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Identification

The allocator
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Purpose

The allocator attempts to satisfy calls to assign core by reassigning groups in the free pool.

Introduction

The free pool is organized by the free list in order of increasing group size. In attempting to satisfy the request for a group of a given size, the allocator first determines whether or not it is desirable to satisfy the request out of the free pool. This determination is based on the emergency core requirements of the system, which demand special consideration. If such allocation is desirable, the allocator scans the free list in order and takes the first applicable group. The splitter returns any surplus to the free pool.

The desirability algorithm

The desirability of attempting to satisfy the request out of the free pool is based on several factors. These are the number nfree of blocks in the free pool, the size (in blocks) of the requested group, and the value of the threshold $T(i)$, where the index i is provided by thresholdno. If $nfree - size$ is larger than $T(\text{thresholdno})$, allocation is desirable. Otherwise it is not desirable.

Allocating

If it is desirable, the attempt to allocate out of the free pool proceeds as follows. The free list is maintained in order of increasing group size. The first free group of adequate size is sought. External pointers to the first group of each of several convenient sizes (e.g., 64, 128, 256, 1024 and 2048 words, or other sizes as needed) facilitate the search. If the group which is chosen is larger than necessary, it is split and the surplus is returned to the free pool at the appropriate place in the list. A slight complication arises when a segment is paged with 1024-word pages. In such cases, a free group must be found which is large enough to contain the desired hyperpage where the newly assigned group must begin on a 1024-word boundary. In this case, the free group may get divided into three pieces, with the splitter returning the first and third pieces to the free pool.