

Licensed Software Usage on HPCC

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Recently, we received a few tickets from users about their job(s) crashing due to the license number limit and/or the license server not responding. Here is some information about how it could happen and how to resolve such issue.

How does a license shortage lead to a job crash? To run the licensed software, a job needs to obtain and hold the license of the software. If the job could not obtain a license at the startup of the software, it will be terminated with the error message reporting the license was unavailable. There are several reasons to cause this issue, such as licenses expired, all licenses being in use or malfunction of license server.

How could we prevent this type of job crash from happening? User could use the “licensecheck” powertool to help identify the source of the problem. To use this tool, the user needs to load module “powertools” first. It can be done by running “module load powertools” from any dev node. Run “licensecheck” command without parameters will get the list the names of all the licensed software on HPCC. Run “licensecheck <software>” with the software name, it will show the license usage information for that software.

For example, the following screenshot shows how to obtain the usage information of the software “totalview”:

```
[wangx147@dev-intel14 ~]$ module load powertools
[wangx147@dev-intel14 ~]$ licensecheck
Check the status of license on the HPCC

usage:
  licensecheck <softwarename>

possible software names:
  Schrodinger gauss abaqus comsol converge matlab heeds totalview intel starp
  pgi mathematica tecplot

[wangx147@dev-intel14 ~]$ licensecheck totalview

Checking Licenses for totalview
  lmstat -a -c 7127@lm-01.i

Users of CUDA:  (Total of 16 licenses issued;  Total of 0 licenses in use)
Users of TotalView_Team:  (Total of 16 licenses issued;  Total of 0 licenses
in use)
Users of Replay:  (Total of 16 licenses issued;  Total of 0 licenses in use)
[wangx147@dev-intel14 ~]$
```

If the license is expired or the license server does not function correctly, the error message from running either “licensecheck” command or the licensed software would likely indicate the error. Report the problem by contacting us with the details and we will fix it accordingly.

If the problem is caused by the shortage of the number of licenses, users’ efforts may be needed to resolve it. The HPCC may contact and ask the current users of the software to share the licenses by limiting the usage for each user. Here are a few things that a user may do to limit the license usage:

Try not to run the job that could take all the licenses of the software. For example, try to limit the parallel execution of the many instances of the program.

Note that one single job may take many licenses if it runs in parallel.

Try not to run many of jobs that need the license at a time which may take up to all licenses. If you would like to submit many jobs at a time, please add a job dependency so that all the jobs submitted at once could run in sequence. In this way, the total number of licenses in use could be limited. For example, to submit a job with script myjob.qsub with dependency on the completion of the job with ID as 123456 for example, you could use:

```
[wangx147@dev-intel14 ~]$ qsub -W depend=afterok:123456 myjob.qsub
```

In this way, this job will be held in queue until after job 123456 successfully completes.

Use job scheduler to reserve the license and launch the job only when a license is available. To do so, you could add the line “#PBS -W x=gres:<license_name>:<number>” into your job script or run qsub with the -W option, such as using “qsub -W x=gres:<license_name>:<number> job.qsub” instead of “qsub job.qsub” to reserve certain number of licenses for the job. The advantage of such reservation is that the job would be launched when <number> licenses are available. Note that the reservation by scheduler is only to ensure license availability at launch time and does not hold the license for the job. If the license is not used, in the next scheduling cycle, scheduler may launch another job that also request the license. The competition for the license may lead to job failure.