# Cloud based ISA100 Wireless data acquisition system

Control Data Systems

Challenges specific to large deployments

1. Configuration of multiple CDS VR950 Gateways

2. Integration SCADA – CDS VR950 Gateway

3. Communication infrastructure with remote locations

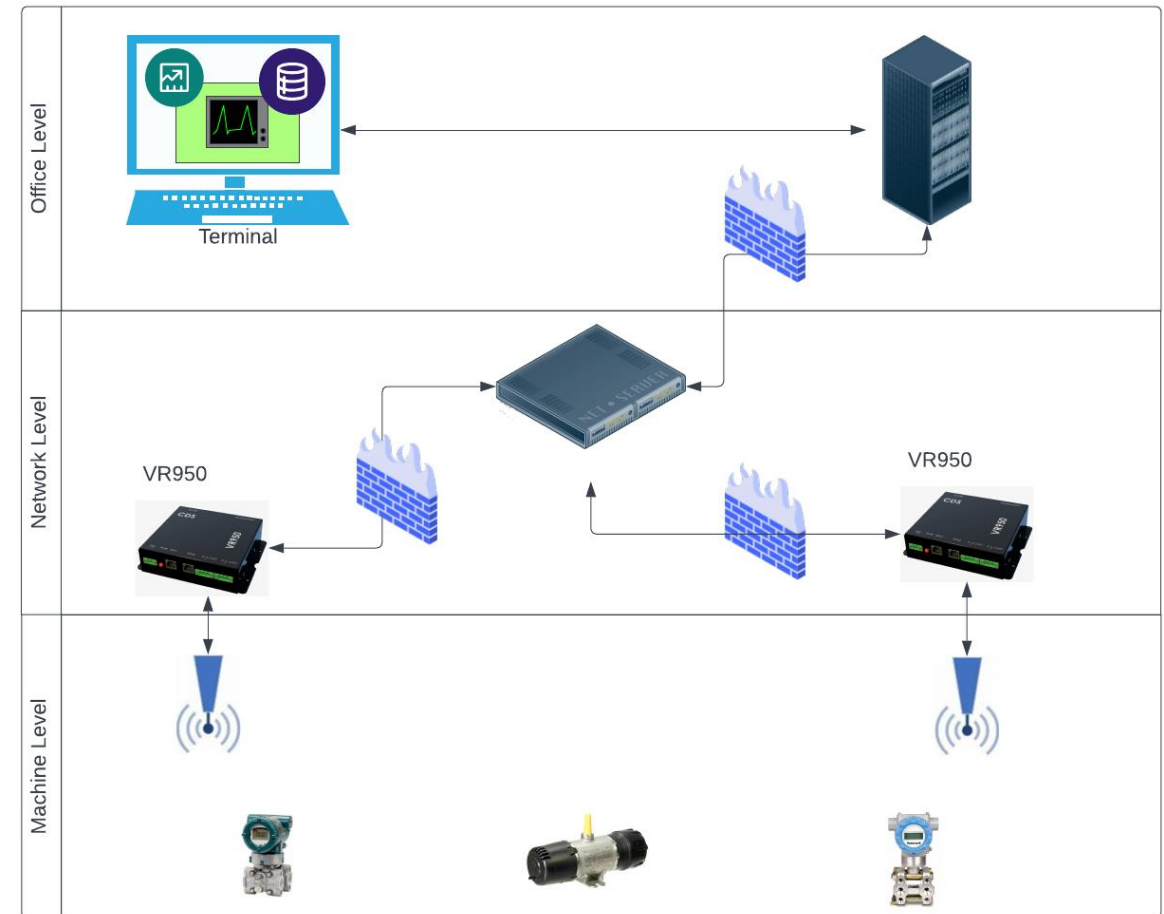4. Data availability for Big Data processing or Cloud infrastructure

Challenge 1: Configuration of multiple Gateways

- Each gateway is configured manually trough Gateway web interface
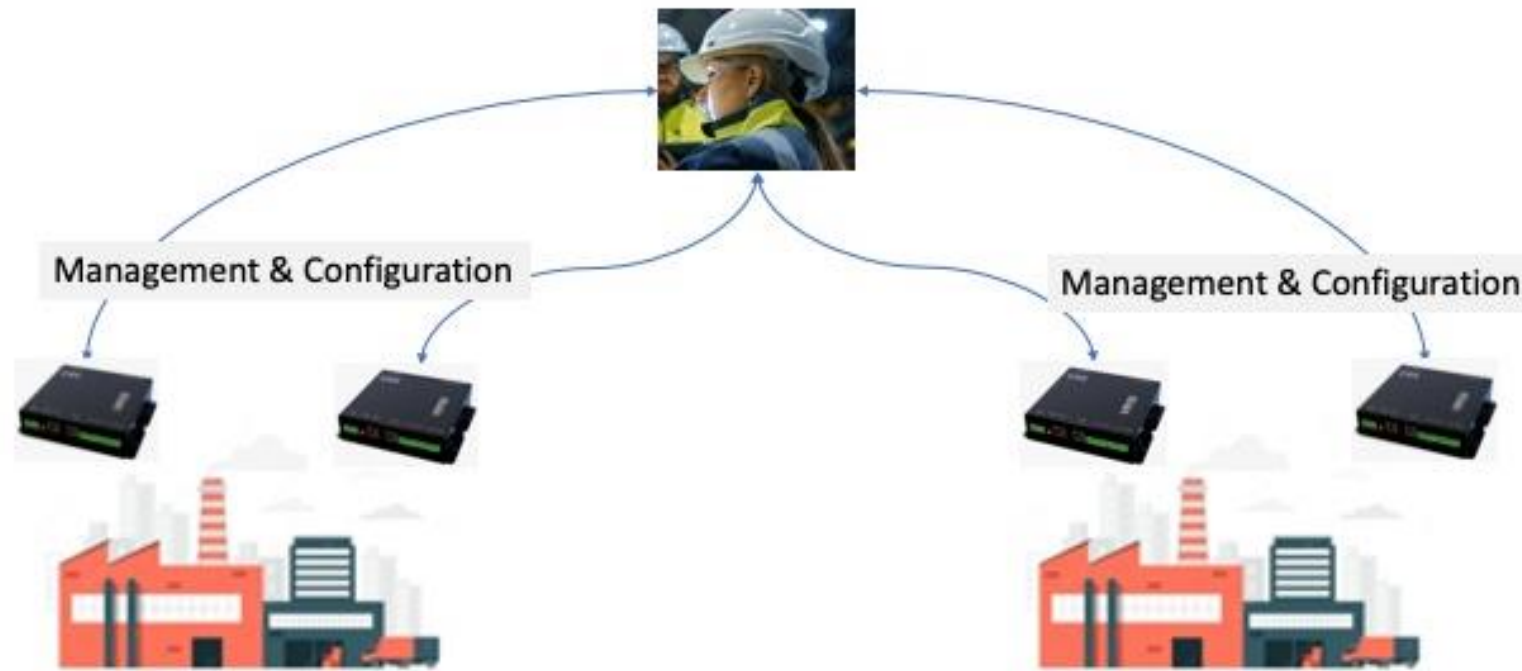
Challenge 2: Integration SCADA – Gateway

- Sensor data retrieved over Modbus (TCP or RTU)
- Modbus provides only raw data from sensors
- Network information exposed over GCI
- GCI not adopted by SCADA systems

Challenge 3: Communication with remote locations

- No infrastructure to link remote locations

- Each remote location has local data storage

Remote Communication Infrastructure
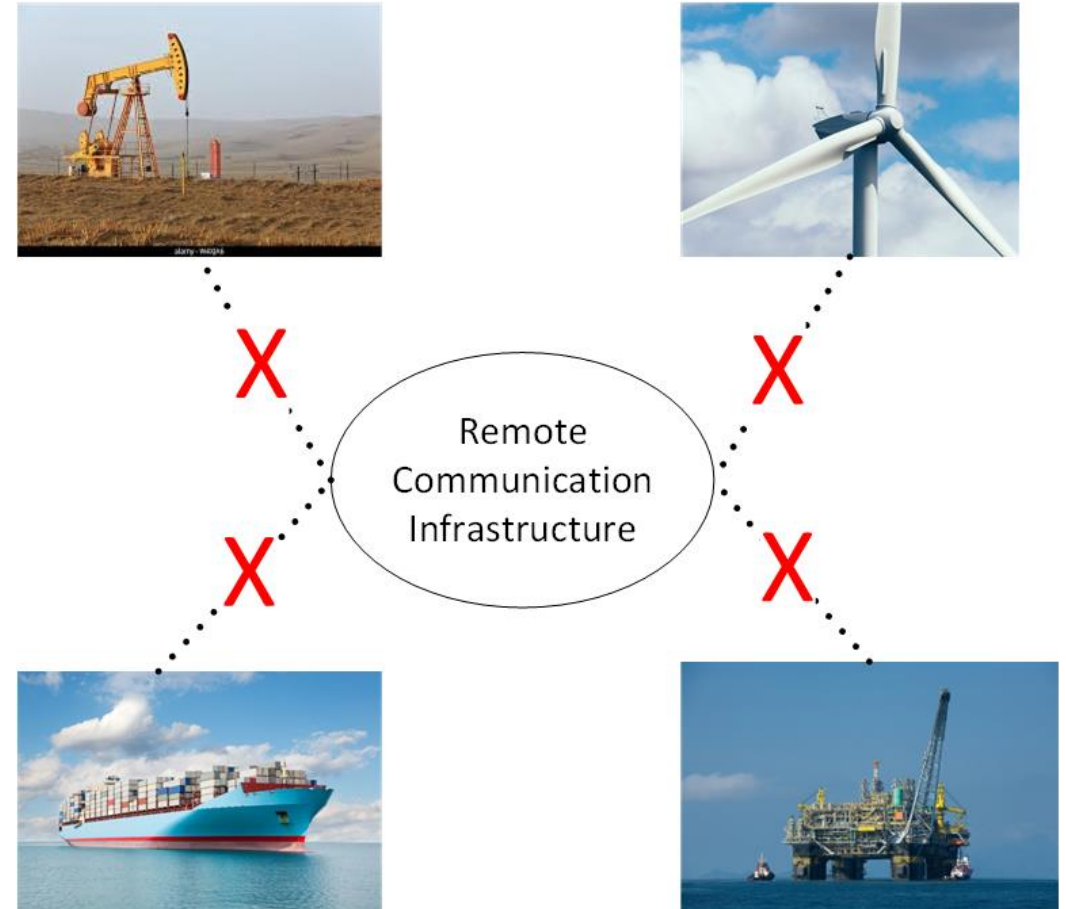
Challenge 4: Data availability

- No data availability for "Big Data" processing use cases
- No direct access to cloud infrastructure from all remote locations

CDS Solutions

1. Centralize location for management and configuration of multiple gateways

2. Expose data trough general access APIs like MQTT, REST

3. Communication infrastructure for Ethernet, 3G/4G/5G and Satellite

4. Flexible deployment on cloud or on premises infrastructure

# Centralized management (Gateway Manager)

- All gateways connect to a central location to allow remote configuration
- Push sensor data to central location trough MQTT
- Added support for bidirectional communication from Gateway Manager to sensors
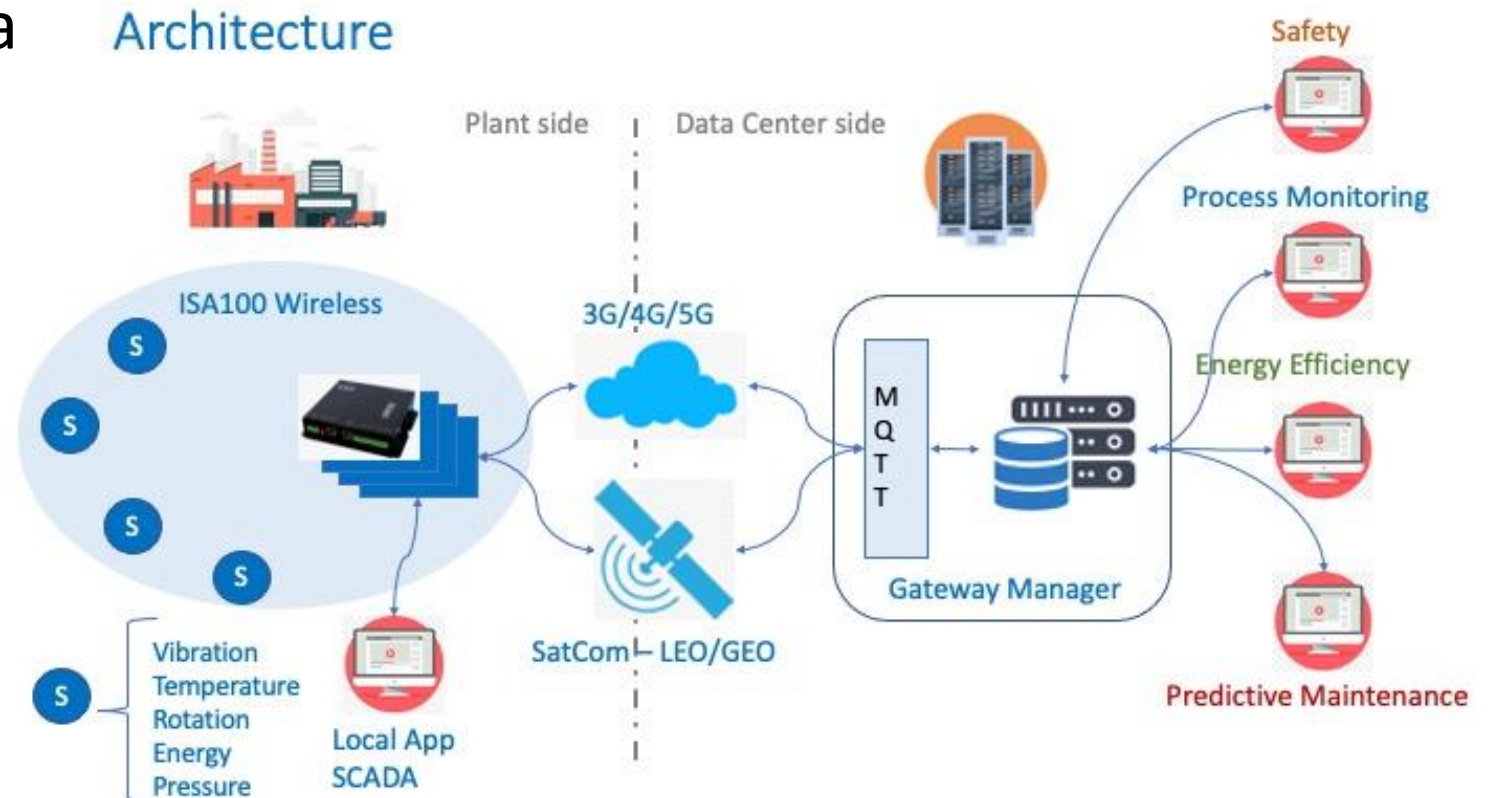
General integration APIs

- Use MQTT for sensor data exchange

- Use REST interface for programmatic integration with SCADA systems.

- Provide programmatic integration libraries (LabView, Java, ...)

SCADA System

LabView Library

Java Library

Other

MQTT Broker

REST Server

DB

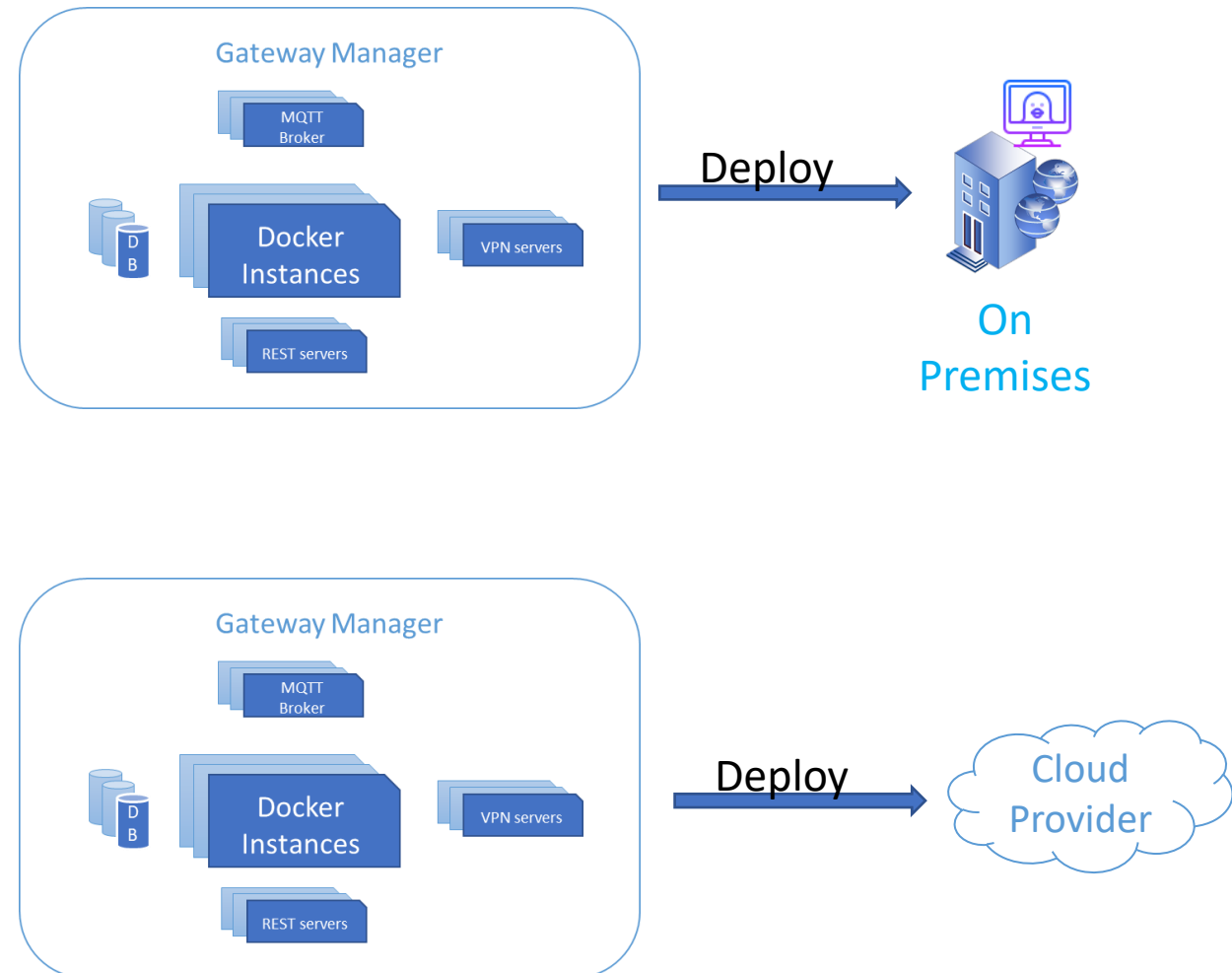Gateway Manager

MQTT/VPN
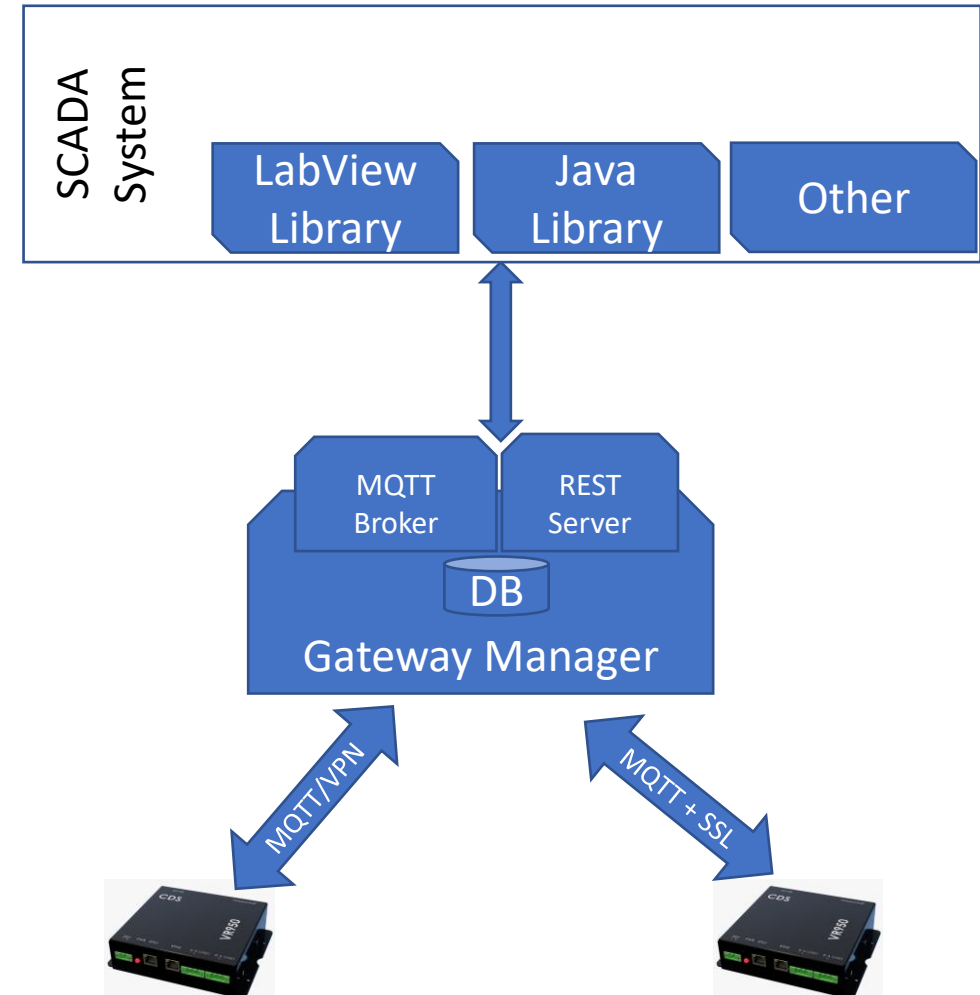
MQTT + SSL

Communication infrastructure

- Ethernet

- 3G / 4G / 5G

- Satellite

- Data aggregation at VR950 level
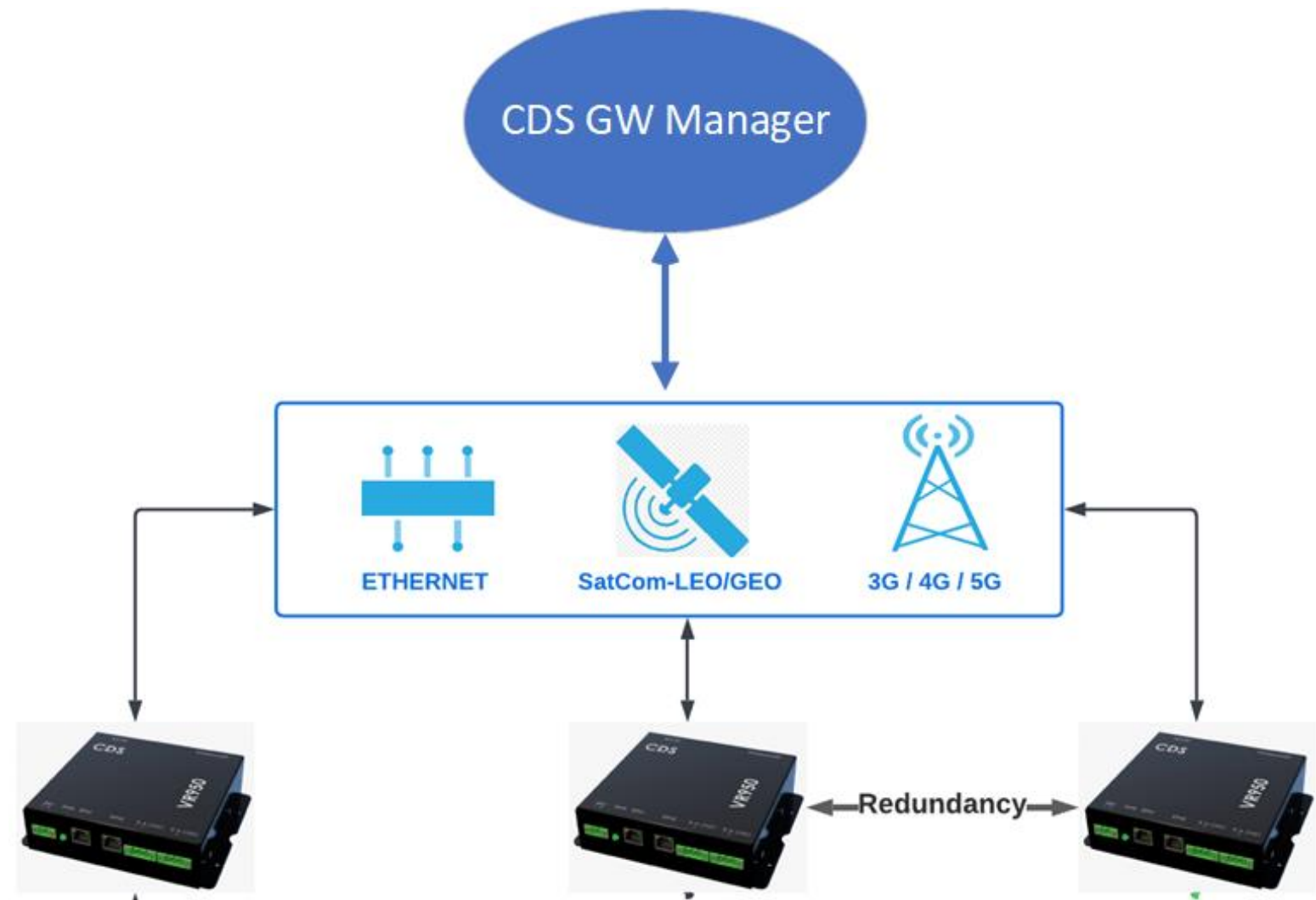
Flexible deployment

- Deploy on premise infrastructure
  - Communication encryption
  - (Optional) private VPN
  - MQTT + SSL

- Securely deploy on cloud infrastructure
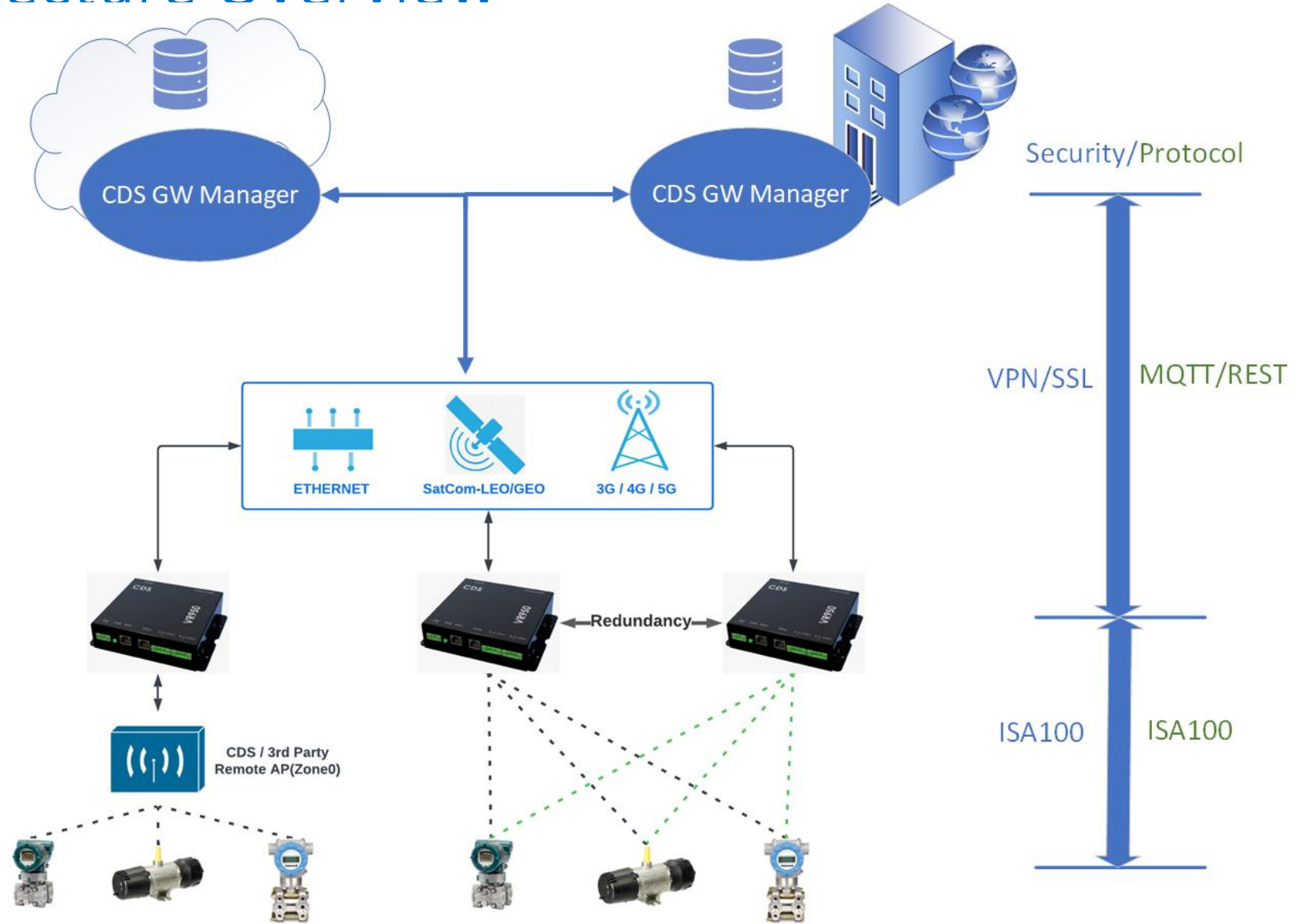 - Communication encryption
  - Private VPN
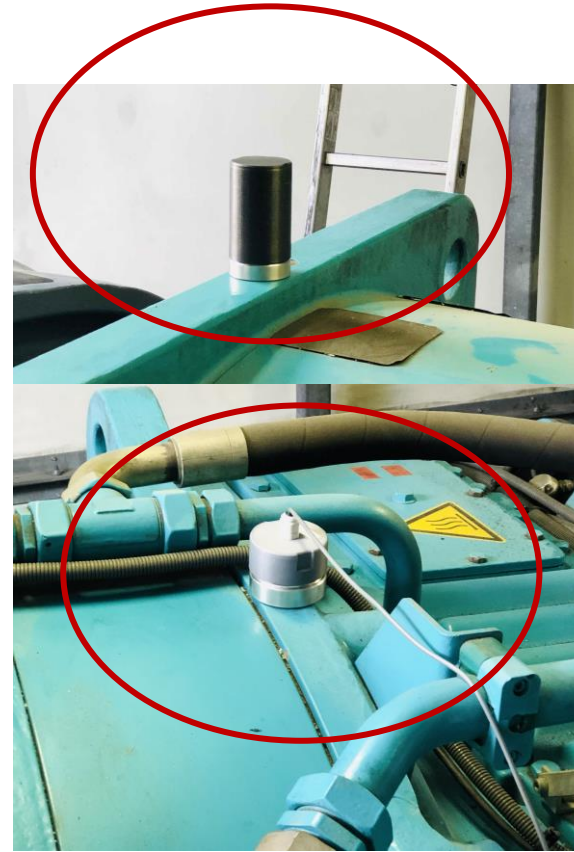
Integration with cloud providers

- Provide integration with AWS or Azure trough dedicated IOT libraries at centralized Gateway Manager component level
- Data arrives back to factory trough value added by large data processing capabilities
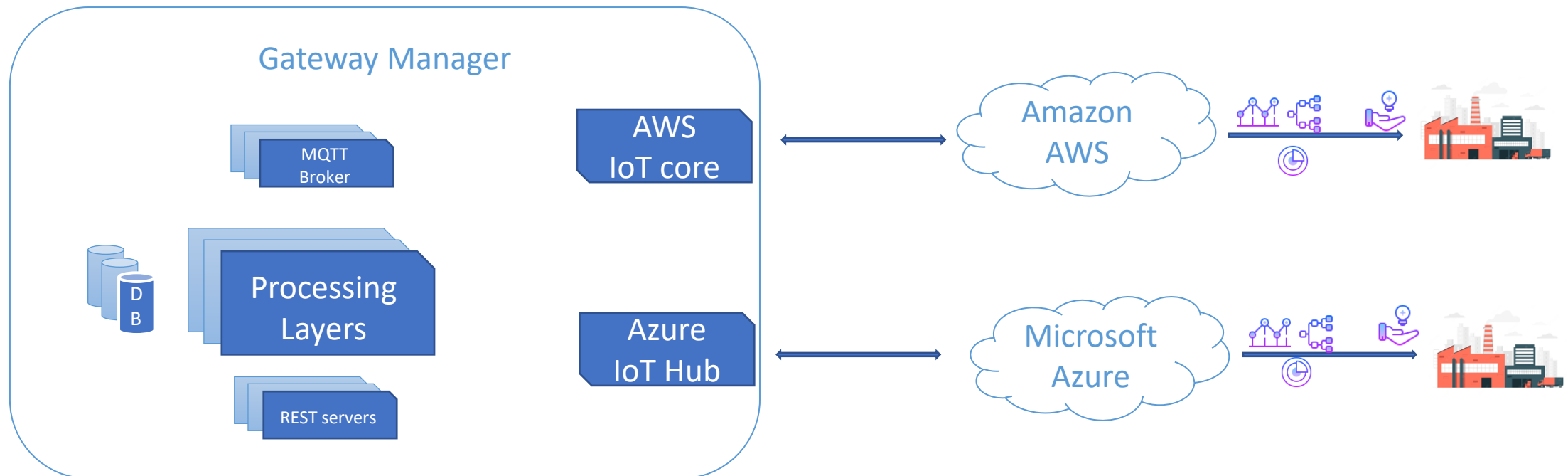
Architecture Overview

Live deployment – wind turbine monitoring

Thank you