Historical Trend Wizard for OpcDbGateway

Productivity tool to create historical trends

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What's Historical Trends

OpcDbGateway can collect and process data from various kinds of OPC Servers. Sometimes it is necessary not only to process these data, but also to save them for future statistical processing. To provide this a historical trend tool was added to the OpcDbGateway.

Historical trends allow storing memory operands into a database, with given saving period. It means, that a new table is created in the database, with columns for every selected memory operand (as well as for ID and timestamp), and at every time period the values of these memory operands are saved into this table, together with the current timestamp (a new row in the table is added).

The backup mechanism for these trends was added too. It allows creating the copy of trend's database into a XML, HTML or CSV file with the given period. These files may be used as a backup copy of the database (CSV and XML files can be exported back to a mdb file), or as report files, for the specific time or period. Every time, a new file is created and stored in the directory "..\Data\REPORT\"File type"\" Backup's event name"\.. (see Figure 1)

Name	Ext	Size	↓Date	Attr
[..]		<DIR>	16.11.2006 10:00	----
TrendTest_Backup_Event_061116_100030	HTML	3 276	16.11.2006 10:00	-a--
TrendTest_Backup_Event_061116_100000	HTML	3 161	16.11.2006 10:00	-a--
TrendTest_Backup_Event_061116_095930	HTML	3 156	16.11.2006 09:59	-a--
TrendTest_Backup_Event_061116_095900	HTML	3 175	16.11.2006 09:59	-a--
TrendTest_Backup_Event_061116_095830	HTML	3 247	16.11.2006 09:58	-a--
TrendTest_Backup_Event_061116_095800	HTML	3 168	16.11.2006 09:58	-a--
TrendTest_Backup_Event_061116_095730	HTML	3 153	16.11.2006 09:57	-a--
TrendTest_Backup_Event_061116_095700	HTML	3 172	16.11.2006 09:57	-a--
TrendTest_Backup_Event_061116_095630	HTML	3 242	16.11.2006 09:56	-a--
TrendTest_Backup_Event_061116_095600	HTML	3 179	16.11.2006 09:56	-a--

Fig. 1: Example of backup files

Wizard

Historic trends are created using a wizard. It allows a simple and fast creation, the only parameters that user has to insert are:

- Trend's name
- Database
- Saving period
- Memory operands
- Backup parameters (optional)

Historic trends mechanism uses only items and tools provided by OpcDbGateway (events, triggers …). User can create its own trend mechanism also using queries, triggers and events, but wizard makes this process much easier and faster. The items created by wizard can be changed later manually if necessary.

The wizard contains four pages:

- Page 1 – Introduction and description
- Page 2 – Memory Operands selection
- Page 3 – Main trend's parameters
- Page 4 – Backup settings

How to start wizard

There are two ways how to start the wizard:

1. From the main menu, Tools -> Wizard -> Create Historic Trends (Figure 2)
2. From the tree view, right click on trend's group, and New -> Trends (Figure 2)

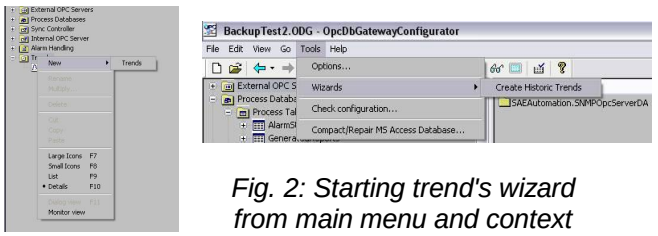

Fig. 2: Starting trend's wizard from main menu and context menu

Fig. 3: First wizard page - Basic information

http://www.saeautom.sk, sae-automation@saeautom.sk, tel.:+421-(0)42-445 07 01, fax:+421-(0)42-445 07 02,
Address: Sady Cyrila a Metoda, 21/18, 018 51 Nová Dubnica, Slovakia

Page 1

The first wizard page contains only information about:

- what's historic trend
- what is created using this wizard
- what's necessary before starting a wizard

The only two things, that are not created by this wizard, and must be done manually by the user before are:

- The database must be created
- Memory operands must be created and mapped (there is another productivity tool to do it)

If user is not sure, how to make this, the buttons  are placed on this page, which will open the proper page in the OpcDbGateway help.

Page 2

The second page is used to select memory operands, which will be saved into the database. The combo box on the left contains the list of all memory operands; the selected memory operands are placed on the right. Maximum number of selected operands is 6. Use mouse double click to remove a memory operand from the list.

Fig. 4: Second wizard page - Memory operands

Page 3

Page 3 is to set three main trend's parameters:

- Trends name (the created table will have the same name)
- Database, where the table will be located
- Saving period (in milliseconds)

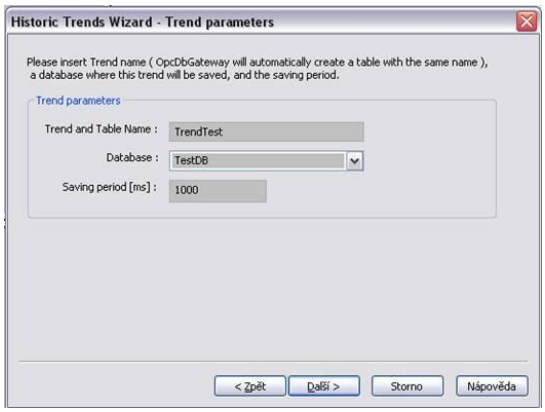

Fig. 5: Third wizard page - Main parameters

Page4

It is the last page of the wizard, and it is used to set a backup of the trend. Backup is only optional; you must check the checkbox "Use Backup", if you want to use it. There are only two things to set on this page:

- Backup period – user can set backup period in days, or in number of iterations (number of records in the table)
- File type – the type of backup file. There are three supported type : XML, HTML and CSV

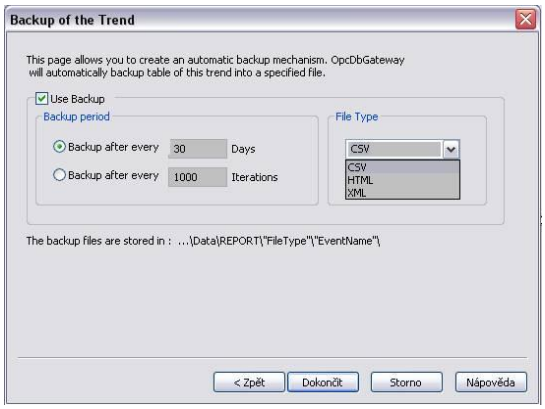

Fig. 6: Last wizard page - Backup settings

Trends View

Trends view offers aggregated information view about the selected trend. It contains all information about the trend itself, about backup of trend data, and all OpcDbGateway items used to create this trend.

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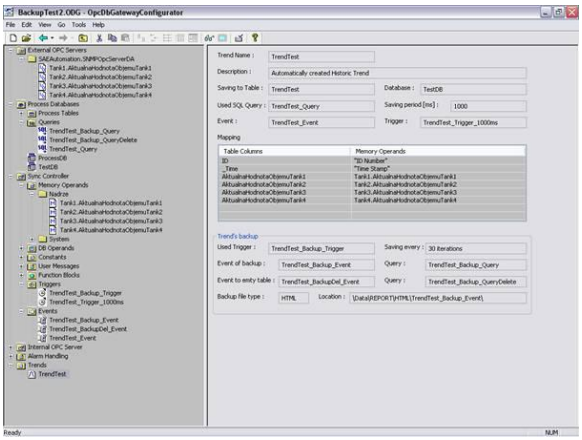

Fig. 7: Trend's view

Trend's items

To create the functionality of a trend (and backup), many OpcDbGateway items are created automatically. For a trend with the name "TrendName", items as follows are created:

Trends:

TrendName
New trend record is inserted; it contains the information about used events.

Tables:

The table in that the values are stored. It has the same name as the trend.

Columns:

ID - ID number of the record
_Time - time stamp
Operand1…OperandN – one column for every memory operand. The columns have the same names as memory operands (just not including folder's path)

Triggers:

TrendName_Trigger_Nms
Trigger used by the trend itself

TrendName_Backup_Trigger
Trigger used to start the backup of the trend data. Its period is in days, or in milliseconds (when user selects backup period as number of iterations, in this case is period the number of iterations multiplied by trend's trigger time)

Event*'s items*:

TrendName_Event
The event used by trend, it is called by *TrendName_Trigger_Nms*, and it executes the query *TrendName_Query.*

TrendName_Backup_Event
This event is used to create the backup file. It is called by *TrendName_Backup_Trigger.*
It is used to switch to the "Create report" mode, and to call the query *TrendName_Backup_Query* to select the values from the table.

TrendName_BackupDel_Even it is used to empty trend's table, after a backup was created. To do that, it is used the query *TrendName_Backup_QueryDelete*. It is also called by the trigger *TrendName_Backup_Trigger.*

Queries:

TrendName_Query
This query makes the trend's record into the table, saves ID, timestamp and values of memory operands

TrendName_Backup_Query
This query is used by the backup mechanism, called by *TrendName_Backup_Event.* It just selects all records from the table

TrendName_Backup_QueryDelete
This query is used to empty trend's table

Conclusion

As you can see historical trend wizard can do very much for you. You can spare not only much work by creating configuration itself but much time also when learning details how to create the application configuration. Creating historical trends using the wizard takes a few minutes instead of hours by using of standard techniques.

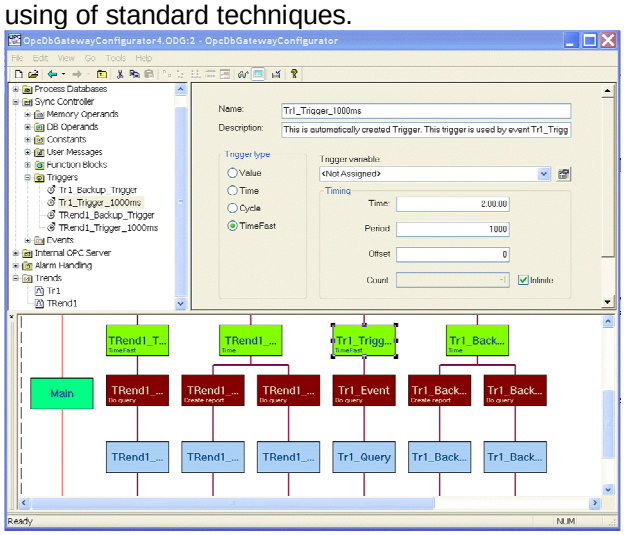

Fig. 9: Triggers, events and commands created using wizard.

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Address: Sady Cyrila a Metoda, 21/18, 018 51 Nová Dubnica, Slovakia