The Bridge

```
┌─────────────────────┐
│       View          │
└─────────────────────┘
           △
           │
     ┌─────┴─────┐
┌─────────┐  ┌─────────┐
│  Label  │  │ Button  │
└─────────┘  └─────────┘
```

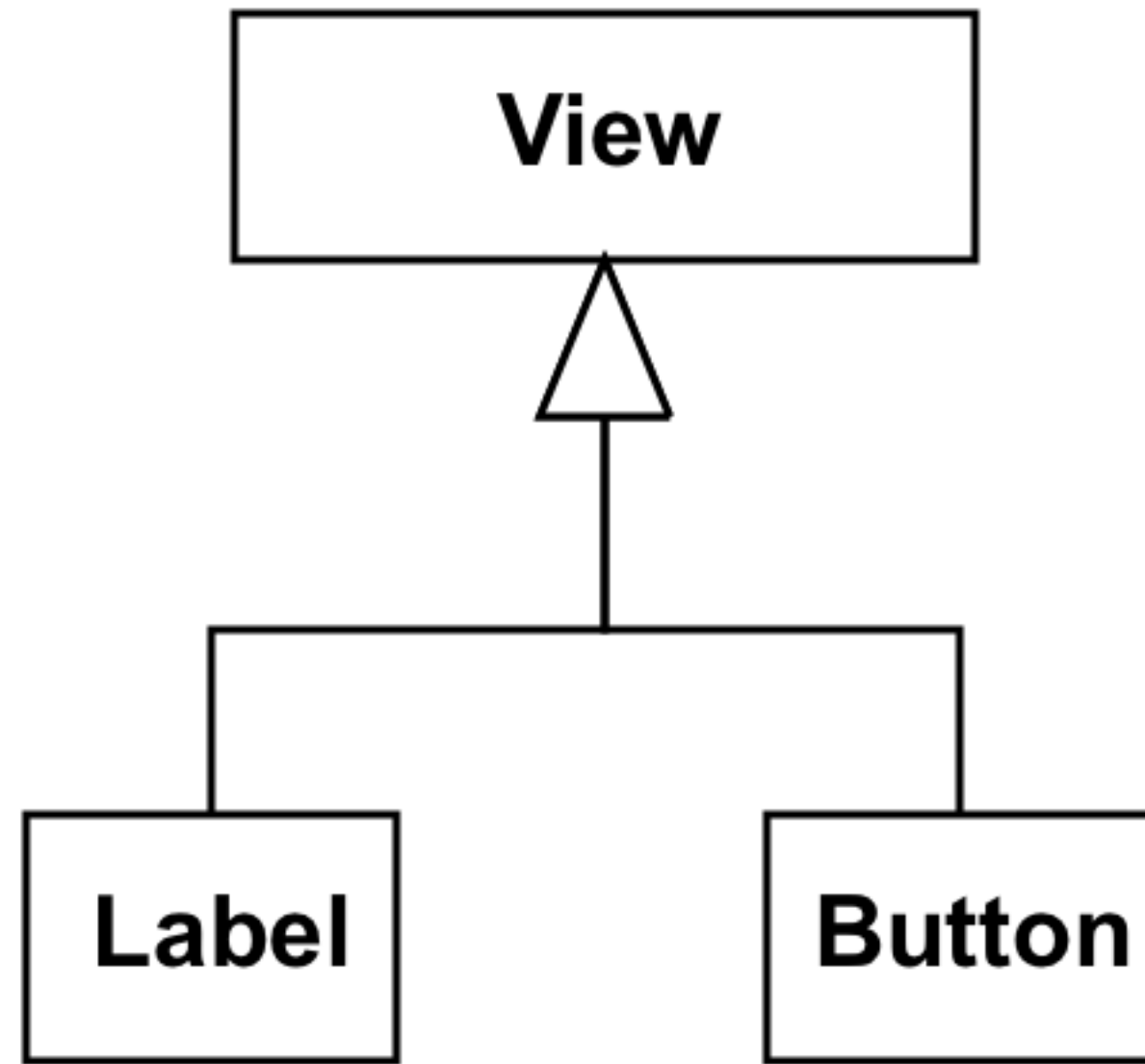**Support light and dark color themes**

```
                           ┌──────────────┐
                           │     View     │
                           └──────────────┘
                                  △
                                  │
             ┌────────────────────┴────────────────────┐
       ┌──────────┐                              ┌──────────┐
       │  Label   │                              │  Button  │
       └──────────┘                              └──────────┘
             △                                        △
             │                                        │
      ┌──────┴──────┐                          ┌──────┴──────┐
┌───────────┐ ┌───────────┐            ┌────────────┐ ┌─────────────┐
│ DarkLabel │ │ LightLabel│            │ DarkButton │ │ LightButton │
└───────────┘ └───────────┘            └────────────┘ └─────────────┘
```

```
                              ┌──────────────┐
                              │     View     │
                              └──────────────┘
                                     △
                                     │
              ┌──────────────────────┴──────────────────────┐
       ┌──────────────┐                              ┌──────────────┐
       │    Label     │                              │    Button    │
       └──────────────┘                              └──────────────┘
              △                                             △
     ┌────────┼────────┐                          ┌─────────┼─────────┐
┌──────────┐    ┌───────────┐              ┌────────────┐     ┌─────────────┐
│ DarkLabel│    │ LightLabel│              │ DarkButton │     │ LightButton │
└──────────┘    └───────────┘              └────────────┘     └─────────────┘
              │                                          │
     ┌────────────────────┐                    ┌─────────────────────┐
     │ HighContrastLabel  │                    │ HighContrastButton  │
     └────────────────────┘                    └─────────────────────┘
```
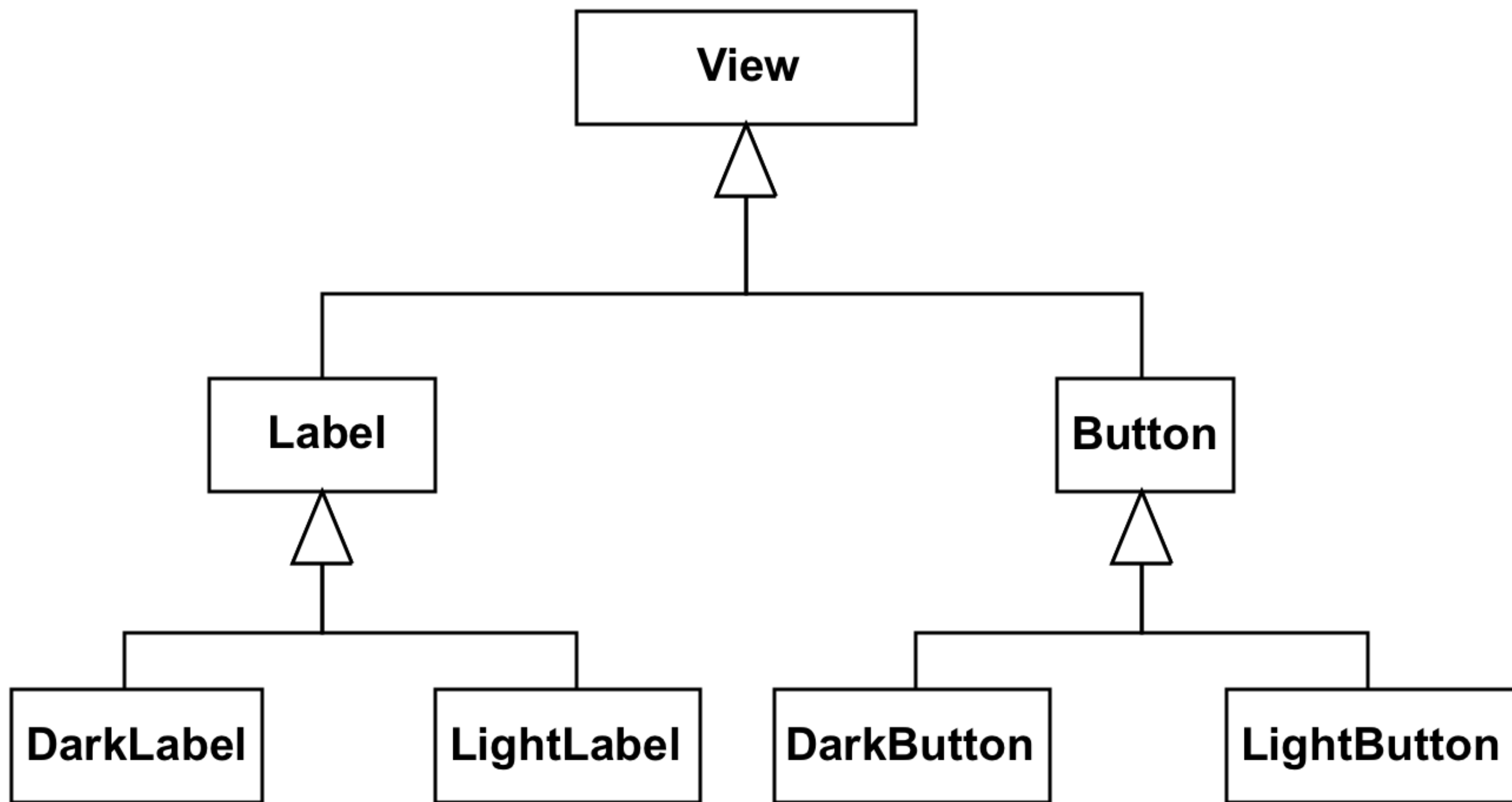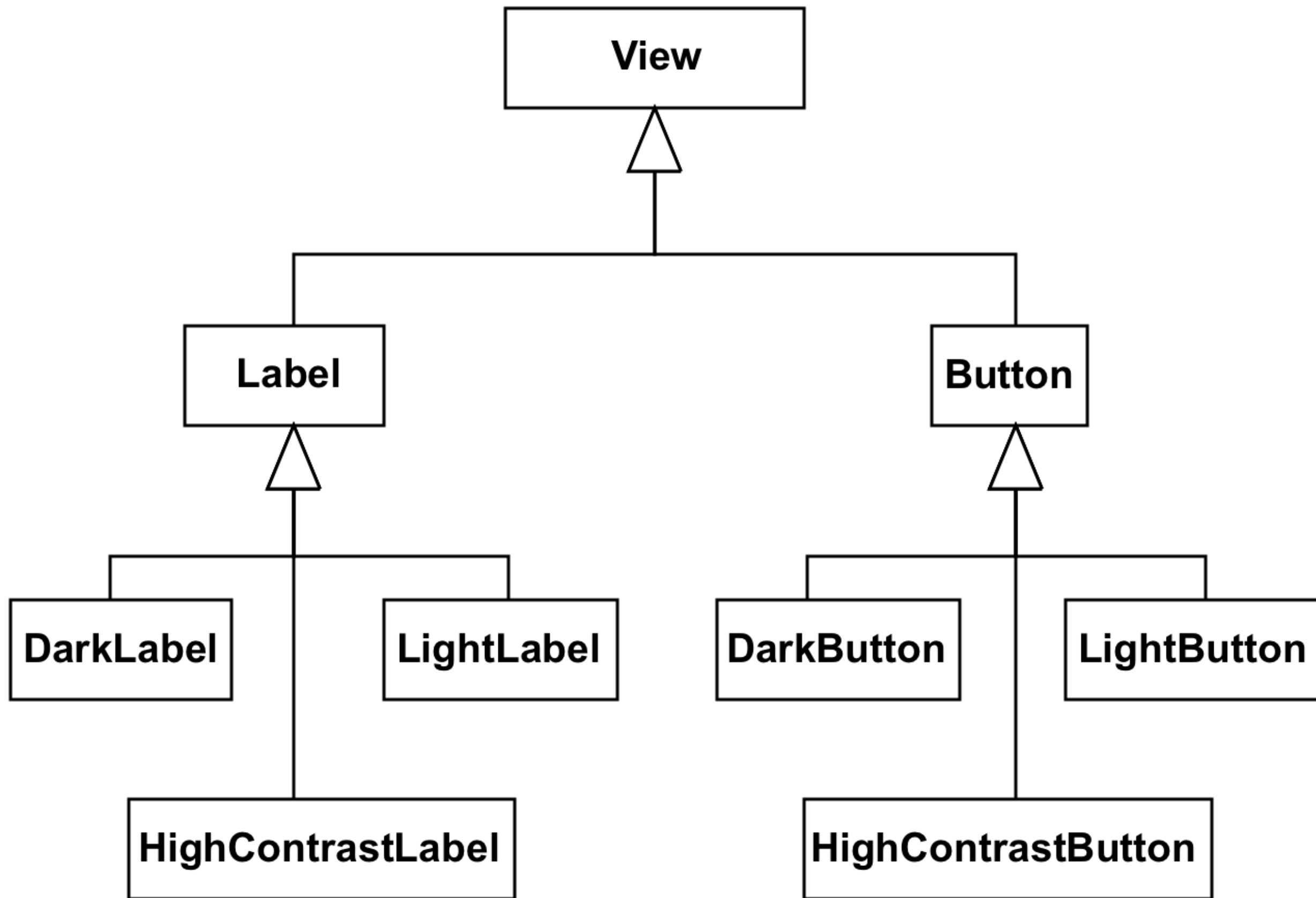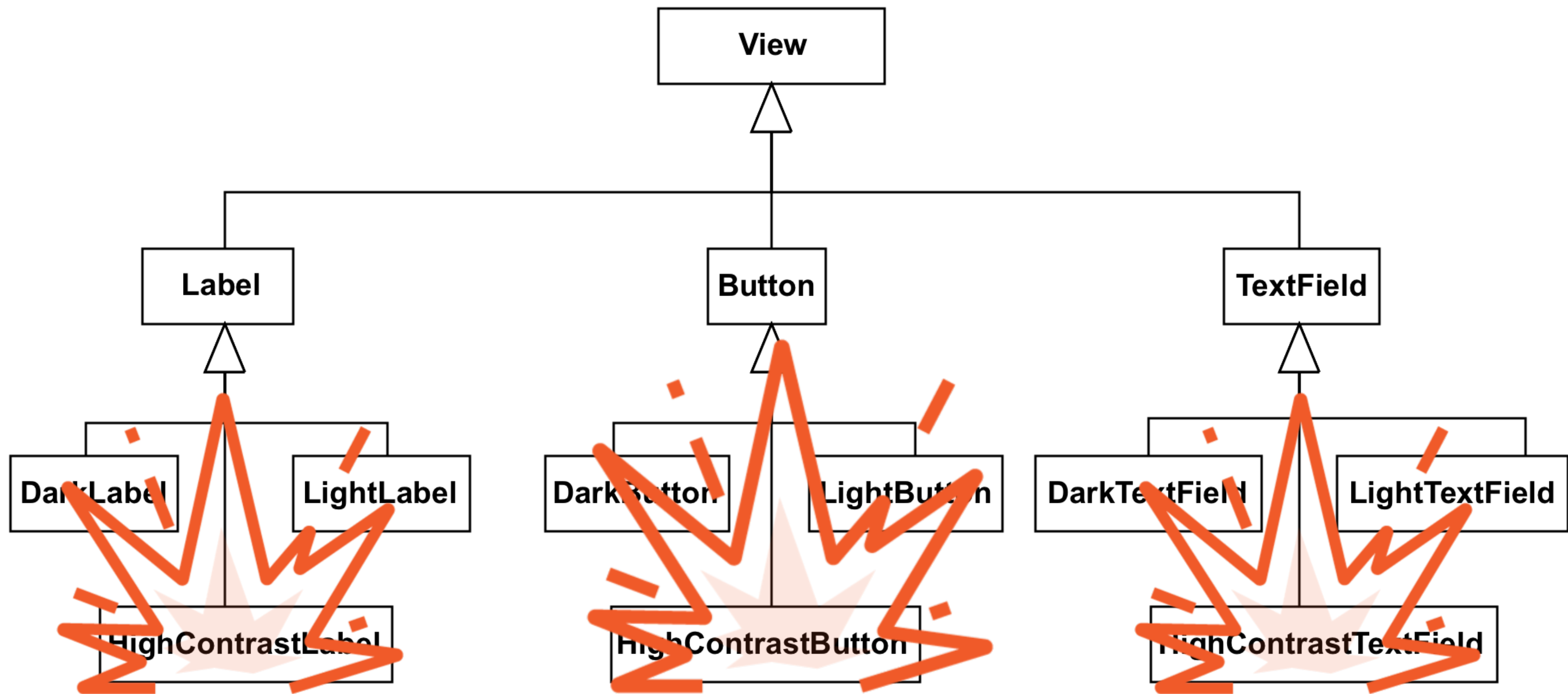
Bridge

Separates common and specific functionality into different hierarchies.

```
                 ┌────────┐                                      ┌─────────┐
                 │  View  │◇─────────────────────────────────▷  │  Theme  │
                 └────────┘                                      └─────────┘
                      △                                               △
                      │                                               │
         ┌────────┬───┴────────┐                      ┌───────────┬───┴──────────┐
    ┌────────┐ ┌────────┐ ┌──────────┐           ┌────────┐ ┌────────┐ ┌──────────────┐
    │ Label  │ │ Button │ │TextField │           │  Dark  │ │ Light  │ │ HighContrast │
    └────────┘ └────────┘ └──────────┘           └────────┘ └────────┘ └──────────────┘
```
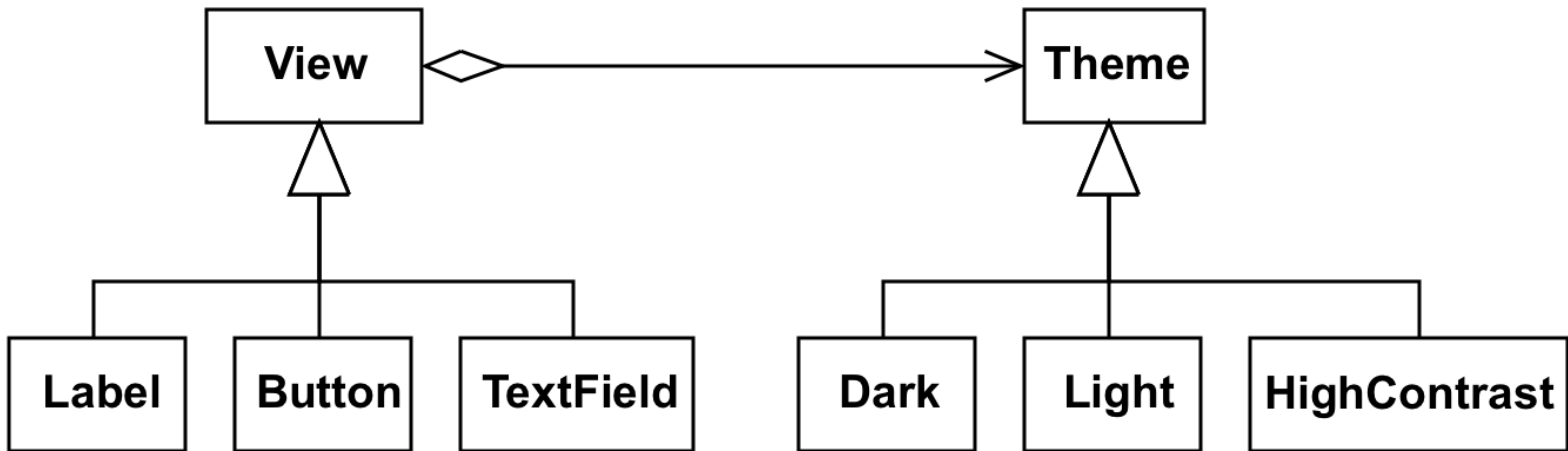
Applying the Bridge

Demo

Exploding Class Hierarchies
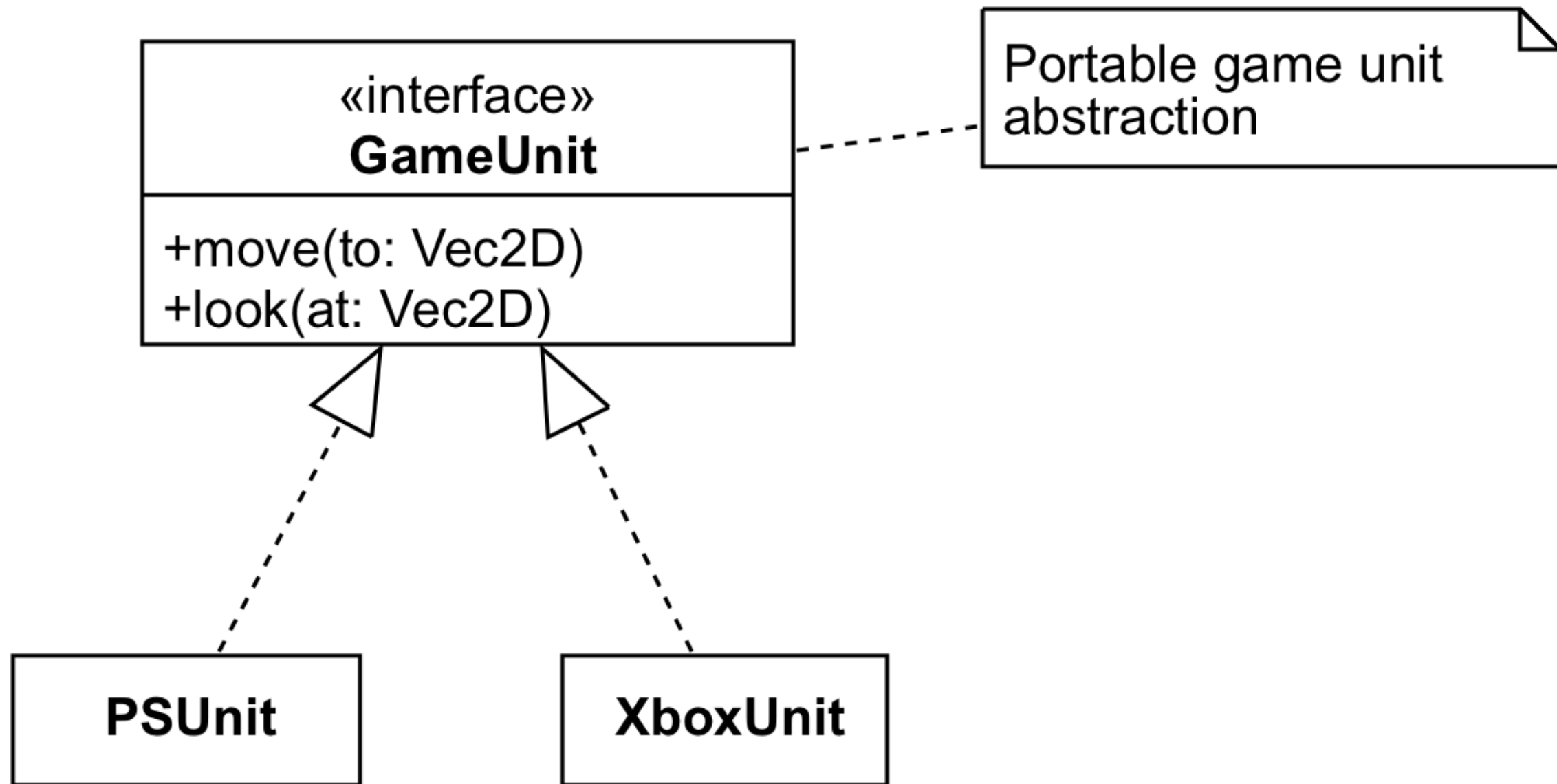
Autonomous agent
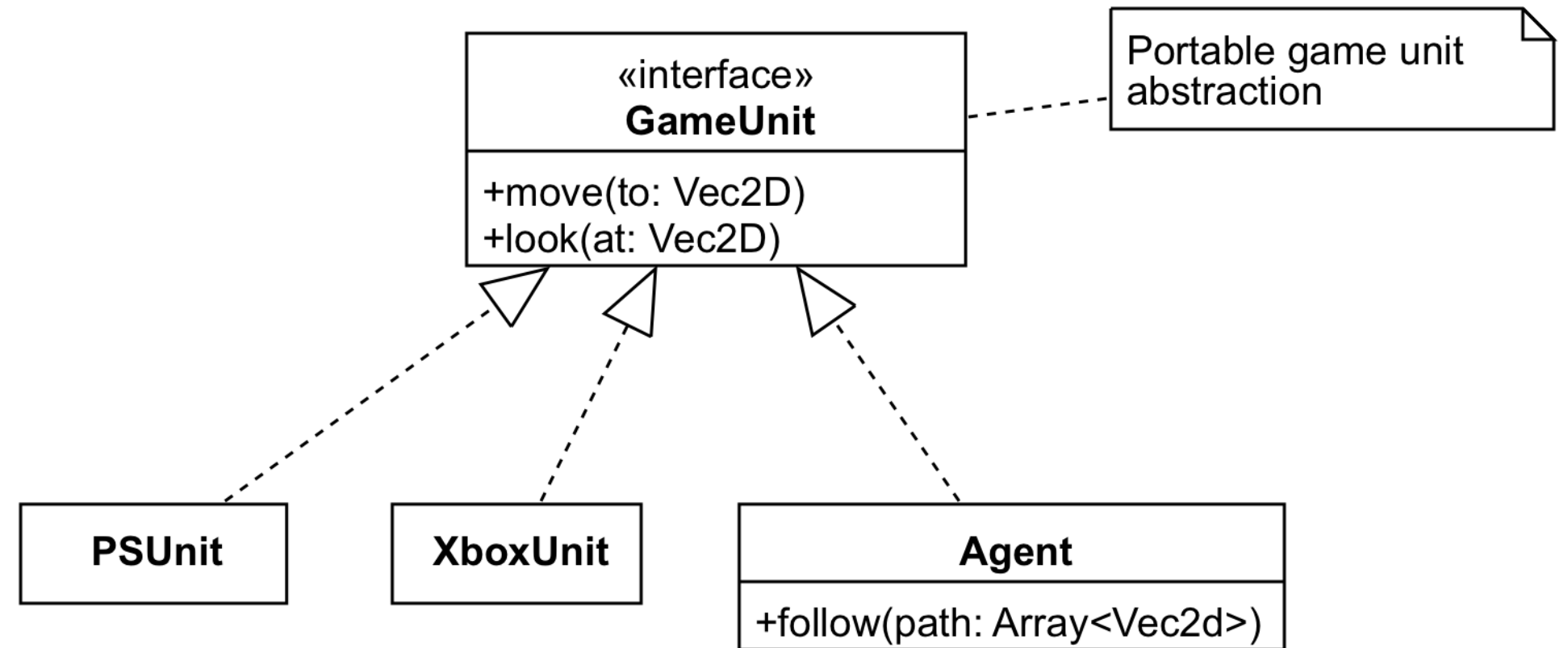
Autonomous agent

Platform-specific agents
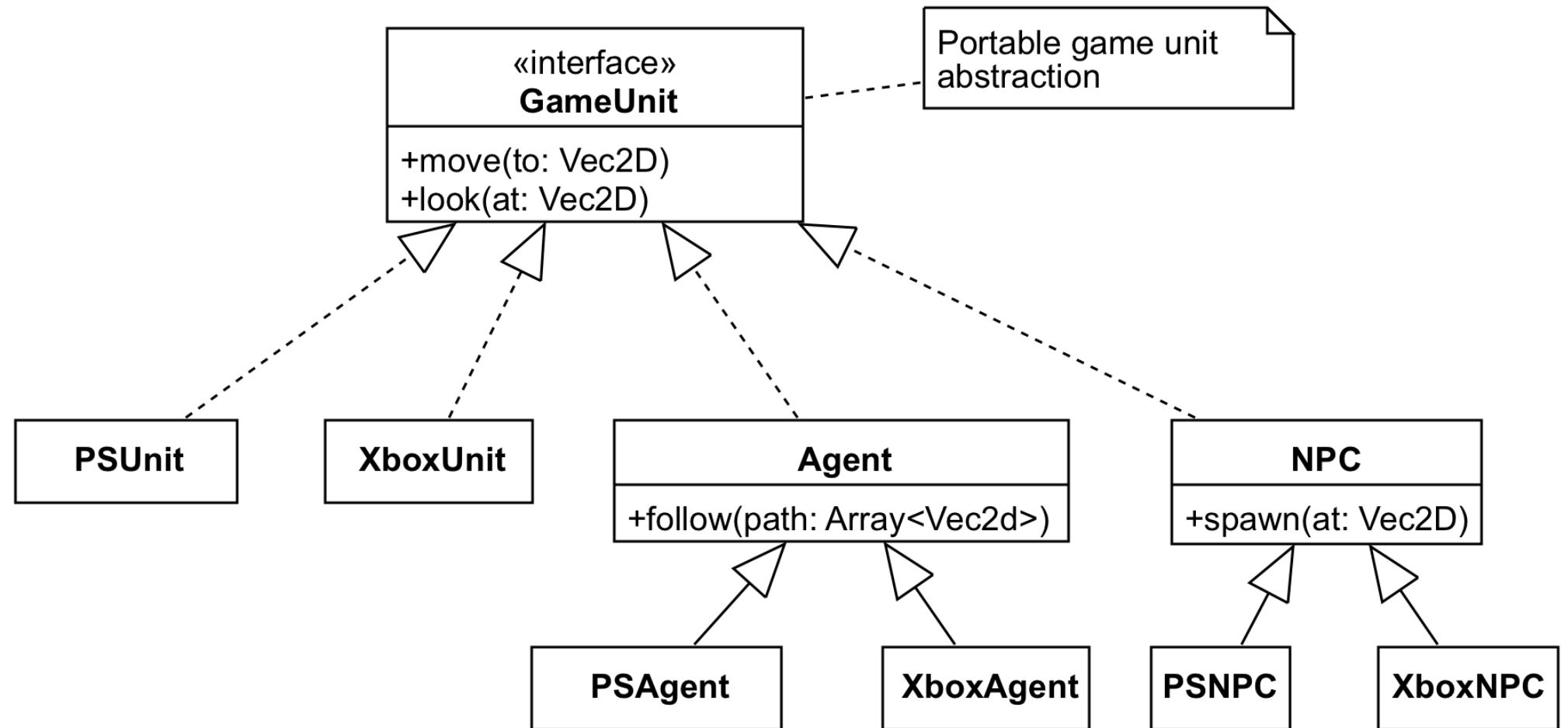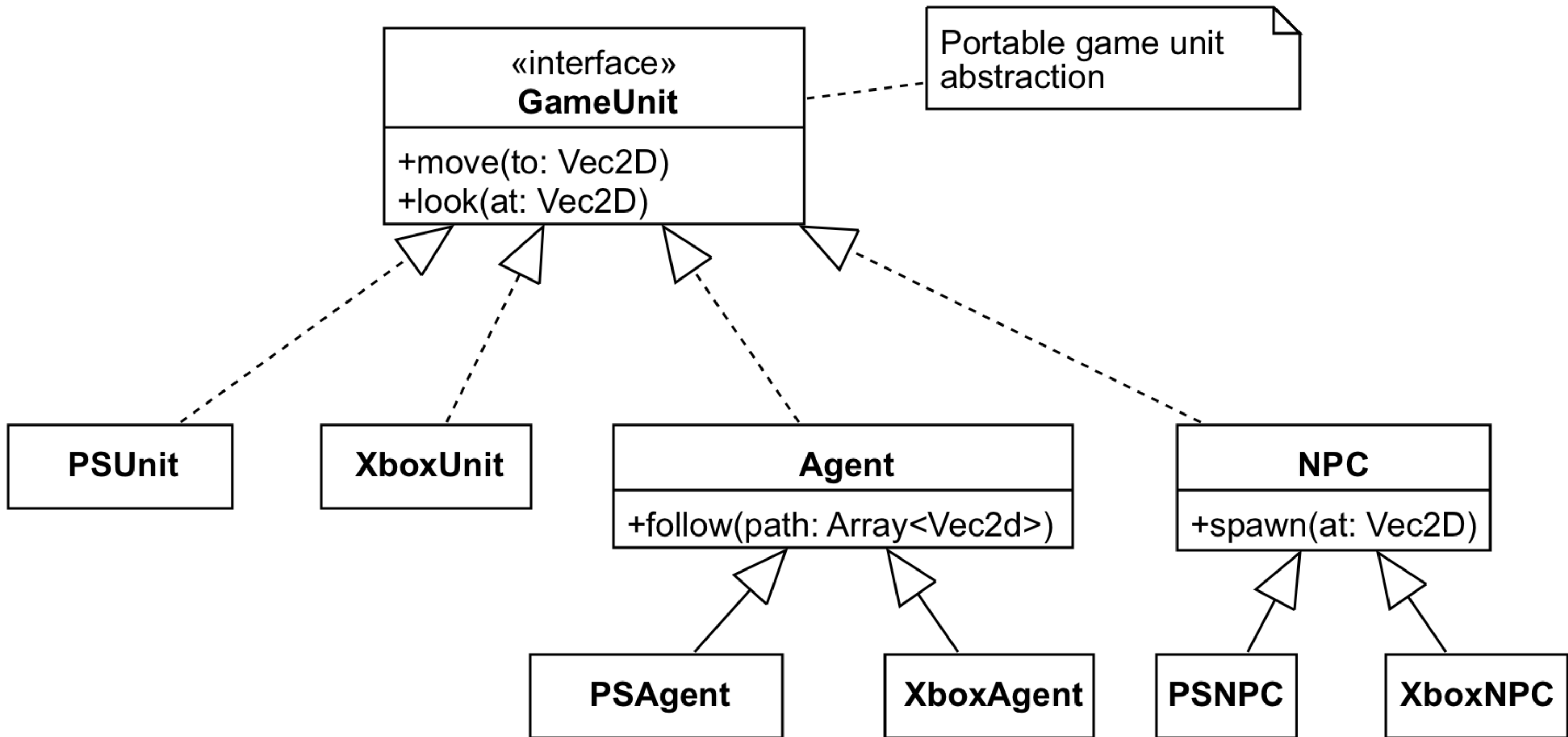
Exploding class hierarchy problem

Adding a new feature causes a jump in the number of child classes.

Applying the Bridge
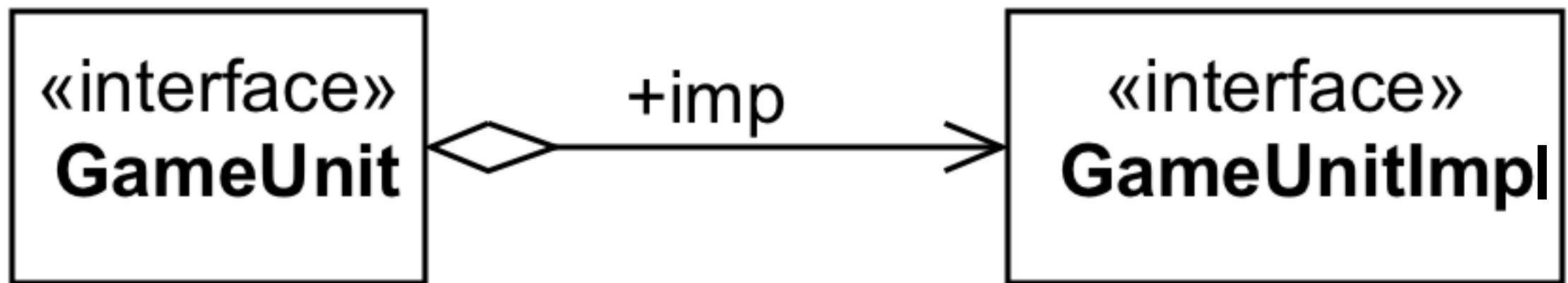
Introduce two separate hierarchies
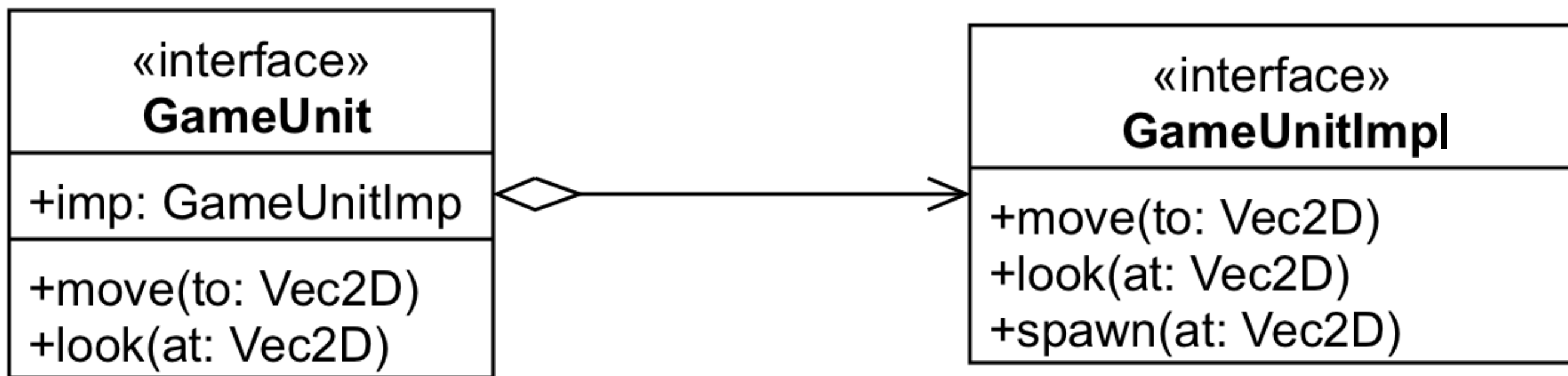
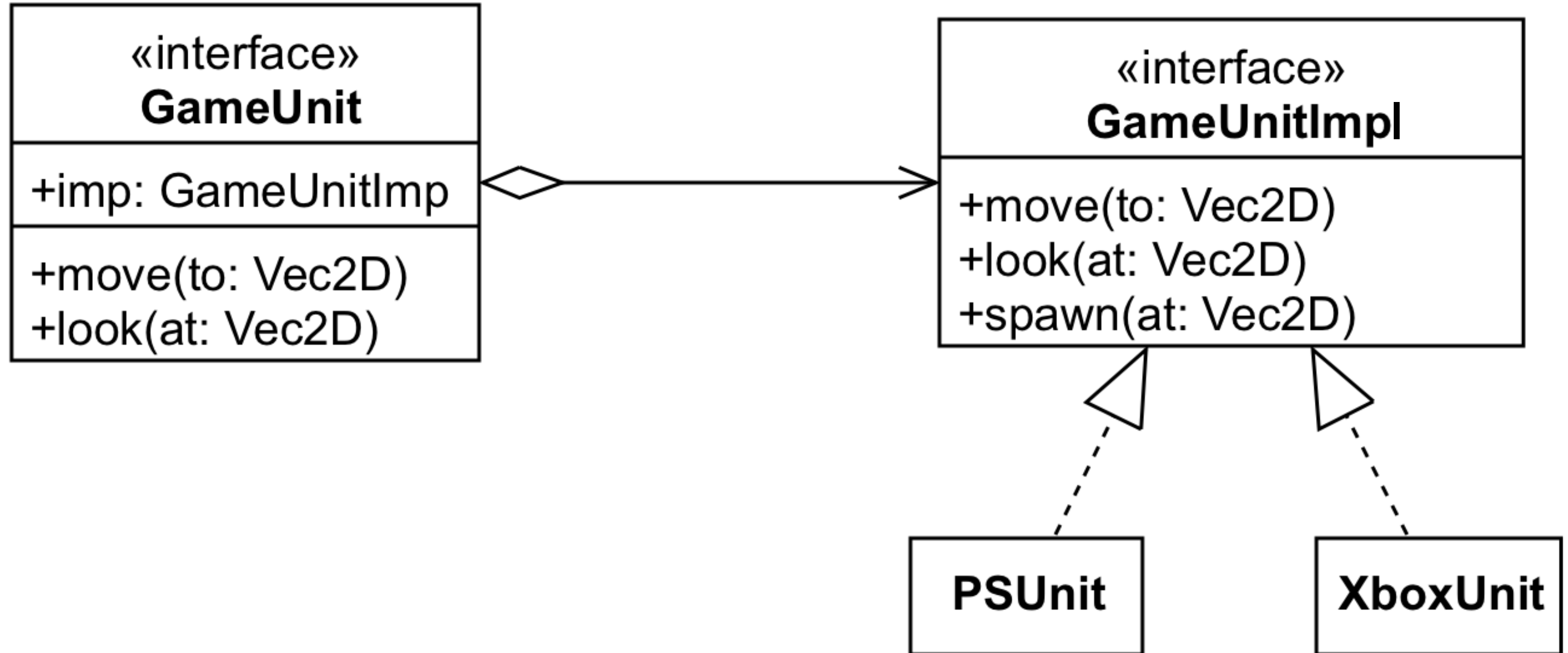Decouple game units from platform-code

GameUnit
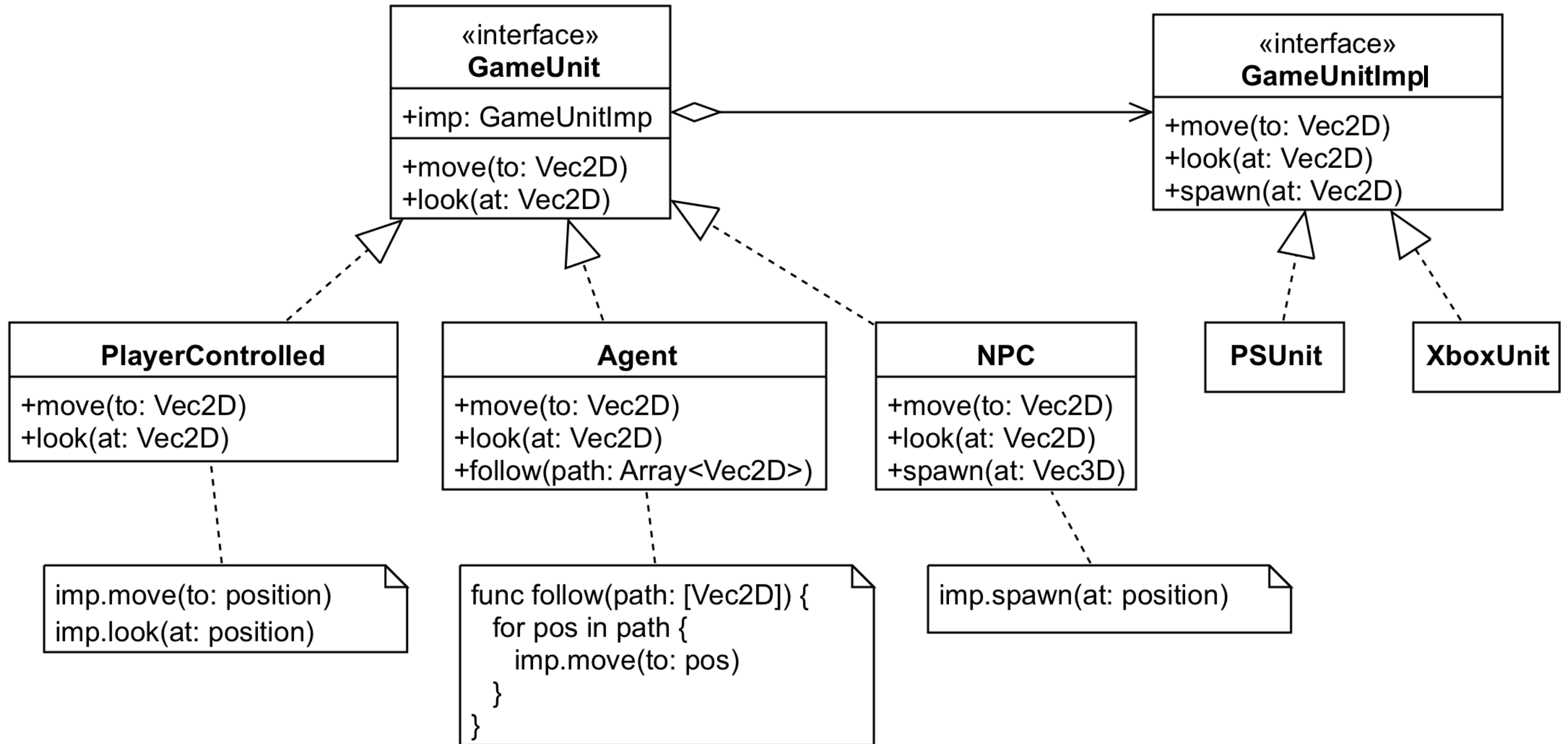# Protocol

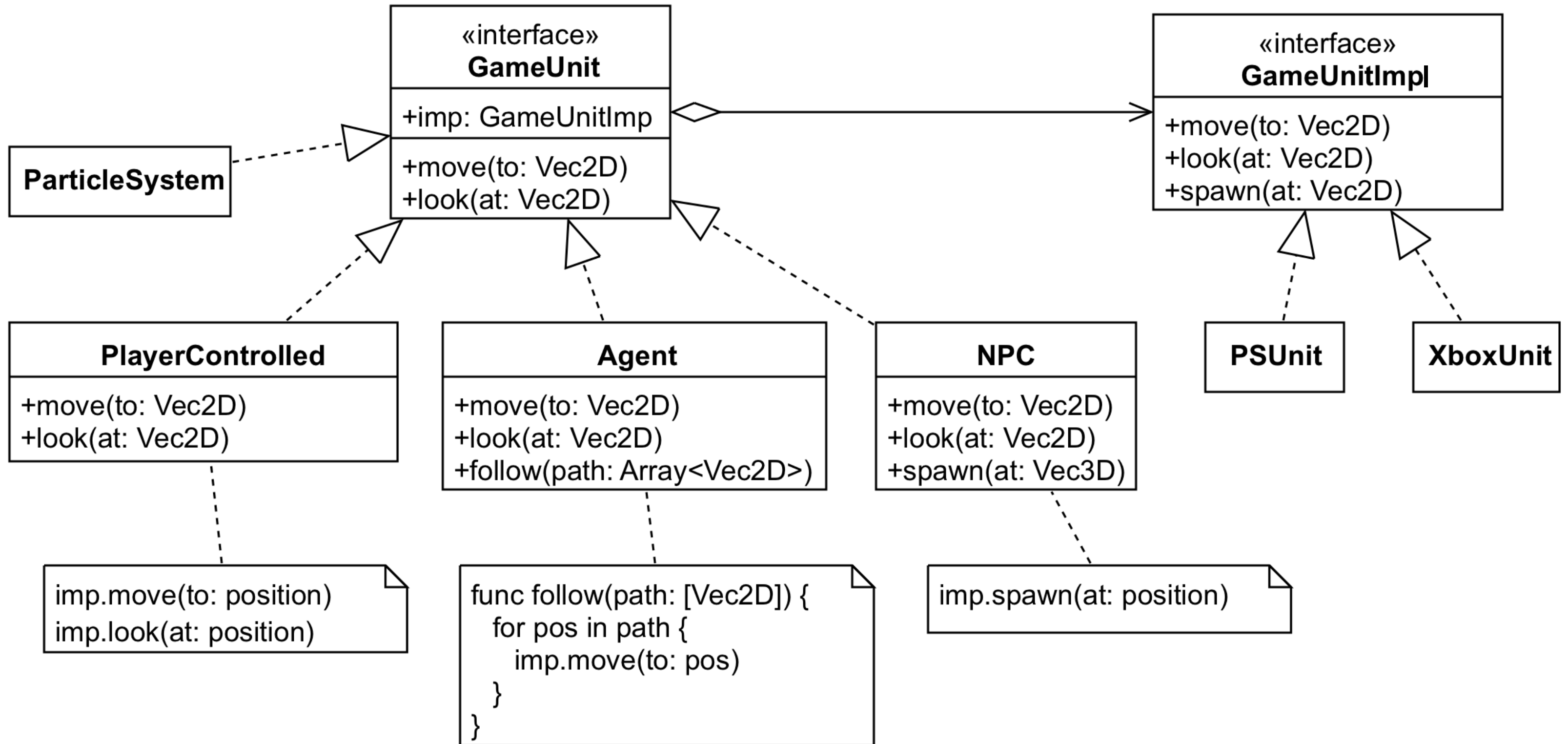**Defines the game unit interface**

GameUnitImpl Protocol

Defines the platform-specific interface

«interface»
GameUnit

+imp: GameUnitImp

+move(to: Vec2D)
+look(at: Vec2D)

«interface»
GameUnitImpl

+move(to: Vec2D)
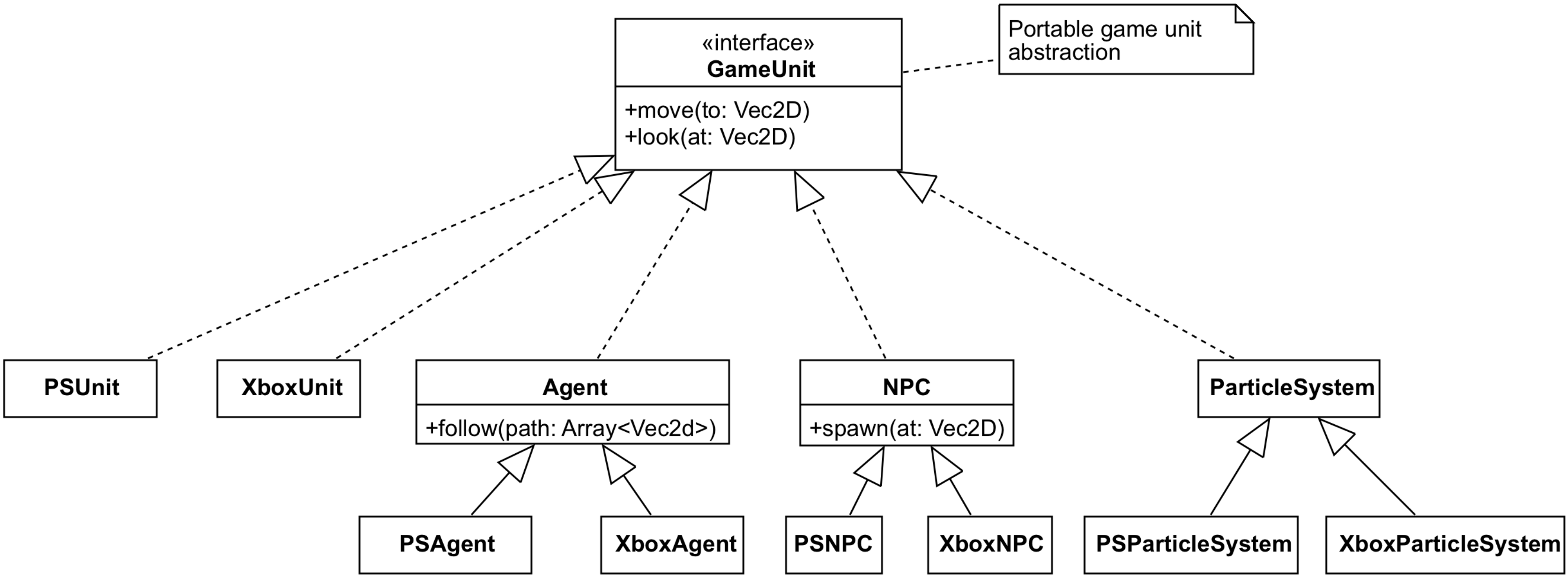+look(at: Vec2D)
+spawn(at: Vec2D)

The Bridge

Purpose

- Build platform-independent applications

- Separates concerns into different hierarchies

- Relies on object composition

Pitfalls

- Failing to separate common and specific functionality

- Supporting a new feature/platform requires adding more than one type