Operating Systems
Named Pipes

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1 Objectives

Become familiar with and use system calls related to communication between processes via named pipes.

2 System Calls

```
#include <sys/types.h>
#include <sys/stat.h>

int mkfifo(const char *pathname, mode_t mode);
```

3 Exercises

1. Write three programs that will illustrate the operation of named pipes. The first program creates a named pipe "fifo". The second repeats to this pipe all the lines of text read from its standard input. In turn, the third program repeats to its standard output all the lines of text read from this same pipe.

   Note that, unlike anonymous pipes, opening a named pipe for writing blocks it until a process opens it for reading, and vice versa.

2. You want to determine all the occurrences of a given number in a vector of integers. Write a "server" program that runs in the background and performs this search at the request of clients. Write a "client" program that sends the server the number to search for. The server must send the number of hits as a reply to the respective client. The client and server should communicate via named pipes.

4 Additional exercises

1. Modify the previous exercise so that:

   (a) Clients are not blocked waiting for other searches in progress on the server to finish.

   (b) The server records all the searches made in a "log" file in text format. Each line of the file must contain the number to be searched and its occurrence.