

# Getting Started with Cellular IoT

**Rob Lauer & TJ VanToll**

Developer Relations





## Rob Lauer

Director of Developer Relations

[@RobLauer](#)



## TJ VanToll

Principal Developer Advocate

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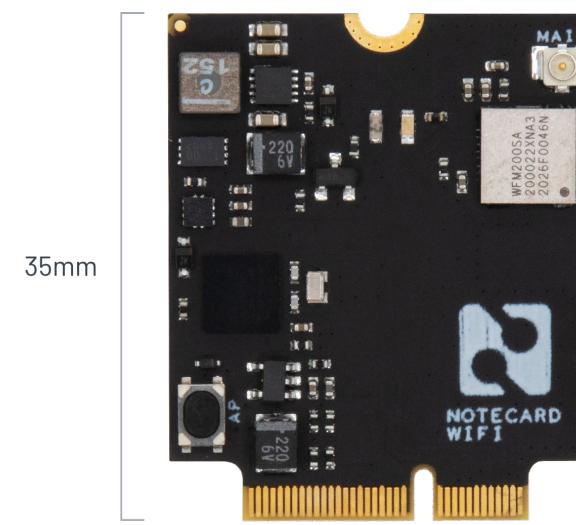
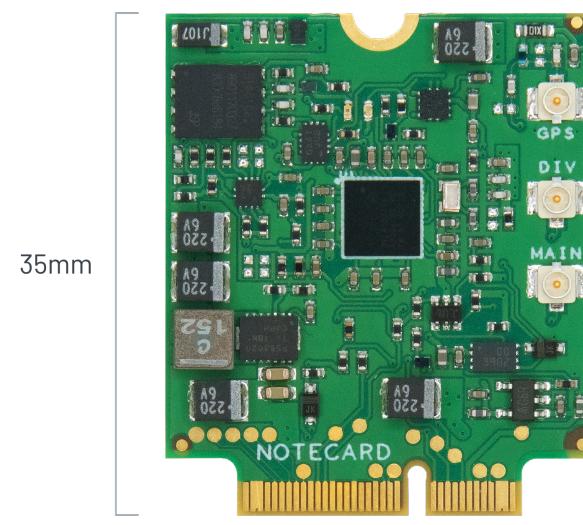
“

**Complexity kills.** It sucks the life out of developers, it makes products difficult to plan, build, and test.

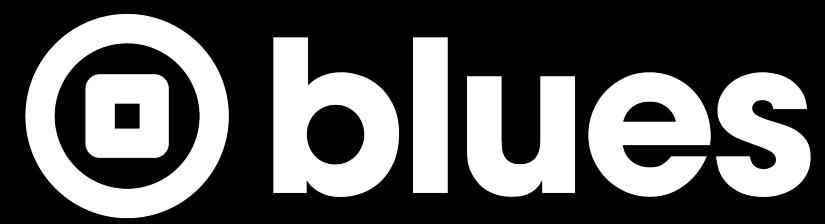
Ray Ozzie - Blues CEO

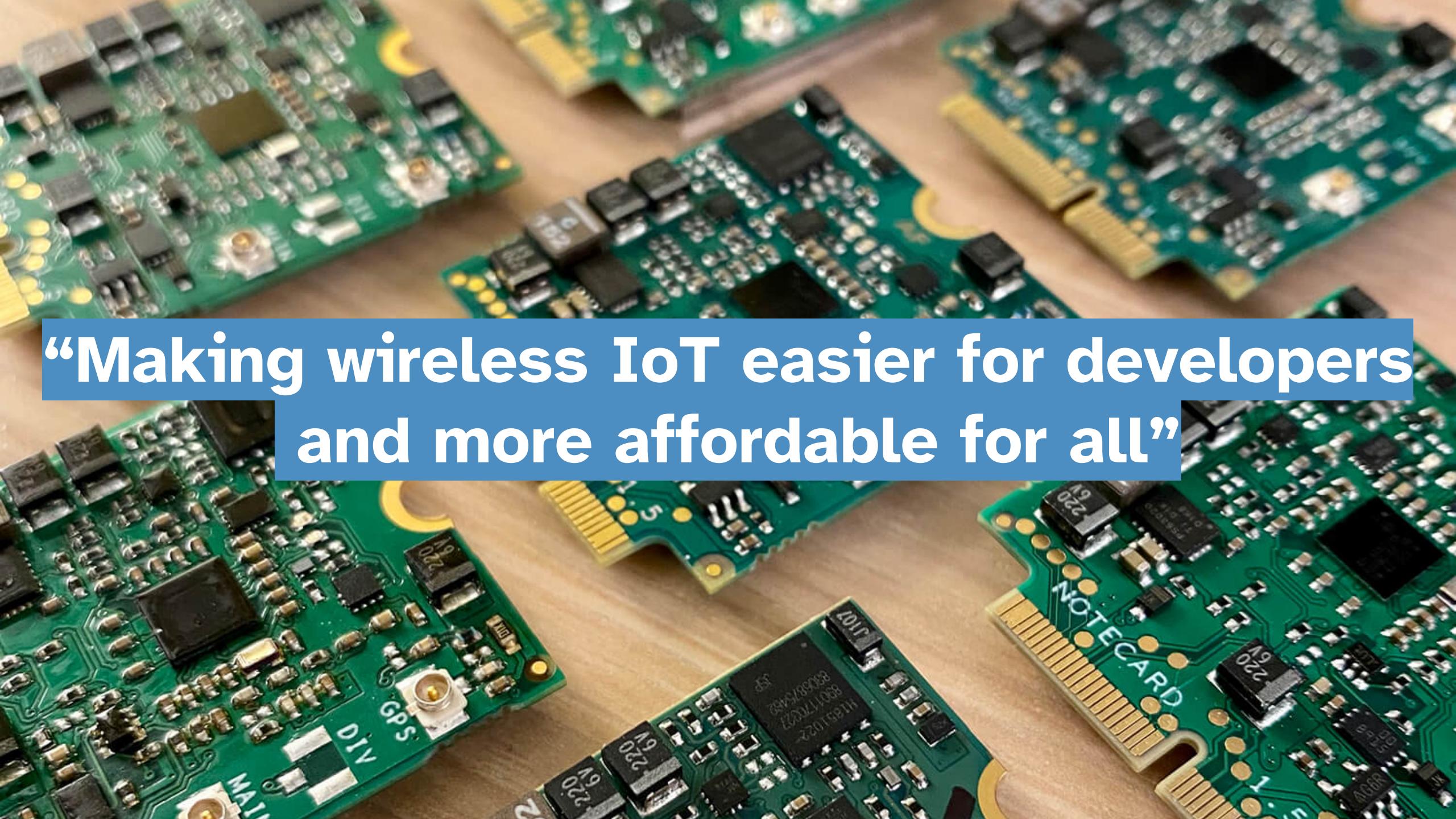
# Today's Agenda

- Intro to the Blues Ecosystem
- Hands-on Demonstration of Wireless IoT

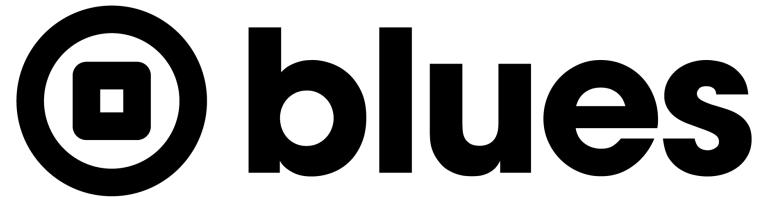








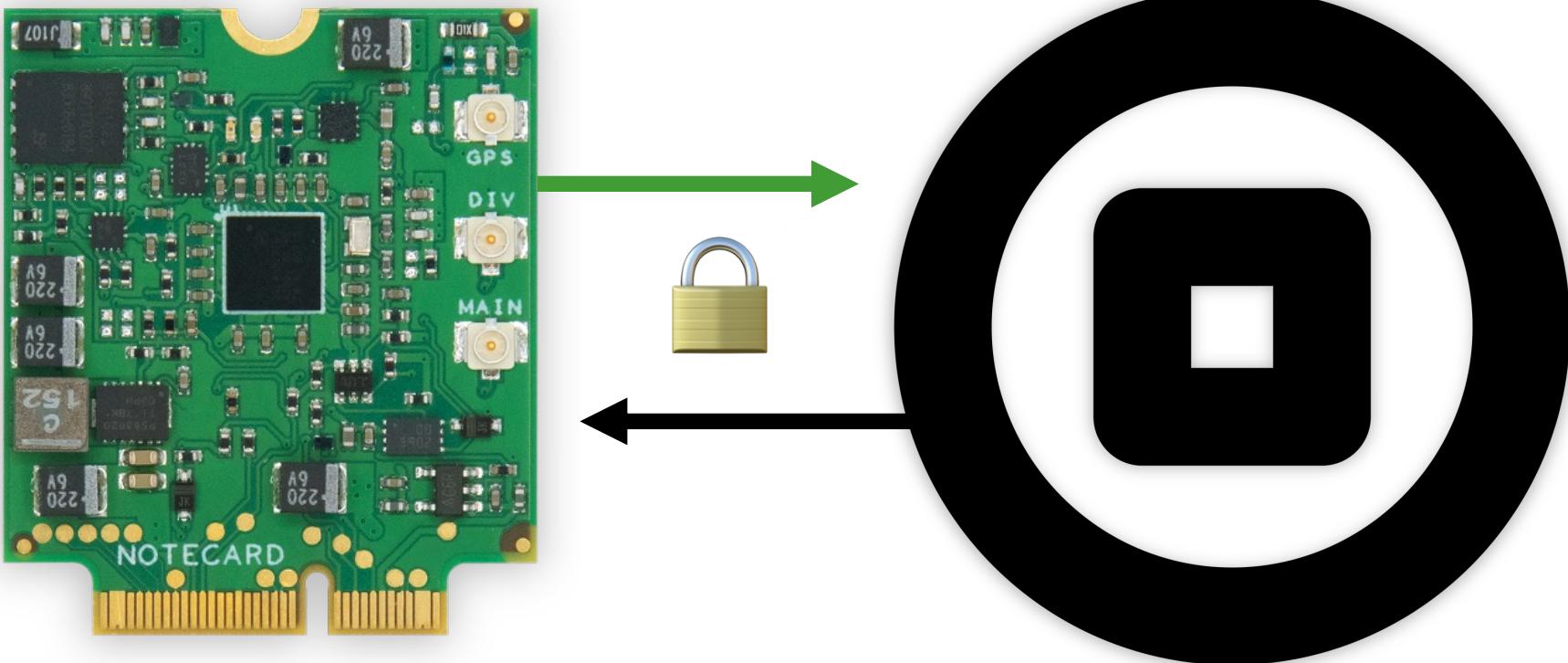
**“Making wireless IoT easier for developers  
and more affordable for all”**



**Easy** for developers and **affordable** for all.

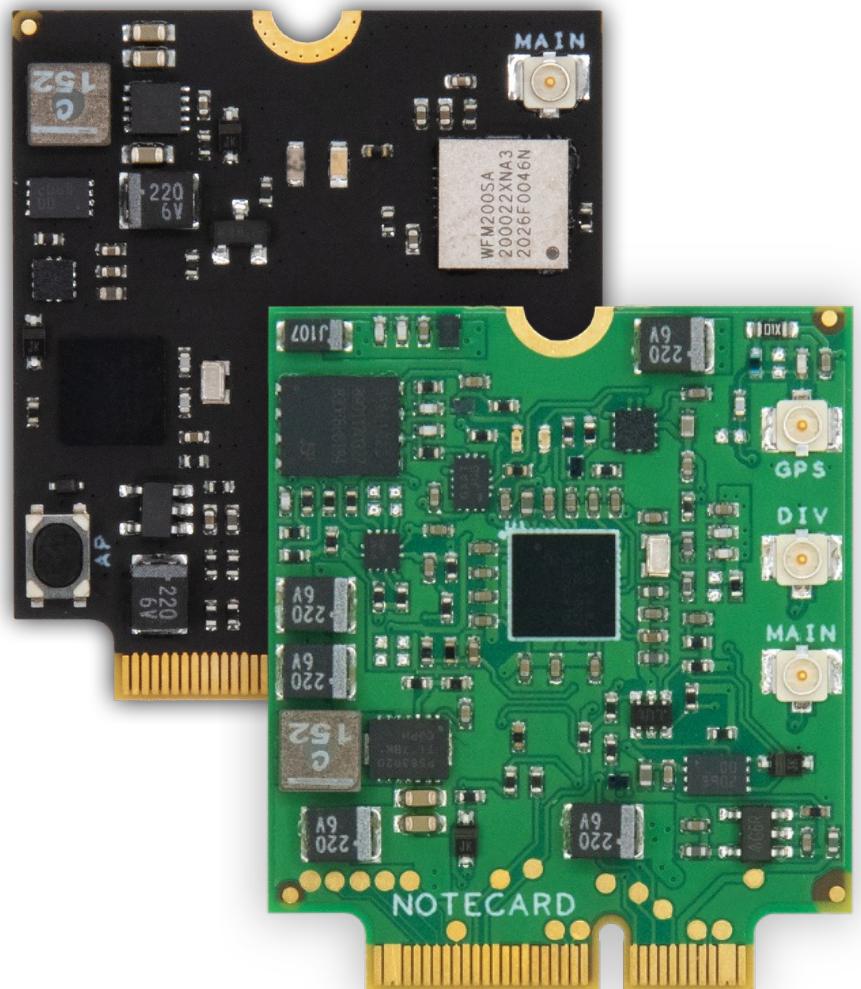
- 🔒 Securing your data from device to cloud
- 🔋 Building zero-config low-power hardware
- 💻 Providing an unmatched developer experience

# “Device-to-Cloud Data Pump”



# Notecard

- Low-power system-on-module
- Global cellular/GPS or Wi-Fi
- 500MB cell data + 10 years service
- Dual SIM support
- JSON-based API
- Python, Go, Arduino, C/C++, Zephyr
- NB-IoT, LTE-M, LTE Cat-1



# Example: *card.location* API

*Request*

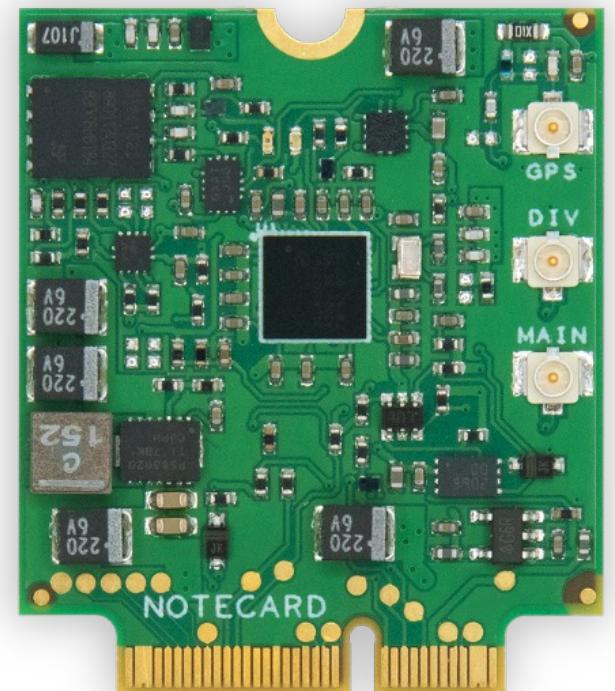
```
{ "req": "card.location" }
```

*Response*

```
{
  "status": "GPS updated (58 sec, 41dB SNR, 9 sats),
  "mode":    "periodic",
  "lat":     42.577600,
  "lon":     -70.871340,
  "time":    1598554399
}
```

# What don't you need with Blues?

- SIM or Separate Mobile Plan
- AT Commands or Cellular Radio Management
- Custom Security Implementation
- Roll-Your-Own OTA Firmware Updates
- Power Management
- Custom Cloud Integration
- Certifications



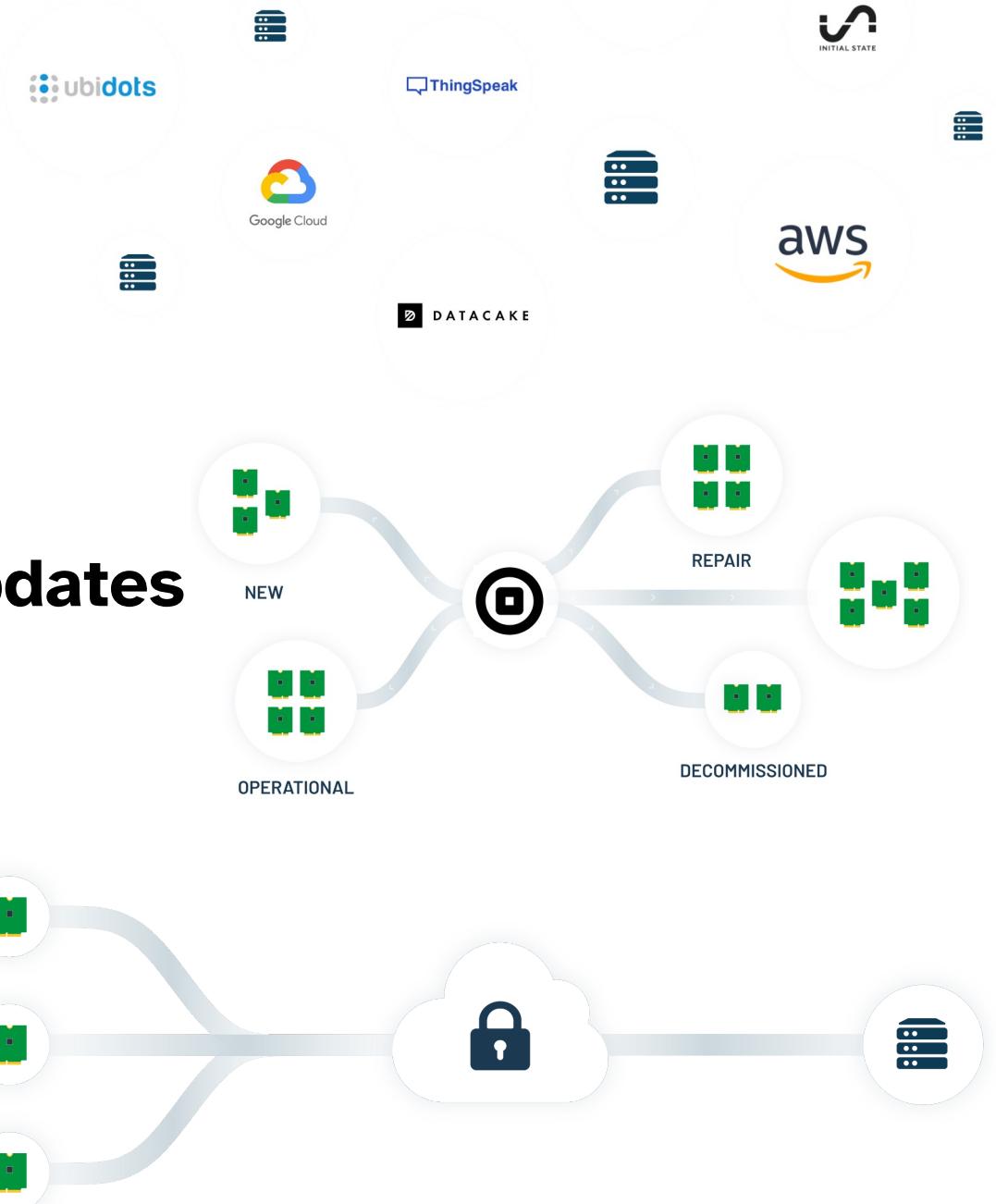
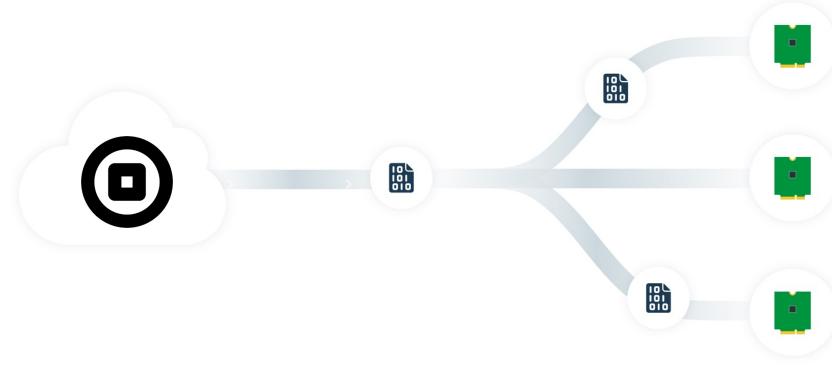
# Notecarrier

- Carrier boards for easy prototyping
- Notecarrier for every scenario:
  - **F** - Feather-compatible socket
  - **A** - Any MCU, onboard antennas
  - **B** – Small form factor
  - **Pi** - Raspberry Pi SBC
  - SparkFun MicroMod Cellular Function



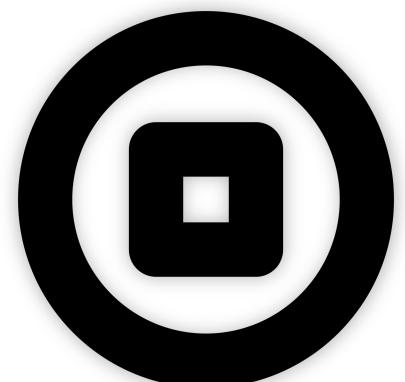
# Notehub

- Route data to **any cloud app**
- Manage **fleets** of devices
- OTA MCU/Notecard **firmware updates**
- **Secure** communications



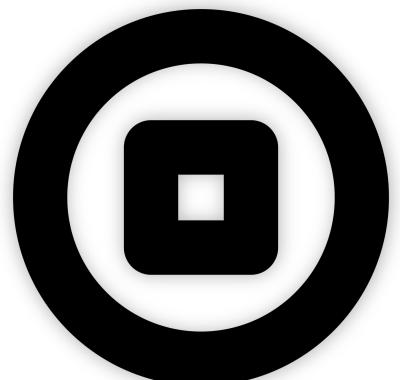
# Notehub “Consumption Credits”

- Only Pay for What You Use!
- Billing Account “Topped Up” to 5,000 CCs Monthly
- Notecard Purchase → 5,000 CCs



# Notehub “Consumption Credits”

- Send an Event to Notehub? **FREE**
- Route an Event from Notehub to Cloud? **1 CC**
- Pull an Event via API? **1 CC**
- All other API requests? **0.001 CC**



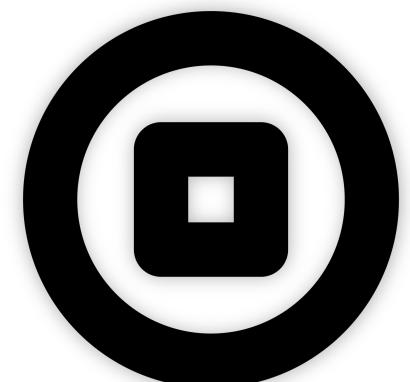
# Notehub “Consumption Credits”

## Volume Discounting

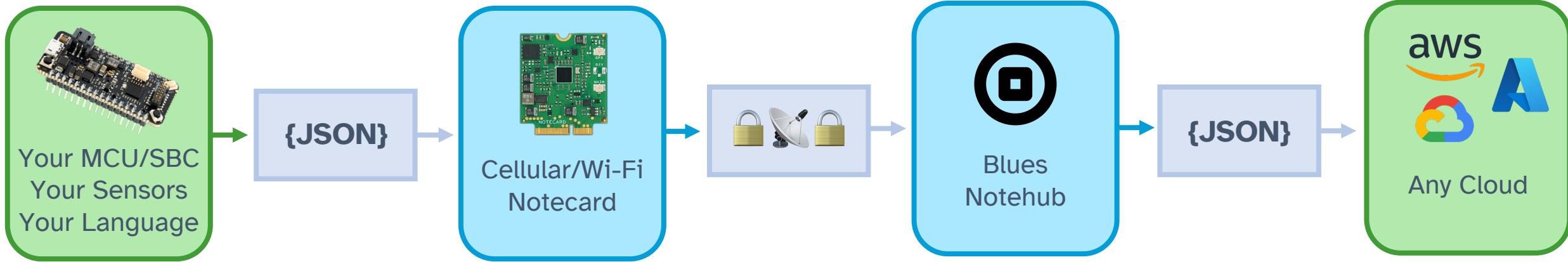
If you require more Consumption Credits, you can purchase more with volume discounts.

*Base Unit Price \$0.000750*

Quantities Starting From	Cost	Discount	Unit Price
15,000	\$11	0%	\$0.000750
1,000,000	\$563	25%	\$0.000563
10,000,000	\$3,750	50%	\$0.000375
20,000,000	\$4,500	70%	\$0.000225
50,000,000	\$9,375	75%	\$0.000188
100,000,000	\$15,000	80%	\$0.000150



# Outbound Communication (from Host to Cloud)



Arduino

C/C++

Python

```
J *req = NoteNewRequest("note.add");
JAddStringToObject(req, "file", "data.qo");

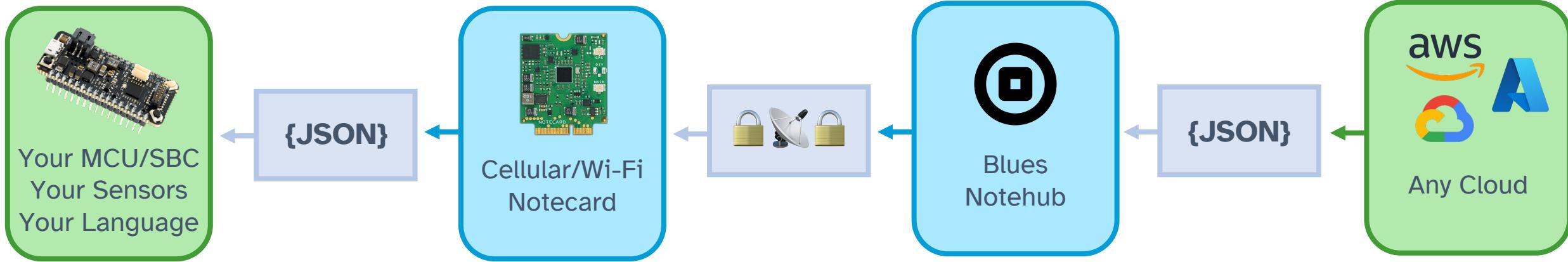
J *body = JCreateObject();
JAddNumberToObject(body, "temp", 27.3);
JAddItemToObject(req, "body", body);

NoteRequest(req);
```

JSON

```
{
  "file": "data.qo",
  "temp": 27.3,
  "when": 1644268443,
  "lat": 42.11,
  "lon": -88.32
  "device": "dev:89347"
}
```

# Inbound Communication (from Cloud to Host)



Arduino | C/C++ | Python

```
J *req = NoteNewRequest("note.get");
JAddStringToObject(req, "file", "data.qi");
JAddBoolToObject(req, "delete", true);

NoteRequest(req);
```

JSON

```
{
  "file": "data.qi",
  "sample_freq": 5,
  "notify": true
}
```

# When Does Blues Make Sense?



- Need low-bandwidth cellular
- Edge computing scenarios
- Secure communications
- Turnkey cloud integrations
- Low-power is important



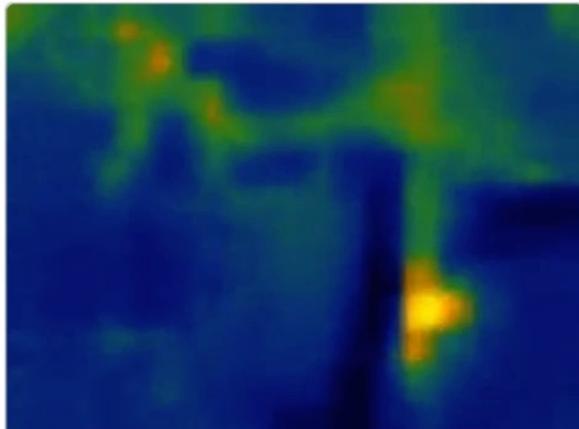
- Wi-Fi replacement
- Sub-millisecond latency
- Video or high-res images



# TJ VanToll

Principal Developer Advocate

@TJVanToll



Thermal Image Anomaly Detection  
with TinyML

Rob Lauer



Sending a Cellular/GPS Tracker  
Around the World (Literally)

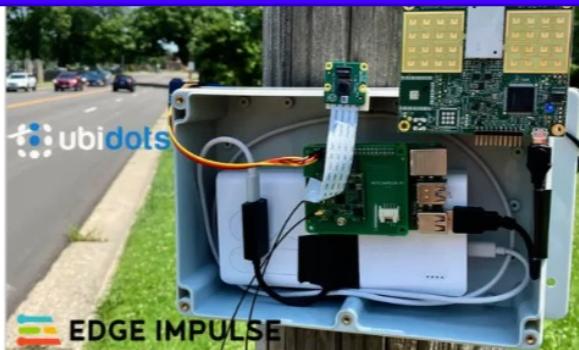
Rob Lauer



Debugging a Hot Tub Time (Series)  
Machine

Rob Lauer

# blues.dev/community/projects



Busted! Create an ML-Powered Speed  
Trap

Rob Lauer

1 50 22K



Optimizing a Raspberry Pi for Off-Grid  
Power Consumption

Rob Lauer

1 7 4.7K



blues wireless

Solar-Powered Crypto Mining with  
Raspberry Pi

Rob Lauer

1 28 44K

# Thanks! (Time for Q&A)

- 🤖 **blues.dev** for Blues resources
- 🏁 15% off Starter Kits @ **bit.ly/blues-get-started**
- 🚶 “50 Ways to Accelerate Your IoT Project” @ **bit.ly/accelerate-iot**



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