

## Batch Table Wrapper SimApi User Guide

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# 1 Introduction

The Batch Table Wrapper is used by Easy Analytics, SIMCA, or SIMCA-online to create the batch context table or **Batch Node** as it is referred to in SIMCA and SIMCA-online. The batch node is used to determine when batches are executing, i.e. the start and stop times for the batches.

Note: With SIMCA-online 15, batch contexts can be generated directly within SIMCA-online which also is the preferred method for creating batch contexts.

The Batch Table Wrapper creates a database from a Batch ID tag and a logical start and stop condition based on tags in the process. A useful side effect with the Batch Table Wrapper is that the user can append or prepend the start date/time to the Batch name. This is needed when the system has recurring batch names so that SIMCA-online can know which batch has run at a certain time.

The Batch Table Wrapper cannot be used alone. It needs data from another SimApi that connects to a process database to be able to generate the batch node. The SimApi that is used must support reading both current and historical data since this is required in order to create the batch information. Note: when used with the IP21 SimApi make sure that the **Include Bounds** setting is set to false, see 2.1.5.5 Include Bounds.

Note that the Batch Table Wrapper cannot have more than one batch running in the internal batch table at once for each generated batch node that is used. This will limit some of the functionality inside of SIMCA-online.

The Batch Node that is maintained by the SimApi consists of three required fields and zero or more optional fields;

- BatchID - Generated from a process batch tag, and in if needed any part of the start timestamp
- Start Time of the batch - Generated from a process data driven trigger
- Stop Time of the batch - Generated from a process data driven trigger
- In addition, any number of Batch Conditions (batch data variables) can be added. Batch conditions will be read at the start time of the batch from the process data source.

Note that reading process data through the Batch Table Wrapper is a bit slower than reading data through a dedicated SimApi connection.

## 1.1 Features

- Generated batch node - a batch node that is created from continuous process data.
- Mirrored batch node - Used with an OSIsoft PI server to wrap around an existing batch node to work around recurring batch names.
- Multiple instances of the Batch Table Wrapper SimApi on the same SIMCA-online server. This lets you connect to multiple data sources and use the Batch Table Wrapper functionality on each.
- Possibility to specify the instance name for the configured SimApi to be used in Batch Table Wrapper.

# 2 Installation, Setup, and Configuration

Refer to the **SimApi Guide** located at [umetrics.com/simapi](http://umetrics.com/simapi) for how to install and setup this SimApi.

## 2.1 Batch Table Wrapper Configuration

**Batch Table Wrapper Configuration**

**Configuration**

Output Directory (Optional) ...

SimApi ... **Config**

Instance Name (Optional)

**Mirrored Batch Node**

Select Batch Node	Mirrored_PI_Node
Batch Name Affix	;
Interval	10
Batch Time Offset	5

**Generated Batch Node**

Batch Node Name	BTW_Generated_Batch_Node
Batch ID Tag	BatchID
Batch Name Affix	;
Interval (s)	10
Maximum Backlog (s)	60
Start Trigger	Start == 1
Stop Trigger	Stop == 1
Batch Conditions	

**Configuration**  
Configuration for the Batch Table Wrapper.

**Node**

Add Generated Add Mirrored PI Remove

**Batch Records**

Remove All This will remove all created batch records for this Batch Table Wrapper instance. This can be useful if the batch records need to be repopulated due to changed data.

OK Cancel

The configuration consists of Output Directory (optional), SimApi configuration, SimApi instance name (optional) and one or more Batch Node configurations.

Batch Node can be added / removed by the clicking **Add Generated**, **Add Mirrored** or **Remove Node** buttons in the Node group.

**Note:** At least one batch node needs to be configured.

The various fields you can provide are described below.

### 2.1.1 Output Directory (Optional)

Output directory is where the database file(s) will be stored, if several instances of the Batch Table Wrapper is used each will use its own database file. This setting is optional meaning if this field is left empty the database file(s) will be stored in the default location which is %ProgramData%\Umetrics\SimApi\BatchTableWrapper. The naming of the database file corresponds to the name the configuration is given on the SimApi tab in the SIMCA-online server options dialog with the extension .db. For instance if the configuration is named BTW the database file name will be

btw.db. The database is a SQLite database. It can be opened with an external program that understands SQLite, for example “SQLiteBrowser”.

If you want to redo the configuration of the Batch Table Wrapper you should remove all old batch records from the database so that it will be created from scratch. This can be done by clicking the Remove All button in the configuration dialog. Otherwise old batches will remain and can conflict with the new ones generated after changing the settings.

## 2.1.2 SimApi

Select the SimApi to use for obtaining the process data used by the Batch Table Wrapper by clicking the ... button to browse to and select the SimApi dll.

If a configuration of the selected SimApi is needed click the **Config** button and follow the instructions for that SimApi.

## 2.1.3 Instance name (Optional)

When using Batch Table Wrapper with a SimApi that support multiple instances of itself with each instance having a unique name, this setting can be used in order to connect to a specific instance. The instance name is the name given for a configured SimApi on the SimApi tab in the SIMCA-online Server Options dialog. Make sure to configure the SimApi after this field is filled out so the correct configuration file is used.

## 2.1.4 Generated Batch Node

The generated batch node is used when the real process SimApi does not provide its own batch node.

A start and stop trigger using continuous process tags will be used to set the start and stop times of batch node that is created in the Batch Table Wrapper SimApi itself.

The batch node created is populated both at startup and when SIMCA-online is executed. At startup it will go back the configured time (Maximum Backlog) and look for batches after that it will keep updating the batch node for every configured time interval. It will also go back in time and look for batches if SIMCA-online asks for batches via the repredict dialog. If a batch was active during the Maximum Backlog time it should be available immediately after startup in the extract tool.

### 2.1.4.1 Batch Node Name

The Batch Node Name will be used in SIMCA-online for project configurations and in SIMCA to setup the data export. In the SIMCA-online project configuration select this batch node name as the desired Batch Node, and also as the unit's Batch Identifier Tag (see below).

If you set up several batch nodes, each Batch Node has to have a unique name.

### 2.1.4.2 Batch ID Tag

The Batch Identifier Tag is used to retrieve the name of the batch from selected SimApi (2.1.2). Click the (...) -button to show a dialog with available tags and select one as the Batch ID Tag. The tag is allowed to contain numeric or string values.

The Batch Table Wrapper then will generate the new batch id to be shown in SIMCA-online using the value from the Batch ID Tag combined with Batch Name Affix (see 2.1.4.3).

This tag can be left empty, however this requires that an affix and start and stop trigger is configured. When this feature is used the string **Batch** will be used together with the affix so the batch name will look something like this:

---

Batch\_20160510\_1230

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### 2.1.4.3 Batch Name Affix

Batch Name Affix should be used when same batch name can occur more than once in the process data. This is required because SIMCA-online expects unique batch names.

Batch Name Affix is optional. When creating batch name affix the batch start time is used and the supported format specifiers are:

- %Y - Year with century, as decimal number
- %m - Month as decimal number (01 - 12)
- %d - Day of month as decimal number (01 - 31)
- %H - Hour in 24-hour format (00 - 23)
- %M - Minute as decimal number (00 - 59)
- %S - Second as decimal number (00 - 59)
- %b - Abbreviated month name
- %B - Full month name

The batch name shown in SIMCA-online will be the value stored in the Batch ID Tag (2.1.4.2) combined with Batch Name Affix.

Note that any characters can be used as well to get the desired batch name. For instance "%d\_," would become 23\_B1 if the date was the 23rd and the original batch name was B1.

#### 2.1.4.4 Data read interval = Execution interval

The interval (in seconds) determines how often data is read from the SimApi to generate the batch node. The same interval should be used as in the execution interval used in the project configuration in SIMCA-online.

The Interval must be greater than 0.

#### 2.1.4.5 Maximum Backlog

The Maximum Backlog (in seconds) is how far back the SimApi will look when started for a batch that is active.

The value has to be at least the same size as of the length of a typical batch. Good value is 1-2 times the normal length of a batch.

The Maximum Backlog must be set higher than 0.

#### 2.1.4.6 Start Trigger

Start Trigger expression specifies when a batch starts. If this is not used the expression can be set to **true**.

Build an expression by clicking on the three dots (...). Select a tag, logical expression and a value. Click **Add** to build expression. Several conditions can be added to the expression with an **And** or **Or** separator. Available tags depend on the configured SimApi (2.1.2) and can be either a numeric value or a string value.

Note that this is a trigger and not a condition, meaning that the trigger expression does not need to be fulfilled throughout the batch. Once the trigger expression is met the batch will be created and run until the Stop Trigger expression is met or if the **Batch ID Tag** changes.

#### 2.1.4.7 Stop Trigger

Stop Trigger expression specifies when a batch stops. If this is not used the expression can be set to **false**.

Build an expression by clicking on the three dots (...). Select a tag, logical expression and a value. Click **Add** to build expression. Several conditions can be added to the expression with an **And** or **Or** separator. Available tags depend on the configured SimApi (2.1.2) and can be either a numeric value or a string value.

#### 2.1.4.8 Batch Conditions

Selected Batch Conditions are visible in SIMCA-online project configuration as tags and these tags should be used as batch conditions when applicable.

Add batch condition by clicking on the three dots (...). A dialog is shown where one or more tags can be selected as batch conditions by marking in the tag list. Available tags depend on the configured SimApi (2.1.2) and only numerical values can be used.

Remove a batch condition by clicking **X**.

Batch conditions are optional and should be specified when batch conditions are used in SIMCA-online projects.

### 2.1.5 Mirrored Batch Node – Only for PI SimApi

A mirrored batch node can be used to allow SimApi's to have recurring batch names. The configured SimApi (2.1.2) will then have to have an already existing Batch Node. The wrapper will then add an affix to the batch name from the SimApi with part of or the complete date when the batch began. This way, all batch names will be unique from SIMCA-online's point of view. This functionality will have a penalty of about 50ms per phase and observation.

When this feature is used the Batch Table Wrapper looks at the actual values that are read for process data (BatchID for instance that is needed in SIMCA-online for **Phase Conditions**) and compare those values with the original batch names (without the affix) that are kept in the internal database, if the value matches with a batch name, the value is replaced with the batch name including the affix.

Current implementation only supports the PI SimApi made by OSIsoft or IP21 SimApi since these systems support a hint time that is used in order to get the correct start and stop times for a batch.

#### 2.1.5.1 Select Batch Node

When the SimApi is correctly configured, a list with available nodes from the SimApi will be available in the drop down menu. Select the Batch Node that needs to be mirrored.

#### 2.1.5.2 Batch Name Affix

See 2.1.4.3.

#### 2.1.5.3 Interval

The interval is the time between each time point in the unit seconds when reading data from selected SimApi (2.1.2). The same interval should be used in the SIMCA-online project configuration.

The Interval must be set higher than 0.

#### 2.1.5.4 Batch Time Offset

This is a time value (in seconds) that specifies how far back the Batch Table Wrapper will look for a batch. Without this offset sometimes batches are not found due to how the OSIsoft PI SimApi works.

This offset should be set to the same as the **batchtimeoffset** value in the PI SimApi ini-file. See the OSIsoft PI documentation for more on batch time offset in PI.

It is important that the specified offset is shorter than the shortest delay between batches, otherwise the Batch Table Wrapper might get the wrong batch when querying PI for details about a batch.

(A note on the BatchTableWrapper.xml file: The value for Batch Time Offset is stored in the MaxBacklog attribute used for a generated batch node).

#### 2.1.5.5 Include Bounds

This setting is default set to 1 (true) and should only be changed to 0 (false) when the Batch Table Wrapper is used with the IP21 SimApi. This must be done so current data is read for the last time point instead of historical value for the same time (resulting in missing data).

To change this setting open up the configuration file (BatchTableWrapperConfiguration.xml) located in C:\ProgramData\Umetrics\SimApi with a text editor (Notepad) and locate the **IncludeBounds** setting for the current node. Change the setting accordingly and save the file.

#### 2.1.5.6 Empty batch id does not end an ongoing batch

If you don't want an ongoing batch to end when the value for the batch id tag changes to empty change this setting to 0 (false). The batch will then be ended by the stop trigger condition or if the value for the batch id tag is changed to another valid value.

To change this setting open the regular configuration file with a text editor (Notepad) and locate the **EmptyBatchIDEndsBatch** setting in the **BatchNode** XML section. If you can't find this setting please open the Batch Table Wrapper configuration dialog and click OK to save the default configuration file. The default setting is set to 1 (true).

#### 2.1.5.7 Read configuration settings from another location

This setting is default set to empty and should only be changed if you need to read the configuration file from another location than the ordinary (C:\ProgramData\Umetrics\SimApi). Note that the regular configuration file (BatchTableWrapperConfiguration.xml) must be present in the ordinary location.

To change this setting open the regular configuration file with a text editor (Notepad) and locate the **Configuration** setting in the **Paths** XML section. If you can't find this setting please open the Batch Table Wrapper configuration dialog and click OK to save the default configuration file. Change the setting to the location where you want to read the BatchTableWrapperConfiguration.xml from, the file name should not be present in the path. Copy the regular

configuration file to the configured path, now any changes made in the Batch Table Wrapper configuration dialog will be saved in the specified location.

## 2.2 Setup in SIMCA-online

### 2.2.1 Generated Batch Node

The batch node in the project configuration should be set to the generated node created by the Batch Table Wrapper.

The batch identifier tag on the Unit Triggers page in the project configuration should be set to the **internally generated** tag called **BatchTableWrapper::Batch**.

### 2.2.2 Mirrored Batch Node

The batch node in the project configuration should be set to the PI node via the Batch Table Wrapper SimApi.

The batch identifier tag on the Unit Triggers page in the project configuration should be set to the batch identifier in PI via the Batch Table Wrapper SimApi.

## 3 Support

This SimApi is developed by Sartorius Stedim Data Analytics. For support, please visit <https://umetrics.com/support>