

Lab – 1 Report

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Pthread

Exercise 1 – No issues encountered

C++

Exercise 2 – No issues encountered

Java

Exercise 3 – Incorrect result is caused because the operation is not synchronized by locks. sum variable may be used by multiple threads at a time. This results in incorrect sum value. This can be avoided by adding synchronized locks to the sum operation which makes it atomic and can be accessed by only one thread at a time

Exercise 4 - Static modifier is required because, when static is used, it is initialized only once and the same lck variable is used throughout for achieving synchronized lock. If the static modifier is not used, lck is initialized each time separately and there is again no synchronization while calculating the sum

Exercise 5 – No issues encountered

OpenMP

Exercise 6 – No issues encountered

Exercise 7 - No issues encountered

MPI

Changes that were added to the .bashrc file was not reflected in the environment variables. This caused an error which said “No protocol specified” while executing the program using mpirun. This was resolved by saving/compiling the .bash_profile and .bashrc files and then executing the program.

Exercise 8 – Initially it displays the output as expected, but next time when I login there is no output nor any error message to debug.

```
hegde@neutron:~$ mpirun -n 4 ./sum-mpi
```

Sometimes getting a timeout error as shown below

```

hegde@neutron:~$ mpirun -n 4 ./sum-mpi
ssh: connect to host snares.cs.pdx.edu port 22: Connection timed out
-----
ORTE was unable to reliably start one or more daemons.
This usually is caused by:

* not finding the required libraries and/or binaries on
  one or more nodes. Please check your PATH and LD_LIBRARY_PATH
  settings, or configure OMPI with --enable-orterun-prefix-by-default

* lack of authority to execute on one or more specified nodes.
  Please verify your allocation and authorities.

* the inability to write startup files into /tmp (--tmpdir/orte_tmpdir_base).
  Please check with your sys admin to determine the correct location to use.

* compilation of the orted with dynamic libraries when static are required
  (e.g., on Cray). Please check your configure cmd line and consider using
  one of the contrib/platform definitions for your system type.

* an inability to create a connection back to mpirun due to a
  lack of common network interfaces and/or no route found between
  them. Please check network connectivity (including firewalls
  and network routing requirements).
-----
ORTE does not know how to route a message to the specified daemon
located on the indicated node:

    my node:  neutron
    target node:  chatham

This is usually an internal programming error that should be
reported to the developers. In the meantime, a workaround may
be to set the MCA param routed=direct on the command line or
in your environment. We apologize for the problem.
-----
[neutron.cs.pdx.edu:3805105] 48 more processes have sent help message help-errmgr-base.txt / no-path
[neutron.cs.pdx.edu:3805105] Set MCA parameter "orte_base_help_aggregate" to 0 to see all help / error messages
hegde@neutron:~$ █

```

This might be because, all the hosts listed in the linuxhosts file is used up and there are no other hosts that are free

Chapel

Exercise 9 – No issues encountered

When N is made 10, then sum is going to be partial sum. Sum is not calculated for the complete range.