Introduction of Open OnDemand to Supercomputer Fugaku

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1 INTRODUCTION

Since there is a lot of pre-requisite knowledge to use HPC clusters, the learning cost is high for beginners. In order to use HPC resources easily, we introduce Open OnDemand[1] to the supercomputer Fugaku[3], which is the flagship supercomputer in Japan. Open OnDemand allows users to access HPC resources from a web browser instead of SSH. Furthermore, interactive operations of GUI applications running on the compute nodes of the HPC cluster can be easily executed. Open OnDemand supports various schedulers, but Fujitsu TCS[2], a job scheduler on Fugaku, does not be supported. Therefore, we develop an adapter to use Fujitsu TCS in Open OnDemand.

2 SUPPORT FOR FUGAKU

Open OnDemand provides an adapter interface to support various job schedulers. We develop the following methods for Fujitsu TCS defined in the parent class of the adapter. The adapter developed by us has been merged into the master branches of the Open OnDemand GitHub repositories. Please refer to our pull requests for details[1].

submit Submit a job
delete Delete a job
status Get status of a job
hold Hold a job
release Release a held job
info Get information of a job
info_all Get information of all job
cluster_info Get information of an HPC cluster
supports_job_arrays Get bulk job support availability
directive_prefix Get the prefix used by the job scheduler

Fig. 1 shows a part of the implementation for a **delete** method. In line 8, the overridden **delete** method is defined. In line 9, **@fujitsu_tcs** is an instance of the **Batch** class. The `pjdel` command called in line 5 is a Fujitsu TCS command that deletes a job, and the job ID is passed as an argument.

Fig. 2 shows the dashboard of Open OnDemand installed on Fugaku. The icons in Interactive Apps are GUI applications with interactive operations that run on compute nodes (**Remote Desktop**, **JupyterLab**, **RStudio**, **VSCode**). In order to facilitate the management of the Interactive Apps, we use SingularityPro, which is a container environment for HPC. The Icons in Passenger Apps are applications that run on the server on which Open OnDemand is installed (**Home Directory** uploads, downloads, and edits files, **Active Jobs** monitors jobs, **Job Composer** creates and submits jobs, **Shell** provides CUI via a web browser).

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[1]https://github.com/OSC/ood_core/pull/766 and https://github.com/OSC/ondemand/pull/2194

```
1  module Adapters
2    class Fujitsu_TCS < Adapter
3      class Batch
4        def delete_job(id)
5          call("pjdel", id.to_s)
6        end
7
8        def delete(id)
9          @fujitsu_tcs.delete_job(id.to_s)
10       end
```
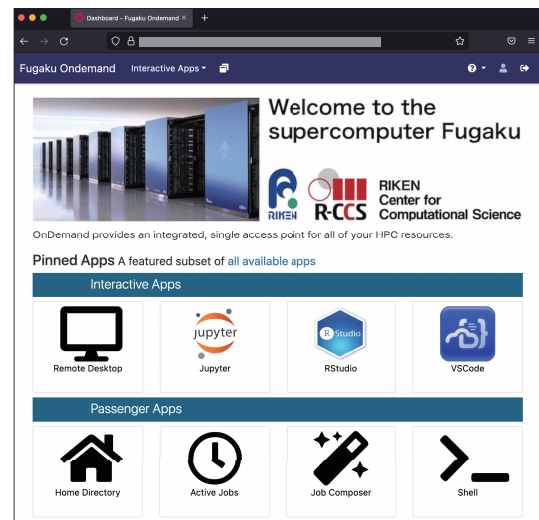
Figure 1: Code of delete method

Figure 2: Dashboard on Open OnDemand

3 CONCLUSION

This paper developed the adapter for Fujitsu TCS to introduce Open OnDemand to Fugaku. We believe that the introduction has improved user convenience. As a future work, it is necessary to clarify the effect of the introduction quantitatively.

REFERENCES

[1] Dave Hudak et al. 2018. Open OnDemand: A web-based client portal for HPC centers. *Journal of Open Source Software* 3, 25 (2018), 622. https://doi.org/10.21105/joss.00622
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