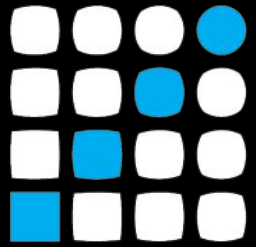


APACHE SLING & FRIENDS TECH MEETUP
10-12 SEPTEMBER 2018

Integrating a Modern Frontend Setup with AEM

Natalia Venditto, Netcentric

A modern frontend setup

How do we understand a modern setup?

- A modern setup
  - ...does not necessarily include the latest tool in the market
  - …it's standard enough that it can be easily maintained
  - …does not force everyone in the team to a high knowledge ramp up investment
  - …it implements industry (current) best practices
  - ...requires a strategy

adaptTo()

Defining a frontend strategy!

photocredit: @rawpixel / unsplash.com

The `What?` and `How?` questions

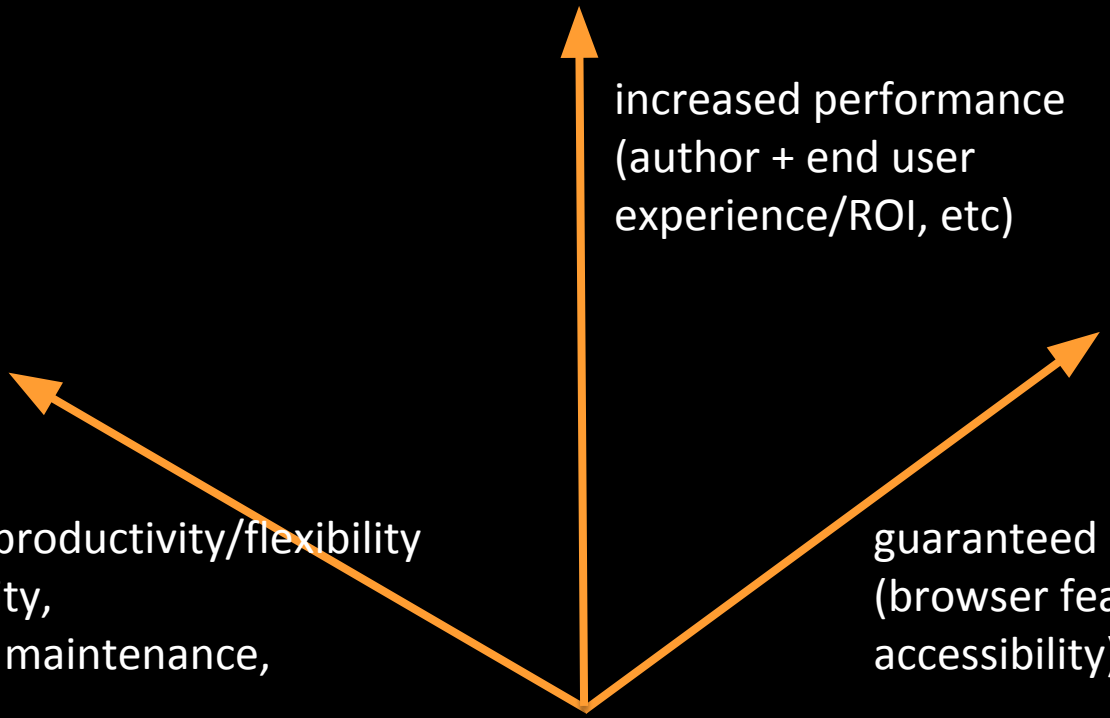
… browser support, performance reqs, http protocol (ie: http/2), accessibility, analytics, testing strategy, more productivity?

photocredit: @kevingrieve / unsplash.com

The `Which?` questions

adaptTo()

The win/win results matrix



Study case: directory structure

Directory structure

```
. ~
|-- [PROJECT-ID]-3rd-party/
|-- [PROJECT-ID]-complete-package/
|-- [PROJECT-ID]-components/[PROJECT-ID]-components-package/
   |-- src/main/jcr_root/apps/[PROJECT-ID]/
      |-- commons/
      |-- components/
         |-- component1/
         |-- component2/
         |-- // as many components
      |-- pages/
|-- [PROJECT-ID]-configuration/
|-- [PROJECT-ID]-demo-content/
.pom.xml
```

Directory structure

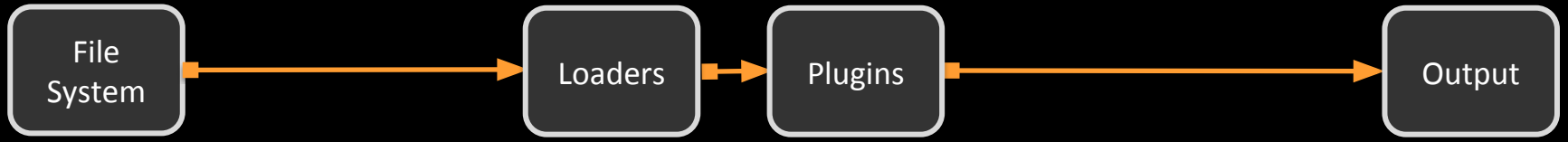
```
|-- components/component1/
      |-- clientlibs/
         |-- author/
         |-- publish/
            |-- .content.xml
            |-- component1.publish.entry.js
            |-- component1.publish.entry.scss
            |-- css.txt
            |-- js.txt
       |-- .content.xml
       |-- component1.html
```

```
<?xml version="1.0" encoding="UTF-8"?>
<jcr:root
xmlns:cq="http://www.day.com/jcr/cq/1.0"
xmlns:jcr="http://www.jcp.org/jcr/1.0"
jcr:primaryType="cq:ClientLibraryFolder"
categories="[PROJECT-ID.publish.component1
]"
jsProcessor="[min:gcc;obfuscate=true]"
cssProcessor="[min:gcc]"
/>
```

Study case: tools and configuration

Tools and configuration

Tools and configuration



- configure webpack to traverse our component folders, collect [name-of-component].entry.js [name-of-component].entry.scss files

  (webpack allows us to configure entry points per path or other params)

- configure webpack to read files according to loaders, and perform additional operations

  (transpilation, tree-shaking and DCE, etc)

- configure webpack to output files in designated targets, so that we are able to minify them,

  aggregate them and compress them (in AEM with gcc)

Setup Tools

```
nvm install --lts
cd [PROJECT-ID]-components/[PROJECT-ID]-components-package
mkdir frontend
cd frontend
npm init -y // generates package.json
npm install webpack --save-dev // maintain as dev
dependency

//successive installations
npm install modulename --save ||
--save-dev
```

Setup Tools

Transpiling of ES (to JS ES5)

test: /\.css$/,

Transpiling of CSS pre processed code

Linting

Browser Support

Setup configuration

```
. ~
|-- [PROJECT-ID]-components/[PROJECT-ID]-components-package/
    |-- frontend/
        |-- .browserslistrc
        |-- .eslintignore
        |-- .eslintcache
        |-- .eslintrc
        |-- .stylelintcache
        |-- .stylintrc
        |-- .gitignore
        |-- .npmrc
        |-- package.json
.pom.xml
```

```
last 2 version
> 1%
maintained node versions
not dead
```

Setup Tools

Transpiling of ES (to JS ES5)

test: /\.css$/,

Transpiling of CSS pre processed code

Linting

Browser Support

Minification Aggregation of JS and CSS

Directory structure

```
|-- components/component1/
      |-- clientlibs/
         |-- author/
         |-- publish/
            |-- .content.xml
            |-- component1.publish.entry.js
            |-- component1.publish.entry.scss
            |-- css.txt
            |-- js.txt
       |-- .content.xml
       |-- component1.html
```

```
<?xml version="1.0" encoding="UTF-8"?>
<jcr:root
xmlns:cq="http://www.day.com/jcr/cq/1.0"
xmlns:jcr="http://www.jcp.org/jcr/1.0"
jcr:primaryType="cq:ClientLibraryFolder"
categories="[PROJECT-ID.publish.component1
]"
jsProcessor="[min:gcc;obfuscate=true]"
cssProcessor="min:gcc]"
/>
```

Setup configuration

```
. ~
|-- [PROJECT-ID]-3rd-party/
|-- [PROJECT-ID]-complete-package/
|-- [PROJECT-ID]-components/[PROJECT-ID]-components-package/
   |-- frontend/
      |-- build/config/
         |-- webpack.config.dev.js
         |-- webpack.config.prod.js
         |-- whatever other configs (ie: unit testing, e2e...)
      |-- package.json
|-- [PROJECT-ID]-configuration/
|-- [PROJECT-ID]-demo-content/
.pom.xml
```

Setup configuration

```
const config = {
  entry: './app.js'
  //...
};

module.exports = (env, argv) => {

  if (argv.mode === 'development') {
    config.devtool = 'source-map';
  }

  if (argv.mode === 'production') {
    //...
  }

  return config;
};
```

- for our frontend code build, we will favor webpack 4 optimized "mode" configuration, over OSGI environment definition, in order to leverage Webpacks caching and performance

Setup configuration

```
// we run globbing sync to create dynamically named outputs with wildcards (in the entries)
glob.sync(`${componentsPackagePath}/src/**/*${entryFileNameEnding}.js`)
    .forEach((entryFilePath) => {
      const key = path.dirname(path.relative(paths.project_root, entryFilePath))

      if (entryConfigs.target) {
        const pathClientLibRelative = path.relative(
                    paths.project_root, componentsPackagePath
                )
        const changedKey = key.replace(
                    `${pathClientLibRelative}/src/`,
                    `${pathClientLibRelative}/target/`
                )
        entryConfigs.target[changedKey] = entryFilePath
      }
      if (entryConfigs.src) {
        entryConfigs.src[key] = entryFilePath
      }
    }
    )
```

Setup configuration

```
module.exports = {
  //...
  optimization: {
    splitChunks: {
      chunks: 'async',
      minSize: 30000,
      maxSize: 0,
      minChunks: 1,
      maxAsyncRequests: 5,
      maxInitialRequests: 3,
      automaticNameDelimiter: '~',
      name: true,
      cacheGroups: {
        vendors: {
          test: /[\\/]node_modules[\\/]/,
          priority: -10
        },
        default: {
          minChunks: 2,
          priority: -20,
          reuseExistingChunk: true
        }
      }
    }
  }
};
```

may need to update this (default) config for SplitChunkPlugin

Setup configuration

- edit the corresponding POM.xml, to make use of the frontend plugin for maven* -> https://mvnrepository.com/artifact/com.github.eirslett/frontend-maven-plugin?repo=redhat-ga

Maven frontend plugin

```
<build>
    <pluginManagement>
        <plugins>
            <plugin>
                <groupId>com.github.eirslett</groupId>
                <artifactId>frontend-maven-plugin</artifactId>
                <version>1.4</version>

                <configuration>
                    <workingDirectory>${frontend.build.directory}</workingDirectory>
                </configuration>
            </plugin>

            <!-- define the cq-server plugin to make all cq goals available on this project -->
            <!-- used for cq:hotdeploy -->
            <plugin>
                <groupId>biz.netcentric.cq.buildext</groupId>
                <artifactId>cq-build-extensions-plugin</artifactId>
                <configuration>
```

Syncing with AEM

```
<!-- define the cq-server plugin to make all cq goals available on this project -->
<!-- used for cq:hotdeploy -->
<plugin>
    <groupId>biz.netcentric.cq.buildext</groupId>
    <artifactId>cq-build-extensions-plugin</artifactId>
    <configuration>
        <additionalHotDeploymentPaths>
            ${project.basedir}/target
        </additionalHotDeploymentPaths>
        <fullDeployPath>.</fullDeployPath>
    </configuration>
</plugin>
```


```
webpack --watch
```

Setup configuration

```
|-- components/component1/
      |-- clientlibs/
         |-- author/
             |-- .content.xml
             |-- component1.author.entry.js
             |-- component1.author.scss
             |-- css.txt
             |-- js.txt
             |-- component1_dialog.js
         |-- publish/
      |-- _cq_dialog/
      |-- .content.xml
      |-- component1.html
```

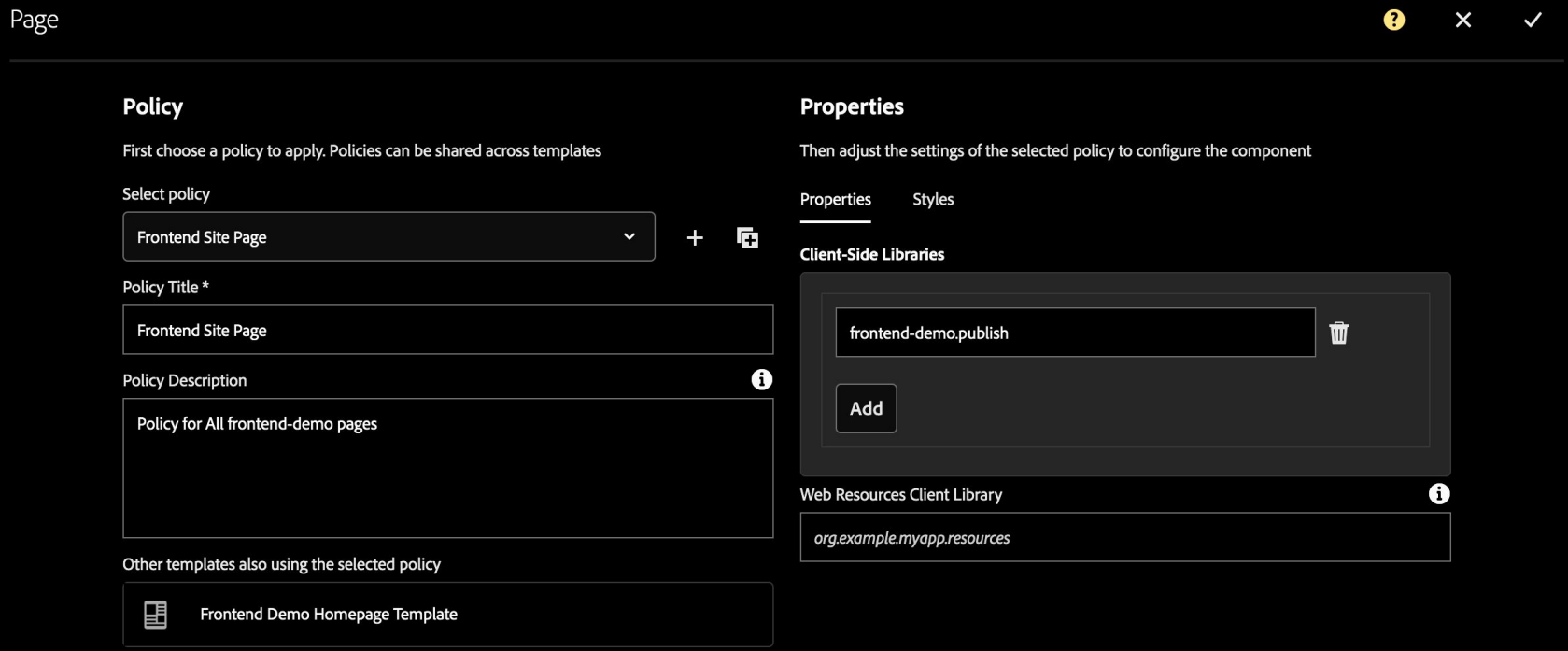
Setup configuration

```
. ~
|-- [PROJECT-ID]-components/[PROJECT-ID]-components-package/
    |-- frontend/
        |-- .browserslistrc
        |-- .eslintignore
        |-- .eslintcache
        |-- .eslintrc
        |-- .stylelintcache
        |-- .stylintrc
        |-- .gitignore
        |-- .npmrc
        |-- package.json
.pom.xml
```

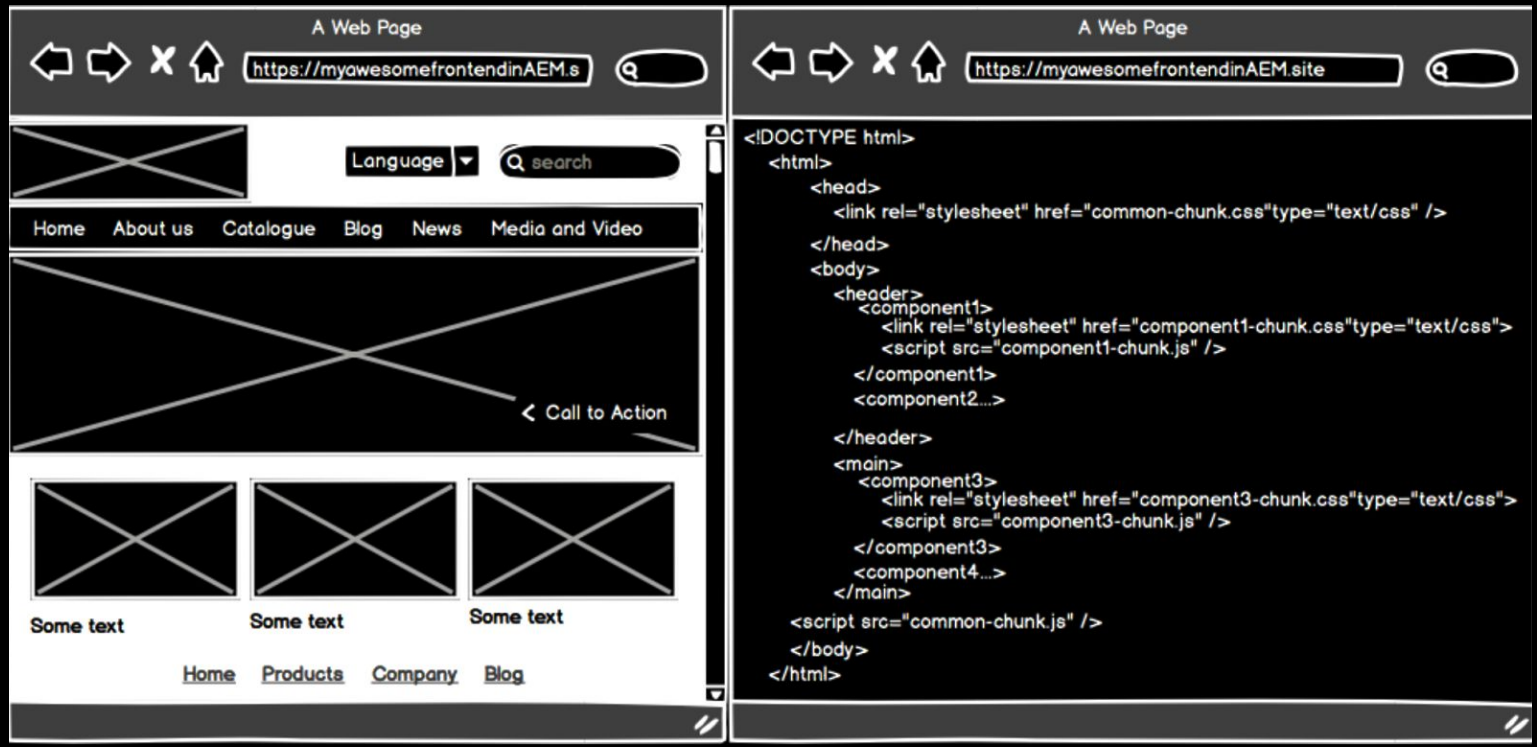
```
*.bundle.js
node_modules
*_dialog.js
build/shared/variabl
es/*.js
node/*
build/config
gulpfile.js
```

Study case: shipping the code (to the browser)

Loading styles via Content Policies



Loading techniques



Loading: Templating (Sightly, Handlebars...)

```
|-- components/component1/
      |-- clientlibs/
         |-- author/
         |-- publish/
         |-- additional-styles
            |-- .content.xml
            |-- component1.add-sty
            |-- component1.add-sty
            |-- css.txt
            |-- js.txt
       |-- .content.xml
       |-- component1.html
```

```
<!--/* component1.author */-->
<sly data-sly-test="${wcmmode.edit}"
data-sly-use.clientLib="${'/libs/granite/sightly/tem
plates/clientlib.html'}"
data-sly-call="${clientLib.all @
categories='[PROJECT-ID].component1.author'}" />


<!--/* component1.publish */-->
<sly
data-sly-use.clientLib="${'/libs/granite/sightly/tem
plates/clientlib.html'}"
data-sly-call="${clientLib.all @
categories='[PROJECT-ID].component1.publish'}" />
```

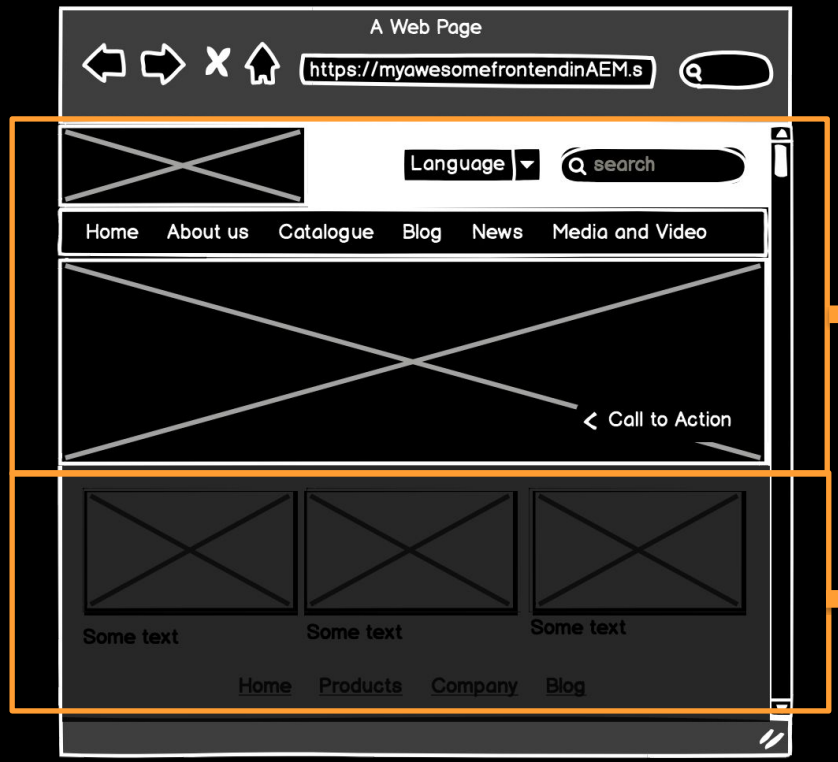
Script loading attributes

```
<script src="myproject.component1.js" defer></script>
<script src="myproject.component1.js" async></script>

<script src="myproject.component1.js" preload></script>
<script ...
```

Lazy Loading

Inline load + Lazy Loading strategy



hero area/above the fold

lazy loaded chunks

(and resources, such as images)

Intersection Observers API

```
// test for browser support
if (!'IntersectionObserver' in window &&
    !'IntersectionObserverEntry' in window &&
    !'intersectionRatio' in
window.IntersectionObserverEntry.prototype) {
    // load polyfill now
}
```

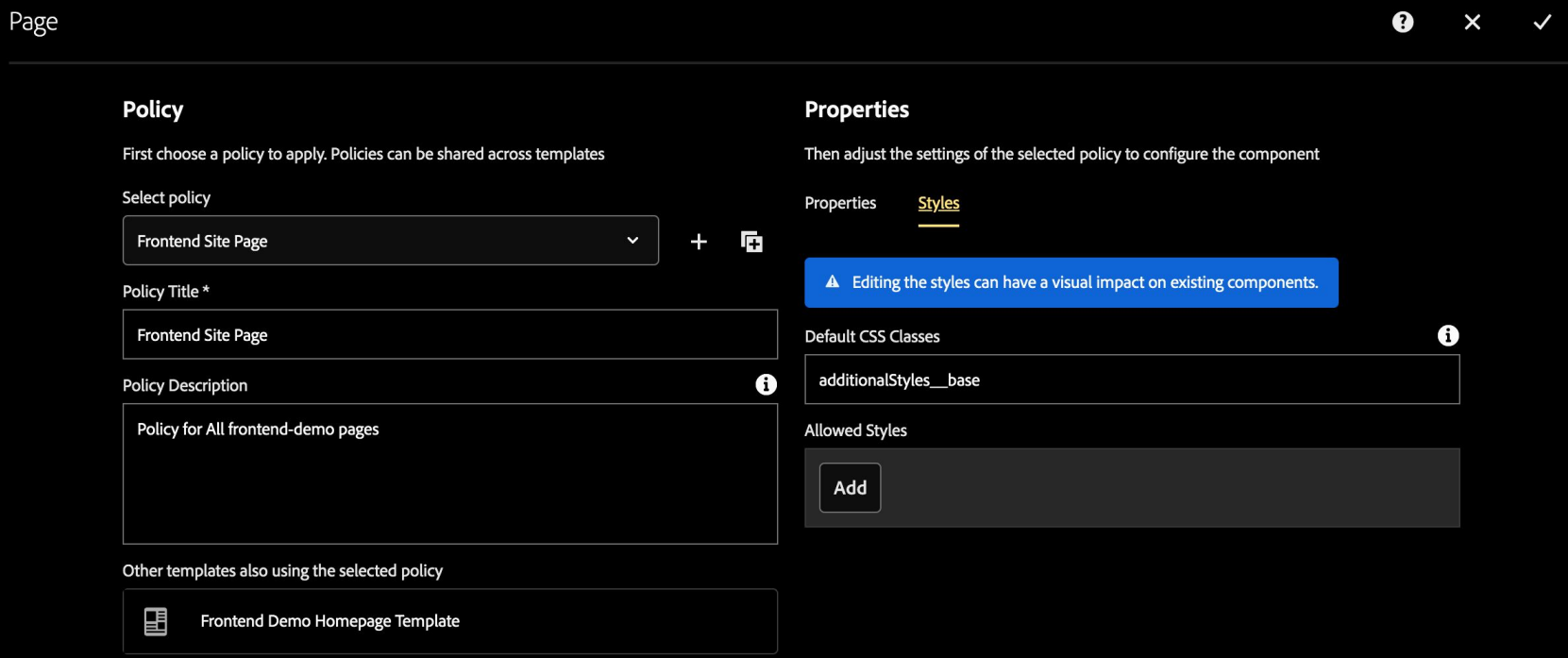
adaptTo()

LazyLoading and SEO

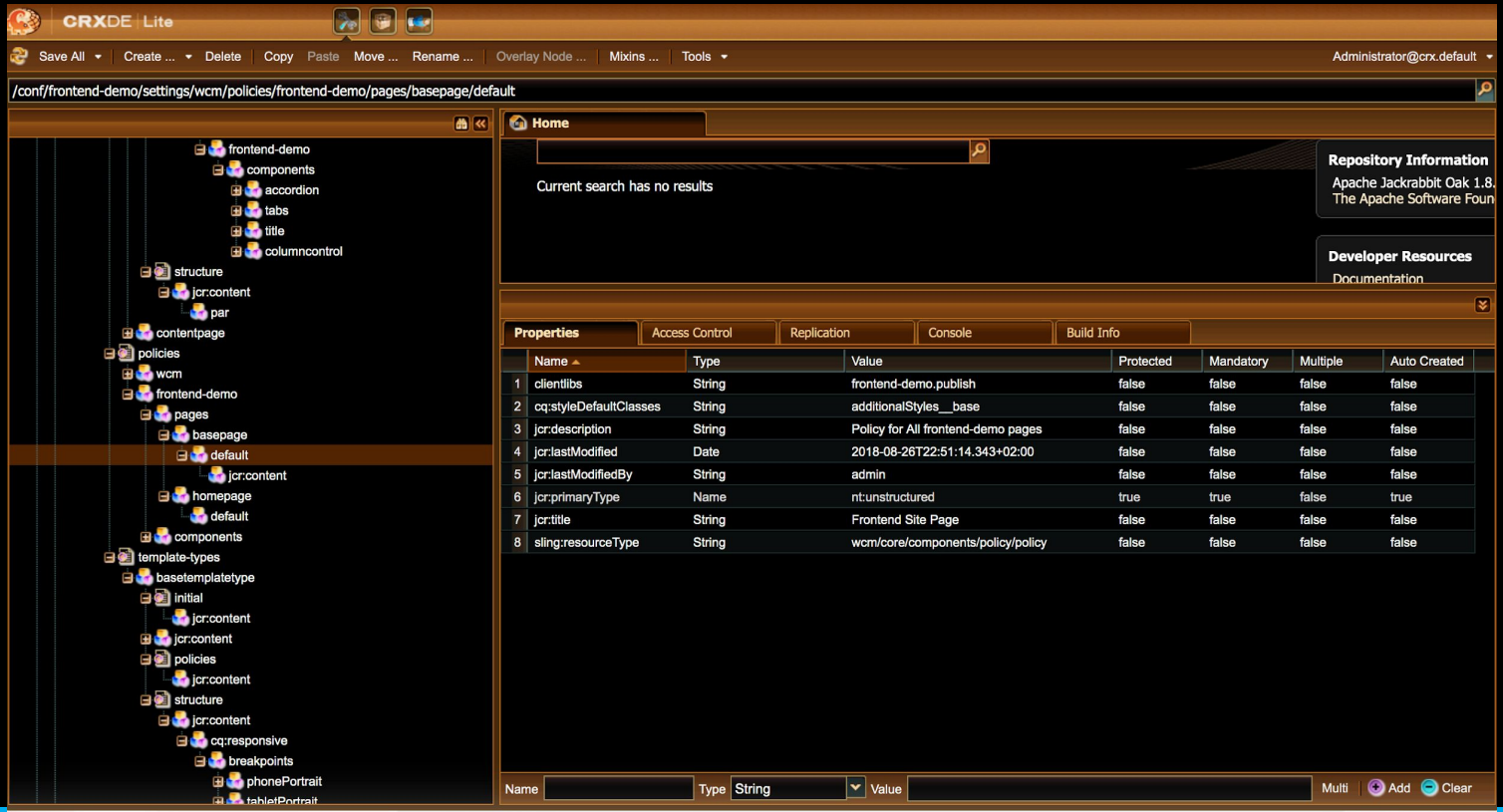
- SSR (server side rendering techniques)
- Content Fragments
- Experience Fragments

Demo Time (added backup)

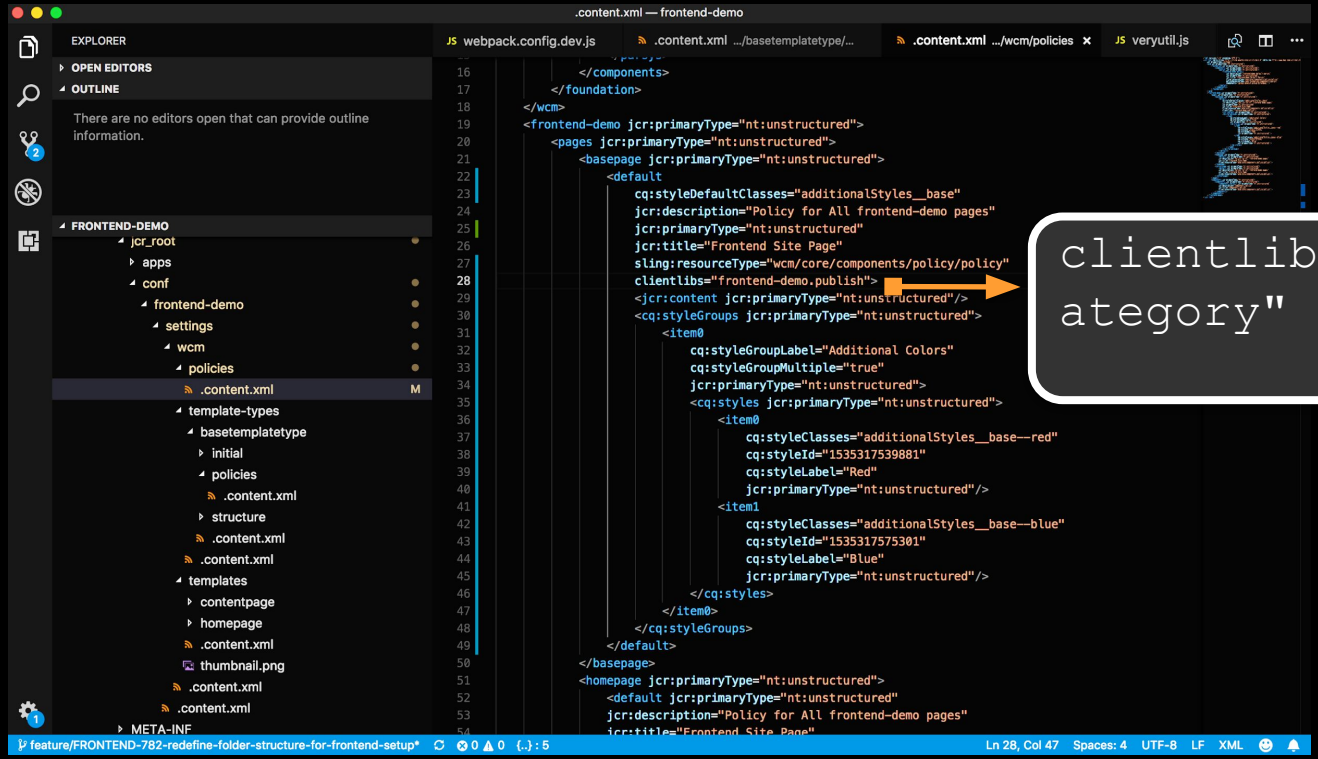
Loading styles via Content Policies



Loading styles via Content Policies



Loading styles via Content Policies



Thank you!