DOKUMENTASI TUGAS 9

PEMROGRAMAN JARINGAN – B

Dipersiapkan oleh :

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TUGAS 9

a. Soal

Tugas 9 :
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. Tabulasi Hasil Performance Test

- **Server Asynchronous**

No	Concurrency Level	Time Taken for Tests (seconds)	Completed Request	Failed Request	Total Transferred (bytes)	Request per second (#/s)	Time per Request (ms)	Transfer Rate (Kbytes/sec)
1	1	2.926	1000	0	122000	341.72	2.926	40.71
2	5	1.177	1000	0	122000	849.31	1.177	101.19
3	10	1.222	1000	0	122000	818.01	12.225	1.222
4	25	2.695	1000	0	122000	371.07	2.695	44.21
5	50	14.343	1000	0	122000	69.72	14.343	8.31
6	100	55.345	1000	0	122000	18.07	55.345	2.15

- **Server Thread**

No	Concurrency Level	Time Taken for Tests (seconds)	Completed Request	Failed Request	Total Transferred (bytes)	Request per second (#/s)	Time per Request (ms)	Transfer Rate (Kbytes/sec)
1	1	782.795	1000	0	122000	1.28	782.795	0.15
2	5	509.644	1000	0	122000	1.96	509.644	0.23
3	10	680.538	1000	0	122000	1.47	680.538	0.18
4	25	696.912	1000	0	122000	1.43	696.912	0.17
5	50	630.537	1000	0	122000	1.59	630.537	0.19
6	100	1417.823	1000	0	122000	0.71	1417.823	0.08

c. Kesimpulan

Kesimpulan yang bisa diambil dari kedua tabulasi di atas adalah performa yang dihasilkan oleh Server Asynchronous lebih baik dibanding performa yang dihasilkan oleh Server Thread, terutama dari sisi kecepatan tes.

d. Lampiran

- **Server Asynchronous**
  - ○ **Concurrency 1**

```
tubagus@ubuntu:~$ ab -n 1000 -c 1 http://127.0.0.1:45000/
This is ApacheBench, Version 2.3 <$Revision: 1807734 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
Licensed to The Apache Software Foundation, http://www.apache.org/

Benchmarking 127.0.0.1 (be patient)
Completed 100 requests
Completed 200 requests
Completed 300 requests
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:        127.0.0.1
Server Port:            45000

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      1
Time taken for tests:   2.926 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    341.72 [#/sec] (mean)
Time per request:       2.926 [ms] (mean)
Time per request:       2.926 [ms] (mean, across all concurrent requests)
Transfer rate:          40.71 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    0   0.1      0       2
Processing:     1    3   2.9      2      92
Waiting:        1    2   2.9      2      92
Total:          1    3   3.0      3      92
```

  - ○ **Concurrency 5**

```
tubagus@ubuntu:~$ ab -n 1000 -c 5 http://127.0.0.1:45000/
This is ApacheBench, Version 2.3 <$Revision: 1807734 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
Licensed to The Apache Software Foundation, http://www.apache.org/

Benchmarking 127.0.0.1 (be patient)
Completed 100 requests
Completed 200 requests
Completed 300 requests
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:        127.0.0.1
Server Port:            45000

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      5
Time taken for tests:   1.177 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    849.31 [#/sec] (mean)
Time per request:       5.887 [ms] (mean)
Time per request:       1.177 [ms] (mean, across all concurrent requests)
Transfer rate:          101.19 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    0   0.0      0       0
Processing:     1    6   1.7      5      14
Waiting:        1    6   1.6      5      14
Total:          2    6   1.7      5      14
```

o **Concurrency 10**

```
tubagus@ubuntu:~$ ab -n 1000 -c 10 http://127.0.0.1:45000/
This is ApacheBench, Version 2.3 <$Revision: 1807734 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
Licensed to The Apache Software Foundation, http://www.apache.org/

Benchmarking 127.0.0.1 (be patient)
Completed 100 requests
Completed 200 requests
Completed 300 requests
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:        127.0.0.1
Server Port:            45000

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      10
Time taken for tests:   1.222 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    818.01 [#/sec] (mean)
Time per request:       12.225 [ms] (mean)
Time per request:       1.222 [ms] (mean, across all concurrent requests)
Transfer rate:          97.46 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    3  55.8      0    1020
Processing:     1    8   6.3      8     202
Waiting:        1    8   6.3      8     202
Total:          2   11  59.6      8    1222
```

o **Concurrency 25**

```
tubagus@ubuntu:~$ ab -n 1000 -c 25 http://127.0.0.1:45000/
This is ApacheBench, Version 2.3 <$Revision: 1807734 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
Licensed to The Apache Software Foundation, http://www.apache.org/

Benchmarking 127.0.0.1 (be patient)
Completed 100 requests
Completed 200 requests
Completed 300 requests
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:        127.0.0.1
Server Port:            45000

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      25
Time taken for tests:   2.695 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    371.07 [#/sec] (mean)
Time per request:       67.373 [ms] (mean)
Time per request:       2.695 [ms] (mean, across all concurrent requests)
Transfer rate:          44.21 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0   19 138.3      0    1030
Processing:     1   21 115.6      7    1668
Waiting:        1   21 115.6      7    1668
Total:          1   40 239.1      7    2673
```

o **Concurrency 50**

```
tubagus@ubuntu:~$ ab -n 1000 -c 50 http://127.0.0.1:45000/
This is ApacheBench, Version 2.3 <$Revision: 1807734 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
Licensed to The Apache Software Foundation, http://www.apache.org/

Benchmarking 127.0.0.1 (be patient)
Completed 100 requests
Completed 200 requests
Completed 300 requests
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:        127.0.0.1
Server Port:            45000

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      50
Time taken for tests:   14.343 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    69.72 [#/sec] (mean)
Time per request:       717.137 [ms] (mean)
Time per request:       14.343 [ms] (mean, across all concurrent requests)
Transfer rate:          8.31 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0   44 207.8      0    1027
Processing:     2  126 934.2      7   13317
Waiting:        1  126 934.2      7   13317
Total:          2  170 1071.7      7   14341
```

o **Concurrency 100**

```
tubagus@ubuntu:~$ ab -n 1000 -c 100 http://127.0.0.1:45000/
This is ApacheBench, Version 2.3 <$Revision: 1807734 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
Licensed to The Apache Software Foundation, http://www.apache.org/

Benchmarking 127.0.0.1 (be patient)
Completed 100 requests
Completed 200 requests
Completed 300 requests
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:        127.0.0.1
Server Port:            45000

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      100
Time taken for tests:   55.345 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    18.07 [#/sec] (mean)
Time per request:       5534.471 [ms] (mean)
Time per request:       55.345 [ms] (mean, across all concurrent requests)
Transfer rate:          2.15 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0   58 234.8      0    1032
Processing:     1  546 4148.5     8   54308
Waiting:        1  546 4148.5     8   54308
Total:          2  604 4278.0     8   55331
```

- **Server Thread**
  - **Concurrency 1**

```
Benchmarking 127.0.0.1 (be patient)
Completed 100 requests
Completed 200 requests
Completed 300 requests
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:        127.0.0.1
Server Port:            46000

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      1
Time taken for tests:   782.795 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    1.28 [#/sec] (mean)
Time per request:       782.795 [ms] (mean)
Time per request:       782.795 [ms] (mean, across all concurrent requests)
Transfer rate:          0.15 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    0   0.1      0       2
Processing:     2  782 738.9     573    6005
Waiting:        2  732 708.1     531    5837
Total:          3  783 738.9     574    6005

Percentage of the requests served within a certain time (ms)
  50%    574
  66%    762
  75%    928
  80%   1061
  90%   1605
  95%   2283
  98%   3339
  99%   3866
 100%   6005 (longest request)
```

- o **Concurrency 5**

```
Benchmarking 127.0.0.1 (be patient)
Completed 100 requests
Completed 200 requests
Completed 300 requests
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:        127.0.0.1
Server Port:            46000

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      5
Time taken for tests:   509.644 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    1.96 [#/sec] (mean)
Time per request:       2548.218 [ms] (mean)
Time per request:       509.644 [ms] (mean, across all concurrent requests)
Transfer rate:          0.23 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median    max
Connect:        0   256 1205.0      0    31518
Processing:     9  2276 2048.0   1790    14822
Waiting:        7  2213 2005.7   1707    14197
Total:          9  2532 2483.7   1930    34148

Percentage of the requests served within a certain time (ms)
  50%    1930
  66%    2974
  75%    3633
  80%    4157
  90%    5492
  95%    6693
  98%    8405
  99%   10673
 100%   34148 (longest request)
```

  o **Concurrency 10**

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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      10
Time taken for tests:   680.538 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:    1.47 [#/sec] (mean)
Time per request:       6805.381 [ms] (mean)
Time per request:       680.538 [ms] (mean, across all concurrent requests)
Transfer rate:          0.18 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    1   0.3      1       4
Processing:    15 6714 9564.0   3252   56158
Waiting:       15 6628 9485.2   3214   56152
Total:         19 6714 9564.0   3253   56159

Percentage of the requests served within a certain time (ms)
  50%   3253
```

o **Concurrency 25**

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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      25
Time taken for tests:   696.912 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:    1.43 [#/sec] (mean)
Time per request:       17422.798 [ms] (mean)
Time per request:       696.912 [ms] (mean, across all concurrent requests)
Transfer rate:          0.17 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    1   1.2      0      12
Processing:    88 16635 19356.7 9635   99319
Waiting:       88 16544 19273.1 9544   98993
Total:         99 16635 19356.5 9635   99319

Percentage of the requests served within a certain time (ms)
  50%   9635
```

o **Concurrency 50**

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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      50
Time taken for tests:   630.537 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:    1.59 [#/sec] (mean)
Time per request:       31526.849 [ms] (mean)
Time per request:       630.537 [ms] (mean, across all concurrent requests)
Transfer rate:          0.19 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    1    3.2      1      22
Processing:    48 28744 33436.0  14977  141149
Waiting:       48 28660 33338.3  14908  141139
Total:         64 28746 33435.4  14977  141149

Percentage of the requests served within a certain time (ms)
  50%  14977
```

o **Concurrency 100**

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

Document Path:          /
Document Length:        4 bytes

Concurrency Level:      100
Time taken for tests:   1417.823 seconds
Complete requests:      1000
Failed requests:        0
Non-2xx responses:      1000
Total transferred:      122000 bytes
HTML transferred:       4000 bytes
Requests per second:    0.71 [#/sec] (mean)
Time per request:       141782.287 [ms] (mean)
Time per request:       1417.823 [ms] (mean, across all concurrent requests)
Transfer rate:          0.08 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    3   10.6      0      62
Processing:   260 101305 153320.2  34463  730360
Waiting:      259 101093 152976.2  34445  725951
Total:        316 101309 153318.2  34464  730361
```