

Hitachi Application Protector CLI Guide for Oracle® Database Server

FASTFIND LINKS

- Document organization
- Product version
- Getting help
- Table of contents

© 2014 Hitachi Data Systems Corporation. All rights reserved.

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying and recording, or stored in a database or retrieval system for any purpose without the express written permission of Hitachi Data Systems Corporation.

Hitachi Data Systems Corporation reserves the right to make changes to this document at any time without notice and assumes no responsibility for its use. This document contains the most current information available at the time of publication. When new or revised information becomes available, this entire document will be updated and distributed to all registered users.

Some of the features described in this document might not be currently available. Refer to the most recent product announcement for information about feature and product availability, or contact Hitachi Data Systems Corporation at <https://portal.hds.com>.

Notice: Hitachi, Ltd., products and services can be ordered only under the terms and conditions of the applicable Hitachi Data Systems Corporation agreements. The use of Hitachi, Ltd., products is governed by the terms of your agreements with Hitachi Data Systems Corporation.

Hitachi is a registered trademark of Hitachi, Ltd., in the United States and other countries. Hitachi Data Systems is a registered trademark and service mark of Hitachi, Ltd., in the United States and other countries.

Archivas, Essential NAS Platform, HiCommand, Hi-Track, ShadowImage, Tagmaserve, Tagmasoft, Tagmasolve, Tagmastore, TrueCopy, Universal Star Network, and Universal Storage Platform are registered trademarks of Hitachi Data Systems Corporation.

AIX, AS/400, DB2, Domino, DS6000, DS8000, Enterprise Storage Server, ESCON, FICON, FlashCopy, IBM, Lotus, MVS, OS/390, RS/6000, S/390, System z9, System z10, Tivoli, VM/ESA, z/OS, z9, z10, zSeries, z/VM, and z/VSE are registered trademarks or trademarks of International Business Machines Corporation.

All other trademarks, service marks, and company names in this document or website are properties of their respective owners.

Microsoft product screen shots are reprinted with permission from Microsoft Corporation.

Notice Export Controls. The technical data and technology inherent in this Document may be subject to U.S. export control laws, including the U.S. Export Administration Act and its associated regulations, and may be subject to export or import regulations in other countries. Reader agrees to comply strictly with all such regulations and acknowledges that it has the responsibility to obtain licenses to export, re-export, or import the Document and any Compliant Products.



Contents

Contents

Preface	xi
Intended audience	xii
Product version	xii
Related documents	xii
Document revision level	xii
Document organization	xiii
Document conventions	xiii
Getting help	xiv
Comments	xiv
1 Introduction	1-1
Application Protector overview	1-2
Application Protector operations	1-2
Preventing the command parsing errors	1-4
Parsing of command	1-4
2 Working with Help commands	2-1
Application Protector Help commands	2-2
3 Working with Snapshot commands	3-1
Creating a snapshot	3-2
Syntax	3-2
Parameter description	3-3
Sample command(s) and output	3-4
Command for VSP or HUS	3-4
Output	3-4
Command for HNAS	3-4

Output	3-4
Deleting the snapshots	3-5
Syntax	3-5
Parameter description	3-6
Sample command(s) and output	3-7
Command	3-7
Output	3-7
Listing the snapshots	3-8
Syntax	3-8
Parameter description	3-9
Sample command(s) and output	3-10
Command	3-10
Output	3-10
Command for long listing of snapshots	3-10
Output	3-10
Command to redirect the output to an xml file	3-12
Output	3-12
Reverting a snapshot	3-13
Syntax	3-13
Parameter description	3-14
Sample command(s) and output	3-14
Command	3-14
Output	3-15
Mounting a snapshot	3-16
Syntax	3-16
Parameter description	3-17
Sample command(s) and output	3-18
Command	3-18
Output	3-18
Unmounting a snapshot	3-19
Syntax	3-19
Parameter description	3-20
Sample command(s) and output	3-20
Command	3-20
Output	3-20
Recovering from a snapshot	3-21
Syntax	3-21
Parameter description	3-23
Sample command(s) and output	3-24
Command for complete recovery	3-24
Output	3-24
4 Working with Schedule commands	4-1
Creating a schedule	4-2
Syntax	4-2

Parameter description	4-4
Error scenarios and messages	4-6
Sample command(s) and output	4-6
Command for finite schedule	4-6
Output	4-6
Command for infinite weekly schedule	4-6
Output	4-6
Modifying a schedule	4-7
Syntax	4-7
Parameter description	4-8
Sample command(s) and output	4-9
Command	4-9
Output	4-9
Deleting a schedule	4-10
Syntax	4-10
Parameter description	4-11
Sample command(s) and output	4-11
Command	4-11
Output	4-11
Listing the schedules	4-12
Syntax	4-12
Parameter description	4-13
Sample command(s) and output	4-14
Command	4-14
Output	4-14
Command	4-14
Output	4-14
5 Working with Admin commands	5-1
Configuring the Application Protector server and client	5-2
Setting the Application Protector configuration	5-2
Syntax	5-2
Parameter description	5-3
Sample command(s) and output	5-4
Resetting the Application Protector configuration	5-5
Syntax	5-5
Parameter description	5-6
Sample command(s) and output	5-6
Listing the Application Protector configuration	5-7
Syntax	5-7
Parameter description	5-8
Sample command(s) and output	5-9
Importing the Application Protector metadata	5-12
Syntax	5-12

Parameter description	5-13
Sample command(s) and output	5-13
Licensing Application Protector	5-14
Generating the Application Protector license.	5-15
Syntax	5-15
Parameter description	5-16
Sample command(s) and output	5-17
Activating the Application Protector license	5-18
Syntax	5-18
Parameter description	5-19
Sample command(s) and output	5-19
Listing the licenses	5-20
Syntax	5-20
Parameter description	5-21
Sample command(s) and output	5-21
Configuring the database service account	5-23
Setting the database service account.	5-23
Syntax	5-23
Parameter description	5-24
Sample command(s) and output	5-24
Listing the database service account	5-25
Syntax	5-25
Parameter description	5-26
Sample command(s) and output	5-26
Modifying the database service account.	5-28
Syntax	5-28
Parameter description	5-29
Sample command(s) and output	5-29
Configuring the ASM service account.	5-30
Adding the ASM service account	5-30
Syntax	5-30
Parameter description	5-31
Sample command(s) and output	5-31
Listing the ASM service account	5-32
Syntax	5-32
Parameter description	5-32
Sample command(s) and output	5-34
Command.	5-34
Output	5-34
Modifying the ASM service account	5-35
Syntax	5-35
Parameter description	5-36
Sample command(s) and output	5-36
Working with the operations.	5-37

Listing the operations	5-37
Syntax	5-37
Parameter description	5-38
Sample command(s) and output	5-39
Deleting the operations	5-41
Syntax	5-41
Parameter description	5-42
Sample command(s) and output	5-42
Listing the log details	5-43
Syntax	5-43
Parameter description	5-44
Sample command(s) and output	5-45
6 Working with Server commands	6-1
Listing the databases	6-2
Syntax	6-2
Parameter description	6-3
Sample command(s) and output	6-3
Command	6-3
Output	6-4
Command	6-4
Output	6-4
Listing the tablespaces	6-5
Syntax	6-5
Parameter description	6-6
Sample command(s) and output	6-6
Command	6-6
Output	6-6
Command	6-7
Output	6-7
Configuring the storage array	6-8
Registering a storage array	6-8
Syntax	6-8
Parameter description	6-9
Sample command(s) and output	6-10
Modifying a storage array	6-11
Syntax	6-11
Parameter description	6-12
Sample command(s) and output	6-13
Unregistering a storage array	6-14
Syntax	6-14
Parameter description	6-15
Sample command(s) and output	6-15
Listing the storage arrays	6-16

Syntax	6-16
Parameter description	6-17
Sample command(s) and output	6-17
Configuring the user scripts	6-19
Registering a user script.	6-19
Syntax	6-19
Parameter description	6-20
Sample command(s) and output	6-20
Unregistering a user script	6-21
Syntax	6-21
Parameter description	6-22
Sample command(s) and output	6-22
Listing the user scripts.	6-23
Syntax	6-23
Parameter description	6-24
Sample command(s) and output	6-24
Modifying a user script.	6-26
Syntax	6-26
Parameter description	6-27
Sample command(s) and output	6-27
7 Working with the utilities	7-1
HAPRO dump	7-2
Syntax	7-2
Parameter description	7-3
Sample command(s)	7-3
Command.	7-3
Output	7-4
HAPRO sync	7-8
Syntax	7-9
Parameter description	7-10
Sample command(s)	7-10
Command.	7-10
Output	7-10
Command.	7-10
Output	7-11
Command.	7-11
Output	7-11
Command.	7-11
Output	7-11
A . Appendix.	A-1
Application types.	A-2

Snapshot limit for supported storage	A-2
Listing the Application Protector logs	A-2
Application Protector server log	A-2
Application Protector client log	A-2
Application Protector operation log	A-3
Listing the events	A-3
Default log paths	A-3
Schedule types	A-3
Days of week	A-3
Months of year	A-4
Service account user privileges	A-5
Displaying status of a command	A-5

Glossary



Preface

This document provides information about the Hitachi Application Protector (Application Protector) command line interface (CLI) for Oracle® Database (Oracle Database) Server.

This preface includes the following information:

- [Intended audience](#)
- [Product version](#)
- [Related documents](#)
- [Document revision level](#)
- [Document organization](#)
- [Document conventions](#)
- [Comments](#)

Notice: The use of all Hitachi Data Systems products is governed by the terms of the agreement(s) with Hitachi Data Systems.

Intended audience

This document is intended for customers, application backup administrators, and Hitachi Ltd. partners involved in configuring and using Application Protector. Readers of this document should be familiar with the following:

- Oracle® Database administration
- Linux® and Solaris® operating system
- Storage administration
- Backup and recovery concepts

Product version

This document revision applies to Hitachi Application Protector v1.2 for Oracle® Database.

Related documents

- *Hitachi Application Protector Quick Install & Configuration Guide for Oracle® Database Server MK-91HAP013-00*
- *Hitachi Application Protector User Guide for Oracle® Database Server MK-91HAP011-00*
- *Hitachi Application Protector Troubleshooting Guide for Oracle® Database Server FE-91HAP015-00*

Document revision level

Revision	Date	Description
MK-91HAP023-00	July 2014	Initial release

Document organization

The following table provides an overview of the contents and organization of this document. [Click the chapter title](#) in the first column to refer that chapter. The first page of every chapter or appendix contains links to the contents.

Chapter	Description
Chapter 1, Introduction	Provides an introduction and overview of Application Protector.
Chapter 2, Working with Help commands	Provides syntax and parameter description of help.
Chapter 3, Working with Snapshot commands	Provides syntax and parameter description of snapshot commands.
Chapter 4, Working with Schedule commands	Provides syntax and parameter description for scheduling snapshot commands.
Chapter 5, Working with Admin commands	Provides syntax and parameter description for administrative commands.
Chapter 6, Working with Server commands	Provides syntax and parameter description for server commands.
Chapter7, Working with the utilities	Provides the utility details for HAPRO dump and HAPRO sync.
ChapterA, Appendix	Provides snapshot limit for supported storage, service account privileges, details to list logs and monitoring CLI status.
Glossary	Defines the acronyms and special terms used in this document.


Document conventions

The document uses the following typographic conventions.

Convention	Description
Bold	Indicates text on a window, other than the window title, including menus, menu options, buttons, fields, and labels. Example: Click OK .
<i>Italic</i>	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: copy <i>source-file target-file</i> . Note: Angled brackets (< >) are also used to indicate variables.
screen/code	Indicates text that is displayed on screen or entered by the user. Example: # pairdisplay -g oradb
< > angled brackets	Indicates a variable, which is a placeholder for actual text provided by the user or system. Example: # pairdisplay -g <group> Note: <i>Italic</i> font is also used to indicate variables.
[] square brackets	Indicates optional values. Example: [a b] indicates that you can choose a, b, or nothing.
{ } braces	Indicates required or expected values. Example: {a b} indicates that you must choose either a or b.

Convention	Description
vertical bar	Indicates that you have a choice between two or more options or arguments. Examples: [a b] indicates that you can choose a, b, or nothing. { a b } indicates that you must choose either a or b.
<u>underline</u>	Indicates the default value. Example: [<u>a</u> b]

This document uses the following symbol to draw attention to the specific information.

Symbol	Meaning	Description
	Note	Notes emphasize or supplement important points of the main text.

Getting help

The Hitachi Data Systems customer support staff is available 24 hours a day, seven days a week.

If you need technical support, log on to the Hitachi Data Systems support portal for contact information: <https://hdssupport.hds.com>.

If you purchased this product from an authorized HDS reseller, contact that reseller for support. For the name of your nearest HDS authorized reseller, refer to the HDS support portal for locations and contact information.

Comments

Your comments and suggestions to improve this document are greatly appreciated. Please send your comments on this document to doc.comments@hds.com. Include the document title, number, and revision. Please refer to specific sections and paragraphs whenever possible.

Thank you! (All comments become the property of Hitachi Data Systems.)

Introduction

Hitachi Application Protector (Application Protector) is a snapshot based backup and recovery software. It is based on the client-server architecture, where the Application Protector Client can be installed on the same or a remote server on the same network.

This section describes the following topics:

- ❑ [Application Protector overview](#)
- ❑ [Application Protector operations](#)
- ❑ [Preventing the command parsing errors](#)

Application Protector overview

Application Protector facilitates creation of snapshots of the Oracle[®] Database (Oracle Database) on the Linux[®] and Solaris[®] platform. You can perform recovery by using the snapshots, based on the recovery time objective (RTO) and recovery point objective (RPO).

Backup and storage administrators can use Application Protector to create snapshots of the storage logical units (LU)s hosting the supported Oracle Database.

Application Protector has a Java™ based graphical user interface (GUI) and command line interface (CLI). The Application Protector CLI provides commands and actions to invoke the workflow on Application Protector Server.

Application Protector supports the following:

- Register the supported Hitachi storage arrays.
- Create, list, mount, unmount, and delete ShadowImage[®] (SI), Hitachi Thin Image (HTI), and Tree Clone snapshots.
- Restore, Point-in-Time (PIT), and complete recovery of the selected database at database or tablespace level.
- Revert database using a snapshot.
- Set policy to configure snapshot retention count at server level.
- Create, list, delete, and modify snapshot schedules.
- Native Device-Mapper Multipath environment for Red Hat[®] Enterprise Linux[®] (RHEL) and SUSE[®] Linux Enterprise Server (SLES) operating system.
- Protect databases hosted on Logical Volume Manager (LVM) devices for SLES platforms.
- Supports Automatic Storage Management (ASM) setups for RHEL and non-ASM setups for Solaris and SLES platform.

Application Protector operations

This document guides you through the commands containing the syntax, parameter description, sample commands, and the output of Application Protector.



NOTE: You can invoke the Application Protector CLI using the `hapro` command from anywhere on the terminal.

You can perform the following operations using the command line interface (CLI):

1. Snapshot related operations
 - Create Snapshot
 - Delete Snapshot
 - List Snapshot

- Revert Snapshot
 - Mount Snapshot
 - Unmount Snapshot
 - Recover Snapshot
2. Snapshot schedule related operations
 - Create Schedule
 - Modify Schedule
 - Delete Schedule
 - List Schedule
 3. Administrative operations
 - List Operations
 - Delete Operation
 - Set Configuration
 - Reset Configuration
 - List Configuration
 - List Log
 - Import metadata
 - Set DB Service Account
 - List DB Service Account
 - Modify DB Service Account
 - Set ASM Service Account
 - List ASM Service Account
 - Modify ASM Service Account
 - Generate License Request
 - Activate License
 - List License
 4. Server operations
 - List Databases
 - List Tablespaces
 - Register Storage Array
 - Unregister Storage Array
 - List Storage Array
 - Modify Storage Array
 - Register User script
 - Unregister User script
 - List User script
 - Modify User script
 5. Utilities

- HAPRO dump
- HAPRO sync



NOTE: Installation and related prerequisites are described in the *Hitachi Application Protector Quick Install & Configuration Guide for Oracle® Database Server on Linux®* guide.

Preventing the command parsing errors

The following section lists the scenarios that can provide errors while executing the commands.

Parsing of command

Table 1-1: Parsing of command error scenarios and messages

Scenario	Error message(s)
If you provide an invalid parameter.	<Parameter name> is an invalid input parameter
If you do not specify a value for a parameter.	<Parameter name> parameter value is not specified
If you pass an incorrect value such as - application type, revert snapshot mode, operation type, and log level.	Specified value is invalid
If you do not specify one or more mandatory parameters.	Parameters required: <Parameter 1>, <Parameter 2>



NOTE: For more details about error codes, messages, and validations, see *Hitachi Application Protector Troubleshooting Guide for Oracle® Database Server*.

Working with Help commands

This chapter provides the list of operations supported by Hitachi Application Protector (Application Protector) for Oracle Database on Linux and Solaris platforms and the sample help command and output.

This section describes the following topic.

- [Application Protector Help commands](#)

Application Protector Help commands

This chapter provides sample help command and the output.

Sample command(s) and output

Syntax

```
hapro
```

Command for generic help

```
hapro --help
```

Output

```
usage: hapro [ -h [ -a oracle|saporacle ] | command ]
```

```
-----
```

		Application Support	

Command	Description	Oracle	SAP Oracle
=====	=====	=====	=====
snapshot	Snapshot Operations	Y	Y
schedule	Schedule Operations	Y	N
server	Server Operations	Y	Y
admin	Administrative Operations	Y	Y

Command for application specific help

```
hapro -h -a oracle
```

Output

```
usage: hapro [ -h [ -a oracle|saporacle ] | command ]
```

```
-----
```

Command	Description
=====	=====
snapshot	Snapshot Operations
schedule	Schedule Operations
server	Server Operations
admin	Administrative Operations

Command

```
hapro snapshot -h -a oracle
```

Output

```
usage: hapro snapshot [ -h [ -a oracle|saporacle ] | action ]
```

```
-----  
---
```

Action	Description
create	Create Snapshot
delete	Delete Snapshot
list	List Snapshots
mount	Mount Snapshot
unmount	Unmount Snapshot
recover	Recover Database
revert	Revert Snapshot

Syntax

```
HAPRO <command> <action> [--help]
```

where:

<command> can be snapshot, schedule, admin, server

<action> varies with command provided

Table 2-1: Available actions for commands

Command	Action
snapshot	create, delete, list, mount, unmount, recover, revert
schedule	create, modify, delete, list
admin	listoperations, deleteoperation, setconfig, resetconfig, listconfig, importmetadata, listlog, setdbserviceaccount, listserviceaccount, modifyserviceaccount, setasmserviceaccount, listasmserviceaccount, modifyasmserviceaccount, generatelicenserequest, activatelicense, listlicense
server	listdb, listitem, registerstoragearray, unregisterstoragearray, liststoragearray, modifystoragearray, registerscript, modifyscript, unregisterscript, listscripts

Command

```
hapro snapshot create -h -a oracle
```

Output

```
usage: hapro snapshot create
  { -s | --server          } Hostname/FQDN/IP of HAPRO server
  { -a | --app             } Application: oracle
  { -e | --database       } Database name
  [{ -x | --snapshot      }] Snapshot name
  [{ -b | --snapshottype  }] Snapshot type: treeclone/spceff/
  flcpy. (Defaults: treeclone for HNAS, spceff otherwise.)
  [{ -d | --description   }] Description
  [{ -p | --prescript     }] Prescript
  [{ -Z | --postscript    }] Postscript
  [{ -f | --force         }] Do not warn if snapshot retention
  policy is active
  [{ -w | --sync          }] Show live progress of the operation
  [{ -u | --user          }] Login user for HAPRO server
  [{ -P | --password     }] Login password for HAPRO server
```



NOTE: You cannot stop the Application Protector operations that are in progress by using Ctrl+C. The Application Protector CLI quits, but the operation continues on the Application Protector Server.

Working with Snapshot commands

Application Protector protects the Oracle databases by using the Hitachi's snapshot technology.

This section describes the following topics:

- [Creating a snapshot](#)
- [Deleting the snapshots](#)
- [Listing the snapshots](#)
- [Reverting a snapshot](#)
- [Mounting a snapshot](#)
- [Unmounting a snapshot](#)
- [Recovering from a snapshot](#)

Creating a snapshot

Application Protector takes snapshot of the data files, control files, and archive logs. These files must be in a device or diskgroup from the same supported storage array.



NOTE: Application Protector does not support snapshot of devices or diskgroups created on mixed storages such as a device1 from HUS and device2 from VSP.

You can create HTI or SI type of snapshots. For SI type of snapshots, you must create a pair relationship of P-VOL and S-VOL prior to creating a snapshot. If the requested P-VOL is in pair relationship with more than one S-VOL:

- The pair selection logic is based on the priority between the available pairs. The highest priority goes to any pair in the PAIR state, if no such pair is found, then the oldest SPLIT pair is selected.

This command creates a snapshot of the database on the specified server.

Syntax

```
hapro snapshot create
```

```
usage: hapro snapshot create
```

```
{ -s | --server          } Hostname/FQDN/IP of HAPRO server
{ -a | --app             } Application: oracle
{ -e | --database       } Database name
[{-x | --snapshot       }] Snapshot name
[{-b | --snapshottype   }] Snapshot type: treeclone/spceff/flcpy. (Defaults: treeclone for HNAS, spceff otherwise.)
[{-d | --description   }] Description
[{-p | --prescript     }] Prescript
[{-Z | --postscript    }] Postscript
[{-f | --force         }] Do not warn if snapshot retention
policy is active
[{-w | --sync          }] Show live progress of the operation
[{-u | --user          }] Login user for HAPRO server
[{-P | --password     }] Login password for HAPRO server
```


Parameter description

Table 3-1: Create snapshot parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of Application Protector server.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	oracle	Yes
Database name	--database	-e	This parameter specifies the Oracle database name for which snapshot is created.	Oracle database name	Yes
Snapshot name	--snapshot	-x	This parameter specifies the user specified snapshot name.	String of ¹ alphabets, numbers, space, underscore, dash up to 255 characters	No ²
Snapshot type	--snapshottype	-b	This parameter specifies the snapshot type. By default, space efficient snapshot is created. For HNAS, by default, Tree Clone snapshot is created.	Acceptable values are: <ul style="list-style-type: none"> • flcpy • spceff³ • treeclone 	No
Description	--description	-d	This parameter specifies the description.	Any string of characters	No
Prescript	--prescript	-p	This parameter specifies the script that is executed before the operation.	Valid registered script	No
Postscript	--postscript	-Z	This parameter specifies the script that is executed after the operation.	Valid registered script	No
Force	--force	-f	Do not warn if snapshot retention policy is active.	Not applicable	No
Sync	--sync	-w	Show live progress of the operation.	Not applicable	No
User Name	--user	-u	Login user for Application Protector server.	Valid username	No ⁴
Password	--password	-P	Login password for Application Protector server.	Valid password	No ⁵

- 1.The maximum character length for a snapshot name is 255. Application Protector does not support special characters excluding underscore (_) and hyphen (-).
- 2.If the snapshot name parameter is not specified, the snapshot is created using default snapshot name. The default snapshot name is made up of <user name>_<databasename>_<datetimeformat: iso/system>.
- 3.“spceff” refers to space efficient/HTI snapshots and “flcpy” refers to full copy/SI snapshots.
- 4.You must provide the user name when prompted.
- 5.You must provide the password when prompted.

Sample command(s) and output

Command for VSP or HUS

```
hapro snapshot create -s <Hostname/IP of Application  
Protector Server/FQDN> -a oracle -e <Database name> -x  
<snapshot name> -b <snapshot type: spceff/flcpy/treeclone> -  
u <username> -P <password>
```

Output

```
[I7203019] Request to create snapshot submitted successfully.
```

Command for HNAS

```
hapro snapshot create -s <Hostname/IP of Application  
Protector Server/FQDN> -a oracle -e <Database name> -x  
<snapshot name> -u <username> -P <password>
```

Output

```
[I7203019] Request to create snapshot submitted successfully.
```

Deleting the snapshots

This command deletes the snapshot identified by the specified snapshot name(s) or set ID(s). When a snapshot is deleted, the backup control files are also deleted.

Syntax

```
hapro snapshot delete

usage: hapro snapshot delete

  { -s          | --server          } Hostname/FQDN/
IP of HAPRO server

  { -a          | --app            } Application:
oracle/saporacle

  { -x || -X | --snapshot || --snapshotsetid } Snapshot
name(s)/set ID(s)

[ { -p          | --prescript      } ] Prescript

[ { -Z          | --postscript     } ] Postscript

[ { -f          | --force          } ] Skip user
confirmation

[ { -w          | --sync           } ] Show live
progress of the operation

[ { -u          | --user           } ] Login user for
HAPRO server

[ { -P          | --password       } ] Login password
for HAPRO server
```

Parameter description

Table 3-2: Delete snapshot parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of Application Protector server.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	<ul style="list-style-type: none"> • oracle • saporacle 	Yes
Snapshot name	--snapshot	-x	This parameter specifies the snapshot name to be deleted.	Snapshot name (Multiple comma separated values allowed.)	Yes* ¹
Snapshot set ID	--snapshotsetid	-X	This parameter specifies the set ID of snapshot to be deleted.	Snapshot set ID Multiple comma separated values allowed.	Yes*
Prescript	--prescript	-p	This parameter specifies the script that is executed before this operation.	Valid registered script	No
Postscript	--postscript	-Z	This parameter specifies the script that is executed after this operation.	Valid registered script	No
Force	--force	-f	Skip user confirmation	Not applicable	No
Sync	--sync	-w	Show live progress of the operation.	Not applicable	No
Login user	--user	-u	This parameter specifies the user name required for connecting to the server.	Valid username	No ²
Login password	--password	-P	This parameter specifies the password required for connecting to the server.	Valid password	No ³

1.Note: “*” indicates, you must provide either the snapshot name or snapshot set ID to delete a snapshot.

2.You must provide the user name when prompted.

3.You must provide the password when prompted.



NOTE: Snapshots created using Application Protector must be deleted using Application Protector only.

Sample command(s) and output

Command

```
hapro snapshot delete -s <Hostname/IP of Application  
Protector Server/FQDN> -a oracle -x <snapshot name>  
  
Username [root]: oracle  
  
Password:
```

Output

```
[W720307C] Are you sure you want to delete these snapshot(s)?  
(y/n): y  
  
[I7203046] Request to delete snapshot(s) submitted  
successfully.
```

Listing the snapshots

This command lists all the snapshots created on the specified server.



NOTE:

- To view the complete details of a particular snapshot, use the `Enable long listing` flag in the command.
 - The fields that are not provided by the user, are marked with “-” in the output.
-

Syntax

```
hapro snapshot list

usage: hapro snapshot list

  { -s          | --server          } Hostname/FQDN/
IP of HAPRO server

  { -a          | --app            } Application:
oracle/saporacle

  [{ -e          | --database          }] Database name

  [{ -x || -X | --snapshot || --snapshotsetid }] Snapshot name/
set ID

  [{ -l          | --long            }] Enable long listing

  [{ -O          | --output          }] Redirect output
to this file

  [{ -u          | --user            }] Login user for
HAPRO server

  [{ -P          | --password        }] Login password
for HAPRO server
```

Parameter description

Table 3-3: List snapshot parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of Application Protector server.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	<ul style="list-style-type: none"> • oracle • saporacle 	Yes
Database name	--database	-e	Lists snapshots of this database only.	Oracle database name	No ¹
Snapshot name	--snapshot	-x	This parameter specifies the snapshot name or the set ID.	Snapshot name of an existing snapshot	No* ²
Set ID	--snapshotsetid	-X	This parameter specifies the set ID.	Set ID of an existing snapshot	No*
Enable long listing	--long	-l	This parameter specifies whether the snapshot listing is long format. The default is short format.	Not applicable	No
XML output	--output	-O	Redirect output to this file	File name	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ³
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ⁴

1.If you do not provide the Oracle database name, then all snapshots created on the connected Application Protector Server are listed, else snapshots created on the database are only listed.

2.Note: “*” indicates, you can provide the snapshot name or the set ID.

3.You must provide the user name when prompted.

4.You must provide the password when prompted.

Sample command(s) and output

Command

```
hapro snapshot list -s <Hostname/IP of Application Protector Server/FQDN> -a oracle -u <user> -P <password>
```

Output

Name	Mounted	Database	Time	Set Id	Type	Description	User
oracle at 2013_08 _02_02_ 00_31 oracle snap-01	No	vsp	2013- 11-12 15:45:2 8	2F17276A -6627- 51F4- D3F1- F1643BD4 3525	Space Effici ent	Snapshot for SP	oracle
snap1	No	vsp	2013- 08-02 00:12:2 8	10845846 -A6F2- D36D- 2EDD- 8E03D839 4BD5	Space Effici ent	Snapshot for SP	oracle

Command for long listing of snapshots

```
hapro snapshot list -a oracle -s <Hostname/IP of Application Protector Server/FQDN> -e <Oracle database name> -u <user> -P <password> -l
```

Output

```
Name:                root_DB01_2014_04_09_23_54_07
Mounted:             Yes
Time:                2014-04-09 23:54:23
Set Id:              DA284B75-9030-1E3D-D7AE-EF04BFA55C8C
Type:                Tree Clone
Description:         Snapshot request created by root at
2014_04_09_23_54_07
User:                root
Database:            DB01
Database Type:       NON-ASM
```



```

Source Device(s) :
6C81267EFDC989D90000000000000000:192.168.0.7:/HAP135Data:/
data/DB01/datafile:/

6C8126A2321719580000000000000000:192.168.0.14:/HAP135Redo1:/
redo/DB01/controlfile:/

6C81267EFDC989D90000000000000000:192.168.0.7:/HAP135Arch:/
archive:/

Target Device(s) :
6C81267EFDC989D90000000000000000:192.168.0.7:/45015C5C-AE18-
8362-C02B-AD0B54D5DF1F:/ .haproclone/DA284B75-9030-1E3D-D7AE-
EF04BFA55C8C/45015C5C-AE18-8362-C02B-AD0B54D5DF1F/datafile/
:/

6C8126A2321719580000000000000000:192.168.0.14:/4318BE7E-
F593-B73E-2EE0-DD024C2D930B:/ .haproclone/DA284B75-9030-1E3D-
D7AE-EF04BFA55C8C/4318BE7E-F593-B73E-2EE0-DD024C2D930B/
controlfile:/

6C81267EFDC989D90000000000000000:192.168.0.7:/7AE9BB88-D159-
C60A-8023-8A7EB379F81D:/ .haproclone/DA284B75-9030-1E3D-D7AE-
EF04BFA55C8C/7AE9BB88-D159-C60A-8023-8A7EB379F81D/archive:/

Application:          oracle
Snapshot IDs:         45015C5C-AE18-8362-C02B-AD0B54D5DF1F
                       4318BE7E-F593-B73E-2EE0-DD024C2D930B
                       7AE9BB88-D159-C60A-8023-8A7EB379F81D
Originating Machine: Sol10-135
Service Machine:     Sol10-135
-----
Name:                 root_DB01_2014_04_09_05_41_13
Mounted:              Yes
Time:                 2014-04-09 05:41:24
Set Id:               47CA1B6C-3864-0B97-9EED-B05875982EDB
Type:                 Tree Clone
Description:          Snapshot request created by root at
2014_04_09_05_41_13
User:                 root
Database:             DB01

```

```

Database Type:          NON-ASM

Source Device(s):
6C81267EFDC989D90000000000000000:192.168.0.7:/HAP135Data:/
data/DB01/datafile:/

6C8126A2321719580000000000000000:192.168.0.14:/HAP135Redo1:/
redo/DB01/controlfile:/

6C81267EFDC989D90000000000000000:192.168.0.7:/HAP135Arch:/
archive/://

Target Device(s):
6C81267EFDC989D90000000000000000:192.168.0.7:/28E194AC-CA68-
27AE-1A21-3F2A63C46727:/.haproclone/47CA1B6C-3864-0B97-9EED-
B05875982EDB/28E194AC-CA68-27AE-1A21-3F2A63C46727/datafile/
:/

6C8126A2321719580000000000000000:192.168.0.14:/73EA6825-
2C05-FDFC-0AB8-EF944EB1F192:/.haproclone/47CA1B6C-3864-0B97-
9EED-B05875982EDB/73EA6825-2C05-FDFC-0AB8-EF944EB1F192/
controlfile/://

6C81267EFDC989D90000000000000000:192.168.0.7:/E4F5BFC8-C34E-
3511-A84F-BEFA2E1E3405:/.haproclone/47CA1B6C-3864-0B97-9EED-
B05875982EDB/E4F5BFC8-C34E-3511-A84F-BEFA2E1E3405/archive/://

Application:          oracle

Snapshot IDs:        28E194AC-CA68-27AE-1A21-3F2A63C46727
                    73EA6825-2C05-FDFC-0AB8-EF944EB1F192
                    E4F5BFC8-C34E-3511-A84F-BEFA2E1E3405

Originating Machine: Sol110-135

Service Machine:     Sol110-135

-----

```

Command to redirect the output to an xml file

```

hapro snapshot list -a oracle -s <Hostname/IP of Applica-
tion Protector Server/FQDN> -u <user> -P <password> -O
<Output file name.xml>

```

Output

```

[I720304D] XML output generated successfully.

```

Reverting a snapshot

This command reverts the database storage volume with the contents of the snapshot. For the SAN storage, P-VOL that is involved in the snapshot should be in the PAIR state.

Syntax

```
hapro snapshot revert

usage: hapro snapshot revert

  { -s          | --server          } Hostname/FQDN/
IP of HAPRO server

  { -a          | --app              } Application: oracle

  { -x || -X | --snapshot || --snapshotsetid } Snapshot name/
set ID

[ { -p          | --prescript          } ] Prescript

[ { -Z          | --postscript         } ] Postscript

[ { -f          | --force              } ] Skip user
confirmation

[ { -w          | --sync              } ] Show live
progress of the operation

[ { -u          | --user              } ] Login user for
HAPRO server

[ { -P          | --password          } ] Login password
for HAPRO server
```

Parameter description

Table 3-4: Revert snapshot parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of Application Protector server.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	oracle	Yes
Snapshot name	--snapshot	-x	This parameter specifies the snapshot name.	Snapshot name	Yes* ¹
set ID	--snapshotsetid	-X	This parameter specifies the set ID.	Snapshot set ID	Yes*
Prescript	--prescript	-p	This parameter specifies the script that is executed before this operation.	Valid registered script	No
Postscript	--postscript	-Z	This parameter specifies the script that is executed after the operation.	Valid registered script	No
Force	--force	-f	This parameter skips user confirmation.	Not applicable	No
Sync	--sync	-w	Show live progress of the operation.	Not applicable	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ²
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ³

1.Note: “*” indicates, either provide the snapshot name or set ID.

2.You must provide the user name when prompted.

3.You must provide the password when prompted.

Sample command(s) and output

Command

```
hapro snapshot revert -a oracle -s <Hostname/IP of Application
Protector Server/FQDN> -x <snapshot name> -u <user name> -P
<password>
```

Output

```
[W7203043] Revert is a destructive operation that overwrites  
all files on the volume. Are you sure you want to continue?  
(y/n): y
```

```
[I72030A1] Request to revert snapshot submitted successfully.
```

Mounting a snapshot

The mount operation lets you create a mount point and mount the snapshot.

Syntax

```
hapro snapshot mount

usage: hapro snapshot mount

  { -s          | --server          } Hostname/FQDN/
IP of HAPRO server

  { -a          | --app            } Application:
oracle/saporacle

  { -x || -X | --snapshot || --snapshotsetid } Snapshot name/
set ID

  { -z          | --prefix          } ASM diskgroup
name prefix/Mount point

  [{ -p          | --prescript      }] Prescript

  [{ -Z          | --postscript     }] Postscript

  [{ -w          | --sync           }] Show live
progress of the operation

  [{ -u          | --user           }] Login user for
HAPRO server

  [{ -P          | --password       }] Login password
for HAPRO server
```

Parameter description

Table 3-5: Mount snapshot parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of Application Protector server.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	<ul style="list-style-type: none"> • oracle • saporacle 	Yes
Snapshot name	--snapshot	-x	This parameter specifies the snapshot name to be mounted.	Snapshot name	Yes* ¹
Snapshot set ID	--snapshotsetid	-X	This parameter specifies the set ID to be mounted.	Snapshot set ID	Yes*
ASM diskgroup name prefix/ Mount point	--prefix	-z	ASM: This string is prefixed to the randomly generated names of the snapshot's devices or diskgroups. Non-ASM: valid directory path	ASM: First character ² must be an alphabet, followed by alphabets and/or numbers. Non-ASM: Valid directory path.	Yes
Prescript	--prescript	-p	This parameter specifies the script that is executed before this operation.	Valid registered script	No
Postscript	--postscript	-Z	This parameter specifies the script that is executed after the operation.	Valid registered script	No
Sync	--sync	-w	Show live progress of the operation.	Not applicable	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ³
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ⁴

1. Note: "*" indicates, either provide the snapshot name or snapshot set ID to mount a snapshot.

2. The mount prefix supports maximum 18 alphanumeric characters. Special characters are not supported.

3. You must provide the user name when prompted.

4. You must provide the password when prompted.

Sample command(s) and output

Command

```
hapro snapshot mount -s <Hostname/IP of Application Protector  
Server/FQDN> -a oracle -x <snapshot name> -z <Valid directory  
path>
```

```
Username [root]: oracle
```

```
Password:
```

Output

```
[I7203095] Request to mount snapshot submitted successfully.
```


Unmounting a snapshot

The Unmount operation lets you unmount a mounted snapshot.

Syntax

```
hapro snapshot unmount

usage: hapro snapshot unmount

  { -s          | --server          } Hostname/FQDN/
IP of HAPRO server

  { -a          | --app            } Application:
oracle/saporacle

  { -x || -X | --snapshot || --snapshotsetid } Snapshot name/
set ID

[ { -w          | --sync          } ] Show live
progress of the operation

[ { -u          | --user          } ] Login user for
HAPRO server

[ { -P          | --password      } ] Login password
for HAPRO server
```

Parameter description

Table 3-6: Unmount snapshot parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of Application Protector server.	<ul style="list-style-type: none">• Hostname• IP of Application Protector Server• FQDN• Valid port number (The port number is optional and not applicable for Solaris systems)	Yes
Application	--app	-a	This parameter specifies the application type.	<ul style="list-style-type: none">• oracle• saporacle	Yes
Snapshot name	--snapshot	-x	This parameter specifies the snapshot name.	Snapshot name	Yes* ¹
Set Id	--snapshotsetid	-X	This parameter specifies the snapshot set id which is unmounted.	Set ID of an existing snapshot	Yes*
Sync	--sync	-w	Show live progress of the operation.	Not applicable	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ²
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ³

1.Note: “*” indicates, you must provide the snapshot name or the set ID to unmount a snapshot.

2.You must provide the user name when prompted.

3.You must provide the password when prompted.

Sample command(s) and output

Command

```
hapro snapshot unmount -a oracle -P <password> -u <user> -s  
<Hostname/IP of Application Protector Server/FQDN> -x  
<snapshot name>
```

Output

```
[I720304E] Request to unmount snapshot submitted  
successfully.
```

Recovering from a snapshot

This command recovers a database from the snapshot on the specified server.

Complete recovery: Provide the `-C` | `--complete` parameter to perform complete recovery.

Point-in-time recovery: Provide the `-N` | `--pointintime` parameter to perform PIT recovery.

Restore: If `-C` or `-N` is not provided, then snapshot is restored.

Syntax

```
hapro snapshot recover

usage: hapro snapshot recover

  { -s          | --server                } Hostname/FQDN/
IP of HAPRO server

  { -a          | --app                    } Application: oracle

  { -e          | --database                } Database name

  { -x || -X | --snapshot || --snapshotsetid } Snapshot name/
set ID

  { -R          | --recoverytarget        } Recovery target:
database/tablespace

  [{ -m          | --item                    }] Tablespace name(s)

  [{ -G          | --archivelogpath        }] Archive log path

  [{ -C          | --complete                }] Perform complete
recovery

  [{ -N          | --pointintime            }] Point in time:
ISO(yyyy-MM-dd HH:mm:ss)/System

  [{ -t          | --tempdir                }] Temporary
directory. (Defaults to "/var/tmp/HAPRO/".)

  [{ -p          | --prescript              }] Prescript

  [{ -Z          | --postscript             }] Postscript

  [{ -f          | --force                  }] Skip user
confirmation

  [{ -w          | --sync                    }] Show live
progress of the operation

  [{ -u          | --user                    }] Login user for
HAPRO server
```

```
[{ -P          | --password          }] Login password  
for HAPRO server
```

Parameter description

Table 3-7: Recover snapshot parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of Application Protector server.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	oracle	Yes
Database name	--database	-e	This parameter specifies the Oracle database for which snapshot is created.	Oracle database ¹ name	No
Snapshot name	--snapshot	-x	This parameter specifies the snapshot name.	Snapshot name	Yes* ²
Set Id	--snapshotsetid	-X	This parameter specifies the snapshot set ID.	Set ID of an existing snapshot	Yes*
Recovery target	--recoverytarget	-R	This parameter specifies the recovery target.	<ul style="list-style-type: none"> • database • tablespace 	Yes
Tablespace name(s)	--item	-m	This parameter specifies the tablespaces name that is recovered.	Can be a list of comma separated tablespace names	No ³
Archive log path	--archivelogpath	-G	This parameter specifies the archive path for logs. If -N option is not specified, then complete logs are replayed.	File path of archive log location	No
Complete recovery	--complete	-C	This parameter specifies if complete recovery is performed.	Not applicable	No
Recovery point	--pointintime	-N	This parameter specifies the point in time for recovery.	Provide time in ISO(yyyy-MM-dd HH:mm:ss)/ System format	No

Table 3-7: Recover snapshot parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Temporary directory	--tempdir	-t	Path to temporary directory used in tablespace recovery.	Valid path to directory. Defaults to <code>'/var/tmp/HAPRO/'</code> .	No
Prescript	--prescript	-p	This parameter specifies the script that is executed before this operation.	Valid registered script	No
Postscript	--postscript	-Z	This parameter specifies the script that is executed after the operation.	Valid registered script	No
Force	--force	-f	This parameter skips user confirmation.	Not applicable	No
Sync	--sync	-w	Show live progress of the operation.	Not applicable	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ⁴
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ⁵

1. The device name or diskgroup name of the database supports maximum 15 characters for recovery.

2. Note: “*” indicates, you must provide the snapshot name or the set ID to recover a snapshot.

3. This parameter is mandatory if the recovery target is a tablespace.

4. You must provide the user name when prompted.

5. You must provide the password when prompted.

Sample command(s) and output

Command for complete recovery

```
hapro snapshot recover -a oracle -s <Hostname/IP of
Application Protector Server/FQDN> -e <Database name> -x
<snapshot name> -R database -C -u <user> -P <password>
```

Output

```
[W720306B] Recovery is a destructive operation that
overwrites all database files. Are you sure you want to
continue? (y/n): y
```

```
[I720308F] Request to recover database "SIMDB" submitted
successfully.
```

Working with Schedule commands

This chapter provides the details to schedule snapshots in Application Protector. You can create one time, hourly, daily, weekly, and monthly snapshot schedules.

This section describes the following topics:

- ❑ [Creating a schedule](#)
- ❑ [Modifying a schedule](#)
- ❑ [Deleting a schedule](#)
- ❑ [Listing the schedules](#)

Creating a schedule

This command creates a snapshot schedule for the specified application on the specified server.

Application Protector supports creating infinite schedules. For infinite schedules, you need not provide the start and end dates. If the start date is not provided, then Application Protector considers the current date as start date. If the end date is not provided then schedule executes infinitely.

Syntax

```
hapro schedule create

usage: hapro schedule create

  { -s | --server          } Hostname/FQDN/IP of HAPRO server
  { -a | --app            } Application: oracle
  { -e | --database       } Database name
  { -t | --scheduletype   } Schedule type: once/hourly/daily/
weekly/monthly
  [{ -c | --schedule      }] Schedule name
  [{ -b | --snapshottype  }] Snapshot type: treeclone/spceff/
flcpy. (Defaults: treeclone for HNAS, spceff otherwise.)
  [{ -d | --description   }] Schedule description
  [{ -R | --startdate     }] Start date: ISO(yyyy-MM-dd)/System
  [{ -E | --enddate       }] End date: ISO(yyyy-MM-dd)/System
  [{ -S | --start         }] HOURLY: Time of day: ISO(HH:mm)/
System; DAILY: Day of month (1 - 31)
  [{ -n | --end           }] HOURLY: Time of day: ISO(HH:mm)/
System; DAILY: Day of month (1 - 31)
  [{ -g | --trigger       }] Trigger time of schedule. (Defaults
to midnight. Not required for HOURLY schedules.)
  [{ -I | --interval      }] Schedule recurrence:- HOURLY: 1 -
23 hours; DAILY: 1 - 30 days
  [{ -w | --weekdays     }] Day(s) of week: sun, mon, tue, wed,
thu, fri, sat
  [{ -D | --days         }] Day(s) of month: 1 - 31
  [{ -M | --months        }] Month(s): jan, feb, mar, apr, may,
jun, jul, aug, sep, oct, nov, dec
  [{ -p | --prescript     }] Prescript
  [{ -Z | --postscript    }] Postscript
```



```
[{ -u | --user          }] Login user for HAPRO server  
[{-P | --password     }] Login password for HAPRO server
```

Parameter description

Table 4-1: Create schedule parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of the server.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	oracle	Yes
Database name	--database	-e	This parameter specifies the database name.	Oracle database name	Yes
Schedule name	--schedule	-c	This parameter specifies the schedule name.	First character ¹ must be an alphabet and a-z, A-Z, 0-9, space, underscore and hyphen up to 240 characters.	No
Schedule type	--schedulingtype	-t	This parameter specifies the schedule type.	<ul style="list-style-type: none"> • once • hourly • daily • weekly • monthly 	Yes
Snapshot type	--snapshottype	-b	This parameter specifies the snapshot type. By default, space efficient snapshot is created. For HNAS, by default, Tree Clone snapshot is created.	<ul style="list-style-type: none"> • spceff² • flcpy • treeclone 	No
Description	--description	-d	This parameter specifies the description.	Description	No
Start date	--startdate	-R	This parameter specifies the start date and time of the schedule.	Valid date >= Application Protector server's current date. Format: ISO(yyyy-MM-dd)/System	No
End date	--enddate	-E	This parameter specifies the end date of the schedule.	Valid end date and time in ISO(yyyy-MM-dd)/System format	No

Table 4-1: Create schedule parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Start	--start	-S	This parameter specifies the start time/day of the hourly or daily schedule.	<ul style="list-style-type: none"> HOURLY: Time of day: ISO(HH:mm)/System DAILY: Day of month (1 - 30) 	No
End	--end	-n	This parameter specifies the end time/day of the hourly or daily schedule.	<ul style="list-style-type: none"> HOURLY: Time of day: ISO(HH:mm)/System DAILY: Day of month (1 - 31) 	No
Trigger time of schedule	--trigger	-g	Trigger time of schedule. (Not required for HOURLY schedules.)	Trigger time, defaults to <u>00:00</u>	No
Schedule recurrence	--interval	-I	This parameter specifies the recurrence of the schedule.	<ul style="list-style-type: none"> HOURLY: 1 - 23 hours DAILY: Day of month (1 - 31) 	No
Day(s) of week	--weekdays	-w	This parameter specifies the days of the week.	sun, mon, tue, wed, thu, fri, sat Multiple comma separated values allowed	No
Day(s) of month	--days	-D	This parameter specifies the days of the month.	1 - 31 Multiple comma separated values allowed	No
Month(s)	--months	-M	This parameter specifies the months of year.	jan, feb, mar, apr, may, jun, jul, aug, sep, oct, nov, dec. Multiple comma separated values allowed	No
Prescript	--prescript	-p	This parameter specifies the script that is executed before this operation.	Valid registered script	No
Postscript	--postscript	-Z	This parameter specifies the script that is executed after the operation.	Valid registered script	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ³
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ⁴

1. The maximum character length for a snapshot name is 255. Application Protector does not support special characters excluding underscore (_) and hyphen (-).

2. speff refers to space efficient/HTI snapshots and flopy refers to full copy/SI snapshots.
3. You must provide the user name when prompted.
4. You must provide the password when prompted.



NOTE: The following parameters are required based on the schedule type: Interval, Start Date, End Date, Start, End, Days of Week, and Days of Months, Months.

Error scenarios and messages

Table 4-2: Create schedule error scenarios and messages

Scenario	Error message(s)
Parsing of command	Parsing of command error scenarios and messages
If parameter is not valid for a particular schedule type	Invalid parameters for schedule type <specified-schedule-type>. Parameters required <list of parameters required for specified schedule type>
If weekly interval parameter value is not between 1 and 52	Invalid week's interval value. Please enter week's interval value between 1 to 52.
If daily interval parameter value is not between 1 and 31	Invalid day's interval value. Please enter day's interval value between 1 to 31.
If hour interval parameter value is not between 1 and 23	Invalid hour's interval value. Please enter hour's interval value between 1 to 23.
If date provided is not in datetimeformat: iso/system	Please provide date in valid format

Sample command(s) and output

Command for finite schedule

```
hapro schedule create -a oracle -u <user> -P <password> -s
<Hostname/IP of Application Protector Server/FQDN> -e
<Database name> -c <schedule name> -t <schedule type> -R
<start date>
```

Output

```
[I720308E] Schedule created successfully.
```

Command for infinite weekly schedule

```
hapro schedule create -s <Hostname/IP of Application
Protector Server/FQDN/Valid port number (optional)> -a oracle
-e <Database name> -t <schedule type> -c <schedule name> -R
<start date> -w <weekdays> -u <user> -P <password>
```

Output

```
[I720309D] Schedule created successfully.
```

Modifying a schedule

This command modifies a snapshot schedule for the specified application on the specified server.

Syntax

```
hapro schedule modify
usage: hapro schedule modify
    { -s | --server      } Hostname/FQDN/IP of HAPRO server
    { -a | --app        } Application: oracle
    { -c | --schedule   } Schedule to modify
    [{ -d | --description }] Schedule description
    [{ -R | --startdate  }] Start date: ISO(yyyy-MM-dd)/System
    [{ -E | --enddate   }] End date: ISO(yyyy-MM-dd)/System
    [{ -S | --start     }] HOURLY: Time of day: ISO(HH:mm)/
System; DAILY: Day of month (1 - 31)
    [{ -n | --end       }] HOURLY: Time of day: ISO(HH:mm)/
System; DAILY: Day of month (1 - 31)
    [{ -g | --trigger   }] Trigger time of schedule. (Not
required for HOURLY schedules.)
    [{ -I | --interval  }] Schedule recurrence:- HOURLY: 1 - 23
hours; DAILY: 1 - 30 days
    [{ -w | --weekdays } ] Day(s) of week: sun, mon, tue, wed,
thu, fri, sat
    [{ -D | --days     }] Day(s) of month: 1 - 31
    [{ -M | --months    }] Month(s): jan, feb, mar, apr, may,
jun, jul, aug, sep, oct, nov, dec
    [{ -p | --prescript } ] Prescript
    [{ -Z | --postscript }] Postscript
    [{ -u | --user      }] Login user for HAPRO server
    [{ -P | --password  }] Login password for HAPRO server
```

Parameter description

Table 4-3: Modify schedule parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of the server.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	oracle	Yes
Schedule name	--schedule	-c	This parameter specifies the schedule name you want to modify.	Name of the existing schedule	Yes
Schedule description	--description	-d	This parameter specifies the description.	All characters	No
Start date	--startdate	-R	This parameter specifies the start date and time of the schedule.	Valid date >= Application Protector server's current date. Format: ISO(yyyy-MM-dd)/System	No
End date	--enddate	-E	This parameter specifies the end date of the schedule.	Valid end date in ISO(yyyy-MM-dd)/System format	No
Start	--start	-S	This parameter specifies the start time/day of the hourly or daily schedule.	<ul style="list-style-type: none"> • HOURLY: Time of day: ISO(HH:mm)/System • DAILY: Day of month (1 - 30) 	No
End	--end	-n	This parameter specifies the end time/day of the hourly or daily schedule.	<ul style="list-style-type: none"> • HOURLY: Time of day: ISO(HH:mm)/System • DAILY: Day of month (1 - 30) 	No
Trigger time of schedule	--trigger	-g	Trigger time of schedule.	Trigger time ¹	No
Schedule recurrence	--interval	-I	This parameter specifies the recurrence of the schedule.	<ul style="list-style-type: none"> • HOURLY: 1 - 23 hours • DAILY: 1 - 30 days 	No

Table 4-3: Modify schedule parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Day(s) of week	--weekdays	-w	This parameter specifies the days of the week.	sun, mon, tue, wed, thu, fri, sat Multiple comma separated values are allowed	No
Day(s) of month	--days	-D	This parameter specifies the days of the month.	1 - 31 Multiple comma separated values are allowed	No
Month(s)	--months	-M	This parameter specifies the months of year.	jan, feb, mar, apr, may, jun, jul, aug, sep, oct, nov, dec. Multiple comma separated values are allowed	No
Prescript	--prescript	-p	This parameter specifies the script that is executed before this operation.	Valid registered script	No
Postscript	--postscript	-Z	This parameter specifies the script that is executed after this operation.	Valid registered script	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ²
Login password	--password	-P	This parameter specifies the password required for connecting to the server.	Valid password	No ³

1. This parameter is not required for hourly schedules.
2. You must provide the user name when prompted.
3. You must provide the password when prompted.



NOTE: You can change the interval, description, prescripts, postscripts. You cannot change the type of the schedule and snapshot type in the modify command.

Sample command(s) and output

Command

```
hapro schedule modify -a oracle -u <user> -P <password> -s
<Hostname/IP of Application Protector Server/FQDN> -c
<schedule name> -R <start date> -I <new interval> -p <new
prescript> -Z <new postscript>
```

Output

```
[I7203059] Schedule modified successfully.
```

Deleting a schedule

This command deletes a particular snapshot schedule from the specified server.

Syntax

```
hapro schedule delete
```

```
usage: hapro schedule delete
```

```
{ -s | --server    } Hostname/FQDN/IP of HAPRO server
```

```
{ -a | --app       } Application: oracle
```

```
{ -c | --schedule } Schedule name(s)
```

```
[{ -u | --user     }] Login user for HAPRO server
```

```
[{ -P | --password }] Login password for HAPRO server
```


Parameter description

Table 4-4: Delete schedule parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of the server.	<ul style="list-style-type: none">• Hostname• IP of Application Protector Server• FQDN• Valid port number (The port number is optional and not applicable for Solaris systems)	Yes
Application	--app	-a	This parameter specifies the application type.	oracle	Yes
Schedule name(s)	--schedule	-c	This parameter specifies the schedule to delete.	Schedule name ¹	Yes
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ²
Login password	--password	-P	This parameter specifies the password required for connecting to the server.	Valid password	No ³

1.You can delete multiple schedules by separating the schedules by a comma.

2.You must provide the user name when prompted.

3.You must provide the password when prompted.

Sample command(s) and output

Command

```
hapro schedule delete -u <user> -P <password> -s <Hostname/IP  
of Application Protector Server/FQDN> -c <schedule name>
```

Output

```
[I720300F] Schedule deleted successfully.
```

Listing the schedules

This command lists all the snapshot schedules on the specified server.

Syntax

```
hapro schedule list
usage: hapro schedule list
      { -s | --server      } Hostname/FQDN/IP of HAPRO server
      { -a | --app         } Application: oracle
      [{ -e | --database  }] Database name
      [{ -c | --schedule  }] Filter string for schedule names
      [{ -l | --long       }] Enable long listing
      [{ -O | --output    }] Redirect output to this file
      [{ -u | --user       }] Login user for HAPRO server
      [{ -P | --password  }] Login password for HAPRO server
```

Parameter description

Table 4-5: List schedule parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of the server.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	oracle	Yes
Database name	--database	-e	This parameter specifies the database name with which to filter the fetched schedules.	Oracle database name	No
Filter string for schedule names	--schedule	-c	This parameter specifies the schedule name. If "abc" is specified, then all the schedules having abc in their name are listed.	All characters	No
Enable long listing	--long	-l	This parameter specifies if the listing of schedules is done in long format. The default is short format.	Not applicable	No
XML output	--output	-O	Redirect output to this file	File name	No
Login user for Application Protector server	--user	-u	This parameter specifies the user name required for connecting to the server.	Valid username	No ¹
Login password for Application Protector server	--password	-P	This parameter specifies the password required for connecting to the server.	Valid password	No ²

1. You need to provide the user name when prompted.

2. You need to provide the password when prompted.



NOTE:

- To view the complete details of the snapshot schedule, use the `Enable long listing` flag in the command.
- The fields that are not provided by the user, are marked with "-" in the output.

Sample command(s) and output

Command

```
hapro schedule list -a oracle -u <user> -P <password> -s  
<Hostname/IP of Application Protector Server/FQDN>
```

Output

Name	Frequency	Snapshot Type	Username	Trigger
Onetime	Once	Tree Clone	oracle	Onetime
oracle_or cl_2013_1 1_25_21_3 0_33	Once	Space Efficient	oracle	At 00:00 on the 1st, 2nd and 3rd of January, February and March

Command

```
hapro schedule list -a oracle -u <user> -P <password> -s  
<Hostname/IP of Application Protector Server/FQDN> -l
```

Output

```
Schedule ID:      042889E7-7365-B6B3-CAAA-5A3B69B1AC8A  
Schedule Name:   oracle_orcl_2013_11_25_21_30_33  
Application:     oracle  
Server Name:     sles11-sp3-11-230  
Database:        orcl  
Username:        oracle  
Description:     -  
Schedule Type:   Once  
Snapshot Type:   Space Efficient  
Start Date:      2013-12-02  
End Date:        -  
Start:           -  
End:             -  
Trigger Time:    00:00  
Interval:        -  
Day(s) of Week: -
```

Day(s) of Month: -

Month(s): -

Prescript: -

Postscript: -

Working with Admin commands

This chapter provides the details of configuring Application Protector Server and Client. It also provides the details to generate and activate the Application Protector license.

This section describes the following topics:

- ❑ [Configuring the Application Protector server and client](#)
- ❑ [Importing the Application Protector metadata](#)
- ❑ [Licensing Application Protector](#)
- ❑ [Configuring the database service account](#)
- ❑ [Configuring the ASM service account](#)
- ❑ [Working with the operations](#)

Configuring the Application Protector server and client

Configurable Application Protector server parameters

The configurable parameters for Application Protector server are:

- Log level
- Metadata directory
- Log directory path
- Snapshot retention count
- Metadata backup path

Configurable Application Protector client parameters

The configurable parameters for Application Protector Client are:

- Log level
- Date-time format

Setting the Application Protector configuration

This command sets the configuration of Application Protector server and client for the specified application from the specified server.

Syntax

```
hapro admin setconfig
usage: hapro admin setconfig
    { -s | --server      }  Hostname/FQDN/IP of HAPRO server
    { -a | --app        }  Application: oracle/saporacle
    { -p | --param      }  Config param: haprometadir/haprologdir/
    haprosnapshotretentioncount/metadatabackuppath/
    mounttoolpath/haprologlevel/clientloglevel/datetimeformat
    { -g | --configval }  Config val:- haprologlevel: fatal/
    error/warn/info/dbg1; clientloglevel: fatal/error/warn/info/
    debug/trace; datetimeformat: iso/system
    [{ -f | --force     }] Skip user confirmation
    [{ -u | --user      }] Login user for HAPRO server
    [{ -P | --password  }] Login password for HAPRO server
```


Parameter description

Table 5-1: Set config parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	Location of Application Protector server.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	<ul style="list-style-type: none"> • oracle • saporacle 	Yes
Config param	--param	-p	This parameter specifies the configuration parameter which is set.	Editable parameters are: <ul style="list-style-type: none"> • haprometadir • haprologdir • haprosnapshotretentioncount • metadatabackuppath • mounttoolpath¹ • haprologlevel • clientloglevel • datetimetype 	Yes
Config val	--configval	-g	This parameter specifies value to be set.	Config val. <ul style="list-style-type: none"> • haprologlevel: fatal, error, warn, info, dbg1; • clientloglevel: fatal, error, warn, info, debug, trace. • datetimetype: iso, system 	Yes
Skip user confirmation	--force	-f	This parameter skips the user confirmation.	-	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ²
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ³

1. Applicable for RHEL Oracle 10gR2 only.
2. You must provide the user name when prompted.
3. You must provide the password when prompted.

Configuration parameters

Table 5-2: Default configuration parameters

Parameter	Description	Default values
haprologdir	Specifies the directory where logs are saved.	/opt/Hitachi/HAPRO/server/logs/
haprologlevel	Specifies the log levels for logging of server information.	Info ¹
haprometadir	Specifies the metadata folder path.	/opt/Hitachi/HAPRO/server/
haprosnapshotretentioncount	Specifies the snapshot rotation count.	1024
metadatabackuppath	Specifies the directory where the snapshot metadata is saved.	/opt/Hitachi/HAPRO/server
mounttoolpath	Specifies the mount tool path to the path where patch set is installed.	NULL
clientloglevel	Specifies the log levels for logging client logs.	info ²
datetimeformat	Specifies the date-time format for the client.	iso

1. Server log level numeric equivalent are haprologlevel: fatal/error/warn/info/dbg1;
clientloglevel: fatal/error/warn/info/debug/trace
2. Client log levels are: fatal, error, warn, info, debug, and trace.

Sample command(s) and output

Command

```
hapro admin setconfig -s <Hostname/FQDN/IP of HAPRO server> -  
a oracle -u <username> -P <password> -p haprologlevel -g info
```

Output

```
[I7203093] Configuration set successfully.
```

Resetting the Application Protector configuration

This command resets the configuration of Application Protector server and Application Protector client to the default values for the specified server.

Syntax

```
hapro admin resetconfig  
  
usage: hapro admin resetconfig  
  
  { -s | --server    }  Hostname/FQDN/IP of HAPRO server  
  
  { -a | --app      }  Application: oracle/saporacle  
  
  { -p | --param    }  Config param: haprometadir/haprologdir/  
haprosnapshotretentioncount/metadatabackuppath/  
mounttoolpath/haprologlevel/clientloglevel/  
haproserviceaccount/haproasmerviceaccount/datetimetypeformat  
  
[ { -f | --force    } ] Skip user confirmation  
  
[ { -u | --user     } ] Login user for HAPRO server  
  
[ { -P | --password } ] Login password for HAPRO server
```

Parameter description

Table 5-3: Reset config parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of the server.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	<ul style="list-style-type: none"> • oracle • saporacle 	Yes
Config param	--param	-p	This parameter specifies the configuration parameter which is set.	Editable parameters are: <ul style="list-style-type: none"> • haprologlevel • haprometadir • haprologdir • haprosnapshotretentioncount • metadatabackuppath • mounttoolpath¹ • haproserviceaccount • haproasm²serviceaccount • clientloglevel • datetimetypeformat 	Yes
Skip user confirmation	--force	-f	This parameter skips the user confirmation.	Not applicable	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ³
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ⁴

1. Applicable for RHEL Oracle 10gR2 only.
2. Applicable for ASM setup only.
3. You must provide the user name when prompted.
4. You must provide the password when prompted.

Sample command(s) and output

Command to reset haprologlevel to default

```
hapro admin resetconfig -s <Hostname/FQDN/IP of HAPRO server>
-a oracle -u <user> -P <password> -p haprologlevel
```

Output

```
[I720302F] Configuration reset successfully.
```

Listing the Application Protector configuration

This command lists the configuration of the specified server.

Syntax

```
hapro admin listconfig
usage: hapro admin listconfig
      { -s | --server    } Hostname/FQDN/IP of HAPRO server
      { -a | --app      } Application: oracle/saporacle
  [{ -l | --long       }] Enable long listing
  [{ -O | --output    }] Redirect output to this file
  [{ -u | --user      }] Login user for HAPRO server
  [{ -P | --password  }] Login password for HAPRO server
```

Parameter description

Table 5-4: List config parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of the server.	<ul style="list-style-type: none">• Hostname• IP of Application Protector Server• FQDN• Valid port number (The port number is optional and not applicable for Solaris systems)	Yes
Application	--app	-a	This parameter specifies the application type.	<ul style="list-style-type: none">• oracle• saporacle	Yes
Enable long listing	--long	-l	This parameter specifies if the listing is done in long format. The default is short format.	Not applicable	No
XML output	--output	-O	Redirect output to this file	File name	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ¹
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ²

1. You must provide the user name when prompted.

2. You must provide the password when prompted.



NOTE:

- To view the details, use the `Enable long listing` flag in the command.
- The fields that are not provided by the user, are marked with “-” in the output.

Sample command(s) and output

Command

```
hapro admin listconfig -s <Hostname/FQDN/IP of HAPRO server>  
-a oracle -u <user> -P <password>
```

Output

```
=====
```

```
Server
```

```
=====
```

Parameter	Value
Operating System	Oracle Solaris 10 9/10 s10x_u9wos_14a X86
Server Name	Solaris
Version	1.2.0.24
Installation Path	/opt/Hitachi/HAPRO/server/
Log Level	info
Metadata Directory Path	/opt/Hitachi/HAPRO/server/
Log Directory Path	/opt/Hitachi/HAPRO/server/logs/
Snapshot Retention Limit	1024
Metadata Backup Path	/opt/Hitachi/HAPRO/server
Mount Tool Path	-

```
=====
```

```
Client
```

```
=====
```

Parameter	Value
Operating System	Oracle Solaris 10 9/10 s10x_u9wos_14a X86
Version	1.2.0.24
Installation Path	/opt/Hitachi/HAPRO/client
Log Directory Path	/opt/Hitachi/HAPRO/client/logs
Log Level	trace

Date-time Format ISO (yyyy-MM-dd HH:mm:ss)

Command

```
hapro admin listconfig -s <Hostname/FQDN/IP of HAPRO server>  
-a oracle -u <user> -P <password> -l
```

Output

```
=====
```

```
Server
```

```
=====
```

```
Parameter: Operating System
```

```
Value:        Oracle Solaris 10 9/10 s10x_u9wos_14a X86
```

```
-----
```

```
Parameter: Server Name
```

```
Value:        Solaris
```

```
-----
```

```
Parameter: Version
```

```
Value:        -
```

```
-----
```

```
Parameter: Installation Path
```

```
Value:        /opt/Hitachi/HAPRO/server/
```

```
-----
```

```
Parameter: Log Level
```

```
Value:        info
```

```
-----
```

```
Parameter: Metadata Directory Path
```

```
Value:        /opt/Hitachi/HAPRO/server/
```

```
-----
```

```
Parameter: Log Directory Path
```

```
Value:        /opt/Hitachi/HAPRO/server/logs/
```

```
-----
```

```
Parameter: Snapshot Retention Limit
```

```
Value:        1024
```



```
-----  
Parameter: Metadata Backup Path  
Value:      opt/Hitachi/HAPRO/server  
-----  
  
Parameter: Mount Tool Path  
Value:      -  
-----  
  
=====  
Client  
=====  
  
Parameter: Operating System  
Value:      Oracle Solaris 10 9/10 s10x_u9wos_14a X86  
-----  
  
Parameter: Version  
Value:      1.2.0.24  
-----  
  
Parameter: Installation Path  
Value:      /opt/Hitachi/HAPRO/client  
-----  
  
Parameter: Log Directory Path  
Value:      /opt/Hitachi/HAPRO/client/logs  
-----  
  
Parameter: Log Level  
Value:      trace  
-----  
  
Parameter: Date-time Format  
Value:      ISO (yyyy-MM-dd HH:mm:ss)  
-----
```

Importing the Application Protector metadata

This command imports the backed up Application Protector metadata.

Syntax

```
hapro admin importmetadata
usage: hapro admin importmetadata
    { -s | --server      }  Hostname/FQDN/IP of HAPRO server
    { -a | --app        }  Application: oracle/saporacle
    { -b | --backuppath }  Import metadata from this location
    [{ -u | --user      }]  Login user for HAPRO server
    [{ -P | --password  }]  Login password for HAPRO server
```

Parameter description

Table 5-5: Import metadata parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of the server.	<ul style="list-style-type: none">• Hostname• IP of Application Protector Server• FQDN• Valid port number (The port number is optional and not applicable for Solaris systems)	Yes
Application	--app	-a	This parameter specifies the application type.	<ul style="list-style-type: none">• oracle• saporacle	Yes
Backup path	--backuppath	-b	Import metadata from this location	Valid path	Yes
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ¹
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ²

1. You must provide the user name when prompted.

2. You must provide the password when prompted.

Sample command(s) and output

Command

```
hapro admin importmetadata -s <Hostname/FQDN/IP of HAPRO server> -a oracle -u <user> -P <password> -b <valid backup path>
```

Licensing Application Protector

The Application Protector license must be activated to use the snapshot-based backup and recovery features for the supported storage array and application. The following is applicable for an Application Protector license key:

- The Application Protector license is node-locked. A license is generated for a given server and you can install it on that server only.
- The license is a perpetual license.

For example, license keys purchased and installed for version 1.0 continues to function for all 1.x releases. Upgrading to 2.x requires an updated license key.

- The trial license expires after 30 days. No expiry date for the production license.
- The license is a combination of the application and storage.
For example, Application Protector-Oracle-HNAS.



NOTE: You must generate and activate the Application Protector license for SLES and RHEL setups.

To install and activate the production license

1. Create a capability license request based on information provided while purchasing the product license from HDS.
2. Provide the Activation ID for the supported storage.
3. Install the license response file reverted by the HDSLicensing@hds.com team as a part of production license activation.

This section describes the following topics:

- [Generating the Application Protector license](#)
- [Activating the Application Protector license](#)
- [Listing the licenses](#)

Generating the Application Protector license

This command generates a license request for the specified user for the specified server.

Syntax

```
hapro admin generatelicenserequest
```

```
usage: hapro admin generatelicenserequest
```

```
{ -s | --server          } Hostname/FQDN/IP of HAPRO server
{ -a | --app             } Application: oracle/saporacle
{ -f | --firstname      } First name
{ -L | --lastname       } Last name
{ -i | --activationid   } Activation ID
{ -E | --email          } Email address
{ -C | --company        } Company name
{ -c | --country        } Country
{ -x | --requestfile    } Save the license request XML here
[{-S | --siteid         }] Site
[{-A | --address        }] Address
[{-u | --user           }] Login user for HAPRO server
[{-P | --password      }] Login password for HAPRO server
```

Parameter description

Table 5-6: Generate license parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the server name for which snapshot is created.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	<ul style="list-style-type: none"> • oracle • saporacle 	Yes
First name	--firstname	-f	Specifies the first name of the licensee.	String up to 64 characters	Yes
Last name	--lastname	-L	Specifies the last name of the licensee.	String up to 64 characters	Yes
Activation ID	--activationid	-i	Specifies an activation ID for the license.	String up to 32 characters	Yes
Email address	--email	-E	Specifies the email address of the licensee.	String up to 32 characters	Yes
Company name	--company	-C	Specifies the name of the company of the licensee.	String up to 32 characters	Yes
Country	--country	-c	Specifies the country of the licensee.	String up to 32 characters	Yes
Save the license request XML here	--requestfile	-x	Specifies the XML request file in which a license request is to be stored.	Valid file name or path	Yes
Site	--siteid	-S	Site ID of the licensee.	String up to 64 characters	No
Address	--address	-A	Address of the licensee.	String up to 256 characters	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ¹
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ²

1. You must provide the user name when prompted.

2. You must provide the password when prompted.

Sample command(s) and output

Command

```
hapro admin generatelicenserequest -a oracle -s <Hostname/  
FQDN/IP of HAPRO server> -u <username> -P <password> -E <email  
ID> -f <first name> -L <last name> -i <activation ID> -C  
<company name> -c <country> -x <request file> -A <address>
```

Output

```
[I720308B] License request generated successfully.
```

Activating the Application Protector license

This command activates the trial license or the production license on the specified server.

Syntax

```
hapro admin activatelicense

usage: hapro admin activatelicense

  { -s          | --server          } Hostname/FQDN/IP
of HAPRO server

  { -a          | --app             } Application: oracle/
saporacle

  { -t || -x | --trial || --responsefile } Activate trial
license/Production license response file

[ { -u          | --user            } ] Login user for HAPRO
server

[ { -P          | --password        } ] Login password for
HAPRO server
```


Parameter description

Table 5-7: Activate license parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the server name for which snapshot is created.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	<ul style="list-style-type: none"> • oracle • saporacle 	Yes
Activate trial license / Production license response file	--trial --responsefile	-t -x	This parameter specifies the activation trial license or production license response file.	<ul style="list-style-type: none"> • Trial license • Response file: Valid file name/path 	No ¹
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ²
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ³

1. You need to provide either trial license or production license details.

2. You must provide the user name when prompted.

3. You must provide the password when prompted.



NOTE: It is mandatory to provide either Trial license (`--trial|-t`) or the Full License (`--responsefile|-x`) parameter during activation.

Sample command(s) and output

Command

```
hapro admin activatelicence -a oracle -s <Hostname/FQDN/IP of HAPRO server> -u <username> -P <password> -t
```

Output

```
[I720300C] License activated successfully.
```

Listing the licenses

This command lists all the licenses installed on the specified server.

Syntax

```
hapro admin listlicense
```

```
usage: hapro admin listlicense
```

```
{ -s | --server    } Hostname/FQDN/IP of HAPRO server
```

```
{ -a | --app       } Application: oracle/saporacle
```

```
[{ -l | --long     }] Enable long listing
```

```
[{ -O | --output  }] Redirect output to this file
```

```
[{ -u | --user    }] Login user for HAPRO server
```

```
[{ -P | --password}] Login password for HAPRO server
```

Parameter description

Table 5-8: List license parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the server name for which snapshot is created.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	<ul style="list-style-type: none"> • oracle • saporacle 	Yes
Enable long listing	--long	-l	This parameter specifies the listing of snapshot if done in long format. The default is short format.	Not applicable	No
XML output	--output	-O	Redirect output to this file	File name	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ¹
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ²

- 1.You must provide the user name when prompted.
- 2.You must provide the password when prompted.



NOTE:

- To view the complete details, use the `Enable long listing` flag in the command.
- The fields that are not mandatory or not provided by the user, are blank in the output.

Sample command(s) and output

Command

```
hapro admin listlicense --server <Hostname/FQDN/IP of HAPRO server> --app oracle --user <username> --password <password>
```

Output

	Id	Type	Feature	Expiry (Days)
	1	TRIAL	TRIAL_ALL	30

Command

```
hapro admin listlicense -s <Hostname/FQDN/IP of HAPRO server>  
--app oracle --user <username> -P <password> -l
```

Output

Id:

Type: TRIAL

Feature: TRIAL_ALL

Expiry (Days): 30

Configuring the database service account

This section provides the details to set, modify, and list the database service account.

Setting the database service account

This command sets the service account credentials of an Oracle Database user. Each Application Protector user has a service account and all the databases that you intend to work with, must be accessible with the registered service account credentials.

Syntax

```
hapro admin setdbserviceaccount  
  
usage: hapro admin setdbserviceaccount  
  
  { -s | --server           } Hostname/FQDN/IP of HAPRO server  
  { -a | --app              } Application: oracle  
  [{ -N | --serviceusername }] Service username  
  [{ -Z | --servicepassword }] Service password  
  [{ -u | --user            }] Login user for HAPRO server  
  [{ -P | --password        }] Login password for HAPRO server
```

Parameter description

Table 5-9: Add service account parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of the server.	<ul style="list-style-type: none">• Hostname• IP of Application Protector Server• FQDN• Valid port number (The port number is optional and not applicable for Solaris systems)	Yes
Application	--app	-a	This parameter specifies the application type.	oracle	Yes
Service username	--serviceusername	-N	This parameter specifies the username of service account.	Valid username	No ¹
Service password	--servicepassword	-Z	This parameter specifies the password of service account.	Valid password	No ²
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ³
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ⁴

- 1.You must provide the service user name when prompted.
- 2.You must provide the service password when prompted.
- 3.You must provide the user name when prompted.
- 4.You must provide the password when prompted.



NOTE: For details about service account user privileges, see *Hitachi Application Protector User Guide for Oracle® Database Server*.

Sample command(s) and output

Command

```
hapro admin setdbserviceaccount -s <Hostname/FQDN/IP of HAPRO server> -a oracle -N <service username> -Z <password>
```

Output

```
[I7203030] Database service account set successfully.
```

Listing the database service account

This command lists the database service account details.

Syntax

```
hapro admin listdbserviceaccount
usage: hapro admin listdbserviceaccount
      { -s | --server      } Hostname/FQDN/IP of HAPRO server
      { -a | --app         } Application: oracle
      [{ -l | --long       }] Enable long listing
      [{ -O | --output     }] Redirect output to this file
      [{ -u | --user       }] Login user for HAPRO server
      [{ -P | --password   }] Login password for HAPRO server
```

Parameter description

Table 5-10: List service account parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of the server.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	oracle	Yes
Enable long listing	--long	-l	This parameter specifies if the listing is done in long format. The default is short format.	Not applicable	No
XML output	--output	-O	Redirect output to this file	File name	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ¹
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ²

1. You must provide the user name when prompted.

2. You must provide the password when prompted.



NOTE:

- To view the details of the service account, use the `Enable long listing` flag in the command.
- The fields that are not provided by the user, are marked with "-" in the output.

Sample command(s) and output

Command

```
hapro admin listdbserviceaccount -s <Hostname/FQDN/IP of HAPRO server> -a oracle -u <username> -P <password>
```


Output

Id	Username	Authentication Type
4B00400E-15E9-6159-6EE9-7E845B6476BC	sys	Database Authentication

Command

```
hapro admin listdbserviceaccount -s <Hostname/FQDN/IP of HAPRO server> -a oracle -u <username> -P <password> -l
```

Output

```
ID: 4B00400E-15E9-6159-6EE9-7E845B6476BC
Application Type: oracle
Authentication Type: Database Authentication
Service Account Username: sys
Username: oracle
```

Modifying the database service account

This command modifies the registered service account and any operations performed and henceforth will use the new service account.

Syntax

```
hapro admin modifydbserviceaccount
```

```
usage: hapro admin modifydbserviceaccount
```

```
{ -s | --server           } Hostname/FQDN/IP of HAPRO server
```

```
{ -a | --app              } Application: oracle
```

```
[{ -N | --serviceusername }] Service username
```

```
[{ -Z | --servicepassword }] Service password
```

```
[{ -u | --user            }] Login user for HAPRO server
```

```
[{ -P | --password        }] Login password for HAPRO server
```

Parameter description

Table 5-11: Modify service account parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the server name for which snapshot is created.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	oracle	Yes
Service username	--serviceusername	-N	This parameter specifies the username of service account.	Valid username	No ¹
Service password	--servicepassword	-Z	This parameter specifies the password of service account.	Valid password	No ²
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ³
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ⁴

1. You must provide the service user name when prompted.
2. You must provide the service password when prompted.
3. You must provide the user name when prompted.
4. You must provide the password when prompted.

Sample command(s) and output

Command

```
hapro admin modifydbserviceaccount -s <Hostname/FQDN/IP of HAPRO server> -a oracle -u <username> -P <password> -A <authentication type> -N <service username> -Z <password>
```

Output

```
Service Username []: sys
Service Password:
[I7203027] Service account modified successfully.
```

Configuring the ASM service account

This section provides the details to set, modify, and list the ASM service account. You must set the ASM service account for ASM setups on RHEL platform only. Application Protector supports the following:

- ❑ [Adding the ASM service account](#)
- ❑ [Listing the ASM service account](#)
- ❑ [Modifying the ASM service account](#)

Adding the ASM service account

This command adds an ASM service account for the specified ASM group.

Syntax

```
hapro {admin} setasmerviceaccount  
usage: hapro admin setasmerviceaccount  
  { -s | --server          } Hostname/FQDN/IP of HAPRO server  
  { -a | --app             } Application: oracle  
  [{ -N | --serviceusername }] ASM service username  
  [{ -Z | --servicepassword }] ASM service password  
  [{ -u | --user           }] Login user for HAPRO server  
  [{ -P | --password       }] Login password for HAPRO server
```

Parameter description

Table 5-12: Add ASM service account parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the server name for which snapshot is created.	<ul style="list-style-type: none">• Hostname• IP of Application Protector Server• FQDN• Valid port number (The port number is optional and not applicable for Solaris systems)	Yes
Application	--app	-a	This parameter specifies the application type.	oracle	Yes
ASM service username	--serviceusername	-N	This parameter specifies the username of the ASM service account.	Valid username	No ¹
ASM Service password	--servicepassword	-Z	This parameter specifies the password of ASM service account.	Valid password	No ²
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ³
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ⁴

- 1.You must provide the service user name when prompted.
- 2.You must provide the service password when prompted.
- 3.You must provide the user name when prompted.
- 4.You must provide the password when prompted.

Sample command(s) and output

Command

```
hapro admin setasmerviceaccount -s <Hostname/FQDN/IP of HAPRO server> -a oracle -N <ASM service account user name> -Z <ASM service account password> -u <username> -P <password>
```

Output

```
[I7203075] ASM service account added successfully.
```

Listing the ASM service account

This command lists the ASM service account for the specified application from the specified server.

Syntax

```
hapro {admin} listasmerviceaccount  
usage: hapro admin listasmerviceaccount  
  { -s | --server    } Hostname/FQDN/IP of HAPRO server  
  { -a | --app      } Application: oracle  
  [{ -l | --long    }] Enable long listing  
  [{ -O | --output  }] Redirect output to this file  
  [{ -u | --user    }] Login user for HAPRO server  
  [{ -P | --password}] Login password for HAPRO server
```

Parameter description

Table 5-13: List ASM service account parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies location of the server.	<ul style="list-style-type: none">• Hostname• IP of Application Protector Server• FQDN• Valid port number (The port number is optional and not applicable for Solaris systems)	Yes
Application	--app	-a	This parameter specifies the application type.	oracle	Yes
Enable long listing	--long	-l	This parameter specifies if the listing is done in long format. The default is short format.	Not applicable	No
XML output	--output	-O	Redirect output to this file	File name	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ¹

Table 5-13: List ASM service account parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ²

1. You must provide the user name when prompted.
2. You must provide the password when prompted.



NOTE:

- To view the complete data for a particular column, use the `Enable long listing` flag in the command.
 - The fields that are not provided by the user, are marked with "-" in the output.
-

Sample command(s) and output

Command

```
hapro admin listasmerviceaccount -s <Hostname/FQDN/IP of HAPRO server> -a oracle -u <username> -P <password> -l
```

Output

```
ID:                                D50E7D54-38BC-81AC-266A-EBAFA78F7114
Application:                        oracle
Authentication Type:                ASM
Service Account Username:          sys
Username:                            oracle
```

Command

```
hapro admin listasmerviceaccount -s <Hostname/FQDN/IP of HAPRO server> -a oracle -u <username> -P <password>
```

Output

Id	Username	Authentication Type
75FDD3FF-1D3E-D9E8-83E1-7716E7B36FBD	sys	ASM

Modifying the ASM service account

This command modifies the ASM service account for the specified application from the specified server.

Syntax

```
hapro {admin} modifyasmerviceaccount
usage: hapro admin modifyasmerviceaccount
      { -s | --server          } Hostname/FQDN/IP of HAPRO server
      { -a | --app             } Application: oracle
      [{ -N | --serviceusername }] ASM service username
      [{ -Z | --servicepassword }] ASM service password
      [{ -u | --user           }] Login user for HAPRO server
      [{ -P | --password       }] Login password for HAPRO server
```

Parameter description

Table 5-14: Modify ASM service account parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of the server.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	oracle	Yes
ASM service username	--serviceusername	-N	This parameter specifies the username of ASM service account.	Valid service username	No ¹
ASM service password	--servicepassword	-Z	This parameter specifies the password of ASM service account.	Valid password	No ²
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ³
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ⁴

- 1.You must provide the ASM service username when prompted.
- 2.You must provide the ASM service password when prompted.
- 3.You must provide the user name when prompted.
- 4.You must provide the password when prompted.

Sample command(s) and output

Command

```
hapro admin modifyasmerviceaccount -s <Hostname/FQDN/IP of HAPRO server> -a oracle -u <username> -P <password> -N <ASM service account username> -Z <<ASM service account Password>
```

Output

```
[I7203083] ASM service account modified successfully.
```

Working with the operations

This section provides the details to list and delete Application Protector operations and list logs.

Listing the operations

This command lists all the operations for a specified database on the specified server.

Syntax

```
hapro admin listoperations
usage: hapro admin listoperations
      { -s | --server      } Hostname/FQDN/IP of HAPRO server
      { -a | --app         } Application: oracle/saporacle
      [{ -e | --database  }] Database name
      [{ -C | --count     }] Number of operations to list
      [{ -l | --long      }] Enable long listing
      [{ -O | --output    }] Redirect output to this file
      [{ -u | --user      }] Login user for HAPRO server
      [{ -P | --password  }] Login password for HAPRO server
```

Parameter description

Table 5-15: List operations parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of the server.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	<ul style="list-style-type: none"> • oracle • saporacle 	Yes
Database name	--database	-e	This parameter specifies the Oracle database for which snapshot is created.	Oracle database name	No
Count	--count	-C	Number of operations to list.	Valid number	No
Enable long listing	--long	-l	This parameter specifies if the listing of operations is done in long format. The default is short format.	Not applicable	No
XML output	--output	-O	Redirect output to this file	File name	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ¹
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ²

1.You must provide the user name when prompted.

2.You must provide the password when prompted.



NOTE:

- To view the details, use the `Enable long listing` flag in the command.
- The fields that are not provided by the user, are marked with “-” in the output.

Sample command(s) and output

Command

```
hapro admin listoperations -s <Hostname/FQDN/IP of HAPRO  
server> -a oracle -u <username> -P <password> -l
```

Output

```
ID: 93C4BB83-97CE-E666-AAF1-6F8A5409D526  
Log ID: OpLog_0F73ACE2-59BF-0A59-E225-2D0DB26DE80E  
Time: 2013-11-24 22:44:57  
User: oracle  
Operation: Create Snapshot  
Database: orcl  
Name: oracle_orcl_2013_11_24_22_44_54  
Description: Snapshot request created by oracle at  
2013_11_24_22_44_54  
Snapshot Mount Root: -  
Status: In Progress  
Result: 10%  
Prescript: -  
Postscript: -  
-----  
ID: 907CF52D-82D5-8CC2-0EEE-AFF77FB4F538  
Log ID: -  
Time: 2013-11-22 04:20:09  
User: oracle  
Operation: Register User Script  
Database: -  
Name: pre  
Description: -  
Snapshot Mount Root: -  
Status: Failed  
Result: 100%  
Prescript: -
```

```

Postscript:          -
-----
ID:                  2B6951C9-0707-41F6-5948-E1086B42EB31
Log ID:              -
Time:                2013-11-22 04:15:44
User:                oracle
Operation:           Register User Script
Database:            -
Name:                pre
Description:         -
Snapshot Mount Root: -
Status:              Completed
Result:              100%
Prescript:           -
Postscript:          -
-----

```

Command

```
hapro admin listoperations -s <Hostname/FQDN/IP of HAPRO
server> -a oracle -u <username> -P <password>
```

Output

Id	Operation	Log ID	Time	User	Name	Status	Result
FAEB0349- 81D0-			2013-		oracle_or		
ED1D-	Delete	-	11-25	oracle	cl_2013_1	Completed	100%
4B7F-	Schedule		21:36:		1_25_21_3		
61B5D5599 638			21		0_33		
15BA9CDB- F573-			2013-				
5DCF-	Modify	-	11-25	oracle	sch_hrl_0	Completed	100%
921A-	Schedule		21:33:		1		
AEB5BFA33 B74			40				

Deleting the operations

This command deletes an existing operation for the specified application from the specified server.

Syntax

```
hapro admin deleteoperation  
usage: hapro admin deleteoperation  
  { -s | --server    } Hostname/FQDN/IP of HAPRO server  
  { -a | --app      } Application: oracle/saporacle  
  { -i | --id       } Operation ID(s)  
  [{ -u | --user    }] Login user for HAPRO server  
  [{ -P | --password}] Login password for HAPRO server
```

Parameter description

Table 5-16: Delete operation parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of the server.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	<ul style="list-style-type: none"> • oracle • saporacle 	Yes
Operation ID	--id	-i	This parameter specifies the operation id which is to be deleted.	Operation ID Multiple comma separated values are allowed.	Yes
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ¹
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ²

1. You must provide the user name when prompted.

2. You must provide the password when prompted.



NOTE: You can not delete the operations of create or modify schedule, if their corresponding schedule exists. These operations can be deleted after the schedule is deleted only.

Sample command(s) and output

Command

```
hapro admin deleteoperation -s <Hostname/FQDN/IP of HAPRO server> -a oracle -u <username> -P <password> -i <operation ID>
```

Output

```
[I72030A9] Operation "FAEB0349-81D0-ED1D-4B7F-61B5D5599638" deleted successfully.
```


Listing the log details

This command lists information about the specific operation log.

Syntax

```
hapro admin listlog

usage: hapro admin listlog
      { -s | --server      }  Hostname/FQDN/IP of HAPRO server
      { -a | --app         }  Application: oracle/saporacle
  [{ -i | --logid         }]  Log ID: HAPROserver(default)/
  OpLog_XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX
  [{ -L | --loglevel     }]  Log Level: fatal/error/warn/info/dbg1
  [{ -C | --count        }]  Number of log entries to display
  [{ -l | --long         }]  Enable long listing
  [{ -O | --output       }]  Redirect output to this file
  [{ -u | --user         }]  Login user for HAPRO server
  [{ -P | --password    }]  Login password for HAPRO server
```

Parameter description

Table 5-17: List log parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of the server.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	<ul style="list-style-type: none"> • oracle • saporacle 	Yes
Log ID	--logid	-i	This parameter specifies the Log Id.	<ul style="list-style-type: none"> • <u>HAPRO Server</u> (Default) • OpLog_XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX 	No
Log Level	--loglevel	-L	This parameter specifies the messages logged at this log level.	fatal, error, warn, info, dbg1	No
Count	--count	-C	Number of log entries to display.	Any number between 1 to 1000	No
Enable long listing	--long	-l	This parameter specifies if the listing is done in long format. The default is short format.	Not applicable	No
XML output	--output	-O	Redirect output to this file	File name	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ¹
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ²

1. You must provide the user name when prompted.

2. You must provide the password when prompted.



NOTE:

- To view the details, use the `Enable long listing` flag in the command.
- The fields that are not provided by the user, are marked with “-” in the output.

Sample command(s) and output

Command

```
hapro admin listlog -a oracle -s <Hostname/FQDN/IP of HAPRO server> -u <username> -P <password> -C <count>
```

Output

Time	Message	Level
2013-11-25 22:00:46	List operation log initiated.	info
2013-11-25 22:00:46	Request for operation [ListOperationLog] validated successfully.	info
2013-11-25 22:00:46	Application : [ORACLE].	info

Command

```
hapro admin listlog -a oracle -s <Hostname/FQDN/IP of HAPRO server> -u <username> -P <password> -C <count> -l
```

Output

```
Time:      2013-11-25 22:00:51
Message: List operation log initiated.
Level:    info
-----
Time:      2013-11-25 22:00:51
Message: Request for operation [ListOperationLog] validated successfully.
Level:    info
-----
Time:      2013-11-25 22:00:51
Message: Application : [ORACLE].
Level:    info
-----
```


Working with Server commands

This chapter provides the details of registering the supported storage arrays and user script, and listing the databases and tablespaces.

This section describes the following topics:

- ❑ [Listing the databases](#)
- ❑ [Listing the tablespaces](#)
- ❑ [Configuring the storage array](#)
- ❑ [Configuring the user scripts](#)

Listing the databases

This command lists all the databases on the specified server.

Syntax

```
hapro server listdb
usage: hapro server listdb
    { -s | --server    } Hostname/FQDN/IP of HAPRO server
    { -a | --app      } Application: oracle
    [{ -l | --long    }] Enable long listing
    [{ -O | --output  }] Redirect output to this file
    [{ -u | --user    }] Login user for HAPRO server
    [{ -P | --password}] Login password for HAPRO server
```

Parameter description

Table 6-1: List database parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the host name.	<ul style="list-style-type: none">• Hostname• IP of Application Protector Server• FQDN• Valid port number (The port number is optional and not applicable for Solaris systems)	Yes
Application	--app	-a	This parameter specifies the application type.	oracle	Yes
XML output	--output	-O	Redirect output to this file	File name	No
User Name	--user	-u	Login user for Application Protector server.	Valid username	No ¹
Password	--password	-P	Login password for Application Protector server.	Valid password	No ²
Enable long listing	--long	-l	Enable long listing.	Not applicable	No

1. You must provide the user name when prompted.

2. You must provide the password when prompted.



NOTE:

- To view the complete details, use the `Enable long listing` flag in the command.
- The fields that are not mandatory or not provided by the user, are blank in the output.

Sample command(s) and output

Command

```
hapro server listdb --app oracle -s <Hostname, IP of  
Application Protector Server, FQDN> --user <username> -P  
<password>
```

Output

Database Name	Database ID	Database Version	Storage Detail	Database Type	Storage Type
vsp	3677794848	Oracle Database 11g Enterprise Edition Release 11.2.0.3.0 - 64bit Production	/mnt/data:/dev/sdbx1, /mnt/redo:/dev/sdby1, /mnt/archive:/dev/sdbz1	NON-ASM	VSP

Command

```
hapro server listdb --app oracle -s <Hostname, IP of Application Protector Server, FQDN> --user <username> -P <password> -l
```

Output

```
Database ID: 1878011957
Database GUID: 1878011957
Application Type: oracle
Database Name: oracle
Instance Name: oracle
Database Version: Oracle Database 11g Enterprise Edition Release 11.2.0.3.0 - Production
Data Volume(s): /mnt/data
Archive Log Volume(s): /mnt/archive
Control File Volume(s): /mnt/redo
Storage Detail: /mnt/archive:03:1B
                /mnt/data:03:19
                /mnt/redo:03:1A
Snapshot Support: Yes
Database Type: NON-ASM
Storage Type: VSP
Database Mode: READ WRITE
Database State: ACTIVE
```


Listing the tablespaces

This command lists all the tablespace names for the specified database.

Syntax

```
hapro server listitem
usage: hapro server listitem
    { -s | --server    } Hostname/FQDN/IP of HAPRO server
    { -a | --app      } Application: oracle
    { -e | --database } Database name
  [{ -S | --search   }] Filter string for tablespace name
  [{ -O | --output   }] Redirect output to this file
  [{ -u | --user     }] Login user for HAPRO server
  [{ -P | --password }] Login password for HAPRO server
```

Parameter description

Table 6-2: List item parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the host name.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	oracle	Yes
Database name	--database	-e	This parameter specifies the Oracle database name for which tablespace are listed.	Oracle database name	Yes
Search String	--search	-S	This parameter specifies the filter string for tablespace name.	Alpha-numeric string	No
XML output	--output	-O	Redirect output to this file	File name	No
User Name	--user	-u	Login user for Application Protector server.	Valid username	No ¹
Password	--password	-P	Login password for Application Protector server.	Valid password	No ²

- 1.You must provide the user name when prompted.
- 2.You must provide the password when prompted.



NOTE: The fields that are not provided by the user, are marked with “-” in the output.

Sample command(s) and output

Command

```
hapro server listitem -s <Hostname, IP of Application
Protector Server, FQDN> -a oracle -e VSP -u <username> -P
<password>
```

Output

```
Item Name
=====
SYSTEM
```

```
SYSAUX  
UNDOTBS1  
USERS  
TEMP
```

Command

```
hapro server listitem -s <Hostname, IP of Application  
Protector Server, FQDN> -a oracle -e VSP -u <username> -P  
<password> -l
```

Output

```
Item Name: SYSTEM
```

```
Item Name: SYSAUX
```

```
Item Name: UNDOTBS1
```

```
Item Name: USERS
```

```
Item Name: TEMP
```

Configuring the storage array

On registration, Application Protector maintains a list of storage arrays for snapshot management operations. You can register, modify, and unregister the storage array.

You must register the storage subsystem with the storage array details. The storage registration is a one time activity.

Registering a storage array

This command registers the storage array.

Syntax

```
hapro server registerstoragearray
usage: hapro server registerstoragearray
  { -s | --server                } Hostname/FQDN/IP of HAPRO
server
  { -a | --app                    } Application: oracle/saporacle
  { -T | --type                    } Storage array type: vsp/
hus/hnas
  [{ -I | --ip                      }] Storage array IP(s)
  [{ -c | --protocol                }] Network protocol:
https(default)/http. (Applicable to HNAS only.)
  [{ -r | --serialnumber            }] Serial number. (Mandatory
for VSP.)
  [{ -o | --raidcominstancenumber }] RAIDCOM instance number.
(Mandatory for VSP.)
  [{ -N | --admin                    }] Storage array admin user.
(Mandatory for VSP.)
  [{ -Z | --adminpassword            }] Storage array admin password.
(Mandatory for VSP.)
  [{ -p | --storagepool              }] Storage pool name/number
  [{ -d | --description              }] Description
  [{ -u | --user                      }] Login user for HAPRO server
  [{ -P | --password                }] Login password for HAPRO
server
```

Parameter description

Table 6-3: Register storage array parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of the server.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	<ul style="list-style-type: none"> • oracle • saporacle 	Yes
Storage array type	--type	-T	This parameter specifies the type of the storage array.	<ul style="list-style-type: none"> • vsp • hus • hnas 	Yes
Storage array IP(s)	--ip	-I	This parameter specifies the following: hus: IP of the storage array.	<ul style="list-style-type: none"> • hus: IP Multiple comma-separated values are allowed. • vsp: Not required • hnas: EVS IP 	Yes
Network protocol	--protocol	-c	Network protocol used to communicate with the storage array. Applicable to HNAS only.	<ul style="list-style-type: none"> • https(default) • http 	No
Serial number	--serialnumber	-r	This parameter specifies the serial number for VSP storage.	Valid serial number	No ^{*1}
RAIDCOM instance number	--raidcominstancenumber	-o	This parameter specifies the RAIDCOM instance number.	A positive number	No [*]
Storage array admin user	--admin	-N	This parameter specifies the admin user of storage array.	Admin user name	No ²
Storage array admin password	--adminpassword	-Z	This parameter specifies the password of the admin user of storage array.	Admin password	No ³

Table 6-3: Register storage array parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Storage pool name/ number	--storagepool	-p	This parameter specifies the name of the storage pool.	Name of the storage pool	No
Description	--description	-d	This parameter specifies the description.	Description	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ⁴
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ⁵

1.Note: “*” indicates, this parameter is applicable and mandatory for VSP storage only.

2.This parameter mandatory for VSP storage only.

3.This parameter mandatory for VSP storage only.

4.You must provide the user name when prompted.

5.You must provide the password when prompted.

Sample command(s) and output

Command

```
hapro server registerstoragearray -s <Hostname, IP of
Application Protector Server, FQDN> -a oracle -T hnas -I
<storage array IPs> -u <username> -P <password> -Z <Storage
array admin password> -N <Storage array admin user>
```

Output

```
[I720302E] Storage registered successfully.
```

Modifying a storage array

This command modifies the storage array details.

Syntax

```
hapro server modifystoragearray

usage: hapro server modifystoragearray

  { -s | --server                } Hostname/FQDN/IP of HAPRO
server
  { -a | --app                    } Application: oracle/saporacle
  { -i | --id                      } Storage array ID
  [{ -I | --ip                      }] Storage array IP(s)
  [{ -c | --protocol                }] Network protocol:
https(default)/http. (Applicable to HNAS only.)
  [{ -r | --serialnumber            }] Serial number. (Applicable
to VSP only.)
  [{ -o | --raidcominstancenumber }] RAIDCOM instance number.
(Applicable to VSP only.)
  [{ -N | --admin                    }] Storage array admin user
  [{ -Z | --adminpassword            }] Storage array admin password.
(Mandatory for VSP.)
  [{ -p | --storagepool              }] Storage pool name/number
  [{ -d | --description              }] Description
  [{ -u | --user                      }] Login user for HAPRO server
  [{ -P | --password                  }] Login password for HAPRO
server
```

Parameter description

Table 6-4: Modify storage array parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of the server.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	<ul style="list-style-type: none"> • oracle • saporacle 	Yes
Storage array ID	--id	-i	Storage array ID	Valid storage ID	Yes
Storage array IP(s)	--ip	-I	This parameter specifies the following: HUS: IP of the storage array.	<ul style="list-style-type: none"> • hus: IP Multiple comma-separated values are allowed. • vsp: Not required. • hnas: EVS IP 	No
Network protocol	--protocol	-c	Network protocol used to communicate with the storage array. Applicable to HNAS only.	<ul style="list-style-type: none"> • https(default) • http 	No
Serial number	--serialnumber	-r	This parameter specifies the Serial number. (Applicable to VSP only.)	Valid serial number	No
RAIDCOM instance number	--raidcominstancenumber	-o	This parameter specifies the RAIDCOM instance number.	A positive number	No
Storage array admin user	--admin	-N	This parameter specifies the admin user of storage array.	Admin user name	No ^{*1}
Storage array admin password	--adminpassword	-Z	This parameter specifies the password of the admin user of storage array.	Admin password	No [*]

Table 6-4: Modify storage array parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Storage pool name/number	--storagepool	-p	This parameter specifies the name of the storage pool.	Name of storage pool	No
Description	--description	-d	This parameter specifies the description.	Description	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ²
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ³

1. Note: “*” indicates, this parameter is mandatory for VSP storage only.

2. You must provide the user name when prompted.

3. You must provide the password when prompted.



NOTE: You can change the device manager location, serial number, RAIDCOM instance number, storage pool number, description, username and password, device manager username, and device manager password.

Sample command(s) and output

Command

```
hapro server modifystoragearray --app oracle --server
<Hostname/FQDN/IP of HAPRO server> --user <user> --password
<password> --storagepool <new storage pool number> --
raidcominstancenumber <new RAIDCOM instance number> -N
<storage array admin user> -Z <storage array admin password>
```

Output

```
[I7203075] Storage modified successfully.
```

Unregistering a storage array

This command unregisters an array from the list of registered storage systems.

Syntax

```
hapro server unregisterstoragearray
usage: hapro server unregisterstoragearray
    { -s | --server    } Hostname/FQDN/IP of HAPRO server
    { -a | --app      } Application: oracle/saporacle
    { -i | --id       } Storage array ID
  [{ -f | --force    }] Skip user confirmation
  [{ -u | --user     }] Login user for HAPRO server
  [{ -P | --password }] Login password for HAPRO server
```

Parameter description

Table 6-5: Unregister storage array parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the server name for which snapshot is created.	<ul style="list-style-type: none">• Hostname• IP of Application Protector Server• FQDN• Valid port number (The port number is optional and not applicable for Solaris systems)	Yes
Application	--app	-a	This parameter specifies the application type.	<ul style="list-style-type: none">• oracle• saporacle	Yes
Storage array ID	--id	-i	Storage array ID	Valid storage ID	Yes
Skip user confirmation	--force	-f	Skip user confirmation	NA	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ¹
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ²

1.You must provide the user name when prompted.

2.You must provide the password when prompted.

Sample command(s) and output

Command

```
hapro server unregisterstoragearray -s <Hostname/FQDN/IP of HAPRO server> --user <user> --password <password> -a oracle -i <storage array ID>
```

Output

```
[W7203090] Are you sure you want to unregister this storage array? (y/n): y
```

```
[I720307E] Storage unregistered successfully.
```

Listing the storage arrays

This command lists detailed information about one or more storage arrays.

Syntax

```
hapro server liststoragearray
usage: hapro server liststoragearray
    { -s | --server      } Hostname/FQDN/IP of HAPRO server
    { -a | --app        } Application: oracle/saporacle
    [{ -i | --id        }] Filter string for storage array ID
    [{ -T | --type      }] Storage array type: vsp/hus/hnas
    [{ -l | --long      }] Enable long listing
    [{ -O | --output    }] Redirect output to this file
    [{ -u | --user      }] Login user for HAPRO server
    [{ -P | --password  }] Login password for HAPRO server
```

Parameter description

Table 6-6: List storage array parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of the server	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	<ul style="list-style-type: none"> • oracle • saporacle 	Yes
Filter string for storage array ID	--id	-i	This parameter specifies the filter string for the storage array.	Alpha-numeric characters	No
Storage array type	--type	-T	This parameter specifies the storage type.	<ul style="list-style-type: none"> • vsp • hus • hnas 	No
Enable long listing	--long	-l	This parameter specifies if the listing is done in long format. The default is short format.	Not applicable	No
XML output	--output	-O	Redirect output to this file	File name	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ¹
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ²

1. You must provide the user name when prompted.

2. You must provide the password when prompted.



NOTE:

- To view the complete details, use the `Enable long listing` flag in the command.
- The fields that are not provided by the user, are marked with "-" in the output.

Sample command(s) and output

Command

```
hapro server liststoragearray -s <Hostname/FQDN/IP of HAPRO server> --user <user> --password <password>
```

Output

Id	Name	Type	IP Address(es)	Serial No(s)
7FDE1C52- D648-8901- E4F6- 0692B22D46BB	HNAS_2bb0e2 30-17f5- 11cb-9010- e9a72e6c888 8	HNAS	<IP of HAPRO server>	<Serial number>

Command

```
hapro server liststoragearray -s <Hostname/FQDN/IP of HAPRO  
server> --user <user> --password <password> -l
```

Output

```
Id: ADC3C691-6F16-A261-CAA3-6A72B32F76A1
Name: HNAS_2bb0e230-17f5-11cb-9010-  
e9a72e6c8888
Description: -
Type: HNAS
IP Address(es): <EVS IP>
Serial No(s): -
RAIDCOM Instance Number: -
Storage Pool: -
Admin User: system
Device Manager User: system
-----
```

Configuring the user scripts

This section provides the details to register, unregister, and list user scripts using Application Protector.

Registering a user script

This command registers the user script.

Syntax

```
hapro server registerscript
usage: hapro server registerscript
      { -s | --server      }  Hostname/FQDN/IP of HAPRO server
      { -a | --app        }  Application: oracle
      { -N | --name       }  Script name
      { -f | --file       }  Script location
      [{ -t | --type      }]  Script type: sh(default)/bash/ksh/
      csh/perl
      [{ -d | --description }]  Description
      [{ -u | --user      }]  Login user for HAPRO server
      [{ -P | --password  }]  Login password for HAPRO server
```

Parameter description

Table 6-7: Register user script parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of the server.	<ul style="list-style-type: none"> • Hostname • IP of Application Protector Server • FQDN • Valid port number (The port number is optional and not applicable for Solaris systems) 	Yes
Application	--app	-a	This parameter specifies the application type.	oracle	Yes
Script name	--name	-N	This parameter specifies the name which the script will be added.	Valid script name ¹	Yes
Script location	--file	-f	This parameter specifies the location of the script.	File name with full path	Yes
Script type	--type	-t	This parameter specifies the script type.	<ul style="list-style-type: none"> • <u>sh</u> (default) • bash • ksh • csh • perl 	No
Description	--description	-d	This parameter specifies the description for the script.	Any string	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ²
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ³

1.The maximum character length for a script name is 255. Application Protector does not support special characters excluding underscore (_) and hyphen (-).

2.You must provide the user name when prompted.

3.You must provide the password when prompted.

Sample command(s) and output

Command

```
hapro server registerscript -s <Hostname/FQDN/IP of HAPRO server> -a oracle -N <script name> -f <script file location> -u <username> -P <password>
```

Output

```
[I720303A] Script registered successfully.
```


Unregistering a user script

This command unregisters the user script.

Syntax

```
hapro server unregisterscript
usage: hapro server unregisterscript
      { -s          | --server          } Hostname/FQDN/IP of HAPRO
server
      { -a          | --app              } Application: oracle
      { -N || -i | --name || --scriptid } Script name(s)/ID(s)
[ { -u          | --user          } ] Login user for HAPRO server
[ { -P          | --password      } ] Login password for HAPRO
server
```

Parameter description

Table 6-8: Unregister user script parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Application	--app	-a	This parameter specifies the application type.	oracle	Yes
Hostname	--server	-s	This parameter specifies the server name for which snapshot is created.	<ul style="list-style-type: none">• Hostname• IP of Application Protector Server• FQDN• Valid port number (The port number is optional and not applicable for Solaris systems)	Yes
Script name	--name	-N	This parameter specifies the script name which you need to delete.	Valid script name(s)	No* ¹
Id	--scriptid	-i	This parameter specifies the script id which you need to delete.	script ID (s)	No*
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ²
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ³

1.Note: "*" indicates, provide either the script name or script ID.

2.You must provide the user name when prompted.

3.You must provide the password when prompted.

Sample command(s) and output

Command

```
hapro server unregisterscript -s <Hostname/FQDN/IP of HAPRO server> -a oracle -N <script name> -u <user> -P <password>
```

Output

```
[I7203096] Script(s) unregistered successfully.
```

Listing the user scripts

This command lists all the registered user scripts.

Syntax

```
hapro server listscripts
usage: hapro server listscripts
      { -s | --server    } Hostname/FQDN/IP of HAPRO server
      { -a | --app      } Application: oracle
      [{ -N | --name    }] Filter string for script name
      [{ -l | --long    }] Enable long listing
      [{ -O | --output  }] Redirect output to this file
      [{ -u | --user    }] Login user for HAPRO server
      [{ -P | --password}] Login password for HAPRO server
```

Parameter description

Table 6-9: List script parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the server name for which snapshot is created.	<ul style="list-style-type: none">• Hostname• IP of Application Protector Server• FQDN• Valid port number (The port number is optional and not applicable for Solaris systems)	Yes
Application	--app	-a	This parameter specifies the application type.	oracle	Yes
Filter string for script name	--name	-N	This parameter specifies the script(s) whose details are to be listed.	Valid script name	No
Enable long listing	--long	-l	This parameter specifies if the listing is to be done in long format. The default is short format.	Not applicable	No
XML output	--output	-O	Redirect output to this file	File name	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ¹
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ²

1. You must provide the user name when prompted.

2. You must provide the password when prompted.



NOTE:

- To view the complete details, use the `Enable long listing` flag in the command.
 - The fields that are not provided by the user, are marked with "-" in the output.
-

Sample command(s) and output

Command

```
hapro server listscripts --app oracle --server <Hostname/  
FQDN/IP of HAPRO server> --user <username> --password  
<password>
```

Output

ID	Name	Description	File	Type
2CE5EFB6-627F-7FA6-B6CF-B7C4B5F055A7	script1	test script	tmp.sh	sh

Command

```
hapro server listscripts --app oracle --server <Hostname/  
FQDN/IP of HAPRO server> --user <username> --password  
<password> -l
```

Output

ID: 2CE5EFB6-627F-7FA6-B6CF-B7C4B5F055A7

Name: pre

Description: -

File: shell1.sh

Type: sh

Size (B): 61

User: oracle

Modifying a user script

This command modifies the registered user scripts.

Syntax

```
hapro server modifyscript
usage: hapro server modifyscript
      { -s | --server      } Hostname/FQDN/IP of HAPRO server
      { -a | --app        } Application: oracle
      { -N | --name       } Script name
      [{ -f | --file      }] Script location
      [{ -d | --description }] Description
      [{ -u | --user      }] Login user for HAPRO server
      [{ -P | --password  }] Login password for HAPRO server
```

Parameter description

Table 6-10: Modify script parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Hostname	--server	-s	This parameter specifies the location of the server.	<ul style="list-style-type: none">• Hostname• IP of Application Protector Server• FQDN• Valid port number (The port number is optional and not applicable for Solaris systems)	Yes
Application	--app	-a	This parameter specifies the application type.	oracle	Yes
Script name	--name	-N	This parameter specifies the script name which is modified.	Valid script name	Yes
Script location	--file	-f	This parameter specifies the script location.	Valid script location	No
Description	--description	-d	This parameter specifies the description.	Not applicable	No
Login user	--user	-u	Login user for Application Protector server.	Valid username	No ¹
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ²

1. You must provide the user name when prompted.

2. You must provide the password when prompted.



NOTE: You can modify the description and the location of an added script.

Sample command(s) and output

Command

```
hapro server modifyscript -N pre -f /root/shell1.sh -a oracle  
-s <Hostname/FQDN/IP of HAPRO server> --user <username> --  
password <password>
```

Output

```
[I7203052] Script modified successfully.
```


Working with the utilities

This section describes the following utilities:

- ❑ [HAPRO dump](#)
- ❑ [HAPRO sync](#)

HAPRO dump

Debugging support is provided using the `HAPRO dump` utility. `HAPRO_dump` is a shell script, used to gather the Application Protector metadata and logs into a single `.tar` file.

The format of the file is `HAPRO_dump-
<yyyy_mm_dd_HH_mm_ss>.tar`. For example, `HAPRO_dump-
2014_05_27_23_59_30.tar.gz`.

Execute the script file from the `/opt/Hitachi/HAPRO/server/
util` directory.

Syntax

```
./HAPRO_dump.sh -h  
usage: ./HAPRO_dump.sh <destination>  
HAPRO dump is generated at <destination>  
<destination> defaults to /opt/Hitachi/HAPRO/server/
```

Parameter description

Table 7-1: HAPRO dump parameter description

Parameter	Description
Destination Path	Provide the absolute destination path where the dump file needs to be generated. If <destination> is not an absolute path, it will consider the path from present working directory of 'HAPRO_dump.sh'.



NOTE:

- If <destination> is not an absolute path, it will consider the path from present working directory of 'HAPRO_dump.sh'.
- If <destination> does not exist, it will be created automatically by the script.
- If <destination> not specified, HAPRO_dump will create a dump file at '/opt/Hitachi/HAPRO/server/'.

Table 7-2: HAPRO dump file details

Directory	Description
HAPRO_dumpLog-061213012239.tar.gz	Application Protector dump log tar file.
HORCM	HORCM logs.
<destination>	The HAPRO_dump log will be generated in this path when the tar file is unzipped.
opt	Client, server logs, and server metadata.
root	The user preferences of the Application Protector client.
var	This folder structure includes the Application Protector temporary files, and syslog messages.

Sample command(s)

Command

```
./HAPRO_dump.sh
```

Output

```
No Arguments Detected

Taking default destination path

Destination dir: /opt/Hitachi/HAPRO/server
HAPRO Metadata path: /opt/Hitachi/HAPRO/server/
HAPRO Log file path: /opt/Hitachi/HAPRO/server/logs/
HAPRO Metadata dir: /opt/Hitachi/HAPRO/server//
metadata/
HAPRO Log dir: /opt/Hitachi/HAPRO/server/logs/
File Cache data exists: /opt/Hitachi/HAPRO/server//
metadata//filecache/
File logs data exists: /opt/Hitachi/HAPRO/server/
logs/
Script data exists: /opt/Hitachi/HAPRO/server//
metadata//script
Client logs data exists: /opt/Hitachi/HAPRO/client/
logs
Syslog data exists: /var/log
HaproInstallLog file exists: /var/tmp/HAPRO/
hapro.log
HaproClientConf file exists: /root/.java/.userPrefs/
HAPRO
HORCMLog file exists: /HORCM
HAPRO Dump operation started
Mon Dec 16 00:55:05 PST 2013
Mark HAPRO Metadata to include in HAPRO_dump-
161213005505.tar.gz from:
/opt/Hitachi/HAPRO/server//metadata/
Mark HAPRO Logs to include in HAPRO_dump-
161213005505.tar.gz from:
/opt/Hitachi/HAPRO/server/logs/
Mark Sys Logs to include in HAPRO_dump-
161213005505.tar.gz from: /var/log
```

```
Mark HAPRO Temp files to include in HAPRO_dump-
161213005505.tar.gz from:

/var/tmp/HAPRO

Mark HAPRO client logs to include in HAPRO_dump-
161213005505.tar.gz

from: /opt/Hitachi/HAPRO/client/logs

Mark HAPRO install logs: /var/tmp/HAPRO/hapro.log to
include in

HAPRO_dump-161213005505.tar.gz

Mark HAPRO client configuration to include in

HAPRO_dump-161213005505.tar.gz from: /root/.java/
.userPrefs/HAPRO

Mark HORCM log file to include in HAPRO_dump-
161213005505.tar.gz from:

/HORCM

Mark Multipath config file to include in HAPRO_dump-
161213005505.tar.gz

from: /etc/multipath.conf

Mark HAPRO_dump log file to include in HAPRO_dump-
161213005505.tar.gz

from: /opt/Hitachi/HAPRO/server/HAPRO_dumpLog-
161213005505.log

./HAPRO_dump.sh: line 268:

/var/tmp/storagearraycontext/03873D2A-7B88-88AA-
A273-DE8711643103: No

such file or directory

Mark storagearraycontextMetadata directory to
include in

HAPRO_dump-161213005505.tar.gz from: /var/tmp/HAPRO/
storagearraycontext

Disk /dev/mapper/arch_part1 doesn't contain a valid
partition table

Disk /dev/mapper/data_part1 doesn't contain a valid
partition table

Disk /dev/mapper/redo_part1 doesn't contain a valid
partition table
```

```
Disk /dev/mapper/cmd doesn't contain a valid
partition table

Disk /dev/sdk doesn't contain a valid partition table

Disk /dev/mapper/mpatha_part1 doesn't contain a valid
partition table

java version "1.6.0"

Java(TM) SE Runtime Environment (build 1.6.0-b105)

Java HotSpot(TM) Server VM (build 1.6.0-b105, mixed
mode)

cksum: /opt/Hitachi/HAPRO/server/lib/log: Is a
directory

device path not found

tar: Removing leading `/' from member names

/opt/Hitachi/HAPRO/server//metadata/
backupcontrolfiles/590D3F1C-96A7-A292-26FF-
A84941B47A4C_ctl.bak

/opt/Hitachi/HAPRO/server//metadata/
backupcontrolfiles/60098C62-ABE5-B2E8-F524-
21908C7F598C_ctl.bak

/opt/Hitachi/HAPRO/server/logs//HAPROserver.log.9

/opt/Hitachi/HAPRO/server/logs//OpLog_014E0F0E-
C153-04FF-5B37-22CFB299A50A.log

/opt/Hitachi/HAPRO/server/logs//OpLog_052EADA8-
7D1D-F5D3-EBB8-6423CED6BF4C.log

/var/log/messages

/var/log/messages-20131126.bz2

/var/tmp/HAPRO/HAPRO08B8tR

/var/tmp/HAPRO/HAPRO08B8tR.OUT

/var/tmp/HAPRO/HAPRO0EJ1wV.sql

/opt/Hitachi/HAPRO/client/logs/HAPROclient.log.1

/opt/Hitachi/HAPRO/client/logs/HAPROclient.log.2

/opt/Hitachi/HAPRO/client/logs/HAPROclient.log.3

/opt/Hitachi/HAPRO/client/logs/HAPROclient.log

/var/tmp/HAPRO/hapro.log

/root/.java/.userPrefs/HAPRO/prefs.xml

/root/.java/.userPrefs/HAPRO/client/prefs.xml
```

```
/HORCM/log/curlog/horcm_sles11sp3-11-223.log
/HORCM/log/curlog/horcmlog_sles11sp3-11-223/
horcm_2988.trc
/HORCM/log/curlog/horcmlog_sles11sp3-11-223/
horcm.log
/HORCM/log/raidcom.log
/HORCM/log--help/curlog/horcm_sles11sp3-11-223.log
/HORCM/log0/curlog/horcm_sles11sp3-11-223.log
/HORCM/log0/curlog/horcmlog_sles11sp3-11-223/
horcm_13718.trc
/HORCM/log0/curlog/horcmlog_sles11sp3-11-223/
horcm.log
/HORCM/log0/horcc_sles11sp3-11-223.log
/HORCM/log0/tmplog/horcm_sles11sp3-11-223.log
/HORCM/log0/tmplog/horcmlog_sles11sp3-11-223/
horcm_12580.trc
/HORCM/log0/tmplog/horcmlog_sles11sp3-11-223/
horcm.log
/HORCM/log1/curlog/horcm_sles11sp3-11-223.log
/HORCM/log1/curlog/horcmlog_sles11sp3-11-223/
horcm_2972.trc
/HORCM/log1/curlog/horcmlog_sles11sp3-11-223/
horcm.log
/etc/multipath.conf
/opt/Hitachi/HAPRO/server/HAPRO_dumpLog-
161213005505.log
HAPRO dump operation finished
HAPRO dump is generated at
/opt/Hitachi/HAPRO/server/HAPRO_dump-
161213005505.tar.gz
Mon Dec 16 00:55:20 PST 2013
```

HAPRO sync

The `HAPRO_sync` utility is used to fix inconsistency caused in the Application Protector metadata, such as snapshot set, snapshot database reference count, and schedule information. This utility works on the Application Protector Server. Execute the utility from `/opt/Hitachi/HAPRO/server/bin`.



NOTE: For an ASM setup, you should ensure to use `HAPRO_sync` to update all the nodes after performing operation on a single node.

Snapshot Set: Fix inconsistencies related to snapshot records in the cache. The `HAPRO_sync -s cache` operation fixes metadata cache snapshots with reference to actual system/storage status of snapshots.

Schedule: Fix inconsistencies related to schedule.

Snapshot database: Fix inconsistencies in the snapshot database reference counts of snapshot objects.

Replicate: Replicate cache metadata and logs to a user specified path.

Check: Checks if the process related to any Application Protector operation is hung or not in running state. `HAPRO_sync` will change the status of such operations as 'FAILED' (update in operation cache metadata).



NOTE: `HAPRO_sync` synchronizes the Application Protector metadata cache and not the configuration files.

NOTE: In the Solaris setup, for successful execution of `HAPRO_sync`, the crontab file must exist in the system.

Syntax

```
./HAPRO_sync -h
```

Command line usage:

```
HAPRO_sync [ {-help|-h} ] [ {-ownership|-o} ][ {-sync|-s} {system|cache} ] [ {-check | -c} ] [ { -replicate | -r} ["<from>[,<to>"] ]
```

-h, -help

HAPRO_sync help.

-o, -ownership

This option causes HAPRO metadata to be owned by machine running HAPRO_sync

-s, -sync

This option causes HAPRO metadata to be synced with the

system state. Argument controls the type of sync activity.

system - Sync system using cache metadata.

cache - Sync cache metadata using system state.

-c, -check (default)

This can be used to perform HAPRO metadata consistency check.

NOTE: If no option is passed -check is assumed.

-r ["<from>[,<to>"], -replicate ["<from>[,<to>"]]

<from>: This parameter is optional in this command. If not specified, HAPRO_sync will take HAPRO metadata path from the config.

<to> : This parameter is optional in this command. If not specified, HAPRO_sync will use "/HAPRO_Sync_Metadata/" as default destination.

Parameter description

Table 7-3: HAPRO sync parameter description

Parameter	Description
<code>-help -h</code>	Displays command line help.
<code>-ownership -o</code>	This option provides Application Protector metadata ownership to the machine running <code>HAPRO_sync</code> .
<code>-sync -s {system}</code>	To sync the system from the cache metadata.
<code>-sync -s {cache}</code>	To sync cache metadata using system state. If schedules are accidentally deleted from CRON then <code>HAPRO_sync</code> will create such entries in CRON using cache metadata.
<code>-check -c</code>	To perform normal <code>HAPRO_sync</code> consistency check. This is the default action taken if no option is given.
<code>-replicate -r "<from>[,<to> <to>]"</code>	To perform replication of metadata, logs, etc from the path provided in <code>from</code> to the destination in the <code>to</code> parameter. Source path must be cache directory path <code>/opt/Hitachi/HAPRO/server</code> . You can use the <code>replicate</code> parameter to backup the Application Protector metadata.

Sample command(s)

Command

```
./HAPRO_sync -r
```

Output

```
[I720053e] Starting HAPRO_sync activity.  
[I720075e] Copying Metadata Directory from [/opt/Hitachi/HAPRO/server/metadata/] to [/HAPRO_Sync_Metadata/].  
[I720075e] Copying Metadata Directory from [/opt/Hitachi/HAPRO/server/logs/] to [/HAPRO_Sync_Metadata/].  
[I720053f] Finished HAPRO_sync activity.
```

Command

```
./HAPRO_sync -r "</opt/Hitachi/HAPRO/server>,</home/MetadataDir>"
```

Output

```
[I720053e] Starting HAPRO_sync activity.  
[I720075e] Copying Metadata Directory from [/opt/  
Hitachi/HAPRO/server/metadata/] to [/home/  
amithbackup/].  
[I720075e] Copying Metadata Directory from [/opt/  
Hitachi/HAPRO/server/logs/] to [/home/amithbackup/].  
[I720053f] Finished HAPRO_sync activity.
```

Command

```
./HAPRO_sync -s system
```

Output

```
[I720053e] Starting HAPRO_sync activity.  
[I720076a] Checking consistency of system schedules.  
[I7200991] Started Schedule Consistency fix:System  
Fix.  
[I720076c] All schedules in system are in consistent  
state.  
crontab: can't open your crontab file.  
[I720076d] Checking and fixing consistency of system  
schedules is finished.  
[I7200767] Checking Snapshot Entity ref count.  
[I7200769] Verify and fix for snapshot entity  
reference count is completed.  
[I720053f] Finished HAPRO_sync activity.
```

Command

```
./HAPRO_sync -s cache
```

Output

```
[I720053e] Starting HAPRO_sync activity.  
[I7200760] Checking consistency of Snapshots.  
[I7200762] Verify and fix for snapshots is completed.  
[I7200763] Checking Import and Mount Status of  
Snapshots.  
[I7200782] Import/Mount status of snapshots fixed  
successfully.
```

[I720076e] Checking consistency of cache schedules.
[I7200993] Started Schedule Consistency fix:Cache Fix.
[I7200754] No Schedules found.
[I720076f] All cache schedules are in consistent state.
[I7200770] Checking and fixing consistency of cache schedules is finished.
[I7200771] Checking consistency of HAPRO operations.
[I720077d] Do you want to fix operation record: 7491A0E9-CC13-A9E6-A387-7B4AC3783B00 ?[y=yes/n=no/a=yes to all]: y

[I720077d] Do you want to fix operation record: 554CDCC5-4518-D3F6-224D-43392AEEB900 ?[y=yes/n=no/a=yes to all]: a

[I7200773] Checking and fixing of consistency of HAPRO operations is finished.
[I7200767] Checking Snapshot Entity ref count.
[I7200769] Verify and fix for snapshot entity reference count is completed.
[I720053f] Finished HAPRO_sync activity.



A

Appendix

The appendix provides the following topics.

- ❑ [Application types](#)
- ❑ [Snapshot limit for supported storage](#)
- ❑ [Listing the Application Protector logs](#)
- ❑ [Schedule types](#)
- ❑ [Days of week](#)
- ❑ [Months of year](#)
- ❑ [Service account user privileges](#)

Application types

Application types	Description
oracle	Refers to Oracle® Database Server
saporacle	Refers to SAP®

Snapshot limit for supported storage

You can create the following number of maximum snapshots for the supported storage arrays.

Storage	Snapshot type	Snapshot retention limit
VSP	ShadowImage	3
	HTI	1024
HUS	HTI	1024
	Full Copy	7
HNAS	Tree Clone	1024

Listing the Application Protector logs

This section provides information regarding listing the Application Protector server, client, and operations logs.

Application Protector server log

Application Protector generates a common server log for logging and synchronization operations. The name of the Application Protector Server log is `HAPROserver.log`. If the log size exceeds 20MB, then the older log is rotated and renamed to `HAPROserver.log.1` and so on.

By default, the Application Protector server logs are present in the `/opt/Hitachi/HAPRO/server/logs` directory. To configure the location, see [Setting the Application Protector configuration](#).

Application Protector client log

Application Protector generates a common client log for Application Protector client requests. The name of the Application Protector Client log is `HAPROclient.log`. If the log size exceeds 20MB, then the older log is rotated and renamed to `HAPROclient.log.1` and so on.

The Application Protector client logs are present in the `/opt/Hitachi/HAPRO/client/logs` directory.

Application Protector operation log

Application Protector creates separate log file in the `OpLog_<unique_id>.log` format for all the Application Protector operations, where `OpLog_<unique_id>` is the operation log ID.

The Application Protector operation logs are present in the `/opt/Hitachi/HAPRO/server/logs` directory.

Listing the events

Application Protector supports event logging for the performed operations. These system logs are generated in the `/var/log/messages` directory.

Default log paths

The default log paths for client and server logs are as follows.

Table A-1: Default log paths

Field	Path
Application Protector Client log directory path	<code>/opt/Hitachi/HAPRO/client/logs</code>
Application Protector Server logs	<code>/opt/Hitachi/HAPRO/server/logs</code>
Event notifications	For Solaris: <code>/var/adm/messages</code>
	For RHEL and SLES: <code>/var/log/messages</code>

Schedule types

Schedule type	Description
once	The schedule creates one snapshot.
hourly	The schedule creates a snapshot hourly.
daily	The schedule creates a snapshot daily.
weekly	Schedule runs every week.
monthly	Schedule runs on the same date every month.

Days of week

Day	CLI equivalent
Sunday	sun
Monday	mon
Tuesday	tue

Day	CLI equivalent
Wednesday	wed
Thursday	thu
Friday	fri
Saturday	sat

Months of year

Month	CLI equivalent
January	jan
February	feb
March	mar
April	apr
May	may
June	jun
July	jul
August	aug
September	sep
October	oct
November	nov
December	dec

Service account user privileges

If you do not have sufficient privilege to perform snapshot management operations, the corresponding database is listed, but is non-snapshotable. For details about snapshotable instance, see [Snapshotable instance](#).

The following table lists the service account privileges you must have to perform various Application Protector operations.

Table A-3: Service account user privileges

Application Protector operation	OS user	Privileges	Details
Create snapshot	Oracle	SYSDBA	RMAN requires SYSDBA privilege to connect to target DB.
Delete snapshot	-	-	SYSDBA privilege
Mount snapshot	Oracle	SYSDBA	SYSDBA privilege
Unmount snapshot	Oracle	SYSDBA	SYSDBA privilege
Revert snapshot	Oracle	SYSDBA	RMAN requires SYSDBA privilege to connect to target DB.
Recover snapshot	Oracle	SYSDBA	RMAN requires SYSDBA privilege to connect to target DB.

Displaying status of a command

You can use the `-w | --sync` CLI command to view the progress of an operation. The CLI monitors the status of the operation every 5 seconds. This parameter is applicable for the following:

- Create snapshot
- Delete snapshot
- Revert snapshot
- Recover snapshot
- Mount snapshot
- Unmount snapshot



Glossary

This glossary provides definitions of general storage terms as well as specific terms related to the technology that supports Hitachi Application Protector. Click the letter of the glossary section to display that page.

A

Application Protector

Hitachi Application Protector

ASM

Automatic Storage Management (ASM) is a volume manager and a file system for Oracle database files that supports single-instance Oracle database and Oracle RAC configurations. It uses disk-groups to store data files. The ASM disk-group is basically a collection of disks that it manages as a unit.

C

Complete recovery

Complete recovery involves using redo data or incremental backups combined with a backup of database, tablespace, or datafile to update it to the current point-in-time. The recovery is called complete recovery because all redo changes contained in the archived and online logs are overwritten completely. Complete recovery is generally performed after a control file or data file damage.

CIM

Common information model

#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------

CLI

Command line interface

CSV

Comma separated value

F**FQDN**

Fully qualified domain name

Full copy snapshot

Full copy (ShadowImage snapshot) type of snapshots backup complete database and enable restoring the data without referring to any other snapshot copies. A complete copy of the original database is created using full copy snapshot technology that can be replicated to other sites or backed up.

G**Gbps**

Gigabit per second.

GUI

Graphical user interface.

H**HAPRO**

Hitachi Application Protector.

HDD

Hard disk drive.

HNAS

Hitachi Network Attached Storage.

HTI

Hitachi Thin Image.

HUS

Hitachi Unified Storage.

#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Glossary–2

I

I/O

Input/output.

L

LVM

Logical volume manager.

LU

Logical unit.

LUN

Logical unit number.

M

Mount tool path

The mount tool path is configurable for Oracle 10gR2. You can set the mount tool path to the path where patch set is installed. This parameter is applicable for mount, recovery and revert operations.

O

OCI

Oracle call interface.

OCR

Oracle Cluster Registry (OCR) holds cluster and database configuration information for RAC setups. It is a shared disk component that must be accessible to all the nodes in the cluster.

P

PL

Perl script.

Point-in-time recovery

Application Protector uses the log files generated by the application server, to replay the log operation to recover the data to the point-in-time (PIT).

#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Prescripts

Executed prior to snapshot management operations in a synchronous manner. If the prescript fails, the snapshot creation fails, you can refer to the error log for failure details.

Postscripts

Executed after snapshot management operations in a synchronous manner. If the postscript fails, the snapshot is created and you need to check the process ID to decide whether you want to keep the snapshot.

PSUS

PAIR suspended.

P-VOL

A volume that consists of a production volume containing the original data is called the primary volume (P-VOL).

R

RAC

Real Application Cluster (RAC) allows multiple nodes in a clustered system to mount and open a single database residing on the shared disk storage. In case a single node fails, the database services are yet available on the remaining nodes. This allows you to connect to either node to access the data.

Recovery

Recovery is the process of copying data from the backup or the snapshot data and then applying logs to roll forward the recovered database up to the point of failure or to any point-in-time. Recovery can be performed on the host that has the current active database and has access to the snapshot volumes.

Restore

Restore is a process of copying a database from a snapshot copy to the original LUN or to a new LUN. On restoring a snapshot, only data files are restored from the snapshot.

RHEL

Red Hat® Enterprise Linux®.

RMAN

Oracle Recovery Manager.

#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Revert

The database is overwritten completely and is performed on the same host only.

RPO

Recovery point objective.

RTO

Recovery time objective.

S**SI**

ShadowImage® (SI)

SH

Shell script.

SLES

SUSE® Linux Enterprise Server

Snapshot

Snapshot is a point-in-time copy of the data of the application database. The data files, control files, and archive log files are backed-up while creating a snapshot.

Snapshotable instance

The database instance that resides on a Hitachi supported storage device such as VSP. You must move the database to VSP arrays for protection.

Space efficient snapshot

Space efficient snapshots are created using space efficient snapshot technologies. These are transient copies that allow quick recovery of database.

SPFile

A Server parameter file (SPFILE) is a server parameter file. When an instance is started, this file is read. This file stores initialization parameters for the next startup of the database.

S-VOL

Secondary volumes contain copies of the P-VOL.

#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

T

Tablespace

A tablespace is a logical storage unit within an Oracle database. It consists of at least one datafile that is physically located in the file system of the server.

Target

Devices that receive iSCSI requests that originate from an iSCSI initiator.

Tree Clone snapshots

Tree Clone is a cloning method for NAS based storages. It recreates the source directory structure at the destination and clones contained files.

V

VSP

Virtual Storage Platform

V-VOL

Virtual volumes contain virtual copies on the P-VOL.

#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Hitachi Data Systems

Corporate Headquarters

2845 Lafayette Street, Santa Clara,
California 95050-2629, U.S.A.

www.hds.com

Regional Contact Information

Americas

+1 408 970 1000

info@hds.com

Europe, Middle East, and Africa

+44 (0)1753 618000

info.emea@hds.com

Asia Pacific

+852 3189 7900

hds.marketing.apac@hds.com



MK-91HAP023-00