DeltaV™ Event Chronicle

This document provides information on how to configure, use, and manage the DeltaV Event Chronicle.

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Introduction

An event is any noteworthy occurrence in your process or system that you want the system to react to and record. Events that are brought to the operator's attention are alarms. Along with standard alarms and events, the DeltaV system provides the means for users to easily create their own specific alarms and events.

The DeltaV system provides an event historian to capture the process alarms, events, log messages and user actions generated by the system. The event historian also captures safety related alarms, events, log messages and user actions generated by DeltaV SIS. The event historian may also capture batch events generated by DeltaV Batch. High resolution events and log messages generated by the DeltaV Sequence of Events (SOE) card are also captured in the event historian. The event historian is called the Event Chronicle. The Event Chronicle database stores process, safety, batch and SOE alarm and event data in event history data sets. Process History View is the DeltaV application used to view, query, and analyze the alarms and events captured in the Event Chronicle.

You determine which workstations maintain an active Event Chronicle database and the areas for which the workstation collects the events. The DeltaV ProfessionalPLUS, Operator Stations, and Application Stations are each capable of collecting alarm and event data in their local Event Chronicle.

Each DeltaV workstation has an Alarms and Events subsystem which is used for managing alarms and events. You assign areas to the Alarms and Events subsystem on the DeltaV workstation. The alarms and events generated in these areas are captured in the local Event Chronicle. It is practical to collect alarms and events for the areas that match the operator span of control on each workstation. System-wide events such as logins, logouts, and downloads are always associated with AREA_A in a DeltaV system. This means that AREA_A must be assigned to the Alarms & Events subsystem in order for those types of events to be recorded. At the same time, it may also be helpful to set up the ProfessionalPLUS or Application Station to record the alarms and events for the entire system. This enables operators to query records across all areas when necessary.

Database Technology

The Event Chronicle was initially released with a Microsoft Jet database engine. The Jet database is the same database used by Microsoft Access. The MS Jet based Event Chronicle was available in the DeltaV system up to the v8.x release. The original Event Chronicle created a single Jet database file, EJournal.mdb, which was limited to a maximum of 500,000 records.

In DeltaV v9.3 and later releases, the Event Chronicle uses a Microsoft SQL Server database engine. The current Event Chronicle is capable of creating multiple user-configurable SQL database files, each capable of holding from approximately 300,000 records up to 14,000,000 records, providing greater on-line storage capacity.

Database Architecture

The SQL based Event Chronicle stores events in event history data sets. The storage capacity of each event data set and the total size consumed by the data sets are user-configurable by file size or time duration. There are three types of event history data sets, Active, Current, and Extended.

The Active data set contains the most recent event records for the associated Event Chronicle. In MS SQL Server terminology, the Active data set is the main database. There is one Active event history data set in each Event Chronicle.

The Current data sets contain events that the system has copied from the Active data set. In MS SQL Server terminology, a Current data set is an attached archive. There can be any number of Current data sets in the Event Chronicle, subject to only to the Current data set total storage target (as discussed below).

The Extended data sets are created from Current data sets that have been exported from the Event Chronicle. In SQL Server terminology, creating an Extended data set is reattaching a detached archive. There can be multiple Extended data sets in the Event Chronicle. The number is limited only by the amount of available disk space. Note Extended data sets do not count against the Current data set total storage target.

Event history data sets can be exported from one Event Chronicle and imported into another Event Chronicle as an Extended data set, within the same system.
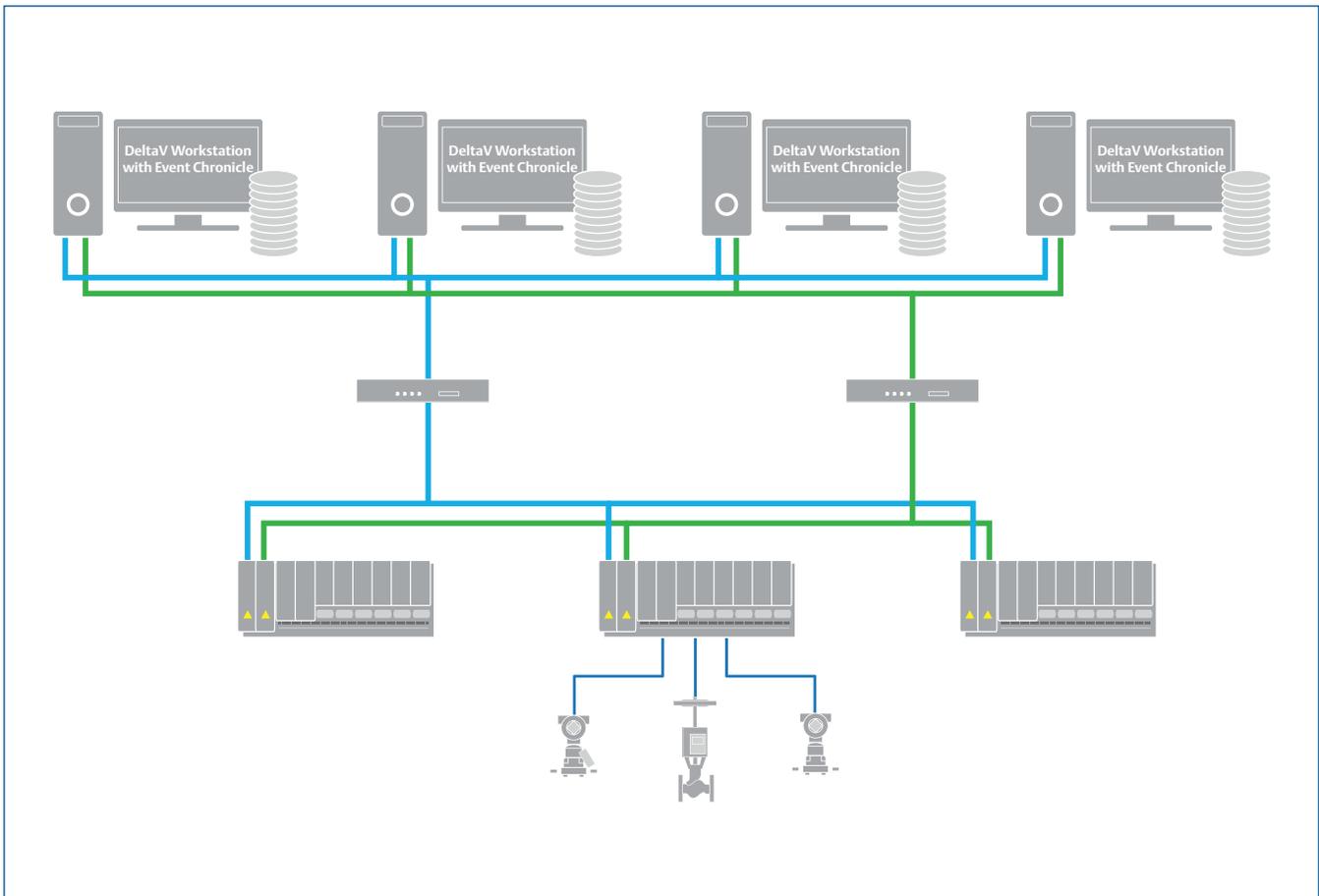
Figure 1 – *Sample DeltaV system with an Event Chronicle licensed and enabled on every DeltaV workstation.*

Configuration

It is easy to configure alarm and event collection in the DeltaV system. The alarm and event collection can be separated into two activities, workstation configuration and database configuration.

Workstation Configuration

Workstation configuration begins with assigning areas to the Alarms and Events subsystem on the workstation. As mentioned in the Introduction, it is practical to collect alarms and events for the areas that match the operator span of control on each workstation. System-wide events such as logins, logouts, and downloads are always associated with AREA_A in a DeltaV system. In DeltaV Explorer, simply drag and drop the areas of interest onto the Alarms and Events subsystem on the associated workstation. Note that AREA_A is assigned to the workstation by default.

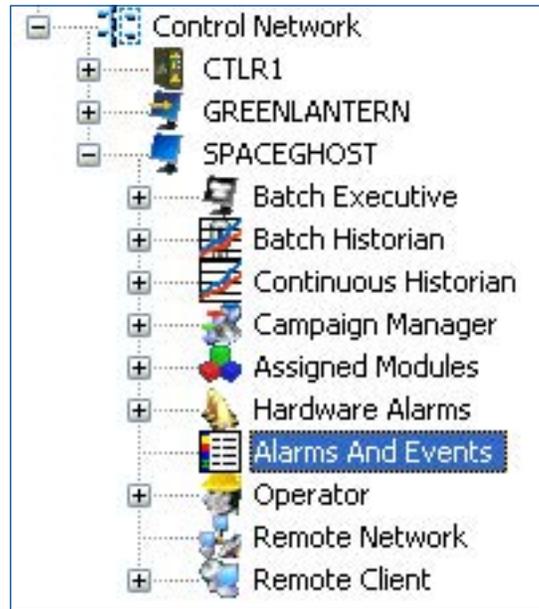Figure 2 shows DeltaV Explorer with the workstation's Alarms and Events subsystem highlighted.

Figure 2 – *Alarms and Events subsystem.*

The second step of workstation configuration is to enable the Alarms and Events subsystem on the workstation. The Alarms and Events subsystem is enabled from the General tab of the Alarms and Events Properties dialog, accessed from DeltaV Explorer by right-clicking the Alarms and Events subsystem on the workstation. Note the Alarms and Events subsystem on the ProfessionalPLUS workstation is enabled by default.

Figure 3 shows the General tab in the Alarms and Events Properties dialog. This dialog shows the Event Chronicle is enabled and configured as the System SOE Collector.
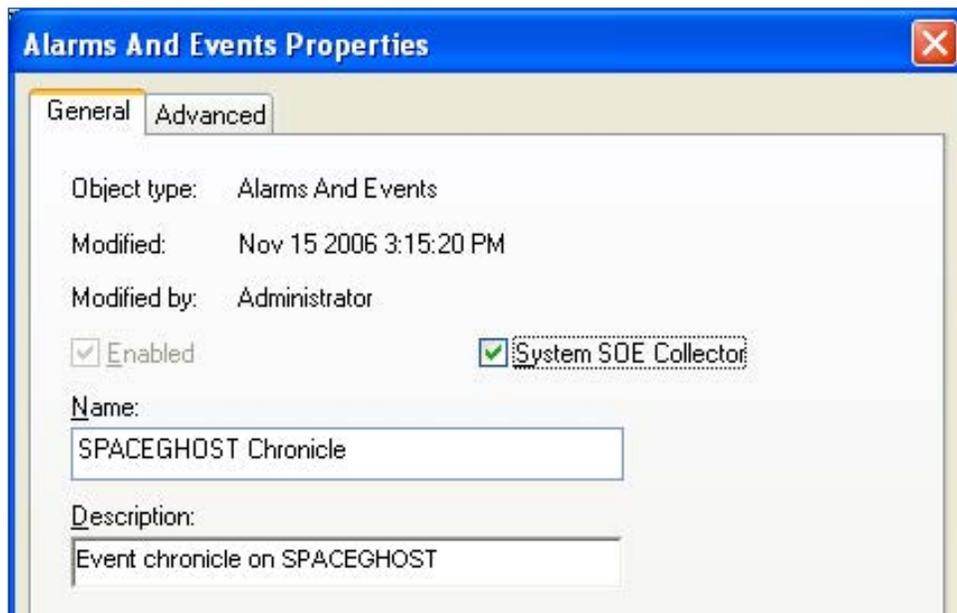

Figure 3 – *Alarms and Events Properties dialog general tab.*

Optionally, the Event Chronicle can be enabled as the System SOE Collector. The System SOE Collector captures log messages and events from Sequence of Events discrete input cards. By default, the Event Chronicle on the ProfessionalPLUS Station is configured as the System SOE Collector. If you want these events collected in a different workstation, open the Events and Alarms Properties dialog for that workstation and click the System SOE Collector box. Only one workstation can be designated as the System SOE collector.

Changes to the assigned areas and enabling/disabling the Alarms and Events subsystem require a workstation download.

The order of workstation configuration is not important – you can enable the Alarms and Events subsystem before you assign the areas. However, you must complete both steps and download the changes before the Event Chronicle starts to collect alarms and events.

Database Configuration

The SQL Server based Event Chronicle has greater functionality than the original Jet based Event Chronicle, which requires slightly different configuration options. In the original Jet based Event Chronicle, you configured when to perform the database maintenance cycle, the size of the database (in number of days), the export behavior, and the maximum number of event records. In the SQL Server based Event Chronicle, you configure the Active data set size target (in MB), the time duration for copying alarms and events from the Active to the Current data set, the Current data set size target (in MB or time duration), the Current data set total storage target (in MB), and the export behavior. In the SQL Server based Event Chronicle, the database maintenance cycle is performed continually, so there is no need to specify when to run the maintenance cycle.

The Event Chronicle database is configured from the Advanced tab of the Alarms and Events Properties dialog, accessed from DeltaV Explorer by right-clicking the Alarms and Events subsystem on the workstation. The Alarms and Events Properties Advanced tab includes the following sections for setting the database configuration options.

Figure 4 shows the Advanced tab in the Alarms and Events Properties dialog. The individual sections of this dialog are detailed below.
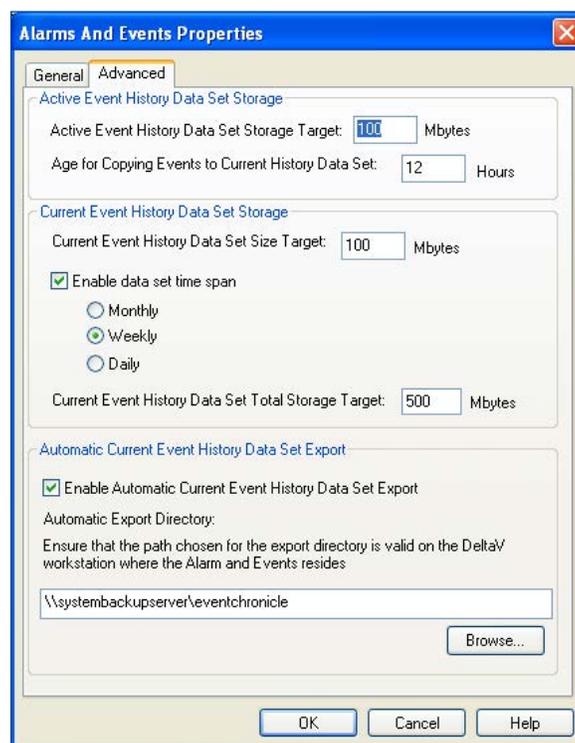
Figure 4 – *Alarms and Events Properties dialog advanced tab.*

Active Event History Data Set Storage: The Active data set contains the most recent event records for the Event Chronicle. There is one Active data set in each Event Chronicle. The Active data set is managed by the Event Chronicle. The Active data set cannot be deleted or backed up. To back up event records, at least one Current data set must be created, which allows event in the Active data set to be automatically copied to a Current data set. Creation of Current data sets is detailed below.

The storage target of the Active data set is user configurable from 100 MB to 4000 MB. The default storage target for the Active data set is 100 MB. The Event Chronicle will allocate the configured disk space for the Active data set on creation of the Active data set, even though the Active data set does not yet contain any event records.
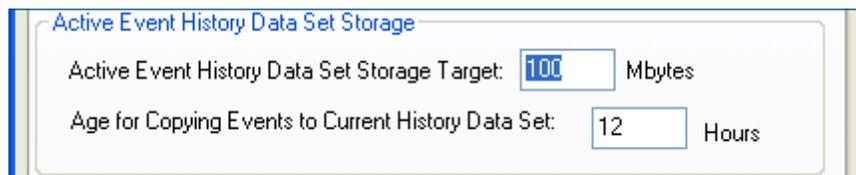
When the Active data set storage target is configured, the system allocates the user-specified disk space for the Active data set. When the Active data set approaches the target size, the system deletes the oldest event records in the Active data set to make room for new events. To retain these older event records, you must create at least one Current data set for the Active data set to use to copy event records. Creation of Current data sets is detailed below.

NOTE: Decreasing the storage target of the Active data set requires a workstation restart.

You also may configure the time duration for copying alarms and events from the Active data set to the most recent Current data set. This value defines the age (in hours) at which events in the Active data set are replicated in the most recent Current data set. For example, if the value is 12 hours, then the alarms and events in the most recent Current data set will contain alarms and events that are 12 or more hours old. It will not contain alarms and events that occurred within the last 12 hours. Since the Active data set cannot be backed up or exported, this setting allows the most recent Current data set, which can be backed up or exported, to contain nearly all the alarms and events in the Active data set. At least one Current data set must exist in order to use the copy event records feature.

The time range for copying event records to the most recent Current data set is 1 hour to 1000 hours. The default time duration is 12 hours. The Event Chronicle transfers event records that meet the age requirement at the beginning of every hour.

Figure 5 shows the Active data set storage configuration. The Active data set is configured at the default setting of 100MB. The age for copying event records from the Active to the Current data set is configured at the default setting of 12 hours.

Figure 5 – *Active Event History Data Set Storage configuration.*

Current Event History Data Set Storage: The Current data sets contain alarms and events that the system has copied from the Active data set. Current data sets enable you to organize event records into manageable chunks for storage on off-line media. You define the rules that the system uses to create data sets. You can set a target size and a calendar period for creating new Current data sets. For example, you might configure a data set to be approximately the size of a CD for convenient copying to optical storage. Or, you might configure the system to create a new data set at the start of each week.

In general, Current data sets may be deleted, backed up, or exported. The most recent Current data set is unique in that it is the data set that is receiving event records copied from the Active data set. The most recent Current data set may be backed up or exported, but it may not be deleted.

The storage target of the Current data set is user configurable from 100 MB to 4000 MB. The default storage target for the Current data set is 100 MB. Note that changing this value only affects future data sets.

The storage target for the Current data set can also be configured by time span. Daily, weekly, and monthly time spans are available. If time span is selected, new Current data sets are created at 12:00 am, local time. Thus, daily Current data sets are created each day at 12:00 am; weekly Current data sets are created on Sunday at 12:00 am; and monthly Current data sets are created on the first day of the month at 12:00 am.

The Current data set time span setting is subject to the Current data set storage target. If the Current data set is configured for a monthly time span, and the default Current data set storage target is 100 MB, then a new Current data set will be created at the start of a new month or when the Current data set reaches 100 MB, whichever comes first.

The Current data set total storage target defines how much disk space is allocated to retaining Current data sets. To create Current data sets, the Current data set total storage target must be greater than 0 MB. If the Current data set total storage target is 0 MB, then no Current data sets will be created, regardless of whether the Current data set storage target or time span is configured.

The Current data set total storage target is user configurable as 0 MB or from 100 MB to 50,000 MB. The default setting for the Current data set total storage target is 0 MB.
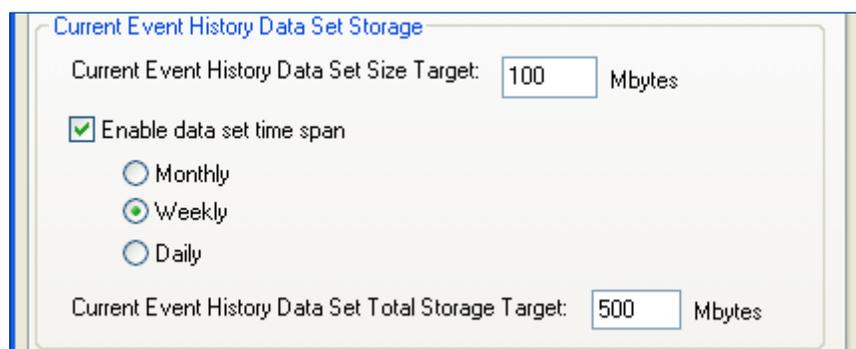
NOTE: The default Current data set total storage target is 0 MB, meaning the default configuration does not create any Current data sets. To create Current data sets, the Current data set total storage target must be greater than 0 MB.

When the Active data set approaches its target size, the system deletes the oldest event records in the Active data set. To retain these older records, you must configure the Current data set total storage target to be at least as big as the Current data set storage target (100 MB or greater). If a Current data set is available, the event records in the Active data set should already exist in the Current data set prior to deletion.

When the size of all the Current data sets reaches or exceeds the Current data set storage target, the Event Chronicle begins deleting the oldest Current event history data sets until the available storage is within the target. If the event records in these older Current data sets are needed, you must manually export the oldest Current data sets using the Event Chronicle Administration Utility or configure the Event Chronicle for automatic export. The manual export and automatic export features are detailed below.

The disk space used by the Active and Current data sets is called Primary Storage.

Figure 6 shows the Current data set configuration. The Current data set is configured to collect data in weekly increments with a data set size target override configured to the default setting of 100MB. The Current event history data set total storage target setting was modified from the default of 0 MB to 500 MB. A Current data set total storage target of 500 MB will create five (5) Current data sets of 100 MB each.

Figure 6 – *Current Event History Data Set Storage configuration.*

Automatic Current Event History Data Set Export The Event Chronicle includes automatic data set export. Enabling automatic Current data set export copies Current data sets to the specified directory in order to stay within the total storage target. The Event Chronicle will delete the oldest Current data set to stay within the configured Current data set total target size. You can configure the Event Chronicle to export the oldest Current data set to another directory or workstation for archival before it is deleted by the Event Chronicle. If the oldest Current data sets are not required, then there is no need to enable automatic export.

The directory path field defines where the Event Chronicle will copy the oldest Current data sets. Browse to the directory to which you want to send the exported data sets. The automatic export directory may be a local fixed drive or a UNC path. Use of mapped network drives is not supported. If the export directory is a local drive, the path should be outside the DeltaV directory path and capable of write access by the Event Chronicle. If the export directory is a UNC path, you must ensure that the network connection to the server is available and the proper security has been established on the shared folder to allow write access by the Event Chronicle.

NOTE: If the defined directory path is not available to the workstation, the automatic export will fail. Failed automatic exports leave Current data sets in the Event Chronicle where they are subject to deletion.

Figure 7 shows the automatic data set export configuration. Automatic export is enabled with the exported data sets being copied to the UNC directory \\systembackupserver\eventchronicle.
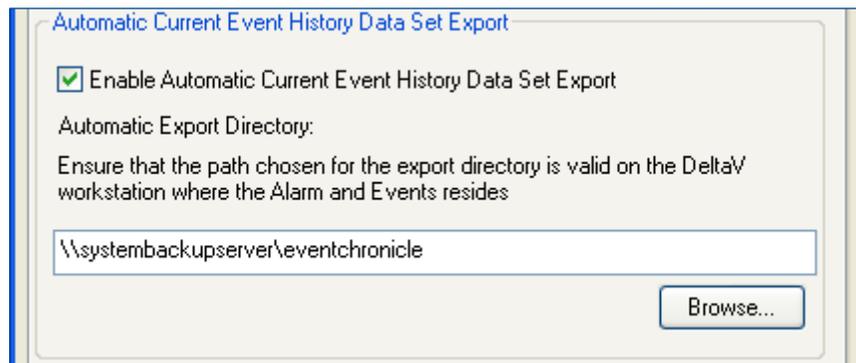

Figure 7 – *Automatic Current Event History Data Set Export.*

Data Set Sizing Estimate: The SQL-based Event Chronicle data sets are sized by the storage capacity of the SQL database, measured in MB. The default data set size is 100 MB. In general, 100 MB of disk space can hold between 250,000 and 500,000 event records depending on the event type and associated content of each event record. Note that the data set storage target value represents a target value, not a fixed limit, meaning the eventual data set may not be exactly the configured size, but that the configured size is the goal.

The following table provides an estimate for the number of event records based on various data set size targets.

Data Set Size Target	Number of Records
100 MB	350,000
1,000 MB	3,500,000
4,000 MB	14,000,000

Viewing Data

Viewing the event records in Event Chronicle is unchanged with the migration from the Jet database to the SQL Server database. The primary DeltaV applications that use event records from the Event Chronicle database are Process History View, Batch History View, the Batch Historian, and DeltaV Analyze.

Process History View

Process History View remains the primary client application for viewing event records. The Event View in Process History View is relatively unchanged; the only difference is that now you have access to a much greater quantity of event records per data set as well as access to multiple on-line data sets.

Figure 8 shows the Process History View Event View. It retains the same look and feel as earlier versions, as does the Process History View E+Chart view.

Figure 8 – *Automatic Current Event History data set export.*

One of the advantages of the SQL-based Event Chronicle is the ability to create multiple data sets for greater on-line storage capacity. Process History View can read event records from any Active, Current, or Extended data set in any Event Chronicle in the system. However, you can only connect to one data set at a time. Thus, in Process History View, you must select from which data set you want to view event records.

A new Configure Events dialog is available for selecting the appropriate data set. The dialog may be launched from the Process History View menu bar Events | Configure Events… or from the Configure Events… icon on the Process History View Events tool bar. The dialog allows you to select the desired workstation and data set and provides an indication of the connection status. The dialog also provides a workstation ping feature that allows you to quickly determine whether the desired workstation is available prior to attempting a connection to the Event Chronicle database.

Figure 9 shows the Process History View Configure Event Chronicle dialog. The Events Data selection is set to "defaulthost", which is the default selection. The defaulthost selection means the Event Data source defaults to the data source configured for the instance of Process History View (see below). The Events Data selection may be any workstation in the system with an Event Chronicle enabled. The data source selected in the Events Data list overrides the data source selection made in the Default Data Source selection for the instance of Process History View. The Events selection provides access to all Active, Current, and Extended data sets available in the selected data source.
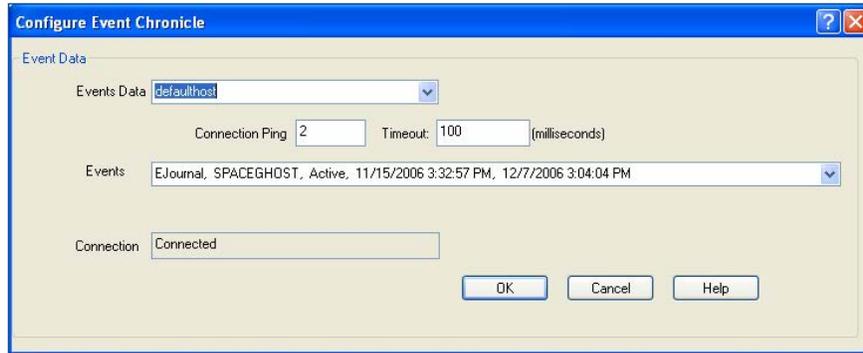
Figure 9 – *Configure Event Chronicle.*

In addition, Process History View was enhanced to allow connections to multiple data sources within the same instance of Process History View. On any DeltaV workstation, you can launch up to two instances of Process History View. Within one instance of Process History View, you can launch up to six Event Views, and each Event View can connect to a different data source. Thus with two instances of Process History View, you can view event records from up to 12 different Event Chronicle databases within the same DeltaV system.

Figure 10 shows the Process History View Default Data Servers dialog which is accessed from the Process History View file menu File | Set Default Data Servers. The Events Data Server selection is set to "localhost", which is the default selection. However, the Events Data Server selection may be any workstation in the system with an Event Chronicle enabled. By default, all Event Views within the same instance of Process History View connect to the Events Data Server configured in the Default Data Servers dialog. The Events Data Server selection is overridden by the Events Data selection within the individual Event View.

Figure 10 – *Default Data Servers.*

Batch History View

Batch History View is unchanged. The ability to store more on-line event records is a significant improvement for users of Batch History View. With more storage capacity in the Event Chronicle, it is much more likely that event records associated with batches that ran in the past will be available for viewing from Process History View.
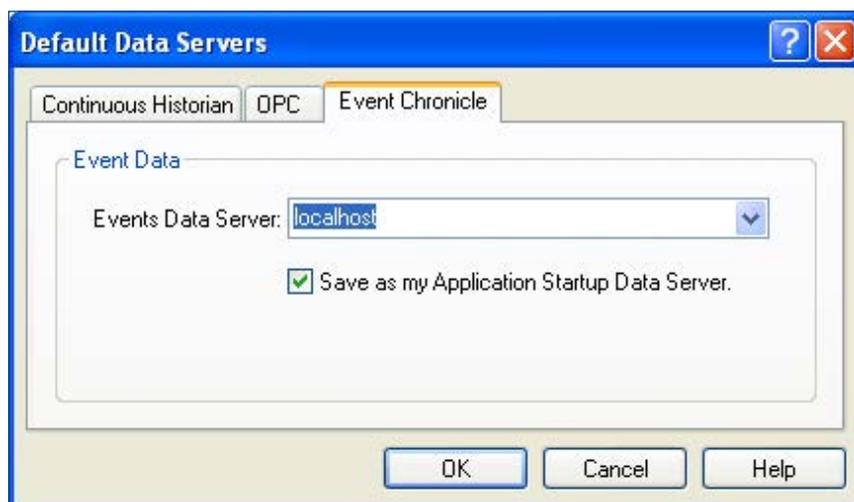
To view Process Events from Batch History View, Batch History View launches the Event View in Process History View. The Event View in Process History View is launched within the context of the batch. In other words, the Date/Time filter in Process History View is set to the time duration of the batch. However, the Event View is opened with the Default Data Server selection that was previously configured and the default data set is the Active data set on the configured data source. You may need to select another data source from the Events Data selection and/or select another data set from the Events selection in the Configure Event Chronicle dialog to view the appropriate event records.

Batch Historian

The ability of the Batch Historian to use the Event Chronicle as an input data source is unchanged. Event records collected in the Event Chronicle may be duplicated in the Batch Historian by assigning the Event Chronicle as an input data source. However, Batch History View will continue to launch Process History View to view Process Events.

DeltaV Analyze

DeltaV Analyze is an alarm analysis application that connects to the Event Chronicle and provides a comprehensive, Web-based view of the alarms, events and user actions recorded in the Event Chronicle database. DeltaV Analyze is compatible with both the Jet-based Event Chronicle and the SQL-based Event Chronicle databases. For more information on DeltaV Analyze, see the DeltaV Analyze Product Data Sheet found at www.easydeltav.com/productdata/pds.

Figure 11 shows the DeltaV Analyze overview page which is displayed when DeltaV Analyze is first accessed. By default, the overview page shows the monthly accumulations for the past 12 months. EEMUA recommended alarm averages are also displayed on the Overview screen. From the overview display, you can quickly determine if the alarm, event and user action rates are properly trending month over month and whether there is any area that needs further investigation. More information on specific time periods, plant areas, control modules, or devices can be found by "drilling down" into the overview.
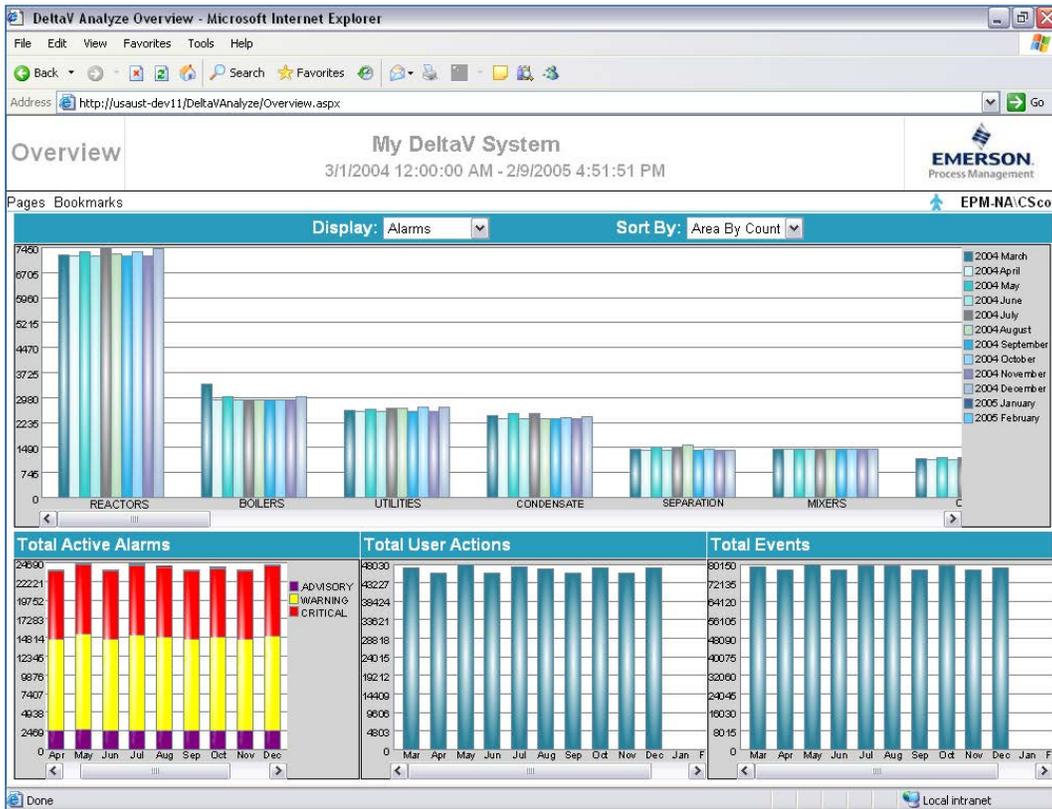
Figure 11 – *DeltaV Analyze Overview.*

Database Management

The DeltaV Event Chronicle provides tools to enable you to manage the event history data sets, automatically back up the data sets, and troubleshoot SQL Server.

Event Chronicle Administration Utility

The DeltaV Event Chronicle Administration utility enables you to monitor and manage the event history data sets. With the Administration utility, you can view and analyze the contents of the entire Event Chronicle. Storage details are provided for the individual Active, Current, and Extended data sets, the automatically exported data sets, and the total Current data set storage area.

The Administration utility also enables you to manage the individual event history data sets. With the Administration utility you can manually export data sets, create Extended data sets, backup and restore data sets, and delete unwanted data sets.

Figure 12 shows the Event Chronicle Administration utility. In the left hand pane, you select which storage area you want to obtain information from either Primary Storage or Automatic Export areas. Details for the data sets included in each area are shown in the right hand pane. The data set information includes data set name, type, backup status, size, start time, and end time. In Figure 12, you can see that the Primary Storage area contains one Active data set, three Current data sets, and two Extended data sets. Note that one Current data set has not been backed up (Backup Status = Modified) and one Extended data set is from another workstation (GREENLANTERN).

Figure 12 – *Event Chronicle Administration utility.*

Export Data Set: The data set export feature enables you to export Active, Current or Extended data sets. The data set export feature allows export to one of three file formats: standard SQL, Access, and Text. Multiple file formats are provided for backwards compatibility for 3rd party or user developed applications that were used with the previous Jet-based Event Chronicle. The default export file format is SQL.

The data set export feature also allows the export of all or part of the data set. You define the time span of the export file based on your specific requirements. For example, if your data set includes one month of event records, but you are only interested in the second week of event records, you can define the export to only include the second week. The default time span is the entire data set. Exporting a data set does not delete it from primary storage.

The Export Data Set feature is available by selecting Tools | Export Data Set on the menu bar, selecting the Export Data Set icon on the tool bar, or by right-clicking the data set in the right hand pane and selecting Export Data Set from the context menu.

Only one data set may be exported at a time and the data set must be selected before performing the export. Browse to the directory to which you want to export the data set. The export directory may be a local fixed drive or a UNC path. Use of mapped network drives is not supported. If the export directory is a local drive, the path should be outside the DeltaV directory path and capable of write access by the Event Chronicle. If the export directory is a UNC path, you must ensure that the network connection to the server is available and the proper security has been established on the shared folder to allow write access by the Event Chronicle.

NOTE: If the defined directory path is not available to the workstation, the export will fail.

Figure 13 shows the Export Data Set dialog. This dialog shows the progress of the data set as it is exported and informs you if there are any errors. The total number of exported event records is noted on the dialog after completion of the export. More details on the export operation can be obtained by selecting the Details button on the dialog.
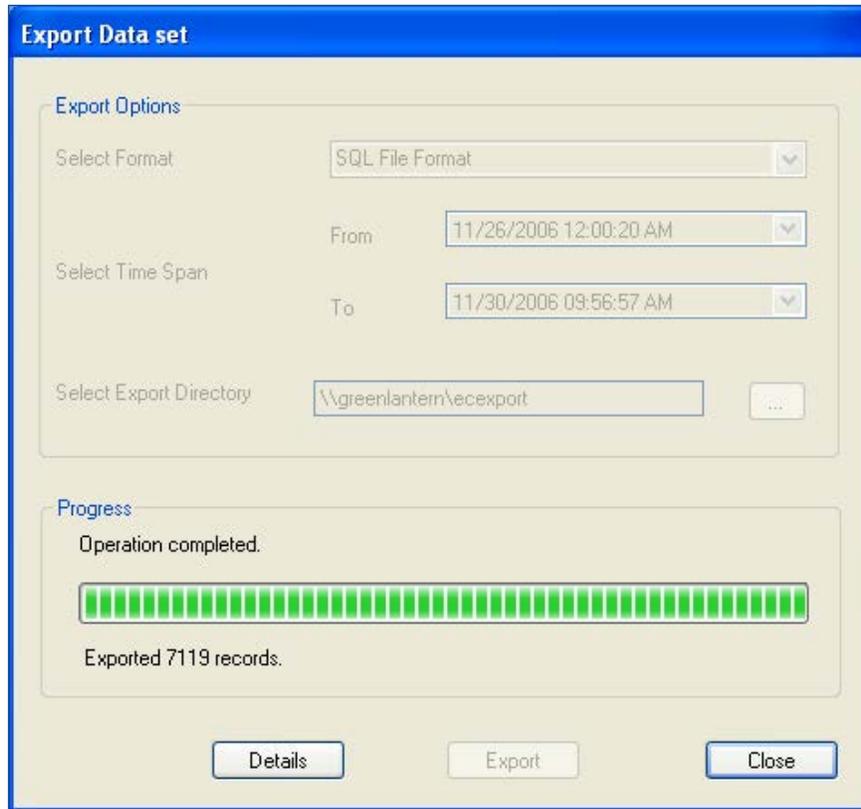
Figure 13 – *Export Data set.*

Create Extended Data Set: Extended data sets are Current data sets that have been previously exported from an Event Chronicle (either manually or automatically) and imported back into the Event Chronicle. The create Extended data set feature allows you to import any exported data set from any other Event Chronicle from the same system or any other system of the same revision. Extended data sets are stored in the DeltaV\CHRONICLE directory.

There can be multiple Extended data sets in the Event Chronicle, limited only by the amount of available disk space on the workstation. Note Extended data sets do not count against the Current data set storage target.

The create Extended Data Set feature is available by selecting Tools | Create Extended Data Set(s) on the menu bar, selecting the Create Extended Data Set icon on the tool bar, or by right-clicking the Primary storage area in the left hand pane and selecting Create Extended Data Set(s) from the context menu. You may enter a comment in the Comment field on the Create Extended History Data Set(s) dialog if desired.

Browse to the directory that contains the exported data sets to be used to create the Extended data sets. Multiple Extended data sets may be created in one create Extended data set operation.

The Exported data set file names follow the format: computername#eventstartdate#eventenddate.

Figure 14 shows the Create Extended data set dialog. This dialog shows the progress of each Extended data set as it is created and informs you if there are any errors. The total number of data sets created is noted on the dialog after creation of the Extended data sets. More details on the Extended data set creation operation can be obtained by selecting the Details button on the dialog.
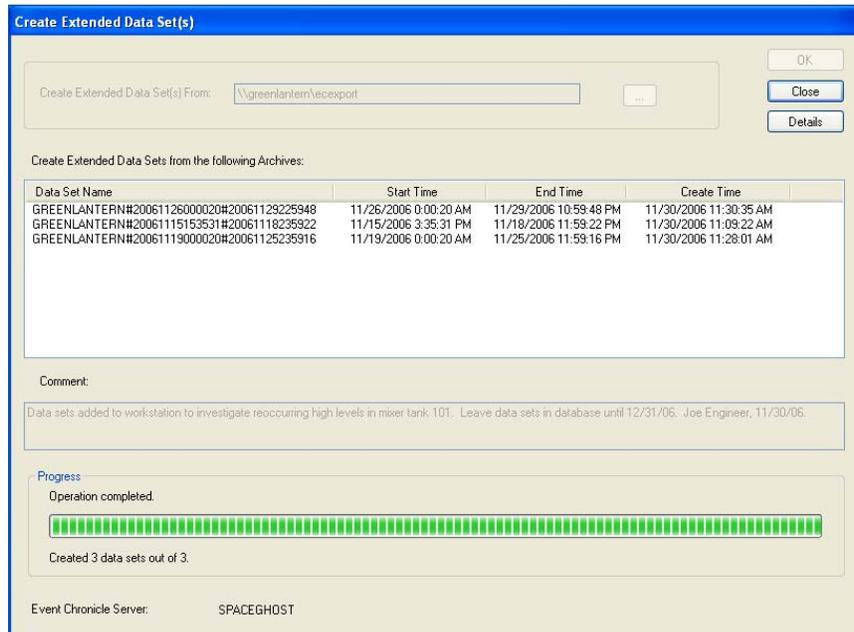
Figure 14 – *Create Extended Data Sets.*

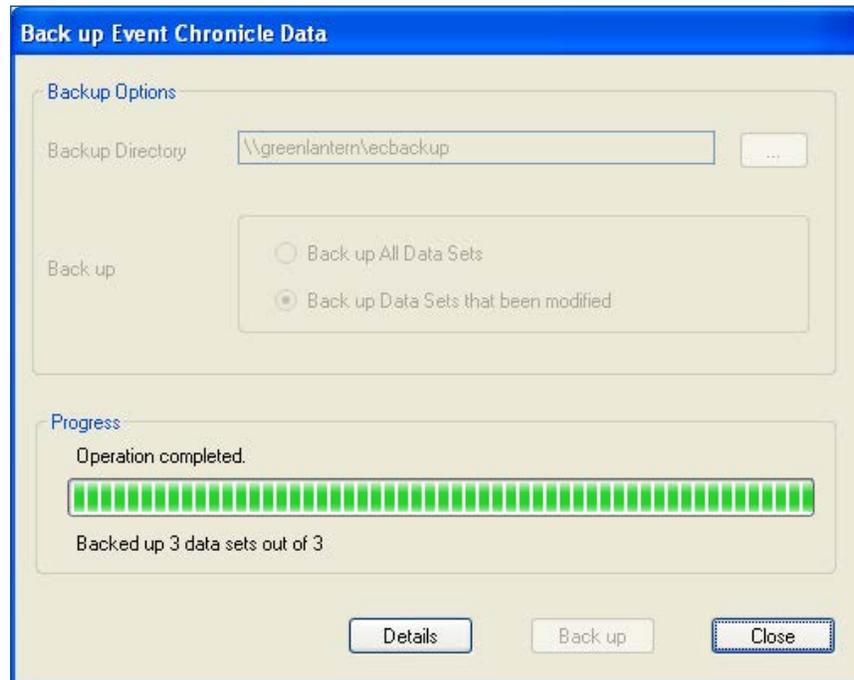**Back Up Event Chronicle Data:** The data set backup feature allows you to back up all the Current data sets to a directory of your choice (select a directory location on the workstation, but outside the DeltaV system directory). The resulting backup is a collection of data files that may be restored into Primary Storage as a collection of Current history data sets. Backing up the Event Chronicle data does not delete the data sets from Primary Storage.

The Backup Event Chronicle Data feature is available by selecting Tools | Back up Data Set(s) on the menu bar, selecting the Backup Event Chronicle Data icon on the tool bar, or by right-clicking the Primary storage area in the left hand pane and selecting Back up Event Chronicle Data from the context menu.

The Event Chronicle provides an intelligent backup feature that allows you to back up all Current data sets or only those that have been modified. Browse to the directory to which you want to send the backed up data sets. The backup directory may be a local fixed drive or a UNC path. Use of mapped network drives is not supported. If the backup directory is a local drive, the path should be outside the DeltaV directory path and capable of write access by the Event Chronicle. If the backup directory is a UNC path, you must ensure that the network connection to the server is available and the proper security has been established on the shared folder to allow write access by the Event Chronicle.

NOTE: If the defined directory path is not available to the workstation, the backup will fail.

Figure 15 shows the Backup Event Chronicle Data dialog. This dialog shows the progress of each data set backup operation and informs you if there are any errors. The total number of data sets backed up is noted on the dialog after completion of the backup. More details on the data set backup operation can be obtained by selecting the Details button on the dialog.

Figure 15 – *Back up Event Chronicle Data.*

Restore Event Chronicle Data: The data set restore feature allows you to restore backup files to Current data sets. The backup files are restored into Primary Storage as a collection of Current history data sets. Browse to the backup directory and select the data sets to be restored.

The Restore Event Chronicle Data feature is available by selecting Tools | Restore Event Chronicle Data on the menu bar, selecting the Restore Event Chronicle Data icon on the tool bar, or by right-clicking the Primary storage area in the left hand pane and selecting Restore Event Chronicle Data from the context menu.

Figure 16 shows the Restore Event Chronicle Data dialog. This dialog shows the progress of each data set restore operation and informs you if there are any errors. The total number of data sets restored is noted on the dialog after completion of the backup. If a data set was selected for restore, but already exists in the Event Chronicle, it will not be restored. More details on the data set restore operation can be obtained by selecting the Details button on the dialog.
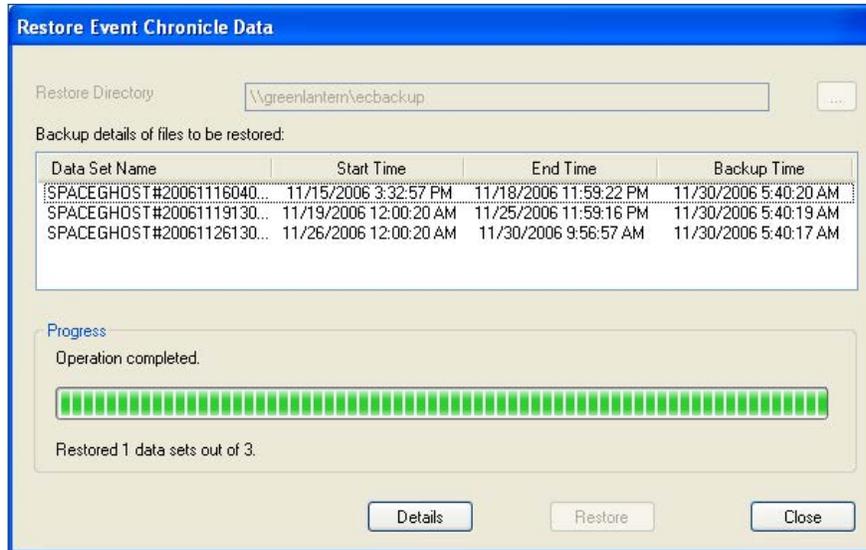
Figure 16 – *Back up Event Chronicle Data.*

Delete Data Set: The data set delete feature allows you to delete unwanted data sets from the Event Chronicle. You cannot delete the Active or the most Current data set. The data set delete feature is useful for deleting Current data sets that have been exported (as the data set export feature does not delete the data set) to free up disk space in the primary storage area or for deleting Extended data sets that are not longer required in the Event Chronicle.

NOTE: If you delete a data set, it will be permanently deleted from the Event Chronicle.

To ensure that event records are not deleted inadvertently, you should back up or export the data sets from the Event Chronicle prior to deleting them.

The delete data set feature is available by selecting Tools | Delete Data Set on the menu bar, selecting the Delete Data Set icon on the tool bar, or by right-clicking the data set in the right hand pane and selecting Delete Data Set from the context menu. Data sets must be deleted individually.

Display Storage Details: The display storage details feature allows you to view the amount of disk space allotted to the Primary Storage area and the amount of disk space currently consumed by the Active and Current data sets.

The display storage details feature is available by selecting Tools | Display Storage Details on the menu bar or by right-clicking the Primary storage area in the left hand pane and selecting Display Storage Details from the context menu.

Figure 17 shows the Event Chronicle Storage Contents dialog. In this example, the Primary Storage area contains a maximum of 600 MB of event records, 115.8 MB of which is in use and 484.2 MB of which is available. The total disk space available in Primary Storage is the total of the Active and Current data sets. As shown in Figure 4, the Active data set storage target is 100 MB and the Current data set total storage target is 500 MB.
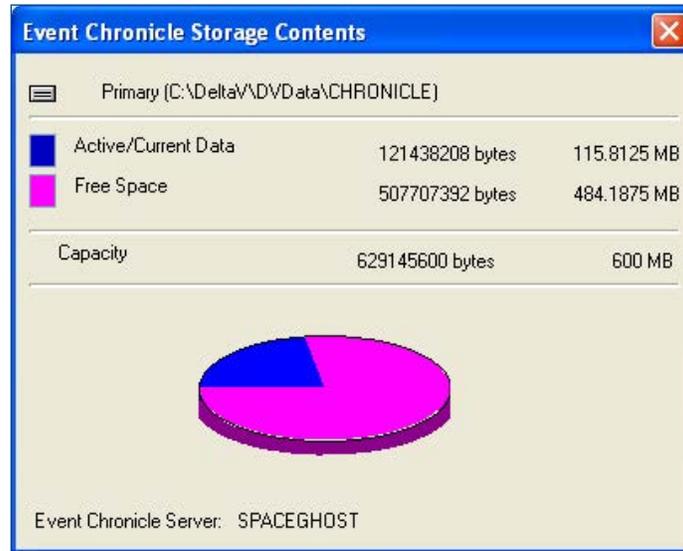

Figure 17 – *Display storage details.*

Data Set Properties: The data set properties feature allows you to view detailed information on any Active, Current, or Extended data set.

The data set properties feature is available by right-clicking the data set in the right hand pane and selecting Data Set Details from the context menu.

Figure 18 shows the Data Set Properties dialog for an Extended data set. Note that the details for the Extended data set include any comments that may have been added when the Extended data set was created.
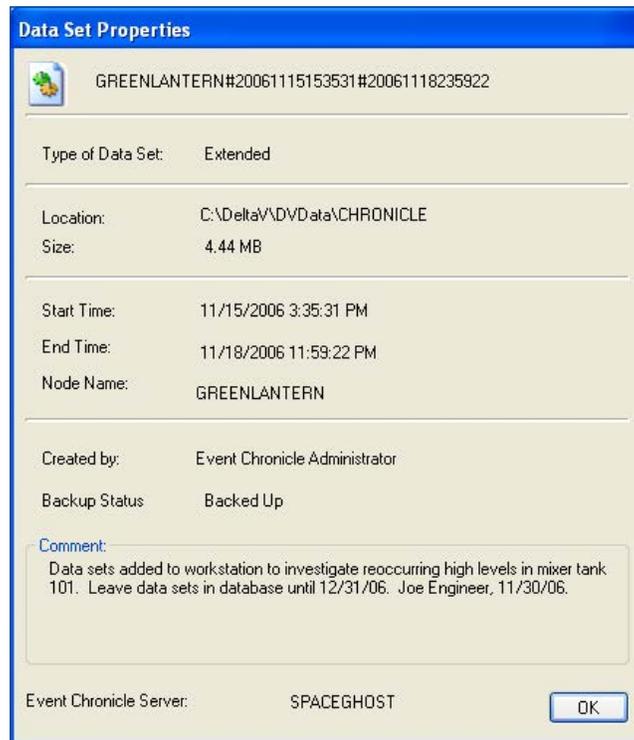
Figure 18 – *Data Set Properties.*

Automatic Data Set Backup: The Event Chronicle automated backup utility enables you to perform backups of Current data sets using the Windows Scheduler or other 3rd party applications. You can also run the utility manually from a DOS command prompt.

The Event Chronicle automated backup utility supports the following functions: backing up all current event data sets to local/networked storage, backing up only current event data sets that have not been backed up, and deleting backed up event data sets in the target directory according to their age.

NOTE: If you have configured the Event Chronicle to copy events from the Active to the Current data set, the Event Chronicle performs this copy function at the top of the appropriate hour. Schedule automated backups such that they do not conflict with the copy function.

The automated backup utility is located in the DeltaV/bin directory on the DeltaV workstation. The filename is ECBackup.exe. The syntax for the Automated Backup Utility is:

ECBackup Directory [/Retries:n] [/DeleteIfGTdays:n] [/OnlyIfModified]

The parameters in brackets are optional. The parameters are:

Directory - the directory to which the event data sets will be backed up in local fixed drive or UNC format. Use of mapped network drives is not supported. If the backup directory is a local drive, the path should be outside the DeltaV directory path and capable of write access by the Event Chronicle. If the backup directory is a UNC path, you must ensure that the network connection to the server is available and the proper security has been established on the shared folder to allow write access by the Event Chronicle.

NOTE: If the defined directory path is not available to the workstation, the backup will fail.

/Retries:n – retries the backup procedure if an error occurs; "n" retries, where "n" is in the range of 0 to 720; the default is 5 retries

/DeleteIfGTDays:n - deletes off line event data sets greater than "n" days old

/OnlyIfModified - backs up modified event data sets only

/?, -?, or no parameters - displays a help message with the command syntax

Any combination of these backup command parameters may be used. The following example backs up Current data sets to the DeltaV_EC_Backups directory on the c: drive, allows for up to 20 retries if an error occurs, deletes all backed up event data sets whose end times are prior to 15 days before the backup, and only backs up the Current event data sets whose backup status is Modified.

ECBackup c:\DeltaV_EC_Backups /Retries:20 /DeleteIfGTDays:15 /OnlyIfModified

Note if the directory does not exist, it will be created as part of the backup process. In addition, the retry rate is once per minute and must be between 0 and 720, inclusive. If the /Retries:n parameter is not specified, the backup utility defaults to 5 retries. If the database does not become available during the retry period, an error will be logged stating that the retry period was exceeded.

Security: Access to individual Event Chronicle administration functions, such as exporting or deleting data sets, is restricted to those users who have been granted access keys individually or who belong to a group that has been granted access keys. In addition, user accounts for those users who need access to Event Chronicle administration functions must be a DeltaV Event Chronicle Administrator. Note the DeltaVAdmin user has access to the Event Chronicle administration functions by default.

Troubleshooting

The SQL-based Event Chronicle provides a robust and reliable event record data store. The SQL-based Event Chronicle addresses several robustness and reliability issues that existed in the Jet-based Event Chronicle. It is not expected that you will have issues with the Event Chronicle, but if you do, there are tools, tips, and tricks available to help you resolve the issue.

Event Chronicle Diagnostics

DeltaV Diagnostics provides detailed information about the Event Chronicle database. Event Chronicle diagnostics information that you can obtain from DeltaV Diagnostics include an indication of the availability of the Event Chronicle database (Server), event record collection or connection errors (ServerErr), available disk space for storing data sets (HDSXSMB), running status (ECStop), and the number of failed data set export operations (EXPFails). Alarms can be created for these diagnostics parameters to alert you if there is a problem with the Event Chronicle.

Figure 19 shows the Alarms and Events subsystem information available in DeltaV Diagnostics. Note the ServerErr value is blank if there are no errors.
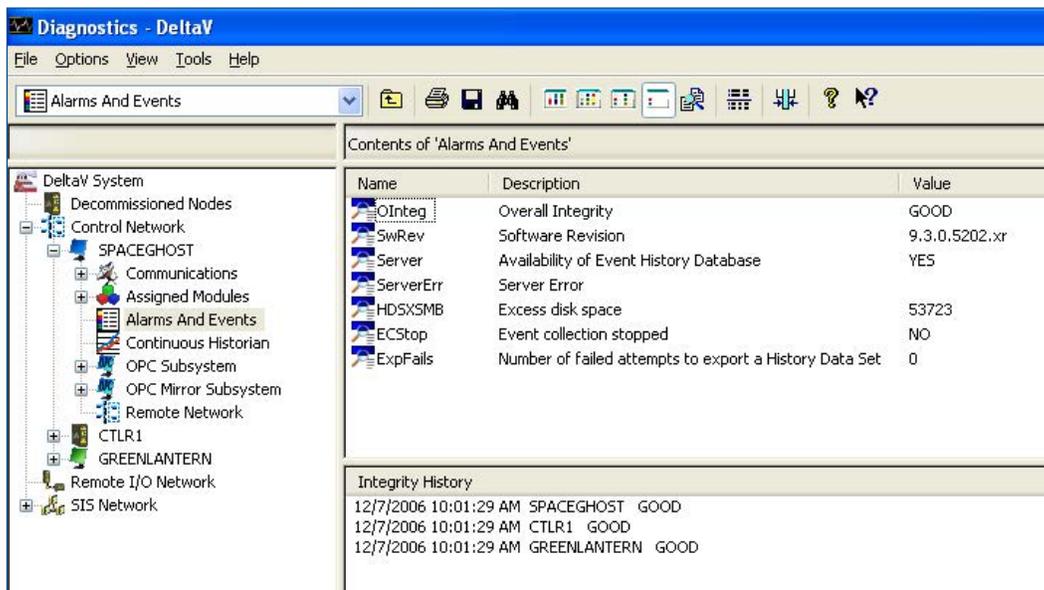

Figure 19 – *DeltaV Diagnostics.*

Microsoft SQL Server Database Management Utility

The DeltaV Event Chronicle Administration utility provides you with all of the capability you require to view, manage, and analyze the Event Chronicle data sets. However, in abnormal situations, the Event Chronicle Administration utility may not provide enough detailed information about the SQL Server databases. In the rare cases that the Event Chronicle Administration utility is not sufficient to diagnose or troubleshoot an Event Chronicle problem, it may be necessary to install and use the SQL Server database management utility provided by Microsoft.

The Event Chronicle in DeltaV v9.x and v10.x uses Microsoft SQL Server 2005 Express Edition. SQL Server Express 2005 Management Studio is the native utility provided by Microsoft to manage the SQL Server Express 2005 database. The SQL Server Express 2005 Management Studio installation file is found in the DeltaV\bin directory. The file is Express_Mgmt_Studio_SQLServer2005_SSMSEE. msi. When installing the utility, accept all of the defaults.

It is recommended that if you encounter problems with the Event Chronicle that you cannot easily solve yourself, you should first call DeltaV Technical Support for assistance. If the DeltaV Technical Support staff cannot solve the problem with the DeltaV utilities, they may ask you to install the Microsoft SQL Server database management utility. You will need local computer administrator privileges to install the Microsoft SQL Server database management utility.

Power Failure

The Event Chronicle Administration utility allows you to move and copy SQL files. These operations may take some time, especially if the data sets are large. If power is interrupted during an Event Chronicle Administrative function, it may be necessary to delete incomplete files or take a few extra steps to finish the operation. There are a few cases where an incomplete database administrative operation requires additional attention: Export, Create Extended, and Restore data sets.

Export Operation Interrupted: After a power failure on a workstation that has not completed an Export operation, a temporary copy of the data set that was being exported remains in the destination folder. To remove the incomplete data set, delete it using the Event Chronicle Administration utility. This will delete the data set and any temporary files that were created during the Export. After deleting the data set, run the Export operation again.

Create Extended Operation interrupted: After a power failure on a workstation that has not completed a Create Extended operation, a temporary copy of the Extended data set that was being created remains in the DeltaV\CHRONICLE folder. To remove the incomplete Extended data set, delete temporary copy of the data set in the Delta\CHRONICLE folder using the Windows Explorer delete file function. After deleting the extended data set, run the Create Extended operation again.

Restore Operation Interrupted: After a power failure on a workstation that has not completed a Restore operation, the Event Chronicle will automatically attempt to complete the Restore operation after power is restored. If power is interrupted during a Restore operation, wait for the Event Chronicle to resume and complete the operation. This may take several minutes. The time required to resume and complete the Restore operation depends on the quantity and size of the data sets being restored. The data sets will not be visible in the Event Chronicle Administration utility until the Restore operation is complete. However, it is possible to use the Microsoft SQL Server database management utility to view the data sets and their status (e.g. the status of a data set being restored is "Restoring…").

Performance

One of the design goals for the SQL-based Event Chronicle was to improve performance with regard to retrieval of event records from another DeltaV workstation, for example running Process History View on an Operator Station and reading event records from the Application Station. The retrieval of event records from another DeltaV workstation in the Jet-based Event Chronicle was very inefficient due to the inherent behavior of the Jet database when queried across a network. This was especially true with a large Jet-based Event Chronicle. The SQL-based Event Chronicle is much more efficient at retrieving event records from another DeltaV workstation and thus read performance when calling up event records from another DeltaV workstation is greatly improved for a similar sized database.

The SQL-based Event Chronicle has also improved read performance when retrieving event records from a local database. The read performance of the Jet-based Event Chronicle was good when retrieving event records from a local Event Chronicle, but the performance is even better with the SQL-based Event Chronicle for a similar-sized database.

The size the Event Chronicle database has a significant impact on event record retrieval performance. In the Jet-based Event Chronicle, the maximum size of the database is 500,000 event records. In the SQL-based Event Chronicle, the maximum size of any one data set is 4,000 MB, which can contain up to approximately 14,000,000 event records. On equal sized databases, the SQL-based Event Chronicle outperforms the Jet-based Event Chronicle when retrieving event records either locally or remotely. However, as the size of the SQL-based Event Chronicle database is increased, the performance of data retrieval is impacted. Retrieving 14,000,000 records from another DeltaV workstation will take some time, in the order of minutes, not seconds. When sizing the Event Chronicle data sets, take care to balance event record capacity with event record retrieval performance.

Licensing Requirements

The Event Chronicle is available for use on any DeltaV workstation type with the Event Chronicle license. The Event Chronicle license is standard on the ProfessionalPLUS, Professional, and Maintenance Station workstation types. The Event Chronicle license is optional on the Operator, Base, and Application Station workstation types. The Event Chronicle license allows you to collect as many event records and maintain as many data sets as necessary. Contact your local Emerson Process Management sales office for more information.

Event Chronicle Migration

When you upgrade a DeltaV v8.x or older system to a DeltaV v9.x or later release, the Jet-based Event Chronicle database will be upgraded to the SQL-based Event Chronicle. During the workstation upgrade, the event records in the Jet database will be migrated and placed in an Extended data set. The Extended data set with the migrated event records is available for use in the SQL-based Event Chronicle. The text files (*.txt) that were created from the Jet-based Event Chronicle will not be migrated to the SQL-based Event Chronicle. However, the text files will remain on the disk.