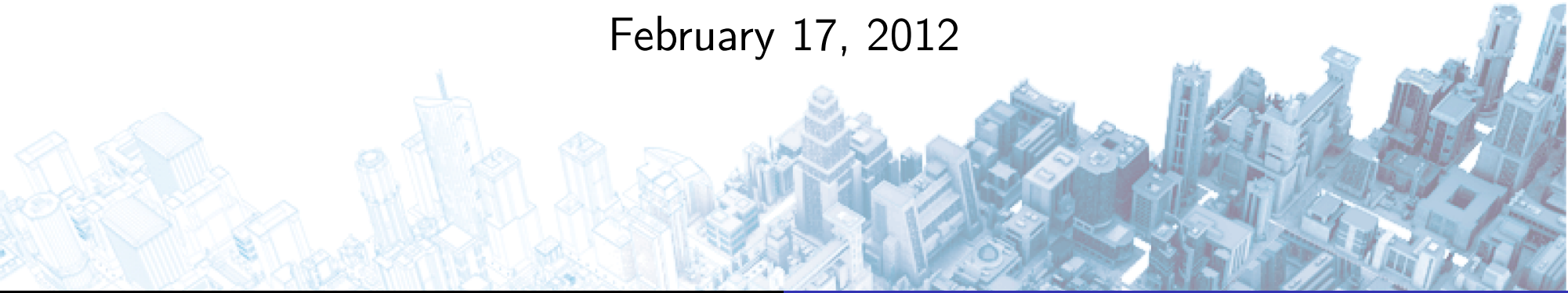
Scala Enthousiasts
The Actor model and Akka

Christophe Pache
Nicolas Jorand

Crossing-Tech
EPFL

February 17, 2012



Agenda

- Some theory about the Actor model and Akka
- Use case : Nao by Nicolas
- Examples with Nao by Nicolas

Disclamer

This is an introduction by dummies for enthousiasts

Philipp Haller, from TypeSafe, is interested in giving a presentation on more advanced features
(Future and Promise)

Plan I

- Actor Model
- Akka

Actor model

The Actor model provides efficient concurrent computation where every object is an actor communicating with each other with messages

Actor model

An actor consists of:

- an independant process ($\rightarrow$ Actor in Akka)
- a mailbox to communicate ($\rightarrow$ ActorRef in Akka)

Actor and ActorRef are separated

Plan I

Actor communication

Send a message to an Actor

```
myActor ! myMessage
```

Send and get an answer

```
val answer = myActor ? myMessage
```

Messages should be immutable

Actor creation in Akka 1.3

Using a factory

```
val actorRef = actorOf(classOf[MyActor])
```

Actor creation in Akka 1.3

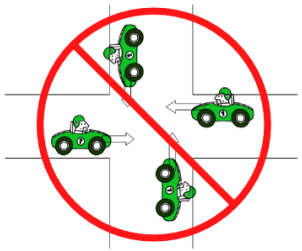
Using a factory

```
val myActor: ActorRef = actorOf(classOf[MyActor])
```

Actor model advantages

- Synchonous and asynchonous communication
- High level concurrent computation
- Sequential execution, one message at a time
- Simplified distribution of processes
- Avoid deadlocks through timeout



Actor model and Akka

Akka provides more than only Actors, among the most important:

- registry

- routing

- remote

- supervision

- STM

Registry

- store every created Actor
- lookup using ids or types

uuid	id	Actor

Akka features

Routing

- Routing actors
- Actor pool size fixed or dynamic

Akka features

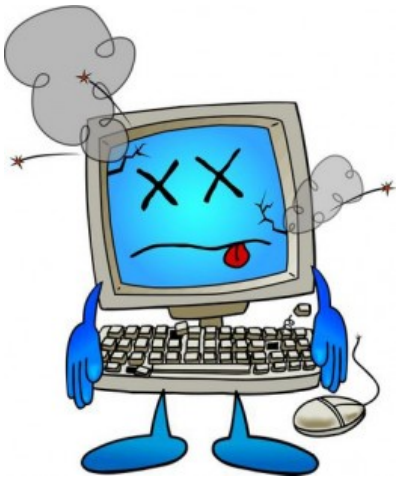
Remote

- Server managed
- Client request accessing registred actors
- Transparent

Akka features

Supervision

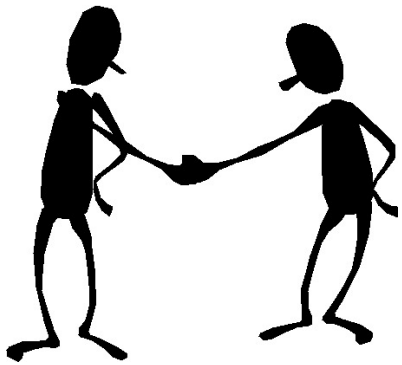
- Let it crash
- Life cycle management : Permanent or not
- Restart hook



Akka features

Software Transactional Memory

- Shared references
- Transactions
- Coordination



Akka features

POSCO integration

- Class and Interface
- Factory for creation
- Transparent



Akka features

AKKA

Akka provides high-level concurrent computation with (amoung most important):

- POSCO integration
- load balancing
- supervising

And now. . . .

- Everyone is now Akka enthousiast?
- Practice and you will