Practical Application of Huawei Cloud Solutions

Quickly Deploying a High-Availability RabbitMQ Cluster

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1 Solution Overview

Scenarios

You can easily create a high-availability **RabbitMQ** cluster on Huawei Cloud Elastic Cloud Servers (ECSs). RabbitMQ is open-source message-oriented middleware developed in Erlang to implement the Advanced Message Queuing Protocol (AMQP). It supports multiple programming languages.

Solution Architecture

This solution helps you quickly create a RabbitMQ cluster on Huawei Cloud ECSs.

Figure 1-1 Architecture

This solution will:

- Create three Linux ECSs, which will be deployed in different AZs to work as RabbitMQ nodes.

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- Create three elastic IP addresses (EIPs), which will be used for internal and external communication.
- Create security groups, which secure the ECS environment by controlling access to ECSs.

Advantages

- High availability

  ECSs are deployed across AZs to provide multi-AZ disaster recovery. Failover can be automated and data consistency can be ensured to the greatest possible extent.

- Easy deployment

  You can create ECSs running RabbitMQ with just a few clicks.

- Open source and customization

  This solution is open-source and free for commercial use. You can also make custom development according to the practical requirements.

Constraints

- Before deploying this solution, you need to register with Huawei Cloud. Ensure that your account is not in arrears or frozen. You can estimate the total price according to **Table 2-1**.
- After this solution is successfully deployed, it takes about 10 minutes to set up the RabbitMQ cluster. After the cluster is set up, you can verify the solution by referring to **3.3 Getting Started**.

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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 **pricing details**.

Table 2-1 Resource and cost planning (yearly/monthly)

Huawei Cloud Service	Example Configuration	Estimated Monthly Cost
Elastic Cloud Server (ECS)	• Region: AP-Singapore • Billing Mode: Yearly/Monthly • CPU Architecture: x86 • Type: General computing | s6.medium.2 | 1 vCPU | 2 GB • Image: CentOS 7.6 64bit • System Disk: High I/O | 40 GiB • Data Disk: High I/O | 100 GiB • Quantity: 3	$28.18 USD x 3 = $84.54 USD
Elastic IP (EIP)	• Region: AP-Singapore • Billing Mode: Yearly/Monthly • Product Type: Dedicated • Routing Type: Dynamic BGP • Billed By: Bandwidth • Bandwidth: 5 Mbit/s • Quantity: 3	$57 USD x 3 = $171.00 USD
Total		$255.54 USD

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Table 2-2 Resource and cost planning (pay-per-use)

Huawei Cloud Service	Example Configuration	Estimated Monthly Cost
Elastic Cloud Server (ECS)	• Pay-per-use: $0.05 USD/hour • Region: AP-Singapore • Billing Mode: Pay-per-use • CPU Architecture: x86 • Type: General computing | s6.medium.2 | 1 vCPU | 2 GB • Image: CentOS 7.6 64bit • System Disk: High I/O | 40 GiB • Data Disk: High I/O | 100 GiB • Quantity: 3	$0.05 USD x 24 x 30 x 3 = $108 USD
Elastic IP (EIP)	• Pay-per-use: $0.13 USD/5 Mbit/s/hour • Region: AP-Singapore • Billing Mode: Pay-per-use • Product Type: Dedicated • Routing Type: Dynamic BGP • Billed By: Bandwidth • Bandwidth: 5 Mbit/s • Quantity: 3	$0.13 USD x 24 x 30 x 3 = $270.00 USD
Total		$378.00 USD

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3 Procedure

3.1 Preparations
3.2 Quick Deployment
3.3 Getting Started
3.4 Quick Uninstallation

3.1 Preparations

Creating the rf_admin_trust Agency

Step 1 Log in to Huawei Cloud official website, open the **console**, move your mouse over the account name, and choose **Identity and Access Management**.

Figure 3-1 Console page

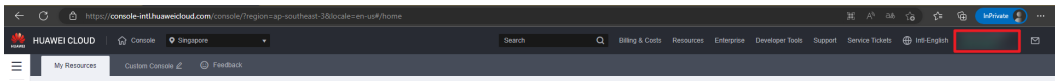

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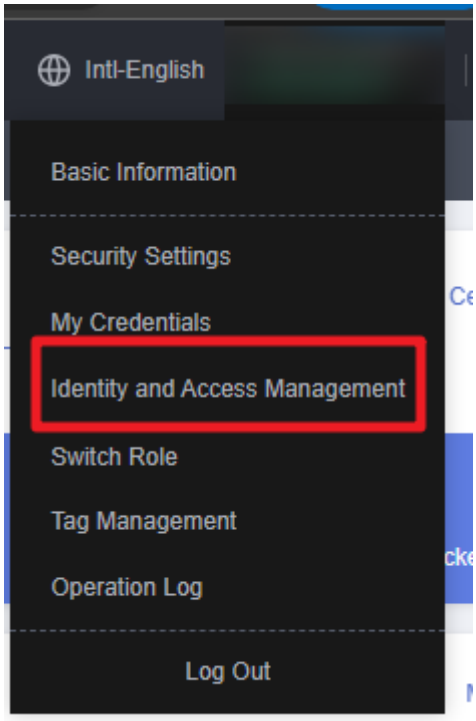
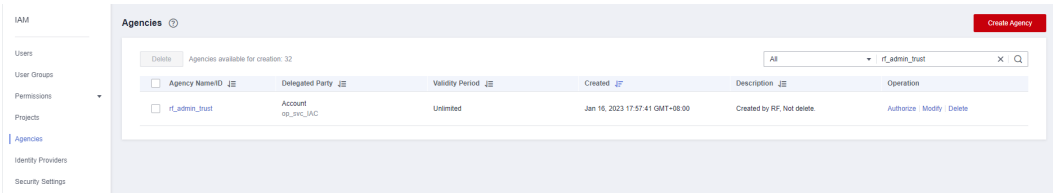
Figure 3-2 Identity and Access Management



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

Figure 3-3 Agency list



- If the agency is found, skip the following steps.
- If the agency is not found, perform the following steps to create it.

Step 3 Click **Create Agency** in the upper right corner of the page. On the displayed page, enter **rf_admin_trust** for **Agency Name**, select **Cloud service** for **Agency Type**, enter **RFS** for **Cloud Service**, and click **Next**.

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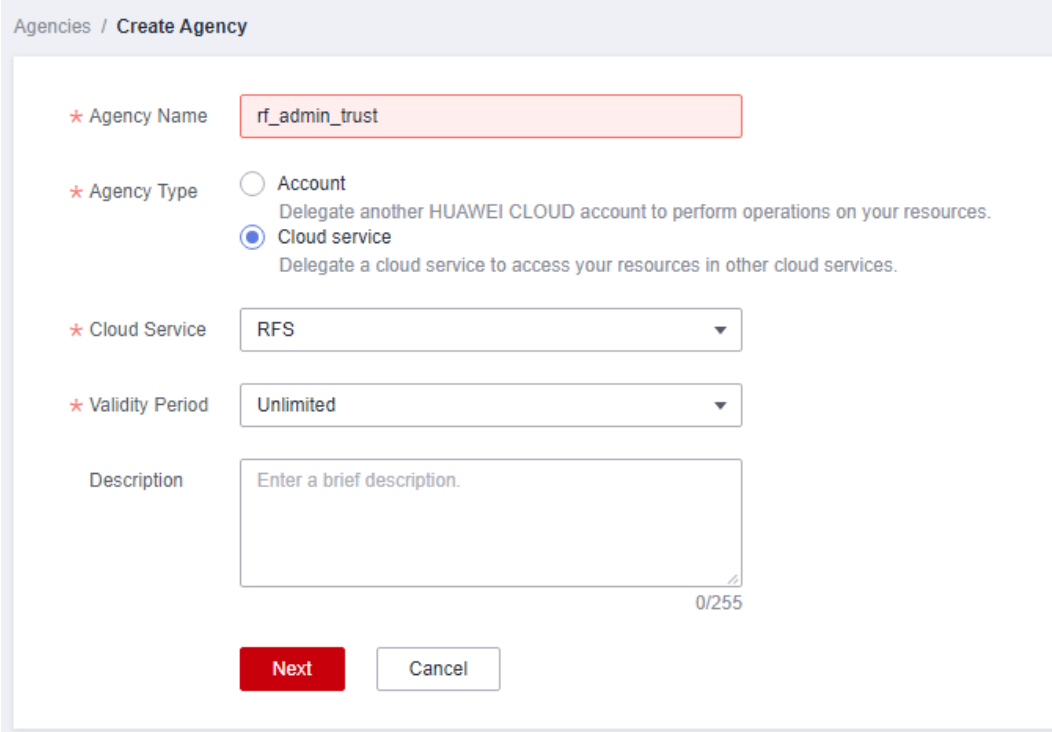
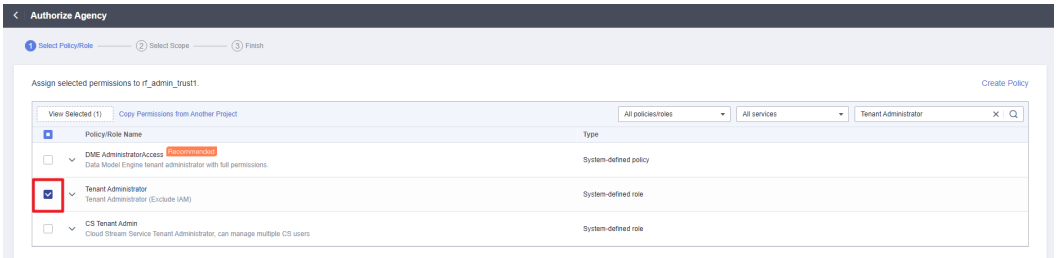
Figure 3-4 Create Agency



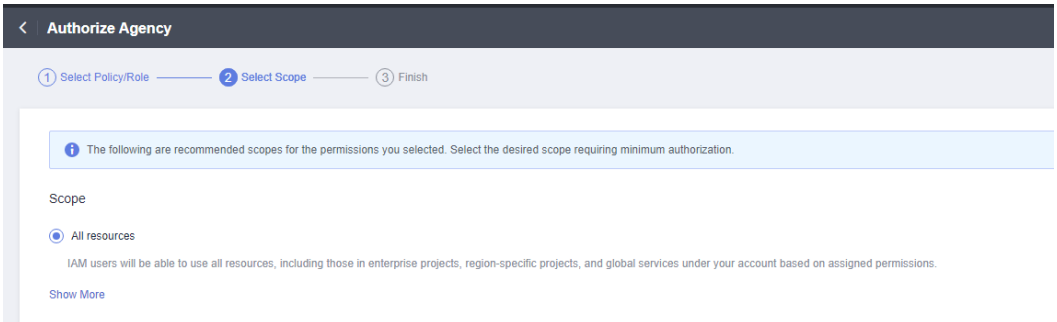
Step 4 Search for **Tenant Administrator** and select it in the search results.

Figure 3-5 Select Policy



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

Figure 3-6 Select Scope



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

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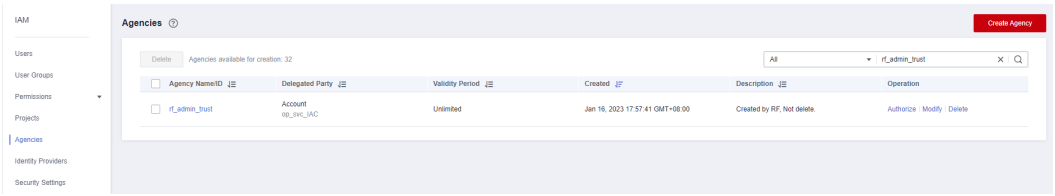
Figure 3-7 Agency list



----End

3.2 Quick Deployment

This section describes how to deploy the solution.

Table 3-1 Parameter description

Parameter	Type	Mandatory	Description	Default Value
vpc_name	String	Yes	The prefix of a Virtual Private Cloud (VPC) name. The VPC naming format is {vpc_name}_vpc. This template uses a newly created VPC and the VPC name must be unique. The prefix can contain 1 to 57 characters and can include letters, digits, underscores (_), hyphens (-), and periods (.).	highly-available-rabbitmq-cluster_demo

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Parameter	Type	Mandatory	Description	Default Value
secgroup_name	String	Yes	The prefix of a security group name. The security group naming format is {secgroup_name}_secgroup. This template uses a newly created security group. For details about how to configure security group rules, see the **(Optional) Modifying Security Group Rules**. It can contain 1 to 55 characters and can include letters, digits, underscores (_), hyphens (-), and periods (.).	highly-available-rabbitmq-cluster_demo
ecs_name	String	Yes	ECS name, which must be unique. The ECSs are named *{ecs_name}*-node01, *{ecs_name}*-node02, and *{ecs_name}*-node03. It can contain 1 to 57 characters and can include letters, digits, and hyphens (-).	highly-available-rabbitmq-cluster-demo
ecs_flavor	String	Yes	ECS flavor. For more flavors, see **A Summary List of x86 ECS Specifications**.	s6.medium.2

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Parameter	Type	Mandatory	Description	Default Value
ecs_password	String	Yes	ECS initial password. After an ECS is created, 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 administrator is **root**.	Left blank
system_disk_size	String	Yes	System disk size, in GiB. The value ranges from 1 to 1024. The system disk size cannot be scaled down.	40
data_disk_size	String	Yes	Data disk size, in GiB. The value ranges from 10 to 32768.	100
charging_mode	String	Yes	Billing mode. By default, fees are automatically deducted. The value can be **prePaid** (yearly/monthly) or **postPaid** (pay-per-use).	prePaid

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Parameter	Type	Mandatory	Description	Default Value
charging_unit	String	Yes	The value can be **year** or **month**. This parameter is mandatory when **charging_mode** is set to **prePaid**.	month
charging_period	number	Yes	When **charging_unit** is set to **year**, the value ranges from **1** to **3**. When **charging_unit** is set to **month**, the value ranges from **1** to **9**. This parameter is mandatory when **charging_mode** is set to **prePaid**.	1
eip_bandwidth_size	number	Yes	EIP bandwidth size. This template uses an EIP billed by bandwidth. The value ranges from 1 Mbit/s to 2000 Mbit/s.	5
RabbitMQ_username	String	Yes	RabbitMQ username. It can contain 5 to 16 characters and can include letters and digits.	admin
RabbitMQ_password	String	Yes	Password of the RabbitMQ user. After the creation is complete, change the password by following the instructions provided in the deployment guide. It can contain 6 to 12 characters and can include letters, digits, and special characters (!@$#%^-=+,./?)	Left blank

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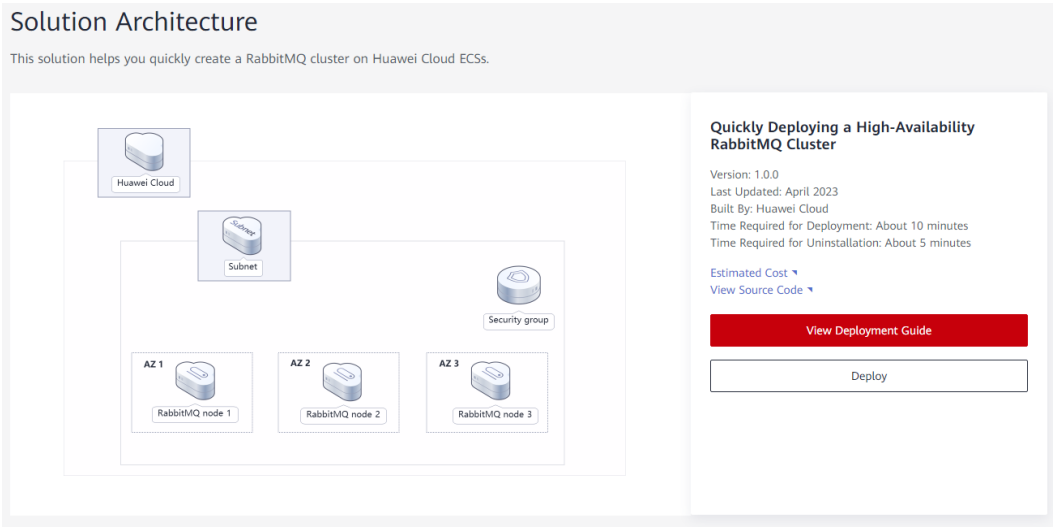
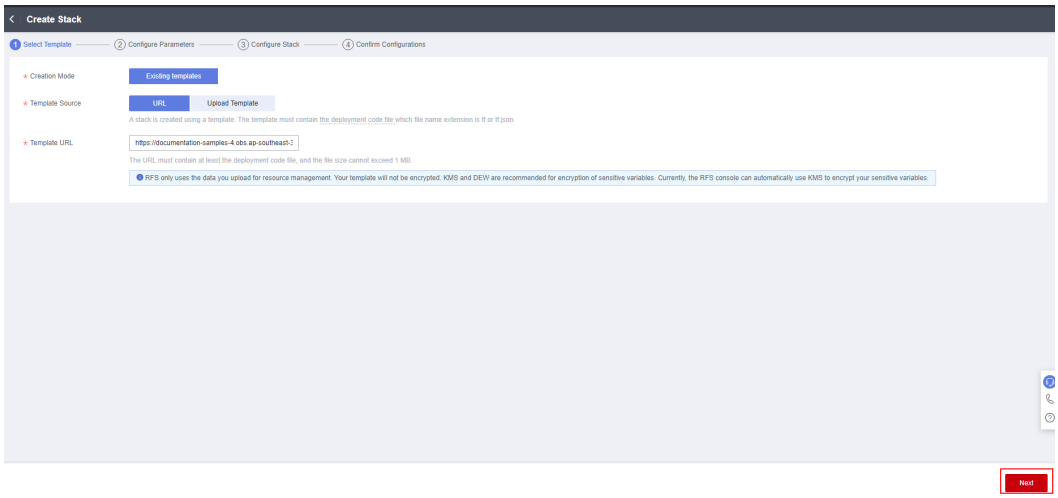
Step 1 Log in to Huawei Cloud Solution Best Practices, choose **Quickly Deploying a High-Availability RabbitMQ Cluster**, and click **Deploy**.

Figure 3-8 Selecting a solution



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

Figure 3-9 Select Template



Step 3 On the **Configure Parameters** page, enter a stack name, configure parameters according to **Table 3-1**, and click **Next**.

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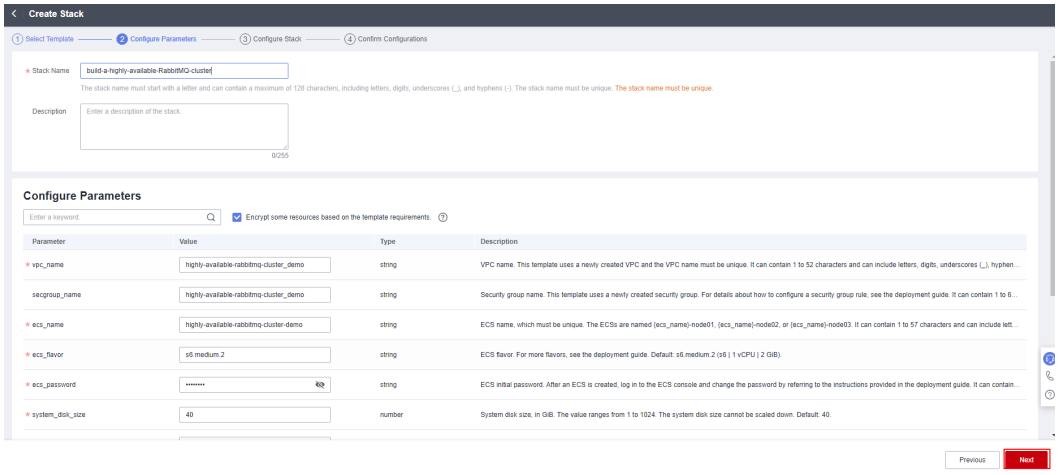
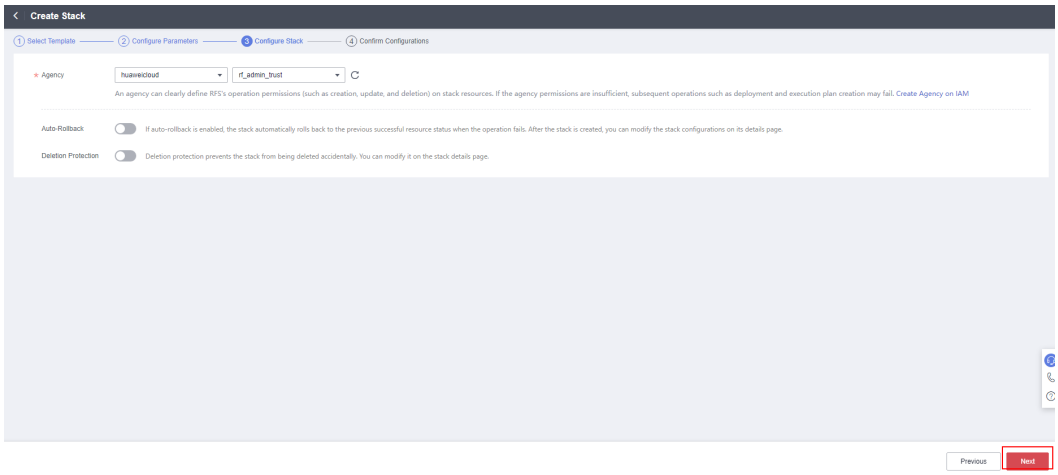
Figure 3-10 Configure Parameters



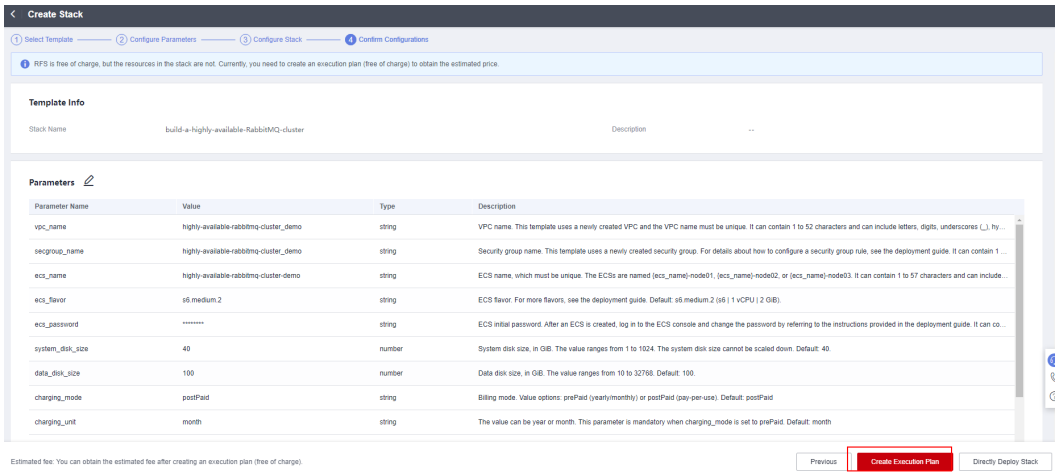
Step 4 On the **Configure Stack** page, select the **rf_admin_trust** agency and click **Next**.

Figure 3-11 Configure Stack



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

Figure 3-12 Confirm Configurations



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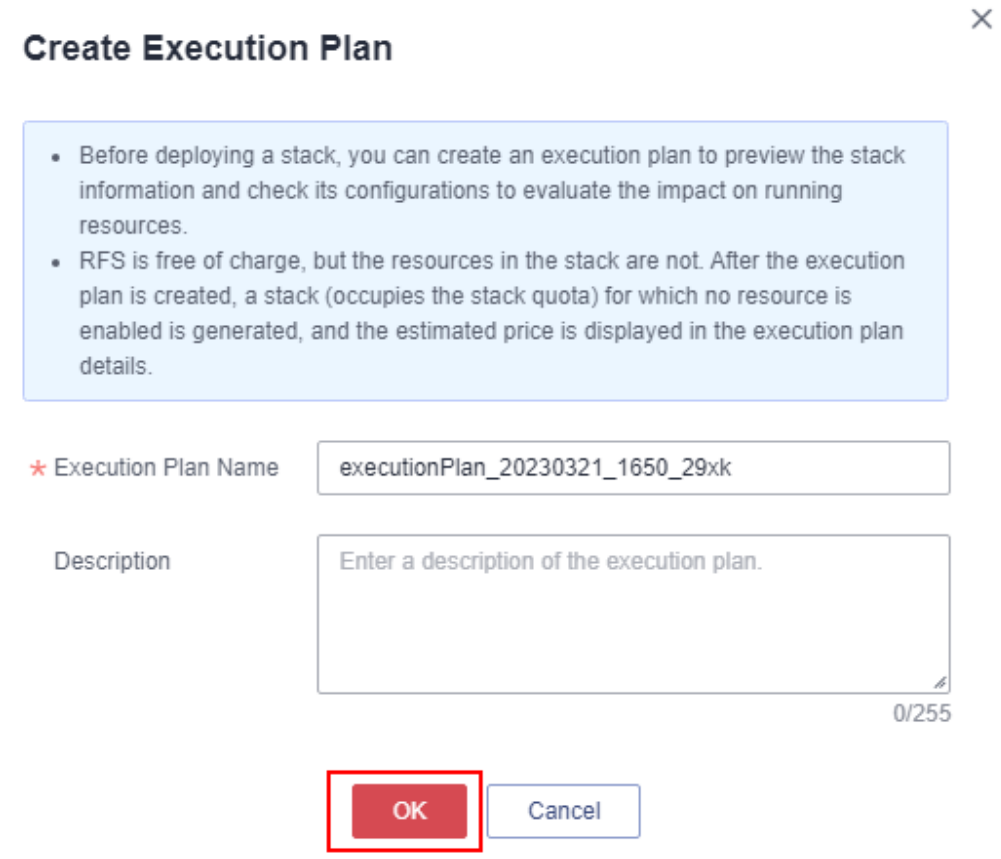
Step 6 In the displayed **Create Execution Plan** dialog box, enter an execution plan name and click **OK**.

Figure 3-13 Create Execution Plan



Step 7 Wait until the status of the execution plan changes to **Available** and click **Deploy** in the **Operation** column. In the displayed dialog box, click **Execute**.

Figure 3-14 Execution plan created

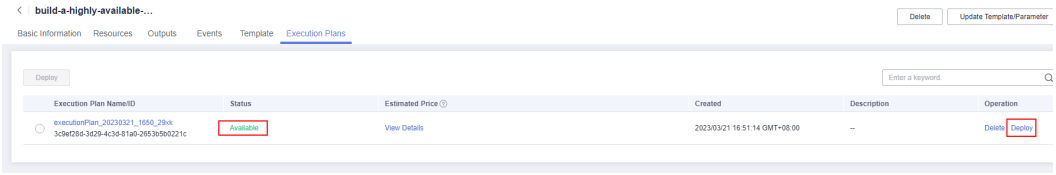


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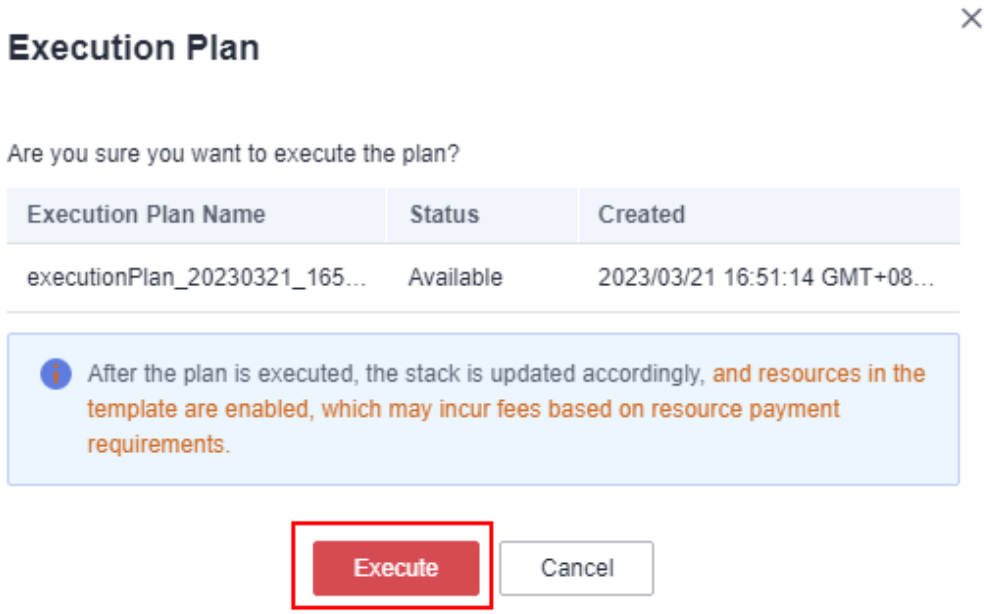
Figure 3-15 Confirming the execution plan



Step 8 Wait until automatic deployment is complete, and click the **Events** tab to view details.

Figure 3-16 Resources created

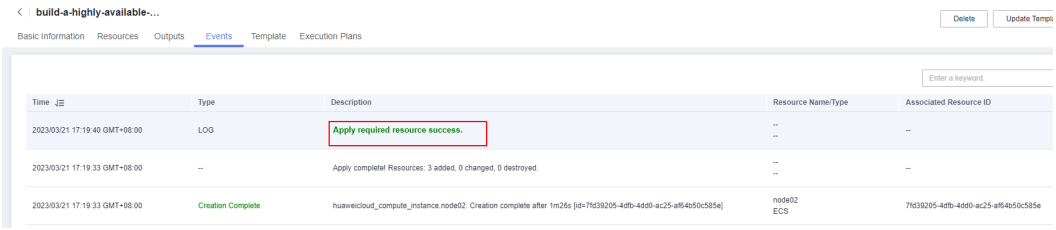
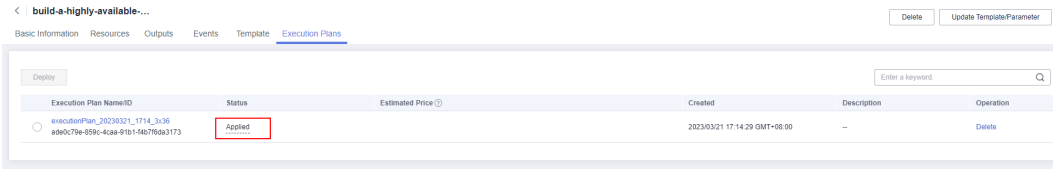


Figure 3-17 Execution plan complete



Step 9 Click the **Outputs** tab to view information about the VIP and ECSs.

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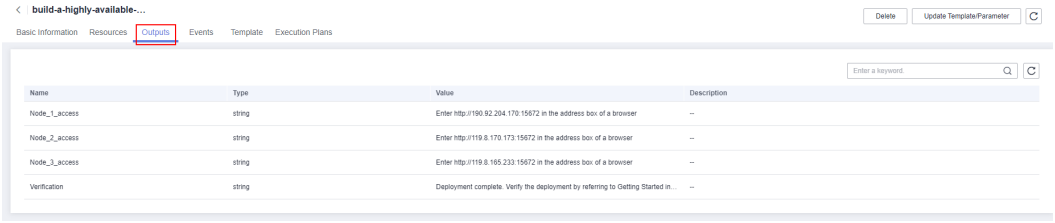
Figure 3-18 Outputs



----End

3.3 Getting Started

(Optional) Modifying Security Group Rules

NOTICE

- This solution uses port 22 to remotely log in to the ECS. By default, the VPC subnet created in this solution allows access from port 22. Configure an IP address whitelist by referring to **Modifying a Security Group Rule**.

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

You can modify the security group policy, 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 can be a serious security risk. 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 does not need to be enabled, you can **delete the security group rule**.

(Optional) Changing the RabbitMQ Password

Step 1 Log in to the **ECS console**, select any of the ECSs created, and click **Remote Login** or use any other tool to log in to the Linux ECS.

Figure 3-19 ECS console

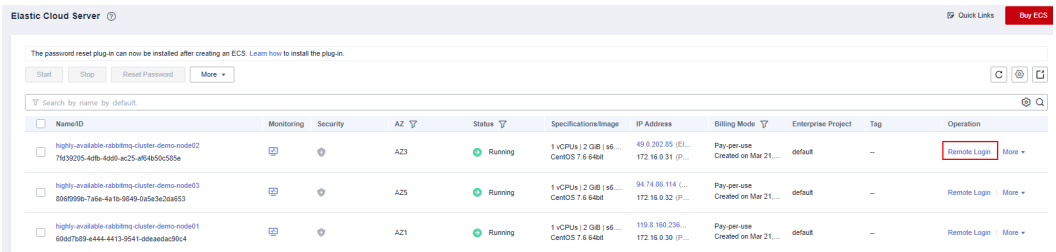


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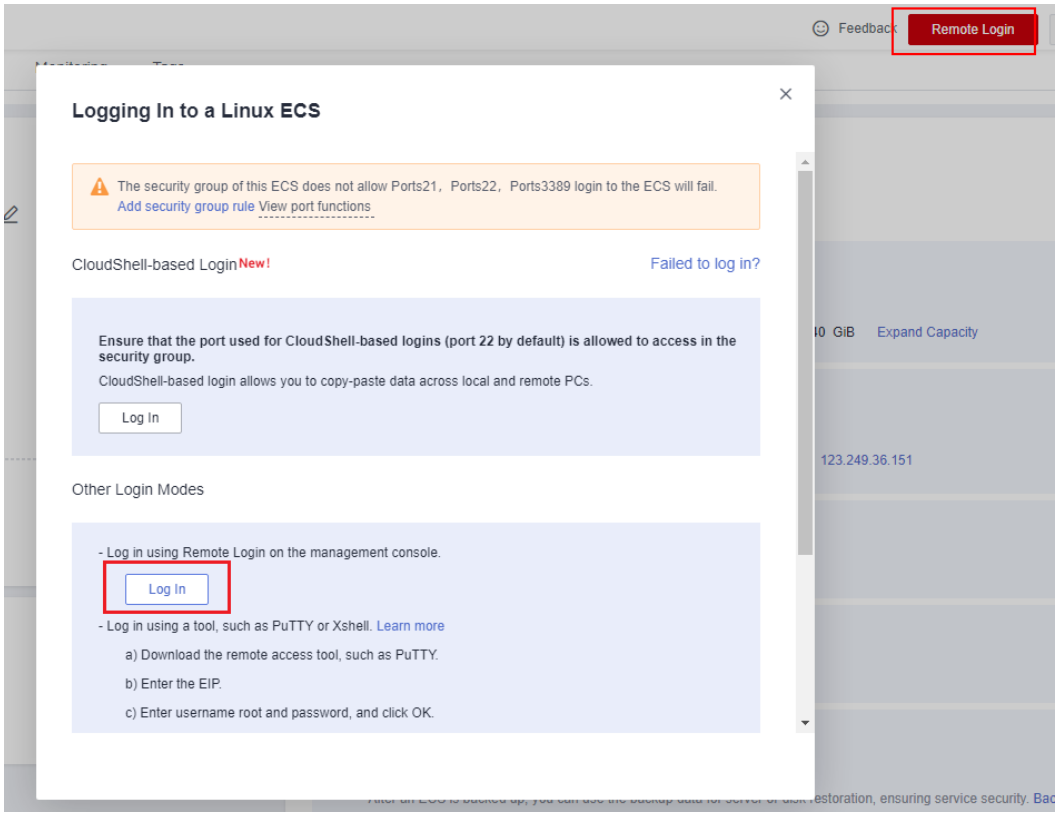
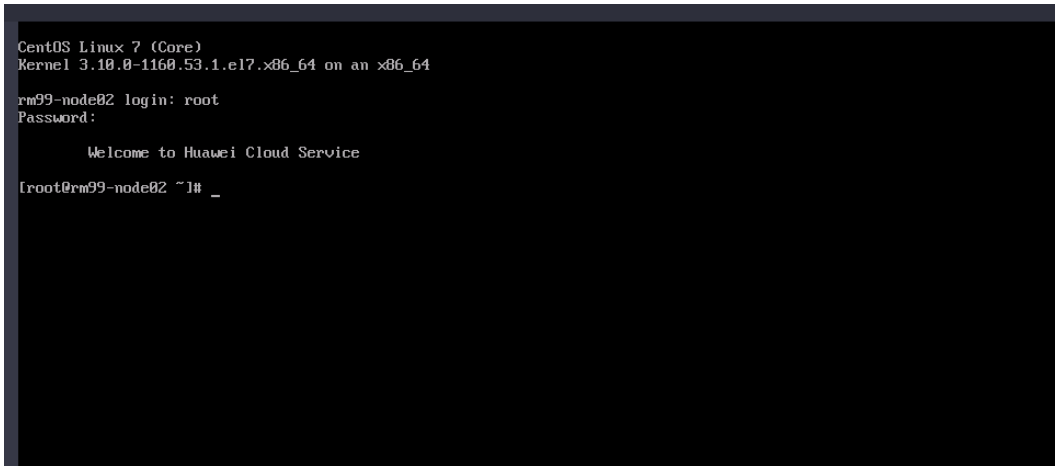
Figure 3-20 Logging in to a Linux ECS



Step 2 On the ECS, enter the username and password and press **Enter**.

Figure 3-21 Logging in to an ECS



Step 3 Run **rabbitmqctl change_password** *Username New password* to change the password.

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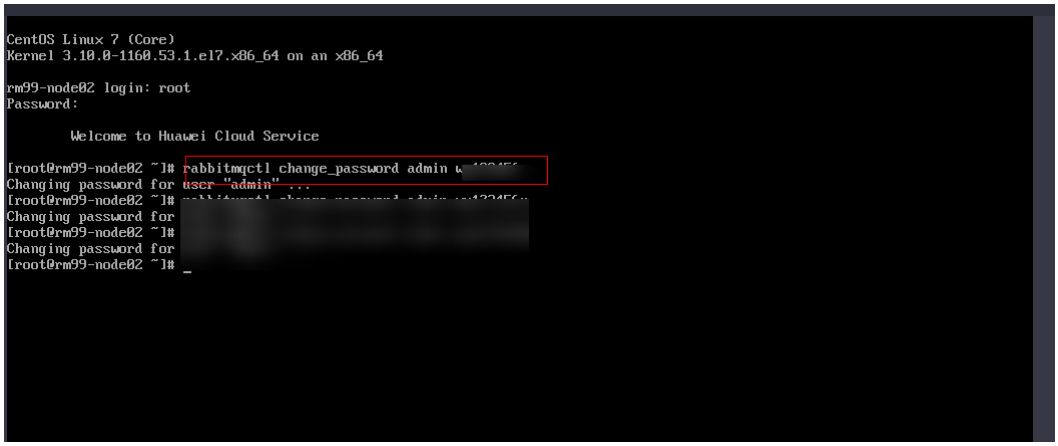
Figure 3-22 Changing the password



----End

Verifying Deployment of the RabbitMQ Cluster

Step 1 Click the **Outputs** tab and select any node.

Figure 3-23 Outputs

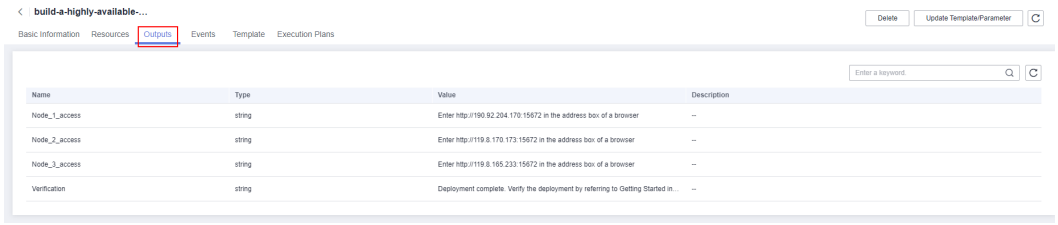
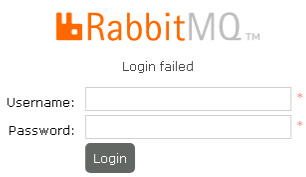


Figure 3-24 RabbitMQ webpage



Step 2 Enter the username and password, and click **Login**.

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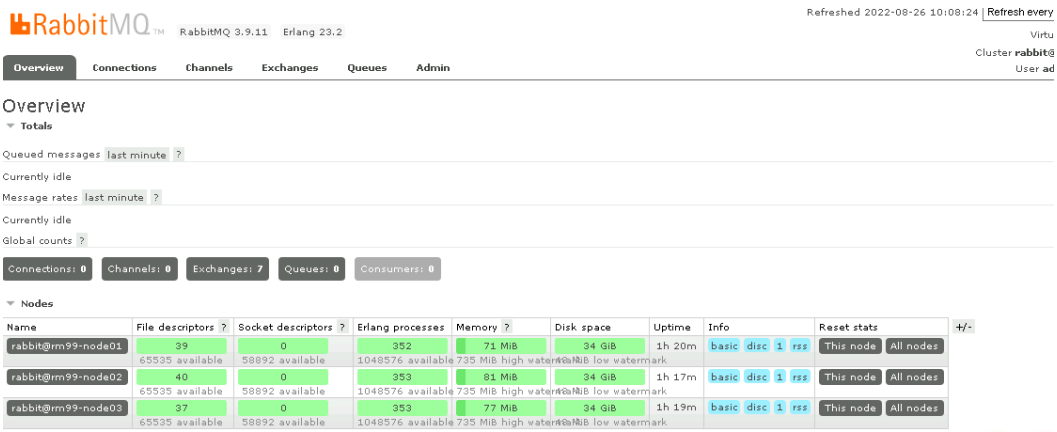
Figure 3-25 Entering the username and password

Figure 3-26 RabbitMQ cluster page

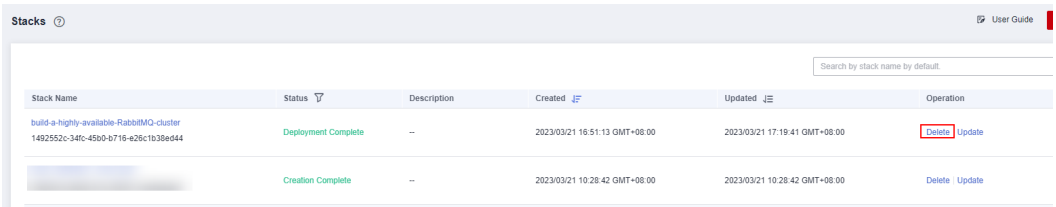


----End

3.4 Quick Uninstallation

Step 1 Click **Delete** in the row where the solution stack is.

Figure 3-27 Uninstalling the solution



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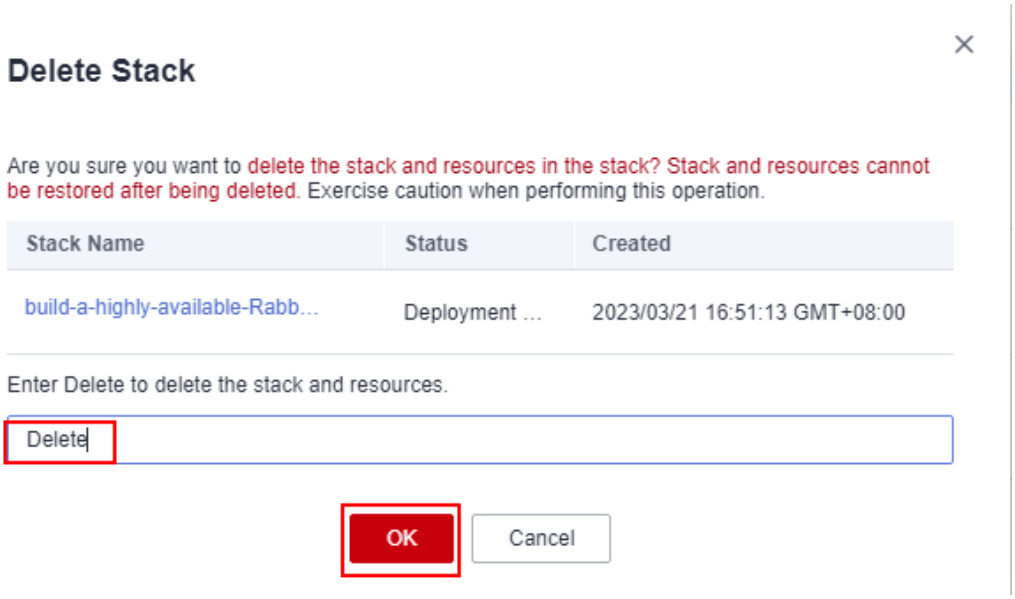
Step 2 Enter **Delete** and click **OK**.

Figure 3-28 Confirming the uninstallation



----End

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4 Appendix

Terms

- **Elastic Cloud Server (ECS)**: ECS provides secure, scalable, on-demand compute resources, enabling you to flexibly deploy applications and workloads.
- **Elastic IP (EIP)**: EIP provides static public IP addresses and scalable bandwidths that enable your cloud resources to communicate with the Internet. You can easily bind an EIP to an ECS, BMS, virtual IP address, NAT gateway, or load balancer, enabling immediate Internet access.

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5 Change History

Table 5-1 Change history

Released On	Description
2023-04-30	This issue is the first official release.

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