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# STNS01-6 BEE – FY20 P6-2: Support for HPC resource managers

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.

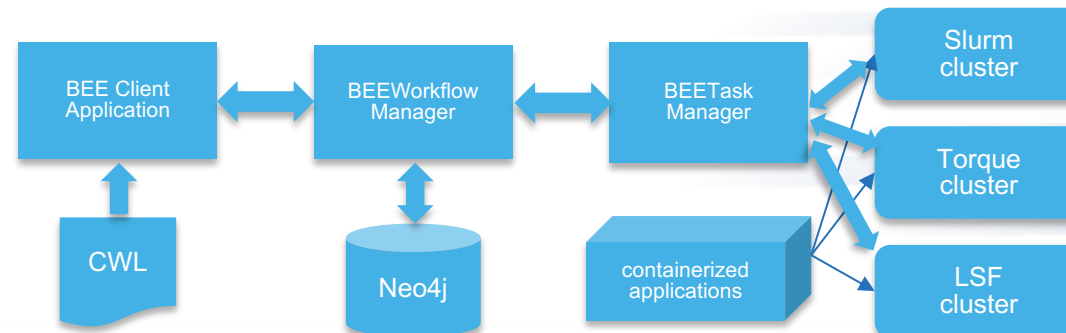
## Impact

- BEE will give ECP a tool that greatly 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.

**Deliverables** Report: <https://github.com/lanl/BEE/blob/master/doc/ECPFY20STNS01-6-Completion.pdf>  
HPC resources used: ORNL Summit cluster



## BEE: cross-platform portability of workflows



## 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 promise of the refactored, modular, BEE code base was realized in completing this milestone. Support for submitting containerized (Charliecloud or Singularity) LSF jobs was implemented in this milestone.
- Support for the PBS and Torque/Moab HPC resource managers, on the BEE project roadmap for the future as time allows, has been moved up given the ease of implementation. The BEE project anticipates less than a week's work to add support for these additional resource managers.