

◀ Kotlin 1.4 Online Event

Server-Side Development With Kotlin

Anton Arhipov



@antonarhipov

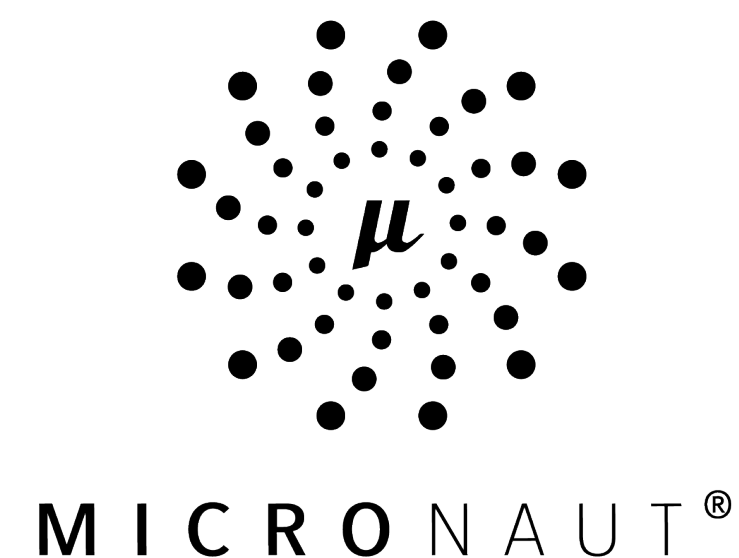
October 15, 2020



Frameworks

The background features a complex geometric composition. On the left, a series of overlapping planes in shades of blue and purple create a sense of depth and movement. These planes are oriented diagonally, with some facing towards the viewer and others receding. The right side of the image is a solid, dark gray, which contrasts with the vibrant, multi-colored geometric shapes on the left.

VERT.X





Spring Framework 5.x Themes

- Java 8+
- Kotlin
- Functional
- Reactive



start.spring.io



Project

☒ Maven Project

☐ Gradle Project

Language

☐ Java ☒ Kotlin

☐ Groovy

Spring Boot

☐ 2.4.0 (SNAPSHOT)

☐ 2.4.0 (M3)

☐ 2.3.5 (SNAPSHOT)

☒ 2.3.4

☐ 2.2.11 (SNAPSHOT)

☐ 2.2.10

☐ 2.1.18 (SNAPSHOT)

☐ 2.1.17



Why Spring ▾

Learn ▾

Projects ▾

Training

Support

Community ▾



[< ALL GUIDES](#)

Building web applications with Spring Boot and Kotlin

This tutorial shows you how to build efficiently a sample blog application by combining the power of [Spring Boot](#) and [Kotlin](#).

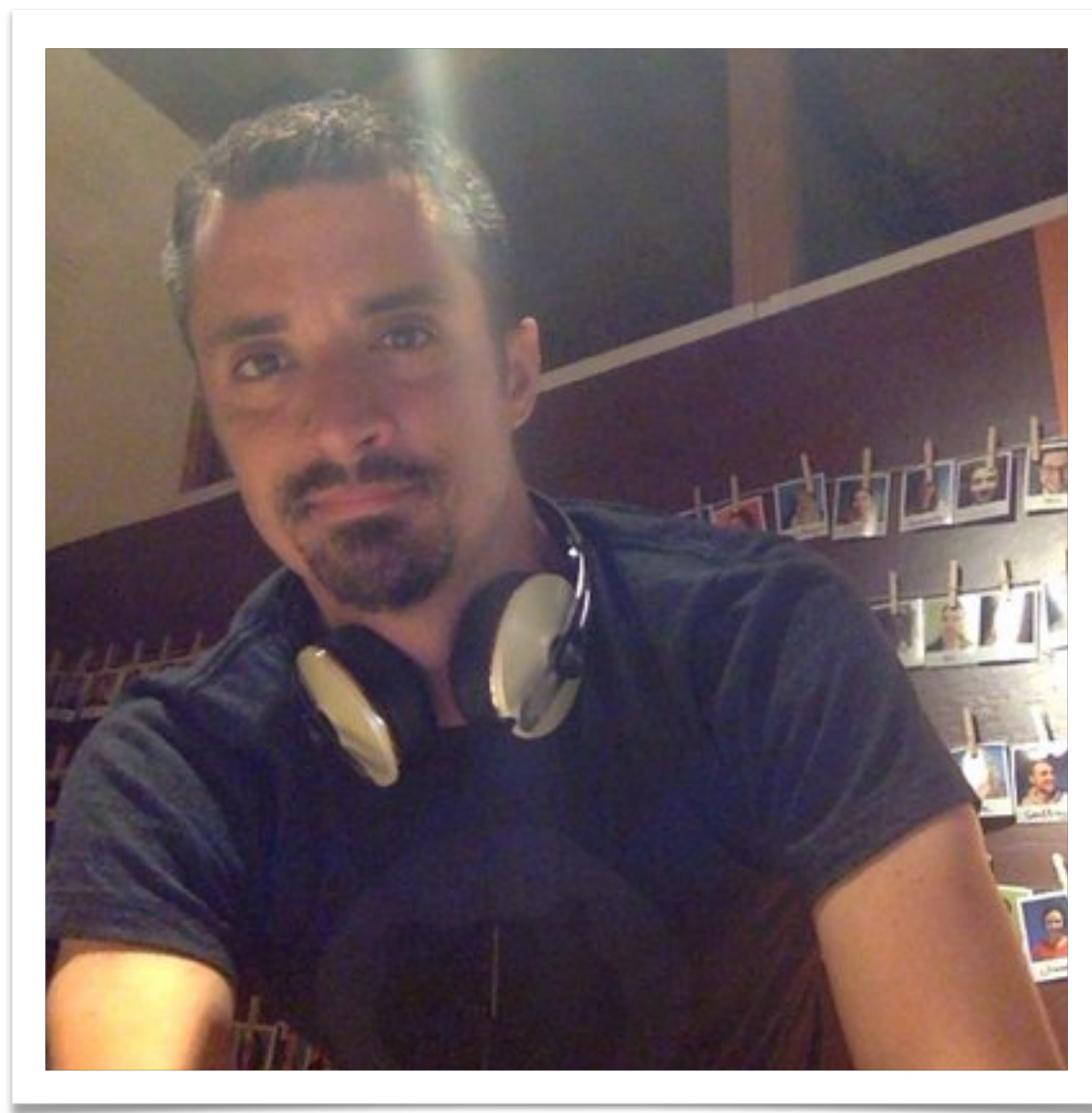
If you are starting with Kotlin, you can learn the language by reading the [reference documentation](#), following the online [Kotlin Koans tutorial](#) or just using [Spring Framework reference documentation](#) which now provides code samples in Kotlin.

Spring Kotlin support is documented in the [Spring Framework](#) and [Spring Boot](#) reference documentation. If you need help, search or ask questions with the [spring](#) and

Get the Code

 [Go To Repo](#)

State of Kotlin Support in Spring

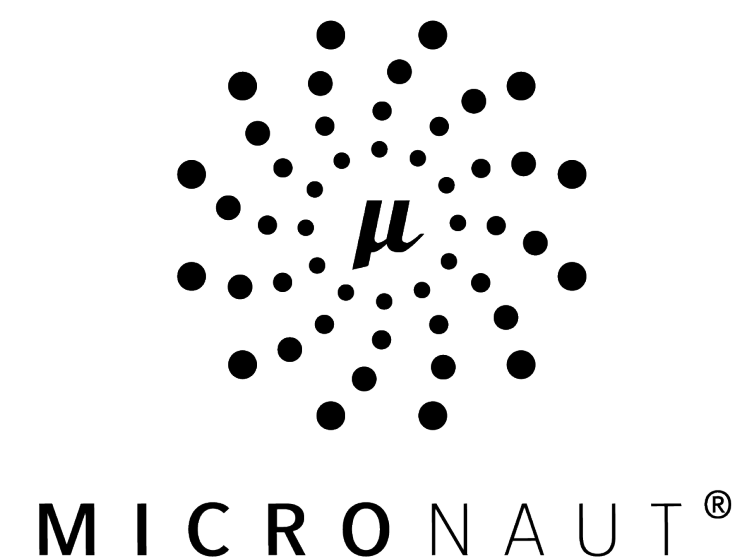


Sébastien Deleuze

Spring Framework committer at VMWare



VERT.X



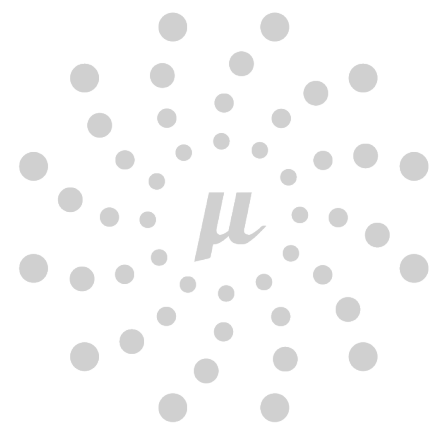
VERT.X



spring®



Ktor



MICRONAUT®



QUARKUS



CUBA
.platform

Spark

vaadin}>



javalin



HTTP4K

[Learn](#)[Download](#)[Support](#)

```
fun main() {  
    embeddedServer(Netty, port = 8000) {  
        routing {  
            get("/") {  
                call.respondText("Hello, world!")  
            }  
        }  
    }.start(wait = true)  
}
```

Simple and fun

Ktor is an asynchronous framework for creating microservices, web applications, and more. It's fun, free, and open source.

[Get Ktor](#)[Learn more](#)

Lightweight



Extensible



Multiplatform



Asynchronous



Kotlin Hands-On

A series of hands-on labs where you can create applications with Kotlin using a variety of different technologies and targeting multiple platforms. The exercises are divided into a series of steps, walking you through each section.

Building Web Applications with React and Kotlin/JS

Create a React Application using Kotlin/JS and see how you can leverage static typing with Kotlin.

Start

Creating HTTP APIs with Ktor

Create a backend API for your application that responds to HTTP requests.

Start

Creating an interactive website with Ktor

Learn how to use files, templating engines such as Freemarker and the kotlinx.html DSL, and work with form input from Ktor.

Start

Building a Full Stack Web App with Kotlin Multiplatform

Create an application with Kotlin/JVM and

Introduction to Coroutines and Channels

Learn about coroutines in Kotlin and

Introduction to Kotlin Multiplatform

Learn how to create a server (JVM) and



- ← Creating HTTP APIs with Ktor
- 1 Introduction
- 2 Project setup
- 3 Customer routes
- 4 Order routes
- 5 Manually testing HTTP endpoints
- 6 Automated testing
- 7 What's next

Customer routes

Edit page

First, let's tackle the `Customer` side of our application. We need to create a model which defines the data that's associated with a customer. We also need to create a series of endpoints to allow Customers to be added, listed, and deleted.

The `Customer` model

For our case, a customer should store some basic information in the form of text: A customer should have an `id` by which we can identify them, a first and last name, and an email address. An easy way to model this in Kotlin is by using a data class.

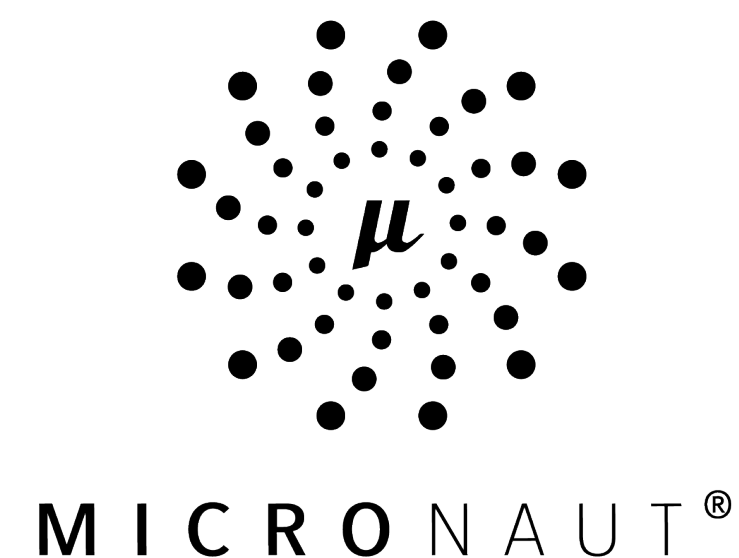
Create a file name `Customer.kt` in a new package named `models` and add the following:

```
import kotlinx.serialization.Serializable

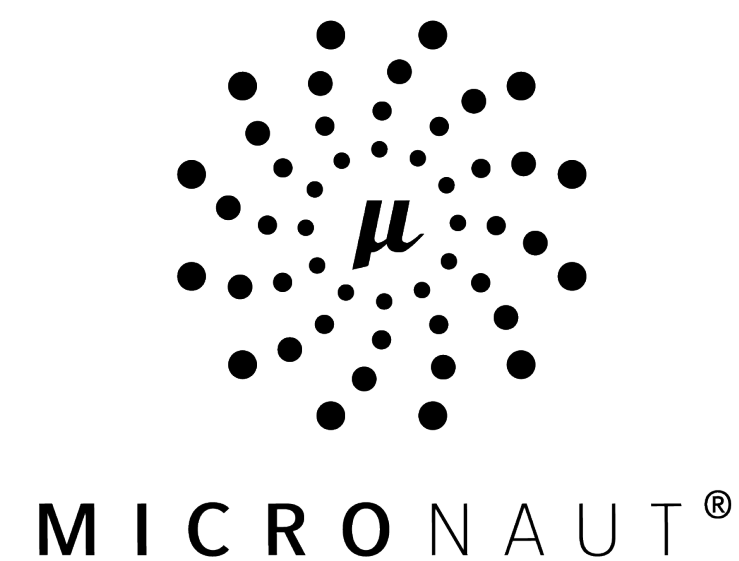
@Serializable
data class Customer(val id: String, val firstName: String, val lastName: String, val email: String)
```

Note that we are using the `@Serializable` annotation from `kotlinx.serialization`. Together with its Ktor integration, this will allow us to generate the JSON representation we need for our API responses automatically – as we will see in just a bit.

VERT.X



VERT.X



<https://kotlin.link>



Kotlin is Awesome!

✕

+

←

→

↻

🔒 kotlin.link

🔍

☆

☰

🌀

⋮

🐳

G

FB

🧩

👤

⋮

LIBRARIES/FRAMEWORKS

Data Science

thomasniel/kotlin-statistics746★
Last update: Oct 24, 2019
Advanced math and statistical extensions for Kotlin.

Kotlin/kotlin-jupyter398★
Last update: Sep 28, 2020
Official Kotlin Jupyter kernel

holgerbrandl/krangl382★
Last update: Oct 12, 2020
krangl is a {K}otlin library for data w{rangl}ing.

mipt-npm/kmath251★
Last update: Oct 13, 2020
A (not so numpy-like) multiplatform mathematical library with higher level abstractions.

JetBrains/lets-plot-kotlin87★
Last update: Oct 12, 2020
Grammar of graphics visualization for Kotlin

Kotlin for Data Science
Kotlin for Data Science overview page

Tools

pinterest/ktlint3751★
Last update: Oct 10, 2020
An anti-bikeshedding Kotlin linter with built-in formatter.

detekt/detekt3196★
Last update: Oct 12, 2020
Static code analysis for Kotlin.

Kotlin/dokka1753★
Last update: Oct 13, 2020
Documentation Engine for Kotlin.

jmfayard/buildSrcVersions714★
Last update: Oct 13, 2020
Better Gradle dependencies management inside the IDE. Search for available updates.

cqfn/diktat109★
Last update: Oct 13, 2020
Strict coding standard for Kotlin and a custom set of rules for detecting and autofixing code smells.

Web

ktorio/ktor7357★
Last update: Oct 13, 2020
Web backend framework for Kotlin. Easy to use, fun and asynchronous.

http4k/http4k1498★
Last update: Oct 12, 2020
Toolkit for serving and consuming HTTP services in a functional and consistent way.

Kotlin/kotlinx.html1036★
Last update: Oct 8, 2020
Kotlin DSL for HTML.

jetbrains/kotless553★
Last update: Oct 12, 2020
Kotlin serverless framework reducing the routine of serverless deployment.

Testing

mockk/mockk3388★
Last update: Sep 27, 2020
Pure Kotlin mocking library.

nhaarman/mockito-kotlin2414★
Last update: Sep 23, 2020
Using Mockito with Kotlin

Database

JetBrains/Exposed4461★
Last update: Oct 13, 2020
Exposed is a prototype for a lightweight SQL library written over JDBC driver for Kotlin language.

square/caldelight3506★
Last update: Oct 13, 2020
Lightweight SQL library for Kotlin

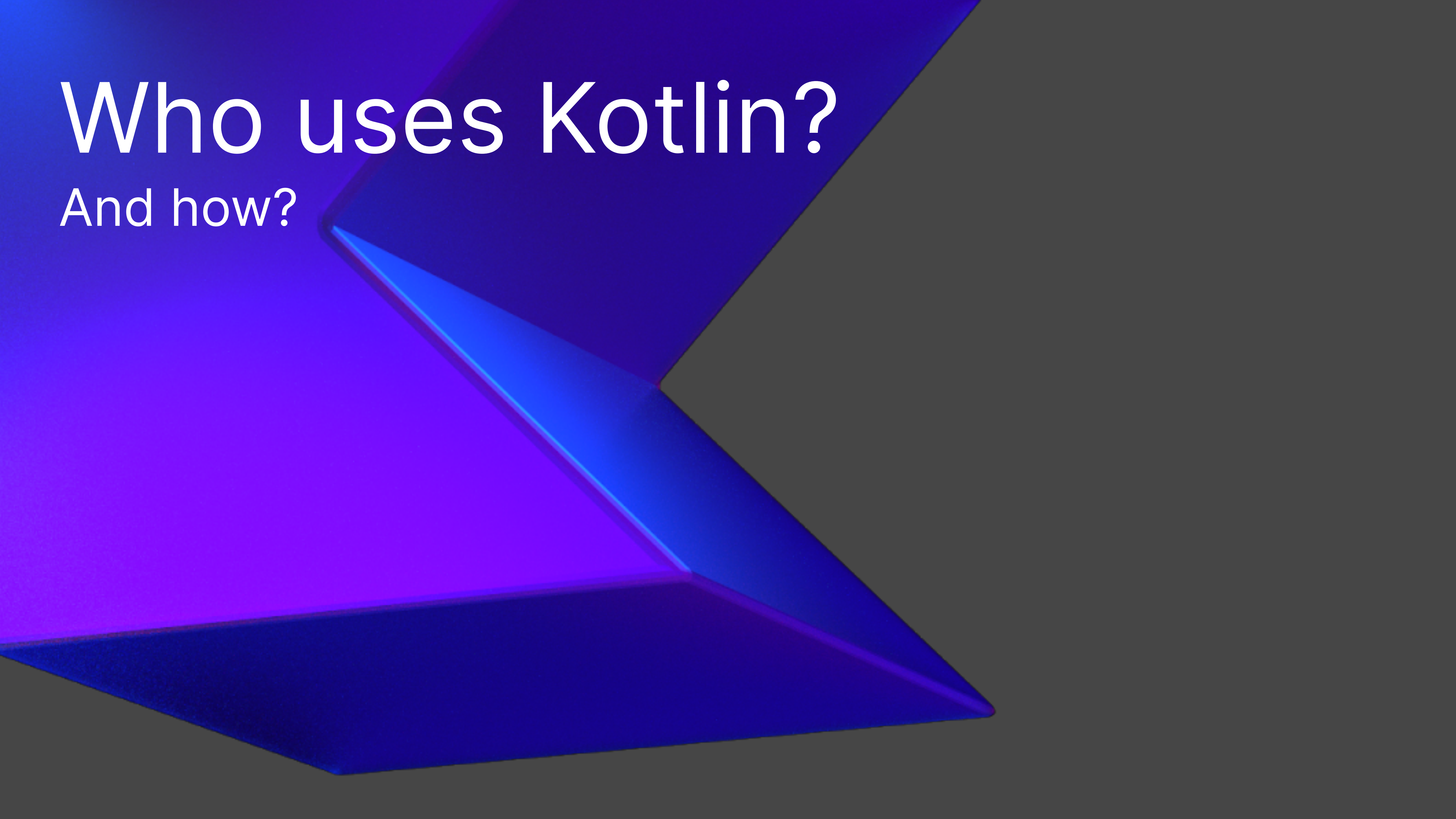
Misc

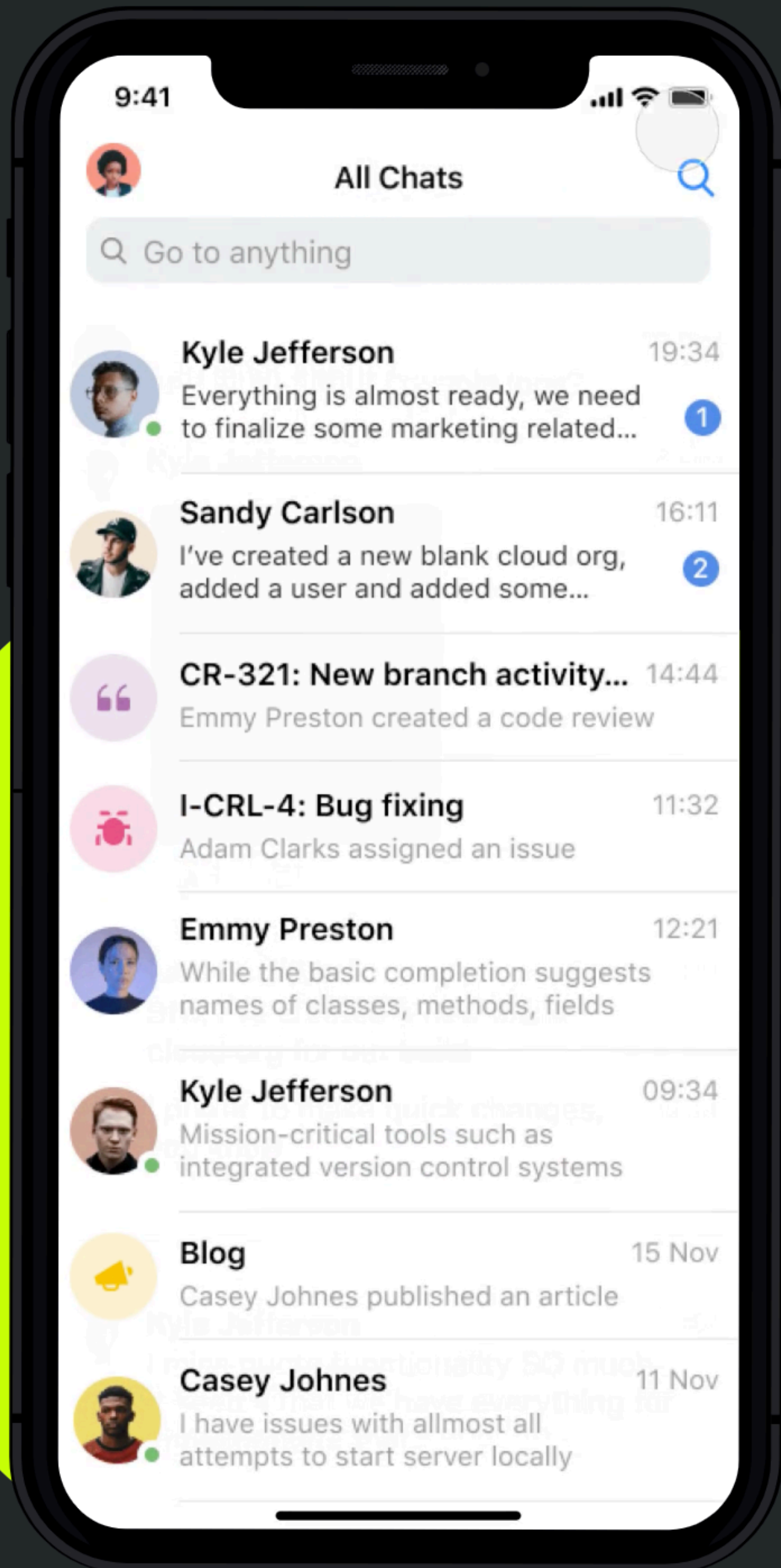
Kotlin/kotlinx-datetime571★
Last update: Sep 22, 2020
A multiplatform Kotlin library for working with date and time.

Kotlin/kotlinx.atomicfu332★
Last update: Oct 13, 2020
Atomic reference types for Kotlin

Who uses Kotlin?

And how?





Space Apps

Access everything you need to stay on top of communication while in the office or on a business trip



At your workplace

The desktop app is packed full of features and provides an enhanced experience for notifications and chats. It runs on Windows, macOS, or Linux.

[Download](#)
[.dmg](#)


On the go

Reply to chats, read blog updates, and post comments. Team members' schedules, statuses, and contact details are just a tap away.





Ktor

Ktor: past, present and future!



Hadi Hariri

Developer Advocate in Kotlin,
Team Lead in Ktor





Ktor

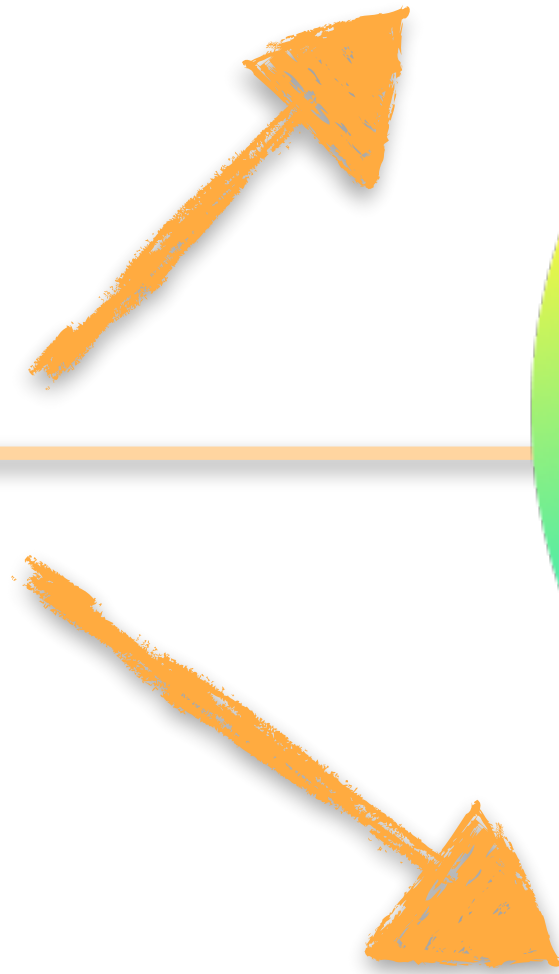
Code sharing
across clients



Ktor



Code sharing
between frontend
and backend



Ktor



KOTLIN IN SPACE

MAXIM MAZIN

@maximmazin

Copenhagen

Denmark

#KotlinConf



0:13 / 26:39

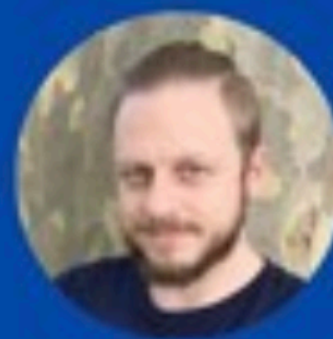


<https://youtu.be/4GkoB4hZUnw>



Future of Jira Software

Powered by Kotlin



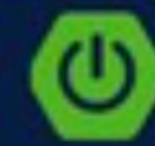
MARTIN VARGA | SOFTWARE DEVELOPER | @MARTINTEEVARGA

Jira Software Tech Stack



Kotlin

For all new services.



Spring Boot

Custom wrapper that makes monitoring etc. easier.



DynamoDB or PostgreSQL

Depends on the application.



Project Reactor

Mature reactive library.

Jira Software Tech Stack



Kotlin

For all new



Dynamo

Depends on the application.

Monolith → microservices

Java → Kotlin

Developer happiness



Mature reactive library.



Kotlin

<https://youtu.be/7YJyPXjLdug>

Why Kotlin?

- Strong types
- Null-safety
- Data classes
- Interop with Java
- ... coroutines are also great

In Kotlin, you can build a data model that's going to match exactly how your GraphQL schema looks like



Introduction ▾

- Getting Started
- Examples
- GraphQL Java Comparison
- Blogs & Videos

Schema Generator >

Federation >

Spring Server >

HTTP Client >

Build Plugins >

Contributors >

Blogs & Videos

EDIT

graphql-kotlin
GraphQL

Here are some links to other blog posts and videos which may provide further examples and reading.

graphql-kotlin

Articles and videos specifically about graphql-kotlin

- 📺 Bootiful GraphQL with Kotlin (Dariusz Kuc)(GOTO Chicago 2020) (en)
- ✍️ Introducing GraphQL Kotlin Client
- ✍️ Announcing graphql-kotlin 2.0!
- 📺 Bootiful GraphQL with Kotlin (Dariusz Kuc, Guillaume Scheibel)(KotlinConf 2019) (en)
- ✍️ Creating a Reactive GraphQL Server with Spring Boot and Kotlin
- ✍️ Apollo Federation in a GraphQL Kotlin Server
- ✍️ Creating GraphQL Schemas in Kotlin
- ✍️ Release of graphql-kotlin 1.0.0!
- ✍️ graphql-kotlin: Generate a GraphQL schema from Kotlin code

GraphQL

Articles and videos about how Expedia Group is using GraphQL

- 📺 Creating a federated schema for a global company (Shane Myrick) (en)
- 📺 Migrer ses APIs vers GraphQL: pourquoi? comment! (Guillaume Scheibel) (fr)
- 📺 Migrate your APIs to GraphQL: how? and why! (Guillaume Scheibel) (en)



Introduction >

Schema Generator >

Federation >

Spring Server v

[Spring Server Overview](#)

Automatically Created Beans

Configuration Properties

Writing Schemas with Spring

Generating GraphQL Context

Access the HTTP Request-Response

Subscriptions

HTTP Client >

Build Plugins >

Contributors >



Spring **Initializr**
Bootstrap your application

Project

Language

Spring Boot

Project Metadata

© 2013-2019 Pivotal Software

start.spring.io is powered by

[Spring Initializr](#) and [Pivotal Web Services](#)

Light UI

Github

Twitter

Help

Maven Project

Gradle Project

Java

Kotlin

Groovy

2.2.1 (SNAPSHOT)

2.2.0

2.1.10 (SNAPSHOT)

2.1.9

Group

com.example



Artifact

graphql

> Options

Generate - ⌘ + ↵

Explore - Ctrl + Space

Share...

Once you get the sample application setup locally, you will need to add `graphql-kotlin-spring-server` dependency:

With Maven:

```
<dependency>
  <groupId>com.expediagroup</groupId>
  <artifactId>graphql-kotlin-spring-server</artifactId>
  <version>${latestVersion}</version>
```

WebFlux vs WebMVC

Setup

Configuration

Writing Schema Code

Default Routes



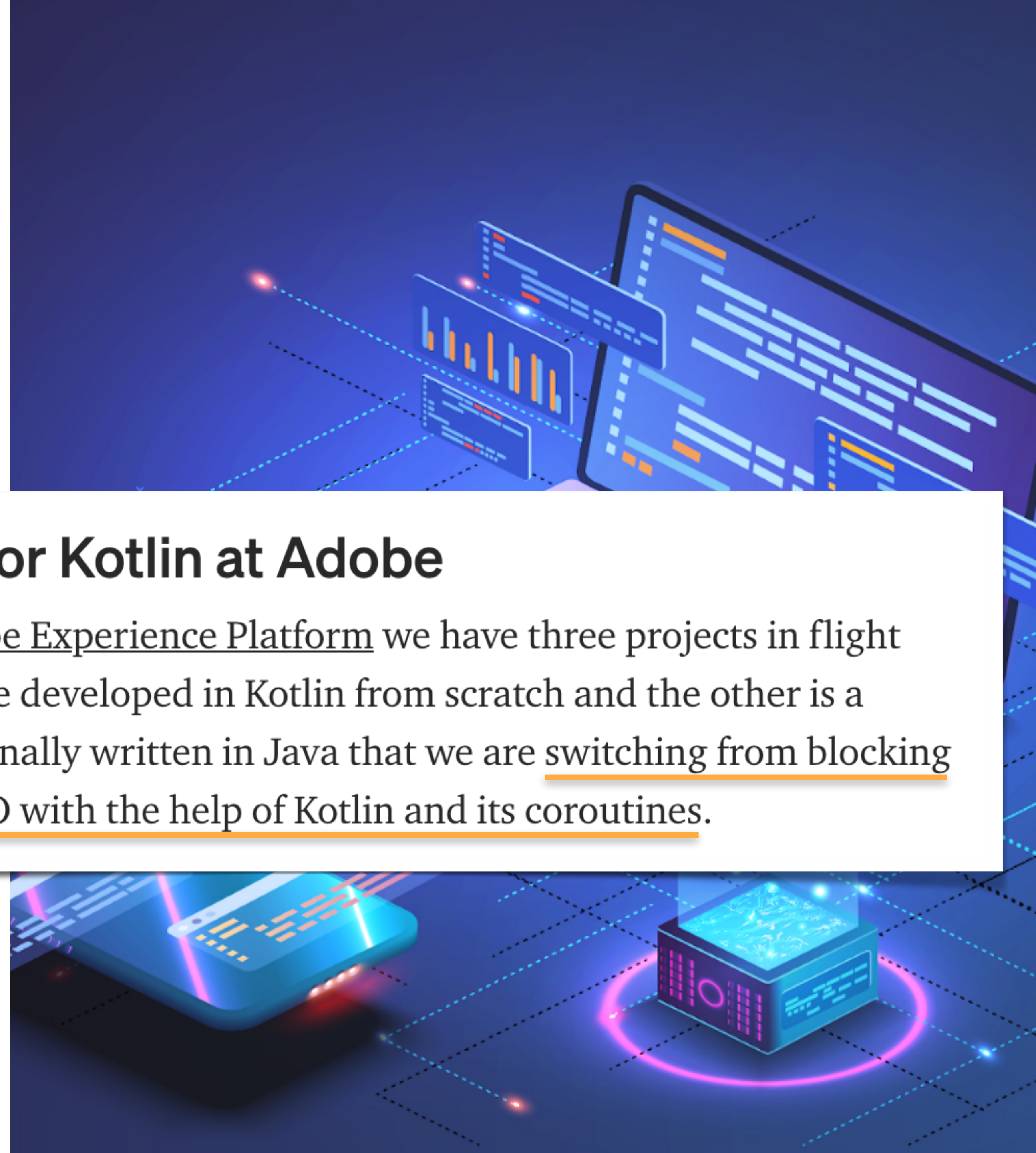
Adobe: leveraging Kotlin Coroutines

<https://medium.com/adobetech/streamlining-server-side-app-development-with-kotlin-be8cf9d8b61a>



What's next for Kotlin at Adobe

Currently, for Adobe Experience Platform we have three projects in flight with Kotlin: two are developed in Kotlin from scratch and the other is a legacy project originally written in Java that we are switching from blocking to non-blocking I/O with the help of Kotlin and its coroutines.



Kotlin Playbook

How we write (backend) Kotlin code in the Content Acquisition domain of Springer Nature Digital IT.

A living document

We follow the [standard Kotlin coding conventions](#), although our codebase predates these, and so may occasionally diverge for historical reasons.

Beyond the standard coding conventions, we have the following rules of thumb:

Organising the codebase:

- [Classes, Methods, and Extension Functions](#)
- [Extension functions to avoid bare calls to copy](#)
- [Organising code into files](#)
- [Deployable and library modules](#)
- [Tests and supporting code](#)

Design style:

- [Immutable domain models](#)
- [Pipelines of transformations](#)
- [Reporting and handling errors \(exceptions, null, monads, etc.\)](#)
- [Speed bumps](#)
- [Monitoring events, rather than static loggers](#)

springernature / kotlin-playbook

How we write Kotlin code

☆ 6 stars 🍴 0 forks

☆ Star

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<> Code

! Issues

🔗 Pull requests

▶ Actions

📁 Projects

...

🔗 master ▾

...



StephanEggermont typo ...

on 25 Feb ⌚ 121

[View code](#)

README.md

Kotlin Playbook

How we write (backend) Kotlin code in the Content Acquisition domain of Springer Nature Digital IT.

A living document

We follow the [standard Kotlin coding conventions](#), although our codebase predates these, and so may occasionally diverge for historical reasons.

There's more!

≡ **intuit.** Blog

Kotlin Development Plan

UNCATEGORIZED

June 21, 2019 / Shelby Cohen / Katie Levy

Context

The original purpose of this paper was to help drive the consideration to introduce Kotlin at Intuit. The current version is a slight variation of the paper featuring me and Katie Levy's opinions and observations and why we think Kotlin has helped increase our developer productivity velocity.

5 Reasons Why N26 is Moving to Kotlin



Pat Kua [Follow](#)

May 3, 2018 · 4 min read

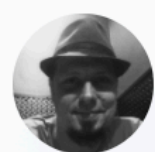


Like any modern technology company, we use many tools to bring our banking platform to life. Many of our backend services, for example, were implemented in Java. And our engineering team has tried out both Scala and Typescript — but later decided it wasn't for us.

SPRUCE



Why We Write Micro-Services in Kotlin



Written by **Alex Zuzin**

March 5, 2019

ING Blog

Introducing Kotlin at ING, a long but rewarding story



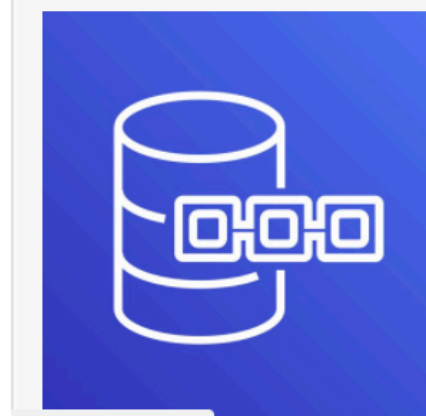
julien lengrand-lambert [Follow](#)

Dec 3, 2019 · 11 min read

This article describes our journey being the first team to run Kotlin in the backend at ING (Netherlands). Hopefully this article will give you some keys on how to introduce it as well in your own large company, and reduce some of the friction you might encounter.

← → ↺ 🔒 talkingkotlin.com/qldb/ ☆ FB ⚙️ 👤 ⋮

QLDB at Amazon



[Cookie policy](#)



Talking Kotlin
QLDB

SOUNDCLOUD

📶 ⬇️ 🔄 Share



Recorded March 05, 2020. Published June 30, 2020

We sit down with the folks from the team at AWS that work on QLDB, to discuss what Amazon Quantum Ledger Database (QLDB) is, their usage of Kotlin, why they choose Kotlin over Java for this new project, and how their overall experience has been.



Extreme code reuse
with Kotlin Multiplatform



Expressiveness and safety
for building GraphQL APIs
(with Java interoperability!!!11)



Jira Software

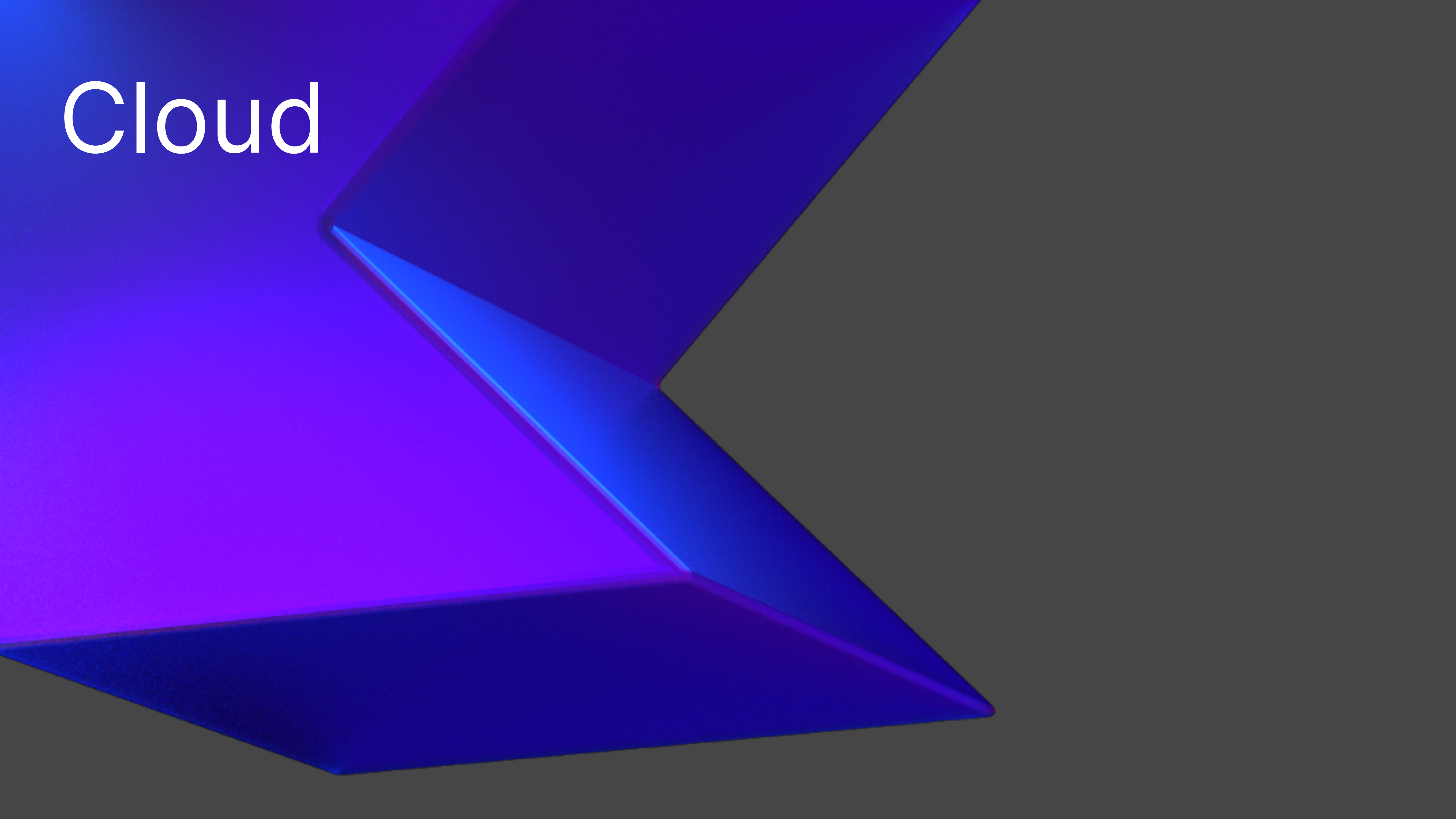
Brave new world with microservices
and happier developers!



Adobe

High-load, lock-free software
with Kotlin Coroutines

Cloud



Kotlin | Google Cloud

cloud.google.com/kotlin

Google Cloud

Why Google

Solutions

Products

Pricing

Getting Started

>


Q

Docs

Support


English ▾

Console



KOTLIN ON GOOGLE CLOUD PLATFORM

A community-supported project

 QUICKSTART

COMMUNITY TUTORIALS

Build rich backends in your favorite language

- Create and deploy autoscaling Kotlin backends for your mobile apps
- Write Kotlin using your favorite Java frameworks and libraries
- Use fully-managed MySQL/PostgreSQL or Firebase for your application database
- Run Kotlin in a containerized application at scale on Google Kubernetes Engine
- Use IntelliJ with Google Cloud Tools Plugins to add Google Cloud API libraries and deploy to App Engine.



Search or jump to...



Pulls


Issues

Marketplace

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 [GoogleCloudPlatform](#) / [kotlin-samples](#)

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75


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128

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47

 **Code**

 Issues **6**

 Pull requests **21**


 Actions

 Projects

 Wiki

 Security



 master ▾

Go to file


Add file ▾

 **Code** ▾

About

No description, website, or topics provided.

 [Readme](#)

 [Apache-2.0 License](#)

Releases



renovate chore: add renovate.json ([#63](#)) ...

✓ 17 days ago ⌚ 67



[.github/workflows](#)

feat: add quarkus and micronaut ([#82](#))

17 days ago



[appengine](#)

fix: ktor dependency error ([#69](#))

4 months ago



[firestore](#)

misc samples updates ([#47](#))

17 months ago



[functions](#)

Add region tags to Cloud Functions sample ([#...](#))

9 months ago

Kotless

Kotless Getting Started DSL ▾ Plugin ▾ FAQ

Kotlin Serverless Framework

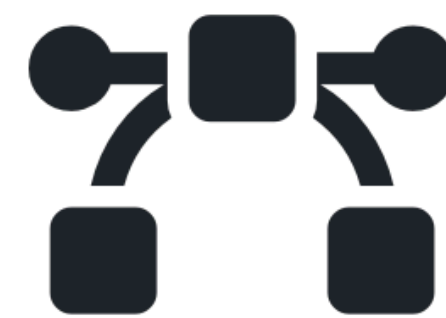
Create and deploy serverless application using Kotlin only.

```
//This page code and deployment at once
@Get("/")
fun root() = html {
    header()
    body {
        navbar()
        text()
        cards()
    }
}
```



Fast

Warm execution <10ms.
Cold execution <600ms.



Scalable

Up to 1000 requests at once.
Automatic scaling.



Simple

Code now is your deployment.
No more pain with cloud.

Serverless Development with Kotlin and Kotless



Vladislav Tankov
Team Lead in Kotless

Thanks!
Have a nice Kotlin!



@antonarhipov