

Assignment Project Exam Help

Wait

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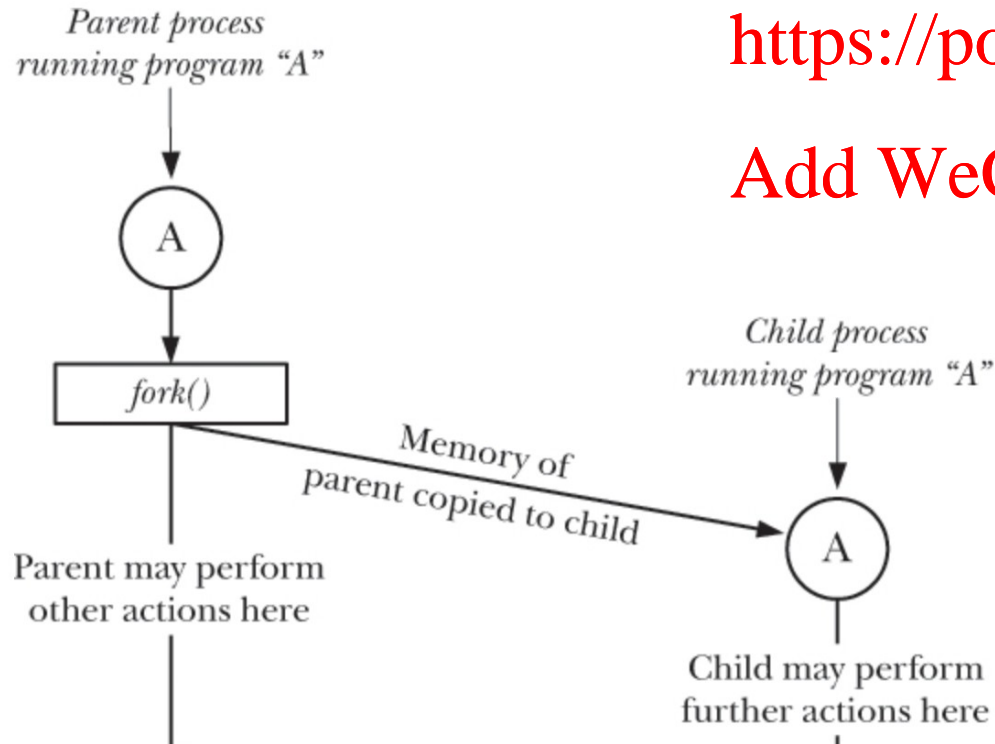
Review of fork

- Fork creates a new child process with a duplicate of memory
 - The main differences are: 1) The value of PID 2) The return value of fork.

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Example

- Let's say I want to count to 100 as fast as possible.
- The following code uses multiple cores to count faster! (maybe...)

```
#include<unistd.h>
#include<stdio.h>
#include<string.h>
#include<stdlib.h>

int main(int argc, char* argv[])
{
    int proc_count=0;
    int threads=atoi(argv[1]);
    for (int j=1; j< threads+1; j++){
        if (proc_count == 0){
            if(fork() == 0){ //creates a fork and checks to see if you are a child process
                proc_count = j; // sets a unique integer to each child
            }
        }
    }
    // Set up individual threads, now start counting
    if(proc_count>0){
        int x = proc_count;
        while(x < 100){
            printf("%d,",x); //if you are a child then start from your proc_count and count up by threads
            x+=threads;
        }
        exit(EXIT_SUCCESS); //exit and return success to calling process
    }
}
```

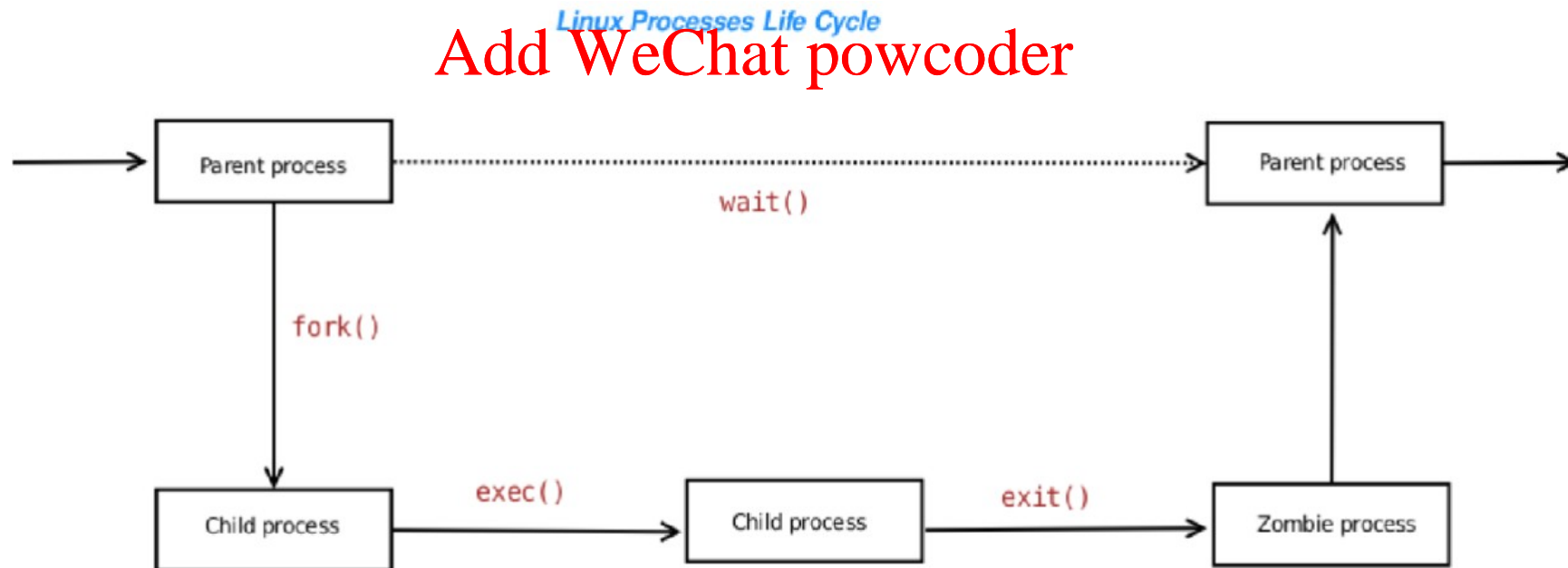
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ZOMBIES!

- Zombie processes are a real danger of forking
- When a process exits, it enters a “zombie” state while it waits for its parent to accept its return state.
 - The return state is accepted by `wait()`



Wait

- `x = wait(&stat)`, suspends the process until at least one zombie process exits.

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- `x` is the PID of the return

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- The integer `stat` stores the returned exit code.

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- Other useful functions:

- `exit(int code)`, terminates calling process and returns error code to parent.
- `WEXITSTATUS(int status)`, decodes the exit status to the raw integer returned
- `waitpid(pid_t pid, &stat)`, waits for the specified process to send exit signal.

Example

```
#include<stdio.h>
#include<stdlib.h>
#include<unistd.h>
#include<sys/types.h>
#include<sys/wait.h>

int main()
{
    int x=6;
    pid_t fork_pid = fork();
    if (fork_pid == 0){
        //child process
        exit(x*x);
    }
    else{
        int stat,y;
        y=wait(&stat);
        printf("Value returned by child %d is %d\n",y,WEXITSTATUS(stat));
    }
}
```

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Value returned by child 27514 is 36