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Lab-Report

Report No:03

Report Name:Threads on operating system

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Experiment No:03

Experiment Name:Threads on operating system

Objective:

In this experiment,we will learn about thread.We will also describe the types of threads,implementation of threads and how it works in operating system.We will know its advantages and disadvantages too.

Question:What is thread?

Ans: A thread is a flow of execution through the process code, with its own program counter that keeps track of which instruction to execute next, system registers which hold its current working variables, and a stack which contains the execution history. A thread is also called a lightweight process.

Question:Types of threads

Ans: Threads are two types −

1.User Level Threads − User managed threads.

2.Kernel Level Threads − Operating System managed threads acting on kernel, an operating system core.

User Level Threads:

In this case, the thread management kernel is not aware of the existence of threads. The thread library contains code for creating and destroying threads, for passing message and data between threads, for scheduling thread execution and for saving and restoring thread contexts. The application starts with a single thread.

Advantages:

1)Thread switching does not require Kernel mode privileges.

2)User level thread can run on any operating system.

3)Scheduling can be application specific in the user level thread.

4)User level threads are fast to create and manage.

Disadvantages:

1)In a typical operating system, most system calls are blocking.

2)Multithreaded application cannot take advantage of multiprocessing.

Kernel Level Threads:

In this case, thread management is done by the Kernel. There is no thread management code in the application area. Kernel threads are supported directly by the operating system. Any application can be programmed to be multithreaded. All of the threads within an application are supported within a single process..

Advantages:

1)Kernel can simultaneously schedule multiple threads from the same process on multiple processes.

2)If one thread in a process is blocked, the Kernel can schedule another thread of the same process.

3)Kernel routines themselves can be multithreaded.

Disadvantages:

1)Kernel threads are generally slower to create and manage than the user threads.

2)Transfer of control from one thread to another within the same process requires a mode switch to the Kernel.

Question: Implementation of threads

Ans: There are two ways of implenmenting a thread

1)In user space

2)In kernel

Threads implementation in the user space

In this model of implementation, the threads package entirely in user space, the kernel has no idea about it. A user-level threads package can be executed on an operating system that doesn't support threads and this is the main advantage of this implementation model i.e. Threads package in user space.

Threads implementation in the kernel

In this method of implementation model, the threads package completely in the kernel. There is no need for any runtime system. To maintain the record of all threads in the system a kernel has a thread table.A call to the kernel is made whenever there is a need to create a new thread or destroy an existing thread. In this, the kernel thread table is updated.

Other two methods are as follows:

1)Hybrid implementation

2)Scheduler activation

Hybrid implementation:

In this implementation, there is some set of user-level threads for each kernel level thread that takes turns by using it.

Scheduler activation:

The objective of this scheduler activation work is to replicate the working or function of kernel threads, but with higher performance and better flexibility which are usually related to threads packages which are implemented in userspace.

Discussion:From this experiment,I can learn about thread and how it works it works in operating system.We can also learn the implementation of thread.we can see it can be implemented in different ways. Threads do have some limitations and cannot be used for some special purposes which still require multi-processed programs.