



Getting started with LoRaWAN

Orne Brocaar - info@brocaar.com - www.chirpstack.io

Orne Brocaar

Amsterdam based software engineer

London

Brazil

Golang Amsterdam meetup group (1k+ members)

ChirpStack (then known as LoRa Server) since 2015

What is
LoRaWAN?

LoRaWAN

LoRa vs LoRaWAN

Star-of-stars topology

Multiple data-rates / spreading factors

Long range

Low power

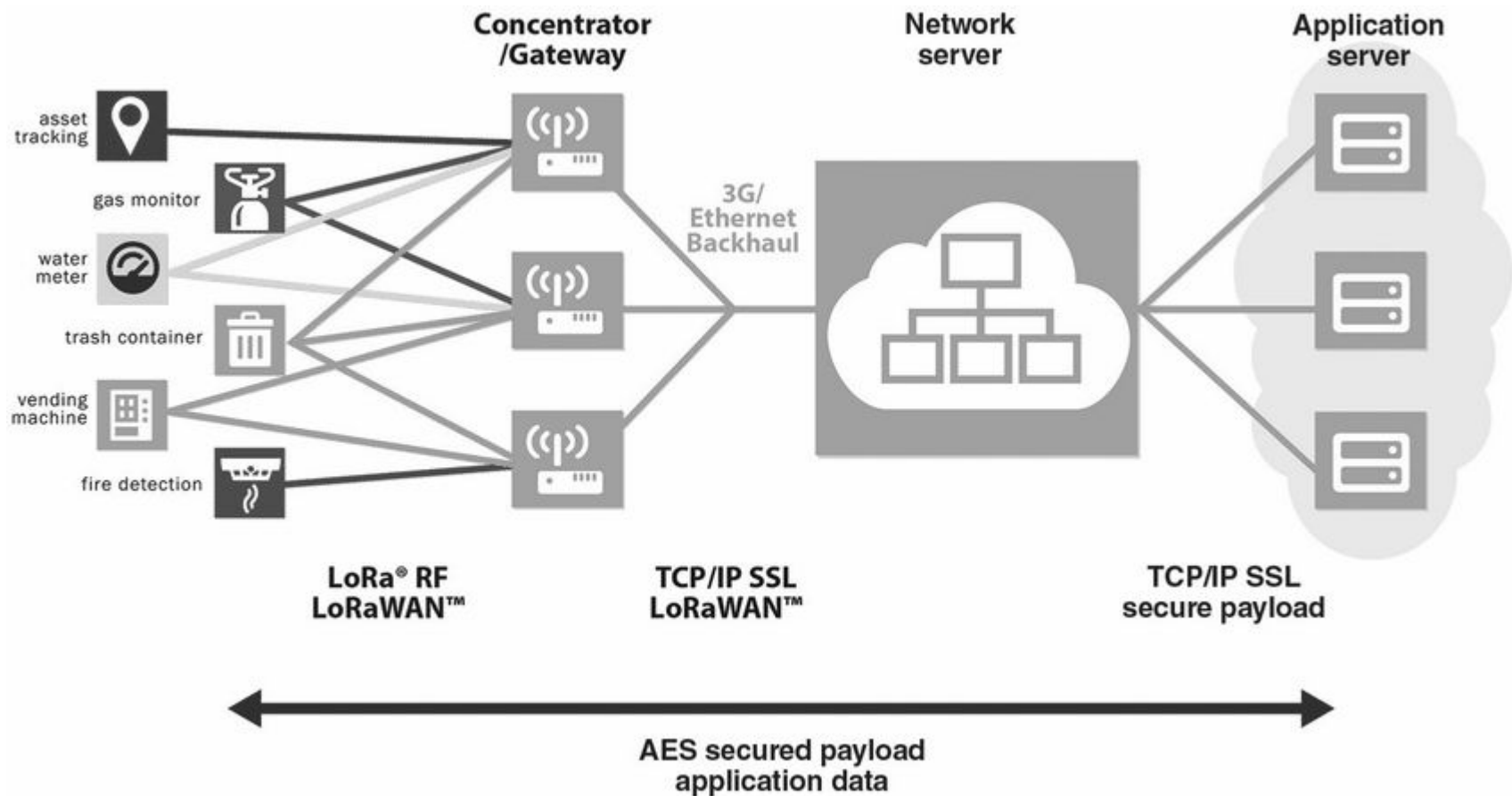
LoRaWAN components

Devices

Gateways

Network Server

Application Server



Why LoRaWAN?

License free ISM band

Inexpensive hardware

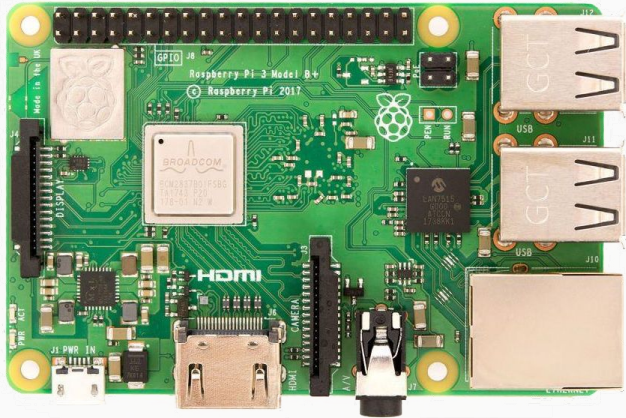
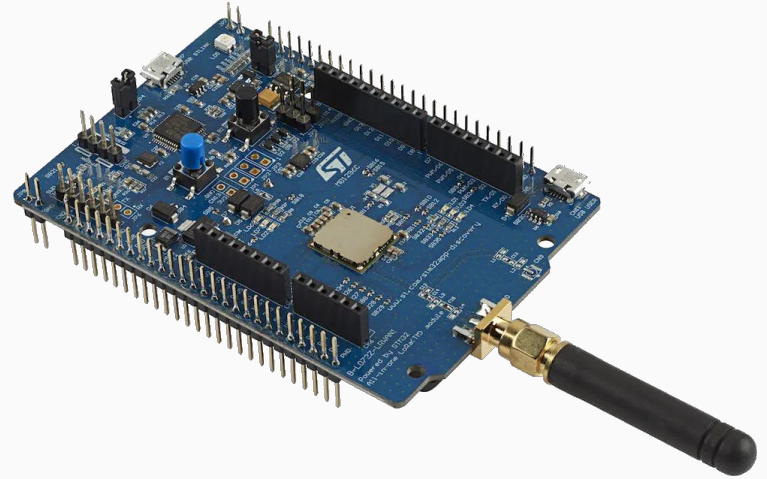
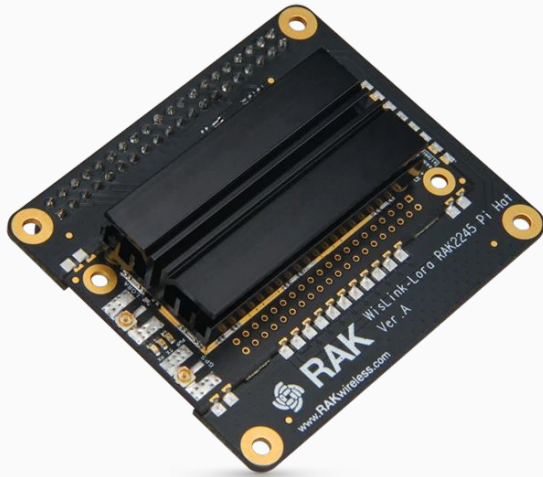
Private networks within own secure environment

You can start your network today!

What do you
need?



+ LoRaWAN
Network Server



 ChirpStack

The ChirpStack project

Three main components

ChirpStack Gateway Bridge

Connect your gateway over MQTT

ChirpStack Network Server

LoRaWAN Network Server

ChirpStack Application Server

LoRaWAN Application Server

Use them together as a complete solution or mix and match and embed them into your own platform or products.

localhost

ChirpStack

Search organization, application, gateway or device

admin

Network-servers

Gateway-profiles

Organizations

All users

chirpstack

Org. settings

Org. users

Service-profiles

Device-profiles

Gateways

Applications

Multicast-groups

Applications

+ CREATE

ID	Name	Service-profile	Description
1	air-quality	EU868	Air quality application
2	parking-sensor	EU868	Parking sensor application
3	weather-station	EU868	Weather station application

Rows per page: 10 1-3 of 3

Why ChirpStack?

Easy to get started

Scale up as you go

Full visibility of the data flow

Mix and match components

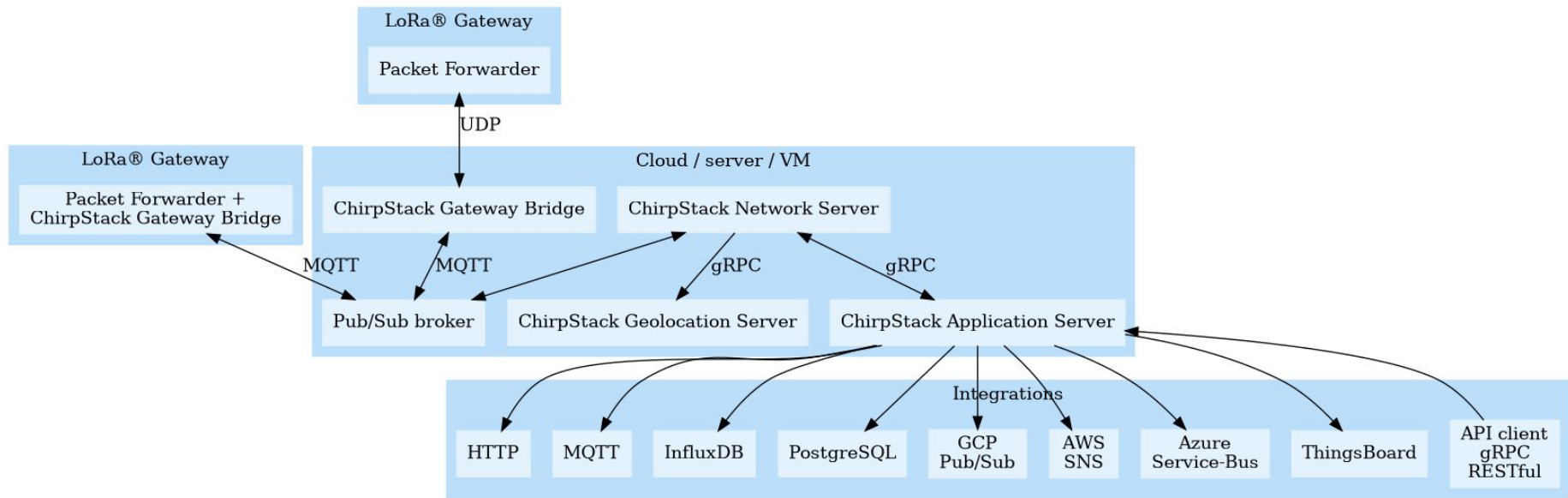
Open Source (MIT)

Used worldwide

Thousands of downloads and visitors per month



Architecture



Scaling up

Horizontal scaling

Pub/Sub broker

Google Cloud IoT Core + Pub/Sub

Azure IoT Hub + Service Bus

RabbitMQ / AMQP

Features

LoRaWAN 1.0.x and 1.1.0

Class A / B / C

Multicast

Adaptive data-rate

Device (re)configuration

Join Server support

All LoRaWAN regions supported

Multi-tenant web-interface

API endpoints for integration

Firmware Update Over The Air (experimental)

Debugging features

Many (cloud) integrations

Getting started

www.chirpstack.io

Debian, Ubuntu, Centos and RedHat packages

Binary “.tar.gz” packages

Docker images

Guides and tutorials

Community forum

Run it on your gateway!

ChirpStack Gateway OS

Raspberry Pi

Most concentrator shield supported

“base” and “full” images

VPN (WireGuard)

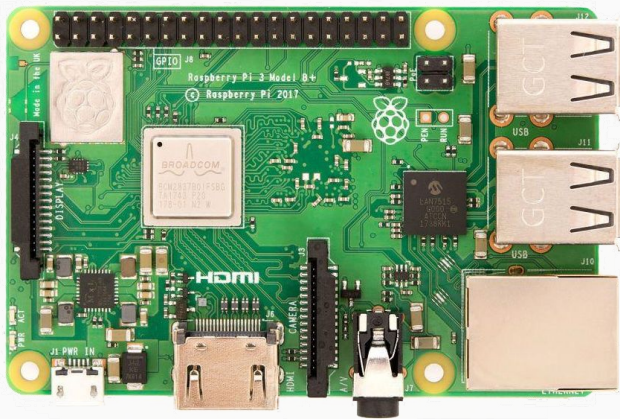
Firmware update

Recovery partition

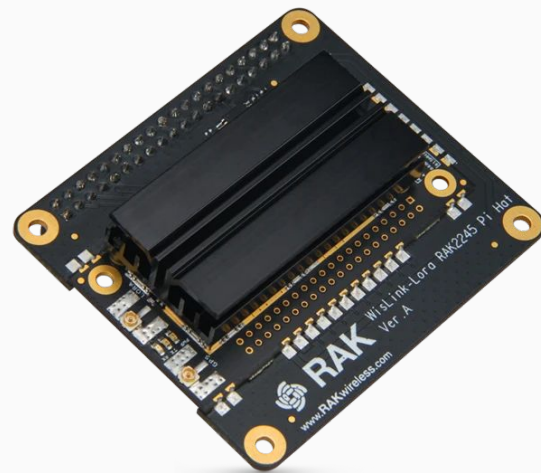
Data persistence (configuration)

Flash it on a sdcard and you are ready to go!

Demo time!



Raspberry Pi 3 B+



RAK2245 RPi HAT Edition



Gateway OS "full"

Questions?

Orne Brocaar - info@brocaar.com - www.chirpstack.io

