

Smart Building Solutions

# Industrial Edge Insights SW for Buildings

Enabler SW Brief

## Simplify, Scale, Unify Building Systems with Industrial Edge Insights SW for Buildings

Traditionally, the high cost of building management systems (BMS) has been difficult to justify for small- to medium-sized buildings. This is now changing as leading-edge technologies for the Internet of Things (IoT) are being used to drive down BMS cost, transforming the market dynamics for software vendors, systems integrators, and solution providers.

Accelerating this transformation is the Industrial Edge Insights SW for Buildings, which is a middleware solution that aggregates and contextualizes BACnet and Modbus data collected from disparate building equipment comprising traditional as well as new generation of IoT sensors. Thus, the middleware enables an SI/ISV to go to market faster by unlocking the full potential of integrated and contextualized data to generate actionable insight.

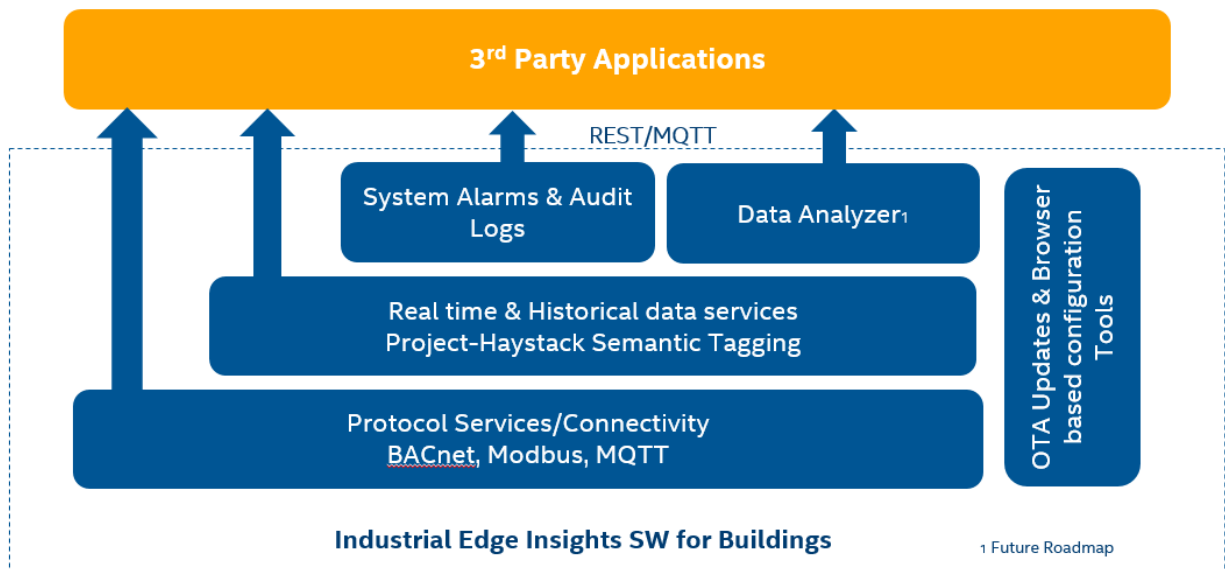


Industrial Edge Insights SW for Buildings is:

- a developer-ready Data Aggregation Software
- for Building Workload Consolidation and Edge Compute
- with Ease of App Development
- to enable Faster Time to Market
- is Scalable from Intel Atom® to Intel® Xeon® processors

## Developer-Ready Solution

The middleware solution interfaces to building sensors, and contextualizes the aggregated data using Project Haystack standard, which can then be securely transferred to the cloud or stored locally. These connections can be made to air-handling units, chillers, thermostats, meters, lighting control, sensors, switches, and video cameras using standard protocols such as BACnet and Modbus. A suite of REST APIs allows secure and easy access to historic and real time data. The solution also includes the Over the Air capability to remotely provision, manage and maintain the software. The middleware solution reduces development time and effort for solution providers by offering a pre-integrated middleware, on which they can deploy a wide range of affordable applications and services.



## Data Contextualization

The middleware solution supports [Project Haystack](#) data modeling and semantic tagging standard that enables contextualization of data flowing from the building systems, using a standard browser-based user interface. A suite of REST APIs enables tagging data from non-Haystack legacy equipment as well as newer IoT sensors. High-level software systems and their operators can use the contextualized data at the right level of abstraction to enable analytics and machine learning workflows, interoperable across facilities, and generate actionable insights for Smart Buildings.



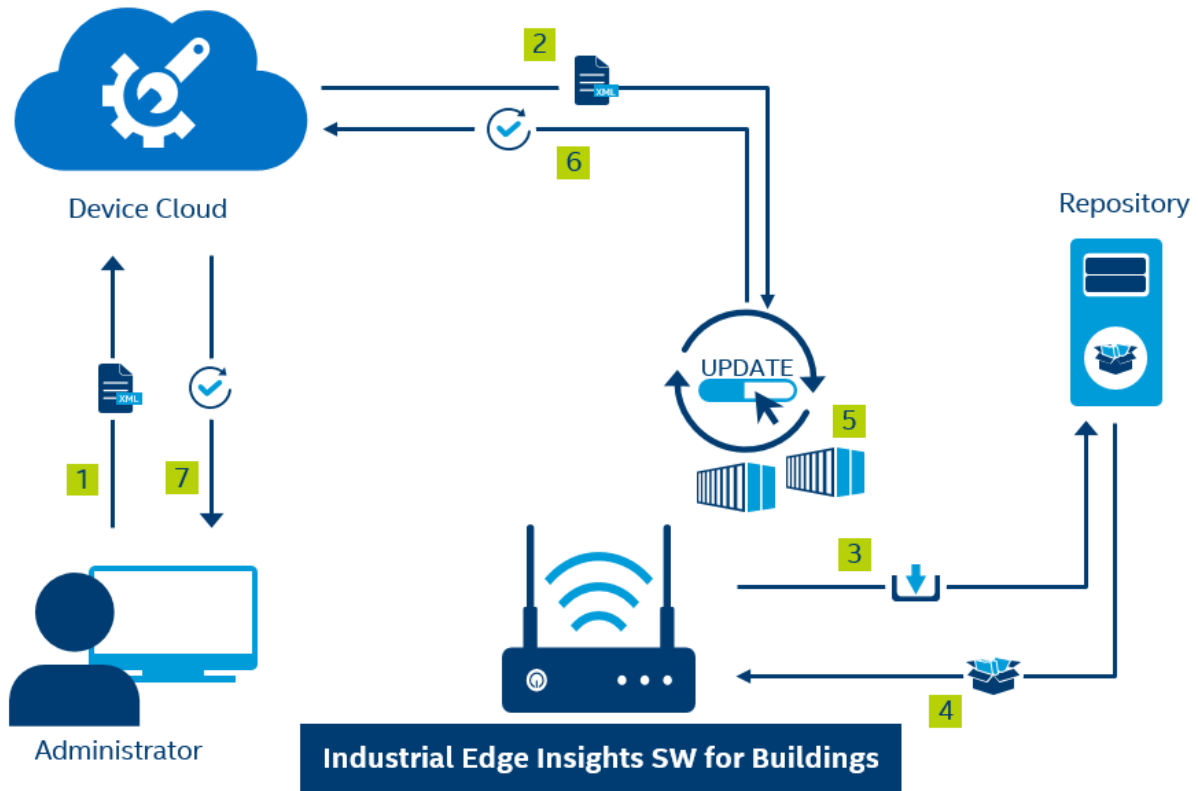
Example of Haystack Contextualized Data

## Data Aggregation and Local Storage

The middleware solution has pre-integrated building protocol stacks, BACnet IP Protocol Revision 19 and Modbus IP v1.1, that make it easier to connect building subsystems. A browser-based user interface is included to configure protocol stacks, view BACnet discovered devices, and configure the connection to Modbus devices. REST BACnet, Modbus and Haystack REST APIs enable SI/ISVs to write applications for bidirectional real-time communications with sensors and control systems.

Telemetry and metadata is stored locally at the edge. Historical data is collected based on configurable schedules and polling requests and Data Retention policy can be configured using a browser-based UI, with the down-sample policy support to optimize the storage at the edge and fast query capabilities for applications to perform edge analytics.

## OTA Device Manageability



Smart Buildings integrated technologies benefit from the secure<sup>1</sup> Over-the-Air management capabilities for periodic software updates. The remote management of edge node includes firmware upgrade, application/container update, OS update, security patch update and configuration update without a truck roll, thus, saving dollars. The middleware solution offers pre-integrated secure OTA update capability along with system telemetry. It ensures minimum downtime by providing incremental updates for application/firmware/container vs performing a full image update. Rest assured with the OTA fail-safe update with auto rollback to the last stable version, if the update fails due to network connectivity or similar issues.

## Features

- **Scalability** – Microservices based containerized software architecture that scales to support processing needs at the edge (Intel Atom®, Intel® Core™, Intel® Xeon® processors) and supports monitoring 40K+ building points.
- **Data Interoperability** – Collects data from multiple building equipment, sensors, protocols and normalizes data to Project Haystack data model.
- **Security** – Transport Layer Security (TLS) for Data, JWT authentication for REST APIs, Secured keys in TPM for MQTT, Runtime container policy violation checks using Docker\* Bench Security.
- **Remote Manageability** – OTA update for firmware, OS, application and remote system diagnostics.
- **Local Historian** – Stores building model data and telemetry data with configurable retention policy.
- **Connectivity** – Bidirectional communication (data ingest & control) to building equipment and sensors via standard protocols BACnet, Modbus
- **REST APIs** – Supports Project Haystack open REST APIs, application can read, write, poll or subscribe to data over IP protocol irrespective of underlying communication.
- **Configuration Tools** – Handles data from multiple sources and provides easy to use browser-based user interface for tagging and visualization.

## Use Cases



- **New Markets/UseCases** – Accelerate time to solution development for previously unaddressed market without a Building Automation System (BAS).
- **Connect Siloed Building Systems** – Orchestrate building data by associating Haystack semantic tag model to equipment, subsystems (HVAC, lighting, etc.) and integrating with existing applications and dashboard.
- **Digital Twin** – Value-added application that automatically creates a digital twin of building using Haystack semantic model.
- **Analytics at the Edge** - Deploy machine learning models at edge for energy optimization, space optimization, building occupants comfort improvement etc.

- **Remote BMS**—Add a cloud connector to monitor real time status of building alarms, faults, energy consumption and diagnostics from any cloud based application.
- **Consolidate** – Develop an application to monitor 40k+ building sensor points.

## Contact

[Intel® IOTG ISD Product Marketing](#)

[Softdel\\* RRK Partners](#)

## RRK Solution

Softdel\* RRK Solution

---

<sup>i</sup> Cost reduction scenarios described are intended as examples of how a given Intel-based product, in the specified circumstances and configurations, may affect future costs and provide cost savings. Circumstances will vary. Intel does not guarantee any costs or cost reduction.

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at intel.com.

This document contains information on products, services and/or processes in development. All information provided here is subject to change without notice. Contact your Intel representative to obtain the latest forecast, schedule, specifications and roadmaps.

Intel, the Intel logo, the Intel Inside logo, Intel Core, Intel Atom and Xeon are trademarks of Intel Corporation or its subsidiaries in the U.S. and/or other countries.

\*Other names and brands may be claimed as the property of others.

© Intel Corporation 2019