

# Hitachi Block Storage Driver for Red Hat OpenStack Services on OpenShift

v1.1

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## Installation Guide

This guide provides information about installing Hitachi Block Storage Driver (HBSD) for Red Hat OpenStack Services on OpenShift (RHOSO) v18.0.

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# Preface

## About this document

This document provides technical details and step-by-step procedures for installing the Hitachi Block Storage Driver, which is included as part of Red Hat OpenStack Services on OpenShift (RHOSO). The configuration described here is based on RHOSO version 18.0.

## Document conventions

This document uses the following typographic convention:

| Convention    | Description  |
|---------------|--|
| <b>Bold</b>   | <ul style="list-style-type: none"><li>Indicates text in a window, including window titles, menus, menu options, buttons, fields, and labels. Example: <b>Click OK</b>.</li><li>Indicates emphasized words in list items.</li></ul> |
| <i>Italic</i> | Indicates a document title or emphasized words in text.  |
| Monospace     | Indicates text that is displayed on screen or entered by the user.<br>Example: <code>pairdisplay -g oradb</code>   |

## Intended audience

This document is intended for cloud operators and system administrators who configure and operate cloud environments using Red Hat OpenStack Services on OpenShift (RHOSO). It assumes foundational understanding of Red Hat OpenShift and Linux-based operating systems.

## Revision history

| Changes  | Date      |
|--|-----------|
| Added a new section titled Create Secret Custom Resource (CR). | June 2025 |
| Initial release  | June 2025 |

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# Installing Hitachi Block Storage Driver for Red Hat OpenStack Services on OpenShift

This document outlines the steps to set up and implement the Hitachi Block Storage Driver (HBSD) in a Red Hat OpenStack Services on OpenShift (RHOSO) 18.0 environment. Upon completion, you can configure Hitachi Storage Cinder backends in a RHOSO cluster.

In RHOSO 18.0, the HBSD Cinder volume drivers support the following protocols:

- Fibre Channel
- iSCSI

## Procedure

Deploy the RHOSO control plane. The HBSD is shipped as part of the Red Hat OpenStack Services on OpenShift (RHOSO). For more information about RHOSO, see its [documentation pages](#). To configure the Cinder service in RHOSO, follow these steps:

1. **Create Secret Custom Resource (CR):** Create a separate Secret CR for each backend, and reference its name under the 'customServiceConfigSecrets' section in the 'cinderVolumes' configuration of the OpenStack control plane deployment YAML file.

This approach ensures that sensitive information, such as storage access credentials, is not placed directly under the 'customServiceConfig' section.

Although these parameters can be defined directly under 'customServiceConfig', it is considered best practice to store sensitive data in a Secret CR for enhanced security.

**Note:** The secret must be created before it is referenced in the control plane CR.

- a. Create the Secret CR for the Fibre Channel backend with the following command.

```
[root@ocpadmin oc-sw]# cat secret-hv-fc.conf
---
apiVersion: v1
kind: Secret
metadata:
  labels:
    service: cinder
    component: cinder-volume
    name: cinder-volume-hv-secret1
type: Opaque
stringData:
  vsp-secret: |
    [vsp5600-fc]
    hitachi_storage_id=900000030008
    san_ip=172.23.67.15
    san_login=HBSD_USER
    san_password=password
[root@ocpadmin oc-sw]#
[root@ocpadmin oc-sw]#
[root@ocpadmin oc-sw]# oc create -f secret-hv-fc.conf
secret/cinder-volume-hv-secret1 created
[root@ocpadmin oc-sw]#
```

- b. Create the Secret CR for the iSCSI backend with the following command.

```
[root@ocpadmin oc-sw]# cat secret-hv-iscsi.conf
---
apiVersion: v1
kind: Secret
metadata:
  labels:
    service: cinder
    component: cinder-volume
    name: cinder-volume-hv-secret2
type: Opaque
stringData:
  vsp-secret: |
    [vsp5600-iscsi]
    hitachi_storage_id=900000030008
    san_ip=172.23.67.15
    san_login=HBSD_USER
    san_password=password
[root@ocpadmin oc-sw]#
[root@ocpadmin oc-sw]#
[root@ocpadmin oc-sw]# oc create -f secret-hv-iscsi.conf
secret/cinder-volume-hv-secret2 created
[root@ocpadmin oc-sw]#
```

2. **During RHOSO control plane deployment:** Add the Hitachi HBSD Cinder backend parameters in the OpenStack control plane deployment YAML file before deploying the control plane.

3. **After RHOSO control plane deployment:**

If deploying HBSD Cinder backends after the control plane has been deployed, modify your OpenStackControlPlane custom resource (CR) YAML file (`openstack_control_plane.yaml`). Insert the HBSD backend parameters, save the file and apply the update.

For details about specifying settings in an environment file, see the Red Hat document [Configure persistent storage](#) and the [Hitachi Block Storage Driver documentation](#) on the OpenStack Documentation portal.

Examples of HBSD backend parameters for Fibre Channel and iSCSI are provided in the following section.

```
cinder:
  template:
    cinderVolumes:
      vsp5600-fc:
        customServiceConfig: |
          [vsp5600-fc]
          volume_backend_name=vsp5600-fc
          volume_driver=cinder.volume.drivers.hitachi.hbsd_fc.HBSDFCDriver
          hitachi_pools=10
          hitachi_target_ports=CL5-D,CL6-D
          hitachi_group_create=true
        customServiceConfigSecrets:
          - cinder-volume-hv-secret1
        networkAttachments:
          - storage
          - storageMgmt
```

The following is an example for the iSCSI backend.

```

cinder:
  template:
    cinderVolumes:
      vsp5600-iscsi:
        customServiceConfig: |
          [vsp5600-iscsi]
          volume_backend_name=vsp5600-iscsi
          volume_driver=cinder.volume.drivers.hitachi.hbsd_iscsi.HBSDISCSIDriver
          hitachi_pools=15
          hitachi_target_ports=CL1-A,CL2-A
          hitachi_group_create=true
        customServiceConfigSecrets:
          - cinder-volume-hv-secret2
        networkAttachments:
          - storage
          - storageMgmt

```

| Parameter                  | Definition  |
|----------------------------|---|
| Backend definition section | vsp5600-fc (This can be any string that identifies the backend.).   |
| volume_backend_name        | Name of the backend.  |
| volume_driver              | HBSD volume driver.   |
| hitachi_storage_id         | Specifies the storage serial number (12 digits).  |
| san_ip                     | IP address of the storage device (SVP IP for VSP 5600).   |
| san_login                  | Username used to log to the target storage system.  |
| san_password               | Password used to log in to the target storage system.   |
| hitachi_pools              | DP pool ID.   |
| hitachi_target_ports       | Names of the storage controller ports.  |
| hitachi_group_create       | If set to True, the driver will create host groups or iSCSI targets on the specified storage ports as required. |

# Restriction

- Volumes that have snapshots cannot be extended.

# Verifying Hitachi Block Storage Driver installation for Red Hat OpenStack Services on OpenShift

Use the following procedure to verify the installation and configuration of the Hitachi Block Storage Driver (HBSD) for Red Hat OpenStack Services on OpenShift (RHOSO).

## Procedure

1. After deploying the RHOSO, verify the status of the Cinder service. To ensure that the Hitachi Block Storage Driver (HBSD) for RHOSO is available for use, verify that the `cinder-volume` service is running on the backend.
  - a. To verify the `cinder-volume` service status, access the `openstackclient` pod to run the OpenStack CLI commands as shown in the following example. If the `cinder-volume` service state is down, volume operations cannot proceed. If the service is down, check the logs in `cinder-volume` service pod for further troubleshooting.

```
[root@ocpadmin ~]# oc rsh -n openstack openstackclient
sh-5.1$
sh-5.1$ openstack volume service list
```

| Binary           | Host                                  | Zone | Status  | State | Updated At                 |
|------------------|---------------------------------------|------|---------|-------|----------------------------|
| cinder-scheduler | cinder-scheduler-0                    | nova | enabled | up    | 2025-06-19T05:05:29.000000 |
| cinder-volume    | cinder-volume-vsp5600-fc-0@vsp5600-fc | nova | enabled | up    | 2025-06-19T05:05:32.000000 |
| cinder-backup    | cinder-backup-0                       | nova | enabled | up    | 2025-06-19T05:05:32.000000 |

```
sh-5.1$
```

2. Verify that the following volume operations can be performed from the Horizon Dashboard:
  - Create Volume
  - Delete Volume
  - Attach Volume
  - Detach Volume
  - Create Snapshot
  - Delete Snapshot
  - Create Volume from Snapshot
  - Create Volume from Volume (Clone)

If any of these volume operations fail, check the log files available in the cinder-volume pod for error details.

## Configuration options

The following table shows configuration options for the Hitachi Block Storage Driver.

| Configuration option = Default value   | Description  | Note |
|--|--|------|
| hitachi_async_copy_check_interval = 10 | (Integer(min=1, max=600))<br>Interval in seconds to check asynchronous copying status during a copy pair deletion or data restoration.                             |      |
| hitachi_compute_target_ports = []      | (List of String)<br>IDs of the storage ports used to attach volumes to compute nodes. To specify multiple ports, connect them by commas (e.g.CL1-A,CL2-A).         |      |
| hitachi_copy_check_interval = 3        | (Integer(min=1, max=600))<br>Interval in seconds to check copying status during a volume copy.   |      |
| hitachi_copy_speed = 3                 | (Integer(min=1, max=15))<br>Copy speed of storage system. 1 or 2 indicates low speed, 3 indicates middle speed, and a value between 4 and 15 indicates high speed. |      |
| hitachi_discard_zero_page = True       | (Boolean)<br>Enable or disable zero page reclamation in a DP-VOL.  |      |
| hitachi_exec_retry_interval = 5        | (Integer)<br>Retry interval in seconds for REST API execution.   |      |
| hitachi_extend_timeout = 600           | (Integer)<br>Maximum wait time in seconds for a volume extension to complete.  |      |

| <b>Configuration option = Default value</b> | <b>Description</b>  | <b>Note</b> |
|---|---|-------------|
| hitachi_group_create = False                | (Boolean)<br>If True, the driver will create host groups or iSCSI targets on storage ports as needed.   |             |
| hitachi_group_delete = False                | (Boolean)<br>If True, the driver will delete host groups or iSCSI targets on storage ports as needed.   |             |
| hitachi_host_mode_options = []              | (List of Integer)<br>host mode option for host group or iSCSI target  |             |
| hitachi_ldev_range = None                   | (String)<br>Range of the LDEV numbers in the format of 'xxxx-yyyy' that can be used by the driver. Values can be in decimal format (e.g. 1000) or in colon-separated hexadecimal format(e.g. 00:03:E8). |             |
| hitachi_lock_timeout = 7200                 | (Integer)<br>Maximum wait time in seconds for storage to be logged in or unlocked.  |             |
| hitachi_lun_retry_interval = 1              | (Integer)<br>Retry interval in seconds for REST API adding a LUN mapping to the server.   |             |
| hitachi_lun_timeout = 50                    | (Integer)<br>Maximum wait time in seconds for adding a LUN mapping to the server.   |             |
| hitachi_mirror_auth_password = None         | (String)<br>iSCSI authentication password   |             |
| hitachi_mirror_auth_user = None             | (String)<br>iSCSI authentication username   |             |

| <b>Configuration option = Default value</b> | <b>Description</b>   | <b>Note</b> |
|---|--|-------------|
| hitachi_mirror_compute_target_ports = []    | (List of String)<br>Target port names of compute node for host group or iSCSI target |             |
| hitachi_mirror_ldev_range = None            | (String)<br>Logical device range of secondary storage system                         |             |
| hitachi_mirror_pair_target_number = 0       | (Integer(min=0, max=99))<br>Pair target name of the host group or iSCSI target       |             |
| hitachi_mirror_pool = None                  | (String)<br>Pool of secondary storage system   |             |
| hitachi_mirror_rest_api_ip = None           | (String)<br>IP address of REST API server  |             |
| hitachi_mirror_rest_api_port = 443          | (Port(min=0, max=65535))<br>Port number of REST API server                           |             |
| hitachi_mirror_rest_pair_target_ports = []  | (List of String)<br>Target port names for pair of the host group or iSCSI target     |             |
| hitachi_mirror_rest_password = None         | (String)<br>Password of secondary storage system for REST API                        |             |
| hitachi_mirror_rest_user = None             | (String)<br>Username of secondary storage system for REST API                        |             |
| hitachi_mirror_snap_pool = None             | (String)<br>Thin pool of secondary storage system                                    |             |

| <b>Configuration option = Default value</b> | <b>Description</b>   | <b>Note</b> |
|---|--|-------------|
| hitachi_mirror_ssl_cert_path = None         | (String)<br>Can be used to specify a non-default path to a CA_BUNDLE file or directory with certificates of trusted CAs, which will be used to validate the backend. |             |
| hitachi_mirror_ssl_cert_verify = False      | (Boolean)<br>If set to True the http client will validate the SSL certificate of the backend endpoint.   |             |
| hitachi_mirror_storage_id = None            | (String)<br>ID of secondary storage system.  |             |
| hitachi_mirror_target_ports = []            | (List of String)<br>Target port names for host group or iSCSI target.  |             |
| hitachi_mirror_use_chap_auth = False        | (Boolean)<br>Whether or not to use iSCSI authentication.   |             |
| hitachi_pair_target_number = 0              | (Integer(min=0, max=99))<br>Pair target name of the host group or iSCSI target.  |             |
| hitachi_pool = None                         | (String)<br>Pool number or pool name of the DP pool.   |             |
| hitachi_port_scheduler = False              | (Boolean)<br>Enable port scheduling of WWNs to the configured ports so that WWNs are registered to ports in a round-robin fashion.                                   |             |
| hitachi_quorum_disk_id = None               | (Integer(min=0, max=31))<br>ID of the Quorum disk used for global-active device.   |             |

| <b>Configuration option = Default value</b>          | <b>Description</b>   | <b>Note</b> |
|--|--|-------------|
| hitachi_rest_another_ldev_mapped_retry_timeout = 600 | (Integer)<br>Retry time in seconds when new LUN allocation request fails.  |             |
| hitachi_rest_connect_timeout = 30                    | (Integer)<br>Maximum wait time in seconds for connecting to REST API session.  |             |
| hitachi_rest_disable_io_wait = True                  | (Boolean)<br>This option will allow detaching volume immediately. If set False, storage may take few minutes to detach volume after I/O. |             |
| hitachi_rest_get_api_response_timeout = 1800         | (Integer)<br>Maximum wait time in seconds for a response against sync methods, for example GET.  |             |
| hitachi_rest_job_api_response_timeout = 1800         | (Integer)<br>Maximum wait time in seconds for a response against async methods from REST API, for example PUT and DELETE.                |             |
| hitachi_rest_keep_session_loop_interval = 180        | (Integer)<br>Loop interval in seconds for keeping REST API session.  |             |
| hitachi_rest_pair_target_ports = []                  | (List of String)<br>Target port names for pair of the host group or iSCSI target.  |             |
| hitachi_rest_server_busy_timeout = 7200              | (Integer)<br>Maximum wait time in seconds when REST API returns busy.  |             |
| hitachi_rest_tcp_keepalive = True                    | (Boolean)<br>Enables or disables use of REST API tcp keepalive.  |             |

| <b>Configuration option = Default value</b> | <b>Description</b>   | <b>Note</b> |
|---|--|-------------|
| hitachi_rest_tcp_keepcnt = 4                | (Integer)<br>Maximum number of transmissions for TCP keepalive packet.           |             |
| hitachi_rest_tcp_keepidle = 60              | (Integer)<br>Wait time in seconds for sending a first TCP keepalive packet.      |             |
| hitachi_rest_tcp_keepintvl = 15             | (Integer)<br>Interval of transmissions in seconds for TCP keepalive packet.      |             |
| hitachi_rest_timeout = 30                   | (Integer)<br>Maximum wait time in seconds for each REST API request.             |             |
| hitachi_restore_timeout = 86400             | (Integer)<br>Maximum wait time in seconds for the restore operation to complete. |             |
| hitachi_set_mirror_reserve_attribute = True | (Boolean)<br>Whether or not to set the mirror reserve attribute.                 |             |
| hitachi_snap_pool = None                    | (String)<br>Pool number or pool name of the snapshot pool.                       |             |
| hitachi_state_transition_timeout = 900      | (Integer)<br>Maximum wait time in seconds for a volume transition to complete.   |             |
| hitachi_storage_id = None                   | (String)<br>Product number of the storage system.                                |             |

| Configuration option = Default value | Description   | Note |
|--------------------------------------|---|------|
| hitachi_target_ports = []            | <p>(List of String)</p> <p>IDs of the storage ports used to attach volumes to the controller node. To specify multiple ports, connect them by commas (e.g.CL1-A,CL2-A).</p> |      |
| hitachi_zoning_request = False       | <p>(Boolean)</p> <p>If True, the driver will configure FC zoning between the server and the storage system provided that FC zoning manager is enabled.</p>                  |      |

## Hitachi Vantara

Corporate Headquarters 2535 Augustine Drive  
Santa Clara, CA 95054 USA [www.HitachiVantara.com](http://www.HitachiVantara.com) [community.HitachiVantara.com](http://community.HitachiVantara.com)

### Regional Contact Information

Americas: +1 866 374 5822 or [info@hitachivantara.com](mailto:info@hitachivantara.com)

Europe, Middle East and Africa: +44 (0) 1753 618000 or [info.emea@hitachivantara.com](mailto:info.emea@hitachivantara.com)

Asia Pacific: +852 3189 7900 or [info.marketing.apac@hitachivantara.com](mailto:info.marketing.apac@hitachivantara.com)

