Prioritizing storage object events using annotations

Active IQ Unified Manager

NetApp
May 24, 2022

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You can create and apply annotation rules to storage objects so that you can identify and filter those objects based on the type of annotation applied and its priority.

Understanding more about annotations

Understanding the concepts about annotations helps you to manage the events related to the storage objects in your environment.

What annotations are

An annotation is a text string (the name) that is assigned to another text string (the value). Each annotation name-value pair can be dynamically associated with storage objects using annotation rules. When you associate storage objects with predefined annotations, you can filter and view the events that are related to them. You can apply annotations to clusters, volumes, and storage virtual machines (SVMs).

Each annotation name can have multiple values; each name-value pair can be associated with a storage object through rules.

For example, you can create an annotation named "data-center" with the values "Boston" and "Canada". You can then apply the annotation "data-center" with the value "Boston" to volume v1. When an alert is generated for any event on a volume v1 that is annotated with "data-center", the generated email indicates the location of the volume, "Boston", and this enables you to prioritize and resolve the issue.

How annotation rules work in Unified Manager

An annotation rule is a criterion that you define to annotate storage objects (volumes, clusters, or storage virtual machines (SVMs)). You can use either condition groups or conditions for defining annotation rules.

- You must associate an annotation rule to an annotation.
- You must associate an object type for an annotation rule; only one object type can be associated for an annotation rule.
- Unified Manager adds or removes annotations from storage objects after each monitoring cycle or when a rule is created, edited, deleted, or reordered.
- An annotation rule can have one or more condition groups, and each condition group can have one or more conditions.
- Storage objects can have multiple annotations. An annotation rule for a particular annotation can also use different annotations in the rule conditions to add another annotation to already annotated objects.

Conditions

You can create multiple condition groups, and each condition group can have one or more conditions. You can apply all the defined condition groups in an annotation rule of an annotation in order to annotate storage

objects.

Conditions within a condition group are executed using logical AND. All the conditions in a condition group must be met. When you create or modify an annotation rule, a condition is created that applies, selects, and annotates only those storage objects that meet all the conditions in the condition group. You can use multiple conditions within a condition group when you want to narrow the scope of which storage objects to annotate.

You can create conditions with storage objects by using the following operands and operator and specifying the required value.

Storage object type	Applicable operands
Volume	• Object name • Owning cluster name • Owning SVM name • Annotations
SVM	• Object name • Owning cluster name • Annotations
Cluster	• Object name • Annotations

When you select annotation as an operand for any storage object, the "Is" operator is available. For all other operands, you can select either "Is" or "Contains" as operator. When you select the "Is" operator, the condition is evaluated for an exact match of the operand value with the value provided for the selected operand. When you select the "Contains" operator, the condition is evaluated to meet one of the following criteria:

- The operand value is an exact match to the value of the selected operand.
- The operand value contains the value provided for the selected operand.

Example of an annotation rule with conditions

Consider an annotation rule with one condition group for a volume with the following two conditions:

- Name contains "vol"
- SVM name is "data_svm"

This annotation rule annotates all volumes that include "vol" in their names and that are hosted on SVMs with the name "data_svm" with the selected annotation and the annotation type.

Condition groups

Condition groups are executed using logical OR, and then applied to storage objects. The storage objects must meet the requirements of one of the condition groups to be annotated. The storage objects that meet the conditions of all the condition groups are annotated. You can use condition groups to increase the scope of storage objects to be annotated.

Example of an annotation rule with condition groups

Consider an annotation rule with two condition groups for a volume; each group contains the following two conditions:

- Condition group 1

  - Name contains "vol"

  - SVM name is "data_svm" This condition group annotates all volumes that include "vol" in their names and that are hosted on SVMs with the name "data_svm".

- Condition group 2

  - Name contains "vol"

  - The annotation value of data-priority is "critical" This condition group annotates all volumes that include "vol" in their names and that are annotated with the data-priority annotation value as "critical".

When an annotation rule containing these two condition groups is applied on storage objects, then the following storage objects are annotated:

- All volumes that include "vol" in their names and that are hosted on SVM with the name "data_svm".

- All volumes that include "vol" in their names and that are annotated with the data-priority annotation value as "critical".

Description of predefined annotation values

Data-priority is a predefined annotation that has the values Mission critical, High, and Low. These values enable you to annotate storage objects based on the priority of data that they contain. You cannot edit or delete the predefined annotation values.

- **Data-priority:Mission critical**

  This annotation is applied to storage objects that contain mission-critical data. For example, objects that contain production applications can be considered as mission critical.

- **Data-priority:High**

  This annotation is applied to storage objects that contain high-priority data. For example, objects that are hosting business applications can be considered high priority.

- **Data-priority:Low**

  This annotation is applied to storage objects that contain low-priority data. For example, objects that are on secondary storage, such as backup and mirror destinations, might be of low priority.

Adding annotations dynamically

When you create custom annotations, Unified Manager dynamically associates clusters, storage virtual machines (SVMs), and volumes with the annotations by using rules. These rules automatically assign the annotations to storage objects.

What you'll need

You must have the Application Administrator or Storage Administrator role.

Steps

1. In the left navigation pane, click **Storage Management** > **Annotations**.

2. In the **Annotations** page, click **Add Annotation**.

3. In the **Add Annotation** dialog box, type a name and description for the annotation.

4. Optional: In the **Annotation Values** section, click **Add** to add values to the annotation.

5. Click **Save**.

Adding values to annotations

You can add values to annotations, and then associate storage objects with a particular annotation name-value pair. Adding values to annotations helps you to manage storage objects more effectively.

What you'll need

You must have the Application Administrator or Storage Administrator role.

You cannot add values to predefined annotations.

Steps

1. In the left navigation pane, click **Storage Management** > **Annotations**.

2. In the **Annotations** page, select the annotation to which you want to add a value and then click **Add** in the **Values** section.

3. In the **Add Annotation Value** dialog box, specify a value for the annotation.

   The value that you specify must be unique for the selected annotation.

4. Click **Add**.

Deleting annotations

You can delete custom annotations and their values when they are no longer required.

What you'll need

- You must have the Application Administrator or Storage Administrator role.

- The annotation values must not be used in other annotations or group rules.

Steps

1. In the left navigation pane, click **Storage Management** > **Annotations**.

2. In the **Annotations** tab, select the annotation that you want to delete.

   The details of the selected annotation are displayed.

3. Click **Actions** > **Delete** to delete the selected annotation and its value.

4. In the warning dialog box, click **Yes** to confirm the deletion.

Viewing the annotation list and details

You can view the list of annotations that are dynamically associated with clusters, volumes, and storage virtual machines (SVMs). You can also view details such as the description, created by, created date, values, rules, and the objects associated with the annotation.

Steps

1. In the left navigation pane, click **Storage Management** > **Annotations**.

2. In the **Annotations** tab, click the annotation name to view the associated details.

Deleting values from annotations

You can delete values associated with custom annotations when that value no longer applies to the annotation.

What you'll need

- You must have the Application Administrator or Storage Administrator role.
- The annotation value must not be associated with any annotation rules or group rules.

You cannot delete values from predefined annotations.

Steps

1. In the left navigation pane, click **Storage Management** > **Annotations**.

2. In the annotations list in the **Annotations** tab, select the annotation from which you want to delete a value.

3. In the **Values** area of the **Annotations** tab, select the value you want to delete, and then click **Delete**.

4. In the **Warning** dialog box, click **Yes**.

   The value is deleted and no longer displayed in the list of values for the selected annotation.

Creating annotation rules

You can create annotation rules that Unified Manager uses to dynamically annotate storage objects such as volumes, clusters, or storage virtual machines (SVMs).

What you'll need

You must have the Application Administrator or Storage Administrator role.

Storage objects that are currently monitored are annotated as soon as the annotation rule is created. New objects are annotated only after the monitoring cycle is completed.

Steps

1. In the left navigation pane, click **Storage Management** > **Annotations**.

2. In the **Annotation Rules** tab, click **Add**.

3. In the **Add Annotation Rule** dialog box, specify a name for the annotation rule.

4. In the **Target Object Type** field, select the type of storage object that you want to annotate.

5. In the **Apply Annotation** fields, select the annotation and annotation value that you want to use.

6. In the Conditions section, perform the appropriate action to create a condition, a condition group, or both:

To create…	Do this…
A condition	a. Select an operand from the list of operands. b. Select either **Contains** or **Is** as the operator. c. Enter a value, or select a value from the available list.
A condition group	a. Click **Add Condition Group**. b. Select an operand from the list of operands. c. Select either **Contains** or **Is** as the operator. d. Enter a value, or select a value from the available list. e. Click **Add condition** to create more conditions if required, and repeat steps a through d for each condition.

7. Click **Add**.

Example of creating an annotation rule

Perform the following steps in the Add Annotation Rule dialog box to create an annotation rule, including configuring a condition and adding a condition group:

Steps

1. Specify a name for the annotation rule.

2. Select the target object type as storage virtual machine (SVM).

3. Select an annotation from the list of annotations, and specify a value.

4. In the Conditions section, select **Object Name** as the operand.

5. Select **Contains** as the operator.

6. Enter the value as `svm_data`.

7. Click **Add condition group**.

8. Select **Object Name** as the operand.

9. Select **Contains** as the operator.

10. Enter the value as `vol`.

11. Click **Add condition**.

12. Repeat steps 8 through 10 by selecting **data-priority** as the operand in step 8, **Is** as the operator in step 9, and **mission-critical** as the value in step 10.

13. Click **Add**.

Adding annotations manually to individual storage objects

You can manually annotate selected volumes, clusters, and SVMs without using annotation rules. You can annotate a single storage object or multiple storage objects, and specify the required name-value pair combination for the annotation.

What you'll need

You must have the Application Administrator or Storage Administrator role.

Steps

1. Navigate to the storage objects you want to annotate:

To add annotation to…	Do this…
Clusters	a. Click **Storage** > **Clusters**. b. Select one or more clusters.
Volumes	a. Click **Storage** > **Volumes**. b. Select one or more volumes.
SVMs	a. Click **Storage** > **SVMs**. b. Select one or more SVMs.

2. Click **Annotate** and select a name-value pair.

3. Click **Apply**.

Editing annotation rules

You can edit annotation rules to modify the condition groups and conditions within the condition group to add annotations to or remove annotations from storage objects.

What you'll need

You must have the Application Administrator or Storage Administrator role.

Annotations are dissociated from storage objects when you edit the associated annotation rules.

Steps

1. In the left navigation pane, click **Storage Management** > **Annotations**.

2. In the **Annotation Rules** tab, select the annotation rule you want to edit, and then click **Actions** > **Edit**.

3. In the **Edit Annotation Rule** dialog box, change the rule name, annotation name and value, condition groups, and conditions as required.

   You cannot change the target object type for an annotation rule.

4. Click **Save**.

Configuring conditions for annotation rules

You can configure one or more conditions to create annotation rules that Unified Manager applies on the storage objects. The storage objects that satisfy the annotation rule are annotated with the value specified in the rule.

What you'll need

You must have the Application Administrator or Storage Administrator role.

Steps

1. In the left navigation pane, click **Storage Management** > **Annotations**.

2. In the **Annotation Rules** tab, click **Add**.

3. In the **Add Annotation Rule** dialog box, enter a name for the rule.

4. Select one object type from the Target Object Type list, and then select an annotation name and value from the list.

5. In the **Conditions** section of the dialog box, select an operand and an operator from the list and enter a condition value, or click **Add Condition** to create a new condition.

6. Click **Save and Add**.

Example of configuring a condition for an annotation rule

Consider a condition for the object type SVM, where the object name contains "svm_data".

Perform the following steps in the Add Annotation Rule dialog box to configure the condition:

Steps

1. Enter a name for the annotation rule.

2. Select the target object type as SVM.

3. Select an annotation from the list of annotations and a value.

4. In the **Conditions** field, select **Object Name** as the operand.

5. Select **Contains** as the operator.

6. Enter the value as `svm_data`.

7. Click **Add**.

Deleting annotation rules

You can delete annotation rules from Active IQ Unified Manager when the rules are no longer required.

What you'll need

You must have the Application Administrator or Storage Administrator role.

When you delete an annotation rule, the annotation is disassociated and removed from the storage objects.

Steps

1. In the left navigation pane, click **Storage Management** > **Annotations**.

2. In the **Annotation Rules** tab, select the annotation rule that you want to delete, and then click **Delete**.

3. In the **Warning** dialog box, click **Yes** to confirm the deletion.

Reordering annotation rules

You can change the order in which Unified Manager applies annotation rules to storage objects. Annotation rules are applied to storage objects sequentially based on their rank. When you configure an annotation rule, the rank is least. But you can change the rank of the annotation rule depending on your requirements.

What you'll need

You must have the Application Administrator or Storage Administrator role.

You can select either a single row or multiple rows and perform many drag-and-drop operations to change the rank of annotation rules. However, you must save the changes for the reprioritization to be displayed in the Annotation Rules tab.

Steps
1. In the left navigation pane, click **Storage Management** > **Annotations**.

2. In the **Annotation Rules** tab, click **Reorder**.

3. In the **Reorder Annotation Rule** dialog box, drag and drop single or multiple rows to rearrange the sequence of the annotation rules.

4. Click **Save**.

   You must save the changes for the reorder to be displayed.