Expressions in dashboard widgets

OnCommand Insight

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Expressions in dashboard widgets

Expressions in time series widgets allow you to display data based on calculations with metrics of your choosing.

In a dashboard, any time series widget (line, spline, area, stacked area) allows you to build expressions from metrics you choose, and show the result of those expressions in a single graph. The following examples use expressions to solve specific problems. In the first example, we want to show Read IOPS as a percentage of Total IOPS for all storage assets in our environment. The second example gives us visibility into the "system" or "overhead" IOPS that occur in our environment—those IOPS that are not from reading or writing data.

Expressions example: Read IOPS percentage

Using expressions, you can view metrics by alternate means, such as percentage of total.

About this task

In this example we want to show Read IOPS as a percentage of Total IOPS. You can think of this as the following formula:

- Read Percentage = (Read IOPS / Total IOPS) x 100

This data can be shown in a line graph on your dashboard. To do this, follow these steps:

Steps

1. Create a new dashboard, or open an existing dashboard in **edit mode**.
2. Add a widget to the dashboard. Choose **Area chart**.

   The widget opens in edit mode. By default, a query is displayed showing **IOPS - Total** for **Storage** assets. If desired, select a different asset type.

3. Click the **Convert to Expression** button.

   The current query is converted to Expression mode. Notice that you cannot change the asset type while in Expression mode. Notice that while you are in Expression mode, the button changes to **Revert to Query**. Click this if you wish to switch back to Query mode at any time. Be aware that switching between modes will reset fields to their defaults.

   For now, stay in **Expression** mode.

4. The **IOPS - Total** metric is now in the alphabetic variable field “a”. In the “b” variable field, click **Select** and choose **IOPS - Read**.

   You can add up to a total of five alphabetic variables for your expression by clicking the**+**button following the variable fields. For our Read Percentage example, we only need Total IOPS (“a”) and Read IOPS (“b”).

5. In the **Expression** field, you use the letters corresponding to each variable to build your expression. We know that *Read Percentage = (Read IOPS / Total IOPS) x 100*, so we would write this expression as: `(b / a) * 100`
6. The **Label** field identifies the expression. Change the label to “Read Percentage”, or something equally

meaningful for you.

7. Change the **Units** field to “%” or “Percent”.

   The chart displays the IOPS Read percentage over time for the chosen storage devices. If desired, you can set a filter, or choose a different rollup method. Be aware that if you select **Sum** as the rollup method, all percentage values are added together, which potentially may go higher than 100%.

8. Click **Save** to save the chart to your dashboard.

   You can also use expressions in **Line chart**, **Spline chart**, or **Stacked Area chart** widgets.

Expressions example: "System" I/O

Expressions give you the freedom to chart data that can be calculated from other metrics.

About this task

Example 2: OnCommand Insight acquires many metrics from data sources. Among them are read, write, and total IOPS. However, the total number of IOPS reported by acquisition sometimes includes "system" IOPS, which are those IO operations that are not a direct part of data reading or writing. This system I/O can also be thought of as "overhead" I/O, necessary for proper system operation but not directly related to data operations.

To show these system I/Os, you can subtract read and write IOPS from the total IOPS reported from acquisition. The formula might look like this:

- System IOPS = Total IOPS - (Read IOPS + Write IOPS)

This data can then be shown in a line graph on your dashboard. To do this, follow these steps:

Steps

1. Create a new dashboard, or open an existing dashboard in **edit mode**.
2. Add a widget to the dashboard. Choose **Line chart**.

   The widget opens in edit mode. By default, a query is displayed showing **IOPS - Total** for **Storage** assets. If desired, select a different asset type.

3. Click the button to create a copy of the query.

   A duplicate of the query is added below the original.

4. In the second query, click the **Convert to Expression** button.

   The current query is converted to Expression mode. Click **Revert to Query** if you wish to switch back to Query mode at any time. Be aware that switching between modes will reset fields to their defaults.

   For now, stay in **Expression** mode.

5. The **IOPS - Total** metric is now in the alphabetic variable field “a”. Click on **IOPS - Total** and change it to **IOPS - Read**. .
6. In the “b” variable field, click **Select** and choose **IOPS - Write**.
7. In the **Expression** field, you use the letters corresponding to each variable to build your expression. We

would write our expression simply as: `a + b`. In the **Display** section, choose**Area chart** for this expression.

8. The **Label** field identifies the expression. Change the label to “System IOPS”, or something equally meaningful for you.

   The chart displays the total IOPS as a line chart, with an area chart showing the combination of read and write IOPS below that. The gap between the two shows the IOPS that are not directly related to data read or write operations.

9. Click **Save** to save the chart to your dashboard.

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