MONASH University

FIT3143 Tutorial Week 5

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DISTRIBUTED MEMORY

OBJECTIVES

- The purpose of this tutorial is to introduce parallel computing in distributed memory
- Understand the concept of virtual topologies
- Understand MPI coding pattern
- Understand the concept of blocking and non-blocking message passing

TOPICS

1. Discuss virtual topologies supported in MPI
2. Describe the general coding pattern for an MPI application.
3. Briefly describe the difference between a blocking and non-blocking message passing.
4. Discuss what is wrong with the following code snippet?

```c
#include <mpi.h>
#include <stdio.h>

int main(int argc,char *argv[]) {
    int numtasks, rank, dest, source, rc, count, tag=1;
    char inmsg, outmsg='x';
    MPI_Status Stat;

    MPI_Init(&argc,&argv);
    MPI_Comm_size(MPI_COMM_WORLD, &numtasks);
    MPI_Comm_rank(MPI_COMM_WORLD, &rank);
    if(rank == 0) {
        dest = 1; source = 1;
        rc = MPI_Recv(&inmsg, 1, MPI_CHAR, source, tag, MPI_COMM_WORLD,
    &Stat);
        rc = MPI_Send(&outmsg, 1, MPI_CHAR, dest, tag, MPI_COMM_WORLD);
    }
    else if (rank == 1) {
        dest = 0; source = 0;
        rc = MPI_Recv(&inmsg, 1, MPI_CHAR, source, tag, MPI_COMM_WORLD,
    &Stat);
        rc = MPI_Send(&outmsg, 1, MPI_CHAR, dest, tag, MPI_COMM_WORLD);
    }

    rc = MPI_Get_count(&Stat, MPI_CHAR, &count);
    printf("Task %d: Received %d char(s) from task %d with tag %d \n",
   rank, count, Stat.MPI_SOURCE, Stat.MPI_TAG);

    MPI_Finalize();

    return(0);
}
```