Mc bloom filter 各版本测试结果

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本文档修订历史：

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| **版本号** | **修订人** | **修订说明** |
| 1.0 2012-11-08 | 何跃 | 多线程版本测试的结果，多线程版本比单线程版本有了大幅度的性能的提高。 |

# Mc-bloom-filter的两大版本

为了更好地使用cpu的性能，我们在以前的单线程版本中开辟了一个分支，多线程版本，多线程版本能更好地使用多核cpu，从我们的测试结果来看，mc-bloom-filter在多线程版本下，性能比单线程高出许多倍。

多线程版本在开启服务的时候，-t参数可以设置线程的个数，默认是4个线程。

# 测试方法

## 服务器配置

同网段的两台服务器

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| **配置** | **服务器端** | **测试端** |
| CPU | Intel(R)Xeon(R)E5620 @ 2.40GHz | Intel(R)Xeon(R)E5620 @ 2.40GHz |
| CPU核数 | 8 | 8 |
| 内存 | 12G | 32G（这个影响不大） |
| 测试方法 | 创建一个100万的bloom filter  启动单线程版  启动多线程版，并设置线程数为1、2、4、8、12、16、32、64等线程数，在客户端分别做压力测试 | 启用我们的多线程测试脚本，在客户端启动1、2、4、8、16、32、64、128个线程，分别以读、写的方式压服务器，以各个线程跑完100万的时间计算qps。 |
| 程序 | mc\_bloom\_filter | 执行脚本在test中  执行sh auto\_porf host:port |

# 测试结果分析

通过测试，读写速度差不多，在一个量级别，我们在下面的值中选择其中一个作为展示。

## 服务器端单线程、客户端单线程

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| Mc\_bloom\_filter单线程版本 | 9500 左右次/s |
| Mc\_bloom\_filter 多线程版本 | 9500 左右次/s |

## 服务器端多线程、客户端多线程（以客户端启动32线程的数据为例子）

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| 客户端  服务器 | 4线程 | 16线程 | 32线程 | 64线程 | 96线程 | 128线程 |
| 单线程版 | 34872 | 110707 | 121636 | 122535 | 122074 | 122690 |
| 1线程 | 35692 | 107885 | 123607 | 123131 | 122146 | 125977 |
| 2线程 | 34532 | 109297 | 142858 | 140748 | 145482 | 160145 |
| 4线程 | 34430 | 107866 | 183305 | 197348 | 235381 | 199043 |
| 8线程 | 35303 | 113126 | 191491 | 261371 | 268622 | 282339 |
| 12线程 | 34561 | 111992 | 201749 | 280137 | 301253 | 326020 |
| 16线程 | 34624 | 116992 | 210695 | 267621 | 294098 | 260567 |
| 32线程 | 34312 | 115012 | 210611 | 301463 | 326963 | 302890 |
| 64线程 | 34530 | 112756 | 201559 | 282864 | 308890 | 293492 |
| 96线程 | 34047 | 116359 | 205076 | 294292 | 288630 | 293492 |

多线程的表现能力图：

# 详细结果

1. **单线程版本**

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| Thread num: 1, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:103452973, Average request time:103.453 (microseconds)  **All request finished in 105.822 seconds, speed: 9449.795 req/s**  Thread num: 1, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:107176430, Average request time:107.176 (microseconds)  **All request finished in 109.692 seconds, speed: 9116.471 req/s**  Thread num: 4, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:112486792, Average request time:112.487 (microseconds)  All request finished in 28.676 seconds, speed: 34872.513 req/s  Thread num: 4, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:115052006, Average request time:115.052 (microseconds)  All request finished in 29.339 seconds, speed: 34084.549 req/s  Thread num: 8, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:125979391, Average request time:125.979 (microseconds)  All request finished in 16.046 seconds, speed: 62319.274 req/s  Thread num: 8, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:130976267, Average request time:130.976 (microseconds)  All request finished in 16.748 seconds, speed: 59708.308 req/s  Thread num: 16, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:141101304, Average request time:141.101 (microseconds)  All request finished in 9.033 seconds, speed: 110707.043 req/s  Thread num: 16, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:141807303, Average request time:141.807 (microseconds)  All request finished in 9.147 seconds, speed: 109331.080 req/s  Thread num: 32, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:259197273, Average request time:259.197 (microseconds)  All request finished in 8.221 seconds, speed: 121636.788 req/s  Thread num: 32, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:254668680, Average request time:254.669 (microseconds)  All request finished in 8.098 seconds, speed: 123492.923 req/s  Thread num: 64, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:515903465, Average request time:515.903 (microseconds)  All request finished in 8.161 seconds, speed: 122535.279 req/s  Thread num: 64, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:508055194, Average request time:508.055 (microseconds)  All request finished in 8.063 seconds, speed: 124029.208 req/s  Thread num: 96, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:775329559, Average request time:775.330 (microseconds)  All request finished in 8.192 seconds, speed: 122074.545 req/s  Thread num: 96, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:769746306, Average request time:769.746 (microseconds)  All request finished in 8.129 seconds, speed: 123023.852 req/s  Thread num: 128, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:1037361938, Average request time:1037.362 (microseconds)  All request finished in 8.221 seconds, speed: 121636.241 req/s  Thread num: 128, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:1029053709, Average request time:1029.054 (microseconds)  All request finished in 8.151 seconds, speed: 122690.204 req/s |

1. **多线程版本：**
2. 1线程

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| Thread num: 1, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:104645959, Average request time:104.646 (microseconds)  All request finished in 106.784 seconds, speed: 9364.680 req/s  Thread num: 1, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:108083425, Average request time:108.083 (microseconds)  All request finished in 110.332 seconds, speed: 9063.536 req/s  Thread num: 4, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:110086057, Average request time:110.086 (microseconds)  All request finished in 28.017 seconds, speed: 35692.562 req/s  Thread num: 4, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:117431520, Average request time:117.432 (microseconds)  All request finished in 29.979 seconds, speed: 33356.742 req/s  Thread num: 8, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:130805242, Average request time:130.805 (microseconds)  All request finished in 16.726 seconds, speed: 59786.797 req/s  Thread num: 8, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:127902508, Average request time:127.903 (microseconds)  All request finished in 16.291 seconds, speed: 61381.766 req/s  Thread num: 16, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:143090177, Average request time:143.090 (microseconds)  All request finished in 9.269 seconds, speed: 107885.188 req/s  Thread num: 16, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:139779783, Average request time:139.780 (microseconds)  All request finished in 8.999 seconds, speed: 111124.286 req/s  Thread num: 32, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:256831494, Average request time:256.831 (microseconds)  All request finished in 8.154 seconds, speed: 122636.503 req/s  Thread num: 32, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:254636974, Average request time:254.637 (microseconds)  All request finished in 8.090 seconds, speed: 123607.240 req/s  Thread num: 64, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:509855931, Average request time:509.856 (microseconds)  All request finished in 8.121 seconds, speed: 123131.192 req/s  Thread num: 64, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:508731085, Average request time:508.731 (microseconds)  All request finished in 8.133 seconds, speed: 122961.347 req/s  Thread num: 96, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:769019503, Average request time:769.020 (microseconds)  All request finished in 8.187 seconds, speed: 122146.714 req/s  Thread num: 96, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:765062962, Average request time:765.063 (microseconds)  All request finished in 8.117 seconds, speed: 123205.072 req/s  Thread num: 128, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:1044188547, Average request time:1044.189 (microseconds)  All request finished in 8.315 seconds, speed: 120271.337 req/s  Thread num: 128, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:997436671, Average request time:997.437 (microseconds)  All request finished in 7.938 seconds, speed: 125977.173 req/s |

1. 2线程

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| Thread num: 1, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:103838304, Average request time:103.838 (microseconds)  All request finished in 106.230 seconds, speed: 9413.551 req/s  Thread num: 1, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:106899658, Average request time:106.900 (microseconds)  All request finished in 109.245 seconds, speed: 9153.743 req/s  Thread num: 4, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:113738132, Average request time:113.738 (microseconds)  All request finished in 28.958 seconds, speed: 34532.806 req/s  Thread num: 4, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:116657853, Average request time:116.658 (microseconds)  All request finished in 29.711 seconds, speed: 33657.750 req/s  Thread num: 8, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:126543429, Average request time:126.543 (microseconds)  All request finished in 16.106 seconds, speed: 62089.746 req/s  Thread num: 8, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:130835178, Average request time:130.835 (microseconds)  All request finished in 16.666 seconds, speed: 60001.176 req/s  Thread num: 16, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:142871860, Average request time:142.872 (microseconds)  All request finished in 9.149 seconds, speed: 109297.621 req/s  Thread num: 16, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:150274473, Average request time:150.274 (microseconds)  All request finished in 9.681 seconds, speed: 103292.906 req/s  Thread num: 32, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:217131125, Average request time:217.131 (microseconds)  All request finished in 7.000 seconds, speed: 142858.102 req/s  Thread num: 32, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:185554224, Average request time:185.554 (microseconds)  All request finished in 6.155 seconds, speed: 162460.352 req/s  Thread num: 64, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:404417937, Average request time:404.418 (microseconds)  All request finished in 7.105 seconds, speed: 140748.212 req/s  Thread num: 64, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:319627778, Average request time:319.628 (microseconds)  All request finished in 6.172 seconds, speed: 162010.695 req/s  Thread num: 96, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:569556192, Average request time:569.556 (microseconds)  All request finished in 6.874 seconds, speed: 145482.309 req/s  Thread num: 96, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:513402157, Average request time:513.402 (microseconds)  All request finished in 5.442 seconds, speed: 183769.784 req/s  Thread num: 128, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:759481448, Average request time:759.481 (microseconds)  All request finished in 6.831 seconds, speed: 146402.124 req/s  Thread num: 128, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:636738984, Average request time:636.739 (microseconds)  All request finished in 6.244 seconds, speed: 160145.617 req/s |

1. 4线程

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| delete key 1000000 fail  Thread num: 1, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:103179826, Average request time:103.180 (microseconds)  All request finished in 105.316 seconds, speed: 9495.239 req/s  Thread num: 1, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:107590572, Average request time:107.591 (microseconds)  All request finished in 109.909 seconds, speed: 9098.398 req/s  Thread num: 4, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:113963782, Average request time:113.964 (microseconds)  All request finished in 29.044 seconds, speed: 34430.168 req/s  Thread num: 4, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:117230236, Average request time:117.230 (microseconds)  All request finished in 29.902 seconds, speed: 33442.626 req/s  Thread num: 8, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:126839200, Average request time:126.839 (microseconds)  All request finished in 16.126 seconds, speed: 62012.823 req/s  Thread num: 8, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:129215491, Average request time:129.215 (microseconds)  All request finished in 16.461 seconds, speed: 60749.285 req/s  Thread num: 16, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:145783315, Average request time:145.783 (microseconds)  All request finished in 9.271 seconds, speed: 107866.918 req/s  Thread num: 16, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:145449233, Average request time:145.449 (microseconds)  All request finished in 9.296 seconds, speed: 107574.203 req/s  Thread num: 32, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:167628008, Average request time:167.628 (microseconds)  All request finished in 5.455 seconds, speed: 183305.288 req/s  Thread num: 32, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:157604464, Average request time:157.604 (microseconds)  All request finished in 5.193 seconds, speed: 192559.093 req/s  Thread num: 64, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:268324538, Average request time:268.325 (microseconds)  All request finished in 5.067 seconds, speed: 197348.699 req/s  Thread num: 64, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:225255361, Average request time:225.255 (microseconds)  All request finished in 4.202 seconds, speed: 237978.459 req/s  Thread num: 96, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:397960128, Average request time:397.960 (microseconds)  All request finished in 5.100 seconds, speed: 196096.118 req/s  Thread num: 96, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:328953837, Average request time:328.954 (microseconds)  All request finished in 4.248 seconds, speed: 235381.624 req/s  Thread num: 128, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:526684221, Average request time:526.684 (microseconds)  All request finished in 5.024 seconds, speed: 199043.714 req/s  Thread num: 128, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:385970789, Average request time:385.971 (microseconds)  All request finished in 4.292 seconds, speed: 233001.330 req/s |

1. 8线程

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| Thread num: 1, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:105312902, Average request time:105.313 (microseconds)  All request finished in 107.515 seconds, speed: 9301.068 req/s  Thread num: 1, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:110832647, Average request time:110.833 (microseconds)  All request finished in 113.196 seconds, speed: 8834.246 req/s  Thread num: 4, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:111366655, Average request time:111.367 (microseconds)  All request finished in 28.325 seconds, speed: 35303.953 req/s  Thread num: 4, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:114552322, Average request time:114.552 (microseconds)  All request finished in 29.186 seconds, speed: 34262.911 req/s  Thread num: 8, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:133877991, Average request time:133.878 (microseconds)  All request finished in 17.189 seconds, speed: 58175.370 req/s  Thread num: 8, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:144315656, Average request time:144.316 (microseconds)  All request finished in 18.394 seconds, speed: 54365.057 req/s  Thread num: 16, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:137220142, Average request time:137.220 (microseconds)  All request finished in 8.840 seconds, speed: 113126.945 req/s  Thread num: 16, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:141706816, Average request time:141.707 (microseconds)  All request finished in 9.160 seconds, speed: 109171.247 req/s  Thread num: 32, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:155449538, Average request time:155.450 (microseconds)  All request finished in 5.222 seconds, speed: 191491.717 req/s  Thread num: 32, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:149904411, Average request time:149.904 (microseconds)  All request finished in 5.062 seconds, speed: 197555.527 req/s  Thread num: 64, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:205736744, Average request time:205.737 (microseconds)  All request finished in 3.826 seconds, speed: 261371.694 req/s  Thread num: 64, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:190785809, Average request time:190.786 (microseconds)  All request finished in 3.636 seconds, speed: 275026.217 req/s  Thread num: 96, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:265178216, Average request time:265.178 (microseconds)  All request finished in 3.723 seconds, speed: 268622.669 req/s  Thread num: 96, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:252074041, Average request time:252.074 (microseconds)  All request finished in 3.374 seconds, speed: 296427.339 req/s  Thread num: 128, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:394793199, Average request time:394.793 (microseconds)  All request finished in 3.542 seconds, speed: 282339.681 req/s  Thread num: 128, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:385527768, Average request time:385.528 (microseconds)  All request finished in 3.806 seconds, speed: 262763.128 req/s |

1. 12线程

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| Thread num: 1, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:103880153, Average request time:103.880 (microseconds)  All request finished in 106.335 seconds, speed: 9404.215 req/s  Thread num: 1, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:106962022, Average request time:106.962 (microseconds)  All request finished in 109.384 seconds, speed: 9142.117 req/s  Thread num: 4, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:113583219, Average request time:113.583 (microseconds)  All request finished in 28.934 seconds, speed: 34561.469 req/s  Thread num: 4, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:117480363, Average request time:117.480 (microseconds)  All request finished in 29.929 seconds, speed: 33412.330 req/s  Thread num: 8, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:127705594, Average request time:127.706 (microseconds)  All request finished in 16.256 seconds, speed: 61515.593 req/s  Thread num: 8, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:127941143, Average request time:127.941 (microseconds)  All request finished in 16.284 seconds, speed: 61408.253 req/s  Thread num: 16, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:138034152, Average request time:138.034 (microseconds)  All request finished in 8.929 seconds, speed: 111992.630 req/s  Thread num: 16, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:139508555, Average request time:139.509 (microseconds)  All request finished in 9.128 seconds, speed: 109552.076 req/s  Thread num: 32, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:150554905, Average request time:150.555 (microseconds)  All request finished in 4.930 seconds, speed: 202854.405 req/s  Thread num: 32, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:145824170, Average request time:145.824 (microseconds)  All request finished in 4.957 seconds, speed: 201749.654 req/s  Thread num: 64, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:197390175, Average request time:197.390 (microseconds)  All request finished in 3.570 seconds, speed: 280137.077 req/s  Thread num: 64, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:191948204, Average request time:191.948 (microseconds)  All request finished in 3.707 seconds, speed: 269768.574 req/s  Thread num: 96, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:275343742, Average request time:275.344 (microseconds)  All request finished in 3.319 seconds, speed: 301253.274 req/s  Thread num: 96, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:282615640, Average request time:282.616 (microseconds)  All request finished in 3.422 seconds, speed: 292264.262 req/s  Thread num: 128, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:367521715, Average request time:367.522 (microseconds)  All request finished in 3.255 seconds, speed: 307226.647 req/s  Thread num: 128, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:339483524, Average request time:339.484 (microseconds)  All request finished in 3.067 seconds, speed: 326020.796 req/s |

1. 16线程

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| Thread num: 1, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:102446284, Average request time:102.446 (microseconds)  All request finished in 104.701 seconds, speed: 9551.029 req/s  Thread num: 1, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:106414603, Average request time:106.415 (microseconds)  All request finished in 108.906 seconds, speed: 9182.221 req/s  Thread num: 4, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:113377579, Average request time:113.378 (microseconds)  All request finished in 28.881 seconds, speed: 34624.888 req/s  Thread num: 4, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:114974564, Average request time:114.975 (microseconds)  All request finished in 29.250 seconds, speed: 34187.518 req/s  Thread num: 8, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:125470962, Average request time:125.471 (microseconds)  All request finished in 15.957 seconds, speed: 62667.946 req/s  Thread num: 8, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:128139645, Average request time:128.140 (microseconds)  All request finished in 16.332 seconds, speed: 61230.039 req/s  Thread num: 16, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:133799368, Average request time:133.799 (microseconds)  All request finished in 8.548 seconds, speed: 116992.219 req/s  Thread num: 16, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:134898517, Average request time:134.899 (microseconds)  All request finished in 8.677 seconds, speed: 115245.505 req/s  Thread num: 32, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:146899429, Average request time:146.899 (microseconds)  All request finished in 4.746 seconds, speed: 210695.360 req/s  Thread num: 32, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:141071236, Average request time:141.071 (microseconds)  All request finished in 4.606 seconds, speed: 217084.554 req/s  Thread num: 64, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:228280990, Average request time:228.281 (microseconds)  All request finished in 3.737 seconds, speed: 267621.254 req/s  Thread num: 64, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:234270215, Average request time:234.270 (microseconds)  All request finished in 3.886 seconds, speed: 257323.690 req/s  Thread num: 96, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:303069193, Average request time:303.069 (microseconds)  All request finished in 3.400 seconds, speed: 294098.617 req/s  Thread num: 96, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:332202924, Average request time:332.203 (microseconds)  All request finished in 3.625 seconds, speed: 275860.927 req/s  Thread num: 128, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:454792508, Average request time:454.793 (microseconds)  All request finished in 3.682 seconds, speed: 271601.411 req/s  Thread num: 128, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:475783747, Average request time:475.784 (microseconds)  All request finished in 3.838 seconds, speed: 260567.307 req/s |

1. 32线程

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| Thread num: 1, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:102837096, Average request time:102.837 (microseconds)  All request finished in 105.171 seconds, speed: 9508.304 req/s  Thread num: 1, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:106845346, Average request time:106.845 (microseconds)  All request finished in 109.316 seconds, speed: 9147.776 req/s  Thread num: 4, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:114475663, Average request time:114.476 (microseconds)  All request finished in 29.144 seconds, speed: 34312.445 req/s  Thread num: 4, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:117761053, Average request time:117.761 (microseconds)  All request finished in 30.109 seconds, speed: 33212.352 req/s  Thread num: 8, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:125051580, Average request time:125.052 (microseconds)  All request finished in 15.860 seconds, speed: 63050.422 req/s  Thread num: 8, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:127848301, Average request time:127.848 (microseconds)  All request finished in 16.296 seconds, speed: 61363.558 req/s  Thread num: 16, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:135489679, Average request time:135.490 (microseconds)  All request finished in 8.695 seconds, speed: 115012.329 req/s  Thread num: 16, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:139160844, Average request time:139.161 (microseconds)  All request finished in 8.920 seconds, speed: 112101.566 req/s  Thread num: 32, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:144834041, Average request time:144.834 (microseconds)  All request finished in 4.748 seconds, speed: 210611.358 req/s  Thread num: 32, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:142442651, Average request time:142.443 (microseconds)  All request finished in 4.644 seconds, speed: 215323.821 req/s  Thread num: 64, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:194237413, Average request time:194.237 (microseconds)  All request finished in 3.317 seconds, speed: 301463.242 req/s  Thread num: 64, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:195992791, Average request time:195.993 (microseconds)  All request finished in 3.414 seconds, speed: 292913.257 req/s  Thread num: 96, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:276065198, Average request time:276.065 (microseconds)  All request finished in 3.058 seconds, speed: 326963.004 req/s  Thread num: 96, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:258283773, Average request time:258.284 (microseconds)  All request finished in 3.127 seconds, speed: 319824.583 req/s  Thread num: 128, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:404711104, Average request time:404.711 (microseconds)  All request finished in 3.302 seconds, speed: 302890.790 req/s  Thread num: 128, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:402307651, Average request time:402.308 (microseconds)  All request finished in 3.397 seconds, speed: 294385.365 req/s |

1. 64线程

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| Thread num: 1, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:103642461, Average request time:103.642 (microseconds)  All request finished in 106.038 seconds, speed: 9430.562 req/s  Thread num: 1, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:108347667, Average request time:108.348 (microseconds)  All request finished in 110.887 seconds, speed: 9018.164 req/s  Thread num: 4, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:113806627, Average request time:113.807 (microseconds)  All request finished in 28.960 seconds, speed: 34530.893 req/s  Thread num: 4, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:116474654, Average request time:116.475 (microseconds)  All request finished in 29.710 seconds, speed: 33658.513 req/s  Thread num: 8, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:128406945, Average request time:128.407 (microseconds)  All request finished in 16.406 seconds, speed: 60953.339 req/s  Thread num: 8, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:132039195, Average request time:132.039 (microseconds)  All request finished in 16.830 seconds, speed: 59419.412 req/s  Thread num: 16, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:137904445, Average request time:137.904 (microseconds)  All request finished in 8.869 seconds, speed: 112756.059 req/s  Thread num: 16, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:140975165, Average request time:140.975 (microseconds)  All request finished in 9.104 seconds, speed: 109845.375 req/s  Thread num: 32, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:150309896, Average request time:150.310 (microseconds)  All request finished in 4.961 seconds, speed: 201559.912 req/s  Thread num: 32, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:142644097, Average request time:142.644 (microseconds)  All request finished in 4.639 seconds, speed: 215545.625 req/s  Thread num: 64, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:212287155, Average request time:212.287 (microseconds)  All request finished in 3.535 seconds, speed: 282864.067 req/s  Thread num: 64, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:204803284, Average request time:204.803 (microseconds)  All request finished in 3.595 seconds, speed: 278200.178 req/s  Thread num: 96, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:289445958, Average request time:289.446 (microseconds)  All request finished in 3.237 seconds, speed: 308890.422 req/s  Thread num: 96, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:280645404, Average request time:280.645 (microseconds)  All request finished in 3.159 seconds, speed: 316540.140 req/s  Thread num: 128, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:344383884, Average request time:344.384 (microseconds)  All request finished in 2.872 seconds, speed: 348179.716 req/s  Thread num: 128, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:340584915, Average request time:340.585 (microseconds)  All request finished in 2.910 seconds, speed: 343601.757 req/s  [root@localhost test]# sh auto\_prof.sh 10.69.3.107:12345  delete key 1000000 fail  Thread num: 1, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:104641874, Average request time:104.642 (microseconds)  All request finished in 106.963 seconds, speed: 9349.034 req/s  Thread num: 1, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:107358087, Average request time:107.358 (microseconds)  All request finished in 109.768 seconds, speed: 9110.098 req/s  Thread num: 4, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:115390066, Average request time:115.390 (microseconds)  All request finished in 29.370 seconds, speed: 34047.828 req/s  Thread num: 4, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:117929979, Average request time:117.930 (microseconds)  All request finished in 30.083 seconds, speed: 33241.489 req/s  Thread num: 8, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:126609592, Average request time:126.610 (microseconds)  All request finished in 16.124 seconds, speed: 62019.008 req/s  Thread num: 8, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:127479239, Average request time:127.479 (microseconds)  All request finished in 16.239 seconds, speed: 61580.435 req/s  Thread num: 16, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:134556386, Average request time:134.556 (microseconds)  All request finished in 8.594 seconds, speed: 116359.574 req/s  Thread num: 16, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:136362398, Average request time:136.362 (microseconds)  All request finished in 8.748 seconds, speed: 114315.319 req/s  Thread num: 32, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:145516140, Average request time:145.516 (microseconds)  All request finished in 4.813 seconds, speed: 207757.197 req/s  Thread num: 32, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:148721666, Average request time:148.722 (microseconds)  All request finished in 4.876 seconds, speed: 205076.084 req/s  Thread num: 64, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:202769125, Average request time:202.769 (microseconds)  All request finished in 3.398 seconds, speed: 294292.145 req/s  Thread num: 64, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:191557445, Average request time:191.557 (microseconds)  All request finished in 3.286 seconds, speed: 304325.253 req/s  Thread num: 96, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:314676091, Average request time:314.676 (microseconds)  All request finished in 3.465 seconds, speed: 288630.859 req/s  Thread num: 96, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:282457603, Average request time:282.458 (microseconds)  All request finished in 3.209 seconds, speed: 311631.716 req/s  Thread num: 128, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:416784727, Average request time:416.785 (microseconds)  All request finished in 3.407 seconds, speed: 293492.939 req/s  Thread num: 128, Total request: 1000000, E.M.A.O.E.: 1000000, F.P.R.: 0.00001  Total request time:356930510, Average request time:356.931 (microseconds)  All request finished in 3.132 seconds, speed: 319238.832 req/s |