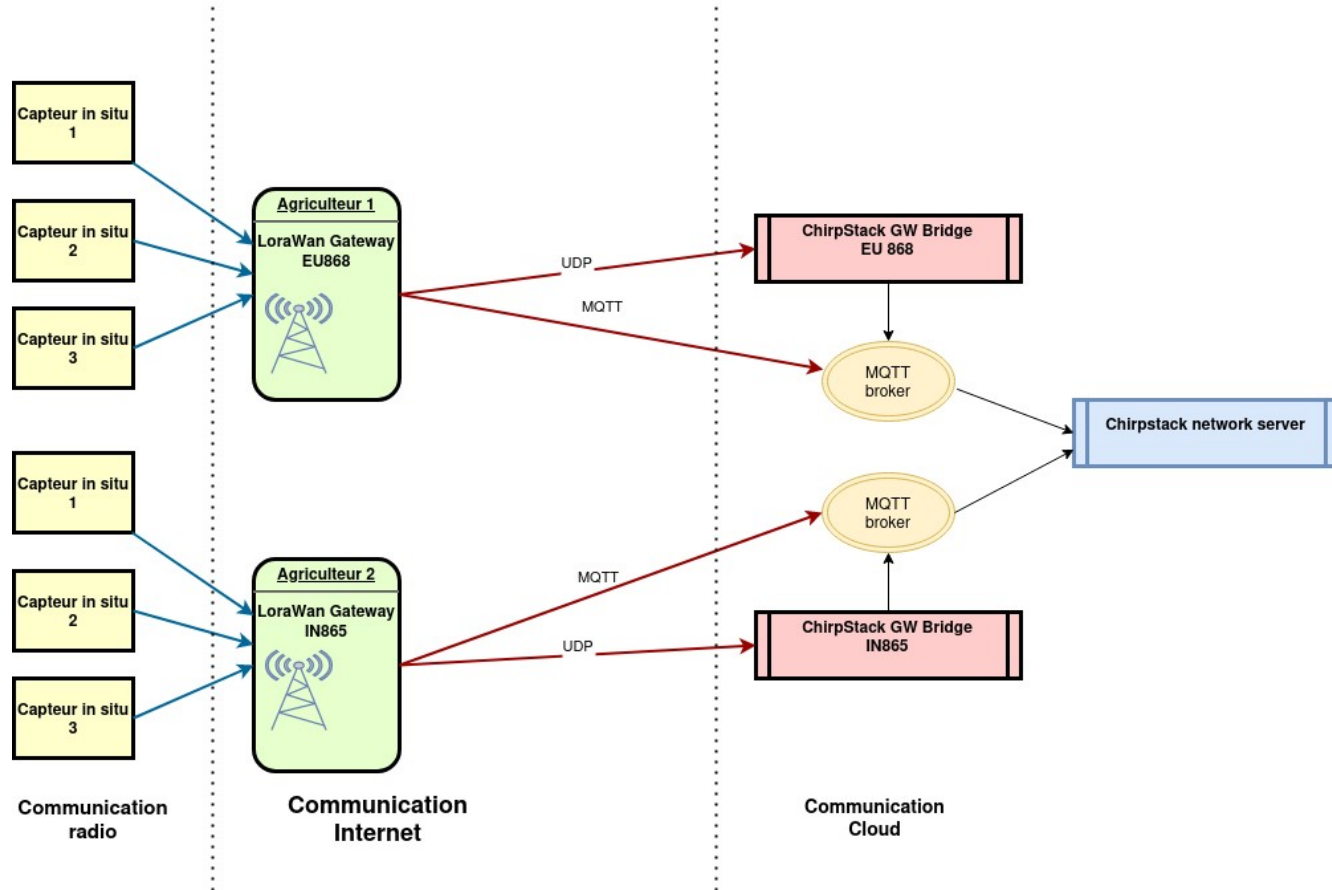# expLoRa: display LoraWAN Data in Kano

Kalisio.com
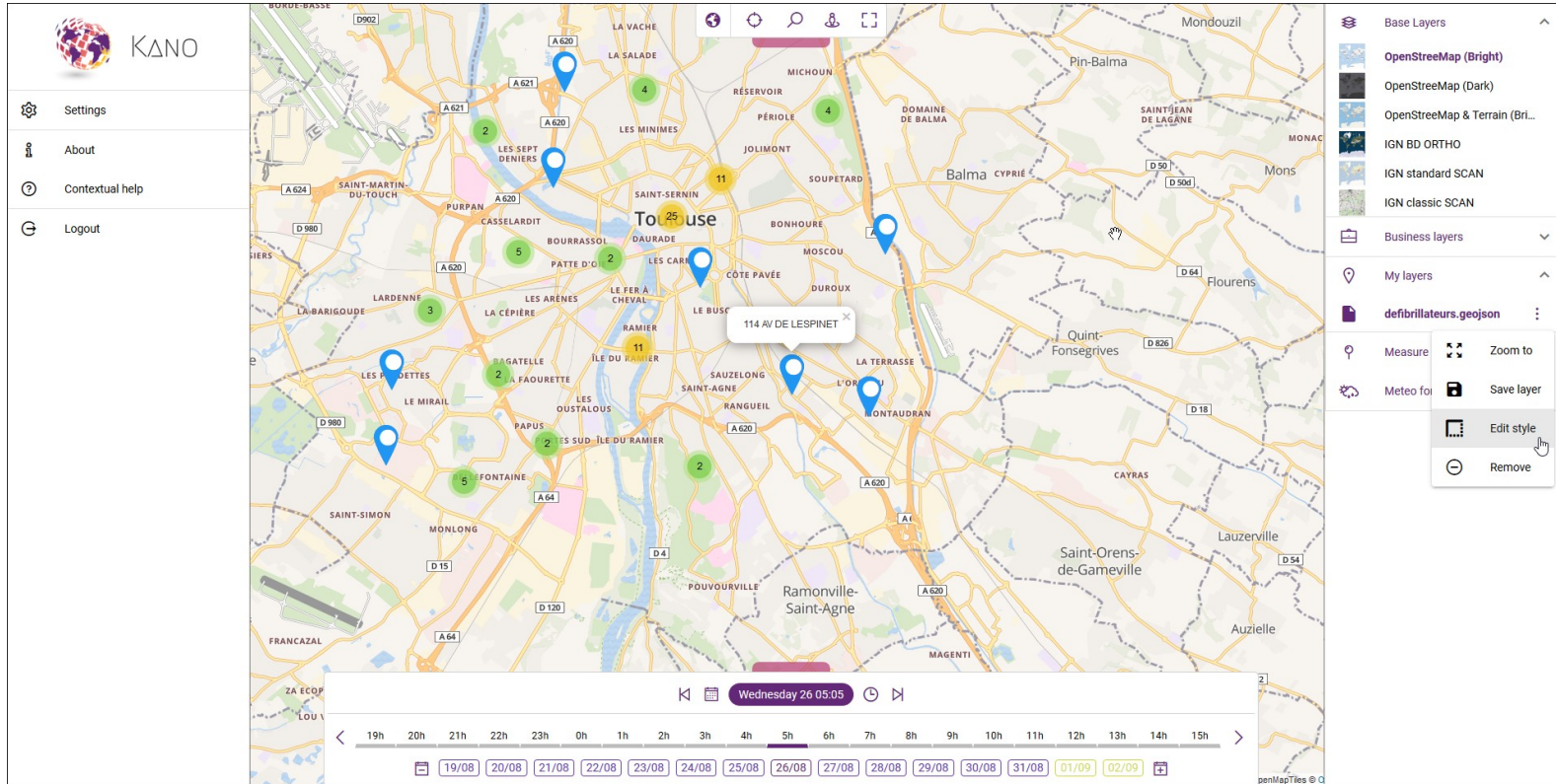**Romain JACQUET (rjacquet31@gmail.com)**

Context: LoraWAN and Chirpstack

Wireless network for sensor and gateways
- 3 type of network communication: radio, LAN, internet
- 3 zones: sensors, gateway, cloud

Kano a 2D/3D visualisator sponsored by Kalisio

- Different type of layers supported
- Flexible API to add new layer

expLoRa goals

Target: display values flowing from sensor through Chirpstack to Kano

Issues to tackle:

- No package to install Chirpstack on Kubernetes
- Find a way to transform the LoraWAN Data in GeoJSON?
- Setup a test infrastructure

Hardware for test

Another type of gateway has been experimend (Raspberry+ chirpstack OS)

Create an helm package for Chirpstack

HELM — The package manager for Kubernetes

bitnami by **vmware**

Features:

- Fetch the LoraWAN devices in a InitContainer
- Deploy the REST API, the mongoDB integration and add a support for KeyCloak authentication via OpenIDConnect
Hosted on Kalisio harbour

helm chart for chirpstack

This is a helm package for chirpstack, an open-source network server for LoraWAN Networks. The chart include:

- all components of the chirpstack project: the gateway bridge, the network server, an **optionnally** the rest API
- mosquitto, a MQTT broker used by Chirpstack
- the micro service to transform UpLink events to geojson, aka chirstack mongodb integration (cf doc)
- has no dependency
- provide a default configuration in the config folder, for two regions eu868 and in865.

As there is no dependencies it means that you need to install them or re-use existing ones. The dependencies can be found as helm charts:

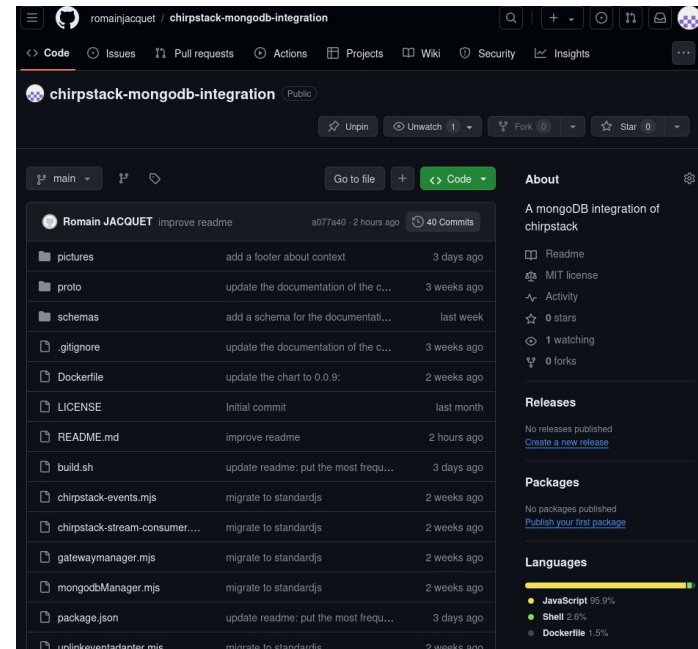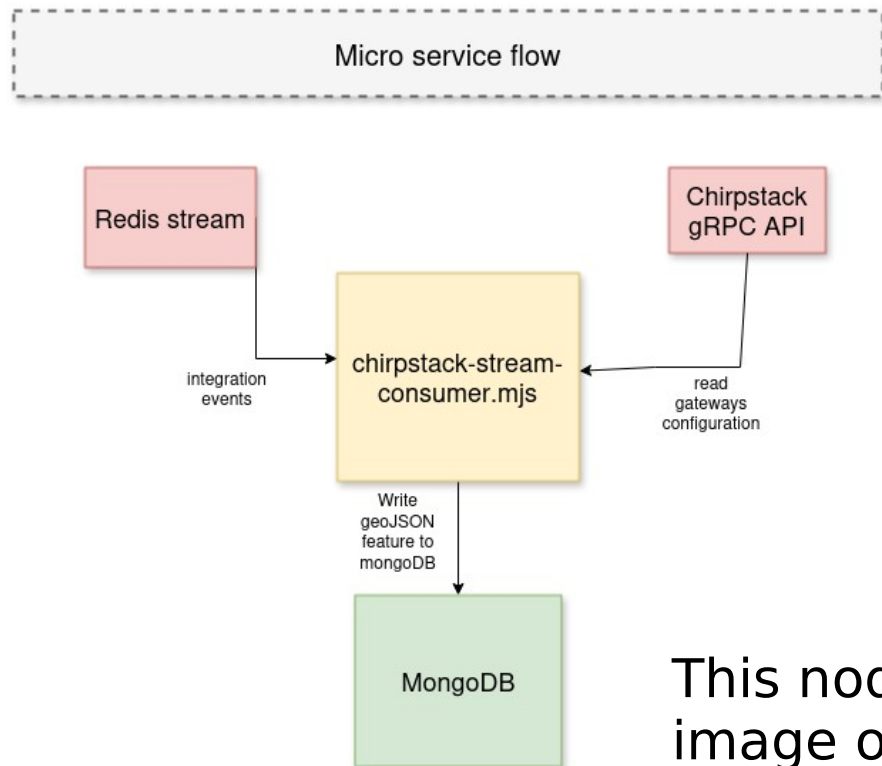| Dependency	Usage	Possible chart	Optional
PostGreSQL	Use by Chirpstack and keycloak	bitnami/postgresql	NO
Redis	Used by Chirpstack	bitnami/redis	No
MongoDB	Used by the Chirpstack mongoDB integration	bitnami/mongodb	No
Keycloak	Used by Chirpstack to provide authentication	bitnami/keycloak	Yes

TL;TR

```
helm install my-release oci://harbor.portal.kalisio.com/kalisio/helm/chirpstack
```

Configuration is required to connect the different components together. There is also optionnal configuration to toggle some feature like fecthing the lorawan devices or enable the REST API.

Check the default values with this command:

```
helm show values oci://harbor.portal.kalisio.com/kalisio/helm/chirpstack
```
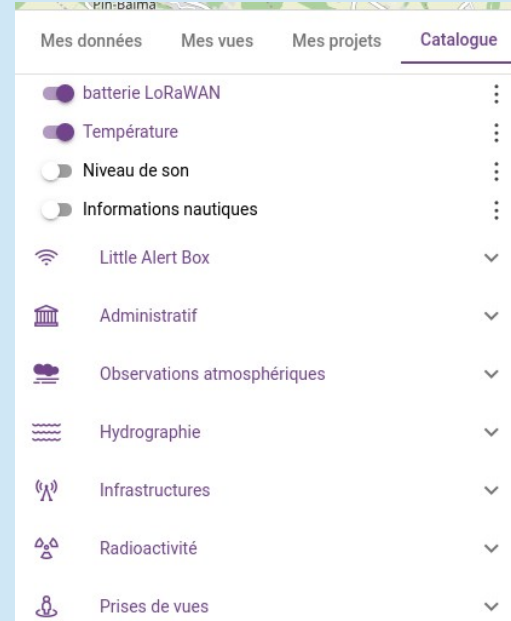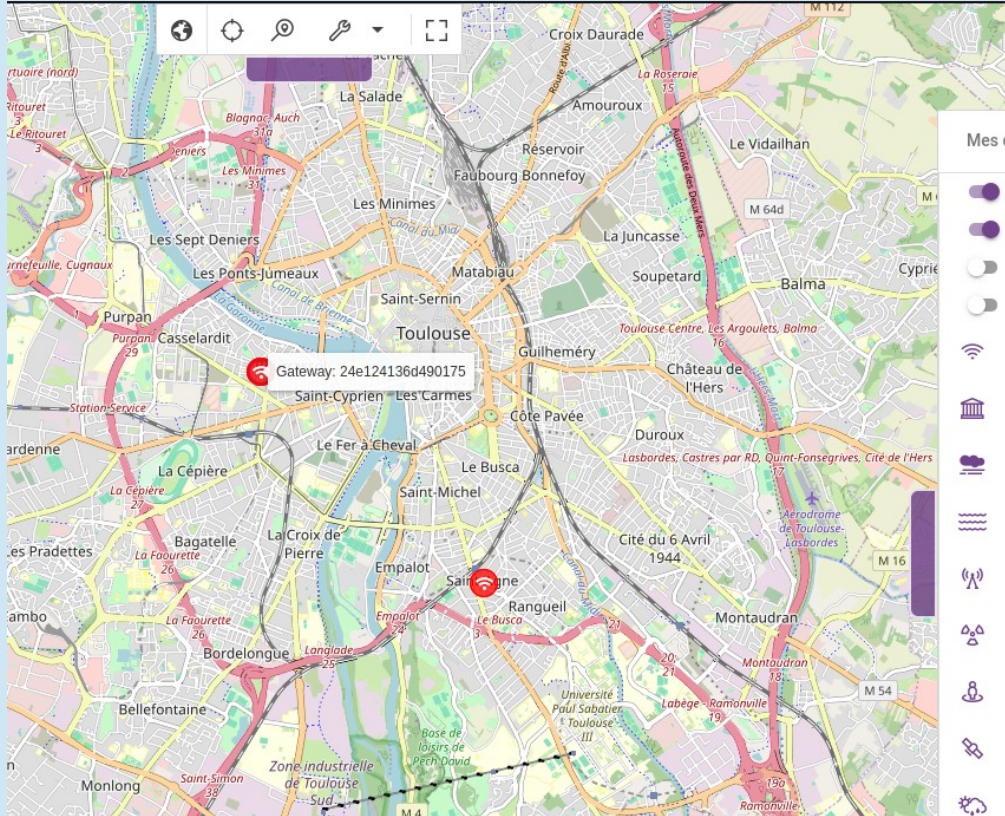
Chirpstack mongoDB integration

Micro service flow

Redis stream → chirpstack-stream-consumer.mjs ← Chirpstack gRPC API

integration events

read gateways configuration

Write geoJSON feature to mongoDB

MongoDB

This node micro-service is provided as a docker image on Kalisio harbor (**kalisio/chirpstack-mongodb-integration:latest**)

Results

- Gateway overview
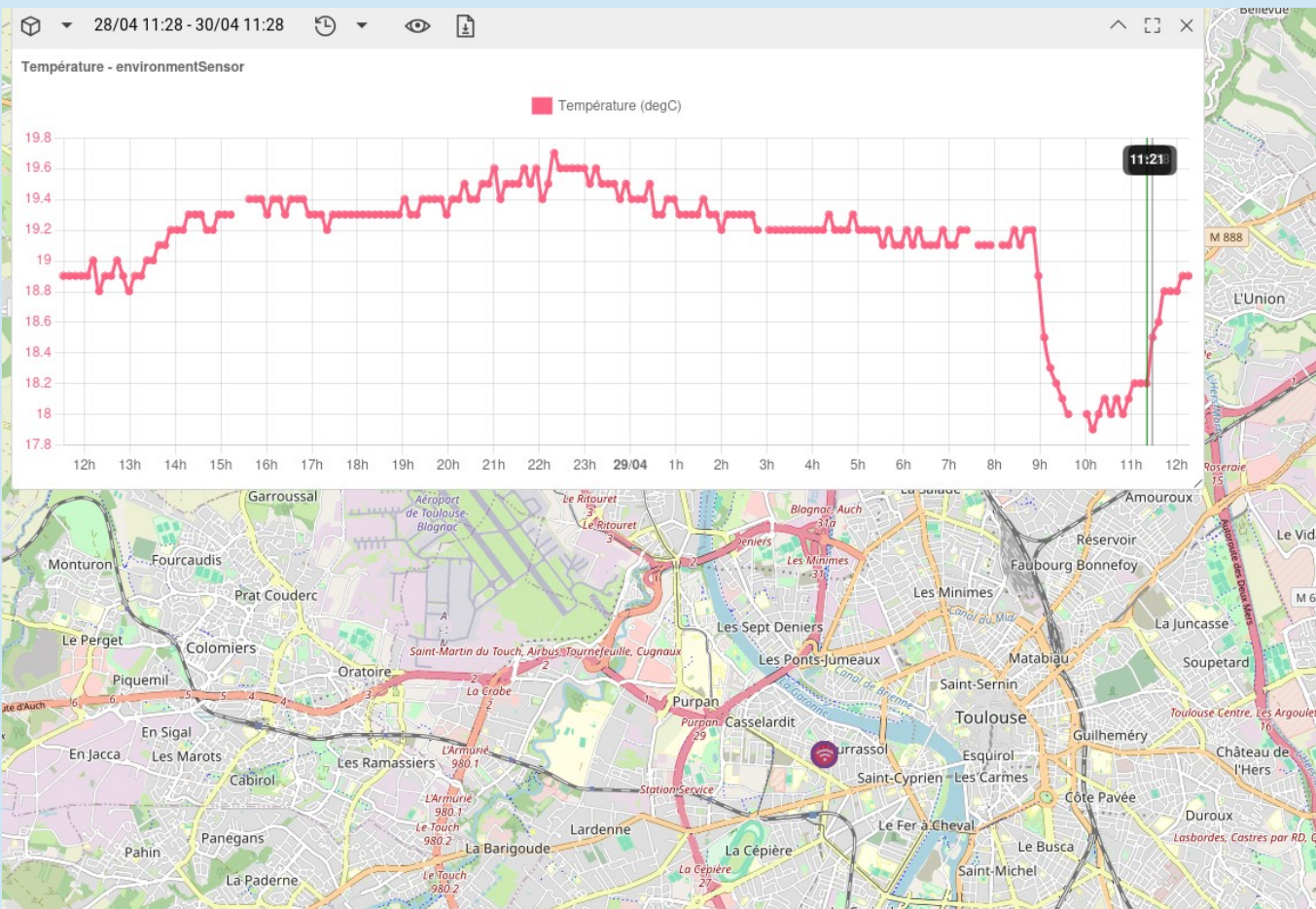- Layers specific to lorawan in the catalog

Result

Chart with a possibility to display the measurement

expLoRa: Improvements and future work

- **Helm chart:** moving the mongoDB integration to a specific chart to foster use of the chart even without the mongoDB integration

- **MongoDB integration:**

  - Add support for all events type (Join, Log, Status). Only Up is currently supported

  - Testing a implementation for Downlink events (send commands to devices)

  - Management of chirpstack tenants

  - A more complete roadmap is available

Thank you for your attention

Contribution are welcomed on the github Chirpstack-helm :
https://github.com/romainjacquet/chirpstack-helmChirpstack-mongodb-integration :
https://github.com/romainjacquet/chirpstack-mongodb-integration

Questions : https://kalisio.com/contact