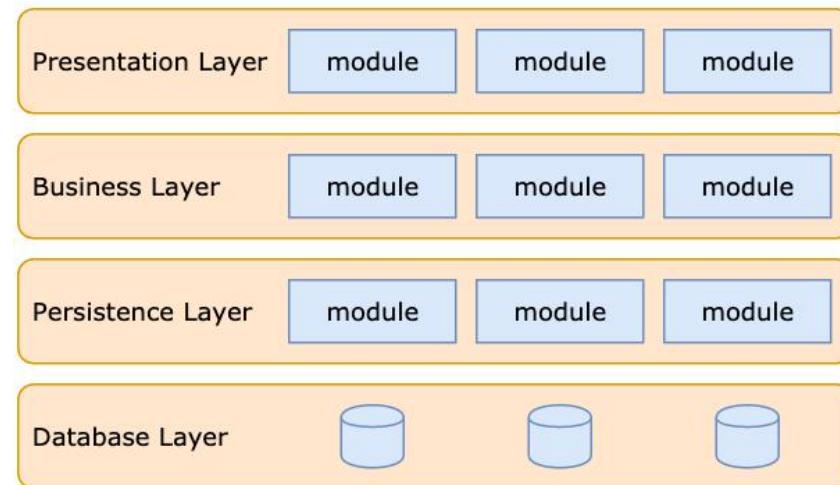


1. Layered Architecture

The layered architecture is the most common in adoption, well-known among developers, and hence the de facto standard for applications. If you do not know what architecture to use, use it.



Examples

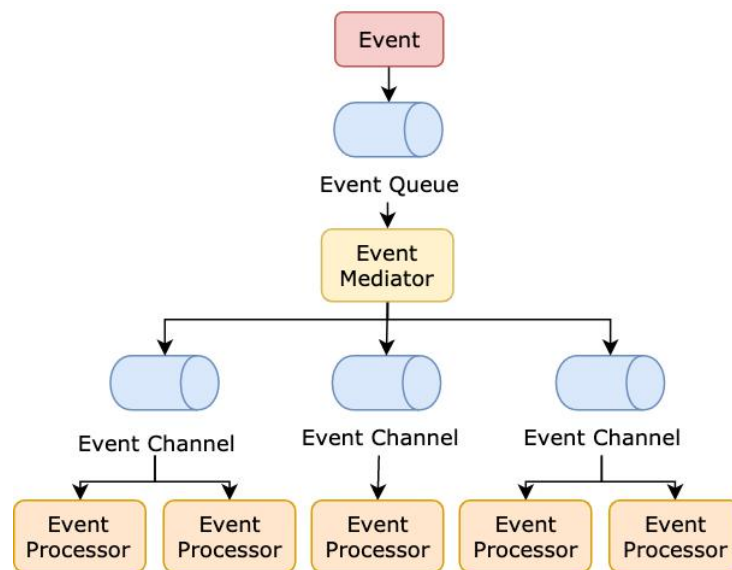
- TCP / IP Model: Application layer > transport layer > internet layer > network access layer
- [Facebook TAO](#): web layer > cache layer (follower + leader) > database layer

Pros and Cons

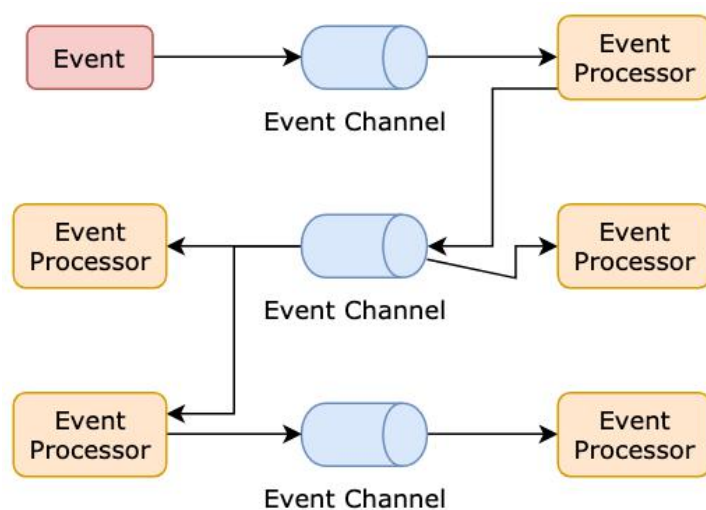
- Pros
 - ease of use
 - separation of responsibility
 - testability
- Cons
 - monolithic
 - hard to adjust, extend or update. You have to make changes to all the layers.

2. Event-Driven Architecture

A state change will emit an event to the system. All the components communicate with each other through events.



A simple project can combine the mediator, event queue, and channel. Then we get a simplified architecture:

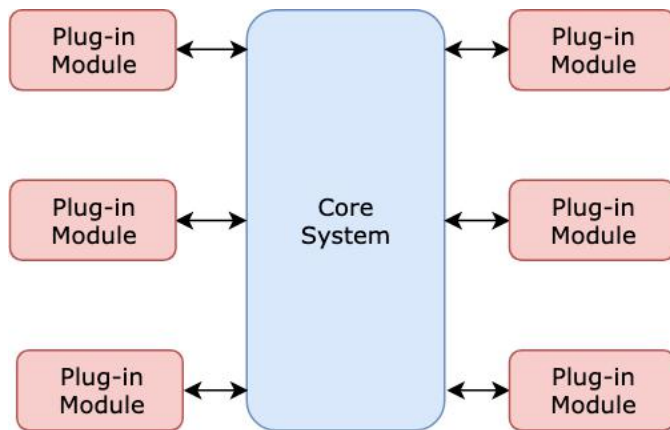


Examples

- QT: Signals and Slots
- Payment Infrastructure: Bank gateways usually have very high latencies, so they adopt async technologies in their architecture design.

3. Micro-kernel Architecture (aka Plug-in Architecture)

The software's responsibilities are divided into one "core" and multiple "plugins". The core contains the bare minimum functionality. Plugins are independent of each other and implement shared interfaces to achieve different goals.

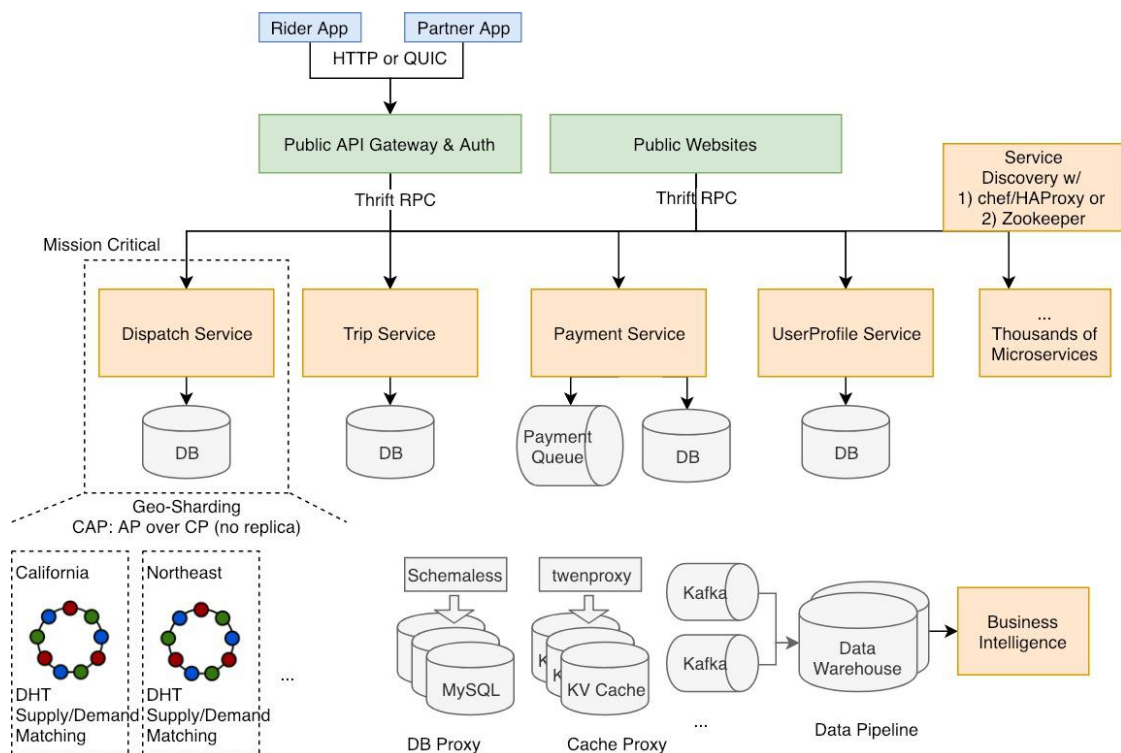


Examples

- Visual Studio Code, Eclipse
- MINIX operating system

4. Microservices Architecture

A massive system is decoupled to multiple micro-services, each of which is a separately deployed unit, and they communicate with each other via **RPCs**.

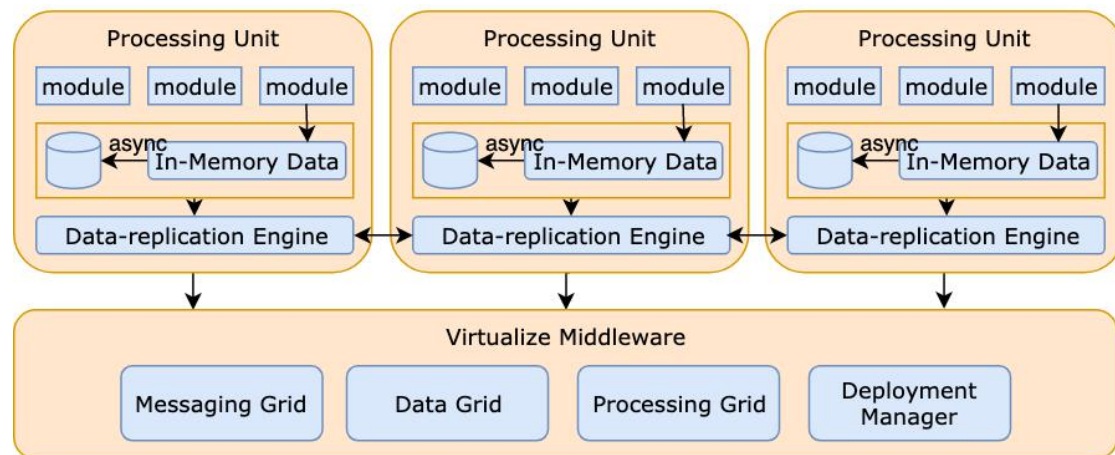


Examples

- Uber: See [designing Uber](#)
- Smartly

5. Space-based Architecture

This pattern gets its name from “tuple space”, which means “distributed shared memory”. There is no database or synchronous database access, and thus no database bottleneck. All the processing units share the replicated application data in memory. These processing units can be started up and shut down elastically.



Examples: See [Wikipedia](#)

- Mostly adopted among Java users: e.g., JavaSpaces