Operating System Project

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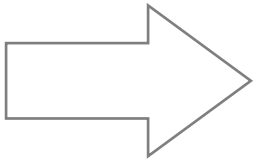
Topic

vmalloc

- Virtually continuous
- Physically discontinuous
- When memory offer is larger than page size



kmalloc

- Physically continuous
- Allocation suitable for DMA
- Has better performance than vmalloc

Kernel information

vmalloc.c

- It assigns virtually contiguous memory for the kernel
- vmalloc_32 calls the __vmalloc_node function
- It connects with physical pages and vm mapping

slab.h(kmalloc)

- It returns a pointer to a region of memory that is at least size bytes in length
- If the page size is large, sends request to page allocator
- If the page size is small, sends request to the slab cache

Modification

```
#define GFP_KMALLOC32 (GFP_DMA32 | GFP_KERNEL)
```

- Add the new flag, for the DMA and KERNEL

```
void *vmalloc_32(unsigned long size)
{
        if(size < KMALLOC_MAX_SIZE){
                return kmalloc(size, GFP_KMALLOC32);
        }

        return __vmalloc_node(size, 1, GFP_VMALLOC32, PAGE_KERNEL,
                              NUMA_NO_NODE, __builtin_return_address(0));
}
EXPORT_SYMBOL(vmalloc_32);
```

- The allocation is determined by the required size