Exercise 3

To compile: unzip our uploaded code, and run `make` inside `code/`. The slurm scripts are stored inside `code/slurm/`.

3.1 Measure Latency

The MPI ping-pong implementation in `code/src/latency.cpp` is measuring the roundtrip latency for each ping pong exchange 100000 times. This results in the latencies observed in Figure 1. Visualized in blue are the times for two ranks running on the same node, while the communication between two ranks on two different nodes is visualized in red.

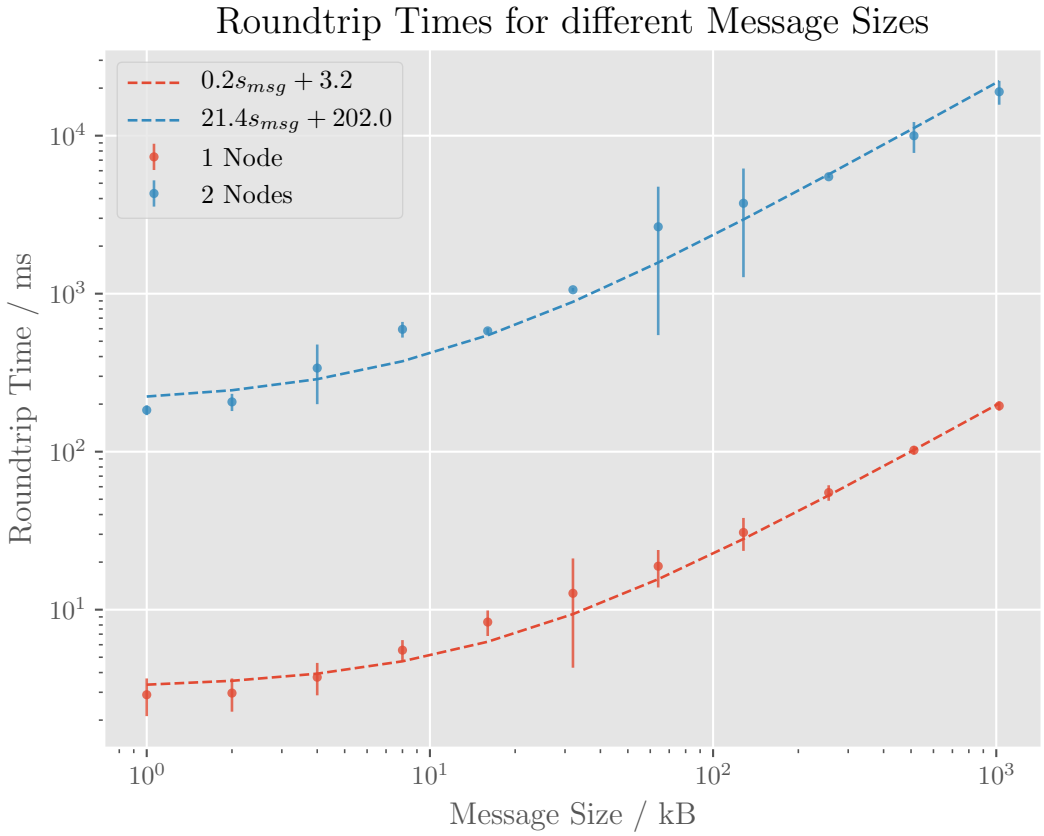

Figure 1: Roundtrip Latency over 100000 ping-pong exchanges

Both times the Latency roughly increases linearly with message size and for the communication between nodes a distinct offset and worse latency scaling can be observed

3.2 Measure Bandwidth

The MPI flood-test implentation in `code/src/bandwidth.cpp` is measuring the bandwidth over an averarge of 1000 mags, repeating this measurement 100 times. This results in the bandwidths observed in Figure 2.

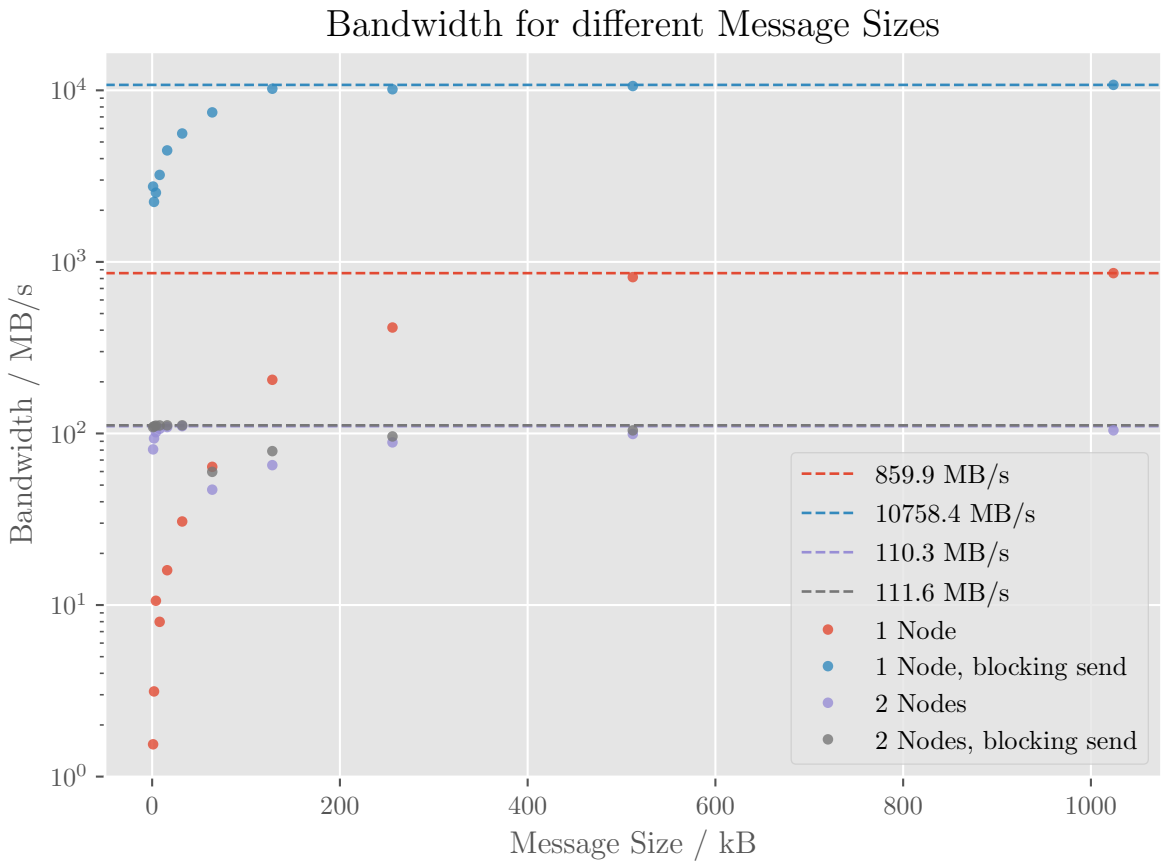

Figure 2: Bandwidth over 100000 flood-messages

3.3 Matrix multiply — sequential