Canary User Conference

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Mountain Creek's Successful Migration to the Canary System

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Mountain Creek Power Plant

Facility Overview

- Dallas area power plant
- 808 MW capacity
- Three gas-fired steam turbines
- Built in the 50’s and 60’s
- “Flexible” source of electricity
- 1,500-acre site (room to grow)

Operations

- Owned by Trafigura
- Operated by EthosEnergy
- Regulated by ERCOT

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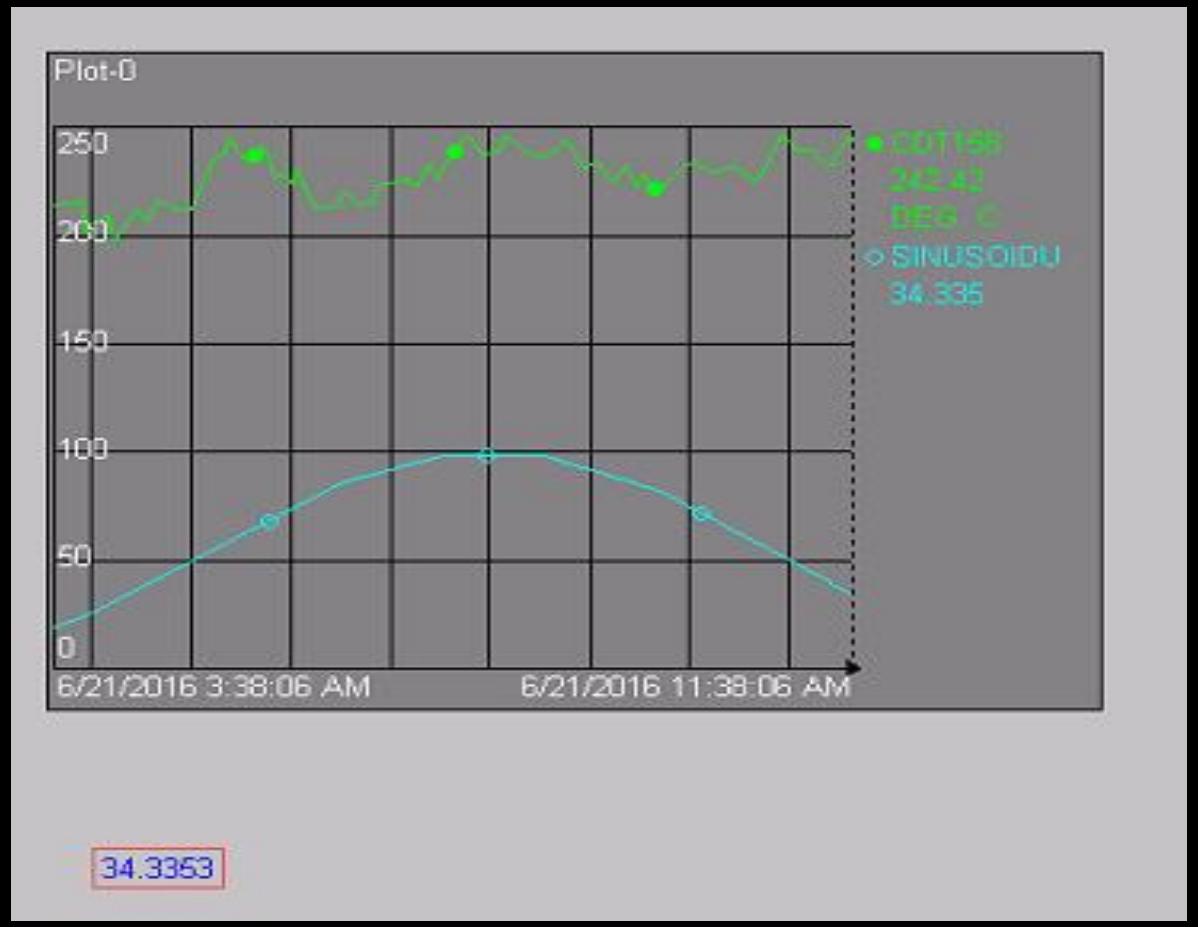
Initial State – Poor Legacy Solution Performance

Existing Historian

- Unresponsive
- Unreliable
- Underutilized
- Not actively developed
- Increasing license cost
- Restricted visibility

Existing Visualizations

- Mostly ad hoc trending
- Poor user adoption



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Key Stakeholders

Facility Manager/Operator (EthosEnergy):

- EthosEnergy was contracted by plant owners to run the day-to-day operations of the facility. Responsible for running equipment considering economic-based directives from owners.

Owner (Trafigura)

- Holds direct financial stake. Constantly re-evaluating market conditions to determine when to start and stop generators.

Grid Manager (ERCOT)

- Can impose generation requirements on the facility that may not be in the best interest of the owners but must be complied with.

System Users (Ethos and Trafigura)

- Power plant operators, technicians, engineers and managers and EthosEnergy personnel that use Canary and the data it provides to make data driven decisions.

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Design and Selection Process

The Canary System was selected based on its ability to meet all primary selection criteria.

Available Options

- ❑ Upgrade the existing historian
- ❑ Migrate to another historian
- ✓ Migrate to Canary System

Selection Criteria

- Favorable cost
- Reliable data available
- Low administrative burden
- Easy of use
- Easy migration

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Evaluation Results

- Unfavorable commercial negotiations with the existing vendor.
- Alternative solutions were evaluated and presented for consideration.
- The customer selected the Canary System because it provided similar functionality and greater ease of use at a more attractive price point.

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Solution Architecture

Canary Historian

- 7,500 tags

Virtualized Server Hardware

- Stratus - ftServer 2920
- Fault tolerant
- 8 CPU, 16 GB RAM
- 500 GB data drive

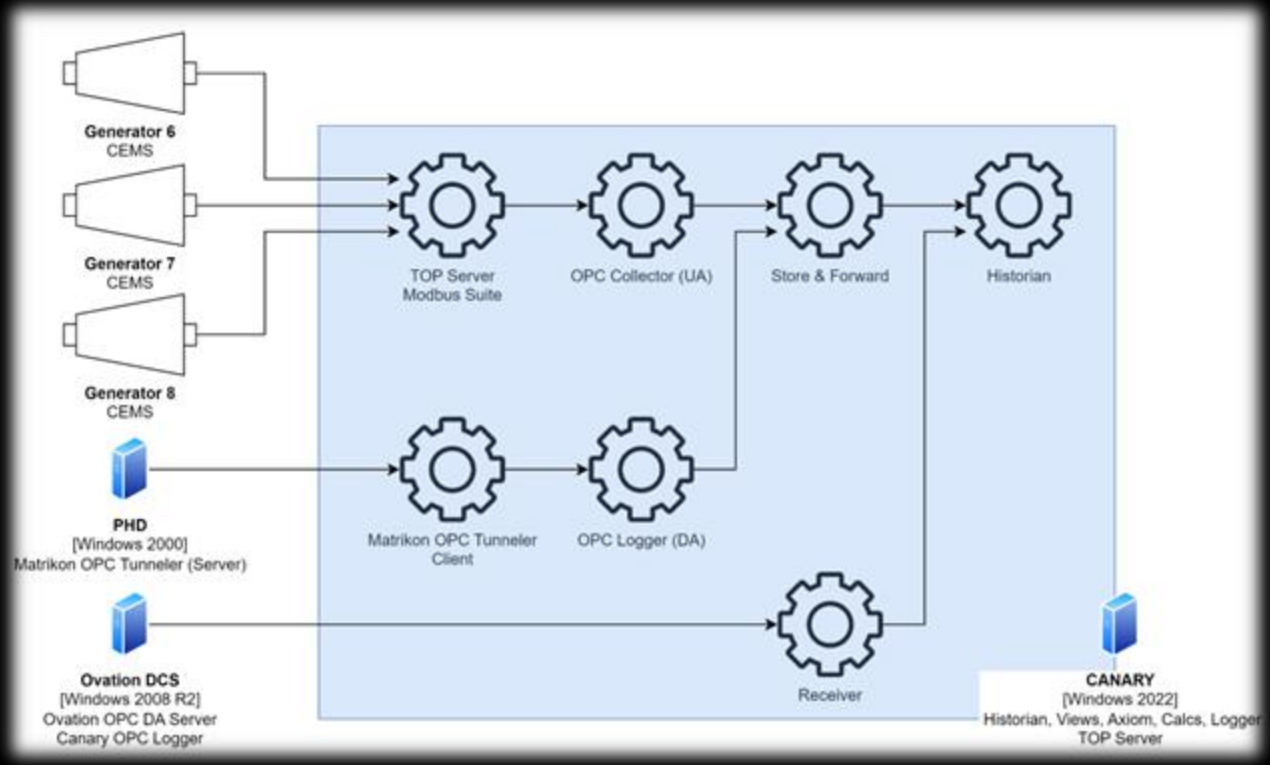
Data Integrations

- TOP Server & Canary OPC UA Collector
- Matrikon OPC Tunneller and OPC DA Logger for Server 2000

Visualizations & Reports

- Canary Views
- Axiom Displays and Excel Reports.

Data is collected, stored, contextualized, analyzed delivered and visualized with the Canary System.



Overcoming Hurdles

We leveraged third party solutions to connect to various data sources.

Modbus

- Software Toolbox's TOP Server was implemented to support system integration.

Server 2000

- Matrikon OPC Tunneller use to overcome firewall constraints.

Server 2008

- Older Logger Version (20.1)

Canary Excel Add-In

- Some Initial functional limitations & bugs
- Canary was responsive to develop enhancements and bug fixes.

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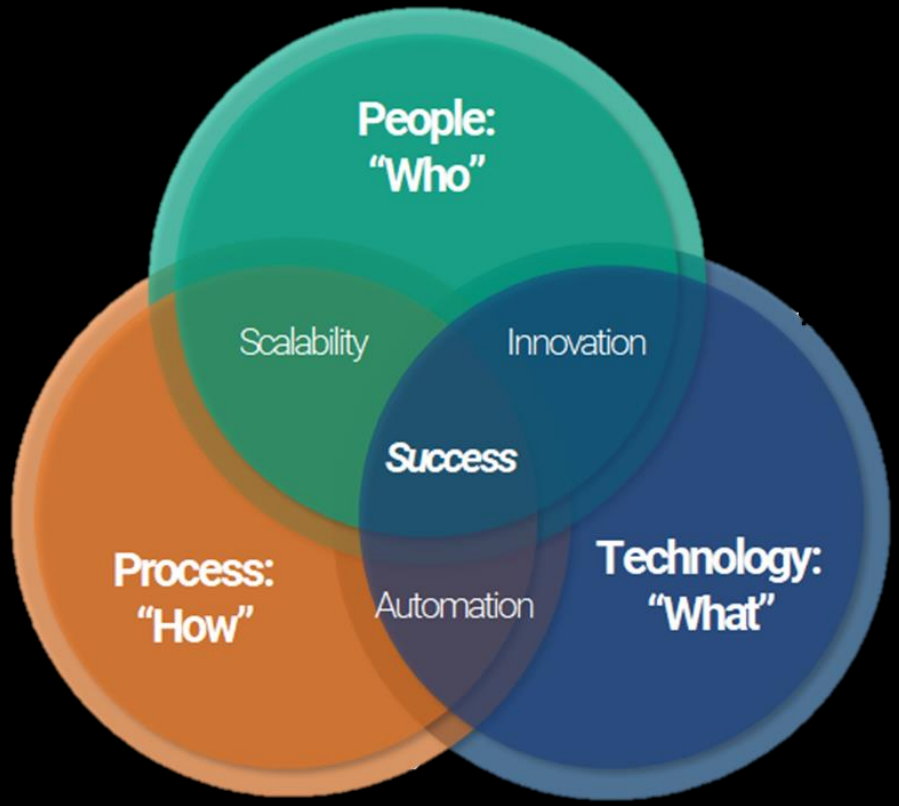
Primary Migration Process Steps

Bringing the People, Technology and Process together through cross functional team collaboration is the key to success!

1. Install & Configure Server
2. Install & Configure Canary System
3. Connect to each data source
4. Categorize existing tag data
   a. Migrate
   b. Cold storage (CSV on network)
   c. Ignore
5. Run Canary Migration Tool
6. Run Canary Merge Tool
7. Perform quality checks
8. Decommission old historian



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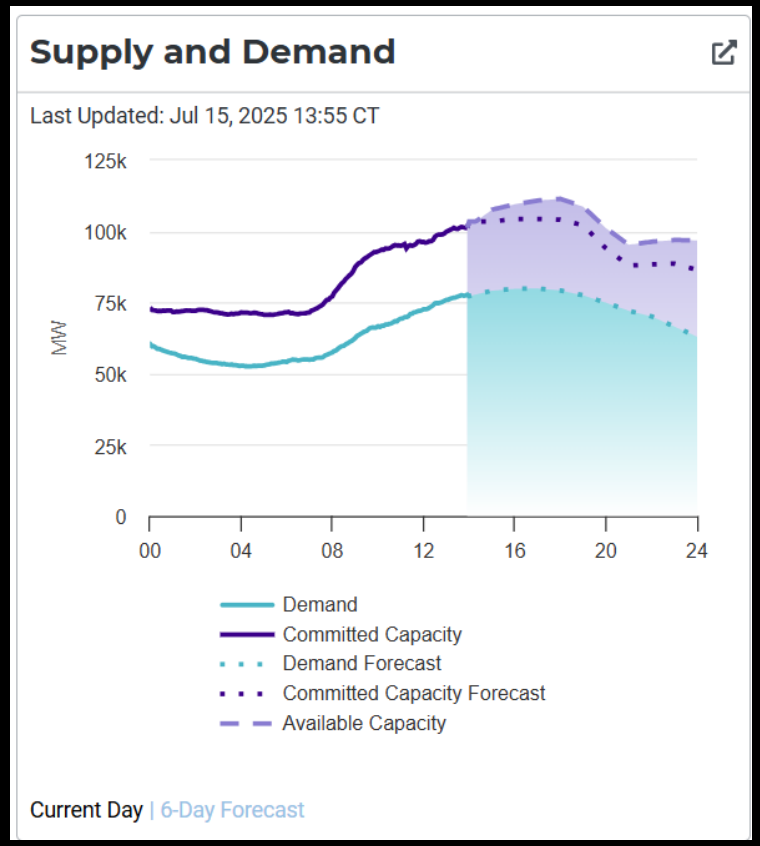
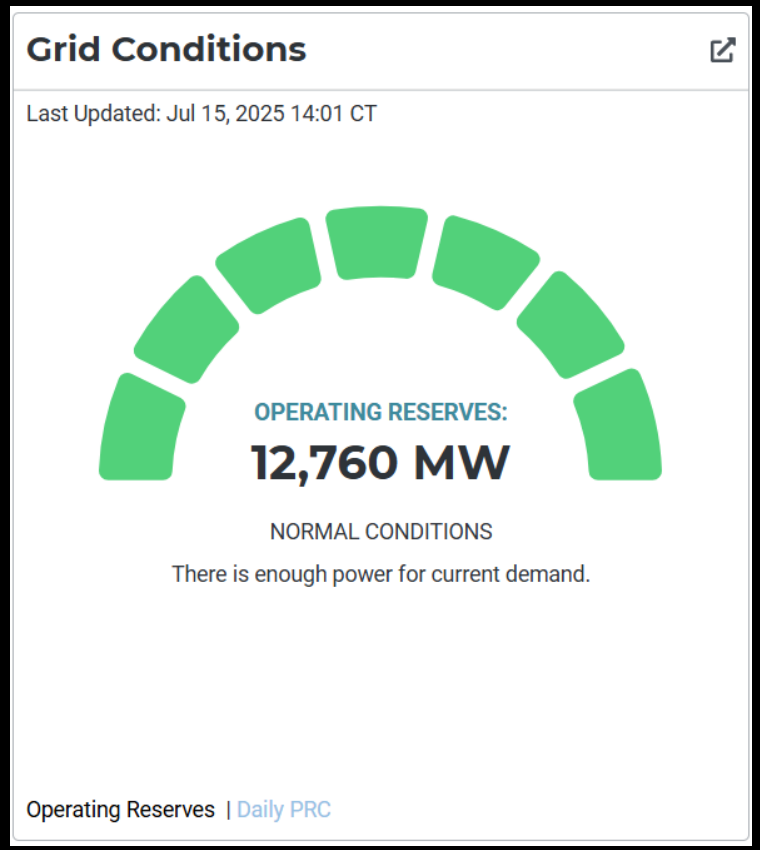
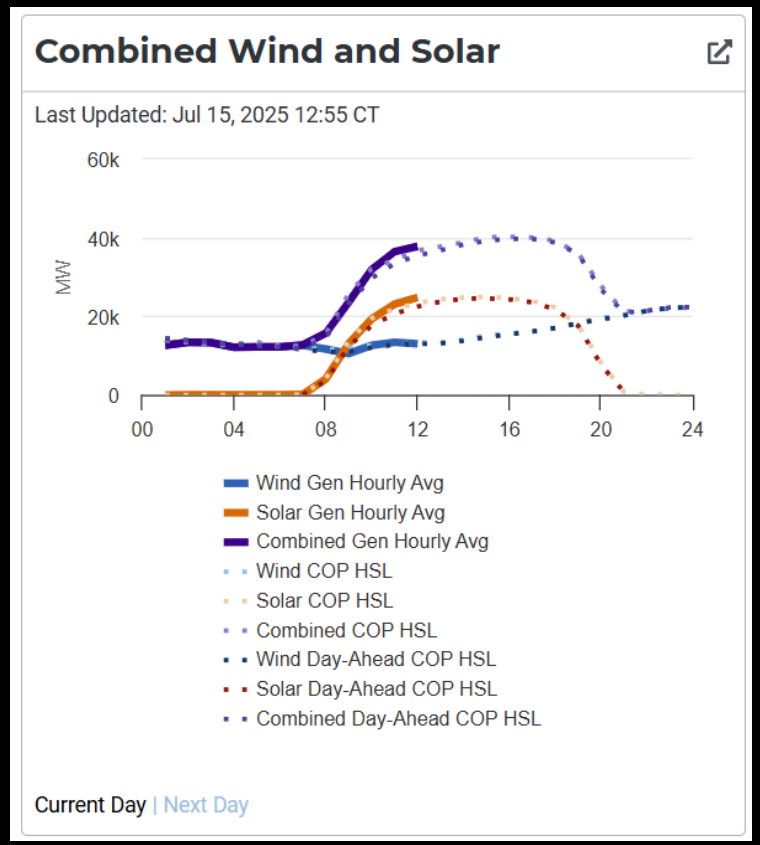
Grid Operators Must Balance Supply and Demand

Grid Managers must balance supply and demand based on forecasts. They publish the supply and demand forecast to help producers plan and manage their energy production operations.







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Power Producers must Optimize Unit Operations

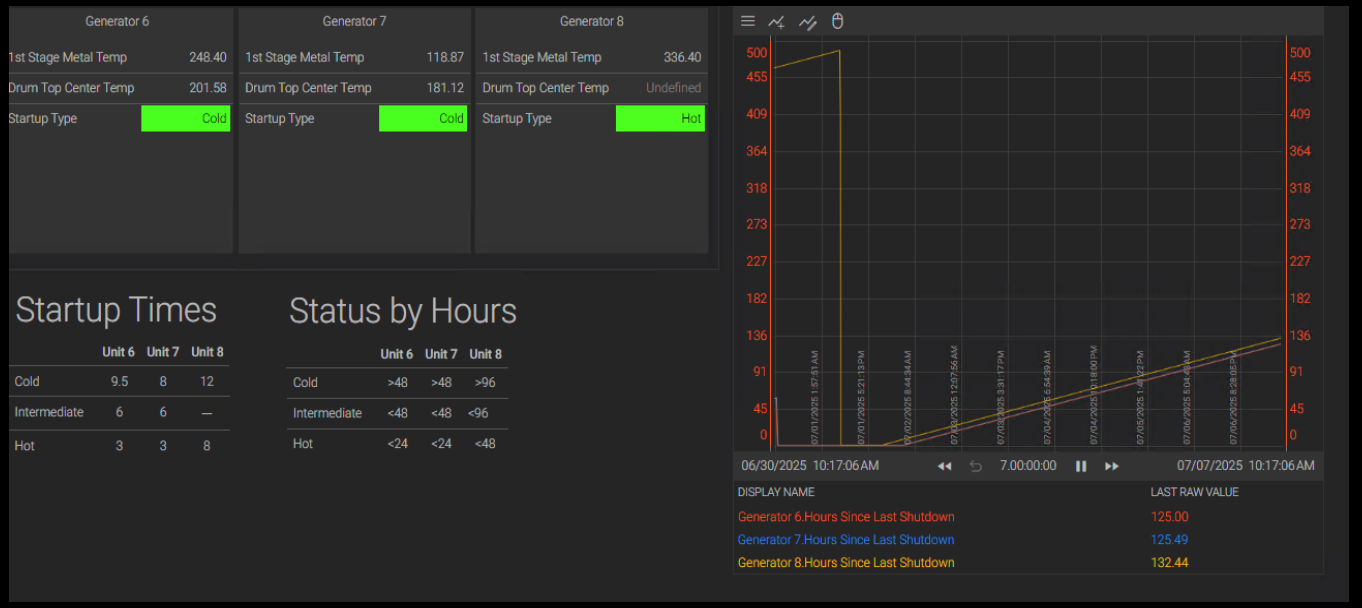
Producers must manage their power generation based on demand, demand pricing and their internal capacity and production cost.

Challenges

- Decisions to start and stop units are made by offsite by grid managers and energy traders.
- Taking a unit offline hinders the ability to take advantage of market swings and reduces overall plant production.
- Units can take hours to start up due to the ramp up of thermal conditions which are negatively impacted by the elapsed time since shutdown.

Solution

Leveraged Canary's Calcs & Events and created Axiom dashboards to allow decision makers the ability visualize unit status, allowing for quick decisions during operational discussions.



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Real Time Operational Visibility

Visibility

- Axiom Trends and Dashboards provide operational visibility to the remote process performance data center.

Actionable Insights

- Issues and opportunities can be quickly identified so that appropriate actions can be taken to maximize overall plant performance.

Historical Records

- Historical data enables engineers to investigate and identify root causes to formulate improvement plans.

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Success

High Performance

- Data is returned quickly.

User Engagement

- Operators are engaged and building dashboards.

Operational Visibility

- All stakeholders have insight into the operation and assets.

Easy Admin

- Very minimal administrative burden and easy to use administration tools.

High Reliability

- Fault tolerant solution

"The Axiom tool has been especially impactful, enhancing our troubleshooting capabilities due to ease of use. Everyone here loves it."

Facility Manager

	MT6	MT7	MT8
Setpoint NetMW	26.50	2.95	Bad
Net Load	-1.24	-0.23	-0.07
Deviation	27.74	3.18	Bad
Gross Load	-1.04	-0.13	0.33
AUX Load	0.20	0.10	0.40

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Lessons Learned

Educate Stakeholders on Functional Differences

- Educated stakeholders upfront on how Canary functions differently that their existing platform(s).
- All systems have strengths and limitations. If users of the existing system(s) expect Canary to be an identical replacement, they may become frustrated.
- Canary System is configured with a bottom-up data centric approach that is quite different from other historians. This must be understood along with the pros and cons of this approach.

Validate Software Compatibility

- Validate that the selected software is compatible with the OS they must run on.
- The Matrikon OPC Tunneller was a mid-project addition because the team did not identify that the Honeywell PHD system was running on Windows Sever 2000 that is not supported by the current versions of the Canary Collectors.

Emphasize the Value of Canary Views and Asset Models early and often.

- The customers adoption of Virtual Views was lower than it could have been because the users lacked understanding on their value and desire to continuing the use or the source systems tag names. Additional gains can be made by creating leveraging Views and Asset Models by defining rules to recast the tag names into new virtualized tags.

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Final Thoughts

In an increasingly crowded market of enterprise historians, Canary stands out as both established and rapidly evolving solution that is:

- Secure
- Robust
- Scalable
- Open
- Easy to Use
- Favorably priced.

Canary offers easy to use client and administrative applications that provide rapid access to information. They continue to develop tools to help partners quickly and accurately migrate data from other historians.

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Questions

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