Test Description

**Tests Overview:**

**Test 1, 2: Default latency count for 10 seconds.**

**Test 3, 4: Latency count of 1 and subscriber with multicast for 10 seconds.**

**Test 5, 6: Test 3 + 4 on 120 seconds**

**Test 7, 8: Test 5 + 6 (3 + 4) on 300 seconds**

I started by running a latency test using one publisher and one subscriber. Here are the scripts used:

Publisher

perftest\_java.bat -pub -dataLen 4096 -numSubscribers 1 -domain 1 -executionTime 10 -latencyTest -multicast

Subscriber

perftest\_java.bat -sub -dataLen 4096 -domain 1 -fileName sub1.csv

Publisher Parameters

|  |  |
| --- | --- |
| Parameter | Description |
| dataLen | Packet Size in bytes = 4096 Bytes = 4KB |
| numSubscribers | number of subscribers to wait for to start test |
| Domain | pub and sub must use same domain to communicate |
| executionTime | Test is run for this number of seconds |
| latencyTest | state that this test is a latency test |
| Multicast | Help optimise bandwidth (sending one single packet per sample, rather than multiple packets to each subscriber) |

Subscriber Parameters

|  |  |
| --- | --- |
| Parameter | Description |
| dataLen | Packet Size in bytes = 4096 Bytes = 4KB |
| Domain | pub and sub must use same domain to communicate |
| filename | Name of csv file to write to |

I ran two of these tests and the results are named test 1 and test 2.

I then ran these scripts (pub now has latency count of 1 and sub now has multicast):

Publisher

perftest\_java.bat -pub -dataLen 4096 -numSubscribers 1 -domain 1 -executionTime 10 -latencyTest -multicast -latencyCount 1

Subscriber

perftest\_java.bat -sub -dataLen 4096 -domain 1 -fileName sub1.csv -multicast

Results are files starting with test 3 and test 4. All the tests up to this point have been run for 10 seconds. Now I will run the commands again for 120 seconds for statistically better results.

The results start with test 5 and test 6. The next two tests were same commands as before but this time run for 300 seconds = 5 minutes. These results are stored under test 7 and test 8.

**Tests Overview:**

**Test 1 + 2: Default latency count for 10 seconds.**

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**Test 5 + 6: Test 3 + 4 on 120 seconds**

**Test 7 + 8: Test 5 + 6 (3 + 4) on 300 seconds**

**Results Analysis**

Test 1

From the subscriber we can see that each line in the csv file represents one second. In the publisher there are 459 records. The last record of the subscriber mentions that there are 451 packets, I think that the publisher must have added 8 more records, but I will clarify why in the future.

The throughput of the packets range from 1.2 to 1.6 Mbps and average at 1.5 Mbps. The latency measurements are mostly in the magnitude of hundreds, however, there are a few measurements in the thousands. The reason for these measurements I do not know and we can discuss this in the future.

Test 2

Again, we can see that on the subscriber file, each line corresponds to each second of the rest that has been run. In this test we can see that the last record of the subscriber mentions that 462 packets have been sent. Good news is that this corresponds with the number of results in the publisher file.

The throughput of the packets range from 1.2 to 1.6 Mbps just as the previous test averages at 1.5 Mbps. The latency measurements are mostly in the magnitude of hundreds although there are a few measurements in the thousands just like the previous test.

Test 3

The packets shown in the last subscriber result do not correspond with the amount in the publisher. In the subscriber, there are 405 cumulative packets. However, in the publisher there are 446 results. Also, in the first second, there are 51 packets, if there are 47 packets per second then the next second should have 51 + 47 = 98. However, the result states that there are 90 packets. So these packets per second don’t seem to add up.

The throughput of the packets range from 1.2 to 1.6 just as the last two tests and averages at 1.4 Mbps which is 0.1 Mbps less than the two previous tests. The latency measurements are similar to the previous tests.

Test 4

Good news with these results is that the number of packets correspond to that in the publisher.

The throughput measurements range from 0.6 to 1.5 which is dramatically different to previous test results. The previous results have ranged starting from a minimum of 1.2 which is double this test’s range minimum.

Test 5

This test was the same as the last, however, it is run for a longer time for statistically better results according to the documentation. From the results we can see that 5507 packets does not correspond to the 5516 results in the publisher results. There are an extra 9 packets which is almost similar to test 1 in which there were 8 packets, so there may be a pattern here.

In terms of the actual data, the throughput ranges from 0.8 to 1.8 which is similar to the previous test. The latency results average at about 731 micro seconds.

Test 6

Again, in this test the number of packets in the subscriber results does not correspond to that in the publisher. The subscriber results state that there are 5285 results however there are 5304 results in the publisher. This means that there is an extra 19 results which is 10 more that the previous test (test 5).

The throughput ranges from 1 to 1.7 Mbps. Compared to the previous test which had the exact same parameters and was run for the same amount of time, there is a slight difference. The latency results average at 630 micro seconds.

Test 7

This test was run for 300 seconds and again the number of packets and results do not correspond. The subscriber states that there are 20865 results whilst the publisher shows 20905 which is a difference of 40 packets. From previous results, it seems like there are roughly 8 packets per minute. This is just an observation and should not be made concrete.

The throughput ranges from 0.8 to 3 Mbps with an average of 2.3 Mbps. These results have a much higher throughput than all previous tests. Maybe the throughput correlates to the time spent doing the test since all other parameters were the exact same. The latency results average at 420 seconds which is much lower than previous tests. Maybe this is due to the longer time again? Again, it is just an observation.

Test 8

Once again, the numbers do not correspond. The subscriber states that there are 11827 results, however, the publisher shows 11836 which is a difference of 9 packets. This is five times smaller of a difference than the previous test (test 7) even though all parameters including execution time were the exact same.

The throughput measurements range from 0.9 to 1.8 Mbps. This is much lower than the previous test (test 7) where it ranged from 0.8 to 3. The throughput averages to 1.3 Mbps which is 1Mb lower than the previous test (test 7).

Results Table

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Throughput (Mbps) |  |  | Latency (Micro seconds) |  |
| Test | Minimum | Maximum | Average | Minimum | Maximum | Average |
| 1 | 1.3 | 1.6 | 1.5 | 395 | 17378 | 1017 |
| 2 | 1.2 | 1.6 | 1.5 | 395 | 58821 | 1273 |
| 3 | 1.2 | 1.6 | 1.4 | 455 | 82813 | 1430 |
| 4 | 0.6 | 1.5 | 1.0 | 469 | 64812 | 1408 |
| 5 | 0.8 | 1.8 | 1.5 | 275 | 56981 | 731 |
| 6 | 1.0 | 1.7 | 1.4 | 279 | 72355 | 630 |
| 7 | 0.8 | 3.0 | 2.3 | 235 | 60185 | 420 |
| 8 | 0.9 | 1.8 | 1.3 | 238 | 74991 | 526 |