CodeArts Check

User Guide

Issue 01

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Working with CodeArts Check

CodeArts Check is a cloud-based service that check code. With years of experience in automatic static check and enterprise application, CodeArts Check provides rich check services on code style, common quality, cyber security risk, and other elements. It also includes comprehensive check reports, convenient bug handling, and many other efficient, easy-to-use functions for enterprises to effectively improve code quality.

Usage Process

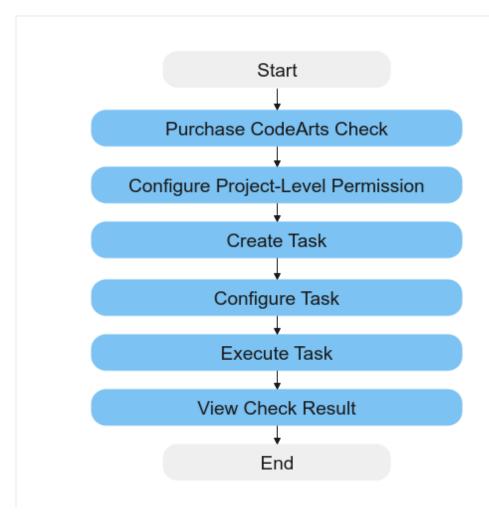


Table 1-1 Process description

Process	Description
Purchasing CodeArts Check	Purchase CodeArts Check.
Configuring Project-level Role Permissions	Access the CodeArts Check homepage and configure project-level permissions.
Creating a Task	Create tasks from different repositories.
Configuring a Task	Modify or configure existing check tasks.
Executing a Task	Execute a check task to identify issues in the source code.

Process	Description
Viewing Check Results	View the check results and fix code issues after a code check task is complete.

2 Purchasing CodeArts Check

2.1 Purchasing CodeArts Check

Prerequisites

You have registered with Huawei Cloud and completed real-name authentication. If you do not have a HUAWEI ID yet, follow these steps to create one:

- Visit the Huawei Cloud official website.
- Click Sign Up and create your account as instructed.
 Once your account is created, the system automatically redirects you to your personal information page.
- 3. Complete individual or enterprise real-name authentication. For details, see **Real-Name Authentication**.

Purchasing CodeArts Check

Refer to Purchasing a CodeArts Package.

Configuring Project-level Role Permissions

Assign a role to the new member. Each role comes with its own default permissions. For details, see **Table 3-1**.

Table 3-1 Default role permissions in CodeArts Check

Permi /Role	ssion	Proj ect Ad mini stra tor	Proj ect Man ager	Dev elop er	Test Man ager	Test er	Part icip ant	Vie wer	Pro du ct Ma na ger	Sys te m Eng ine er	Co mm itter
Task s	Crea te	√	√	√	×	×	×	×	×	√	√
	Exec ute	√	√	√	×	×	×	×	√	√	√
	View	√	√	√	×	×	×	×	√	√	√
	Edit	√	√	√	×	×	×	×	√	√	√
	Dele te	√	√	×	×	×	×	×	√	✓	√
Rule sets	Set as defa ult	√	√	×	×	×	×	×	√	√	√
Issu	View	√	√	√	×	×	×	×	√	√	√
es	Edit	√	√	√	×	×	×	×	√	√	√

Prerequisites

- You have purchased CodeArts Check and authorized users.
- You have added members by referring to CodeArts User Guide >
 "Preparations" > "Adding Project Members", and assigned roles to the new members by referring to "Managing Permissions".

Accessing CodeArts Check

- Step 1 Log in to the Huawei Cloud console.
- Step 2 Click in the upper left corner and choose Developer Services > CodeArts Check from the service list.
- **Step 3** You can access CodeArts Check in either of the following ways:
 - Homepage entry

Click Access Service. This page displays the check task list of the current user.



- Project entry
 - a. Click **Access Service**.
 - b. On the navigation bar, click **Homepage**.
 - c. Click the name of the project to be viewed.
 - d. Choose Code > Check.

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

----End

Configuring Project-level Role Permissions

- 1. Access CodeArts Check through a project.
- 2. In the navigation pane, choose **Settings** > **Permissions**.
- 3. On the displayed page, configure permissions for different roles in CodeArts Check.

4 Creating a Task

CodeArts Check supports different code repositories. Before task creation, you should:

- Create a project.
- (Optional) **Create a code repository** by referring to *CodeArts Repo User Guide* > "Creating a Repo".
- (Optional) Create a third-party code repository.

Constraints

When the task to be deleted has a code repository with multiple branches, the
deletion will be successful if there are fewer than 200 branches. Otherwise,
the deletion will fail

Creating a Task to Check Code from CodeArts Repo

If you select **Automatically create Check task** when creating a code repository in CodeArts Repo, a code check task will be created synchronously. You can view the task in the task list of CodeArts Check.

If you do not select **Automatically create Check task** when creating a code repository, perform these steps to create a task:

- **Step 1** Access CodeArts Check through a project.
- **Step 2** Click **Create Task**, configure parameters by referring to **Table 4-1**.

Table 4-1 Task parameters

Param eter	Description
Projec t	 Project that the task belongs to. This parameter is set by default when you access CodeArts Check from the project entry.
	• During access through the service entry, select the project created in Creating a Project based on the site requirements.

Param eter	Description
Code Source	Select Repo .
Name	Customize your task name. Enter 1 to 128 characters: letters, digits, underscores (_), hyphens (-), and periods (.).
Reposi tory	Select the code repository to be checked.
Defaul t Branc h	Select the code branch to be checked.
Langu age	Select the code language to be checked.

□ NOTE

- To modify the task name and default branch, go to the task details page, choose **Settings** > **Basic Info**, and then modify the target task.
- To delete a task, go to the task details page, choose **Settings** > **Basic Info**, and then delete the target task. Alternatively, click in the row where the target task is located, and choose **Delete** from the drop-down list.

When the task to be deleted has a code repository with multiple branches, the deletion will be successful if there are fewer than 200 branches. Otherwise, the deletion will fail.

Step 3 Click Create Task.

----End

Creating a Check Task from a Third-Party Code Repository

- The network may be unstable or other problems may occur when a third-party repository is used.
- It is advised to use the code import function of CodeArts Repo for secure, stable, and efficient download and build.
- **Step 1** Access CodeArts Check through a project.
- **Step 2** Click **Create Task**, configure parameters by referring to **Table 4-2**.

Table 4-2 Parameters

Paramet er	Description
Project	Project that the task belongs to.
	This parameter is set by default when you access CodeArts Check from the project entry.
	During access through the service entry, select the project created in Creating a Project based on the site requirements.
Code Source	Select Git . For code hosted on other services, use Git to pull the code.
Name	Customize your task name.
Service Endpoint	Select the service endpoint connected to the third-party repository. If no endpoint is available, create one by referring to Creating a Service Endpoint .
Repositor y	Enter the code repository to be checked.
Default Branch	Enter the repository branch to be checked.
Languag e	Select the code language to be checked.

□ NOTE

- To modify the task name and default branch, go to the task details page, choose **Settings** > **Basic Info**, and then modify the target task.
- To delete a task, go to the task details page, choose **Settings** > **Basic Info**, and then delete the target task. Alternatively, click in the row where the target task is located, and choose **Delete** from the drop-down list.

When the task to be deleted has a code repository with multiple branches, the deletion will be successful if there are fewer than 200 branches. Otherwise, the deletion will fail.

Step 3 Click Create Task.

----End

5 Configuring a Task

5.1 Configuring a Rule Set

5.1.1 Configuring a Preset Rule Set

A rule set is a set of rules used for code checks, with variations within different sets. These sets are classified based on different objectives, such as security, Android apps, and coding styles.

You can modify the rule sets as needed, and the updated rules will be applied during the next check.

CodeArts Check supports rule sets in multiple languages at different levels. For details about system rule sets, see **Table 5-1**.

Table 5-1 Preset rule sets

Langua ge	System Rule Set	Default Rule Set	Extension of Supported File
C++	 Huawei C Coding Standard Rule Set Huawei C Enhanced Coding Standard Rule Set Huawei C++ Enhanced Coding Standard Rule Set Huawei C++ Coding Standard Rule Set CodeArts Check C Recommended Criterion Set CodeArts Check C++ Recommended Criterion Set Huawei C Codestyle Specification Criterion Set Huawei CPP Codestyle Specification Criterion Set Huawei C/C++ Codestyle Specification Criterion Set Comprehensive Criterion Set Critical Criterion Set General Criterion Set Generic Inspection Rule Set 	General Criterion Set Generic Inspection Rule Set	.c/.cc/.cpp/.cxx/.c p/.c+ +/.inc/.inl/.mm/. h/.hh/.hpp/.hxx/. h++

Langua ge	System Rule Set	Default Rule Set	Extension of Supported File
Java	 Huawei Java Coding Standard Rule Set Huawei Java Enhanced Coding Standard Rule Set CodeArts Check JAVA Recommended Criterion Set Huawei Codestyle Specification Criterion Set DevCloud Recommended Criterion Set Security Criterion Set Mobile Field-Android Criterion Set General Criterion Set Critical Criterion Set Google Codestyle Specification Criterion Set Comprehensive Criterion Set Generic Inspection Rule Set 	General Criterion Set Generic Inspection Rule Set	.java
Go	 CodeArts Check GO Recommended Criterion Set Huawei Codestyle Specification Criterion Set Critical Criterion Set General Criterion Set Comprehensive Criterion Set Generic Inspection Rule Set 	General Criterion Set Generic Inspection Rule Set	.go
Python	 CodeArts Check PYTHON Recommended Criterion Set Huawei Codestyle Specification Criterion Set Critical Criterion Set General Criterion Set Generic Inspection Rule Set 	General Criterion Set Generic Inspection Rule Set	.ру

Langua ge	System Rule Set	Default Rule Set	Extension of Supported File
JavaScri pt	 Huawei Codestyle Specification Criterion Set Critical Criterion Set General Criterion Set Comprehensive Criterion Set Generic Inspection Rule Set 	General Criterion Set Generic Inspection Rule Set	.js/.jsx
C#	 Critical Criterion Set General Criterion Set Comprehensive Criterion Set Generic Inspection Rule Set 	General Criterion Set Generic Inspection Rule Set	.cs
TypeScr ipt	 Critical Criterion Set General Criterion Set Comprehensive Criterion Set Generic Inspection Rule Set 	General Criterion Set Generic Inspection Rule Set	.ts/.tsx
CSS	General Criterion SetGeneric Inspection Rule Set	General Criterion Set Generic Inspection Rule Set	.css
HTML	General Criterion SetGeneric Inspection Rule Set	General Criterion Set Generic Inspection Rule Set	.html
PHP	Critical Criterion SetGeneral Criterion SetGeneric Inspection Rule Set	General Criterion Set Generic Inspection Rule Set	.php
LUA	General Criterion Set	General Criterion Set	.lua
RUST	General Criterion Set	General Criterion Set	.rs
Shell	General Criterion Set	General Criterion Set	.sh

Langua ge	System Rule Set	Default Rule Set	Extension of Supported File
KOTLIN	General Criterion Set	General Criterion Set	.kt
SCALA	General Criterion Set	General Criterion Set	.scala
ArkTS	General Criterion Set	General Criterion Set	.ets
SQL	General Criterion Set	General Criterion Set	.sql

Constraints

- Rule sets of multiple languages cannot be used to check a task at the same time. Example: C# rule sets cannot be applied with other language rule sets to check a task.
- To use a code security enhanced package, configure check parameters.

Viewing Rule Details in a Rule Set

View the rule details in rules sets, such as issue levels, compliant and non-compliant examples, and fix suggestions, to select a desired rule set.

- Step 1 Access CodeArts Check through a project.
- **Step 2** Click the **Rule Sets** tab.
- **Step 3** Click the rule set name to go to the details page and view the rule usage details.

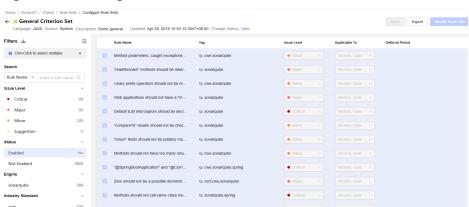


Figure 5-1 Viewing rules in a rule set

Alternatively, click **Export** to export the enabled rules in the rule set to the local PC and view the rule details.

----End

Modifying the Default Rule Set

Each language has its default set, as shown in **Table 5-1**. Perform the following operations to modify the default rule set if needed.

To view the default rule sets, access CodeArts Check through a project.

- **Step 1** On the **Rule Sets** tab page, filter the target language in the **Language** column.
- **Step 2** Click in the row where the rule set locates and select **Default Set** to set the current rule set as default.

----End

Configuring the Rule Set to Be Used

Perform the following operations to use other preset rule sets. Alternatively, customize rule sets if needed. For details, see **Configuring a Custom Rule Set**.

- **Step 1** Go to the task page. In the task list, click a task name.
- **Step 2** On the task details page, choose **Settings** > **Rule Sets**.
- **Step 3** In the **Languages Included** area, enable the switch of target language.
- **Step 4** In the **Enable Rule Set** area, click to select the rule set to be used.

(Optional) To configure extended parameters for the selected rule set, click **Parameter**, configure extended parameters, enable the configuration function, and click **OK**.

□ NOTE

To use a code security enhanced package, configure check parameters.

----End

5.1.2 Configuring a Custom Rule Set

CodeArts Check supports custom rule sets. Each rule set must contain at least one rule.

A rule set can be configured with only one language.

Constraints

- Purchase the code security check enhancement package as required before using CodeArts Check. This package identifies code security risks and vulnerabilities more comprehensively for Java, C++, Go, and Python.
- Language cannot be modified for custom rule sets.
- Only rule set creators can modify custom rule sets.
- Only rule set creators can delete custom rule sets.
- System rule sets and custom rule sets in use cannot be deleted.
- To delete a rule set being used by a code check task, you can either delete the task or assign another rule set to the task.
- Custom rules: max. 10.
- Lines of code scanned by a rule set with only custom rules: max. 100,000. This applies when the rule set contains only custom rules.
- Duration per code check task with 100,000 LOC scanned by a rule set with only custom rules: max. 1.5 hours. This applies when the rule set contains only custom rules.
- Only the te admin accountand rule creators can edit and delete custom rules.

Customizing a Rule Set

- **Step 1** Access CodeArts Check through a project.
- Step 2 Click the Rule Sets tab.
- **Step 3** Click **Create Rule Set**. In the displayed dialog box, enter a rule set name and description, and select a language.

You can also copy an existing rule set by selecting it from the **Replicated in** drop-down list.

- Step 4 Click OK.
- **Step 5** Select rule names, set **Issue Level** and click **Save** in the upper right corner.

Create custom rules if needed.

- Click the rule set name to go to the details page.
- Alternatively, on the details page, click Export to export the enabled rules in the rule set to the local PC and view the rule details.

• On the details page, click **Modify Basic Info** to modify the rule set name or description.

Ⅲ NOTE

- Language cannot be modified for custom rule sets.
- Preset rule sets cannot be modified.
- Only rule set creators can modify custom rule sets.

----End

Deleting a Custom Rule Set

Click · · · in the row where the rule set is located and choose **Delete Set**.

- Only rule set creators can delete custom rule sets.
- System rule sets and custom rule sets in use cannot be deleted.
- To delete a rule set being used by a code check task, you can either delete the task or assign another rule set to the task.

Using a Custom Rule Set

- **Step 1** Go to the task details page, and choose **Settings** > **Rule Sets**.
- **Step 2** If any changes are made to the code repository after you create a code check task, click in the **Languages Included** row to re-obtain the target language, and enable the switch of language.
- **Step 3** Click to select the created custom rule set.

----End

Customizing a Rule

- Custom rules: max. 10.
- Lines of code scanned by a rule set with only custom rules: max. 100,000. This applies when the rule set contains only custom rules.
- Duration per code check task with 100,000 LOC scanned by a rule set with only custom rules: max. 1.5 hours. This applies when the rule set contains only custom rules.
- Only the te_admin accountand rule creators can edit and delete custom rules.

To scan more code or customize more rules, contact technical support.

- Step 1 Click the Rules tab.
- **Step 2** Click **Create Rule**. Set parameters by referring to **Table 5-2**.

Table 5-2 Rule parameters

Param eter	Description	Ma nda tor y
Rule Name	Custom rule name. It can be customized. Enter 1 to 128 characters: letters, digits, underscores (_), hyphens (-), and periods (.).	Yes
Tool Rule Name	Rule source code file (by default).	Yes
Tool	Check tool used by a custom rule. Currently, only SecBrella is supported.	Yes
Langua ge	Language checked by a custom rule. Currently, only Java is supported.	Yes
Source Code	Rule source code file. Create a .kirin file, create a domain-specific language (DSL) for rules, run the local plug-in to generate a SecH_Rule name.json file in the OutputReport directory, and upload the .json file.	Yes
Severit y	Severity of a code issue detected by a rule. The value can be Critical , Major , Minor , or Suggestion .	Yes
Tag	Rule tag for different scenarios. Use commas (,) to separate multiple tags.	No
Descrip tion	Rule description. The content can contain code in Markdown. Max. 10,000 characters.	Yes
Compli ant Exampl e	Compliant code example. The content contains code in Markdown. Max. 10,000 characters.	No
Nonco mplian t Exampl e	Noncompliant code example. The content contains code in Markdown. Max. 10,000 characters.	No
Fix Sugges tions	Issue fixing suggestions. The content can contain code in Markdown. Max. 10,000 characters.	No

Step 3 Click Create Rule.

----End

5.2 Configuring Quality Gates

Set the threshold based on the quality requirements to check whether the project is ready for production. If the actual check result surpasses the gate threshold, the project is deemed unfit for production.

Quality gate can be set at the tenant, project, and task levels in a descending order of precedence. The navigation paths are as follows:

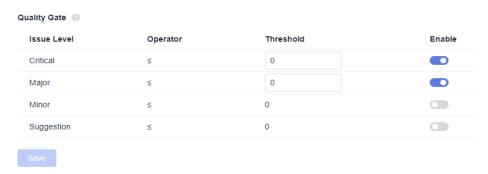
- Tenant level: Go to the CodeArts Check homepage, and choose Config Center. The Quality Gate details are displayed by default.
- Project level: Go to the project details page, and choose Code > Check > Config Center > Quality Gate.
- Task level: Go to the task details page, and choose **Settings** > **Quality Gate**.

Notification settings are supported at the project level and task level.

This section uses a task-level quality gate as an example to describe how to configure a quality gate.

- **Step 1** Access CodeArts Check through a project.
- **Step 2** Go to the task page. In the task list, click a task name.
- **Step 3** On the task details page, choose **Settings** > **Quality Gate**.
- **Step 4** In the **Quality Gate** area, enable gate items and set thresholds based on quality requirements.

Figure 5-2 Configuring a gate



Step 5 Click Save.

You can click Start Check and view the check results.

If the issues of a gate item exceed the corresponding thresholds for a gate, **Failed** is displayed in the **Task-level Gate Result** area of the **Overview** tab page. Fix code as prompted.

----End

5.3 Configuring a Scheduled Task

You can set the execution plans of a code check task as required to periodically execute the check task for the default branch.

Ⅲ NOTE

It is advised to configure this for tasks in non-pipeline mode.

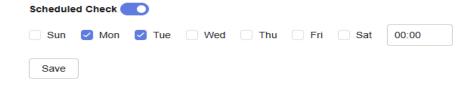
Constraints

The interval on the current day must be longer than 5 minutes.

Configuring an Execution Plan

- Step 1 Access CodeArts Check through a project.
- **Step 2** Go to the task page. In the task list, click a task name.
- **Step 3** On the task details page, choose **Settings** > **Execution Plans**.
- **Step 4** Enable **Scheduled Check** and set the automatic execution time.

Figure 5-3 Configuring an execution plan



Step 5 Click Save.

----End

5.4 Configuring Notifications

Notifications can be set at the system project, service project, and task levels. You can set notification modes for the code check task event types as required. The navigation paths are as follows:

- Service project level: Go to the project details page, and choose Code > Check
 Config Center > Notifications.
- Task level: Go to the task details page and choose **Settings** > **Notifications**. This section uses the task-level notification settings as an example to describe how to enable and disable notifications.

Configuring Message Notices

- Step 1 Access CodeArts Check through a project.
- **Step 2** Go to the task page. In the task list, click a task name.

- **Step 3** On the task details page, choose **Settings** > **Notifications**.
- **Step 4** Enable or disable the notification of an event type as required.
 - If **Notify** is enabled, event notices will be sent to specific members of current project.
 - If **Email** is enabled, emails will be sent to specific members of current project.

----End

5.5 Configuring Check Modes

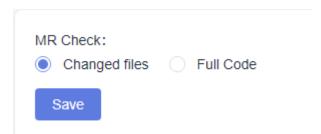
You can set check modes and checked catalogs for efficiency.

Constraints

Neither C# nor the secbrella engine supports merge requests.

Configuring MR Check Modes

- **Step 1** Access CodeArts Check through a project.
- **Step 2** Go to the task page. In the task list, click a task name.
- **Step 3** On the task details page, choose **Settings** > **Check Modes**.
- **Step 4** In the **MR Check** area, select **Changed Files** or **Full Code**. By default, **Changed Files** is selected.



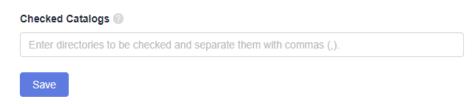
Step 5 Click Save.

----End

Configuring Checked Directories

You can specify certain directories to be checked in the code repository.

- By default, all code in the code repository is checked.
- If you specify one or more directories, the files in the specified directories are checked.



You can specify multiple directories by separating them with commas (,). For example:

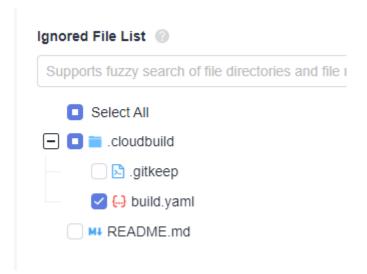
- To check the dir1 and dir2 directories, enter dir1,dir2.
- To check dir3 in the dir1 directory, enter dir1/dir3.
- Specify directories instead of file names. Otherwise, all code in the code repository is checked by default.
- The specified directories cannot start with a period (.).
- By default, all directories are checked if you leave the text box empty. If you specify directories, all files within them are checked except for those that have been set to be ignored.
- This function takes effect only for the files that do not need to be compiled. If file B is generated after the compilation of file A, issues in file B are not reported.

Setting an Ignored File List

You can configure the file scope by task.

- If you do not specify a file path, all code of the selected repository branch is checked.
- If you specify a file path, the files in it are ignored during a check.

In the **Ignored File List** area, select the file paths that do not need to be checked. Run the code check task. The files in the selected paths will not be checked.



This function takes effect for the files that (do not) need to be compiled.

- Files that do not need to be compiled: If these files are set to be ignored, they
 are not checked.
- Files that need to be compiled: For example, file A and file B depend on each other. If file A is set to be ignored, file A is not checked, but file A is still involved in the compilation process before the check.

5.6 Viewing Health Status

After the check task is complete, you can view the code health status and mark the code in the code repository.

The impact degree of each issue level is as follows:

Critical: 5

Major: 3

Minor: 1

Suggestion: 0.1

The health status levels are as follows (Formula: Health status score = SUM Σ (The number of issues × Issue level)/Code volume):

A: Health score ≤ 0.001

B: $0.001 < \text{Health score} \le 0.005$

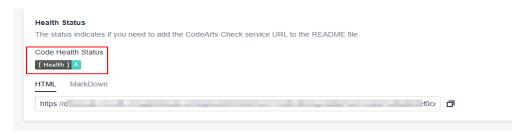
C: 0.005 < Health score ≤ 0.01

D: Health score > 0.01

Viewing Health Status

- Step 1 Access CodeArts Check through a project.
- **Step 2** In the task list, click a task name.
- **Step 3** On the task details page, choose **Settings** > **Health Status**.

HTML and **MarkDown** are supported.



----End

5.7 Configuring Integration Services

If branch merging exists in CodeArts Repo, you can configure an automatic check task and generate a subtask. That is, if branch merging exists in a code repository, a new code check subtask is generated.

Configuring MR Check Status

Step 1 Access CodeArts Check through a project.

- **Step 2** Go to the task page. In the task list, click a task name.
- **Step 3** On the task details page, choose **Settings** > **Integration Services** > **CodeArts Repo**.
- **Step 4** Determine whether to select **MR Status** (MR indicates merge requests). If you select it, the automatic check of code review is enabled.
- **Step 5** If a branch is merged in the code repository of the task, a code check job is automatically generated.
 - 1. Access the task details page.
 - 2. Click and create a merge request in CodeArts Repo.

Based on the **Check Modes** you selected, the changed files or full code will be checked after the branch is merged.

3. Click ** master **. You can view all historical records of MR-triggered code check in the drop-down list.

----End

Configuring an Automatic Check Task Executed upon Code Commit

Step 1 Select **Executed upon code submission**.

This function applies only to branches with created tasks.

Step 2 Click Save.

----End

5.8 Configuring a Custom Environment

If a common build environment does not have the required dependency packages and tools when you use CodeArts Check, you can use the base image provided by a custom build environment to execute the code check task.

Prerequisite

You have pushed the custom environment to the image repository.

Configuring a Custom Image

- **Step 1** Access CodeArts Check through a project.
- **Step 2** Go to the task page. In the task list, click a task name.
- **Step 3** On the task details page, choose **Settings** > **Custom Environment**.
- **Step 4** In the **Custom Image** area, enter the content in the format of *Domain name/Organization name/Image repository name:Tag name* or an image link of SoftWare Repository for Container (SWR).

Step 5 Click Save.

----End

5.9 Configuring Advanced Configurations

Currently, this function is not available in the AP-Singapore, R-Istanbul, and ME-Riyadh regions.

Configuring the Start Time of New Issues

You can configure the start time of new issues for each task and perform the scanning again after configuration. If the finding time is later than the configured time, the issue is classified as new. If the start time is not configured, gaps between two consecutive check results are considered the number of new issues.

- **Step 1** Access CodeArts Check through a project.
- **Step 2** Go to the task page. In the task list, click a task name.
- **Step 3** On the task details page, choose **Settings** > **Advanced**.
- **Step 4** In the **New Defects Start** area, click issues.

By default, findings since the first successful check are incremental.

----End

Configuring Source File Encoding

You can configure how to encode a file. The source file encoding affects integrity of the source code content identified by the system. The default encoding mode is UTF-8.

Step 1 In the **Source File Encoding** area, select an encode format from the drop-down list.



Step 2 Check whether a message is displayed, indicating that the modification is successful.

----End

6 Executing a Task

You can perform a check task to identify issues in the source code in time.

You can use either of the following methods to check code:

- Manual execution: After creating a task, manually execute it. This section uses it as an example.
- Scheduled execution: For details, see Configuring a Scheduled Task.

Prerequisites

You have created a task.

Executing a Task

- **Step 1** Access CodeArts Check through a project.
- **Step 2** Click in the row where the task is located and wait until the task is complete.

----End

Checking Code in Other Branches

On the task details page, you can manually select a code repository. The procedure is as follows:

- **Step 1** Click a task name.
- **Step 2** The **Overview** tab page is displayed by default. Click **Pmaster** ▼ to filter code repositories by **Branch**.
- **Step 3** After filtering, click **Start Check** and wait until the task is complete.

Clicking again will automatically switch the branch to the default branch for checking.

----End

Viewing Check Results

Prerequisite

You have **created** and **executed** a task.

Viewing Check Details

- **Step 1** Access CodeArts Check through a project.
- **Step 2** Go to the **CodeArts Check** page and search for the target task. You can view the status of the check task in the **Issue** column of the code check task list.
 - New: new issues that need to be solved after the task is executed.
 - Unsolved: issues that have not been solved after the task is executed.
 - Solved: issues that have been solved after the task is executed.
- **Step 3** Click the task name to view the check details.
 - Number of lines of code.
 - Gate result: The result can be **Passed** or **Failed**, and the numbers of critical issues and major issues are displayed.
 - You can set the gate threshold by referring to **Configuring Quality Gates**.
 - The number of detected issues.
 - The number of delayed rollout issues detected by the upgraded check engines.
 - The number of unresolved new issues.
 - The number of resolved new issues.
 - Average cyclomatic complexity.
 - Code duplication rate.
 - The number of non-blank non-comment lines of code.
 - Top 10 rules with the most issues and the numbers of these issues.
 - The numbers of unclosed issues in different levels.
 - Issue assignments. If the number of assigned issues does not match the total number of issues, there are some issues that have not been assigned to owners.

• Historical trends. By default, the figures show trends of issues, cyclomatic complexity, and duplicate rates in the last month.

----End

Viewing Code Issues

You can view code issue details in either of the following ways:

• Exporting issues to the local PC

Method 1:

- a. On the task list page, select the tasks for which you want to export issues in batches (max. 20 tasks at a time).
- b. Choose More > Export Task Issues.
- In the displayed dialog box, select the items to be exported and click Export.
- d. Click View Downloads to view the export progress.
- e. After the export is complete, click **Download** to export the issues to the local PC.

Method 2:

- a. Click the **Issues** tab.
- b. Choose **Apply to Filtered** > **Export** to export issues to the local PC.

Online viewing

a. Click the **Issues** tab. In the **Filters** area, set filter criteria to filter issues. The following table lists the filter criteria.

Filter Criteria	Description
Issue Level	The options are Critical , Major , Minor , and Suggestion .
Issue Status	The options are Pending , Resolved , Ignored , and Fixed .
Latency Issues	Indicates the number of issues in the official version and in the delayed version.
Check Time	Indicates New issues and Inventory issues distinguished based on the detection time. NOTE You can set the start time of new issues . Issues found after that time are new.
File	Filter issues by source file name.
Languag e	Filter issues by language.
Rule	Filter issues by rule so that users can solve the same type of issues at a time.

Filter Criteria	Description
User Tag	Filter issues by user tag of rules.
Owner	Filter issues by issue owner. NOTE During check, new issues are automatically assigned to the last committer of the faulty code line when you enable Accurate Matching of Issue Owners.
CWE	Filter issues by security rule name.

- b. After setting the filter criteria, you can perform the following operations in the right pane.
 - If an issue has been resolved, click **Pending** and select **Resolved**. If an issue does not need to be handled, click **Pending** and select **Ignore Issue**. To ignore the issue, submit a comment.
 - Click Owner to transfer the issue to another owner.
 - Click Help to view the rule details corresponding to the issue.
 - Click View Context. On the Context page, you can modify the issue status, transfer the owner, and click to modify the code in the repository based on Help.
 - Click Create Ticket to submit the service ticket to the specified owner. This function is available only in Scrum projects.
 - Click Generate Report to generate a report in PDF format.
 - Choose Apply to Filtered > Change Status to modify the status of all filtered issues.

	NOTE
--	------

If the number of issues is 0, this button is not displayed.

Choose Apply to Filtered > Change Owner to transfer all the filtered issues to a specified owner.

Viewing Code Metrics

Code metrics reflect the quality of committed code, helping you detect and fix issues in a timely manner and improving R&D efficiency. Code metrics cover the following two types of issues:

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•	(VIC	0matic	comp	IΔVIŤ\.	,
•	CVC	lomatic	COLLID	にしんししゃ	٧.

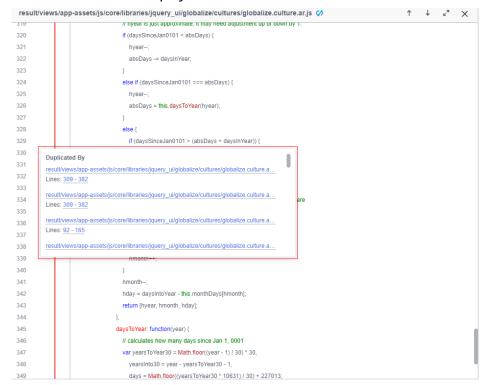
◯ NOTE

Code cyclomatic complexity is not supported for code in Shell.

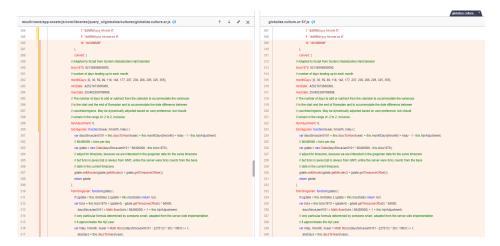
Click a file name to go to the file details page. Click to modify the code in the code repository.

```
worker/src/main/java/worker/Worker.java 💸
            import redis.clients.iedis.Jedis:
            import redis.clients.jedis.exceptions.JedisConnectionException;
            import java sol *-
            import org.json.JSONObject;
            class Worker {
             public static void main(String[] args) {
10
               Jedis redis = connectToRedis("redis");
11
               Connection dbConn = connectToDB("db"):
12
13
14
               System.err.println("Watching vote queue");
15
                String voteJSON = redis.blpop(0, "votes").get(1);
17
18
                JSONObject voteData = new JSONObject(voteJSON);
19
                String voterID = voteData.getString("voter_id");
20
                String vote = voteData.getString("vote");
21
22
                System.err.printf("Processing vote for '%s' by '%s'\n", vote, voterID);
23
                 updateVote(dbConn, voterID, vote);
24
```

- Duplication rate. CodeArts Check identifies duplicate lines, blocks, and rates.
 To solve this problem, perform the following steps:
 - a. Click a file name to go to the file details page.
 - b. The vertical bars on the left of the file details page identify duplicated code blocks. If you click a vertical bar, the list of files that contain the same code blocks is displayed.



c. Click a file name to compare the duplicated code blocks of the two files.



d. Click on to modify the code in the code repository.

Viewing Check Logs

Click the **Logs** tab to view the logs and check parameters.

Figure 7-1 Logs

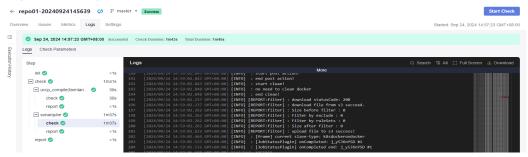
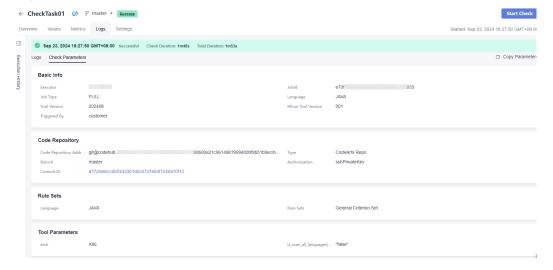


Figure 7-2 Check parameters



8 Querying Audit Logs

Cloud Trace Service (CTS) records operations on CodeArts Check for query, audit, and backtrack.

Operations Recorded by CTS

Table 8-1 Operations recorded by CTS

Operation	Resource Type	Event
Creating a task	task	create
Modifying a task	task	modify
Deleting a task	task	delete
Executing a task	job	create
Canceling a task	job	modify_job
Favoriting a task	followingTask	create_followingTask
Unfavoriting a task	followingTask	delete_followingTask
Modifying rule set information	ruleset	modify_ruleset
Modifying rules in a rule set	ruleset	modify_ruleset
Deleting a rule set	ruleset	delete_ruleset
Setting a rule set as default	ruleset	set_default_ruleset
Exporting a rule set	ruleset	export_ruleset
Exporting issues	defectExcel	export_defectExcel
Downloading issues	defectExcel	downloadAndExport_def ectExcel

Operation	Resource Type	Event
Modifying an issue status	issueStatus	update_issueStatus
Changing the owner	issueOwner	update_issueOwner
Modifying an issue comment	issueComment	update_issueComment

Viewing Audit Logs

Query CodeArts Check traces on the CTS console. For details, see **Viewing Audit Logs**.

9 Reference

9.1 Using CodeArts Check Plug-in in IntelliJ IDEA

This plug-in is a powerful assistant for developers to protect the code quality. It provides industry standard check, one-click code style formatting, and automatic code fixing, adhering to the concepts of simplicity, high speed, and real-time monitoring.

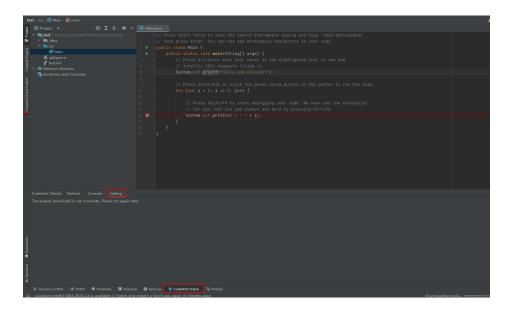
Installing the Plug-in

- Step 1 On the IntelliJ IDEA editor, choose File > Settings on the top menu bar.
- **Step 2** Click **Plugins** in the navigation pane on the left and click **Marketplace** in the right pane.
- **Step 3** Enter **Huawei Cloud CodeArts Check** or **CodeArts Check** in the search box.
- **Step 4** Click **Install**. Then IntelliJ IDEA restarts. After the restart, IntelliJ IDEA automatically downloads the engine package and the JDK package.
- **Step 5** Once the download is finished, a message appears in the lower right corner confirming the successful download.

----End

Configuring the Plug-in

Step 1 Click **CodeArts Check** at the bottom of the IntelliJ IDEA editor and click **Setting** on the toolbar.



- **Step 2** In the displayed window, click on the left to view the rule details.
- **Step 3** Decide whether to enable automatic code check, enter the masked directory, and specify directory to be checked.
- **Step 4** See the activated or applied rule details (including status, level, language, engine tag, and rule type) or filter rules by all/recommended rule set.
- **Step 5** After the configuration, click **Apply**.

----End

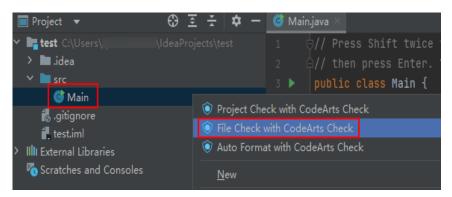
Checking and Fixing Files by the Plug-in

Take a local Java project as an example.

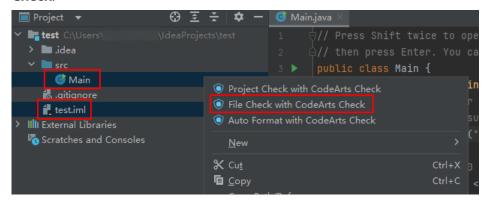
The CodeArts Check plug-in allows you to check one or multiple Java files, as well as the entire project. You can also correct code style issues with just one click. For details, see Plug-in Functions, One-Click Formatting and Automatic Fix, and Rule Configuration.

Plug-in Functions

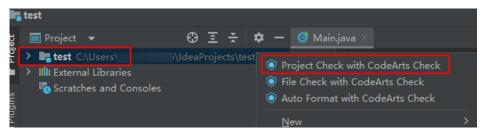
- Checking one or multiple files, as well as the entire project, and viewing the results.
 - Checking one file: In the editor area, right-click and click File Check with CodeArts Check. Alternatively, in the Project window, right-click the file to be checked and click File Check with CodeArts Check.



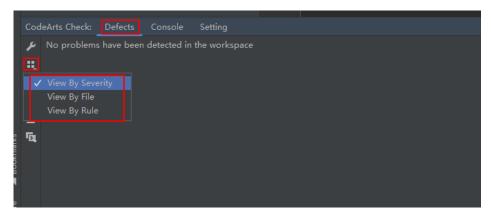
 Checking multiple files: In the Project window, hold down Ctrl and select multiple files. Then, right-click and click File Check with CodeArts Check.



 Checking the entire project: In the editor area, right-click and click Project Check with CodeArts Check. Alternatively, in the Project window, right-click the file and click Project Check with CodeArts Check.



- Viewing defect details, severity, type, compliant example, non-compliant example, and fixing suggestion. Filtering defects by severity, rule, and file.
 - Viewing defects by file: Open the CodeArts Check window, click Defects
 View By File.



- Viewing defects by severity: Open the CodeArts Check window, click
 Defects > , and select a defect type as required.
- Triggering automatic check and defect update.

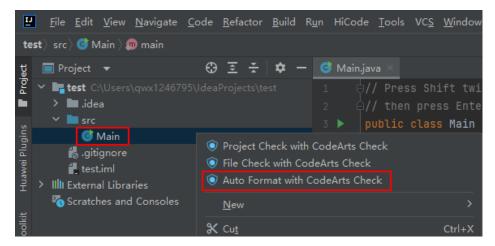
The plug-in automatically checks code in real time and updates defects after you fix the code defects based on fixing suggestions.

One-Click Formatting and Automatic Fix

• One-click formatting on a single file, multiple files, a folder, or an entire project.

With one-click formatting, you can easily resolve common code specification issues in your project, such as extra spaces or blank lines.

In the editor area, right-click and click **Auto Format with CodeArts Check**. Alternatively, in the **Project** window, right-click the file and click **Auto Format with CodeArts Check**.



• Automatic fix for a single defect checked by the plug-in.

The plug-in provides a preview window with suggestions on how to fix and the automatic fix function.

Rule Configuration

Open the CodeArts Check window, click **Setting**.

Table 9-1 Configurations

No.	Configuration	Description	
1	Automatic code check after editing and before commit	 Automatic code check after saved editing: Select whether to automatically trigger CodeArts Check after code is edited and saved. Automatic check does not affect the current window. Once you modify and save the code, the latest check results will be automatically updated in the Defects tab. Automatic code check before commit: Select whether to automatically trigger CodeArts Check before code is committed. 	
2	Check mode	The local mode is used by default.	
3	Excluded directory	Specify multiple directories by separating them with commas (,). To check the dir1 directory, enter dir1. To check dir2 in the dir1 directory, enter dir1/dir2. If no directory is specified, all content of the entire project is checked by default. This parameter is valid	
		only during project check.	
4	Search by category	Search for or filter rules.	
5	Setting rule	Select or deselect rules.	
6	Uploading/ Exporting rule	Export the rule details to an XLSX file on the local PC. Upload the rule file in XLSX format prepared on the local PC.	