Programming Assignment 4

CSCE 313-503

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**Data from PA3:**

|  |  |  |
| --- | --- | --- |
| w (number of threads) |  | Time(s) |
| 5 |  | 21.54874 |
| 7 |  | 15.388716 |
| 9 |  | 12.29127 |
| 11 |  | 9.794712 |
| 13 |  | 8.325531 |
| 15 |  | 7.205072 |
| 17 |  | 6.336332 |
| 19 |  | 5.682988 |
| 21 |  | 5.144861 |
| 23 |  | 4.709214 |
| 25 |  | 4.319872 |
| 27 |  | 4.22587 |
| 29 |  | 3.757309 |
| 31 |  | 3.492765 |
| 33 |  | 3.295093 |
| 35 |  | 3.288575 |
| 37 |  | 3.28482 |
| 39 |  | 3.283577 |
| 41 |  | 3.298902 |
| 43 |  | 3.29277 |

**Data from PA4:**

|  |  |
| --- | --- |
| test1 results  with n=10k, b=50 | |
| w | time(s) |
| 5 | 22.35698 |
| 10 | 11.09 |
| 15 | 7.3737 |
| 20 | 5.504534 |
| 25 | 4.403469 |
| 30 | 3.790703 |
| 35 | 3.231393 |
| 40 | 2.798102 |
| 45 | 2.499317 |
| 50 | 2.278127 |
| 55 | 2.0927 |
| 60 | 1.944695 |
| 65 | 1.857902 |
| 70 | 1.699158 |
| 75 | 1.597411 |
| 80 | 1.512779 |
| 85 | 1.43268 |
| 90 | 1.394121 |
| 95 | 1.316433 |
| 100 | 1.283623 |
| 105 | 1.210263 |
| 110 | 1.165291 |
| 115 | 1.123334 |
| 120 | 1.10245 |
| 125 | 1.085334 |
| 130 | 1.067159 |
| 135 | 1.090014 |
| 140 | 1.039637 |
| 145 | 0.947392 |
| 150 | 0.939459 |
| 155 | 0.953246 |
| 160 | 0.905213 |
| 165 | 0.909927 |
| 170 | 0.88845 |
| 175 | 0.843838 |
| 180 | 0.827398 |
| 185 | 0.825066 |
| 190 | 0.797439 |
| 195 | 0.791124 |
| 200 | 0.761222 |
| 205 | 0.81448 |
| 210 | 0.780194 |
| 215 | 0.776044 |
| 220 | 0.77972 |
| 225 | 0.788753 |
| 230 | 0.686699 |
| 235 | 0.69843 |
| 240 | 0.700885 |
| 245 | 0.677965 |
| 250 | 0.677008 |

|  |  |
| --- | --- |
| test 2 results with n=10k,w=80 | |
| b | time(s) |
| 1 | 1.455055 |
| 2 | 1.535218 |
| 4 | 1.517496 |
| 8 | 1.529807 |
| 16 | 1.534752 |
| 32 | 1.50822 |
| 64 | 1.522259 |
| 128 | 1.509482 |
| 256 | 1.510031 |
| 512 | 1.527324 |
| 1024 | 1.535929 |
| 2048 | 1.532826 |
| 8096 | 1.518911 |
| 8192 | 1.551727 |
| 16384 | 1.558902 |

**See plots in question 2.**

**1. Present a brief performance evaluation of your code. If there is a difference in performance from PA3, attempt to explain it. If the performance appears to have decreased,can it be justied as a necessary trade-off?**

There is not much difference in term of performance when I compare few data points between PA3 and PA4. The performance in PA4 however is a little bit slower, but the difference is not significant. It’s a good trade off since with a very small decrease in term performance, we can avoid underflow and overflow in the program.

**2. Make two graphs for the performance of your client program with varying numbers**

**of worker threads and varying size of request buffer (i.e. different values of \w" and**

**\b") for n = 10000. Discuss how performance changes (or fails to change) with each of**

**them, and offer explanations for both.**

The trend is very similar to PA3’s. As the number of threads increases, the performance increases. Notice the significant improvement in performance when w increases from 1 to about 50. After the threads have been increasing for more than 100, the change is not much significant. With that characteristic, we can determine the best number of worker threads for the program that meets our needs in both terms of performance and resource consumption.

The graph looks not very consistent due to fact that only few data points were tested. However, the results were very close to 1.5s when the number of request is 10000 and number of threads is 80, regardless the significant increase of buffer size. Therefore, it can be said that the size of buffer doesn’t have noticeable impact on the performance.

**3. Describe the platform that your data was gathered on and the operating system it was**

**running. A simple description like \a Raspberry PI model B running Raspbian OS,"**

**or \the CSE Linux server," is sufficient. (Think of this as free points)**

For this programming assignment, I decided to test the program on Ubuntu Linux system on my personal computer (recently installed) rather than the school’s unix server. The tamu unix server is very limited and I wasn’t able to create many threads when I was doing PA3. With the linux system on my computer, I was able to run and pass all the test cases from the test files provided. The better result gives better observation and better learning experience.