Memory Management(2) PEI memory allocation

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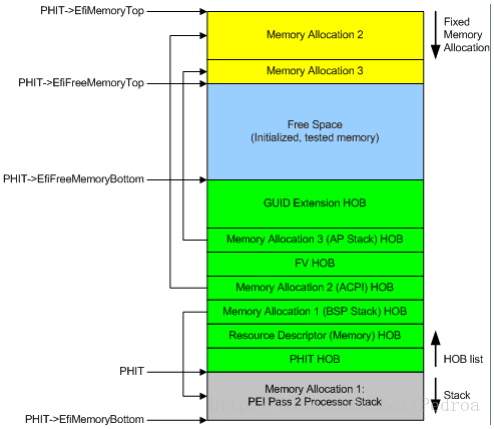
There are two functions for memory allocation in the PEI stage :

- AllocatePage()
- AllocatePool()

For details, please refer to Vol1_PEI_1_5 4.6

I still look at the pictures. Sometimes, when I read the spec, I like to look at the outline pictures. I look at them every time and I have a different understanding every time.



Regarding these two functions AllocatePage() and AllocatePool(), if we just look at the literal meaning, one is to allocate a relatively large memory, and the other is to allocate a relatively small memory.

But there are some differences between the two functions. The main differences are as follows:

- AllocatePage() requires memory install before it can be used, while AllocatePool() does not.
- AllocatePage() allocates memory in the blue box, and adds a Hob of EFI_HOB_TYPE_MEMORY_ALLOCATION in the green box; AllocatePool() allocates memory return address in the green box, and adds a Hob of EFI_HOB_TYPE_MEMORY_POOL type in the green box;
- Different address alignment
- AllocatePage will be recorded in GCD, but AllocatePool() will not.

Regarding the specific implementation of these two functions, I don't want to post the code, but just look at the picture above. Observe the yellow frame and the Allocate 1 2 3 in the green frame.
The yellow frame is when we use AllocatePage() to allocate memory, and the green frame Allocate 1 2 3 is when we use AllocatePool() to allocate memory. Also recall the situation of the PHIT pointer when Pei memory is installed in the previous article.

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```
PHIT->EfiMemoryTop = dPeiMemHi
PHIT->EfiMemoryBottom = dPeiMemBase
PHIT->EfiFreeMemoryTop = dPeiMemHi
PHIT->EfiFreeMemoryBottom=PHIT->EfiEndOfHobList+sizeof (EFI_HOB_GENERIC_HEADER);
```

At first, EfiMemoryTop and EfiFreeMemoryTop are equal. When we use AllocatePage to allocate the two yellow boxes of memory 2 and 3, EfiFreeMemoryTop moves down to the bottom of the yellow box (of course, a hub will be added in the green area, and EfiFreeMemoryBottom will also move). On the contrary, when we use AllocatePool, EfiFeeMemoryBottom moves up.

The memory in the EFI stage is not managed, it just records the memory and does not support the Free memory function.

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