



Enabling Grids for E-scienceE

Grid MPI exercises

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- **Obtain a list of MPI implementations available on the gridgate.cs.tcd.ie CE.**
 - `lcg-info --list-ce --vo dteam --query "CE=*gridgate.cs.tcd.ie*" --attrs "Tag" | grep MPI`
- **Find out which CEs support mpi-start**
 - `lcg-info --list-ce --vo dteam --query "Tag=MPI-START*" --attrs "CE"`
- **Obtain a list of CEs that support OPENMPI**
 - `lcg-info --list-ce --vo dteam --query "Tag=OPENMPI*" --attrs "CE"`
- **Find out which sites support MPI but not the new configuration**
 - Easiest to do this with JDL requirements:
 - `Requirements = Member("MPICH", other.GlueHostApplicationSoftwareRunTimeEnvironment) && !Member("MPI-START", other.GlueHostApplicationSoftwareRunTimeEnvironment);`

1: On the worker node

- **Find out where the mpich2 library is installed at the GRIF site at LAL (grid10.lal.in2p3.fr)**
 - Submit an MPI job with a JDL that matches the LAL site and a script that includes the following:
 - `echo $MPI_MPICH2_PATH`

- **Find out whether the version of mpich installed at LAPP (lapp-ce01.in2p3.fr) matched what is advertised in the information system**
 - First of all see which version of OPENMPI is in the tags for LAPP:
 - `lcg-info --list-ce --vo dteam --query "CE=*lapp-ce01.in2p3.fr*" --attrs "Tag" | grep OPENMPI`
 - Then submit a job to the site that executes
 - `echo $MPI_OPENMPI_VERSION`

- **Find out whether OSC mpiexec is used at TCD (gridgate.cs.tcd.ie)**
 - Submit a job to TCD and see whether the environment variable `MPI_MPIEXEC_PATH` is defined

- **See what else you can find out about the MPI installation at a site!**

- Run the simple MPI application `mpi-test.c` on the Grid using MPI-START.
- To do this create:
 - A JDL file to submit the job to a site supporting both MPI-START and any MPI flavour
 - An MPI-START hooks file to compile the application
 - An MPI-START wrapper script to run the application
 - The page http://egee-docs.web.cern.ch/egee-docs/uig/development/uc-mpi-jobs_2.html contains sample files to solve this problem

3. MPI with Grid storage

- **Submit a grid job that downloads the source code file for the application from grid storage as the initial stage of the application and then compiles and executes the application. (Take the MPI-START enabled MPI application developed in the previous exercise and upload the files to grid storage)**
- **Upload the tar file containing the application, mpi-job.tgz, to grid storage**
- **Create a script to download the application from grid storage and execute the application**
- **Create a JDL file to submit the application**
- **Modify the MPI application to output some data to a file, then upload the data to grid storage when the MPI application completes**
- **Verify the output of the data file by downloading it from grid storage**

4: Running an MPI job at a grid site without MPI-START installed

- You can use MPI-START at sites that don't have it installed by submitting it along with the job
- Get the mpi-start tarball from the course website
- Modify the wrapper script to unpack mpi-start and use it to execute your test application at a site that doesn't have mpi-start installed

- <http://grid.ie/distribution/mpi/mpi-start.tar.gz>

- **Option 1: Continue working on yesterday's exercises on EGEE grid (or start working with your own applications)**
- **Option 2: Try out the int.eu.grid tools**
 - Log on to `gridui.i2g.cs.tcd.ie`
 - Copy your certificate into place in `~/ .globus`
 - VO is itut: `voms-proxy-init --voms itut`