ABSTRACT

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Splice Zerocopy System optimization using dual pipe schemes

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The process of transferring data is one function of the data processing performed by the operating system. Traditionally, due to the unnecessary iterative process or CPU copy performed twice by the CPU, this process consumes relatively a lot of memory and CPU resources on a computer system.

The main principle of zero copy is to prevent or to minimize the operation of copying data performed by the CPU during I/O data processing in the kernel such as during network queuing and diskdrive storing. Nowadays, various approaches to zero copy are carried out and this thesis focuses on the Splice System Calls. This Splice System Call prevents copying all data from user space to kernel space and vice versa. It reads data from the specified offset from the input file and writes them to the pipe buffer in the kernel space.

The tests were conducted on a single file with 10 types of files with different sizes. The process of transferring data of the same file, name and size was tested using two different methods, namely splice system calls and splice dual pipe system calls. The durations of each process with different methods were recorded and then compared. Each file using each method was tested 10 times; thus, each file had 20 pieces of files, 10 pieces using splice and 10 pieces using splice dual pipe. The experiments showed that using Splice Dual Pipes System Calls the transferring process was quicker than using the Splice System Calls methods. The average data rate generated by splice dual pipes was 418.56 bytes per millisecond. This was faster than the Splice which was only 65.60 bytes per millisecond.

Keyword: Transferring data, Zero Copy, Splice System Calls, Splice Dual Pipe System Calls