

# Grimoire E21

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\*karena terdapat masalah pada DNS, beberapa pengujian tidak dapat dilakukan

## Nomor 7

```
ab -n 1000 -c 100 http://10.47.3.1/
```

```
Server Software:      nginx/1.14.2
Server Hostname:      10.47.3.1
Server Port:          80

Document Path:        /
Document Length:      625 bytes

Concurrency Level:     100
Time taken for tests:  0.561 seconds
Complete requests:     1000
Failed requests:        0
Total transferred:     762000 bytes
HTML transferred:      625000 bytes
Requests per second:   1782.49 [#/sec] (mean)
Time per request:      56.101 [ms] (mean)
Time per request:      0.561 [ms] (mean, across all concurrent requests)
Transfer rate:         1326.42 [Kbytes/sec] received

Connection Times (ms)
  min  mean[+/-sd] median  max
Connect:    0    1   2.1      0   12
Processing:  4   52   9.1     54   63
Waiting:    3   52   9.1     54   63
Total:      5   53   8.6     54   67

Percentage of the requests served within a certain time (ms)
 50%    54
 66%    55
 75%    57
 80%    59
 90%    61
 95%    62
 98%    63
 99%    63
100%    67 (longest request)
root@Revolte:~# |
```

```
Benchmarking 10.47.3.1 (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
```

## Nomor 8

- Round Robin

```
root@Revolte:~# ab -n 200 -c 10 http://www.granz.channel.e21.com/
This is ApacheBench, Version 2.3 <$Revision: 1843412 $>
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Benchmarking www.granz.channel.e21.com (be patient)
Completed 100 requests
Completed 200 requests
Finished 200 requests

Server Software:      nginx/1.14.2
Server Hostname:      www.granz.channel.e21.com
Server Port:          80

Document Path:        /
Document Length:      625 bytes

Concurrency Level:    10
Time taken for tests:  0.129 seconds
Complete requests:    200
Failed requests:       0
  (Connect: 0, Receive: 0, Length: 66, Exceptions: 0)
Total transferred:    152334 bytes
HTML transferred:     124934 bytes
Requests per second:  1547.46 [#/sec] (mean)
Time per request:     6.462 [ms] (mean)
Time per request:     0.646 [ms] (mean, across all concurrent requests)
Transfer rate:        1151.03 [Kbytes/sec] received

Connection Times (ms)
  min   mean[+/-sd] median   max
Connect:    0    1  0.4      0    3
Processing:  3    5  3.4      4   21
Waiting:    3    5  3.4      4   21
Total:      3    6  3.7      4   23
ERROR: The median and mean for the initial connection time are more than twice the st
deviation apart. These results are NOT reliable.

Percentage of the requests served within a certain time (ms)
 50%    4
 66%    5
 75%    6
 80%    7
 90%    9
 95%   14
 98%   21
 99%   22
100%   23 (longest request)
root@Revolte:~#
```

- Least Connection

```
root@Revolte:~# ab -n 200 -c 10 http://www.granz.channel.e21.com/
This is ApacheBench, Version 2.3 <$Revision: 1843412 $>
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Benchmarking www.granz.channel.e21.com (be patient)
Completed 100 requests
Completed 200 requests
Finished 200 requests

Server Software:      nginx/1.14.2
Server Hostname:      www.granz.channel.e21.com
Server Port:          80

Document Path:        /
Document Length:      625 bytes

Concurrency Level:    10
Time taken for tests:  0.115 seconds
Complete requests:    200
Failed requests:       0
  (Connect: 0, Receive: 0, Length: 66, Exceptions: 0)
Total transferred:    152334 bytes
HTML transferred:     124934 bytes
Requests per second:  1736.37 [#/sec] (mean)
Time per request:     5.759 [ms] (mean)
Time per request:     0.576 [ms] (mean, across all concurrent requests)
Transfer rate:        1291.54 [Kbytes/sec] received

Connection Times (ms)
  min   mean[+/-sd] median   max
Connect:    0    0  0.8      0    6
Processing:  2    5  3.7      4   25
Waiting:    2    5  3.7      4   25
Total:      3    6  3.8      4   25

Percentage of the requests served within a certain time (ms)
 50%    4
 66%    5
 75%    6
 80%    6
 90%    7
 95%   14
 98%   24
 99%   25
100%   25 (longest request)
root@Revolte:~#
```

## - IP Hash

```
root@Revoite:~# ab -n 200 -c 10 http://www.granz.channel.e21.com/
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Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.seustech.net/
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Benchmarking www.granz.channel.e21.com (be patient)
Completed 100 requests
Completed 200 requests
Finished 200 requests

Server Software:      nginx/1.14.2
Server Hostname:      www.granz.channel.e21.com
Server Port:          80

Document Path:        /
Document Length:      625 bytes

Concurrency Level:    10
Time taken for tests:  0.153 seconds
Complete requests:    200
Failed requests:       0
Total transferred:    152400 bytes
HTML transferred:     125000 bytes
Requests per second:  1304.44 [#/sec] (mean)
Time per request:     7.666 [ms] (mean)
Time per request:     0.767 [ms] (mean, across all concurrent requests)
Transfer rate:        970.69 [Kbytes/sec] received

Connection Times (ms)
  min  mean[+/-sd] median  max
Connect:  0    1  0.7    1    4
Processing: 3    7  4.6    5   26
Waiting:  3    7  4.6    5   26
Total:    4    7  5.1    6   29

Percentage of the requests served within a certain time (ms)
 50%    6
 66%    6
 75%    7
 80%    7
 90%   10
 95%   27
 98%   28
 99%   29
100%   29 (longest request)
root@Revoite:~#
```

## - Generic Hash

```
root@Revoite:~# ab -n 200 -c 10 http://www.granz.channel.e21.com/
This is ApacheBench, Version 2.3 <Revision: 1843412 >
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Benchmarking www.granz.channel.e21.com (be patient)
Completed 100 requests
Completed 200 requests
Finished 200 requests

Server Software:      nginx/1.14.2
Server Hostname:      www.granz.channel.e21.com
Server Port:          80

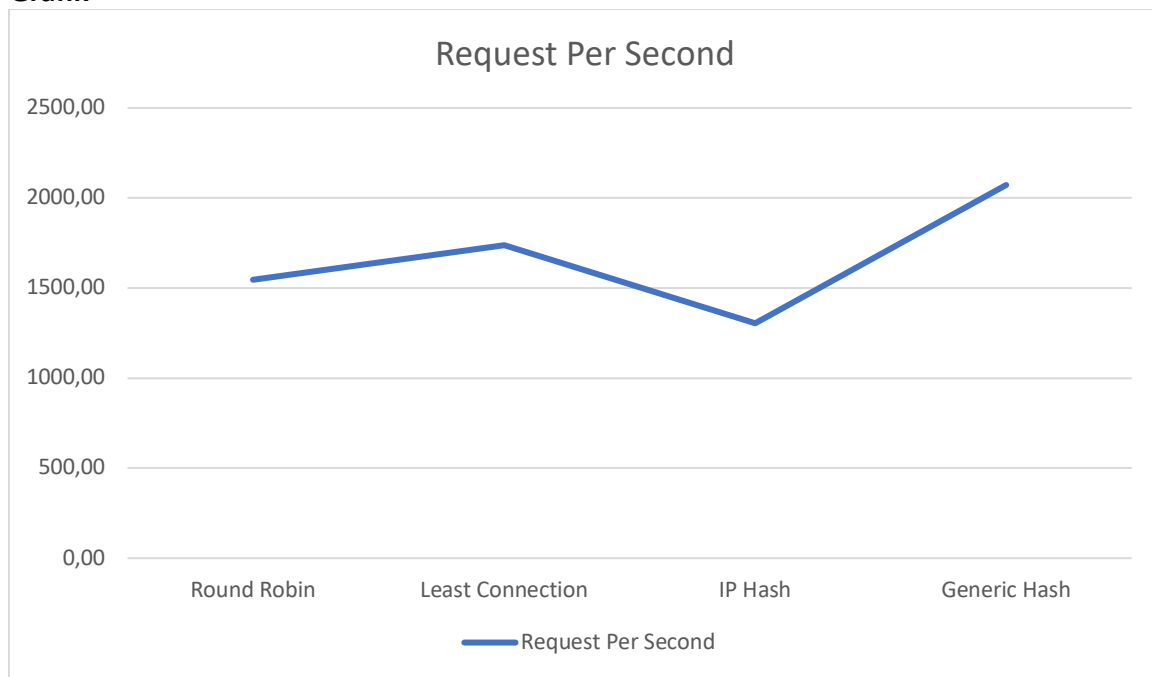
Document Path:        /
Document Length:      625 bytes

Concurrency Level:    10
Time taken for tests:  0.097 seconds
Complete requests:    200
Failed requests:       0
Total transferred:    152400 bytes
HTML transferred:     125000 bytes
Requests per second:  2072.13 [#/sec] (mean)
Time per request:     4.826 [ms] (mean)
Time per request:     0.483 [ms] (mean, across all concurrent requests)
Transfer rate:        1541.96 [Kbytes/sec] received

Connection Times (ms)
  min  mean[+/-sd] median  max
Connect:  0    0  0.3    0    2
Processing: 2    4  1.1    4    8
Waiting:  2    4  1.1    4    8
Total:    3    5  1.2    4    8

Percentage of the requests served within a certain time (ms)
 50%    4
 66%    5
 75%    5
 80%    5
 90%    7
 95%    8
 98%    8
 99%    8
100%    8 (longest request)
root@Revoite:~#
```

## Grafik



## Analisis

"Requests per second" (RPS) menggunakan algoritma IP Hash menghasilkan nilai yang paling rendah, sementara penggunaan algoritma generic hash memberikan hasil yang lebih tinggi. Semakin rendah nilai RPS, semakin baik performa server, karena server tidak perlu mengelola sebanyak permintaan. Namun, secara fungsionalitas, performa yang lebih tinggi (RPS yang lebih tinggi) mungkin diinginkan, meskipun dapat mengakibatkan beban yang lebih besar pada server.

Diketahui bahwa hasil dari eksperimen ini menunjukkan variasi nilai yang cukup signifikan, dan oleh karena itu, pernyataan bahwa algoritma IP Hash memiliki performa yang paling baik belum dapat dianggap mutlak. Hasil ini dapat dipengaruhi oleh berbagai faktor, termasuk konfigurasi server, ukuran beban, dan karakteristik jaringan.

Keputusan dalam memilih algoritma sebaiknya didasarkan pada evaluasi keseluruhan performa, serta mempertimbangkan kebutuhan spesifik aplikasi atau lingkungan. Dengan kata lain, pilihan algoritma sebaiknya disesuaikan dengan kondisi dan kebutuhan khusus dari aplikasi yang digunakan.

## Nomor 9

- 3 Worker

```
root@Revolve:~# ab -n 100 -c 10 http://www.granz.channel.e21.com/
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Licensed to The Apache Software Foundation, http://www.apache.org/

Benchmarking www.granz.channel.e21.com (be patient).....done

Server Software:      nginx/1.14.2
Server Hostname:      www.granz.channel.e21.com
Server Port:          80

Document Path:        /
Document Length:      625 bytes

Concurrency Level:    10
Time taken for tests:  0.078 seconds
Complete requests:    100
Failed requests:      33
   (Connect: 0, Receive: 0, Length: 33, Exceptions: 0)
Total transferred:    76167 bytes
HTML transferred:    62467 bytes
Requests per second:  1278.87 [#/sec] (mean)
Time per request:     7.819 [ms] (mean)
Time per request:     0.782 [ms] (mean, across all concurrent requests)
Transfer rate:        951.25 [Kbytes/sec] received

Connection Times (ms)
  min  mean[+/-sd] median  max
Connect:    0    1  0.2      1    1
Processing:  2    6  4.5      5   26
Waiting:    2    6  4.5      5   26
Total:      2    7  4.6      6   27

Percentage of the requests served within a certain time (ms)
 50%    6
 66%    6
 75%    6
 80%    7
 90%   14
 95%   21
 98%   23
 99%   27
100%   27 (longest request)
root@Revolve:~#
```

- 2 Worker

```
root@Revolve:~# ab -n 100 -c 10 http://www.granz.channel.e21.com/
This is ApacheBench, Version 2.3 <$Revision: 1843412 $>
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Benchmarking www.granz.channel.e21.com (be patient).....done

Server Software:      nginx/1.14.2
Server Hostname:      www.granz.channel.e21.com
Server Port:          80

Document Path:        /
Document Length:      624 bytes

Concurrency Level:    10
Time taken for tests:  0.069 seconds
Complete requests:    100
Failed requests:      50
   (Connect: 0, Receive: 0, Length: 50, Exceptions: 0)
Total transferred:    76150 bytes
HTML transferred:    62450 bytes
Requests per second:  1454.59 [#/sec] (mean)
Time per request:     6.875 [ms] (mean)
Time per request:     0.687 [ms] (mean, across all concurrent requests)
Transfer rate:        1081.71 [Kbytes/sec] received

Connection Times (ms)
  min  mean[+/-sd] median  max
Connect:    0    1  0.2      1    1
Processing:  2    6  2.5      5   12
Waiting:    2    6  2.5      5   12
Total:      3    6  2.3      6   12

Percentage of the requests served within a certain time (ms)
 50%    6
 66%    7
 75%    8
 80%    9
 90%   10
 95%   11
 98%   11
 99%   12
100%   12 (longest request)
root@Revolve:~#
```

- 1 Worker

```
75% 6
80% 7
90% 9
95% 9
98% 10
99% 10
100% 10 (longest request)
root@Revolte:~# ab -n 100 -c 10 http://www.granz.channel.e21.com/
This is ApacheBench, Version 2.3 <$Revision: 1841412 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
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Benchmarking www.granz.channel.e21.com (be patient).....done

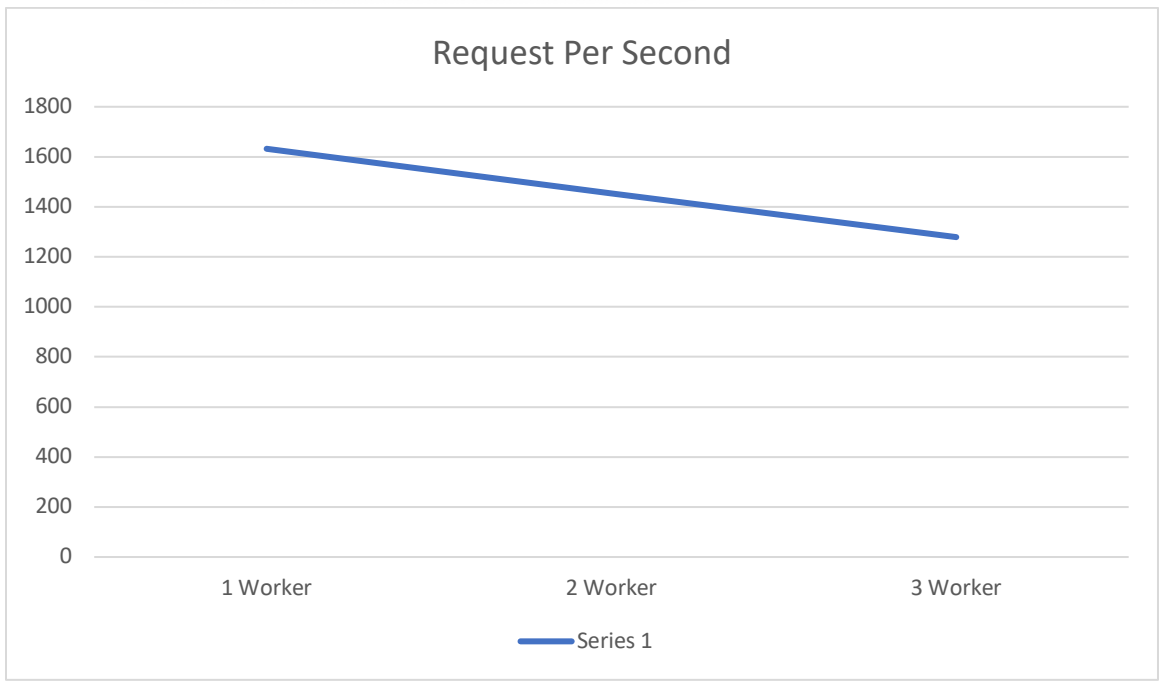
Server Software:      nginx/1.14.2
Server Hostname:      www.granz.channel.e21.com
Server Port:          80

Document Path:        /
Document Length:      625 bytes

Concurrency Level:    10
Time taken for tests:  0.061 seconds
Complete requests:    100
Failed requests:       0
Total transferred:    76200 bytes
HTML transferred:     62500 bytes
Requests per second:  1631.99 [#/sec] (mean)
Time per request:     6.128 [ms] (mean)
Time per request:     0.613 [ms] (mean, across all concurrent requests)
Transfer rate:        1214.43 [Kbytes/sec] received

Connection Times (ms)
  min  mean[+/-sd] median  max
Connect:  0   1  0.3   1   2
Processing: 3   5  1.3   5   8
Waiting:  3   5  1.4   5   8
Total:     3   6  1.4   5   9

Percentage of the requests served within a certain time (ms)
 50%  5
 64%  6
 75%  7
 80%  7
 90%  8
 95%  8
 98%  9
 99%  9
100%  9 (longest request)
root@Revolte:~#
```



Dari grafik di atas, terlihat bahwa semakin banyak jumlah worker, jumlah Request Per Second (RPS) akan semakin berkurang. Fenomena ini menunjukkan peningkatan performa pada setiap worker, karena beban request yang diterima oleh setiap worker menjadi lebih ringan. Dengan demikian, setiap worker dapat beroperasi dengan performa yang lebih optimal dan efisien. Perlu diingat bahwa performa ini dapat bervariasi tergantung pada kebutuhan dan karakteristik spesifik dari aplikasi atau sistem yang sedang dijalankan.

## POST /auth/register

[illegible]

## Nomor 16

## POST /auth/login

```

http://192.168.74.128/static/web-ui/server/project/63f1dd9-bbae-4d92-845e-c6d8173b04d9/nodes/494bc1
http://10.47.4.4:8000/api/auth/login
This is ApacheBench, Version 2.3
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
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Benchmarking 10.47.4.4 (be patient)....done

Server Software:      nginx/1.14.2
Server Hostname:      10.47.4.4
Server Port:          8000

Document Path:        /api/auth/login
Document Length:      95 bytes

Concurrency Level:     10
Time taken for tests:   0.264 seconds
Complete requests:     100
Failed requests:        0
  (Connect: 0, Receive: 0, Length: 23, Exceptions: 0)
Non-2xx responses:     100
Total transferred:      189981 bytes
Total body sent:        18000
HTML transferred:       159552 bytes
Requests per second:    375.53 [#/sec] (mean)
Time per request:       26.688 [ms] (mean)
Time per request:       2.688 [ms] (mean, across all concurrent requests)
Transfer rate:          697.26 [Kbytes/sec] received
                        85.00 kb/s sent
                        766.26 kb/s total

Connection Times (ms)
      min      mean[+sd]      median      max
Connect:    0      0.3      0          1
Processing: 4      20.137      17        69
Waiting:    3      28.14.0      32        69
Total:      4      20.13.9      17        70

Percentage of the requests served within a certain time (ms)
 50%      4
 66%      19
 75%      25
 80%      22
 90%      37
 95%      44
 98%      59
 99%      75
100%     70 (longest request)
connect: 1

```

[illegible]



## Nomor 16

GET /me (17)

```
192.168.74.128/static/web-ui/server/project/3f1dd9-bba-4b92-845e-c6bd873b04/nodes/94ebc
http://10.47.4.4:8000/api/auth/login > login_output.json -d $login.json hit
% Total % Received % Xferd Average Speed Time Time Current
100 133 0 95 100 38 1837 655 --:--:-- --:--:-- 2133
root@Stark:~# token=$(cat login_output.txt | jq -r '.token')
1800/ab/rwef ab -n 100 -c 10 -H "Authorization: Bearer $token" http://10.47.4.4:
This is ApacheBench, Version 2.3 <Revision: 1843412 >
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Licensed to The Apache Software Foundation, http://www.apache.org/

Benchmarking 10.47.4.4 (be patient).....done

Server Software: nginx/1.14.2
Server Hostname: 10.47.4.4
Server Port: 8000
Document Path: /api/me
Document Length: 29 bytes
Concurrency Level: 10
Time taken for tests: 0.248 seconds
Complete requests: 100
Failed requests: 0
  (Connect: 0, Receive: 0, Length: 27, Exceptions: 0)
Non-2xx responses: 0
Total transferred: 211475 bytes
HTML transferred: 18000 bytes
Requests per second: 403.27 [#/sec] (mean)
Time per request: 24.797 [ms] (mean)
Time per request: 2.480 [ms] (mean, across all concurrent requests)
Transfer rate: 832.83 [Kbytes/sec] received

Connection Times (ms)
  min mean[+/-sd] median max
Connect: 0 0 0.1 0 1
Processing: 5 21 14.2 18 99
Waiting: 4 21 14.1 17 98
Total: 5 21 14.3 18 99

Percentage of the requests served within a certain time (ms)
 50% 18
 60% 21
 75% 23
 80% 24
 90% 34
 95% 41
 98% 77
 99% 99
100% 99 (longest request)

root@Stark:~#
```

```
192.168.74.128/static/web-ui/server/project/3f1dd9-bba-4b92-845e-c6bd873b04/nodes/e60bc
xtraWbWmNwIzI0rOziCiIqfGQ5Ej4AqM5G0Cj3AqghnQwVjIv_M0itlvWwqGc' | jqmax
% Total % Received % Xferd Average Speed Time Time Current
100 115 0 115 0 0 1736 0 --:--:-- --:--:-- --:--:-- 1854
{"id":1,"username":"test123","created_at":"2022-11-19T07:57:11.000000Z","updated_at":"2023-11-19T07:57:11.000000Z"}
root@Flame:~#
```

## Nomor 19

### Percobaan 1

pm.max\_children = 10  
pm.start\_servers = 5  
pm.min\_spare\_servers = 4  
pm.max\_spare\_servers = 3

```
/api/auth/login10 -p login.json -T application/json http://reigel.canyon.e21.com/
This is ApacheBench, Version 2.3 <$Revision: 1843412 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
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Benchmarking reigel.canyon.e21.com (be patient).....done

Server Software:      BigIP
Server Hostname:      reigel.canyon.e21.com
Server Port:          80
Document Path:        /api/auth/login
Document Length:      0 bytes

Concurrency Level:    10
Time taken for tests:  0.503 seconds
Complete requests:    100
Failed requests:       0
Non-2xx responses:    100
Total transferred:    11200 bytes
Total body sent:      19500
HTML transferred:     0 bytes
Requests per second:  198.96 [#/sec] (mean)
Time per request:     50.261 [ms] (mean)
Time per request:     5.026 [ms] (mean, across all concurrent requests)
Transfer rate:        21.76 [Kbytes/sec] received
                      37.89 kb/s sent
                      59.65 kb/s total

Connection Times (ms)
      min      mean[+/-sd] median   max
Connect:    5       9  2.3      9    14
Processing: 26      34  5.5     33    46
Waiting:    26      34  5.5     33    46
Total:      33      44  5.5     43    54

Percentage of the requests served within a certain time (ms)
 50%    43
 66%    47
 75%    48
 80%    49
 90%    52
 95%    52
 98%    53
 99%    54
100%    54 (longest request)
root@Stark:~#
```

### Percobaan 2

pm.max\_children = 40  
pm.start\_servers = 15  
pm.min\_spare\_servers = 12  
pm.max\_spare\_servers = 9

```
/api/auth/login10 -p login.json -T application/json http://reigel.canyon.e21.com/
This is ApacheBench, Version 2.3 <$Revision: 1843412 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
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Benchmarking reigel.canyon.e21.com (be patient).....done

Server Software:      BigIP
Server Hostname:      reigel.canyon.e21.com
Server Port:          80

Document Path:        /api/auth/login
Document Length:       0 bytes

Concurrency Level:     10
Time taken for tests:   0.486 seconds
Complete requests:     100
Failed requests:        0
Non-2xx responses:     100
Total transferred:     11200 bytes
Total body sent:       19500
HTML transferred:      0 bytes
Requests per second:   205.67 [#/sec] (mean)
Time per request:      48.622 [ms] (mean)
Time per request:      4.862 [ms] (mean, across all concurrent requests)
Transfer rate:         22.49 [Kbytes/sec] received
                       39.17 kb/s sent
                       61.66 kb/s total

Connection Times (ms)
      min      mean[+/-sd] median   max
Connect:    5       9  2.7      8    18
Processing: 25      34  5.6     35    46
Waiting:    25      34  5.6     35    46
Total:      31      43  6.4     44    58

Percentage of the requests served within a certain time (ms)
 50%    44
 66%    46
 75%    47
 80%    48
 90%    51
 95%    56
 98%    58
 99%    58
100%    58 (longest request)
root@Stark:~#
```

### Percobaan 3

pm.max\_children = 80  
pm.start\_servers = 20  
pm.min\_spare\_servers = 16  
pm.max\_spare\_servers = 12

```
root@Stark:~# ab -n 100 -c 10 http://riegel.canyon.e21.com/
This is ApacheBench, Version 2.3 <$Revision: 1843412 $>
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Benchmarking riegel.canyon.e21.com (be patient).....done

Server Software:      nginx/1.14.2
Server Hostname:      riegel.canyon.e21.com
Server Port:          80

Document Path:        /
Document Length:      18872 bytes

Concurrency Level:    10
Time taken for tests:  0.558 seconds
Complete requests:    100
Failed requests:       0
Total transferred:    1998000 bytes
HTML transferred:     1887200 bytes
Requests per second:  179.26 [#/sec] (mean)
Time per request:     55.785 [ms] (mean)
Time per request:     5.578 [ms] (mean, across all concurrent requests)
Transfer rate:        3497.66 [Kbytes/sec] received

Connection Times (ms)
  min   mean[+/-sd] median   max
Connect:    0      0   0.2      0      1
Processing:  5     47  45.5     32     247
Waiting:    5     45  44.9     30     245
Total:       5     47  45.6     32     247

Percentage of the requests served within a certain time (ms)
 50%    32
 66%    44
 75%    54
 80%    61
 90%   115
 95%   160
 98%   211
 99%   247
100%   247 (longest request)
root@Stark:~#
```

**pm.max\_children:** Jumlah maksimum proses PHP yang dapat berjalan secara bersamaan. Jika nilai ini terlalu rendah, server mungkin tidak dapat menangani sejumlah besar permintaan secara bersamaan. Jika terlalu tinggi, dapat mengakibatkan kelebihan beban pada server.

**pm.start\_servers:** Menentukan jumlah proses yang akan dimulai saat PHP-FPM pertama kali dijalankan atau setelah di-restart. Menaikkan nilai ini dapat membantu mengatasi permintaan awal dengan lebih cepat, tetapi perlu diingat untuk tidak mengatur nilai ini terlalu tinggi agar tidak memberikan tekanan berlebihan pada server saat memulai.

**pm.min\_spare\_servers:** Menentukan jumlah minimum proses yang tetap hidup untuk menangani permintaan ketika lalu lintas berkurang. Menaikkan nilai ini dapat membantu mengurangi latensi saat ada lonjakan permintaan atau lalu lintas yang tidak terduga.

**pm.max\_spare\_servers:** Menentukan jumlah maksimum proses yang tetap hidup yang akan ditoleransi. Menaikkan nilai ini dapat membantu mengatasi lonjakan lalu lintas tanpa harus menunggu proses tambahan dimulai. Tetapi, Anda perlu memantau penggunaan memori karena nilai yang terlalu tinggi dapat menghabiskan sumber daya sistem.

## **Analisis**

Berdasarkan hasil uji coba, setiap peningkatan nilai pm dalam percobaan mengindikasikan bahwa performa worker mengalami perubahan. Dalam konteks ini, ketika nilai-nilai pm berada pada tingkat yang terlalu tinggi atau rendah, terjadi penurunan nilai Requests Per Second (RPS). Sebaliknya, jika nilai-nilai pm berada pada titik yang optimal, RPS mencapai tingkat tertinggi. Namun, perlu dicatat bahwa dalam serangkaian percobaan berulang, observasi data masih cenderung fluktuatif, dan nilai RPS tidak konsisten. Hal ini menunjukkan bahwa penentuan parameter pm yang ideal masih memerlukan eksplorasi lebih lanjut untuk mendapatkan hasil yang lebih stabil dan dapat diandalkan.