

NPM



Agenda

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- Understand package management
- Discuss versioning issues
- A bit of mono repo challenges

Node Package Manager

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- Introduced in 2011
- Automatically installed with Node
- “A set of publicly available reusable components, available through easy installation via an online repository, with version and dependency management”
- Full list of packages <https://npmjs.org/>

More

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- Managed by npm, Inc.
- Company founded 2014 by npm's creator Isaac Z. Schlueter
- Runs the npm registry as free service
- Build supporting tools for the community
- Moto: *“when everyone else is adding force, we work to reduce friction”*

Not just for Node.js

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- Using NPM you can install any package that adheres to NPM rules
- Not just node modules
- But also client side libraries
 - ▣ Angular
 - ▣ React
 - ▣ Vue

NPM repo

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- npmjs.org is opened for every one to publish
- Is considered insecure
 - ▣ left-pad use case
- Can use your own local NPM repo
 - ▣ Artifactory
 - ▣ NPM Enterprise
 - ▣ Nexus
 - ▣ ProGet

npm -v

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- Returns the version of currently installed npm
- Although installed together with Node.js, npm can be updated without updating node itself
- Node 8.10.0 is bundles with npm 5.6.0
- **npm install -g npm**
- Now, npm is version is 5.7.0

Global Installation

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- `npm install -g typescript`
- Installs the package into the current logged-on user
 - ▣ Linux: `/usr/local/lib/node_modules`
 - ▣ Windows: `%AppData%\npm\node_modules`
- Global installation eventually creates conflicts between different projects
- Therefore, some consider that a bad practice

Local Installation

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- **npm install typescript**
- Installs into the first parent directory that contains
 - ▣ node_modules
 - OR
 - ▣ package.json
- Therefore, directory structure is important
- Nested directory implies inheritance of packages

npm init

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- Create package.json file inside the current directory
- Can append `-y` to skip all questions

```
{
  "name": "myapp",
  "version": "1.0.0",
  "description": "",
  "main": "index.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "keywords": [],
  "author": "",
  "license": "ISC",
  "dependencies": {
    "angular": "^1.6.9"
  }
}
```

Updating package.json

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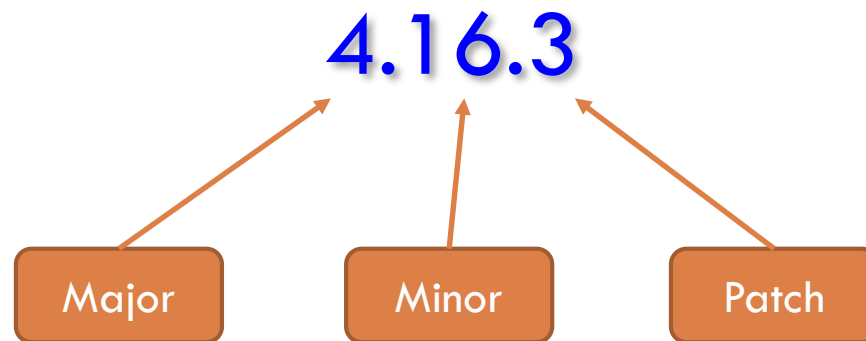
- If package.json exists, npm automatically updates it with the installed package
 - ▣ Old npm did not do that

```
{  
  "dependencies": {  
    "express": "^4.16.3"  
  }  
}
```

SEMVER

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□ Semantic versioning



- Major - incompatible API changes
- Minor - New functionality in a backwards-compatible manner
- Patch - backwards-compatible bug fixes

Versioning Constraints

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- `~version` - Allows for greater patch number
- `^version` – Greater minor number
- `version` – Exact match
- `>version` – Greater than

Lock down versions

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- During development all team members should use the same version for all packages
- Can use exact match inside package.json
- However, it does not effect sub dependencies
- Starting NPM 5 a package-lock.json file is automatically created
 - ▣ Lists versions for all sub dependencies
 - ▣ You should commit it to source control

Common Dependency

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- NPM will re-use common sub dependency as much as it can
 - ▣ Without breaking SEMVER
- The same package might reside multiple times inside `node_modules`
 - ▣ Each time with different version
- Might lead to multiple instances of the same package at runtime ☹️

peerDependency

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- ❑ npm does not install peer dependencies
- ❑ However it generates a warning
- ❑ The application owner is expected to install the missing dependency
- ❑ Use it when publishing a package that has dependency that is being used also by the application

devDependencies

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- `npm i typescript --save-dev`
- Use it when installing packages that are not needed at runtime
 - ▣ Mostly build tools
- At production NPM does not install `devDependencies`
 - ▣ Production mode is considered such when `NODE_ENV` equals `production`

npm publish

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- ❑ Publishes all files from current directory into the remote NPM repo
- ❑ Version inside package.json must not conflict with existing published packages
- ❑ Cannot overwrite existing package
- ❑ Consider cleaning directory before publishing it
- ❑ Need to login before publish
 - ❑ `npm login`

npm link

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- Lets assume common and app packages
- Whenever common is changed we must
 - ▣ npm publish
 - ▣ npm install
- This flow is tedious and time consuming
- npm link allows linking both common and app directly without publishing to NPM repo
- Run **npm link** inside common and then **npm link common** inside app

Monorepo

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- ❑ One repo with many projects
- ❑ Each project has its own package.json
- ❑ There are dependencies between projects
- ❑ Linking all projects is a nightmare
- ❑ NPM wont help 😞
- ❑ Yarn will 😊

Yarn workspace

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- Install yarn
- Add package.json at the root directory that contains all projects → A.K.A workspace

```
{  
  "private": true,  
  "workspaces": [  
    "common",  
    "lib1",  
    "lib2"  
  ]  
}
```

- Execute **yarn**
- All projects are now linked together

npm outdated

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- ❑ The world is changing ...
- ❑ Soon your project is out of date
- ❑ Must decide on the “upgrade approach”
- ❑ Upgrading all packages once a year creates a technical debt
- ❑ **npm outdated** is just the tip of the ice berg

Summary

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- NPM is impressive
- The world largest open source repository
- You should use Yarn instead
 - ▣ Same internet repo
 - ▣ But much faster
- Be careful of versioning hell