Analyzing Scientific Activity Dominancies on Scientific Workflow Models

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***Abstract*—In this paper, we propose an algorithmic approach for analyzing (control-flow and data-flow driven) dominancies among scientific activities in a scientific workflow model supported by data intensive experiment procedures and large scale computing environments. Upon the scICN-based scientific workflow model, we explicate the proposed approach from devising an activity dominancy analysis algorithm to exemplifying its application to a pseudo scICN-based scientific workflow model, and finally define the activity dominancy net to represent the output of the algorithm formally and graphically. We expect that the analyzed activity dominancies ought to be helpful not only in the design of load balancing mechanisms for large scale distributed workflow systems, but also in the implementation of exception-handling and recovery mechanisms for concretizing data intensive and flexible scientific workflow systems.**

***Keyword*—scientific workflow; dominancy; load-balancing; verification; exception handling and recovery**

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