

REGION-BASED FINALIZATION

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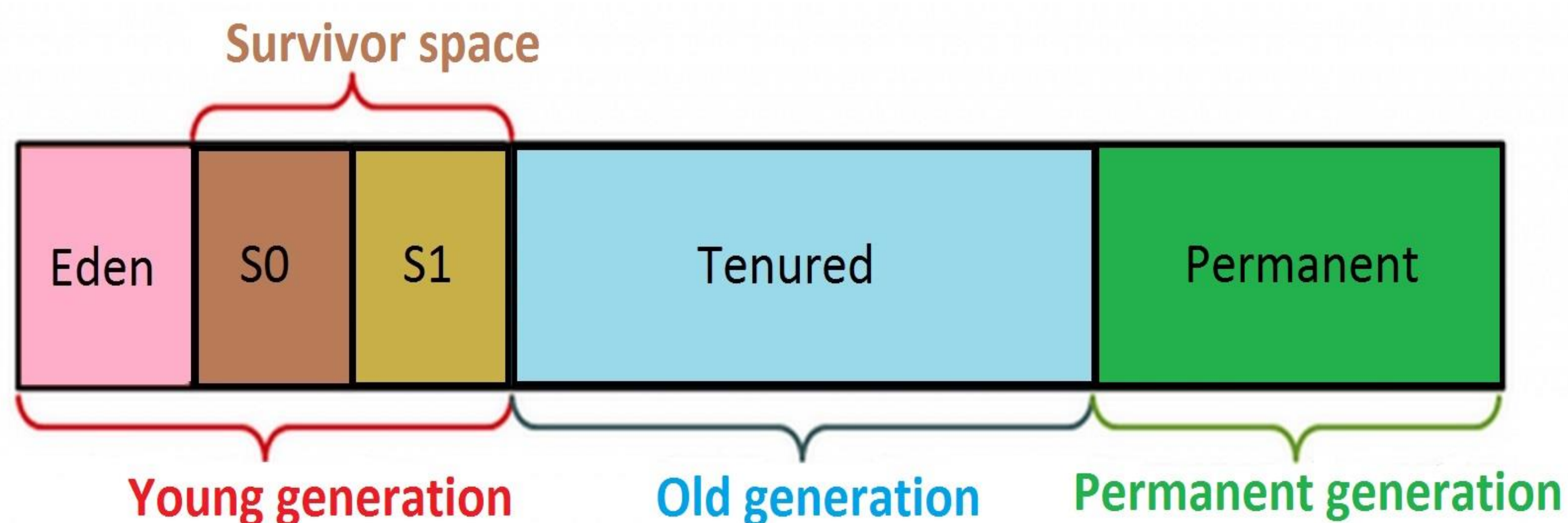
OBJECTIVE

To reduce garbage collection (GC) time by improving efficiency of finalization task.

BACKGROUND

Region Based GC

- ❑ An object becomes eligible for GC when there is no live reference for that object or it can not be reached by any live thread.
- ❑ In region based GC, heap is divided into regions to make GC faster.
- ❑ “Young objects die early” philosophy.

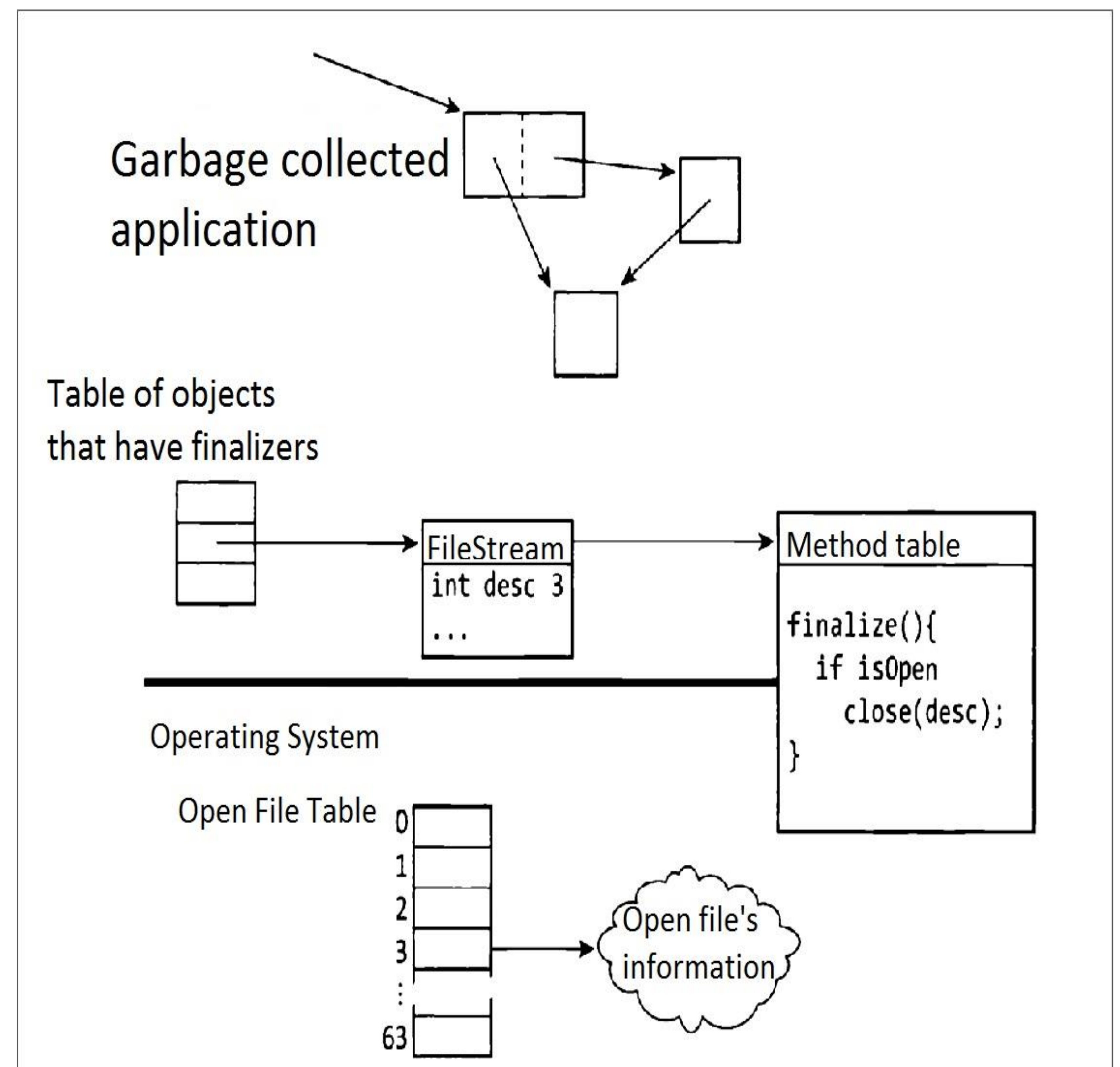


Finalization

- ❑ A procedure to free the resources occupied by dead objects.
- ❑ Occurs after GC is completed.
- ❑ References to finalizable objects are stored in a table which is called finalization queue.
- ❑ This table is accessible only by collectors and not by mutators.
- ❑ One cannot precisely guess when or how often the content of the finalization queue will be processed.
- ❑ Java guarantees that finalization occurs only once for a specific object.

Finalization Thread

- ❑ A thread which is responsible for finalization task.
- ❑ Multiple finalization threads may exist.
- ❑ Multiple finalization threads can run concurrently.
- ❑ Run(s) in background.



RESEARCH AREA

- ❑ Divide heap space into regions with objects needing finalization and those that do not. Analyze finalization execution time.
- ❑ Collect finalizable objects after several GCs, when the size of finalizable region reaches a specific threshold.
- ❑ Analyze performance for different threshold values.