1. Сортировка слиянием.

Начало: 21:20:41.586

Завершение: 21:20:41.787.

2. Сортировка методом вставки.

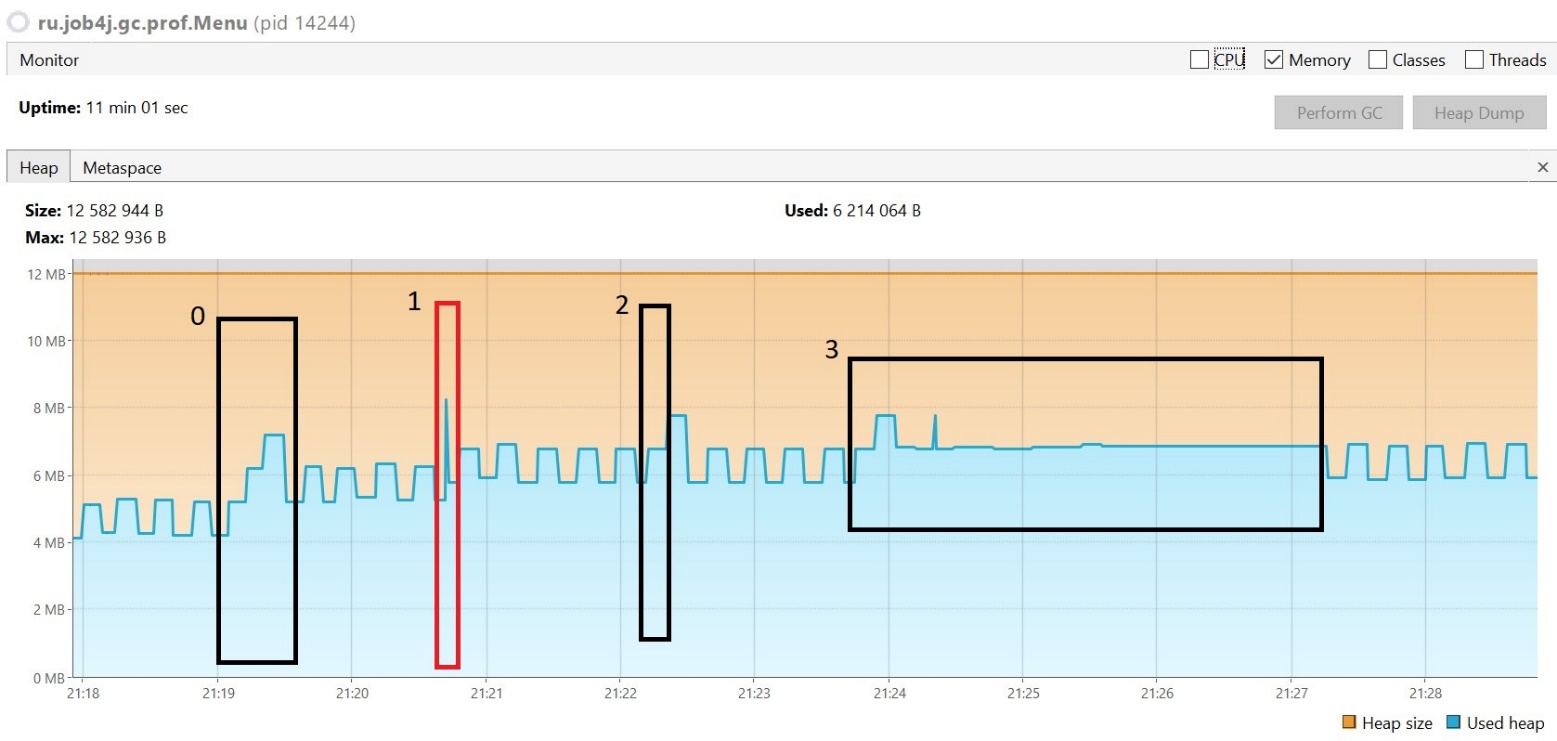
Начало: 21:22:11.725

Завершение: 21:22:20.194.

3. Сортировка пузырьком.

Начало: 21:23:44.816

Завершение: 21:27:12.637.



Фаза 0: фаза бездействия запущенного приложения, затем создание массива и заполнение элементами (первый вертикальный подъем на графике в отмеченной области). После заполнения элементами видим продолжение влияния этого этапа на объем объектов, а именно: два вертикальных подъема и затем сборка мусора. После сборки график стабилизировался и некоторое время программа продолжала работу без активных действий.

Фаза 1: сортировка слиянием. Очень быстрая сортировка, которая на графике отразилась остроконечным пиком. После сборки мусора график стабилизировался на более высоких уровнях, чем до сортировки.

Фаза 2: сортировка методом вставки. Более длинный этап, по сравнению с сортировкой слиянием. Однако, видим, что на графике это отразилось в виде обычного подъема после которого наступил горизонтальный этап. После завершения сортировки произошел еще один скачок, после которого сборка мусора. После сборки всё вернулось на уровни, как было и до сортировки.

Фаза 3: Сортировка пузырьком, самая длительная из трех представленных. Однако, видим, что на графике было только два подъема, которые были нивелированы сборками мусора. После второй сборки уровень застыл и не менялся до самого завершения сортировки. Затем график стабилизировался.

Файл log.txt:

[0.014s][info][gc] Using G1

[6.569s][info][gc] GC(0) Pause Young (Normal) (G1 Evacuation Pause) 4M->1M(12M) 6.364ms

[6.636s][info][gc] GC(1) Pause Young (Normal) (G1 Evacuation Pause) 3M->2M(12M) 4.650ms

[6.681s][info][gc] GC(2) Pause Young (Normal) (G1 Evacuation Pause) 3M->2M(12M) 2.002ms

[6.787s][info][gc] GC(3) Pause Young (Normal) (G1 Evacuation Pause) 4M->2M(12M) 3.147ms

[6.837s][info][gc] GC(4) Pause Young (Normal) (G1 Evacuation Pause) 4M->3M(12M) 5.141ms

[6.891s][info][gc] GC(5) Pause Young (Normal) (G1 Evacuation Pause) 6M->3M(12M) 4.097ms

[7.132s][info][gc] GC(6) Pause Young (Normal) (G1 Evacuation Pause) 6M->3M(12M) 2.505ms

[7.555s][info][gc] GC(7) Pause Young (Normal) (G1 Evacuation Pause) 6M->4M(12M) 4.260ms

[18.591s][info][gc] GC(8) Pause Young (Normal) (G1 Evacuation Pause) 6M->4M(12M) 8.583ms

[34.627s][info][gc] GC(9) Pause Young (Normal) (G1 Evacuation Pause) 6M->4M(12M) 4.159ms

[51.591s][info][gc] GC(10) Pause Young (Normal) (G1 Evacuation Pause) 6M->4M(12M) 2.962ms

[68.601s][info][gc] GC(11) Pause Young (Normal) (G1 Evacuation Pause) 6M->4M(12M) 4.405ms

[75.675s][info][gc] GC(12) Pause Young (Concurrent Start) (G1 Humongous Allocation) 5M->4M(12M) 2.288ms

[75.676s][info][gc] GC(13) Concurrent Undo Cycle

[75.676s][info][gc] GC(13) Concurrent Undo Cycle 0.293ms

[100.707s][info][gc] GC(14) Pause Young (Normal) (G1 Evacuation Pause) 8M->5M(12M) 6.005ms

[118.630s][info][gc] GC(15) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->5M(12M) 3.718ms

[118.630s][info][gc] GC(16) Concurrent Mark Cycle

[118.656s][info][gc] GC(16) Pause Remark 5M->5M(12M) 14.070ms

[118.662s][info][gc] GC(16) Pause Cleanup 5M->5M(12M) 0.186ms

[118.663s][info][gc] GC(16) Concurrent Mark Cycle 32.656ms

[132.726s][info][gc] GC(17) Pause Young (Normal) (G1 Evacuation Pause) 7M->5M(12M) 4.595ms

[150.739s][info][gc] GC(18) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->5M(12M) 3.499ms

[150.739s][info][gc] GC(19) Concurrent Mark Cycle

[150.759s][info][gc] GC(19) Pause Remark 5M->5M(12M) 6.344ms

[150.764s][info][gc] GC(19) Pause Cleanup 5M->5M(12M) 0.215ms

[150.764s][info][gc] GC(19) Concurrent Mark Cycle 25.431ms

[168.656s][info][gc] GC(20) Pause Young (Normal) (G1 Evacuation Pause) 7M->5M(12M) 3.992ms

[172.867s][info][gc] GC(21) Pause Young (Concurrent Start) (G1 Humongous Allocation) 5M->5M(12M) 2.508ms

[172.868s][info][gc] GC(22) Concurrent Mark Cycle

[172.881s][info][gc] GC(22) Pause Remark 7M->7M(12M) 4.472ms

[172.885s][info][gc] GC(22) Pause Cleanup 8M->8M(12M) 0.113ms

[172.885s][info][gc] GC(22) Concurrent Mark Cycle 17.781ms

[172.890s][info][gc] GC(23) Pause Young (Normal) (G1 Evacuation Pause) 8M->6M(12M) 2.389ms

[172.905s][info][gc] GC(24) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->6M(12M) 2.259ms

[172.906s][info][gc] GC(25) Concurrent Mark Cycle

[172.915s][info][gc] GC(25) Pause Remark 6M->6M(12M) 3.759ms

[172.920s][info][gc] GC(25) Pause Cleanup 7M->7M(12M) 0.174ms

[172.920s][info][gc] GC(25) Concurrent Mark Cycle 14.576ms

[172.927s][info][gc] GC(26) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 2.242ms

[172.936s][info][gc] GC(27) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->6M(12M) 2.374ms

[172.936s][info][gc] GC(28) Concurrent Mark Cycle

[172.942s][info][gc] GC(29) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 2.229ms

[172.949s][info][gc] GC(28) Pause Remark 6M->6M(12M) 3.461ms

[172.954s][info][gc] GC(30) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 2.040ms

[172.956s][info][gc] GC(28) Pause Cleanup 7M->7M(12M) 0.184ms

[172.956s][info][gc] GC(28) Concurrent Mark Cycle 19.826ms

[172.959s][info][gc] GC(31) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 1.664ms

[172.963s][info][gc] GC(32) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->6M(12M) 1.570ms

[172.963s][info][gc] GC(33) Concurrent Mark Cycle

[172.968s][info][gc] GC(34) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 1.503ms

[172.972s][info][gc] GC(35) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 1.824ms

[172.978s][info][gc] GC(33) Pause Remark 7M->7M(12M) 4.851ms

[172.982s][info][gc] GC(36) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 1.421ms

[172.984s][info][gc] GC(33) Pause Cleanup 7M->7M(12M) 0.118ms

[172.984s][info][gc] GC(33) Concurrent Mark Cycle 21.480ms

[172.987s][info][gc] GC(37) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 1.535ms

[172.992s][info][gc] GC(38) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->6M(12M) 1.460ms

[172.992s][info][gc] GC(39) Concurrent Mark Cycle

[172.996s][info][gc] GC(40) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 1.782ms

[173.000s][info][gc] GC(41) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 1.226ms

[173.005s][info][gc] GC(39) Pause Remark 7M->7M(12M) 3.351ms

[173.008s][info][gc] GC(42) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 1.249ms

[173.010s][info][gc] GC(39) Pause Cleanup 7M->7M(12M) 0.174ms

[173.010s][info][gc] GC(39) Concurrent Mark Cycle 18.838ms

[173.013s][info][gc] GC(43) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 1.309ms

[173.017s][info][gc] GC(44) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->6M(12M) 1.531ms

[173.017s][info][gc] GC(45) Concurrent Mark Cycle

[173.022s][info][gc] GC(46) Pause Young (Normal) (G1 Evacuation Pause) 7M->7M(12M) 1.319ms

[173.026s][info][gc] GC(47) Pause Young (Normal) (G1 Evacuation Pause) 8M->7M(12M) 1.310ms

[173.032s][info][gc] GC(45) Pause Remark 7M->7M(12M) 4.980ms

[173.035s][info][gc] GC(48) Pause Young (Normal) (G1 Evacuation Pause) 8M->7M(12M) 1.212ms

[173.037s][info][gc] GC(45) Pause Cleanup 7M->7M(12M) 0.215ms

[173.038s][info][gc] GC(45) Concurrent Mark Cycle 20.683ms

[173.040s][info][gc] GC(49) Pause Young (Normal) (G1 Evacuation Pause) 8M->7M(12M) 1.147ms

[173.044s][info][gc] GC(50) Pause Young (Concurrent Start) (G1 Evacuation Pause) 8M->7M(12M) 1.614ms

[173.044s][info][gc] GC(51) Concurrent Mark Cycle

[173.048s][info][gc] GC(52) Pause Young (Normal) (G1 Evacuation Pause) 8M->7M(12M) 1.242ms

[173.052s][info][gc] GC(53) Pause Young (Normal) (G1 Evacuation Pause) 8M->7M(12M) 1.329ms

[173.059s][info][gc] GC(51) Pause Remark 7M->7M(12M) 5.440ms

[173.063s][info][gc] GC(51) Pause Cleanup 9M->9M(12M) 0.168ms

[173.063s][info][gc] GC(51) Concurrent Mark Cycle 18.865ms

[173.757s][info][gc] GC(54) Pause Young (Normal) (G1 Evacuation Pause) 9M->5M(12M) 2.172ms

[187.769s][info][gc] GC(55) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->5M(12M) 2.394ms

[187.769s][info][gc] GC(56) Concurrent Mark Cycle

[187.794s][info][gc] GC(56) Pause Remark 6M->6M(12M) 5.990ms

[187.802s][info][gc] GC(56) Pause Cleanup 6M->6M(12M) 0.239ms

[187.803s][info][gc] GC(56) Concurrent Mark Cycle 33.617ms

[204.788s][info][gc] GC(57) Pause Young (Normal) (G1 Evacuation Pause) 7M->5M(12M) 2.503ms

[222.800s][info][gc] GC(58) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->5M(12M) 2.563ms

[222.800s][info][gc] GC(59) Concurrent Mark Cycle

[222.824s][info][gc] GC(59) Pause Remark 5M->5M(12M) 5.847ms

[222.829s][info][gc] GC(59) Pause Cleanup 5M->5M(12M) 0.174ms

[222.830s][info][gc] GC(59) Concurrent Mark Cycle 29.941ms

[240.809s][info][gc] GC(60) Pause Young (Normal) (G1 Evacuation Pause) 7M->5M(12M) 2.666ms

[258.711s][info][gc] GC(61) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->5M(12M) 2.187ms

[258.711s][info][gc] GC(62) Concurrent Mark Cycle

[258.731s][info][gc] GC(62) Pause Remark 5M->5M(12M) 8.088ms

[258.737s][info][gc] GC(62) Pause Cleanup 5M->5M(12M) 0.186ms

[258.737s][info][gc] GC(62) Concurrent Mark Cycle 25.530ms

[263.023s][info][gc] GC(63) Pause Young (Concurrent Start) (G1 Humongous Allocation) 6M->5M(12M) 1.594ms

[263.024s][info][gc] GC(64) Concurrent Mark Cycle

[263.034s][info][gc] GC(64) Pause Remark 6M->6M(12M) 3.515ms

[263.038s][info][gc] GC(64) Pause Cleanup 6M->6M(12M) 0.155ms

[263.038s][info][gc] GC(64) Concurrent Mark Cycle 14.739ms

[280.864s][info][gc] GC(65) Pause Young (Normal) (G1 Evacuation Pause) 8M->5M(12M) 2.800ms

[298.881s][info][gc] GC(66) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->5M(12M) 2.678ms

[298.881s][info][gc] GC(67) Concurrent Mark Cycle

[298.901s][info][gc] GC(67) Pause Remark 5M->5M(12M) 6.263ms

[298.907s][info][gc] GC(67) Pause Cleanup 5M->5M(12M) 0.131ms

[298.908s][info][gc] GC(67) Concurrent Mark Cycle 26.867ms

[315.892s][info][gc] GC(68) Pause Young (Normal) (G1 Evacuation Pause) 7M->5M(12M) 2.890ms

[333.759s][info][gc] GC(69) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->5M(12M) 2.503ms

[333.759s][info][gc] GC(70) Concurrent Mark Cycle

[333.787s][info][gc] GC(70) Pause Remark 5M->5M(12M) 9.848ms

[333.796s][info][gc] GC(70) Pause Cleanup 5M->5M(12M) 0.143ms

[333.797s][info][gc] GC(70) Concurrent Mark Cycle 37.493ms

[350.927s][info][gc] GC(71) Pause Young (Normal) (G1 Evacuation Pause) 7M->5M(12M) 2.754ms

[356.130s][info][gc] GC(72) Pause Young (Concurrent Start) (G1 Humongous Allocation) 6M->5M(12M) 1.623ms

[356.130s][info][gc] GC(73) Concurrent Mark Cycle

[356.142s][info][gc] GC(73) Pause Remark 6M->6M(12M) 3.698ms

[356.145s][info][gc] GC(73) Pause Cleanup 6M->6M(12M) 0.119ms

[356.145s][info][gc] GC(73) Concurrent Mark Cycle 14.920ms

[373.941s][info][gc] GC(74) Pause Young (Normal) (G1 Evacuation Pause) 8M->6M(12M) 1.769ms

[382.948s][info][gc] GC(75) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->6M(12M) 1.758ms

[382.948s][info][gc] GC(76) Concurrent Mark Cycle

[382.963s][info][gc] GC(76) Pause Remark 6M->6M(12M) 3.744ms

[382.968s][info][gc] GC(76) Pause Cleanup 6M->6M(12M) 0.139ms

[382.968s][info][gc] GC(76) Concurrent Mark Cycle 20.190ms

[391.788s][info][gc] GC(77) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 1.772ms

[399.961s][info][gc] GC(78) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->6M(12M) 1.463ms

[399.961s][info][gc] GC(79) Concurrent Mark Cycle

[399.980s][info][gc] GC(79) Pause Remark 6M->6M(12M) 7.517ms

[399.985s][info][gc] GC(79) Pause Cleanup 6M->6M(12M) 0.182ms

[399.986s][info][gc] GC(79) Concurrent Mark Cycle 24.137ms

[408.969s][info][gc] GC(80) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 1.791ms

[417.972s][info][gc] GC(81) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->6M(12M) 1.700ms

[417.972s][info][gc] GC(82) Concurrent Mark Cycle

[417.983s][info][gc] GC(82) Pause Remark 6M->6M(12M) 4.883ms

[417.986s][info][gc] GC(82) Pause Cleanup 6M->6M(12M) 0.125ms

[417.986s][info][gc] GC(82) Concurrent Mark Cycle 13.908ms

[426.802s][info][gc] GC(83) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 1.128ms

[434.988s][info][gc] GC(84) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->6M(12M) 1.367ms

[434.988s][info][gc] GC(85) Concurrent Mark Cycle

[435.001s][info][gc] GC(85) Pause Remark 6M->6M(12M) 5.575ms

[435.004s][info][gc] GC(85) Pause Cleanup 6M->6M(12M) 0.180ms

[435.004s][info][gc] GC(85) Concurrent Mark Cycle 16.444ms

[442.992s][info][gc] GC(86) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 1.476ms

[451.867s][info][gc] GC(87) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->6M(12M) 1.626ms

[451.867s][info][gc] GC(88) Concurrent Mark Cycle

[451.883s][info][gc] GC(88) Pause Remark 6M->6M(12M) 7.814ms

[451.889s][info][gc] GC(88) Pause Cleanup 6M->6M(12M) 0.117ms

[451.889s][info][gc] GC(88) Concurrent Mark Cycle 22.113ms

[457.871s][info][gc] GC(89) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 1.706ms

[466.012s][info][gc] GC(90) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->6M(12M) 1.730ms

[466.012s][info][gc] GC(91) Concurrent Mark Cycle

[466.026s][info][gc] GC(91) Pause Remark 6M->6M(12M) 3.818ms

[466.031s][info][gc] GC(91) Pause Cleanup 6M->6M(12M) 0.121ms

[466.032s][info][gc] GC(91) Concurrent Mark Cycle 19.896ms

[475.020s][info][gc] GC(92) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 1.585ms

[484.028s][info][gc] GC(93) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->6M(12M) 1.786ms

[484.029s][info][gc] GC(94) Concurrent Mark Cycle

[484.039s][info][gc] GC(94) Pause Remark 6M->6M(12M) 4.823ms

[484.044s][info][gc] GC(94) Pause Cleanup 6M->6M(12M) 0.144ms

[484.044s][info][gc] GC(94) Concurrent Mark Cycle 15.540ms

[492.888s][info][gc] GC(95) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 1.486ms

[501.041s][info][gc] GC(96) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->6M(12M) 1.554ms

[501.041s][info][gc] GC(97) Concurrent Mark Cycle

[501.056s][info][gc] GC(97) Pause Remark 6M->6M(12M) 4.674ms

[501.061s][info][gc] GC(97) Pause Cleanup 6M->6M(12M) 0.125ms

[501.062s][info][gc] GC(97) Concurrent Mark Cycle 20.741ms

[510.046s][info][gc] GC(98) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 1.545ms

[519.052s][info][gc] GC(99) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->6M(12M) 1.343ms

[519.052s][info][gc] GC(100) Concurrent Mark Cycle

[519.061s][info][gc] GC(100) Pause Remark 6M->6M(12M) 3.122ms

[519.064s][info][gc] GC(100) Pause Cleanup 6M->6M(12M) 0.088ms

[519.064s][info][gc] GC(100) Concurrent Mark Cycle 12.065ms

[528.057s][info][gc] GC(101) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 1.445ms

[536.912s][info][gc] GC(102) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->6M(12M) 1.768ms

[536.912s][info][gc] GC(103) Concurrent Mark Cycle

[536.922s][info][gc] GC(103) Pause Remark 6M->6M(12M) 4.131ms

[536.925s][info][gc] GC(103) Pause Cleanup 6M->6M(12M) 0.134ms

[536.925s][info][gc] GC(103) Concurrent Mark Cycle 13.033ms

[545.073s][info][gc] GC(104) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 1.723ms

[554.077s][info][gc] GC(105) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->6M(12M) 1.470ms

[554.077s][info][gc] GC(106) Concurrent Mark Cycle

[554.095s][info][gc] GC(106) Pause Remark 6M->6M(12M) 7.658ms

[554.100s][info][gc] GC(106) Pause Cleanup 6M->6M(12M) 0.122ms

[554.100s][info][gc] GC(106) Concurrent Mark Cycle 23.439ms

[562.925s][info][gc] GC(107) Pause Young (Normal) (G1 Evacuation Pause) 7M->6M(12M) 1.522ms

[567.088s][info][gc] GC(108) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->5M(12M) 3.081ms

[567.088s][info][gc] GC(109) Concurrent Mark Cycle

[567.108s][info][gc] GC(109) Pause Remark 5M->5M(12M) 7.492ms

[567.116s][info][gc] GC(109) Pause Cleanup 5M->5M(12M) 0.200ms

[567.116s][info][gc] GC(109) Concurrent Mark Cycle 27.955ms

[585.936s][info][gc] GC(110) Pause Young (Normal) (G1 Evacuation Pause) 7M->5M(12M) 2.550ms

[603.952s][info][gc] GC(111) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->5M(12M) 3.131ms

[603.952s][info][gc] GC(112) Concurrent Mark Cycle

[603.974s][info][gc] GC(112) Pause Remark 5M->5M(12M) 11.048ms

[603.982s][info][gc] GC(112) Pause Cleanup 5M->5M(12M) 0.197ms

[603.982s][info][gc] GC(112) Concurrent Mark Cycle 30.362ms

[619.958s][info][gc] GC(113) Pause Young (Normal) (G1 Evacuation Pause) 7M->5M(12M) 2.523ms

[638.139s][info][gc] GC(114) Pause Young (Concurrent Start) (G1 Evacuation Pause) 7M->5M(12M) 2.904ms

[638.139s][info][gc] GC(115) Concurrent Mark Cycle

[638.158s][info][gc] GC(115) Pause Remark 6M->6M(12M) 6.886ms

[638.164s][info][gc] GC(115) Pause Cleanup 6M->6M(12M) 0.191ms

[638.165s][info][gc] GC(115) Concurrent Mark Cycle 25.677ms

[656.153s][info][gc] GC(116) Pause Young (Normal) (G1 Evacuation Pause) 7M->5M(12M) 2.746ms