Node Package Manager

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npm

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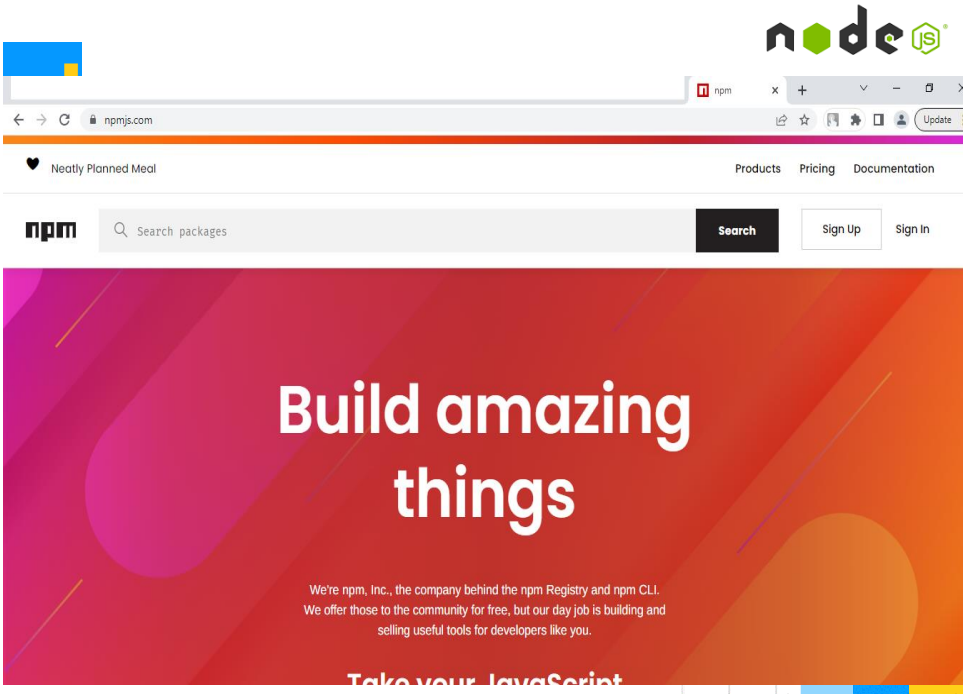

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Intro to npm

- **Node Package Manager** (npm) is the **standard** package manager for Node.js.
- In **January 2017** over **350000** packages were reportedly being listed in the npm registry, making it the biggest single language code repository on Earth.
- It started as a way to download and manage dependencies of Node.js packages, but it has since become a tool used also in frontend JavaScript.
- **NOTE**: **Yarn** and **pnpm** are alternatives to **npm** command line interface.

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Installing All Dependencies

- **Node Package Manager** (npm) is the **standard** package manager for Node.js.
- If a project has a **package.json** file, by running

```
C:\thePrj>npm  install
```

- it will install everything the project needs, in the **node_modules** folder, creating it if it's not existing already.

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Installing Single Package

- You can also install a **specific package** by running

```
C:\thePrj>npm  install  <package_name>
```

- Furthermore, since **npm 5**, this command adds <package-name> to the **package.json** file dependencies.
- Often, you'll see more **flags** added to this command:

Common npm Flags	
Flag	Description
-g	Install globally
-D	Install and add the entry to package.json file devDependencies
-O	Install and add the entry to package.json file optionalDependencies

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Installing Single Package

- The difference between **devDependencies** and **dependencies** is that the former contains development tools, like a testing library, while the latter is bundled with the app in production.
- As for the **optionalDependencies** the difference is that build failure of the dependency will not cause installation to fail. But it is your program's responsibility to handle the lack of the dependency.

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Versioning

- **npm** also manages **versioning**, so you can specify any specific version of a package
- Specifying an **explicit version** of a library helps to keep everyone on the same exact version of a package, so that the whole team runs the same version until the **package.json** file is updated.
- In such cases, versioning helps a lot, and npm follows the **semantic versioning** (**semver**) standard.
- You can install a specific version of a package, by running

```
C:\thePrj>npm  install  <package_name>@<version>
```

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Where does npm install the packages?

- When you install a package using **npm** you can perform TWO types of installation:
  - a **local** install
  - a **global** install
- By default, when you type an npm install command, like:

```
C:\thePrj>npm  install  lodash
```

- the package is installed in the current file tree, under the **node_modules** subfolder.
- As this happens, **npm** also adds the **lodash** entry in the dependencies property of the **package.json** file present in the current folder.

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Where does npm install the packages?

```
C:\thePrj>npm  install  lodash
npm notice created a lockfile as package-lock.json. You should commit this file.
npm WARN theprj@1.0.0 No description
npm WARN theprj@1.0.0 No repository field.

+ lodash@4.17.21
added 1 package from 2 contributors and audited 1 package in 1.67s
found 0 vulnerabilities
```

```
C:\thePrj>tree
Folder PATH listing for volume OS
Volume serial number is 9EAD-1162
C:.
└───node_modules
    └───lodash
        └───fp
```

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Global Installation

- A global installation is performed using the **-g** flag
- When this happens, **npm** won't install the package under the local folder, but instead, it will use a global location.

Where, exactly?

- The **npm root -g** command will tell you where that exact location is on your machine.
- On **macOS** or **Linux** this location could be **`/usr/local/lib/node_modules`.**
- On **Windows** it could be C:\Users\YOU\AppData\Roaming\npm\node_modules
- If you use **nvm** to manage Node.js versions, however, that location would differ.

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Updating Packages

- Updating is also made easy, by running

```
npm update [-g] [<pkg>...]

aliases: up, upgrade
```

- **npm** will check all packages for a newer version that satisfies your versioning constraints.

Running Tasks

- The **package.json** file supports a format for specifying command line tasks that can be run

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The package.json Guide

- If you work with JavaScript project, Node.js or a frontend project, you surely would have seen the **package.json** file.
  - What's that for?
  - What should you know about it? and
  - What are some of the cool things you can do with it?
- The **package.json** file is kind of a **manifest** for your project. It can do a lot of things, completely unrelated. It's a central repository of configuration for tools, for example.
- It's also where **npm** and yarn store the names and versions for all the installed packages.

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The package.json Content

- There are lots of things going on here:
- **version** indicates the current version
- **name** sets the application/package name
- **description** is a brief description of the app/package
- **main** sets the entry point for the application
- **private** if set to true prevents the app/package to be accidentally published on **npm**
- **scripts** defines a set of node scripts you can run
- **dependencies** sets a list of **npm** packages installed as dependencies

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The package.json Content

- There are lots of things going on here:
- **devDependencies** sets a list of **npm** packages installed as development dependencies
- **engines** sets which versions of Node.js this package/app works on
- **browserslist** is used to tell which browsers (and their versions) you want to support
- All those properties are used by either npm or other tools that we can use.

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Find Installed npm Packages

- To see the version of all installed **npm** packages, including their dependencies

```
npm list
```

```
> npm list
/Users/joe/dev/node/cowsay
└─┬ cowsay@1.3.1
  ├── get-stdin@5.0.1
  ├─┬ optimist@0.6.1
  │ ├── minimist@0.0.10
  │ └── wordwrap@0.0.3
  ├─┬ string-width@2.1.1
  │ ├── is-fullwidth-code-point@2.0.0
  │ └─┬ strip-ansi@4.0.0
  │   └── ansi-regex@3.0.0
  └── strip-eof@1.0.0
```

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Find Installed npm Packages

- You can also just open the **package-lock.json** file, but this involves some visual scanning.
- **`npm list -g`** is the same, but for globally installed packages.
- To get only your top-level packages (basically, the ones you told **npm** to install and you listed in the package.json), run **`npm list --depth=0`**

```
> npm list --depth=0
/Users/joe/dev/node/cowsay
└── cowsay@1.3.1
```

```
> npm list cowsay
/Users/joe/dev/node/cowsay
└── cowsay@1.3.1
```

```
> npm view cowsay version

1.3.1
```

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Uninstalling npm Packages

- To uninstall a package, you have previously installed locally (using npm install <package-name>), run

```
C:\thePrj>npm  uninstall  <package_name>
```

- If the package is installed globally, you need to add the –g option

```
C:\thePrj>npm  uninstall  <package_name> -g
```

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The npx Node.js Package Runner

- **npx** is a very powerful command that's been available in **npm** starting version **5.2**, released in July 2017.
- **NOTE**: If you don't want to install **npm**, you can install **npx** as a standalone package
- **npx** lets you run code built with Node.js and published through the **npm** registry.

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Installation-less Command Execution

- There is great feature of **npx**, which is allowing to run commands without first installing them.
- This is pretty useful, mostly because:
  - you don't need to install anything
  - you can run different versions of the same command, using the syntax **@version**
- A typical demonstration of using **npx** is through the **cowsay** command. **cowsay** will print a cow saying what you wrote in the command.

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Installation-less Command Execution

- **cowsay** will print a cow saying what you wrote in the command.

```
C:\thePrj>
C:\thePrj>npx cowsay "Hello"
npx: installed 41 in 9.671s
 _______
< Hello >
 -------
        \   ^__^
         \  (oo)\_______
            (__)\       )\/\
                ||----w |
                ||     ||

C:\thePrj>tree
Folder PATH listing for volume OS
Volume serial number is 00000232 9EAD:1162
C:.
└───node_modules
    └───lodash
        └───fp
```

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