

Annual Review for RTDIP

2025

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RTDIP

Easy access to high volume, historical and real time process data for analytics applications, engineers, and data scientists wherever they are.

Use Cases

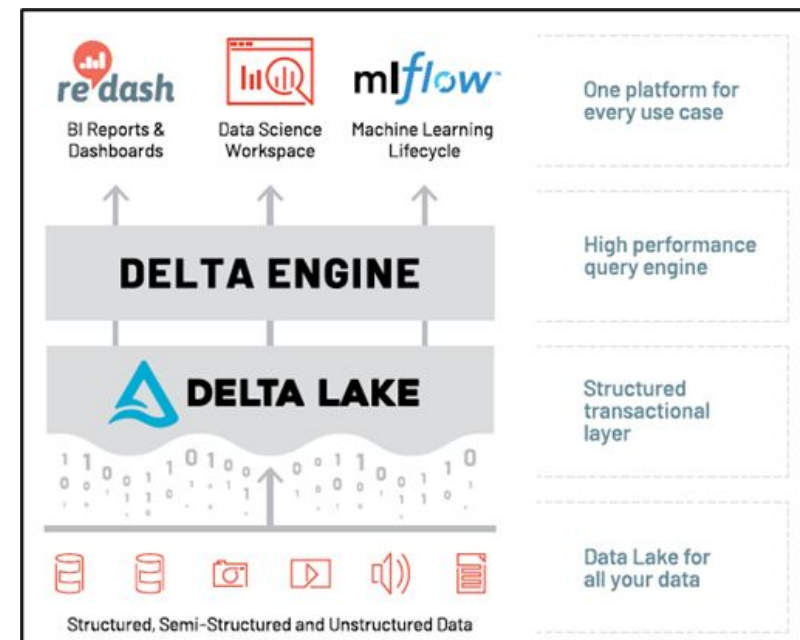
- Process time series data for preventive maintenance management, monitoring and production optimization

Technical Summary

Key components are:

- The Delta Ingestion engine used to process streaming data from streaming sources and files stored in cloud storage into Delta format. The data ingested is typically sourced from Pi Historians, OPC UA Servers, IoT Devices 2.
- Python SDK that enables data consumers to read and query raw, sampled, interpolated or time weighted averages of the data stored in Delta3.
- REST APIs that are wrappers for the Python SDK that enable developers in non-python languages to consume the data

Contributed by [Shell](#)



Learn more at rtdip.io

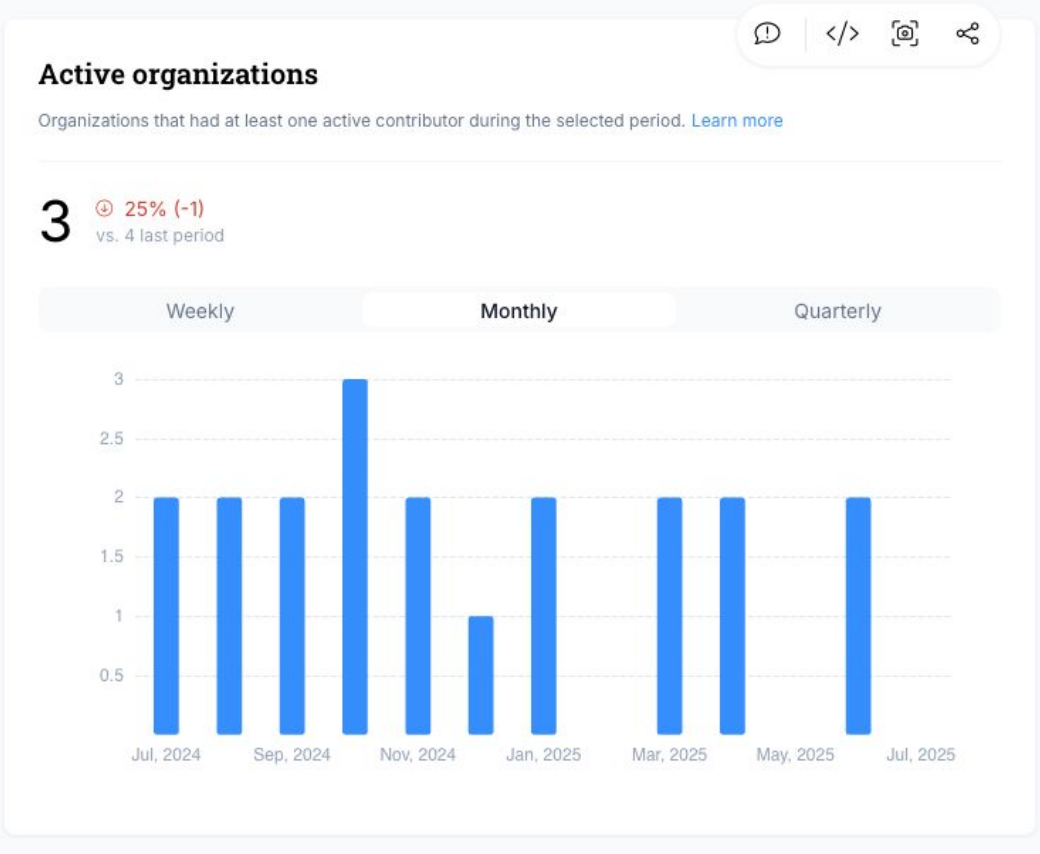
Edge & Distributed Intelligence

System Management

Data Management

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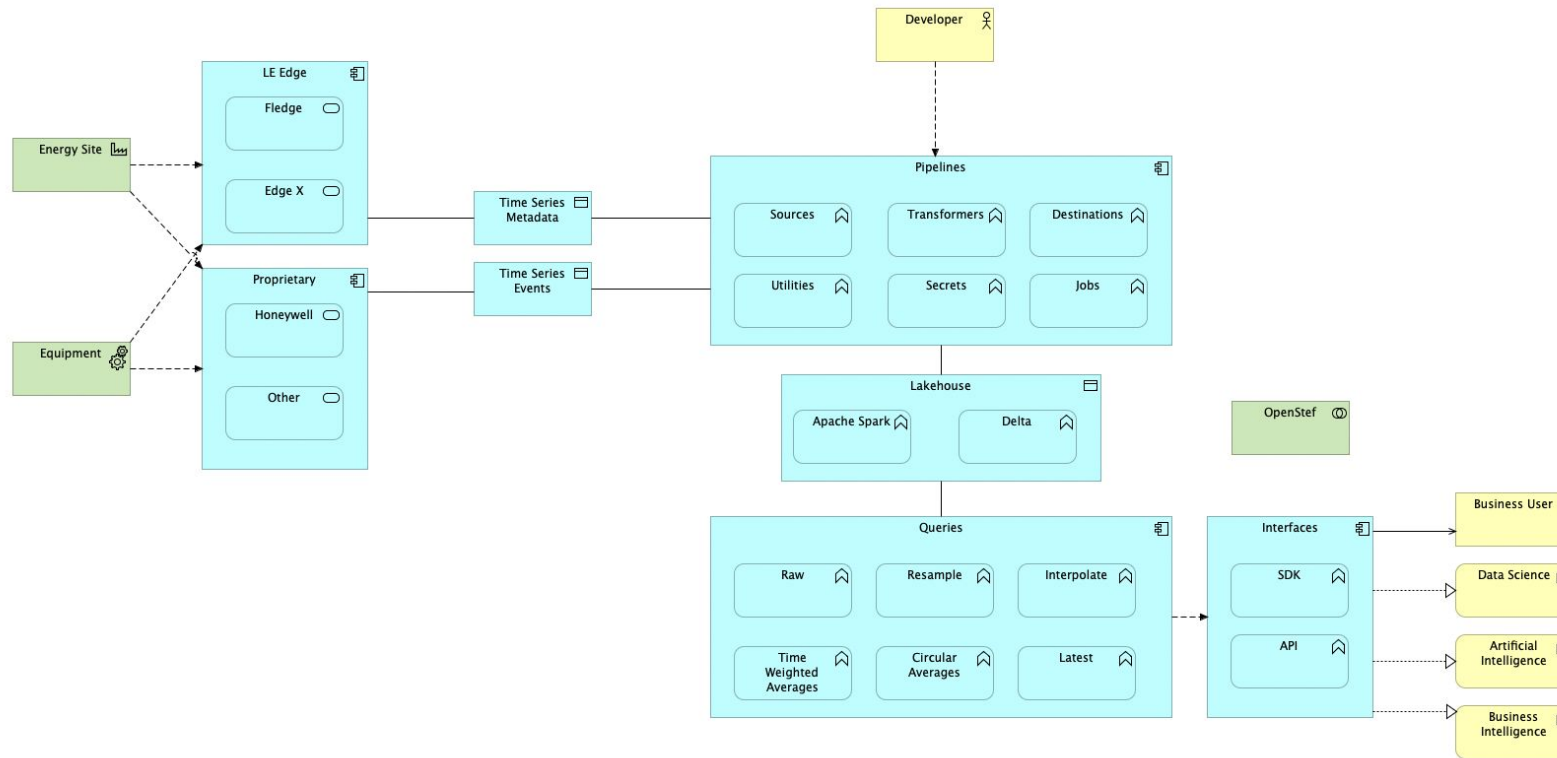
Contributions



Organizations contributing and/or using in production



ArchiMate Architecture Diagram



Key Achievements in the past year

- RTDIP is deployed at **86** energy sites globally, including:
 - 9 Wind & Solar Renewable sites
 - 20 Energy & Chemical manufacturing plants
 - 8 Integrated Gas processing sites
 - 12 Research sites
 - 37 Exploration platforms
- Ingests 8 million sensors in real time into a Lakehouse containing ~10trln time series data points at Shell
- ~1.2mln pypi total downloads
- Worked with Apache Spark community on Python Custom Data Sources and Variant Types functionality in Spark 4.0 and LF project Delta.io on Liquid Clustering in Delta 4.0
- 2 commercialization deals signed for industry protocol connectors that produce data that can leverage RTDIP

Community Building Activities



RTDIP Data Quality Checker Project

- 9 students
- **Challenge:** To support the advancement of the Real-Time Data Ingestion Platform (RTDIP) by contributing to the development of innovative, open-source components focused on ensuring data quality. The mission includes creating tools to detect missing data, outliers, duplicates, and irregularities in real-time data streams, while aligning with RTDIP's development guidelines to promote robust, scalable, and collaborative solutions.
- **Result:** 12 Data Quality validators, 3 data monitoring & 3 transformers components developed

The Energy-Efficient Ghosts of Holiday Past

- 195 teams participated
- \$30,000 prize
- **Data:** NREL's End-Use Load Profiles for the US Residential Building Stock
- **Challenge:** Forecast the load for the remaining days of December. Specifically, predict the load for three particular elements (two heating-related loads and one plug load), each of which will surge by 30% during the Party due to increased usage. Account for additional decorative electric devices (holiday lights, holiday inflatables, etc.) during the event, with a fixed total power rating of 2kW. **Use RTDIP functionality somewhere in your solution**