

Hitachi Application Protector CLI Guide for SAP®

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	ix
Intended audience	x
Product version	x
Document revision level	x
Related documents	x
Document organization	xi
Document conventions	xi
Getting help	xii
Comments	xii
1 Introduction	1-1
Application Protector overview	1-2
Application Protector operations	1-2
Using the Application Protector CLI	1-2
Integrating with SAP® BR*Tools	1-3
2 Working with Help commands	2-1
Application Protector help commands	2-2
Application Protector operations	2-5
3 Working with snapshots	3-1
Creating a snapshot	3-2
Syntax	3-2
Parameter description	3-3
Sample command	3-4
Command	3-4
Output	3-4

Listing the snapshots	3-14
Syntax	3-14
Parameter description	3-15
Sample command(s) and output	3-16
Command	3-16
Output	3-16
Command	3-16
Output	3-16
Deleting a snapshot	3-21
Syntax	3-21
Parameter description	3-22
Sample command(s) and output	3-23
Command	3-23
Output	3-23
Mounting a snapshot	3-24
Syntax	3-24
Parameter description	3-25
Sample command(s) and output	3-26
Command	3-26
Output	3-26
Unmounting a snapshot	3-27
Syntax	3-27
Parameter description	3-28
Sample command(s) and output	3-28
Command	3-28
Output	3-28
Performing recovery	3-29
Recovering database using a snapshot	3-29
Syntax	3-29
Parameter description	3-30
Sample command	3-30
Sample command for complete recovery	3-30
Sample command for PIT recovery	3-30
Restoring database using a snapshot	3-31
Syntax	3-31
Parameter description	3-32
Sample command	3-32
Sample command for restore	3-32
4 Working with Admin commands	4-1
Configuring the Application Protector Server and Client	4-2
Setting the Application Protector configuration	4-2
Syntax	4-2
Parameter description	4-3
Sample command(s) and output	4-4

Resetting the Application Protector configuration	4-5
Syntax	4-5
Parameter description	4-6
Sample command(s) and output	4-6
Listing the Application Protector configuration	4-7
Syntax	4-7
Parameter description	4-8
Sample command(s) and output	4-9
Importing the Application Protector metadata	4-12
Syntax	4-12
Parameter description	4-13
Sample command(s) and output	4-13
Licensing Application Protector	4-14
Generating the Application Protector license	4-15
Syntax	4-15
Parameter description	4-15
Sample command(s) and output for SLES and RHEL setups	4-17
Activating the Application Protector license	4-18
Syntax	4-18
Parameter description	4-19
Sample command(s) and output for SLES and RHEL setups	4-19
Listing the license	4-20
Syntax	4-20
Parameter description	4-21
Sample command(s) and output for SLES and RHEL setups	4-22
Listing the operations	4-23
Syntax	4-23
Parameter description	4-24
Sample command(s) and output	4-25
Deleting the operations	4-26
Syntax	4-26
Parameter description	4-27
Sample command(s) and output	4-27
Listing the log details	4-28
Syntax	4-28
Parameter description	4-29
Sample command(s) and output	4-30
Command	4-30
Output	4-30
5 Working with Server commands	5-1
Configuring the storage subsystem	5-2
Registering a storage array	5-2
Syntax	5-2

Parameter description	5-3
Sample command(s) and output	5-4
Modify a storage array	5-5
Syntax	5-5
Parameter description	5-6
Sample command(s) and output	5-7
Unregistering a storage array	5-8
Syntax	5-8
Parameter description	5-9
Sample command(s) and output	5-9
Listing the storage array	5-10
Syntax	5-10
Parameter description	5-11
Sample command(s) and output	5-11
6 Working with the utilities	6-1
HAPRO dump	6-2
Syntax	6-2
Parameter description	6-3
Sample command(s)	6-3
Command	6-3
Output	6-4
HAPRO sync	6-13
Syntax	6-13
Parameter description	6-14
Sample command(s)	6-15
Command	6-15
Output	6-15
Command	6-15
Output	6-15
Command	6-15
Output	6-15
A . Appendix.	A-1
Application types.	A-2
Snapshot limit for supported storage.	A-2
Listing Application Protector logs	A-2
Application Protector server log	A-2
Application Protector client log	A-2
Application Protector operation log	A-3
Listing events	A-3
Default log paths.	A-3

Glossary

Index



Preface

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

The preface describes the following topics:

- [Intended audience](#)
- [Product version](#)
- [Document revision level](#)
- [Related documents](#)
- [Document organization](#)
- [Document conventions](#)
- [Getting help](#)
- [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 installing, configuring, and using Application Protector. Readers of this document should be familiar with the following concepts:

- Linux® and Solaris® operating system
- Storage administration
- Backup and recovery concepts
- SAP® BR*Tools

Product version

This document revision applies to Hitachi Application Protector CLI Guide for SAP® for v1.2 release.

Document revision level

This section provides a history of the revision changes to this document.

Revision	Date	Description
MK-91HAP024-00	July 2014	Initial release

Related documents

- *Hitachi Application Protector Quick Install & Configuration Guide for SAP®, MK-91HAP018*
- *Hitachi Application Protector User Guide for SAP®, MK-91HAP016*
- *Hitachi Application Protector Troubleshooting Guide for SAP®, FE-91HAP020*


Document organization

The following table provides an overview of the content and organization of this document. Click the chapter title in the first column to refer that chapter. The first page of every chapter 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 snapshots	Provides syntax and parameter details for snapshot management operations.
Chapter 4, Working with Admin commands	Provides syntax and parameter description for administrative commands.
Chapter 5, Working with Server commands	Provides syntax and parameter description for server commands.
Chapter 6, Working with the utilities	Provides the utility details for HAPRO dump and HAPRO sync.
Appendix A, Appendix	Provides details of notifications, log levels, and Application Protector logs.
Glossary	Defines the acronyms and special terms used in this document.
Index	Provides a detailed and linked list of topics in this document.

Document conventions

The 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.

The document uses the following conventions for the support matrix.

Convention	Description
√	Features fully functional and available in Hitachi Application Protector for v1.2 release.
x	Features not functional and feature not available in Hitachi Application Protector for v1.2 release.
Not Supported	Features not supported by Hitachi Application Protector for v1.2 release.
-	Not applicable

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 source-file target-file. 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: Italic 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.
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]

Getting help

If you need to call the Hitachi Data Systems Support Center, make sure you provide as much information about the problem as possible, including:

- The circumstances surrounding the error or failure.
- The content of any error message(s) displayed on the host system(s).

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 Portal for contact information at <https://hdssupport.hds.com>.

Comments

Your comments and suggestions to improve this document are greatly appreciated. Please send us your comments on this document to doc.comments@hds.com. Include the document title, number, and revision, and refer to specific section(s) and paragraph(s) whenever possible.

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

Introduction

Hitachi Application Protector for SAP® (Application Protector) is a snapshot-based backup and recovery software. It is based on the client-server architecture. Application Protector Server is installed on the server having Oracle Database on a non-Automatic Storage Management (ASM) setup in the SAP® environment. The Application Protector Client can be installed on the same machine as Application Protector Server.

This section describes the following topics:

- ❑ [Application Protector overview](#)
- ❑ [Application Protector operations](#)

Application Protector overview

Application Protector facilitates creation of snapshots of the Oracle Database in SAP environment. You can recover the database from the snapshot. Application Protector supports the following.

- Register the supported storage arrays.
- Set policy to configure snapshot retention count at server level.
- Create, list, mount, unmount, and delete snapshots.
- List, and delete ShadowImage® (SI), TreeClone, and Hitachi Thin Image (HTI) snapshots at volume level.
- Recover and restore database from the snapshot at volume level.
- Native Device-Mapper Multipath environment for Red Hat® Enterprise Linux® (RHEL) and SUSE® Linux Enterprise Server (SLES) operating system.
- Protect databases hosted on the Logical Volume Manager (LVM) devices for SLES operating system.

Application Protector operations

You can use the SAP® BR*Tools in Application Protector to protect the Oracle Database in SAP environment. This section lists the operations that you can perform in Hitachi Application Protector for SAP®.

Using the Application Protector CLI

The Application Protector executable is in the `/opt/Hitachi/HAPRO/client/bin` directory. You can perform the following using the Application Protector CLI.

- Configuration:
 - Storage configuration
 - Application Protector Server configuration
 - Application Protector Client configuration
- License management:
 - Generate license request
 - Activate and list Application Protector license
- Logs and operations:
 - List Application Protector logs
 - List Application Protector operations
 - List events
- Application Protector tools:
 - HAPRO dump
 - HAPRO sync

- Snapshot management operations:
 - List snapshot
 - Delete snapshot
 - Mount snapshot
 - Unmount snapshot

For details about Application Protector snapshot management operations, see [Working with snapshots](#).

Integrating with SAP® BR*Tools

Application Protector integrates with SAP® BR*Tools using the BACKINT interface. This allows Application Protector to provide end-to-end support for backup and recovery tasks initiated using the following SAP® BR*Tools utilities:

- **BRBACKUP:** Create snapshot-based backup of the online Oracle database.
- **BRRESTORE:** Restore the database as per given criteria.
- **BRRECOVER:** Recover the database as per given criteria. It supports complete and point-in-time (PIT) recovery.



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

Working with Help commands

This chapter provides the list of operations supported in Hitachi Application Protector for SAP® (Application Protector) and sample help command and the output.

This chapter describes the following topics.

- ❑ [Application Protector help commands](#)
- ❑ [Application Protector operations](#)

Application Protector help commands

This section provides sample help command and the output. The commands and actions are available depending on the application (-a|--app) you select.

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 saporacle
```

Output

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

```
-----
```

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

Command

```
hapro snapshot -h -a saporacle
```

Output

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

```
-----
```

```
---
```

Action	Description
=====	=====
delete	Delete Snapshot
list	List Snapshots
mount	Mount Snapshot
unmount	Unmount Snapshot

Sample command(s) and output

Command

```
hapro admin -h -a saporacle
```

Output

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

```
-----
```

Action	Description
=====	=====
listoperations	List Operations
deleteoperation	Delete Operation
setconfig	Set Configurations
resetconfig	Reset Configurations to their Defaults
listconfig	List Configurations
importmetadata	Import Metadata
listlog	List Logs
generatelicenserequest	Generate License Request
activatelicense	Activate License
listlicense	List Licenses

Command

```
hapro server -h -a saporacle
```

Output

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

Action	Description
=====	=====
registerstoragearray	Register Storage Array
unregisterstoragearray	Unregister Storage Array
liststoragearray	List Registered Storage Arrays
modifystoragearray	Modify Registered Storage Arrays

For details about supported commands in Application Protector for SAP, see [Application Protector operations](#).



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.

Application Protector operations

This section lists the supported commands and actions in Hitachi Application Protector for SAP®.

Table 2-1: Actions in Application Protector for SAP

Command	Action	Supported
admin	listoperations	√
	deleteoperation	√
	setconfig	√
	resetconfig	√
	listconfig	√
	listlog	√
	setdbserviceaccount	x
	listdbserviceaccount	x
	modifydbserviceaccount	x
	setasmserviceaccount	x
	listasmserviceaccount	x
	modifyasmserviceaccount	x
	importmetadata	√
	generatelicenserequest	√
	activatelicense	√
listlicense	√	
server	listdb	x
	listitem	x
	registerstoragearray	√
	unregisterstoragearray	√
	liststoragearray	√
	modifystoragearray	√
	registerscript	x
	modifyscript	x
	unregisterscript	x
	listscripts	x
snapshot	create	x
	delete	√
	list	√
	mount	√
	unmount	√
	recover	x
	restore	x

Table 2-1: Actions in Application Protector for SAP

Command	Action	Supported
schedule	create	x
	modify	x
	delete	x
	list	x

Working with snapshots

Application Protector protects the Oracle Databases in SAP environment by using the BR*Tools interface and Application Protector CLI. You can backup and recover the Oracle Database in SAP environment using Hitachi's snapshot technology.

This chapter describes the following topics.

- ❑ [Creating a snapshot](#)
- ❑ [Listing the snapshots](#)
- ❑ [Deleting a snapshot](#)
- ❑ [Mounting a snapshot](#)
- ❑ [Unmounting a snapshot](#)
- ❑ [Performing recovery](#)

Creating a snapshot

Application Protector takes backup of the online Oracle Database in SAP environment using BR*Tools. This section describes the command options for BRBACKUP.

If you start BRBACKUP without command options, the values in the `init<SID>.sap` profile file are used.

If you use BRBACKUP with the command options, these override the corresponding values in the profile file. For more details about using the options, see [SAP Help Portal](#).



NOTE: The profile file is at `$oracle home/dbs/init<SID>.sap`. You can customize the profile file as required to take backup.

Syntax

This section displays only the supported parameters for BRBACKUP in Application Protector.

```
./brbackup  
[-c|-confirm [force]]  
[-d|-device] util_vol_online  
[-m|-mode] all | full  
[-p|-profile <profile>]  
[-r|-parfile] <parfile>  
[-t|-type] online | online_cons  
[-u|-user [user[/password]]|/]
```


Parameter description

Table 3-1: BRBACKUP parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Backs up in unattended mode	-confirm	-c	Unattended mode Passed to BACKINT as -c.	Not applicable	Optional
Backup device type	-device	-d	Volume level backup Volume by Volume backup. Defines a backup at disk-volume level with dynamic switching of tablespace backup status	util_vol_online	No ^{*1}
			File Level Backup. Backup can also be at volume level.	util_file_online	Not supported
Backup mode	-mode	-m	Backup DATA+REDO. HAPRO backs up D+A (with log switch) Application Protector performs volume level backup and backup all the tablespaces including empty ones.	all	No*
			Backup DATA+REDO+ARCHIVE. HAPRO backs up D+A	full	No*
Profile file	-profile	-p	Specifies the path of the profile file. If this file is not in the standard directory, specify the complete path.	<Complete profile file path>	No
Parameter file	-parfile	-r	Contains the extra parameters and its value for Application Protector. These parameters and values are used for snapshot management operations.	<Complete param file path>	No
Backup type	-type	-t	Consistent Online Backup (with Oracle BACKUP mode + Control File) This is online or offline backup type. Must be set to "online_cons".	online_cons	No*
			Performs backup for the open database	online	No

Table 3-1: BRBACKUP parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
User name and password that BRBACKUP uses to log on to the database system	-user	-u	Username and password of database	<user/ password> Database user	Yes

1. Note: “*” indicates that if you do not provide this parameter, then it will take the init<SID>.sap file value, else; you must provide the parameter in the command line.

Sample command

Command

```
./brbackup -u <user/password> [-p <profile file path>]
```

Output

```
BR0051I BRBACKUP 7.20 (1)
BR0055I Start of database backup: bemshkiw.anv 2013-12-09
05.20.06
BR0484I BRBACKUP log file: /oracle/CST/112_64/sapbackup/
bemshkiw.anv
BR0049W Last BRBACKUP run was probably killed

BR0280I BRBACKUP time stamp: 2013-12-09 05.20.06
BR0256I Enter 'c[ont]' to continue, 's[top]' to cancel
BRBACKUP:
c
BR0280I BRBACKUP time stamp: 2013-12-09 05.20.08
BR0257I Your reply: 'c'
BR0259I Program execution will be continued...
BR0477I Oracle pfile /oracle/CST/112_64/dbs/initCST.ora
created from spfile /oracle/CST/112_64/dbs/spfileCST.ora

BR0280I BRBACKUP time stamp: 2013-12-09 05.20.09
BR0319I Control file copy created: /oracle/CST/112_64/
sapbackup/cntrlCST.dbf 20267008
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.20.09
BR0057I Backup of database: CST
BR0058I BRBACKUP action ID: bemshkiw
BR0059I BRBACKUP function ID: anv
BR0110I Backup mode: ALL
BR0077I Database files for backup:
/oracle/CST/sapdata4/temp_1/temp.data1
/oracle/CST/112_64/sapbackup/cntrlCST.dbf
BR0061I 20 files found for backup, total size 129043.477 MB
BR0143I Backup type: online_cons
BR0130I Backup device type: util_vol_online
BR1501I Files will be saved by backup utility at volume level
BR0142I Files will be switched to backup status during the
backup
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.20.09
BR0256I Enter 'c[ont] ' to continue, 's[top] ' to cancel
BRBACKUP:
```

```
c
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.20.33
BR0257I Your reply: 'c'
BR0259I Program execution will be continued...
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.20.33
BR0229I Calling backup utility with function 'backup'...
BR0278I Command output of '/usr/sap/CST/SYS/exe/run/backint -
u CST -f backup -i /oracle/CST/112_64/sapbackup/.bemshkiw.lst
-t volume_online -n no_check':
```

```
BR0280I BRCONNECT time stamp: 2013-12-09 05.20.35
#BEGIN /oracle/CST/sapdata1/sr3_1/sr3.data1
#BEGIN /oracle/CST/sapdata1/sr3_2/sr3.data2
#BEGIN /oracle/CST/sapdata2/sr3_3/sr3.data3
```

```

#BEGIN /oracle/CST/sapdata2/sr3_4/sr3.data4
#BEGIN /oracle/CST/sapdata3/sr3_5/sr3.data5
#BEGIN /oracle/CST/sapdata3/sr3_6/sr3.data6
#BEGIN /oracle/CST/sapdata3/sr3_7/sr3.data7
#BEGIN /oracle/CST/sapdata1/sr3701_1/sr3701.data1
#BEGIN /oracle/CST/sapdata1/sr3701_2/sr3701.data2
#BEGIN /oracle/CST/sapdata2/sr3701_3/sr3701.data3
#BEGIN /oracle/CST/sapdata2/sr3701_4/sr3701.data4
#BEGIN /oracle/CST/sapdata4/sr3701_5/sr3701.data5
#BEGIN /oracle/CST/sapdata4/sr3701_6/sr3701.data6
#BEGIN /oracle/CST/sapdata4/sr3701_7/sr3701.data7
#BEGIN /oracle/CST/sapdata3/sr3usr_1/sr3usr.data1
#BEGIN /oracle/CST/sapdata4/temp_1/temp.data1
#BEGIN /oracle/CST/sapdata3/undo_1/undo.data1
#BEGIN /oracle/CST/sapdata3/sysaux_1/sysaux.data1
#BEGIN /oracle/CST/sapdata4/system_1/system.data1
BR0315I 'Alter tablespace PSAPSR3 begin backup' successful
BR0315I 'Alter tablespace PSAPSR3701 begin backup' successful
BR0315I 'Alter tablespace PSAPSR3USR begin backup' successful
BR0315I 'Alter tablespace PSAPUNDO begin backup' successful
BR0315I 'Alter tablespace SYSAUX begin backup' successful
BR0315I 'Alter tablespace SYSTEM begin backup' successful
BR0280I BRCONNECT time stamp: 2013-12-09 05.20.36

BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
BR0204I Percentage done: 0.01%, estimated end time: 19:20
BR0001I _____

BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
BR0204I Percentage done: 40.00%, estimated end time: 5:34
BR0001I ***** _____

```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
BR0204I Percentage done: 100.00%, estimated end time: 5:26
BR0001I *****
```

```
BR0280I BRCONNECT time stamp: 2013-12-09 05.26.12
```

```
#END /oracle/CST/sapdata1/sr3_1/sr3.data1
#END /oracle/CST/sapdata1/sr3_2/sr3.data2
#END /oracle/CST/sapdata2/sr3_3/sr3.data3
#END /oracle/CST/sapdata2/sr3_4/sr3.data4
#END /oracle/CST/sapdata3/sr3_5/sr3.data5
#END /oracle/CST/sapdata3/sr3_6/sr3.data6
#END /oracle/CST/sapdata3/sr3_7/sr3.data7
#END /oracle/CST/sapdata1/sr3701_1/sr3701.data1
#END /oracle/CST/sapdata1/sr3701_2/sr3701.data2
#END /oracle/CST/sapdata2/sr3701_3/sr3701.data3
#END /oracle/CST/sapdata2/sr3701_4/sr3701.data4
#END /oracle/CST/sapdata4/sr3701_5/sr3701.data5
#END /oracle/CST/sapdata4/sr3701_6/sr3701.data6
#END /oracle/CST/sapdata4/sr3701_7/sr3701.data7
#END /oracle/CST/sapdata3/sr3usr_1/sr3usr.data1
#END /oracle/CST/sapdata4/temp_1/temp.data1
#END /oracle/CST/sapdata3/undo_1/undo.data1
#END /oracle/CST/sapdata3/sysaux_1/sysaux.data1
#END /oracle/CST/sapdata4/system_1/system.data1
```

```
BR0317I 'Alter tablespace PSAPSR3 end backup' successful
BR0317I 'Alter tablespace PSAPSR3701 end backup' successful
BR0317I 'Alter tablespace PSAPSR3USR end backup' successful
BR0317I 'Alter tablespace PSAPUNDO end backup' successful
BR0317I 'Alter tablespace SYSAUX end backup' successful
BR0317I 'Alter tablespace SYSTEM end backup' successful
BR0280I BRCONNECT time stamp: 2013-12-09 05.26.12
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
#FILE..... /oracle/CST/sapdata1/sr3_1/sr3.data1
#SAVED.... 967389-7B92-3D85
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
#FILE..... /oracle/CST/sapdata1/sr3_2/sr3.data2
#SAVED.... 967389-7B92-3D85
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
#FILE..... /oracle/CST/sapdata2/sr3_3/sr3.data3
#SAVED.... 967389-7B92-3D85
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
#FILE..... /oracle/CST/sapdata2/sr3_4/sr3.data4
#SAVED.... 967389-7B92-3D85
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
#FILE..... /oracle/CST/sapdata3/sr3_5/sr3.data5
#SAVED.... 967389-7B92-3D85
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
#FILE..... /oracle/CST/sapdata3/sr3_6/sr3.data6
#SAVED.... 967389-7B92-3D85
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
#FILE..... /oracle/CST/sapdata3/sr3_7/sr3.data7
#SAVED.... 967389-7B92-3D85
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
#FILE..... /oracle/CST/sapdata1/sr3701_1/sr3701.data1
#SAVED.... 967389-7B92-3D85
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
#FILE..... /oracle/CST/sapdata1/sr3701_2/sr3701.data2
#SAVED.... 967389-7B92-3D85
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
#FILE..... /oracle/CST/sapdata2/sr3701_3/sr3701.data3
#SAVED.... 967389-7B92-3D85
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
#FILE..... /oracle/CST/sapdata2/sr3701_4/sr3701.data4
#SAVED.... 967389-7B92-3D85
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
#FILE..... /oracle/CST/sapdata4/sr3701_5/sr3701.data5
#SAVED.... 967389-7B92-3D85
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
#FILE..... /oracle/CST/sapdata4/sr3701_6/sr3701.data6
#SAVED.... 967389-7B92-3D85
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
#FILE..... /oracle/CST/sapdata4/sr3701_7/sr3701.data7
#SAVED.... 967389-7B92-3D85
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
#FILE..... /oracle/CST/sapdata3/sr3usr_1/sr3usr.data1
#SAVED.... 967389-7B92-3D85
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
#FILE..... /oracle/CST/sapdata4/temp_1/temp.data1
#SAVED.... 967389-7B92-3D85
```

```
BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
#FILE..... /oracle/CST/sapdata3/undo_1/undo.data1
#SAVED.... 967389-7B92-3D85

BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
#FILE..... /oracle/CST/sapdata3/sysaux_1/sysaux.data1
#SAVED.... 967389-7B92-3D85

BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
#FILE..... /oracle/CST/sapdata4/system_1/system.data1
#SAVED.... 967389-7B92-3D85

BR0280I BRBACKUP time stamp: 2013-12-09 05.26.15
BR0232I 19 of 19 files saved by backup utility
BR0230I Backup utility called successfully

BR0280I BRBACKUP time stamp: 2013-12-09 05.26.17
BR0340I Switching to next online redolog file for database
instance CST ...
BR0321I Switch to next online redolog file for database
instance CST successful

BR0085I 1 offline redolog file found for backup, size 95.524
MB

BR0280I BRBACKUP time stamp: 2013-12-09 05.26.22
BR0229I Calling backup utility with function 'backup'...

BR0280I BRBACKUP time stamp: 2013-12-09 05.29.43
BR0204I Percentage done: 0.01%, estimated end time: 11:46
BR0001I _____

BR0280I BRBACKUP time stamp: 2013-12-09 05.29.43
```



```
BR0204I Percentage done: 40.00%, estimated end time: 5:34
BR0001I *****
BR0280I BRBACKUP time stamp: 2013-12-09 05.29.43
BR0204I Percentage done: 100.00%, estimated end time: 5:29
BR0001I *****
BR0280I BRBACKUP time stamp: 2013-12-09 05.29.43
#ARCHIVE.. /oracle/CST/oraarch/CSTarch1_1_833690869.dbf
#SAVED.... 967389-7B92-3D85
BR0280I BRBACKUP time stamp: 2013-12-09 05.29.43
BR0204I Percentage done: 0.01%, estimated end time: 11:46
BR0001I _____
BR0280I BRBACKUP time stamp: 2013-12-09 05.29.43
BR0204I Percentage done: 100.00%, estimated end time: 5:29
BR0001I *****
BR0280I BRBACKUP time stamp: 2013-12-09 05.29.43
#FILE..... /oracle/CST/112_64/sapbackup/cntrlCST.dbf
#SAVED.... 967389-7B92-3D85
BR0280I BRBACKUP time stamp: 2013-12-09 05.29.43
BR0232I 2 of 2 files saved by backup utility
BR0230I Backup utility called successfully
BR0280I BRBACKUP time stamp: 2013-12-09 05.29.43
BR0229I Calling backup utility with function 'backup'...
BR0280I BRBACKUP time stamp: 2013-12-09 05.29.56
BR0204I Percentage done: 0.01%, estimated end time: 17:36
```

BR0001I

BR0280I BRBACKUP time stamp: 2013-12-09 05.29.56

BR0204I Percentage done: 100.00%, estimated end time: 5:29

BR0001I *****

BR0280I BRBACKUP time stamp: 2013-12-09 05.29.56

#PFLOG.... /oracle/CST/112_64/dbs/initCST.ora

#SAVED.... 967389-7B92-3D85

BR0280I BRBACKUP time stamp: 2013-12-09 05.29.56

#PFLOG.... /oracle/CST/112_64/dbs/spfileCST.ora

#SAVED.... 967389-7B92-3D85

BR0280I BRBACKUP time stamp: 2013-12-09 05.29.56

#PFLOG.... /oracle/CST/112_64/dbs/initCST.sap

#SAVED.... 967389-7B92-3D85

BR0280I BRBACKUP time stamp: 2013-12-09 05.29.56

#PFLOG.... /oracle/CST/112_64/sapreorg/spaceCST.log

#SAVED.... 967389-7B92-3D85

BR0280I BRBACKUP time stamp: 2013-12-09 05.29.56

#PFLOG.... /oracle/CST/112_64/sapbackup/bemshkiw.anv

#SAVED.... 967389-7B92-3D85

BR0280I BRBACKUP time stamp: 2013-12-09 05.29.56

#PFLOG.... /oracle/CST/112_64/sapbackup/backCST.log

#SAVED.... 967389-7B92-3D85

BR0280I BRBACKUP time stamp: 2013-12-09 05.29.56

BR0232I 6 of 6 files saved by backup utility

BR0230I Backup utility called successfully

BR0056I End of database backup: bemshkiw.anv 2013-12-09
05.29.56

BR0280I BRBACKUP time stamp: 2013-12-09 05.29.56

BR0053I BRBACKUP completed successfully with warnings



NOTE: The <backup_vol> parameter is not supported in the output of backup call to BACKINT.

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 3-2: 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. This parameter is not supported for SAP.

2.Note: “*” indicates, you can provide the snapshot name or the set ID. Not applicable for SAP.

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 saporacle -u <user> -P <password>
```

Output

Name	Mounted	Database	Time	Set Id	Type	Description	User
BI_4886 33- DBD4- 7D48	No	CSV	2013- 12-16 05:19:0 7	488633- DBD4- 7D48	Space Effici ent	Snapshot for SP	root

Command

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

Output

```
Name: BI_F68079-B638-4BD7  
Mounted: No  
Mount Point: -  
Time: 2014-06-30 01:37:55  
Set Id: F68079-B638-4BD7  
Type: Tree Clone  
Description: Snapshot created from HAPRO for SAP  
User: root  
Database: CSH  
Database Type: NON-ASM  
Source Device(s):  
6C8CB095F82E421C0000000000000000:192.168.0.11:/007SAPDATA1:/  
sr3_1:/  
  
6C8CB095F82E421C0000000000000000:192.168.0.11:/007SAPDATA1:/  
sr3_3:/
```

6C8CB095F82E421C0000000000000000:192.168.0.11:/007SAPDATA1:/
sr3_2:/

6C8CB095F82E421C0000000000000000:192.168.0.11:/007SAPDATA1:/
sr3_4:/

6C8CB08077BE9C040000000000000000:192.168.0.11:/008SAPDATA2:/
sr3701_1:/

6C8CB08077BE9C040000000000000000:192.168.0.11:/008SAPDATA2:/
sr3701_2:/

6C8CB08077BE9C040000000000000000:192.168.0.11:/008SAPDATA2:/
sr3701_3:/

6C8CB08077BE9C040000000000000000:192.168.0.11:/008SAPDATA2:/
sr3701_4:/

6C8CB0B1AE4F3E130000000000000000:192.168.0.11:/009SAPDATA3:/
sr3701_5:/

6C8CB0B1AE4F3E130000000000000000:192.168.0.11:/009SAPDATA3:/
sr3_6:/

6C8CB0B1AE4F3E130000000000000000:192.168.0.11:/009SAPDATA3:/
sr3_5:/

6C8CB0B1AE4F3E130000000000000000:192.168.0.11:/009SAPDATA3:/
sr3usr_1:/

6C8CB0BD228F6DE800000000000000000:192.168.0.11:/010SAPDATA4:/
sr3701_6:/

6C8CB0B1AE4F3E130000000000000000:192.168.0.11:/009SAPDATA3:/
sysaux_1:/

6C8CB0B1AE4F3E130000000000000000:192.168.0.11:/009SAPDATA3:/
undo_1:/

6C8CB0BD228F6DE800000000000000000:192.168.0.11:/010SAPDATA4:/
temp_1:/

D4AE625D-449F-8EDB-818F-F77370017B91
B6F5AE71-F4F8-812E-7CF8-B7B2EBCCF418
5774CF63-720D-BBC1-77D9-24762A191BF2
A073D86B-351A-18B5-AE0F-011200DECEE4
14C5B8C7-B021-6850-98A2-28ED132BBD9B
1CF9281A-1BBD-445D-1589-BE47074BEF34
DDA95463-81C0-15FC-5F6D-2B78BFE613F4
5047151D-6E4A-1A7A-1777-5C7449A6AFF5
EC0B200B-D5DC-DE87-16EB-9B1B00499181
CDEC0952-8B97-7642-4407-A160B6AC867A
924FCDE3-1CA6-E2F9-F44F-2468315A5124
1668382B-EADD-55FD-8796-EE07E2C206F7

Originating Machine: calsapdb229

Service Machine: calsapdb229

Deleting a snapshot

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 -h -a saporacle
```

```
usage: hapro snapshot delete
```

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

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

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

```
[{ -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 3-3: 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.	saporacle	Yes
Snapshot name	--snapshot	-x	This parameter specifies the snapshot name to be deleted.	Snapshot name (Multiple CSV 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*
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.

NOTE: It is recommended that after deleting a snapshot from Application Protector, you need to manually delete the entry from the BR*Tools metadata.

Sample command(s) and output

Command

```
hapro snapshot delete -s <Hostname/IP of Application  
Protector Server/FQDN> -a saporacle -x <snapshot name> -u  
<username> -P <password>
```

Output

```
[W7303085] Are you sure you want to delete these snapshot(s)?  
(y/n): y  
  
[I730304C] Request to delete snapshot(s) submitted  
successfully.
```

Mounting a snapshot

This command lets you mount the snapshot within the specified device.

Syntax

```
hapro snapshot mount -h -a saporacle

usage: hapro snapshot mount

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

  { -a          | --app              } Application: saporacle

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

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

  [{ -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: 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.	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. Non-ASM: valid directory path	ASM: First character ² must be an alphabet, followed by alphabets and/or numbers. For supported for SAP. Non-ASM: Valid directory path.	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 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.



NOTE: It is recommended to create a valid mount path prior to executing the snapshot mount command.

Sample command(s) and output

Command

```
hapro snapshot mount -s <Hostname/IP of Application Protector  
Server/FQDN> -a saporacle -x <snapshot name> -z <Valid  
directory path> -u <username> -P <password>
```

Output

```
[I73030A4] Request to mount snapshot submitted successfully.
```


Unmounting a snapshot

This command unmounts a mounted snapshot.

Syntax

```
hapro snapshot unmount -h -a saporacle  
usage: hapro snapshot unmount  
      { -s          | --server          } Hostname/FQDN/  
      IP of HAPRO server  
      { -a          | --app            } Application: 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 3-5: 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.	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 saporacle -P <password> -u <user> -s <Hostname/IP of Application Protector Server/FQDN> -x <snapshot name>
```

Output

```
[I7303050] Request to unmount snapshot submitted successfully.
```

Performing recovery

Application Protector recovers the Oracle Database in SAP environment using the selected snapshots. This section describes the details to perform restore and recover snapshot.

- **BRRECOVER:** Partially revert the database volumes based on the input file list.
- **BRRESTORE:** Revert the database volumes with snapshot volumes and restore the control file from the snapshot.

Recovering database using a snapshot

This section describes the command options for **BRRECOVER**. If you start **BRRECOVER** without command options, the values in the `init<SID>.sap` profile file are used.

If you use **BRRECOVER** with the command options, these override the corresponding values in the profile file. For more details about using the options, see [SAP Help Portal](#).

You can use the snapshot and archive files to perform complete and PIT recovery.

Complete recovery: Application Protector uses the snapshot and current archive files to perform complete recovery.

PIT recovery: Application Protector uses the snapshot and the logs until the time provided to perform PIT recovery.



NOTE: The profile file is at `$oracle_home/dbs/init<SID>.sap`. You can customize the profile file as required to recover the database using the backup.

Syntax

This section displays only the supported parameters for **BRRECOVER** in Application Protector.

```
./BRRECOVER  
[-b|-backup [<log_name>|last]]  
[-c|-confirm [force]]  
[-d|-device] util_vol_online  
{-m|-pit|-time} yyyy-mo-dd hh.mi.ss  
[-r|-parfile] parameter_file  
{-t|-type} complete|dbpit  
[-u|-user [user[/password]]|/]
```

Parameter description

Table 3-6: BRRECOVER snapshot parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Backup name	-backup	-b	Specifies the brbackup name from which to restore DB	<Log Name>	Yes
Backs up in unattended mode	-confirm	-c	Interactive (unattended mode) Passed to BACKINT as -c.	<force>	No
Backup device type	-device	-d	Used for volume by volume backup	util_vol	Yes
PIT	-time	-m -pit	Specifies the point in time to which BRRECOVER recovers the database for a point-in-time (PIT) recovery.	<yyyy-mo-dd hh.mi.ss>	Yes
Input param file for BACKINT	-parfile	-r	Defines the BACKINT or mount parameter file	<Param File>	Yes <Param File contents required>
Recovery type	-type	-t	Complete database recovery	complete	No* ¹
			Database point-in-time recovery	dbpit	No*
User name and password that BRBACKUP uses to log on to the database system	-user	-u	User name and password with which BRRECOVER connects to the database.	<user/ password> SAP SID user	Yes

1. Note: “*” indicates, if you do provide the value, by default, complete recovery is performed.

Sample command

Sample command for complete recovery

```
./brrecover -u <user/password> [-p <profile file path>]
```

Sample command for PIT recovery

```
./brrecover -u<user> [-p <profile file path>] -t dbpit -pit <date/time for dbpit recovery>
```

Restoring database using a snapshot

This section describes the command options for `BRRESTORE`. If you start `BRRESTORE` without command options, the values in the `init<SID>.sap` profile file are used.

If you use `BRRESTORE` with the command options, these override the corresponding values in the profile file. For more details about using the options, see [SAP Help Portal](#).



NOTE: The profile file is at `$oracle_home/dbs/init<SID>.sap`. You can customize the profile file as required to recover the database using the backup.

Syntax

This section displays only the supported parameters for `BRRESTORE` in Application Protector.

```
./BRRESTORE  
  
{-b|-backup} log_name  
[-c|-confirm [force]]  
[-d|-device] util_vol_online  
{-m|-mode} all|full  
[-r|-parfile] parameter_file  
[-u|-user [user[/password]]|/]
```

Parameter description

Table 3-7: BRRESTORE snapshot parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
Backup name	-backup	-b	Specifies the brbackup name from which to restore DB	<Log Name>	Yes
Backs up in unattended mode	-confirm	-c	Interactive (unattended mode) Passed to BACKINT as -c.	<force>	No
Backup device type	-device	-d	Used for volume by volume backup	util_vol	Yes
Restore	-mode	-m	A complete backup, including any non-database files, directories, control files, online redo log files and offline redo log files.	full/all	Yes
Input param file for BACKINT	-parfile	-r	Defines the BACKINT or mount parameter file	<Param File>	Yes <Param File contents required>
User name and password that BRBACKUP uses to log on to the database system	-user	-u	User name and password with which BRRESTORE connects to the database.	<user/ password> SAP SID user	Yes

Sample command

Sample command for restore

```
./brrecover -u <user/password> [-p <profile file path>]
```

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 chapter describes the following topics:

- ❑ [Configuring the Application Protector Server and Client](#)
- ❑ [Importing the Application Protector metadata](#)
- ❑ [Licensing Application Protector](#)
- ❑ [Listing the operations](#)
- ❑ [Deleting the operations](#)
- ❑ [Listing the log details](#)

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. The commands and actions are available depending on the application (`-a|--app`) you select.

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 4-1: 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.	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.	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. 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 4-2: 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 ²
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 ³
clientloglevel	Specifies the log levels for logging client logs.	info ⁴
datetimeformat	Specifies the date-time format for the client.	iso

1. Server log level values are: fatal, error, warn, info, and dbg1.

2. The snapshot retention limit for HUS: Full copy (7), HTI (1024), VSP are: ShadowImage (3), HTI (1024), and HNAS: TreeClone (1024).

3. This parameter is not applicable for SAP.

4. 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> -  
u <user> -P <password> -a saporacle -p haprologlevel -g error
```

Output

```
[I7303096] Configuration set successfully.
```

Resetting the Application Protector configuration

This command resets the configuration of Application Protector Server and 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/
  hapro snapshotretentioncount/metadatabackuppath/
  mounttoolpath/haprologlevel/clientloglevel/
  hapro serviceaccount/haproasm serviceaccount/datetimetypeformat

  [{ -f | --force      }]  Skip user confirmation
  [{ -u | --user       }]  Login user for HAPRO server
  [{ -P | --password   }]  Login password for HAPRO server
```

Parameter description

Table 4-3: 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.	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 • haproserviceaccount*² • haproasmerviceaccount* 	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. Note: "*" indicates, this parameter is not applicable for -a saporacle.

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

Output

```
[I720302C] Configuration reset successfully.
```

Listing the Application Protector configuration

This command lists the Application Protector Client and Server configuration. The commands and actions are available depending on the application (-a|--app) you select.

Syntax

```
hapro admin listconfig -h -a saporacle
usage: hapro admin listconfig
      { -s | --server      } Hostname/FQDN/IP of HAPRO server
      { -a | --app        } Application: 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 4-4: 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.	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 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 listconfig -s <Hostname/FQDN/IP of HAPRO server>  
-u <user> -P <password> -a saporacle
```

Output

```
=====
```

```
Server
```

```
=====
```

Parameter	Value
Operating System	Oracle Solaris 10 1/13
s10x_u11wos_24a X86	
Server Name	Cal64-137
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 1/13 s10x_u11wos_24a
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>
-u <user> -P <password> -a saporacle -l
```

Output

```
=====
```

```
Server
```

```
=====
```

```
Parameter: Operating System
```

```
Value:      Oracle Solaris 10 1/13 s10x_u11wos_24a X86
```

```
-----
```

```
Parameter: Server Name
```

```
Value:      Cal64-137
```

```
-----
```

```
Parameter: Version
```

```
Value:      1.2.0.24
```

```
-----
```

```
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 1/13 s10x_u11wos_24a 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 4-5: 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.

After installing Application Protector, register a valid license key on the server. 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.



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.

Generating the Application Protector license

The license request is server specific. This command generates a license request for the specified server.

Syntax

```
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 4-6: 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.	saporacle	Yes
First name	--firstname	-f	Specifies the first name of the licensee.	String up to 64 characters	Yes

Table 4-6: Generate license parameter description

Parameter	Long option	Short option	Description	Possible value(s)	Required
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 for SLES and RHEL setups

Command

```
hapro admin generatelicenserequest -a saporacle -s <Hostname/  
IP of Application Protector Server/ FQDN> -u <user> -P  
<Password> -E <email@hds.com> -f <first name> -L <last name>  
-i <activation ID> -C <company> -c <country> -x /  
<Response_SAP_HUS_LastOctetOfIP.xml>
```

Output

```
[I720308D] License request generated successfully.
```

Activating the Application Protector license

Application Protector is available with the following license types:

- Trial License (30 days)
- Production License

You need to activate the trial license or the production license on the specified server using Application Protector CLI.

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

Syntax

```
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 4-7: 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: Not applicable • 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 for SLES and RHEL setups

Command

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

Output

```
[I730300D] License activated successfully.
```

Listing the license

This command lists all the licenses installed on the specified server. You can perform the snapshot management operations for the activated license only.

Syntax

```
hapro admin listlicense -h -a saporacle
usage: hapro admin listlicense
  { -s | --server    } Hostname/FQDN/IP of HAPRO server
  { -a | --app      } Application: 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 4-8: 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.	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 data for a particular column, 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 for SLES and RHEL setups

Command

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

Output

Id	Type	Feature	Expiry (Days)
==	====	=====	=====
1	TRIAL	TRIAL_ALL	29

Listing the operations

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

Syntax

```
hapro admin listoperations -h -a saporacle
usage: hapro admin listoperations
      { -s | --server      } Hostname/FQDN/IP of HAPRO server
      { -a | --app         } Application: 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 4-9: 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.	saporacle	Yes
Database name	--database	-e	List operations performed on the database.	Database name	No ¹
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 ²
Login password	--password	-P	Login password for Application Protector server.	Valid password	No ³

1. To view the snapshot management operations, you must provide the `-e` parameter. Not applicable for SAP.

2. You must provide the user name when prompted.

3. 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 listoperations --server <Hostname/FQDN/IP of  
HAPRO server> --app saporacle -u <user> -P <password>
```

Output

ID			Operation	Log ID
Time	User	Name	Status	Result
==			=====	=====
====	====	====	=====	=====
088B2730-8D8F-0FEB-41F0-60597B234724			Register Storage	-
2014-01-02				
07:58:07	root	-	Completed	100%

Deleting the operations

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

Syntax

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


Parameter description

Table 4-10: 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.	saporacle	Yes
Operation ID	--id	-i	This parameter specifies the operation id which is 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.

Sample command(s) and output

Command

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

Output

```
[I73030AE] Operation "088B2730-8D8F-0FEB-41F0-60597B234724" deleted successfully.
```

Listing the log details

This command lists information about the specific operation log.

Syntax

```
hapro admin listlog -h -a saporacle
usage: hapro admin listlog
  { -s | --server    }  Hostname/FQDN/IP of HAPRO server
  { -a | --app       }  Application: 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 4-11: 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.	saporacle	Yes
Log ID	--logid	-i	This parameter specifies the Log Id.	<ul style="list-style-type: none"> • HAPRO Server (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 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 listlog -s <Hostname/FQDN/IP of HAPRO server> -a  
saporacle -u <user> -P <password> -C <count> -l
```

Output

```
Time:      2014-05-28 10:28:10  
Message: Get Log Entries request created  
Level:    info  
-----  
Time:      2014-05-28 10:28:10  
Message: LogLevel:  
Level:    info  
-----  
Time:      2014-05-28 10:28:10  
Message: Log level: 0  
Level:    info  
-----  
Time:      2014-05-28 10:28:10  
Message: Request for operation: [GetLogEntries] validated  
successfully.  
Level:    info  
-----  
Time:      2014-05-28 10:28:10  
Message: Application: [SAPORACLE].  
Level:    info  
-----  
Time:      2014-05-28 10:28:10  
Message: Entity Type is : 0  
Level:    info  
-----  
Time:      2014-05-28 10:28:10  
Message: GetLogEntries workflow called.
```

Level: info

Time: 2014-05-28 10:28:10

Message: Log Level: [0]

Level: info

Time: 2014-05-28 10:28:10

Message: No. of Log Entries: [10]

Level: info

Time: 2014-05-28 10:28:10

Message: Opening LogFile /opt/Hitachi/HAPRO/server/logs//
HAPROserver.log

Level: info

Working with Server commands

This chapter provides the details of registering the supported storage arrays.

This chapter describes the following topic:

- ❑ [Configuring the storage subsystem](#)

Configuring the storage subsystem

On registration, Application Protector maintains a list of storage arrays for snapshot management operations. You can register, change, 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 -h -a saporacle
usage: hapro server registerstoragearray
  { -s | --server          } Hostname/FQDN/IP of HAPRO
server
  { -a | --app            } Application: 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 5-1: 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.	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.	hus: IP Multiple comma-separated values are allowed.	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 5-1: 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 saporacle -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.
```

Modify a storage array

This command modifies the storage array details.

Syntax

```
hapro server modifystoragearray -h -a saporacle
usage: hapro server modifystoragearray
  { -s | --server                } Hostname/FQDN/IP of HAPRO
server
  { -a | --app                    } Application: 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 5-2: 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.	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 5-2: 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 details, 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 saporacle --server
<Hostname/FQDN/IP of HAPRO server> --user <user> --password
<password> --id <Storage array ID> -Z <Storage array admin
password> -N <Storage array admin user>
```

Output

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

Unregistering a storage array

This command unregisters the storage 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: 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 5-3: 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.	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 array

This command lists detailed information about the registered storage arrays.

Syntax

```
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 5-4: 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.	Valid storage ID	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 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 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
```

Working with the utilities

This chapter describes the Application Protector 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.

`HAPRO_dump-<yyyy_mm_dd_HH_mm_ss>.tar`. For example, `HAPRO_dump-2014_05_27_23_59_30.tar.gz`.

Prior to executing `HAPRO_dump` set the `$Oracle_HOME` path. Execute the script file from the `/opt/Hitachi/HAPRO/server/util` directory.

For more details about using `HAPRO_dump`, see *Hitachi Application Protector CLI Guide for SAP*®.

Syntax

```
hapro_dump.sh -h
```

```
./HAPRO_dump.sh <destination>
```

HAPRO dump is generated at <destination>

<destination> defaults to `/opt/Hitachi/HAPRO/server/`

Parameter description

Table 6-1: HAPRO dump parameter description

Parameter	Description
Destination	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 at '/opt/Hitachi/HAPRO/server/'.

Table 6-2: HAPRO dump directory 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, syslog messages, and storagearraycontext metadata.

Sample command(s)

Command

```
./HAPRO_dump.sh /root/dump/
```

Output

HAPRO dump started on Tuesday, May 13, 2014 11:28:31 PM PDT

Using destination directory: /root/dump/

ORACLE_HOME is not set.

\$ORACLE_HOME/sapbackup will not be included in the dump.

Metadata directory: /opt/Hitachi/HAPRO/server//metadata/

Log directory: /opt/Hitachi/HAPRO/server/logs/

Temporary directory: /var/tmp/HAPRO

Client logs directory: /opt/Hitachi/HAPRO/client/logs

Syslog directory: /var/adm

Install log is missing: /var/tmp/HAPRO/hapro.log

Client configuration directory: ///.java/.userPrefs/HAPRO

System Information

=====

User: root

Login: root

Shell: /sbin/sh

Home: /

OS: solaris2.10

Path: /usr/sbin:/usr/bin

Current directory: /opt/Hitachi/HAPRO/server/util

Logged in users: 6

Hostname: calsapdb229

OS release:-

Oracle Solaris 10 1/13 s10x_u11wos_24a X86

Copyright (c) 1983, 2013, Oracle and/or its affiliates. All rights reserved.

Assembled 17 January 2013

System configuration:-

System Configuration: Oracle Corporation i86pc

Memory size: 4088 Megabytes

System Peripherals (Software Nodes):

i86pc

System properties:

name='acpi-status' type=int items=1

value=00000013

name='relative-addressing' type=int items=1

value=00000001

name='MMU_PAGEOFFSET' type=int items=1

value=00000fff

name='MMU_PAGESIZE' type=int items=1

value=00001000

name='PAGESIZE' type=int items=1

value=00001000

<Native instruction set:-

amd64 pentium_pro+mmx pentium_pro pentium+mmx pentium i486
i386 i86

Processor information:-

Status of virtual processor 0 as of: 05/13/2014 23:28:48

on-line since 03/25/2014 06:00:08.

The i386 processor operates at 2400 MHz,

and has an i387 compatible floating point processor.

Status of virtual processor 1 as of: 05/13/2014 23:28:48

on-line since 03/25/2014 06:00:18.

The i386 processor operates at 2400 MHz,
and has an i387 compatible floating point processor.>

<Disk usage:-

Filesystem	size	used	avail	capacity	Mounted on
sapdbos/ROOT/s10x_u11wos_24a	721G	29G	663G	5%	/
/devices	0K	0K	0K	0%	/devices
ctfs	0K	0K	0K	0%	/system/contract
proc	0K	0K	0K	0%	/proc
mnttab	0K	0K	0K	0%	/etc/mnttab
swap	25G	384K	25G	1%	/etc/svc/volatile
objfs	0K	0K	0K	0%	/system/object
sharefs	0K	0K	0K	0%	/etc/dfs/sharetab
/usr/lib/libc/libc_hwcapi.so.1	693G	29G	663G	5%	/lib/libc.so.1
fd	0K	0K	0K	0%	/dev/fd
swap	25G	453M	25G	2%	/tmp
swap	25G	32K	25G	1%	/var/run
sapdbos/export	721G	32K	663G	1%	/export
sapdbos/export/home	721G	2.4M	663G	1%	/export/home
sapdbos	721G	43K	663G	1%	/sapdbos
/vol/dev/dsk/c2t0d0/sol_10_113_x86	2.1G	2.1G	0K	100%	
/cdrom/sol_10_113_x86					
192.168.0.11:/001ORACLE	60G	15G	45G	26%	/oracle

>

<Firewall:-

```
bad packets:          in 0    out 0
  IPv6 packets:      in 0 out 0
  input packets:     blocked 0 passed 0 nomatch 0 counted
0 short 0
  output packets:    blocked 0 passed 0 nomatch 0 counted
0 short 0
  input packets logged: blocked 0 passed 0
```



```

output packets logged:  blocked 0 passed 0
  packets logged:        input 0 output 0
  log failures:         input 0 output 0
fragment state(in):    kept 0  lost 0  not fragmented 0
fragment state(out):   kept 0  lost 0  not fragmented 0
packet state(in):      kept 0  lost 0
packet state(out):     kept 0  lost 0
ICMP replies:         0      TCP RSTs sent: 0
Invalid source(in):   0
Result cache hits(in): 0      (out): 0
IN Pullups succeeded: 0      failed: 0
OUT Pullups succeeded: 0      failed: 0
Fastroute successes:  0      failures: 0
TCP cksum fails(in):  0      (out): 0
IPF Ticks:            0
Packet log flags set: (0)
                        none

```

IP configuration:-

```

lo0:
flags=2001000849<UP,LOOPBACK,RUNNING,MULTICAST,IPv4,VIRTUAL>
mtu
8232 index 1
      inet 127.0.0.1 netmask ff000000
igb0: flags=1000843<UP,BROADCAST,RUNNING,MULTICAST,IPv4> mtu
1500 index 2
      inet 172.17.11.229 netmask ffffffff00 broadcast
172.17.11.255
      ether 1c:6f:65:90:9b:10
igb1: flags=1000843<UP,BROADCAST,RUNNING,MULTICAST,IPv4> mtu
1500 index 3
      inet 192.168.0.229 netmask ffffffff00 broadcast
192.168.0.255
      ether 1c:6f:65:90:9b:11

```

System name:-

SunOS calsapdb229 5.10 Generic_147148-26 i86pc i386
i86pcSystem = SunOS

Node = calsapdb229

Release = 5.10

KernelID = Generic_147148-26

Machine = i86pc

BusType = <unknown>

Serial = <unknown>

Users = <unknown>

OEM# = 0

Origin# = 1

NumCPU = 8

Crontab entries:-

```
#ident "@(#)root 1.21 04/03/23 SMI"
```

```
#
```

```
# The root crontab should be used to perform accounting data  
collection.
```

```
#
```

```
#
```

```
10 3 * * * /usr/sbin/logadm
```

```
15 3 * * 0 /usr/lib/fs/nfs/nfsfind
```

```
30 3 * * * [ -x /usr/lib/gss/gsscred_clean ] && /usr/lib/gss/  
gsscred_clean
```

```
#
```

```
# The rtc command is run to adjust the real time clock if and  
when
```

```
# daylight savings time changes.
```

```
#
```

```
1 2 * * * [ -x /usr/sbin/rtc ] && /usr/sbin/rtc -c > /dev/null  
2>&1
```

```
#10 3 * * * /usr/lib/krb5/kprop_script ___slave_kdcs___
```

Mounts:-

sapdbos/ROOT/s10x_u11wos_24a on / type zfs

read/write/setuid/devices/rstchown/dev=2d50002 on Wed Dec 31
16:00:00 1969

/devices on /devices type devfs

OpenSSL:-

PKGINST: SUNWopensslr
NAME: OpenSSL (Root)
CATEGORY: system
ARCH: i386
VERSION: 11.10.0,REV=2005.01.21.16.34
BASEDIR: /
VENDOR: Sun Microsystems, Inc.
DESC: OpenSSL (Root)
PSTAMP: on10ptchfeatx20100805214408
INSTDATE: Mar 21 2014 13:31
HOTLINE: Please contact your local service provider
STATUS: completely installed
FILES: 6 installed pathnames
2 shared pathnames
5 directories
16 blocks used (approx)

ORATAB:-

#

This file is used by ORACLE utilities. It is created by
root.sh

and updated by either Database Configuration Assistant while
creating

```

# a database or ASM Configuration Assistant while creating ASM
instance.

Oracle version:-

./HAPRO_dump.sh: line 220: /bin/sqlplus: No such file or
directory

Java version:-

java version "1.6.0_37"

Java(TM) SE Runtime Environment (build 1.6.0_37-b06)

Java HotSpot(TM) Server VM (build 20.12-b01, mixed mode)

log4j:-

    PKGINST:   CSWlog4j
        NAME:   log4j - Apache log4j Logging Services
CATEGORY:   application
        ARCH:   all
    VERSION:   1.2.15,REV=2009.03.25
    BASEDIR:   />

<HAPRO APF:-

    PKGINST:   HAPROapf
        NAME:   Hitachi Application Protector APF
CATEGORY:   application
..>

HAPRO Client:-

    PKGINST:   HAPROclient
        NAME:   Hitachi Application Protector Client
CATEGORY:   application
        ARCH:   i386
    VERSION:   1.2.0.13
    BASEDIR:   /
    PSTAMP:   unknown20140506140754

```

```
INSTDATE:  May 06 2014 03:41
STATUS:    completely installed
FILES:     124 installed pathnames
           14 directories
           99 executables
           18085 blocks used (approx)
```

Checksums:-

```
2192424481      717144  /opt/Hitachi/HAPRO/server/bin/backint
6426726 865480  /opt/Hitachi/HAPRO/server/bin/HAPRO_server
3177698424      48756   /opt/Hitachi/HAPRO/server/bin/
HAPRO_wfm
1529080702      1669    /opt/Hitachi/HAPRO/server/bin/
haproserver
2751858922      715096  /opt/Hitachi/HAPRO/server/bin/
org_backint
3406179025      220276  /opt/Hitachi/HAPRO/server/lib/
libapf_hnas_plugin.so
3921643589      843288  /opt/Hitachi/HAPRO/server/lib/
libapf.so
4273304548      3178644 /opt/Hitachi/HAPRO/server/lib/
libapfhelper.so
```

HAPRO Server configuration:-

```
HaproOperationReferenceCount=0
haprologdir=/opt/Hitachi/HAPRO/server/logs/
haprologlevel=8
haprometadir=/opt/Hitachi/HAPRO/server/
haprosnapshotretentioncount=1024
mounttoolpath=
```

HAPRO Client configuration:-

```
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<!DOCTYPE map SYSTEM "http://java.sun.com/dtd/
preferences.dtd">
<map MAP_XML_VERSION="1.0"/>
```

HAPRO dump generated at /root/dump/HAPRO_dump-2014_05_13-23_28_31.tar.gz

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.

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. Schedules are not applicable for SAP applications.

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/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.

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 6-3: HAPRO sync parameter description

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

Sample command(s)

Command

```
./HAPRO_sync
```

Output

```
[I730053e] Starting HAPRO_sync activity.  
[I7300767] Checking Snapshot Entity ref count.  
[I7300769] Verify and fix for snapshot entity reference count  
is completed.  
[I730053f] Finished HAPRO_sync activity.
```

Command

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

Output

```
[I730053e] Starting HAPRO_sync activity.  
[I730076a] Checking consistency of system schedules.  
[I7300991] Started Schedule Consistency fix:System Fix.  
[I730076c] All schedules in system are in consistent state.  
[I730076d] Checking and fixing consistency of system  
schedules is finished.  
[I7300767] Checking Snapshot Entity ref count.  
[I7300769] Verify and fix for snapshot entity reference count  
is completed.  
[I730053f] Finished HAPRO_sync activity.
```

Command

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

Output

```
[I730053e] Starting HAPRO_sync activity.  
[I7300760] Checking consistency of Snapshots.  
[I7300762] Verify and fix for snapshots is completed.  
[I7300763] Checking Import and Mount Status of Snapshots.  
[I7300782] Import/Mount status of snapshots fixed  
successfully.
```

[I730076e] Checking consistency of cache schedules.
[I7300993] Started Schedule Consistency fix:Cache Fix.
[I7300754] No Schedules found.
[I730076f] All cache schedules are in consistent state.
[I7300770] Checking and fixing consistency of cache schedules is finished.
[I7300771] Checking consistency of HAPRO operations.
[I730077d] Do you want to fix operation record: 5DEDC91B-8327-EC90-6275-24E3280B3F95 ?[y=yes/n-no/a=yes to all]: a

[I7300773] Checking and fixing of consistency of HAPRO operations is finished.
[I7300767] Checking Snapshot Entity ref count.
[I7300769] Verify and fix for snapshot entity reference count is completed.
[I730053f] Finished HAPRO_sync activity.



A

Appendix

This appendix provides the following topics.

- ❑ [Application types](#)
- ❑ [Snapshot limit for supported storage](#)
- ❑ [Listing Application Protector logs](#)

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
HUS	HTI	1024
	ShadowImage	7
VSP	ShadowImage	3
	HTI	1024
HNAS	TreeClone	1024

Listing 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 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 is 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>



Glossary

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

A

Array

A set of hard disks grouped logically together to function as one contiguous storage space.

Application Protector

Hitachi Application Protector

ASM

Automatic Storage Management

B

BRBACKUP

SAP® BR*Tools uses BRBACKUP to create database backups.

BRRECOVER

SAP® BR*Tools uses BRRECOVER to recover the database from the snapshot.

C

Cache

A temporary, high-speed storage mechanism. It is a reserved section of main memory or an independent high-speed

#	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
---	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------

storage device. Two types of caching are found in computers: memory caching and disk caching. Memory caches are built into the architecture of microprocessors and often computers have external cache memory. Disk caching works like memory caching; however, it uses slower, conventional main memory that on some devices is called a memory buffer.

CCI

Command control interface

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.

F

FQDN

Fully qualified domain name.

G

Gbps

Gigabit per second.

H

HAPRO

Hitachi Application Protector

HDD

Hard disk drive.

HNAS

Hitachi Network Attached Storage.

HUS

Hitachi Unified Storage. Currently, Application Protector supports the DF 850 array.

#	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
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

I

I/O

Input/output.

IP address

An identifier for a computer or device on a TCP/IP network. Networks using the TCP/IP protocol route messages based on the IP address of the destination. The format of an IP address is a 32-bit numeric address written as four numbers separated by periods. Each number can be zero to 255 (for example, 192.168.0.200).

Inquire

The Application Protector `BACKINT` adapter uses this command to list the snapshots.

L

LAN

Local Area Network, a computer network that spans a relatively small area, such as a single building or group of buildings.

LVM

Logical volume manager.

LU

Logical unit.

LUN

Logical unit number.

O

Oracle Database

In this document, refer Oracle® Database in SAP® environment as Oracle Database.

P

PIT

Point-in-Time.

#	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
---	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------	-------------------

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

RAID

Redundant Array of Independent Disks, a disk array in which part of the physical storage capacity is used to store redundant information about user data stored on the remainder of the storage capacity. The redundant information enables regeneration of user data in the event that one of the array's member disks or the access path to it fails. SNIA.

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.

RHEL

Red Hat® Enterprise Linux®

S

ShadowImage

ShadowImage (SI) 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.

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 backedup while creating a snapshot.

#	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

Target

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

V

VSP

Virtual Storage Platform

#	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
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

#	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-6

Index

A

activate license [418](#)
activation ID [414](#)
Application Protector
 config client [42](#)
 config server [42](#)
Application Protector client log [A2](#)
Automatic Storage Management [11](#)

B

BRBACKUP [13, 32](#)
 Backup device type [33](#)
 Backup mode [33](#)
 Backup type [33](#)
 Parameter file [33](#)
 Profile file [33](#)
BRRECOVER [13, 329](#)
 Backup device type [330](#)
 Backup name [330](#)
 Input param file for
 BACKINT [330](#)
 PIT [330](#)
 Recovery type [330](#)
BRRESTORE [13, 329](#)
 Backup device type [332](#)
 Backup name [332](#)
 Input param file for
 BACKINT [332](#)
 Restore [332](#)
brrestore [329](#)

C

capability license request [414](#)
client-server architecture [11](#)
complete recovery [329](#)
config storage [52](#)
create snapshot [32](#)
Customer Support
 Contact information [2xii](#)

D

delete operations [426](#)
delete snapshot [321](#)

G

generate license [415](#)

H

HAPRO dump [62](#)
HAPRO sync [613](#)

I

intended audience [2x](#)

L

license response file [414](#)
list config [47](#)
list license [420](#)
list operations [423](#)
long listing [314](#)

M

mount snapshot [324](#)

N

note symbol [2xi](#)
notes symbol [2xi](#)

O

overview [12](#)

P

parameters
 Activation ID [416](#)
 Address [416](#)
 Application [315](#)
 ASM diskgroup name prefix/
 Mount point [325](#)

- Company name [416](#)
- Config param [43](#)
- Config val [43](#)
- Count [424](#)
- Country [416](#)
- Database name [315](#)
- Email address [416](#)
- Enable long listing [315](#)
- First name [415](#)
- Force [322](#)
- Hostname [315](#)
- Last name [416](#)
- Log ID [429](#)
- Log Level [429](#)
- Login password [315](#)
- Login user [315](#)
- Operation ID [427](#)
- RAIDCOM instance number [53](#)
- Serial number [53](#)
- Set ID [315](#)
- Site [416](#)
- Snapshot name [315](#)
- Storage array admin password [53](#)
- Storage array admin user [53](#)
- Storage array IP(s) [53](#)
- Storage array type [53](#)
- Storage pool name/number [54](#)
- Sync [322](#)
- PIT recovery [329](#)
- point-in-time [13](#)
- profile file [32](#)

R

- recover snapshot [329](#)
- related documents [2x](#)
- reset config [45](#)

S

- sample help [22](#)
- set config [42](#)
- shadow image [12](#)
- snapshot retention count [12](#)
- storage array
 - list [510](#)
 - register [52](#)
 - unregister [58](#)
- supported commands [25](#)

T

- Thin Image [12](#)

U

- unmount snapshot [327](#)

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-91HAP024-00