influxdata

Act in Time

IoT and Time Series Data

Tim Hall, VP of Products, InfluxData

Michael Hall, Community Manager, InfluxData

November 13th, 2020

Introductions

What is time series data?

Time series data comes in two forms

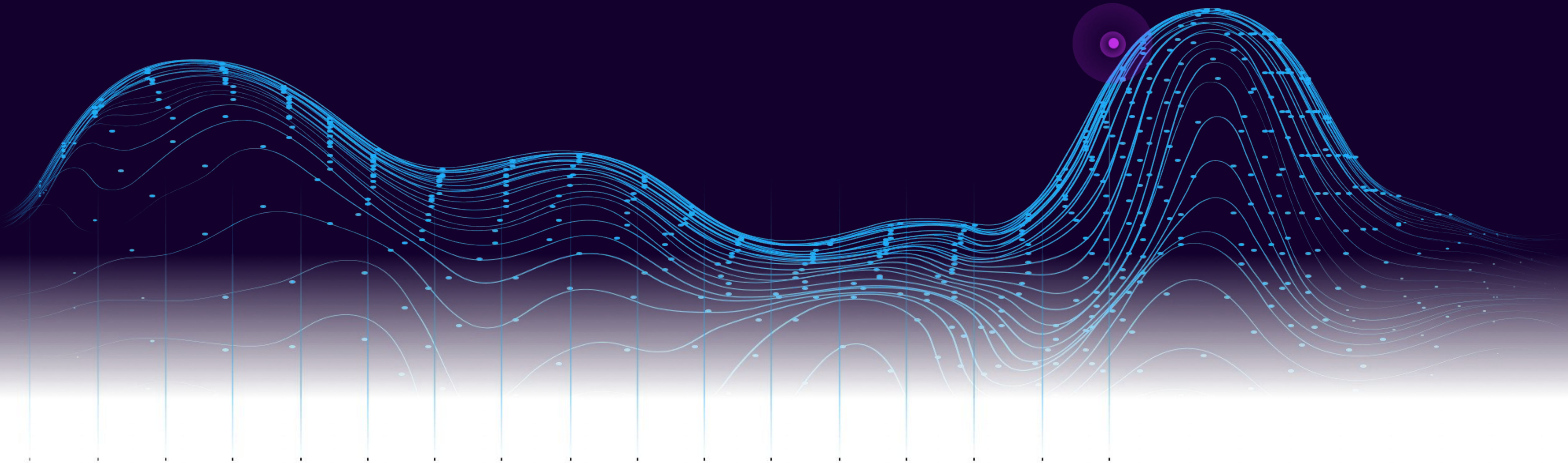
Regular: A sequence of data points, typically consisting of successive measurements made from the same source over a *regular* time interval.

- Plot the points on a graph and one of your axes would always be time.

Irregular: A sequence of data points, generated from the same source when meaningful changes occur. (aka events)

Why? The move to autonomy and Industry 4.0

INSTRUMENT 〉 OBSERVE 〉 LEARN 〉 AUTOMATE

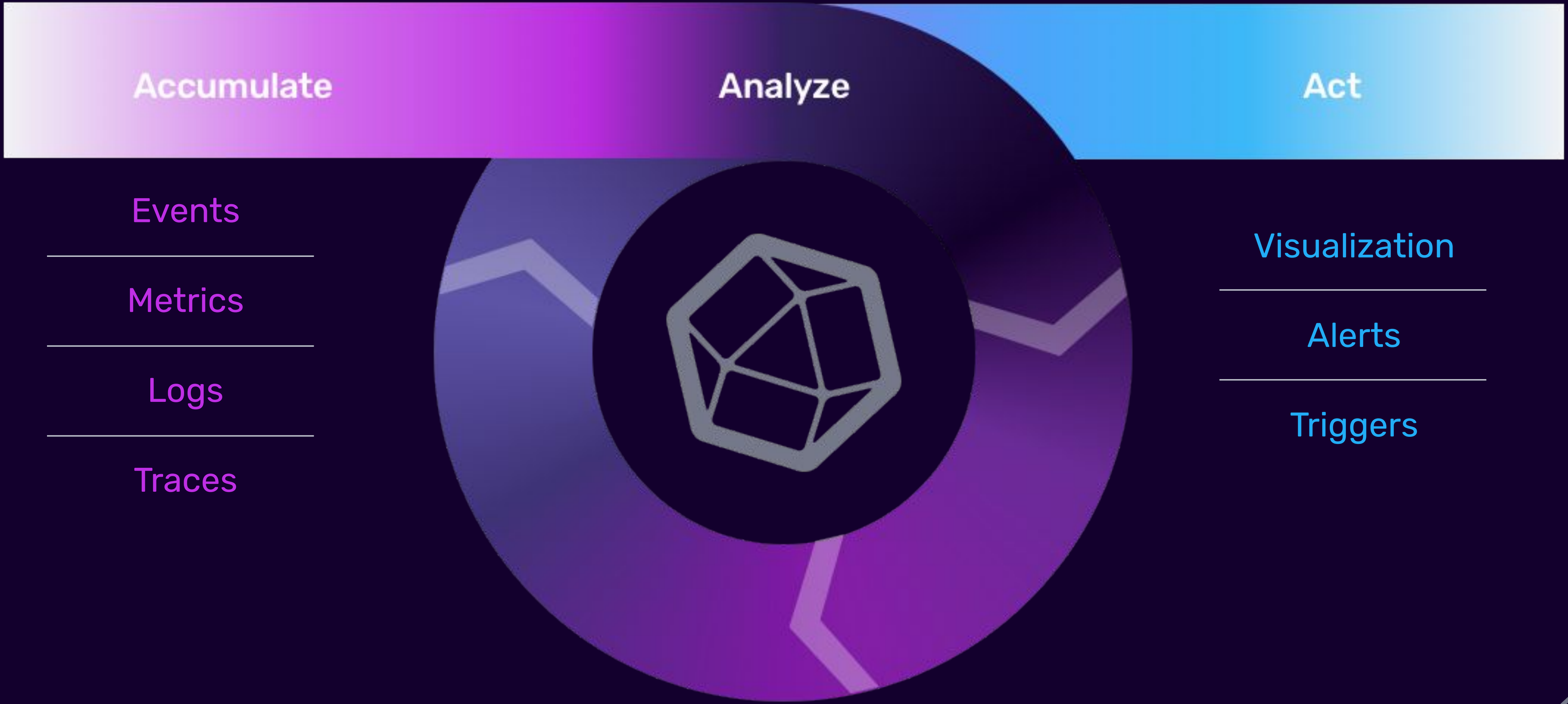


The age of instrumentation

Sensors in the physical world (IoT)

Instrumentation of virtual world (DevOps)

Purpose-built platform for all metrics & event workloads



Accumulate

- Events
- Metrics
- Logs
- Traces

Analyze

Act

- Visualization
- Alerts
- Triggers

Core Focus: **Developers and builders**

- Developer happiness
- Time to awesome
- Reliable operations in a lights-out environment

Some of our customers

IoT monitoring

DELAIR

INTESENS® The connected maintenance

ARABLE

Greensmith

TESLA

ASML

ecoult energy storage solutions

NEAS ENERGY

aquicore

BBOXX

APMT

WayKonect

Software

COMCAST

coupa

robinhood

cruise

SAP®

BBC NEWS

BARCLAYS

TD Bank

MuleSoft®

ORACLE®

cisco

wayfair®

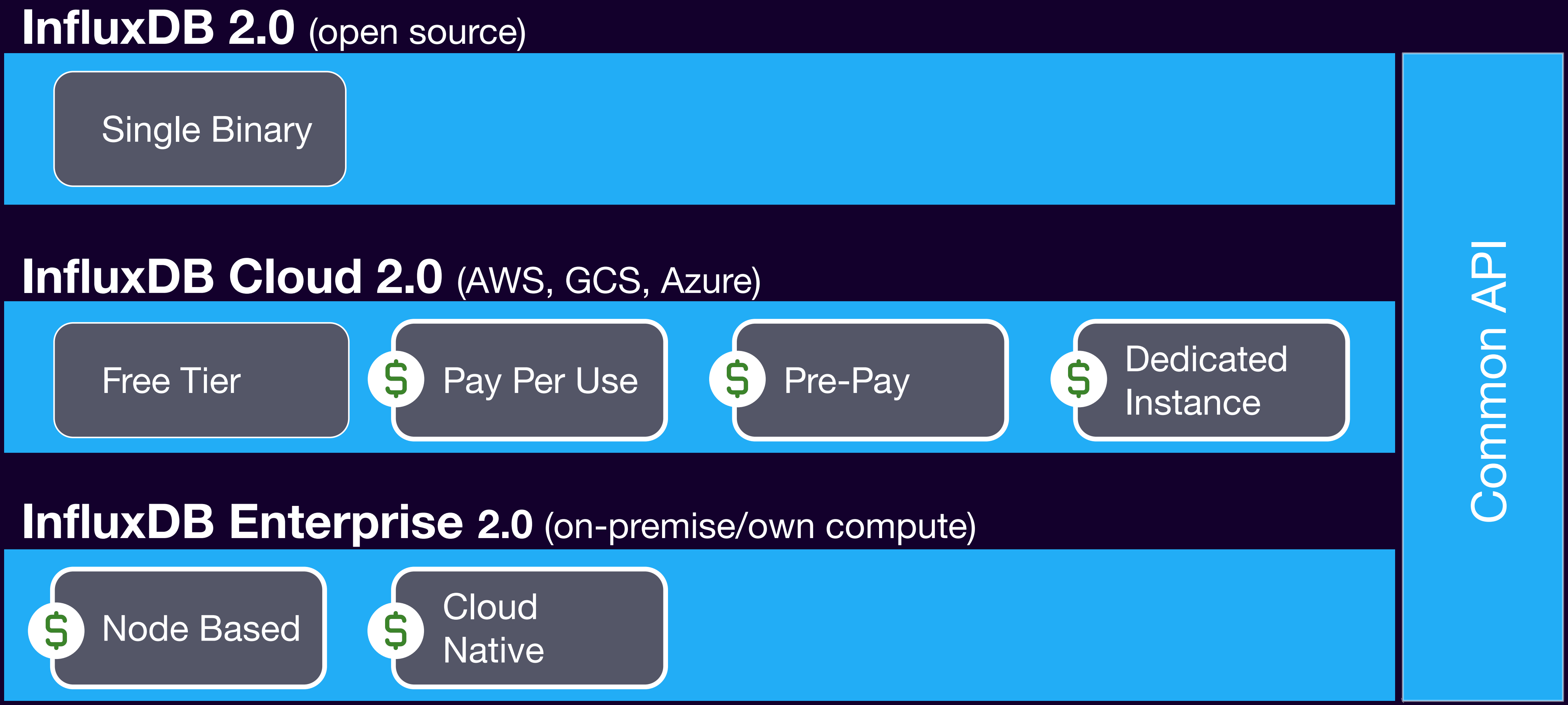
PayPal

VERISIGN®

Capital One

SIEMENS

InfluxDB 2.0 Offerings



InfluxDB 2.0 (open source)

- Single Binary

InfluxDB Cloud 2.0 (AWS, GCS, Azure)

- Free Tier
- $ Pay Per Use
- $ Pre-Pay
- $ Dedicated Instance

InfluxDB Enterprise 2.0 (on-premise/own compute)

- $ Node Based
- $ Cloud Native

Common API

Broad Solution Architecture

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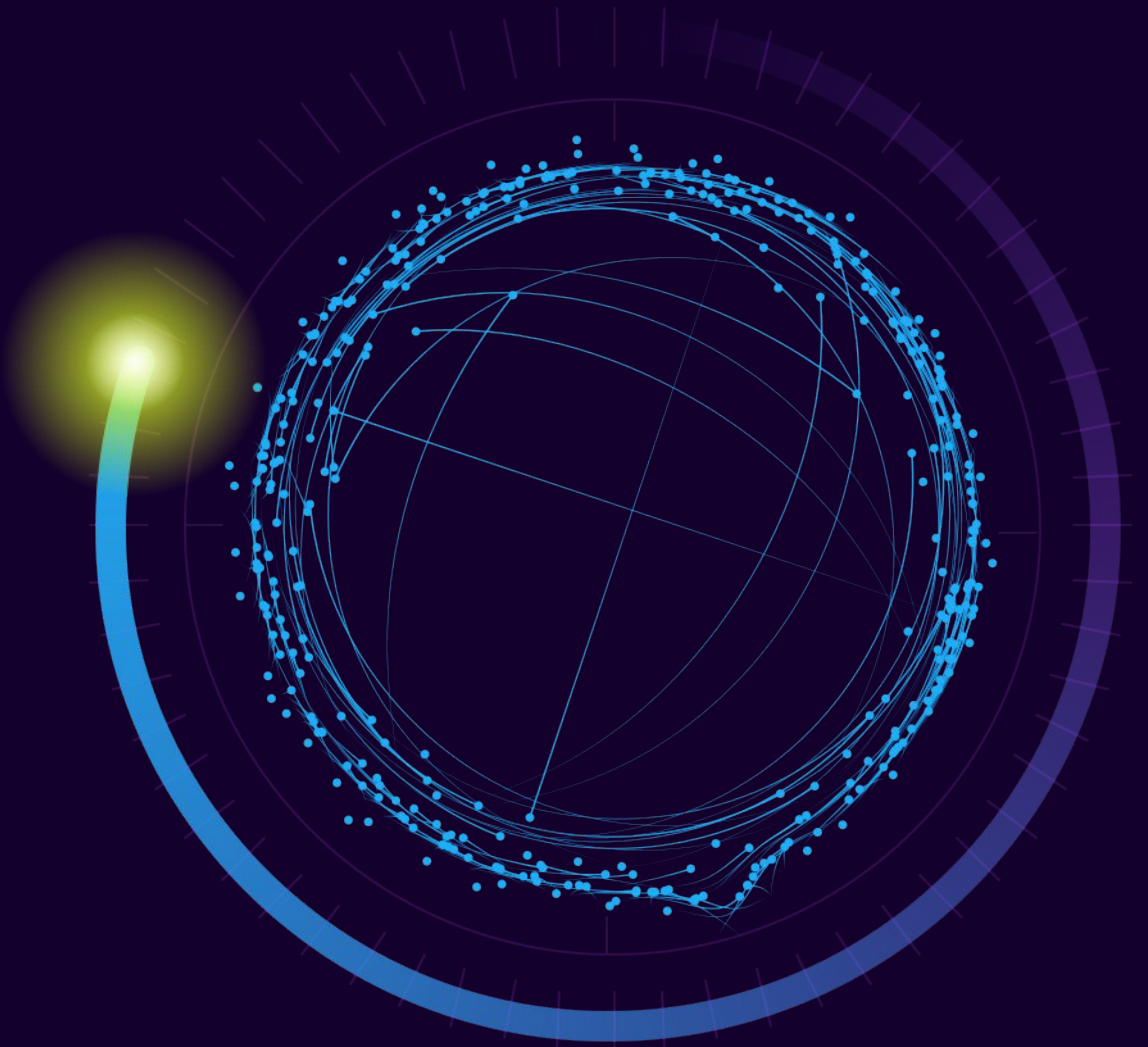
Data Acquisition

Agent-based,
Agent-less,
Native,
Client Libraries



Data Acquisition

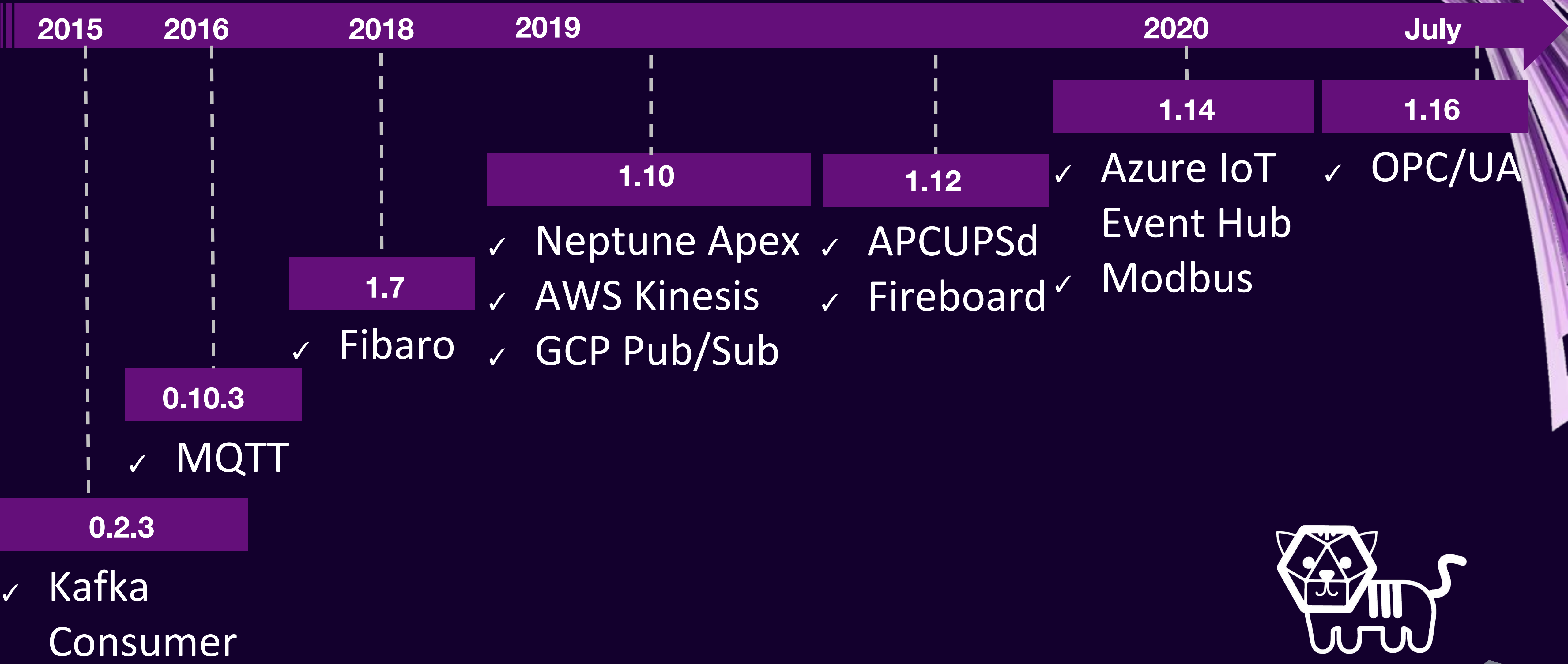
Agent-based

Native/Ecosystem

Agent-less

Client Libraries

IoT Data Acquisition via Telegraf



2015 2016 2018 2019 2020 July

0.2.3
- ✓ Kafka Consumer

0.10.3
- ✓ MQTT

1.7
- ✓ Fibaro

1.10
- ✓ Neptune Apex
- ✓ AWS Kinesis
- ✓ GCP Pub/Sub

1.12
- ✓ APCUPSd
- ✓ Fireboard

1.14
- ✓ Azure IoT Event Hub
- ✓ Modbus

1.16
- ✓ OPC/UA

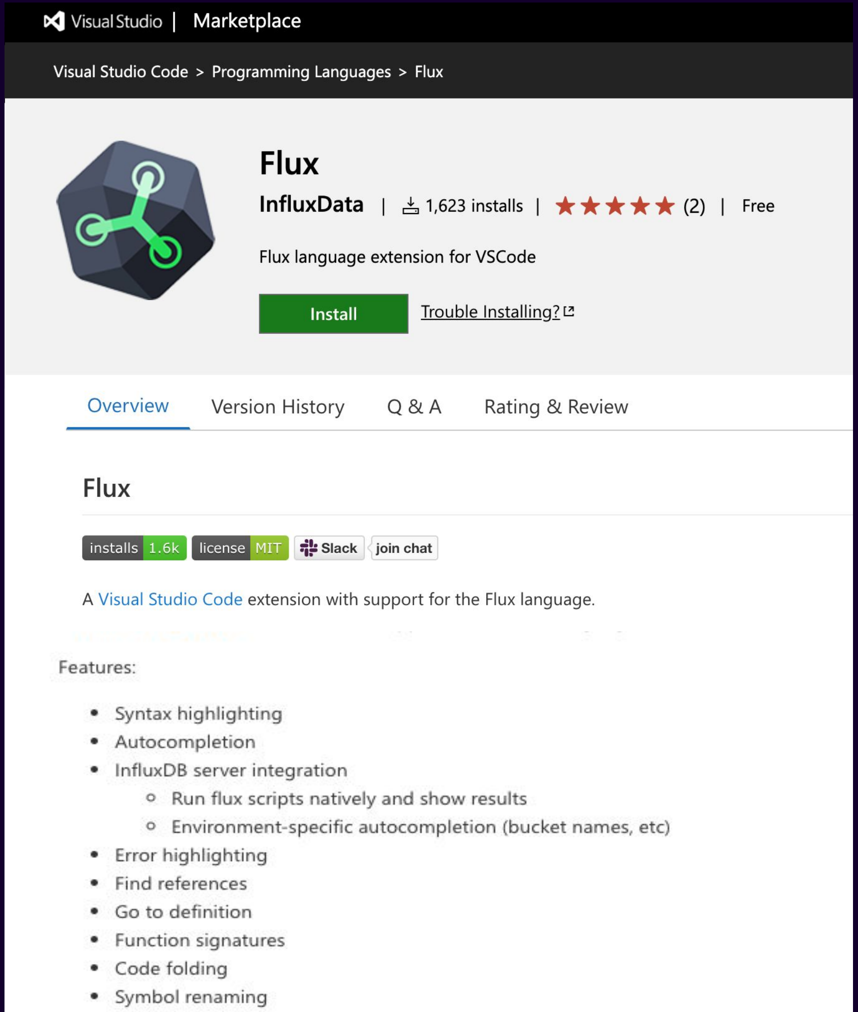
Near term roadmap
Agent-less: Cloud Native

Within a CSP, connect your InfluxDB Cloud instance with messaging service of your choice

Examples: Azure EventHub, Google Pub/Sub, AWS Kinesis

Direct ingest using supported formats to specific buckets

Developer Tooling and Client Libraries



Visual Studio | Marketplace
Visual Studio Code > Programming Languages > Flux

Flux

InfluxDB | 1,623 installs | ★★★★★ (2) | Free

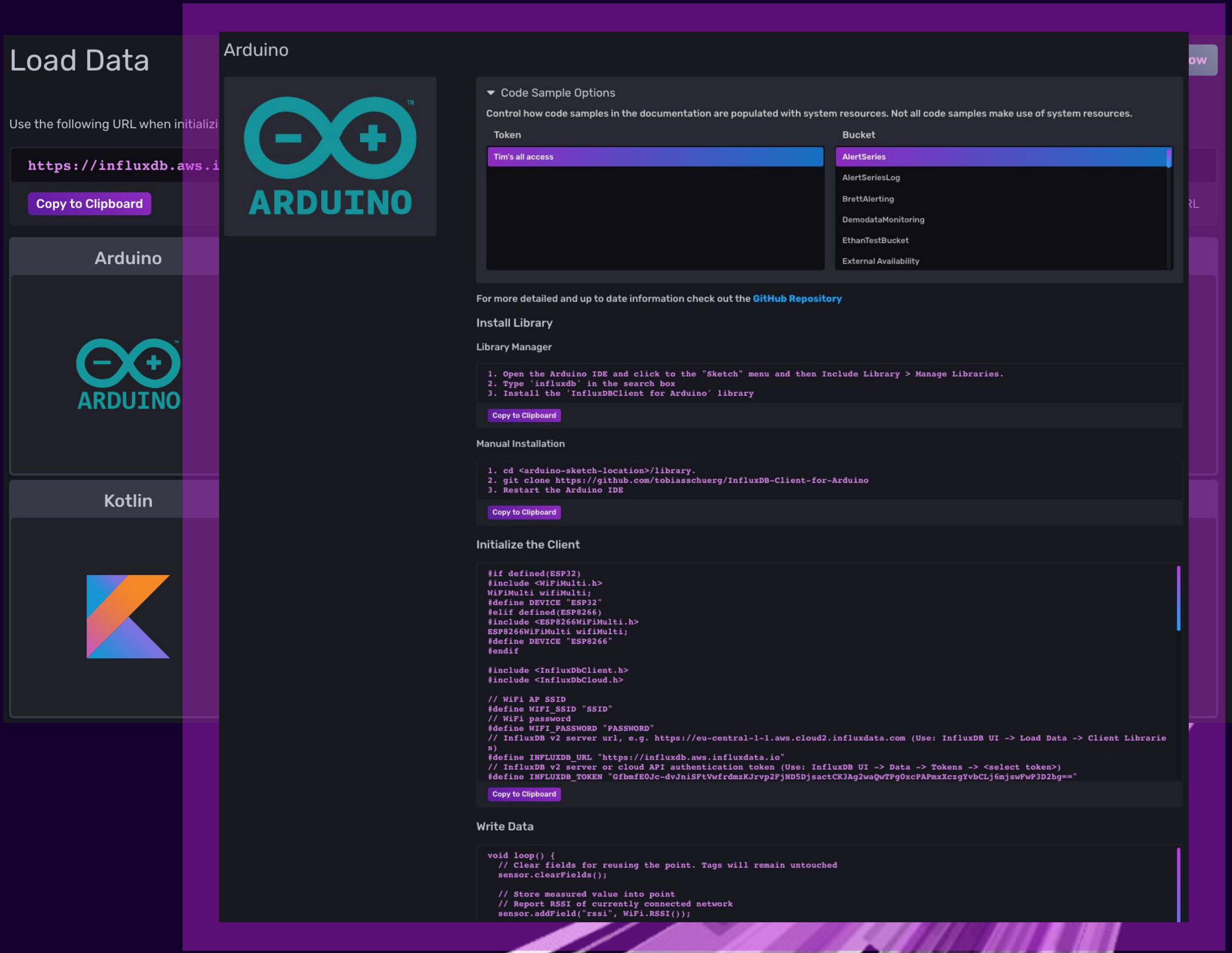
Flux language extension for VSCode

Flux

A Visual Studio Code extension with support for the Flux language.

Features:

- Syntax highlighting
- Autocompletion
- InfluxDB server integration
  - Run flux scripts natively and show results
  - Environment-specific autocompletion (bucket names, etc)
- Error highlighting
- Find references
- Go to definition
- Function signatures
- Code folding
- Symbol renaming



Code Sample Options

Control how code samples in the documentation are populated with system resources. Not all code samples make use of system resources.

Token	Bucket
Tim's all access	AlertSeries
	AlertSeriesLog
	BrettAlerting
	DemodataMonitoring
	EthanTestBucket
	External Availability

For more detailed and up to date information check out the GitHub Repository

Install Library

Library Manager

```
1. Open the Arduino IDE and click to the "Sketch" menu and then Include Library > Manage Libraries.
2. Type 'influxdb' in the search box
3. Install the 'InfluxDBClient for Arduino' library
```

Manual Installation

```
1. cd <arduino-sketch-location>/library.
2. git clone https://github.com/tobiasschuerg/InfluxDB-Client-for-Arduino
3. Restart the Arduino IDE
```

Initialize the Client

```
#if defined(ESP32)
#include <WiFiMulti.h>
WiFiMulti wifiMulti;
#define DEVICE "ESP32"
#elif defined(ESP8266)
#include <ESP8266WiFiMulti.h>
ESP8266WiFiMulti wifiMulti;
#define DEVICE "ESP8266"
#endif

#include <InfluxDbClient.h>
#include <InfluxDbCloud.h>

// WiFi AP SSID
#define WIFI_SSID "SSID"
// WiFi password
#define WIFI_PASSWORD "PASSWORD"
// InfluxDB v2 server url, e.g. https://eu-central-1-1.aws.cloud2.influxdata.com (Use: InfluxDB UI -> Load Data -> Client Librarie
s)
#define INFLUXDB_URL "https://influxdb.aws.influxdata.io"
// InfluxDB v2 server or cloud API authentication token (Use: InfluxDB UI -> Data -> Tokens -> <select token>)
#define INFLUXDB_TOKEN "GfbmfE0Jc-dvJniSFtVwfrdmzKJrvp2FjND5DjsactCK3Ag2waQwTPg0xcPAPmxXczgYvbCLj6mjswFwP3D2hg=="
```

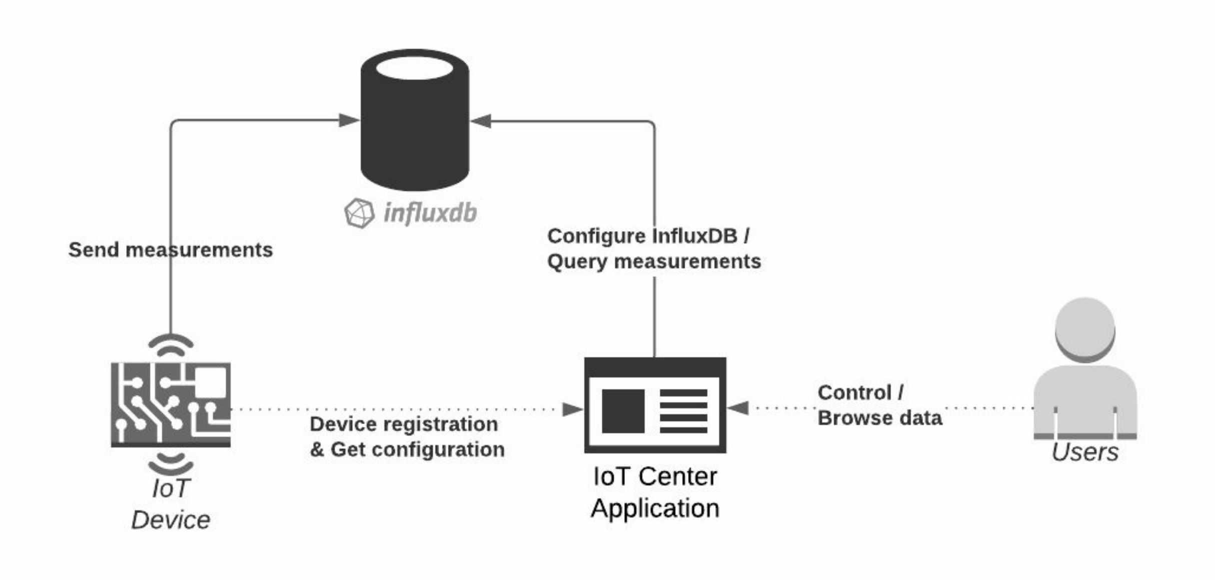
Write Data

```
void loop() {
  // Clear fields for reusing the point. Tags will remain untouched
  sensor.clearFields();

  // Store measured value into point
  // Report RSSI of currently connected network
  sensor.addField("rssi", WiFi.RSSI());
```

https://github.com/influxdata/flux-lsp-cli

Build by Example



Reference Application

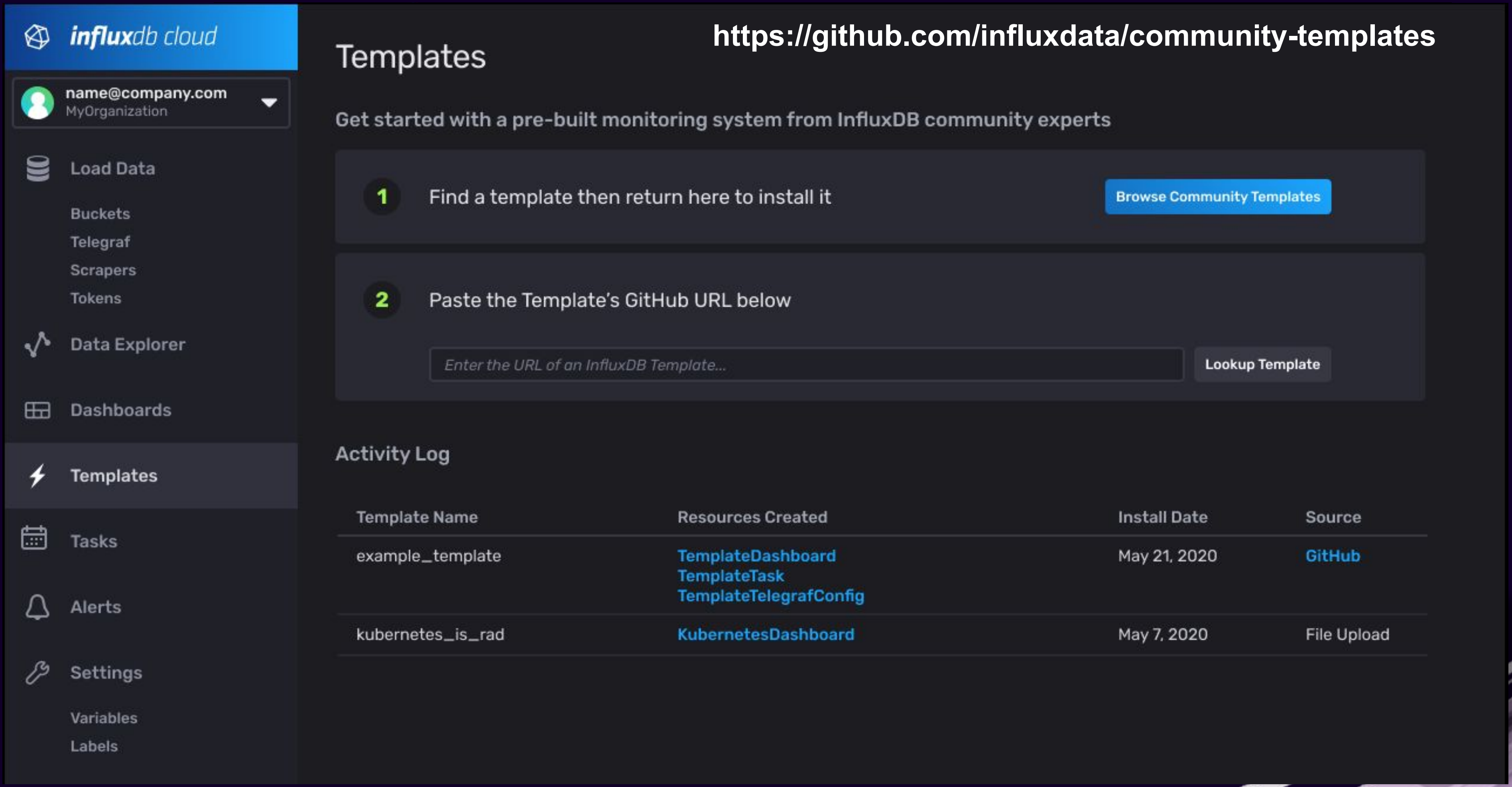
IoT Center: Capturing Common Use Cases

- Device registration and token handling
- Custom visualization
- Administration and configuration
- Multiple implementations starting with Node.js

Developer’s Guide

- Breakdown of Application components
- Detailed examples of working with APIs
- Guidance for building custom applications

Sharing Expertise via InfluxDB Templates



https://github.com/influxdata/community-templates

Templates

Get started with a pre-built monitoring system from InfluxDB community experts

1 Find a template then return here to install it

2 Paste the Template's GitHub URL below

Activity Log

Template Name	Resources Created	Install Date	Source
example_template	TemplateDashboard TemplateTask TemplateTelegrafConfig	May 21, 2020	GitHub
kubernetes_is_rad	KubernetesDashboard	May 7, 2020	File Upload

43 InfluxDB Templates and counting

Covering:

- Networks,
- Infrastructure,
- Software,
- IoT,
- Games,
- and more...

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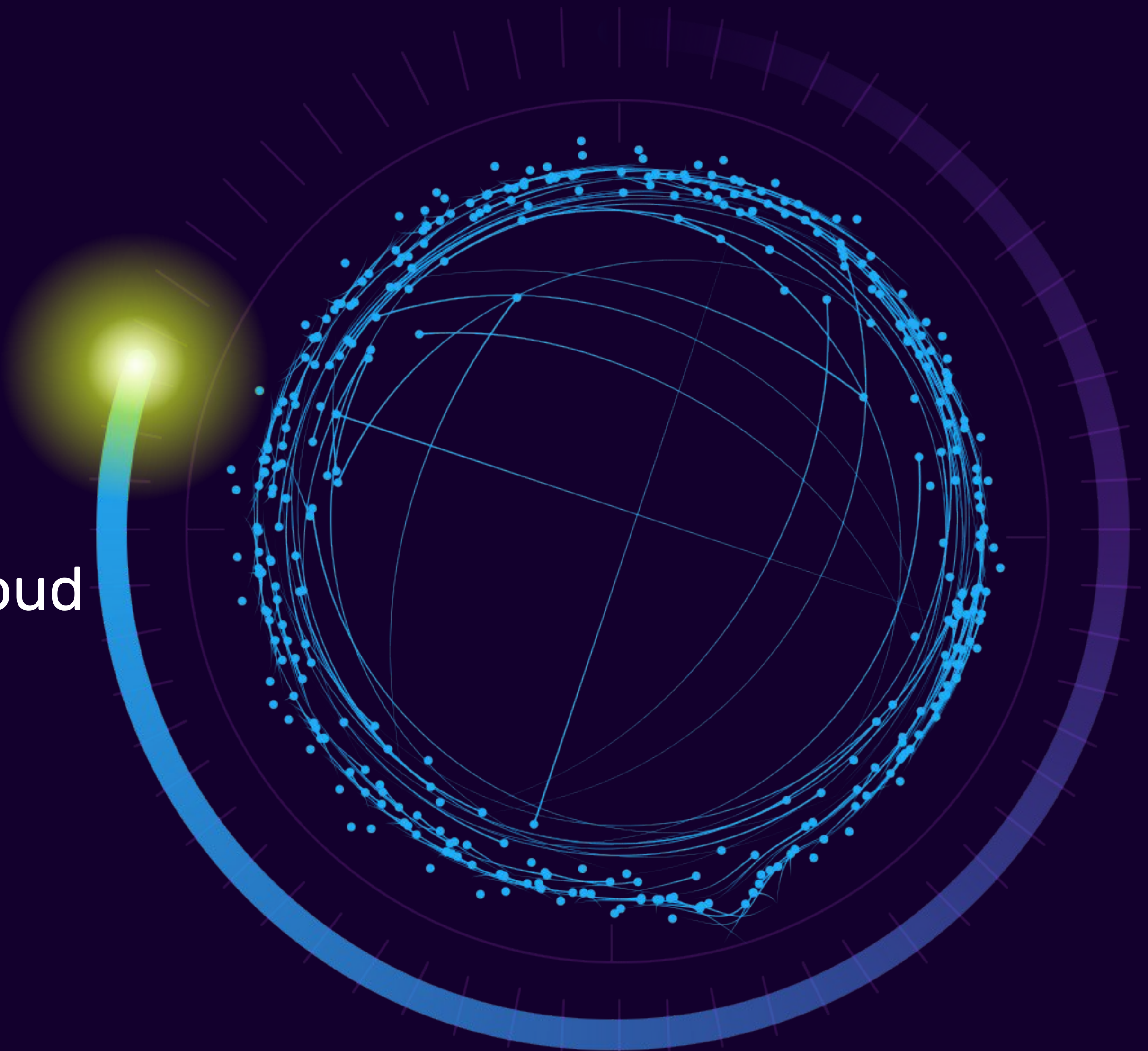
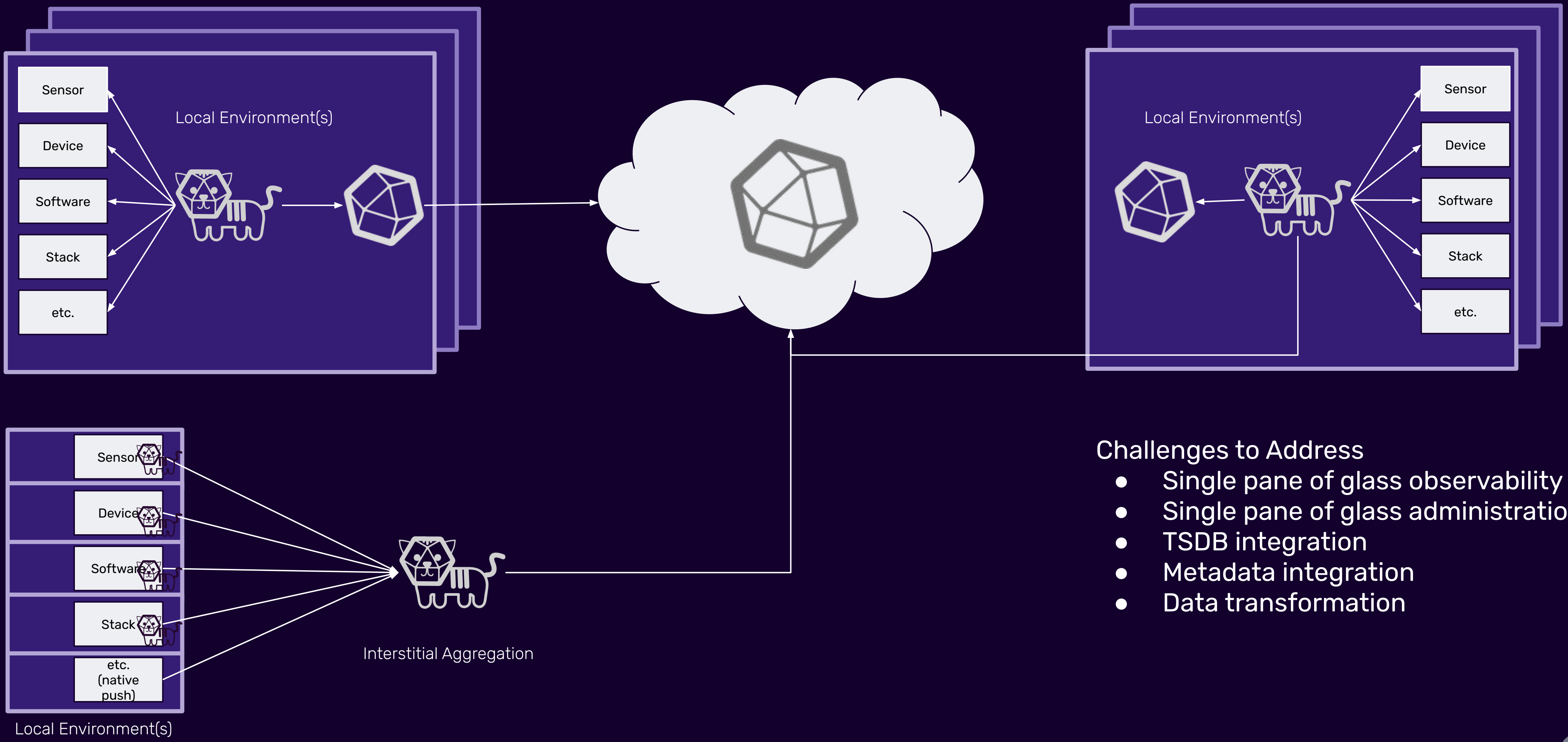
OSS at the Edge

Connecting the Edge with InfluxDB Cloud



Example Deployments



Challenges to Address

- Single pane of glass observability
- Single pane of glass administration
- TSDB integration
- Metadata integration
- Data transformation

Near term roadmap: Connect the OSS Edge(s) to the Cloud

InfluxDB OSS to InfluxDB Cloud

Supported feature(s) with each edition

- OSS registration to Cloud
- Staged GitOps deployment of stacks and templates
- Make connected "edges" completely observable, layering in controls for change management and more

Telegraf and InfluxDB

- Telegraf unique identifier
- Expand and simplify configuration/editing capabilities across the board
- Make data ingestion completely observable, layering in controls based on observed behavior

Thank You

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