Lecture 8 31/1 Lecture 8 fork & exec

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2/8 : CS347 Quiz

6/8 : CS333 Lab Quiz

① - fork : duplicate / create a process

- exec : replace a process.

- two distinct and separate operations.

- several instances only when fork is useful / required

  - multi-process / threaded web server
  - parallelizing analysis on a set of images.

  ⇒ client process "same" as parent process.

  ⇒ same program!

② Why is this beneficial?

(i) can customize client process state before starting new program.

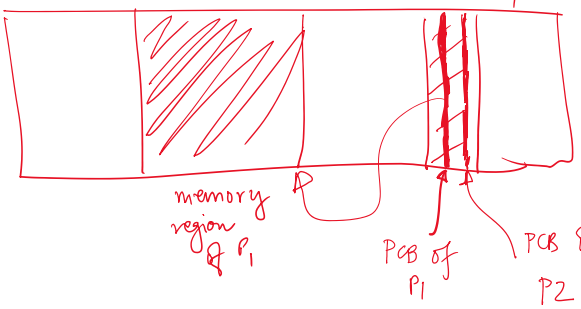
- e.g.

```
pid = fork();
if (pid == 0) {
    // close some files
    // open files
    // chdir
    exec (    ); // start new program here.
}
```

(ii) easy duplication of a process.

③ What happens on fork of P_1?

memory map



⊛ PCB is allocated for new process

- fields from parent PCB copied
- new values initialized (pid)
- some values maybe updated
- memory region!

option 1

- use same memory description as that of parent.
- copy memory description pointers.

option 2

- allocate memory area for new process
- copy memory content of P_1 to region of P2 — byte-by-byte. child is same as process!

issues with

option 1 : What about updates to shared variables?

option 2 : • copy ovhd. increases latency of fork.

• copy is of no use, if fork is immediately followed by fork!