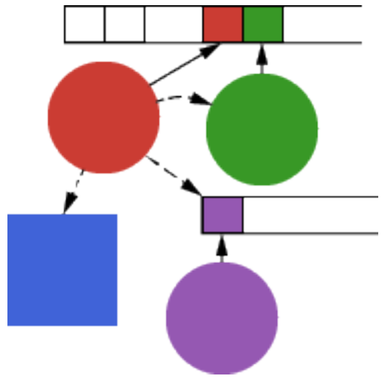


https://github.com/JuliaActors/Actors.jl

Actors.jl

- What are actors, where do they come from?
- How are they implemented in Julia?
- A quick demo, some first impressions!
- Why would you use them?

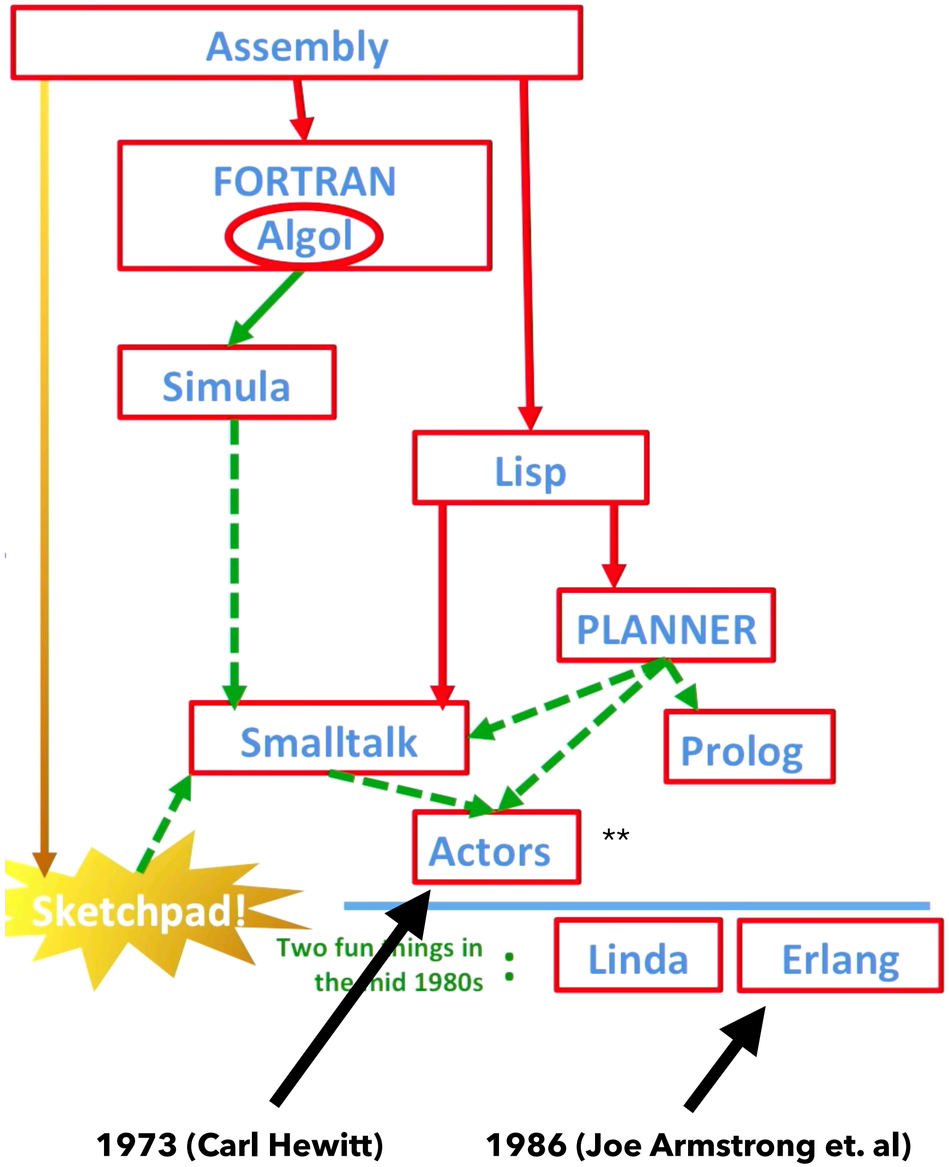
Paul Bayer, 2021-07-01

What are Actors?

Where do they come from

Alan Kay *:

- I thought of objects being like biological cells and/or individual computers on a network, only able to communicate with messages …
- OOP to me means only messaging, local retention and protection and hiding of state-process, and extreme late-binding of all things.



* http://www.purl.org/stefan_ram/pub/doc_kay_oop_de

** Joe Armstrong & Alan Kay - Joe Armstrong interviews Alan Kay

The Actor Model

Carl Hewitt, 1973 ff

When an Actor receives a message, it can concurrently:

- send messages to … addresses of Actors that it has;
- create new Actors;
- designate how to handle the next message it receives.*

and actors …

- come in systems (“one actor is no actor”) and
- scale in universality, space and number!

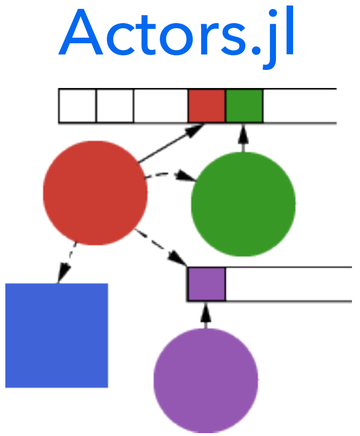
embody
- processing,
- storage,
- communication**

* https://hal.archives-ouvertes.fr/hal-01163534v7/document

** Hewitt, Meijer and Szyperski: The Actor Model

Actors in Julia

complement Julia's concurrency features

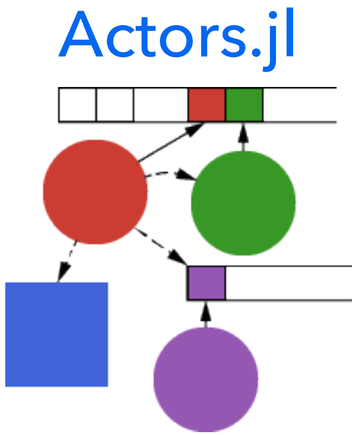


An **Actors.jl** actor

- is a persistent `Task`, which
- is represented by a message `Channel`,
- serves a Julia `Function`, (as a mutable behavior),
- has state (behavior and acquaintances),
- executes asynchronously when it receives a message,
- follows a messaging protocol,
- has an Erlang (GenServer) like API,
- is lightweight.

Julia with Actors.jl

Actors integrate with Tasks + Distributed



With **Actors.jl** right now you can

- provide services to parallel `Tasks` and worker processes,
- implement concurrent applications and
- build fault-tolerant systems (with supervisors and monitors …),

They will (with some development) *

- communicate with other actor languages and
- integrate into microservices.

* see: https://github.com/pbayer/erjulix