EFFICIENT IMPLEMENTATION OF THE FIRST-FIT STRATEGY FOR DYNAMIC STORAGE ALLOCATION

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Abstract

We describe an algorithm that efficiently implements the first-fit strategy for dynamic storage allocation. The algorithm imposes a storage overhead of only one word per allocated block (plus a few percent of the total space used for dynamic storage), and the time required to allocate or free a block is $O(\log W)$, where W is the maximum number of words allocated dynamically. The algorithm is faster than many commonly used algorithms, especially when many small blocks are allocated, and it has good worst-case behaviour. It is relatively easy to implement and could be used internally by an operating system, or to provide run-time support for high-level languages such as Pascal and Ada. A Pascal implementation is given in the Appendix.

Comments

Only the Abstract is given here. The full paper appeared as [2], and a preliminary version appeared as [1].

References

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