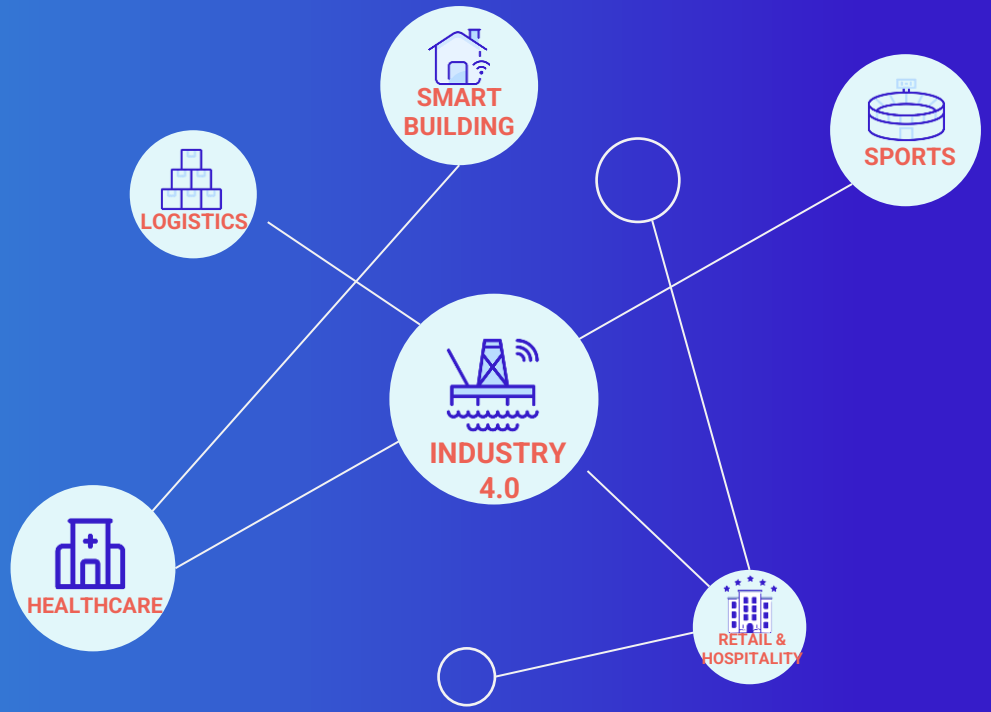
# Transforming Healthcare with Wireless IoT based RTLS




Jithu Niruthambath

Atoll Solutions

A Seshaasai® company

# Why RTLS in Running a Hospital?

# Key Outcomes for Hospitals

- **Patient Care** - Track & manage movements (OT/Labs/MRI/X Ray)
- **Operational efficiency** - Job allocation & completion
- **Streamlined processes** - Allocate and track wheelchairs/porters
- **Assets** - Real-time tracking of biomedical equipment & assets
- **Safety** - Free fall detection and panic buttons for patients/staff
- **Security** - Access control, Theft prevention
- **Flow control** - Wayfinding, visitor management

# How do we implement affordably?

Clue: Utilize Existing WiFi Infrastructure

# WiFi in Hospitals

- Nearly all Biomedical Equipment is an IoT device
  - They all require WiFi/BLE to update operations data & for analytics
- This makes WiFi infrastructure a **“must have”** for Hospitals
- This is where the opportunity to implement RTLS starts

# Wireless Technologies for RTLS

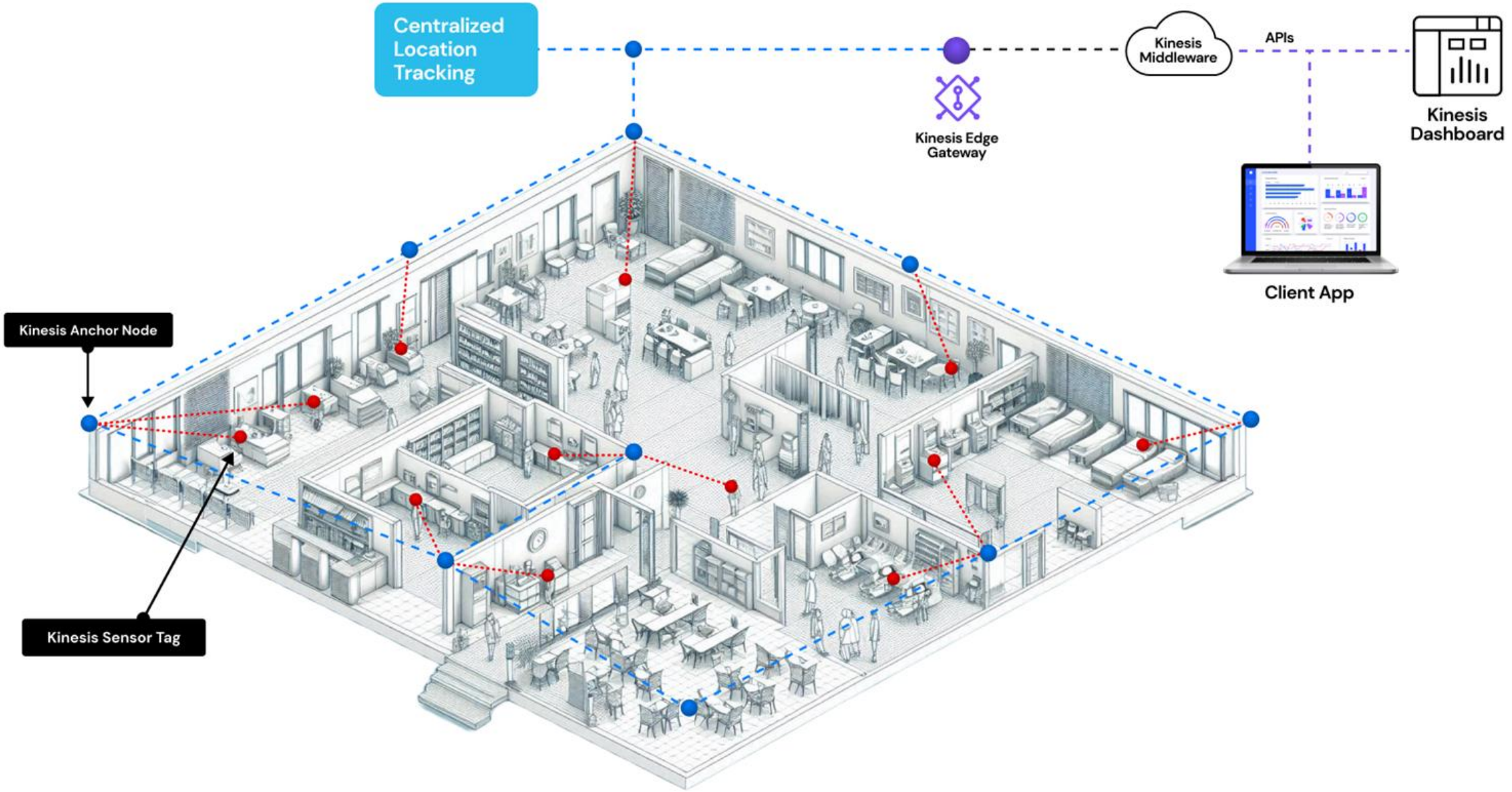
| Features | UWB | BLE | WiFi |
|---|---|---|---|
| **Accuracy** | High<br>(20 to 30 cm) | Medium<br>(Zonal or 1 to 3 m) | Low<br>(3 to 5M) |
| **Cost of Tags** | High | Lowest | Medium |
| **Cost of Infrastructure** | High | Medium<br>(Low with modern WiFi infrastructure) | Low<br>(with good WiFi coverage) |
| **Battery Life** | Medium (1 year life) | High (5 year life) | Low (Moths) |

# Impact of RTLS - One Example?

Movement of Patients

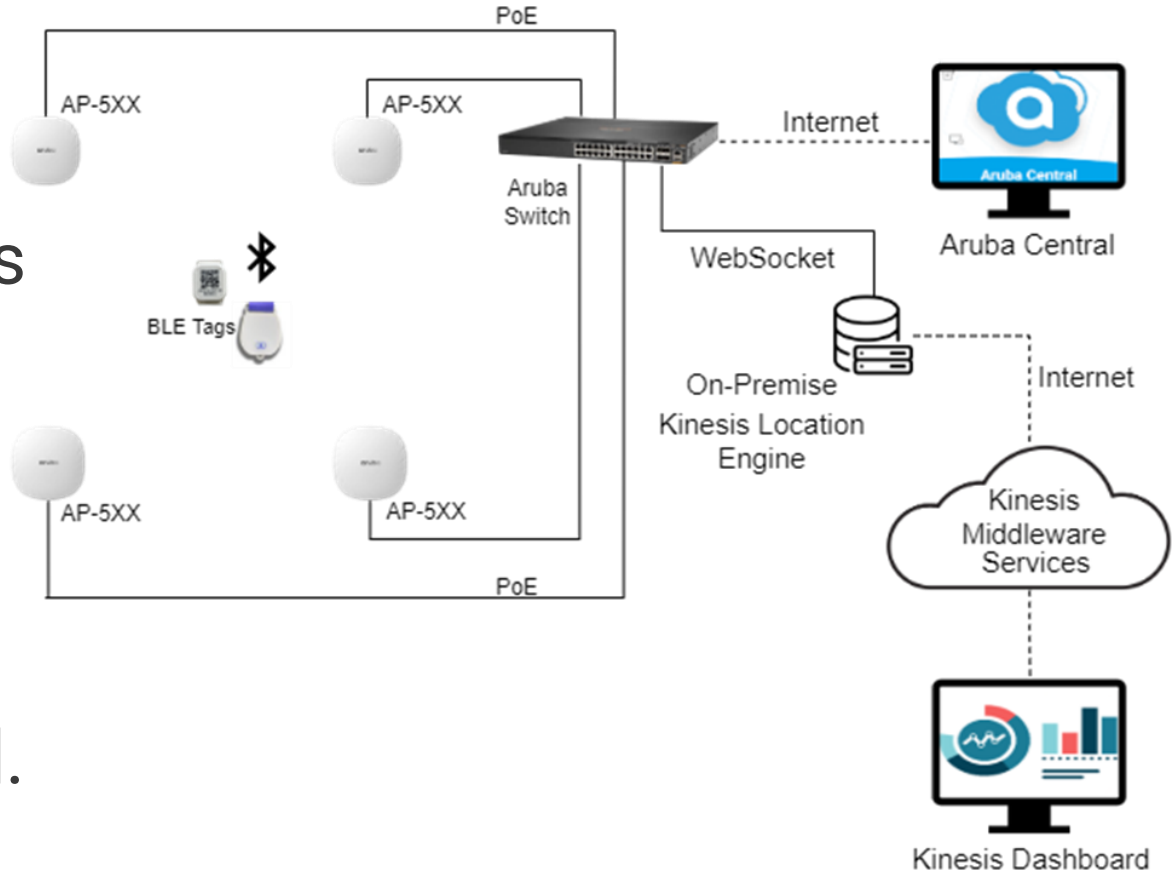
Wheelchair and Porter Management

# Deployment Architecture in Hospital



# Infrastructure Setup -CMC Vellore - Ranipet Campus

- HPE Aruba APs with full coverage
- WiFi Access Points (APs) act as BLE Receivers
- No New Capital Costs
- All Wheelchairs and Stretchers are fitted with BLE tags
- Porters wears tag to be located.



# Photographs

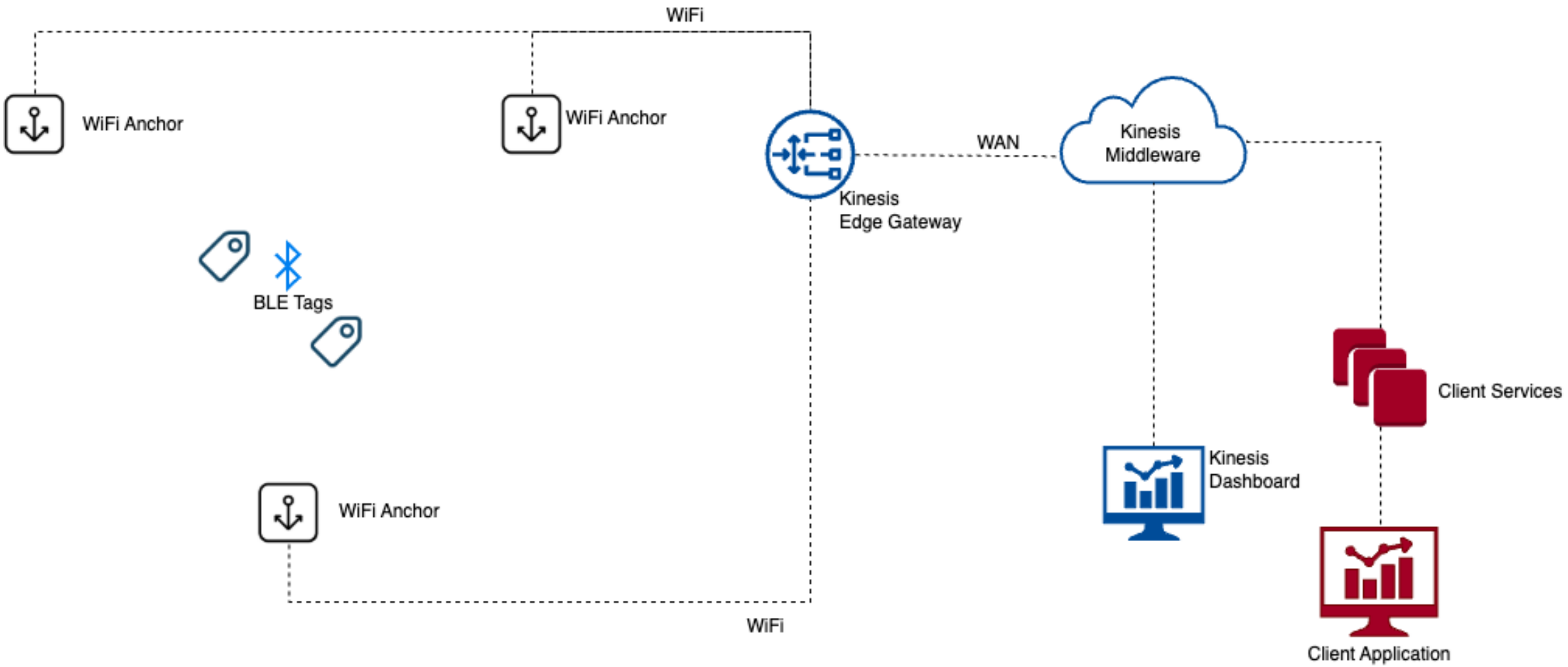

# Impact of RTLS based Application Deployment

| Action/Tasks | Before Implementation | After Implementation |
|---|---|---|
| **Identification of Wheelchairs** | • Manual search for ~1000 Wheelchairs<br>• Hours spent daily on recovery<br>• Delays during peak hours | • Real time location visibility<br>• No manual search<br>• Faster patient movement |
| **Locating and Allocating jobs to porters** | • Calls or manual coordination<br>• Uneven workload | • Automatic job assignment<br>• Nearest porter and wheelchair allocated |

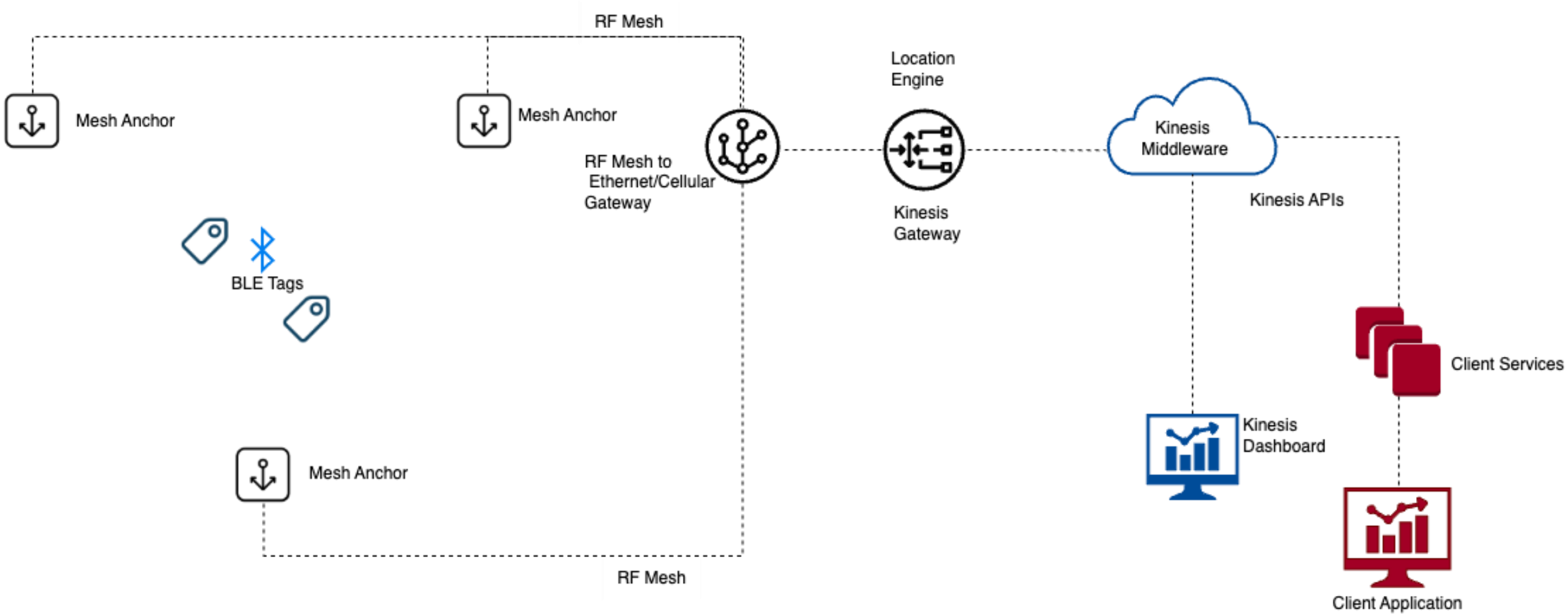
Implementation used existing Wi-Fi infrastructure and the Atoll Kinesis RTLS platform, resulting in low CAPEX and ROI within months.

# Other Architectures

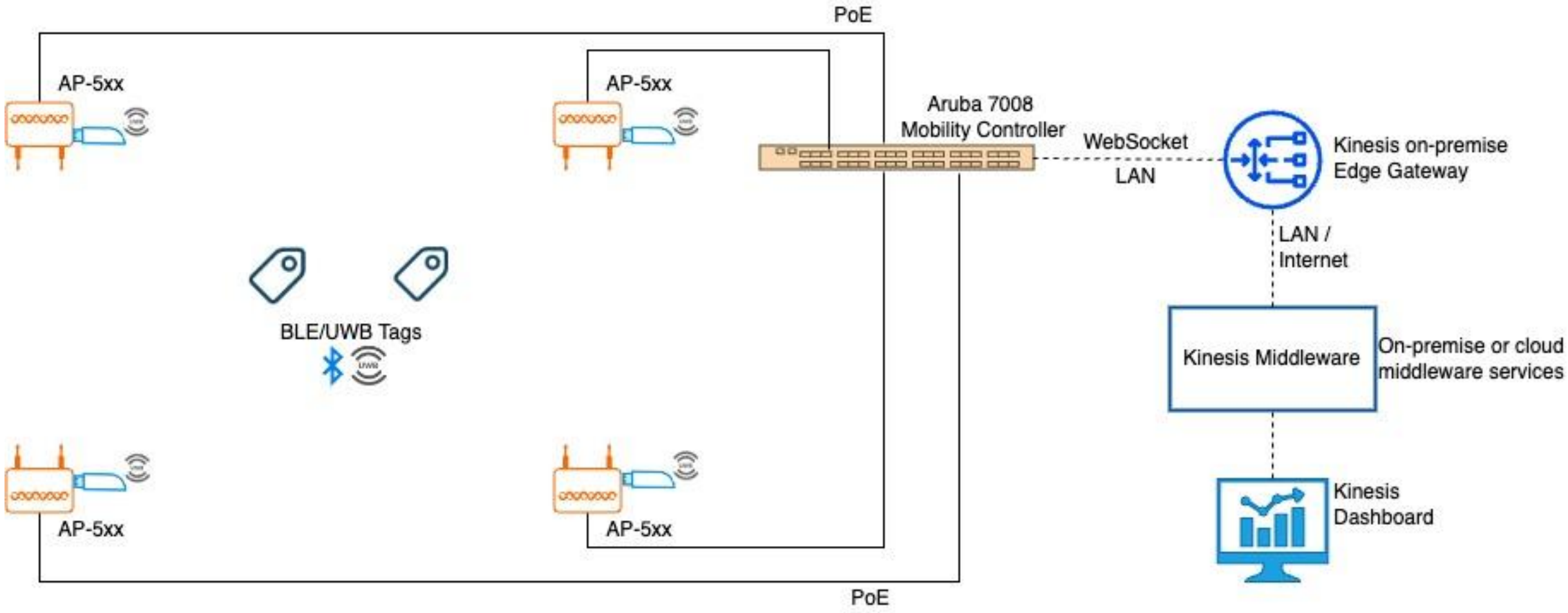
# Kinesis with WiFi Anchors



# No Infrastructure: Wireless Mesh or Halo



# UWB based Precision RTLS with Aruba

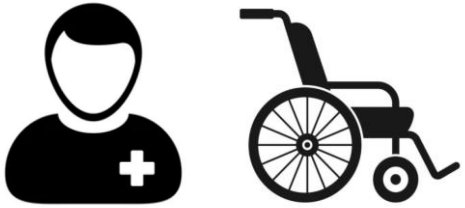



Notes:

- Atoll UWB Anchor dongle is installed on USB slot of APs
- Example shown here is with controller. But, it can work with Aruba Central also.

# What are Other Hospital Applications Can Benefit from RTLS?

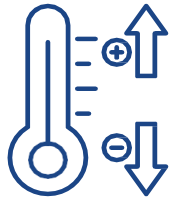
# Hospital Applications



Manage critical activities
locate, activate and trace
assets and staff


Track staff/caregiver
access & movement

Track Utilization & Movement
Assets Auditing



Real-time condition
Monitor Temperature
Energy Efficiency

Inpatient & Outpatient
Flow Management

Flow Control
Visitor Management

# Backup

# BLE Tags – Assets / Inventory / Machinery / People… anything

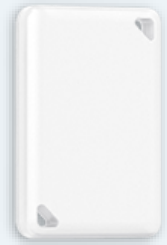
Asset Tag

Wearable Tag

Lanyard Tag

Low Profile Tag

Environment Tag



Thin Tag

- Zone/Presence Detection
- Long Battery Life
- Low Power operation
- Splash & Dust Proof
- Movement Alerts
- Fall Detection
- Panic Alert Option
- Custom Tag Options

# Thank You


**Making Location Intelligence Precise and Ubiquitous**

Offices:

**Atoll Solutions Private Limited**

143, 1st Floor, 10th Cross,
1st Stage, Indira Nagar, Bengaluru,
Karnataka 560038, INDIA

1049 El Monte Avenue Ste C
#987 Mountain View,
CA 94040, USA

Contact:

kinesis@atollsolutions.com
www.atollsolutions.com