The Derivation of a New DMOS Distributed Garbage Collector

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This talk describes the derivation of a modularised version of the DMOS distributed garbage collection algorithm. DMOS appears to exhibit a unique combination of attractive characteristics for a distributed garbage collector but the original algorithm is known to contain a bug and, previous to this work, lacks a satisfactory, understandable implementation. A modularised DMOS algorithm is developed using an expanded version of a previously published distributed garbage collector derivation methodology that centres on mapping centralised collection schemes to distributed termination detection algorithms. The expanded methodology centres on the partitioning (distribution) of the shared state of the centralised collector. Distributed termination techniques are used to identify globally stable properties of this shared state and to construct globally consistent views that allow for safe distributed collection. The role of the distributed termination algorithms is defined through a process of stepwise refinement. An implementation using the Task Balancing DTA is then outlined.