

Akka is not going anywhere

Amsterdam Scala Meetup

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PairTime

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About Me

1. Founder of PairTime
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3. I Like hiking, bouldering, CrossFit

Outline

1. Introduction to Akka
2. Why Akka is irreplaceable at PairTime
3. How Akka makes you a better engineer

Introduction to Akka

- High-level overview
- Actor model and actor systems
- Concurrency and fault tolerance
- Event Sourcing

High-level Overview (credit: chatGPT)

- Akka: An open-source toolkit and runtime for building highly concurrent, distributed, and fault-tolerant systems
- Based on the Actor model
- Implemented in Scala (and Java)
- Excellent for handling large-scale, stateful applications

Actors

- Fundamental unit of computation in Akka
- Represent objects or entities in your system
- Encapsulate state and behavior
- Communicate exclusively through messages
- Single-threaded illusion

Concurrency and Fault Tolerance

- Akka handles concurrency efficiently using message-passing
- Actors can be distributed across multiple nodes
- Location-transparent messaging enables scaling and fault tolerance
- Supervision and actor hierarchies support self-healing systems

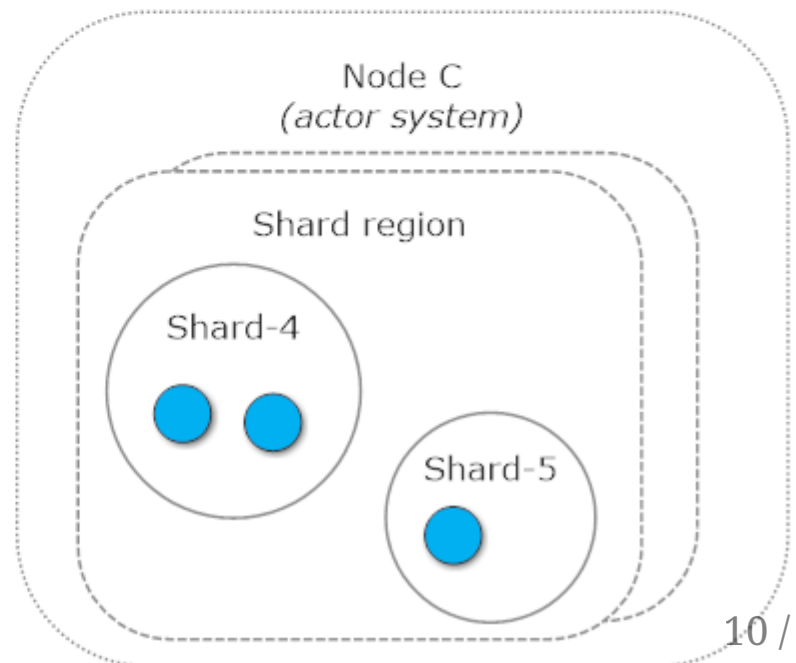
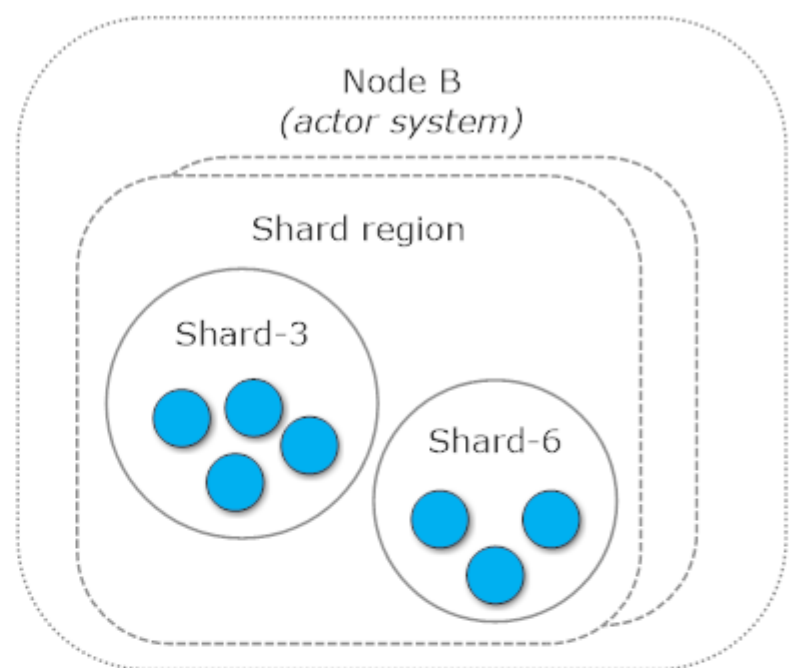
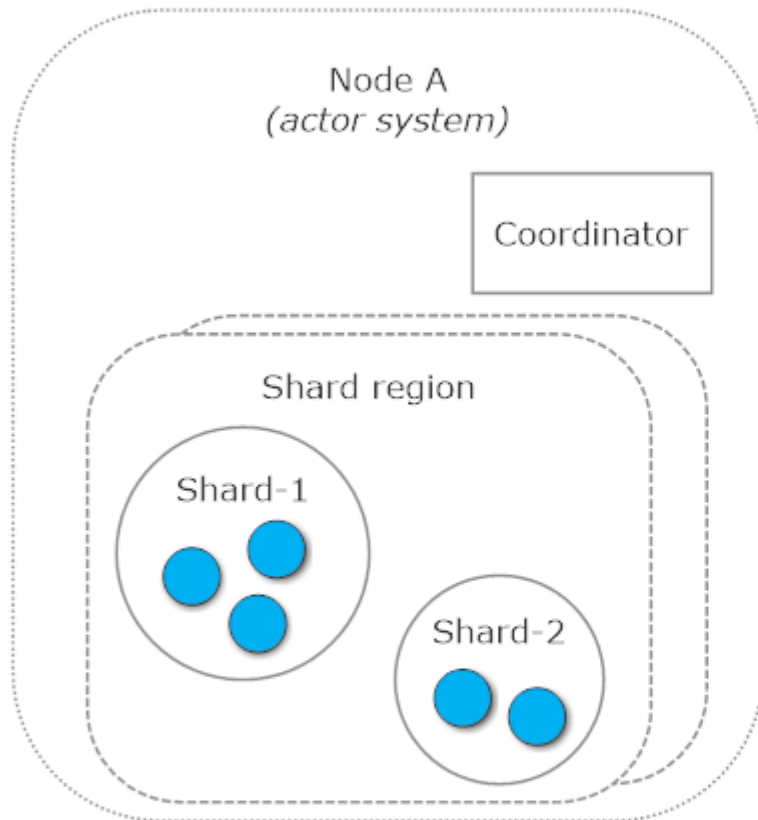
Event Sourcing

- Event Sourcing: State is a `foldLeft` of sequence of events
- Akka Persistence gives us event-sourced actors
- Persistent actors store events in an event journal
- Event journals can be used for recovery, replication, and historical analysis
- Supports various storage backends, such as Cassandra and PostgreSQL

Why Akka is Irreplaceable at PairTime

- We want to use domain driven design and event sourcing
- We want fearless iteration (deploy to production at anytime)
- Without user disruption
- Akka enables zero-downtime rolling deployments:
 - Cluster sharding: Distribute actors across nodes
 - Location transparency: Actors can move between nodes seamlessly
 - Graceful shutdown: Migrate actors to other nodes before stopping a node
 - Gossip Protocol: Fast failure detection

Image credit: [Bartosz Sypytkowski](#)



How Akka Makes You a Better Engineer

- Learning disciplined OO
- Learning event sourcing
- Understanding resilience and fault tolerance
- Focussing on domain modeling
- Applying Akka knowledge to other frameworks and languages

Azure Durable Functions

```
# Python example
import azure.functions as func
import azure.durable_functions as df

def entity_function(context: df.DurableEntityContext):
    current_value = context.get_state(lambda: 0)
    operation = context.operation_name
    if operation == "add":
        amount = context.get_input()
        current_value += amount
    elif operation == "reset":
        current_value = 0
    elif operation == "get":
        context.set_result(current_value)
        context.set_state(current_value)

main = df.Entity.create(entity_function)
```

copied from <https://learn.microsoft.com/en-us/azure/azure-functions/durable/durable-functions-entities?tabs=python#define-entities>

Thanks!