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---

1. React路由原理

- 不同的路径渲染不同的组件
- 有两种实现方式
    - HashRouter:利用hash实现路由切换
    - BrowserRouter:实现h5 Api实现路由的切换

1.1 HashRouter

- 利用hash实现路由切换

public\index.html

```
<html lang="en">

<head>
  <meta charset="utf-8" />
  <link rel="icon" href="%PUBLIC_URL%/favicon.ico" />
  <meta name="viewport" content="width=device-width, initial-scale=1" />
  <meta name="theme-color" content="#000000" />
  <title>React Apptitle>
head>

<body>
  <div id="root">div>
  <a href="#/a">去aa>
  <a href="#/b">去ba>

  <script>
    window.addEventListener('hashchange', () => {
      console.log(window.location.hash);
    });
  script>
body>
html>
```

1.2 BrowserRouter

- 利用h5 Api实现路由的切换

1.2.1 history

- history (https://developer.mozilla.org/zh-CN/docs/Web/API/Window/history)对象提供了操作浏览器会话历史的接口。
- `historylength` 属性声明了浏览器历史列表中的元素数量
- pushState (https://developer.mozilla.org/zh-CN/docs/Web/API/History_API) HTML5引入了 `history.pushState()` 和 `history.replaceState()` 方法，它们分别可以添加和修改历史记录条目。这些方法通常与 `window.onpopstate`配合使用
- onpopstate (https://developer.mozilla.org/zh-CN/docs/Web/API/Window/onpopstate) `window.onpopstate`是 `popstate`事件在 `window`对象上的事件处理程序

1.2.2 pushState

- `pushState`会往 `History`中写入一个对象，他造成的结果便是, `History length +1`、 `url` 改变、该索引 `History`对应有一个 `State`对象,这个时候若是点击浏览器的后退，便会触发 `popstate`事件，将刚刚的存入数据对象读出
- `pushState` 会改变 `History`
- 每次使用时候会为该索引的 `State`加入我们自定义数据
- 每次我们会根据State的信息还原当前的view，于是用户点击后退便有了与浏览器后退前进一致的感受
- `pushState()` 需要三个参数: 一个状态对象, 一个标题 (目前被忽略), 和 (可选的) 一个URL
- 调用history.pushState()或者history.replaceState()不会触发popstate事件. popstate事件只会在浏览器某些行为下触发, 比如点击后退、前进按钮(或者在JavaScript中调用history.back()、history.forward()、history.go()方法)

```
<html lang="en">

<head>
  <meta charset="utf-8" />
  <link rel="icon" href="%PUBLIC_URL%/favicon.ico" />
  <meta name="viewport" content="width=device-width, initial-scale=1" />
  <meta name="theme-color" content="#000000" />
  <title>React Apptitle>
head>

<body>
  <div id="root">div>
  <script>
    window.onpopstate = (event) => {
      console.log({ state: event.state, pathname: window.location.pathname, type: 'popstate' });
    };
    window.onpushstate = (event) => {
      console.log(event);
    };
    (function (history) {
      var pushState = history.pushState;
      history.pushState = function (state, title, pathname) {
        if (typeof window.onpushstate == "function") {
          window.onpushstate({ state, pathname, type: 'pushstate' });
        }
        return pushState.apply(history, arguments);
      };
    })(window.history);

    setTimeout(() => {
      history.pushState({ page: 1 }, "title 1", "/page1");
    }, 1000);
    setTimeout(() => {
      history.pushState({ page: 2 }, "title 2", "/page2");
    }, 2000);

    setTimeout(() => {
      history.replaceState({ page: 3 }, "title 3", "/page3");
    }, 3000);

    setTimeout(() => {
      history.back();
    }, 4000);

    setTimeout(() => {
      history.go(1);
    }, 5000);

  script>
body>
html>
```

2. 跑通路由

- createBrowserHistory (https://github.com/ReactTraining/history/blob/master/modules/createBrowserHistory.js)
- createHashHistory.js (https://github.com/ReactTraining/history/blob/master/modules/createHashHistory.js)

```
cnpm i  react-router-dom @types/react-router-dom path-to-regexp -S
```

2.1 src\index.tsx

src\index.tsx

```
import React from 'react';
import ReactDOM from 'react-dom';
import { HashRouter as Router, Route } from 'react-router-dom';
import Home from './components/Home';
import User from './components/User';
import Profile from './components/Profile';
ReactDOM.render(
    <Router>
        <div>
            <Route path="/" component={Home} />
            <Route path="/user" component={User} />
            <Route path="/profile" component={Profile} />
        div>
    Router>
    , document.getElementById('root'));
```

2.2 Home.tsx

src\components\Home.tsx

```
import React, { Component } from 'react';
export default class Home extends Component {
    render() {
        return (
            <div>Homediv>
        )
    }
}
```

2.3 User.tsx

src\components\User.tsx

```tsx
import React, { Component } from 'react';
import { RouteComponentProps } from '../react-router-dom';
interface Params { }
type Props = RouteComponentProps & {

}
export default class User extends Component {
    render() {
        console.log(this.props);
        return (
            <div>Userdiv>
        )
    }
}
```

```
function createBrowserHistory(props = {}) {
    const globalHistory = window.history;
    let listeners = [];
    function createHref(location) {
        let { path, search, hash } = location;
        return path + search + hash;
    }
    function setState(nextState) {
        Object.assign(history, nextState);
        history.length = globalHistory.length;
        listeners.forEach(listener => listener());
    }

    function push(path, state) {
        const action = 'PUSH';
        const location = { state, path };
        globalHistory.pushState(state, null, path);
        setState({ action, location });
    }
    function replace(path, state) {
        const action = 'REPLACE';
        const location = { state, path };
        globalHistory.replaceState(state, null, path);
        setState({ action, location });
    }
    function go(n) {
        globalHistory.go(n);
    }

    function goBack() {
        go(-1);
    }

    function goForward() {
        go(1);
    }
    let isBlocked = false;
    function block(prompt = false) {
        isBlocked = prompt;
    }
    function listen(listener) {
        listeners.push(listener);
    }
    const history = {
        length: globalHistory.length,
        action: 'POP',
        location: { pathname: window.location.pathname, state: globalHistory.state },
        createHref,
        push,
        replace,
        go,
        goBack,
        goForward,
        block,
        listen
    };

    return history;
}

let myHistory = createBrowserHistory();
console.log('myHistory', myHistory);
```

2.4 Profile.tsx

src\components\Profile.tsx

```
import React, { Component } from 'react';
export default class Profile extends Component {
    render() {
        return (
            <div>Profilediv>
        )
    }
}
```

3. 实现路由

3.1 history\index.tsx

src\history\index.tsx

```
export * from './types';
```

3.2 history\types.tsx

src\history\types.tsx

```
export interface Location {
    pathname: string;
    state?: any;
}
export interface History {
    location: Location;
}
```

3.3 react-router-dom\index.tsx

src\react-router-dom\index.tsx

```
import HashRouter from './HashRouter';
import Route from './Route';
export {
    HashRouter,
    Route
}
export * from './types';
```

3.4 react-router-dom\types.tsx

src\react-router-dom\types.tsx

```
import { History } from '../history';
export type Location = History['location'];
export interface ContextValue {
    location?: Location
}
export interface match {
    params: Params;
    isExact: boolean;
    path: string;
    url: string;
}
export interface RouteComponentProps {
    history: History;
    location: Location;
    match: match;
}
```

3.5 react-router-dom\context.tsx

src\react-router-dom\context.tsx

```
import { ContextValue } from './types';
import { createContext } from 'react';
export default createContext({});
```

3.6 HashRouter.tsx

src\react-router-dom\HashRouter.tsx

```
import React, { Component } from 'react'
import Context from './context';
import { ContextValue, Location } from './types';
interface Props { }
interface State {
    location: Location;
}
export default class HashRouter extends Component<Props, State> {
    state = {
        location: {
            pathname: window.location.hash.slice(1),
            state: null
        }
    }
    componentWillMount() {
        window.addEventListener('hashchange', (event: HashChangeEvent) => {
            this.setState({
                location: {
                    ...this.state.location,
                    pathname: window.location.hash.slice(1) || '/'
                }
            });
        });
        window.location.hash = window.location.hash || '/';
    }
    render(): React.ReactNode {
        let value: ContextValue = {
            location: this.state.location
        }
        return (
            <Context.Provider value={value}>
                {this.props.children}
            Context.Provider>
        )
    }
}
```

3.7 Route.tsx

src\react-router-dom\Route.tsx

```
import React, { Component,ComponentType } from 'react';
import RouterContext from './context';
interface Props {
    path: string;
    component: ComponentType
}
export default class Route extends Component<Props> {
    static contextType = RouterContext;
    render() {
        let { path, component: Component } = this.props;
        let pathname = this.context.location.pathname;
        if (pathname.startsWith(path)) {
            return <Component />
        } else {
            return null;
        }
    }
}
```

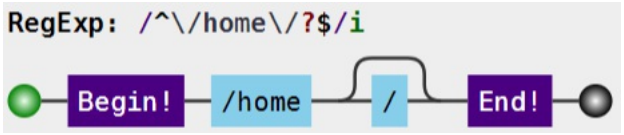
4.path-to-regexp

- path-to-regexp (https://www.npmjs.com/package/path-to-regexp)

- regulex (https://jex.im/regulex)

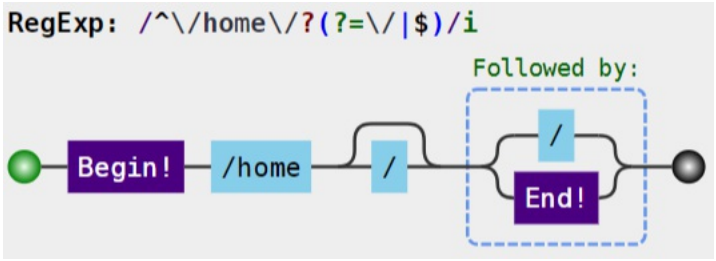
4.1 /home结束

```
let pathToRegExp = require('path-to-regexp');
let regxp = pathToRegExp('/home',[],{end:true});
console.log(regxp);
console.log(regxp.test('/home'));
console.log(regxp.test('/home/2'));
```



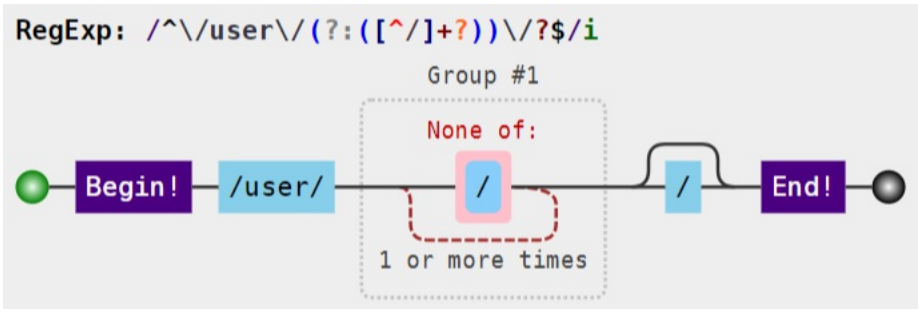
4.2 /home非结束

```
let pathToRegExp = require('path-to-regexp');
let regx2 = pathToRegExp('/home',[],{end:false});
console.log(regx2);
console.log(regx2.test('/home'));
console.log(regx2.test('/home/'));
console.log(regx2.test('/home//'));
console.log(regx2.test('/home/2'));
```



4.3 路径参数

```
let params = [];
let regx3 = pathToRegExp('/user/:id',params,{end:true});
console.log(regx3,params);
```



4.4 正则匹配

表达式 含义 () 表示捕获分组，()会把每个分组里的匹配的值保存起来，使用$n(n是一个数字，表示第n个捕获组的内容) (?:) 表示非捕获分组，和捕获分组唯一的区别在于，非捕获分组匹配的值不会保存起来

- 正则匹配的前瞻就是给正则匹配的选项定义一个断言，或者说是一个条件比如：我要匹配一个字母，但是我的需求是字母后面必须是跟着一个数字的情况，那么这种场景是怎么实现了，就是用到前瞻的概念，那么我想要他的前面也要是一个数字怎么办了，这就是后顾

表达式 含义 (?=pattern) 正向肯定查找(前瞻),后面必须跟着什么 (?!pattern) 正向否定查找(前瞻)，后面不能跟着什么 (?

```
console.log('1a'.match(/\d(?=[a-z])/));
console.log('1@'.match(/\d(?![a-z])/));
console.log('a1'.match(/(?));
console.log('$1'.match(/(?));
```

5.正则匹配

5.1 Route.js

src\react-router-dom\Route.js

```
import React, { Component } from 'react';
import RouterContext from './context';
+import { pathToRegexp } from 'path-to-regexp';
interface Props {
    path: string;
+    exact?: boolean;
    component: ComponentType
}
export default class Route extends Component {
    static contextType = RouterContext;
    render() {
+        let { path="/", component: RouteComponent, exact = false } = this.props;
+        let pathname = this.context.location.pathname;
+        let regxp = pathToRegexp(path, [], { end: exact });
+        let result = pathname.match(regxp);
+        if (result) {
            return
        } else {
            return null;
        }
    }
}
```

6.1 src\index.tsx

src\index.tsx

```
import React from 'react';
import ReactDOM from 'react-dom';
+import { HashRouter as Router, Route, Link } from './react-router-dom';
import Home from './components/Home';
import User from './components/User';
import Profile from './components/Profile';
ReactDOM.render(

+
+                Home
+                User
+                Profile
+
+


    , document.getElementById('root'));
```

6.2 history\types.tsx

src\history\types.tsx

```
export interface Location {
    pathname: string;
    state?: any;
}
export interface History {
    location: Location;
+   push(path: string, state?: any): void;
}
```

6.3 react-router-dom\types.tsx

src\react-router-dom\types.tsx

```
import { History } from '../history';
export type Location = History['location'];
export interface ContextValue {
    location?: Location;
+    history?: History
}
export interface match {
    params: Params;
    isExact: boolean;
    path: string;
    url: string;
}
export interface RouteComponentProps {
    history: History;
    location: Location;
    match?: match;
}
```

src\react-router-dom\Link.tsx

```
import React, { Component } from 'react'
import RouterContext from './context';
import { LocationDescriptor } from '../history';
export interface LinkProps {
    to: LocationDescriptor;
}
export default class Link extends Component<LinkProps> {
    static contextType = RouterContext;
    render() {
        return (
            <a {...this.props} onClick={() => this.context.history.push(this.props.to)}>{this.props.children}a>
        )
    }
}
```

6.5 HashRouter.tsx

src\react-router-dom\HashRouter.tsx

```
import React, { Component } from 'react'
import Context from './context';
import { ContextValue } from './types';
+import { LocationDescriptor, Location } from '../history';
interface Props { }
interface State {
    location: Location;
}
export default class HashRouter extends Component {
    locationState: any
    state = {
        location: {
+            pathname: window.location.hash.slice(1),
+            state: null
        }
    }
    componentWillMount() {
        window.addEventListener('hashchange', (event: HashChangeEvent) => {
            this.setState({
                location: {
                    ...this.state.location,
                    pathname: window.location.hash.slice(1) || '/',
+                    state: this.locationState
                }
            });
        });
        window.location.hash = window.location.hash || '/';
    }
    render(): React.ReactNode {
+        let that = this;
        let value: ContextValue = {
            location: this.state.location,
            history: {
                location: this.state.location,
+                push(to: LocationDescriptor) {
+                    if (typeof to === 'object') {
+                        let { pathname, state } = to;
+                        that.locationState = state;
+                        window.location.hash = pathname!;
+                    } else {
+                        window.location.hash = to;
+                    }
                }
            }
        }
        return (

                {this.props.children}

        )
    }
}
```

7. 引入bootstrap

```
cnpm i bootstrap@3 -S
```

7.1 src\index.tsx

src\index.tsx

```
import React from 'react';
import ReactDOM from 'react-dom';
import { HashRouter as Router, Route, Link } from './react-router-dom';
import Home from './components/Home';
import User from './components/User';
import Profile from './components/Profile';
+import 'bootstrap/dist/css/bootstrap.css';
ReactDOM.render(

+        <>
+
+
+
+                        珠峰架构
+
+
+                        Home
+                        User
+                        Profile
+
+
+
+
+
+
+
+
+
+
+
+        </>

    , document.getElementById('root'));
```

8. Redirect&Switch

8.1 src\index.tsx

src\index.tsx

```
import React from 'react';
import ReactDOM from 'react-dom';
+import { HashRouter as Router, Route, Link, Redirect, Switch } from './react-router-dom';
import Home from './components/Home';
import User from './components/User';
import Profile from './components/Profile';
import 'bootstrap/dist/css/bootstrap.css';
ReactDOM.render(

        <>

                        珠峰架构

                        Home
                        User
                        Profile

+
+
+
+
+
+


        </>

    , document.getElementById('root'));
```

8.2 react-router-dom\index.tsx

src\react-router-dom\index.tsx

```
import HashRouter from './HashRouter';
import Route from './Route';
import Link from './Link';
+import Switch from './Switch';
+import Redirect from './Redirect';
export {
    HashRouter,
    Route,
    Link,
+    Switch,
+    Redirect
}
export * from './types';
```

8.3 Switch.tsx

src\react-router-dom\Switch.tsx

```
import React, { Component } from 'react'
import Context from './context';
import { pathToRegexp } from 'path-to-regexp';
interface Props {
    children: Array
}
export default class Switch extends Component<Props> {
    static contextType = Context;
    render() {
        let pathname = this.context.location.pathname;
        if (this.props.children) {
            for (let i = 0; i < this.props.children.length; i++) {
                let child: JSX.Element = this.props.children[i];
                let { path = '/', component: Component, exact = false } = child.props;
                let regxp = pathToRegexp(path, [], { end: exact });
                let result = pathname.match(regxp);
                if (result) {
                    return child;
                }
            }
        }
        return null;
    }
}
```

8.4 Redirect.tsx

src\react-router-dom\Redirect.tsx

```
import React, { Component } from 'react'
import { LocationDescriptor } from '../history';
interface Props {
    to: LocationDescriptor;
}
export default class  extends Component<Props> {
    static contextType = Context;
    render() {
        this.context.history.push(this.props.to);
        return null;
    }
}
```

9. 路径参数

9.1 User.tsx

src\components\User.tsx

```
import React, { Component } from 'react';
+import { RouteComponentProps, Link, Route } from '../react-router-dom';
+import UserAdd from './UserAdd';
+import UserDetail from './UserDetail';
+import UserList from './UserList';
interface Params { }
type Props = RouteComponentProps & {

}
export default class User extends Component {
    render() {
        return (
+
+
+
+                        用户列表
+                        添加用户
+
+
+
+
+
+
+
+
        )
    }
}

/**
{
    history: H.History;
    location: H.Location;
    match: match;
    staticContext?: C;
}
export interface Location {
    pathname: Pathname;
    search: Search;
    state: S;
    hash: Hash;
    key?: LocationKey;
}
export interface match {
    params: Params;
    isExact: boolean;
    path: string;
    url: string;
}
 */
```

9.2 UserAdd.tsx

src\components\UserAdd.tsx

```
import React, { Component, RefObject } from 'react';
import { RouteComponentProps } from '../react-router-dom';

type Props = RouteComponentProps;
export default class UserAdd extends Component<Props> {
    usernameRef: RefObject
    constructor(props: Props) {
        super(props);
        this.usernameRef = React.createRef();
    }
    handleSubmit = (event: React.FormEvent) => {
        event.preventDefault();
        let username = this.usernameRef.current!.value;
        let usersStr = localStorage.getItem('users');
        let users = usersStr ? JSON.parse(usersStr) : [];
        users.push({ id: Date.now() + '', username });
        localStorage.setItem('users', JSON.stringify(users));
        this.props.history.push('/user/list');
    }
    render() {
        return (
            <form onSubmit={this.handleSubmit}>
                <input className="form-control" type="text" ref={this.usernameRef} />
                <button type="submit" className="btn btn-primary">提交button>
            form>
        )
    }
}
```

9.3 src\types.tsx

src\types.tsx

```
export interface User {
    id?: string;
    username?: string;
}
```

9.4 UserList.tsx

src\components\UserList.tsx

```
import React, { Component } from 'react'
import { Link, RouteComponentProps } from '../react-router-dom';
import { User } from '../types';
type Props = RouteComponentProps;
interface State {
    users: Array
}

export default class UserList extends Component<Props, State> {
    state = { users: [] }
    componentDidMount() {
        let usersStr = localStorage.getItem('users');
        let users: Array = usersStr ? JSON.parse(usersStr) : [];
        this.setState({ users });
    }
    render() {
        return (
            <ul className="list-group">
                {
                    this.state.users.map((user: User, index) => (
                        <li className="list-group-item" key={index}>
                            <Link to={{ pathname: `/user/detail/${user.id}`, state: user }}>{user.username}Link>
                        li>
                    ))
                }
            ul>
        )
    }
}
```

9.5 UserDetail.tsx

src\components\UserDetail.tsx

```
import React, { Component } from 'react';
import { RouteComponentProps } from '../react-router-dom';
import { User } from '../types';
interface Params {
    id: string;
}
type Props = RouteComponentProps & {

}

interface State {
    user: User
}
export default class UserDetail extends Component<Props, State> {
    state = {
        user: {}
    }
    componentDidMount() {
        let user: User = this.props.location.state!;
        if (!user) {
            let usersStr = localStorage.getItem('users');
            let users = usersStr ? JSON.parse(usersStr) : [];
            let id = this.props.match!.params.id;
            user = users.find((user: User) => user.id === id);
        }
        if (user) this.setState({ user });
    }
    render() {
        let user: User = this.state.user;
        return (
            <div>
                {user.id}:{user.username}
            div>
        )
    }
}
```

9.6 history\types.tsx

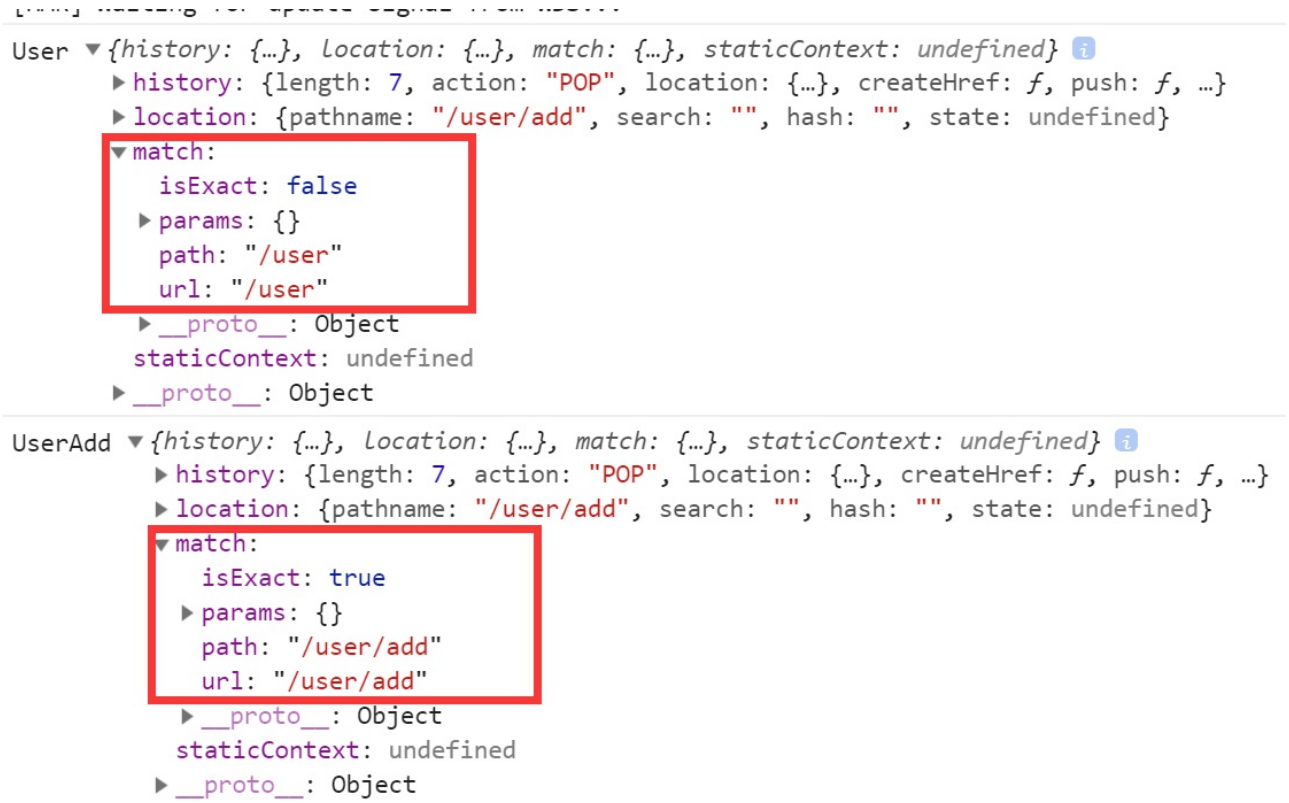
src\history\types.tsx

```
+export interface Location {
+    pathname: string;
+    state?: T;
+}
+export type LocationDescriptor = string | Location;
+export interface History {
+    location: Location;
+    push(pathname: string): void;
+    push(to: Location): void;
+}
```

src\react-router-dom\Link.tsx

```
import React, { Component } from 'react'
import RouterContext from './context';
+import { LocationDescriptor } from '../history';
interface Props {
+    to: LocationDescriptor;
}
export default class Link extends Component {
    static contextType = RouterContext;
    render() {
        return (
             this.context.history.push(this.props.to)}>{this.props.children}
        )
    }
}
```

9.8 Route.tsx



src\react-router-dom\Route.tsx

```
import React, { Component,ComponentType } from 'react';
import RouterContext from './context';
+import { RouteComponentProps, match } from './';
+import { pathToRegexp, Key } from 'path-to-regexp';
interface Props {
    path: string;
    exact?: boolean;
+    component: ComponentType>
}
export default class Route extends Component {
    static contextType = RouterContext;
    render() {
        let { path, component: RouteComponent, exact = false } = this.props;
        let pathname = this.context.location.pathname;
+        let keys: Array = [];
+        let regxp = pathToRegexp(path, keys, { end: exact });
        let result = pathname.match(regxp);
        if (result) {
+            let [url, ...values] = result;
+            let paramNames = keys.map((item: Key) => item.name);
+            let memo: Record = {};
+            //values=['zhufeng',10] paramNames=['name','age']
+            let params = values.reduce((memo: Record, val: string, index: number) => {
+                memo[paramNames[index]] = val;
+                return memo;
+            }, memo);
+            type ParamsType = typeof params;
+            //当路由路径和当前路径成功匹配，会生成一个match对象
+            let matchResult: match = {
+                url,  //URL中匹配到的部分
+                path, //用来的路径正则，取自path属性
+                isExact: pathname === url,//判断匹配到的url是否和完整路径匹配
+                params
+            }
+            let props: RouteComponentProps = {
+                location: this.context.location,
+                history: this.context.history,
+                match: matchResult
+            }
+            return ;
+        }
        return null;
    }
}
```

9.9 react-router-dom\types.tsx #

src\react-router-dom\types.tsx

```
import { Location, History } from '../history';
export interface ContextValue {
    location?: Location;
    history?: History
}
export interface match {
    params: Params;
    isExact: boolean;
    path: string;
    url: string;
}
+export interface RouteComponentProps {
+    history: History;
+    location: Location;
+    match?: match;
+}
```

9.10 Home.tsx

src\components\Home.tsx

```
import React, { Component } from 'react';
+import { RouteComponentProps } from '../react-router-dom';
+type Props = RouteComponentProps;
+export default class Home extends Component {
    render() {
        return (
            Home
        )
    }
}
```

9.11 Profile.tsx

src\components\Profile.tsx

```
import React, { Component } from 'react';
+import { RouteComponentProps } from '../react-router-dom';
+type Props = RouteComponentProps;
+export default class Profile extends Component {
    render() {
        return (
            Profile
        )
    }
}
```

10. 受保护的路由

10.1 src\index.tsx

src\index.tsx

```
import React from 'react';
import ReactDOM from 'react-dom';
import { HashRouter as Router, Route, Link, Redirect, Switch } from './react-router-dom';
import Home from './components/Home';
import User from './components/User';
import Profile from './components/Profile';
+import Protected from './components/Protected';
+import Login from './components/Login';
import 'bootstrap/dist/css/bootstrap.css';
ReactDOM.render(

        <>

                        珠峰架构

                        Home
                        User
                        Profile


+
+


        </>

    , document.getElementById('root'));
```

10.2 Protected.tsx

src\components\Protected.tsx

```
import React from 'react'
import { Route, Redirect } from '../react-router-dom';
interface Props extends Record {
    path: string;
    component: React.ComponentType;
}
export default (props: Props) => {
    let { component: RouteComponent, path } = props;
    return (
        <Route path={path} render={
            (props: any) => (
                localStorage.getItem('logined') ? <RouteComponent {...props} /> : <Redirect to={{ pathname: '/login', state: { from: props.location.pathname }
}} />
            )
        } />
    )
}
```

10.3 Login.tsx

src\components\Login.tsx

```
import React, { Component } from 'react';
import { RouteComponentProps } from '../react-router-dom';
type Props = RouteComponentProps;
export default class Login extends Component<Props> {
    handleClick = () => {
        localStorage.setItem('logined', 'true');
        if (this.props.location.state)
            this.props.history.push(this.props.location.state.from);
    }
    render() {
        return (
            <button className="btn btn-primary" onClick={this.handleClick}>登录button>
        )
    }
}
```

10.4 Route.tsx

src\react-router-dom\Route.tsx

```
import React, { Component, ComponentType } from 'react';
import RouterContext from './context';
import { RouteComponentProps, match } from './';
import { pathToRegexp, Key } from 'path-to-regexp';
interface Props {
    path?: string;
    exact?: boolean;
    component?: ComponentType>;
+   render?: (props: any) => React.ReactNode
}
export default class Route extends Component {
    static contextType = RouterContext;
    render() {
+        let { path="/", component: RouteComponent, exact = false, render } = this.props;
        let pathname = this.context.location.pathname;
        let keys: Array = [];
        let regxp = pathToRegexp(path, keys, { end: exact });
        let result = pathname.match(regxp);
        if (result) {
            let [url, ...values] = result;
            let paramNames = keys.map((item: Key) => item.name);
            let memo: Record = {};
            let params = values.reduce((memo: Record, val: string, index: number) => {
                memo[paramNames[index]] = val;
                return memo;
            }, memo);
            type ParamsType = typeof params;
            let matchResult: match = {
                url: pathname,
                isExact: pathname
                path,
                params
            }

            let props: RouteComponentProps = {
                location: this.context.location,
                history: this.context.history,
                match: matchResult
            }
+            if (RouteComponent)
+                return ;
+            else if (render) {
+                return render(props);
+            } else {
+                return null;
+            }
        }
        return null;
    }
}
```

11. 自定义导航

11.1 src\index.tsx

src\index.tsx

```
import React from 'react';
import ReactDOM from 'react-dom';
+import { HashRouter as Router, Route, MenuLink, Redirect, Switch } from './react-router-dom';
import Home from './components/Home';
import User from './components/User';
import Profile from './components/Profile';
import Protected from './components/Protected';
import Login from './components/Login';
import 'bootstrap/dist/css/bootstrap.css';
ReactDOM.render(

        <>

                        珠峰架构

+                        Home
+                        User
+                        Profile

        </>

    , document.getElementById('root'));
```

11.2 react-router-dom\index.tsx

src\react-router-dom\index.tsx

```
import HashRouter from './HashRouter';
import Route from './Route';
import Link from './Link';
import Switch from './Switch';
import Redirect from './Redirect';
+import MenuLink from './MenuLink';
export {
    HashRouter,
    Route,
    Link,
    Switch,
    Redirect,
+   MenuLink
}
export * from './types';
```

src\react-router-dom\MenuLink.tsx

```
import React from 'react'
import { Route, Link } from '.';
import './MenuLink.css';
import { LocationDescriptor } from '../history';
import { match } from '.';
interface Props {
    to: LocationDescriptor,
    exact?: boolean;
    children?: React.ReactNode
}
export default (props: Props) => {
    let { to, exact, children } = props;
    return  (
                {children}
            )
        }
    />
}
```

src\react-router-dom\MenuLink.css

```
.navbar-inverse .navbar-nav > li > .active{
    background-color: green;
    color:red;
}
```

12. withRouter

12.1 src\index.tsx

```
import React from 'react';
import ReactDOM from 'react-dom';
import { HashRouter as Router, Route, MenuLink, Redirect, Switch } from './react-router-dom';
import Home from './components/Home';
import User from './components/User';
import Profile from './components/Profile';
import Protected from './components/Protected';
import Login from './components/Login';
+import NavHeader from './components/NavHeader';
import 'bootstrap/dist/css/bootstrap.css';
ReactDOM.render(

        <>

+

                        Home
                        User
                        Profile

        </>

    , document.getElementById('root'));
```

src\components\NavHeader.tsx

```
import React from 'react';
import { RouteComponentProps } from '../react-router-dom';
import { withRouter } from '../react-router-dom';

interface NavHeaderProps {
    title: string;
}

class NavHeader extends React.Component<RouteComponentProps & NavHeaderProps> {
    render() {
        return (
            <div className="navbar-header">
                <div
                    onClick={(event: React.MouseEvent) => this.props.history.push('/')}
                    className="navbar-brand">{this.props.title}div>
            div>
        )
    }
}
export default withRouter(NavHeader);
```

12.3 withRouter.tsx

src\react-router-dom\withRouter.tsx

```
import React from 'react';
import { Route, RouteComponentProps } from './';
export default function <NavHeaderProps>(OldComponent: React.ComponentType) {
    return (props: NavHeaderProps) => (
        <Route render={
            (routeProps: RouteComponentProps) => <OldComponent {...props} {...routeProps} />
        } />
    )
}
```

12.4 react-router-dom\index.tsx

src\react-router-dom\index.tsx

```
import HashRouter from './HashRouter';
import Route from './Route';
import Link from './Link';
import Switch from './Switch';
import Redirect from './Redirect';
import MenuLink from './MenuLink';
+import withRouter from './withRouter';
export {
    HashRouter,
    Route,
    Link,
    Switch,
    Redirect,
    MenuLink,
+    withRouter
}
export * from './types';
```

13. 阻止跳转

13.1 UserAdd.tsx

src\components\UserAdd.tsx

```
import React, { Component, RefObject } from 'react';
+import { RouteComponentProps, Prompt } from '../react-router-dom';
type Props = RouteComponentProps;
+interface State {
+    isBlocking: boolean;
+}
+export default class UserAdd extends Component {
+    state = {
+        isBlocking: false
+    }
    usernameRef: RefObject
    constructor(props: Props) {
        super(props);
        this.usernameRef = React.createRef();
    }
    handleSubmit = (event: React.FormEvent) => {
        event.preventDefault();
+        this.setState({
+            isBlocking: false
+        }, () => {
+            let username = this.usernameRef.current!.value;
+            let usersStr = localStorage.getItem('users');
+            let users = usersStr ? JSON.parse(usersStr) : [];
+            users.push({ id: Date.now() + '', username });
+            localStorage.setItem('users', JSON.stringify(users));
+            this.props.history.push('/user/list');
+        })

    }
    render() {
+        let { isBlocking } = this.state;
        return (

+
+                    when={isBlocking}
+                    message={location => `你确定要跳转到${location.pathname}吗? `}
+                />
+                ) => {
+                    this.setState({ isBlocking: event.target.value.length > 0 });
+                }} />
                提交

        )
    }
}
```

13.2 history\types.tsx

src\history\types.tsx

```
+import { Message } from '../react-router-dom';
export interface Location {
    pathname: string;
    state?: T;
}

export type LocationDescriptor = string | Location;
export interface History {
    push(pathname: string): void;
    push(to: Location): void;
+   message:Message | null
+   block(message: Message | null): void;
}
```

13.3 react-router-dom\types.tsx

src\react-router-dom\types.tsx

```
import { Location, History } from '../history';
export interface ContextValue {
    location?: Location;
    history?: History
}
export interface match {
    params: Params;
    isExact: boolean;
    path: string;
    url: string;
}
export interface RouteComponentProps {
    history: History;
    location: Location;
    match?: match;
}
+export interface Message {
+    (location: Location): string
+}
```

13.4 react-router-dom\Prompt.tsx

src\react-router-dom\Prompt.tsx

```
import React from 'react'
import RouterContext from './context';
import { History } from '../history';
import { Message } from './';
interface Props {
    when: boolean;
    message: Message;
}
export default class Prompt extends React.Component<Props> {
    static contextType = RouterContext;
    history: History
    componentWillUnmount() {
        this.history.block(null);
    }
    render() {
        this.history = this.context.history;
        const { when, message } = this.props;
        if (when) {
            this.history.block(message);
        } else {
            this.history.block(null);
        }
        return null;
    }
}
```

13.5 react-router-dom\HashRouter.tsx

src\react-router-dom\HashRouter.tsx

```
import React, { Component } from 'react'
import Context from './context';
import { ContextValue } from './types';
import { LocationDescriptor, Location } from '../history';
import { Message } from './';
interface Props { }
interface State {
    location: Location;
}
export default class HashRouter extends Component {
    locationState: any
    prompt: Message | null
    state = {
        location: {
            pathname: window.location.hash.slice(1),
            state: null
        }
    }
    componentWillMount() {
        window.addEventListener('hashchange', (event: HashChangeEvent) => {
            this.setState({
                location: {
                    ...this.state.location,
                    pathname: window.location.hash.slice(1) || '/',
                    state: this.locationState
                }
            });
        });
        window.location.hash = window.location.hash || '/';
    }
    render(): React.ReactNode {
        let that = this;
        let value: ContextValue = {
            location: this.state.location,
            history: {
                push(to: LocationDescriptor) {
+                   if (that.prompt) {
+                     let allow = window.confirm(that.prompt(typeof to === 'object' ? to as Location : { pathname: to }));
+                     if (!allow) return;
+                    }
                    if (typeof to
                        let { pathname, state } = to;
                        that.locationState = state;
                        window.location.hash = pathname!;
                    } else {
                        window.location.hash = to;
                    }
                },
+            prompt : null,
+            block(prompt : Message | null) {
+                that.prompt  = prompt ;
+            }
            }
        }
        return (

                {this.props.children}

        )
    }
}
```

13.6 react-router-dom\index.tsx

src\react-router-dom\index.tsx

```
import HashRouter from './HashRouter';
import Route from './Route';
import Link from './Link';
import Switch from './Switch';
import Redirect from './Redirect';
import MenuLink from './MenuLink';
import withRouter from './withRouter';
+import Prompt from './Prompt';
export {
    HashRouter,
    Route,
    Link,
    Switch,
    Redirect,
    MenuLink,
    withRouter,
+    Prompt
}
export * from './types';
```

14. BrowserRouter

14.1 public\index.html

public\index.html

```
  React App
+  </span>
<span class="hljs-addition">+    (function (history) {</span>
<span class="hljs-addition">+      var pushState = history.pushState;</span>
<span class="hljs-addition">+      history.pushState = function (state, title, pathname) {</span>
<span class="hljs-addition">+        if (typeof window.onpushstate == "function") {</span>
<span class="hljs-addition">+          window.onpushstate(state, pathname);</span>
<span class="hljs-addition">+        }</span>
<span class="hljs-addition">+        return pushState.apply(history, arguments);</span>
<span class="hljs-addition">+      };</span>
<span class="hljs-addition">+    })(window.history);</span>
<span class="hljs-addition">+
```

14.2 src\index.tsx

src\index.tsx

```
import ReactDOM from 'react-dom';
+import { BrowserRouter as Router, Route, MenuLink, Redirect, Switch } from './react-router-dom';
import Home from './components/Home';
```

14.3 BrowserRouter.tsx

src\react-router-dom\BrowserRouter.tsx

```
import React, { Component } from 'react'
import Context from './context';
import { Message } from './';
import { LocationDescriptor, Location } from '../history';
declare global {
    interface Window {
        onpushstate: (state: any, pathname: string) => void;
    }
}

export default class BrowserRouter extends Component {
    state = {
        location: { pathname: '/' }
    }
    message: Message | null
    componentDidMount() {
        window.onpopstate = (event: PopStateEvent) => {
            this.setState({
                location: {
                    ...this.state.location,
                    pathname: document.location.pathname,
                    state: event.state
                }
            });
        };
        window.onpushstate = (state: any, pathname: string) => {
            this.setState({
                location: {
                    ...this.state.location,
                    pathname,
                    state
                }
            });
        };
    }
    render() {
        let that = this;
        let value = {
            location: that.state.location,
            history: {
                push(to: LocationDescriptor) {
                    if (that.message) {
                        let allow = window.confirm(that.message(typeof to == 'object' ? to : { pathname: to }));
                        if (!allow) return;
                    }
                    if (typeof to === 'object') {
                        let { pathname, state } = to;
                        window.history.pushState(state, '', pathname);
                    } else {
                        window.history.pushState('', '', to);
                    }
                },
                block(message: Message) {
                    that.message = message;
                }
            }
        }
        return (
            <Context.Provider value={value}>
                {this.props.children}
            Context.Provider>
        )
    }
}
```

14.4 react-router-dom\index.tsx

src\react-router-dom\index.tsx

```
import HashRouter from './HashRouter';
import Route from './Route';
import Link from './Link';
import Switch from './Switch';
import Redirect from './Redirect';
import MenuLink from './MenuLink';
import withRouter from './withRouter';
import Prompt from './Prompt';
+import BrowserRouter from './BrowserRouter';
export {
    HashRouter,
    Route,
    Link,
    Switch,
    Redirect,
    MenuLink,
    withRouter,
    Prompt,
+    BrowserRouter
}
export * from './types';
```

参考

可选参数

```
let express = require("express");
let app = express();

let reg = /^\/member\/([^\/]+?)?(?:\/([^\/]+?))?\/?$/;
app.get(reg, (req, res) => {
    res.json({ path: req.params[0], tag: req.params[1] });
});
app.listen(9999);
```