Laporan Tugas 9

Pemrograman Jaringan

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Pemrograman Jaringan – B

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A. Soal

1. Pull update terakhir
2. Jalankan kedua model tersebut
   a. Server_async_http.py di port 45000
   b. Server_thread_http.py di port 46000
3. Ujicobalah dengan apache benchmark untuk 1000 request dan konkurensi yang bervariasi
4. Buatlah tabel untuk melaporkan hasilnya

B. Jawaban

1. Hasil Performance Test

a. Port 45000 Server_async_http.py
   Jumlah request : 1000

No test	Concurrency level	Time taken for test (seconds)	Complete request	Failed request	Total transferred (bytes)	Request per second (#/sec)	Time per request (ms)	Transfer rate (Kbytes/sec)
1	1	0.446	1000	0	122000	2244.22	0.446	267.38
2	5	0.335	1000	0	122000	2985.26	1.675	355.67
3	10	0.293	1000	0	122000	3416.88	2.927	407.09
4	25	0.293	1000	0	122000	3415.30	7.320	406.90
5	50	0.269	1000	0	122000	3718.81	13.445	443.06
6	100	0.291	1000	0	122000	3435.00	29.112	409.25
7	250	0.275	1000	0	122000	3631.83	68.836	432.70
8	500	0.284	1000	0	122000	3518.27	142.115	419.17
9	1000	0.356	1000	0	122000	2806.68	356.293	334.39

b. Port 46000 Server_thread_http.py
   Jumlah request : 1000

No test	Concurrency level	Time taken for test (seconds)	Complete request	Failed request	Total transferred (bytes)	Request per second (#/sec)	Time per request (ms)	Transfer rate (Kbytes/sec)
1	1	0.840	1000	0	122000	1190.71	0.840	141.86
2	5	1.220	1000	0	122000	819.41	6.102	97.63
3	10	1.840	1000	0	122000	543.43	18.402	64.75
4	25	14.531	1000	0	122000	68.82	363.269	8.20
5	50	4.325	1000	0	122000	231.19	216.269	27.54
6	100	1.228	1000	0	122000	814.39	122.792	97.03
7	250	1.225	1000	0	122000	816.60	306.146	97.29
8	500	4.348	1000	0	122000	229.99	2174.018	27.40
9	1000	1.010	1000	0	122000	990.59	1009.501	118.02

2. Kesimpulan

Kesimpulan yang dihasilkan dari melakukan performance test pada kedua model tersebut dengan total jumlah request 1000 adalah bahwa Server Asynchronus lebih baik dari segi waktu kecepatan testnya.

3. Screenshot

- Server Asynchronus
  1. Concurrency 1

```
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests


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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      1
Time taken for tests:   0.446 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    2244.22 [#/sec] (mean)
Time per request:       0.446 [ms] (mean)
Time per request:       0.446 [ms] (mean, across all concurrent
Transfer rate:          267.38 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median    max
Connect:        0     0    0.0      0       1
Processing:     0     0    0.9      0      28
Waiting:        0     0    0.9      0      28
Total:          0     0    0.9      0      28

Percentage of the requests served within a certain time (ms)
  50%       0
  66%       0
  75%       0
  80%       0
  90%       0
  95%       1
  98%       1
  99%       1
 100%      28 (longest request)
```

2. Concurrency 5

```
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests


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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      5
Time taken for tests:   0.335 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    2985.26 [#/sec] (mean)
Time per request:       1.675 [ms] (mean)
Time per request:       0.335 [ms] (mean, across all concurrent requ
Transfer rate:          355.67 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median    max
Connect:        0    0   0.0      0        0
Processing:     0    2   3.0      1       44
Waiting:        0    2   3.0      1       44
Total:          0    2   3.0      1       44

Percentage of the requests served within a certain time (ms)
  50%      1
  66%      1
  75%      1
  80%      1
  90%      2
  95%      2
  98%      2
  99%      8
 100%     44 (longest request)
```
3. Concurrency 10

```
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests


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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      10
Time taken for tests:   0.293 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    3416.88 [#/sec] (mean)
Time per request:       2.927 [ms] (mean)
Time per request:       0.293 [ms] (mean, across all concurren
Transfer rate:          407.09 [Kbytes/sec] received

Connection Times (ms)
              min   mean[+/-sd] median   max
Connect:        0     0    0.0      0        0
Processing:     0     2    0.4      2        4
Waiting:        0     2    0.4      2        4
Total:          1     2    0.4      2        4

Percentage of the requests served within a certain time (ms)
  50%      2
  66%      2
  75%      2
  80%      2
  90%      2
  95%      2
  98%      3
  99%      3
 100%      4 (longest request)
```
4. Concurrency 25

```
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests


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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      25
Time taken for tests:   0.293 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    3415.30 [#/sec] (mean)
Time per request:       7.320 [ms] (mean)
Time per request:       0.293 [ms] (mean, across all concurrent requests)
Transfer rate:          406.90 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median    max
Connect:        0    0   0.0      0       0
Processing:     0    2   0.6      2       8
Waiting:        0    2   0.6      2       8
Total:          0    2   0.6      2       8

Percentage of the requests served within a certain time (ms)
  50%      2
  66%      2
  75%      2
  80%      2
  90%      2
  95%      2
  98%      3
  99%      5
 100%      8 (longest request)
```

5. Concurrency 50

```
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests


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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      50
Time taken for tests:   0.269 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    3718.81 [#/sec] (mean)
Time per request:       13.445 [ms] (mean)
Time per request:       0.269 [ms] (mean, across all concurrent requests)
Transfer rate:          443.06 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    0   0.1      0       1
Processing:     0    2   0.4      2       5
Waiting:        0    2   0.4      2       5
Total:          0    2   0.4      2       5

Percentage of the requests served within a certain time (ms)
  50%      2
  66%      2
  75%      2
  80%      2
  90%      2
  95%      2
  98%      3
  99%      4
 100%      5 (longest request)
```

6. Concurrency 100

```
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests


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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      100
Time taken for tests:   0.291 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    3435.00 [#/sec] (mean)
Time per request:       29.112 [ms] (mean)
Time per request:       0.291 [ms] (mean, across all concurrent requests)
Transfer rate:          409.25 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median    max
Connect:        0    0   0.1      0        1
Processing:     0    2   0.5      2        6
Waiting:        0    2   0.5      2        6
Total:          0    2   0.5      2        6

Percentage of the requests served within a certain time (ms)
  50%      2
  66%      2
  75%      2
  80%      2
  90%      2
  95%      3
  98%      3
  99%      5
 100%      6 (longest request)
```

7. Concurrency 250

```
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests


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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      250
Time taken for tests:   0.275 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    3631.83 [#/sec] (mean)
Time per request:       68.836 [ms] (mean)
Time per request:       0.275 [ms] (mean, across all concurrent requests)
Transfer rate:          432.70 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median    max
Connect:        0    0   0.6      0        3
Processing:     0    2   1.4      2       12
Waiting:        0    2   1.4      2       12
Total:          0    2   1.8      2       13

Percentage of the requests served within a certain time (ms)
  50%      2
  66%      2
  75%      2
  80%      2
  90%      2
  95%      6
  98%     10
  99%     12
 100%     13 (longest request)
```

8. Concurrency 500

```
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests


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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      500
Time taken for tests:   0.284 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    3518.27 [#/sec] (mean)
Time per request:       142.115 [ms] (mean)
Time per request:       0.284 [ms] (mean, across all concurrent requests)
Transfer rate:          419.17 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    0   1.2      0        6
Processing:     0    2   2.6      2       19
Waiting:        0    2   2.6      2       19
Total:          1    3   3.3      2       20

Percentage of the requests served within a certain time (ms)
  50%      2
  66%      2
  75%      2
  80%      2
  90%      2
  95%     12
  98%     16
  99%     17
 100%     20 (longest request)
```

9. Concurrency 1000

```
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests


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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      1000
Time taken for tests:   0.356 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    2806.68 [#/sec] (mean)
Time per request:       356.293 [ms] (mean)
Time per request:       0.356 [ms] (mean, across all concurrent requests)
Transfer rate:          334.39 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median    max
Connect:        0    7  19.4      0       73
Processing:     0    5   8.6      2       73
Waiting:        0    5   8.4      2       37
Total:          1   13  23.3      2       83

Percentage of the requests served within a certain time (ms)
  50%      2
  66%      2
  75%      2
  80%     37
  90%     42
  95%     78
  98%     81
  99%     82
 100%     83 (longest request)
```

- Server Thread
    1. Concurrency 1

```
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests


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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      1
Time taken for tests:   0.840 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    1190.71 [#/sec] (mean)
Time per request:       0.840 [ms] (mean)
Time per request:       0.840 [ms] (mean, across all concurrent requests)
Transfer rate:          141.86 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median    max
Connect:        0    0   0.0      0       0
Processing:     0    1   3.8      1      85
Waiting:        0    1   3.2      1      85
Total:          0    1   3.8      1      85

Percentage of the requests served within a certain time (ms)
  50%      1
  66%      1
  75%      1
  80%      1
  90%      1
  95%      1
  98%      2
  99%      4
 100%     85 (longest request)
```

2. Concurrency 5

```
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests


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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      5
Time taken for tests:   1.220 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    819.41 [#/sec] (mean)
Time per request:       6.102 [ms] (mean)
Time per request:       1.220 [ms] (mean, across all concurrent requests)
Transfer rate:          97.63 [Kbytes/sec] received

Connection Times (ms)
             min  mean[+/-sd] median    max
Connect:       0    3  55.3      0     1014
Processing:    0    3   9.3      1      206
Waiting:       0    3   9.3      1      205
Total:         0    6  63.0      2     1219

Percentage of the requests served within a certain time (ms)
  50%      2
  66%      2
  75%      2
  80%      2
  90%      5
  95%      7
  98%     11
  99%     13
 100%   1219 (longest request)
```
3. Concurrency 10

```
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests


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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      10
Time taken for tests:   1.840 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    543.43 [#/sec] (mean)
Time per request:       18.402 [ms] (mean)
Time per request:       1.840 [ms] (mean, across all concurrent requests)
Transfer rate:          64.75 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median    max
Connect:        0     8  89.9       0    1031
Processing:     0     5  42.4       2     834
Waiting:        0     5  42.4       2     834
Total:          0    14 125.0       2    1839

Percentage of the requests served within a certain time (ms)
  50%      2
  66%      2
  75%      2
  80%      3
  90%      6
  95%     11
  98%     14
  99%     16
 100%   1839 (longest request)
```

4. Concurrency 25

```
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests


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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      25
Time taken for tests:   14.531 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    68.82 [#/sec] (mean)
Time per request:       363.269 [ms] (mean)
Time per request:       14.531 [ms] (mean, across all concurrent requests)
Transfer rate:          8.20 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median    max
Connect:        0    15 125.1      0    1029
Processing:     0    42 551.4      1   13501
Waiting:        0    42 551.4      1   13500
Total:          0    58 633.2      1   14529

Percentage of the requests served within a certain time (ms)
  50%      1
  66%      2
  75%      2
  80%      2
  90%      5
  95%      9
  98%     11
  99%   1447
 100%  14529 (longest request)
```

5. Concurrency 50

```
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests


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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      50
Time taken for tests:   4.325 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    231.19 [#/sec] (mean)
Time per request:       216.269 [ms] (mean)
Time per request:       4.325 [ms] (mean, across all concurrent requests)
Transfer rate:          27.54 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0   13 116.3      0    1030
Processing:     0   12 134.7      2    3296
Waiting:        0   12 134.7      1    3296
Total:          0   26 226.7      2    4324

Percentage of the requests served within a certain time (ms)
  50%      2
  66%      2
  75%      2
  80%      3
  90%      6
  95%     10
  98%     14
  99%   1232
 100%   4324 (longest request)
```

6. Concurrency 100

```
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests


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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      100
Time taken for tests:   1.228 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    814.39 [#/sec] (mean)
Time per request:       122.792 [ms] (mean)
Time per request:       1.228 [ms] (mean, across all concurrent requests)
Transfer rate:          97.03 [Kbytes/sec] received

Connection Times (ms)
            min  mean[+/-sd] median    max
Connect:        0     2   45.3      0    1021
Processing:     0     3    6.8      2     204
Waiting:        0     2    6.8      1     204
Total:          0     5   50.3      2    1225

Percentage of the requests served within a certain time (ms)
  50%      2
  66%      2
  75%      2
  80%      3
  90%      5
  95%      8
  98%     11
  99%     12
 100%   1225 (longest request)
```

7. Concurrency 250

```
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests


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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      250
Time taken for tests:   1.225 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    816.60 [#/sec] (mean)
Time per request:       306.146 [ms] (mean)
Time per request:       1.225 [ms] (mean, across all concurrent requests)
Transfer rate:          97.29 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    5   70.9      0    1020
Processing:     0    3    9.6      2     211
Waiting:        0    3    9.6      1     211
Total:          0    8   77.2      2    1212

Percentage of the requests served within a certain time (ms)
  50%      2
  66%      2
  75%      2
  80%      3
  90%      6
  95%     11
  98%     13
  99%     14
 100%   1212 (longest request)
```

8. Concurrency 500

```
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests


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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      500
Time taken for tests:   4.348 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    229.99 [#/sec] (mean)
Time per request:       2174.018 [ms] (mean)
Time per request:       4.348 [ms] (mean, across all concurrent requests)
Transfer rate:          27.40 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median    max
Connect:        0    17 131.8      0     1032
Processing:     0    15 140.9      2     3297
Waiting:        0    15 140.9      1     3297
Total:          0    33 249.4      2     4328

Percentage of the requests served within a certain time (ms)
  50%      2
  66%      2
  75%      3
  80%      4
  90%      8
  95%     13
  98%     19
  99%   1412
 100%   4328 (longest request)
```

9. Concurrency 1000

```
Completed 400 requests
Completed 500 requests
Completed 600 requests
Completed 700 requests
Completed 800 requests
Completed 900 requests
Completed 1000 requests
Finished 1000 requests


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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      1000
Time taken for tests:   1.010 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    990.59 [#/sec] (mean)
Time per request:       1009.501 [ms] (mean)
Time per request:       1.010 [ms] (mean, across all concurrent requests)
Transfer rate:          118.02 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    0   1.4      0      12
Processing:     0    3   3.4      1      21
Waiting:        0    2   3.4      1      21
Total:          0    3   4.5      1      32

Percentage of the requests served within a certain time (ms)
  50%      1
  66%      2
  75%      2
  80%      2
  90%      5
  95%     12
  98%     22
  99%     25
 100%     32 (longest request)
```