



Vicinia IIoT Platform

Device Lifecycle · Data · Edge/Fog · OTA · ML/AI Services

The **Vicinia IIoT Platform** is the foundational technology stack that powers all sensing, positioning, navigation, and data intelligence across the Vicinia ecosystem.

It integrates hardware, cloud services, edge/fog processing, and AI-driven location intelligence into a single, flexible, extensible platform.

Core Capabilities

1. Device Lifecycle Management

A full framework for managing Vicinia-compatible IoT and sensing devices:

- Equipment BoM & component modeling
- Batch & firmware version management
- OTA firmware updates
- Device authentication & authorization
- Inventory & operations dashboards
- Diagnostics and fault tracing



2. Data Management & Edge/Fog Processing

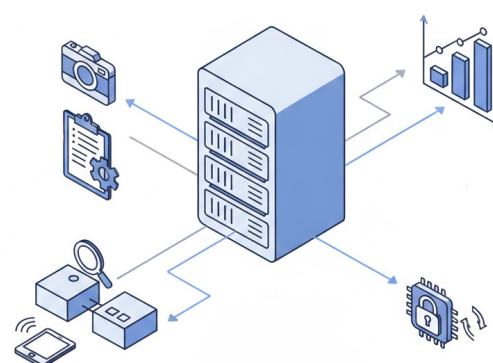
Real-time ingestion, transformation, and aggregation of sensor data:

- Multi-type sensor ingestion (raw, feature, structured)
- Edge/fog processing via custom DGNs (Data Gathering Nodes)
- Cloud-managed IoT controller devices
- Local storage, buffering, and resilience
- High-throughput aggregation for large facilities
- Upstream APIs for apps; downstream channels for sensors

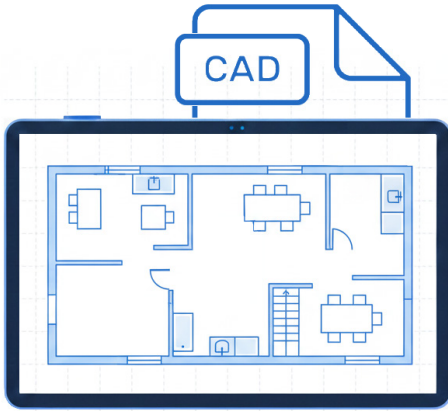
3. AI & ML Experiment Management

Infrastructure for running, testing, and deploying spatial AI models:

- Experiment scenario capture & metadata tracking
- Device-data association analysis
- Data quality assessment and QoS profiling
- Firmware digital signatures & verification
- ML model OTA deployment
- Online/offline experiment reporting



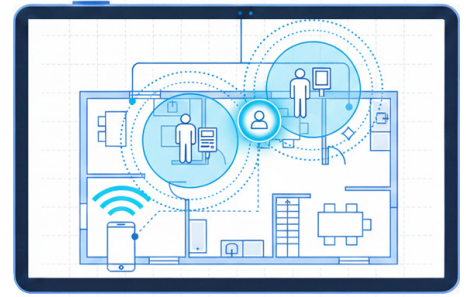
4. AI-Powered Location Services



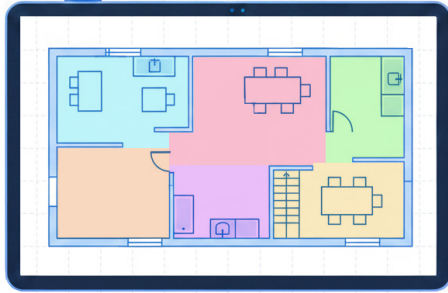
Digital twin map management for indoor environments and campuses



Indoor positioning (device + server)



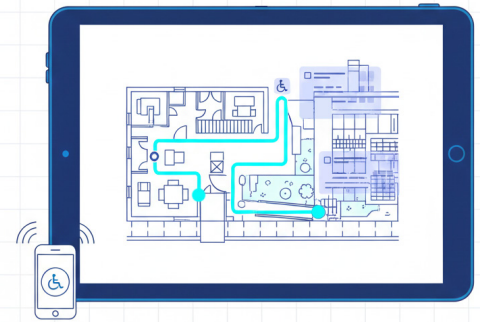
Proximity detection



Zoning & geofencing



Radio map learning & physical map inference



Multi-mode ADA compliant indoor/outdoor navigation algorithms

How It Supports Applications

- **Developer First Architecture:** Exposes device management, sensor data pipelines, spatial AI, and map services through secure APIs/SDKs for building custom applications.
- **Production Ready Components:** Enables third party teams to compose solutions using the same core primitives that power Vicinia's Space, Mobility, and Engagement products.
- **Enterprise Scale Reliability:** Built for hybrid indoor/outdoor environments with edge/fog processing for monitoring and control with interoperability, and multi tenant scalability.
- **Cross Industry Flexibility:** Supports rapid innovation for smart campuses, industrial IoT, logistics, culture/tourism, workplace management, and more.



Enterprise access-aware navigation with dynamic closure handling

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