

# Program 1A

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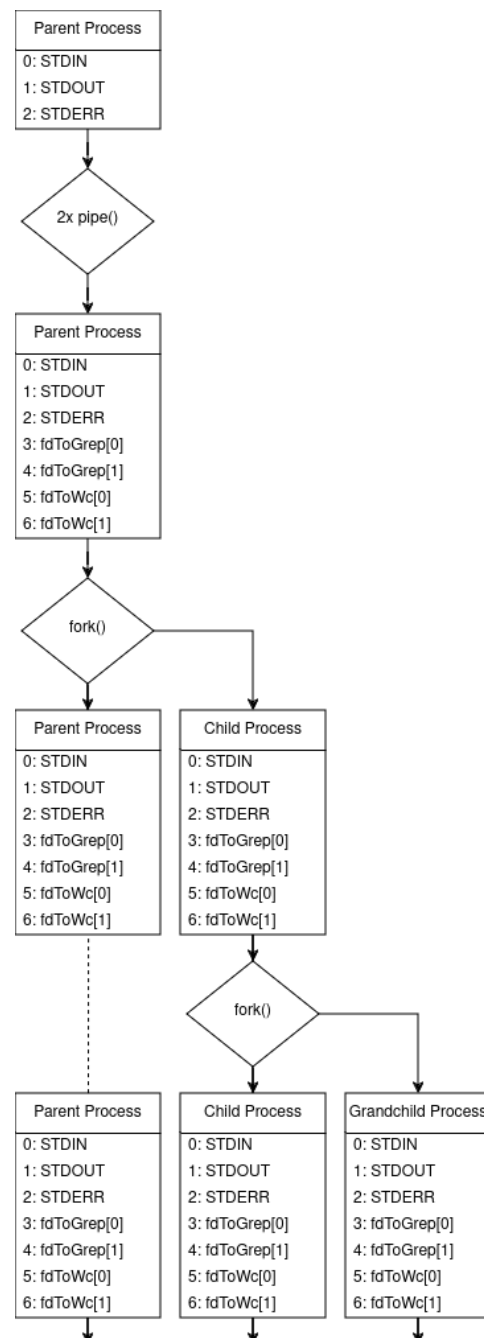
## Illustration

We start with only the parent process

Execute pipe twice to create the file descriptors we need

Fork the parent process, copying file descriptors

Fork the child process, copying file descriptors



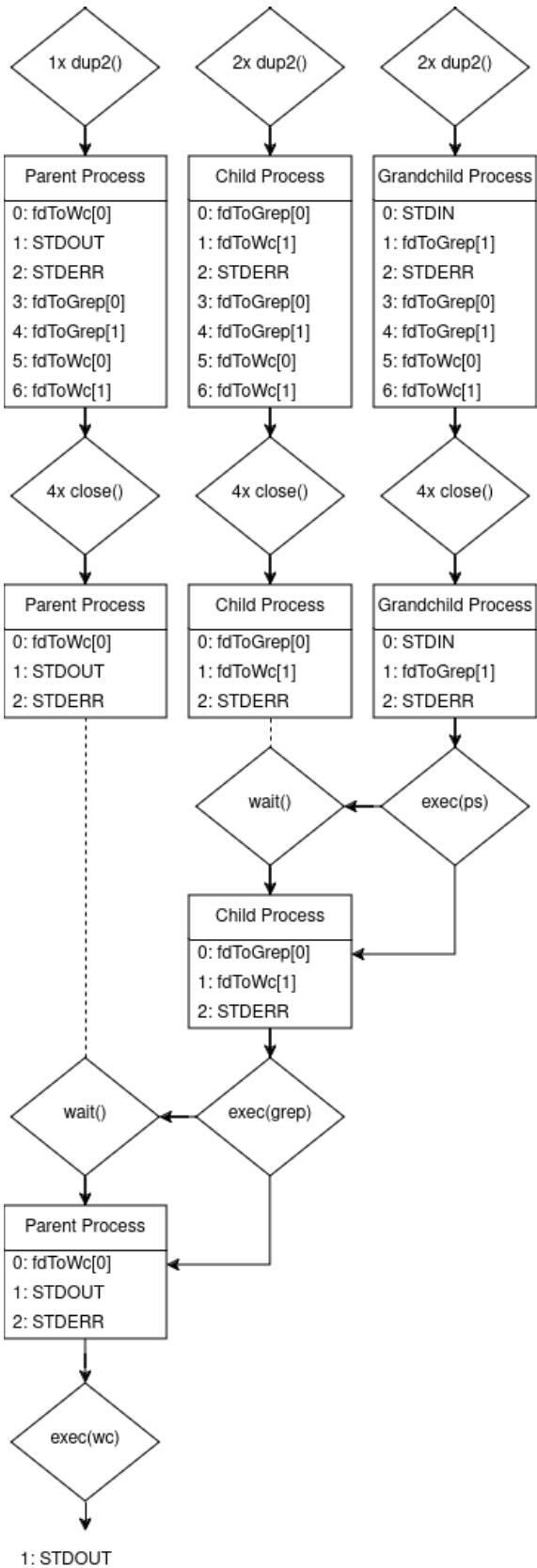
Duplicate the file descriptors to the Standard Out/In of their processes

Close the file descriptors we no longer need

Execute ps command, the child process is waiting for this to finish. Sends results through Standard Out and pipes into Standard In of child process

Execute grep command, the parent process is waiting for this to finish. Sends results through Standard Out and pipes into Standard In of parent process

Execute wc command. Sends results through Standard Out.



## Compile and Execution

The screenshot below is proof that I compiled and ran the homework assignment on the UWB lab machines.

```
[rynlynch@csslalab15 hw-1a]$ ls -tl
total 228
-rw-r--r-- 1 rynlynch rynlynch 225433 Jul  7 12:28 Prog1A.pdf
-rw-r--r-- 1 rynlynch rynlynch   1937 Jul  7 12:28 processes.cpp
[rynlynch@csslalab15 hw-1a]$ g++ processes.cpp
[rynlynch@csslalab15 hw-1a]$ ./a.out ssh
3
[rynlynch@csslalab15 hw-1a]$ ps -A | grep -i ssh | wc -l
3
[rynlynch@csslalab15 hw-1a]$ ./a.out system
6
[rynlynch@csslalab15 hw-1a]$ ps -A | grep -i system | wc -l
6
[rynlynch@csslalab15 hw-1a]$
```

This also shows the program returning the same value as the equivalent commands on the CLI

```
ps -A | grep -i ssh | wc -l
```