

Application Operations Management

Best Practices

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1 Threshold Alarms

Alarm is a basic function of AOM and plays an important role in routine O&M. AOM can interconnect with dozens of VM and component metrics, and notify customers of system problems by SMS message or email.

Supported Metrics

AOM allows you to set threshold rules for metrics of various resources such as hosts and components. You can view the supported metric types on the threshold rule creation page.

For more information about metrics, see [Metric Overview](#).

Creation Methods

You can **customize threshold rules** or **use templates to create threshold rules**. Only one rule is generated at a time. All resources are monitored using the same rule.

To use the second method to create a static threshold rule, ensure that a static threshold template has been created.

You are advised to customize threshold rules.


Customizing a Threshold Rule

Step 1 Log in to the AOM console. In the navigation pane, choose **Alarm Center > Alarm Rules**. Then, click **Add Alarm** in the upper right corner.


Step 2 Customize a threshold rule.

1. Set basic information such as the rule name and description.
2. Set rule details.
 - a. Set **Rule Type** to **Threshold alarm**.
 - b. Select monitored objects. Use either of the following methods:
 - Select resource objects: Click **Select Resource Object**, add objects by dimension or resource, and click **Confirm**.

 NOTE

- A threshold rule can monitor up to 100 pieces of metric data.
 - If you enable **Apply to All** () when selecting objects to monitor, an alarm rule will be created for all metrics of the type you select under an application or service. For example, if you select **CCE/Host/Host/CPU Usage** and enable **Apply to All**, an alarm rule will be created for all hosts in CCE.
 - Click **Edit resource objects** to modify the selected resource object.
- Command input: Both manual and auto inputs are supported.
 - Manual input: used when you know the metric name and IP address, and you are familiar with the Prometheus format.
For example, to query the CPU usage of the host, run command **avg(label_replace(avg_over_time(aom_node_cpu_usage{hostID="81010a40-1682-41c1-9645-f0588ff9c0cf",nodeIP="192.168.1.210",clusterId = '00000000-0000-0000-0000-00000000'}[59999ms]), "_name_", "aom_node_cpu_usage", "", "")) by(_name_, hostID, nodeIP).**

 NOTE

For details about Prometheus commands, move the cursor to  next to the search box and click [Learn more](#).


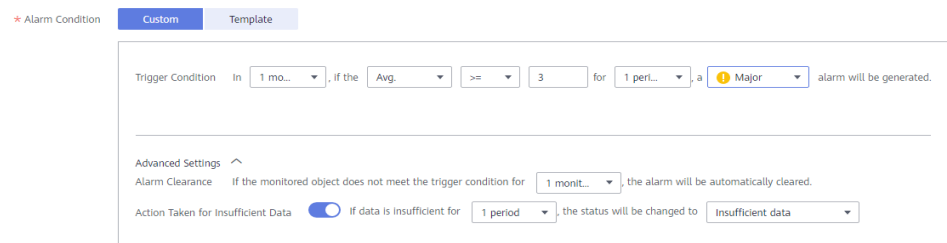
- Auto input: used when you do not know the metric information or are unfamiliar with the Prometheus format. The command can only be automatically filled when you switch from the **Metric Monitoring** page.
Specifically, choose **Monitoring > Metric Monitoring** in the navigation pane. Then, click **Add Metric** and select **Dimension** or **Resource** for **Add By**. Select up to 12 metrics to monitor. Next, click  in the **Operation** column. The system automatically switches to the threshold rule creation page and fills the Prometheus command for your metric.
- c. Set an alarm condition. Click **Custom** and set information such as **Statistical Period**, **Consecutive Periods**, and **Threshold Criterion**. [Table 1-1](#) describes the parameters.

Table 1-1 Alarm condition parameters

Category	Parameter	Description
Trigger Condition	Statistical Period	Interval at which metric data is collected. By default, only one period is measured. A maximum of five periods can be measured.
	Consecutive Periods	When the metric value meets the threshold condition for a specified number of consecutive periods, a threshold-crossing alarm will be generated.

Category	Parameter	Description
	Statistic	Method used to measure metrics. Options: Avg., Min., Max., Sum, and Samples.
	Threshold Condition	Trigger condition of a threshold alarm. A threshold condition consists of two parts: operators (\geq , \leq , $>$, and $<$) and threshold value. For example, after Threshold Criterion is set to > 85 , if the actual metric value exceeds 85, a threshold alarm is generated. Move the cursor to the graph area above the alarm condition. The ID, IP address, and unit of the current metric are displayed.
	Alarm Severity	Severity of a threshold alarm. Options: Critical, Major, Minor, and Warning.
Advanced Settings	Alarm Clearance	An alarm will be cleared if the monitored object does not meet the trigger condition within the monitoring period. By default, metrics in only one period are monitored. You can set up to five monitoring periods.
	Action Taken for Insufficient Data	Action to be taken when no metric data is generated or metric data is insufficient within the monitoring period. You can set this option based on your requirements. By default, metrics in only one period are monitored. You can set up to five monitoring periods. Options: Alarm, Insufficient data, Keep previous status, and Normal.

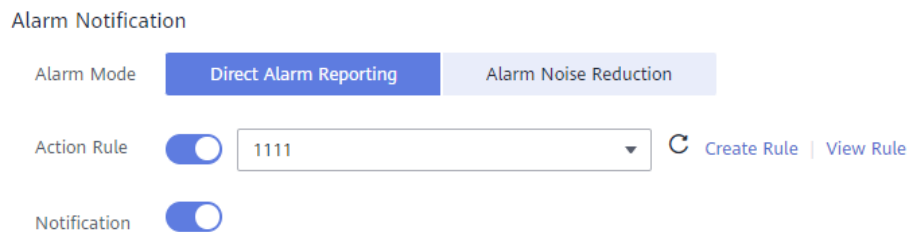
Figure 1-1 Setting an alarm condition



- d. Set alarm tags and annotations to group alarms. They can be associated with alarm noise reduction policies for sending notifications.
Click Add Tag or Add Annotation.
3. Set an alarm notification policy. There are two alarm notification modes.
 - **Direct Alarm Reporting:** An alarm is directly sent when the alarm condition is met.

- i. Specify whether to enable an alarm action rule. After an alarm action rule is enabled, the system sends notifications based on the associated SMN topic and message template. If existing alarm action rules cannot meet your requirements, click **Create Rule** to create one. For details, see [Creating an Alarm Action Rule](#).
- ii. After an alarm action rule is selected, specify whether to enable alarm clearance notification. After alarm clearance notification is enabled, if the alarm clearance condition set in [Advanced Settings > Alarm Clearance](#) is met, alarm clearance notifications are sent based on the selected action rule.

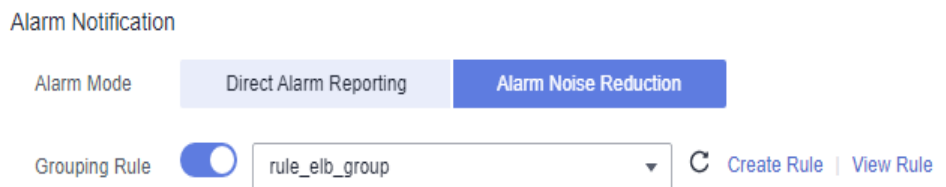
Figure 1-2 Selecting the direct alarm reporting mode



- **Alarm Noise Reduction:** Alarms are sent only after being processed based on alarm action rules, preventing alarm storms.

Select a grouping rule from the drop-down list. If existing grouping rules cannot meet your requirements, click **Create Rule** to create one. For details, see [Grouping Rules](#).

Figure 1-3 Selecting the alarm noise reduction mode



Step 3 Click **Create Now** to complete the creation. As shown in the following figure, a threshold rule is created. Click **▼** to monitor the same metric of multiple resources.

In the expanded list, if the metric data of a host meets the preset alarm condition, a threshold alarm is generated on the alarm page. To view the alarm, go to the AOM console and choose **Alarm Center > Alarm List** in the navigation pane. If a host meets the preset notification policy, the system sends an alarm notification to the specified personnel by WeCom, email, or SMS.

Figure 1-4 Creating threshold rules

Alarm Name	Status	Rule Type	Resource Type	Template	Started or Stopped	Operation
Host_CPU_ph	Normal	Multi-resource threshold rules	Host	N/A	Started	Modify Delete More
Name	Status	Cluster Name	Physical memory usage (%)	Status Change Description		
	Exceeded	--	37.1	Time: 2022-03-08 11:15:33 GMT+08:00 Threshold Condition: >=10 Latest Value: 37.1 Status Update: from 'N...		
	Exceeded	--	28.3	Time: 2022-03-08 11:15:33 GMT+08:00 Threshold Condition: >=10 Latest Value: 28.3 Status Update: from 'N...		
	Exceeded	--	31.2	Time: 2022-03-08 11:15:33 GMT+08:00 Threshold Condition: >=10 Latest Value: 31.2 Status Update: from 'N...		

----End

2 Discovering Applications

Overview

AOM can discover applications deployed on hosts and collects their metrics based on preset rules. The discovered applications and their metric data will be displayed on the **Application Monitoring** and **O&M** pages.

The relationship between applications and components is as follows:

- Component refers to the smallest unit for completing a task. It can be a microservice, container process, or common process.
- Application refers to a complete service module and consists of multiple components.

After application discovery is configured, you can use AOM to monitor application metrics and associate related alarms. Mainly, AOM can:

1. Provide association relationships between applications and components, between components and component instances, and between applications and hosts.
2. Enable you to search for associated components and logs.
3. Aggregate component metrics (so that you can obtain aggregated results of all component instances).

Configuring Application Discovery Rules

Step 1 In the navigation pane, choose **Configuration Management > Application Discovery**.

Step 2 Click **Add Custom Application Discovery Rule** and configure an application discovery rule.

Step 3 Select a host for pre-detection.

1. Customize a rule name, for example, **rule-test**.
2. Select a typical host, for example, **host-test**, to check whether the application discovery rule is valid. The hosts that execute the rule will be configured in **Step 6**. Then, click **Next**.

Step 4 Set an application discovery rule.

1. Click **Add Check Items**. AOM can discover processes that meet the conditions of check items.

For example, AOM can detect the processes whose command parameters contain **ovs-vswitchd unix:** and environment variables contain **SUDO_USER=paas**.

 **NOTE**

- To precisely detect processes, you are advised to add check items about unique features of the processes.
 - You must add at least one check item and can add up to five check items. If there are multiple check items, AOM only discovers the processes that meet the conditions of all check items.
2. After adding check items, click **Detect** to search for the processes that meet the conditions.

If no process is detected within 20s, modify the discovery rule and detect processes again. Only when at least one process is detected can you proceed to the next step.

Step 5 Set an application name and component name.

Set an application name.

1. Set an application name.

In the **Application Name Settings** area, click **Add Naming Rule** to set an application name for the detected process.


 **NOTE**

- If you do not set an application name, the default name **unknownapplicationname** is used.
 - When you add multiple naming rules, all the naming rules are combined as the application name of the process. Metrics of the same application are aggregated.
2. Set a component name.

In the **Component Name Settings** area, specify an application type and click **Add Naming Rule** to set a component name for the discovered process. For example, add the text **app-test** as a component name.

 **NOTE**

- Application types are specified to identify application categories. They are used only for better rule classification and console display. You can enter any field. For example, you can enter **Java** or **Python** to categorize applications by technology stack or enter **collector** or **database** to categorize applications by function.
 - If you do not set a component name, the default name **unknownapplicationname** is used.
 - When you add multiple naming rules, all the naming rules are combined as the component name of the process. Metrics of the same component are aggregated.
3. Preview the component name.

If the name does not meet your requirements, click  in the **Preview Component Name** table to rename the component.

Step 6 Set a priority and detection range.

1. Set a priority: When there are multiple rules, set priorities. Enter 1 to 9999. A smaller value indicates a higher priority. For example, **1** indicates the highest priority and **9999** indicates the lowest priority.
2. Set a detection range: Select a host to be detected. That is, select the host to which the configured rule is applied. If no host is selected, this rule will be executed on all hosts, including hosts added later.

Step 7 Click **Add** to complete the configuration. AOM collects metrics of the process.

Step 8 After about two minutes, choose **Monitoring > Component Monitoring** in the navigation pane, select the target host from the cluster drop-down list, and find out the monitored component.

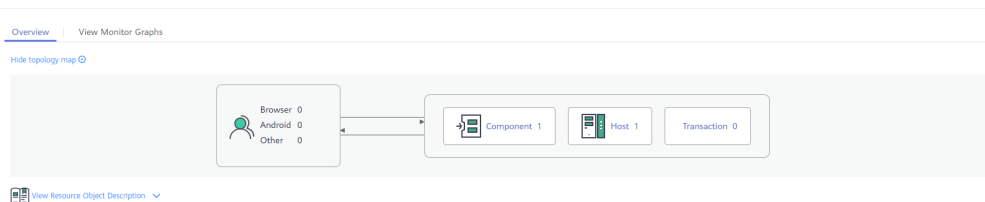
----End

Viewing the Application Status

Step 1 In the navigation pane, choose **Monitoring > Application Monitoring**.

Step 2 Click an application to view its components and other resources.

Figure 2-1 Viewing the application status



Step 3 Click the **Component List** tab and view the component information.

Figure 2-2 Viewing components

Component Name	Status	CPU Usage	Physical Memory Usage
common-tomcat	Normal	0%	7.071%

Step 4 Click the **Host List** tab to view the host information.

Figure 2-3 Viewing hosts

Host Name	Host IP Address	Host Status	CPU Usage	Physical Memory Usage
centos	192.168.1.57	Normal	0.9%	49.1%

Step 5 Click the **Alarm Analysis** tab to view alarms.

----End