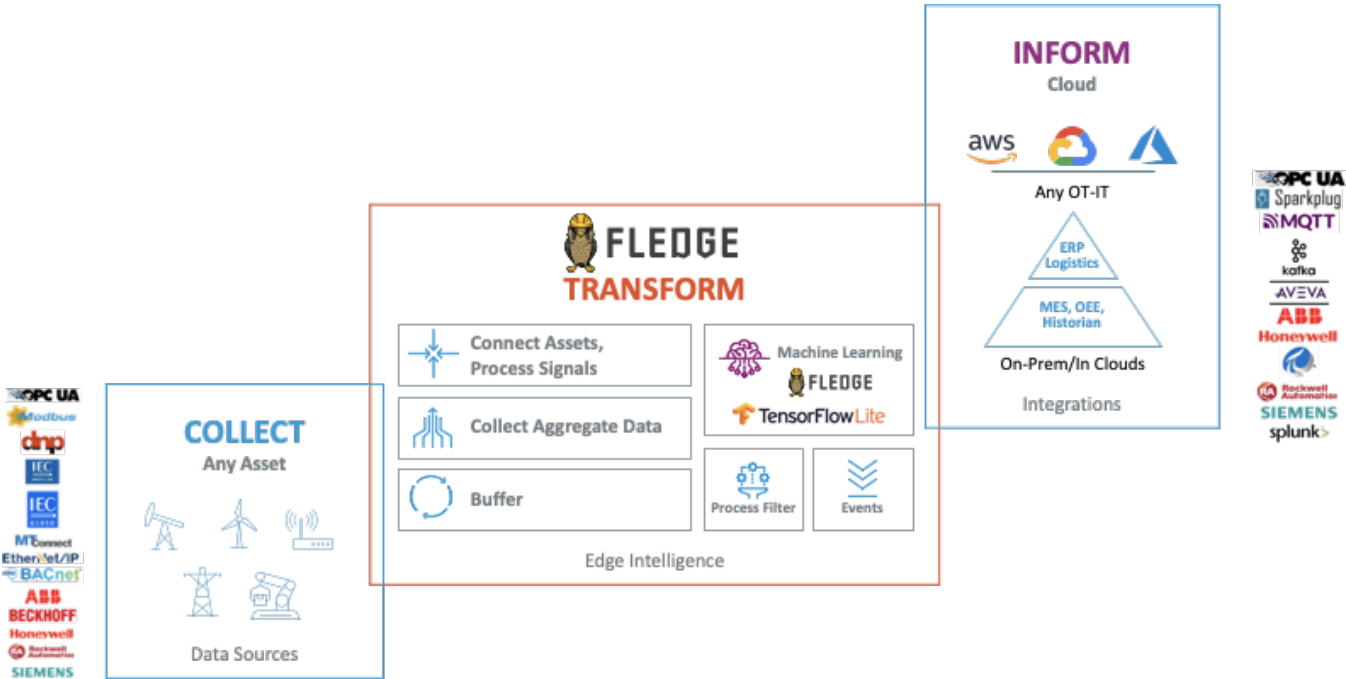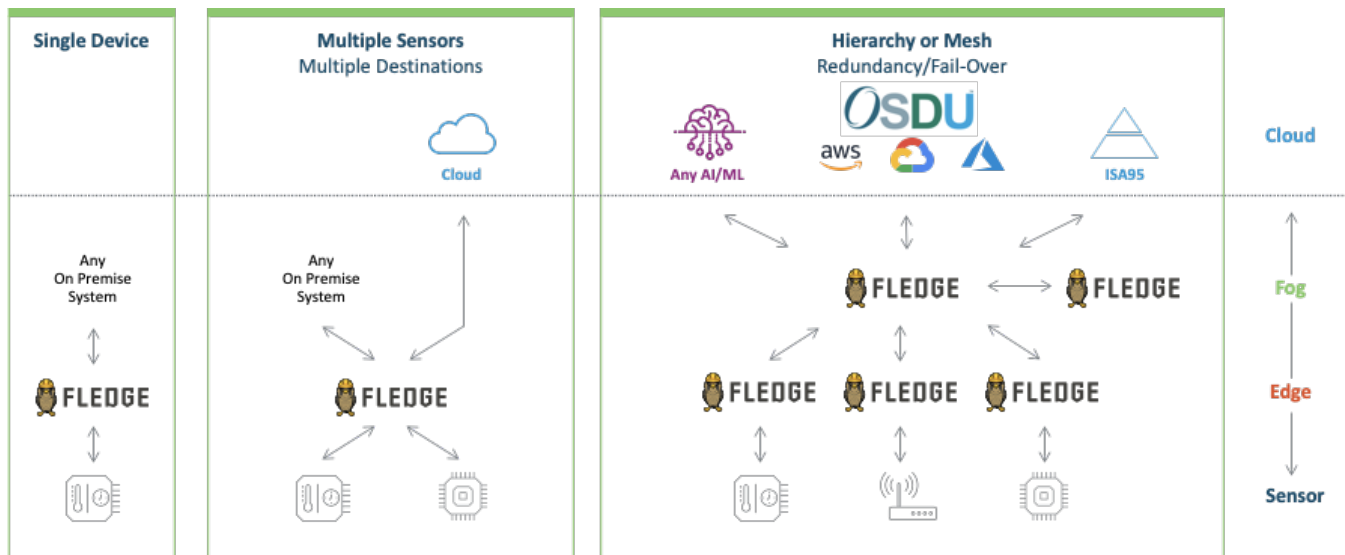# Architecture

Industry 4.0 Requires a 4.0 Edge

Fledge collects, aggregates, buffers, filters and processes industrial data on the edge. It alerts, notifies and executes ML on the edge enabling the machine learning.   Then transforms and integrates data with legacy systems. ISA95 infrastructure and the clouds.


Smart OT Data Fabrics

Fledge collects, transforms and integrates data from any sensor or machine to any destination. It aggregates data from multiple sensors and machines conveniently enabling shared transformations from the sources or transformations for the destinations.   Fledge supports smart data pipelines to multiple destinations that may have unique roots of trust per pipeline.   Fledge can connect to Fledge enabling smart data pipeline hierarchies or meshes. Application workloads can then be executed where needed and all the various users of the data can use their tools of choice.

Single Device	Multiple Sensors Multiple Destinations	Hierarchy or Mesh Redundancy/Fail-Over	

Architecture

Fledge has a modern RESTful API based microservices architecture.

Starting from data ingress, Fledge has a South Service that collects, aggregates, filters and transforms data.   Using plugins written in Python or C++, any sensor or machine protocol can be added.   The South Service also uses plugins for filtering, signal processing and transforming data.   Data flows from the South Service to the Storage Service where it is converted to JSON and buffered in Postgres. The storage is a plugin so Postgres can be swapped with your database of choice. Data flows from the Storage Service to the North Service where it is transformed, filtered and secured as required by the destinations.   The North Service also uses protocol plugins and filter plugins. Fledge north plugins include: MS Azure, AWS, Google Cloud, OPC-UA, Kafka, MQTT, OSIsoft OMF, HTTP/s and many more. A Set Point Control Service enables bidirectional flow of data.   Fledge uses Linux so this control service is ideal for smart applications that interact with PLCs, MES, RTU Servers and other industrial infrastructures.   The Event Service monitors the data on the edge. Using a rules engine smart applications can be built including AI/ML edge inference. The Orchestration Service enables management and monitoring of Fledge via an extensive REST API.
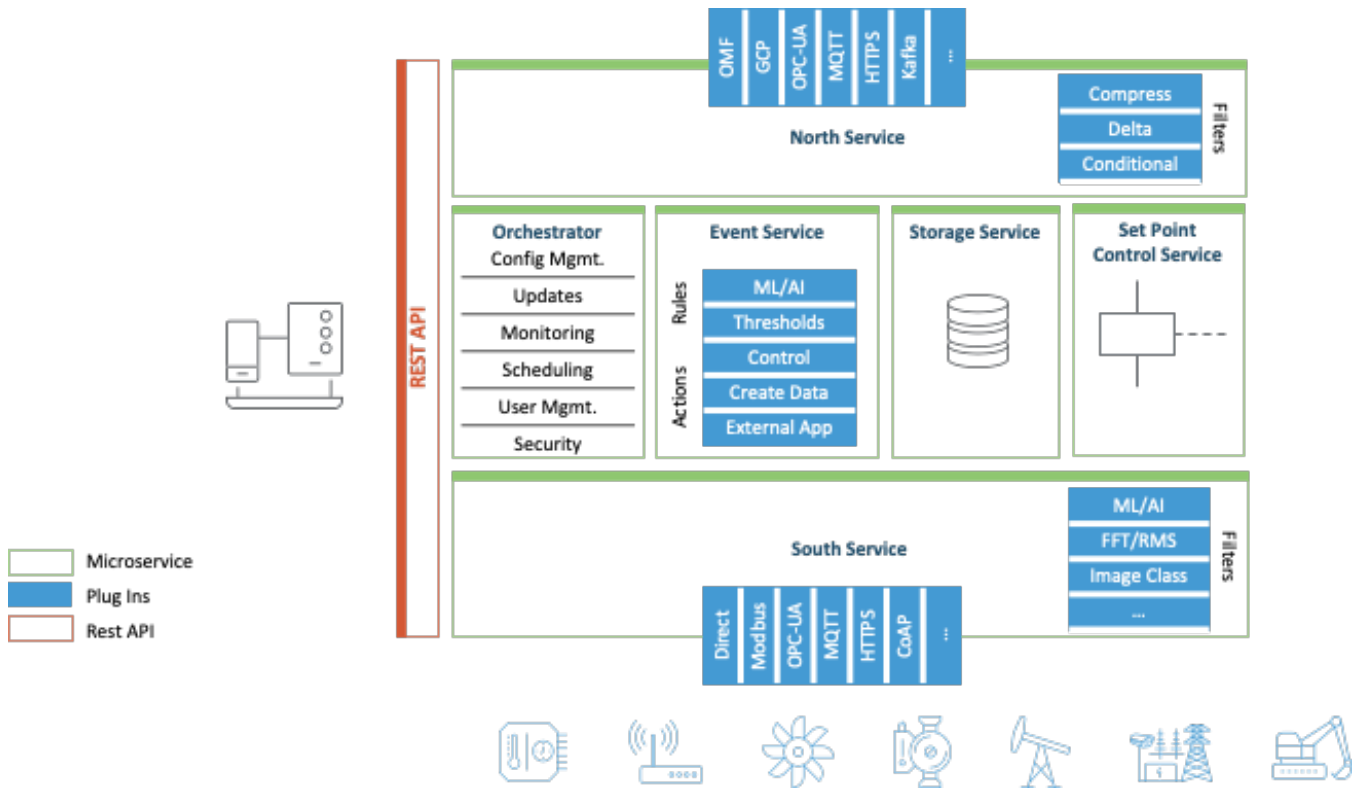
Visit the latest documentation for the latest Fledge Architecture.