# Alibaba Cloud Container Service

User Guide

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# **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.	<b>Danger:</b> Resetting will result in the loss of user configuration data.
<b>A</b>	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 information, supplementary instructions, and other content that the user must understand.	<b>Note:</b> Take the necessary precautions to save exported data containing sensitive information.
	This indicates supplemental instructio ns, best practices, tips, and other content that is good to know for the user.	<b>Note:</b> You can use <b>Ctrl + A</b> 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 <b>OK</b> .
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 listinstanceid Instance_ID
[] or [a b]	It indicates that it is a optional value, and only one item can be selected.	ipconfig [-all/-t]
{} or {a b}	It indicates that it is a required value, and only one item can be selected.	<pre>swich {stand   slave}</pre>

# Contents

	egal disclaimer Generic conventions	
	Authorizations	
	2 Clusters	
_	2.1 Cluster lifecycle	
	2.2 Add an existing ECS instance	
	2.3 Download cluster certificate	
	2.4 Migrate a cluster	9
3		
3	8 Nodes	12
3	<b>3</b> .1 View containers running on a node	<b>12</b>
	8 Nodes	<b>12</b> 12 13
	<b>3.1</b> View containers running on a node <b>3.2</b> Update a node certificate	<b>12</b> 12 
4	<ul> <li>3.1 View containers running on a node</li></ul>	<b>12</b> 12 
4 5	<ul> <li>3 Nodes</li></ul>	<b>12</b> 

# **1** Authorizations

# 2 Clusters

### 2.1 Cluster lifecycle

 Table 2-1: A complete cluster lifecycle includes the following statuses.

Status	Description
inactive	The successfully created cluster does not contain any node.
initial	The cluster is applying for corresponding cloud resources.
running	The cluster successfully applied for the cloud resources.
updating	The cluster is upgrading the Agent.
scaling	Change the number of cluster nodes.
failed	The cluster application for cloud resources failed.
deleting	The cluster is being deleted.
delete_failed	The cluster failed to be deleted.
deleted (invisible to users)	The cluster is successfully deleted.

### Figure 2-1: Cluster status flow



### 2.2 Add an existing ECS instance

You can add a purchased Elastic Compute Service (ECS) instance to a specified cluster.



At most 20 ECS instances can be added to a cluster by default. To add more ECS instances, *open a ticket*.

You can add an existing ECS instance in the following ways:

- Add ECS instances automatically: The image and system disk of the ECS instance are reset by using this method. You can add one or more ECS instances to the cluster at a time.
- Add the ECS instance manually: Manually add the ECS instance by running scripts on the ECS instance. You can only add one ECS instance to the cluster at a time.

#### Prerequisites

If you have not created a cluster before, create a cluster first. For information about how to create a cluster, see *Create a cluster*.

### Instructions

- The ECS instance to be added must be in the same region and use the same network type ( Virtual Private Cloud (VPC)) as the cluster.
- When adding an existing ECS instance, make sure that your ECS instance has an Elastic IP ( EIP) for the network type VPC, or the corresponding VPC has configured the NAT gateway. In short, make sure the corresponding node can access public network normally. Otherwise, the ECS instance fails to be added.
- The ECS instance to be added must be under the same account as the cluster.
- If you select to manually add the ECS instance, note that:
  - If you have already installed Docker on your ECS instance, the ECS instance may fail to be added. We recommend that you uninstall Docker and remove the Docker folders before adding the ECS instance by running the following command:

```
Ubuntu: apt-get remove -y docker-engine, rm -fr /etc/docker/ /var/lib/
docker /etc/default/docker
```

```
CentOS: yum remove -y docker-engine, rm -fr /etc/docker /var/lib/
docker
```

Container Service nodes have special requirements for the operating system of the ECS instance. We recommend that you use Ubuntu 14.04/16.04 or CentOS 7 as the operating system. We have strictly tested the stability and compatibility of these operating systems.

### Procedure

- 1. Log on to the Container Service console.
- 2. Click Swarm > Clusters in the left-side navigation pane.
- Click More at the right of the cluster that you want to add ECS instances and then select Add Existing Instances from the drop-down list.

Container Service	Cluster List			You can create up to 5 cluster	s and can a	dd up to 20 node	es in each cluster	Subaccount A	uthorization	Refresh	Create Cluster
Overview Applications	Help: Create cluster How to add exis	sting ECS instance	s Cross-zone node	management Log Service in	tegration	Connect to clust	er through Docke	er Client			
Services	Name				Cluster	Node Status	Number of		Docker		
Nodes Data Volumes	Cluster Name/ID routing-test-online ccf530ee2b1c1400e96425b05846fa35c	Cluster Type Alibaba Cloud Cluster	Region China East 1 (Hangzhou)	Network Type VPC vpc- bp1659u1p811058ea3npd	Ready	No node status 😋	Nodes	Time Created 2017-03-31 22:32:40	Version 17.03.1-ce	Manage	Action
Configurations  Images and Temp Operation Logs Getting Started									Upgrade Upgrade	Agent Docker	ion Information
Getting Started								3	Expand	System Service ing Instances pplication	_

### 4. Add ECS instances.

The ECS instances displayed are filtered and synchronized from your ECS instance list according to the region and network type defined by the cluster.

Add the ECS instances in the following ways:

· Add ECS instances automatically.

### Note:

As this method will reset the image and system disk of the ECS instance, proceed with caution. Create a snapshot to back up your data before adding the ECS instance. For information about how to create a snapshot, see *Create snapshots*.

1. Select the ECS instances you want to add to the cluster and click Next Step.

You can add one or more ECS instances at a time.

- Configure the instance information. Click Next Step and then click Confirm in the confirmation dialog box.
- 3. Click Finish.
- Manually add the ECS instance by running scripts on the ECS instance.
  - 1. Select Manually Add. Select an ECS instance, and then click Next Step.

You can only add one ECS instance at a time.

- 2. Confirm the instance information and click Next Step.
- The scripts unique to this ECS instance are displayed. Click log on to the ECS instance xxxxxx.

	Select Existing ECS Instance(s)	Enter Instance Information	Added Successfully	
$\bigotimes$	Token generated. Pless log on to the curl -L: http://ali 3acebe46789530192 -	and execute the following command:		
	do and execute dis command			
				Done

**4.** The VNC connection password is displayed in the dialog box. Copy the password and click **Close**.

VNC Con	nection Password	×
	VNC Connection Password:	
	<b>Warning!</b> The VNC connection password is viewable only once. Ensure you record this password and keep it in a secure location for subsequent login attempts.	
	Close	)

5. In the dialog box, enter the VNC connection password and click OK.

Enter VNC Password	×
*Please enter VNC password:	•••••
	OK Cancel

**6.** Enter the logon account (root) and password of the ECS instance, and press Enter to log on to the ECS instance.

Send Remote Command+ St	uccessfully connected to the instance.	Note: A black screen indicates that the system is in sleep mode. Press any key to activate the system.	Input Commands	Modify Management Terminal Password
	Ubuntu 16.04.2 LTS ttyl (2a) login: root Paravord: belicom: to Ubuntu 16.04.2 LTS (ONL/Linux 4.4.0-4 belicom: to Ubuntu 16.04.2 LTS (ONL/Linux 4.4.0-4 e Documentation: https://abuntacpe.cannical. https://abuntacpe.cannical. https://abuntacpe.cannical. bitps://abuntacpe.cannical. Belicome to Allbhab Cloud Elastic Compute Servic root#: "#	con		

 Click Input Commands. Paste the preceding scripts into the dialog box, click OK and press Enter.

Copy Commands		×
Copy and paste cont keyboard characters	ent into the text box. Up to 2000 characters are allowed. Non-standard are not supported.	
* Commands Content:	curl -Ls http://alivuncontainerservice.oss-cn- hangzhou.alivuncs.com/17.03.1-ce/attachNodeScript   sudo -H bash -s	
	OK Cance	

The system runs the scripts. Wait until the scripts are successfully run. A success message is displayed. The ECS instance is successfully added.

发送远程命令+	成功连接到实例i-bp	and an a second s	提示:如果出现持续黑屏	,说明系统处于休眠状态,按任詹	罐可以激活。	复制命令输入:	修改远程连接密码
		The following NEW packages will be installed:					
		unzip					
		0 upgraded, 1 newly installed, 0 to remove and 18 not upgraded. Need to get 158 kB of archives.					
		After this operation, 530 kB of additional disk space will be used.					
		Get:1 http://nirrors.aliuun.com/ubuntu xenial/main amd64 unzip amd64 6.0-20ubuntu1 [	158 kB]				
		Fetched 158 kB in 0s (747 kB/s)					
		Selecting previously unselected package unzip.					
		(Reading database 124231 files and directories currently installed.)					
		Preparing to unpack/unzip_6.0-20ubuntu1_and64.deb Unpacking unzip (6.0-20ubuntu1)					
		Processing triggers for mine-support (3.59ubuntu1)					
		Processing triggers for man-db (2.7.5-1)					
		Setting up unzip (6.0-20ubuntu1)					
		do nothing for GPU					
		Archive: /tnp/tnp.2009fdanNp					
		inflating: /etc/docker/agent-key.pen					
		inflating: /etc/docker/agent.pen inflating: /etc/docker/acs-ca.pen					
		inflating: /etc/docker/acs-ca.pem inflating: /etc/docker/service-key.pem					
		inflating: /etc/docker/service.pem					
		+ sh -c 'sed -i 'N''/Nsw\$/d'N'' /etc/docker/daemon.json   true'					
		+ sh -c 'service docker restart'					
		WARNING: Disabling the OOM killer on containers without setting a '-n/nemory' lini					
		Unable to find image 'registry-internal.cn-hangzhou.aliyuncs.com/acs/tunnel-agent:0.' 0.9-30ba369: Pulling from acs/tunnel-agent	9-30ba369° locally				
		d8c8452902d6: Pull complete					
		Digest: sha256:6fffc08dfc126ed2fe8708d19bed826d15e1584a858627beba1a2a76bfc714b1					
		Status: Downloaded newer image for registry-internal.cn-hangzhou.aliyuncs.com/acs/tu	nnel-agent:0.9-30ba3	69			
		c5139a5927f5264f1576e626b7b0a56b79cc5d3f659d2b3d1a2bd591f8ae274e					
		WARNING: Disabling the DOM killer on containers without setting a '-n/nemory' lini	t may be dangerous.				
		Unable to find image 'registry-internal.cn-hangzhou.aliyuncs.com/acs/agent:0.9-979afa 0.9-979afad: Pulling from acs/agent	ad' locally				
		53ebc9bfbcc0: Pull complete					
		ed3bef47b76b: Pull complete					
		24e2a860997f: Pull complete					
		28d86b232c6a: Pull complete					
		ee316b63e21e: Pull complete					
		ed9f510739f3: Pull complete					
		f?e6cb9275dd: Pull complete					
		Digest: sha256:ccc574cacf6de05e2ccbf983340a0b661ed9391545f8dfa60cab43f5f3b4d7a9 Status: Downloaded newer image for registry-internal.cn-hangzhou.aliyuncs.com/acs/ag	ent:0.9_929afad				
		c7036c614092106833bf b1ea0da9791ba7e5c3f5e8551361a9a4cd5b8a622b1d	enerous susai au				
		SUCCESS					
		SUCCESS					

### **Related operation**

You can modify the VNC connection password of the ECS instance in the remote terminal connection page. Click **Modify Management Terminal Password**, enter the new password and click **OK** in the dialog box.

Modify Managemer	nt Terminal Password	×
Note: The modified V console.	NC password will not take effect until the instance is restarted at the	
*Please enter a new		
password:	Password character limit is 6 characters. Only uppercase letters, lowercase letters, and numbers are supported.	
*Confirm the new password:	•••••	
	OK Cance	əl

### 2.3 Download cluster certificate

### Context

With the downloaded certificate, you can connect to the endpoint exposed from the cluster by using Docker Swarm API or Docker client. For more information, see *Connect to a cluster by using Docker tools*.

### Procedure

- 1. Obtain the access address.
  - a) Log on to the Container Service console.
  - b) Log on to the Container Service console.
  - c) Click **Clusters** in the left-side navigation pane. On the Cluster List page, click **Manage** at the right of a cluster.

Container Service	Cluster List			Ye	u can create	up to 5 cluste	rs and can add	up to 10 nodes in each o	luster. Ref	resh Crea	te Cluster 🕞
Overview	Help: & Create cluster & How to add	d existing ECS insta	nces 🔗 Cross-zone	node management 🔗 Log	Service integ	ration 🔗 Co	nnect to cluster	through Docker Client			
Applications	Name 🔻										
Services	Cluster Name/ID	Cluster Type	Region (All) -	Network Type	Cluster Status	Node Status 🕜	Number of	Time Created	Docker Version	3	Action
Clusters 2	Cluster Name/1D	Cluster Type	Region (All) *	Network Type	SIdlus	Status 🕡	Nodes	Time Created	Version		ACUON
Nodes Networks	test-swarm collidel.ac/Wbw/04880408013abbd204a	Alibaba Cloud Cluster	China East 1 (Hangzhou)	VPC vpc- bol.kil?n-kamitaamuevati	Running	Healthy 🕽	1	05/21/2018,10:29:11	17.06.2- ce	Manage   Mo	View Logs   Delete onitor   More +

d) The cluster details page is displayed, showing the cluster connection information.

access and manage clusters, certi Revoke Downloaded Certificate	icates granted by Albaba Cloud are required. Each cluster has its own certificate. If you have not yet downloaded the certificate for the current cluster, click Download Certificate
uster Access Point:	
tcp://master4g5.cs-cn-han	gzhou.aliyun.com:21003
er Guide:	
Configure Environment Variable (L	inux or Mac):
	//master4g5.cs-cn-hangzhou.aliyun.com:21003" the storage path for the cluster certificate file.
export DOCKER_HOST="tcp: #Set the current path as	//master4g5.cs-cn-hangzhou.aliyun.com:21003" the storage path for the cluster certificate file.
export DOCKER_HOST="tcp: #Set the current path as export DOCKER_CERT_PATH= tice:	//master4g5.cs-cn-hangzhou.aliyun.com:21003" the storage path for the cluster certificate file.

2. Download and save the TLS certificate.

Configure a TLS certificate before you use the preceding access address to access the Docker cluster.

Click **Download Certificate** in the cluster details page to download the TLS certificate. The certFiles.zip file is downloaded. In the following example, the downloaded certificate is saved to the ~/.acs/certs/ClusterName / directory. ClusterName indicates the name of your cluster. You can save the certificate to a different directory, but we recommend using the ~/.acs/certs/ClusterName/ directory for easy management.

```
mkdir ~/.acs/certs/ClusterName/ #Replace ClusterName with your
cluster name
  cd ~/.acs/certs/ClusterName/
  cp /path/to/certFiles.zip .
  unzip certFiles.zip
```

The certFiles.zip file contains ca.pem, cert.pem, and key.pem.

### 2.4 Migrate a cluster

For a Swarm cluster created earlier, you can guarantee the performance and stability of the cluster by migrating the cluster.

### Context

- The latest time for migrating a cluster is displayed through SMS, station message, or email
   Complete the Swarm cluster migration before the latest time. The system automatically migrates the cluster if you do not migrate the cluster before the latest time.
- Cluster migration rebuilds connections from cluster nodes to the container server without
  affecting applications deployed in the cluster, nor adding or modifying any data. Make sure that
  you perform this operation during the low peak period of your business because unpredictable
  risks might still exist throughout the migration process.

#### Procedure

- 1. Log on to the Container Service console.
- 2. Under the Swarm menu, click Clusters.
- 3. Click **Cluster Migration** in the action column at the right of the cluster to be migrated.

	Alibaba Cloud Cluster	US Western 1 (Silicon Valley)	VPC	Running	Healthy 🕽	2	08/21/2018,21:46:39	17.06.2- ce	Manage   View Logs   Delete Monitor   Cluster Migration   More <del>v</del>
	Alibaba Cloud Cluster	US Western 1 (Silicon Valley)	VPC	Running	Healthy 🕽	2	08/21/2018,21:46:32	17.06.2- ce	Manage   View Logs   Delete Monitor   More <del>-</del>

4. Click OK in the Prompt dialog box.



During cluster migration:

- Information query, deployment, upgrade, and other operations cannot be performed in the console.
- The cluster cannot be connected to through the cluster access point API.
- The data and application status in the cluster remain unchanged. Applications deployed on the cluster are still accessible.
- The migration process takes about three minutes.

On the Cluster List page, Migrating is displayed in the Cluster Status column.

11/2 8/80	Alibaba Cloud Cluster	US Western 1 (Silicon Valley)	VPC	Migrating	Healthy	2	08/21/2018,21:46:47	17.06.2- ce	Manage   View Logs   Delete Monitor   More <del>-</del>
and a state of the second	Alibaba Cloud Cluster	US Western 1 (Silicon Valley)	VPC	Running	Healthy 🕽	2	08/21/2018,21:46:39	17.06.2- ce	Manage   View Logs   Delete Monitor   More <del>-</del>

#### Result

After cluster migration is completed, on the **Cluster List** page, **Running** is displayed in the **Cluster Status** column.



Note:

- The cluster ID, access point address, and other attributes remain unchanged.
- Please be sure to confirm that your business is running properly.
- During the migration process, if you have any questions, please open a ticket in which you include the cluster ID and state whether your deployed applications are normal.

 Alibaba Cloud Cluster	US Western 1 (Silicon Valley)	VPC	Running	Healthy 🕽	2	08/21/2018,21:46:47	17.06.2- ce	Manage   View Logs   Delete Monitor   More <i>▼</i>
 Alibaba Cloud Cluster	US Western 1 (Silicon Valley)	VPC	Running	Healthy ${f C}$	2	08/21/2018,21:46:39	17.06.2- ce	Manage   View Logs   Delete Monitor   More <del>▼</del>

# 3 Nodes

### 3.1 View containers running on a node

### Context

You can view containers running on a node on the Node List page.

### Procedure

- 1. Log on to the Container Service console.
- 2. Click Swarm > Nodes in the left-side navigation pane.
- **3.** On the Node List page, select a cluster from the Cluster drop-down list.
- 4. Click the node ID.

Container Service	Node List									
Kubernetes Swarm										
Overview	Help: Ø Postpay instand	ce to Prepay								
Applications										
Services	IP Address	Instance Type	Instance ID/Name	Status	Number of Containers	Configuration	Operating System	Docker Version	Agent	Action
Clusters	114 3 (eip)	Alibaba Cloud Node		Normal	7	CPU:2core(s) Memory:3.702 GB	CentOS Linux 7 (Core)	17.06.2-ce	0.10-98812ae	Monitor   More 🗸

You can see the list of containers running on the node.

<	Node:17								
Container List									
Node Monitoring	Instance ID: i-bp1bn8 Instance Name: c9b0	Labels: com.docker.swarm.task: com.docker.swarm.node.	id:js8ghfwj5m1sc9vet	Status: N	lormal		Region: China East 1 (Hangzhou)		Cluster: swarmmode-cluster
	Name/ID	e874b2lz com.docker.stack.names		Port		Container IP		Node IP	Actio
	acs-agent <b>()</b> system	aliyun.addon:acslogging com.docker.compose.pro com.docker.swarm.servic	ject:acslogging			172.1		172.	Monitor Log
	acslogging_logsp	dkq40en	arm.task.id:izp2ab29r7e6hplv23			acsio		172.	Monitor   Logs   Web Termina
	acslogging_logta () default	com.docker.swarm.servic 8z53swkifvx aliyun.cap.oom_kill_disab	ole:true			172.1		172.	Monitor   Logs   Web Termin
3	acsmonitoring_ac () default	com.docker.swarm.task.r pout.js8ghfwj5m1sc9vete 6hplv23dkq40en aliyun.service.id:acsloggi	e874b2lz.lzp2ab29r7e			172.1		172.	Monitor   Logs   Web Termin
	acsrouting_routi Ø default				80/tcp	10.25 ingre multi acsro			Monitor   Logs   Web Termina
	acsvolumedriver () system	running	registry-vpc.cn sha256:4030f33dc			172.1		172.	Monitor   Log
	tunnel-agent () system	running	registry-vpc.cn sha256:644001fe1			172.1		172.	Monitor Log

### What's next

In the list, you can view the labels, images, the image SHA256 values, logs, and monitoring information of containers and perform operations on containers, including starting and stopping containers, deleting containers, and operating on containers on a remote terminal.

### 3.2 Update a node certificate

You can update a node certificate of a Swarm cluster to avoid node certificate expiration.

### Prerequisites

- 1. You have created a swarm cluster, see Create a cluster.
- **2.** Updating a node certificate reboots the node Docker Daemon. Make sure that containers on the node are all configured to restart automatically.

### Note:

You can configure a container restart policy when creating an application. When you create an application by using an image, select the **Always** check box for **Restart**. When you create an application by using a template, configure a container restart policy in the template restart : always.

**3.** If a node certificate expires within 60 days, a prompt is displayed. You must timely update the node certificate.

### Context

Each cluster node has a certificate used to access system control services. Each issued certificat e has a valid period. When the valid period of a certificate is about to expire, you must manually renew the certificate. Otherwise, the service of the node is affected.

### Procedure

- 1. Log on to the Container Service console.
- 2. Under the Swarm menu, click **Nodes** in the left-side navigation pane. The certificate expiration information of each cluster node is displayed.



The certificate expiration time is displayed in the status column only if the node certificate expires within 60 days.

 Select a node in the node list, and click More > Update Certificate on the right to reissue the node certificate.

### Note:

We recommend that you upgrade the cluster agent to the latest version before updating the node certificate.

- 4. Optional: If the system prompts you to upgrade the cluster agent after you click Update Certificate, the current cluster agent does not support this feature. You need to upgrade the cluster agent to the new version first, see Upgrade Agent. If no prompt is displayed, go to the next step.
- **5.** If no prompt is displayed or the cluster agent is updated, click **Update Certificate**. Confirm updating information and then update the node cluster certificate.



- When the node certificate update is completed, the Docker Daemon node is automatically restarted about 1 minute later.
- To guarantee that containers on the node can automatically restart, make sure that an automatic restart policy is configured.
- **6.** After the cluster node certificate is updated, the node certificate information is no longer displayed.

# **4 Service orchestrations**

### 4.1 Routing

Configure the access domain name of a service.

### Format:

```
aliyun.routing.port_$container_port: [http://]$domain|$domain_prefix[:
$context_path]
```

Field explanation:

- \$container\_port: The container port. Note: This is not the host port.
- \$domain: The domain name. Enter your own domain name.
- \$domain\_prefix: The domain name prefix. If you enter a domain name prefix, Container Service provides you with a domain name for test and the domain name suffix is .<</li>
   cluster\_id>.<region\_id>.alicontainer.com.
- \$context\_path: The request service path. You can select and distinguish different services according to the request path.

### Domain name selection:

- If HTTP protocol is used to expose the service, you can use the internal domain name (the toplevel domain is alicontainer.com) provided by Container Service for test, or use your own domain name.
- If HTTPS protocol is used, you can use only your own domain name. For example, www.
   example.com. Modify the DNS settings to specify the domain name to the Server Load
   Balancer service provided by the container cluster.

### Format requirements of the label statement:

- Container Service allocates subdomain names for each cluster, and you only need to provide the domain name prefix to bind the internal domain name. The domain name prefix only indicates a domain name level and cannot be separated with periods (.).
- If you do not specify scheme, the HTTP protocol is used by default.
- The length of the domain name cannot exceed 128 characters. The length of the context root cannot exceed 128 characters.
- When you bind multiple domain names to the service, use semicolons (;) to separate them.

 A backend service can have several ports. Here, the port refers to the port exposed by the container. A port can only use one label for statement and a service with several ports need to state several labels.

#### Example:

Use the routing label.

Bind the internal domain name wordpress.<cluster\_id>.<region\_id>.alicontainer .com provided by Container Service and your own domain name http://wp.sample.com/ context to port 80 of the Web service.

```
web:
    image: wordpress:4.2
    links:
        - db:mysql
    labels:
        aliyun.routing.port_80: wordpress;http://wp.sample.com/context
    db:
        image: mysql
        environment:
            - MYSQL_ROOT_PASSWORD=password
```

The internal domain name you finally get is wordpress.cd3dfe269056e4543acbec5e19b01c 074.cn-beijing.alicontainer.com.

After starting the Web service, you can access corresponding Web services by using the URL: http://wordpress.cd3dfe269056e4543acbec5e19b01c074.cn-beijing.alicontain er.com Orhttp://wp.sample.com/context.

To support HTTPS service, upload the HTTPS certificate by using the Server Load Balancer console on the Alibaba Cloud website. Then, bind the corresponding cluster to access the Server Load Balancer endpoint.

#### routing.session\_sticky

This feature enables you to determine whether to maintain session sticky (session persistence) when you set the routing for a routing request. With session persistence, during the session, the request is routed to the same backend container instead of being randomly routed to different containers for each request.



### Note:

 The setting takes effect only when you have configured aligun.routing.port\_\$ contaienr\_port. • Simple route session persistence is based on the Cookie mechanism. By default, the maximum expiration time of Cookie is 8h and the idle expiration time is 30m.

The setting method is as follows:

• Enable session persistence

aliyun.routing.session\_sticky: true

• Disable session persistence

aliyun.routing.session\_sticky: false

Example of a template orchestration file:

```
web:
    image: wordpress:4.2
    links:
        - db:mysql
    labels:
        aliyun.routing.port_80: wordpress;http://wp.sample.com/context
        aliyun.routing.session_sticky: true
db:
    image: mysql
    environment:
        - MYSQL_ROOT_PASSWORD=password
```

# 5 Data volumes

### 6 DevOps

### 6.1 Jenkins-based continuous delivery

As an important step in agile development, continuous integration aims to maintain high quality while accelerating product iteration. Every time codes are updated, an automated test is performed to test the codes and function validity. The codes can only be delivered and deployed after they pass the automated test. This document mainly introduces how to integrate Jenkins, one of the most popular continuous integration tools, with Alibaba Cloud Container Service to realize automated test and image building push.

The following example demonstrates how to perform automated test and build a Docker image by using Alibaba Cloud Container Service Jenkins, which realizes high-quality continuous integration.

### **Background information**

Every time codes are submitted to nodejs project in GitHub, Alibaba Cloud Container Service Jenkins will automatically trigger a unit test. If the test is successful, Jenkins continues to build images and then pushes them to a target image repository. Finally, Jenkins notifies you of the results by email.

A general process is as follows.



Slave-nodejs is a slave node used for unit test and building and pushing the image.

### Jenkins introduction

Jenkins is an open-sourced continuous integration tool developed on Java. It monitors and triggers continuously repeated work and supports expansion of multiple platforms and plug-ins. Jenkins is an open-sourced tool featuring easy installation and interface-based management. It uses job to describe every work step, and node is a project execution environment. The master node is a default execution environment of a Jenkins job and also the installation environment for Jenkins applications.

#### Master/slave

Master/slave is equivalent to the server/agent concept. A master provides Web interface with which you manage the job and slave. The job can run on the master or be assigned to the slave . One master can be associated with several slaves to serve different jobs or different configurat ions of the same job.

Several slaves can be configured to prepare a separate test and building environment for different projects.

### Note:

The Jenkins job and project mentioned in this document all refer to a build unit of Jenkins, namely, an execution unit.

#### Step 1 Deploy Jenkins applications and slave nodes

The building and testing of different applications need different dependencies. The best practice is to use different slave containers with corresponding runtime dependencies and tools to perform the test and building. By using the slave images and sample templates provided by Alibaba Cloud Container Service for different environments such as Python, Node.js, and Go, you can quickly and easily generate Jenkins applications and various slave nodes, configure node information in Jenkins applications, and specify the execution nodes in the build projects so as to implement the entire continuous integration process.

### Note:

For images provided by Alibaba Cloud Container Service for developing slave nodes, see *https://github.com/AliyunContainerService/jenkins-slaves*.

#### 1.1 Create a Jenkins orchestration template

Create a template and create the orchestration based on the following contents.

The labels supported by Alibaba Cloud Container Service Jenkins master are: 1.651.3, 2.19.2, and 2.32.2.

Note:

For how to create an orchestration template, see *#unique\_21*.

```
jenkins:
    image: 'registry.aliyuncs.com/acs-sample/jenkins:1.651.3'
    volumes:
        - /var/lib/docker/jenkins:/var/jenkins_home
    restart: always
    labels:
        aliyun.scale: '1'
        aliyun.probe.url: 'tcp://container:8080'
        aliyun.probe.initial_delay_seconds: '10'
        aliyun.routing.port_8080: jenkins
    links:
        - slave-nodejs
slave-nodejs:
    image: 'registry.aliyuncs.com/acs-sample/jenkins-slave-dind-nodejs
ī
    volumes:
        - /var/run/docker.sock:/var/run/docker.sock
    restart: always
    labels:
        aliyun.scale: '1'
```

### 1.2 Use the template to create Jenkins application and slave node

Use the orchestration template created in the preceding section or the Jenkins sample template provided by Alibaba Cloud Container Service to create the Jenkins application and slave node.



After a successful creation, the Jenkins application and slave node are displayed in the service list.

Application:	jenkins									Refresh	
Overview											
Name: jenkins Time Created:							d: 2018-01-16	Time Updated: 2018-01-16	Cluster: test		
Trigger 1.	You can o	nly have o	ne of	each trigg	ger type.@					Create Trigger	
No trigger is available at the moment. Click "Create Trigger" in the upper-right corner.											
Services	Containe	rs Log	s	Events	Routes						
Name		Applicatio	n	Statu	5	Container Status	Image			Actio	
enkins		jenkins		Real	ady	Ready:1 Stop:0	registry.cn-hangzhou	.aliyuncs.com/acs-sample/jen		Stop   Restart   Reschedule Update   Delete   Event	
slave-golang	9	jenkins		● Rea	ady	Ready:1 Stop:0	registry.aliyuncs.com	/acs-sample/jenkins-slave-d		Stop   Restart   Reschedule Update   Delete   Event:	
slave-java jenkins  Ready Ready:1 Stop:0					registry.aliyuncs.com	/acs-sample/jenkins-slave-d	Stop   Restart   Reschedule Update   Delete   Event				
slave-nodejs jenkins Ready Ready:1 Stop:0					ady		registry.aliyuncs.com	/acs-sample/jenkins-slave-d	Stop   Restart   Reschedule Update   Delete   Event		

Open the access endpoint provided by Container Service to use the deployed Jenkins application.

Service:jenkin	Service:jenkins_jenkins Refresh												
Overview													
Service Nam	ne: <b>jenkins</b>			Application: jenkin	Image: re	gistry.cn-hangzh	Number: 1	Ready					
Access Endp	Access Endpoint: http://jenkins.com/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/access/acces												
Containers	Logs	Conf	figurations	s Events									
Name/ID		9	Status	Health Check	Image	Port	Container IP	Node IP			Action		
jenkins_jenkins () 8402cbd57131355b		r	running	Normal	registry.cn-hang sha256:a33929a9c	8080/tcp 50000/tcp	17115.68	192,168,351,239	Delete   Stop	Monitor Logs	Web Terminal		

### Step 2 Realize automated test and automated build and push of image

### 2.1 Configure the slave container as the slave node of the Jenkins application

Open the Jenkins application. Click Manage Jenkins in the left-side navigation pane. Click Manage Nodes on the right pane. Click New Node in the left-side navigation pane. Enter the node name and then click OK. Then, complete the parameters as follows.

Name	slave-nodejs-ut	0								
Description	slave-nodejs-ut	Ð								
# of executors	1	0								
Remote root directory	/home/jenkins	0								
Labels	slave-nodejs-ut	0								
Usage	Utilize this node as much as possible	ze this node as much as possible 🔹 🔹								
Launch method	nch slave agents on Unix machines via SSH									
	Host 172 TROL									
	Credentials jenkins/***** • • Add •	Ð								
	Advanced									
Availability	Keep this slave on-line as much as possible	0								
Node Properties										
Environment varial     Tool Locations     Save	les									

Note:

- Label is the unique identifier of the slave.
- The slave container and Jenkins container run on the Alibaba Cloud platform at the same time
  . Therefore, enter a container node IP address that is inaccessible to the Internet to isolate the
  test environment.
- When adding the credentials, use the jenkins account and password (the initial password is jenkins) in Dockerfile for the creation of the slave-nodejs image. The image Dockerfile address is jenkins-slave-dind-nodejs.

### 2.2 Create a project to implement automated test

- **1.** Go back to the Jenkins home page. Click New Item in the left-side navigation pane. Enter the item name, select Freestyle project, and then click OK.
- Enter the project name and select a node for running the project. In this example, enter the slave-nodejs-ut node prepared in the preceding section.

nodejs-ut	
[Plain text] <u>Preview</u>	
https://github.com/qinyujia/containerop	J
	Advanced
	Auvanceu
gitlab	÷
ed	
ilds will be executed until the project is r	e-enabled.)
s if necessary	
t can be run	
slave-nodejs-ut	
	Plain text] <u>Preview</u> https://github.com/qinyujia/containerops gitlab ed ilds will be executed until the project is re s if necessary et can be run

 Configure the source code management and code branch. In this example, use GitHub to manage source codes.

Source Code Management		
O None		
⊖ CVS		
O CVS Projectset		_
<ul> <li>Git</li> </ul>		
Repositories	Repository URL https://github.com/qinyujia/containerops.git	0
	Credentials 756 Com/*****  Credentials	
	Advanced	0
	Add Repository Delete Repository	
Branches to build	Branch Specifier (blank for 'any') +/jenkins-test	2
	Add Branch Delete Branch	

**4.** Configure the build trigger. In this example, automatically trigger project execution by combining GitHub Webhooks & services.

Bu	uild Triggers	
	Build after other projects are built	2
	Build periodically	2
<	Build when a change is pushed to GitHub	2
	Build when a change is pushed to GitLab. GitLab CI Service URL: http://jenkins.c11267d36daf04ee3960854773128225e.cn-hangzhou.alicontainer.com/project/test2	0
	Poll SCM	?

5. Add the Jenkins service hook to GitHub to implement automatic triggering.

On the GitHub project home page, click the **Settings**. Click **Webhooks & services**, click **Add Service**, and then select **Jenkins(Git plugin)** from the drop list. In the dialog box of **Jenkins hook url**, enter  $\{Jenkins IP\}/github-webhook/.$  For example:

http://jenkins.cd\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*.cn-beijing.alicontainer.com/github -webhook/ % qinyujia / containerops OUnwatch → 1 ★ Star 0 % Fork 3 orked from ringtail/conta <> Code 11 Pull requests 0 Projects 0 Wiki III Graphs C Settings Options Services / Add Jenkins (Git plugin) Collaborators **Install Notes** Branches Requires Git Plugin v1.1.18, released 2012-04-27, and the "Poll SCM" build trigger needs to be enabled. Webhooks (Though you can have it poll very infrequently, I recommend something like 0 \*/3 \* \* \*) • "Jenkins Url" is the base URL of your Jenkins server. For example: http://ci.jenkins-ci.org/. We will hit Integrations & services /git/notifyCommit under this URL. (See the Git plugin wiki page for more details.) Deploy keys Details Jenkins is a popular continuous integration server. If you're using the standard Jenkins Git plugin to poll & check out your repository, you can quickly and easily switch to a push model using this service. It will send a request to your Jenkins instance telling it about the repositories and branches that changed. Jenkins will then poll the repository and build if needed. See push notification from repository on the Jenkins wiki for information. Jenkins url -hang http://jenkins.c112 Active We will run this service when an event is triggered. Add service

6. Add a build step of Execute shell type and write shell scripts to perform the test.



The commands in this example are as follows:

pwd ls cd chapter2 npm test

#### SVN source code example:

Select **Subversion** in Source Code Management and enter the SVN repository address in the **Repository URL** field (if the Jenkins master and SVN server are in different time zones, add @ <u>HEAD</u> at the end of the repository address). Add the username and password of the SVN server in **Credentials**.

Source Code Management		
O None		
O CVS		
O CVS Projectset		_
<ul> <li>Git</li> </ul>		1
Repositories	Repository URL https://github.com/qinyujia/containerops.git	D
	Credentials 756 - Add -	
	Advanced	0
	Add Repository Delete Repository	
Branches to build	Branch Specifier (blank for 'any') •/jenkins-test	)
	Add Branch Delete Branch	

Configure the build trigger. In this example, Post-commit hook is used to automatically trigger the project execution. Enter your configured token in **Token Name**.

Build Triggers		
Build after other projects are built		?
Projects to watch	nodejs-ut	
	Trigger only if build is stable	
	O Trigger even if the build is unstable	
	O Trigger even if the build fails	
Build periodically		?
<ul> <li>Build when a chan</li> </ul>	ge is pushed to GitHub	?
<ul> <li>Build when a chan build</li> </ul>		
Poll SCM		?

Log on to the SVN server. Create a *post-commit* file in the *hooks* directory of the code repository (svn-java-demo).

```
cd /home/svn/svn-java-demo/hooks
cp post-commit.tmpl post-commit
chmod 755 post-commit
```

Add the curl -u \${Jenkins\_account}:\${password}

```
${Jenkins_url}/job/svn/build?
```

token=\${token} command

in the <g id="1">post-commit</g> file. For example:

```
curl -u test:test
http://127.0.0.1:8080/jenkins/job/svn/build?token=qinyujia
```

.

#### 2.3 Create a project to automatically build and push images

- **1.** Go back to the Jenkins home page. Click New Item in the left-side navigation pane. Enter the item name, select Freestyle project, and then click OK.
- **2.** Enter the project name and select a node for running the project. In this example, enter the slave-nodejs-ut node prepared in the preceding section.
- **3.** Configure the source code management and code branch. In this example, use GitHub to manage source codes.
- **4.** Add the following trigger and set to automatically build the image only after the unit test is successful.

Build Triggers		
Build after other projects are built		?
Projects to watch	nodejs-ut	
	• Trigger only if build is stable	
	Trigger even if the build is unstable	
	○ Trigger even if the build fails	
<ul> <li>Build periodically</li> </ul>		2
<ul> <li>Build when a characteristic</li> </ul>	nge is pushed to GitHub	2
<ul> <li>Build when a char build</li> </ul>	Build when a change is pushed to GitLab. GitLab CI Service URL: http://jenkins.c11267d36daf04ee3960854773128225e.cn-hangzhou.alicontainer.com/project/nodejs- build	
Poll SCM		0

5. Write the shell script for building and pushing images.



The commands in this example are as follows:

```
cd chapter2
sudo docker build -t registry.aliyuncs.com/qinyujia-test/nodejs-
demo .
sudo docker login -u ${yourAccount} -p ${yourPassword} registry.
aliyuncs.com
```

sudo docker push registry.aliyuncs.com/qinyujia-test/nodejs-demo

#### Step 3 Automatically redeploy the application

#### 3.1 Deploy the application for the first time

Use the orchestration template to deploy the image created in step 2.3 to Container Service and create the nodejs-demo application.

Example:

```
express:
image: 'registry.aliyuncs.com/qinyujia-test/nodejs-demo'
expose:
    - '22'
    - '3000'
restart: always
labels:
    aliyun.routing.port_3000: express
```

#### 3.2 Automatic redeployment

1. Select the created application **nodejs-demo** and create the trigger.



Trigger 1. You can only have one of each trigger type.		Cr	eate Trigger 🔷 🔺
Trigger Link (move mouse over to copy)	Secret (move mouse over to copy)	Туре	Action
https://undefined/hook/triager?triagerUrl=Y2lkNW11NTkMzhlZTOxMzhNiJhNiqyY2axNiY3NzhfGplbmtpbnN8cmVkZX8sb3l8MTjjYTNMTYy2axNiY3NzhfGplbmtpbnN8cmVkZX8sb3l8MTjjYTNMTYy2axNiY3NzhfGplbmtpbnN8cmVkZX8sb3l8MTjjYTNMTYy2axNiY3NzhfGplbmtpbnN8cmVkZX8sb3l8MTjjYTNMTYy2axNiY3NzhfGplbmtpbnN8cmVkZX8sb3l8MTjjYTNMTYy2axNiY3NzhfGplbmtpbnN8cmVkZX8sb3l8MTjjYTNMTYy2axNiY3NzhfGplbmtpbnN8cmVkZX8sb3l8MTjjYTNMTYy2axNiY3NzhfGplbmtpbnN8cmVkZX8sb3l8MTjjYTNMTYy2axNiY3NzhfGplbmtpbnN8cmVkZX8sb3l8MTjjYTNMTYy2axNiY3NzhfGplbmtpbnN8cmVkZX8sb3l8MTjjYTNMTYy2axNiY3NzhfGplbmtpbnN8cmVkZX8sb3l8MTjjYTNMTYy2axNiY3NzhfGplbmtpbnN8cmVkZX8sb3l8MTjjYTNMTYy2axNiY3NzhfGplbmtpbnN8cmVkZX8sb3l8MTjjYTNMTYy2axNiY3NzhfGplbmtpbnN8cmVkZX8sb3l8MTjjYTNMTYy	74386f737245553732703738674b7966439e	Redeploy	Delete Trigger

2. Add a line to the shell script in 2.3. The address is the trigger link of the created trigger.

```
curl `https://cs.console.aliyun.com/hook/trigger?triggerUrl=***==&
secret=***'
```

**3.** Change the command in the example of 2.3 as follows:

```
cd chapter2
sudo docker build -t registry.aliyuncs.com/qinyujia-test/nodejs-
demo .
sudo docker login -u ${yourAccount} -p ${yourPassword} registry.
aliyuncs.com
sudo docker push registry.aliyuncs.com/qinyujia-test/nodejs-demo
curl `https://cs.console.aliyun.com/hook/trigger?triggerUrl=***==&
secret=***'
```

After pushing the image, Jenkins automatically triggers the redeployment of the nodejs-demo application.

### Step 4 Configure email notification of the results

To send the unit test or image building results to relevant developers or project execution initiators by email, perform the following configurations:

 On the Jenkins homepage, click Manage Jenkins > Configure System, and configure the Jenkins system administrator email.

Jenl	ins Location		
	Jenkins URL System Admin e-mail address	http://jenkins.c11267d36daf04ee3960854773128225e.cn-hangzhou.alicontainer.com/	0
		jenkins-cs@alibaba-inc.com	0

**2.** Install the Extended Email Notification plug-in, configure the SMTP server and other relevant information, and then set the default email recipient list, as shown in the following figure:

E-mail Notification		
SMTP server	smtp.alibaba-inc.com	0
Default user e-mail suffix		0
Use SMTP Authentication		0
User Name	jenkins-cs@alibaba-inc.com	
Password		
Use SSL	۷	0
SMTP Port	465	Ø
Reply-To Address	101000	
Charset	UTF-8	
<ul> <li>Test configuration by sending test e-mail</li> </ul>		

The preceding example shows the parameter settings of the Jenkins application system. The following example shows the relevant configurations for Jenkins projects whose results are to be pushed by email.

**3.** Add post-building steps in the Jenkins project, select Editable Email Notification and enter the email recipient list.

Add build step 👻		
Post-build Actions		
Editable Email Notification		?
Disable Extended Email Publisher		0
	Allows the user to disable the publisher, while maintaining the settings	
Project Recipient List	@alibaba-inc.com	
		0

4. Add a trigger to send emails.

Triggers	Always	0	
	Send To	© Delete	
	Developers	(?) Delote	
	Requestor	() Delete	0
	Add 👻		
		Advanced	
		Remove Trigger	