

The world's most elaborate CI workflow for an Angular library

By Lars Gyrup Brink Nielsen



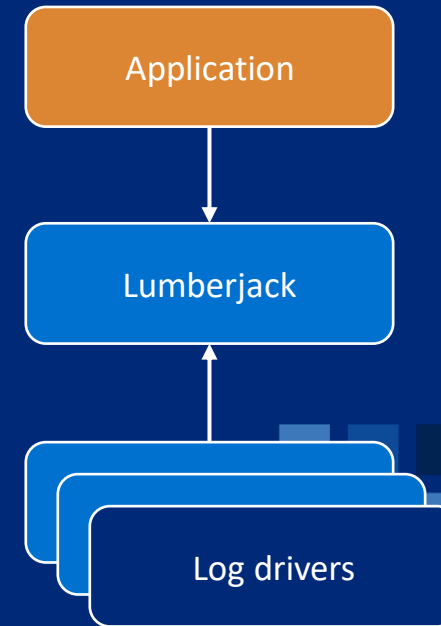
Overview of Lumberjack



Lumberjack features

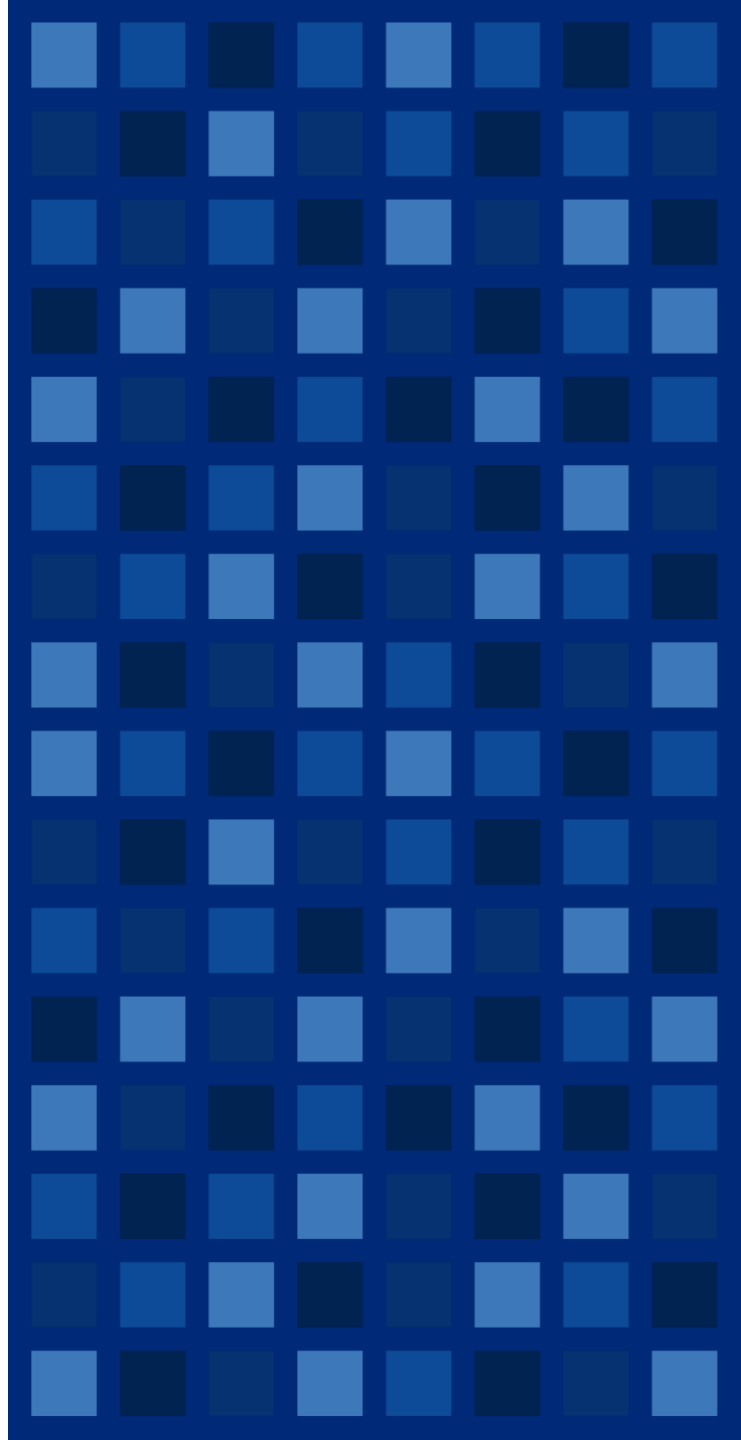
Lumberjack is a versatile and extensible logging library for Angular.

- Configurable logging with 6 severity levels
- Robust error handling
- Plugin-based architecture
- Built-in log drivers:
 - Browser console log driver
 - HTTP log driver
- Angular schematics code generation and codemods
- Verified cross-version Angular compatibility



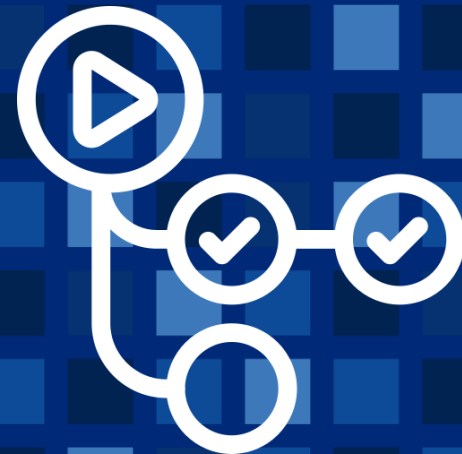
Log levels

- Default log levels:
 - Development: All log levels are enabled
 - Production: All log levels except Debug and Trace are enabled
- Default log levels can be overridden
- Log levels are configurable on a per-log driver basis



Cross-version Angular and TypeScript compatibility

GitHub Actions workflow



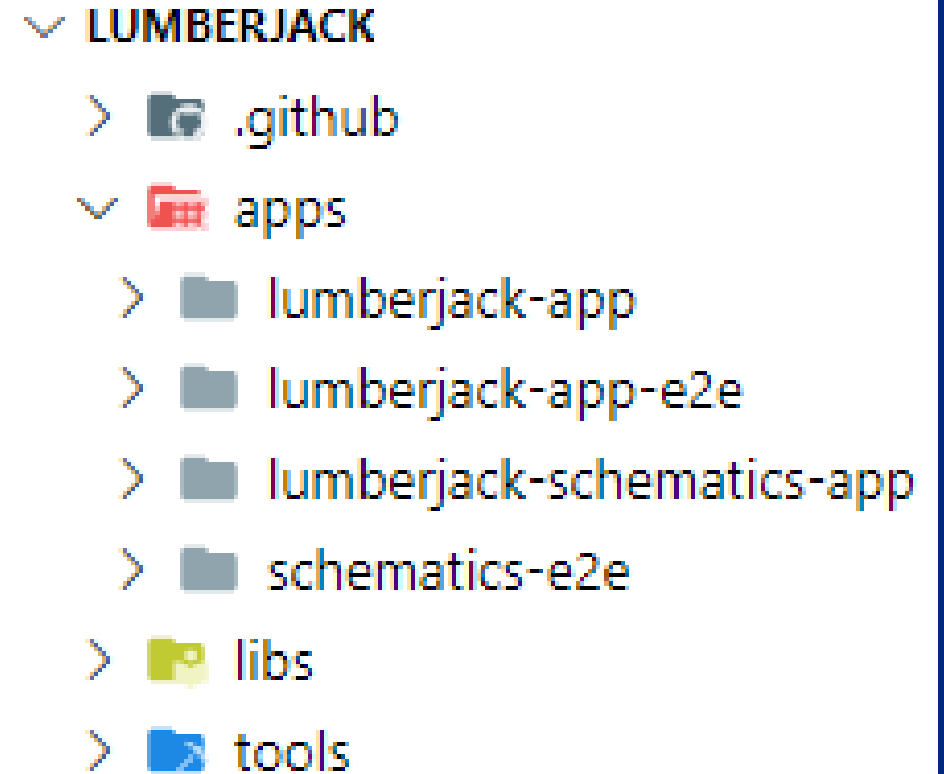
The problem

- 8 Angular versions
- 6 TypeScript versions
- 2 Node.js versions
- 30 possible combinations of dependencies

| Angular CLI version | Angular version | Node.js version | TypeScript version |
|---------------------|-----------------|--|--------------------|
| 9.0.7 | 9.0.x | 10.13.x/12.11.x or later minor version | 3.6.x/3.7.x |
| 9.1.x | 9.1.x | 10.13.x/12.11.x or later minor version | 3.6.x/3.7.x/3.8.x |
| 10.0.8 | 10.0.x | 10.13.x/12.11.x or later minor version | 3.9.x |
| 10.1.7 | 10.1.x | 10.13.x/12.11.x or later minor version | 3.9.x/4.0.x |
| 10.2.x | 10.2.x | 10.13.x/12.11.x or later minor version | 3.9.x/4.0.x |
| 11.0.7 | 11.0.x | 10.13.x/12.11.x or later minor version | 4.0.x |
| 11.1.x | 11.1.x | 10.13.x/12.11.x or later minor version | 4.0.x/4.1.x |
| 11.2.x | 11.2.x | 10.13.x/12.11.x or later minor version | 4.0.x/4.1.x |

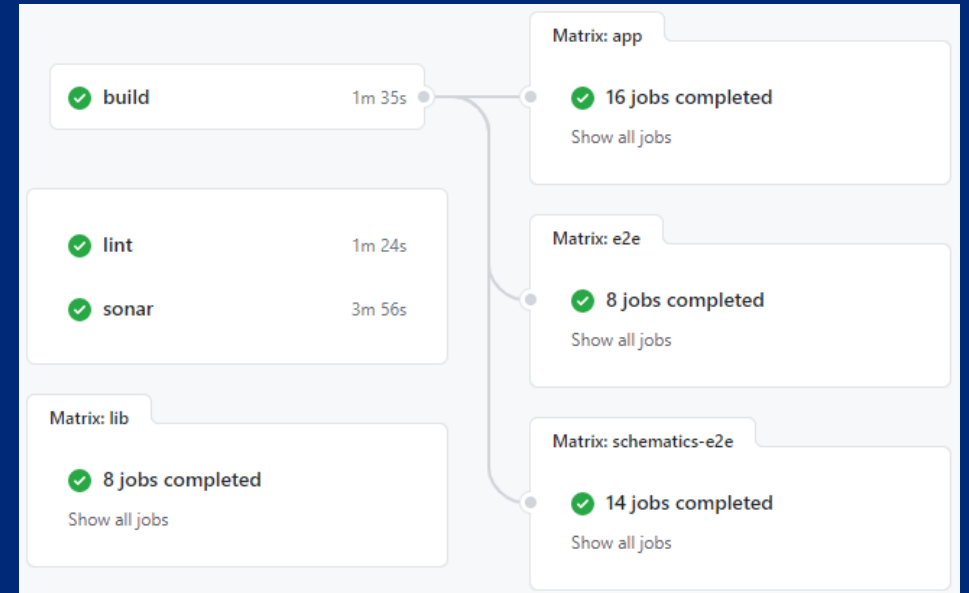
The solution

- Angular CLI workspace
- Single-source codebase solution
 - 1 demo application
 - 1 end-to-end application test suite
 - 1 schematics target application
 - 1 schematics end-to-end test suite
- A GitHub Actions job run per combination of dependencies
- Node.js scripts



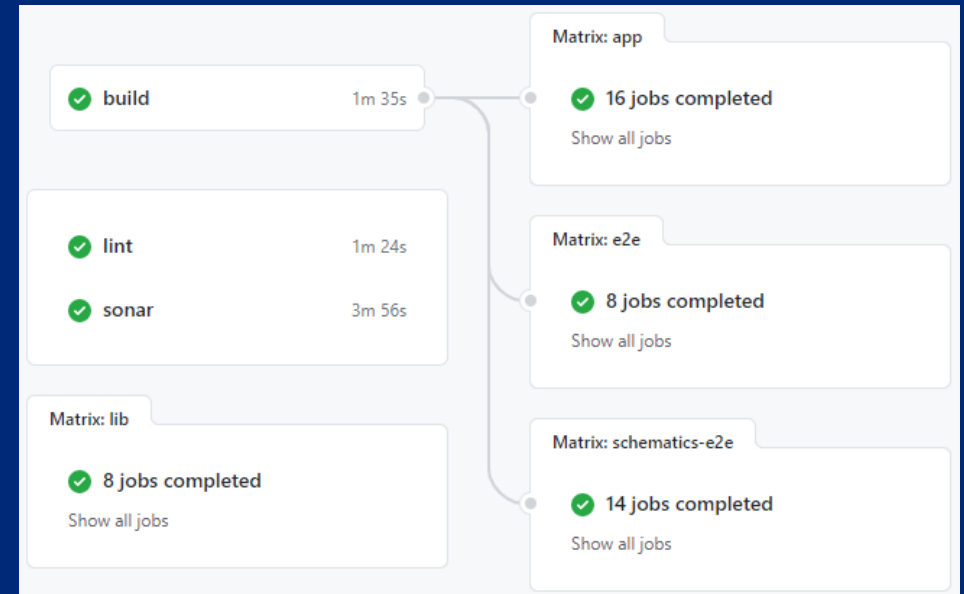
50 jobs per CI run

- 49 GitHub Actions job runs
- 10-30 job runs in parallel
- ~6 minutes in total



50 jobs per CI run The build, lint, and sonar jobs

- The build job: Production library build, latest versions
- The lint job: Check formatting and linting rules, latest versions
- The sonar job: Generate test coverage and lint reports, then upload them to SonarCloud



50 jobs per CI run The lib job

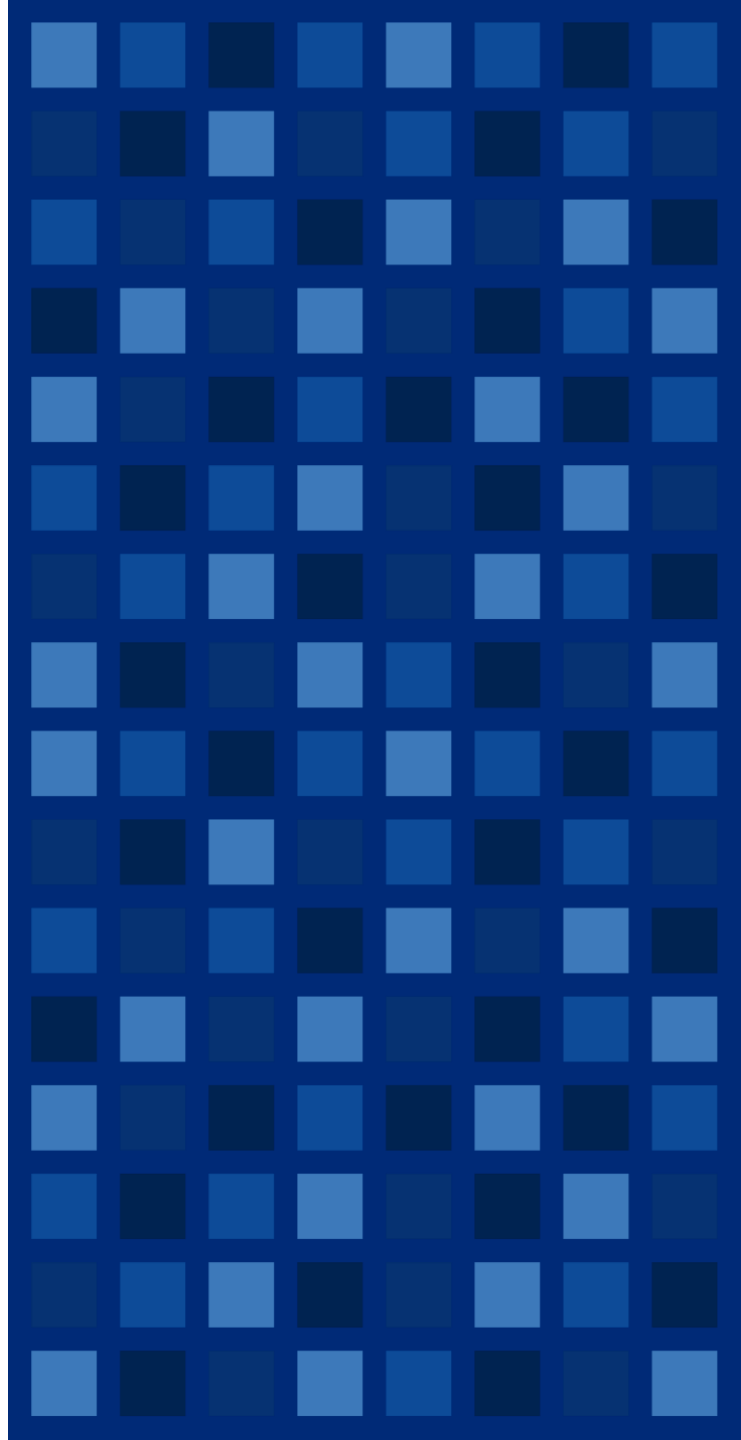
- Node.js: 12.x
- Angular versions:
 - 9.0.x, 9.1.x
 - 10.0.x, 10.1.x, 10.2.x
 - 11.0.x, 11.1.x, 11.2.x
- TypeScript versions:
 - 3.7.x, 3.8.x, 3.9.x
 - 4.0.x, 4.1.x

Matrix: lib

| | |
|----------------|--------|
| ✓ lib (9.0.x) | 2m 26s |
| ✓ lib (9.1.x) | 2m 33s |
| ✓ lib (10.0.x) | 2m 7s |
| ✓ lib (10.1.x) | 1m 56s |
| ✓ lib (10.2.x) | 2m 16s |
| ✓ lib (11.0.x) | 2m 3s |
| ✓ lib (11.1.x) | 1m 49s |
| ✓ lib (11.2.x) | 1m 38s |

The lib job

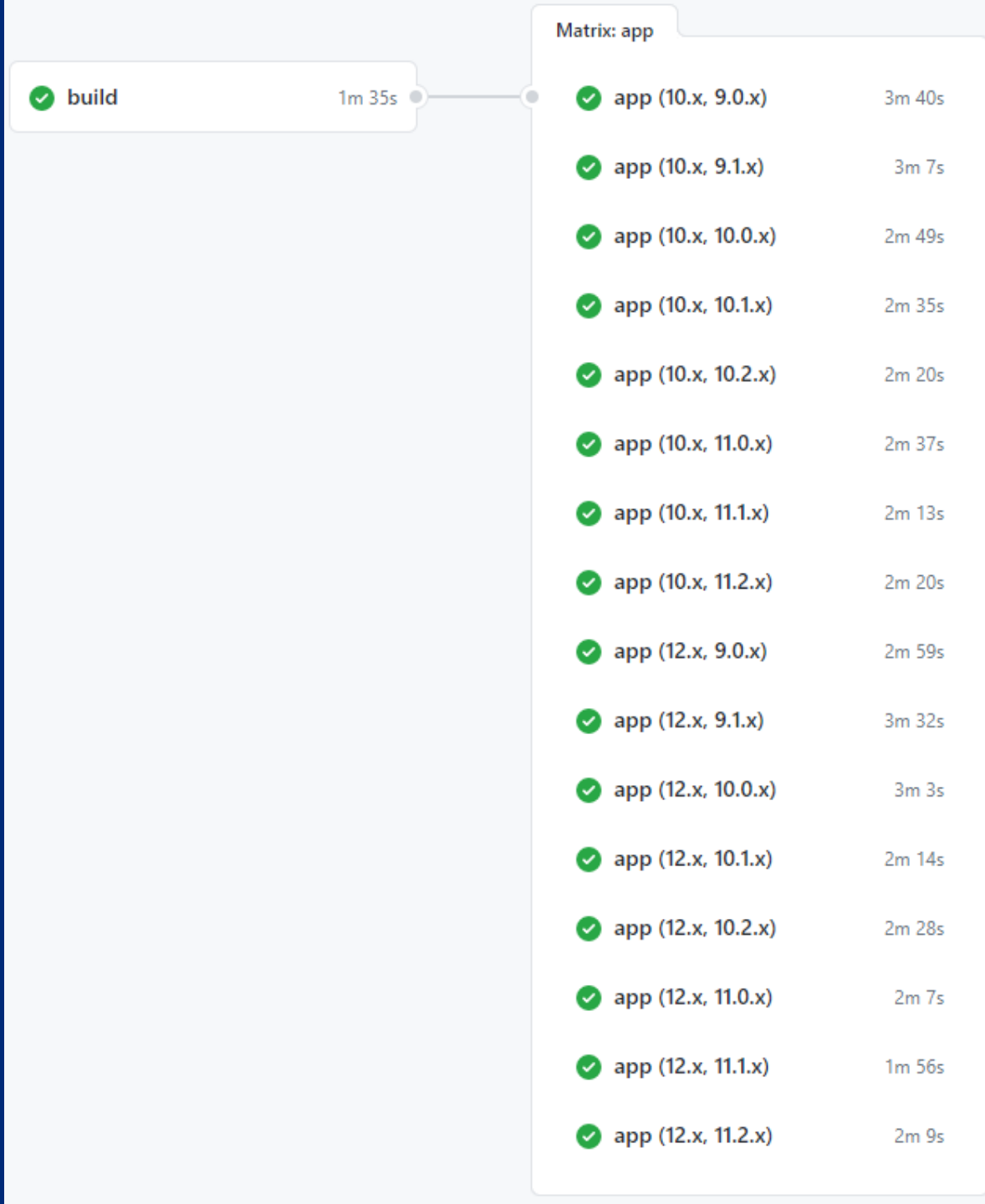
- 8 matrix legs:
 - Install Angular matrix leg version
 - Install associated TypeScript version
- Run unit and integration tests for:
 - Development library projects
 - Publishable library projects
 - Angular schematics



50 jobs per CI run

The app job

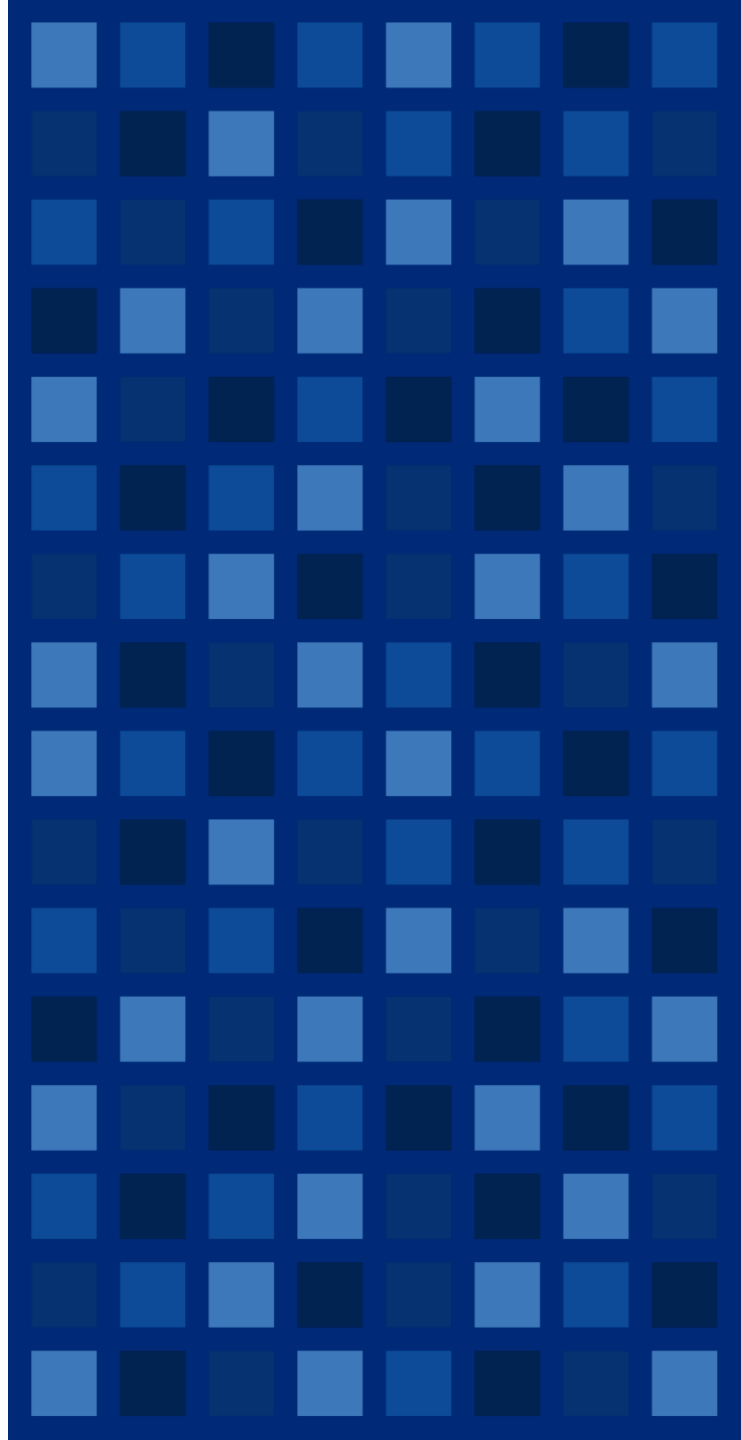
- Node.js versions:
 - 10.x
 - 12.x
- Angular versions:
 - 9.0.x, 9.1.x
 - 10.0.x, 10.1.x, 10.2.x
 - 11.0.x, 11.1.x, 11.2.x
- TypeScript versions:
 - 3.7.x, 3.8.x, 3.9.x
 - 4.0.x, 4.1.x



The app job

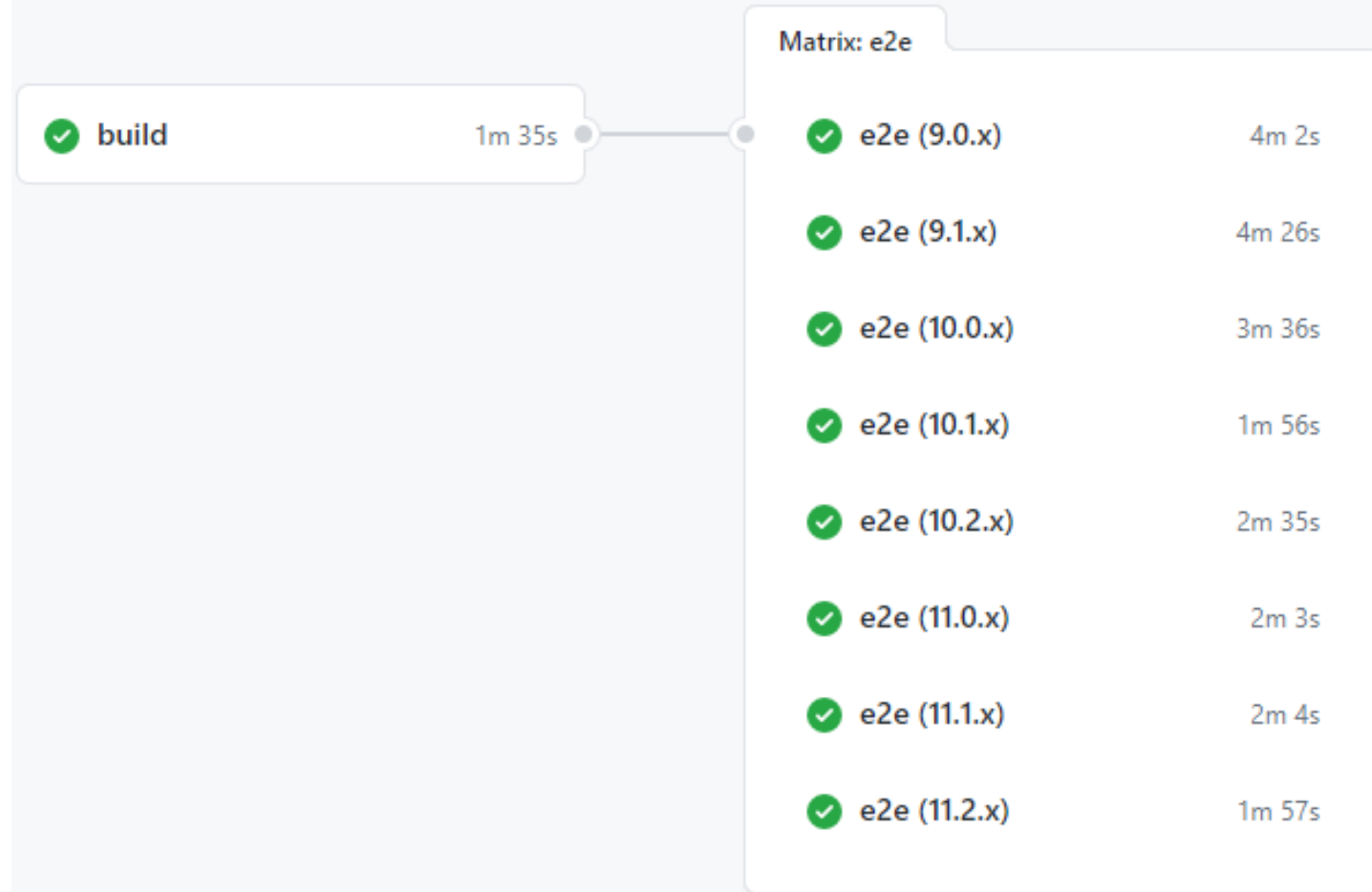
- 16 matrix legs:
 - Install Node.js matrix leg version
 - Install Angular matrix leg version
 - Install associated TypeScript version
- Delete local TypeScript path mappings
- Download build artifact from "build" job
- Move Lumberjack package into node_modules
- Run Angular Compatibility Compiler (NGCC)

- Run demo application unit and integration tests
- Run demo application production build



50 jobs per CI run The e2e job

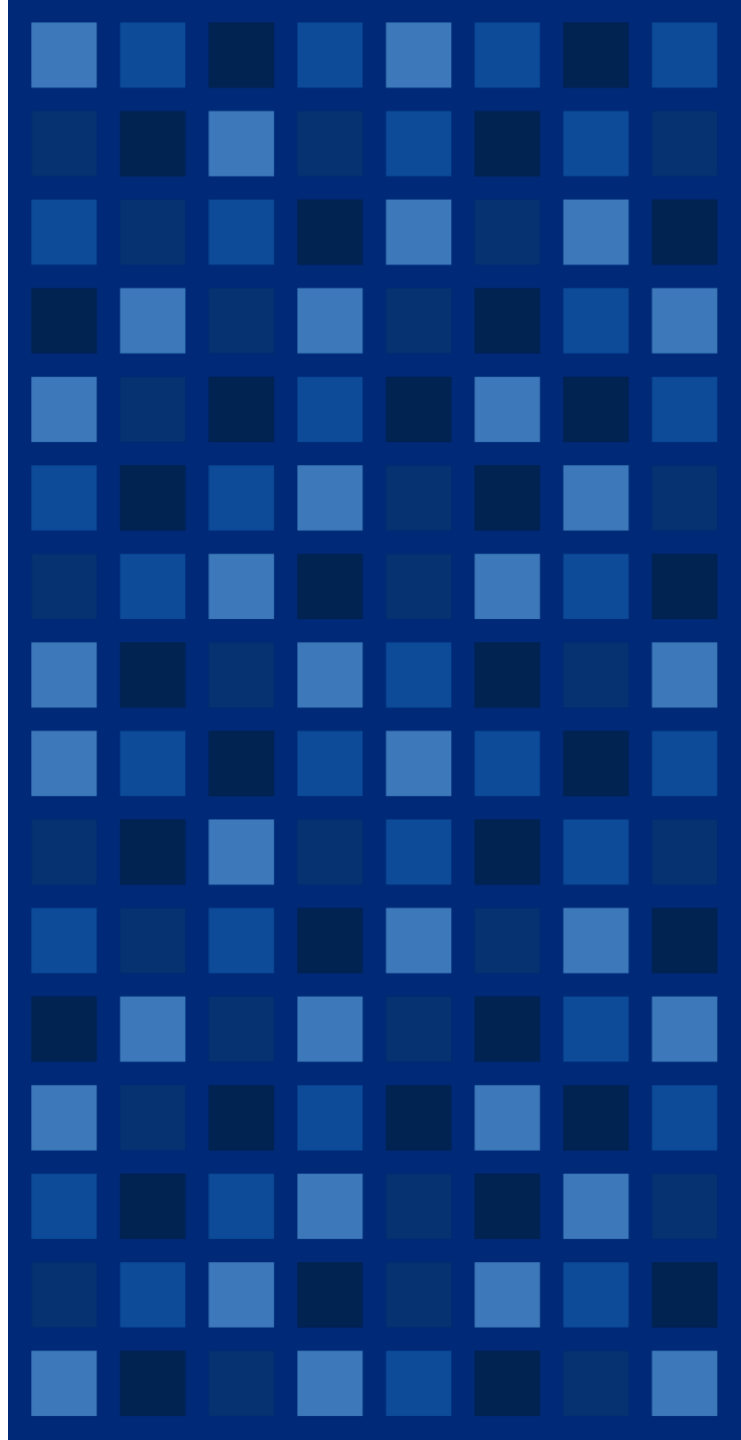
- Node.js: 12.x
- Angular versions:
 - 9.0.x, 9.1.x
 - 10.0.x, 10.1.x, 10.2.x
 - 11.0.x, 11.1.x, 11.2.x
- TypeScript versions:
 - 3.7.x, 3.8.x, 3.9.x
 - 4.0.x, 4.1.x



The e2e job

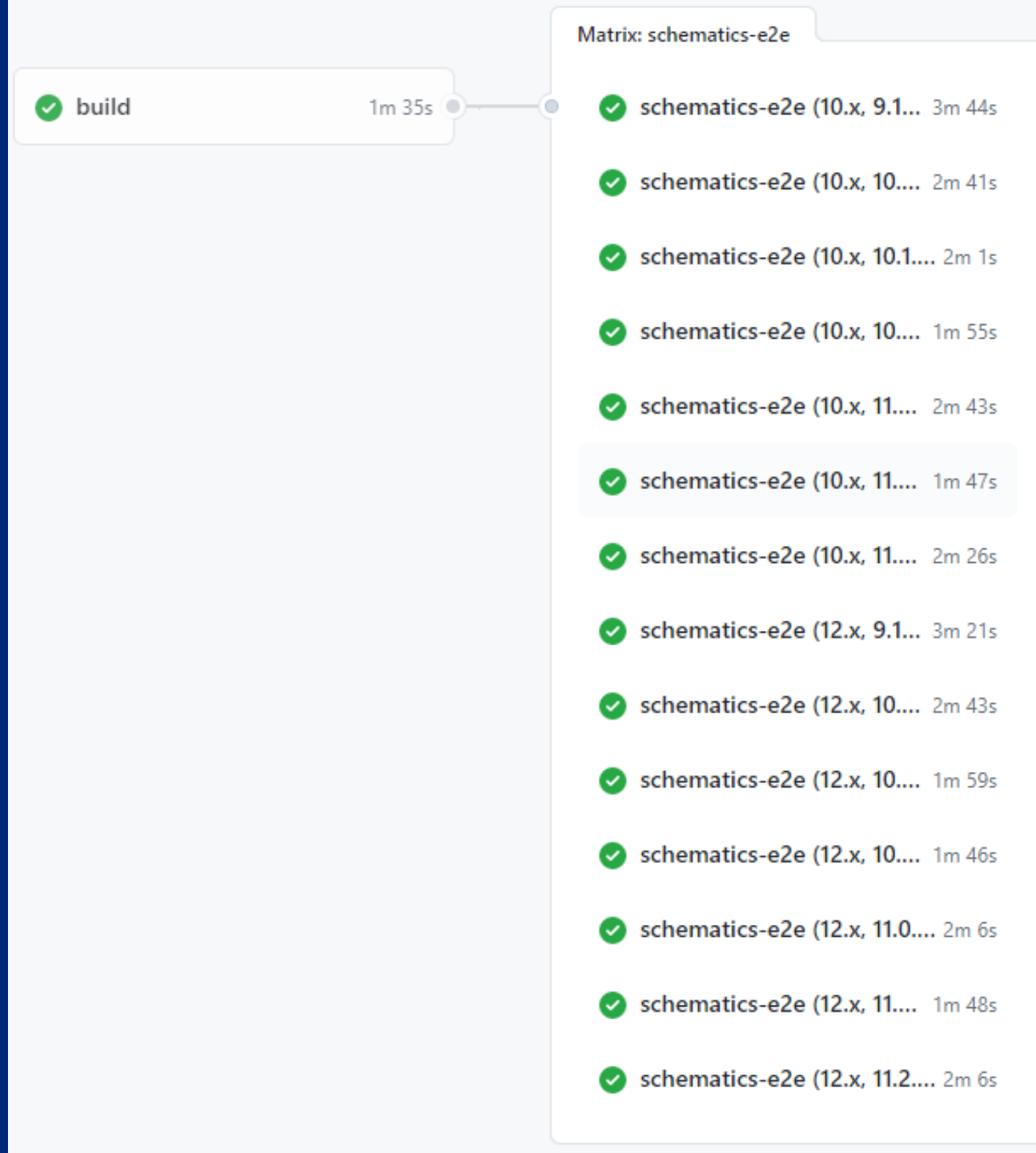
- 8 matrix legs:
 - Install Angular matrix leg version
 - Install associated TypeScript version
- Delete local TypeScript path mappings
- Download build artifact from "build" job
- Move Lumberjack package into node_modules
- Run Angular Compatibility Compiler (NGCC)

- Install latest Google Chrome
- Run end-to-end tests for demo application



50 jobs per CI run The schematics-e2e job

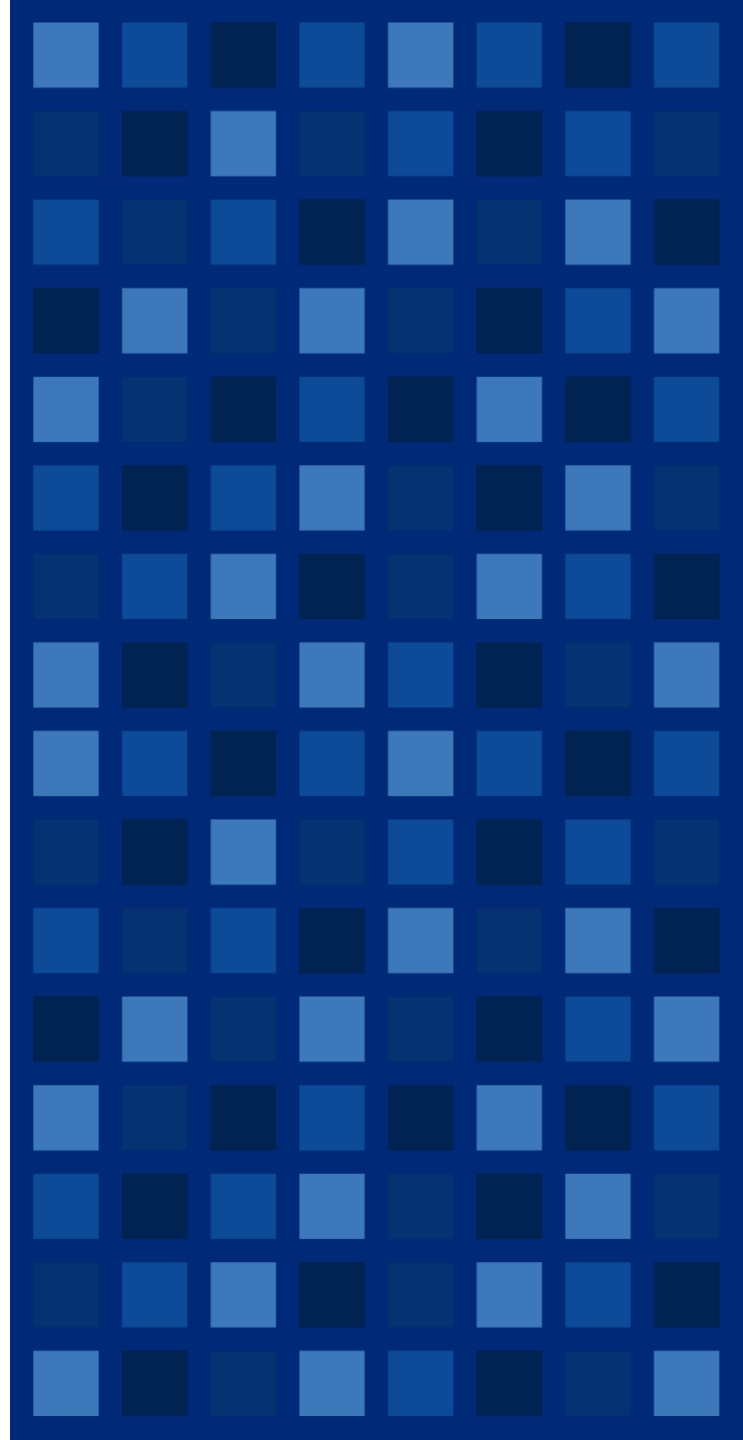
- Node.js versions:
 - 10.x
 - 12.x
- Angular versions:
 - 9.1.x
 - 10.0.x, 10.1.x, 10.2.x
 - 11.0.x, 11.1.x, 11.2.x
- TypeScript versions:
 - 3.7.x, 3.8.x, 3.9.x
 - 4.0.x, 4.1.x



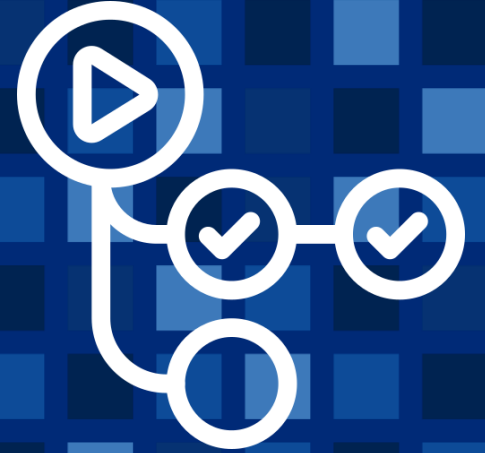
The schematics-e2e job

- 14 matrix legs:
 - Install Node.js matrix leg version
 - Install Angular matrix leg version
 - Install associated TypeScript version
- Delete local TypeScript path mappings
- Download build artifact from "build" job
- Move Lumberjack package into node_modules
- Run Angular Compatibility Compiler (NGCC)

- Run end-to-end tests for schematics



CI matrix workflow



How our GitHub workflow matrix is configured

```
app:
  runs-on: ubuntu-latest
  needs: build
  strategy:
    matrix:
      node-version: [10.x, 12.x]
      angular-version: [9.0.x, 9.1.x, 10.0.x, 10.1.x, 10.2.x, 11.0.x, 11.1.x, 11.2.x]
  steps:
    - uses: actions/checkout@v2
    - name: Use Node.js ${{ matrix.node-version }}
      uses: actions/setup-node@v2 # 🖱️
      with:
        node-version: ${{ matrix.node-version }}
    - name: Use Angular version ${{ matrix.angular-version }}
      uses: ngworker/angular-versions-action@v3
      with:
        angular-version: ${{ matrix.angular-version }}
    # Yarn caching left out for brevity
    - run: yarn install
    # Intermediary steps left out for brevity
    - run: yarn test:ci
    - run: yarn build
```

How our GitHub workflow matrix is configured

```
app:
  runs-on: ubuntu-latest
  needs: build
  strategy:
    matrix:
      node-version: [10.x, 12.x] # 👉
      angular-version: [9.0.x, 9.1.x, 10.0.x, 10.1.x, 10.2.x, 11.0.x, 11.1.x, 11.2.x]
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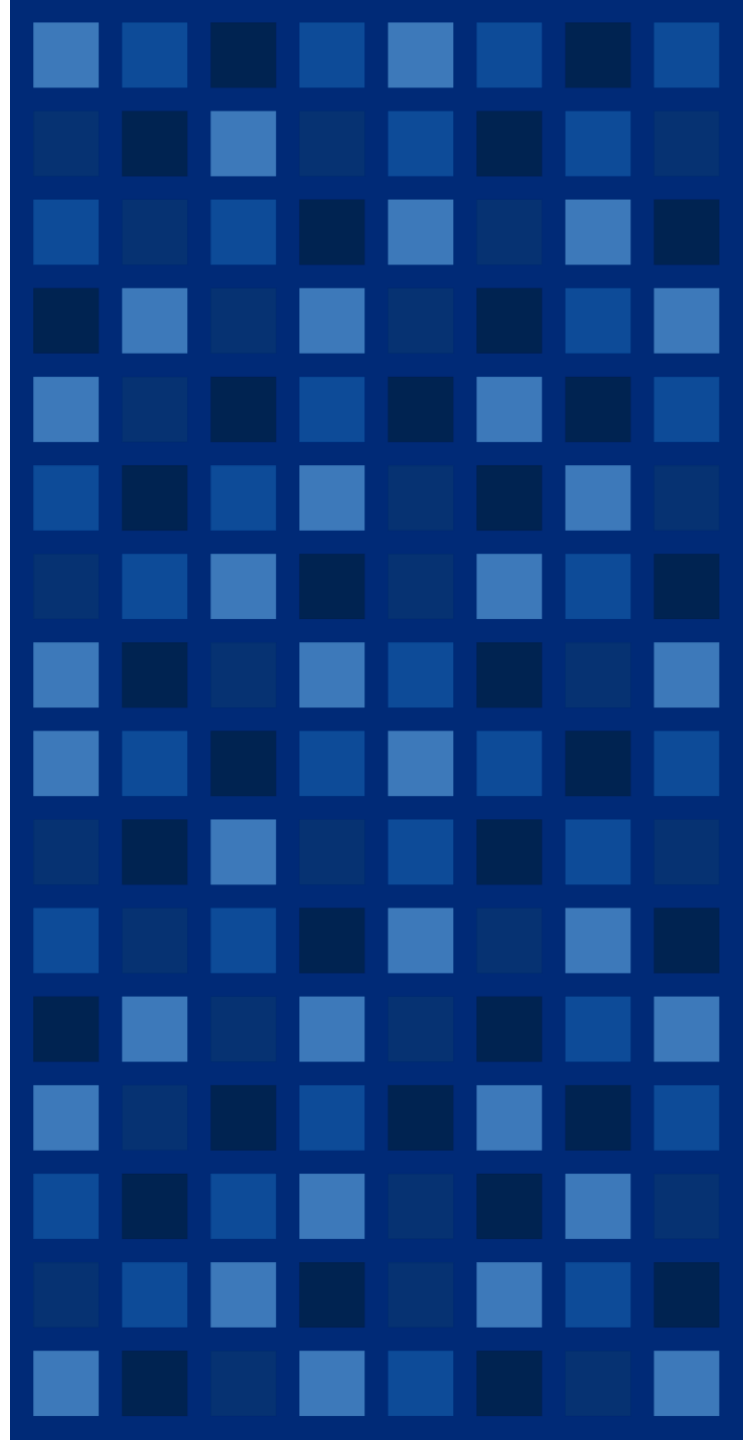
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app:
  runs-on: ubuntu-latest
  needs: build
  strategy:
    matrix:
      node-version: [10.x, 12.x]
      angular-version: [9.0.x, 9.1.x, 10.0.x, 10.1.x, 10.2.x, 11.0.x, 11.1.x, 11.2.x]
      #
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    - uses: actions/checkout@v2
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      with:
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    # Yarn caching left out for brevity
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How our GitHub workflow matrix is configured

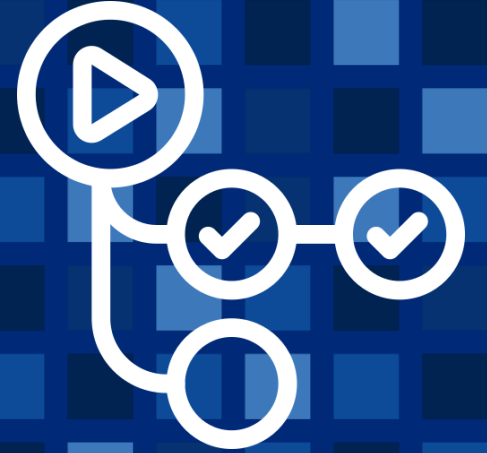
```
app:
  runs-on: ubuntu-latest
  needs: build
  strategy:
    matrix:
      node-version: [10.x, 12.x]
      angular-version: [9.0.x, 9.1.x, 10.0.x, 10.1.x, 10.2.x, 11.0.x, 11.1.x, 11.2.x]
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    - uses: actions/checkout@v2
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      uses: actions/setup-node@v2
      with:
        node-version: ${{ matrix.node-version }}
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      uses: ngworker/angular-versions-action@v3 # 👉
      with:
        angular-version: ${{ matrix.angular-version }}
    # Yarn caching left out for brevity
    - run: yarn install
    # Intermediary steps left out for brevity
    - run: yarn test:ci
    - run: yarn build
```

ngworker/angular-versions-action

- Input parameter: `angular-version`
 - Example value: `[11.0.x, 11.1.x, 11.2.x]`
- Replaces >20 Angular and related dependencies such as TypeScript in `package.json`
- Combinations of dependencies verified to still be in a working state

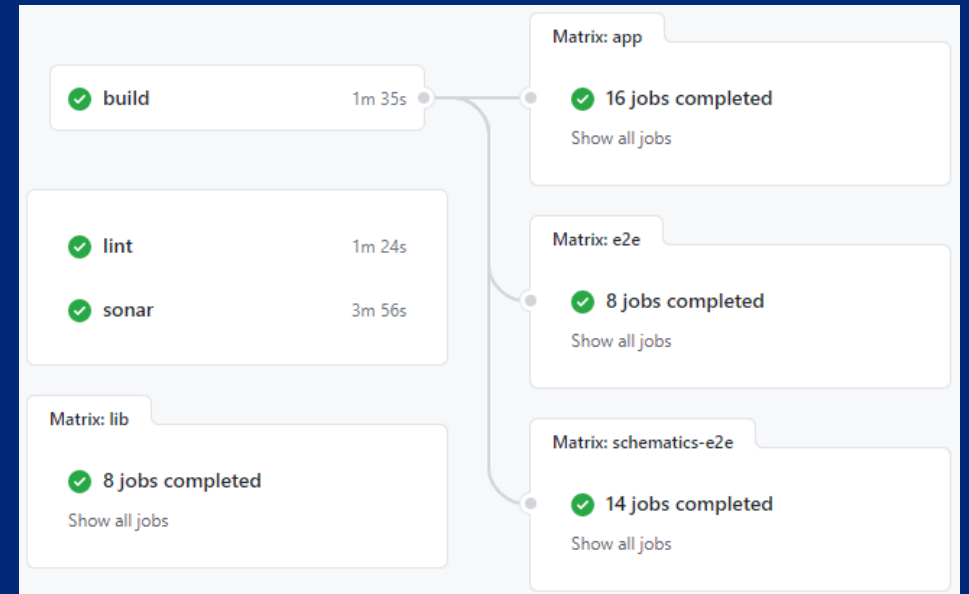


Conclusion



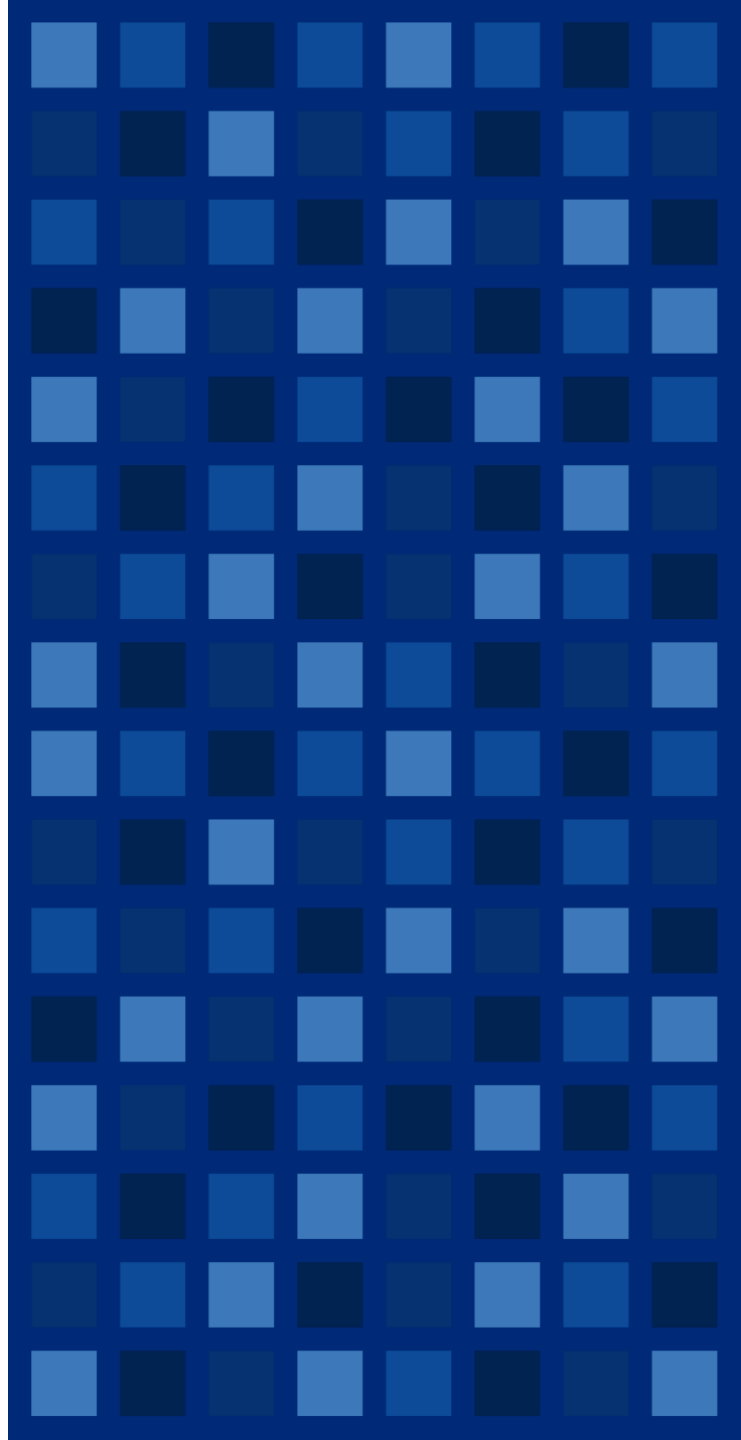
Cross-version compatibility

- Simple single-source codebase solution
- Purpose-built GitHub Action for Angular dependency management in CI workflows
- Fast, parallellized GitHub Actions workflow
- Each combination of dependencies is run in isolation for:
 - Unit and integration tests
 - End-to-end tests
 - Angular schematics end-to-end tests



Cross-version compatibility

- We release features and patches across 8 Angular versions, 6 TypeScript versions, and 2 Node.js versions from a single-source codebase
- Backward-incompatible API and syntax usage is immediately detected
- Verified support for new Angular, TypeScript, and Node.js versions is usually as simple as adding a value to a list parameter in our CI workflow



Thank you 🙌

 @LayZeeDK

github.com/ngworker/lumberjack





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