

Laporan Tugas 9



Mata Kuliah :

Pemrograman Jaringan

Kelas : B

Oleh :

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1. Tugas 9

- Pull update terakhir repo progjar
- Jalankan file server_async_http.py di port 45000 dan server_thread_http.py di port 46000
- Uji coba apache benchmark untuk 1000 request dan minimal 5 variasi nilai konkurensi
- Buatlah tabel untuk menunjukkan hasil benchmark

2. Parameter Test

- Jumlah request : 1000
- Jumlah konkurensi : 1, 5, 10, 20, 50, 100

3. Hasil Performance Test

- Server Async

No Test	Concurrency	Time taken for test (second)	Complete request	Failed request	Total transferred (bytes)	Request per second (#/sec)	Time per request (ms)	Transfer rate (Kbytes/sec)
1	1	3,632	1000	0	122000	275,35	3,632	32,81
2	5	3,211	1000	0	122000	311,44	16,055	37,1
3	10	2,866	1000	0	122000	348,98	28,655	41,58
4	20	3,368	1000	0	122000	296,94	67,353	35,38
5	50	3,399	1000	0	122000	294,2	169,951	35,05
6	100	2,869	1000	0	122000	348,5	286,944	41,52

- Server Thread

No Test	Concurrency	Time taken for test (second)	Complete request	Failed request	Total transferred (bytes)	Request per second (#/sec)	Time per request (ms)	Transfer rate (Kbytes/sec)
1	1	2875,522	1000	0	122000	0,35	2875,522	0,04
2	5	1293,22	1000	0	122000	0,77	6466,099	0,09
3	10	2579,568	1000	0	122000	0,39	25795,682	0,05
4	20	2141,564	1000	0	122000	0,47	42831,277	0,06
5	50	1515,492	1000	0	122000	0,66	75774,611	0,08
6	100	774,286	1000	0	122000	1,29	77428,64	0,15

4. Hasil (Screenshot)

- Async server konkurensi 1

```
Server Software:      myserver/1.0
Server Hostname:     127.0.0.1
Server Port:         45000

Document Path:       /
Document Length:     4 bytes

Concurrency Level:    1
Time taken for tests: 3.632 seconds
Complete requests:    1000
Failed requests:      0
Non-2xx responses:    1000
Total transferred:    122000 bytes
HTML transferred:     4000 bytes
Requests per second:  275.35 [#/sec] (mean)
Time per request:     3.632 [ms] (mean)
Time per request:     3.632 [ms] (mean, across all concurrent requests)
Transfer rate:        32.81 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median  max
Connect:      0    0   0.1      0    1
Processing:    2    3   1.5      3   13
Waiting:       2    3   1.5      3   12
Total:         2    4   1.6      3   13

Percentage of the requests served within a certain time (ms)
 50%    3
 66%    3
 75%    4
 80%    5
 90%    6
 95%    7
 98%    7
 99%    8
100%   13 (longest request)
```

- Async server konkurensi 5

```
Server Software:      myserver/1.0
Server Hostname:     127.0.0.1
Server Port:         45000

Document Path:       /
Document Length:     4 bytes

Concurrency Level:    5
Time taken for tests: 3.211 seconds
Complete requests:    1000
Failed requests:      0
Non-2xx responses:    1000
Total transferred:    122000 bytes
HTML transferred:     4000 bytes
Requests per second:  311.44 [#/sec] (mean)
Time per request:     16.055 [ms] (mean)
Time per request:     3.211 [ms] (mean, across all concurrent requests)
Transfer rate:        37.10 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median  max
Connect:      0    0   0.1      0    1
Processing:   10   16   1.7     15   28
Waiting:      10   16   1.7     15   28
Total:        10   16   1.7     16   28

Percentage of the requests served within a certain time (ms)
 50%   16
 66%   16
 75%   16
 80%   17
 90%   17
 95%   19
 98%   21
 99%   22
100%   28 (longest request)
```

- Async server konkurensi 10

```

Server Port:          45000

Document Path:        /
Document Length:      4 bytes

Concurrency Level:     10
Time taken for tests:  2.866 seconds
Complete requests:     1000
Failed requests:       0
Non-2xx responses:     1000
Keep-Alive requests:   0
Total transferred:     122000 bytes
HTML transferred:     4000 bytes
Requests per second:   348.98 [#/sec] (mean)
Time per request:      28.655 [ms] (mean)
Time per request:      2.866 [ms] (mean, across all concurrent requests)
Transfer rate:         41.58 [Kbytes/sec] received

Connection Times (ms)
              min    mean[+/-sd] median   max
Connect:        0      0   0.1      0      2
Processing:      3     28   2.5     28     36
Waiting:         3     28   2.5     28     36
Total:           5     28   2.4     28     36

Percentage of the requests served within a certain time (ms)
 50%    28
 66%    29
 75%    30
 80%    30
 90%    31
 95%    32
 98%    33
 99%    34
100%    36 (longest request)

```

- Async server konkurensi 20

```

Server Software:      myserver/1.0
Server Hostname:      127.0.0.1
Server Port:          45000

Document Path:        /
Document Length:      4 bytes

Concurrency Level:     20
Time taken for tests:  3.368 seconds
Complete requests:     1000
Failed requests:       0
Non-2xx responses:     1000
Keep-Alive requests:   0
Total transferred:     122000 bytes
HTML transferred:     4000 bytes
Requests per second:   296.94 [#/sec] (mean)
Time per request:      67.353 [ms] (mean)
Time per request:      3.368 [ms] (mean, across all concurrent requests)
Transfer rate:         35.38 [Kbytes/sec] received

Connection Times (ms)
              min    mean[+/-sd] median   max
Connect:        0      0   0.9      0     10
Processing:      8     66  21.2     60    191
Waiting:         8     66  21.2     60    191
Total:          18     67  21.1     60    191

Percentage of the requests served within a certain time (ms)
 50%    60
 66%    61
 75%    62
 80%    65
 90%    89
 95%   110
 98%   169
 99%   181
100%   191 (longest request)

```

- Async server konkurensi 50

```

Server Hostname:      127.0.0.1
Server Port:         45000

Document Path:       /
Document Length:     4 bytes

Concurrency Level:    50
Time taken for tests: 3.399 seconds
Complete requests:    1000
Failed requests:      0
Non-2xx responses:    1000
Keep-Alive requests:  0
Total transferred:    122000 bytes
HTML transferred:     4000 bytes
Requests per second:  294.20 [#/sec] (mean)
Time per request:      169.951 [ms] (mean)
Time per request:      3.399 [ms] (mean, across all concurrent requests)
Transfer rate:         35.05 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median  max
Connect:        0    1   2.7      0   16
Processing:      6   165  87.2    148  556
Waiting:         5   165  87.2    148  556
Total:          22   166  86.6    149  557

Percentage of the requests served within a certain time (ms)
 50%    149
 66%    150
 75%    151
 80%    152
 90%    156
 95%    495
 98%    543
 99%    550
100%    557 (longest request)

```

- Async server konkurensi 100

```

Server Hostname:      127.0.0.1
Server Port:         45000

Document Path:       /
Document Length:     4 bytes

Concurrency Level:    100
Time taken for tests: 2.869 seconds
Complete requests:    1000
Failed requests:      0
Non-2xx responses:    1000
Keep-Alive requests:  0
Total transferred:    122000 bytes
HTML transferred:     4000 bytes
Requests per second:  348.50 [#/sec] (mean)
Time per request:      286.944 [ms] (mean)
Time per request:      2.869 [ms] (mean, across all concurrent requests)
Transfer rate:         41.52 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median  max
Connect:        0    2   4.7      0   39
Processing:      6   271  48.1    285  291
Waiting:         5   271  48.2    284  291
Total:          28   273  43.6    285  292

Percentage of the requests served within a certain time (ms)
 50%    285
 66%    286
 75%    287
 80%    288
 90%    289
 95%    290
 98%    290
 99%    291
100%    292 (longest request)

```

- Thread Server konkurensi 1

```

Server Port:          46000

Document Path:        /
Document Length:      4 bytes

Concurrency Level:     1
Time taken for tests:  2875.522 seconds
Complete requests:     1000
Failed requests:       0
Non-2xx responses:     1000
Keep-Alive requests:   0
Total transferred:     122000 bytes
HTML transferred:      4000 bytes
Requests per second:   0.35 [#/sec] (mean)
Time per request:      2875.522 [ms] (mean)
Time per request:      2875.522 [ms] (mean, across all concurrent requests)
Transfer rate:         0.04 [Kbytes/sec] received

Connection Times (ms)
      min  mean[+/-sd] median   max
Connect:    0      0   0.3      0    10
Processing:  2 2875 4653.8    886 31815
Waiting:    2 2727 4420.1    834 31302
Total:       3 2875 4653.8    887 31816

Percentage of the requests served within a certain time (ms)
 50%    887
 66%   2085
 75%   3410
 80%   4879
 90%   7930
 95%  12134
 98%  19877
 99%  23674
100% 31816 (longest request)

```

- Thread Server konkurensi 5

```

Server Port:          46000

Document Path:        /
Document Length:      4 bytes

Concurrency Level:     5
Time taken for tests:  1293.220 seconds
Complete requests:     1000
Failed requests:       0
Non-2xx responses:     1000
Keep-Alive requests:   0
Total transferred:     122000 bytes
HTML transferred:      4000 bytes
Requests per second:   0.77 [#/sec] (mean)
Time per request:      6466.099 [ms] (mean)
Time per request:      1293.220 [ms] (mean, across all concurrent requests)
Transfer rate:         0.09 [Kbytes/sec] received

Connection Times (ms)
      min  mean[+/-sd] median   max
Connect:    0      0   0.2      0      3
Processing:  3 6382 8904.3   2205 44477
Waiting:    3 6194 8658.0   2141 44160
Total:       4 6382 8904.3   2206 44478

Percentage of the requests served within a certain time (ms)
 50%    2206
 66%    4665
 75%    7843
 80%   11179
 90%   21373
 95%   26850
 98%   33157
 99%   37095
100%  44478 (longest request)

```

- Thread Server konkurensi 10

```

Server Software:      myserver/1.0
Server Hostname:      127.0.0.1
Server Port:          46000

Document Path:        /
Document Length:      4 bytes

Concurrency Level:     10
Time taken for tests:  2579.568 seconds
Complete requests:     1000
Failed requests:       0
Non-2xx responses:     1000
Keep-Alive requests:   0
Total transferred:     122000 bytes
HTML transferred:     4000 bytes
Requests per second:   0.39 [#/sec] (mean)
Time per request:      25795.682 [ms] (mean)
Time per request:      2579.568 [ms] (mean, across all concurrent requests)
Transfer rate:         0.05 [Kbytes/sec] received

Connection Times (ms)
      min    mean[+/-sd] median    max
Connect:    0       7  85.2      0   1104
Processing: 55 24956 42595.4   6277 268310
Waiting:    55 24625 42062.6   6151 268308
Total:      62 24962 42591.6   6277 268311

Percentage of the requests served within a certain time (ms)
 50%    6277
 66%   17554
 75%   32083
 80%   37706
 90%   62534
 95%  136458
 98%  169286
 99%  199581
100% 268311 (longest request)

```

- Thread Server konkurensi 20

```

Server Software:      myserver/1.0
Server Hostname:      127.0.0.1
Server Port:          46000

Document Path:        /
Document Length:      4 bytes

Concurrency Level:     20
Time taken for tests:  2141.564 seconds
Complete requests:     1000
Failed requests:       0
Non-2xx responses:     1000
Keep-Alive requests:   0
Total transferred:     122000 bytes
HTML transferred:     4000 bytes
Requests per second:   0.47 [#/sec] (mean)
Time per request:      42831.277 [ms] (mean)
Time per request:      2141.564 [ms] (mean, across all concurrent requests)
Transfer rate:         0.06 [Kbytes/sec] received

Connection Times (ms)
      min    mean[+/-sd] median    max
Connect:    0       0   0.6      0     6
Processing:  8 39398 56236.9  10162 325840
Waiting:     7 39129 55857.9  10157 323382
Total:      14 39399 56236.9  10162 325841

Percentage of the requests served within a certain time (ms)
 50%    10162
 66%   45869
 75%   54584
 80%   77938
 90%  111797
 95%  166447
 98%  205017
 99%  257786
100% 325841 (longest request)

```

- Thread Server konkurensi 50

```

Server Software:      myserver/1.0
Server Hostname:     127.0.0.1
Server Port:         46000

Document Path:       /
Document Length:     4 bytes

Concurrency Level:    50
Time taken for tests: 1515.492 seconds
Complete requests:    1000
Failed requests:      0
Non-2xx responses:    1000
Keep-Alive requests:  0
Total transferred:    122000 bytes
HTML transferred:     4000 bytes
Requests per second:  0.66 [#/sec] (mean)
Time per request:     75774.611 [ms] (mean)
Time per request:     1515.492 [ms] (mean, across all concurrent requests)
Transfer rate:        0.08 [Kbytes/sec] received

Connection Times (ms)
      min    mean[+/-sd] median    max
Connect:    0      1    2.6      0      15
Processing: 29 64513 99104.3 18923 466088
Waiting:    29 64321 98808.6 18876 464020
Total:       43 64513 99103.9 18923 466088

Percentage of the requests served within a certain time (ms)
 50% 18923
 66% 49769
 75% 78691
 80% 85683
 90% 222041
 95% 293023
 98% 418542
 99% 438536
100% 466088 (longest request)

```

- Thread Server konkurensi 100

```

Server Port:         46000

Document Path:       /
Document Length:     4 bytes

Concurrency Level:    100
Time taken for tests: 774.286 seconds
Complete requests:    1000
Failed requests:      0
Non-2xx responses:    1000
Keep-Alive requests:  0
Total transferred:    122000 bytes
HTML transferred:     4000 bytes
Requests per second:  1.29 [#/sec] (mean)
Time per request:     77428.640 [ms] (mean)
Time per request:     774.286 [ms] (mean, across all concurrent requests)
Transfer rate:        0.15 [Kbytes/sec] received

Connection Times (ms)
      min    mean[+/-sd] median    max
Connect:    0      2    5.0      0     30
Processing: 45 58865 73368.8 27253 332497
Waiting:    45 58763 73219.3 27225 332023
Total:      66 58867 73367.6 27253 332497

Percentage of the requests served within a certain time (ms)
 50% 27253
 66% 53312
 75% 79430
 80% 103583
 90% 170590
 95% 227353
 98% 290053
 99% 306751
100% 332497 (longest request)

```


5. Kesimpulan

Perbedaan waktu yang didapat antara menjalankan server async dan server thread sangat signifikan hingga 2000 detik. Server async atau asynchronous memproses jauh lebih cepat daripada server thread atau multithread.