Alibaba Cloud **Cloud Monitor**

Best Practices

Legal disclaimer

Alibaba Cloud reminds you to carefully read and fully understand the terms and conditions of this legal disclaimer before you read or use this document. If you have read or used this document, it shall be deemed as your total acceptance of this legal disclaimer.

- 1. You shall download and obtain this document from the Alibaba Cloud website or other Alibaba Cloud-authorized channels, and use this document for your own legal business activities only. The content of this document is considered confidential information of Alibaba Cloud. You shall strictly abide by the confidentiality obligations. No part of this document shall be disclosed or provided to any third party for use without the prior written consent of Alibaba Cloud.
- 2. No part of this document shall be excerpted, translated, reproduced, transmitted, or disseminated by any organization, company, or individual in any form or by any means without the prior written consent of Alibaba Cloud.
- 3. The content of this document may be changed due to product version upgrades , adjustments, or other reasons. Alibaba Cloud reserves the right to modify the content of this document without notice and the updated versions of this document will be occasionally released through Alibaba Cloud-authorized channels. You shall pay attention to the version changes of this document as they occur and download and obtain the most up-to-date version of this document from Alibaba Cloud-authorized channels.
- 4. This document serves only as a reference guide for your use of Alibaba Cloud products and services. Alibaba Cloud provides the document in the context that Alibaba Cloud products and services are provided on an "as is", "with all faults "and "as available" basis. Alibaba Cloud makes every effort to provide relevant operational guidance based on existing technologies. However, Alibaba Cloud hereby makes a clear statement that it in no way guarantees the accuracy, integrity , applicability, and reliability of the content of this document, either explicitly or implicitly. Alibaba Cloud shall not bear any liability for any errors or financial losses incurred by any organizations, companies, or individuals arising from their download, use, or trust in this document. Alibaba Cloud shall not, under any circumstances, bear responsibility for any indirect, consequential, exemplary, incidental, special, or punitive damages, including lost profits arising from the use

- or trust in this document, even if Alibaba Cloud has been notified of the possibility of such a loss.
- 5. By law, all the content of the Alibaba Cloud website, including but not limited to works, products, images, archives, information, materials, website architecture, website graphic layout, and webpage design, are intellectual property of Alibaba Cloud and/or its affiliates. This intellectual property includes, but is not limited to, trademark rights, patent rights, copyrights, and trade secrets. No part of the Alibaba Cloud website, product programs, or content shall be used, modified , reproduced, publicly transmitted, changed, disseminated, distributed, or published without the prior written consent of Alibaba Cloud and/or its affiliates . The names owned by Alibaba Cloud shall not be used, published, or reproduced for marketing, advertising, promotion, or other purposes without the prior written consent of Alibaba Cloud. The names owned by Alibaba Cloud include, but are not limited to, "Alibaba Cloud", "Aliyun", "HiChina", and other brands of Alibaba Cloud and/or its affiliates, which appear separately or in combination, as well as the auxiliary signs and patterns of the preceding brands, or anything similar to the company names, trade names, trademarks, product or service names, domain names, patterns, logos, marks, signs, or special descriptions that third parties identify as Alibaba Cloud and/or its affiliates).
- 6. Please contact Alibaba Cloud directly if you discover any errors in this document.

II Issue: 20190320

Generic conventions

Table -1: Style conventions

Style	Description	Example
	This warning information 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.
A	This warning information 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 restore business.
	This indicates warning informatio n, supplementary instructions, and other content that the user must understand.	Notice: Take the necessary precautions to save exported data containing sensitive information.
	This indicates supplemental instructions, best practices, tips, and other content that is good to know for the user.	Note: You can use Ctrl + A to select all files.
>	Multi-level menu cascade.	Settings > Network > Set network type
Bold	It is used for buttons, menus , page names, and other UI elements.	Click OK.
Courier font	It is used for commands.	Run the cd / d C : / windows command to enter the Windows system folder.
Italics	It is used for parameters and variables.	bae log list instanceid <i>Instance_ID</i>
[] or [a b]	It indicates that it is a optional value, and only one item can be selected.	ipconfig [-all -t]

Style	Description	Example
{} or {a b}	It indicates that it is a required value, and only one item can be selected.	swich {stand slave}

II Issue: 20190320

Contents

Legal disclaimer	I
Generic conventions	I
1 Create an alarm template	1
2 Receive alarm notifications in a DingTalk group	6
3 Create a dashboard for Container Service instances	12
4 Monitor the intranet	15
5 Process ECS status change events	19

IV Issue: 20190320

1 Create an alarm template

This topic illustrates how to use application groups and alarm templates to manage cloud resource alarm rules for various services more efficiently. These tactics are especially important for those who need to monitor and manage resources across several Alibaba Cloud products and regions and who need to modify alarm rules for these resources in a timely manner.

Purposes

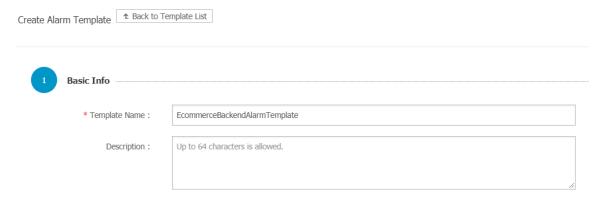
- · Configuring alarm rules for application groups rather than for single instances can improve efficiency by greatly reducing the time required to configure alarm rules.
 - By setting the resource range of an alarm rule to application group, your alarm rule will be effective for all resources within the target application group, and the number of resources monitored can expand as your services are scaled outward. After initial configuration, you can move specific resources into or out of the application group easily. You can also modify the alarm rule directly so to make changes effective to all instances within an application group.
 - Conversely, setting the resource range to instance will make your alarm rule effective for only one instance. Modifications to your alarm rule will also be effective for only one instance. As a consequence, supposing that you set all your alarm rules this way, as the number of your instances increase, managing alarm rules for these instances will become increasingly time consuming and difficult.
- · Using alarm templates can also reduce the time required to configure alarm rules. The monitoring metrics and alarm thresholds of basic services, such as ECS, RDS, and SLB, are set to fixed values during alarm rule configuration. You can create alarm templates easily based on these configurations, and by creating alarm templates with your target metrics and condition thresholds, you can easily apply these templates to alarm rules you configure for an application group, making configuring rules easy even as your services scale outward. Using alarm templates also enables you to easily modify multiple alarm rules at the same time.

Procedures

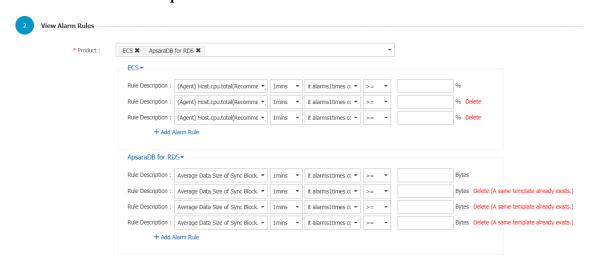
The following case outlines the procedure that can be applied to the typical back-end services of an e-commerce company. This case serves to illustrate how you can create

application groups and use alarm templates to easily build a service monitoring and alarming system on the cloud, even for growing service requirements.

- 1. Create an alarm template named "EcommerceBackendAlarmTemplate".
 - a. Log on to the CloudMonitor Console.
 - b. From the left-side navigation pane, choose Alarm Templates > Alarms.
 - c. On the Alarm Templates page, click Create Alarm Template in the upper-right corner.
 - d. In the displayed dialog box, set the parameters in the Basic Info area.



e. In the View Alarm Rules area, click Add Alarm Rule to add the required alarm rules to the alarm template.



f. Click OK.

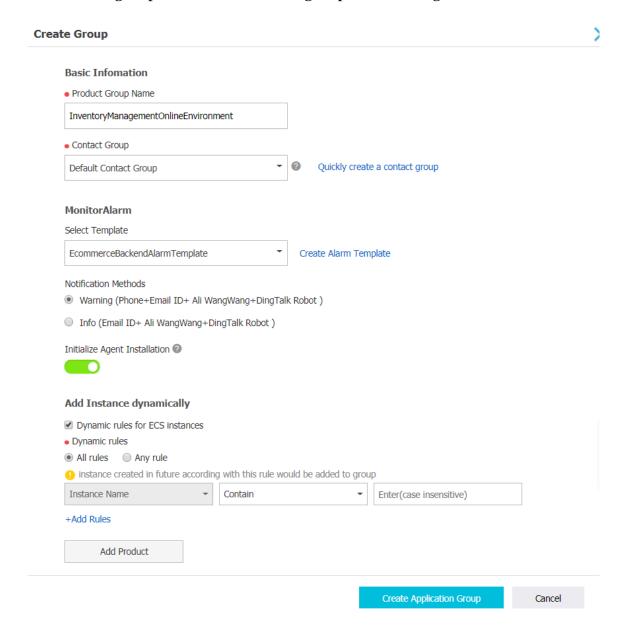
- 2. Create an alarm contact and an alarm contact group.
 - a. Log on to the CloudMonitor Console.
 - b. From the left-side navigation pane, choose Alarms > Alarm Contacts.
 - c. On the Alarm Contact Management page, click Create Alarm Contact in the upper-right corner. In the displayed dialog box, enter your phone number and email.

To ensure that you can receive and verify alarm notifications in a timely manner , the system will send verification codes to your phone and email.

- d. Click the Alarm Contact Group tab.
- e. In the upper-right corner, click Create Alarm Contact Group.
- f. In the displayed dialog box, enter the group name and select the contacts that you want to add to the group.

- 3. Create an application group and apply the alarm template. Here, we create an application group named "InventoryManagementOnlineEnvironment" and use the created alarm template "EcommerceBackendAlarmTemplate".
 - a. Log on to the CloudMonitor Console.
 - b. In the left-side navigation pane, click Application Groups.
 - c. On the Application Groups page, click Create Group in the upper-right corner.
 - d. In the Basic Information area, set Product Group Name and Contact Group.

 The contact group is the alarm contact group for receiving alarm notifications.



e. In the MonitorAlarm area, set Select Template and Notification Methods and enable Initialize Agent Installation.

The selected template is used to initialize alarm rules for the instances in the group. After new instances are created, a CloudMonitor agent will be automatically installed to collect monitoring data.

f. In the Add Instance dynamically area, add at most three dynamic rules with the relationship of AND or OR. Then, click Add Product to customize dynamic rules for RDS and SLB.

Generally, the cloud resources used for inventory management are a server, database, and SLB resource. You can customize dynamic rules to add ECS instances. An ECS instance name can be matched through the condition of Contain, start with, or end with. The instances conforming to the dynamic rules will be added to the specified application group (including instances to be created in the future).

g. Click Create Application Group.

The instances conforming to the dynamic rules are added to the created application group, which can be viewed on the Basic Information page of the application group.

2 Receive alarm notifications in a DingTalk group

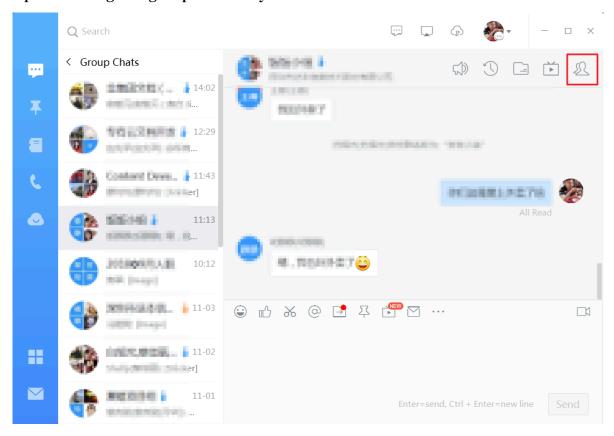
This topic discusses how you can receive alarm notifications in a DingTalk group. Among the alarm notification methods available on CloudMonitor, one option is to send alarm notifications to a DingTalk group.

To add this notification method to existing alarm rules, you only need to add the webhook address of the DingTalk robot to your contacts. You do need to modify any other configurations in your alarm rules.

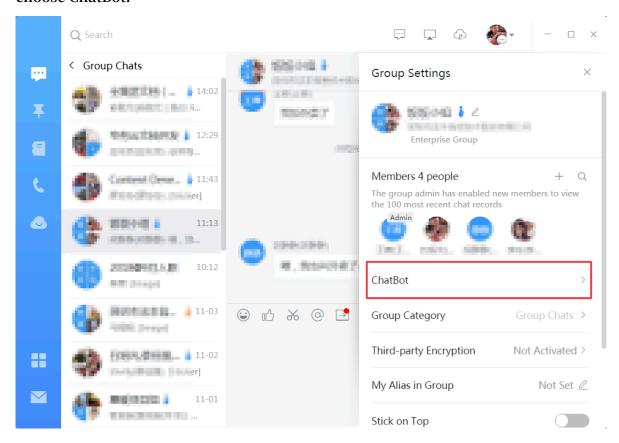
After the webhook address is added to an existing contact, all alarm notifications that were previously sent by email or SMS can also be received by the DingTalk group.

Create a DingTalk robot (desktop version)

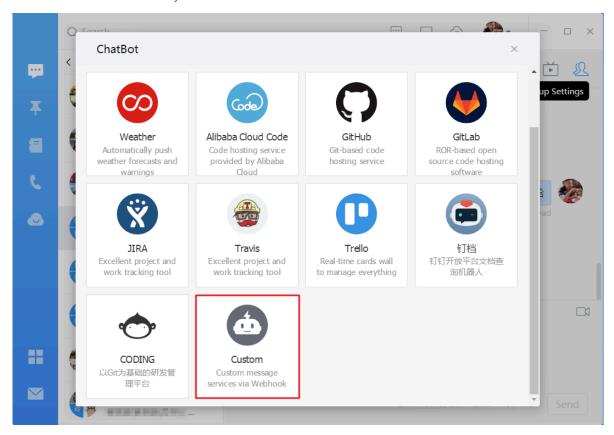
1. Open the DingTalk group in which you want to receive alarm notifications.



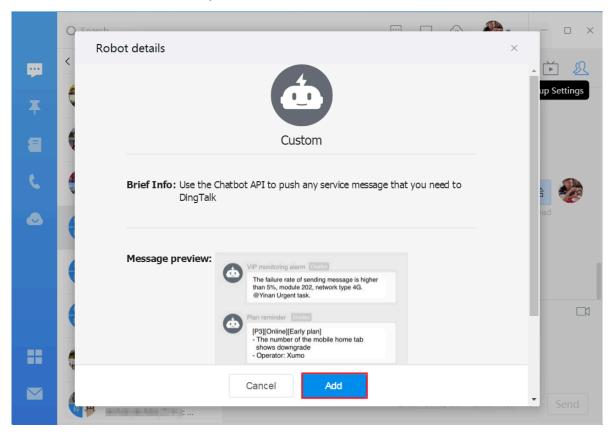
2. In the upper-right corner of the group page, click the Group Settings icon and choose ChatBot.



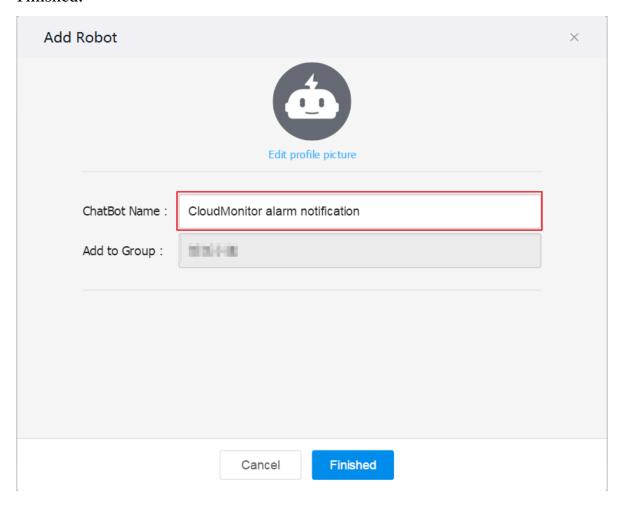
3. In the ChatBot window, click Custom.



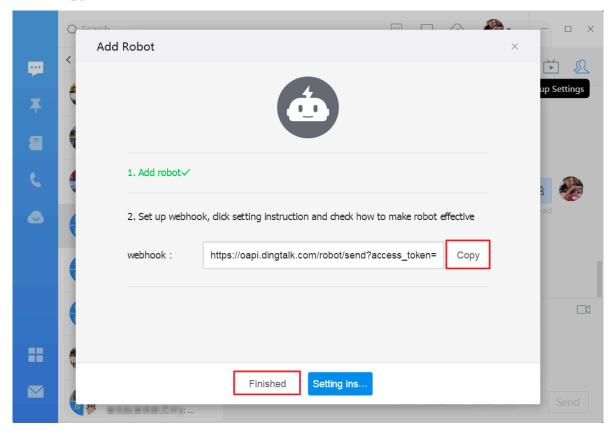
4. In the Robot details window, click Add.



5. In the Add Robot window, enter a name for the robot. For example, you can name the robot "CloudMonitor alarm notification". Once you have entered a name, click Finished.



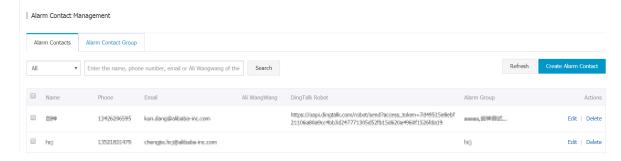
6. Click Copy and then click Finished.



Add a DingTalk robot to your alarm contacts

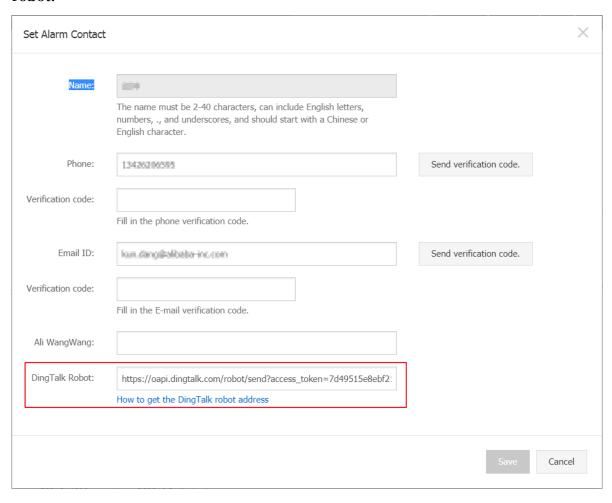
You can add the webhook address of the created DingTalk robot to your alarm contacts so that you can receive alarm notifications from the DingTalk group where you created the robot.

- 1. Log on to the CloudMonitor Console.
- 2. From the left-side navigation pane, choose Alarms > Alarm Contacts.



3. On the Alarm Contact Management page, find the target contact and click Edit. In the Set Alarm Contact window, add the webhook address of the DingTalk robot.

Alternatively, click Create Alarm Contact to create a contact to use the DingTalk robot.



3 Create a dashboard for Container Service instances

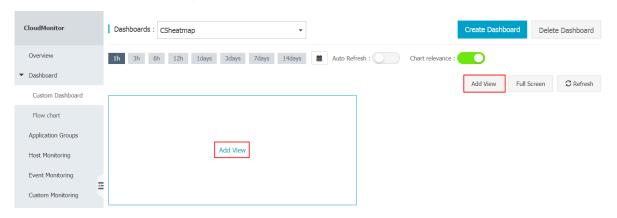
This topic discusses how the dashboard function of CloudMonitor can enable you to learn about the global status of all your Container Service instances in a centralized manner. The dashboard function of CloudMonitor, as a powerful visualization tool, can satisfy the demand of enterprise-level users to closely monitor large service applications of the Container Service in a timely fashion.

Procedure

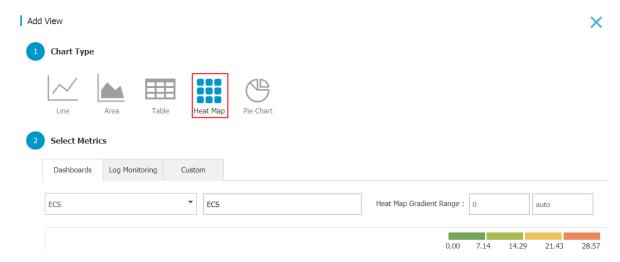
- 1. Log on to the CloudMonitor Console.
- 2. From the left-side navigation pane, choose Dashboard > Custom Dashboard.
- 3. On the Dashboards page, click Create Dashboard in the upper-right corner.



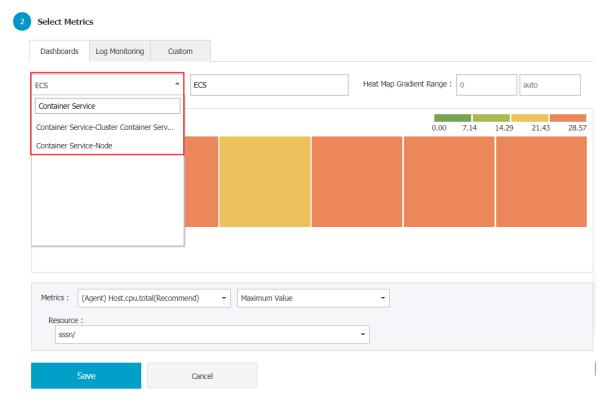
4. In the created dashboard, click Add View.



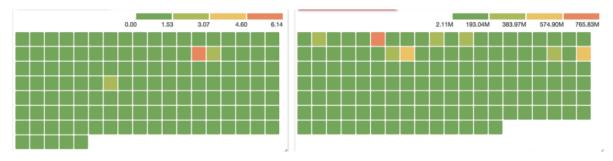
5. In the Chart Type area, click Heat Map.



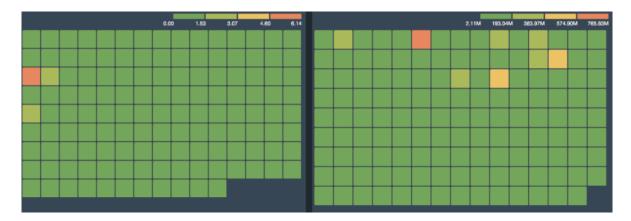
6. On the Dashboards tab page in the Select Metrics area, click Container Service from the drop-down list, and then select the required metrics and resource.



7. Click Save. The following figure shows the heat map rendering.



In the upper-right corner, click Full Screen to view the full-screen rendering.



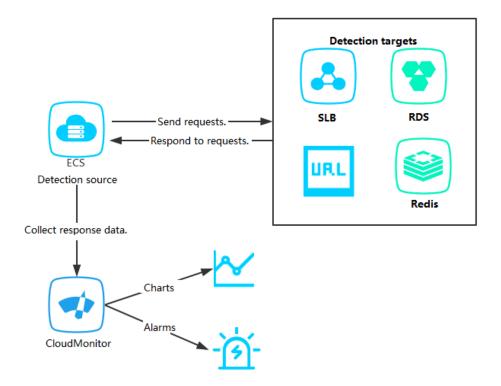
You can create multiple independent charts in a dashboard, and each chart reflects the monitoring conditions of a product (for example, ECS, RDS, or SLB). You can also view the full-screen rendering of the dashboard.

4 Monitor the intranet

This topic describes how to use CloudMonitor to monitor the intranet and internal VPC services, specifically helping you closely manage the availability of ECS services, the connectivity of ECS to RDS and Redis instances, and the responsiveness of SLB instances in a VPC.

Principle

Before you can begin to monitor the intranet, you will need to install a CloudMonit or agent on your server and create monitoring tasks in the CloudMonitor console , selecting the server on which the agent is installed as the detection source, and configure the target URL or port. The principle behind these prerequisites and the procedure that follows is to allow the detection source to send an HTTP request or a Telnet request through the agent and collect the response time and status codes, so that this data can be sent to CloudMonitor for alarm and visualization monitoring purposes.



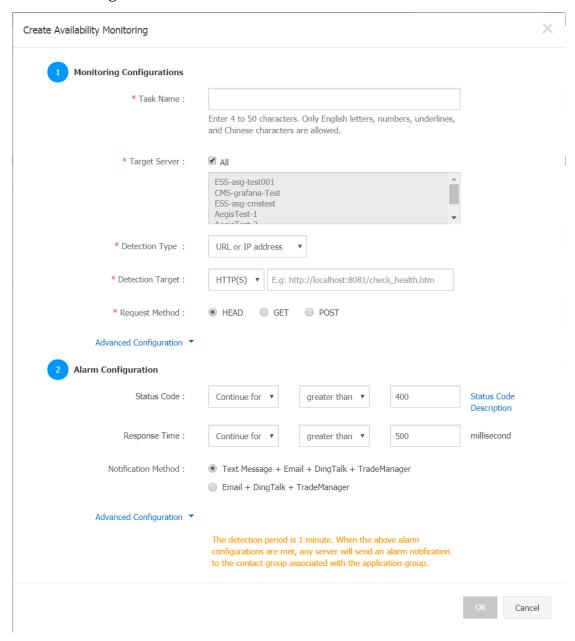
Monitor the intranet

- · Prerequisites
 - The CloudMonitor agent has been installed on the detection source.
 - You have created an application group and added the detection source to the group.

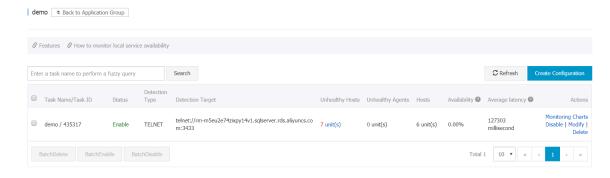
· Procedure

- 1. Log on to the CloudMonitor Console.
- 2. In the left-side navigation pane, click Application Groups.
- 3. On the Application Groups page, click the application group for which you want to create an availability monitoring task.
- 4. In the left-side navigation pane, click Availability Monitoring.
- 5. In the upper-right corner, click Create Configuration.
 - To monitor the responsiveness of a local ECS process in a VPC, select the target ECSs to be monitored as Target Server and enter the addresses in localhost: port / path format as Detection Target.
 - To monitor the responsiveness of the SLB in a VPC, select an ECS that is located in the VPC as Target Server and enter the SLB address as Detection Target.
 - To monitor the responsiveness of the RDS or Redis used in the ECS backend in a VPC, add the RDS or Redis in the VPC to the application group, select

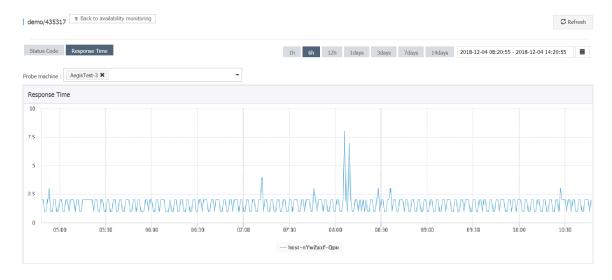
the corresponding ECS as Target Server, and select RDS or Redis instances as Detection Target.



6. Click OK. Then, you can view the detection results in the corresponding monitoring chart of the task. If detection fails, you will receive an alarm notification.



7. Click Monitoring Charts of a task to view the monitoring details.



5 Process ECS status change events

This topic describes how CloudMonitor automatically processes ECS status change events by using MNS message queues.

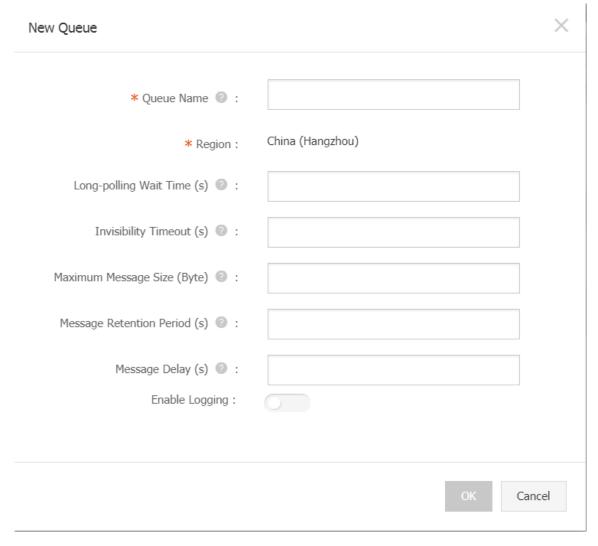
Overview

An ECS instance status change event is triggered when the instance status changes . Specifically, a status change event can indicate changes resulting from operations on the console, the usage of APIs or SDKs, automatic scaling, detection of overdue payments, system exceptions, and more.

To automate the processing of ECS status change events, CloudMonitor provides two methods: function calculation formulas and MNS message queues. This topic describes three best practice cases that use MNS message queues.

Preparations

- · Create a message queue.
 - 1. Log on to the MNS Console.
 - 2. On the Queue List page, select the target region, and click Create Queue in the upper-right corner.



3. In the New Queue dialog box, enter the queue name (for example, ecs-cms-event) and other required information, and then click OK.

- · Create an alarm rule for status change events.
 - 1. Log on to the CloudMonitor Console.
 - 2. In the left-side navigation pane, click Event Monitoring.
 - 3. Switch to the Alarm Rules tab page, and then click Create Event Alerts.

Create / Modify Event Alerts **Basic Infomation** *Alarm Rule Name Combination of alphabets, numbers and unders Event alert Event Type System Event Custom Event Product Type ECS Event Type StatusNotification X Event Level All Levels X Event Name All Events X Resource Range All Resources Application Groups Alarm Type ■ Alarm Notification Delete Contact Group GPU监控 Notification Method Warning (Message+Email ID+Ali WangWar +Add ■ MNS queue ■ Function service (Best Practises) ■ URL callback OK Cancel

4. In the Basic Information area, enter a name for the alarm rule, for example, ecstest-rule.

- 5. In the Event alert area, set the parameters as follows:
 - Set Event Type to System Event.
 - Set Product Type to ECS and Event Type to StatusNotiifcation, and set other parameters as needed.
 - If Resource Range is set to All Resources, change events of any resource will trigger notifications. If Resource Range is set to Application Groups, only change events of the resources within the specified group will trigger notifications.
- 6. In the Alarm Type area, select MNS queue, and then specify Region and Queue (for example, ecs-cms-event).
- 7. Click OK.
- · Install Python dependencies.

The following code is tested in Python 3.6. You can use other programming languages, such as Java, as needed.

Use PyPi to install the following Python dependencies:

- aliyun-python-sdk-core-v3 of 2.12.1 or later
- aliyun-python-sdk-ecs of 4.16.0 or later
- aliyun-mns of 1.1.5 or later

Procedure

CloudMonitor sends all status change events of ECS instances to MNS. You can then obtain the notifications from MNS and process them by running code. The following practice sections overview a complete tutorial of the preceding methods.

Practice 1: Records of all ECS creation and release events

Currently, you cannot query instances that have been released on the ECS console . If you need to perform these queries, you need to record the life cycle of all ECS instances in your own database or log through an ECS status change event. Specifical ly, whenever an ECS instance is created, a Pending event will be sent, and whenever an ECS instance is released, a Deleted event will be sent. You can record these two events by performing the following steps:

1. Create a *Conf* file, which must include the MNS endpoint, AccessKeyId and AccessKeySecret of your Alibaba Cloud account, region ID (for example, cnbeijing), and the MNS queue name.



Note:

To view the MNS endpoint, you can log on to the MNS console, and click Get Endpoint on the Queue List page.

```
class Conf:
    endpoint = ' http://< id >. mns .< region >. aliyuncs . com
/'
    access_key = '< access_key >'
    access_key _secret = '< access_key _secrect >'
    region_id = ' cn - beijing '
    queue_name = ' test '
    vsever_gro up_id = '< your_vserv er_group_i d >'
```

2. Use the MNS SDK to compile an MNS client to receive MNS messages.

```
# -*- coding : utf - 8 -*-
import
          json
                                   import
                                             MNSExcepti onBase
from
        mns . mns_except ion
import
          logging
from
      mns . account
                         import
                                    Account
from . import
                    Conf
        MNSClient ( object ):
class
          __init__ ( self ):
     def
         self . account = Account ( Conf . endpoint , Conf .
access_key , Conf . access_key _secret )
self . queue_name = Conf . queue_name
self . listeners = dict ()
          regist_lis tener ( self , listener , eventname ='
Instance : StateChang e '):
                                  self . listeners . keys ():
               eventname in
              self . listeners . get ( eventname ). append ( listener
)
              self . listeners [ eventname ] = [ listener ]
            run ( self ):
                 = self . account . get_queue ( self . queue_name )
          queue
                 True :
         while
              try:
                  message = queue . receive_me ssage ( wait_secon
ds = 5
                  event = json . loads ( message . message_bo dy )
if event [' name '] in self . listeners :
    for listener in self . listeners . get (
event [' name ']):
                           listener . process ( event )
                  queue . delete_mes sage ( receipt_ha ndle =
message . receipt_ha ndle )
              except
                       MNSExcepti onBase
                                               as
                        e . type == ' QueueNotEx ist ':
```

```
logging . error (' Queue % s not exist ,
please create queue before receive message .', self .
queue_name )

else:
logging . error (' No Message , continue
waiting ')

class BasicListe ner (object ):
def process (self , event ):
pass
```

The preceding code is used only to pull MNS messages and delete the messages after the listener consumption message is called.

3. Register a listener to use a specified event. When this listener determines that it has received a Pending or Deleted event, it prints a row in the log file.

```
# -*- coding : utf - 8 -*-
import
           logging
from . mns_client
                           import BasicListe ner
          ListenerLo g ( BasicListe ner ):
   process ( self , event ):
class
     def
          state = event [' content '][' state ']
resource_i d = event [' content '][' resourceId ']
         logging . info ( f ' The
is { state }')
elif state
                                                  instance { resource_i d }
state
               f state == ' Deleted ': logging . info ( f ' The
                                                  instance { resource_i d }
          is { state }')
state
```

The following Main function can also be used:

```
mns_client = MNSClient ()
mns_client . regist_lis tener ( ListenerLo g ())
mns_client . run ()
```

In your actual scenario, you can store events in your database or use SLS to facilitate search and audit tasks at a later date.

Practice 2: Automatic restart of ECS servers

In some scenarios, ECS servers may shut down unexpectedly. In this case, you need to set automatic restart for the servers.

Use the MNS client in Practice 1 and create a new listener. Then, when the listener receives a Stopped event, the listener executes a Start command on the target ECS server.

```
# -*- coding : utf - 8 -*-
```

```
import logging
        aliyunsdke cs . request . v20140526
from
                                                           import
                                                                       StartInsta
nceRequest
from
        aliyunsdkc ore . client
                                           import
                                                       AcsClient
       . mns_client import BasicListe
from
from . config
                    import Conf
class
          ECSClient (object):
          __init__ ( self , acs_client ):
self . client = acs_client
     def
    # Start
                the ECS
                                instance
          start_inst ance ( self ,
logging . info ( f ' Start
                                               instance_i d ):
                                               instance { instance_i d
          request = StartInsta nceRequest . StartInsta nceRequest
()
          request . set_accept _format (' json ')
request . set_Instan ceId ( instance_i
          self . client . do_action_ with_excep tion ( request )
          ListenerSt art ( BasicListe ner ):
    __init__ ( self ):
acs_client = AcsClient ( Conf . access_key ,
class
     def
                                                                        Conf .
process ( self , event ):
detail = event [' content ']
instance_i d = detail [' resourceId ']
if detail [' state '] == ' Stopped ':
    self . ecs_client . start_inst ance ( instance_i d )
```

In your actual scenario, after the Start command is executed, you will receive Starting, Running, or Stopped event notifications. In this case, you can proceed with the procedure upon command execution for more detailed O&M with the help of a timer and a counter.

Practice 3: Automatic removal of preemptible instances from SLB before they are released

A release alarm event will be sent five minutes before a preemptible instance is released. During these five minutes, you can run some processes without your services being interrupted. For example, you can manually remove the target preemptible instance from the backend SLB server.

Use the MNS client in Practice 1 and create a new listener. Then, when the listener receives the preemptible instance release alarm, the listener calls an SLB SDK.

```
# -*- coding : utf - 8 -*-
from aliyunsdkc ore . client import AcsClient
from aliyunsdkc ore . request import CommonRequ est
from . mns_client import BasicListe ner
```

```
from . config
                   import
                              Conf
       SLBClient ( object ):
class
    def __init__ ( self ):
         self . client = AcsClient ( Conf . access_key , Conf .
access_key _secret , Conf . region_id )
         self . request = CommonRequ est ()
         self . request . set_method (' POST ')
         self . request . set_accept _format (' json ')
self . request . set_versio n (' 2014 - 05 - 15 ')
self . request . set_domain (' slb . aliyuncs . com ')
         self . request . add_query_ param (' RegionId ', Conf .
region_id )
    def remove_vse rver_group _backend_s ervers ( self ,
vserver_gr oup_id , instance_i d ):
         self . request . set_action _name (' RemoveVSer verGroupBa
ckendServe rs ')
         self . request . add_query_ param (' VServerGro
vserver_gr oup_id )
         self . request . add_query_ param (' BackendSer
"[{' ServerId ':'" +
                                                                     instance_i
d + "',' Port ':' 80 ',' Weight ':' 100 '}]")
         response = self . client . do_action_ with_excep tion (
self . request )
                    str (response, encoding = 'utf - 8')
         return
         ListenerSL B ( BasicListe ner ):
class
         __init__ ( self , vsever_gro up_id ):
self . slb_caller = SLBClient ()
self . vsever_gro up_id = Conf . vsever_gro up_id
    def
         process ( self , event ):
detail = event [' content ']
         instance_i d = detail [' instanceId ']
              detail [' action '] == ' delete ':
self . slb_caller . remove_vse    rver_group _backend_s
ervers ( self . vsever_gro up_id , instance_i d )
```



Notice:

The event name of the preemptible instance release alarm is Instance:Preemptible eInstanceInterruption", mns_client.regist_listener(ListenerSLB(Conf.vsever_group_id), 'Instance:PreemptibleInstanceInterruption').

In your actual scenario, you need to apply for a new preemptible instance and attach it to SLB to guarantee that your services can run normally.