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MPI

- MPI working group [↗](#)
- MPI for Grids (1): MPICH-G2 <http://www3.niu.edu/mapi/> [↗](#)
- MPI for Grids (2): PACX-MPI <http://www.hlr.de/organization/amt/projects/pacx-mpi/> [↗](#)
- MPI intro by Apple: <http://developer.apple.com/hardware/drivers/hpc/mpionmacosx.html> [↗](#)
- MPI Tutorial (part 1): <http://www.lam-mpi.org/tutorials/nd/part1/> [↗](#)
- MPI Tutorial (part 2): <http://www.lam-mpi.org/tutorials/nd/part2/> [↗](#)
- MPI Tutorial (part 3): <http://www.lam-mpi.org/tutorials/nd/part3/> [↗](#)

- OpenMPI Workshop 06: <http://www.open-mpi.org/papers/workshop-2006/> [↗](#)
- OpenMPI FAQ: <http://www.open-mpi.org/faq/> [↗](#)
- OpenMPI FAQ (What does MPI mean to sysops?): <http://www.open-mpi.org/faq/?category=sysadmin> [↗](#)
- **"8. Does Open MPI support execution in heterogeneous environments? Open MPI currently requires that the representation of C, C++, and Fortran datatypes be the same on all platforms within a single parallel application.** Endian and size difference between nodes in a parallel job will cause undefined behavior in Open MPI. Support for heterogeneous run-time environments is on the to-do list, but has not yet been implemented."

versus MPICH

- OpenMPI is 'the new kid on the block', should become the *de facto* implementation of MPI (?)
- OpenMPI merges (is the successor of) LAM-MPI, PACX-MPI (MPI for grids) and FT-MPI

- "OpenMPI - recommended for macs, compiles smoothly but takes quite a while to compile. Further information is available at http://en.wikipedia.org/wiki/Open_MPI [↗](#)"
- "MPICH - a portable, open source MPICH. Can be emerged on Gentoo (ssh) where it will install in /usr. Further information on MPICH is available at: <http://www-unix.mcs.anl.gov/mpi/mpich/> [↗](#), including documentation and manual pages."

- "The various MPI distributions (OpenMPI, LamMPI, MPICH) all attempt

conform to a set of MPI standards. Thus, sometimes they differ slightly in implementation, but normally a code will run on all of them (though you will need to compile it using the correct libraries)."

- At Dartmouth, they state [↗](#):
 - ◆ Examples of Different Implementations
 - ◇ MPICH - developed by Argonne National Labs (freeware)
 - ◇ MPI/LAM - developed by Indiana, OSC, Notre Dame (freeware)
 - ◇ MPI/Pro - commercial product
 - ◇ Apple's X Grid
 - ◇ OpenMPI - recent project, MPI-2 compliant, thread safe
 - ◆ Similarities in Various Implementations
 - ◇ source code compatibility (except parallel I/O)
 - ◇ programs should compile and run as is
 - ◇ support for heterogeneous parallel architectures
 - clusters, groups of workstations, SMP computers, grids
 - ◆ Difference in Various Implementations
 - ◇ commands for compiling and linking
 - ◇ how to launch an MPI program
 - ◇ parallel I/O (from MPI-2)
 - ◇ debugging

- ◆ Programming Approaches
 - ◇ SPMD - Single Program Multiple Data (same program on all processors)
 - ◇ MPMP - Multiple Program Multiple Data (different programs on different processors)

MPICH on LCG howto

- Notes on gLite-3.0+MPI
 - Example MPI job (jdl and shellscript)
 - Another example script (MPItest.c, MPItest.jdl and MPItest.sh)
 - ImprovingMpiSupport [↗](#)
 - <https://csd.vpac.org/twiki/bin/view/Tech/MpichHowTo> [↗](#)
 - Pre-gLite (i.e., LCG-2.x): "ssh hostbased authentication MUST BE well configured between all the WNs." (OBSOLETE)
 - MPI_Support_with_Torque [↗](#)
 - NA4 working group on parallel jobs [↗](#)
 - Cal Loomis' RPMS for MPI [↗](#)
 - leading RPMS for Torque for LCG? [↗](#)
 - leading RPMS for Maui for LCG? [↗](#)
- "Unlike the LCG middleware, gLite WMS is able to support both configurations (shared and not shared) automatically for both LSF and Torque. With gLite-1.4 job wrapper will take care to mirror the working directory in all nodes dedicated to the mpi job if the home are not shared."

JMS-MPI Interoperability

- OpenMPI/Condor are OK from Condor-6.7:
<https://lists.cs.wisc.edu/archive/condor-users/2006-March/msg00468.shtml> [↗](#)
- From OpenMPI FAQ:

17. How do I run with the SLURM and PBS/Torque launchers?

If support for these systems are included in your Open MPI installation (which you can check with

Specifically, if you execute an mpirun command in a SLURM or a PBS/Torque job, it will automatica

```
# Allocate a SLURM job with 4 nodes
shell$ srun -N 4 -A
# Now run a 4-process Open MPI job
shell$ mpirun -np 4 a.out
```

This will run the 4 MPI processes on the nodes that were allocated by SLURM. Similar results occur

```
# Allocate a PBS job with 4 nodes
shell$ qsub -I -lnodes=4
# Now run a 4-process Open MPI job
shell$ mpirun -np 4 a.out
```

Other stuff

- Tool for checking correctness of MPI-code for use on Grids:
<http://savannah.fzk.de/projects/cg-wp2-2/> [↗](#)
- CampusGrid LRM w/MPI support?: <http://savannah.fzk.de/projects/cg-broker/> [↗](#)
- CampusGrid Job Scheduler w/MPI support?: <http://savannah.fzk.de/projects/cg-wp3-2/> [↗](#)
- Gridle has implemented MPI in the LCG-RB: <http://www.grid.ie/wiki/RbMpiSupport> [↗](#)

-- RichardDeJong - 14 Jun 2006

This topic: LCG > MPI

Topic revision: r5 - 2011-06-21 - AndresAeschlimann



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