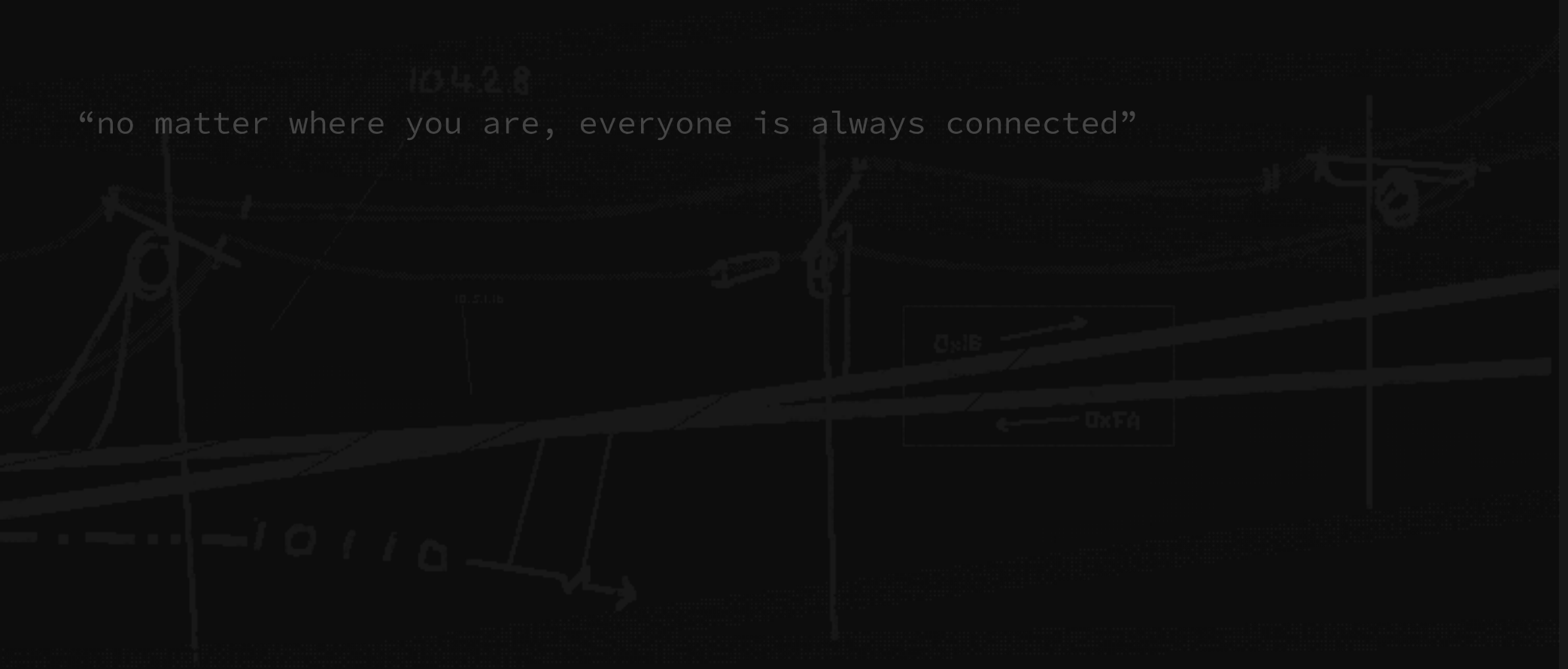
“no matter where you are, everyone is always connected”

08



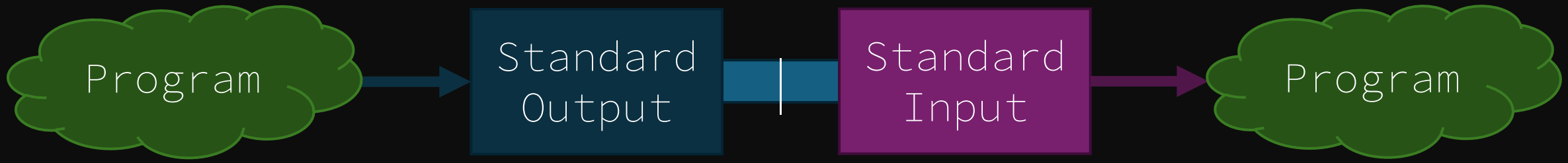
Streams, Pipes, and Redirects

Rivers of Data

In Linux, there are three “standard streams” which are the communication channels for a program. They are diagrammed below:

Pipes

Pipes are a bridge between two commands. Specifically, it takes the standard output of one command and “pipes” it into the standard input of the next command.



Using a Pipe

in terminal

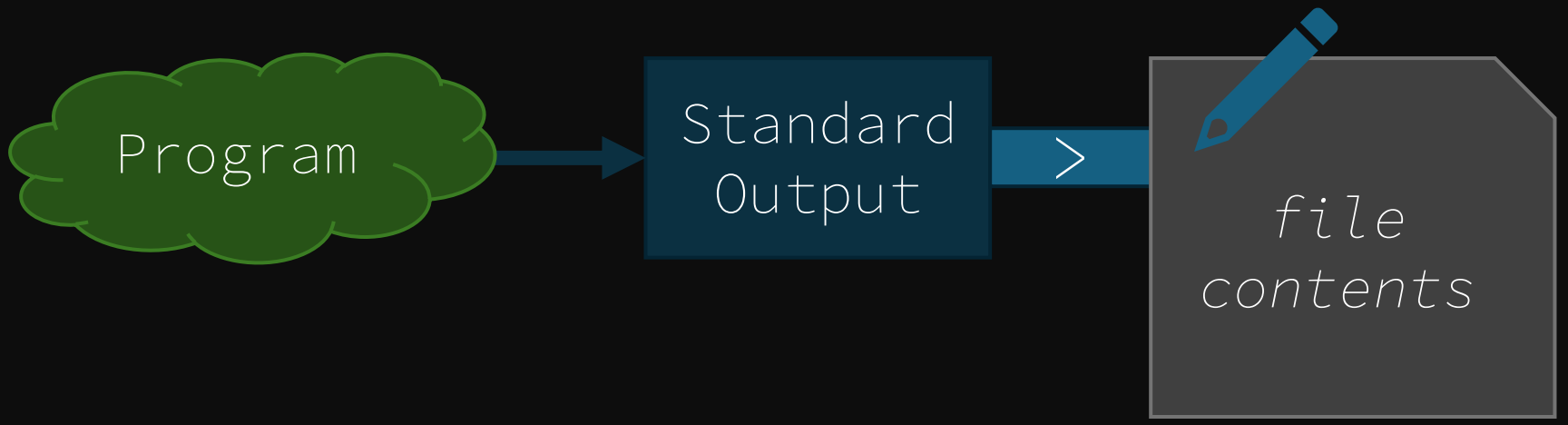
```
# cat example | grep “hello”
This line contains the word hello!
```

The *grep* command is one of the most common uses of pipes (indicated by a “|”).

The *grep* command finds the line that contains a string.

Overwrite Redirects

Overwrite redirects take the standard output of one command and writes it into a file, *overwriting any content in it.*



Using an Overwrite Redirect

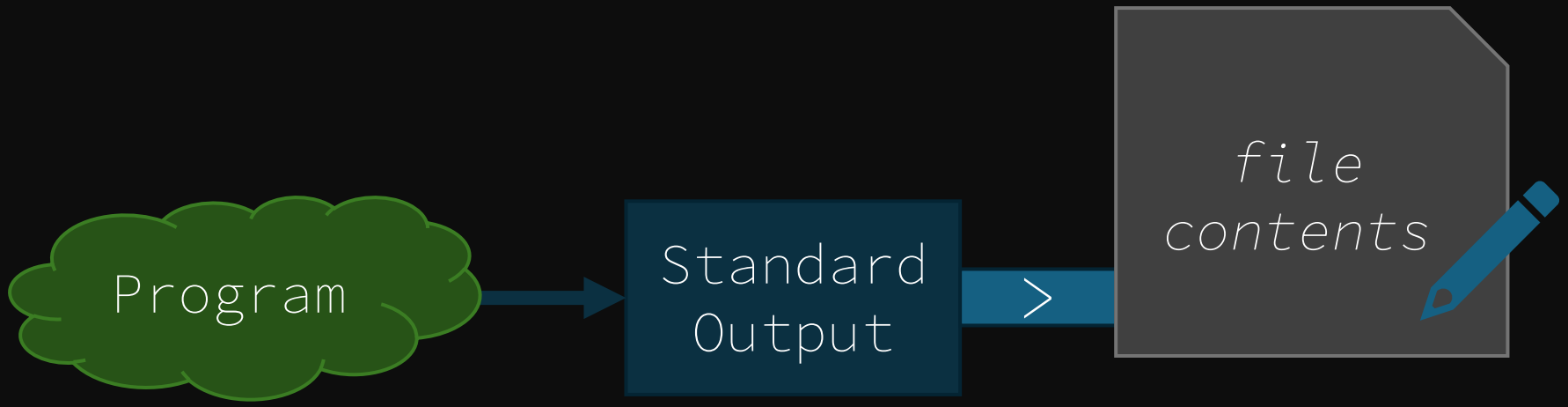
in terminal

```
# cat example1
Hello.

# cat example2
Hi!

# cat example1 > example2

# cat example2
Hello.
```

This command copies the content of one file into another file.

Append Redirects

Append redirects take the standard output of one command and writes it into a file, *starting at the end of any content in it.*



Using an Append Redirect

in terminal

```
# cat example1
Hello.

# cat example2
Hi!

# cat example1 >> example2

# cat example2
Hi!
Hello.
```

This command adds the content of one file onto another file.

Redirecting Standard Error

in terminal

```
$ cat /etc/shadow
cat: /etc/shadow: Permission denied

$ touch errors
$ cat /etc/shadow 2> errors

$ cat errors
cat: /etc/shadow: Permission denied
```

The standard error stream can be redirected by prefixing the redirect operation with “2” (indicating the standard error stream)

Errors? What Errors?

 in terminal

```
$ cat /etc/shadow 2> /dev/null
```

This command sends all errors to /dev/null, essentially throwing them away

Putting on Blindfolds

in terminal

```
$ cat /etc/shadow > /dev/null 2>&1
```

This command sends any output from both stdout and stderr to /dev/null.

Note the “2>&1”. This means we would like to redirect stderr to stdout (which is again redirected to /dev/null).