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CS415
PA1 Report
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Overview:
This report details the results of passing integer buffers of varying sizes between two computers. For each individual timing test, 30 sample times were collected and averaged to ensure their accuracy. The one box test, the two box test, and the timing tests will be discussed below. The results generally show that small jumps in timing occur with every 100 additional integers passed and that large jumps occur with every increase of 1000 integers.

One Box:
One integer was passed between two nodes on one box in this test. The averaged results are displayed in Table 1.

Integers	Seconds
1	4.667E-06

Table 1: the one box test timing in seconds. The use of shared memory is likely the cause of the very small amount of time necessary to “ping pong” the data.

Two Box:
One integer was passed between two boxes in the cluster in this test. The average results are displayed in Table 2.

Integers	Seconds
1	0.000161

Table 2: the two box test timing in seconds. The transmission of the data over the network caused a considerable delay.

Timing Test:
In the timing test 10,000 trial timings were ran over a range of 1 to 10,000 integers. Each trial timing consisted of 30 samples which were averaged. Figure 1 displays all 10,000 trial timings.

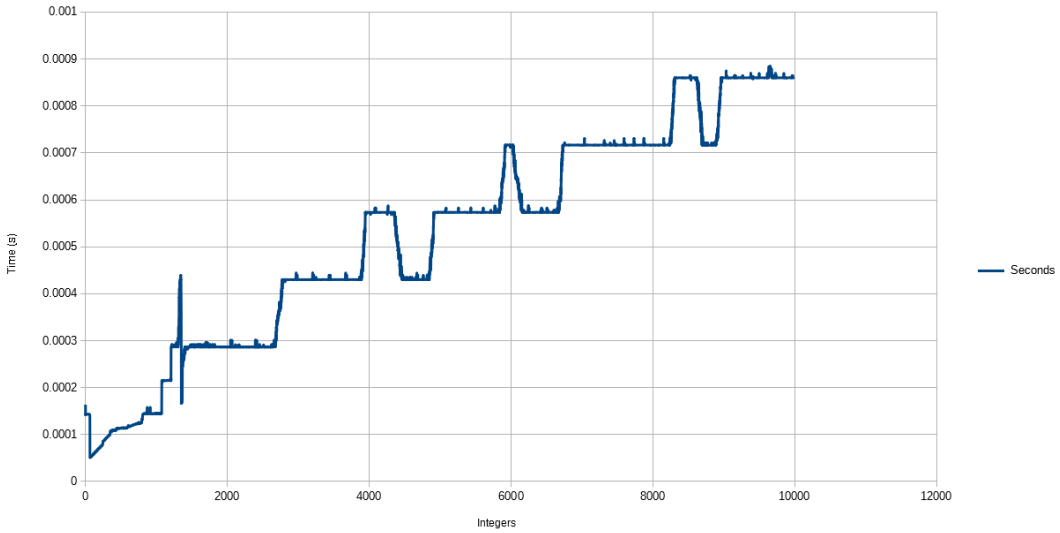

Figure 1: 10,000 trials run over a range of 1 to 10,000 integers. As this graph shows, there are significant timing jumps roughly every 1000 integers added.

There are large jumps every 1000 integers. Interestingly enough each of these jumps are followed by an equivalent drop in the amount of time used to transfer the integers. Specific subsets of the data are analyzed. The first subset of data that is being analyzed is the range between 1 and 100 integers. Figure 2 shows the graph of this range.

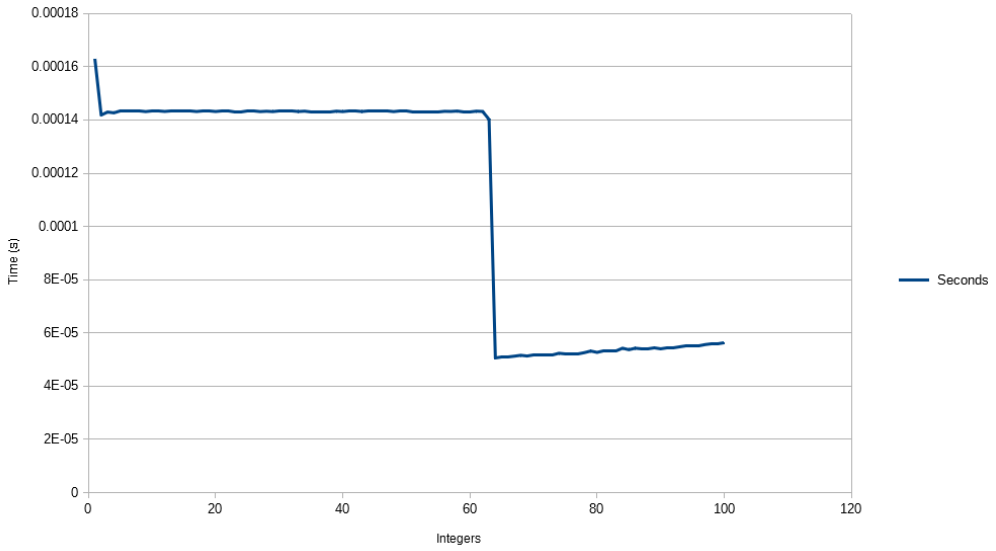

Figure 2: the timings of 1 to 100 integers. As this chart shows, there is a considerable drop in the time required between 1 and 100.

The times required in the range of 1 to 100 show an interesting downward trend in the amount of time required to transfer the integers. Table 3 shows the jump point.

Integers	Seconds
60	0.0001431
61	0.0001433
62	0.0001432
63	0.000140167
64	5.0567E-05
65	5.0767E-05
66	5.11E-05
67	5.1233E-05
68	5.1567E-05
69	5.13E-05
70	5.1833E-05

Table 3: The jump point in the 1 to 100 range. The difference between 63 and 64 integers lead to time savings in the factor of tens.

The next subset of data will be analyzed over the 1 to 1000 integer range. Figure 3 shows the results of the timing trials in this range.

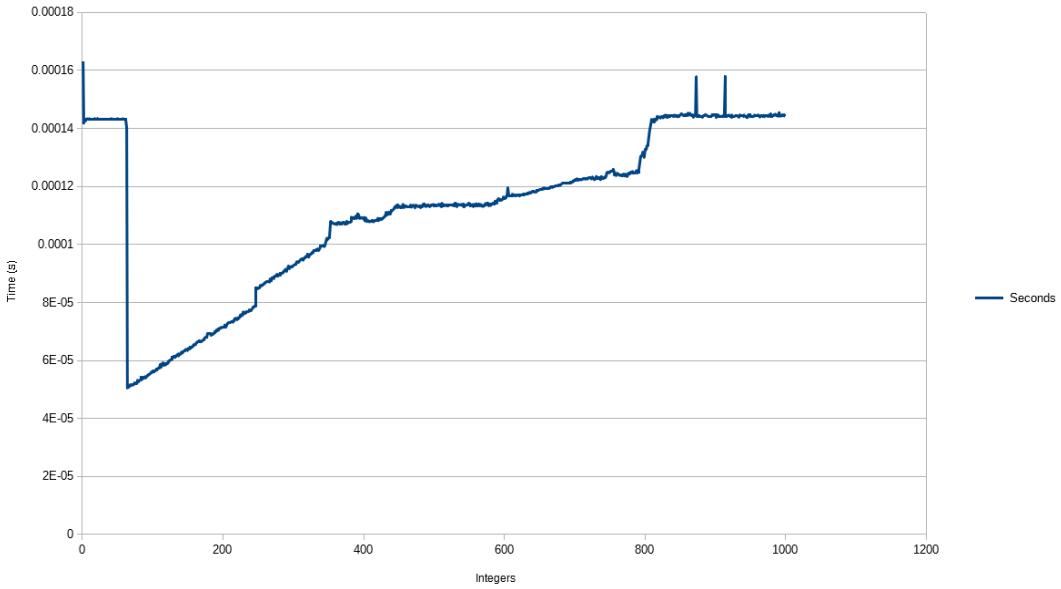

Figure 3: the timings of data over the 1 to 1000 integer range.

In the 1 to 1000 range jumps can be seen around passing 200, 400, 500, 600, 800, and 900 integers. Figure 4 shows the change bewteen passing 100 and 400 integers.

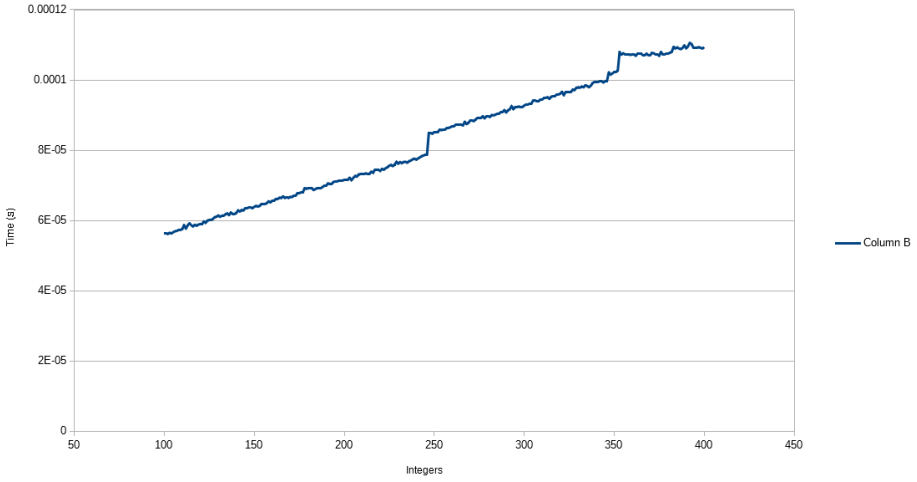

Figure 4: the timings of passing 100 to 400 integers.

As figure four shows, the jumps in this range occurred roughly at 250 and 350 integers passed. This combined with the trend of the 1 to 1000 range results would imply that every 100 integers causes an increase in time.

Conclusion:

It can be concluded that relatively small jumps occur every increase of 100 integers and that large jumps occur every time 1000 additional integers are passed.