

instructions

todo

- unzip source code packages and install.
- develop and test the code locally.
- deploy code on stampede2.

MPICH links

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MPICH on Local Machine

This section includes all the material documented so far to run MPI application on a local machine.

Installation

Install MPICH on linux via Debian package manager.

```
sudo apt install mpich
```

compile and run

Compile simple source code (no linking needed) and execute on local machine.

```
cd ./src  
mpicc main.c -o ../out/hello_world  
mpirun -np 5 ../out/hello-world
```

On TACC

Login

Log in to Stampede2 using SSH and use '@HelloTaco4545' as password:

```
ssh mojra@stampede2.tacc.utexas.edu
```

Load Module and Environment Setup

Load the MPICH2 module:

```
module help swr      # show help text for software package swr
module help          # show help text for the module system itself
module load intel/19.1.1 gcc/9.1.0 # load required compilers
module load mvapich2/2.3.7 # load MPI module
cd $SCRATCH          # use this directory as main workspace
pwd                  # check and confirm workspace address
mkdir test && cd test
touch test.c         # c
```

File Transfer

Transfer the source code file using 'rsync'.

```
localhost$ rsync      mybigfile
bjones@stampede2.tacc.utexas.edu:~/$WORK/data
localhost$ rsync -avtr mybigdir
bjones@stampede2.tacc.utexas.edu:~/$WORK/data
```

Build Source Code

Compile and link (build) the source code.

```
mpicc hello-world.c -o hello-world # C source, full build
mpicc -show # Show compile line generated by call to mpicc; similarly for
other wrappers
```

or alternatively, the HEADER file and precompiled INC directory needs to be included in compile and linking commands. This method uses "mpich" library instead of using "mpicc" compiler application.

```
icc      -c main.c -I${WORK}/mylib/inc -I${TACC_HDF5_INC}
# compile
icc main.o -o myexe -L${WORK}/mylib/lib -L${TACC_HDF5_LIB} -lmylib -lhdf5
# link
```

Launch the MPI application

Option	Argument	Description
-p	Title	Queue name.
-J	job_name	Job name.
-N	total_nodes	Total number of nodes to use (required).
-n	total_tasks	Total number of tasks (required).
-o	output_file	Output file.
-e	error_file	Standard error file.
-t	hh:mm:ss	Wall clock time for job (required).
--mail-user=	email_address	Specify the email address to use for notifications.

```
idev -N 4 -n 4 # run on 4 nodes (-N), 1 tasks each (-n)
ibrun hello-world -o hello-world.out -e hello-world.err
```