

Ahsay Online Backup Manager v9

Oracle Database Backup and Restore Guide for Linux (GUI)

Ahsay Systems Corporation Limited

27 January 2023

Copyright Notice

© 2023 Ahsay Systems Corporation Limited. All rights reserved.

The use and copying of this product is subject to a license agreement. Any other use is prohibited. No part of this publication may be reproduced, transmitted, transcribed, stored in a retrieval system or translated into any language in any form by any means without prior written consent of Ahsay Systems Corporation Limited. Information in this manual is subject to change without notice and does not represent a commitment on the part of the vendor, Ahsay Systems Corporation Limited does not warrant that this document is error free. If you find any errors in this document, please report to Ahsay Systems Corporation Limited in writing.

This product includes software developed by the Apache Software Foundation (<https://www.apache.org/>).

Trademarks

Ahsay, Ahsay Cloud Backup Suite, Ahsay Online Backup Suite, Ahsay Offsite Backup Server, Ahsay Online Backup Manager, Ahsay A-Click Backup, Ahsay Replication Server, Ahsay BackupBox Firmware, Ahsay Universal Backup System and Ahsay NAS Client Utility, Ahsay Mobile are trademarks of Ahsay Systems Corporation Limited.

Amazon S3 is a registered trademark of Amazon Web Services, Inc., or its affiliates.

Apple and Mac OS X, macOS, and iOS are registered trademarks of Apple Computer, Inc.

Dropbox is a registered trademark of Dropbox Inc.

Google Cloud Storage, Google Drive, Google Authenticator, and Android are registered trademarks of Google Inc.

Wasabi Hot Cloud Storage is a registered trademark of Wasabi Technologies Inc.

Backblaze B2 Cloud Storage is a registered trademark of Backblaze Inc.

MariaDB is a registered trademark of MariaDB Corporation AB.

Lotus, Domino, and Notes are registered trademark of IBM Corporation.

Microsoft Windows, Microsoft Exchange Server, Microsoft SQL Server, Microsoft Hyper-V, Microsoft Azure, OneDrive, OneDrive for Business, Microsoft Authenticator, and Microsoft Office 365 are registered trademarks of Microsoft Corporation.

Oracle, Oracle Database, Java and MySQL are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

OpenJDK is a registered trademark of Oracle America, Inc.

Rackspace and OpenStack are registered trademarks of Rackspace US, Inc.

Red Hat, Red Hat Enterprise Linux, the Shadowman logo and JBoss are registered trademarks of Red Hat, Inc. www.redhat.com in the U.S. and other countries.

Linux is a registered trademark of Linus Torvalds in the U.S. and other countries.

Ubuntu is a registered trademark of Canonical Ltd.

Debian is a registered trademark of Software in the Public Interest, Inc.

Rocky is a registered trademark of Rocky Brands.

ShadowProtect is a registered trademark of StorageCraft Technology Corporation.

VMware ESXi, vCenter, and vSAN are registered trademarks of VMware, Inc.

All other product names are registered trademarks of their respective owners.

Disclaimer

Ahsay Systems Corporation Limited will not have or accept any liability, obligation or responsibility whatsoever for any loss, destruction or damage (including without limitation consequential loss, destruction or damage) however arising from or in respect of any use or misuse of reliance on this document. By reading and following the instructions in this document, you agree to accept unconditionally the terms of this Disclaimer and as they may be revised and/or amended from time to time by Ahsay Systems Corporation Limited without prior notice to you.

Revision History

Date	Descriptions	Version
7 March 2022	▪ Ch. 5.2 – added Migrate Data	9.1.0.0
27 January 2023	▪ Ch. 6 – updated restore instructions	9.5.2.0

Table of Contents

1	Overview.....	1
1.1	What is this software?	1
1.2	System Architecture	1
1.3	Oracle Database Backup Mode.....	2
2	Requirements.....	3
2.1	Hardware Requirement	3
2.2	Software Requirement.....	3
2.3	AhsayOBM Installation	3
2.4	AhsayOBM Add-On Module Configuration	3
2.5	Backup Quota Requirement	3
2.6	Java Heap Size	4
2.7	Temporary Directory Folder.....	4
2.8	Linux Requirements	5
2.8.1	Supported OS Version.....	5
2.8.2	GUI Desktop Environment	5
2.9	Oracle Backup Requirements.....	5
2.9.1	Oracle Tools	6
2.9.2	Oracle Internal Process Checking	7
2.9.3	Supported Oracle Database Server Version	9
2.9.4	System Identifier (SID)	10
2.9.5	Oracle_Home Path.....	10
2.9.6	Database Status.....	11
2.9.7	Archived Log Mode.....	12
2.9.8	Java Installation.....	12
2.9.9	JAVASYSPRIV Permission for Oracle System Account	13
2.9.10	SYSDBA Privileges for Oracle System Account	14
2.9.11	TNS Listener Service.....	14
2.9.12	Localhost is Resolvable	15
2.9.13	Oracle Port Number.....	16
2.10	Limitations	17
2.11	Best Practices and Recommendations	18
3	Creating an Oracle Database Backup Set.....	19
4	Overview on the Backup Process	29
4.1	Database Backup	29
4.2	Archived Log Backup.....	30

5	Running Backup Jobs	31
5.1	Login to AhsayOBM	31
5.2	Start a Manual Backup	31
5.3	Configure Backup Schedule for Automated Backup	34
6	Restoring Backup for Oracle Database Server	39
6.1	Login to AhsayOBM	41
6.2	Automatic Oracle Database Restore	41
6.3	Manual Oracle Database Restore.....	48
7	Contacting Ahsay	53
7.1	Technical Assistance.....	53
7.2	Documentation	53
Appendix.....		54
Appendix A	Example of Restore Log with Error Due to Enforced Password Complexity Requirements	54

1 Overview

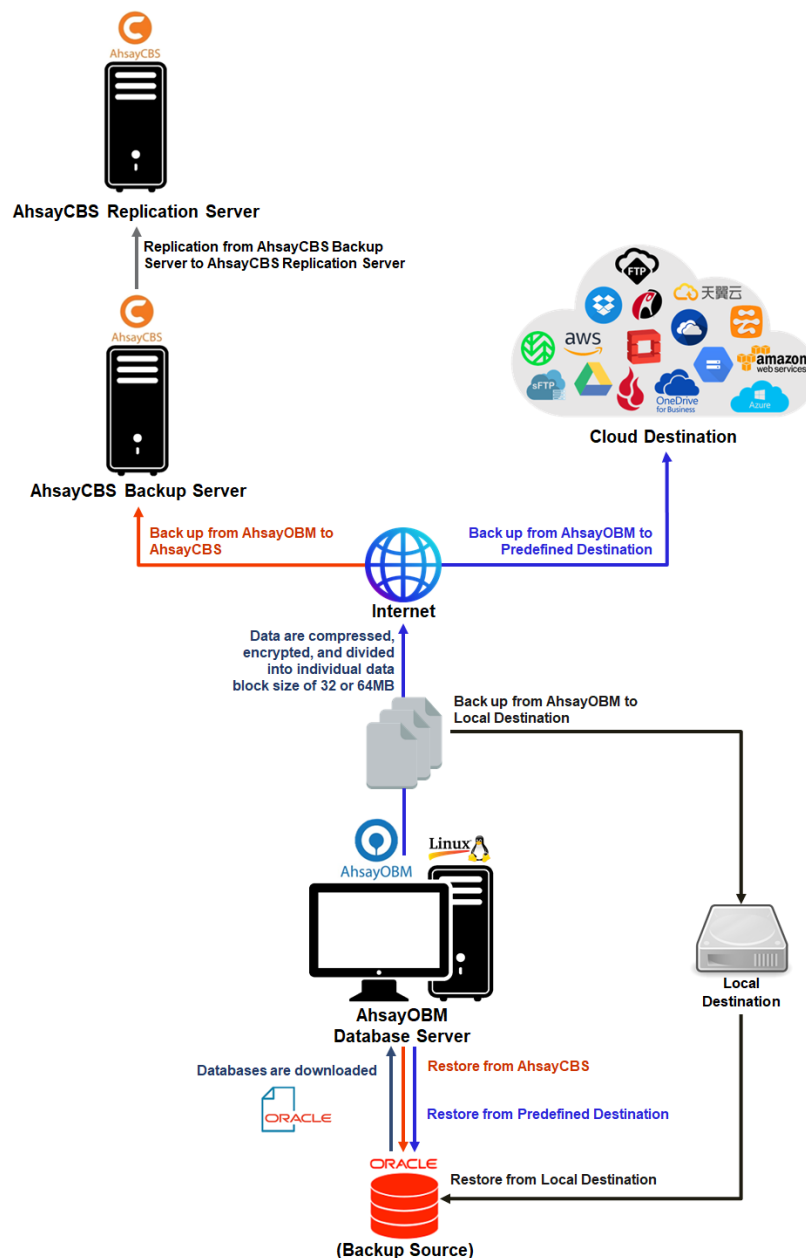
1.1 What is this software?

Ahsay brings you specialized client backup software, namely AhsayOBM, to provide a comprehensive backup solution for your Oracle Database Server. The Oracle Database Server module of AhsayOBM provides you with a set of tools to protect your Oracle Server with both full database and archived log backups while your database is online.

1.2 System Architecture

Below is the system architecture diagram illustrating the major elements involved in the backup process among the Oracle Database Server, AhsayOBM and AhsayCBS.

In this user guide, we will focus on the software installation, as well as the end-to-end backup and restore process using AhsayOBM as a client backup software on using Linux GUI mode.

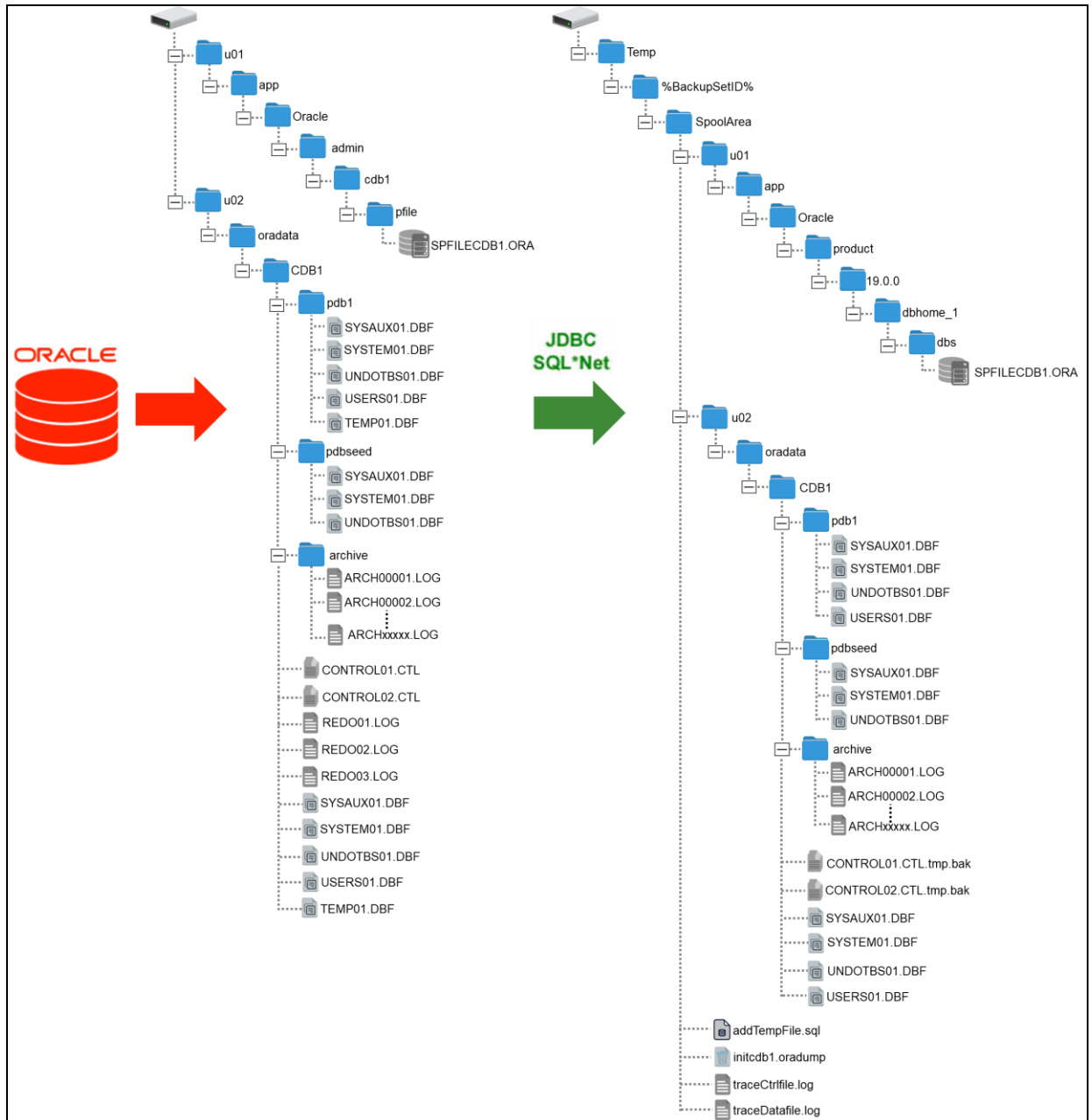


1.3 Oracle Database Backup Mode

Ahsay Oracle database and archived log backups use a spooling method to make a consistent snapshot of the database for backup.

For each database backup job, AhsayOBM will trigger Oracle to spool or make a copy of the following files to the temporary folder:

- Database files (.DBF)
- Archived Log files
- Control files (.CTL)
- Init.ora file



2 Requirements

2.1 Hardware Requirement

Refer to the following article for the list of hardware requirements for AhsayOBM:

[FAQ: Ahsay Hardware Requirement List \(HRL\) for version 9.1 or above](#)

2.2 Software Requirement

Refer to the following article for the list of supported operating systems and application versions:

[FAQ: Ahsay Software Compatibility List \(SCL\) for version 9.1 or above](#)

2.3 AhsayOBM Installation

Make sure the latest version of AhsayOBM is installed directly on the machine where the Oracle database server is hosted.

NOTE

Backup and restore of Oracle database(s) running on a remote machine is not supported.

2.4 AhsayOBM Add-On Module Configuration

Make sure the Oracle Database Server add-on module is enabled on your AhsayOBM user account.

Please contact your backup service provider for more details.

The screenshot shows the 'Backup Client Settings' tab in the AhsayOBM interface. Under the 'Add-on Modules' section, the 'Oracle Database Server' module is selected with a checked checkbox and is highlighted by a red rectangular box. Other modules listed include Microsoft Exchange Server, MySQL Database Server, Lotus Domino, Windows System Backup, VMware, Microsoft Exchange Mailbox, NAS - QNAP, Mobile (max. 10), Volume Shadow Copy, OpenDirect / Granular Restore, MariaDB Database Server, Microsoft SQL Server, Lotus Notes, Windows System State Backup, Hyper-V, ShadowProtect System Backup, NAS - Synology, Continuous Data Protection, In-File DeltaOnly apply to v8 or before, Office 365 Backup, and Deduplication.

2.5 Backup Quota Requirement

Make sure that your AhsayOBM user account has enough storage quota assigned to accommodate the storage of Oracle database server backup set and retention policy.

2.6 Java Heap Size

The default maximum Java heap size setting on AhsayOBM on Linux is 768MB. For Oracle database backup, it is highly recommended to increase the Java heap size setting to be at least 4096MB to improve backup and restore performance. The actual heap size is dependent on the amount of free memory available on your Oracle server.

For details on how to modify the Java heap size setting of AhsayOBM/AhsayACB, refer to the following article:

[FAQ: How to modify the Java heap size setting of AhsayOBM / AhsayACB?](#)

2.7 Temporary Directory Folder

The Temporary directory folder is used by AhsayOBM during a backup job as the storage of spooled Oracle database(s) and archived log files.

It is strongly recommended that the temporary directory folder is located on a local drive with enough free disk space to be used by the spooled databases and archived log files. The temporary folder should **not** be located on the Oracle Home drive.

NOTE

The calculation of disk space required on the drive where the temporary folder is located is as follows:

$(\text{Total Database Size} * \text{Delta Ratio}) * \text{number of backup destinations} = \text{Minimum Free Space Required}$

Example:

If the default Delta ratio is 50% for in-file delta, and if the total Oracle database size is 1TB and there is only one backup destination, the minimum free space needed on the drive where the temporary directory folder is located = 1.5TB:

1TB = Total Oracle database size

500GB = Total maximum size of incremental or differential delta files generated

To obtain the size of the data files on the Oracle database instance, use the Oracle RMAN REPORT SCHEMA feature and sum up the total "List of Permanent Datafiles" by running the following command.

NOTE: The values shown are just examples and might be different on your Oracle instance.

```
$ export ORACLE_SID=cdb1
$ rman target /

Recovery Manager: Release 19.0.0.0.0 - Production on Fri Nov 6 11:04:21 2020
Version 19.3.0.0.0

Copyright (c) 1982, 2019, Oracle and/or its affiliates. All rights reserved.

connected to target database: CDB1 (DBID=981637913)

RMAN> report schema;

using target database control file instead of recovery catalog
Report of database schema for database with db_unique_name CDB1

List of Permanent Datafiles
```

=====				
<i>File</i>	<i>Size (MB)</i>	<i>Tablespace</i>	<i>RB segs</i>	<i>Datafile Name</i>

1	920	SYSTEM	YES	/u02/oradata/CDB1/system01.dbf
3	660	SYS_AUX	NO	/u02/oradata/CDB1/sysaux01.dbf
4	335	UNDOTBS1	YES	/u02/oradata/CDB1/undotbs01.dbf
5	270	PDB\$SEED:SYSTEM	NO	/u02/oradata/CDB1/pdbseed/system01.dbf
6	330	PDB\$SEED:S_AUX	NO	/u02/oradata/CDB1/pdbseed/sysaux01.dbf
7	5	USERS	NO	/u02/oradata/CDB1/users01.dbf
8	100	PDB\$SEED:UNDOTBS1	NO	/u02/oradata/CDB1/pdbseed/undotbs01.dbf
9	270	PDB1:SYSTEM	YES	/u02/oradata/CDB1/pdb1/system01.dbf
10	340	PDB1:S_AUX	NO	/u02/oradata/CDB1/pdb1/sysaux01.dbf
11	100	PDB1:UNDOTBS1	YES	/u02/oradata/CDB1/pdb1/undotbs01.dbf
12	5	PDB1:USERS	NO	/u02/oradata/CDB1/pdb1/users01.dbf
List of Temporary Files				
=====				
<i>File</i>	<i>Size (MB)</i>	<i>Tablespace</i>	<i>Maxsize (MB)</i>	<i>Tempfile Name</i>

1	132	TEMP	32767	/u02/oradata/CDB1/temp01.dbf
2	36	PDB\$SEED:TEMP	32767	/u02/oradata/CDB1/pdbseed/temp012019-05-10_17-58-06-785-PM.dbf
3	36	PDB1:TEMP	32767	/u02/oradata/CDB1/pdb1/temp01.dbf

2.8 Linux Requirements

Ensure that the following Linux requirements and conditions are met.

2.8.1 Supported OS Version

Oracle 19c

The backup of Oracle 19c is supported on the following OS versions:

- Red Hat Enterprise Linux 7 and 8 (or above)

Oracle 18c

The backup of Oracle 18c is supported on the following OS versions:

- Red Hat Enterprise Linux 6.4 and 7 (or above)

2.8.2 GUI Desktop Environment

The Linux machine must be installed with a GUI desktop environment (i.e., GNOME, KDE, Cinnamon etc.).

2.9 Oracle Backup Requirements

Ensure that the following requirements and conditions on the Oracle database server are met.

NOTE: Please consult your Oracle database administrator before making any changes.

2.9.1 Oracle Tools

Although the following tools are usually installed by default on all Oracle database installations, ensure that the following tools are installed on the Oracle database server, and they are functioning correctly.

- **RMAN (Recovery manager)** - is required by AhsayOBM for both full database and archive log backups.

To verify if RMAN is installed on the Oracle database server and is working properly, run the following command.

Example of RMAN running in Oracle 19c

```
$ export ORACLE_SID=cdb1
$ rman target /

Recovery Manager: Release 19.0.0.0.0 - Production on Fri
Nov 6 11:04:21 2020

Version 19.3.0.0.0

Copyright (c) 1982, 2019, Oracle and/or its affiliates.
All rights reserved.

connected to target database: CDB1 (DBID=981637913)

RMAN>
```

- **SQL*Plus** – is required by AhsayOBM during Oracle Backup Set creation, backup and restore.

To verify if SQL*Plus is installed on the Oracle database server and is working properly, run the following command `sqlplus / as sysdba`.

Example of SQL*Plus running in Oracle 19c

```
$ sqlplus / as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Thu Nov 5
11:32:52 2020

Version 19.3.0.0.0

Copyright (c) 1982, 2019, Oracle. All rights reserved.

Connected to:

Oracle Database 19c Enterprise Edition Release 19.0.0.0.0
- Production

Version 19.3.0.0.0

SQL>
```

2.9.2 Oracle Internal Process Checking

For the Oracle instance to run smoothly, ensure that the following internal processes are working well:

- **PMON** (Process Monitor)
- **PSP0** (Process Spawner Process)
- **MMAN** (Memory Manager Process)
- **DBW0** (Database Writer)
- **ARC0** (Archive Process)
- **LGWR** (Log Writer)
- **CKPT** (Checkpoint process)
- **SMON** (System Monitor)
- **RECO** (Distributed Recovery Background Process)

To check this, open the Terminal application.

Run the SQLPlus to connect to the Oracle database server. Once connected, use the following SQL query to verify if the internal processes are running.

```
$ sqlplus / as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Thu Nov 5 11:32:52
2020

Version 19.3.0.0.0

Copyright (c) 1982, 2019, Oracle. All rights reserved.

Connected to:

Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Production

Version 19.3.0.0.0

SQL> select name, description from v$bgprocess where PADDR <>
'00';

NAME      DESCRIPTION
-----
PMON      process cleanup
CLMN      process cleanup
PSP0      process spawner 0
VKTM      Virtual Keeper of Time process
GEN0      generic0
MMAN      Memory Manager
M004      MMON slave class 1
GEN1      generic1
SCMN
DIAG      diagnosability process
OFSD      Oracle File Server BG

NAME      DESCRIPTION
```

SCMN	
DBRM	DataBase Resource Manager
VKRM	Virtual sKeduler for Resource Manager
SVCB	services background monitor
PMAN	process manager
DIA0	diagnosibility process 0
DBW0	db writer process 0
LGWR	Redo etc.
CKPT	checkpoint
LG00	Log Writer Slave
SMON	System Monitor Process
NAME	DESCRIPTION

LG01	Log Writer Slave
SMCO	Space Manager Process
RECO	distributed recovery
W000	space management slave pool
LREG	Listener Registration
W001	space management slave pool
PXMN	PX Monitor
FENC	IOServer fence monitor
MMNL	Manageability Monitor Process 2
MMON	Manageability Monitor Process
D000	Dispatchers
NAME	DESCRIPTION

S000	Shared servers
TMON	Transport Monitor
M000	MMON slave class 1
M002	MMON slave class 1
TT00	Redo Transport
ARC0	Archival Process 0
TT01	Redo Transport
ARC1	Archival Process 1
ARC2	Archival Process 2
ARC3	Archival Process 3
TT02	Redo Transport
NAME	DESCRIPTION

AQPC	AQ Process Coord
W002	space management slave pool
CJQ0	Job Queue Coordinator
P000	Parallel query slave
P001	Parallel query slave
P002	Parallel query slave
P003	Parallel query slave
P004	Parallel query slave
P005	Parallel query slave
P006	Parallel query slave

```
P007 Parallel query slave

NAME DESCRIPTION
-----
W003 space management slave pool
M001 MMON slave class 1
W004 space management slave pool
Q002 QMON MS
W005 space management slave pool
W006 space management slave pool
W007 space management slave pool
Q004 QMON MS
M005 MMON slave class 1
Q005 QMON MS

65 rows selected.

SQL>
```

2.9.3 Supported Oracle Database Server Version

AhsayOBM supports the following version of Oracle database server:

- **Oracle 19c**
- **Oracle 18c**

To verify if the Oracle database server version is supported by AhsayOBM, use the following SQL query.

Oracle 19c

```
$ sqlplus / as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Thu Nov 5
11:32:52 2020

Version 19.3.0.0.0

Copyright (c) 1982, 2019, Oracle. All rights reserved.

Connected to:

Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Production

Version 19.3.0.0.0

SQL>
```

Oracle 18c

```
$ sqlplus / as sysdba

SQL*Plus: Release 18.0.0.0.0 - Production on Mon Jan 4
11:06:36 2021

Version 18.3.0.0.0
```

```

Copyright (c) 1982, 2018, Oracle. All rights reserved.

Connected to:

Oracle Database 18c Enterprise Edition Release 18.0.0.0.0 -
Production

Version 18.3.0.0.0

SQL>

```

2.9.4 System Identifier (SID)

Make sure the System Identifier (SID) is correct by using the following SQL query.

```

SQL> select instance from v$instance;

INSTANCE
-----
-
cdb1

SQL>

```

NOTE

The instance shown is just an example. The SID may be different on your Oracle instance.

Another way to verify the SID is by checking the **init.ora** file. Go to the **/u01/app/oracle/admin/cdb1/pfile** directory and open the **init.ora** file using a text editor (e.g., vi).

```

#####
# Database Identification
#####
db_name="cdb1"

```

2.9.5 Oracle_Home Path

Oracle 19c

The Oracle_Home path can be obtained by using the following SQL query. The Oracle_Home path for Oracle 19c is **"/u01/app/oracle/product/19.0.0/dbhome_1"**.

```

SQL> SELECT file_spec FROM DBA_LIBRARIES WHERE library_name =
      'DBMS_SUMADV_LIB';

FILE_SPEC
-----
/u01/app/oracle/product/19.0.0/dbhome_1/lib/libqsmashr.so

SQL>

```

NOTE

The directory path shown is just an example. The Oracle_Home path may be different on your Oracle instance.

Another way to verify the Oracle_Home path is by checking the **init.ora** file. Go to the **/u01/app/oracle/admin/cdb1/pfile** directory and open the **init.ora** file using a text editor (e.g., vi).

```
#####
# File Configuration
#####
control_files=("/u01/app/oracle/oradata/CDB1/control01.ctl", "/u01/app/oracle
oradata/cdb1/control02.ctl")
#####
```

Oracle 18c

The Oracle_Home path can be obtained by using the following SQL query. The Oracle_Home path for Oracle 18c is **"/u01/app/oracle/product/18.0.0/dbhome_1"**.

```
SQL> SELECT file_spec FROM DBA_LIBRARIES WHERE library_name =
'DBMS_SUMADV_LIB';

FILE_SPEC
-----
/u01/app/oracle/product/18.0.0/dbhome_1/lib/libqsmashr.so

SQL>
```

NOTE

The directory path shown is just an example. The Oracle_Home path may be different on your Oracle instance.

Another way to verify the Oracle_Home path is by checking the **init.ora** file. Go to the **/u01/app/oracle/admin/cdb1/pfile** directory and open the **init.ora** file using a text editor (e.g., vi).

WARNING

The value of the Oracle_Home path in init.ora file needs to match the value obtained from the SQL query. If the value does not match, please contact the Oracle database administrator for further assistance.

2.9.6 Database Status

Ensure that the status of Oracle instance is "Open". To check, use the following query.

```
SQL> select instance_name, status from v$instance;

INSTANCE_NAME      STATUS
-----
-
cdb1               OPEN

SQL>
```

2.9.7 Archived Log Mode

Ensure that the database instance is in Archived Log mode. To check, use the following command.

```
SQL> archive log list;
```

<i>Database log mode</i>	<i>Archive Mode</i>
Automatic archival	Enabled
Archive destination	/u01/app/oracle/product/19.0.0/dbhome_1/dbs/arch
Oldest online log sequence	42
Next log sequence to archive	44
Current log sequence	44

```
SQL>
```

NOTE: The values shown are just examples and might be different on your Oracle instance.

NOTE

The values shown are just examples and might be different on your Oracle instance.

2.9.8 Java Installation

Java must be installed on the Oracle Database. To check if Java is installed, use the following SQL query. The status of the **JServer JAVA Virtual Machine** and **Oracle Database Java Packages** should be "VALID".

```
SQL> select comp_name, status from dba_registry;
```

<i>COMP_NAME</i>	<i>STATUS</i>
-----	-----
Oracle Database Catalog Views	VALID
Oracle Database Packages and Types	VALID
Oracle Real Application Clusters	OPTION OFF
<i>COMP_NAME</i>	<i>STATUS</i>
-----	-----
JServer JAVA Virtual Machine	VALID
Oracle XDK	VALID
Oracle Database Java Packages	VALID
<i>COMP_NAME</i>	<i>STATUS</i>
-----	-----
OLAP Analytic Workspace	VALID

```

Oracle XML Database                                VALID

Oracle Workspace Manager                          VALID

COMP_NAME                                         STATUS
-----
Oracle Text                                       VALID

Oracle Multimedia                                VALID

Spatial                                           VALID

COMP_NAME                                         STATUS
-----

Oracle OLAP API                                  VALID

Oracle Label Security                            VALID

Oracle Database Vault                            VALID

15 rows selected.

SQL>

```

2.9.9 JAVASYSPRIV Permission for Oracle System Account

The Oracle **system** account is used by AhsayOBM to connect to the Oracle database server to authenticate the backup and restore process. The following permission must be assigned to the system account. Use the following SQL query to assign.

```

SQL> select * from DBA_ROLE_PRIVS where
upper(grantee)='SYSTEM';

GRANTEE      GRANTED_ROLE      ADM DEL DEF COM INH
-----
SYSTEM       JAVASYSPRIV       NO  YES NO
SYSTEM       DBA                NO  YES NO

GRANTEE      GRANTED_ROLE      ADM DEL DEF COM INH
-----
SYSTEM       AQ_ADMINISTRATOR_ROLE YES NO YES NO

SQL>

```

If not, grant javasyspriv to the system account by using the following SQL query.

```
SQL> grant javasyspriv to system;

Grant succeeded.

SQL>
```

2.9.10 SYSDBA Privileges for Oracle System Account

To check if the system account has **sysdba** privileges, use the following SQL query.

```
SQL> select * from v$pwfile_users where sysdba='TRUE';

USERNAME SYSDB SYSOP SYSAS SYSBA SYSDG SYSKM ACCOUNT_STATUS
-----
SYSTEM    TRUE  FALSE FALSE OPEN

SQL>
```

If not, grant **sysdba** to the system account using the following SQL query.

Oracle 19c and Oracle 18c

```
SQL> grant sysdba to system container=ALL;

Grant succeeded.

SQL>
```

2.9.11 TNS Listener Service

TNS listener service must be started to allow connections to the Oracle database server. To check if the TNS listener service is running, use the `lsnrctl status` command.

If the TNS listener service is not started, use the `lsnrctl start` command to start the service.

Example: A running TNS Listener service on Oracle 19c.

```
$ lsnrctl status

LSNRCTL for Linux: Version 19.0.0.0.0 - Production on 10-FEB-2022 16:02:24

Copyright (c) 1991, 2019, Oracle. All rights reserved.

Connecting to
(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)(HOST=oracle19c.local)(PORT=1521)))
STATUS of the LISTENER
-----
Alias                     LISTENER
Version                   TNSLSNR for Linux: Version
19.0.0.0.0 - Production
Start Date                10-FEB-2022 16:02:24
Uptime                    0 days 0 hr. 43 min. 7 sec
Trace Level               off
```

```

Security                                ON: Local OS Authentication
SNMP                                    OFF
Listener Parameter File
/u01/app/oracle/product/19.0.0/dbhome_1/network/admin/listener
.ora
Listener Log File
/u01/app/oracle/diag/tnslsnr/oracle19c/listener/alert/log.xml
Listening Endpoints Summary...

(DESCRIPTION=(ADDRESS=(PROTOCOL=tcp) (HOST=oracle19c.local) (POR
T=1521)))
  (DESCRIPTION=(ADDRESS=(PROTOCOL=ipc) (KEY=EXTPROC1521)))
Services Summary...
Service "86b637b62fdf7a65e053f706e80a27ca" has 1 instance(s).
  Instance "cdbl", status READY, has 1 handler(s) for this
service...
Service "8886b84fb1e0709de053631e100a76ed" has 1 instance(s).
  Instance "cdbl", status READY, has 1 handler(s) for this
service...
Service "cdbl" has 1 instance(s).
  Instance "cdbl", status READY, has 1 handler(s) for this
service...
Service "cdblXDB" has 1 instance(s).
  Instance "cdbl", status READY, has 1 handler(s) for this
service...
Service "pdb1" has 1 instance(s).
  Instance "cdbl", status READY, has 1 handler(s) for this
service...
The command completed successfully

```

NOTE

The values shown are just examples and might be different on your Oracle instance.

2.9.12 Localhost is Resolvable

Verify if the localhost IP 127.0.0.1 on the Oracle database server is resolvable using the **ping** command as this will be the IP address that AhsayOBM will use to connect to the Oracle instance.

```

# ping -c4 127.0.0.1

PING 127.0.0.1 (127.0.0.1) 56(84) bytes of data.

64 bytes from 127.0.0.1: icmp_seq=1 ttl=64 time=0.043 ms
64 bytes from 127.0.0.1: icmp_seq=2 ttl=64 time=0.043 ms
64 bytes from 127.0.0.1: icmp_seq=3 ttl=64 time=0.032 ms
64 bytes from 127.0.0.1: icmp_seq=4 ttl=64 time=0.038 ms
--- 127.0.0.1 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 2999ms
rtt min/avg/max/mdev = 0.032/0.039/0.043/0.004 ms

```

2.9.13 Oracle Port Number

The default Oracle port number is **1521**. To check, use the **netstat** and **tnsping** commands to verify the actual port number.

NETSTAT

```
# netstat -pan|more
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address Foreign Address State PID/Program name
tcp 0 0 0.0.0.0:111 0.0.0.0:* LISTEN 1/systemd
tcp 0 0 192.168.122.1:53 0.0.0.0:* LISTEN 6054/dnsmasq
tcp 0 0 0.0.0.0:22 0.0.0.0:* LISTEN 5218/sshd
tcp 0 0 127.0.0.1:631 0.0.0.0:* LISTEN 5220/cupsd
tcp 0 0 127.0.0.1:25 0.0.0.0:* LISTEN 5513/master
tcp 0 0 10.16.30.99:49829 10.16.30.99:1521 ESTABLISHED
6523/ora_lreg_cdb1
tcp6 0 0 :::31181 :::* LISTEN
6535/ora_d000_cdb1
tcp6 0 0 :::111 :::* LISTEN 1/systemd
tcp6 0 0 :::50000 :::* LISTEN 7140/bschJW
tcp6 0 0 :::1521 :::* LISTEN 6965/tnslsnr
tcp6 0 0 :::22 :::* LISTEN 5218/sshd
tcp6 0 0 ::1:631 :::* LISTEN 5220/cupsd
tcp6 0 0 127.0.0.1:60024 :::* LISTEN 7140/bschJW
tcp6 0 0 ::1:25 :::* LISTEN 5513/master
tcp6 0 0 10.16.30.99:1521 10.16.30.99:49829 ESTABLISHED 6965/tnslsnr
```

NOTE

The values shown are just examples and might be different on your Oracle instance.

TNSPING

```
$ tnsping 127.0.0.1

TNS Ping Utility for Linux: Version 19.0.0.0.0 - Production on
06-NOV-2020 10:18:56

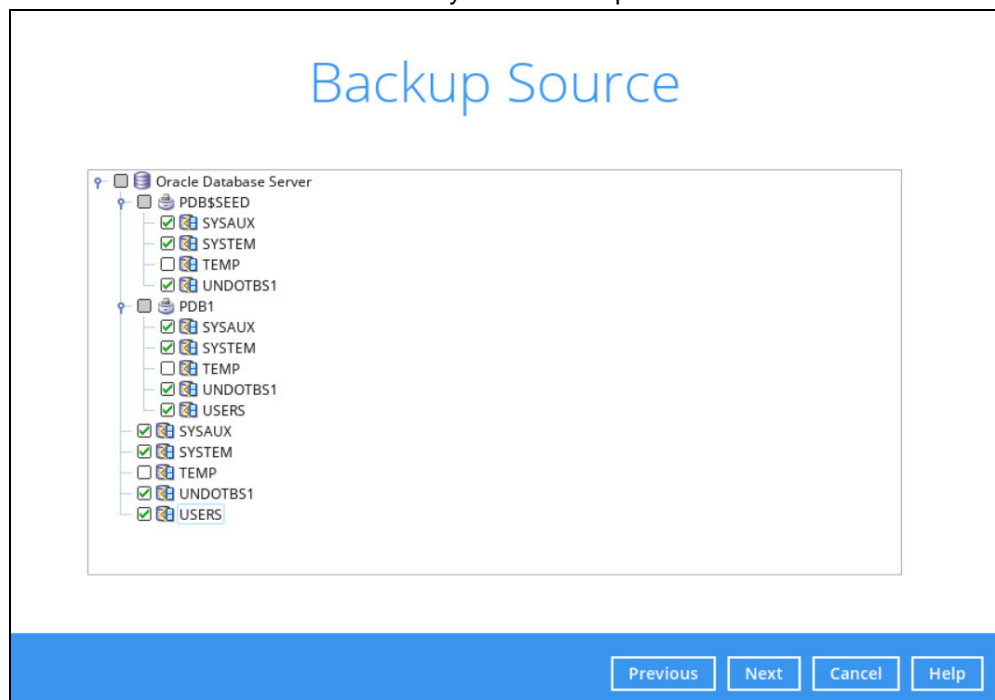
Copyright (c) 1997, 2019, Oracle. All rights reserved.

Used parameter files:
/u01/app/oracle/product/19.0.0/dbhome_1/network/admin/sqlnet.o
ra

Used EZCONNECT adapter to resolve the alias
Attempting to contact
(DESCRIPTION=(CONNECT_DATA=(SERVICE_NAME=)) (ADDRESS=(PROTOCOL=
tcp) (HOST=127.0.0.1) (PORT=1521)))
OK (0 msec)
```

2.10 Limitations

1. For Oracle database server on Linux CLI environment, AhsayOBM does not fully support all restore options. Whenever possible, it is strongly recommended to use Linux GUI for restore.
2. AhsayOBM does not support Oracle Express Edition or Oracle XE.
3. Backup and restore of Oracle database(s) running on a remote machine is not supported.
4. AhsayOBM Oracle database module only supports backup and/or restore of standalone Oracle installations. The following advanced Oracle database setups are not supported:
 - Clusterware or RAC (Real Application Clusters)
 - ASM (Automatic Storage Management)
 - Data Guard etc.
5. An AhsayOBM Oracle database backup set supports the backup and restore of one Oracle instance. For Oracle database server's setup with multiple instances, a separate backup set is required for each instance.
6. To recover a full Oracle database instance, the following items must be selected in the backup source:
 - Oracle Database Server must be selected.
 - All databases including **SYSAUX**, **SYSTEM**, **UNDOTBS1**, **USERS** and related application databases except for "TEMP" must be selected in the backup source when creating the backup set. Otherwise, without a backup of these databases, a full Oracle database instance recovery will NOT be possible.



NOTE

Even if the "TEMP" is selected in the backup source, this database will be skipped during a backup job.

2.11 Best Practices and Recommendations

1. To enable a full Oracle database instance recovery, all databases including **SYSAUX**, **SYSTEM**, **UNDOTBS1**, **USERS** and related application databases except for “TEMP” must be selected in the backup source when creating the backup set. Otherwise, without a backup of these databases, a full Oracle database instance recovery will NOT be possible.
2. Full database backup or incremental / differential database backups should be scheduled when system activity is low to achieve the best possible performance and to minimize the impact on the database server performance (for example: scheduled to run on weekends).
3. For **Archived Log backups**, the backup frequency should be dependent on the number of transactions or activity on the database. Databases with more transaction should run archived log backup more frequently (for example: instead of a daily backup, it should be run multiple times a day).
4. To provide **maximum data protection** and **flexible restore options**, it is recommended to configure:
 - At least one offsite or cloud destination
 - At least one local destination for fast recovery
5. Perform **test restores** periodically to ensure that your backup is set up and data are backed up properly.

Performing recovery tests can also help identify potential issues or gaps in your recovery plan. It is important that you do not try to make the test easier, as the objective of a successful test is not to demonstrate that everything is flawless. There might be flaws identified in the plan throughout the test and it is important to identify those flaws.

6. The **Restore Raw File** option is for advanced Oracle database administrators and should only be used if you have in-depth knowledge and understanding of Oracle database engine, Oracle database schema, knowledge of the database server and network infrastructure. Therefore, it is not recommended to use this restore option as there is need to utilize additional Oracle techniques and scripts to facilitate a manual database restore.

Please refer to the following article of Oracle Database Backup and Recovery User's Guide for details:

Oracle 19c

<https://docs.oracle.com/en/database/oracle/oracle-database/19/bradv/index.html>

Oracle 18c

<https://docs.oracle.com/en/database/oracle/oracle-database/18/bradv/index.html>

7. To ensure an optimal backup/restoration performance, it is highly recommended to set the temporary directory folder to a local disk location with sufficient free disk space. It must **not** be on the location of the Oracle Home drive.

3 Creating an Oracle Database Backup Set

1. Click the Backup Sets icon on the AhsayOBM main interface.



2. Create a new backup set by clicking the **Add** button.
3. In the Create Backup Set window, select Oracle Database Server Backup as the Backup set type. Configure the following settings:

- **Name** - the name of the backup set.
- **Backup set type** – the type of the backup set (i.e. Oracle Database Server Backup).
- **Login ID** – the login ID of the Oracle server. The default login ID is “system”.
- **Password** – the password of the login account.
- **Host** – this value is not user configurable.
- **Port** – the port where the connections to the Oracle server is made. The default port is “1521”.
- **SID** – the Oracle System Identifier. For more details, please refer to [Ch. 2.9.4](#).

Once all the fields are configured, click **Next** to proceed.

A screenshot of the "Create Backup Set" window. The title "Create Backup Set" is at the top in blue. Below it are several input fields: "Name" with "BackupSet_01", "Backup set type" with a dropdown menu showing "Oracle Database Server Backup" and a red icon, "Login ID" with "SYSTEM", "Password" with "*****", "Host" with "127.0.0.1", "Port" with "1521", and "SID" with "orcl". At the bottom right are three buttons: "Next", "Cancel", and "Help".

Create Backup Set

Name
BackupSet_01

Backup set type
Oracle Database Server Backup

Login ID
SYSTEM

Password

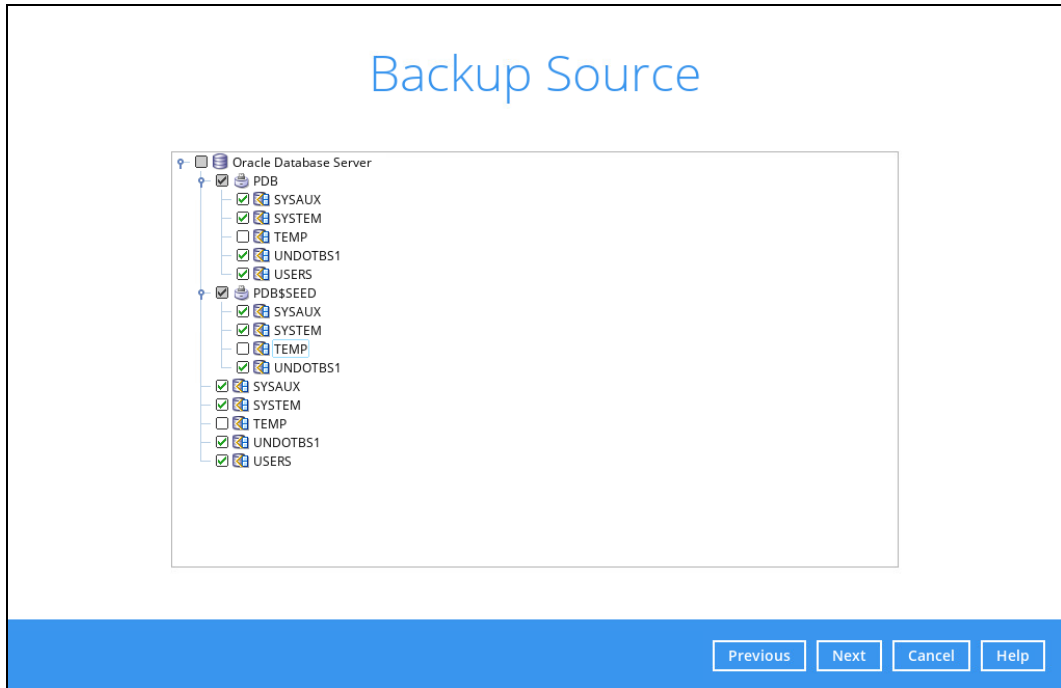
Host
127.0.0.1

Port
1521

SID
orcl

Next Cancel Help

4. In the Backup Source menu, select the Oracle database(s) you would like to back up. Click **Next** to proceed.



NOTE

All databases including **SYSAUX**, **SYSTEM**, **UNDOTBS1**, **USERS** and related application databases except for "TEMP" must be selected in the backup source when creating the backup set. Otherwise, without a backup of these databases, a full Oracle database instance recovery will NOT be possible.

Even if the "TEMP" is selected in the backup source, this database will be skipped during a backup job.

5. A backup schedule for a backup job to run automatically at your specified time interval can be configured. The backup schedule is enabled by default.

Schedule

Run scheduled backup for this backup set

On

Existing schedules

- Tablespace Backup Schedule**
Database(Tablespace, Control & Init File, Archived Logs); Weekly - Friday (Every week at 23:00)
- Archived Redo Log Backup Schedule**
Archived Log; Weekly - Monday, Tuesday, Wednesday & Thursday (Every week at 23:00)

There are two default backup schedules:

- Tablespace Backup Schedule
- Archived Redo Log Backup Schedule

Tablespace Backup Schedule – This type of backup schedule will automatically run weekly every Friday at 23:00.

Backup Schedule

Name
Tablespace Backup Schedule

Backup set type
☒ Database(Tablespace, Control & Init File, Archived Logs)
☐ Archived Log

Type
Weekly

Backup on these days of the week
☐ Sun ☐ Mon ☐ Tue ☐ Wed ☐ Thu ☒ Fri ☐ Sat

Start backup
at 23:00

Stop
until full backup completed


☒ Run Retention Policy after backup

[Delete this backup schedule](#)

Archived Redo Log Backup Schedule – This type of backup schedule will automatically run weekly every Monday, Tuesday, Wednesday and Thursday at 23:00.

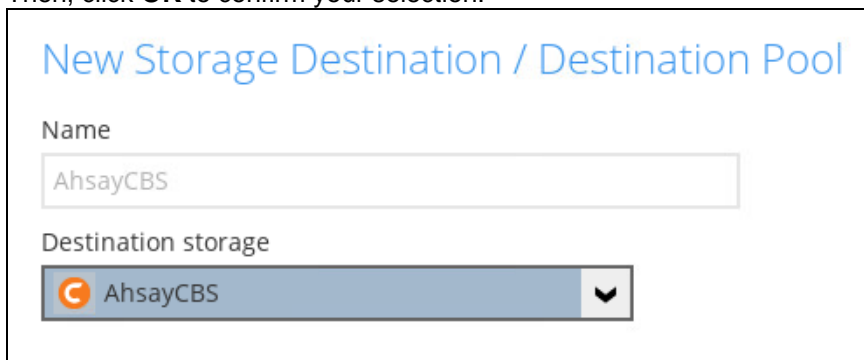
The screenshot shows the 'Backup Schedule' configuration window. At the top, the title 'Backup Schedule' is displayed in blue. Below it, the 'Name' field contains 'Archived Redo Log Backup Schedule'. The 'Backup set type' section has two radio buttons: 'Database(Tablespace, Control & Init File, Archived Logs)' and 'Archived Log', with the latter selected. The 'Type' dropdown is set to 'Weekly'. The 'Backup on these days of the week' section shows checkboxes for Sun, Mon, Tue, Wed, Thu, Fri, and Sat, with Mon, Tue, Wed, and Thu checked. The 'Start backup' section shows 'at' followed by a dropdown set to '23' and another dropdown set to '00'. The 'Stop' section shows a dropdown set to 'until full backup completed'. There is a checkbox for 'Run Retention Policy after backup' which is checked. At the bottom, there is a blue bar with the text 'Delete this backup schedule' on the left and 'OK', 'Cancel', and 'Help' buttons on the right.

To change the backup schedule settings of an existing schedule, double-click the schedule to be modified. Otherwise, click **Next** to proceed.

6. In the **Destination** window, select a backup mode then click the  button to add a backup storage destination.

The screenshot shows the 'Destination' configuration window. At the top, the title 'Destination' is displayed in blue. Below it, the 'Backup mode' dropdown is set to 'Sequential'. The 'Existing storage destinations' section shows a plus button and the text 'Add new storage destination / destination pool'. Below this, there are two small upward and downward arrow icons. At the bottom, there is a blue bar with 'Previous', 'Next', 'Cancel', and 'Help' buttons.

In the **New Storage Destination / Destination Pool** window, select the destination storage. Then, click **OK** to confirm your selection.



New Storage Destination / Destination Pool

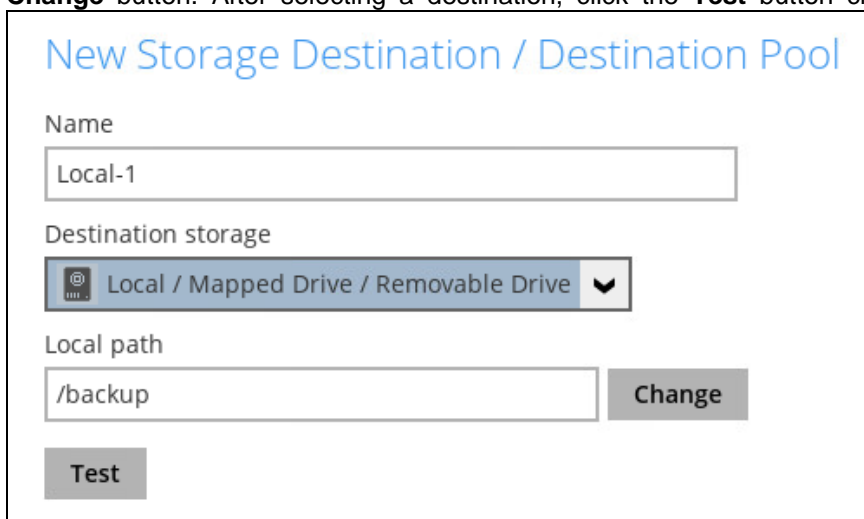
Name

AhsayCBS

Destination storage

AhsayCBS

If **Local / Mapped Drive / Removable Drive** is selected, specify the path by clicking the **Change** button. After selecting a destination, click the **Test** button check the connection.



New Storage Destination / Destination Pool

Name

Local-1

Destination storage

Local / Mapped Drive / Removable Drive

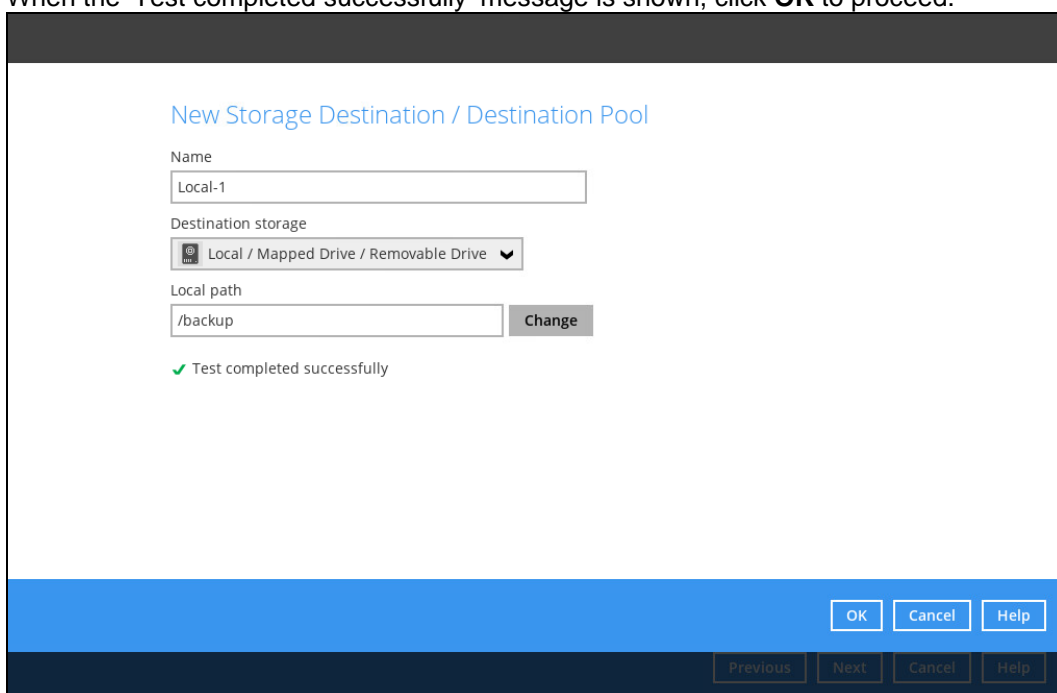
Local path

/backup

Change

Test

When the 'Test completed successfully' message is shown, click **OK** to proceed.



New Storage Destination / Destination Pool

Name

Local-1

Destination storage

Local / Mapped Drive / Removable Drive

Local path

/backup

Change

Test completed successfully

OK Cancel Help

Previous Next Cancel Help

7. In the **Destination** window, your selected storage destination will be shown. Click **Next** to proceed.

Destination

Backup mode
Sequential

Existing storage destinations

- AhsayCBS
Host: 10.201.10.54:80
- Local-1
/backup

Add

Previous Next Cancel Help

8. In the Encryption window, the **Encrypt Backup Data** option is enabled by default with an encryption key preset by the system.

There are three (3) types of Encryption to choose from:

- **Default** – an encryption key with forty-four (44) alpha numeric characters will be randomly generated by the system.
- **User password** – the encryption key will be the same as the login password of your AhsayOBM at the time when this backup set is created. Please be reminded that if you change the AhsayOBM login password later, the encryption keys of the backup sets previously created with this encryption type **will remain unchanged**.
- **Custom** – the encryption key can be customized where the user can select the Algorithm, Method and Key length, and then input an Encryption key.

Encryption

Encryption Type
Custom

Algorithm
AES

Encryption key

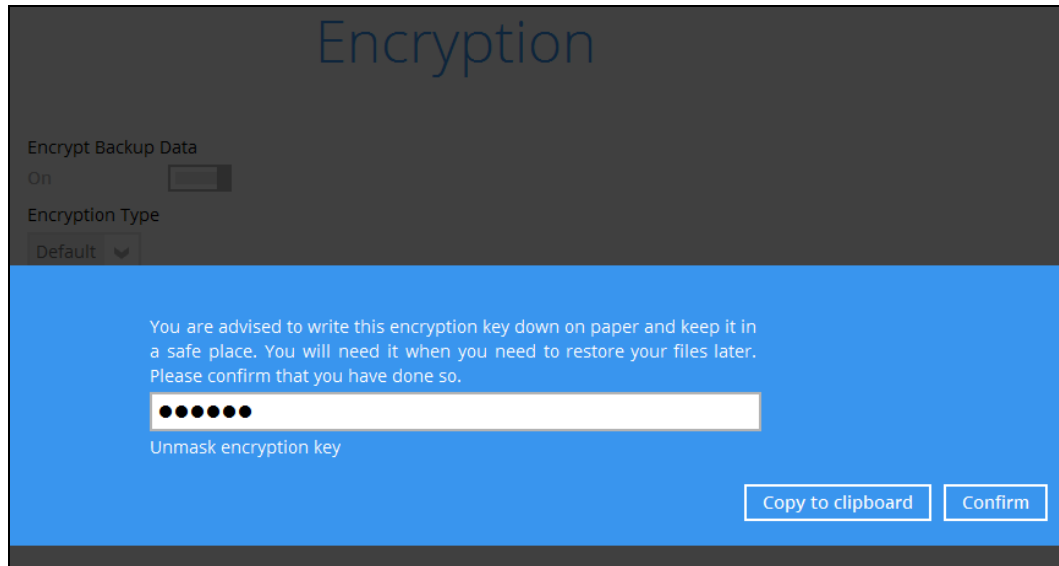
Re-enter encryption key

Method
☐ ECB ☒ CBC

Key length
☐ 128-bit ☒ 256-bit

Click **Next** once done with the Encryption settings.

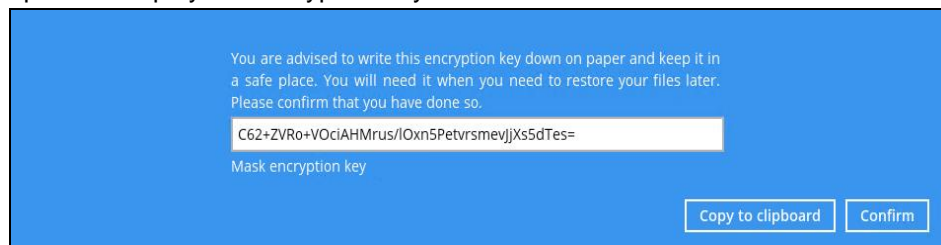
9. If the Encryption feature is enabled in the previous step, the following window will pop-up whichever encryption type is selected.



The image shows a window titled "Encryption". At the top, it says "Encrypt Backup Data" with a toggle switch set to "On". Below that, "Encryption Type" is set to "Default". The main area has a blue background with the text: "You are advised to write this encryption key down on paper and keep it in a safe place. You will need it when you need to restore your files later. Please confirm that you have done so." Below this text is a text input field containing seven black dots, representing a masked key. Below the input field is the label "Unmask encryption key". At the bottom right, there are two buttons: "Copy to clipboard" and "Confirm".

This pop-up window has three (3) options to choose from:

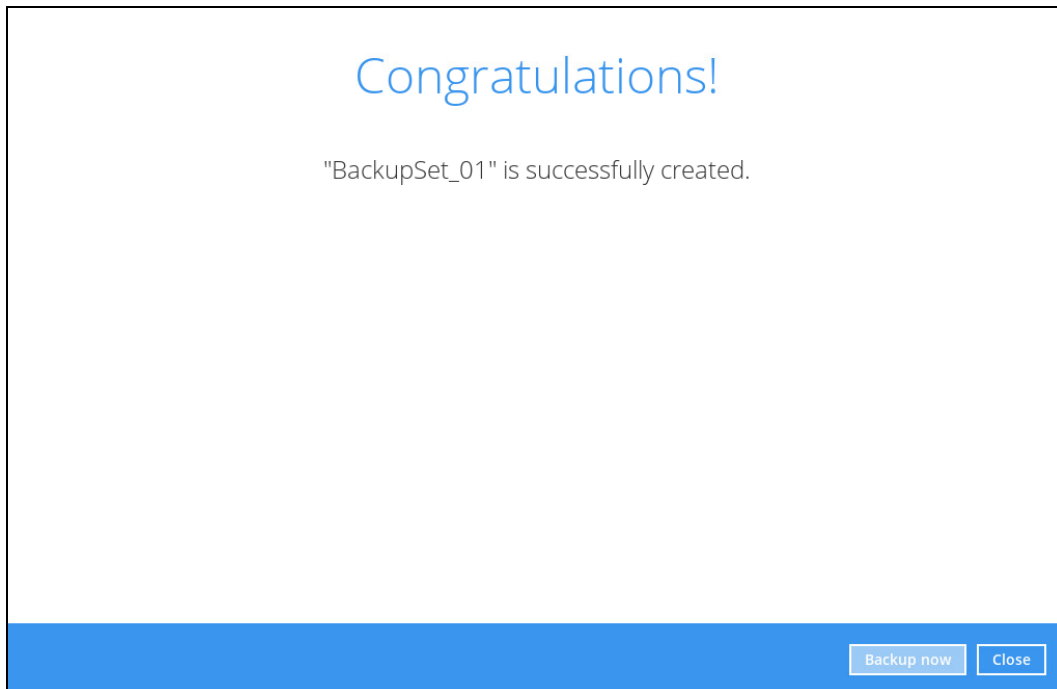
- **Unmask encryption key** – The encryption key is masked by default. Click this option to display the encryption key.



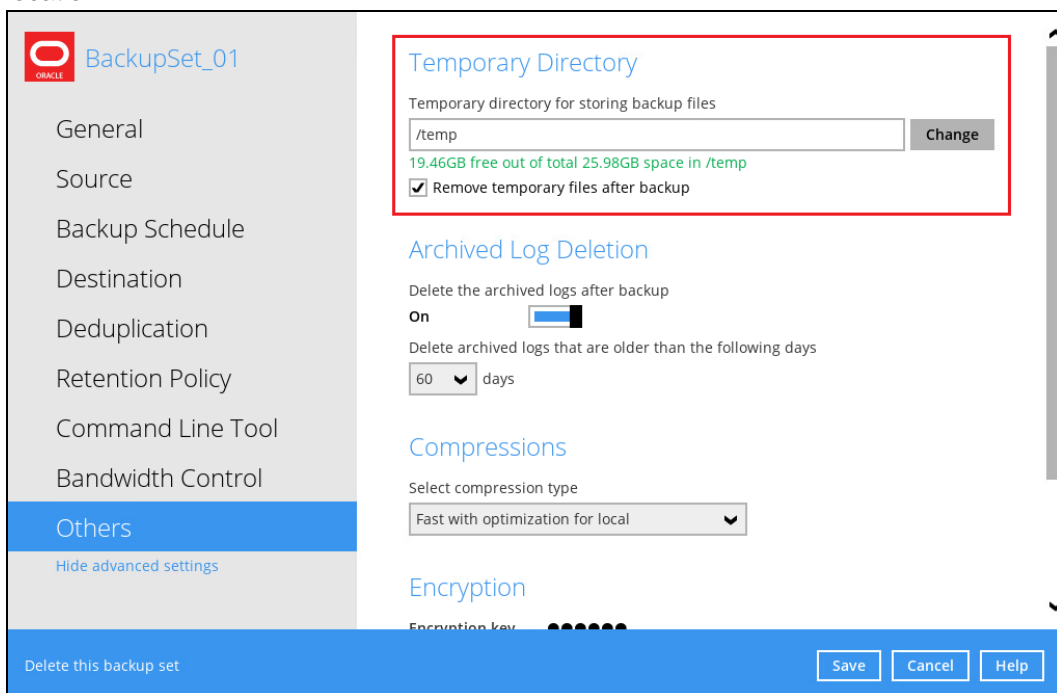
The image shows the same "Encryption" window, but the text input field now contains the alphanumeric string "C62+ZVRo+VOciAHMrus/IOxn5PetrsmevjjXs5dTes=". Below the input field is the label "Mask encryption key". The "Copy to clipboard" and "Confirm" buttons remain at the bottom right.

- **Copy to clipboard** – Select this option to copy the encryption key. Once copied, you can paste it to a text editor (e.g., gedit) and save to a location.
- **Confirm** – Select this option to exit the pop-up window and proceed to the next step.

10. After completing all the configuration settings, the Oracle database server backup set will be created.



11. According to [Best Practices and Recommendations](#), it is highly recommended to set the temporary directory folder to a local disk location with sufficient free disk space. It must **not** be on the location of the Oracle Home drive. To do this, click the **Backup Sets** icon on the AhsayOBM main interface, then select a backup set. Click **Show advanced settings** link. Go to **Others > Temporary Directory** and click the **Change** button to browse for another location.



Tick the 'Remove temporary files after backup' option.

12. Optional: **Archived Log Deletion**

The deletion of the archived logs is enabled by default and archived logs more than 60 days are deleted from the Oracle database instance. This process is done after every Database and Archived Log backup job.

For example, if the Oracle database instance generates a lot of archived log files, you may want to reduce the number of days before they are deleted.

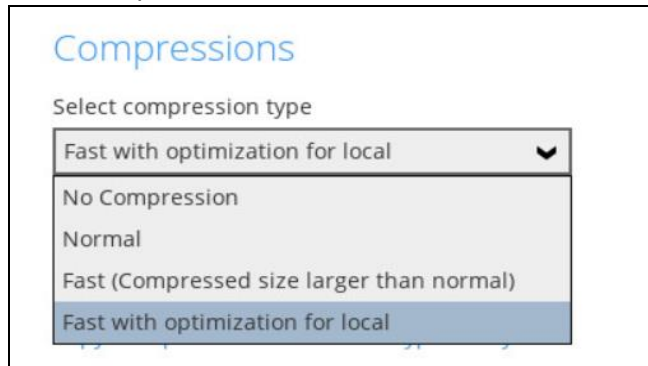
The screenshot shows the 'BackupSet_01' configuration window. On the left is a sidebar with a menu: General, Source, Backup Schedule, Destination, Deduplication, Retention Policy, Command Line Tool, Bandwidth Control, Others (highlighted in blue), and a link for 'Hide advanced settings'. The main area is divided into sections: 'Temporary Directory' with a text field for '/temp', a 'Change' button, and a status message '19.46GB free out of total 25.98GB space in /temp'; a checked checkbox 'Remove temporary files after backup'; 'Archived Log Deletion' (highlighted with a red box) with a toggle set to 'On' and a dropdown for '60 days'; 'Compressions' with a dropdown set to 'Fast with optimization for local'; and 'Encryption' with a masked key. At the bottom is a blue bar with 'Delete this backup set' and 'Save', 'Cancel', 'Help' buttons.

13. Optional: Select your preferred **Compression** type. The compression type is set to **Fast with optimization for local** by default. To change the compression type, go to **Others > Compressions**.

This screenshot is identical to the previous one, but the 'Compressions' section is highlighted with a red box. It shows the 'Select compression type' dropdown menu set to 'Fast with optimization for local'. The 'Archived Log Deletion' section is no longer highlighted.

Select from the following:

- No Compression
- Normal
- Fast (Compressed size larger than normal)
- Fast with optimization for local



14. Click **Save** to apply the changes.

4 Overview on the Backup Process

The following steps are performed during an Oracle Server backup job in Database and Archived Log backup modes.

For an overview of the detailed process for Steps 3, 5, 11, and 14, please refer to Chapter 11 of the [AhsayOBM v9 Quick Start Guide for Linux \(GUI\)](#).

- Periodic Data Integrity Check (PDIC) Process (**Step 3**)
- Backup Set Index Handling Process
 - Start Backup Job (**Step 5**)
 - Completed Backup Job (**Step 14**)
- Data Validation Check Process (**Step 11**)

4.1 Database Backup



4.2 Archived Log Backup



5 Running Backup Jobs

5.1 Login to AhsayOBM

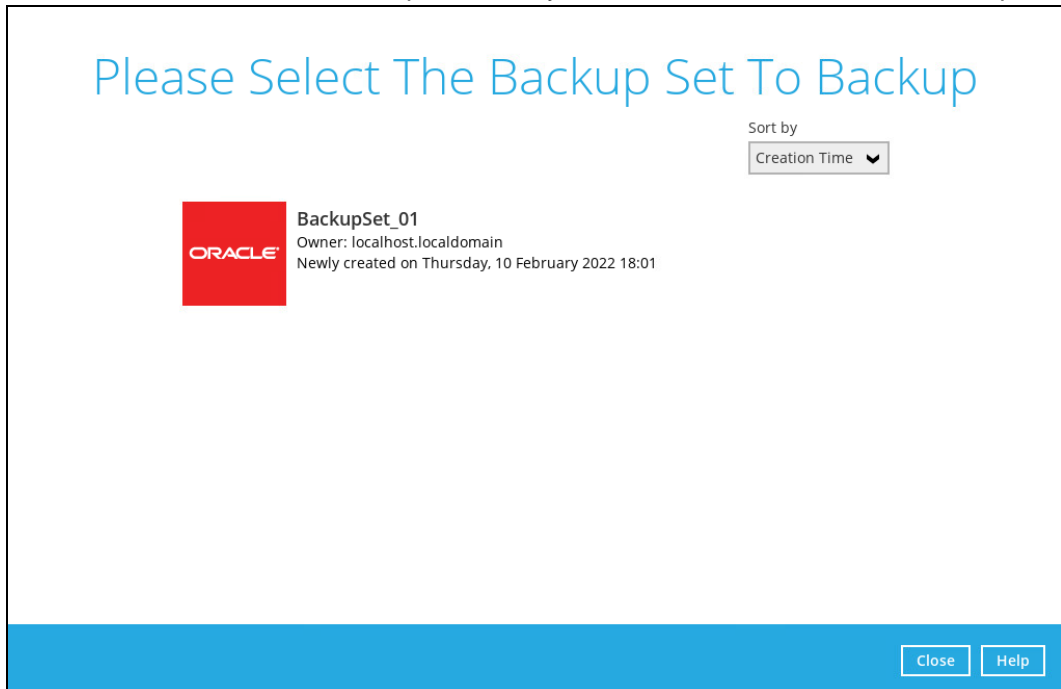
For instructions on how to do this refer to Chapter 11 of [AhsayOBM v9 Quick Start Guide for Linux \(GUI\)](#).

5.2 Start a Manual Backup

1. Click the **Backup** icon on the AhsayOBM main interface.




2. Select the Oracle database backup set which you would like to start a manual backup on.



3. There are two (2) types of backup mode in an Oracle database backup set:
 - **Database** – this type of backup includes Tablespaces, Control and Init File, and Archived Log Files. To see the steps during a database backup job, please refer to [Ch. 4.1 Overview on the Database Backup Process](#).
 - **Archived Log** – this type of backup is for archived log files. To see the steps during an archived log backup job, please refer to [Ch. 4.2 Overview on the Archived Log Backup Process](#).

Choose Your Backup Options

 BackupSet_01


Backup set type
☒ Database(Tablespace, Control & Init File, Archived Logs)
☐ Archived Log
[Show advanced option](#)

[Previous](#)
[Backup](#)
[Cancel](#)
[Help](#)

To modify the Destinations, Migrate Data or Run Retention Policy settings before running a backup, click the **Show advanced option** link.

When advanced options are shown, it is recommended that you tick the checkbox next to **Run Retention Policy after backup** in the Retention Policy section at the bottom. This will help you save hard disk quota in the long run.

Choose Your Backup Options

 BackupSet_01

Backup set type
☒ Database(Tablespace, Control & Init File, Archived Logs)
☐ Archived Log

Destinations
☒ AhsayCBS (Host: 10.201.10.54:80)
☒ Local-1 (/backup)

Migrate Data
☐ Migrate existing data to latest version

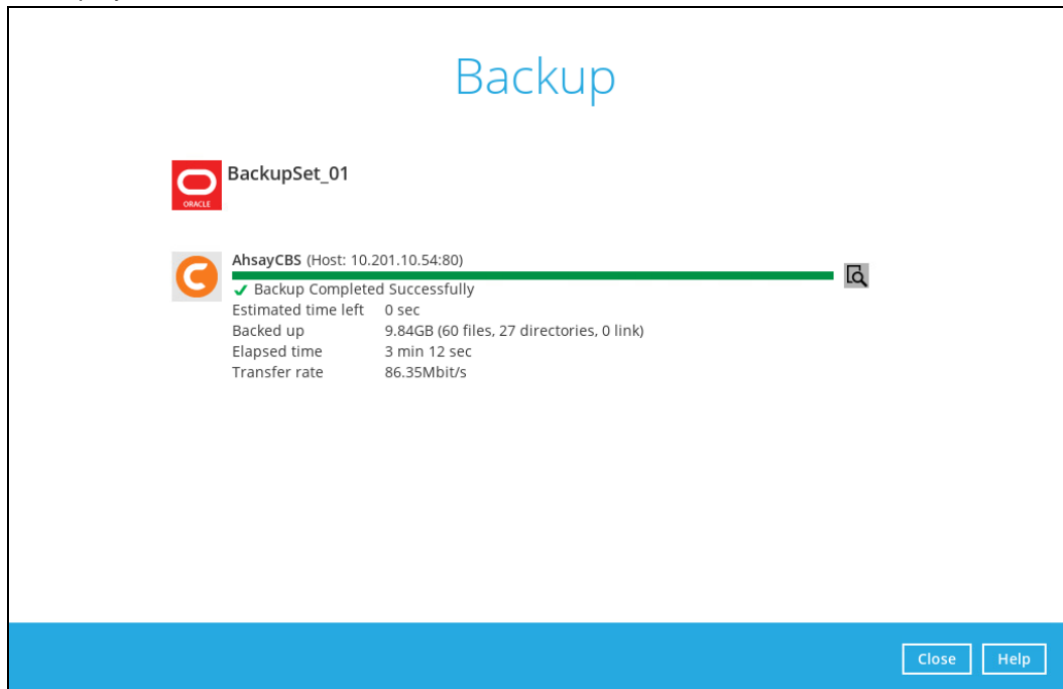
Retention Policy
☒ Run Retention Policy after backup
[Hide advanced option](#)

[Previous](#)
[Backup](#)
[Cancel](#)
[Help](#)

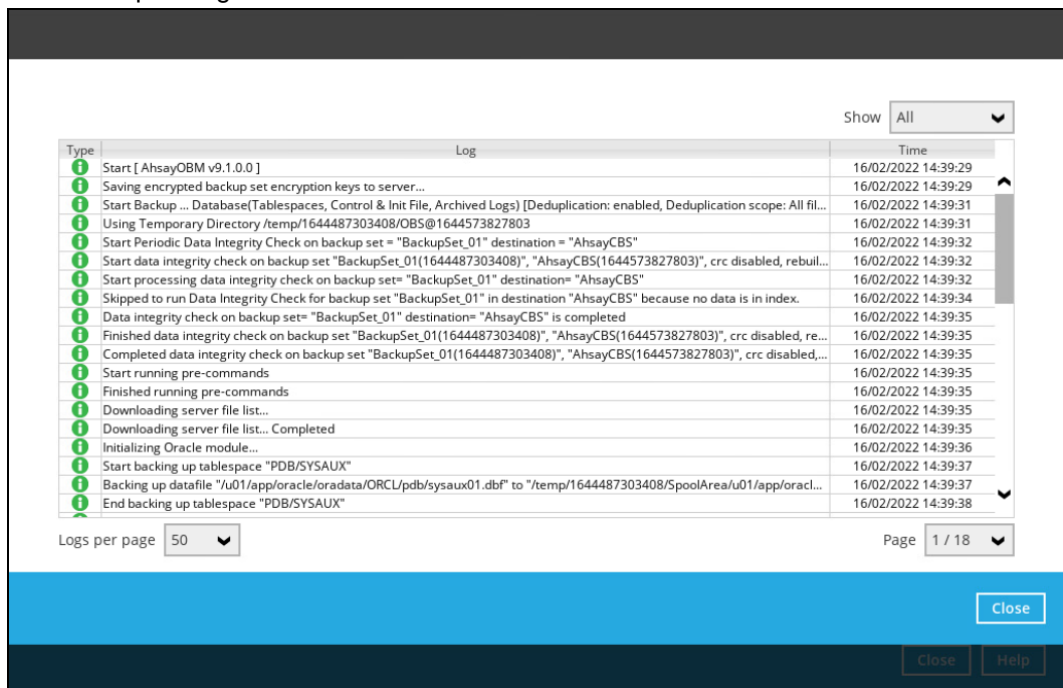
NOTE

The Migrate Data option will only be displayed if Deduplication is enabled for the backup set. When the Migrate Data option is enabled, the existing data will be migrated to the latest version during a backup job. Backup job(s) for backup sets with Migrate Data enabled may take longer to finish. For more information about this feature, refer to [AhsayCBS v9 New Features Datasheet](#).

4. Click **Backup** to start the backup job. Once finished, 'Backup Completed Successfully' will be displayed.



To check the log of your backup, click this icon . It will show you the log of your backup with corresponding date and time.

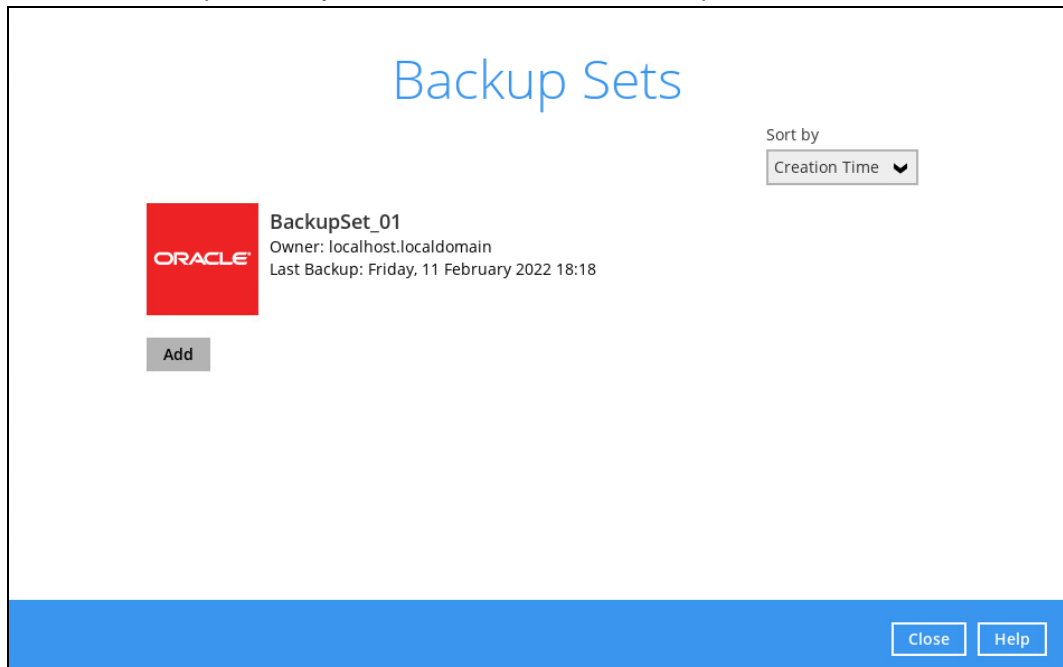


5.3 Configure Backup Schedule for Automated Backup

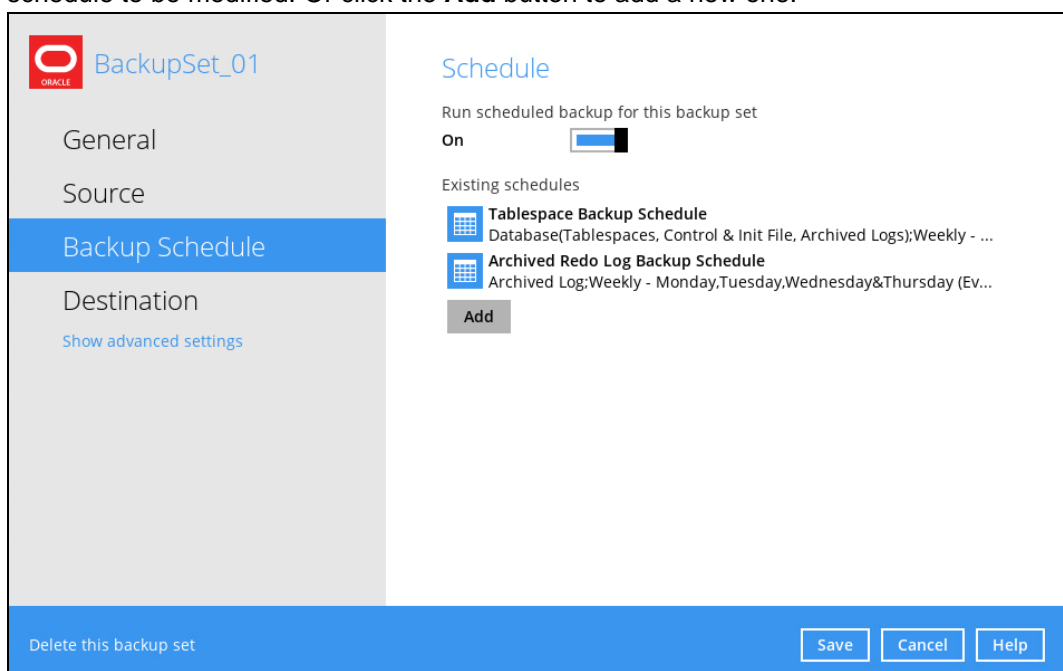
1. Click the **Backup Sets** icon on the AhsayOBM main interface.



2. Select the backup set that you would like to create a backup schedule for.



3. Go to the **Backup Schedule** tab. To modify an existing schedule, click the backup schedule to be modified. Or click the **Add** button to add a new one.



4. In the **New Backup Schedule** window, configure the following settings:

The screenshot shows the 'New Backup Schedule' window. The 'Name' field contains 'Daily-1'. The 'Backup set type' has 'Database(Tablespaces, Control & Init File, Archived Logs)' selected. The 'Type' dropdown is set to 'Daily'. The 'Start backup' is configured as 'at 14:48'. The 'Stop' dropdown is set to 'until full backup completed'. The 'Run Retention Policy after backup' checkbox is unchecked. At the bottom right, there are 'OK', 'Cancel', and 'Help' buttons.

- **Name** – the name of the backup schedule
- **Backup set type** – the type of backup mode (i.e., Database and Archived Log)
- **Type** – the type of backup schedule. There are four (4) different types of backup schedule: Daily, Weekly, Monthly and Custom
 - **Daily** – the time of the day or interval in minutes/hours when the backup job will run

This screenshot is identical to the previous one, but the 'Run Retention Policy after backup' checkbox is now checked.

- **Weekly** – the day of the week and the time of the day or interval in minutes/hours when the backup job will run

New Backup Schedule

Name
Weekly-1

Backup set type
☒ Database(Tablespace, Control & Init File, Archived Logs)
☐ Archived Log

Type
Weekly

Backup on these days of the week
☐ Sun ☐ Mon ☐ Tue ☐ Wed ☐ Thu ☒ Fri ☐ Sat

Start backup
 at 14 : 48

Stop
 until full backup completed

☒ Run Retention Policy after backup

- **Monthly** – the day of the month and the time of that day which the backup job will run

New Backup Schedule

Name
Monthly-1

Backup set type
☐ Database(Tablespace, Control & Init File, Archived Logs)
☒ Archived Log

Type
Monthly

Backup on the following day every month
☒ Day 1
☐ First Sunday

Start backup at
 14 : 48 on the selected days

Stop
 until full backup completed

☒ Run Retention Policy after backup

- **Custom** – a specific date and the time of that date when the backup job will run

New Backup Schedule

Name: Custom-1

Backup set type: ☐ Database(Tablespace, Control & Init File, Archived Logs) ☒ Archived Log

Type: Custom

Backup on the following day once: 2020 December 12

Start backup at: 14 : 48

Stop: until full backup completed

☒ Run Retention Policy after backup

- **Start backup** – the start time of the backup job

- **at** – this option will start a backup job at a specific time
- **every** – this option will start a backup job in intervals of minutes or hours

Start backup: every 1 minute

Stop: until full backup completed

☒ Run Retention Policy after backup

Interval options: 1 minute, 2 minutes, 3 minutes, 4 minutes, 5 minutes, 6 minutes, 10 minutes, 12 minutes

Start backup: every 1 minute

Stop: until full backup completed

☒ Run Retention Policy after backup

Interval options: 30 minutes, 1 hour, 2 hours, 3 hours, 4 hours, 6 hours, 8 hours, 12 hours

Here is an example of a backup set that has a periodic and normal backup schedule.

New Backup Schedule

Name: Weekly-1

Backup set type: ☐ Database(Tablespace, Control & Init File, Archived Logs) ☒ Archived Log

Type: Weekly

Backup on these days of the week: ☐ Sun ☒ Mon ☒ Tue ☒ Wed ☒ Thu ☒ Fri ☐ Sat

Start backup: every 4 minutes

Stop: until full backup completed

☒ Run Retention Policy after backup

Figure 1.1

New Backup Schedule

Name: Weekly-1

Backup set type: ☒ Database(Tablespace, Control & Init File, Archived Logs) ☐ Archived Log

Type: Weekly

Backup on these days of the week: ☒ Sun ☐ Mon ☐ Tue ☐ Wed ☐ Thu ☐ Fri ☐ Sat

Start backup: at 21 : 00

Stop: until full backup completed

☒ Run Retention Policy after backup

Figure 1.2

Figure 1.1 – Periodic backup schedule runs every 4 hours from Monday – Friday during business hours for Archived Log backup

Figure 1.2 – Normal backup schedule runs at 21:00 or 9:00 PM every Sunday during non-business hours for Database backup

- **Stop** – the stop time of the backup job. This only applies to schedules with start backup “at” and is not supported for periodic backup schedule (start backup “every”)

- **until full backup completed** – this option will stop a backup job once it is complete. This is the configured stop time of the backup job by default.
- **after (defined no. of hrs.)** – this option will stop a backup job after a certain number of hours regardless of whether the backup job has completed or not. This can range from 1 to 24 hrs.

The number of hours must be enough to complete a backup of all files in the backup set. For small files in a backup, if the number of hours is not enough to back up all files, then the outstanding files will be backed up in the next backup job. However, if the backup set contains large files, this may result in partially backed up files.

For example, if a backup has 100GB file size which will take approximately 15 hours to complete on your environment, but you set the “stop” after 10 hours, the file will be partially backed up and cannot be restored. The next backup will upload the files from scratch again.

The partially backed up data will have to be removed by running the data integrity check.

As a general rule, it is recommended to review this setting regularly as the data size on the backup machine may grow over time.

- **Run Retention Policy after backup** – if enabled, the AhsayOBM will run a retention policy job to remove files from the backup destination(s) which have exceeded the retention policy after performing a backup job

5. Before closing the Backup Schedule menu, click the **Save** button to apply the backup schedule settings.

6 Restoring Backup for Oracle Database Server

There are three (3) restore options to choose from in Linux GUI mode:

- **Original location** – AhsayOBM will restore the database(s) from the backup destination and apply them to the original production Oracle instance.
- **Alternate location** – AhsayOBM will restore the database(s) from the backup destination and apply them to either the original Oracle instance or another Oracle instance on the production machine. This option can also be used to clone a database by changing the database name.
- **Restore raw file** – AhsayOBM will restore the Oracle database files to a location on the local machine, which then can be copied to another Oracle server on another machine for recovery.

The **Restore Raw File** option is for advanced Oracle database administrators and should only be used if you have in-depth knowledge and understanding of Oracle database engine, Oracle database schema, knowledge of the database server and network infrastructure. Therefore, it is not recommended to use this restore option as there is need to utilize additional Oracle techniques and scripts to facilitate a manual database restore.

Please refer to the following article of Oracle Database Backup and Recovery User's Guide for details:

Oracle 19c

<https://docs.oracle.com/en/database/oracle/oracle-database/19/bradv/index.html>

Oracle 18c

<https://docs.oracle.com/en/database/oracle/oracle-database/18/bradv/index.html>

Before restoring your Oracle database, check the following:

1. TNS listener service must be started to allow connections to the Oracle database server for the restore process. To check if the TNS listener service is running, use the `lsnrctl status` command. If the TNS listener service is not started, use the `lsnrctl start` command to start the service.

Example: A running TNS Listener service on Oracle 19c.

```
$ lsnrctl status

LSNRCTL for Linux: Version 19.0.0.0.0 - Production on 16-FEB 2022
12:13:24

Copyright (c) 1991, 2019, Oracle. All rights reserved.

Connecting to
(DESCRIPTION=(ADDRESS=(PROTOCOL=TCP) (HOST=oracle19c.local) (PORT=1
521)))
STATUS of the LISTENER
-----
Alias                     LISTENER
Version                   TNSLSNR for Linux: Version 19.0.0.0.0 -
Production
Start Date                16-FEB-2022 12:13:24
Uptime                    1 days 23 hr. 20 min. 20 sec
```

```

Trace Level                                off
Security                                  ON: Local OS Authentication
SNMP                                      OFF
Listener Parameter File
/u01/app/oracle/product/19.0.0/dbhome_1/network/admin/listener.or
a
Listener Log File
/u01/app/oracle/diag/tnslsnr/oracle19c/listener/alert/log.xml
Listening Endpoints Summary...

(DESCRIPTION=(ADDRESS=(PROTOCOL=tcp) (HOST=oracle19c.local) (PORT=1
521)))
  (DESCRIPTION=(ADDRESS=(PROTOCOL=ipc) (KEY=EXTPROC1521)))
Services Summary...
Service "86b637b62fdf7a65e053f706e80a27ca" has 1 instance(s).
  Instance "cdb1", status READY, has 1 handler(s) for this
service...
Service "8886b84fb1e0709de053631e100a76ed" has 1 instance(s).
  Instance "cdb1", status READY, has 1 handler(s) for this
service...
Service "cdb1" has 1 instance(s).
  Instance "cdb1", status READY, has 1 handler(s) for this
service...
Service "cdb1XDB" has 1 instance(s).
  Instance "cdb1", status READY, has 1 handler(s) for this
service...
Service "pdb1" has 1 instance(s).
  Instance "cdb1", status READY, has 1 handler(s) for this
service...
The command completed successfully

```

NOTE

The values shown are just examples and might be different on your Oracle instance.

2. Run the `sqlplus / as sysdba` command to verify if the Oracle service is active.

The following is just an example after an Oracle instance failure due to corrupted data and/or configuration files. It might be different on your Oracle instance.

```

$ sqlplus / as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Wed Feb 16 12:23:34
2022
Version 19.3.0.0.0

Copyright (c) 1982, 2019, Oracle. All rights reserved.

Connected to an idle instance.

```

3. This step is only for restoring to an Alternate location. Create a folder that will be used for the Alternate location, it must be created using the Oracle user.

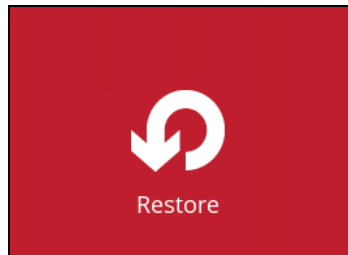
6.1 Login to AhsayOBM

For instructions on how to do this refer to Chapter 11 of [AhsayOBM v9 Quick Start Guide for Linux \(GUI\)](#).

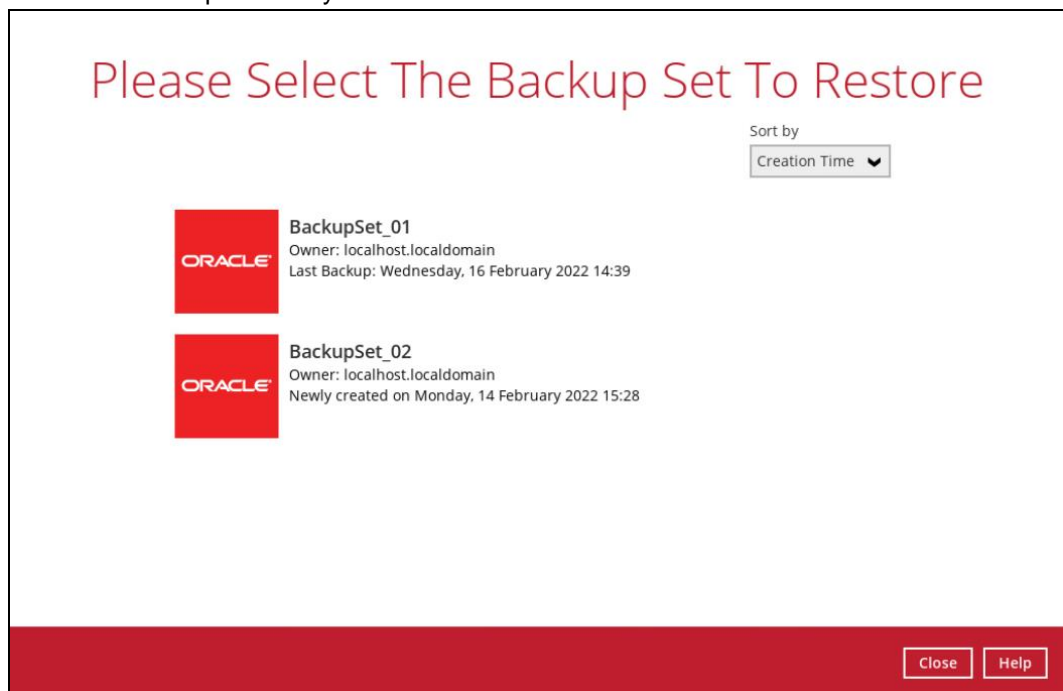
6.2 Automatic Oracle Database Restore

This feature is used to restore the Oracle database(s) from your backup destination and apply them either to the original production Oracle instance or another Oracle instance on the production machine.

1. On the AhsayOBM main interface, click the **Restore** icon.



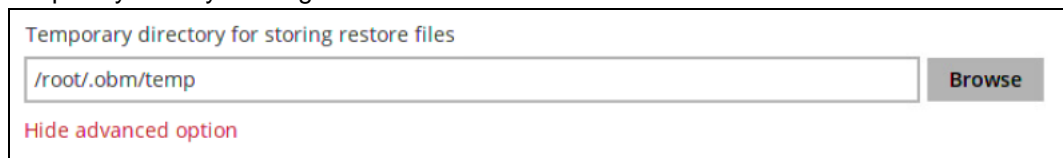
2. Select the backup set that you would like to restore the Oracle database from.



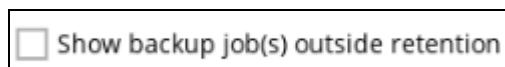
3. Select the destination storage that contains the Oracle database(s) that you would like to restore from.



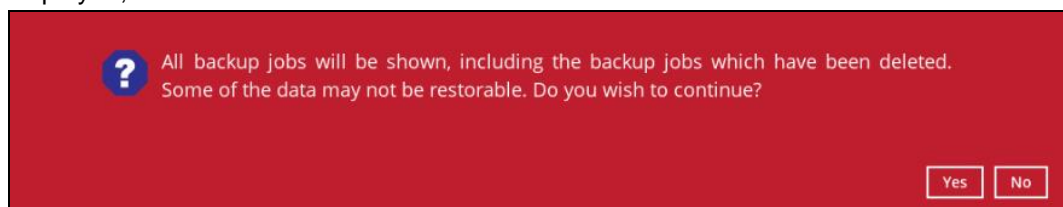
You may configure the **Temporary directory for storing restore files** by clicking **Show advanced option**. This will allow you to select the directory that will be used to store temporary files by clicking the **Browse** button.



4. Tick **Show backup job(s) outside retention** if you want all backup jobs to be displayed, even the deleted ones.



Once ticked, this message will be displayed. Click **Yes** if you want all backup jobs to be displayed, otherwise click **No**.



5. Select the database(s) that you would like to restore. You can also choose to restore backed up database from a specific backup job using the **Select what to restore** drop-down menu. Click **Next** to proceed.

Select Your Databases To Be Restored

Select what to restore

Choose from files as of job ▼ 16/02/2022 ▼ Latest ▼ ☐ Show backup job(s) outside retention

Folders

- AhsayCBS
 - Oracle Database Server
 - PDB\$SEED
 - ☒ SYS_AUX
 - ☒ SYSTEM
 - ☒ UNDOTBS1
 - PDB
 - ☒ SYS_AUX
 - ☒ SYSTEM
 - ☒ UNDOTBS1
 - ☒ USERS
 - ☒ SYS_AUX
 - ☒ SYSTEM
 - ☒ UNDOTBS1
 - ☒ USERS

☐ Restore raw file

Previous Next Cancel Help

6. Select where to restore the database, either to Original location or Alternate location.

Choose Where The Databases To Be Restored

Restore databases to

☒ Original location

☐ Alternate location

[Show advanced option](#)

Previous Restore Cancel Help

If you would like to enable the 'Verify checksum of in-file delta files during restore' setting, click the **Show advanced option** link.

Choose Where The Databases To Be Restored

Restore databases to

☒ Original location

☐ Alternate location

☐ Verify checksum of in-file delta files during restore

[Hide advanced option](#)

If Alternate location is selected, configure the following settings in the Alternate database screen:

- **Oracle Home** – where the Oracle_Home path is located. This is already set to the location of the Oracle_Home by default.
- **Host** – this value is set to 127.0.0.1.
- **Port** – the new port number of the alternate Oracle database instance.
- **SID** – the new SID for the alternate Oracle database instance.

NOTE

If a restore will be performed to an alternate location, it is required to change the Oracle SID and port number.

- **Password** – the password for the system user account in the new database

Alternate database

Oracle Home

[Browse](#)

Host Port

Database Identification

A database is referenced by at least one Oracle instance which is uniquely identified from any other instance on this computer by an Oracle System Identifier (SID)

SID

Database Credentials

For security reasons, you must specify passwords for the SYSTEM user account in the new database

Password

Confirm password

[Previous](#) [Next](#) [Cancel](#) [Help](#)

NOTE

If password complexity is enabled on the Oracle instance, ensure that the password you will enter complies fully with the password complexity requirements.

Otherwise, a restore error message will be shown due to a failed password complexity and the restore process will not be completed. Please refer to [Appendix A](#) for more details.

Once configured, click **Next** to proceed.

Once the Oracle database instance has been modified, it will reflect on the original Database File Locations automatically. Click **Next** to proceed.

Database File Locations

Database Area

Specify locations for the database files to be restored

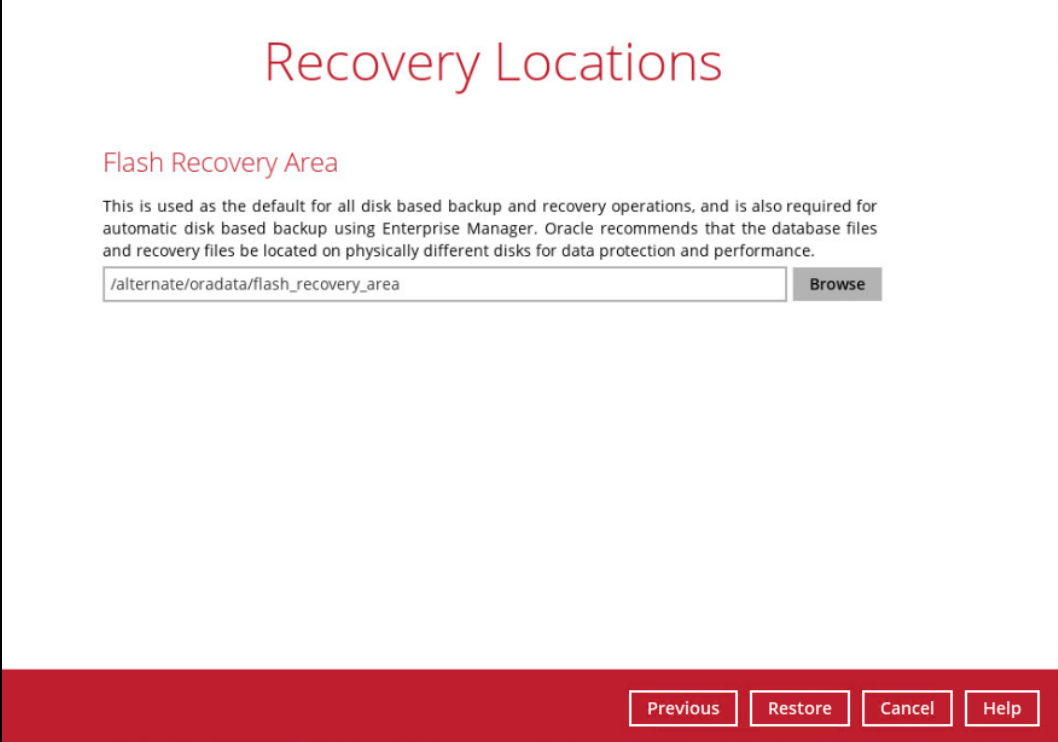
Control file

Filename	File Directory	
<input type="text" value="control01.ctl"/>	<input type="text" value="/u01/app/oracle/oradata/orcl"/>	<input type="button" value="Browse"/>
<input type="text" value="control02.ctl"/>	<input type="text" value="/u01/app/oracle/oradata/orcl"/>	<input type="button" value="Browse"/>

Data files

Filename	File Directory	
<input type="text" value="sysaux01.dbf"/>	<input type="text" value="/u01/app/oracle/oradata/orcl/pdb1"/>	<input type="button" value="Browse"/>
<input type="text" value="system01.dbf"/>	<input type="text" value="/u01/app/oracle/oradata/orcl/pdb1"/>	<input type="button" value="Browse"/>
<input type="text" value="temp01.dbf"/>	<input type="text" value="/u01/app/oracle/oradata/orcl/pdb1"/>	<input type="button" value="Browse"/>
<input type="text" value="undotbs01.dbf"/>	<input type="text" value="/u01/app/oracle/oradata/orcl/pdb1"/>	<input type="button" value="Browse"/>
<input type="text" value="users01.dbf"/>	<input type="text" value="/u01/app/oracle/oradata/orcl/pdb1"/>	<input type="button" value="Browse"/>
<input type="text" value="sysaux01.dbf"/>	<input type="text" value="/u01/app/oracle/oradata/orcl/pdbseed"/>	<input type="button" value="Browse"/>

Select the path of the **Recovery Location**. Click **Restore** to proceed.



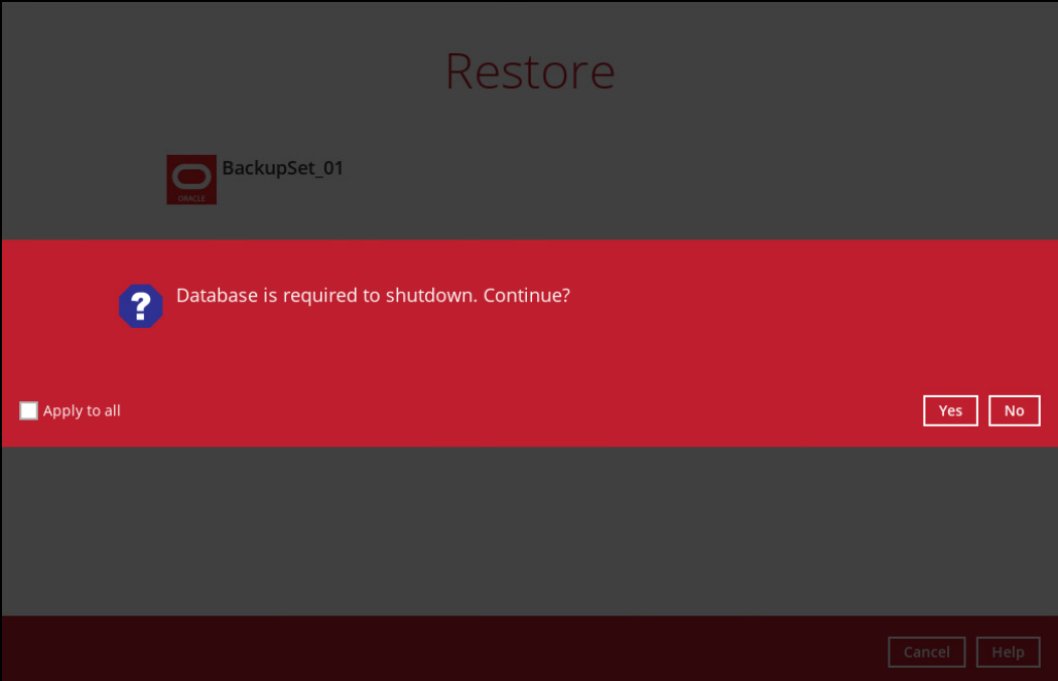
The dialog box is titled "Recovery Locations" in a large, red, sans-serif font. Below the title, the section "Flash Recovery Area" is highlighted in red. A paragraph of text explains its purpose: "This is used as the default for all disk based backup and recovery operations, and is also required for automatic disk based backup using Enterprise Manager. Oracle recommends that the database files and recovery files be located on physically different disks for data protection and performance." Below this text is a text input field containing the path "/alternate/oradata/flash_recovery_area" and a "Browse" button. At the bottom of the dialog, there is a red bar containing four buttons: "Previous", "Restore", "Cancel", and "Help".

Recovery Locations

Flash Recovery Area


This is used as the default for all disk based backup and recovery operations, and is also required for automatic disk based backup using Enterprise Manager. Oracle recommends that the database files and recovery files be located on physically different disks for data protection and performance.


7. When this pop-up message is displayed, click **Yes** to continue.



The dialog box has a dark grey header with the word "Restore" in a large, dark font. Below the header, there is a section with an Oracle logo and the text "BackupSet_01". A red banner across the middle contains a question mark icon and the text "Database is required to shutdown. Continue?". Below the banner, there is a checkbox labeled "Apply to all" and two buttons: "Yes" and "No". At the bottom of the dialog, there is a dark bar containing two buttons: "Cancel" and "Help".

Restore

 BackupSet_01

 Database is required to shutdown. Continue?

☐ Apply to all

8. Restore job has completed successfully.



9. After the restore job is completed, verify if the Oracle database instance has been restored using the following SQL query to verify if the instance is online.

```
$ sqlplus / as sysdba

SQL*Plus: Release 19.0.0.0.0 - Production on Wed Feb 16 15:32:52
2022

Version 19.3.0.0.0

Copyright (c) 1982, 2019, Oracle. All rights reserved.

Connected to:

Oracle Database 19c Enterprise Edition Release 19.0.0.0.0 -
Production

Version 19.3.0.0.0

SQL> select instance from v$instance;

INSTANCE
-----

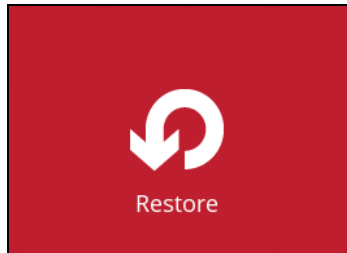
orcl

SQL>
```

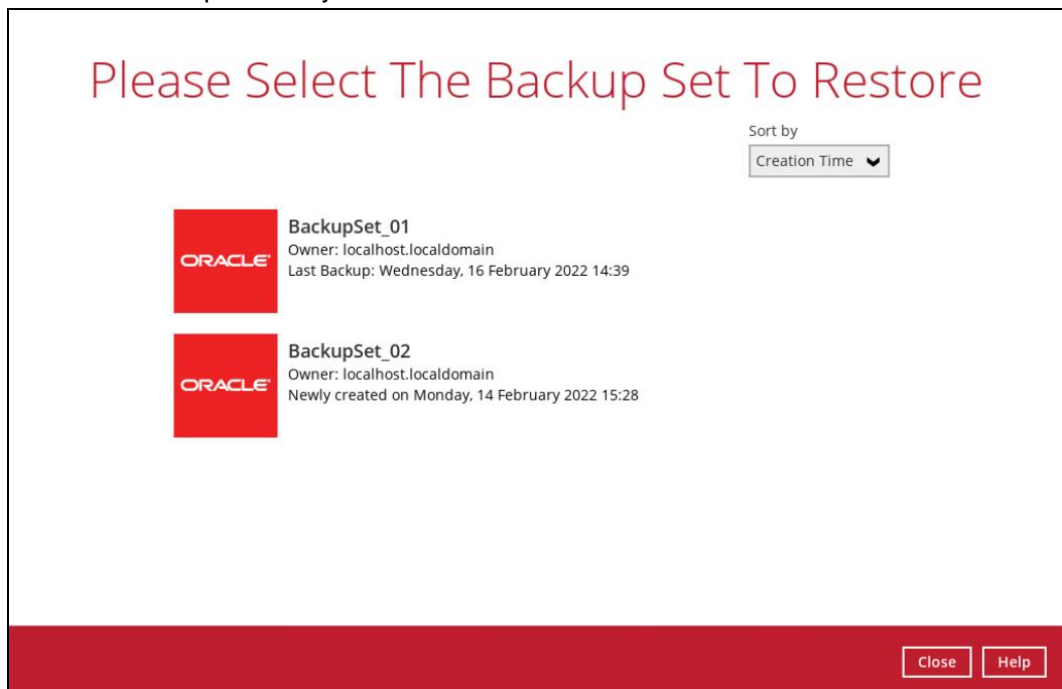
6.3 Manual Oracle Database Restore

This feature is used to restore the Oracle database(s) from your storage destination to a location on disk and manually recover the databases.

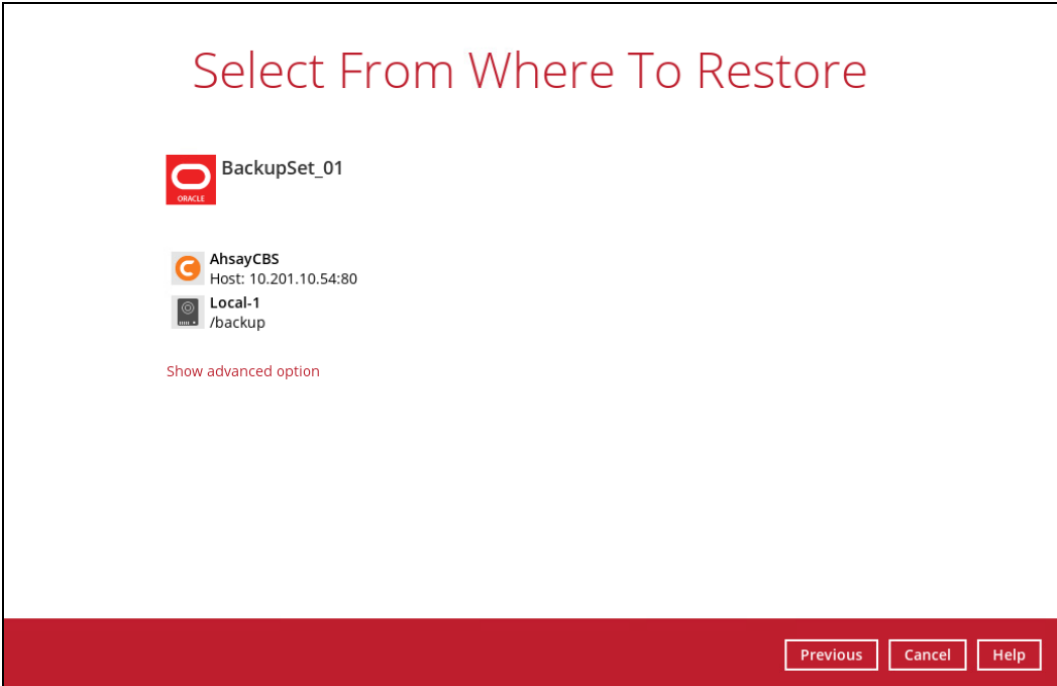
1. On the AhsayOBM main interface, click the **Restore** icon.



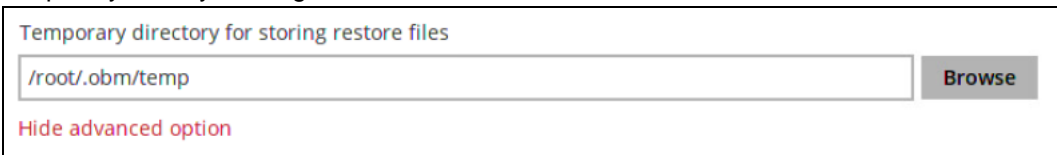
2. Select the backup set that you would like to restore the Oracle database from.



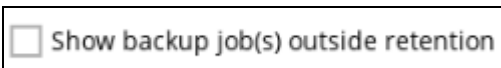
3. Select the destination storage that contains the Oracle database(s) that you would like to restore from.



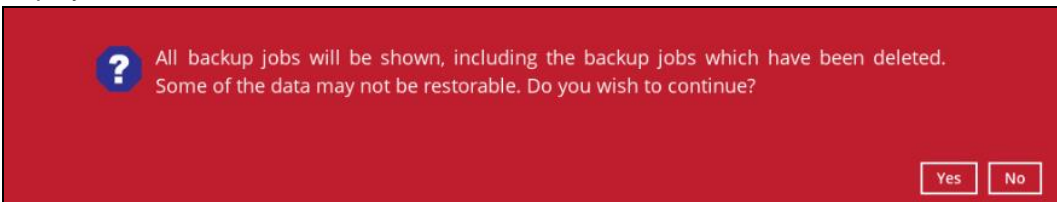
You may configure the **Temporary directory for storing restore files** by clicking **Show advanced option**. This will allow you to select the directory that will be used to store temporary files by clicking the **Browse** button.



4. Tick **Show backup job(s) outside retention** if you want all backup jobs to be displayed, even the deleted ones.



Once ticked, this message will be displayed. Click **Yes** if you want all backup jobs to be displayed, otherwise click **No**.



5. Click the **Restore raw file** option then select the Oracle database(s) to be restored. Click **Next** to proceed.

Select Your Databases To Be Restored

Select what to restore

Choose from files as of job Latest ☐ Show backup job(s) outside retention

Folders	Name	Size	Date modified
AhsayCBS	u01		
Oracle Database Serv	addTempFile.sql	494B	16/02/2022 14:39
u01	initiorcl.oradump	781B	16/02/2022 14:39
app	traceCtrlfile.log	3KB	16/02/2022 14:39
oracle	traceDatafile.log	599B	16/02/2022 14:39
database			
dbs			

☒ Restore raw file

Items per page 50 Page 1 / 1

Search

6. Click **Browse** to select the location on the local machine where you wish to restore the Oracle database(s) to. Click **Restore** to start the restore process.

Choose Where The Databases To Be Restored

Restore databases to

[Show advanced option](#)

If you would like to enable the **Verify checksum of in-file delta files during restore** setting, click the **Show advanced option** link.

Choose Where The Databases To Be Restored

Restore databases to

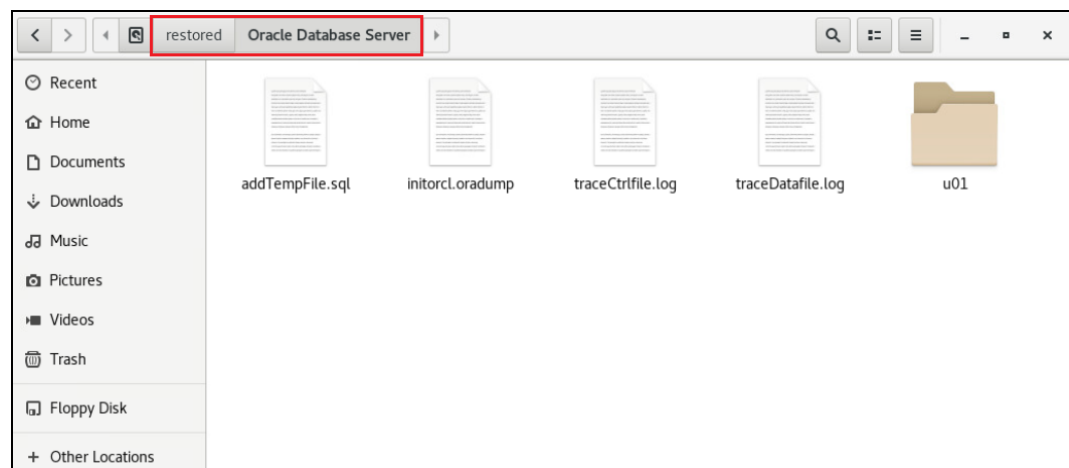
[Show advanced option](#)

7. Restore job has completed successfully.



8. After the restore job is completed, verify if the Oracle database(s) have been restored. Go to the designated path on the local machine where you restored the Oracle database files to.

Example:



9. Recovering RAW Oracle databases

To recover RAW databases, please refer to the following article of Oracle Database Backup and Recovery User's Guide for details:

Oracle 19c

<https://docs.oracle.com/en/database/oracle/oracle-database/19/bradv/index.html>

Oracle 18c

<https://docs.oracle.com/en/database/oracle/oracle-database/18/bradv/index.html>

7 Contacting Ahsay

7.1 Technical Assistance

To contact Ahsay support representatives for technical assistance, visit the Partner Portal:

<https://www.ahsay.com/partners/>

Also use the Ahsay Wikipedia for resource such as Hardware Compatibility List, Software Compatibility List, and other product information:

<https://wiki.ahsay.com/>

7.2 Documentation

Documentations for all Ahsay products are available at:

https://www.ahsay.com/jsp/en/home/index.jsp?pageContentKey=ahsay_downloads_documentation_guides

You can send us suggestions for improvements or report on issues in the documentation by contacting us at:

<https://www.ahsay.com/partners/>

Please specify the specific document title as well as the change required/suggestion when contacting us.

Appendix

Appendix A Example of Restore Log with Error Due to Enforced Password Complexity Requirements

The following log highlighted in red is an example of a common restore error message that may be shown during Restore to Alternate location if the password entered for the system user account in the [Alternate Database](#) screen is unable to comply with password complexity requirements.

```
[2022/02/15 17:29:24] [cbs] info,"Start restore database from \"cdb1\" to  
\"orcl\""",0,0,0,1614580626387,0,0  
[2022/02/15 17:29:28] [erro] OPW-00029: Password complexity failed for  
SYS user : Password must contain at least 1 special character.  
[2022/02/15 17:29:28] [cbs] erro,OPW-00029: Password complexity failed  
for SYS user : Password must contain at least 1 special  
character.,0,0,0,1614580626387,0,0  
[2022/02/15 17:29:28] [erro] [hV] Restore database fail., Reason = "New  
password file fail"  
[2022/02/15 17:29:28] [cbs] erro,"[hV] Restore database fail., Reason =  
\"New password file fail\""",0,0,0,1614580626387,0,0  
[2022/02/15 17:29:28] [erro] Restore completed with error(s)  
[2022/02/15 17:29:28] [cbs]  
end,RESTORE_STOP_SUCCESS_WITH_ERROR,0,0,0,1614580626387,0,0
```