Dart

A language believed dead,
experiences a new bloom 🌸

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Head of Mobile & Web Development

- Software developer by heart
- Working in the IT sector since 2004
- Regular speaker at tech conferences
- Main topics
  - Clean code
  - Test automation
  - Security
  - CI / CD

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Agenda

- Overview & History
- Type System
- Asynchronous Programming
- Interoperability
- Packages
- Tools
- Q&A

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Overview

- Open Source
- Main sponsor is Google

- First presentation was in October 2012
- Dart 1.0 was released in November 2013
- Focus was to build an alternative for JavaScript
    - But was not successful
    - ⚡

- New bloom with Flutter in 2018

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Overview

“Dart is a **client-optimized** language
for **fast apps** on **any platform**”

“Its goal is to offer **the most productive** programming language
for **multi-platform** development”

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Overview

- **Optimized for UI**
  - Async-await, isolate-based concurrency, sound null safety
  - Spread operator, collection if, familiar syntax

- **Productive development**
  - Hot reload, configurable tooling
  - Profiling, logging, debugging

- **Fast on all platforms**
  - AOT & JIT compilation, instant startup
  - Compilation to JavaScript

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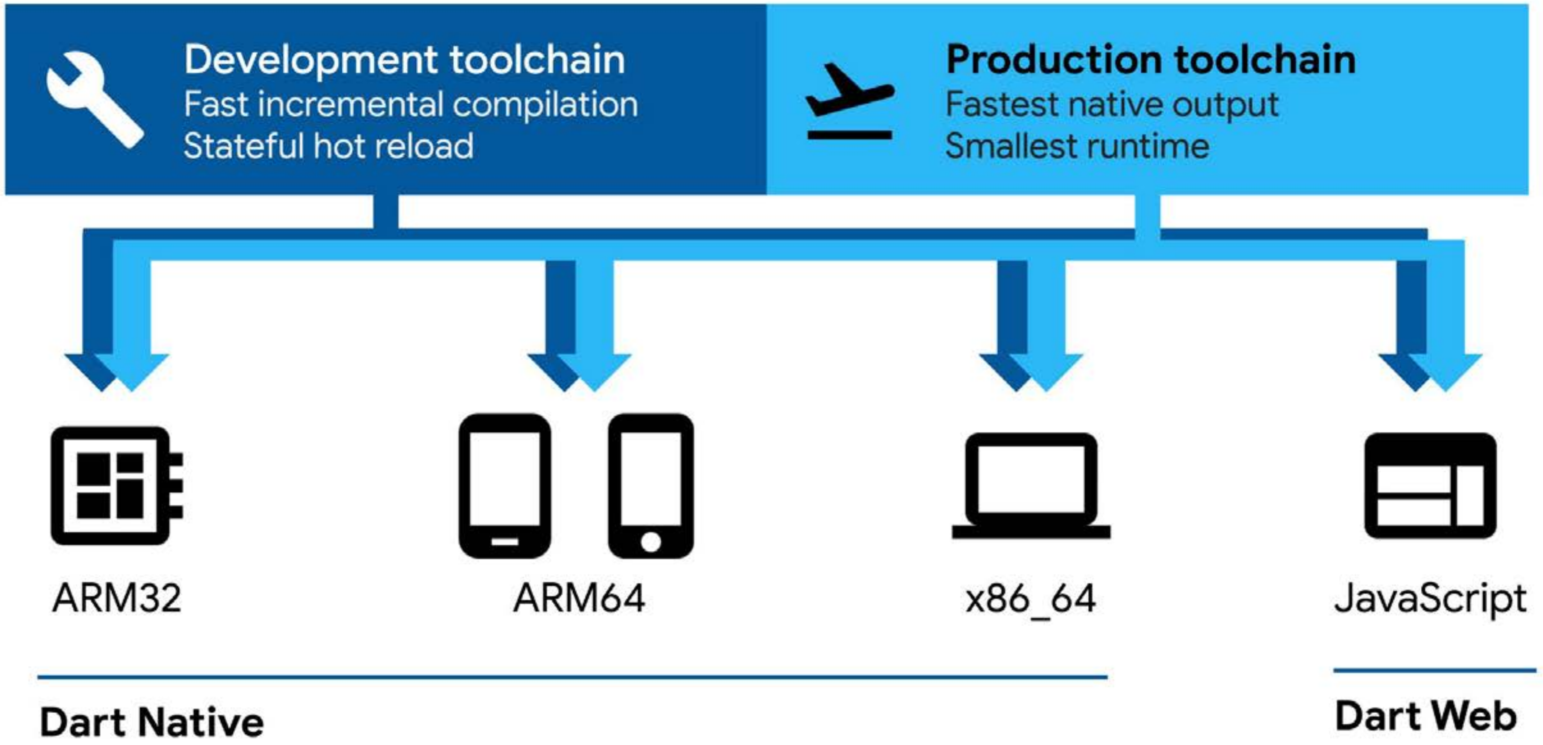
Under the Hood

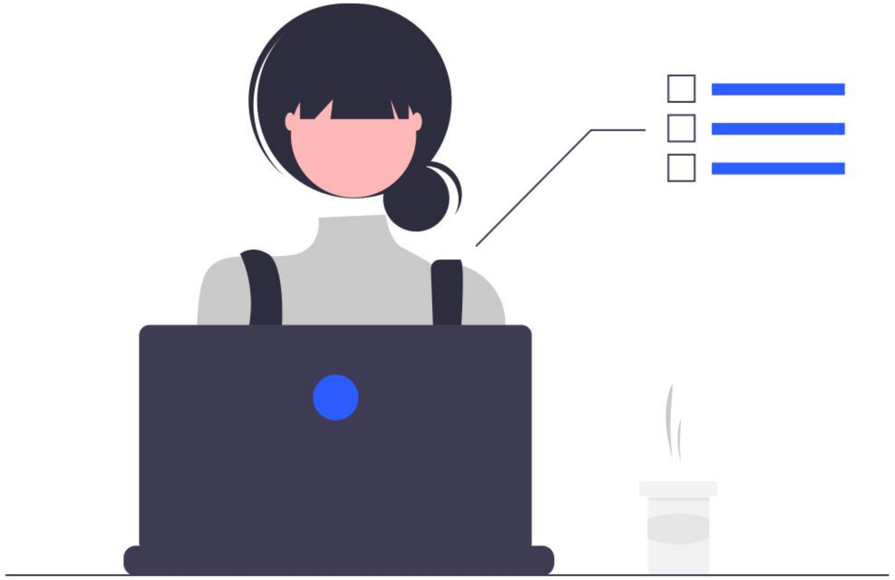


https://dart.dev/assets/img/Dart-platforms.svg

The Type System

- Strongly typed with type inference
- Null safety
  - Variables can’t contain null unless you say they can
- Supports
  - Generic types
  - Top-level functions
  - Top-level variables
  - Class functions (static and instance methods)
  - Class variables (static and instance variables)
- No *public*, *protected* and *private* keywords
- An underscore (_) is used to mark a member as private to its library

Live Coding



Asynchronous Programming

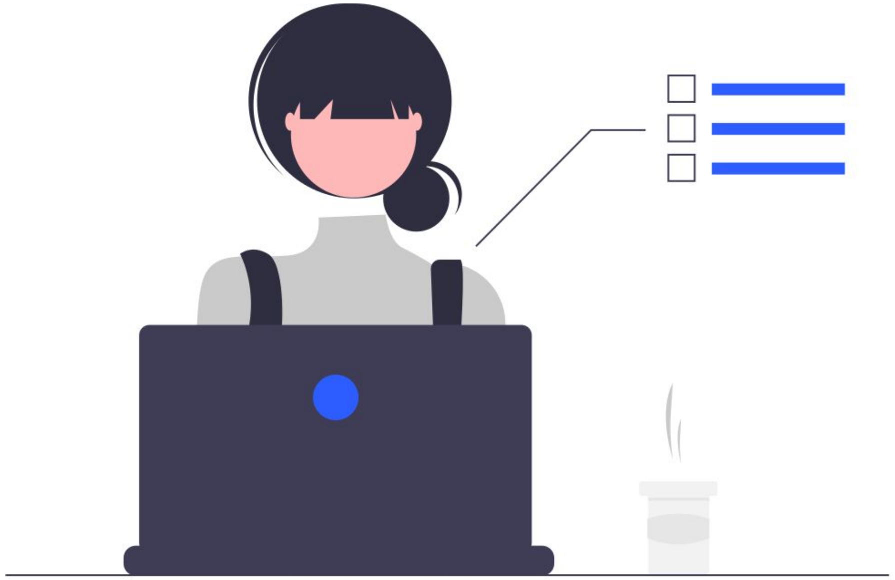
- ***async-await***, ***Future***, ***Stream*** and ***Isolate*** for concurrent programming

- ***await*** keyword works only in ***async*** functions

- ***Future*** and ***Stream*** represent future values

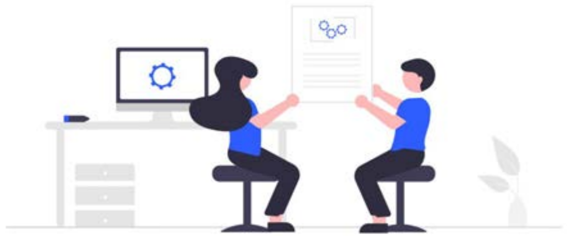
- ***Isolate*** is like a thread or process but has its own memory heap
- Inside an ***Isolate*** a single thread running an event loop is used

Live Coding



Interoperability

- Different types of interoperability
  - Native C APIs
  - JavaScript
  - Objective-C and Swift
  - Java and Kotlin



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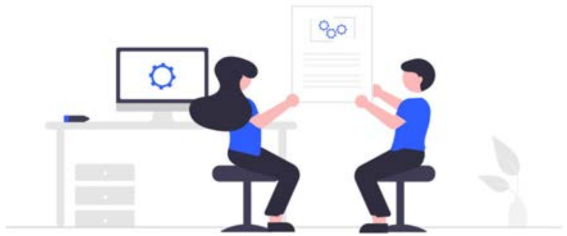
Interoperability

- The dart:ffi library is used for native C APIs
  - Supports calling APIs and read, write, allocate and deallocate native memory

- Calling JavaScript APIs is supported via the dart:js_interop library



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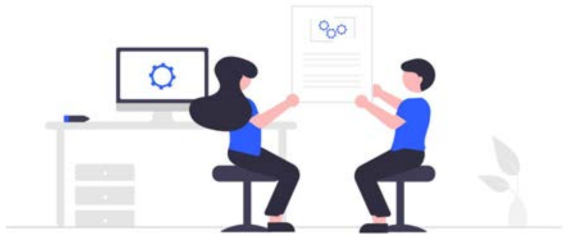
Interoperability

experimental

- The package:ffigen is used to call Objective-C and Swift APIs
- Furthermore it supports languages that compile to C modules following the C calling convention (e.g. Go or Rust)

- The package:jni and package:jnigen are used to call Java and Kotlin APIs



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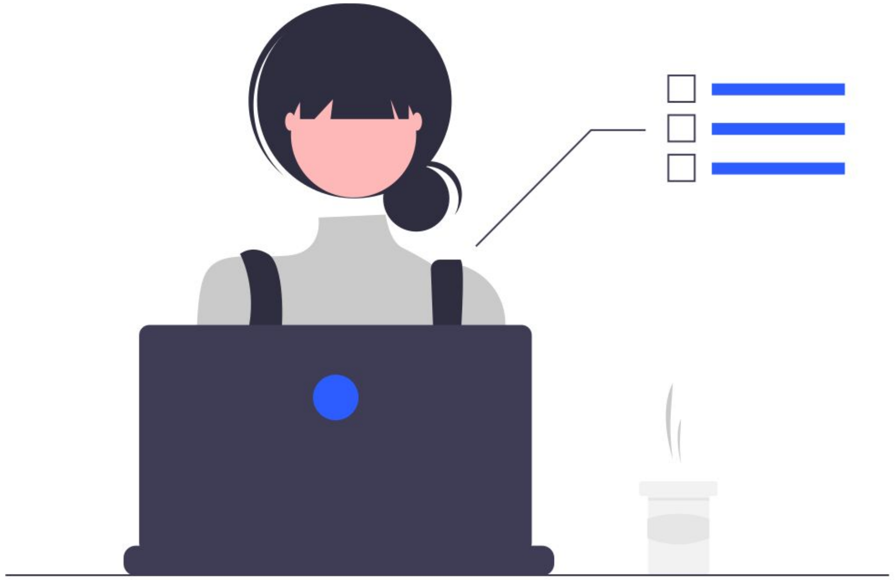
Live Coding



Packages

- pub.dev
- 52.652 packages available (April 2024)

- For publishing a Google Account is needed

- **Keep in mind publishing is forever!**
    - Only in view cases unpublishing is possible

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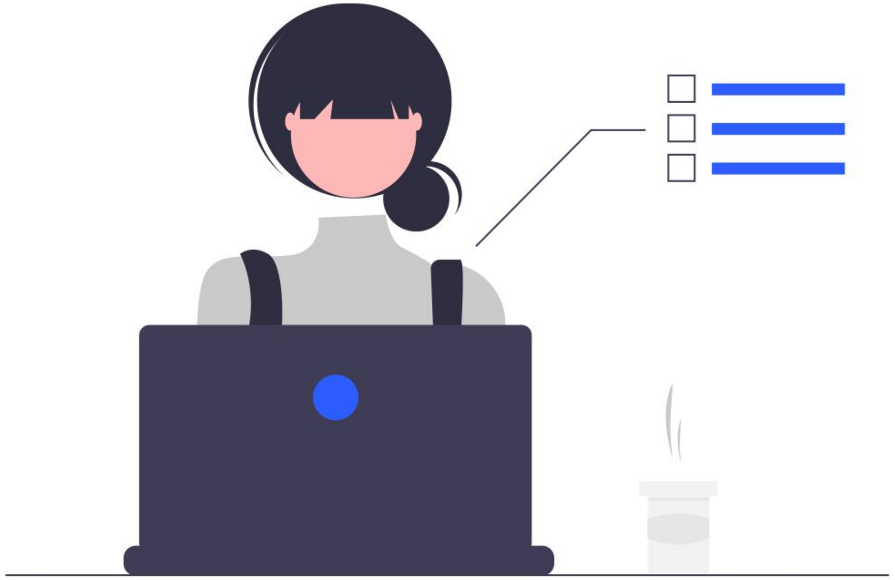
Live Coding



Development Tools

- Hot reload
- Debugger
- Logging view
- App size tool
- CPU profiler
- Memory view
- Network view
- Performance view
- Formatter (dartfmt)
- Analyzer (dartanalyzer)
- …

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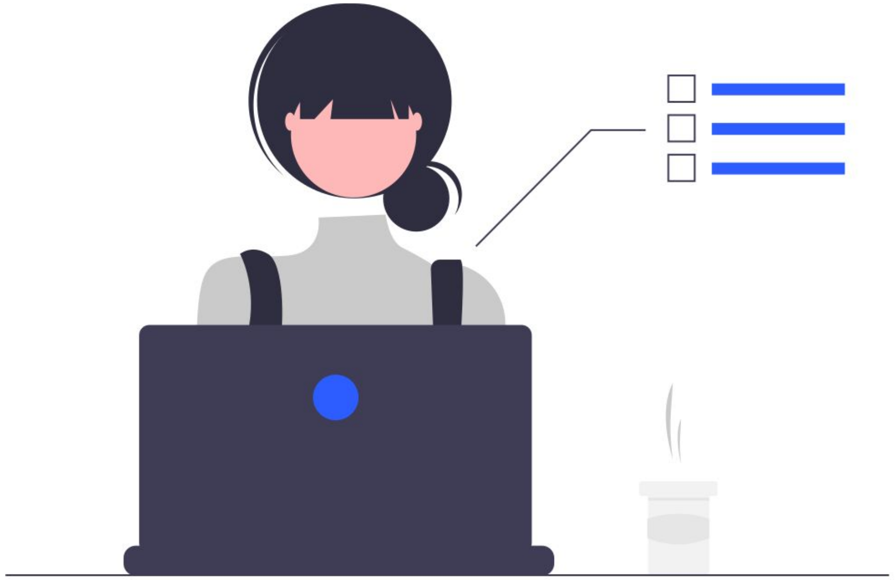
Live Coding



And much much more

- Exceptions
- String interpolation
- Null-aware operators
- Conditional property access
- Optional positional parameters / optional named parameters
- Initializer lists
- Const constructors
- Typedefs
- Test support (Unit Tests)
- …

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Q&A

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Vielen Dank!

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