

APPLICATIONS AND INTEGRATION
IN SCALA AND AKKA

V A U G H N V E R N O N

Foreword by Jonas Bonér, Founder of the Akka Project

Reactive Messaging Patterns with the Actor Model

Reactive Messaging Patterns with the Actor Model: Applications and Integration in Scala and Akka

Table of Contents

Contents

Foreword

Preface

Acknowledgments

About the Author

Chapter 1 Discovering the Actor Model and the Enterprise, All Over Again

Why Enterprise Software Development Is Hard

Introducing Reactive Applications

Responsive

Resilient

Elastic

Message Driven

Enterprise Applications

Actor Model

Origin of Actors

Understanding Actors

The Actor Way Is Explicit

What Next?

Chapter 2 The Actor Model with Scala and Akka



How to Get Scala and Akka

Using Typesafe Activator

Using sbt

Using Maven

Using Gradle

Programming with Scala

A Condensed Scala Tutorial

Programming with Akka

Actor System

Supervision

Remoting

Clustering

Testing Actors

The CompletableApp

Summary

Chapter 3 Performance Bent

Transistors Matter

Clock Speed Matters

Cores and Cache Matter

Scale Matters

Multithreading Is Hard

How the Actor Model Helps

Dealing with False Sharing

The Patterns

Chapter 4 Messaging with Actors

Message Channel

Message

Pipes and Filters



Message Router

Message Translator

Message Endpoint

Summary

Chapter 5 Messaging Channels

Point-to-Point Channel

Publish-Subscribe Channel

Local Event Stream

Distributed Publish-Subscribe

Datatype Channel

Invalid Message Channel

Dead Letter Channel

Guaranteed Delivery

Channel Adapter

Message Bridge

Message Bus

Summary

Chapter 6 Message Construction

Command Message

Document Message

Managing Flow and Process

Event Message

Request-Reply

Return Address

Correlation Identifier

Message Sequence

Message Expiration



Format Indicator

Summary

Chapter 7 Message Routing

Content-Based Router

Message Filter

Dynamic Router

Recipient List

Splitter

Aggregator

Resequencer

Composed Message Processor

Scatter-Gather

Routing Slip

Process Manager

Message Broker

Summary

Chapter 8 Message Transformation

Envelope Wrapper

Content Enricher

Immutable DoctorVisitCompleted

Should the AccountingEnricherDispatcher Be Local?

Content Filter

Claim Check

Normalizer

Canonical Message Model

Actor Systems Require a Canon

Summary



Chapter 9 Message Endpoints

Messaging Gateway

Messaging Mapper

Transactional Client/Actor

Transactional Client

Transactional Actor

Polling Consumer

Resource Polling

Event-Driven Consumer

Competing Consumers

Message Dispatcher

Selective Consumer

Durable Subscriber

Idempotent Receiver

Message De-duplication

Design Messages with Identical Impact

State Transition Renders Duplicates Harmless

Service Activator

Summary

Chapter 10 System Management and Infrastructure

Control Bus

Detour

Wire Tap

Message Metadata/History

Message Journal/Store

Smart Proxy

Test Message



Channel Purger

Summary

Appendix A: Dotsero: An Akka-like Toolkit for .NET

Dotsero Actor System

Actors Using C# and .NET

Dotsero Implementation

Summary

Bibliography

Index

