

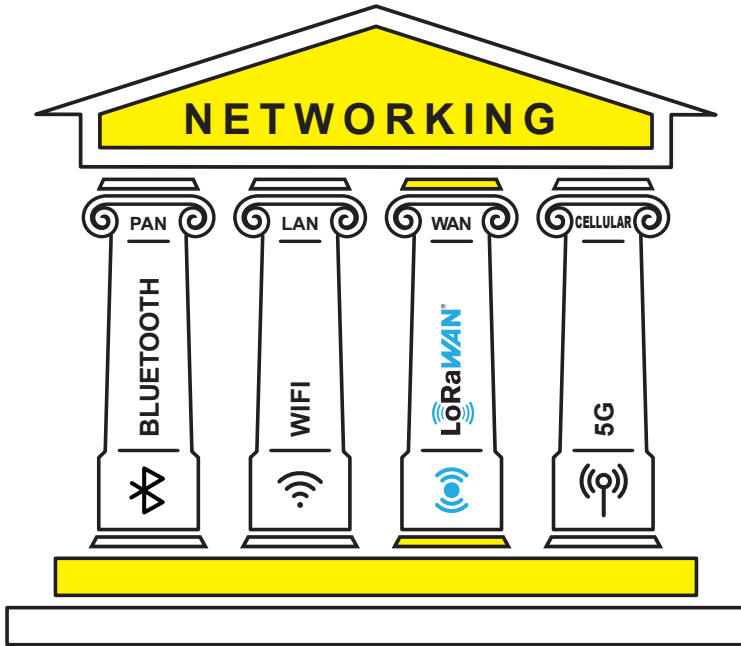
A silhouette of a person wearing a hat and a jacket, standing on a rocky cliff edge and looking out over a vast landscape. The background is a night sky with a prominent blue aurora borealis and a starry sky with the Milky Way galaxy visible. The foreground shows a cityscape with lights reflecting on a body of water.

THE **POWER** OF
LoRaWAN

INTRODUCTION TO LORAWAN

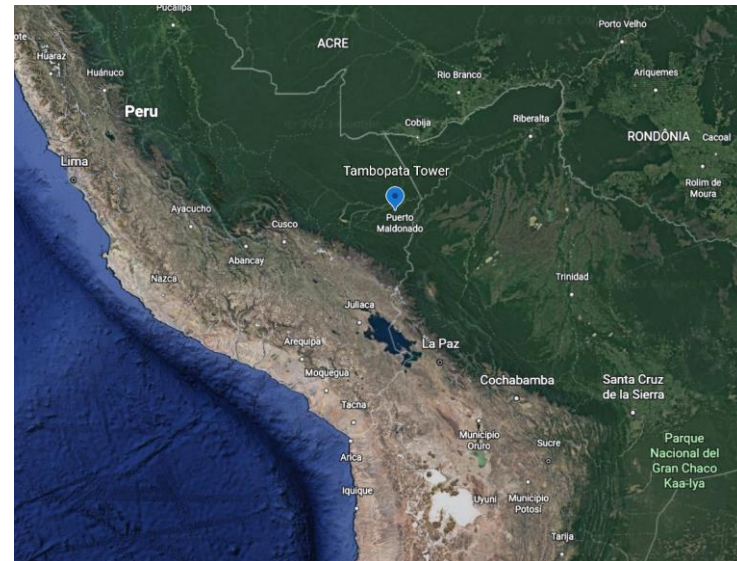
Presented by Jan Sonntag
September 09, 2024

4 PILLARS OF NETWORKING

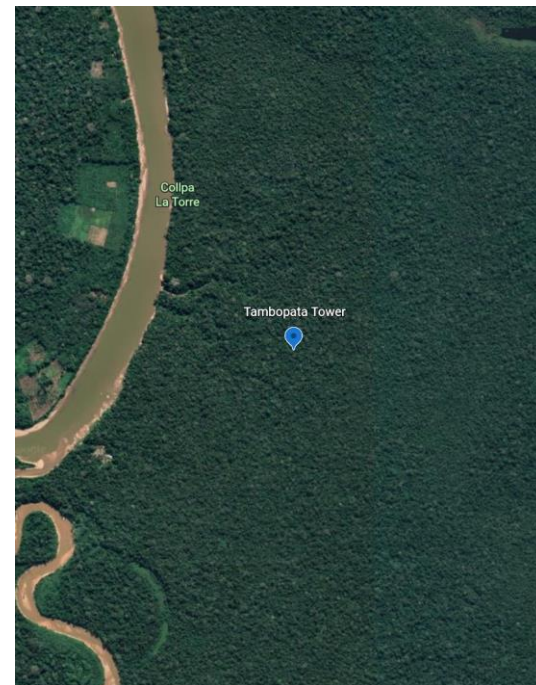


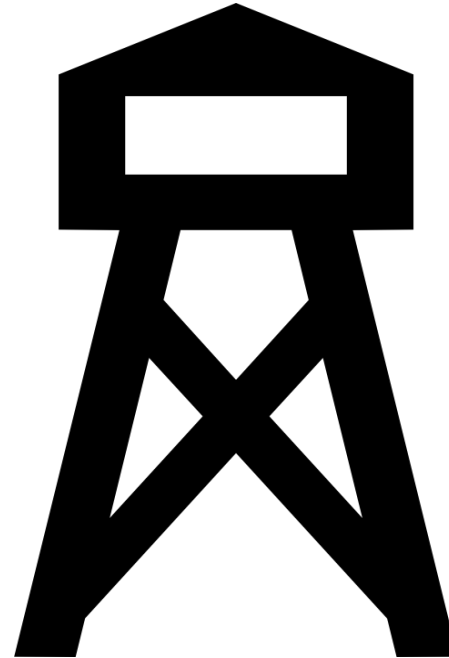
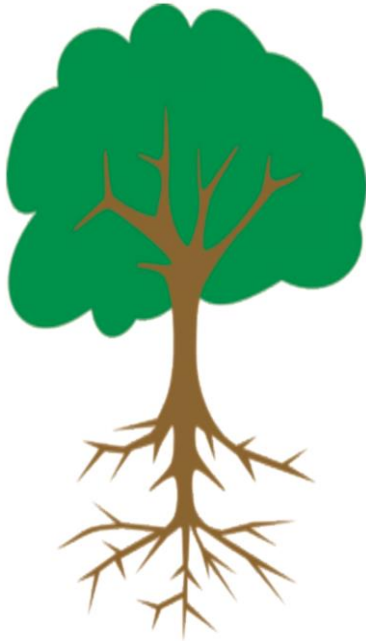
The addressable IoT market is served by 4 types of networks, including:

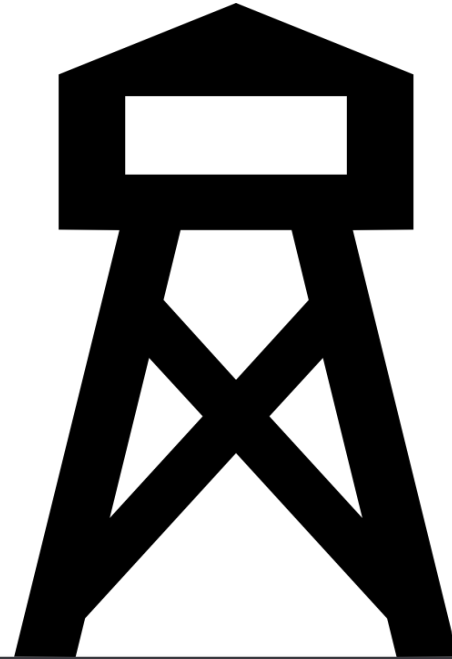
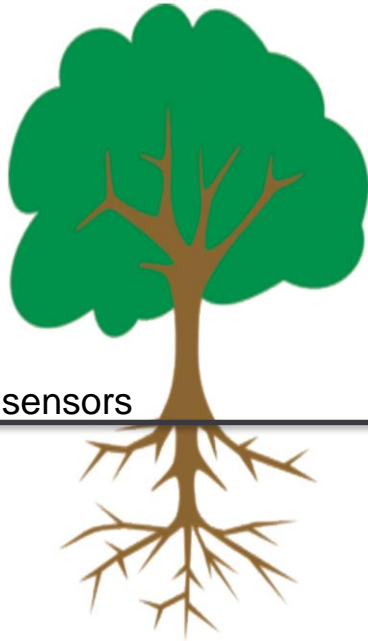
- Personal Area Networks (PAN)
- Local Area Networks (LAN)
- Wide Area Networks (WAN)
- Cellular







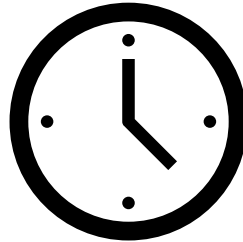




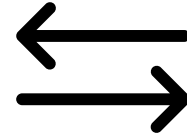
Ground level sensors



Low cost



Low maintenance



High flexibility

LAN



Short Range, Unlicensed
<100 mbps

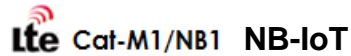
Great For:

- Short range communications
- Moderately high data-rate transmissions

Weaknesses:

- Short battery life due to higher data rates
- Short range [30-100 ft]
- Poor penetration ability

CELLULAR



Long Range, Licensed
=>100 mbps

Great For:

- Long range communications
- High data-rate transmissions
- Advanced features for routing, multicast, firmware broadcast, etc.
- Works well indoors and in dense urban areas

Weaknesses:

- Short battery life when using high data rates or always on status
- High costs due to infrastructure requirements
- Service model only [high ongoing monthly subscription fees]
- Limited to no availability in rural, ocean & other settings

The Power of LoRaWAN®

LPWAN



Long Range, Unlicensed
0.3 kbps to 50 kbps

Great For:

- Short or long range [>10 miles]
- Longest battery life [10 – 15+ years]
- Low cost of infrastructure implementation, easy to add nodes
- Flexibility: public or private networks, capex or service model available
- Deep penetration inside home/buildings and underground
- Allows for roaming, FUOTA
- Bi-directional (Full Duplex capability)

Less Effective For:

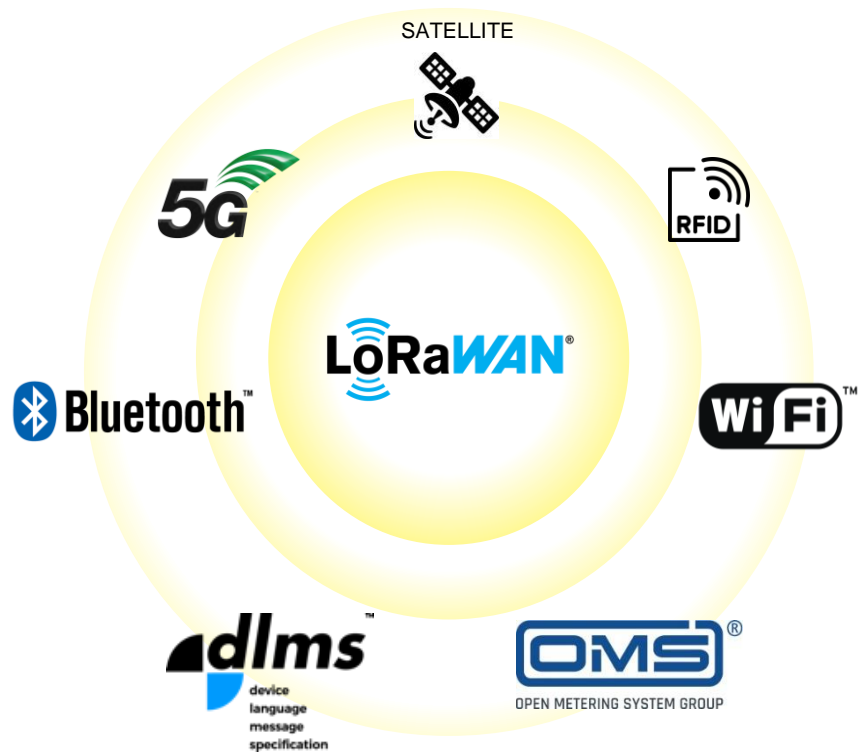
- High data-rate transmissions

“No single communication technology can support all IoT use cases.”

--Donna Moore
Chairwoman & CEO of the LoRa Alliance

LoRaWAN® works with other technologies to:

- enable the widest variety of use cases
- protect legacy tech investment



LoRaWAN[®] IS AN ESSENTIAL TECHNOLOGY

Improves Quality
of Life

Preserves &
Conserves the Planet's
Resources

Maximizes
Efficiencies

Essential Needs that LoRaWAN Supports



AIR



FOOD



WATER



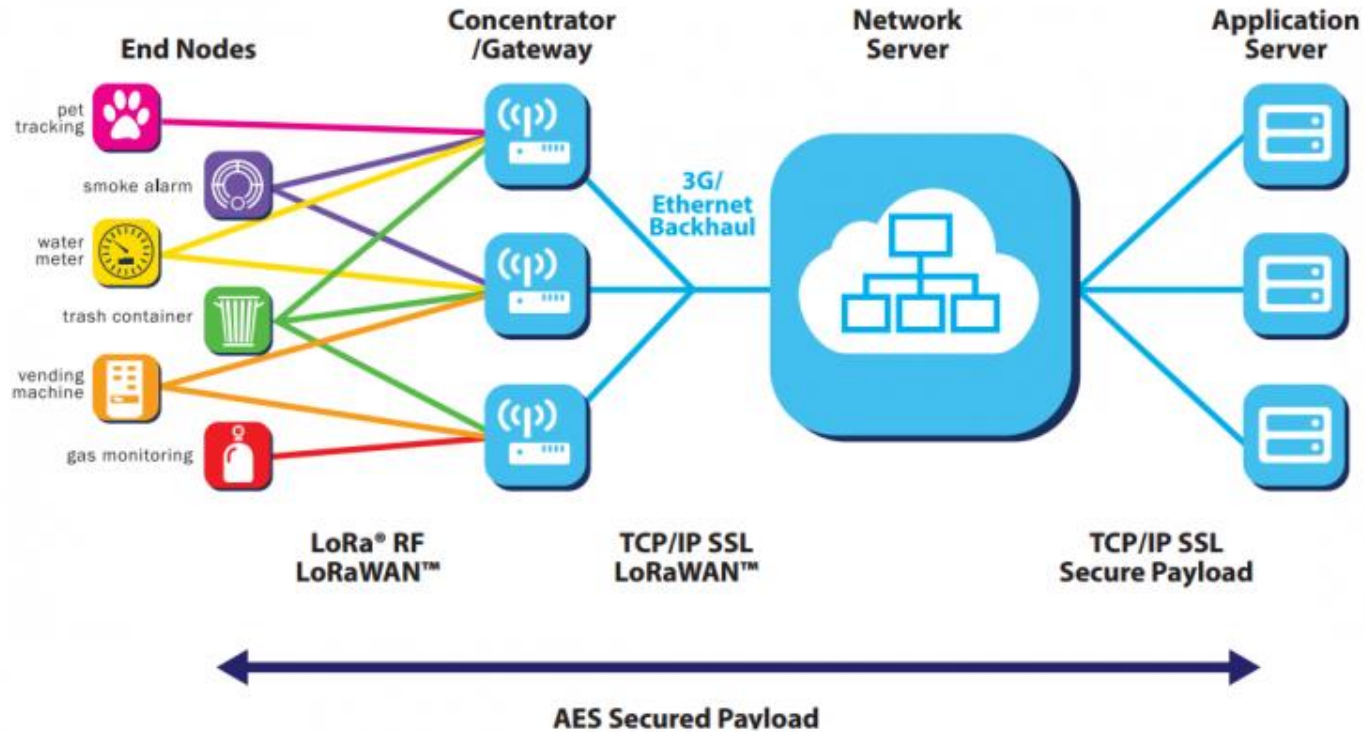
HEALTH



SAFETY



FINANCIAL
PERFORMANCE



Source: The Things Network



Off the shelf sensors

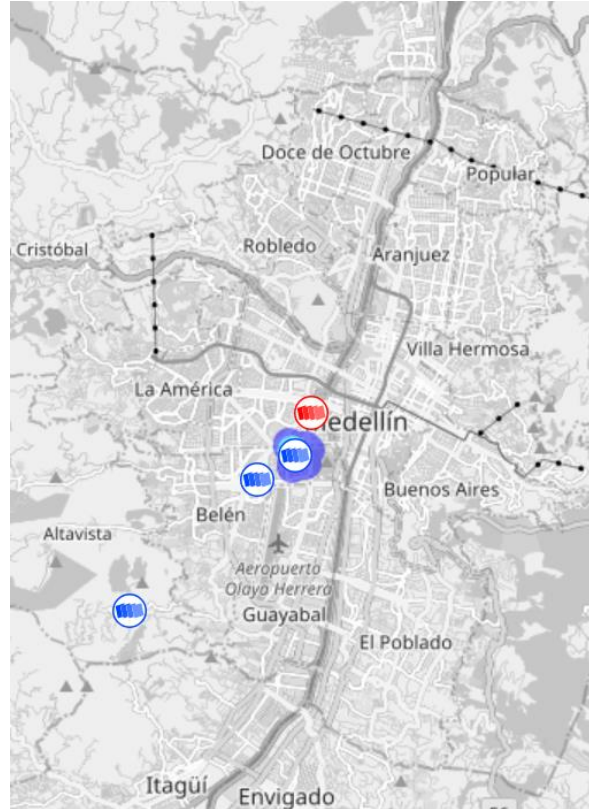


Custom sensor solutions





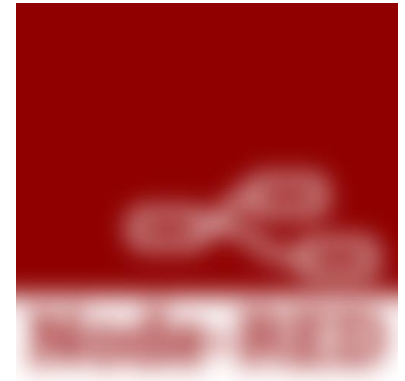
<https://ttnmapper.org/heatmap/>



<https://eu1.cloud.thethings.network/console/>

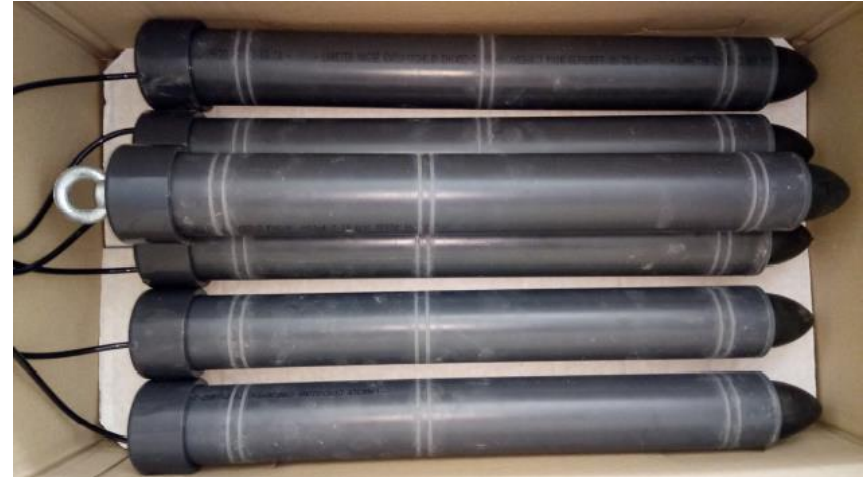


What comes next?





Dendrometer



Multi-Level Soil Moisture Sensor





THANK YOU FOR YOUR ATTENTION

ANY QUESTIONS?