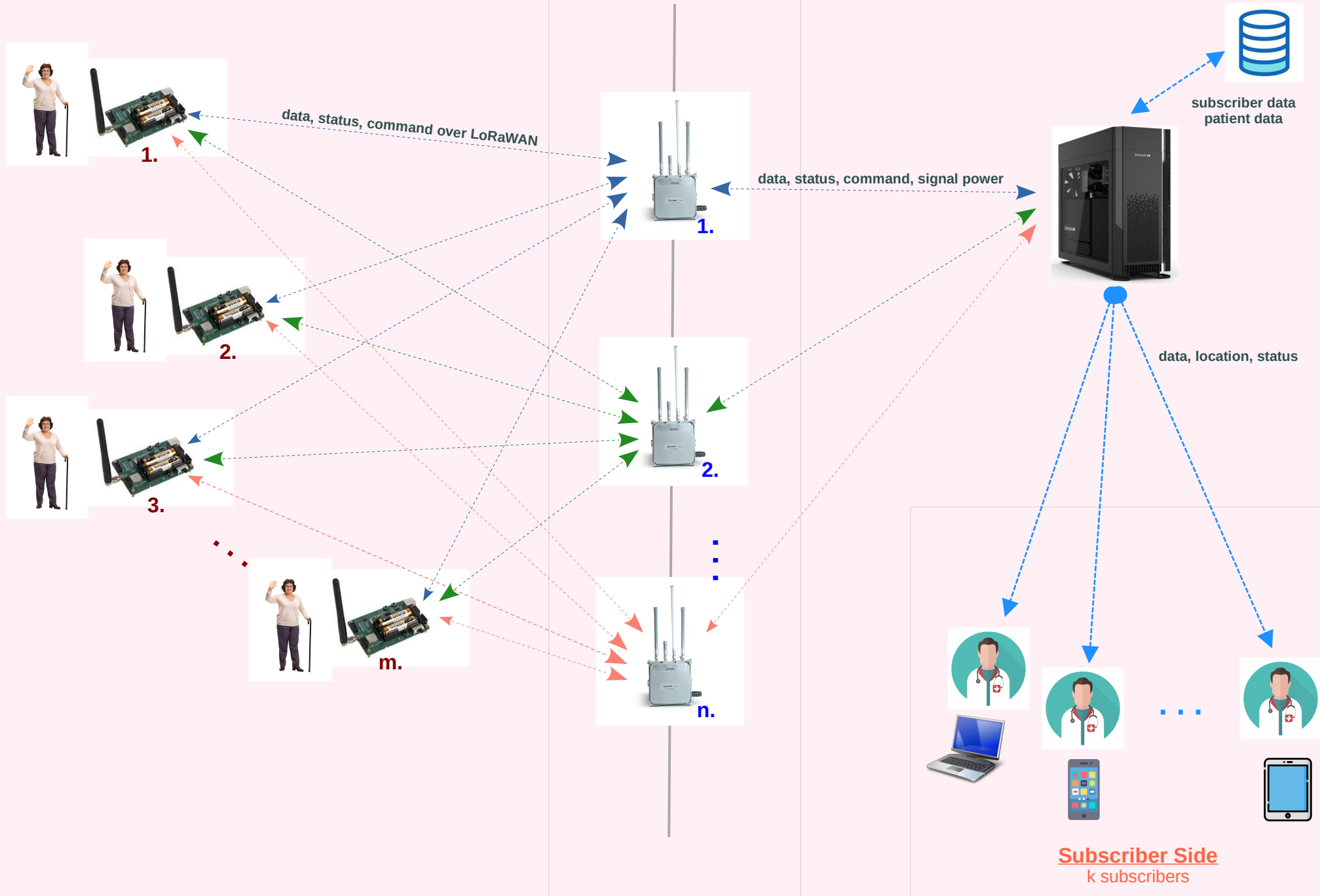


Client Side
m clients

LoRaWAN Gateway
n gateways

Server Side
one server



Client Side

m clients



- **IoT board** such as Raspberry PI, STM32, etc.
 - Purchasing
 - Operating System Support
 - Documentation
- **Sensors and Actuators**
 - Heart Rate Sensor
 - Oxygen Level/Breath Pace Sensor
 - Fall Detection Sensor
 - Reminder Actuator
- **LoRaWAN Module & Antenna**
 - Low power consumption
 - Long range communication
- **Power Supply Unit**
- **Operating System** (GPOS or RTOS)
 - Scheduling & Concurrency Infrastructure
 - Comprehensive Driver Support
 - Easy integration
- **C or C++** Programming Language
 - Performance
 - Efficient resource usage
 - 3rd party libraries

Server Side

one server



- **Server**
 - Real-time data transfer
 - Log storage
 - LoRaWAN gateway integration
- **Cloud Database**
 - Secure
 - Long Term Support
- **Publish-Subscribe Approach**
 - Serves patient data to its subscribers
 - Message Broker support (MQTT or similar)
 - Provides pseudonymization (GPDR, KVKK)
- **Positioning Algorithm**
 - Calculate boards' locations using signal data of the gateways
 - Online or offline map for subscribers
- **User Panel**
 - Server application updates
 - Firmware update for the boards
 - Maintenance support