Assignment 1 (Due to 1st of March**)**

1. A multiprocessor consists of 100 processors, each capable of a peak execution rate of 2Gflops. What is the performance of the system as measured in Gflops when 10% of the code is sequential and 90% is parallelizable (Textbook 1.1).

2. It is possible to construct a system physically that is a hybrid of a message-passing multicomputer and a shared memory multiprocessor. Explain how this might be achieved and its relative advantages over a pure message-passing system and a pure shared memory system (Textbook 1.9).

3. The programming environment is Linux. on 155.223.40.101/8 . In MPI, there are two commands that will be used mainly: mpicc, the command (a script) to compile MPI programs, and mpirun the command to execute a MPI program. You may use any editor available such as vi or nano (preferred) when asked to alter files (or use ftp).

   Connect to 155.223.40.101 using ssh client with given acount information (or Putty).

   Make a directory called mpi that will be used for the MPI programs in this course, and "cd" into that directory.
   The commands are:

   mkdir mpi
   cd mpi

   All mpi commands will be issued from this directory.

   Configure lamhosts file as only including 155.223.40.101. And copy into mpi directory.

   Main Task Executing a simple Hello World program.

   Copy the C program hello.c into mpi. This program is given below:

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

int main( int argc, char **argv )
{
    int err;
    err = MPI_Init( &argc, &argv );
    printf("Hello MPI World!\n");
    err = MPI_Finalize();
    return 0;
}
```

Compilation:

Compile and execute the hello program using seven processes in total. To compile the program use the script:

mpicc -o hello hello.c

which uses the gcc compiler (probably) to links in the libraries and create an executable hello, and hence all the usual flags that can be used with gcc can be used with mpicc.

Execution:

For the execution on 155.223.40.101, it is necessary to submit the application to mpirun with the specific path to the executable, i.e:

mpirun -n 7 ./hello (./ means under the mpi directory)

After executing this code only on 155.223.40.101, copy object file “hello.o” to 155.223.40.102, 155.223.40.104, 155.223.40.105, 155.223.40.106, 155.223.40.107 and 155.223.40.108 (under the mpi directory).

Then configure lamhosts file as including this computers and execute program again using command:

mpirun -n 7 ./hello

If computers specified in the lamhost file has no hello.o file, execution will not be succesful.

Please send your homework report (including screenshots) by email and bring hard copy on next class.

PS: Read http://ube.ege.edu.tr/~dalkilic/courses/ube520/UBE_LAM_MPI.doc file before doing this assignment. Please do not forget stopping your processes with using commands in section 4 of UBE_LAM_MPI.doc. For questions, send email to elifacar101@yahoo.com.