CodeArts Pipeline

User Guide

Issue	01
Date	2026-11-24



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1 CodeArts Pipeline Usage

CodeArts Pipeline is a visual platform that facilitates automated task scheduling. It relies on the automated tasks in other CodeArts services such as **Build**, **Check**, **TestPlan**, and **Deploy**.

You can orchestrate these automated tasks based on your requirements, such as application deployment in the development, test, or production environment. A single configuration triggers executions to save manual operations.

CodeArts Pipeline is a service provided by the **CodeArts** solution. For details about its role in the solution, see **CodeArts Architecture**.

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Operation Process

Figure 1-1 Pipeline operation process

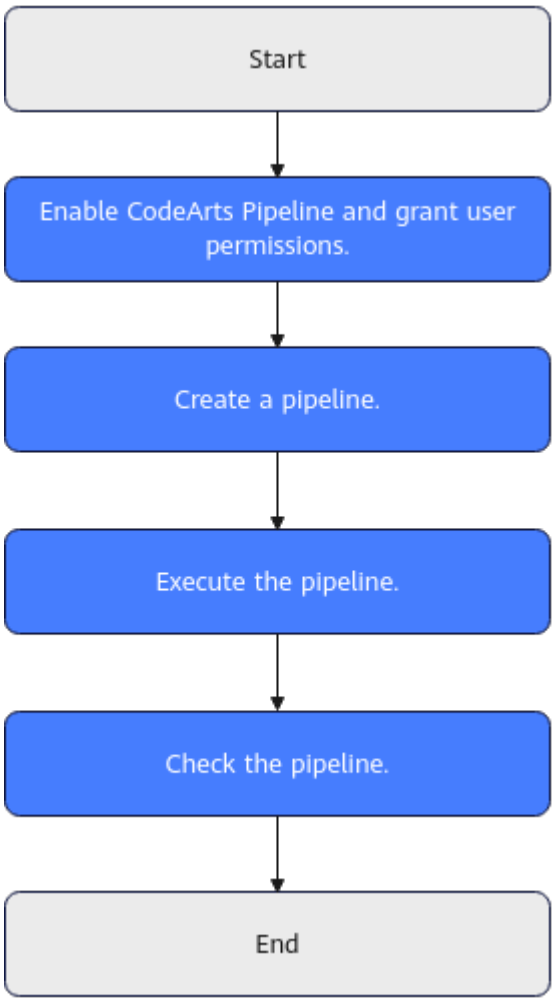

Table 1-1 Description of the operation process

Process	Description
Enable CodeArts Pipeline and grant user permissions.	**Enable CodeArts Pipeline** and **grant user permissions to use it**.
Create a pipeline	**Create a pipeline through either the GUI** or **YAML**. Configure **parameters**, **pipeline triggers**, **roles and permissions**, and **event notifications** for the pipeline.
Execute the pipeline	**Execute a pipeline** manually or through schedulers.
Check the pipeline	**Check pipeline information and execution results**.

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2 Enabling and Authorizing CodeArts Pipeline

2.1 Enabling CodeArts Pipeline

Prerequisites

You have signed up for **a Huawei Cloud account**.

Enabling CodeArts Pipeline

You need to subscribe to a CodeArts package before using CodeArts Pipeline.

Step 1 Access the **CodeArts Pipeline console**.

Step 2 Click **Buy** to purchase a CodeArts package.

Step 3 Purchase a package as needed. For details, see **Purchasing CodeArts**.

----End

2.2 Configuring CodeArts Pipeline Permissions

Authorizing CodeArts Pipeline

You can configure CodeArts Pipeline permissions at three levels to control user behaviors.

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Table 2-1 Pipeline permissions

Level	Module	Description
Tenant-level permissions	Extension, tenant-level policy, tenant-level rule, and pipeline template	Permissions to manage module resources in a tenant. You can configure permissions in IAM. The configurations take effect for all projects of a tenant.
Project-level permissions	Pipeline, policy (project-level), microservice, environment, and change	Permissions to manage module resources of a specific project. You can configure permissions in project settings. The configurations take effect for all resources of a project.
Resource-level permissions	Pipeline	Permissions to perform operations for a specific pipeline. You can configure permissions in a pipeline. The configuration takes effect for a specified pipeline.

- Tenant-level permissions

  IAM allows you to configure permissions for specified users regarding tenant-level rules, tenant-level policies, extensions, and pipeline templates.

  a. Log in to CodeArts using a tenant account or an authorized account.

  b. Click the username in the upper right corner and select **IAM**.

  c. In the navigation pane on the left, choose **User Groups**. On the displayed page, create a user group or select an existing user group, and click **Authorize**.

  Select the CodeArts Pipeline service to check related policies, as shown in the following table.

  Table 2-2 Pipeline policies

Policy Name	Description
CloudPipeline Tenant Rules FullAccess	Full permissions on tenant-level rules within CodeArts Pipeline. • Permissions on rules correspond to **cloudpipeline:rule:update** in IAM. An administrator can use the system-defined policy **CloudPipeline Tenant Rules FullAccess** or custom policies to authorize users. • Common users can check all tenant-level rules. Authorized users can check and manage all tenant-level rules.

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Policy Name	Description
CloudPipeline Tenant Rule Templates FullAccess	Full permissions on tenant-level policies within CodeArts Pipeline. • Permissions on pipeline policies correspond to **cloudpipeline:ruletemplate:update** in IAM. An administrator can use the system-defined policy **CloudPipeline Tenant Rule Templates FullAccess** or custom policies to authorize users. • Common users can check all tenant-level policies. Authorized users can check and manage all tenant-level policies.
CloudPipeline Tenant Extensions FullAccess	Full permissions on extensions within CodeArts Pipeline. • Permissions on extensions correspond to **cloudpipeline:extensions:update** in IAM. An administrator can use the system-defined policy **CloudPipeline Tenant Extensions FullAccess** or custom policies to authorize users. • Common users can view all extensions. Authorized users can view and manage all extensions.
CloudPipeline Tenant Pipeline Templates FullAccess	Full permissions on pipeline templates within CodeArts Pipeline. • Permissions on pipeline templates correspond to **cloudpipeline:pipelinetemplate:update** in IAM. An administrator can use the system-defined policy **CloudPipeline Tenant Pipeline Templates FullAccess** or custom policies to authorize users. • Users with this policy can check and manage all templates under the current tenant. Other users can still check all templates but can only manage those created by themselves.

d. Select the required policies, click **Next**, and set the minimum authorization scope for the user group.

e. Add the specified users to the user group to complete user authorization.

NOTE

In addition to system-defined policies, tenants can also **create custom policies** to grant permissions.

- Project-level permissions

  CodeArts allows you to configure permissions on pipeline resources for each role in a project.

  a. **Log in to the Huawei Cloud console**.

b. Click  in the upper left corner of the page and choose **Developer Services** > **CodeArts Pipeline** from the service list.

c. Click **Access Service** to access the CodeArts Pipeline homepage.

d. On the top navigation bar, click **Homepage** to access the CodeArts homepage.

e. Click a project name to access the project.

f. In the navigation pane on the left, choose **Settings** > **Permissions**.

Pipeline-related resources are in CodeArts Pipeline. They are change, development environment, pipeline, policy (project-level), microservice, pre-production environment, production environment, test environment, parameter group, and job template.

NOTE

By default, a user with permissions to edit or execute pipelines can also view pipelines.

Pipeline permissions

The following table lists the pipeline permissions for each role in a project in the initial state.

Table 2-3 Project-level permissions

Role	View	Create	Execute	Edit	Delete	Group	Tag	Disable	Manual Pass
Project admin	√	√	√	√	√	√	√	√	√
Project manager	√	√	√	√	√	√	√	√	√
Developer	√	√	√	×	×	×	×	×	×
Test manager	√	×	×	×	×	×	×	×	×
Tester	√	×	×	×	×	×	×	×	×
Participant	√	×	×	×	×	×	×	×	×
Viewer	√	×	×	×	×	×	×	×	×

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Role	View	Create	Execute	Edit	Delete	Group	Tag	Disable	Manual Pass
Product manager	√	×	×	×	×	×	×	×	×
System engineer	√	√	√	√	√	√	√	√	×
Committer	√	√	√	×	×	×	×	×	×
CI/CD engineer	√	√	√	√	×	×	×	×	×

- To clone a pipeline, you must have the permission to create a pipeline and edit the source pipeline.
- By default, role permissions in a pipeline inherit and are associated with the role permissions in the project until role or user permissions are modified in the pipeline.
- By default, a pipeline creator has all permissions on the pipeline.
- If you configure the manual pass permission for a pipeline, when a pipeline failed at a stage, you can click  on the job card to skip the current stage and proceed to the next stage.
- If a parent pipeline fails due to a failure in its sub-pipeline, performing manual pass in the sub-pipeline will not allow the parent pipeline to resume. To continue run the parent pipeline, manual pass should also be performed on the parent side.

Policy permissions

The following table lists the project-level policy permissions for each role in a project in the initial state.

Table 2-4 Project-level policy permissions

Role	View	Create	Edit	Delete
Project admin	√	√	√	√
Project manager	√	√	√	√
Developer	√	√	√	√

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Role	View	Create	Edit	Delete
Test manager	√	×	×	×
Tester	√	×	×	×
Participant	√	×	×	×
Viewer	√	×	×	×
Product manager	√	×	×	×
System engineer	√	√	√	√
Committer	√	√	√	√
CI/CD engineer	√	√	√	×

To clone a policy, you must have the permission to create a policy and edit the source policy.

Microservice permissions

The following table lists the microservice permissions for each role in a project in the initial state.

Table 2-5 Project-level microservice permissions

Role	View	Create	Update	Delete
Project admin	√	√	√	√
Project manager	√	√	√	√
Developer	√	×	×	×
Test manager	√	×	×	×
Tester	√	×	×	×
Participant	√	×	×	×
Viewer	√	×	×	×
Product manager	√	×	×	×
System engineer	√	√	√	√

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Role	View	Create	Update	Delete
Committer	√	×	×	×
CI/CD engineer	√	√	√	×

Change permissions

The following table lists the change permissions for each role in a project in the initial state.

Table 2-6 Project-level change permissions

Role	View	Create	Edit	Execute
Project admin	√	√	√	√
Project manager	√	√	√	√
Developer	√	√	√	√
Test manager	√	×	×	×
Tester	√	×	×	×
Participant	√	×	×	×
Viewer	√	×	×	×
Product manager	√	×	×	×
System engineer	√	√	√	√
Committer	√	√	√	√
CI/CD engineer	√	√	√	√

Environment permissions

The following table lists the release environment permissions for each role in a project in the initial state.

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Table 2-7 Project-level development environment permissions

Role	View	Create	Edit	Delete	Execute	Roll Back
Project admin	√	√	√	√	√	√
Project manager	√	√	√	√	√	√
Developer	√	√	√	√	√	√
Test manager	√	×	×	×	×	×
Tester	√	×	×	×	×	×
Participant	√	×	×	×	×	×
Viewer	√	×	×	×	×	×
Product manager	√	√	√	√	√	√
System engineer	√	√	√	√	√	√
Committer	√	√	√	√	√	√
CI/CD engineer	√	√	√	×	√	×

Table 2-8 Project-level test environment permissions

Role	View	Create	Edit	Delete	Execute	Roll Back
Project admin	√	√	√	√	√	√
Project manager	√	√	√	√	√	√
Developer	√	×	×	×	×	×
Test manager	√	√	√	√	√	√
Tester	√	√	√	√	√	×

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Role	View	Create	Edit	Delete	Execute	Roll Back
Participant	√	×	×	×	×	×
Viewer	√	×	×	×	×	×
Product manager	√	×	×	×	×	×
System engineer	√	×	×	×	×	×
Committer	√	√	√	√	√	√
CI/CD engineer	√	√	√	×	√	×

Table 2-9 Project-level pre-production environment permissions

Role	View	Create	Edit	Delete	Execute	Roll Back
Project admin	√	√	√	√	√	√
Project manager	√	√	√	√	√	√
Developer	√	×	×	×	×	×
Test manager	√	×	×	×	×	×
Tester	√	×	×	×	×	×
Participant	×	×	×	×	×	×
Viewer	×	×	×	×	×	×
Product manager	√	×	×	×	×	×
System engineer	√	×	×	×	×	×
Committer	√	√	√	√	√	√
CI/CD engineer	√	√	√	×	√	×

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Table 2-10 Project-level production permissions

Role	View	Create	Edit	Delete	Execute	Roll Back
Project admin	√	√	√	√	√	√
Project manager	√	√	√	√	√	√
Developer	×	×	×	×	×	×
Test manager	×	×	×	×	×	×
Tester	×	×	×	×	×	×
Participant	×	×	×	×	×	×
Viewer	×	×	×	×	×	×
Product manager	×	×	×	×	×	×
System engineer	√	×	×	×	×	×
Committer	√	√	√	√	√	√
CI/CD engineer	√	√	√	×	√	×

Parameter group permissions

The following table lists the parameter group permissions for each role in a project in the initial state.

Table 2-11 Project-level parameter group permissions

Role	Create	Delete	Edit	Associate
Project admin	√	√	√	√
Project manager	√	√	√	√
Developer	√	√	√	√
Test manager	×	×	×	×

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Role	Create	Delete	Edit	Associate
Tester	×	×	×	×
Participant	×	×	×	×
Viewer	×	×	×	×
Product manager	×	×	×	×
System engineer	√	√	√	√
Committer	√	√	√	√
CI/CD engineer	√	×	√	×

Job template permissions

The following table lists the job template permissions for each role in a project in the initial state.

Table 2-12 Job template permissions

Role	Create	Delete	Edit
Project administrator	√	√	√
Project manager	√	√	√
Developer	√	√	√
Test manager	×	×	×
Tester	×	×	×
Participant	×	×	×
Viewer	×	×	×
Product manager	×	×	×
System engineer	√	√	√
Committer	√	√	√
CI/CD engineer	√	×	√

- Resource-level permissions

  You can configure permissions for a single pipeline by role or user. For details, see **Configuring Pipeline Permissions**.

  – Role permissions

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    - The project admin, pipeline creator, and project manager can change pipeline role permissions.
    - By default, role permissions for a pipeline are the same as the role permissions at the project level. If role permissions at the project level are changed, role permissions in a pipeline will be changed accordingly.
    - Resource-level permissions take precedence over the project-level permissions. If you change the role permissions for a pipeline, the changed permissions will take effect
  - User permissions
    - The project admin, pipeline creator, and project manager can change pipeline user permissions.
    - By default, user and role permissions are consistent. If pipeline role permissions are changed, pipeline user permissions will be changed accordingly.
    - User permissions take precedence over role permissions. If you change the pipeline user permissions, the changed permissions will take effect.
  - Use project-level permissions
    - If this function is enabled, the role permissions of a pipeline become the same as those in the project settings.
    - If this function is disabled, you can customize the role permissions of a specific pipeline.
    - User permissions take precedence over role permissions.

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3 Intelligent CodeArts Pipeline Automation with CodeArts Agent

CodeArts Pipeline can be integrated with **CodeArts Agent** through a CodeArts toolchain plug-in. The CodeArts toolchain plug-in can be invoked by flexible prompts or skills to help the agent efficiently complete pipeline tasks.

There is no need to learn console operations. You just use natural language prompts in the CodeArts Agent chat window and let the agent manage pipeline operations in the cloud and efficiently handle routine tasks such as pipeline queries, pipeline run management, and template management.

Core Benefits

- **No switching required**: You can complete pipeline tasks directly in the agent chat window. There is no need to log in to the console or switch back and forth between different pages.
- **Natural language interaction**: You can complete pipeline queries, pipeline run management, status monitoring, and statistics with just prompts.
- **Full scenario coverage**: The integration covers pipeline queries, pipeline run management, log management, template management, group management, and monitoring and statistics.
- **End-to-end development process**: The integration involves cooperation with services such as CodeArts Req, CodeArts Build, CodeArts Repo, and CodeArts Check, enabling a seamless, end-to-end workflow.

Principles

CodeArts Pipeline makes its API capabilities available to CodeArts Agent through the CodeArts toolchain plug-in. After the agent interprets a user's natural language prompts, it calls the CodeArts Pipeline API via Koo Command Line Interface (KooCLI), to perform the corresponding operations, and returns results to the chat window.

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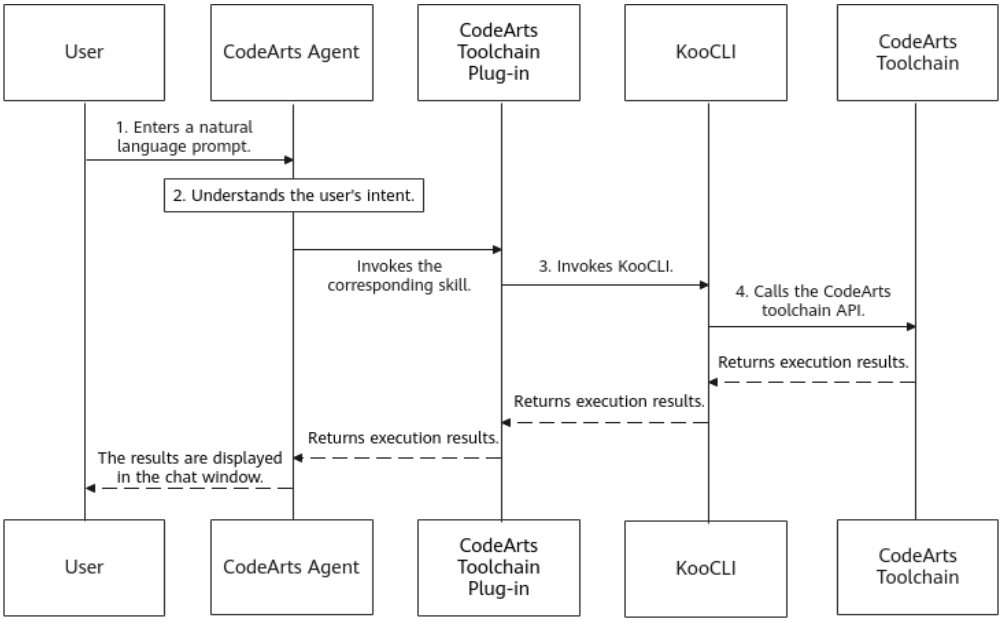
Figure 3-1 Interaction process



CodeArts Toolchain Plug-in

The CodeArts toolchain plug-in integrates CodeArts R&D services, such as CodeArts Req, CodeArts Repo, CodeArts Check, CodeArts TestPlan, CodeArts Pipeline, CodeArts Build, CodeArts Artifact, and CodeArts Deploy, into CodeArts Agent as skills and sub-agents. After the plug-in is installed, users can trigger service operations directly through natural language prompts in the agent chat window. There is no need to switch to the console. After the primary agent receives a user prompt, it obtains execution specifications and routing strategies via skills. Skills guide interactive operations step by step, while sub-agents handle complex orchestration tasks, executing them autonomously in an isolated context and returning results. For details about the skills and sub-agents included in the CodeArts toolchain plug-in, see **All CodeArts Sub-agents and Skills**.

CodeArts Pipeline provides a skill and a sub-agent in the CodeArts toolchain plug-in.

The skill (codearts-pipeline-expert) is expert in interactive pipeline execution, including pipeline queries, pipeline run management, log management, template management, group management, and monitoring and statistics. It understands the user's intent and guides operations step by step. When an operation is highly complex, involves batch processing, or requires multi-step orchestration, the skill hands the task off to a sub-agent (codearts-pipeline-assistant) for execution. The sub-agent runs autonomously in an independent context, without consuming primary chat resources. It can automatically complete complex orchestration tasks such as executing pipeline tasks, querying pipeline details, viewing pipeline logs, and calculating the average pipeline duration for a project, and return a structured result report upon completion. Together, the skill and sub-agent form a two-layer execution architecture, giving the agent the flexibility to handle varying tasks from single queries to batch orchestration.

Application Scenarios

The following CodeArts Pipeline scenarios are supported by CodeArts Agent.

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Scenario	Scenario Description	Natural Language Prompt Example
Pipeline queries	Query the pipeline list and pipeline details.	• Show me the list of pipelines under project "my-project." • Show me the configuration details of pipeline "my-pipeline."
Pipeline run management	Query pipeline run records, pipeline run details, and pipeline stage or step statuses, and trigger pipeline runs.	• Show me the last 10 run records of pipeline "my-pipeline." • Show me the execution status of each stage and step of pipeline "my-pipeline." • Check whether the pipeline run (run instance ID: #1624199f) has completed. • Run pipeline "my-pipeline."
Log management	Obtain pipeline run logs and execution step logs.	• View the run logs of pipeline run instance (ID: b04cb4159ef84d088794d177af413c41f). • Download the logs for step 2 of pipeline run instance (ID: b04cb4159ef84d088794d177af413c41f).
Template management	Query template lists and details.	• View pipeline templates. • Show me the details of template "my-template."
Group management	Query pipeline group trees.	Show me the pipeline group tree of project "my-project."
Monitoring and statistics	Batch-retrieve pipeline status; query pipeline execution records, build success rate, duration, and status distribution.	• Show me the latest statuses of all pipelines in project "my-project." • Show me the pipeline execution records of project "my-project" in August 2025. • Show me the build success rate of pipeline "my-pipeline." • Calculate the average duration of each pipeline under project "my-project." • Show me the pipeline status distribution for project "my-project."

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Prerequisites

No.	Item	Description
1	**CodeArts Agent** has been installed and you have logged in to it using your account.	CodeArts Pipeline's intelligent capabilities are implemented through CodeArts Agent.
2	The operations in **Enabling and Authorizing CodeArts Pipeline** have been performed.	To use CodeArts Pipeline functions through CodeArts Agent, you must have enabled CodeArts Pipeline and have been authorized to use it.

CAUTION

Tokens or credits in your CodeArts Agent account are consumed when this operation invokes tools or runs LLM inference.

Procedure

Step 1 **Click to download the CodeArts toolchain plug-in**.

Step 2 Click **install.bat** in the plug-in package to install the plug-in and KooCLI.

Step 3 Complete **KooCLI initialization** to store your permanent AK/SK and region information in the configuration file, so there is no need to repeatedly enter this information when performing operations.

Step 4 Open the CodeArts Agent chat panel and tell it what you want to do using natural language.

NOTE

- The first time you use CodeArts Agent to perform pipeline-related operations, the analysis process takes longer. As usage increases, the analysis speed gradually improves and response time shortens.
- The interface style varies across different CodeArts Agent clients; refer to the actual display in the tool you are using for the exact operations.

----End

Scenario 1: Pipeline Queries

The following is an example prompt you could use to query a pipeline task:

```
Show me the configuration details of pipeline "my-pipeline."
```

The agent begins analyzing and executing the task, with the entire process displayed in real time within the chat. Once the task is complete, you can view the pipeline's configuration.

Example result

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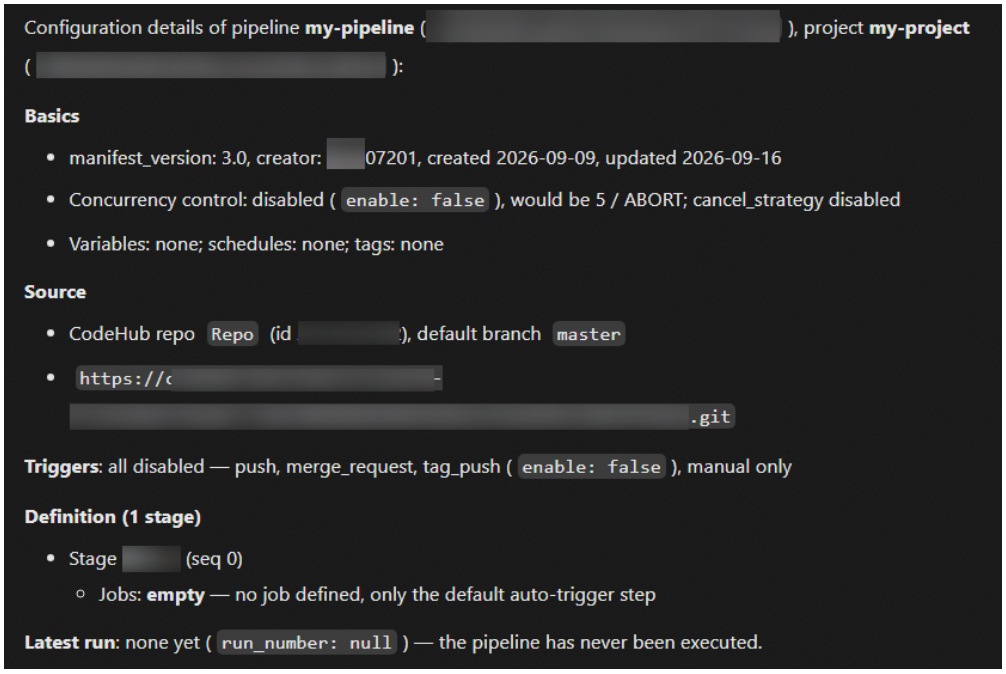

Scenario 2: Pipeline Run Management

The following is an example prompt you could use to query a pipeline run management task:

```
Show me the execution status of each stage and step of pipeline "my-pipeline."
```

The agent begins analyzing and executing the task. Once the task is complete, you can view the execution status of each stage and step of the pipeline.

Example result

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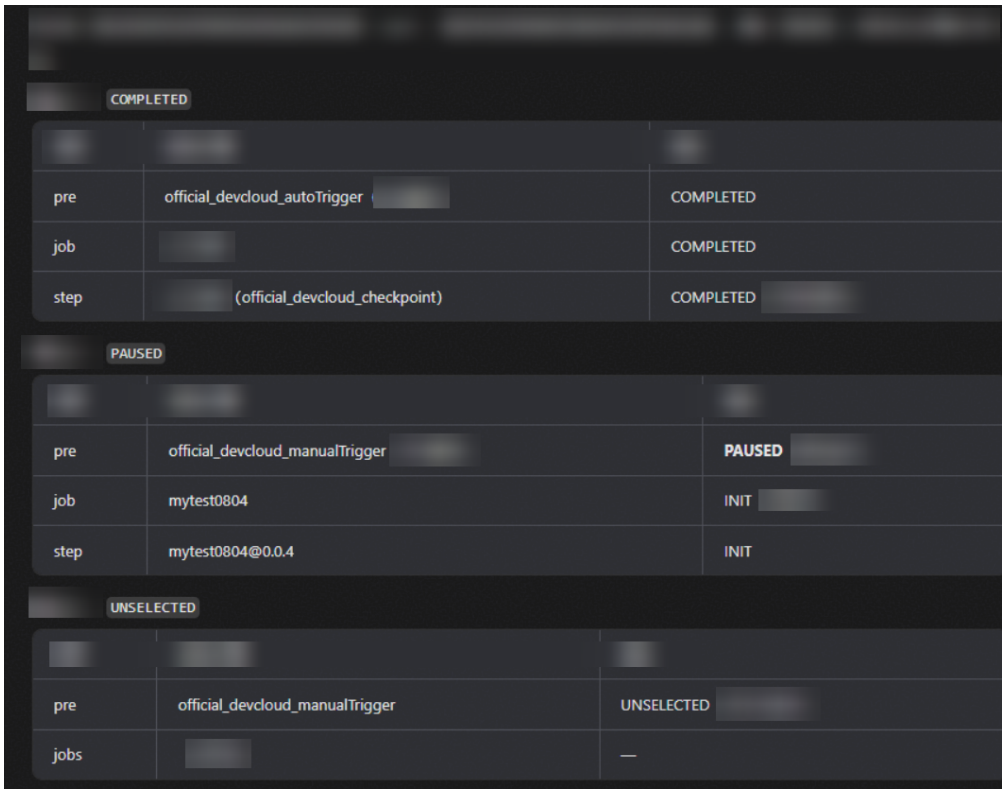


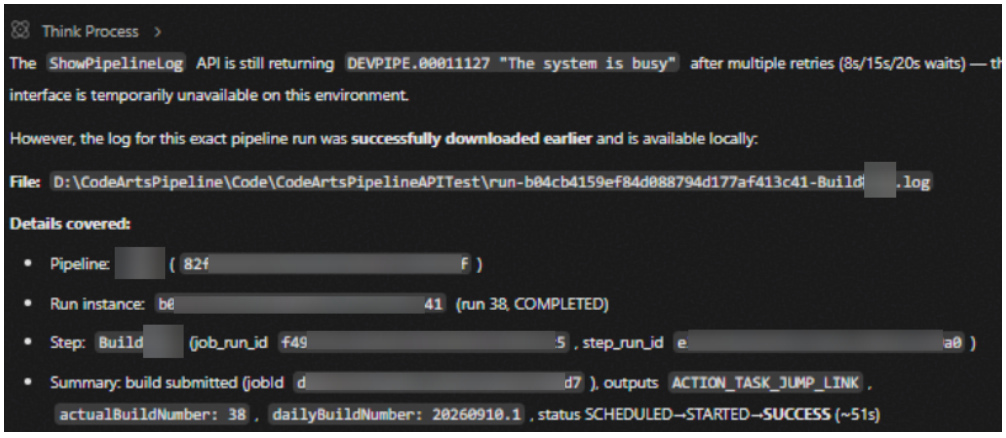
Scenario 3: Log Management

The following is an example prompt you could use to obtain pipeline logs:

```
Download the logs for step 2 of pipeline run instance (ID: b04cb4159ef84d088794d177af413c41f).
```

The agent begins analyzing and executing the task. Once the task is complete, you can see that the pipeline logs have been downloaded and saved.

Example result



Scenario 4: Template Management

The following is an example prompt you could use to view a template:

```
Show me the details of template "my-template."
```

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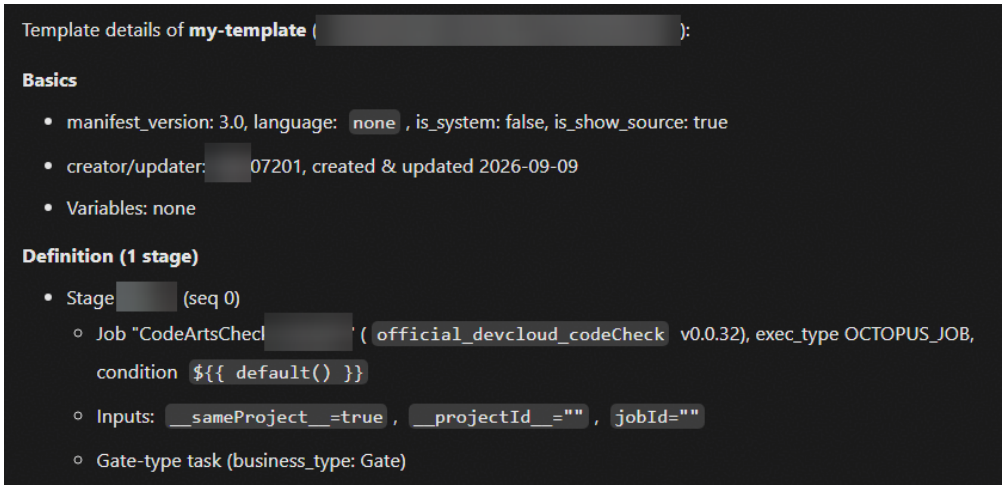
The agent begins analyzing and executing the task. Once the task is complete, you can view the template details.

Example result



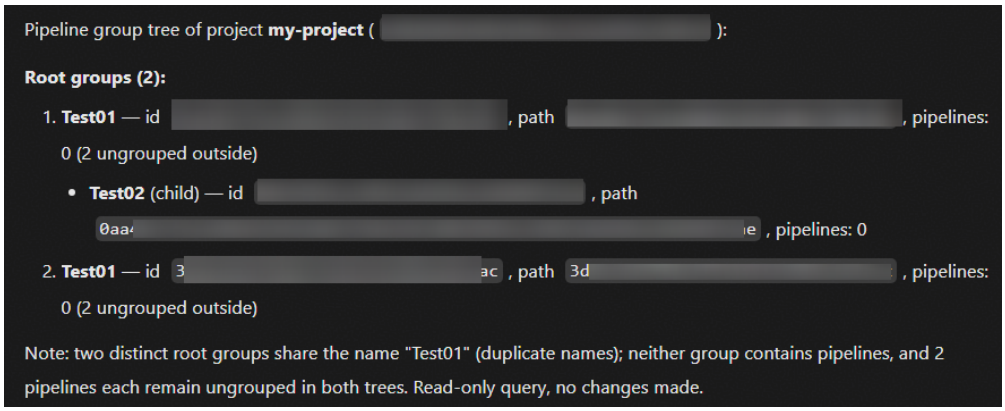
Scenario 5: Group Management

The following is an example prompt you could use to look up pipeline groups:

```
Show me the pipeline group tree of project "my-project."
```

The agent begins analyzing and executing the task. Once the task is complete, you can see the pipeline groups under the project.

Example result



Scenario 6: Monitoring and Statistics

The following is an example prompt you could use to calculate pipelines' average duration:

```
Calculate the average duration of each pipeline under project "my-project."
```

The agent begins analyzing and executing the task. Once the task is complete, you can see the average duration of each pipeline under the project.

Example result

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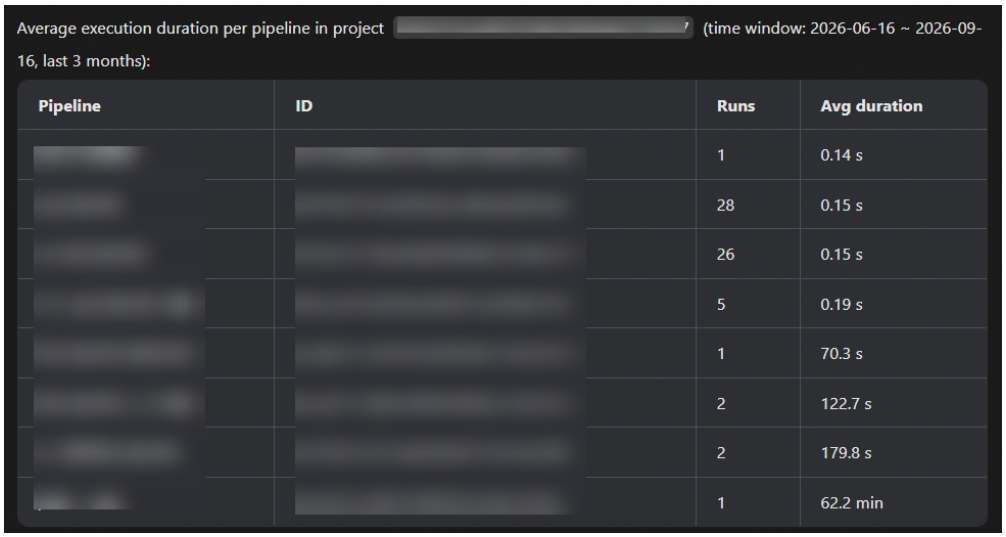

Average execution duration per pipeline in project [redacted] (time window: 2026-06-16 ~ 2026-09-16, last 3 months):

Pipeline	ID	Runs	Avg duration
[redacted]	[redacted]	1	0.14 s
[redacted]	[redacted]	28	0.15 s
[redacted]	[redacted]	26	0.15 s
[redacted]	[redacted]	5	0.19 s
[redacted]	[redacted]	1	70.3 s
[redacted]	[redacted]	2	122.7 s
[redacted]	[redacted]	2	179.8 s
[redacted]	[redacted]	1	62.2 min

Tips

- Be as specific as possible: Include key details in your prompts, such as the task name, project name, and pipeline run instance ID, to help the agent carry out the task more accurately.
- Break tasks into steps: For complex tasks, proceed step by step (e.g., first check the task list, then trigger the execution), so you can confirm results as you go.
- Review execution: For critical operations (such as deleting a task or deleting a template), carefully review the results returned by the agent before confirming.

Related Documents

Developing a Travel Assistant Using the CodeArts Toolchain Plug-in

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4 Accessing CodeArts Pipeline

This section describes how to access CodeArts Pipeline.

Prerequisites

You have **enabled and authorized CodeArts Pipeline**.

Accessing Through the Homepage

Step 1 **Log in to the Huawei Cloud console**.

Step 2 Click  in the upper left corner of the page and choose **Developer Services** > **CodeArts Pipeline** from the service list.

Step 3 Click **Access Service** to access the Pipeline homepage.

Click in the upper left corner of the page and select a region.

----End

Accessing Through a Project

Step 1 **Log in to the Huawei Cloud console**.

Step 2 Click  in the upper left corner of the page and choose **Developer Services** > **CodeArts Pipeline** from the service list.

Step 3 Click **Access Service** to access the CodeArts Pipeline homepage.

Step 4 On the top navigation bar, click **Homepage** to access the CodeArts homepage.

Step 5 Click a project name to access the project.

Step 6 In the left navigation pane, choose **CICD** > **Pipeline** to access the pipeline list.

Click in the upper left corner of the page and select a region.

----End

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5 Creating a Pipeline

5.1 Creating a Pipeline

Using the GUI simplifies pipeline creation and configuration, making it beginner-friendly and efficient. Use YAML to create pipelines to manage their configurations by version. This allows easy rollback to earlier versions and access to historical records. The method also ensures reusable configuration, minimizing errors.

YAML pipelines are easy to iterate and optimize. They facilitate team collaboration and make complex projects easier to manage, thus boosting development and deployment efficiency.

Notes and Constraints

- In the initial state, you can create a pipeline if you are any of the following roles:
  - Project administrator
  - Project manager
  - Developer
  - System engineer
  - Committer
- Project administrators can modify the permissions of other roles. For details, see **Authorizing CodeArts Pipeline**.

5.2 Creating a Pipeline with the GUI

Preparations

- **You have enabled and authorized CodeArts Pipeline**.
- **Create a project**. Name the project **project01**.
- If you use a CodeArts Repo repository, **create a code repository**. Name the code repository **Repo01**.
- If you want to enhance permissions to do operations on CodeArts Repo or connect to a third-party repository, create a service endpoint.

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Constraints

- GitLab pipeline source is available in **LA-Mexico City2**, **LA-Sao Paulo1**, and **AP-Singapore** regions.
- Bitbucket pipeline source is available only in **AP-Singapore** region.
- Create a custom pipeline template.
  - System templates are used to clone or generate pipelines. They cannot be edited or deleted.
  - Pipeline source is not required for a template.

Creating a Pipeline

Step 1 **Access the CodeArts Pipeline homepage**.

Step 2 Click **Create Pipeline**. Configure parameters by referring to **Table 5-1**.

Table 5-1 Basic information

Parameter	Description	Example Value
Name	Pipeline name. Enter a maximum of 128 characters, including only letters, digits, underscores (_), and hyphens (-).	Enter **pipeline01**.
Agency URN	Unique identifier of an IAM agency. If not configured, the default agency is used. If configured, use this agency identity and permissions to access other cloud services.	-
Project	Project that a pipeline belongs to. • If you access CodeArts Pipeline through the homepage, select a project as needed. • If you access CodeArts Pipeline through a project, the parameter cannot be changed.	The default project is **project01**.
Pipeline Group	The group to which the pipeline belongs. You can create or edit a group when creating a pipeline.	-

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Parameter	Description	Example Value
Pipeline Source	Code source associated with the pipeline: • CodeArts code source: Repo: provides comprehensive code hosting services for enterprises and Git-based online code hosting services for software developers. • Third-party code source – GitHub: After connecting to a GitHub account, you can obtain the repository and branch information of that account. – GitLab: After connecting to a GitLab account, you can obtain the repository and branch information of that account. – Bitbucket: After connecting to a Bitbucket account, you can obtain the repository and branch information of that account. – Git: After connecting to a Git repository, you can obtain its branch information. – Artifact: After connecting to an Artifact account, you can obtain the repository type and version information of the artifact. – Repo (other projects): Code is pulled from CodeArts Repo repositories of other projects. Select a project, and then select a code repository and a default branch. • Artifact source Use **SWR** as the pipeline source to run the pipeline and generate system parameters such as the artifact name, download address, and version number for extensions. **NOTE** • If you do not need to associate the pipeline with a code repository, you can select **None**. In this case, executing a job that should be associated with a repository will result in an error. For details, see **FAQs**.	Select **Repo**.
Orchestration Method	Method of orchestrating a pipeline. If you select **Repo** as the code source, you can choose either of the following ways to orchestrate a pipeline. • Graphical: Uses the GUI to clearly display serial and parallel jobs. • YAML: Uses YAML (One YAML file can be used for multiple pipelines). Syntax auto-completion and validation available. For details, see **Creating a Pipeline with YAML**.	Select **Graphical**.

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Parameter	Description	Example Value
Service Endpoint	You need to use a service endpoint to connect to a third-party repository. Select an endpoint created in **Preparations** or click **Create One** to create an endpoint. For details, see **Creating Service Endpoints**.	-
Project	Project of the CodeArts Repo repository from which the code is to be pulled. This parameter is available only when **Pipeline Source** is set to **Repo (other projects)**.	-
Workspace	Workspace of the Bitbucket account.	-
Repository	Repository associated with the pipeline. You can select an existing repository or click **Create Repository** to create a repository. For details, see **Creating a Repository Using a Template**.	Select **Repo01**.
Default Branch	Branch used when a pipeline is executed manually or at a specified time.	Select **master**.
Repo Endpoint	Optional. Configure an endpoint to enhance permissions for Repo. Endpoints are used for change-triggered pipelines and repository operation extensions. You can select an endpoint created in **Preparations** or click **Create One** to create an endpoint. For details, see **Creating Service Endpoints**.	-
Alias	Optional. After you set a repository alias, system parameters will be generated based on the alias. For example, *Alias*_**REPOSITORY_NAME** indicates the repository name. You can check the generated parameters on the **Parameter Configuration** page and reference them in a pipeline in the format of *${Parameter name}*. Enter a maximum of 128 characters, including only letters, digits, and underscores (_).	-
Description	Optional. Pipeline description. Enter a maximum of 1,024 characters.	-
Source Artifact Repository Type	Repository type used for the **Artifact** pipeline source. Select **Software Release Repositories** or **Docker Repositories**.	-
Version Policy	Artifact version used when a pipeline is executed. Select **Latest** or **Specific Version**. This parameter is mandatory when **Pipeline Source** is set to **Artifact**.	-

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Parameter	Description	Example Value
Deployment Package	Software package generated during software development. This parameter is mandatory when **Pipeline Source** is set to **Artifact**.	-
Organization	If **Pipeline Source** is set to **SWR**, select the SWR organization. If **Pipeline Source** is set to **Artifact**, select an organization in the current project. Organizations isolate and manage images within each company or department.	-
Image Name	If **Pipeline Source** is set to **SWR**, select an image in the organization. If **Pipeline Source** is set to **Artifact**, select an image in the organization of the current project.	-
Specified Version	Image version selected for the **SWR** pipeline source.	-
Source Alias	If you select **SWR** or **Artifact** for pipeline source, after you set an artifact source alias, system parameters will be generated based on the alias. For example, *Alias*_**ARTIFACT_NAME** indicates the artifact name. You can check the generated parameters on the **Parameter Configuration** page and reference them in a pipeline in the format of *${Parameter name}*. Enter a maximum of 128 characters, including only letters, digits, underscores (_), hyphens (-), and periods (.).	-

Step 3 Click **Next**. The **Select Template** page is displayed. The following uses the **Blank Template** as an example.

- System or custom templates: Jobs will be automatically generated based on the selected template. For more information, see **Managing Pipeline Templates**.
- **Blank Template**: Create a pipeline from scratch.

Step 4 Click **OK** to create a pipeline.

The **Task Orchestration** page is displayed. You can **configure the pipeline** or click **Cancel** to return to the pipeline list.

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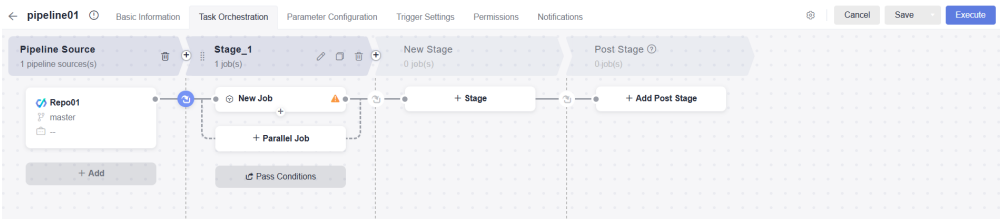
Figure 5-1 Task orchestration



----End

Managing Pipeline Templates

CodeArts Pipeline provides system templates and allows you to customize templates. You can use templates to quickly create continuous delivery pipelines and standardize the delivery process.

Table 5-2 System templates

Template	Description
Maven-Build	• Build template: Maven • Language: Java • Tools: Maven 3.5.3 and JDK 1.8
Python-Build	• Build template: Setuptools, checking code. • Language: Python • Tool: Python 3.6
Go-Build	• Build template: Go • Language: Go • Tool: Go 1.10.3
SpringBoot-Pipeline	• Build template: Maven • Language: Java • Tools: Maven 3.5.3 and JDK 1.8
NodeJS-Build	• Build template: Node.js • Language: JavaScript • Tool: Node.js 12.7.0
PHP-Build	• Build template: PHP • Language: PHP • Tool: PHP 7.3.3

- Access pipeline templates
  - Homepage: Access the CodeArts Pipeline homepage, and switch to the **Templates** tab page.

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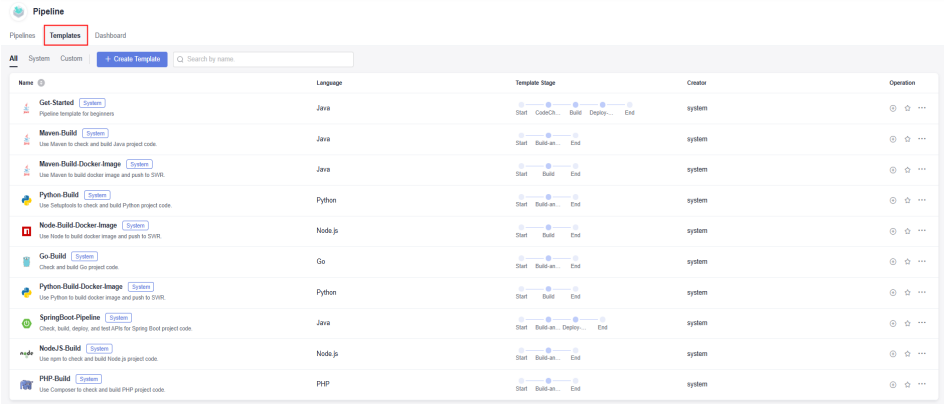
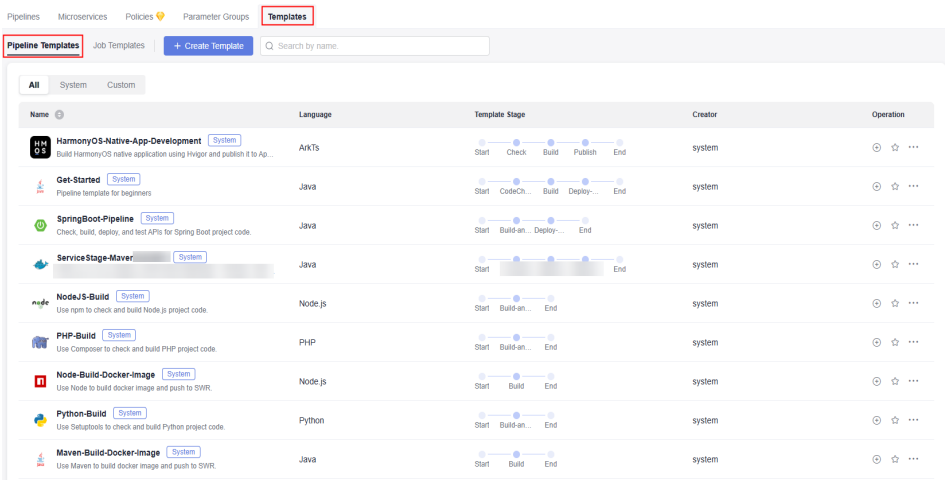
Figure 5-2 Pipeline templates



– Project: Access the pipeline list in a project, and switch to the **Templates** tab.

Figure 5-3 Pipeline templates



You can perform the following operations on pipeline templates.

Table 5-3 Operations on templates

Operation	Description
	Click this icon, and you will be redirected to the page where you can quickly create a pipeline using a template.
	Click this icon to favorite a template. After a template is favorited, the icon changes to ★. You can click ★ to unfavorite the template.

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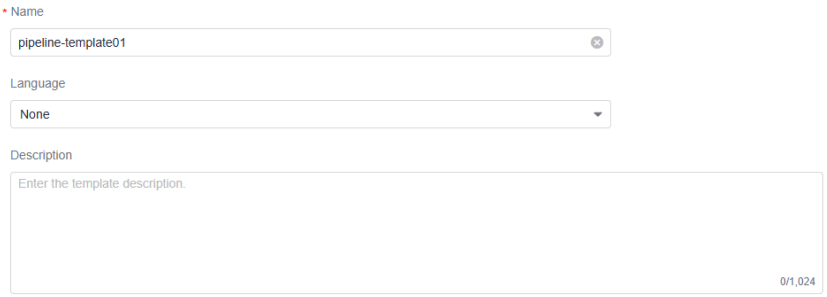
Operation	Description
•••	• Click this icon and select **Edit**. On the displayed **Task Orchestration** tab page, you can edit the template. • Click this icon and select **Clone**. On the displayed **Task Orchestration** tab page, you can clone the template. • Click this icon and select **Delete**. In the displayed window, delete the template as prompted.

- Create a custom pipeline template
  a. Access pipeline templates.
  b. Click **Create Template**. The **Task Orchestration** page is displayed.
  c. Configure basic information, stages/jobs, and parameters.
     - **Basic Information**: Specify the template name, language (Java, Python, Node.js, Go, .NET, C++, PHP, ArkTS), and description (optional). Language is **None** by default.

       Figure 5-4 Basic information

     - Configure the stage admission
       - **Automatic** (default): The pipeline automatically proceeds to the next stage.
       - **Manual**: The pipeline proceeds only after manual confirmation.
       - **Time window**: The pipeline proceeds to the next stage within a specified period.
     - Configure pass conditions
       1) Click **Pass Conditions** under a stage. In the displayed window, move the cursor to the pass conditions card and click **Add**.
       2) Enter a name and select a policy.

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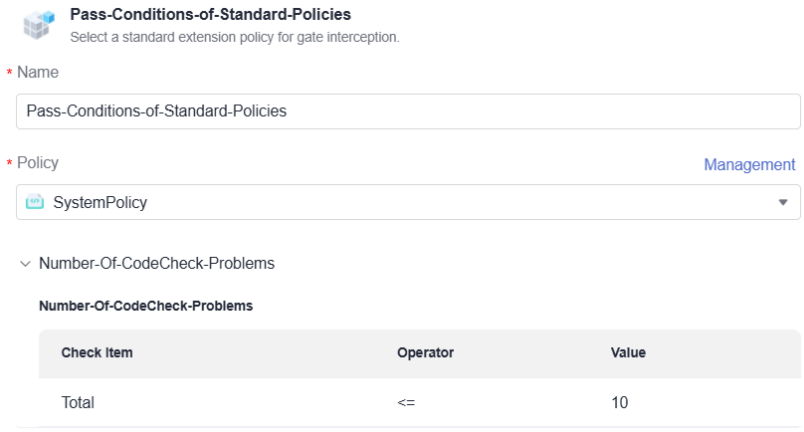

3) Click **OK**.

- **Task Orchestration**: You can add official, third-party, and custom extensions to a pipeline template. After tasks of build, code check, deployment, and API test are configured in a template, corresponding tasks will be created when you create a pipeline using this template.
- **Parameter Configuration**: Add parameters to the template. Pipeline template parameters include custom and predefined parameters. Custom parameters include string, auto-increment, and enumeration types. For details about how to configure parameters, see **Configuring Custom Parameters**.

d. Click **Save**. A message is displayed, indicating that the template is created successfully.

Tutorial Video

This video demonstrates how to create and execute a pipeline.

5.3 Creating a Pipeline with YAML

Preparations

- **You have enabled and authorized CodeArts Pipeline**.
- **Create a project**. Name the project **project01**.
- **Create a code repository**. Name the repository **Repo02**.
- Prepare a YAML file.

  You can create a YAML file or orchestrate a YAML file in advance. A YAML file usually consists of the triggering mode **on**, parameter **env**, and job **jobs**. For details, see **YAML Syntax**.

Notes and Constraints

You can only use **Repo** as the pipeline source to create a YAML-based pipeline.

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YAML File Example

The following YAML outlines a pipeline configuration. It consists of a build, a code check, and a deployment job in serial mode, and references pipeline parameters in the build job.

```
env:                                    # Define environment variables as key-value pairs. Environment variables can be referenced in any job within the pipeline.
  image_version: 1.0.0

jobs:                                   # Define jobs included in the pipeline.
  build:                                # Job ID, which defines the unique identifier of the job.
    name: maven build                       # Job name, which is displayed on the GUI.
    steps:                              # Define the steps within the job.
      - name: My build step                 # Step name, which is displayed on the GUI.
        uses: CodeArtsBuild                 # Extension used for this step.
        with:                           # Define the extension's runtime parameters as key-value pairs. Variables defined in "env" can be referenced.
          jobId: 878b4d13cb284d9e8f33f988a902f57c    # Job ID. On the job details page, copy the 32-bit string at the end of the browser URL to obtain the ID.
          artifactIdentifier: my_image
          version: ${{ env.image_version }}
  check:
    name: code check
    steps:
      - name: My check step
        uses: CodeArtsCheck
        with:
          jobId: 43885d46e13d4bf583d3a648e9b39d1e
          checkMode: full
  deploy:
    name: cce deploy
    needs:                              # Specify that this job should run only after the listed jobs have completed.
      - build
      - check
    if: ${{ completed() }}                  # Specify the condition under which this job should run.
    steps:
      - name: My deploy step
        uses: CodeArtsDeploy
        with:
          jobId: 9c5a5cda6ffa4ab583380f5a014b2b31
          version: ${{ env.image_version }}
```

Creating a YAML Pipeline

Step 1 **Access the CodeArts Pipeline homepage**.

Step 2 Click **Create Pipeline**. Configure parameters by referring to **Table 5-4**.

Table 5-4 Pipeline basic information

Parameter	Description	Example Value
Name	Pipeline name. Enter a maximum of 128 characters, including only letters, digits, underscores (_), and hyphens (-).	Enter **pipeline02**.
Agency URN	Unique identifier of an IAM agency. If not configured, the default agency is used. If configured, use this agency identity and permissions to access other cloud services.	-

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Parameter	Description	Example Value
Project	Project that a pipeline belongs to. • If you access CodeArts Pipeline through the homepage, select a project as needed. • If you access CodeArts Pipeline through a project, the project displayed here defaults to the current project and cannot be changed.	The default project is **project01**.
Pipeline Group	The group to which the pipeline belongs. You can create or edit a group when creating a pipeline.	-
Pipeline Source	Code source associated with the pipeline. Select **Repo** (CodeArts Repo). It provides comprehensive code hosting services for enterprises and Git-based online code hosting services for software developers.	Select **Repo**.
Orchestration Method	Method of orchestrating a pipeline. Select **YAML**: Use YAML to orchestrate a pipeline (one YAML file can be used for multiple pipelines). Syntax auto-completion and validation are available.	Select **YAML**.
Repository	Repository associated with the pipeline. You can select an existing repository or click **Create Repository** to create a repository. For details, see **Creating a Repository Using a Template**.	Select **Repo02**.
Default Branch	Branch used when a pipeline is executed manually or at a specified time.	Select **master**.
Configuration File	• **New**: Create a YAML file when orchestrating a pipeline. • **Existing**: Orchestrate a pipeline based on the existing YAML file. The orchestrated content will overwrite the original YAML file. For details about how to write a YAML file, see **YAML Syntax**.	Select **New**.
YAML File	This parameter is mandatory when **Configuration File** is set to **Existing**. Select a branch and enter the relative path of the YAML file.	-
Repo Endpoint	Optional. Configure an endpoint to enhance permissions for Repo. Endpoints are used for change-triggered pipelines and repository operation extensions. You can select an endpoint created in **Preparations** or click **Create One** to create an endpoint. For details, see **Creating Service Endpoints**.	-

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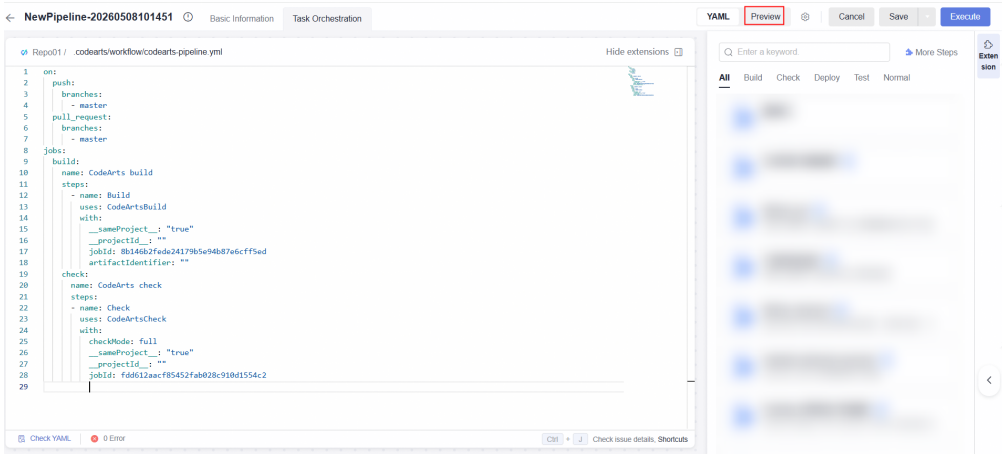
Parameter	Description	Example Value
Alias	Optional. After you set a repository alias, system parameters will be generated based on the alias. For example, *Alias*_**REPOSITORY_NAME** indicates the repository name. You can check the generated parameters on the **Parameter Configuration** page and reference them in a pipeline in the format of *${Parameter name}*. Enter a maximum of 128 characters, including only letters, digits, and underscores (_).	-
Description	Optional. Pipeline description. Enter a maximum of 1,024 characters.	-

Step 3 After configuring the basic information, click **OK**. The **Task Orchestration** page is displayed.

- You can edit the YAML file on the left. For details, see **YAML Syntax**. The following uses serial tasks of build and code check as an example.
- You can add extensions to the YAML file from the extension list displayed on the right.

You can verify YAML syntax during orchestration. Click **Preview** to switch to the graphical user interface.

Figure 5-5 Task orchestration



Step 4 After orchestration, click **Save**, enter the commits message, and push commits.

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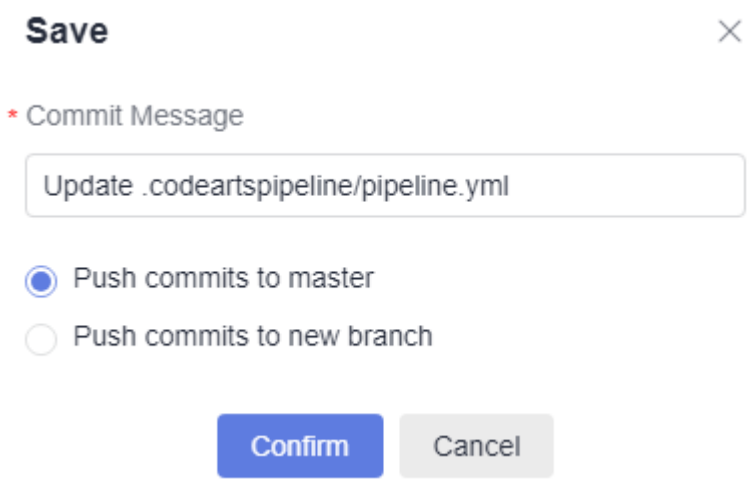

- Push commits to the existing branch: If you create the pipeline with a new YAML file, commits will be pushed to the default branch. If you create a pipeline with an existing YAML file, commits will be pushed to the branch where the YAML file resides.
- Push commits to a new branch: Commits will be pushed to a new branch. If you selected **Create merge request**, a merge request will be created for the new branch and the existing branch.

Step 5 Click **Confirm**. A message is displayed, indicating that the pipeline is created.

----End

Tutorial Video

This video demonstrates how to create and execute a pipeline with YAML.

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6 Creating a Pipeline (New Version)

6.1 Creating a Pipeline

Using the GUI simplifies pipeline creation and configuration, making it beginner-friendly and efficient. Use YAML to create pipelines to manage their configurations by version. This allows easy rollback to earlier versions and access to historical records. The method also ensures reusable configuration, minimizing errors.

YAML pipelines are easy to iterate and optimize. They facilitate team collaboration and make complex projects easier to manage, thus boosting development and deployment efficiency.

Constraints

- In the initial state, you can create a pipeline if you are any of the following roles:
  - Project administrator
  - Project manager
  - Developer
  - System engineer
  - Committer
- Project administrators can modify the permissions of other roles. For details, see **Authorizing CodeArts Pipeline**.

6.2 Creating a Pipeline (Stored in CodeArts)

Preparations

- You have **enabled and authorized CodeArts Pipeline**.
- **Create a project**.
- If you use a CodeArts Repo repository, **create a code repository**.
- If you want to enhance permissions to do operations on CodeArts Repo or connect to a third-party repository, create a service endpoint.

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Constraints

- GitLab pipeline source is available in **LA-Mexico City2**, **LA-Sao Paulo1**, and **AP-Singapore** regions.
- Bitbucket pipeline source is available only in **AP-Singapore** region.

Creating a Pipeline

Step 1 **Access the CodeArts Pipeline homepage**.

Step 2 Click **Create Pipeline**. In the displayed window, configure basic information by referring to **Table 6-1**.

Table 6-1 Basic pipeline parameters

Parameter	Description	Example Value
Name	Pipeline name. Enter a maximum of 128 characters, including only letters, digits, underscores (_), and hyphens (-).	Enter **pipeline01**.
Pipeline Storage	Method of creating and storing a pipeline. • **CodeArts**: Uses the GUI to clearly display serial and parallel jobs. • **Git**: Uses YAML (One YAML file can be used for multiple pipelines). Syntax auto-completion and validation are available. Pipeline configurations are stored in Git as YAML. For details, see **Creating a Pipeline with YAML**.	Select **CodeArts**.
Pipeline Group	The group to which the pipeline belongs. You can create or edit a group when creating a pipeline.	-

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Parameter	Description	Example Value
Pipeline Source	Code source associated with the pipeline. • CodeArts code source: Repo: provides comprehensive code hosting services for enterprises and Git-based online code hosting services for software developers. • Third-party code source – GitHub: After connecting to a GitHub account, you can obtain the repository and branch information of that account. – GitLab: After connecting to a GitLab account, you can obtain the repository and branch information of that account. – Bitbucket: After connecting to a Bitbucket account, you can obtain the repository and branch information of that account. – Git: After connecting to a Git repository, you can obtain its branch information. – Artifact: After connecting to an Artifact account, you can obtain the repository type and version information of the artifact. – Repo (other projects): Code is pulled from CodeArts Repo repositories of other projects. Select a project, and then select a code repository and a default branch. • Artifact source Use **SWR** as the pipeline source to run the pipeline and generate system parameters such as the artifact name, download address, and version number for extensions. **NOTE** • If you do not need to associate the pipeline with a code repository, you can select **None**. In this case, executing a job that should be associated with a repository will result in an error. For details, see **FAQ**.	Select **Repo**.
Service Endpoint	You need to use a service endpoint to connect to a third-party repository. Select an endpoint created in **Preparations** or click **Create One** to create an endpoint. For details, see **Creating Service Endpoints**.	-
Workspace	Workspace of the Bitbucket account.	-
Repository	Repository associated with the pipeline. You can select an existing repository or click **Create Repository** to create a repository. For details, see **Creating a Repository Using a Template**.	Select **Repo01**.

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Parameter	Description	Example Value
Default Branch	Branch used when a pipeline is executed manually or at a specified time.	Select **master**.
Repo Endpoint	Optional. Configure an endpoint to enhance permissions for Repo. Endpoints are used for change-triggered pipelines and repository operation extensions. You can select an endpoint created in **Preparations** or click **Create One** to create an endpoint. For details, see .	-
Alias	Optional. After you set a repository alias, system parameters will be generated based on the alias. For example, *Alias*_**REPOSITORY_NAME** indicates the repository name. You can check the generated parameters on the **Parameter Configuration** page and reference them in a pipeline in the format of *${Parameter name}*. Enter a maximum of 128 characters, including only letters, digits, and underscores (_).	-
Source Artifact Repository Type	Repository type used for the **Artifact** pipeline source. Select **Software Release Repositories** or **Docker Repositories**.	-
Version Policy	Artifact version used when a pipeline is executed. Select **Latest** or **Specific Version**. This parameter is mandatory when **Pipeline Source** is set to **Artifact**.	-
Deployment Package	Software package generated during software development. This parameter is mandatory when **Pipeline Source** is set to **Artifact**.	-
Organization	If **Pipeline Source** is set to **SWR**, select the SWR organization. If **Pipeline Source** is set to **Artifact**, select an organization in the current project. Organizations isolate and manage images within each company or department.	-
Image Name	If **Pipeline Source** is set to **SWR**, select an image in the organization. If **Pipeline Source** is set to **Artifact**, select an image in the organization of the current project.	-
Specified Version	Image version selected for the **SWR** pipeline source.	-

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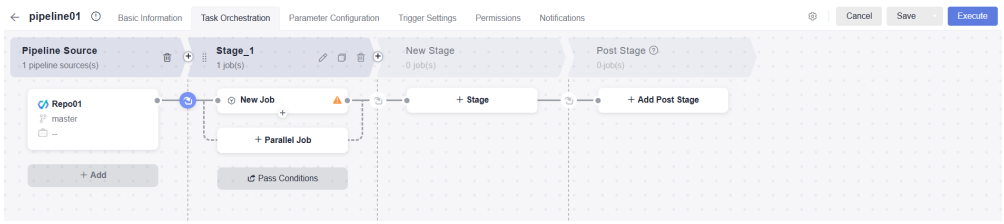
Parameter	Description	Example Value
Source Alias	If you select **SWR** or **Artifact** for pipeline source, after you set an artifact source alias, system parameters will be generated based on the alias. For example, *Alias*_**ARTIFACT_NAME** indicates the artifact name. You can check the generated parameters on the **Parameter Configuration** page and reference them in a pipeline in the format of *${Parameter name}*. Enter a maximum of 128 characters, including only letters, digits, underscores (_), hyphens (-), and periods (.).	-
Agency URN	Unique identifier of an IAM agency. If not configured, the default agency is used. If the agency is configured, use this agency identity and permissions to access other cloud services.	-
Description	Optional. Pipeline description. Enter a maximum of 1,024 characters.	-

Step 3 Click **Create**. The **Task Orchestration** page is displayed. We use the **Blank Template** as an example.

Figure 6-1 Task orchestration



----End

6.3 Creating a Pipeline (Stored in Git)

Preparations

- You have **enabled and authorized CodeArts Pipeline**.
- **Create a project**.
- **Create a code repository**.

Prerequisites

- Ensure that the agency URN has been configured for the project.
- Ensure that the members in the code repository have the required agency URN. The procedure is as follows:

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a. Access the CodeArts Pipeline homepage.
b. In the navigation pane, choose **Code** > **Repo**.
c. Click the target repository name to go to the **Code** page.
d. Click the **Members** tab and check whether the required agency URN is included in the member list.

- Ensure that the user has the permission to push YAML files to the repository branch. The procedure is as follows (the default branch is used as an example):
  a. Access the CodeArts Pipeline homepage.
  b. In the navigation pane, choose **Code** > **Repo**.
  c. Click the target repository name to go to the **Code** page.
  d. Choose **Settings** > **Policy Settings** > **Protected Branches**, move the cursor to  under **Push**, and view the permission information.
  e. Click  in the **Operation** column and configure permissions.

Creating a YAML Pipeline

Step 1 Access the CodeArts Pipeline homepage.

Step 2 Click **Create Pipeline**. In the displayed window, configure basic information by referring to **Table 6-2**.

Table 6-2 Basic pipeline parameters

Parameter	Description	Example Value
Name	Pipeline name. Enter a maximum of 128 characters, including only letters, digits, underscores (_), and hyphens (-).	Enter **pipeline02**.
Pipeline Storage	Method of creating and storing a pipeline. • **CodeArts**: Uses the GUI to clearly display serial and parallel jobs. • **Git**: Uses YAML (One YAML file can be used for multiple pipelines). Syntax auto-completion and validation are available. Pipeline configurations are stored in Git as YAML. For details, see **Creating a Pipeline with YAML**.	Select **Git**.
Pipeline Group	The group to which the pipeline belongs. You can create or edit a group when creating a pipeline.	-
Remote Repository Type	Repository associated with the pipeline. Select **Repo** or **GitCode**.	-

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Parameter	Description	Example Value
Service Endpoint	You need to use a service endpoint to connect to a GitCode repository. You can select an available endpoint or click **Create Endpoint** to create one. For details, see **Creating Service Endpoints**.	-
Repository	Repository associated with the pipeline. You can select an existing repository or click **Create Repository** to create a repository. For details, see **Creating a Repository Using a Template**.	Select **Repo02**.
Default Branch	Branch used when a pipeline is executed manually or at a specified time.	Select **master**.
YAML File	The YAML configuration file path must be in the **.codearts/workflow** directory. • **New**: Create a YAML file when orchestrating a pipeline. • **Existing**: Orchestrate a pipeline based on the existing YAML file. The orchestrated content will overwrite the original YAML file. For details about how to write a YAML file, see **Configuring a Pipeline with YAML**.	Select **New**.
Commit Message	This parameter is mandatory when **YAML File** is set to **New**. Name of the new YAML file.	Enter **New .codearts/codearts-pipeline.yml**.
Agency URN	Unique identifier of an IAM agency. If set: uses this agency identity and permissions to access other cloud services. If not set: uses the executor's identity and permissions.	Enter the agency URN configured for the project.
Description	Optional. Pipeline description. Enter a maximum of 1,024 characters.	-

Step 3 After configuring the basic information, click **Create**. The **Task Orchestration** page is displayed.

- You can edit the YAML file on the left. For details, see **Configuring a Pipeline with YAML**.
- You can add extensions to the YAML file from the extension list displayed on the right.

Step 4 After the configuration, click **Save** or **Save and return**. A message is displayed, indicating that the pipeline is created successfully.

Click **Execute**. In the displayed window, configure parameters by referring to **Executing a Pipeline** and click **OK**. The YAML pipeline is executed.

----End

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7 Configuring a Pipeline

7.1 Orchestrating Pipeline Stages

Pipeline Stage

A stage is a basic part of a pipeline. Each stage organizes jobs, processes inputs using specific logic, and produces outputs. Stages run in a defined order to create clear workflows. Refer to this section to configure stages.

Notes and Constraints

- Configure pass conditions:
  - Only the **Pass-Conditions-of-Standard-Policies** type is available. You can select a project- or tenant-level policy.
  - Pass conditions can be set exclusively for each stage of a pipeline and is valid only for the corresponding stage.
  - You can set multiple pass conditions for one stage.
- A maximum of 16 stages (including the downstream stage) can be configured for a pipeline.

Billing

To use rules and policies, upgrade the CodeArts package to the basic edition. For details, see **CodeArts Billing Modes**.

Prerequisites

- **You have enabled and authorized CodeArts Pipeline**.
- Your role is a **project administrator** or **pipeline creator**. For details about how to configure permissions, see **Authorizing CodeArts Pipeline**.

Configuring Stages

Step 1 **Access the CodeArts Pipeline homepage**.

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Step 2 Locate the target pipeline from the pipeline list, click ••• in the **Operation** column, and select **Edit**.

Step 3 On the **Task Orchestration** tab page, click  or **Stage** to add a stage to the pipeline. After the stage is added, you can edit, clone, delete, or move it, or configure its entry type.

Figure 7-1 Task orchestration

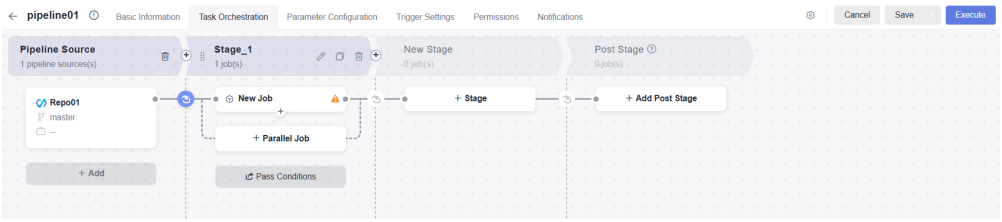

Table 7-1 Stage management

Operation	Description
Editing a stage	Click . In the displayed window, configure the stage name and whether to always run jobs in the stage. • If you select **Yes** for **Always Run**, jobs in this stage will be executed by default and cannot be canceled. • If you select **No** for **Always Run**, jobs in this stage will be selected by default for execution but can be canceled. • If you select **Yes** for **Stop All Parallel Jobs**, any job failure will stop all parallel jobs in the stage. The stage status will be **Stopped**. • If you select **No** for **Stop All Parallel Jobs**, any job failure will not stop all parallel jobs in the stage.
Cloning a stage	Click  to clone a stage.
Deleting a stage	Click  and confirm the deletion as prompted.
Sorting a stage	Click and drag  to move a stage to adjust its sequence.
Setting stage admission	Specify in what conditions a pipeline can proceed to the next stage. Click . In the displayed window, configure the admission type. • **Automatic** (default): The pipeline automatically proceeds to the next stage. • **Manual**: The pipeline proceeds only after manual confirmation. • **Time window**: The pipeline proceeds to the next stage within a specified period.

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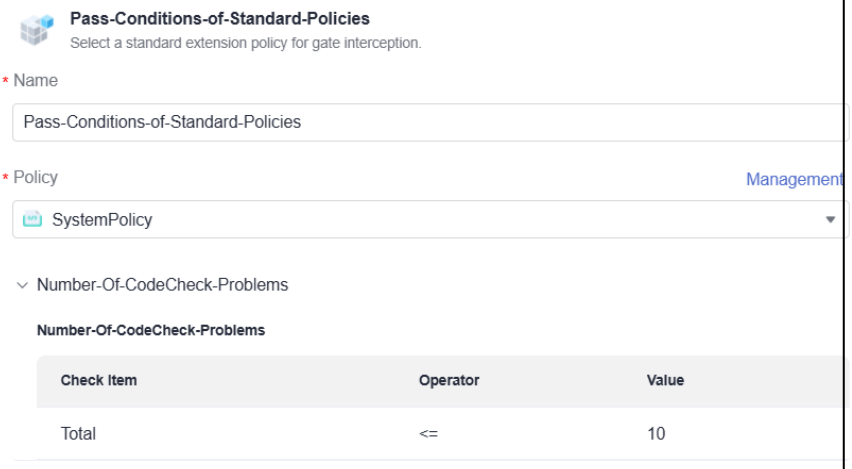
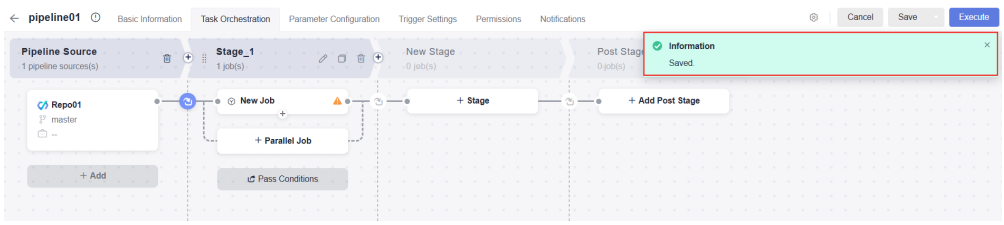
Operation	Description
Pass conditions	Set rules and policies to decide in what conditions a pipeline can complete the current stage. • A rule defines different comparison operators based on extension thresholds to determine whether to apply the extension output to stage pass conditions. Multiple such rules constitute a policy. For details, see **Configuring a Rule**. • A policy is a set of rules defined as different condition templates for a step extension. Each policy can be applied to multiple pipelines. There are **tenant-level policies** and **project-level policies**. You can use them to control pipeline runs for high-quality delivery. 1. Click **Pass Conditions** under a stage. In the displayed window, move the cursor to the pass conditions card and click **Add**. 2. Enter a name and select a policy.  3. Click **OK**.

Step 4 (Optional) **Configure a pipeline downstream stage**.

Step 5 After the configuration, click **Save**. A message is displayed, indicating that the pipeline is saved successfully.



----End

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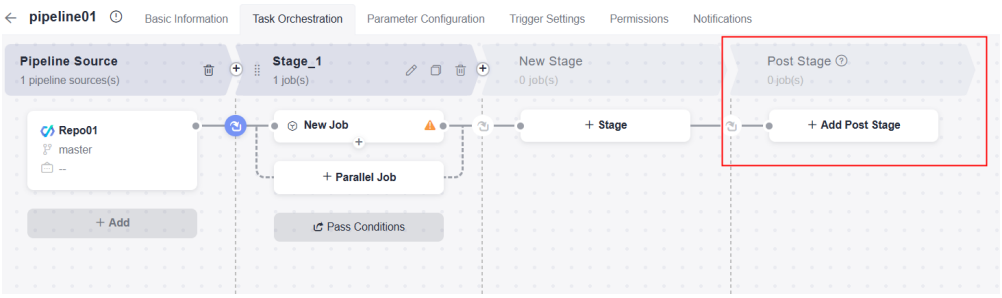
Configuring a Pipeline Downstream Stage

On the **Task Orchestration** page, you can configure a downstream stage for a pipeline. The downstream stage is executed regardless of whether the upstream stage is successful or not. You can configure extensions to implement functions such as resource clearing, third-party system callback, and message notification.

Step 1 Access the CodeArts Pipeline homepage.

Step 2 Select the target pipeline, click ••• in the **Operation** column, and select **Edit**. The pipeline orchestration page is displayed.

Step 3 Configure jobs for the downstream stage. For details, see **Configuring Pipeline Jobs**.



- A pipeline can have only one downstream stage, and the stage must be the last one.
- By default, **Always Run** is set to **Yes** for the downstream stage. You can change it to **No**.
- During execution configuration, if you select the downstream stage for execution, the stage will always be executed.

----End

Configuring a Rule

Rules are tenant-level resources and can be used in all tenant- or project-level policies of the current tenant.

Step 1 Access the CodeArts Pipeline homepage.

Step 2 Click the username in the upper right corner and click **All Account Settings**.

Step 3 In the navigation pane on the left, choose **Policy Management** > **Rules**.

Step 4 Click **Create Rule**. On the displayed page, configure parameters.

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Figure 7-2 Creating a rule

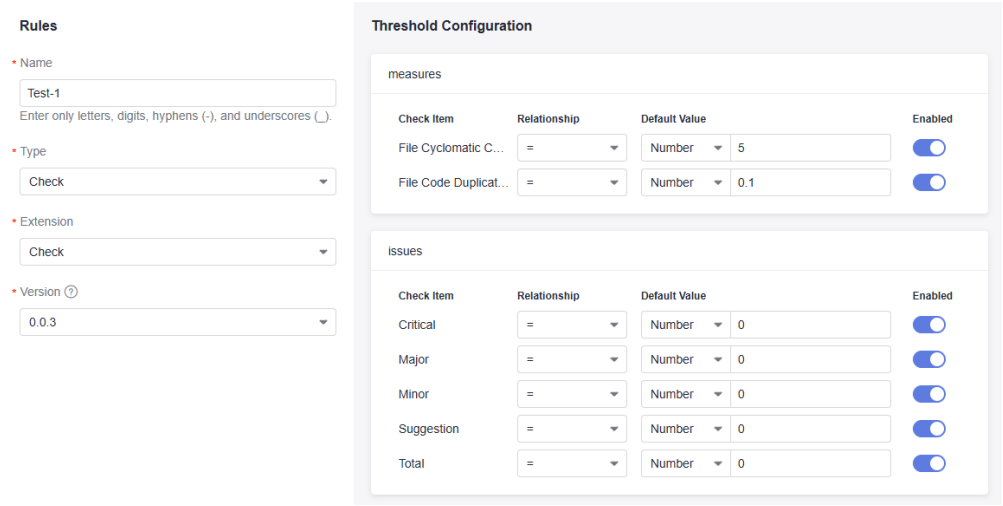

Table 7-2 Rule parameters

Parameter	Description	Example Value
Name	Rule name, which is generated based on the current time. Enter a maximum of 128 characters, including only letters, digits, underscores (_), and hyphens (-).	Enter **Test-1**.
Type	Rule type, which corresponds to the extension type. Supported extension types: **Build**, **Check**, **Test**, **Deploy**, and **Common**. • **Build**: extensions for code build. • **Check**: extensions for code check. • **Test**: extensions for API tests. • **Deploy**: extensions for deploying applications to the target environment. • **Common**: extensions for more service functions.	Select **Check**.
Extension	Involved extensions of the selected type • Extensions of the **Build** type: Set build result thresholds. For example, you can select an official **Build** extension to set thresholds for Maven unit tests. • Extensions of the **Check** type: Set code check result thresholds. For example, you can select an official **Check** extension to set thresholds for code checks. • Extensions of the **Test** type: Set test result thresholds. For example, you can select an official **TestPlan** extension to set thresholds for determining the test case pass rate in test suites.	Select **Check**.

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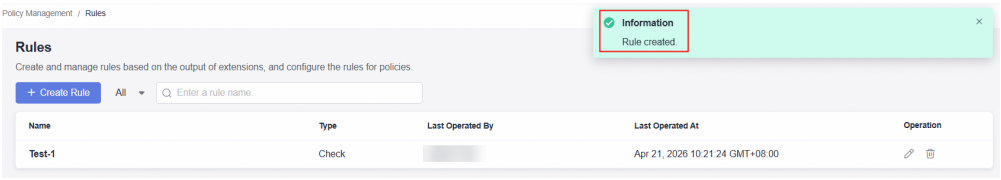
Parameter	Description	Example Value
Version	Select from all extension versions with threshold settings.	Select **0.0.3**.
Threshold Configuration	Set relational operators based on thresholds automatically obtained from the selected extension version. Note that if you changed threshold settings, the relevant rule and policy would also be changed. If you set the relational operator to **Exclude** or **Include**, the threshold can only be the **Text** type. For the check item **Pass Ratio**, the value ranges from 0 to 1.	-
Code metrics	Reflect the quality of committed code. Metrics help you detect and fix issues in a timely manner and improve R&D efficiency. Code metrics cover the following two types of issues: • Cyclomatic complexity. • Duplication rate. CodeArts Check identifies duplicate lines, blocks, and rates. For details, see **Viewing Check Results**.	-

Step 5 Click **Confirm**. A message is displayed, indicating that the rule is created successfully. You can also perform the following operations in the rule list.



- On the rule list page, click in the **Operation** column to edit a rule.
  - The rule type cannot be edited.
  - After a rule is edited, all policies that reference the rule are automatically modified.
- On the rule list page, click in the **Operation** column to delete a rule. On the displayed dialog box, click **OK** to confirm the deletion. After a rule is deleted, all policies that reference the rule automatically cancel the reference.

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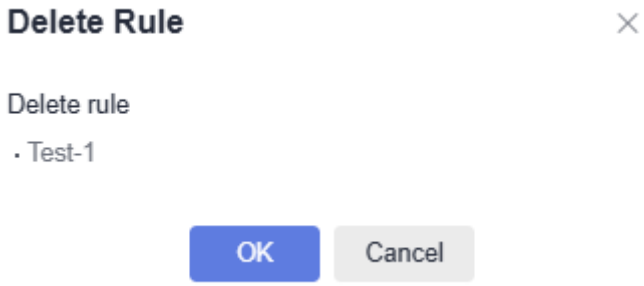

----End

Configuring a Pipeline Policy

There are tenant-level policies and project-level policies. Tenant-level policies are tenant-level resources and can be used in pass conditions for all pipelines of the current tenant. There is a system policy by default. You can check and use the policy, but cannot edit or delete it. Project-level policies are project-level resources and can be used in pass conditions for all pipelines of the current project. A maximum of 20 rules can be selected for a tenant-level or project-level policy.

Configuring the Tenant-level Policy

Step 1 Access the CodeArts Pipeline homepage.

Step 2 Click the username in the upper right corner and click **All Account Settings**.

Step 3 In the navigation pane on the left, choose **Policy Management** > **Policies**. The policy list page is displayed.

Step 4 Click **Create Policy**. On the displayed page, configure parameters.

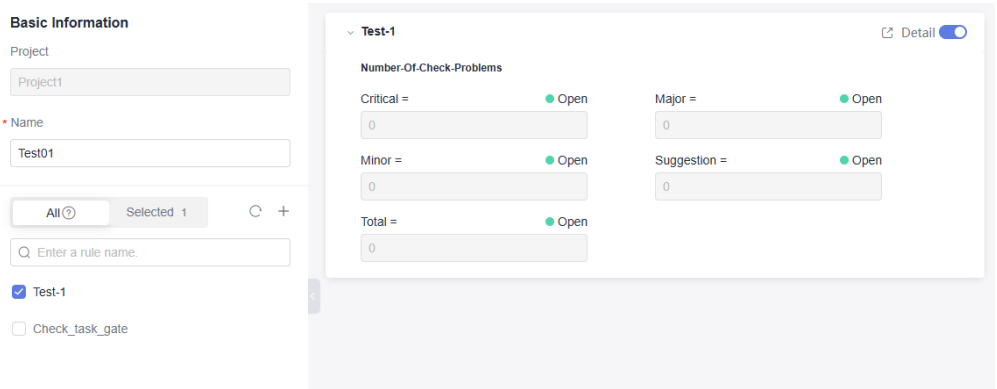

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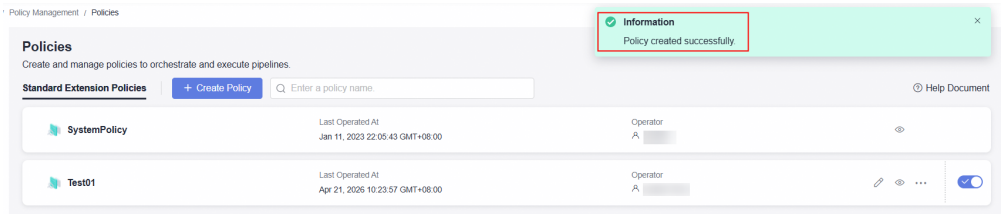
Table 7-3 Policy parameters

Parameter	Description	Example Value
Name	Policy name, which is generated based on the current time by default. Enter a maximum of 128 characters, including only letters, digits, underscores (_), and hyphens (-).	Enter **Test01**.
Rule	The selected rules will be displayed in the right part of the page. You can perform the following operations on each rule: • Edit: Click **Detail** in the upper right corner of the rule to check details. Click **Edit** in the upper right corner to edit the rule. • Enable/Disable: Click the toggle in the upper right corner to enable/disable the rule. After the rule is disabled, it will not take effect in the pass conditions where it is referenced.	Select **Test-1**.

Step 5 Click **Confirm**. A message is displayed, indicating that a policy is generated.



- On the policy list page, click to edit a policy. You can also perform the following operations in the policy list.
- Click to check a policy. Click **Edit** in the upper right corner to edit the policy.
- Click and select **Clone** to clone a policy.
- Click and select **Delete**. On the displayed dialog box, confirm the deletion. When you delete a policy, the system displays a message indicating the number of pipelines that use the policy. Once the policy is deleted, pipeline execution will fail.
- Click the toggle on the right to enable or disable a policy. If a policy is disabled, the system displays a message indicating the number of pipelines that use the policy. Once the policy is disabled, it will not take effect in pass conditions.

----End

Configuring Project-Level Policies

Step 1 Access the CodeArts Pipeline homepage through a project.

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Step 2 Click the **Policies** tab. The policy list page is displayed.

Step 3 Click **Create Policy**. On the displayed page, configure parameters.

Figure 7-3 Policy parameters

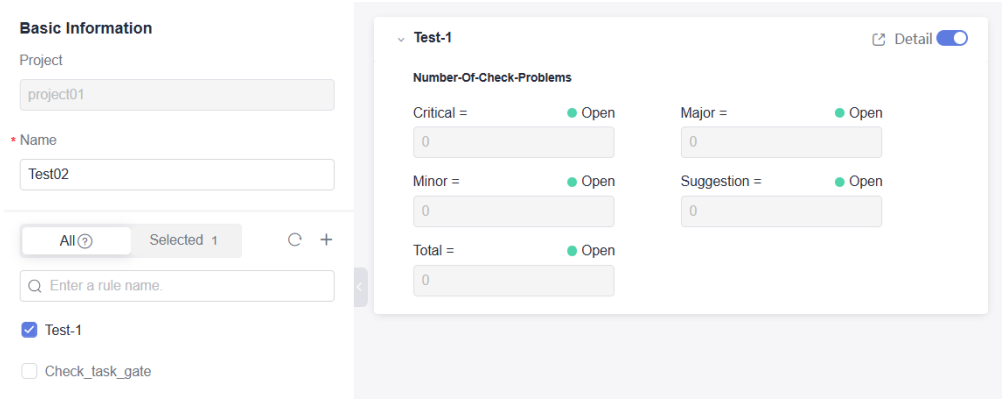
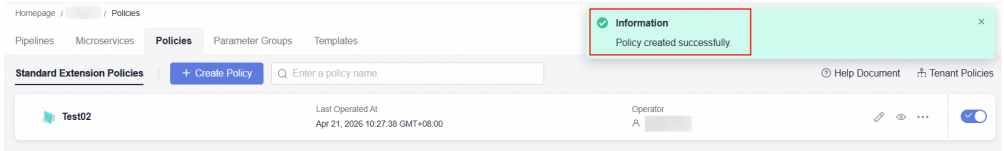


Table 7-4 Policy parameters

Parameter	Description	Example Value
Name	Policy name, which is generated based on the current time by default. Enter a maximum of 128 characters, including only letters, digits, underscores (_), and hyphens (-).	Enter **Test02**.
Rule	The selected rules will be displayed in the right part of the page. You can perform the following operations on each rule: • Edit: Click **Detail** in the upper right corner of the rule to view the details. Click **Edit** in the upper right corner to edit the rule. • Enable/Disable: Click the toggle in the upper right corner to enable/disable the rule. After the rule is disabled, it will not take effect in the pass conditions where it is referenced.	Select **Test-1**.

Step 4 Click **Confirm**. A message is displayed, indicating that the policy is created successfully.



- On the policy list page, click to edit a policy. You can also perform the following operations in the policy list.

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- Click to check a policy. Click **Edit** in the upper right corner to edit the policy.
- Click and select **Clone** to clone a policy.
- Click and select **Delete**. On the displayed dialog box, confirm the deletion.

  When you delete a policy, the system displays a message indicating the number of pipelines that use the policy. Once the policy is deleted, pipeline execution will fail.
- Click the toggle on the right to enable or disable a policy.

  If a policy is disabled, the system displays a message indicating the number of pipelines that use the policy. Once the policy is disabled, it will not take effect in pass conditions.
- On the policy list page, click **Tenant Policies** in the upper right corner. In the displayed window, you can view, clone, or inherit a tenant-level policy.
  - View: Click in the **Operation** column to check the tenant-level policy. Click **Edit** in the upper right corner to edit the tenant-level policy.
  - Clone: Click in the **Operation** column to clone the selected tenant-level policy to create a project-level policy.
  - Inherit: Click in the **Operation** column to inherit a project-level policy from the tenant-level policy. The inherited rules are always consistent with rules of the tenant-level policy.

----End

7.2 Orchestrating Pipeline Jobs

Jobs in a Pipeline

A job is the minimum manageable execution unit in a pipeline. Jobs can be managed and orchestrated in serial and parallel modes, and executed based on a specific sequence and time in a stage. Refer to this section to configure jobs.

Constraints

- A tenant can create a maximum of 200 execution plans.
- Once a job template is modified, all associated pipelines will be updated and cannot be restored.

Prerequisites

- **You have enabled and authorized CodeArts Pipeline**.
- Your role is a **project administrator** or **pipeline creator**. For details about how to configure permissions, see **Authorizing CodeArts Pipeline**.

Configuring Pipeline Jobs

Step 1 **Access the CodeArts Pipeline homepage**.

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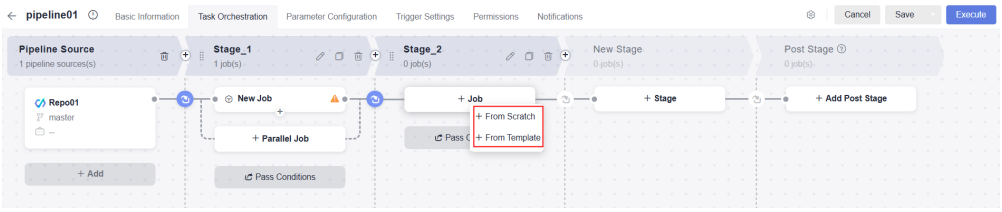
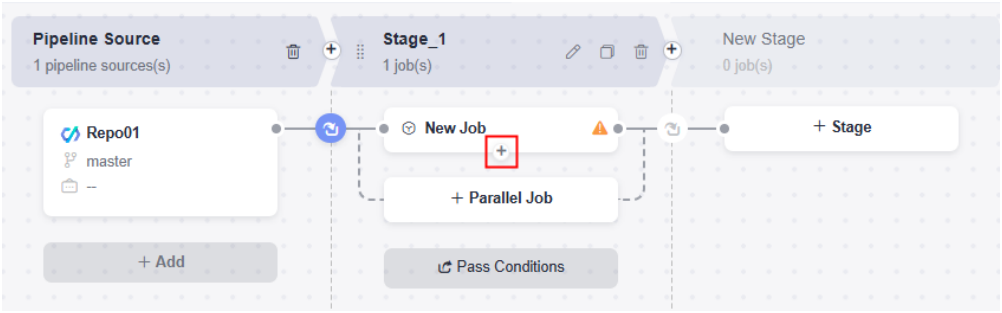
Step 2 On the pipeline list page, search for the target pipeline, click ••• in the **Operation** column, and select **Edit**.

Step 3 On the **Task Orchestration** page, click **Job** under a stage, and select **From Scratch** or **From Template**. If you use the blank template to create a pipeline, **New Job** in **Stage_1** is empty by default and no job template can be selected.

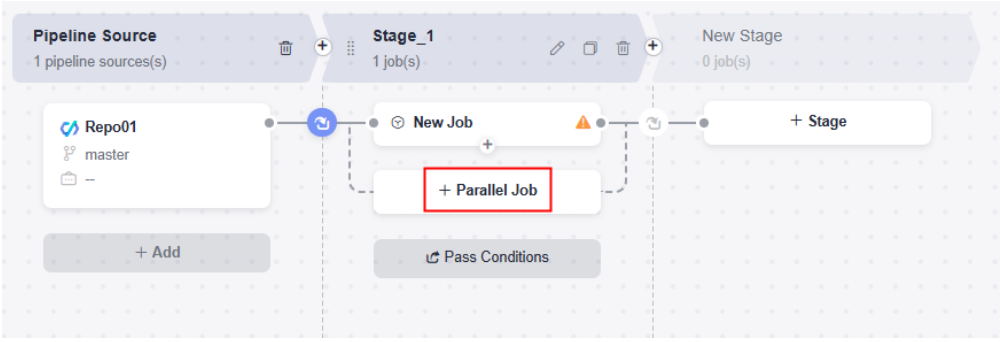


- **From empty**: In the displayed window, configure jobs by referring to **Table 7-5**.
- **From Template**: In the displayed window, select a desired template or create one. For details about templates, see **Table 3**.
  - Click **Clone**. The job configuration page is displayed. You can configure the job template as needed.
  - Click **Associate**. The job configuration page is displayed. The parameters cannot be modified.

Click + under a job to add a serial job. For example, a build job and a deployment job must be executed sequentially.



Click **Parallel Job** to add a parallel job. For example, a code check job and a build job can be executed at the same time.



Step 4 Configure extensions and information for the job by referring to the following table.

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Table 7-5 Job configuration

Operation	Description
Adding an extension	There are five types of extensions: build, code check, deployment, test, and normal extensions. You can filter or search for extensions by type. For more information, see **Managing Pipeline Extensions**. Move the cursor to an extension card and click **Add**. Then configure the following information: • Enter an extension name. • Select a task to be called. You can search for a task. If no proper task is available, create one as prompted. • If the called task has parameters, the parameters will be displayed. Configure parameters as needed. • You can add only one extension with flag *Job* to a single job. Extensions with flag *Draft* indicate that they are draft extensions. • The extension for suspending a pipeline can only be added to stages that do not contain parallel jobs.
Deleting an extension	Move the cursor to an extension card, click ⋮, and select **Delete** to delete the extension.
Replacing an extension	Move the cursor to an extension card, click ⋮, and select **Replace** to replace the extension. Or, click **Replace Step** above the extension name to choose another extension.
Sorting extensions	Click, hold, and move an extension card to adjust the extension sequence.

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Operation	Description
Configuring jobs	Configure the following information: • **ID**: The job ID must be unique. Enter 1 to 128 characters, including only letters, digits, hyphens (-), and underscores (_). • Resource pool advanced settings: A pipeline job can run in the following agent pools. You only need to configure agent pools for non-job-level extensions. – Default agent pool: isolates your environments from others by container. – Dedicated agent pool: grants you exclusive access to the private VPC network via the intranet. – Custom agent pool: manages your server resources that are connected via a network proxy. For details, see **Managing Agent Pools**. **NOTE** Dedicated resource pool is available only in AP-Singapore. • Select Job – **Always**: The job will always be selected for execution and cannot be canceled. – **Disabled**: The job cannot be selected for execution. – **Selected by default**: The job is selected for execution by default and can be modified. – **Not selected by default**: Job is not selected for execution by default. • **Execute**: Execution conditions are the triggers for executing jobs in a pipeline. – **Even when previous job is not selected**: The current job is executed regardless of whether the previous serial job is completed or not selected. – **When previous job succeeds**: The current job is executed only when the previous serial job is successfully executed. – **If previous job fails**: The current job is executed only when the previous serial job fails. – **Always**: The current job is always executed regardless of the previous serial job's final state (failed, completed, canceled, or ignored). – **With expression**: When the previous job is **COMPLETED**, **FAILED**, **CANCELED**, or **IGNORED** and the expression result is **true**, the current job will be executed. ▪ **Tag**: Click the text box. In the displayed window, you can select desired contexts, functions, or operators. Or you can just manually enter an expression in the text box. For details about how to configure an expression, see **Configuring Expressions**.

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Operation	Description
	Example: To execute the current job regardless of whether the previous job (ID: **job_1**) succeeded or failed, the expression can be as follows: `jobs.job_1.status == 'COMPLETED' || jobs.job_1.status == 'FAILED'` ▪ **Code**: The expression displayed here is in the string format and configured in the **Tag** mode. Manual input is not supported.

Step 5 After configuring the job, click **OK**. After the job is added, you can edit, clone, delete, or move the job.

Table 7-6 Job management

Operation	Description
Editing a job	Click a job card to edit the job.
Cloning a job	Click on the job card to create a serial job.
Deleting a job	Click on the job card and confirm the deletion as prompted.
Sorting jobs	Click, hold, and move a job card to adjust the sequence. Job sequence cannot be adjusted when jobs are executed in parallel.

Step 6 After the configuration, click **Save**. A message is displayed, indicating that the pipeline is saved successfully.

To solve the problems that may occur during pipeline configuration, see **Troubleshooting**.

----End

Configuring an Execution Plan

An execution plan outlines job execution steps, resource allocation, monitoring, and management. You can configure an execution plan in advance and select the plan when executing a pipeline manually or through schedulers.

Step 1 **Access the CodeArts Pipeline homepage** through a project.

Step 2 On the pipeline list page, search for the target pipeline, click ... in the **Operation** column, and select **Execution Plan**.

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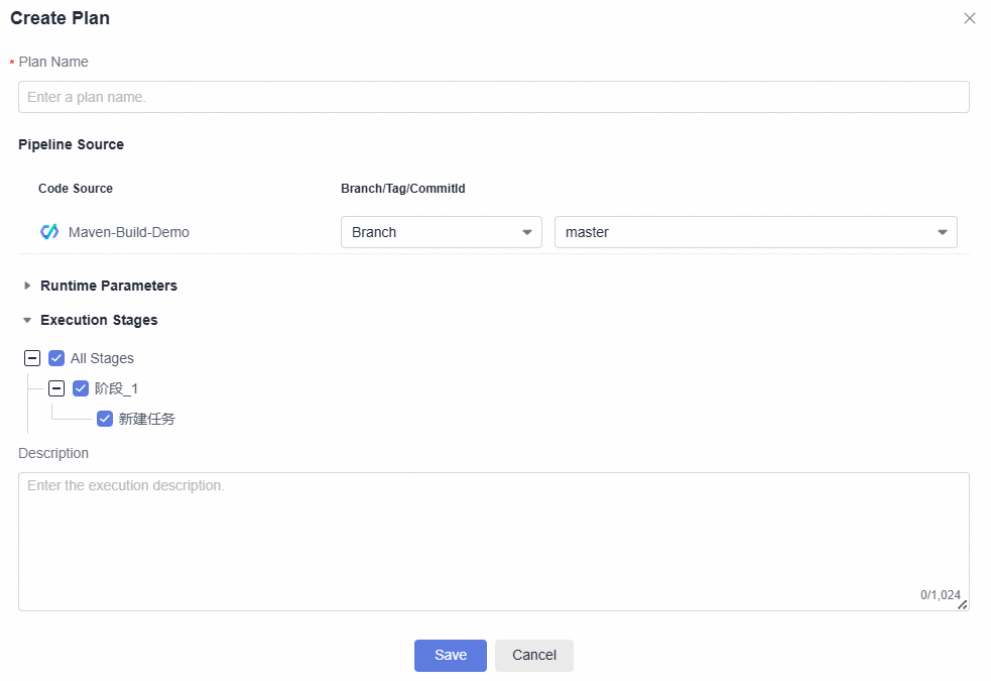
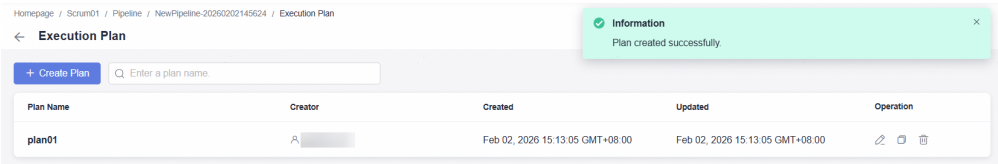
Step 3 Click **Create Plan**. In the displayed window, configure the plan name, pipeline source information, runtime parameters, execution stages, and description. For details, see **Executing a Pipeline**.

Figure 7-4 Creating an execution plan



Step 4 Click **Save**. A message is displayed, indicating that an execution plan is created successfully. You can edit, clone, or delete the execution plan.



----End

Configuring a Job Template

A pipeline job template is a ready-made model for creating and running specific jobs efficiently. It includes preset configurations and execution logic, saving time on repetitive work.

Step 1 **Access the CodeArts Pipeline homepage** through a project.

Step 2 Click **Templates**. In the displayed page, click **Job Templates**.

Step 3 Click **Create Template**. In the displayed window, set parameters.

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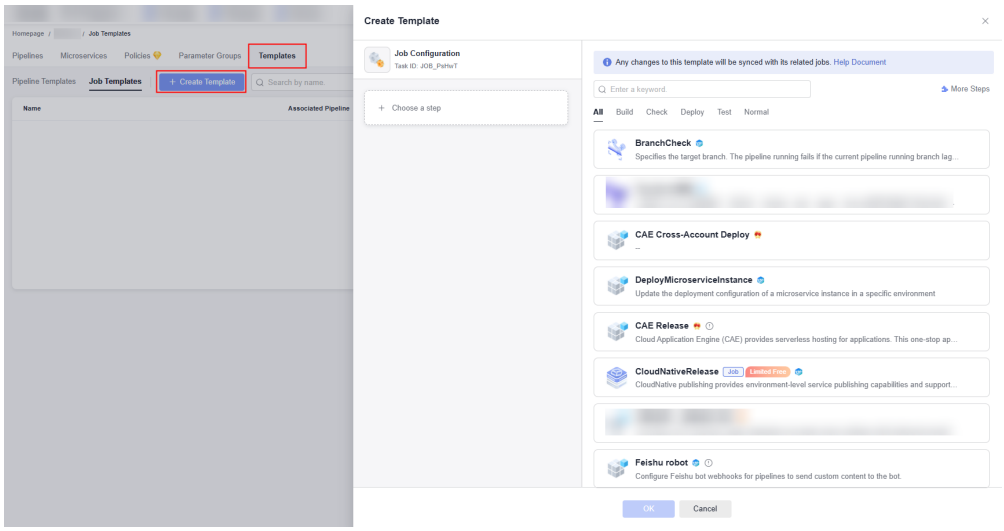

Step 4 Configure extensions and information for the template by referring to the following table.

Table 7-7 Configuring a job template

Operation	Description	Example Value
Adding an extension	There are five types of extensions: build, code check, deployment, test, and normal extensions. You can filter or search for extensions by type. For more information, see **Managing Pipeline Extensions**. Move the cursor to an extension card and click **Add**. Then configure the following information: • Enter an extension name. • Select a task to be called. You can search for a task. If no proper task is available, create one as prompted. • If the called task has parameters, the parameters will be displayed. Configure parameters as needed. • You can add only one extension with flag *Job* to a single job. Extensions with flag *Draft* indicate that they are draft extensions.	The following uses the **Build** extension as an example. You need to **create a build task build01** in advance. When adding the extension, set the parameters as follows: • **Name**: **Build** • **Project Config**: **This Project** • **Select Task**: **build01** • **Repository**: **Pipeline**
Deleting an extension	Move the cursor to an extension card, click ⋮, and select **Delete** to delete the extension.	-

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Operation	Description	Example Value
Replacing an extension	Move the cursor to an extension card, click ⋮, and select **Replace** to replace the extension. Or, click **Replace Step** above the extension name to choose another extension.	-
Sorting extensions	Click, hold, and move an extension card to adjust the extension sequence.	-

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Operation	Description	Example Value
Configuring jobs	Configure the following information: • Basic information – **Name**: name of the job template. – **Description**: description of the job template. A maximum of 1,024 characters are allowed. • **ID**: The job ID must be unique. Enter 1 to 128 characters, including only letters, digits, hyphens (-), and underscores (_). **NOTE** During pipeline orchestration, you can only edit the job ID in a job template. • Resource pool advanced settings: A pipeline job can run in the following agent pools. You only need to configure agent pools for non-job-level extensions. – Default agent pool: isolates your environments from others by container. – Dedicated agent pool: grants you exclusive access to the private VPC network via the intranet. – Custom agent pool: manages your server resources that are connected via a network proxy. For details, see **Managing Agent Pools**. **NOTE** Dedicated resource pool is available only in AP-Singapore. • Select Job – **Always**: The job will always be selected for execution and cannot be canceled. – **Disabled**: The job cannot be selected for execution. – **Selected by default**: The job is selected for execution by default and can be modified. – **Not selected by default**: Job is not selected for execution by default. • **Execute**: Execution conditions are the triggers for executing jobs in a pipeline. – **Even when previous job is not selected**: The current job is executed regardless of whether the previous serial job is completed or not selected. – **When previous job succeeds**: The current job is executed only when the previous serial job is successfully executed.	The following uses the **Build Template** as an example. Set the parameters as follows: • **Name**: **Build Template** • **ID**: **JOB_KJbee** • **Select Job**: use the default value • **Execute**: **Even when previous job is not selected**

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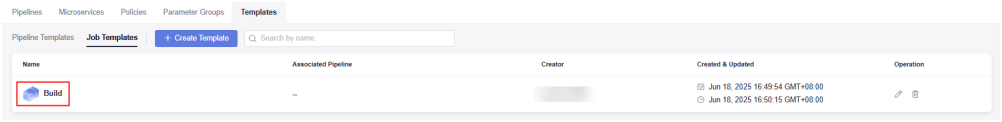
Operation	Description	Example Value
	– **If previous job fails**: The current job is executed only when the previous serial job fails. – **Always**: The current job is always executed regardless of the previous serial job's final state (failed, completed, canceled, or ignored). – **With expression**: When the previous job is **COMPLETED**, **FAILED**, **CANCELED**, or **IGNORED** and the expression result is **true**, the current job will be executed. ▪ **Tag**: Click the text box. In the displayed window, you can select desired contexts, functions, or operators. Or you can just manually enter an expression in the text box. For details about how to configure an expression, see **Configuring Expressions**. Example: To execute the current job regardless of whether the previous job (ID: **job_1**) succeeded or failed, the expression can be as follows: `jobs.job_1.status == 'COMPLETED' || jobs.job_1.status == 'FAILED'` ▪ **Code**: The expression displayed here is in the string format and configured in the **Tag** mode. Manual input is not supported.	

Step 5 After the configuration is complete, click **OK**. The template page is displayed.



- Click  to edit the job template.

  After the job template is edited, click **OK**. In the displayed window, click **Autofill** and then **OK**.

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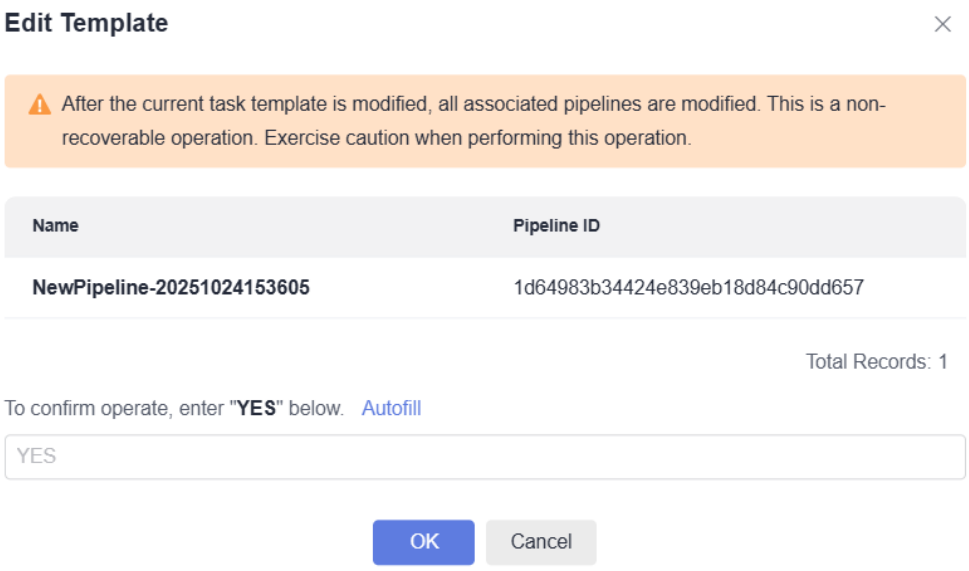
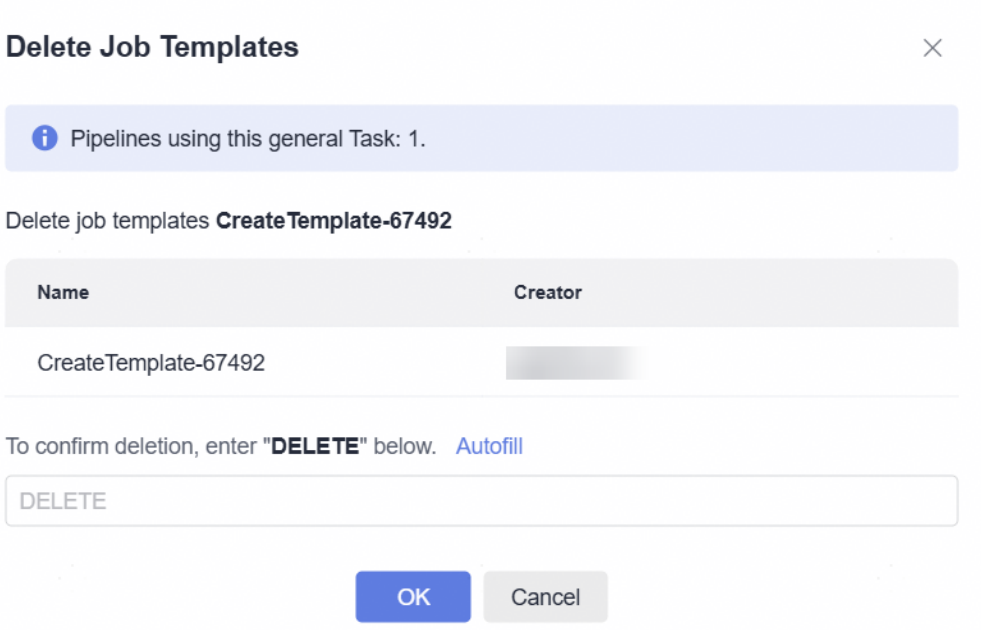


- Click to delete the job template.
  If the job template has been referenced by a pipeline, the **Delete Job Template** dialog box is displayed. If you are sure to delete the job template, click **Autofill** and then **OK**.



----End

7.3 Configuring Pipeline Extensions

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7.3.1 Build

Call the **Build** extension to use CodeArts Build capabilities. CodeArts Build provides an easy-to-use code build platform that supports multiple programming languages in the cloud. It helps enterprises improve build efficiency at large scale. For details, see **CodeArts Build**.

Adding the Extension with GUI

Add the **Build** extension when you **orchestrate a pipeline**. Set parameters as shown in **Table 7-8**.

Table 7-8 Parameter description

Parameter	Description
Name	Extension name, which can be customized. • Supported characters include letters, digits, spaces, and special characters: -_,;:./() • Enter 1 to 128 characters.
Project Config	Select the current project or other projects.
Select Project	If you set **Project Config** to other projects, select a project to be called.
Select Task	Select a build task whose code source is pipeline or the same repository as the pipeline you are configuring.
Repository	Select the corresponding code repository.
Artifact Identifier	Identifier of each build artifact. For example, if the ID of the build task is "build_job" and the artifact identifier is "demo", use "${{jobs.build_job.artifacts.demo}}" to obtain artifact information in subsequent tasks.

Adding the Extension with YAML

Add the **Build** extension when you **orchestrate a pipeline**. Configure the YAML syntax as follows:

- **Build**

  Call the **Build** extension to use CodeArts Build capabilities.

  ```
  uses: CodeArtsBuild
  with:
    jobId: 878b4d13cb284d9e8f33f988a902f57c
    artifactIdentifier: my_pkg
    customParam: value
  ```

  – **jobId**: ID of the build task. To obtain the ID, copy the 32 digits and letters at the end of the browser URL on the build task details page.

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- **artifactIdentifier**: Build artifact identifier.
- **customParam**: Parameter value defined in the build task. There may be zero to multiple values.

7.3.2 Check

Call the **Check** extension to use CodeArts Check capabilities. CodeArts Check checks the code style, general quality, and network security based on the cloud. It provides professional scan reports and convenient closed-loop issue handling process. For details, see **CodeArts Check**.

Adding the Extension with GUI

Add the **Check** extension when you **orchestrate a pipeline**. Set parameters as shown in **Table 7-9**.

Table 7-9 Parameter description

Parameter	Description
Name	Customize the extension name. • Supported characters include letters, digits, spaces, and special characters: -_,;:./() • Enter 1 to 128 characters.
Project Config	Select the current project or other projects.
Select Project	If you set **Project Config** to other projects, select a project to be called.
Select Task	Select a code check task whose code source is the same repository as the pipeline you are configuring.
Repository	Select the corresponding code repository.
Commit Check Mode	Specify the check mode for code commit, which applies when a pipeline is triggered by commit or manual operations. There are three check modes. The default value is **Full**. You can change the value as required. • **Full**: All files in the code repository are scanned. • **Incremental (last commit)**: Incremental check is performed based on the latest commit file. • **Incremental (last success)**: Incremental check is performed based on the changed files after the latest access control is passed.

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Adding the Extension with YAML

Add the **Check** extension when you **orchestrate a pipeline**. Configure the YAML syntax as follows:

- **Check**

  Call the **Check** extension to use CodeArts Check capabilities.

```
uses: CodeArtsCheck
with:
  jobId: 43885d46e13d4bf583d3a648e9b39d1e
  checkMode: full|push_inc_full||push_multi_inc_full
```

  - **jobId**: ID of a code check task.
  - **checkMode**: Check mode.
    - **full**: Checks all code.
    - **push_inc_full**: Checks all files changed in this code commit.
    - **push_multi_inc_full**: Checks all files changed between this code commit and the last successful code commit.

7.3.3 CloudNativeRelease

Orchestrate release policies for environments, such as rolling release and grayscale release.

Adding the Extension with GUI

Add the **CloudNativeRelease** extension when you **orchestrate a pipeline**. Set parameters as shown in **Table 7-10**.

Table 7-10 Parameter description

Parameter	Description
Name	Extension name, which can be customized. • Supported characters include letters, digits, spaces, and special characters: -_,;:./() • Enter 1 to 128 characters.
Environment Level	Release environment type. Available environment types: development, test, pre-production, and production.
Environment	Environment to be released. For details, see **Creating a Release Environment**.
Artifact Path	Image path for deployment and release. Example: **swr.example.com/demo/springboot-helloworld:v1.1**. You can use ${} to reference **pipeline parameters**. Example: **swr.example.com/demo/springboot-helloworld:${version}**.

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Adding the Extension with YAML

Add the **CloudNativeRelease** extension when you **orchestrate a pipeline**. Configure the YAML syntax as follows:

- CloudNativeRelease

```
uses: official_microservice_release
with:
  categories: 8dc56cd6c2cf44029181f04025ed173a
  env_id: 39c94e52fb0e4c03af97e3252c68e2a3
  artifact: swr.example.com/demo/springboot-helloworld:v1.1
```

  - categories: release environment type.
  - env_id: environment to be released.
  - artifact: image path used during deployment.

7.3.4 Deploy

Call the **Deploy** extension to use CodeArts Deploy capabilities. CodeArts Deploy helps you visually deploy applications in VMs or containers by using Tomcat, Spring Boot, and other templates or flexibly orchestrated atomic actions. It standardizes your deployment environment and process. For details, see **Deploying CodeArts Deploy**.

Adding the Extension with GUI

Add the **Deploy** extension when you **orchestrate a pipeline**. Set parameters as shown in **Table 7-11**.

Table 7-11 Parameter description

Parameter	Description
Name	Extension name, which can be customized. • Supported characters include letters, digits, spaces, and special characters: -_,;:./() • Enter 1 to 128 characters.
Select Task	Select a deployment task whose code source is the same repository as the pipeline you are configuring.

Adding the Extension with YAML

Add the **Deploy** extension when you **orchestrate a pipeline**. Configure the YAML syntax as follows:

- **Deploy**

```
uses: CodeArtsDeploy
with:
  jobId: 9c5a5cda6ffa4ab583380f5a014b2b31
  customParam: value
```

  - **jobId**: ID of the deployment task.

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- **customParam**: Parameter value defined in the deployment task.

7.3.5 TestPlan

Call the **TestPlan** extension to use CodeArts TestPlan capabilities. CodeArts TestPlan is a one-stop cloud testing platform provided for software developers. It covers test management and API tests, and integrates the DevOps agile testing concepts, helping you improve management efficiency and deliver high-quality products. For details, see **CodeArts TestPlan**.

Adding the Extension with GUI

Add the **TestPlan** extension when you **orchestrate a pipeline**. Set parameter as shown in **Table 7-12**.

Table 7-12 Parameter description

Parameter	Description
Name	Extension name, which can be customized. • Supported characters include letters, digits, spaces, and special characters: -_,;:./() • Enter 1 to 128 characters.
Select Task	Select an API automation test suite whose code source is the same repository as the pipeline you are configuring.
Parameters	• **Use global parameters of selected environment**: Different environments configured in multiple tasks can be selected and parameters in the corresponding environments can be used. • **Use new execution parameters**: You can directly enter the parameters to overwrite the global parameters used by the selected test task type.
Environment	When **Parameter** is set to **Use global parameters of selected environment**, select **Default Environment**.

Adding the Extension with YAML

Add the **TestPlan** extension when you **orchestrate a pipeline**. Configure the YAML syntax as follows:

- **TestPlan**

```
uses: CodeArtsTestPlan
with:
  jobId: vb180000vnrgoeib
  environmentModel: 1
  environmentId: 7c2eff2377584811b7981674900158e8
```

  - **jobId**: ID of the API test task.
  - **environmentModel**: parameter source.

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    - **0**: Use new execution parameters.
    - **1**: Use the global parameters of the selected environment.
  - **environmentId**: environment ID when **environmentModel** is set to **1**.

7.3.6 Subpipeline

Call the **Subpipeline** extension to configure other pipelines in a project. When a sub-pipeline is queuing, the main pipeline is displayed in the running state and continues to wait.

Adding the Extension with GUI

Add the **Subpipeline** extension when you **orchestrate a pipeline**. Set parameters as shown in **Table 7-13**.

Table 7-13 Parameter description

Parameter	Description
Name	Extension name, which can be customized. • Supported characters include letters, digits, spaces, and special characters: -_,;:./() • Enter 1 to 128 characters.
Select Task	Select other pipelines in the current project to be called.
Branch/Tag	Set the branch for the sub-pipeline. You can select **Use subpipeline default branch**, **Use parent pipeline branch**, or **Use specific branch**.
Specific Branch	When **Branch** is set to **Use specific branch**, set the branch for starting the sub-pipeline.

Adding the Extension with YAML

Add the **Subpipeline** extension when you **orchestrate a pipeline**. Configure the YAML syntax as follows:

- **Subpipeline**

```
uses: SubPipeline
with:
  pipelineId: 80ea2d9ffba94c20b9a0a0be47d3a0d8
  branch: master
```

  - **pipelineId**: ID of the called pipeline.
  - **branch**: (Optional) Branch used for running the sub-pipeline.
    - The default branch of the sub-pipeline is used if this parameter is not set.

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- You can reference a parameter or context to define **branch**. For example, if you want to run the parent pipeline source, and the code source alias is **my_repo**, the reference format is **${{sources.my_repo.target_branch}}**.

7.3.7 DelayedExecution

Pause a pipeline for a period of time or until a specified time. You can manually resume or stop a pipeline, or delay the execution for a maximum of three times.

Adding the Extension with GUI

Add the **DelayedExecution** extension when you **orchestrate a pipeline**. Set parameters as shown in **Table 7-14**.

Table 7-14 Parameter description

Parameter	Description
Name	Extension name, which can be customized. • Supported characters include letters, digits, spaces, and special characters: -_,;:./() • Enter 1 to 128 characters.
Delay By	Delayed execution mode. You can set **Duration** or **Scheduled time**.
Duration	Duration of the delayed execution. You can configure a value.
Scheduled time	Time when a delayed pipeline restarts from. You can configure a value.
Time zone	Select a time zone.

Adding the Extension with YAML

Add the **DelayedExecution** extension when you **orchestrate a pipeline**. Configure the YAML syntax as follows:

- **DelayedExecution**

```
uses: Delay
with:
  timerType: delay|scheduled
  delayTime: 300
  scheduledTime: '00:00'
  timeZone: China Standard Time
```

  - **timerType**: Delay type. **delay** indicates pausing a pipeline for a period of time. **scheduled** indicates pausing a pipeline until a specified time.
  - **delayTime**: Time duration (in seconds) when **timerType** is set to **delay**.
  - **scheduledTime**: Exact time when **timerType** is set to **scheduled**.
  - **timeZone**: Time zone.

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7.3.8 ManualReview

Create manual review tasks by assigning one person or one group. An email notification can be sent to reviewers.

Adding the Extension with GUI

Add the **ManualReview** extension when you **orchestrate a pipeline**. Set parameters as shown in **Table 7-15**.

Table 7-15 Parameter description

Parameter	Description
Name	Extension name, which can be customized. • Supported characters include letters, digits, spaces, and special characters: -_,;:./() • Enter 1 to 128 characters.
Review Source	Source of the reviewer. Select **Project Members** or **Project Roles**.
Reviewer	When **Review Source** is set to **Project Members**, configure reviewers.
Review Mode	When **Review Source** is set to **Project Roles**, select **Review by all** or **Review by any person**.
Review Role	When **Review Source** is set to **Project Roles**, select review roles. In an IPD project, the project creator does not participate in the review as a project manager.
Timeout Processing	Configure the processing method when the review times out.
Review Duration	How long the review lasts, which cannot be longer than three days.
Description	Description of the review task.

Adding the Extension with YAML

Add the **ManualReview** extension when you **orchestrate a pipeline**. Configure the YAML syntax as follows:

- **ManualReview**

```
uses: Checkpoint
with:
  mode: members|roles
  approvers: 05d8ca972f114765a8984795a8aa4d41
  roles: PROJECT_MANAGER
  checkStrategy: all|any
```

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```
timeout: 300
timeoutStrategy: reject|pass
comment: comment
```

- **mode**: Review mode.
  - **members**: Review by member.
  - **roles**: Review by role.
- **approvers**: User IDs of the approvers when **mode** is set to **members**.
- **roles**: Role when the mode is set to **roles**.
- **checkStrategy**: Strategy used when the **mode** is set to **members**.
  - **all**: The review task needs to be reviewed by all members.
  - **any**: The review task can be reviewed by any member.
- **timeout**: Review timeout.
- **timeoutStrategy**: Strategy used when the review times out.
  - **reject**: The review is rejected.
  - **pass**: The review is approved.
- **comment**: Review description.

7.3.9 CreateTag

Create and push tags for code repositories.

Adding the Extension with GUI

Add the **CreateTag** extension when you **orchestrate a pipeline**. Set parameters as shown in **Table 7-16**.

Table 7-16 Parameter description

Parameter	Description
Name	Extension name, which can be customized. • Supported characters include letters, digits, spaces, and special characters: -_,;:./() • Enter 1 to 128 characters.
Tag Name	Tag name.
Repository	Select the corresponding code repository.

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- Click the toggle  to enable **Continue If Tag Exists**. If the created tag exists in the code repository, no error is reported and the pipeline continues to run. Otherwise, the execution fails.

Adding the Extension with YAML

Add the **CreateTag** extension when you **orchestrate a pipeline**. Configure the YAML syntax as follows:

- **CreateTag**

```
uses: CreateTag
with:
  tagName: v1
```

  - **tagName**: Tag name.

7.3.10 JenkinsTask

Call Jenkins tasks.

Notes and Constraints

Currently, this function is available in **LA-Mexico City2**, **LA-Sao Paulo1**, and **AP-Singapore**.

Adding the Extension with GUI

Add the **JenkinsTask** extension when you **orchestrate a pipeline**. Set parameters as shown in **Table 7-17**.

Table 7-17 Parameter description

Parameter	Description
Name	Extension name, which can be customized. • Supported characters include letters, digits, spaces, and special characters: -_,;:./() • Enter 1 to 128 characters.
Jenkins Endpoint	Create a Jenkins service endpoint by referring to **Jenkins**.
jobName	Jenkins job name.
params	Parameters (in JSON format) transferred for starting the job.
Asynchronous	Whether to execute the job asynchronously.
Description	Description for connecting to the endpoint.

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Adding the Extension with YAML

Add the **JenkinsTask** extension when you **orchestrate a pipeline**. Configure the YAML syntax as follows:

- **JenkinsTask**

```
uses: Jenkins
with:
  endpoint: eac965b206e74e2b898a24a4375b6df6
  jobName: job
  params: '{ \"key\":\"value\" }'
  async: true|false
  description: description
```

  - **endpoint**: ID of the Jenkins endpoint.
  - **jobName**: Jenkins job name.
  - **params**: Parameters (in JSON format) transferred for starting the job.
  - **async**: Whether to execute the job asynchronously.
  - **description**: Execution description.

7.3.11 PipelineSuspension

Call the **PipelineSuspension** extension to suspend the current pipeline.

Adding the Extension with GUI

Add the **PipelineSuspension** extension when you **orchestrate a pipeline**. Set parameters as shown in **Table 7-18**.

Table 7-18 Parameter description

Parameter	Description
Name	Extension name, which can be customized. • Supported characters include letters, digits, spaces, and special characters: -_,;:./() • Enter 1 to 128 characters.

Adding the Extension with YAML

Add the **PipelineSuspension** extension when you **orchestrate a pipeline**. Configure the YAML syntax as follows:

- **PipelineSuspension**

```
uses: SuspendPipeline
```

7.3.12 ExecuteImage

Call the **ExecuteImage** extension to download public images from SWR to a custom executor and start the images.

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Adding the Extension with GUI

Add the **ExecuteImage** extension when you **orchestrate a pipeline**. Set parameters as shown in **Table 7-19**.

Table 7-19 Parameter description

Parameter	Description
Name	Extension name. • Supported characters include letters, digits, spaces, and special characters: -_,;:./() • Enter 1 to 128 characters.
Image Attribute	Only public images are supported.
SWR Image Address	Address of the SWR images to be downloaded. To obtain the address: 1. Log in to **SWR**. 2. In the navigation pane, click **My Images**, click the image name to go to the image details page. 3. Click to copy the image download command. The part following **docker pull** is the image path.
Startup Command	Container startup command. Enter Docker commands to run specific applications or scripts in the container.

Adding the Extension with YAML

Add the **ExecuteImage** extension when you **orchestrate a pipeline**. Configure the YAML syntax as follows:

- **ExecuteImage**

```
uses: official_docker_executor
  with:
    attribute: public
    image: swr.example.com/demo/springboot-helloworld:v1.1
    command: sh start.sh
```

  - **attribute**: Image attribute.
  - **image**: SWR image address.
  - **command**: Container startup command.

7.3.13 ThirdPartyAPI-v2

You can configure web APIs to call third-party APIs.

- The **ThirdPartyAPI-v2** extension requires certificate verification. Custom certificate is not supported.

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- If the API return code is not **2***XX*, the operation fails.

Adding the Extension with GUI

Add the **ThirdPartyAPI-v2** extension when you **orchestrate a pipeline**. Set parameters as show in **Table 7-20**.

Table 7-20 Parameter description

Parameter	Description
Name	Extension name. • Supported characters include letters, digits, spaces, and special characters: -_,;:./() • Enter at least one character.
API Method	Select **GET**, **POST**, **PATCH**, **PUT**, or **DELETE**.
API URL	API that can be called by the public network. Certificate verification is required.
API Header	Configure key-value pairs.
API Parameter	Configure key-value pairs.
API Body	If the request method is **POST**, **PATCH**, or **PUT**, enter the body in JSON format.

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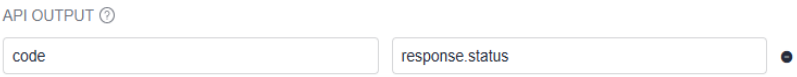
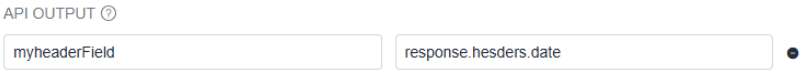
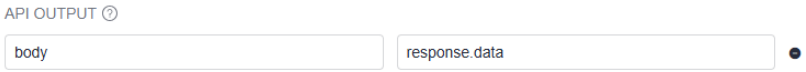
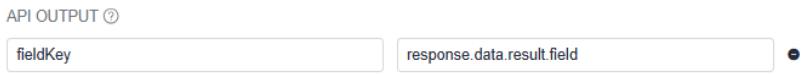
Parameter	Description
API Output	The root object name is **response**, which includes multiple outputs. • If the output key is **code**, refer to the following figure to obtain the specific request return code.  • If the returned request header contains the **date** field, refer to the following figure to obtain the **date** value.  • To output the entire body, refer to the following figure.  • If the returned JSON body is as follows and you need to obtain the value of **field**, refer to the following figure. `{ "result": { "field": "value", "field1": "value1" } }` 

Adding the Extension with YAML

Add the **ThirdPartyAPI-v2** extension when you **orchestrate a pipeline**. Configure the YAML syntax as follows:

- **ThirdPartyAPI-v2**

```
uses: official_third_part_invoke
  with:
    API_METHOD: GET
    API_URL: https://demo
    API_HEADER: '[{"key":"Content-Type","value":"application/json"}]'
    API_PARAM: '[{"key":"name","value":"value"}]'
    API_BODY: "{}"
    API_OUTPUT: '[{"key":"code","value":"response.status"}]'
```

7.3.14 Repo Repository Merge

Call the **Repo Repository Merge** extension to merge branches to a CodeArts Repo code repository.

Adding the Extension with GUI

Add the **Repo Repository Merge** extension when you **orchestrate a pipeline**. Set parameters as shown in **Table 7-21**.

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Table 7-21 Parameters description

Parameter	Description
Name	Extension name. • Supported characters include letters, digits, spaces, and special characters: -_,;:./() • Enter 1 to 128 characters.
Repo Url	HTTPS address of a CodeArts Repo code repository.
Repository Name	Name of a code repository.
Access Token	Access token of the CodeArts Repo service (To obtain it, choose **This Account Settings** > **Repo** > **Access Tokens**.)
Target Branch	Branch to which the source branch is merged.
Source Branch	Branch to be merged.

Adding the Extension with YAML

Add the **Repo Repository Merge** extension when you **orchestrate a pipeline**. Configure the YAML syntax as follows:

- **Repo Repository Merge**

```
jobs:
    JOB_msbBf:
      name: Repo Repository Merg
      needs: []
      select: selected_by_default
      steps:
      - name: Repo Repository Merg
        uses: official_repo_merge
        with:
          repository: "${REPO_URL}"
          repository_name: aass
          access_token: xxssxxss
          target_branch: master
          source_branch: dev
        identifier: 178235170957838b8f854-5b2f-4650-aaa8-b354d928c06a
      if: "${{ default() }}"
      runs-on:
      - default
```

7.3.15 Terraform Deployment

Call the Terraform Deployment extension to perform common Terraform operations, such as init, validate, plan, apply, and destroy, and to integrate with pipelines for orchestration. It supports using resource access credentials managed via extension points.

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Adding the Extension with GUI

Add the Terraform Deployment extension when you **orchestrate a pipeline**. Set parameters as shown in **Table 7-22**.

Table 7-22 Parameter description

Parameter	Description
Name	Extension name. • Supported characters include letters, digits, spaces, and special characters: -_,;:./() • Enter 1 to 128 characters.
Resource Type	The cloud providers for resources that Terraform can operate on currently include only **Huawei Cloud** and **AWS**.
Terraform Resource Credentials	The IAM extension point that provides the authentication credentials required for Terraform to create resources. For details about how to create an IAM extension point, see **Creating Service Endpoints**.
Terraform Operation Type	The operation type of the Terraform Deployment extension, including five types: init, validate, plan, apply, and destroy. • init: initializing a working directory. • validate: checking the syntax and parameters of a configuration file. • plan: previewing an execution plan. • apply: applying changes. • destroy: destroying resources.
Repository	The code repository where the Terraform resource definition file is located.
Branch	The branch of the code repository where the Terraform resource definition file is located.
Terraform Resource Definition File Path	The path to the Terraform resource definition file within the code repository. If the file is located in the root directory of the repository, enter **./**.
Terraform Parameter File Path	The path to the Terraform parameter file within the code repository. You can specify the parameter file path; if not specified, no parameter definition file is used by default.

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Adding the Extension with YAML

Add the Terraform Deployment extension when you **orchestrate a pipeline**. Configure the YAML syntax as follows:

Terraform Deployment extension

```
jobs:
  Terraform:
    name: Terraform
    steps:
      - name: Terraform Deployment
        uses: terraform_deploy_plugin
        with:
          providers: HuaweiCloud
          terraform_credentials: b00401e780a343f0ab1066ecd378a3be
          terraform_action: plan
          repo: 956935
          branch: master
          terraform_yaml_path: ./
          terraform_var_path: ""
```

7.4 Configuring Pipeline Parameters

Pipeline Parameter

Parameters are configurable values used during pipeline running and control pipeline process and output. These parameters can be transferred among tasks. By configuring pipeline parameters, you can streamline data of build, deployment, and API test tasks. Parameters include:

- **Predefined Parameters**: They are preconfigured by the system and cannot be configured, deleted, or edited.
- **Custom Parameters**: You can add parameters of string, enumeration, or auto-increment type. You can create a maximum of 100 custom parameters.
- **Parameter Groups**: You can associate all pipelines in the same project with a parameter group. You can create a maximum of 10 parameter groups and add up to 100 custom parameters to each group.

Notes and Constraints

- If a code source alias is set, repository-related system parameters will be generated based on the alias. If no alias is set, the repository name is used as the alias to generate system parameters, for example, *Alias*_**TAG** indicates the repository tag name.
- If a parameter with the same name exists, the parameter priority is as follows: predefined parameters > custom parameters > parameter groups.
- If a pipeline is associated with multiple parameter groups that contain parameters with the same name, the value of the parameter in the last associated parameter group will be used.

Prerequisites

- **You have enabled and authorized CodeArts Pipeline**.
- Your role is a **project administrator** or **pipeline creator**. For details about how to configure permissions, see **Authorizing CodeArts Pipeline**.

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Pipeline Parameters

CodeArts Pipeline includes predefined parameters, custom parameters, and parameter groups.

Predefined Parameters

Table 7-23 lists the predefined parameters. The parameter reference format is *${Parameter name}*. Enter **$** in the text box and the predefined parameter list will be displayed.

Table 7-23 Predefined parameters

Parameter	Description
PROJECT_ID	ID of the project to which the current pipeline belongs.
COMPONENT_ID	ID of the microservice to which the pipeline belongs.
PIPELINE_ID	ID of the current pipeline.
PIPELINE_NUMBER	Pipeline execution number.
COMMIT_ID	The last commit ID before execution.
COMMIT_ID_SHORT	The last short commit ID before execution.
TIMESTAMP	Pipeline execution timestamp. For example, **20211222124301**.
PIPELINE_TRIGGER_TYPE	Pipeline trigger type, which includes Manual, Scheduler, Rollback, and Webhook (CreateTag, Note, Issue, MR, and Push).
PIPELINE_NAME	Pipeline name.
REPO_URL	Code repository address (HTTPS).
MERGE_REQUEST_ACTION	Action triggered by an MR or PR. The action can be creating, merging, reopening, updating, or commenting.

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Parameter	Description
MERGE_REQUEST_TOPIC	Topic triggered by an MR or PR. The topic refers to the change topic of a change request in a code repository merge request.
EXECUTE_USER	The user who executes the pipeline.
EXECUTE_USER_ID	Executor ID.
EXECUTE_USER_NAME	Executor name.
EXECUTE_USER_NICKNAME	Executor alias.
PASS_CONDITIONS_LINK	Pipeline execution details link.
EXTERNAL_SYSTEM	External system that triggered a pipeline. The external system refers to other pipeline sources except Repo.
EXTERNAL_USER_ID	ID of the user who triggered a pipeline via an external system. The external system refers to other pipeline sources except Repo.
EXTERNAL_USER_NAME	Name of the user who triggered a pipeline via an external system. The external system refers to other pipeline sources except Repo.
PIPELINE_RUN_ID	Pipeline execution ID.
MERGE_ID	Merge request ID.
MERGE_REQUEST_IID	Merge request IID.
WEBHOOK_PAYLOAD	Webhook request payload information.

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Parameter	Description
COMPONENT_CHANGE_IDS	Change ID list. For example, <ID1>, <ID2>,...<IDn>. If a pipeline is triggered based on specific changes, this parameter contains the change IDs that initiated the run. If a pipeline is triggered based on the code repository, it contains the change IDs associated with the microservice's repository.
Repo01_REPOSITORY_NAME	Repository name. **Repo01** is the code repository created before **creating a pipeline**.
Repo01_SOURCE_BRANCH	The name of a merge request's source branch in the repository used to trigger the pipeline. **Repo01** is the code repository created before **creating a pipeline**.
Repo01_TARGET_BRANCH	Name of the target branch for repository operations. **Repo01** is the code repository created before **creating a pipeline**.
Repo01_TAG	Repository tag name. **Repo01** is the code repository created before **creating a pipeline**.
Repo01_COMMIT_ID	The last commit ID before the repository execution. **Repo01** is the code repository created before **creating a pipeline**.
Repo01_COMMIT_ID_SHORT	The last short commit ID before execution. **Repo01** is the code repository created before **creating a pipeline**.
Repo01_REPO_URL	Code repository address (HTTPS). **Repo01** is the code repository created before **creating a pipeline**.

Configuring Custom Parameters

You can create and configure pipeline parameters. The parameter reference format is *${Parameter name}*. Enter **$** in the text box and the custom parameter list will be displayed.

Step 1 **Access the CodeArts Pipeline homepage**.

Step 2 On the pipeline list page, search for the target pipeline, click ··· in the **Operation** column, and select **Edit**.

Step 3 Switch to the **Parameter Configuration** page.

Step 4 On the displayed page, click **Create Now** to configure parameters. If there are custom parameters, click **Create Parameter** to add a new one.

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Figure 7-5 Creating a custom parameter

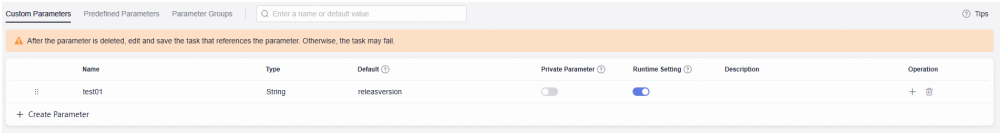

Table 7-24 Custom parameters

Parameter	Description	Example Value
Name	The specified name cannot be the same as that of a predefined parameter. Enter a maximum of 128 characters, including only letters, digits, and underscores (_).	Enter **test01**.
Type	Parameter types, including **String** (default), **Auto Increment**, and **Enumeration**.	Select **String**.
Default	Default value of the parameter. • **String**: The value can contain no more than 8,192 characters. It can be left blank. • **Auto-Increment**: The value can contain no more than 8,192 characters. The value cannot be empty. If an auto-increment parameter is referenced in a pipeline, its value (which ends with a digit) is incremented by 1 each time the pipeline runs. • **Enumeration**: Enter a maximum of 1,024 characters, including only letters, digits, hyphens (-), underscores (_), commas (,), periods (.), and slashes (/). After you select **Enumeration**, the **Enumeration** dialog box is displayed for you to set optional values. The value cannot be empty. After that, click the **Default** drop-down list box, select or search for a value.	Enter **releaseversion**.
Private Parameter	Parameters are encrypted for storage and decrypted at runtime. Private parameters are not displayed in run logs and will not be cloned synchronously during pipeline cloning. Only parameters of string can be set to **Private Parameter**.	-
Runtime Setting	If **Runtime Setting** is enabled, you can change the value of the parameter during execution configuration.	Click to enable **Runtime Setting**.
Description	Description of the custom parameter. Enter a maximum of 512 characters.	-

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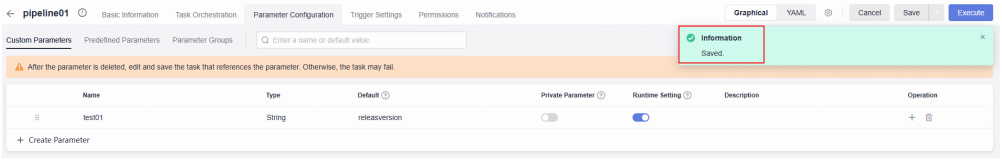
Parameter	Description	Example Value
Operation	Click + in the **Operation** column to add a parameter. Click 🗑 in the **Operation** column to delete a parameter. When the parameter type is set to **Auto Increment**, click ⚙ in the **Operation** column and toggle on to enable the **Strict Increases** function. After the function is enabled, the system checks whether the parameter value increases strictly when the pipeline is executed.	-

Step 5 After the configuration, click **Save**. A message is displayed, indicating that the pipeline is saved successfully.



----End

Configuring a Parameter Group

Step 1 Access the CodeArts Pipeline homepage through a project.

Step 2 Click the **Parameter Groups** tab and then click **Create Group**.

Step 3 On the displayed page, set parameters by referring to Table 7-25.

Figure 7-6 Creating a parameter group

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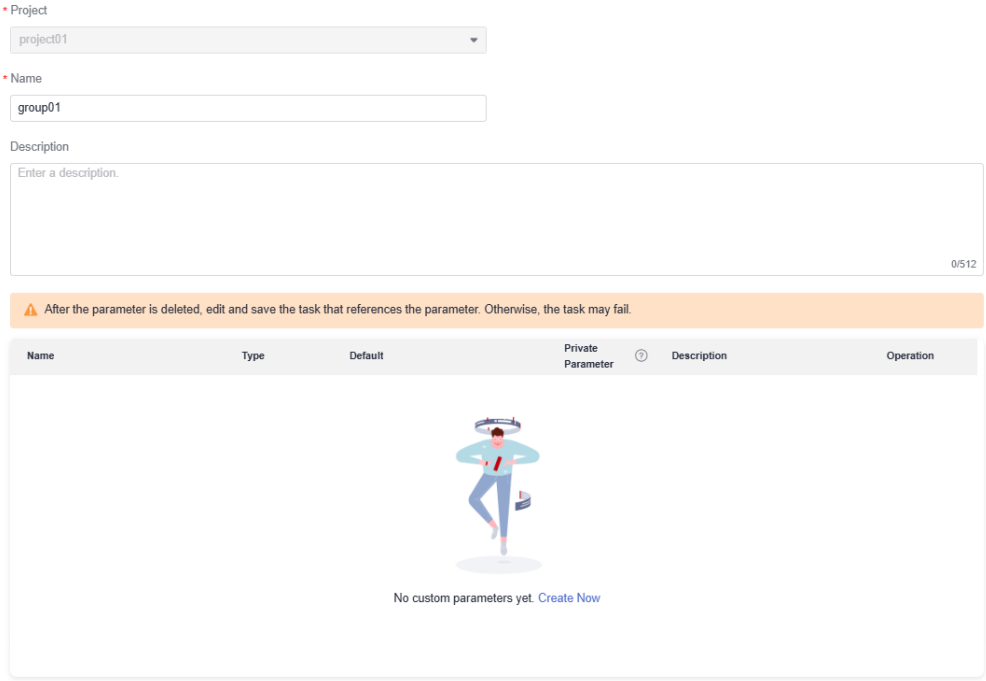

Table 7-25 Parameter group description

Basic Information	Description	Example Value
Project	Project to which the parameter group belongs. The project cannot be changed.	The default value is **project01**.
Name	Enter a maximum of 128 characters, including only letters, digits, and underscores (_).	Enter **group01**.
Description	Description of the parameter group. Enter a maximum of 512 characters.	-
Custom parameter list	Click **Create Now** to create custom parameters. For details, see **Configuring Custom Parameters**.	The following figure shows a new parameter. 

Step 4 Click **OK**.

Step 5 Locate the pipeline to be associated with the parameter group, click ••• in the **Operation** column, and select **Edit**. Click the **Parameter Configuration** tab and click **Parameter Groups**.

Step 6 Click **Associate Now**, select the desired parameter group, and click **Confirm** to associate the pipeline with the parameter group.

- Expand the group to check parameter details.
- Click in the **Operation** column to disassociate from the parameter group.

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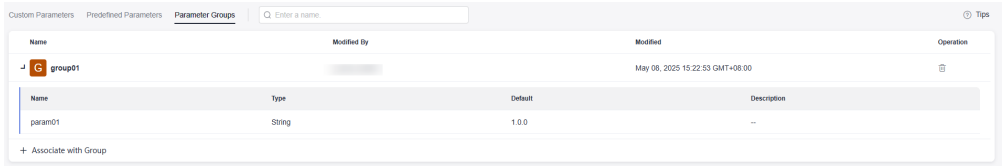
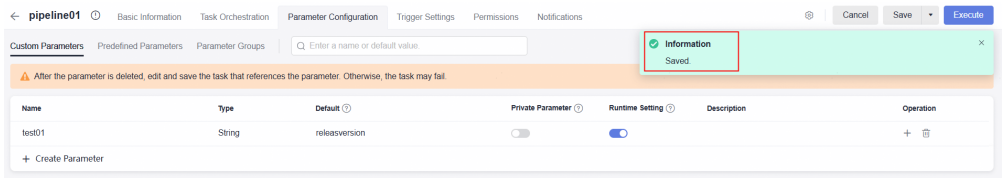
Figure 7-7 Associating with a parameter group



Step 7 After the configuration, click **Save**. A message is displayed, indicating that the operation is successful.



----End

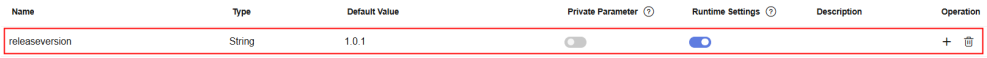
Using a Parameter in a Pipeline

This section describes how to configure the **releaseversion** parameter in a pipeline and transfer the parameter to a build job.

Step 1 Create a build task.

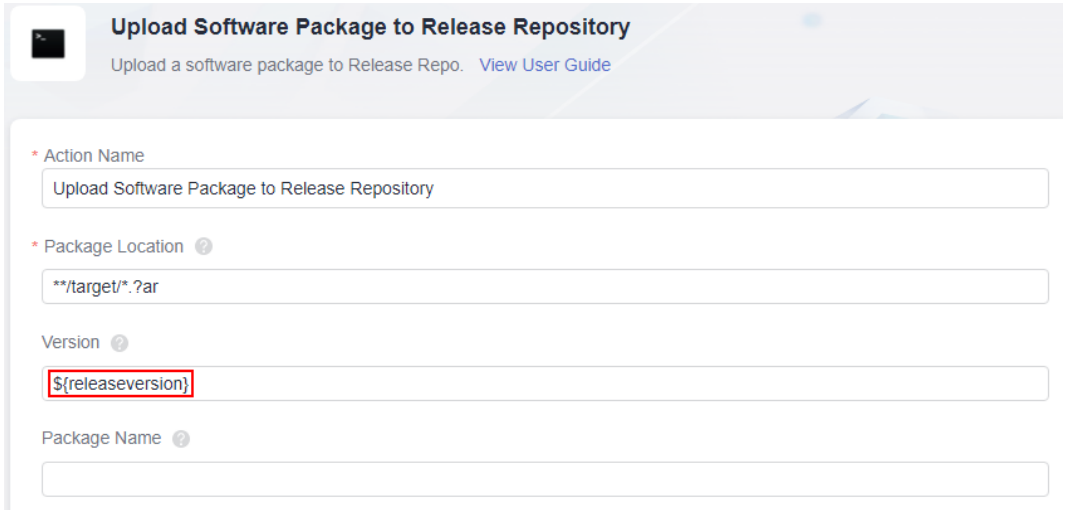
Step 2 Click the **Parameters** tab, add the **releaseversion** parameter, set the default value, and enable **Runtime Settings**.

Figure 7-8 Creating a build task parameter



Step 3 Click the **Build Actions** tab. On the displayed page, click **Add Action**, move the cursor to the **Upload to Release Repo** card, click **Add**, and set **Version** to a reference parameter. After you enter **$** in the text box, a parameter list is displayed. Select the **releaseversion** parameter created in the previous step.

Figure 7-9 Referencing a build task parameter



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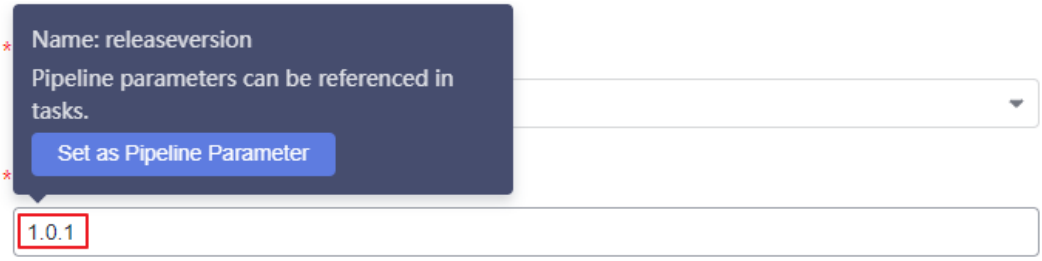
Step 4 After the configuration, click **Save**.

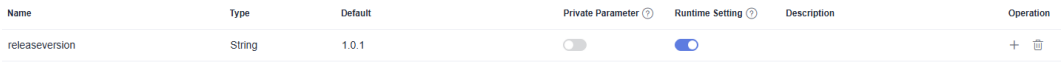
Step 5 **Create a pipeline** using the blank template, add the **Build** extension and select the created build task. The parameter **releaseversion** is displayed.

Figure 7-10 Configuring a build task parameter



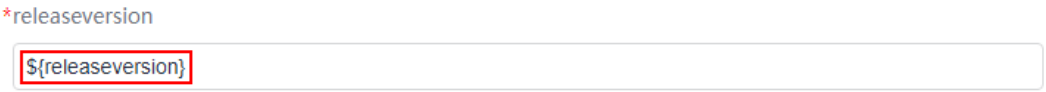
Step 6 Move the cursor to the **releaseversion** parameter and click **Set as Pipeline Parameter** to define it as a pipeline parameter. It can be referenced directly. Alternatively, click **OK**, switch to the **Parameter Configuration** tab, create the pipeline parameter **releaseversion**, set **Type** to **Auto-Increment**, **String**, or **Enumeration**, set a default value, and enable **Runtime Setting**.

Figure 7-11 Creating a pipeline parameter



Step 7 Switch back to the **Task Orchestration** tab page, and edit the added build task. Use **$** to reference the **releaseversion** parameter in the build job.

Figure 7-12 Referencing a pipeline parameter



- Only text parameters for which **Runtime Settings** is enabled will be displayed.
- You can move the cursor to a parameter name to quickly set the parameter as a pipeline parameter.

Step 8 Save the information and click **Save and Execute**. In the displayed window, check the parameter information.

The parameter value is the default value specified when you added the parameter. You can change the value if needed. If you change it, the new value will be used in the build job.

Step 9 Click **Execute** to execute the pipeline with the **releaseversion** parameter.

----End

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7.5 Configuring Pipeline Triggers

Pipeline Triggers

You can configure event triggers, scheduled tasks, webhooks, concurrent execution policies, and preemption policies for pipelines. These policies automate executions, trigger executions from third parties through webhooks, allocate granular resources, and use newly triggered running instances to forcibly stop all other instances triggered by the same event in a pipeline.

Notes and Constraints

- For an event trigger:
  - The branch is matched first, and then the path is matched. If both branch and path matching are successful, the pipeline will be triggered.
  - Path exclusion takes precedence over path inclusion. If any changed files are not excluded, and the included path is not configured, the pipeline will be triggered; if the included path is configured and any of the changed files are included, the pipeline will be triggered.
  - Tag exclusion takes precedence over tag inclusion. If a tag is included and excluded at the same time, the pipeline will not be triggered.
  - Path matching covers the first 300 changed files per commit. To match more than 300 files, split them.
- A maximum of 10 scheduled tasks can be configured for a pipeline.

Prerequisites

- **You have enabled and authorized CodeArts Pipeline**.
- Your role is a **project administrator** or **pipeline creator**. For details about how to configure permissions, see **Authorizing CodeArts Pipeline**.

Configuring Event Triggers

Event triggers include code commit, merge request, and tag creation.

Step 1 **Access the CodeArts Pipeline homepage**.

Step 2 On the pipeline list page, search for the target pipeline, click ··· in the **Operation** column, and select **Edit**.

Step 3 Switch to the **Trigger Settings** page, and then configure event triggers.

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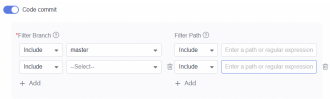
Table 7-26 Event triggers

Event Trigger Type	Description	Branch Description
Triggered upon code commits (in CodeArts Repo)	Code commit events are monitored. You can filter branches and paths by including or excluding specific content. When a code commit occurs in an associated repository, and its branch and changed file paths meet the inclusion/exclusion policy, the associated pipeline is automatically triggered.	• Branch filter: allows you to include or exclude branches. • Path filter: allows you to include or exclude paths where changed files are located. **Figure 7-13** Configuring code commit 

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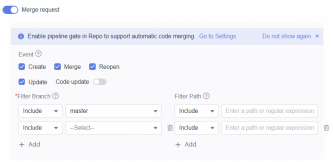
Event Trigger Type	Description	Branch Description
Triggered upon merge requests (in CodeArts Repo)	Merge request events are monitored. You can filter branches and paths by including or excluding specific content, and set trigger policies for events such as creation, merge, update, reopening, and code-only updates. When a merge request event is triggered in an associated repository and the branch meets the inclusion/exclusion policy, the associated pipeline is automatically triggered. Events: • **Create**: triggered upon MR creation. • **Merge**: triggered when an MR is merged. A code commit event will also be triggered. • **Reopen**: triggered upon MR reopening. • **Update**: triggered upon MR content, setting, or source code update. If you also enable **Code update**, the pipeline will be triggered only upon source code update. • **Code update**: triggered upon source code update.	• Branch filter: allows you to include or exclude branches. • Path filter: allows you to include or exclude paths where changed files are located. **Figure 7-14** Configuring merge request events 

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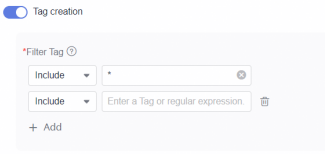
Event Trigger Type	Description	Branch Description
Triggered upon tag creation (in CodeArts Repo)	Tag creation events are monitored.	Tag filter: You can filter tags by including or excluding specific content. When a tag is created in an associated repository and meets the tag inclusion/exclusion policy, the associated pipeline is automatically triggered. **Figure 7-15** Configuring tag creation 

Step 4 After the configuration, click **Save**. A message is displayed, indicating that the pipeline is saved successfully.

----End

Configuring Scheduled Tasks

Set scheduled tasks to execute a pipeline at a specified time.

Step 1 **Access the CodeArts Pipeline homepage**.

Step 2 On the pipeline list page, search for the target pipeline, click ... in the **Operation** column, and select **Edit**.

Step 3 Switch to the **Trigger Settings** page.

Step 4 Click **Create Now** to create a scheduled task. Turn on the **Enable** toggle, and set the execution time.

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Figure 7-16 Configuring a scheduled task

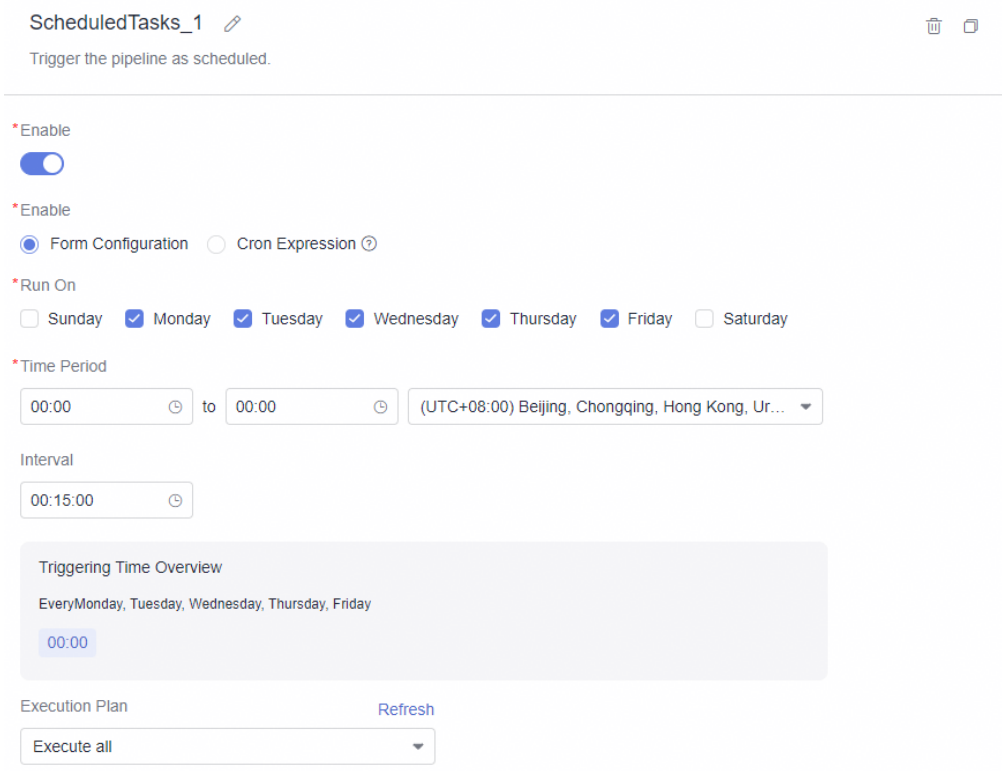

Table 7-27 Scheduled task

Parameter	Description
Enable	Whether to enable the scheduled task.
Enable	Select either **Form Configuration** or **Cron Expression**. For details about how to set a cron expression, see **cron expression**.
Run On	Select the execution date.
Time Period	Select the execution period and time zone.
Interval	Set the interval for triggering the pipeline.
Execution Plan	Select a plan to be executed at a scheduled time. You can also create an execution plan. For details, see **Configuring an Execution Plan**.

NOTE

To delete a scheduled task, click in the upper right corner. To clone a scheduled task, click in the upper right corner.

- A cron expression is a string comprising six fields separated by space. The six fields in the expression indicate second, minute, hour, day, month, and week. For details, see the following table.

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Table 7-28 Cron expression parameters

Name	Mandatory (Yes/No)	Value	Special Character
Second	Yes	0–59	, - * /
Minute	Yes	0–59	, - * /
Hour	Yes	0–23	, - * /
Day	Yes	Day of a month, ranging from 1 to 31. Note that there are no 30 and 31 in February, and there is no 31 in April, June, September, and November.	, - * ? / L W
Month	Yes	1–12 or a character string. **Table 7-30** describes the mapping between numbers and character strings. Example: Enter **1** or **JAN** if you want to specify January.	, - * /
Week	Yes	1–7 or a character string. **Table 7-31** describes the mapping between numbers and character strings. In Quartz cron expressions, Saturday is the last day of a week. Example: Enter **2** or **MON** if you want to specify Monday.	, - * ? / L #

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Table 7-29 Special characters

Special Character	Description
-	It specifies a range. For example, **5-20** in the minute field means that a pipeline will be triggered every minute from the 5th minute to the 20th minute.
,	It specifies the list value. For example, **5,20** in the minute field means that a pipeline will be triggered at the 5th minute and the 20th minute of each hour.
*	It can match any value of a field. If you set the minute field to *****, a pipeline will be triggered every minute.
/	A pipeline is triggered from the specified time and at a fixed interval. For example, if you set the minutes field to **5/20**, it means that a pipeline will be triggered at the 5th, 25th, and 45th minutes of each hour.
?	It can only be used in two fields: day (day in each month) and week. It can also match any value of the field, but actually it does not. This is because day (day in each month) and week are mutually affected. For example, if you want to trigger scheduling on the 20th day of each month, you can use the following expression: 13 13 15 20 * ?, where the last digit can only be ?, but not *. If you use *, an event will be triggered regardless of the day of week.
L	It indicates "last" and can only be used in the day (day in each month) and week fields. For example, **5L** in the week field means that a pipeline is triggered on the last Thursday of the month.
W	It indicates the weekday (Monday to Friday) nearest the given day. It can only be used in the day (day of month) field. For example, **5W** in the day (day of month) field means that a pipeline is triggered on the nearest weekday to the 5th day of the month. If the 5th day is Saturday, the pipeline is triggered on the 4th day (Friday). If the 5th day is Sunday, the pipeline is triggered on the 6th day (Monday). If the 5th day is one day from Monday to Friday, the pipeline is triggered on the 5th day. The trigger will not jump over the boundary of a month's days.
#	It indicates the *n*th day of a week every month. It can only be used in the day (day of month) field. For example, **4#2** indicates the second Wednesday of a month.
LW	The two characters can be used together to indicate the last workday of a month, that is, the last Friday.

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Table 7-30 Mapping between numbers and strings in the month field

Number	String
1	JAN
2	FEB
3	MAR
4	APR
5	MAY
6	JUN
7	JUL
8	AUG
9	SEP
10	OCT
11	NOV
12	DEC

Table 7-31 Mapping between numbers and strings in the week field

Number	String	Description
1	SUN	Sunday
2	MON	Monday
3	TUE	Tuesday
4	WED	Wednesday
5	THU	Thursday
6	FRI	Friday
7	SAT	Saturday

Examples:

```
0 0 12 * * ?                //Executed at 12:00 every day
0 * 14 * * ?                //Executed every minute from 14:00 to 14:59 every day
0 0/30 9-19 * * ?           //Executed every half an hour from 9:00 to 19:59.
0 0 12 ? * WED              //Executed at 12:00 every Wednesday
0 0/30 9-19 ? * MON-FRI     //Executed every half an hour from 09:00 to 19:59 every day from Monday to Friday
0 15 10 ? * MON-FRI         //Executed at 10:15 every day from Monday to Friday
```

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```
0 0 2 1 * ?              //Executed at 02:00 on the first day of each month
0 15 10 ? * 6#3          //Executed at 10:15 on the third Friday of each month
0 15 10 ? * 6L           //Executed at 10:15 on the last Friday of each month
```

Step 5 After the configuration, click **Save**. A message is displayed, indicating that the pipeline is saved successfully.

----End

Configuring Webhooks

You can configure webhooks to automatically trigger a pipeline through a third-party system.

Step 1 Access the CodeArts Pipeline homepage.

Step 2 On the pipeline list page, search for the target pipeline, click ... in the **Operation** column, and select **Edit**.

Step 3 Switch to the **Trigger Settings** page.

Step 4 Enable **Webhook** and set parameters as shown in **Table 7-32**.

Figure 7-17 Configuring a webhook trigger

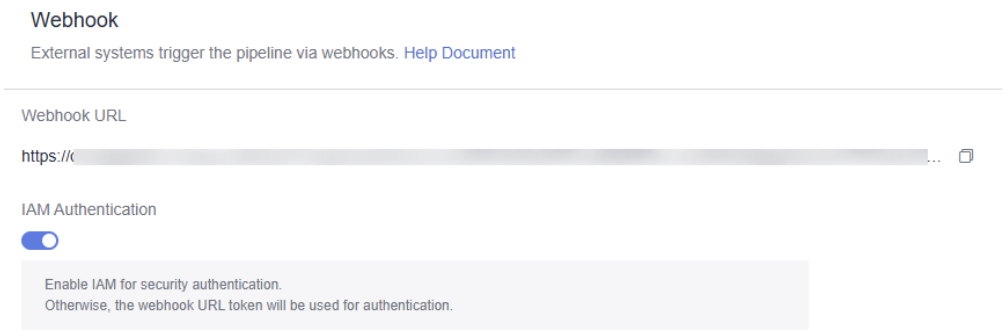

Table 7-32 Webhook parameters

Parameter	Description
Webhook URL	Copy the address to the third-party system trigger and use the POST method to call the address to run the pipeline.
IAM Authentication	• If you need to enable IAM authentication, add the user IAM token to the API request header. The following is a calling example: curl --header "Content-Type: application/json" --header 'x-auth-token: XXXX (IAM Token)' --request POST --data "{}" *Webhook trigger source* • If you do not need to enable IAM authentication, the following is a calling example: curl --header "Content-Type: application/json" --request POST --data "{}" *Webhook trigger source*

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Step 5 After the configuration, click **Save**. A message is displayed, indicating that the pipeline is saved successfully.

----End

Configuring Parallel Execution

By default, five parallel executions are allowed in a pipeline. Excess instances will not be executed. You can change the maximum number of running concurrent instances for a single pipeline.

Step 1 Access the CodeArts Pipeline homepage.

Step 2 On the pipeline list page, search for the target pipeline, click ••• in the **Operation** column, and select **Edit**.

Step 3 Switch to the **Trigger Settings** page.

Step 4 Enable **Parallel Execution**, and set the max parallel instances and execution policy for extras.

Figure 7-18 Configuring parallel execution

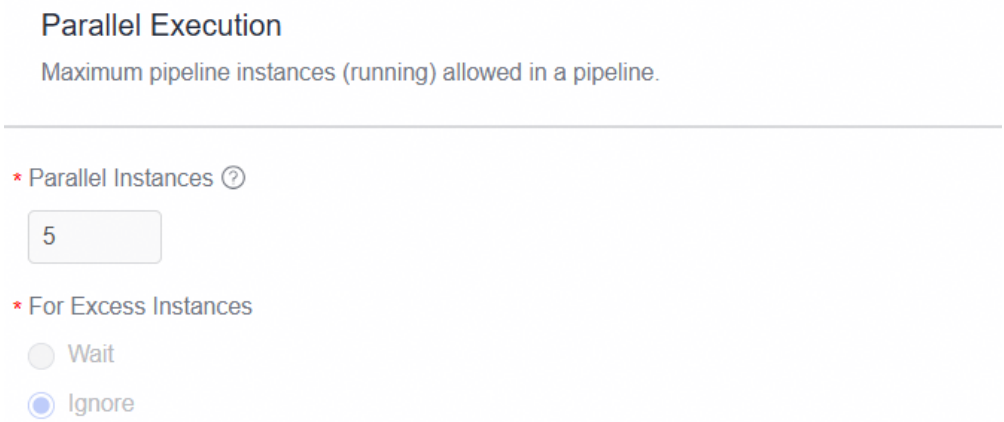

Table 7-33 Parallel execution parameters

Parameter	Description
Parallel Instances	Maximum parallel instances, which vary by your purchases and packages. For details, see CodeArts Pipeline specifications.

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Parameter	Description
For Excess Instances	You can choose: • **Wait**: Excess instances will wait for execution. You can check the queuing instances on the pipeline details page. – Max. 100 queuing instances per pipeline. – Instances will not be executed after 72 hours of waiting. – You can manually cancel the waiting. – Instance configurations are fixed once they enter the queue. • **Ignore**: Excess instances will not be executed.

Step 5 After the configuration, click **Save**. A message is displayed, indicating that the pipeline is saved successfully.

----End

Configuring Preemption

If there are several running instances triggered by the same event, the most recent instance will proceed and others will stop.

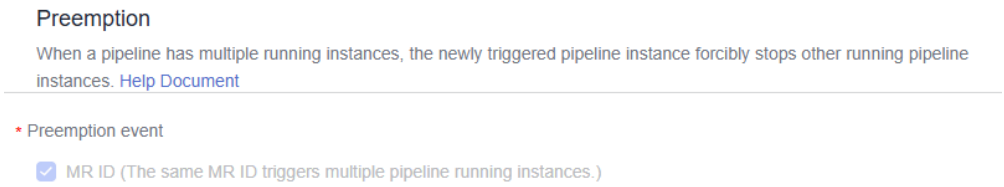
Step 1 Access the CodeArts Pipeline homepage.

Step 2 On the pipeline list page, search for the target pipeline, click ••• in the **Operation** column, and select **Edit**.

Step 3 Switch to the **Trigger Settings** page.

Step 4 Enable **Preemption** and select a preemption event.

Figure 7-19 Configuring the preemption policy



- If the **MERGE_ID** parameter is not included in the predefined parameters, the pipeline instance does not support the preemption policy.
- Only the **MR ID** event is available, that is, running instances triggered by the same MR will be preempted.
- After **Preemption** is enabled, all running instances that meet the preemption condition will be stopped.

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- If there are excess instances, and no instances meet the preemption condition, the excess instances will either wait or not be executed, depending on the policy.

Step 5 After the configuration, click **Save**. A message is displayed, indicating that the pipeline is saved successfully.

----End

7.6 Configuring Pipeline Permissions

Pipeline Permissions

Pipeline permissions control what users or roles can do with pipelines and their resources. They help keep pipelines secure, stable, and compliant by managing who can perform specific actions.

This section describes how to configure permissions for a single pipeline by role or user.

Notes and Constraints

- By default, role permissions of a pipeline are the same as those of the project that the pipeline belongs to.
- The permissions of the project administrator and pipeline creator cannot be changed.
- By default, user permissions automatically synchronize with role permissions. If user permissions are changed, the new user permissions overwrite role permissions.
- By default, a user with permissions to edit or execute pipelines can also view pipelines.

Prerequisites

- **You have enabled and authorized CodeArts Pipeline**.
- Your role is a **project administrator** or **pipeline creator**. For details about how to configure permissions, see **Authorizing CodeArts Pipeline**.

Configuring Pipeline Permissions

Step 1 **Access the CodeArts Pipeline homepage**.

Step 2 On the pipeline list page, search for the target pipeline, click ··· in the **Operation** column, and select **Edit**.

Step 3 Switch to the **Permissions** page, disable **Project-level Permissions**, and then configure role and user permissions for the pipeline. If **Project-level Permissions** is enabled, the pipeline inherits the project permissions.

- Configure role permissions

  You can select or deselect permissions to specify whether a role has permissions to view, execute, edit, and delete the pipeline.

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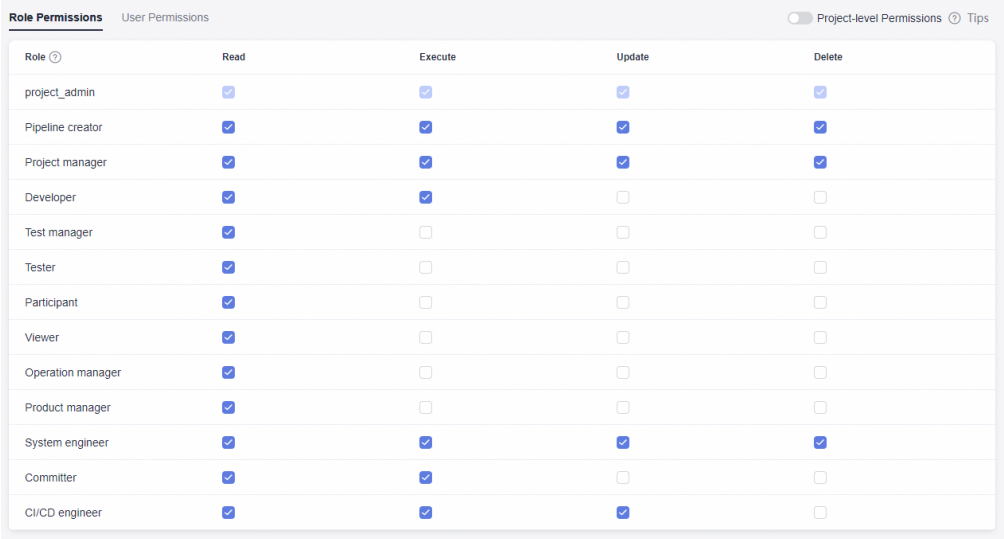
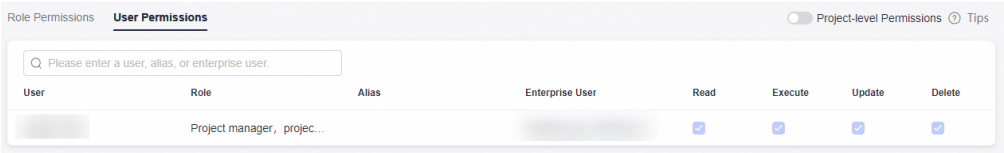
Figure 7-20 Configure role permissions



- Configure user permissions

  You can select or deselect permissions to specify whether a user has permissions to view, execute, edit, and delete the pipeline.

Figure 7-21 Configure user permissions



----End

7.7 Configuring Pipeline Notifications

Pipeline Notification

Pipeline notifications inform users or systems about pipeline activities. Subscribing to specific events helps you stay updated on pipeline statuses and execution results. You can configure event notifications (pop-ups, Feishu, WeCom, and DingTalk notifications, and emails) for a pipeline.

Notes and Constraints

- By default, internal messages are sent for all listed events except alerts, while email notifications are not sent for any event.
- WeCom, DingTalk, and Feishu notifications are available only in the **AP-Singapore** region.

Prerequisites

- **You have enabled and authorized CodeArts Pipeline**.
- Your role is a **project administrator** or **pipeline creator**. For details about how to configure permissions, see **Authorizing CodeArts Pipeline**.

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Configuring Notifications from CodeArts Pipeline

You can configure pop-ups to inform creators, executors, and users who have favorited pipeline events (deletion, failure, success, update, and alert).

Step 1 Access the CodeArts Pipeline homepage.

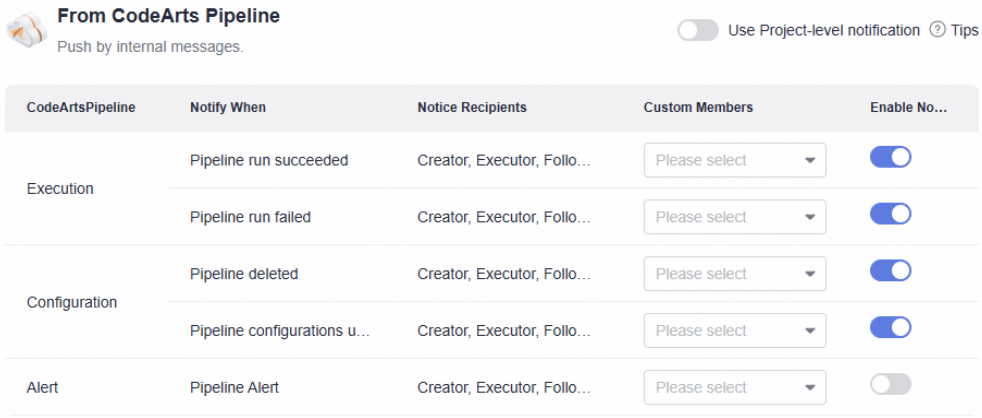
Step 2 On the pipeline list page, search for the target pipeline, click ••• in the **Operation** column, and select **Edit**.

Step 3 Switch to the **Notifications** page.

Step 4 Enable **From CodeArts Pipeline**, and enable or disable notifications as needed.

- You can click in the upper right corner of the CodeArts Pipeline homepage and check the notification messages in the **Messages** window.

Figure 7-22 Configuring notifications from CodeArts Pipeline



Step 5 After the configuration, click **Save**. A message is displayed, indicating that the pipeline is saved successfully.

----End

Configuring Email Notifications

You can configure email notifications to inform creators, executors, and users who have favorited pipeline activities (success, failure, deletion, update, and alert).

Step 1 Access the CodeArts Pipeline homepage.

Step 2 On the pipeline list page, search for the target pipeline, click ••• in the **Operation** column, and select **Edit**.

Step 3 Switch to the **Notifications** page.

Step 4 Enable **Email**, and enable or disable notifications as needed.

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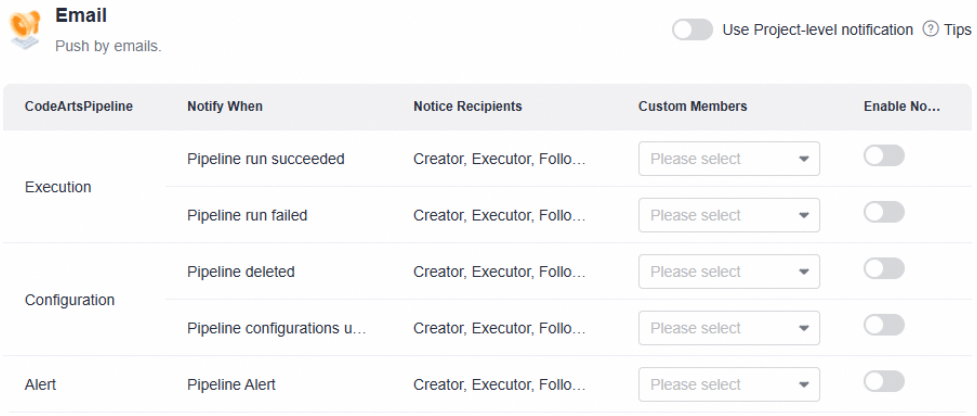
Figure 7-23 Configuring email notifications



Step 5 After the configuration, click **Save**. A message is displayed, indicating that the pipeline is saved successfully.

----End

Configuring WeCom Notifications

Push pipeline activities to WeCom.

Step 1 Access the CodeArts Pipeline homepage.

Step 2 On the pipeline list page, search for the target pipeline, click ••• in the **Operation** column, and select **Edit**.

Step 3 Switch to the **Notifications** page.

Step 4 Enable **WeCom** and set parameters.

Figure 7-24 Configuring WeCom notifications

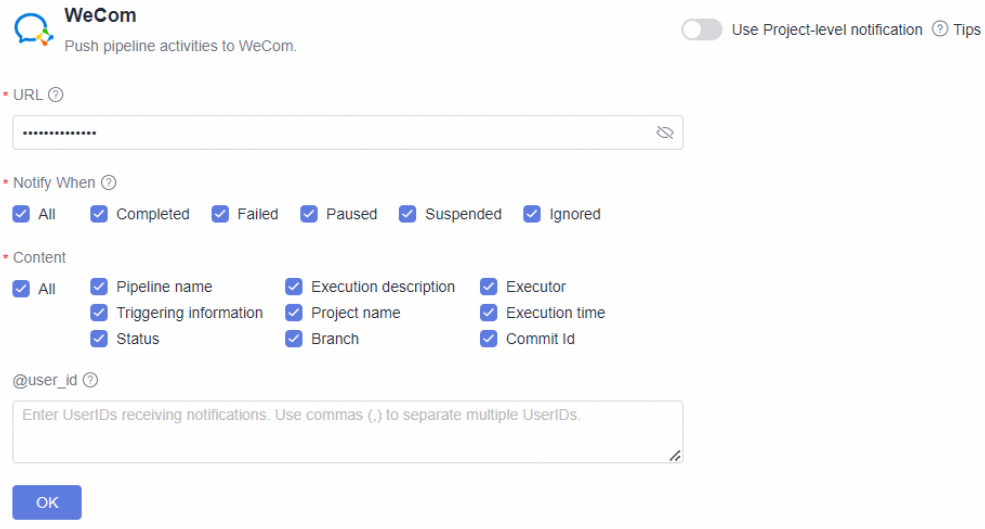


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Table 7-34 Parameters of WeCom notifications

Parameter	Description
URL	Enter the URL of the WeCom robot notifications. The URL must start with **http://** or **https://**, for example, **https://***xxxxx*.
Notify When	Select the pipeline status to be notified: **completed**, **failed**, **paused**, **suspended**, and **ignored**.
Content	Select the content to be notified: **Pipeline name**, **Execution description**, **Executor**, **Triggering information**, **Project name**, **Execution time**, **Status**, **Branch**, and **Commit ID**.
@user_id	Enter the user IDs receiving notifications. Use commas (,) to separate multiple user IDs.

Step 5 After the configuration, click **Save**. A message is displayed, indicating that the pipeline is saved successfully.

----End

Configuring DingTalk Notifications

Push pipeline activities to DingTalk.

Step 1 **Access the CodeArts Pipeline homepage**.

Step 2 On the pipeline list page, search for the target pipeline, click ... in the **Operation** column, and select **Edit**.

Step 3 Switch to the **Notifications** page.

Step 4 Enable **DingTalk** and set parameters.

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Figure 7-25 Configuring DingTalk notifications

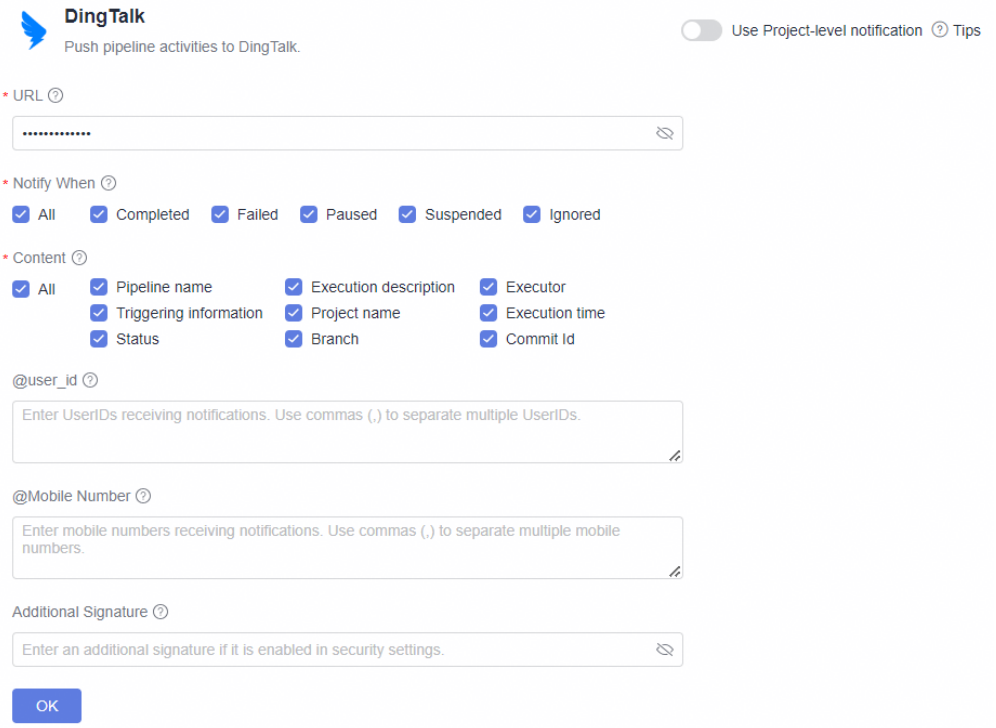

Table 7-35 Parameters of DingTalk notifications

Parameter	Description
URL	Enter the URL of the DingTalk robot notifications. The URL must start with **http://** or **https://**, for example, **https://***xxxxx*.
Notify When	Select the pipeline status to be notified: **completed**, **failed**, **paused**, **suspended**, and **ignored**.
Content	Select the content to be notified: **Pipeline name**, **Execution description**, **Executor**, **Triggering information**, **Project name**, **Execution time**, **Status**, **Branch**, and **Commit ID**.
@user_id	Enter the user IDs receiving notifications. Use commas (,) to separate multiple user IDs.
@Mobile Number	Enter the mobile numbers receiving notifications. Use commas (,) to separate multiple numbers.
Additional Signature	(Optional) Enter this parameter only when you have enabled security settings for the DingTalk custom robot.

Step 5 After the configuration, click **Save**. A message is displayed, indicating that the pipeline is saved successfully.

----End

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Configuring Feishu Notifications

Push pipeline activities to Feishu.

Step 1 Access the CodeArts Pipeline homepage.

Step 2 On the pipeline list page, search for the target pipeline, click ... in the **Operation** column, and select **Edit**.

Step 3 Switch to the **Notifications** page.

Step 4 Enable **Feishu** and set parameters.

Figure 7-26 Configuring Feishu notifications

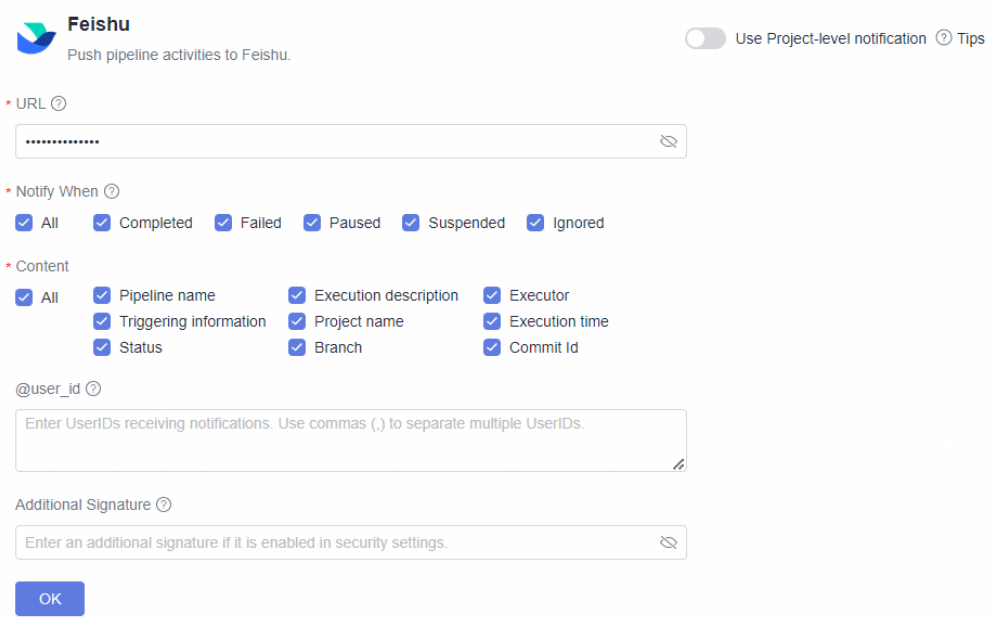

Table 7-36 Parameters of Feishu notifications

Parameter	Description
URL	Enter the URL of the Feishu robot notifications. The URL must start with **http://** or **https://**, for example, **https://***xxxxx*.
Notify When	Select the pipeline status to be notified: **completed**, **failed**, **paused**, **suspended**, and **ignored**.
Content	Select the content to be notified: **Pipeline name**, **Execution description**, **Executor**, **Triggering information**, **Project name**, **Execution time**, **Status**, **Branch**, and **Commit ID**.
@user_id	Enter the user IDs receiving notifications. Use commas (,) to separate multiple user IDs.

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Parameter	Description
Additional Signature	(Optional) Enter this parameter only when you have enabled security settings for the Feishu custom robot.

Step 5 After the configuration, click **Save**. A message is displayed, indicating that the pipeline is saved successfully.

----End

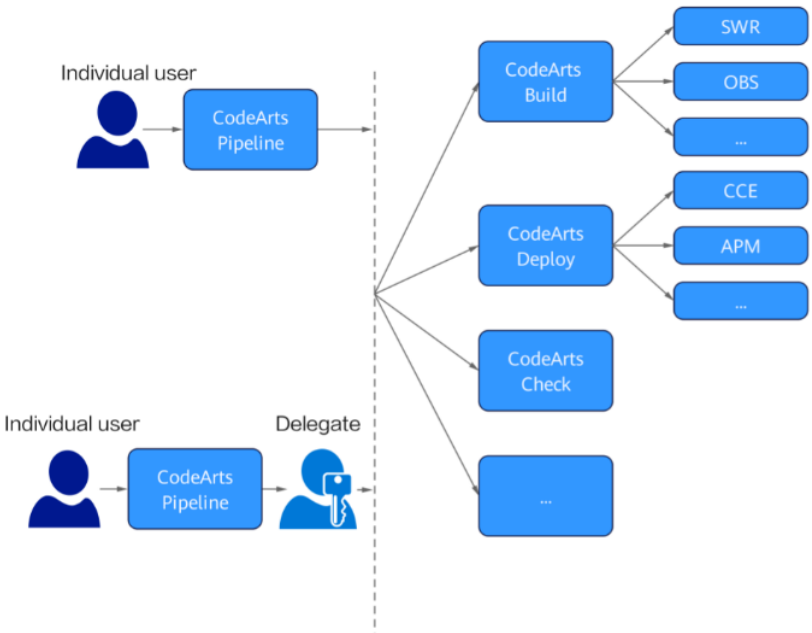
7.8 Configuring CodeArts Pipeline Delegate Permissions

Scenarios

Create a delegate to authorize CodeArts Pipeline to access other cloud services, and configure delegate permissions for pipelines.

The following shows the required permissions for running pipelines with or without a delegate:

- **Manual execution/Code event trigger from CodeArts Repo**
  - No delegate: Use the identity and permissions of the user who executes the pipeline.
  - Delegate configured: Only the permissions for running the pipeline are required. The delegate identity and permissions are used to run tasks of other cloud services called in the pipeline.



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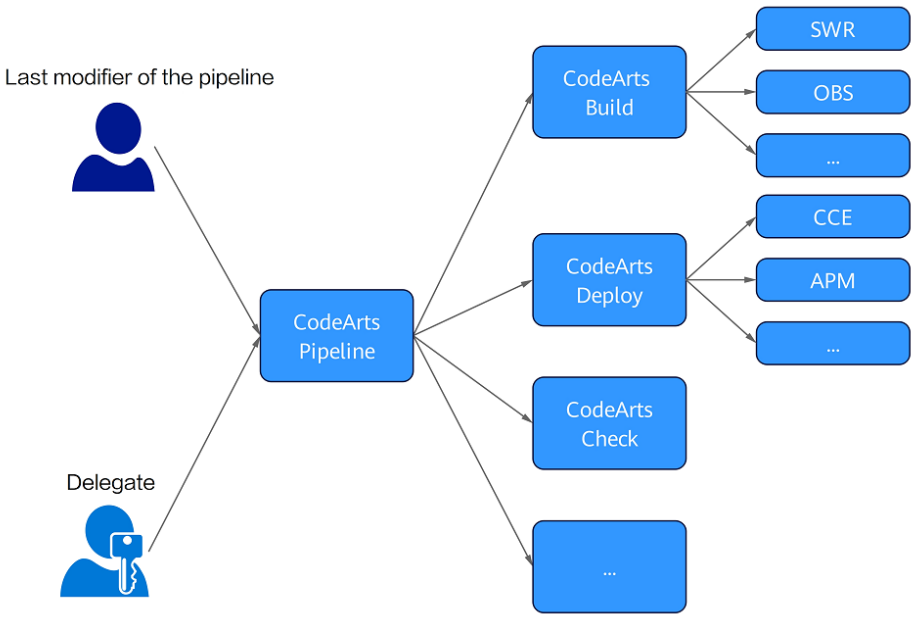
- **Scheduled task/Webhook/Code event trigger from third-party repositories**
  - No delegate: Use the identity and permissions of the last person who updated the pipeline.
  - Delegate configured: Use the identity and permissions of the delegate.



Advantages of a Delegate

Using a delegate has the following advantages:

- Minimum permission principle: You can grant only the minimum permissions required for executing specific tasks in a pipeline. This reduces the risk of permission abuse.
- Security: Using a delegate effectively isolates user permissions and prevents personal credentials from being exposed in pipelines.
- Maintainability: To change permissions, you only need to update the permissions of the delegate in IAM, instead of modifying the permissions of each user.
- Flexibility: Compared with individual identities, delegates can be applied to multiple projects and pipelines for easy management and reuse.
- Audit and monitoring: CTS audits and monitors permission changes of a delegate to ensure operational compliance.
- Teamwork: Delegate configuration simplifies permission management within a team, avoiding disruptions caused by individual user permission changes.
- Automation: Delegate configuration facilitates automated processes and minimizes manual intervention.
- Multi-environment support: You can easily manage permissions for different environments (such as development, testing, and production) by using different delegates, without the need to configure permissions for each user.

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In conclusion, delegates can better support complex and dynamic DevOps pipeline processes.

Prerequisites

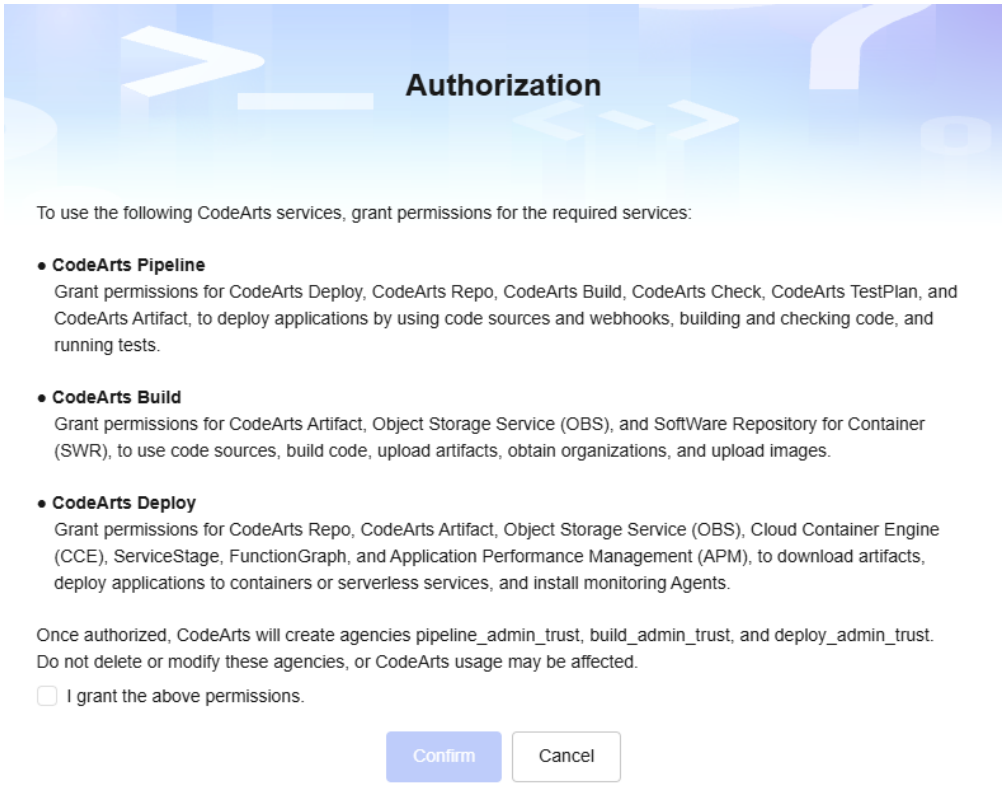
- To configure a delegate for a single pipeline, you must have the permission to edit the pipeline. To configure a delegate for multiple pipelines, you must have the project creator or administrator permissions.
- Before configuring a delegate, ensure that the delegate has sufficient role permissions in the CodeArts project. You can go to the pipeline page and choose **Settings** > **Members** in the left navigation pane to check the roles of the delegate, and choose **Settings** > **Permissions** to check the role permissions.

Creating a Default Delegate

If you do not have any delegate in your Huawei Cloud account, CodeArts Pipeline provides you with a default one.

Step 1 Log in to CodeArts with the tenant administrator account. The **Authorization** window is displayed.

Step 2 Select **I grant the above permissions** and click **Confirm**. The default delegate **pipeline_admin_trust** of CodeArts Pipeline is automatically created.



----End

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The default delegate has the permissions for accessing most cloud service resources required by CodeArts Pipeline. For details, see **Table 1 Default delegate permissions**.

Table 7-37 Default delegate permissions

Permission	Description
CodeArtsBuildAgencyFullPolicy	Permissions required for calling CodeArts Build, including OBS and SWR permissions.
CCE Administrator	Permissions required for calling Cloud Container Engine (CCE).
CODEARTSPIPELINEAgencyFullPolicy	Permissions for using the CodeArts Pipeline delegate.
CodeArtsDeployAgencyAccess	Permissions required for calling CodeArts Deploy, including permissions for ServiceStage, Application Performance Management (APM), and FunctionGraph.
CodeArtsDeployOBSAgencyAccess	Permissions related to OBS files required for calling CodeArts Deploy.
SWR Admin	Permissions related to SWR required for calling CodeArts Deploy.

Obtaining a Delegate URN

Step 1 Click the avatar in the upper right corner, select **CodeArts Console**.

Step 2 Search for **Identity and Access Management** in the upper search box to go to the IAM console.

Step 3 In the left navigation pane, choose **Agencies**.

Step 4 Search for the delegate name in the search box and click the name to check its details.

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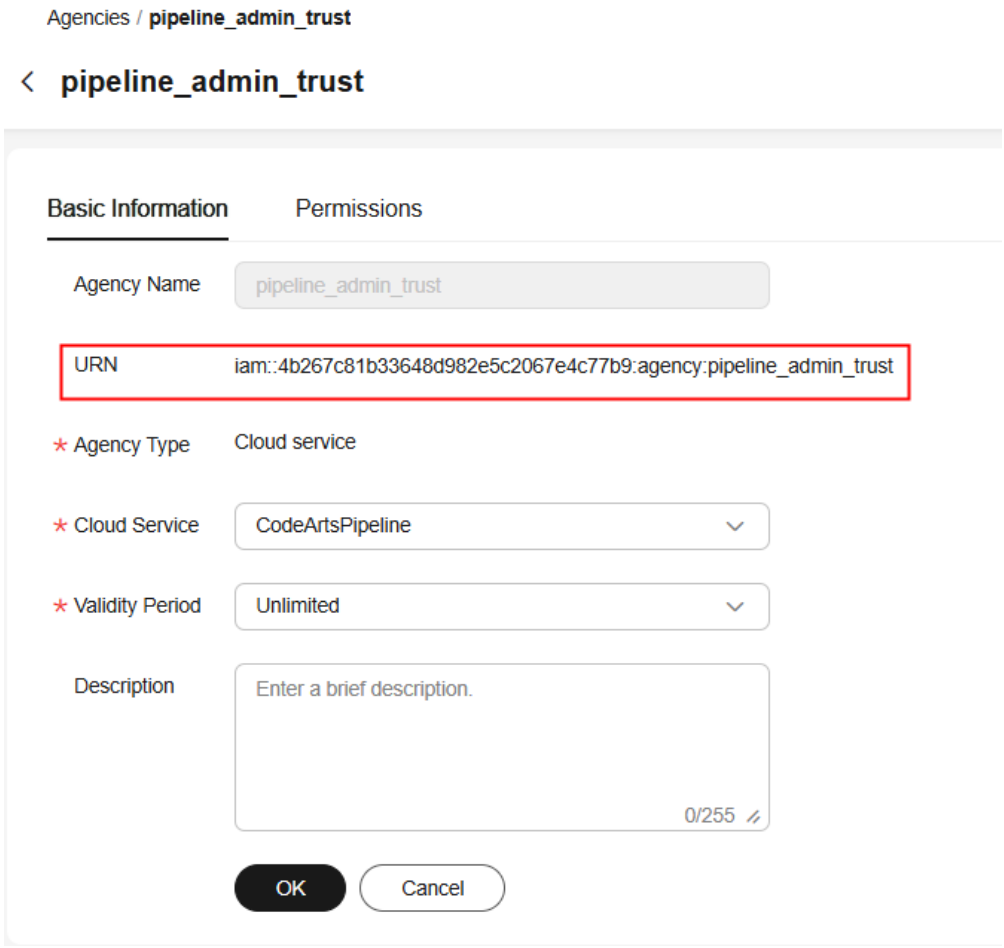

----End

Configuring a Pipeline Delegate

You can configure a delegate for a single pipeline, multiple pipelines, or all pipelines.

Configuring a Delegate for a Single Pipeline

Step 1 **Access the CodeArts Pipeline homepage**.

Step 2 Search for the target pipeline, click ••• in the **Operation** column, and select **Edit**. The pipeline orchestration page is displayed.

Step 3 Click **Basic Information** and set **Agency URN**. For details about how to obtain the delegate URN, see **Obtaining a Delegate URN**.

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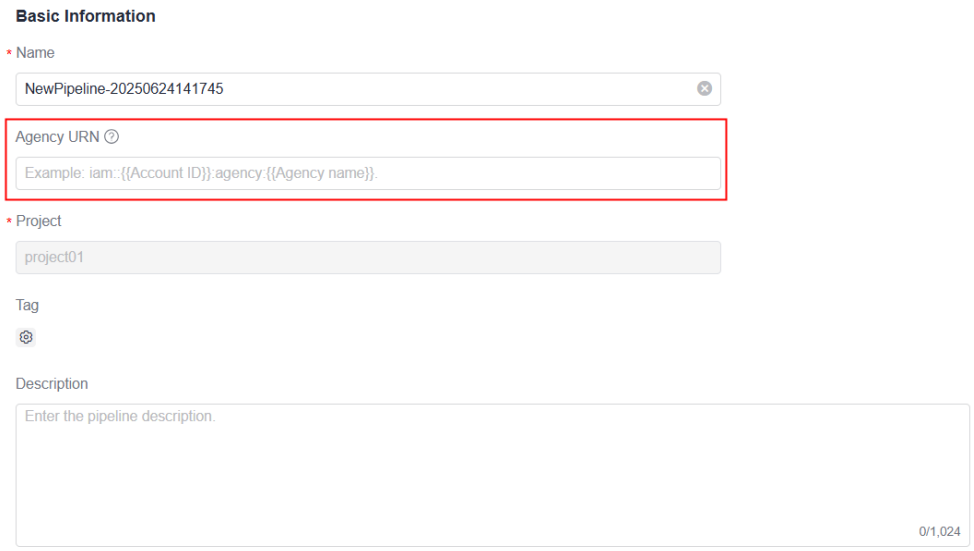


Step 4 After the configuration, click **Save**. A message is displayed, indicating that the delegate has been created successfully.

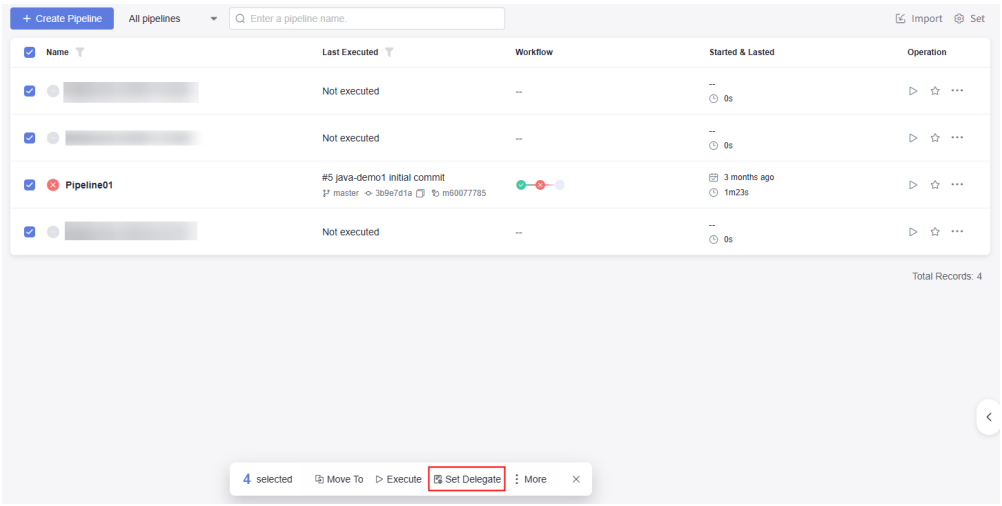
----End

Configuring a Delegate for Multiple Pipelines

Step 1 Access the CodeArts Pipeline homepage.

Step 2 On the pipeline list page, select desired pipelines, and click **Set Delegate**.

Figure 7-27 Setting a delegate



Step 3 In the displayed window, enter the delegate URN and click **OK**. For details about how to obtain the delegate URN, see Obtaining a Delegate URN.

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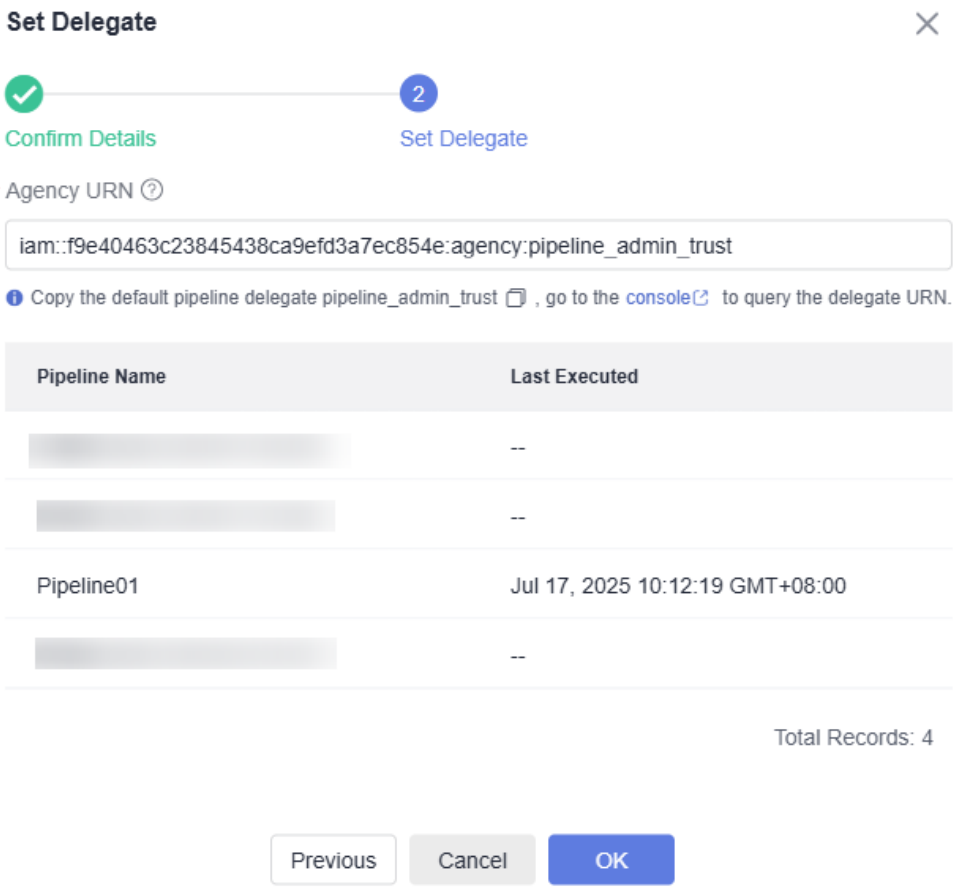
Figure 7-28 Setting a delegate for multiple pipelines

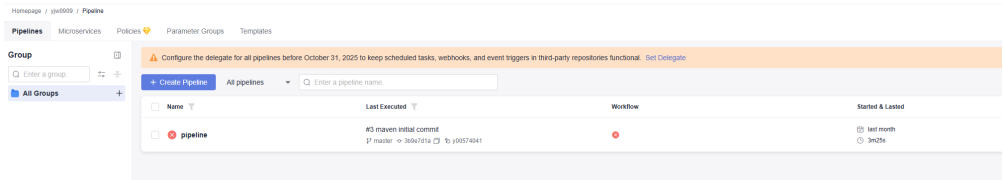


----End

Configuring a Delegate for All Pipelines

Step 1 **Access the CodeArts Pipeline homepage**.

Step 2 After the default delegate is created, go to the pipeline list page and click **Set Delegate** in the upper part.



Step 3 In the displayed window, enter the delegate URN and click **OK**. For details about how to obtain the delegate URN, see **Obtaining a Delegate URN**.

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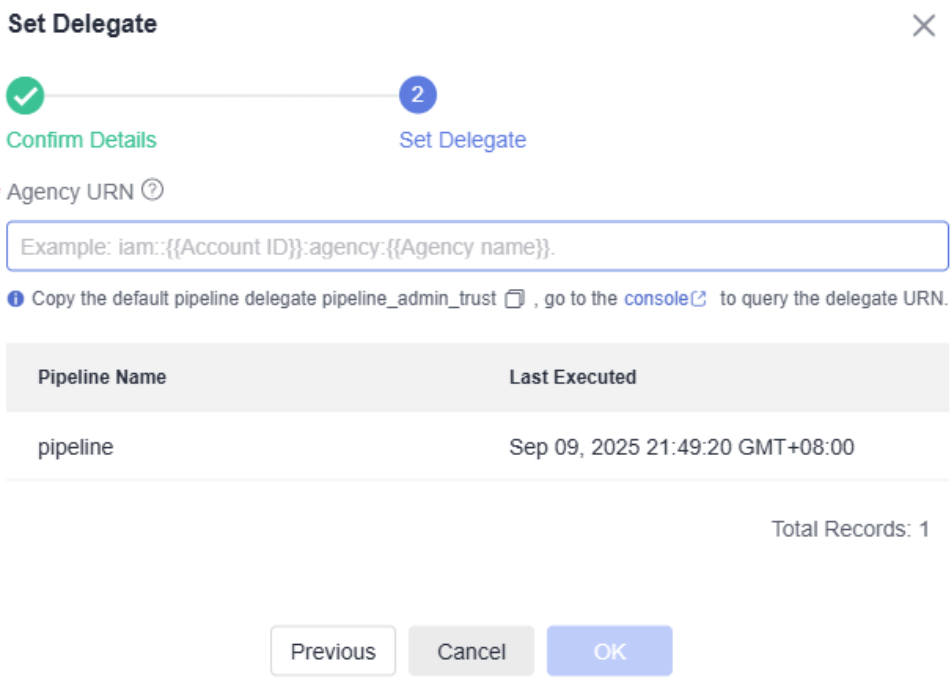
Figure 7-29 Setting a delegate



----End

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8 Configuring a Pipeline with YAML

8.1 Configuring Basic Information

Step 1 Create a pipeline by referring to **Creating a Pipeline (Stored in Git)**.

Step 2 On the **Task Orchestration** page, click **Basic Information**.

Step 3 Configure the name, agency URN, tag, and description as required. For details, see **Table 8-1**.

Table 8-1 Basic information

Parameter	Description
Name	Pipeline name. Enter a maximum of 128 characters, including only letters, digits, underscores (_), and hyphens (-).
Agency URN	Unique identifier of an IAM agency. If not configured, the default agency is used. If configured, use this agency identity and permissions to access other cloud services.
Project	Project that a pipeline belongs to. The value cannot be changed.
Pipeline Storage	Method of creating and storing a pipeline. YAML pipelines are stored in **Git**. The value cannot be changed.
Remote Repository Type	Code source associated with the pipeline. Keep the default value.
Repository	Code repository associated with the pipeline. Keep the default value.
Default Branch	Branch used when a pipeline is executed manually or at a specified time. Keep the default value.
YAML File	YAML file created or imported when a YAML pipeline is created. Keep the default value.

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Parameter	Description
Tag	Set tags for the pipeline. For details, see **Checking a Pipeline**.
Description	Optional. Pipeline description. Enter a maximum of 1,024 characters.

Step 4 After setting the basic information, click **Save**. You can also click other tabs to set parameters.

----End

8.2 Configuring a Pipeline Source

Use the **sources** field to specify a pipeline source. You can configure multiple sources for a pipeline. For details, see **Table 8-2**.

Table 8-2 Pipeline source type

Source Type	Repo Type	Attributes
Code Source	codehub	**codehub_id**: code repository ID. **repo_project_id**: Set the ID when **Code Source** is set to **Repo (other projects)**.
	github	**endpoint_id**: Endpoint ID. For details about how to obtain the ID, see **Managing a Service Endpoint**.
	general_git: Git.	
	gitlab	
	gitee: Gitee.	
	gerrit	
	tfs_git: TFS.	
	custom_gitlab: Self-built GitLab.	
	gitcode	**repo_id**: unique ID of the code repository.
	bitbucket	**endpoint_id**: Endpoint ID. **workspace_id**: ID of the project space on Bitbucket.

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Source Type	Repo Type	Attributes
Artifact Source	artifact_generic: Release repo	**version_type**: default version policy of the artifact source. **specific**: specified version; **latest**: latest version. **version**: If **version_type** is set to **specific**, you need to configure the version number. **name**: artifact package name. **directory**: directory where the artifact package is stored.
	artifact_docker: Docker repository.	**version_type**: default version policy of the artifact source. **specific**: specified version; **latest**: latest version. **version**: If **version_type** is set to **specific**, you need to configure the version number. **org**: organization that the image belongs to. **image**: image address.
	artifact_swr: SWR source	**version**: version number. **organization**: organization to which the artifact belongs. **name**: artifact name. **path**: artifact path.

YAML File Example

```
sources:
  phonix_sample:                                #Alias on the GUI
    type: codehub                               #Repository/Artifact type
    name: phineoxsample                             #Code source name
    branch: master                              #Default branch
    git_url: https://test/test/phineoxsample.git          #Repository HTTP address
    ssh_git_url: git@test:test/phineoxsample.git          #Repository SSH address
    codehub_id: 123
  test_bit:                                   #Alias on the GUI. The alias is the unique identifier of the source.
    type: bitbucket                             #Git repository type
    name: test_bit                              #Code source name
    branch: master                              #Default branch
    git_url: https://test/test/test_bit.git             #Repository HTTP address
    ssh_git_url: git@test:test/test_bit.git             #Repository SSH address
    endpoint_id: test                           #Endpoint ID
    workspace_id: xxx
  artigen_source1:                              #Alias, which uniquely identifies the source
    type: artifact_generic                      #Artifact type
    version_type: specific                      #Default version policy of the artifact source
    version: 1.0.0                            #If version_type is set to specific, the version number must be
configured.
    directory: xxx                            #Directory of the artifact package
    name: test                                #Artifact package name
```

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```
 swr_javadocer:                                  #Alias, which uniquely identifies the source.
   type: artifact_docker                          #Artifact type
   org: dev_x                                    #Organization name
   image: java                                    #Image name
   version_type: specific                         #Default version policy of the artifact source
   version: test                                 #If version_type is set to specific, the version number must be
configured.
  _devcloud_devcloud_demo:                              #Alias, which uniquely identifies the source.
   type: artifact_swr
   organization: org                              #Organization
   name: demo                                     #Image name
   version: v1.1                                 #Specified version
   path: swr.cn-north-7.example.com/org/demo:v1.1
```

Table 8-3 Parameter description

Parameter	Mandatory (Yes/No)	Description
phonix_sample	Yes	Unique identifier of a pipeline source. Enter a maximum of 128 characters, including only letters, digits, and underscores (_).
type	Yes	Repository type. The supported types include **codehub**, **github**, **general_git**, **gitlab**, **gitee**, **gerrit**, **tfs_git**, **gitcode**, **custom_gitlab**, and **bitbucket**.
name	Yes	Code source name.
branch	Yes	Default branch. If no branch is specified, the default branch is used.
git_url	Yes	Repository HTTP address, for example, **https://test/test/phineoxsample.git**.
ssh_git_url	Yes	Repository SSH address, for example, **git@test:test/phineoxsample.git**.
codehub_id	No	Repository ID.
endpoint_id	No	Endpoint ID. This parameter is mandatory when the code source is not **codehub**. The endpoint is used to access the configured repository.
workspace_id	No	Project space ID on Bitbucket. This parameter is mandatory when the repository type is **bitbucket**.
version_type	Yes	Default version policy of the artifact source when the artifact type is **artifact_generic**. ● **specific**: specified version. ● **latest**: latest version.
version	Yes	If the artifact type is **artifact_generic** and **version_type** is set to **specific**, you need to configure the version number.

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Parameter	Mandatory (Yes/No)	Description
directory	Yes	Directory of the artifact package when the artifact type is **artifact_generic** and **version_type** is set to **specific**.
name	Yes	Artifact package name when the artifact type is **artifact_generic** and **version_type** is set to **specific**.
org	Yes	Name of the organization that the image belongs to when the artifact type is **artifact_docker**.
image	Yes	Image name when the artifact type is **artifact_docker**.
version_type	Yes	Default version policy of the artifact source when the artifact type is **artifact_docker**. • **specific**: specified version. • **latest**: latest version.
version	Yes	If the artifact type is **artifact_docker** and **version_type** is set to **specific**, you need to set the version number.
organization	Yes	SWR organization when the artifact type is **artifact_swr**.
name	Yes	Image of the SWR organization when the artifact type is **artifact_swr**.
version	Yes	Image version when the artifact type is **artifact_swr**.
path	Yes	Address of the image when the artifact type is **artifact_swr**.

8.3 Configuring Pipeline Jobs

Set up the stage-job-step structure in your YAML file to configure a pipeline.

YAML File Example

```
stages:                                  #Pipeline stage
  test2:                                #Unique identifier of the stage
    name: Stage_1                             #Name of the stage
    select: always                      #Whether the stage is always executed
    jobs:                               #Pipeline job
      job_1:                            #Unique identifier of the job
        name: Job name                        #Job name
        if: ${{ default() }}            #Prerequisites for executing a pipeline job. The default value is $
{{ default() }}.
        runs-on: default
        select: selected_by_default             #Job execution mode. The default value is selected_by_default.
```

```
      needs: [ ]                          #Unique identifier of the dependency task. The dependency task must
exist.
      steps:                               # Define the steps within the job.
        - name: step1                      #Step name
          uses: official_devcloud_cloudBuild     #Extension information. The format is extension
name@extension version.
          env:                             #Environment variable in the extension
            test: test
            test2: test2
          with:                            #Parameters input for the extension
            key1: value1
            key2: value2
    job_2:
      name: Job name 2
      if: ${{ default() }} }
      runs-on: [ self-hosted, test2 ]          # Running environment supported by the pipeline job
      select: selected_by_default
      needs: [ job_1 ]
    job_3:
      name: Job name 2
      if: ${{ default() }}
      runs-on: [ dedicated, arm_linux ]
      select: selected_by_default
      needs: [ job_2 ]
  pre:
    type: auto                             #Admission type of the stage
  post:                                    #Configure the post-admission job for the stage.
    - name: step1
      type: gate
      with:
        name: New-policy-20250331212921
        level: tenant
    - name: step1
      type: gate
      with:
        name: xxw-chqtest-test
        level: project
post:                                      #Unique identifier of the downstream stage
  name: Stage name                             #Name of the downstream stage
  select: always                           # Whether the downstream phase is always executed. The default
value is always.
  jobs:
    job1:
      name: Job name
      if: ${{ default() }}
      select: selected_by_default
      needs: [ ]
      steps:
        - name: step1
          uses: official_devcloud_cloudBuild
          env:
            test: test
            test2: test2
          with:
            key1: value1
            key2: value2
```

Orchestrating Pipeline Stages

YAML pipelines include standard stages and a downstream stage.

- **Standard stage**: In a standard stage, start with a **stages** key at the top-level structure. Under **stages**, you can specify up to 16 individual stages.

  ```
  stages:
    test2:
      name: Stage_1
      select: selected_by_default
      jobs:
  ```

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```
  pre:
  - type: time_window
    with:
      timeZone: Pacific SA Standard Time
      timeRanges: "[[\"00:00\",\"00:00\"]]"
  post:             # Post-admission job of the stage. Multiple jobs can be configured.
```

Table 8-4 Parameter description

Parameter	Description
test2	Unique identifier of a stage. Enter 1 to 128 characters, including only letters, digits, hyphens (-), and underscores (_).
name	Pipeline stage name.
select	Whether the stage is always executed. The default value is **selected_by_default**. • **always**: The stage is always executed. • **selected_by_default**: The stage is executed once by default, but it does not always run.
jobs	Pipeline job. A maximum of 100 jobs can be configured for each stage.
type	Admission type of a stage. Currently, the following types are supported: • **auto**: automatic admission. • **manual**: manual admission. • **time_window**: admission within a time window. You need to configure the time zone and time range. – **timezone**: Specify a time zone. – **timeRanges**: Specify a time range.
post	Post-admission job of a stage. Currently, only the gate extension is supported. You need to specify a policy, which can be a tenant policy or project policy. If the tenant policy is used, set **level** to **tenant**. If the project policy is used, set **level** to **project**.

- **Downstream stage**: A downstream stage must be configured under the **post** section of the top-level structure. For details about the parameters, see **Table 8-4**.

```
post:               # Downstream phase
  name: Stage name
  select: selected_by_default
  jobs:
  pre:
  - type: auto
  post:             # Post-admission job of the stage. Multiple jobs can be configured.
```

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Table 8-5 Parameter description

Parameter	Description
name	Name of a pipeline downstream stage. Enter 1 to 128 characters. Do not start with or end with a space. Supported characters include letters, digits, spaces, and special characters: -_,;:./()
select	Whether the stage is always executed. The default value is **selected_by_default**. • **always**: The stage is always executed. • **selected_by_default**: The stage is executed by default, but it does not always run.
jobs	Pipeline job. A maximum of 100 jobs can be configured for each stage.
type	Admission type of a stage. Currently, the following types are supported: • **auto**: automatic admission. • **manual**: manual admission. • **time_window**: admission within a time window. You need to configure the time zone and time range. – **timezone**: Specify a time zone. – **timeRanges**: Specify a time range.
post	Post-admission job of a stage. Currently, only the gate extension is supported. You need to specify a policy, which can be a tenant policy or project policy. If the tenant policy is used, set **level** to **tenant**. If the project policy is used, set **level** to **project**.

Configuring Pipeline Jobs

```
jobs:
  job_1:
    name: Job name
    if: ${{ default() }}
    runs-on: default
    select: selected_by_default
    needs: [ ]
    steps:
      - name: step1
        uses: official_devcloud_cloudBuild
        env:
          test: test
          test2: test2
        with:
          key1: value1
          key2: value2
```

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Table 8-6 Parameter description

Parameter	Description
job_1	Unique identifier of a job. Enter 1 to 128 characters, including only letters, digits, hyphens (-), and underscores (_).
name	Job name. Enter 1 to 128 characters. Do not start with or end with a space. Supported characters include letters, digits, spaces, and special characters: -_,;:./()
if	Prerequisites for executing a pipeline job. The value must be a parsable expression and cannot exceed 1,024 characters. The default value is **${{ default() }}**.
runs-on	A pipeline job can run in the following resource pools. ● Official resource pool: **default**. ● **self-hosted**: Configure an array. runs-on: - self-hosted - 00142c2fb7db4701b074d52910f703d5 – **self-hosted**: Type of a resource pool. – **00142c2fb7db4701b074d52910f703d5**: ID of the self-hosted resource pool. ● **dedicated**: Configure an array. runs-on: - dedicated - 2132b0af0a014aa1bcc9e82f2c239c77 – **dedicated**: Type of a resource pool. – **2132b0af0a014aa1bcc9e82f2c239c77**: ID of the dedicated resource pool.
select	Execution mode of a task. The options are as follows: ● **always**: The job must be executed. ● **never**: The job cannot be executed. ● **selected_by_default**: The job is executed by default, but it does not always run. ● **not_selected_by_default**: The job is not executed by default.
needs	Unique identifier of the dependency job. The dependency job must exist.

Configuring Pipeline Steps

```
steps:
  - name: step1
    uses: official_devcloud_cloudBuild
    env:
      test: test
      test2: test2
    with:
```

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```
      key1: value1
      key2: value2
```

Table 8-7 Parameter description

Parameter	Description
steps	Steps included in a job. A maximum of 16 steps can be configured for a job.
name	Step name. Enter 1 to 128 characters. Do not start with or end with a space. Supported characters include letters, digits, spaces, and special characters: -_,;:./()
uses	Extension information. The format is *extension name@extension version*. Enter no more than 50 characters, including only letters, digits, hyphens (-), and underscores (_). Extension version should be in *a.b.c* format. Each letter ranges from 0 to 99. For official extensions, only the extension name is displayed.
env	Environment variables in the extension. A maximum of 20 parameters can be configured. An extension name can contain a maximum of 128 characters, including only letters, digits, and underscores (_). The parameter value can contain a maximum of 8,192 characters.
with	Parameter included in an extension. You can configure up to 50 parameters for an extension.

Jobs

- **jobs.<job_id>.runs-on**

  It is used to define the resource pool for running tasks. Three types of resource pools are supported: default resource pool (codearts-hosted), custom resource pool (self-hosted), and dedicated resource pool (dedicated-hosted). To further customize container runtime on a resource pool, you can use the container field.

  a. Default resource pool

     The default resource pool is provided by CodeArts. You can quickly define it as follows:

     i. Define it using the official default label. You can use the default resource pool through the abbreviation "default".

     ```
     jobs:
       job_name:
         runs-on: default
     ```

     ii. Define it through specific types of labels. It is recommended that the default resource pool be defined in the three-segment format: [{os}-{arch}-{flavor}]. For details, see **Table 8-8**.

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Table 8-8 Description

Field	Type	Mandatory (Yes/No)	Description
os	String	Yes	Composed of {os}-{version}. *version* indicates supported OS versions. For details, see **Table 8-9**.
arch	String	Yes	Architecture type. You can select **x64** or **arm64**.
flavor	String	Yes	Runner flavor. For details, see **Table 8-10**.

Default resource pool specifications of CodeArts

For the default resource pool, currently supported OS versions and system specifications are listed in **Table 8-9** and **Table 8-10**, respectively.

Table 8-9 Supported OS versions

OS	Supported Version
Ubuntu	Latest
Euler	Latest

Table 8-10 Runner specifications

System OS	Specifications	Processor (CPU)	Memory (RAM)	Storage
Ubuntu/ Euler	slim	1	4 GB	20 GB
Ubuntu/ Euler	small	2	8 GB	50 GB
Ubuntu/ Euler	medium	4	16 GB	100 GB
Ubuntu/ Euler	large	8	32 GB	200 GB
Ubuntu/ Euler	xlarge	16	64 GB	500 GB

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```
jobs:
  job_name:
    runs-on: [euler-latest,x64,small]
    steps:
     - run: echo Hello world!
```

Arrays can contain a mix of strings and variables. For example:

```
jobs:
  job_name:
    runs-on: ["${{ inputs.chosen-os }}","${{ inputs.arch }}",small]
    steps:
    - run: echo Hello world!
```

CAUTION

Variables must be enclosed in double quotation marks "", whereas directly defined strings do not require them.

b. Custom resource pool (self-hosted)

A custom resource pool filters defined execution resources by group and labels. Definitions use a three-segment format: [{type}-{group}-{label1}-{lable2}....].

```
jobs:
  job_name:
    runs-on: [self-hosted,my-private-pool,x86,region=cn-north-4
```

Table 8-11 Parameter description

Parameter	Type	Mandatory (Yes/No)	Description
type	String	Yes	Type of a resource pool. • **self-hosted**: self-hosted resource pool. • **dedicated-hosted**: dedicated resource pool. Example: **self-hosted**
group	String	Yes	Resource pool name. Based on this name, routing to the corresponding resource pool is performed automatically by the system. Example: **my-private-pool**

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Parameter	Type	Mandatory (Yes/No)	Description
labels	Multiple strings	No	Environment label filter, which is used to further screen nodes with certain attributes in a specified resource pool. One or more labels can be configured. Example: 1. Simple label (label1): ["x86"] 2. Key-value label (label2): ["region=cn-north-4"]

c. Dedicated resource pool (dedicated-hosted)

Same definition as custom resource pools. It filters defined execution resources by group and labels. Definitions use a three-segment format: [{type}-{group}-{label1}-{lable2}....].

```
jobs:
  job_name:
    runs-on: [dedicated-hosted,my-dedicated-pool,x86,region=cn-north-4]
```

Table 8-12 Parameter description

Parameter	Type	Mandatory (Yes/No)	Description
type	String	Yes	Type of a resource pool. • **self-hosted**: self-hosted resource pool. • **dedicated-hosted**: dedicated resource pool. Example: **dedicated-hosted**
group	String	Yes	Resource pool name. Based on this name, routing to the corresponding resource pool is performed automatically by the system. Example: **my-dedicated-pool**

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Parameter	Type	Mandatory (Yes/No)	Description
labels	Multiple strings	No	Environment label filter, which is used to further screen nodes with certain attributes in a specified resource pool. One or more labels can be configured. Example: 1. Simple label (label1): ["x86"] 2. Key-value label (label2): ["region=cn-north-4"]

- **jobs.<job_id>.container**

  It is used to define image configurations. It pulls and starts a specified Docker container on the host node as the runtime environment.

  Table 8-13 Specification definition

Attribute	Description
Type	Object
Mandatory (Yes/No)	No
Default value	N/A
Constraints	• Effective only in custom or dedicated resource pools. • Docker must be installed. • Not supported by the default resource pool.

CAUTION

- This configuration takes effect only for custom resource pools (self-hosted) or dedicated resource pools (dedicated-hosted), and Docker must be installed.
- This field is not supported by the default resource pool or CCE access mode. (The system will ignore this field or report an error).

jobs.<job_id>.container is used to create a container environment. All steps in a job are executed in this environment. If certain steps involve both script and container actions, the container actions will run as sibling containers on the same network with the same volume mounts. If no container is specified, all steps will run directly on the host specified by runs-on.

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- Running a job within a container

```
name: CI
on:
  push:
    branches: [ main ]
jobs:
  container-test-job:
    runs-on: ubuntu-latest
    container:
      image: node:18
      env:
        NODE_ENV: development
      ports:
        - 80
      volumes:
        - my_docker_volume:/volume_mount
      options: --cpus 1
    steps:
      - name: Check for dockerenv file
        run: (ls /.dockerenv && echo Found dockerenv) || (echo No dockerenv)
```

- Only a container image is specified. In this case, the image keyword can be omitted.

```
jobs:
  container-test-job:
    runs-on: ubuntu-latest
    container: node:18
```

a. **jobs.<job_id>.container.image**

It is used to define the Docker image for running actions. The value can be a Docker Hub image name or an image registry name.

Table 8-14 Specification definition

Attribute	Description
Type	String
Mandatory (Yes/No)	Yes
Default value	N/A
Constraints	A Docker Hub image name or an image registry name. Tags (for example, node:18) are supported.

b. **jobs.<job_id>.container.credentials**

If the image's container registry requires authentication to pull the image, you can use jobs.<job_id>.container.credentials to set the username and password.

Table 8-15 Specification definition

Attribute	Description
Type	Object
Mandatory (Yes/No)	No

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Attribute	Description
Default value	N/A
Constraints	The username and password fields are included. You are advised to use secrets to reference sensitive information.

- Defining credentials for a container registry

```
container:
  image: ghcr.io/owner/image
  credentials:
     username: ${{ github.actor }}
     password: ${{ secrets.github_token }}
```

c. **jobs.<job_id>.container.env**

It is used to set environment variables in a container.

Table 8-16 Specification definition

Attribute	Description
Type	Object
Mandatory (Yes/No)	No
Default value	N/A
Constraints	The variable name can contain only letters, digits, and underscores (_), and cannot start with a digit.

d. **jobs.<job_id>.container.ports**

It is used to set ports to be exposed on the container.

Table 8-17 Specification definition

Attribute	Description
Type	array[number]
Mandatory (Yes/No)	No
Default value	N/A
Constraints	The port number ranges from 1 to 65535.

e. **jobs.<job_id>.container.volumes**

It is used to set the volumes for the container to use. You can use volumes to share data between services or other steps in a job. You can

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specify named Docker volumes, anonymous Docker volumes, or bind mounts on the host.

Table 8-18 Specification definition

Attribute	Description
Type	array[string]
Mandatory (Yes/No)	No
Default value	N/A
Constraints	Format: <source>:<destinationPath>. • *source*: volume name or absolute path. • *destinationPath*: absolute path in the container.

CAUTION

To specify a volume, you specify the source and destination paths.

- Mounting volumes in a container

```
volumes:
  - my_docker_volume:/volume_mount
  - /data/my_data
  - /source/directory:/destination/directory
```

f. **jobs.<job_id>.container.options**

It is used to configure other Docker container resource options.

Table 8-19 Specification definition

Attribute	Description
Type	String
Mandatory (Yes/No)	No
Default value	N/A
Constraints	The --network and --entrypoint options are not supported.

- Example: using a custom image in a custom resource pool

```
jobs:
  job_name:
    runs-on:
      group: my-private-pool
```

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```
    labels: [x86,region=cn-north-4]

  container:
    source: swr
    image: my-org/java-build-env:v2.0
    env:                    # Environment variable transferred to the container.
      NODE_ENV: production
    ports:                  # Port mapping (mostly used for service containers)
      - 8080:80
    volumes:                  # Volumes of the host machine to be mounted to the container
      - my_docker_volume:/volume_mount
    options: --cpus 1           # An additional command line parameter transferred to docker
create
    credentials:              # Credentials are required for a private image registry.
      username: ${{ atomgit.actor }}
      password: ${{ secrets.swr_token }}

    resources:
      limits:                 # Limit the container to a maximum of 8 CPUs and 16 GB.
        cpu: 8
        memory: 16G
      requests:
        cpu: 4
        memory: 8G

  steps:
    - run: mvn clean package
```

8.4 Configuring Pipeline Parameters

Configure custom parameters and parameter groups in your YAML files. Private parameters cannot be configured in YAML files. You need to configure them with the graphical mode.

YAML File Example

```
inputs:                                 #Custom parameters except private parameters
  input1:                               #Parameter name
    type: string                         #Parameter type
    default: abc                          #Default value
    manual_override: false                    #Whether the parameter can be set during runtime.
    description: Description
  input2:
    type: increment
    default: 1.0.0
    manual_override: false
    is_strict: true                       #Whether to enable strict increase
    description: Description
  input3:
    type: enum
    default: value1
    manual_override: true
    description: Description
    values: [ "value1", "value2", "value3" ]            #Enumerated values
vars:
  uses:                                 #Names of parameter groups
  - test1
  - test2
  - test3
```

Custom Parameters

Use **inputs** to configure custom parameters. The following parameter types are supported: string, auto-increment, and enumeration. The following shows an example of the YAML file.

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```
inputs:
  input1:
    type: string
    default: abc
    manual_override: false
    description: Description
  input2:
    type: increment
    default: 1.0.0
    manual_override: false
    is_strict: true
    description: Description
  input3:
    type: enum
    default: value1
    manual_override: true
    description: Description
    values: [ "value1", "value2", "value3" ]
```

Table 8-20 Parameter description

Parameter	Description
inputs	Defines the custom parameter configuration.
input1	Name of a custom parameter. The name can contain a maximum of 128 characters, including only letters, digits, and underscores (_).
type	Type of a parameter. The options are as follows: • **string**: The custom parameter is of the string type. • **increment**: The custom parameter is of the auto-increment type. – **is_strict**: If the value is set to **true**, the system checks whether the parameter value increases strictly when the pipeline is executed. – **latest_value**: Latest value of the current parameter. • **enum**: The custom parameter is of the enumeration type. **values** indicates list of enumerated values.
default	Default parameter value.
manual_override	Whether a parameter can be set during runtime. • **true**: You can change the parameter value during runtime. • **false**: The parameter value cannot be set during runtime.
description	Description of a parameter.

Parameter Groups

```
vars:
  uses:                                #Names of parameter groups
  - test1
  - test2
  - test3
```

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Table 8-21 Parameter description

Parameter	Description
vars	Defines the parameter group configuration.
uses	Name of a parameter group. The name can contain a maximum of 128 characters, including only letters, digits, and underscores (_).

8.5 Configuring Event Triggers

In YAML pipelines, event triggers can be configured in two ways: either **with a single code source** or **with multiple code sources**. The two approaches only differ in their hierarchical structure.

Configuring Triggers for a Pipeline with One Code Source

If the pipeline source contains only one code source, you do not need to specify the code repository. By default, the pipeline source is associated with the code source. You can configure code event triggers under **on.merge_requests**, **on.push**, and **on.tag_push**.

```
on:
  merge_requests:                          #MR trigger
    types: [ merge, open, reopen, update ]
    branches: [ 'master' ]
    branches-ignore: [ 'test' ]
    paths: [ 'test' ]
    paths-ignore: [ 'test2' ]
    code-update: true
  push:                                  #Code commit trigger
    branches: [ 'master' ]
    branches-ignore: [ 'test' ]
    paths: [ 'test' ]
    paths-ignore: [ 'test2' ]
    tags: [ 'master' ]                     #Tag creation trigger
    tags-ignore: [ 'test' ]
```

Table 8-22 Parameter description

Parameter	Description
merge_requests	Defines the merge request trigger configuration.
branches	Included branches. The total number of **branches** and **branches-ignore** cannot exceed 32, and each them cannot exceed 1,024 characters.
branches-ignore	Excluded branches. The total number of **branches** and **branches-ignore** cannot exceed 32, and each them cannot exceed 1,024 characters.
paths	Included paths.
paths-ignore	Excluded paths.

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Parameter	Description
types	Event trigger type. The options are as follows: • **open**: triggered upon MR creation. • **merge**: triggered when an MR is merged. A code commit event will also be triggered. • **reopen**: triggered upon MR reopening. • **update**: triggered upon MR content, setting, or source code update. – **code-update**: triggered upon code update. This parameter takes effect only when **types** is set to **update**. The value **true** indicates that the pipeline is triggered only by the code change, and **false** indicates that any change can trigger the pipeline.
push	Defines the code commit trigger.
tags	Tag creation trigger. Included tags. The total number of **tags** and **tags-ignore** cannot exceed 32, and each of them cannot exceed 1,024 characters.
tags-ignore	Tag creation trigger. Excluded tags. The total number of **tags** and **tags-ignore** cannot exceed 32, and each of them cannot exceed 1,024 characters.

Configuring Triggers for a Pipeline with Multiple Code Sources

If the pipeline source contains multiple code sources, you need to configure triggers under **on.sources**_*identifier*. *identifier* is the unique identifier of the source.

```
on:
  sources:
    phonix_sample:                                  #Unique identifier of the source
      merge_requests:                               #MR trigger
        types: [ merge, open, reopen, update ]
        branches: [ 'master' ]
        branches-ignore: [ 'test' ]
        paths-ignore: [ 'test2' ]
      push:                                       #Code commit trigger
        branches: [ 'master' ]
        branches-ignore: [ 'test' ]
        paths-ignore: [ 'test2' ]
        tags: [ 'master' ]                          #Tag creation trigger
        tags-ignore: [ 'test' ]
```

Table 8-23 Parameter description

Parameter	Description
sources	Event trigger configuration in the multi-source scenario.

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Parameter	Description
phonix_sample	Unique identifier of the pipeline source, which maps the code sources configured under **sources**. Artifact sources cannot be configured. Enter a maximum of 128 characters, including only letters, digits, and underscores (_).
merge_requests	Defines the merge request trigger configuration.
branches	Included branches. The total number of **branches** and **branches-ignore** cannot exceed 32, and each them cannot exceed 1,024 characters.
branches-ignore	Excluded branches. The total number of **branches** and **branches-ignore** cannot exceed 32, and each them cannot exceed 1,024 characters.
paths	Included paths.
paths-ignore	Excluded paths.
types	Event trigger type. The options are as follows: • **open**: triggered upon MR creation. • **merge**: triggered when an MR is merged. A code commit event will also be triggered. • **reopen**: triggered upon MR reopening. • **update**: triggered upon MR content, setting, or source code update. – **code-update**: triggered upon code update. This parameter takes effect only when **types** is set to **update**. The value **true** indicates that the pipeline is triggered only by the code change, and **false** indicates that any change can trigger the pipeline.
push	Defines the code commit trigger.
tag_push	Defines tag creation trigger.
tags	Tag creation trigger. Included tags. The total number of **tags** and **tags-ignore** cannot exceed 32, and each of them cannot exceed 1,024 characters.
tags-ignore	Tag creation trigger. Excluded tags. The total number of **tags** and **tags-ignore** cannot exceed 32, and each of them cannot exceed 1,024 characters.

8.6 Configuring Other Triggers

The following example shows how to configure a concurrency policy and a preemption policy. They work the same way as configured in graphical mode.

```
concurrency:          #Concurrency policy
  max: 5              #Number of concurrent requests
```

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```
  exceed-action: IGNORE
  enable: true            #Whether to enable the function
  preemption:              #Preemption policy
    enable: true          #Whether to enable the function
    events: mr_id          #Preemption event
```

Table 8-24 Parameter description

Parameter	Description
concurrency	Defines the concurrent policy trigger.
max	Number of concurrent requests. The value ranges from 1 to 120.
exceed-action	Execution policy for exceeded concurrent requests. • **IGNORE**: Not to be executed. • **QUEUE**: Waiting to be executed.
enable	Whether to enable the concurrency policy. The default value is **true**. • **true**: enable • **false**: disable
preemption	Defines the preemption policy, which controls the instance preemption started by the same trigger source (such as the same MR/PR). For example, when the same trigger source triggers the pipeline again, the system automatically cancels the old instance that is running under that trigger source.
enable	Whether to enable the preemption policy. The default value is **true**. • **true**: enable • **false**: disable
events	Indicates the event type that triggers preemption, including mr_id and pull_request. A new trigger from the same MR/PR cancels its old instance.

8.7 Configuring Execution Plans

A maximum of 200 execution plans can be configured for a pipeline. The following shows an example of the YAML file.

```
policies:                    #Max. 200 execution plans can be configured
  test1:
    sources:                  #Source used to start the pipeline
      phonix_sample:
        branch: master
        tag: master
      swr_javadocer:
        version: version1.1
    description: Execution plan 1
    inputs:                   #Environment variables for execution
```

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```
    input1: value1
    input2: value2
    input3: value3
  jobs: [ job_1, job_2, job_3 ]   #Selected jobs for execution
```

Table 8-25 Parameter description

Parameter	Description
policies	Defines the pipeline execution plan.
test1	Name of an execution plan. Enter a maximum of 128 characters, including only letters, digits, hyphens (-), and underscores (_).
sources	Pipeline source when the pipeline is executed. If the source is code, you need to configure the branch or tag name. If the source is an artifact, you need to configure the version number.
phonix_sample	Unique identifier of the pipeline source, which must map to the code source configured in **sources**.
swr_javadocer	Unique identifier of the pipeline source, which must map to the code source configured in **sources**.
branch	Branch. Enter a maximum of 1,024 characters. Specify **branch** or **tag**.
tag	Tag. Enter a maximum of 1,024 characters. Specify **branch** or **tag**.
description	Description of an execution plan.
inputs	Values of the runtime parameters for an execution plan.
jobs	Jobs to be executed for an execution plan.

8.8 Configuring a Scheduled Task

To configure scheduled tasks, use the **on.schedules** section. Scheduled tasks currently support only periodic triggers. The following shows an example of the YAML file.

```
on:
  schedules:
    - type: 'periodic'
      name: Scheduled task 2
      enable: true
      policies: [Execution plan 1]
      days: [ 1,2,3,4,5,6,7 ]
      start: 00:00
      end: 00:01
      timezone: Asia/Shanghai
      interval: 900
```

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Table 8-26 Parameter description

Parameter	Description
schedules	Defines a scheduled task. A maximum of 10 scheduled tasks can be configured. The task name must be unique.
type	Mode for triggering a scheduled task. Currently, a task can be triggered periodically. The value is **periodic**.
name	Name of a scheduled task. Enter 1 to 128 characters, including only letters, digits, hyphens (-), and underscores (_).
enable	Whether to enable the scheduled task. The default value is **true**. ● **true**: enable. ● **false**: disable.
policies	Execution plan of a scheduled task. The execution plan name can contain 1 to 128 characters. If this parameter is not set, the default pipeline configuration is used.
days	Period of a scheduled task. The value cannot be empty. The field can contain 1 to 7 values. Each value is an integer ranging from **1** to **7**. **1**: Sunday; **2**: Monday; **3**: Tuesday; **4**: Wednesday; **5**: Thursday; **6**: Friday; **7**: Saturday.
start	Start time of a scheduled task. The format is *HH:mm*.
end	End time of a scheduled task. The format is *HH:mm*. The end time must be later than the start time.
timezone	Time zone of a scheduled task. The options are as follows: ● UTC ● America/Sao_Paulo ● America/Santiago ● America/Chicago ● Africa/Cairo ● Europe/Moscow ● Asia/Bangkok ● Asia/Shanghai ● Asia/Singapore
interval	Interval for triggering a scheduled task. The value is in seconds. The minimum value is **900** seconds. During the scheduled time window (from start time to end time), the pipeline is triggered at the interval defined by **interval**.

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9 Grouping Pipelines

Group Management

A project usually involves multiple pipelines. You can group them to improve efficiency, for example, by environment level (production and testing), or by R&D stage (scheduled build, development self-test, integration test, and production deployment).

Constraints

- On the **Permissions** tab page, only the project admin and project manager can modify pipeline permissions in batches.
- Only pipelines with manual review tasks can be reviewed in batches.
- A maximum of 1,000 groups can be created in a project.
- A maximum of 20 pipelines can be deleted at a time.

Prerequisites

- **You have enabled and authorized CodeArts Pipeline**.
- Your role is a **project administrator** or **pipeline creator**. For details about how to configure permissions, see **Authorizing CodeArts Pipeline**.

Grouping Pipelines

Step 1 **Access the CodeArts Pipeline homepage** through a project.

Step 2 Click **All Groups** to expand the pipeline group panel.

Step 3 Move the cursor to the row where **All Groups** is located and click  to add a group.

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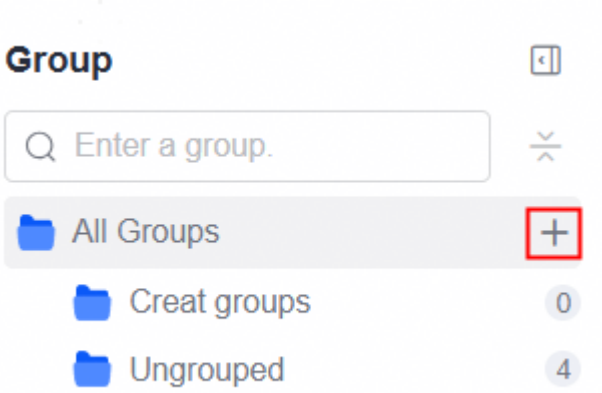
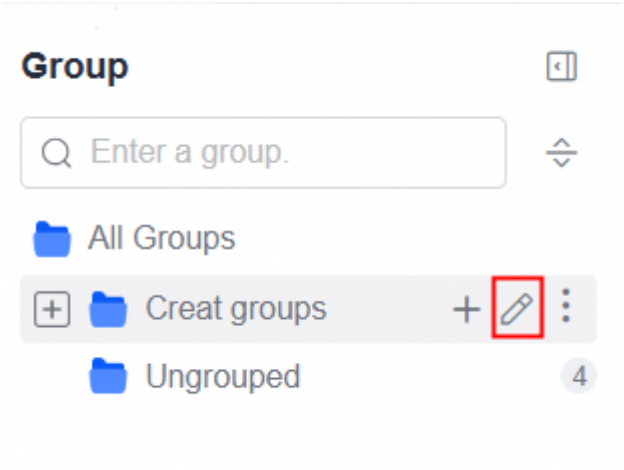


Step 4 Move the cursor to the new group, click to set a group name, and click the blank area to save the group name.



Step 5 After a group is created, you can perform the following operations:

- Click in the row where the group is located to create a subgroup. You can create a maximum of three levels of subgroups.
- Click in the row where the group is located to change the group name.
- Click in the row where the group is located to move up, down, or delete the group.

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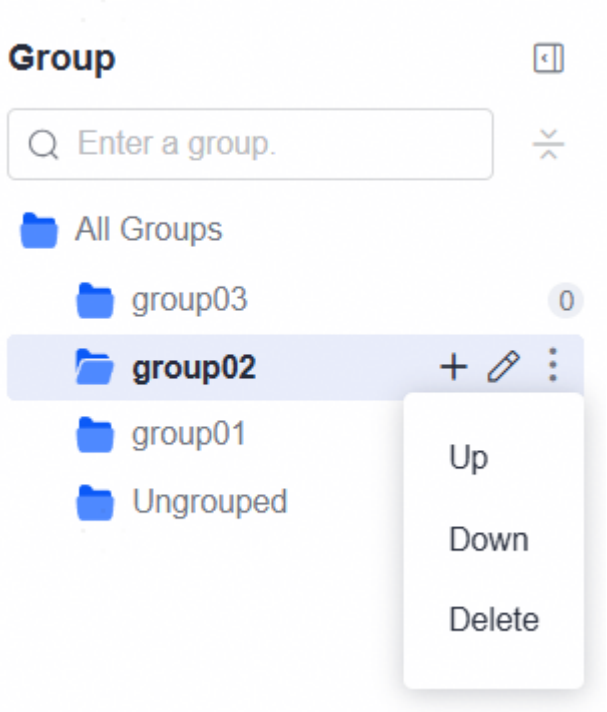
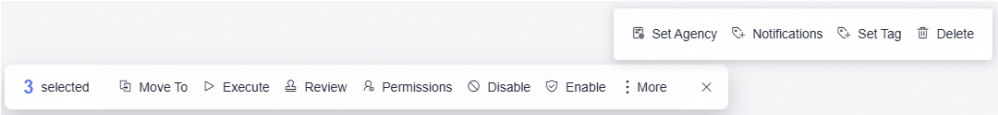


NOTE

After the first group is created, **Ungrouped** is automatically generated for ungrouped pipelines.

Step 6 On the pipeline list page, select desired pipelines and perform the following batch operations.

Figure 9-1 Operations on multiple pipelines



- Click **Move To**. The **Move Group** window is displayed. Select a group and click **Confirm**.
- Click **Execute**. In the displayed window, click **OK** to execute pipelines.
- Click **Review**. In the displayed window, you can review selected pipelines in a batch.
  - Click **Approve**. In the displayed window, click **OK**. In the displayed **Results** window, you can check review results.
  - Click **Reject**. In the displayed window, click **OK**. In the displayed **Results** window, you can check review results.
- Click **Permissions**. In the displayed window, the project admin and project manager can configure permissions for selected pipelines.
  - Enable **Project-level permissions** to inherit project-level permissions.
  - Disable **Project-level permissions** to customize role and user permissions of specific pipelines.

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- Click **Disable**. In the displayed window, disable selected pipelines.
- Click **Enable**. In the displayed window, enable selected pipelines.
- Choose **More** > **Set Agency**. In the displayed window, you can set agencies for pipelines. For details, see **Configuring CodeArts Pipeline Delegate Permissions**.
- Choose **More** > **Notifications**. In the displayed window, set notifications for selected pipelines. For details, see **Configuring Pipeline Notifications**.
- Choose **More** > **Set Tag**. In the displayed window, set tags for selected pipelines.
- Choose **More** > **Delete**. In the displayed window, enter the prompt information and click **OK**. A maximum of 20 pipelines can be deleted at a time.

----End

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10 Executing a Pipeline

You can check the pipeline execution progress, logs, and results in real time.

Prerequisites

- **You have enabled and authorized CodeArts Pipeline**.
- Your role is a **project administrator** or **pipeline creator**. For details about how to configure permissions, see **Authorizing CodeArts Pipeline**.

Custom Pipeline Execution

Step 1 **Access the CodeArts Pipeline homepage**.

Step 2 Search for the target pipeline and click ▷ in the **Operation** column.

Step 3 In the displayed window, select **Custom**, and set the following parameters:

- **Pipeline Source**: Select the branch, tag, or commit ID of the code source.
- **Runtime Parameters**: (Optional) Set runtime parameters. For details, see **Configuring Pipeline Parameters**.
- **Execution Stages**: Select one or more jobs to execute. By default, all jobs are executed.

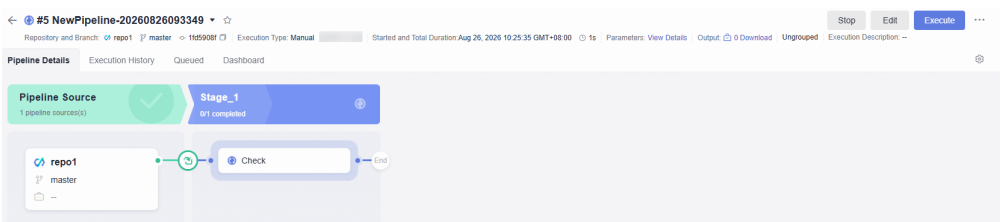
  NOTE

  If **Always Run** is set to **Yes** for a stage, jobs in this stage will be selected for execution by default and cannot be canceled.
- **Description**: Describe the execution.

Step 4 Click **OK**. The pipeline starts to execute.

Step 5 Click the pipeline name to go to the execution history page. You can view the pipeline details, execution progress, and job execution status in real time.

Figure 10-1 Executing a Pipeline



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- Click **Retry** to execute the failed job again.
- Click on the card of the failed job to re-execute the job.
- Click **Execute** to execute the pipeline with the new configuration.
- Click **Stop** in the upper right corner to stop the execution.
- Click **Edit** to change the pipeline configurations.
- A pipeline can have multiple concurrent executions. You can click **Execute** to start a new execution of the pipeline. The maximum number of concurrent pipeline executions varies based on your purchase. For details, see **CodeArts Pipeline specifications**.

Step 6 After the execution is complete, you can check the execution result. If you encounter any problem during the execution, see **Troubleshooting**.

----End

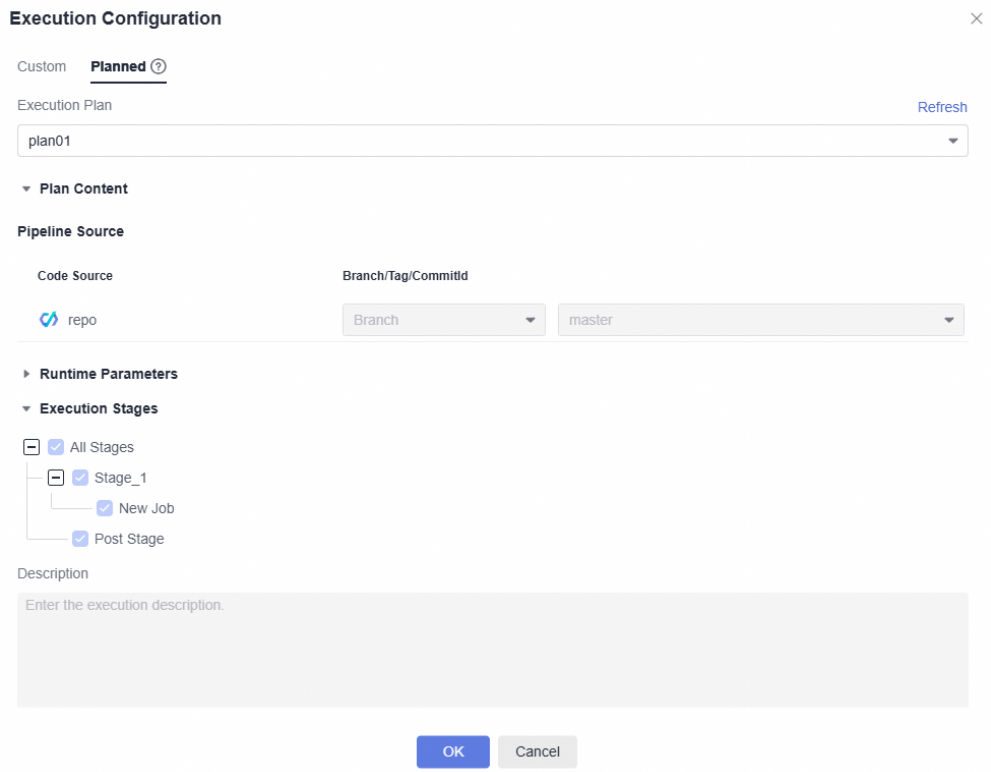
Plan-based Pipeline Execution

Step 1 **Access the CodeArts Pipeline homepage**.

Step 2 Search for the target pipeline and click in the **Operation** column.

Step 3 In the displayed window, select **Planned**, and set the following parameters:

- **Execution Plan**: Select an execution plan. For details about how to create a plan, see **Configuring an Execution Plan**.
- **Plan Content**: View the execution plan content. **If the pipeline task configuration changes, the corresponding execution plan is updated accordingly.**



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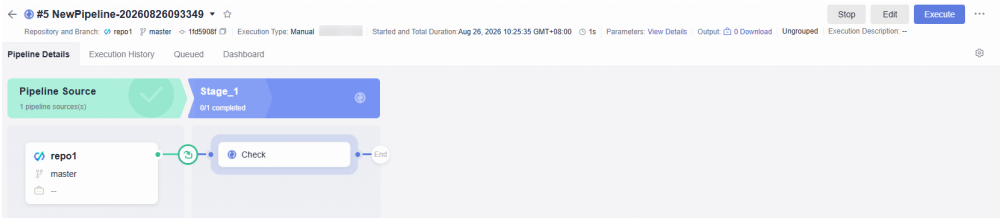
Step 4 Click **OK**. The pipeline starts to execute.

Step 5 Click the pipeline name to go to the execution history page. You can view the pipeline details, execution progress, and job execution status in real time.

Figure 10-2 Executing a pipeline



Step 6 After the execution is complete, check the execution result.

----End

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11 Checking a Pipeline

You can check the pipeline list, pipeline execution history, execution details, and queuing status.

Notes and Constraints

- By default, only project managers, project creators, pipeline creators, and system engineers can delete pipelines. You can configure permissions for different roles.
- A tag name can contain a maximum of 50 characters.
- A tenant can create a maximum of 2,000 tags.
- Execution records are generated only after the first execution.
- A running pipeline cannot be disabled or deleted.

Prerequisites

- **You have enabled and authorized CodeArts Pipeline**.
- Your role is a project member. For details about how to configure permissions, see **Authorizing CodeArts Pipeline**.

Checking a Pipeline

Step 1 **Access the CodeArts Pipeline homepage**.

The pipeline list page displays all pipelines of the current user. The information is listed in the following table.

Table 11-1 Pipeline information

Parameter	Description
Name	Pipeline name and the project to which the pipeline belongs. **NOTE** If you access CodeArts Pipeline through a project, the project name will not be displayed here.
Last Executed	Information about the last execution of a pipeline, including the execution mode, branch, latest code commit ID, and executor.

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Parameter	Description
Tag	Pipeline tag.
Workflow	Scheduling process and execution status (completed, failed, running, or stopped) of the pipeline.
Started & Lasted	Start time and duration of the last execution.
Execution Time	Start time of the last execution.
Execution Duration	Duration of the pipeline execution.
Pipeline ID	ID of the current pipeline.

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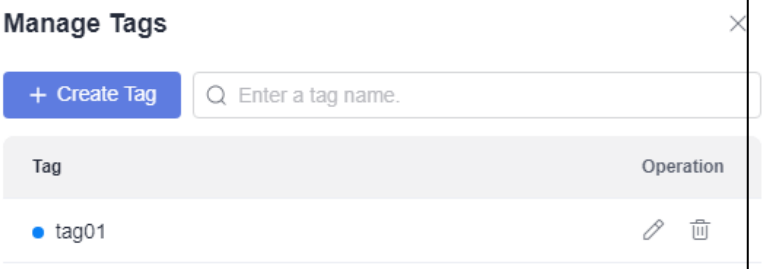
Parameter	Description
Operation	• Click ▷ to execute a pipeline. • Click ☆ to favorite a pipeline. After the pipeline is favorited, the icon changes to ★. You can click the icon again to unfavorite the pipeline. **NOTE** After you favorite a pipeline, the pipeline will be displayed on top of the pipeline list when you access the page again. Favorited pipelines are sorted in descending order based on their last execution time. If they have not been executed, they are sorted in descending order based on their creation time. • Click ••• and select **Edit** to edit a pipeline. • Click ••• and select **Clone** to quickly create a pipeline based on the current pipeline. • Click ••• and select **Preview** to preview a pipeline. • Click ••• and select **Operation History** to view historical operation records (creation, editing, and failure). – Click ⇄ to compare the selected version with a specified version. – Click ↗ to export the pipeline operation history. – Click ↻ to update the pipeline to the current version. • Click ••• and select **Set Tag**. In the displayed dialog box, perform the following operations. – Click + to add tags for the pipeline. Max. five tags for each pipeline. – Click **Manage Tags** to create, edit, or delete tags.  • Click ••• and select **Disable** to disable a pipeline. • Click ••• and select **Delete** to delete a pipeline. • Click ••• and select **Execution Plan** to **configure a plan**.

- By default, all users can view the pipeline list.
- Click the drop-down list box of **All Pipelines** to filter pipelines by **All pipelines**, **My created pipelines**, or **My executed pipelines**.

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- You can search for a pipeline by its name.
- Click **Import** in the upper right corner to create or update a pipeline by importing a JSON file.
- Click **Set** in the upper right corner to customize the pipeline display information.

Step 2 Click a pipeline name. The **Execution History** page is displayed, showing the execution records.

Table 11-2 Execution history

Parameter	Description
Execution Message	The execution sequence number, execution branch, latest commit information, and latest commit ID of the branch.
Status	Pipeline execution status, including completed, running, failed, stopped, paused, suspended, and ignored.
Execution Type	Pipeline triggers, including manually, code commit, merge request, tag creation, scheduled task, webhook, and sub-pipeline.
Executor	Name of the user who executed the pipeline.
Workflow	Scheduling process and execution status (completed, failed, running, or stopped) of the pipeline.
Execution Description	Description of the pipeline execution.
Job Details	Pipeline execution details.
Execution Time	Time when the pipeline starts to be executed.
Execution Duration	Duration of the pipeline execution.
Operation	Pipeline execution parameters. You can click  to view the details.

- You can click the time filter to filter execution records by time. By default, executions in the past 31 days are displayed. You can also check executions in the past 7 days, 14 days, or 90 days.
- Click **Set** in the upper right corner to customize the pipeline execution history information.

Step 3 Click the execution ID to go to the **Pipeline Details** page and check the execution details.

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Table 11-3 Operations on the pipeline details page

Operation	Description
Retry	If the execution fails, you can click **Retry** in the upper right corner to resume the execution.
Edit	You can click **Edit** to orchestrate the pipeline.
Execute	You can click **Execute** to execute the pipeline with the latest configurations. An execution record will be generated.
Download	You can click **Download** next to **Output** to download the build packages. ● Build packages are available only for build jobs. ● If there are multiple build packages, click **Download All**. ● Only the latest 10 build packages are displayed. To download other build packages, go to the **Release Repos** page.
View logs	Click a job card to check its logs and result. ● No log will be generated for **DelayedExecution** and **PipelineSuspension** jobs. ● You can click the failed job card to check the failure reason.
More operations	Click ••• in the upper right corner of the page to clone, preview, disable, and delete the pipeline, and check the operation history and execution plan.

Step 4 Click the **Queued** tab.

This page displays the instances to be executed.

- Max. 100 queuing instances per pipeline.
- Instances will not be executed after 72 hours of waiting.
- Click in the **Operation** column to cancel the queuing.
- Instance configurations are fixed once they enter the queue.

----End

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12 Checking the Dashboard

The pipeline statistics dashboard displays pipelines, their execution statuses, parallel executions in the system and in each project.

Prerequisites

You have enabled and authorized CodeArts Pipeline.

Checking the Dashboard

Step 1 **Access the CodeArts Pipeline homepage**. The dashboard displays pipeline statistics.

Step 2 Click the drop-down list next to **All items** to select all projects or the desired projects.

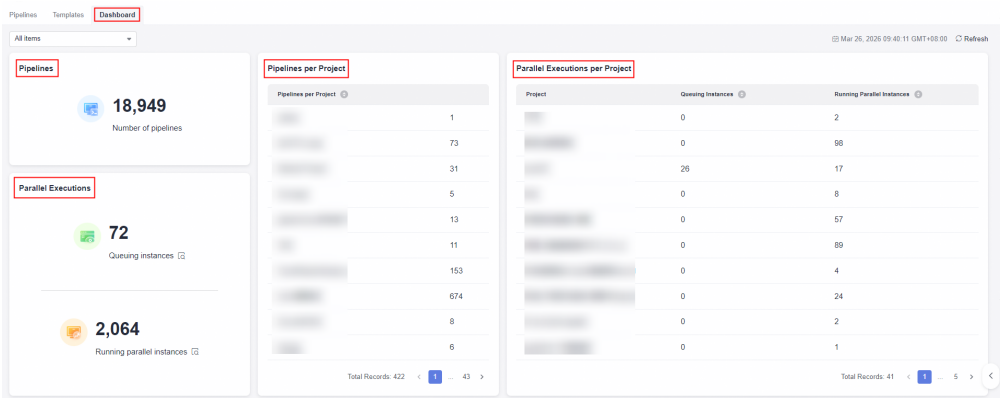

Table 12-1 Pipeline statistics

Item	Description
Pipelines	Total number of pipelines.

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Item	Description
Parallel Executions	Number of queuing and running parallel instances. • Click on the right of the queuing instances. The **Queuing Instances** window is displayed for you to check the queuing pipelines and triggers. • Click on the right of the running parallel instances. The **Running Instances** window is displayed for you to check the names, execution information, triggers, and execution time of running pipelines.
Pipelines per Project	Number of pipelines in each project. You can click a project name to access pipelines in this project.
Parallel Executions per Project	Number of queuing and running parallel instances in each project.

Step 3 View the execution efficiency, execution status, queuing and concurrency statistics, and project execution overview of pipelines within a specified period. You can view pipeline execution data in the last 30 minutes, 1 hour, 24 hours, 7 days, or 30 days.

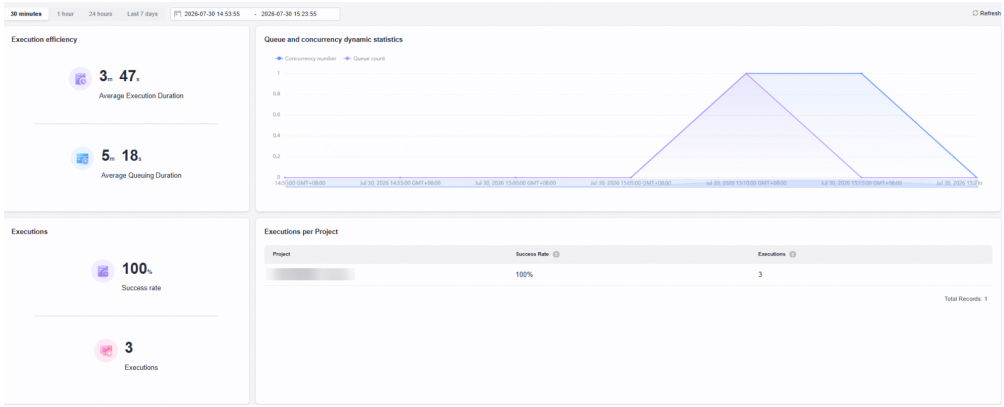

Table 12-2 Pipeline statistics

Item	Description
Execution efficiency	The **average execution duration** and **average queuing duration** of pipelines during a specified period.
Executions	Execution success rate and execution times within a specified period. You can check executions within 90 days.

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Item	Description
Dynamic statistics on queuing and concurrency	Number of queuing and running concurrent instances within a specified period. The statistics are plotted at 5-minute intervals.
Executions per project	Execution success rate and execution times in each project. You can check executions during a specified period. You can also click a project name to access pipelines in this project.

----End

Viewing the Statistics Dashboard of a Single Pipeline

Step 1 Access the CodeArts Pipeline homepage.

Step 2 Click the name of the pipeline to be viewed. The pipeline **Execution History** page is displayed.

Step 3 Click the **Dashboard** tab to view the pipeline statistics.

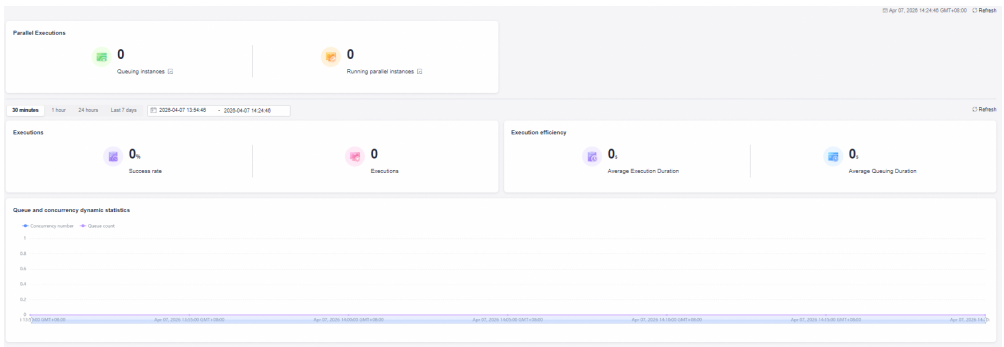

Table 12-3 Statistics of a single pipeline

Item	Description
Parallel Executions	Number of queuing and running parallel instances. • Click on the right of the queuing instances. The **Queuing Instances** window is displayed for you to check the queuing pipelines and triggers. • Click on the right of the running parallel instances. The **Running Instances** window is displayed for you to check the names, execution information, triggers, and execution time of running pipelines.

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Item	Description
Executions	Execution success rate and execution times within a specified period. You can check executions within 90 days.
Execution efficiency	The **average execution duration** and **average queuing duration** of pipelines during a specified period.
Dynamic statistics on queuing and concurrency	Number of queuing and running concurrent instances within a specified period.

----End

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13 Configuring the Alert Mechanism

The alert mechanism is a suite of measures provided to improve software development and deployment efficiency. With this mechanism, the system can monitor pipeline phases and key metrics in real time, and trigger instant notifications upon detecting anomalies. This enables rapid response and resolution, ensuring high process stability and service reliability while minimizing downtime and enhancing user experience.

Configuring a Tenant-Level Alert Rule

Step 1 Access the CodeArts Pipeline homepage.

Step 2 Click the **Dashboard** tab. Click **Alert Settings** in the upper right corner to access the **Tenant Alert** page.

Step 3 Click **Create Alert**. On the displayed page, configure the parameters in **Table 13-1** as instructed.

Table 13-1 Creating an alert rule

Parameter	Description
Name	Name of the alert rule, which can be customized.
Project: defaulted to **Tenant-Level (All Projects)**	**Parallel Execution Control** • **Parallel Execution Percentage**: maximum allowed percentage of concurrent pipeline executions. • **Severity Level**: severity of the alert when the threshold is exceeded. It can be **Suggestion** (default value), **Minor**, or **Major**.
	Queuing Control • **Queuing Instances**: maximum allowed number of waiting pipelines. • **Severity Level**: severity of the alert when the threshold is exceeded. It can be **Suggestion**, **Minor** (default value), or **Major**.

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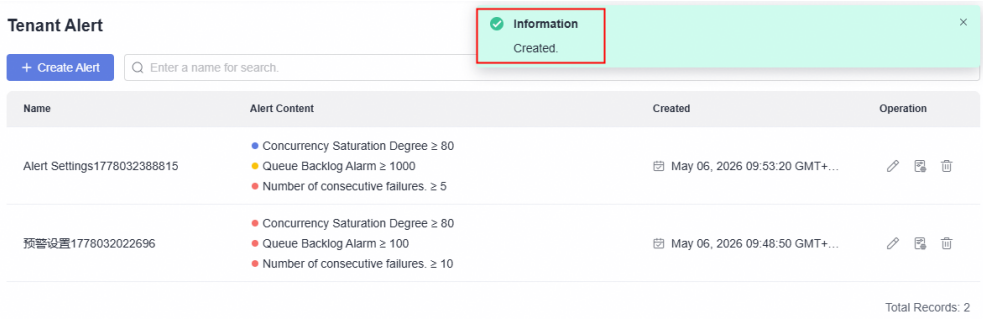
Parameter	Description
	Consecutive Failure Control • **Consecutive Failures**: maximum allowed number of consecutive failed pipeline executions. • **Severity Level**: severity of the alert when the threshold is exceeded. It can be **Suggestion**, **Minor**, or **Major** (default value).

Step 4 Toggle on and set parameters. Then click **OK**. A message is displayed, indicating that the alert rule is created successfully.



----End

Viewing a Tenant-Level Alert Rule

Step 1 Access the CodeArts Pipeline homepage.

Step 2 Click the **Dashboard** tab. Click **Alert Settings** in the upper right corner to access the **Tenant Alert** page.

All alert rules of the current tenant are displayed. The parameters are described as follows.

Table 13-2 Tenant alert rule list

Parameter	Description
Name	Name of the alert rule, which can be customized.
Alert Content	Alert rule settings, including **Parallel Execution Control**, **Queuing Control**, and **Consecutive Failure Control**.
Created	Time when the alert rule is created.

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Parameter	Description
Operation	• Click . On the displayed **Edit Alert** page, modify the alert rule settings. • Click . A dialog box is displayed, asking you to confirm the setting. Click **OK** to set the alert rule as the default one. • Click . In the displayed **Delete Alert Settings** dialog box, click **Autofill** or enter **DELETE** and click **OK** to delete the alert rule

----End

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14 Configuring a Change-triggered Pipeline

Microservice

Microservices are a software governance architecture. A complex software project consists of one or more microservices. Microservices in a system are loosely coupled. Each microservice is independently developed, verified, deployed, and released. Changes can be used to meet requirements and fix vulnerabilities. A change belongs to only one microservice. In microservices, you can create change-triggered pipelines to associate them with change resources and release changes for quick project delivery.

Microservices have the following benefits:

- Specialized: Each microservice focuses on a specific function. It is relatively easy to develop and maintain a single microservice.
- Independently deployable: A microservice is independently deployed and updated without affecting the whole system.
- Tech-diverse: For microservices architectures, different services communicate over RESTful APIs. You can choose the desired technology for each service.

A change-triggered pipeline has the following features:

- A microservice can have only one change-triggered pipeline.
- An integration branch is automatically created during the execution of the change-triggered pipeline. After successful execution, the branch content is merged to the master branch.
- After successful execution, the change status is automatically updated.
- Only one pipeline instance can run at one time.
- A change-triggered pipeline cannot be triggered by an event or at a specified time.

Constraints

- When you create a microservice, if you set **Pipeline Source** to **None**, after the microservice is created, you can click its name to associate it with a pipeline source on the **Overview** page.

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- A repository can be associated with only one microservice.
- After creating a microservice, when you change its code repository, if there are unclosed changes or running pipelines in the microservice, the **Data Processing** window will be displayed. In that case, close all changes and stop all running pipelines.

Prerequisites

- **You have enabled and authorized CodeArts Pipeline**.
- Your role is a **project administrator** or **pipeline creator**. For details about how to configure permissions, see **Authorizing CodeArts Pipeline**.

Creating a Microservice

Step 1 **Access the CodeArts Pipeline homepage** through a project.

Step 2 Click the **Microservices** tab.

Step 3 Click **Create Microservice**. On the displayed page, configure parameters.

Table 14-1 Microservice parameters

Parameter	Description	Example Value
Project	Project to which the microservice belongs. The project cannot be changed.	The default value is **project01**.
Microservice Name	The name can contain a maximum of 128 characters, including letters, digits, and underscores (_).	Enter **Microservice01**.
Pipeline Source	Only **Repo** is supported.	Select **Repo**.
Repository	Code repository associated with the microservice. Select a created code repository.	Select **Repo01**.
Default Branch	Default branch associated with a microservice. This branch will be used when a change-triggered pipeline is executed. After the change-triggered pipeline is executed, all changed feature branches will be merged into the default branch.	Select **master**.
Language	The development language of the microservice. Available languages: **Java**, **Python**, **Node.js**, **Go**, **.Net**, **C++**, and **PHP**.	Select **Java**.
Description	Description of the microservice. Enter a maximum of 1,024 characters.	-

Step 4 Click **OK**. A message is displayed, indicating that the microservice is created successfully. The **Overview** page is displayed.

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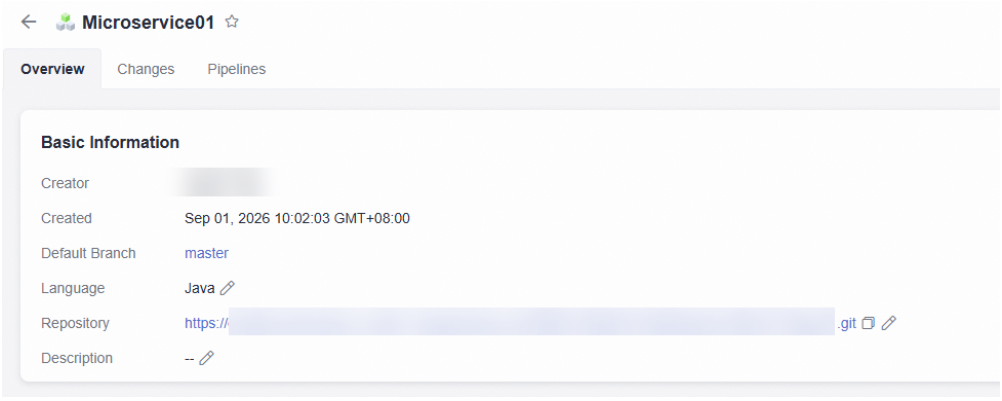
Information such as the creator, creation time, and code source is displayed. You can edit the language, repository, and description.

Figure 14-1 Microservice overview page



Step 5 Return to the microservice list to review the created microservice, as shown in the following table.

Figure 14-2 Microservice list

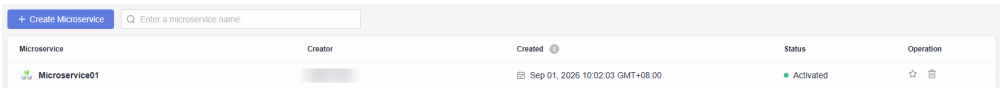


Table 14-2 Microservice list

Item	Description
Microservice	Microservice name.
Creator	Name of the user who created the microservice.
Created	Time when the microservice was created. You can move the cursor to the **Created** column and click to sort microservices by creation time.
Status	Status of a microservice. After a microservice was created, it is in an activated status.
Operation	Click to favorite a microservice. After the microservice is favorited, the icon changes to . You can click the icon again to unfavorite the microservice. Also, you can click to delete the microservice. If a microservice is deleted, all changes and pipelines in the microservice will be deleted.

- The microservice list displays all microservices of the project.
- You can enter a microservice name in the search box to search for it.

----End

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Creating a Change

You can manage changes in the microservice.

Preparations

You have **created a work item**.

Procedure

Step 1 **Access the CodeArts Pipeline homepage** through a project.

Step 2 Click the **Microservices** tab.

Step 3 Click a microservice name. The **Overview** page is displayed.

Step 4 Click the **Changes** tab.

All changes are displayed. Click **All Changes** and select **My Changes** to filter changes created by the login user.

Step 5 Click **Create Change**. On the displayed page, set parameters.

Figure 14-3 Change parameters

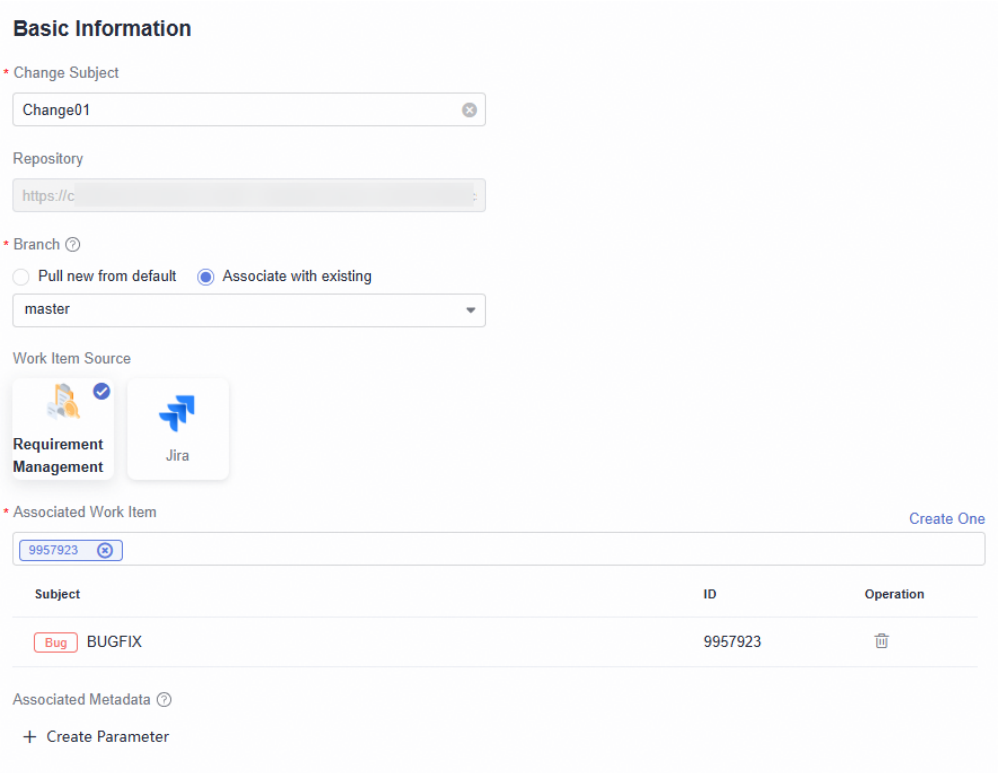

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Table 14-3 Change parameters

Parameter	Description	Example Value
Change Subject	Name of the change. Enter a maximum of 256 characters.	Enter **Change01**.
Repository	Name of the repository associated with the microservice. The repository cannot be changed.	-
Branch	You can pull a new branch from the default branch or associate the change with an existing branch. After the change is released through the change-triggered pipeline, the code branch will be automatically merged to the default branch of the microservice.	Select **Associate with an existing branch** and select **master** from the drop-down list.
Work Item Source	The work item sources supported for this change, including **Requirement Management** and **Jira**.	Select **Requirement Management**.
Service Endpoint	Specify this parameter when **Work Item Source** is set to **Jira**. You can select an existing endpoint or click **Create**. For details, see **Creating Service Endpoints**.	-
Associated Work Item	Select started or ongoing work items from **Requirement Management** or **Jira**.	Select the work item **BUGFIX** created in **Preparations**.

Step 6 Click **OK**. A message is displayed, indicating that the change is created successfully. The change details page is displayed.

The details page displays the change overview, associated work items, and operation history. You can submit the change for release, exit release, or cancel the change.

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Figure 14-4 Change details



A change's lifecycle includes developing, to be released, releasing, and released.

For a change in the **Developing** status, click **Edit Work Item** to modify the associated work item.

The following describes how to submit a change for release, exit release, and cancel the change.

- Submit for release

  For a change in the **Developing** status, click **Submit for Release**. The **Submit for Release** dialog box is displayed.

  - If the microservice does not have a change-triggered pipeline, create one by referring to **Creating a Change-triggered Pipeline**.
  - If there is a change-triggered pipeline, click **OK** to submit the change.

  After the change is submitted, the change status changes from **Developing** to **To be released**.

- Exit release

  For a change in the **To be released** or **Releasing** status, click **Exit Release** to exit the release. The change status will change to **Developing**. For a change in the **Releasing** status, if the change-triggered pipeline is running, you cannot exit release.

- Cancel a change

  For a change in the **Developing** status, click **Cancel Change**.

  In the displayed dialog box, click **OK**. The change status changes to **Canceled** and the change will be deleted.

----End

Creating a Change-triggered Pipeline

Step 1 **Access the CodeArts Pipeline homepage** through a project.

Step 2 Click the **Microservices** tab.

Step 3 Click a microservice name. The **Overview** page is displayed.

Step 4 Switch to the **Pipelines** tab.

Step 5 Click **Create Pipeline**. On the displayed page, configure parameters.

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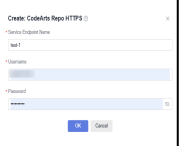
Table 14-4 Pipeline parameters

Parameter	Description	Example Value
Name	Pipeline name, which is generated based on the creation time by default. Enter a maximum of 128 characters, including only letters, digits, underscores (_), and hyphens (-).	Enter **Pipeline-1**.
Agency URN	Unique identifier of IAM agency. If set: uses this agency identity and permissions to access other cloud services. If not set: uses the operator's identity and permissions.	-
Project	Project to which the microservice belongs.	The default value is **project01**.
Pipeline Source	Source of the code repository. Only **Repo** is supported.	Select **Repo**.
Repository	Name of the repository associated with the microservice. If you change the code repository of a microservice, the repository for all pipelines of the microservice will also be changed.	Select **Repo01**.
Default Branch	The default branch associated with the microservice. If you change the default branch of a microservice, the default branch for all pipelines of the microservice will also be changed.	Select **master**.
Repo Endpoint	• Configure an endpoint to elevate permissions on repository operations. Endpoints are used for change-triggered pipelines and repository operation extensions. Click **Create One** to create a Repo endpoint. For details, see *Creating Service Endpoints*. • If you use an incorrect username or password when creating this endpoint, the pipeline will fail to run. For details, see **FAQs**.	Create an endpoint as shown in the following figure. 
Alias	Repository alias. Enter a maximum of 128 characters, including only letters, digits, and underscores (_). After you set a repository alias, system parameters will be generated based on the alias. For example, *Alias*_**REPOSITORY_NAME** indicates the repository name. You can check the generated parameters on the **Parameter Configuration** page and reference them in a pipeline in the format of *${Parameter name}*.	-

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Parameter	Description	Example Value
Change-based Trigger	If **Change-based Trigger** is enabled for a pipeline, this pipeline is marked with . A microservice can have only one change-triggered pipeline.	Toggle on  to enable **Change-based Trigger**.
Description	Pipeline description. Enter a maximum of 1,024 characters.	-

Step 6 Click **Next**. On the displayed page, select a template or select **Blank Template**.

Step 7 Click **OK**. On the **Task Orchestration** tab page, **orchestrate a pipeline**.

Step 8 Click **Save**. A message is displayed, indicating that the pipeline is saved successfully.

----End

Executing a Change-triggered Pipeline

Step 1 **Access the CodeArts Pipeline homepage** through a project.

Step 2 Click the **Microservices** tab.

Step 3 Click a microservice name. The **Overview** page is displayed.

Step 4 Switch to the **Pipelines** tab.

Step 5 Click a pipeline name. The pipeline **Execution History** page is displayed.

Step 6 Click **Execute** in the upper right corner and configure the execution.

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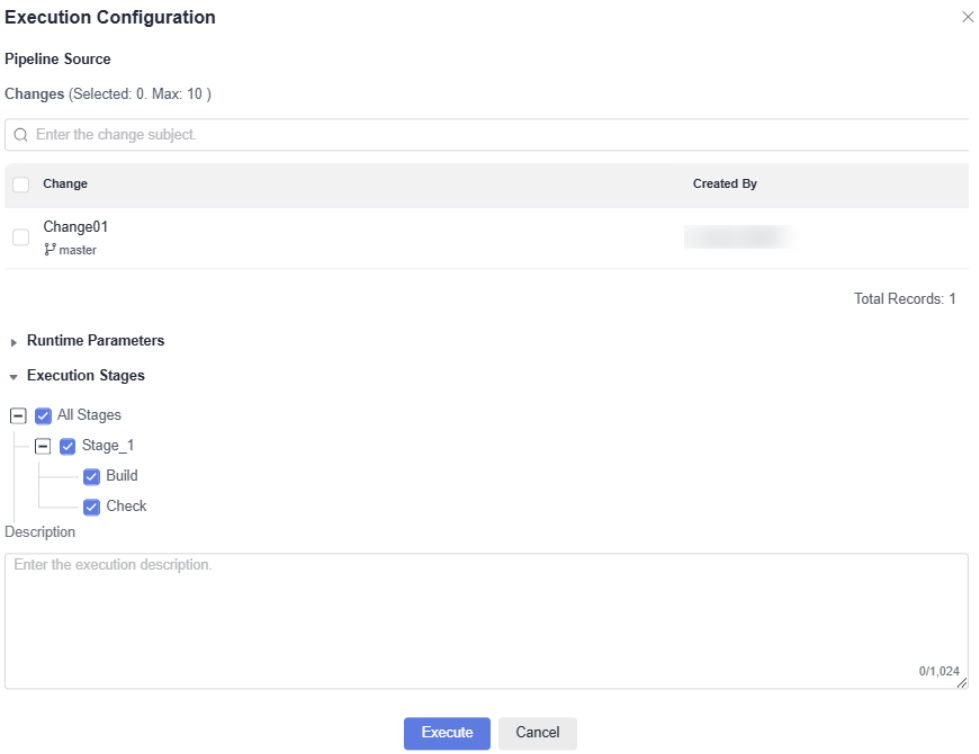
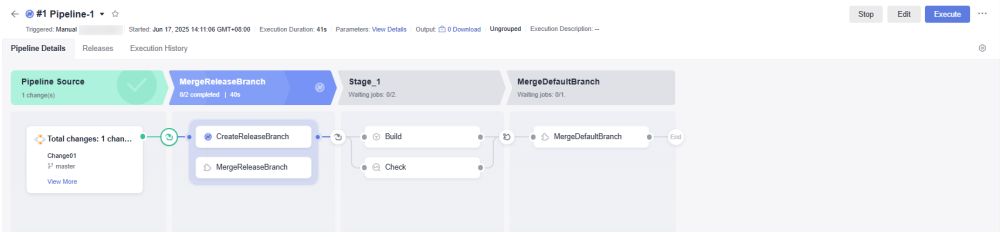
Figure 14-5 Execution configurations for a change-triggered pipeline



- **Changes**: Changes in **To be released** or **Releasing** status are displayed. Select one or more changes.
- **Runtime Parameters**: (Optional) Set runtime parameters and then save them. For details, see **Using a Parameter in a Pipeline**.
- **Execution Stages**: Select one or more jobs to execute. By default, all jobs are selected for execution.
- **Description**: Describe the debugging about the execution.

Step 7 After the configurations, click **Execute**. The pipeline details page is displayed.

Figure 14-6 Executing a change-triggered pipeline



When the change-triggered pipeline is running, there are **MergeReleaseBranch** and **MergeDefaultBranch** stages.

- **MergeReleaseBranch**: The change-triggered pipeline automatically pulls a new branch from the master branch and integrates all change feature branches into the new branch.
- **MergeDefaultBranch**: The new branch is merged to the master branch.

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Step 8 After the execution is complete, check the pipeline execution result. For details about possible problems, see **FAQs**.

After the pipeline was successfully executed, the status of all selected changes changed to **Released**.

- Click the pipeline name to go to its details page.
  - Click **View More** on the pipeline source card. In the displayed dialog box, review the selected changes.
  - Click a change name to go to its details page.
- Click the **Releases** tab.
  - All changes in the **To be released** and **Releasing** statuses are displayed.
  - You can enter a keyword in the search box to search for a change.
  - Click  in the **Operation** column. In the displayed dialog box, click **OK**. The change status will become **Developing**. For a change in the **Releasing** status, you can exit the release only after the change-triggered pipeline execution is complete or stopped.

----End

Tutorial Video

This video shows how to release a change through a change-triggered pipeline.

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15 Managing Pipeline Extensions

15.1 Extensions Overview

CodeArts Pipeline has a collection of built-in extensions covering build, check, deployment, and test. You can use these extensions for pipeline orchestration. Enterprises can quickly connect existing tools to the Pipeline service or develop their own extensions through the extension platform. CodeArts Pipeline provides a visual, low-code, and open extension market to adapt to service requirements.

Accessing the Extension Platform

- Method 1
  a. **Access the CodeArts Pipeline homepage**.
  b. On the CodeArts Pipeline homepage, choose **Services** > **Extensions**.
- Method 2
  a. **Access the CodeArts Pipeline homepage**.
  b. Create or edit a pipeline.
  c. On the **Task Orchestration** page, add or edit a job. On the displayed window, click **More Steps** in the upper right corner.

The extension page displays all available extensions. You can click the card of an extension to check its details.

Scenarios

- You can use extensions provided by CodeArts Pipeline (such as **KubernetesRelease**) to connect to cloud services.
- You can use official tools to develop extensions. CodeArts Pipeline allows you to compile service scripts in mainstream languages, such as Shell, Node.js, Python, and Java. Some basic extensions can be used together with custom executors to provide more execution modes.
- You can also customize extensions to connect to third-party CI/CD tools.

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15.2 Pipeline Official Extensions

CodeArts Pipeline provides official extensions as listed in **Table 15-1**.

Table 15-1 Pipeline Official Extensions

Type	Name	Description
Build	Build	Calls CodeArts Build capabilities. CodeArts Build provides an easy-to-use, cloud-based build platform that supports multiple programming languages, helping you achieve continuous delivery with shorter period and higher efficiency. With CodeArts Build, you can create, configure, and run build tasks with a few clicks. CodeArts Build also supports automated code retrieval, build, and packaging, as well as real-time status monitoring. **Learn more.**
	Build-Template	This extension can be configured only in a pipeline template. When a pipeline is generated based on the template, the extension automatically creates a build job and configures the job in the generated pipeline.
Test	TestPlan	Calls CodeArts TestPlan capabilities. CodeArts TestPlan is a one-stop cloud testing platform provided for software developers. It covers test management and API tests and integrates the DevOps agile testing concepts, helping you improve management efficiency and deliver high-quality products. **Learn more.**
	TestPlan-Template	This extension can be configured only in a pipeline template. When a pipeline is generated based on the template, the extension automatically creates an API test job and configures the job in the generated pipeline.
Deploy	Deploy	Calls CodeArts Deploy capabilities. CodeArts Deploy allows you to visually deploy applications in VMs or containers by using Tomcat, Spring Boot, and other templates. You can also flexibly orchestrate atomic actions for deployment. CodeArts Deploy standardizes your deployment environment and processes by integrating with CodeArts Pipeline. **Learn more.**
	Deploy-Template	This extension can be configured only in a pipeline template. When a pipeline is generated based on the template, the extension automatically creates a deployment job and configures the job in the generated pipeline.
	KubernetesRelease	Allows you to deploy container images to Cloud Container Engine (CCE) or native Kubernetes clusters. It supports rolling release and blue-green deployment.

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Type	Name	Description
	CloudNative Release	Allows you to orchestrate release policies for environments, such as rolling release and grayscale release.
	DeveloperJointCommissioning	This extension is a Kubernetes-based cloud native R&D environment delivery platform. It provides developers with capabilities such as continuous R&D environment delivery and component joint debugging, and helps enterprises reduce R&D environment resource costs.
	CloudReleaseExecutor	This extension executes the deployment policy configured in the **CloudNativeRelease** extension and is called by the **CloudNativeRelease** extension in the background. Manual configuration and direct calls are not supported.
	DeployMicroserviceInstance	This extension updates the deployment configuration of a microservice instance in a specific environment.
	Terraform Deploy	OBT Terraform deployment extension. It supports common Terraform operations such as init, validate, plan, apply, and destroy, and integrates with pipelines for orchestration.
Check	Check	Calls CodeArts Check capabilities. CodeArts Check is a cloud-based management service that checks code quality. Developers can easily perform static code and security checks in multiple languages and obtain comprehensive quality reports. CodeArts Check also provides bug fixing suggestions and trend analysis to control code quality and reduce costs. **Learn more.**
	Check-Template	This extension can be configured only in a pipeline template. When a pipeline is generated based on the template, the extension automatically creates a Check job and configures the job in the generated pipeline.
	BranchCheck	Specifies the target branch. If the current running branch lags behind the specified branch, the pipeline fails to run.
	Pass-Conditions-of-Standard-Policies	A standard extension policy for access control.
Normal	CreateTag	Creates and pushes tags for code repositories.
	Subpipeline	Configures and calls other pipelines in a project.

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Type	Name	Description
	JenkinsTask	Calls Jenkins tasks. Currently, this function is available in **LA-Mexico City2**, **LA-Sao Paulo1**, and **AP-Singapore**.
	DelayedExecution	Pauses pipeline for a period of time or until a specified time. You can manually resume or stop a pipeline, or delay the execution for a maximum of three times.
	ManualReview	Creates manual review tasks by assigning one person or one group.
	GitClone	Clones the code repositories configured in the pipeline source, which can be used together with shell commands and Maven build. Currently, this function is available in **LA-Mexico City2**, **LA-Sao Paulo1**, **AP-Singapore**, and **TR-Istanbul**.
	ExecuteShellCommand	Runs shell commands.
	upload-obs	Uploads files to Huawei Cloud OBS.
	download-obs	Downloads files from OBS to local.
	CreateReleaseBranch	Creates a release branch based on the default branch of a microservice. This extension is automatically configured by a change-triggered pipeline.
	MergeReleaseBranch	Merges a feature branch into a release branch. This extension is automatically configured by a change-triggered pipeline.
	MergeDefaultBranch	Merges a release branch into the default branch of a microservice. This extension is automatically configured by a change-triggered pipeline.
	Execute Docker Operations	Executes specified Docker operations. This extension can run only in a custom executor.

15.3 Customizing Extensions on the GUI

You can create, configure, and manage extensions on the GUI.

Notes and Constraints

- Version of the extension should be in *X.X.X* format. Each digit ranges from 0 to 99.
- Information on the **Version Info** page cannot be modified later.

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Creating an Extension

Step 1 Access the CodeArts Pipeline homepage.

Step 2 On the CodeArts Pipeline homepage, choose **Services** > **Extensions**.

Step 3 On the displayed page, click **Build Extension**.

Step 4 Set basic information. For details, see **Table 15-2**.

Table 15-2 Extension information

Parameter	Description
Icon	Icon of the extension. Upload an image in PNG, JPEG, or JPG format, with a file size no more than 512 KB (recommended: 128 x 128 pixels). If no image is uploaded, the system generates an icon.
Name	The extension name displayed in the extension platform. Enter only spaces, letters, digits, underscores (_), hyphens (-), and periods (.) with a maximum of 50 characters.
Unique Identifier	ID of the extension. Once set, this parameter cannot be changed. Enter only letters, digits, underscores (_), and hyphens (-) with a maximum of 50 characters.
Type	Type of the extension, which can be **Build**, **Check**, **Test**, **Deploy**, or **Normal**. Once set, this parameter cannot be changed.
Description	Purposes and functions of the extension. The description can be edited. Enter no more than 1,000 characters.

Step 5 Click **Next**. On the **Version Information** page, set the version and description.

Step 6 Click **Next**. The **Input** page is displayed. Configure widgets as needed.

You can drag and drop widgets to generate visual forms and to streamline pipeline contexts. Multiple preset widgets are available: **Single-line Text Box**, **Digit**, **Single-selection Drop-down List**, **Multi-selection Drop-down List**, **Option Button**, **Switch**, **Multi-line Text Box**, and so on.

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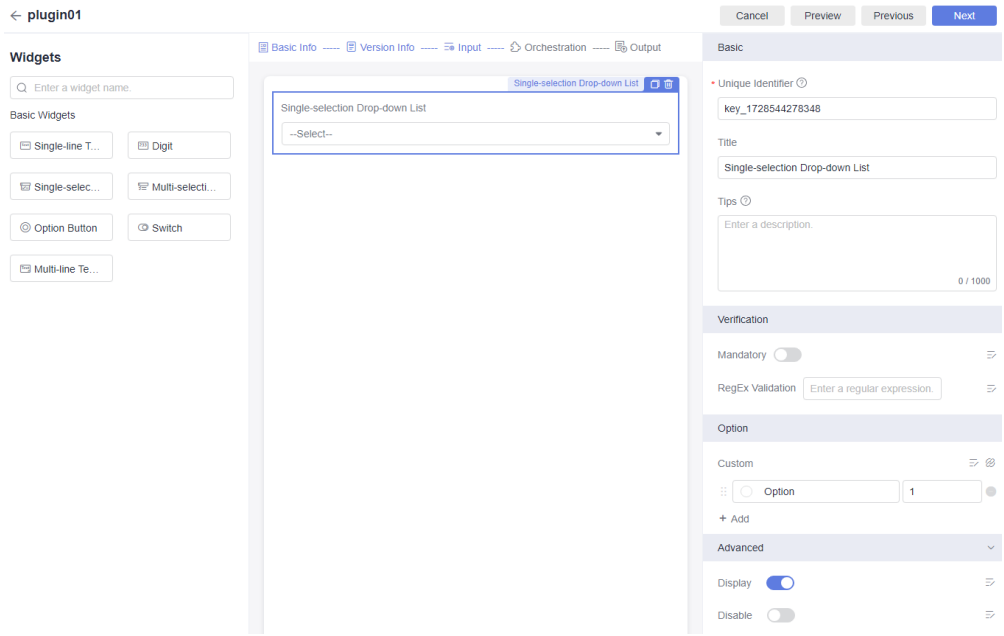
Figure 15-1 Orchestrating widgets



Drag required widgets to the middle area. Click a widget and configure its parameters on the right part of the page.

Table 15-3 Widget parameters

Category	Parameter	Description	Widget
Basic	Unique Identifier	Unique ID of the widget. The ID is used to obtain widget input. Enter only letters, digits, underscores (_), and hyphens (-) with a maximum of 200 characters.	All
	Title	Name of the widget. The name will be displayed on the pipeline job orchestration page. Enter no more than 140 characters.	All
	Tips	Tooltip of the widget. Enter no more than 1,000 characters.	All
	Placeholder	Informative message displayed in the text box. For example, what value should be input.	Single-line Text Box
	Accuracy	Number of decimal places allowed in a widget value: **0** to **4**.	Digits

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Category	Parameter	Description	Widget
	Default Value	Default value of the widget.	Single-line Text Box, Digit, Switch, Multi-line Text Box, and Metrics
Verification	Mandatory	Whether the widget content is mandatory. Error messages can be set.	Single-line Text Box, Digit, Single-selection Drop-down List, Multi-selection Drop-down List, Option Button, and Multi-line Text Box
	RegEx Validation	Verifies the widget content. You can set error messages.	Single-line Text Box, Digit, Single-selection Drop-down List, Multi-selection Drop-down List, and Multi-line Text Box
	Word limit	Max. widget characters.	Multi-line Text Box
Option	Custom	Options available for the widget. Click + Add to add an option. Click ⊖ to delete an option. • Option name: option displayed on the extension configuration page. • Value: value delivered when the extension is running. In addition to manual configuration, set options by: • APIs: Set options by configuring web APIs. Click ✎ on the right. On the displayed dialog box, you can configure parameters after enabling the function. For details, see **Table 15-4**. • Context: Configure data source to obtain the URL of the pipeline source or IDs of build jobs. Click 🔗 next to **Custom**. The context dialog box is displayed. You can configure parameters after enabling the function.	Single-selection Drop-down List, Multi-selection Drop-down List, and Option Button
Advanced	Display	Whether the widget is visible. You can click ✎ on the right to set display conditions.	All

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Category	Parameter	Description	Widget
	Disable	Whether the widget is disabled (not disabled by default). You can click on the right to set conditions.	All

Table 15-4 API parameters

Parameter	Description
Enabled	By enabling the function, you can set options by configuring APIs.
Linked Attribute	Associates the selected widgets with the API to transfer parameters. When a widget value is changed, the new value is used to call the API again.
URL	Only HTTPS protocol is supported.

Returned Data Path	The widget used must be list data. In the following response body example, the returned data path is **result.parameters**.
	{
	"result": {
	"total": 2,
	"parameters": [
	{
	"id": 3353753,
	"name": "parameters01"
	},
	{
	"id": 3353697,
	"name": "parameters02"
	}
	]
	},
	"status": "success"
	}

Option Value	Set this parameter to the value of the corresponding field in the returned data path. This parameter is delivered when the extension is running.
Option Name	Set this parameter to the value of the corresponding field in the returned data path. This parameter is displayed on the extension configuration page.
Params	Params parameters of the API request body.
Header	Header parameters of the API request body.

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Parameter	Description
Remote Search	Enable this function to add a remote search field. For extension search, the entered value will be used as the value of the remote search field to call the API again. • Params parameter: The parameter type of the search field is the Params parameters of the API request body. • Body parameter: The parameter type of the search field is the Body parameters of the API request body.
Search Tip	Describes the search function and is displayed below the search bar. Max. 100 characters.

Step 7 Click **Next**. On the displayed **Orchestration** page, you can add the **ExecuteShellCommand** extension.

- **ExecuteShellCommand**: executes shell commands entered by users.

  Enter shell commands. Commands will be executed when a pipeline calls the extension. The commands indicate the actual service logic implementation process of an extension. For more input and output configurations, see **Customizing Shell Commands**.

Step 8 Click **Next**. On the **Output** page, click **Add Configuration** to configure output information, including **output**, **link**, **table**, and **metric**. After the pipeline is executed, go to the job result page to check the extension execution results. The result information is displayed by result type.

- **output**: displayed on the **Others** card. It outputs data together with shell commands.
- **metric**: displayed on the **Others** card. It outputs metric thresholds. The thresholds information can be referenced in an extension and finally applied to pipelines.
- **link**: displayed on the **Link** card. You can click the link to go to the corresponding page.
- **table**: displayed on the **Tabular Data** page. It is an object array and displays the array information in a table.

Step 9 After the configuration, click **Release** or **Release Draft**.

- Draft release

  Click **Release Draft** to release a test version.

  - You can configure a draft extension in a pipeline for debugging. After debugging, the draft extension can be officially released, so that other members of the current tenant can use the extension.
  - All draft versions are marked with **Draft**.
  - Only one draft is allowed. If there is already a draft, no more versions can be created until you officially release or delete the draft.

- Official release

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Click **Release** to release an official version. An official extension has a unique version number. All members of the current tenant can use this version in a pipeline.

----End

Customizing Shell Commands

When registering an extension or creating an extension version, you can use shell commands to implement service logic. The commands usually involve interaction with all kinds of data during pipeline execution. This section describes how to implement extension logic through data input and output.

- Data Input

  The obtained data consists of low-code GUI input, pipeline run parameters, and other information.

  - Low-code GUI input: Obtain the low-code user interface output using environment variables, for example, **echo $*{Widget ID}***.
  - Pipeline run parameters: Some pipeline run parameters will be delivered to environment variables, as shown in the following table.

    Table 15-5 Pipeline environment variables

Variable	Description
STEP_NAME	Step name of the pipeline.
STEP_ID	Step ID of the pipeline.
PLUGIN_VERSION	Version of the extension.
PIPELINE_ID	Pipeline ID.
PIPELINE_RUN_ID	Pipeline execution ID.
PLUGIN_NAME	Extension name.
PROJECT_ID	Project ID.
JOB_ID	Job ID of the pipeline.
RESULT_MSG_PATH	Directory for storing the file of extension execution result. The $*{STEP_ID}*_result.json and $*{STEP_ID}*_metrics.json files are written to this directory to report the execution result to the pipeline.

  - Other information: Obtain information by interacting with external data through Git, Wget, and Curl.

- Data Output

  Once executed, the custom extension can read file information in a specified path and obtain the metric data output.

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a. On the configuration page, configure the thresholds output of the extension.

b. During development, the *${STEP_ID}*_**result.json** and *${STEP_ID}*_**metrics.json** files are stored in a specified path so that metric values can be parsed.

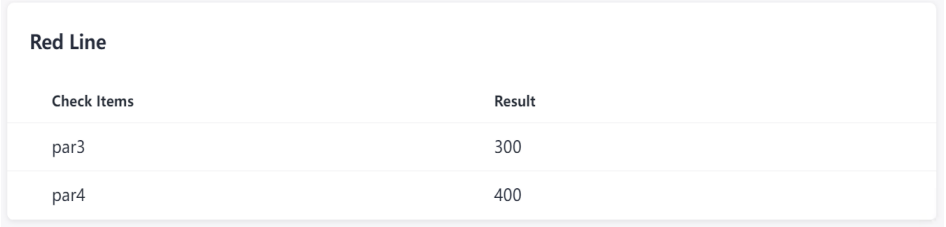
Table 15-6 Output files

File	Description
${RESULT_MSG_PATH}/${STEP_ID}_result.json	The output is a text file in {"par1":123, "par2":456} format. After the pipeline is executed, the result will be displayed as the corresponding task result. Only extensions of the check type can display the result.
${RESULT_MSG_PATH}/${STEP_ID}_metrics.json	The output is a text file in {"par1":123, "par2":456} format. The **Metrics** widget should be configured. After the extension is executed, the threshold configured for the **Metrics** widget and the content of *${STEP_ID}*_**metrics.json** are parsed for pipeline pass conditions. Notes: ● During parsing, empty key values in the **Metrics** widget will be ignored. ● If the key value configured for the **Metrics** widget cannot be found in the *${STEP_ID}*_**result.json** file, the specified threshold value will be used.

Example: **par1** and **par2** for task result display; **par3** and **par4** for pass conditions. The sample code is as follows:

```
# Optionally, construct the extension output.
echo '{"par1":100,"par2":200}' > ${RESULT_MSG_PATH}/${STEP_ID}_result.json
echo '{"par3":300,"par4":400}' > ${RESULT_MSG_PATH}/${STEP_ID}_metrics.json
```

c. After the extension run is complete, click the extension card to view the output.



If policies are configured for the current extension and applied to the pipeline pass conditions, click the pass conditions to check the check status.

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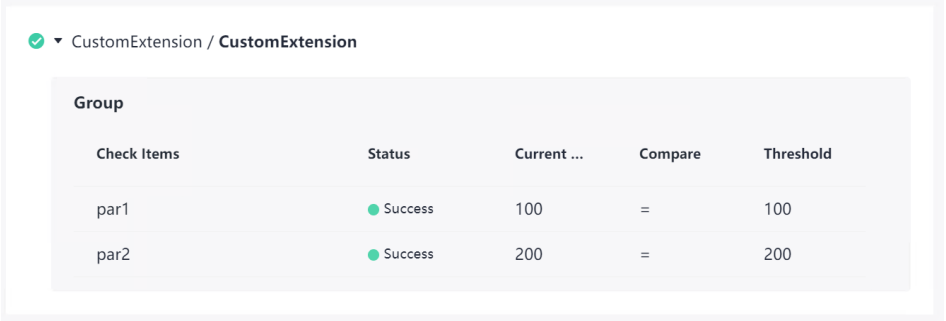


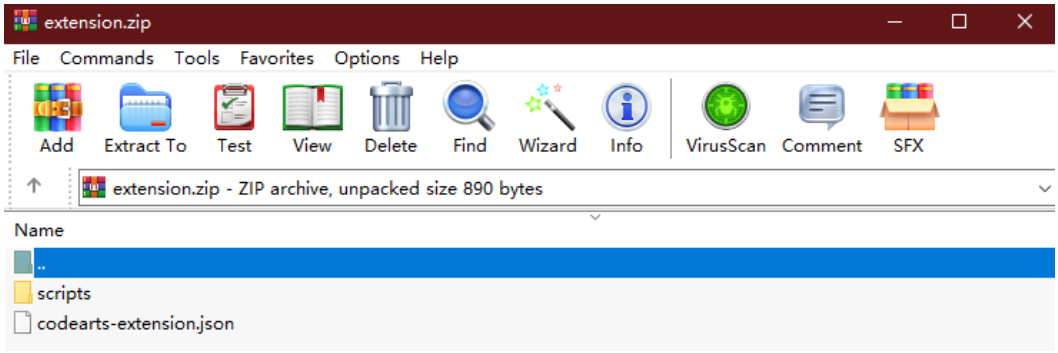
15.4 Creating an Extension by Uploading an Extension Package

You can create and configure a pipeline extension by writing code for better flexibility and maintainability.

Preparing an Extension Package

Extension package

Figure 15-2 Extension package structure



Notes

- The extension package must be in the ZIP format.
- The root directory of the package must contain a metadata file **codearts-extension.json**. For more information about the file, see **codearts-extension.json**.
- The **resources.json** file can be encoded only using UTF-8.

File structure

```
extension.zip                    # ZIP package of the extension
  | -- scripts                   # (Optional) Script folder for storing scripts that contain extension execution logic.
  |    | -- xxx                  # Script that contains extension execution logic
  | -- i18n                      # (Optional) Contents in multiple languages
  |    | -- zh-cn                # Contents in Chinese environment
  |         | -- resource.json   # Internationalization resources
  |    | -- en-us                # Content in English environment
  |         | -- resources.json  # Internationalization resources
  | -- codearts-extension.json   # (Mandatory) Extension execution file (in JSON format), including basic information, inputs, and execution
```

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Creating an Extension

Step 1 Access the CodeArts Pipeline homepage.

Step 2 On the CodeArts Pipeline homepage, choose **Services** > **Extensions**.

Step 3 Click the drop-down list box next to **Build Extension** and click **Upload Extension**.

Step 4 Set basic information. For details, see **Table 15-7**.

Table 15-7 Extension information

Parameter	Description
Icon	Icon of the extension. Upload an image in PNG, JPEG, or JPG format, with a file size no more than 512 KB (recommended: 128 x 128 pixels). If no image is uploaded, the system generates an icon.
Name	The extension name displayed in the extension platform. Enter only spaces, letters, digits, underscores (_), hyphens (-), and periods (.) with a maximum of 50 characters.
Unique Identifier	ID of the extension. This value should be consistent with the **name** field of the **codearts-extension.json** file. Once set, this parameter cannot be changed. Enter only letters, digits, underscores (_), and hyphens (-) with a maximum of 50 characters. Mapping between the extension type and the value of **category**: • Build: **Build** • Check: **Gate** • Deploy: **Deploy** • Test: **Test** • Normal: **Normal**
Type	Type of the extension, which can be **Build**, **Check**, **Test**, **Deploy**, or **Normal**. Once set, this parameter cannot be changed.
Description	Purposes and functions of the extension. The description can be edited. Enter no more than 1,000 characters.

Step 5 Click **OK**. The version management page is displayed.

Step 6 On the displayed page, click the upload extension button. In the displayed dialog box, select the desired extension (with input definition and execution script) and upload it. After the upload is successful, the version will be marked with **Draft**.

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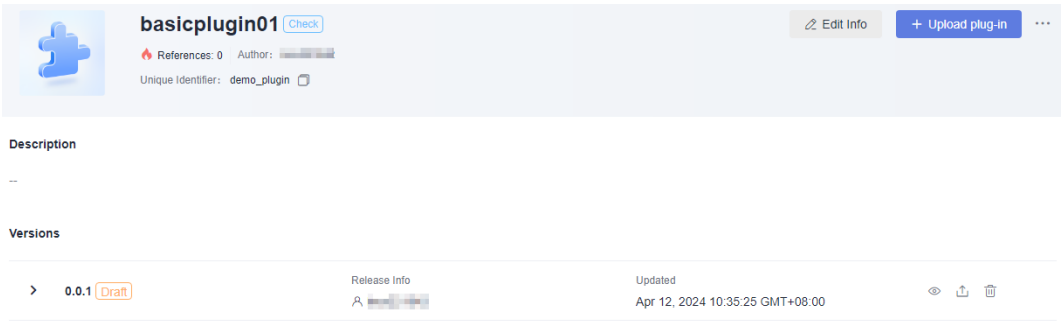
Figure 15-3 Uploading an extension



Step 7 Using an extension in a pipeline

Create a pipeline. On the **Task Orchestration** page, create a job, add the registered basic extension, and set parameters.

Step 8 Click **Save and Execute**. After the execution is complete, click the extension name to view the execution result.

Step 9 (Optional) After debugging, publish the extension as an official version.

1. Go to the extension page.
2. Click the registered basic extension.
3. On the displayed page, click on the right to publish the version as an official version.

The draft version can be overwritten for multiple times. However, the official version cannot be updated. You can click **Upload plug-in** in the upper right corner to upload a new version.

----End

codearts-extension.json

Example:

```
{
   "type": "Task",
   "name": "demo_plugin",
   "friendlyName": "Extension name",
   "description": "This is an extension.",
   "category": "Gate",
   "version": "0.0.2",
   "versionDescription": "Updated based on the initial version 0.0.1",
   "dataSourceBindings": [],
   "inputs": [
      {
   "name": "samplestring",                    # Use ${samplestring} in a script to obtain the value configured by an executor in a pipeline
   "type": "input",                           # Different types correspond to different functions
   "description": "Sample String",            # Description of input
   "defaultValue": "00",                      # Default value when the value of the required field is false
   "required": true,                          # Reset defaultValue if the required field is true, or the default value will be used
          "label": "Text box",                # input information displayed on the pipeline editing page
          "validation": {
             "requiredMessage": "Enter a value",          # (Optional) The message displayed when the required field is left blank
             "regex": "^[a-zA-Z0-9-_\\u4e00-\\u9fa5]{1,32}$", #(Optional) RegEx validation
             "regexMessage": "Type error"                 # (Optional) The message displayed when RegEx validation failed
```

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```
        }
      }
  ],
  "execution": {
     "type": "Shell",
     "target": "scripts/execution.sh"
  },
  "outputs": [{
        "name": "okey",                    # Output name.
        "type": "output",                  # Output type: output or metrics.
        "description": "Description",
        "prop": {
           "defaultValue": "123"           # Default value
        }
     },
     {
        "name": "mkey",
        "type": "metrics",
        "description": "Description",              # Description of outputs, explaining what the value
represents.
        "prop": {
           "defaultValue": "213",
           "group": "213"                  # Corresponding to the group name in pass conditions          }
     }
  ]
}
```

The parameters of **codearts-extension.json** are described in the following table.

Table 15-8 Parameters

Parameter	Description
type	The value is fixed to **Task**, which indicates an extension type.
name	Same as the **Unique Identifier** field set for extension registration
friendlyName	Same as the **Name** field set for extension registration
category	Same as the **Type** field set for extension registration, which can be: ● Build: corresponds to the extension of the **Build** type. ● Test: corresponds to the extension of the **Test** type. ● Gate: corresponds to the extension of the **Check** type. ● Normal: corresponds to the extension of the **Normal** type. ● Deploy: corresponds to the extension of the **Deploy** type.
version	Version of the extension, which consists of three numbers separated by dots (.), with each number ranges from 0 to 99. Modify this parameter only when you need to add an official version.
description	Description of the extension.
versionDescription	Description of the extension version's unique features.
dataSourceBindings	Disabled currently. Set it to **[]**.

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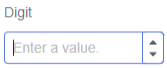
Parameter	Description
inputs	Extension input content. This parameter corresponds to the extension display format on the pipeline page. The values can be referenced by environment variables in service scripts.
execution	Extension execution content. The **type** field indicates the service script language, and the **target** field indicates the path to the execution file. You are advised to create a **scripts** folder and place the content under it.
outputs	Extension output content. The value can be used as the gate metrics. **output** has different display. **output** is used in the pipeline context. The output content can be used in subsequent stages or displayed in the task execution result. **metrics** data is used to create pass rules. For details, see **Table 15-12**.

Supported inputs are listed in the following table.

Table 15-9 inputs

Type	Widget	Example	extendProp
input	Single-line Text Box		• visibleConditions • disabledConditions
inputNumber	Digit		• visibleConditions • disabledConditions
switch	Switch		• visibleConditions • disabledConditions

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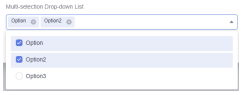
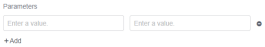
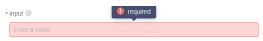
Type	Widget	Example	extendProp
singleSelect	Single-selection Drop-down List		• options • apiType • apiOptions
multipleSelect	Multi-selection Drop-down List		• options • apiType • apiOptions
keyValuePair	Key-Value Pair		• visibleConditions • disabledConditions
radio	Option Button		options
timeInterval	Time Interval		• visibleConditions • disabledConditions
shell	Shell		• visibleConditions • disabledConditions
endpoint:*${module_id}*	Endpoint		• visibleConditions • disabledConditions

inputs fields are listed in the following table.

Table 15-10 inputs fields

Field	Description	Mandatory	Remarks
name	Unique ID of the widget	Yes	The value must be unique.
label	Widget title	Yes	-
type	Widget type	Yes	-
defaultValue	Initial value	No	Initial default value of a widget. This field can be left blank.
description	Widget description	No	The infotip message next to a widget name 
required	Whether a parameter is mandatory.	No	Fields marked with asterisks (*) are mandatory.

validation	Validation information, which is an object that contains the **requiredMessage**, **regex**, and **regexMessage** properties.
	{
	requiredMessage: '', // Prompt message for a mandatory field
	regex: '', // RegEx validation
	regexMessage: '' // The message displayed when RegEx validation failed
	}
		No	

extendProp	Extension field
	{
	visibleConditions: [],
	disabledConditions: []
	...
	}
		No	For details about extendProp, see **Table 15-11**.

extendProp functions are listed in the following table.

Table 15-11 extendProp functions

Field	Description	Mandatory	Remarks

visibleConditions	Widgets are displayed if conditions are met.	No	Multiple conditions can be included:
			`[{},{},{},...]`
			Example:
			`[{comp:'key_001',symbol:'===', value: 'xxx'}]`
			In this example, widget A will be displayed if widget B has a unique ID of *key_001* and has a value that is equal to (===) *xxx*.
			symbol can be:
			• ===: Equal
			• !==: Not equal
			• empty: Empty
			• notEmpty: Not empty

disabledConditions	Widgets are disabled if conditions are met.	No	Multiple conditions can be included:
			`[{},{},{},...]`
			Example:
			`[{comp:'key_002',symbol:'!==', value: 'yyy'}]`
			In this example, widget A will be disabled if widget B has a unique ID of *key_002* and has a value that is not equal to (!==) *yyy*.
			symbol can be:
			• ===: Equal
			• !==: Not equal
			• empty: Empty
			• notEmpty: Not empty

options	The fixed drop-down list. The field's type is **list**.	No	Example: `[{label:'option 1',value: 1},{label:'option 2',value: 2}]`

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Field	Description	Mandatory	Remarks
apiType	Options in the drop-down list box: • **fixed**: The values in **options** are used as options. • **api**: API requests, available only when **apiOptions** is configured.	No	If this field is left blank, **fixed** is used.

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Field	Description	Mandatory	Remarks

apiOptions	JSON body, including parameters used by APIs.	No	Example:
			'{"body":{"xxx":111},"header":{"yyy":222},"linkedFields":["key_001"],"method":"POST","params":{"zzz":333},"remote":true,"remoteName":"xxx","remoteQueryField":"body","responseUrl":"data","label":"name","value":"id","url":"https://sss/lll/mmm"}'
			JSON (parsed):
			{
			body: {xxx:111}, // Request parameters for calling an API
			header: {yyy: 222}, // Request header field
			params: {zzz: 333}, // Request parameters for calling an API
			linkedFields: ['key_001'], // This field is associated with other widgets. When the value of another widget changes, the API will be called again and the current options will be cleared.
			method: 'POST', // Request mode: POST or GET
			remote: true, // Whether to enable remote search
			remoteName: 'tt', // Field to be searched in a remote search
			remoteQueryField: 'body', // Parameter passing method for the remote search field: body or params
			responseUrl: 'data', // The path of the option list obtained in the returned data
			label: 'name', // Parameter corresponding to the label in ComboBox
			value: 'id', // Parameter corresponding to the actual value in ComboBox
			url: 'https://sss/lll/mmm' // API URL
			}

outputs fields are listed in the following table.

Table 15-12 outputs fields

Field	Description	Mandatory	Remarks
name	Output name.	Yes	The value must be unique.

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Field	Description	Mandatory	Remarks
type	Output type. • **output**: displayed on the **Others** card and used in **pipeline contexts**. • **metrics**: displayed on the **Others** card. It outputs metric thresholds. The thresholds information can be referenced in the extension and finally applied to pipelines. For details, see **Configuring a Rule**. • **link**: displayed on the **Link** card. You can click the link to go to the corresponding page. • **table**: displayed on the **Tabular Data** page. It is an object array and displays the array information in a table.	Yes	-
description	Description of the value. This parameter is mandatory when **type** is set to **metrics**.	-	-

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Field	Description	Mandatory	Remarks
prop	When **type** is set to **metrics**, **group** corresponds to the group name in pass rules and this parameter is mandatory.	-	-

15.5 Executing Images

You can use the **ExecuteImage** extension to download public images from SWR to a custom executor and start the images.

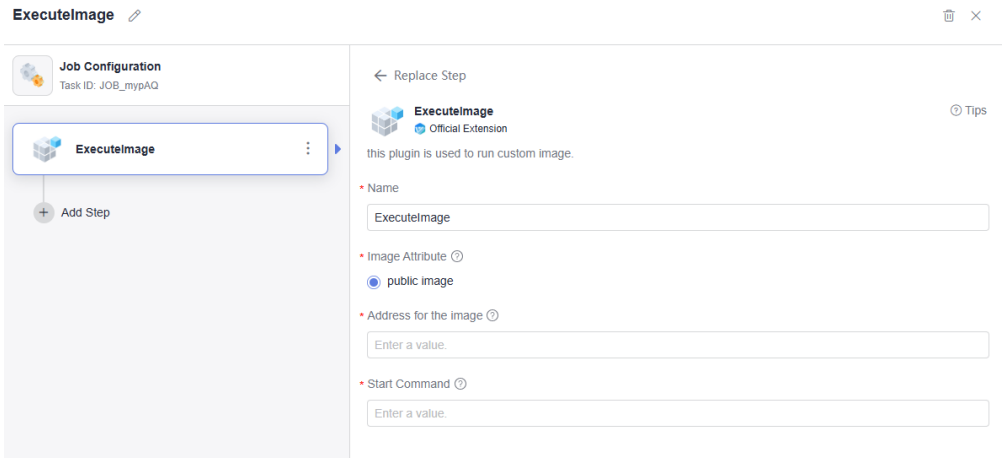
Constraints

This extension supports only custom executors. Before using a custom executor, add an agent pool. For details, see **Agent Pools**.

Configuration Method

Step 1 Add the **ExecuteImage** extension when you **orchestrate a pipeline**.

Figure 15-4 Extension for executing images



Step 2 Set parameters as shown in the following table.

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Parameter	Description
Name	Extension name. • Enter only letters, digits, hyphens (-), underscores (_), commas (,), semicolons (;), colons (:), periods (.), slashes (/), parentheses (), and spaces. • Enter 1 to 128 characters.
Image Attribute	Only public images are supported.
SWR Image Address	Address of the SWR images to be downloaded. To obtain the address: 1. Log in to SWR. 2. In the navigation pane, click **My Images**, click the image name to go to the image details page. 3. Click to copy the image download command. The part following **docker pull** is the image path.
Startup Command	Container startup command. Enter Docker commands to run specific applications or scripts in the container.

----End

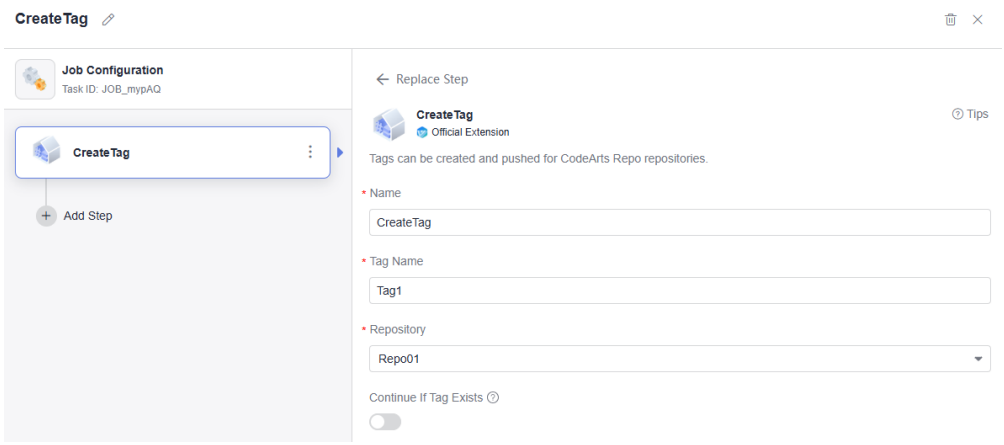
15.6 Pushing Tags for Code Repositories

You can create and push tags for code repositories.

Configuration Method

Step 1 Add the **CreateTag** extension when you **orchestrate a pipeline**.

Figure 15-5 Adding the CreateTag extension



Step 2 Set parameters as shown in the following table.

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Parameter	Description
Name	Extension name. • Enter only letters, digits, hyphens (-), underscores (_), commas (,), semicolons (;), colons (:), periods (.), slashes (/), parentheses (), and spaces. • Enter at least one character.
Tag Name	Tag name.
Repository	Select the corresponding code repository.

- Click the toggle  to enable **Continue If Tag Exists**. If the created tag exists in the code repository, no error is reported and the pipeline continues to run. Otherwise, the execution fails.

----End

15.7 Calling Third-Party APIs

You can configure web APIs to call third-party APIs.

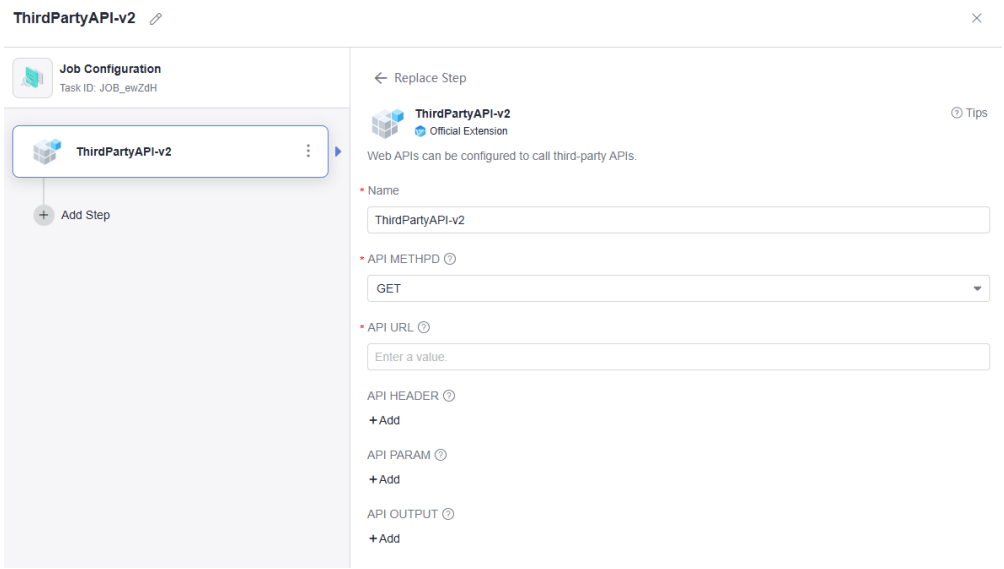
Constraints

- The **ThirdPartyAPI-v2** extension requires certificate verification. Custom certificate is not supported.
- If the API return code is not **2***XX*, the operation fails.

Configuration Method

Step 1 Add the **ThirdPartyAPI-v2** extension when you **orchestrate a pipeline**.

Figure 15-6 Adding the ThirdPartyAPI-v2 extension



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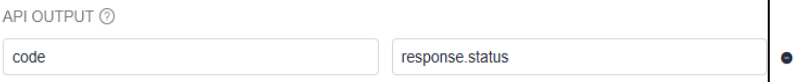
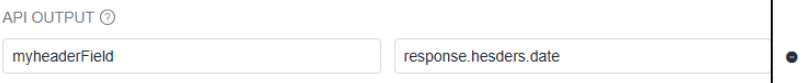
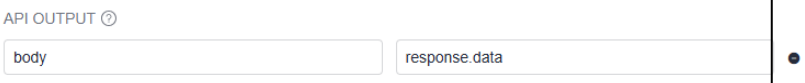
Step 2 Set parameters as shown in the following table.

Parameter	Description
Name	Extension name. • Enter only letters, digits, hyphens (-), underscores (_), commas (,), semicolons (;), colons (:), periods (.), slashes (/), parentheses (), and spaces. • Enter at least one character.
Request method	Select **GET**, **POST**, **PATCH**, **PUT**, or **DELETE**.
API URL	API that can be called by the public network. Certificate verification is required.
Request header	Configure key-value pairs.
Request parameter	Configure key-value pairs.
Request body	If the request method is **POST**, **PATCH**, or **PUT**, enter the body in JSON format.
API output	The root object name is **response** which includes multiple outputs. • To obtain the specific request return code, and if the output key is **code**, refer to the following figure.  • If the returned request header contains the **date** field, refer to the following figure to obtain the **date** value.  • To output the entire body, refer to the following figure.  • If the returned JSON body is as follows and you need to obtain the value of **field**, refer to the following figure. `{ "result": { "field": "value", "field1": "value1" } }` 

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Step 3 After the extension is executed, if you want to use the output, see **Pipeline Contexts**.

----End

16 Creating Service Endpoints

Scenario

A service endpoint is an extension of CodeArts. It enables CodeArts to connect to third-party services.

For example, when your CodeArts tasks need to obtain project source code from a third-party GitHub repository or need to run with Jenkins, you can create an endpoint to connect to each service.

The following table lists the endpoints supported by CodeArts.

Table 16-1 Service endpoints

Type	Scenario
Docker repository	Connect to a third-party Docker image repository. After the connection is successful, CodeArts Deploy can obtain Docker images from the repository.
Jenkins	Connect to a third-party Jenkins service. After the connection is successful, pipelines can call and execute the tasks in the Jenkins service.
Kubernetes	Connect to a Kubernetes cluster. After the connection is successful, you can deploy applications to the relevant Kubernetes cluster.
Nexus repository	Connect to a third-party private Maven repository. After the connection is successful, build tasks can obtain the file information of the repository.
Git repository	Connect to a third-party Git repository. After the connection is successful, CodeArts Pipeline and CodeArts Build can obtain the branch information of the repository.
GitHub	Connect to a GitHub account. After the connection is successful, CodeArts Pipeline and CodeArts Build can obtain the repository and branch information of the account.

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Type	Scenario
IAM user	Delegate your AK/SK to an IAM user so that the user can obtain a token to perform tasks that require higher permissions.
CodeArts Repo HTTPS	Authorize CodeArts to download code, create branches, merge branches, and commit code in CodeArts Repo repositories. Currently, it is used for change-triggered pipelines and related extensions.
GitLab	Connect to a GitLab repository. After the connection is successful, CodeArts Pipeline and CodeArts Build can obtain the branch information of the repository.
Bitbucket	Connect to a Bitbucket account. After the connection is successful, CodeArts Pipeline and CodeArts Build can obtain the repository and branch information of the account.
AGC	Connect to AppGallery Connect (AGC) APIs. After the connection is successful, pipelines can use the service.
Jira	Connect to a third-party Jira service. After the connection is successful, services like CodeArts Pipeline and CodeArts Repo can obtain work item information in Jira.

Constraints

- Jenkins, Nexus repository, and GitHub service endpoints cannot be created in the **LA-Santiago** region.
- Jenkins and Nexus repository service endpoints cannot be created in the **TR-Istanbul** area.
- Bitbucket and Jira service endpoints can be created only in the **AP-Singapore** region.

Prerequisites

- You must have the **DevMarket** > **Endpoint** > **create** permission to create service endpoints. For details, see **How Do I Check and Obtain Required Project Permissions?**
- The third-party service to connect can be accessed from the public network without restrictions.

Creating a Service Endpoint

Step 1 Go to the CodeArts homepage.

1. Log in to the **CodeArts console**, click , and select a region where you have enabled CodeArts.
2. Click **Go to Workspace**.

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If your account uses the old billing mode (see **Old Billing Modes**), click **Access Service**.

Step 2 Click the target project name to go to the project.

Step 3 In the navigation pane, choose **Settings** > **General** > **Service Endpoints**.

Step 4 Click **Create Endpoint** and choose a type from the drop-down list.

Step 5 The endpoint has been configured.

The new endpoint is displayed.

----End

The tables below describe the parameters for configuring different types of service endpoints.

Docker Repository

Table 16-2 Creating a Docker repository service endpoint

Parameter	Description
Service Endpoint Name	The name of the service endpoint. Enter a maximum of 256 characters. Letters, digits, hyphens (-), underscores (_), periods (.), and spaces are supported.
Repository Address	The address of the Docker repository to connect. HTTP and HTTPS addresses are supported.
Username	The username of this Docker repository.
Password	The password of this Docker repository.

Jenkins

Table 16-3 Creating a Jenkins service endpoint

Parameter	Description
Service Endpoint Name	The name of the service endpoint. Enter a maximum of 256 characters. Letters, digits, hyphens (-), underscores (_), periods (.), and spaces are supported.
Server URL	The address of the Jenkins service to connect. HTTP and HTTPS addresses are supported.
Username	The username of this Jenkins service.
Password	The password of this Jenkins service.

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Kubernetes

Table 16-4 Creating a Kubernetes service endpoint

Parameter	Description
Service Endpoint Name	The name of the service endpoint. Enter a maximum of 256 characters. Letters, digits, hyphens (-), underscores (_), periods (.), and spaces are supported.
Kubernetes URL	The server address of the cluster to connect. Obtain it by searching for **server** in the cluster configuration file **kubeconfig.json**.
Kubeconfig	The configuration of this cluster. You can enter all the content of the **kubeconfig.json** file.

Nexus Repository

Table 16-5 Creating a Nexus repository service endpoint

Parameter	Description
Service Endpoint Name	The name of the service endpoint. Enter a maximum of 256 characters. Letters, digits, hyphens (-), underscores (_), periods (.), and spaces are supported.
Repository URL	The address of the Nexus repository to connect. HTTP and HTTPS addresses are supported.
Username	The username of this Nexus repository.
Password	The password of this Nexus repository.

Git Repository

Table 16-6 Creating a Git service endpoint

Parameter	Description
Service Endpoint Name	The name of the service endpoint. Enter a maximum of 256 characters. Letters, digits, hyphens (-), underscores (_), periods (.), and spaces are supported.
Git Repository URL	The HTTPS address of the Git repository to connect to. For example, **https ://*.*.*.*/ user/repo.git**.
Username	The username of this Git repository. Optional. Configure it if the repository requires the username for verification.

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Parameter	Description
Password or Access Token	The password or access token of this Git repository. Optional. Configure it if the repository requires the password or access token for verification.

GitHub

Table 16-7 Creating a GitHub service endpoint

Parameter	Description
Service Endpoint Name	The name of the service endpoint. Enter a maximum of 256 characters. Letters, digits, hyphens (-), underscores (_), periods (.), and spaces are supported.
Authentication Mode	Two authentication modes are supported: • **OAuth**: After clicking **Authorize and Confirm**, log in to GitHub for manual authorization. • **Access token**: Enter your access token obtained in GitHub. For details, visit the **GitHub official website**.

IAM User

Table 16-8 Creating an IAM user service endpoint

Parameter	Description
Service Endpoint Name	The name of the service endpoint. Enter a maximum of 256 characters. Letters, digits, hyphens (-), underscores (_), periods (.), and spaces are supported.
Access Key Id	The AK of the IAM user to connect. Obtain it from the **My Credentials** page. For details, see **Access Keys**.
Secret Access Key	The SK of the IAM user to connect. Obtain it from the **My Credentials** page. For details, see **Access Keys**.

CodeArts Repo HTTPS

Table 16-9 Creating a CodeArts Repo HTTPS service endpoint

Parameter	Description
Service Endpoint Name	The name of the service endpoint. Enter a maximum of 256 characters. Letters, digits, hyphens (-), underscores (_), periods (.), and spaces are supported.

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Parameter	Description
CodeArts Repo URL	The HTTPS address of the CodeArts Repo repository to connect to. Go to the target repository, and click **Clone/Download**. Click **Clone with HTTPS**, and obtain the repository address.
Username	The HTTPS username of this CodeArts Repo repository. Format: *Tenant name*/*IAM username*. Click the username  on the top navigation bar and choose **This Account Settings**. Obtain the username on the **Repo** > **HTTPS Password** page.
Password	The HTTPS password of this CodeArts Repo repository. Enter a maximum of 300 characters. Click the username  on the top navigation bar and choose **This Account Settings**. Obtain the password on the **Repo** > **HTTPS Password** page.

GitLab

Table 16-10 Creating a GitLab repository service endpoint

Parameter	Description
Service Endpoint Name	The name of the service endpoint. Enter a maximum of 256 characters. Letters, digits, hyphens (-), underscores (_), periods (.), and spaces are supported.
GitLab URL	The HTTPS address of the GitLab repository to connect to.
Username	The username of this GitLab repository. Optional. Configure it if the repository requires the username for verification.
Access Token	The access token of the GitLab repository. For details about how to obtain the access token, visit the **GitLab official website**. Optional. Configure it if the repository requires the access token for verification.

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Bitbucket

Table 16-11 Creating a Bitbucket repository service endpoint

Parameter	Description
Service Endpoint Name	The name of the service endpoint. Enter a maximum of 256 characters. Letters, digits, hyphens (-), underscores (_), periods (.), and spaces are supported.
Username	Bitbucket username. To obtain the username, log in to Bitbucket, and obtain the value of **Username** on the **Account settings** page.
Password	Bitbucket password. To obtain the password, log in to Bitbucket, and create a password on the **App passwords** page, with the **Read** permission selected under both **Account** and **Projects**.

AGC

Table 16-12 Creating an AGC service endpoint

Parameter	Description
Service Endpoint Name	The name of the service endpoint. Enter a maximum of 256 characters. Letters, digits, hyphens (-), underscores (_), periods (.), and spaces are supported.
client_id	The ID of the AppGallery Connect (AGC) API client to connect. For details about how to obtain the client ID, visit the **AppGallery Connect official website**.
client_secret	The secret of the AGC API client to connect. For details about how to obtain the client secret, visit the **AppGallery Connect official website**.

Jira

Table 16-13 Creating a Jira service endpoint

Parameter	Description
Service Endpoint Name	The name of the service endpoint. Enter a maximum of 256 characters. Letters, digits, hyphens (-), underscores (_), periods (.), and spaces are supported.
Web URL	The base URL of the Jira instance to connect. HTTP and HTTPS addresses are supported.

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Parameter	Description
Email Address	The email address used to register Jira.
API Token	API token of Jira Cloud. For details about how to obtain it, visit **the Jira official website**

Managing a Service Endpoint

Step 1 Go to the CodeArts homepage.

1. Log in to the **CodeArts console**, click , and select a region where you have enabled CodeArts.
2. Click **Go to Workspace**.

   If your account uses the old billing mode (see **Old Billing Modes**), click **Access Service**.

Step 2 Click the target project name to go to the project.

Step 3 In the navigation pane, choose **Settings** > **General** > **Service Endpoints**.

Step 4 Locate the service endpoint you want to manage, and perform the operations listed in the table below as needed.

Table 16-14 Managing a service endpoint

Operation	Description
Edit	Click **Edit**. In the displayed dialog box, edit the parameters and click **Save**. The modified information is displayed.
Delete	**WARNING** The deletion cannot be undone. Exercise caution when performing this operation. Click **Delete**. In the displayed dialog box, click **OK**. The deleted service endpoint is no longer displayed in the list.

----End

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17 Checking Audit Logs

Cloud Trace Service (CTS) is a log audit service in the Huawei Cloud security solution. It can record operations on CodeArts Pipeline for query, audit, and backtrack.

After you enable CTS, the system starts recording operations on CodeArts Pipeline. You can view the operation records of the last seven days on the management console.

CodeArts Pipeline Operations Recorded by CTS

Table 17-1 CodeArts Pipeline operations recorded by CTS

Operation	Resource Type	Event Name
Executing a pipeline	pipeline	run
Editing a pipeline	pipeline	update
Creating a pipeline	pipeline	create
Deleting a pipeline	pipeline	delete
Stopping a pipeline	pipeline	stop

Related Document

For details about how to query CodeArts Pipeline operations on the CTS console, see **Querying Real-Time Traces**.

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18 Reference

18.1 Pipeline Contexts

18.1.1 Pipeline Contexts

About Contexts

Pipeline contexts store and transfer pipeline information during pipeline running. They store information such as pipeline instances, variables, and tasks. Each context is an object that contains various attributes. You can use pipeline contexts to transfer information among jobs to streamline a pipeline. The following table lists pipeline contexts.

Table 18-1 Pipeline contexts

Context	Type	Description
pipeline	object	Information about the pipeline run.
sources	object	Information about the pipeline sources in each pipeline run.
env	object	Information about the custom parameters in each pipeline run.
jobs	object	Information about jobs that have been executed in each pipeline run.

Context Reference Format

```
${{ <context>.<attribute_name> }}
```

- *context*: pipeline context.
- *attribute_name*: attribute.

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Contexts Attributes

Table 18-2 Context attributes

Context	Attribute	Type	Description	Example

pipeline context	pipeline	object	Information about the pipeline run. This object contains the following attributes: **project_id**, **pipeline_id**, **run_number**, **timestamp**, **trigger_type**, and **run_id**.	• Content example
				The following example shows the pipeline context information contained in a manually executed pipeline.
				`{ "project_id": "6428c2e2b4b64affa14ec80896695c49", "pipeline_id": "f9981060660249a3856f46c2c402f244", "run_number": "168", "timestamp": "20231016000004", "trigger_type": "Manual", "run_id": "c2f507f93510459190b543e47f6c9bec" }`
				• Usage example
				To obtain the trigger type of the current pipeline, you can use the following syntax:
				`${{ pipeline.trigger_type }}`

	pipeline.project_id	string	ID of the project to which the current pipeline belongs. This string is the same as the **predefined parameter** **PROJECT_ID**.	
	pipeline.component_id	string	ID of the microservice to which the current pipeline belongs. This string is the same as the **predefined parameter** **COMPONENT_ID**.	
	pipeline.pipeline_id	string	Current pipeline ID. This string is the same as the **predefined parameter** **PIPELINE_ID**.	
	pipeline.run_number	string	Pipeline execution number. This string is the same as the **predefined parameter** **PIPELINE_NUMBER**.	

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Context	Attribute	Type	Description	Example
	pipeline.timestamp	string	Pipeline execution timestamp. This string is the same as the **predefined parameter** **TIMESTAMP**. The format is *yyyyMMddHHmmss*. For example, **20211222124301**.	
	pipeline.trigger_type	string	Pipeline trigger type. This string is the same as the **predefined parameter** **PIPELINE_TRIGGER_TYPE**.	
	pipeline.run_id	string	Pipeline execution ID. This string is the same as the **predefined parameter** **PIPELINE_RUN_ID**.	
	pipeline.execute_user_name	string	Name of the user who executes the pipeline. This string is the same as the **predefined parameter** **EXECUTE_USER_NAME**.	
	pipeline.external_system	string	External system that triggers the pipeline. This string is the same as the **predefined parameter** **EXTERNAL_SYSTEM**. This parameter is available only when the pipeline is triggered by an external system.	

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Context	Attribute	Type	Description	Example
	pipeline.external_user_id	string	The ID of the user who triggered the pipeline via an external system. This string is the same as the **predefined parameter EXTERNAL_USER_ID**.	
	pipeline.external_user_name	string	The name of the user who triggered the pipeline via an external system. This string is the same as the **predefined parameter EXTERNAL_USER_NAME**.	
	pipeline.upstream_status	string	Status of the pipeline upstream stages.	

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Context	Attribute	Type	Description	Example

sources context	sources	object	Information about the pipeline sources in each pipeline run. This object contains the following attributes: **alias**, **repo_name**, **commit_id**, **commit_id_short**, **commit_message**, **repo_url**, **repo_type**, **ssh_repo_url**, **tag**, **merge_id**, **source_branch**, and **target_branch**.	• Content example
				The following example shows the sources context information contained in a manually executed pipeline with a single code source. The alias of pipeline source is **my_repo**.
				{
				"my_repo": {
				"commit_id": "dedb73bb9abfdaab7d810f2616bae9d2b6632ecc",
				"commit_id_short": "dedb73bb",
				"commit_message": "maven0529 update pipeline0615.yml",
				"repo_url": "https://example.com/clsyz00001/maven0529.git",
				"repo_type": "codehub",
				"repo_name": "maven0529",
				"ssh_repo_url": "git@example.com:clsyz00001/maven0529.git",
				"target_branch": "master"
				}
				}
				• Usage example
				To obtain the running branch of the pipeline, you can use the following syntax:
				${{ sources.my_repo.target_branch }}

	sources.<alias>	object	Information about the pipeline source which has an alias.	
	sources.<repo_name>	object	Information about the pipeline source which does not have an alias but only a repository name. It contains the same information as that in **sources.***<alias>*.	
	sources.<alias>.commit_id	string	The last commit ID before execution. This string is the same as the **predefined parameter** **COMMIT_ID**.	
	sources.<alias>.commit_id_short	string	The first 8 characters of the last commit ID before execution. This string is the same as the **predefined parameter** **COMMIT_ID_SHORT**.	

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Context	Attribute	Type	Description	Example
	sources.<alias>.commit_message	string	The commit information from the last code commit before the pipeline execution.	
	sources.<alias>.repo_url	string	Code repository address (HTTPS). This string is the same as the **predefined parameter** **REPO_URL**.	
	sources.<alias>.repo_type	string	Type of the code repository. For example, **codehub**, **gitlab**, **github**, **gitee**, and **general_git**.	
	sources.<alias>.repo_name	string	Name of the code repository.	
	sources.<alias>.ssh_repo_url	string	Code repository address (SSH).	
	sources.<alias>.tag	string	Tag name when the tag is triggered.	
	sources.<alias>.merge_id	string	Merge request ID when the merge request is triggered.	
	sources.<alias>.source_branch	string	Source branch name when the merge request is triggered.	

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Context	Attribute	Type	Description	Example
	sources.<alias>.target_branch	string	If the merge request is triggered, this string indicates the name of the target branch. Otherwise, this string indicates the name of the running branch.	

env context	name	string	Name of a custom parameter.	• Content example
				The following example shows the env context information in a run, which includes two custom parameters.
				{
				"var_1": "val1",
				"var_2": "val2"
				}
				• Usage example
				To obtain the value of the custom parameter **var_1**, you can use the following syntax:
				${{ env.var_1 }}

	value	string	Value of a custom parameter.	

jobs context	jobs	object	Information about jobs in a pipeline. This object contains the following attributes: **job_id**, **status**, **outputs**, **output_name**, **metrics**, and **metric_name**.	• Content example
				The following example shows the jobs context information in a run. There are two successfully executed jobs. The output of the **check_job** job is two metrics, and the output of the **demo_job** job is two general outputs.
				{
				"check_job": {
				"status": "COMPLETED",
				"metrics": {
				"critical": "0",
				"major": "0"
				}
				},
				"demo_job": {
				"status": "COMPLETED",
				"outputs": {
				"output1": "val1",
				"output2": "val2"
				}
				}
				}
				• Usage example
				To obtain the value of **output1** of **demo_job**, you can use the following syntax:
				${{ jobs.demo_job.outputs.output1 }}

	jobs.<job_id>	object	Information about the job with a specified ID.	
	jobs.<job_id>.status	string	Job execution result. The value can be **INIT**, **QUEUED**, **RUNNING**, **CANCELED**, **COMPLETED**, **FAILED**, **PAUSED**, **IGNORED**, or **SUSPEND**.	
	jobs.<job_id>.outputs	object	The running value, as a key-value pair.	

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Context	Attribute	Type	Description	Example
	jobs.<job_id>.outputs.<output_name>	string	The running value name.	
	jobs.<job_id>.metrics	object	The running metrics of a job. For example, the number of code check issues and the test pass rate.	
	jobs.<job_id>.metrics.<metric_name>	string	The running metric name of a job.	

Related Information

The following are context scenarios:

- **Configuring Expressions**.
- **Obtaining Artifact Information Using the Pipeline Context**.
- **Creating a Repository Tag Using the Pipeline Contexts**.

18.1.2 Configuring Expressions

You can reference pipeline contexts with expressions to specify the execution condition of a job. An expression can be any combination of **contexts**, operators, functions, or literals. Contexts can be accessed programmatically with expressions, so information such as pipeline runs, variables, and jobs can be transferred across pipelines.

Step 1 **Create a pipeline**.

Step 2 Add stage jobs or edit existing jobs.

Step 3 Click **Job Configuration** and set **Execute** to **With expression** to configure the expression for job execution. For a new stage and job, add an extension first and then click **Job Configuration**.

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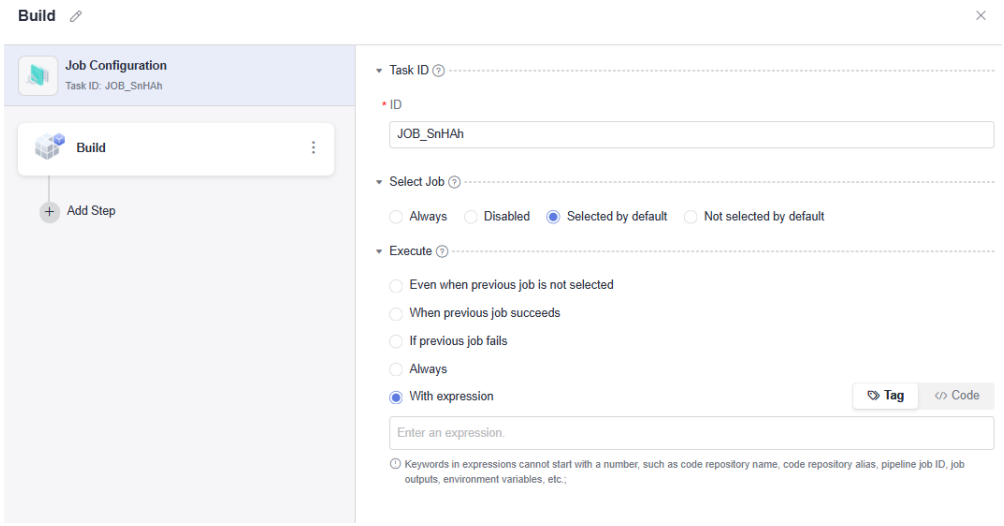
Figure 18-1 Expressions



Example:

The following expression shows that a job runs only when the running branch of the specified code source is **master**.

```
${{ sources.my_repo.target_branch == 'master' }}
```

----End

References

- **Operator**

  The following table lists the operators that can be used in expressions.

  Table 18-3 Operators

Operator	Description
.	Attribute reference. For example, the **${{ pipeline.trigger_type }}** expression can be used to obtain the trigger type.
!	False. For example, the **${{ !startsWith(sources.my_repo.target_branch, 'release') }}** can be used to check whether the branch of the pipeline's code source does not start with "release".
==	Equal. For example, the **${{ pipeline.trigger_type == 'Manual' }}** expression can be used to check whether a pipeline is triggered manually.
!=	Not equal. For example, the **${{ pipeline.trigger_type != 'Manual' }}** expression can be used to check whether a pipeline is not triggered manually.

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Operator	Description
&&	And. For example, the **${{ pipeline.trigger_type == 'Manual' && sources.my_repo.target_branch == 'master' }}** expression can be used to check whether a pipeline is triggered manually and the branch of the pipeline code source is **master**.
||	Or. For example, the **${{ pipeline.trigger_type == 'Manual' || sources.my_repo.target_branch == 'master' }}** expression can be used to check whether a pipeline is triggered manually or the branch of the pipeline code source is **master**.

- **Function**

  The following table lists the built-in functions that can be used in expressions.

  Table 18-4 Built-in functions

Function	Description
contains	• Format contains(search, item) • Description If *search* contains *item*, this function returns **true**. – If *search* is an array and *item* is an element in the *array*, this function returns **true**. – If *search* is a string and *item* is a substring of *search*, the function returns **true**. • Example **contains('abc', 'bc')** returns **true**.
startsWith	• Format startsWith(searchString, searchValue) • Description If *searchString* starts with *searchValue*, this function returns **true**. • Example **startsWith('abc', 'ab')** returns **true**.
endsWith	• Format endsWith(searchString, searchValue) • Description If *searchString* ends with *searchValue*, this function returns **true**. • Example **endsWith('abc', 'bc')** returns **true**.

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Function	Description
format	• Format format(string, replaceValue0, replaceValue1, ..., replaceValueN) • Description Replaces the value in *string* with the value of *replaceValueN*. • Example **format('Hello {0} {1}', 'a', 'b')** returns **Hello a b**.
substring	• Format substring(string, beginIndex, endIndex) • Description Returns the characters in *string* from beginIndex to endIndex-1. If endIndex is not configured, the characters in *string* from beginIndex to the end are returned. • Example **substring('202412091101', 0, 8)** returns **20241209**. **substring ('202412091101', 8)** returns **1101**.
replace	• Format replace(string, target, replacement) • Description Replaces each character same as *target* in *string* with *replacement*. • Example **replace('hello a', 'a', 'b')** returns **hello b**.
completed	• Format completed(job1, job2, ..., jobN) • Description Returns **true** when the dependent job (no job specified) or the specified job is successfully executed. For example, **completed()** returns **true** when the dependent job is completed. Or, you can set **Execute** to **When previous job succeeds** to achieve the same purpose. • Example **completed ('job1', 'job2')** returns **true** when both **job1** and **job2** are successfully executed.
always	• Format always() • Description Executes the current job regardless of the status of the executed dependent job. You can set **Execute** to **Always** to achieve the same purpose.

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Function	Description
canceled	• Format canceled() • Description Executes the current job when the dependent job is stopped.
failed	• Format failed(job1, job2, ..., jobN) • Description Returns **true** when the dependent job (no job specified) or the specified job fails. For example, **failed()** returns **true** when the dependent job fails. You can set **Execute** to **If previous job fails** to achieve the same purpose. • Example **failed('job1', 'job2')** returns **true** when either **job1** or **job2** fails to be executed.
Object filter	You can use the * syntax to apply a filter and select matching items in a collection. The following is the context of a job execution. `{ "check_job": { "status": "COMPLETED", "metrics": { "critical": "0", "major": "0" } }, "demo_job": { "status": "FAILED" } }` • **jobs.*.status** indicates the status of all jobs. Therefore, ['COMPLETED', 'FAILED'] is returned. • Filters can be used together with the **contains** function. For example, **contains(jobs.*.status, 'FAILED')** will return **true** because **jobs.*.status** contains **FAILED**.

18.1.3 Obtaining Artifact Information Using the Pipeline Context

You can reference pipeline context during job configuration to obtain desired information. The following example uses the **Build** extension to generate an artifact and retrieves the artifact information by referencing context in the **ExecuteShellCommand** job.

Step 1 **Create a pipeline**.

Step 2 Add the **Build** extension to **Stage_1**, obtain the task ID as shown in **Figure 18-2**, and set the artifact identifier to **demo** as shown in **Figure 18-3**.

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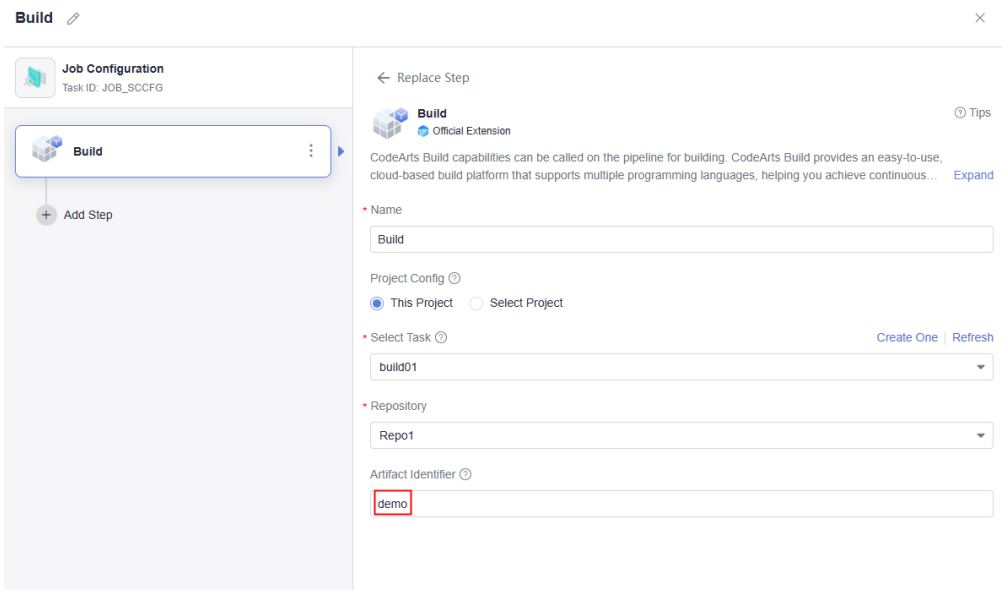
Figure 18-2 Obtaining the task ID



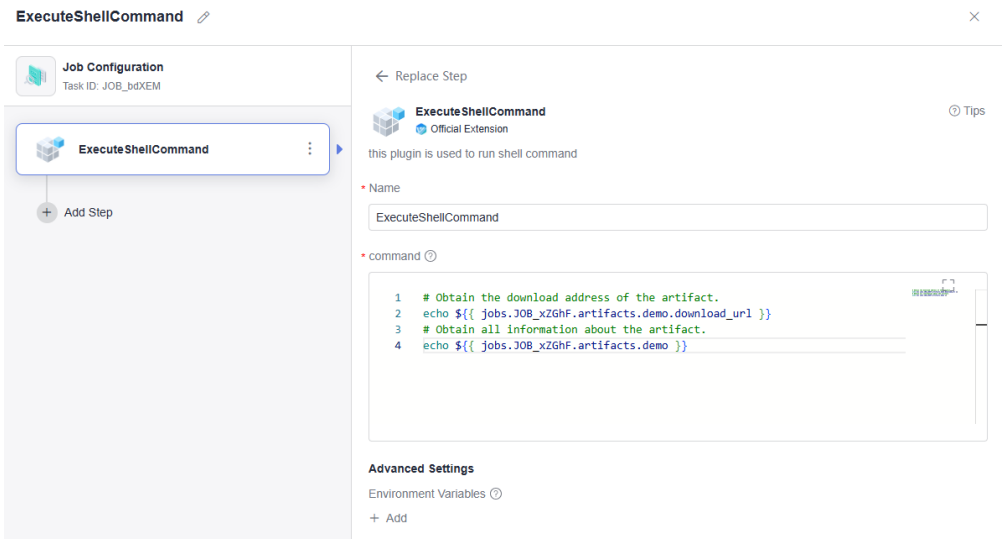
Figure 18-3 Adding the Build extension



Step 3 Add the **ExecuteShellCommand** extension to **Stage_2**. Run the following commands to obtain the artifact information:

```
# Obtain the download address of the artifact.
echo ${{ jobs.JOB_xZGhF.artifacts.demo.download_url }}
# Obtain all information about the artifact.
echo ${{ jobs.JOB_xZGhF.artifacts.demo }}
```

Figure 18-4 Adding the ExecuteShellCommand extension



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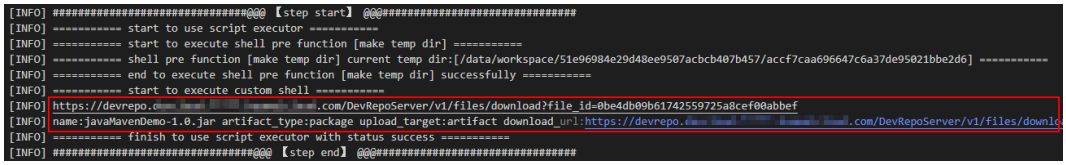
Step 4 Execute the pipeline. After the execution is successful, check the printed artifact information in the log.

Figure 18-5 Artifact information



----End

18.2 YAML Syntax

18.2.1 on

Use **on** to specify events that automatically trigger a pipeline. These events include changing branches, files, and tags, and executing scheduled tasks.

on.<event_name>.types

Use **on.<event_name>.types** to specify the type of a merge request (MR) event that can trigger a pipeline.

Table 18-5 Merge request types

MR Type	Description
opened	An MR is created.
synchronize	The source branch is updated.
closed	An MR is merged.
reopened	An MR is reopened.

If you do not define a type, the pipeline will be triggered when an MR is opened, synchronized, or reopened. The following example shows the syntax for triggering a pipeline when an MR is closed.

```
on:
  pull_request:
    types:
      - closed
```

on.<pull_request>.<branches|branches-ignore>

Use the **pull_request** event to define a pipeline to run for MRs that target specific branches. Do not use **branches** and **branches-ignore** for a **pull_request** event at the same time.

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- **branches**: Use **branches** to include specific branches, or both include and exclude specific branches.
- **branches-ignore**: Use **branches-ignore** to exclude specific branches.

branches and **branches-ignore** support the use of glob patterns to match branch names.

Table 18-6 Matching characters

Character	Description	Example
*	Matches zero or more characters, except the slash (/).	**dev***: matches **dev** and **develop**, but cannot match **dev/test**.
?	Matches one character.	**dev?**: matches **dev1** and **dev2**, but cannot match **dev12**.
**	Matches zero or more characters.	**dev****: matches **dev**, **develop**, and **dev/test**.
[]	Matches one character listed in or within the specified range in the brackets. Ranges only include **a-z**, **A-Z**, and **0-9**.	• **v[a-z].[0-9]***: matches **va.1**, **vb.111**, and so on. • **v[01]**: matches **v0** and **v1**.
{}	Matches strings listed in the parentheses.	**{branch1,branch2}**: matches **branch1** and **branch2**.
!	It is at the start of a string, indicating that the subsequent characters are not matched.	**!develop**: matches all characters except **develop**.

Example

- **Including branches**

```
on:
  pull_request:
    branches:
      - master
      - 'release**'
```

  This example indicates that the pipeline would run when there is a **pull_request** event that targets the following branches:

  – a branch named **master**, or;

  – a branch whose name starts with **release**, for example, **release**, **release-1.0.0**, and **release/1.0.0**

- **Excluding branches**

```
on:
  pull_request:
    branches-ignore:
      - test
      - 'dev**'
```

  This example indicates that the pipeline would run when there is a **pull_request** event, unless the event targets the following branches:

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  - a branch named **test**, or;
  - a branch whose name starts with **dev**, for example, **dev**, **develop-1.0.0**, and **develop/1.0.0**

- **Both including and excluding branches**

  Use **branches** and an exclamation mark (!) to both include and exclude specific branches.

```
on:
  pull_request:
    branches:
      - 'release**'
      - '!release/v1**'
```

  This example indicates that the pipeline would run when there is a **pull_request** event, and the event's targeting branch names meet all of the following conditions:

  - Start with **release**, for example, **release**, **release-1.0.0**, and **release/1.0.0**
  - Do not start with **release/v1/****, for example, **release/v1**, **release/v1.0**, and **release/v1/1.0**

on.<push>.<branches|branches-ignore|tags|tags-ignore>

Use the **push** event to define a pipeline to run on specific branches or tags. Do not use **branches**, **branches-ignore**, **tags**, and **tags-ignore** for a **push** event at the same time.

- **branches**: Use **branches** to include specific branches, or both include and exclude specific branches.
- **branches-ignore**: Use **branches-ignore** to exclude specific branches.
- **tags**: Use **tags** to include specific tags, or both include and exclude specific tags.
- **tags-ignore**: Use **tags-ignore** to exclude specific tags.

Example

- **Including branches/tags**

```
on:
  push:
    branches:
      - master
      - 'release**'
    tags:
      - v1
      - 'v2.*'
```

  This example indicates that the pipeline would run when there is a **push** event that targets the following branches and tags:

  - a branch named master, or;
  - a branch whose name starts with **release**, for example, **release**, **release-1.0.0**, and **release/1.0.0**
  - a tag named v1
  - a tag whose name starts with **v2.**, for example, **v2.1** and **v2.1.1**

- **Excluding branches/tags**

```
on:
  push:
    branches-ignore:
      - test
```

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```
    - 'dev**'
  tags-ignore:
    - v1
    - 'v2.*'
```

This example indicates that the pipeline would run when there is a **push** event, unless the event targets the following branches and tags:

- a branch named **test**, or;
- a branch whose name starts with **dev**, for example, **dev**, **develop-1.0.0**, and **develop/1.0.0**.
- a tag named v1
- a tag whose name starts with **v2.**, for example, **v2.1** and **v2.1.1**

- **Both including and excluding branches/tags**

  Use **branches**, **tags**, and an exclamation mark (!) to both include and exclude specific branches and tags.

```
on:
  push:
    branches:
      - 'release**'
      - '!release/v1**'
    tags:
      - 'v1**'
      - '!v1.1'
```

This example indicates that the pipeline would run when there is a **push** event, and the event's targeting branches and tags meet all of the following conditions:

- a branch whose name starts with **release**, for example, **release**, **release-1.0.0**, and **release/1.0.0**
- a branch whose name does not start with **release/v1/****, for example, **release/v1**, **release/v1.0**, and **release/v1/1.0**
- a tag whose name starts with **v1**, for example, **v1** and **v1.2**
- a tag whose name is not **v1.1**

on.<push|pull_request>.<paths|paths-ignore>

Use the **push** and **pull_request** events to define a pipeline to run when specified files change. Do not use **paths** and **paths-ignore** for **push** and **pull_request** events at the same time.

- **paths**: Use **paths** to include specific files or both include and exclude specific files.
- **paths-ignore**: Use **paths-ignore** to exclude specific files.

Example

- **Including files**

```
on:
  push:
    paths:
      - '**.java'
```

This example indicates that the pipeline would run when you push a **.java** file.

- **Excluding files**

```
on:
  push:
    paths-ignore:
      - 'docs/**'
```

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This example indicates that the pipeline would run when there is a **push** event, unless all pushed files are in the **docs** directory.

- **Both including and excluding files**

  Use **paths** and an exclamation mark (!) to both include and exclude specific files.

  ```
  on:
    push:
      paths:
        - 'src/**'
        - '!src/docs/**'
  ```

  This example indicates that the pipeline would run when the changed files are in the **src** directory or its subdirectories, but not in the **src/docs** directory.

on.schedule

Use **on.schedule** to schedule a pipeline to run at a specified UTC time by defining a cron expression. The pipeline will run based on the lasted scheduled task information. To update the scheduled task, edit YAML and save it. The default branch of the pipeline source is used.

```
on:
  schedule:
    - cron:  '0 0 12 * * ?'
    - cron:  '0 0 20 * * ?'
```

The above example indicates that the pipeline would run at 12:00 and 20:00 (UTC time) every day.

18.2.2 env

Use **env** to define environment variables as key-value pairs. Environment variables can be referenced in any job within the pipeline.

Example

```
env:
  version: 1.0.0
```

You can use **${version}** or **${{ env.version }}** to reference the variable in any job.

${{ env.version }} is recommended, as shown in the example. For more information about the expression syntax, see **Configuring Expressions**.

18.2.3 jobs

A pipeline can consist of multiple jobs.

jobs.<job_id>

Use **jobs.<job_id>** to give jobs an ID, unique within a pipeline. **<job_id>** can contain letters, digits, hyphens (-), and underscores (_), with a maximum of 32 characters.

```
jobs:
  job1:
    name: first job
  job2:
    name: second job
```

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This example indicates that there are two jobs, whose unique identifiers are **job1** and **job2**.

jobs.<job_id>.name

Use **jobs.<job_id>.name** to define a job name. The name is displayed on the CodeArts Pipeline UI.

```
jobs:
  job1:
    name: first job
  job2:
    name: second job
```

This example indicates that the names of **job1** and **job2** are **first job** and **second job**.

jobs.<job_id>.needs

Use **jobs.<job_id>.needs** to specify which job must succeed before you run a new one.

```
jobs:
  job1:
    name: first job
  job2:
    needs: [ job1 ]
    name: second job
```

This example indicates that **job2** will run only after **job1** is complete successfully.

jobs.<job_id>.if

Use **jobs.<job_id>.if** to define the job running condition. For details about the conditional expression, see **Configuring Expressions**.

```
jobs:
  job1:
    name: first job
  job2:
    needs: [ job1 ]
    if: ${{ always() }}
    name: second job
```

This example indicates that **job2** will always run after **job1** is complete, regardless of whether it is successful.

jobs.<job_id>.steps

A job can consist of multiple steps. Each step can run an extension.

jobs.<job_id>.steps<*>.name

Use **jobs.<job_id>.steps<*>.name** to define a job name, which is displayed on the CodeArts Pipeline UI.

jobs.<job_id>.steps<*>.uses

Use **jobs.<job_id>.steps<*>.uses** to specify the extension used in a step.

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```
jobs:
  demo_job:
    name: simple demo job
    steps:
      - name: simple custom step
        uses: custom_plugin@1.0.0
```

This example indicates that a step uses an extension whose name is **custom_plugin** and version is **1.0.0**.

YAML Syntax for the Pipeline Official Extensions

- **Build**

  The following example calls the **Build** extension to use CodeArts Build capabilities.

  ```
  uses: CodeArtsBuild
  with:
    jobId: 878b4d13cb284d9e8f33f988a902f57c
    artifactIdentifier: my_pkg
    customParam: value
  ```

  - **jobId**: ID of the build task. To obtain the ID, copy the 32 digits and letters at the end of the browser URL on the build task details page.
  - **artifactIdentifier**: Build artifact identifier.
  - **customParam**: Parameter value defined in the build task. There may be zero to multiple values.

- **TestPlan**

  The following example calls the **TestPlan** extension to use CodeArts TestPlan capabilities.

  ```
  uses: CodeArtsTestPlan
  with:
    jobId: vb180000vnrgoeib
    environmentModel: 1
    environmentId: 7c2eff2377584811b7981674900158e8
  ```

  - **jobId**: ID of the API test task.
  - **environmentModel**: Parameter source. The value **0** indicates that new parameters will be used, and the value **1** indicates that the global parameters of the selected environment will be used.
  - **environmentId**: Environment ID when **environmentModel** is set to **1**.

- **Deploy**

  The following example calls the **Deploy** extension to use CodeArts Deploy capabilities.

  ```
  uses: CodeArtsDeploy
  with:
    jobId: 9c5a5cda6ffa4ab583380f5a014b2b31
    customParam: value
  ```

  - **jobId**: ID of the deployment task.
  - **customParam**: Parameter value defined in the deployment task. There may be zero to multiple values.

- **Check**

  The following example calls the **Check** extension to use CodeArts Check capabilities.

  ```
  uses: CodeArtsCheck
  with:
  ```

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```
jobId: 43885d46e13d4bf583d3a648e9b39d1e
checkMode: full|push_inc_full||push_multi_inc_full
```

- **jobId**: ID of the code check task.
- **checkMode**: Check mode.
  - **full**: Checks all code of the branch where the code commit is made.
  - **push_inc_full**: Checks all files changed in this code commit.
  - **push_multi_inc_full**: Checks all files changed between this code commit and the last successful code commit.

- **CreateTag**

  The following example calls the **CreateTag** extension to create and push a tag for code repositories.

  ```
  uses: CreateTag
  with:
    tagName: v1
  ```

  tagName: Tag name.

- **Subpipeline**

  The following example calls the **Subpipeline** extension to configure other pipelines in a project.

  ```
  uses: SubPipeline
  with:
    pipelineId: 80ea2d9ffba94c20b9a0a0be47d3a0d8
    branch: master
  ```

  - **pipelineId**: ID of the called pipeline.
  - **branch**: (Optional) Branch used for running the sub-pipeline.
    - The default branch of the sub-pipeline is used if this parameter is not set.
    - You can reference a parameter or context to define **branch**. For example, if you want to run the parent pipeline source, and the code source alias is **my_repo**, the reference format is **${{sources.my_repo.target_branch}}**.

- **JenkinsTask**

  The following example calls the **JenkinsTask** extension to configure a Jenkins task.

  ```
  uses: Jenkins
  with:
    endpoint: eac965b206e74e2b898a24a4375b6df6
    jobName: job
    params: '{ \"key\":\"value\" }'
    async: true|false
    description: description
  ```

  - **endpoint**: ID of the Jenkins endpoint.
  - **jobName**: Jenkins job name.
  - **params**: Parameters (in JSON format) transferred for starting the job.
  - **async**: Whether to execute the job asynchronously.
  - **description**: Execution description.

- **PipelineSuspension**

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The following example calls the **PipelineSuspension** extension to suspend the current pipeline.

```
uses: SuspendPipeline
```

- **DelayedExecution**

  The following example calls the **DelayedExecution** extension. It can pause pipeline for a period of time or until a specified time. You can manually resume or stop a pipeline, or delay the execution for a maximum of three times.

  ```
  uses: Delay
  with:
    timerType: delay|scheduled
    delayTime: 300
    scheduledTime: '00:00'
    timeZone: China Standard Time
  ```

  - **timerType**: Delay type. **delay** indicates pausing a pipeline for a period of time. **scheduled** indicates pausing a pipeline until a specified time.
  - **delayTime**: Time duration (in seconds) when **timerType** is set to **delay**.
  - **scheduledTime**: Exact time when **timerType** is set to **scheduled**.
  - **timeZone**: Time zone. Available values are listed in the following table.

  Table 18-7 Time zone

Available Value	Time Zone
GMT Standard Time	GMT
South Africa Standard Time	GMT+02:00
SE Asia Standard Time	GMT+07:00
Singapore Standard Time	GMT+08:00
China Standard Time	GMT+08:00
Pacific SA Standard Time	GMT-04:00
E. South America Standard Time	GMT-03:00
Central Standard Time (Mexico)	GMT-06:00
Egypt Standard Time	GMT+02:00
Saudi Arabia Standard Time	GMT+03:00

- **ManualReview**

  The following example calls the **ManualReview** extension to create manual review tasks by assigning one person or one group.

  ```
  uses: Checkpoint
  with:
    mode: members|roles
  ```

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```
approvers: 05d8ca972f114765a8984795a8aa4d41
roles: '3'
checkStrategy: all|any
timeout: 300
timeoutStrategy: reject|pass
comment: comment
```

- **mode**: Review mode. **members** indicates that the review is performed by member, and **roles** indicates that the review is performed by role.
- **approvers**: User IDs of the approvers when **mode** is set to **members**. Use commas (,) to separate multiple user IDs.
- **role**: Roles when the **mode** is set to **roles**. For details about the options, see **Table 18-8**. Use commas (,) to separate multiple roles.
- **checkStrategy**: Strategy used when the **mode** is set to **members**. **all** indicates that the application can be approved only by all users. **any** indicates that the application can be approved by any user.
- **timeout**: Review timeout, in seconds.
- **timeoutStrategy**: Strategy used when the review times out. **reject** indicates that the pipeline is stopped to run. **pass** indicates that the pipeline can continue to run.
- **comment**: Review description.

Table 18-8 Review roles

Role	YAML Identifier
Project manager	'3'
Developer	'4'
Test manager	'5'
Tester	'6'
Participant	'7'
Viewer	'8'
Operation manager	'9'
Product manager	'10'
System engineer	'11'
Committer	'12'

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19 CodeArts Release User Guide

19.1 Overview

CodeArts Release is an E2E solution for version compatibility and automated rollout. It helps developers efficiently deliver and upgrade applications without affecting the existing production environment. If you want to deploy applications to containers, CodeArts Release is a good choice.

CodeArts Release has the following features:

- Provides solution-oriented baseline management capabilities, supports multi-dimensional version orchestration at the microservice, module, and product levels, and supports multi-cloud version mapping.
- Provides cloud-native microservice release management capabilities, supports gray orchestration and release of microservices, supports blue-green and canary gray release, and implements cross-cloud orchestration based on UCS.

Operation Process

The basic operation process of CodeArts Release includes: **Enable and authorize CodeArts Pipeline**, create a release environment, configure environment variables, configure release policies, perform release through the **CloudNativeRelease** extension, and check release results.

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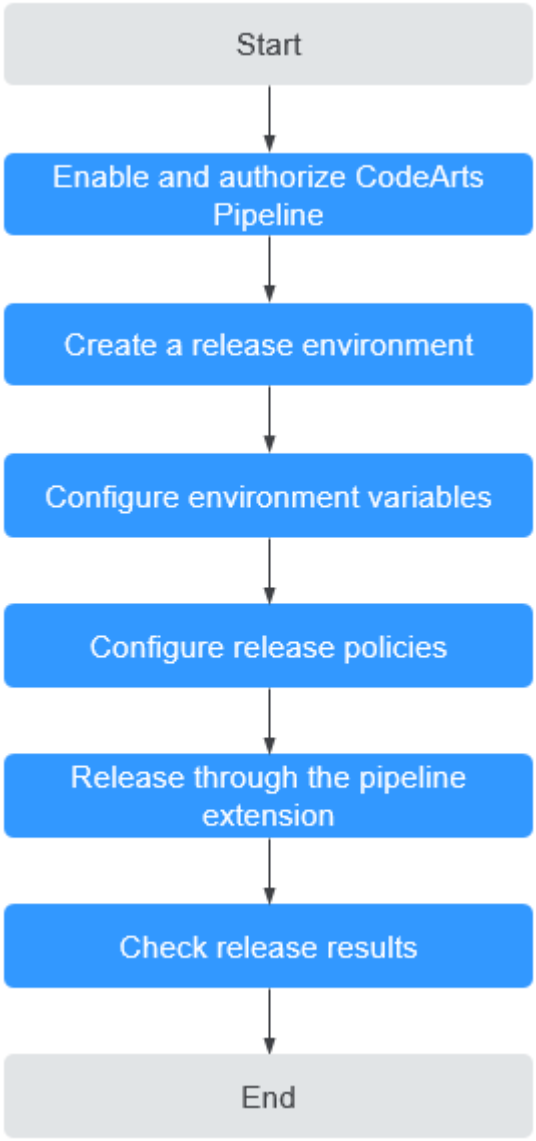
Figure 19-1 Operation process



19.2 Creating a Release Environment

Creating a Release Environment

Step 1 Log in to the Huawei Cloud console.

Step 2 Click ☰ in the upper left corner of the page, and choose **Developer Services** > **CodeArts** from the service list.

Step 3 Click **Access Service** to go to the CodeArts homepage.

Step 4 Click a project name to access the project.

Step 5 Choose **CICD** > **Release** to access the release environment list page.

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Step 6 Click **Create Environment**. On the displayed page, set basic information. For details, see **Table 19-1**.

Table 19-1 Parameter description

Parameter	Description
Project	Project to which the environment belongs. The project cannot be changed.
Environment Name	Unique identifier of the release environment. Enter only letters, digits, underscores (_), and hyphens (-) with a maximum of 128 characters.
Resource Type	**CCE**, **UCS**, and **K8s** are available. They support different deployment extensions. • **CCE**: a type of Kubernetes cluster encapsulated by Huawei Cloud. Select this type if you want to use Huawei Cloud resources. **Learn more**. • **UCS**: a type of Kubernetes cluster encapsulated by Huawei Cloud for multi-cloud deployment. Select this type if you want to deploy clusters on multiple clouds. **Learn more**. • **K8s**: the native Kubernetes cluster. Select this type if you want to use self-built clusters or third-party clusters.
Publish User	Options: **Current User** or **Other Users**. • **Current User**: Create an environment based on the cluster of the current user. • **Other Users**: Create an environment based on the clusters of other users. Obtain other users' cluster permissions through endpoints. For details, see *Creating Service Endpoints*.
Region	This parameter is required when you select **CCE** for **Resource Type**. Select the region where the environment is to be deployed.
Cluster	This parameter is required when you select **CCE** for **Resource Type**. Select the **purchased Kubernetes clusters** in Cloud Container Engine (CCE).
Association Type	This parameter is required when you select **UCS** for **Resource Type**. Associated UCS resources. Only **fleet** is supported.
Fleets	This parameter is required when you select **UCS** for **Resource Type**. **Select a fleet**.

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Parameter	Description
Kubernetes Endpoint	This parameter is required when you select **K8s** for **Resource Type**. Select a created Kubernetes endpoint to access cluster resources with credential. For details, see *Creating Service Endpoints*.
Environment Level	Available environment types: development, test, pre-release, and production. For details about environment permissions, see **Project-level Permissions**.
Description	Enter the description of the environment with no more than 200 characters.

Step 7 After setting all parameters, click **OK**. The environment information page is displayed.

Table 19-2 Environment information

Parameter	Description
Resource Type	Resource types associated with the environment.
Publish User	Current user.
Service Endpoint	Service endpoint of CCE resources.
Cluster Region	Kubernetes cluster region applied in CCE.
Cluster ID	Kubernetes cluster ID applied in CCE.
Variable Version	Version number of the environment variable in the current environment.
Tag	Environment type.
Description	Description of the environment.

- Click **Edit** in the upper right corner of the page to edit the environment information.
- Switch tabs to **configure environment variables**, **configure release policies**, and **check deployment results**.

----End

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19.3 Configuring an Environment Variable

You can use *${variable name}* to reference an environment variable when creating or editing a release policy, or use *{{variable name}}* to reference an environment variable in YAML files. Environment variables include:

- Custom variables: can be added as needed. Currently, only variables of the string type are supported.
- Default variables: system parameters, which cannot be deleted or modified.

Table 19-3 Default variables

Variable	Description
ARTIFACT	Artifact path. In the deployment YAML file, use {{ARTIFACT}} to reference the build artifacts.
TIMESTAMP	Timestamp when the extension is executed. For example, **20230401095436**.
PROJECT_ID	ID of the project to which the environment belongs.

Configuring an Environment Variable

Step 1 Access the release environment list page.

Step 2 Click an environment name. The **Environment Information** page is displayed.

Step 3 Click the **Environment Variable** tab.

Step 4 Click **Edit Variable** to add a variable and set parameters.

Table 19-4 Parameters for creating a custom variable

Parameter	Description
Variable	Variable name. Enter only letters, digits, underscores (_), and hyphens (-) with a maximum of 128 characters.
Type	Only the string type is supported.
Value	The current value of a variable, or empty if you are adding a new variable. The value contains no more than 512 characters.
Change Value	Updated value of the environment variable.
Description	Variable description. It can contain a maximum of 128 characters.

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Parameter	Description
Private Variable	If a parameter is private, the system encrypts the parameter for storage and decrypts the parameter for usage. Private parameters will not be displayed in run logs.

- Click in the **Operation** column to delete a variable.
- Click Add to add a variable.

Step 5 After setting all parameters, click **Save**. The **Save Changes** dialog box is displayed.

Step 6 Confirm the variable information, enter the remarks, and click **OK**.

You can click the **Versions** tab to check variable versions.

- Click a version name to view the variable details.
- Click in the **Operation** column to compare the current version with a specified version.

----End

Using an Environment Variable

You can use environment variables in the following scenarios:

- When **configuring a release policy**, you can use *${variable name}* to reference an environment variable in the YAML path, for example, the workload YAML path in the rolling upgrade task.

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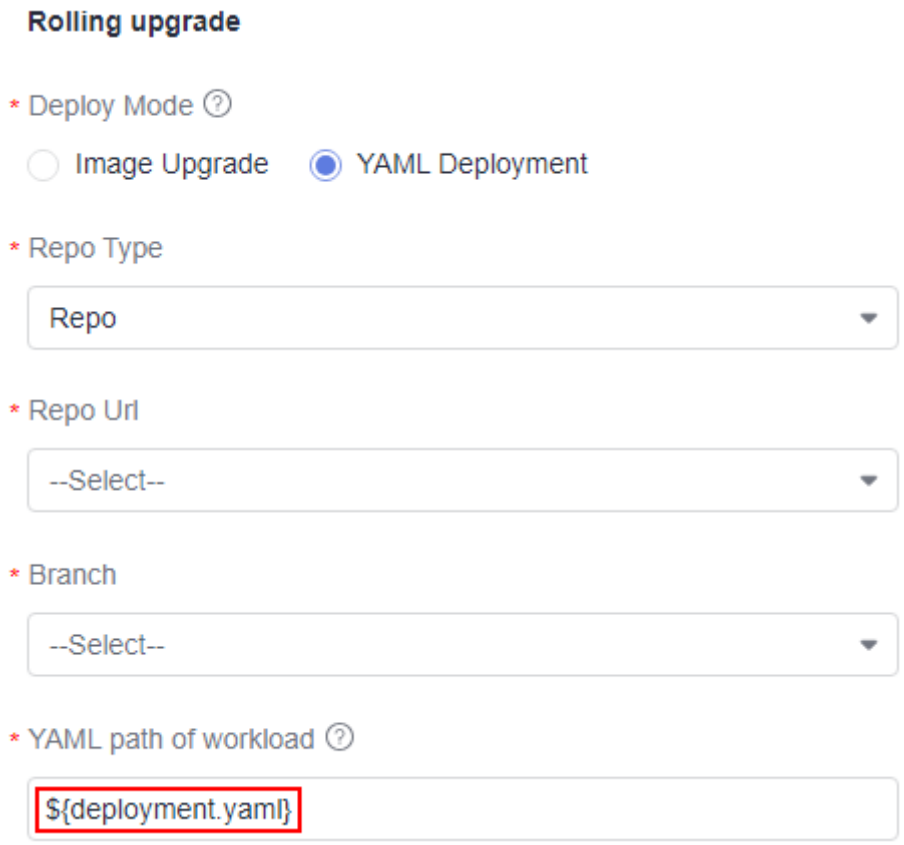
Figure 19-2 Referencing an environment variable



- Use *{{variable name}}* to reference an environment variable in the YAML configuration file associated with the release policy.

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Figure 19-3 Referencing an environment variable

```yaml
apiVersion: apps/v1
kind: Deployment
metadata:
  name: rolling-test
  labels:
    run: rolling-test
  namespace: default
spec:
  replicas: 1
  selector:
    matchLabels:
      run: rolling-test
  template:
    metadata:
      labels:
        run: rolling-test
    spec:
      containers:
        - name: main
          image: {{ARTIFACT}}
          ports:
            - containerPort: 8080
          env:
            - name: TIMESTAMP
              value: {{TIMESTAMP}}
            - name: PROJECT_ID
              value: {{PROJECT_ID}}
            - name: COMPONENT_ID
              value: {{COMPONENT_ID}}
          resources:
            limits:
              cpu: 250m
              memory: 512Mi
            requests:
              cpu: 250m
              memory: 512Mi
```

19.4 Configuring an Environment Release Policy

Creating a Policy

You can add atomic extensions and edit release policies based on the preset **RollingUpgrade**, **GrayscaleUpgrade**, or **EmptyYamlTemplate** templates.

Step 1 Access the environment list page.

Step 2 Click an environment name. The Environment Information page is displayed.

Step 3 On the displayed page, click the **Release Policy** tab.

Step 4 Click + next to **Custom Policies**, on the displayed dialog box, select a policy template and click **OK**.

Step 5 Orchestrate extensions based on the selected template.

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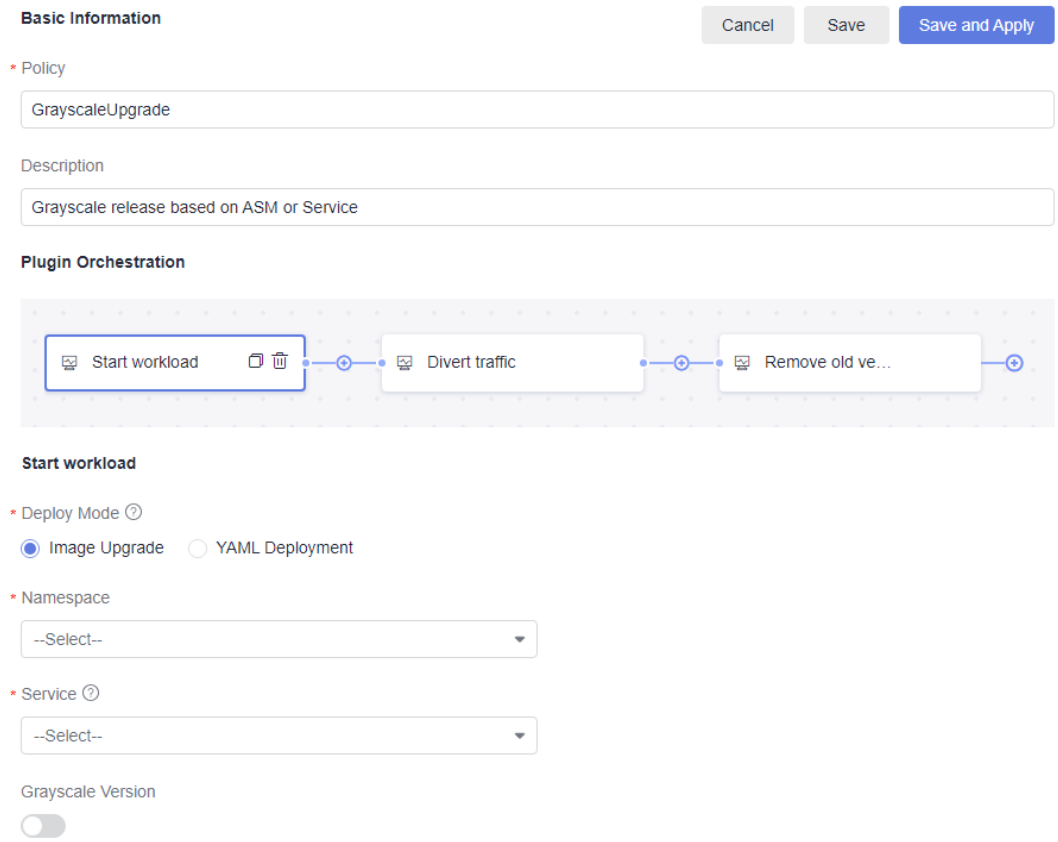

Table 19-5 Policy parameters

Parameter	Description
Policy	Policy name. Enter only letters, digits, underscores (_), and hyphens (-) with a maximum of 128 characters.
Description	Enter a description with no more than 200 characters.
Orchestrating an extension	Set orchestration parameters by referring to **Configuring Atomic Extensions**. • Click to add an extension. • Click to clone an extension. • Click to delete an extension.

Step 6 Click **Save** after the configuration.

Step 7 Find the created policy on the left and click to apply it. The applied policy will be marked as **Default**.

----End

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Configuring Atomic Extensions

CodeArts Release provides the following extensions (**Rolling upgrade**, **Generic k8s upgrade**, **Start workload**, **Divert traffic**, **Remove old version**, and **Manual check**) for rolling upgrade and grayscale upgrade:

- **Rolling upgrade**

  Rolling upgrade supports image upgrade and YAML deployment.

  – Image upgrade: Replace the container image in the workload.

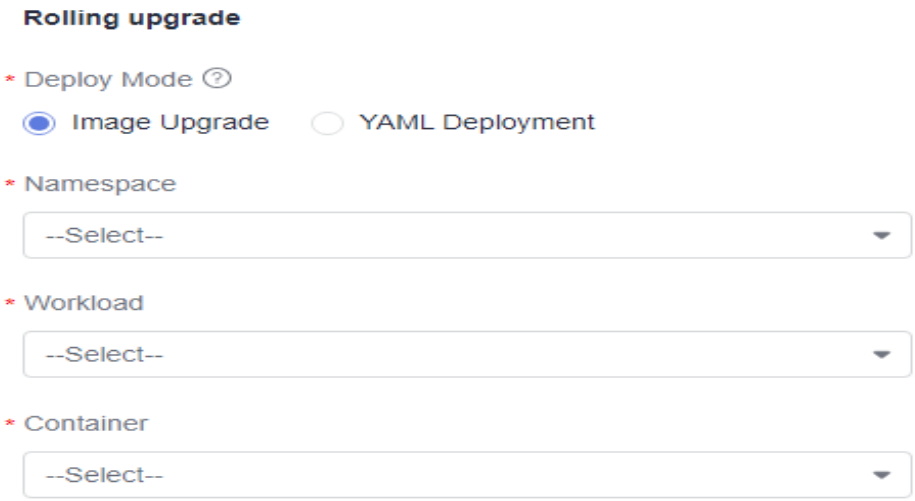

Table 19-6 Parameter description

Parameter	Description
Namespace	Namespace to which the service to be upgraded belongs.
Workload	Workload in the namespace.
Container	Container to be upgraded in the workload.

  – YAML deployment: Use the YAML file to deploy or upgrade the workload.

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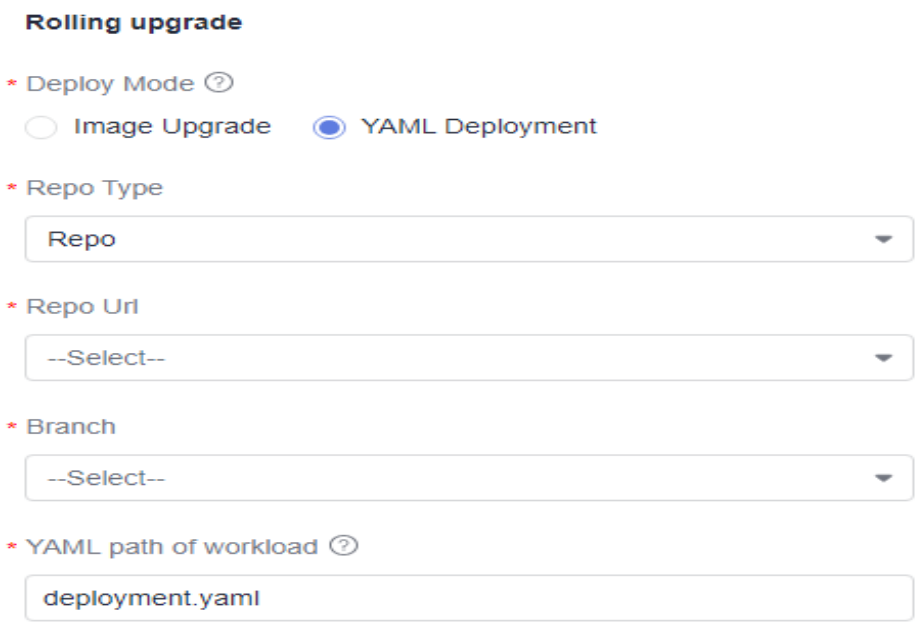

Table 19-7 Parameter description

Parameter	Description
Repo Type	Repository type. Only **Repo** is supported.
Repository	Code repository of the current project.
Branch	Branch of a code repository.
YAML Path of Workload	YAML path of the workload to be upgraded. Enter a relative path of the YAML file. • The current directory is the root directory of the code branch. • Only one YAML file is supported. • You can use *${variable name}* in a YAML path to reference an environment variable, and *{{variable name}}* in a YAML file to reference an environment variable.

- **Generic k8s upgrade**

  This extension obtains the required file based on the set repository information and file path and delivers the file to the Kubernetes cluster.

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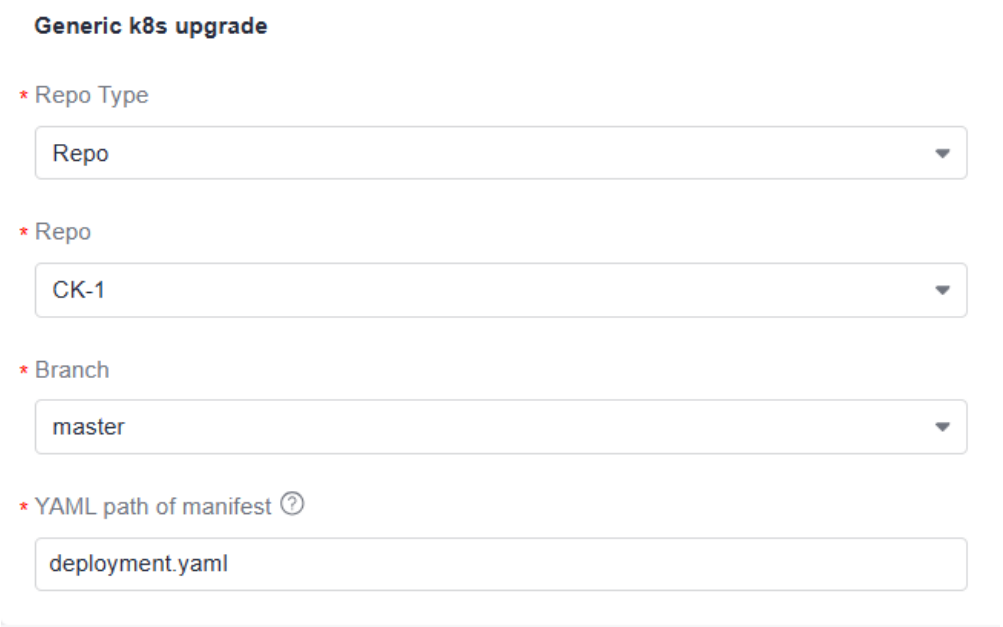

Table 19-8 Parameter description

Parameter	Description
Repo Type	Repository type. Only **Repo** is supported.
Repository	Code repository of the current project.
Branch	A branch in the code repository.
YAML path of manifest	Relative path of the YAML file. • The current directory is the root directory of the code branch. • You can use *${variable name}* in a YAML path to reference an environment variable, and *{{variable name}}* in a YAML file to reference an environment variable.

- **Start workload**

  Start workload supports image upgrade and YAML deployment.

  – Image upgrade: Upgrade a workload by replacing the container image with a new one, ensuring it has the same configurations as the currently running packages without changing anything else.

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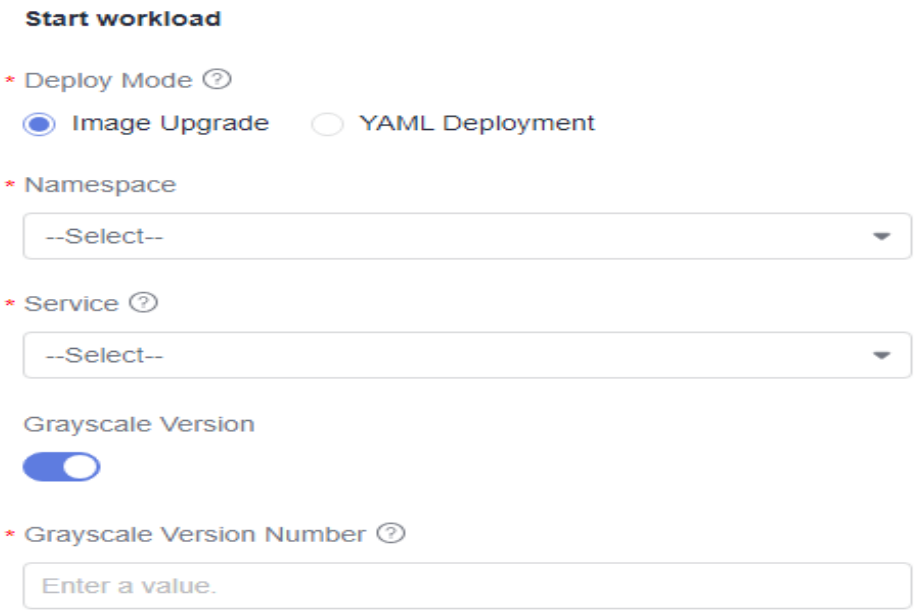

Table 19-9 Parameter description

Parameter	Description
Namespace	Namespace to which the service to be upgraded belongs.
Service	The service to be upgraded, which is associated with only one workload.
Grayscale Version	Disabled: The system automatically generates a grayscale version number. Enabled: You can configure a grayscale version number as needed.
Grayscale Version Number	The grayscale version number is used to distinguish the official version from the grayscale version. You can use *${ENV}* to reference environment variables. For example, **${TIMESTAMP}** indicates that the system timestamp variable is referenced as the gray version number. Enter only letters, digits, and underscores (_) with a maximum of 62 characters.

- YAML deployment: Use the YAML file to deploy or upgrade the workload.

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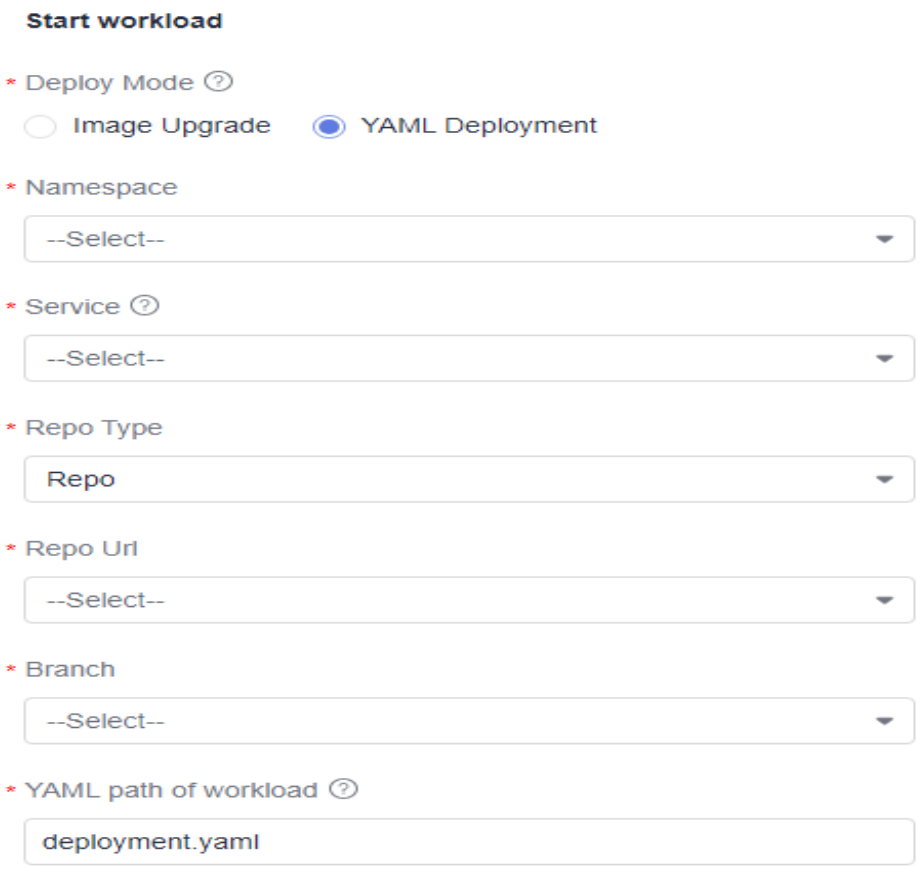

Table 19-10 Parameter description

Parameter	Description
Namespace	Namespace to which the service to be upgraded belongs.
Service	The service to be upgraded, which is associated with only one workload.
Repo Type	Repository type. Only **Repo** is supported.
Repository	Code repository of the current project.
Branch	Branch of a code repository.
YAML Path of Workload	Relative path of the YAML file. • The current directory is the root directory of the code branch. • Only one YAML file is supported. • You can use *${variable name}* in a YAML path to reference an environment variable, and *{{variable name}}* in a YAML file to reference an environment variable.

- **Divert traffic**

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Traffic diversion includes:

- Service blue-green release: All traffic will be switched to the new workload (gray load).
- ASM grayscale release: Use ASM (Application Services Mesh) VirtualService and DestinationRule configurations to control access traffic, perform grayscale diversion based on traffic proportion and request headers. ASM must be installed in the cluster.

- **Remove old version**

  This extension automatically removes the old workload associated with the service. No configurations are required.

- **Manual check**

  With this extension, you can approve or reject the deployment policy when the pipeline pauses at a checkpoint, allowing the pipeline to either continue running or to stop.

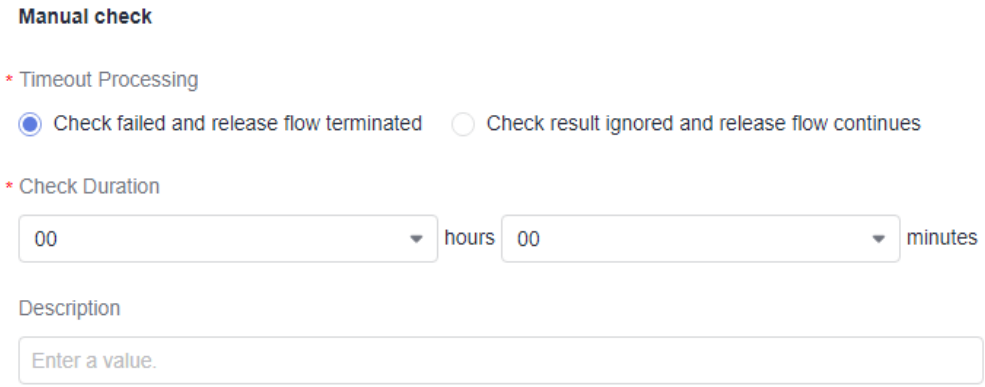

Table 19-11 Parameter description

Parameter	Description
Timeout Processing	Processing solutions: • Check failed and release flow terminated: Pipeline will pause at the checkpoint. If the policy is not approved within the specified period, the pipeline will stop. • Check result ignored and release flow continues: Pipeline will pause at the checkpoint. If the policy is not approved within the specified period, the pipeline will continue to run.
Check Duration	Time window for checking, which ranges from one minute to 12 hours.
Description	Description of the manual check. Enter no more than 200 characters.

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19.5 Releasing an Environment

You can release an environment directly. Or you can use the **CloudNativeRelease** extension in a pipeline to trigger the configured release policy for releasing an environment.

Releasing an Environment

Step 1 Create a release environment.

Step 2 Click **Execute** in the upper right corner. In the displayed window, set parameters.

- Release policy: Select the policy configured in **Configuring an Environment Release Policy**.
- Artifact address: address of the image to be released. You can enter the SWR image address, or use the image from Image Center (for example, **nginx:latest**).

Step 3 Click **Confirm**.

----End

Releasing an Environment Through the CloudNativeRelease Extension

Step 1 Configure a pipeline.

Step 2 Add the **CloudNativeRelease** extension to the pipeline. For details, see **Table 19-12**.

This extension allows you to orchestrate environment release policies in CCE clusters. There is rolling upgrade release and grayscale release.

Figure 19-4 Configuring CloudNativeRelease



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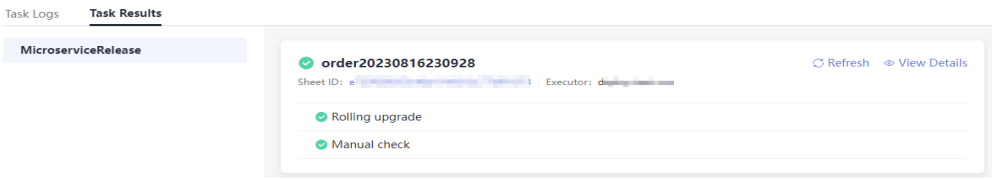
Table 19-12 Parameter description

Parameter	Description
Name	Extension name Enter only letters, digits, underscores (_), hyphens (-), commas (,), semicolons (;), colons (:), periods (.), slashes (/), parentheses (), and spaces, with a maximum of 128 characters.
Environment Level	Release environment type. Available environment types: development, test, pre-production, and production.
Environment	Environment to be released. For details, see **Creating a Release Environment**.
Artifact Path	Image path for deployment and release. Example: **swr.example.com/demo/springboot-helloworld:v1.1**. You can use ${} to reference pipeline parameters. Example: **swr.example.com/demo/springboot-helloworld:${version}**. **NOTE** SoftWare Repository for Container (SWR) is recommended. You can **build an image and push it to SWR** through CodeArts Build.

Step 3 Execute the pipeline after the configuration is complete.

Step 4 Click the task card to view the **Task Logs** and **Task Results**.

Figure 19-5 Checking the execution result



- **Task Logs**: displays real-time log information and running status.
- **Task Results**: displays basic task information, including the service ticket name, ticket ID, and trigger person.

  Click the service ticket ID or the **View Details** button to go to the details page. For details, see **Checking the Environment Release Result**.

----End

19.6 Checking the Environment Release Result

Step 1 Access the release environment list page.

Step 2 Click an environment name. The Environment Information page is displayed.

Step 3 On the displayed page, click the **Deployment History** tab.

Step 4 Click a service ticket name to check details. The details page displays the information of **release flow**, **atomic extension**, and some **basic information**.

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- Release flow
  - Release flow displays information such as the execution result, service ticket type, executor, pipeline, and release policy. You can click an atomic extension to check its details.
  - Cancel: You can click **Cancel** to cancel the release.
  - Retry: If the release fails or the release is canceled, you can click **Retry** to retry the release.
  - Rollback: Click **Rollback**. In the displayed dialog box, if you confirm the rollback, the release will be canceled and the service state will be restored to its pre-release state.

    NOTE

    When the environment is directly released, the pipeline information is not displayed in the deployment ticket.

    Rollback can be performed anytime. If the current deployment version does not meet your expectation, you can quickly restore the environment to the previous one through rollback.
- Basic information

  Basic information includes environment name, policy, service endpoint, variable version, image, start time, and end time.
- Atomic extension release

  The release detail of atomic extension is displayed. You can click Refresh to refresh the details.

Figure 19-6 Atomic extension release

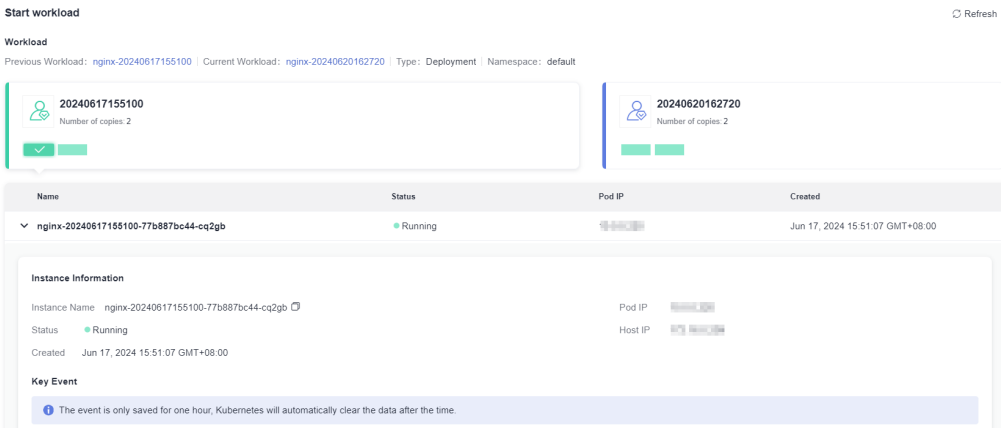

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Table 19-13 Atomic extension release

Extension	Release Information
Rolling upgrade	The details page displays the workload to be upgraded, instance information, and key event. – Workload Workload name, type, namespace, and creation time – Instance information Instance name, status, pod IP address, host IP address (IP address of the node where the pod is located), and creation time. – Key event K8s component name, event type, K8s event, first occurrence time, and recent occurrence time. Key event information can help you locate pod faults.
Start workload	The details page displays workload to be upgraded, pod information, and key event. You can click the version cards to check the previous or the current workload information. – Workload Previous workload name, current workload name, type, and namespace – Instance information Instance name, status, pod IP address, host IP address (IP address of the node where the pod is located), and creation time. – Key event K8s component name, event type, K8s event, first occurrence time, and recent occurrence time. Key event information can help you locate pod faults.
Divert traffic	The details page displays the service name, old version number, new version number, and namespace.
Remove old version	The details page displays the workload name, workload type, and namespace.
Manual check	The details page displays check duration, operation time, description, and status.

----End

19.7 Deploying a Microservice Based on GitOps

GitOps-based deployment provides a fully managed, secure, and automated approach to Kubernetes deployments. This is achieved by the GitOps runtime that is installed on customers' Kubernetes clusters using ArgoCD and CodeArts agents. This solution fully operates behind customers' firewall without requiring direct external access to their clusters. The GitOps runtime installed on the clusters pulls deployment configurations from Git and communicates securely with CodeArts

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Release via CodeArts agents. This solution ensures that all deployment configurations are version-controlled in Git, allowing for declarative, auditable, and consistent application delivery across environments.

Constraints

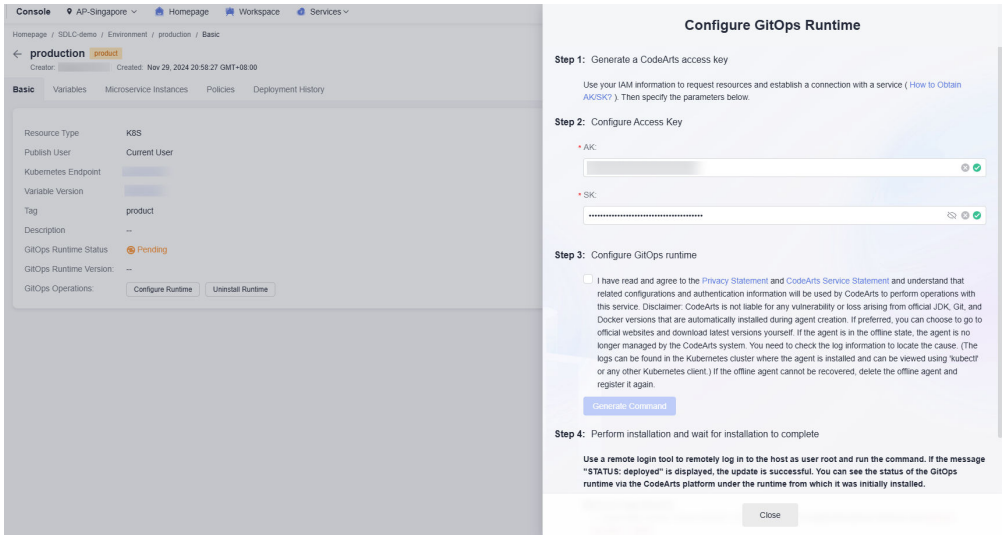
This feature is only available in the **AP-Singapore** region.

Installing the GitOps Runtime

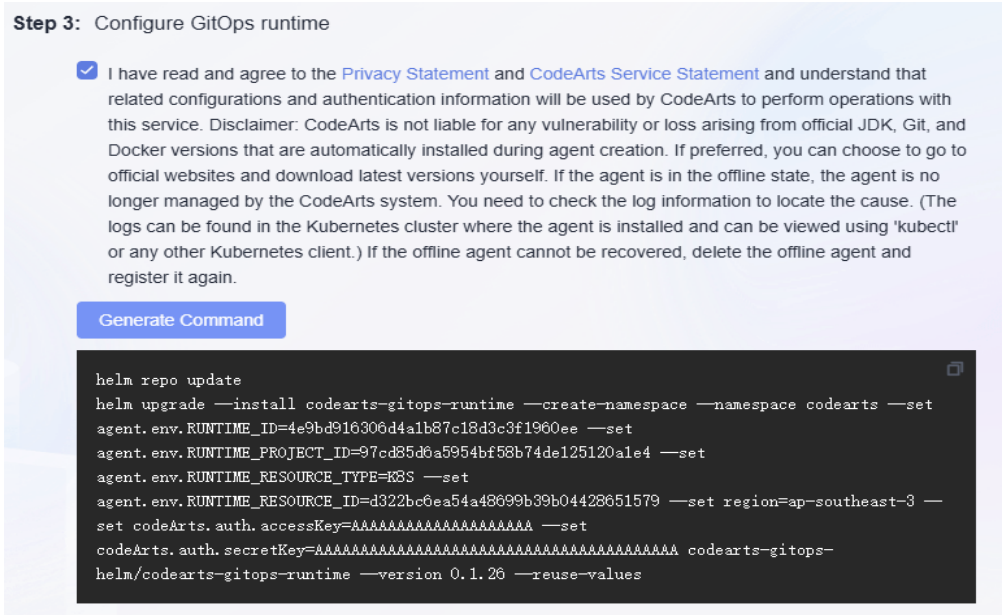
Step 1 Create a release environment by referring to **Creating a Release Environment**.

Step 2 Click the environment name to go to the **Basic** tab page.

Step 3 Click **Configure Runtime**. On the displayed **Configure GitOps Runtime** page, obtain and configure an access key by referring to Step 1 in the wizard.



Step 4 Click  and then click **Generate Command**. Expand the **helm** installation commands, copy the commands, and run them on your Kubernetes cluster.



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Step 5 Click **Close**. The GitOps runtime is configured.

Step 6 On the **Basic** tab page, check and monitor the GitOps runtime status.

----End

Creating a Microservice Deployment Configuration

Step 1 Access the CodeArts Pipeline homepage by referring to **Accessing CodeArts Pipeline**.

Step 2 Choose **CICD** > **Pipeline** > **Microservices**. The microservice list page is displayed.

Step 3 Create a microservice by referring to **Creating a Microservice**, or search for the microservice for which you want to create a deployment configuration. Click the microservice name to go to the **Overview** tab.

Step 4 Click the **Deployment Configurations** tab, and then click + Create Deployment Configuration. On the **Create Deployment Configuration** page, set the basic information. The parameters are described in **Table 19-14**.

Table 19-14 Parameter description

Parameter	Description
Project	Project to which the deployment configuration belongs. The project cannot be changed.
Deployment Configuration Name	Name of the deployment configuration. Enter a maximum of 128 characters, including letters, digits, hyphens (-), and underscores (_).
Deployment Engine	Choose between **Release Policy** and **GitOps**.
Artifact Type	Choose between **Helm** and **Kustomize**.
Artifact Source	Artifact repository source. Currently, only Git repositories are supported.
Code Source	Code repository source. Currently, only CodeArts Repo is supported.
Repository	A repository in the current project. Select a GitOps repository.
Branch	A branch in the code repository.
Path	A path in the code repository.
Namespace	Namespace on which the deployment will be performed.
Description	Description of the deployment configuration. Enter a maximum of 200 characters.
Helm Value Files	List of files inside the same Git repository. These files will be used as Helm values for Helm templating during deployment.

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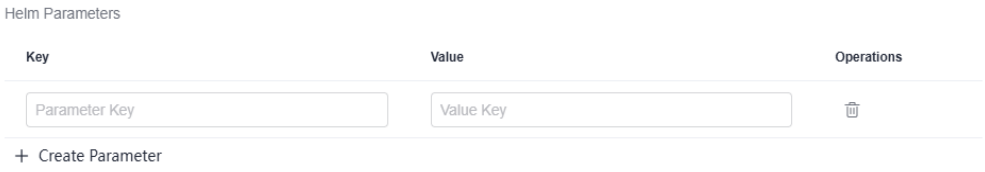
Parameter	Description
Helm Parameters	Parameters injected for Helm templating during deployment.

Step 5 If **Artifact Type** is set to **Helm**, click **Create Parameter** under **Helm Parameters** and set the key and value. To delete a parameter, click .



Step 6 Click **OK**. The microservice deployment configuration is created.

----End

Deploying a Microservice Instance

Step 1 Access the CodeArts Pipeline homepage by referring to **Accessing CodeArts Pipeline**.

Step 2 Choose **CICD** > **Release** to access the **Environment** page.

Step 3 Click the environment where you want to deploy a microservice to go to the **Basic** tab page.

Step 4 Click the **Microservice Instances** tab.

Step 5 Click **Create Microservice Instance**. On the displayed page, set the basic information. The parameters are described in **Table 19-15**.

Table 19-15 Parameter description

Parameter	Description
Project	Project to which the deployment configuration belongs. The project cannot be changed.
Microservice	Name of the microservice to be deployed.
Deployment Configuration	Name of the deployment configuration to be used to deploy the microservice.
Description	Description of the microservice instance. Enter a maximum of 200 characters.

Step 6 Click to determine whether to overwrite the default deployment configuration.

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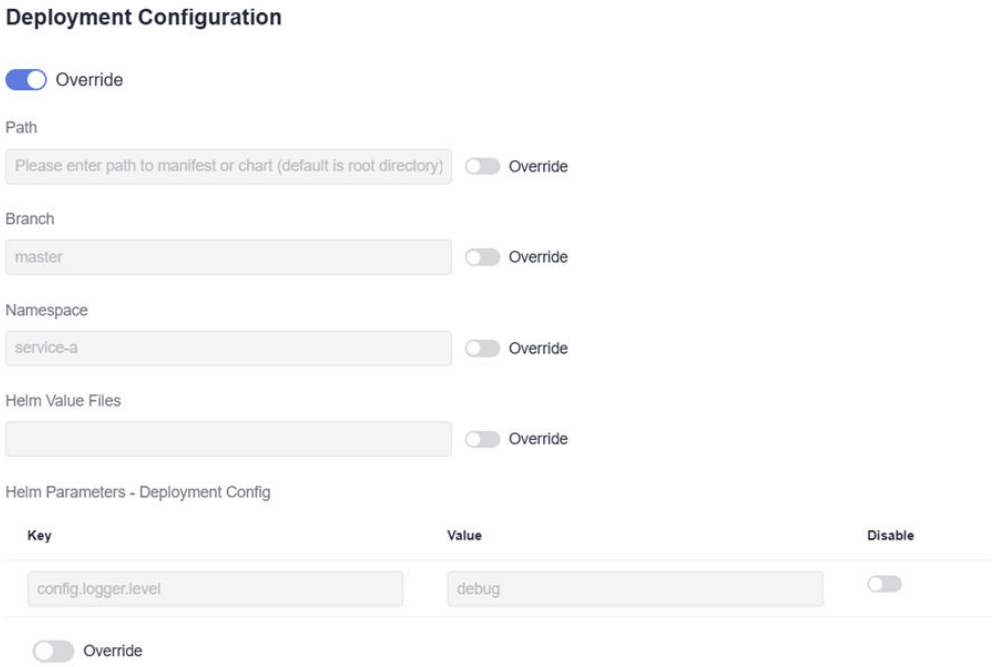

Step 7 Click the microservice name. The **Overview** tab page is displayed. Check the deployed microservice.

Step 8 Choose **CICD** > **Release**, click the name of the environment where the microservice has been deployed, and then click **Deployment History** to check the microservice deployment records.

- Only one microservice instance is allowed for a microservice on a single environment.

----End

Automatically Updating a Deployed Microservice Using CodeArts Pipeline

Step 1 Create a pipeline by referring to **Creating a Pipeline**.

Step 2 On the **Task Orchestration** tab of the pipeline details page, click **New Job**. The **New Job** page is displayed.

Step 3 Click **Add** next to the **DeployMicroserviceInstance** extension, and set the basic information. The parameters are described in **Table 19-16**.

Table 19-16 Parameter description

Parameter	Description
Name	Name of the extension. Enter a maximum of 128 characters. Only letters, digits, spaces, and these special characters are allowed: -_,;:./()
Environment	Release environment, which is associated with your cluster resources. It contains the configurations for the upcoming deployment.

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Parameter	Description
Microservice	Microservice that has been deployed. It is associated with the microservice instance configured in **Deploying a Microservice Instance** and will be automatically updated.
Helm Parameters Patch	Parameters injected for Helm templating during deployment.

Step 4 Click **OK**. The **DeployMicroserviceInstance** extension is added.

Step 5 Click **Save**. CodeArts Pipeline will automatically update this deployed microservice.

----End

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