Basic Metrics

```
Current server is on ws://16.147.254.83:8080/chat/
All 20 rooms are connected successfully.
Message generation complete

All tasks completed within timeout
Closing 20 WebSocket connections...

=== Basic Load Test Performance Metrics With 32 Threads ===
Messages sent: 32000
Successful Message: 32000
Failed Messages: 0
Duration: 774 ms
Throughput: 41343.67 msg/sec
Success rate: 100.00%
```

Detailed Metrics with 32, 64, 128 threads

Interesting findings: 32 threads performs best among all

- *Main Phase with 32 threads*

```
==========================================
Starting LoadTest Part 2
Warmup: 32000 messages with 32 threads
Main: 468000 messages with 32 threads
==========================================

Current server is on ws://16.147.254.83:8080/chat/
All 20 rooms are connected successfully.
Message generation complete

Queue size: 500000
>>> Phase 1: Warmup >>>
Sending 32000 messages with 32 threads...
>>> Main Phase >>>
Sending 468000 messages with 32 threads...
CSV writing complete: 500000 records written to /Users/janehuang/CS66
50/Assignments/my-websocket-project/client-part2/results/part2/part2_
metrics.csv
Closing 20 WebSocket connections...
After connections closed
=====Load test 2 completed=====

=== Initial Phase Performance Metrics With 32 Threads ===
Messages sent: 32000
Successful Message: 32000
Failed Messages: 0
Duration: 1156 ms
Throughput: 27681.66 msg/sec
Success rate: 100.00%

=== Main Phase Performance Metrics With 32 Threads ===
Messages sent: 468000
Successful Message: 468000
Failed Messages: 0
Duration: 5924 ms
Throughput: 79000.68 msg/sec
Success rate: 100.00%

=== Overall Performance Metrics With 32 Threads ===
Messages sent: 500000
Successful Message: 500000
Failed Messages: 0
Duration: 8674 ms
Throughput: 57643.53 msg/sec
Success rate: 100.00%
Total Connections: 20
Total Reconnections: 0
Generating detailed statistical analysis...
Processing CSV data...
```

```
=========================================
          LOAD TEST PERFORMANCE REPORT
=========================================
Total Messages Processed: 500,000
Mean Response Time:      1341.31 ms
Median Response Time:    1277 ms
95th Percentile (P95):   2681 ms
99th Percentile (P99):   2881 ms
Min Response Time:       20 ms
Max Response Time:       3014 ms

--- Throughput per Room (Messages Received) ---
Room 1     : 25118 msgs
Room 10    : 24951 msgs
Room 11    : 24908 msgs
Room 12    : 25002 msgs
Room 13    : 25241 msgs
Room 14    : 25034 msgs
Room 15    : 24831 msgs
Room 16    : 25131 msgs
Room 17    : 25003 msgs
Room 18    : 24935 msgs
Room 19    : 25131 msgs
Room 2     : 25063 msgs
Room 20    : 24742 msgs
Room 3     : 25088 msgs
Room 4     : 24861 msgs
Room 5     : 24971 msgs
Room 6     : 25190 msgs
Room 7     : 24832 msgs
Room 8     : 24996 msgs
Room 9     : 24972 msgs

=== Message Type Distribution ===
JOIN    : 25205 messages (5.04%)
LEAVE   : 20112 messages (4.02%)
TEXT    : 454683 messages (90.94%)
```

- *Main Phase with 64 threads*

```
=== Initial Phase Performance Metrics With 32 Threads ===
Messages sent: 32000
Successful Message: 32000
Failed Messages: 0
Duration: 670 ms
Throughput: 47761.19 msg/sec
Success rate: 100.00%

=== Main Phase Performance Metrics With 64 Threads ===
Messages sent: 468000
Successful Message: 468000
Failed Messages: 0
Duration: 6616 ms
Throughput: 70737.61 msg/sec
Success rate: 100.00%

=== Overall Performance Metrics With 64 Threads ===
Messages sent: 500000
Successful Message: 500000
Failed Messages: 0
Duration: 8921 ms
Throughput: 56047.53 msg/sec
Success rate: 100.00%
Total Connections: 20
Total Reconnections: 0
Generating detailed statistical analysis...
Processing CSV data...
```

```
==========================================
         LOAD TEST PERFORMANCE REPORT
==========================================
Total Messages Processed: 500,000
Mean Response Time:        2203.90 ms
Median Response Time:      2468 ms
95th Percentile (P95):     3587 ms
99th Percentile (P99):     4028 ms
Min Response Time:         17 ms
Max Response Time:         4161 ms

--- Throughput per Room (Messages Received) ---
Room 1      : 25220 msgs
Room 10     : 24888 msgs
Room 11     : 25047 msgs
Room 12     : 24949 msgs
Room 13     : 24887 msgs
Room 14     : 24943 msgs
Room 15     : 25087 msgs
Room 16     : 24898 msgs
Room 17     : 24827 msgs
Room 18     : 24990 msgs
Room 19     : 25098 msgs
Room 2      : 24973 msgs
Room 20     : 24917 msgs
Room 3      : 25178 msgs
Room 4      : 25026 msgs
Room 5      : 25232 msgs
Room 6      : 24722 msgs
Room 7      : 25071 msgs
Room 8      : 24845 msgs
Room 9      : 25202 msgs

=== Message Type Distribution ===
JOIN        : 25115 messages (5.02%)
LEAVE       : 20099 messages (4.02%)
TEXT        : 454786 messages (90.96%)
```

- *Main Phase with 128 threads*

```
=====Load test 2 completed=====

=== Initial Phase Performance Metrics With 32 Threads ===
Messages sent: 32000
Successful Message: 32000
Failed Messages: 0
Duration: 708 ms
Throughput: 45197.74 msg/sec
Success rate: 100.00%

=== Main Phase Performance Metrics With 128 Threads ===
Messages sent: 468000
Successful Message: 468000
Failed Messages: 0
Duration: 7766 ms
Throughput: 60262.68 msg/sec
Success rate: 100.00%

=== Overall Performance Metrics With 128 Threads ===
Messages sent: 500000
Successful Message: 500000
Failed Messages: 0
Duration: 10067 ms
Throughput: 49667.23 msg/sec
Success rate: 100.00%
Total Connections: 20
Total Reconnections: 0
Generating detailed statistical analysis...
Processing CSV data...
```

```
===========================================
        LOAD TEST PERFORMANCE REPORT
===========================================
Total Messages Processed: 500,000
Mean Response Time:       2402.25 ms
Median Response Time:     2943 ms
95th Percentile (P95):    4319 ms
99th Percentile (P99):    4558 ms
Min Response Time:        18 ms
Max Response Time:        4660 ms

--- Throughput per Room (Messages Received) ---
Room 1     : 24975 msgs
Room 10    : 24857 msgs
Room 11    : 24877 msgs
Room 12    : 25175 msgs
Room 13    : 24869 msgs
Room 14    : 25171 msgs
Room 15    : 24913 msgs
Room 16    : 25009 msgs
Room 17    : 24914 msgs
Room 18    : 24964 msgs
Room 19    : 25109 msgs
Room 2     : 24873 msgs
Room 20    : 25027 msgs
Room 3     : 25064 msgs
Room 4     : 24843 msgs
Room 5     : 25191 msgs
Room 6     : 25029 msgs
Room 7     : 24906 msgs
Room 8     : 24989 msgs
Room 9     : 25245 msgs

=== Message Type Distribution ===
JOIN      : 25267 messages (5.05%)
LEAVE     : 19901 messages (3.98%)
TEXT      : 454832 messages (90.97%)
[INFO]
```
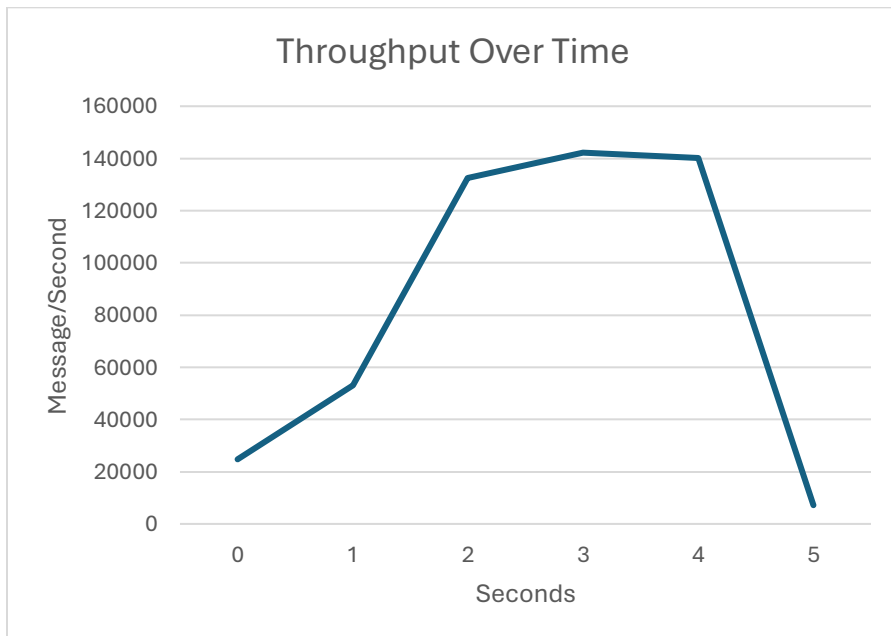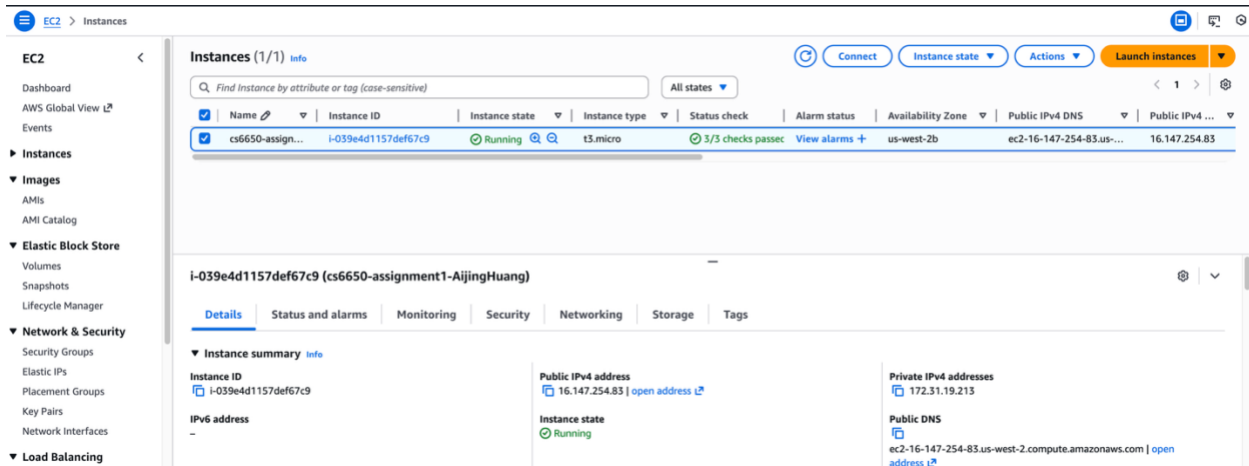
Performance analysis charts: use 32 threads csv file for visualization

The initial 10-second bucket analysis produced a single data point, as the entire 500,000-message transmission completed in under 10 seconds. To enable meaningful throughput analysis and identify performance trends, the granularity was refined to 1-second intervals.
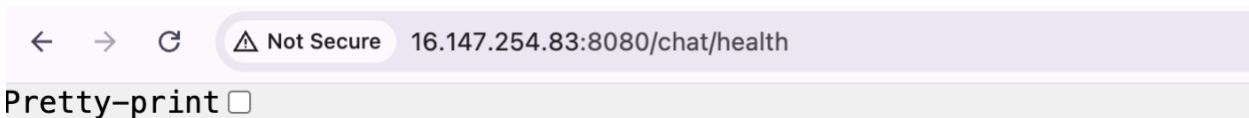

Throughput Over Time

Evidence of EC2 deployment

EC2 Screen Shot:

Health check with EC2 IP:

{"webSocketStatus":"UP","timestamp":"2026-02-13T08:31:15.942020Z"}

Deployment of chat.war in EC2 TomCat