Vue Fundamentals - 05
Routing basics

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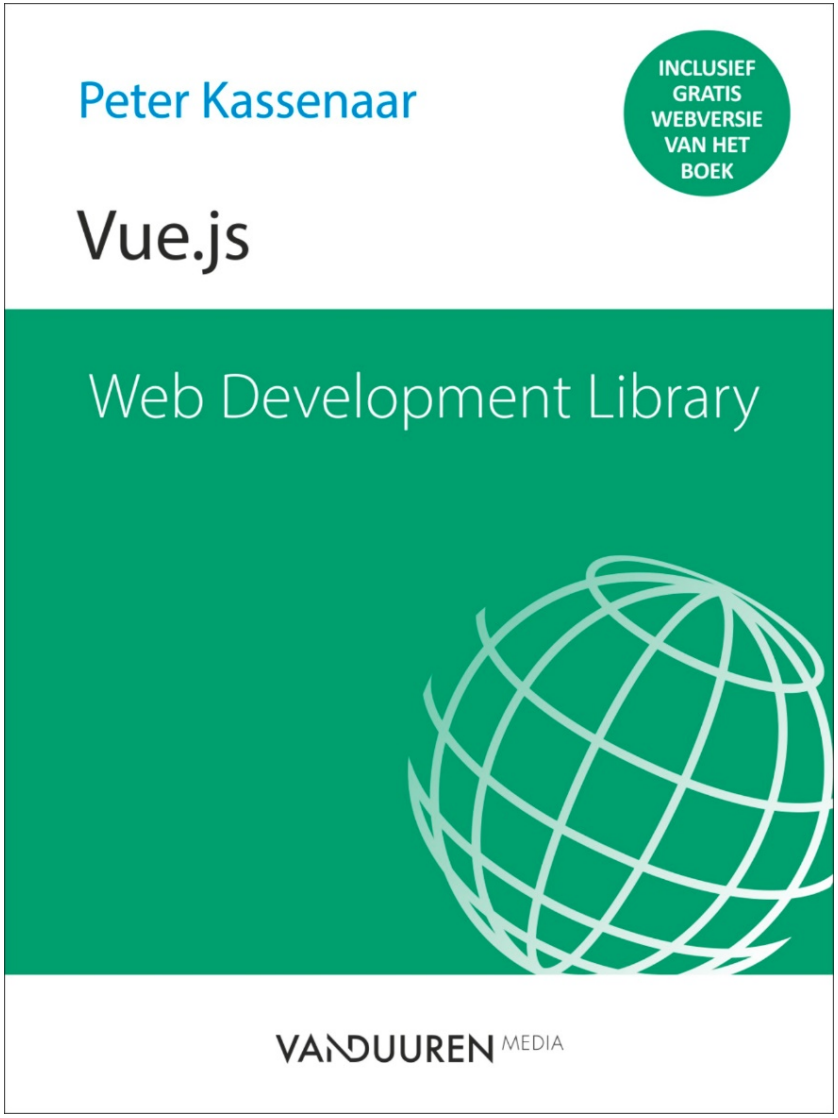


Chapter 6, P. 164

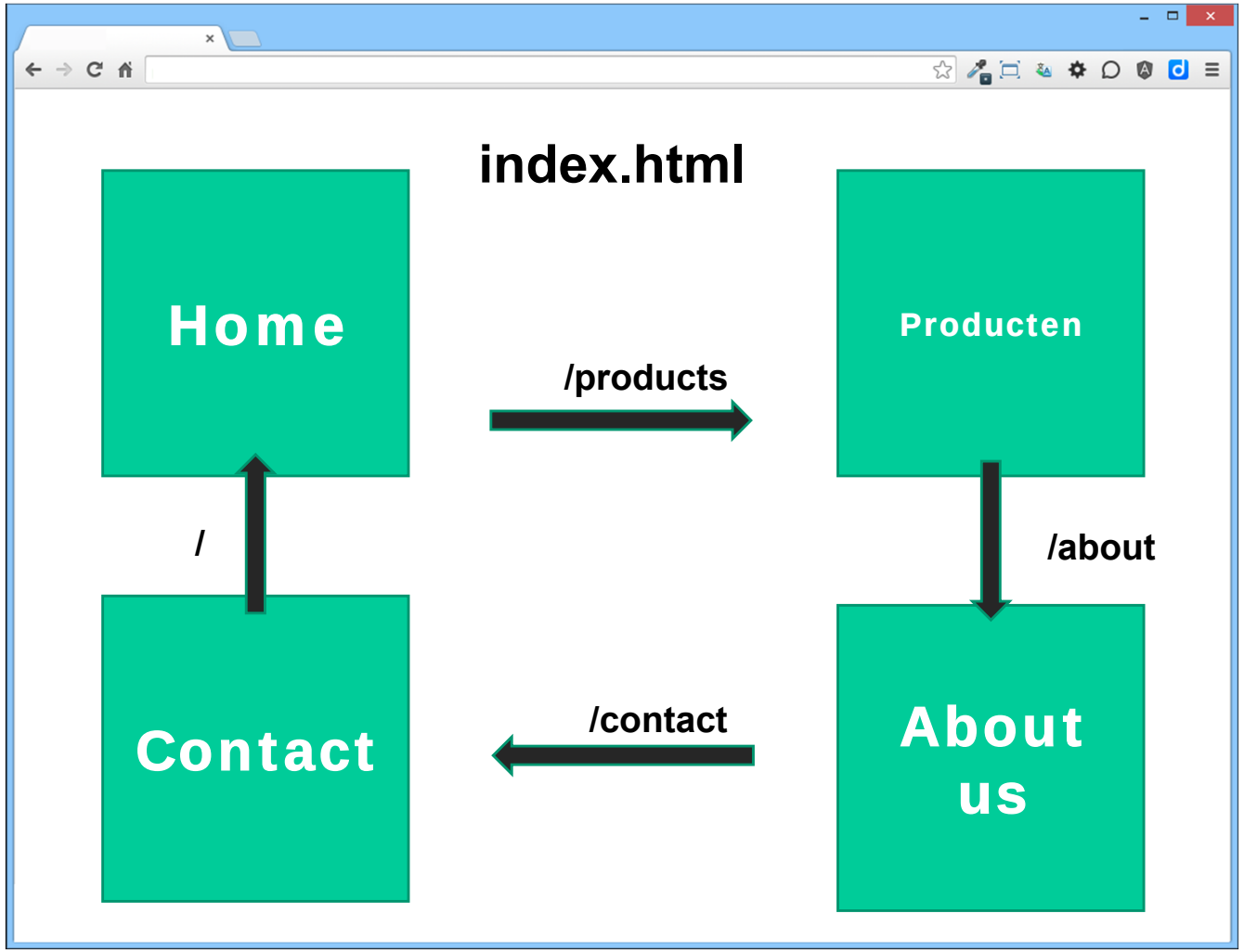
Routing

“For most Single Page Applications, it’s recommended to use the officially-supported vue-router library. For more details, see vue-router’s documentation.`”

https://github.com/vuejs/vue-router

https://router.vuejs.org/

Routing architecture and goal



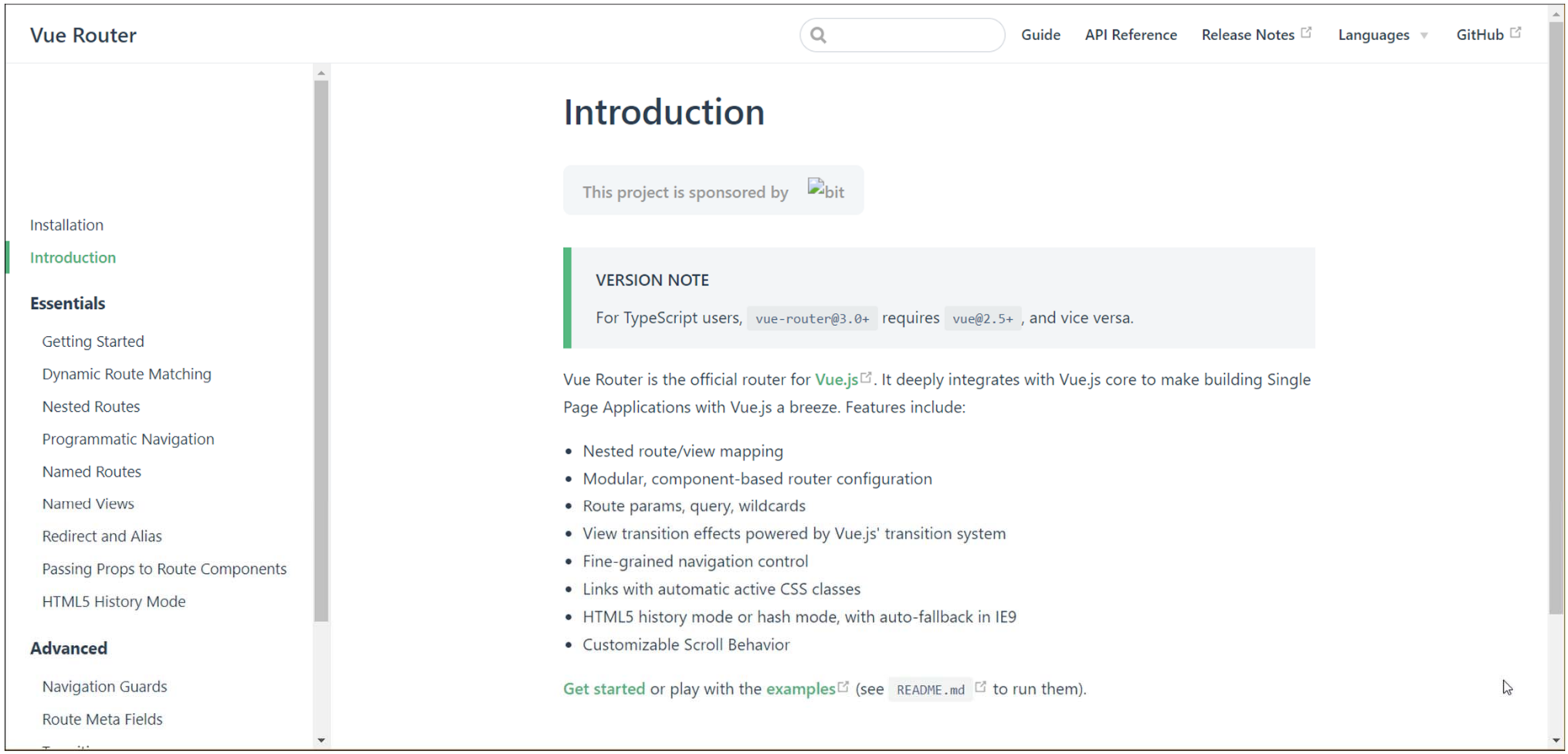
- Make use of SPA principle
- Making deep links possible

Router capabilities / characteristics

- Update URL when changing to routes/components
- Nested routes/view mapping
- Modular, component based router configuration
- Route params, query, wildcards
- View transition effects
- Link with automatic active CSS classes to denote active route
- HTML5 history mode
- Prevent navigating to a route, or navigating away

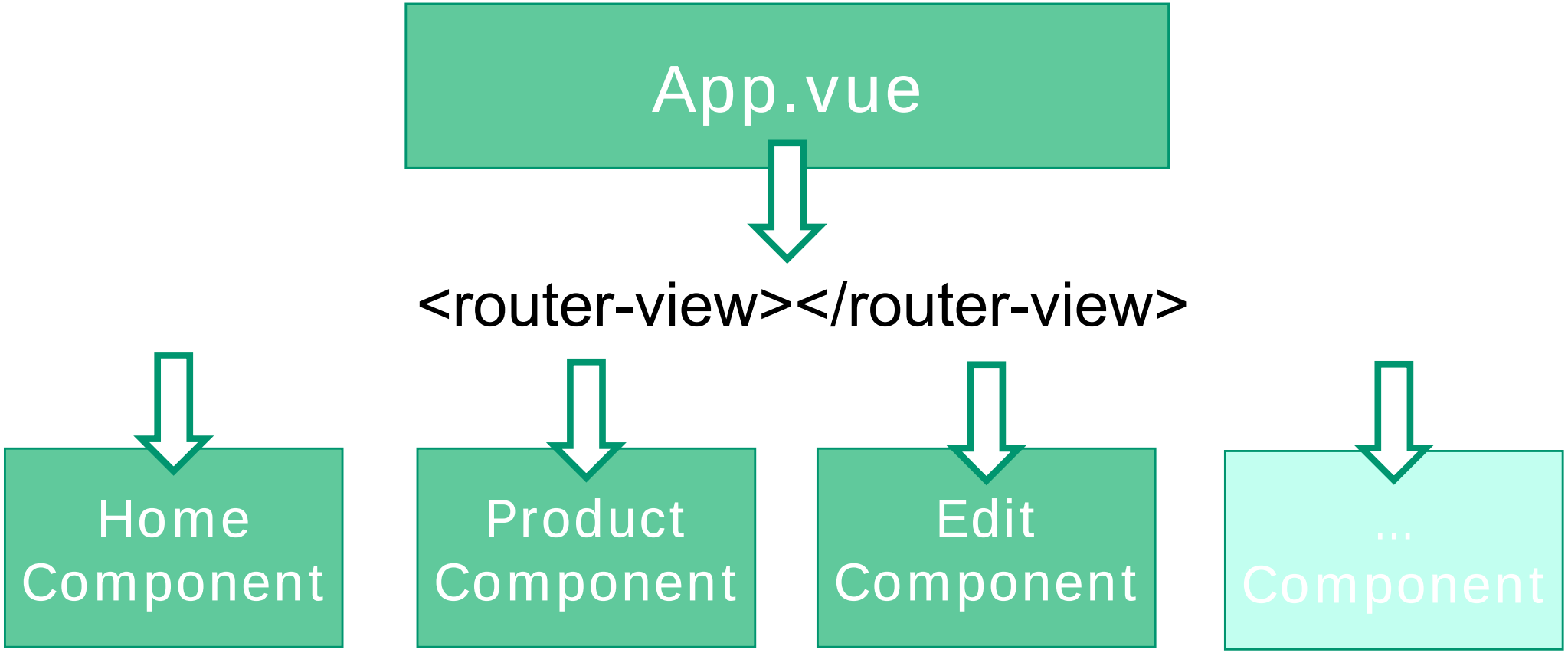
https://router.vuejs.org/

https://router.vuejs.org/



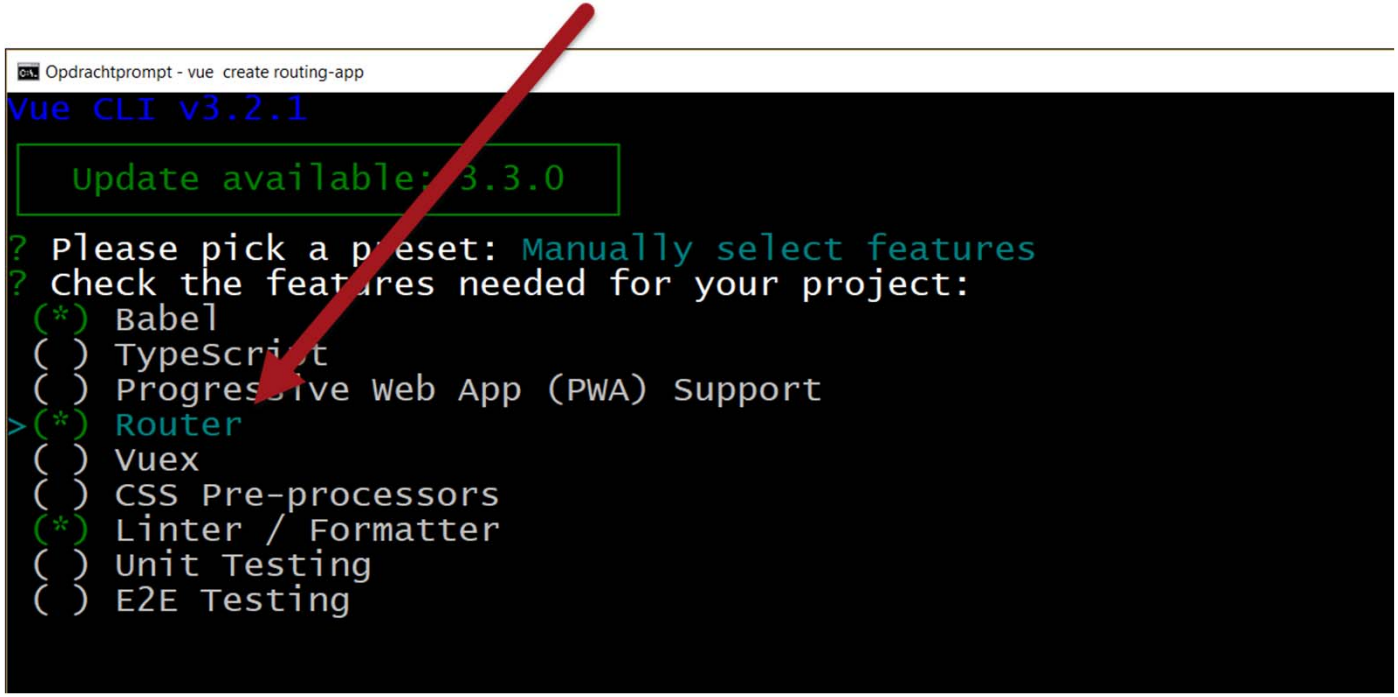
Routing – every route is a Component

- `App.vue` gets a main menu (typically in its own component :-)
- Components are injected in `<router-view></router-view>`

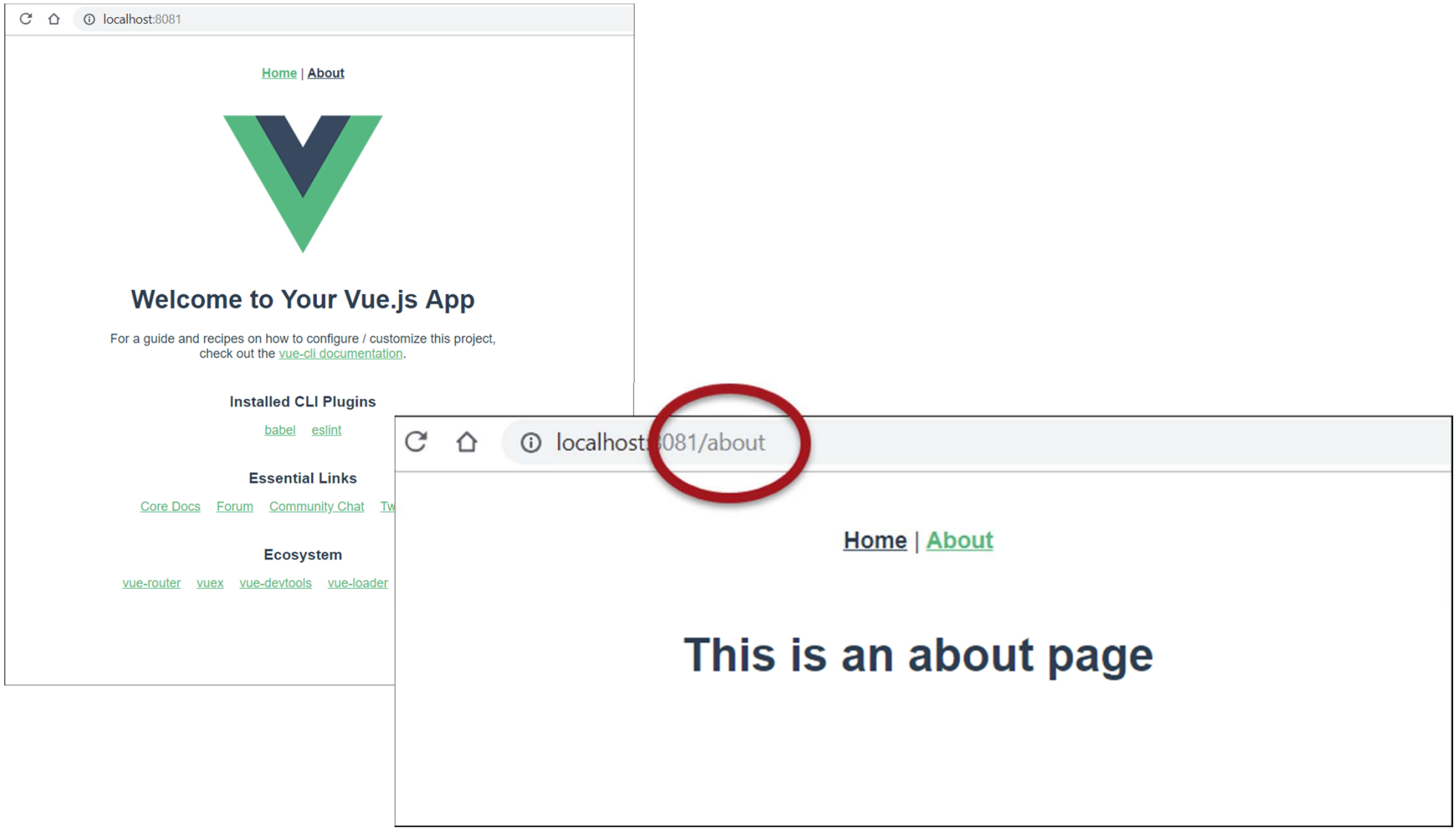


Sidestep - routing via Vue CLI

- For instance: `vue create routing-app`
- `Manually select features`
- Select `Router` (you can have multiple selections!)
- `Use history mode for router?` – typically `Yes`



Result – a default routing app



This is exactly what we are going to create manually

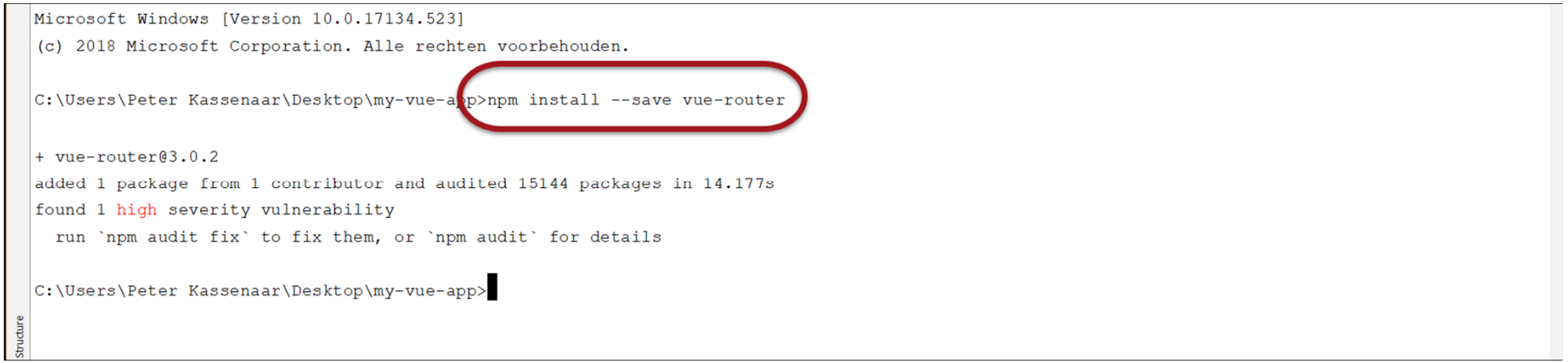
Agenda - In this module

- Adding routing to an existing app
  - Also possible – start a new app with routing from scratch, using the CLI
- Linking to routed pages
- Styling links, based on the active route
- Working with route params
- Nested router views
- More info on routing

https://router.vuejs.org/guide/

1. Installing the router to an existing app

- Install the router module: `npm install --save vue-router`
- Check if the application still runs!



2. Create router folder

- Create a `router` folder, holding all router configuration
  - Not mandatory, just for good code organization
  - Otherwise, call your file `router.js` in the root of the application
- Create an `index.js` inside `../router`
- Basic lay-out for routing table:

```
// ../router/index.js
import Vue from 'vue'
import Router from 'vue-router'

Vue.use(Router);

export default new Router({
   routes: [
      // define all routes here....
   ]
})
```

3. Define routing table

```
…
// import the required components
import VacationPicker from "../components/VacationPicker";
import AddCountry from "../components/AddCountry";
import UpdateCountry from "../components/UpdateCountry";

export default new Router({
   routes: [
      // define all routes here....
      {
         path: '/',
         name: 'home',
         component: VacationPicker
      },
      {
         path: '/add',
         name : 'add',
         component: AddCountry
      }
      …
   ]
})
```

Tell Vue which component to load when a specific route is requested

3a. Optional: lazy loading

- You can *lazy load* components, i.e. only load them once the user navigates to them
- Use the webpack `import` statement for that
- Don't forget to remove the component from the list with `import` statements at the top of the file! (if applicable)
  - Otherwise it would still *always* be loaded, and not lazy loaded.

```
{
    path: '/add',
    name: 'add',
    component: () => import('../components/AddCountry') // lazy loading
},
```

Optional w/ lazy loading

- Give the chunk / module that webpack creates a meaningful name:

```
{
    path: '/add',
    name: 'add',
    component: () => import(/* webpackChunkName: "add-component" */ '../components/AddCountry')
},
```

4. Add the routes to Vue configuration

- Add the correct `import` to `main.js`
- Add `router` to the Vue instance like so:

```
// main.js
…

// import router stuff
import router from './router'

Vue.config.productionTip = false;

new Vue({
   render: h => h(App),
   router,
}).$mount('#app');
```

5. Tell Vue where to project routed content

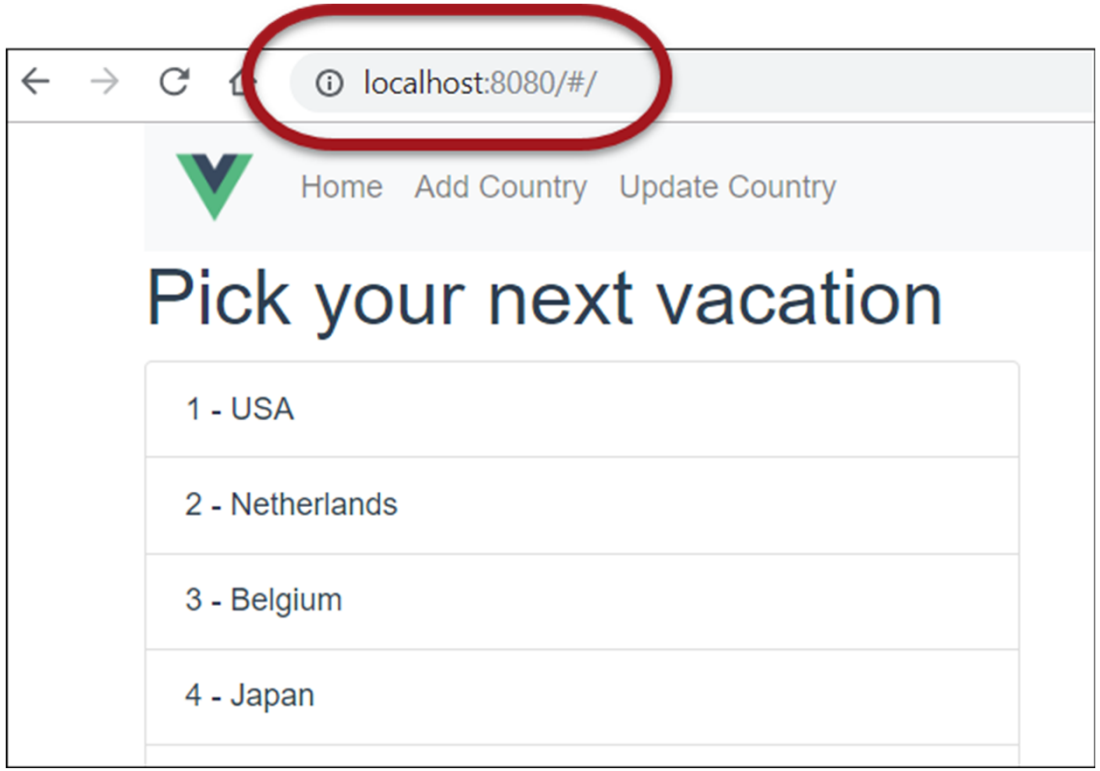
- Use `<router-view />` to tell Vue where to project the components
- You don't need the import for `VacationPicker` in `App.vue` anymore
  - We *do* need `MainNavigation`, b/c we placed it inside its own component

```
<!--App.vue-->
<template>
    <div id="app" class="container">
        <MainNavigation />
        <router-view></router-view>
    </div>
</template>

<script>
   import MainNavigation from "./components/MainNavigation";

   export default {
      name: 'app',
      components: {
         MainNavigation,
      }
   }
</script>
```

Result so far:



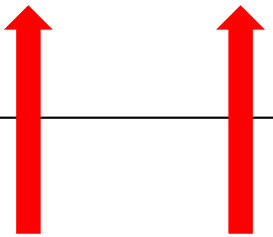
The links in the `MainNavigation` component don't work yet!

We will solve the hashtag – `localhost:8080/#/` issue later on, by using HTML5-mode routing

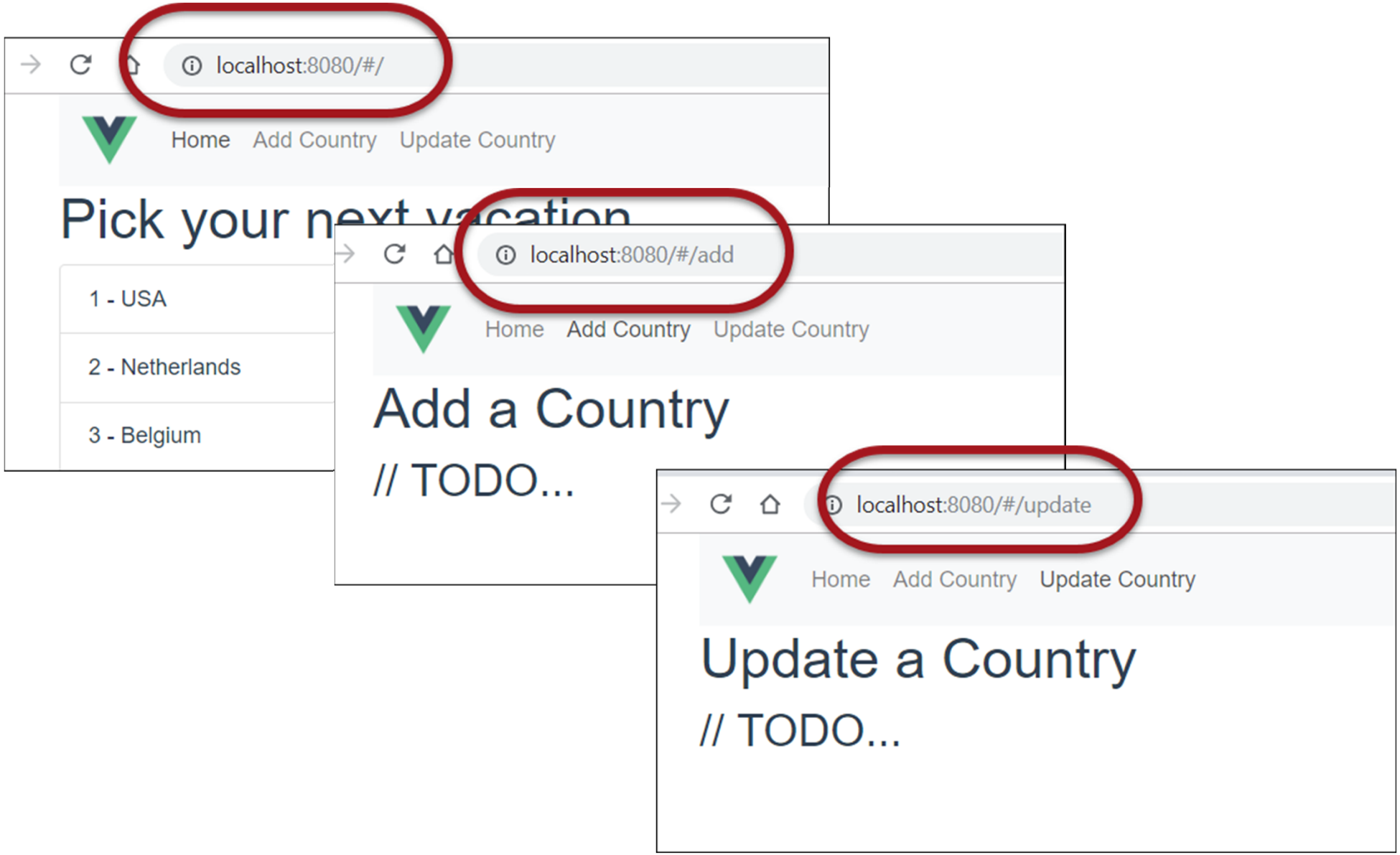
Linking to routed pages

- We can now route to pages by typing the route manually in the address bar.
  - But of course we want to achieve this by clicking links!
- No more <a href="…"> -tags!
- Use Vue-specific <router-link to="name-of-route"> tags

```
…
<li class="nav-item">
    <router-link to="/" class="nav-link">Home</router-link>
</li>
<li class="nav-item">
    <router-link to="add" class="nav-link">Add Country</router-link>
</li>
…
```



Result


localhost:8080/#/
Home
Add Country
Update Country
Pick your next vacation
1 - USA
2 - Netherlands
3 - Belgium
localhost:8080/#/add
Home
Add Country
Update Country
Add a Country
// TODO...
localhost:8080/#/update
Home
Add Country
Update Country
Update a Country
// TODO...

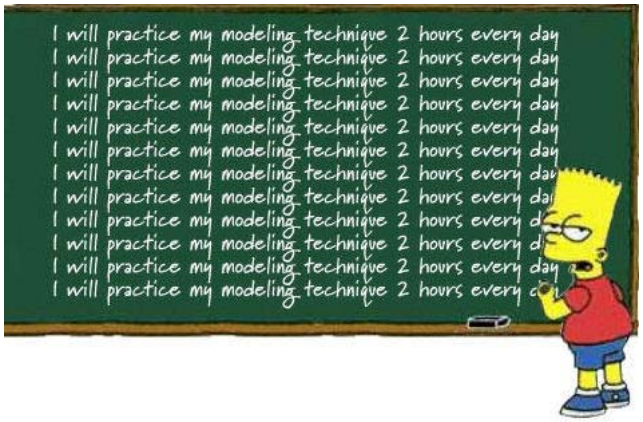
Another syntax – navigating by binding

- We also defined a `name` property for our routes
- Use the `name` to navigate by binding to `:to`
- By clicking the logo, we navigate to the home page (i.e. `VacationPicker` component)
- This is completely optional, but you see how you can also link to routes and bind via code

```
<router-link class="navbar-brand" :to="{name: 'home'}">
    <img src="../assets/logo.png" alt="Vue Logo">
</router-link>
```

Workshop

1. Add routing to your own application, using the steps in this module. OR:
2. Start a new project from scratch, using the CLI
   - Add routing via the prompt
   - Add a few components, route to them
   - Don't forget to link to the new routes/components, OR:
3. Generic example: `../300-routing-basics`
   - Add a new component
   - Add a route to that component
   - Update the `<MainNavigation />`
   - Make sure it works



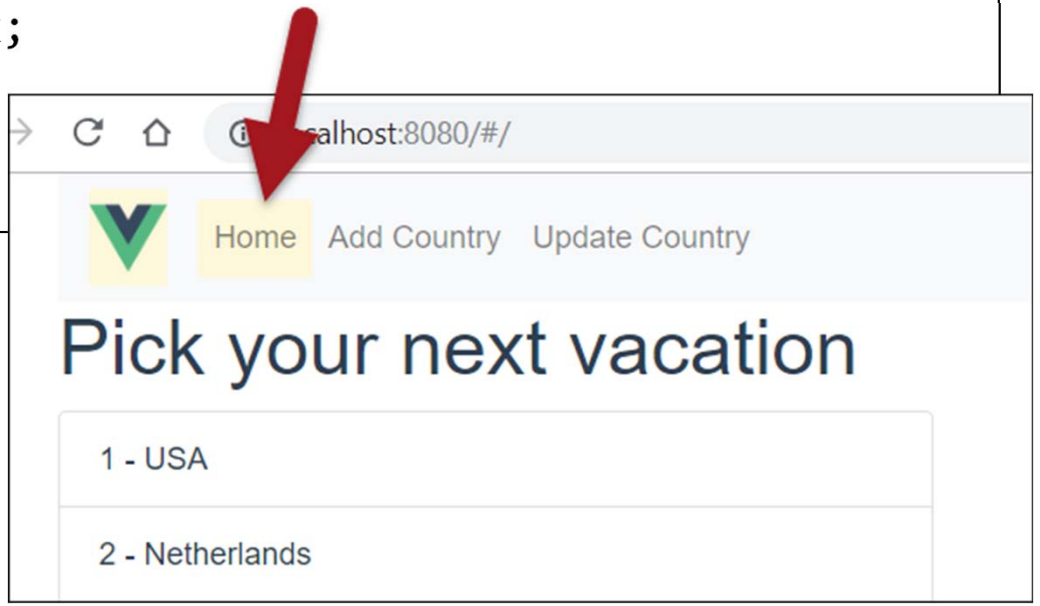
Styling the active link

Emphasizing the current route in the UI, based on a URL match

Special class names

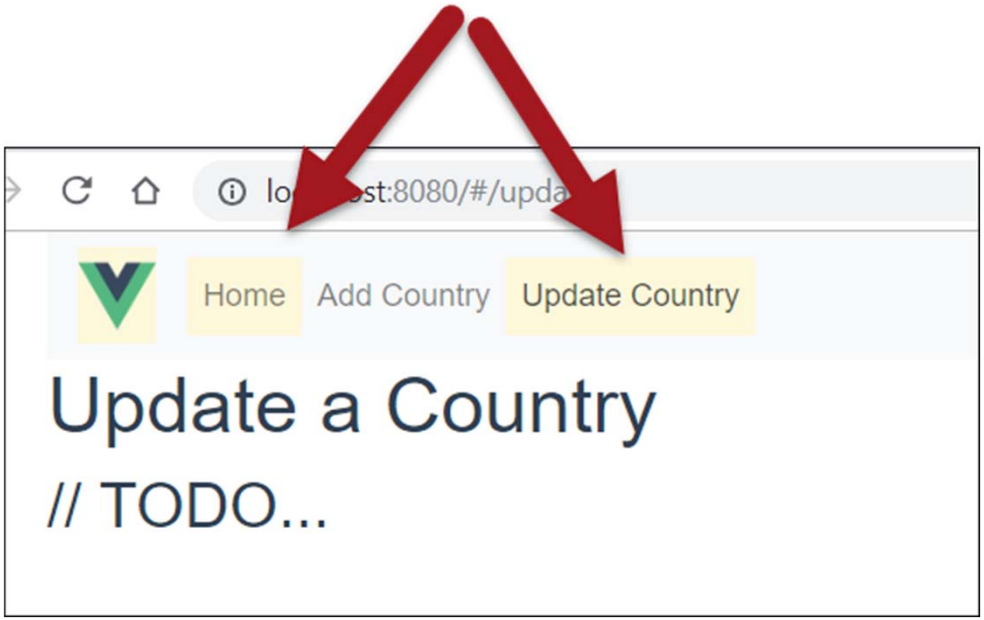
- Vue assigns a `router-link-active` class to the current active route.
- You can write a CSS-class for that
- No need to update the HTML/UI. Vue assigns it automatically.
- Of course you can add any property you want/need

```
<style scoped>
    /*Automatic assignment of this class by Vue, based on router state*/
    .router-link-active{
        background-color: cornsilk;
        color: white;
    }
</style>
```



Issue – the home link

- Vue is by default using an *inclusive match* on the route
  - Which means, the home route is *always* `active` (as every route has a slash `'/'` in it



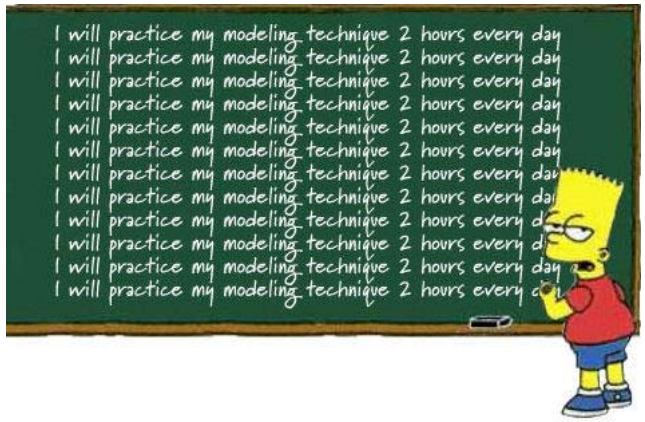
Solution: add the exact directive on links

```
<li class="nav-item">
    <router-link to="/" class="nav-link" exact>Home</router-link>
</li>
<li class="nav-item">
    <router-link to="add" class="nav-link" exact>Add Country</router-link>
</li>
<li class="nav-item">
    <router-link to="update" class="nav-link" exact>Update Country</router-link>
</li>
```

(Now only the logo still has a yellow background, b/c this links to the homepage, but IRL you will overcome this.)

Workshop

- Add a style to your active links, as described in this section.
  - Create a style for your active links
  - Add the style to the Navigation component
  - Use the exact keyword to highlight only the correct style



Navigating from code

Using the router from JavaScript, instead of HTML

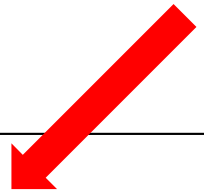
Navigating from code

- We're going to navigate to the `<CountryDetail />` component via code
- We'll use this page later on for route params
- First – create a route for it in `../router/index.js`.

```
export default new Router({
   routes: [
      // define all routes here....
      …
      {
         path: '/detail',
         name : 'detail',
         component: CountryDetail
      }
   ]
})
```

Navigate from code

- Next, define a method that uses the router in the `VacationPicker` component
- Because we injected the router in the Vue instance, we have access to the `$router` instance on components

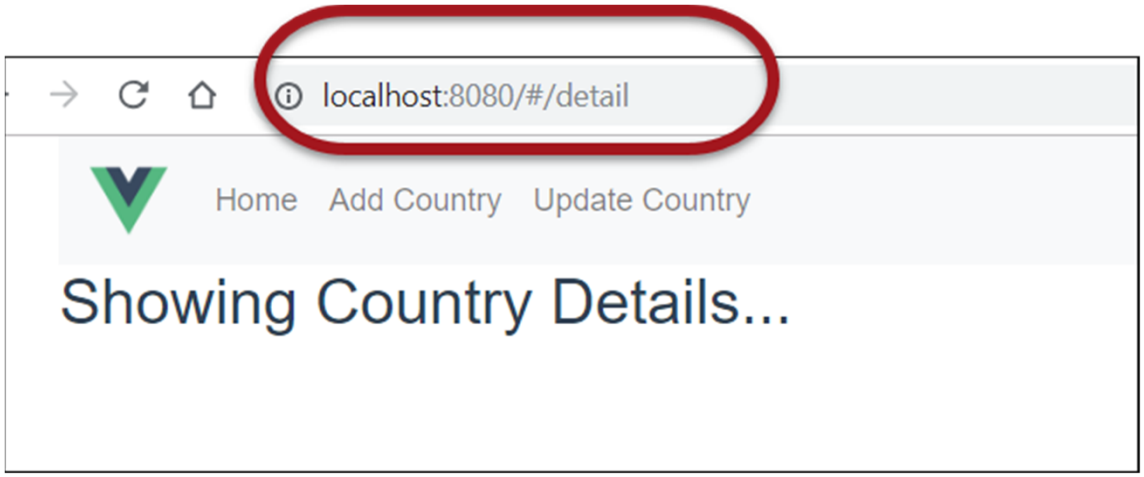


```
<li class="list-group-item"
    @click="showCountry(country)"
    v-for="country in data.countries" :key="country.id">
     …
</li>
```

```
methods:{
   // a method for navigating to the specific country from code, instead of HTML
   showCountry(country){
      console.log('navigate to ' + country.name);
      this.$router.push('/detail')
    }
}
```

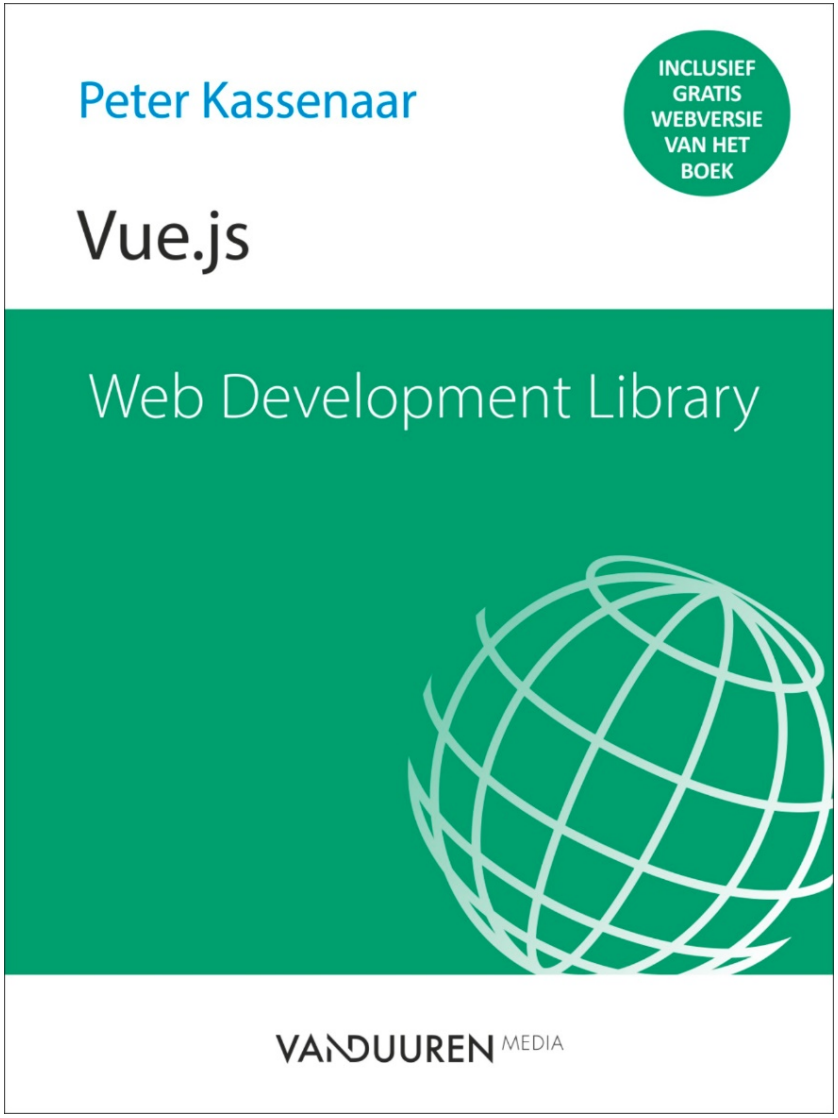
Result

- Hardcoded text for now – we're going to solve that by using route parameters.



Using Route Parameters

Passing detail parameters to the next view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So far, we're just displaying hardcoded text on the Detail page.

The goal of course, is to show data from the passed in country.

For that we use *Route Parameters*

1. Update the route

`../router/index.js` → add `/:name` and possible other parameters to the detail route

```
{
   path: '/detail/:id/:name',
   name : 'detail',
   component: CountryDetail
}
```

2. Update the <`CountryDetail /`> component, to grab the parameters from the route. We can do this for instance in a created() lifecycle hook

```
created(){
   this.id = this.$route.params.id;
   this.name = this.$route.params.name;
},
```

3. Update routerlink, to send the parameters

- Update the `<VacationPicker />` component to send the correct `id` and `name` in the URL
- Vue needs an object notation for that.
  - We can't just send a composed string like `'detail/1/Netherlands'`.

```
this.$router.push({
    name: 'detail',
    params: {
        id: country.id,
        name: country.name
    }
})
```

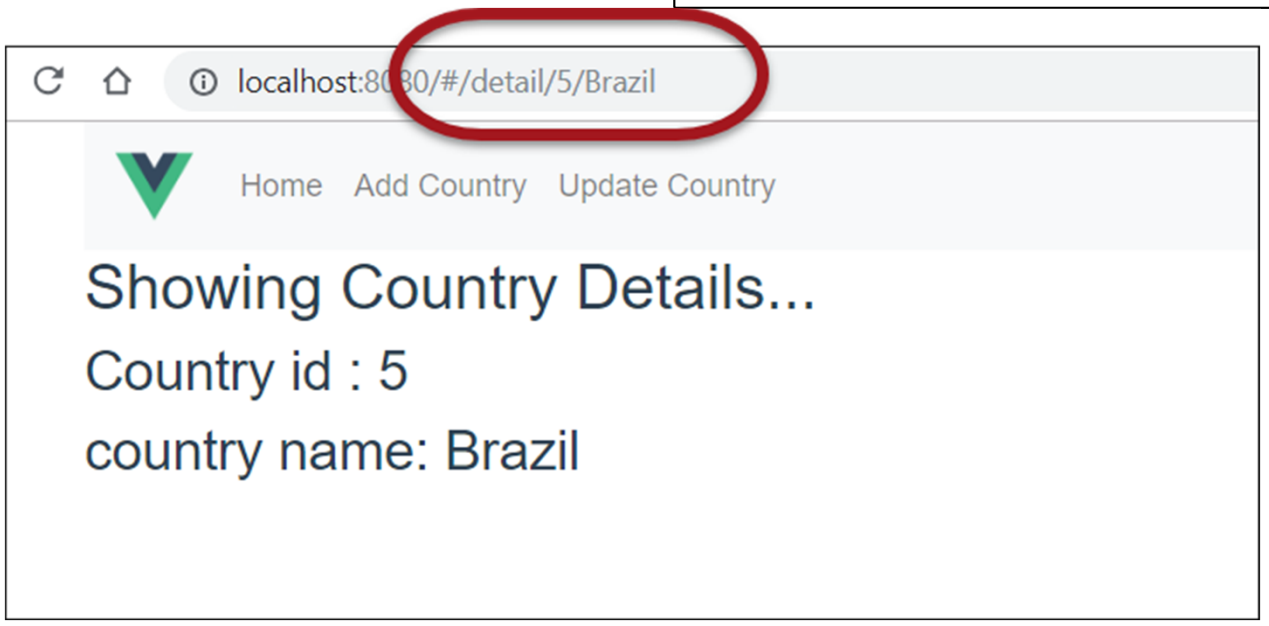
4. Show the parameter in the UI

- Start simple – just show the passed paramater in the UI.

```
created(){

   this.id = this.$route.params.id;
   this.name = this.$route.params.name;
},
```

```
<h2>Showing Country Details...</h2>
<h3>Country id : {{ id }}</h3>
<h3>country name: {{ name }}</h3>
```



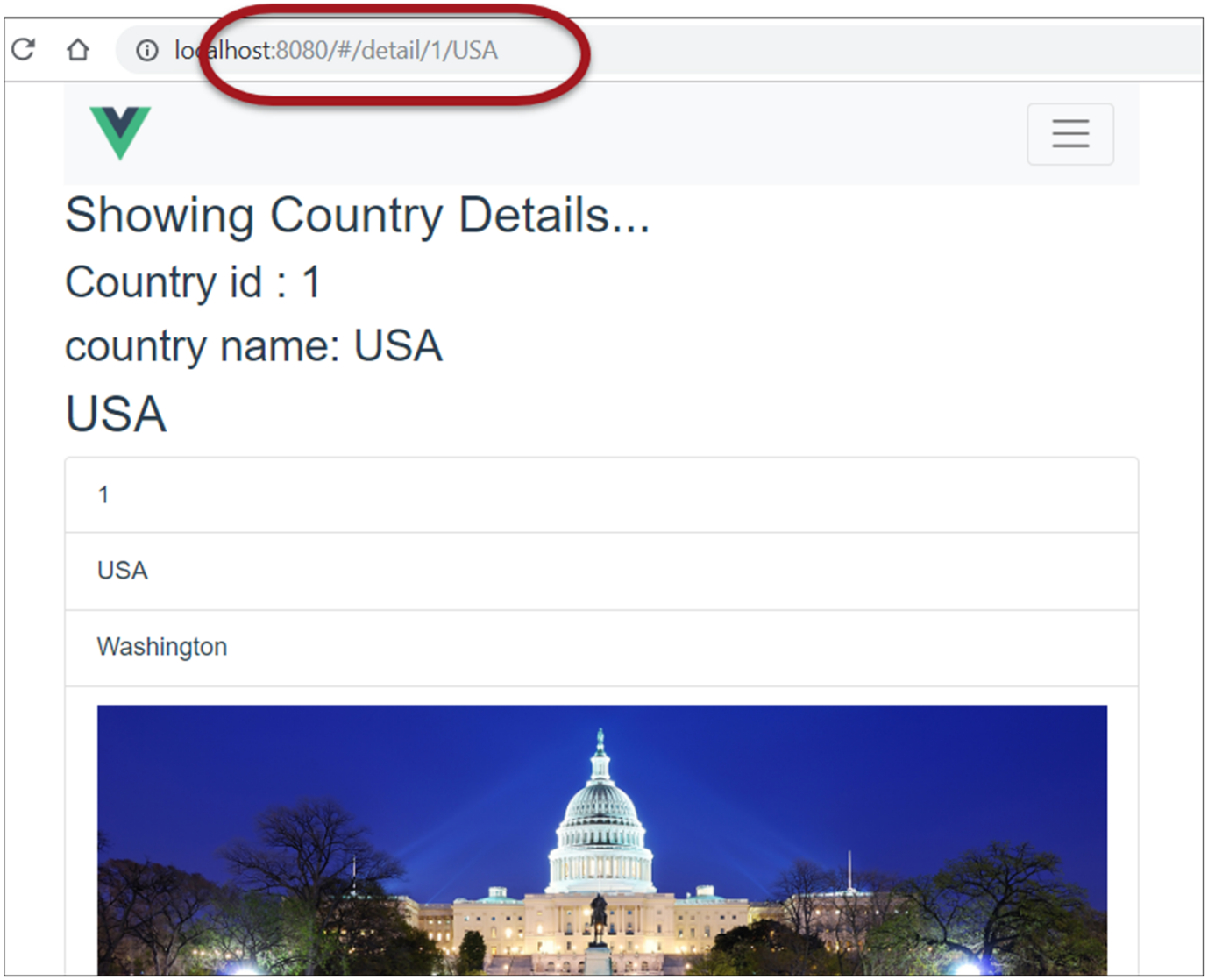
Show country data

- Grab the data (for now: local, to get the correct country)
  - We're going to fetch data from an API later on
- Look for the data based on the id

```
import data from '../data/data';
```

```
created(){
   …
   // fetch the correct country from the loaded data (+cast id-string)
    this.country = this.data.countries.find(c => c.id === +this.id);
},
```

Result


localhost:8080/#/detail/1/USA
Showing Country Details...
Country id : 1
country name: USA
USA
1
USA
Washington

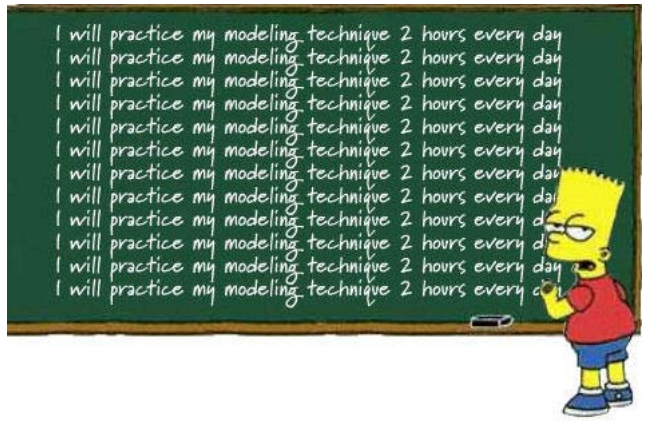
Remember:

`this.$router` gives access to the (application wide) ***router instance***

`this.$route` gives access to the ***currently selected route*** *inside a component!*

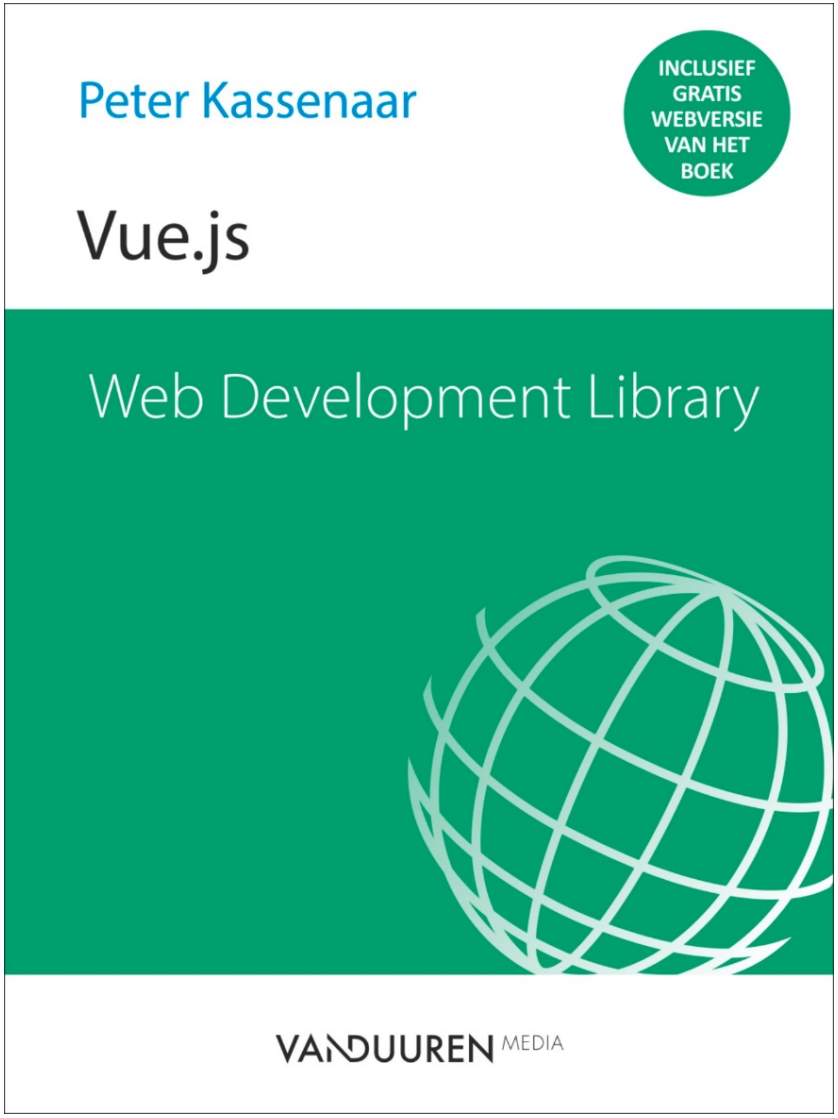
Workshop

- Add routing parameters to your own application, using the steps in this module
  - Create a parametrized route, using `/:<name>` notation
  - Use `this.$route.params` in the detail component to fetch the route parameters
  - Push a parametrized object to the `$router` when element is clicked
- Generic example: `../310-routing-parameters`



HTML 5 History mode

Getting rid of the # in the URL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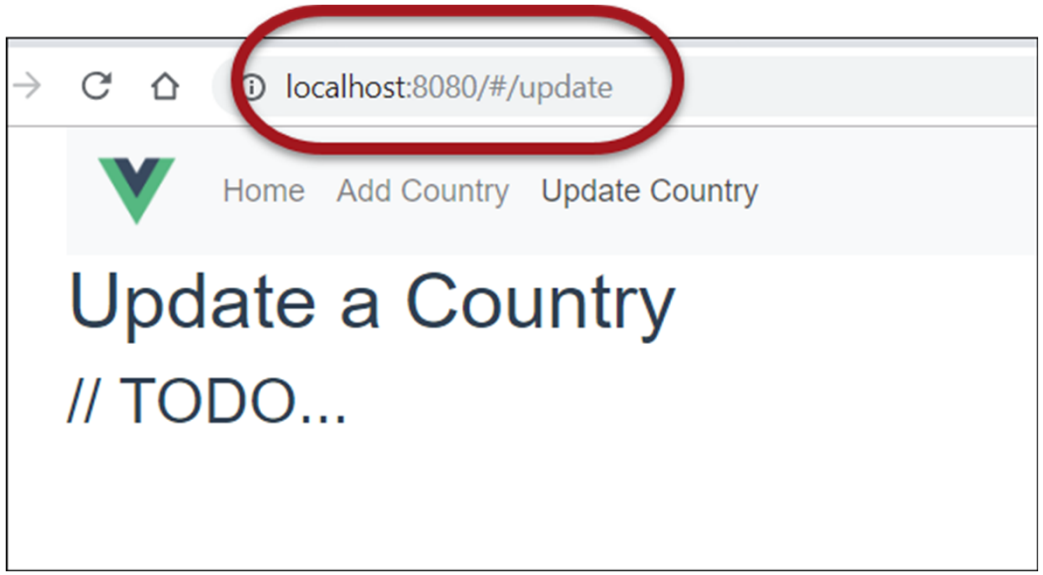
Enabling HTML 5 History mode

- No more hash sign /#/… in the URL/Address bar
- Just add a property to the router configuration
  - mode: ‘history’

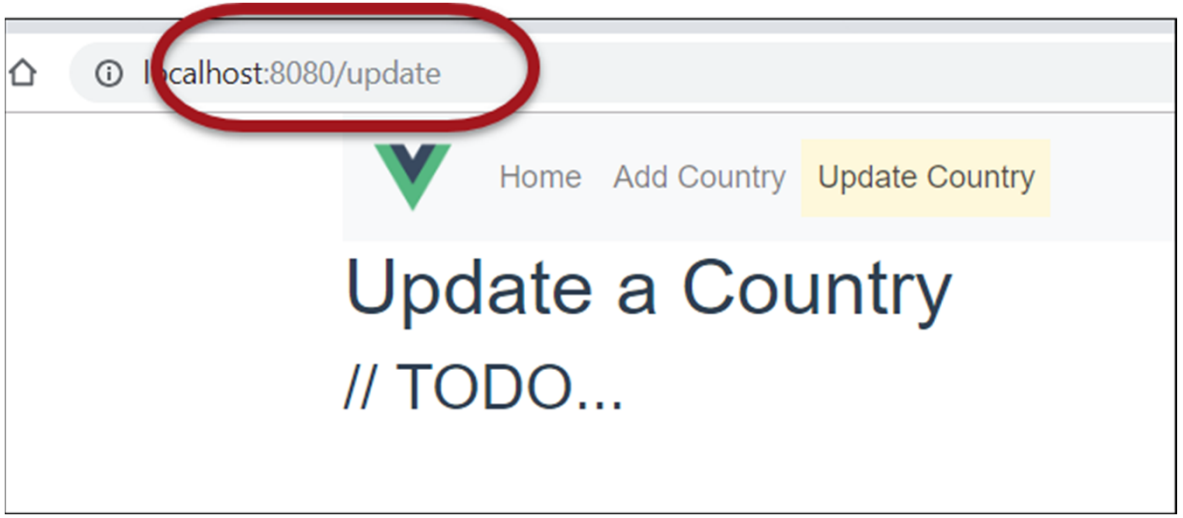
```
export default new Router({
   mode: 'history',
   routes: [
      // define all routes here....
})
```

https://router.vuejs.org/guide/essentials/history-mode.html#html5-history-mode

Before



After



Caveats on HTML History mode

- Configure your server accordingly!
  - WebPack Dev Server (used by VueJS) handles the URL correctly.
  - But other servers might actually want to fetch the requested `directory/path`!
    - IIS
    - Apache
    - Nginx
- The server should always return the `index.html` file, so Vue can handle it.
- https://router.vuejs.org/guide/essentials/history-mode.html#example-server-configurations

Check docs for your server to update configuration

Example Server Configurations

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

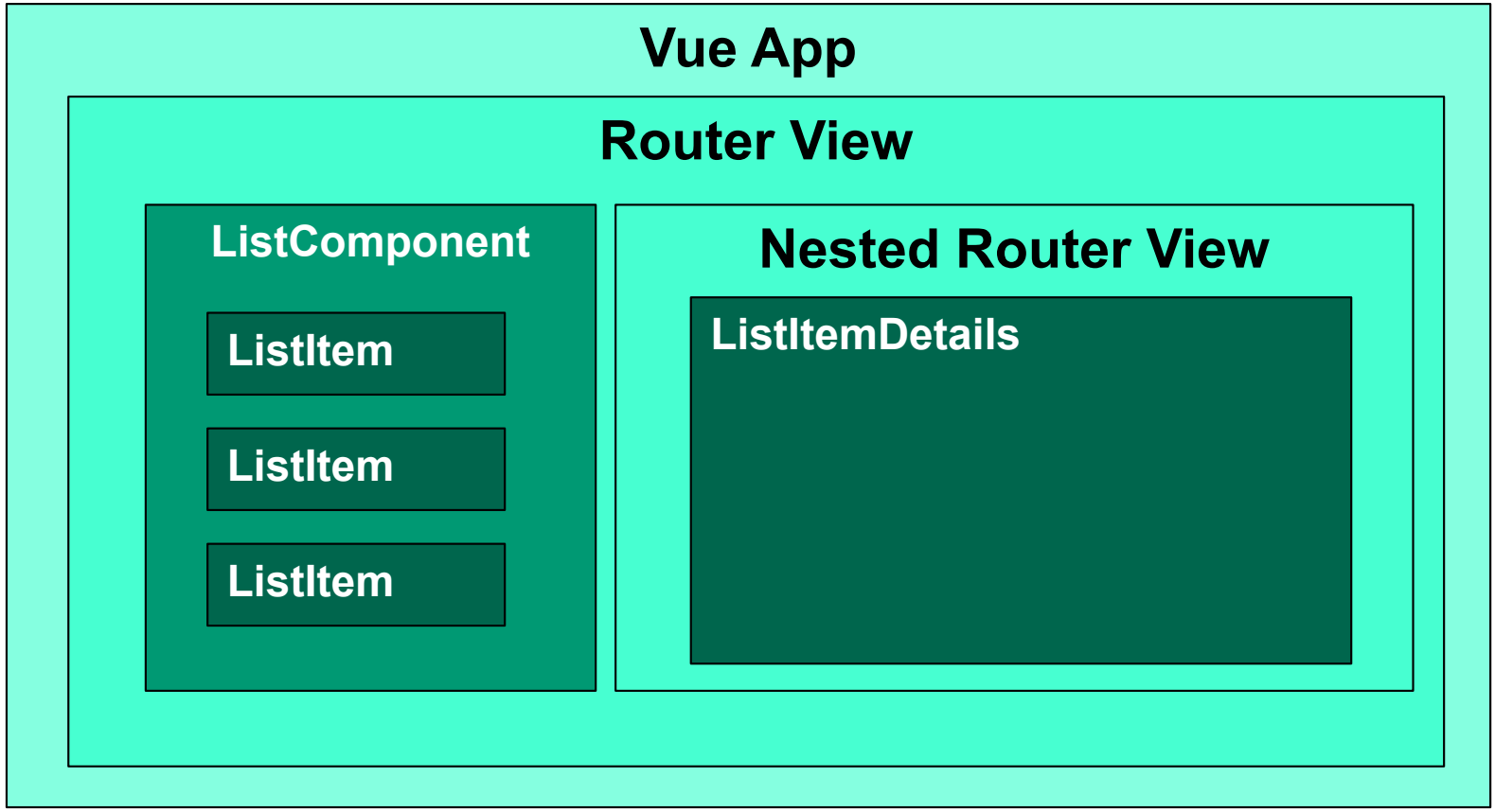
```
location / {
  try_files $uri $uri/ /index.html;
}
```

https://router.vuejs.org/guide/essentials/history-mode.html#example-server-configurations

Nested Router Views

Enabling Children: views inside views

What are nested router views?



Show router links *inside* another router view, but still update the URL

https://router.vuejs.org/guide/essentials/nested-routes.html

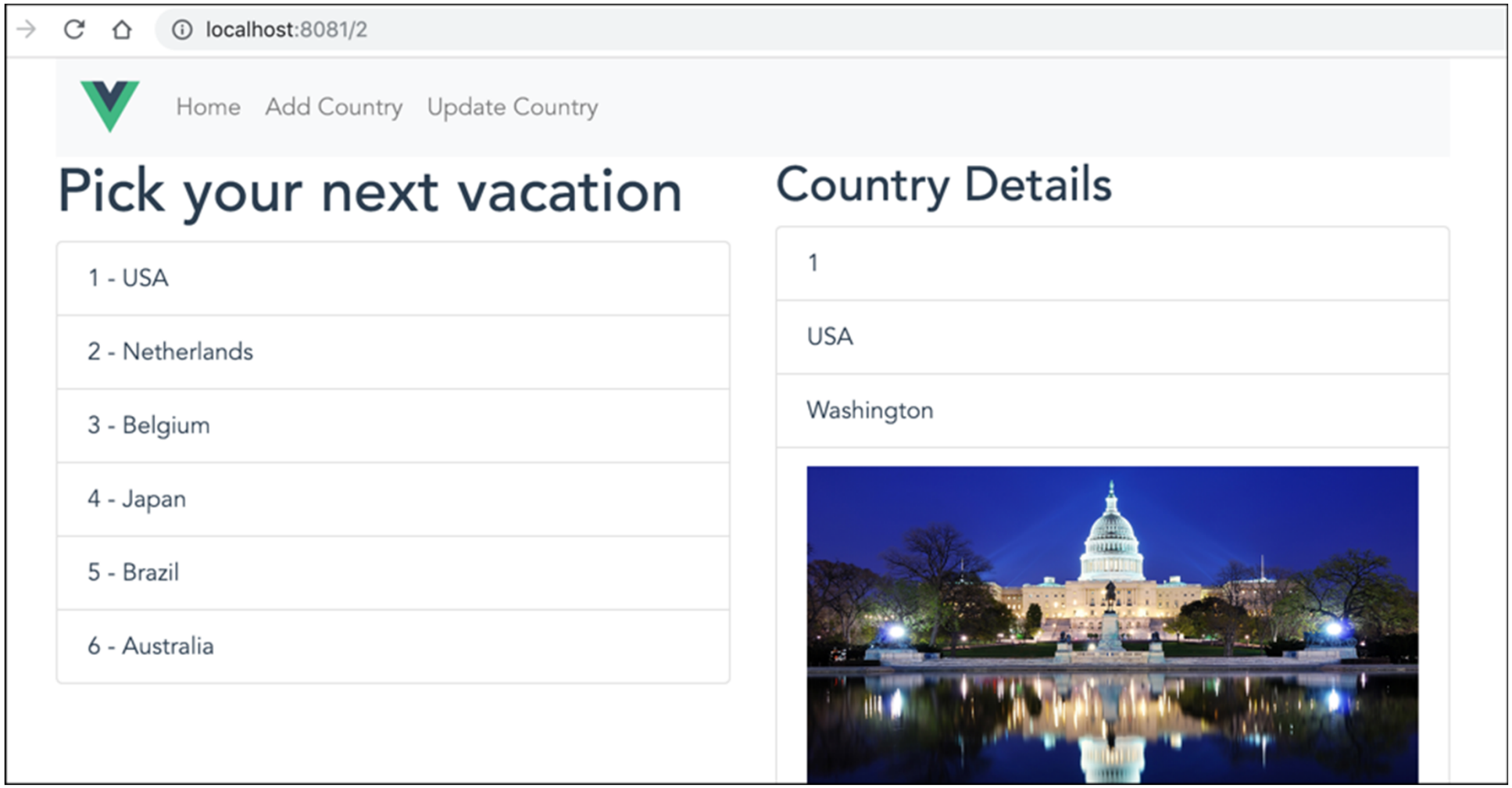
Adding a nested router

- Add a new `<router-view>` to the component you want the nested routes to appear
  - In our case: `<VacationPicker />`
- Add an array of childroutes to the main routing table
  -
```
children: [
    { <child-router-path-1> }
    { <child-router-path-2> }
]
```
- Don’t forget to remove other dynamic routes (if you have some, of course)

```
<div class="row">
    <div class="col-md-6">
        <h1>{{ header }}</h1>
        <ul class="list-group">
            <li class="list-group-item"
                @click="showCountry(country)"
                v-for="country in data.countries" :key="country.id">
            <span :id="country.id"...>
            </li>
        </ul>
    </div>
    <div class="col-md-6">
        <!--The Nested router view here-->
        <router-view></router-view>
    </div>
</div>
```

```
routes: [
    // define all routes here....
    {
        path: '/',
        name: 'home',
        component: VacationPicker,
        children: [
            {
                path: ':id',
                name: 'detail',
                component: CountryDetail
            },
        ]
    },
```

Now it works...the first time



Updating the nested view

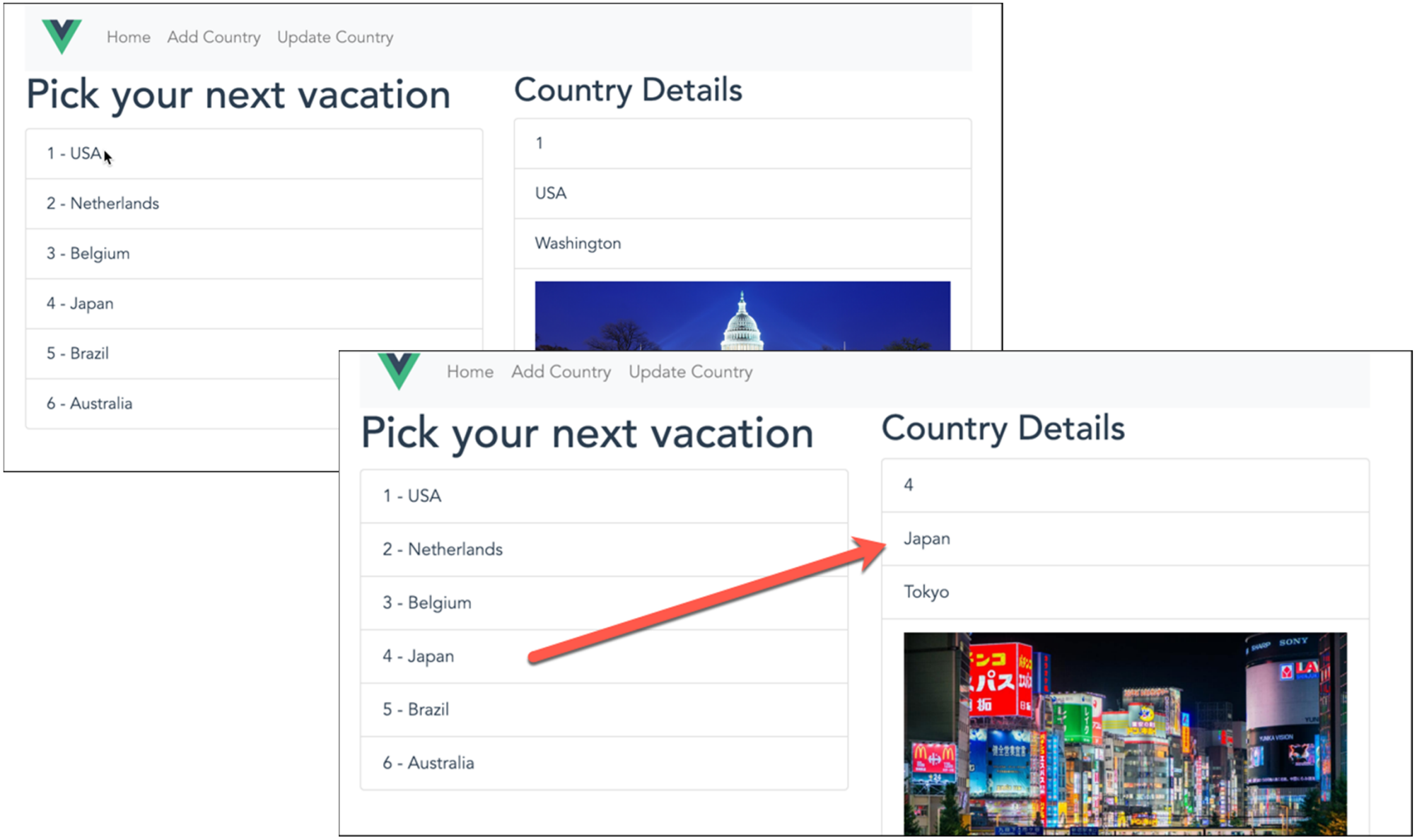
- A nested view is (by default) *not* recreated once the `$route` updates
  - Better for performance
  - You need to tell the component to watch for changes
  - Multiple solutions
- 1st: Tell the `<router-view>` to update once the route changes
  - `<router-view :key="$route.fullPath"></router-view>`
  - This works, but it is not the best for performance
  - Recreating and binding of DOM-element

Updating the nested view

- 2nd – Set a watcher on the route.
  - The component is updated on route change
  - You *need* to have an explicitly declared and initialized data variable on the component, i.e. `country : null`.

```
    data() {
        return {
            data,
            country: null
        }
    },
    watch: {
        '$route'(to, from) {
            console.log(to, from); // logging, so you can see what's going on
            this.id = to.params.id;
            this.country = this.data.countries.find(c => c.id === +this.id);
        }
    },
```

https://router.vuejs.org/guide/essentials/dynamic-matching.html#reacting-to-params-changes


Home
Add Country
Update Country
Pick your next vacation
1 - USA
2 - Netherlands
3 - Belgium
4 - Japan
5 - Brazil
6 - Australia
Country Details
1
USA
Washington
Home
Add Country
Update Country
Pick your next vacation
1 - USA
2 - Netherlands
3 - Belgium
4 - Japan
5 - Brazil
6 - Australia
Country Details
4
Japan
Tokyo

Updating nested view

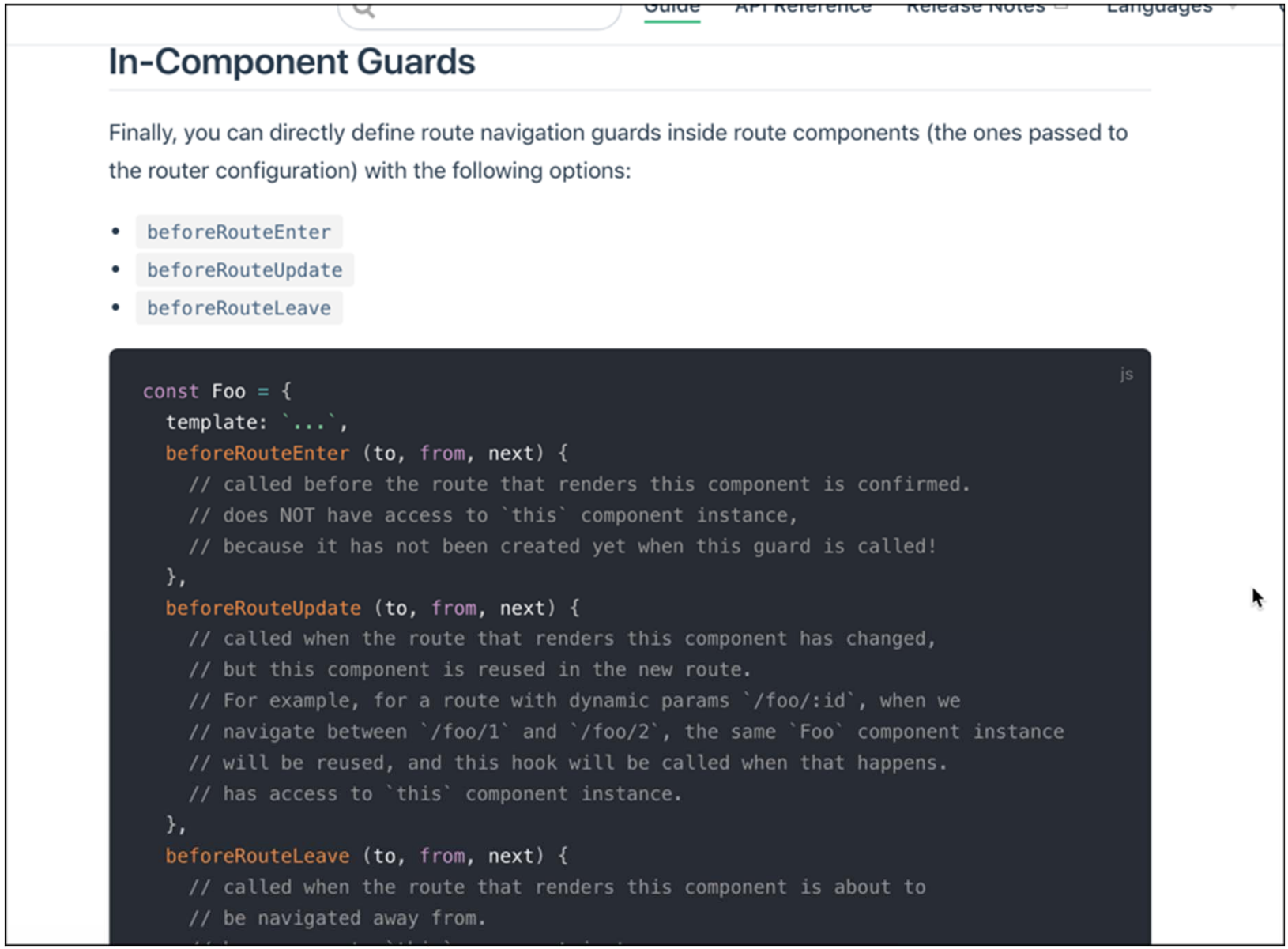
- 3rd – Use the Router ‘ in-component guard’

  `beforeRouteUpdate(to, from, next)`

  - Introduced in Vue 2.2+
  - Don’t forget to call `next()` at the end!
  - https://router.vuejs.org/guide/advanced/navigation-guards.html#in-component-guards

```
// Update nested view, Method 3 - use the beforeRouteUpdate() method,
// introduced in Vue 2.2.
beforeRouteUpdate(to, from, next) {
    this.id = to.params.id;
    this.country = this.data.countries.find(c => c.id === +this.id);
    next();
},
```

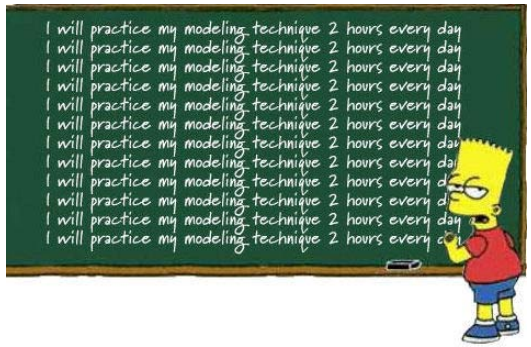
More info on In-Component guards



https://router.vuejs.org/guide/advanced/navigation-guards.html#in-component-guards

Workshop

- Use your own application, or start from `../310-route-parameters` (the *previous* example)
- Enable HTML5 History mode
- Add a nested `<router-view>`, as shown in the previous slides
  - If a country is selected, the view is updated in the same page.
  - Update the application, so that not only the `id` is shown in the URL, but also the country name.
  - Optional – update the master view, so that no `@click` event handler is used, but dynamic binding on the `<router-link :to="…">` parameter
- Generic example: `../320-nested-routing`



Checkpoint

- You know how to add routing to a project
- You can create a routing table in an `index.js`, or `router.js`
- You can use `<router-view>` and `<router-link>`
- You can add styles and conditional styles to routes
- You know how to navigate from code, by using `$router.push(…)`
- You can use route parameters (`/:<some-name>`) to create dynamic routes
- You know how to enable HTML5 history mode on the router
- You are able to use nested router views