

npm - Node Package Manager

npm (Node Package Manager) is the default tool used to install and manage JavaScript packages in Node.js projects.

When you run a command like `npm install express`, a lot happens behind the scenes. Let's break it down step-by-step in a simplified and beginner-friendly way.

Step-by-Step Internal Flow of npm

1. npm Searching a package

npm checks online at the npm registry (<https://registry.npmjs.org/>) to find the package you requested.

For example, if you type `npm install [indian-date-utils-suratwala](#)`, npm looks for the latest version of this package.

2. It downloads the parcel

npm downloads a small zipped file (.tgz) containing the Express package. It saves a cached copy locally at `~/.npm/_cacache` so future installs are faster.

```
~/.npm/_cacache/
```

3. npm opens the parcel and builds node_modules

npm extracts the package and places it into the `node_modules` folder, making it available for your application.

```
PS C:\Users\Vraj Suratwala\OneDrive\Desktop\Sem_7\MERN\Node\Data> npm i indian-date-utils-suratwala
added 2 packages, and audited 3 packages in 28s

1 package is looking for funding
  run `npm fund` for details

found 0 vulnerabilities
```

```
▼ Data
  ► node_modules
  📄 package-lock.json
  📄 package.json
```

4. It writes a receipt

npm updates package.json (if needed) and creates/updates package-lock.json.

This file records the exact versions installed to ensure consistency across environments.

5. Installs other needed packages

If the package (like Express) has dependencies, npm repeats the process for each one.

It tries to avoid duplicating packages by reusing where possible.

6. Ready to roll

Once all packages are installed and configured, you can start using them in your application. The app is now ready to go!

Quick Summary

Step	What Happens
1	npm goes online and finds the package
2	Downloads and saves it in cache
3	Unpacks it into node_modules/
4	Updates package-lock.json
5	Installs dependencies
6	App is ready to use the package

Where to Look on Your System

- node_modules/: folder where packages are stored
- package-lock.json: file listing exact package versions
- ~/.npm/_cacache: local cache for downloaded packages

Additional : “cowsay” Package : cowsay is a fun CLI tool that displays a speech bubble with a message... coming from an ASCII art **cow**!

[Note : npx : Node Package execute]

Let's Install it!

```
PS C:\Users\Vraj Surattwala\OneDrive\Desktop\Sem_7\MERN\Node\Data> npm i cowsay
added 41 packages, and audited 44 packages in 5s

4 packages are looking for funding
  run `npm fund` for details

found 0 vulnerabilities
```

Usage :

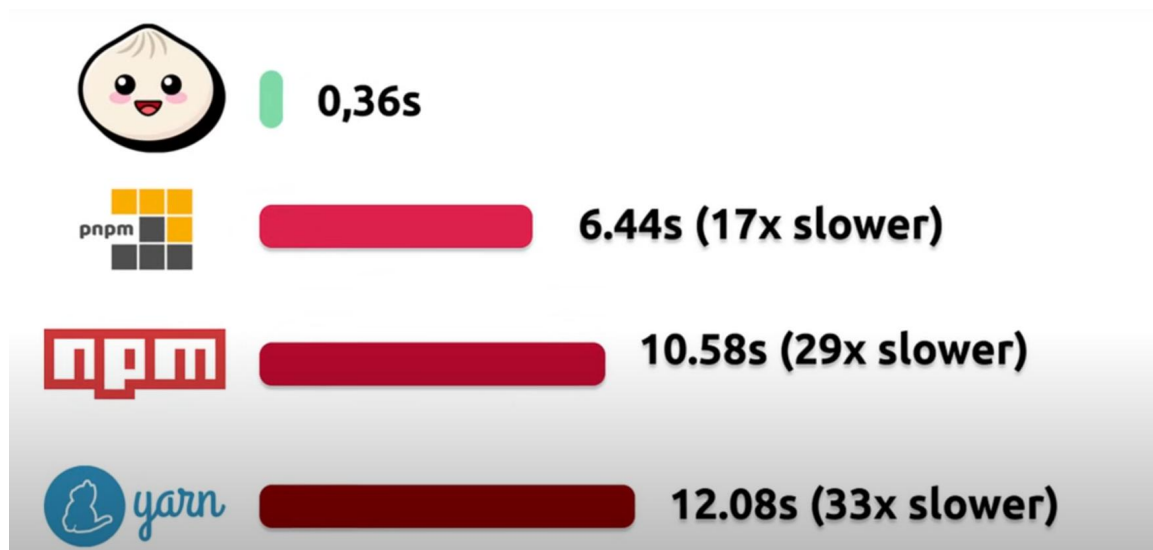
```
PS C:\Users\Vraj Surawatla\OneDrive\Desktop\Sem_7\MERN\Node\Data> npx cowsay "Hello World!"
```

```
< Hello World! >
-----
      \   ^__^
       (oo)\_______
            (_____)
              |
              |  ----w
              ||----w
              ||

```

REFER SOME NPM CLI : [npm](#) | [npm Docs](#)

Comparison of npm with other Package Managers.



References :

- Node.js Official Website – <https://nodejs.org/>
- npm Documentation – <https://docs.npmjs.com/>
- Express.js Official Documentation – <https://expressjs.com/>
- cowsay npm Package – <https://www.npmjs.com/package/cowsay>
- npx Documentation (npm CLI Docs) – <https://docs.npmjs.com/cli/v9/commands/npx>
- "What is npx?" – freeCodeCamp Article
<https://www.freecodecamp.org/news/npx-npm-run-node-js-packages-without-installing/>

- GitHub Repository for cowsay – <https://github.com/piuccio/cowsay>