CS633: Parallel Computing

Swapnil Raykar (18111078)

April 23, 2019

1 Assignment 4.1: Profiling of Parmetis-4.0.3

1.1 Methodology

1. Setup the TAU and Parmetis path.
2. Generate the profile files by using TAU
mpirun -np 12 -f machinefile parmetis parmetis/Graphs/rotor.graph 1 6 1 1 6 1
3. use pprof to get the profile details in text format.
4. run paraprof to get the visualize details.

1.2 Observations

I have profiled the parmetis with rotor graph example. The figure 1 shows the summary time plot for all nodes.
I have run the *mpirun -np 12 -f machinefile parmetis parmetis/Graphs/rotor.graph 1 6 1 1 6 1* with ppn=12.

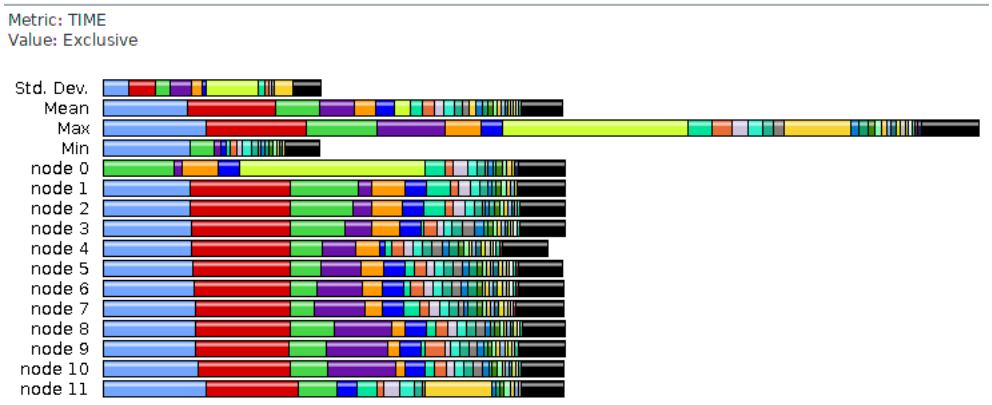

Figure 1: Summary of rotor graph on 12 processes

Figure 2 shows that the time required for all functions on node 0. From the graph it can be concluded that max time required for node 0 is for WritePVector function. WritePVector function write the partition vector by receiving the data from all nodes other than 0.

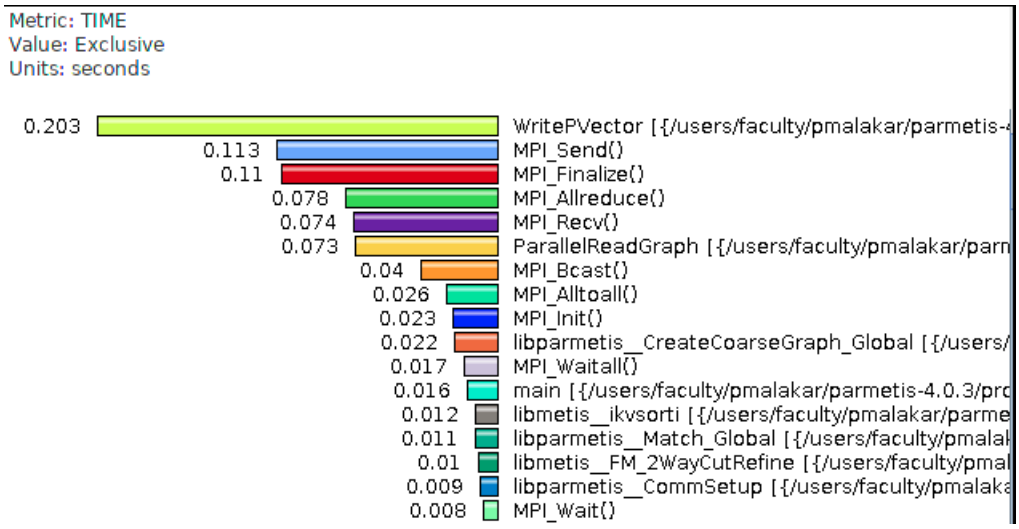

Figure 2: Time on node 0

Figure 3 shows that the time required for writePVector on all node. We can see that WritePVector is executed on Node 0 only.

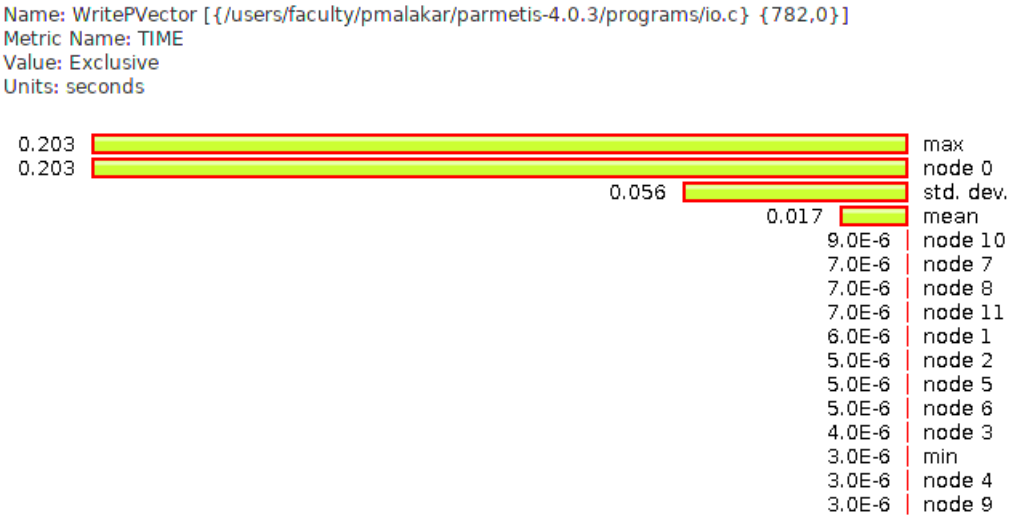

Figure 3: Time of WritePVector on all nodes

Figure 4 shows the time on node 11(last node). From the graph it can be concluded that most time required for node 11 is for MPISend, MPIFinalzie and ParallelReadGraph. Node 11 read the graph file and send the adjacency data to all other nodes. So, the time is more for MPISend to send data to all other nodes and ParallelReadGraph for reading the input graph.

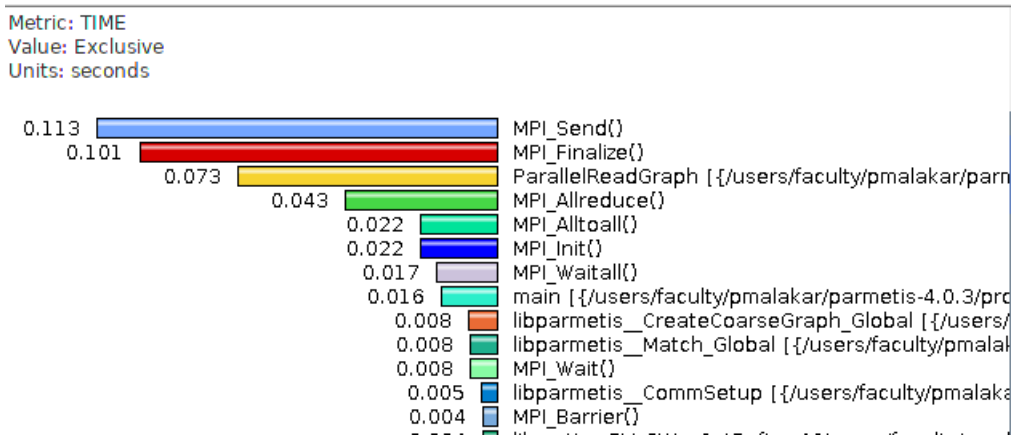

Figure 4: Time on node 11

Figure 5 shows that the time required for ParallelReadGraph on all node. We can see that node11 has max time for ParallelReadGraph.

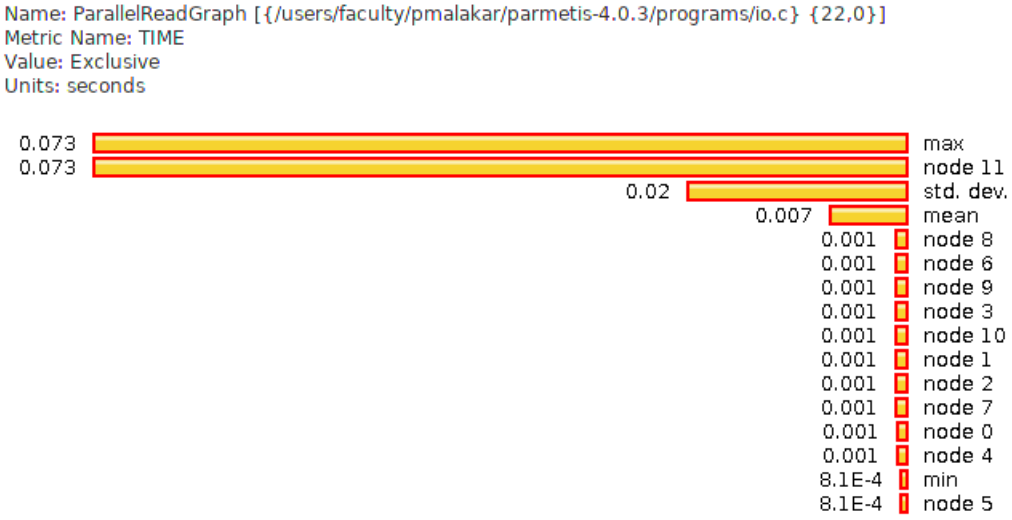

Figure 5: Time of ParallelReadGraph on all nodes

Figure 6 shows the time on node 6(intermediate). It resembles all nodes other than 0 and 11. Maximum time is for MPIFinalize because the processes has to wait for node 0 to finish writing Partition Vector. Then MPISend and MPIRecv take the time to send and receive the graph data.

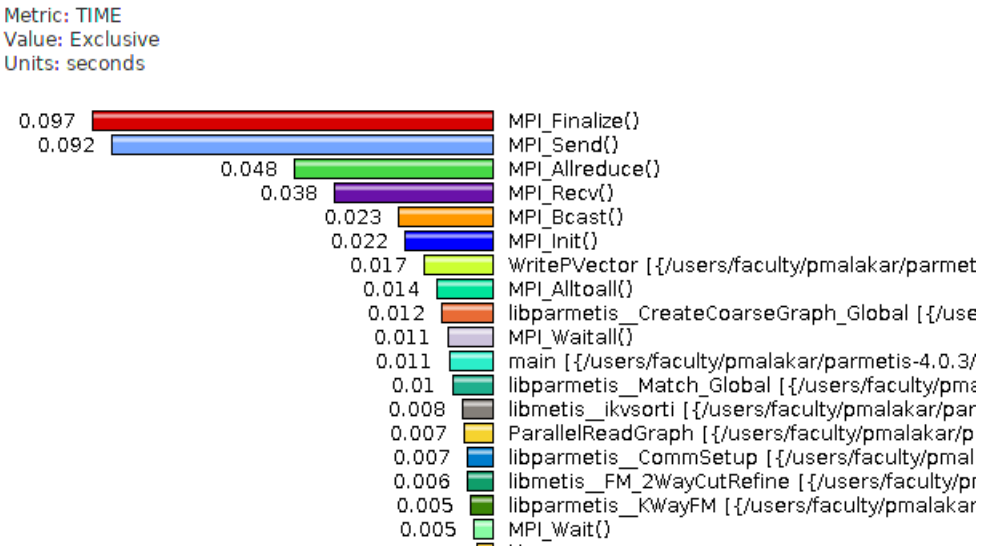

Figure 6: Time on node 6