

**OPERATING SYSTEMS**  
**KNOW HOW TO DEBUGGING THE BOOTSTRAP-LOADER**  
**PROGRAM**



**By:**  
**GANNO TRIBUANA KURNIAJI**  
**NIM: L200184092**

**INFORMATION TECHNOLOGY**  
**FACULTY OF COMMUNICATION AND INFORMATICS**  
**UNIVERSITY OF MUHAMMADIYAH SURAKARTA**

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### First Question

1. Make the memory mapping table on a PC as complete as possible!

Answer:

Blok Memori	Alokasi Pemakaian
F 0 0 0 0	ROM BIOS, Diagnostic, BASIC
E 0 0 0 0	ROM program
D 0 0 0 0	ROM program
C 0 0 0 0	Perluasan BIOS untuk hardisk XT
B 0 0 0 0	Monokrom Monitor
A 0 0 0 0	Monitor EGA, VGS, dll
9 0 0 0 0	Daerah kerja pemakai s/d 640 KB
8 0 0 0 0	Daerah kerja pemakai s/d 576 KB
7 0 0 0 0	Daerah kerja pemakai s/d 512 KB
6 0 0 0 0	Daerah kerja pemakai s/d 448 KB
5 0 0 0 0	Daerah kerja pemakai s/d 384 KB
4 0 0 0 0	Daerah kerja pemakai s/d 320 KB
3 0 0 0 0	Daerah kerja pemakai s/d 256 KB
2 0 0 0 0	Daerah kerja pemakai s/d 192 KB
1 0 0 0 0	Daerah kerja pemakai s/d 128 KB
0 0 0 0 0	Daerah kerja pemakai s/d 64 KB

### Second Question

2. Read the reference book, explain the difference between "Real-Mode" work mode and "Protect-Mode" work mode on an IBM Compatible PC!

Answer:

- a. Real-Mode

Real-Mode is a mode where the Intel x86 processor runs as if it were an Intel 8085 or Intel 8088 processor, even though it is an Intel 80286 or higher.

Therefore, this mode is also referred to as 8086 mode (8086 Mode). In this mode, the processor can only execute 16-bit instructions using 16-bit internal registers, and can only access only 1024 KB of memory because it only uses 20-bit address bus lines. All DOS programs run in this mode.

Processors released after 8085, such as the Intel 80286, can also run 16-bit instructions, but are much faster than 8085. In other words, the Intel 80286 is completely compatible with the previously designed Intel 8086 processor. So

that the Intel 80286 processor can run 16-bit programs that are designed for 8085 (IBM PC), with of course a much higher speed.

In Real-mode, there is no memory address space protection, so it cannot do multi-tasking. This is why DOS programs are single-tasking. If in real mode there is multi-tasking, then most likely between the two programs that are running, a crash occurs between one another.

b. Protected Mode

Protected mode (protected mode) is a mode in which there is memory address space protection offered by the microprocessor for use by the operating system. This mode comes with an Intel 80286 microprocessor or higher. Because it has memory address space protection, in this mode the operating system can do multitasking.

The Intel 80286 processor does have the ability to enter protected mode, but it cannot exit that mode without having to reset (warm boot or cold boot). This error has been corrected by Intel by releasing an Intel 80386 processor that can enter protected mode and exit it without having to reset it. This is why Windows 95 / Windows 98 is equipped with Restart mode in MS-DOS Mode, even though the operating system is actually an operating system that runs in protected mode.