

# **LAPORAN TUGAS 9**

## **PEMROGRAMAN JARINGAN**



**Kelas: Pemrograman Jaringan B**

**Disusun Oleh:**

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## Deskripsi Tugas

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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. Uji cobalah dengan apache benchmark untuk 1000 request dan konkurensi yang bervariasi
4. Buatlah tabel untuk melaporkan hasilnya

## Variasi Level Konkurensi dan Jumlah Request

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Variasi level konkurensi yang digunakan pada percobaan ini adalah 1, 10, 15, 50, 100, 200, dan 500. Sedangkan jumlah request yang digunakan adalah 1000 request.

## Performance Test

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### Server Asinkronus

Hasil benchmark testing menggunakan apache-benchmark pada <http://127.0.0.1:45000/> menggunakan server asinkronus

Platform yang digunakan:

- Windows Subsystem for Linux (Windows 10)
- WSL Distro: Ubuntu 18.04 LTS

Concurrency level	Time taken for test (sec)	Complete request	Failed request	Total transferred (bytes)	Request per second (#/sec)	Time per request (ms)	Transfer rate (Kbytes/sec)
1	3,324	1000	0	122000	300,88	3,324	35,85
10	2,844	1000	0	122000	351,65	2,844	41,90
15	3,016	1000	0	122000	331,54	3,016	39,50
50	2,946	1000	0	122000	339,41	2,946	40,44
100	3,012	1000	0	122000	332,01	3,012	39,56
200	0,855	1000	167	20374	1170,08	0,855	23,28
500	0,817	1000	226	27572	1223,29	0,817	32,94

**Note:** *Time per request* yang dicantumkan adalah mean pada semua request konkuren (*mean, across all concurent requests*)

## Server Thread

Hasil benchmark testing menggunakan apache-benchmark pada <http://127.0.0.1:46000/> menggunakan server thread

Platform yang digunakan:

- Windows Subsystem for Linux (Windows 10)
- WSL Distro: Ubuntu 18.04 LTS

Concurrency level	Time taken for test (sec)	Complete request	Failed request	Total transferred (bytes)	Request per second (#/sec)	Time per request (ms)	Transfer rate (Kbytes/sec)
1	1906,472	1000	0	122000	0,52	1906,472	0,06
10	471,406	1000	0	122000	2,12	471,406	0,25
15	475,540	1000	0	122000	2,10	475,540	0,25
50	480,935	1000	0	122000	2,08	480,935	0,25
100	461,906	1000	0	122000	2,16	461,906	0,26
200	3,522	1000	159	19398	283,93	3,522	5,38
500	1,307	1000	145	17690	765,25	1,307	13,22

**Note:** *Time per request* yang dicantumkan adalah mean pada semua request konkuren (*mean, across all concurent requests*)

## Kesimpulan

Dari hasil percobaan, dapat dilihat bahwa server yang menggunakan metode asinkronus menunjukkan performa yang lebih baik daripada server yang menggunakan thread. Hal ini dapat dilihat dari waktu running masing-masing yang jelas bahwa server asinkronus dapat memproses permintaan lebih cepat.

# Dokumentasi Hasil Percobaan

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## Server asinkronus

### Concurrency Level 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:  3.324 seconds
Complete requests:    1000
Failed requests:      0
Non-2xx responses:    1000
Total transferred:    122000 bytes
HTML transferred:     4000 bytes
Requests per second:  300.88 [#/sec] (mean)
Time per request:     3.324 [ms] (mean)
Time per request:     3.324 [ms] (mean, across all concurrent requests)
Transfer rate:        35.85 [Kbytes/sec] received
```

### Concurrency Level 10

```
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:  2.844 seconds
Complete requests:    1000
Failed requests:      0
Non-2xx responses:    1000
Total transferred:    122000 bytes
HTML transferred:     4000 bytes
Requests per second:  351.65 [#/sec] (mean)
Time per request:     28.437 [ms] (mean)
Time per request:     2.844 [ms] (mean, across all concurrent requests)
Transfer rate:        41.90 [Kbytes/sec] received
```

### Concurrency Level 15

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

Document Path:        /
Document Length:      4 bytes

Concurrency Level:    15
Time taken for tests:  3.016 seconds
Complete requests:    1000
Failed requests:      0
Non-2xx responses:    1000
Total transferred:    122000 bytes
HTML transferred:     4000 bytes
Requests per second:  331.54 [#/sec] (mean)
Time per request:     45.244 [ms] (mean)
Time per request:     3.016 [ms] (mean, across all concurrent requests)
Transfer rate:        39.50 [Kbytes/sec] received
```

### Concurrency Level 50

```
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:  2.946 seconds
Complete requests:    1000
Failed requests:      0
Non-2xx responses:    1000
Total transferred:    122000 bytes
HTML transferred:     4000 bytes
Requests per second:  339.41 [#/sec] (mean)
Time per request:     147.316 [ms] (mean)
Time per request:     2.946 [ms] (mean, across all concurrent requests)
Transfer rate:        40.44 [Kbytes/sec] received
```

### Concurrency Level 100

### Concurrency Level 200

```
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:  3.012 seconds
Complete requests:    1000
Failed requests:      0
Non-2xx responses:    1000
Total transferred:    122000 bytes
HTML transferred:     4000 bytes
Requests per second:  332.01 [#/sec] (mean)
Time per request:     301.194 [ms] (mean)
Time per request:     3.012 [ms] (mean, across all concurrent requests)
Transfer rate:        39.56 [Kbytes/sec] received
```

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

Document Path:        /
Document Length:      0 bytes

Concurrency Level:    200
Time taken for tests:  0.855 seconds
Complete requests:    1000
Failed requests:      167
                    (Connect: 0, Receive: 0, Length: 167, Exceptions: 0)
Non-2xx responses:    167
Total transferred:    20374 bytes
HTML transferred:     668 bytes
Requests per second:  1170.08 [#/sec] (mean)
Time per request:     170.928 [ms] (mean)
Time per request:     0.855 [ms] (mean, across all concurrent requests)
Transfer rate:        23.28 [Kbytes/sec] received
```

## Concurrency Level 500

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

Document Path:        /
Document Length:      0 bytes

Concurrency Level:    500
Time taken for tests:  0.817 seconds
Complete requests:    1000
Failed requests:      226
                    (Connect: 0, Receive: 0, Length: 226, Exceptions: 0)
Non-2xx responses:    226
Total transferred:    27572 bytes
HTML transferred:     904 bytes
Requests per second:  1223.29 [#/sec] (mean)
Time per request:     408.733 [ms] (mean)
Time per request:     0.817 [ms] (mean, across all concurrent requests)
Transfer rate:        32.94 [Kbytes/sec] received
```

## Server thread

### Concurrency Level 1

```
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:  1906.472 seconds
Complete requests:     1000
Failed requests:       0
Non-2xx responses:     1000
Total transferred:     122000 bytes
HTML transferred:     4000 bytes
Requests per second:   0.52 [#/sec] (mean)
Time per request:      1906.472 [ms] (mean)
Time per request:      1906.472 [ms] (mean, across all concurrent requests)
Transfer rate:         0.06 [Kbytes/sec] received
```

### Concurrency Level 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:  471.406 seconds
Complete requests:     1000
Failed requests:       0
Non-2xx responses:     1000
Total transferred:     122000 bytes
HTML transferred:     4000 bytes
Requests per second:   2.12 [#/sec] (mean)
Time per request:      4714.063 [ms] (mean)
Time per request:      471.406 [ms] (mean, across all concurrent requests)
Transfer rate:         0.25 [Kbytes/sec] received
```

### Concurrency Level 15

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

Document Path:        /
Document Length:      4 bytes

Concurrency Level:     15
Time taken for tests:  475.540 seconds
Complete requests:     1000
Failed requests:       0
Non-2xx responses:     1000
Total transferred:     122000 bytes
HTML transferred:     4000 bytes
Requests per second:   2.10 [#/sec] (mean)
Time per request:      7133.093 [ms] (mean)
Time per request:      475.540 [ms] (mean, across all concurrent requests)
Transfer rate:         0.25 [Kbytes/sec] received
```

### Concurrency Level 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:  480.935 seconds
Complete requests:     1000
Failed requests:       0
Non-2xx responses:     1000
Total transferred:     122000 bytes
HTML transferred:     4000 bytes
Requests per second:   2.08 [#/sec] (mean)
Time per request:      24046.739 [ms] (mean)
Time per request:      480.935 [ms] (mean, across all concurrent requests)
Transfer rate:         0.25 [Kbytes/sec] received
```

### Concurrency Level 100

### Concurrency Level 200

```
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:  461.906 seconds
Complete requests:     1000
Failed requests:        0
Non-2xx responses:     1000
Total transferred:     122000 bytes
HTML transferred:      4000 bytes
Requests per second:   2.16 [#/sec] (mean)
Time per request:      46190.569 [ms] (mean)
Time per request:      461.906 [ms] (mean, across all concurrent requests)
Transfer rate:          0.26 [Kbytes/sec] received
```

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

Document Path:        /
Document Length:       0 bytes

Concurrency Level:     200
Time taken for tests:  3.522 seconds
Complete requests:     1000
Failed requests:        159
    (Connect: 0, Receive: 0, Length: 159, Exceptions: 0)
Non-2xx responses:     159
Total transferred:     19398 bytes
HTML transferred:      636 bytes
Requests per second:   283.93 [#/sec] (mean)
Time per request:      704.400 [ms] (mean)
Time per request:      3.522 [ms] (mean, across all concurrent requests)
Transfer rate:          5.38 [Kbytes/sec] received
```

## Concurrency Level 500

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

Document Path:        /
Document Length:       0 bytes

Concurrency Level:     500
Time taken for tests:  1.307 seconds
Complete requests:     1000
Failed requests:        145
    (Connect: 0, Receive: 0, Length: 145, Exceptions: 0)
Non-2xx responses:     145
Total transferred:     17690 bytes
HTML transferred:      580 bytes
Requests per second:   765.25 [#/sec] (mean)
Time per request:      653.378 [ms] (mean)
Time per request:      1.307 [ms] (mean, across all concurrent requests)
Transfer rate:          13.22 [Kbytes/sec] received
```