

# Round Robin (default)

```
root@Colossal:~# ab -n 1000 -c 75 http://eldia.it08.com/
This is ApacheBench, Version 2.3 <$Revision: 1913912 $>
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Licensed to The Apache Software Foundation, http://www.apache.org/

Benchmarking eldia.it08.com (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:      nginx/1.14.2
Server Hostname:      eldia.it08.com
Server Port:          80


Document Path:        /
Document Length:      1428 bytes


Concurrency Level:    75
Time taken for tests:  3.072 seconds
Complete requests:    1000
Failed requests:       0
Total transferred:    1565000 bytes
HTML transferred:     1428000 bytes
Requests per second:  325.52 [#/sec] (mean)
Time per request:     230.403 [ms] (mean)
Time per request:     3.072 [ms] (mean, across all concurrent requests)
Transfer rate:        497.49 [Kbytes/sec] received


Connection Times (ms)
              min  mean[+/-sd] median  max
Connect:        0    1   3.4      0    14
Processing:     7  109 205.8     67   3063
Waiting:        2  109 205.8     67   3062
Total:          7  110 205.8     68   3070


Percentage of the requests served within a certain time (ms)
 50%    68
 66%    71
 75%    72
 80%    75
 90%    93
 95%   311
 98%  1020
 99%  1074
100%  3070 (longest request)
```

# IP Hash

```
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```

```
Document Path:        /
Document Length:      1428 bytes
```

```
Concurrency Level:    75
Time taken for tests:  8.373 seconds
Complete requests:    1000
Failed requests:       0
Total transferred:    1565000 bytes
HTML transferred:     1428000 bytes
Requests per second:  119.43 [#/sec] (mean)
Time per request:     627.970 [ms] (mean)
Time per request:     8.373 [ms] (mean, across all concurrent requests)
Transfer rate:        182.53 [Kbytes/sec] received
```

Connection Times (ms)

	min	mean[+/-sd]	median	max
Connect:	0	1 2.4	0	12
Processing:	10	111 252.5	68	6152
Waiting:	10	111 252.1	67	6135
Total:	16	112 252.4	68	6152

Percentage of the requests served within a certain time (ms)

50%	68
66%	71
75%	73
80%	74
90%	85
95%	316
98%	1012
99%	1032
100%	6152 (longest request)

## Generic Hash

---

```
root@Colossal:~# ab -n 1000 -c 75 http://eldia.it08.com/
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Server Hostname:      eldia.it08.com
Server Port:          80
```

```
Document Path:        /
Document Length:       1428 bytes
```

```
Concurrency Level:     75
Time taken for tests:   8.369 seconds
Complete requests:     1000
Failed requests:        0
Total transferred:     1565000 bytes
HTML transferred:      1428000 bytes
Requests per second:   119.49 [#/sec] (mean)
Time per request:      627.659 [ms] (mean)
Time per request:      8.369 [ms] (mean, across all concurrent requests)
Transfer rate:          182.62 [Kbytes/sec] received
```

Connection Times (ms)

	min	mean[+/-sd]	median	max
Connect:	0	1 4.7	0	20
Processing:	11	110 248.1	66	6157
Waiting:	10	110 247.4	66	6130
Total:	27	112 247.8	67	6157

Percentage of the requests served within a certain time (ms)

50%	67
66%	70
75%	73
80%	75
90%	95
95%	316
98%	1019
99%	1033
100%	6157 (longest request)

## Least Connection

---

```
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Server Hostname:      eldia.it08.com
Server Port:          80
```

```
Document Path:        /
Document Length:       1428 bytes
```

```
Concurrency Level:     75
Time taken for tests:   60.048 seconds
Complete requests:      1000
Failed requests:         0
Total transferred:      1565000 bytes
HTML transferred:       1428000 bytes
Requests per second:    16.65 [#/sec] (mean)
Time per request:       4503.622 [ms] (mean)
Time per request:       60.048 [ms] (mean, across all concurrent requests)
Transfer rate:          25.45 [Kbytes/sec] received
```

Connection Times (ms)

	min	mean[+/-sd]	median	max
Connect:	0	1 3.8	0	17
Processing:	7 1988	9982.4	33	60037
Waiting:	2 1988	9982.4	33	60037
Total:	7 1989	9984.8	34	60042

Percentage of the requests served within a certain time (ms)

50%	34
66%	34
75%	35
80%	35
90%	37
95%	3083
98%	60040
99%	60042
100%	60042 (longest request)

## Analisis

### Round Robin:

- Menunjukkan performa tertinggi dengan rata-rata 325.52 rps.
- Algoritma ini mendistribusikan request secara merata ke tiap server, yang menghasilkan throughput tinggi dan waktu pemrosesan yang konsisten di pengaturan ini.

### IP Hash & Generic Hash:

- Kedua algoritma ini memiliki hasil yang hampir serupa, dengan IP Hash mencapai 119.43 rps dan Generic Hash di 119.49 rps.
- IP Hash mendistribusikan request berdasarkan hash dari IP client, sementara Generic Hash menggunakan hash yang lebih umum. Hasilnya menunjukkan

kedua metode ini memberi performa yang mirip, namun lebih rendah dibanding Round Robin.

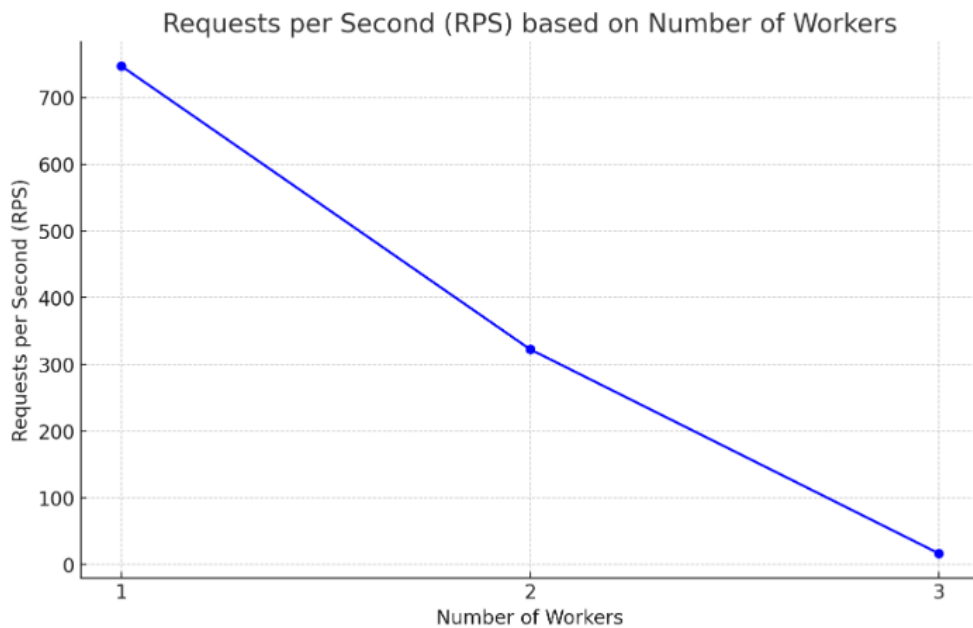
#### Least Connection:

- Memberikan performa terendah, yaitu 16.65 rps.
- Algoritma ini cenderung bekerja lebih baik untuk distribusi beban jangka panjang karena mengarahkan request ke server dengan koneksi paling sedikit. Namun, dalam pengujian ini, waktu pemrosesan sangat lambat karena sifatnya yang menghitung beban terkini sebelum mendistribusikan request.

## Kesimpulan:

- Round Robin lebih cocok untuk beban dengan request rate tinggi dan beban yang relatif merata.
- IP Hash dan Generic Hash cocok untuk kasus di mana konsistensi client-server penting, meski throughput lebih rendah.
- Least Connection ideal untuk menjaga stabilitas saat server memiliki beban berbeda-beda, namun tidak optimal untuk throughput tinggi dalam skenario ini.

## Nomor 9: Grafik RPS berdasarkan jumlah worker dengan least\_conn



Grafik ini memperlihatkan bahwa ketika jumlah workers bertambah, RPS cenderung menurun, menunjukkan beban tambahan yang mungkin memperlambat respons server.