German Razo

CSCI551

Report

N = 44083498

ABRTE = 4.9344706640471111563e-15

T1 = 27.080032

Table of timings for all runs

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Times n = 44083498**  **Runs** | | |
|  | **1** | **2** | **3** |
| **comm\_sz (number of cores)** |  |  |  |
| **2** | 14.774259 | 14.778778 | 14.777839 |
| **8** | 3.736527 | 3.712802 | 3.725332 |
| **14** | 2.126143 | 2.185688 | 2.129180 |
| **20** | 1.506926 | 1.508567 | 1.531197 |

Speedups for each configuration

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Times, n = 43804687**  **Runs** | | |
|  | 1 | **2** | **3** |
| **comm\_sz (number of cores)** |  |  |  |
| **2** | 1.8329 | 1.8323 | 1.8324 |
| **8** | 7.2473 | 7.2936 | 7.2691 |
| **14** | 12.7366 | 12.3897 | 12.7185 |
| **20** | 17.9703 | 17.9508 | 17.6855 |

Efficiencies for each configuration

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Times, n = 43804687**  **Runs** | | |
|  | **1** | **2** | **3** |
| **comm\_sz (number of cores)** |  |  |  |
| **2** | .91645 | .916175 | .9162 |
| **8** | .90592 | .911711 | .9086 |
| **14** | .90976 | .884979 | .9084 |
| **20** | .89851 | .897541 | .8842 |

**Table of minimum times with estimated integral, absolute relative true error,**

**And calculated speedup and efficiency**.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Minimum time** | **Estimated integral** | **ABSTRE** | **Calculated Speedup** | **Efficiency** |
| **2** | 14.774259 | 4.7540192288588e+03 | 5.0344230268089317103e-15 | 1.8329 | .91645 |
| **8** | 3.712802 | 4.7540192288588e+03 | 5.0129379394862973857e-15 | 7.293 | .91171 |
| **14** | 2.126143 | 4.7540192288588e+03 | 5.0439511959694043240e-15 | 12.736 | .9097 |
| **20** | 1.506926 | 4.7540192288588e+03 | 5.0396541785048774588e-15 | 17.9703 | .89851 |

Graphs representation of each configuration

Speedup Graph

Efficiency Graph

**Conclusion:**

One of the expected results I saw was the increasing of time with more processors running the code, time increase from 27 seconds with one process to 1.50 seconds with 20 processors. Also, speedup increase with more processes because of the time it took for more processes.

**43000000**

**0 100 55500000**

**5500000**

**13107200 5.701955e-14**

**1.3992905500000000000**

**/26999999 - 50000000**

**0 100 89000000**

**44499999**

**44083498**

**43999999**

**44083083 cel:44084441 mid:44083762.0000000000000**

**fl:44083496 cel:44083498 mid:44083497.0000000000000**

**0 100 42000000**

**l:43804687 cel:44500000 mid:44152343.5000000000000**

**l:43804687 cel:44500000 mid:44152343.5000000000000**

**fl:43978515 cel:44152343 mid:44065429.0000000000000**

**fl:44081725 cel:44087157 mid:44084441.0000000000000**

**fl:44083083 cel:44084441 mid:44083762.0000000000000**

**2Cores**

1 Run

1. Time: 14.780935, ABSRE 5.0344230268089317103e-15 Integral: 4.7540192288588e+03
2. Time: 19.625122, ABSRE 5.0344230268089317103e-15 Integral: 4.7540192288588e+03
3. Time: 14.774259, ABSRE 5.0344230268089317103e-15 Integral: 4.7540192288588e+03

2Run

1. Time: 14.781535, ABSRE 5.0344230268089317103e-15 Integral: 4.7540192288588e+03
2. Time: 14.778778, ABSRE 5.0344230268089317103e-15 Integral: 4.7540192288588e+03
3. Time: 14.785097, ABSRE 5.0344230268089317103e-15 Integral: 4.7540192288588e+03

3Run

1. Time: 14.784493, ABSRE 5.0344230268089317103e-15 Integral: 4.7540192288588e+03
2. Time: 14.777839, ABSRE 5.0344230268089317103e-15 Integral: 4.7540192288588e+03
3. Time: 14.777839, ABSRE 5.0344230268089317103e-15 Integral: 4.7540192288588e+03

**8Cores**

1Run

1. Time: 3.739483, ABSRE 5.0129379394862973857e-15 Integral: 4.7540192288588e+03
2. Time: 3.748028, ABSRE 5.0129379394862973857e-15 Integral: 4.7540192288588e+03
3. Time: 3.736527, ABSRE 5.0129379394862973857e-15 Integral: 4.7540192288588e+03

2Run

1. Time: 3.731128, ABSRE 5.0129379394862973857e-15 Integral: 4.7540192288588e+03
2. Time: 3.712802, ABSRE 5.0129379394862973857e-15 Integral: 4.7540192288588e+03
3. Time: 3.719669, ABSRE 5.0129379394862973857e-15 Integral: 4.7540192288588e+03

3Run

1. Time: 3.725332, ABSRE 5.0129379394862973857e-15 Integral: 4.7540192288588e+03
2. Time: 3.734192, ABSRE 5.0129379394862973857e-15 Integral: 4.7540192288588e+03
3. Time: 3.750579, ABSRE 5.0129379394862973857e-15 Integral: 4.7540192288588e+03

**14Cores**

1Run

1. Time: 2.182241, ABSRE 5.0439511959694043240e-15 Integral: 4.7540192288588e+03
2. Time: 2.126143, ABSRE 5.0439511959694043240e-15 Integral: 4.7540192288588e+03
3. Time: 2.159059, ABSRE 5.0439511959694043240e-15 Integral: 4.7540192288588e+03

2Run

1. Time: 3.027148, ABSRE 5.0439511959694043240e-15 Integral: 4.7540192288588e+03
2. Time: 2.185688, ABSRE 5.0439511959694043240e-15 Integral: 4.7540192288588e+03
3. Time: 2.271023, ABSRE 5.0439511959694043240e-15 Integral: 4.7540192288588e+03

3Run

1. Time: 2.485289, ABSRE5.0439511959694043240e-15 Integral: 4.7540192288588e+03
2. Time: 2.180086, ABSRE 5.0439511959694043240e-15 Integral: 4.7540192288588e+03
3. Time: 2.129180, ABSRE 5.0439511959694043240e-15 Integral: 4.7540192288588e+03

**20Cores**

1Run

1. Time: 1.515536, ABSRE 5.0396541785048774588e-15 Integral: 4.7540192288588e+03
2. Time: 1.52567, ABSRE 5.0396541785048774588e-15 Integral: 4.7540192288588e+03
3. Time: 1.506926 ABSRE 5.0396541785048774588e-15 Integral: 4.7540192288588e+03

2Run

1. Time: 1.508567, ABSRE 5.0396541785048774588e-15 Integral: 4.7540192288588e+03
2. Time: 1.534503, ABSRE 5.0396541785048774588e-15 Integral: 4.7540192288588e+03
3. Time: 1.514102 ABSRE 5.0396541785048774588e-15 Integral: 4.7540192288588e+03

3Run

1. Time: 1.531197, ABSRE 5.0396541785048774588e-15 Integral: 4.7540192288588e+03
2. Time: 1.580722, ABSRE 5.0396541785048774588e-15 Integral: 4.7540192288588e+03
3. Time: 1.536876, ABSRE 5.0396541785048774588e-15 Integral: 4.7540192288588e+03

T1

1. 27.297300
2. 27.087698
3. 27.080032