



Physical memory allocation:

- Low overhead
- Big chunks allocated together
- System require large memory

To allocate memory use the Buddy system algorithm

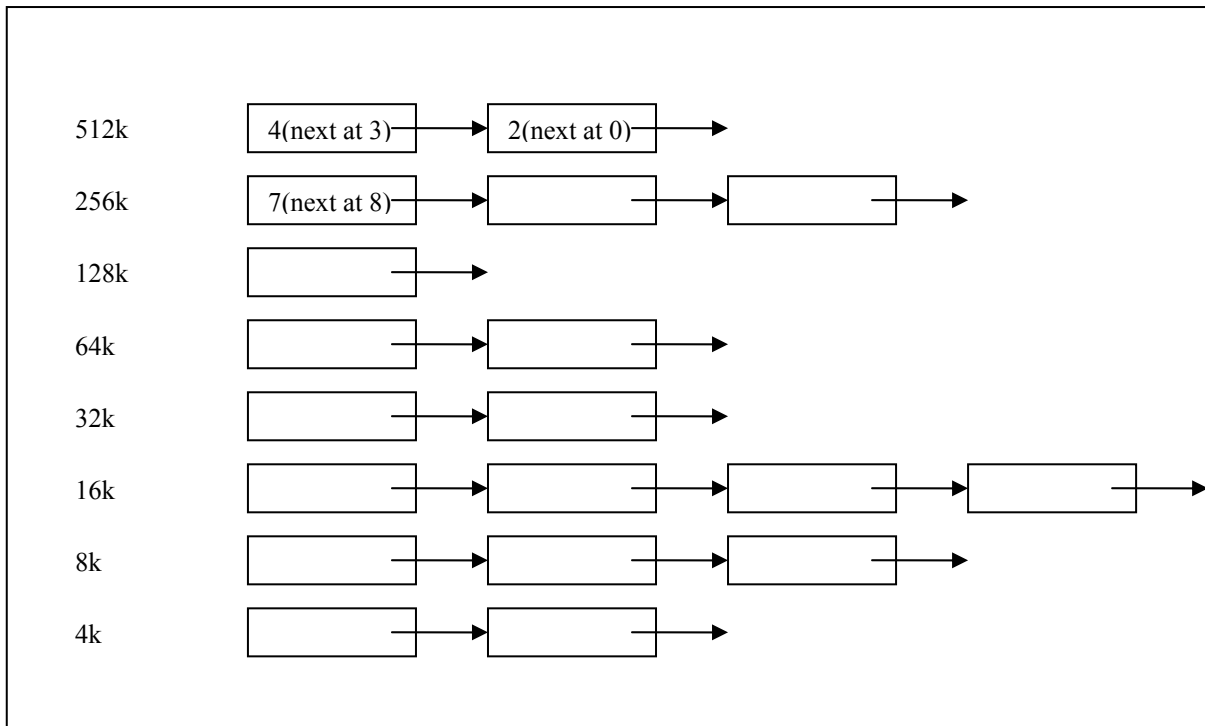
- Smallest chunk 4k
- Largest chunk 512k
- Largest internal memory 64G

All memory allocation, deallocation and reallocation is controlled by the kernel.

Buddy algorithm:

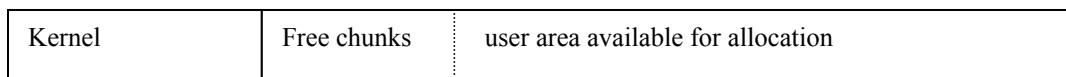
Keep track of all the free chunks using a tree. If 256k allocated, a 512k chunk is no longer free it is divided into two 256k chunks. Only one of the 256k chunk must be known.

If a 256k is deallocated the chunk is put together with another 256k if its free.



Every chunk free is know by the system using pointers. Every information about free chunks contains frame number, type of chunk(512k, 256k, ...) and a next pointer (0 means last information).

The information about free chunks resides in the first frames in user area memory at internal memory.



The first frame after the free chunks area is available for allocation and it is them the buddy system is referring to by absolute frame numbers.

Functions:

Init_buddy_system

Init the buddy system by calculating how much space there is available and how the free chunk area is to be set up



allocate_frames(number of frames)

Finds free frames that is in the free chunks area. If a chunk with correct number of frames is found the chunk information will be divided into two where only the frames not allocated will overwrite the old chunk information
The found chunk must be one step over the required size of chunk.

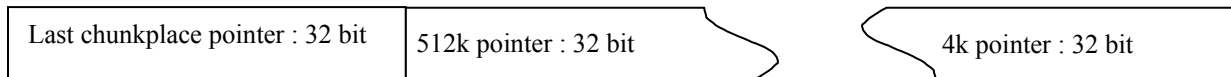
deallocate_frames(frame number)

Finds the nearest free chunk and combinds these two to one or removes items from free chunk list.

Buddy system allocate structures:



The first information in the free chunk area memory



Last chunkplace pointer: Points to the last place where a chunk can be added this increases every time a new free chunk block is created.

512k pointer: The pointer to the first 512k free chunk information in the memory.

128k pointer:

...

4k pointer: The pointer to the first 4k free chunk information in the memory.