PA 1

CS 615

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Assignment Description

The objective of this assignment is to determine differences in timing when passing messages between processes. This involves comparing the round-trip send time of messages sent on the same computer to messages sent between different computers. Initial examination will compare how long it takes to send an int between processes, evaluating how much longer it takes for messages sent between different computers to that of messages sent on the same computer. Afterwards, the number of ints sent between different computers will be set to gradually increase until noticeable jumps in round-trip travel time for messages are observed. The times will then be plotted against number of ints sent in order to establish an observed pattern in the message travel times. An assessment will then be made to explain trend(s) shown in the graph.

Assignment Methodology

The assignment was implemented in the form of a single c file, 3 batch files, and a makefile. The c file contained the code for initiating round-trip message sends, starting with the initialization of mpi. Then the code is partitioned into two sections, one for the master node initiating the message send and one for a slave node which receives the message and sends another message back to the master node. The master node is responsible for initiating the timer when it sends the first message to the slave node. It is also responsible for stopping the timer when it receives the return message from the slave node. The program holds command line argument functionality to specify a number n such that the program will increment a variable x from 1 to n, timing how long it takes x ints to travel in a message round trip prior to each incrementation.

The c code is compiled through the usage of makefile which is capable of producing an executable to run the code, as well as the ability to remove the produced executable from the directory. Once the executable is produced, one of three batch files can be run in the form of the command sbatch <file_name>. The batch file One_box.sh measures the time it takes to send a single int between processes on the same computer. The batch file Two_box.sh measures the time it takes to send a single int between processes on different computers. The batch file Timing.sh measures how long it takes to send a message of sizes ranging from 1 to 10000 ints.

Data and Analysis

currently lacking access to data on cluster