CS 301
High-Performance Computing

Lab 4

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Contents

1 Hardware Details

1.1 HPC Cluster

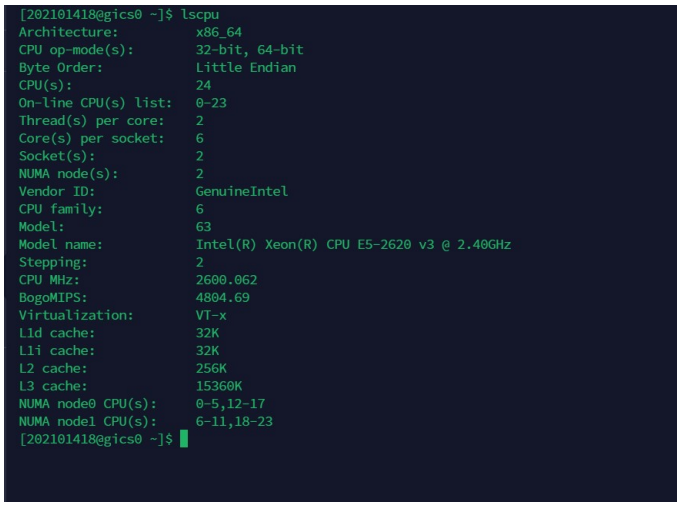

Figure 1: lscpu in cmd

As we can see from the above image

- CPU - 16
- Socket - 2
- Cores per Socket - 8
- Size of L1 cache - 32K
- Size of L2 cache - 256K
- Size of L3 cache - 15360K

1.2 Lab 207 PC

Figure 2: lscpu in cmd

- CPU - 4
- Socket - 1
- Cores per Socket - 4
- Size of L1 cache - 32K
- Size of L2 cache - 256K
- Size of L3 cache - 6144K

2 Description of Problem

Sorting arrays with merge sort algorithm optimized with multiple threads

3 Complexity of algorithm (serial)

O(N*LogN)

4 Optimization strategy

1. used iterative approach instead of recursive
2. Parallelized merging of sorted arrays

5 Graphs

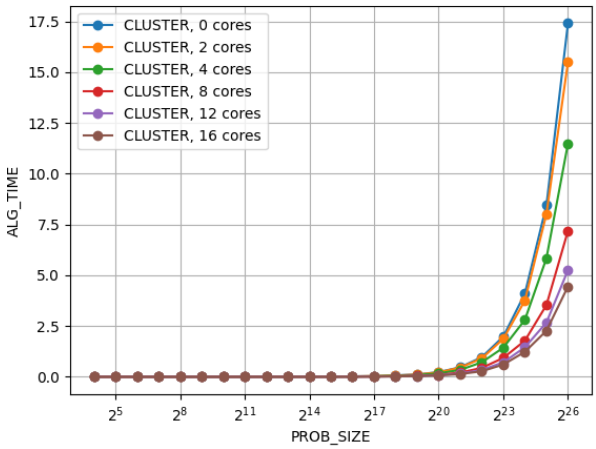

Figure 3: Cluster results

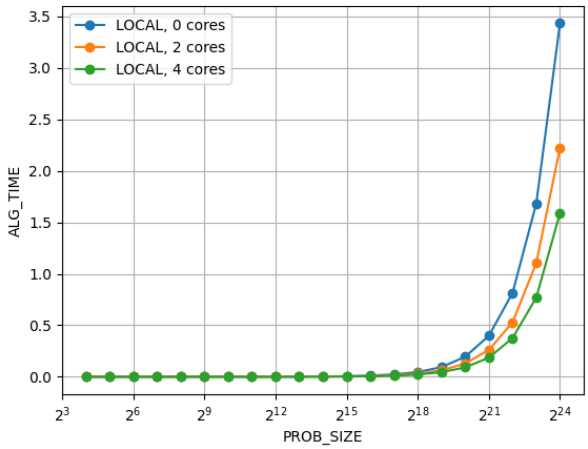

Figure 4: Lab results

6 Explanation of results

As the number of threads increases, time decreases as more operations are done simultaneously.