

Quantitative Assessment of Large-Scale Application Traces

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Problem to be Solved

- We want to be able to perform a variety of analyses on communication trace data generated using TAU or other tracing tools.
- Existing tools do a good job of collecting communication traces.
- The analyses provided by existing tools are relatively limited.
- We want to build a flexible platform for analyzing communication traces.

Trace Analysis is Graph Analysis

- A communication trace is essentially just a DAG.
- We can leverage large-scale graph analysis systems to analyze communication traces.
 - The DAG longest path is the application critical path
 - Can we use clustering algorithms for analyzing communication phases?

Data Pipeline

- Gather trace data from applications using TAU or other software.
- Convert trace data into useful format; JSON, CSV, etc.
- Read trace files into graph data structure using GraphX, Graph Frames, or some other graph building software.
- Analyze graphs produced using statistical methods, or potentially other graph analysis methods/tools.

Next Steps

- Gathering traces using Sandia LibAllProf.
- Continue working on integration of trace data into graph format.
- Implement simple communication analysis in Spark GraphX.
- Make use of statistical methods, neural networks, regression analysis, linear programming when analyzing MPI application flow.

Questions?



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