Collaborative WorkBench (CWB): ENABLING EXPERIMENT EXECUTION, ANALYSIS AND VISUALIZATION WITH INCREASED SCIENTIFIC PRODUCTIVITY

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The Collaborative WorkBench (CWB) has been successfully developed to support collaborative science algorithm development. It incorporates many features that enable and enhance science collaboration, including the support for both asynchronous and synchronous modes of interactions in collaborations. With the former, members in a team can share a full range of research artifacts, e.g. data, code, visualizations, and even virtual machine images. With the latter, they can engage in dynamic interactions such as notification, instant messaging, file exchange, and, most notably, collaborative programming. CWB also implements behind-the-scene provenance capture as well as version control to relieve scientists of these chores. Furthermore, it has achieved a seamless integration between researchers' local compute environments and those of the Cloud. CWB has also been successfully extended to support instrument verification and validation.

Adopted by almost every researcher, the current practice of downloading data to local compute resources for analysis results in much duplication and inefficiency. CWB leverages Cloud infrastructure to provide a central location for data used by an entire science team, thereby eliminating much of this duplication and waste. Furthermore, use of CWB in concert with this same Cloud infrastructure enables co-located analysis with data where opportunities of data-parallelism can be better exploited, thereby further improving efficiency. With its collaboration-enabling features apposite to steps throughout the scientific process, we expect CWB to fundamentally transform research collaboration and realize maximum science productivity.