命令

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| java -Xmx1g -Xms1g -XX:-UseAdaptiveSizePolicy -XX:+UseSerialGC -jar target/gateway-server-  0.0.1-SNAPSHOT.jar （串行GC）  java -Xmx1g -Xms1g -XX:-UseAdaptiveSizePolicy -XX:+UseParallelGC -jar gateway-server-  0.0.1-SNAPSHOT.jar （并行GC）  java -Xmx1g -Xms1g -XX:-UseAdaptiveSizePolicy -XX:+UseConcMarkSweepGC -jar  gateway-server-0.0.1-SNAPSHOT.jar （CMS GC）  java -Xmx1g -Xms1g -XX:-UseAdaptiveSizePolicy -XX:+UseG1GC -XX:MaxGCPauseMillis=50 -jar  gateway-server-0.0.1-SNAPSHOT.jar （G1 GC） |

# 串行GC

-XX:+UseSerialGC

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| Attaching to process ID 28176, please wait...  Debugger attached successfully.  Server compiler detected.  JVM version is 25.202-b08  using thread-local object allocation.  Mark Sweep Compact GC  Heap Configuration:  MinHeapFreeRatio = 40 #收缩堆内存的预估最小值,默认40%  MaxHeapFreeRatio = 70 #收缩堆内存的预估最大值,默认70%  MaxHeapSize = 1073741824 (1024.0MB) #最大堆内存(等于新生代+老年代)  NewSize = 357892096 (341.3125MB) #新生代堆内存大小  MaxNewSize = 357892096 (341.3125MB) #最大新生代内存大小(默认堆内存1/3)  OldSize = 715849728 (682.6875MB) #老年代内存大小  NewRatio = 2 #新生代和老年代的例(此处为new:old = 1:2)  SurvivorRatio = 8 #Eden区和Survivor区的比例(eden:s0:s1 = 8:1:1)  MetaspaceSize = 21807104 (20.796875MB) #元数据区大小  CompressedClassSpaceSize = 1073741824 (1024.0MB) #类指针压缩空间大小  MaxMetaspaceSize = 17592186044415 MB #最大元数据区大小  G1HeapRegionSize = 0 (0.0MB) #G1 GC 每个区域的大小  Heap Usage:  New Generation (Eden + 1 Survivor Space):  capacity = 322109440 (307.1875MB)  used = 150411856 (143.4439239501953MB)  free = 171697584 (163.7435760498047MB)  46.69588572132503% used  Eden Space:  capacity = 286326784 (273.0625MB)  used = 133895352 (127.69255828857422MB)  free = 152431432 (145.36994171142578MB)  46.763125031292915% used  From Space:  capacity = 35782656 (34.125MB)  used = 16516504 (15.751365661621094MB)  free = 19266152 (18.373634338378906MB)  46.15784809266255% used  To Space:  capacity = 35782656 (34.125MB)  used = 0 (0.0MB)  free = 35782656 (34.125MB)  0.0% used  tenured generation:  capacity = 715849728 (682.6875MB)  used = 15157888 (14.4556884765625MB)  free = 700691840 (668.2318115234375MB)  2.1174678716927584% used  16083 interned Strings occupying 2159968 bytes. |

# 并行GC

-XX:+UseParallelGC

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| Attaching to process ID 32900, please wait...  Debugger attached successfully.  Server compiler detected.  JVM version is 25.202-b08  using thread-local object allocation.  Parallel GC with 10 thread(s)  Heap Configuration:  MinHeapFreeRatio = 40 #收缩堆内存的预估最小 值,默认40%  MaxHeapFreeRatio = 70 #收缩堆内存的预估最大值,默认70%  MaxHeapSize = 1073741824 (1024.0MB) #最大堆内存（等于新生代+老年代）  NewSize = 357564416 (341.0MB) #新生代堆内存大小  MaxNewSize = 357564416 (341.0MB) #最大新生代内存大小(默认堆内存1/3)  OldSize = 716177408 (683.0MB) #老年代内存大小  NewRatio = 2 #新生代和老年代的比例  (此处为new:old = 1:2)  SurvivorRatio = 8 #Eden区和Survivor区的比例  (eden:s0:s1 = 8:1:1)  MetaspaceSize = 21807104 (20.796875MB) #元数据区大小  CompressedClassSpaceSize = 1073741824 (1024.0MB) #类指针压缩空间大小  MaxMetaspaceSize = 17592186044415 MB #最大元数据区大小  G1HeapRegionSize = 0 (0.0MB) #G1 GC 每个区域的大小  Heap Usage:  PS Young Generation  Eden Space:  capacity = 268435456 (256.0MB)  used = 140166832 (133.6735076904297MB)  free = 128268624 (122.32649230957031MB)  52.2162139415741% used  From Space:  capacity = 44564480 (42.5MB)  used = 16704400 (15.930557250976562MB)  free = 27860080 (26.569442749023438MB)  37.483664119944855% used  To Space:  capacity = 44564480 (42.5MB)  used = 0 (0.0MB)  free = 44564480 (42.5MB)  0.0% used  PS Old Generation  capacity = 716177408 (683.0MB)  used = 13960776 (13.314033508300781MB)  free = 702216632 (669.6859664916992MB)  1.9493460480674643% used  15860 interned Strings occupying 2119512 bytes. |

# CMS GC (和并行GC 差不多)

-XX:+UseConcMarkSweepGC

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| Attaching to process ID 53356, please wait...  Debugger attached successfully.  Server compiler detected.  JVM version is 25.202-b08  using parallel threads in the new generation.  using thread-local object allocation.  Concurrent Mark-Sweep GC  Heap Configuration:  MinHeapFreeRatio = 40  MaxHeapFreeRatio = 70  MaxHeapSize = 1073741824 (1024.0MB)  NewSize = 357892096 (341.3125MB)  MaxNewSize = 357892096 (341.3125MB)  OldSize = 715849728 (682.6875MB)  NewRatio = 2  SurvivorRatio = 8  MetaspaceSize = 21807104 (20.796875MB)  CompressedClassSpaceSize = 1073741824 (1024.0MB)  MaxMetaspaceSize = 17592186044415 MB  G1HeapRegionSize = 0 (0.0MB)  Heap Usage:  New Generation (Eden + 1 Survivor Space):  capacity = 322109440 (307.1875MB)  used = 149620264 (142.68900299072266MB)  free = 172489176 (164.49849700927734MB)  46.450133221801885% used  Eden Space:  capacity = 286326784 (273.0625MB)  used = 124349192 (118.58863067626953MB)  free = 161977592 (154.47386932373047MB)  43.4291162925226% used  From Space:  capacity = 35782656 (34.125MB)  used = 25271072 (24.100372314453125MB)  free = 10511584 (10.024627685546875MB)  70.6238016540751% used  To Space:  capacity = 35782656 (34.125MB)  used = 0 (0.0MB)  free = 35782656 (34.125MB)  0.0% used  concurrent mark-sweep generation:  capacity = 715849728 (682.6875MB)  used = 0 (0.0MB)  free = 715849728 (682.6875MB)  0.0% used  16137 interned Strings occupying 2164056 bytes. |

# G1 GC

-XX:+UseG1GC -XX:MaxGCPauseMillis=50

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| Attaching to process ID 52116, please wait...  Debugger attached successfully.  Server compiler detected.  JVM version is 25.202-b08  using thread-local object allocation.  Garbage-First (G1) GC with 10 thread(s)  Heap Configuration:  MinHeapFreeRatio = 40 #收缩堆内存的预估最小值,默认40%  MaxHeapFreeRatio = 70 #收缩堆内存的预估最大值,默认70%  MaxHeapSize = 1073741824 (1024.0MB) #最大堆内存（等于新生代+老年代）  NewSize = 1363144 (1.2999954223632812MB) #当前新生代内存大小  MaxNewSize = 643825664 (614.0MB) #新生代最大内存,默认堆内存60%  OldSize = 5452592 (5.1999969482421875MB) #old区大小，默认堆内存5%  NewRatio = 2 #新生代和老年代的比例  (此处为new:old = 1:2)  SurvivorRatio = 8 #Eden区和Survivor区比例  (eden:s0:s1 = 8:1:1)  MetaspaceSize = 21807104 (20.796875MB) #元数据区大小  CompressedClassSpaceSize = 1073741824 (1024.0MB) #类指针压缩空间大小  MaxMetaspaceSize = 17592186044415 MB #最大元数据区大小  G1HeapRegionSize = 1048576 (1.0MB) #G1 GC 每个区域的大小  Heap Usage:  G1 Heap:  regions = 1024  capacity = 1073741824 (1024.0MB)  used = 425403968 (405.69683837890625MB)  free = 648337856 (618.3031616210938MB)  39.61883187294006% used  G1 Young Generation:  Eden Space:  regions = 386  capacity = 656408576 (626.0MB)  used = 404750336 (386.0MB)  free = 251658240 (240.0MB)  61.66134185303515% used  Survivor Space:  regions = 19  capacity = 19922944 (19.0MB)  used = 19922944 (19.0MB)  free = 0 (0.0MB)  100.0% used  G1 Old Generation:  regions = 1  capacity = 397410304 (379.0MB)  used = 0 (0.0MB)  free = 397410304 (379.0MB)  0.0% used  16104 interned Strings occupying 2161880 bytes. |

# Eden区和old区内存大小计算方法

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| ratio是N的话，一般计算基数就是 1/(N+1);  一边是N/(N+1)，一边是1/(N+1);  特别地，newRatio = 2 说的是，new也就是young区最大值占 heap的 1/(2+1) = 1/3, 这里是最大值，也就是MaxNewSize。  xmx=1024m的话，对应于maxNewSize=1024/3 m = 341m。  survivor因为有两个，所以survivorRatio是N的话，计算基数就是 1/(N+2)；  每个survivor，不管是s0，还是s1，都占new区的最大值的1/(N+2)。  survivorRatio = 8 对应于s0最大值=s1最大值=new区最大值的1/(8+2) = 1/10，  也就是说最大值 eden:s0:s1 = 8:1:1 。  如果maxNewSize = 341m，那么s0和s1的最大值是34m，eden最大值是273m。 |