Skeleton programming environments
Muesli (2)

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Outline

- Compiling and Running sample applications on Muesli
- Demo on my machine
- Installing Muesli and MPI

Compiling a Muesli Application

- **`mpicxx` is the mpi compiler for C++ application**
- **you also can use `g++` setting the proper folders for:**
  - *include (`-I`)*
  - *libraries (`-L`)*
- **With current version of compilers you have to set:**
  - **`-fpermissive`**
- **Compiler needs to know where to find Muesli code**

```
mpicxx -I <Muesli.h folder> application.cpp
```

Running a Muesli Application

- **On a single machine**
  - *Start the MPI daemon with* **`mpd&`**
  - *mpiexec -n <number of processes> <application>*

- **On a cluster of machines**
  - *define a machinefile in home directory*
  - *start the MPI daemons using mpiboot -n <number of machines>*
  - *mpiexec -n <number of processes> <application>*

Demo

- I'll show now how these things actually work on my machine ....

Framework installation

- **Installing Muesli is mainly matter of installing G++ and MPI**
- **Muesli is made of a few header files to include in the skeleton application**
- **Muesli works as it is on Linux but need adaptations for running either on**
  - *other Unix OS*
  - *Windows*

Guidelines for installing on Linux Ubuntu 8.04 (1)

- **Guidelines for a single machine, on clusters you**
  - *need to configure NFS*
  - *can refer to:* `https://wiki.ubuntu.com/MpichCluster`
- **User and FileSystem**
  - *create /mirror folder*
    `sudo mkdir /mirror`
  - *create a user, e.g. mpiuser, with its home folder inside that folder*
    `sudo adduser --home /mirror/mpiuser mpiuser`
  - *change the owner of /mirror*
    `sudo chown mpiuser /mirror`

Guidelines for installing on Linux Ubuntu 8.04 (2)

- **Configure ssh**
  - *install openssh-server*
    `sudo apt-get install openssh-server`
- **Login with mpiuser**
  - *enabling passphrase free connections*
    `ssh-keygen -tdsa`
  - *adding the public key to the authorized keys*
    `cd .ssh/`
    `cat id_dsa.pub >> authorized_keys`
  - *test passphrase free connection*
    `ssh <yourhostname>`

Guidelines for installing on Linux Ubuntu 8.04 (3)

- **Installing Compiler and MPI (Issue commands as sudoer)**
  - *install gcc*
    `sudo apt-get install build-essential`
  - *download mpich source code from*
    `http://www.mcs.anl.gov/research/projects/mpich2`
  - *move downloaded tar.gz in /mirror*
  - *untar it in /mirror*
    `tar -xvf <mpich tar.gz>`
  - *change the owner of downloaded tar.gz to mpiuser*
    `sudo chown mpiuser <mpich folder>`

Guidelines for installing on Linux Ubuntu 8.04 (3)

- **Compile and Install mpich (Issue commands as sudoer)**
  - *compile mpich*

```
./configure --prefix = /mirror/mpich2
make
sudo make install
```

- **Configure the user environment (Issue commands as mpiuser)**
  -

```
export PATH=/mirror/mpich2/bin:$PATH
export PATH
LD_LIBRARY_PATH=/mirror/mpich2/lib:$LD_LIBRARY_PATH
export LD_LIBRARY_PATH
```

Guidelines for installing on Linux Ubuntu 8.04 (4)

- **Configure the global environment (Issue commands as sudoer)**
  - *add to the PATH defined in /etc/environment*
    `/mirror/mpich2/bin`
- **Create the machine file mpd.hosts in the mpiuser home directory**
  - *add to mpd.hosts the machine hostname*
- **Change .mpd.conf file in the mpiuser home directory**
  - *add a line with*
    `secretword=spm`
  - *change file modes with*
    `chmod 600 .mpd.conf`

Guidelines for installing on Linux Ubuntu 8.04 (5)

- **Test the MPI configuration**
  - `mpd&`
  - `mpdtrace`
  - `mpdallexit`

Questions ?