

# **Ahsay Online Backup Manager v9**

## **MariaDB Database Backup and Restore for Linux (CLI)**

Ahsay Systems Corporation Limited

11 February 2022

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## Revision History

Date	Descriptions	Version
11 February 2022	▪ Appendix A, B, C and D – added deduplication	9.1.0.0

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# 1 Overview

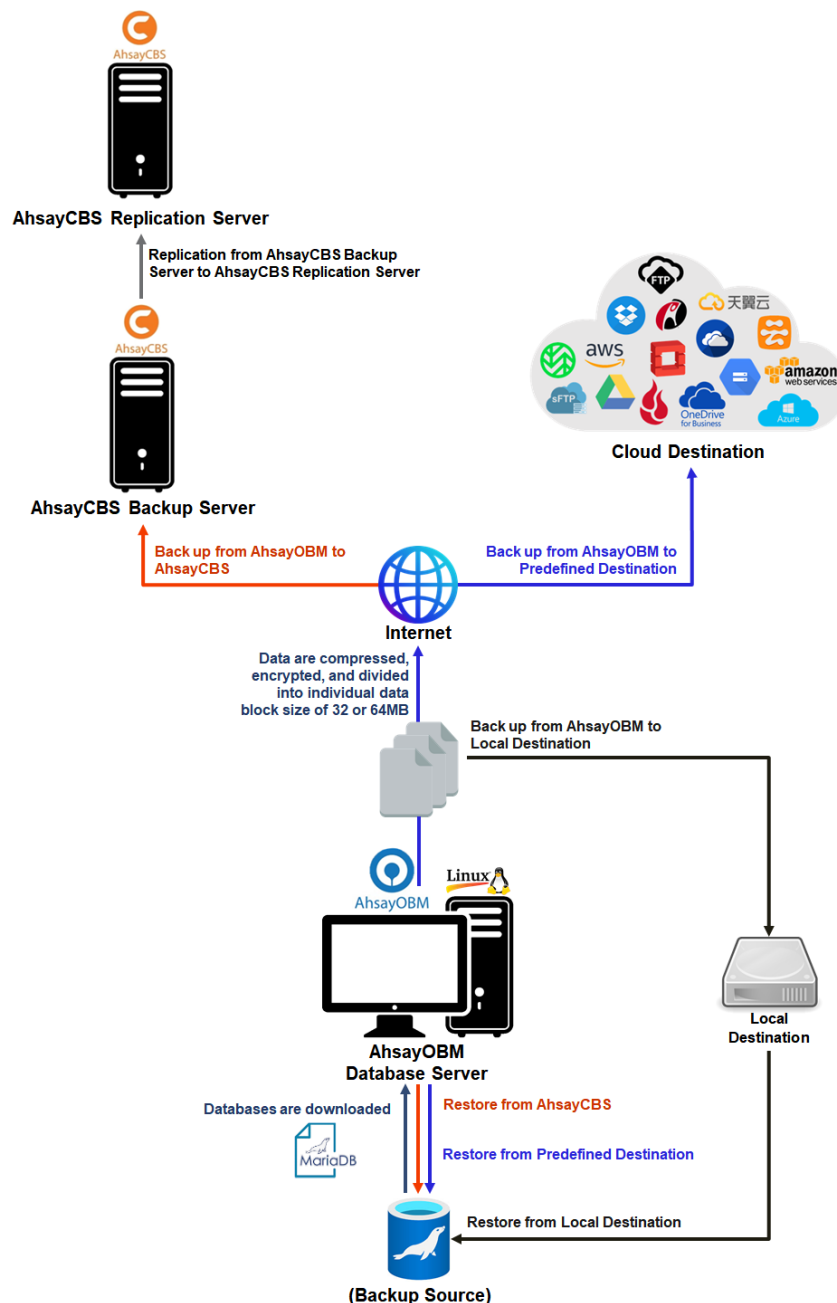
## 1.1 What is this software?

Ahsay brings you specialized client backup software, namely AhsayOBM, to provide a set of tools to protect your MariaDB Database Server.

## 1.2 System Architecture

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

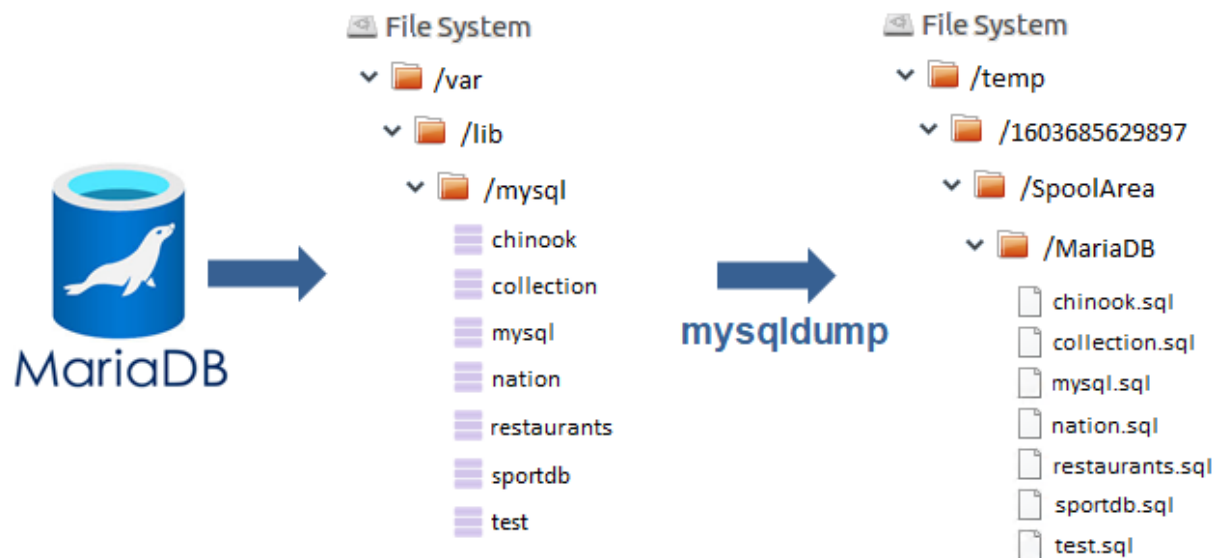
In this user guide, we will focus on the end to end backup and restore process using AhsayOBM as a client backup software.



## 1.3 MariaDB Database Backup Method

AhsayOBM MariaDB Database backup uses a spooling method to make a consistent snapshot of the database(s) for backup.

For each database backup job AhsayOBM will trigger MariaDB to spool or make a copy of the database (.sql) file to the temporary folder using the mysqldump utility.



## 1.4 Mysqldump Parameters

Here is the mysqldump parameter list used for generating the spooled dump file:

- --databases
- --password
- --result-file
- --port
- --user
- --host
- --opt
- --quote-names
- --allow-keywords
- --triggers

Example:

For spooling of the “collection” database to /temp folder, the following parameters will be used:

Mysqldump --databases collection --user=user1 --password=qwerty --host=localhost --port=3306 --opt --quote-names --allow-keywords --triggers --result-file=/temp/collection.sql

For details on mysqldump parameters please refer to

<https://dev.mysql.com/doc/refman/8.0/en/mysqldump.html>

## 2 Preparing for Backup and Restore

### 2.1 Hardware Requirement

To achieve the optimal performance when AhsayOBM is running on your machine, refer to the following article for the list of hardware requirements.

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

### 2.2 Software Requirement

Make sure the operating system where you have the MariaDB Database Server installed is compatible with the AhsayOBM. Refer to the following article for the list of compatible operating systems and application versions.

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

### 2.3 AhsayOBM Installation

Make sure that the latest version of AhsayOBM is installed directly on the machine where the MariaDB database(s) are hosted.

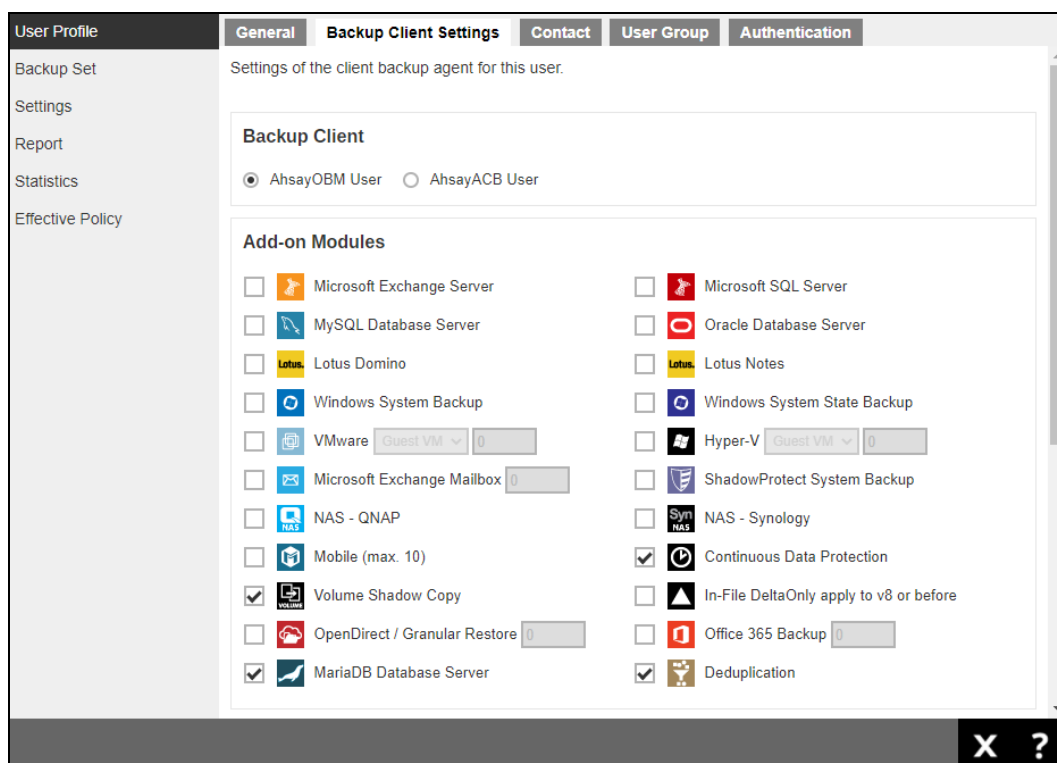
#### NOTE

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

### 2.4 Add-on Module Requirement

Make sure the MariaDB Database Server add-on module has been enabled in your AhsayOBM user account.

Please contact your backup service provider for more details.





## 2.5 Backup Quota Requirement

Make sure that your AhsayOBM user account has sufficient quota assigned to accommodate the storage of MariaDB Database Server backup set and retention policy.

Please contact your backup service provider for more details.

## 2.6 MariaDB Database Server Requirements

Please ensure that the following requirements and conditions are met on the MariaDB database server.

### 2.6.1 MariaDB Version

AhsayOBM support MariaDB version 10.0 or above. For details of all supported MariaDB versions please refer to [FAQ: Ahsay Software Compatibility List \(SCL\) for version 9.1 or above](#).

To verify the MariaDB database version you can run either:

- i. From the Linux command line use the `/usr/bin/mariadb --version` or `/usr/bin/mysql --version` command.

Example: MariaDB 10.4.15

```
# /usr/bin/mariadb --version
/usr/bin/mariadb Ver 15.1 Distrib 10.4.15-MariaDB, for debian-linux-
gnu (x86_64) using readline 5.2
```

or

Example: MariaDB 10.4.15

```
# /usr/bin/mysql --version
/usr/bin/mariadb Ver 15.1 Distrib 10.4.15-MariaDB, for debian-linux-
gnu (x86_64) using readline 5.2
```

However for some older MariaDB database versions, you can only use the `/usr/bin/mysql` command to verify the version.

Example: MariaDB 10.0.38

```
# /usr/bin/mysql --version
/usr/bin/mysql Ver 15.1 Distrib 10.0.38-MariaDB, for debian-linux-
gnu (x86_64) using readline 5.2
```

- ii. Login to the MariaDB instance and use the `select version();` command.

To login you can use either the `mariadb -u root -p` or `mysql -u root -p` command.

Example: MariaDB 10.4.15

```
# mariadb -u root -p
Enter password:
Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MariaDB connection id is 255
Server version: 10.4.15-MariaDB-1:10.4.15+maria~focal mariadb.org
binary distribution
```

```

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input
statement.

MariaDB [(none)]> select version();
+-----+
| version() |
+-----+
| 10.4.15-MariaDB-1:10.4.15+maria~focal |
+-----+
1 row in set (0.000 sec)

```

or

#### Example: MariaDB 10.4.15

```

# mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 341
Server version: 10.4.15-MariaDB-1:10.4.15+maria~focal mariadb.org
binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input
statement.

MariaDB [(none)]> select version();
+-----+
| version() |
+-----+
| 10.4.15-MariaDB-1:10.4.15+maria~focal |
+-----+
1 row in set (0.000 sec)

```

However for some older MariaDB database versions, you can only use the **mysql -u root -p** command to login.

#### Example: MariaDB 10.0.38

```

# mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 31
Server version: 10.0.38-MariaDB-0ubuntu0.16.04.1 Ubuntu 16.04
distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input
statement.

MariaDB [(none)]> select version();
+-----+
| version() |
+-----+
| 10.0.38-MariaDB-0ubuntu0.16.04.1 |
+-----+
1 row in set (0.000 sec)

```

## 2.6.2 MariaDB Database Status

The MariaDB database instance is online. To check use either the **service mariadb status** or **service mysql status** command.

Example: MariaDB 10.4.15 on Ubuntu 20.04 LTS

```
# service mariadb status
● mariadb.service - MariaDB 10.4.15 database server
   Loaded: loaded (/lib/systemd/system/mariadb.service; enabled;
   vendor preset disabled)
   Drop-In: /etc/systemd/system/mariadb.service.d
            └─migrated-from-my.cnf-settings.conf
   Active: active (running) since Wed 2020-10-21 09:41:54 PST; 1 day
   6h ago
     Docs: man:mysqld(8)
           https://mariadb.com/kb/en/library/systemd/
  Main PID: 831 (mysqld)
    Status: "Taking your SQL requests now..."
     Tasks: 30 (limit: 4657)
    Memory: 260.8M
    CGroup: /system.slice/mariadb.service
            └─831 /usr/sbin/mysqld
```

or

Example: MariaDB 10.4.15 on Ubuntu 20.04 LTS

```
# service mysql status
● mariadb.service - MariaDB 10.4.15 database server
   Loaded: loaded (/lib/systemd/system/mariadb.service; enabled;
   vendor preset disabled)
   Drop-In: /etc/systemd/system/mariadb.service.d
            └─migrated-from-my.cnf-settings.conf
   Active: active (running) since Wed 2020-10-21 09:41:54 PST; 3
   months 0 days ago
     Docs: man:mysqld(8)
           https://mariadb.com/kb/en/library/systemd/
  Main PID: 831 (mysqld)
    Status: "Taking your SQL requests now..."
     Tasks: 30 (limit: 4657)
    Memory: 260.8M
    CGroup: /system.slice/mariadb.service
            └─831 /usr/sbin/mysqld
```

However for some older MariaDB database versions, use the **service mysql status** command.

Example: MariaDB 10.0.38 on Ubuntu 16.04

```
# service mysql status
● mysql.service - LSB: Start and stop the mysql database server daemon
   Loaded: loaded (/etc/init.d/mysql; bad; vendor preset: enabled)
   Active: active (running) since Wed 2021-01-20 16:02:03 HKT; 23h ago
     Docs: man:systemd-sysv-generator(8)
    CGroup: /system.slice/mysql.service
            └─1234 /bin/bash /usr/bin/mysqld_safe
            └─1443 /usr/sbin/mysqld --basedir=/usr --
datadir=/var/lib/mysql --plugin-dir=/usr/lib/mysql/plugin --user=mysql
--skip-log-error --pid-file=/var/run/mysqld/mysqld.pid --
socket=/var/run/mysqld/mysqld.sock --port=3306
            └─1444 logger -t mysqld -p daemon error

Jan 20 16:02:01 ubuntu1604 mysqld[1444]: 210120 16:02:01 [Note]
InnoDB: Waiting for purge to start
```

```

Jan 20 16:02:01 ubuntu1604 mysqld[1444]: 210120 16:02:01 [Note]
InnoDB: Percona XtraDB (http://www.percona.com) 5.6.42-84.2 started;
log sequence number 9155283
Jan 20 16:02:01 ubuntu1604 mysqld[1444]: 210120 16:02:01 [Note] Plugin
'FEEDBACK' is disabled.
Jan 20 16:02:01 ubuntu1604 mysqld[1444]: 210120 16:02:01 [Note] Server
socket created on IP: '127.0.0.1'.
Jan 20 16:02:02 ubuntu1604 mysqld[1444]: 210120 16:02:02 [Note]
/usr/sbin/mysqld: ready for connections.
Jan 20 16:02:02 ubuntu1604 mysqld[1444]: Version: '10.0.38-MariaDB-
0ubuntu0.16.04.1' socket: '/var/run/mysqld/mysqld.sock' port: 3306
Ubuntu 16.04
Jan 20 16:02:03 ubuntu1604 mysql[1068]: ...done.

```

## 2.6.3 TCP/IP Port

Check the listening port of the MariaDB database instance (default is 3306) using the **netstat -an** command.

```

# netstat -an|more
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address Foreign Address State
tcp 0 0 127.0.0.53:53 0.0.0.0:* LISTEN
tcp 0 0 0.0.0.0:22 0.0.0.0:* LISTEN
tcp 0 0 127.0.0.1:631 0.0.0.0:* LISTEN
tcp 0 0 10.16.30.80:22 192.168.12.1:59654 ESTABLISHED
tcp 0 192 10.16.30.80:22 192.168.12.1:56350 ESTABLISHED
tcp 0 0 10.16.30.80:22 192.168.12.1:59609 ESTABLISHED
tcp6 0 0 :::631 :::* LISTEN
tcp6 0 0 :::3306 :::* LISTEN
udp 0 0 127.0.0.53:53 0.0.0.0:*
udp 0 0 0.0.0.0:57754 0.0.0.0:*
udp 0 0 0.0.0.0:631 0.0.0.0:*
udp 0 0 0.0.0.0:5353 0.0.0.0:*
udp6 0 0 :::35723 :::*
udp6 0 0 :::5353 :::*
raw6 0 0 :::58 :::*

```

## 2.6.4 Mysqldump Utility

The **mysqldump** utility is installed on the MariaDB database server. To locate the **mysqldump** utility use the **whereis** command:

```

# whereis mysqldump
mysqldump: /usr/bin/mysqldump /usr/share/man/man1/mysqldump.1.gz

```

## 2.6.5 Mysqldump Utility Version

The mysqldump utility is the same version as the MariaDB database.

To check the mysqldump version use the **mysqldump --version** command.

Example: MariaDB 10.4.15 on Ubuntu 20.04 LTS

```
# mysqldump --version
mysqldump Ver 10.17 Distrib 10.4.15-MariaDB, for debian-linux-gnu
(x86_64)
```

## 2.6.6 User Account Privileges

A MariaDB database user account with the following privileges must be setup for the backup operation.

```
MariaDB [(none)]> GRANT ALL PRIVILEGES ON *.* TO 'username'@'localhost'
IDENTIFIED BY 'password';
Query OK, 0 rows affected (0.103 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON *.* TO
'username'@'localhost.localdomain' IDENTIFIED BY 'password';
Query OK, 0 rows affected (0.001 sec)

MariaDB [(none)]> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.003 sec)
```

## 2.6.7 Localhost

Verify that 'localhost' on the MariaDB database server is resolvable using the command **ping localhost**.

```
# ping localhost
PING localhost (127.0.0.1) 56(84) bytes of data.
64 bytes from localhost (127.0.0.1): icmp_seq=1 ttl=64 time=0.046 ms
64 bytes from localhost (127.0.0.1): icmp_seq=2 ttl=64 time=0.044 ms
64 bytes from localhost (127.0.0.1): icmp_seq=3 ttl=64 time=0.044 ms
64 bytes from localhost (127.0.0.1): icmp_seq=4 ttl=64 time=0.044 ms
64 bytes from localhost (127.0.0.1): icmp_seq=5 ttl=64 time=0.046 ms

--- localhost ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4097ms
rtt min/avg/max/mdev = 0.044/0.044/0.046/0.000 ms
```

'localhost' is allowed to access the MariaDB database instance on the MariaDB service listening port (default 3306) using the command **telnet localhost 3306**.

```
# telnet localhost 3306
Trying 127.0.0.1...
Connected to 127.0.0.1.
Escape character is '^]'.
J
5.5.5-10.4.15-MariaDB-
1:10.4.15+maria~focal[?>Z)\uY>hpz42={v\Lmysql_native_password
```

## 2.6.8 MariaDB Virtual System Databases

The 'information\_schema' and 'performance\_schema' databases are MariaDB virtual system databases, which contains information about the user databases on the MariaDB instance,

are automatically excluded from the backup source. They are read-only and cannot be backed up.

```
MariaDB [(none)]> show databases;
+-----+
| Database |
+-----+
| Chinook  |
| employees|
| information_schema |
| mysql    |
| nation   |
| northwind|
| performance_schema |
| sportdb  |
+-----+
8 rows in set (0.001 sec)
```

## 2.6.9 Temporary Directory

The databases selected for backup will be temporarily spooled to a temporary directory before being uploaded to the backup server or destination storage.

Ensure the temporary directory configured for the MariaDB database backup has sufficient disk space for the backup operation. The free space on the temporary directory drive should be at least 150% of the database size, as the temporary directory is also used for storing index files and any incremental or differential delta files generated during the backup job before they are uploaded to the backup destination.

Example:

If the default setting for Delta ratio is 50% for in-file delta, if the total MariaDB database size is 100GB and there is only one backup destination, the minimum free space needed on the drive where the temporary directory folder is located = 150GB

100GB = Total MariaDB database size

50GB = Total maximum size of incremental or differential delta files generated

Please bear in mind the size of the databases may grow over time and you may need to review the temporary directory free space requirements on a regular basis.

To calculate for the size of your databases run the command below.

```
MariaDB [(none)]> SELECT table_schema AS "Database",
ROUND(SUM(data_length + index_length) / 1024 / 1024, 2) AS "Size (MB)"
FROM information_schema.tables GROUP BY table_schema;
+-----+-----+
| Database | Size (MB) |
+-----+-----+
| Chinook  | 1.83 |
| employees| 140.80 |
| information_schema | 0.19 |
| mysql    | 2.24 |
| nation   | 0.66 |
| northwind| 1.09 |
| performance_schema | 0.00 |
| sportdb  | 2.89 |
+-----+-----+
8 rows in set (7.980 sec)
```

## 3 Creating a MariaDB Database Backup Set

Startup AhsayOBM.

For instructions on how to do this refer to Chapter 5 of the [AhsayOBM v9 Quick Start Guide for Linux \(CLI\)](#).

There are two options to create a MariaDB Database Backup Set for Linux.

### • [Using AhsayCBS web console](#)

For backup set creation on AhsayCBS web console, most backup set preferences may be configured using AhsayCBS except the following:

- backup set encryption key settings
- MariaDB login password

After the backup set preferences are setup on the AhsayCBS web console, to complete the backup set creation process the RunConfigurator.sh script will need to be used on the MariaDB machine to do the following:

- to setup the backup set encryption key settings
- to export/import the backupSet.xml file to setup the MariaDB login password

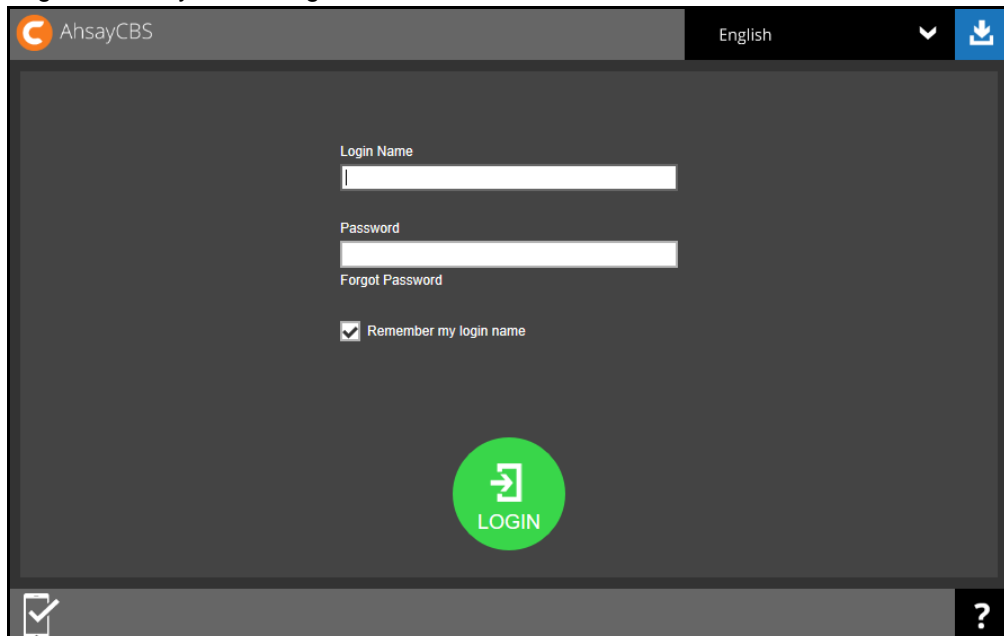
### • [Using command line](#)

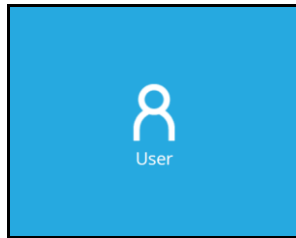
For backup set creation using command line, most backup set preferences may be configured using the backupSet.xml file.


To complete the backup set creation process after successfully importing the backupSet.xml file, the RunConfigurator.sh script will need to be used on the MariaDB machine to setup the backup set encryption key settings.

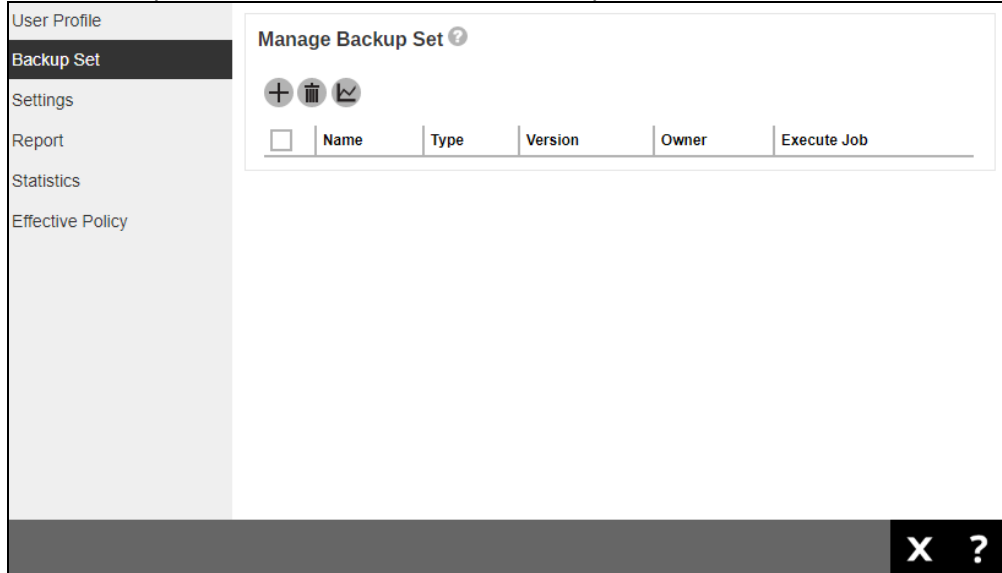
### 3.1 Create a MariaDB Database Backup Set using AhsayCBS


1. Log in to AhsayCBS and go to User.

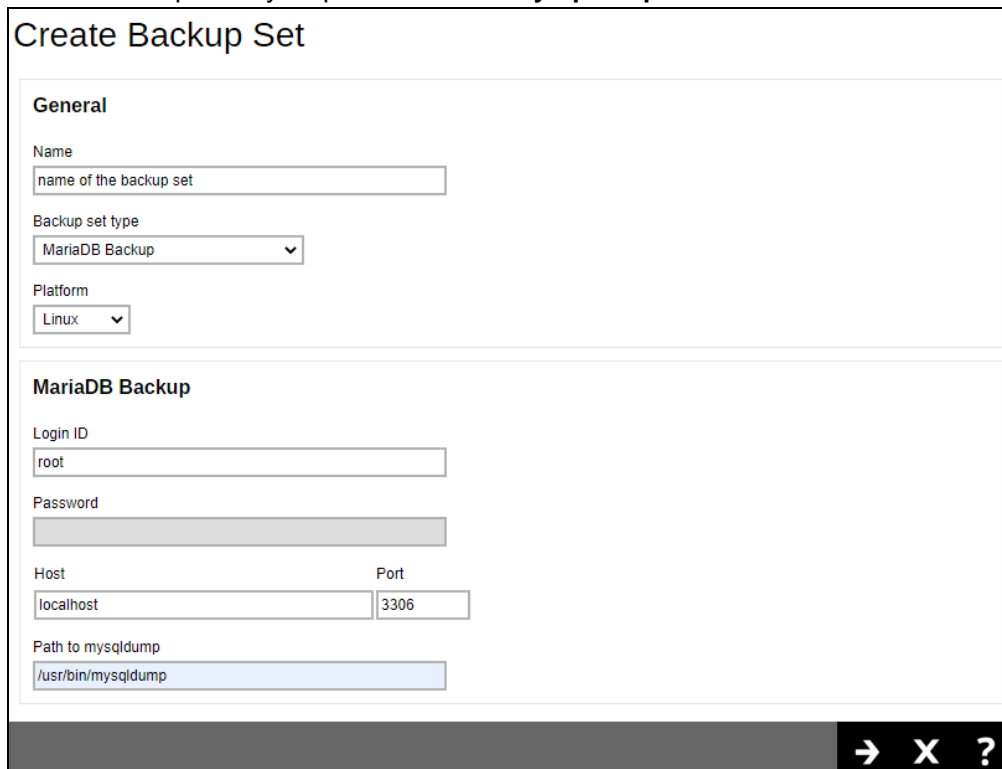




2. Go to Backup Set then click  to create a backup set.



3. Input the **Name**, select the **Type** which should be 'MariaDB Backup' and **Platform** which should be 'Linux'. Update the Host and Port. Default settings for these are 'localhost' and '3306' respectively. Input the **Path to mysqldump** then click .





4. Add the backup source in the **Other Selected Source** by clicking the  button e.g. path is MariaDB/collection.

### Backup Source

#### Other Selected Source



☐ Path

☐ MariaDB/collection

☐ MariaDB/test

To backup all databases in the MariaDB machine, use the path MariaDB.


### Backup Source

#### Other Selected Source



☐ Path

☐ MariaDB

Input the path of the source to be backed up. Click the  button to add the source. Keep doing this until all the backup source are added.

### Other Selected Source

Path

path of the database to be backed up



To exclude a source you can add it under **Deselected Source** by clicking the  button.

#### NOTE

Always add the 'information\_schema' and 'performance\_schema' databases under **Deselected Source** since they are MariaDB virtual system databases. They are read-only and cannot be backed up.



### Deselected Source



☐ Path

☐ MariaDB/information\_schema




☐ MariaDB/performance\_schema

Input the path of the source to be excluded in the backup. Click the  button to add the deselected source. Keep doing this until all source to be excluded are added. Click .

### Deselected Source

Path

path of the database to be excluded in the backup


- The **Run scheduled backup for this backup set** is turned on by default. If you do not want to create a backup schedule you can turn it off by sliding the lever to the left. By default, there is already a backup schedule created that is scheduled to run daily at 3am until full backup is completed. This schedule may either be edited or deleted if you want to create your own backup schedule.

#### NOTE



It is optional to input the computer name in the **Run scheduled backup on computers named** field since it will be updated once backup set creation is completed in the AhsayOBM client. In Step 15, the computer name can be checked as the Owner.

### Schedule

Run scheduled backup for this backup set







Manage schedule






<input type="checkbox"/>	Name	Type
<input type="checkbox"/>	Backup Schedule	Daily

Run scheduled backup on computers named

\*

Click  to add a new schedule or double click on the existing schedule to change the values. Click  to proceed.

### Backup Schedule

Client version < 8.3.3.20 does not support periodic schedule, periodic schedule will work as normal schedule.

#### Details

Name

name of the backup schedule

Type

Daily

Start backup

at

00

:


00


Stop


until full backup completed

☐

Run Retention Policy after backup







6. Select the **Backup Mode** if Concurrent or Sequential. By default, **Sequential** is selected. In Sequential backup mode, if there are multiple destinations configured in the backup set, AhsayOBM will backup to one destination at a time. In **Concurrent** backup mode, if there are multiple destinations configured in the backup set, AhsayOBM will backup to all destinations at the same time or concurrently.

#### NOTE

For backup sets with multiple destinations, sequential backup mode will take longer compared with concurrent backup mode.

### Destination

Backup Mode

Sequential





☐

Name

If **Concurrent** is selected, specify the maximum number of backup destinations.

### Destination

Backup Mode  
Concurrent

Maximum concurrent backup destinations  
Unlimited

2  
3  
4  
5  
6  
7  
8  
9  
10

← → X ?

Click the **+** button to add the standard or predefined destinations.

### Destination

Backup Mode  
Sequential

+ -

☐ Name

← → X ?

Select your desired destination, it could be one or both displayed destinations. Tick the checkbox and click **+** to proceed. Click **→**.


### Add Destination

☐ Name

☐  AhsayCBS

☐  GoogleDrive-1

**+** X ?

7. Click  to create the Backup Set.

### Destination

Backup Mode

Sequential


+

🗑️


☐

Name

☐

 AhsayCBS

←



X

?

8. Click on the backup set you just created.

User Profile

**Backup Set**

Settings

Report

Statistics


Effective Policy

### Manage Backup Set ?

+


🗑️

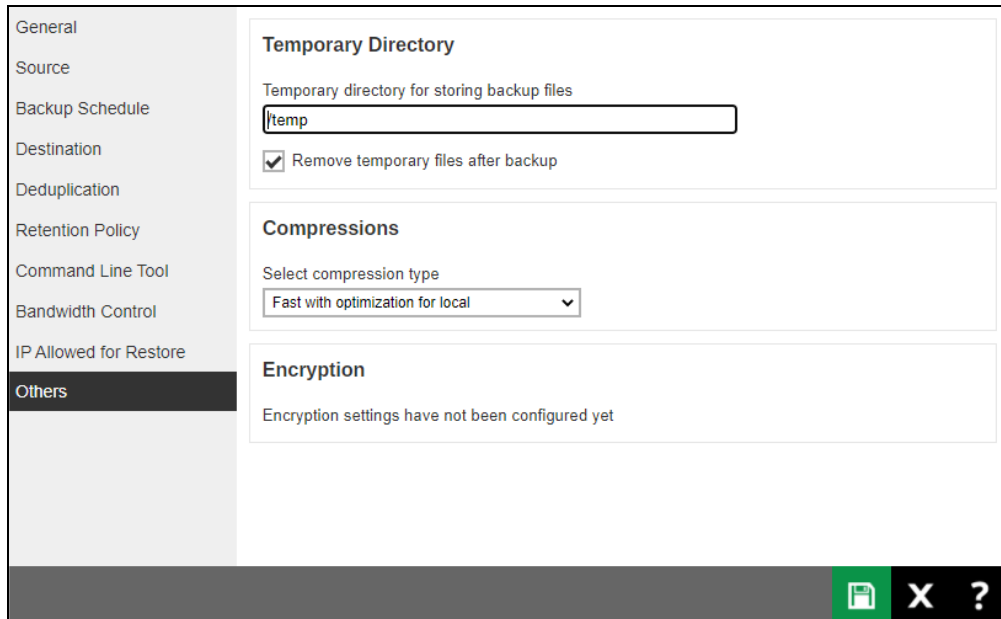
📈

<input type="checkbox"/>	Name	Type	Version	Owner	Execute Job
<input type="checkbox"/>	MariaDB Daily (1604415181939)		--	--	--

X

?

Go to **Others** and input the path of your temporary directory. It is recommended to check the box beside **Remove temporary files after backup** to make sure the spooled database files are cleaned up after each backup job to free up space on the temporary drive. Otherwise, if the temporary drive runs out of space the database backup job will not run. You can also change the settings for the **Compressions**. Click  once done.



9. Open ssh session in the Linux machine and execute the RunConfigurator.sh script. The Login Menu will be displayed. Select (1) . **Login** then press Enter to login. Input your Login Name and Password. Set the encryption setting for the backup set.

```
# cd /usr/local/obm/bin
# sh RunConfigurator.sh
Startup Ahsay Online Backup Manager ...
Config file found

Login Menu
-----
(1). Login
(2). Change Network Settings
(3). Forgot Password
(4). Quit
-----
Your Choice: 1

Login Name : MariaDBLinux
Password : *****

Please wait while verifying user account with server...
Your profile has been downloaded and updated.

Encryption setting has not been defined for backup set "MariaDB Daily"
Do you want to set the encryption setting for this backup set? (Y/N) ? Y
Enable Encryption (Y/N) ? Y

Choose Encryption Type
-----
(1). Default
(2). User password
(3). Custom
-----
Your Choice: 2
```

10. Edit the backup set created from AhsayCBS to add the MariaDB Password. Select (1) .  
**List Backup Sets** to list the backup set.

```
Main Menu
-----
(1). List Backup Sets
(2). Delete Backup Set
(3). Export Backup Set Settings to XML
(4). Import Backup Set Settings from XML
(5). Generate new Backup Set Settings Template
(6). Change Language [English]
(7). Update Profile Settings
(8). Quit
-----
Your Choice: 1
```

11. Select the backup set to show the details by selecting (1) . **Name of your backup set**

```
Select a Backup Set to show more details
-----
(1). MariaDB Daily
-----
Your Choice: 1

Name           : MariaDB Daily
Owner          : localhost.localdomain
Type           : MariaDB
Selected Source : MariaDB/collection
Selected Source : MariaDB/test
Deselected Source : MariaDB/information_schema
Deselected Source : MariaDB/performance_schema
Destination Name : AhsayCBS, Type: OBS
Encryption Key  : abc
Encryption Algorithm : AES
Encryption Mode  : CBC
Encryption Key Length: 256

Press Enter to continue...
```

12. Export the backup set to XML by selecting (3) . **Export Backup Set Setting to XML**

```
Main Menu
-----
(1). List Backup Sets
(2). Delete Backup Set
(3). Export Backup Set Settings to XML
(4). Import Backup Set Settings from XML
(5). Generate new Backup Set Settings Template
(6). Change Language [English]
(7). Update Profile Settings
(8). Quit
-----
Your Choice: 3

Choose your backup set to generate XML file
-----
(1). MariaDB Daily
-----
Your Choice: 1

XML file successfully exported to /root/.obm/config/backupSet.xml
```

13. Exit from the Main Menu then edit the XML file by using an editor like vi. Add the Value data for **MariaDB Password** to the file then save.

```
# cd /root/.obm/config
# vi backupSet.xml

<!-- MariaDB Password -->
  <Value data="abc123$%" name="Password" type="string" />
```

#### NOTE

Please refer to [Appendix B](#) for details on the field to be configured.

14. Import the backup set by selecting **(4) . Import Backup Set Setting from XML**. Confirm overwrite of file.

```
Main Menu
-----
(1). List Backup Sets
(2). Delete Backup Set
(3). Export Backup Set Settings to XML
(4). Import Backup Set Settings from XML
(5). Generate new Backup Set Settings Template
(6). Change Language [English]
(7). Update Profile Settings
(8). Quit
-----

Your Choice: 4

Backup Set 'MariaDB Daily' already exist. Confirm overwrite? (Y/N) ? Y
XML imported, uploading to server...

XML successfully uploaded to server
```

15. Check in AhsayCBS web console if MariaDB Password and Encryption setting was successfully added.

General	General
Source	ID 1643355672811
Backup Schedule	Name <input type="text" value="MariaDB Daily"/>
Destination	Owner localhost.localdomain
Deduplication	Backup set type <input type="text" value="MariaDB Backup"/>
Retention Policy	
Command Line Tool	
Bandwidth Control	
IP Allowed for Restore	
Others	

MariaDB Backup	
Login ID	<input type="text" value="root"/>
Password	<input type="password" value=""/>
Host	Port <input type="text" value="localhost"/> <input type="text" value="3306"/>
Path to mysqldump	<input type="text" value="/usr/bin/mysqldump"/>



General

Source

Backup Schedule

Destination

Deduplication

Retention Policy

Command Line Tool

Bandwidth Control

IP Allowed for Restore

Others

Temporary Directory

Temporary directory for storing backup files

☒ Remove temporary files after backup

Compressions

Select compression type

Encryption

Backup user password is used as the encrypting key since "User Password" encryption type has been applied to this backup set

Encrypting key \*\*\*\*\*

Algorithm

AES

Method

CBC

Key length

256

X ?

## 3.2 Create a MariaDB Database Backup Set using command line

1. To create a MariaDB database backup set, select (5) . **Generate new Backup Set Settings Template** from the menu.

```
Main Menu
-----
(1). List Backup Sets
(2). Delete Backup Set
(3). Export Backup Set Settings to XML
(4). Import Backup Set Settings from XML
(5). Generate new Backup Set Settings Template
(6). Change Language [English]
(7). Update Profile Settings
(8). Quit
-----
Your Choice: 5
```

2. Select (3) . **MariaDB** to generate a MariaDB Database Backup Set template file to **/root/.obm/config** directory.

```
Choose a template from a backup set type
-----
(1). File
(2). MySQL Database
(3). MariaDB
(4). Oracle Database Server
(5). IBM Domino
-----
Your Choice: 3

XML file successfully exported to /root/.obm/config/backupSet.xml

Main Menu
-----
(1). List Backup Sets
(2). Delete Backup Set
(3). Export Backup Set Settings to XML
(4). Import Backup Set Settings from XML
(5). Generate new Backup Set Settings Template
(6). Change Language [English]
(7). Update Profile Settings
(8). Quit
-----
Your Choice:
```

### 3. Configuring MariaDB Backup Set Settings.

To configure the MariaDB backup set setting you need to edit the `/root/.obm/config/backupSet.xml` file using a text editor, for example vi

You can either quit the RunConfigurator.sh script or open a new ssh session to edit the backupSet.xml file.

Please refer to Appendix [A](#), [B](#), [C](#), and [D](#) for details and examples on how to create backup sets using the `backupSet.xml` file.

#### NOTES

- i. Before importing the backupSet.xml file please remove any unused destinations and backup schedule settings. Otherwise the following error will be displayed **"Failed to import XML file (Reason: Value of name is empty!)"** when trying to import the backupSet.xml file.
- ii. Setup of the following cloud storage destinations: OneDrive, OneDrive for Business, DropBox and Google Drive are not supported in Linux CLI environment, as these cloud storage destinations require authentication using a web browser.

### 4. Importing the updated backupSet.xml file to AhsayOBM

After you have edited the backupSet.xml file with your chosen backup settings you need to import the settings back to AhsayOBM, so they can be uploaded to AhsayCBS backup server to create the backup set.

For example: to create a new MariaDB backup set called "MariaDB Database 1" with encryption enabled and default encryption settings.

```
Main Menu
-----
(1). List Backup Sets
(2). Delete Backup Set
(3). Export Backup Set Settings to XML
(4). Import Backup Set Settings from XML
(5). Generate new Backup Set Settings Template
(6). Change Language [English]
(7). Update Profile Settings
(8). Quit
-----
Your Choice: 4

Reading xml...
Reading xml...Done
Verifying destination 'AhsayCBS'...
New backup set created.
Enable Encryption (Y/N) ? y

Choose Encryption Type
-----
(1). Default
(2). User password
(3). Custom
-----
Your Choice: 1

XML imported, uploading to server...

XML successfully uploaded to server
```

## 5. Verify the Backup Set Settings

To verify the uploaded backup set settings are correct select (1) . **List Backup Sets** and then select the backup you wish to verify, for example backup set named “MariaDB Database 1”.

```
Main Menu
-----
(1). List Backup Sets
(2). Delete Backup Set
(3). Export Backup Set Settings to XML
(4). Import Backup Set Settings from XML
(5). Generate new Backup Set Settings Template
(6). Change Language [English]
(7). Update Profile Settings
(8). Quit
-----
Your Choice: 1

Select a Backup Set to show more details
-----
(1). MariaDB Database 1
-----
Your Choice: 1

Name                : MariaDB Database 1
Owner               : ubuntu20
Type                : MariaDB
Selected Source      : MariaDB/collection
Selected Source      : MariaDB/restaurants
Deselected Source   : MariaDB/information_schema
Deselected Source   : MariaDB/performance_schema
Destination Name     : AhsayCBS, Type: OBS
Encryption Key       : abc
Encryption Algorithm : AES
Encryption Mode       : CBC
Encryption Key Length: 256

Press Enter to continue...
```

**Congratulations! The backup set configuration is now complete!**

### NOTES

- i. We would like to stress that it is very important to keep a separate record of your encryption key in a safe place, as you will not be able to restore your data without the correct key.
- ii. If you re-install AhsayOBM or install AhsayOBM on another machine, the encryption key will be required for restoring data from the backup set.

## 4 Overview on the Backup Process

The following steps are performed during a backup job. For an overview of the detailed process for Steps 3, 5, 11, and 13, please refer to Chapter 8 of the [AhsayOBM v9 Quick Start Guide for Linux \(CLI\)](#).

- ▶ Periodic Data Integrity Check (PDIC) Process (**Step 3**)
- ▶ Backup Set Index Handling Process
  - ◉ Start Backup Job (**Step 5**)
  - ◉ Completed Backup Job (**Step 13**)
- ▶ Data Validation Check Process (**Step 11**)



## 5 Running Backup Jobs

Use the **RunBackupSet.sh** script to start a backup job manually.

Example: **RunBackupSet.sh <backupset name>**

```
#cd /usr/local/obm/bin
#sh RunBackupSet.sh "MariaDB Database 1"
-
Using APP_HOME      : /usr/local/obm
Using SETTING_HOME  :
Using JAVA_HOME     : /usr/local/obm/jvm
Using JAVA_EXE      : /usr/local/obm/jvm/bin/java
Using JAVA_OPTS     : -Xrs -Xms128m -Xmx2048m -XX:MaxDirectMemorySize=512m -
client -Dsun.nio.PageAlignDirectMemory=true
Using JNI_PATH      : -Djava.library.path=.
Using CLASSPATH     : ../cb.jar
-
Running Backup Set - 'MariaDB Database 1' ...
[2022/01/31 14:54:40] [info] [-] Start [ AhsayOBM v9.1.0.0 ]
[2022/01/31 14:54:40] [info] [-] Saving encrypted backup set encryption keys
to server...
[2022/01/31 14:54:41] [info] [1643602841932] Start Backup ... Database
[Deduplication: enabled, Deduplication scope: All files within the same
backup set, Migrate Delta: disabled]
[2022/01/31 14:54:41] [info] [1643602841932] Using Temporary Directory
/temp/1643602764440/OBS@1643602841932
[2022/01/31 14:54:43] [info] [-] Start running pre-commands
[2022/01/31 14:54:43] [info] [-] Finished running pre-commands
[2022/01/31 14:54:43] [info] [-] [Start] Backing up database "collection" to
"/temp/1643602764440/SpoolArea/MariaDB/collection.sql"
[2022/01/31 14:54:43] [info] [-] [End]
[2022/01/31 14:54:43] [info] [-] [Start] Backing up database "test" to
"/temp/1643602764440/SpoolArea/MariaDB/test.sql"
[2022/01/31 14:54:43] [info] [-] [End]
[2022/01/31 14:54:43] [info] [-] Start running post-commands
[2022/01/31 14:54:43] [info] [-] Finished running post-commands
[2022/01/31 14:54:53] [info] [1643602841932] Downloading server file list...
[2022/01/31 14:54:53] [info] [1643602841932] Downloading server file list...
Completed
[2022/01/31 14:54:54] [info] [1643602841932] Reading backup source from hard
disk...
[2022/01/31 14:54:54] [info] [1643602841932] Reading backup source from hard
disk... Completed
[2022/01/31 14:54:54] [info] [1643602841932] [New Directory]... MariaDB
[2022/01/31 14:54:55] [info] [1643602841932] [New File]... 100% of
"MariaDB/collection.sql"
[2022/01/31 14:54:55] [info] [1643602841932] [New File]... 100% of
"MariaDB/test.sql"
[2022/01/31 14:54:56] [info] [1643602841932] Start validating the presence
and size of backup data in destination "AhsayCBS"...
[2022/01/31 14:54:56] [info] [1643602841932] File:
"1643602764440/blocks/2022-01-31-14-54-30/0/000000.bak", Size: 960, OK
[2022/01/31 14:54:56] [info] [1643602841932] File:
"1643602764440/blocks/2022-01-31-14-54-30/0/000001.bak", Size: 1,168, OK
[2022/01/31 14:54:56] [info] [1643602841932] Finished validating the
presence and size of backup data in destination "AhsayCBS"
[2022/01/31 14:54:56] [info] [1643602841932] Total New Files = 2
[2022/01/31 14:54:56] [info] [1643602841932] Total New Directories = 1
[2022/01/31 14:54:56] [info] [1643602841932] Total New Links = 0
[2022/01/31 14:54:56] [info] [1643602841932] Total Updated Files = 0
[2022/01/31 14:54:56] [info] [1643602841932] Total Deleted Files = 0
[2022/01/31 14:54:56] [info] [1643602841932] Total Deleted Directories = 0
[2022/01/31 14:54:56] [info] [1643602841932] Total Deleted Links = 0
[2022/01/31 14:54:56] [info] [1643602841932] Total Moved Files = 0
[2022/01/31 14:54:56] [info] [1643602841932] Total Dedupe Saving for this
```

```
job = 0B
[2022/01/31 14:54:56] [info] [1643602841932] Total Backup Data Size for this
job = 9KB
[2022/01/31 14:54:56] [info] [1643602841932] Total Dedupe Saving for
destination = 0B
[2022/01/31 14:54:56] [info] [1643602841932] Total Backup Data Size for
destination = 9KB
[2022/01/31 14:54:56] [info] [-] Deleting temporary file
/temp/1643602764440/SpoolArea
[2022/01/31 14:54:56] [info] [-] Saving server information to destination.
[2022/01/31 14:54:56] [info] [1643602841932] Saving encrypted backup file
index to 1643602764440/blocks/2022-01-31-14-54-30 at destination AhsayCBS...
[2022/01/31 14:55:00] [info] [1643602841932] Deleting temporary file
/temp/1643602764440/OBS@1643602841932
[2022/01/31 14:55:00] [info] [1643602841932] Backup Completed Successfully
```

## 6 Restoring Data

There are two options to restore a MariaDB Database Backup Set for Linux using the Restore.sh script.

### • [Automatic MariaDB Database Restore](#)

This is recommended for restore of MariaDB databases on the original MariaDB server.

For this option the `RESTORE_TO=""` parameter in the Restore.sh script should be left blank or empty.

The MariaDB database .sql files are restored from your backup destination to the MariaDB database server. The restored MariaDB database .sql files are then automatically applied to the MariaDB database server.

### • [Manual MariaDB Database Restore](#)

This is recommended for restore of MariaDB databases on a different MariaDB server.

For this option the `RESTORE_TO=""` parameter in the Restore.sh script should contain a location on the MariaDB server.

The MariaDB database .sql files are only restored from your backup destination to the location specified in `RESTORE_TO=""` parameter, e.g. `RESTORE_TO="/restored_file"`. The restored MariaDB database .sql files then need to be separately applied to the MariaDB database instance using the "source" command.

### 6.1 Automatic MariaDB Database Restore

1. To restore files from your backup destination and automatically apply them to the MariaDB database server.

You need to use the Restore.sh script by using a text editor like vi to configure the restore settings like:

- Backup Set Name -> `BACKUP_SET=""`
- Backup Destination -> `DESTINATION=""`
- Files/Folders to be Restored -> `RESTORE_FROM=""`
- Snapshot to be restored -> `POINT_IN_TIME=""`
- Applying the original permission to the restore files -> `RESTORE_PERMISSION=""`
- Verifying the in-file delta file checksum -> `VERIFY_CHKSUM=""`

#### NOTES

- `RESTORE_TO=""` settings must be blank
- To configure the shell script, press **Esc + I**. You will see this `-- INSERT --` on the lower left corner of the terminal.



```

# cd /usr/local/obm/bin
# vi Restore.sh

# !/bin/sh

##### Restore.sh #####
# You can use this shell script to restore backup files using command-line.
# Just customize the "User Define Section" below with values for your
# restore action.
#####

##### Start: User Defined Section #####

# ----- BACKUP_SET -----
# | The name or ID of the backup set that you want to restore.
# | If backup set name is not in English, please use ID instead.
# | e.g. BACKUP_SET="1119083740107"
# | or BACKUP_SET="FileBackupSet-1"
# |
# | You can leave this parameter blank if you have only 1 backupset.
# -----
BACKUP_SET="MariaDB Database 1"

# ----- DESTINATION -----
# | The name or ID of the backup destination that you want to restore from.
# | If backup destination name is not in English, please use ID instead.
# | e.g. DESTINATION="1740107119083"
# | or DESTINATION="Destination-1"
# |
# | You can leave this parameter blank if you have only 1 destination.
# -----
DESTINATION=""

# ----- RESTORE_TO -----
# | Directory to where you want files to be restored
# | set to "" to restore files to original location
# | e.g. RESTORE_TO="/tmp"
# -----
RESTORE_TO=""

# ----- RESTORE_FROM -----
# | File/Directory on the backup server that you would like to restore
# | e.g. RESTORE_FROM="/Data"
# -----
RESTORE_FROM="MariaDB"

# ----- POINT_IN_TIME -----
# | The point-in-time snapshot (successful backup) that you want to restore
# | from the backup server. Use "Current" for the latest backup snapshot
# | e.g. POINT_IN_TIME="2006-10-04-12-57-13"
# | or POINT_IN_TIME="Current"
# |
# | You can retrieve the point in time by using the ListBackupJob.sh
# -----
POINT_IN_TIME="Current"

# ----- RESTORE_PERMISSION -----
# | set to "Y" if you want to restore file permissions
# | set to "N" if you do NOT want to restore file permissions
# -----
RESTORE_PERMISSION="N"

# ----- SKIP_INVALID_KEY -----
# | set to "Y" if you want to skip restore file with invalid key
# | set to "N" if you want to prompt user to input a correct key
# -----
SKIP_INVALID_KEY="N"

```

```

# ----- SYNC_OPTION -----
# | Delete extra files |
# | set to "Y" if you want to enable sync option |
# | set to "N" if you do NOT want to enable sync option |
# | set to "" to prompt for selection |
# -----
SYNC_OPTION="N"

# ----- REPLACE_EXISTING_FILE -----
# | set to "--all" to replace all existing file(s) of the same filename |
# | set to "--none" to skip all existing file(s) with the same filename |
# | set to "" to prompt for selection |
# -----
REPLACE_EXISTING_FILE="--all"

# ----- SETTING_HOME -----
# | Directory to your setting home. |
# | Default to ${HOME}/.obm when not set. |
# | e.g. SETTING_HOME="${HOME}/.obm" |
# -----
SETTING_HOME=""

# ----- FILTER -----
# | Filter out what files you want to restore |
# | -Pattern=xxx-Type=yyy-Target=zzz |
# | where xxx is the filter pattern, |
# |     yyy is the filter type, which can be one of the following: |
# |         [exact | exactMatchCase | contains | containsMatchCase |
# |         startWith | startWithMatchCase | endWith | endWithMatchCase] |
# |     zzz is the filter target, which can be one of the following: |
# |         [toFile | toFileDir | toDir] |
# | e.g. FILTER="-Pattern=.txt-Type=exact-Target=toFile" |
# -----
FILTER=""

# ----- TEMP_DIR -----
# | Directory to where you want to store restore files temporarily |
# | set to "" to use the temporary directory in the backup set |
# | e.g. TEMP_DIR="/tmp" |
# -----
TEMP_DIR="/temp"

# ----- VERIFY_CHKSUM -----
# | set to "Y" if you want to verify in-file delta file checksum during |
# | restore |
# | set to "N" if you do NOT want to verify in-file delta file checksum |
# | during |
# | restore |
# -----
VERIFY_CHKSUM="N"

##### END: User Defined Section #####

#####
#       R E T R I E V E           A P P _ H O M E           P A T H       #
#####

```

2. After the Restore.sh script is configured the files can be restored automatically to the MariaDB Database Server.

```
# cd /usr/local/obm/bin
# sh Restore.sh
Using APP_HOME:           : /usr/local/obm
Using BACKUP_SET           : MariaDB Database 1
Using RESTORE_FROM         : MariaDB
Using RESTORE_TO           :
Using POINT_IN_TIME        : Current
Using RESTORE_PERMISSION  : N
Using TEMP_DIR             : /temp
Filter Pattern not set, filter would not apply to restore
[2022-01-31 16:18:41] Start [ AhsayOBM v9.1.0.0 ]
[2022-01-31 16:18:41] OS: Linux 3.10.0-1160.11.1.el7.x86_64
(localhost.localdomain); CPU Model: VMware-Intel(R) Xeon(R) Gold 5218R CPU
@ 2.10GHz; Intel(R) Xeon(R) Gold 5218R CPU @ 2.10GHz; Number of Processors:
4; Heap Size: 92.4MB (Current) / 1.8GB (Maximum); Physical Memory: 973.9MB
(Free) / 3.7GB (Total)
[2022-01-31 16:18:41] start,Start [ AhsayOBM v9.1.0.0 ],0,0,0,,0,0

[2022-01-31 16:18:41] Selected job: 2022-01-31-16-18-34
[2022-01-31 16:18:41] Selected source: [MariaDB]
[2022-01-31 16:18:41] Info: [followLink=false marshalTargetPath=false
deleteForSync=false skipFaultKey=false verifyDeltaFileChecksum=false
ignoreSegmentInfoCorruptedData=true restorePermission=false
[RestoreLocation] type=ORIGINAL path=[null]]
[2022-01-31 16:18:42] Downloading...
"/temp/RestoreSet/1643602764440/RestoreDatabase/MariaDB/collection.sql"
(Total 5K bytes)
[2022-01-31 16:18:42] Downloading...
"/temp/RestoreSet/1643602764440/RestoreDatabase/MariaDB/test.sql" (Total
4K bytes)
[2022-01-31 16:18:42] Start restore files to MariaDB... "collection"
[2022-01-31 16:18:43] Restoring to MariaDB Database... "collection"
[2022-01-31 16:18:43] End restore files to MariaDB... "collection"
[2022-01-31 16:18:43] Start restore files to MariaDB... "test"
[2022-01-31 16:18:43] Restoring to MariaDB Database... "test"
[2022-01-31 16:18:43] End restore files to MariaDB... "test"
[2022-01-31 16:18:44] Restore Completed Successfully
[2022-01-31 16:18:44] end,RESTORE_STOP_SUCCESS,0,0,0,,0,0
```

3. Login to MariaDB server to check the database status.

Example: Listing the tables in the database using **show tables**

```
MariaDB [(none)]> show databases;
+-----+
| Database |
+-----+
| collection |
| information_schema |
| mysql |
| performance_schema |
| test |
| test-1 |
+-----+
6 rows in set (0.001 sec)

MariaDB [(none)]> show tables in collection;
+-----+
| Tables_in_collection |
+-----+
| album |
| artist |
| brand |
| model |
| title |
| type |
| year |
+-----+
7 rows in set (0.002 sec)

MariaDB [(none)]> show tables in test;
+-----+
| Tables_in_test |
+-----+
| table1 |
| table2 |
| table3 |
| table4 |
| table5 |
+-----+
5 rows in set (0.001 sec)
```

## 6.2 Manual MariaDB Database Restore

To restore files that have been backed up from your backup destination, you need to use the Restore.sh script by using a text editor like vi to configure the restore settings like:

- Backup Set Name -> BACKUP\_SET=""
- Backup Destination -> DESTINATION=""
- Location of Restored Files -> RESTORE\_TO=""
- Files/Folders to be Restored -> RESTORE\_FROM=""
- Snapshot to be restored -> POINT\_IN\_TIME=""
- Applying the original permission to the restore files -> RESTORE\_PERMISSION=""
- Verifying the in-file delta file checksum -> VERIFY\_CHKSUM=""

```
# sh Restore.sh
Using APP_HOME:           : /usr/local/obm
Using BACKUP_SET          : MariaDB Database 1
Using RESTORE_FROM        : /backup
Using RESTORE_TO          : /root/restored
Using POINT_IN_TIME       : Current
Using RESTORE_PERMISSION : N
Using TEMP_DIR            : /temp
Filter Pattern not set, filter would not apply to restore
[2022-01-31 15:44:21] Start [ AhsayOBM v9.1.0.0 ]
[2022-01-31 15:44:21] OS: Linux 3.10.0-1160.11.1.el7.x86_64
(localhost.localdomain); CPU Model: VMware-Intel(R) Xeon(R) Gold 5218R CPU
@ 2.10GHz; Intel(R) Xeon(R) Gold 5218R CPU @ 2.10GHz; Number of Processors:
4; Heap Size: 100.3MB (Current) / 1.8GB (Maximum); Physical Memory: 1.8GB
(Free) / 3.7GB (Total)
[2022-01-31 15:44:21] start,Start [ AhsayOBM v9.1.0.0 ],0,0,0,,0,0

[2022-01-31 15:44:21] Selected job: 2022-01-31-15-44-13
[2022-01-31 15:44:21] Selected source: [/backup]
[2022-01-31 15:44:21] Info: [followLink=false marshalTargetPath=false
deleteForSync=false skipFaultKey=false verifyDeltaFileChecksum=false
ignoreSegmentInfoCorruptedData=true restorePermission=false
[RestoreLocation] type=RAW path=[/restored]]
[2022-01-31 15:44:22] Restore Completed Successfully
[2022-01-31 15:44:22] end,RESTORE_STOP_SUCCESS,0,0,0,,0,0
```

Verify the files are restored on the machine.

```
#ls -la /root/restored/MariaDB
total 16
drwxr-xr-x. 2 root root  6 Jan 31 15:09 .
drwxr-xr-x. 3 root root 21 Jan 31 15:09 ..
-rwxr-xr-x 1 root root 5893 Jan 31 15:09 collection.sql
-rwxr-xr-x 1 root root 4460 Jan 31 15:09 test.sql
```

## Recovering MariaDB Databases

### 1. Login to MariaDB server

```
# mariadb -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 238
Server version: 10.4.15-MariaDB-1:10.4.15+maria~focal mariadb.org
binary distribution

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input
statement.

MariaDB [(none)]> show databases;
+-----+
| Database                |
+-----+
| information_schema      |
| mysql                   |
| performance_schema      |
| test-1                  |
+-----+
4 rows in set (0.001 sec)
```

### 2. Create the database names that need to be recovered.

Example: collection and restaurants

```
MariaDB [(none)]> create database collection;
Query OK, 1 row affected (0.00 sec)

MariaDB [(none)]> create database test;
Query OK, 1 row affected (0.00 sec)
```

### 3. Recover Databases

Repeat the following steps for all databases you wish to restore.

```
MariaDB [(none)]> use collection;
Database changed
MariaDB [(collection)]> source /restored/MariaDB/collection.sql;

Query OK, 8 rows affected (0.006 sec)
Records: 8 Duplicates: 0 Warnings: 0

Query OK, 7 rows affected (0.002 sec)
Records: 7 Duplicates: 0 Warnings: 0

Query OK, 8 rows affected (0.002 sec)
Records: 8 Duplicates: 0 Warnings: 0

Query OK, 6 rows affected (0.003 sec)
Records: 6 Duplicates: 0 Warnings: 0

Query OK, 7 rows affected (0.002 sec)
Records: 7 Duplicates: 0 Warnings: 0

Query OK, 8 rows affected (0.004 sec)
Records: 8 Duplicates: 0 Warnings: 0

Query OK, 8 rows affected (0.002 sec)
Records: 8 Duplicates: 0 Warnings: 0

MariaDB [(none)]> use test;
Database changed
MariaDB [(test)]> source /restored/MariaDB/test.sql;
```

```

Query OK, 7 rows affected (0.002 sec)
Records: 7 Duplicates: 0 Warnings: 0

Query OK, 7 rows affected (0.001 sec)
Records: 7 Duplicates: 0 Warnings: 0

Query OK, 8 rows affected (0.003 sec)
Records: 8 Duplicates: 0 Warnings: 0

Query OK, 10 rows affected (0.001 sec)
Records: 10 Duplicates: 0 Warnings: 0

```

#### 4. Check the database status

Example: Listing the tables in the database using **show tables**

```

MariaDB [none]> show databases;
+-----+
| Database |
+-----+
| collection |
| information_schema |
| mysql |
| performance_schema |
| test |
| test-1 |
+-----+
6 rows in set (0.001 sec)

MariaDB [none]> show tables in collection;
+-----+
| Tables_in_collection |
+-----+
| album |
| artist |
| brand |
| model |
| title |
| type |
| year |
+-----+
7 rows in set (0.001 sec)

MariaDB [none]> show tables in test;
+-----+
| Tables_in_test |
+-----+
| table1 |
| table2 |
| table3 |
| table4 |
| table5 |
+-----+
5 rows in set (0.000 sec)

```

## 7 Contact 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/downloads/ahsay-downloads\\_documentation\\_guides.jsp](https://www.ahsay.com/jsp/en/downloads/ahsay-downloads_documentation_guides.jsp)

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 MariaDB Backup Set XML Template (Raw)

```
<?xml version="1.0" encoding="UTF-8"?>
<Setting>
  <!-- This is the backup set setting -->
  <Key name="Backup Set Setting" allowMultiple="Y">
    <!-- Backup set type (Read Only) -->
    <Value data="MariaDB" name="Type" type="string" />
    <!-- Backup set name -->
    <Value data="" name="Name" type="string" />
    <!-- Temporary directory for storing backup files -->
    <Value data="" name="Temporary Working Directory" type="string" />
    <!-- Remove temporary files after backup -->
    <!-- Y: Yes -->
    N: No -->
    <Value data="Y" name="Delete temporary files after backup"
    type="boolean" />
    <!-- Select compression type -->
    <!-- GzipDefaultCompression : Normal -->
    <!-- GzipBestSpeedCompression: Fast (Compressed size larger than normal)-->
    <!-- SnappyDefaultCompression: Fast with optimization for local -->
    <!-- Leave the field blank for no compression -->
    <Value data="" name="Compression Type" type="string" />
    <!-- This shows the MariaDB setting -->
    <Key name="MariaDB Setting">
      <!-- MariaDB Login Name -->
      <Value data="" name="Username" type="string" />
      <!-- MariaDB Password -->
      <Value data="" name="Password" type="string" />
      <!-- MariaDB Host -->
      <Value data="" name="Host" type="string" />
      <!-- MariaDB Port -->
      <Value data="" name="Port" type="string" />
      <!-- Path to mysqldump -->
      <Value data="" name="mysqldump path" type="string" />
    </Key>
    <!-- This includes the database you want to backup -->
    <!-- Copy and paste the whole <Key> to add more selected sources -->
    <Key name="Selected Source" allowMultiple="Y">
      <!-- Please enter the path in the format of "MariaDB/_YOUR_FILE_NAME_" -
      -->
      <Value data="" name="Path" type="string" />
    </Key>
    <!-- This excludes the database from the included source -->
    <!-- Copy and paste the whole <Key> to add more deselected sources -->
    <Key name="Deselected Source" allowMultiple="Y">
      <!-- Please enter the path in the format of "MariaDB/_YOUR_FILE_NAME_" -
      -->
      <Value data="" name="Path" type="string" />
    </Key>
    <!-- Settings for your scheduled backups -->
    <Key name="Schedule Settings">
      <!-- Enable scheduled backup on this computer -->
      <!-- Y: Yes -->
      <!-- N: No -->
      <Value data="N" name="Enable" type="boolean" />
      <!-- Daily settings -->
      <!-- Copy and paste the whole <Key> to add more daily schedules -->
      <Key name="Daily Schedule Settings" allowMultiple="Y">
        <!-- Name of schedule -->
        <Value data="Daily-Schedule" name="Name" type="string" />
        <!-- Start hour -->
        <!-- 0, 1, 2... 23 -->
```

```

<!-- This value will be ignored if the schedule is set to be
periodic ("Interval" field contains value other than -1) -->
<Value data="21" name="Hour" type="integer" />
<!-- Start minute -->
<!-- 0, 1, 2... 59 -->
<!-- This value will be ignored if the schedule is set to be
periodic ("Interval" field contains value other than -1) -->
<Value data="0" name="Minute" type="integer" />
<Value data="0" name="Minute" type="integer" />
<!-- Interval -->
<!-- 1 : 1 minute -->
<!-- 2 : 2 minutes -->
<!-- 3 : 3 minutes -->
<!-- 4 : 4 minutes -->
<!-- 5 : 5 minutes -->
<!-- 6 : 6 minutes -->
<!-- 10 : 10 minutes -->
<!-- 12 : 12 minutes -->
<!-- 15 : 15 minutes -->
<!-- 20 : 20 minutes -->
<!-- 30 : 30 minutes -->
<!-- 60 : 1 hour -->
<!-- 120: 2 hours -->
<!-- 180: 3 hours -->
<!-- 240: 4 hours -->
<!-- 360: 6 hours -->
<!-- 480: 8 hours -->
<!-- 720: 12 hours -->
<!-- A value of -1 means a non-periodic normal schedule -->
<Value data="-1" name="Interval" type="integer" />
</Key>
<!-- Weekly settings -->
<!-- Copy and paste the whole <Key> to add more weekly schedules -->
<Key name="Weekly Schedule Settings" allowMultiple="Y">
  <!-- Name of schedule -->
  <Value data="Weekly-Schedule" name="Name" type="string" />
  <!-- Start hour -->
  <!-- 0, 1, 2... 23 -->
  <!-- This value will be ignored if the schedule is set to be
periodic ("Interval" field contains value other than -1) -->
  <Value data="21" name="Hour" type="integer" />
  <!-- Start minute -->
  <!-- 0, 1, 2... 59 -->
  <!-- This value will be ignored if the schedule is set to be
periodic ("Interval" field contains value other than -1) -->
  <Value data="0" name="Minute" type="integer" />
  <!-- Interval -->
  <!-- 1 : 1 minute -->
  <!-- 2 : 2 minutes -->
  <!-- 3 : 3 minutes -->
  <!-- 4 : 4 minutes -->
  <!-- 5 : 5 minutes -->
  <!-- 6 : 6 minutes -->
  <!-- 10 : 10 minutes -->
  <!-- 12 : 12 minutes -->
  <!-- 15 : 15 minutes -->
  <!-- 20 : 20 minutes -->
  <!-- 30 : 30 minutes -->
  <!-- 60 : 1 hour -->
  <!-- 120: 2 hours -->
  <!-- 180: 3 hours -->
  <!-- 240: 4 hours -->
  <!-- 360: 6 hours -->
  <!-- 480: 8 hours -->
  <!-- 720: 12 hours -->
  <!-- A value of -1 means a non-periodic normal schedule -->
  <Value data="-1" name="Interval" type="integer" />
  <!-- Backup on these days of the week -->

```

```

<!-- Y: Yes -->
<!-- N: No -->
<Value data="Y" name="Sunday" type="boolean" />
<Value data="Y" name="Monday" type="boolean" />
<Value data="Y" name="Tuesday" type="boolean" />
<Value data="Y" name="Wednesday" type="boolean" />
<Value data="Y" name="Thursday" type="boolean" />
<Value data="Y" name="Friday" type="boolean" />
<Value data="Y" name="Saturday" type="boolean" />
</Key>
<!-- Monthly settings -->
<!-- Copy and paste the whole <Key> to add more monthly schedules -->
<Key name="Monthly Schedule Settings" allowMultiple="Y">
  <!-- Name of schedule -->
  <Value data="Monthly-Schedule" name="Name" type="string" />
  <!-- Start hour -->
  <!-- 0, 1, 2... 23 -->
  <Value data="21" name="Hour" type="integer" />
  <!-- Start minute -->
  <!-- 0, 1, 2... 59 -->
  <Value data="0" name="Minute" type="integer" />
  <!-- Schedule date of month -->
  <!-- 1, 2, 3... 31 -->
  <!-- 32: Last -->
  <!-- Set to 0 if you want to use the format of occurrence +
  criteria, e.g. Third Wednesday, instead -->
  <Value data="1" name="Schedule Date" type="integer" />
  <!-- Backup occurrence -->
  <!-- First / Second / Third / Fourth / Last -->
  <!-- If "Schedule Date" is not zero, this value will be ignored -->
  <Value data="First" name="Occurrence" type="string" />
  <!-- Backup criteria -->
  <!-- Sunday / Monday / Tuesday / Wednesday / Thursday / Friday /
  Saturday / Weekday / Weekend -->
  <!-- If "Schedule Date" is not zero, this value will be ignored -->
  <Value data="Friday" name="Criteria" type="string" />
</Key>
<!-- Custom settings -->
<!-- Copy and paste the whole <Key> to add more custom schedules -->
<Key name="Custom Schedule Settings" allowMultiple="Y">
  <!-- Name of schedule -->
  <Value data="Custom" name="Name" type="string" />
  <!-- Start hour -->
  <!-- 0, 1, 2... 23 -->
  <Value data="21" name="Hour" type="integer" />
  <!-- Start minute -->
  <!-- 0, 1, 2... 59 -->
  <Value data="0" name="Minute" type="integer" />
  <!-- Date for performing custom schedule backup -->
  <!-- Input in the format of YYYY-MM-DD -->
  <Value data="2020-10-23" name="Schedule Date" type="string" />
</Key>
</Key>
<!-- This is the collection of destinations -->
<Key name="Destination Settings">
  <Value data="1" name="concurrency-level" type="integer" />
  <!-- AhsayCBS destination is where the files are backup to server -->
  <Key name="AhsayCBS Destination Settings" allowMultiple="Y">
  </Key>
  <!-- Local destination means backup files are stored in your computer-->
  <!-- Copy and paste the whole <Key> to add more local destinations -->
  <Key name="Local Destination Settings">
    <!-- Name of your destination -->
    <Value data="" name="Name" type="string" />
    <!-- Directory to store your backup files -->
    <!-- e.g. /tmp -->
    <Value data="" name="Local Path" type="string" />
  </Key>

```

```

<!-- Wasabi destination for storing files -->
<!-- Copy and paste the whole <Key> to add more Wasabi destinations -->
<Key name="Wasabi Destination Settings" allowMultiple="Y">
  <!-- Name of your destination -->
  <Value data="" name="Name" type="string" />
  <!-- Access key -->
  <Value data="" name="Access Key" type="string" />
  <!-- Secret Key -->
  <Value data="" name="Secret Key" type="string" />
  <!-- Region -->
  <!-- us-west-1 : us-west-1 -->
  <!-- ap-northeast-1: ap-northeast-1 -->
  <!-- ap-northeast-2: ap-northeast-2 -->
  <!-- eu-central-1 : eu-central-1 -->
  <!-- eu-west-1 : eu-west-1 -->
  <!-- us-central-1 : us-central-1 -->
  <!-- us-east-1 : us-east-1 -->
  <!-- us-east-2 : us-east-2 -->
  <Value data="" name="Region" type="string" />
  <!-- Bucket to store backup data -->
  <!-- Leave the field empty to use default -->
  <Value data="" name="Bucket Name" type="string" />
  <!-- Select whether to use proxy -->
  <!-- Y: Yes -->
  <!-- N: No -->
  <Value data="N" name="Enable proxy during backup" type="boolean" />
</Key>
<!-- FTP destination for storing files -->
<!-- Copy and paste the whole <Key> to add more FTP destinations -->
<Key name="FTP Destination Settings" allowMultiple="Y">
  <!-- Name of your destination -->
  <Value data="" name="Name" type="string" />
  <!-- Host -->
  <Value data="" name="Host" type="string" />
  <!-- Port -->
  <Value data="0" name="Port" type="integer" />
  <!-- Username -->
  <Value data="" name="Username" type="string" />
  <!-- Password -->
  <Value data="" name="Password" type="string" />
  <!-- FTP directory to store backup data -->
  <!-- Leave the field empty to store to ~/Ahsay -->
  <Value data="" name="Directory" type="string" />
  <!-- Select whether to use proxy -->
  <!-- Y: Yes -->
  <!-- N: No -->
  <Value data="N" name="Enable proxy during backup" type="boolean" />
</Key>
</Key>
<!-- This shows the deduplication setting -->
<Key name="Deduplication Setting">
  <!-- Enable deduplication -->
  <!-- Y: Yes -->
  <!-- N: No -->
  <Value data="Y" name="Enable" type="boolean" />
  <!-- Deduplication scope -->
  <!-- F: Same file path within the same backup set -->
  <!-- B: All files within the same backup set -->
  <Value data="B" name="Deduplication level" type="string" />
</Key>
</Key>
</Setting>

```

## Appendix B MariaDB Backup Set XML Template (with explanation)

This appendix explains all configurable items with their available options, highlighted in red, in this file backup set XML scripts.

### Backup Set Setting

The following items define the basic configurations of the file backup set.

- ❶ **Backup set type** – enter the backup set type, for instance, File, MariaDB etc.
- ❷ **Backup set name** – name your backup set.
- ❸ **Temporary directory for storing backup files** – Enter the directory path where you would like to have the backup files stored temporarily. The temporary directory is used for various purposes, such as storage of temporary spooled file (for database specific backup type in AhsayOBM), remote file list, local file list, temporary delta file and other files of temporary nature.
- ❹ **Remove temporary files after backup** – choose whether to remove temporary files after you finish backup.
- ❺ **Select compression type** – choose the backup compression mode among Normal, Fast, Fast with optimization for local or No compression.

```
<?xml version="1.0" encoding="UTF-8"?>
<Setting>
  <!-- This is the backup set setting -->
  <Key name="Backup Set Setting" allowMultiple="Y">
    <!-- Backup set type (Read Only) -->
    <Value data="MariaDB" name="Type" type="string" />
    <!-- Backup set name -->
    <Value data="" name="Name" type="string" />
    <!-- Temporary directory for storing backup files -->
    <Value data="" name="Temporary Working Directory"
    type="string" />
    <!-- Remove temporary files after backup -->
    <!-- Y: Yes -->
    <!-- N: No -->
    <Value data="Y" name="Delete temporary files after backup"
    type="boolean" />
    <!-- Select compression type -->
    <!-- GzipDefaultCompression : Normal -->
    <!-- GzipBestSpeedCompression: Fast (Compressed size larger
    than normal) -->
    <!-- SnappyDefaultCompression: Fast with optimization for local-->
    <!-- Leave the field blank for no compression -->
    <Value data="" name="Compression Type" type="string" />
  </Key>
</Setting>
```

## MariaDBSetting

- 1 Configure the login and network settings for the MariaDB Database.

```
<!-- This shows the MariaDB setting -->
<Key name="MariaDB Setting">
  <!-- MariaDB Login Name -->
  <Value data="" name="Username" type="string" />
  <!-- MariaDB Password -->
  <Value data="" name="Password" type="string" />
  <!-- MariaDB Host -->
  <Value data="" name="Host" type="string" />
  <!-- MariaDB Port -->
  <Value data="" name="Port" type="string" />
  <!-- Path to mysqldump -->
  <Value data="" name="mysqldump path" type="string" />
</Key>
```

## Selected Source

- 1 Enter the path where the database you would like to backup is located.

```
<!-- This includes the database you want to backup -->
<!-- Copy and paste the whole <Key> to add more selected
sources -->
<Key name="Selected Source" allowMultiple="Y">
  <!-- Please enter the path in the format of "MariaDB/_YOUR_FILE_NAME_"
-->
  <Value data="" name="Path" type="string" />
</Key>
```

## Deselected Source

- 1 Enter the path where database you would like to exclude from the backup is located.

```
<!-- This excludes the database from the included source -->
<!-- Copy and paste the whole <Key> to add more deselected
sources -->
<Key name="Deselected Source" allowMultiple="Y">
  <!-- Please enter the path in the format of "MariaDB/_YOUR_FILE_NAME_"
-->
  <Value data="" name="Path" type="string" />
</Key>
```

## Schedule Settings

- 1 Choose whether you would like backup jobs to be run at the scheduled time you set.

```
<!-- Settings for your scheduled backups -->
<Key name="Schedule Settings">
  <!-- Enable scheduled backup on this computer -->
  <!-- Y: Yes -->
  <!-- N: No -->
  <Value data="N" name="Enable" type="boolean" />
```

## Daily Schedule Settings

Set backup jobs to run daily at the time you specified (start backup “at” or normal backup schedule) or at intervals of minutes/hours (start backup “every” or periodic backup schedule).

- 1 **Name of schedule** – name of the backup schedule.
- 2 **Start hour** – the starting hour of the backup, from 0-23. This value will apply for normal backup schedule or start backup “at”.
- 3 **Start minute** – the starting minute of the backup, from 0-59. This value will apply for normal backup schedule or start backup “at”.
- 4 **Interval** – frequency in minutes or hours when the backup would start, from 1-30 in minutes and 60-720 in hours. This value will apply for periodic backup schedule or start backup “every”.

```
<!-- Daily settings -->
<!-- Copy and paste the whole <Key> to add more daily
schedules -->
<Key name="Daily Schedule Settings" allowMultiple="Y">
  <!-- Name of schedule -->
  <Value data="Daily-Schedule" name="Name" type="string" />
  <!-- Start hour -->
  <!-- 0, 1, 2... 23 -->
  <!-- This value will be ignored if the schedule is set to be
periodic ("Interval" field contains value other than -1) -->
  <Value data="21" name="Hour" type="integer" />
  <!-- Start minute -->
  <!-- 0, 1, 2... 59 -->
  <!-- This value will be ignored if the schedule is set to be
periodic ("Interval" field contains value other than -1) -->
  <Value data="0" name="Minute" type="integer" />
  <!-- Interval -->
  <!-- 1 : 1 minute -->
  <!-- 2 : 2 minutes -->
  <!-- 3 : 3 minutes -->
  <!-- 4 : 4 minutes -->
  <!-- 5 : 5 minutes -->
  <!-- 6 : 6 minutes -->
  <!-- 10 : 10 minutes -->
  <!-- 12 : 12 minutes -->
  <!-- 15 : 15 minutes -->
  <!-- 20 : 20 minutes -->
  <!-- 30 : 30 minutes -->
  <!-- 60 : 1 hour -->
  <!-- 120: 2 hours -->
  <!-- 180: 3 hours -->
  <!-- 240: 4 hours -->
  <!-- 360: 6 hours -->
  <!-- 480: 8 hours -->
  <!-- 720: 12 hours -->
  <!-- A value of -1 means a non-periodic normal schedule -->
  <Value data="-1" name="Interval" type="integer" />
</Key>
```

## Weekly Schedule Settings

Set backup jobs to run weekly at the time you specified (start backup “at” or normal backup schedule) or at intervals of minutes/hours (start backup “every” or periodic backup schedule).

- **Name of schedule** – name of the backup schedule.
- **Start hour** – the starting hour of the backup, from 0-23. This value will apply for normal backup schedule or start backup “at”.
- **Start minute** – the starting minute of the backup, from 0-59. This value will apply for normal backup schedule or start backup “at”.
- **Interval** – frequency in minutes or hours when the backup would start, from 1-30 in minutes and 60-720 in hours. This value will apply for periodic backup schedule or start backup “every”.
- **Backup on these days of the week** – choose to enable or disable backup on each day in week.

```
<!-- Weekly settings -->
<!-- Copy and paste the whole <Key> to add more weekly
schedules -->
<Key name="Weekly Schedule Settings" allowMultiple="Y">
  <!-- Name of schedule -->
  <Value data="Weekly-Schedule" name="Name" type="string" />
  <!-- Start hour -->
  <!-- 0, 1, 2... 23 -->
  <!-- This value will be ignored if the schedule is set to be
periodic ("Interval" field contains value other than -1) -->
  <Value data="21" name="Hour" type="integer" />
  <!-- Start minute -->
  <!-- 0, 1, 2... 59 -->
  <!-- This value will be ignored if the schedule is set to be
periodic ("Interval" field contains value other than -1) -->
  <Value data="0" name="Minute" type="integer" />
  <!-- Interval -->
  <!-- 1 : 1 minute -->
  <!-- 2 : 2 minutes -->
  <!-- 3 : 3 minutes -->
  <!-- 4 : 4 minutes -->
  <!-- 5 : 5 minutes -->
  <!-- 6 : 6 minutes -->
  <!-- 10 : 10 minutes -->
  <!-- 12 : 12 minutes -->
  <!-- 15 : 15 minutes -->
  <!-- 20 : 20 minutes -->
  <!-- 30 : 30 minutes -->
  <!-- 60 : 1 hour -->
  <!-- 120: 2 hours -->
  <!-- 180: 3 hours -->
  <!-- 240: 4 hours -->
  <!-- 360: 6 hours -->
  <!-- 480: 8 hours -->
  <!-- 720: 12 hours -->
  <!-- A value of -1 means a non-periodic normal schedule -->
  <Value data="-1" name="Interval" type="integer" />
  <!-- Backup on these days of the week -->
  <!-- Y: Yes -->
  <!-- N: No -->
  <Value data="Y" name="Sunday" type="boolean" />
  <Value data="Y" name="Monday" type="boolean" />
  <Value data="Y" name="Tuesday" type="boolean" />
  <Value data="Y" name="Wednesday" type="boolean" />
  <Value data="Y" name="Thursday" type="boolean" />
```



```

        <Value data="Y" name="Friday" type="boolean" />
        <Value data="Y" name="Saturday" type="boolean" />
    </Key>

```

## Monthly Schedule Settings

Set backup jobs to run monthly at the time you specified.

- ① **Name of schedule** – name of the backup schedule.
- ① **Start hour** – the starting hour of the backup, from 0-23.
- ① **Start minute** – the starting minute of the backup, from 0-59.
- ① **Schedule date of month** – set exact date in a month when you would like the backup to perform. Set to 0 if you would like the backup performed in a specified occurrence + criteria format, e.g. the third Wednesday in month.
- ① **Backup [Occurrence + Criteria] format**  
 You can set the backup to perform on a specified week (**Occurrence, First / Second / Third / Last**) and on a specified day of the week (**Criteria, Sun thru Sat**), for instance, the third Wednesday in a month.
  - ⦿ **Backup occurrence** – set the week, i.e., First / Second / Third / Last. If you have set an exact date in the previous “Schedule date of month” configuration, this setting will be ignored.
  - ⦿ **Backup criteria** – set a day of the week, i.e., Sunday thru Saturday. If you have set an exact date in the previous “Schedule date of month” configuration, this setting will be ignored.

```

<!-- Monthly settings -->
<!-- Copy and paste the whole <Key> to add more monthly
schedules -->
<Key name="Monthly Schedule Settings" allowMultiple="Y">
    <!-- Name of schedule -->
    <Value data="Monthly-Schedule" name="Name" type="string" />
    <!-- Start hour -->
    <!-- 0, 1, 2... 23 -->
    <Value data="21" name="Hour" type="integer" />
    <!-- Start minute -->
    <!-- 0, 1, 2... 59 -->
    <Value data="0" name="Minute" type="integer" />
    <!-- Schedule date of month -->
    <!-- 1, 2, 3... 31 -->
    <!-- 32: Last -->
    <!-- Set to 0 if you want to use the format of
    occurrence + criteria, e.g. Third Wednesday, instead -->
    <Value data="1" name="Schedule Date" type="integer" />
    <!-- Backup occurrence -->
    <!-- First / Second / Third / Fourth / Last -->
    <!-- If "Schedule Date" is not zero, this value will be
    ignored -->
    <Value data="First" name="Occurrence" type="string" />
    <!-- Backup criteria -->
    <!-- Sunday / Monday / Tuesday / Wednesday / Thursday /
    Friday / Saturday / Weekday / Weekend -->
    <!-- If "Schedule Date" is not zero, this value will be
    ignored -->
    <Value data="Friday" name="Criteria" type="string" />
</Key>

```

## Custom Schedule Settings

Set backup jobs to run at the date and time you specified.

- 1 **Name of schedule** – name of the backup schedule.
- 2 **Start hour** – the starting hour of the backup, from 0-23.
- 3 **Start minute** – the starting minute of the backup, from 0-59.
- 4 **Date for performing custom schedule backup** – enter a specific date when you would like the backup to perform. The date format should be in YYYY-MM-DD.

```
<!-- Custom settings -->
<!-- Copy and paste the whole <Key> to add more custom
schedules -->
<Key name="Custom Schedule Settings" allowMultiple="Y">
  <!-- Name of schedule -->
  <Value data="Custom" name="Name" type="string" />
  <!-- Start hour -->
  <!-- 0, 1, 2... 23 -->
  <Value data="21" name="Hour" type="integer" />
  <!-- Start minute -->
  <!-- 0, 1, 2... 59 -->
  <Value data="0" name="Minute" type="integer" />
  <!-- Date for performing custom schedule backup -->
  <!-- Input in the format of YYYY-MM-DD -->
  <Value data="2020-10-23" name="Schedule Date"
type="string" />
</Key>
</Key>
```

## Destination Settings

- 1 **AhsayCBS Destination Settings** – this option allows backup files to be stored on the server
- 2 **Local Destination Settings** – this option allows backup files to be stored in your local computer. Enter the directory path where you would like the backup files to be stored.

```
<!-- This is the collection of destinations -->
<Key name="Destination Settings">
  <Value data="1" name="concurrency-level" type="integer" />
  <!-- AhsayCBS destination is where the files are backup to
server -->
  <Key name="AhsayCBS Destination Settings" allowMultiple="Y">
  </Key>
  <!-- Local destination means backup files are stored in
your computer -->
  <!-- Copy and paste the whole <Key> to add more local
destinations -->
  <Key name="Local Destination Settings" allowMultiple="Y">
    <!-- Name of your destination -->
    <Value data="" name="Name" type="string" />
    <!-- Directory to store your backup files -->
    <!-- e.g. /tmp -->
    <Value data="" name="Local Path" type="string" />
  </Key>
</Key>
```

## Deduplication setting

A checksum verification of each backup file which was split into several blocks of varying size will be performed to compare its content and identify which block is duplicated. There are 2 deduplication scope in this setting.

- **Same file path within the same backup set** – deduplication applies to the current backup job and it applies to duplicated contents within a file.
- **All files within the same backup set** – deduplication applies across different files in the backup set.

```
<!-- This shows the deduplication setting -->
<Key name="Deduplication Setting">
  <!-- Enable deduplication -->
  <!-- Y: Yes -->
  <!-- N: No -->
  <Value data="Y" name="Enable" type="boolean" />
  <!-- Deduplication scope -->
  <!-- F: Same file path within the same backup set -->
  <!-- B: All files within the same backup set -->
  <Value data="B" name="Deduplication level" type="string" />
</Key>
</Key>
</Setting>
```

## Appendix C Example of MariaDB Database Backup Set with normal backup schedule

### Backup set configurations:

Backup Set Name	MariaDB Database 1
Temporary Working Directory	/temp
Remove temporary files after backup	Yes
Compression Type	Fast
Daily schedule	7:30 PM
Destination	AhsayCBS, Local Drive (/localbackup)
Backup Source	MariaDB/Chinook, MariaDB/employees, MariaDB/nation, MariaDB/sportdb
Exclude	MariaDB/information_schema, MariaDB/performance_schema
Deduplication scope	All files within the same backup set

### MariaDB database settings:

ID	root
Password	pwd123
Hostname	localhost
Port	3306
Mysqldump path	/usr/bin/mysqldump

\*Configurable items are highlighted in red.

```
<?xml version="1.0" encoding="UTF-8"?>
<Setting>
  <!-- This is the backup set setting -->
  <Key name="Backup Set Setting" allowMultiple="Y">
    <!-- Backup set type (Read Only) -->
    <Value data="MariaDB" name="Type" type="string" />
    <!-- Backup set name -->
    <Value data="MariaDB Database 1" name="Name" type="string" />
    <!-- Temporary directory for storing backup files -->
    <Value data="/temp" name="Temporary Working Directory"
    type="string" />
    <!-- Remove temporary files after backup -->
    <!-- Y: Yes -->
    <!-- N: No -->
    <Value data="Y" name="Delete temporary files after backup"
    type="boolean" />
    <!-- Select compression type -->
    <!-- GzipDefaultCompression : Normal -->
    <!-- GzipBestSpeedCompression: Fast (Compressed size larger than
    normal) -->
    <!-- SnappyDefaultCompression: Fast with optimization for local -->
    <!-- Leave the field blank for no compression -->
    <Value data="GzipBestSpeedCompression" name="Compression Type"
    type="string" />
    <!-- This shows the MariaDB setting -->
    <Key name="MariaDB Setting">
      <!-- MariaDB Login Name -->
      <Value data="root" name="Username" type="string" />
      <!-- MariaDB Password -->
      <Value data="pwd123" name="Password" type="string" />
      <!-- MariaDB Host -->
      <Value data="localhost" name="Host" type="string" />
    </Key>
  </Key>
</Setting>
```

```

    <!-- MariaDB Port -->
    <Value data="3306" name="Port" type="string" />
    <!-- Path to mysqldump -->
    <Value data="/usr/bin/mysqldump" name="mysqldump path"
    type="string" />
  </Key>
  <!-- This includes the database you want to backup -->
  <!-- Copy and paste the whole <Key> to add more selected sources -->
  <Key name="Selected Source" allowMultiple="Y">
    <!-- Please enter the path in the format of
    "MariaDB/_YOUR_FILE_NAME_" -->
    <Value data="MariaDB/Chinook" name="Path" type="string" />
  </Key>
  <Key name="Selected Source">
    <!-- Please enter the path in the format of
    "MariaDB/_YOUR_FILE_NAME_" -->
    <Value data="MariaDB/employees" name="Path" type="string" />
  </Key>
  <Key name="Selected Source">
    <!-- Please enter the path in the format of
    "MariaDB/_YOUR_FILE_NAME_" -->
    <Value data="MariaDB/nation" name="Path" type="string" />
  </Key>
  <Key name="Selected Source">
    <!-- Please enter the path in the format of
    "MariaDB/_YOUR_FILE_NAME_" -->
    <Value data="MariaDB/sportdb" name="Path" type="string" />
  </Key>
  <!-- This excludes the database from the included source -->
  <!-- Copy and paste the whole <Key> to add more deselected sources -->
  <Key name="Deselected Source" allowMultiple="Y">
    <!-- Please enter the path in the format of
    "MariaDB/_YOUR_FILE_NAME_" -->
    <Value data="MariaDB/information_schema" name="Path"
    type="string" />
  </Key>
  <Key name="Deselected Source">
    <!-- Please enter the path in the format of
    "MariaDB/_YOUR_FILE_NAME_" -->
    <Value data="MariaDB/performance_schema" name="Path"
    type="string" />
  </Key>
  <!-- Settings for your scheduled backups -->
  <Key name="Schedule Settings">
    <!-- Enable scheduled backup on this computer -->
    <!-- Y: Yes -->
    <!-- N: No -->
    <Value data="Y" name="Enable" type="boolean" />
    <!-- Daily settings -->
    <!-- Copy and paste the whole <Key> to add more daily schedules -->
    <Key name="Daily Schedule Settings" allowMultiple="Y">
      <!-- Name of schedule -->
      <Value data="Daily-Schedule" name="Name" type="string" />
      <!-- Start hour -->
      <!-- 0, 1, 2... 23 -->
      <!-- This value will be ignored if the schedule is set to be
periodic ("Interval" field contains value other than -1) -->
      <Value data="19" name="Hour" type="integer" />
      <!-- Start minute -->
      <!-- 0, 1, 2... 59 -->
      <!-- This value will be ignored if the schedule is set to be
periodic ("Interval" field contains value other than -1) -->
      <Value data="30" name="Minute" type="integer" />
      <!-- Interval -->
      <!-- 1 : 1 minute -->
      <!-- 2 : 2 minutes -->
      <!-- 3 : 3 minutes -->
      <!-- 4 : 4 minutes -->
    </Key>
  </Key>

```

```

        <!-- 5 : 5 minutes -->
        <!-- 6 : 6 minutes -->
        <!-- 10 : 10 minutes -->
        <!-- 12 : 12 minutes -->
        <!-- 15 : 15 minutes -->
        <!-- 20 : 20 minutes -->
        <!-- 30 : 30 minutes -->
        <!-- 60 : 1 hour -->
        <!-- 120: 2 hours -->
        <!-- 180: 3 hours -->
        <!-- 240: 4 hours -->
        <!-- 360: 6 hours -->
        <!-- 480: 8 hours -->
        <!-- 720: 12 hours -->
        <!-- A value of -1 means a non-periodic normal schedule -->
        <Value data="-1" name="Interval" type="integer" />
    </Key>
    <!-- This is the collection of destinations -->
    <Key name="Destination Settings">
        <Value data="-1" name="concurrency-level" type="integer" />
        <!-- AhsayCBS destination is where the files are backup to server -->
        <Key name="AhsayCBS Destination Settings" allowMultiple="Y">
    </Key>
    <!-- Local destination means backup files are stored in your
computer -->
    <!-- Copy and paste the whole <Key> to add more local destinations -->
    <Key name="Local Destination Settings" allowMultiple="Y">
        <!-- Name of your destination -->
        <Value data="local" name="Name" type="string" />
        <!-- Directory to store your backup files -->
        <!-- e.g. /tmp -->
        <Value data="/localbackup" name="Local Path" type="string" />
    </Key>
</Key>
<!-- This shows the deduplication setting -->
<Key name="Deduplication Setting">
    <!-- Enable deduplication -->
    <!-- Y: Yes -->
    <!-- N: No -->
    <Value data="Y" name="Enable" type="boolean" />
    <!-- Deduplication scope -->
    <!-- F: Same file path within the same backup set -->
    <!-- B: All files within the same backup set -->
    <Value data="B" name="Deduplication level" type="string" />
</Key>
</Key>
</Setting>

```

## Appendix D Example of MariaDB Database Backup Set with periodic backup schedule

Backup set configurations:

Backup Set Name	MariaDB Daily Backup
Temporary Working Directory	/temp
Remove temporary files after backup	Yes
Compression Type	Fast
Weekly schedule	Every 8 hours from Monday to Friday
Destination	AhsayCBS
Backup Source	All MariaDB databases
Exclude	MariaDB/information_schema, MariaDB/performance_schema
Deduplication scope	All files within the same backup set

MariaDB database settings:

ID	root
Password	pwd123
Hostname	localhost
Port	3306
Mysqldump path	/usr/bin/mysqldump

\*Configurable items are highlighted in red.

```
<?xml version="1.0" encoding="UTF-8"?>
<Setting>
  <!-- This is the backup set setting -->
  <Key name="Backup Set Setting" allowMultiple="Y">
    <!-- Backup set type (Read Only) -->
    <Value data="MariaDB" name="Type" type="string" />
    <!-- Backup set name -->
    <Value data="MariaDB Daily Backup" name="Name" type="string" />
    <!-- Temporary directory for storing backup files -->
    <Value data="/temp" name="Temporary Working Directory"
    type="string" />
    <!-- Remove temporary files after backup -->
    <!-- Y: Yes -->
    <!-- N: No -->
    <Value data="Y" name="Delete temporary files after backup"
    type="boolean" />
    <!-- Select compression type -->
    <!-- GzipDefaultCompression : Normal -->
    <!-- GzipBestSpeedCompression: Fast (Compressed size larger than
    normal) -->
    <!-- SnappyDefaultCompression: Fast with optimization for local -->
    <!-- Leave the field blank for no compression -->
    <Value data="GzipBestSpeedCompression" name="Compression Type"
    type="string" />
    <!-- This shows the MariaDB setting -->
    <Key name="MariaDB Setting">
      <!-- MariaDB Login Name -->
      <Value data="root" name="Username" type="string" />
      <!-- MariaDB Password -->
      <Value data="pwd123" name="Password" type="string" />
      <!-- MariaDB Host -->
      <Value data="localhost" name="Host" type="string" />
      <!-- MariaDB Port -->
      <Value data="3306" name="Port" type="string" />
    </Key>
  </Key>
</Setting>
```

```

        <!-- Path to mysqldump -->
        <Value data="/usr/bin/mysqldump" name="mysqldump path"
        type="string" />
    </Key>
    <!-- This includes the database you want to backup -->
    <!-- Copy and paste the whole <Key> to add more selected sources - ->
    <Key name="Selected Source" allowMultiple="Y">
        <!-- Please enter the path in the format of
        "MariaDB/_YOUR_FILE_NAME_" -->
        <Value data="MariaDB" name="Path" type="string" />
    </Key>
    <Key name="Deselected Source" allowMultiple="Y">
        <!-- Please enter the path in the format of
        "MariaDB/_YOUR_FILE_NAME_" -->
        <Value data="MariaDB/information_schema" name="Path"
        type="string" />
    </Key>
    <Key name="Deselected Source" allowMultiple="Y">
        <!-- Please enter the path in the format of
        "MariaDB/_YOUR_FILE_NAME_" -->
        <Value data="MariaDB/performance_schema" name="Path"
        type="string" />
    </Key>

    <!-- Settings for your scheduled backups -->
    <Key name="Schedule Settings">
        <!-- Enable scheduled backup on this computer -->
        <!-- Y: Yes -->
        <!-- N: No -->
        <Value data="Y" name="Enable" type="boolean" />
        <Key name="Weekly Schedule Settings" allowMultiple="Y">
            <!-- Name of schedule -->
            <Value data="Weekly-Schedule" name="Name" type="string" />
            <!-- Start hour -->
            <!-- 0, 1, 2... 23 -->
            <!-- This value will be ignored if the schedule is set to be
periodic ("Interval" field contains value other than -1) -->
            <Value data="21" name="Hour" type="integer" />
            <!-- Start minute -->
            <!-- 0, 1, 2... 59 -->
            <!-- This value will be ignored if the schedule is set to be
periodic ("Interval" field contains value other than -1) -->
            <Value data="0" name="Minute" type="integer" />
            <!-- Interval -->
            <!-- 1 : 1 minute -->
            <!-- 2 : 2 minutes -->
            <!-- 3 : 3 minutes -->
            <!-- 4 : 4 minutes -->
            <!-- 5 : 5 minutes -->
            <!-- 6 : 6 minutes -->
            <!-- 10 : 10 minutes -->
            <!-- 12 : 12 minutes -->
            <!-- 15 : 15 minutes -->
            <!-- 20 : 20 minutes -->
            <!-- 30 : 30 minutes -->
            <!-- 60 : 1 hour -->
            <!-- 120 : 2 hours -->
            <!-- 180 : 3 hours -->
            <!-- 240 : 4 hours -->
            <!-- 360 : 6 hours -->
            <!-- 480 : 8 hours -->
            <!-- 720 : 12 hours -->
            <!-- A value of -1 means a non-periodic normal schedule -->
            <Value data="480" name="Interval" type="integer" />
            <!-- Backup on these days of the week -->
            <!-- Y: Yes -->
            <!-- N: No -->
            <Value data="N" name="Sunday" type="boolean" />
        </Key>
    </Key>

```



```

        <Value data="Y" name="Monday" type="boolean" />
        <Value data="Y" name="Tuesday" type="boolean" />
        <Value data="Y" name="Wednesday" type="boolean" />
        <Value data="Y" name="Thursday" type="boolean" />
        <Value data="Y" name="Friday" type="boolean" />
        <Value data="N" name="Saturday" type="boolean" />
    </Key>
</Key>
<!-- This is the collection of destinations -->
<Key name="Destination Settings">
    <Value data="-1" name="concurrency-level" type="integer" />
    <!-- AhsayCBS destination is where the files are backup to server -->
    <Key name="AhsayCBS Destination Settings" allowMultiple="Y">
    </Key>
</Key>
<!-- This shows the deduplication setting -->
<Key name="Deduplication Setting">
    <!-- Enable deduplication -->
    <!-- Y: Yes -->
    <!-- N: No -->
    <Value data="Y" name="Enable" type="boolean" />
    <!-- Deduplication scope -->
    <!-- F: Same file path within the same backup set -->
    <!-- B: All files within the same backup set -->
    <Value data="B" name="Deduplication level" type="string" />
</Key>
</Key>
</Setting>

```