Fledge Home

Overview - Delivering Industry 4.0 Together

The Industrial Edge has unique distributed computing, protocol, data, ML, security and integration challenges not found in retail, consumer or other edge markets.

Fledge is the Linux Foundation’s Industrial Internet of Things (IIoT) edge platform and community architected for and built by industrial users, machine builders, smart industrial sensor suppliers, industrial software suppliers, system integrators and cloud operators. The Fledge project was seeded by Dianomic, Google, AVEVA/OSIsoft, Teledyne/FLIR and JEA (8th largest utility in the U.S.). Our community is growing fast with over 60 contributors. Fledge is also adopted by LF Energy (Fledge Power Project), OS DU and is being evaluated by CESMII.

Some quick links:

- Architecture
- User Documentation
- Developer Documentation
- Get the Code

For Users and No Code Application Developers

- User Documentation
- Fledge - Edge Application Development.pdf

Strategic Collaborations

- AVEVA - Integrates data with PI, AVEVA Data Hub, pulls data from PI
• ACDP - MS Azure Integration
• Beckhoff - Collects data from PLCs
• Cisco - Operates in Cisco containers
• FLIR - Connects, collects and integrates FLIR cameras, Spinnaker for Computer Vision applications, REST for data feeds
• Google - Integrates Google's IoT Core, GC Pub/Sub, TensorFlow, Tensorflow Lite, AutoML, ML Edge
• HarperDB - Integrates data with DB
• Nexcom - J1939 and J1708 integrations, Coral integration
• Nokia - Integrates NDAC private LTE and 5G
• ThinkIQ - Integrates
• Wago - Collects data from PLCs, operates in container
• In Progress
  • AWS Sitewise Integration

We invite you to use Fledge and contribute to the Fledge Project. And, we look forward to delivering the Industrial 4.0 vision together.

Collect, Transform, Integrate - Industrial IoT Fundamentals

Fledge connects to all OT data sources (PLCs, DCS, CNC, robots, sensors, etc) supporting the many legacy, current and emerging protocols, networks and methods found in industrial use. The data types from these machines goes beyond time-series data including image, vibration, radio metric and more.

Second, Fledge collects and aggregates this data on the edge.

Third, Fledge transforms, processes, filters, stores, analyzes, alerts and notifies on the edge. Applications may be as simple as converting celsius to Fahrenheit or multi-protocol gateway transformations that map data from different schemas/protocols or as complex as ML/AL and computer vision detecting anomalies or optimizing operations from the edge.

Fourth, Fledge has bi-directional write capability for set-point control. Using Linux, this control function is not intended for RTOS applications. However, it is suitable for writing PLC instructions or sub-second control functions.

Last, Fledge Integrates the data to any and multiple destinations simultaneously creating a smart secure and scalable OT data fabric from sensors and machines to industrial systems and clouds.

Industry 4.0 Requires a 4.0 Edge
### Features

<table>
<thead>
<tr>
<th>Features</th>
<th>Benefits</th>
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</thead>
<tbody>
<tr>
<td>Universal Data Acquisition (Any sensor, machine, system)</td>
<td>Connect Everything</td>
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<tr>
<td>Universal Data Integration (ISA95, Any Cloud)</td>
<td>Connect Everything</td>
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<tr>
<td>Setpoint Control (Bi-directional write, example MES to PLC)</td>
<td>Automation</td>
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<tr>
<td>Extract Once – Use Many - Source Truth</td>
<td>Connect Everything</td>
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<tr>
<td>Edge Analytics – Data Transformations &amp; ML</td>
<td>Connect Everything</td>
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<tr>
<td>Event Detection and Notification</td>
<td>Connect Everything</td>
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<tr>
<td>No/Low/Source Code Application Dev</td>
<td>Connect Everything</td>
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<tr>
<td>Edge Buffer/HA</td>
<td>Connect Everything</td>
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<tr>
<td>Compliment-Integrate w/ Control System</td>
<td>Connect Everything</td>
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<tr>
<td>Multiple Data Types (TS, image, Radiometric, Vibration)</td>
<td>Connect Everything</td>
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<td>Scale Up-Out</td>
<td>Connect Everything</td>
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<tr>
<td>No Vendor Lock – Apache 2 – Open Governance</td>
<td>Connect Everything</td>
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<tr>
<td>Intel, ARM, nVidia, Google Coral – Any Linux</td>
<td>Connect Everything</td>
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Fledge developers and operators no longer face complexity and fragmentation issues when building their IIoT applications as they gather and process more machine and sensor data to automate and transform business. Fledge’s modern pluggable architecture eliminates the data silos often found in plants, factories and mines. By using a consistent set of RESTful APIs to develop, manage and secure IIoT applications, Fledge creates a unified, scalable, manageable and secure converged OT-IT edge solution.

**Join Us** as our community delivers the benefits of a shared open source stack to OT users and suppliers sharing the Industry 4.0 Vision.

- Quick Start Guide
- Architecture
- Community
- Use Cases
- Cross-LF Edge Collaboration

#### Recent space activity

**Fleek IT Solutions** created Apr 20, 2023

- Daelian Lazaro
  - Releases updated Apr 03, 2023 • view change
  - Use Cases updated Feb 09, 2023 • view change
  - Growth Plan updated Feb 09, 2023 • view change

**Robert Haesemann**
- Growth Plan updated Feb 02, 2023 • view change

#### Links

- Join LF Edge
- Join Fledge Slack Channel
- Join Fledge TSC Meetings