CIS 658 Web Architectures

Pinia

App State Management

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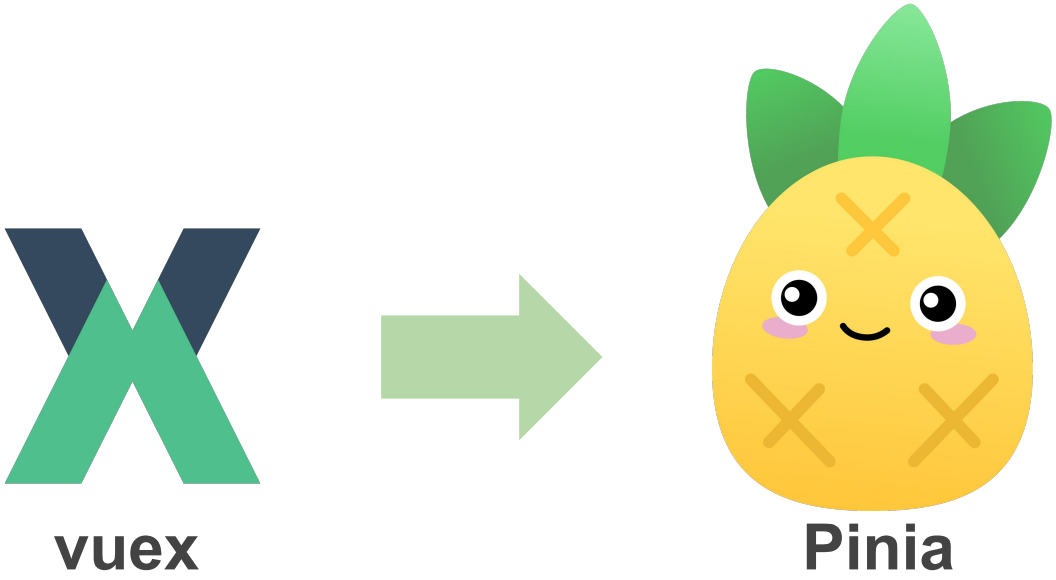
Based on the original version by Daniel Kelly.

What is Pinia?

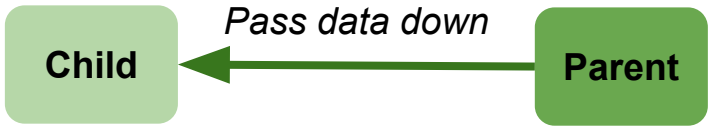
Pinia is a state management solution created by Vue core team member Eduardo San Martin Morote, who also created Vue Router.



What is state management?

Parent.vue

```vue
<template>
  <Child :message="parentData" />
</template>

<script setup lang="ts">
import { ref } from 'vue';
import Child from './Child.vue';

const parentData = ref('Message from Parent');
</script>
```



Demo

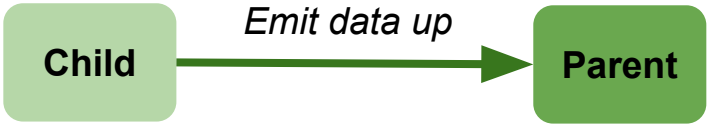
```vue
<template>
  <div>{{ message }}</div>
</template>

<script setup lang="ts">
import { defineProps } from 'vue';

const props = defineProps({
  message: String
});
</script>
```

Child.vue

What is state management?

Parent.vue

```vue
<template>
  <Child @childEvent="handleChildEvent" />
</template>

<script setup lang="ts">
import { ref } from 'vue';
import Child from './Child.vue';

const parentData = ref('');

const handleChildEvent = (data: string) => {
  parentData.value = data;
};
</script>
```

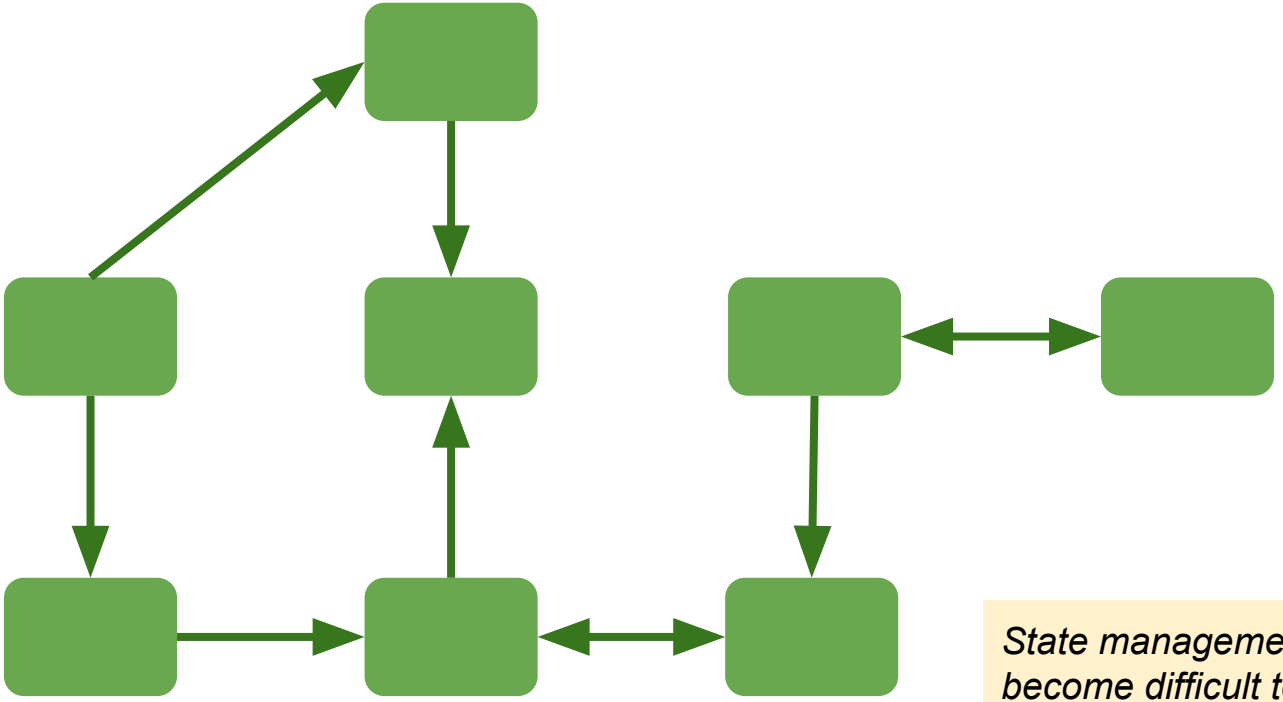



```vue
<template>
  <button @click="sendDataToParent">Send Data to Parent</button>
</template>

<script setup lang="ts">
import { defineEmits } from 'vue';

const emit = defineEmits(['childEvent']);

const sendDataToParent = () => {
  emit('childEvent', 'Data from child');
};
</script>
```

Child.vue

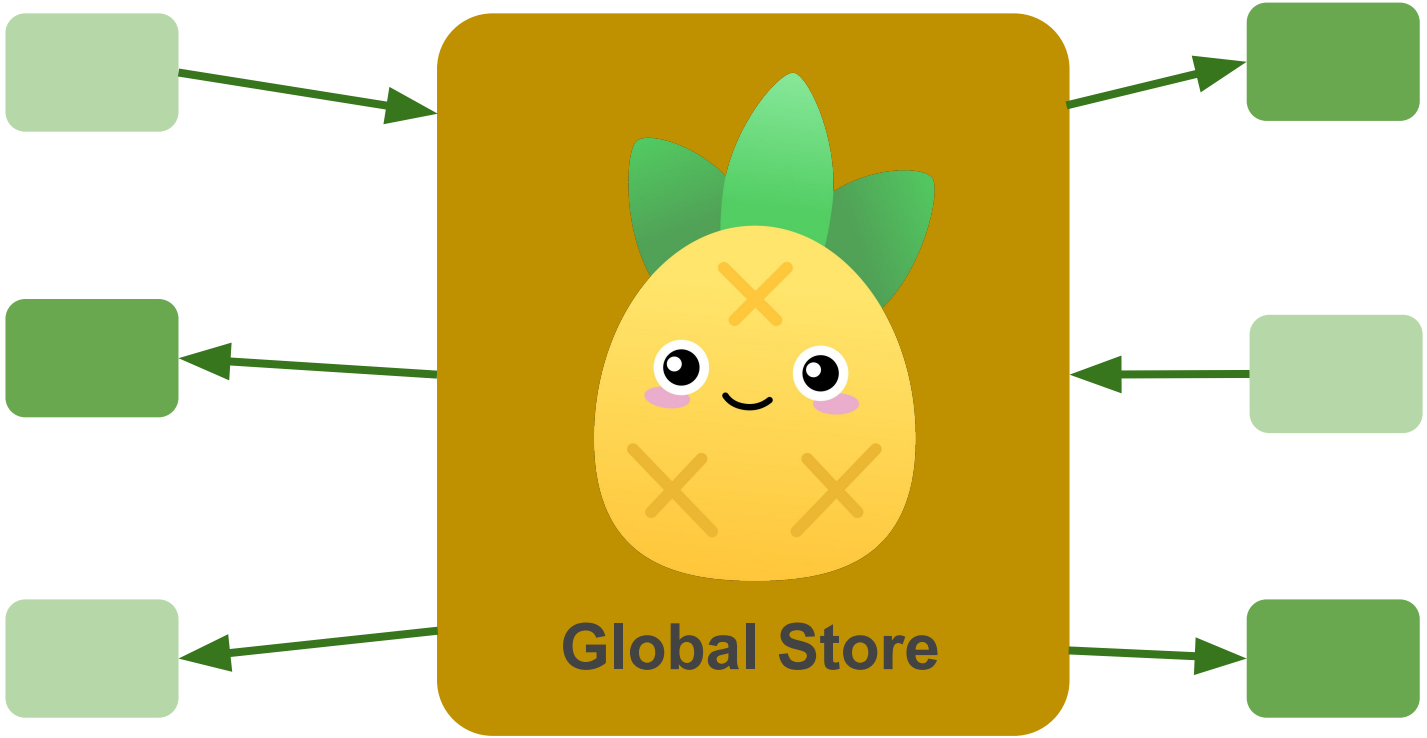
Demo

Large-scale SPA (single page application)



State management can quickly become difficult to maintain

Pinia: state management solution



Pinia is not a replacement for props and events

state management

+

props and events

Do I need to add Pinia to my project?

When should I use it?

Not necessary for

- Project with 5 - 10 components.
- Smaller projects with no shared state.
- Small demo projects.

Useful when:

- Project projected to grow
- Start using Pinia right away
- Almost no downside to using immediately

Why choose Pinia for state management?

Why choose Pinia for state management?

- Stores are as familiar as components. API designed to let you write well organized stores. (fewer new concepts to learn)
- Types are inferred, which means stores provide you with autocompletion even in JavaScript
- Pinia hooks into Vue devtools to give you an enhanced development experience in both Vue2 and Vue3.
- React to store changes to extend Pinia with transactions, local storage synchronization, etc.
- Build multiple stores and let your bundler code split them automatically.
- Pinia is extremely lightweight by design.

Installation

For a new project:
Official Vue3 project setup with interactive customization

```
node ➜/workspaces $ npm init vue@3

Vue.js - The Progressive JavaScript Framework

✓ Project name: … vue-pinia-app
✓ Add TypeScript? … No / Yes
✓ Add JSX Support? … No / Yes
✓ Add Vue Router for Single Page Application development? … No / Yes
? Add Pinia for state management? › No / Yes
```

In an existing project

```
npm install pinia
```

```
import { createApp } from "vue";
import App from "./App.vue";
import { createPinia } from "pinia";


createApp(App)
  .use(createPinia())
  .mount("#app");
```

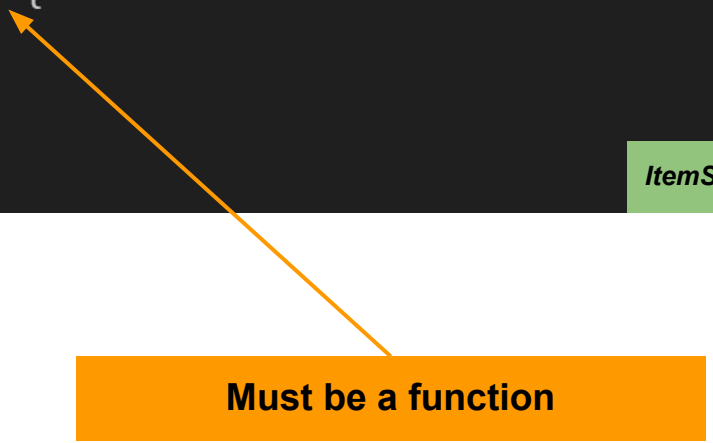
App.vue

Pinia State

Define Pinia State

```
import { defineStore } from "pinia";

export const useItemStore = defineStore("ItemStore", {
  state: () => {
    return {};
  },
});
```

ItemStore.ts



Define Pinia State

```ts
export const useItemStore = defineStore("ItemStore", {
  state: () => {
    return {
      category: "Electronics",
      products: [
        "Gamer's Delight Laptop",
        "SmartTech Pro Phone",
        "Rapid Dual USB-C Charger",
      ],
      inStock: true,
    };
  },
});
```

ItemStore.ts

```vue
<script setup lang="ts">
import { useItemStore } from "./stores/ItemStore";

const itemStore = useItemStore();
console.log(itemStore.category);
</script>
```

AnyVueComponent.vue

Access Pinia State

AnyVueComponent.vue

```
<script setup lang="ts">
import { useItemStore } from "./stores/ItemStore";

const itemStore = useItemStore();
console.log(itemStore.ca);
</script>
```

```
category
$onAction
$patch
```

```
(property) category: string
```

State is TypeSafe

Access Pinia State

AnyVueComponent.vue

```
<script setup lang="ts">
import { useItemStore } from "./stores/useItemStore";

const { category } = useItemStore();
console.log(category);
</script>
```

Can de-structure state from store

*category is **no longer reactive***

Access Pinia State

AnyVueComponent.vue

```vue
<script setup>
import { useItemStore } from "./stores/useItemStore";
import { storeToRefs } from "pinia";

const { category } = storeToRefs(useItemStore());
console.log(category.value);
</script>
```

*convert store to **refs** to maintain reactivity*

Can de-structure state from store

Update Pinia State

AnyVueComponent.vue

```vue
<script setup>
import { useItemStore } from "./stores/useItemStore";
import { storeToRefs } from "pinia";

const { category } = storeToRefs(useItemStore());
category.value = "Groceries";
</script>
```

State can be directly updated

AnyVueComponent.vue

```vue
<script setup lang="ts">
import { useItemStore } from "./stores/useItemStore";

const itemStore = useItemStore();
itemStore.category = "Groceries";
</script>
```

If you don't de-structure, you don't need .value

Two-way Binding

```vue
<script setup lang="ts">
import { useItemStore } from "./stores/ItemStore";
import { storeToRefs } from "pinia";
const { category } = storeToRefs(useItemStore());
</script>

<template>
  <input v-model="category" type="text" />
</template>
```

AnyVueComponent.vue

Demo

Summary

What is state management?

What is Pinia?

- State,

Practice: Pinia(States)