

Input/Output (I/O) in Linux

Linux provides various mechanisms for **input/output (I/O)** operations that allow users to interact with files, commands, and devices.

Standard I/O Streams

1. **Standard Input (stdin)**: Input to a program (default: keyboard).
 - File descriptor: `0`
 - Example: `cat` (takes input from the keyboard or file).
 2. **Standard Output (stdout)**: Output from a program (default: terminal).
 - File descriptor: `1`
 - Example: `echo "Hello, World!"`
 3. **Standard Error (stderr)**: Error messages from a program (default: terminal).
 - File descriptor: `2`
 - Example: `ls non_existing_file 2> error.log`
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I/O Redirection

- Redirect **output** to a file: `command > file`
 - Append **output** to a file: `command >> file`
 - Redirect **stderr** to a file: `command 2> file`
 - Redirect both **stdout** and **stderr**: `command &> file`
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.bashrc

The `.bashrc` file is a **shell script** that runs every time a new **interactive, non-login shell** is opened. It is used to configure the shell environment, including defining aliases, environment variables, and shell settings.

Location

- Located in the user's home directory: `~/.bashrc`

Common Use Cases

Setting Aliases:

```
alias ll='ls -alF'
alias d='date'
```

Aliases

An **alias** is a shortcut for a command or a series of commands. It helps save time by allowing you to type shorter commands.

Creating Aliases

Temporary Alias (valid for the current session):

bash

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```
alias shortname='long command'
```

Example:

bash

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```
alias l='ls -lah'
```

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Permanent Alias (persist between sessions): Add the alias to the `.bashrc` file:

bash

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```
alias cls='clear'
```

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Removing Aliases

To remove an alias temporarily:

bash

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```
unalias shortname
```

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Listing Aliases

View all defined aliases:

bash

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```
alias
```

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Examples

Define a simple alias:

```
alias update='sudo apt update && sudo apt upgrade -y'
```

1.

Add to `.bashrc` for permanent usage:

```
echo "alias update='sudo apt update && sudo apt upgrade -y'" >>  
~/.bashrc
```