workshop

Build your own Gateway with RAK831 and RESIN.IO

Workshops start at:
• 10:45
• 13:30
• 15:30
Workshop
Build your own Gateway with RAK831 and RESIN.IO

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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 and of 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 components
New environment variable
You can configure device-specific environment variables here. These variables can redefine (override) application environment variables of the same name.

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gw_ID</td>
<td>amsterdan-conference</td>
</tr>
<tr>
<td>Gw_KEY</td>
<td>ttn-account-v2.1480EmEwwM3ulFdxKAA7.7y-m593585598KxjUr_</td>
</tr>
<tr>
<td>Gw_RESET_PIN</td>
<td>11</td>
</tr>
</tbody>
</table>
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!