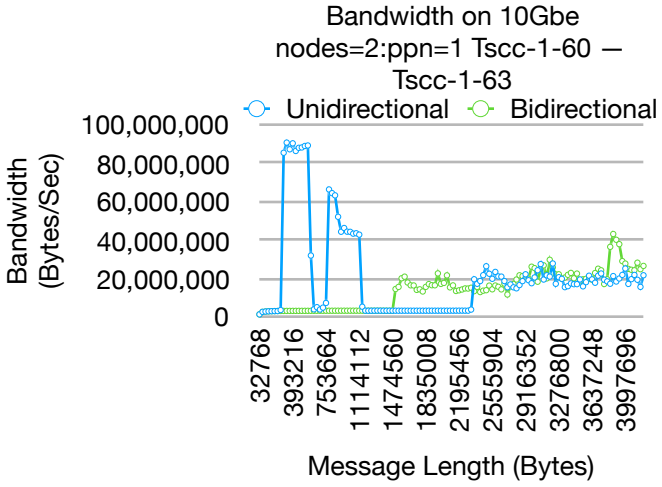

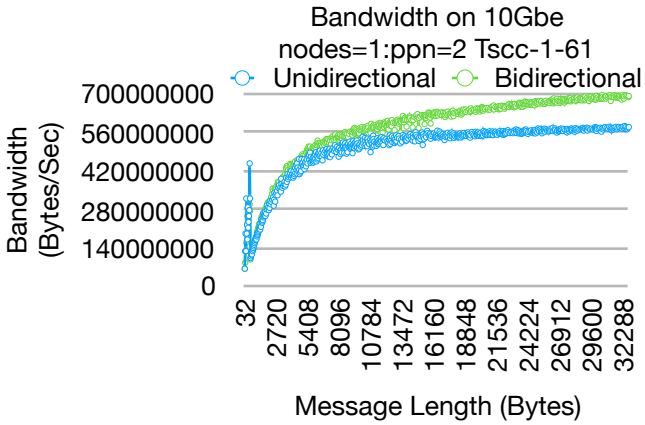

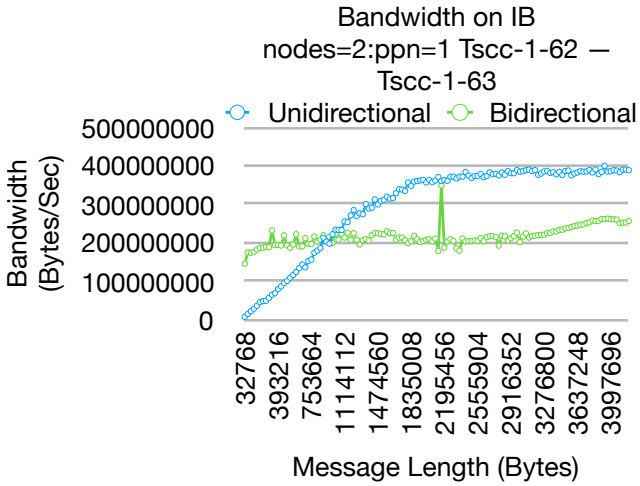

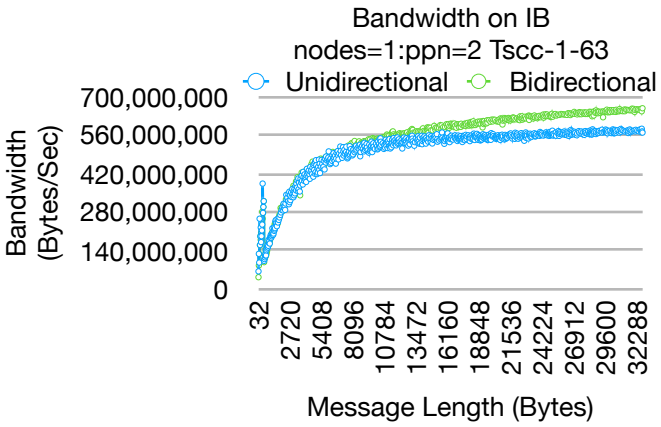

The top two graphs represent sending data over 10Gbe, with the left graph using 2 nodes and the right graph using 1 node where both graphs display unidirectional and bidirectional message sending. As you can see the 1 node graph shows rapid increase in bandwidth and starts to slow down around 61767 byte messages, showing a maximum bandwidth of ~700 million bytes/sec. The 2 node graph is very sporadic and sits around 20 million bytes/sec for its maximum, which means that sending data to two separate nodes is a lot slower than sending data on 1 node to different processes.

The bottom two graphs represent sending data over IB, with the left graph using 2 nodes and the right graph using 1 node where both graphs display unidirectional and bidirectional message sending. Again, the 1 node graph resembles the 1 node graph over 10Gbe and shows a rapid increase and starts to slow down around 61767 byte messages, showing a maximum bandwidth of ~700 million bytes/sec. The 2 node graph is different from the rest in that the lines for unidirectional and bidirectional are very different. The bidirectional seems to have a steady bandwidth of ~200 millions bytes/sec and the unidirectional has a linear increase up to 1.8 million bytes and then levels out at a bandwidth of ~400 million bytes/sec.

We need to measure different message lengths because in the real world you never really know how much data you will be sending or receiving, so it is good to figure out the best and worst case the network can handle for data transmission, and by using a large range of values you can easily find a sweet spot where the network performs the best.