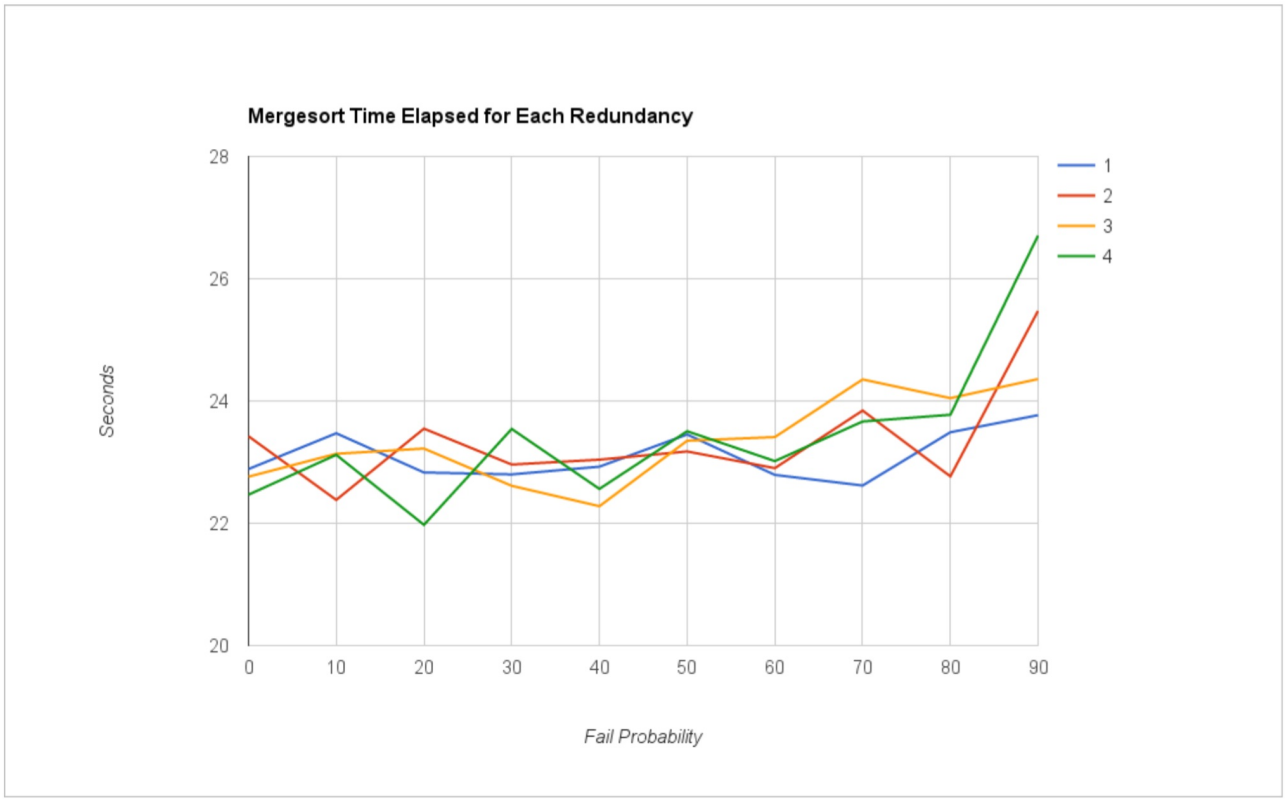
Evaluation

The evaluation was done on a data set generated under the following conditions:

- Four worker servers running on different hosts each.
- The input file used was the one with 10 million numbers (approx 48 MB).
- The chunk size used was 1,000,000 bytes.
- The chunks per merge used was 8 chunks.
- Four values were used for the redundancy (number of concurrent requests for proactive failure tolerance). r = 1, 2, 3, 4.
- Ten values were used for the failure probability. These were 0%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, and 90%.

Plots

I plotted the average time elapsed for each mergesort in the graph below:



Conclusion

Honestly speaking, I don't understand the results I got. The time elapsed does increase significantly from 80% to 90%, but aside from that, the values are roughly the same at all failure probabilities. Because of variability in each line, it's difficult to tell what redundancy setting is better where.

What I would do for a more in-depth evaluation would be to add more data points at each redundancy/failure probability setting, since right now it has 2 data points, and that leaves it vulnerable to things like a busy network. Also, there

is the possibility that 4 workers isn't a good number for these settings, so I would try a few different sizes of the worker fleet. Finally, I picked redundancy vs failure probability because they were the most interesting from a distrubuted systems standpoint, but chunk size, chunks per merge, and fleet size are all potentially interesting parameters to vary.

Overall, the system was implemented quite well, albeit with confusing final results that can be attributed to lack of depth in the evaluation.