

Multi-Processor Computing framework (*MPC version 2.5.1*)

General Installation guide

Please refer to the [GettingStarted.pdf](#) document for general installation.

Cross-compilation Installation guide

Prerequisites

- **General:**
 - You need to install MPC for the architecture you will target *AND* for the architecture from which you will launch your programs. For instance, **For ARM architecture:** a cross-compiled gcc which generate code for ARM architecture.
 - The prefix for both installations has to be on the same.
- **For ARM architecture:** a cross-compiled gcc which generate code for ARM architecture
- **For MIC architecture:** the Intel Compiler suite and the Intel libraries ([Intel MPSS](#))

Cross-Compilation, ARM example

1. Cross-compile gcc for the targeted architecture
2. Launch the *installmpc* script for the targeted architecture:

```
$ ./installmpc --prefix=$HOME/install-mpc --with-mpc-gcc=prefix --target=arm
```

prefix is the path of your cross-compiled gcc (for ARM architecture in this case)

3. Source the *mpcvars* script at the root of your MPC installation prefix

```
$ . $HOME/install-mpc/mpcvars.sh for sh shells
$ source $HOME/install-mpc/mpcvars.sh for bash shells
$ source $HOME/install-mpc/mpcvars.csh for csh or tcsh shells
```

This will load the MPC environment for the current architecture you are using.
You can force to load the environment for the targeted architecture:

```
$ source $HOME/install-mpc/mpcvars.sh arm
```

4. To compile your first MPC program for a particular architecture, you may execute the *mpc_cc* compiler on the host:

If you loaded the *target* environment:

```
$ mpc_cc main.c -o main
```

If you loaded the *host* environment:

```
$ mpc_cc -target=arm main.c -o main.mic
```

5. Execute your binary with *mpcrun* command:

```
$ mpcrun -n=4 ./main
```

MIC Compilation (with *icc* support)

1. Load Intel modules (*icc*, *libraries*, etc) in your environment.
2. Launch the *installmpc* script for the MIC:

```
$ ./installmpc --prefix=$HOME/install-mpc --target=mic --compiler=icc
--arch-library-path=(Path to Intel lib for mic architecture) --disable-mpc-gcc
--disable-mpc-gdb
```

--target=mic: specify the target architecture. You can either use *--target=mic* or *--target=k10m*.

--compiler=icc: specify the compiler to be used by MPC. Here *icc* has to be selected.

--arch-library-path=path: specify the path of libraries used for the target architecture.

Note: Do not forget to add *--disable-mpc-gcc* and *--disable-mpc-gdb* options to the *installmpc* script.
You could have errors installing these two programs with *icc*.

3. Source the *mpcvars* script located in the root directory of your MPC installation prefix

```
$ . $HOME/install-mpc/mpcvars.sh for sh shells
$ source $HOME/install-mpc/mpcvars.sh for bash shells
$ source $HOME/install-mpc/mpcvars.csh for csh or tcsh shells
```

This will load the MPC environment for the current architecture. You can force to load the environment for the MIC architecture by typing:

```
$ source $HOME/install-mpc/mpcvars.sh klom
```

4. To compile your first MPC program for a MIC architecture, you may execute the *mpc_cc* compiler:

If you loaded the MIC environment:

```
$ mpc_cc main.c -o main.mic
```

If you loaded the host environment:

```
$ mpc_cc -target=klom main.c -o main.mic
```

5. Execute your MPC program:

- **Homogeneous launch:**

- Compile your code for the MIC architecture (*main.mic*)
- Create *config.cfg* file:

```
-host mic0 -p 1 ./main.mic
```

- Launch the binary with the *mpcrun* script:

```
$ mpcrun -p=1 -n=4 -net=tcp -l=mic_hybrid --mic-config=config.cfg
```

-l=mic_hybrid: load the mic launcher

--mic-config=*: load the config file for launch

Note that your process number have to be the same in *config.cfg* and launch command

- **Heterogeneous launch:**

- Compile your code for the MIC architecture (*main.mic*) as well as for the host architecture (*main.host*)
- Create *config.cfg* file:

```
-host knc02 -p 4 ./main.host  
-host mic0 -p 3 ./main.mic  
-host mic1 -p 2 ./main.mic
```

- Launch the binaries with the *mpcrun* script:

```
$ mpcrun -p=9 -n=16 -net=tcp -l=mic_hybrid  
--mic-config=config.cfg --mic-nb-task=5 --nb-mic=2 --nb-host=1 --host-nb-task=6
```

--nb-mic=*: number of MIC devices for the launch (optional)

--nb-host=*: number of host devices for the launch (optional)

--mic-nb-task=*: number of tasks per MIC device (optional)

--host-nb-task=*: number of tasks per host device (optional)

If these options are not specified, the repartition of the tasks on the processes is homogeneous.

Arguments of the installmpc installation script



Build script - MPC Distribution 2.5.1 to adapt to many kinds of systems.

Usage: *./installmpc* [OPTION]... [VAR=VALUE]...

Defaults for the options are specified in brackets.

Information

```
--help|-h|-?      : Display this help and exit  
--version          : Report version number and exit
```

Installation

```
--prefix=PREFIX      : Install architecture-independent files in PREFIX [/usr/local]  
--disable-check-install : Override installation if it already exists in the prefix  
--disable-check-deps  : Disable dependency checking
```

Build

```
--compiler            : Default compiler  
clean                 : Delete directories inside build directory
```

```

distclean                                : Delete directories and makefiles inside build directory

# Download missing deps
--download-missing-deps                  : Download dependencies
--mirror={1|2|3|4}                      : Choose a mirror for downloading dependencies

# Disable sub packages
--disable-mpc-gdb                        : Disable gdb
--disable-mpc-gcc                        : Disable gcc
--disable-mpc-binutils                  : Disable binutils
--disable-mpc-fortran                   : Disable fortran

# Specify system subpackages
--with-mpc-gdb=*                         : Specify gdb prefix on the system
--with-mpc-gcc=*                         : Specify gcc prefix on the system
--with-sctk-arch=*                      : Specify sctk_arch prefix on the system
--with-openpa=*                         : Specify openpa prefix on the system
--with-mpfr=*                           : Specify mpfr prefix on the system
--with-gmp=*                            : Specify gmp prefix on the system
--with-mpc-binutils=*                   : Specify binutils prefix on the system
--with-hwloc=*                          : Specify hwloc prefix on the system
--with-libxml2=*                        : Specify libxml2 prefix on the system

# Options to transmit to subpackages
--mpc-gcc-*                             : Add options to gcc configure
--mpc-gdb-*                             : Add options to gdb configure
--sctk-arch-*                           : Add options to sctk-arch configure
--openpa-*                              : Add options to openpa configure
--gmp-*                                 : Add options to gmp configure
--mpfr-*                                : Add options to mpfr configure
--mpc-*                                 : Add options to mpc multiprecision library configure
--mpc-binutils-*                        : Add options to binutils configure
--libxml2-*                             : Add options to libxml2 configure
--hwloc-*                               : Add options to hwloc configure
--mpc-option=*                          : Add options to mpc framework configure

# Cross-compilation
--target=*                              : Specify architecture for target
--host=*                                : Specify architecture for host
--arch-library-path                     : Specify path for architecture libraries

# Features
--disable-color                          : Disable colors in display
--verbose=1|2|3                         : Level of verbosity
-v|-vv|-vvv                             : Level of verbosity
-jN                                      : Allow N jobs at once (parallel install)

```