Getting started with LoRaWAN
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Orne Brocaar

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London

Brazil

Golang Amsterdam meetup group (1k+ members)

ChirpStack (then known as LoRa Server) since 2015
What is 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?
+ Kerlink + LoRaWAN Network Server
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.
## Applications

<table>
<thead>
<tr>
<th>ID</th>
<th>Name</th>
<th>Service-profile</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>air-quality</td>
<td>EU868</td>
<td>Air quality application</td>
</tr>
<tr>
<td>2</td>
<td>parking-sensor</td>
<td>EU868</td>
<td>Parking sensor application</td>
</tr>
<tr>
<td>3</td>
<td>weather-station</td>
<td>EUB68</td>
<td>Weather station application</td>
</tr>
</tbody>
</table>
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-rata
- 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  
ChirpStack  
Gateway OS “full”
Questions?

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