Fortran with MPI

Syntax, and Terminologies

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Terms

- Processor – your PC/Processor
- Core – A fully functional part of a Processor
- Thread – An Input – Process – Output Stream
- Hyperthreading – Core having multiple threads
- CPU
  - Central Processing Unit of a Processor
  - Some Processors have one CPU
  - Some Processors have dual CPU (Intel Dual Core, Intel Core2duo)
    - Here – 1 processor = 2 cores = 2 threads
    - 1 core = 1 CPU = 1 thread
  - Some Processors have four CPU (Intel i3, i5, quadcore)
    - Here – 1 processor = 4 cores = 4 threads
    - 1 core = 1 CPU = 1 thread
  - Some processors have four cores, dual threads (hyperthreading) (Intel i7)
    - 1 Processor = 4 cores = 8 threads
    - 1 core = 2 CPU = 2 threads
    - 1 CPU = 1 thread
- **Before running your codes, it is good to know these details!**

Terms

- Process – one instance of your program running in a processor.
- Always
  - 1 thread = 1 process
- Depending on the Processor architecture
  - 1 core = n process(es) (n threaded core)

Terms

- Communicator
  - An object that collectively represents a group of processes
  - MPI_COMM_WORLD – Default Global Communicator
- Communicator size
  - Number of processes in a communicator
- Rank
  - The number / id of the process

Flow of how MPI Programs works

- Start program
- Data declarations
- Initialize MPI
- Create a Communicator Size
- Set Communicator ranks
- Run code
- Finalize MPI
- End program