



ÉCOLE POLYTECHNIQUE
FÉDÉRALE DE LAUSANNE

Testing Actor Systems

Principles of Reactive Programming

Roland Kuhn

Testing Actors

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```
class Toggle extends Actor {  
    def happy: Receive = {  
        case "How are you?" =>  
            sender ! "happy"  
            context become sad  
    }  
    def sad: Receive = {  
        case "How are you?" =>  
            sender ! "sad"  
            context become happy  
    }  
    def receive = happy  
}
```

Akka's TestKit (1)

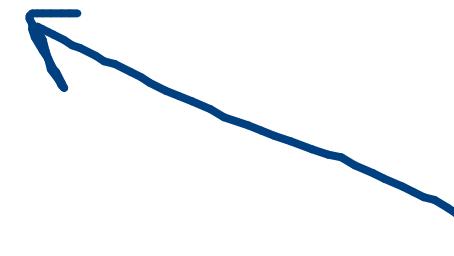
TestProbe as remote-controlled actor.

```
implicit val system = ActorSystem("TestSys")
val toggle = system.actorOf(Props[Toggle])
val p = TestProbe()
p.send(toggle, "How are you?")
p.expectMsg("happy")
p.send(toggle, "How are you?")
p.expectMsg("sad")
p.send(toggle, "unknown")
p.expectNoMsg(1.second)
system.shutdown()
```

Akka's TestKit (2)

Running a test within a TestProbe:

```
new TestKit(ActorSystem("TestSys")) with ImplicitSender {  
    val toggle = system.actorOf(Props[Toggle])  
    toggle ! "How are you?"  
    expectMsg("happy")  
    toggle ! "How are you?"  
    expectMsg("sad")  
    toggle ! "unknown"  
    expectNoMsg(1.second)  
    system.shutdown()  
}
```



sent from testActor

Testing Actors with Dependencies

Accessing the real DB or production web services is not desirable:

- ▶ one simple solution is to add overridable factory methods

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```
class Receptionist extends Actor {  
    def controllerProps: Props = Props[Controller]  
    ...  
    def receive = {  
        ...  
        val controller = context.actorOf(controllerProps, "controller")  
        ...  
    }  
}
```

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- ▶ one simple solution is to add overridable factory methods

```
class Getter extends Actor {  
    ...  
    def client: WebClient = AsyncWebClient  
    client get url pipeTo self  
    ...  
}
```

Testing Interaction with the Parent

Create a step-parent:

```
class StepParent(child: Props, probe: ActorRef) extends Actor {  
    context.actorOf(child, "child")  
    def receive = {  
        case msg => probe.tell(msg, sender)  
    }  
}
```

Inserting a Foster-Parent

For when parent–child communication should occur, but monitored:

```
class FosterParent(child: Props, probe: ActorRef) extends Actor {  
    val child = context.actorOf(child, "child")  
    def receive = {  
        case msg if sender == context.parent =>  
            probe forward msg  
            child forward msg  
        case msg =>  
            probe forward msg  
            context.parent forward msg  
    }  
}
```

Testing Actor Hierarchies

Start verifying leaves, work your way up:

- ▶ “Reverse Onion Testing”