Single Machine:

16 Cores:
Output:
Parameters: 128, 4, 4, 4, 15
Worker 1: 4 matrix multiplies performed,   0.07000000 time working in seconds
Worker 2: 5 matrix multiplies performed,   0.06000000 time working in seconds
Total time: 0.07000000

Parameters: 64, 8, 8, 8, 15
Worker 1: 34 matrix multiplies performed,   0.05000000 time working in seconds
Worker 2: 34 matrix multiplies performed,   0.05000000 time working in seconds
Total time: 0.05000000

Parameters: 32, 16, 16, 16, 15
Worker 1: 273 matrix multiplies performed,   0.31000000 time working in seconds
Worker 2: 273 matrix multiplies performed,   0.30000000 time working in seconds
Total time: 0.33000000

(I omitted the output for processes 3-15 to save on space but had similar output)

MPI command: mpirun -mca btl self,sm,tcp -mca btl_tcp_if_include 132.249.107.0/24 -map-
              by node -np 16 mmmw 32 16 16 16 mmmw-1-15.out >> mmmw-1-15-data.out

Network: 10Gbe

Expectations: I expect that with a large enough block size, 15 workers will perform the best
        but if the block size gets too small then 15 workers will perform worse than the original.

Speedup/Slowdown: 0.3447 / 0.07 = 4.92, .3447, 0.3447 / 0.05 = 6.894, 0.3447 / 0.33 = 1.04

Efficiency: 4.92 / 16 = 0.3075, 6.894 / 16 = 0.43, 1.04 / 16 = 0.065

Conclusion: My expectations were correct in that it looks like the sweet spot for 15 workers is
around a block size of 64 bytes.

9 Cores:
Output:
Parameters: 128, 4, 4, 4, 8
Worker 1: 8 matrix multiplies performed,   0.10000000 time working in seconds
Worker 2: 8 matrix multiplies performed,   0.13000000 time working in seconds
Worker 3: 9 matrix multiplies performed,   0.11000000 time working in seconds
Worker 4: 8 matrix multiplies performed,   0.22000000 time working in seconds
Worker 5: 8 matrix multiplies performed,   0.22000000 time working in seconds
Worker 6: 7 matrix multiplies performed,   0.12000000 time working in seconds
Worker 7: 8 matrix multiplies performed,   0.23000000 time working in seconds
Worker 8: 8 matrix multiplies performed,   0.22000000 time working in seconds
Total time: 0.22000000

MPI command: mpirun -mca btl self,sm,tcp -mca btl_tcp_if_include 132.249.107.0/24 -map-
            by node -np 9 mmmw 32 16 16 16 mmmw-1-8.out >> mmmw-1-8-data.out

Network: 10Gbe

Expectations: I expect that with a medium enough block size, 8 workers will perform the best
        but if the block size gets too small then 8 workers will perform worse than the original.

Speedup/Slowdown: 0.3447 / 0.22 = 1.56

Efficiency: 1.56 / 9 = 0.17

Conclusion: I was only able to run 1 test for 8 workers and a large block size increased
performance

5 Cores:
Output:
Parameters: 128, 4, 4, 4, 4
Worker 1: 15 matrix multiplies performed,   0.09000000 time working in seconds
Worker 2: 17 matrix multiplies performed,   0.18000000 time working in seconds
Worker 3: 16 matrix multiplies performed,   0.17000000 time working in seconds
Worker 4: 16 matrix multiplies performed,   0.10000000 time working in seconds
Total time: 0.18000000

Parameters: 64, 8, 8, 8, 4

Worker 1: 129 matrix multiplies performed,   0.04000000 time working in seconds
Worker 2: 127 matrix multiplies performed,   0.04000000 time working in seconds
Worker 3: 129 matrix multiplies performed,   0.05000000 time working in seconds
Worker 4: 127 matrix multiplies performed,   0.04000000 time working in seconds
Total time: 0.05000000

Parameters: 32, 16, 16, 16, 4
Worker 1: 1025 matrix multiplies performed,   0.30000000 time working in seconds
Worker 2: 1025 matrix multiplies performed,   0.29000000 time working in seconds
Worker 3: 1023 matrix multiplies performed,   0.29000000 time working in seconds
Worker 4: 1023 matrix multiplies performed,   0.29000000 time working in seconds
Total time: 0.29000000

MPI command: mpirun -mca btl self,sm,tcp -mca btl_tcp_if_include 132.249.107.0/24 -map-by node -np 5 mmmw 32 16 16 16 mmmw-1-4.out >> mmmw-1-4-data.out

Network: 10Gbe

Expectations: I expect that again a medium block size will perform the best, and large block sizes will be terrible because there are less workers available

Speedup/Slowdown: 0.3447 / 0.18 = 1.915, 0.3447 / 0.05 = 6.894, 0.3447 / 0.29 = 1.19

Efficiency: 1.915 / 5 = 0.383, 6.894 / 5 = 1.3788, 1.19 / 5 = 0.238

Conclusion: My expectations were somewhat correct in that a medium block size performed the best but also a small block size performed the worst.

I only was able to run on a single machine because my jobs weren't running on tscc for multiple nodes for some reason. Also I ran out of time for my report.