**Research and Study on bootloader, kernel, and file systems**

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**About bootloader**

The dictionary definition of a bootloader is, in short, to help the kernel behave properly before the operating system runs and consequently to help the operating system run. When I looked at the dictionary definition, I didn't know what it meant. First of all, there is an order of booting. When the computer sets the order of booting, bootloaders are called in that order. If so, I wonder where the bootloader will be located. First, the partition table information must be read. This information exists on the hard disk, where the primary bootloader exists. There is a primary and a secondary as well, there is a secondary. Secondary exists in the root path of the boot partition and is in the form of a file. Then, why does the bootloader need a second round? The primary bootloader was not large in capacity. Non-large capacity is not easy to help large operating systems such as today's Windows operating systems. So, I tried to help load the second bootloader through the bridge called the first bootloader. Then, I have another question. Why the bootloader is related to embedded classes. When the embedded is powered on, it can be said that the embedded is booted by the bootloader, which helps to utilize the functions of the embedded board. It can be seen that bootloaders and embedments are deeply related. Naturally, learning about bootloaders is essential for embedded production.

**About kernel**

If so, can the computer's operating system be run only with the bootloader? Of course not. Here, the concept of kernel emerges. The dictionary definition of the kernel is key. Literally, it is at the heart of the operating system. Kernels give hardware resources where necessary and play an important role in operating systems such as system calls. The core roles of the operating system cannot be performed without a kernel. There are several types of kernels. Representatively, there are single-type kernels and micro-kernels, and examples of single-type kernels include Unix and Linux. A single kernel handles all the key tasks of the operating system in one kernel. Relatively simple design and fast speed are advantages, but even if they are not, importance is added to important kernels. There is a disadvantage in that it is not stable as a result of increased dependence on the kernel. So, it is the micro kernel that appeared. The kernel compensated for the shortcomings of the single kernel to some extent. It is a structure that relieves the role of the kernel a little. This method excludes the role of managing services or devices at the same level as system calls. Therefore, it is better in terms of stability and security than a single kernel, but its performance is lower than that of a single kernel. Examples include the Mimics operating system.

**About file systems**

What is a file system? The file system is a familiar system to us.  
Computers store numerous files. Without a file system, it would be difficult to find or manage the files we are trying to find among these numerous files. The system that manages files is the file system. The file system is likely to operate at the user level, but operates in the kernel area. This is to quickly perform functions such as modifying files. The file system may have a hierarchical directory structure and may be placed one for each disk partition. As mentioned above, the file system plays a role in managing files. And allocates the required storage space. It can be said that it manages auxiliary storage. And of course, it only allows you to have information that is suitable for being included in the file. It has file integrity in a similar sense to the data integrity of the database. And it plays a role in informing users of how to access these files and how to access them. So why was this file system created? As you can see from the above,  
This is to help manage files easily. In addition, there is a difference in execution speed between the hard disk and the main memory, and the development of the system can reduce the speed difference between the hard disk and the main memory. Hard disks have the advantage of being slow but large in capacity, making them more efficient to use. Then we'll learn about the structure of the file system. The file system is divided into a meta area and a data area. In the meta area, there is file information such as the name, location, and size of the file recorded in the data area, and the data area literally contains data of the file. So, when we often search for files using Windows Explorer, we can browse the meta area to find files.

I understand that it is important to study these details of the computer, but I am honestly not aware of why it is important. It is also important to learn these contents, but I would like to reconsider and find out why I am learning these contents.