# Nginx、swoole、golang web性能测试

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## 机器配置：

**Cpu配置: 单核cpu**

$ lscpu

Architecture: x86\_64

CPU op-mode(s): 32-bit, 64-bit

Byte Order: Little Endian

CPU(s): 1

On-line CPU(s) list: 0

Thread(s) per core: 1

Core(s) per socket: 1

Socket(s): 1

NUMA node(s): 1

Vendor ID: GenuineIntel

CPU family: 6

Model: 69

Stepping: 1

CPU MHz: 2494.258

BogoMIPS: 4988.51

Hypervisor vendor: VMware

Virtualization type: full

L1d cache: 32K

L1i cache: 32K

L2 cache: 256K

L3 cache: 3072K

NUMA node0 CPU(s): 0

**内存配置：1.5G内存**

$ free -mh

total used free shared buffers cached

Mem: 1.5G 1.2G 229M 13M 241M 442M

-/+ buffers/cache: 572M 912M

Swap: 1.9G 0B 1.9G

**测试情况：(100 个并发，100万http请求基准测试，分析QPS)**

1. swoole 4 个工作线程(php 关闭opcache 缓存)
2. swoole 4 个工作线程 (php 开启opcache 缓存)
3. nginx 4 个工作线程
4. golang web 服务器

## swoole 4 个工作线程(php 关闭opcache 缓存)

$ ab -c 100 -n 1000000 -k http://127.0.0.1:9505/

This is ApacheBench, Version 2.3 <$Revision: 655654 $>

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Benchmarking 127.0.0.1 (be patient)

Completed 100000 requests

Completed 200000 requests

Completed 300000 requests

Completed 400000 requests

Completed 500000 requests

Completed 600000 requests

Completed 700000 requests

Completed 800000 requests

Completed 900000 requests

Completed 1000000 requests

Finished 1000000 requests

Server Software: swoole-http-server

Server Hostname: 127.0.0.1

Server Port: 9505

Document Path: /

Document Length: 24 bytes

Concurrency Level: 100

Time taken for tests: 38.035 seconds

Complete requests: 1000000

Failed requests: 0

Write errors: 0

Keep-Alive requests: 1000000

Total transferred: 265000000 bytes

HTML transferred: 24000000 bytes

Requests per second: 26291.79 [#/sec] (mean)

Time per request: 3.803 [ms] (mean)

Time per request: 0.038 [ms] (mean, across all concurrent requests)

Transfer rate: 6804.03 [Kbytes/sec] received

Connection Times (ms)

min mean[+/-sd] median max

Connect: 0 0 0.1 0 9

Processing: 0 4 1.3 4 129

Waiting: 0 4 1.3 4 129

Total: 0 4 1.3 4 129

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

50% 4

66% 4

75% 4

80% 4

90% 4

95% 5

98% 5

99% 5

100% 129 (longest request)

## swoole 4 个工作线程(php 开启opcache 缓存)

$ ab -c 100 -n 1000000 -k http://127.0.0.1:9505/

This is ApacheBench, Version 2.3 <$Revision: 655654 $>

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)

Completed 100000 requests

Completed 200000 requests

Completed 300000 requests

Completed 400000 requests

Completed 500000 requests

Completed 600000 requests

Completed 700000 requests

Completed 800000 requests

Completed 900000 requests

Completed 1000000 requests

Finished 1000000 requests

Server Software: swoole-http-server

Server Hostname: 127.0.0.1

Server Port: 9505

Document Path: /

Document Length: 24 bytes

Concurrency Level: 100

Time taken for tests: 37.861 seconds

Complete requests: 1000000

Failed requests: 0

Write errors: 0

Keep-Alive requests: 1000000

Total transferred: 265000000 bytes

HTML transferred: 24000000 bytes

Requests per second: 26412.68 [#/sec] (mean)

Time per request: 3.786 [ms] (mean)

Time per request: 0.038 [ms] (mean, across all concurrent requests)

Transfer rate: 6835.31 [Kbytes/sec] received

Connection Times (ms)

min mean[+/-sd] median max

Connect: 0 0 0.1 0 10

Processing: 0 4 1.4 4 141

Waiting: 0 4 1.4 4 141

Total: 0 4 1.4 4 141

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

50% 4

66% 4

75% 4

80% 4

90% 4

95% 5

98% 5

99% 5

100% 141 (longest request)

## nginx 4 个工作线程

$ ab -c 100 -n 1000000 -k http://127.0.0.1:9508/

This is ApacheBench, Version 2.3 <$Revision: 655654 $>

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Benchmarking 127.0.0.1 (be patient)

Completed 100000 requests

Completed 200000 requests

Completed 300000 requests

Completed 400000 requests

Completed 500000 requests

Completed 600000 requests

Completed 700000 requests

Completed 800000 requests

Completed 900000 requests

Completed 1000000 requests

Finished 1000000 requests

Server Software: nginx

Server Hostname: 127.0.0.1

Server Port: 9508

Document Path: /

Document Length: 22 bytes

Concurrency Level: 100

Time taken for tests: 32.692 seconds

Complete requests: 1000000

Failed requests: 0

Write errors: 0

Keep-Alive requests: 990053

Total transferred: 250952022 bytes

HTML transferred: 22000154 bytes

Requests per second: 30588.24 [#/sec] (mean)

Time per request: 3.269 [ms] (mean)

Time per request: 0.033 [ms] (mean, across all concurrent requests)

Transfer rate: 7496.27 [Kbytes/sec] received

Connection Times (ms)

min mean[+/-sd] median max

Connect: 0 0 0.6 0 118

Processing: 0 3 2.2 3 253

Waiting: 0 3 2.1 3 142

Total: 0 3 2.3 3 253

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

50% 3

66% 3

75% 3

80% 4

90% 4

95% 5

98% 7

99% 9

100% 253 (longest request)

## golang web 服务器

$ ab -c 100 -n 1000000 -k http://127.0.0.1:8080/

This is ApacheBench, Version 2.3 <$Revision: 655654 $>

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Benchmarking 127.0.0.1 (be patient)

Completed 100000 requests

Completed 200000 requests

Completed 300000 requests

Completed 400000 requests

Completed 500000 requests

Completed 600000 requests

Completed 700000 requests

Completed 800000 requests

Completed 900000 requests

Completed 1000000 requests

Finished 1000000 requests

Server Software:

Server Hostname: 127.0.0.1

Server Port: 8080

Document Path: /

Document Length: 24 bytes

Concurrency Level: 100

Time taken for tests: 39.107 seconds

Complete requests: 1000000

Failed requests: 0

Write errors: 0

Keep-Alive requests: 1000000

Total transferred: 164000000 bytes

HTML transferred: 24000000 bytes

Requests per second: 25571.13 [#/sec] (mean)

Time per request: 3.911 [ms] (mean)

Time per request: 0.039 [ms] (mean, across all concurrent requests)

Transfer rate: 4095.38 [Kbytes/sec] received

Connection Times (ms)

min mean[+/-sd] median max

Connect: 0 0 0.3 0 47

Processing: 0 4 112.6 0 4973

Waiting: 0 4 112.6 0 4973

Total: 0 4 112.6 0 4973

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

50% 0

66% 0

75% 0

80% 0

90% 0

95% 0

98% 0

99% 0

100% 4973 (longest request)

## 结论

|  |  |  |
| --- | --- | --- |
|  | QPS | TPS |
| Swoole | 26291.79 | 3.803ms |
| Swoole + opcache | 26412.68 | 3.786ms |
| Nginx | 30588.24 | 3.269ms |
| golang | 25571.13 | 3.911 |

1. **nginx 作为web 服务器性能优于swoole、golang ，并没有明显差距**
2. **Swoole web 服务器稍优于golang，但php 作为弱类型语言，实际项目中，golang 会稍优于swoole**
3. **偏运算型应用，可以选择golang，多数项目可以用swoole，系统瓶颈不仅仅在于语言，网络、磁盘IO等因素综合考虑，swoole 最适合phper**