

POSTER (DEMONSTRATION)

EDISON: A Web-Based HPC Simulation Execution Framework for Large-Scale Scientific Computing Software

Young-Kyoon Suh*, Hoon Ryu, Hangi Kim, and Kum Won Cho

Korea Institute of Science and Technology Information (KISTI)

Introduction

Researchers in the Computational Science and Engineering (CSE) fields

- Have been more interested in solving more compute-intensive problems with advancing HPC technology and demonstrating their research results to educate students in a user-friendly environment.
- Build their simulation software running in parallel on HPC resources, in general, via command line interface (CLI).
 - CLI, however, may not be a useful tool as the CSE users are typically not familiar with the tool.

Need on Science Gateway (Simulation SW platform)

- Supporting GUI allowing CSE domain-specific scientists to easily *share*-register, access, and run-HPC simulation software on the web

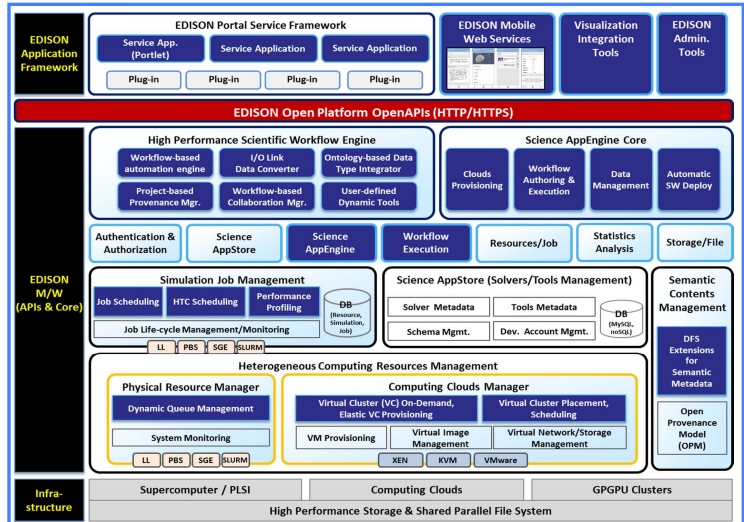
EDISON (EDucation-research Integration through Simulation On the Net)

- Joint work between the “main center” (KISTI) developing and managing a general hub and “several discipline-specific centers” developing simulation software tools to be distributed on the hub (platform): <http://www.edison.re.kr>
- Have been developed for around five years
- Consisting of three layers: *application portal*, *middleware*, and *infrastructure* layers
- Sufficiently robust to service 28K people, about 300 simulation softwares, and 365 contents since the online HPC simulation services started in 2011

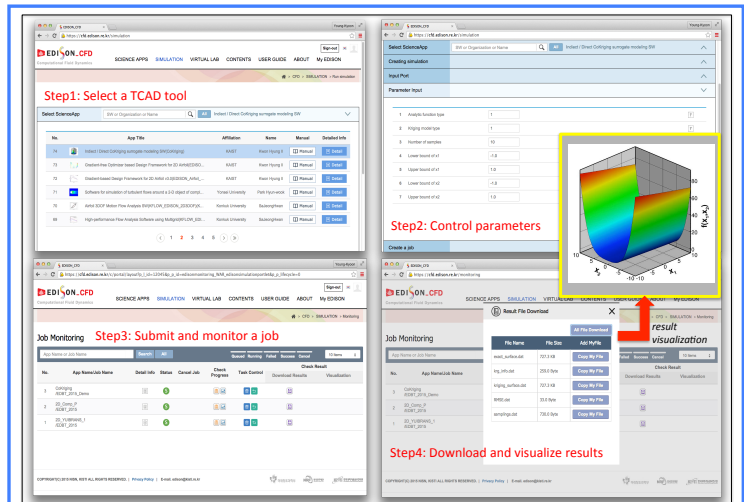
Contributions

- Novel cyber-infrastructure, dedicated to assist the CSE community to easily access and run online simulation services in parallel on HPC resources
- Rigorous abstraction for online simulation work initiated by software tools used in diverse fields
- Solid, robust middleware, consisting of metadata and job/workflow management frameworks
- Reusable a GUI architecture: applied to different web portals supporting different fields in CSE

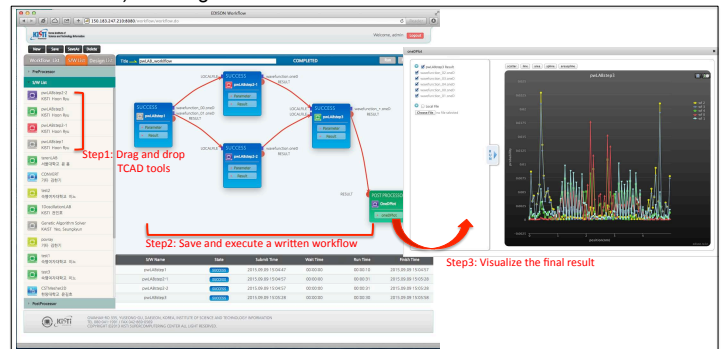
EDISON Architecture



Demonstration Scenarios



1) Running a Simulation Job on a Selected Software Tool



2) Running a Scientific Workflow