Is it time to migrate to Vue.js 3.x?

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<table>
<thead>
<tr>
<th>Vue.js Version</th>
<th>Release date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.6</td>
<td>February 4, 2019</td>
</tr>
<tr>
<td>3.0</td>
<td>September 18, 2020</td>
</tr>
<tr>
<td>3.1</td>
<td>June 7, 2021</td>
</tr>
<tr>
<td>3.2</td>
<td>August 5, 2021</td>
</tr>
<tr>
<td>3.x as new default</td>
<td>February 7, 2022</td>
</tr>
<tr>
<td>2.7 (maintenance mode)</td>
<td>July 1, 2022</td>
</tr>
<tr>
<td>2.x End of Life</td>
<td>End of 2023</td>
</tr>
</tbody>
</table>
export default {
  data() {
    return { count: 0 }
  },
  methods: {
    increment() {
      this.count++
    },
    },
},

<template>
  <button @click="increment">Count is: {{ count }}</button>
</template>
SEPTEMBER 18, 2020

VUE 3.0 OFFICIALY ANNOUNCED

- Composition API
- `<script setup>` (experimental)
- no IE11 support

https://blog.vuejs.org/posts/vue-3-one-piece.html
COMPOSITION API IN setup() (VUE 3)

```javascript
<script>
import { ref } from 'vue'

export default {
  setup() {
    const count = ref(0)

    function increment() {
      count.value++
    }

    return { count, increment }
  },
}

</script>

<template>
  <button @click="increment">Count is: {{ count }}</button>
</template>
```
COMPOSITION API IN setup()
(Vue 2 + @vue/composition-api)

```javascript
import VueCompositionAPI from '@vue/composition-api'
Vue.use(VueCompositionAPI)

- import { ref, ... } from 'vue'
+ import { ref, ... } from '@vue/composition-api'
```
COMPOSITION API IN `setup()`
(Vue 2 + `@vue/composition-api`)

```javascript
import VueCompositionAPI from '@vue/composition-api'

Vue.use(VueCompositionAPI)

- import { ref, ... } from 'vue'
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```

BROKEN TESTS
COMPOSITION API IN `setup()`
(Vue 2 + `@vue/composition-api`)

```javascript
import VueCompositionAPI from '@vue/composition-api'
Vue.use(VueCompositionAPI)
```

**BROKEN TESTS**

```javascript
Vue.use(VueCompositionAPI)
// or
localVue.use(VueCompositionAPI)
```

in tests files
<script setup>
import { ref } from 'vue'

const count = ref(0)

function increment() {
  count.value++
}
</script>

<template>
  <button @click="increment">Count is: {{ count }}</button>
</template>
JULY 1, 2022

VUE 2.7 "NARUTO" RELEASED

• Composition API
• `<script setup>(partial)`

https://blog.vuejs.org/posts/vue-2-7-naruto.html
VUE 2.7 UPGRADE GUIDE

1. Upgrade local @vue/cli-xxx dependencies

npx @vue/cli@latest upgrade

Upgrade to the latest version in your major version range (if applicable)

- ~4.5.18 for v4
- ~5.0.6 for v5
2. Upgrade vue to ^2.7

You can also remove `vue-template-compiler` from the dependencies, it is no longer needed in 2.7.

If you are using `@vue/test-utils`, you may need to keep it in the dependencies for now, but this requirement will also be lifted in a new release of test utils.

Always keep vue and vue-template-compiler in sync.
VUE 2.7 UPGRADE GUIDE

3. Check your package manager lockfile for version requirements

```
npm ls vue-loader  # should be at least ^15.10.0
npm ls vue-demi   # should be at least ^0.13.1
```

If not, you will need to remove `node_modules` and the lockfile and perform a fresh install to ensure they are bumped to the latest version.
VUE 2.7 UPGRADE GUIDE

4. Remove `@vue/composition-api` and update imports to `vue` instead

```javascript
npm uninstall @vue/composition-api

- import VueCompositionAPI from '@vue/composition-api'
- Vue.use(VueCompositionAPI)

- import { ref, ... } from '@vue/composition-api'
+ import { ref, ... } from 'vue'
```
More info about Vue 2.7 upgrade

https://blog.vuejs.org/posts/vue-2-7-naruto.html
USING `<script setup>`

```javascript
- <script>
+ <script setup>
  import { ref } from 'vue'

- export default {
-   setup() {
-     const count = ref(0)

-       function increment() {
-         count.value++
-       }
-     return { count, increment }
-   },
- }
</script>
```
Broken vue-router usage!

```
npm i -S vue-router@^3.6.5

+ import { useRoute, useRouter } from 'vue-router/composables'
+ const route = useRoute()
+ const router = useRouter()

- this.$route
+ route

- this.$router
+ router
```
Same for vuex $store usage?

Import the store and navigate through it

or migrate to pinia

```javascript
import store from '@/store';

store.state.propertyName
store.state.moduleName.propertyName
store.getters.getterName
store.getters['moduleName/getterName']
store.commit(/* */)
store.dispatch(/* */)
```
WHAT ABOUT TESTS?

TESTS WON'T FAIL

IF YOU DON'T WRITE TESTS
Broken tests!

```javascript
console.error
[Vue warn]: Property or method "count" is not defined on the instance but referenced during render.
Make sure that this property is reactive, either in the data option, or for class-based components, by initializing the property.
See: https://v2.vuejs.org/v2/guide/reactivity.html#Declaring-Re
```

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```

@vue/vue2-jest 27.x
not working with Vue 2.7
SEPTEMBER 15, 2022

@vue/vue2-jest 29.1 released with support for `<script setup>` in Vue 2.7...
SEPTEMBER 15, 2022

@vue/vue2-jest 29.1 released with support for `<script setup>` in Vue 2.7...

...with Jest 29
USING JEST DIRECTLY

• update jest.config.js

  from node_modules
  @vue/cli-plugin-unit-jest/presets/default/jest-preset.js

• update package.json test script

  - "test:unit": "vue-cli-service test:unit",
  + "test:unit": "jest",

• run tests without vue-cli-service

  npm run test:unit
  # or
  npx jest
UPGRADING JEST TO 29.X

```shell
npm uninstall @vue/cli-plugin-unit-jest
npm install -D \
  jest-environment-jsdom \
  jest-serializer-vue \
  jest-transform-stub \
  jest-watch-typeahead \
  @vue/vue2-jest@^29 \
  babel-jest@^29 \
  jest@^29
```

and fix deprecation warnings

```javascript
- testURL: 'http://localhost/",
+ testEnvironmentOptions: {
+   url: 'http://localhost/",
+ },
```
Components using `<script setup>` are closed by default

```javascript
const spyIncrement = jest.spyOn(wrapper.vm, 'increment')
```

Won't work anymore

```javascript
defineExpose({ increment }) // not working
```
Components using `<script setup>` are closed by default

```javascript
const spyIncrement = jest.spyOn(wrapper.vm, 'increment')
```

Won't work anymore

```javascript
defineExpose({ increment }) # not working
```

Temporary (not suggested) workaround

```javascript
// FIXME: temporary workaround
- const spyIncrement = jest.spyOn(wrapper.vm, 'increment')
+ const spyIncrement = jest.spyOn(
  + wrapper.vm._setupState, 'increment')
```
COMPONENT TESTING

Test what a component does, not how it does it.

- // FIXME: temporary workaround
- const spyIncrement = jest.spyOn(
  - wrapper.vm._setupState, 'increment'
- wrapper.find('button').trigger('click')
- expect(spyIncrement).toBeCalled()
+ expect(wrapper.find('p').text()).toBe('Count is: 0')
+ await wrapper.find('button').trigger('click')
+ expect(wrapper.find('p').text()).toBe('Count is: 1')

https://vuejs.org/guide/scaling-up/testing.html#component-testing
MIGRATION TO VUE 3

https://v3-migration.vuejs.org/
MIGRATION TO VUE 3

https://v3-migration.vuejs.org/

- New Features
- Breaking Changes
- Recommendations
- Migration Build
MIGRATION TO VUE 3

BREAKING CHANGES

While it looks like a lot has changed, a lot of what you know and love about Vue is still the same; but we wanted to be as thorough as possible and provide detailed explanations and examples for every documented change.

https://v3-migration.vuejs.org/breaking-changes/
NEW FRAMEWORK-LEVEL RECOMMENDATIONS

- New versions of Router, Devtools & test utils w/ Vue 3 support
- Build Toolchain: Vue CLI -> Vite
- State Management: Vuex -> Pinia
- IDE Support: Vetur -> Volar
- ...

https://v3-migration.vuejs.org/recommendations.html
EASY MIGRATIONS

- Devtools
- IDE Support: Vetur -> Volar
MANDATORY MIGRATIONS

- Vue Router
- Vuex
- Test utils
- Third party libraries
  (Vuetify, Quasar, ElementUI, etc...)
AVOIDABLE MIGRATIONS

- Vue CLI -> Vite
- Jest -> Vitest
MIGRATION BUILD: @vue/compat

- build of Vue 3
- configurable Vue 2 compatible behavior
- runs in Vue 2 mode by default
- usage of changed/deprecated features will emit runtime warnings

https://v3-migration.vuejs.org/migration-build.html
KNOWN LIMITATIONS

- dependencies that rely on Vue 2 internal APIs or undocumented behavior.
- usage of private properties on VNodes (Vuetify, Quasar, ElementUI, ...)
- IE11 support dropped
- Server-side rendering
UPGRADE WORKFLOW

1. upgrade tooling if applicable
   - **vue-cli:**
     ```
     npx @vue/cli@latest upgrade
     ```
   - custom webpack setup:
     ```
     upgrade vue-loader to ^16
     ```
2. update vue in package.json

```
"dependencies": {
-   "vue": "~2.7",
+   "vue": "^3.2.39",
+   "@vue/compat": "^3.2.39"
   ...
},
"devDependencies": {
-   "vue-template-compiler": "~2.7"
}
```

```
npm i -S vue@^3.2 @vue/compat@^3.2 --force
npm uninstall vue-template-compiler --force
```
3.1. alias vue to @vue/compat

```javascript
// vue.config.js
module.exports = {
  // ...
  chainWebpack: (config) => {
    config.resolve.alias.set('vue', '@vue/compat')
    // ...
  }
}
```

Webpack or Vite config on
https://v3-migration.vuejs.org/migration-build.html
3.2. enable compat mode via Vue compiler options

```javascript
config.module
  .rule('vue')
  .use('vue-loader')
  .tap((options) => {
    return {
      ...options,
      compilerOptions: {
        compatConfig: {
          MODE: 2
        }
      }
    }
  })
```

Webpack or Vite config on
https://v3-migration.vuejs.org/migration-build.html
4. if using TypeScript, update vue's typing

declare module 'vue' {
  import { CompatVue } from '@vue/runtime-dom'
  const Vue: CompatVue
  export default Vue
  export * from '@vue/runtime-dom'
  const { configureCompat } = Vue
  export { configureCompat }
}
5. fix compile-time errors

When compiler warnings are gone, you can set the compiler to Vue 3 mode

```javascript
compilerOptions: {
  compatConfig: {
    MODE: 3
  }
}
```
6. Run the app

WARNINGS FROM COMMAND LINE AND BROWSER CONSOLE

YOUR APPLICATION
6. Run the app

- the app should be able to run if no limitations mentioned above
- focus on fixing your own source code warnings first
7. Update `<transition>` class names

This feature does not have a runtime warning.

Search for `.*-enter` and `.*-leave` CSS class names

- .*-enter
- .*-enter-from
- .*-leave
- .*-leave-to
8. Update app entry to use new global mounting API

```javascript
- import Vue from 'vue'
+ import { createApp } from 'vue'
  import App from './App.vue'
  import router from './router'
  import store from './store'

- Vue.config.productionTip = false

- new Vue({
+ const app = createApp({
    router,
    store,
-    render: h => h(App)
+    ...App,
-  }).$mount('#app')
+  })

+ app.mount('#app')
```
9. Upgrade vuex to v4

```bash
npm i -S vuex@^4 --force
```

https://vuex.vuejs.org/guide/migrating-to-4-0-from-3-x.html
9. Upgrade vuex to v4

```javascript
// src/store/index.js
- import Vue from 'vue'
- import Vuex from 'vuex'
+ import { createStore } from 'vuex'

- Vue.use(Vuex)

- export default new Vuex.Store({
+ export default createStore({
-   state: {
-     count: 0,
+   state() {
+     return {
+       count: 0,
+     }
+   },
+   // ...
```
9. Upgrade vuex to v4

// src/main.js
import store from './store'

const app = createApp({
  router,
  - store,
    ...App,
})

+ app.use(store)
9. Upgrade Vuex to v4

Composition API usage

```javascript
import { useStore } from 'vuex'

const store = useStore()
```
10. Upgrade vue-router to v4

```
npm i -S vue-router@^4 --force
```

https://router.vuejs.org/guide/migration/index.html
10. Upgrade vue-router to v4

```javascript
// src/router/index.js
- import Vue from 'vue'
- import VueRouter from 'vue-router'
+ import { createRouter, createWebHistory } from 'vue-router'

- Vue.use(Vuex)

const routes = [
  // ...
]

- const default new VueRouter({
+ export default createRouter({
  - mode: 'history',
  - base: process.env.BASE_URL,
+  history: createWebHistory(process.env.BASE_URL),
  routes
})
```
10. Upgrade vue-router to v4

```javascript
// src/main.js
import router from './router'

const app = createApp({
  router,
  ...App,
})

+ app.use(router)
```
10. Upgrade vue-router to v4

Composition API usage

```javascript
import { useRouter, useRoute } from 'vue-router'

const router = useRouter()
const route = useRoute()
```
11. Pick off individual warnings (if any)
Always refer to the doc.

https://v3-migration.vuejs.org/
12. Remove the migration build and switch to Vue 3 when all warnings are fixed.

Note you may not be able to do so if you still have dependencies that rely on Vue 2 behavior.

```
npm uninstall @vue/compat --force
```
BROKEN TESTS!

Upgrade testing packages

```bash
npm uninstall @vue/vue2-jest --force
npm i -D @vue/vue3-jest@^29 --force
npm i -D @vue/test-utils@^2 --force
```

```javascript
// jest.config.js
transform: {
  '-' + '\.vue$': '@vue/vue2-jest',
  '+' + '\.vue$': '@vue/vue3-jest',
}
```

https://test-utils.vuejs.org/migration/
VUE TEST UTILS V2 CHANGES

• `propsData` is now `props`
• no more `createLocalVue`
• mocks and stubs are now in `global`
• `findAll().at()` removed
  use `findAll()[[]]`
• ...

https://test-utils.vuejs.org/migration/
MY FRESHLY MIGRATED PROJECT

ENVIRONMENT UPDATES, BREAKING CHANGES, BROKEN TESTS, UNSUPPORTED DEPENDENCIES, COMPILE/RUNTIME WARNINGS/ERRORS,
RECAP

• Vue 2.6 + @vue/composition-api
  ▪ Composition API (setup() only)

• Vue 2.6 → 2.7
  ▪ Composition API
  ▪ <script setup>

• Vue 2.x → 3.x
  ▪ long term support for your codebase
THANK YOU!

- blog.vuejs.org | vuejs.org
- v3-migration.vuejs.org
- vuex.vuejs.org | router.vuejs.org
- test-utils.vuejs.org
- github.com/dennybiasiolli/vue-migration-2-to-3 migrate-to-vue3 branch

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