The Advantages Of Enterprise Historians Over Relational Databases (Part 2)

GE

Enterprise historians not only offer built-in data collection capabilities, faster speeds and higher data compression compared to RDBs, they can deliver architectural advantages that play a vital role in enabling accurate real-time information for better and faster decisions and a sustainable competitive advantage.

Part 1 of this two-part editorial can be found here *[1].*

To succeed in today's highly competitive business environment, utilities and manufacturers need true process visualization to drive operational excellence. It requires the collection and optimization of vast amounts of process data from across an operation, supported by the right technology solutions that maximize the value of that data to enable increased productivity, greater efficiency, and reduced costs.

While relational databases (RDBs) are designed to manage relationships between contextualized data, enterprise historians are built specifically for process data acquisition and presentation—a critical capability for industrial businesses. Enterprise historians not only offer built-in data collection capabilities, faster speeds and higher data compression compared to RDBs, they can deliver architectural advantages that play a vital role in enabling accurate real-time information for better and faster decisions and a sustainable competitive advantage.

Robust Redundancy for High Availability

RDBs can offer high availability for data stored through clustering, but they are vulnerable to data collection and network availability. Depending on how the data collection function was developed, RDBs may face a couple of issues on data availability. If the collection function resides with the server, there may be vulnerability with the network that connects it to the data source; if the collection function is written to exist at the data source, there may be vulnerability with that computer.

In contrast, historian technology covers all three of these areas to deliver the highest level of availability, with clustering at the data store much like an RDB, as well as another level of redundancy at the collector function, which is a critical component. If there are mission critical data collection points, the collectors themselves can be configured in a redundant fashion.

Some historians such as GE's Proficy Historian can also address network and server disruptions through a "store and forward" capability, which buffers data at the

collector should a disruption occur. The buffers are eventually uploaded when the server comes back online with automatic reconnection—ensuring no data loss.

Enhanced Data Security Ensures Data Integrity

Networks and databases are under constant attack from hackers and viruses, many of which are targeted at well-known RDBs. For example, SQL injection (or SQL insertion) attacks are common with RDBs while some enterprise historians are immune, as they do not allow insert, update, or deletion of data through standard interfaces.

Less vulnerable to these types of attacks, enterprise historians are designed to enforce higher standards of data security. You can implement security for historians at the functional group or down at the tag level, a task that would be exceedingly difficult with an RDB. Furthermore, historians track just about all changes by default, including user access, configuration changes, security violations and system alerts; they even keep a copy of original tag values if altered. All of these capabilities would be difficult to implement in a standard RDB.

Finally, some historians are designed to help address strict regulatory requirements such as the FDA’s 21 CFR Part 11 by implementing electronic signatures, a feature not offered in an RDB.

Quicker Time to Value Drives Efficiency

Implementing an RDB can be a time-intensive and costly process because you have to create and manage custom tables to install the solution. Additionally, because IT resources typically manage RDBs, changes need to be approved by the team, which can add on significant time and effort. The team also needs the knowledge (for example, on the specific device drivers and the table construction) and experience to optimize performance.

However, when installing an enterprise historian, you can “normalize” the implementation, using standard interfaces to decrease implementation time by approximately 50%. You also don’t need to manage or create data “schemas,” triggers, stored procedures or views—resulting in quick installation and configuration without specialized services such as custom coding or scripting. For example, with Proficy Historian, you can streamline implementation by using standard interfaces for rapid time to value.

Finally, historians have pre-built interfaces to the automation layer, providing a single environment whereby you only have to configure tags once, and you can store process data seamlessly in a secure, central location.

Answers To Address Real-Time Production Decisions

Alongside the architectural advantages, enterprise historians can integrate with OLE DB-aware applications and query the data, alarms and events, and system and administrative information using standard SQL commands. It’s also easy to

generate reports and share information across your enterprise using standard web browser tools.

For example, utilities can leverage historian data, which becomes a vital link between plant or transmission and distribution (T&D) operations and business systems. They can review historical events, analyze the data prior to operational changes likes witching, and determine if limitations on equipment will be exceeded, addressing questions such as “What was the steam temperature over the last hour and how did this relate to our heat rate?” or “How did the load spike when we ended our load curtailment operations?”

Similarly, manufacturers can use historian data to compare past production runs, analyze the data prior to a downtime event, and plot ideal production runs against in-process runs. With aggregated data, they can easily identify trends, uncover root causes and implement strategies for improvement, answering questions such as “What was the temperature over for the last batch of product?” or “How much energy was consumed yesterday?” or “How do the process parameters from this batch compare to the ideal batch that I ran a year ago?”

Improving Processes Across the Business

Enterprise historians tie together islands of automation information without compromising data resolution and provide a window into your operations. They serve as the vital link between site operations and business systems, providing an integrated view of your operations with accurate, real-time information. Designed for production and process data acquisition and presentation, enterprise historians maximize the value of time series data beyond what RDBs can deliver—enabling true process visibility for operational excellence.

Links:
[1] http://www.impomag.com/articles/2012/08/advantages-enterprise-historians-over-relational-databases-part-1