Intensive Input Output Applications

What Applications Does ?

In this application, I have been doing the file reading and writing operations.

How Intensive is it ?

I have opened one file, read the data from it (input file contains varied or miscellaneous kind of data) and write to 5 files at a time. The application is costly in doing input output operations.

My Key Observation

Every time the process needs to load into the memory and read all the data present in the file and write it to the different files. I have been doing this operation 2000 times however there would be only fewer page faults as and when I need to load the data from the process into the memory and if you see, gradually there would be no more page faults because all the data either cached or the page entries gets populated into the TLB so page fault occurrences gets reduced slowly as TLB entry gets filled up. It occurs page fault because TLB would be emptied at the first which is also known as **Cold Start Penalty**.

Memory Access Pattern Observation :

- Initially, neither TLB entry nor cached any data is present while process data is being loading into the Main Memory so page faults occurs.
- As TLB gets filled up or data is cached, the occurrences of page fault for the application reduces slowly and the performance of the application doing input output operation also increases as an application does not need to access the data from the disk anymore.

Scatter Plot:

I have plotted a graph using the following values.

X – Time
Y – Virtual Address (Hexadecimal converted to decimal)
Please see the red dots. Actually it looks one however it comprises of more dots.

(0,0)
(850321214, 12058392)
(850321214, 12058392)
(850321214, 12062504)
(850321214, 12066616)
(850321214, 12070728)
(850321214, 12074840)

The following page faults I have gotten and use the same values to plot the graph.

[20889.788448] Time (nsec) = 850321214 Address = 0xb7ff18
[20889.788471] Time (nsec) = 850321214 Address = 0xb80f28
[20889.788475] Time (nsec) = 850321214 Address = 0xb81f38
[20889.788478] Time (nsec) = 850321214 Address = 0xb82f48
[20889.788481] Time (nsec) = 850321214 Address = 0xb83f58