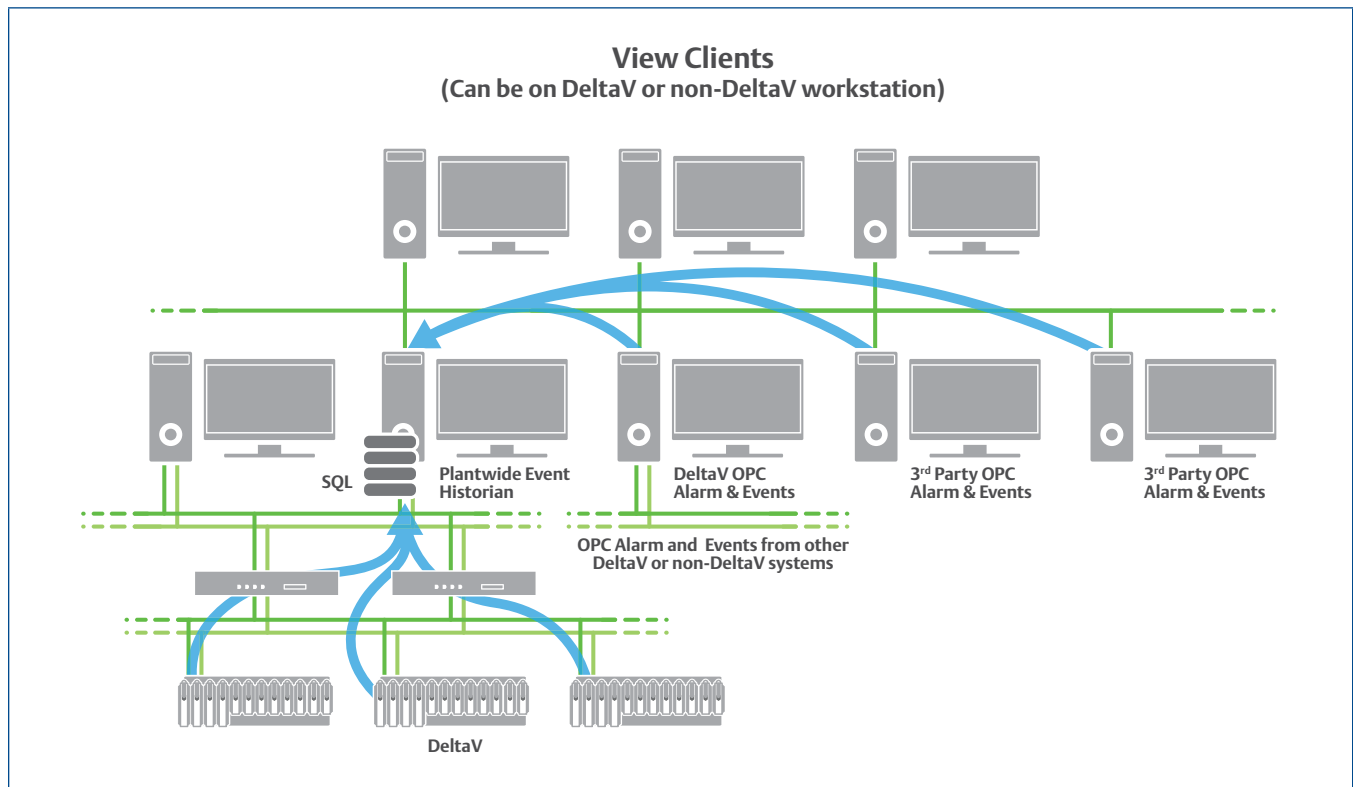


# Plantwide Event Historian



The Plantwide Event Historian collects and stores alarm and event records from any OPC Alarms & Events server.

- Captures and displays event data for the entire plant
- Robust data collection mechanism
- Event viewer provides easy access to data from anywhere on your plant network
- Automatic database management ensures robust and secure data storage

## Introduction

Process events and changes occur on a regular basis throughout the plant. Capturing this information and displaying it together makes it easy to track and analyze events for your entire plant from a single location. It also provides you with an overall view of how process events and changes impact different areas of your plant.

The Plantwide Event Historian records plant event information from any OPC Alarms & Events server, including the DeltaV OPC Events Server, and stores them in a Microsoft SQL Server database. A robust data collection mechanism ensures that no event data is lost due to network or communication upsets. An included view client displays the complete list of events and allows them to be sorted and filtered to facilitate viewing and analyzing the data.

## Benefits

**Captures and displays process events for the entire plant:**

The Plantwide Event Historian is capable of reading event data from a number of different systems that support the OPC Alarms & Events Standard, including the DeltaV OPC Events Server. The Plantwide Event Historian integrates this data and stores the event information in a single SQL Server database. The ability to read events from any system with an OPC Alarms & Events server facilitates integrating data at all levels of the plant.

**Robust data collection mechanism:** The Plantwide Event Historian captures all plant event data and stores it in a single database. During a plant upset, you do not want to lose this data due to a lost network connection or faulty hardware. The Plantwide Event Historian uses Microsoft Message Queue (MSMQ) technology to ensure that all event data generated at the OPC Alarms & Events server is delivered to the Plantwide Event Historian database. The MSMQ will buffer data at the OPC Alarms & Events server node to ensure that no plant event data is lost.

**Event viewer provides easy access to data from anywhere on your plant network:** Viewing data from all areas of the plant is easy with the Plantwide Event Historian Viewer. Events collected by the Plantwide Event Historian are displayed together in chronological order and can be viewed from anywhere on the plant network, including inside the DeltaV control network. When you want to focus on a sub-set of the data, built-in filtering and sorting allow you to get right to the data you need.

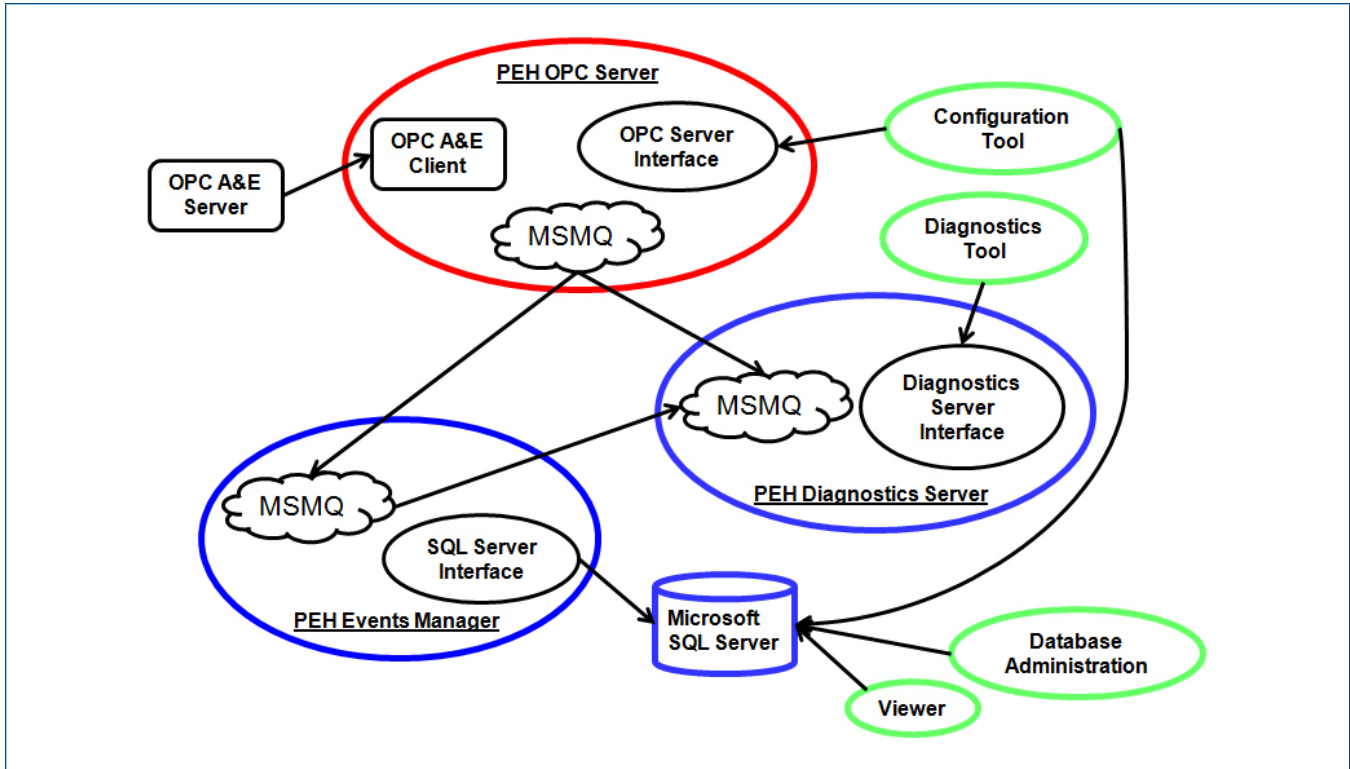
**Automatic database management ensures robust and secure data storage:** Maintaining your plant event data is simplified through the use of the automatic database management functions in the Plantwide Event Historian Admin Tool. The automatic database management functions allow you to automatically backup, archive and delete archived events, saving you time and effort and providing peace of mind that your plant event data is safe and secure.

## Product Description

The Plantwide Event Historian installation consists of four major components: one to collect event data from the OPC Alarms & Events servers, one to receive event data and insert it the SQL Server database, one to manage and diagnose the Plantwide Event Historian and one to view the event data.

Collecting event information is accomplished by taking advantage of industry standards. The Plantwide Event Historian has been designed as an OPC Alarms & Events client application that is capable of collecting event information from any OPC Alarms & Events server. These servers adhere to guidelines set forth in the OPC Alarms & Events Specification and allow for alarm and event information to be easily collected through a standard interface.

The Plantwide Event Historian collects event data from OPC Alarms & Events servers using the Plantwide Event Historian OPC Server. The Plantwide Event Historian OPC Server should be installed on the same computer as the OPC Alarms & Events Server with which it is communicating. The Plantwide Event Historian OPC Server communicates to the OPC Alarms & Events server through the standard OPC COM (Component Object Model) interface. The Plantwide Event Historian OPC Server then forwards the event data to the Plantwide Event Historian Events Manager. The Plantwide Event Historian Events Manager then inserts the event data to the Plantwide Event Historian SQL Server database.



The Plantwide Event Historian component architecture.

The Plantwide Event Historian uses Microsoft Message Queue (MSMQ), an industry standard for robust data delivery, for communicating between the Plantwide Event Historian OPC Server and the SQL Server database. The MSMQ has a sending end and a receiving end. The sending end of the MSMQ is incorporated into the Plantwide Event Historian OPC Server; the receiving end of the MSMQ is incorporated into the Plantwide Event Historian Events Manager. If anything were to happen to the communications between the sending end and the receiving end of the MSMQ, the MSMQ will buffer the event data on the sending end and deliver it to the receiving end when the communications are restored.

A second MSMQ is used with the Plantwide Event Historian Diagnostics Server to ensure that diagnostics events from the Plantwide Event Historian OPC Server and Events Manager are captured and stored in the Diagnostics Server and available for viewing and troubleshooting with the Diagnostics Tool.

Additional robustness is built into the Plantwide Event Historian OPC Server to help quickly and automatically recover from an OPC Alarms & Events server failure. If an OPC Alarms & Events server fails, the PEH OPC Server will automatically reconnect to the OPC Alarms & Events server. If the OPC Alarms & Events server is unavailable, the PEH OPC Server will keep trying to reconnect to the failed OPC Alarms & Events server until the server recovers or is manually removed from collection by the Plantwide Event Historian.

Once the Plantwide Event Historian Events Manager receives the events data, it inserts the data into the SQL Server database. Each event stored contains the name of the OPC Alarms & Events server that generated the event, the time stamp of the event, the type of event, the description of the event, as well as many other standard attributes and vendor-specific attributes that are communicated by the server sending the event. Standard attributes are defined in the OPC Alarms & Events Specification. The specification also allows for additional, or vendor-specific, attributes to be sent as part of the event message.

The Plantwide Event Historian comes with a set of client tools that are used to manage and diagnose the Plantwide Event Historian. The Configuration Tool is used to establish and manage the connections to the OPC Alarms & Events servers. The Administration Tool is used to monitor and manage the Plantwide Event Historian SQL Server database. The Diagnostics Tool is used to monitor the status of the Events Manager, the MSMQ, the PEH OPC Servers and the OPC Alarms & Events servers. The status of these components is collected by the Plantwide Event Historian Diagnostics Server.

Event messages are viewed from the Plantwide Event History Viewer. The Viewer can be used on any computer that has network access to the Plantwide Event Historian SQL Server database. This includes DeltaV and non-DeltaV workstations.

The Viewer connects to the Plantwide Event Historian and displays all of the data stored in the historian's SQL Server database. Even data that has been archived can be read by the Viewer.

By default, for the time span selected, every event stored in the Plantwide Event Historian is displayed, and the entire list appears in chronological order. To help analyze the information, you can filter the events in the Viewer using any of the available attributes. Attribute values can also be used to sort the data when you want to view the events according to criteria other than the time the event occurred.

## System Architecture

The Plantwide Event Historian is used to collect event data from diverse systems within your plant. However, the Plantwide Event Historian may also be used to collect event data from many instances of the same system. In this fashion, the Plantwide Event Historian is used to consolidate alarm and event data for these systems and secure this data in the Plantwide Event Historian's SQL Server database.

Regardless of whether the event data is coming from multiple different OPC Alarms & Events servers or multiple instances of the same OPC Alarms & Events server, the Plantwide Event Historian reads event data from all sources—combining the data into a single set of information that is accessible from anywhere on the plant LAN.

The Plantwide Event Historian supports several plant architecture options. As a generic OPC Alarms & Events client application, the Plantwide Event Historian Events Manager can be installed on any computer that supports the Windows Server 2016 operating system, including the DeltaV Application Station. The Plantwide Event Historian supports a consolidated

configuration, where all of the Plantwide Event Historian components are installed on a single workstation.

The Plantwide Event Historian also supports a distributed configuration, where the various Plantwide Event Historian components are installed on multiple workstations.

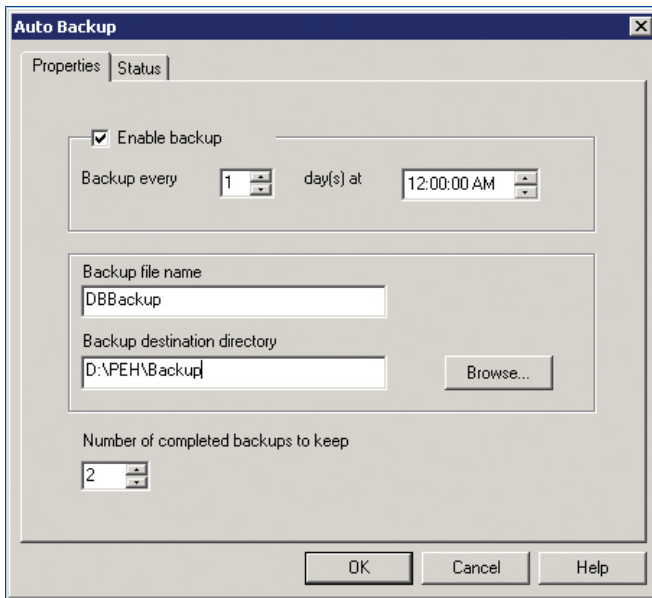
The Plantwide Event Historian OPC Server should be installed on the same workstation as the OPC Alarms & Events server with which it is communicating. This is true regardless of whether the Plantwide Event Historian is configured with a consolidated or a distributed architecture. This is the recommended installation. However, the Plantwide Event Historian also supports the installation of the OPC Alarms & Events server on one workstation and the Plantwide Event Historian OPC Server on another workstation, if necessary, due to operating system or software installation restrictions.

If it is necessary to install the OPC Alarms & Events server remotely from the Plantwide Event Historian OPC Server, the benefit of the Microsoft Message Queue is not fully realized. In this case, the Plantwide Event Historian OPC Server communicates to the OPC Alarms & Events server through the standard OPC Distributed COM (DCOM) interface. If the network connection between the Plantwide Event Historian OPC Server and the OPC Alarms & Events server were to fail, all events from the OPC Alarms and Events Server would be lost, because the OPC DCOM interface does not buffer the event data. In the distributed architecture example, if the Plantwide Event Historian OPC Server and the OPC Alarms & Events server were located on the same workstation, the Microsoft Message Queue between the Plantwide Event Historian OPC Server and the Plantwide Event Historian Event Manager would buffer the event data from the Plantwide Event Historian OPC Server on loss of network communications.

In the consolidated architecture example, all Plantwide Event Historian components are installed on a single workstation. The consolidated installation may be necessary to take advantage of fault-tolerant hardware or in cases where the Plantwide Event Historian components may not be installed on other workstations due to incompatible operating systems or installation restrictions. In the distributed architecture example, the Plantwide Event Historian components are distributed across two or more workstations. The distributed installation allows you to make full use of your system architecture by installing the Plantwide Event Historian components where they make the most sense and take full advantage of the robust features built in to the Plantwide Event Historian.

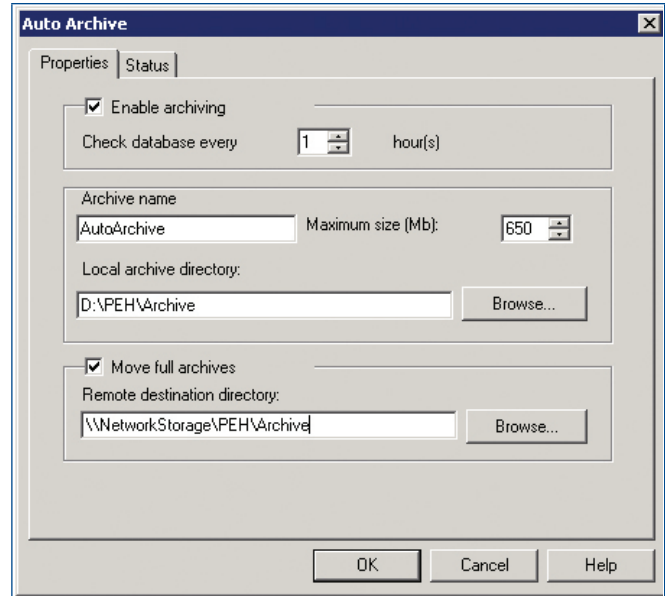
### Automatic Database Management

The Plantwide Event Historian administration tool provides automated database management features which allow you to quickly and easily back up and archive the SQL Server database and delete archived event data. The automatic backup feature allows you to schedule automatic database backups to a secure location, to ensure that your event data can be recovered if something happens to the workstation or the live SQL Server database.



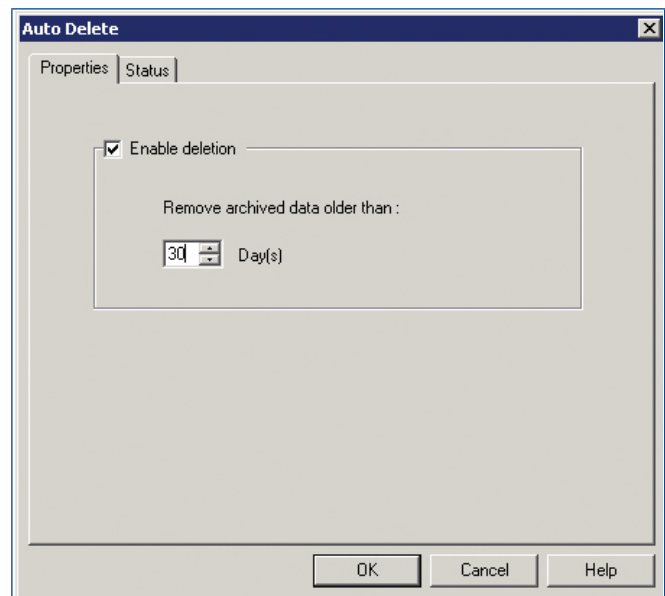
The Plantwide Event Historian Auto Backup Dialog.

The automatic database archive feature allows you to create database archive files and send these files to a secure location, to allow long-term storage of your plant event data. The size of the archive file is configurable, and once the archive file is full it is detached from the SQL Server database. The detached archives may be manually reattached to the SQL Server database at any time.



The Plantwide Event Historian Auto Archive Dialog.

Once your plant event data is safely archived, the automatic event deletion feature allows you to delete any older, archived event data from the main database, to ensure that the main database will never run out of storage space. These automatic database maintenance features make certain that your plant event data is protected and secure for as long as you require.



The Plantwide Event Historian Auto Delete Dialog.

In addition, since the Plantwide Event Historian uses SQL Server, all the database maintenance tools provided with SQL Server are available for use with the Plantwide Event Historian database.

### Benefits of SQL Server Database

A benefit of using SQL Server for the Plantwide Event Historian database is the ability to easily archive events out of the database and restore them at any time for online viewing. Instead of maintaining and managing all of the individual event data sources for each system, the Plantwide Event Historian provides you with a single, comprehensive database to administer—greatly simplifying database management activities.

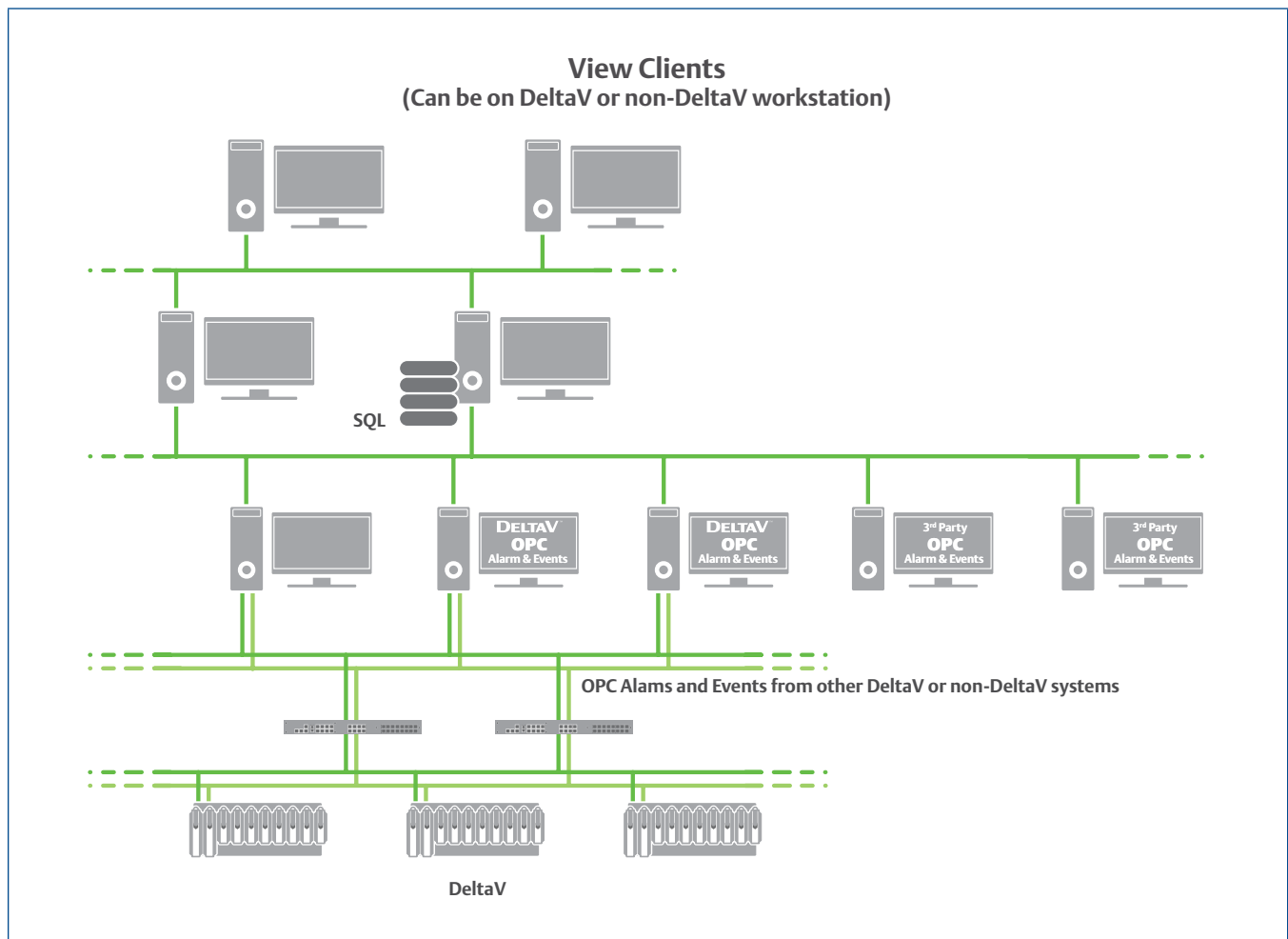
Data can also be exported to other applications—such as MS Access or Excel—from the SQL Server database. This allows you to easily use event data collected by the Plantwide Event Historian in your existing reporting or analysis packages.

### Use with the DeltaV System

If the Plantwide Event Historian is used with the DeltaV system, it will use the DeltaV OPC Events Server to get event data out of the DeltaV system. The DeltaV OPC Events Server provides an OPC Alarms & Events interface to the DeltaV Alarms and Events subsystem. The DeltaV OPC Events Server has access to all events occurring within the plant areas that are assigned to the DeltaV workstation where the DeltaV OPC Events Server is licensed. For example, if you want the DeltaV OPC Events Server to have access to all DeltaV system events, you must assign all plant areas to the workstation where the DeltaV OPC Events Server is licensed.

### Printing

To print event data, choose the Print menu option available from within the Plantwide Event History View client.



The Plantwide Event Historian’s flexible architecture provides many installation options.

## Licensing

### Plantwide Event Historian

The Plantwide Event Historian is licensed based on the quantity of OPC Alarms & Events servers it is connected to. The Plantwide Event Historian connection licenses are separate from any OPC Alarms & Events server licenses that may be required (see DeltaV OPC Events Server Product Datasheet for licensing information).

The quantity of connections is specified at the time of ordering the Plantwide Event Historian license. See ordering information in this document for more details.

### Plantwide Event Historian View Clients

The Plantwide Event Historian Viewer is provided with the Plantwide Event Historian. Each Viewer requires a Microsoft Client Access License (CAL). Two CALs are included with each Plantwide Event Historian connection license that is purchased. These licenses allow the Viewer to be installed on any workstation. If additional Viewers are required, the appropriate number of CALs must be purchased from Microsoft for the additional workstations.

A separate SQL database license is not required, as this is included with Microsoft Client Access Licenses.

The screenshot shows the Plantwide Event Historian Viewer application window. The title bar reads "Plantwide Event Historian Viewer". Below the title bar is a menu bar with "File", "Events", "View", and "Help". A toolbar contains various icons for navigation and actions. The main area displays a table with the following columns: Row, Occur Time, Server Name, Server Node, Event Type Desc, Event Category Desc, Source, Message, Severity, ConditionName, and NewState. The table contains 34 rows of event data, including simple events, process alarms, and hardware alarms. At the bottom left, it says "61 records found" and at the bottom right, "CONNECTED TO DVPENDB on GREENLANTERN".

Row	Occur Time	Server Name	Server Node	Event Type Desc	Event Category Desc	Source	Message	Severity	ConditionName	NewState
1	2009/06/15 13:32:19.7810	DeltaV.OPCEventSi	Greenlantern	SIMPLE	SIMPLE EVENT	FIC-10-301	Inputs Transfer Failure	1		
2	2009/06/15 13:32:18.8900	DeltaV.OPCEventSi	Greenlantern	SIMPLE	SIMPLE EVENT	FIC-10-301	Inputs Transfer Failure	1		
3	2009/06/15 13:17:58.6560	DeltaV.OPCEventSi	Greenlantern	SIMPLE	SIMPLE EVENT	LIC-10-501	Inputs Transfer Failure	1		
4	2009/06/15 13:17:57.7340	DeltaV.OPCEventSi	Greenlantern	SIMPLE	SIMPLE EVENT	LIC-10-501	Inputs Transfer Failure	1		
5	2009/06/15 13:17:57.7030	DeltaV.OPCEventSi	Greenlantern	SIMPLE	SIMPLE EVENT	LIC-10-501	Inputs Transfer Failure	1		
6	2009/06/15 12:46:52.1560	DeltaV.OPCEventSi	Greenlantern	SIMPLE	SIMPLE EVENT	FIC-10-301	I/O Input Failure	1		
7	2009/06/15 12:46:51.8280	DeltaV.OPCEventSi	Greenlantern	SIMPLE	SIMPLE EVENT	FIC-10-301	Inputs Transfer Failure	1		
8	2009/06/15 12:46:51.8280	DeltaV.OPCEventSi	Greenlantern	SIMPLE	SIMPLE EVENT	FIC-10-301	I/O Input Failure	1		
9	2009/06/15 12:46:49.2030	DeltaV.OPCEventSi	Greenlantern	SIMPLE	SIMPLE EVENT	FIC-10-301	Inputs Transfer Failure	1		
10	2009/06/15 12:24:48.0780	DeltaV.OPCEventSi	Greenlantern	CONDITION	PROCESS ALARM	PIC-1003	High Alarm Value 87.355 Limit 90	650	HIGH	ENA
11	2009/06/15 12:24:45.0930	DeltaV.OPCEventSi	Greenlantern	CONDITION	PROCESS ALARM	PIC-1003	High Alarm Value 90.1062 Limit 90	650	HIGH	ENA ACT
12	2009/06/15 12:24:37.1090	DeltaV.OPCEventSi	Greenlantern	CONDITION	PROCESS ALARM	PIC-1003	High Alarm Value 87.6291 Limit 90	650	HIGH	ENA
13	2009/06/15 12:24:30.1400	DeltaV.OPCEventSi	Greenlantern	CONDITION	PROCESS ALARM	PIC-1003	High Alarm Value 90.1524 Limit 90	650	HIGH	ENA ACT
14	2009/06/15 12:23:00.3790	DeltaV.OPCEventSi	Greenlantern	CONDITION	PROCESS ALARM	PIC-1003	High Alarm Value 87.7483 Limit 90	650	HIGH	ENA
15	2009/06/15 12:22:56.3900	DeltaV.OPCEventSi	Greenlantern	CONDITION	PROCESS ALARM	PIC-1003	High Alarm Value 90.2499 Limit 90	650	HIGH	ENA ACT
16	2009/06/15 12:22:53.1400	DeltaV.OPCEventSi	Greenlantern	CONDITION	PROCESS EVENT	RANDOM_WAVES	High Alarm Value 109.071 Limit 109.8	1	HIGH	ENA ACK
17	2009/06/15 12:21:45.3280	DeltaV.OPCEventSi	Greenlantern	CONDITION	PROCESS EVENT	RANDOM_WAVES	High Alarm Value 113.039 Limit 109.8	1	HIGH	ENA ACT ACK
18	2009/06/15 12:20:56.2650	DeltaV.OPCEventSi	Greenlantern	CONDITION	PROCESS ALARM	FIC-1001	Low Alarm Value 17.5177 Limit 15.5	650	LOW	ENA
19	2009/06/15 12:20:54.2650	DeltaV.OPCEventSi	Greenlantern	CONDITION	PROCESS ALARM	FIC-1001	Low Alarm Value 15.4215 Limit 15.5	650	LOW	ENA ACT
20	2009/06/15 12:19:51.8900	DeltaV.OPCEventSi	Greenlantern	SIMPLE	SIMPLE EVENT	AIC-10-401	Inputs Transfer Failure	1		
21	2009/06/15 12:19:49.5930	DeltaV.OPCEventSi	Greenlantern	SIMPLE	SIMPLE EVENT	AIC-10-401	Inputs Transfer Failure	1		
22	2009/06/15 12:19:41.3880	DeltaV.OPCEventSi	Greenlantern	TRACKING	CHANGE			1		
23	2009/06/15 12:19:41.1690	DeltaV.OPCEventSi	Greenlantern	TRACKING	CHANGE			1		
24	2009/06/15 12:18:55.4270	DeltaV.OPCEventSi	Greenlantern	TRACKING	CHANGE			1		
25	2009/06/15 12:18:38.8280	DeltaV.OPCEventSi	Greenlantern	CONDITION	PROCESS ALARM	RANDOM_WAVES	High Alarm Value 81.9261 Limit 83.3	350	HIGH	ENA ACK
26	2009/06/15 12:18:28.8590	DeltaV.OPCEventSi	Greenlantern	CONDITION	PROCESS ALARM	RANDOM_WAVES	High Alarm Value 86.5283 Limit 83.3	350	HIGH	ENA ACT ACK
27	2009/06/15 12:16:36.8570	DeltaV.OPCEventSi	Greenlantern	SIMPLE	GENERIC		Previous node status was: BAD INTEGRIT	1		
28	2009/06/15 12:15:59.5910	DeltaV.OPCEventSi	Greenlantern	CONDITION	HARDWARE ALARM	GREENLANTERN	Event Chronicle: Data collection has stopp	650	FAILED_ALM	ENA
29	2009/06/15 12:15:51.5910	DeltaV.OPCEventSi	Greenlantern	CONDITION	HARDWARE ALARM	GREENLANTERN	[MULT]Event Chronicle: Data collection has	650	FAILED_ALM	ENA ACT
30	2009/06/15 12:14:39.2790	DeltaV.OPCEventSi	Greenlantern	TRACKING	CHANGE			1		
31	2009/06/15 12:05:52.4520	DeltaV.OPCEventSi	Greenlantern	SIMPLE	GENERIC		Previous node status was: BAD INTEGRIT	1		
32	2009/06/15 12:05:37.5610	DeltaV.OPCEventSi	Greenlantern	CONDITION	HARDWARE ALARM	GREENLANTERN	Event Chronicle: Data collection has stopp	650	FAILED_ALM	ENA
33	2009/06/15 12:05:25.5460	DeltaV.OPCEventSi	Greenlantern	CONDITION	HARDWARE ALARM	GREENLANTERN	[MULT]Event Chronicle: Data collection has	650	FAILED_ALM	ENA ACT
34	2009/06/15 12:03:48.1810	DeltaV.OPCEventSi	Greenlantern	SIMPLE	SIMPLE EVENT		Standby is now Available	1		

The Plantwide Event Historian Viewer displays alarms and event records collected in the SQL Server database.

## Ordering Information

Description	Model Number	DeltaV Supported Versions
Plantwide Event Historian v3.6 (Media only)	KL1002X1-KA1	DeltaV v12.3.1, v13.3.1, v14.LTS
Plantwide Event Historian v3.7 (Media only)	KL1002X1-KA2	DeltaV v13.3.1, v14.LTS, v14.FP1
OPC Alarm & Events server connection(s)	VF1020SxxM1, where xx indicates the number of server connections: 01-05, or 10	
OPC Alarm & Events server connection(s) scale-ups	VF1003UP102 (increase from 1 to 2 connections) VF1003UP203 (increase from 2 to 3 connections) VF1003UP204 (increase from 2 to 4 connections) VF1003UP510 (increase from 5 to 10 connections)	

**Note:** Plantwide Event Historian v3.6 and v3.7 will support up to 25 OPC Alarms & Events server connections. However, no more than 10 connections to OPC Alarms & Events servers may be located on a single PC. For example, if you require PEH with 25 server connections, you may have 10 connections installed on PC1, 10 connections installed on PC2 and 5 connections installed on PC3. This would require 3 PEH licenses: VF1020S10M1, VF1020S10M1 and VF1020S05M1 for PC1, PC2 and PC3, respectively.

## DeltaV System Compatibility

Plantwide Event Historian v3.6	DeltaV v12.3.1 Installation	DeltaV 13.3.1 Installation	DeltaV v14.LTS Installation	Non-DeltaV Installation
Events Manager	Windows Server 2008 SP2 (32-bit), Windows Server 2008 R2 SP1 (64-bit)	Windows Server 2008 R2 SP1 (64-bit), Windows Server 2016	Windows Server 2016	Windows Server 2008 R2 SP1 (64-bit), Windows Server 2016
OPC Server, Tools, Viewer Only	Windows 7 Professional SP1 (32 or 64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2008 SP2 (32-bit)	Windows 7 Professional SP1 (64-bit), Windows 10 LTSB 2016 (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2016	Windows Server 2016, Windows 10 LTSB 2016 (64-bit)	Windows 7 Professional SP1 (64-bit), Windows 10 Professional (64-bit), Windows Server 2008 R2 SP1 (64-bit), Windows Server 2016 for Embedded Systems Standard (64-bit)

Plantwide Event Historian v3.7	DeltaV v13.3.1 Installation	DeltaV v14.LTS/V14.FP1 Installation	Non-DeltaV Installation
Events Manager	Windows Server 2016	Windows Server 2016	Windows Server 2016
OPC Server, Tools, Viewer Only	Windows 10 LTSB 2016 (64-bit), Windows Server 2016, Windows 7 SP1 (64-bit), Windows Server 2008 R2 SP1 (64-bit)	Windows 10 LTSB 2016 (64-bit), Windows Server 2016	Windows 10 LTSB 2016 (64-bit), Windows Server 2016

**Note:** Plantwide Event Historian v3.6 uses a Microsoft SQL Server 2014 Standard Edition database. Plantwide Event Historian v3.7 uses Microsoft SQL Server 2016 Standard Edition Database. In Plantwide Event Historian v3.7 only Windows authentication is used for login to SQL Server and SQL Server authentication is not used.



## Related Products

- DeltaV OPC Events Server. Provides a standard interface for getting data out of the DeltaV alarms and events subsystem. Based on the OPC Alarms & Events Specification.
- DeltaV Analyze. Provides Web based analysis of alarms and events in either the Event Chronicle or Plantwide Event Historian.

## Prerequisites

- The Plantwide Event Historian Events Manager (Events Manager, SQL Server, and Diagnostics Server components) software requires the Windows Server 2016 operating system.
- The Plantwide Event Historian OPC Server, Tools and Viewer software requires the Windows 10 LTSB (64-bit), Windows Server 2016 operating system.
- The Plantwide Event Historian components must not be installed on a node serving as Domain Controller.
- If the Plantwide Event Historian is used to collect event data from a DeltaV system, a license for the DeltaV OPC Events Server is required for each DeltaV system. The DeltaV OPC Events Server license is VE2228.
- The Plantwide Event Historian is compatible only with English versions of DeltaV and will not operate on localized versions.

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