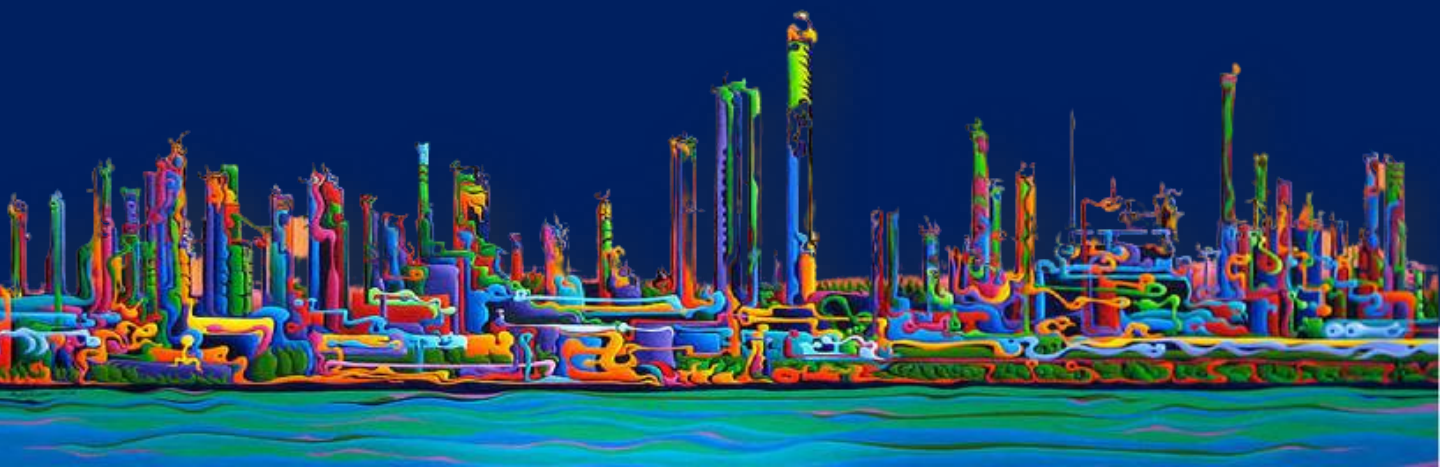




 **LoRa Alliance**<sup>®</sup> Member

**LoRaWAN**  
Is The **DNA** Of  
**IIOT**



# What is LoRa/LoRaWAN?



LoRa (short for Long Range) is a **wireless technology** that uses Spread Spectrum modulation technique to transmit data over long distances. It is designed to be used in low-power, low-data-rate applications. It operates in the **unlicensed Radio Frequency** bands



LoRaWAN is a **network protocol** that uses LoRa technology to create a wide-area network for IOT Devices. It provides **secure bi-directional communication** between devices and a centralised network server, enabling devices to send and receive data over long distances with low power consumption.

# Why LoRa?

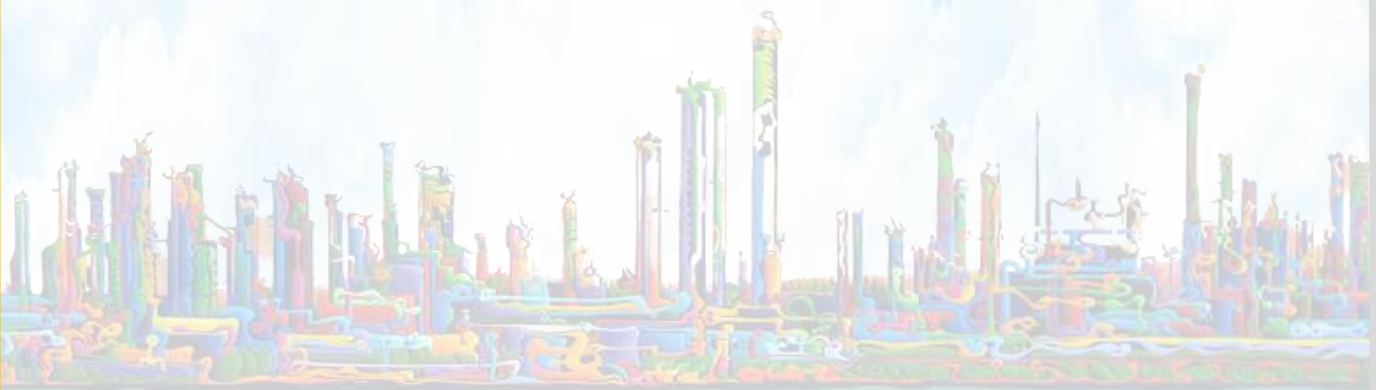
**1** Low Power

**2** High Robustness

**3** Multipath / Fading Resistance

**4** Doppler Resistance

**5** Bandwidth Scalable



# Why LoRa?

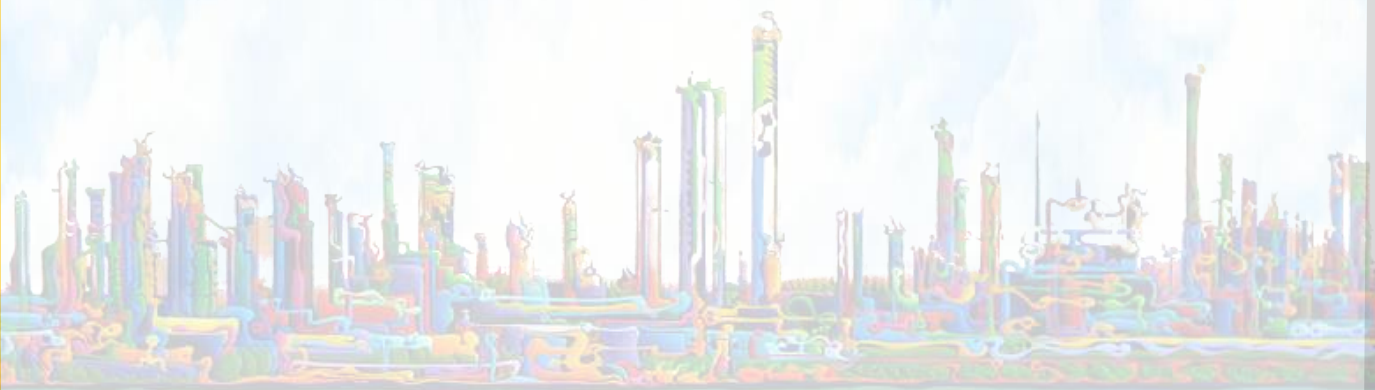
**6** Long-Range Capability

**7** Enhanced Network Capacity

**8** Ranging/Localization

**9** Low-cost

**10** Secured



# **Security** is the Key

A key element of the LoRaWAN network protocol is **SECURITY**.

Its baseline authentication and security framework is based on **AES 128 encryption scheme** as implemented by **IEEE802.15.4/2006 Annex B (IEEE802154)**.

By using separate keys for **user data encryption** and **authentication / network integrity**, LoRaWAN offers a higher level of security compared to single key implementations.

- **Join Request and Join Accept Message Key**
  - 64-bit DevEUI (MAC address)
  - AppEUI (Destination Application Server)
- **128-bit NwkSKey (Network Session Key)**
- **128-bit AppSKey (Application Session Key)**





# LoRa Applications

Waste Management

Air Pollution Monitoring

Agriculture Processing

Water Management &  
Protection

Industrial Temperature  
Management

Indoor Air Quality  
Management

Predictive Maintenance

Parking Management

Valve  
Diagnostic & Control

Smart Irrigation

Tank Flow Monitoring

Wireless  
Gas-Level Monitoring

Fire Detection

Water Flow Monitoring

Energy Management &  
Sustainability

Liquid Presence  
Detection

Medical Refrigerator  
Monitoring

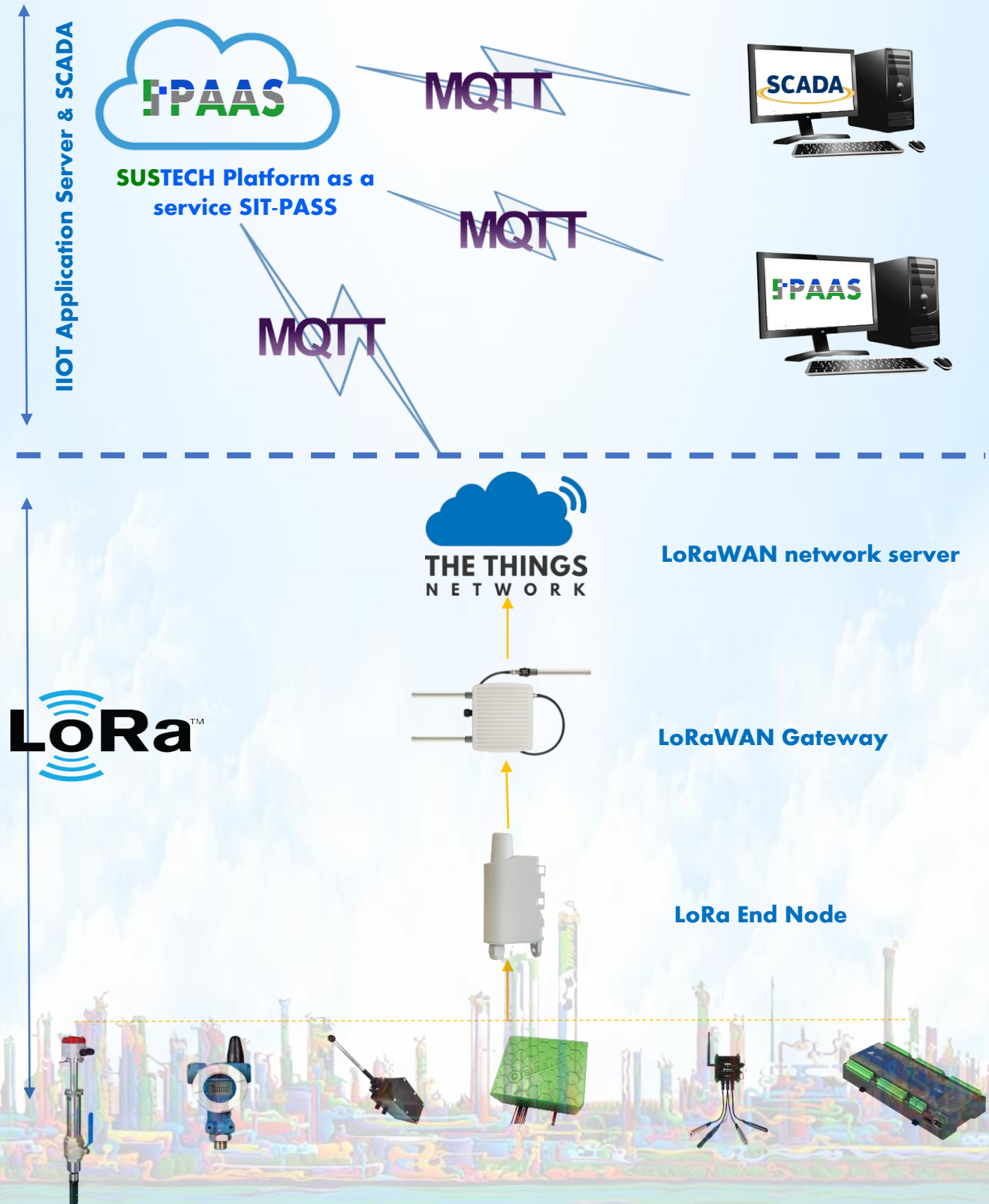
Precision Farming

Smart Lighting

Smart Parking



# LoRaWAN NETWORK ARCHITECTURE



# SUSTECH IS A VALUE-ADDED SOLUTION PROVIDER

## End-to-End LoRaWAN SOLUTION

LoRaWAN Via  
Satellite

LoRaWAN Via  
3G/4G

Modbus to LoRa  
Gateway  
integration

Flow & Pressure  
With battery  
backup for Water  
Network

Valve diagnostic  
AND REMOTE  
CONTROL

Design & assembling  
Power backup  
subject to the  
Application





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