

# Standard streams

engageSPARK August 25th 2015

# Standard streams - Wikipedia

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The three I/O connections are called standard **input** (**stdin**), **standard output** (**stdout**) and **standard error** (**stderr**).

Originally I/O happened via a physically connected system console (input via keyboard, output via monitor), but standard streams abstract this.

[https://en.wikipedia.org/wiki/Standard\\_streams](https://en.wikipedia.org/wiki/Standard_streams)

# According to Dennis Ritchie

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*A stream is a full-duplex connection between a user's process and a device or pseudo-device.*

*A Stream Input-Output System* (1984) by Dennis M. Ritchie

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*A stream is a full-duplex connection between a user's process and a device or pseudo-device. It consists of several linearly connected processing modules, and is analogous to a Shell pipeline, except that data flows in both directions.”*

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# So what are stdin, stdout and stderr??

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<b>STDIN</b>	Used when you type something
<b>STDOUT</b>	Used when you print something
<b>STDERR</b>	Used when a program crashes

# Using streams in the shell

< for STDIN

Reading

```
$ cat < README.md
```

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**< for STDIN**

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**> STDOUT**

Redirecting STDOUT to STDERR

```
$ echo hello 1>&2
```

# Using streams in the shell

**< for STDIN**

Reading

```
$ cat < README.md
```

**> STDOUT**

Redirecting STDOUT to STDERR

```
$ echo hello 1>&2
```

**2> STDERR**

Redirecting the STDERR to STDOUT

```
$ echo 2>&1
```

Redirecting [only] STDERR to `/dev/null`

```
$ du -d 3 / 2> /dev/null | sort -n -k 1
```

# What do the numbers mean?

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1	STDOUT
2	STDERR

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When you open a file in your program, it might get any number except those three.