A guide to creating a NodeJS command-line package

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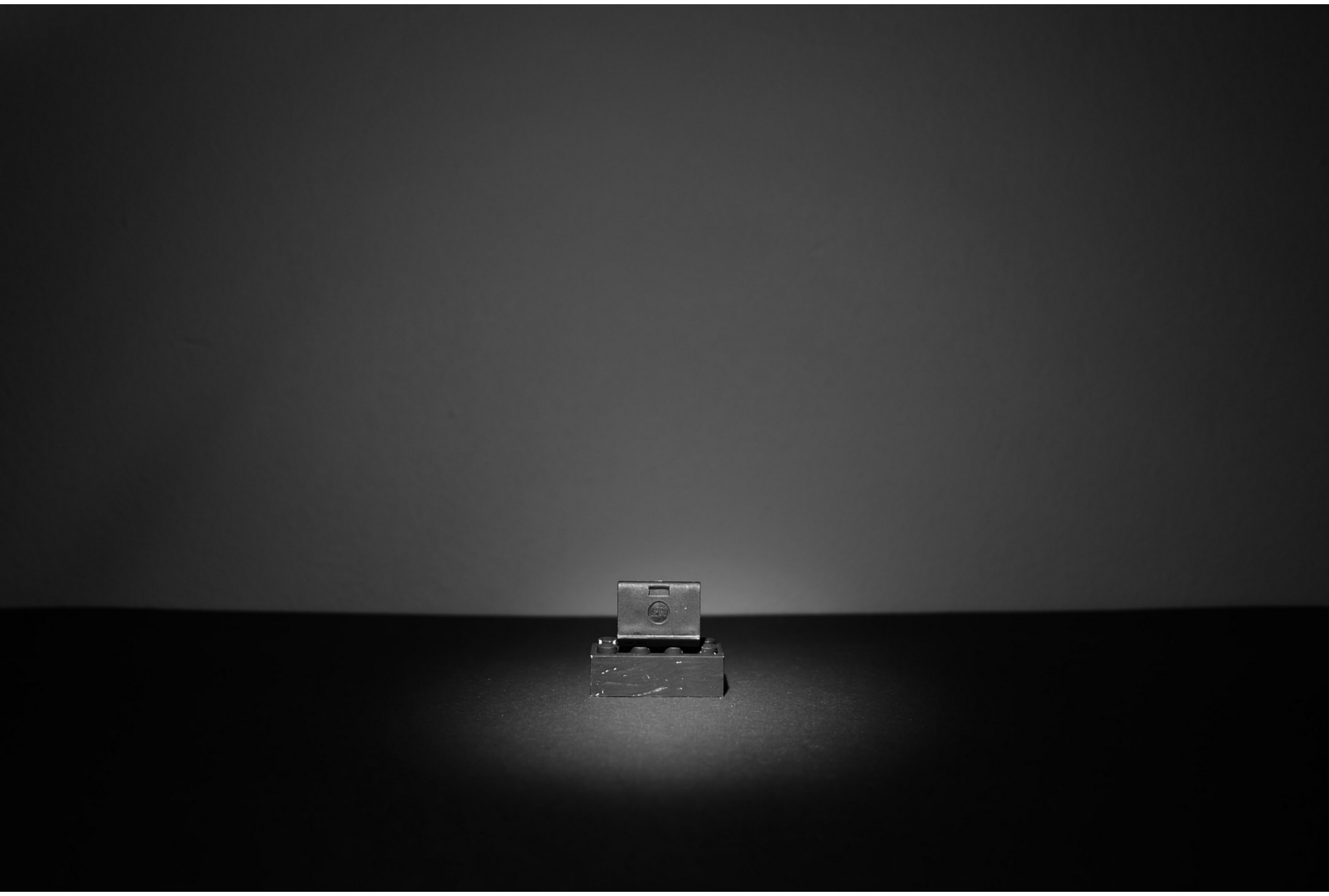

Photo by: Carolin Zöbelein

Feeling inspired to create a NodeJS command-line script to solve a specific issue? Do you want to ship your command-line as an installable package? It should be simple, right? Fortunately, it is!

Here is a concise guide on things we should do to create a NodeJS command-line package.

This guide will walk you through the creation, mapping and linking of a NodeJS command-line script.

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1. Create a NodeJS package

Before doing anything else, we need to create NodeJS package, i.e. just a directory containing a `package.json` file. We can easily do that in 2 steps.

1. Create an empty directory.
2. Run: `npm init` from inside the new directory.

That is nothing new, nor specific to creating a NodeJS command-line package as it is the starting point of any NodeJS package. Now that we have that let us create what will be our NodeJS command-line script.

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2. Create a NodeJS command-line script

You may already know that we can execute a NodeJS script file by running: `node script.js`. That is fine in most cases, but a NodeJS *command-line* script is a regular JavaScript file, except that it contains a special shell-instruction. More about that shortly; first let us create a JavaScript file that will become the NodeJS command-line script.

Create a JavaScript file

The npm.js docs and popular NodeJS projects use to name JavaScript command-line file as `cli.js`. This a good practice because the name itself tells its purpose.

Convert the JavaScript file into a NodeJS command-line script

Similar as other shell script, we want to make our JavaScript file executable by the locally installed `node` program. We do that adding a shebang character sequence at the very top of our JavaScript file that look as follow:

```
#!/usr/bin/env node
```

That way, we are telling *nix systems that the interpreter of our JavaScript file should be `/usr/bin/env node` which looks up for the locally-installed `node` executable.

In Windows, that line will just be ignored because it will be interpreted as a comment, but **it has to be there** because `npm` will read it on a Windows machine when the NodeJS command-line package is being installed.

Make the JavaScript command-line file executable

In most cases, new files are not allowed to be executed. As we are creating a NodeJS command-line script that *will be executed*, we need to modify its file permissions. In a *nix system you can do that as follows:

```
chmod +x cli.js            # Make the file executable
```

Now, let's add some code to our script file. We will create a simple Hello World that will also print any provided arguments.

Add code to our NodeJS command-line script file

A basic NodeJS command-line script.

The code one line 4 will grab all given command line arguments after the third. Moreover, on line 7, we are just printing out `Hello World`, and we are adding any provided arguments (if any).

Awesome! Now we can run it on Linux or Mac OS X as `./cli.js` or in Windows with `node.cmd cli.js`. Try it! Also, pass some argument to it.

Running a basic NodeJS command-line script that outputs provided arguments.

So far, we can run our NodeJS command-line file as a regular script in Linux and Mac OS X, but with still need to add `node.cmd` in Windows. Also, we are bound with the filename to execute our command-line script, which is not nice. In the next section we will circumvent those issues.

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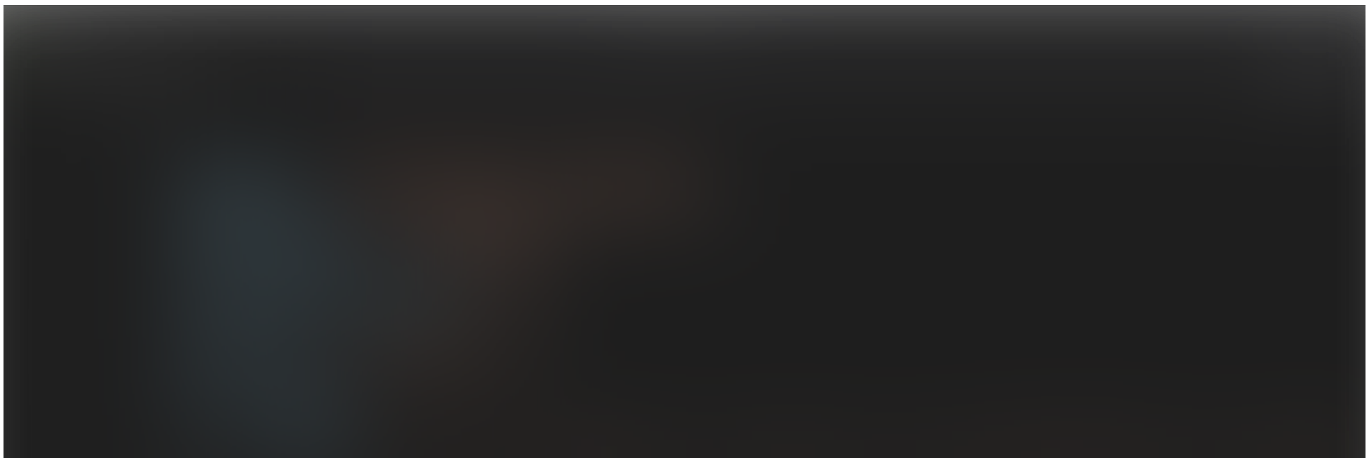
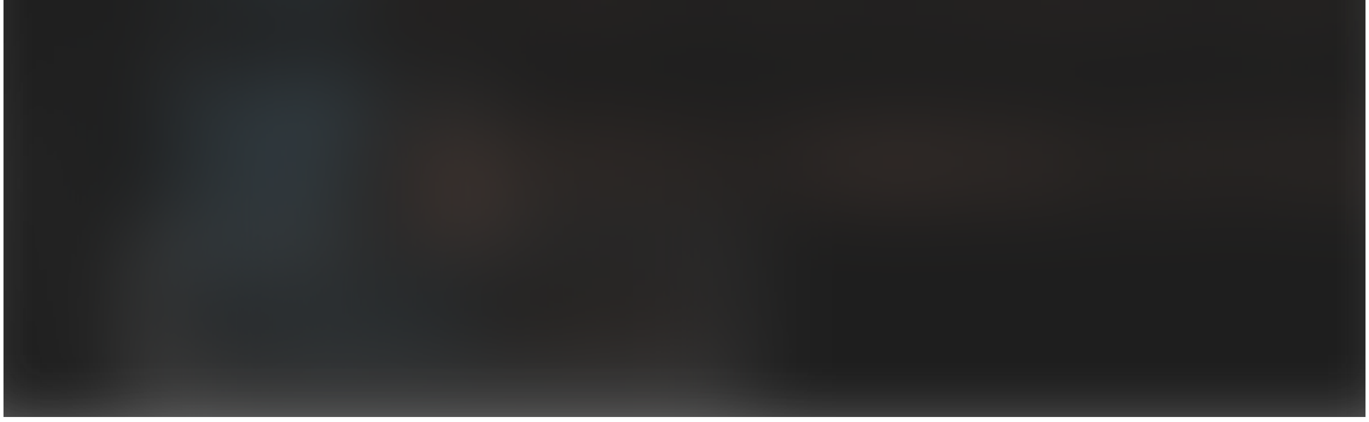
3. Map a command-line script to a command name

So far, we converted a JavaScript file into a NodeJS command-line script file. However, we want to give it a more meaningful name that does not need to be the name of the NodeJS command-line script file. For that, we have to *map our command-line script* by configuring our `package.json`. About this topic the npmjs.com docs say:

> *supply a **`bin`** field in your `package.json` which is a map of command name to local file name.*

This mean we can specify a '*command name*' for our local '*command-line script*'. Let say we want our `cli.js` command-line file to be mapped to **`say-hello`**. We can do that by modifying our `package.json` and adding a `bin` field as aforementioned:




Adding a `bin` field to our `package.json` file to map a command-line script file.

To see its full potential, we are assigning to the `bin` field an object where the keys become the *command names,* and the values are the *NodeJS command-line script files* mapped. That format allows us as developers to provide more than one script mapping. However, if we want to provide a single NodeJS command-line script with the same name as its file, we could just set a string instead of an object where the string would be the local file path.

Notes on naming a command

We can choose any name for a command, but we do not want it to clash with existing popular command names such as `ls`, `cd`, `dir` and so on. If we use one existing name chances are it will not be executed, but instead the already installed one (results may vary).

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4. Link your command for development

As developers, sanity is more than just a word; it is life. That is why we need to be confident enough on how our NodeJS command-line script will be shipped as a package. Thankfully, `npm` comes with the `link` command that will provide our regular dose of sanity.

The `npm link` command allow us to locally 'symlink a package folder', and for our needs, it will locally install any command listed in the `bin` field of our `package.json`. **In other words, `npm link` is like a NodeJS package installation simulator**. It is worth to mention that `npm link` has a wider usage that exceeds the scope of this guide.

The `npm link` command is used from within the NodeJS package directory we want to symlink:

```
npm link
```

Once executed, we will see our command being *symlinked* globally. Now, we can execute our NodeJS command-line script with its own 'command name' `say-hello`:

Running a npm-linked command-line script.

Pretty neat, right? That way, we can play with our NodeJS command-line script locally before even `npm publish`'ing them.

Notes on npm link

Under the hood, `npm link` (also applies to `npm install`) symlink all files specified in the `bin` field of `package.json`. The npmjs docs add:

> *On install, npm will symlink […] file[s] into* **`prefix/bin`** *for global installs, or* **`./node_modules/.bin/`** *for local installs.*

On *nix systems, the `npm` linking process is like creating a shortcut to our specified command file, which will be executed by the shell and then by `node` as specified with the shebang (`#!/usr/bin/env node`). While on Windows, `npm` will do the same (only if the shebang is specified) but will also create a `{command-name}`**`.cmd`** that calls `node` to execute our specified command file.

Keep your room clean

When we finish to test our *symlinked* command, we may want to remove it. We can achieve that by running the following code from inside the package directory.

```
npm unlink                 # No more command installed
```

. . .

Conclusion

That is it for a concise guide on creating a NodeJS command-line package. With those four steps, we have the basics to ship a NodeJS package that will install a command-line package.

Now, it is up to you to *commit*, *push* and *unleash* your creativity by coding a NodeJS command-line package. If you do so, **please, drop me a message in the comments with the GitHub link so I can peek in**.

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Recommendations

Finally, here are some utilities I have used in my own personal command-line projects:

- **meow** – Simple command-line helper.
- **chalk** – Terminal string styling.
- **yargs** – Command-line opt-string parser.

Personal command-line projects

Here are some of my personal NodeJS command-line packages:

- **php-array-to-json** – Convert PHP configuration array files to JSON files.
- **markdown-swagger** – Generate API docs from Swagger to Markdown.
- **spotlight-never-index** – Exclude directories from Spotlight.app.

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This article was cross-posted at X-Team.

JavaScript Nodejs NPM Command Line