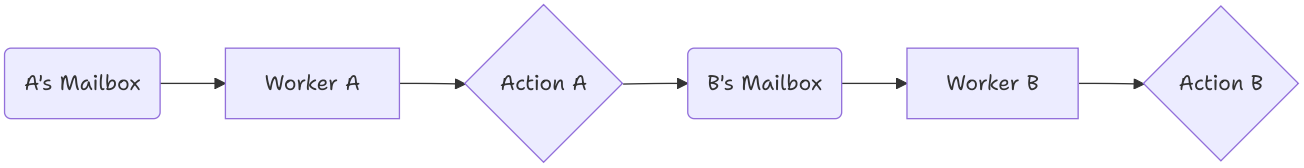
Actor Pattern

Each "actor" is an independent entity that processes messages sequentially.

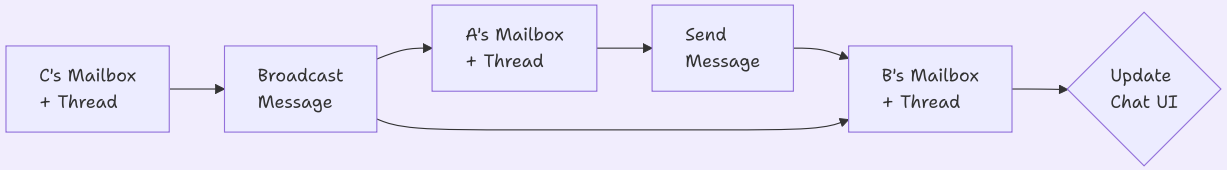
In this system, actors do not share states, but they can communicate with message parsing.



- Each actor has a fandom mailbox (queue) for incoming messages.
- Actors process their own message at a time.
- Actors can create new actors on their own whenever necessary.
- Actors only send messages that are local and known to them - their own social space.

Benefits: Eliminates race conditions, makes systems more fault-tolerant (if one actor crashes, others continue).

Chat Application



The actor here are individual active users in a messaging application.

Design Considerations:

Choosing

Ask yourself this when choosing the design pattern:

- Do you have **independent** entities that maintain their **own** state?
- Can your problem be modeled as message-passing between entities?
- Do you need **fault isolation** (one failure shouldn't crash everything)?
- Do you need to **avoid** shared mutable state entirely?

Building Outline

Ask yourself this when building this pattern.

Actor Design:

- What state does each actor maintain?
- What messages can each actor receive and send?
- How do actors discover and communicate with each other?
- What's the actor life-cycle (creation, supervision, termination)?

Message Design:

- Are messages immutable?
- What's the message serialization strategy?
- How large can messages be?
- Do you need message ordering guarantees?
- What's your message delivery semantics (at-most-once, at-least-once, exactly-once)?

Mailbox Management:

- What's the mailbox size limit per actor?
- What happens when a mailbox overflows?
- Do you need message priorities?
- How do you handle slow actors?

Supervision Strategy:

- What happens when an actor crashes?
- Who supervises which actors?
- What's your restart strategy (one-for-one, all-for-one)?
- How do you handle cascading failures?

Scaling:

- How do you distribute actors across multiple machines?
- Can actors be dynamically created and destroyed?
- How do you handle actor migration?