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About This Document

This document provides the latest information about the Hitachi Adapters for Oracle Database. It includes information that was not available at the time the technical documentation for this product was published, as well as a list of known problems and solutions.

Intended Audience

This document is intended for customers and Hitachi Data Systems partners who license and use the Hitachi Adapters for Oracle Database.

Getting Help

The Hitachi Data Systems Support Center staff is available 24 hours a day, seven days a week. Provisions for patches and fixes are restricted to normal business hours, 8 a.m. to 5 p.m. PST.

If you need technical support, log on to the Hitachi Data Systems Portal for contact information: https://portal.hds.com. If you purchased this product from an authorized Hitachi Data Systems reseller, contact that reseller for support.

Before calling the Hitachi Data Systems Support Center, provide as much information about the problem as possible, including the following:

- The circumstances surrounding the error or failure.
- The exact content of any error messages displayed on the host systems.

Note: This release supports the software and hardware listed below. Hardware or software that are not listed in the tables below are not supported in this release.
Hardware and Software Support

Storage Models (All adapters)

<table>
<thead>
<tr>
<th>Storage Model</th>
<th>Micro Version</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hitachi Unified Storage VM</td>
<td>73-03-51-00/00</td>
<td>X</td>
</tr>
<tr>
<td>Virtual Storage Platform</td>
<td>70-06-43-00/00</td>
<td>X</td>
</tr>
<tr>
<td>Virtual Storage Platform- (G1000/G1500)</td>
<td>80-05-03-00/00</td>
<td>X</td>
</tr>
<tr>
<td>Virtual Storage Platform Gx00 (G200/G400/G600/G800)</td>
<td>83-04-01-60/00</td>
<td>X</td>
</tr>
<tr>
<td>Virtual Storage Platform Gx00 Unified</td>
<td>83-04-01-40/00</td>
<td>X</td>
</tr>
<tr>
<td>Virtual Storage Platform Fx00</td>
<td>83-03-01-40/00</td>
<td>X</td>
</tr>
</tbody>
</table>

Host Interface (All adapters)

<table>
<thead>
<tr>
<th>Storage Interface Type</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fibre Channel</td>
<td>X</td>
</tr>
<tr>
<td>iSCSI</td>
<td>X</td>
</tr>
</tbody>
</table>

Volume Type

<table>
<thead>
<tr>
<th>Storage Volume Type</th>
<th>Supported</th>
<th>Adapter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parity Group</td>
<td>X</td>
<td>• Hitachi Storage Adapter for Oracle Enterprise Manager</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Hitachi Server Adapter for Oracle Enterprise Manager</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Hitachi Storage Adapter for Oracle VM</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Hitachi Storage Adapter for Oracle Enterprise Manager-Database Cloning</td>
</tr>
<tr>
<td>HDP/HDT/HRT</td>
<td>X</td>
<td>All adapters</td>
</tr>
</tbody>
</table>
# Replication Software

<table>
<thead>
<tr>
<th>Replication Software</th>
<th>Supported</th>
<th>Adapter</th>
</tr>
</thead>
</table>
| Hitachi Shadow Image Software       | X         | • Hitachi Storage Adapter for Oracle VM  
• Hitachi Storage Adapter for Oracle Enterprise Manager  
• Hitachi Storage Adapter for Oracle Enterprise Manager-Database Cloning |
| Hitachi Thin Image                  | X         | • Hitachi Storage Adapter for Oracle Enterprise Manager-Database Cloning  
• Hitachi Storage Adapter for Oracle VM  
• Hitachi Storage Adapter for Oracle Enterprise Manager |

## Compute Blade Platforms (All adapters)

<table>
<thead>
<tr>
<th>Storage Model</th>
<th>Version</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hitachi Compute Blade 2500</td>
<td>A0160-B-1453</td>
<td>X</td>
</tr>
<tr>
<td>Hitachi Compute Blade 500</td>
<td>A0315-C-10747</td>
<td>X</td>
</tr>
<tr>
<td>Hitachi Compute Systems Manager</td>
<td>8.4.1-03</td>
<td>X</td>
</tr>
<tr>
<td>QuantaPlex T41S-2U</td>
<td>3.42.00</td>
<td>X</td>
</tr>
</tbody>
</table>

## Server OS (All adapters)

<table>
<thead>
<tr>
<th>OS 64-bit Version</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red Hat Enterprise Linux 6.6 (x86_64)</td>
<td>X</td>
</tr>
<tr>
<td>Red Hat Enterprise Linux 7.2 (x86_64)</td>
<td>X</td>
</tr>
<tr>
<td>Oracle Enterprise Linux 6.6 (x86_64)</td>
<td>X</td>
</tr>
<tr>
<td>Oracle Enterprise Linux 7.2 (x86_64)</td>
<td>X</td>
</tr>
</tbody>
</table>
**Oracle Virtual Machine** *(OEM Storage/Server and Oracle VM adapters ONLY)*

<table>
<thead>
<tr>
<th>OS 64-bit Version</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle VM Server 3.3.3 or 3.3.4</td>
<td>X</td>
</tr>
<tr>
<td>Oracle VM Server 3.4.1 or 3.4.2</td>
<td>X</td>
</tr>
<tr>
<td>Oracle VM Manager 3.3.3 or 3.3.4</td>
<td>X</td>
</tr>
<tr>
<td>Oracle VM Manager 3.4.1 or 3.4.2</td>
<td>X</td>
</tr>
</tbody>
</table>

**Hitachi Virtual Appliance VM (Management VM) - Supported OS**

<table>
<thead>
<tr>
<th>Hypervisor</th>
<th>Guest Operating System</th>
<th>Hitachi Storage Command Device</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vmware ESXi 5.5 and ESXi 6.0</td>
<td>Oracle Enterprise Linux 7.2 (x86_64)</td>
<td>Fibre Channel, iSCSI</td>
</tr>
<tr>
<td>Oracle VM 3.4.2</td>
<td>Oracle Enterprise Linux 7.2 (x86_64)</td>
<td>iSCSI only</td>
</tr>
</tbody>
</table>

**Host Interface** *(All adapters)*

<table>
<thead>
<tr>
<th>Virtualization</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fibre Channel</td>
<td>X</td>
</tr>
<tr>
<td>iSCSI Software Initiator</td>
<td>X</td>
</tr>
</tbody>
</table>

**Multipath Software** *(All adapters)*

<table>
<thead>
<tr>
<th>Multipath Software</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hitachi Dynamic Link Manager v8.4.0-02</td>
<td>X</td>
</tr>
<tr>
<td>Linux Device Mapper</td>
<td>X</td>
</tr>
</tbody>
</table>

**Device Persistence** *(All adapters)*

<table>
<thead>
<tr>
<th>Software</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>UDEV</td>
<td>X</td>
</tr>
<tr>
<td>ASMLIB</td>
<td>X</td>
</tr>
</tbody>
</table>
Oracle Software (All adapters)

<table>
<thead>
<tr>
<th>Oracle Database Software</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oracle 11g Release 2</td>
<td>X</td>
</tr>
<tr>
<td>Oracle 12c Release 1 (Non CDB/PDB)</td>
<td>X</td>
</tr>
<tr>
<td>Oracle 11g Release 2 with Real Application Cluster</td>
<td>X</td>
</tr>
<tr>
<td>Oracle 12c Release 1 with Real Application Cluster</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OEM Software</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>OEM12c Cloud Control (12.1.0.5)</td>
<td>X</td>
</tr>
<tr>
<td>OEM 13c Cloud Control (13.1.0.0 and 13.2.0.0)</td>
<td>X</td>
</tr>
</tbody>
</table>

Other Required Packages on Database Server (All adapters)

- Issci
- sg3_utils
- util-linux
- e2fsprogs
- libcurl
- openssl
- libstd++
- java 1.7

Hitachi Storage Adapter for Oracle Enterprise Manager

New Features

- Vastly improved installation process
- Adapter management from centralized management server (Virtual Appliance)
- Centralized storage management using Metro REST API
- Unified Compute Platform (UCP) for Oracle Cloud Foundation support (OVM templates)
- Support for OEM 13c Cloud Control
- Support for BI Publisher reports
- Support for Hitachi VSP G1500 storage models
- Red Hat Enterprise Linux 7.2 (64-bit) Support
- Oracle Enterprise Linux 7.2 (64-bit) Support
- Pre- and post-installation validation script
- Bug fixes

**Known Problems**

- The adapter may not work if there are missing operating system packages. Be sure to install the required packages as explained in the User’s Guide.

- When the Hitachi storage adapter is undeployed from the agents, its directory is not removed. See the User’s Guide to learn how to delete that directory manually.

- Archived log database files do not appear in the database reports; only control files, data files, and redo log files are in the reports.

- Thin Image pairs do not display in the Replication Report.

- The BI Publisher report Database Usage Summary does not work in some environments. Use the equivalent Information Publisher report instead.

- Pluggable database files do not display in the database reports for the Cluster Container database. For Cluster Container databases, only container-level files are reported.

- Some LUN partitions do not display in the ASM-OS Disk Mapping metric and the reports. If you partition a LUN, only one of the partitions is recognized by the Hitachi Storage Adapter. You should have one partition per LUN.

- In Oracle VM environments, if the ovm-disk install script does not terminate with the Success message, the problem might be an insufficient time-out value in the installation scripts. Change all occurrences of ‘set timeout 10’ to ‘set timeout 60’ in the FirstConn.exp and SetupSsh.exp scripts. (Leave the timeouts that are set to 20 and 600 as they are.)
Other Notes

- You need to deploy the OEM adapter on all database hosts.

- The default collection time for each metric is configured to optimize communication with storage arrays. Any change to the collection time affects the metric collection performance. You can increase the time interval to reduce the load on the system from the default value; however, you cannot decrease it.

Hitachi Server Adapter for Oracle Enterprise Manager

New Features

- Support for monitoring multiple Hitachi Compute Blade Platforms and Quanta servers in Oracle Enterprise Manager (Hitachi Server plug-in)

- For Hitachi Compute Blade Platforms, easy configuration, by pointing to a Hitachi Compute Server Manager (HCSM) installation that is already configured to monitor the platforms of interest

- Metric collection for Quanta servers and Hitachi Compute Blade chassis, blades, and LPARs

- Alerts for status and health of Quanta servers, chassis, blades, and LPARs

- Reports for Quanta servers, Hitachi Compute Blade chassis, blades, and LPARs, and for the mapping between Oracle databases and the Hitachi Compute Blade Platforms

- UCP for Oracle Cloud Foundation support (OVM templates)

Known Problems

- The adapter may not work if operating system packages are missing. Be sure to install the required packages as explained in the User’s Guide.
When the Hitachi server adapter is undeployed on the agents, its directory is not removed. See the User’s Guide to learn how to delete that directory manually.

Values entered on the Metric and Collection Settings screen for the Warning Threshold and Critical Threshold for metrics such as the Power Status and Health Status for Chassis Management Module information are not validated to be valid possible values for that metric. Hitachi recommends not to change the settings for the Health Status, Power Status, and Chassis Status metrics.

Other Notes

The default collection time for each metric is configured to optimize communication with the Hitachi Compute Systems Manager. Any change to the collection time affects the metric collection performance. You can increase the time interval from the default value to reduce the load on the system (also reducing information freshness), but do not decrease the interval from the default.

Hitachi Storage Adapter for Oracle ASM Storage Reclamation Utility

New Features

- Vastly improved installation process
- Adapter management from centralized management server (Virtual Appliance)
- Centralized storage management using Metro REST API
- Flash GUI integration with OEM12c/13c
- RHEL 7.2 and OEL 7.2 x64 bit operating systems

Known Problems

- From the current design of the adapter, ASM Space operation returns the same value before and after the ASM/Storage
Reclamation operations. Verify the validity of these operations from the Storage Status operation.

- When you add an incorrect resource name, the Edit option is not available to correct the string. Delete the resource and add it again.

- ASRU Operations requires more time to age out if wrong resources are added.

**Hitachi Storage Adapter for Oracle Enterprise Manager-Database Cloning**

**New Features in This Release**

- Vastly improved installation process

- Movement of adapters to a management server (Virtual Appliance)

- Centralized storage management using Hitachi Virtual Appliance VM

- Replication report to show the relationship between production system database LUNs, staging LUNs, and target system database LUNs

- Support for OEM12c/13c Flash UI: end-to-end adapter operation management using OEM Flash UI, which eliminates the complexities of multiple configuration files

- Ansible system moved to centralized management server (Hitachi Virtual Appliance)

- More robust design using Oracle Flashback technology

- Oracle 11g standalone/RAC database cloning by way of ShadowImage/Hitachi Thin Image

- Oracle 12c standalone/RAC database cloning by way of ShadowImage/HTI

- DB cloning on RHEL 6.6,RHEL 7.2, OEL 6.6,OEL 7.2 64 bit operating systems
Production database is supported on both physical (FC/iSCSI) and virtual systems (FC/iSCSI).

Database cloning is supported on both physical (FC/iSCSI) and virtual systems (iSCSI only).

The adapter is officially certified on multiple database configurations. Refer to the user’s guide for the supported database configurations.

Assumptions

• In case of database configuration having a separate Archive diskgroup and Fast Recovery Area (FRA) diskgroup, select the Archive diskgroup as Others and the FRA diskgroup as FRA.

• Make sure that the Fast Recovery Area (FRA) diskgroup has enough space for flashback logs. Also ensure that flashback logging is enabled. Refer to the adapter pre-requisites section in the user’s guide.

• The adapter uses Oracle flashback restore points as part of the cloning operation.

• The Adobe Flash plugin should be installed for you to access the adapter Flash UI.

Known Issues

• When creating a target instance, the adapter target type may be set to either “Basic Target Type” or “Hitachi Adapters for Oracle Database”. Use the target type available in your environment.

• The Hitachi Adapter status is shown as Pending on the UI.

• The Delete Clone operation does not remove the UDEV rules and entries from the multipath configuration file. Manually clean them up before re-running the clone operation.
After cloning is successful, change the destination path of the cloned database archive log. Refer to the Debugging section of the user’s guide for more information.

When cloning fails with the error ORA-16038, ORA-00254, ORA-00312, or ORA-15173, clean up the archive logs manually on the source database and restart the cloning operation.

HUVM support is not available in this version of Hitachi Storage Adapter for Oracle Enterprise Manager - Database Cloning.

Adapter clones only to the ASM ‘instance 1’(+ASM1) in RAC cluster. Manually add the database instance to the remaining nodes of the cluster.

In an iSCSI environment on the target system, ensure that the iscsiadm session is active for the respective storage system.

The plugin code sets the oracle admin group as the asmdba. In the case of a delete operation, sometimes the allocated memory is not freed up by Oracle. This is an Oracle issue.

After any cloning operations (Create/Delete), you have to manually refresh the entire page.

The Tasks pane does not provide target system and source system details.

If one of the target systems where the database was cloned in the past is not reachable now, you cannot delete staging LUNs.

The Delete Clone operation fails to delete /dev/sd* devices.

The cloned database will have only one copy of the control file.

The Clone status is shown as Storage Cloning completed even after the Configure Clone process is completed.

If the source cluster goes down in the middle of the Create clone process, the task state is always In-Progress. The workaround is to log in to Hitachi Virtual Appliance VM and issue the following command: “service supervisord restart”.
Hitachi Storage Adapter for Oracle VM

New Features

- Vastly improved installation process
- Adapter management from centralized management server (Virtual Appliance)
- Support for Oracle VM 3.3.3, 3.3.4 & 3.4.1, 3.4.2
- UCP for Oracle Cloud Foundation support (OVM templates)
- Bug fixes

Known Problems

- **Slow Performance when Creating a LUN on a Parity Group or RAID Group**
  The LUN creation operation requires more time on a Parity Group or RAID Group than it does on Dynamic Pools.

- **In the Edit Volume group, the Rename operation is not supported.**
  You cannot perform a renaming operation for any volume group. When editing a volume group or renaming on different volume groups (PG, DP), the UI does not trigger any functions from the adapter. The ovs-agent.log (under /var/log) does not display any activity for this call. Despite the rename operation being successful, the original storage system does not display the change.

- **If there are any replication pairs in a PAIR state in the primary volume, creating a new clone for the primary volume fails.**
  Make sure that the primary volume has no replication pairs in a PAIR state before you create a clone.

  **Solution:** Using Navigator, split the existing replication pair for that primary volume, and then create a clone.

- **After unregistering the SAN server, restart the Oracle VM service.** Determine whether you have removed all the LUs from the system. In some cases, when you use an LU in a resource group, an OCFS file system is created on top of it; the
Oracle VM Server treats this LU as still active. Try to remove the resource group, and then unpresent the logical unit from the host. Then retry.

- **While editing a host group, you cannot change its port number.**
  The port number is part of the host group name; the host group name format is `<port_number>_<hostgroupName>`.

- **If you add a physical device to a secondary access group that does not host an IQN, the device does not list the server name for the LUN under consideration.**
  You cannot create VMs on top of these LUNs.

- **Thin Image pool information is not displayed on Oracle VM console.**
  The adapter does not show external parity group information.

- **Create Access Group and Delete Access Group operations are not supported in virtual storage (HUVM configuration).**
  The adapter does not support this feature.

- **Sometimes, OVM incorrectly displays duplicate entries of the same LUN.**

- **External parity groups information do not display on the Oracle VM console.**
  The adapter does not support external parity groups.

**Notes on Adapter Upgrade**

**Oracle Bug - Bugzilla 15669**

OVM repositories need to be deleted and added again when the adapter is upgraded from the previous version. Oracle OVM Manager does not allow the plugin private data format to be changed/updated when the adapter is upgraded from the previous version.

**Workaround:** The Oracle OVM framework expects private plugin data to be the same when the user upgrades the adapter. If plugin private data has changed from the previous release, delete the existing SAN server in OVM, and then add it again.
**Oracle Recommendation:**

The best way to address this kind of issue is to re-provision the Oracle VM Manager installation. See the following document to re-provision Oracle VM Manager:

*Oracle VM: How To Regenerate The OVM 3.3.x DB (Doc ID 2038168.1)*

**Documentation**

*MK-92ADPTR130-01  Hitachi Adapters for Oracle Database User’s Guide*
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