STNS01-4 BEE – FY20 P6-3: Release BEEWorkflowManager, BEETaskManager, and client application

ECP WBS	2.3.6.01 – LANL ATDM - BEE
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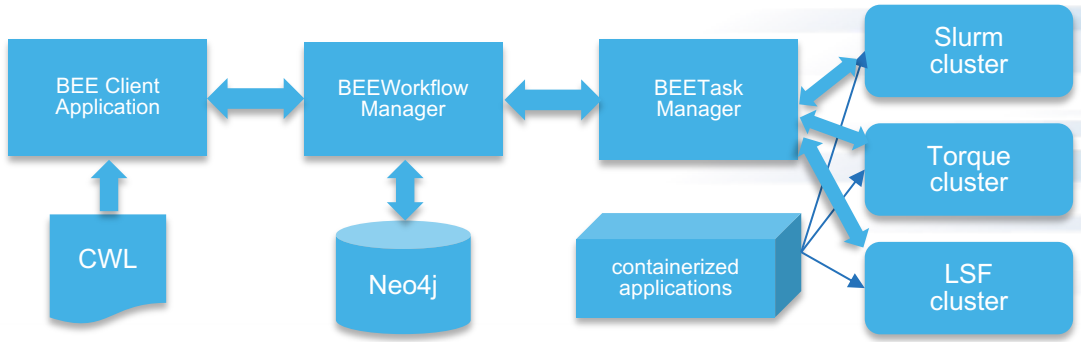
Scope and objectives

- BEE provides a portable, modular, HPC-focused workflow engine capable of managing containerized applications at scale.
- In FY20 BEE will deliver a much improved workflow engine; updated to Python 3, using the Neo4j graph database, capable of launch containerized applications using the Charliecloud and Singularity linux container runtimes on HPC clusters driven by the Slurm and LSF resource managers, as part of complex workflows described using the Common Workflow Language.

BEE: cross-platform portability of workflows



Impact

- BEE will give ECP a tool that great simplifies the deployment of containerized workflows on the next generation of pre-exascale and exascale systems. There are 4 predominant container runtimes and 3 HPC resource managers across the DOE complex. BEE allows scientists to describe their workflow using the Common Workflow Language and then deploy that workflow across the entire spectrum of systems without having to learn the specifics of each container runtime and resource manager.

Project accomplishment

- The entire BEE code base was refactored to make future enhancements and maintenance much easier. The new BEE code is modular and extensible which will enable interoperability with existing and future workflow systems and tools.
- The BEEWorkflowManager now uses the Neo4j open source graph database. This eases management of workflows with complex interdependencies between tasks.
- All BEE components are now resilient. If any one component crashes it can be restarted and the state of the workflow recovered and execution resumed.
- BEE supports a subset of the open standard Common Workflow Language (CWL). This allows users of BEE to leverage existing tools for composing workflows and makes BEE-compliant workflows portable to other CWL-compliant workflow engines.

Deliverables Report: https://github.com/lanl/BEE/blob/master/doc/ECPFY20STNS01-4-Completion.pdf
HPC resources used: LANL ASC cluster “fog”