

Programowanie współbieżne

WYKŁADY - Cz. 11. MPI

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Master–worker model

- Wiele programów jednocześnie...
- Model master-worker lub master-slave
- Przykład programu: `tt m-w.f90`

Program m-w.f90 - MPI I

```
PROGRAM MASTER_WORKER
  USE MPI
  INTEGER istatus(MPI_STATUS_SIZE)
  PARAMETER (njobmx=124)
  !
  CALL MPI_INIT(ierr)
  CALL MPI_COMM_SIZE(MPI_COMM_WORLD,nprocs,ierr)
  CALL MPI_COMM_RANK(MPI_COMM_WORLD,myrank,ierr)

  !===== MASTER
  !
  ! The master recives the masages from workers and if some worker
  ! is idle it sends to it a job number. the worker realizes this
  ! job and sends the message again to the master. If all jobs are
  ! processed then if the worker has finished the master sends the
  ! term signal (job=-1) to the worker and the worker exits.
  !
  IF (myrank == 0) THEN

    itag=1
    DO njob=1,njobmx
      CALL MPI_RECV(iwk, 1, MPI_INTEGER, MPI_ANY_SOURCE, &
        itag, MPI_COMM_WORLD, istatus, ierr)
      idest=istatus(MPI_SOURCE)
      CALL MPI_SEND(njob, 1, MPI_INTEGER, idest, &
        itag, MPI_COMM_WORLD, ierr)
    END DO
```

Program m-w.f90 - MPI II

```
DO i=1,nprocs-1
  CALL MPI_RECV(iwk, 1, MPI_INTEGER, MPI_ANY_SOURCE, &
    itag, MPI_COMM_WORLD, istatus, ierr)
  idest=istatus(MPI_SOURCE)
  CALL MPI_SEND(-1, 1, MPI_INTEGER, idest, &
    itag, MPI_COMM_WORLD, ierr)
END DO
```

ELSE

```
!===== WORKER
!
! The worker sends the signal to the master that it is idle.
! if there are jobs to process then the master sends to the
! worker the job number (njob) and the worker processes the job.
! If there are no other jobs the number njob sent to the worker
! is equal to -1 and after receiving it the worker exits.
```

```
itag=1
iwk=0
```

```
DO
  CALL MPI_SEND(iwk, 1, MPI_INTEGER, 0, &
    itag, MPI_COMM_WORLD, ierr)
  CALL MPI_RECV(njob, 1, MPI_INTEGER, 0, &
    itag, MPI_COMM_WORLD, istatus, ierr)
  IF (njob == -1) EXIT

  CALL DOSOMETHING(njob)
```

END DO



Program m-w.f90 - MPI III

```
!
  CALL MPI_FINALIZE(ierr)

END IF

END PROGRAM MASTER

SUBROUTINE DOSOMETHING(JOB)
!
! MAIN JOB
!
END SUBROUTINE DOSOMETHING
```