HW 2 – Problem 5

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Results:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Array Size | 2^10 | 2^11 | 2^12 | 2^13 |
| Time (same node) | 0.000451 | 0.000669 | 0.001222 | 0.002218 |
| Time (different node) | 0.006278 | 0.001243 | 0.001626 | 0.002397 |

Graphs:

A screenshot of a cell phone

Description automatically generated

A screenshot of a cell phone

Description automatically generated

The different nodes graph is interesting and is likely due to some internal optimizer that gives priority to inter-node communication when the message size is above a certain limit.

In homework 1, the average response time was 0.001 seconds for intra-node performance (UDP over localhost), and 0.1366 seconds for inter-node performance (UDP over the internet). This is much worse than MPI’s 0.000451 seconds for intra-node and 0.006278 for inter-node performance. Additionally, the MPI program is passing 2^10 integers 100 times, while the UDP program is only passing 1 integer 3 times. This means that the RTT for the MPI program is (roughly) 0.00000451 and 0.00006278seconds, respectively, far outperforming UDP.