

Real-Time Operating System (48450)

Week 2 Lab Exercises

Process Creation (2)

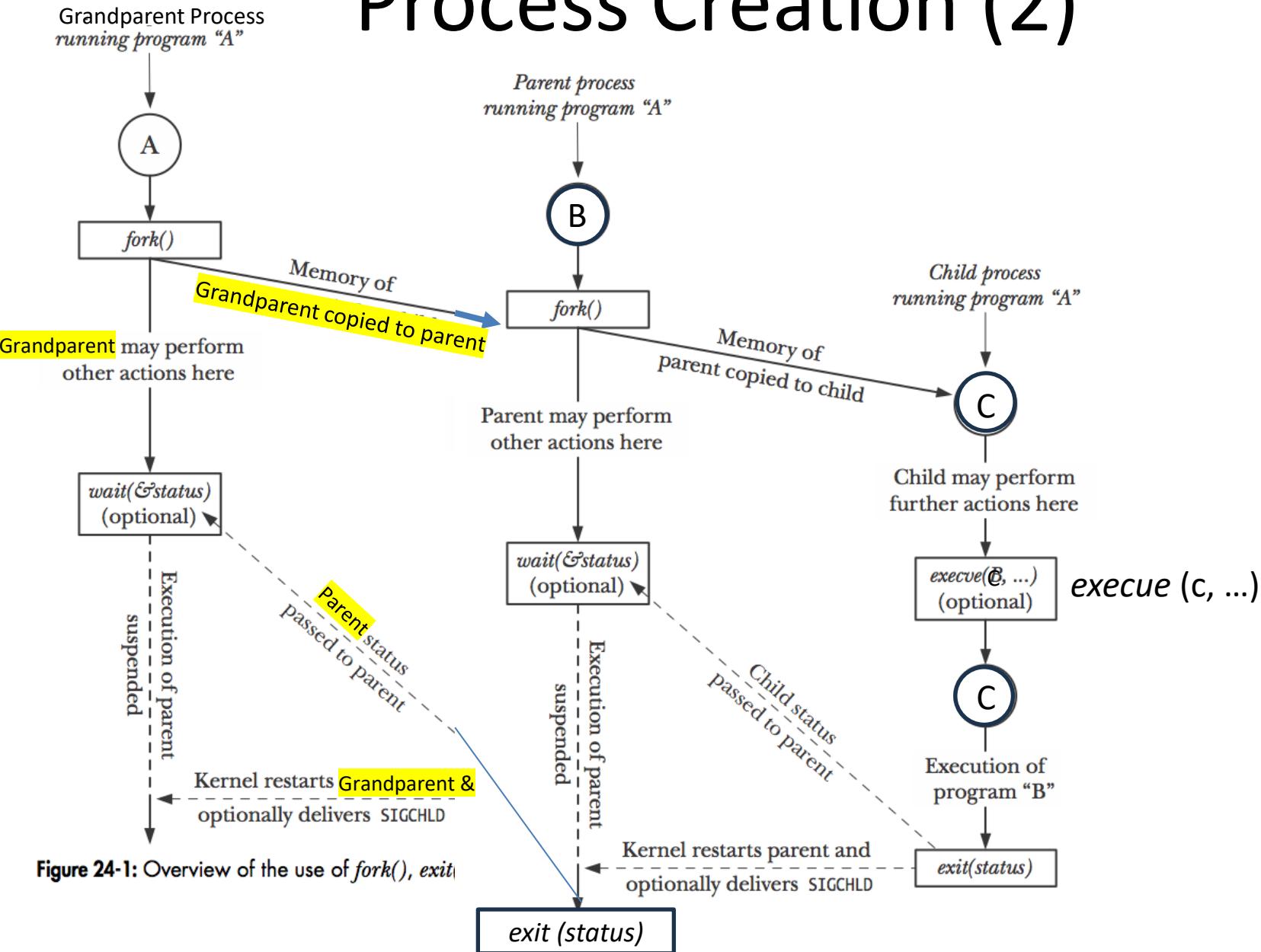


Figure 24-1: Overview of the use of `fork()`, `exit()`

Shared memory

Shared memory is the fastest method of **interprocess communication (IPC)** under **Linux** and other Unix-like systems. The system provides a **shared memory** segment **which the calling process can map to its address space**. After that, it behaves just like any other part of the **process's** address space.

Message Passing

The sending **process** places a **message** (via some (OS) **message-passing** module) onto a **queue** which can be read by another **process**. Each **message** is given an identification or type so that processes can select the appropriate **message**. **Process** must share a common key in order to gain access to the **queue** in the first place.

<https://www.youtube.com/watch?v=dQE6BDNc3z0>

<https://www.softprayog.in/programming/interprocess-communication-using-posix-shared-memory-in-linux>

2.18 What are the two models of inter-process communication? What are the strengths and weaknesses of the two approaches?

Answer:

The two models of inter-process communication are **message-passing model** and the **shared-memory model**. Message passing is useful for exchanging smaller amounts of data, because no conflicts need to be avoided. It is also easier to implement than the shared memory for inter-computer communication. Shared memory allows maximum speed and convenience of communication, since it can be done at memory transfer speeds when it takes place within a computer. However, this method compromises on protection and synchronization between the processes sharing memory.

1. Time required to synchronous switch from the context of one thread to the context of another thread is called

- a) threads fly-back time
- b) jitter
- c) context switch time
- d) none of the mentioned

Answer: c

2. For real time operating systems, interrupt latency should be

- a) minimal
- b) maximum
- c) zero
- d) dependent on the scheduling

Answer: a -- Interrupt latency is the time duration between the generation of interrupt and execution of its service.

3. Time duration required for scheduling dispatcher to stop one process and start another is known as

- a) process latency
- b) dispatch latency
- c) execution latency
- d) interrupt latency

Answer: b

4. Which one of the following is a real time operating system?

- a) RTLinux
- b) VxWorks
- c) Windows CE
- d) All of the mentioned

Answer: d

5. In real time operating system

- a) all processes have the same priority
- b) a task must be serviced by its deadline period
- c) process scheduling can be done only once
- d) kernel is not required

Answer: b

6. The systems which allows only one process execution at a time, are called

- a) uniprogramming systems
- b) uniprocessing systems
- c) unitasking systems
- d) none of the mentioned

Answer: A

Explanation: Those systems which allows more than one process execution at a time, are called multiprogramming systems. Uniprocessing means only one processor.

7. In Unix, Which system call creates the new process?

- a) fork
- b) create
- c) new
- d) none of the mentioned

Answer: a

8. A process can be terminated due to

- a) normal exit
- b) fatal error
- c) killed by another process
- d) all of the mentioned

Answer: d

9. What is inter-process communication?

- a) communication within the process
- b) communication between two process
- c) communication between two threads of same process
- d) none of the mentioned

Answer: b