

Using Platform **LSF**[®] with FLUENT

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Platform Computing

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Platform **LSF**[®] software (“LSF”) is integrated with products from Fluent Inc., allowing FLUENT jobs to take advantage of the checkpointing and migration features provided by LSF. This increases the efficiency of the software and means data is processed faster.

This document provides instructions for installing, configuring, and using LSF with FLUENT. It is assumed you are already familiar with using FLUENT software and checkpointing jobs in LSF.

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How LSF Works with FLUENT

To checkpoint jobs, LSF uses two executable files called `echkpnt` and `erestart`. LSF supplies special versions of `echkpnt` and `erestart` that allow checkpointing with FLUENT.

Checkpoint directories

When you submit a checkpointing job, you specify a checkpoint directory.

Before the job starts running, LSF sets the environment variable `LSB_CHKPNT_DIR`. The value of `LSB_CHKPNT_DIR` is a subdirectory of the checkpoint directory specified in the command line. This subdirectory is identified by the job ID and only contains files related to the submitted job.

Checkpoint trigger files

When you checkpoint a FLUENT job, LSF creates a checkpoint trigger file (`.check`) in the job subdirectory, which causes FLUENT to checkpoint and continue running. A special option is used to create a different trigger file (`.exit`) to cause FLUENT to checkpoint and exit the job.

FLUENT uses the `LSB_CHKPNT_DIR` environment variable to determine the location of checkpoint trigger files. It checks the job subdirectory periodically while running the job. FLUENT does not perform any checkpointing unless it finds the LSF trigger file in the job subdirectory. FLUENT removes the trigger file after checkpointing the job.

Restart jobs

If a job is restarted, LSF attempts to restart the job with the `-r` option appended to the original FLUENT command. FLUENT uses the checkpointed data and case files to restart the process from that checkpoint point, rather than repeating the entire process.

Each time a job is restarted, it is assigned a new job ID, and a new job subdirectory is created in the checkpoint directory. Files in the checkpoint directory are never deleted by LSF, but you may choose to remove old files once the FLUENT job is finished and the job history is no longer required.

Obtaining Distribution Files

Distribution files for LSF to be used with FLUENT are available from Platform Computing. Installation instructions are included.

The files are available from your LSF vendor, and from Platform's web (www.platform.com) and FTP sites ([ftp.platform.com](ftp://platform.com)).

Access to the download area of the Platform Web site and the Platform FTP site is controlled by login name and password. If you are unable to access the distribution files, send email to support@platform.com.

Configuring LSF for FLUENT

LSF provides special versions of `echkpnt` and `erestart` to allow checkpointing with FLUENT. You must make sure LSF uses these files instead of the standard versions.

Configure LSF for FLUENT

- ◆ Overwrite the standard versions of `echkpnt` and `erestart` with the special FLUENT versions.
OR
- ◆ Complete the following steps:
 - a Leave the standard LSF files in the default location and install the FLUENT versions in a different directory.
 - b In `lsf.conf`, modify the `LSF_ECHKPNTDIR` environment variable to point to the FLUENT versions.
The `LSF_ECHKPNTDIR` environment variable specifies the location of the `echkpnt` and `erestart` files that LSF will use. If this variable is not defined, LSF uses the files in the default location, identified by the environment variable `LSF_SERVERDIR`.
 - c Save the changes to `lsf.conf`.
 - d Reconfigure the cluster with the commands `lsadmin reconfig` and `badmin reconfig`.
LSF checks for any configuration errors. If no fatal errors are found, you are asked to confirm reconfiguration. If fatal errors are found, reconfiguration is aborted.

Submitting a FLUENT Job

Submit the job as usual, but include the parameters required for checkpointing.

Syntax

The syntax for the `bsub` command to submit a FLUENT job is:

```
bsub [-k checkpoint_dir | -k "checkpoint_dir[checkpoint_period]"  
[bsub options]  
FLUENT command [FLUENT options] - lsf
```

The checkpointing feature for FLUENT jobs requires all of the following parameters:

-k *checkpoint_dir*

Regular option to `bsub` that specifies the name of the checkpoint directory.

FLUENT command

Regular command used with FLUENT software.

- **lsf** Special option to the FLUENT command. Specifies that FLUENT is running under LSF, and causes FLUENT to check for trigger files in the checkpoint directory if the environment variable `LSB_CHKPNT_DIR` is set.

Checkpointing and Restarting FLUENT jobs

Checkpointing

Syntax The syntax for the `bchkpnt` command is:

```
bchkpnt [bchkpnt options] [-k] [job_ID]
```

FLUENT parameters The following parameters are used with FLUENT:

- ◆ **-k**
Regular option to `bchkpnt` command, specifies checkpoint and exit. The job will be killed immediately after being checkpointed. When the job is restarted, it does not have to repeat any operations.
- ◆ *job_ID*
Job ID of the FLUENT job. Used to specify which job to checkpoint.

Restarting

Syntax The syntax for the `brestart` command is:

```
brestart [brestart options] checkpoint_directory [job_ID]
```

FLUENT parameters The following parameters are used with FLUENT:

- ◆ *checkpoint_directory*
Specifies the checkpoint directory, where the job subdirectory is located.
- ◆ *job_ID*
Job ID of the FLUENT job, specifies which job to restart. At this point, the restarted job is assigned a new job ID, and the new job ID is used for checkpointing. The job ID changes each time the job is restarted.

Technical Support

Contacting Platform

Contact Platform Computing or your LSF vendor for technical support. Use one of the following to contact Platform support:

Email support@platform.com

World Wide Web www.platform.com

Phone

- ◆ North America: +1 905 948 4297
- ◆ Europe: +44 1256 370 530
- ◆ Asia: +86 10 6238 1125

Toll-free phone 1-877-444-4LSF (+1 877 444 4573)

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Platform Computing
3760 14th Avenue
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Canada L3R 3T7

When contacting Platform Computing, please include the full name of your company.

We'd like to hear from you

If you find an error in any Platform documentation, or you have a suggestion for improving it, please let us know:

Email doc@platform.com

Mail Information Development
Platform Computing
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Markham, Ontario
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