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Application Real-time Monitoring Service

Quick start

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Document conventions

Style	Description	Example
Danger	A danger notice indicates a situation that will cause major system changes, faults, physical injuries, and other adverse results.	Danger: Resetting will result in the loss of user configuration data.
Warning	A warning notice indicates a situation that may cause major system changes, faults, physical injuries, and other adverse results.	Warning: Restarting will cause business interruption. About 10 minutes are required to restart an instance.
Notice	A caution notice indicates warning information, supplementary instructions, and other content that the user must understand.	Notice: If the weight is set to 0, the server no longer receives new requests.
Note	A note indicates supplemental instructions, best practices, tips, and other content.	Note: You can use Ctrl + A to select all files.
>	Closing angle brackets are used to indicate a multi-level menu cascade.	Click **Settings**> **Network**> **Set network type**.
Bold	Bold formatting is used for buttons , menus, page names, and other UI elements.	Click **OK**.
`Courier font`	Courier font is used for commands	Run the `cd /d C:/window` command to enter the Windows system folder.
Italic	Italic formatting is used for parameters and variables.	`bae log list --instanceid` *Instance_ID*
[] or [a|b]	This format is used for an optional value, where only one item can be selected.	`ipconfig [-all|-t]`
{} or {a|b}	This format is used for a required value, where only one item can be selected.	`switch {active|stand}`

Table of Contents

1.Activate and upgrade ARMS

After you activate the Trial Edition of Application Real-Time Monitoring Service (ARMS), you can use all sub-services of ARMS. You can get a free trial of 15 days for a paid sub-service. After the free trial expires, you must activate the Basic Edition or Pro Edition. This topic describes how to activate the different editions of ARMS and how to purchase resource plans.

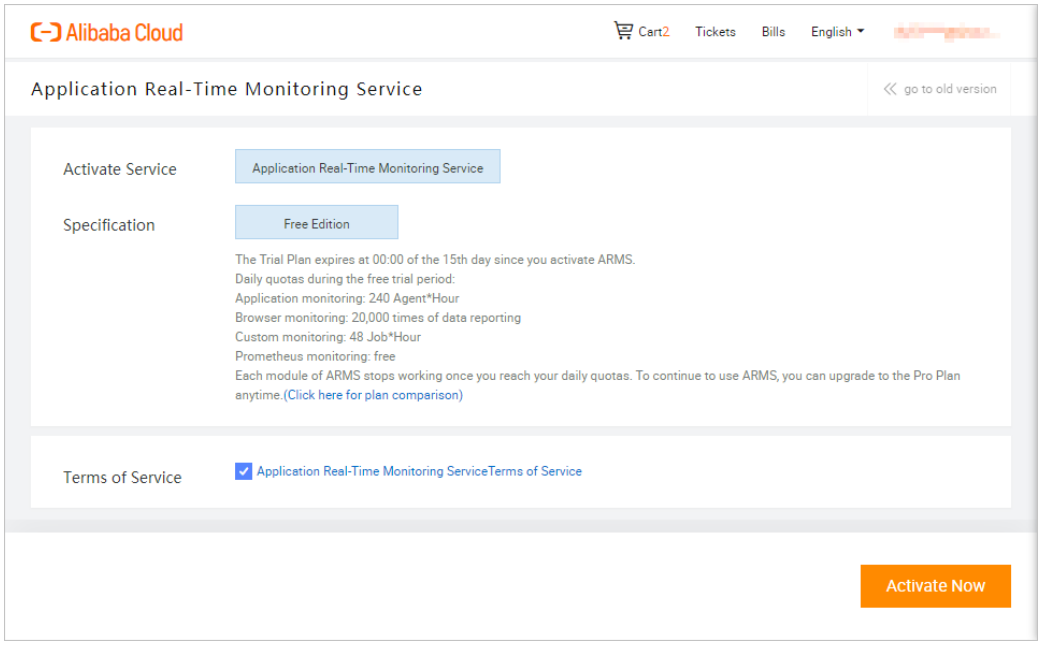
Prerequisites

An Alibaba Cloud account is created and real-name verification is passed.

Activate ARMS for free

If you use ARMS for the first time, perform the following steps to activate ARMS for free.

1. Open the ARMS product homepage.
2. On the page that appears, click **Log In** in the upper-right corner.
3. On the **Sign In** page, enter your Alibaba Cloud account and password, and click **Sign In**.
4. On the product homepage, click **Apply**. On the **Application Real-Time Monitoring Service** page, select **Application Real-Time Monitoring Service Terms of Service** and click **Activate Now**.



Activate a sub-service or upgrade to the Pro Edition

After you activate ARMS, you can get a free trial of 15 days. During this period, you can get a free quota each day. If the daily free quota of a sub-service is used up, the sub-service becomes unavailable. To continue to use the sub-service, you can wait until your free quota is restored the next day. You can also activate the Pro Edition. After you activate the Pro Edition, you can purchase resource plans to reduce costs.

Activate a sub-service

Paid sub-service	Daily quota during 15-day free trial	Activate or purchase link
Application Monitoring	240 agents × hours (for example, 10 agents run for 24 hours)	• Activate Application Monitoring Basic Edition in the ARMS console • Activate Application Monitoring Pro Edition • Purchase an Application Monitoring resource plan **Note** After the free trial expires, you must activate the Basic Edition or Pro Edition. After you activate the Basic Edition, you can upgrade it to the Pro Edition at any time. For more information about the functional differences between the Basic Edition and Pro Edition of Application Monitoring, see Comparison between different editions.
Browser Monitoring	20,000 times of data sending	• Activate Application Monitoring Basic Edition in the ARMS console • Activate Browser Monitoring Pro Edition • Purchase a Browser Monitoring resource plan
Prometheus Monitoring	Sending of 20 million custom metrics	Activate Prometheus Monitoring Pro Edition

More information

After you activate ARMS, read the following topics to get started with the monitoring features of ARMS:

- Application Monitoring: Create an application monitoring job
- Browser Monitoring: Install the browser monitoring probe by using CDN
- Prometheus Monitoring: Use ARMS Prometheus Monitoring
- Dashboards: Create a dashboard for an application monitoring job
- Alerts: Create ARMS alerts

Related information

-
- ARMS Pricing

2.Create an application monitoring job

Application Real-Time Monitoring Service (ARMS) provides application monitoring features such as application trace analysis, local stack diagnosis, and business log troubleshooting. To monitor an application by using ARMS, you must create an application monitoring job.

Background information

ARMS can monitor Java and PHP applications that run in various environments. This topic describes how to create an application monitoring job for a Java application that runs on an Elastic Compute Service (ECS) instance in the Tomcat environment. To ensure that you can monitor applications in different environments, ARMS allows you to install the ARMS agent manually or using scripts. However, to help you understand the general steps for creating an application monitoring job, this topic describes how to manually install the ARMS agent.

Prerequisites

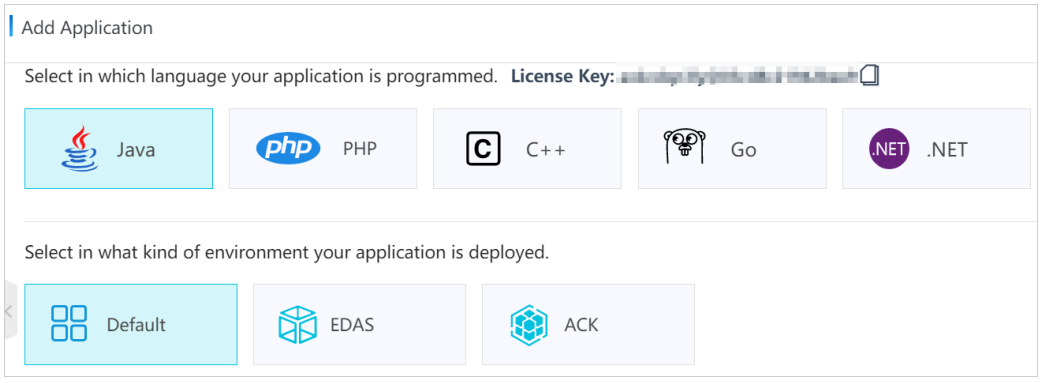
- Activate and upgrade ARMS
- Ports 8442, 8443, and 8883 in the security group have been opened for TCP outbound access. For more information about how to grant outbound permissions to ECS, see Add security group rules.

> **Note** In addition to applications on Alibaba Cloud ECS instances, applications on public network servers can also access ARMS.

Step 1: Obtain the license key

Perform the following steps to obtain the license key:

1. Log on to the ARMS console .
2. In the left-side navigation pane, choose **Application Monitoring > Applications**.
3. On the **Applications** page, select a region in the top navigation bar, and click **Add Application** in the upper-right corner.
4. Copy the license key at the top of the **Add Application** page.



Step 2: Configure the Tomcat runtime environment

Perform the following steps to configure the Tomcat runtime environment and set the required parameters in the configuration file:

1. Open the *{TOMCAT_HOME}/bin/catalina.sh* configuration file.

> **Note** If your Tomcat does not contain the *catalina.sh* configuration file, find and open the *{TOMCAT_HOME}/bin/setenv.sh* configuration file.

2. Append the following configurations to the configuration file:

> **Note** Replace <licenseKey> in the following sample code with the license key that you obtained in Step 1. Replace <appName> with the name of your application.

```
JAVA_OPTS="$JAVA_OPTS -javaagent:/workspace/ArmsAgent/arms-bootstrap-1.7.0-SNAPSHOT.jar -Darms.licenseKey=<licenseKey> -Darms.appName=<appName>"
```

The following sample code shows how to configure the Tomcat runtime environment:

Step 3: Install the ARMS agent for Java applications

Perform the following steps to install the ARMS agent for Java applications and collect the monitoring data that you need:

1. Run the **wget** command to download the compressed package of the ARMS agent for Java applications.

> **Note** The China (Hangzhou) region is used in this example. For the download links of the ARMS agent for Java applications in other regions, see Procedure.

```
# China (Hangzhou)
wget "http://arms-apm-hangzhou.oss-cn-hangzhou.aliyuncs.com/ArmsAgent.zip" -O ArmsAgent.zip
```

2. Decompress the package of the ARMS agent for Java applications to a working directory. In this example, the working directory is *workspace*.

```
unzip ArmsAgent.zip -d /workspace/
```

The following sample code shows how to install the ARMS agent for Java applications:

Step 4: Restart Tomcat

1. Go to the *{TOMCAT_HOME}/bin* directory.
2. Restart Tomcat.

```
./startup.sh
```

The following sample code shows how to restart Tomcat:

Verify the result

After 2 to 3 minutes, log on to the ARMS console. In the left-side navigation pane, choose **Application Monitoring > Applications**. If your application (specified by the <appName> parameter) appears on the Applications page, it indicates that the application monitoring job is created.

Related information

- Manually install the ARMS agent for a Java application
- Enable ARMS to monitor an EDAS application
- Install the ARMS agent for a Java application deployed in Container Service for Kubernetes
- Install the ARMS agent for an application deployed in an open source Kubernetes environment
- Install the ARMS agent for a Java application deployed in a Docker cluster
- Install the ARMS agent for a Java application by using scripts
- FAQ
- Install the ARMS agent for a PHP application
- Install the ARMS agent for PHP applications deployed on multiple servers in standalone mode
- Install the ARMS agent for a PHP application deployed in Container Service for Kubernetes

3.Create a dashboard for an application monitoring job

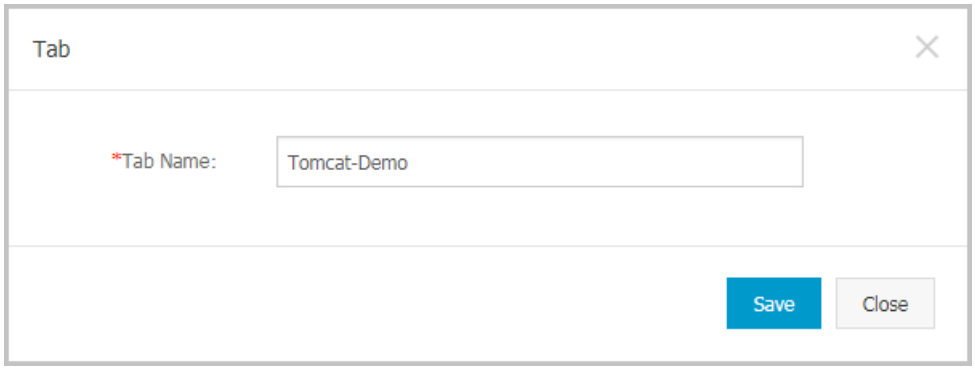
Application Real-Time Monitoring Service (ARMS) provides the Application Monitoring module to help you troubleshoot your applications based on the collected monitoring data. To monitor an application in real time, you can create a dashboard for the application monitoring job. The dashboard displays the status of your application in real time.

Prerequisites

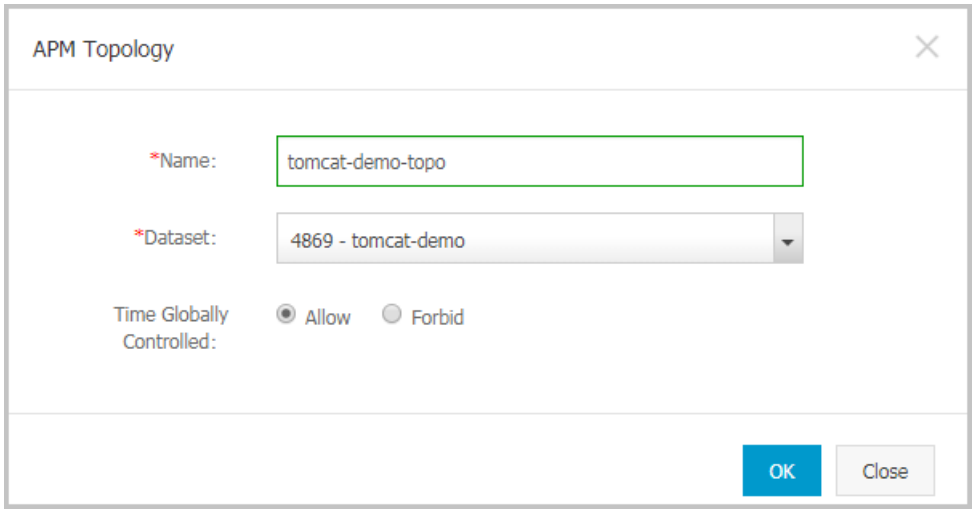
An application monitoring job is created in the ARMS console. For more information, see Create an application monitoring job.

Procedure

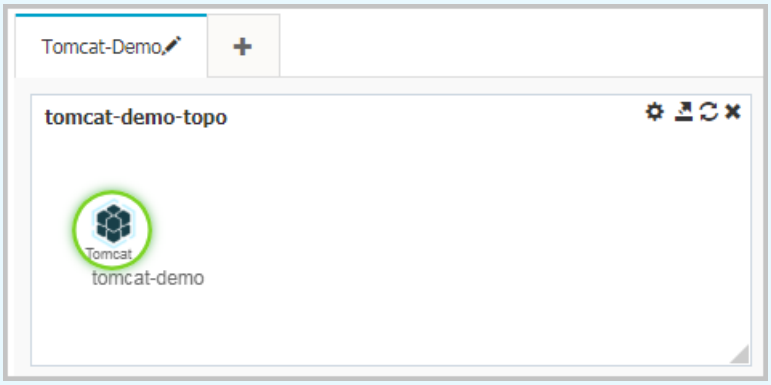
1. Log on to the ARMS console .
2. In the left-side navigation pane, click **Dashboards**. On the **Dashboards** page, choose **Create Dashboard > Custom Dashboard** in the upper-right corner.
3. In the **Create Dashboard** dialog box, enter the dashboard name and click **OK**. For example, enter App Dashboard. The system creates a blank tab for this dashboard.
4. Click the pencil icon on the top of the tab. In the **Tab** dialog box, enter the application name in the Tab Name field and click **Save**. For example, enter Tomcat-Demo.



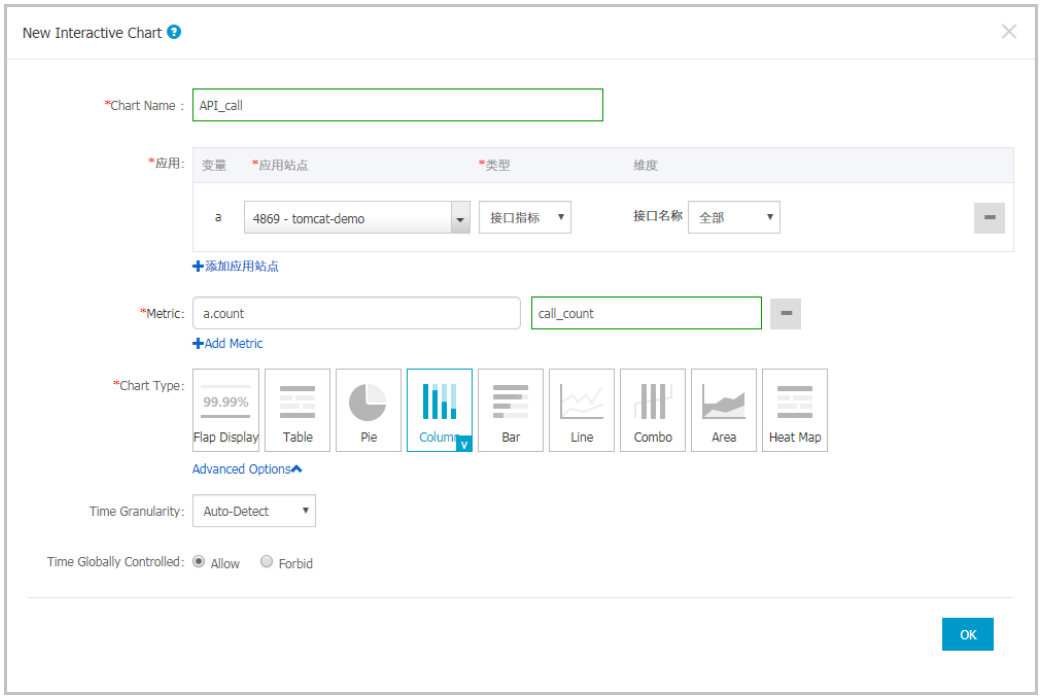
5. Add an application topology. In Edit mode, choose **Interactive Control > APM Monitoring Topology** in the upper-right corner of the page. In the **APM Topology** dialog box, enter the topology name, select a dataset of the application monitoring job, and then click **OK**.



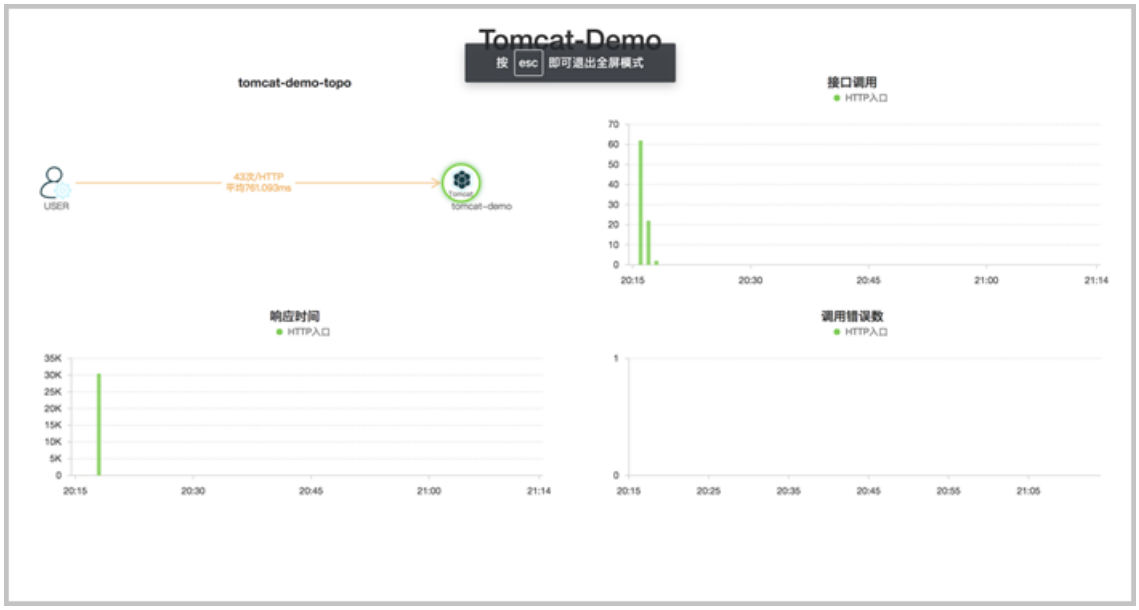
Note Drag the lower-right corner of a chart to resize it as needed. Drag the chart to change its position.



6. Add an application monitoring chart. In Edit mode, choose **Interactive Control > APM Monitoring Graph** in the upper-right corner of the page. In the **New Interactive Chart** dialog box, set all the required parameters and click **OK**. For example, after you select an application site, select **Invocation_Statistic** from the **Type** drop-down list, select **All** from the **Dimension** drop-down list, and select **a.Invocation_count** from the **Metric** drop-down list.



7. Repeat the preceding step to add two more application monitoring charts. One is used to calculate the response time and the other is used to calculate errors. In the **New Interactive Chart** dialog box, select the same application site, type, and dimension as in the preceding step, but select **a.Invocation_RT_ms** and **a.Invocation_ErrorCount** from the **Metric** drop-down list. The following figure shows the created dashboard.



8. (Optional)To create dashboards for more applications, click the add icon (+) on the top of the tab, and follow the preceding steps to add more application monitoring charts.
9. In Edit mode, click **View Mode** in the upper-right corner and click **Full-screen**. The dashboard appears in full-screen mode.

> **Note** To switch to the dark theme, click Edit Mode and choose **Theme** > **Dark** in the upper-right corner of the page.

References

- Create an application monitoring job
- Manually install the ARMS agent for a Java application
- Create a dashboard
- Manage a dashboard

4.Create ARMS alerts

Application Real-Time Monitoring Service (ARMS) allows you to create alerts for monitoring jobs. When alert conditions are met, you can receive alerts in real time through emails, SMS messages, and DingTalk. This helps you detect errors in a proactive manner. This topic describes how to create application monitoring alerts, browser monitoring alerts, custom monitoring alerts, and Prometheus monitoring alerts by using an instance.

Prerequisites

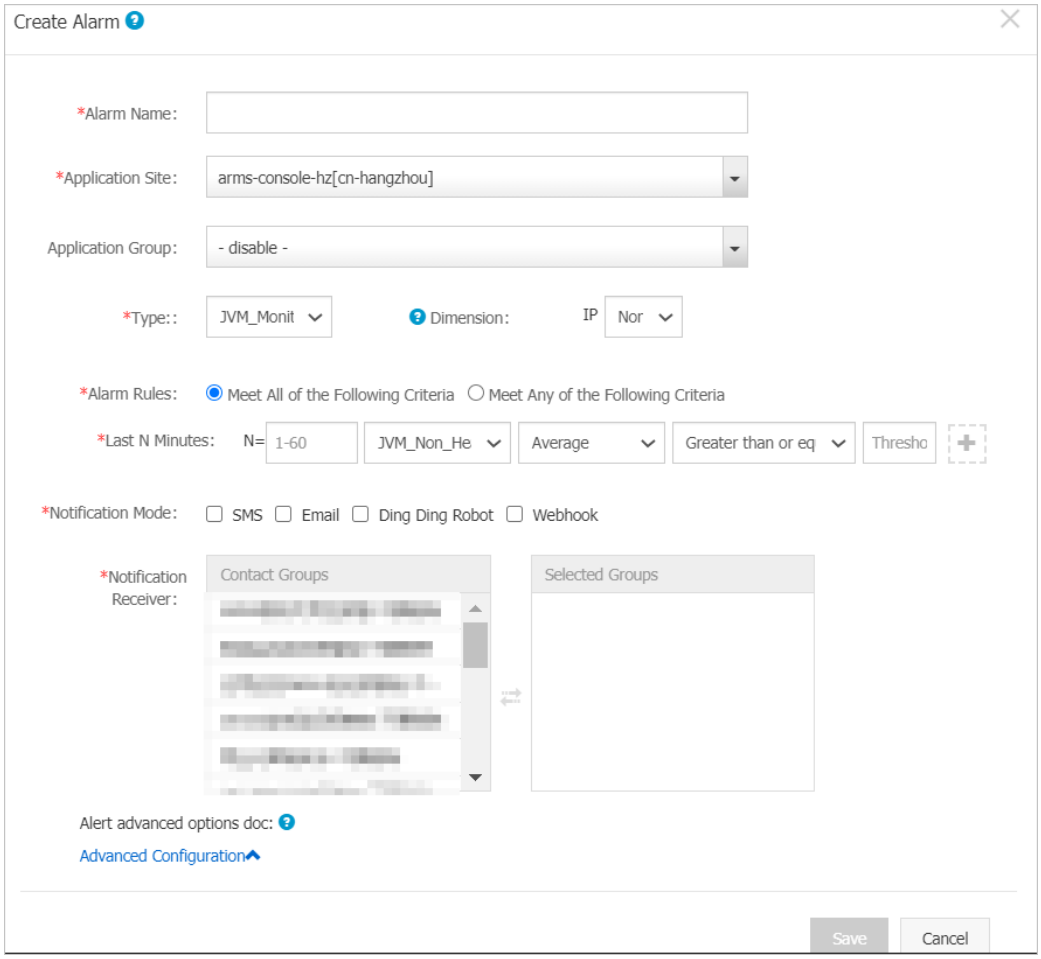
A monitoring job and a contact group are created. For more information, see the following topics:

- Create an application monitoring job
- Create contacts
- Create a contact group

Create an application monitoring alert

To create a Java Virtual Machine-Garbage Collection (JVM-GC) alert for an application monitoring job, perform the following steps:

1. Log on to the ARMS console. In the left-side navigation pane, choose **Alerts > Alert Policies**.
2. On the **Alarm Policies** page, choose **Create Alarm > Application Monitoring Alarm** in the upper-right corner.
3. In the **Create Alarm** dialog box, set all the required parameters and click **Save**.
   Set the following parameters:



i. Enter an alert name, for example, JVM-GC_Comparison.

ii. In the **Application Site** field, select the monitoring job you created.

iii. In the **Type** field, select the type of the monitoring metric, for example, JVM_Monitoring.

iv. Set Dimension to Traverse.

v. Configure an alert rule.

   a. Select **Meet All of the Following Criteria**.

   b. Edit the alert rule. For example, an alert is triggered when the value of N is 5 and the average value of JVM_FullGC increases by 100% compared with that in the previous hour.

> **Note** To add another alert rule, click the plus sign (+) on the right of the first alert rule.

vi. Select one or more notification methods. For example, select Email.

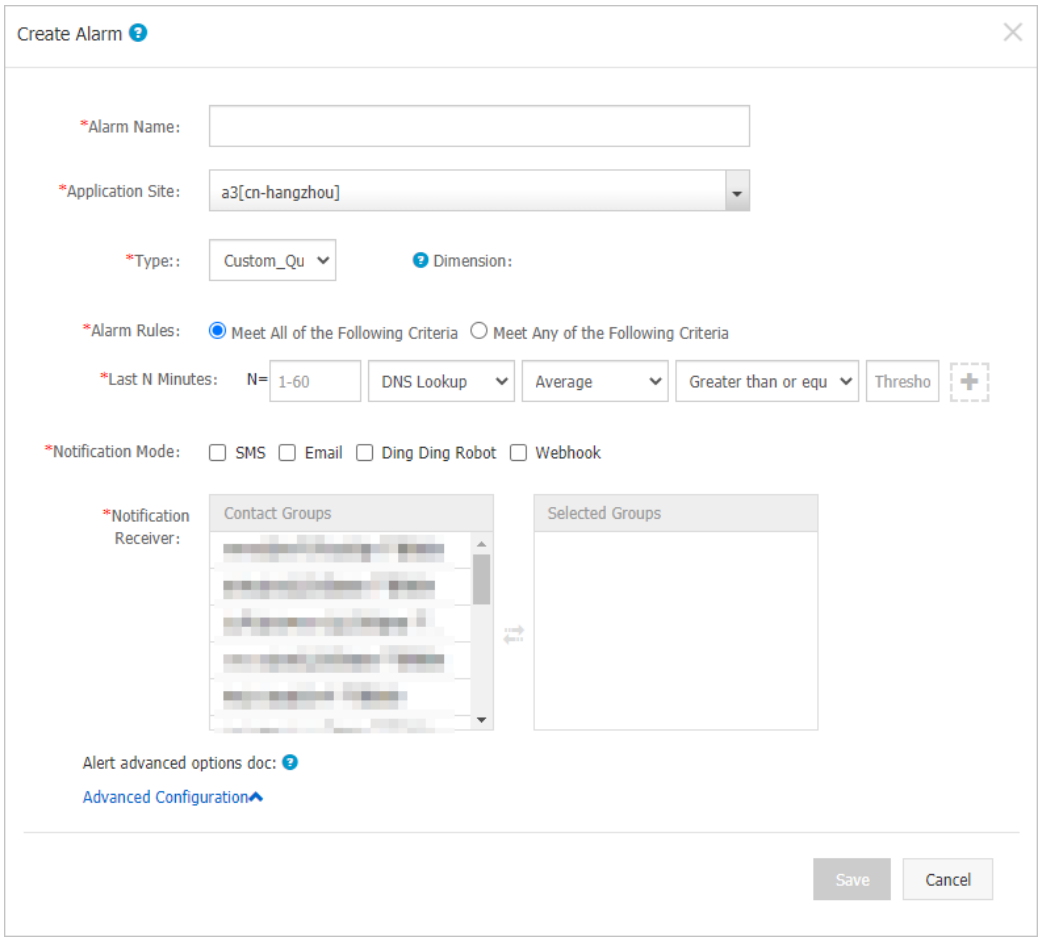
vii. Select the notification receivers. In the **Contact Groups** section, click the name of a contact group. If the contact group appears in the **Selected Groups** section, the setting is successful.

Create a browser monitoring alert

To create a Page_Metric alert to monitor JS_Error_Rate and JS_Error_Count for a browser monitoring job, perform the following steps:

1. In the left-side navigation pane, choose **Alerts > Alert Policies**.

2. On the **Alarm Policies** page, choose **Create Alarm > Browser Monitoring Alarm** in the upper-right corner.
3. In the **Create Alarm** dialog box, set all the required parameters and click **Save**.
   Set the following parameters:



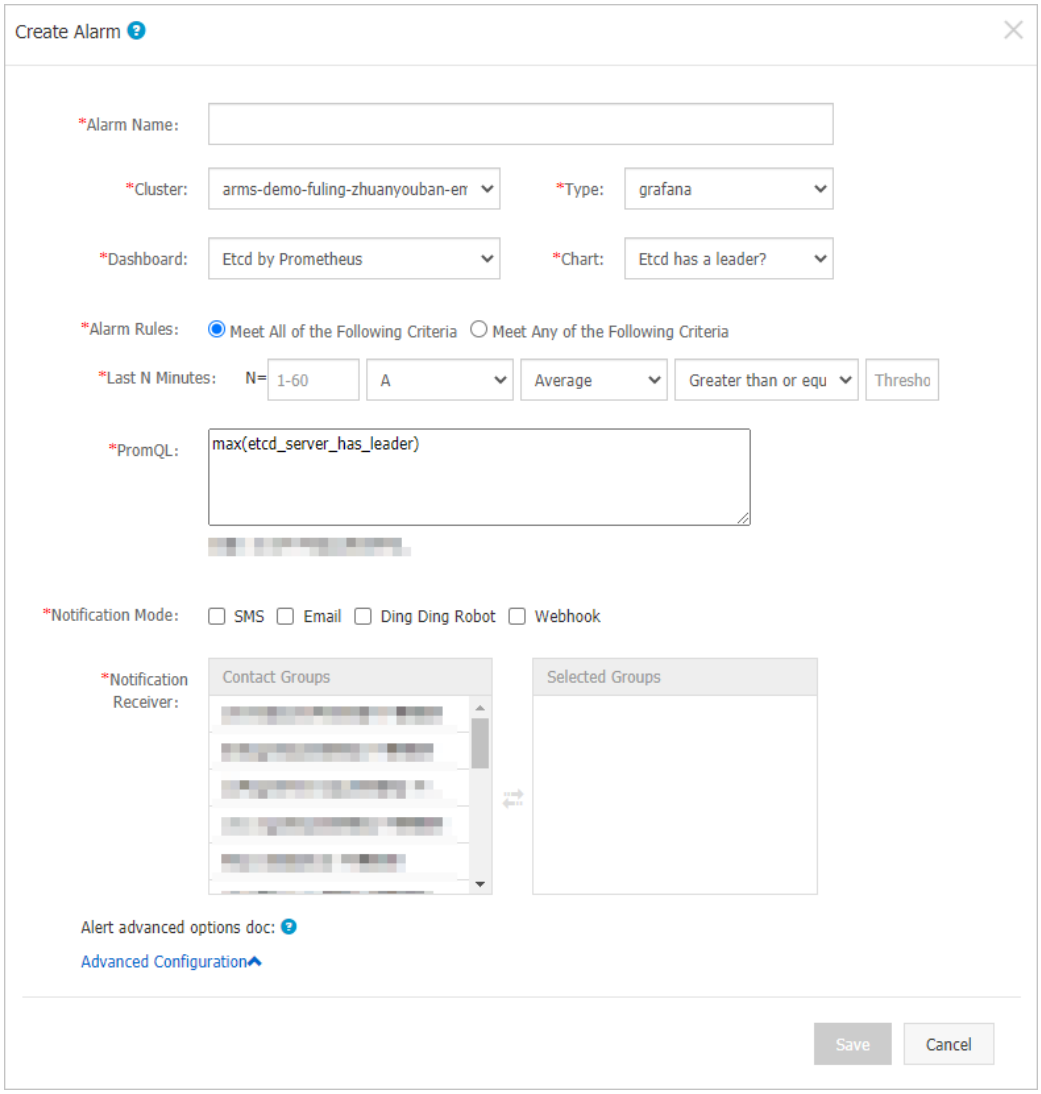
   i. Enter an alert name, for example, Page_Metric.
   ii. In the **Application Site** field, select the monitoring job you created.
   iii. In the **Type** field, select the type of the monitoring metric, for example, Page_Metric.
   iv. Set Dimension to Traverse.
   v. Configure an alert rule.
      a. Select **Meet All of the Following Criteria**.
      b. Edit the alert rule. For example, an alert is triggered when the value of N is 10 and the average value of JS_Error_Rate equals or exceeds 20.
      c. To add another alert rule, click the plus sign (+) on the right of the first alert rule. For example, an alert is triggered when the value of N is 10 and the sum of JS_Error_Count equals or exceeds 20.
   vi. Select one or more notification methods. For example, select SMS and Email.
   vii. Select the notification receivers. In the **Contact Groups** section, click the name of a contact group. If the contact group appears in the **Selected Groups** section, the setting is successful.

Create a Prometheus monitoring alert

To create an alert on network receiving pressure for a Prometheus monitoring job, perform the following steps:

1. In the left-side navigation pane, choose **Alerts > Alert Policies**.
2. On the **Alarm Policies** page, choose **Create Alarm > Prometheus** in the upper-right corner.
3. In the **Create Alarm** dialog box, set all the required parameters and click **Save**.

   Set the following parameters:



   i. Enter an alert name, for example, Received_Bytes.
   ii. Select the **cluster** of the Prometheus monitoring job.
   iii. Set **Type** to **grafana**.
   iv. Select the specific **dashboard** and **chart**.

v. Configure an alert rule.

a. Select **Meet All of the Following Criteria**.

b. Edit the alert rule. For example, an alert is triggered when the value of N is 5 and the average value of Received_Bytes (MB) equals or exceeds 3.

> **Note** A Grafana chart may contain data of curve A, curve B, and curve C. You can select one of them to monitor.

c. In the **PromQL** field, edit or enter a new PromQL statement.

> **Notice** If a PromQL statement contains a dollar sign (`$`), an error may occur. You must delete the equal sign (`=`) and the parameters on both sides of the equal sign (`=`) in the statement that contains the dollar sign (`$`). For example, change `sum(rate(container_network_receive_bytes_total{instance=~"^$HostIp.*"}[1m]))` to `sum(rate(container_network_receive_bytes_total[1m]))` .

vi. Select one or more notification methods. For example, select SMS.

vii. Select the notification receivers. In the **Contact Groups** section, click the name of a contact group. If the contact group appears in the **Selected Groups** section, the setting is successful.