

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- 1 thread-10 Sec:

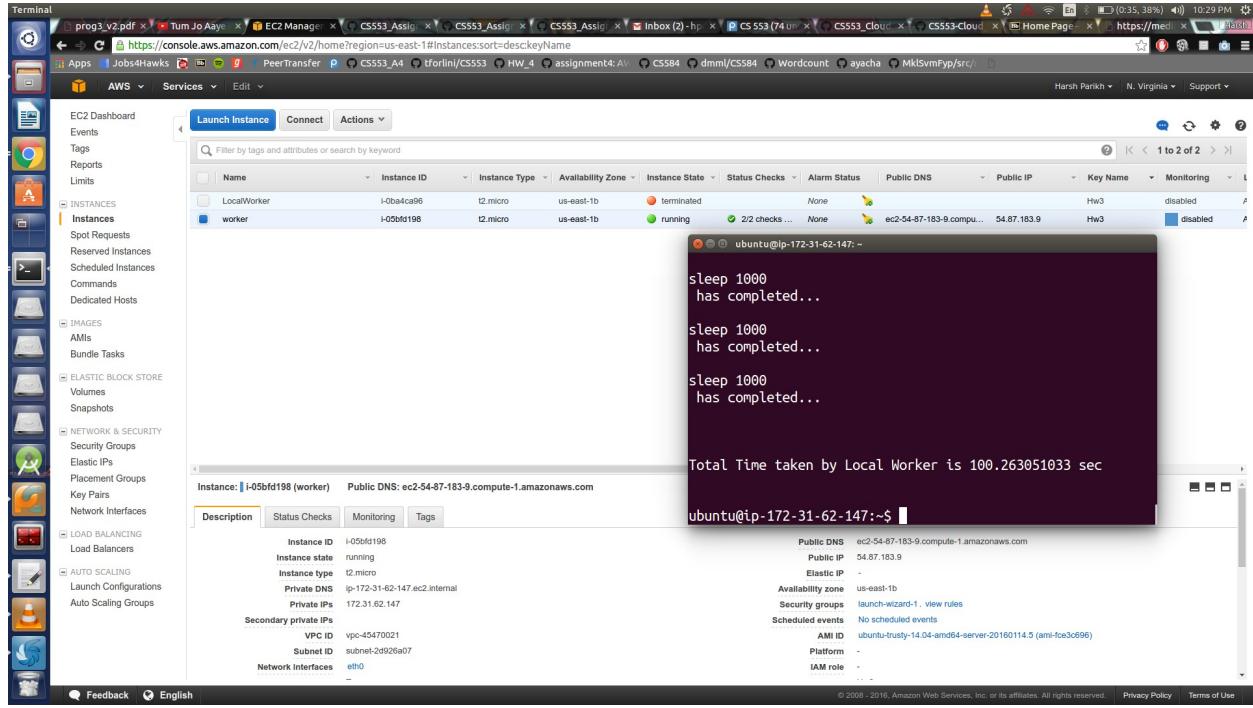


- 2 thread-10 ms:

```
sleep 10
has completed...

Total Time taken by Local Worker is 12.0461599827 sec
```

- 2 thread-1 Sec:



The screenshot shows the AWS CloudWatch interface with a terminal window open. Two threads are running the command `sleep 1000`. The output shows each thread completing its sleep cycle.

```

sleep 1000
has completed...

sleep 1000
has completed...

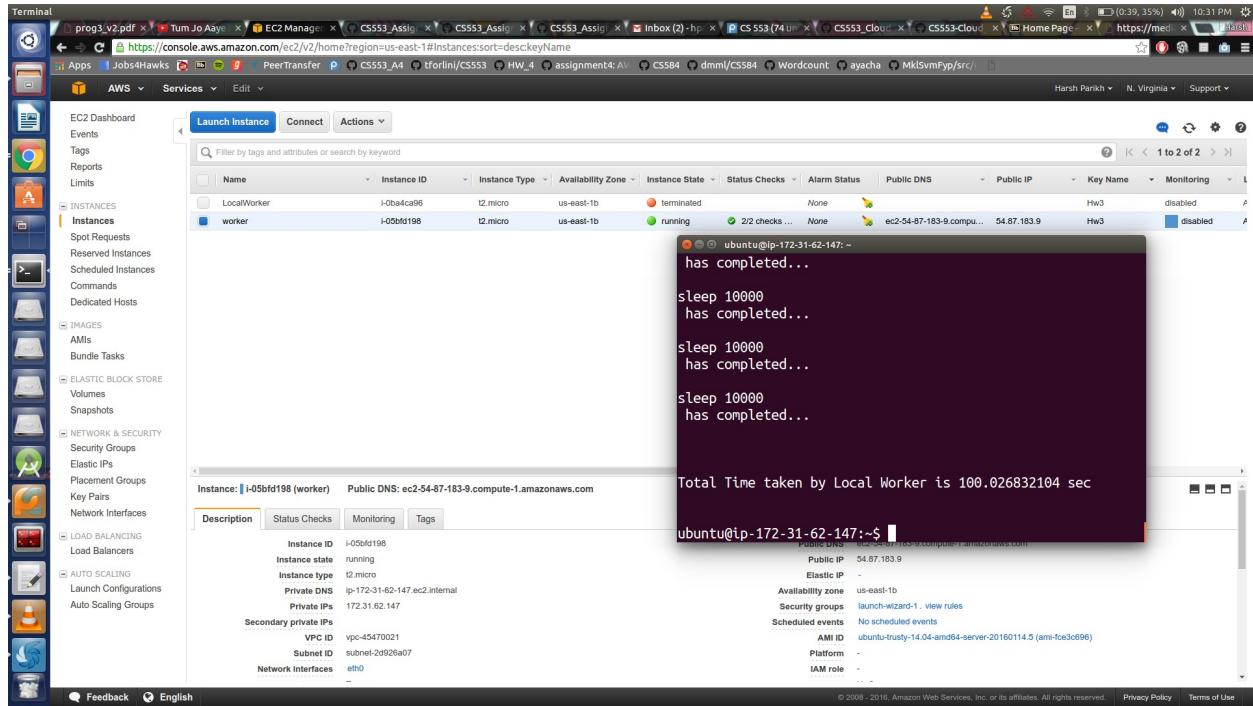
sleep 1000
has completed...

Total Time taken by Local Worker is 100.263051033 sec

```

The terminal also displays the total time taken by the local worker, which is approximately 100 seconds.

- 2 thread-10 Sec:



The screenshot shows the AWS CloudWatch interface with a terminal window open. Two threads are running the command `sleep 10000`. The output shows each thread completing its sleep cycle.

```

has completed...

sleep 10000
has completed...

sleep 10000
has completed...

sleep 10000
has completed...

Total Time taken by Local Worker is 100.026832104 sec

```

The terminal also displays the total time taken by the local worker, which is approximately 100 seconds.

- 4 thread-10 ms:

The screenshot shows the AWS CloudWatch terminal interface. A modal window displays the output of a script running on an EC2 instance. The script consists of four "sleep 10" commands followed by a message indicating completion. The total execution time is printed at the end.

```

has completed...
sleep 10
has completed...
sleep 10
has completed...
sleep 10
has completed...

Total Time taken by Local Worker is 12.1804568768 sec

```

- 4 thread-1 Sec:

The screenshot shows the AWS CloudWatch terminal interface. A modal window displays the output of a script running on an EC2 instance. The script consists of four "sleep 1" commands followed by a message indicating completion. The total execution time is printed at the end.

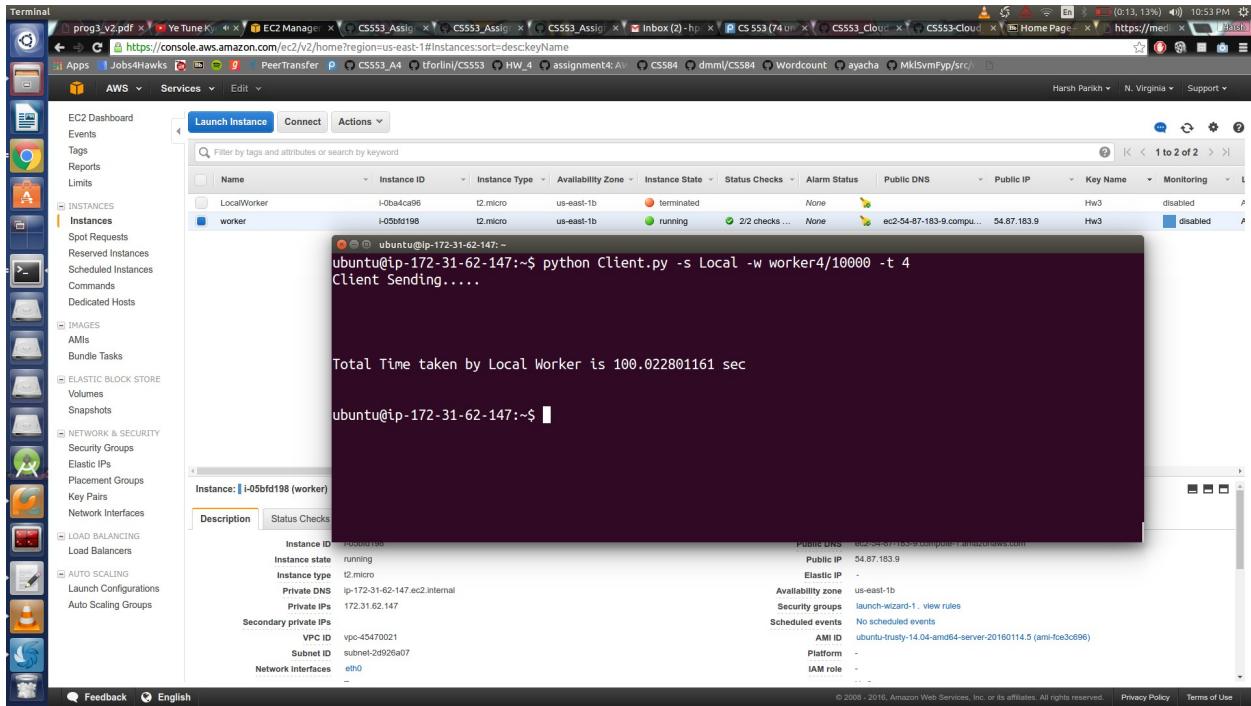
```

ubuntu@ip-172-31-62-147:~$ nano Client.py
ubuntu@ip-172-31-62-147:~$ nano Localworker.py
ubuntu@ip-172-31-62-147:~$ python Client.py -s Local -w worker4/1000 -t 4
Client Sending.....

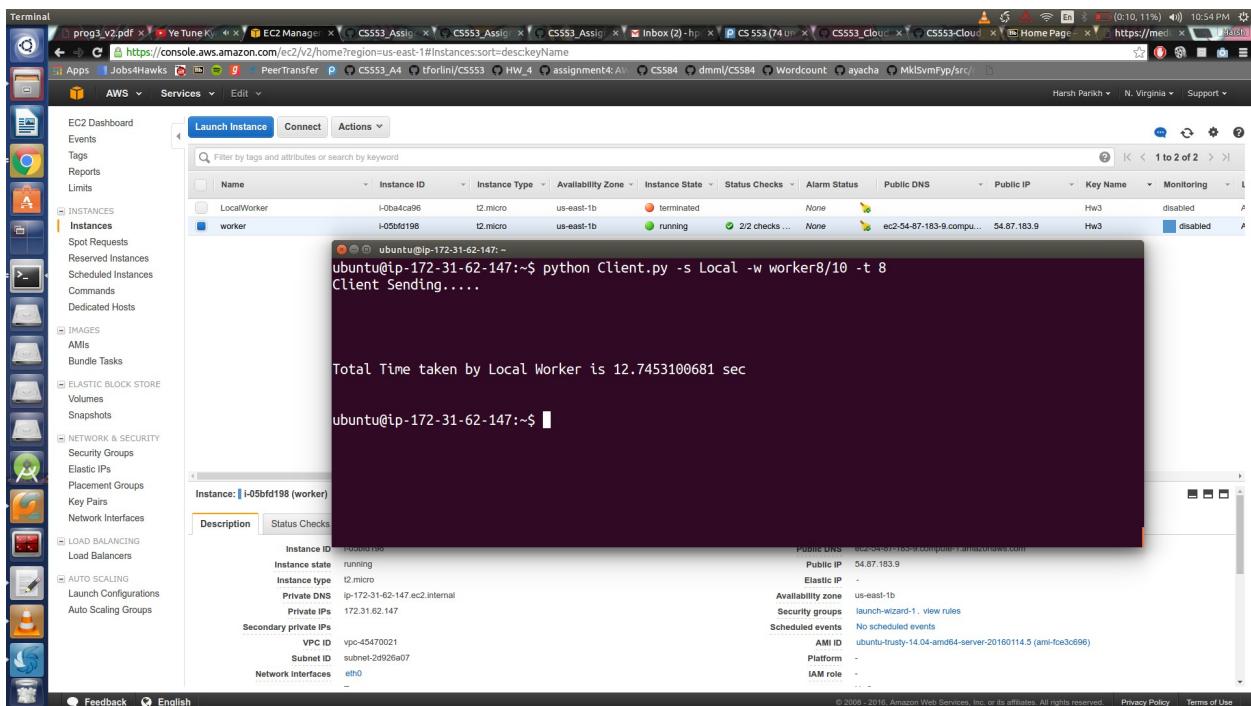
Total Time taken by Local Worker is 100.293053865 sec

```

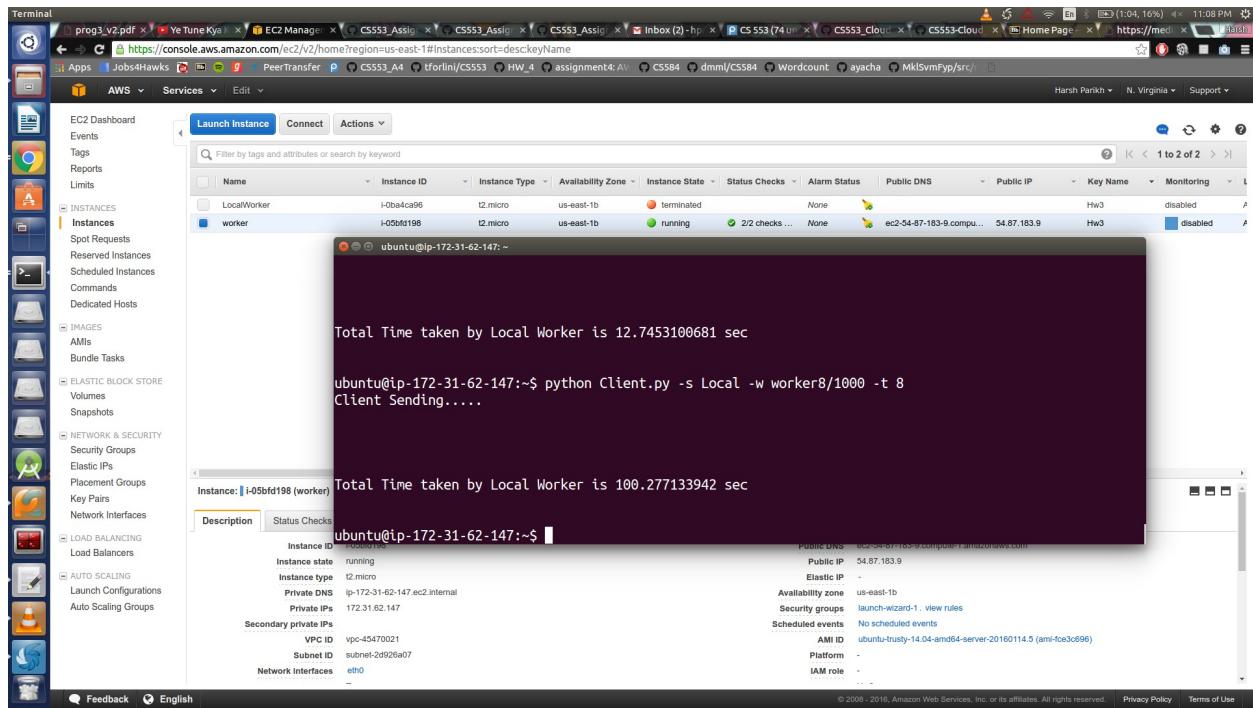
- 4 thread-10 Sec:



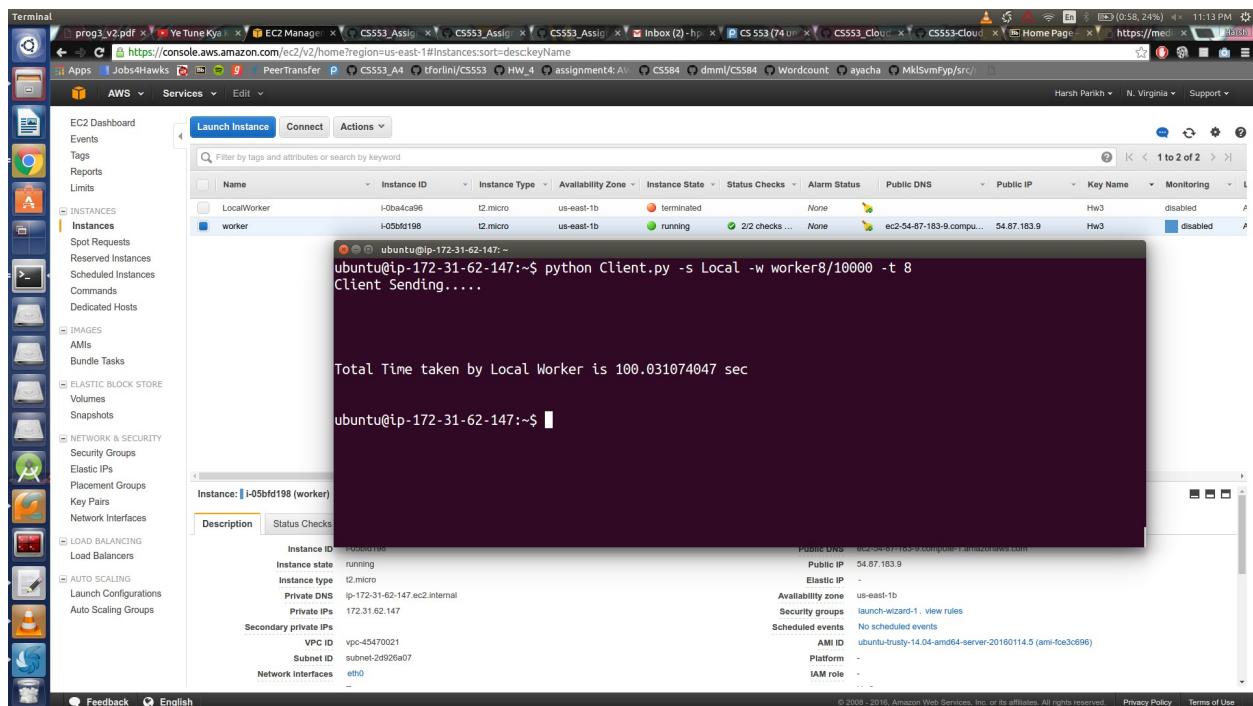
- 8 thread-10 ms:



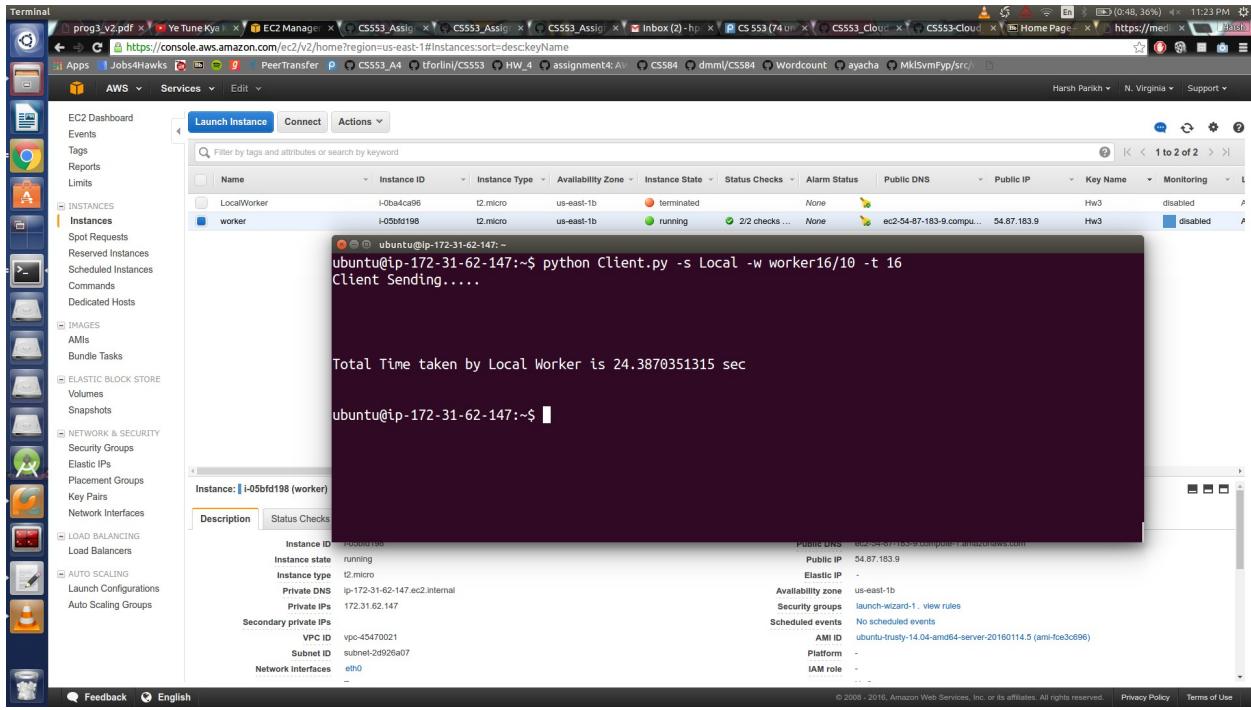
- 8 thread-1 Sec:



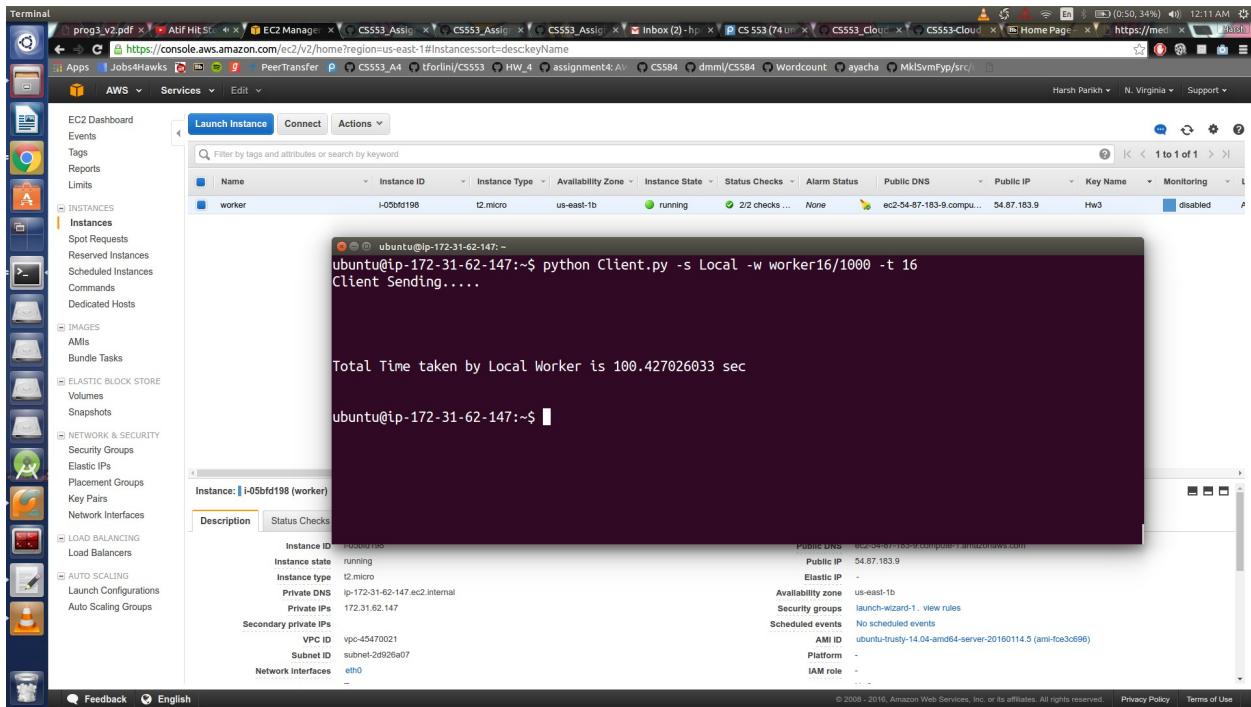
- 8 thread-10 Sec:



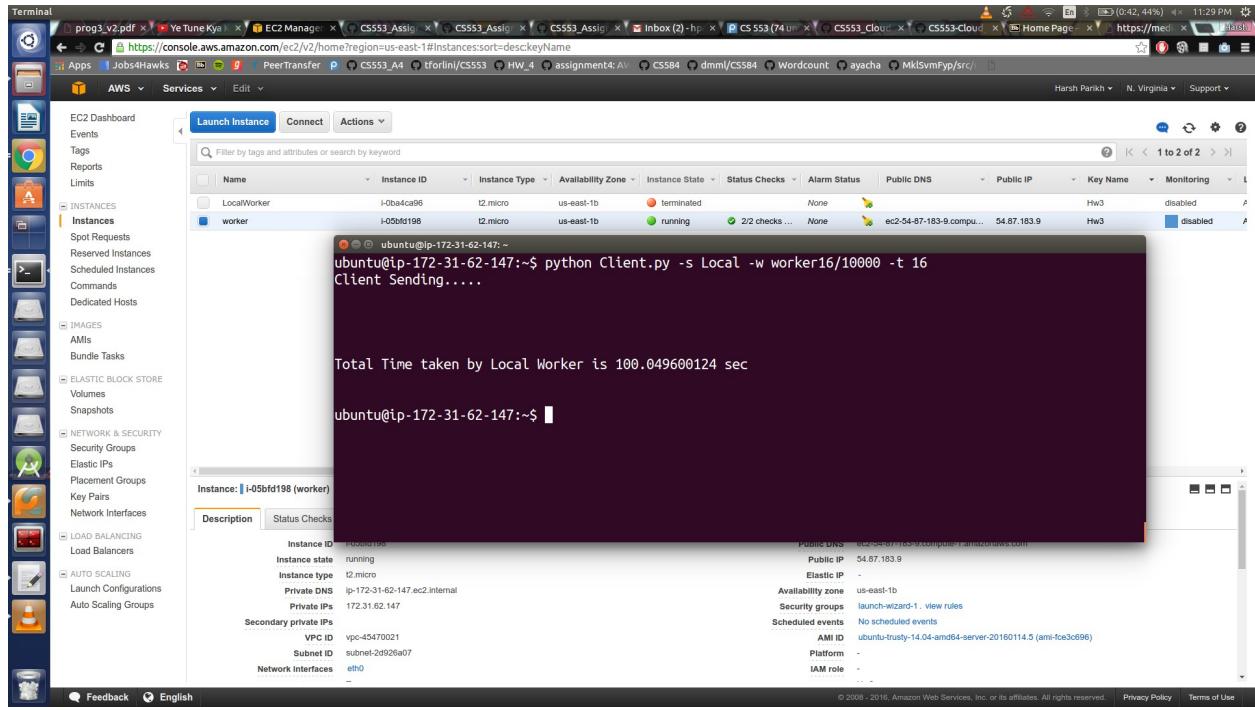
- 16 thread-10 ms:



- 16 thread-1 Sec:



- 16 thread-10 Sec:

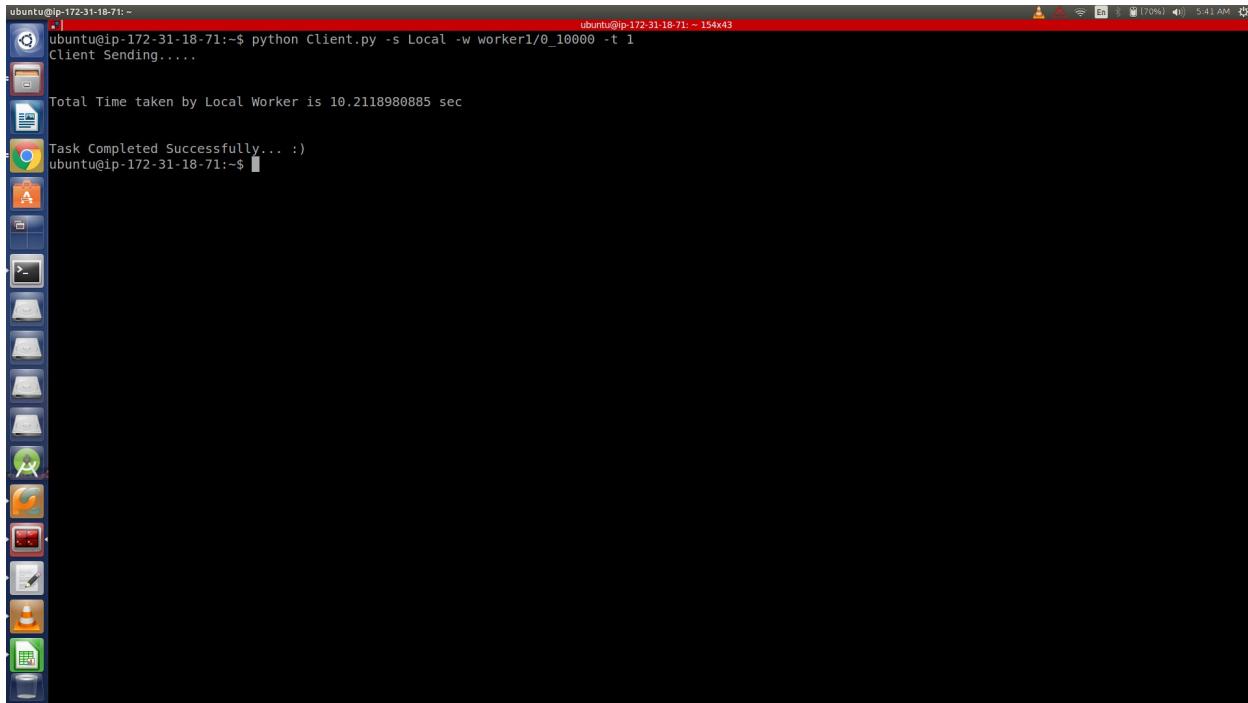


- Local Worker Script

```
Operation Performing for time 10 ms, Thread : 1
Operation Performing for time 1000 ms, Thread : 1
Operation Performing for time 10000 ms, Thread : 1
Operation Performing for time 10 ms, Thread : 2
Operation Performing for time 1000 ms, Thread : 2
Operation Performing for time 10000 ms, Thread : 2
Operation Performing for time 10 ms, Thread : 4
Operation Performing for time 1000 ms, Thread : 4
Operation Performing for time 10000 ms, Thread : 4
Operation Performing for time 10 ms, Thread : 8
Operation Performing for time 1000 ms, Thread : 8
Operation Performing for time 10000 ms, Thread : 8
Operation Performing for time 10 ms, Thread : 16
Operation Performing for time 1000 ms, Thread : 16
Operation Performing for time 10000 ms, Thread : 16
```

## b. Throughput:

- 1 Thread (Sleep-0):

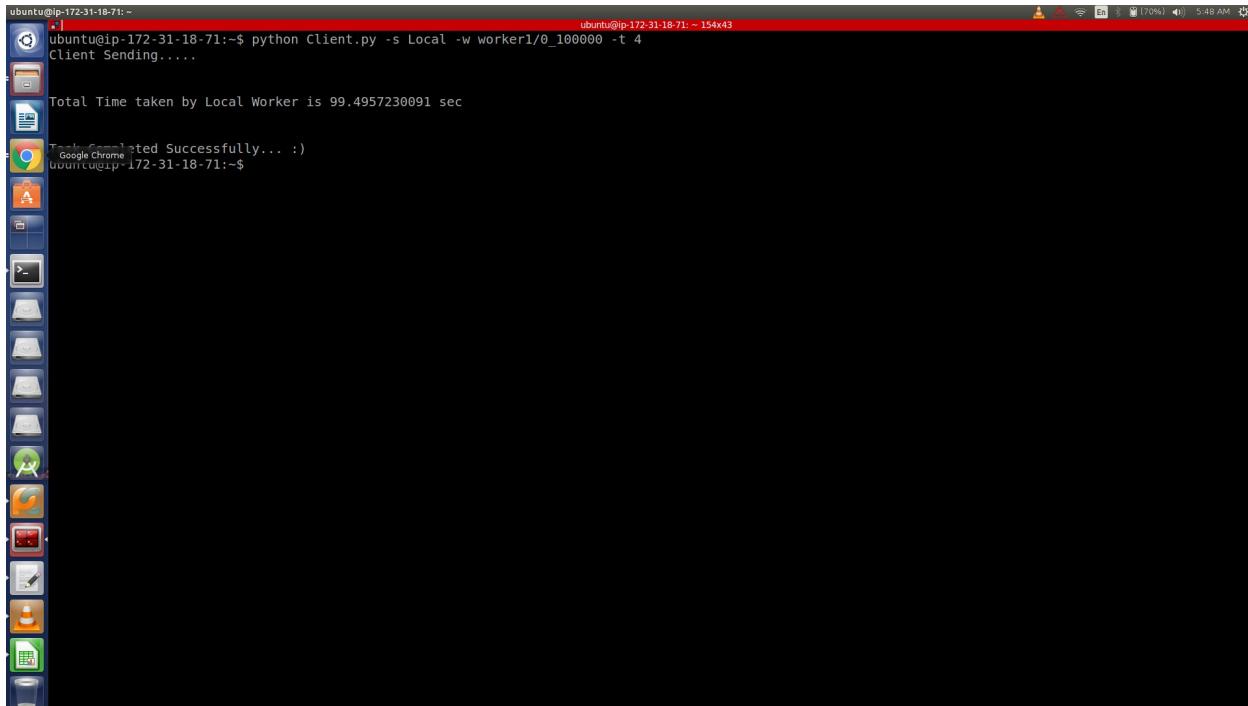


```
ubuntu@ip-172-31-18-71:~$ python Client.py -s Local -w worker1/0_10000 -t 1
Client Sending.....
Total Time taken by Local Worker is 10.2118980885 sec
Task Completed Successfully... :)
ubuntu@ip-172-31-18-71:~$
```

- 2 Thread (Sleep-0):

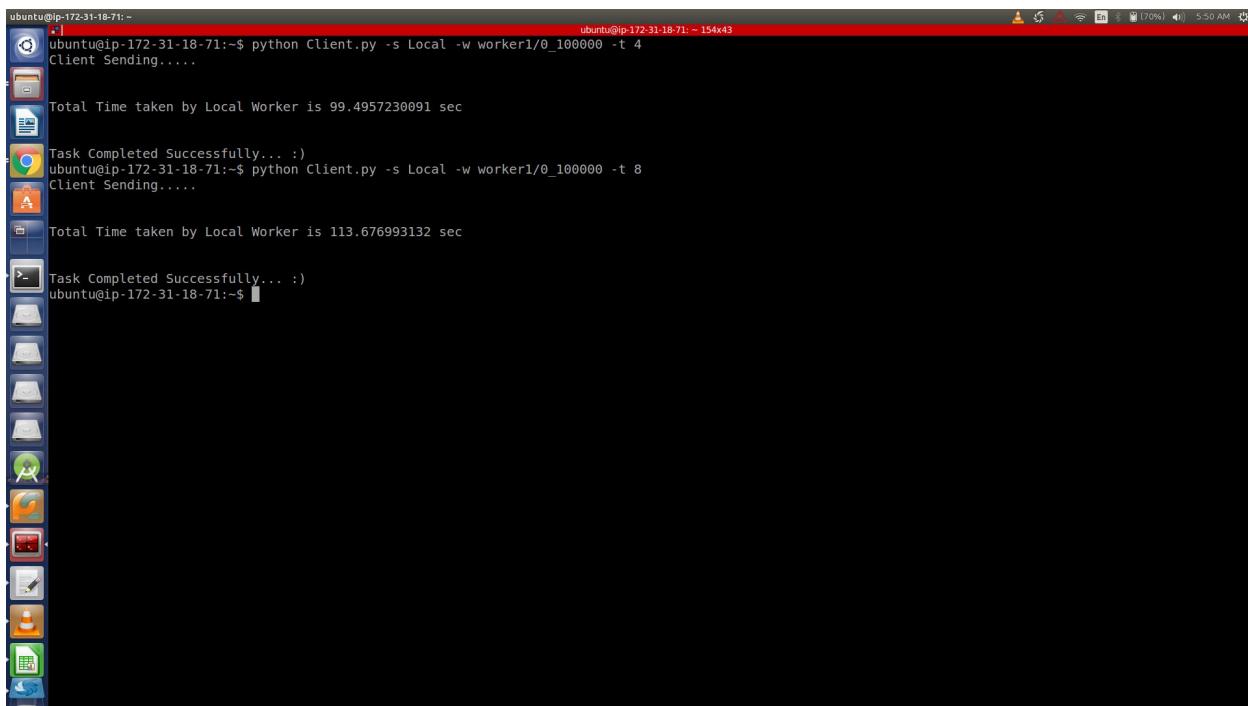
```
ubuntu@ip-172-31-18-71:~$ python Client.py -s Local -w worker1/0_100000 -t 2
Client Sending.....
Total Time taken by Local Worker is 95.4675741196 sec
Task Completed Successfully... :)
ubuntu@ip-172-31-18-71:~$
```

- 4 Thread (Sleep-0):



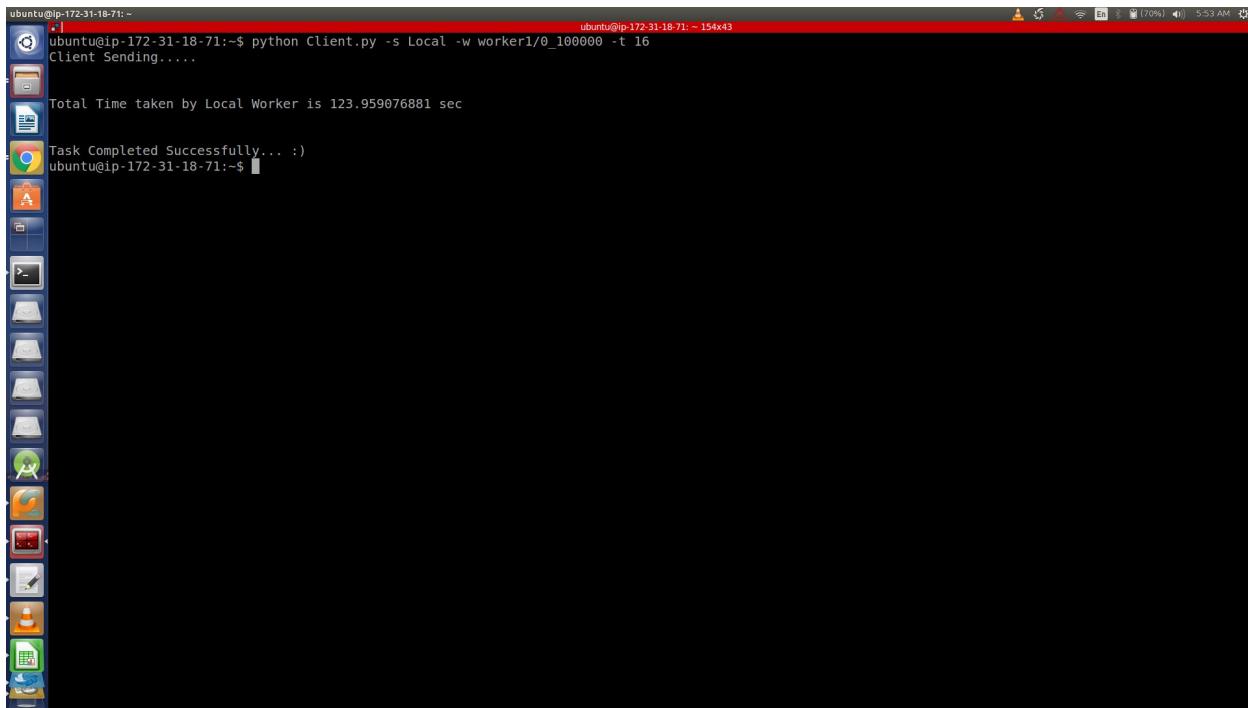
```
ubuntu@ip-172-31-18-71:~$ python Client.py -s Local -w worker1/0_100000 -t 4
Client Sending.....
Total Time taken by Local Worker is 99.4957230091 sec
Task Completed Successfully... :)
ubuntu@ip-172-31-18-71:~$
```

- 8 Thread (Sleep-0):



```
ubuntu@ip-172-31-18-71:~$ python Client.py -s Local -w worker1/0_100000 -t 8
Client Sending.....
Total Time taken by Local Worker is 99.4957230091 sec
Task Completed Successfully... :)
ubuntu@ip-172-31-18-71:~$ python Client.py -s Local -w worker1/0_100000 -t 8
Client Sending.....
Total Time taken by Local Worker is 113.676993132 sec
Task Completed Successfully... :)
ubuntu@ip-172-31-18-71:~$
```

- 16 Thread (Sleep-0):



A screenshot of an Ubuntu desktop environment. On the left, there is a vertical dock containing icons for various applications like the Dash, Home, and System settings. The main area shows a terminal window with the following text:

```
ubuntu@ip-172-31-18-71:~$ python Client.py -s Local -w worker1/0_100000 -t 16
Client Sending.....
Total Time taken by Local Worker is 123.959076881 sec
Task Completed Successfully... :)
ubuntu@ip-172-31-18-71:~$
```

The terminal window has a red border, indicating it is active. The status bar at the top right shows the date and time as "5:53 AM".

## 2. Amazon SQS:

### a. Amazon SQS (Request Queue – Response Queue):

The screenshot shows the AWS SQS Management Console interface. At the top, there are several tabs and a search bar. Below the search bar, there's a 'Create New Queue' button and a 'Queue Actions' dropdown. A 'Filter by Prefix' input field is present. The main area displays a table with two rows of queue information:

Name	Messages Available	Messages in Flight	Created
myqueue	1,950	1	2016-05-02 02:00:01 GMT-05:00
resQueue	2	0	2016-05-02 02:53:59 GMT-05:00

At the bottom of the page, there are links for 'Feedback', 'English', and copyright information.

### b. DynamoDB:

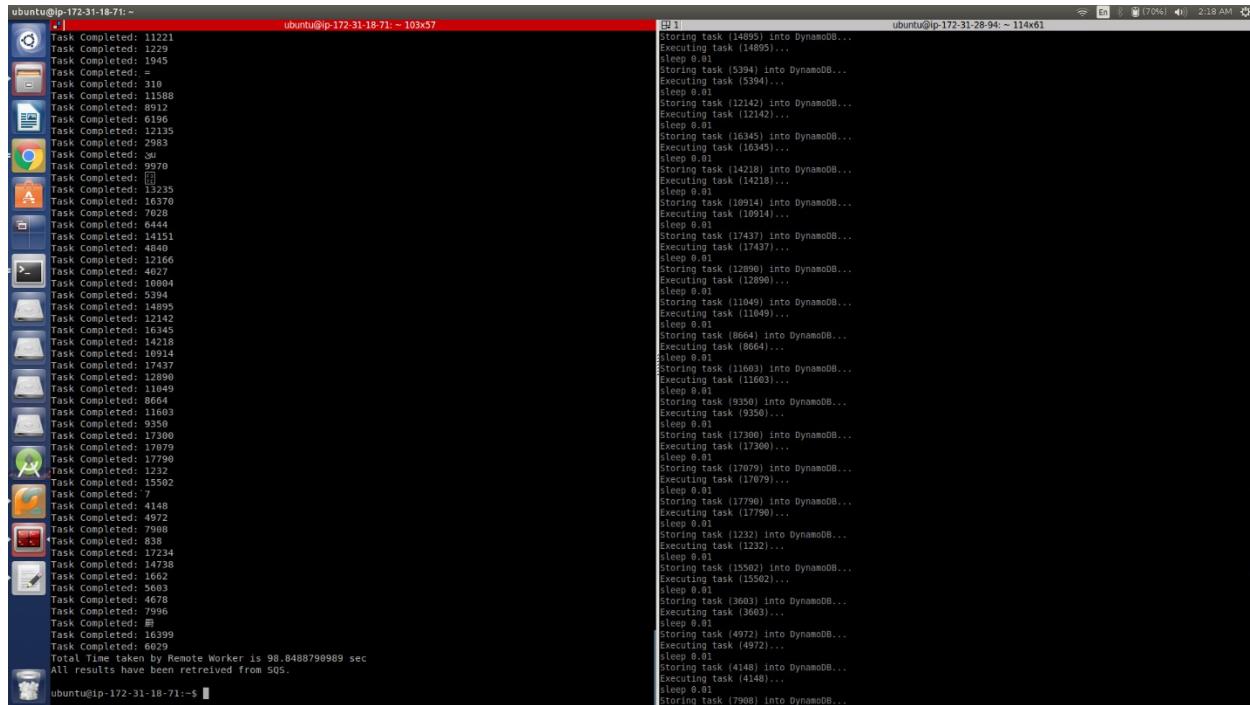
The screenshot shows the AWS DynamoDB console. On the left, there's a sidebar with icons for Dashboard, Tables, and Reserved capacity. The main area shows a table named 'MyTable'. The 'Items' tab is selected, showing a list of 100 items. Each item has a task ID and a task content entry. The table structure is as follows:

task_id	taskContent
6239	sleep 1000
9681	sleep 1000
15071	sleep 1000
15099	sleep 1000
11750	sleep 1000
12807	sleep 1000
12197	sleep 1000
328	sleep 1000
16796	sleep 1000
5407	sleep 1000
17589	sleep 1000
4262	sleep 1000
11293	sleep 1000
17170	sleep 1000
2075	sleep 1000

At the bottom of the page, there are links for 'Feedback', 'English', and copyright information.

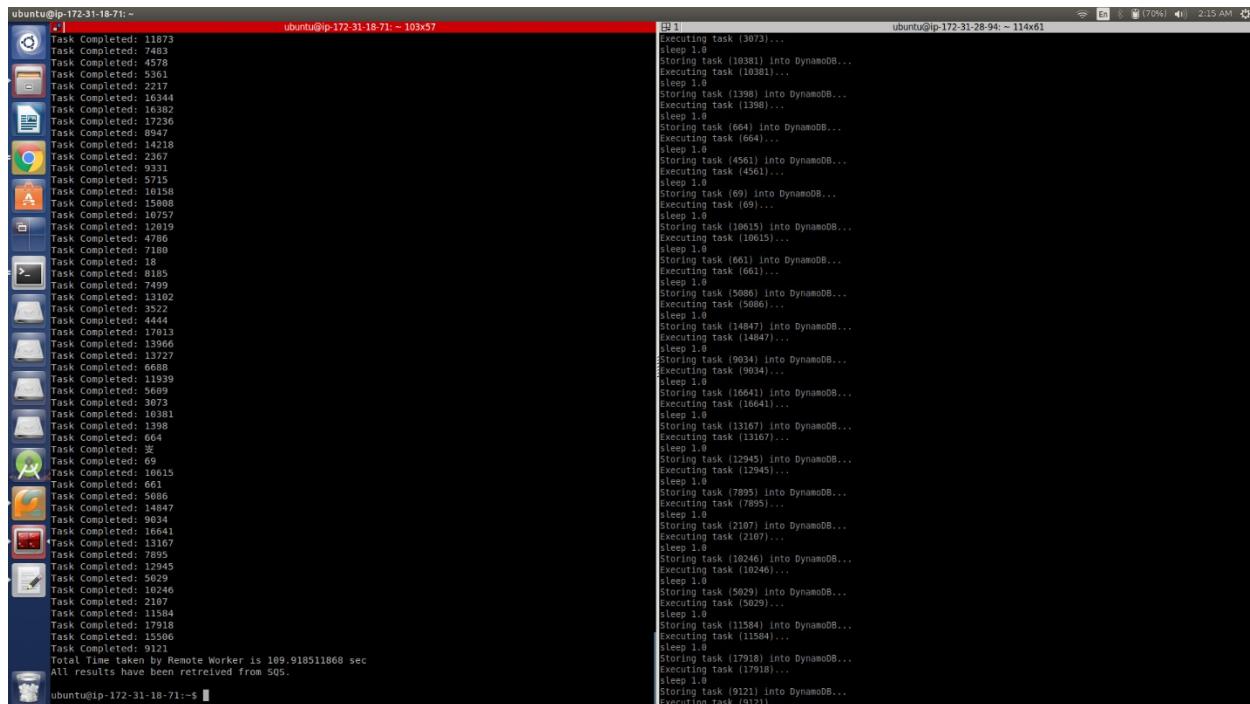
## c. Efficiency:

- 1 thread-10 ms:



```
ubuntu@ip-172-31-18-71:~ [1] Task Completed: 18221 Executing task (14895) into DynamoDB... Task Completed: 1229 sleep 0.01 Storing task (5934) into DynamoDB... Task Completed: 1945 Executing task (5394)... Task Completed: = Storing task (12142) into DynamoDB... Task Completed: 310 Executing task (12142)... Task Completed: 11588 sleep 0.01 Storing task (12142) into DynamoDB... Task Completed: 8912 Executing task (12142)... Task Completed: 16390 Executing task (12142)... Task Completed: 12115 sleep 0.01 Storing task (16345) into DynamoDB... Task Completed: 2983 Executing task (16345)... sleep 0.01 Storing task (14218) into DynamoDB... Task Completed: 341 Executing task (14218)... Task Completed: 95370 Executing task (14218)... Task Completed: 12325 Storing task (10914) into DynamoDB... Task Completed: 16370 Executing task (10914)... Task Completed: 7028 Executing task (10914)... Task Completed: 6444 sleep 0.01 Storing task (17437) into DynamoDB... Task Completed: 14151 Executing task (17437)... sleep 0.01 Storing task (12890) into DynamoDB... Task Completed: 4047 Executing task (12890)... sleep 0.01 Storing task (11049) into DynamoDB... Task Completed: 10004 Executing task (11049)... sleep 0.01 Storing task (8664) into DynamoDB... Task Completed: 5394 Executing task (8664)... sleep 0.01 Storing task (11683) into DynamoDB... Task Completed: 14895 Executing task (11683)... sleep 0.01 Storing task (9350) into DynamoDB... Task Completed: 16342 Executing task (9350)... sleep 0.01 Storing task (17300) into DynamoDB... Task Completed: 17300 Executing task (17300)... sleep 0.01 Storing task (17079) into DynamoDB... Task Completed: 17437 Executing task (17079)... sleep 0.01 Storing task (17790) into DynamoDB... Task Completed: 12890 Executing task (17790)... sleep 0.01 Storing task (1232) into DynamoDB... Task Completed: 838 Executing task (1232)... sleep 0.01 Storing task (15502) into DynamoDB... Task Completed: 17234 Executing task (15502)... sleep 0.01 Storing task (4148) into DynamoDB... Task Completed: 1662 Executing task (4148)... sleep 0.01 Storing task (3603) into DynamoDB... Task Completed: 5083 Executing task (3603)... sleep 0.01 Storing task (4972) into DynamoDB... Task Completed: 14218 Executing task (4972)... sleep 0.01 Storing task (10381) into DynamoDB... Task Completed: 4972 Executing task (10381)... sleep 0.01 Storing task (17236) into DynamoDB... Task Completed: 8947 Executing task (17236)... sleep 0.01 Storing task (3398) into DynamoDB... Task Completed: 2367 Executing task (3398)... sleep 1.0 Storing task (4561) into DynamoDB... Task Completed: 13102 Executing task (4561)... sleep 1.0 Storing task (69) into DynamoDB... Task Completed: 7860 Executing task (69)... sleep 1.0 Storing task (10615) into DynamoDB... Task Completed: 12819 Executing task (10615)... sleep 1.0 Storing task (661) into DynamoDB... Task Completed: 7860 Executing task (661)... sleep 1.0 Storing task (5086) into DynamoDB... Task Completed: 10158 Executing task (5086)... sleep 1.0 Storing task (14847) into DynamoDB... Task Completed: 15808 Executing task (14847)... sleep 1.0 Storing task (1398) into DynamoDB... Task Completed: 10757 Executing task (1398)... sleep 1.0 Storing task (17013) into DynamoDB... Task Completed: 13727 Executing task (17013)... sleep 1.0 Storing task (9034) into DynamoDB... Task Completed: 6688 Executing task (9034)... sleep 1.0 Storing task (16641) into DynamoDB... Task Completed: 13989 Executing task (16641)... sleep 1.0 Storing task (13167) into DynamoDB... Task Completed: 304 Executing task (13167)... sleep 1.0 Storing task (12945) into DynamoDB... Task Completed: 10615 Executing task (12945)... sleep 1.0 Storing task (7895) into DynamoDB... Task Completed: 661 Executing task (7895)... sleep 1.0 Storing task (2107) into DynamoDB... Task Completed: 5086 Executing task (2107)... sleep 1.0 Storing task (10246) into DynamoDB... Task Completed: 14847 Executing task (10246)... sleep 1.0 Storing task (5029) into DynamoDB... Task Completed: 2367 Executing task (5029)... sleep 1.0 Storing task (11584) into DynamoDB... Task Completed: 11584 Executing task (11584)... sleep 1.0 Storing task (17918) into DynamoDB... Task Completed: 17918 Executing task (17918)... sleep 1.0 Storing task (9121) into DynamoDB... Task Completed: 15506 Executing task (9121)... sleep 1.0 Total time taken by Remote Worker is 98.8488798989 sec All results have been retrieved from SQS.
```

- 1 thread-1 sec:



```
ubuntu@ip-172-31-18-71:~ [1] Task Completed: 11873 Executing task (3073)... Task Completed: 7483 sleep 1.0 Storing task (10381) into DynamoDB... Task Completed: 4578 Executing task (10381)... sleep 1.0 Storing task (1398) into DynamoDB... Task Completed: 5361 Executing task (1398)... sleep 1.0 Storing task (664) into DynamoDB... Task Completed: 2217 Executing task (664)... sleep 1.0 Storing task (14847) into DynamoDB... Task Completed: 10382 Executing task (14847)... sleep 1.0 Storing task (16641) into DynamoDB... Task Completed: 17236 Executing task (16641)... sleep 1.0 Storing task (4561) into DynamoDB... Task Completed: 8947 Executing task (4561)... sleep 1.0 Storing task (69) into DynamoDB... Task Completed: 14218 Executing task (69)... sleep 1.0 Storing task (10615) into DynamoDB... Task Completed: 2367 Executing task (10615)... sleep 1.0 Storing task (661) into DynamoDB... Task Completed: 13102 Executing task (661)... sleep 1.0 Storing task (5086) into DynamoDB... Task Completed: 3522 Executing task (5086)... sleep 1.0 Storing task (14847) into DynamoDB... Task Completed: 17013 Executing task (14847)... sleep 1.0 Storing task (13966) into DynamoDB... Task Completed: 13727 Executing task (13966)... sleep 1.0 Storing task (9034) into DynamoDB... Task Completed: 6688 Executing task (9034)... sleep 1.0 Storing task (16641) into DynamoDB... Task Completed: 13989 Executing task (16641)... sleep 1.0 Storing task (13167) into DynamoDB... Task Completed: 304 Executing task (13167)... sleep 1.0 Storing task (12945) into DynamoDB... Task Completed: 10615 Executing task (12945)... sleep 1.0 Storing task (7895) into DynamoDB... Task Completed: 661 Executing task (7895)... sleep 1.0 Storing task (2107) into DynamoDB... Task Completed: 5086 Executing task (2107)... sleep 1.0 Storing task (10246) into DynamoDB... Task Completed: 14847 Executing task (10246)... sleep 1.0 Storing task (5029) into DynamoDB... Task Completed: 2367 Executing task (5029)... sleep 1.0 Storing task (11584) into DynamoDB... Task Completed: 11584 Executing task (11584)... sleep 1.0 Storing task (17918) into DynamoDB... Task Completed: 17918 Executing task (17918)... sleep 1.0 Storing task (9121) into DynamoDB... Task Completed: 15506 Executing task (9121)... sleep 1.0 Total time taken by Remote Worker is 109.918511068 sec All results have been retrieved from SQS.
```

- 1 thread-10 sec:

- 2 thread-10 ms:

- 2 thread-1 sec:

- 2 thread-10 sec:

- 4 thread-10 ms:

```
ubuntu@ip-172-31-18-71:~ [1] 10:25:896 9:10 AM [root]
ubuntu@ip-172-31-18-71:~ $7x43
Task Completed: 17956
Task Completed: 16654
Task Completed: 13596
Task Completed: 4588
Task Completed: 5205
Task Completed: 2879
Task Completed: 14305
Task Completed: 17408
Task Completed: 9734
Task Completed: 9448
Task Completed: 12026
Task Completed: 3871
Task Completed: 14868
Task Completed: 9258
Task Completed: 16907
Task Completed: 4007
Task Completed: 15144
Task Completed: 4415
Task Completed: 4246
Task Completed: 17139
Task Completed: 16309
Task Completed: 17418
Task Completed: 6353
Task Completed: 9105
Task Completed: 2866
Task Completed: 3469
Task Completed: nV
Task Completed: 17634
Task Completed: 10845
Task Completed: 7730
Task Completed: 4652
Task Completed: 253
Task Completed: 14733
Task Completed: 81

Total Time taken by Remote Worker is 90.4784901142 sec

All results have been retrieved from SQS.

ubuntu@ip-172-31-18-71:~ [1] 10:25:896 9:10 AM [root]
ubuntu@ip-172-31-29-73:~ 54x26
[1] 10:25:896 9:10 AM [root]
ubuntu@ip-172-31-29-73:~ 54x26
sleep 0.01
Storing task (7730) into DynamoDB...
Executing task (7730)...
sleep 0.01
Storing task (7661) into DynamoDB...
Executing task (7661)...
sleep 0.01
Storing task (7504) into DynamoDB...
Executing task (7504)...
sleep 0.01
Storing task (4708) into DynamoDB...
Executing task (4708)...
sleep 0.01
Storing task (14585) into DynamoDB...
Executing task (14585)...
sleep 0.01
Storing task (13628) into DynamoDB...
Executing task (13628)...
sleep 0.01
Storing task (10416) into DynamoDB...
Executing task (10416)...
sleep 0.01
Waiting for Client....
Waiting for Client....
Waiting for Client....
Waiting for Client....
Waiting for Client.... [1] 10:25:896 9:10 AM [root]
ubuntu@ip-172-31-22-217:~ 68x29
[1] 10:25:896 9:10 AM [root]
ubuntu@ip-172-31-22-217:~ 68x29
sleep 0.01
Storing task (9105) into DynamoDB...
Executing task (9105)...
sleep 0.01
Storing task (1645) into DynamoDB...
Executing task (1645)...
sleep 0.01
Storing task (17418) into DynamoDB...
Executing task (17418)...
sleep 0.01
Storing task (15612) into DynamoDB...
Executing task (15612)...
sleep 0.01
Storing Task (11071) into DynamoDB...
Executing task (11071)...
sleep 0.01
Executing Task (5263) into DynamoDB...
Executing task (5263)...
sleep 0.01
Storing Task (4702) into DynamoDB...
Executing task (4702)...
sleep 0.01
Storing Task (14877) into DynamoDB...
Executing task (14877)...
sleep 0.01
Waiting for Client....
```

- 4 thread-1 sec:

- 4 thread-10 sec:

```
ubuntu@ip-172-31-28-94:~$ ./task_start.sh
[1]    2673 Task Completed: 2673
[1]    15134 Task Completed: 15134
[1]    2001 Task Completed: 2001
[1]    13457 Task Completed: 13457
[1]    10728 Task Completed: 10728
[1]    15665 Task Completed: 15665
[1]    16093 Task Completed: 16093
[1]    10489 Task Completed: 10489
[1]    11367 Task Completed: 11367
[1]    17754 Task Completed: 17754
[1]    15348 Task Completed: 15348
[1]    5771 Task Completed: 5771
[1]    13382 Task Completed: 13382
[1]    12661 Task Completed: 12661
[1]    17367 Task Completed: 17367
[1]    10672 Task Completed: 10672
[1]    790 Task Completed: 790
[1]    293 Task Completed: 293
[1]    17555 Task Completed: 17555
[1]    3878 Task Completed: 3878
[1]    5584 Task Completed: 5584
[1]    6204 Task Completed: 6204
[1]    6 Task Completed: 6
[1]    15271 Task Completed: 15271
[1]    14387 Task Completed: 14387
[1]    d9 Task Completed: d9
[1]    6235 Task Completed: 6235
[1]    2889 Task Completed: 2889
[1]    15573 Task Completed: 15573
[1]    2834 Task Completed: 2834
[1]    4601 Task Completed: 4601
[1]    14030 Task Completed: 14030

Total Time taken by Remote Worker is 94.5478649139 sec

All results have been retrieved from SQS.

ubuntu@ip-172-31-18-71:~$ [1]    16093 Executing task (16093)...
sleep 10.0
Storing task (17754) into DynamoDB...
Executing task (17754)...
sleep 10.0
Storing task (790) into DynamoDB...
Executing task (790)...
sleep 10.0
Storing task (17555) into DynamoDB...
Executing task (17555)...
sleep 10.0
Storing task (15271) into DynamoDB...
Executing task (15271)...
sleep 10.0
Storing task (3505) into DynamoDB...
Executing task (3505)...
sleep 10.0
Storing task (14030) into DynamoDB...
Executing task (14030)...
sleep 10.0
Waiting for Client....
Waiting for Client....
Waiting for Client....
[1]    14387 Executing task (14387)...
sleep 10.0
Storing task (5771) into DynamoDB...
Executing task (5771)...
sleep 10.0
Storing task (17367) into DynamoDB...
Executing task (17367)...
sleep 10.0
Storing task (5584) into DynamoDB...
Executing task (5584)...
sleep 10.0
Storing task (2742) into DynamoDB...
Executing task (2742)...
sleep 10.0
Storing task (2889) into DynamoDB...
Executing task (2889)...
sleep 10.0
Storing task (4601) into DynamoDB...
Executing task (4601)...
sleep 10.0
Waiting for Client....
Waiting for Client....
[1]    10728 Executing task (10728)...
sleep 10.0
Storing task (11367) into DynamoDB...
Executing task (11367)...
sleep 10.0
Storing task (13382) into DynamoDB...
Executing task (13382)...
sleep 10.0
Storing task (12661) into DynamoDB...
Executing task (12661)...
sleep 10.0
Storing task (293) into DynamoDB...
Executing task (293)...
sleep 10.0
Storing task (5561) into DynamoDB...
Executing task (5561)...
sleep 10.0
Storing task (14387) into DynamoDB...
Executing task (14387)...
sleep 10.0
Storing task (2834) into DynamoDB...
Executing task (2834)...
sleep 10.0
Waiting for Client....
Waiting for Client....
Waiting for Client....
[1]    15665 Executing task (15665)...
sleep 10.0
Storing task (15271) into DynamoDB...
Executing task (15271)...
sleep 10.0
Storing task (15573) into DynamoDB...
Executing task (15573)...
sleep 10.0
Waiting for Client....
Waiting for Client....
Waiting for Client....
[1]    15134 Executing task (15134)...
sleep 10.0
Storing task (2001) into DynamoDB...
Executing task (2001)...
sleep 10.0
Storing task (15665) into DynamoDB...
Executing task (15665)...
sleep 10.0
Storing task (5548) into DynamoDB...
Executing task (5548)...
sleep 10.0
Storing task (10672) into DynamoDB...
Executing task (10672)...
sleep 10.0
Storing task (3878) into DynamoDB...
Executing task (3878)...
sleep 10.0
Storing task (6204) into DynamoDB...
Executing task (6204)...
sleep 10.0
Storing task (6235) into DynamoDB...
Executing task (6235)...
sleep 10.0
Storing task (15573) into DynamoDB...
Executing task (15573)...
sleep 10.0
Waiting for Client....
Waiting for Client....
Waiting for Client....
```

- 8 thread-10 ms;

- 8 thread-1 sec:

```
ubuntu@ip-172-31-18-71:~ [1] + 10:51,49% 3:54 AM [root]
ubuntu@ip-172-31-18-71:~ $7x43
Task Completed: 12874
Task Completed: 8139
Task Completed: 11998
Task Completed: 16378
Task Completed: 10994
Task Completed: 12357
Task Completed: 11741
Task Completed: 4631
Task Completed: 12272
Task Completed: 12514
Task Completed: 8629
Task Completed: 9512
Task Completed: 4836
Task Completed: 10558
Task Completed: 15015
Task Completed: 10326
Task Completed: 13511
Task Completed: `z
Task Completed: 1951
Task Completed: 2739
Task Completed: 15799
Task Completed: 17891
Task Completed: 3927
Task Completed: 10193
Task Completed: 10848
Task Completed: 12961
Task Completed: 8977
Task Completed: 1662
Task Completed: 16527
Task Completed: 4934
Task Completed: 7803
Task Completed: 16170
Task Completed: 5825
Task Completed: 16850
Total Time taken by Remote Worker is 108.70227313 sec

All results have been retrieved from SQS.

ubuntu@ip-172-31-18-71:~ [1] + 10:51,49% 3:54 AM [root]
ubuntu@ip-172-31-29-73:~ - 54x12
[1] + 10:51,49% 3:54 AM [root]
ubuntu@ip-172-31-29-73:~ $7x11
Storing task (2739) into DynamoDB...
Executing task (2739)...
sleep 1.0
Storing task (12961) into DynamoDB...
Executing task (12961)...
sleep 1.0
Storing task (16850) into DynamoDB...
Executing task (16850)...
sleep 1.0
Waiting for Client.....
Waiting for Client.....
[1] + 10:51,49% 3:54 AM [root]
ubuntu@ip-172-31-31-213:~ - 75x14
[1] + 10:51,49% 3:54 AM [root]
ubuntu@ip-172-31-31-213:~ $7x14
sleep 1.0
Starting task (13511) into DynamoDB...
Executing task (13511)...
sleep 1.0
Starting task (10848) into DynamoDB...
Executing task (10848)...
sleep 1.0
Starting task (16170) into DynamoDB...
Executing task (16170)...
sleep 1.0
Waiting for Client.....
Waiting for Client.....
Waiting for Client.....
Waiting for Client.....
[1] + 10:51,49% 3:54 AM [root]
ubuntu@ip-172-31-21-149:~ - 60x11
[1] + 10:51,49% 3:54 AM [root]
ubuntu@ip-172-31-21-149:~ $7x11
Storing task (9512) into DynamoDB...
Executing task (9512)...
sleep 1.0
Storing task (2716) into DynamoDB...
Executing task (2716)...
sleep 1.0
Storing task (1662) into DynamoDB...
Executing task (1662)...
sleep 1.0
Storing task (12998) into DynamoDB...
Executing task (12998)...
[1] + 10:51,49% 3:54 AM [root]
ubuntu@ip-172-31-20-78:~ - 75x14
[1] + 10:51,49% 3:54 AM [root]
ubuntu@ip-172-31-20-78:~ $7x14
Executing task (11998)...
sleep 1.0
Storing task (10558) into DynamoDB...
Executing Task (10558)...
sleep 1.0
Storing task (15799) into DynamoDB...
Executing Task (15799)...
sleep 1.0
Storing task (16527) into DynamoDB...
Executing Task (16527)...
sleep 1.0
Waiting for Client.....
Waiting for Client.....
Waiting for Client.....
[1] + 10:51,49% 3:54 AM [root]
ubuntu@ip-172-31-22-217:~ - 68x14
[1] + 10:51,49% 3:54 AM [root]
ubuntu@ip-172-31-22-217:~ $7x14
sleep 1.0
Starting task (4631) into DynamoDB...
Executing task (4631)...
sleep 1.0
Starting task (8629) into DynamoDB...
Executing task (8629)...
sleep 1.0
Starting task (10193) into DynamoDB...
Executing task (10193)...
sleep 1.0
Starting Task (7803) into DynamoDB...
Executing task (7803)...
sleep 1.0
Waiting for Client.....
[1] + 10:51,49% 3:54 AM [root]
ubuntu@ip-172-31-20-10:~ - 68x14
[1] + 10:51,49% 3:54 AM [root]
ubuntu@ip-172-31-20-10:~ $7x14
sleep 1.0
Sleeping task (10894) into DynamoDB...
Executing task (10894)...
sleep 1.0
Starting task (4836) into DynamoDB...
Executing task (4836)...
sleep 1.0
Starting task (17891) into DynamoDB...
Executing task (17891)...
sleep 1.0
Starting Task (8977) into DynamoDB...
Executing task (8977)...
sleep 1.0
Waiting for Client.....
```

- 8 thread-10 sec;

- 16 thread-10 ms:

- 16 thread-1 sec:

- 16 thread-10 sec:

- All workers:

A screenshot of a terminal window with multiple tabs open. The tabs show various command-line sessions on different Ubuntu hosts, all running the same command: `ls -l /tmp`. The sessions are labeled with their respective host IP addresses and session numbers. The terminal also displays a file editor window titled "host.list" containing a list of Amazon EC2 instance IDs. The status bar at the bottom shows system information like battery level (0-23%, 2.1%), signal strength, and the current time (4:20 AM).

## d. Throughput:

- 1 Thread (Sleep-0):

The screenshot shows two terminal windows side-by-side. Both windows have a title bar indicating they are running on an Ubuntu system at IP address 172-31-18-71. The left window has a width of 71x43 and the right window has a width of 97x44. Both windows show a series of log entries from a script. The logs include messages like "Task Completed: <value>" followed by "sleep 0.0" and "Executing task (12184)..." or "Executing task (10923)...". The logs also mention "Storing task (15299) into DynamoDB..." and "Storing task (15894) into DynamoDB...". The process continues with many more entries. At the bottom of each window, there is a summary message: "Total Time taken by Remote Worker is 385.18354702 sec" and "All results have been retrieved from SQS.". The bottom of the left window shows the command "ubuntu@ip-172-31-18-71:~\$".

- 2 Thread (Sleep-0):

The screenshot shows three terminal windows side-by-side. All three windows have a title bar indicating they are running on an Ubuntu system at IP address 172-31-18-71. The windows are labeled with widths: 55x43, 64x44, and 63x57. Each window displays a similar log pattern to the one in the previous screenshot, with frequent "Waiting for Client..." messages interspersed with task completion logs. The logs show tasks being stored in DynamoDB and executed. The bottom of each window provides a summary: "Total Time taken by Remote Worker is 222.092999935 sec" and "All results have been retrieved from SQS.". The bottom of the leftmost window shows the command "ubuntu@ip-172-31-18-71:~\$".

#### •4 Thread (Sleep-0):

### • 8 Thread (Sleep-0):

### • 16 Thread (Sleep-0):

```
ubuntu@ip-172-31-18-71:~$ ./run.sh
[1]+ 14712 Task Completed: 14712
[1]+ 3294 Task Completed: 3294
[1]+ 8746 Task Completed: 8746
[1]+ 13352 Task Completed: 13352
[1]+ 10824 Task Completed: 10824
[1]+ 13471 Task Completed: 13471
[1]+ 13645 Task Completed: 13645
[1]+ 4882 Task Completed: 4882
[1]+ 8298 Task Completed: 8298
[1]+ 277 Task Completed: 277
[1]+ 2914 Task Completed: 2914
[1]+ 9848 Task Completed: 9848
[1]+ 7929 Task Completed: 7929
[1]+ 8609 Task Completed: 8609
[1]+ 3331 Task Completed: 3331
[1]+ 15728 Task Completed: 15728
[1]+ 15185 Task Completed: 15185
[1]+ 13811 Task Completed: 13811
[1]+ 5509 Task Completed: 5509
[1]+ 5376 Task Completed: 5376
[1]+ 11884 Task Completed: 11884
[1]+ 7505 Task Completed: 7505
[1]+ 16164 Task Completed: 16164
[1]+ 10429 Task Completed: 10429
[1]+ 14041 Task Completed: 14041
[1]+ 15713 Task Completed: 15713
[1]+ 4619 Task Completed: 4619
[1]+ 2881 Task Completed: 2881
[1]+ 14430 Task Completed: 14430
[1]+ 10818 Task Completed: 10818
[1]+ 17836 Task Completed: 17836
[1]+ ; Task Completed: ;
[1]+ 13695 Task Completed: 13695

Total Time taken by Remote Worker is 216.461463928 sec

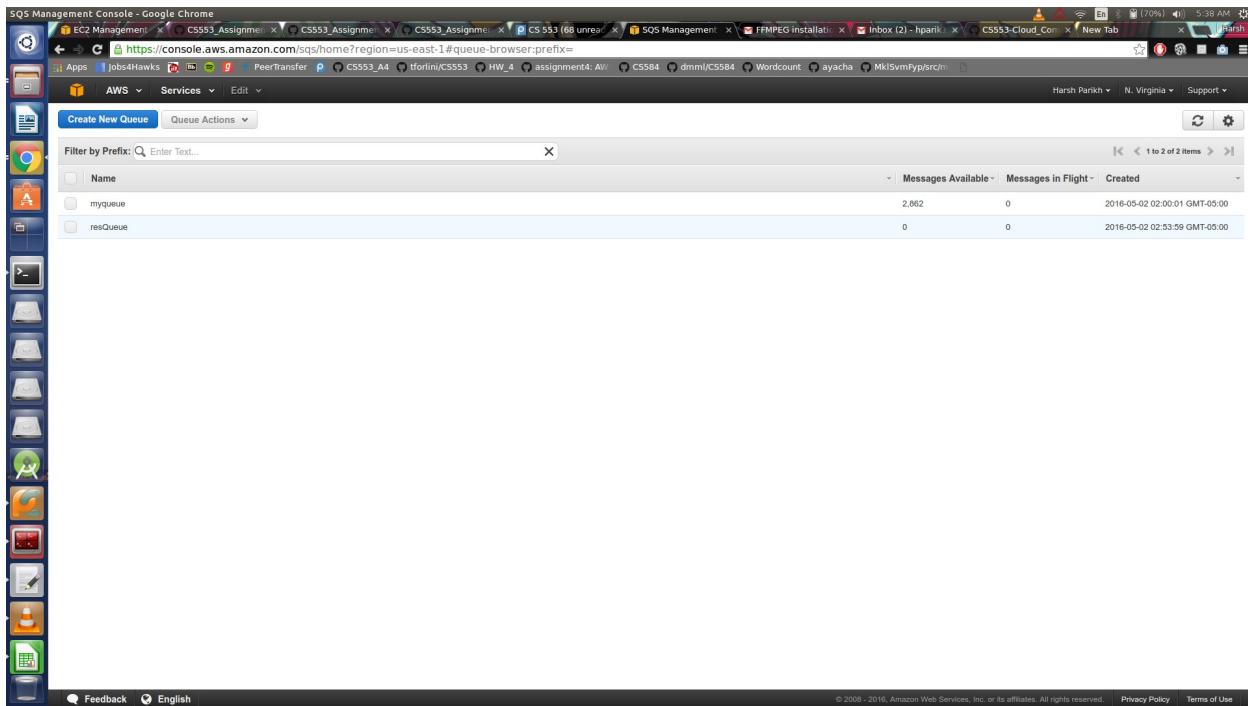
All results have been retrieved from SQS.

ubuntu@ip-172-31-18-71:~$
```

## 16 Instances running:

AWS CloudWatch Metrics												
AWS		Metrics										
EC2 Dashboard		Metrics										
Name	Instance ID	Instance Type	Availability Zone	Instance State	Status Checks	Alarm Status	Public DNS	Public IP	Key Name	Monitoring	Last Update	Actions
9	i-2116f7b	12 small	us-east-1d	running	✓ 2/2 checks ...	None	ec2-52-23-244-169.com...	52.23.244.169	Hw3	disabled	2023-08-29T12:00:00Z	<a href="#">Edit</a>
10	i-d71984d	12 small	us-east-1d	running	✓ 2/2 checks ...	None	ec2-52-91-76-93.com...	52.91.76.93	Hw3	disabled	2023-08-29T12:00:00Z	<a href="#">Edit</a>
1	i-1bd50cb	12 small	us-east-1d	running	✓ 2/2 checks ...	None	ec2-54-175-56-121.com...	54.175.56.121	Hw3	disabled	2023-08-29T12:00:00Z	<a href="#">Edit</a>
6	i-7336fe9	12 small	us-east-1d	running	✓ 2/2 checks ...	None	ec2-54-82-212-229.com...	54.82.212.229	Hw3	disabled	2023-08-29T12:00:00Z	<a href="#">Edit</a>
11	i-1986172	12 small	us-east-1d	running	✓ 2/2 checks ...	None	ec2-54-172-226-172.com...	54.172.226.172	Hw3	disabled	2023-08-29T12:00:00Z	<a href="#">Edit</a>
worker	i-05085198	12 micro	us-east-1b	running	✓ 2/2 checks ...	None	ec2-54-87-183-9.com...	54.87.183.9	Hw3	disabled	2023-08-29T12:00:00Z	<a href="#">Edit</a>
12	i-0a18f750	12 small	us-east-1d	running	✓ 2/2 checks ...	None	ec2-54-175-39-234.com...	54.175.39.234	Hw3	disabled	2023-08-29T12:00:00Z	<a href="#">Edit</a>
13	i-77179ed	12 small	us-east-1d	running	✓ 2/2 checks ...	None	ec2-54-91-42-135.com...	54.91.42.135	Hw3	disabled	2023-08-29T12:00:00Z	<a href="#">Edit</a>
2	i-a2023a308	12 small	us-east-1d	running	✓ 2/2 checks ...	None	ec2-54-88-6-142.com...	54.88.6.142	Hw3	disabled	2023-08-29T12:00:00Z	<a href="#">Edit</a>
14	i-d71984f	12 small	us-east-1d	running	✓ 2/2 checks ...	None	ec2-50-90-214-127.com...	52.90.214.127	Hw3	disabled	2023-08-29T12:00:00Z	<a href="#">Edit</a>
3	i-872ac15	12 small	us-east-1d	running	✓ 2/2 checks ...	None	ec2-52-87-170-128.com...	52.87.170.128	Hw3	disabled	2023-08-29T12:00:00Z	<a href="#">Edit</a>
5	i-034e05b8	12 small	us-east-1d	running	✓ 2/2 checks ...	None	ec2-50-92-204-125.com...	52.90.204.125	Hw3	disabled	2023-08-29T12:00:00Z	<a href="#">Edit</a>
7	i-033a4259	12 small	us-east-1d	running	✓ 2/2 checks ...	None	ec2-50-90-94-133.com...	52.90.94.133	Hw3	disabled	2023-08-29T12:00:00Z	<a href="#">Edit</a>
15	i-d419954e	12 small	us-east-1d	running	✓ 2/2 checks ...	None	ec2-54-91-64-7.com...	54.91.64.7	Hw3	disabled	2023-08-29T12:00:00Z	<a href="#">Edit</a>
Client	i-6ab45590	12 small	us-east-1d	running	✓ 2/2 checks ...	None	ec2-50-90-101-225.com...	52.90.101.225	Hw3	disabled	2023-08-29T12:00:00Z	<a href="#">Edit</a>
16	i-0919873	12 small	us-east-1d	running	✓ 2/2 checks ...	None	ec2-54-215-181.com...	54.82.215.181	Hw3	disabled	2023-08-29T12:00:00Z	<a href="#">Edit</a>
8	i-0304d59a	12 small	us-east-1d	running	✓ 2/2 checks ...	None	ec2-54-87-246-135.com...	54.87.246.135	Hw3	disabled	2023-08-29T12:00:00Z	<a href="#">Edit</a>
4	i-0d2acb17	12 small	us-east-1d	running	✓ 2/2 checks ...	None	ec2-52-90-185-76.com...	52.90.185.76	Hw3	disabled	2023-08-29T12:00:00Z	<a href="#">Edit</a>

## SQS Working:



## **Animoto Workload/Image file:**

```
bin/bash
GNU nano 2.2.6                               File: images.txt
http://www.fulldesktop.com/wp-content/uploads/2014/09/cute%20animal%20background-Fn0h.jpg
http://hostpost.com/serverfile/1/j0w3-ak_91duM/cute-animal-wallpapers.jpg
http://great-images.org/wp-content/uploads/2013/12/cute-animal-wallpapers-cut.jpg
http://gulgule.com/admin/Animals_4.jpg
http://www.wallpaperhd.co/Animals-HD-Wallpaper/Images/Animals%20HQ%20Wallpaper%2024.jpg
http://static.osmosisfactorymedia.com/api/public/images/african-turtle-trail.jpg
http://images.fanpop.com/image/photos/3490000/Cute-Panda-Bears-animals-34916412-1920-1080.jpg
http://www.hdwallpapersbot.com/wp-content/uploads/2014/06/hd-funny-wallpapers-of-snow.jpg
http://www.desktopextreme.com/photos/Nature/National Geographic Widescreen 2129201051130PM351.jpg
http://www.nodvd.nationalgeographic.com/NG/Video/356/98/mus128bmon1-1920x1080.jpg
http://www.bing.com/az/hprichbg/b/Siberianchimpan EN-AU1334033117 1920x1080.jpg
http://www.pageresource.com/wallpapers/wallpaper/animal-collection_329357.jpg
http://wallpaper-download.net/wallpapers/animal-wallpapers-animal-nature-pictures-wallpaper-33289.jpg
http://wallpaper-downloads.com/wallpaper/animal-nature-wallpaper-33289-2.jpg
http://wallpaperpaper.com/wp-content/uploads/2011/11/beautiful-animal-cute-wallpaper1.jpg
http://www.hdwallpaper.com/wp-content/uploads/2013/12/Baby-Animal-Wallpaper-1080.jpg
http://www.hdwallpapers.com/wp-content/uploads/2014/06/fox-wallpaper-animal-wallpapers-backgrounds-hd-photo-popular-fox-animal-wallpapers-for-desktop-wallpaper-patterns-free-download-walls-pc-mobile-sites-of-nature-home.jpg
http://www.hdwallpaper.com/wp-content/uploads/2014/07/Beautiful-Animal-Wallpaper-14.jpg
http://www.wallpaper.com/wp-content/uploads/2014/06/scenery-desktop-wallpaper-56.jpg
http://www.hddesktopbackgrounds.us/backgrounds/images/1920x1080/xjgl-walpwers-331524690-1920x1080.jpg
http://themeparkcompany.com/wp-content/uploads/2012/02/nature-scenery_full_hd_wallpaper_0040_1920x1080.jpg
http://www.hddesktopbackgrounds.us/backgrounds/images/1920x1080/xjgl-walpwers-331524690-1920x1080.jpg
http://www.hddesktopbackgrounds.us/wallpapers/winter-scenery-1920x1080.jpg
http://www.largepictures.net/largepictures/scenery/largepictures/scenery_large_56015.jpg
http://download.largepictures.net/wallpapers/nature-wallpapers/nature-wallpaper-sunset-scenery-wallpaper-39501.jpg
http://con.hippipanda.com/5da9d0943e3410015.jpg
http://www.hddesktopbackgrounds.us/backgrounds/images/1920x1080/sea-scenery-1920x1080.jpg
http://www.hddesktopbackgrounds.us/backgrounds/images/1920x1080/quish-wallpapers-07545740-1920x1080.jpg
http://www.hddesktopbackgrounds.us/backgrounds/mountain-lake-scenery-mountain-backgrounds-lake-mountain-25340.jpg
http://hd_cool-wallpapers.com/wallpapers/patterns/1920x1080/1920x1080_ljwz8.jpg
http://www.wallpaperpersonly.net/wallpapers/a-dreamy-winter-scenery-1920x1080.jpg
http://www.wallpaperpersonly.net/wallpapers/nature-wallpapers/nature-wallpaper-sunset-scenery-wallpaper-39501.jpg
http://www.mrwallpaper.com/wallpapers/winter-scenery-1920x1080.jpg
http://www.hdwallpaperbackground.com/uploads/aling/130313/zhaiqiao-beautiful-HD-Wallpapers-28.jpg
http://www.hdwallpaperbackground.com/uploads/aling/130313/zhaiqiao-beautiful-HD-Wallpaper.jpg
http://www.mrwallpaper.com/wallpapers/scenery/scenery-1920x1080.jpg
http://download.free13k.com/server13/xd6301sr-4rm-/179074_scenic-background-curse-islands-microsoft-windows7-canada-wallpapers_1920x1080.jpg
http://www.kucuu.com/desktop-wallpaper-home/Rural-scenery-1920x1080.jpg
http://74213.com/wallpaper/pic/the-best/AnEndless/Isle-of-Saint-All-in-one-Beautiful-Sleep-On-It-HD-Natural-Scenery-Wallpaper.jpg
http://www.kucuu.com/desktop-wallpaper-home/Scenic-Backgrounds/Kamakura-Japan-Nature-Scene-free-817073.jpg
http://downloads.hddesktopwallpapers.com/wp-content/uploads/2012/07/Cloudy20Highway20Scenes.jpg
http://l1.ytimg.com/vi/YgeGN60a10/maxresdefault.jpg
http://www.kucuu.com/desktop-wallpaper-home/Nordic-scenery/Desktop-Wallpaper-1920x1080.jpg
http://www.mrwallpapers.eu/wallpaper/Windows/2/Seaside/Blurred-Beach-Wallpapers/20Apple%20Perfect%20Scenery.jpg
http://www.wallpaperpersonly.net/wallpapers/nature/madrids-beach-scenery-1920x1080.jpg
http://smashingtoppen.com/wp-content/uploads/Abraham-Lake-Jpg
http://www.lukefun.com/assets/full/1.jpg
http://fc08.deviantart.net/317/f/2010/281/0/0/morning_lake_by_DonaldPilowitch.jpg
http://www.hdwallpaper.com/uploads/2013/04/341515.jpg
http://www.rockynatpatt.com/wp-content/uploads/2014/06/clear-Lake-background.jpg
http://www.hdwallpaper.freeshdw.com/00853d-abstract_hdwallpaper_autumn-lake_42431.jpg
```