Note

Before using this information and the product it supports, read the information in “Notices” on page 17.
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Introduction

This document describes the new and updated features for IBM® Cognos®
Dynamic Cubes Version 10.2.1.1 Interim Fix 3.

Before you read this document, you should be familiar with the IBM Cognos
Dynamic Cubes User Guide.
Chapter 1. Updates to relative time

The following updates to relative time are available in this release of IBM Cognos Dynamic Cubes:

- "New relative time level types"
- "New predefined relative time members"
- "New custom relative time members" on page 3
- "Control the automatic generation of predefined relative time members" on page 3

New relative time level types

When you define a time-based hierarchy level, there are four new level types: semesters, trimesters, holidays, and seasons.

The following rules apply when you use these level types:

- Level types must appear in order in a hierarchy.
  - The order in which they can be used is reflected in the level type list. The order is enforced during validation.
  - Holidays and seasons (like periods) are exceptions to this rule. They can be assigned in any order to any level, and can be used multiple times in the same hierarchy.
- Semesters and trimesters cannot be used in the same hierarchy.
- Trimesters and quarters cannot be used in the same hierarchy.
- Semesters and quarters can be used in the same hierarchy.

The level type is used to construct the name of predefined relative time members. For example, 'Current Semester'.

New predefined relative time members

When you create a hierarchy for a time-based dimension, the following next period relative time members are now available:

- Next Period
- Next Period to Date
- Next Period to Date Change
  - This member is derived from 'Next Period to Date' - 'Period to Date'
- Next Period to Date % Growth
  - This member is derived from 'Next Period to Date Change' / 'Period to Date' * 100

In all cases, "Period" is the level type that is defined for the hierarchy, for example Year or Semester.

These members have a fixed offset from the current period of +1. For example, if the current month is November, the next month is December.
Consider the following Time dimension and Sales fact tables. The current quarter is 201303.

**Table 1. Time dimension**

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>201201</td>
</tr>
<tr>
<td>2012</td>
<td>201202</td>
</tr>
<tr>
<td>2012</td>
<td>201203</td>
</tr>
<tr>
<td>2012</td>
<td>201204</td>
</tr>
<tr>
<td>2013</td>
<td>201301</td>
</tr>
<tr>
<td>2013</td>
<td>201302</td>
</tr>
<tr>
<td>2013</td>
<td>201303</td>
</tr>
<tr>
<td>2013</td>
<td>201304</td>
</tr>
<tr>
<td>2014</td>
<td>201401</td>
</tr>
<tr>
<td>2014</td>
<td>201402</td>
</tr>
<tr>
<td>2014</td>
<td>201403</td>
</tr>
<tr>
<td>2014</td>
<td>201404</td>
</tr>
</tbody>
</table>

**Table 2. Sales fact table**

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>201201</td>
<td>3</td>
</tr>
<tr>
<td>201202</td>
<td>4</td>
</tr>
<tr>
<td>201203</td>
<td>5</td>
</tr>
<tr>
<td>201204</td>
<td>6</td>
</tr>
<tr>
<td>201301</td>
<td>7</td>
</tr>
<tr>
<td>201302</td>
<td>8</td>
</tr>
<tr>
<td>201303</td>
<td>9</td>
</tr>
<tr>
<td>201304</td>
<td>10</td>
</tr>
<tr>
<td>201401</td>
<td>11</td>
</tr>
<tr>
<td>201402</td>
<td>12</td>
</tr>
<tr>
<td>201403</td>
<td>13</td>
</tr>
<tr>
<td>201404</td>
<td>14</td>
</tr>
</tbody>
</table>

The value of 'Year to Date (2013)' is 24. This value is derived from 'aggregate(currentMeasure within set periodsToDate(Year, 201303))'.

The value of 'Prior Year to Date (2012)' is 12. This value is derived from 'aggregate(currentMeasure within set periodsToDate(Year, parallelPeriod(Year,1, 201303)))'.

The value of 'Next Year to Date (2014)' is 36. This value is derived from 'aggregate(currentMeasure within set periodsToDate(Year, parallelPeriod(Year,-1, 201303)))'.

The value of 'Year to Date Change' is 12. This value is derived from 'Year to Date' - 'Prior Year to Date'.


The value of 'Next Year to Date Change' is 12. This value is derived from 'Next Year to Date' - 'Year to Date'.

The value of 'Next Year to Date % Growth' is 50%. This value is derived from 'Next Year to Date Change' / 'Year to Date' * 100.

**Predefined relative time members in virtual cubes**

All relative time members are inherited from the single source cube that supplies the current period.

**Relative time calculated members**

The following relative time members behave the same as the Current® Period, Prior Period, Current Period to Date and Prior Period to Date members:
- Next Period
- Next Period to Date

The following relative time members behave the same as the Period to Date Change and Period to Date Growth relative time calculated members:
- Next Period to Date Change
- Next Period to Date % Growth

**New custom relative time members**

When you create a hierarchy for a time-based dimension, you can now create the following types of custom relative time members:

"Custom single period” on page 4

"Custom period-to-date” on page 5

"Custom N period running total” on page 7

For information on how to create a custom relative time member, see "Create a custom relative time member” on page 8

IBM Cognos Cube Designer validates custom member property values as follows:
- Offsets must be an integer value (-n, 0, +n).
- The context period must be higher than the target period. If the target period is set to the highest level, the context period must be blank.
- For period-to-date, if life-to-date is false, the target period must be lower than the to-date period. If life-to-date is true, target period can be the highest level.
- For n-period running total, the target period cannot be the highest level, and number of periods must be an integer greater than or equal to 1.

If the target and context properties are set so that the corresponding member is outside the bounds of the hierarchy, the custom member is dropped at cube start time, and an event is logged in the xqelog log file.

The parent of a custom relative time member in a hierarchy is assigned automatically by the server as follows:
- Custom single period - the parent is the predefined current period member at the level above the target period. For example, Current Quarter is the parent of 'Same Month Last Year'.

- Custom period-to-date - the parent is the predefined period-to-date member at the level above the to-date period. For example, Year to Date is the parent of 'Quarter to Date Last Year'.

- Life-to-date - the parent is the All member for a single root hierarchy, or the member is at the root level for a multi-root hierarchy.

- N-period running total - the parent is the All member for a single root hierarchy, or the member is at the root level for a multi-root hierarchy.

If the target and context properties are such that the corresponding member is outside the bounds of the hierarchy, the custom member is dropped at cube start time, and an event is logged in the xqelog log file.

**Limitations**

Custom relative time members have the following limitations:

- When you browse relative time members in Cognos Cube Designer, the endpoint member (normally shown in parenthesis) is not displayed for custom members.

  This applies only to source cube, not virtual cubes.

- When you browse relative time members in Cube Designer, the sub tree of reference members is not displayed for custom members.

  This applies only to source cube, not virtual cubes.

- For the life-to-date custom member, there is no sub tree of relative time members available in IBM Cognos Cube Designer or the IBM Cognos studios.

- Values that are returned by custom and predefined relative time members for a retail calendar or Gregorian calendar with a week level differ from values that are returned by IBM Cognos Transformer or PowerPlay®.

**Relative time calculated members**

The following relative time members behave the same as the Current Period, Prior Period, Current Period to Date and Prior Period to Date members:

- Custom single period
- Custom period-to-date

The custom N-period running total relative time member behaves the same as the Current Period, Prior Period, Current Period to Date and Prior Period to Date members.

**Custom relative members in virtual cubes**

All relative time definitions (members and auto-generation options) are inherited from the single source cube that supplies the current period.

**Custom single period**

Use custom single period to define a relative time member that corresponds to a single member at the same level as a current period member, but offset by a defined period. The relative position is specified by a target period with offset, and a context period with offset.
For example, to define a relative time member "Same month, last quarter" you specify:

- target period: month
- target period offset: 0
- context period: quarter
- context offset: -1

This example is illustrated in the following diagram.

![Diagram illustrating single period example]

Use a positive offset for a future period. For example, to define relative time member "Next month, next year" you specify:

- target period: month
- target period offset: 1
- context period: year
- context offset: 1

**Custom period-to-date**

Use custom period-to-date to define a relative time member that is an aggregation from the beginning of a time period to an endpoint within the period.

You must specify whether the period is life-to-date or for a specific to-date period. You then specify target period with offset, and context period with offset.

Life-to-date aggregates data for all time periods to a defined endpoint. The endpoint is defined by the target and context properties.

The target period that you specify affects the granularity of the period-to-date calculation. The calculation ends at the 'close' of the target period, where the close is the last sibling among the descendants. For example, if the current day is January 10, and day is the leaf level, quarter-to-date aggregates January 1 to
January 10, if target period is day. If target period is month, quarter-to-date includes all days in the month, January 1 to January 31.

For example, assume a hierarchy with All, Year, Quarter, and Month levels. To define a relative time member "Quarter to date, last year" you specify:

- life-to-date: false
- to-date period: quarter
- target period: month
- target period offset: 0
- context period: year
- context offset: -1

This example is illustrated in the following diagram.

In this example, if the current month is February, and the quarter ends in March, the defined endpoint is February because the target period is month.

To define a relative time member "life to date (target = quarter)", you specify:

- life-to-date: true
- to-date period: n/a
- target period: quarter
- target period offset: 0
- context period: year
- context offset: 0

This example is illustrated in the following diagram.
For life-to-date members, the sub tree of reference members is not generated in the member browser or in the IBM Cognos studios.

**Custom N period running total**

Use custom N-period running total to define a relative time member that is an aggregation of a defined number of consecutive periods.

You must specify the number of periods, target period with offset, and context period with offset. The endpoint is defined by the target and context properties.

For example, to define a relative time member for "Trailing 6 months, next year" you specify:

- number of periods: 6
- target period: months
- target period offset: -1
- context period: year
- context offset: 1

This example is illustrated in the following diagram.
You cannot select the highest level. For example, if levels are All, Year, Quarter, and Month, you cannot select Year as the target period.

Create a custom relative time member

When you create a hierarchy for a time-based dimension, you can now create custom relative time members.

Procedure

1. From the Project Explorer tree, right-click the hierarchy you want to work with, and then select Open Editor.
2. Select the Relative Time tab.
3. Click one of the following options to create a custom relative time member:
   - New Custom Single Period Definition
   - New Custom Period To Date Definition
   - New Custom N-Period Running Total Definition
4. Complete the definition using the Properties tab.

Control the automatic generation of predefined relative time members

You can now control the automatic generation of the following relative time members:

- prior period members
  For more information about these members, see the IBM Cognos Dynamic Cubes User Guide.
- next period members
  For more information about these members, see “New predefined relative time members” on page 1.
the sub tree of reference members for all relative time members

Relative time reference members are relative time members that refer to regular members within a time hierarchy. They have the same caption and business key value as the members to which they refer.

The purpose of the reference members is to show the sub tree of a hierarchy to which a relative time member corresponds.

In the following example, you can see the first level of reference members highlighted in blue.

![Figure 5. Example of first level reference members](image)

By default, the sub tree of reference members is generated. Depending on the hierarchy structure, there may be a large number of reference members, and you can now exclude them from being auto-generated.

**Procedure**

1. From the **Project Explorer** tree, right click the hierarchy you want to work with, and then select **Open Editor**.
2. Select the **Relative Time** tab.
3. Select one of the following options for prior period members:
   - **Auto-generate members** to include predefined members (default).
   - **Do not auto generate members** to exclude predefined members.
4. Select one of the following options for next period members:
   - **Auto-generate members** to include predefined members.
   - **Do not auto generate members** to exclude predefined members (default).
5. Select one of the following options for the **Reference relative time members subtree**:
   - **Include** to include a sub tree of members (default).
   - **Exclude** to exclude a sub tree of members.
Chapter 2. Named sets

You can now create named sets in a project. A named set is defined by a dimensional set expression that evaluates to a set of members from a single hierarchy. For example, topcount(Customers, 5, Sales). When you run a report containing a named set, the corresponding expression is evaluated and the resulting set of members is rendered in the report.

When a dynamic cube is published, named sets are available as data items in a Named sets folder within the metadata/member tree in the IBM Cognos studios.

Tip: The advantage of using dynamic cube-defined named sets over query-defined sets is that they can be authored once and reused multiple times in different reports.

IBM Cognos Cube Designer validates the syntax of named set expressions. After a cube is started, the dynamic cube engine validates the semantics of the expressions (using the cube default member context and the security of the access account). Any expression which is not successfully validated during cube start is removed from the cube and is not available in the studios. If removed, the error reason is recorded in the xqelog log file. For example, a named set containing circular references (a reference to itself) is not valid.

A named set is dynamic. It is evaluated at report execution time using the query context and the security of the currently logged in user. For example, a named set nested under a set of years is evaluated independently for each year.

Tip: You can use named sets within other named set expressions or within a calculated member/measure expression. Named sets can also make use of parameters and macros.

You create named sets in a project at the cube level. Named sets are stored within the Named sets folder. You can also organize named sets by creating sub folders within this folder.

If you are using member or attribute security, it is also applied to named sets members. Named sets from source cubes are not inherited in a virtual cube; if you want to use named sets in a virtual cube, you must define them.

Procedure

1. From the Project Explorer tree, right click the Named sets folder for a dynamic cube and select New, Named set folder.
2. Rename the folder as required.
3. From the Project Explorer tree, right click the named set folder where you want to store the named set expression.
5. Using the expression editor on the properties page, define the named set expression using members and a valid set of multidimensional operators and functions.
6. Click Validate Syntax to validate the named set expression syntax.
Chapter 3. Shared dimensions

If a project contains dimensions that are referenced by more than one cube or virtual cube, you can now create a shared member cache. This means that each shared dimension is only published once regardless of the number of cubes that reference it. Creating a shared member cache improves performance by reducing the amount of memory consumed when cubes are published.

A shared dimension can include calculated members and relative time members. You can add a shared dimension to security views and security filters defined for a cube. You cannot share a measure dimension.

**Procedure**

1. From the **Project Explorer** tree, select the required dimension.
2. In the **Properties** tab, set the **Share member cache for all cubes** property to true.

**Results**

When you validate a shared dimension in a virtual cube, IBM Cognos Cube Designer checks whether a dimension can be shared between the source cube and virtual cube. You can check for warnings on the **Issues** tab.

After publishing cubes with shared dimensions, the dimension members are not automatically updated when a member cache is refreshed. This is to prevent all the cubes sharing a dimension from refreshing. If you want to update the dimension members, you must stop all cubes to remove the dimension from the shared dimension cache. You can then publish the cubes again.
Chapter 4. Sort measure descendants

You can now change the order in which measures, calculated measures, and folders are sorted from a selected measure dimension or folder to the lowest level nested folder.

For example, suppose your measure dimension contains these objects:

Measure dimension:
- measure C
- calculated measure Z
- measure folder B
  - measure D
  - measure A

If you sort descendants in ascending order, this is the resulting sort order:

Measure dimension:
- measure folder B
  - measure A
  - measure D
- measure C
- calculated measure Z

Note that if the selected measure dimension or folder contains a very large number of measures, calculated measures, and nested measure folders, sorting descendants may take some time.

Procedure

From the Project Explorer tree, right-click a measure dimension or folder in which to sort items, and click one of the following options:
- Sort, Descendants, Ascending.
- Sort, Descendants, Descending.
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