Parallel Programming Project 2

1. Tell what machine you ran this on

I used the Flip server

1. What do you think the actual volume is?

7.67 cubic units (mostly repeated value)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Threads\Nodes** | **64** | **132** | **256** | **512** | **1024** | **2096** | **4096** | **8196** |
| 1 | 2.946536 | 3.298542 | 2.887424 | 3.553477 | 3.61653 | 3.623761 | 3.613273 | 3.636905 |
| 2 | 7.256676 | 5.396581 | 6.476561 | 5.862917 | 7.221295 | 7.211324 | 7.257992 | 7.240433 |
| 4 | 8.466574 | 10.987203 | 10.647669 | 5.434115 | 14.441375 | 13.336587 | 14.366725 | 13.964723 |
| 8 | 21.504921 | 21.682478 | 21.391323 | 20.914707 | 24.116907 | 25.056915 | 25.041563 | 24.79998 |
| 16 | 1.250524 | 4.104032 | 10.438973 | 17.13472 | 41.772717 | 39.633312 | 34.520786 | 40.236206 |
| 32 | 16.965219 | 15.910194 | 16.951471 | 27.29458 | 36.510967 | 31.472717 | 43.21674 | 47.551956 |
| 64 | 5.194955 | 23.022259 | 30.625286 | 28.391592 | 35.807693 | 37.06934 | 49.369556 | 54.236301 |

1. Show the performances you achieved in tables and two graphs showing:
   1. Performance as a function of NUMNODES with colored lines showing different NUMT values
   2. Performance as a function of NUMT with colored lines showing different NUMNODES values
2. What patterns are you seeing in the speeds?

The performance increases gradually and remains constant after 32 threads.

1. Why do you think it is behaving this way?

This might be due to the overloaded tasks on the server or there might be less number of cores that are available than that are needed by the program.

1. What is the Parallel Fraction for this application, using the Inverse Amdahl equation?

Fp = (4./3.)\*( 1. - (1./S) ) S = 13.964723/3.636905 (4 cores: 1 core)

= 0.986 S = 3.84

1. Given that Parallel Fraction, what is the maximum speed-up you could *ever* get?

S = 1 / (1 – Fp)

S = 1 / (1 – 0.986)

S = 1 / 0.014

S = 71.48