Laporan Benchmark Armin

1. Algoritma Round Robin

```
Server Software:        nginx/1.10.3
Server Hostname:        192.239.3.2
Server Port:            1111

Document Path:          /
Document Length:        1429 bytes

Concurrency Level:      75
Time taken for tests:   1.777 seconds
Complete requests:      1000
Failed requests:        667
   (Connect: 0, Receive: 0, Length: 667, Exceptions: 0)
Total transferred:      1574000 bytes
HTML transferred:       1428000 bytes
Requests per second:    562.69 [#/sec] (mean)
Time per request:       133.288 [ms] (mean)
Time per request:       1.777 [ms] (mean, across all concurrent requests)
Transfer rate:          864.92 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        4    29   46.4     27   1052
Processing:    17   100  109.9     88   1104
Waiting:       17    99  108.6     88   1104
Total:         22   129  118.0    116   1141
```

2. Algoritma Weighted RR

```
Server Software:        nginx/1.10.3
Server Hostname:        192.239.3.2
Server Port:            1112

Document Path:          /
Document Length:        1428 bytes

Concurrency Level:      75
Time taken for tests:   3.675 seconds
Complete requests:      1000
Failed requests:        500
   (Connect: 0, Receive: 0, Length: 500, Exceptions: 0)
Total transferred:      1573834 bytes
HTML transferred:       1427834 bytes
Requests per second:    272.13 [#/sec] (mean)
Time per request:       275.606 [ms] (mean)
Time per request:       3.675 [ms] (mean, across all concurrent requests)
Transfer rate:          418.25 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        6    36   95.8     28   1057
Processing:    41    99   94.7     90   2480
Waiting:       40    98   93.7     90   2480
Total:         47   135  150.5    119   3499
```

3. Algoritma Generic Hash

```
Server Software:        nginx/1.10.3
Server Hostname:        192.239.3.2
Server Port:            1113

Document Path:          /
Document Length:        1428 bytes

Concurrency Level:      75
Time taken for tests:   2.078 seconds
Complete requests:      1000
Failed requests:        0
Total transferred:      1574000 bytes
HTML transferred:       1428000 bytes
Requests per second:    481.27 [#/sec] (mean)
Time per request:       155.839 [ms] (mean)
Time per request:       2.078 [ms] (mean, across all concurrent requests)
Transfer rate:          739.76 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        4    29  32.9     28    1036
Processing:    20    95  37.7     91     529
Waiting:       20    93  28.1     91     331
Total:         23   125  50.4    119    1129
```

4. Algoritma IP Hash

```
Server Software:        nginx/1.10.3
Server Hostname:        192.239.3.2
Server Port:            1114

Document Path:          /
Document Length:        1427 bytes

Concurrency Level:      75
Time taken for tests:   2.288 seconds
Complete requests:      1000
Failed requests:        0
Total transferred:      1573000 bytes
HTML transferred:       1427000 bytes
Requests per second:    437.01 [#/sec] (mean)
Time per request:       171.622 [ms] (mean)
Time per request:       2.288 [ms] (mean, across all concurrent requests)
Transfer rate:          671.30 [Kbytes/sec] received

Connection Times (ms)
              min  mean[+/-sd] median   max
Connect:        3    31  56.5     29    1058
Processing:    34   100  83.6     87    1040
Waiting:       33    99  83.6     87    1040
Total:         39   131 101.1    116    1166
```

5. Algoritma Least Connection
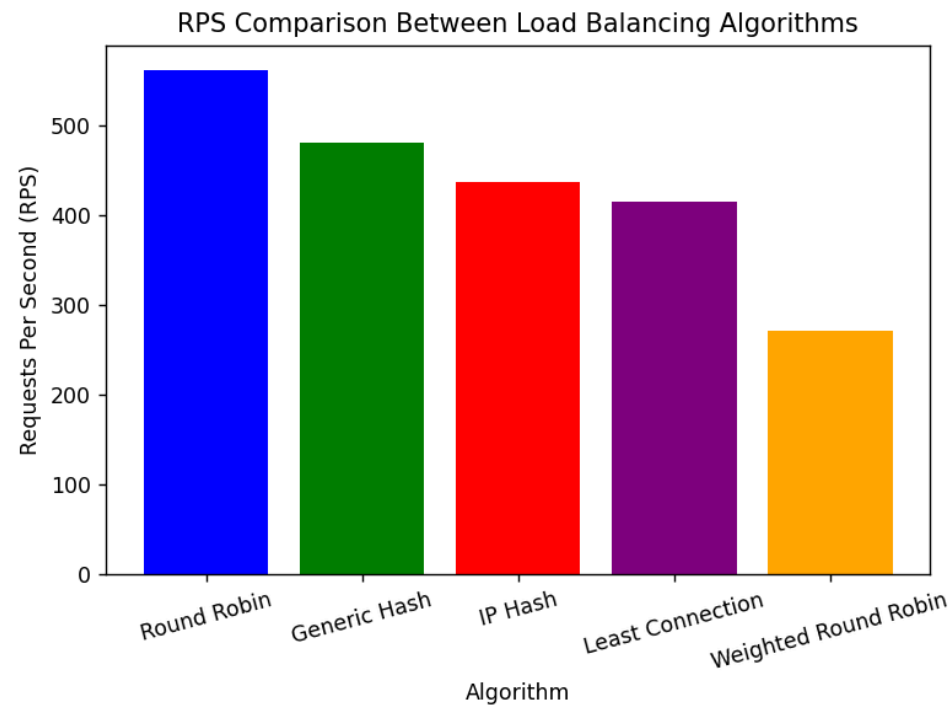
```
Server Software:        nginx/1.10.3
Server Hostname:        192.239.3.2
Server Port:            1115

Document Path:          /
Document Length:        1428 bytes

Concurrency Level:      75
Time taken for tests:   2.407 seconds
Complete requests:      1000
Failed requests:        671
   (Connect: 0, Receive: 0, Length: 671, Exceptions: 0)
Total transferred:      1574017 bytes
HTML transferred:       1428017 bytes
Requests per second:    415.51 [#/sec] (mean)
Time per request:       180.502 [ms] (mean)
Time per request:       2.407 [ms] (mean, across all concurrent requests)
Transfer rate:          638.69 [Kbytes/sec] received

Connection Times (ms)
            min  mean[+/-sd] median   max
Connect:      4    32   56.7     29   1050
Processing:  32   100   55.9     94   1111
Waiting:     31   100   55.3     94   1111
Total:       36   132   78.2    124   1146
```

Grafik

RPS Comparison Between Load Balancing Algorithms

Kesimpulan

Dari grafik perbandingan RPS (Requests Per Second) antara berbagai algoritma load balancing tersebut, beberapa kesimpulan yang dapat diambil:

1. Performa Terbaik:
   - Algoritma Round Robin menunjukkan performa tertinggi dengan sekitar 550 RPS
   - Ini menandakan Round Robin paling efektif dalam menangani jumlah permintaan per detik
2. Urutan Performa (dari terbaik ke terendah):
   - Round Robin (~550 RPS)
   - Generic Hash (~480 RPS)
   - IP Hash (~440 RPS)
   - Least Connection (~410 RPS)
   - Weighted Round Robin (~270 RPS)
3. Perbandingan Relatif:
   - Ada perbedaan signifikan antara algoritma terbaik (Round Robin) dan terburuk (Weighted Round Robin)
   - Weighted Round Robin memiliki throughput hampir setengah dari Round Robin biasa
4. Implikasi Praktis:
   - Round Robin bisa menjadi pilihan utama jika prioritasnya adalah throughput tinggi
   - Weighted Round Robin mungkin kurang cocok untuk situasi yang membutuhkan throughput tinggi
   - Algoritma lain (Generic Hash, IP Hash, Least Connection) menunjukkan performa menengah yang masih cukup baik