Coursework for:

Computer System Organisation

3SFE518

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CONTENTS

ABOUT THE PIPING

In order to be able to communicate between two terminals, pipes have been used. As pipes are FIFO structure (First In First Out), it is well suited to be used for such an application. Two pipes are created, one used to define a communication channel from the server terminal to the client and the other to define a communication channel from the client terminal to the server terminal. Lets call these two pipes, np1 and np2, where np1 is the connection from the client to the server.

In the program running on the server terminal, the pipe np1 is opened in the read only mode. Thereby, allowing it to read the information being sent by the client terminal. In the program running on the client terminal, the pipe np2 is opened in the read only mode so the information being written by the server can be read by the client. Whenever the information from the pipe is being read, it is temporarily stored in a buffer before being printed out on the screen.

PROGRAM LISTING

fullduplex.h

```
//Reference: http://developers.sun.com/solaris/articles/named_pipes.html

#define NP1             "/tmp/np1"
#define NP2             "/tmp/np2"
#define MAX_BUF_SIZE    255
```

server.c

```
//Reference : http://developers.sun.com/solaris/articles/named_pipes.html

#include <stdio.h>
#include <errno.h>
#include <ctype.h>
#include <sys/types.h>
#include <sys/stat.h>
#include <fcntl.h>
#include "fullduplex.h" /* For name of the named-pipe */

int main()
{
   int ReadFromPipe, WriteToPipe, return_val, NumChar;
   char buffer[MAX_BUF_SIZE];

         // Create the first named pipe
   return_val = mkfifo(NP1, 0666);

   if ( return_val == -1 && errno != EEXIST)
   {
      perror("Error creating the named pipe");
      exit(1);
   }

        //creates second named pipe
   return_val = mkfifo(NP2, 0666);

   if (return_val == -1 && errno != EEXIST)
   {
      perror("Error creating the named pipe");
      exit(1);
   }
```

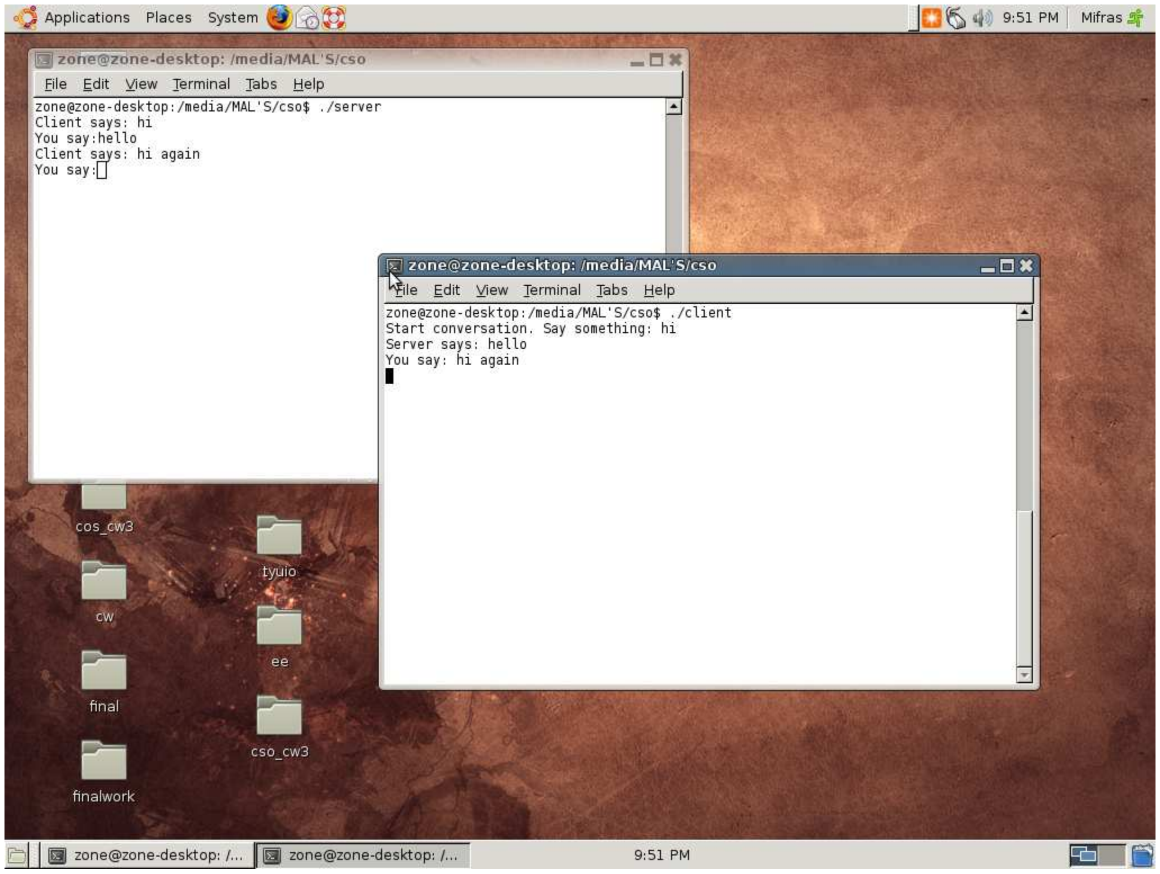
```
        /* Open the first named pipe for reading */
        /* Open the second named pipe for writing */
    ReadFromPipe = open(NP1, O_RDONLY);
    WriteToPipe = open(NP2, O_WRONLY);


    while(1)
    {
                /* Read from the first pipe */
        NumChar = read(ReadFromPipe, buffer, MAX_BUF_SIZE);

        buffer[NumChar] = 0;          //ends the string by placing a null character in the
last slot

        printf("Client says: %s\nYou say:", buffer);

        gets (buffer);

                /* Writes to the second pipe*/
        write(WriteToPipe, buffer, strlen(buffer));

    }
}
```

client.c

```
//Reference: http://developers.sun.com/solaris/articles/named_pipes.html

#include <stdio.h>
#include <errno.h>
#include <ctype.h>
#include <sys/types.h>
#include <sys/stat.h>
#include <fcntl.h>
#include "fullduplex.h" /* For name of the named-pipe */

int main()
{
    int WriteToPipe, ReadFromPipe, NumChar;
    char rdbuffer[MAX_BUF_SIZE];

        /* Open the first named pipe for writing*/
        /* Open the second named pipe for reading */
    WriteToPipe = open(NP1, O_WRONLY);
```

```
   ReadFromPipe = open(NP2, O_RDONLY);

   printf("Start conversation. Say something: ");

  while(1)
  {
         gets(rdbuffer);

            /* Write to the pipe */
         write(WriteToPipe, rdbuffer, strlen(rdbuffer));

           /* Reads from the second pipe */
         NumChar = read(ReadFromPipe, rdbuffer, MAX_BUF_SIZE);

         rdbuffer[NumChar] = 0;         //ends the string by placing '0' in the next slot

         printf("Server says: %s\nYou say: ", rdbuffer);

  }

}
```

SCREENSHOTS



```
zone@zone-desktop:/media/MAL'S/cso$ ./server
Client says: hi
You say:hello
Client says: hi again
You say:
```

```
zone@zone-desktop:/media/MAL'S/cso$ ./client
Start conversation. Say something: hi
Server says: hello
You say: hi again
```

Applications Places System
9:51 PM Mifras
zone@zone-desktop: /media/MAL'S/cso
File Edit View Terminal Tabs Help
zone@zone-desktop: /media/MAL'S/cso
File Edit View Terminal Tabs Help
cos_cw3
tyuio
cw
ee
final
cso_cw3
finalwork
zone@zone-desktop: /...
zone@zone-desktop: /...
9:51 PM