

```
-verbose:gc
-Xms10M
-Xmx10M
-XX:+PrintGCDetails
-XX:+PrintGCDateStamps
-XX:+UseG1GC
-XX:MaxGCPauseMillis=200m
```

```
package main.java.Test1.G1;
```

```
public class Test1 {
    public static void main(String[] args) {
        int size=1024*1024;

        byte[] myAlloc1=new byte[size];
        byte[] myAlloc2=new byte[size];
        byte[] myAlloc3=new byte[size];
        byte[] myAlloc4=new byte[size];

        System.out.println("hello world");

    }
}
```

2020-02-11T14:55:22.652+0800: [GC pause (G1 Humongous Allocation) (young) (initial-mark), 0.0035493 secs]

[Parallel Time: 1.3 ms, GC Workers: 4]

[GC Worker Start (ms): Min: 276.8, Avg: 276.8, Max: 276.8, Diff: 0.0]

[Ext Root Scanning (ms): Min: 0.3, Avg: 0.3, Max: 0.3, Diff: 0.0, Sum: 1.1]

[Update RS (ms): Min: 0.0, Avg: 0.0, Max: 0.0, Diff: 0.0, Sum: 0.0]

[Processed Buffers: Min: 0, Avg: 0.0, Max: 0, Diff: 0, Sum: 0]

[Scan RS (ms): Min: 0.0, Avg: 0.0, Max: 0.0, Diff: 0.0, Sum: 0.0]

[Code Root Scanning (ms): Min: 0.0, Avg: 0.0, Max: 0.0, Diff: 0.0, Sum: 0.0]

[Object Copy (ms): Min: 0.9, Avg: 0.9, Max: 0.9, Diff: 0.0, Sum: 3.8]

[Termination (ms): Min: 0.0, Avg: 0.0, Max: 0.0, Diff: 0.0, Sum: 0.0]

[Termination Attempts: Min: 1, Avg: 1.8, Max: 4, Diff: 3, Sum: 7]

[GC Worker Other (ms): Min: 0.0, Avg: 0.0, Max: 0.0, Diff: 0.0, Sum: 0.1]

[GC Worker Total (ms): Min: 1.3, Avg: 1.3, Max: 1.3, Diff: 0.0, Sum: 5.0]

[GC Worker End (ms): Min: 278.0, Avg: 278.0, Max: 278.0, Diff: 0.0]

[Code Root Fixup: 0.0 ms]

[Code Root Purge: 0.0 ms]

[Clear CT: 0.1 ms]

[Other: 2.2 ms]

[Choose CSet: 0.0 ms]  
[Ref Proc: 0.1 ms]  
[Ref Enq: 0.0 ms]  
[Redirty Cards: 0.0 ms]  
[Humongous Register: 0.0 ms]  
[Humongous Reclaim: 0.0 ms]  
[Free CSet: 0.0 ms]  
[Eden: 3072.0K(6144.0K)->0.0B(2048.0K) Survivors: 0.0B->1024.0K Heap:  
4359.9K(10.0M)->2856.1K(10.0M)]  
[Times: user=0.00 sys=0.00, real=0.00 secs]  
2020-02-11T14:55:22.656+0800: [GC concurrent-root-region-scan-start]  
2020-02-11T14:55:22.658+0800: [GC concurrent-root-region-scan-end, 0.0017780  
secs]  
2020-02-11T14:55:22.658+0800: [GC concurrent-mark-start]  
2020-02-11T14:55:22.658+0800: [GC concurrent-mark-end, 0.0000704 secs]  
2020-02-11T14:55:22.659+0800: [GC remark 2020-02-11T14:55:22.659+0800:  
[Finalize Marking, 0.0001302 secs] 2020-02-11T14:55:22.659+0800: [GC ref-proc,  
0.0001531 secs] 2020-02-11T14:55:22.659+0800: [Unloading, 0.0006640 secs],  
0.0010849 secs]  
[Times: user=0.00 sys=0.00, real=0.00 secs]  
2020-02-11T14:55:22.660+0800: [GC cleanup 4945K->4945K(10M), 0.0002797 secs]  
[Times: user=0.00 sys=0.00, real=0.00 secs]  
hello world  
Heap  
garbage-first heap total 10240K, used 4904K [0x00000000ff600000,  
0x00000000ff700050, 0x0000000100000000)  
region size 1024K, 2 young (2048K), 1 survivors (1024K)  
Metaspace used 3499K, capacity 4498K, committed 4864K, reserved 1056768K  
class space used 387K, capacity 390K, committed 512K, reserved 1048576K

//由于 Humongous 分配导致GC暂停发生在年轻代, 初始标记耗时0.0100740秒  
2020-01-30T11:00:13.034-0800: [GC pause (G1 Humongous Allocation) (young)  
(initial-mark), 0.0100740 secs]  
//运行时间1.8ms, GC有4个工作线程  
[Parallel Time: 1.8 ms, GC Workers: 4]  
//GC 工作线程开始。最小时间 2011.8ms, 平均时间2011.9ms, 最大时间2012.1ms, 相  
差0.3ms  
[GC Worker Start (ms): Min: 2011.8, Avg: 2011.9, Max: 2012.1, Diff: 0.3]  
//根扫描  
[Ext Root Scanning (ms): Min: 0.4, Avg: 0.5, Max: 0.8, Diff: 0.5, Sum: 2.1]  
//更新RSet  
[Update RS (ms): Min: 0.0, Avg: 0.0, Max: 0.0, Diff: 0.0, Sum: 0.0]  
//记录引用变化缓存空间  
[Processed Buffers: Min: 0, Avg: 0.0, Max: 0, Diff: 0, Sum: 0]  
//RSet 扫描

[Scan RS (ms): Min: 0.0, Avg: 0.0, Max: 0.0, Diff: 0.0, Sum: 0.0]  
//根扫描的时间  
[Code Root Scanning (ms): Min: 0.0, Avg: 0.0, Max: 0.0, Diff: 0.0, Sum: 0.0]  
//对象拷贝  
[Object Copy (ms): Min: 0.5, Avg: 0.5, Max: 0.6, Diff: 0.1, Sum: 2.2]  
//GC线程执行完之前的耗时, 检查其他线程的引用 (处理引用队列)  
[Termination (ms): Min: 0.0, Avg: 0.0, Max: 0.0, Diff: 0.0, Sum: 0.0]  
//执行完成  
[Termination Attempts: Min: 1, Avg: 1.2, Max: 2, Diff: 1, Sum: 5]  
//GC线程在其他任务上花费的时间  
[GC Worker Other (ms): Min: 0.0, Avg: 0.1, Max: 0.2, Diff: 0.2, Sum: 0.3]  
//GC线程总花费时间  
[GC Worker Total (ms): Min: 1.0, Avg: 1.2, Max: 1.3, Diff: 0.3, Sum: 4.6]  
//GC线程结束花费时间  
[GC Worker End (ms): Min: 2013.1, Avg: 2013.1, Max: 2013.1, Diff: 0.0]  
[Code Root Fixup: 0.0 ms]  
[Code Root Purge: 0.0 ms]  
//Card Table, Key 指向当前Region, 然后Value就是当前的值  
[Clear CT: 0.1 ms]  
[Other: 8.2 ms]  
//选择回收集合  
[Choose CSet: 0.0 ms]  
//引用处理 (软引用, 弱引用处理)  
[Ref Proc: 8.0 ms]  
//引用处理进入队列  
[Ref Enq: 0.0 ms]  
[Redirty Cards: 0.0 ms]  
[Humongous Register: 0.0 ms]  
[Humongous Reclaim: 0.0 ms]  
[Free CSet: 0.0 ms]  
//执行完Young GC 后的结果  
[Eden: 3072.0K(4096.0K)->0.0B(2048.0K) Survivors: 0.0B->1024.0K Heap:  
4976.2K(10.0M)->2739.5K(10.0M)]  
[Times: user=0.00 sys=0.00, real=0.01 secs]  
//并发扫描开始  
2020-01-30T11:00:13.045-0800: [GC concurrent-root-region-scan-start]  
//并发扫描结束  
2020-01-30T11:00:13.046-0800: [GC concurrent-root-region-scan-end, 0.0012011  
secs]  
//并发标记开始  
2020-01-30T11:00:13.046-0800: [GC concurrent-mark-start]  
//并发标记结束  
2020-01-30T11:00:13.046-0800: [GC concurrent-mark-end, 0.0001928 secs]  
//最终标记  
2020-01-30T11:00:13.049-0800: [GC remark 2020-01-30T11:00:13.049-0800:  
[Finalize Marking, 0.0001507 secs] 2020-01-30T11:00:13.049-0800: [GC ref-proc,  
0.0001743 secs] 2020-01-30T11:00:13.049-0800: [Unloading, 0.0005663 secs],

0.0010505 secs]

[Times: user=0.01 sys=0.00, real=0.01 secs]

//内存清理

2020-01-30T11:00:13.050-0800: [GC cleanup 3763K->3763K(10M), 0.0002342 secs]

[Times: user=0.00 sys=0.00, real=0.00 secs]

hello world

Heap

garbage-first heap total 10240K, used 4787K [0x00000007bf600000,  
0x00000007bf700050, 0x00000007c0000000)

//分区大小1024K, 2个Region作为young, 1个Region Survivors, 其他的待分配

region size 1024K, 2 young (2048K), 1 survivors (1024K)

Metaspace used 3200K, capacity 4592K, committed 4864K, reserved 1056768K

class space used 341K, capacity 424K, committed 512K, reserved 1048576K

Disconnected from the target VM, address: '127.0.0.1:50657', transport: 'socket'

Process finished with exit code 0