A Survey: Simultaneous execution of multiple OS on same system

Mr. S. B. Ambhore[1]

[1]*S.N.J.B's KBJ COE, Chandwad, Nashik, santoshambhore2008@gmail.com*

Abstract- Now a day's number of operating systems can be installed on same system. Operating system is selected on user choice during booting process. A boot loader has a job of loading the selected operating system. At a time a single operating system is loaded and executed by boot loader. If user wants to enter in other operating system he has to restart the system to select the other operating system. Also other solution is virtual operating system, but it is installed on same operating system. As todays computer system has number of cores, such a system can be designed that will help to run the number of operating system on separate core. Computer core has the power to execute the separate environment without interference of other core. So this paper is a step to run number of operating system on same computer system simultaneously on different cores. By this system user does not have to restart the computer system.

Keywords- Boot loader, Core, CPU.

I. INTRODUCTION

As the days have passed there have been large improvement in the technology. There is improvement in hardware as well as software's running on those hardware. Number of operating systems has evolved and hardware too. Even though the large development still the working of boot loader is traditional and if user want to switch to other operating system environment he has to restart the system and again boot loader has to do the booting process of operating system selection. No doubt there are number of software present those gives effect of other operating system environment by being in same operating system (e.g., VMware), still to get real environment of operating system user has to login in it only. As number of cores are added on same computer system to improve performance. This cores does the job of balancing the loads and parallel processing of applications.

II. LITERATURE SURVEY

This paper concentrate on following statements:

On a computer system number of operating systems can be installed [5] [6] [9]. It is fine to boot one of them and let one of operating system to be loaded. To load which operating system is decided by user or default option provided during booting [2] [8].

This is applicable for single processor architecture as well as multicore system. Multicore system can run number of applications simultaneously [1]. Also on same operating system user may be interested to access the features of another operating, this can be possible by using VMware [3].

So this paper is trying to step in way that a number of operating systems can be loaded simultaneously on multicore system. There are number of issues need to be considered for same. Few of them are put in this paper.

III. SYSTEM ARCHITECTURE

A system can be designed that will help to run number of operating system on same computer system and that too simultaneously. Areas that need to think can be

1) Hardware Configuration of System
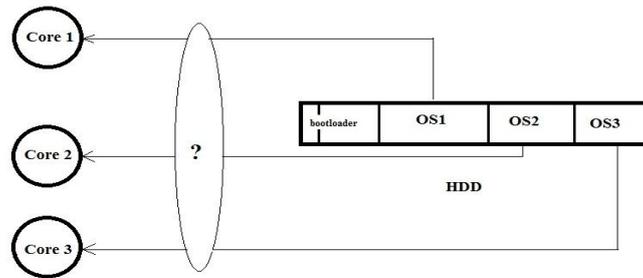2) Modified Boot loader to load number of kernels from hard disk to RAM.

Fig. 1. Areas need to consider for system.

3.1.   Hardware Configuration of System

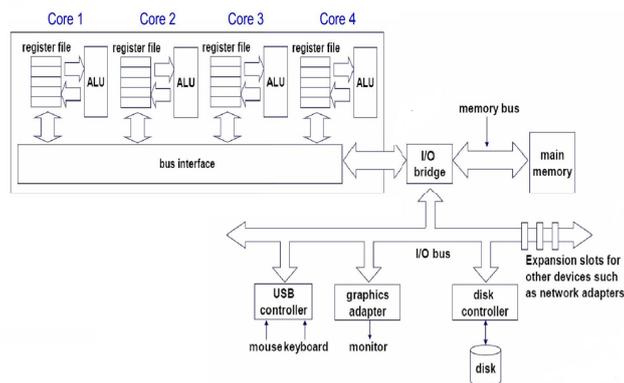Hardware is important which will manage the software's.

Fig. 2. Multicore System.

In Fig.2 Multicore System, the problem is where, it is using common hardware. Such as IO manage Main Memory. Main Memory is important for loading of kernel. So solution for this can be:

i)   Separate Hardware Clone for each core.
ii) Virtual RAM, Cache memories.
iii) Context switching for each common resource.

i.   As different kernels are loaded different main memories should be provided. This can done by physically providing main memories for each core. But this will also increase the cost of hardware. Another way is to provide virtual main memory for each core and it should be initialized at starting.
ii. Now the main question, RAM is common, so different logical RAMs need to be allocated. Two main option is the one should provide separate hardware clones of RAM's or logically provide the separate RAM area to each operating system.

As Cache memory is also important which stores the recent data accessed. Main issue is while switching from one operating system to other, the cache memory contents should be backup for each

operating system. This virtual RAMs will be loaded by the boot loader simultaneously. Separate RAM for each core need to be allocated. This RAM is virtually allocated to the cores and operating system.

3.2. Modified Boot loader

Each core has a capability to run in separate environment. A boot loader has the job of loading the kernel in the RAM for execution. Now the main work has to done for on Boot loader.

Boot loader: As power is On, BIOS does the job of finding the hardware and initialing them. BIOS then selects boot loader from the hard disk. First sector of Hard disk is boot loader part I. boot loader part II will load the kernel of operating system in RAM. Here Boot loader needs to be changed. Boot loader should have capacity to load different kernels on different kernel. Means indirectly Boot loader will load all kernels from hard disk to RAM. Instead of taking single selection option from user or default option. Here boot loader will consider all the options and will try to load all of them.
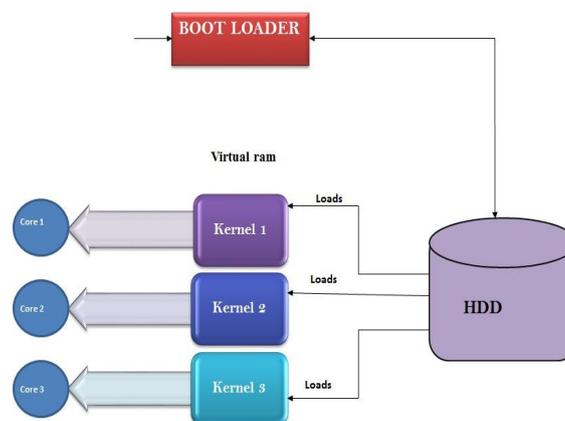

Fig. 3. Modified Boot loader.

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