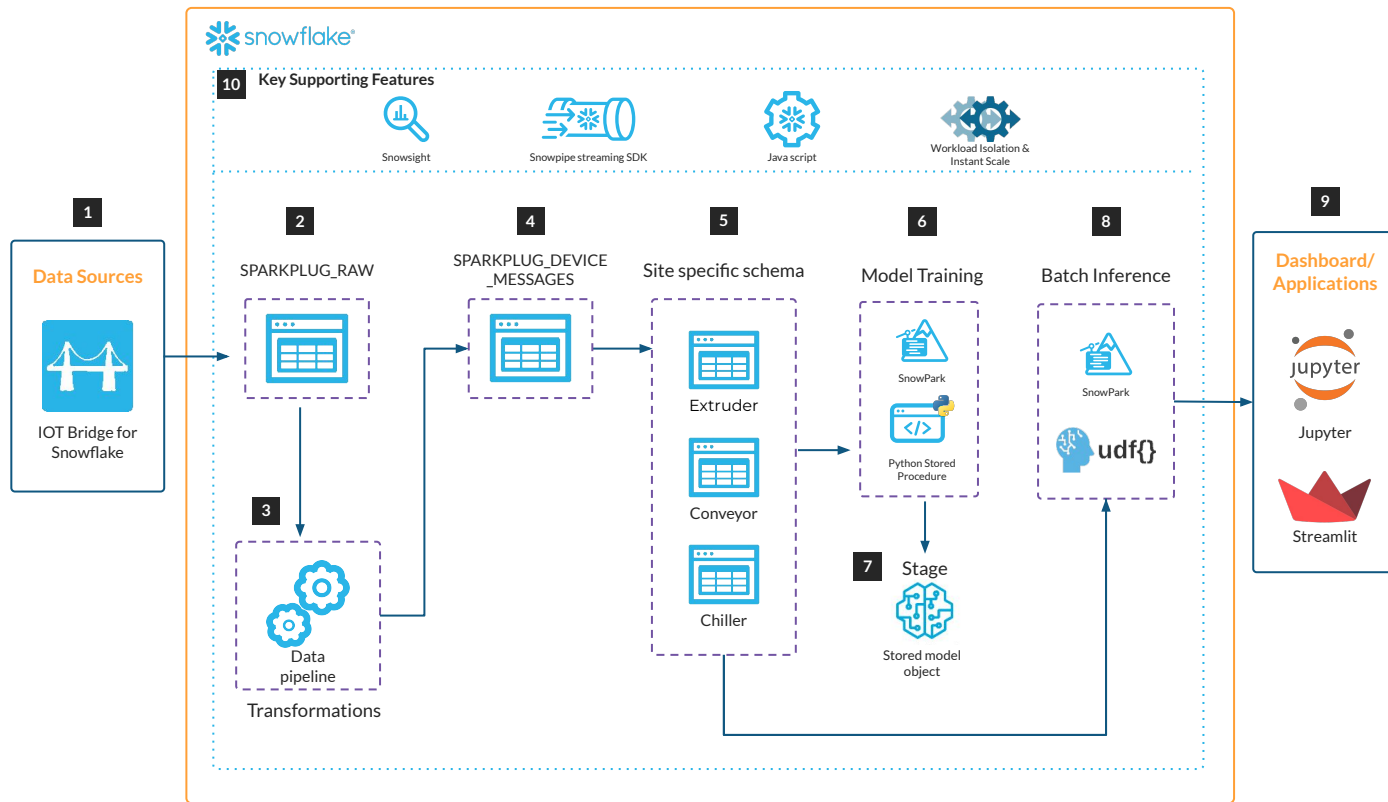


# CIRRUS LINK IOT BRIDGE REFERENCE ARCHITECTURE



## OBJECTIVE

Snowflake in partnership with CirrusLink has built out the "IOT Bridge for Snowflake" solution that not only ingests OT data into Snowflake, but also dynamically builds out and hydrates the various machine/device views with zero coding effort. In addition we include an LSTM autoencoder for Anomaly Detection using Snowpark ML.

## USE CASE FLOW

- 1 MQTT/SparkplugB messages are received by IOT Bridge. The IOT Bridge converts the protobuf format to JSON format and ingest the data into Snowflake.
- 2 The data is staged in the SparkPlug\_Raw table.
- 3 Since SparkPlugB messages are a standard, and knowing the lifecycle events we process these message based on the message types
- 4 The NBIRTH messages are used to create the site specific schema and machine views.
- 5 Messages are flattened, rehydrated and stored as device "As Of" Views for Analytics and other downstream use
- 6 An unsupervised LSTM autoencoder model is trained on healthy running conditions
- 7 A trained LSTM autoencoder model is saved as a reusable model object within snowflake internal stage
- 8 The trained LSTM autoencoder model is called via a UDF in Snowpark to to identify when a signal does not look normal. Based on the error for each signal it is possible to uncover which signal(s) are anomalous
- 9 The views can then be used by downstream applications including dashboards and other data science use cases
- 10 Snowpipe Streaming SDK is used for real-time ingestion into Snowflake. The data transformation pipelines are achieved using JavaScript

## RELATED CONTENT

Partner solution page: [IoT Bridge For Snowflake](#)  
 YouTube: [Learn How to Stream Data Into Snowflake with the IoT Bridge for Manufacturing](#)