Resource Formation Service

User Guide

 Issue
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Resource Formation Service

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1.1 Getting Started

1.1.1 Accessing Resource Formation Service (RFS)

1. Log in to the **Huawei Cloud console** and click **Service List > Management & Governance > Application Orchestration Service**.

2. Log in to the AOS console and click **Resource Formation**.

The supported Regions for RFS are as follows:

Site	Region Name	Region Code
------	-------------	-------------

1.1.2 Viewing the Stack Status

You can manage stack lifecycle (such as creation, update, deletion, and query) and the lifecycle of execution plans of a stack (such as creation, deletion, and query).

 Table 1 describes stack statuses.

 Table 2 describes execution plan statuses.

Status	Description
Creation Complete	The stack has been created but not deployed.
Deployment In Progress	Stack deployment is in progress.
Deployment Complete	The stack has been deployed.
Deployment Failed	The stack deployment failed.
Deletion In Progress	Stack deletion is in progress.
Deletion Failed	Stack deletion failed.
Rollback In Progress	Stack rollback is in progress.
Rollback Failed	Stack rollback failed.
Rollback Complete	The stack has been rolled back.

 Table 1-1
 Stack statuses

 Table 1-2 Execution plan statuses

Status	Description
Creation In Progress	Execution plan creation is in progress.
Creation Failed	Execution plan creation failed.
Available	The execution plan is created and to be deployed.
Applied	The execution plan has been deployed.

1.1.3 Creating a Stack

On the stack list page, click **Create Stack** in the upper right corner, as shown in **Figure 1-1**.

Figure 1-1 Creating a stack

Stacks ⑦					😥 User Gu	de Create Stack
				St	arch by stack name by default.	QC
Stack Name	Status 7	Description	Created 4F	Updated ↓≡	Operation	
stack_20230210_1046_f2mc 920194bf-9bb0-44c5-8150-5e30a067e532	Deployment Complete	-	2023/02/10 10:47:01 GMT+08:00	2023/02/10 10:48:31 GMT+0	8:00 Delete Update	

Procedure:

1. Select a template.

There are ways to select a template, as shown in **Figure 1-2**: (1). Enter a URL of an OBS template. (2). Upload a local template file.

Figure 1-2 Selecting a template

Create Stack	
3 Select Template	- ② Configure Parameters
* Creation Mode	Existing languates
* Template Source	Upload Template A stack to created using a template. The template must certain the deployment code lile which the name entension is if or if joon.
* Template URL	Enter the URL of the corresponding template. The URL must contain at least the deployment code the, and the file size cannot exceed 1 MB.
	• RFS only uses the data you upload for resource management. Your temptate will not be encrypted. KAXS and DEW are recommended for encryption of sensitive variables. Currently, the RFS canside can automatically use KAXS to encrypt your sensitive variables.

The following is an example of uploading a local template file. In this example, the **ecs_test.tf.json** file is uploaded. The template content is as follows:

```
{
 "terraform": {
   "required_providers": {
    "huaweicloud": {
      "source": "huawei.com/provider/huaweicloud",
"version": "1.41.0"
    }
  }
 },
  'provider": {
   "huaweicloud": {
    "cloud": "myhuaweicloud.com",
    "endpoints": {
      "iam":"iam.cn-north-4.myhuaweicloud.com"
    },
"insecure": true,
    "region": "cn-north-4",
    "auth_url": "https://iam.cn-north-4.myhuaweicloud.com:31943/v3"
  }
 },
  'variable": {
   "vpc_name": {
    "type": "string",
"description": "vpc name",
    "default": "rf_teststack_vpc",
    "sensitive": true,
"nullable": false
  },
   "subnet_name": {
    "type": "string",
"description": "subnet name",
"default": "rf_teststack_subnet"
   },
   "ecs_name": {
    "type": "string",
    "description": "ecs name",
    "default": "rf_teststack_ecs"
   "ecs_admin_passwd": {
    "type": "string",
"description": "ecs passwd"
  }
 },
  "resource": {
   "huaweicloud_vpc": {
    "rf_doc_vpc": {
      "name": "${var.vpc_name}",
"cidr": "192.168.0.0/16"
    }
  },
   "huaweicloud_vpc_subnet": {
    "rf_doc_subnet": {
      "name": "${var.subnet_name}",
      "vpc_id": "${huaweicloud_vpc.rf_doc_vpc.id}",
```

```
"cidr": "192.168.1.0/24",
     "gateway_ip": "192.168.1.1"
   }
  },
   "huaweicloud_compute_instance": {
    "rf_doc_ecs": {
     "name": "${var.ecs_name}",
     "flavor_id": "c7.large.2",
     "admin_pass": "${var.ecs_admin_passwd}",
     "image_id": "cecc4bcf-b055-4d35-bd5f-693d4412eaef",
     "network": {
      "uuid": "${huaweicloud_vpc_subnet.rf_doc_subnet.id}"
     },
     "system_disk_type": "SAS",
     "system_disk_size": 100,
     "stop_before_destroy": false,
     "delete_disks_on_termination": true,
     "charging_mode": "postPaid",
     "auto_renew": false
   }
  }
 }.
  'output": {
  "ecs_address": {
    "value": "${huaweicloud_compute_instance.rf_doc_ecs.access_ip_v4}",
    "description": "The ecs private address."
  },
   "ecs_id": {
    "value": "${huaweicloud_compute_instance.rf_doc_ecs.id}",
    "description": "The ecs resource id."
  }
}
}
```


The sample template contains charged resources. Check whether resources need to be enabled before using the template.

The template consists of five parts:

- a. huaweicloud_vpc in resource indicates VPC information.
- b. **huaweicloud_vpc_subnet** in **resource** indicates information about a subnet defined in the VPC. A subnet is a segment within the IP address range of the VPC.
- c. **huaweicloud_compute_instance** in **resource** indicates information about an ECS defined in the template.
- d. **variable** indicates variables defined by users in templates during stack creation and deployment.
- e. **output** defines the outputs of templates. After a stack is created, its output is generated based on the definition and displayed on the **Outputs** tab page.
- 2. Configure parameters.

Click **Next** to go to the parameter configuration page, where you can modify the stack name and description, as shown in **Figure 1-3**.

The stack name must start with a letter and can contain a maximum of 128 characters, including letters, digits, underscores (_), and hyphens (-). The name must be unique.

A stack description can contain a maximum of 1024 characters.

Figure 1-3 Configuring parameters

Create Stac			
) Select Template	Configure Parameters 3 Configure Stack	Confirm Configurations	
* Stack Name	stack_20230210_0949_0n21		
	The stack name must start with a letter and can contain a maximum of 128 characters,	including letters, digits, undersco	res (_), and hyphens (-). The stack name must be unique. The stack name must be unique.
Description	Enter a description of the stack.		
	م 0/255		
Configure Enter a keyword	Parameters Q Encrypt some resources based	on the template requirements. (0
Parameter	Value	Туре	Description
* vpc_name	rf_teststack_vpc	string	vpc name
subnet_name	rf_teststack_subnet	string	subnet name
ecs_name	rf_teststack_ecs	string	ecs name
ecs_admin_pas	swd	string	ecs passwd

Parameters marked with a red asterisk (*) are mandatory. Set these parameters to valid values.

If a value is invalid, the corresponding text box will turn red (as shown in **Figure 1-4**) and page redirection will not be triggered after you click **Next**.

Figure 1-4 Text box with an invalid value

Parameter	Value
* vpc_name	

Click Next. The Configure Stack page is displayed.

If the stack name or description is imported using a URL and contains special characters, the characters must be encoded following the HTTP encoding rules first.

Check whether the default VPC, subnet, and ECS names used on this page already exist on the corresponding consoles. If the names already exist, change them to unique ones to prevent creation failures.

3. Configure the stack.

Click Next to go to the Advanced Settings page, as shown in Figure 1-5.

Figure 1-5 Configuring the stack

< Create Stack	k la
1 Select Template -	
* Agency	huseecloud Int_admm_trust C An agency can clearly define MS's operation permissions (such as creation, update, and deletion) on stack resources. If the agency permissions are insufficient, subsequent operations such as deployment and execution plan creation may fail. Create Agency on MAN
Auto-Rollback	If auto-rollback is enabled, the stack automatically rolls back to the previous successful resource status when the operation fails. After the stack is created, you can modify the stack configurations on to details page.
Deletion Prote	ction Deletion protection prevents the stack from being deleted accidentally. You can modify it on the stack details page.

Mandatory parameter (marked with *)

IAM Permission Agency: An agency can clearly define RFS's operation permissions (such as creation, update, and deletion) on stack resources. If the agency permissions are insufficient, subsequent operations may fail.

Optional parameters:

Deletion Protection: prevents the stack from being deleted accidentally. After a stack is created, you can update this configuration by clicking **Update** in the **Operation** column.

Auto-Rollback: If auto-rollback is enabled, the stack automatically rolls back to the previous successful resource status when an operation fails.

Click **Next** to go to the **Confirm Configurations** page.

4. Confirm the configurations.

After you confirm the configurations, you can click either **Create Execution Plan** or **Directly Deploy Stack**.

a. If you click **Directly Deploy Stack**, a confirmation dialog box will be displayed.

Figure 1-6 Directly Deploy Stack

Directly Deploy Stack	×	
Direct deployment immediately enables all resources in the stack, and fees are generated based on the resources enabled. Are you sure you want to deploy the stack?		
Yes No		

Click **Yes**. A new stack is generated and its status is **Deployment In Progress**, as shown in **Figure 1-7**.

Figure 1-7 Deployment In Progress

Sta	cks 💮						🕼 User Guide	Create St	ck
						Search by stack name by default.		Q	2
	Stack Name	Status 🖓	Description	Created 4F	Updated ↓≣	Operation			
	stack_20230210_1046_f2mc 920194bf-9bb0-44c5-8150-5e30a067e532	Deployment In Progress		2023/02/10 10:47:01 GMT+08:00	2023/02/10 10:47:02 GN	T+08:00 Delete Up	idate		

Then, the status changes to **Deployment Complete**, as shown in **Figure 1-8**.

Figure 1-8 Deployment Complete

			-					
Sta	icks ⑦						🕼 User Guide	Create Stack
						Search by stack name by d	efault.	QC
	Stack Name	Status 🖓	Description	Created 4F	Updated J≣		Operation	
	stack_20230210_1046_f2mc 920194bf-9bb0-44c5-8150-5e30a067e532	Deployment Complete	-	2023/02/10 10:47:01 GMT+06:00	2023/02/10 10:48:31 GF	VT+08:00	Delete Update	

b. If you click **Create Execution Plan**, a dialog box of creating execution plan will be displayed. In this dialog box, you can set the name and description of the execution plan, as shown in **Figure 1-9**.

Figure 1-9 Create Execution Plan dialog box

Create Execution Plan

- ×
- Before deploying a stack, you can create an execution plan to preview the stack information and check its configurations to evaluate the impact on running resources.
- RFS is free of charge, but the resources in the stack are not. After the execution
 plan is created, a stack for which no resource is enabled is generated, and the
 estimated price is displayed in the execution plan details.

★ Execution Plan Name	executionPlan_20230210_1050_1925	
Description	Enter a description of the execution plan.	
		<i>«</i> 0/255
	OK Cancel	

Click **OK**. The **Execution Plans** tab page is displayed.

Wait until the execution plan is created and refresh the page. The execution plan status changes to **Available**, as shown in **Figure 1-10**.

Figure 1-10 Available

< stack_20230210_1046_f2 Basic Information Resources Outputs Events	Temptate Execution Plans			Delete Upda	ste Template/Parameter
Deplay				Enter a keyword.	QC
Execution Plan Name/ID	Status	Estimated Price ③	Created	Description	Operation
executionPlan_20230210_1050_1925 c4002eff-242c-46a8-a7dc-401327312d93	Available	View Details	2023/02/10 10:50:42 GMT+08:00	-	Delete Deploy

Return to the stack list page. The stack status is **Creation Complete**, as shown in **Figure 1-11**.

Figure 1-11 Stack list

Stacks ③					(SP User Guid	Create Stack
				Search	by stack name by default.	QC
Stack Name	Status V	Description	Created 4F	Updated 4	Operation	
stack_20230210_1046_f2mc 92019401-9000-44c5-8150-5e30a	267e532 Deployment Compl	oto	2022/02/10 10:47:01 GMT+08:00	2022/02/10 10:48:31 GMT+08:00	Delete Update	
stack_20230110_1734_1791 231b6bfa-38a3-463a-b8cc-20946	lecf824 Deployment Compl	ete	2023/01/10 17:34:00 GMT+08:00	2023/01/10 17:34:55 GMT+08:00	Delete Update	

Creating an execution plan can preview the resource attribute changes of the entire stack and evaluate the impact. If the execution plan meets your expectations, you can execute the plan. Creating an execution plan does not incur fees. The system changes your stack only when you execute the plan.

Click **Deploy** in the **Operation** column of the execution plan to deploy it, as shown in **Figure 1-12**.

Figure 1-12 Execution plan dialog box

Are yo	u sure you want to execute the	plan?		
Exec	ution Plan Name	Status	Created	
exec	utionPlan_20230210_105	Available	2023/02/10 10:50:42 GMT+08	
•	After the plan is executed, the resources in the template are based on resource payment is	enabled, which		

In the **Execution Plan** dialog box, click **Execute**. A message indicating that the execution plan is being deployed is displayed in the upper right corner. Return to the stack list page. A new stack is generated and its status is **Deployment In Progress**, as shown in **Figure 1-13**.

Figure 1-13 Deployment In Progress

Stacks ③					🕼 User Guide	Create Stack
				Search by stack	name by default.	QC
Stack Name	Status 🖓	Description	Created 4F	Updated J≡	Operation	
stack_20230210_1046_f2mc 920194bf-9bb0-44c5-8150-5e30a067e532	Deployment in Progress	-	2023/02/10 10:47:01 GMT+08:00	2023/02/10 10:47:02 GMT+08:00	Delete Update	

Then, the stack status changes to **Deployment Complete**, as shown in **Figure 1-14**.

Figure 1-14 Deployment Complete

Stacks ⑦					🕼 User Guide	Create Stack
				Search by stack n	ame by default.	QC
Stack Name	Status 🖓	Description	Created ↓₽	Updated J≡	Operation	
stack_20230210_1046_f2mc 920194bf-9bb0-44c5-8150-5e30a057e532	Deployment Complete		2023/02/10 10:47:01 GMT+08:00	2023/02/10 10:48:31 GMT+08:00	Delete Update	

On the **Execution Plans** tab page of the stack details page, the execution plan status is **Applied**, as shown in **Figure 1-15**.

Figure 1-15 Applied

< stack_20230210_1046_f2 Basic Information Resources Outputs Events	a Template Execution Plans			Delete	date Template/Parameter
Deptoy				Enter a keyword.	QC
Execution Plan Name/ID	Status	Estimated Price ③	Created	Description	Operation
executionPlan_20230210_1050_1925 c4002eff-242c-46a8-a76c-481327312d93	Applied		2023/02/10 10:50:42 GMT+08:00	-	Delete

Click the **Events** tab. The event list shows that resources of the stack are deployed, as shown in **Figure 1-16**.

Figure 1-16 Resources deployed

tack_20230210_1046_f2	uts Events Tempute	Padouttini Pitana		Delote Updato Tomolato/Parametor
				Enter a keyword. Q
n+ 1≣	iypa	Description	Mesource Nome/Type	Associated (Reasurce II)
23/02/10 10.13.25 GMT+08.00	-	Apply compretel Resources: 3 actived, 0 citien rowd, 0 devicered,	-	.
2502/10/10/4/25 030 03/00	Creation Domplete	nutwendowing computer_extranse eco-libert1 Operation complete after times (devedlee4cb/bf1644A3-6686-665440646347)	005 10001 EC3	ec:/ee4bt-116-4/a1-985-985-985-986142
23/02/10 10:18:22 GMT+38.00	Creation In Programs	hearveidead compute indexees-flood, Still creating (fmSe elapsed)	ecs-fboa1 ECS	84
502/10/10/4/112 (201) (30100)	Creation in Progress	nueweichtun_compute_exempte ers-Thest 128 mesting [588 elepsed]	eco 10001 EC9	77
3/02/10 10.13.02 GMT+38.00	Creation In Progress	husweidbad compole instance-po-floot), 518 overfinum (46 eksped)	ecs-tboat FCS	2
30210-104252 (341-0310)	Creation in Program	nurweidoud_complete_extense eci-flost1128 creating [10s alroad]	ecs 1000 I ECS	25
3/02/10 10.47.42 GMT+38.00	Croation in Program	hasneidsal_compute_instance.co.: (bool: Sill arealing (200 elused)	ecs-1boa1 1 C21	
(5/02/10 10:47/32 GMI +98:00	Creation in Progress	nuaiweidoud_compute_instance.ecs-1bos1: 308 creating[105 Hepsed]	000 10001 ECS	21
3/02/10 10:47:22 GMT+08:00	Creation in Progress	nuaveidaud_compute_instance.ec0 fibeo1: Creeting	ecs-fboel I (2)	
3/02/10 10:47:22 GMT+38:00	Creation Complete	huavvoidoud_vpc_subnet.vpc-subnet-ug0cp: Creation complete after 7s (jdu-c35c3e47-0821-41d4-910c-94557Da0662)	vpc-subset-ug0pp Subset	c35c3e47-6821-4154-915c-9455793e06f2

You can view details on the console of the corresponding cloud service.

i. In the service list, locate and click **Elastic Cloud Server**. On the displayed page, view the deployed ECS, as shown in **Figure 1-17**.

Figure 1-17 ECS

Elastic C	loud Server ⑦						e Troubleshooting	I ECS News	Quick Links	Buy ECS
Star	t Stop Reset Password	More 🔻							C 🛞 🖸	88 =
Searc	h by Name by default.									@ Q
	Name/ID	Monitoring	AZ 🖓	Status 🖓	Specifications/Image	IP Address	Billing Mode 7	Tag	Operation	
	rf_teststack_ecs1 ec0ee4bf-3f16-47a3-96f6-9d549b	R	AZ3	Running	1 vCPUs 1 GiB s6 Public-CAD-HCE-B	192.168.0.166 (Priv	Pay-per-use	-	Remote Login	More 👻

Resources of the stack are deployed.

1.1.4 Querying a Stack

Log in to the RFS console and click **Stacks** in the navigation pane on the left. The stack list page is displayed.

In the search box above the stack list, enter the name of the target stack and click the search button, as shown in **Figure 1-18**.

Figure	1-18	Querying	а	stack
--------	------	----------	---	-------

Stacks ⑦						(🔉 User Guld	Create Stack
					stack_20230210_1046_f2	nc	×QC
Stack Name	Status 🕜	Description	Created 4F	Updated J≣		Operation	
stack_20230210_1046_f2mc 920194bf-9bb0-44c5-8150-5e30a067e532	Deployment Complete		2023/02/10 10:47:01 GMT+08:00	2023/02/10 10:57:21 G	MT+08:00	Delete Update	

1.1.5 Updating a Template or Parameter

Stack change records are not available. If you want to view change details, you are recommended to create an execution plan.

You can add cloud service resources or change resource specifications in either of the following ways: Go to the stack list page, locate the target stack, and click **Update** in the **Operation** column. Alternatively, go to the stack details page and click **Update Template/Parameter** in the upper right corner to enter the page for updating the resource stack, as shown in **Figure 1-19**.

Figure 1-19 Selecting a template

< │ Update Template/Parame…								
1 Select Template (2)	Configure Parameters	— (3) Confirm Configurations						
★ Update Mode	Current Template	Replace Current Template						

You can select **Current Template** or **Replace Current Template** (use a new template) to update the stack.

Solution 1: Using the current template

1. Click **Next** to go to the **Configure Parameters** page and modify parameters on it, as shown in **Figure 1-20**.

Figure 1-20 Configuring parameters

Update Template/Paran							
Select Template (2)	elect Template ———— ② Configure Parameters ———— ③ Confirm Configurations						
RFS is free of charge, but the r	resources in the stack are not. Currently, you need to create an	n execution plan (free of charge) to obtain the	estimated price.				
Template Info							
Stack Name	stack_20230210_1046_f2mc			Description			
0							
Parameters 🖉							
Parameters 🖉	Value	Туре	Description				
		Type string	Description vpc name				
Parameter Name	Value						
Parameter Name	Value rf_teststack_vpc1	string	vpc name				

2. Click **Next** to go to the **Confirm Configurations** page, as shown in **Figure** 1-21.

Figure 1-21 Confirming configurations

Update Ten	nplate/Parame…				
Select Template	2 Configure Parameters -	(3) Confirm Configuration	IS		
+ Stack Name	stack_20230210_1046_f2mc				
	The stack name must start with a letter an	d can contain a maximum of 128 chai	racters, including letters, digits, underscores	(_), and hyphens (-). The stack name must be unique. The stack name must be unique.	ne stack name must be unique.
Description	Enter a description of the stack.				
		0/255			
Configure Enter a keyword	Parameters		based on the template requirements.		
			based on the template requirements. ⑦	Description	
Enter a keyword	d. Value		_	Description vpc name	
Enter a keyword	d. Value rf_test	Q Encrypt some resources	Туре		
Enter a keyword Parameter * vpc_name	d Value r_iest	Q Encrypt some resources	Type string	vpc name	

Click Directly Deploy Stack. The Events page is displayed.
 The status changes to Update Complete, as shown in Figure 1-22.

Figure 1-22 Update Complete

< stack_20230210_1046_f2 Basic Information Resources Outputs	Events Template Exec	ution Plans		Delete Update TemplateParameter C
				Enter a keyword. Q
Time J≣ 2023/02/10 10:57:21 GMT+08:00	Type LOG	Description Apply required resource success.	Resource Name/Type	Associated Resource ID
2023/02/10 10:57:18 GMT+08:00	-	Apply completel Resources: 0 added, 3 changed, 0 destroyed.		
2023/02/10 10:57:18 GMT+08:00	Update Complete	huaweicloud_compute_instance.ecs-lboa1: Modifications.complete.after 2s [id=ec0ee4tif-3116-47a3-9816-9d548b58a342]	ecs-1boa1 ECS	ec0ee4bf-3116-47a3-9086-9d549b56a342
2023/02/10 10:57:16 GMT+08:00	Update In Progress	huaweicloud_compute_instance.ecs-1boa1: Modifying[id=ec0ee4bf-3116-47a3-6015-9d549b56a342]	ecs-1boa1 ECS	ec0ee4bf-3115-47a3-9665-9d549b55a342
2023/02/10 10:57:16 GMT+08:00	Update Complete	huaneicloud_vpc_subnet-vpc-subnet-up0pp: Modifications complete after 1s [id=c35c3e47-6021-4164-916c-9455773e0802]	vpc-subnet-ug0pp Subnet	c35c3e47-8821-41d4-916c-94557f3e06f2
2023/02/10 10:57:15 GMT+08:00	Update In Progress	hueneicloud_vpc_subnet.vpc-subnet-up0pp: Modifying [id=c35c3e47-6821-4164-916c-9455779e062]	vpc-subnet-ug0pp Subnet	c35c3e47-6821-41d4-916c-94557f3e06f2
2023/02/10 10:57:15 GMT+08:00	Update Complete	husweicloud_vpc.vpc-ght/nv: Modifications complete after 1s (id=36375627-990f-40e7-9be0-b5af8448o574)	vpc-ghhfw VPC	36375627-9901-40e7-9be8-b5st8448c674
2023/02/10 10:57:14 GMT+08:00	Update In Progress	huawelcloud_vpc vpc-ghthv: Modifying [d=36375627-9904-40e7-9be8-b5af8448c674]	vpc-ghhfw VPC	36375627-9901-40e7-9be8-b5a18448c674
2023/02/10 10:57:12 GMT+08:00	LOG	Creating required resource now		-
2023/02/10 10:48:31 GMT+08:00	LOG	Apply required resource success.	-	-

Solution 2: Replacing the current template (see Creating a Stack)

1.1.6 Creating an Execution Plan

On the stack list page, click the name of the stack to go to its details page. Click **Update Template/Parameter** in the upper right corner to go to the page for creating an execution plan, as shown in **Figure 1-23**.

Figure 1-23 Page for creating an execution plan

Update Template/Parame…							
1 Select Template — 2) Configure Parameters	—— (3) Confirm Configurations					
* Update Mode	Current Template	Replace Current Template					

The subsequent steps are the same as those for creating a stack, except for one difference that you need to click **Create Execution Plan** instead of **Directly Deploy Stack**.

Then, an execution plan is generated, but the stack is not directly deployed. If you create multiple execution plans, they will exist in the same stack, as shown in **Figure 1-24**.

Figure 1-24 Execution plan list

< stack_20230210_1046_f2 Basic Information Resources Outputs Event	ts Template Execution Plans			Delete Upda	ate Template/Parameter
Deploy				Enter a keyword,	QC
Execution Plan Name/ID	Status	Estimated Price ③	Created	Description	Operation
executionPlan_20230210_1111_y191 18354ec4-1137-4608-9bb9-32a32d0d2992	Available	View Details	2023/02/10 11:11:02 GMT+08:00		Delete Deploy
executionPlan_20230210_1110_7hqt 6012cfac-0e99-4cd3-bca1-d67b0cd23tc8	Available	View Details	2023/02/10 11:10:40 GMT+08:00	-	Delete Deploy

Locate the row that contains the generated execution plan and click **Deploy** in the **Operation** column if you want to deploy tour execution plan.

If an execution plan is no longer used, click **Delete** in the **Operation** column. Click **OK** in the dialog box displayed, as shown in **Figure 1-25**:

Figure 1-25 Deleting an execution plan

Delete Execution Plan							
Are you sure you want to delete the	execution plan?						
Execution Plan Name	Status	Created					
executionPlan_20230426_164	Available	2023/04/26 16:45:12 GMT+08					
Execution plans cannot be re	estored once delete	ed.					
	OK Cance	1					

1.1.7 Viewing Estimated Fees

On page of the created execution plan (as shown in **Figure 1-26**), click **View Details**. The **Price Details** dialog box is displayed and you can see the estimated price, as shown in **Figure 1-27**.

Figure 1-26 Viewing price details

stack_20230210_1046_f2				Delete	Update Template/Parameter
c Information Resources Outputs Ev	ents Template Execution Plans				
Deploy				Enter a keyword.	Q
Execution Plan NameIID	Status	Estimated Price ()	Created	Description	Operation
executionPlan_20230210_1111_y191 18354ec4-1137-4608-9bb9-32a32d0d2992	Available	Pay-per-Use: $\underline{\forall 0 0 1 \text{hour(s)}}$ Price inquiry is not supported for some resources. For details, see View Details	2023/02/10 11:11:02 GMT+08:00		Delete Deploy
executionPlan_20230210_1110_7hqf 6012cfac-0e99-4cd3-bca1-d67b0cd23fc8	Available	View Details	2023/02/10 11:10:40 GMT+08:00	-	Delete Deploy

Figure 1-27 Price details

< stack_20230210_1046_f2 Basic Information Resources Outputs Events	s Template Execution Dians					Delete	Update Template/Parameter
Basic Information Resources Outputs Events	Price Details				×		QC
Execution Plan Name/ID	This price is an estimate and may differ	from the final price. Pricing Details.	Price inquiry is not supported f	or some resources. Go to Prio	e Calculator to calculate the fees.	Description	Operation
executionPlan_20230210_1111_y191 18354ec4-1137-4608-9bb9-32a32d042992	Total price Estimated pay-per-use price:	F0.01/hour(s) ted for some resources. For detail	s, see the "To Be Supported" ta	b page.		-	Delete Deploy
executionPlan_20230210_1110_7hqf 6012cfac-0e99-4cd3-bca1-d6760cd23fc8	Pay-per-Use Free To Be Sup	ported (t)			Export Price List	-	Delete Deploy
C executionPlan_20230210_1109_v01x 55a785x8-2b7b-4b66-80b3-d88c9eb54b9b	Cloud Product Logical Name ⑦ Elastic Cloud Serve ecs-tboa1	Region Qua CN-North-Ulan 1	Original Price ¥ 0.01 /hour(s)	Discount Details	Estimated Discounted P ¥0.01 /hour(s)	-	Delete
executionPlan_20230210_1050_1925 c4002eff-242c-46a8-a7dc-481327312d93			Close			-	Delete

Figure 1-28 shows the estimated price of yearly/monthly-billed resources. **Figure 1-29** shows the estimated price of pay-per-use resources. **Figure 1-30** shows the resources that do not support price inquiry.

Table 1-3 lists the resources that support price inquiry.

Figure 1-28 Yearly/Monthly

Price Detail	s						
1 This price is	s an estimate and may diffe	er from the final pric	e. Pricing Details	. Price inq	uiry is not supported for so	me resources. Go to Price Cal	culator to calculate the fees.
	stimated yearly/monthly pr					ge.	
'early/Monthly	Pay-per-Use	Free To E	Be Supported	D			Export Price List
Cloud Pro	Logical Name	Region	Duration	Q	Original Price	Discount Details	Estimated Discounted .
Elastic Cloud Se	name1	CN-North-U	2month(s)	1	¥214.40	¥0.00	¥214.40
Elastic Cloud Se	name2	CN-North-U	2year(s)	1	¥ 2,572.80	¥ 858.50	¥ 1,714.30
Elastic Cloud Se	name2	CN-North-U	2year(s)	1 Clos	_	¥ 858.50	¥ 1,714.30

Figure 1-29 Pay-per-use

rice Details						
1 This price is a	n estimate and may differ from	the final price. Pricing	Details. Pr	ice inquiry is not supported for s	ome resources. Go to Price	Calculator to calculate the fees.
	mated pay-per-use price: ¥0.0 Price inquiry is not supported i		or details,	see the "To Be Supported" tab p	age.	
ay-per-Use	Free To Be Supporte	ed @				Export Price List
Cloud Product	Logical Name	Region	Qua	Original Price	Discount Details	Estimated Discounted P
Elastic Cloud Serve	ecs-1boa1	CN-North-Ulan	1	¥ 0.01 /hour(s)	¥ 0.00 /hour(s)	¥ 0.01 /hour(s)

Figure 1-30 To be supported

Price Details				
1 This price is an estimate	and may differ from the fin	al price. Pricing Details. Price inquiry is	s not supported for some resources. Go to Price C	alculator to calculate the fees.
	per-use price: ¥0.01/hour ry is not supported for son	(s) ne resources. For details, see the "To	Be Supported" tab page.	
Pay-per-Use Free	To Be Supported ⑦			Export Price List
Cloud Product		Logical Name	Region	
Virtual Private Cloud		vpc-subnet-ug0pp	CN-North-Ulanqab203	
		Close		

Cloud Service	Resource Type	Billing Mode
Elastic Cloud Server (ECS)	huaweicloud_compute_in stance	Yearly/ Monthly and pay- per-use
Elastic Volume Service (EVS)	huaweicloud_evs_volume	Yearly/ Monthly and pay- per-use
Elastic IP (EIP)	huaweicloud_vpc_eip	Yearly/ Monthly and pay- per-use
Bandwidth	huaweicloud_vpc_bandwi dth	Pay-per-use
Elastic Load Balance (ELB)	huaweicloud_elb_loadbal ancer	Pay-per-use
NAT Gateway	huaweicloud_nat_gatewa y	Pay-per-use
Relational Database Service (RDS)	huaweicloud_rds_instanc e	Yearly/ Monthly and pay- per-use
Cloud Container Engine (CCE)	huaweicloud_cce_cluster	Yearly/ Monthly and pay- per-use
Cloud Search Service (CSS)	huaweicloud_css_cluster	Pay-per-use
GaussDB(for Redis)	huaweicloud_gaussdb_re dis_instance	Yearly/ Monthly and pay- per-use
GaussDB(for MySQL)	huaweicloud_gaussdb_my sql_instance	Yearly/ Monthly and pay- per-use
Scalable File Service (SFS)	huaweicloud_sfs_turbo	Pay-per-use
Distributed Cache Service (DCS)	huaweicloud_dcs_instanc e	Yearly/ Monthly and pay- per-use

Table 1-3 Cloud services/Resources that support price inquiry and billing modes

Cloud Service	Resource Type	Billing Mode
Distributed Message Service (DMS) for Kafka	huaweicloud_dms_kafka_i nstance	Pay-per-use

Price estimation will fail if mandatory fields are not specified or a field is invalid in the template used for price estimation.

After the price inquiry completes, the estimated price is displayed in the basic information on the execution plan details page, as shown in **Figure 1-31**.

Figure 1-31 Execution plan details

< stack_20230210_1046_f2		stack_20230210	_1046_f2mc				×
Basic Information Resources Outputs Events Template Execution Plans	_	Basic Information					
Deploy			executionPlan_20230210_10	-			
Execution Plan Name/ID Status	Estimated Price (1)	Execution Plan ID Description	c4002eff-242c-46a8-a7dc-48	1327312d93			
executionPlan_20230210_1050_1925 c4002etf:242c-46a8-a7dc-481327312d93		Created	2023/02/10 10:50:42 GMT+0	8:00			
040028112420408048160401321312083		Status	Applied				
		Abstract	Resource modified: 3				
		Change History					С
						Enter a keyword.	Q
		Operatio	Mode	Resource Name	Resource Type		
		✓ Modify	RESOURCE	ecs-1boa1	huaweicloud_compute_in:	stance	
		✓ Modify	RESOURCE	vpc-ghhfw	huaweicloud_vpc		
		✓ Modify	RESOURCE	vpc-submet-ug0pp	huaweicloud_vpc_subnet		

1.1.8 Deleting a Stack

When **Deletion Protection** is disabled:

On the stack list page, locate the created stack and click **Delete** in the **Operation** column. In the dialog box displayed, enter **Delete** in the text box and click **OK**.

Alternatively, go to the stack details page and click **Delete** in the upper right corner, as shown in **Figure 1-32**.

Figure 1-32 Dialog box for deleting a stack

acks ③					🕼 User Guide	Create Stack
	Delete Stack		×	Search by stack t	ame by default.	QC
Stack Name		resources in the stack? Stack and resources canno	e i	Updated ↓Ξ	Operation	
stack_20230210_1046_f2mc	be restored after being deleted. Exercise caution	on when performing this operation.				
920194bf-9bb0-44c5-8150-5e30a067e532	Stack Name Stat	us Created		2023/02/10 10:57:21 GMT+08:00	Delete Update	
stack_20230110_1734_1781	stack_20230210_1046_f2mc Dep	oyment 2023/02/10 10:47:01 GMT+08:00	- 1			
231b6bfa-38a3-463a-b8cc-209461ecf824	Enter Delete to delete the stack and resources			2023/01/10 17:34:55 GMT+08:00	Delete Update	
	Enter Delete.	Enter Delete.				
stack_20230109_0928_q41d 7e1a2e7c-1e54-45b2-a73a-7d6b8b8a7acb	OK	Cancel		2023/01/09 09:57:25 GMT+08:00	Delete Update	
stack_20230103_0951_xpkm 36f7a35f-42a5-4ce7-a2c7-d7eb8f372ac1				2023/01/03 09:57:42 GMT+08:00	Delete Update	
stack_20221229_1622_7r0q 0d3964ac-80e2-4921-b731-749411d45aeb	Deployment Complete -	2022/12/29 16:22:29 GMT+08:00		2022/12/29 16:23:02 GMT+08:00	Delete Update	

When **Deletion Protection** is enabled:

Figure 1-33 shows that the Enabled status of Deletion Protection.

Figure 1-33 Deletion Protection

< stack_20230214_0	950_w213	Delete	Update Template/Paramete	er C
Basic Information Resou	rces Outputs Events Template Execution Plans			
Basic Information				🖉 Edit
Stack Name	stack_20230214_0950_w213			
Stack ID	7911567e-6421-4807-8847-688060078e71a 🗗			
Status	Creation Compile			
Description	H Contraction of the second seco			
IAM Permission Agency ①	(Provider) husmeicloud, (Agency) rf_admin_trust			
Auto-Rollback	Disabled			
Deletion Protection	Enabled			
Created	2023/02/14 09:50:39 GMT+08:00			
Updated	2023/02/14 09:50:39 GMT+06:00			

If you delete a resource stack with deletion protection enabled, an error message will be displayed, as shown in **Figure 1-34**.

Figure 1-34 Deletion failed



1.1.9 Viewing Stack Details

1. Viewing Stack Details

There are six function modules on the stack details page (The stack named **stack_20221206_0933_uiyn** is an example here.):

a. **Basic Information**: displays basic information about the stack, as shown in **Figure 1**.

Figure 1-35 Basic Information

stack_20230210_1		Delete Update Template/Parameter C
Basic Information		<i>L</i> Edi
Stack Name	stack_20230210_1046_[2mc	
Stack ID	92019465/9bb0-44c5-8150-5e30a067e532 🗇	
Status	Deployment Complete	
Description	#	
IAM Permission Agency ③	(Provider) husweicloud, (Agency) rf_sdmin_trust	
Auto-Rollback	Disabled	
Deletion Protection	Disabled	
Created	2023/02/10 10:47:01 GMT+08:00	
Updated	2023/02/10 10.57.12 GMT+08.00	

b. **Resources**: displays information about cloud services or resources generated during plan execution and stack deployment, as shown in **Figure 1-36**.

Figure 1-36 Resources

stack_20230210_1046_f2 Basic Information Resources Outputs Events	Template Execution Plans			Delete Update Template/Parameter C
				Enter a keyword. Q
Cloud Product Name	Physical Resource Name/ID (?)	Logical Name (?)	Resource Type	Resource Status 😨
Elastic Cloud Server	rf_teststack_ecs1 ec0ee4bf-3116-47a3-9615-9d549b56a342	ecs-lboa1	huawelcloud_compute_instance	Creation Complete
Virtual Private Cloud	rf_beststack_vpc1 36375627-9901-40e7-9be8-b5a/8448c674	vpc.ghhtw	huamelcloud_vpc	Creation Complete
Virtual Private Cloud	rf_leststack_submet1 c35c3e47-6821-41d4-916c-94557f3e06f2	vpc-submet-ug0pp	huaweicloud_vpc_subnet	Creation Complete

c. **Events**: displays log information generated during plan execution and stack deployment. Events are updated in real time based on the stack status. For example, **Figure 1-37** shows that three resources are created.

Figure 1-37 Events

Stack_20230210_1046_f2	uts <u>Events</u> Template Ex	ecution Plans		Delete Update Template/Parameter C
				Enter a keyword. Q
Time J≣	Type	Description	Resource Name/Type	Associated Resource ID
2023/02/10 10:57:21 GMT+08:00	LOG	Apply required resource success.	-	-
2023/02/10 10:57:18 GMT+08:00	-	Apply completel Resources: 0 added, 3 chanped, 0 destroyed.		-
2023/02/10 10:57:18 GMT+08:00	Update Complete	huawekcloud_compute_instance.ecs-1boa1: Modifications complete after 2s [id=ec0ee4bf-3116-47a3-86/6-9d540b56a342]	ecs-1boa1 ECS	ec0ae4bf-3116-47a3-9616-9d549b56a342
2023/02/10 10:57:16 GMT+08:00	Update in Progress	huawekcloud_compute_instance.ecs-1boa1: Modifying [id=ec0ee4bf-3f16-47a3-9666-9d549b56a342]	ecs-1boa1 ECS	ec0ee4bf-3f16-47a3-96f6-9d549b56a342
2023/02/10 10:57:16 GMT+08:00	Update Complete	huawekcloud_vpc_subnet.vpc-subnet-up0pp: Modifications complete after 1s [id=c35c3e47-6821-41d4-916c-9455773e0872]	vpc-subnet-ug0pp Subnet	c35c3e47-6821-4164-916c-94557f3e06f2
2023/02/10 10:57:15 GMT+08:00	Update in Progress	huaweicloud_vpc_subnet.vpc-subnet-ug0pp: Modifying [id=c35c3e47-8821-4164-916c-0455773e08f2]	vpc-subnet-ug0pp Subnet	c35c3e47-6821-41d4-916c-94557f3e06f2
2023/02/10 10:57:15 GMT+08:00	Update Complete	huswelcloud_vpc-vpc-ghhfw: Modifications complete after 1s [id=36375627-990f-40e7-8be8-b5af8448c674]	vpc-ghhfw VPC	36375627-9901-40e7-9be8-b5at8448c674
2023/02/10 10:57:14 GMT+08:00	Update In Progress	huaweicloud_vpc.vpc.ght/irr: Modifying [id=36375627-0906-40e7-9be8-b5af8448c674]	vpc-ghhfw VPC	36375627-9901-40e7-9te8-b5at8448c674

d. **Outputs**: displays output parameters in the template, as shown in **Figure 1-38**:

Figure 1-38 Outputs

<pre>< stack_20230210_1046_f2 Basic Information Resources Outputs Events Template Execution</pre>	tion Plans			Delete Update Template/Parameter C
Name	Туре		Value	
		No data available.		

e. **Template**: displays the template content used for creating a stack, as shown in **Figure 1-39**.

Figure 1-39 Template

< stack_20230210_1046_f2	Delete Update Template/Parameter C
Basic Information Resources Outputs Events Template Execution Plans	
Deployment Code	C
Content Tempate if jon × DTempate if jon × 1 1 1 1 1 1 1	

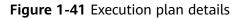
f. **Execution Plans**: displays different execution plans. After an execution plan is generated, you need to click **Deploy** to create resources in the template. After an execution plan is executed, its status changes from

Available to **Applied** and the **Deploy** button disappears, as shown in **Figure 1-40**.

Figure 1-40 Execution Plans

	tck_20230210_1046_f2 formation Resources Outputs Events	Template Execution Plans			Delete Upda	te Template/Parameter
Dep	oloy				Enter a keyword.	QC
	Execution Plan Name/ID	Status	Estimated Price ()	Created	Description	Operation
	executionPlan_20230210_1111_yI9I 18354ec4-1137-4608-9669-32832d0d2992	Available	View Details	2023/02/10 11:11:02 GMT+08:00		Delete Deploy
	executionPlan_20230210_1110_7hqf 6012cfac-0e99-4cd3-bca1-d67b0cd23fc8	Available	View Details	2023/02/10 11:10:40 GMT+08:00	-	Delete Deploy

Click the execution plan name. The execution plan details page is displayed, as shown in **Figure 1-41**.



< stack_20230210_1046_f2			stack	_20230210	_1046_f2mc				×
Basic Information Resources Outputs Even	nts Template Execution P	lans	Basic	Information					
Deploy					executionPlan_20230210_10	-			
Execution Plan Name/ID	Status	Estimated Price ①	Executi Descrip	on Plan ID	c4002eff-242c-46a8-a7dc-48	1327312d93			
executionPlan_20230210_1050_1925 c4002eff-242c-46a8-a7dc-481327312d93	Applied		Creater		2023/02/10 10:50:42 GMT+0	8.00			
04002617242040804700401321312033			Status		Applied				
			Abstrac	1	Resource modified: 3				
			Chang	je History					С
								Enter a keyword.	Q
				Operatio	Mode	Resource Name	Resource Type		
			~	Modify	RESOURCE	ecs-1boa1	huaweicloud_compute_i	instance	
			~	Modify	RESOURCE	vpc-ghhfw	huaweicloud_vpc		
			~	Modify	RESOURCE	vpc-subnet-ug0pp	huaweicloud_vpc_subne	et	

1.2 Visual Designer

1.2.1 Introduction

The RFS Visual Designer is a graphic tool for creating, viewing, and modifying templates. Using the designer, you can drag elements to the canvas, directly connect them, and then edit their details in a visual form.

The designer can help you quickly understand the relationships between elements in templates and modify templates easily.

The designer has the following advantages:

Visualizing template resources

The Visual Designer visualizes template resources to offer you a better insight.

The Visual Designer defines resources in the template metadata, such as resource size. When you open a template, the designer automatically adds the metadata and the layout is saved. Therefore, when you re-open the template, the last-saved template is displayed.

• Simplifying template compiling

When you compile template resources in a JSON or TF file, the process is complex and error-prone. In the designer, you can add resources to the template by dragging resources to the canvas and drawing lines between resources to create a relationship.

• Simplifying editing with the Visual Designer

The designer allows you to modify templates. Text designer is not required. The designer also supports autocomplete and lists all property names for a resource.

1.2.2 Visual Designer UI

The RFS Visual Designer UI includes six parts: control pane, resource bar, log area, design console, template pane, and attribute pane. For details about each part, see .

File 🔻 💭 上 C Deployme	nt Mode 🕥	В 🔲 ← → 🝳 100% 🔍 & Ø 🔮 王 王 🖹	😭 Resource Parame	ters Save Template Create Stack
Enter a keyword. Q	. Template Name: newTemplate 🖉		Att	ribute Editing Panel
Compute -				
Elastic Cloud Server				
Storage +				
Elastic Volume Service	3			
Scalable File Service(S				4
Networking A		Drag resources from the resource list on the left to build a template.		1
 Virtual Private Cloud Elastic IP 				No resources selected.
VPC-Subnet				
NAT Gateway				
Security Group	4			
Security Group Rule	· · · · · · · · · · · · · · · · · · ·			
Databases -				
Belational Database S	Deployment Code 💮			ssages 🗅 🗙
Containers 🔶	1 ()			messages.
Cloud Container Engine	о - С			6
Content Delivery & Edge 🖌				0
CDN domain				Q

Table 1-4 Visual Designer UI	description
------------------------------	-------------

No. (in the Above Figure)	Description
1	Control pane, which displays the control operation shortcuts of the design console.
2	Resource bar, which displays available resources for orchestration. Resources are categorized by service. You can drag resources and orchestrate them on the canvas and
	use lines to connect them and define their relationships.
3	Design console, which is the canvas for you to design templates and connect resources.
4	Attribute pane, which displays the attribute name and type of the selected resource.
5	Template pane, which allows you to modify templates and define attributes.

No. (in the Above Figure)	Description
6	Log area, which displays error information and messages triggered during your operation.
	For example, non-compliant parameters are displayed during syntax verification.

1.2.3 Cloud Services or Elements

A cloud service is an element and a basic unit to be orchestrated in Visual Designer. Each element contains all attributes of the resource type it belongs to.

Resources are classified on the left of the designer UI and can be dragged to the canvas on the right.

Copying or Deleting a Cloud Service

Drag a cloud service to the canvas. Right-click the cloud service.

Figure 1-42 Right-clicking the cloud service

	o	· · · · · · · ·
ecs-cy	Clone	Ctrl+D
	Delete	Delete
	Move to Top	D
	Move to Bo	ttom

Two icons are displayed. Click **Clone** to copy the cloud service. Click **Delete** to delete the cloud service.

Cloud Service Block Diagrams

There are two types of cloud service resource block diagrams in Visual Designer:

• Type 1: Non-scalable elements

A non-scalable element generally represents a terminal service or an entity resource. The block diagram size is fixed.

Figure 1-43 Non-scalable elements



• Type 2: Scalable elements

A scalable element is a container element. The containers and elements can be put into containers. You can adjust the size of the block diagram by dragging.

Figure 1-44 Scalable elements

Г	1				_	<u> </u>				<u> </u>							_	
T	C	5 v	nc	-91	bkr	mk												T
	_		1															l
								~										l
							(7)	vp	c-s	ub	ne	t-o	or				
																		l
																		l
																		l
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Connecting Resources Using Hollow Points/Lines

When some elements are dragged to the canvas, a hollow point is displayed on the resource. There are **green hollow points** and **gray hollow points**.

Hollow points can be used to connect resources. The connection line between two resources represents their association or dependency. There are green lines and gray lines.

• Green hollow points

A resource displayed with a green hollow point can depend on other resources.

You can connect resources as required and the resources to be depended on are created by RFS first.

For example, when you drag an RDS resource to the canvas, a green hollow point is displayed as shown in the following figure.

Figure 1-45 RDS green hollow point



When you move the cursor to the green hollow point of the left resource and click the green hollow point, an arrow is displayed. Drag the cursor to the resource on the right and release the cursor. The left resource depends on the right resource.

Figure 1-46 Green hollow point: an element to be connected

			1	1	1.1	1	1	1															
				÷	÷	÷	÷	÷	÷			÷			Ć) v	рс	-28	Bzl	g			•
		-	_																				
	•				0																		
. 0		1		1							1			₩.								1	1
· 0														٠.									
		-	-																				
		s-i	nst																				
							1		1				1								1	1	1
																					4		
1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	

• Gray hollow point

A resource with a gray hollow point can be associated with other resources.

For example, when you drag a CCE resource to the canvas, a gray hollow point is displayed as shown in the following figure.

Figure 1-47 CCE gray hollow point



When you move the cursor to the gray hollow point, you can view an attribute value as shown in the following figure, which indicates that the CCE resource can only be connected to the EIP resource.

Figure 1-48 CCE attribute



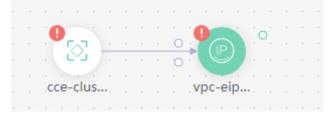
Assume that the CCE resource needs to be connected to a VPC resource. Drag the VPC element to the canvas first.

Figure 1-49 EIP



Move the cursor to the gray hollow point of the CCE resource and click the gray hollow point. An arrow is displayed. Drag the mouse to move the arrow to the EIP resource. When the hollow point of EIP resource turns green, release the mouse. The two resources are associated.

Figure 1-50 Hollow point: an element to be connected



• Green hollow points and connection lines

The line from a resource with a green hollow point to another resource represents the dependencies between two resources. For more information, see •Green hollow points.

Figure 1-51 Green hollow points and connection lines



• Gray hollow points and connection lines

The line from a resource with a hollow gray point to another resource indicates that the two resources are associated using an attribute value. In addition, a dependency relationship exists between the two resources. For more information, see •Green hollow points.

A resource with a gray hollow point can be associated with other resources. For example, when you drag a CCE resource to the canvas, a gray hollow point is displayed as shown in the following figure. When you move the cursor to the gray hollow point, you can view an attribute value as shown in the following figure, which indicates that the CCE resource can only be connected to the EIP resource. Assume that the CCE resource needs to be connected to a EIP resource. Drag the EIP element to the canvas first. Move the cursor to the gray hollow point of the CCE resource and click the gray hollow point. An arrow is displayed. Drag the mouse to move the arrow to the EIP resource. When the hollow point of EIP resource turns green, release the mouse. The two resources are associated. Hollow point: an element to be connected

Figure 1-52 Gray hollow points and connection lines



1.2.4 Shortcut Keys of Visual Designer

Operation	Windows OS	macOS
Сору	Ctrl-C	Command-C
Paste	Ctrl-V	Command-V
Cut	Ctrl-X	Command-X
All	Ctrl-A	Command-A
Find	Ctrl-F	Command-F
Go to the beginning of the text	Ctrl-Home	Command-Home Command-Up
Go to the previous line	Up	Up Ctrl-P
Go to the end of the text	Ctrl-End	Command-End Command-Down
Go to the next line	Down	Down Ctrl-N
Go to the end of the current page	PageDown	PageDown Ctrl-V
Copy the current element	Ctrl-D	Command-D
Undo	Ctrl-Z	Command-Z
Delete	Delete	Delete Ctrl-D Shift- Delete
Zoom in	Ctrl-=	Command-=
Zoom out	Ctrl	Command

1.2.5 Compiling a Template to Create an EVS Disk

This section describes how to **compile a template on the Visual Designer** to create an EVS disk. At the end of this walkthrough, you will see the newly created EVS disk on the Cloud Server Console, as shown in **Figure 1-53**.

Figure 1-53 Created EVS disk

Elastic Volume Service ②										Buy Disk
Disks Recycle BinNew!										
You can create 56 more disks with 5,050 GB of storage spa To renew multiple disks at a time, switch to the Renewals p	ice. age.									
Delete Expand Capacity						All status	ses v Dis	k name 👻		Q Search by Tag 🗧 🖸 🖾
Disk Name	Status	Disk Specifi	Function	Server Name	Disk Sharing	Device Type	Encrypted	AZ 🗑	Billing Mode	Operation

- 1. **Step 1: Use the Visual Designer to Compile a Template**: Use the Visual Designer to add elements and configure parameters for each element.
- 2. **Step 2: Create an EVS Disk**: Use the Visual Designer to create an ECS, a VPC, and a subnet.
- 3. **Step 3: Delete Unnecessary Resources**: Delete unnecessary stacks to avoid unwanted charges.

Step 1: Use the Visual Designer to Compile a Template

- **Step 1** Log in to the RFS console. In the navigation pane on the left, click **Visual Designer**.
- **Step 2** Add and connect elements. Drag elements, such as VPC, VPC subnet, and EVS, to the canvas, and establish relationships between them, as shown in Figure 1-54.

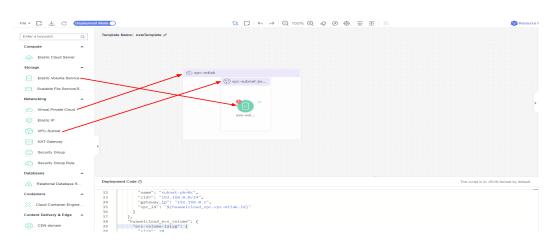


Figure 1-54 Adding an element

- **Step 3** Configure the template parameters. Set the attributes in the **Attribute Editing Panel** panel on the right.
 - 1. Click the **vpc** element in the canvas. The attributes of the element will be automatically displayed in the attribute pane. The CIDR can use the default value **192.168.0.0/16**.
 - 2. Click the **subnet** element in the canvas. The attributes of the element will be automatically displayed in the attribute pane. You can set the default value for the attributes.

3. Click the **evs** element in the canvas. The attributes of the element will be automatically displayed in the attribute pane. The attributes with red text boxes are mandatory, as shown in **Figure 1-55**.

Figure 1-55 Mandatory attributes

ter a keyword.	Template Name: newTemplate 🖉						evs-volume-ialyg 🖉		
ompute							* AZ		
Elastic Cloud Server						111111	Select	~	•
rage						11111	Mandatory		
		C vpc-mtlak					 Hard Disk Type 		
Elastic Volume Service		(>) vpc-subnet-jw				11111	Select	~	
Scalable File Service(5.						11111	Mandatory		
orking						11111	Disk Specification		
						11111 <mark>8</mark> 11	- 10	+ 08	(H)
Virtual Private Cloud		eve-volue							
Elastic IP		evs-vol					Silling Mode		
VPC-Subnet							-Default-	~	Ð
VPC-subset						1.1.1.1.1.1.1.1	Nilling Cycle Unit		
NAT Gateway							Default	~	Ð
Security Group							Required Duration		
							cequired Darabon		œ
Security Group Mule									•
abases									
Relational Database 5.	Deployment Code 🗇				he script is in JSON form	at by default.	dessages		5
italners	32 "name": "subnet 33 "cide": "192.160	-pbr8c",					No messages.		
Cloud Container Engine	34 "gateway ip": "								
tent Delivery & Edge	30)	awercrous_opc.opc.wcrak.ruy							
	37), 38 "huaseicloud_evs_vo	lume") (
CDN domain	39 "evs-volume-ialyg"	- 1 (
	40 "size": 10, 41 "name": "evs-vo	Tump country							

D NOTE

To facilitate parameter setting and modification, you are advised to set parameters whose value needs to be frequently changed as input parameters. **get_input** indicates input parameters. You can define the values behind **get_input**.

4. Click ⁽⁺⁾ on the right of the attribute editing panel to generate an input parameter, as shown in **Figure 1-56**.

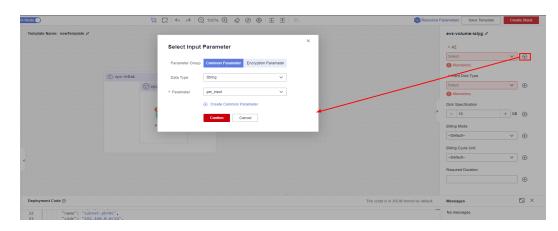


Figure 1-56 Generating an input parameter

Step 4 Click **Save Template** in the upper right corner of the Visual Designer to save the template. If the message "Template saved. You can view and manage it in My Templates." is displayed, the template is saved.

D		$\square \square \land \rightarrow$	€ 100% €	00	亚亚			😭 Reso	urce Parameters Save Terr	plate Crea	ate Sta
nplate Name: newTemplate-test									 Template sa age it in My 	ived. You can view a Templates.	and m
									可用区3	×	÷
									 Hard Disk Type 		
	🖄 vpc-mtlak								General Purpose SSE	~ v	۲
		🕑 vpc-subnet-jw							Disk Specification		
									- 10	+ GB	۲
									Billing Mode		
		evs-vol							Default	~	۲
									Billing Cycle Unit	~	Ð
									Required Duration		
											\oplus
									Name		
									evs-volume-coqvb		Ð
loyment Code 🕥							The script is in	JSON format by defau	t. Messages		٠,

Figure 1-57 Saving a template

----End

Step 2: Create an EVS Disk

- **Step 1** Close the Visual Designer and go to the RFS console.
- **Step 2** In the navigation pane on the left, click **Templates** > **My Templates**. The template is displayed in the template list.
- **Step 3** Click **Create Stack** in the **Operation** column of the template.
- **Step 4** Click **Next** to view the stack information. After confirming the information, click **Next**, select an agency, click **Next**, and click **Create Execution Plan**.

The **Execution Plans** tab page is displayed, click **Deploy** in the **Operation** column of the execution plan.

Step 5 When the status of the plan is **Applied**, you can view that three cloud services exist in the **Resources** tab page. A VPC, a subnet, and an EVS disk have been created.

Figure 1-58 Crested stack

	stack_20230306_1429_n8 Information Resources Outputs	Events Template Execu	ution Plans		Delete Update Template/Parameter C
					Enter a Neyword. Q
6	vent Time Jill	Event Type	Event Description	Resource Name/Type	Associated Resource ID
2	023/03/06 14:30:54 GMT+00:00	L09	Apply required resource success.		
2	023/03/06 14:30:51 GMT+00:00		Apply completel Resources: 3 added, 0 changed, 0 destroyed.		
2	023/03/06 14:30:51 GMY+08:00	Creation Complete	huaweicloud_vpc_subnet.vpc-subnet-easpe: Creation complete after 8s 8d=07226224=03da=417b=ac89-dc9d83311af2)	vpc-subnet-daspp Subnet	07226224-03da-417b-ac89-5c9d83311af2
2	023/03/06 14:30:44 GMT-00:00	Creation In Progress	huswelcloud_vpc_subnet.vpc-subnet-4gapp: Creating	vpc-subnet-datop Subnet	
2	023/03/06 14:30:44 GMT-08:00	Creation Complete	husweicloud_vpc.vpc-khark: Creation comprete after 7s (id=ccb044b9=6755-4990-a131=4c9957b1dcb)	vpic-bhark VPC	ccb04409-0755-4998-a131-4c5957010cb
2	023/03/06 14:30:41 GMT+08:00	Creation Comprete	huawescloud_eva_volume.eva-volume-caldc: Creation complete after 46 (id=0%383b4=6679=48da=ad76=a66a6cf05277)	eve-velume-sable EV6	0%38304-4679-4838-ad70-a06a6ct05277
2	023/03/06 14:30:37 GMT+08:00	Creation in Progress	huawekcloud_evs_volume.evs-volume-k2ktc: Creating	eve-velume-sable EV0	
2	023/03/06 14:30:37 GMT+08:00	Creation In Progress	huawekcloud_vpc.vpc-knam: Creating	vpsi-khark VPO	
2	023/03/00 14 30 34 GMT+08.00	L00	Creating required resource now		

Step 6 View the created cloud services.

- 1. Log in to the Huawei Cloud management console.
- Choose Cloud Server Console > Elastic Volume Service. You can see the newly created EVS disk.

Figure 1-59 EVS created

Elastic Volume Service ⑦									Buy Disk
Disks Recycle Bin New!									
You can create 56 more disks with 5,050 GB of storage s To renew multiple disks at a time, switch to the Renewals	pace. page.								
Delete Expand Capacity					All state	uses 👻	Disk name 👻		Q Search by Tag 🛛 C 🗳 🚳
Disk Name	Status	Disk Specifi Functio	n Server Name	Disk Sharing	Device Type	Encrypted	AZ 🖓	Billing Mode	Operation
ovs-volume-5cc3i 0fe383b4-e679-48da-ad76-a66a6cf05277	😔 Available	Ultra-high I/O Data dis 10 GB	к —	Disabled	VBD	No	AZ3	Pay-per-use Created on	Attach Expand Capacity Create Backup More 👻

3. Choose **Service List** > **Networking** > **Virtual Private Cloud**. You will see the newly created VPC on the VPC list.

Figure 1-60 Cre	ated VPC					
Virtual Private Cloud ⑦						Quick Links Create VPC
Specify filter criteria.						QCE
Name/ID	IPv4 CIDR Block	Status	Subnets	Route Tables	Owner Project ID (?)	Operation
vpc-idc01 ccb044b9-6755-4f88-a131-4cf9f57b1dcb	192.168.0.0/16 (Primary CIDR block)	Available	1	1	47cf611e636c4a73806e2731cc7fa471	Edit CIDR Block Delete

4. Click the VPC name to show more details about the VPC. On the VPC details page, you will see that the subnet has been created in the VPC.

Figure 1-61 Created subnet

onets (?)									Create Subne
VPC ID: ccb044b9-675	55-4168-a131-4c19157b1d	cb 🔘 Add filter							× Q C E
Name/ID	VPC	IPv4 CIDR Block	IPv6 CIDR (?)	Status	AZ (?)	Network ACL	Route Table	Owner Project ID (?)	Operation
subnet-6qoby 07226224-03da-41	vpc-idc0l	192.168.0.0/24	Enable IPv6	Available	-	-	rtb-vpc-idc0l Default	47cf611e636c4a73806e2731cc7fa471	Change Route Table Delete

----End

Step 3: Delete Unnecessary Resources

You are advised to delete unnecessary stacks to avoid unwanted charges.

- **Step 1** Log in to the RFS console.
- **Step 2** In the navigation pane on the left, click **Stacks**.
- **Step 3** Locate the created stack, click **Delete** in the **Operation** column, and delete the stack as prompted.

----End

1.3 Managing a Stack

Stack management consists of two aspects. One is lifecycle management of created stacks, including deleting and changing. The other is viewing stack details to obtain their running statuses.

Modifying a Stack

After a stack is created successfully (that is, in the normal status), you can change the parameters of the stack as needed.

- Step 1 Log in to the RFS console.
- **Step 2** In the navigation pane on the left, click **Stacks**.
- **Step 3** In the stack list, click the stack to be changed.
- **Step 4** On the stack details page, click **Update Template/Parameter**.
- **Step 5** Change the template version or input parameters, and click **Next**.

Step 6 Confirm the configurations and then click **Create Execution Plan**.

Step 7 On the **Execution Plans** tab page of the stack details page, select the created execution plan and click **Deploy** in the **Operation** column.

On the **Events** tab page, you can view the detailed operation events related to resource stack change.

----End

Deleting a Stack

Deleted stacks cannot be restored. Exercise caution when deleting a stack.

- **Step 1** Log in to the RFS console.
- **Step 2** In the navigation pane on the left, click **Stacks**.
- **Step 3** In the stack list, select the stack to be deleted and click **Delete** in the **Operation** column.
- Step 4 In the dialog box displayed, enter Delete and click OK.

Check the stack name carefully. The deletion cannot be revoked.

On the **Events** tab page, you can view the detailed operation events related to stack deletion.

----End

Viewing Stack Details

After a stack is created, you can view its data and resources on the stack details page.

Resources

Elements of a stack, such as applications and cloud services

- Outputs Output parameters and their values in the stack template
- Template

Details of the template used to create the stack

Events

You can view stack events to monitor the stack operation progress. For example, when you create a stack, all important steps during the stack creation are displayed on the **Events** tab page. The events are sorted in chronological order with the latest event being displayed at the top.

1.4 Auditing

1.4.1 RFS Operations Supported by CTS

Cloud Trace Service (CTS) records all operations performed on cloud services, providing data support for customers in fault locating, resource management, and

security auditing. When you enable CTS, it begins to record operations performed on RFS resources.

Table 1-5 RFS operations supported by CTS	
---	--

Operation	Description
createStack	Creating a stack
deployStack	Deploying a stack
deleteStack	Deleting a stack
continueRollback- Stack	Continuing to roll back a stack
createExecution- Plan	Creating an execution plan
applyExecutionPla n	Executing an execution plan
deleteExecution- Plan	Deleting an execution plan
useAgency	Recording user agency

1.4.2 Viewing RFS Logs in CTS

When you enable CTS, it begins to record operations performed on RFS resources. On the CTS console, you can query operation records from the last 7 days by performing the following operations.

Procedure

- **Step 1** Log in to the CTS console.
- **Step 2** In the navigation pane, click **Trace List**.
- **Step 3** Filter the desired operation events.

The trace list supports four filter types:

• Trace Source, Resource Type, and Search By

Select the search criteria from the drop-down lists. For example, select **RFS** from the **Trace Source** drop-down list box.

From the **Search By** drop-down list, select a trace name. From the **Search By** drop-down list, select or enter a specific resource ID. From the **Search By** drop-down list, select or enter a specific resource name.

- Trace Status: Select one of All trace statuses, Normal, Warning, and Incident.
- **Operator**: Select a specific operator (a user other than an account).
- **Time Range**: You can query traces generated during any time range of the last seven days.

Step 4 Click \checkmark on the left of a trace to expand its details.

Step 5 Click **View Trace** in the **Operation** column. A dialog box is displayed to show trace structure details.

```
{
 "trace_id": "4073d5e1-6ee6-11ed-bb00-61c31199dcbc",
 "code": "200",
 "trace_name": "parseTemplateVariables",
 "resource_type": "template",
 "trace_rating": "normal",
 "source_ip": "10.172.131.218",
"trace_type": "ApiCall",
 "service_type": "RFS",
 "event_type": "system",
"project_id": "47cf611e636c4a73806e2731cc7fa471",
 "response": "{\"variables\":[{\"default\":\"jiayue_test_ecs\",\"description\":\"Your ECS name\",\"name\":
\"ecs_name\",\"type\":\"\\\"string\\\"\"}]}",
"resource_id": "",
 "tracker_name": "system",
 "time": "2022/11/28 14:31:12 GMT+08:00",
 "resource_name": "",
 "user": {
   "domain": {
    "name": "iaas_aos_n30000772_01",
    "id": "fcca06b017704dfcb36dcf1b2a29d151"
  },
   "name": "cto_c30031067_dev",
   "id": "155ad09309994f92a5147529aa0ceb2f"
 },
  "record_time": "2022/11/28 14:31:12 GMT+08:00"
3
```

----End

1.5 IAM Agency

By creating an agency, you can share your resources with another account, or delegate an individual or team to manage your resources. You do not need to share your security credentials (the password and access keys) with the delegated party. Instead, the delegated party can log in with its own account credentials and then switches the role to your account and manage your resources.

With RFS, you can create a stack to bind an agency with a provider and update the binding relationship by updating the stack.

RFS uses an agency only in resource operation requests, such as creating a stack (triggering deployment), creating an execution plan, deploying a stack, and deleting a stack. The agency applies only to resource operations performed by the bound provider. If the permissions provided by the agency are insufficient, resource operations may fail.

Procedure

- 1. Log in to the IAM console.
- 2. On the IAM console, choose **Agencies** from the navigation pane on the left, and click **Create Agency** in the upper right corner.

rigure i-	02	creating a	in ayei	icy				
IAM	Agen	cies 🕜						+ Create Agency
Users	A	gencies available for creation: 1			All	v	Enter an agency name.	Q
User Groups		Agency Name/ID J⊒	Delegated ↓Ξ	Validity Per ↓Ξ	Created 🐙	Description ↓Ξ	Operation	
Permissions •		agency244	Account	Unlimited	Aug 18, 2021 09	agencyTest	Authorize Modify Delete	
Agencies		agency243	Account	Unlimited	Aug 18, 2021 09	agencyTest	Authorize Modify Delete	
Identity Providers Security Settings		agency242	Account	Unlimited	Aug 18, 2021 09	agencyTest	Authorize Modify Delete	

Figure 1-62 Creating an agency

3. Enter an agency name.

Set Cloud Service to RFS.

Figure 1-63 Creating an agency

Agencies / Create Agence	cy
* Agency Name	
* Agency Type	 Account Delegate another HUAWEI CLOUD account to perform operations on your resources. Cloud service Delegate a cloud service to access your resources in other cloud services.
* Cloud Service	RFS
* Validity Period	Unlimited •
Description	Enter a brief description.
	0/255 Next Cancel

The agency name is user-defined.

If **op_svc_iac** has been used for registration, you are advised to change it to **RFS**.

4. Click **Next**. The **Authorize Agency** page is displayed. You can grant permissions to the agency on this page.

Figure 1-64 Agency authorization

LAIM	Agencies / AgencyTestForRF							
Users	Basic Information Permissio	303						
Liser Circups	Lielete Authorize A	uthorization records (LAM projects) 1; (enterprise projec	ts): U	Agency name. Agency les	Dearch by policyirole name.	Q	By WM Project	Ry Enterprise Project
Permotions *	PolicyRole	Policy/Role Description	Project [Region]	Principal	Principal Description		Principal Type	Operation
Projecta Agencias	Tenant Guout	Tenunt Gueut (Exclude (AM)	All resources (Existing and fature projects)	AgencyTestForRF			Aguncy	Delulo
Identity Providers								
Socurity Sottings								

5. Filter specific permissions and grant them to the agency.

Figure 1-65 Selecting policies

sian sek	ected permissions to AgencyTestForRF	Circate Pr
	Wecked (1) Cour Pennissions from Another Project	All policies/ toks • All services • Inerant. X C
	Policy/Role Name	Турн
	CloudPowine Terrar I Plywine Terrar Lengelase FulAccese Luit permosions for the Courst genne Lengel (perma Lengelates	System tofined policy
0	CitudPpoint Tonari Rue Templates FullAccess Full permissions for the CoopEripethe Tenant Rule Templates	System-server policy
	Citudi pene (reart) i decretes) utacress Full cernisistics for the CoccEptitine Tensel Edensions	By stam-claffined policy
	VIAI AdministratorAccess Poddrimstatide Data Moder Encine Ierrarit administrator with full permissions.	System-refined poicy
V	Tenant Guest	System-villed role
U	CS Terrari Uver Cloud thream Service Uver	system contract rate
П	V Tenant Administrator Tenant Administrator (Exclude UAB)	thy strate - versions rate
C .	Cloud/speine lener/likines/ul/Access Full comissions for the Cloud/Poster Terrant Polios	System-defined policy
	C3 Tensafi Admin Citudi Stroum Service Tenant, Administratore, con monope multiple CS scorp	System-Jeined role

You can determine the permissions to be granted to an agency. Huawei Cloud best practices do not advise you to automatically create agencies with the Tenant Administrator permission for users. The best practice is to grant management permissions (including read and write operations) to resources that may be used in a stack.

6. Set the authorization scope. You can select **All resources** or **Region-specific projects**.

Figure 1-66 Authorization scope

Authorize Agency Overal Tweaters	
Aneronatione	
The following are recommended scopes for the permissions you selected. Select the desired scope requiring minimum authorization.	×
Score	
Altreautes A	
() Isolati - abrear to the second of the	
C Blobal services (2)	
Show Less	

7. Click **OK**. The agency is created.

Figure 1-67

The following are recommended scopes for the permissions you selected. Select the desired	ed scope requiring minimum authorization.		×
cope			
). All remainmen			
) Region-specific projects (2)			
The selected permissions will be applied to resolucions in the region-specific projects you when			
ter projects 29. Select the desired projects.		Enter a project name or description.	c
Project [Region] 4	Description		
Cn-north-4_testawr (CN North-199) ng4)	-		
cn-mcth-4_test_cre (CN Matt-4 in (n)4)			
cn each 9_acc_set [CN North Usessb1]			
on narth 9_doc_tect1 (CN North Ulancab 1)			
on narth 1 (CN North Boljing I)			
on north 4 (CN North Bol(Ing4)			
cn north 2 (GN North Bol(ing2)			
cn north 900 (CA: North BollingEdge2)			
Con-march-9 (CN North-Clancelo 1)	-		

Issue 01 (2023-05-26)

Previou

2 Application Orchestration Service

2.1 Introduction2.2 Stack Management2.3 CTS

2.1 Introduction

This chapter introduces how to use Application Orchestration Service (AOS).

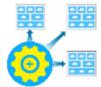
With AOS, you can deploy applications in the cloud by writing templates (declarations of resources that make up stacks) and creating stacks from the templates, as shown in **Figure 2-1**. AOS also provides application lifecycle management features, such as starting, changing, and deleting.

Figure 2-1 How AOS works



- Select a public template
- Write a template from scratch

Create Stack



Create a stack from the template. AOS automatically configures the resources and elements you specified in the template.

Step	Description
1. Create a template	A template is a text file that uses AOS syntax to describe application attributes, cloud service configurations, and dependencies between applications and cloud services.
	How to obtain a template:
	 Write a template from scratch: You can write a template from scratch in JSON or YAML format. Before writing a template, gain a basic understanding of AOS templates from . In addition to writing a template on the web UI, you can also write it on a local host and then upload it to AOS. For details on how to orchestrate and deploy resources by writing a template, see Writing a Template to Create an ECS. NOTICE The YAML syntax does not support the Tab key. The hierarchical relationship must be aligned with an even number of spaces, such as 2, 4, 6, or 8 spaces.
	For more information about templates, see Templates (Cloud-Based Automation Scripts) .
2. Create a stack	A stack is a collection of applications and cloud service resources. The applications or cloud services in a stack are treated as a unit when being created or deleted.
	You can create stacks from templates. After you select a template and specify stack parameters, AOS automatically sets up the resources and elements you specify in the template.
	For more information about stacks, see Stack Management .

Table 2-1 How AOS works

2.2 Stack Management

Stack management consists of two aspects. One is lifecycle management of created stacks, including deleting and changing. The other is viewing stack details to obtain stack running status.

 Table 2-2 describes stack lifecycle status.

Status	Description
Normal	Both the stack and its instances run properly.
Abnormal	The stack runs abnormally. Some or all stack instances run abnormally and cannot provide functions.
Initializing	Stack instances have not been installed or have been uninstalled. The stack does not provide functions.

 Table 2-2 Status description

Status	Description
Processing	A stack lifecycle action is being performed. The status of stack instances is unknown.
Unknown error	An unknown stack error occurs.

Deleting a Stack

Deleted stacks cannot be restored. Exercise caution when deleting a stack.

- **Step 1** Log in to the AOS console.
- **Step 2** In the navigation pane, click **My Stacks**.
- **Step 3** In the stack list, select the stack to be deleted and click **Delete**.
- **Step 4** In the dialog box that is displayed, click **OK**.

Check the stack name carefully. The deletion cannot be revoked.

On the **Events** tab page, view the detailed operation events related to stack deletion.

NOTE

If the stack status remains **Deleting** until a timeout message is displayed and the stack status becomes **Abnormal**, try to forcibly delete the stack.

----End

Viewing Stack Details

After a stack is created, view its data and resources on the stack details page.

• Stack elements

The elements of a stack, such as applications and cloud services are displayed. Element health status:

- Healthy: The resource is running properly.
- Unknown: The AOS fails to obtain the resource status because an error occurs during the health check.
- Abnormal: The AOS successfully calls the health check API of the resource, but the resource status is abnormal.
- Output parameters
 - Output parameters and their values in the stack template are displayed.
- Input parameters
 - Input parameters and their values in the stack template are displayed.
- Alarms

Alarm information of the stack is displayed.

• Events

View stack events to monitor stack operation progress. For example, when you create a stack, all important steps during the stack creation are displayed

on the **Events** tab page. The events are sorted in chronological order with the latest event being displayed at the top.

2.3 CTS

2.3.1 AOS Operations Supported by CTS

Cloud Trace Service (CTS) records all operations performed on cloud services, providing data support for customers in fault locating, resource management, and security auditing. When you enable CTS, it begins to record operations performed on Application Orchestration Service (AOS) resources. CTS stores operation records from the last seven days.

Operation	Description
CreateTemplate	Creating a template
DeleteTemplate	Deleting a template
UpdateTemplate	Updating a template
PreviewStack	Previewing a stack
CreateStack	Creating a stack
DeleteStack	Deleting a stack
UpdateStack	Updating a stack
ExecuteStackActio n	Executing a stack lifecycle action
CleanupResources	Cleaning a resource
UpdateTenantState	Freezing or unfreezing an account

Table 2-3 AOS	operations	supported	hv	CTS
	operations	Jupporteu	υy	C15

2.3.2 Viewing Logs in CTS

When you enable CTS, operations performed on Application Orchestration Service (AOS) resources begin to be recorded. On the CTS console, you can query operation records from the last 7 days by performing the following operations.

Procedure

- **Step 1** Log in to the CTS console.
- **Step 2** In the left navigation pane, click **Trace List**.
- **Step 3** Filter the desired operation events.

The trace list supports four filter types:

• Trace Source, Resource Type, and Search By

Select the search criteria from the drop-down lists. For example, select **AOS** from the **Trace Source** drop-down list box.

From the **Search By** drop-down list, specify a trace name. From the **Search By** drop-down list, select or enter a specific resource ID. From the **Search By** drop-down list, select or enter a specific resource name.

- Trace Status: Select one of All trace statuses, Normal, Warning, and Incident.
- **Operator**: Select a specific operator (at the user level rather than the account level).
- Time range: You can query traces generated during any time range in the last seven days.

Step 4 On the left of the to-be-queried record, click \checkmark to view details.

Step 5 Click **View Trace** in the **Operation** column. On the displayed **View Trace** dialog box, the trace structure details are displayed.

```
{
  "service_type": "AOS",
  "user": {
     "domain": {
       "name": "***"
        "id": "6c389820d2fd46489c8987e5eb2675cc"
     "id": "19652d0b0ff1407a9432b85b9e12f9eb",
     "name": "***
  },
"time": "2018/04/26 16:16:53 GMT+08:00",
  "code": 200,
  "resource_type": "AOS",
  "resource_name": "Stack",
  "resource_id": "19652d0b0ff1407a9432b85b9e12f9eb",
  "source_ip": "192.168.12.22",
  "trace_name": "PreviewStack",
  "trace_type": "ApiCall",
  "request": {},
  "api_version": "3.0.0",
  "message": "Preview stack successfully. Project id: 1e19d41bb1f24b5da4a98107607aac0f, stack name:
jhgdjh, template id: cea9ee29-3b39-f7be-d093-aff126b250e8, cluster id: . ",
  "record_time": "2018/04/26 16:16:53 GMT+08:00",
  "trace_id": "2da40c60-492a-11e8-a065-286ed488cbe3",
  "trace_status": "warning"
}
```

----End