Week02

# 作业 1.

循环次数

|  | SerialGC | ParallelGC | CMS | G1GC |
| --- | --- | --- | --- | --- |
| 256M | 4139 | 3330 | 4385 | Not counted |
| 512M | 8955 | 9812 | 10849 | 10579 |
| 1G | 7555 | 8856 | 13310 | 10223 |
| 4G | 8286 | 7838 | 10314 | 12648 |

Full GC计数

|  | SerialGC | ParallelGC |  |  |
| --- | --- | --- | --- | --- |
| 256M | 43 (OOM) | 34 (OOM) | 24 | 13 |
| 512M | 1 | 11 | 7 | 0 |
| 1G | 0 | 1 | 0 | 0 |
| 4G | 0 | 0 | 0 | 0 |

Young + Mixed GC计算

|  | Serial GC | ParallelGC |  |  |
| --- | --- | --- | --- | --- |
| 256M | 10 | 46 | 32 | 71 young + 11 mixed |
| 512M | 4 | 39 | 20 | 60 young + 28 mixed |
| 1G | 9 | 23 | 12 | 10 young + 8 mixed |
| 4G | 2 | 3 | 10 | 14 young |

# 作业 2. -Xmx1G -Xms1G

Use G1GC

**~~ wrk -t8 -c40 -d60s http://localhost:8088/api/hello**

Running 1m test @ http://localhost:8088/api/hello

8 threads and 40 connections

Thread Stats Avg Stdev Max +/- Stdev

Latency 14.00ms 35.14ms 470.33ms 90.71%

Req/Sec 2.11k 0.89k 5.24k 65.88%

1000404 requests in 1.00m, 119.44MB read

Requests/sec: 16651.12

Transfer/sec: 1.99MB

Use CMS

**~~ wrk -t8 -c40 -d60s http://localhost:8088/api/hello**

Running 1m test @ http://localhost:8088/api/hello

8 threads and 40 connections

Thread Stats Avg Stdev Max +/- Stdev

Latency 14.17ms 33.19ms 410.07ms 90.48%

Req/Sec 1.73k 757.63 4.25k 67.38%

824167 requests in 1.00m, 98.40MB read

Requests/sec: 13718.15

Transfer/sec: 1.64MB

Use ParallelGC

**~~ wrk -t8 -c40 -d60s http://localhost:8088/api/hello**

Running 1m test @ http://localhost:8088/api/hello

8 threads and 40 connections

Thread Stats Avg Stdev Max +/- Stdev

Latency 17.18ms 45.04ms 635.47ms 91.22%

Req/Sec 1.90k 0.87k 6.48k 64.27%

904916 requests in 1.00m, 108.04MB read

Requests/sec: 15059.90

Transfer/sec: 1.80MB

Use Serial GC

**~~ wrk -t8 -c40 -d60s http://localhost:8088/api/hello**

Running 1m test @ http://localhost:8088/api/hello

8 threads and 40 connections

Thread Stats Avg Stdev Max +/- Stdev

Latency 13.97ms 36.79ms 428.27ms 91.30%

Req/Sec 2.09k 0.95k 5.48k 64.01%

994376 requests in 1.00m, 118.72MB read

Requests/sec: 16561.21

Transfer/sec: 1.98MB

# 作业 4.

从1中可见，Heap很小时，GC回收器的选择对系统性能影响不大。增加Heap，可以有效的减少GC，提高系统性能。当Heap 超过4G时，G1GC的优势明显。在1G时，CMS有微弱优势。还需要结合时间消耗得出更准确判断。

比较ParallelGC和CMS在Xmx1G时的表现，可以看出ParallelGC发生的GC更频繁，单次消耗时间更短，CMS消耗时间长但是STW更短。

从2中可见，G1GC表现最佳，吞吐量最高而延迟较低，CMS的延迟也很低但是吞吐量最低，ParallelGC的吞吐量表现不错但是延迟高。 SerialGC的表现出乎意料的好，仅次于G1GC, 可见测试最好跑在一个专用的机器以排除其它干扰因素。