OS-Assignment-2 Question 2

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Description of the code:

1. SYSCALL_DEFINE2 is the main function of the system call which takes in two arguments: the file name and PID, Due to the restrictions of accessing user space values in the kernel space, strncpy_from_user() is used to make a copy of the file name.
2. check_file_path() checks whether the file name is valid or not, Invalid file names are returned with relevant error
3. get_pid_task(find_get_pid(pid2), PIDTYPE_PID); returns a pointer to the task struct which is used to access PID, TGID, Number of CPUs , Exit status and process comm
4. filp_open(path, O_WRONLY|O_CREAT, 0644) is used to open a user space file in the kernel
5. kernel_write() is used to write the data to the file name passed by the user.

User Input:

The user enters the PID of the process to fetch the details, A file name is also entered by the user.

Expected Output and Interpretation:

The following are saved to the file (file name specified by the user) in the same directory as test.c :

PID: Process Id
TGID: Thread Group Id
Comm: Process identifier
Nr_cpus_allowed :Number of CPUs allowed
exit_state : Exit status of the process

Error Values and Interpretation:

When a system call fails, it usually returns -1 and sets the variable errno to a value describing what went wrong. (These values can be found in <errno.h>.)

The following errno values are used:

```
EPERM 1 Operation not permitted
ENOENT 2 No such file or directory
ESRCH 3 No such process
```

1. In case the PID is invalid, -3 corresponding to ERSCH is returned by the system call and relevant error is printed out.

2. In case the file name entered is invalid , -2 corresponding to ENOENT is returned by the system call and relevant error is printed out.

References:

Procedure to add the system call:
https://dev.to/jasper/adding-a-system-call-to-the-linux-kernel-5-8-1-in-ubuntu-20-04-lts-2ga8

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