

LAPORAN TUGAS 7

PEMROGRAMAN JARINGAN

“PERFORMANCE TEST”



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SOAL TUGAS 7

Performance test dilakukan untuk mengetahui seberapa kapasitas dari web server yang kita gunakan untuk melayani request dari client (browser, device dsb). Request dari client datang secara simultan (berbarengan) dan konkuren (datang berbarengan tidak pada saat yang bersamaan). Untuk meningkatkan layanan, kita tidak bisa memproses request satu demi satu, yang berarti satu selesai baru dilanjutkan ke yang lain. Hal ini selain menghambat layanan, juga membuat resource computing kita menjadi IDLE/ menganggur.

Untuk meningkatkan layanan, kita harus memproses layanan kita secara konkuren, artinya request tidak harus menunggu request yang lain selesai terlebih dahulu, memproses layanan secara konkuren dapat menimbulkan efek bahwa layanan dapat dilakukan secara paralel/simultan, walaupun pada kenyataannya, resource yang digunakan hanya satu. Agar dapat meningkatkan konkurensi, maka model pemrograman penggunaan thread adalah yang kita gunakan saat ini. Tapi, semakin banyak request tentu saja akan semakin banyak thread yang dibuat, konsekuensinya tentu saja semakin besar memori yang diperlukan. Tentu saja kapasitas yang dibagi, pasti akan ada batas kemampuannya. Oleh karena itu performance test dibutuhkan untuk melihat kemampuan sistem layanan yang kita berikan.

Banyak tool untuk performance test yang dapat digunakan, seperti apache-benchmark, siege dsb yang bertujuan untuk menilai performance dari web server.

PENJELASAN

Performance test sederhana, hanya bisa dilakukan di linux/unix based sebagai berikut :

1. Menggunakan apachebenchark , dengan command ab
2. Testlah server anda dengan : ab -n <jumlahrequest> -c <concurrency> <http://127.0.0.1:10001/>
3. Dengan parameter sbb:

Nomor	Jumlah request	Konkurensi
1	10	1,5,10
2	50	1,10,30,50
3	100	1,10,50,100

Concurrency melambangkan user yang mengakses secara bersamaan, concurrency berbeda dengan paralel, concurrency adalah bagaimana satu resource dibagi ke sekian banyak request yang meminta layanan

No test	Concurrency level	Time taken for test	Complete request	Failed request	Total transfer red	Request per second	Time per request	Transfer rate
1	1	10.555 seconds	10	0	1360 bytes	0.95 [#/sec]	1055.48 9 [ms]	0.13 [Kbytes/sec]
2	5	8.457 seconds	10	0	1360 bytes	1.18 [#/sec]	845.708 [ms]	0.16 [Kbytes/sec]
3	10	4.384 seconds	10	0	1360 bytes	2.20 [#/sec]	438.427 [ms]	0.30 [Kbytes/sec]

4	1	38.349 seconds	48	0	6528 bytes	1.25 [#/sec]	798.940 [ms]	0.17 [Kbytes/s ec]
5	10	14.359 seconds	15	0	2448 bytes	1.04 [#/sec]	857.258 [ms]	0.16 [Kbytes/s ec]
6	30	27.378 seconds	50	0	6800 bytes	1.83 [#/sec]	547.564 [ms]	0.16 [Kbytes/s ec]
7	50	27.532 seconds	50	0	6800 bytes	1.82 [#/sec]	550.648 [ms]	0.16 [Kbytes/s ec]
8	1	101.537 seconds	100	0	13600 bytes	0.98 [#/sec]	1015.37 2 [ms]	0.16 [Kbytes/s ec]
9	10	62.913 seconds	100	0	13600 bytes	1.53 [#/sec]	652.063 [ms]	0.16 [Kbytes/s ec]
10	50	51.442 seconds	100	0	13600 bytes	1.94 [#/sec]	514.415 [ms]	0.16 [Kbytes/s ec]
11	100	71.438 seconds	100	0	13600 bytes	1.40 [#/sec]	714.381 [ms]	0.16 [Kbytes/s ec]

4. Mencatat keluaran hasil performance test tersebut dalam bentuk tabel sebagai berikut :

✚ Berikut ini adalah hasil untuk performance test 1, 2 , 3 adalah sebagai berikut :

1. **ab -n 10 -c 1 http://127.0.0.1:10001/**

```
Command Prompt
C:\xampp\apache\bin>ab -n 10 -c 1 http://127.0.0.1:10001/
This is ApacheBench, Version 2.3 <$Revision: 1826891 $>
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).....done

Server Software:      myserver/1.0
Server Hostname:      127.0.0.1
Server Port:          10001

Document Path:        /
Document Length:      24 bytes

Concurrency Level:    1
Time taken for tests:  10.555 seconds
Complete requests:    10
Failed requests:       0
Total transferred:    1360 bytes
HTML transferred:     240 bytes
Requests per second:  0.95 [#/sec] (mean)
Time per request:     1055.489 [ms] (mean)
Time per request:     1055.489 [ms] (mean, across all concurrent requests)
Transfer rate:        0.13 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median  max
Connect:        0    0   0.4      0    1
Processing:    251 1054 502.7   1014 1786
Waiting:       243  930 443.4    881 1750
Total:         252 1055 502.4   1015 1786

Percentage of the requests served within a certain time (ms)
 50%    1015
 66%    1340
 75%    1399
 80%    1690
 90%    1786
 95%    1786
 98%    1786
 99%    1786
100%    1786 (longest request)
```

2. `ab -n 10 -c 5 http://127.0.0.1:10001/`

```
Command Prompt
C:\xampp\apache\bin>ab -n 10 -c 5 http://127.0.0.1:10001/
This is ApacheBench, Version 2.3 <$Revision: 1826891 $>
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).....done


Server Software:      myserver/1.0
Server Hostname:      127.0.0.1
Server Port:          10001

Document Path:        /
Document Length:      24 bytes

Concurrency Level:     5
Time taken for tests:   8.457 seconds
Complete requests:      10
Failed requests:         0
Total transferred:      1360 bytes
HTML transferred:       240 bytes
Requests per second:    1.18 [#/sec] (mean)
Time per request:       4228.540 [ms] (mean)
Time per request:       845.708 [ms] (mean, across all concurrent requests)
Transfer rate:          0.16 [Kbytes/sec] received


Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0   501 527.7    501   1503
Processing:    1044 2288 1154.7   2504   4130
Waiting:       1001 1897 1033.9   2003   4008
Total:         1101 2789 1081.7   3006   4131


Percentage of the requests served within a certain time (ms)
 50%    3006
 66%    3008
 75%    4008
 80%    4008
 90%    4131
 95%    4131
 98%    4131
 99%    4131
100%    4131 (longest request)
```

3. **ab -n 10 -c 10 http://127.0.0.1:10001/**

```
Command Prompt
C:\xampp\apache\bin>ab -n 10 -c 10 http://127.0.0.1:10001/
This is ApacheBench, Version 2.3 <$Revision: 1826891 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
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Benchmarking 127.0.0.1 (be patient).....done

Server Software:      myserver/1.0
Server Hostname:      127.0.0.1
Server Port:          10001

Document Path:        /
Document Length:      24 bytes

Concurrency Level:    10
Time taken for tests:  4.384 seconds
Complete requests:    10
Failed requests:       0
Total transferred:    1360 bytes
HTML transferred:     240 bytes
Requests per second:  2.28 [#/sec] (mean)
Time per request:     4384.270 [ms] (mean)
Time per request:     438.427 [ms] (mean, across all concurrent requests)
Transfer rate:        0.30 [Kbytes/sec] received

Connection Times (ms)
      min   mean[+/-sd] median   max
Connect:    0   251 264.0     500     503
Processing: 1005 1876 651.5    1926    2957
Waiting:    448 1588 662.7    1747    2509
Total:      1052 2126 565.0    2415    2958

Percentage of the requests served within a certain time (ms)
 50%    2415
 66%    2508
 75%    2509
 80%    2509
 90%    2958
 95%    2958
 98%    2958
 99%    2958
100%    2958 (longest request)
```

4. **ab -n 50 -c 1 http://127.0.0.1:10001/**

```
Command Prompt - ab -n 50 -c 1 http://127.0.0.1:10001/
C:\xampp\apache\bin>ab -n 50 -c 1 http://127.0.0.1:10001/
This is ApacheBench, Version 2.3 <$Revision: 1826891 $>
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)...
```

Server Software:	myserver/1.0
Server Hostname:	127.0.0.1
Server Port:	10001
Document Path:	/
Document Length:	24 bytes
Concurrency Level:	1
Time taken for tests:	38.349 seconds
Complete requests:	48
Failed requests:	0
Total transferred:	6528 bytes
HTML transferred:	1152 bytes
Requests per second:	1.25 [#/sec] (mean)
Time per request:	798.940 [ms] (mean)
Time per request:	798.940 [ms] (mean, across all concurrent requests)
Transfer rate:	0.17 [Kbytes/sec] received

```
Connection Times (ms)
      min  mean[+/-sd] median  max
Connect:    0     0   0.4      0    1
Processing: 66   775 510.3    705  2751
Waiting:    66   657 448.3    633  2234
Total:      66   776 510.2    705  2751

Percentage of the requests served within a certain time (ms)
 50%    705
 66%    860
 75%   1098
 80%   1219
 90%   1458
 95%   1574
 98%   2751
 99%   2751
100%   2751 (longest request)
```


5. **ab -n 50 -c 10 http://127.0.0.1:10001/**

```
Command Prompt
C:\xampp\apache\bin>ab -n 50 -c 10 http://127.0.0.1:10001/
This is ApacheBench, Version 2.3 <$Revision: 1826891 $>
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)...

Server Software:      myserver/1.0
Server Hostname:      127.0.0.1
Server Port:          10001

Document Path:        /
Document Length:      24 bytes

Concurrency Level:     10
Time taken for tests:  14.359 seconds
Complete requests:     15
Failed requests:        0
Total transferred:     2448 bytes
HTML transferred:      432 bytes
Requests per second:   1.04 [#/sec] (mean)
Time per request:      9572.575 [ms] (mean)
Time per request:      957.258 [ms] (mean, across all concurrent requests)
Transfer rate:          0.17 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0   501 567.6    500   1503
Processing:    4392 5471 731.5   5511   7015
Waiting:        384 4468 1357.1   4760   6013
Total:         4393 5972 968.2   6013   7515

Percentage of the requests served within a certain time (ms)
 50%    6013
 66%    6015
 75%    7013
 80%    7014
 90%    7515
 95%    7515
 98%    7515
 99%    7515
100%    7515 (longest request)
```

6. `ab -n 50 -c 10 http://127.0.0.1:10001/`

```
Command Prompt
C:\xampp\apache\bin>ab -n 50 -c 30 http://127.0.0.1:10001/
This is ApacheBench, Version 2.3 <$Revision: 1826891 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
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Benchmarking 127.0.0.1 (be patient).....done

Server Software:      myserver/1.0
Server Hostname:      127.0.0.1
Server Port:          10001

Document Path:        /
Document Length:      24 bytes

Concurrency Level:    30
Time taken for tests:  27.378 seconds
Complete requests:    50
Failed requests:       0
Total transferred:    6800 bytes
HTML transferred:     1200 bytes
Requests per second:  1.83 [#/sec] (mean)
Time per request:     16426.934 [ms] (mean)
Time per request:     547.564 [ms] (mean, across all concurrent requests)
Transfer rate:        0.24 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0   481 452.0    501   1504
Processing:    763 10318 5020.8  12031  16042
Waiting:       683  7122 4034.0   7523  14041
Total:         763 10799 5004.0  13034  16543

Percentage of the requests served within a certain time (ms)
 50%  13034
 66%  14540
 75%  15042
 80%  15043
 90%  16042
 95%  16043
 98%  16543
 99%  16543
100% 16543 (longest request)
```

7. `ab -n 50 -c 50 http://127.0.0.1:10001/`

```
Command Prompt
C:\xampp\apache\bin>ab -n 50 -c 50 http://127.0.0.1:10001/
This is ApacheBench, Version 2.3 <$Revision: 1826891 $>
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).....done


Server Software:      myserver/1.0
Server Hostname:      127.0.0.1
Server Port:          10001

Document Path:        /
Document Length:      24 bytes

Concurrency Level:    50
Time taken for tests:  27.532 seconds
Complete requests:    50
Failed requests:       0
Total transferred:    6800 bytes
HTML transferred:     1200 bytes
Requests per second:  1.82 [#/sec] (mean)
Time per request:     27532.387 [ms] (mean)
Time per request:     550.648 [ms] (mean, across all concurrent requests)
Transfer rate:        0.24 [Kbytes/sec] received


Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0   461 415.2    501   2004
Processing:    2787 12287 6506.4  12545  23790
Waiting:        716 11809 6511.6  12039  23073
Total:         3136 12748 6455.5  13547  23790


Percentage of the requests served within a certain time (ms)
 50%  13547
 66%  16553
 75%  17558
 80%  19065
 90%  22573
 95%  23075
 98%  23790
 99%  23790
100%  23790 (longest request)
```

8. `ab -n 100 -c 1 http://127.0.0.1:10001/`

```
Command Prompt
C:\xampp\apache\bin>ab -n 100 -c 1 http://127.0.0.1:10001/
This is ApacheBench, Version 2.3 <$Revision: 1826891 $>
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).....done

Server Software:      myserver/1.0
Server Hostname:      127.0.0.1
Server Port:          10001

Document Path:        /
Document Length:      24 bytes

Concurrency Level:    1
Time taken for tests:  101.537 seconds
Complete requests:    100
Failed requests:       0
Total transferred:    13600 bytes
HTML transferred:     2400 bytes
Requests per second:  0.98 [#/sec] (mean)
Time per request:     1015.372 [ms] (mean)
Time per request:     1015.372 [ms] (mean, across all concurrent requests)
Transfer rate:        0.13 [Kbytes/sec] received

Connection Times (ms)
              min    mean[+/-sd] median    max
Connect:      0      0    0.4      0      1
Processing:   40 1015 474.0    975   2402
Waiting:      30  901 428.5    866   2106
Total:        40 1015 474.0    975   2402

Percentage of the requests served within a certain time (ms)
 50%    975
 66%   1195
 75%   1355
 80%   1454
 90%   1656
 95%   1930
 98%   2263
 99%   2402
100%   2402 (longest request)
```

9. `ab -n 100 -c 1 http://127.0.0.1:10001/`

```
Command Prompt
C:\xampp\apache\bin>ab -n 100 -c 10 http://127.0.0.1:10001/
This is ApacheBench, Version 2.3 <$Revision: 1826891 $>
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).....done

Server Software:      myserver/1.0
Server Hostname:      127.0.0.1
Server Port:          10001

Document Path:        /
Document Length:      24 bytes

Concurrency Level:    10
Time taken for tests:  65.206 seconds
Complete requests:    100
Failed requests:       1
  (Connect: 1, Receive: 0, Length: 0, Exceptions: 0)
Total transferred:    13600 bytes
HTML transferred:     2400 bytes
Requests per second:  1.53 [#/sec] (mean)
Time per request:     6520.627 [ms] (mean)
Time per request:     652.063 [ms] (mean, across all concurrent requests)
Transfer rate:        0.20 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0   601 433.1    501   2004
Processing:    2005 5647 1673.6   5516   8525
Waiting:        213 4056 1720.6   4011   8020
Total:          2005 6249 1790.8   6516   9026

Percentage of the requests served within a certain time (ms)
 50%    6516
 66%    7516
 75%    7524
 80%    8017
 90%    8518
 95%    8525
 98%    9025
 99%    9026
```

10. `ab -n 100 -c 50 http://127.0.0.1:10001/`

```
Command Prompt
C:\xampp\apache\bin>ab -n 100 -c 50 http://127.0.0.1:10001/
This is ApacheBench, Version 2.3 <$Revision: 1826891 $>
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).....done


Server Software:      myserver/1.0
Server Hostname:      127.0.0.1
Server Port:          10001

Document Path:        /
Document Length:      24 bytes

Concurrency Level:     50
Time taken for tests:   51.442 seconds
Complete requests:     100
Failed requests:        1
  (Connect: 1, Receive: 0, Length: 0, Exceptions: 0)
Total transferred:     13600 bytes
HTML transferred:      2400 bytes
Requests per second:    1.94 [#/sec] (mean)
Time per request:       25720.763 [ms] (mean)
Time per request:       514.415 [ms] (mean, across all concurrent requests)
Transfer rate:          0.26 [Kbytes/sec] received


Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0   466  416.6    501   2001
Processing:    1232 18050 7373.8   20549  27081
Waiting:        501 11601 8262.0   10025   26578
Total:         1733 18516 7290.4   21057  27081


Percentage of the requests served within a certain time (ms)
 50%   21057
 66%   22059
 75%   23566
 80%   24575
 90%   25579
 95%   26580
 98%   27080
 99%   27081
```

11. `ab -n 100 -c 100 http://127.0.0.1:10001/`

```
Command Prompt
C:\xampp\apache\bin>ab -n 100 -c 100 http://127.0.0.1:10001/
This is ApacheBench, Version 2.3 <$Revision: 1826891 $>
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).....done


Server Software:      myserver/1.0
Server Hostname:      127.0.0.1
Server Port:          10001

Document Path:        /
Document Length:      24 bytes

Concurrency Level:    100
Time taken for tests:  71.438 seconds
Complete requests:    100
Failed requests:       0
Total transferred:    13600 bytes
HTML transferred:     2400 bytes
Requests per second:  1.40 [#/sec] (mean)
Time per request:     71438.132 [ms] (mean)
Time per request:     714.381 [ms] (mean, across all concurrent requests)
Transfer rate:        0.19 [Kbytes/sec] received


Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0   687 454.0    502   2006
Processing:    2117 35571 20508.7  35618  69320
Waiting:        621 34873 20524.9  34609  68699
Total:         3121 36258 20458.9  36621  69321


Percentage of the requests served within a certain time (ms)
 50%   36621
 66%   48152
 75%   54668
 80%   58174
 90%   65692
 95%   67699
 98%   68702
 99%   69321
100%   69321 (longest request)
```