

ECE Capstone Program
Spring 2018
Project Abstract & Info

1. Project Number: 40

2. Project Title: Analytics Dashboard for RADICAL Cybertools

3. Team Members:

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5. Keywords:

Visualization, Analytics, High-Performance Compute (HPC)

6. Project Abstract (Text):

The objective of this project was to design and configure a visualization and analytics dashboard that operates on log-files containing the state transitions of EnTK pipelines, stages, and tasks (PSTs). EnTK is an HPC library for use in supercomputing, which organizes HPC program execution into pipelines, stages, and tasks. All analytics and visualizations (plots) are updated at run-time, within three second intervals. The displays implemented include (1) status of the execution of individual PSTs, (2) analytics illustrating PST temporal and/or spatial locality, (3) branching tree showing the tasks within each stage and stages within each pipeline.

The dashboard's Python backend utilizes a log-file parser to gain information about the PST state transitions, ID numbers, and epoch time. This information is then processed, organized, and plotted with the Bokeh library into the visualizations and analytics described above, embedded in an HTML file. A Flask server acts as the controller for the backend and acts in response to frontend requests. The webpage-based frontend continually requests updates and inserts them into an HTML iframe for display. Based on the user's selection of which analytics or visualizations to generate, the dashboard can output multiple types of plots and is scalable enough to handle other plots implemented in the future.