# Comparison of Node.js Package Managers

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## 1. npm (Node Package Manager) – The Original one

* **Official package manager** bundled with Node.js.
* Massive **registry** with the widest support.
* Common commands:
  + npm install
  + npm update
  + npm uninstall
  + npm ci

**Pros:** - Stable and widely supported - Great community - Improved performance in v7+

**Cons:** - Slower than newer managers - Used to suffer from dependency bloat

## 2. Yarn – The Speedster from Facebook

* Developed by Facebook to address npm issues.
* Uses yarn.lock and caches packages.
* Supports **Plug’n’Play (PnP)**.

**Pros:** - Faster installs with caching - Deterministic builds - Cleaner CLI output

**Cons:** - Slight complexity for advanced use - Not fully in sync with npm updates

**Common Commands:** - yarn add - yarn install - yarn remove - yarn upgrade

## 3. pnpm – The Space Saver

* Performance-optimized & disk-space efficient
* Uses hard links/symlinks
* Ideal for monorepos

**Pros:** - Significant disk space savings - Very fast - Strict dependency rules

**Cons:** - Learning curve if new to symlink structure

**Common Commands:** - pnpm install - pnpm add - pnpm remove

## 4. Bun – The New Cool Kid

* JavaScript runtime + package manager
* Built in Zig – very fast
* Includes bundler, transpiler, test runner

**Pros:** - Ultra-fast performance - Built-in tools - Easy setup

**Cons:** - Still young and evolving - Some compatibility issues

**Common Commands:** - bun install - bun add - bun remove - bun run, bun test

## Quick Comparison Table

| **Feature** | **npm** | **Yarn** | **pnpm** | **Bun** |
| --- | --- | --- | --- | --- |
| **Speed** | Slow-ish | Fast | Faster | Fastest |
| **Disk Efficiency** | Duplication | Cache | Hard links | Optimized |
| **Work spaces** | Yes | Yes | Best for it | Limited |
| **Zero Install** | No | Optional | Supported | Built-in |
| **Compatibility** | Best | Good | Good | Mixed |
| **Extra Features** | Basic | PnP | Strict deps | Bundled |

## When to Use What

* **Beginner**: Go with **npm**.
* **Fast and deterministic installs**: Use **Yarn**.
* **Mono repo or low disk space**: Use **pnpm**.
* **All-in-one modern stack**: Try **Bun**.

## Official Links

* [npm](https://www.npmjs.com/)
* [Yarn](https://yarnpkg.com/)
* [pnpm](https://pnpm.io/)
* [Bun](https://bun.sh/)