

User

C program

fork function

write operation

Linux (4.15) kernel

clone system call

COW mechanism

Page fault

if more than
one reference
to the page

Effective implementation of the fork operation

do_fork function

copy_process function

check flags

dup_stack_struct function

create new kernel stack

allocate task_struct

allocate thread_info

copy_flags function

Process (parent and child)	
Memory	PCB (task_struct)
Static data	pid*
Stack	<i>user id*</i>
	<i>status (registers)*</i>
Heap	status (process)*
Text	...

Page duplication

Process (parent)	
Memory	PCB (task_struct)
Static data	pid*
Stack	<i>user id*</i>
	<i>status (registers)*</i>
Heap	status (process)*
Text	...

Process (child)	
Memory	PCB (task_struct)
Static data	pid*
Stack	<i>user id*</i>
	<i>status (registers)*</i>
Heap	status (process)*
Text	...

Legend

user operation

system call

kernel operation

action

call to

execute

update

* : different between parent and child

** : shared between parent and child (pointer)*