
Fugaku Commercial Software

Cradle CFD scFLOW

User's Guide

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1 . Preface

Purpose of this document

This document describes how to use Cradle CFD scFLOW, which is maintained by the RIKEN Center for Computational Science (R-CCS) on the supercomputer "Fugaku".

- For general information on how to use Fugaku, please refer to the manuals in the Fugaku Portal
- Please refer to the Cradle CFD scFLOW manual for general Cradle CFD scFLOW usage

Prerequisite

The user shall have executed procedures such as the conclusion of a license agreement for Cradle CFD scFLOW in accordance with the "Flow to Start Using" and shall have received a notice of completion for the software usage environment.

When using commercial software installed on Fugaku, R-CCS and cooperating organizations cooperate with software vendors to manage software licenses (operation checks) and conduct investigations when inquiring about software operation. Therefore, license information and inquiries may be shared among R-CCS, cooperating organizations, and software vendors. Please understand this in advance.

In addition, it is assumed that the pre-processing to run Cradle CFD scFLOW on Fugaku has already been executed on a Windows machine.

2. Change license registration details

If there is any change of user (addition or deletion) or license file, you are required to contact the Fugaku Support. For detailed procedures, please refer to "Fugaku Commercial Software Cradle CFD scFLOW Flow to Start Using".

3. Executing Cradle CFD scFLOW Mesher

The following is an example of a job script for executing Mesher. Please modify it as appropriate for your work environment. Refer to the description below for **the red parts**. This job is submitted to the computation node.

```
#!/bin/bash
#PJM -L "rscgrp=small"
#PJM -L "node=1"
#PJM -L "elapsed=00:10:00"
#PJM --mpi "proc=5"
#PJM -S
#PJM -x PJM_LLIO_GFSCACHE=/vol0004

module use /vol0004/apps/isv/scFLOW/modulefiles
module load scFLOW

export MSC_LICENSE_FILE=[Port number of License Server@IP address of License Server]

/home/system/tool/dir_transfer ${MESHERPATH}
scflowcomb [input filename].cmb 4
/home/system/tool/dir_transfer -p ${MESHERPATH}
```

This job script assumes that the job is submitted from the directory where the input files (extension .cmb) are stored.

3.1 . Settings for Cradle CFD scFLOW Mesher

- #PJM -x PJM_LLIO_GFSCACHE=/vol0004
When submitting jobs, be sure to specify /vol0004 in the environment variable PJM_LLIO_GFSCACHE.
- module command

Used to set environment variables.

- `module use`
Specifies where modulefile is stored. Do not change.

- `module load modulefile`
Sets environment variables defined in *modulefile*.

```
module load scFLOW
```

is specified, the latest version installed on Fugaku is used.

Important: Environment variables set by the `module load` command may include runtime parameters. When specifying runtime parameters, be sure to specify them after the `module load` command.

To use a specific version, change the *modulefile*.

Example: Using v2022_Patch02_Jan2022 version

```
module load scFLOW/v2022_Patch02_Jan2022
```

- `module avail`
Displays a list of available *modulefiles*.

```
module use /vol0004/apps/isv/scFLOW/modulefiles  
module avail scFLOW
```

- `module show modulefile`
Displays what is set by the module command.

Example: Show what is set when scFLOW is specified

```
module use /vol0004/apps/isv/scFLOW/modulefiles  
module show scFLOW
```

- `MSC_LICENSE_FILE`
Specify the IP address and port number of the license server. Set the IP address and port number you received from the Fugaku Support in the format "port-number@IP-address".

- `/home/system/tool/dir_transfer ${MESHERPATH}`

- `/home/system/tool/dir_transfer -p ${MESHERPATH}`

Specifies the directory to be used for Cradle CFD scFLOW. Do not change the argument. For more information on `dir_transfer`, refer to the User's Guide (https://www.fugaku.r-ccs.riken.jp/doc_root/ja/user_guides/use_latest/).

4. Executing Cradle CFD scFLOW Solver

The following is an example of a job script for executing Solver. Please modify it as appropriate for your work environment. Refer to the description below for **the red parts**. This job is submitted to the computation node. The maximum number of MPI parallelism that has been proven on the Fugaku computation node is 66,000.

```
#!/bin/bash
#PJM -L "rscgrp=small"
#PJM -L "node=1"
#PJM -L "elapsed=00:05:00"
#PJM --mpi "proc=36"
#PJM -S
#PJM -x PJM_LLIO_GFSCACHE=/vol0004

module use /vol0004/apps/isv/scFLOW/modulefiles
module load scFLOW

export MSC_LICENSE_FILE=[Port number of License Server@IP address of License Server]

/home/system/tool/dir_transfer ${SOLVERPATH} ${PMETISLIBPATH} ${CMNLIBPATH}

LFILE=[Output Log filename]
scflowsol -lfilename ${LFILE}.1.0 [Input Config. filename].sph 36:1 -stdout-proc ${LFILE}
mv ${LFILE}.1.0 ${LFILE}

/home/system/tool/dir_transfer -p ${SOLVERPATH} ${PMETISLIBPATH} ${CMNLIBPATH}
```

This job script assumes that the job is submitted from the directory where the input files (extension .sph) are stored.

4.1. Settings for Cradle CFD scFLOW Solver

- #PJM -x PJM_LLIO_GFSCACHE=/vol0004
When submitting jobs, be sure to specify /vol0004 in the environment variable PJM_LLIO_GFSCACHE.
- module command
Used to set environment variables.

-
- `module use`
Specifies where *modulefile* is stored. Do not change.

- `module load modulefile`
Sets environment variables defined in *modulefile*.

```
module load scFLOW
```

is specified, the latest version installed on Fugaku is used.

Important: Environment variables set by the `module load` command may include runtime parameters. When specifying runtime parameters, be sure to specify them after the `module load` command.

To use a specific version, change the *modulefile*.

```
Example: Using v2022_Patch02_Jan2022 version  
module load scFLOW/v2022_Patch02_Jan2022
```

- `module avail`
Displays a list of available *modulefiles*.

```
module use /vol0004/apps/isv/scFLOW/modulefiles  
module avail scFLOW
```

- `module show modulefile`
Displays what is set by the `module` command.

```
Example: Show what is set when scFLOW is specified  
module use /vol0004/apps/isv/scFLOW/modulefiles  
module show scFLOW
```

- `MSC_LICENSE_FILE`
Specify the IP address and port number of the license server. Set the IP address and port number you received from the Fugaku Support in the format "port-number@IP-address".
- `/home/system/tool/dir_transfer ${SOLVERPATH} ${PMETISLIBPATH} ${CMNLIBPATH}`
- `/home/system/tool/dir_transfer -p ${SOLVERPATH} ${PMETISLIBPATH} ${CMNLIBPATH}`

Specifies the directory to be used for Cradle CFD scFLOW. Do not change the argument. For more information on `dir_transfer`, refer to the User's Guide (https://www.fugaku.r-ccs.riken.jp/doc_root/ja/user_guides/use_latest/).

5. Change in the environment of Cradle CFD scFLOW

When environmental changes are made to Cradle CFD scFLOW, the details and date of the changes will be posted on the Fugaku Portal. Please check the details of the changes and take action if necessary. The following is a list of expected changes, their impact on users, and how to deal with them.

- **Cradle CFD scFLOW Version Upgrade**

If you use the latest version specified with `scFLOW` in module load, the software version executed after the change date will be changed to the newly latest version. If you want to continue using the currently used version, add product version to the module load specification.

- **Cradle CFD scFLOW specific version removal**

If the version to be deleted is specified in module load, the software will not be available after the change date. Please change the module load setting and use another version.

6. Support

Please contact the Fugaku support (<https://fugaku.zendesk.com/hc/en-us/requests/new>) for Fugaku-specific content. For general information about Cradle CFD scFLOW, please contact your licensee. When you do so, please also mention that you are using the service at Fugaku.