Practical Application of Huawei Cloud Solutions

Application Containerization on the Cloud

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Contents

1 Solution Overview

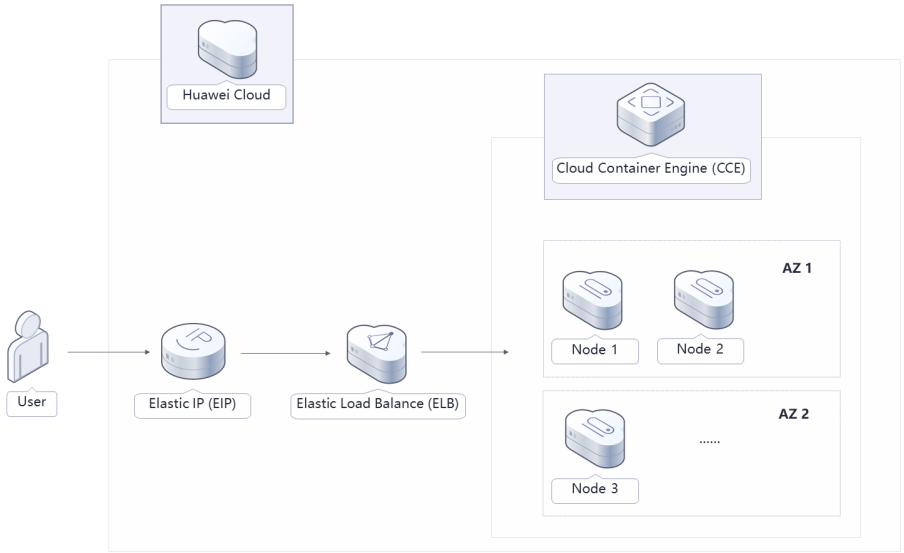
Scenarios

This solution is built on **Cloud Container Engine (CCE)** to quickly deploy a cross-AZ HA container cluster environment, helping you quickly containerize your service systems. CCE is a high-performance, highly reliable service through which enterprises can easily manage containerized applications. It supports native applications and tools of the Kubernetes community.

Architecture

This solution is built on Cloud Container Engine (CCE) to quickly deploy a cross-AZ HA container cluster environment, helping you quickly containerize your service systems.

Figure 1-1 Architecture



This solution will:

- Deploy master nodes of a CCE cluster across AZs to manage compute nodes and manage and schedule resources of service systems.
- Create a node pool for a CCE cluster to quickly create, manage, and destroy nodes without affecting the entire cluster.
- Contain three compute nodes in a node pool to run service systems. Compute nodes are deployed across AZs. Each node contains basic components required for running pods. You can add nodes as needed.
- Automatically install common add-ons, such as autoscaler, metrics-server, and cce-hpa-controller, to support scale-out that meets feature requirements.

Advantages

- HA

  A CCE cluster has three master nodes. If one master node is faulty, the cluster can still work without affecting service functions. Compute nodes can be deployed across AZs to ensure high availability of service systems.

- Open and compatible

  CCE is built on Kubernetes and compatible with Kubernetes native APIs and kubectl (a command line tool). CCE provides full support for the most recent Kubernetes and Docker releases.

- Easy deployment

  One-click deployment allows you to quickly use the capabilities of Huawei Cloud container services.

Constraints

- Before deploying this solution, you need to sign up for Huawei Cloud. Ensure that your account is not in arrears or frozen.

2 Resource and Cost Planning

This solution involves the resources listed in **Table 2-1**. The costs are only estimates and may differ from the final prices. For details, see **Pricing Details**.

Table 2-1 Resource and cost planning

Huawei Cloud Service	Example Configuration	Monthly Cost
Cloud Container Engine (CCE)	• Pay-per-use: $0.08 USD/hour • Region: AP-Singapore • Billing Mode: Pay-per-use • Cluster Type: CCE Cluster • Management Scale: 50 nodes • High Availability: Yes • Quantity: 1	$302.40 USD
CCE Cluster Nodes	• Pay-per-use: $0.52 USD/hour • Region: AP-Singapore • Billing Mode: Pay-per-use • CPU Architecture: x86 • Specifications: General computing-plus | c6s.xlarge.2 | 4 vCPUs | 8 GiB • Image: EulerOS 2.5 • System Disk: High I/O | 40 GiB • Data Disk: High I/O | 100 GiB • Quantity: 3	$371.52 USD

Huawei Cloud Service	Example Configuration	Monthly Cost
Elastic IP (EIP)	• Region: AP-Singapore • Billing Mode: Pay-per-use • Product Type: Dedicated • Routing Type: Dynamic BGP • Billed By: Traffic • Quantity: 1	$0.11 USD/GB $0.01 USD/2 hours (The specific cost is estimated based on the actual service traffic and duration.)
Total		$673.92 USD + Public network traffic fee ($0.11 USD/GB & $0.01 USD/2 hours)

3 Procedure

3.1 Preparations

Creating the rf_admin_trust Agency

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

Figure 3-1 Console page

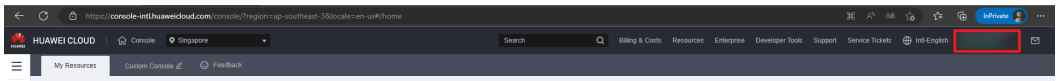
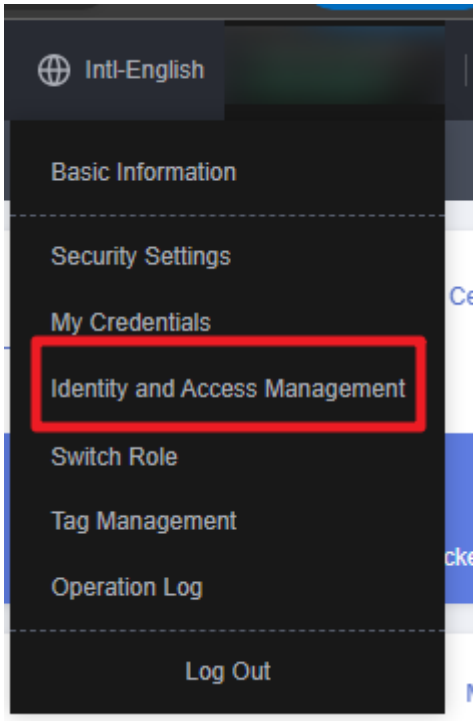
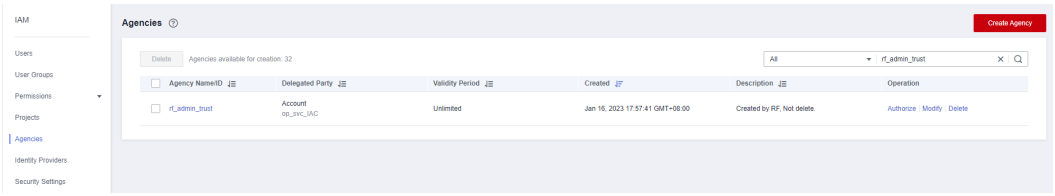


Figure 3-2 Identity and Access Management



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

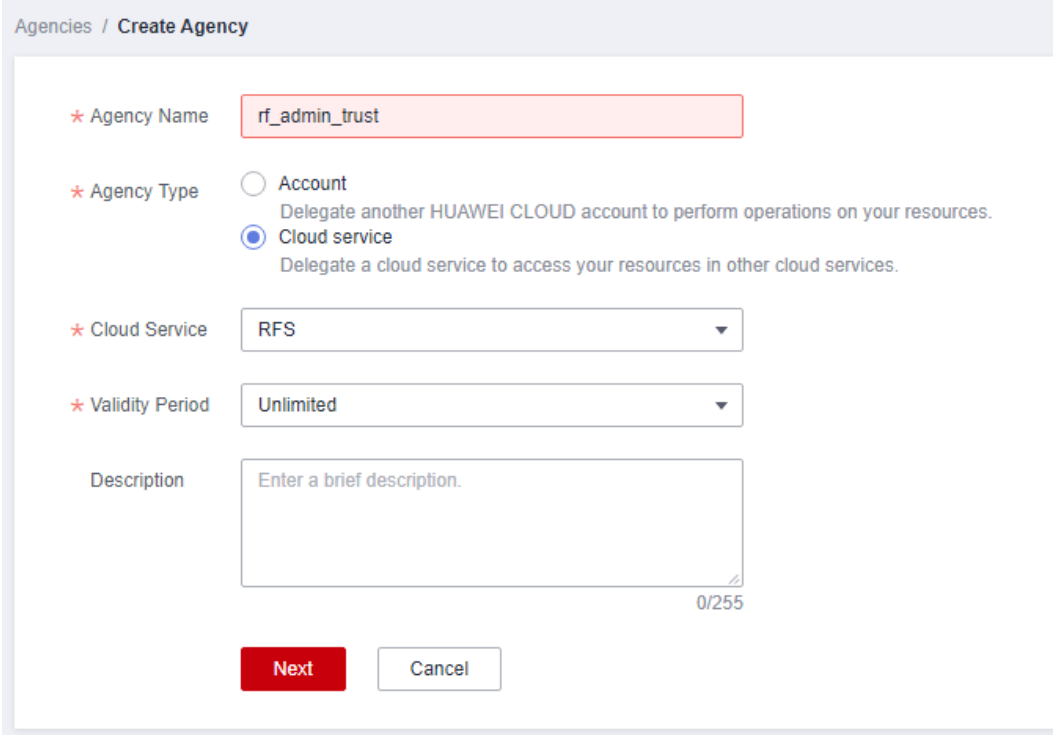
Figure 3-3 Agencies



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

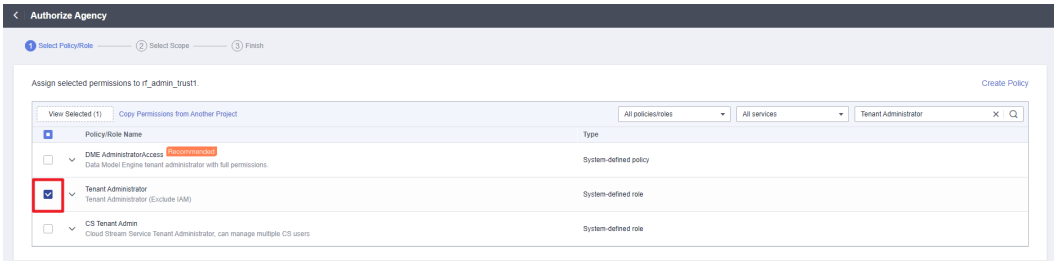
Step 3 Click **Create Agency** in the upper right corner of the page. On the displayed page, enter **rf_admin_trust** for **Agency Name**, select **Cloud service** for **Agency Type**, select **RFS** for **Cloud Service**, and click **Next**.

Figure 3-4 Creating an agency



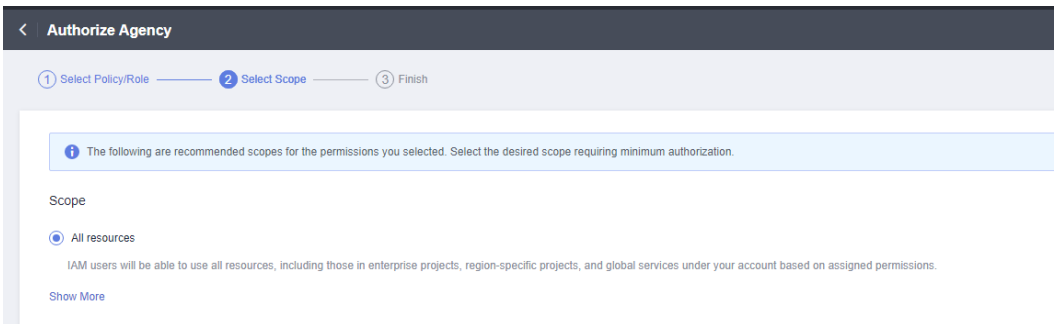
Step 4 Search for **Tenant Administrator**, select it in the search results, and click **Next**.

Figure 3-5 Selecting a policy



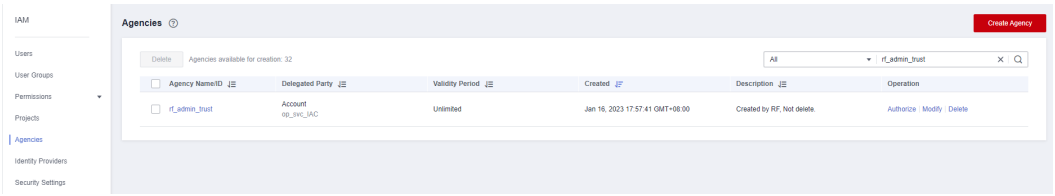
Step 5 Select **All resources** and click **OK**.

Figure 3-6 Selecting a scope



Step 6 If **rf_admin_trust** is displayed in the agency list, the agency has been created.

Figure 3-7 Agencies



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3.2 Quick Deployment

Automatically deploy the Application Containerization on the Cloud solution.

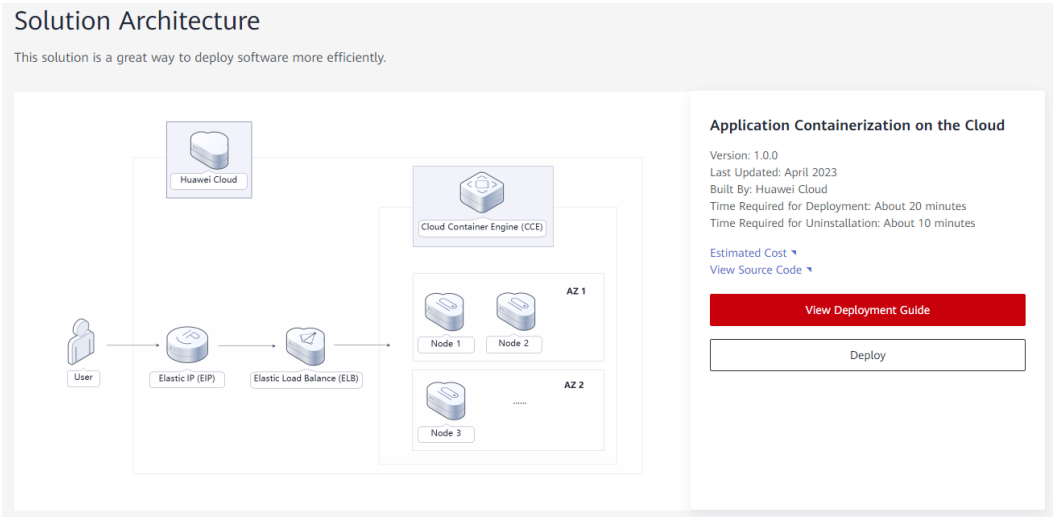
Table 3-1 Parameter description

Parameter	Type	Mandatory (Yes/No)	Description	Default Value
vpc_name	String	Yes	The prefix of a 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 57 characters and can include letters, digits, underscores (_), hyphens (-), and periods (.).	application-containerization-to-the-cloud-demo
cce_name	String	Yes	Cloud Container Engine (CCE) name. The value contains 4 to 128 characters starting with a letter and not ending with a hyphen (-). Only lowercase letters, digits, and hyphens (-) are allowed.	application-containerization-to-the-cloud-demo

Parameter	Type	Mandatory (Yes/No)	Description	Default Value
node_pool_name	String	Yes	Node pool name. The value contains 1 to 50 characters starting with a letter and not ending with a hyphen (-). Only lowercase letters, digits, and hyphens (-) are allowed.	application-containerization-to-the-cloud-demo
node_pool_password	String	Yes	Node pool Password. The value contains 8 to 26 characters consisting of at least three of the following types: uppercase letters, lowercase letters, digits, and special characters (!@$ %^-_=+[{}]:,./?).	Empty

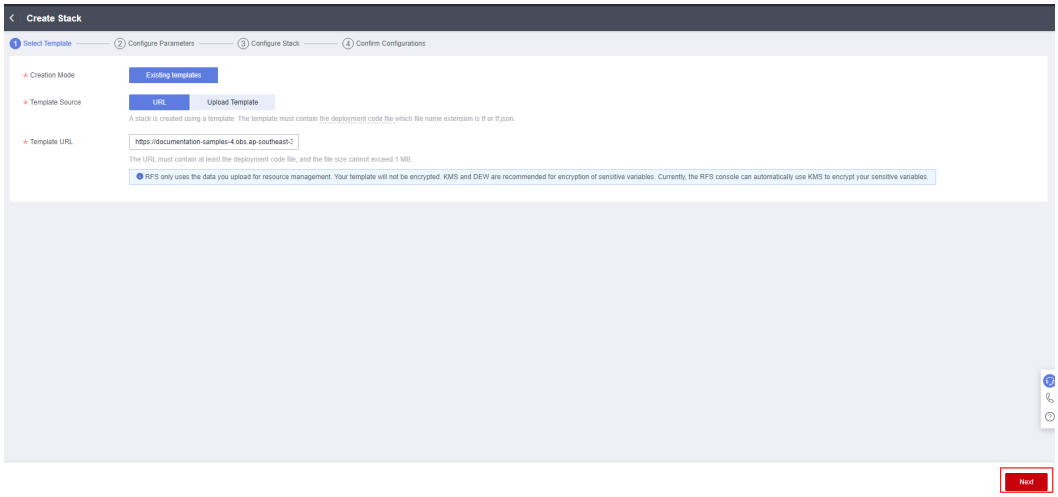
Step 1 Log in to Huawei Cloud Solution Best Practices, choose **Application Containerization on the Cloud** and click **Deploy**. The **Create Stack** page is displayed.

Figure 3-8 Selecting a solution



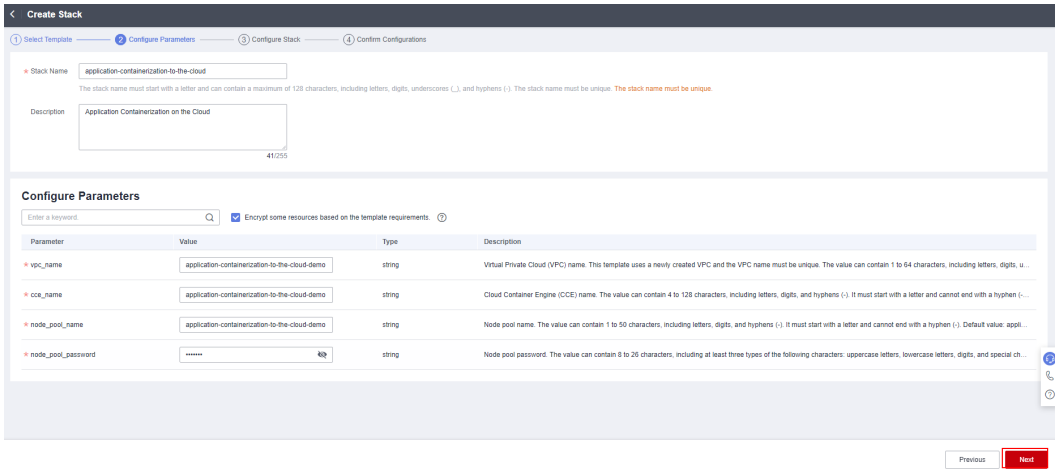
Step 2 On the **Select Template** page, click **Next**.

Figure 3-9 Selecting a template



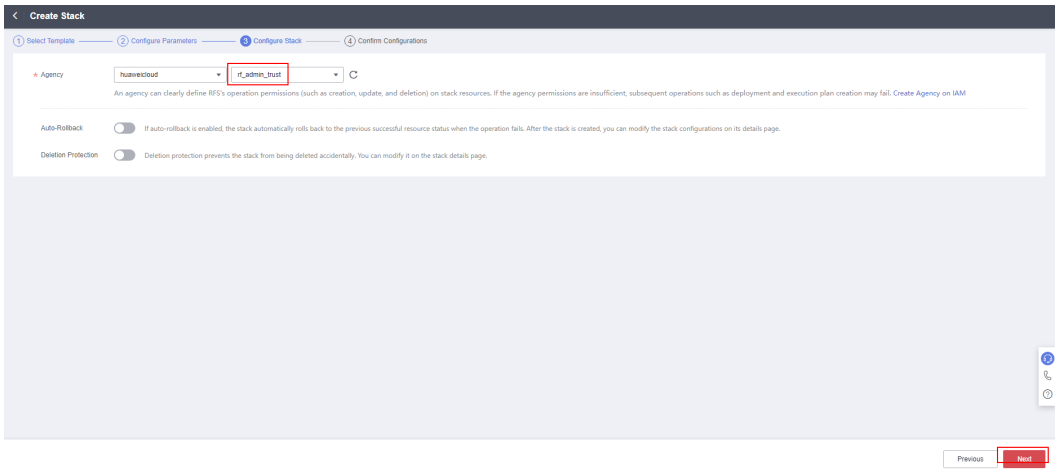
Step 3 On the **Configure Parameters** page, enter a stack name, configure parameters according to **Table 3-1**, and click **Next**.

Figure 3-10 Configure parameters



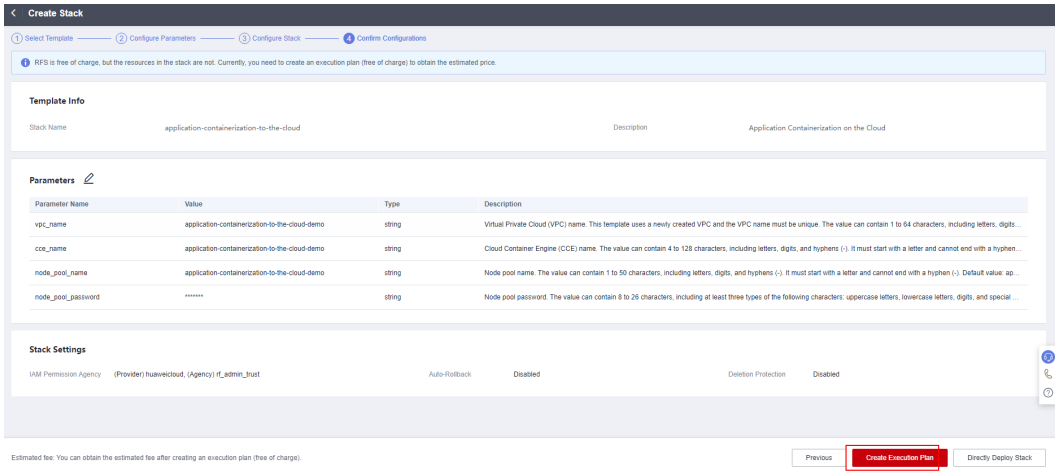
Step 4 On the **Configure Stack** page, select the **rf_admin_trust** agency and click **Next**.

Figure 3-11 Configuring a stack



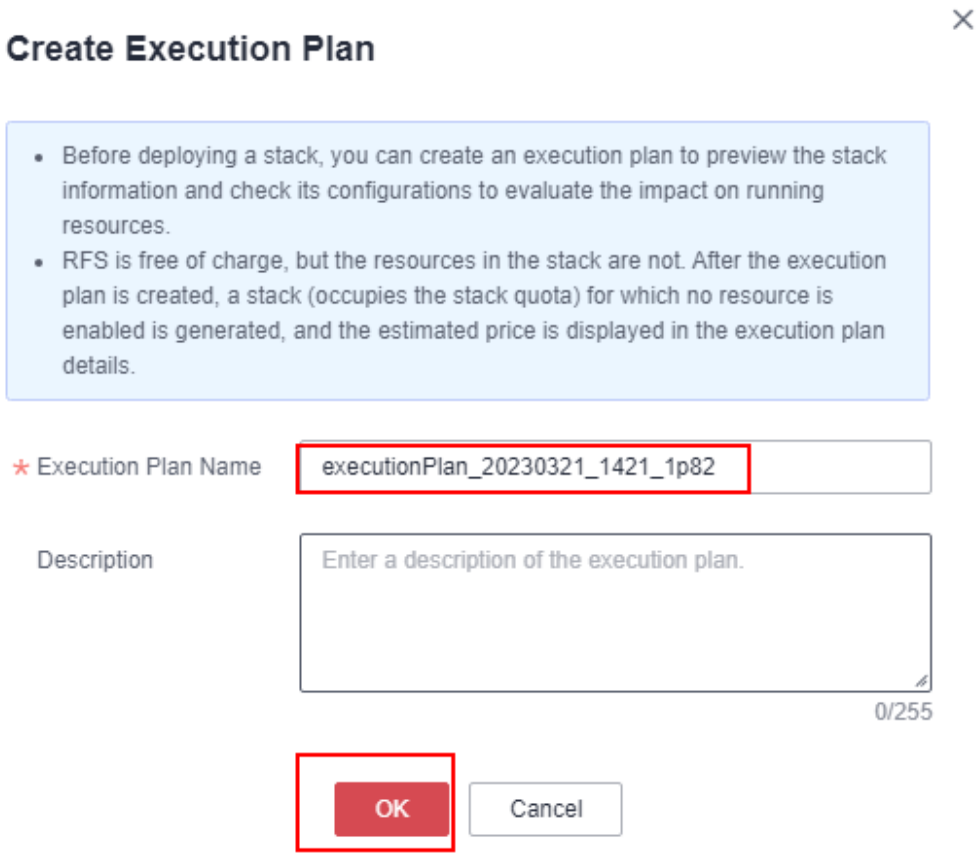
Step 5 On the **Confirm Configurations** page, confirm the configurations and click **Create Execution Plan**.

Figure 3-12 Confirming configurations



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

Figure 3-13 Creating an 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

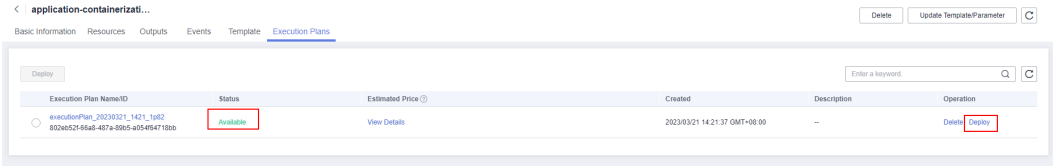
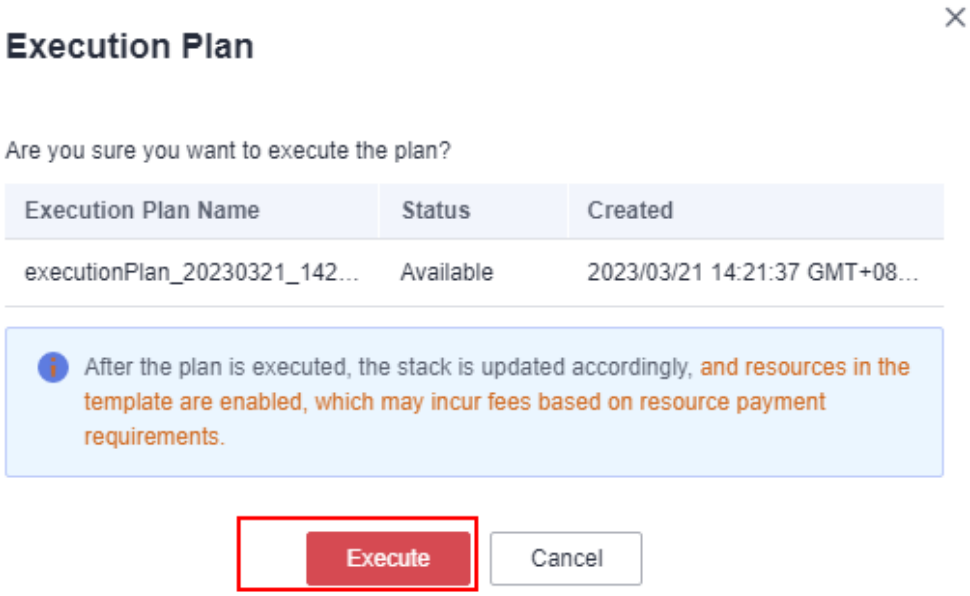


Figure 3-15 Confirming the execution plan



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

Figure 3-16 Resources created

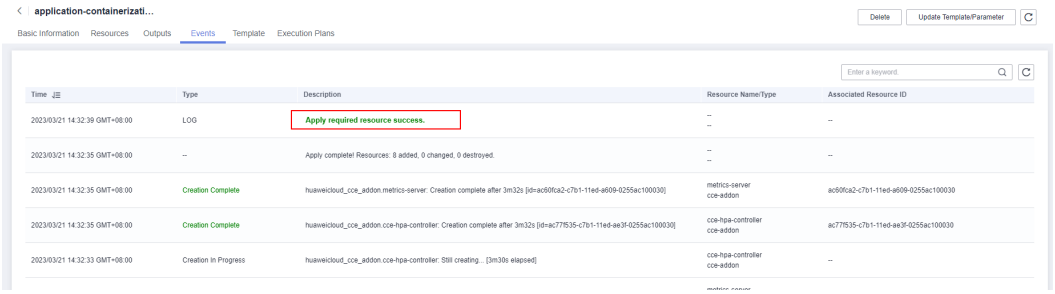
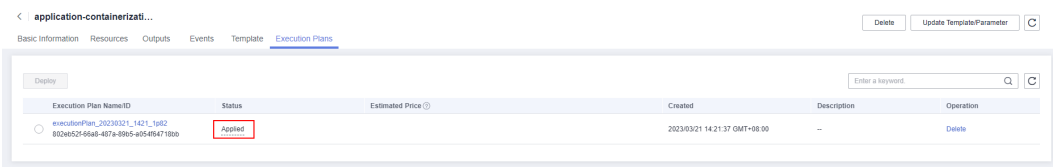


Figure 3-17 Execution completed

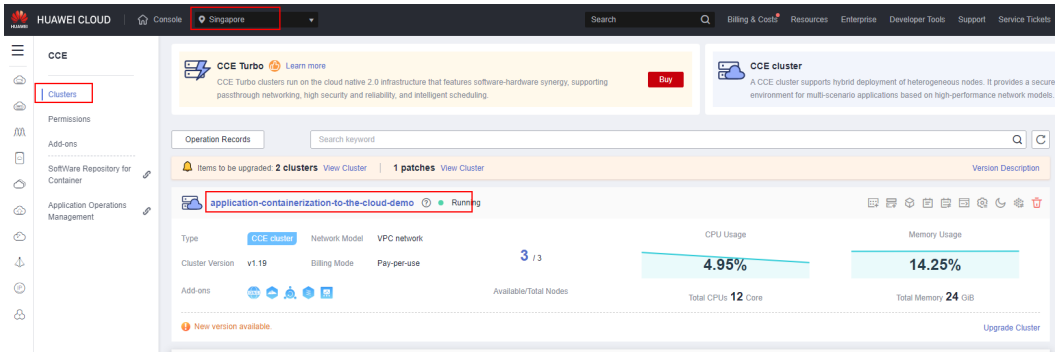


----End

3.3 Getting Started

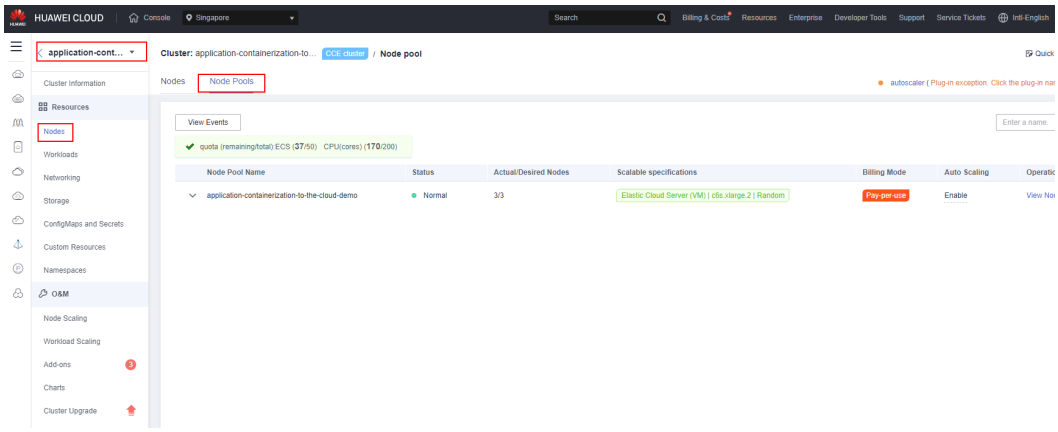
Step 1 Log in to the **Huawei Cloud CCE** console, select a region, and choose **Resources** > **Clusters** to view the CCE cluster created using this solution.

Figure 3-18 CCE cluster



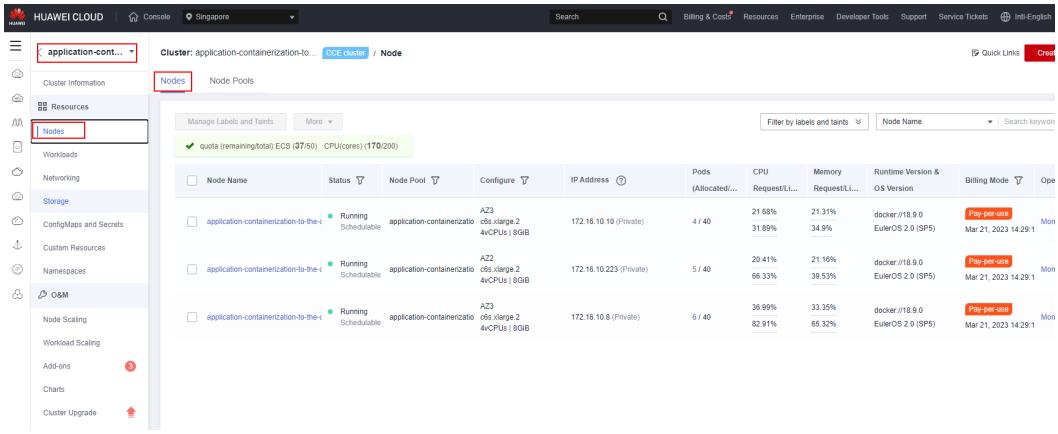
Step 2 On the CCE console, choose **Resources** > **Nodes** > **Node Pools** to view the node pool created using this solution.

Figure 3-19 Node pools



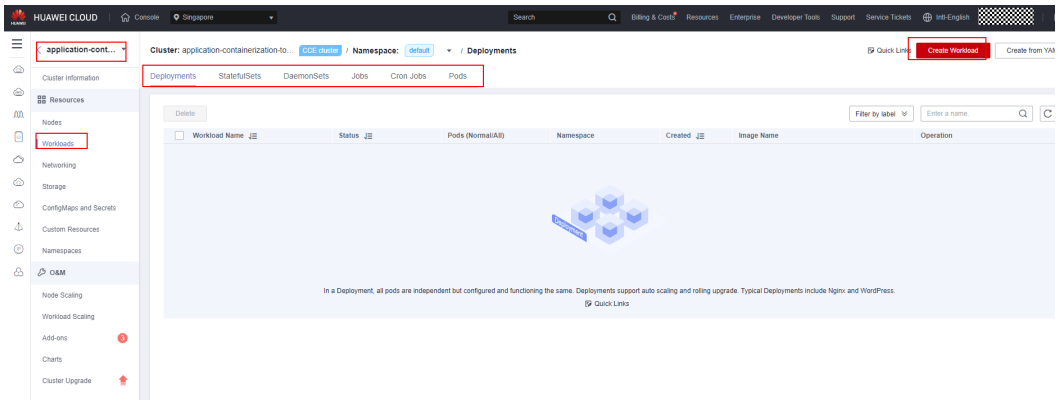
Step 3 On the CCE console, choose **Resources** > **Nodes** > **Nodes** to view the cluster node created using this solution.

Figure 3-20 Nodes



Step 4 On the CCE console, choose **Workloads** in the navigation pane, and click **Create Workload** in the upper right corner to add a workload. When adding a container, you can select a private or public image to deploy your application on CCE.

Figure 3-21 Creating a workload

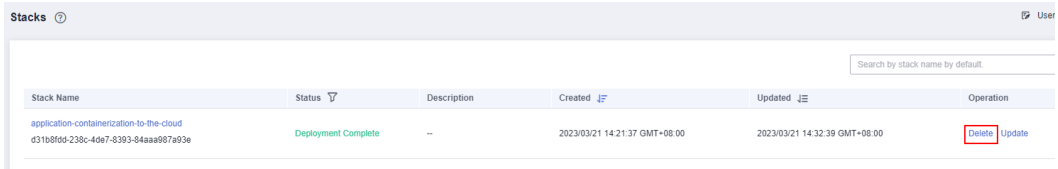


----End

3.4 Quick Uninstallation

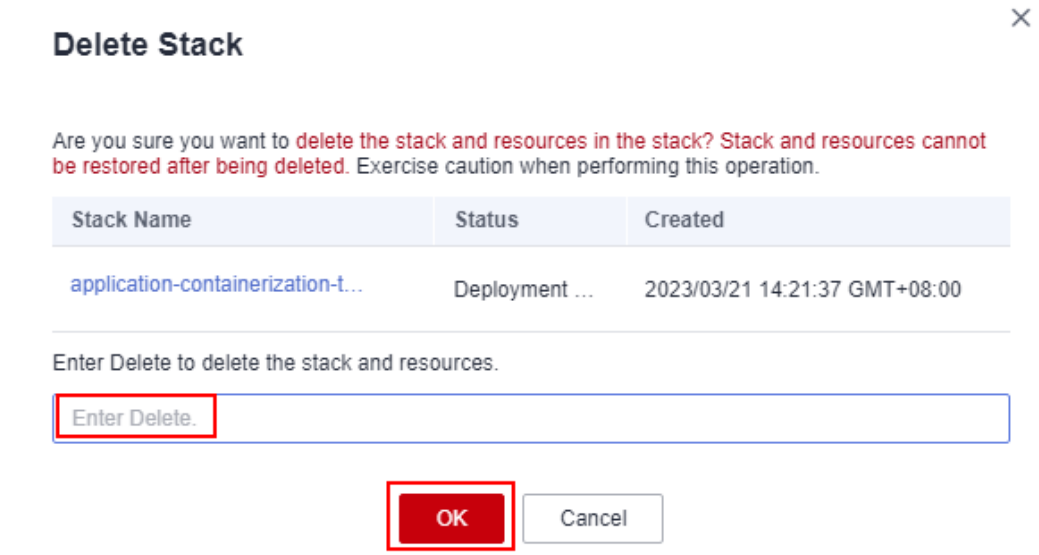
Step 1 Click **Delete** in the row where the solution stack is.

Figure 3-22 Uninstalling the solution



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

Figure 3-23 Confirming the uninstallation



----End

4 Appendix

Terms

- **Cloud Container Engine (CCE)**: A fully hosted Kubernetes service for you to build, run, and scale containerized applications.
- **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.
- **Virtual Private Cloud (VPC)**: VPC allows you to isolate online resources with virtual private networks. VPC enables your cloud resources to securely communicate with each other, the internet, and on-premises networks.
- A **cluster** is a collection of compute resources, including a group of nodes. A container runs on a node. Before creating a containerized application, you must have an available cluster.
- A **node** is a virtual or physical machine that provides compute resources. You must have sufficient node resources to ensure successful operations such as creating applications.
- A **workload** indicates a group of container pods running on CCE. CCE supports third-party application hosting and provides the full lifecycle (from deployment to O&M) management for applications. This section describes how to use a container image to create a workload.

5 Change History

Table 5-1 Change history

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

