

# Reactive System

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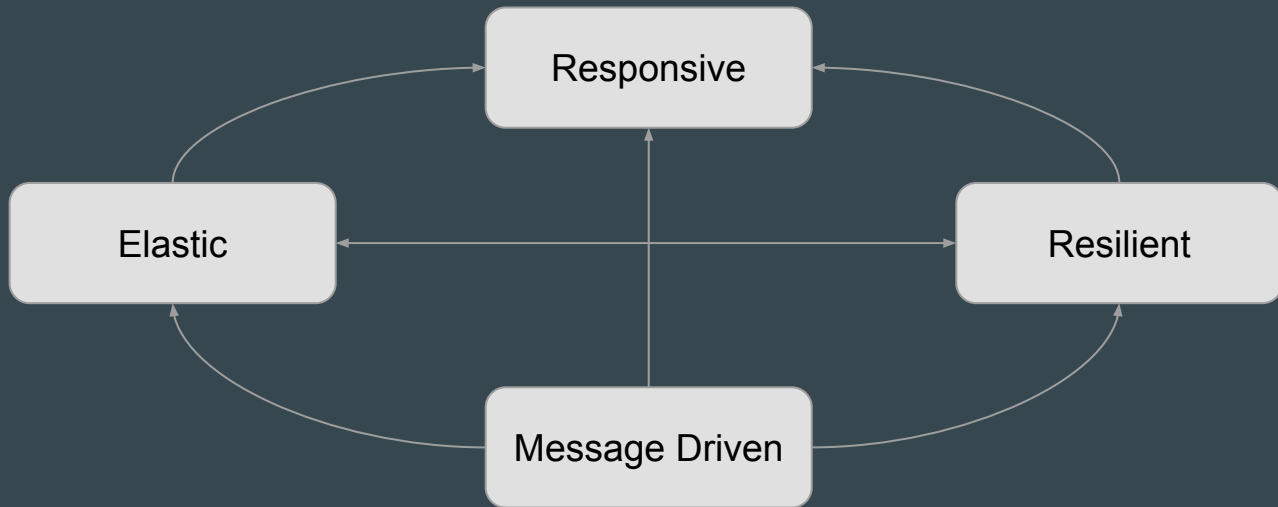
The Actor Model with Akka and Scala

# Agenda

- Reactive System - Reactive Manifesto
- Actor Model
- Scala and Akka
- Let's go to the code
- What else?
- Q&A

# Reactive System - Reactive Manifesto

- Application requirements have changed
- Users expect millisecond response times and 100% uptime
- Coherent approach to systems architecture is needed
- 19327 people already signed



# Reactive System

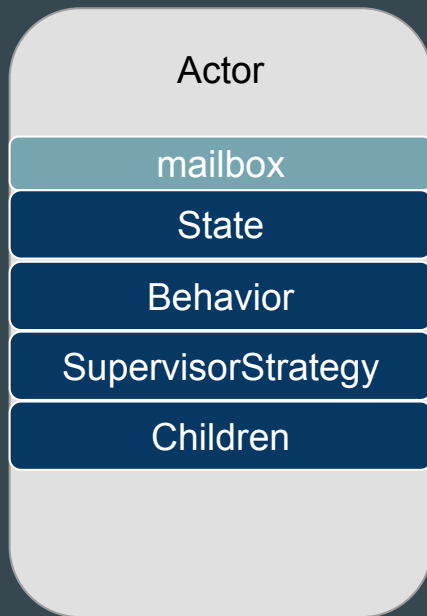
- It is **not** Reactive Programming
- It is Responsive
- It is Resilient
- It is Elastic
- It is Message Driven

# Actor Model

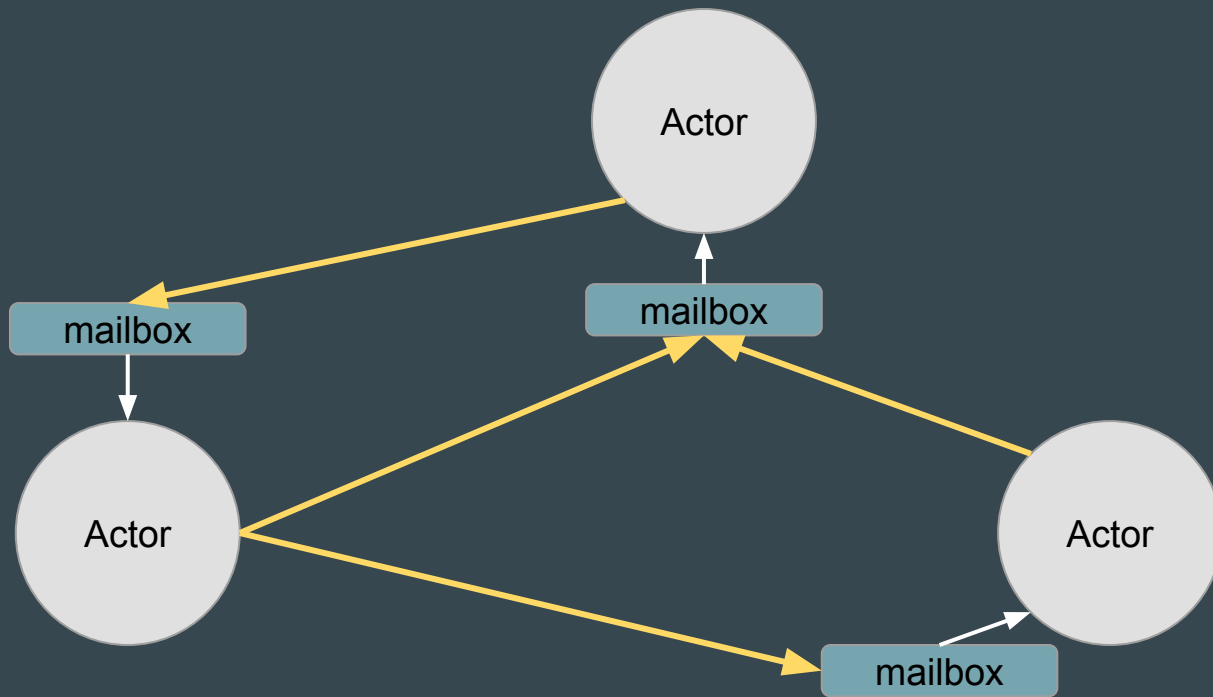
- Is a Mathematical Model of concurrent computation
- Everything is a Actor
- Actor is an Entity that
  - Can create finite number of Actors
  - Can Receive a message
  - Determines how to respond to the Message
  - Send a finite number of messages

# Actor Model

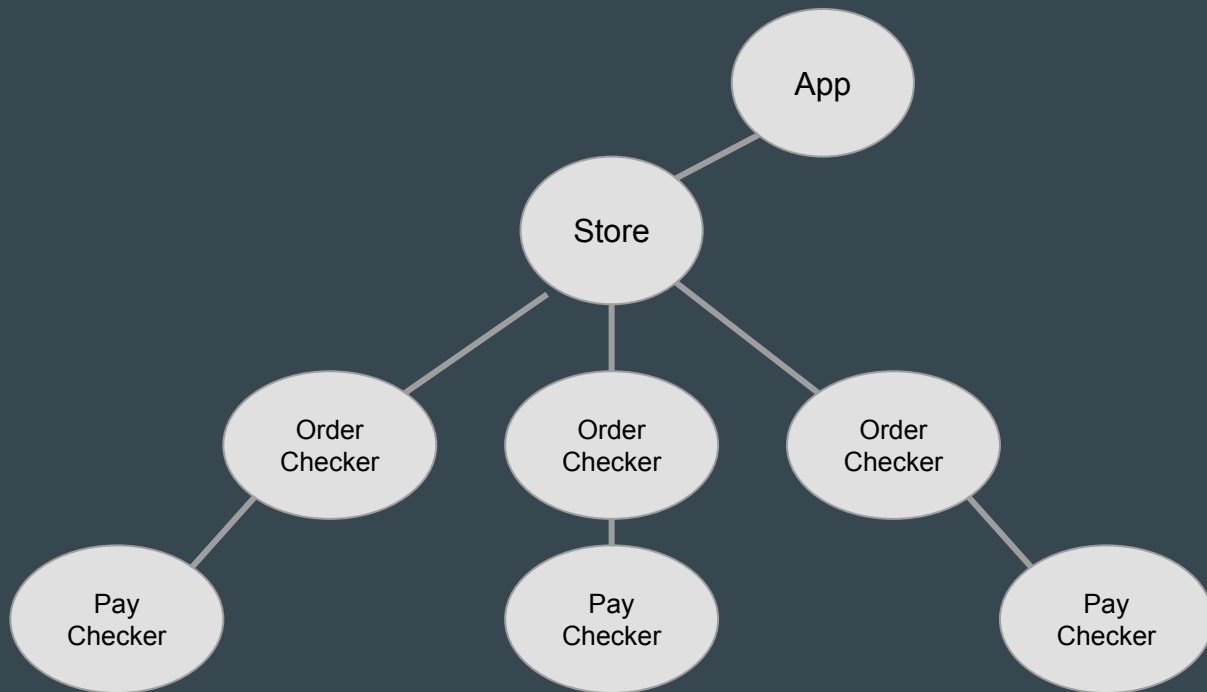
- Run in its own thread
- No Shared State
- Messages are kept in MailBox
  - and processed in order
- No Shared State



# Actor Model



# Actor Model





# Akka and Scala

- **Scala Programming Language** providing support for **Functional Programming**
  - Compiles to Java Bytecodes
  - Run on top of JVM
  - Higher-order function (function that receive a function and can return a function)
  - Pattern matching
- Jonas Bonér inspired by the **Erlang programming** language's created **Akka** to bring similar capabilities to Scala and Java
  - **Akka** is toolkit and runtime for building highly concurrent, distributed, and resilient message-driven applications for Java and Scala
  - Implements the **Actor Model**
  - **“With 4 nodes, the whole throughput can reach 11 million messages per second (100 bytes per message) with average latency of 17ms.”** - Engineering Manager for BigData Enabling, Intel

**Let's go to the Source Code**

# What else?

- Reactive Streaming - <http://www.reactive-streams.org/>
- Project Reactor - <https://projectreactor.io/> - Pivotal
- Reactive Programming
  - ReactiveX - <http://reactivex.io/>
- Akka.NET - yes, they copied it again :)
- Orleans - <http://dotnet.github.io/orleans/> - Microsoft
- Vert.x - Eclipse (Event Driven)

# Thanks

Enrique Ell Pereira

GitHub: <https://github.com/EnriqueEll/>

Presentation Link: <https://github.com/EnriqueEll/actor-model-peresentation>