CS 3305A

Process

Lecture 5

Sept 25th 2023

Pipe()

- Values of the variables from parent get copied to child but they reside in different memory locations

```
Int main()
{
int_pid pid;
int x = 10, y = 20;
pid = fork();

if (pid>0)
{
wait(null);
Printf(" x = %d  y = %d", x,y);
}

if (pid == 0)
 {
    x = 100;
    Y = 200;
Printf("\n x = %d y = %d", x,y);
}
return 0;
}
```

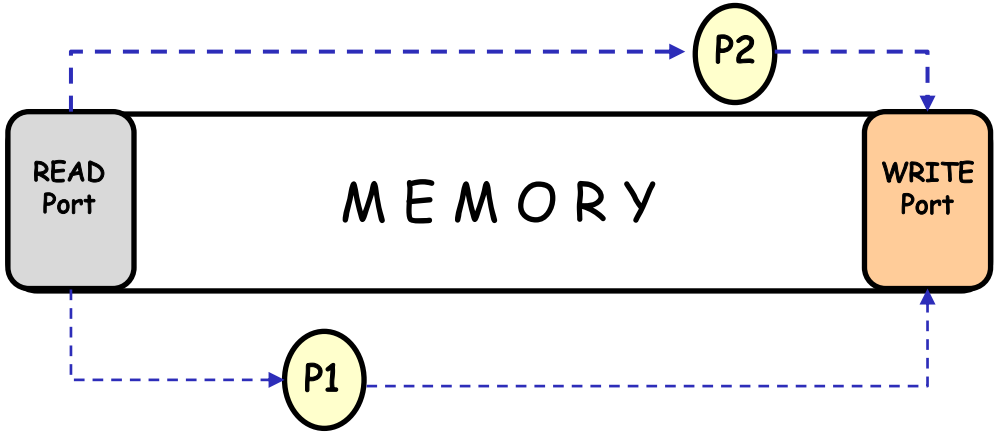
x = 10 y = 20

x = 100 y = 200

How parent and child will communicate?

Pipe()

- The pipe() function can be used to provide the shared memory to allow communication between two processes



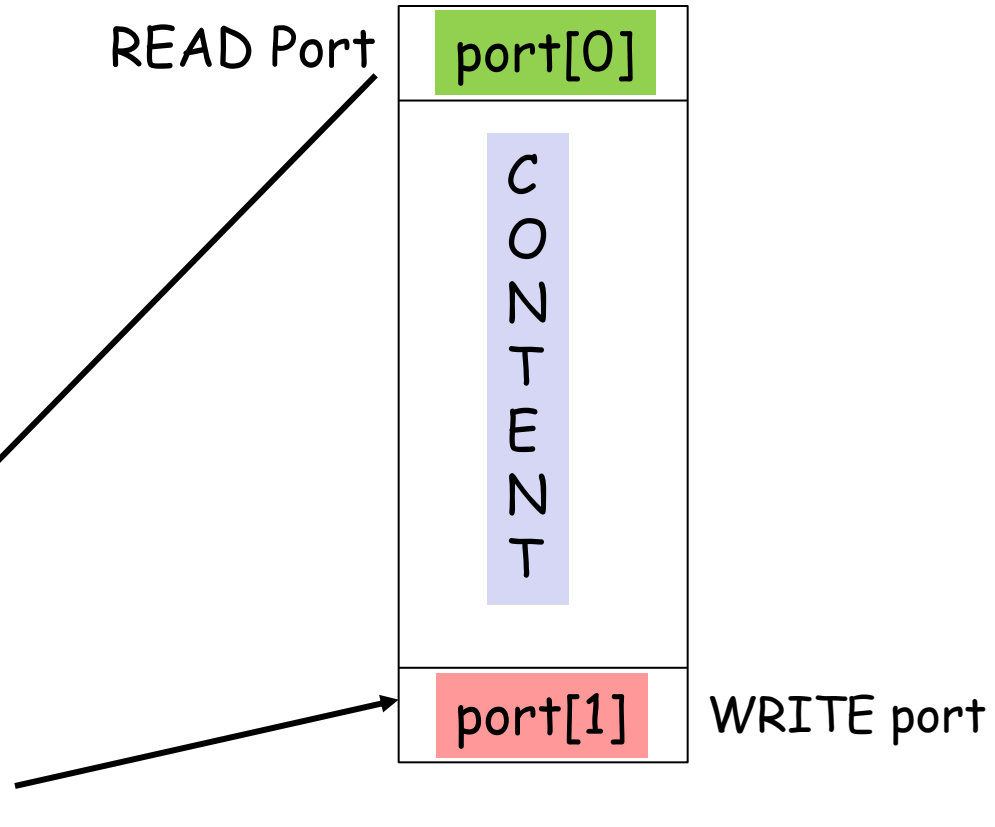
- We will discuss how pipe() can be used to communicate between parent and child process
  - pipe() must be created before fork()
  - Single R/W operations by parent and child
  - Multiple R/W operations by parent and child

Creating a Pipe

```
int port[2];
int status;

status = pipe(port);
```

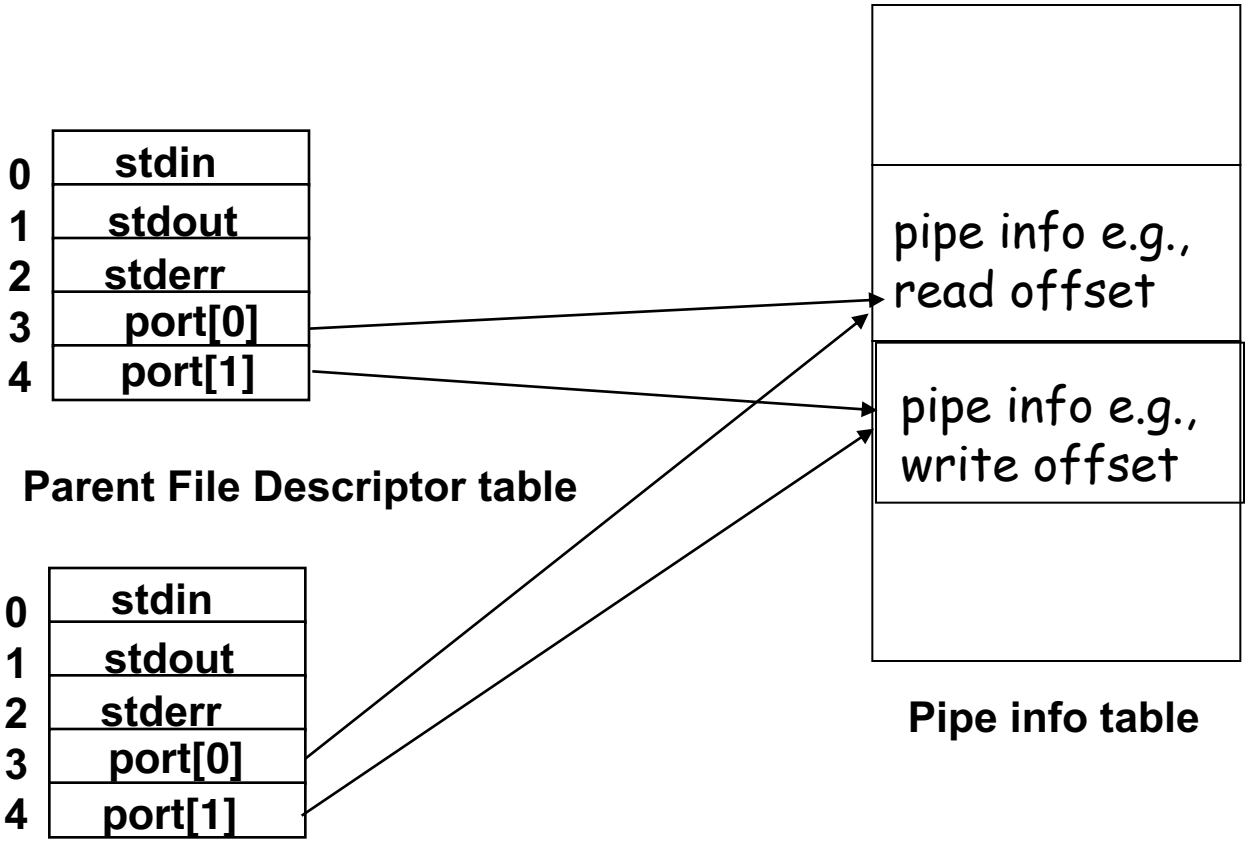
- Returns 0 if ok, -1 on error
- Attached two file descriptors
  - port[0] is open for reading
  - port[1] is open for writing



Fork and Pipes

- A fork() copies the port info to the child
- port[0] of parent and child points to the same location in the pipe.
- port[1] of parent and child points to the same location in the pipe.

Fork and Pipes



After Fork

Pipes

- When the pipe is full: By default, if a writing process attempts to write to a full pipe
  - the system will automatically block the process until the pipe is able to receive the data
  - The OS has a limit on the buffer space used by the pipe and if you hit the limit, write will be blocked

- When the pipe is empty: if a read is attempted on an empty pipe, the process will block until data is available

Example

- pipe_SRW.c
- pipe_MRW.c