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How to Implement Micro Frontend Architecture using Angular Framework

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Micro Frontend Architecture in Angular

The Angular team introduced the concept of workspaces in their 7.0.0 version which was released in Oct, 2018. With this update, Angular gave developers a new **--create-application** flag feature during creation of the application. By default the **--create-application** flag will be false.

Example:-

```
ng new <workspaceName> --create-application=<true/false>
```

With this addition, the developers now have the option to easily create an application, library or workspace.

The following is the Angular CLI command to generate/modify the files based on schematics:-

```
ng generate <schematic> [options]
```

This schematic can take one of the following values:

- appShell
- application
- class
- component
- directive
- enum
- guard
- interceptor
- interface
- library
- module
- pipe
- service
- serviceWorker
- webWorker

Workspace Setup-Basic Angular CLI Commands How to Implement Micro Frontend Architecture using Angular Framework

We will be looking into the basic commands used for generating:-

1. **Application**

```
ng generate application <name> [options]
ng g application <name> [options]
```

OPTION	DESCRIPTION
--inlineStyle=true|false	True -> Includes styles inline in the root component.ts file. Only CSS styles can be included inline. False -> External styles file is created and referenced in the root component.ts file. Default: false Aliases: -s

--inlineTemplate=true|false	True -> Includes template inline in the root component.ts file. False ->External template file is created and referenced in the root component.ts file. Default: false Aliases: -t
--lintFix=true|false	True -> Applies lint fixes after generating the application. Default: false
--minimal=true|false	True -> Creates a bare-bones project without any testing frameworks. (Used for learning purposes only.) Default: false
--prefix=prefix	A prefix to apply to generated selectors. Default: app Aliases: -p
--routing=true|false	True -> Creates a routing NgModule. Default: false
--skipInstall=true|false	Skips installing dependency packages. Default: false
--skipPackageJson=true|false	True -> Does not add dependencies to the "package.json" file. Default: false
--skipTests=true|false	True -> Does not create "spec.ts" test files for the app. Default: false Aliases: -S
--style= css|scss|sass|less|styl	File extension/preprocessor to use for style files. Default: css
--viewEncapsulation= Emulated|Native|None|ShadowDom	View encapsulation strategy to use in the new app.

2. Component

ng generate **component** <name> [options]
ng g **component** <name> [options]

OPTION	DESCRIPTION
--changeDetection=Default|OnPush	Change detection strategy to use in the new component. Default: Default Aliases: -c
--displayBlock=true|false	Specifies if the style will contain :host { display: block; }. Default: false Aliases: -b
--export=true|false	True -> Declaring NgModule exports this component. Default: false
--flat=true|false	True -> Creates the new files at the top level of the current project. Default: false

--inlineStyle=true|false	True -> Includes styles inline in the root component.ts file. Only CSS styles can be included inline. False -> External styles file is created and referenced in the root component.ts file. Default: false Aliases: -s
--inlineTemplate=true|false	True -> Includes template inline in the root component.ts file. False ->External template file is created and referenced in the root component.ts file. Default: false Aliases: -t
--lintFix=true|false	True -> Applies lint fixes after generating the application. Default: false
--module=module	Declaring NgModule. Aliases: -m
--prefix=prefix	Prefix to apply to the generated component selector. Aliases: -p
--project=project	Name of the project.
--selector=selector	HTML selector to use for this component.
--skipImport=true|false	True -> Does not import this component into the owning NgModule. Default: false
--skipSelector=true|false	True -> Specifies if the component should have a selector. Default: false
--skipTests=true|false	True -> Does not create "spec.ts" test files for the new component. Default: false
--style= css|scss|sass|less|styl	File extension or preprocessor to use for style files. Default: css
--type=type	Adds a developer-defined type to the filename, in the format "name.type.ts". Default: Component
--viewEncapsulation= Emulated|Native|None|ShadowDom	View encapsulation strategy to use in the new component. Aliases: -v

3. Library

ng generate **library** <name> [options]
ng g **library** <name> [options]

OPTION	**DESCRIPTION**
--entryFile=entryFile	Path in which the library's public API file is created, relative to the workspace root. Default: public-api
--lintFix=true|false	True -> Applies lint fixes after generating the library. Default: false

--prefix=prefix	Prefix to apply to generated selectors. Default: lib Aliases: -p
--skipInstall=true|false	True -> does not install dependency packages. Default: false
--skipPackageJson=true|false	True -> Does not add dependencies to the "package.json" file. Default: false
--skipTsConfig=true|false	True -> Does not update "tsconfig.json" to add a path mapping for the new library. The path mapping is needed to use the library in an app, but can be disabled here to simplify development. Default: false

How to Implement Micro Frontend Architecture using Angular Framework

The basic idea is to create an application that has the following characteristics, incorporating the new feature. The outline is as follows:-

1. Create a workspace named Next.
2. It has 2 projects named - User Management, Login.
3. It has a library named apiCall which is used across the 2 projects.

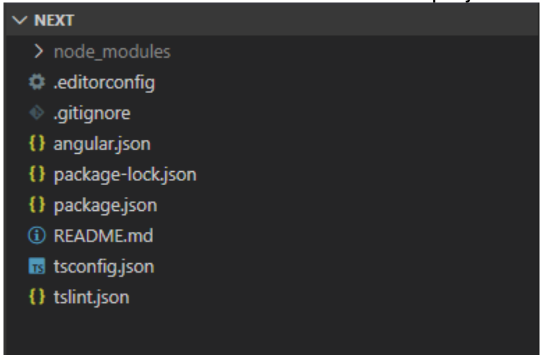
Let's start creating it:-

Step 1
Open git bash in the desired folder location.

Type in:-

```
ng new Next --create-application=false;
```

Dive inside the Next folder. The created project structure is as follows:-



```
NEXT
  > node_modules
  .editorconfig
  .gitignore
  angular.json
  package-lock.json
  package.json
  README.md
  tsconfig.json
  tslint.json
```

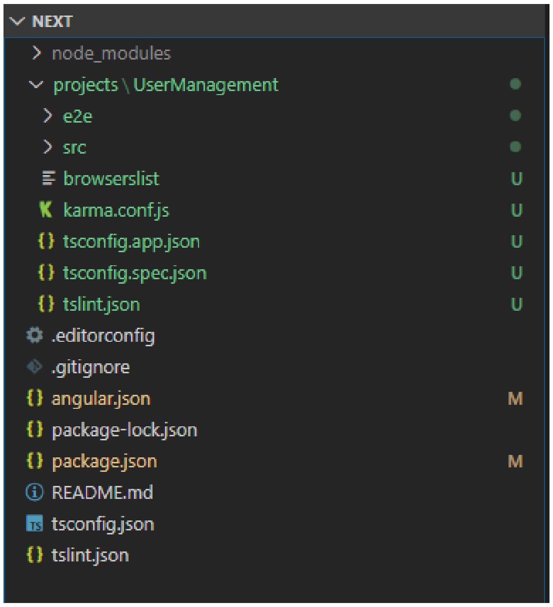
WORKSPACE CONFIG FILES	PURPOSE
.editorconfig	Configuration for code editors.
.gitignore	Specifies intentionally untracked files that Git should ignore.

README.md	Introductory documentation for the root app.
angular.json	CLI configuration defaults for all projects in the workspace, including configuration options for build, serve, and test tools that the CLI uses, such as TSLint, Karma, and Protractor.
package.json	Configures npm package dependencies that are available to all projects in the workspace.
package-lock.json	Provides version information for all packages installed into node_modules by the npm client.
src/	Source files for the root-level application project.
node_modules/	Npm packages to the entire workspace. Workspace-wide node_modules dependencies are visible to all projects.
tsconfig.json	Default TypeScript configuration for projects in the workspace.
tslint.json	Default TSLint configuration for projects in the workspace.

<u>Step 2</u>

Create new project UserManagement.
Type in:-

```
ng generate application UserManagement
```

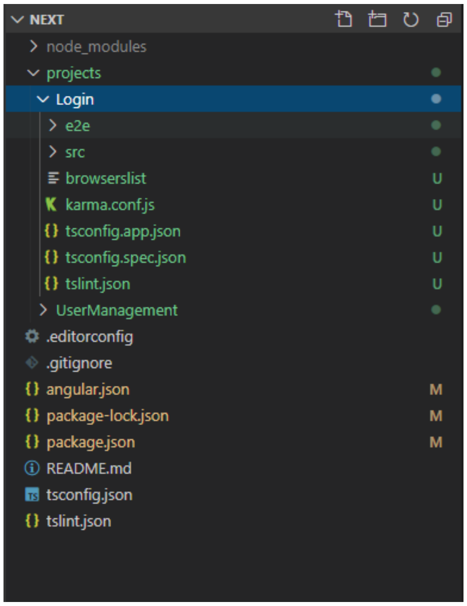


```
NEXT
  > node_modules
  ˅ projects \ UserManagement          ●
    > e2e                              ●
    > src                              ●
      browserslist                     U
      karma.conf.js                    U
      tsconfig.app.json                U
      tsconfig.spec.json               U
      tslint.json                      U
    .editorconfig
    .gitignore
    angular.json                       M
    package-lock.json
    package.json                       M
    README.md
    tsconfig.json
    tslint.json
```

Similarly create an application called Login following the same above commands.

```
ng generate application Login
```

The end result will be like:-



```
NEXT
  > node_modules
  v projects
    v Login
      > e2e
      > src
        browserslist            U
        karma.conf.js           U
        tsconfig.app.json       U
        tsconfig.spec.json      U
        tslint.json             U
    > UserManagement
    .editorconfig
    .gitignore
    angular.json                M
    package-lock.json           M
    package.json                M
    README.md
    tsconfig.json
    tslint.json
```

Note - The Login and User Management are two separate Angular Applications. We also have an option to set the default when the workspace is served. All the features that can be used in Angular projects apply to each of these projects too. Additional to that, we can also share the styles, assets and services across all the projects inside the workspace.

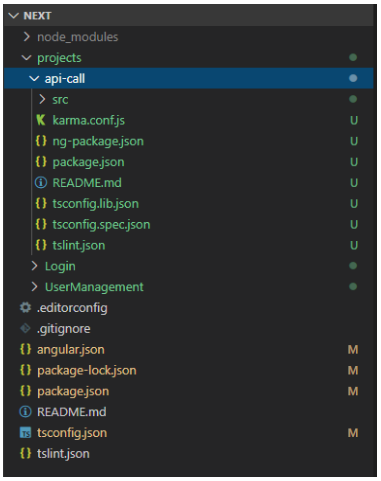
APP SUPPORT FILES	PURPOSE
app/	Component files in which your application logic and data are defined.
assets/	Images and other asset files to be copied when you build your application.
environments/	Build configuration options for particular target environments. By default there is an unnamed standard development environment and a production ("prod") environment. You can define additional target environment configurations.
favicon.ico	Icon used in the bookmark bar.
index.html	The main HTML page that is served when someone visits your site. The CLI automatically adds all JavaScript and CSS files when building your app, so you typically don't need to add any <script> or<link> tags here manually.
main.ts	The main entry point for your application. Compiles the application with the JIT compiler and bootstraps the application's root module (AppModule) to run in the browser.
polyfills.ts	Provides polyfill scripts for browser support.
styles.sass	Lists CSS files that supply styles for a project. The extension reflects the style preprocessor you have configured for the project.
test.ts	Main entry point for your unit tests, with some Angular-specific configuration. You don't typically need to edit this file.
app/src/	Angular components, templates, and styles go here. The app/scr/ folder inside contain your project's logic and data.

Step 3 –

Create a library apiCall in the work space.
Type in:-

```
ng generate library apiCall
```

It will look like the following in the editor:-



```
v NEXT
  > node_modules
  v projects                    ●
    v api-call                  ●
      > src                     ●
        karma.conf.js           U
        ng-package.json         U
        package.json            U
        README.md               U
        tsconfig.lib.json       U
        tsconfig.spec.json      U
        tslint.json             U
    > Login                     ●
    > UserManagement            ●
    .editorconfig
    .gitignore
    angular.json                M
    package-lock.json           M
    package.json                M
    README.md
    tsconfig.json               M
    tslint.json
```

Now the newly created apiCall library can be added as a dependency in both the Login and User Management applications created earlier. The library can be reused across the workspace.

About RapidValue

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