

Spring Bananas From The Edge

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Project Available At:
<https://github.com/cppwfs/cpmtask>

The Inspiration

-  What is Edge Computing?
-  Topology of Base Project
-  Orchestrating data received from the edge
-  Processing data from the edge

Evolution of the talk

Note about the talk

.1 MicroSieverts

$\frac{1}{10,000,000}$ of a Sievert

You get .1- .2 micro Sieverts every hour.

Dental X-Ray == 5 microsieverts

Airplane flight from New York to Los Angeles == 40 microsieverts

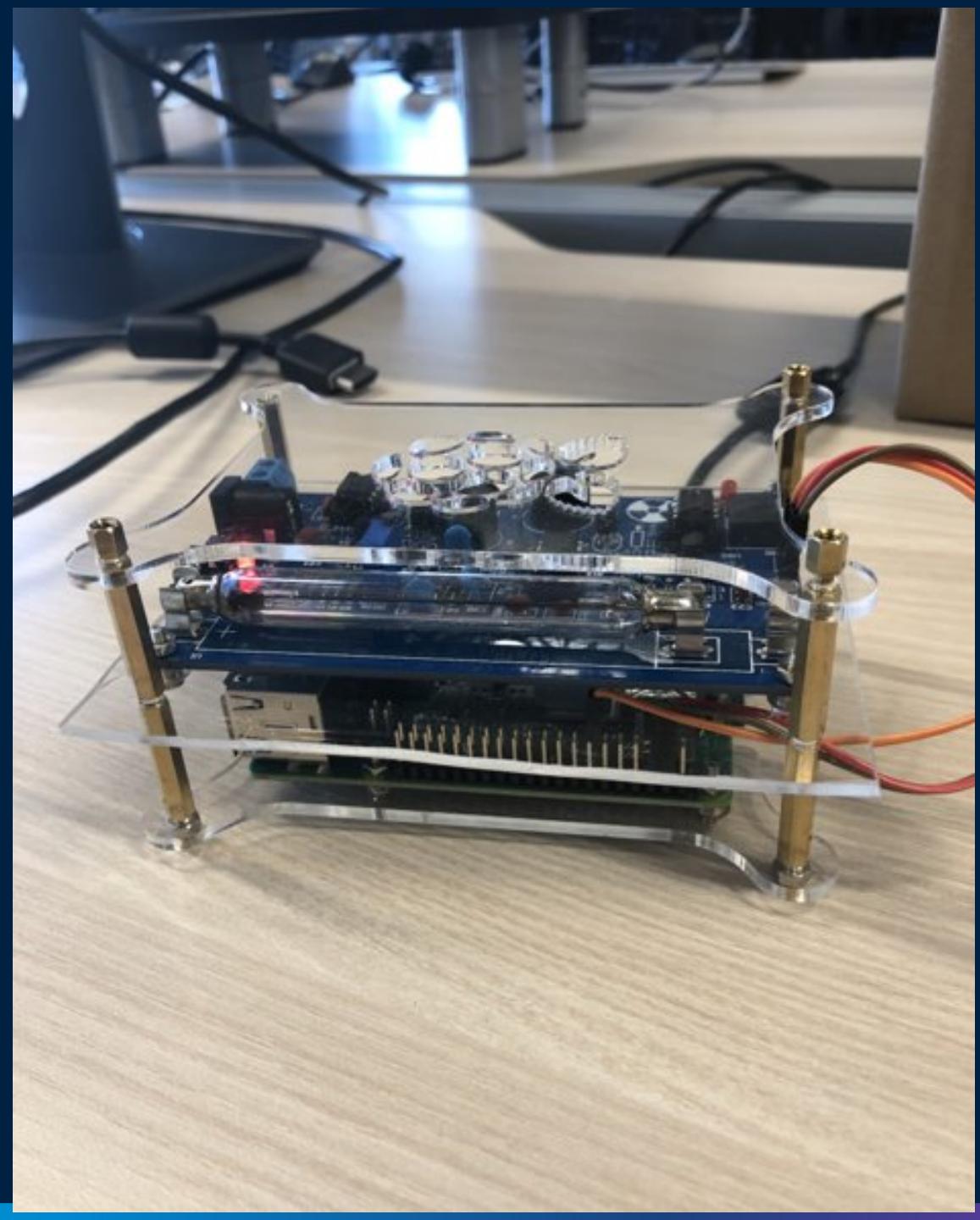
x 400

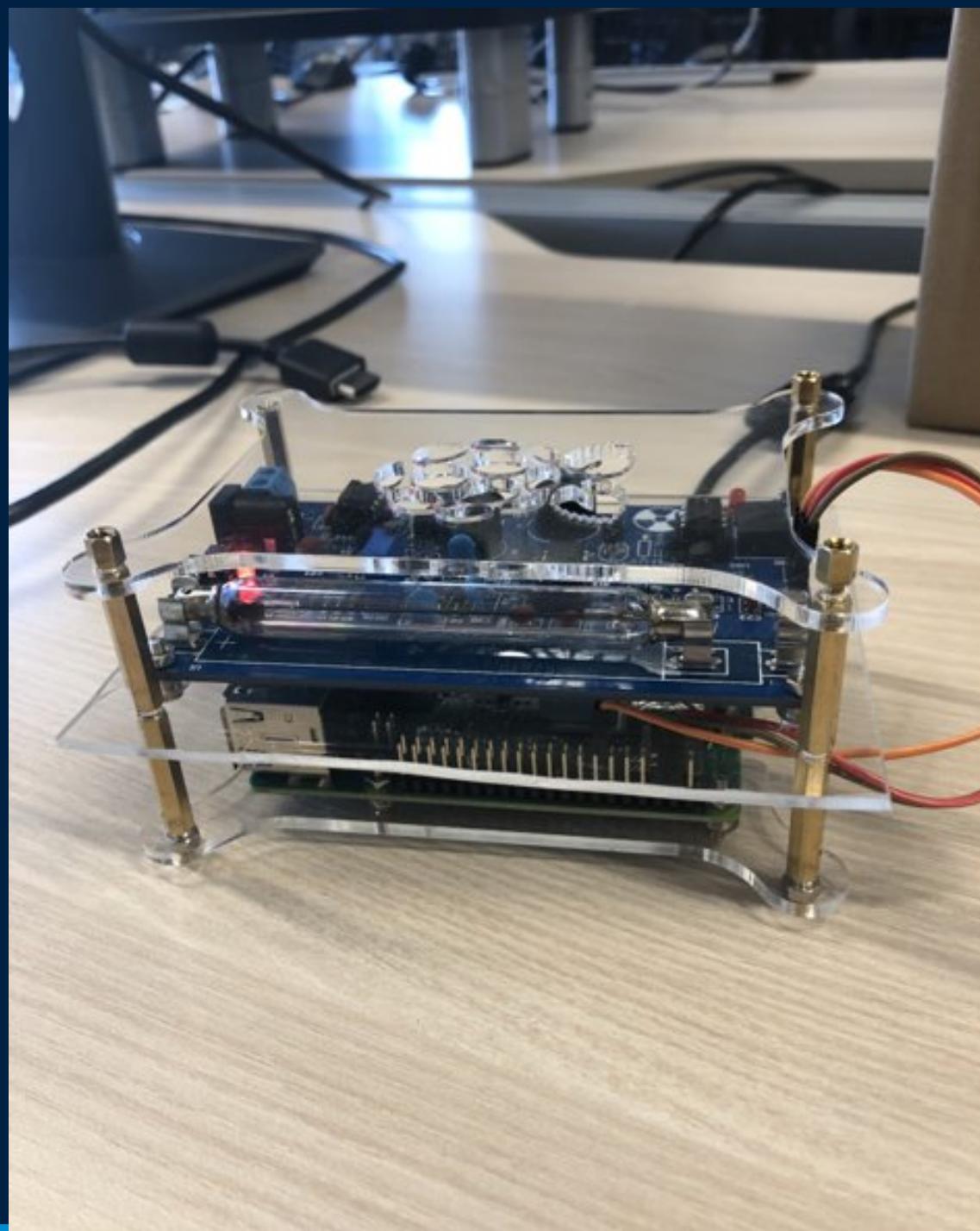
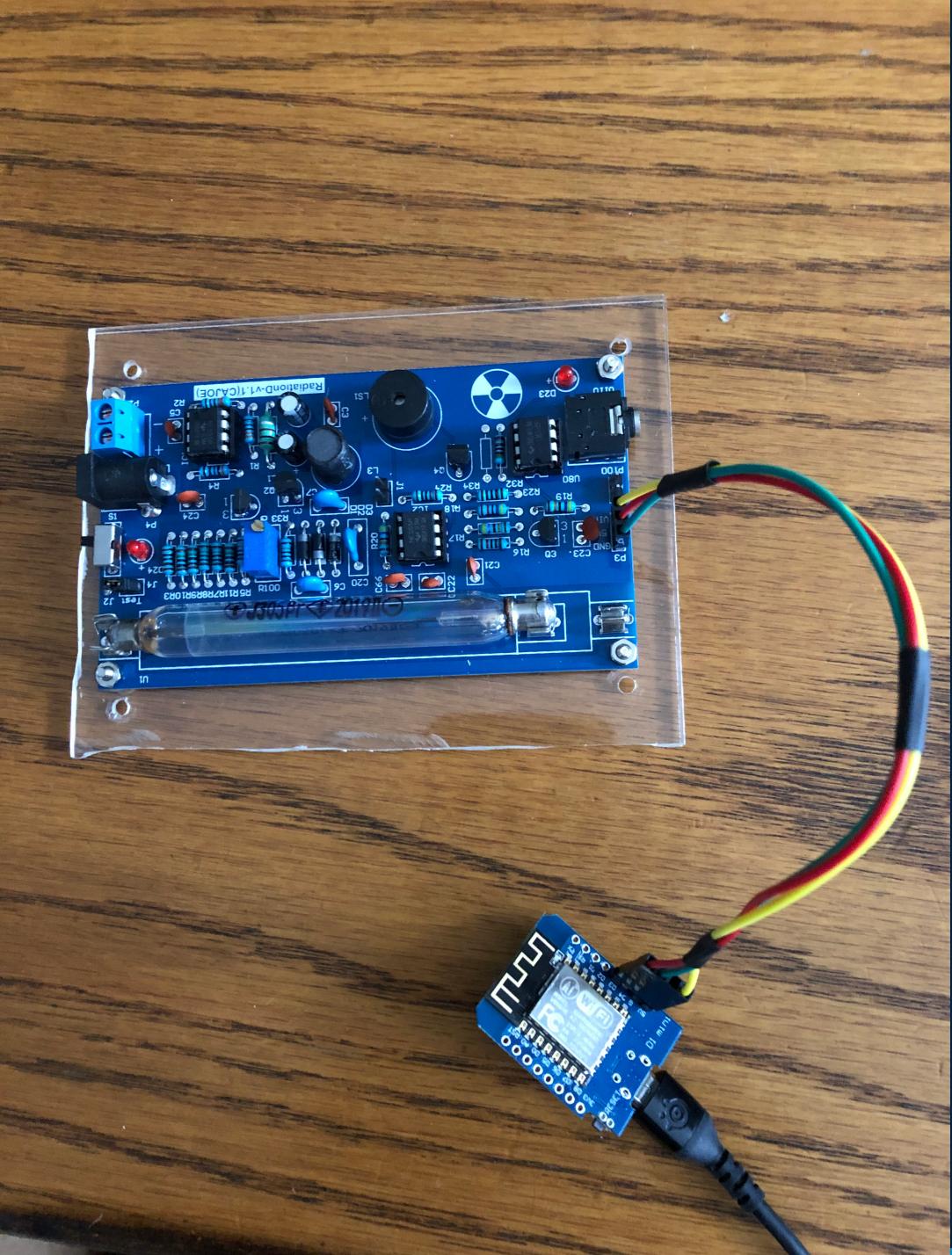
Full-body CT Scan == 10 millisieverts

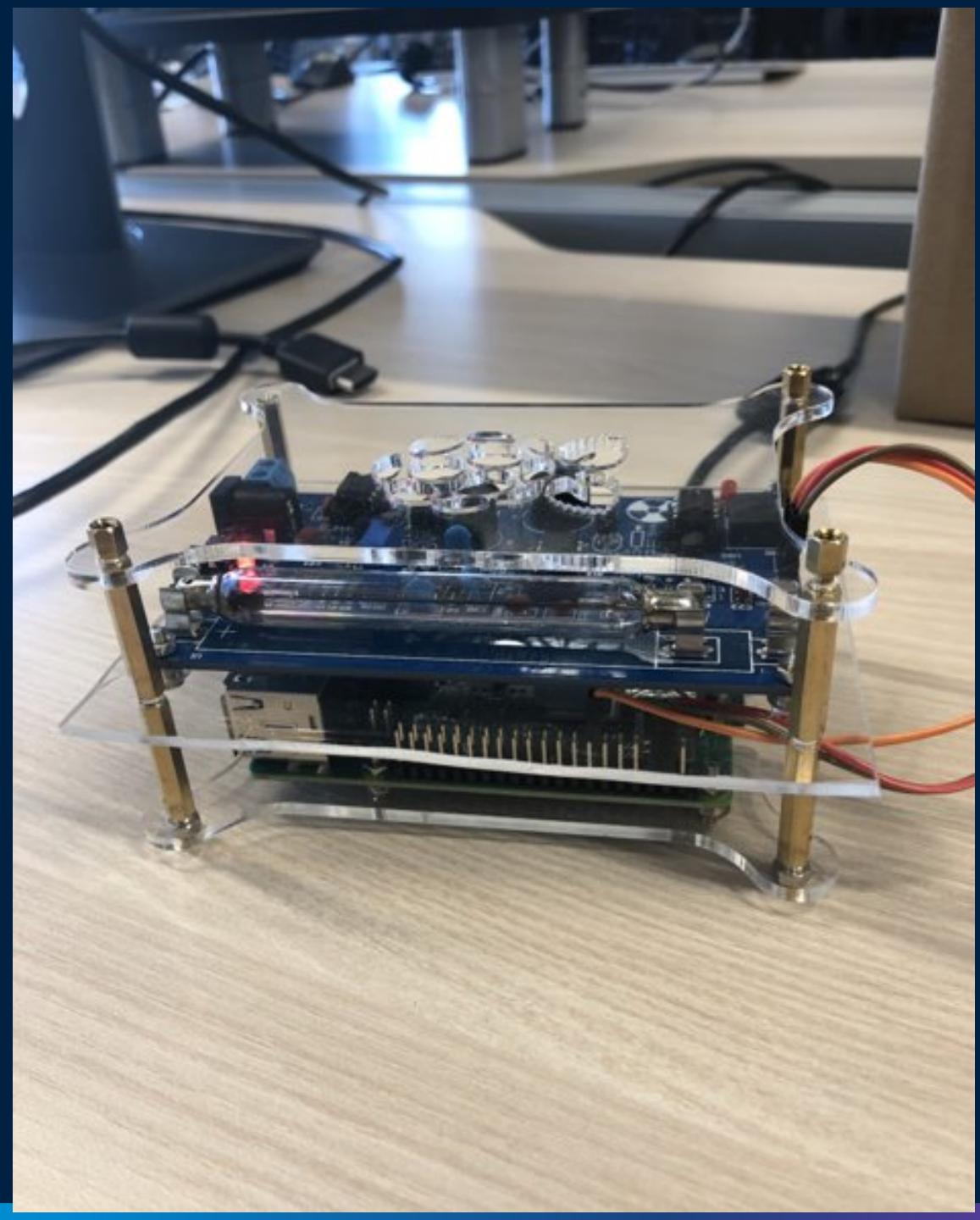
x 10,000

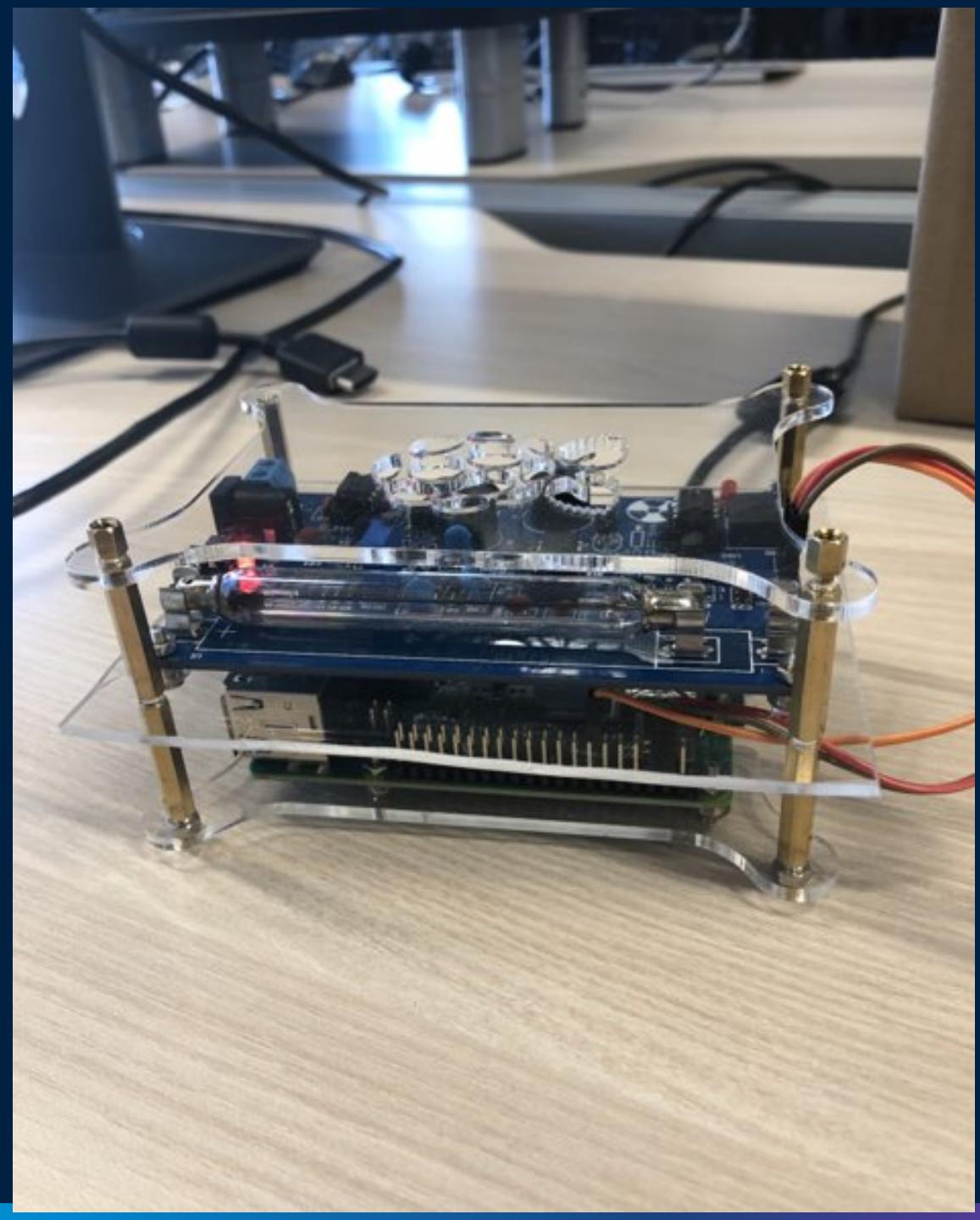
Recommended yearly limit for US radiation workers == 50 millisieverts

x 50,000











Long Haul Communication: wifi (https)

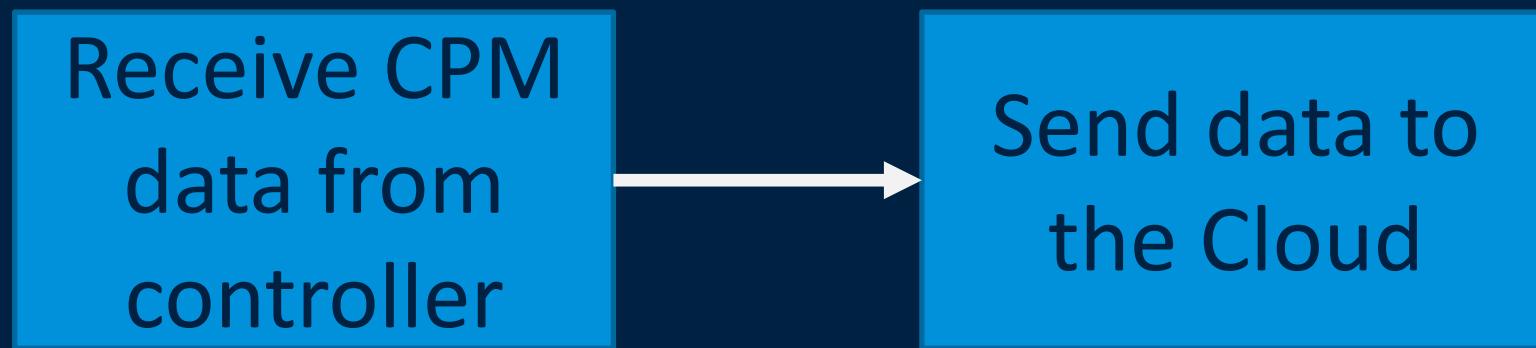
Agent/Controller:
Raspberry Pi + Spring Boot App



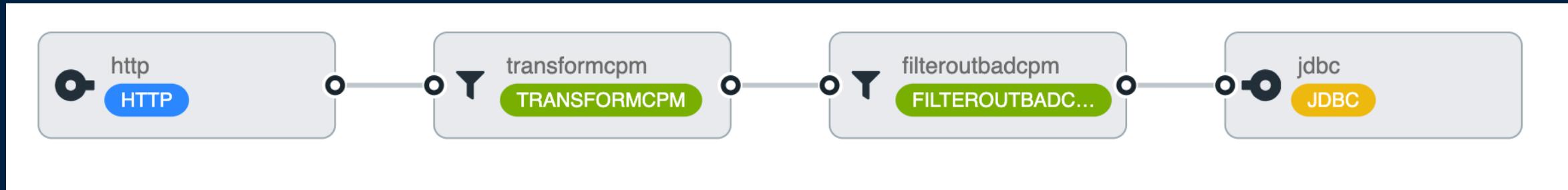
Sensor: Geiger Counter



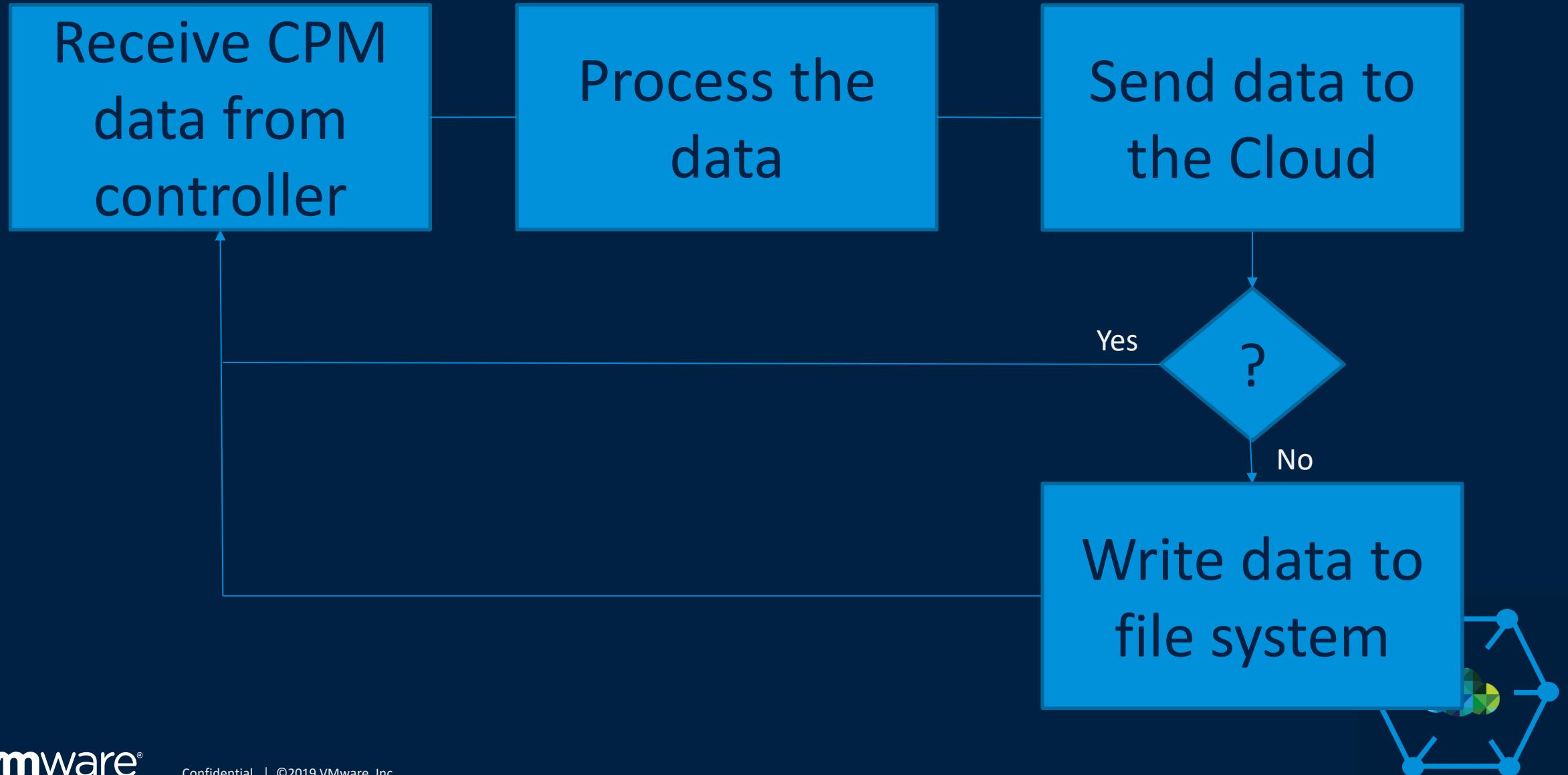
IOT Device



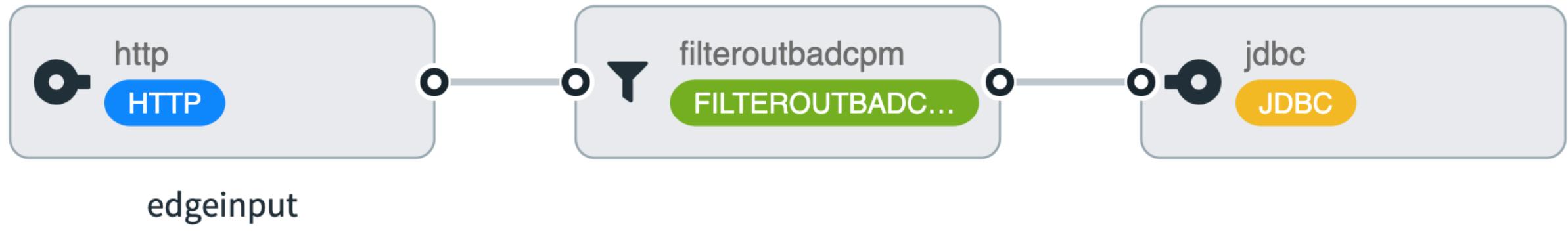
IOT Device Stream

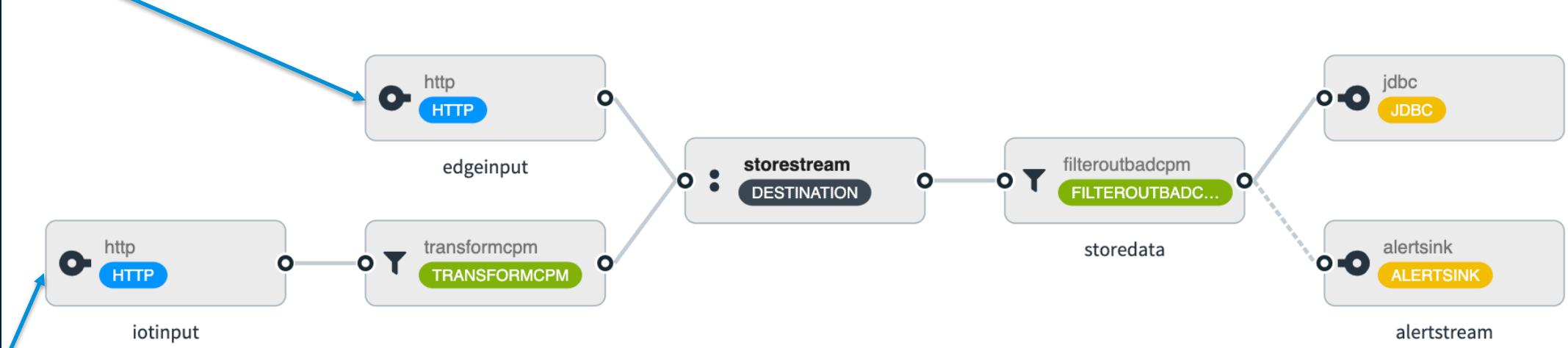


Edge Device



Edge Stream





Spring Cloud Stream

- General Purpose framework for writing event driven/stream processing micro services
- Destination based bindings on your choice of middleware



```
@EnableBinding(Processor.class)
public class FilterCpmApplication {
    @StreamListener(Processor.INPUT)
    @SendTo(Processor.OUTPUT)
    public SensorData filterCPM(String sensorDataString) {
        SensorData result = null;
        ObjectMapper mapper = new ObjectMapper();
        try {
            result = mapper.readValue(sensorDataString, SensorData.class);
        }
        catch (JsonProcessingException e) {
            e.printStackTrace();
        }
        return result;
    }
}
```



```
@EnableAutoConfiguration
public class FilterCpmApplication {
    @Bean
    public Function<SensorData, String> filterCPM() {
        SensorData result = null;
        ObjectMapper mapper = new ObjectMapper();
        try {
            result = mapper.readValue(sensorDataString, SensorData.class);
        }
        catch (JsonProcessingException e) {
            e.printStackTrace();
        }
        return result;
    }
}
```



How Do We Orchestrate these Streams?



Spring Cloud Data Flow

**A toolkit for
building data
integration, real-
time streaming,
and batch data
processing
pipelines.**



What is Spring Cloud Data Flow?

A toolkit for building data integration, real-time streaming, and batch data processing pipelines.

Data pipelines consist of Spring Boot apps, using **Spring Cloud Stream** for event-streaming or **Spring Cloud Task** for batch processes.

Ready for **Data Integration** with >60 out-of-the-box streaming and batch Apps.

DSL, GUI, and REST-APIs to build and orchestrate data pipelines onto platforms like Kubernetes and Cloud Foundry.

Continuous delivery for streaming data pipelines using **Spring Cloud Skipper**.

Cron-job scheduler for batch data pipelines using **Spring Cloud Scheduler**.



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Cron-job **scheduler** for batch data pipelines.





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Apps

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Actions

Filter items

All types



Refresh

Name	Type	Uri	Versions		
aggregator	PROCESSOR	docker:springcloudstream/aggregator-processor-rabbit:2.1.1.RELEASE	2.1.1.RELEASE		
alsertsink	SINK	docker:cppwfs/bananaalert:1.0.0.BUILD-SNAPSHOT	1.0.0.BUILD-SNAPSHOT		
bridge	PROCESSOR	docker:springcloudstream/bridge-processor-rabbit:2.1.1.RELEASE	2.1.1.RELEASE		
cassandra	SINK	docker:springcloudstream/cassandra-sink-rabbit:2.1.1.RELEASE	2.1.1.RELEASE		
composed-task-runner	TASK	docker:springcloudtask/composedtaskrunner-task:2.1.3.RELEASE	2.1.3.RELEASE		
counter	PROCESSOR	docker:springcloudstream/counter-processor-rabbit:2.1.1.RELEASE	2.1.1.RELEASE		
counter	SINK	docker:springcloudstream/counter-sink-rabbit:2.1.1.RELEASE	2.1.1.RELEASE		
file	SOURCE	docker:springcloudstream/file-source-rabbit:2.1.1.RELEASE	2.1.1.RELEASE		
file	SINK	docker:springcloudstream/file-sink-rabbit:2.1.1.RELEASE	2.1.1.RELEASE		
filter	PROCESSOR	docker:springcloudstream/filter-processor-rabbit:2.1.1.RELEASE	2.1.1.RELEASE		
ftp	SINK	docker:springcloudstream/ftp-sink-rabbit:2.1.1.RELEASE	2.1.1.RELEASE		
ftp	SOURCE	docker:springcloudstream/ftp-source-rabbit:2.1.1.RELEASE	2.1.1.RELEASE		
gemfire	SINK	docker:springcloudstream/gemfire-sink-rabbit:2.1.2.RELEASE	2.1.2.RELEASE		
gemfire	SOURCE	docker:springcloudstream/gemfire-source-rabbit:2.1.2.RELEASE	2.1.2.RELEASE		
gemfire-cq	SOURCE	docker:springcloudstream/gemfire-cq-source-rabbit:2.1.2.RELEASE	2.1.2.RELEASE		
groovy-filter	PROCESSOR	docker:springcloudstream/groovy-filter-processor-rabbit:2.1.1.RELEASE	2.1.1.RELEASE		
groovy-transform	PROCESSOR	docker:springcloudstream/groovy-transform-processor-rabbit:2.1.1.RELEASE	2.1.1.RELEASE		
grpc	PROCESSOR	docker:springcloudstream/grpc-processor-rabbit:2.1.1.RELEASE	2.1.1.RELEASE		
hdfs	SINK	docker:springcloudstream/hdfs-sink-rabbit:2.1.1.RELEASE	2.1.1.RELEASE		
header-enricher	PROCESSOR	docker:springcloudstream/header-enricher-processor-rabbit:2.1.2.RELEASE	2.1.2.RELEASE		





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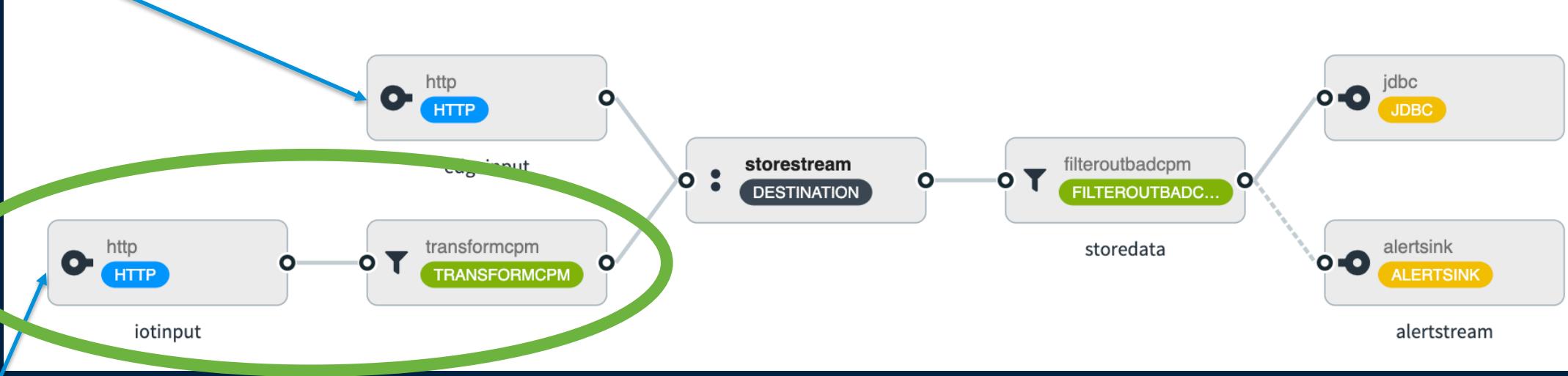
About & Docs

Applications

+ Add Application(s)

This section lists all the available applications and provides the control to register/unregister them (if applicable).

Actions	Filter items		All types	Refresh
	Name	Type	Uri	Versions
<input type="checkbox"/>	aggregator	PROCESSOR	docker:springcloudstream/aggregator-processor-rabbit:2.1.1.RELEASE	2.1.1.RELEASE
<input type="checkbox"/>	alsotsink	SINK	docker:cppwfs/bananaalert:1.0.0.BUILD-SNAPSHOT	1.0.0.BUILD-SNAPSHOT
<input type="checkbox"/>	bridge	PROCESSOR	docker:springcloudstream/bridge-processor-rabbit:2.1.1.RELEASE	2.1.1.RELEASE
<input type="checkbox"/>	cassandra	SINK	docker:springcloudstream/cassandra-sink-rabbit:2.1.1.RELEASE	2.1.1.RELEASE
<input type="checkbox"/>	composed-task-runner	TASK	docker:springcloudtask/composedtaskrunner-task:2.1.3.RELEASE	2.1.3.RELEASE
<input type="checkbox"/>	counter	PROCESSOR	docker:springcloudstream/counter-processor-rabbit:2.1.1.RELEASE	2.1.1.RELEASE
<input type="checkbox"/>	counter	SINK	docker:springcloudstream/counter-sink-rabbit:2.1.1.RELEASE	2.1.1.RELEASE
<input type="checkbox"/>	file	SOURCE	docker:springcloudstream/file-source-rabbit:2.1.1.RELEASE	2.1.1.RELEASE
<input type="checkbox"/>	file	SINK	docker:springcloudstream/file-sink-rabbit:2.1.1.RELEASE	2.1.1.RELEASE
<input type="checkbox"/>	filter	PROCESSOR	docker:springcloudstream/filter-processor-rabbit:2.1.1.RELEASE	2.1.1.RELEASE
<input type="checkbox"/>	filteroutbadcpm	PROCESSOR	docker:cppwfs/filterbadcpm:1.0.0.BUILD-SNAPSHOT	1.0.0.BUILD-SNAPSHOT
<input type="checkbox"/>	ftp	SINK	docker:springcloudstream/ftp-sink-rabbit:2.1.1.RELEASE	2.1.1.RELEASE
<input type="checkbox"/>	ftp	SOURCE	docker:springcloudstream/ftp-source-rabbit:2.1.1.RELEASE	2.1.1.RELEASE
<input type="checkbox"/>	gemfire	SINK	docker:springcloudstream/gemfire-sink-rabbit:2.1.2.RELEASE	2.1.2.RELEASE
<input type="checkbox"/>	gemfire	SOURCE	docker:springcloudstream/gemfire-source-rabbit:2.1.2.RELEASE	2.1.2.RELEASE
<input type="checkbox"/>	gemfire-cq	SOURCE	docker:springcloudstream/gemfire-cq-source-rabbit:2.1.2.RELEASE	2.1.2.RELEASE
<input type="checkbox"/>	groovy-filter	PROCESSOR	docker:springcloudstream/groovy-filter-processor-rabbit:2.1.1.RELEASE	2.1.1.RELEASE
<input type="checkbox"/>	groovy-transform	PROCESSOR	docker:springcloudstream/groovy-transform-processor-rabbit:2.1.1.RELEASE	2.1.1.RELEASE
<input type="checkbox"/>	grpc	PROCESSOR	docker:springcloudstream/grpc-processor-rabbit:2.1.1.RELEASE	2.1.1.RELEASE





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This section lists all the stream definitions and provides the ability to deploy/undeploy or destroy streams.

Actions ▾

Filter items



Refresh

 Name

Description

> Definitions

Status ?

 storedata

> :storestream > filteroutbadcpm | jdbc --spring.datasource.driver-class-name=org.mariadb.jdbc.Driver --spring.datasource.

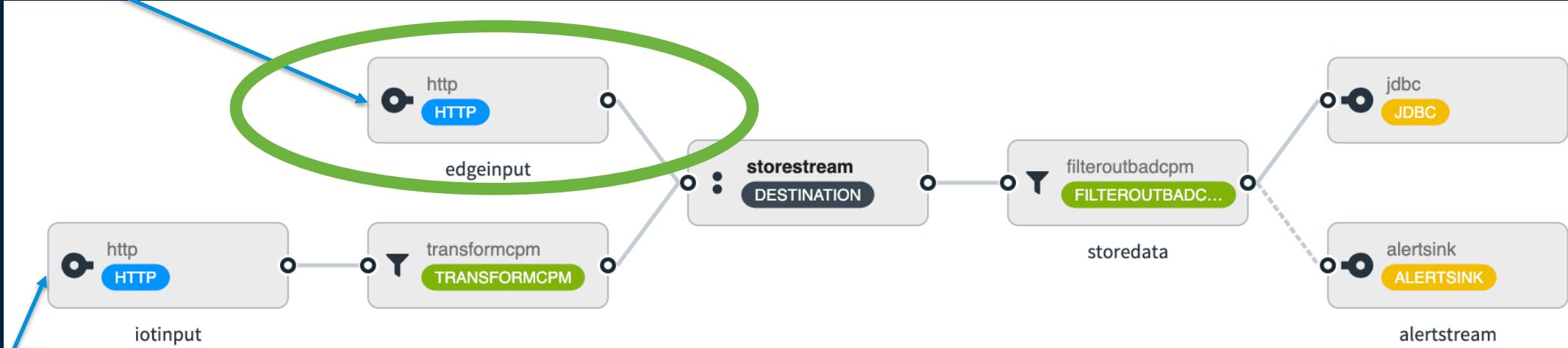
...

DEPLOYED



items per page: 30 ▾

1-1 stream definition of 1 stream definition





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This section lists all the stream definitions and provides the ability to deploy/undeploy or destroy streams.

Actions

Filter items



Refresh

Name	Description	Definitions	Status	Actions
iotinput		> http --server.port=9001 transformcpm > :storestream	DEPLOYED	
storedata		> :storestream > filteroutbadcpm jdbc --spring.datasource.driver-class-name=org.mariadb.jdbc.Driver --spring.datasource.	DEPLOYED	

items per page:

30

1-2 stream definitions of 2 stream definitions

About & Docs



Aliases

Drivers

Connect to: DB2 on Docker Active Session: 3 - Minikube (mysql) ...

Catalog: mysql Objects SQL

```
select * from bananas
select * from bananas
truncate table bananas
```

Rows 1; select * from bananas Rows: 1, Cols: 0

Results MetaData Info Overview / Charts Rotated table Results as text

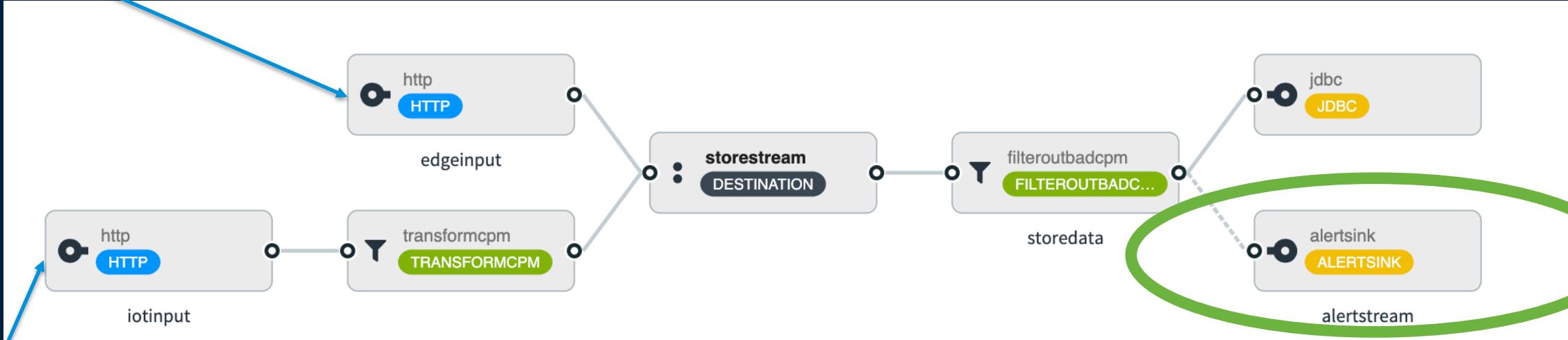
countsPerMin...	microSieverts	bananas	unitId	timestamp
18	0.14618	1.46175	A1	Thu Feb 13 10:35:50 EST 2020

/Minikube 1,18 / 18

Query 1 of 1, Rows read: 0, Elapsed time (seconds) - Total: 0.021, SQL query: 0.005, Reading results: 0.016

Query 1 of 1, Rows read: 0, Elapsed time (seconds) - Total: 0.022, SQL query: 0.005, Reading results: 0.017

Query 1 of 1, Rows read: 0, Elapsed time (seconds) - Total: 0.021, SQL query: 0.005, Reading results: 0.016





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This section lists all the stream definitions and provides the ability to deploy/undeploy or destroy streams.

Actions

Filter items



Refresh

Name	Description	Definitions	Status	Actions
edgeinput		> http --server.port=9000 > :storestream	DEPLOYED	
iotinput		> http --server.port=9001 transformcpm > :storestream	DEPLOYED	
storedata		> :storestream > filteroutbadcpm jdbc --spring.datasource.driver-class-name=org.mariadb.jdbc.Driver --spring.datasource...	DEPLOYED	

items per page: 30 | 1-3 stream definitions of 3 stream definitions

banana232



#alerts

☆ | 2 | 0 | Add a topic

Alert Customer [Cloud App] to have house evaluated, because banana count was: 20.70813707974663 Friday, February 7th

Alert Customer [Cloud App] to have house evaluated, because banana count was: 20.70813707974663

Alert Customer [Cloud App] to have house evaluated, because banana count was: 20.70813707974663

Alert Customer [Cloud App] to have house evaluated, because banana count was: 20.70813707974663

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Alert Customer [Cloud App] to have house evaluated, because banana count was: 20.70813707974663

Alert Customer [Cloud App] to have house evaluated, because banana count was: 20.70813707974663

Alert Customer [Cloud App] to have house evaluated, because banana count was: 649.6670456391099

Alert Customer [Cloud App] to have house evaluated, because banana count was: 81208.38070488874

bananaradiation APP 3:34 PM

Alert Customer [Cloud App] to have house evaluated, because banana count was: 649.6670456391099

Yesterday

bananaradiation APP 5:43 PM

Alert Customer [Cloud App] to have house evaluated, because banana count was: 649.6670456391099

Alert Customer [Cloud App] to have house evaluated, because banana count was: 649.6670456391099

Alert Customer [Cloud App] to have house evaluated, because banana count was: 649.6670456391099

Alert Customer [Cloud App] to have house evaluated, because banana count was: 649.6670456391099

Alert Customer [Cloud App] to have house evaluated, because banana count was: 12.18125710573331

Today

bananaradiation APP 11:16 AM

Alert Customer [Cloud App] to have house evaluated, because banana count was: 12.18125710573331

Alert Customer [Cloud App] to have house evaluated, because banana count was: 12.18125710573331

Alert Customer [Cloud App] to have house evaluated, because banana count was: 12.18125710573331

Alert Customer [Cloud App] to have house evaluated, because banana count was: 12.18125710573331

Alert Customer [Cloud App] to have house evaluated, because banana count was: 12.18125710573331

bananaradiation APP 11:30 AM

Alert Customer [Cloud App] to have house evaluated, because banana count was: 16.16046776027286

new messages

Message #alerts

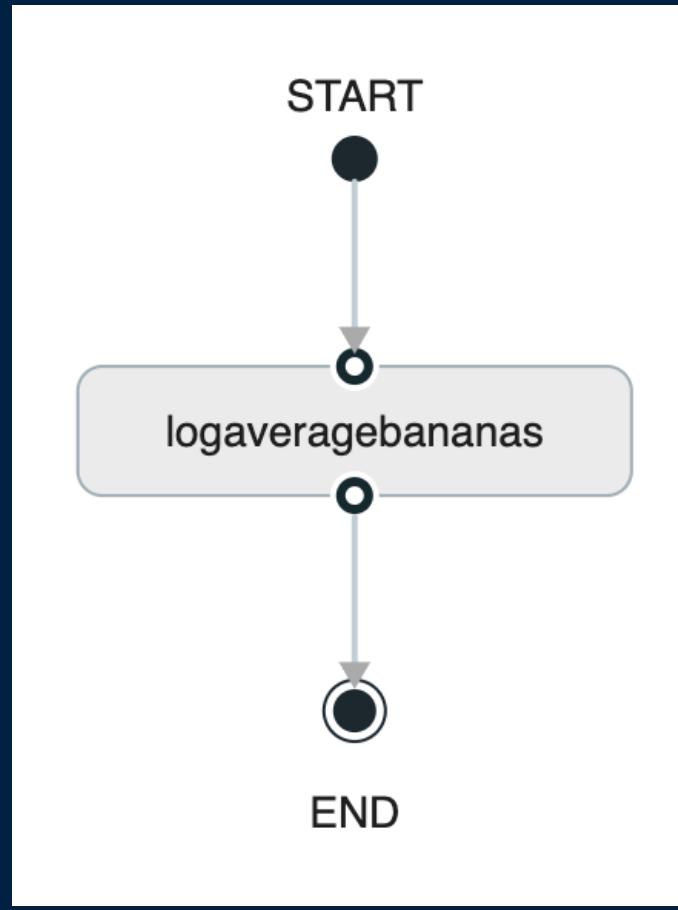
U B I C </> ≡ ≡ ≡ ≡

Aa @ :)

Search

Call Info Settings

@ ☆ :





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Apps



Runtime



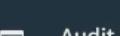
Streams



Tasks



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Audit Records



About & Docs



Task

Executions

Schedules

There is **no registered task**, yet.

You can [Create Task\(s\)](#) or [Refresh](#) the page

Demo



What's Next:

- Create an executable of the sensor app using Graal
- Update the long haul with cellular instead of wifi
- Provide a lightning talk update
- Have the app send the offline results



Questions?



A Special Thanks To Chris Schaefer



Thanks!

