



Red Hat Software Certification 2024

Red Hat OpenStack Application and VNF Policy Guide

For Use with Red Hat OpenStack 17

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Abstract

Red Hat OpenStack Application Policy Guide covers the requirements for achieving a Red Hat OpenStack Platform (RHOSP) application software certification. Version 9.3 and 8.83 updated July 31, 2024.

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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. OVERVIEW OF RED HAT OPENSTACK APPLICATION AND VNF POLICIES

Use this guide to understand the prerequisites and environmental testing requirements that are necessary to successfully complete and obtain a Red Hat OpenStack Platform (RHOSP) application certification.

This includes applications that depend on RHOSP API's, provide additional functionality in RHOSP cloud, such as a Virtual Network Function (VNF), Network Functions Virtualization (NFV), Management and Orchestration (MANO), and those applications which run on top of a RHOSP environment. It includes the applications that do not implement infrastructure software (plug-in or driver) for use with Red Hat OpenStack Platform in a supported customer environment.

1.1. AUDIENCE

Red Hat OpenStack Application certification policy guide is intended for Partners who want to certify their system using an Openstack application like Virtual Network Function (VNF), Network Functions Virtualization (NFV), Management and Orchestration (MANO) and others.

1.2. CREATING VALUE FOR OUR CUSTOMERS

Red Hat OpenStack application certification creates value for customers as it ensures that the certified application can be used with RHOSP in addition to making sure the underlying architecture is still supportable after installation of application. The certification process, through a series of tests, validates that a certified solution meets the requirements of an enterprise cloud, and is jointly supported by Red Hat and your organization.

CHAPTER 2. CERTIFICATION PREREQUISITES FOR RED HAT OPENSTACK PLATFORM APPLICATION

1. Companies must be Partners in [Red Hat Connect for Technology Partners](#). This program enables an ecosystem for commercial OpenStack deployments and includes numerous technology companies.
2. You must have a support relationship with Red Hat. This can be fulfilled through the multi-vendor support network of TSANet, or through a custom support agreement.
3. You must have a good working knowledge of Red Hat OpenStack Platform (RHOSP) including installation and configuration of the product.
4. You must have a tested application on a supported RHOSP release.



NOTE

The RHOSP application certification does not verify if your application's intended behavior matches the application's actual behavior. This responsibility remains under your full control.

Additional resources

- For more information about the product, see detailed product documentation on [Red Hat Customer Portal](#)
- To undertake the product training or certification, see [Red Hat Training Page](#)

CHAPTER 3. TESTING REQUIREMENTS FOR RED HAT OPENSTACK PLATFORM APPLICATION

The RHOSP Application Testing Requirements will be required and provided by Red Hat in a test plan for each certification. The following tests are explained in [Certification tests](#) of this guide.

- System Report Test
- Supportability Test
- Director Test
- VNF Configuration Testing Report Test (for VNF only)

You are expected to perform System Report, Supportability, and Director test for a regular RHOSP application. For VNF certification along with these three test you also need to perform the VNF Testing Configuration report test.

CHAPTER 4. CERTIFICATION TESTS

The Red Hat OpenStack application policy includes multiple tests each with a series of subtests and checks. Different certifications will require different tests. Following are the certification tests:

4.1. OVERVIEW OF SYSTEM REPORT

The System Report test, also known as **openstack/sosreport**, captures the basic sosreport. Red Hat uses a tool called sos to collect the configuration and diagnostics information from a Red Hat Enterprise Linux(RHEL) system, and to assist the customers in troubleshooting their system by following the recommended practices.

The system report subtest ensures that the sos tool functions as expected on the image or system and captures a basic sosreport.

Success Criteria

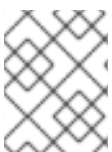
- A basic sosreport can be captured from the system under test
- The test status will be PASS if a valid rpm version captures and collects the openstack data.

Additional resources

- For more information about sosreport, see [What is an sosreport and how to create one in Red Hat Enterprise Linux?](#)

4.2. OVERVIEW OF SUPPORTABILITY TEST

The Supportability test, also known as **openstack/supportable**, ensures that the test environment is compliant with Red Hat's support policy. The test confirms that the test node (an OpenStack deployment-under-test) consists only of components RHOSP and RHEL that are supported by Red Hat or the Partner.



NOTE

An OpenStack deployment-under-test refers to the node where the plugin/application-under-test is installed and also the Undercloud Director node.

4.2.1. Kernel subtest

The **kernel** subtest checks the kernel module running on the test environment. The version of the kernel can be either the original General Availability (GA) version or any subsequent kernel update released for the RHEL major and minor releases.

The kernel subtest also ensures that the kernel is not tainted when running in the environment.

Success criteria

- The running kernel is a Red Hat kernel.
- The running kernel is released by Red Hat for use with the RHEL version.
- The running kernel is not tainted.

- The running kernel has not been modified.

Additional resources

- [Red Hat Enterprise Linux Life Cycle](#)
- [Red Hat Enterprise Linux Release Dates](#)
- [Why is the kernel "tainted" and how are the taint values deciphered?](#)

4.2.2. Kernel modules subtest

The **kernel modules** subtest verifies that loaded kernel modules are released by Red Hat, either as part of the kernel's package or added through a Red Hat Driver Update. The kernel module subtest also ensures that kernel modules do not identify as Technology Preview.

Success criteria

- The kernel modules are released by Red Hat and supported.

Additional resources

- [What does a "Technology Preview" feature mean?](#)

4.2.3. Hardware Health subtest

The Hardware Health subtest checks the system's health by testing if the hardware is supported, meets the requirements, and has any known hardware vulnerabilities. The subtest does the following:

- Checks that the Red Hat Enterprise Linux (RHEL) kernel does not identify hardware as unsupported. When the kernel identifies unsupported hardware, it will display an unsupported hardware message in the system logs and/or trigger an unsupported kernel taint. This subtest prevents customers from possible production risks which may arise from running Red Hat products on unsupported configurations and environments.
In hypervisor, partitioning, cloud instances, and other virtual machine situations, the kernel may trigger an unsupported hardware message or taint based on the hardware data presented to RHEL by the virtual machine (VM).
- Checks that the system under test (SUT) meets the minimum hardware requirements.
 - **RHEL 8 and 9:** Minimum system RAM should be 1.5GB, per CPU logical core count.
- Checks if the kernel has reported any known hardware vulnerabilities, if those vulnerabilities have mitigations and if those mitigations have resolved the vulnerability. Many mitigations are automatic to ensure that customers do not need to take active steps to resolve vulnerabilities. In some cases this is not possible; where most of these remaining cases require changes to the configuration of the system BIOS/firmware which may not be modifiable by customers in all situations.
- Confirms the system does not have any offline CPUs.
- Confirms if Simultaneous Multithreading (SMT) is available, enabled, and active in the system.

Failing any of these tests will result in a WARN from the test suite and should be verified by the partner to have correct and intended behavior.

Success criteria

- The kernel does not have the UNSUPPORTEDHARDWARE taint bit set.
- The kernel does not report an unsupported hardware system message.
- The kernel should not report any vulnerabilities with mitigations as vulnerable.
- The kernel does not report the logic core to installed memory ratio as out of range.
- The kernel does not report CPUs in an offline state.

Additional resources

- [Minimum required memory](#)
- [Hardware support available in RHEL 8 but removed from RHEL 9](#) .

4.2.4. Installed RPMs subtest

The **installed RPMs** subtest verifies that RPM packages installed on the system are released by Red Hat and not modified. Modified packages may introduce risks and impact the supportability of the customer's environment. You might install non-Red Hat packages if necessary, but you must add them to your product's documentation, and they must not modify or conflict with any Red Hat packages.

Red Hat will review the output of this test if you install non-Red Hat packages.

Success criteria

- The installed Red Hat RPMs are not modified.
- The installed non-Red Hat RPMs are necessary and documented.
- The installed non-Red Hat RPMs do not conflict with Red Hat RPMs or software.

Additional resources

- [Production Support Scope of Coverage](#)

4.2.5. SELinux subtest

Security-Enhanced Linux (SELinux) adds Mandatory Access Control (MAC) to the Linux kernel, and is enabled by default in RHEL. The SELinux subtest confirms that SELinux is running in enforcing mode on the OpenStack deployment-under test.

**NOTE**

SELinux policy is administratively-defined, enforced system-wide, and is not set at user discretion reducing vulnerability to privilege escalation attacks helping limit the damage made by configuration mistakes.

Success criteria

SELinux is configured and running in enforcing mode on the OpenStack deployment-under-test.

Additional resources

- For more information on SELinux in RHEL, see [SELinux Users and Administrators Guide](#)

4.3. DIRECTOR TEST

The Director test also known as openstack/director ensures that the deployment-under-test is originally installed using Red Hat OpenStack Platform Director. This test is required for all OpenStack software certifications.

Red Hat OpenStack Platform Director is the supported toolset for installing and managing a Red Hat OpenStack Platform environment in production. It helps in easy installation of a lean and robust OpenStack cloud and is targeted specifically for enterprise cloud environments where updates, upgrades and infrastructure control are critical for underlying OpenStack operations.

Success criteria

The deployment under test is originally installed using Red Hat OpenStack Platform Director.

Additional resources

- For more information about installing Red Hat OpenStack Platform Director, see [Director Installation and Usage Guide](#).

4.4. VNF TESTING CONFIGURATION REPORT TEST

The VNF testing configuration report test is applicable only for VNF certification. In this test, a Partner selects the operating system on which the VNF is based; provides the link to a report, or uploads a VNF configuration testing report file. The VNF SME, reviews the report that describes the installation, configuration, and testing details that the Partner conducts.

The format of the required report is pre-defined and is at the Partner's discretion, however it will need to include the following information:

- Hardware configuration
 - Server make and model
 - CPU: make, model, speed, cores, HT
 - NIC make/model
 - Networking HW make/model
 - Storage make/model
 - Traffic Generator make/model
- Firmware configuration
 - Server firmware version
 - BMC firmware version
 - NIC firmware version
- System software configuration

- Version and architecture of Red Hat Enterprise Linux used on the host
- NUMA, Cores, Huge Pages config.
- OpenStack Platform version
- Third party OSP plug-ins used, with versions
- Storage software used
- Architectural / Topology Diagram
- VNF configuration
 - VNF version
 - vCPUs, Memory, storage used in testing
 - Dataplane acceleration (ovs-dpdk, sr-ioV, etc.)
 - Cores allocation - DPDK vs. application
 - Bandwidth, IOPS, latency, etc. requirements
 - Test cases performed:
 - Instantiation, termination, scale out/in, healing, HA, and others

CHAPTER 5. VNF CERTIFICATION LEVEL

Most certification do not have levels; instead a Partner solution is either certified or not. VNF however includes an additional certification level to address that these applications often include a VM that is not otherwise supportable by Red Hat. If a Partners performs a VNF certification following VNF certification levels will get generated:

- **Certified:** The Red Hat team generates a Certified level when the certificate is completed. The VNF test level will be Certified if the VNF image is based on the RHEL operating system during the VNF certification process. The following screenshot illustrates the Certified level:

Figure 5.1. VNF Certified Level

RED HAT CERTIFICATIONS

This product has been certified to run on the following Red Hat products and technologies:

Target Product	Level
Red Hat OpenStack Platform 10.0 Base: Red Hat Enterprise Linux (x86_64) 7.3-7.x	Certified
Red Hat OpenStack Platform 9.0 Base: Red Hat Enterprise Linux (x86_64) 7.2-7.x	Certified

- **Vendor Validated:** The Red Hat team generates a Vendor Validated level when the certificate is completed. The VNF test level will be Vendor Validated if the VNF image is based on a non-RHEL operating system during the VNF certification process. The following screenshot illustrates the Vendor Validated level:

Figure 5.2. VNF Vendor Validated Level

RED HAT CERTIFICATIONS

This product has been certified to run on the following Red Hat products and technologies:

Target Product	Level
Red Hat OpenStack Platform 10.0 Base: Red Hat Enterprise Linux (x86_64) 7.4-7.x	Vendor Validated