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Abstract

This document describes the certification workflow for CCSP partners who want to offer Infrastructure-as-a-Service (IaaS) based on Red Hat Enterprise Linux. Last updated: June 28, 2021.
# Table of Contents

## PART I. MAKING OPEN SOURCE MORE INCLUSIVE .................................................. 3

### CHAPTER 1. INTRODUCTION TO RED HAT CERTIFIED CLOUD AND SERVICE PROVIDER CERTIFICATION WORKFLOW ................................................................. 4  
1.1. UNDERSTAND RED HAT CERTIFICATION ................................................. 4  
1.2. CERTIFICATION WORKFLOW ................................................................. 4  
1.3. GIVE FEEDBACK AND GET HELP .............................................................. 5  
1.4. ADDITIONAL RESOURCES ....................................................................... 6  

### CHAPTER 2. CERTIFICATION PREREQUISITES .................................................. 7  
2.1. PROGRAM MEMBERSHIP, ACCOUNT AND ENTITLEMENTS ....................... 7  
2.2. IMAGE REQUIREMENTS .......................................................................... 7  
2.3. PREPARING THE TEST ENVIRONMENT .................................................... 8  
2.4. OVERVIEW OF TEST ENVIRONMENT ...................................................... 8  
2.5. PREPARING THE IMAGE-UNDER-TEST ................................................... 9  
2.6. PREPARING THE TEST SERVER ............................................................... 10  

### CHAPTER 3. CERTIFICATION WORKFLOW ...................................................... 13  
3.1. CREATING A NEW CERTIFICATION REQUEST ....................................... 13  
3.2. RUNNING CERTIFICATION TESTS ......................................................... 13  
   3.2.1. Running certification tests using Red Hat certification Web UI ............ 13  
   3.2.2. Running certification tests using Red Hat certification CLI ................. 15  
3.3. VIEW THE TEST LOGS AND SUBMIT THE TEST LOGS FOR REVIEW ....... 15  
   3.3.1. Viewing and submitting the test logs for review using Red Hat certification Web UI 15  
   3.3.2. Viewing and submitting the test logs for review using Red Hat certification CLI 16  
3.4. REVIEW AND PUBLISHING OF CERTIFICATION .................................. 17  

### CHAPTER 4. RECERTIFICATION ................................................................. 18  

### CHAPTER 5. CREATING A PASSTHROUGH CERTIFICATION ......................... 19
PART I. MAKING OPEN SOURCE MORE INCLUSIVE

Red Hat is committed to replacing problematic language in our code and documentation. We are beginning with these four terms: master, slave, blacklist, and whitelist. Due to the enormity of this endeavor, these changes will be gradually implemented over upcoming releases. For more details on making our language more inclusive, see our CTO Chris Wright’s message.
CHAPTER 1. INTRODUCTION TO RED HAT CERTIFIED CLOUD AND SERVICE PROVIDER CERTIFICATION WORKFLOW

Use this guide to certify infrastructure cloud images built on Red Hat Enterprise Linux.

1.1. UNDERSTAND RED HAT CERTIFICATION

The Red Hat Certification Program ensures compatibility of Red Hat’s partner’s hardware and software products with Red Hat Enterprise Linux, Red Hat OpenStack Platform, Red Hat Gluster Storage, Red Hat Enterprise Linux for Real Time, and other Red Hat software products. The program has three main elements:

- **Test suite**: Tests for hardware or software undergoing certification.

- **Red Hat Certification Ecosystem**: Explore and find certified products including Hardware, Software, Cloud and service providers.

- A joint support relationship between Red Hat and the vendor whose hardware or software is undergoing certification.

1.2. CERTIFICATION WORKFLOW

Workflow of the certification program

1. Create a certification request for a specific software or hardware component using redhat-certification.

2. Run the tests specified in the workflow guide and submit results using redhat-certification to Red Hat for analysis.

3. The certification team analyzes the test results and communicates any required retesting.

4. When all tests have favourable results, the certification is complete and the entry is made visible to the public on the external Red Hat Certification website at Red Hat Certification Ecosystem

Know your roles and responsibilities

The following diagram represents the roles & responsibilities of Red Hat and Partners in the certification process.
1.3. GIVE FEEDBACK AND GET HELP

If you experience difficulty during the certification process with a Red Hat product, the Red Hat certification toolset, or with a procedure described in this documentation, visit Red Hat Customer Portal where you can gain access to Red Hat product documentation as well as solutions and technical articles about Red Hat products.

**Give feedback**

You may also open a case under the following instances:

- To report issues and get help with the certification process
- To submit feedback and request enhancements in the certification toolset & documentation
To receive assistance on the Red Hat product on which your product/application is being certified

**NOTE**

To receive Red Hat product assistance, it is necessary to have the required product entitlements or subscriptions, which may be separate from the partner program and certification program memberships.

Opening a Support Case

To open a support case, see [How do I open and manage a support case](#). Complete the Support Case Form with special attention to the following fields:

- From the **Product** field, select **Red Hat Enterprise Linux**
- From the **Product Version** field, select the version of the Red Hat product on which your product/application is being certified.
- In the **Problem Statement** field, type a problem statement/issue or feedback using the following format:

  {Partner Certification} (The Issue/Problem or Feedback)

  Replace *(The Issue/Problem or Feedback)* with either the issue or problem faced in the certification process/Red Hat product or feedback on the certification toolset or documentation. For example: *(Partner Certification)* Error occurred while submitting certification test results using Red Hat Certification application.

**IMPORTANT**

It is mandatory to write the problem statement with the {Partner Certification} tag to ensure assignment of the case to the appropriate groups.

All cases related to Certification use a **Severity 3 SLA** which provides for a one business day response time.

**NOTE**

Red Hat recommends that you are a Red Hat Certified Engineer or hold equivalent experience before starting the certification process.

### 1.4. ADDITIONAL RESOURCES

- For more information about program requirements fulfilled by the certification of images, see Red Hat Certified Cloud and Service Provider Program Guide (CCSP Program Guide) available in [Red Hat Connect for Business Partners](#)
- For more information about requirements and policies for image certification, see Red Hat Certified Cloud and Service Provider [Red Hat Certified Cloud and Service Provider Certification Policy Guide](#)
CHAPTER 2. CERTIFICATION PREREQUISITES

2.1. PROGRAM MEMBERSHIP, ACCOUNT AND ENTITLEMENTS

To certify cloud images, you need:

- **An active membership** in the Certified Cloud and Service Provider (CCSP) Program. If you are not already a member, visit [Red Hat Connect for Business Partners](https://connect.redhat.com) to learn more and become a member.

- **Red Hat Single Sign-On (SSO) account** During the CCSP program sign-up process a Red Hat Single Sign-On (SSO) account will be created for you. This SSO account and its credentials will be used throughout the certification process to access Red Hat products, the certification toolset, and other Red Hat assets.

- **Certification Privileges** After you have an active membership in the CCSP program and an SSO account, the account must be entitled with certification privileges. To do this, open a case and include the following information in the **Problem Statement** field:

  **Problem Statement:**

  - Partner Certification: CCSP Certification Access for {Red Hat SSO Username} at {Partner Name}
    
    **OPTIONAL** Include all of the following information in the **What do you expect to see** field to have a Red Hat associate service your case and create the first certification request for you:

    - Name of the Cloud or the Cloud Service Offering
    - Public Catalog URL/Public URL of the Cloud or Cloud Service Offering
    - Supported Regions (Global/Australia & New Zealand/ASEAN/EMEA/Japan/LATAM/North America/Public Sector):
    - Supported Languages
    - Any 3rd Party Certifications Acquired (E.g. FedRAMP, Systrust, SAS 70, PCI, Other Non-NA Certs, etc.):
    - RHEL Version (6.x or 7.x) of the first certification desired to be achieved

Attach File:

Attached Partner Brand Logo (PNG 256x256)

2.2. IMAGE REQUIREMENTS

- As a Certified Cloud and Service Provider (CCSP), you are required to certify images that you publish in a catalog. The certification process provides your Red Hat customers with the assurance that they will have a consistent experience across cloud providers, that the customer’s experience comes with the highest level of support, and that good security practices are available to the customers.

- Your image needs to meet the complete list of image requirement policies outlined in the CCSP Program Guide and the Technical and Operations requirements Guide available in [Red Hat Connect for Business Partners](https://connect.redhat.com).
Additional resources

- For more information about certification specific policies and requirements, see CCSP Policy Guide.

2.3. PREPARING THE TEST ENVIRONMENT

2.4. OVERVIEW OF TEST ENVIRONMENT

The following diagram depicts the environment setup required for all Cloud Image certification testing. The image-under-test should be RHEL 6, RHEL7, or upcoming versions of RHEL 8 (whichever is applicable) and the local-test-server should be RHEL 7.x.

The diagram includes the certification packages that need to be installed on each host (color coded).

The Red Hat Certification program now also supports using Red Hat Certification Web UI, hosted rhcert for you to interact with Red Hat in case an LTS is not available. Currently, you can use the hosted rhcert to create new certifications, update existing ones, submit results, and interact with the Red Hat Certification Operations team. But, setting up a LTS is still required for all other activities such as running tests and registering a SUT.

The primary application that is implemented in the Red Hat Certification workflow is a client server application. You can launch the Red Hat Certification web user interface on a different host (test server), and use the web UI to run certification tests on a cloud image-under-test (test client). The test server communicates with the image-under-test or the test client and triggers certification tests on the image-under-test/test client host. Using the Red Hat Certification web user interface you can:
Generate requests for new certifications

- Submit logs

- Conduct discussions with the certification team

TIP

Red Hat recommends that you set up an independent test server to run certification tests on the image-under-test/test client. This allows testing of multiple images/test clients from a single host/test server, provides detailed validation reports on the test server and prevents resource constraints. The validated test results/reports are also saved on Red Hat Certification server and can be viewed on Red Hat Certification web user interface. After the data is submitted, partners can maintain the Red Hat Certification web user interface for further communication with the certification team if required.

NOTE

You may use the Red Hat Certification Command-Line Interface if Red Hat Certification web UI is inaccessible or if the image-under-test does not have access to the internet. Red Hat supports the usage of Red Hat Certification CLI as documented for this release of CCSP certification.

2.5. PREPARING THE IMAGE-UNDER-TEST

To ensure minimum modifications to the default content of the image-under-test, install the software packages required on the image-under-test manually from Red Hat Customer Portal.

NOTE

If the image-under-test does not have internet access, we recommend that you download the required software packages on any other connected RHEL 6/7 host (whichever is applicable) and then transfer the RPM files to the image-under-test. After installation of the required packages on the image-under-test, Red Hat recommends using Red Hat Certification CLI to run certification tests and complete the rest of the process.

Procedure


2. Select the relevant version of RHEL from the Version list. Select an appropriate architecture from the Architecture list.

   Product Variant: Red Hat Certification (for RHEL Server)  Version: 7  Architecture: x86_64

3. Click the Download Latest button next to the redhat-certification-backend and redhat-certification-cloud packages.
4. Install the RPM files/packages downloaded in the previous step on the image-under-test.

5. Run the following command to start Red Hat Certification back-end server and the server listener process on the image-under-test:

```bash
# rhcertd start
```

Result

The image-under-test is now prepared for certification testing.

2.6. PREPARING THE TEST SERVER

To ensure that the required dependencies are automatically installed, the software packages required on the test server must be installed by subscribing to Red Hat Certification channel via Red Hat web user interface or Satellite.

Prerequisites

- Select a persistent RHEL 7 host which can act as the test server host. The chosen RHEL 7 host should be able to access Red Hat services including the certification channels and use the same network as the RHEL 6, RHEL 7 or RHEL 8 image-under-test.

Procedure

1. To register your host using Red Hat Subscription Management:

```bash
# subscription-manager register
```

Use your RHN credentials for the registration.

2. To display the list of available subscriptions for your system:

```bash
# subscription-manager list --available
```

From the list of available subscriptions, search for the subscription which provides the Red Hat Certification (for RHEL Server) repository. Make a note of the subscription and its Pool ID.

IMPORTANT

The Red Hat Certification (for RHEL Server) repository provides the certification packages.

3. To attach the subscription which provides the Red Hat Certification (for RHEL Server) repository to your system:

```bash
# subscription-manager attach --pool=[pool_ID]
```
Replace [pool_ID] with the Pool ID of the subscription which provides the Red Hat Certification (for RHEL Server) repository.

It is mandatory to use the correct Pool ID with the `subscription-manager attach --pool` command to attach the required subscription to the system.

**TIP**

To verify the list of subscriptions your system has currently attached, at any time, run the `subscription-manager list --consumed` command. Ensure that the subscription which provides the Red Hat Certification (for RHEL Server) repository is attached to your system.

4. To subscribe to Red Hat Certification channel

   - On RHEL 8
     
     ```
     $ subscription-manager repos --enable=cert-1-for-rhel-8-x86_64-source-rpms
     $ subscription-manager repos --enable=cert-1-for-rhel-8-x86_64-rpms
     ```

   - On RHEL 8 [aarch64]:
     
     ```
     $ subscription-manager repos --enable=cert-1-for-rhel-8-aarch64-source-rpms
     $ subscription-manager repos --enable=cert-1-for-rhel-8-aarch64-rpms
     ```

   - On RHEL 8 [ppc64le]:
     
     ```
     $ subscription-manager repos --enable=cert-1-for-rhel-8-ppc64le-source-rpms
     $ subscription-manager repos --enable=cert-1-for-rhel-8-ppc64le-rpms
     ```

   - RHEL 8 [s390x]:
     
     ```
     $ subscription-manager repos --enable=cert-1-for-rhel-8-s390x-source-rpms
     $ subscription-manager repos --enable=cert-1-for-rhel-8-s390x-rpms
     ```

   - On RHEL 7:
     
     ```
     # subscription-manager repos --enable=rhel-7-server-cert-rpms
     ```

   - RHEL 6:
     
     ```
     $ subscription-manager repos --enable=rhel-6-server-cert-rpms
     ```

5. Install the required packages using yum package manager.

   ```
   # yum install redhat-certification-backend
   # yum install redhat-certification-cloud
   ```

6. To start Apache, Red Hat Certification back-end server and the server listener process

   ```
   # systemctl start httpd
   # rhcertd start
   ```
Result

The test server (RHEL 7.x host) is now prepared. The **redhat-certification** package provides Red Hat Certification web UI which can be used to run certification tests on the image-under-test/test client.
CHAPTER 3. CERTIFICATION WORKFLOW

3.1. CREATING A NEW CERTIFICATION REQUEST

To create a new certification request, you can use either of the following

Procedure
Launch Red Hat Certification Web UI (hosted rhcert) in a browser.

Or,

1. In your test server, launch Red Hat Certification web user interface in a browser using the http://machine-IP.

2. Type your Red Hat account credentials previously enabled for certification in the Username and Password fields. Click Log In.

3. Click the Create Certification button. The New Certification webpage displays.

4. Choose the Partner, Make, and Name items from the drop-down list. The Make and Name value gets populated on selecting a Partner. Click Next.

5. Select the Certification, Platform, and Red Hat Product from the drop-down list, and click Next.

6. A notification of the requested Cloud certification gets displayed.

NOTE
If you do not see Red Hat Certified Cloud Provider option on Red Hat Certification web user interface, ensure that you are logged in with the account previously enabled for certification and have completed all the certification prerequisites. For further assistance, try Opening a support case.

3.2. RUNNING CERTIFICATION TESTS

3.2.1. Running certification tests using Red Hat certification Web UI

Procedure
To run certification tests on the image-under-test using Red Hat Certification web user interface, complete the following steps on the test server:

1. Launch Red Hat Certification web user interface in a browser using the http://machine-IP link. Replace machine-IP with the IP address/hostname of your machine.

2. Type Red Hat account credentials previously enabled for certification in the User Name and Password fields. Click Log In.

3. On Red Hat Certification Home Page, click the Server settings tab.
4. In the **Register a System** field, enter the hostname or IP address of the image-under-test and then click **Add**.

5. On Red Hat Certification Home Page, click on your existing certification entry.

<table>
<thead>
<tr>
<th>Program</th>
<th>Certification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloud</td>
<td>Red Hat Enterprise Linux 7.2 - x86_64</td>
</tr>
</tbody>
</table>

The Progress Page opens and displays the certification tests available in the certification test suite and the progress of the previous runs (if any).

6. Click the **Testing** link to open the Testing Page.

7. In the Testing Page, click **Add System**.

8. In the Select Host Page, select the host.hostname of the image-under-test and click **Test**.

The Testing Page opens and a certification test plan is created for the image-under-test. After the certification test plan run is complete and the test plan is ready, the status column displays a "Finished test run" status and a **Continue Testing** button.

1. Click **Continue Testing**.

2. From the Run Table, select all the tests which are displayed and then click **Run Selected**.

```
   Run:  Run Selected  debug
  rhcert/self_check    yes
  cloud/supportable    yes
  cloud/configuration  yes interactive
  cloud/security       yes
```

**NOTE**

It is mandatory to run all the tests which are displayed after the creation of a test plan for certification. It is recommended to select and run specific tests only for debugging purposes if advised by Red Hat Review team.

**Result**

Certification tests are run on the image-under-test. The status of the certification test run is displayed on the Testing Page. Tests with the **interactive** label will require feedback from the user during runtime. The status column on the Testing page displays a question and a textbox for inputs during testing. The test pauses until you provide a response and click **Submit**.

After the test run completes, the test logs from various tests are stored in a single log file in `.xml.gz` format.
3.2.2. Running certification tests using Red Hat certification CLI

Procedure

1. Red Hat certification CLI (rhcert-cli) command allows partners to run tests in interactive mode.

```bash
# rhcert-cli
```

Certain tests require feedback from the user during runtime (on the CLI). The test pauses until you provide a response and click Enter. The following screenshot shows an example.

**NOTE**

It is recommended that you run all the tests.

1. After the tests run, the test logs/results are automatically collected in a single .xml.gz file. To save the test results/logs, run the following command on the image-under-test:

```bash
# rhcert-cli save --server [hostname/IP address of LTS]
```

It is also possible to directly submit the test results/logs for validation without saving them on the image-under-test.

**NOTE**

To run tests in a non-interactive mode, Partners can execute the rhcert-ci command. To run tests on a remote client that has redhat-certification-backend installed and is running rhcertd, you must execute the rhcert-ci command on the Red Hat Certification image-under-test.

Additional resources

- For rhcert-cli or rhcert-ci optional argument subcommands, see Optional arguments of rhcert-cli subcommands for Cloud and OpenStack Partner Certification.

3.3. VIEW THE TEST LOGS AND SUBMIT THE TEST LOGS FOR REVIEW

3.3.1. Viewing and submitting the test logs for review using Red Hat certification Web UI

**IMPORTANT**

The following procedure also provides steps to submit, save, download and delete the test results or log file. However, it is mandatory to submit the test log file to Red Hat Certification services for validation.
1. Launch Red Hat Certification web user interface on the test server.

2. From the Certification Page, click the relevant certification entry.

3. Click the Testing link to open the Testing Page.

4. In the Testing page, click the timestamp under the relevant hostname that corresponds to the results you wish to view.

5. From the Actions list, select an appropriate action based on the following details:

   **NOTE**

   You may view the results of each test from the Results column in the table.

   - To submit the test log file for validation, select Submit. To close the test log file, select Close.
   - To save the test log file on a different Red Hat Certification server, select Save. The save action transfers the test log file (in .xml.gz format) to a remote server which has Red Hat Certification application installed. If you save the test log file on a different Red Hat Certification server, you must submit the log file from the same server.
   - To download the test log file (in .xml.gz format), select Download.
   - To delete the test log file from the server, select Delete.

The Submit option submits the consolidated test log or test results file to Red Hat certification services for review.

### 3.3.2. Viewing and submitting the test logs for review using Red Hat certification CLI

**Procedure**

1. To submit the test logs using Red Hat Certification CLI, use the `# rhcert-cli submit` command on the image-under-test.

2. Specify your Red Hat account credentials previously enabled for certification in the Red Hat Catalog Username and Password. The Certification ID is generated when you successfully create a certification request. Type the ID of the certification request in the Certification ID dialog box.

   **NOTE**

   You can view your product Certification ID in the Details tab with the row named as certification_id.
The `# rhcert-cli submit` command works only if the image has a network that can connect to the Red Hat services. The command submits the latest timestamped test logs on your host/image to Red Hat certification services for review. The test log file is reviewed by Red Hat certification services and Red Hat Review team. The certification results are displayed on Red Hat Certification web user interface.

If the image-under-test does not have internet access, complete the following steps to submit the test log file:

1. Save the results to a file using the `rhcert-cli --save` command. Copy the file to a USB.
2. Connect the USB to your LTS.
3. To upload the copied file, click the `Upload Results File` button on the `Testing` tab of your certification page.
4. To submit the test results click on the timestamp link. On the `Progress` tab click the Submit button.

After the result is successfully submitted, the certificate state in the `Testing` tab changes to `Submitted`.

The uploaded file will appear in the `Testing` tab of the Certification page and will be associated with the `Certification ID` and the `Program`.

**NOTE**

The uploaded file will replace the original file if both the filenames are same.

### 3.4. REVIEW AND PUBLISHING OF CERTIFICATION

The test log file submitted after a certification test run is validated by Red Hat certification services and the Review Team. The review team may get in touch with the partner using the `Dialog` tab on Red Hat Certification web user interface to confirm specific results and obtain more information.

In some instances, there may be a need to rerun some tests. However, the logs from the rerun can be submitted using the existing certification request. The final certification results are displayed on Red Hat Certification web user interface. To view certification results, check the `Show In Progress Certifications` button on Red Hat Certification web user interface.

After a successful certification, the certified product is listed on Red Hat Certified Cloud Providers Page.
CHAPTER 4. RECERTIFICATION

Partners must recertify their cloud application image on every major release of the Red Hat Enterprise Linux included in the image and are recommended to also recertify their image on each minor release.

To recertify an image, complete the following steps:

1. **Create a new certification request**. It is mandatory to create a new certification request for recertification.

2. Run the certification tests and proceed with the rest of the workflow as documented.
CHAPTER 5. CREATING A PASSTHROUGH CERTIFICATION

A passthrough certification is used when the same image is provided as a copy of an existing certified cloud certification and is listed under a different image name.

You can pass-through RHEL images in any of the following ways:

- Create a pass-through gold image from an originally certified regular image
- Create a pass-through gold image from an originally certified gold image
- Create a pass-through regular image from an originally certified gold image
- Create a pass-through regular image from an originally certified regular image

Prerequisites

- Ensure that the existing image is certified or published in the ecosystem catalog.

Procedure

1. Launch Red Hat Certification Web UI (hosted rhcert) in a browser.
   Or, In your test server, launch the Red Hat Certification web user interface in a browser using the http://<machine-IP>.

2. Open the existing certified image certification.

3. Click Related certification > New Certification.
   The New Pass-Through Product page displays.

4. Enter details in all the fields: Product name, Description, Product URL, Supported Regions, Supported Languages, 3rd Party Certifications, and then click Create.
   A new passthrough certification is created.

5. Click the Details tab and update the relevant Subscription Model.