

Sandia's IWF NextGen Workflow System

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Abstract: Engineering sciences workflows are now common practice in design and analysis, where parallel simulation runs substitute for physical experiments. Coupling the upstream design models with the discretized analysis models, along with all the requisite model-building tools and post processing analysis tools via modern workflow engines (e.g., SAW at Sandia or ICE at ORNL) is replacing script-based 'workflows'. This allows more complex workflows to be created, run, and shared. Additionally, parametric runs are now the norm due to V&V needs, and typically the simulations and analysis codes are run on large-scale parallel computers. This design-through-analysis coupling gives rise to a new set of problems, as we now span computational scale and environments (e.g., a CAD design is run on a Windows workstation, the output of which is used to mesh the problem on a Linux scientific workstation, and the mesh is then used to run a large-scale parametric simulation/analysis on a cluster or supercomputer). This trend of easily organizing tasks and data together into workflows will surely continue, giving rise to a new sort of problem in terms of managing the information and processes. In this talk we will examine Sandia's NextGen Workflow capability in the context of our engineering analysis problems.