LoRaWAN Gateways
Installation & Network Considerations

Sebastian Büttrich, IT University of Copenhagen, 201912

LoRaWAN / Architecture

NETWORK
SERVER

APPLICATION
SERVER
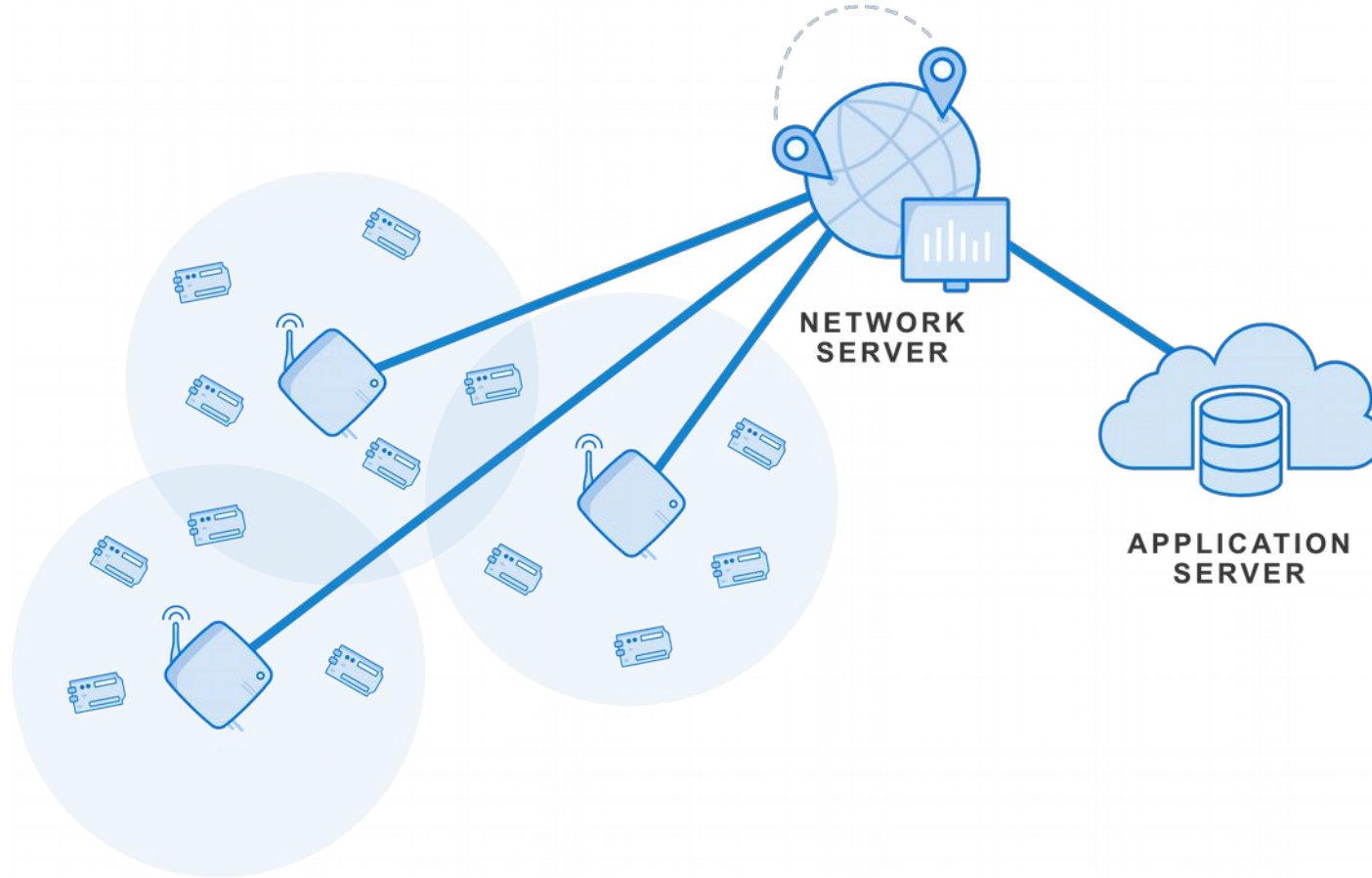
LoRaWAN Gateways / Intro

Gateways communicate with device/nodes via LoRa and with Network servers via UDP and TCP/IP on the other side

NETWORK SERVER

APPLICATION SERVER
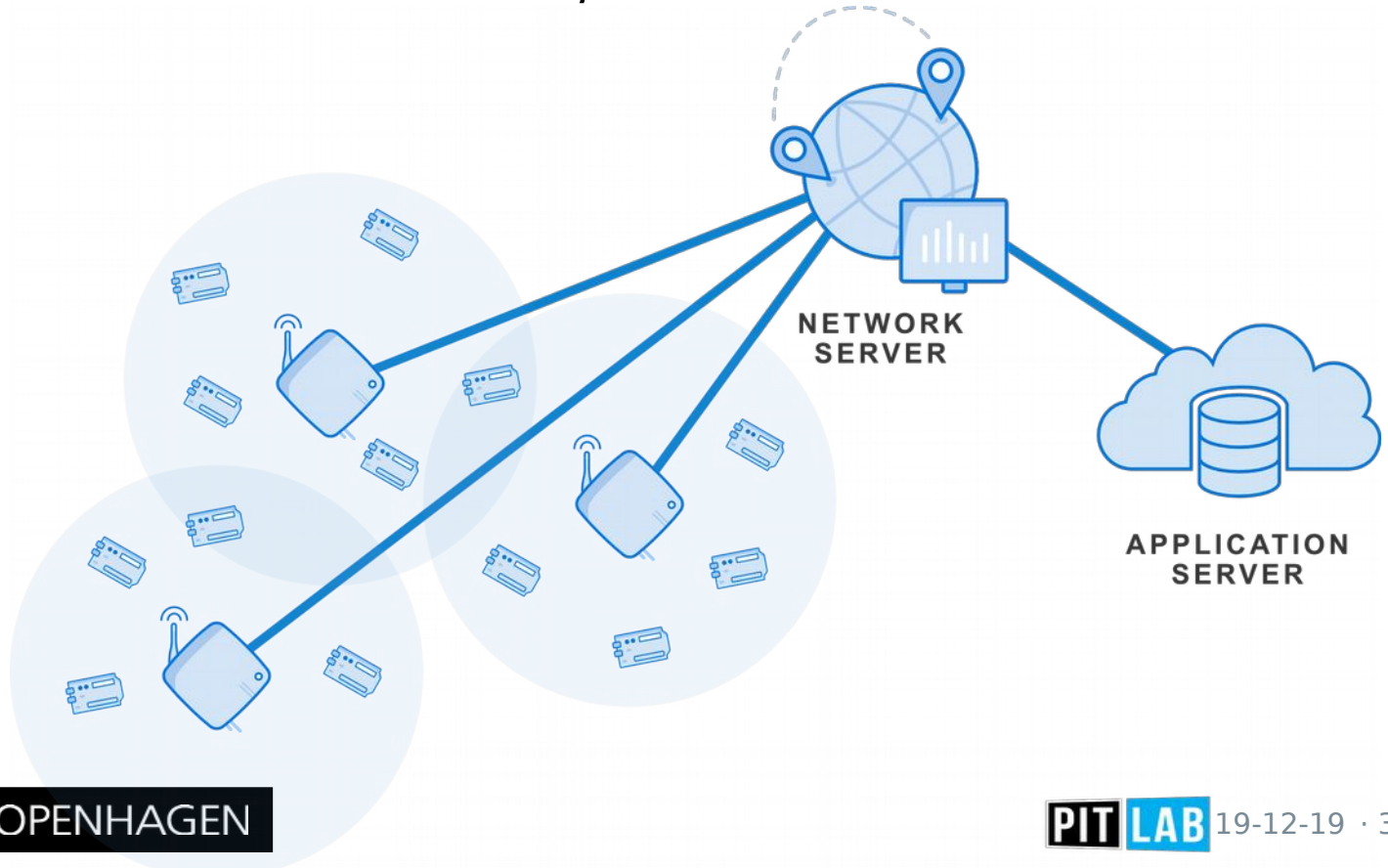
LoRaWAN Gateways / Criteria

- Indoor / Outdoor
- Full 8-channel (or even 16-channel) vs 1-channel (NOT recommended)
- Frequency: 433 / 868 / 915 / 923 … Mhz
- Antenna: internal / external
- Firmware/Operating System
- Management
- Price

LoRaWAN Gateways / Price

- Entry level – simple indoor gateway (e.g. TTIG)

    ~ EUR 70

- Raspberry Pi based (DIY) gateways – (e.g. IMST, RAK, ..)

    ~ EUR 150

- Mid-price outdoor (RAK, Ursalink, Multitech, Laird, Lorix, ..)

    ~ EUR 200 – 600

- Carrier grade / heavy duty outdoor gateways (e.g. Kerlink)

    ~ EUR 800

- High-end with geolocation capabilities

    ~ EUR 1500

LoRaWAN Gateways / Price

- Local / Regional taxes, fees and bribes apply

- Consider new ways of procurement (NRENs? New distributors?)

- Prices currently falling fast, as LoRaWAN becomes more mainstream (home gateways)

LoRaWAN Gateways / Physical Install / 1

- Typically as high as possible (mast, building, tower) for long range

- Unobstructed view, if possible

- Consider devices near the gateway, antenna patterns

www.jpole-antenna.com
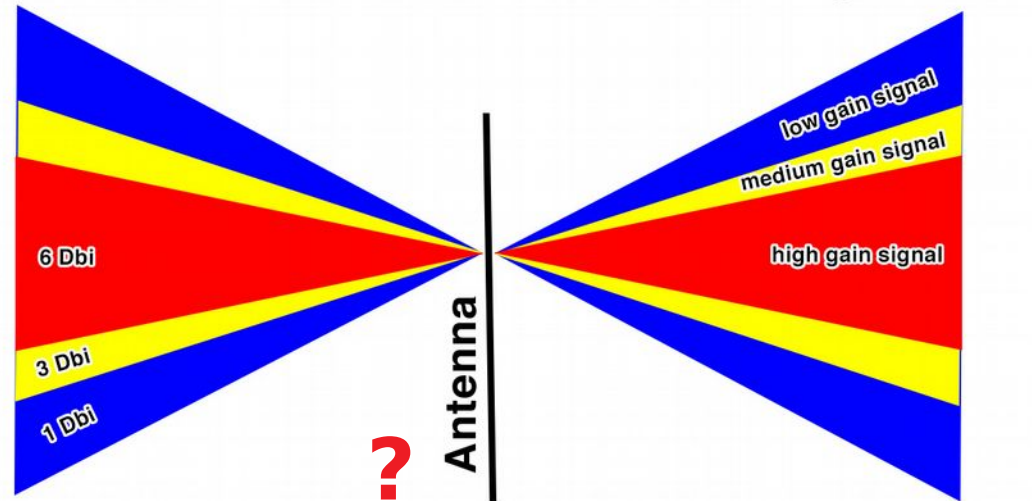
LoRaWAN Gateways / Physical Install / 2

- Keep distance from metal structures, e.g. tower
- Keep distance from other radio devices (e.g. mobile), GPS antennas – minimum 20 cm, more is better
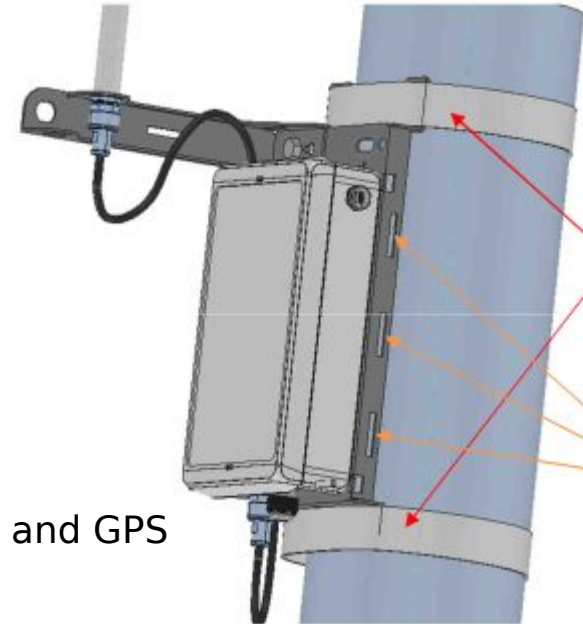
Picture: Kerlink mount securing antenna distance from tower and GPS

LoRaWAN Gateways / Physical Install / 3

- You can not always avoid other infrastructure,

  but try to

  stay clear

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LoRaWAN Gateways / Network / 1

- Gateways use **Ethernet,** WiFi, or Cellular to connect to backend (router, network server)
- Gateways are infrastructure and require stable and well-managed backhaul
- Ethernet connection to a stable campus backbone or such is highly recommended
- Location on the core network less important, but keep it secure and managable

LoRaWAN Gateways / Network / 2

- May or may not work on typical home WiFi router (depending on NAT, port forwarding, ..)
- Likely to not work well on 4G modems ...
- Reasons:
  - typical consumer connections do not offer routed path back to gateway – but gateway needs to be reachable via UDP
  - there may be NAT (outside your control)
  - there may be firewalls (outside your control)

LoRaWAN Gateways / Network / 3

- A minimum set of ports needs to be open

- LoRaWAN gateways communicate on ports …

  udp 1700   for most packet forwarders

                            gw <=> backend

  tcp 1883 / 8883 MQTT ports (for some packet forwarders)

  tcp 22   for remote admin

- + optional **vendor specific management ports**

LoRaWAN Gateways / Packet Forwarder

- Packet forwarders run on gateway, translate between non-IP LoRa side and IP based backend