1 2 3 February

AMSTERDAM

workshop

Build your own Gateway with RAK831 and RESIN.IO

Workshops start at:

- 10:45
- 13:30
- 15:30

THE THINGS NETWORK

LoRaWAN™

THE THINGS CONFERENCE

Workshop
Build your own Gateway with RAK831 and RESIN.IO

Your trainers:

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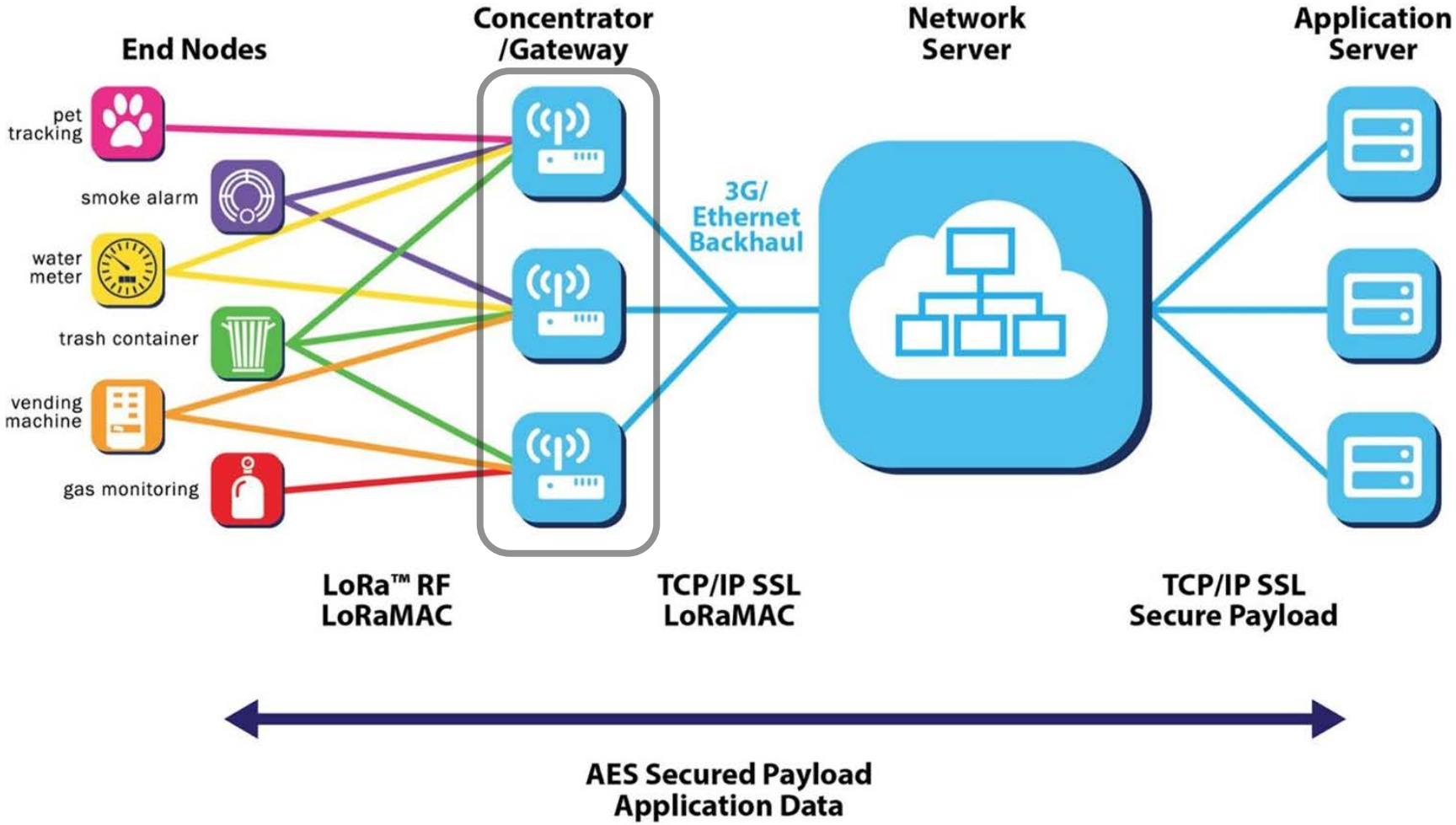
01-02-2018

Agenda

- Brief LoRaWAN Gateways overview
- RESIN.IO introduction
- The real thing - Setup your own RAK831 gateway *(self-paced)*
- Demo of advanced RESION.IO features

LoRaWAN Gateways overview

LoRaWAN Gateways



Gateway function

- Gateways receive LoRa modulated data packets conforming to the LoRaWAN specification
- Add metadata (frequency, spreading factor, SNR, RSSI, (wall) time received, timestamp)
- Forward to back-end
- Receive packets with metadata (frequency, spreading factor, timestamp andof course data)
- Forward to radio at the appropriate time for transmission (JIT)

Gateway hardware

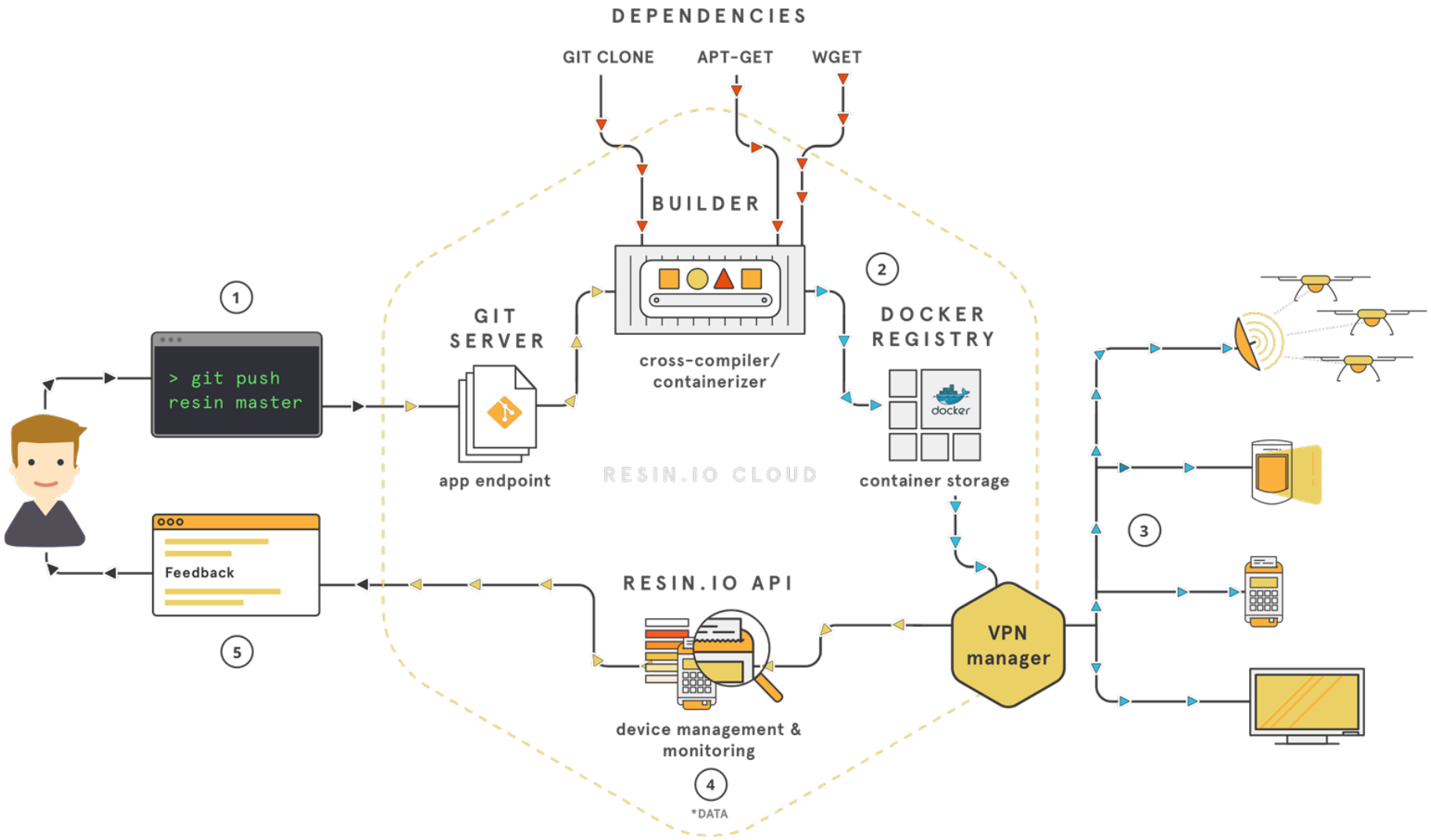
- Gateways cover at least 8 channels.
- Most gateways are based on embedded Linux system, the Things Network Gateway being a notable exception.
- All gateways require a decent antenna and proper antenna placement!
- Don’t expect 15 km range from an indoor gateway with ½ wave whip antenna in a city

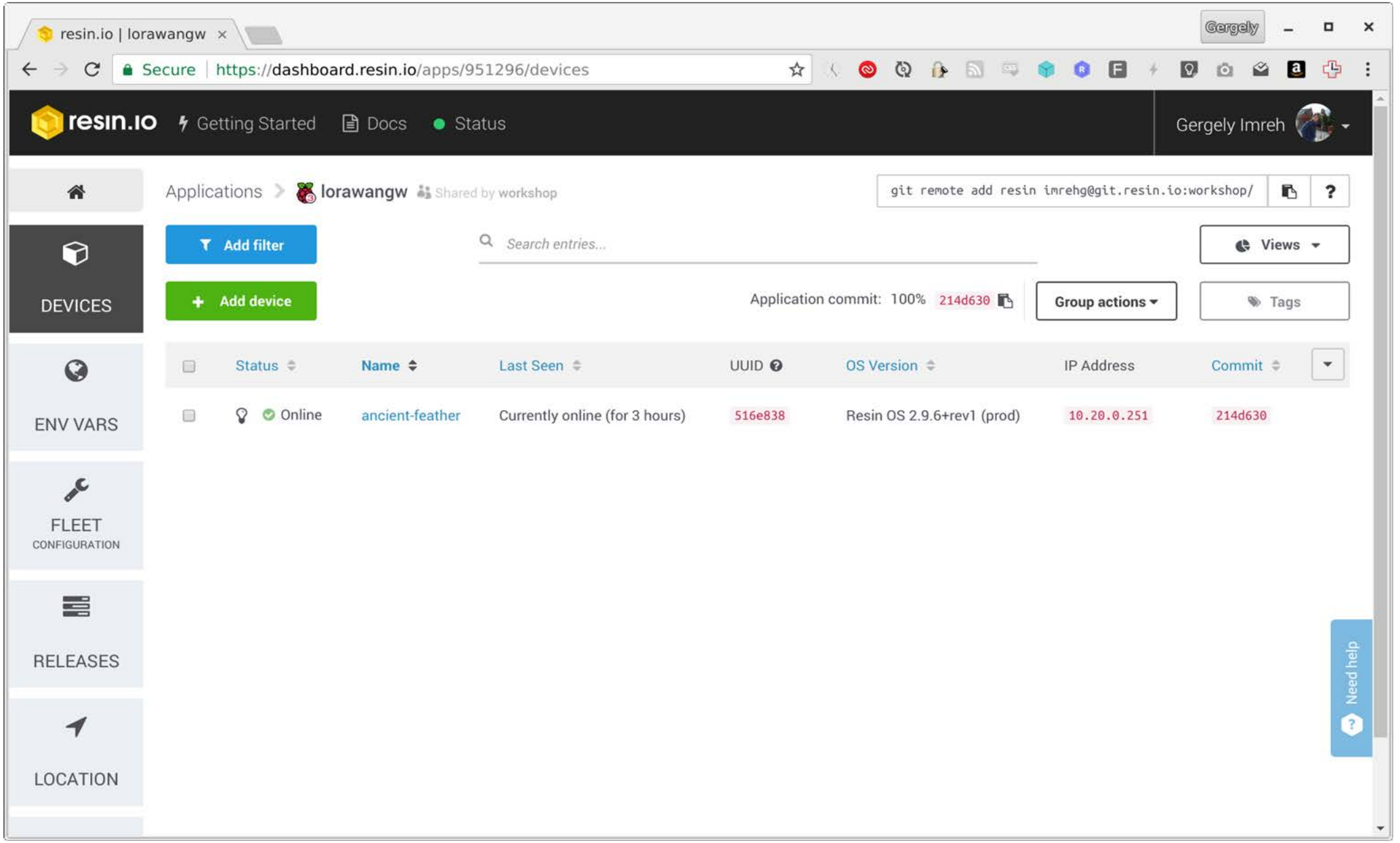
Gateway software

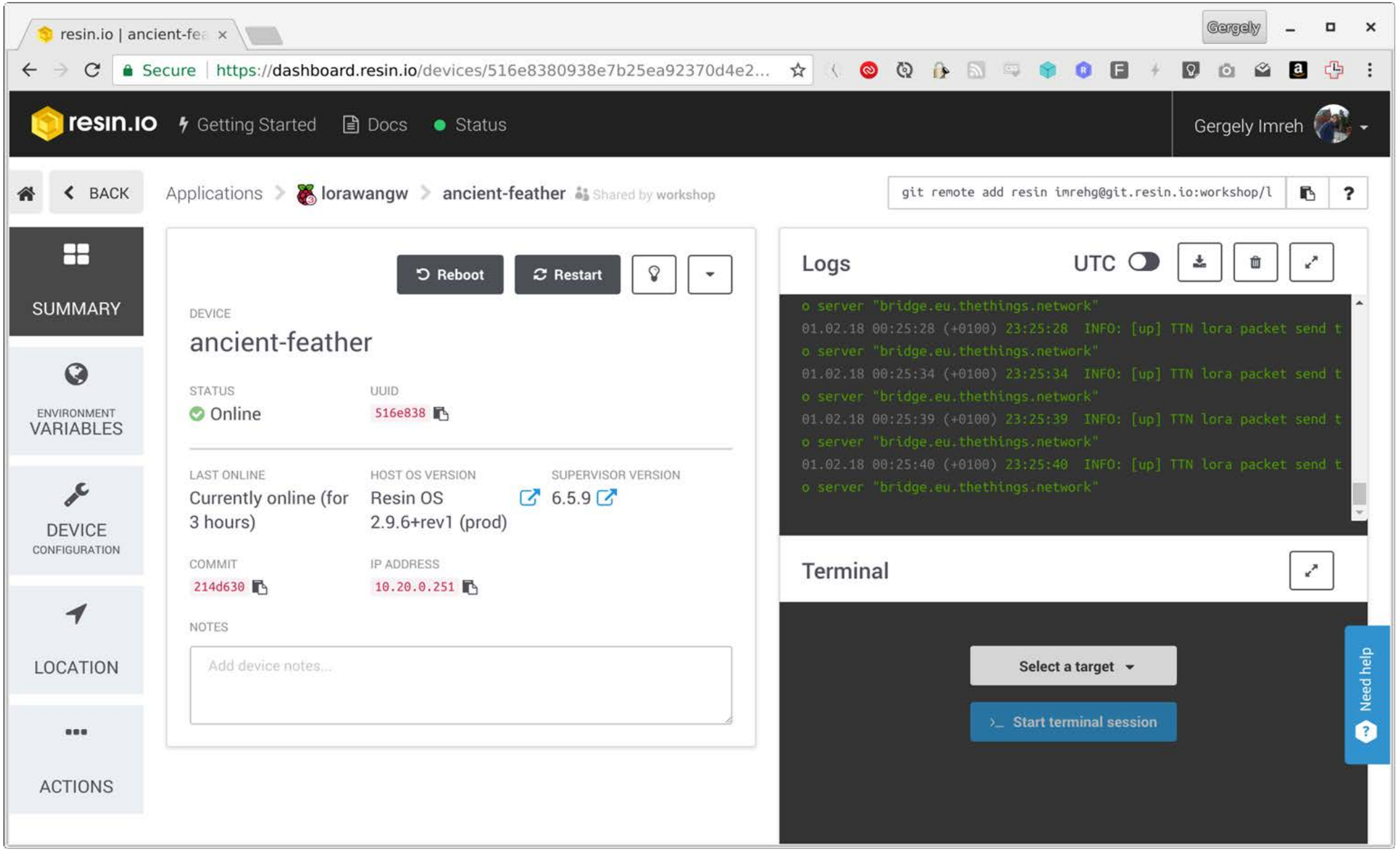
- Gateway requires a ‘packet forwarder’ that receives the data and forwards it (from radio to network and v.v.)
- Some forwarders allow connection to multiple backends, take care when using as this might result in airtime restriction violations!
- Packet forwarders are dumb:
  - they do **not** filter packets in any way (a gateway does not know which packets are valid within the network)
  - they can not decrypt the data (keys are not known)

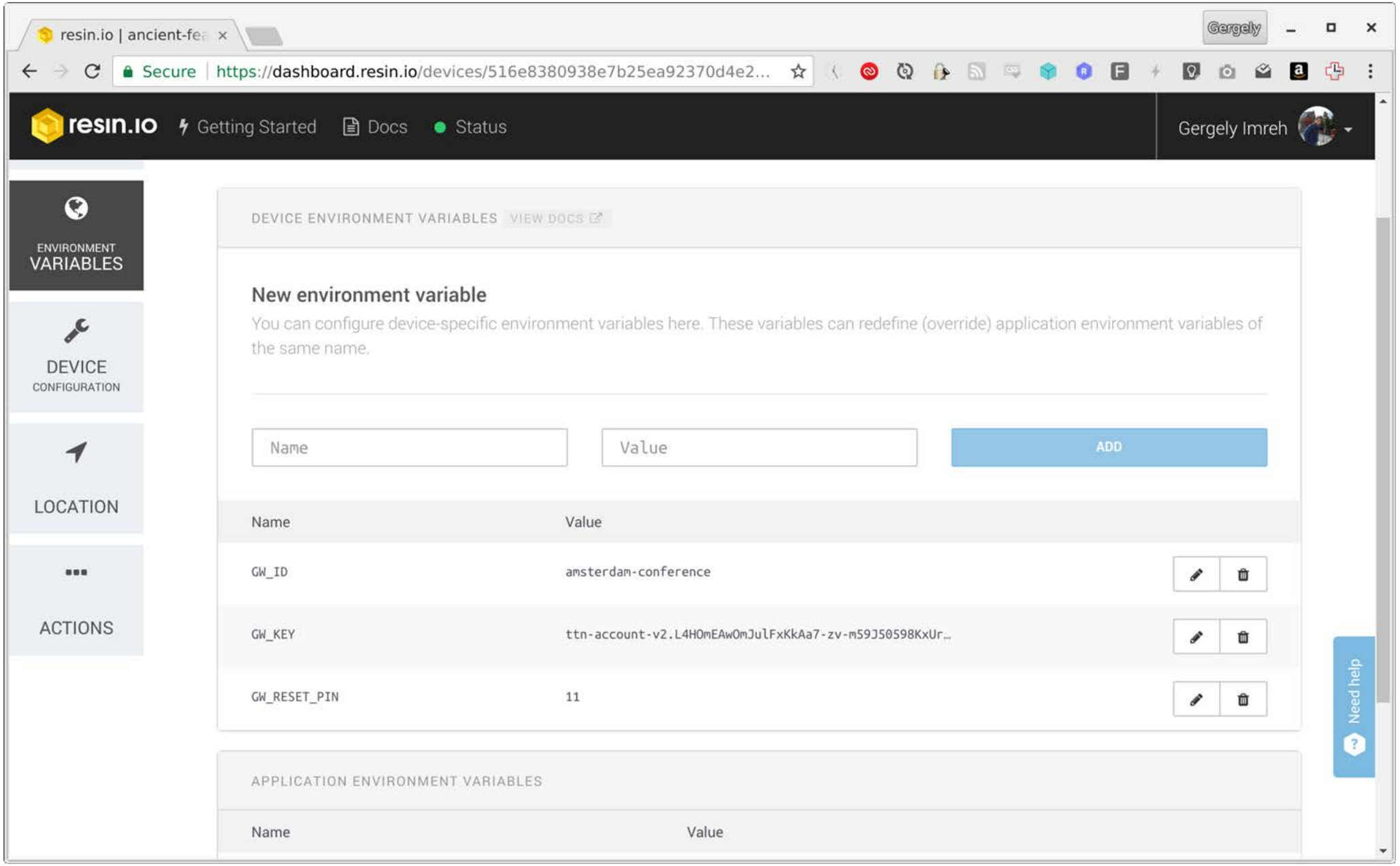
resin.io introduction

resin.io components




resin.io | lorawangw
Gergely
Secure
https://dashboard.resin.io/apps/951296/devices
resin.io
Getting Started
Docs
Status
Gergely Imreh
Applications
lorawangw
Shared by workshop
git remote add resin imrehg@git.resin.io:workshop/
Add filter
Search entries...
Views
Add device
Application commit: 100% 214d630
Group actions
Tags
DEVICES
ENV VARS
FLEET
CONFIGURATION
RELEASES
LOCATION
Status
Name
Last Seen
UUID
OS Version
IP Address
Commit
Online
ancient-feather
Currently online (for 3 hours)
516e838
Resin OS 2.9.6+rev1 (prod)
10.20.0.251
214d630
Need help


resin.io | ancient-fea
Gergely
Secure
https://dashboard.resin.io/devices/516e8380938e7b25ea92370d4e2...
resin.io
Getting Started
Docs
Status
Gergely Imreh
BACK
Applications
lorawangw
ancient-feather
Shared by workshop
git remote add resin imrehg@git.resin.io:workshop/l
SUMMARY
ENVIRONMENT VARIABLES
DEVICE CONFIGURATION
LOCATION
ACTIONS
Reboot
Restart
DEVICE
ancient-feather
STATUS
Online
UUID
516e838
LAST ONLINE
Currently online (for 3 hours)
HOST OS VERSION
Resin OS 2.9.6+rev1 (prod)
SUPERVISOR VERSION
6.5.9
COMMIT
214d630
IP ADDRESS
10.20.0.251
NOTES
Add device notes...
Logs
UTC
o server "bridge.eu.thethings.network"
01.02.18 00:25:28 (+0100) 23:25:28 INFO: [up] TTN lora packet send t
o server "bridge.eu.thethings.network"
01.02.18 00:25:34 (+0100) 23:25:34 INFO: [up] TTN lora packet send t
o server "bridge.eu.thethings.network"
01.02.18 00:25:39 (+0100) 23:25:39 INFO: [up] TTN lora packet send t
o server "bridge.eu.thethings.network"
01.02.18 00:25:40 (+0100) 23:25:40 INFO: [up] TTN lora packet send t
o server "bridge.eu.thethings.network"
Terminal
Select a target
Start terminal session
Need help


resin.io | ancient-fe
Gergely
Secure
https://dashboard.resin.io/devices/516e8380938e7b25ea92370d4e2...
resin.io
Getting Started
Docs
Status
Gergely Imreh
ENVIRONMENT VARIABLES
DEVICE CONFIGURATION
LOCATION
ACTIONS
DEVICE ENVIRONMENT VARIABLES
VIEW DOCS
New environment variable
You can configure device-specific environment variables here. These variables can redefine (override) application environment variables of the same name.
Name
Value
ADD
Name
Value
GW_ID
amsterdam-conference
GW_KEY
ttn-account-v2.L4HOmEAwOmJulFxKkAa7-zv-m59J50598KxUr…
GW_RESET_PIN
11
Need help
APPLICATION ENVIRONMENT VARIABLES
Name
Value

git push resin master

Setup your own RAK831 gateway

Workshop Steps *(self-paced)*

- Install required tools / create accounts
- Flash resin.io image to SD card
- Get prebuild software template
- Push template to resin.io to have it build the software
- Wait for gateway to get the software and ‘activate’

Workshop URL

https://github.com/kersing/gateway-workshop

References for gateway software

For Linux based systems there are a couple of options:

- Semtech reference implementation
  https://github.com/Lora-net/lora_gateway
- TTN packet forwarder *(development frozen)*
  https://github.com/Lora-net/lora_gateway
- Poly Packet forwarder
  https://github.com/devlaam/packet_forwarder
- Multi Protocol Packet forwarder
  https://github.com/kersing/packet_forwarder

Questions?

Thanks for participating in the workshop. Have a great conference!