第2周 2. 压测，各种GC情况下的吞吐量和延迟

笔记本： JVM进阶
创建时间： 2020/10/23 21:06 **更新时间：** 2020/10/24 8:55
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1.串行GC

1.1 启动命令：java -jar **-XX:+UseSerialGC -Xms512m -Xmx512m** .\gateway-server-0.0.1-SNAPSHOT.jar

压测结果：

```
Finished at 2020/10/23 21:14:47 (took 00:01:03.4259347)
Status 200:    282315

RPS: 4614.7 (requests/second)
Max: 45ms
Min: 0ms
Avg: 0.1ms

  50%   below 0ms
  60%   below 0ms
  70%   below 0ms
  80%   below 0ms
  90%   below 0ms
  95%   below 0ms
  98%   below 2ms
  99%   below 2ms
99.9%   below 7ms
```

1.2 启动命令：java -jar **-XX:+UseSerialGC -Xms1g -Xmx1g** .\gateway-server-0.0.1-SNAPSHOT.jar

压测结果：

```
Finished at 2020/10/23 21:19:48 (took 00:01:03.9299808)
Status 200:    281435

RPS: 4604 (requests/second)
Max: 47ms
Min: 0ms
Avg: 0.1ms

  50%   below 0ms
  60%   below 0ms
  70%   below 0ms
  80%   below 0ms
  90%   below 0ms
  95%   below 0ms
  98%   below 1ms
  99%   below 2ms
99.9%   below 6ms
```

2.并行GC

2.1 启动命令：java -jar **-XX:+UseParallelGC -Xms512m -Xmx512m** .\gateway-server-0.0.1-SNAPSHOT.jar

压测结果：

```
Finished at 2020/10/23 21:32:12 (took 00:01:03.3648231)
Status 200:    279135

RPS: 4567.2 (requests/second)
Max: 42ms
Min: 0ms
Avg: 0.1ms

  50%   below 0ms
  60%   below 0ms
  70%   below 0ms
  80%   below 0ms
  90%   below 0ms
  95%   below 0ms
  98%   below 2ms
  99%   below 2ms
99.9%   below 7ms
```

2.2 启动命令：java -jar **-XX:+UseParallelGC -Xms1g -Xmx1g** .\gateway-server-0.0.1-SNAPSHOT.jar

压测结果：

```
Finished at 2020/10/23 21:35:31 (took 00:01:03.3820183)
Status 200:    263349

RPS: 4306 (requests/second)
Max: 43ms
Min: 0ms
Avg: 0.1ms

  50%   below 0ms
  60%   below 0ms
  70%   below 0ms
  80%   below 0ms
  90%   below 0ms
  95%   below 0ms
  98%   below 2ms
  99%   below 3ms
99.9%   below 7ms
```

3.CMS

3.1 启动命令：java -jar **-XX:+UseConcMarkSweepGC -Xms512m -Xmx512m** .\gateway-server-0.0.1-SNAPSHOT.jar

压测结果：

```
Finished at 2020/10/23 21:42:18 (took 00:01:03.5714343)
Status 200:    237265

RPS: 3880.9 (requests/second)
Max: 40ms
Min: 0ms
Avg: 0.1ms

  50%   below 0ms
  60%   below 0ms
  70%   below 0ms
  80%   below 0ms
  90%   below 0ms
```

```
  95%   below 1ms
  98%   below 2ms
  99%   below 3ms
99.9%   below 8ms
```

3.2 启动命令：java -jar **-XX:+UseConcMarkSweepGC -Xms1g -Xmx1g** .\gateway-server-0.0.1-SNAPSHOT.jar

压测结果：

```
Finished at 2020/10/23 21:46:39 (took 00:01:03.5415052)
Status 200:    214588

RPS: 3508.9 (requests/second)
Max: 42ms
Min: 0ms
Avg: 0.2ms

  50%   below 0ms
  60%   below 0ms
  70%   below 0ms
  80%   below 0ms
  90%   below 1ms
  95%   below 2ms
  98%   below 3ms
  99%   below 4ms
99.9%   below 9ms
```

4.G1

4.1 启动命令：java -jar **-XX:+UseG1GC -Xms512m -Xmx512m** .\gateway-server-0.0.1-SNAPSHOT.jar

压测结果：

```
Finished at 2020/10/23 21:57:36 (took 00:01:03.5305755)
Status 200:    256240

RPS: 4192 (requests/second)
Max: 43ms
Min: 0ms
Avg: 0.1ms

  50%   below 0ms
  60%   below 0ms
  70%   below 0ms
  80%   below 0ms
  90%   below 0ms
  95%   below 1ms
  98%   below 2ms
  99%   below 3ms
99.9%   below 7ms
```

4.2 启动命令：java -jar **-XX:+UseG1GC -Xms1g -Xmx1g** .\gateway-server-0.0.1-SNAPSHOT.jar

压测结果：

```
Finished at 2020/10/23 22:02:10 (took 00:01:03.5803679)
Status 200:    238385

RPS: 3897.9 (requests/second)
Max: 40ms
Min: 0ms
Avg: 0.2ms
```

```
  50%   below 0ms
  60%   below 0ms
  70%   below 0ms
  80%   below 0ms
  90%   below 1ms
  95%   below 2ms
  98%   below 3ms
  99%   below 4ms
99.9%   below 7ms
```

结论：通过4个GC的压测比较，可以发现串行GC、并行GC延迟相对来说比较大，但是吞吐量也相对大一点，而CMS和G1则是延迟相对低一点，但是吞吐量也相对小点。