INRAE

Systèmes d'Informations et Calcul pour le Phénotypage Animal

Le projet SICPA_IOT

Contexte et objectifs

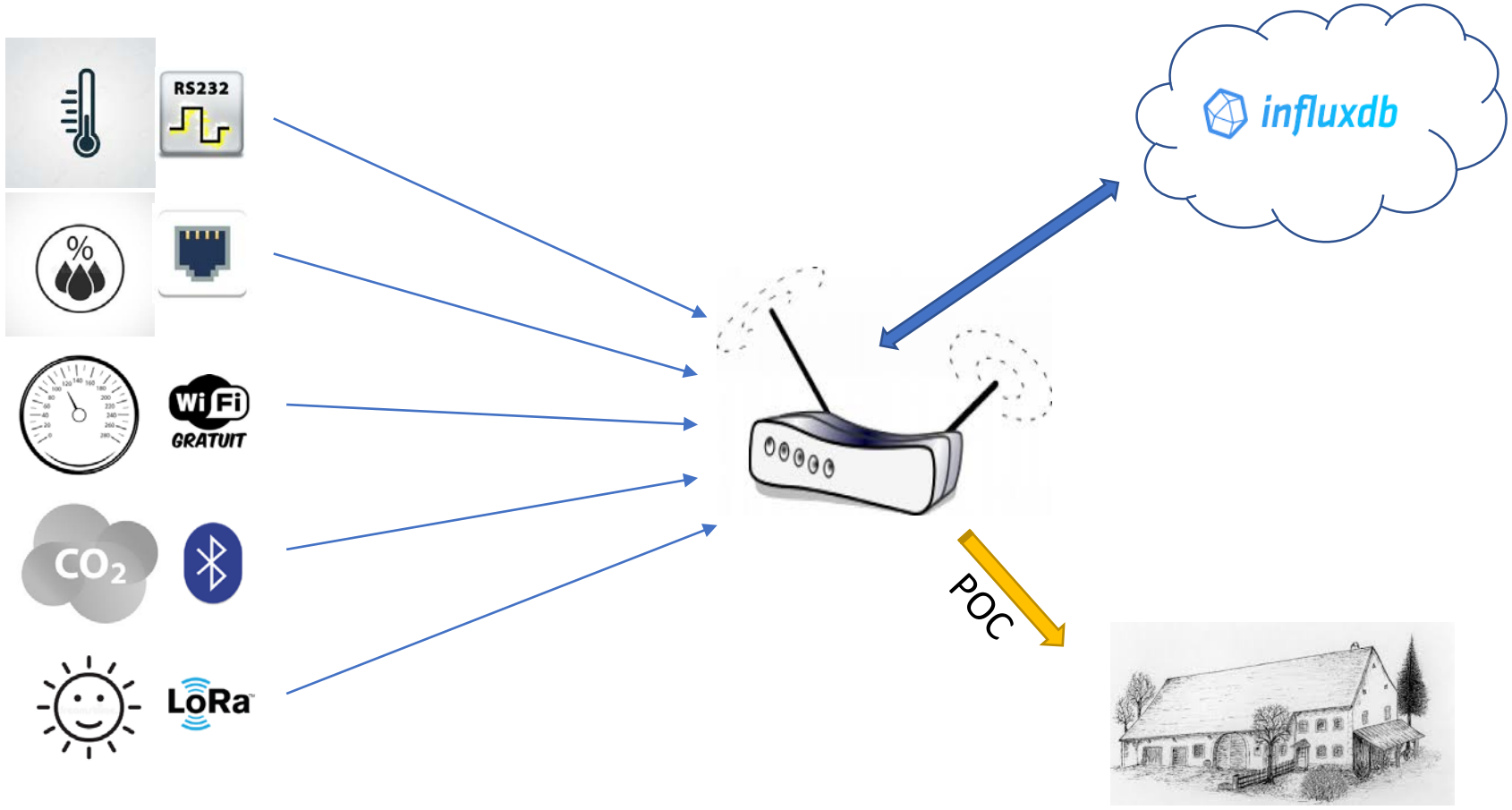
1 Directive 2010/63/UE du Parlement Européen relative à la protection des animaux utilisés à des fins scientifiques.
-> Contrôler et enregistrer les données d'environnement (température, humidité, lumière, qualité de l'air, …).

2 Intérêt scientifique. Mieux contrôler et intégrer l'impact des données d'ambiances sur les résultats des expérimentations.

-> Création d'une infrastructure LoRa et d'un stockage type time série.

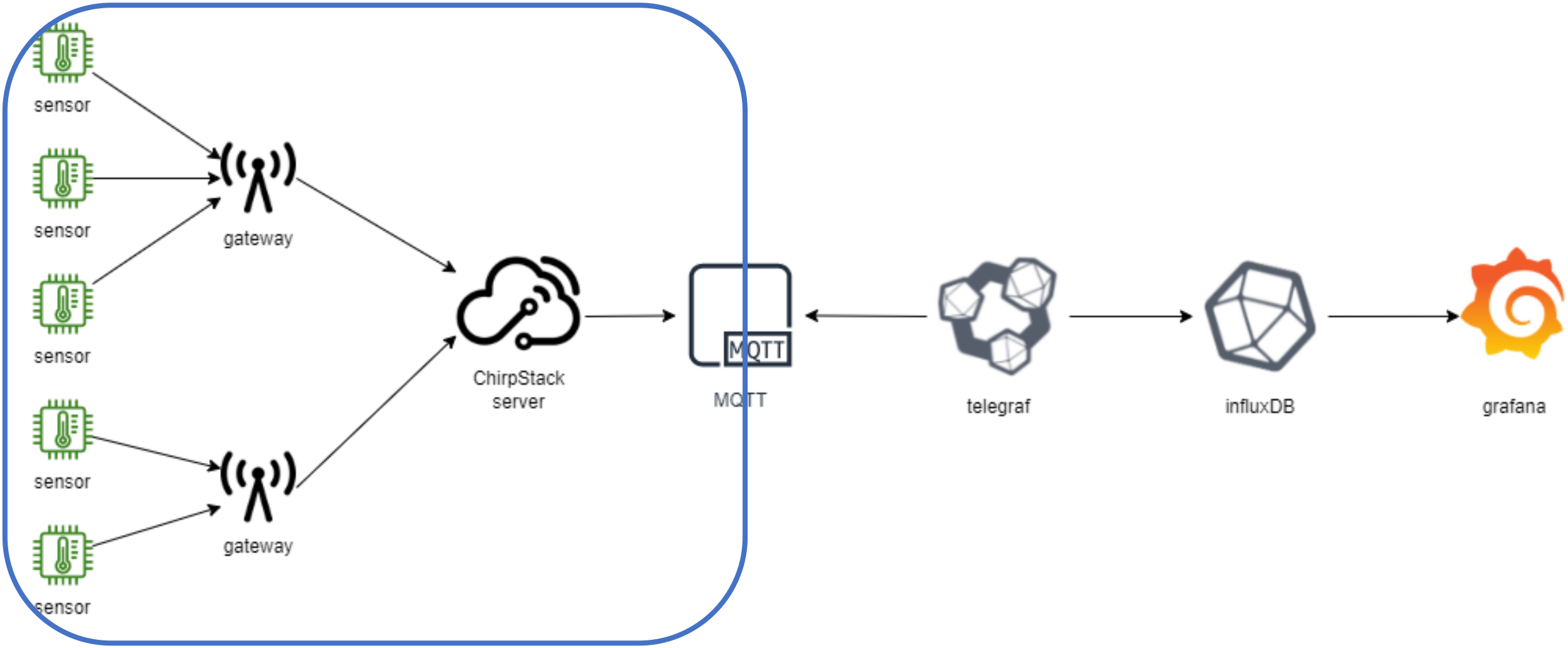
Réseau de capteurs

Collecter des données de différents capteurs de différentes façon en utilisant différentes technologies



UE de Langlade

Réseau de capteurs et LoRa



Des capteurs LoRa

Capteurs

Elsys ERS

Température

Humidité

Lumière

Son

CO2

Axioma

Consommation d'eau

MCF88

Courant

Puissance

Pilotage à distance

RF Track

GPS

ESP32

Adeunis FTD

Testeur de réseau

Des capteurs LoRa

Passerelles

Rak Wireless

Wifi

Gsm

Gps

IP67

Rak Wireless

Raspberry PI

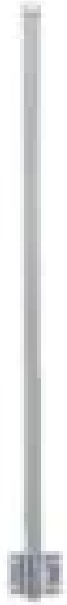
Wifi

Gps

Mikrotik

Wifi

IP56



Dashboard
Network-servers
Gateway-profiles
Organizations
All users
API keys
sicpa
Org. dashboard
Org. users
Org. API keys
Service-profiles
Device-profiles
Gateways
Applications

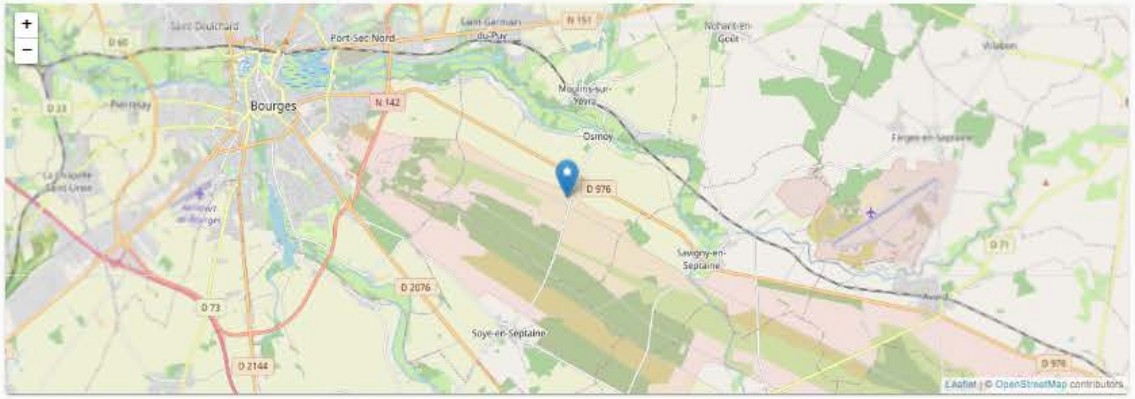
Gateways / mkt-loragw-sapiniere-ltap-lr8-lte-kit

DELETE

GATEWAY DETAILS | GATEWAY CONFIGURATION | CERTIFICATE | GATEWAY DISCOVERY | LIVE LORAWAN FRAMES

Gateway details

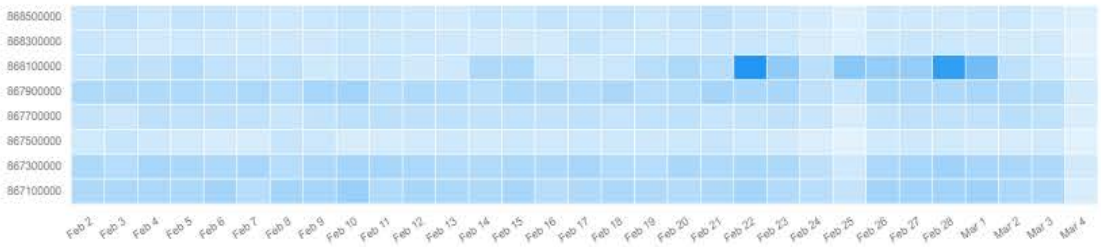
Gateway ID	3530362033004300
Altitude	0 meters
GPS coordinates	47.058516345778, 2.510789107827858
Last seen at	Mar 4, 2022 9:08 AM



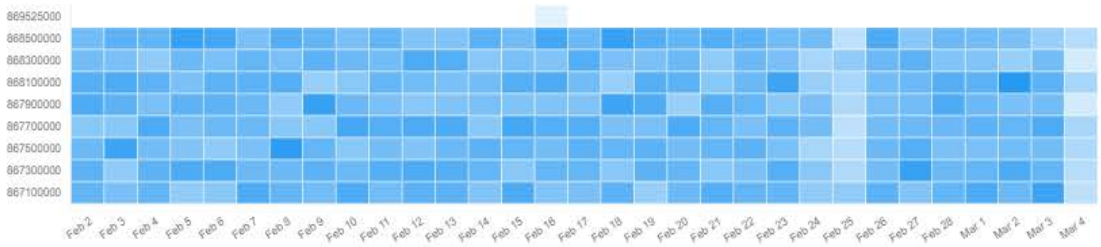
Received

Transmitted

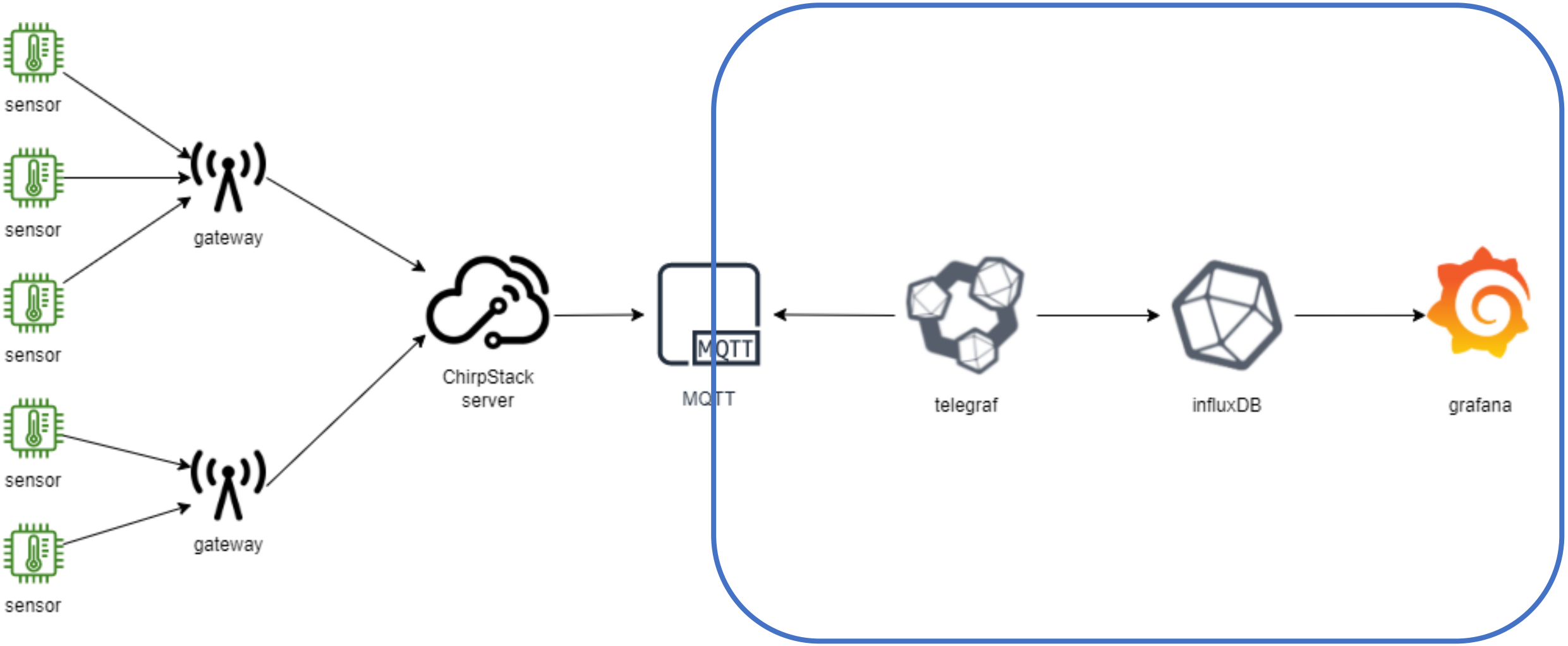
Received / frequency



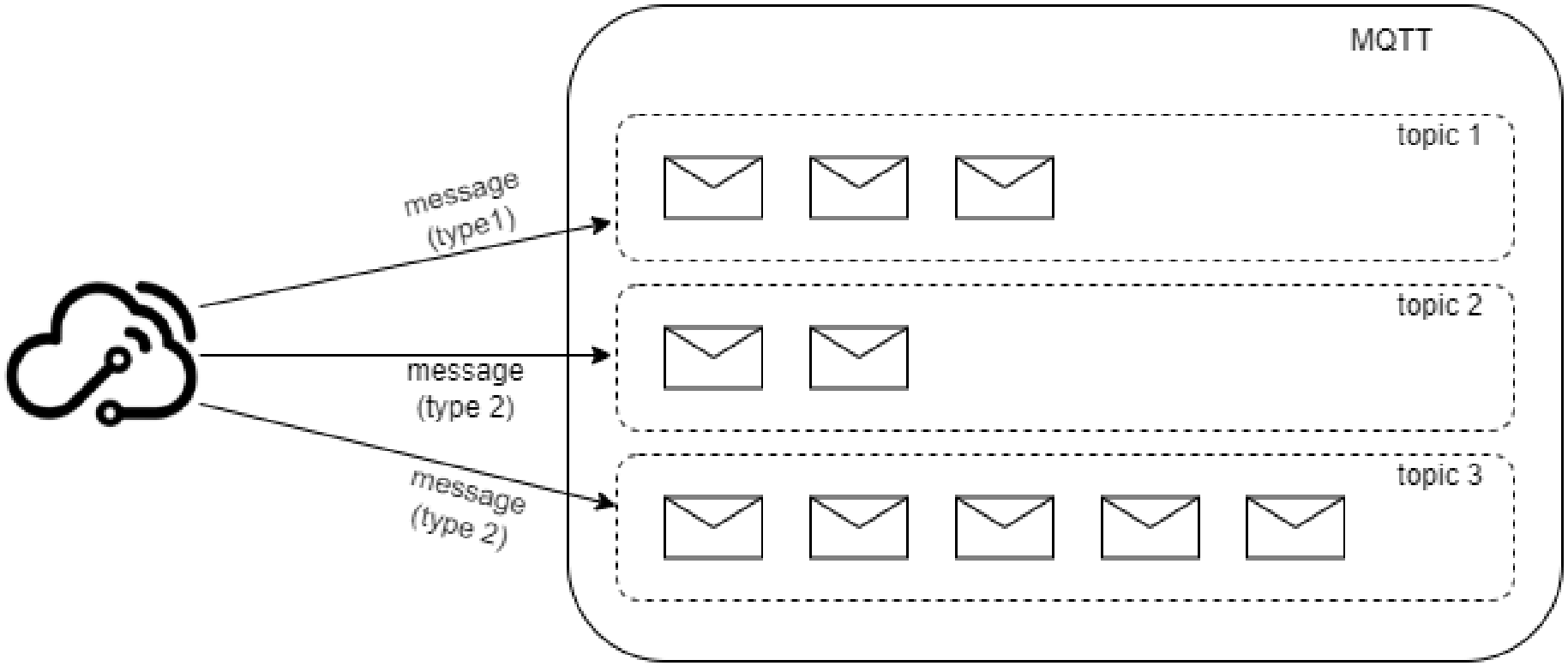
Transmitted / frequency



Chaine de traitement de la donnée



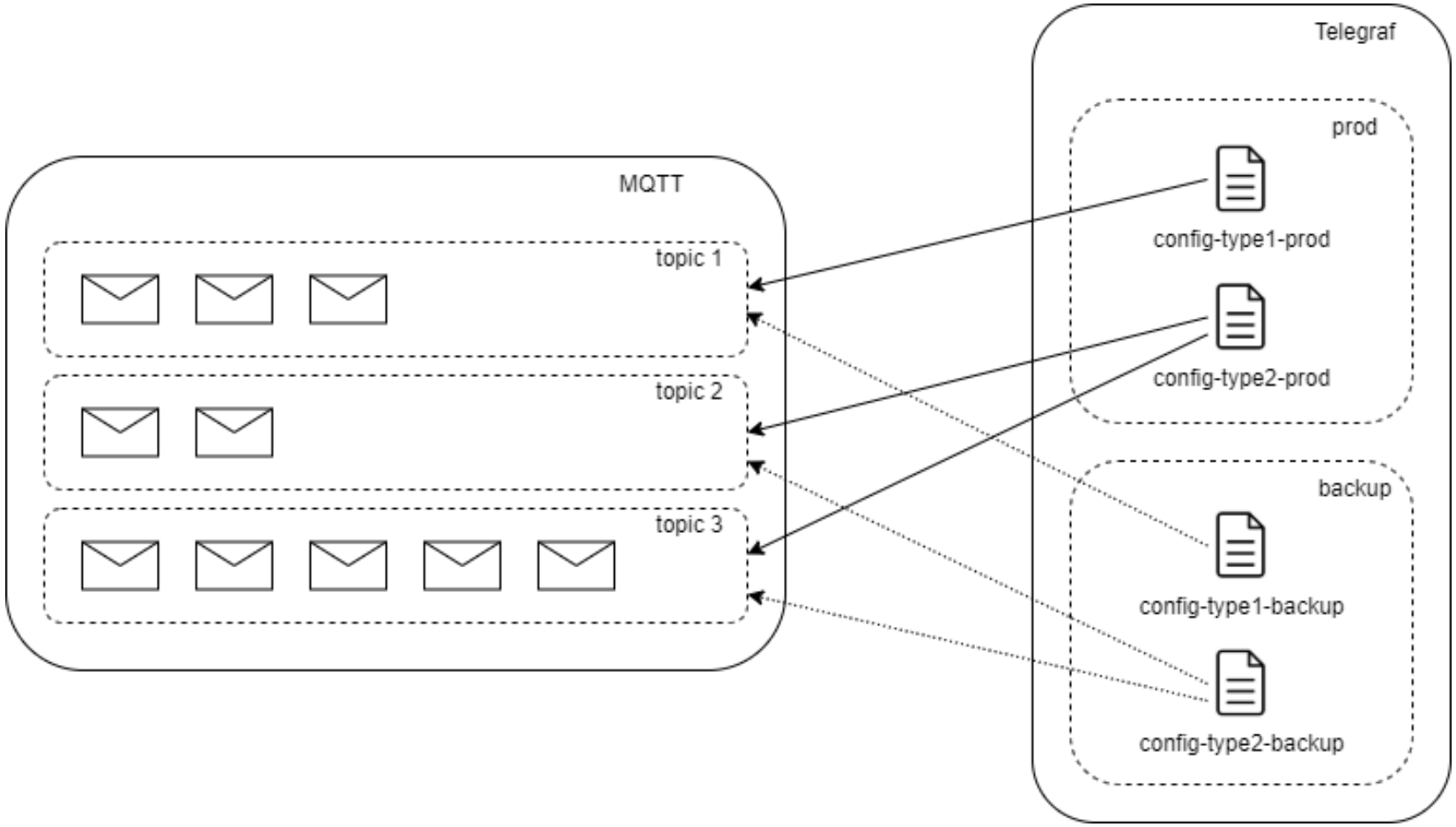
MQTT (Mosquitto)



MQTT : https://mqtt.org/

Mosquitto : https://mosquitto.org/

Telegraf (Stack InfluxData)



Telegraf : https://www.influxdata.com/time-series-platform/telegraf/

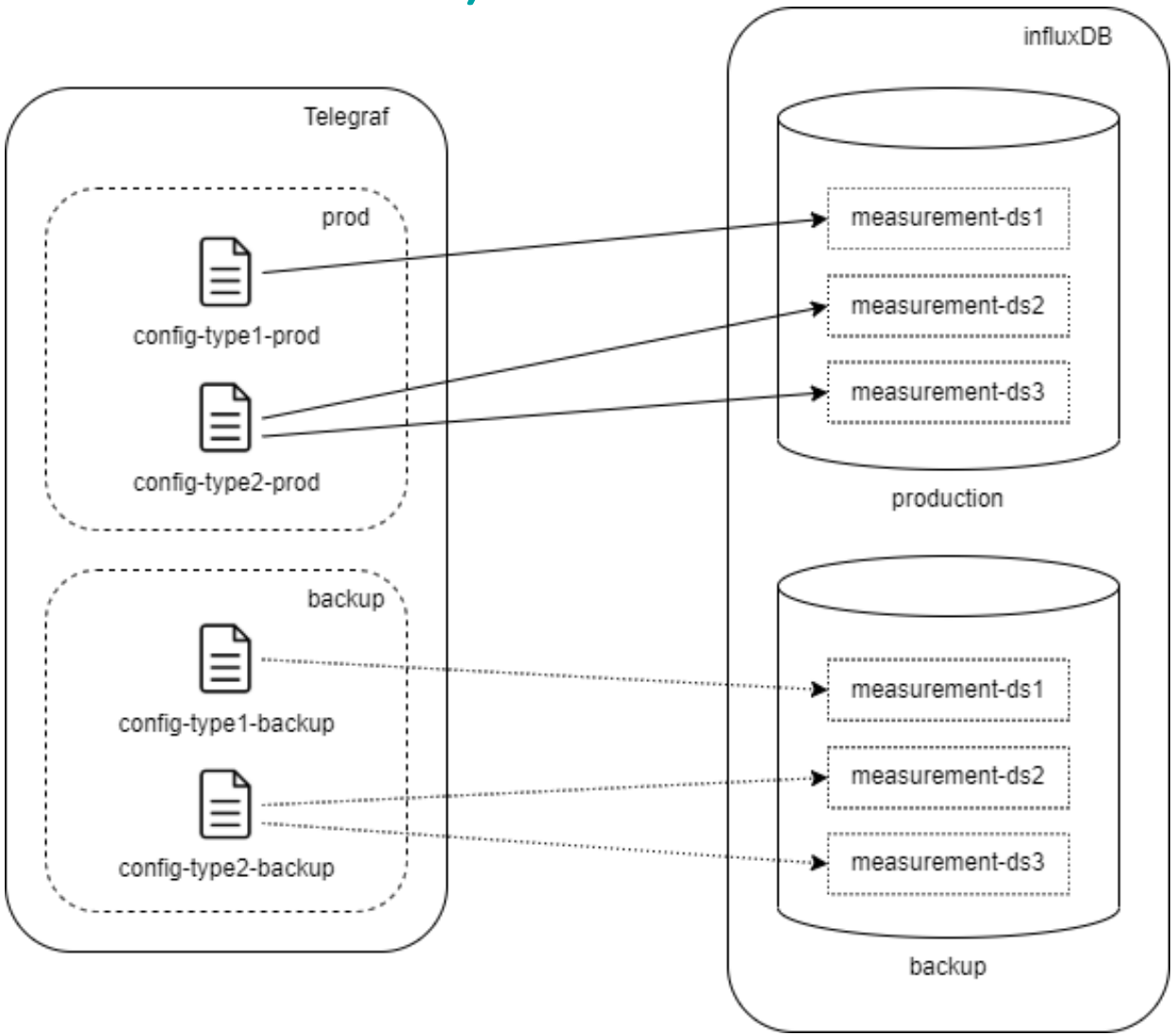
Aggregators : https://docs.influxdata.com/telegraf/v1.21/plugins/#aggregator-plugins

Inputs : https://docs.influxdata.com/telegraf/v1.21/plugins/#input-plugins

Outputs : https://docs.influxdata.com/telegraf/v1.21/plugins/#output-plugins

Processors : https://docs.influxdata.com/telegraf/v1.21/plugins/#processor-plugins

InfluxDB (Stack InfluxData)



InfluxDB : https://www.influxdata.com/products/influxdb-overview/

Line protocol : https://docs.influxdata.com/influxdb/v1.8/write_protocols/line_protocol_tutorial

InfluxQL : https://docs.influxdata.com/influxdb/v1.8/query_language/

Grafana

Grafana : https://grafana.com/

/ Edit Panel

Discard | Save | Apply

Table view | Fill | Actual | Last 7 days | Graph (old)

Temp C°/Humid %/Pression Pa RAK-7204-EA87

Query 3 | Transform 0 | Alert 0

Data source: InfluxDB- | Query options: MD = auto = 1940, Interval = 5m | Query inspector

A (InfluxDB-)

FROM	rp_	device_rak7204-ea87	WHERE	+
SELECT	field(temperature)	mean()	+	
GROUP BY	time(15m)	fill(null)	+	
TIMEZONE	(optional)	ORDER BY TIME	ascending	
LIMIT	(optional)	SLIMIT	(optional)	
FORMAT AS	Time series	ALIAS	temperature	

B (InfluxDB-)

FROM	rp_	device_rak7204-ea87	WHERE	+
SELECT	field(humidity)	mean()	+	
GROUP BY	time(15m)	fill(null)	+	
TIMEZONE	(optional)	ORDER BY TIME	ascending	
LIMIT	(optional)	SLIMIT	(optional)	
FORMAT AS	Time series	ALIAS	Humidity	

Search options

All | Overrides

Panel options

Title: Temp C°/Humid %/Pression Pa RAK-7204-EA87

Description:

Transparent background: ON

Panel links

Repeat options

Display

Series overrides

Axes

Left Y

Show	ON
Unit	none
Scale	linear
Y-Min	auto
Y-Max	auto
Decimals	auto
Label	

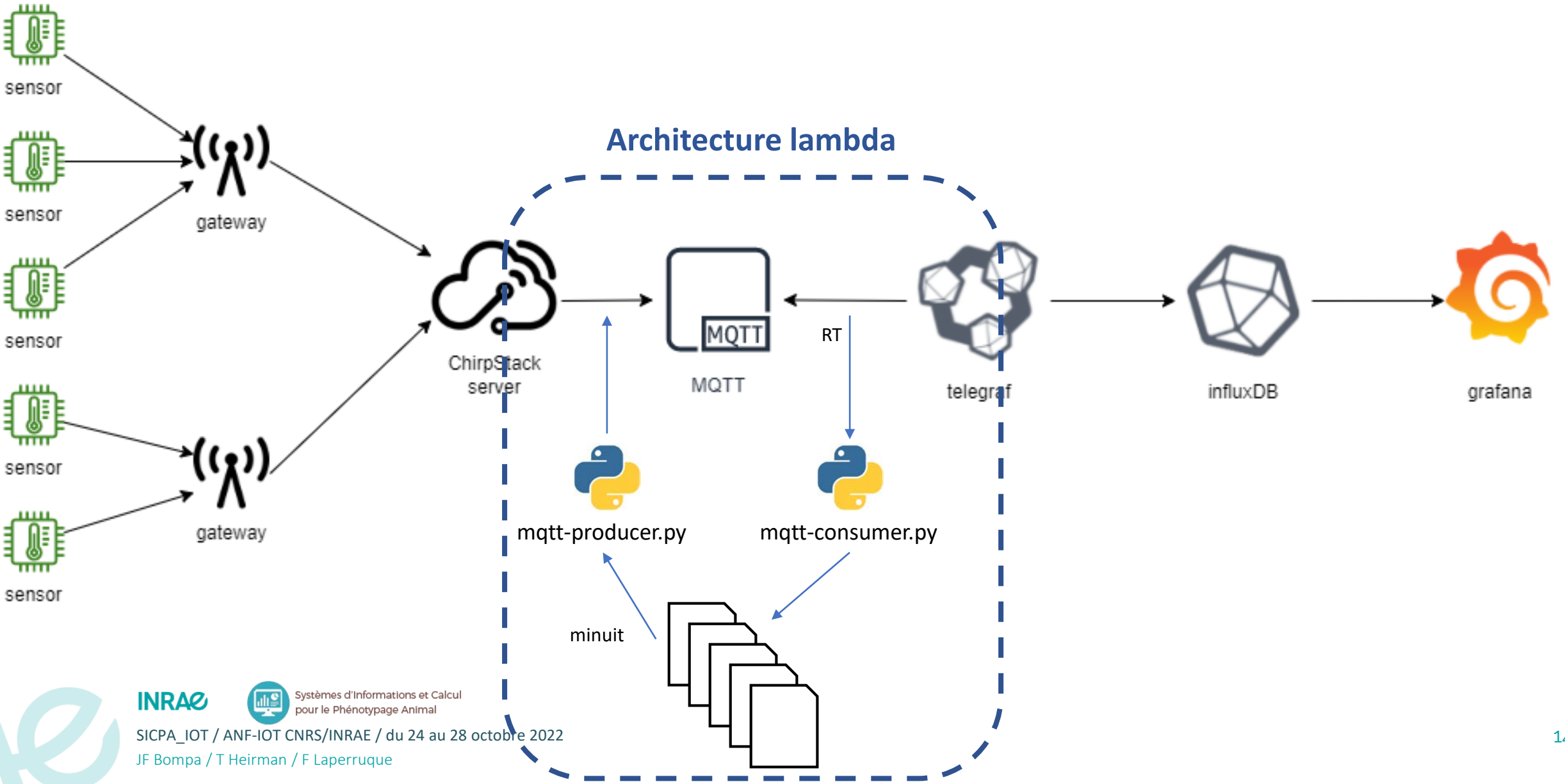
Right Y

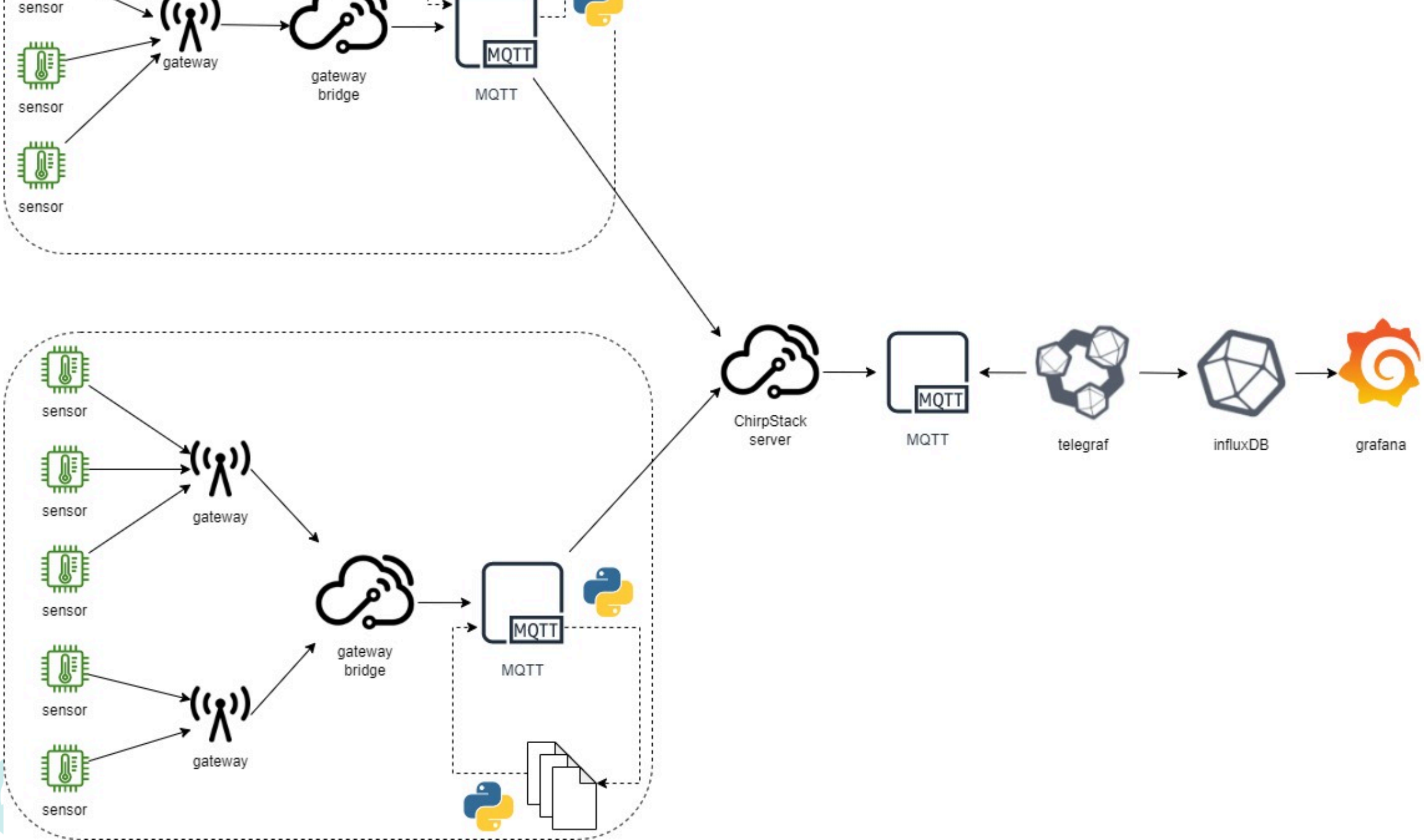
Show	ON
Unit	Hectopascals
Scale	linear
Y-Min	auto
Y-Max	auto
Decimals	auto
Label	

Y-Axes

Align Y-Axes: OFF

Et ensuite ?


Architecture lambda
sensor
sensor
sensor
sensor
sensor
gateway
gateway
ChirpStack server
MQTT
MQTT
RT
telegraf
influxDB
grafana
mqtt-producer.py
mqtt-consumer.py
minuit


sensor
sensor
sensor
gateway
gateway
bridge
MQTT
MQTT
sensor
sensor
sensor
sensor
sensor
gateway
gateway
gateway
bridge
MQTT
MQTT
ChirpStack
server
MQTT
telegraf
influxDB
grafana