Nama : Fiodhy Ardito Narawangsa

NRP : 05111940000218

Kelas : Progjar D

Tugas 2 Individu

Progjar5 merupakan implementasi sederhana dari protokol HTTP 1.0 (RFC 2616). Metode yang diimplementasikan adalah GET dan POST

- File http.py merupakan implementasi http server
- File server_thread_http.py merupakan implementasi servernya, dijalankan di port 8889

Pendahuluan:
- Jalankan environment lab (progjar/environment at master · rm77/progjar (github.com))
- Jalankan server_thread.py pada server 16.101
- Dengan menggunakan browser akseslah alamat
  - http://172.16.16.101:8889/
  - http://172.16.16.101:8889/rfc2616.pdf
  - http://172.16.16.101:8889/testing.txt
  - http://172.16.16.101:8889/pokijan.jpg

- Install apache-benchmark (ab) di console shell **172.16.16.102**
  - #sudo bash
  - #apt update -y && apt install -y apache2-utils
  - Jalankan perintah ab
    - Ab merupakan apache-benchmark, tool untuk melakukan performance test pada web server

Tugas

Input parameter				hasil						
Jumlah request	Concurency level	url	Tipe media	Complete requests	Failed requests	Time per request	Transfer rate	Connect time (mean)	Processing time (mean)	Waiting time (mean)
10	1	http://172.16.16.102:8887/testing.txt	txt	10	0	10.85	14.31	0	11	10
50	1	http://172.16.16.102:8887/testing.txt	txt	50	0	61.752	2.51	0	62	60
100	1	http://172.16.16.102:8887/testing.txt	txt	100	0	184.769	0.84	0	185	181
500	1	http://172.16.16.102:8887/testing.txt	txt	500	0	616.355	0.25	0	616	599
10	10	http://172.16.16.102:8887/testing.txt	txt	10	0	307.351	0.51	523	1099	1074
50	10	http://172.16.16.102:8887/testing.txt	txt	50	0	236.791	0.66	418	1482	1446
100	10	http://172.16.16.102:8887/testing.txt	txt	100	0	247.799	0.63	583	1669	1634
500	10	http://172.16.16.102:8887/testing.txt	txt	500	0	293.103	0.53	730	2135	2094
10	1	pokijan.jpg	jpg	10	0	1325.335	11.68	0	1325	1272
50	1	pokijan.jpg	jpg	50	0	1480.252	10.45	0	1480	1448
100	1	pokijan.jpg	jpg	100	0	1692.278	9.14	0	1692	1649
500	1	pokijan.jpg	jpg	500	0	1914.17	8.08	0	1914	1857
10	10	pokijan.jpg	jpg	10	0	693.822	22.3	601	2773	2695
50	10	pokijan.jpg	jpg	50	0	635.037	24.37	773	4607	4517
100	10	pokijan.jpg	jpg	100	0	578.173	26.76	1175	4125	4047
500	10	pokijan.jpg	jpg	500	0	618.831	25.01	1554	4424	4341
10	1	rfc2616.pdf	pdf	10	0	3526.731	152.49	0	3526	3452
50	1	rfc2616.pdf	pdf	50	0	3342.495	160.9	0	3342	3236
100	1	rfc2616.pdf	pdf	100	0	3134.844	171.56	0	3135	3003
500	1	rfc2616.pdf	pdf	500	0	3687.005	145.86	0	3687	3552
500	10	rfc2616.pdf	pdf	10	0	2949.524	182.33	626	10782	10606
500	10	rfc2616.pdf	pdf	50	0	1902.034	282.75	2466	13483	13313
500	10	rfc2616.pdf	pdf	100	0	1712.023	314.13	3000	12181	12020
500	10	rfc2616.pdf	pdf	227	273	OVERLOAD	OVERLOAD	OVERLOAD	OVERLOAD	OVERLOAD

Dari tabel metrik diatas, terlihat bahwa semakin besar jumlah request maka semakin besar pula total time nya. Hal tersebut juga dapat dioptimasi dengan menambah jumlah konkurensi. Pada jumlah request dibawah 100, dengan menaikkan jumlah konkurensi, maka dapat memperkecil total time. Namun pada jumlah request diatas 100, menaikkan jumlah konkurensi tidak dapat menghasilkan perubahan yang berarti. Tipe media tidak berpengaruh pada request time, namun panjang dari data itu lah yang mempengaruhi total time. Namun pada kasus nyata, tipe txt biasanya memiliki panjang data yang lebih kecil daripada jpg, begitu juga jpg lebih kecil daripada pdf. Sehingga pada pengukuran diatas rata-rata total time menghasilkan txt yang paling cepat, disusul jpg, lalu pdf

Solusi Overload

Untuk mengatasi OVERLOAD adalah dengan mendisable logging pada server. Sehingga penggunaan resources pada server akan berkurang dan akan lebih berfokus untuk melayani request dari client. Pada kasus ini logging menghambat waktu proses pada server, atau lebih sering dikenal dengan I/O Bottleneck.

File tipe txt dengan Konkurensi = 1

```
(base) jovyan@24499f95f184:~$ ab -n 10 -c 1 http://172.16.16.102:8887/testing.txt
This is ApacheBench, Version 2.3 <$Revision: 1843412 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
Licensed to The Apache Software Foundation, http://www.apache.org/

Benchmarking 172.16.16.102 (be patient).....done


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /testing.txt
Document Length:        22 bytes

Concurrency Level:      1
Time taken for tests:   0.109 seconds
Complete requests:      10
Failed requests:        0
Total transferred:      1590 bytes
HTML transferred:       220 bytes
Requests per second:    92.16 [#/sec] (mean)
Time per request:       10.850 [ms] (mean)
Time per request:       10.850 [ms] (mean, across all concurrent requests)
Transfer rate:          14.31 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    0   0.0      0       0
Processing:     1   11   6.6     15      18
Waiting:        1   10   6.6     14      18
Total:          1   11   6.6     15      18
```

```
(base) jovyan@24499f95f184:~$ ab -n 50 -c 1 http://172.16.16.102:8887/testing.txt
This is ApacheBench, Version 2.3 <$Revision: 1843412 $>
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Benchmarking 172.16.16.102 (be patient).....done


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /testing.txt
Document Length:        22 bytes

Concurrency Level:      1
Time taken for tests:   3.088 seconds
Complete requests:      50
Failed requests:        0
Total transferred:      7950 bytes
HTML transferred:       1100 bytes
Requests per second:    16.19 [#/sec] (mean)
Time per request:       61.752 [ms] (mean)
Time per request:       61.752 [ms] (mean, across all concurrent requests)
Transfer rate:          2.51 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    0   0.0      0       0
Processing:    21   62  26.2     61     111
Waiting:       20   60  25.8     59     108
Total:         21   62  26.2     61     111
```

```
(base) jovyan@24499f95f184:~$ ab -n 100 -c 1 http://172.16.16.102:8887/testing.txt
This is ApacheBench, Version 2.3 <$Revision: 1843412 $>
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Benchmarking 172.16.16.102 (be patient).....done


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /testing.txt
Document Length:        22 bytes

Concurrency Level:      1
Time taken for tests:   18.477 seconds
Complete requests:      100
Failed requests:        0
Total transferred:      15900 bytes
HTML transferred:       2200 bytes
Requests per second:    5.41 [#/sec] (mean)
Time per request:       184.769 [ms] (mean)
Time per request:       184.769 [ms] (mean, across all concurrent requests)
Transfer rate:          0.84 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    0   0.0      0       0
Processing:   100  185  54.2    185     355
Waiting:      100  181  53.3    177     350
Total:        100  185  54.2    185     355
```

```
(base) jovyan@24499f95f184:~$ ab -n 500 -c 1 http://172.16.16.102:8887/testing.txt
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Benchmarking 172.16.16.102 (be patient)
Completed 100 requests
Completed 200 requests
Completed 300 requests
Completed 400 requests
Completed 500 requests
Finished 500 requests


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /testing.txt
Document Length:        22 bytes

Concurrency Level:      1
Time taken for tests:   308.178 seconds
Complete requests:      500
Failed requests:        0
Total transferred:      79500 bytes
HTML transferred:       11000 bytes
Requests per second:    1.62 [#/sec] (mean)
Time per request:       616.355 [ms] (mean)
Time per request:       616.355 [ms] (mean, across all concurrent requests)
Transfer rate:          0.25 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    0   0.0      0       1
Processing:   165  616 292.3    553    1519
Waiting:      155  599 288.6    537    1493
Total:        165  616 292.3    553    1519
```

File tipe txt dengan konkurensi = 10

```
(base) jovyan@24499f95f184:~$ ab -n 50 -c 10 http://172.16.16.102:8887/testing.txt
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Benchmarking 172.16.16.102 (be patient).....done


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /testing.txt
Document Length:        22 bytes

Concurrency Level:      10
Time taken for tests:   11.840 seconds
Complete requests:      50
Failed requests:        0
Total transferred:      7950 bytes
HTML transferred:       1100 bytes
Requests per second:    4.22 [#/sec] (mean)
Time per request:       2367.907 [ms] (mean)
Time per request:       236.791 [ms] (mean, across all concurrent requests)
Transfer rate:          0.66 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0  418 633.9      0    3147
Processing:   474 1482 1150.9   1350    8431
Waiting:      464 1446 1155.3   1300    8420
Total:        475 1900 1467.2   1669    9494
```

```
(base) jovyan@24499f95f184:~$ ab -n 10 -c 10 http://172.16.16.102:8887/testing.txt
This is ApacheBench, Version 2.3 <$Revision: 1843412 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
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Benchmarking 172.16.16.102 (be patient).....done


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /testing.txt
Document Length:        22 bytes

Concurrency Level:      10
Time taken for tests:   3.074 seconds
Complete requests:      10
Failed requests:        0
Total transferred:      1590 bytes
HTML transferred:       220 bytes
Requests per second:    3.25 [#/sec] (mean)
Time per request:       3073.510 [ms] (mean)
Time per request:       307.351 [ms] (mean, across all concurrent requests)
Transfer rate:          0.51 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0  523 550.8   1045    1045
Processing:   631 1099 397.9   1099    1945
Waiting:      626 1074 405.4   1028    1940
Total:        696 1622 545.3   1867    2260
```

```
(base) jovyan@24499f95f184:~$ ab -n 100 -c 10 http://172.16.16.102:8887/testing.txt
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Benchmarking 172.16.16.102 (be patient).....done


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /testing.txt
Document Length:        22 bytes

Concurrency Level:      10
Time taken for tests:   24.780 seconds
Complete requests:      100
Failed requests:        0
Total transferred:      15900 bytes
HTML transferred:       2200 bytes
Requests per second:    4.04 [#/sec] (mean)
Time per request:       2477.994 [ms] (mean)
Time per request:       247.799 [ms] (mean, across all concurrent requests)
Transfer rate:          0.63 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0  583 928.2      0    3159
Processing:   372 1669 541.8   1683    3039
Waiting:      362 1634 532.2   1637    2983
Total:        372 2253 1102.7   2007    5463
```

```
(base) jovyan@24499f95f184:~$ ab -n 500 -c 10 http://172.16.16.102:8887/testing.txt
This is ApacheBench, Version 2.3 <$Revision: 1843412 $>
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Benchmarking 172.16.16.102 (be patient)
Completed 100 requests
Completed 200 requests
Completed 300 requests
Completed 400 requests
Completed 500 requests
Finished 500 requests


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /testing.txt
Document Length:        22 bytes

Concurrency Level:      10
Time taken for tests:   146.551 seconds
Complete requests:      500
Failed requests:        0
Total transferred:      79500 bytes
HTML transferred:       11000 bytes
Requests per second:    3.41 [#/sec] (mean)
Time per request:       2931.029 [ms] (mean)
Time per request:       293.103 [ms] (mean, across all concurrent requests)
Transfer rate:          0.53 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0  730 1434.2      0   15586
Processing:   674 2135 616.4   2126    4068
Waiting:      670 2094 611.8   2079    4067
Total:        674 2864 1593.6   2542   18428
```

File tipe jpg dengan konkurensi = 1

```
(base) jovyan@24499f95f184:~$ ab -n 10 -c 1 http://172.16.16.102:8887/pokijan.jpg
This is ApacheBench, Version 2.3 <$Revision: 1843412 $>
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Benchmarking 172.16.16.102 (be patient).....done


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /pokijan.jpg
Document Length:        15706 bytes

Concurrency Level:      1
Time taken for tests:   13.253 seconds
Complete requests:      10
Failed requests:        0
Total transferred:      158460 bytes
HTML transferred:       157060 bytes
Requests per second:    0.75 [#/sec] (mean)
Time per request:       1325.335 [ms] (mean)
Time per request:       1325.335 [ms] (mean, across all concurrent requests)
Transfer rate:          11.68 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    0   0.1      0       0
Processing:   994 1325 271.6   1380    1655
Waiting:      955 1272 274.3   1295    1610
Total:        994 1325 271.6   1380    1656
```

```
(base) jovyan@24499f95f184:~$ ab -n 50 -c 1 http://172.16.16.102:8887/pokijan.jpg
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Benchmarking 172.16.16.102 (be patient).....done


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /pokijan.jpg
Document Length:        15706 bytes

Concurrency Level:      1
Time taken for tests:   74.013 seconds
Complete requests:      50
Failed requests:        0
Total transferred:      792300 bytes
HTML transferred:       785300 bytes
Requests per second:    0.68 [#/sec] (mean)
Time per request:       1480.252 [ms] (mean)
Time per request:       1480.252 [ms] (mean, across all concurrent requests)
Transfer rate:          10.45 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    0   0.0      0       0
Processing:   403 1480 589.9   1525    2701
Waiting:      371 1448 581.1   1475    2645
Total:        403 1480 589.9   1525    2701
```

```
(base) jovyan@24499f95f184:~$ ab -n 100 -c 1 http://172.16.16.102:8887/pokijan.jpg
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Benchmarking 172.16.16.102 (be patient).....done


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /pokijan.jpg
Document Length:        15706 bytes

Concurrency Level:      1
Time taken for tests:   169.228 seconds
Complete requests:      100
Failed requests:        0
Total transferred:      1584600 bytes
HTML transferred:       1570600 bytes
Requests per second:    0.59 [#/sec] (mean)
Time per request:       1692.278 [ms] (mean)
Time per request:       1692.278 [ms] (mean, across all concurrent requests)
Transfer rate:          9.14 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    0   0.0      0       0
Processing:   361 1692 526.6   1676    3013
Waiting:      356 1649 515.9   1585    3008
Total:        361 1692 526.6   1676    3013
```

```
(base) jovyan@24499f95f184:~$ ab -n 500 -c 1 http://172.16.16.102:8887/pokijan.jpg
This is ApacheBench, Version 2.3 <$Revision: 1843412 $>
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Benchmarking 172.16.16.102 (be patient)
Completed 100 requests
Completed 200 requests
Completed 300 requests
Completed 400 requests
Completed 500 requests
Finished 500 requests


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /pokijan.jpg
Document Length:        15706 bytes

Concurrency Level:      1
Time taken for tests:   957.085 seconds
Complete requests:      500
Failed requests:        0
Total transferred:      7923000 bytes
HTML transferred:       7853000 bytes
Requests per second:    0.52 [#/sec] (mean)
Time per request:       1914.170 [ms] (mean)
Time per request:       1914.170 [ms] (mean, across all concurrent requests)
Transfer rate:          8.08 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    0   0.0      0       0
Processing:   408 1914 573.6   1879    4449
Waiting:      402 1857 569.5   1835    4396
Total:        408 1914 573.6   1879    4449
```

File tipe jpg dengan konkurensi = 10

```
(base) jovyan@24499f95f184:~$ ab -n 10 -c 10 http://172.16.16.102:8887/pokijan.jpg
This is ApacheBench, Version 2.3 <$Revision: 1843412 $>
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Benchmarking 172.16.16.102 (be patient).....done


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /pokijan.jpg
Document Length:        15706 bytes

Concurrency Level:      10
Time taken for tests:   6.938 seconds
Complete requests:      10
Failed requests:        0
Total transferred:      158460 bytes
HTML transferred:       157060 bytes
Requests per second:    1.44 [#/sec] (mean)
Time per request:       6938.222 [ms] (mean)
Time per request:       693.822 [ms] (mean, across all concurrent requests)
Transfer rate:          22.30 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0  601 516.9   1001    1001
Processing:  1409 2773 1050.0  2851    4528
Waiting:     1408 2695 1050.5  2655    4507
Total:       1409 3374 1424.3  3254    5529
```

```
(base) jovyan@24499f95f184:~$ ab -n 50 -c 10 http://172.16.16.102:8887/pokijan.jpg
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Benchmarking 172.16.16.102 (be patient).....done


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /pokijan.jpg
Document Length:        15706 bytes

Concurrency Level:      10
Time taken for tests:   31.752 seconds
Complete requests:      50
Failed requests:        0
Total transferred:      792300 bytes
HTML transferred:       785300 bytes
Requests per second:    1.57 [#/sec] (mean)
Time per request:       6350.368 [ms] (mean)
Time per request:       635.037 [ms] (mean, across all concurrent requests)
Transfer rate:          24.37 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0  773 1007.1  1008    3160
Processing:  1975 4607 3608.7  3848   28373
Waiting:     1851 4517 3624.4  3793   28363
Total:       1976 5380 3810.5  4759   29419
```

```
(base) jovyan@24499f95f184:~$ ab -n 100 -c 10 http://172.16.16.102:8887/pokijan.jpg
This is ApacheBench, Version 2.3 <$Revision: 1843412 $>
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Benchmarking 172.16.16.102 (be patient).....done


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /pokijan.jpg
Document Length:        15706 bytes

Concurrency Level:      10
Time taken for tests:   57.817 seconds
Complete requests:      100
Failed requests:        0
Total transferred:      1584600 bytes
HTML transferred:       1570600 bytes
Requests per second:    1.73 [#/sec] (mean)
Time per request:       5781.727 [ms] (mean)
Time per request:       578.173 [ms] (mean, across all concurrent requests)
Transfer rate:          26.76 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0 1175 2189.7     0   15624
Processing:  2028 4125 1095.8  3999    7597
Waiting:     1900 4047 1084.9  3898    7582
Total:       2029 5299 2628.6  4620   21151
```

```
(base) jovyan@24499f95f184:~$ ab -n 500 -c 10 http://172.16.16.102:8887/pokijan.jpg
This is ApacheBench, Version 2.3 <$Revision: 1843412 $>
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Benchmarking 172.16.16.102 (be patient)
Completed 100 requests
Completed 200 requests
Completed 300 requests
Completed 400 requests
Completed 500 requests
Finished 500 requests

Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /pokijan.jpg
Document Length:        15706 bytes

Concurrency Level:      10
Time taken for tests:   309.416 seconds
Complete requests:      500
Failed requests:        0
Total transferred:      7923000 bytes
HTML transferred:       7853000 bytes
Requests per second:    1.62 [#/sec] (mean)
Time per request:       6188.311 [ms] (mean)
Time per request:       618.831 [ms] (mean, across all concurrent requests)
Transfer rate:          25.01 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0 1554 4051.8     0   32409
Processing:  1329 4424 1187.7  4326   10318
Waiting:     1283 4341 1177.8  4229   10063
Total:       1826 5977 4215.6  5049   38393
```

File tipe pdf dengan konkurensi = 1

```
(base) jovyan@24499f95f184:~$ ab -n 10 -c 1 http://172.16.16.102:8887/rfc2616.pdf
This is ApacheBench, Version 2.3 <$Revision: 1843412 $>
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Benchmarking 172.16.16.102 (be patient).....done


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /rfc2616.pdf
Document Length:        550562 bytes

Concurrency Level:      1
Time taken for tests:   35.267 seconds
Complete requests:      10
Failed requests:        0
Total transferred:      5507080 bytes
HTML transferred:       5505620 bytes
Requests per second:    0.28 [#/sec] (mean)
Time per request:       3526.731 [ms] (mean)
Time per request:       3526.731 [ms] (mean, across all concurrent requests)
Transfer rate:          152.49 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    0   0.1      0       0
Processing:  2775 3526 540.7   3542    4334
Waiting:     2763 3452 525.6   3466    4323
Total:       2775 3527 540.7   3542    4334
```

```
(base) jovyan@24499f95f184:~$ ab -n 50 -c 1 http://172.16.16.102:8887/rfc2616.pdf
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Benchmarking 172.16.16.102 (be patient).....done


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /rfc2616.pdf
Document Length:        550562 bytes

Concurrency Level:      1
Time taken for tests:   167.125 seconds
Complete requests:      50
Failed requests:        0
Total transferred:      27535400 bytes
HTML transferred:       27528100 bytes
Requests per second:    0.30 [#/sec] (mean)
Time per request:       3342.495 [ms] (mean)
Time per request:       3342.495 [ms] (mean, across all concurrent requests)
Transfer rate:          160.90 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    0   0.1      0       1
Processing:  2186 3342 792.1   3253    5818
Waiting:     2108 3236 805.7   3141    5790
Total:       2186 3342 792.1   3253    5818
```

```
(base) jovyan@24499f95f184:~$ ab -n 100 -c 1 http://172.16.16.102:8887/rfc2616.pdf
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Benchmarking 172.16.16.102 (be patient).....done


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /rfc2616.pdf
Document Length:        550562 bytes

Concurrency Level:      1
Time taken for tests:   313.484 seconds
Complete requests:      100
Failed requests:        0
Total transferred:      55070800 bytes
HTML transferred:       55056200 bytes
Requests per second:    0.32 [#/sec] (mean)
Time per request:       3134.844 [ms] (mean)
Time per request:       3134.844 [ms] (mean, across all concurrent requests)
Transfer rate:          171.56 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    0   0.0      0       0
Processing:  1877 3135 916.9   2981    8274
Waiting:     1849 3003 882.6   2865    7827
Total:       1877 3135 916.9   2981    8274
```

```
(base) jovyan@24499f95f184:~$ ab -n 500 -c 1 http://172.16.16.102:8887/rfc2616.pdf
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Benchmarking 172.16.16.102 (be patient)
Completed 100 requests
Completed 200 requests
Completed 300 requests
Completed 400 requests
Completed 500 requests
Finished 500 requests


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /rfc2616.pdf
Document Length:        550562 bytes

Concurrency Level:      1
Time taken for tests:   1843.503 seconds
Complete requests:      500
Failed requests:        0
Total transferred:      275354000 bytes
HTML transferred:       275281000 bytes
Requests per second:    0.27 [#/sec] (mean)
Time per request:       3687.005 [ms] (mean)
Time per request:       3687.005 [ms] (mean, across all concurrent requests)
Transfer rate:          145.86 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0    0   0.1      0       1
Processing:  1208 3687 858.6   3611    7116
Waiting:     1170 3552 834.6   3467    7089
Total:       1208 3687 858.6   3611    7116
```

File tipe pdf dengan konkurensi = 10

```
(base) jovyan@24499f95f184:~$ ab -n 10 -c 10 http://172.16.16.102:8887/rfc2616.pdf
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Benchmarking 172.16.16.102 (be patient).....done


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /rfc2616.pdf
Document Length:        550562 bytes

Concurrency Level:      10
Time taken for tests:   29.495 seconds
Complete requests:      10
Failed requests:        0
Total transferred:      5507080 bytes
HTML transferred:       5505620 bytes
Requests per second:    0.34 [#/sec] (mean)
Time per request:       29495.244 [ms] (mean)
Time per request:       2949.524 [ms] (mean, across all concurrent requests)
Transfer rate:          182.33 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0   626 538.4   1049    1050
Processing:  4756 10782 5577.6   9754   22349
Waiting:     4590 10606 5544.2   9608   22119
Total:       4757 11407 5972.5  10763   23399
```

```
(base) jovyan@24499f95f184:~$ ab -n 50 -c 10 http://172.16.16.102:8887/rfc2616.pdf
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Benchmarking 172.16.16.102 (be patient).....done


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /rfc2616.pdf
Document Length:        550562 bytes

Concurrency Level:      10
Time taken for tests:   95.102 seconds
Complete requests:      50
Failed requests:        0
Total transferred:      27535400 bytes
HTML transferred:       27528100 bytes
Requests per second:    0.53 [#/sec] (mean)
Time per request:       19020.344 [ms] (mean)
Time per request:       1902.034 [ms] (mean, across all concurrent requests)
Transfer rate:          282.75 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0  2466 5156.5   1024   32261
Processing:  4060 13483 6445.8  12383   48111
Waiting:     4003 13313 6464.3  12024   48082
Total:       4061 15950 8655.8  14618   53520
```

```
(base) jovyan@24499f95f184:~$ ab -n 100 -c 10 http://172.16.16.102:8887/rfc2616.pdf
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Benchmarking 172.16.16.102 (be patient).....done


Server Software:        myserver/1.0
Server Hostname:        172.16.16.102
Server Port:            8887

Document Path:          /rfc2616.pdf
Document Length:        550562 bytes

Concurrency Level:      10
Time taken for tests:   171.202 seconds
Complete requests:      100
Failed requests:        0
Total transferred:      55070800 bytes
HTML transferred:       55056200 bytes
Requests per second:    0.58 [#/sec] (mean)
Time per request:       17120.226 [ms] (mean)
Time per request:       1712.023 [ms] (mean, across all concurrent requests)
Transfer rate:          314.13 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        0  3000 7208.0   1039   64817
Processing:  5632 12181 2702.9  12150   20957
Waiting:     5472 12020 2657.4  11897   20222
Total:       5632 15181 7569.2  13363   75695
```

```
(base) jovyan@24499f95f184:~$ ab -n 500 -c 10 http://172.16.16.102:8887/rfc2616.pdf
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Benchmarking 172.16.16.102 (be patient)
Completed 100 requests
Completed 200 requests
apr_socket_recv: Connection timed out (110)
Total of 227 requests completed
```