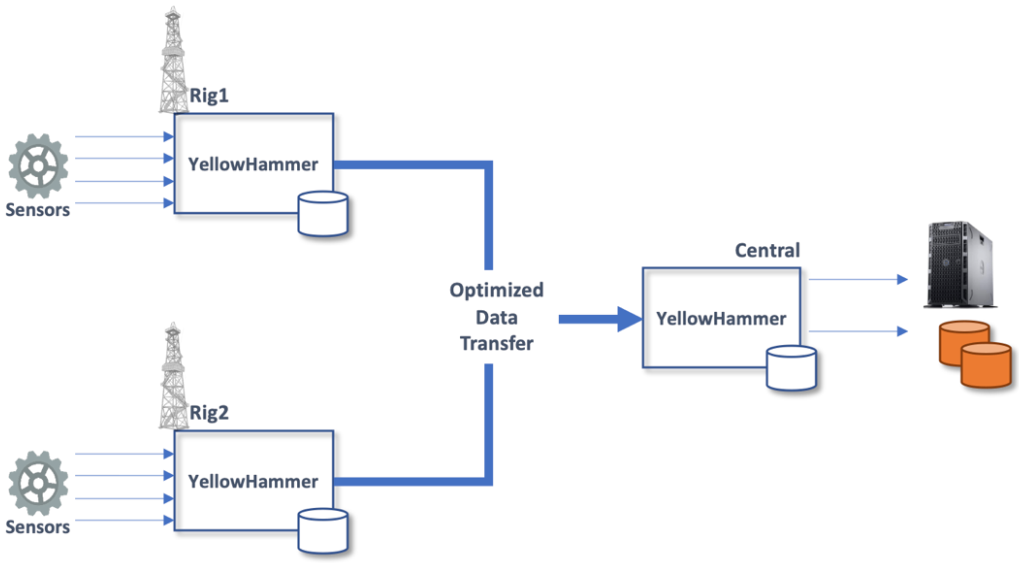
YellowHammer

Overview

YellowHammer is a comprehensive, data aggregation platform for streaming data that can publish low latency and high frequency data over low bandwidth networks to multiple consumption points. The software delivers a step change in the attainment of operational efficiencies by delivering high fidelity data from a broad range of protocols and frequencies.

BENEFITS

- Seamless data collection from multiple devices and systems
- Time synchronized data streams from multiple data vendors
- Zero data loss during collection & transportation
- Monitoring of quality of streaming data in the context of environment and stage of operations
- Delivery of high fidelity data irrespective of quality of input data streams
- Streaming of data at different frequencies as demanded by the downstream applications
- Flexibility of choice of Units of Measurement (UoM) to consumers of streaming data
- Data backfilling feature
- Support for bi-directional data flow for advisory and asset control messages
- Customizable for different industry segments
- Support for localization
- Platform-agnostic



YellowHammer is the centerpiece of SigmaStream's ***interoperability*** message. With YellowHammer, rig contractors or operators can finally bid farewell to vendor lock-in. As long as the data provider publishes data in an industry standard protocol and format, YellowHammer can easily ingest, store and transport data for consumers downstream. YellowHammer can be installed and configured in a matter of hours. To configure YellowHammer server, a feature rich, web-based UI can be used along with a scriptable command line interface (CLI). Additionally, power users can use a combination of the JSON, RESTful, and Python APIs to programmatically interact with the server. YellowHammer can be deployed on an ARM based platform such as a Raspberry PI III to a full-blown multi-node cluster. The software product has been tested on Windows, Linux, and MacOS X.

YellowHammer is designed to ingest and normalize drilling data from multiple disparate sources into a unified, standards-compliant format. It ensures seamless aggregation, harmonization, and accessibility for downstream analytics and visualization tools. In addition to its robust aggregation capabilities, YellowHammer can simultaneously handle low, high, and mixed frequency data streams from multiple sources without degradation in performance. It has been tested to reliably process data at frequencies as high as 1,000 Hz, making it suitable for both high-resolution sensor data and lower-frequency operational signals in parallel.

SYSTEM REQUIREMENTS

Server

OS: Windows
Ubuntu 14+
CentOS 6+
MacOS X

CPU: Quad-core 3.0 GHz or higher

Memory: 8 GB+

Client

Browser(s): Google Chrome Version 60.x+

MS Edge 25.x

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Features

The key features of YellowHammer are:

Protocols & Data Formats

YellowHammer supports widely used data protocols including ETP, Modbus, OPC U/A, WITS, WITSML, and MQTT. In addition to the protocols listed YellowHammer can consume and produce many data formats such as JSON, CSV, and Wireshark PCAP. The software connects to RDBMSs and the popular NoSQL databases such as MongoDB, Cassandra, HBase, and Kudu and to a host of custom endpoints.

Unified View of Data Streams

Time synchronization and mapping of Units of Measurement results in producing unified data streams for downstream applications. YellowHammer processes the differences in timestamps of data streams from multiple sensors and devices to deliver one steady data stream. Mapping of UoM for data channels offers flexibility to view data with the preferred UoM, irrespective of UoM of original data.

Export and Replay

Streaming data captured by the Yellowhammer is persisted. YellowHammer comes with an array of options to export and replay the historical data. For instance, one can replay data for a specific set of channels collected from a specific device between a start and end time. One can also replay data from the persisted store and a CSV file and merge the output, on-the-fly, at the natural frequency or at a sped-up rate.

Custom Subscriptions

The ability to choose channels from multiple devices producing data at different frequencies is a convenient and powerful mechanism to ensure just the right data at the right frequency. YellowHammer can regularize the data in terms of frequency for its consumers using waterwheel subscription mode.

Data Backfilling

One of the key features of YellowHammer is the ability to provide data to consumer applications in real-time. However, network outages during data transportation may result in gaps in the time-series data at the destination. To address the problem, Backfilling process is designed to identify gaps and fill them up, automatically.

Data Management

YellowHammer provides an abstraction layer above the persistence mechanism by offering a full featured set of data management tools. The YellowHammer administrator is shielded from the complexities of the underlying technology.

Contextual Data

Built-in business rules engine ensures a "single version of the truth" of contextual data from multiple sources.

Optimized Architecture

Segregation of functional units into separate components to facilitate distributed deployment for enhanced performance. For instance, WebClient which is a UI component for YellowHammer server is packaged and deployed separately. It allows the use of a single WebClient for the administration of multiple YellowHammer servers.

Quick Setup & Configuration

CLI tool and WebClient have many options provided to create / export/ import / copy configurations for business asset hierarchy including devices. Selective extraction and import of data are supported, too. Thus, helping users to establish a working setup quickly and start data streaming.

Device-centric operations

YellowHammer's device-centric mode facilitates continuous data collection and replication with minimum configuration and need for metadata. Any changes done in the higher levels of business assets hierarchy, for data consolidation do not affect the streaming. Changes are treated as events and are broadcasted using pub-sub model.