**The Experiment about adaptive**

1. **Introduction.**

This time I do the experiment that making the figure proved the correctness of the adaptive pattern, I set first 50 tasks are normal tasks which cost 4000 around per 10 tasks at 5 workers, 50~100 are heavy tasks, and 100~150 are light tasks

And I set the 5 works active at the begin, then if the consume larger than 5000 second, we need the adaptive, so the #workers add 1 every 10 tasks, if the consume less than 2000 second, that means we don’t need the adaptive, so the #workers reduce 1 every task

And the experiment tests the adaptive with the 1%, 10, 20% stateful pattern, the consume , but with 20% stateful ,its no very well adaptive performance.

**total number of workers:16**

1. **experiment outputs.**
   1. **adaptive with no stateful**

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| --- | --- | --- | --- |
| **time** | **Time per 10 tasks** | **# workers used** | **state** |
| **10** | 5635 | 5 | add worker |
| **20** | 3648 | 5 |  |
| **30** | 3716 | 5 |  |
| **40** | 3801 | 5 |  |
| **50** | 5240 | 6 | add worker |
| **60** | 6061 | 7 | add worker |
| **70** | 3746 | 7 |  |
| **80** |  | 7 |  |
| **90** |  | 7 |  |
| **100** | 5800 | 8 | add worker |
| **110** | 3111 | 8 |  |
| **120** | 3575 | 8 |  |
| **130** |  | 8 |  |
| **140** | 3296 | 8 |  |
| **150** |  | 8 |  |
| **160** | 2763 | 8 |  |
| **170** | 2828 | 8 |  |
| **180** | 2867 | 8 |  |
| **190** |  | 8 |  |
| **200** | 1449 | 7 | reduce worker |
| **210** | 3550 | 7 |  |
| **220** | 1757 | 6 | reduce worker |
| **230** | 2011 | 6 |  |
| **240** |  | 6 |  |
| **250** | 1175 | 5 | reduce worker |
| **260** | 1672 | 4 | reduce worker |
| **270** | 2912 | 4 |  |
| **280** |  | 4 |  |
| **290** | 2819 | 4 |  |
| **300** | 2168 | 4 |  |
| **310** | 1873 | 3 |  |
| **320** | 1972 | 2 |  |
| **330** | 3309 | 2 |  |
| **340** | 4864 | 2 |  |
| **350** | 3903 | 2 |  |
| **360** | 3988 | 2 |  |
| **370** | 3653 | 2 |  |
| **380** | 5240 | 3 | add worker |
| **390** | 4197 | 3 |  |

**2.2 adaptive with 1% stateful**

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| --- | --- | --- | --- |
| **time** | **Time per 10 tasks** | **# workers used** | **state** |
| **10** | 7512 | 5 | add worker |
| **20** | 3856 | 5 |  |
| **30** | 4264 | 5 |  |
| **40** | 3801 | 5 |  |
| **50** | 3819 | 5 |  |
| **60** | 5238 | 6 | add worker |
| **70** | 6167 | 7 | add worker |
| **80** |  | 7 |  |
| **90** | 5510 | 8 | add worker |
| **100** | 5438 | 9 | add worker |
| **110** | 5682 | 10 | add worker |
| **120** | 2914 | 10 |  |
| **130** | 2984 | 10 |  |
| **140** | 2419 | 10 |  |
| **150** |  | 10 |  |
| **160** | 2620 | 10 |  |
| **170** | 2536 | 10 |  |
| **180** | 2563 | 10 |  |
| **190** | 2885 | 10 |  |
| **200** | 3149 | 10 |  |
| **210** | 3869 | 10 |  |
| **220** | 953 | 9 | reduce worker |
| **230** | 987 | 8 | reduce worker |
| **240** | 830 | 7 | reduce worker |
| **250** |  | 7 |  |
| **260** | 971 | 6 | reduce worker |
| **270** | 1018 | 5 | reduce worker |
| **280** | 1138 | 4 | reduce worker |
| **290** | 1539 | 3 | reduce worker |
| **300** | 2727 | 3 |  |
| **310** | 3000 | 3 |  |
| **320** | 2904 | 3 |  |
| **330** | 2627 | 3 |  |
| **340** | 2535 | 3 |  |
| **350** | 2609 | 3 |  |
| **360** | 3072 | 3 |  |
| **370** | 3653 | 3 |  |
| **380** | 2658 | 3 |  |
| **390** | 2825 | 3 |  |

**2.3 adaptive with 10% stateful**

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| **time** | **Time per 10 tasks** | **# workers used** | **state** |
| **10** | 7479 | 5 | add worker |
| **20** | 4370 | 5 |  |
| **30** | 3918 | 5 |  |
| **40** | 4161 | 5 |  |
| **50** | 4070 | 5 |  |
| **60** | 5771 | 5 |  |
| **70** | 8353 | 6 | add worker |
| **80** |  | 6 |  |
| **90** | 8037 | 7 | add worker |
| **100** | 7368 | 8 | add worker |
| **110** | 4873 | 8 |  |
| **120** | 5205 | 8 |  |
| **130** | 5172 | 8 |  |
| **140** | 5626 | 8 |  |
| **150** | 5498 | 8 |  |
| **160** | 5624 | 8 |  |
| **170** | 5512 | 8 |  |
| **180** | 5389 | 8 |  |
| **190** | 5154 | 8 |  |
| **200** | 5226 | 8 |  |
| **210** | 3534 | 8 |  |
| **220** | 1684 | 7 | reduce worker |
| **230** | 2262 | 7 |  |
| **240** | 2339 | 7 |  |
| **250** | 2264 | 7 |  |
| **260** | 2246 | 7 |  |
| **270** | 2510 | 7 |  |
| **280** | 2525 | 7 |  |
| **290** | 2354 | 7 |  |
| **300** | 2541 | 7 |  |
| **310** | 2303 | 7 |  |
| **320** | 2262 | 7 |  |
| **330** | 2231 | 7 |  |
| **340** | 2594 | 7 |  |
| **350** | 2262 | 7 |  |
| **360** | 2246 | 7 |  |
| **370** | 2381 | 7 |  |
| **380** | 2231 | 7 |  |
| **390** | 2390 | 7 |  |

**2.4 adaptive with 20% stateful**

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| **time** | **Time per 10 tasks** | **# workers used** | **state** |
| **10** | 8955 | 4 |  |
| **20** | 5904 | 4 |  |
| **30** | 6108 | 4 |  |
| **40** | 7507 | 4 |  |
| **50** | 6272 | 4 |  |
| **60** | 8305 | 4 |  |
| **70** | 8757 | 4 |  |
| **80** | 8818 | 4 |  |
| **90** | 10956 | 5 | add worker |
| **100** | 8511 | 5 |  |
| **110** | 8474 | 5 |  |
| **120** | 8841 | 5 |  |
| **130** | 11558 | 6 |  |
| **140** | 8580 | 6 |  |
| **150** | 11624 | 7 | add worker |
| **160** | 11559 | 8 | add worker |
| **170** | 10848 | 9 | add worker |
| **180** | 11852 | 10 | add worker |
| **190** | 11447 | 11 | add worker |
| **200** | 6512 | 11 |  |
| **210** | 3041 | 10 | reduce worker |
| **220** | 2767 | 9 | reduce worker |
| **230** | 3012 | 8 | reduce worker |
| **240** | 3197 | 7 | reduce worker |
| **250** | 2989 | 6 | reduce worker |
| **260** | 4166 | 6 |  |
| **270** | 3734 | 5 | reduce worker |
| **280** |  |  |  |
| **290** | 3837 | 4 | reduce worker |
| **300** | 3689 | 3 | reduce worker |
| **310** | 4740 | 3 |  |
| **320** | 4144 | 3 |  |
| **330** | 4356 | 3 |  |
| **340** | 4502 | 3 |  |
| **350** | 4307 | 3 |  |
| **360** | 4750 | 3 |  |
| **370** | 4752 | 3 |  |
| **380** | 4487 | 3 |  |
| **390** | 4518 | 3 |  |