LAB2 性能测试

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测试工具：ab-ApacheHTTPServer

测试网址：localhost:___(不固定)/index.html

测试机器：ubuntu 32 位虚拟机 内存1G 2核 intel 八代 i5

测试结果：

请求数 1000 并发数 10

Requests per second 为 1062

对比百度 www.baidu.com 为 81.75


```
Server Software:        BWS/1.1
Server Hostname:        www.baidu.com
Server Port:            443
SSL/TLS Protocol:       TLSv1.2,ECDHE-RSA-AES128-GCM-SHA256,2048,128

Document Path:          /
Document Length:        227 bytes

Concurrency Level:      10
Time taken for tests:   12.232 seconds
Complete requests:      1000
Failed requests:        0
Total transferred:      1081921 bytes
HTML transferred:       227000 bytes
Requests per second:    81.75 [#/sec] (mean)
Time per request:       122.319 [ms] (mean)
Time per request:       12.232 [ms] (mean, across all concurrent requests)
Transfer rate:          86.38 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:       65    92   15.6     91    153
Processing:    20    29    8.1     28     73
Waiting:       20    29    6.9     27     69
Total:         87   122   20.3    119    216

Percentage of the requests served within a certain time (ms)
  50%    119
  66%    128
  75%    136
  80%    139
  90%    149
  95%    158
  98%    170
  99%    175
 100%    216 (longest request)
swg@swg-VirtualBox:~$
```

分析：我的网站比百度快得多，但这并不完全是并发程度高的原因，和网络也有很大联系。分析是本机地址访问本机，所以速度偏快。但另一方面，在 debug 的时候我加上了很多控制台输出指令，这在一定程度上拖慢了我的 server 响应速度。下面删去 output 进行测试。

```
HTML transferred:        117000 bytes
Requests per second:     2504.88 [#/sec] (mean)
Time per request:        3.992 [ms] (mean)
Time per request:        0.399 [ms] (mean, across all concurrent requests)
Transfer rate:           440.31 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    0   0.1      0        1
Processing:     0    4   2.2      3       16
Waiting:        0    3   1.9      3       15
Total:          1    4   2.2      4       16

Percentage of the requests served within a certain time (ms)
  50%      4
  66%      4
  75%      5
  80%      5
  90%      7
  95%      8
  98%     11
  99%     12
 100%     16 (longest request)
swg@swg-VirtualBox:~$
```
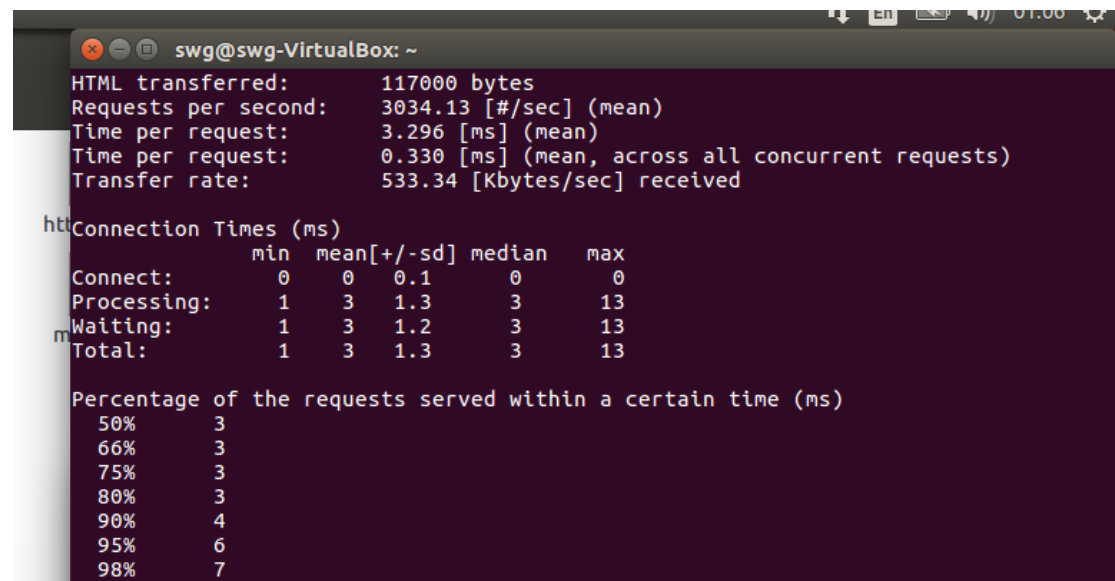
结果为 2504，快了整整一倍还多！

以上测试均在 2 核进行，考虑到特殊性，我决定增加系统核数至 6

核进行测试（条件有限，只能在本机上测试）


```
Concurrency Level:       10
Time taken for tests:    0.680 seconds
Complete requests:       1000
Failed requests:         0
Total transferred:       180000 bytes
HTML transferred:        117000 bytes
Requests per second:     1470.94 [#/sec] (mean)
Time per request:        6.798 [ms] (mean)
Time per request:        0.680 [ms] (mean, across all concurrent requests)
Transfer rate:           258.56 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    0   0.1      0        1
Processing:     2    7   2.7      6       19
Waiting:        1    6   2.5      5       18
Total:          2    7   2.7      6       19

Percentage of the requests served within a certain time (ms)
  50%      6
  66%      7
  75%      8
  80%      9
```

竟然发现效率变差了！并且这是多次测试后的稳定结果，两次测试

间隔很短，可以排除网络因素。

我百思不得其解，再次在 2 核条件下做测试，并降低线程数为 2

发现 2 核 2 线程比 2 核 8 线程更快（符合 Lab1 的结论）

因此，我认为 6 核 8 线程较慢的原因是线程在不同核之间的切换浪费了时间（毕竟是虚拟机，线程调度情况复杂）。