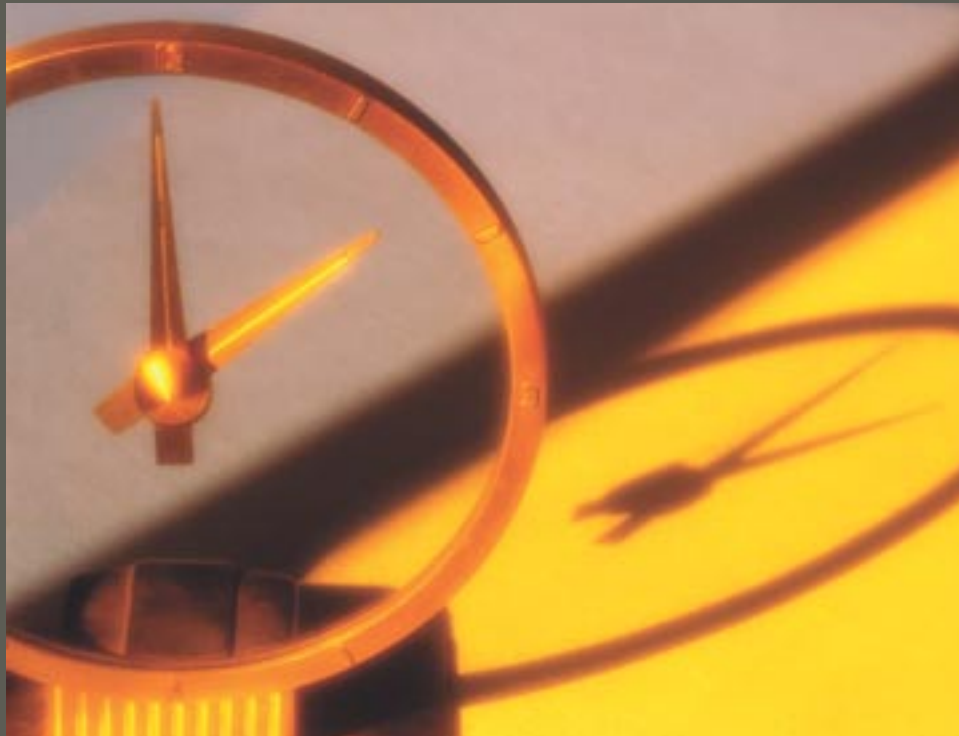


ECHO

Embedded Component Historian Object



E C H O

ECHO Embedded Component Historian Object

Build products that provide

Intelligence requires historical data. You could make your product more intelligent — and more valuable — if it captured essential data that your customer needs. What if there was a proven technology that could be built into your product that would make it a “smarter” machine for your end consumer? Your product would be extremely valuable if it could be used as a dependable resource for information that tracked, monitored, trended, automated and served operational intelligence. Now you can develop your products to give your customers more intelligence with the Embedded Component Historian Object, or ECHO, from OSIsoft.

Data historians and why they matter

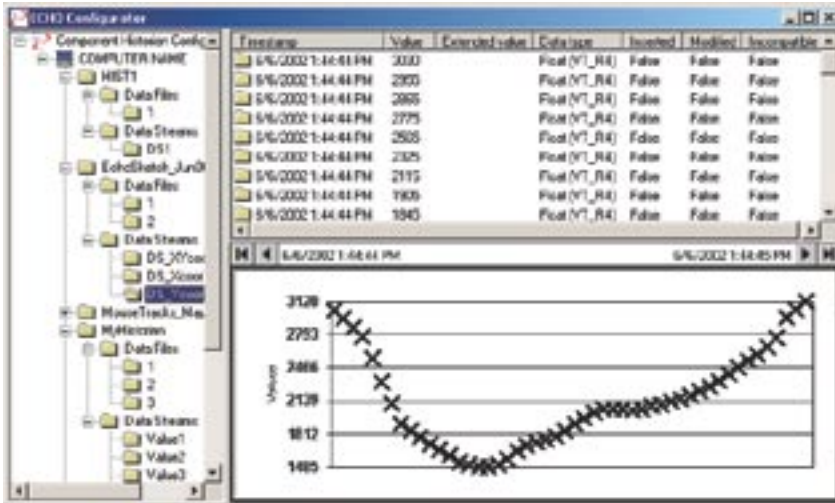
A data historian is software for archiving time-series data, the kind of data typically measured on a continuous basis. Much like the flight recorder in an airplane, a data historian keeps a continuous record of events as they occur in real-time. Because a well-designed historian is optimized for handling vast quantities of time-series data over long periods, typically years if not decades, it outperforms a traditional relational database.

The OSIsoft Embedded Component Historian Object is a specialized tool that allows you to create and embed a data historian in your software or hardware product. With an ECHO-based historian, you can provide access to any data — even years after the fact — with the same accuracy as when it was recorded. Because of its unique architecture, an ECHO historian requires minimal resources to provide maximum storage power.



No matter what the scale of the system, ECHO delivers historical data where it's needed.

operational intelligence and value



Example applications allow the user to configure an entire historian network and test performance. This sample code is provided to exercise all ECHO features including data storage and retrieval. You can examine the source code for examples of how to implement this functionality or re-use the code directly.

ECHO: What it is and how it works

ECHO is a COM/.NET software server object used to create a compact historian for time-series data.

It enables the developer to scale to any size, storing up to a million datastreams worth of data in minimal space. All data management functions are integrated through a Software Development Kit (SDK). It leverages native Windows functionality such as the event logger, performance monitor and Unicode.

Interface to the OSIsoft PI System is available and ECHO interoperates with standard relational and object databases. To better partition your data, ECHO can run multiple historians at the same time.

ECHO encapsulates all time-series data with no data loss and no performance degradation over time. It imposes virtually no limitations on storage or retrieval of data. For predictive metrics and forecasting, ECHO stores time-into-future projections.

Highlights of ECHO

ECHO is a data historian tool designed specifically for software developers.

- High-performance data historian
- Embedded software that interfaces to a customer's core value components
- Scalability within Windows architecture
- ECHO-based applications can be remotely monitored by PI to improve customer support and service
- Designed using COM/.NET software server object model
- Application interface designed for ease of use
- Streamlined coding for common usages of temporal data
- SDK provides all object and data management capability



You can't predict which data points will solve your problem. ECHO preserves all your data in its original form.

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The ECHO historian has many advantages over other storage technologies

Applications that rely on accurate time for their functionality must deal with a wide range of time-based problems, such as changes in time zones and daylight savings time transactions. ECHO automatically realigns the data in time order, resolving differences in time bases as it stores.

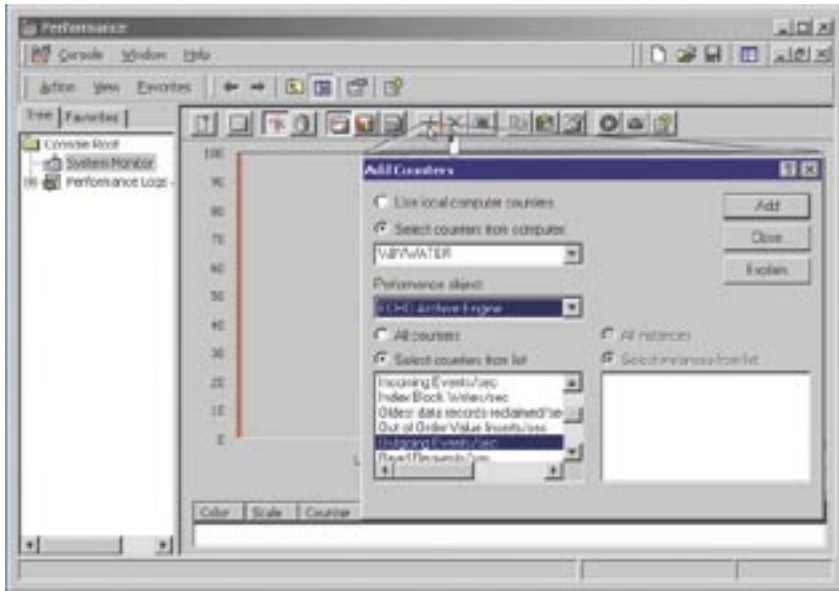
ECHO achieves extremely high system throughput. Archiving and retrieval take a fraction of the time required by a traditional relational database with the highest data fidelity possible. Using the optional input filtering minimizes storage space and provides interpolation for extremely high data fidelity and makes it possible to store the history of thousands of data streams for years at a time. This time-proven function has allowed systems to reap the benefit of extremely high volumes of information in a minimal storage footprint.

Because ECHO is event based rather than transaction based, it can be deployed on a distributed network without the use of complex data synchronization techniques, allowing this scalable system to support highly distributed or centralized server architectures.

Interfaces to other tools are available through standard data exchange formats to simplify integration with existing analysis tools, including integration tools for the PI System, the world's most powerful real-time information management system.



Accurate historical data can save money by tighter management of complex processes.



Monitor more than a dozen performance parameters for an ECHO server, such as the number of client operations, the number of write operations per second and incoming events per second. You can add these to the Windows Performance Monitor as shown in this display.

Sell your core expertise for greater profits

Whether your customers work in a hospital emergency room or on a power network, they all have one thing in common, they need useful information to make the right decisions. The supplier who can help them get that information gets their business. Your specialized knowledge and analytical expertise can translate historical data into greater intelligence — ECHO provides you with a tool set designed to capture and provide every last bit of that data. The result is a smarter product that provides more value to both you and your market because it delivers your core expertise into your customer's hands.

Build performance into your product

When you're working with time-series data — whether it's a process variable, test parameter or a stock quote — ECHO gives you the ability to build high performance information storage directly into your product. When you use ECHO, you have leveraged over twenty years of high performance data collection experience from OSIsoft, the leader in the industry — so you can deliver your product with confidence.

Not only is an ECHO historian easily embedded into your product, but with its small footprint, it consumes far fewer system resources than other data stores. This means you can store more data even when you're faced with massive inputs without having to increase your hardware costs. If your requirements grow, ECHO is ready to scale with your applications.

How ECHO outperforms a relational database

ECHO is a well-designed data historian optimized for handling vast quantities of time-series data over long periods of time.

- ECHO measures time in nanoseconds — not seconds
- Input filtering minimizes storage space and provides interpolation for linear data
- Deploys easily on a distributed network without complex data synchronization
- Archiving and retrieval take a fraction of the time required by a traditional relational database
- Simplified integration with time-series or event-based analysis tools
- Automatic reorientation of out-of-series data
- Data flags for tracking data that is modified, inserted, or incompatible
- Uses standard formats for output
- Includes integration tools for the PI System, the world's most powerful real-time information management system



ECHO is an ideal solution for electronic documentation required for process validation and compliance reporting.

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Provide data needed for compliance reporting

Regulations continue to be imposed on all facets of the economy. Often, the critical part of compliance is proving it. Providing compliance reporting capabilities within your products gives both you and your customer a competitive edge.

Compliance involves anything from monitoring air quality in a building to providing documentation for 21 CFR Part 11, but it has to be reliable, easy to use and uninterrupted. With so many new standards, reporting has become vital.

All this translates into an increased customer demand for historical data — whether it's to meet your partners' standards, internal quality standards, or to satisfy the demands of new manufacturing methods. Using proven ECHO technology for data storage and retrieval, you can build regulatory compliance reporting directly into your product, increasing its value to your customer.

Faster time to market means larger market share

First-to-market product releases typically capture an increased market share over time. Using the testing and deployment utilities in ECHO's complete historian tool set shortens your development time. All aspects of your data storage technology are known in advance.

One could argue that, given enough time and money, a competent development staff can create a proprietary historian with sufficient performance to meet the needs of a limited market. By choosing the ECHO solution, you not only incorporate decades of OSIsoft expertise with time-series data, but you ensure a predictable and managed upgrade path for your historian component. OSIsoft engineers work continuously to increase the speed and functionality of ECHO and to make sure it conforms to the latest standards and operating system requirements. Tools are provided with ECHO to simulate system performance prior to development. When you choose ECHO, you have leveraged our years of development work, leaving you more time to concentrate on your core competencies.

OSIsoft is the leading global supplier of software products for managing process information

OSIsoft is a privately held company founded in 1980 by Dr. J. Patrick Kennedy in San Leandro, California. For over twenty years OSIsoft has experienced consistent growth.

OSIsoft sales have been increasing at an annual rate of twenty-five percent. Today over 6,500 of its PI Systems in over 80 countries record an unprecedented amount of process data, and then transform those data into actionable information.



Manage costly assets for better equipment utilization.

OSIsoft's PI System remains the company's flagship product, the most successful real-time information management system in the world. Ongoing research, development and refinement over the past twenty years has advanced the OSIsoft historian to be the most efficient and reliable data collection software on the market today. OSIsoft embraces strategic software technology like Microsoft's .NET and SAP's R/3, and provides the bridge between real-time operations and enterprise business systems. With thin client technology and a growing number of client applications and interfaces, the PI System remains the premiere real-time information and development environment for both intranet and Internet deployment throughout the global enterprise.

At OSIsoft, quality milestones take precedence over production budgets. OSIsoft rigorously tests all products in simulations prior to shipping — whenever possible on hardware that duplicates the final configuration.

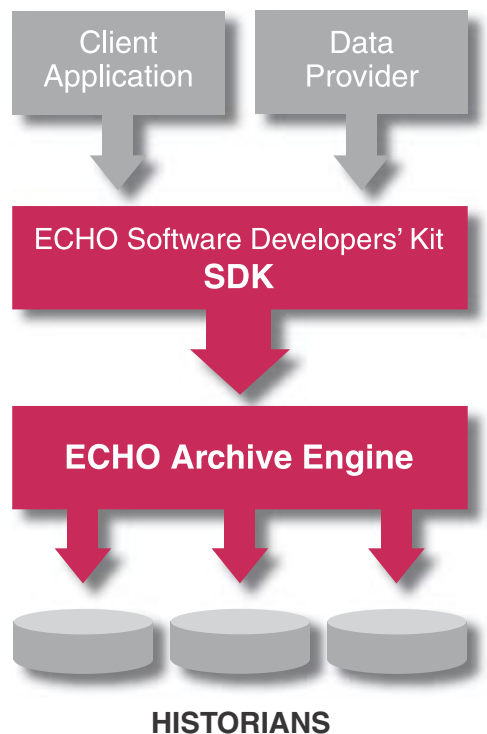
Your product expertise and our historian technology make the perfect match

Discover how ECHO adds value and operational intelligence to your product. Email ECHO@osisoft.com. For demo software, specifications and local sales, visit www.echohistorian.com. Find company background from OSIsoft on the Web at www.osisoft.com.

ECHO Architecture

ECHO includes two components:

- An **ECHO Software Developers' Kit (SDK)**, which provides the tools for creating applications and interfaces that interact with the archive engine.
- The **ECHO Archive Engine** to manage the data historians and the reading/writing of process data.



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