Installation

Direct Download / CDN

https://unpkg.com/vue-router/dist/vue-router.js

Unpkg.com provides npm-based CDN links. The above link will always point to the latest release on npm. You can also use a specific version/tag via URLs like `https://unpkg.com/vue-router@2.0.0/dist/vue-router.js`.

Include `vue-router` after Vue and it will install itself automatically:

```
<script src="/path/to/vue.js"></script>
<script src="/path/to/vue-router.js"></script>
```

npm

```
npm install vue-router
```

When used with a module system, you must explicitly install the router via `Vue.use()`:

```
import Vue from 'vue'
import VueRouter from 'vue-router'

Vue.use(VueRouter)
```

You don't need to do this when using global script tags.

Dev Build

You will have to clone directly from GitHub and build `vue-router` yourself if you want to use the latest dev build.

```
git clone https://github.com/vuejs/vue-router.git node_modules/vue-router
cd node_modules/vue-router
npm install
npm run build
```

Introduction

> **VERSION NOTE**
> For TypeScript users, `vue-router@3.0+` requires `vue@2.5+`, and vice versa.

Watch a free video course about Vue Router on Vue School

Vue Router is the official router for Vue.js. It deeply integrates with Vue.js core to make building Single Page Applications with Vue.js a breeze. Features include:

- Nested route/view mapping
- Modular, component-based router configuration
- Route params, query, wildcards
- View transition effects powered by Vue.js' transition system
- Fine-grained navigation control
- Links with automatic active CSS classes
- HTML5 history mode or hash mode, with auto-fallback in IE9
- Customizable Scroll Behavior

Get started or play with the examples (see `README.md` to run them).

Getting Started

> **Note**
> We will be using ES2015 in the code samples in the guide.
>
> Also, all examples will be using the full version of Vue to make on-the-fly template compilation possible. See more details here.

Watch a free video course about Vue Router on Vue School

Creating a Single-page Application with Vue + Vue Router is dead simple. With Vue.js, we are already composing our application with components. When adding Vue Router to the mix, all we need to do is map our components to the routes and let Vue Router know where to render them. Here's a basic example:

HTML

```
<script src="https://unpkg.com/vue/dist/vue.js"></script>
<script src="https://unpkg.com/vue-router/dist/vue-router.js"></script>

<div id="app">
  <h1>Hello App!</h1>
  <p>
    <!-- use router-link component for navigation. -->
    <!-- specify the link by passing the `to` prop. -->
    <!-- `<router-link>` will be rendered as an `<a>` tag by default -->
    <router-link to="/foo">Go to Foo</router-link>
    <router-link to="/bar">Go to Bar</router-link>
```

```
  </p>
  <!-- route outlet -->
  <!-- component matched by the route will render here -->
  <router-view></router-view>
</div>
```

JavaScript

```
// 0. If using a module system (e.g. via vue-cli), import Vue and VueRouter
// and then call `Vue.use(VueRouter)`.

// 1. Define route components.
// These can be imported from other files
const Foo = { template: '<div>foo</div>' }
const Bar = { template: '<div>bar</div>' }

// 2. Define some routes
// Each route should map to a component. The "component" can
// either be an actual component constructor created via
// `Vue.extend()`, or just a component options object.
// We'll talk about nested routes later.
const routes = [
  { path: '/foo', component: Foo },
  { path: '/bar', component: Bar }
]

// 3. Create the router instance and pass the `routes` option
// You can pass in additional options here, but let's
// keep it simple for now.
const router = new VueRouter({
  routes // short for `routes: routes`
})

// 4. Create and mount the root instance.
// Make sure to inject the router with the router option to make the
// whole app router-aware.
const app = new Vue({
  router
}).$mount('#app')

// Now the app has started!
```

By injecting the router, we get access to it as `this.$router` as well as the current route as `this.$route` inside of any component:

```
// Home.vue
export default {
  computed: {
    username() {
```

```
      // We will see what `params` is shortly
      return this.$route.params.username
    }
  },
  methods: {
    goBack() {
      window.history.length > 1 ? this.$router.go(-1) : this.$router.push('/')
    }
  }
}
```

Throughout the docs, we will often use the `router` instance. Keep in mind that `this.$router` is exactly the same as using `router`. The reason we use `this.$router` is because we don't want to import the router in every single component that needs to manipulate routing.

You can also check out this example live.

Notice that a `<router-link>` automatically gets the `.router-link-active` class when its target route is matched. You can learn more about it in its API reference.

Dynamic Route Matching

Learn how to match dynamic routes with a free lesson on Vue School

Very often we will need to map routes with the given pattern to the same component. For example we may have a `User` component which should be rendered for all users but with different user IDs. In `vue-router` we can use a dynamic segment in the path to achieve that:

```
const User = {
  template: '<div>User</div>'
}

const router = new VueRouter({
  routes: [
    // dynamic segments start with a colon
    { path: '/user/:id', component: User }
  ]
})
```

Now URLs like `/user/foo` and `/user/bar` will both map to the same route.

A dynamic segment is denoted by a colon `:`. When a route is matched, the value of the dynamic segments will be exposed as `this.$route.params` in every component. Therefore, we can render the current user ID by updating `User`'s template to this:

```
const User = {
  template: '<div>User {{ $route.params.id }}</div>'
}
```

You can check out a live example here.

You can have multiple dynamic segments in the same route, and they will map to corresponding fields on `$route.params`. Examples:

pattern	matched path	$route.params
/user/:username	/user/evan	`{ username: 'evan' }`
/user/:username/post/:post_id	/user/evan/post/123	`{ username: 'evan', post_id: '123' }`

In addition to `$route.params`, the `$route` object also exposes other useful information such as `$route.query` (if there is a query in the URL), `$route.hash`, etc. You can check out the full details in the API Reference.

Reacting to Params Changes

One thing to note when using routes with params is that when the user navigates from `/user/foo` to `/user/bar`, **the same component instance will be reused**. Since both routes render the same component, this is more efficient than destroying the old instance and then creating a new one. **However, this also means that the lifecycle hooks of the component will not be called**.

To react to params changes in the same component, you can simply watch the `$route` object:

```
const User = {
  template: '...',
  watch: {
    $route(to, from) {
      // react to route changes...
    }
  }
}
```

Or, use the `beforeRouteUpdate` navigation guard introduced in 2.2:

```
const User = {
  template: '...',
  beforeRouteUpdate (to, from, next) {
    // react to route changes...
    // don't forget to call next()
  }
}
```

Catch all / 404 Not found Route

Regular params will only match characters in between url fragments, separated by `/`. If we want to match **anything**, we can use the asterisk (`*`):

```
{
  // will match everything
  path: '*'
}
{
  // will match anything starting with `/user-`
  path: '/user-*'
}
```

When using *asterisk* routes, make sure to correctly order your routes so that *asterisk* ones are at the end. The route `{ path: '*' }` is usually used to 404 client side. If you are using *History mode*, make sure to correctly configure your server as well.

When using an *asterisk*, a param named `pathMatch` is automatically added to `$route.params`. It contains the rest of the url matched by the *asterisk*:

```
// Given a route { path: '/user-*' }
this.$router.push('/user-admin')
this.$route.params.pathMatch // 'admin'

// Given a route { path: '*' }
this.$router.push('/non-existing')
this.$route.params.pathMatch // '/non-existing'
```

Advanced Matching Patterns

`vue-router` uses path-to-regexp as its path matching engine, so it supports many advanced matching patterns such as optional dynamic segments, zero or more / one or more requirements, and even custom regex patterns. Check out its documentation for these advanced patterns, and this example of using them in `vue-router`.

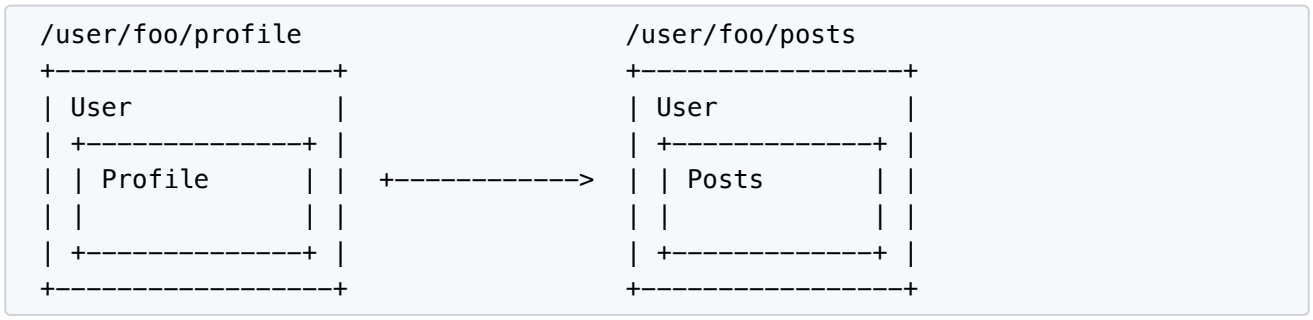
Matching Priority

Sometimes the same URL may be matched by multiple routes. In such a case the matching priority is determined by the order of route definition: the earlier a route is defined, the higher priority it gets.

Nested Routes

Learn how to work with nested routes with a free lesson on Vue School

Real app UIs are usually composed of components that are nested multiple levels deep. It is also very common that the segments of a URL corresponds to a certain structure of nested components, for example:



With `vue-router`, it is very simple to express this relationship using nested route configurations.

Given the app we created in the last chapter:

```
<div id="app">
  <router-view></router-view>
</div>
```

```
const User = {
  template: '<div>User {{ $route.params.id }}</div>'
}

const router = new VueRouter({
  routes: [
    { path: '/user/:id', component: User }
  ]
})
```

The `<router-view>` here is a top-level outlet. It renders the component matched by a top level route. Similarly, a rendered component can also contain its own, nested `<router-view>`. For example, if we add one inside the `User` component's template:

```
const User = {
  template: `
    <div class="user">
      <h2>User {{ $route.params.id }}</h2>
      <router-view></router-view>
    </div>
  `
}
```

To render components into this nested outlet, we need to use the `children` option in `VueRouter` constructor config:

```
const router = new VueRouter({
  routes: [
    { path: '/user/:id', component: User,
      children: [
        {
          // UserProfile will be rendered inside User's <router-view>
          // when /user/:id/profile is matched
          path: 'profile',
          component: UserProfile
        },
        {
          // UserPosts will be rendered inside User's <router-view>
          // when /user/:id/posts is matched
          path: 'posts',
          component: UserPosts
        }
      ]
    }
  ]
})
```

Note that nested paths that start with `/` will be treated as a root path. This allows you to leverage the component nesting without having to use a nested URL.

As you can see the `children` option is just another Array of route configuration objects like `routes` itself. Therefore, you can keep nesting views as much as you need.

At this point, with the above configuration, when you visit `/user/foo`, nothing will be rendered inside `User`'s outlet, because no sub route is matched. Maybe you do want to render something there. In such case you can provide an empty subroute path:

```
const router = new VueRouter({
  routes: [
    {
      path: '/user/:id', component: User,
      children: [
        // UserHome will be rendered inside User's <router-view>
        // when /user/:id is matched
        { path: '', component: UserHome },

        // ...other sub routes
      ]
    }
  ]
})
```

A working demo of this example can be found here.

Programmatic Navigation

Aside from using `<router-link>` to create anchor tags for declarative navigation, we can do this programmatically using the router's instance methods.

`router.push(location, onComplete?, onAbort?)`

Note: Inside of a Vue instance, you have access to the router instance as `$router`. You can therefore call `this.$router.push`.

To navigate to a different URL, use `router.push`. This method pushes a new entry into the history stack, so when the user clicks the browser back button they will be taken to the previous URL.

This is the method called internally when you click a `<router-link>`, so clicking `<router-link :to="...">` is the equivalent of calling `router.push(...)`.

Declarative	Programmatic
`<router-link :to="...">`	`router.push(...)`

The argument can be a string path, or a location descriptor object. Examples:

```
// literal string path
router.push('home')

// object
router.push({ path: 'home' })

// named route
router.push({ name: 'user', params: { userId: '123' } })

// with query, resulting in /register?plan=private
router.push({ path: 'register', query: { plan: 'private' } })
```

Note: `params` are ignored if a `path` is provided, which is not the case for `query`, as shown in the example above. Instead, you need to provide the `name` of the route or manually specify the whole `path` with any parameter:

```
const userId = '123'
router.push({ name: 'user', params: { userId } }) // -> /user/123
router.push({ path: `/user/${userId}` }) // -> /user/123
// This will NOT work
router.push({ path: '/user', params: { userId } }) // -> /user
```

The same rules apply for the `to` property of the `router-link` component.

In 2.2.0+, optionally provide `onComplete` and `onAbort` callbacks to `router.push` or `router.replace` as the 2nd and 3rd arguments. These callbacks will be called when the navigation either successfully completed (after all async hooks are resolved), or aborted (navigated to the same route, or to a different route before current navigation has finished), respectively.
In 3.1.0+, you can omit the 2nd and 3rd parameter and `router.push` / `router.replace` will return a promise instead if Promises are supported.

Note: If the destination is the same as the current route and only params are changing (e.g. going from one profile to another `/users/1` -> `/users/2`), you will have to use `beforeRouteUpdate` to react to changes (e.g. fetching the user information).

`router.replace(location, onComplete?, onAbort?)`

It acts like `router.push`, the only difference is that it navigates without pushing a new history entry, as its name suggests - it replaces the current entry.

Declarative	Programmatic
`<router-link :to="..." replace>`	`router.replace(...)`

`router.go(n)`

This method takes a single integer as parameter that indicates by how many steps to go forwards or go backwards in the history stack, similar to `window.history.go(n)`.

Examples

```
// go forward by one record, the same as history.forward()
router.go(1)

// go back by one record, the same as history.back()
router.go(-1)

// go forward by 3 records
router.go(3)

// fails silently if there aren't that many records.
router.go(-100)
router.go(100)
```

History Manipulation

You may have noticed that `router.push`, `router.replace` and `router.go` are counterparts of `window.history.pushState`, `window.history.replaceState` and `window.history.go`, and they do imitate the `window.history` APIs.

Therefore, if you are already familiar with Browser History APIs, manipulating history will be super easy with Vue Router.

It is worth mentioning that Vue Router navigation methods (`push` , `replace` , `go`) work consistently in all router modes (`history` , `hash` and `abstract`).

Named Routes

Learn how to use named routes and params with a free lesson on Vue School
Sometimes it is more convenient to identify a route with a name, especially when linking to a route or performing navigations. You can give a route a name in the `routes` options while creating the Router instance:

```
const router = new VueRouter({
  routes: [
    {
      path: '/user/:userId',
      name: 'user',
      component: User
    }
  ]
})
```

To link to a named route, you can pass an object to the `router-link` component's `to` prop:

```
<router-link :to="{ name: 'user', params: { userId: 123 }}">User</router-link>
```

This is the exact same object used programmatically with `router.push()` :

```
router.push({ name: 'user', params: { userId: 123 }})
```

In both cases, the router will navigate to the path `/user/123` .

Full example here.

Named Views

Sometimes you need to display multiple views at the same time instead of nesting them, e.g. creating a layout with a `sidebar` view and a `main` view. This is where named views come in handy. Instead of having one single outlet in your view, you can have multiple and give each of them a name. A `router-view` without a name will be given `default` as its name.

```
<router-view class="view one"></router-view>
<router-view class="view two" name="a"></router-view>
<router-view class="view three" name="b"></router-view>
```

A view is rendered by using a component, therefore multiple views require multiple components for the same route. Make sure to use the `components` (with an s) option:

```
const router = new VueRouter({
  routes: [
    {
      path: '/',
      components: {
        default: Foo,
        a: Bar,
        b: Baz
      }
    }
  ]
})
```

A working demo of this example can be found here.

Nested Named Views

It is possible to create complex layouts using named views with nested views. When doing so, you will also need to name nested `router-view` components used. Let's take a Settings panel example:

```
/settings/emails                                       /settings/profile
+-----------------------------------+                  +-----------------------
------+
| UserSettings                      |                  | UserSettings
      |
| +-----+-------------------------+ |                  | +-----+---------------
----+ |
| | Nav | UserEmailsSubscriptions | |  +------------>  | | Nav | UserProfile
   | |
| |     +-------------------------+ |                  | |     +---------------
----+ |
| |     |                         | |                  | |     |
UserProfilePreview | |
| +-----+-------------------------+ |                  | +-----+---------------
----+ |
+-----------------------------------+                  +-----------------------
------+
```

- `Nav` is just a regular component
- `UserSettings` is the view component

- `UserEmailsSubscriptions`, `UserProfile`, `UserProfilePreview` are nested view components

Note: *Let's forget about how the HTML/CSS should look like to represent such layout and focus on the components used.*

The `<template>` section for `UserSettings` component in the above layout would look something like this:

```
<!-- UserSettings.vue -->
<div>
  <h1>User Settings</h1>
  <NavBar/>
  <router-view/>
  <router-view name="helper"/>
</div>
```

The nested view components are omitted here but you can find the complete source code for the example above here.

Then you can achieve the layout above with this route configuration:

```
{
  path: '/settings',
  // You could also have named views at the top
  component: UserSettings,
  children: [{
    path: 'emails',
    component: UserEmailsSubscriptions
  }, {
    path: 'profile',
    components: {
      default: UserProfile,
      helper: UserProfilePreview
    }
  }]
}
```

A working demo of this example can be found here.

Redirect and Alias

Redirect

Redirecting is also done in the `routes` configuration. To redirect from `/a` to `/b`:

```
const router = new VueRouter({
  routes: [
    { path: '/a', redirect: '/b' }
  ]
})
```

The redirect can also be targeting a named route:

```
const router = new VueRouter({
  routes: [
    { path: '/a', redirect: { name: 'foo' }}
  ]
})
```

Or even use a function for dynamic redirecting:

```
const router = new VueRouter({
  routes: [
    { path: '/a', redirect: to => {
      // the function receives the target route as the argument
      // return redirect path/location here.
    }}
  ]
})
```

Note that Navigation Guards are not applied on the route that redirects, only on its target. In the example below, adding a `beforeEnter` guard to the `/a` route would not have any effect.

For other advanced usage, checkout the example.

Alias

A redirect means when the user visits `/a`, the URL will be replaced by `/b`, and then matched as `/b`. But what is an alias?

An alias of `/a` as `/b` means when the user visits `/b`, the URL remains `/b`, but it will be matched as if the user is visiting `/a`.

The above can be expressed in the route configuration as:

```
const router = new VueRouter({
  routes: [
    { path: '/a', component: A, alias: '/b' }
  ]
})
```

An alias gives you the freedom to map a UI structure to an arbitrary URL, instead of being constrained by the configuration's nesting structure.

For advanced usage, check out the example.

Passing Props to Route Components

Learn how to pass props to route components with a free lesson on Vue School
Using `$route` in your component creates a tight coupling with the route which limits the flexibility of the component as it can only be used on certain URLs.

To decouple this component from the router use option `props` :

Instead of coupling to `$route` :

```
const User = {
  template: '<div>User {{ $route.params.id }}</div>'
}
const router = new VueRouter({
  routes: [
    { path: '/user/:id', component: User }
  ]
})
```

Decouple it by using `props`

```
const User = {
  props: ['id'],
  template: '<div>User {{ id }}</div>'
}
const router = new VueRouter({
  routes: [
    { path: '/user/:id', component: User, props: true },

    // for routes with named views, you have to define the `props` option for
each named view:
    {
      path: '/user/:id',
      components: { default: User, sidebar: Sidebar },
      props: { default: true, sidebar: false }
    }
  ]
})
```

This allows you to use the component anywhere, which makes the component easier to reuse and test.

Boolean mode

When `props` is set to `true`, the `route.params` will be set as the component props.

Object mode

When `props` is an object, this will be set as the component props as-is. Useful for when the props are static.

```
const router = new VueRouter({
  routes: [
    { path: '/promotion/from-newsletter', component: Promotion, props: {
newsletterPopup: false } }
  ]
})
```

Function mode

You can create a function that returns props. This allows you to cast parameters into other types, combine static values with route-based values, etc.

```
const router = new VueRouter({
  routes: [
    { path: '/search', component: SearchUser, props: (route) => ({ query:
route.query.q }) }
  ]
})
```

The URL `/search?q=vue` would pass `{query: 'vue'}` as props to the `SearchUser` component.

Try to keep the `props` function stateless, as it's only evaluated on route changes. Use a wrapper component if you need state to define the props, that way vue can react to state changes.

For advanced usage, check out the example.

HTML5 History Mode

The default mode for `vue-router` is *hash mode* - it uses the URL hash to simulate a full URL so that the page won't be reloaded when the URL changes.

To get rid of the hash, we can use the router's **history mode**, which leverages the `history.pushState` API to achieve URL navigation without a page reload:

```
const router = new VueRouter({
  mode: 'history',
  routes: [...]
})
```

When using history mode, the URL will look "normal," e.g. `http://oursite.com/user/id`. Beautiful!

Here comes a problem, though: Since our app is a single page client side app, without a proper server configuration, the users will get a 404 error if they access `http://oursite.com/user/id` directly in their browser. Now that's ugly.

Not to worry: To fix the issue, all you need to do is add a simple catch-all fallback route to your server. If the URL doesn't match any static assets, it should serve the same `index.html` page that your app lives in. Beautiful, again!

Example Server Configurations

Note: The following examples assume you are serving your app from the root folder. If you deploy to a subfolder, you should use the `publicPath` option of Vue CLI and the related `base` property of the router. You also need to adjust the examples below to use the subfolder instead of the root folder (e.g. replacing `RewriteBase /` with `RewriteBase /name-of-your-subfolder/`).

Apache

```
<IfModule mod_rewrite.c>
  RewriteEngine On
  RewriteBase /
  RewriteRule ^index\.html$ - [L]
  RewriteCond %{REQUEST_FILENAME} !-f
  RewriteCond %{REQUEST_FILENAME} !-d
  RewriteRule . /index.html [L]
</IfModule>
```

Instead of `mod_rewrite`, you could also use `FallbackResource`.

nginx

```
location / {
  try_files $uri $uri/ /index.html;
}
```

Native Node.js

```
const http = require('http')
const fs = require('fs')
const httpPort = 80
```

```
http.createServer((req, res) => {
  fs.readFile('index.htm', 'utf-8', (err, content) => {
    if (err) {
      console.log('We cannot open "index.htm" file.')
    }

    res.writeHead(200, {
      'Content-Type': 'text/html; charset=utf-8'
    })

    res.end(content)
  })
}).listen(httpPort, () => {
  console.log('Server listening on: http://localhost:%s', httpPort)
})
```

Express with Node.js

For Node.js/Express, consider using connect-history-api-fallback middleware.

Internet Information Services (IIS)

1. Install IIS UrlRewrite
2. Create a `web.config` file in the root directory of your site with the following:

```
<?xml version="1.0" encoding="UTF-8"?>
<configuration>
  <system.webServer>
    <rewrite>
      <rules>
        <rule name="Handle History Mode and custom 404/500"
stopProcessing="true">
          <match url="(.*)" />
          <conditions logicalGrouping="MatchAll">
            <add input="{REQUEST_FILENAME}" matchType="IsFile" negate="true" />
            <add input="{REQUEST_FILENAME}" matchType="IsDirectory"
negate="true" />
          </conditions>
          <action type="Rewrite" url="/" />
        </rule>
      </rules>
    </rewrite>
  </system.webServer>
</configuration>
```

Caddy

```
rewrite {
    regexp .*
    to {path} /
}
```

Firebase hosting

Add this to your `firebase.json` :

```
{
  "hosting": {
    "public": "dist",
    "rewrites": [
      {
        "source": "**",
        "destination": "/index.html"
      }
    ]
  }
}
```

Caveat

There is a caveat to this: Your server will no longer report 404 errors as all not-found paths now serve up your `index.html` file. To get around the issue, you should implement a catch-all route within your Vue app to show a 404 page:

```
const router = new VueRouter({
  mode: 'history',
  routes: [
    { path: '*', component: NotFoundComponent }
  ]
})
```

Alternatively, if you are using a Node.js server, you can implement the fallback by using the router on the server side to match the incoming URL and respond with 404 if no route is matched. Check out the Vue server side rendering documentation for more information.

Navigation Guards

As the name suggests, the navigation guards provided by `vue-router` are primarily used to guard navigations either by redirecting it or canceling it. There are a number of ways to hook into the route navigation process: globally, per-route, or in-component.

Remember that **params or query changes won't trigger enter/leave navigation guards**. You can either watch the `$route` object to react to those changes, or use the `beforeRouteUpdate` in-component guard.

Global Before Guards

Learn how navigation guards works with a free lesson on Vue School
You can register global before guards using `router.beforeEach` :

```
const router = new VueRouter({ ... })

router.beforeEach((to, from, next) => {
  // ...
})
```

Global before guards are called in creation order, whenever a navigation is triggered. Guards may be resolved asynchronously, and the navigation is considered **pending** before all hooks have been resolved.

Every guard function receives three arguments:

- **`to: Route`** : the target Route Object being navigated to.
- **`from: Route`** : the current route being navigated away from.
- **`next: Function`** : this function must be called to **resolve** the hook. The action depends on the arguments provided to `next` :
  - **`next()`** : move on to the next hook in the pipeline. If no hooks are left, the navigation is **confirmed**.
  - **`next(false)`** : abort the current navigation. If the browser URL was changed (either manually by the user or via back button), it will be reset to that of the `from` route.
  - **`next('/')` or `next({ path: '/' })`** : redirect to a different location. The current navigation will be aborted and a new one will be started. You can pass any location object to `next` , which allows you to specify options like `replace: true` , `name: 'home'` and any option used in `router-link` 's `to` prop or `router.push`
  - **`next(error)`** : (2.4.0+) if the argument passed to `next` is an instance of `Error` , the navigation will be aborted and the error will be passed to callbacks registered via `router.onError()` .

Make sure that the `next` function is called exactly once in any given pass through the navigation guard. It can appear more than once, but only if the logical paths have no overlap, otherwise the hook will never be resolved or produce errors. Here is an example of redirecting to user to `/login` if they are not authenticated:

```
// BAD
router.beforeEach((to, from, next) => {
  if (to.name !== 'Login' && !isAuthenticated) next({ name: 'Login' })
  // if the user is not authenticated, `next` is called twice
  next()
})
```

```
// GOOD
router.beforeEach((to, from, next) => {
  if (to.name !== 'Login' && !isAuthenticated) next({ name: 'Login' })
  else next()
})
```

Global Resolve Guards

You can register a global guard with `router.beforeResolve`. This is similar to `router.beforeEach`, with the difference that resolve guards will be called right before the navigation is confirmed, **after all in-component guards and async route components are resolved**.

Global After Hooks

You can also register global after hooks, however unlike guards, these hooks do not get a `next` function and cannot affect the navigation:

```
router.afterEach((to, from) => {
  // ...
})
```

Per-Route Guard

You can define `beforeEnter` guards directly on a route's configuration object:

```
const router = new VueRouter({
  routes: [
    {
      path: '/foo',
      component: Foo,
      beforeEnter: (to, from, next) => {
        // ...
      }
    }
  ]
})
```

These guards have the exact same signature as global before guards.

In-Component Guards

Finally, you can directly define route navigation guards inside route components (the ones passed to the router configuration) with the following options:

- `beforeRouteEnter`
- `beforeRouteUpdate`
- `beforeRouteLeave`

```
const Foo = {
  template: `...`,
  beforeRouteEnter (to, from, next) {
    // called before the route that renders this component is confirmed.
    // does NOT have access to `this` component instance,
    // because it has not been created yet when this guard is called!
  },
  beforeRouteUpdate (to, from, next) {
    // called when the route that renders this component has changed,
    // but this component is reused in the new route.
    // For example, for a route with dynamic params `/foo/:id`, when we
    // navigate between `/foo/1` and `/foo/2`, the same `Foo` component instance
    // will be reused, and this hook will be called when that happens.
    // has access to `this` component instance.
  },
  beforeRouteLeave (to, from, next) {
    // called when the route that renders this component is about to
    // be navigated away from.
    // has access to `this` component instance.
  }
}
```

The `beforeRouteEnter` guard does **NOT** have access to `this`, because the guard is called before the navigation is confirmed, thus the new entering component has not even been created yet.

However, you can access the instance by passing a callback to `next`. The callback will be called when the navigation is confirmed, and the component instance will be passed to the callback as the argument:

```
beforeRouteEnter (to, from, next) {
  next(vm => {
    // access to component instance via `vm`
  })
}
```

Note that `beforeRouteEnter` is the only guard that supports passing a callback to `next`. For `beforeRouteUpdate` and `beforeRouteLeave`, `this` is already available, so passing a callback is unnecessary and therefore *not supported*:

```
beforeRouteUpdate (to, from, next) {
  // just use `this`
  this.name = to.params.name
  next()
}
```

The **leave guard** is usually used to prevent the user from accidentally leaving the route with unsaved edits. The navigation can be canceled by calling `next(false)`.

```
beforeRouteLeave (to, from, next) {
  const answer = window.confirm('Do you really want to leave? you have unsaved changes!')
  if (answer) {
    next()
  } else {
    next(false)
  }
}
```

The Full Navigation Resolution Flow

1. Navigation triggered.
2. Call `beforeRouteLeave` guards in deactivated components.
3. Call global `beforeEach` guards.
4. Call `beforeRouteUpdate` guards in reused components.
5. Call `beforeEnter` in route configs.
6. Resolve async route components.
7. Call `beforeRouteEnter` in activated components.
8. Call global `beforeResolve` guards.
9. Navigation confirmed.
10. Call global `afterEach` hooks.
11. DOM updates triggered.
12. Call callbacks passed to `next` in `beforeRouteEnter` guards with instantiated instances.

Route Meta Fields

You can include a `meta` field when defining a route:

```
const router = new VueRouter({
  routes: [
    {
      path: '/foo',
      component: Foo,
      children: [
        {
```

```
            path: 'bar',
            component: Bar,
            // a meta field
            meta: { requiresAuth: true }
          }
        ]
      }
    ]
  })
```

So how do we access this `meta` field?

First, each route object in the `routes` configuration is called a **route record**. Route records may be nested. Therefore when a route is matched, it can potentially match more than one route record.

For example, with the above route config, the URL `/foo/bar` will match both the parent route record and the child route record.

All route records matched by a route are exposed on the `$route` object (and also route objects in navigation guards) as the `$route.matched` Array. Therefore, we will need to iterate over `$route.matched` to check for meta fields in route records.

An example use case is checking for a meta field in the global navigation guard:

```
router.beforeEach((to, from, next) => {
  if (to.matched.some(record => record.meta.requiresAuth)) {
    // this route requires auth, check if logged in
    // if not, redirect to login page.
    if (!auth.loggedIn()) {
      next({
        path: '/login',
        query: { redirect: to.fullPath }
      })
    } else {
      next()
    }
  } else {
    next() // make sure to always call next()!
  }
})
```

Transitions

Learn how to create route transitions with a free lesson on Vue School

Since the `<router-view>` is essentially a dynamic component, we can apply transition effects to it the same way using the `<transition>` component:

```
<transition>
  <router-view></router-view>
</transition>
```

All transition APIs work the same here.

Per-Route Transition

The above usage will apply the same transition for all routes. If you want each route's component to have different transitions, you can instead use `<transition>` with different names inside each route component:

```
const Foo = {
  template: `
    <transition name="slide">
      <div class="foo">...</div>
    </transition>
  `
}

const Bar = {
  template: `
    <transition name="fade">
      <div class="bar">...</div>
    </transition>
  `
}
```

Route-Based Dynamic Transition

It is also possible to determine the transition to use dynamically based on the relationship between the target route and current route:

```
<!-- use a dynamic transition name -->
<transition :name="transitionName">
  <router-view></router-view>
</transition>
```

```
// then, in the parent component,
// watch the `$route` to determine the transition to use
watch: {
  '$route' (to, from) {
    const toDepth = to.path.split('/').length
    const fromDepth = from.path.split('/').length
    this.transitionName = toDepth < fromDepth ? 'slide-right' : 'slide-left'
  }
}
```

See full example here.

Data Fetching

Sometimes you need to fetch data from the server when a route is activated. For example, before rendering a user profile, you need to fetch the user's data from the server. We can achieve this in two different ways:

- **Fetching After Navigation**: perform the navigation first, and fetch data in the incoming component's lifecycle hook. Display a loading state while data is being fetched.
- **Fetching Before Navigation**: Fetch data before navigation in the route enter guard, and perform the navigation after data has been fetched.

Technically, both are valid choices - it ultimately depends on the user experience you are aiming for.

Fetching After Navigation

When using this approach, we navigate and render the incoming component immediately, and fetch data in the component's `created` hook. It gives us the opportunity to display a loading state while the data is being fetched over the network, and we can also handle loading differently for each view.

Let's assume we have a `Post` component that needs to fetch the data for a post based on `$route.params.id`:

```
<template>
  <div class="post">
    <div v-if="loading" class="loading">
      Loading...
    </div>

    <div v-if="error" class="error">
      {{ error }}
    </div>

    <div v-if="post" class="content">
      <h2>{{ post.title }}</h2>
      <p>{{ post.body }}</p>
    </div>
  </div>
</template>
```

```
export default {
  data () {
    return {
      loading: false,
      post: null,
```

```
      error: null
    }
  },
  created () {
    // fetch the data when the view is created and the data is
    // already being observed
    this.fetchData()
  },
  watch: {
    // call again the method if the route changes
    '$route': 'fetchData'
  },
  methods: {
    fetchData () {
      this.error = this.post = null
      this.loading = true
      // replace `getPost` with your data fetching util / API wrapper
      getPost(this.$route.params.id, (err, post) => {
        this.loading = false
        if (err) {
          this.error = err.toString()
        } else {
          this.post = post
        }
      })
    }
  }
}
```

Fetching Before Navigation

With this approach we fetch the data before actually navigating to the new route. We can perform the data fetching in the `beforeRouteEnter` guard in the incoming component, and only call `next` when the fetch is complete:

```
export default {
  data () {
    return {
      post: null,
      error: null
    }
  },
  beforeRouteEnter (to, from, next) {
    getPost(to.params.id, (err, post) => {
      next(vm => vm.setData(err, post))
    })
  },
  // when route changes and this component is already rendered,
  // the logic will be slightly different.
  beforeRouteUpdate (to, from, next) {
```

```
    this.post = null
    getPost(to.params.id, (err, post) => {
      this.setData(err, post)
      next()
    })
  },
  methods: {
    setData (err, post) {
      if (err) {
        this.error = err.toString()
      } else {
        this.post = post
      }
    }
  }
}
```

The user will stay on the previous view while the resource is being fetched for the incoming view. It is therefore recommended to display a progress bar or some kind of indicator while the data is being fetched. If the data fetch fails, it's also necessary to display some kind of global warning message.

Scroll Behavior

Learn to control the scroll behavior with a free lesson on Vue School

When using client-side routing, we may want to scroll to top when navigating to a new route, or preserve the scrolling position of history entries just like real page reload does. `vue-router` allows you to achieve these and even better, allows you to completely customize the scroll behavior on route navigation.

Note: this feature only works if the browser supports `history.pushState`.

When creating the router instance, you can provide the `scrollBehavior` function:

```
const router = new VueRouter({
  routes: [...],
  scrollBehavior (to, from, savedPosition) {
    // return desired position
  }
})
```

The `scrollBehavior` function receives the `to` and `from` route objects. The third argument, `savedPosition`, is only available if this is a `popstate` navigation (triggered by the browser's back/forward buttons).

The function can return a scroll position object. The object could be in the form of:

- `{ x: number, y: number }`

- `{ selector: string, offset? : { x: number, y: number }}` (offset only supported in 2.6.0+)

If a falsy value or an empty object is returned, no scrolling will happen.

For example:

```
scrollBehavior (to, from, savedPosition) {
  return { x: 0, y: 0 }
}
```

This will simply make the page scroll to top for all route navigations.

Returning the `savedPosition` will result in a native-like behavior when navigating with back/forward buttons:

```
scrollBehavior (to, from, savedPosition) {
  if (savedPosition) {
    return savedPosition
  } else {
    return { x: 0, y: 0 }
  }
}
```

If you want to simulate the "scroll to anchor" behavior:

```
scrollBehavior (to, from, savedPosition) {
  if (to.hash) {
    return {
      selector: to.hash
      // , offset: { x: 0, y: 10 }
    }
  }
}
```

We can also use route meta fields to implement fine-grained scroll behavior control. Check out a full example here.

Async Scrolling

> New in 2.8.0

You can also return a Promise that resolves to the desired position descriptor:

```
scrollBehavior (to, from, savedPosition) {
  return new Promise((resolve, reject) => {
    setTimeout(() => {
      resolve({ x: 0, y: 0 })
    }, 500)
  })
}
```

It's possible to hook this up with events from a page-level transition component to make the scroll behavior play nicely with your page transitions, but due to the possible variance and complexity in use cases, we simply provide this primitive to enable specific userland implementations.

Lazy Loading Routes

Learn how to lazy load routes with a free lesson on Vue School

When building apps with a bundler, the JavaScript bundle can become quite large, and thus affect the page load time. It would be more efficient if we can split each route's components into a separate chunk, and only load them when the route is visited.

Combining Vue's async component feature and webpack's code splitting feature, it's trivially easy to lazy-load route components.

First, an async component can be defined as a factory function that returns a Promise (which should resolve to the component itself):

```
const Foo = () => Promise.resolve({ /* component definition */ })
```

Second, in webpack 2, we can use the dynamic import syntax to indicate a code-split point:

```
import('./Foo.vue') // returns a Promise
```

> **Note**
> if you are using Babel, you will need to add the syntax-dynamic-import plugin so that Babel can properly parse the syntax.

Combining the two, this is how to define an async component that will be automatically code-split by webpack:

```
const Foo = () => import('./Foo.vue')
```

Nothing needs to change in the route config, just use `Foo` as usual:

```
const router = new VueRouter({
  routes: [
    { path: '/foo', component: Foo }
  ]
})
```

Grouping Components in the Same Chunk

Sometimes we may want to group all the components nested under the same route into the same async chunk. To achieve that we need to use named chunks by providing a chunk name using a special comment syntax (requires webpack > 2.4):

```
const Foo = () => import(/* webpackChunkName: "group-foo" */ './Foo.vue')
const Bar = () => import(/* webpackChunkName: "group-foo" */ './Bar.vue')
const Baz = () => import(/* webpackChunkName: "group-foo" */ './Baz.vue')
```

webpack will group any async module with the same chunk name into the same async chunk.