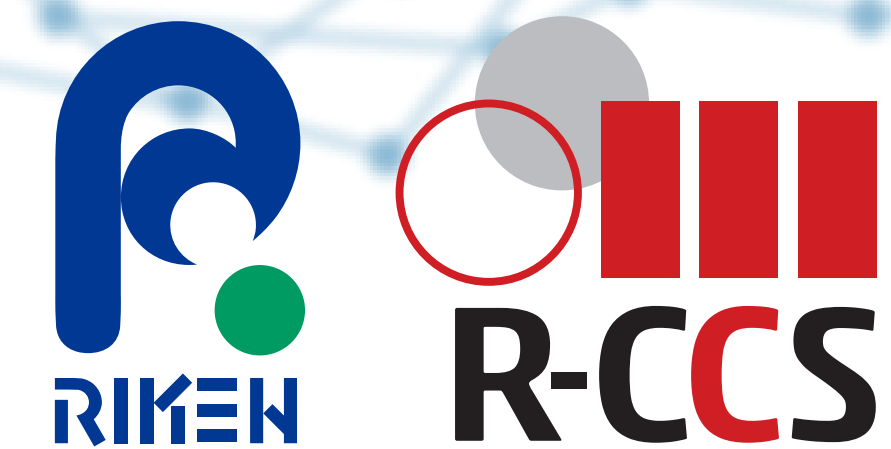# Open Composer: A web application for simplifying job submission on HPC clusters
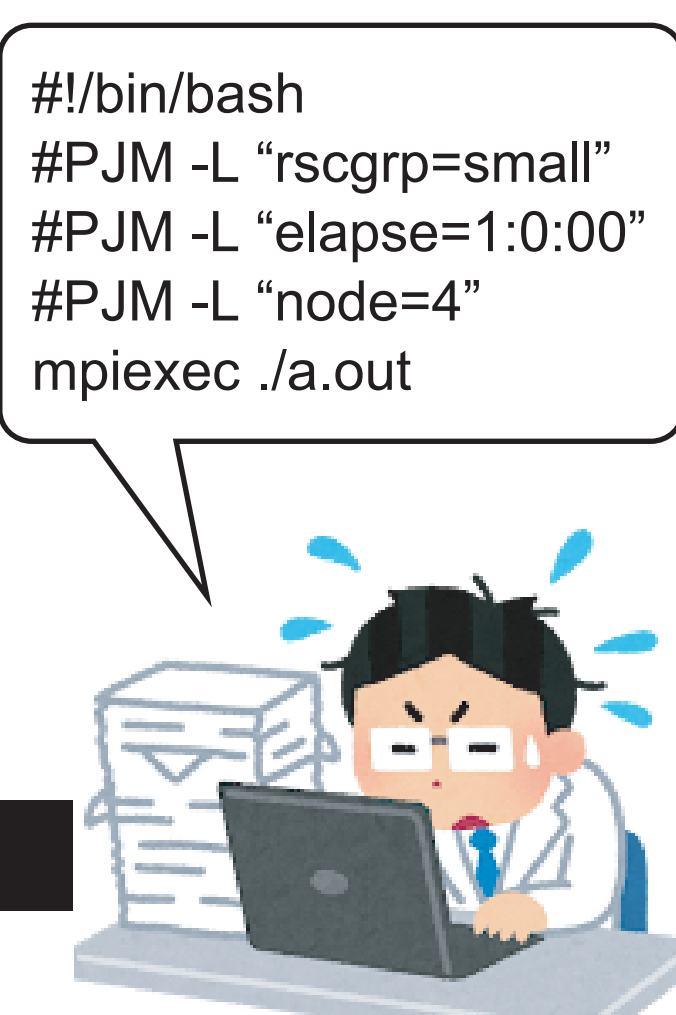
Masahiro Nakao and Keiji Yamamoto
(RIKEN Center for Computational Science)
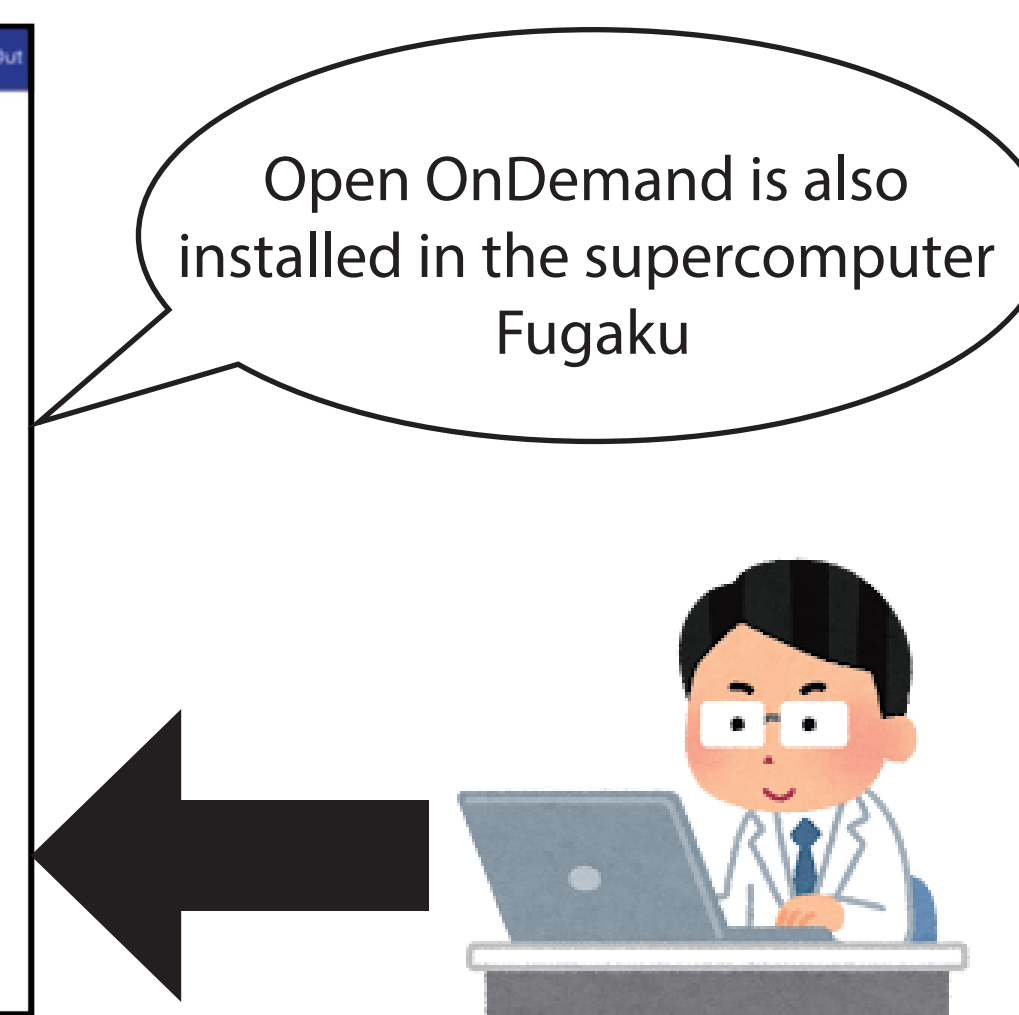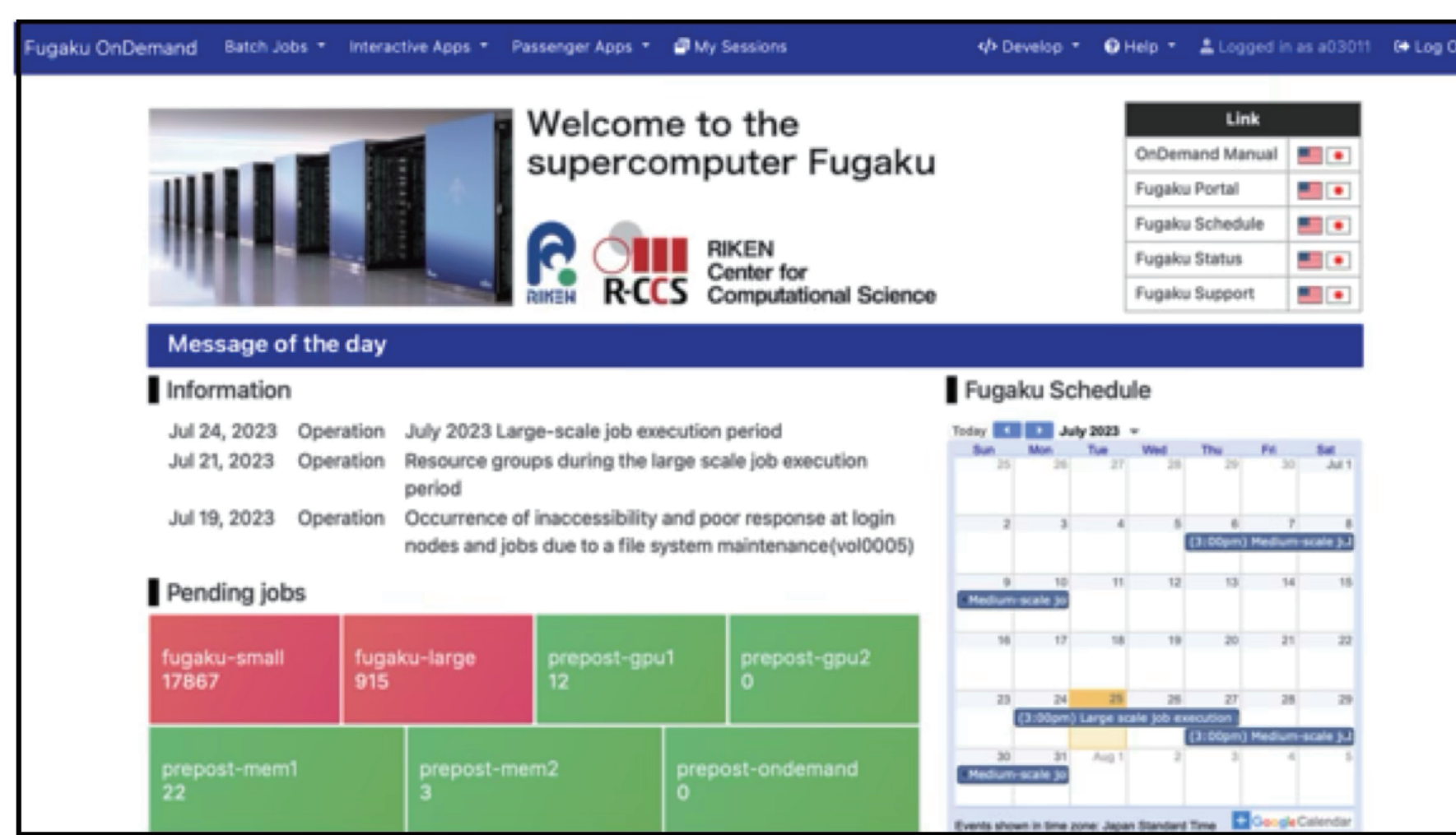
Background

High learning cost for HPC clusters

- Install and configure a terminal software
- Generate an SSH key pair and register the public key
- Learn command line such as bash
- Learn how to use a job scheduler for submitting batch jobs


```
#!/bin/bash
#PJM -L "rscgrp=small"
#PJM -L "elapse=1:0:00"
#PJM -L "node=4"
mpiexec ./a.out
```

Open Composer

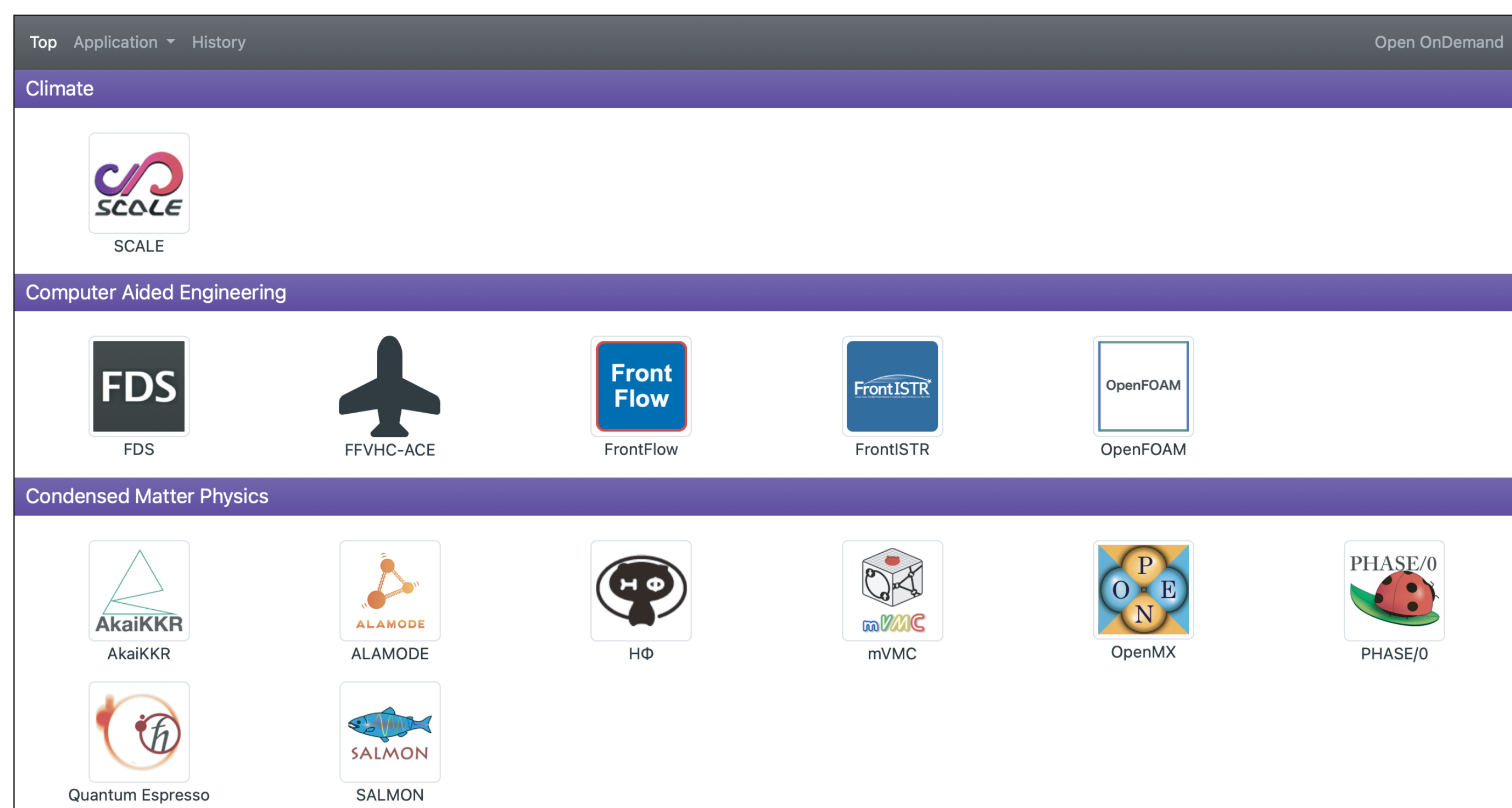https://github.com/RIKEN-RCCS/OpenComposer

Features

- Web application to generate and submit job scripts on Open OnDemand
- Easy to deploy in any Open OnDemand sites
- Generate job scripts by entering parameters into a web form prepared for each application
- Reduce the learning cost for job schedulers and mistakes in writing job scripts
- Consist of **Top page**, **History page**, and **Application page**

Top page

- Registered applications are displayed by category
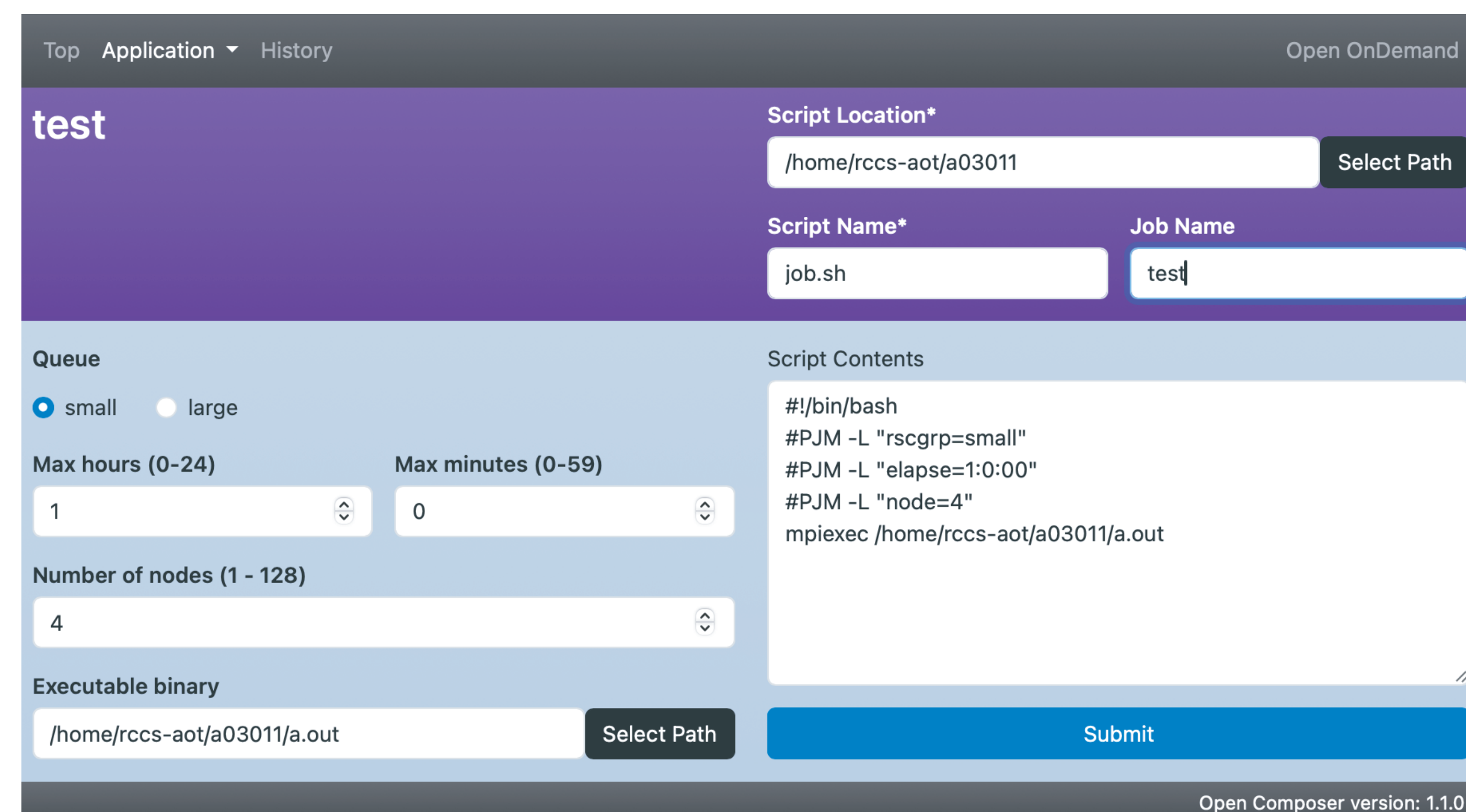- Clicking on an icon navigates you to the respective **Application page**

History page

- Display execution status of job history and stop currently running jobs
- Reuse parameters from your job

Web portal Open OnDemand for HPC clusters

- Open source software developed by Ohio State University
- Access HPC clusters from your web browser instead of SSH
- Execute interactive jobs with GUIs, perform file operations, upload/download data, and connect by a web terminal
- Used as the de facto standard around the world
- Run other web applications on Open OnDemand

Open OnDemand is also installed in the supercomputer Fugaku

Application page

- Generate a job script
- When entering values in the web form on the left side, a job script is dynamically generated in the text area on the right side
- When clicking "Submit" button, the script is submitted to a job scheduler


```
form:
  queue:
    widget: radio
    label: Queue
    value: small
    direction: horizontal
    options:
      - [small]
      - [large]
  time:
    widget: number
    size: 2
    label: [Max hours (0-24), Max minutes (0-59)]
    value: [ 1, 0]
    min: [ 0, 0]
    max: [24, 59]
    step: [ 1, 1]
```

```
nodes:
  widget: number
  label: Number of nodes (1 - 128)
  value: 4
  min: 1
  max: 128
  step: 1
binary:
  widget: path
  label: Executable binary

script: |
  #!/bin/bash
  #PJM -L "rscgrp=#{queue}"
  #PJM -L "elapse=#{time_1}:#{time_2}:00"
  #PJM -L "node=#{nodes}"
  mpiexec #{binary}
```

- Widgets for various applications
  - number: Enter a number
  - text: Enter text
  - email: Enter an email address
  - select: Select one item from the select box
  - multi_select: Select multiple items from the select box
  - radio: Select one item from the radio buttons
  - checkbox: Select multiple items from the checkboxes
  - path: Select a path of a file or directory on the server