Understanding & Analysing the G1 Family of Garbage Collectors

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In this talk, I will introduce one of our recently completed project which aims to discover the relationship and differences among the G1 family of garbage collectors. I will first have some discussion of the relationship of several GC algorithms as well as their pros and cons. As the main contribution of the project, I will describe a simple region-based garbage collector we firstly implemented on JikesRVM and a series of progressive refinements we performed on it, including linear-scan evacuation, concurrent marking, remembered-sets, and concurrent evacuation. Based on the refinements we further built the Garbage-first GC and Shenandoah GC on JikesRVM. In the end, I will also discuss the results of the evaluations we performed on all of our implemented G1 family of garbage collectors.