



Flutter

What is Flutter?

A SDK that makes building high-performing, modern and beautiful apps easy

Works for both Android and iOS

An open-source toolkit, developed by Google*

100+ contributions from the open source community

* Currently in Beta

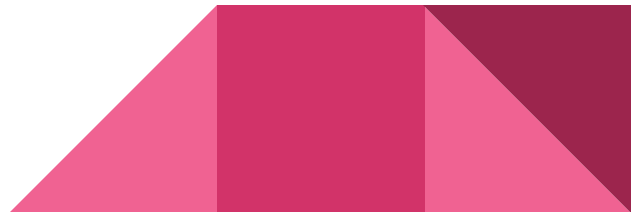


Who is Flutter for?

Designers converge on a brand-driven experience on Android and iOS

Prototypers enjoy a high-fidelity and fast way to build working prototypes.

Developers benefit from fantastic developer tools, an easy-to-use language, a rich set of widgets and great IDE support. Flutter frees up valuable time for working on features and delightful experiences.



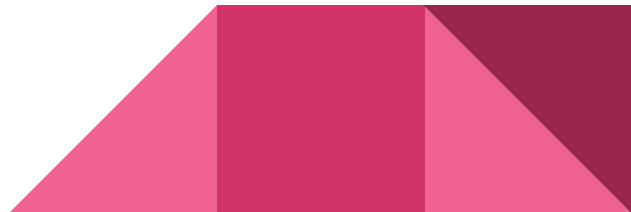
Course Plan

Week 1 Installation + hello world + Calculator

Week 2 Connecting database + sign up and login

Week 3 Adding more pages to the app

Week 4 Lists and material design and app polish + project





1. Developer Experience Performance

Design-oriented Development Flow



What do you see here?



Oeschinen Lake Campground

Kandersteg, Switzerland

★ 41



CALL



ROUTE



SHARE

Lake Oeschinen lies at the foot of the Blüemlisalp in the Bernese Alps. Situated 1,578 meters above sea level, it is one of the larger Alpine Lakes. A gondola ride from Kandersteg, followed by a half-hour walk through pastures and pine forest, leads you to the lake, which warms to 20 degrees Celsius in the summer. Activities enjoyed here include rowing, and riding the summer toboggan run.

Diagram the Layout

- Look for rows and columns
- Is there a grid?
- Any overlapping elements?
- Do we need tabs?
- Padding, alignment or borders needed?

Column



Oeschinen Lake Campground

Kandersteg, Switzerland



CALL



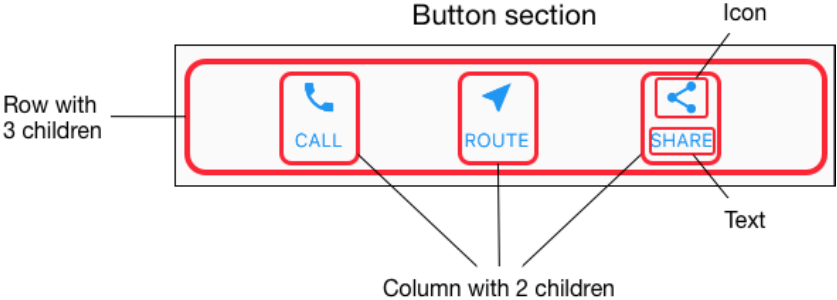
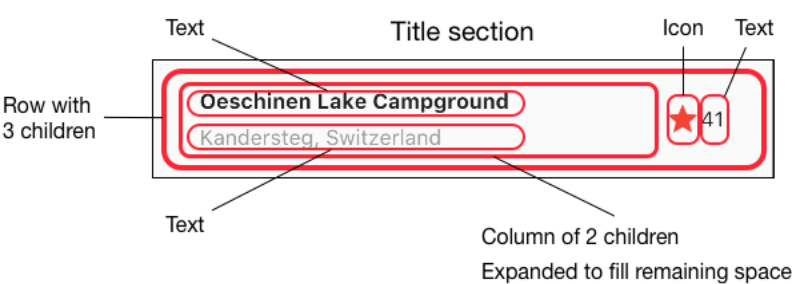
ROUTE



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Designing bottom up



HTML/CSS Analogs in Flutter

```
<div class="greybox">  
  Lorem ipsum  
</div>
```

```
.greybox {  
  background-color: #e0e0e0; /* grey 300 */  
  width: 320px;  
  height: 240px;  
  font: 900 24px Georgia;  
}
```

```
var container = new Container( // grey box  
  child: new Text(  
    "Lorem ipsum",  
    style: new TextStyle(  
      fontSize: 24.0  
      fontWeight: FontWeight.w900,  
      fontFamily: "Georgia",  
    ),  
  ),  
  width: 320.0,  
  height: 240.0,  
  color: Colors.grey[300],  
);
```

Efficient Tooling



```
$ flutter doctor
```

Checks your environment and displays a report to the terminal window

```
$ flutter upgrade
```

Updates both the Flutter SDK and your packages



pubspec.yaml

name: flutter_project

description: An amazing Flutter project using Firebase Auth

dependencies:

flutter:

sdk: flutter

firebase_auth: "^0.2.5"



pubspec.yaml

name: flutter_project

description: An amazing Flutter project using Firebase Auth

dependencies:

flutter:

sdk: flutter

firebase_auth: ">=0.1.2 <0.2.6"

```
$ flutter packages get
```

Checks your environment and displays a report to the terminal window

```
$ flutter packages upgrade
```

Will retrieve the highest available version of the package



`$ flutter format`

Automatically formats your code according to the Flutter-style

`$ flutter analyze`

Analyzes your code and help you find possible mistakes



Hot Reload

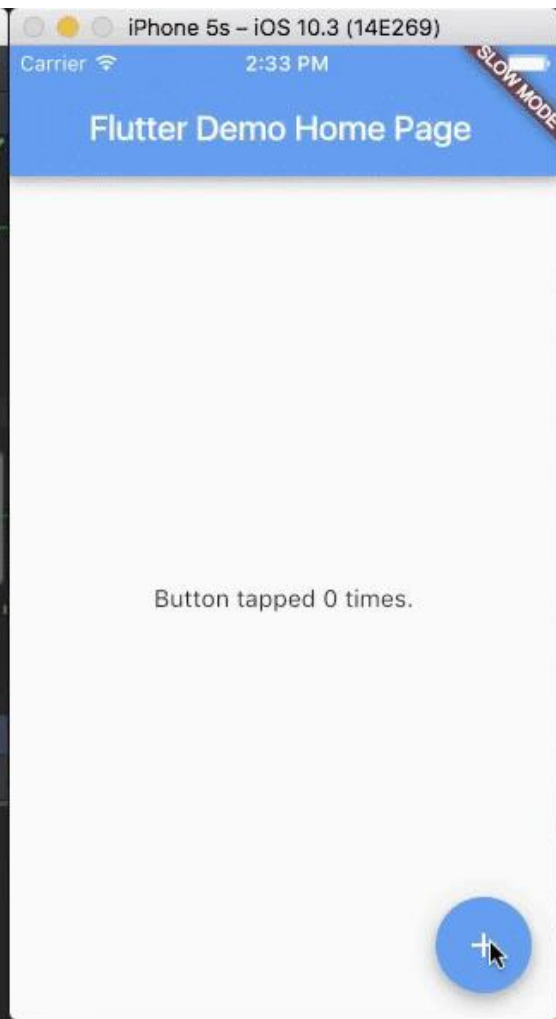
Injecting updated source code files into the running Dart VM

Stateful: App state is retained after a reload.

Quickly iterate on a screen deeply nested in your app



```
main.dart - hot-reload - [~/tmp/hot-reload]
hot-reload | iPhone 5s | hot-reload | 01 to 01
main.dart x
40 int _counter = 0;
41
42 void _incrementCounter() {
43   setState(() {
44     _counter++;
45   });
46 }
47
48 @override
49 Widget build(BuildContext context) {
50   return new Scaffold(
51     appBar: new AppBar(
52       title: new Text(widget.title),
53     ),
54     body: new Center(
55       child: new Text(
56         'Button tapped $_counter times${ _counter == 1 ? '' : 's' }',
57       ),
58     ),
59   );
60 }
Run hot-reload
```



Dart Observatory

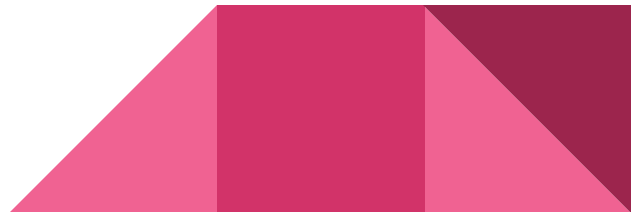
Statement-level single-stepping debugger and profiler

Automatically running when you start your app using flutter run

See which lines of code have executed

Check out memory allocations

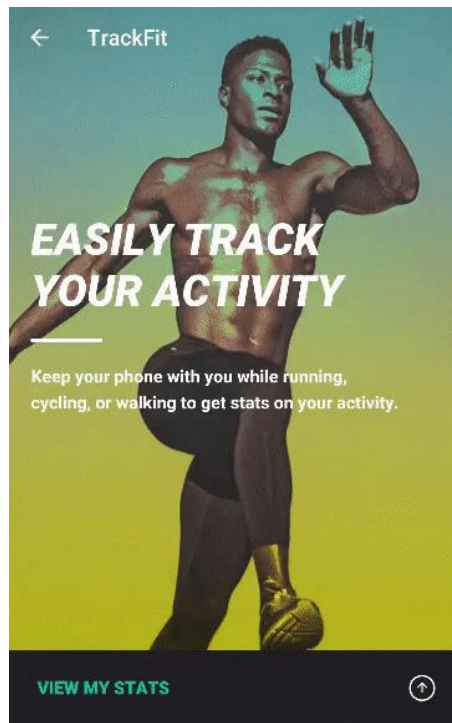
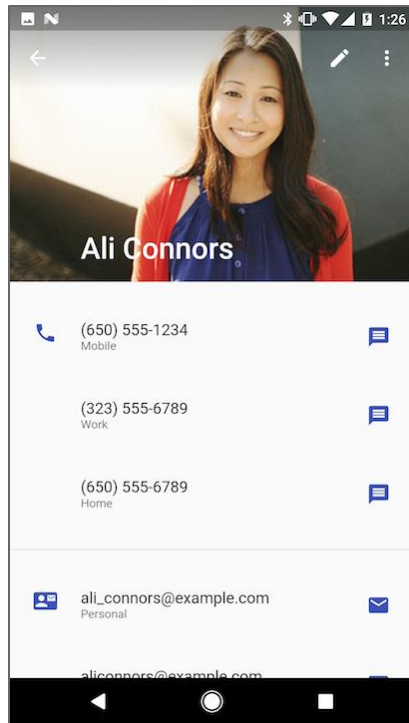
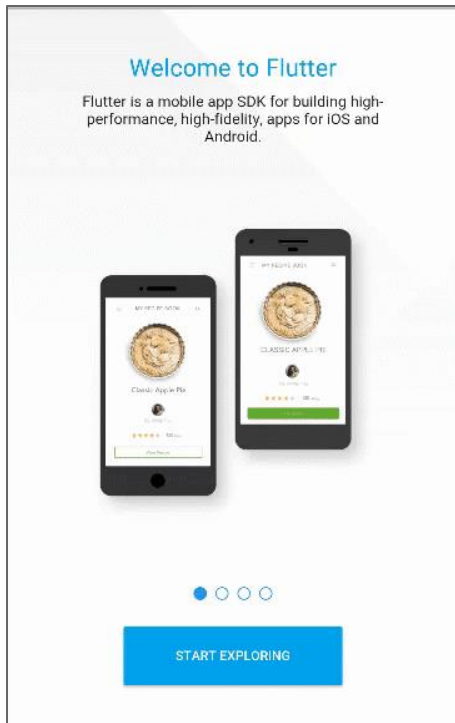
Debug memory leaks & fragmentation



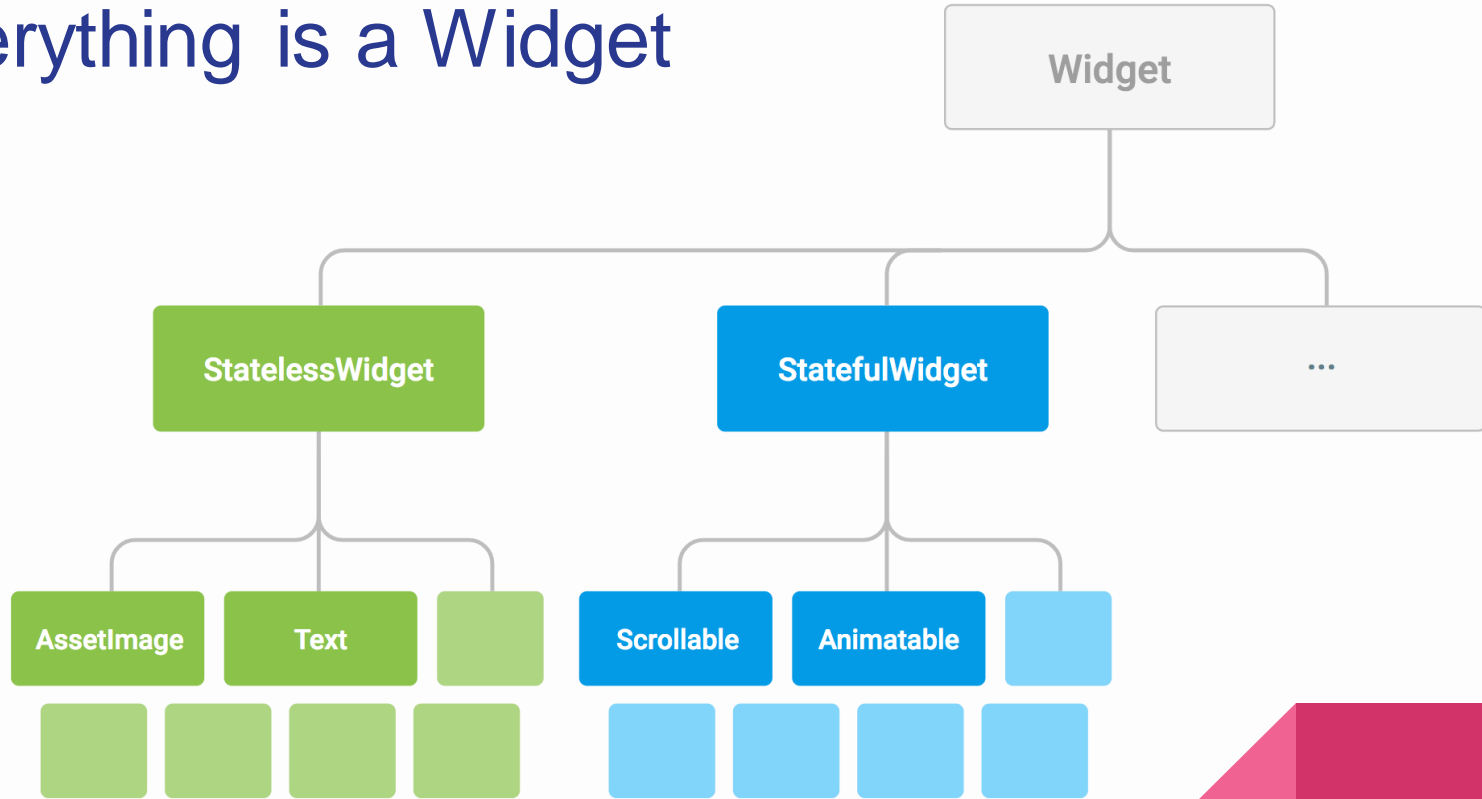
The Power of Widgets



Great looking and fast Widgets



Everything is a Widget



Goodbye, global layout system

```
new Center(  
  child: new Text('Centered Text', style: textStyle),  
)
```

Local layouts: Every Widget defines its **own** layout. No need to tell the parent that its children are supposed to be centered.



StatefulWidget vs. StatelessWidget



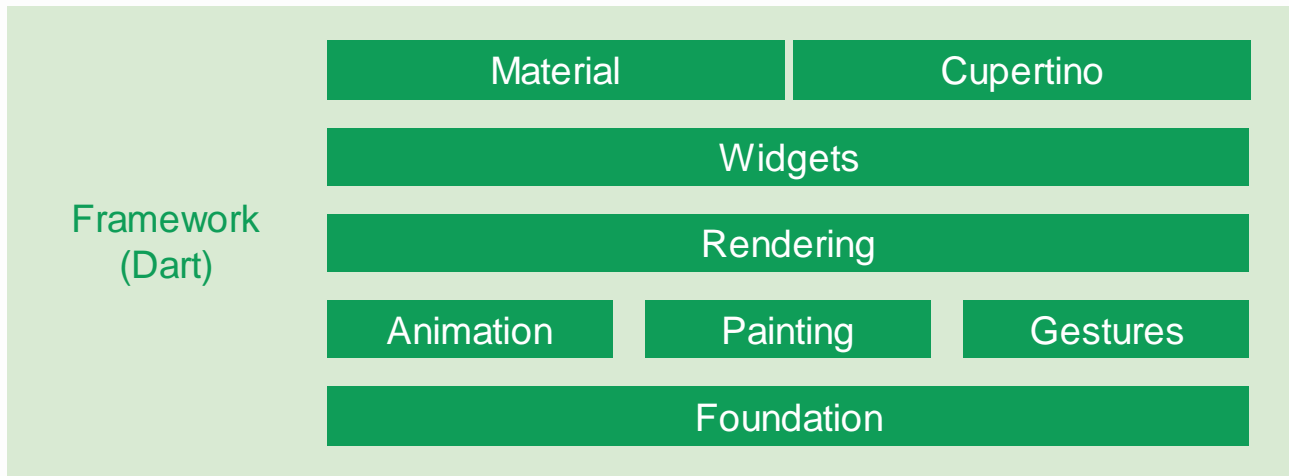
Customizing and extending Widgets

Flutter's Widget system was designed to be easily customizable

Composition: Widgets are built out of smaller widgets that you can reuse and combine in novel ways to make custom widgets

```
class RaisedButton extends StatelessWidget {  
  ...  
}
```



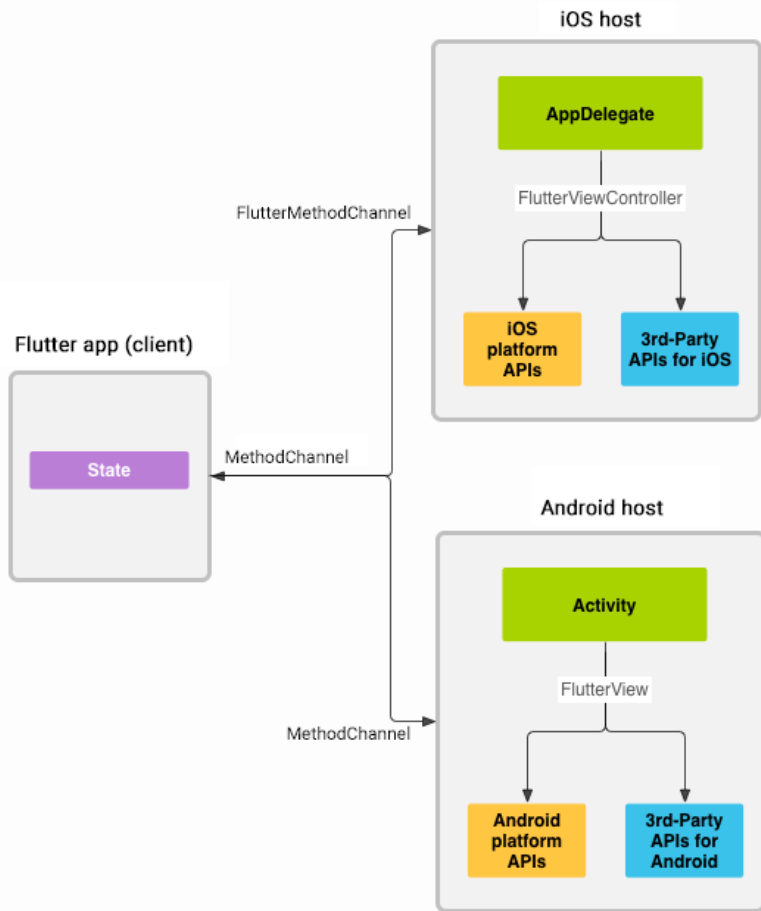


Each layer builds upon the previous layer



Platform Channels





Using platform channels allows for receiving method calls and sending back results

Example: Retrieving the battery level*

```
class MainActivity() : FlutterActivity() {  
    private val CHANNEL = "samples.flutter.io/battery"
```

```
    override fun onCreate(savedInstanceState: Bundle?) {  
        super.onCreate(savedInstanceState)  
        GeneratedPluginRegistrant.registerWith(this)
```

```
        MethodChannel(flutterView, CHANNEL).setMethodCallHandler { call, result ->  
            // TODO
```

```
    }  
}
```

* Example written in Kotlin for Android

Working with the response argument*

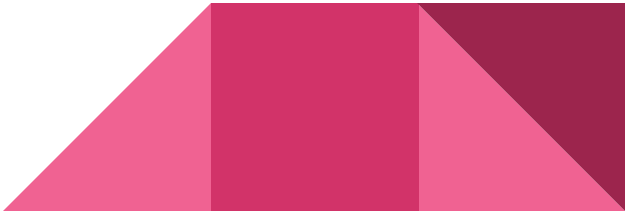
```
MethodChannel(flutterView, CHANNEL).setMethodCallHandler { call, result ->
    if (call.method == "getBatteryLevel") {
        val batteryLevel = getBatteryLevel()
        if (batteryLevel != -1) {
            result.success(batteryLevel)
        } else {
            result.error("UNAVAILABLE", "Battery level not available.", null)
        }
    } else {
        result.notImplemented()
    }
}
```

* Example written in Kotlin for Android




Flutter-side invocation of platform methods

```
String _batteryLevel = 'Unknown battery level.';
Future<Null> _getBatteryLevel() async {
  String batteryLevel;
  try {
    final int result = await platform.invokeMethod('getBatteryLevel');
    batteryLevel = 'Battery level at $result %.';
  } on PlatformException catch (e) {
    batteryLevel = "Failed to get battery level: '${e.message}'.";
  }
  setState() {
    _batteryLevel = batteryLevel;
  });
}
```

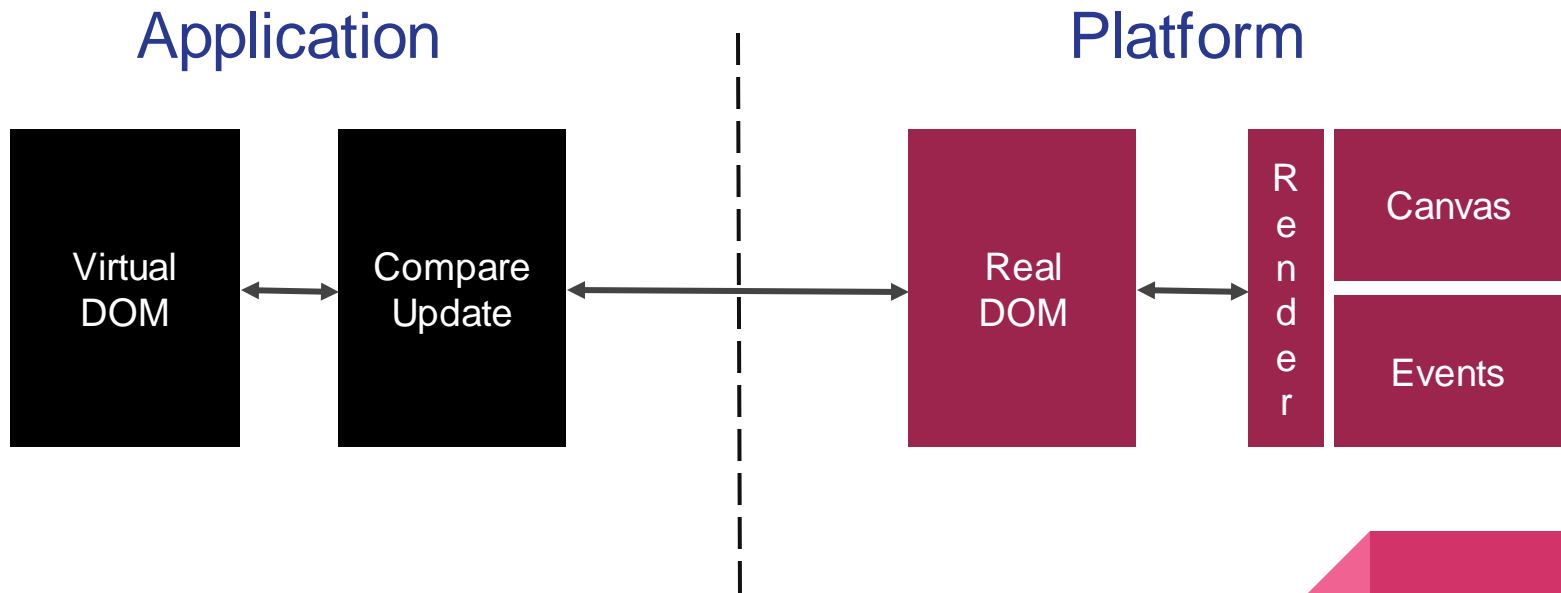




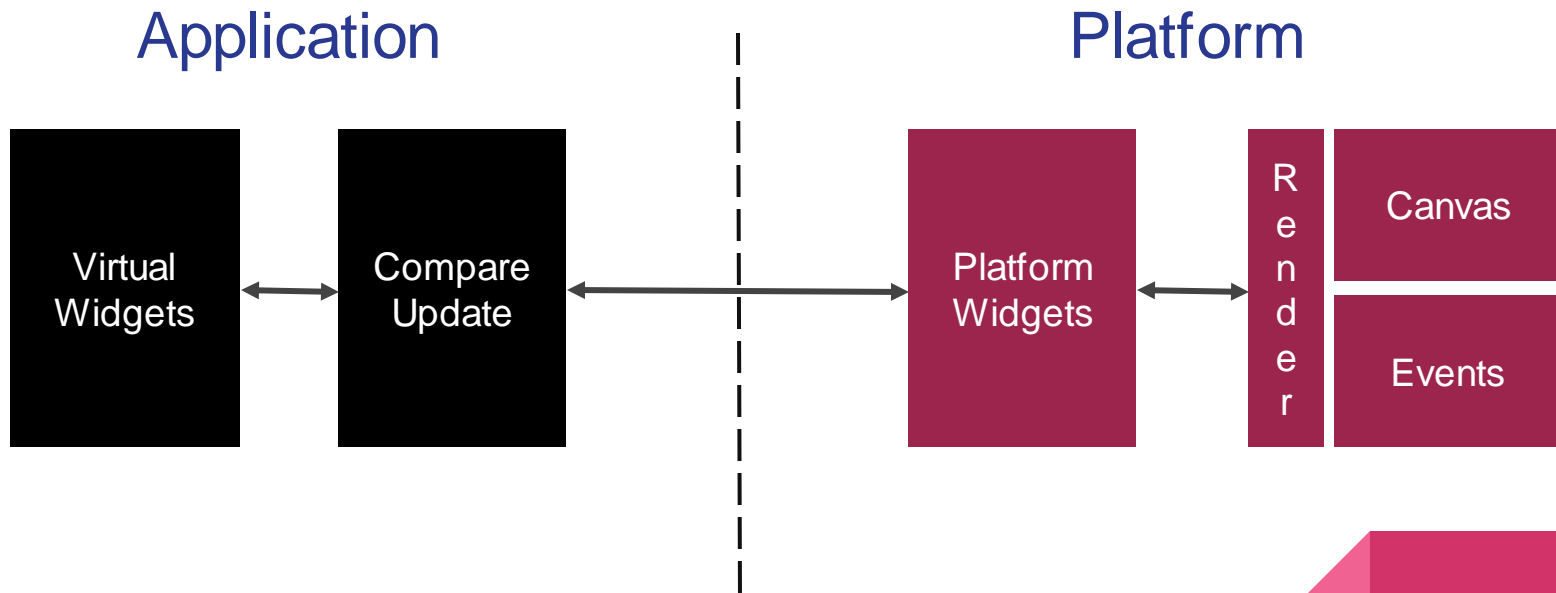
Optimized for Performance

- 
- Compiles to Native Code
- No reliance on OEM widgets
- No bridge needed
- Structural Repainting

Reactive Frameworks on the Web

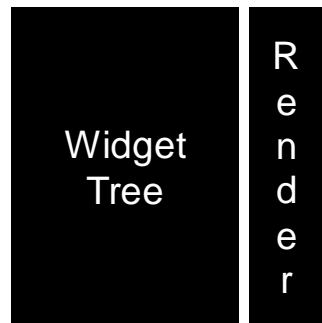


Reactive Frameworks on Mobile

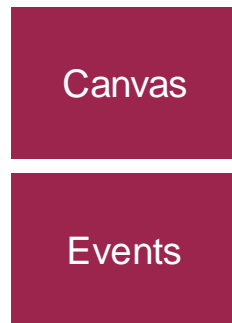


Using Flutter

Application




Platform





Superpowered by Dart


- 
- Sound type system
- Tree Shaking
- Rich core libraries
- Multi-gen, lockless GC

- Single codebase for
Android and iOS

Rapid development cycles

Great tooling






“Running at 60 fps, user interfaces created with Flutter perform far better than those created with other cross-platform development frameworks.”

code.tutsplus.com/tutorials/developing-an-android-app-with-flutter--cms-28270



“Coding with Dart and Flutter rekindled the joy I
had when I started with mobile dev way back
when ... No B.S.”

traversoft.com/blog/2017/08/08/conference-app-flutter



"The UI is butter smooth (when building a release version), I have never seen such a smooth Android app"

Pascal Welsch, Speaker at Droidcon Berlin

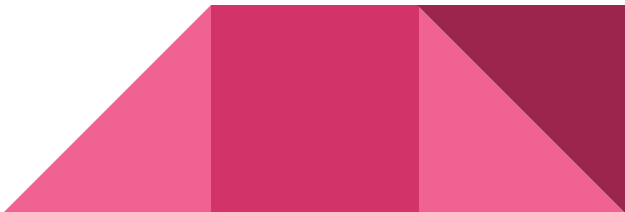
Additional resources

Blog: What's Revolutionary about Flutter by Wm Leler: goo.gl/bZcFR9

Video: Flutter's Rendering Pipeline by Adam Barth: youtu.be/UUfXWzp0-DU

Video: The Mahogany Staircase by Ian Hickson: youtu.be/dkyY9WCGMi0

And of course: github.com/flutter & flutter.io





Thank you!

Done by :

- Ayman Rahmon
- Mohamed Gamal
- Abdul Maane Sualah
- Abdirahman Ahmed hadi