Solution

Quickly Deploying a Highly Available Pulsar Cluster

 Issue
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Solution Overview

Application Scenarios

This solution helps you quickly deploy a highly available Pulsar cluster on Huawei Cloud based on Apache Pulsar. Apache Pulsar is the top-level, open-source project of the Apache Software Foundation. It is a next-generation cloud-native distributed message flow platform. It integrates messaging, storage, and lightweight functional computing. It uses decoupled storage and computing to support multi-tenancy, persistent storage, and multi-equipment room and crossregion data replication. Apache Pulsar features strong consistency, high throughput, low latency, and high scalability, and has other streaming data storage characteristics.

Solution Architecture

The following figure shows the solution architecture.

Figure 1 Solution architecture



To use this solution, you need to:

- Create ten **Elastic Cloud Servers (ECSs)** and use three of them to deploy three ZooKeeper nodes, three to deploy three bookie nodes, three to deploy three broker nodes, and the remaining one to create a manager node.
- Create an **Elastic IP (EIP)** and associate it with the manager node so that the manager node can be accessed from the public network.
- Create a Virtual Private Cloud (VPC) and a subnet for configuring the network of nodes.
- Create a security group to control network access to Pulsar nodes.

Advantages

• High availability and reliability

The solution uses cluster deployment, decoupled storage and computing, data redundancy, and strong data consistency. These features all help improve system reliability and ensure good performance.

• Open-source customizability

This solution and Pulsar are both open-source and free for commercial use. You can even use the source code for secondary development.

• Easy deployment

This solution helps you easily deploy a Pulsar cluster using ECSs and install Pulsar Manager, a web-based GUI management and monitoring tool, to quickly use Distributed Message Service (DMS) on the cloud.

Constraints

- Before deploying this solution, sign up for a HUAWEI ID, enable Huawei Cloud services, and complete real-name authentication. Ensure that your account is not in arrears or frozen. If you select yearly/monthly billing, ensure that your account has sufficient balance. If you do not have sufficient balance, you can go to Billing Center to pay for the order manually.
- Before deploying this solution, ensure that your account has sufficient IAM permissions. For details, see **3.1 Preparations**.

2 Resource Planning and Costs

This solution will deploy the resources listed in the following table. The costs are only estimates and may differ from the final prices. For details, see **Price Calculator**.

Huawei Cloud Service	Configuration Example	Estimated Monthly Cost
ECS (Manager)	 Region: AP-Singapore Pay-per-use: \$0.11 USD/ hour 	\$78.26 USD
	 Specifications: general computing-plus ECS c7n.large.2 2 vCPUs 4 GiB 	
	Image: CentOS 7.9 64bit	
	 System disk: general- purpose SSD 100 GB 	
	Quantity: 1	
	Required duration: 720 hours	

Table 2-1 Resource planning and costs (pay-per-use)

Huawei Cloud Service	Configuration Example	Estimated Monthly Cost
ECS (ZooKeeper)	 Region: AP-Singapore Pay-per-use: \$0.13 USD/ hour Specifications: general computing-plus ECS c7n.large.4 2 vCPUs 8 GiB Image: CentOS 7.9 64bit System disk: general- purpose SSD 100 GB Quantity: 3 Required duration: 720 	\$280.15 USD
ECS (Bookie)	 Region: AP-Singapore Pay-per-use: \$0.20 USD/ hour Specifications: general computing-plus ECS c7n.xlarge.2 4 vCPUs 8 GiB Image: CentOS 7.9 64bit System disk: general- purpose SSD 100 GB Quantity: 3 Required duration: 720 hours 	\$435.67 USD
ECS (Broker)	 Region: AP-Singapore Pay-per-use: \$0.20 USD/ hour Specifications: general computing-plus ECS c7n.xlarge.2 4 vCPUs 8 GiB Image: CentOS 7.9 64bit System disk: general- purpose SSD 100 GB Quantity: 3 Required duration: 720 hours 	\$435.67 USD

Huawei Cloud Service	Configuration Example	Estimated Monthly Cost
Elastic IP (EIP)	 Region: AP-Singapore Pay-per-use: \$0.12 USD/GB/hour 	\$0.12 USD/GB/hour
	 Routing type: dynamic BGP 	
	Billed by: traffic	
	 Bandwidth: 300 Mbit/s 	
	Quantity: 1	
	Required duration: 1 hour	
Total	-	\$1229.75 USD + Public network traffic price (\$0.12 USD/GB/hour)

Table 2 2 Deserves			(، را ما ه مر م مرد / را بر م م ر را
Table 2-2 Resource	planning	and costs	(yearly/monthly)

Huawei Cloud Service	Configuration Example	Estimated Monthly Cost
ECS (Manager)	 Region: AP-Singapore Specifications: general computing-plus ECS c7n.large.2 2 vCPUs 4 GiB Image: CentOS 7.9 64bit System disk: general- purpose SSD 100 GB Quantity: 1 	\$60.28 USD
ECS (ZooKeeper)	 Region: AP-Singapore Specifications: general computing-plus ECS c7n.large.4 2 vCPUs 8 GiB Image: CentOS 7.9 64bit System disk: general- purpose SSD 100 GB Quantity: 3 	\$213.96 USD

Huawei Cloud Service	Configuration Example	Estimated Monthly Cost
ECS (Bookie)	 Region: AP-Singapore Specifications: general computing-plus ECS c7n.xlarge.2 4 vCPUs 8 GiB Image: CentOS 7.9 64bit System disk: general- purpose SSD 100 GB Quantity: 3 	\$327.48 USD
ECS (Broker)	 Region: AP-Singapore Specifications: general computing-plus ECS c7n.xlarge.2 4 vCPUs 8 GiB Image: CentOS 7.9 64bit System disk: general- purpose SSD 100 GB Quantity: 3 	\$327.48 USD
EIP	 Region: AP-Singapore Pay-per-use: \$0.12 USD/GB/hour Routing type: dynamic BGP Billed by: traffic Bandwidth: 300 Mbit/s Quantity: 1 Required duration: 1 hour 	\$0.12 USD/GB/hour
Total	-	\$929.20 USD + Public network traffic price (\$0.12 USD/GB/hour)

3_{Procedure}

- 3.1 Preparations
- 3.2 Quick Deployment
- 3.3 Getting Started
- 3.4 Quick Uninstallation

3.1 Preparations

(Optional) Creating the rf_admin_trust Agency

Step 1 Access the Huawei Cloud official website, log in to the console, hover your mouse over the account name in the upper right corner, and choose Identity and Access Management.

Figure 3-1 Huawei Cloud console





Figure 3-2 Identity and Access Management

Step 2 Choose **Agencies** in the navigation pane and search for the **rf_admin_trust** agency.

Figure 3-3 Agency list

IAM	Agencies ⑦									Create Ager	ncy
Users	Delete	Agencies available for creat	ion: 36			All	Ŧ	rf_admin_trust	×Q		
User Groups	Age	ncy Name/ID ↓≣	Delegated Party ↓⊞	Validity Period ↓≣	Created 4F	Descrip	tion ↓≣		Operation		
Permissions • Projects	_ rLe	imin_trust	Cloud service RFS	Unimited	Mar 13, 2023 14:49:16 GMT+08:00	-			Authorize Modify Delete		
Agencies											
Identity Providers											
Security Settings											

- If the agency is found, you can skip this section.
- If the agency is not found, perform the following steps.
- Step 3 Click Create Agency in the upper right corner of the page. On the displayed page, set Agency Name to rf_admin_trust, Agency Type to Cloud service, and Cloud Service to RFS, and click Next.

Figure 3-4 Creating an agency

Agencies / Create Agencies	cy
★ Agency Name	rf_admin_trust
★ 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

Step 4 Search for **Tenant Administrator**, select it in the search results, and click **Next**.

Figure 3-5 Selecting a policy

< Authorize Agency								
🚯 Salad Falley Ride (2) Salad Scope (3) Fitch								
Assign selected permissions to rf_admin_thust1.								
View Selected (1) Copy Permissions from Another Project	All policies/toles All services Tenant Administrator X Q							
Policy/Role Name	Туре							
DAE AdministratorAccess Recommended Data Model Engine tensart administrator with full permissions.	System-defined policy							
Tenant Administrator Tenant Administrator (Exclude (AM)	System-defined role							
Cisud Stream Service Tenant Administrator, can manage multiple CS users	System-defined role							

Step 5 Select **All resources** and click **OK**.

Figure 3-6 Setting the authorization scope

<	Authorize Agency
	Select Policy/Role 2 Select Scope 3 Finish
	1 The following are recommended scopes for the permissions you selected. Select the desired scope requiring minimum authorization.
	Scope
	All resources
	IAM users will be able to use ail resources, including those in enterprise projects, region-specific projects, and global services under your account based on assigned permissions.
	Show More

Step 6 Check that the **rf_admin_trust** agency is displayed in the agency list.

Figure 3-7 Agency list

IAM	Age	ncies 🕜						Create Agency
Users		Delete Agencies available for cre	sation: 32			AI	* rf_admin_trust	X Q
User Groups		Agency NameID ↓≣	Delegated Party ↓≣	Validity Period ↓Ξ	Created 4F	Description J≣	Operation	
Permissions -		rt_admin_trust	Account op_svc_JAC	Unlimited	Jan 16, 2023 17:57:41 GMT+08:00	Created by RF, Not delete.	Authorize Modity Delete	
Agencies								
Identity Providers								
Security Settings								

----End

3.2 Quick Deployment

This section describes how to quickly deploy this solution.

Table 3-1	Parameter	description
-----------	-----------	-------------

Parameter Name	Туре	Ma nda tory	Description	Default Value
enterprise_proje ct_id	strin g	Yes	Enterprise project ID. Visit https://console/ intl.huaweicloud.com/eps/ to find the ID. 0 indicates the default enterprise project. Value range: 0 or a string of characters in UUID format	0
vpc_name	strin g	Yes	Virtual Private Cloud (VPC) name. It must be unique. It can contain 1 to 64 characters. Only letters, digits, underscores (_), hyphens (-), and periods (.) are allowed.	vpc-pulsar- cluster
security_group_ name	strin g	Yes	Security group name. For details about how to modify security group rules, see (Optional) Modifying Security Group Rules. The value can contain 1 to 64 characters. Only letters, digits, underscores (_), hyphens (-), and periods (.) are allowed.	sg-pulsar- cluster

Parameter Name	Туре	Ma nda tory	Description	Default Value
ecs_name	strin g	Yes	Prefix of the ECS name. It must be unique. The naming rules are {ecs_name}-zookeeper-0X, {ecs_name}-bookie-0X, {ecs_name}-broker-0X, and {ecs_name}-manager. X is an integer from 1 to 3. The value can contain 1 to 51 characters. Only letters, digits, underscores (_), hyphens (-), and periods (.) are allowed.	pulsar-cluster
ecs_password	strin g	Yes	Initial ECS password. After a Pulsar cluster is created and deployed, log in to the ECS console and change the password by referring to Resetting the Password for Logging In to an ECS on the Management Console . It can contain 8 to 26 characters and must include at least three of the following character types: uppercase letters, lowercase letters, digits, and special characters (!@\$%^=+[{}]:,./?). The password cannot contain the username or the username spelled backwards. The administrator username is root .	None
pulsar_manager _flavor	strin g	Yes	ECS flavor of the manager node. You are advised to use an ECS with at least 2 vCPUs and 4 GB of memory. For more flavors, see A Summary List of x86 ECS Specifications .	c7n.large.2
pulsar_zookeep er_flavor	strin g	Yes	ECS flavor of the ZooKeeper node. You are advised to use an ECS with at least 2 vCPUs and 8 GB of memory. For more flavors, see A Summary List of x86 ECS Specifications .	c7n.large.4
pulsar_zookeep er_ecs_count	num ber	Yes	Number of ECSs running the ZooKeeper nodes. The value is an integer between 0 and 10.	3

Parameter Name	Туре	Ma nda tory	Description	Default Value
pulsar_bookie_b roker_flavor	strin g	Yes	ECS flavor of bookie and broker nodes. You are advised to use an ECS with at least 4 vCPUs and 8 GB of memory. For more flavors, see A Summary List of x86 ECS Specifications.	c7n.xlarge.2
pulsar_bookie_e cs_count	num ber	Yes	Number of ECSs running the bookie nodes. The value is an integer between 0 and 10.	3
pulsar_broker_e cs_count	num ber	Yes	Number of ECSs running the broker nodes. The value must be an integer between 0 and 10.	3
ecs_disk_size	num ber	Yes	System disk size of components, in GB. The default disk type is general-purpose SSD. The disk size cannot be decreased. Value range: 40 to 1,024	100
charge_mode	strin g	Yes	Billing mode. The value can be postPaid (for pay-per-use) or prePaid (for yearly/monthly). Billing is automatic by default.	postPaid
charge_period_ unit	strin g	Yes	Type of an ECS subscription term. This parameter is valid only when charge_mode is set to prePaid (yearly/monthly). The value can be month or year .	month
charge_period	strin g	Yes	Subscription term. This parameter is valid only when charge_mode is set to prePaid (yearly/monthly). If charge_period_unit is set to month, the value range is 1 to 9. If charge_period_unit is set to year, the value range is 1 to 3.	1

Step 1 Access Huawei Cloud Quick-Start Guides and choose Quickly Deploying a Highly Available Pulsar Cluster. Select your desired region from the Data Center drop-down list and then click Deploy.

Figure 3-8 Selecting a solution

Deploy a highly available Pul manager node.	sar cluster based on Huawei Cloud ECSs.	. By default, there	are three ZooKeeper n	odes, three BookKeeper nodes,	three broker nodes, and one
	Dorrer Dorrer Dorrepr Dorrepr Dorrepr Dorrepr Dorrepr Dorrepr Dorrepr Dorrepr	inny Ca		Quickly Deploying a Cluster Version: 1.0.0 Last Updated: June 2024 Built By: Huawel Cloud Time Required for Deploy Time Required for Long Time Req	Highly Available Pulsar ment: About 20 minutes allation: About 5 minutes AP-Singapore AP-Singapore Perfor CN-Hong Kong Deploy

Step 2 On the **Select Template** page, click **Next**.

Figure 3-9 Selecting a template

Create Stack	
1 Select Template	(2) Configure Parameters 3 Configure Stack 4 Configurations
* Creation Mode	Existing Templates Visual Designer
* Template Source	My Templates URL Upload Template
	A stack is created using a template. The template must contain the deployment code file which file name extension is if or if joon.
* Template URL	https://documentation-samples-4.obs.ap-southeast-2
	The URL must contain at least the deployment code file, and the file size cannot exceed 1 MB.
	6 RFS only uses the data you upload for resource management. Your template will not be encrypted. KMS and DEW are recommended for encryption of sensitive variables. Currently, the RFS console can automatically use KMS to encrypt your sensitive variables.

Step 3 On the **Configure Parameters** page, configure parameters based on **Table 3-1** and click **Next**.

Figure 3-10 Configuring parameters

Create Stack						
) Select Template 2 Co	nfigure Parameters ③ Configure Stack	nfirm Configurations				
A Stack Name Lot drag as hat splate-cluster Difference of Difference (), and highlans, (), and highlans (). The stack name must be ungen.						
Description Dashty Deproving a Highly Available Putter Cluster 61225						
Configure Parameters	C Encrypt some resources based on the tr	amplate requirements.				
Parameter	Value	Туре	Description			
* enterprise_project_id	0	string	Enterprise project ID. Visit https://console/inti.huaweicloud.com/eps/ and refer to the deployment guide to find the ID. 0 (the default value) indicates the def			
* vpc_name	vpc-pulsar-cluster	string	Virtual Private Cloud (VPC) name. This template uses a newly created VPC and the VPC name must be unique. The value can contain 1 to 64 characters			
* security_group_name	sg-pulsar-cluster	string	Security group name. This template uses a newly created security group. For details about how to set security group rules, see the deployment guide. The			
* ecs_name	pulsar-cluster	string	Prefix of the Elastic Cloud Server (ECS) name, which must be unique. The naming rules are (ecs_name)-zookeeper-0X, (ecs_name)-bookie-0X, (ecs_na			
* ecs_password		रेख्ने string	Initial password of ECSs. After the Pulsar cluster is created, refer to the deployment guide and log in to the ECS console to change the password. It must			
			Previous			

Step 4 On the **Configure Stack** page, select **rf_admin_trust** from the **Agency** drop-down list and click **Next**. This step is optional if you use an account (HUAWEI ID) or use an IAM user in the **admin** user group.





Step 5 On the **Confirm Configurations** page, click **Create Execution Plan**.

Figure 3-12 Confirming configurations

Touto outer			
ect Template 📿 Confi	gure Parameters — Configure Stack —	Confirm Configurations	
RFS is free of charge, but the resource	ces in the stack are not. Currently, you need to create an	execution plan (free of charge) to obtain the e	estimated price.
emplate info			
lack Name	building-an-ha-pulsar-cluster		Description Oxidally Deploying a Highly Available Pulsar Cluster
arameters 🖉			
Parameter Name	Value	Туре	Description
enterprise_project_id	0	string	Enterprise project ID. Visit https://console.intl.huaweicloud.com/eps/ and refer to the deployment guide to find the ID. 0 (the default value) indicates the default enterprise proj
enterprise_project_id	0 vpc-pulsar-cluster	string	Enterprise project ID. Viol https://consolenth.huseeicoud.com/epu/ and refer to the deployment guide to find the ID. of the default value) indicates the default enterprise proj. Virtual Phrate Coud (VPC) name. This template uses a newly created VPC and the VPC name must be unique. The value can contain 16 64 characters. Only letters, digits
enterprise_project_id vpc_name security_group_name	0 vpc-pulsar-cluster sg-pulsar-cluster	string string string	Enterprise project D. Vish https://consolenth.husevec.oud.com/spoil.and refer to the deployment guide to find the ID. O the default value) indicates the default relation in the second of the VPC and the VPC same must be unique. The value can contain 116 64 characters. Only letters: dg/s
enterprise_project_id vpc_name secunty_group_name ecs_name	0 vpc-pulsar-cluster sp-pulsar-cluster pulsar-cluster	string string string string	Enterprise project D. Vish https://console/infl hasevecoud com/spoil and refer to the deployment guide to find the ID. 0 the default value) indicates the default relation of the VPC and the VPC annow must be unique. The value can contain 116 64 characters. Only letters, dgls Security group name. This temptate uses a newly created VPC and the VPC name must be unique. The value can contain 116 64 characters. Only letters, dgls Security group name. This temptate uses a newly created security group. For datalis about how to set security group nates, see the deployment guide. The value can contain Prefix of the Elastic Disud Server (ECS) name, which must be unique. The naming nates are (sccname)-cookie-dX, (sccname)-c
enterprise_project_id vpc_name securly_group_name ecs_name ecs_password	0 vpc-pulsar-cluster sg-pulsar-cluster pulsar-cluster *******	string string string string string	Enterprise project D. Visit https://console/infl husevec/out com/spoir and refer to the deployment guide to find the UD. 0 the default value) indicates the default relation of the VPC and the VPC annow must be unique. The value can contain 116 64 characters. Only afters, dgts Security group name. This template uses a newly created VPC and the VPC name must be unique. The value can contain 116 64 characters. Only afters, dgts Security group name. This template uses a newly created security group. For details about how to set security group nales, see the deployment guide. The value can contain Prefin of the Elastic Cloud Server (ECS) name, which must be unique. The naming nates are (eccname)-cookie-pot, (eccname)-cookie-pot, eds, added the security cloude to the CCS coreale to change the password it must contain 8 to 20 ma.
enterprise_project_id vpc_name eci_name eci_name eci_name pulsar_manager_flavor	0 vpc-putar-cluster ap-putar-cluster putar-cluster c/n large 2	string string string string string string	Enterprise provid: OL Visit Thips / Increase/site hauweicload compary and refer to the deprivant guide to first the 10.0 grad default value) includes to first haumeicload compary and refer to the deprivant guide. The value can contain 1 to default value) includes the default value) includes the default value) includes the default value) includes the default value). The value can contain 1 to default value) includes the default value) includes the default value) includes the default value). The value can contain 1 to default value) includes the default value) includes the default value) includes the default value) includes the default value). The value can contain 1 to default value) includes the default value) includes the default value) includes the default value). The value can contain 1 to default value) includes the default value) includes the default value) includes the default value). The value can contain 1 to default value) includes the default value) includes the default value) includes the default value). The value can contain 1 to default value) includes the default
enterprise_project_id vsc_name ecs_name ecs_name ecs_name putaer_manager_flavor putaer_zookeper_flavor	0 yoc-putral-cluster putral-cluster putral-cluster cluster cluster cluster cluster cluster clusters2 clusters2	ating string string string string string string	Enterprise project CL: Visit Thips://consolekitth.humevic.bod.com/spij.adv.fef to the deployment guide to for the U.D. 0 the default vision) indicates the default releging and the thread enterprise proj. Visital Physice Divide (VPC) reme. This template uses a newly created VPC and the VPC name must be unique. The value can contrain 1 to 44 characters. Only Metrin, diget. Security group name. This template uses a newly created security group. For details doub hor to be de security group name. See the deployment guides. The value can contrain 1.0 to 1 the default vision) indicates the default releging on the security group name. This template uses a newly created security group. For details doub hor to be de security group name. See the deployment guides. The value can contrain 1.0 to 1 the default vision of the Easter Cloud Server (ECC) name, which multi be unique. The namering uses are (sci_amering-cloudeseper CA, (sci_amering-blookie OC, (sci_ameris-blookie OC, (sci_ameri

Step 6 In the displayed dialog box, enter an execution plan name and click **OK**.

Figure 3-13 Creating an execution plan

reate Execution	Plan
To preview your res	ource billing information, you can create an execution plan.
k Execution Plan Name	executionPlan_20240520_1709_rwlp
Description	Enter a description of the execution plan.
	0/255
	OK Cancel

Step 7 Click **Deploy** in the **Operation** column. In the displayed dialog box, click **Execute**.

Figure 3-14 An execution plan created

	< building-an-ha-pulsar-cluster									D	lete Upda	te Template/Parameter	С
B	asic Infor	mation	Resources	Outputs	Events	Template	Execution Plans						
	Depk	by								E	iter a keyword.		Q
		Execution F	Plan Name/ID	s	tatus		Estimated Price (?)		Created	Descrip	tion	Operation	
	executionPlan_20240520_1709_rwlp 85c145d2-14b3-4bdb-bd85-8065/650c87c Available		View Details		May 20, 2024 17:09:57 GMT+08:00	-		Deploy Delete					

Figure 3-15 Confirming the execution plan

Execution Plan			×			
Are you sure you want to execute the Execution Plan Name	e plan? Status	Created				
executionPlan_20240520_170	Available	May 20, 2024 17:09:57 GMT+				
After the plan is executed, the stack is updated accordingly, and resources in the template are enabled, which may incur fees based on resource payment requirements.						
	ixecute	0				

- Step 8 (Optional) If you select yearly/monthly billing and your account balance is insufficient, log in to the Billing Center to pay for the order manually. You can refer to Table 2-2 to see the total price.
- **Step 9** Wait until the message **Apply required resource success** is displayed. It will take about 20 minutes for the environment to be deployed in the background.

Figure 3-16 Checking the deployment

< Ba	building-an-ha-pulsar-cl	Uster Outputs Events	Template Execution Plans		Delete Update Template/Parameter	C
				Resour •	Enter a keyword.	Q
	Time ↓ ,	Туре 🍞	Description	Resource Name/Type	Associated Resource ID	
	May 20, 2024 17:14:21 GMT+08:00	Log	Apply required resource success.			
	May 20, 2024 17:14:17 GMT+08:00	Creation Complete	huaweicloud_compute_instance.manager: Creation complete after 1m4s [id=a94a4713- bf64-4461-9ce9-5de382f8873d]	manager ECS	a94a4713-bf64-4461-9ce9-5de382f8873d	
	May 20, 2024 17:14:17 GMT+08:00	Summary	Apply completel Resources: 22 added, 0 changed, 0 destroyed.		-	
	May 20, 2024 17:14:12 GMT+08:00	Creation In Progress	huawekkoud_compute_instance.manager: Still creating [1m0s elapsed]	manager ECS	-	
	May 20, 2024 17:14:02 GMT+08:00	Creation In Progress	huaweicloud_compute_instance.manager. Still creating [50s elapsed]	manager ECS	-	
	May 20, 2024 17:13:52 GMT+08:00	Creation In Progress	huawekcloud_compute_instance.manager: Still creating [40s elapsed]	manager ECS		

Figure 3-17 Final results

K Ba	building-an-	ha-pulsar-clus	Outputs	Events	Template	Execution Plans			Delete	Update Template/Parameter	С
									Enter a ke	ryword.	Q
	Name			Тур	e		Value	Description			
	bookie-ips			strin	19		Bookie nodes: 10.150.1.98,10.150.1.170,10.150.1.205; service port: 6650	-			
	broker-ips			strin	19		Broker nodes: 10.150.1.185,10.150.1.226,10.150.1.149; service port: 8080	-			
	manager-ip			strin	10		Manager node:	-			
	pulsar			stri	19		After the resources are created, the cluster environment starts to be deployed	-			
	zookeeper-ips			strin	10		ZooKeeper nodes: 10.150.1.92, 10.150.1.144, 10.150.1.85	-			



3.3 Getting Started

This section describes how to use Pulsar. For details, see **Pulsar Overview**.

By default, all service ports involved in this solution are accessible within the same subnet. You can modify the security group rules if needed. The service ports are as follows:

- 9527 for the Pulsar manager node
- 2181, 2888, and 3888 for Pulsar ZooKeeper nodes
- 8000, 3181, 4181 for Pulsar bookie nodes
- 6650, 6651, 8080, 8443 for Pulsar broker nodes

NOTE

- By default, this solution uses Pulsar 3.1.0 and deploys Java JDK-21 and Pulsar Manager 0.4.0.
- A cluster named **pulsar-cluster** has been created in Pulsar by default.

(Optional) Modifying Security Group Rules

A security group is a collection of access control rules for traffic to and from cloud resources, such as cloud servers, containers, and databases. Cloud resources associated with the same security group have the same security requirements and are mutually trusted within a given VPC.

You can modify security group rules, for example, by adding, modifying, or deleting a TCP port, as follows:

- Adding a security group rule: Add an inbound rule and enable a TCP port if needed.
- Modifying a security group rule: Inappropriate security group settings may introduce serious security risks. You can modify security group rules to ensure the network security of your ECSs.
- Deleting a security group rule: If the source or destination IP address of an inbound or outbound security group rule changes, or a port needs to be disabled, you can **delete the security group rule**.

Procedure

Step 1 Log in to the **ECS console** to check whether the ECSs have been successfully created and check the EIP of the manager node.

Figure 3-18 Checking ECSs and the EIP (marked as Manager-ip) of the Pulsar manager node

٨														
Cloud Server Q	Ela	stic cloud server (1)										+ Troubleshooting	Cuick Links	Buy ECS
Console														
Dashboard	The password reset plug-in can now be installed after creating an ECS.													
Events		Start Stop Restart Reset Password Export ~												
Troubleshooting 🖸		Q, Search or filter by name.												00
NEW		□ Name/ID ⊕	Monit	Se	Status 😔	AZ 🖯	Specifications/Image \ominus	OS Type ⊖	Manager-ip	Billing Mode 😔	Enterprise Pro 😣	Tag ⊖	Operation	
Servers and Images		pulsar-cluster-man	Θ	٥	Running	AZ1	2 vCPUs 4 GIB c7n.large.2 CentOS 7.9 64bit	Linux	1 13 10.150.1.138 (Pay-per-use Created on May 20,	default	-	Remote Login	More ~
Elastic Cloud Server		putsar-cluster-zoo)	8	0	O Running	AZ1	2 vCPUs 8 GIB c7n.large.4 CentOS 7.9 64bit	Linux	10.150.1.177 (Pay-per-use Created on May 20,	default	-	Remote Login	More ~
ECS Group	4	putsar-cluster-boo	8	0	O Running	AZ1	4 vCPUs 8 GIB c7n.xlarge.2 CentOS 7.9 64bit	Linux	10.150.1.58 (P	Pay-per-use Created on May 20,	default	-	Remote Login	More ~
Server (HECS)		putsar-cluster-brok	8	٠	Running	AZ1	4 vCPUs 8 GIB c7n.xlarge.2 CentOS 7.9 64bit	Linux	10.150.1.110 (Pay-per-use Created on May 20,	default	-	Remote Login	More ~
Bare Metal Server Image Management		pulsar-cluster-zoo	•	٠	Running	AZ1	2 vCPUs 8 GIB c7n.large.4 CentOS 7.9 64bit	Linux	10.150.1.144 (Pay-per-use Created on May 20,	default	-	Remote Login	More ~
Network and		pulsar-cluster-zoo	•	٠	Running	AZ1	2 vCPUs 8 GiB c7n.large.4 CentOS 7.9 64bit	Linux	10.150.1.55 (P	Pay-per-use Created on May 20,	default	-	Remote Login	More ~
Security Security Groups		ulsar-duster-boo	•	٠	Running	AZ1	4 vCPUs 8 GiB c7n:xlarge.2 CentOS 7.9 64bit	Linux	10.150.1.123 (Pay-per-use Created on May 20,	default	-	Remote Login	More ~
Elastic IP 🕐		pulsar-cluster-brok (k	8	٠	Running	AZ1	4 vCPUs 8 GiB c7notarge.2 CentOS 7.9 64bit	Linux	10.150.1.239 (Pay-per-use Created on May 20,	default	-	Remote Login	More ~

Step 2 Log in to the Pulsar Manager.

After ECSs are created, the environment starts to be deployed in the background. About 20 minutes later, the Pulsar cluster is created. Then, you can log in to the **Pulsar Manager** at **http://manager-ip:9527**.

- Before logging in, ensure that port 9527 has been enabled on the Pulsar manager node for the client. If it is not enabled, **modify security group rules**.
- By default, admin is configured as the administrative user of the Pulsar cluster, and JSON Web Token (JWT) authentication is enabled.
- The default username and password are used for login.
 - Default username: admin
 - Default password: password used for creating ECSs



Login Form
Login Form 🕰
🚊 Username
🔒 Password but
Log in
Login with casdoor

Step 3 (Optional) Check whether the Pulsar cluster has been deployed.

Figure 3-20 Logging in to any ZooKeeper node and connecting to the ZooKeeper server

WATCHER::
WatchedEvent state:Closed type:None path:null
2023-11-15T16:15:19,699+0800 [main] INFO org.apache.zookeeper.ZooKeeper - Session: 0x10000085d46000b closed
2023-11-15T16:15:19,699+0800 [main-EventThread] INF0 org.apache.zookeeper.ClientCnxn - EventThread shut down for session: 0x10000085d46000b
2023-11-15T16:15:19,701+0800 [main] INFO org.apache.zookeeper.util.ServiceUtils - Exiting JVM with code 0
[root@pulsar-cluster-zookeeper zookeeper]# pwd
/usr/local/pulsar/zookeeper
[root@pulsar-cluster-zookeeper zookeeper]# ./bin/pulsar zookeeper-shell
Connecting to localhost:2181
2023-11-15T16:17:18,434+0800 [main] INFO org.apache.zookeeper.ZooKeeper - Client environment:zookeeper.version=3.8.1-74db005175a4ec545697012f9069cb9dcc8cdda7, built on 2023-01-25
2023-11-15T16:17:18,439+0800 [main] INFO org.apache.zookeeper.ZooKeeper - Client environment:host.name=localhost
2023-11-15T16:17:18,439+0800 [main] INFO org.apache.zookeeper.ZooKeeper - Client environment:java.version=21
2023-11-15T16:17:18,439+0800 [main] INFO org.apache.zookeeper.ZooKeeper - Client environment:java.vendor=Oracle Corporation
2023-11-15T16:17:18,439+0800 [main] INFO org.apache.zookeeper.ZooKeeper - Client environment:java.home=/usr/local/java/jdk-21

Figure 3-21 Checking whether the active ZooKeeper node is the same as the existing ZooKeeper node

invatio path string /200keeper/quota//200keeper_timits	Caup
<pre>[zk: localhost:2181(CONNECTED) 33] get /zookeeper/config</pre>	
server.l=10.150.1.7:2888:3888:participant	
server.2=10.150.1.216:2888:3888:participant	
server.3=10.150.1.175:2888:3888:participant	
version=0	
[zk: localhost:2181(CONNECTED) 34]	

Figure 3-22 Checking whether the active bookie node is the same as the existing bookie node

[zk: localhost:2181(CONNECTED) 19] ls /ledgers/available
[10.150.1.215:3181, 10.150.1.220:3181, 10.150.1.60:3181, readonly]
[zk. localhost.2181(CONNECTED) 20] ls /loadbalance/

Figure 3-23 Checking whether the active broker node is the same as the existing broker node

[broker-time-average, brokers, leader]
[zk: localhost:2181(CONNECTED) 22] ls /loadbalance/brokers
[10.150.1.10:8080, 10.150.1.117:8080, 10.150.1.66:8080]
[zk: localhost:2181(CONNECTED) 23]

Step 4 Add the new environment to Pulsar Manager.

Figure 3-24 Adding the new environment with any broker or bookie node

Service URL	Bookie URL
	No Data
New Environme	ent ×
* Environment Nam	ne
pulsar-test	
http://broker-ip:	8080
* Bookie URL	
http://bookie-ip	:6650
Confirm	Cancel



Figure 3-25 Viewing Pulsar details (built-in cluster name: pulsar-cluster)

Hanagement ^	Management								tes	st-pulsar ~
Tenants	Search Tenants	Q + New Tenant								
Namespaces	Tenant	Namespaces	Allowed Clusters	Admin Roles	In Rate	Out Rate	In Throughput	Out Throughput	Storage Size	
Topics	public	1	pulsar-cluster		生 0.00	± 0.00	\pm 0 Bytes	± 0 Bytes	0 Bytes	E C
Tokens	pulsar	1	pulsar-cluster		± 0.00	± 0.00	± 0 Bytes	± 0 Bytes	0 Bytes	
🖸 Apache Pulsar										
	l									

Step 6 Add a new tenant.

enants	Q + Ne	w Tenant					
t	Namespaces	Allowed Clusters	Admin Roles	In Rate	Out Rate	In Throughput	Out Through
;	1	pulsar-cluster		± 0.00	1 0.00	± 0 Bytes	± 0 Byte
r	1	pulsar-cluster	New Tenant		×	± 0 Bytes	⊥ 0 Byte
			* Tenants				
			user-test				
			* Allowed Clusters				
			pulsar-cluster 🛞		~		
			Admin Roles				
			+ New Role				
			Confirm				



Figure 3-27 Creating a namespace

Management ^	Management / Tenants / Tena	int Details			
Tenants	Tenant user-test				
Namespaces	NAMESPACES CONFIGURATI	ON			
Topics	Search namespaces	A + New Namespace		_	
Tokens	Namespace	Topics	New Namespace	×	Out
🖾 Apache Pulsar			" Namespaces		
			namespace-test		
			Confirm		



Figure 3-28 Adding a topic

He Management	Management / Tenants	/ Namespaces /	Namespace Details				pulsar 🗸 🕇	A ² Admin ~
Tenants	Tenant public	VNa	mespace default v					
Namespaces	OVERVIEW TOPICS	POLICIES	New Topic	×				
Topics	Search Topics		Domain					
Tokens	Topic	Partitions	Persistent Non-persistent		Out Pate	In Throughpu	Out Through	Storage Size
년 Apache Pulsar		Futuona	* Topic Name		our Rate	t	put	storage size
			topic-role					
			Partitions					
			0					
			Confirm Cancel					



Figure 3-29 Generating a token

		Management	Hanagement ^
		+ New Token	Tenants
Description	Token	Role	Namespaces
			Topics
^	New Token		Tokens
	Role		🖸 Apache Pulsar
	topic-role		
	Description		
	can create topic		
_	Confirm Cancel		

The Pulsar cluster has been deployed. You can now integrate the Pulsar applications into your applications.

----End

3.4 Quick Uninstallation

Deleting a Stack

Step 1 Log in to the RFS console, locate the stack you created for the solution and click **Delete** in the **Operation** column.

Figure 3-30 Deleting a stack

RFS OBT		Sta	acks ⑦					🕼 User Guide	Create Stack
Dashboard							Stack Name Search by stack name by default		Q®C
Stacks			Stack Name/ID	Status 7	Description	Created 4F	Updated ↓≡	Operation	
Stack Sets			building-an-ha-pulsar-cluster	Deployment Complete	Quickly Deploying a Highly A	Jun 26, 2024 17:38:43 GMT+08:00	Jun 26, 2024 17:41:00 GMT+08:00	Delete Update	
Visual Designer	°								
Templates	•								

Step 2 In the displayed dialog box, type "Delete" and click **OK**.

Delete Stack

Figure 3-31 Confirming the deletion

×

Are you sure you want to delete the stack and resources in the stack? Cannot be restored after being deleted. Exercise caution when performing this operation. Stack Name Status Created building-an-ha-pulsar-cluster Deployment ... May 20, 2024 17:09:56 GMT+08:00 Resources (22) Cloud Product N... Physical Resource Name/ID Resource Status pulsar-cluster-bookie-01 Elastic Cloud Server Creation Complete pulsar-cluster-bookie-02 Elastic Cloud Server Creation Complete pulsar-cluster-bookie-03 Elastic Cloud Server Creation Complete pulsar-cluster-broker-01 Elastic Cloud Server Creation Complete pulsar-cluster-broker-02 Elastic Cloud Server Creation Complete pulsar-cluster-broker-03 When Deleted Delete resource Retain resource Type Delete in the box below to continue. Delete OK Cancel

----End

4 Appendix

Concepts, cloud service introduction, and terms:

- **Elastic IP (EIP)**: EIP enables your cloud resources to communicate with the Internet using static public IP addresses and scalable bandwidth.
- Virtual Private Cloud (VPC): VPC enables you to provision logically isolated virtual private networks for cloud resources, such cloud servers, containers, and databases. You can create custom subnets, security groups, network ACLs, route tables, and assign EIPs and bandwidths.
- Elastic Cloud Server (ECS): An ECS is a basic computing unit that consists of vCPUs, memory, OS, and Elastic Volume Service (EVS) disks. After an ECS is created, you can use it just like a local computer or physical server.

5 Change History

Table 5-1 Change history

Released On	Description		
2023-11-30	This issue is the first official release.		