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stats: paragraph=183 sentences=1022, words=6660

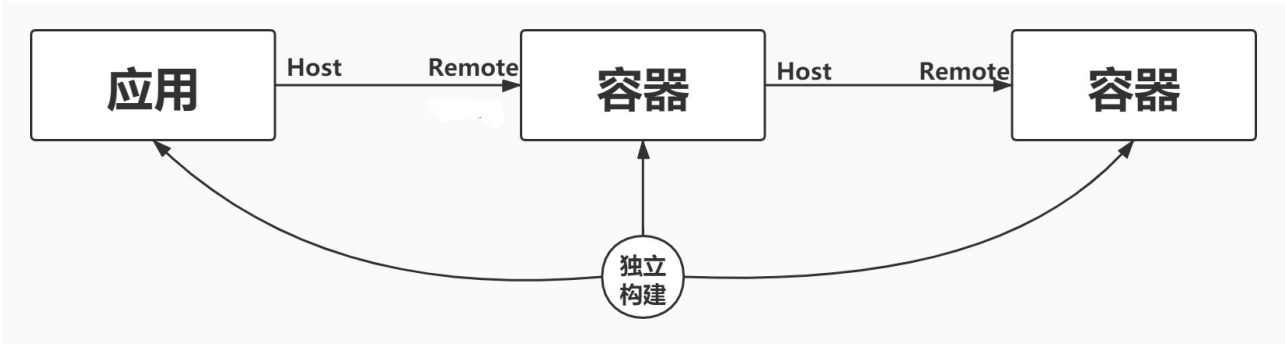
1.模块联邦实战

1.1.动机

- Module Federation的动机是为了不同开发小组间共同开发一个或者多个应用
- 应用将被划分为更小的应用块，一个应用块，可以是比如头部导航或者侧边栏的前端组件，也可以是数据获取逻辑的逻辑组件
- 每个应用块由不同的组开发
- 应用或应用块共享其他其他应用块或者库

1.2.Module Federation

- 使用Module Federation时，每个应用块都是一个独立的构建，这些构建都将编译为容器
- 容器可以被其他应用或者其他容器应用
- 一个被引用的容器被称为 `remote`, 引用者被称为 `host`， `remote`暴露模块给 `host`, `host`则可以使用这些暴露的模块，这些模块被成为 `remote`模块



1.3.实战

1.3.1 配置参数

字段 类型 含义 name string 必传值，即输出的模块名，被远程引用时路径为${name}/${expose} library object 声明全局变量的方式，name为umd的name filename string 构建输出的文件名 remotes object 远程引用的应用名及其别名的映射，使用时以key值作为name exposes object 被远程引用时可暴露的资源路径及其别名 shared object 与其他应用之间可以共享的第三方依赖，使你的代码中不用重复加载同一份依赖

1.3.2 remote

1.3.2.1 remote\webpack.config.js

```
let path = require("path");
let webpack = require("webpack");
let HtmlWebpackPlugin = require("html-webpack-plugin");
const ModuleFederationPlugin = require("webpack/lib/container/ModuleFederationPlugin");
module.exports = {
    mode: "development",
    entry: "./src/index.js",
    output: {
        publicPath: "http://localhost:3000/",
    },
    devServer: {
        port: 3000
    },
    module: {
        rules: [
            {
                test: /\.jsx?$/,
                use: {
                    loader: 'babel-loader',
                    options: {
                        presets: ["@babel/preset-react"]
                    },
                },
                exclude: /node_modules/,
            },
        ]
    },
    plugins: [
        new HtmlWebpackPlugin({
            template:'./public/index.html'
        }),
        new ModuleFederationPlugin({
            filename: "remoteEntry.js",
            name: "remote",
            exposes: {
                "./NewsList": "./src/NewsList",
            }
          })
    ]
}
```

1.3.2.2 remote\src\index.js

remote\src\index.js

```
import("./bootstrap");
```

1.3.2.3 remote\src\bootstrap.js

remote\src\bootstrap.js

```
import React from "react";
import ReactDOM from "react-dom";
import App from "./App";
ReactDOM.render(<App />, document.getElementById("root"));
```

1.3.2.4 remote\src\App.js

remote\src\App.js

```
import React from "react";
import NewsList from './NewsList';
const App = () => (
  <div>
    <h2>本地组件NewsListh2>
    <NewsList />
  div>
);

export default App;
```

1.3.2.5 remote\src\NewsList.js

remote\src\NewsList.js

```
import React from "react";
export default ()=>(
    <div>新闻列表div>
)
```

1.3.3 host

1.3.3.1 host\webpack.config.js

host\webpack.config.js

```
let path = require("path");
let webpack = require("webpack");
let HtmlWebpackPlugin = require("html-webpack-plugin");
const ModuleFederationPlugin = require("webpack/lib/container/ModuleFederationPlugin");
module.exports = {
    mode: "development",
    entry: "./src/index.js",
    output: {
        publicPath: "http://localhost:8000/",
    },
    devServer: {
        port: 8000
    },
    module: {
        rules: [
            {
                test: /\.jsx?$/,
                use: {
                    loader: 'babel-loader',
                    options: {
                        presets: ["@babel/preset-react"]
                    },
                },
                exclude: /node_modules/,
            },
        ]
    },
    plugins: [
        new HtmlWebpackPlugin({
            template: './public/index.html'
        }),
        new ModuleFederationPlugin({
            filename: "remoteEntry.js",
            name: "host",
            remotes: {
                remote: "remote@http://localhost:3000/remoteEntry.js"
            }
        })
    ]
}
```

1.3.3.2 host\src\index.js

host\src\index.js

```
import("./bootstrap");
```

1.3.3.3 host\src\bootstrap.js

host\src\bootstrap.js

```
import React from "react";
import ReactDOM from "react-dom";
import App from "./App";
ReactDOM.render(<App />, document.getElementById("root"));
```

1.3.3.4 host\src\App.js

host\src\App.js

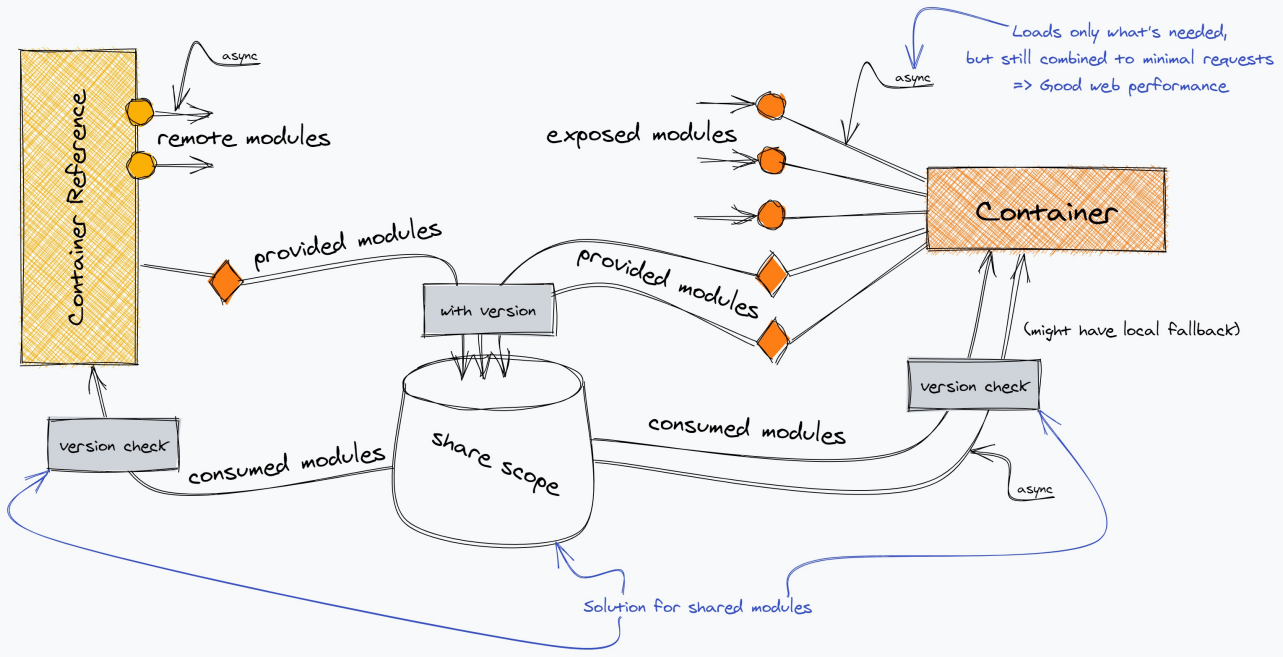
```
import React from "react";
import Slides from './Slides';
const RemoteNewsList = React.lazy(() => import("remote/NewsList"));

const App = () => (
  <div>
    <h2 >本地组件Slides, 远程组件NewsListh2>
    <Slides />
    <React.Suspense fallback="Loading NewsList">
      <RemoteNewsList />
    React.Suspense>
  div>
);
export default App;
```

1.3.3.5 host\src\Slides.js

host\src\Slides.js

```
import React from "react";
export default ()=>(
    <div>轮播图div>
)
```

- shared配置主要是用来避免项目出现多个公共依赖



1.4.1 remote\webpack.config.js

```
    plugins: [
        new HtmlWebpackPlugin({
            template:'./public/index.html'
        }),
        new ModuleFederationPlugin({
            filename: "remoteEntry.js",
            name: "remote",
            exposes: {
                "./NewsList": "./src/NewsList",
            },
+           shared:{
+               react: { singleton: true },
+               "react-dom": { singleton: true }
+           }
        })
    ]
```

1.4.2 host\webpack.config.js

```
    plugins: [
        new HtmlWebpackPlugin({
            template: './public/index.html'
        }),
        new ModuleFederationPlugin({
            filename: "remoteEntry.js",
            name: "host",
            remotes: {
                remote: "remote@http://localhost:3000/remoteEntry.js"
            },
+           shared:{
+               react: { singleton: true },
+               "react-dom": { singleton: true }
+           }
        })
    ]
```

1.5.双向依赖

- Module Federation 的共享可以是双向的

1.5.1 remote\webpack.config.js

```
    plugins: [
        new HtmlWebpackPlugin({
            template:'./public/index.html'
        }),
        new ModuleFederationPlugin({
            filename: "remoteEntry.js",
            name: "remote",
+           remotes: {
+               host: "host@http://localhost:8000/remoteEntry.js"
+           },
            exposes: {
                "./NewsList": "./src/NewsList",
            },
            shared:{
                react: { singleton: true },
                "react-dom": { singleton: true }
            }
        })
    ]
```

1.5.2 host\webpack.config.js

```
    plugins: [
        new HtmlWebpackPlugin({
            template: './public/index.html'
        }),
        new ModuleFederationPlugin({
            filename: "remoteEntry.js",
            name: "host",
            remotes: {
                remote: "remote@http://localhost:3000/remoteEntry.js"
            },
+           exposes: {
+                "./Slides": "./src/Slides",
+           },
            shared:{
                react: { singleton: true },
                "react-dom": { singleton: true }
              }
        })
    ]
```

1.5.3 remote\src\App.js

remote\src\App.js

```
import React from "react";
import NewsList from './NewsList';
+const RemoteSlides = React.lazy(() => import("host/Slides"));
const App = () => (

+    本地组件NewsList,远程组件Slides

+
+
+

);

export default App;
```

1.6.多个remote

1.6.1 all\webpack.config.js

```
let path = require("path");
let webpack = require("webpack");
let HtmlWebpackPlugin = require("html-webpack-plugin");
const ModuleFederationPlugin = require("webpack/lib/container/ModuleFederationPlugin");
module.exports = {
    mode: "development",
    entry: "./src/index.js",
    output: {
        publicPath: "http://localhost:3000/",
    },
    devServer: {
        port: 5000
    },
    module: {
        rules: [
            {
                test: /\.jsx?$/,
                use: {
                    loader: 'babel-loader',
                    options: {
                        presets: ["@babel/preset-react"]
                    },
                },
                exclude: /node_modules/,
            },
        ]
    },
    plugins: [
        new HtmlWebpackPlugin({
            template:'./public/index.html'
        }),
        new ModuleFederationPlugin({
            filename: "remoteEntry.js",
            name: "all",
            remotes: {
                remote: "remote@http://localhost:3000/remoteEntry.js",
                host: "host@http://localhost:8000/remoteEntry.js",
            },
            shared:{
                react: { singleton: true },
                "react-dom": { singleton: true }
              }
          })
    ]
}
```

1.6.2 remote\src\index.js

remote\src\index.js

```
import("./bootstrap");
```

1.6.3 remote\src\bootstrap.js

remote\src\bootstrap.js

```
import React from "react";
import ReactDOM from "react-dom";
import App from "./App";
ReactDOM.render(<App />, document.getElementById("root"));
```

1.6.4 remote\src\App.js

remote\src\App.js

```
import React from "react";
const RemoteSlides = React.lazy(() => import("host/Slides"));
const RemoteNewsList = React.lazy(() => import("remote/NewsList"));
const App = () => (
  <div>
    <h2>远程组件Slides,远程组件NewsListh2>
    <React.Suspense fallback="Loading Slides">
      <RemoteSlides />
    React.Suspense>
    <React.Suspense fallback="Loading NewsList">
      <RemoteNewsList />
    React.Suspense>
  div>
);

export default App;
```

2.模块联邦原理

```
npm install webpack webpack-cli webpack-dev-server html-webpack-plugin -D
```

2.1 remote

2.1.1 webpack.config.js

remote\webpack.config.js

```
const HtmlWebpackPlugin = require('html-webpack-plugin');
const ModuleFederationPlugin = require('webpack/lib/container/ModuleFederationPlugin');
module.exports = {
  mode: 'development',
  devtool: false,
  entry: './src/index.js',
  devServer: {
    port: 3000
  },
  module: {
    rules: [
      {
        test: /\.js$/,
        use: {
          loader: 'babel-loader',
          options: {
            presets: ['@babel/preset-react']
          }
        }
      }
    ]
  },
  plugins: [
    new HtmlWebpackPlugin({
      template: './src/index.html'
    }),
    new ModuleFederationPlugin({
      filename: 'remoteEntry.js',
      name: 'remote',
      exposes: {
        './RemoteComponent': './src/RemoteComponent',
      }
    })
  ]
}
```

2.1.2 src\index.js

remote\src\index.js

```
import('./bootstrap');
```

2.1.3 bootstrap.js

remote\src\bootstrap.js

```
import RemoteComponent from './RemoteComponent'
console.log(RemoteComponent);
```

2.1.4 RemoteComponent.js

remote\src\RemoteComponent.js

```
export default 'RemoteComponent'
```

2.1.5 index.html

remote\src\index.html

```

<html lang="en">
<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>remotetitle>
head>
<body>
body>
html>
```

2.1.6 index.html

remote\hand\index.html

```
<html lang="en">

<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>remotetitle>
<script defer src="main.js">script>head>

<body>

body>

html>
```

2.1.7 main.js

remote\hand\main.js

```
(() => {
  var modules = {};
  function require(moduleId) {
    var module = {
      exports: {}
    };
    modules[moduleId](module, module.exports, require);
    return module.exports;
  }
  require.m = modules;
  require.d = (exports, definition) => {
    for (var key in definition) {
      Object.defineProperty(exports, key, {
        enumerable: true,
        get: definition[key]
      });
    }
  };
  require.f = {};
  require.e = chunkId => {
    return Promise.all(Object.keys(require.f).reduce((promises, key) => {
      require.f[key](chunkId, promises);
      return promises;
    }, []));
  };
  require.u = chunkId => {
    return "" + chunkId + ".js";
  };
  require.g = window;
  require.o = (obj, prop) => Object.prototype.hasOwnProperty.call(obj, prop);
  require.l = url => {
    let script = document.createElement('script');
    script.src = url;
    document.head.appendChild(script);
  };
  require.r = exports => {
    Object.defineProperty(exports, '__esModule', {
      value: true
    });
  };
  require.p = '';
  var installedChunks = {
    "main": 0
  };
  require.f.j = (chunkId, promises) => {
    var installedChunkData;
    var promise = new Promise((resolve, reject) => installedChunkData = installedChunks[chunkId] = [resolve, reject]);
    promises.push(installedChunkData[2] = promise);
    var url = require.p + require.u(chunkId);
    require.l(url);
  };
  var webpackJsonpCallback = data => {
    var [chunkIds, moreModules] = data;
    var moduleId,
      chunkId,
      i = 0;
    for (moduleId in moreModules) {
      if (require.o(moreModules, moduleId)) {
        require.m[moduleId] = moreModules[moduleId];
      }
    }
    for (; i < chunkIds.length; i++) {
      chunkId = chunkIds[i];
      if (require.o(installedChunks, chunkId) && installedChunks[chunkId]) {
        installedChunks[chunkId][0]();
      }
      installedChunks[chunkId] = 0;
    }
  };
  var chunkLoadingGlobal = self["webpackChunkremote"] = self["webpackChunkremote"] || [];
  chunkLoadingGlobal.push = webpackJsonpCallback;
  require.e("src_bootstrap_js").then(() => {
    require("./src/bootstrap.js")
  });
})();
```

2.1.8 src_bootstrap_js.js

remote\hand\src_bootstrap_js.js

```
;
(self["webpackChunkremote"] = self["webpackChunkremote"] || []).push([["src_bootstrap_js"], {
  "./src/RemoteComponent.js": (module, exports, require) => {
    require.r(exports);
    require.d(exports, {
      "default": () => _DEFAULT_EXPORT__
    });
    const _DEFAULT_EXPORT__ = 'RemoteComponent';
  },
  "./src/bootstrap.js": (module, exports, require) => {
    require.r(exports);
    var RemoteComponent = require("./src/RemoteComponent.js");
    console.log(RemoteComponent.default);
  }
}]);
```

2.1.9 remoteEntry.js

remote\hand\remoteEntry.js

```
var remote;
(() => {
    var modules = {};
    function require(moduleId) {
        var module = {
            exports: {}
        };
        modules[moduleId](module, module.exports, require);
        return module.exports;
    }
    require.m = modules;
    require.d = (exports, definition) => {
        for (var key in definition) {
            Object.defineProperty(exports, key, {
                enumerable: true,
                get: definition[key]
            });
        }
    };
    require.f = {};
    require.e = chunkId => {
        return Promise.all(Object.keys(require.f).reduce((promises, key) => {
            require.f[key](chunkId, promises);
            return promises;
        }, []));
    };
    require.u = chunkId => {
        return "" + chunkId + ".js";
    };
    require.g = window;
    require.o = (obj, prop) => Object.prototype.hasOwnProperty.call(obj, prop);
    require.l = url => {
        let script = document.createElement('script');
        script.src = url;
        document.head.appendChild(script);
    };
    require.r = exports => {
        Object.defineProperty(exports, '__esModule', {
            value: true
        });
    };
    scriptUrl = document.currentScript.src;
    require.p = scriptUrl.replace(/\/[^\/]+$/, "/");
    var installedChunks = {
        "remote": 0
    };
    require.f.j = (chunkId, promises) => {
        var installedChunkData;
        var promise = new Promise((resolve, reject) => installedChunkData = installedChunks[chunkId] = [resolve, reject]);
        promises.push(installedChunkData[2] = promise);
        var url = require.p + require.u(chunkId);
        require.l(url);
    };
    var webpackJsonpCallback = data => {
        var [chunkIds, moreModules] = data;
        var moduleId, chunkId, i = 0;
        for (moduleId in moreModules) {
            if (require.o(moreModules, moduleId)) {
                require.m[moduleId] = moreModules[moduleId];
            }
        }
        for (; i < chunkIds.length; i++) {
            chunkId = chunkIds[i];
            if (require.o(installedChunks, chunkId) && installedChunks[chunkId]) {
                installedChunks[chunkId][0]();
            }
            installedChunks[chunkId] = 0;
        }
    };
    var chunkLoadingGlobal = self["webpackChunkremote"] = self["webpackChunkremote"] || [];
    chunkLoadingGlobal.push = webpackJsonpCallback;
    var exports = {};
    var moduleMap = {
        "./RemoteComponent": () => {
            return require.e("src_RemoteComponent_js").then(() => () => require("./src/RemoteComponent.js"));
        }
    };
    var get = (module) => {
        return moduleMap[module]();
    };
    require.d(exports, {
        get: () => get
    });
    remote = exports;
})();
```

2.1.10 src_RemoteComponent_js.js

remote\hand\src_RemoteComponent_js.js

```
(self["webpackChunkremote"] = self["webpackChunkremote"] || []).push([["src_RemoteComponent_js"], {
  "./src/RemoteComponent.js": (module, exports, require) => {
    require.r(exports);
    require.d(exports, {
      "default": () => _DEFAULT_EXPORT__
    });
    const _DEFAULT_EXPORT__ = 'RemoteComponent';
  }
}]);
```

2.2 host

2.2.1 webpack.config.js

remote\webpack.config.js

```
const webpack = require('webpack');
const path = require('path');
const HtmlWebpackPlugin = require('html-webpack-plugin');
const ModuleFederationPlugin = require('webpack/lib/container/ModuleFederationPlugin');
module.exports = {
  mode: 'development',
  devtool: false,
  entry: './src/index.js',
  output: {

  },
  devServer: {
    port: 8000
  },
  plugins: [
    new HtmlWebpackPlugin({
      template: './src/index.html'
    }),
    new ModuleFederationPlugin({

      remotes: {
        remote: 'remote@http://127.0.0.1:3000/remoteEntry.js'
      }
    })
  ]
}
```

2.2.2 src\index.js

remote\src\index.js

```
import('./bootstrap');
```

2.2.3 bootstrap.js

remote\src\bootstrap.js

```
import RemoteComponent from './RemoteComponent'
console.log(RemoteComponent);
```

2.2.4 RemoteComponent.js

remote\src\RemoteComponent.js

```
export default 'RemoteComponent'
```

2.2.5 index.html

host\hand\index.html

```
<html lang="en">

<head>
  <meta charset="UTF-8">
  <meta http-equiv="X-UA-Compatible" content="IE=edge">
  <meta name="viewport" content="width=device-width, initial-scale=1.0">
  <title>remotetitle>
<script defer src="main.js">script>head>

<body>

body>

html>
```

2.2.6 main.js

host\hand\main.js

```
(() => {
    var modules = {
        "webpack/container/reference/remote": (module, exports, require) => {
            module.exports = new Promise(resolve => {
                if (typeof remote !== "undefined") return resolve();
                require.l("http://127.0.0.1:3000/remoteEntry.js", resolve);
            }).then(() => remote);
        }
    };
    function require(moduleId) {
        var module = {
            exports: {}
        };
        modules[moduleId](module, module.exports, require);
        return module.exports;
    }
    require.m = modules;
    require.d = (exports, definition) => {
        for (var key in definition) {
            Object.defineProperty(exports, key, {
                enumerable: true,
                get: definition[key]
            });
        }
    };
    require.f = {};
    require.e = chunkId => {
        return Promise.all(Object.keys(require.f).reduce((promises, key) => {
            require.f[key](chunkId, promises);
            return promises;
        }, []));
    };
    require.u = chunkId => {
```

```
        return "" + chunkId + ".js";
    };
    require.g = window;
    require.o = (obj, prop) => Object.prototype.hasOwnProperty.call(obj, prop);
    require.l = (url, done) => {
        let script = document.createElement('script');
        script.src = url;
        script.onload = done;
        document.head.appendChild(script);
    };
    require.r = exports => {
        Object.defineProperty(exports, '__esModule', {
            value: true
        });
    };
    var chunkMapping = {
        "webpack_container_remote_remote_RemoteComponent": ["webpack/container/remote/remote/RemoteComponent"]
    };
    var idToExternalAndNameMapping = {
        "webpack/container/remote/remote/RemoteComponent": ["default", "./RemoteComponent", "webpack/container/reference/remote"]
    };
    require.f.remotes = (chunkId, promises) => {
        if (require.o(chunkMapping, chunkId)) {
            chunkMapping[chunkId].forEach(id => {
                var data = idToExternalAndNameMapping[id];
                var promise = require(data[2]).then(external => {
                    return external.get(data[1]);
                }).then(factory => {
                    require.m[id] = module => {
                        module.exports = factory();
                    };
                });
                promises.push(promise);
            });
        }
    };
    scriptUrl = document.currentScript.src;
    require.p = scriptUrl.replace(/\/[^\/]+$/, "/");
    var installedChunks = {
        "main": 0
    };
    require.f.j = (chunkId, promises) => {
        var installedChunkData;
        if ("webpack_container_remote_remote_RemoteComponent" !== chunkId) {
            var promise = new Promise((resolve, reject) => installedChunkData = installedChunks[chunkId] = [resolve, reject]);
            promises.push(installedChunkData[2] = promise);
            var url = require.p + require.u(chunkId);
            require.l(url);
        }
    };
    var webpackJsonpCallback = data => {
        var [chunkIds, moreModules] = data;
        var moduleId,
            chunkId,
            i = 0;
        if (chunkIds.some(id => installedChunks[id] !== 0)) {
            for (moduleId in moreModules) {
                if (require.o(moreModules, moduleId)) {
                    require.m[moduleId] = moreModules[moduleId];
                }
            }
        }
        for (; i < chunkIds.length; i++) {
            chunkId = chunkIds[i];
            if (require.o(installedChunks, chunkId) && installedChunks[chunkId]) {
                installedChunks[chunkId][0]();
            }
            installedChunks[chunkId] = 0;
        }
    };
    var chunkLoadingGlobal = self["webpackChunkhost"] = self["webpackChunkhost"] || [];
    chunkLoadingGlobal.push = webpackJsonpCallback;
    require.e("src_bootstrap_js").then(() => require("./src/bootstrap.js"));
})();
```

2.2.7 src_bootstrap_js.js

host\hand\src_bootstrap_js.js

```
(self["webpackChunkhost"] = self["webpackChunkhost"] || []).push([["src_bootstrap_js"], {
  "./src/bootstrap.js": (module, exports, require) => {
    require.e("webpack_container_remote_remote_RemoteComponent").then(() => require("webpack/container/remote/remote/RemoteComponent")).then(result => {
      console.log(result.default);
    });
  }
}]);
```

- webpack_require.f.j 利用script标签去加载其他js文件
- webpack_require.f.remotes 加载remote入口文件，然后将remote模块关联到runtime中
- webpack_require.f.consumes：让当前share的模块，关联到runtime中

3.1 remote

3.1.1 src\index.js

remote\src\index.js

```
import('./bootstrap');
```

3.1.2 bootstrap.js

remote\src\bootstrap.js

```
import RemoteComponent from './RemoteComponent'
import isArray from 'check-is-array';
console.log(RemoteComponent, isArray);
```

2.1.3 RemoteComponent.js

remote\src\RemoteComponent.js

```
export default 'RemoteComponent'
```

3.1.4 main.js

remote\hand\main.js

```
(() => {
  var modules = {
    "./src/index.js": (module, exports, require) => {
      require.e("src_bootstrap_js").then(require.bind(require, "./src/bootstrap.js"));
    }
  };
  function require(moduleId) {
    var module = {
      exports: {}
    };
    modules[moduleId](module, module.exports, require);
    return module.exports;
  }
  require.m = modules;
  require.n = module => {
    var getter = module && module.__esModule ? () => module['default'] : () => module;
    require.d(getter, {
      a: getter
    });
    return getter;
  };
  require.d = (exports, definition) => {
    for (var key in definition) {
      Object.defineProperty(exports, key, {
        enumerable: true,
        get: definition[key]
      });
    }
  };
  require.f = {};
  require.e = chunkId => {
    return Promise.all(Object.keys(require.f).reduce((promises, key) => {
      require.f[key](chunkId, promises);
      return promises;
    }, []));
  };
  require.u = chunkId => {
    return "" + chunkId + ".js";
  };
  require.g = window;
  require.o = (obj, prop) => Object.prototype.hasOwnProperty.call(obj, prop);
  require.l = (url, done) => {
    var script = document.createElement('script');
    script.src = url;
    script.onload = done;
    document.head.appendChild(script);
  };
  require.r = exports => {
    Object.defineProperty(exports, '__esModule', { value: true });
  };
  require.S = {};
  require.I = (name) => {
    if (!require.o(require.S, name)) require.S[name] = {};
    var scope = require.S[name];
    var uniqueName = "remote";
    var register = (name, version, factory) => {
      var versions = scope[name] = scope[name] || {};
      var activeVersion = versions[version];
      if (!activeVersion)
        versions[version] = {
          get: factory,
          from: uniqueName
        };
    };
    var promises = [];
    switch (name) {
      case "default":
        {
          register("check-is-array", "2.0.6", () => require.e("node_modules_check-is-array_index_js").then(() => () => require("./node_modules/check-is-
array/index.js")));
        }
        break;
    }
    return Promise.all(promises);
  };
  require.p = document.currentScript.src.replace(/\/[^\/]+$/, "/");
  var parseVersion = str => {
    var p = p => {
      return p.split(".").map(p => {
        return +p == p ? +p : p;
      });
    },
      n = /^([^-+]+)?(?:-([^+]+))?(?:\+(.+))?$/.exec(str),
      r = n[1] ? p(n[1]) : [];
    return n[2] && (r.length++, r.push.apply(r, p(n[2]))), n[3] && (r.push([]), r.push.apply(r, p(n[3]))), r;
  };
  var versionLt = (a, b) => {
    a = parseVersion(a), b = parseVersion(b);
    for (var r = 0; ;) {
      if (r >= a.length) return r < b.length && "u" != (typeof b[r])[0];
```

```
    var e = a[r],
      n = (typeof e)[0];
    if (r >= b.length) return "u" == n;
    var t = b[r],
      f = (typeof t)[0];
    if (n != f) return "o" == n && "n" == f || "s" == f || "u" == n;
    if ("o" != n && "u" != n && e != t) return e < t;
    r++;
  }
};
var rangeToString = range => {
  var r = range[0],
    n = "";
  if (1 === range.length) return "*";
  if (r + .5) {
    n += 0 == r ? ">=" : -1 == r ? " : 1 == r ? "^" : 2 == r ? "~" : r > 0 ? "=" : "!=";
    for (var e = 1, a = 1; a < range.length; a++) {
      e--, n += "u" == (typeof (t = range[a]))[0] ? "-" : (e > 0 ? "." : "") + (e = 2, t);
    }
    return n;
  }
  var g = [];
  for (a = 1; a < range.length; a++) {
    var t = range[a];
    g.push(0 === t ? "not(" + o() + ")" : 1 === t ? "(" + o() + " || " + o() + ")" : 2 === t ? g.pop() + " " + g.pop() : rangeToString(t));
  }
  return o();
  function o() {
    return g.pop().replace(/^\((.+)\)$/, "$1");
  }
};
var satisfy = (range, version) => {
  if (0 in range) {
    version = parseVersion(version);
    var e = range[0],
      r = e < 0;
    r && (e = -e - 1);
    for (var n = 0, i = 1, a = !0; ; i++, n++) {
      var f,
        s,
        g = i < range.length ? (typeof range[i])[0] : "";
      if (n >= version.length || "o" == (s = (typeof (f = version[n]))[0])) return !a || ("u" == g ? i > e && !r : "" == g != r);
      if ("u" == s) {
        if (!a || "u" != g) return !1;
      } else if (a) {
        if (g == s) {
          if (i if (f != range[i]) return !1;
          } else {
            if (r ? f > range[i] : f < range[i]) return !1;
            f != range[i] && (a = !1);
          }
        } else if ("s" != g && "n" != g) {
          if (r || i return !1;
          a = !1, i--;
        } else {
          if (i return !1;
          a = !1;
        }
      } else "s" != g && "n" != g && (a = !1, i--);
    }
  }
  var t = [],
    o = t.pop.bind(t);
  for (n = 1; n < range.length; n++) {
    var u = range[n];
    t.push(1 == u ? o() | o() : 2 == u ? o() & o() : u ? satisfy(u, version) : !o());
  }
  return !!o();
};
var findSingletonVersionKey = (scope, key) => {
  var versions = scope[key];
  return Object.keys(versions).reduce((a, b) => {
    return !a || !versions[a].loaded && versionLt(a, b) ? b : a;
  }, 0);
};
var getInvalidSingletonVersionMessage = (scope, key, version, requiredVersion) => {
  return "Unsatisfied version " + version + " from " + (version && scope[key][version].from) + " of shared singleton module " + key + " (required " +
rangeToString(requiredVersion) + ")";
};
var getSingletonVersion = (scope, scopeName, key, requiredVersion) => {
  var version = findSingletonVersionKey(scope, key);
  if (!satisfy(requiredVersion, version))
    console.warn(getInvalidSingletonVersionMessage(scope, key, version, requiredVersion));
  return get(scope[key][version]);
};
var get = entry => {
  entry.loaded = 1;
  return entry.get();
};
var init = fn => function (scopeName, key, version, fallback) {
  var promise = require.I(scopeName);
  return promise.then(() => fn(scopeName, require.S[scopeName], key, version, fallback));
};
var loadSingletonVersionCheckFallback = init((scopeName, scope, key, version, fallback) => {
  if (!scope || !require.o(scope, key)) return fallback();
  return getSingletonVersion(scope, scopeName, key, version);
});
var installedModules = {};
var moduleToHandlerMapping = {
  "webpack/sharing/consume/default/check-is-array/check-is-array": () => loadSingletonVersionCheckFallback("default", "check-is-array", [1, 2, 0, 6], () =>
require.e("node_modules_check-is-array_index_js").then(() => () => require("./node_modules/check-is-array/index.js")))
};
var chunkMapping = {
  "src_bootstrap_js": ["webpack/sharing/consume/default/check-is-array/check-is-array"]
```

```
  };
  require.f.consumes = (chunkId, promises) => {
    if (require.o(chunkMapping, chunkId)) {
      chunkMapping[chunkId].forEach(id => {
        if (require.o(installedModules, id)) return promises.push(installedModules[id]);
        var onFactory = factory => {
          installedModules[id] = 0;
          require.m[id] = module => {
            module.exports = factory();
          };
        };
        var promise = moduleToHandlerMapping[id]();
        if (promise.then) {
          promises.push(installedModules[id] = promise.then(onFactory));
        } else onFactory(promise);
      });
    }
  };
  var installedChunks = {
    "main": 0
  };
  require.f.j = (chunkId, promises) => {
    var installedChunkData;
    var promise = new Promise((resolve, reject) => installedChunkData = installedChunks[chunkId] = [resolve, reject]);
    promises.push(installedChunkData[2] = promise);
    var url = require.p + require.u(chunkId);
    require.l(url);
  };
  var webpackJsonpCallback = (data) => {
    var [chunkIds, moreModules] = data;
    var moduleId, chunkId, i = 0;
    for (moduleId in moreModules) {
      if (require.o(moreModules, moduleId)) {
        require.m[moduleId] = moreModules[moduleId];
      }
    }
    for (; i < chunkIds.length; i++) {
      chunkId = chunkIds[i];
      if (require.o(installedChunks, chunkId) && installedChunks[chunkId]) {
        installedChunks[chunkId][0]();
      }
      installedChunks[chunkId] = 0;
    }
  };
  var chunkLoadingGlobal = self["webpackChunkremote"] = self["webpackChunkremote"] || [];
  chunkLoadingGlobal.push = webpackJsonpCallback;
  require("./src/index.js");
})();
```

3.1.5 node_modules_check-is-array_index_js.js

remote\hand\node_modules_check-is-array_index_js.js

```
;
(self["webpackChunkremote"] = self["webpackChunkremote"] || []).push([["node_modules_check-is-array_index_js"], {
  "./node_modules/check-is-array/index.js": (module, exports, require) => {
    require.r(exports);
    require.d(exports, {
      "default": () => _DEFAULT_EXPORT__
    });
    const _DEFAULT_EXPORT__ = Array.isArray;
  }
}]);
```

3.1.6 remoteEntry.js

remote\hand\remoteEntry.js

```
var remote;
(() => {
    var modules = {
        "webpack/container/entry/remote": (module, exports, require) => {
            var moduleMap = {
                "./RemoteComponent": () => {
                    return require.e("src_RemoteComponent_js").then(() => () => require("./src/RemoteComponent.js"));
                }
            };
            var get = module => {
                return moduleMap[module]();
            };
            var init = shareScope => {
                if (!require.S) return;
                var name = "default";
                require.S[name] = shareScope;
                return require.I(name);
            };
            require.d(exports, {
                get: () => get,
                init: () => init
            });
        }
    };
    function require(moduleId) {
        var module = {
            exports: {}
        };
        modules[moduleId](module, module.exports, require);
        return module.exports;
    }
    require.m = modules;
    require.d = (exports, definition) => {
        for (var key in definition) {
            Object.defineProperty(exports, key, {
                enumerable: true,
```

```
                get: definition[key]
            });
        }
    };
    require.f = {};
    require.e = chunkId => {
        return Promise.all(Object.keys(require.f).reduce((promises, key) => {
            require.f[key](chunkId, promises);
            return promises;
        }, []));
    };
    require.u = chunkId => {
        return "" + chunkId + ".js";
    };
    require.g = window;
    require.o = (obj, prop) => Object.prototype.hasOwnProperty.call(obj, prop);
    require.l = (url, done) => {
        var script = document.createElement('script');
        script.src = url;
        script.onload = done;
        document.head.appendChild(script);
    };
    require.r = exports => {
        Object.defineProperty(exports, '__esModule', { value: true });
    };
    require.S = {};
    require.I = (name) => {
        if (!require.o(require.S, name)) require.S[name] = {};
        var scope = require.S[name];
        var uniqueName = "remote";
        var register = (name, version, factory) => {
            var versions = scope[name] = scope[name] || {};
            var activeVersion = versions[version];
            if (!activeVersion)
                versions[version] = {
                    get: factory,
                    from: uniqueName
                };
        };
        switch (name) {
            case "default":
                {
                    register("check-is-array", "2.0.6", () => require.e("node_modules_check-is-array_index_js").then(() => () => require("./node_modules/check-
is-array/index.js")));
                }
                break;
        }
    };
    require.p = document.currentScript.src.replace(/\/[^\/]+$/, "/");
    var installedChunks = {
        "remote": 0
    };
    require.f.j = (chunkId, promises) => {
        var installedChunkData;
        var promise = new Promise((resolve, reject) => installedChunkData = installedChunks[chunkId] = [resolve, reject]);
        promises.push(installedChunkData[2] = promise);
        var url = require.p + require.u(chunkId);
        require.l(url);
    };
    var webpackJsonpCallback = (data) => {
        var [chunkIds, moreModules] = data;
        var moduleId, chunkId, i = 0;
        for (moduleId in moreModules) {
            if (require.o(moreModules, moduleId)) {
                require.m[moduleId] = moreModules[moduleId];
            }
        }
        for (; i < chunkIds.length; i++) {
            chunkId = chunkIds[i];
            if (require.o(installedChunks, chunkId) && installedChunks[chunkId]) {
                installedChunks[chunkId][0]();
            }
            installedChunks[chunkId] = 0;
        }
    };
    var chunkLoadingGlobal = self["webpackChunkremote"] = self["webpackChunkremote"] || [];
    chunkLoadingGlobal.push = webpackJsonpCallback;
    var exports = require("webpack/container/entry/remote");
    remote = exports;
})();
```

3.1.7 src_bootstrap_js.js

remote\hand\src_bootstrap_js.js

```
;
(self["webpackChunkremote"] = self["webpackChunkremote"] || []).push([["src_bootstrap_js"], {
  "./src/RemoteComponent.js": (module, exports, require) => {
    require.r(exports);
    require.d(exports, {
      "default": () => _DEFAULT_EXPORT__
    });
    const _DEFAULT_EXPORT__ = 'RemoteComponent';
  },
  "./src/bootstrap.js": (module, exports, require) => {
    require.r(exports);
    var _RemoteComponent_0__ = require("./src/RemoteComponent.js");
    var check_is_array_1__ = require("webpack/sharing/consume/default/check-is-array/check-is-array");
    var check_is_array_1___default = require.n(check_is_array_1__);
    console.log(_RemoteComponent_0__["default"], check_is_array_1___default());
  }
}]);
```

3.1.8 src_RemoteComponent_js.js

remote\hand\src_RemoteComponent_js.js

```
;
(self["webpackChunkremote"] = self["webpackChunkremote"] || []).push([["src_RemoteComponent_js"], {
  "./src/RemoteComponent.js": (module, exports, require) => {
    require.r(exports);
    require.d(exports, {
      "default": () => _DEFAULT_EXPORT__
    });
    const _DEFAULT_EXPORT__ = 'RemoteComponent';
  }
}]);
```

3.2 host

3.2.1 src\index.js

host\src\index.js

```
import('./bootstrap');
```

3.2.2 bootstrap.js

host\src\bootstrap.js

```
import isArray from 'check-is-array';
import("remote/RemoteComponent").then(result => {
    console.log(result.default, isArray);
});
```

3.2.3 main.js

host\hand\main.js

```
(() => {
    var modules = {
        "./src/index.js": (module, exports, require) => {
            require.e("src_bootstrap_js").then(() => require("./src/bootstrap.js"));
        },
        "webpack/container/reference/remote": (module, exports, require) => {
            module.exports = new Promise(resolve => {
                if (typeof remote !== "undefined") return resolve();
                require.l("http://127.0.0.1:3001/remoteEntry.js", resolve);
            }).then(() => remote);
        }
    };
    function require(moduleId) {
        var module = {
            exports: {}
        };
        modules[moduleId](module, module.exports, require);
        return module.exports;
    }
    require.m = modules;
    require.n = module => {
        var getter = module && module.__esModule ? () => module['default'] : () => module;
        require.d(getter, {
            a: getter
        });
        return getter;
    };
    require.d = (exports, definition) => {
        for (var key in definition) {
            Object.defineProperty(exports, key, {
                enumerable: true,
                get: definition[key]
            });
        }
    };
    require.f = {};
    require.e = chunkId => {
        return Promise.all(Object.keys(require.f).reduce((promises, key) => {
            require.f[key](chunkId, promises);
            return promises;
        }, []));
    };
    require.u = chunkId => {
        return "" + chunkId + ".js";
    };
    require.g = window;
    require.o = (obj, prop) => Object.prototype.hasOwnProperty.call(obj, prop);
    require.l = (url, done) => {
        let script = document.createElement('script');
        script.src = url;
        script.onload = done;
        document.head.appendChild(script);
    };
    require.r = exports => {
        Object.defineProperty(exports, '__esModule', {
            value: true
        });
    };
    (() => {
        var chunkMapping = {
            "webpack_container_remote_remote_RemoteComponent": ["webpack/container/remote/remote/RemoteComponent"]
        };
        var idToExternalAndNameMapping = {
            "webpack/container/remote/remote/RemoteComponent": ["default", "./RemoteComponent", "webpack/container/reference/remote"]
        };
        require.f.remotes = (chunkId, promises) => {
            if (require.o(chunkMapping, chunkId)) {
                chunkMapping[chunkId].forEach(id => {
                    var [, moduleId, remoteModuleId] = idToExternalAndNameMapping[id];
                    var promise = require(remoteModuleId).then(remoteModule => {
```

```
                        return remoteModule.get(moduleId);
                    }).then(factory => {
                        require.m[id] = module => {
                            module.exports = factory();
                        };
                    });
                    promises.push(promise);
                });
            }
        };
    })()
    require.S = {};
    require.I = (name) => {
        if (!require.o(require.S, name)) require.S[name] = {};
        var scope = require.S[name];
        var uniqueName = "host";
        var register = (name, version, factory) => {
            var versions = scope[name] = scope[name] || {};
            var activeVersion = versions[version];
            if (!activeVersion) versions[version] = {
                get: factory,
                from: uniqueName
            };
        };
        var promises = [];
        var initExternal = id => {
            var module = require(id);
            promises.push(module.then(module => module.init(require.S[name])));
        };
        switch (name) {
            case "default":
                {
                    register("check-is-array", "2.0.6", () => require.e("node_modules_check-is-array_index_js").then(() => () => require("./node_modules/check-
is-array/index.js")));
                    initExternal("webpack/container/reference/remote");
                }
                break;
        }
        return Promise.all(promises);
    };
    require.p = document.currentScript.src.replace(/\/[^\/]+$/, "/");
    var parseVersion = str => {
        var p = p => {
            return p.split(".").map(p => {
                return +p == p ? +p : p;
            });
        },
            n = /^([^-+]+)?(?:-([^+]+))?(?:\+(.+))?$/.exec(str),
            r = n[1] ? p(n[1]) : [];
        return n[2] && (r.length++, r.push.apply(r, p(n[2]))), n[3] && (r.push([]), r.push.apply(r, p(n[3]))), r;
    };
    var versionLt = (a, b) => {
        a = parseVersion(a), b = parseVersion(b);
        for (var r = 0; ;) {
            if (r >= a.length) return r < b.length && "u" != (typeof b[r])[0];
            var e = a[r],
                n = (typeof e)[0];
            if (r >= b.length) return "u" == n;
            var t = b[r],
                f = (typeof t)[0];
            if (n != f) return "o" == n && "n" == f || "s" == f || "u" == n;
            if ("o" != n && "u" != n && e != t) return e < t;
            r++;
        }
    };
    var rangeToString = range => {
        var r = range[0],
            n = "";
        if (1 === range.length) return "*";
        if (r + .5) {
            n += 0 == r ? ">=" : -1 == r ? " : 1 == r ? "^" : 2 == r ? "~" : r > 0 ? "=" : "!=";
            for (var e = 1, a = 1; a < range.length; a++) {
                e--, n += "u" == (typeof (t = range[a]))[0] ? "-" : (e > 0 ? "." : "") + (e = 2, t);
            }
            return n;
        }
        var g = [];
        for (a = 1; a < range.length; a++) {
            var t = range[a];
            g.push(0 === t ? "not(" + o() + ")" : 1 === t ? "(" + o() + " || " + o() + ")" : 2 === t ? g.pop() + " " + g.pop() : rangeToString(t));
        }
        return o();
        function o() {
            return g.pop().replace(/^\((.+)\)$/, "$1");
        }
    };
    var satisfy = (range, version) => {
        if (0 in range) {
            version = parseVersion(version);
            var e = range[0],
                r = e < 0;
            r && (e = -e - 1);
            for (var n = 0, i = 1, a = !0; ; i++, n++) {
                var f,
                    s,
                    g = i < range.length ? (typeof range[i])[0] : "";
                if (n >= version.length || "o" == (s = (typeof (f = version[n]))[0])) return !a || ("u" == g ? i > e && !r : "" == g != r);
                if ("u" == s) {
                    if (!a || "u" != g) return !1;
                } else if (a) {
                    if (g == s) {
                        if (i if (f != range[i]) return !1;
                        } else {
                            if (r ? f > range[i] : f < range[i]) return !1;
```

```
                        f != range[i] && (a = !1);
                    }
                } else if ("s" != g && "n" != g) {
                    if (r || i return !1;
                    a = !1, i--;
                } else {
                    if (i return !1;
                    a = !1;
                }
            } else "s" != g && "n" != g && (a = !1, i--);
        }
    }
    var t = [],
        o = t.pop.bind(t);
    for (n = 1; n < range.length; n++) {
        var u = range[n];
        t.push(1 == u ? o() | o() : 2 == u ? o() & o() : u ? satisfy(u, version) : !o());
    }
    return !!o();
};
var findSingletonVersionKey = (scope, key) => {
    var versions = scope[key];
    return Object.keys(versions).reduce((a, b) => {
        return !a || !versions[a].loaded && versionLt(a, b) ? b : a;

    }, 0);
};
var getInvalidSingletonVersionMessage = (scope, key, version, requiredVersion) => {
    return "Unsatisfied version " + version + " from " + (version && scope[key][version].from) + " of shared singleton module " + key + " (required " +
rangeToString(requiredVersion) + ")";
};
var getSingletonVersion = (scope, scopeName, key, requiredVersion) => {
    var version = findSingletonVersionKey(scope, key);
    if (!satisfy(requiredVersion, version))
        console.warn(getInvalidSingletonVersionMessage(scope, key, version, requiredVersion));
    return get(scope[key][version]);
};
var get = entry => {
    entry.loaded = 1;
    return entry.get();
};
var init = fn => function (scopeName, key, version, fallback) {
    var promise = require.I(scopeName);
    return promise.then(() => fn(scopeName, require.S[scopeName], key, version, fallback));
};
var loadSingletonVersionCheckFallback = init((scopeName, scope, key, version, fallback) => {
    if (!scope || !require.o(scope, key)) return fallback();
    return getSingletonVersion(scope, scopeName, key, version);
});
var moduleToHandlerMapping = {
    "webpack/sharing/consume/default/check-is-array/check-is-array": () => loadSingletonVersionCheckFallback('default', "check-is-array", [1, 2, 0, 6], ()
=> require.e("node_modules_check-is-array_index_js").then(() => () => require("./node_modules/check-is-array/index.js")))
};
var chunkMapping = {
    "src_bootstrap_js": ["webpack/sharing/consume/default/check-is-array/check-is-array"]
};
require.f.consumes = (chunkId, promises) => {
    if (require.o(chunkMapping, chunkId)) {
        chunkMapping[chunkId].forEach(id => {
            var onFactory = factory => {
                require.m[id] = module => {
                    module.exports = factory();
                };
            };
            var promise = moduleToHandlerMapping[id]();
            promises.push(promise.then(onFactory));
        });
    }
};
var installedChunks = {
    "main": 0
};
require.f.j = (chunkId, promises) => {
    var installedChunkData;
    if ("webpack_container_remote_remote_RemoteComponent" !== chunkId) {
        var promise = new Promise((resolve, reject) => installedChunkData = installedChunks[chunkId] = [resolve, reject]);
        promises.push(installedChunkData[2] = promise);
        var url = require.p + require.u(chunkId);
        require.l(url);
    }
};
var webpackJsonpCallback = data => {
    var [chunkIds, moreModules] = data;
    var moduleId,
        chunkId,
        i = 0;
    if (chunkIds.some(id => installedChunks[id] !== 0)) {
        for (moduleId in moreModules) {
            if (require.o(moreModules, moduleId)) {
                require.m[moduleId] = moreModules[moduleId];
            }
        }
    }
    for (; i < chunkIds.length; i++) {
        chunkId = chunkIds[i];
        if (require.o(installedChunks, chunkId) && installedChunks[chunkId]) {
            installedChunks[chunkId][0]();
        }
        installedChunks[chunkId] = 0;
    }
};
var chunkLoadingGlobal = self["webpackChunkhost"] = self["webpackChunkhost"] || [];
chunkLoadingGlobal.push = webpackJsonpCallback;
require("./src/index.js");
```

```
})();
```

3.2.4 node_modules_check-is-array_index_js.js

host\hand\node_modules_check-is-array_index_js.js

```
(self["webpackChunkhost"] = self["webpackChunkhost"] || []).push([["node_modules_check-is-array_index_js"], {
  "./node_modules/check-is-array/index.js": (module, exports, require) => {
    require.r(exports);
    require.d(exports, {
      "default": () => _DEFAULT_EXPORT__
    });
    const _DEFAULT_EXPORT__ = Array.isArray;
  }
}]);
```

3.2.5 src_bootstrap_js.js

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```
(self["webpackChunkhost"] = self["webpackChunkhost"] || []).push([["src_bootstrap_js"], {
  "./src/bootstrap.js": (module, exports, require) => {
    require.r(exports);
    var check_is_array_0__ = require("webpack/sharing/consume/default/check-is-array/check-is-array");
    var check_is_array_0___default = require.n(check_is_array_0__);
    require.e("webpack_container_remote_remote_RemoteComponent").then(() => require("webpack/container/remote/remote/RemoteComponent")).then(result => {
      console.log(result.default, check_is_array_0___default());
    });
  }
}]);
```