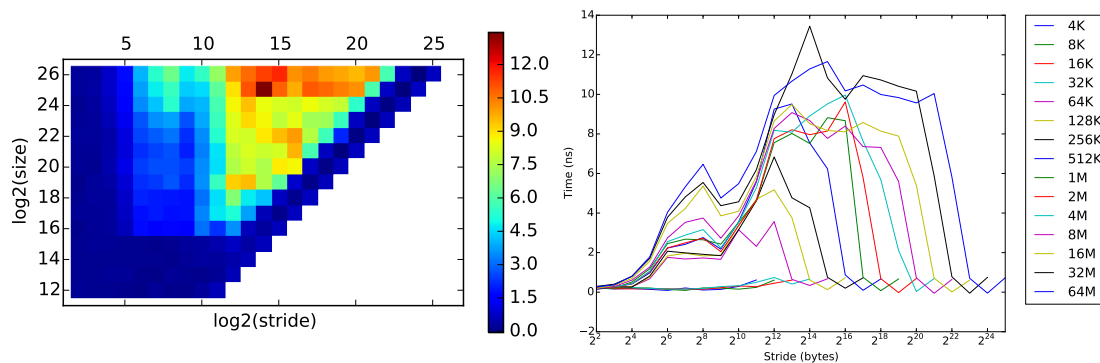
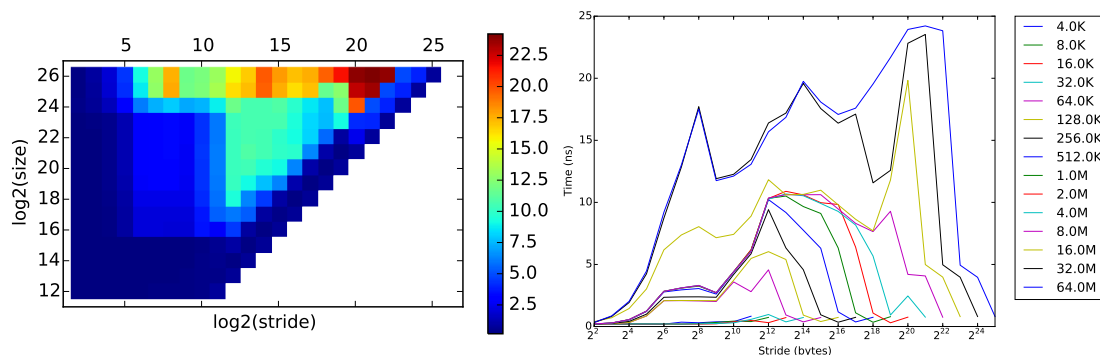


1. See previous submission.
2. See previous submission.
3. There is a  $p - 1$  speedup factor.
4. The minimum serial time is 2.75h. The minimum parallel time is 2.25h.



5.



6.

7. A caveat: when attempting to run `centroid.c` verbatim from the course repo on the cluster, one found that it was consistently giving a timing of 0 for all three functions. The initial hypothesis was that the resolution of the default C timer was insufficient. Following up on Piazza, `centroid.c` was modified to use the OpenMP timer, giving the following results:

(a) 4.440892e-16 to 1.443290e-15

(b) 4.440892e-16 to 1.443290e-15

(c) 1.332268e-15 to 1.443290e-15

also known as the unfortunate case where the numbers do not really make sense. Theoretically, Implementation B should be the slowest because it does not exploit memory locality or look-ahead, whereas Implementations A and C should be faster because the compiler can optimize for array access from contiguous blocks of memory.