

Report Time and Schedule Time

Overview

When designing report templates and schedules in **XLReporter**, there are two times that can be taken into account: report time and schedule time.

Report time is the time applied to every facet of the report, including report names, data group time periods and any date or time expression configured as a data connection in the report template.

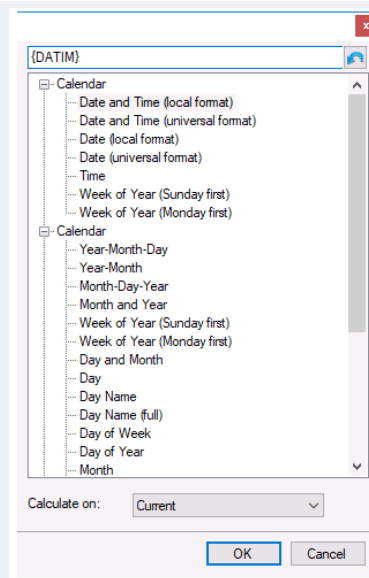
Schedule time is the time at which the report is generated or updated in **XLReporter's** built-in Scheduler.

In many cases these are the same time, but in others it may not be. This document spotlights how these two times can be used to generate any report needed.

Template Design

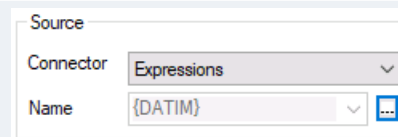
The following shows all the places where times need to be taken into account when designing a template.

Name Types



Name Types are **XLReporter** keywords for date and time expressions. They can be used in many places in the template where date and time values are applicable.

Expression Data Connections



Expression Data Connections can contain one or more Name Types which can show things like the date or time for the report.

Data Connection Placement

Placement

Cell

Type

Direction

Offset

When a data connection is configured, if the **Placement** is set to *Offset*, the **Offset** is a Name Type which defines the offset based on the date or time when the data is written to the report.

Report Names

Report Names

Modify Delete Options

Template	Folder	Report	Over
WORKBOOK			
DailyValues		DailyValues_{MMM}{YYYY}	No
WORKSHEET			
*			
Template		{DD}	No

In **Report Names**, Name Types can be used for both the **Report WORKBOOK** and **WORKSHEET** to create dynamic reports named after the report period they contain data for.

Database Data Groups

Database Group (Access DB)

File Preview

Setup Columns Filters Order Group Calculations SQL

Optional. Choose conditions to filter the information before it is displayed in the report.

Columns	Conditions	Values	And/Or
<ul style="list-style-type: none"> Alarms Alarm Type DateAndTime DateAndTimeOut Description DstFlag LoggingStr Militm Severty TagName TagType TagValue ThreshLabl ThreshNum 	<ul style="list-style-type: none"> Numeric String Date/Time = <> > >= < <= DURATION BETWEEN NOT BETWEEN All 	<ul style="list-style-type: none"> Value List Query 	<ul style="list-style-type: none"> AND AND NOT OR OR NOT

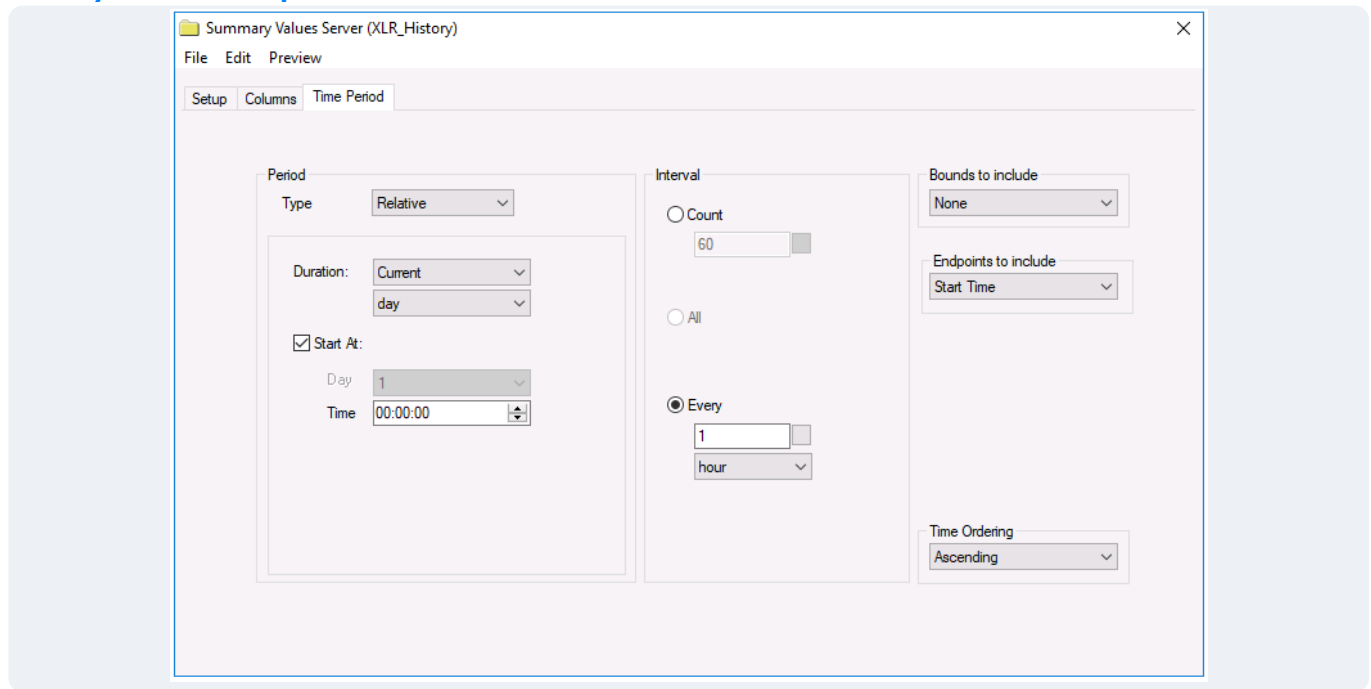
Filter Condition

DateAndTime BETWEEN #{date} \$time)# AND DateAdd('d', 1, #{date} \$time)#

When configuring a database data group, the **Filters** tab may contain Name Types to filter date/time columns in the database table.

Typically, these Name Types appear in the **Filter Condition** based on settings configured in the options above.

History Data Groups



When configuring a history data group, the **Time Period** tab defines the overall time period and interval for the group. If the **Period Type** is *Relative*, *Offset* or *Endpoint*, when executed, this is based on the report time.

Preview/On Demand

When previewing a data group or running the report template on demand, if Name Types are used in the template or the history data group is set up *Relative*, *Offset* or *Endpoint*, the dialog prompts for the report date and report time (when applicable) as **Start**.

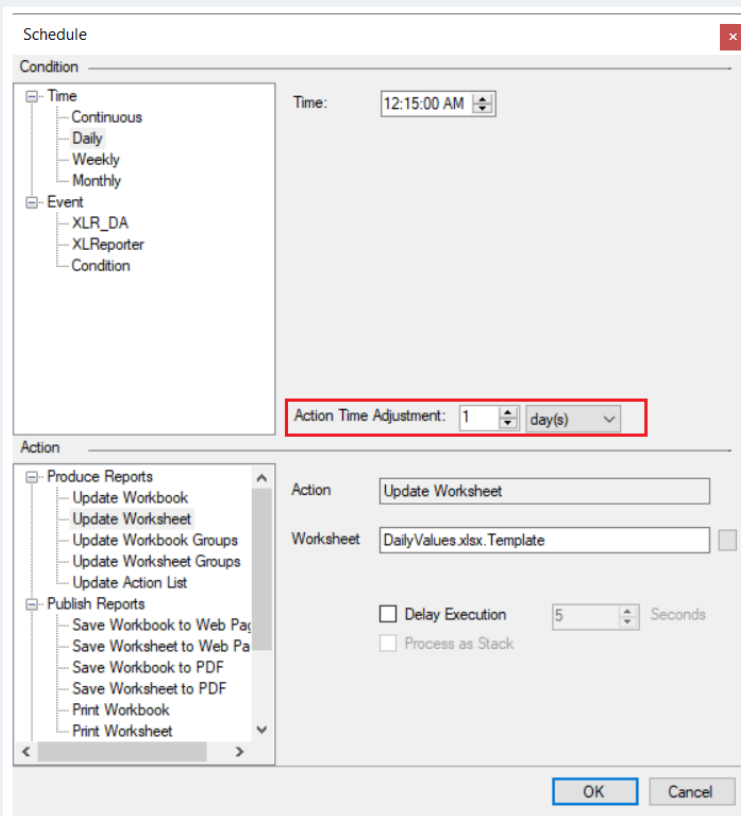
When refreshed the entire report is based off the date and time specified.

Schedule

Action Time Adjustment

By default, the report time and the schedule time are the same. This means that when the schedule triggers, the current date and time when it triggers is used for the report.

However, there are many scenarios where this is not desirable.

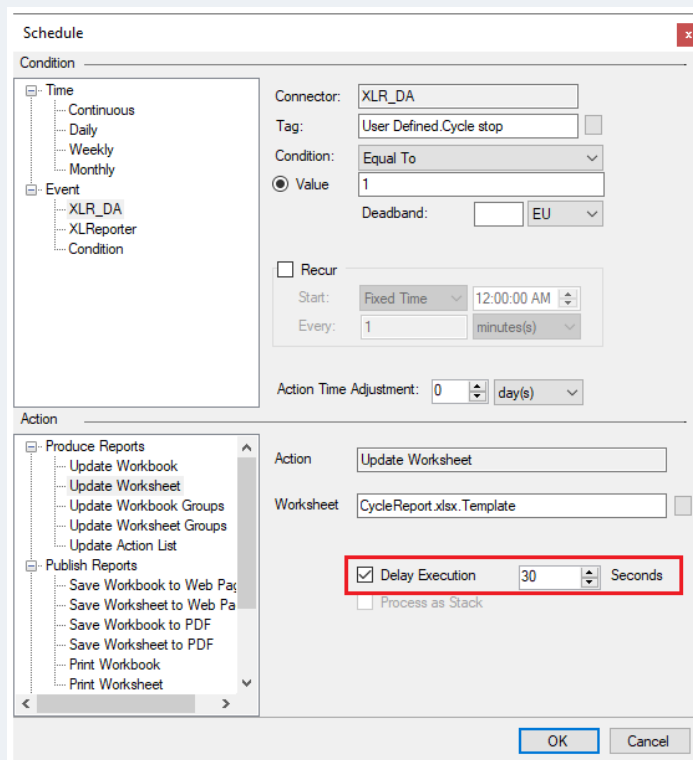


To adjust the report time so that it is different to the schedule time, the **Action Time Adjustment** needs to be set for the action.

The **Action Time Adjustment** is the amount of time subtracted from the schedule time to determine the report time.

Delay Execution

Sometimes the report time and schedule time should be the same, however a small amount of time may be needed between when the **Condition** to execute the **Action** is met but the **Action** itself should not be executed quite yet.



The **Delay Execution** option can be used to wait a specific amount of time (in seconds) after the **Condition** is met before executing the **Action** specified.

Please note that if the **Condition** is met but the **Scheduler** is stopped before the **Delay Execution** time is elapsed, the **Action** will not execute. For this reason, it is recommended to keep the delay time as short as possible.

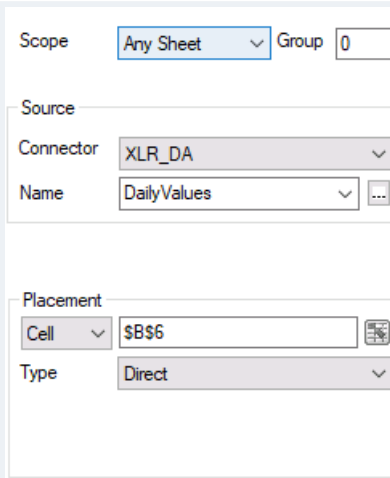
Scenarios

To better understand the use of report time and schedule time, consider the following report scenarios.

Daily Report with Real Time Values Snapshot at the End of the Day

In this scenario a daily report worksheet is generated in a monthly workbook containing values collected from a real time server at the end of the day.

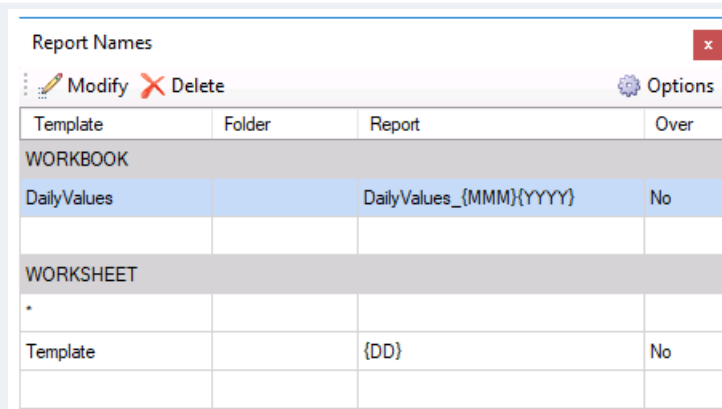
Data Connection



The screenshot shows the 'Data Connection' configuration dialog box. It is divided into three sections: 'Scope', 'Source', and 'Placement'.
- **Scope:** 'Any Sheet' (dropdown), 'Group' 0 (text box).
- **Source:** 'Connector' XLR_DA (dropdown), 'Name' DailyValues (dropdown with a plus icon).
- **Placement:** 'Cell' (dropdown), '\$B\$6' (text box with a plus icon), 'Type' Direct (dropdown).

The **Placement** of the data connection is *Direct* since the data is brought into the report one time at the end of the day.

Report Names

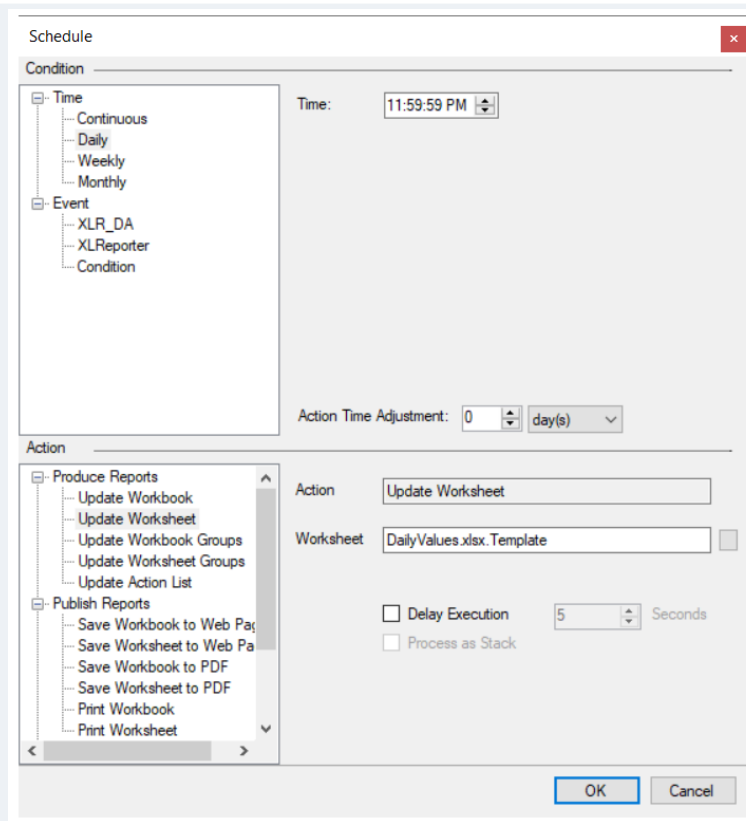


The screenshot shows the 'Report Names' dialog box with a table of report configurations. The table has columns for Template, Folder, Report, and Over. It is organized into sections for WORKBOOK and WORKSHEET.

Template	Folder	Report	Over
WORKBOOK			
DailyValues		DailyValues_{MMM}{YYYY}	No
WORKSHEET			
*			
Template		{DD}	No

The **WORKBOOK Report** is set with Name Types for the month {MMM} and year {YYYY}. The **Template WORKSHEET Report** is set to the day of the month {DD}.

Schedule



The schedule is triggered **Daily** at 11:59:59 PM, right at the end of the day.

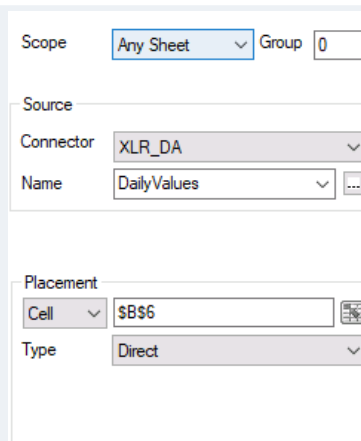
Analysis

For this scenario the report time and schedule time is the same because the report is generated and updated for the current day, right at the end of the day.

Daily Report with Real Time Values Snapshot the Next Day for the Previous Day

In this scenario a daily report worksheet is generated in a monthly workbook containing values collected from a real time server. The values in the report cannot be retrieved for the report until the next day, but need to be written in to the report for the previous day.

Data Connection



The **Placement** of the data connection is *Direct* since the data is brought into the report one time.

Report Names

Template	Folder	Report	Over
WORKBOOK			
DailyValues		DailyValues_{MMM}{YYYY}	No
WORKSHEET			
•			
Template		{DD}	No

The **WORKBOOK Report** is set with Name Types for the month {MMM} and year {YYYY}. The **Template WORKSHEET Report** is set to the day of the month {DD}.

Schedule

Condition

Time: 12:01:00 AM

Action Time Adjustment: 1 day(s)

Action: Update Worksheet

Worksheet: DailyValues.xlsx.Template

Delay Execution 5 Seconds

Process as Stack

The schedule is triggered **Daily** at 12:01:00 AM. The **Action Time Adjustment** is set to 1 day.

Analysis

For this scenario the report time must be one day before the schedule time, that is why the **Action Time Adjustment** is set to 1 day. Technically speaking this could be set to 2 minutes and the same result would be achieved but 1 day emphasizes that the report time is 1 day before the schedule time.

Let's say the action is triggered at 12:01 AM on January 1st 2020. Because of the adjustment, the report time is December 31st 2019 at 12:01 AM.

For **Report Names**, the **WORKBOOK** is `DailyValues_Dec2019` and the **WORKSHEET** is 31.

Daily Report with Hourly Real Time Values Midnight to Midnight

In this scenario a daily report worksheet is generated in a monthly workbook containing values collected from a real time server every hour throughout the day.

Data Connection

Scope: Any Sheet (dropdown), Group: 0 (input)

Source:

Connector: XLR_DA (dropdown)

Name: DailyValues (dropdown)

Placement:

Cell: \$B\$6 (input)

Type: Offset (dropdown)

Direction: Down (dropdown)

Offset: hD (input)

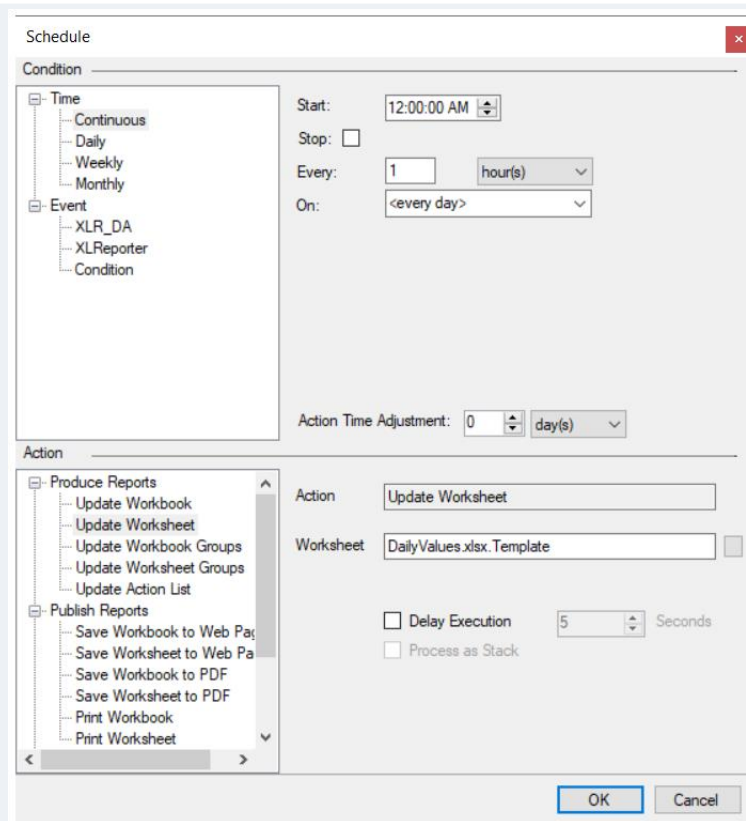
The **Placement** of the data connection is *Offset* with the **Offset** set to *hD*, the hour offset of the day.

Report Names

Template	Folder	Report	Over
WORKBOOK			
DailyValues		DailyValues_{MMM}{YYYY}	No
WORKSHEET			
Template		{DD}	No

The **WORKBOOK Report** is set with Name Types for the month {MMM} and year {YYYY}. The **Template WORKSHEET Report** is set to the day of the month {DD}.

Schedule



The schedule is triggered **Continuous Every 1 hour**.

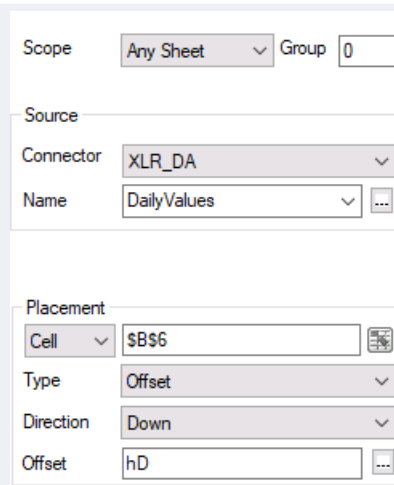
Analysis

For this scenario the report time and schedule time is the same because the report is generated and updated for the current day every hour of the day.

Daily Report with Hourly Real Time Values 7AM to 7AM

In this scenario a daily report worksheet is generated in a monthly workbook containing values collected from a real time server every hour throughout the day. However, instead of the day being midnight to midnight, the day is defined as 7AM to 7AM the next day.

Data Connection



The **Placement** of the data connection is *Offset* with the **Offset** set to *hD*, the hour offset of the day.

Report Names

Template	Folder	Report	Over
WORKBOOK			
DailyValues		DailyValues_{MMM}{YYYY}	No
WORKSHEET			
•			
Template		{DD}	No

The **WORKBOOK Report** is set with Name Types for the month {MMM} and year {YYYY}. The **Template WORKSHEET Report** is set to the day of the month {DD}.

Schedule

The schedule is triggered **Continuous Every 1 hour**. The **Action Time Adjustment** is 7 hours.

Analysis

For this scenario the report time must be adjusted by 7 hours from the schedule time.

Let's say the action is triggered at 7AM on January 1st 2020. Because of the adjustment, the report time is January 1st 2020 at 12 AM (00:00:00).

For the **Data Connection**, the **Placement Offset** is calculated as 0.

For **Report Names**, the **WORKBOOK** is *DailyValues_Jan2020* and the **WORKSHEET** is *01*.

Fast forward to the last update for the report on January 2nd 2020 at 6AM. The report time is calculated as January 1st 2020 at 11 PM (23:00:00).

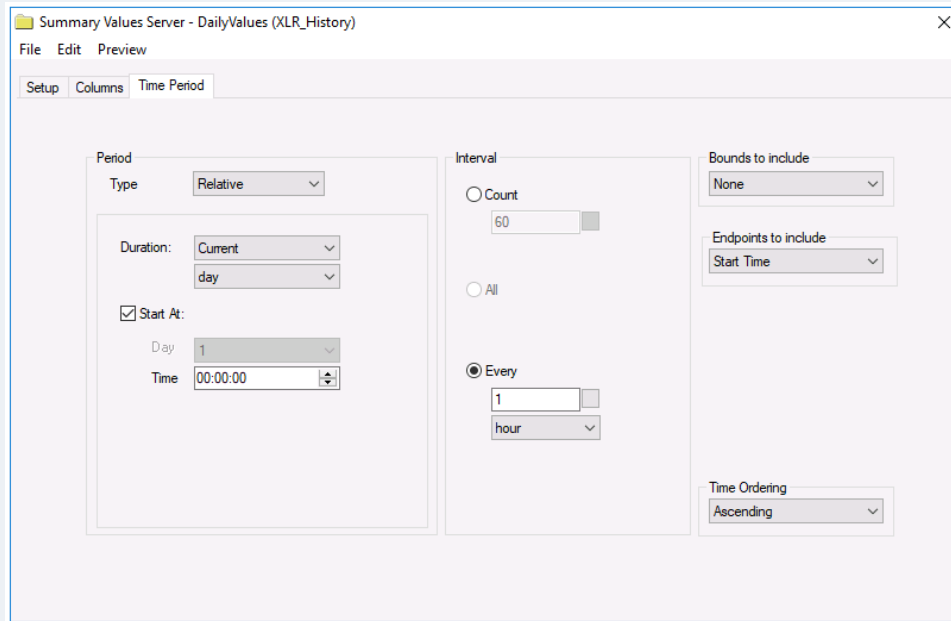
For the **Data Connection**, the **Placement Offset** is calculated as 23.

For **Report Names**, the **WORKBOOK** is still *DailyValues_Jan2020* and the **WORKSHEET** is still 01.

Daily Report with Hourly History Values Midnight to Midnight

In this scenario a daily report worksheet is generated in a monthly workbook containing hourly values collected from a history server at the end of the day.

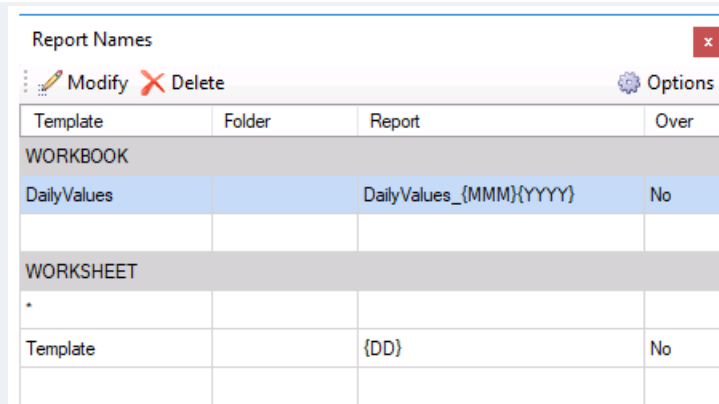
Data Group



The screenshot shows the configuration window for a data group. The 'Time Period' tab is selected. The 'Period' section is set to 'Relative' with a duration of 'Current' and 'day', starting at '00:00:00' on 'Day 1'. The 'Interval' section is set to 'Every' with an interval of '1' hour. The 'Bounds to include' is set to 'None' and 'Endpoints to include' is set to 'Start Time'. The 'Time Ordering' is set to 'Ascending'.

The **Time Period** defined for the history data group is the *Current* day at 00:00:00 (midnight). The **Interval** is 1 hour so this group will return 24 rows of data, one for each hour of the day.

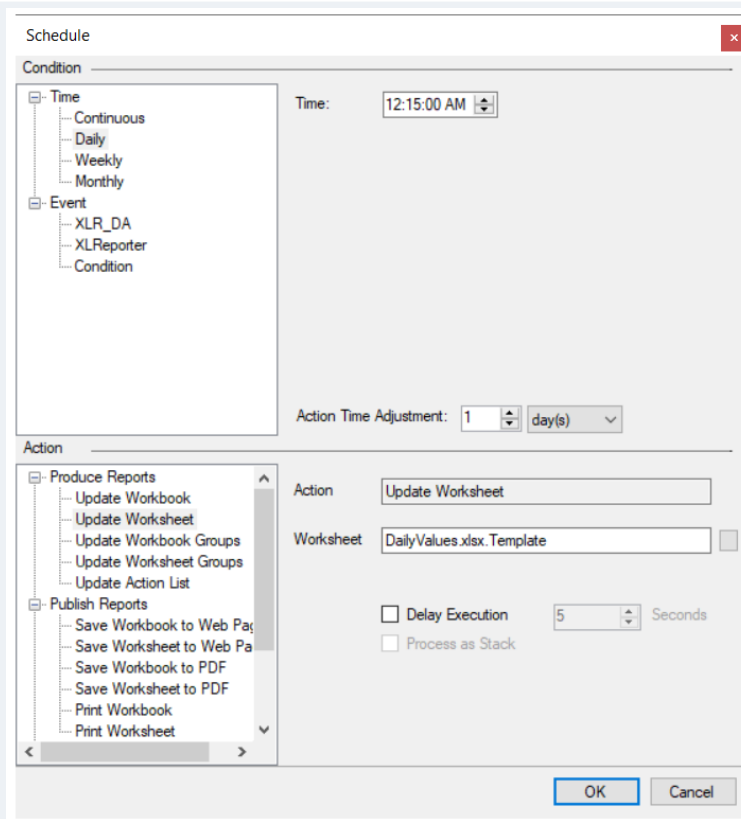
Report Names



Template	Folder	Report	Over
WORKBOOK			
DailyValues		DailyValues_{MMM}{YYYY}	No
WORKSHEET			
Template		{DD}	No

The **WORKBOOK Report** is set with Name Types for the month {MMM} and year {YYYY}. The **Template WORKSHEET Report** is set to the day of the month {DD}.

Schedule



The schedule is triggered **Daily** at 12:15 AM, with an **Action Time Adjustment** of 1 day.

Analysis

In this scenario the report is generated at 12:15 AM the next day, so the **Action Time Adjustment** of 1 day is needed to push the report time to the previous day.

Why is the report generated on the next day? Because the data is coming from the historian, all the data for the day is not available until the next day to ensure that all the data for the day is considered. Besides, the data retrieval from the historian is not time critical. Once it is in the historian, it can be retrieved any time over the day, so why not give it some extra time? Besides, is anyone sitting at the machine right at the end of the day eagerly awaiting the report to generate?

Daily Report with Hourly History Values 7AM to 7AM

In this scenario, a daily report worksheet is generated in a monthly workbook containing hourly values collected from a history server at the end of the day. However, for this report, the day is not midnight to midnight but rather 7 AM to 7 AM the next day.

Data Group

Summary Values Server - DailyValues (XLR_History)

File Edit Preview

Setup Columns Time Period

Period

Type: Relative

Duration: Current, day

Start At:

Day: 1

Time: 07:00:00

Interval

Count: 60

All

Every: 1 hour

Bounds to include: None

Endpoints to include: Start Time

Time Ordering: Ascending

The **Time Period** defined for the history data group is the *Current day at 07:00:00 (7 AM)*. The **Interval** is *1 hour*, so this group will return 24 rows of data, one for each hour of the day.

Report Names

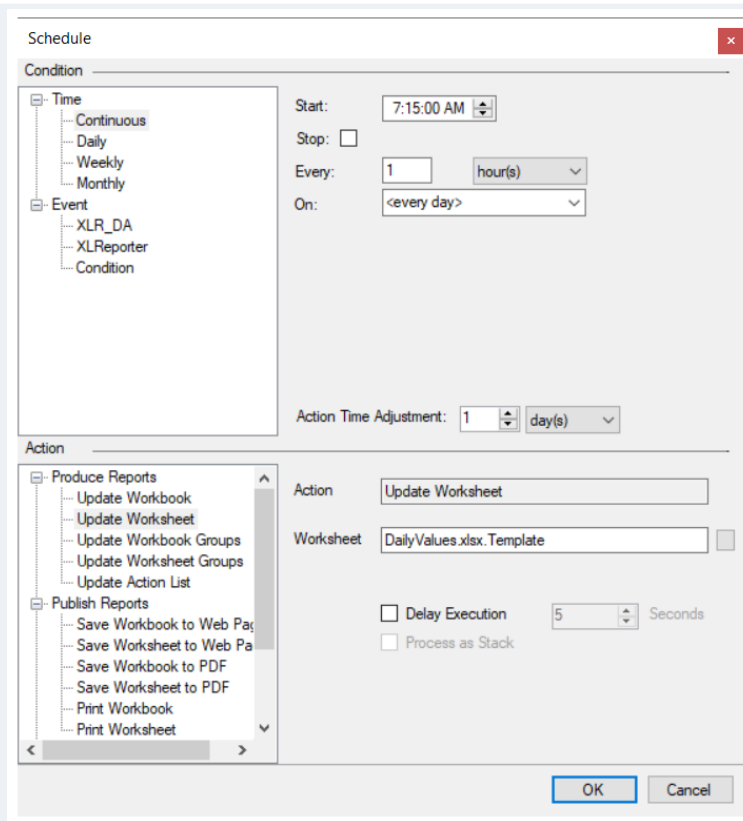
Report Names

Modify Delete Options

Template	Folder	Report	Over
WORKBOOK			
DailyValues		DailyValues_{MMM}{YYYY}	No
WORKSHEET			
•			
Template		{DD}	No

The **WORKBOOK Report** is set with Name Types for the month {MMM} and year {YYYY}. The **Template WORKSHEET Report** is set to the day of the month {DD}.

Schedule



The schedule is triggered **Daily** at 7:15 AM, with an **Action Time Adjustment** of 1 day.

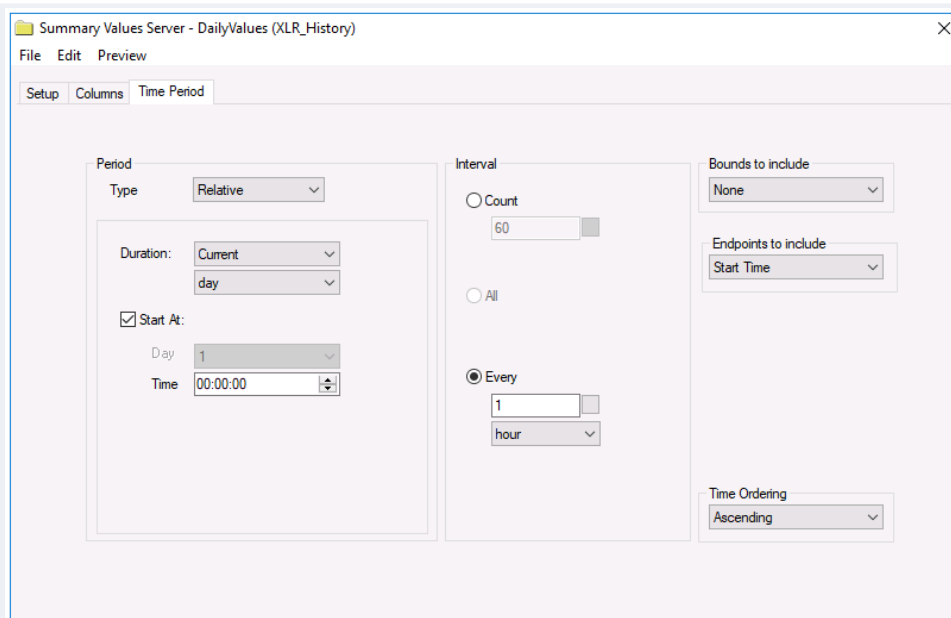
Analysis

In this scenario the report is generated at 7:15 AM the next day so the **Action Time Adjustment** of 1 day is needed to push the report time to the previous day.

Daily Report with Hourly History Values Midnight to Midnight with Date Generated

In this scenario a daily report worksheet is generated in a monthly workbook containing hourly values collected from a history server at the end of the day.

Data Group

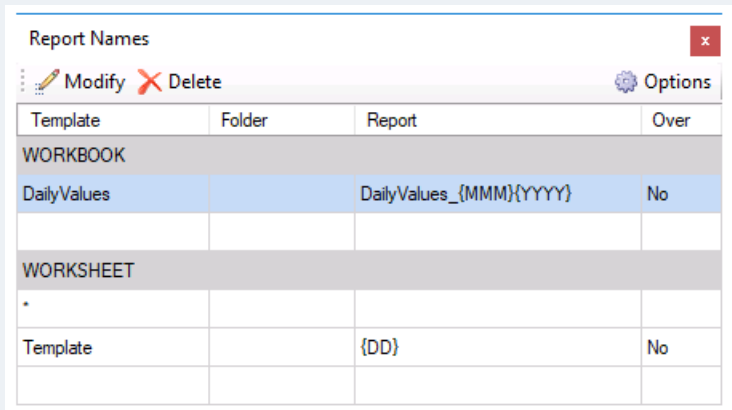


The **Time Period** defined for the history data group is the *Current day* at 00:00:00 (midnight). The **Interval** is 1 hour so this group will return 24 rows of data, one for each hour of the day.

Data Connection

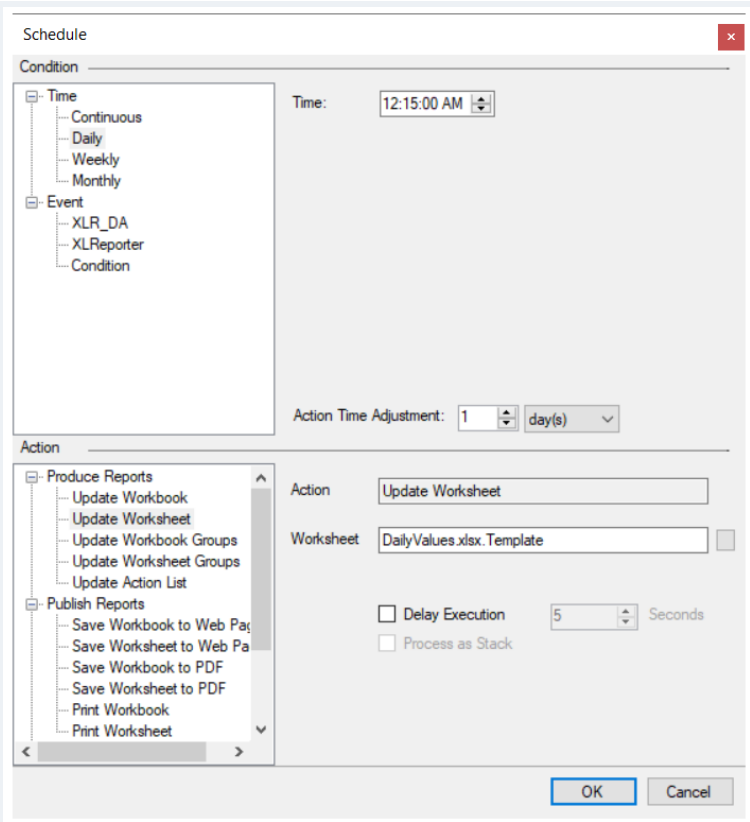
To show the date and time when the report was generated an Expression connection is configured for the date and time Name Type.

Report Names



The **WORKBOOK Report** is set with Name Types for the month {MMM} and year {YYYY}. The **Template WORKSHEET Report** is set to the day of the month {DD}.

Schedule



The schedule is triggered **Daily** at 12:15 AM, with an **Action Time Adjustment** of 1 day.

Analysis

In this scenario the report is generated at 12:15 AM the next day so the **Action Time Adjustment** of 1 day is needed to push the report time to the previous day.

However, the date and time written by the **Expression** connection needs to show the schedule time, not the report time. By default all Name Types are resolved based on the report time. But, if the Name Type begins with a \$, the Name Type is resolved using the schedule time. That is why the **Expression** connection is configured as `{$DATIM}`.

Event Report with 5 Minute History Values over a Cycle

In this scenario a report worksheet is generated in a daily workbook containing 5-minute values collected from a history server during a cycle at the end of the cycle. The history server is located on a remote machine and the PC clocks of both machines are not synced so in order to retrieve all the data from the history server for the cycle, the request should not be made until 30 seconds after the cycle has ended.

Data Group

The **Time Period** defined for the history data group are **Variables** that are set when the cycle starts and ends. The **Interval** is **5 minutes** so this group will return a row of data for every 5-minute interval between when the cycle started and ended.

Report Names

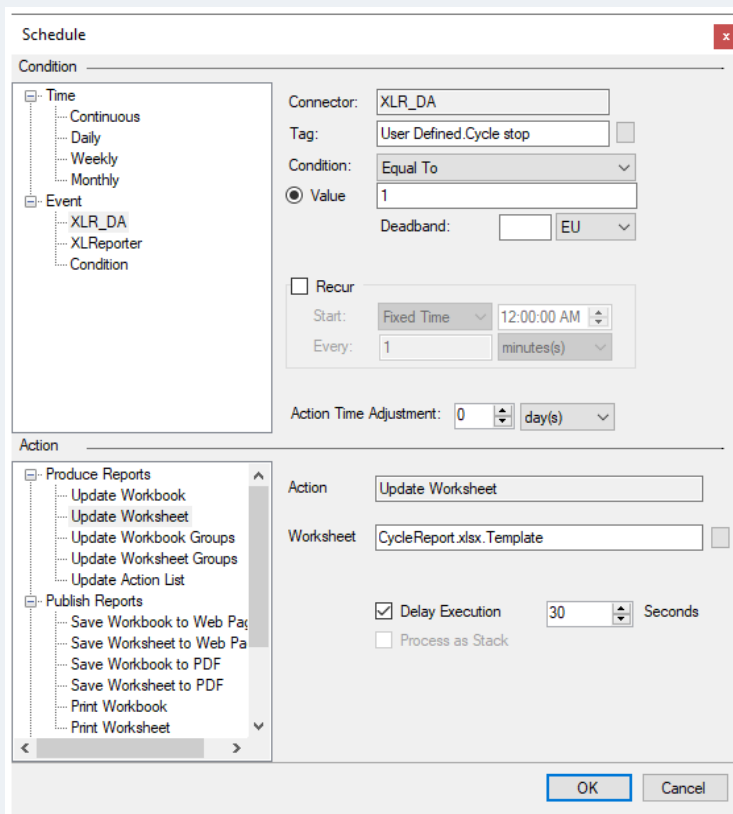
Template	Folder	Report	Over
WORKBOOK			
CycleReport		CycleReport_{MMM}-{D...	No
WORKSHEET			
Template		{RG000}	No

The **WORKBOOK Report** is set with Name Types for the month `{MMM}`, day of the Month `{DD}` and year `{YYYY}`. The **Template WORKSHEET Report** is set to a **Variable** that is set when the cycle starts indicating the name of the cycle.

Schedule

The schedule consists of actions at the beginning of the cycle that establish the cycle name for the report naming convention and the start time of the cycle.

At the end of the cycle, the end time is captured, and the report is generated.



The schedule to generate the report is configured to run at the end of the cycle with **Delay Execution** enabled and set to 30 seconds.

Analysis

In this scenario the report is generated at the end of the cycle but since the PC with the history server is not synced with the PC generating the report, the **Delay Execution** of 30 seconds is needed to give some bandwidth so that all the data collected in the historian over the cycle is available for the report.