loaderloaderloader

WebpackJSJSjsonloaderJS

Webpack loader

- babel-loaderES6loader
- css-loaderCSSloader
- style-loaderCSSHTML<style>loader
- less-loaderlessloader
- file-loaderloader
- url-loaderloaderfile-loaderData URL
- image-webpack-loaderloader
- eslint-loaderESLintloader

loader

1. npmloader
2. modulerulesruletestuseloaderloader

```
module.exports = {
  // loader
  module: {
    rules: [
      {
        test: /\.css$/,
        use: [
          { loader: 'style-loader' },
          {
            loader: 'css-loader',
            options: {
              modules: true,
            },
          },
          { loader: 'sass-loader' },
        ],
      },
    ],
  },
};
```

pluginpluginplugin

pluginWebpackWebpackHTMLCSS

plugin

- HtmlWebpackPluginHTML
- UglifyJsPluginJavaScript
- CleanWebpackPlugin
- MiniCssExtractPluginCSS
- DefinePlugin

- CopyWebpackPlugin
- ProvidePlugin

plugin

1. npmplugin
2. pluginspluginpluginnewoption

```javascript
const HtmlWebpackPlugin = require('html-webpack-plugin');

module.exports = {
  // ...
  plugins: [
    new HtmlWebpackPlugin({
      template: './src/index.html'
    })
  ]
}
```

WebpackVuecssjs

Webpack　HashedModuleIdsPluginMiniCssExtractPlugin

Source Map

Source Map

Source MapSource Map

Vue.Vue

Source Map

Source Map

Source MapJSONSource Map

Source Map

WebpackdevtoolSource Map

- **eval**evaleval
- **source-map**source-map
- **cheap-source-map**source-map
- **cheap-module-source-map**source-maploadersourcemap

Tree-shaking

Tree-shakingJS

Tree-shakingES6ES6ES6

Tree-ShakingoptimizationusedExportstruebabelbabel-preset-envmodulesfalseES6CommonJS

HMR

HMR

HMRwebsocketWebpack Dev ServerWebpack Dev Server

HMR

1. webpack.HotModuleReplacementPlugin
2. webpack-dev-serverhot: true
3. entryhot module replacement runtime
4. module.hot.accept

HMRHMRHMR

loader

loader

```
module.exports = function(source) {
  return source.toLowerCase();   //
};
```

loaderloader-utilsloader-utilsAPIloader

loader-utilsAPI

- getOptions(loaderContext)Loader
- parseQuery(queryString)
- stringifyRequest(loaderContext, request)
- getRemainingRequest(loaderContext)
- getCurrentRequest(loaderContext)

loader

```
const { getOptions } = require('loader-utils');

module.exports = function(source) {
  const options = getOptions(this);
  const mode = options.mode || 'uppercase';
  if (mode === 'uppercase') {
    return source.toUpperCase();
  } else if (mode === 'lowercase') {
    return source.toLowerCase();
  } else {
    return source;
  }
};
```

optionsloader

```
module.exports = {
  // ...
  module: {
    rules: [
      {
        test: /\.txt$/,
        use: [
          {
            loader: 'my-loader',
            options: {
              mode: 'lowercase',
            },
          },
        ],
      },
    ],
  },
};
```

plugin

pluginapplyapplycompilerWebpack

```
class MyPlugin {
  apply(compiler) {
    compiler.hooks.done.tap('MyPlugin', (stats) => {
      console.log('Bundle is now finished!\n');
      console.log(stats.toString());
    });
  }
}

module.exports = MyPlugin;
```

plugin

```
const MyPlugin = require('./my-plugin');

module.exports = {
  // ...
  plugins: [
    new MyPlugin(),
  ],
};
```

plugin

1. Webpack
   WebpackWebpackWebpackdone

2. Webpack
   WebpackWebpacknormalModuleFactory

3. WebpackAPI
   WebpackAPIWebpackAPIcopy-webpack-plugincopyWebpackPlugin

4. Webpack
   WebpackWebpackWebpackSourceMapdevtool

pluginplugin

Webpack

1. WebpackWebpack
2. Webpackentry
3. WebpackloaderWebpack
4. WebpackHTML
5. Webpack
6. Webpack

Webpack

Webpack

- before-run: Webpack
- run: Webpack
- before-compile: Webpack
- compile: Webpack
- this-compilation: CompilationCompilation
- compilation: Webpack
- emit: Webpack
- after-emit: Webpack
- done: Webpack

Webpack

WebpackTapableTapableWebpackWebpackCompilerCompilationTapable

Webpack5Webpack4

Webpack5Webpack4

1. Webpack5
2. Tree ShakingWebpack5Tree Shaking
3. Webpack5
4. WebAssemblyWebpack5WebAssembly
5. Module FederationWebpack5Webpack

UI

UI

ModuleFederationPlugin

```
const ModuleFederationPlugin =
require('webpack/lib/container/ModuleFederationPlugin');

module.exports = {
  // ...
  plugins: [
    new ModuleFederationPlugin({
      name: 'app1',   //
      filename: 'remoteEntry.js',
      exposes: {     //
        './Button': './src/components/Button',
      },
      shared: ['react', 'react-dom'], //
    }),
  ],
};
```

ModuleFederationPlugin

```
const ModuleFederationPlugin =
require('webpack/lib/container/ModuleFederationPlugin');

module.exports = {
  // ...
  plugins: [
    new ModuleFederationPlugin({
      name: 'app2',  //
      filename: 'remoteEntry.js',
      remotes: {
        app1: 'app1@http://localhost:3001/remoteEntry.js', //
      },
      shared: ['react', 'react-dom'],  //
    }),
  ],
};
```

Webpack

1.
2.
3.

1. Webpackcache-loaderhard-source-webpack-plugin
2. DllPluginDllPlugin Webpack
3. SourceMap SourceMap SourceMap
4. thread-loaderhappypack
5. Webpack node_modules resolve.alias Webpack
6. Webpack5Vite

Webpack

1. webpack-bundle-analyzer
2. UglifyJsPluginMiniCssExtractPluginJSCSS
3. Webpack
4. gzipcompression-webpack-plugingzipNginxgzip
5. splitChunks
6.
7. Tree ShakingVueReactTree ShakingES