

Synchronizing State in a Multi-Device World

Created by [Jenny Tong](#) / [mimming.com](#) / [@MimmingCodes](#)



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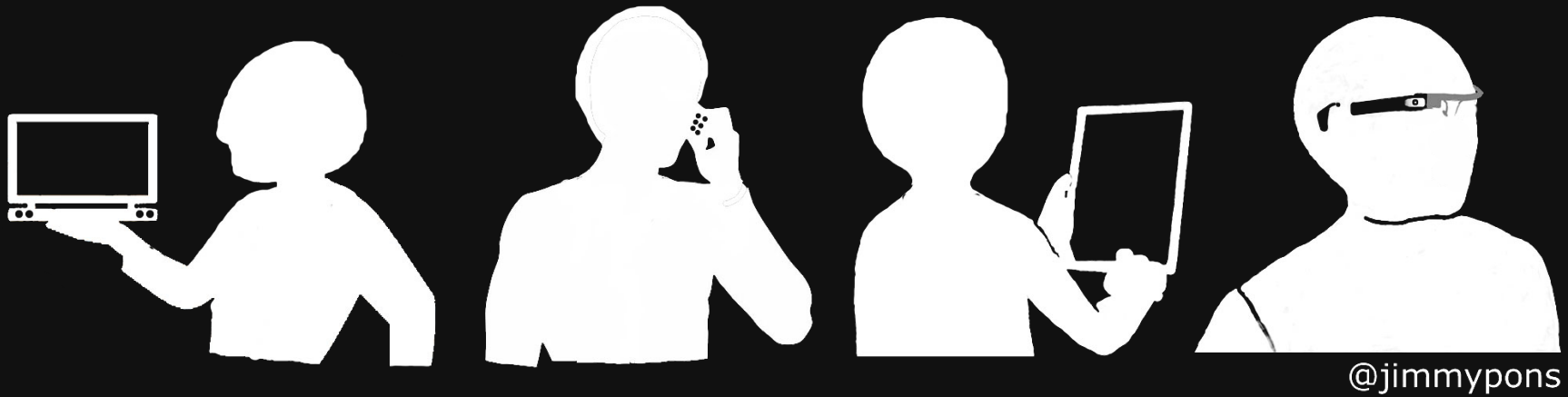
Agenda

- Introducing *Trendy Startup*
- Hear the *Trendy Startup* pitch
- The code behind the pitch

Trendy Startup

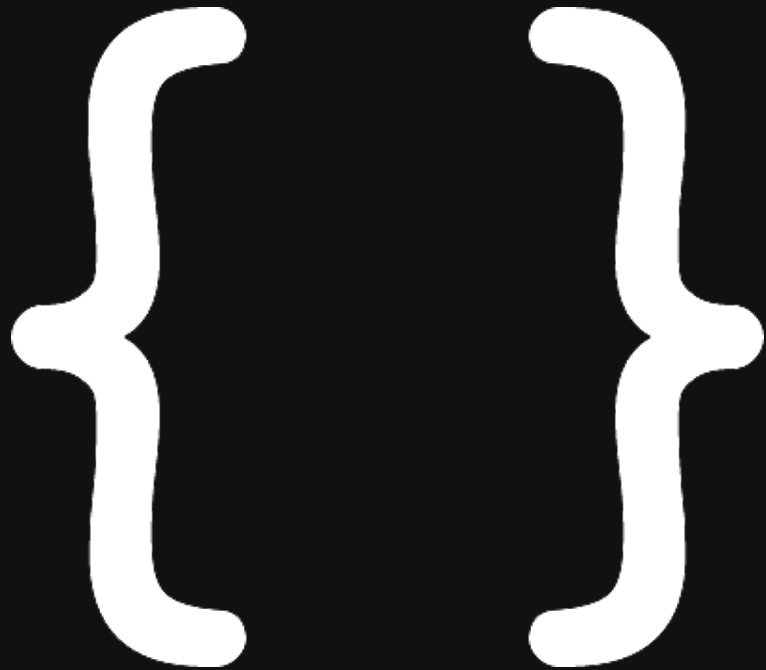
A tiny app company that specializes in solving important problems across many platforms.

Many devices



Great Apps

Code and data



Great Apps

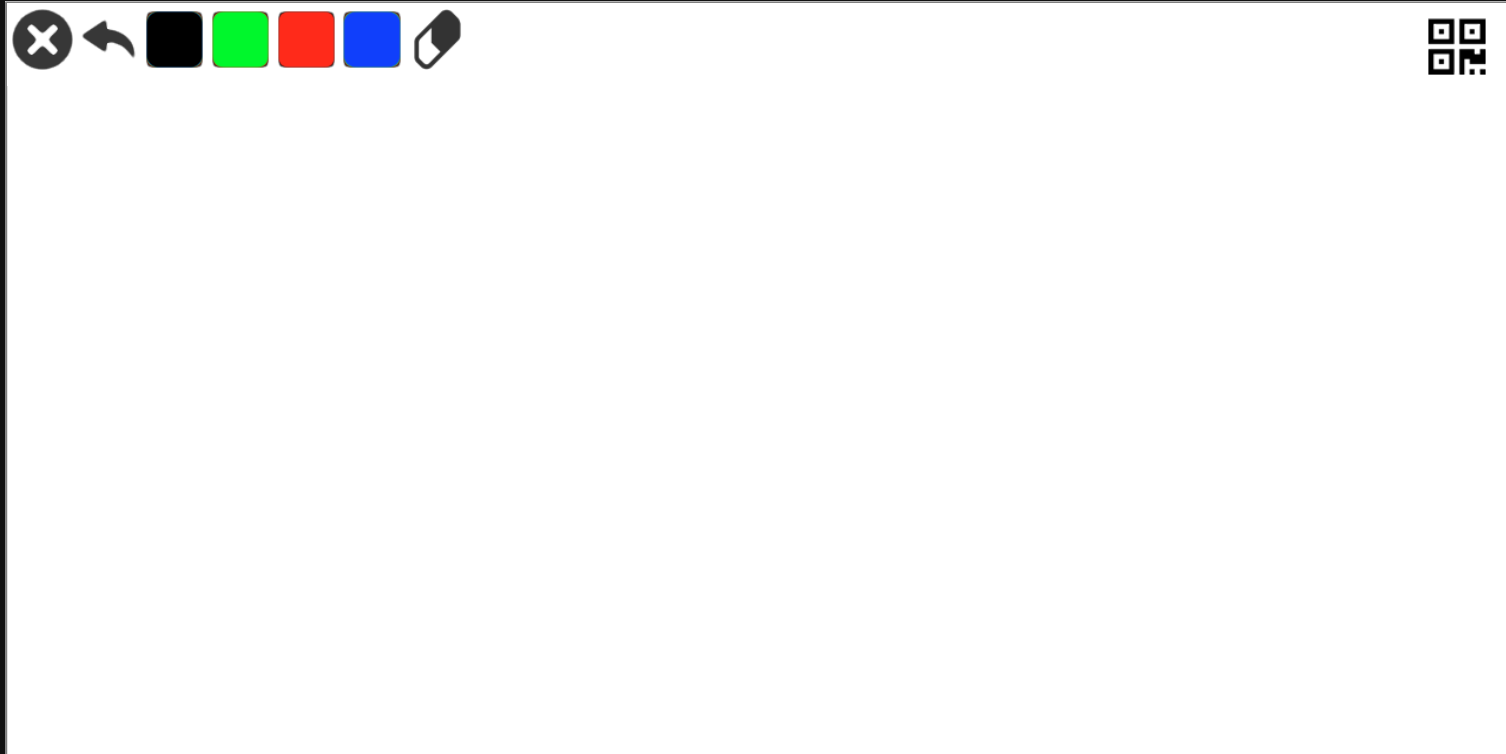
Much data



- Preferences and settings
- User created media
- Recorded sensor data
- Real time state

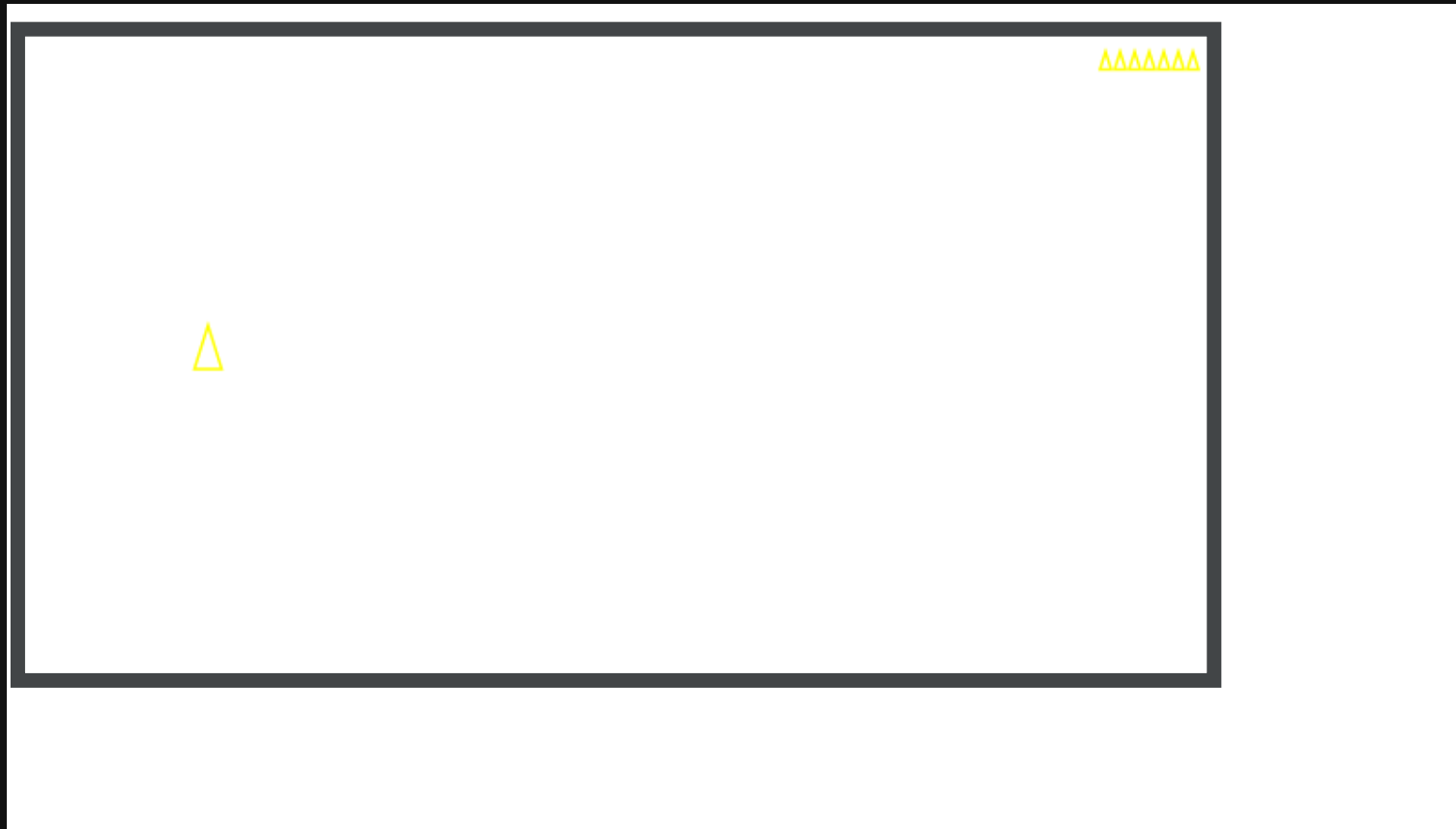
**Realtime is
Where your bus is**

Realtime is Collaborative drawing



<http://tinyurl.com/FireDraw>

Realtime data is Game state



<http://tinyurl.com/MMOasteroids>

Trendy Startup's Needs

- Focus on writing killer real-time apps
- Support for Android, iOS, and Web
- Some way on to the Internet of Things bandwagon

Things they considered

- Point to point
- Roll their own backend
- Cloud backend

Point to point

- Super fast
- No Internet needed
- Support matrix from sad land



Roll your own backend

- Fits your needs perfectly!
- Some CTOs love writing server code
- But, you pay with time



Backend as a service

- Easier to get started
- Faster pivots
- Scales automagically
- But, there's lock-in risk



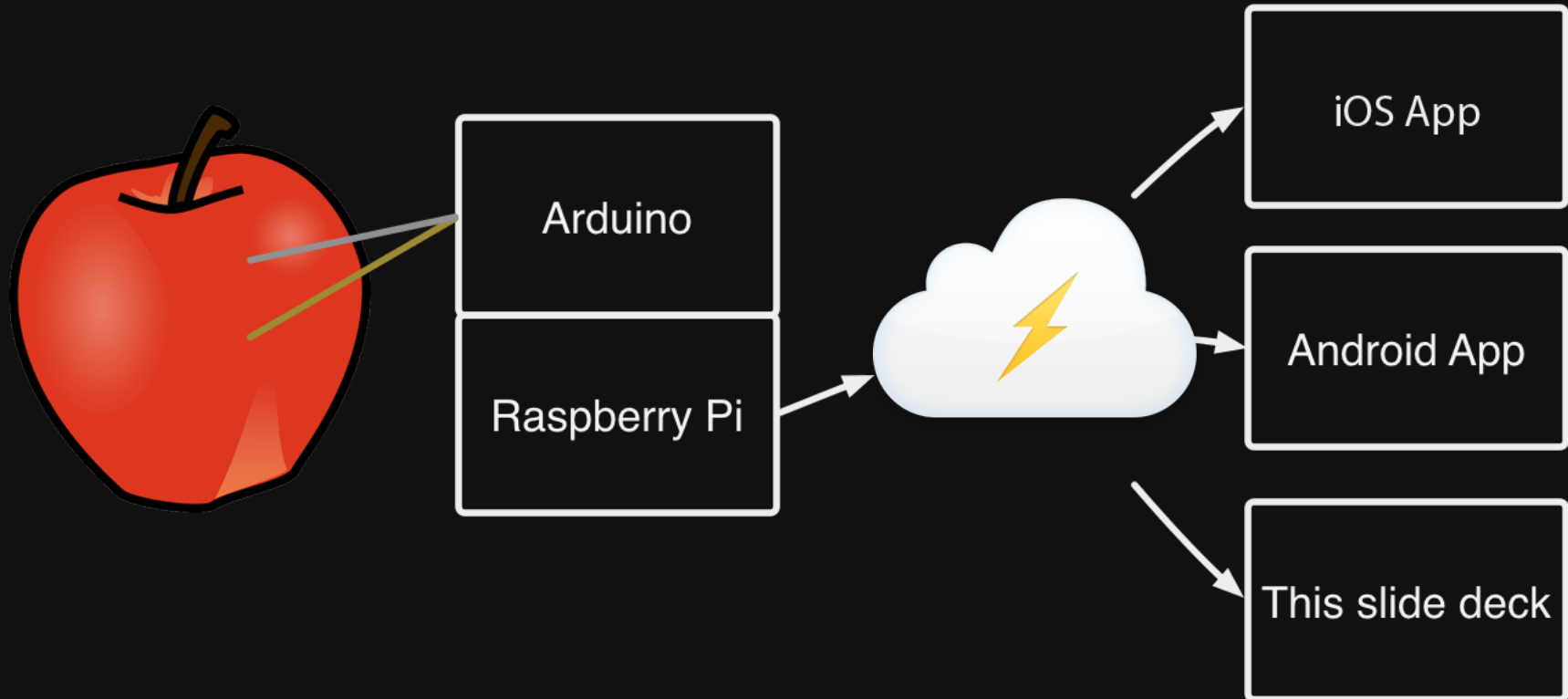
The Trendy Startup Pitch

Realtime Fruit Detector

Your fruit is an
none

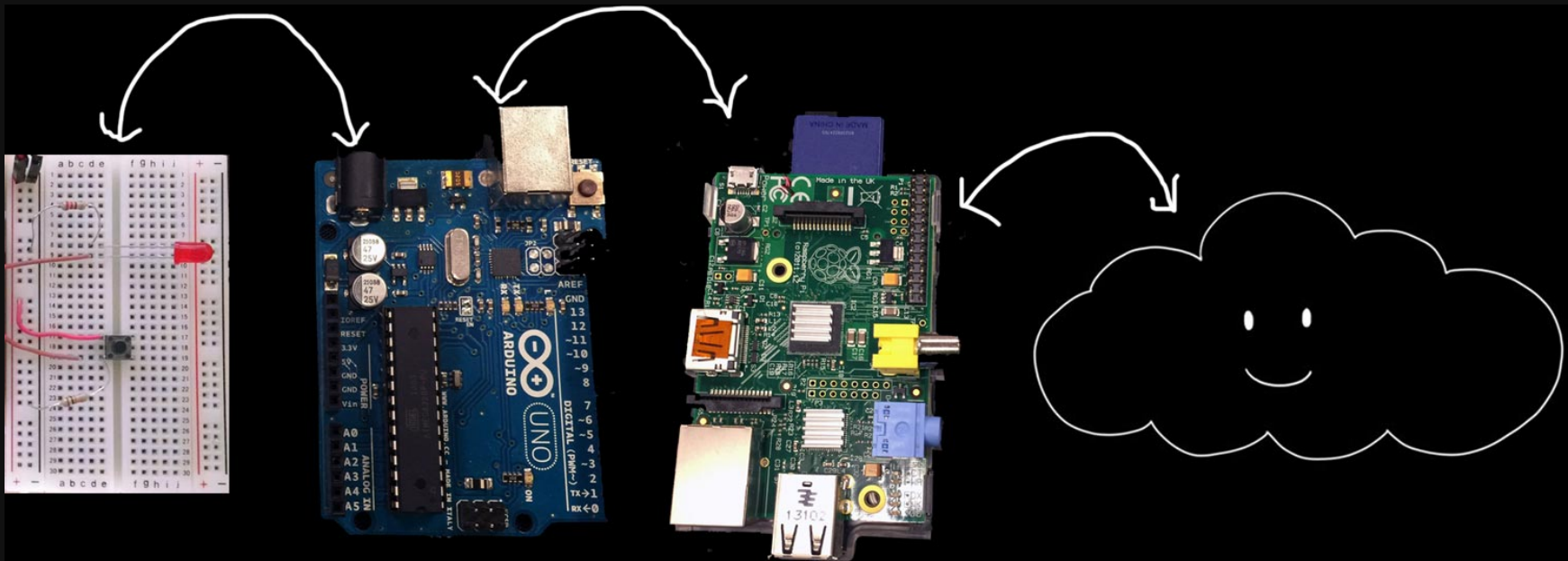
Realtime Fruit Detector

How it works



How it works

A primitive NodeBot



Device Code

```
var five = require("johnny-five");
var Firebase = require("firebase");

var board = new five.Board();
// Connect to Firebase
var myFirebaseRef =
  new Firebase("https://fruit.firebaseio-demo.com/");

board.on("ready", function() {

  // Set up the Arduino
  var fruit = new five.Sensor({
    pin: "A2",
    freq: 250
  });
  board.repl.inject({ sensor: fruit });
  ...
});
```

Device code

```
// When the voltage changes, do math
fruit.scale([0, 1024]).on("data", function() {
  var voltage = this.raw / 1024 * 5;
  var fruitType = "unknown";
  if(this.raw < 20) {
    fruitType = "none";
  } else if(this.raw >= 20 && this.raw < 92) {
    fruitType = "orange";
  } else if(this.raw >= 92 ) {
    fruitType = "apple";
  }

  // Save to to Firebase and alert all listeners
  myFirebaseRef.set({"type":fruitType, "voltage":voltage});
});
});
```

Web client code

```
// Connect to Firebase
var fruitRef =
    new Firebase("https://fruit.firebaseio-demo.com/");

// Listen for fruit changes
fruitRef.on("value", function(snapshot) {
    var fruitType = snapshot.val();
    $("#fruit-type").html(fruitType.type);
});
```

iOS Swift code

```
let ref = Firebase(url:"https://fruit.firebaseio-demo.com/")

ref.observeEventType(.Value, withBlock: {
    snapshot in

    let fruit = "\(snapshot.value)"

    self.textView.text = fruit

    if(fruit == "apple") {
        self.imageView.image = UIImage(named: "apple");
    } else if(fruit == "orange") {
        self.imageView.image = UIImage(named: "orange");
    }
})
```

Android code

```
protected void onResume() {
    Firebase ref = new Firebase("https://fruit.firebaseio-demo.com/");

    // Find the ImageView
    final ImageView fruitImageView =
        (ImageView)findViewById(R.id.fruit_image);

    // Listen for changes
    ref.child("type").addValueEventListener(new ValueEventListener() {
        @Override
        public void onDataChange(DataSnapshot snapshot) {
            String fruitType = snapshot.getValue(String.class);
            if(fruitType.equals("orange")) {
                fruitImageView.setImageResource(R.drawable.orange);
            } else ...
        }
    });
}
```


Why is this cool?

- Less than 100 total lines of code, total
- Idiomatic code on each platform
- Each client is independent of the others

Wrap up

- We got to know *Trendy Startup*
- Heard the *Trendy Startup* pitch
- Saw the code behind the pitch

Epilogue

- *Trendy Startup* got funded
- But they failed to solve the pickel matrix, and were forced to pivot
- Now they're the Geocities of gourmet sandwiches

THE END

These Slides

mimming.com/presos/synchronizing-state

Code

github.com/mimming/synchronizing-state

github.com/mimming/firebase-fruit-detector

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