Backup Advanced Backup Manager (B247PRO) v9

MariaDB Database Backup & Restore for Linux (CLI)

247

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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?

Backup247 brings you specialized client backup software, namely Backup247 Advanced Client (B247PRO), 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, Backup247 Advanced Client (B247PRO) and B247CBS.

In this user guide, we will focus on the end-to-end backup and restore process using Backup247 Advanced Client (B247PRO) as a client backup software.
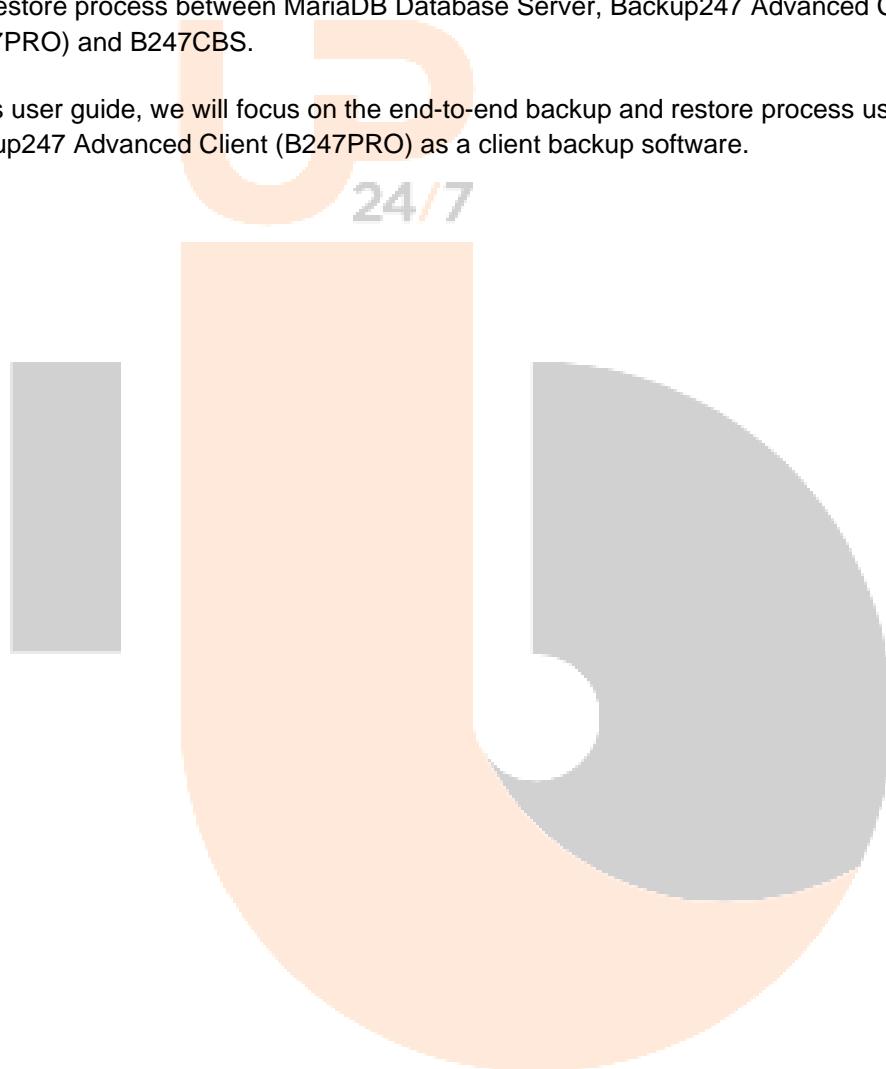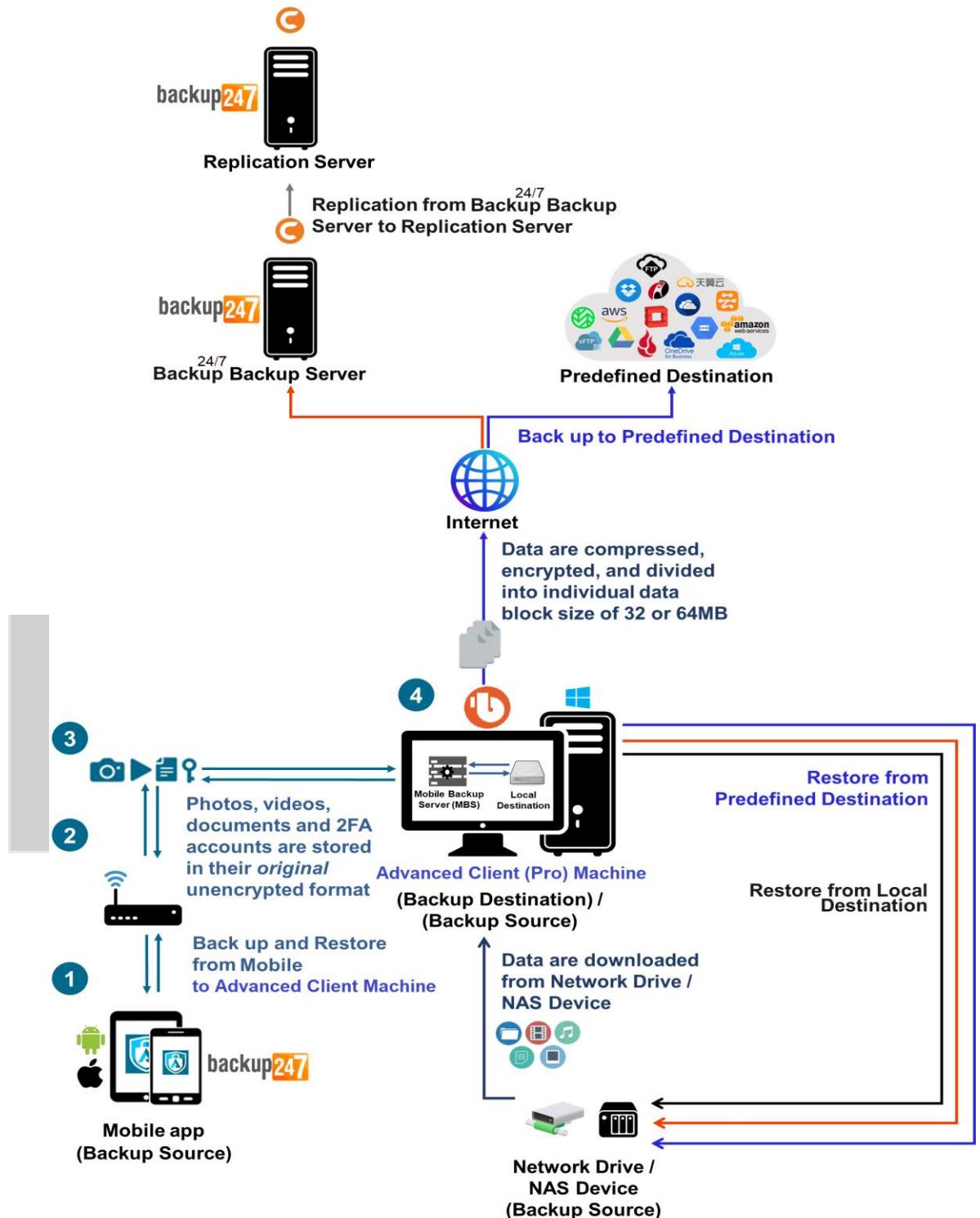
1.3 MariaDB Database Backup Method

Backup247 Advanced Client (B247PRO) MariaDB Database backup uses a spooling method to make a consistent snapshot of the database(s) for backup.

For each database backup job Backup247 Advanced Client (B247PRO) will trigger MariaDB to spool or make a copy of the database (.sql) file to the temporary folder using the mysqldump utility.

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File System
- /var
  - /lib
    - /mysql
      - chinook
      - collection
      - mysql
      - nation
      - restaurants
      - sportdb
      - test

mysqldump

File System
- /temp
  - /1603685629897
    - /SpoolArea
      - /MariaDB
        - chinook.sql
        - collection.sql
        - mysql.sql
        - nation.sql
        - restaurants.sql
        - sportdb.sql
        - test.sql
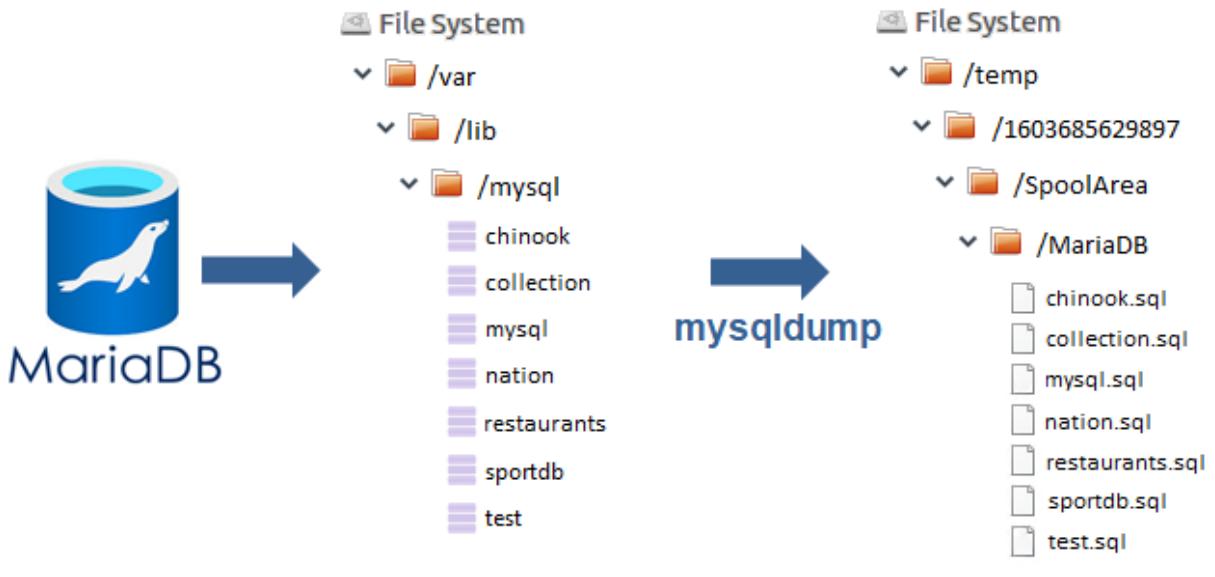
1.4 Mysqldump Parameters

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 Backup247 Advanced Client (B247PRO) is running on your machine, refer to the following article for the list of hardware requirements.

FAQ: Backup247 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 Backup247 Advanced Client (B247PRO). Refer to the following article for the list of compatible operating systems and application versions.

FAQ: Backup247 Software Compatibility List (SCL) for version 9.1 or above

2.3 Backup247 Advanced Client (B247PRO) Installation

Make sure that the latest version of Backup247 Advanced Client (B247PRO) 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 Backup247 Advanced Client (B247PRO) user account.

Please contact your backup service provider for more details.

2.5 Backup Quota Requirement

Make sure that your Backup247 Advanced Client (B247PRO) 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

Backup247 Advanced Client (B247PRO) support MariaDB version 10.0 or above. For details of all supported MariaDB versions please refer to FAQ: Backup247 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 ::1:631             :::*               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                :::*                 7
```

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▒[J?>Z)\u▒Y>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 Backup247 Advanced Client (B247PRO).

For instructions on how to do this refer to Chapter 5 of the Backup247 Advanced Client (B247PRO) v9 Quick Start Guide for Linux (CLI).

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

- Using B247CBS web console

  For backup set creation on B247CBS web console, most backup set preferences may be configured using B247CBS except the following:

  - backup set encryption key settings
  - MariaDB login password

  After the backup set preferences are setup on the B247CBS 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 B247CBS.

1. Log in to B247CBS and go to User.
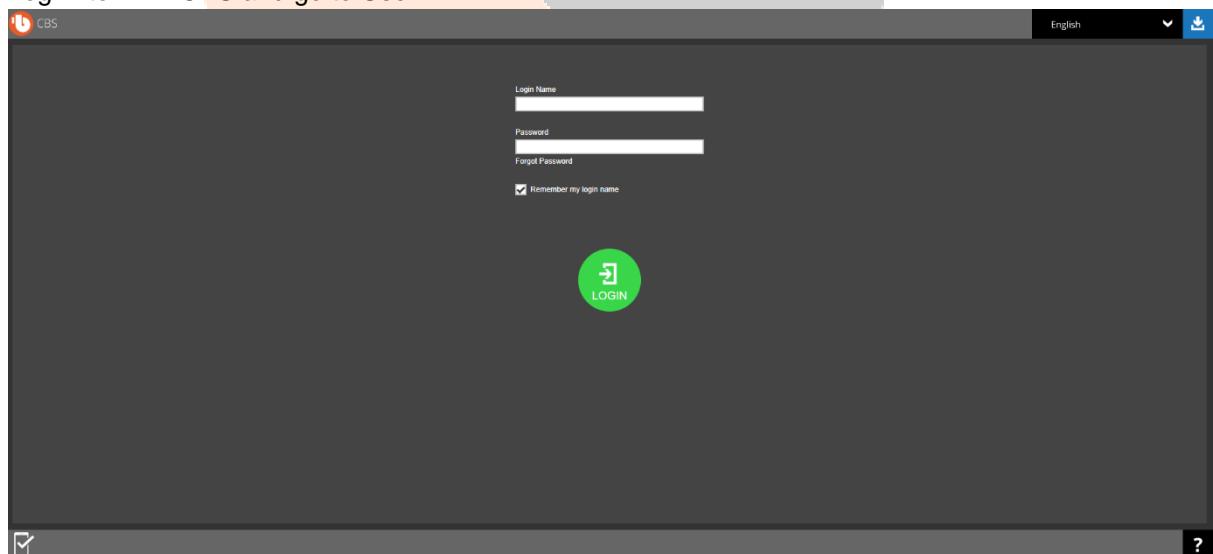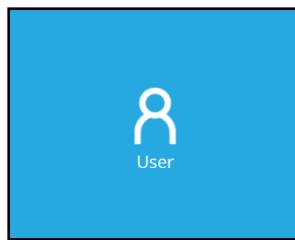
2. Go to Backup Set then click ⊕ to create a backup set.

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

➕ X ?

5. 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 Backup247 Advanced Client (B247PRO) client. In Step 15, the computer name can be checked as the Owner.

Schedule

Run scheduled backup for this backup set

Manage schedule

➕ 🗑

	Name	Type
☐	Backup Schedule	Daily

Run scheduled backup on computers named
*

← → X ?

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, Backup247 Advanced Client (B247PRO) will back up to one destination at a time. In **Concurrent** backup mode, if there are multiple destinations configured in the backup set, Backup247 Advanced Client (B247PRO) 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 ∨

| 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 ➡.
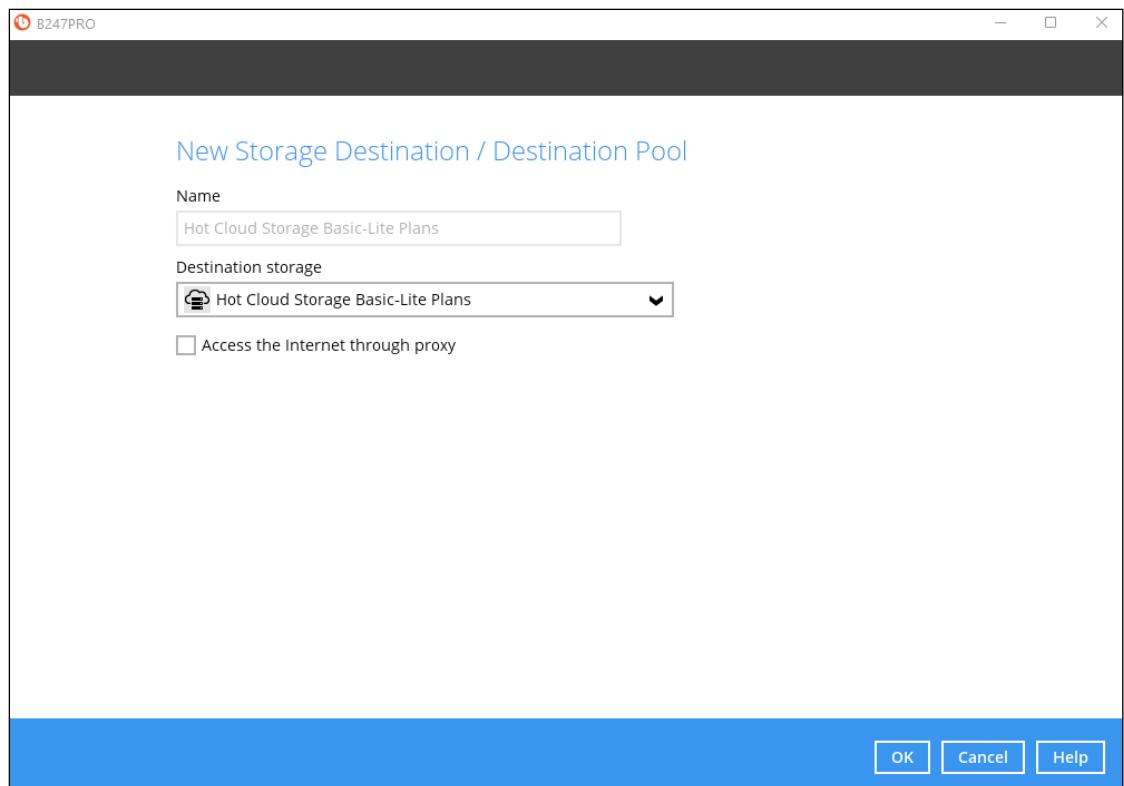
7. Click to create the Backup Set.
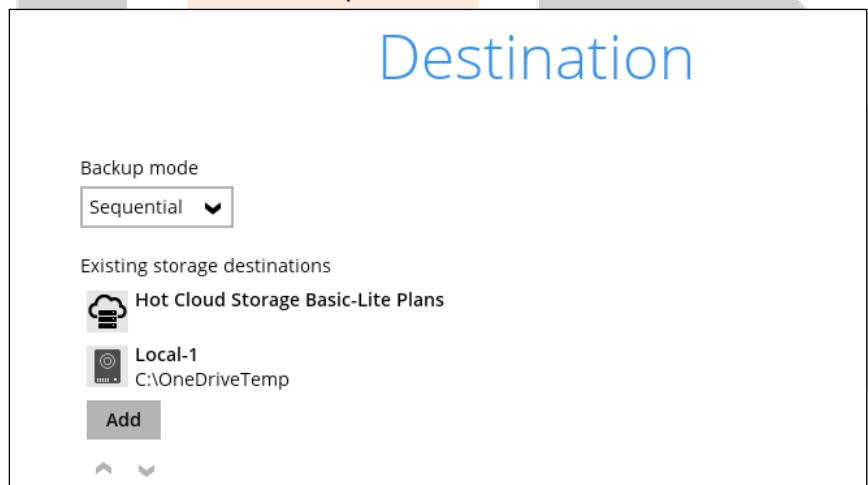
8. Click on the backup set you just created.
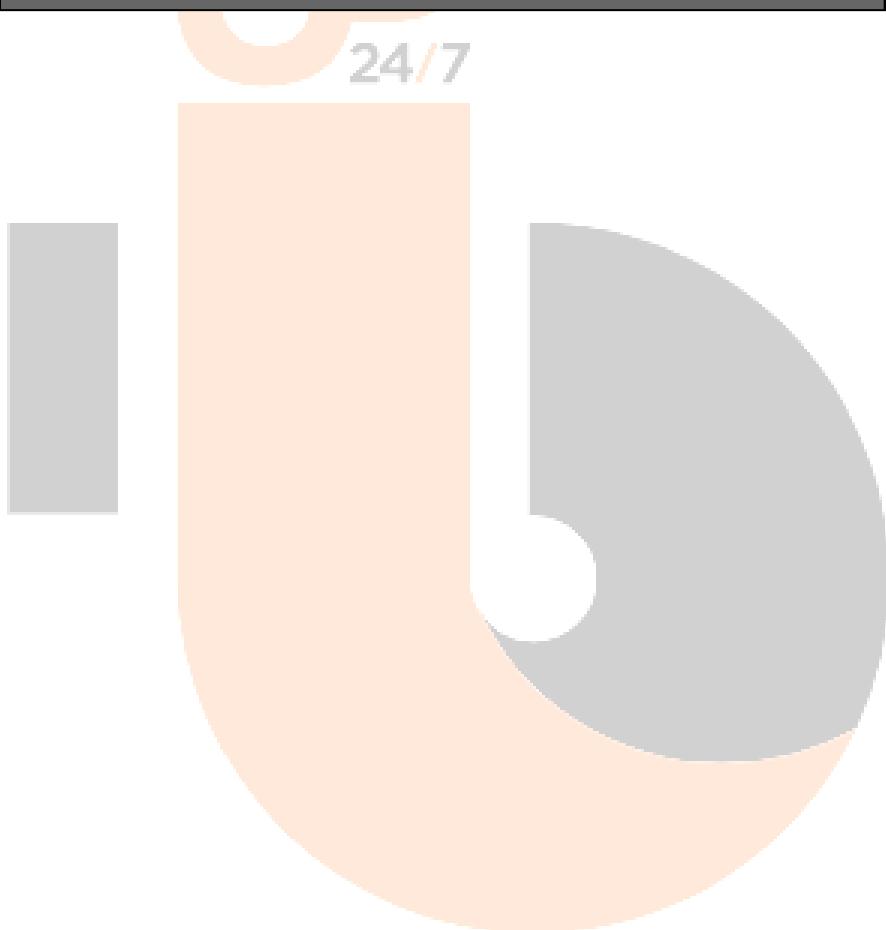
Go to **Others** and input the path of your temporary directory. It is recommended to check the box beside **Remove temporary files after backup** to make sure the spooled database files are cleaned up after each backup job to free up space on the temporary drive. Otherwise, if the temporary drive runs out of space the database backup job will not run. You can also change the settings for the **Compressions**. Click 🖫 once done.
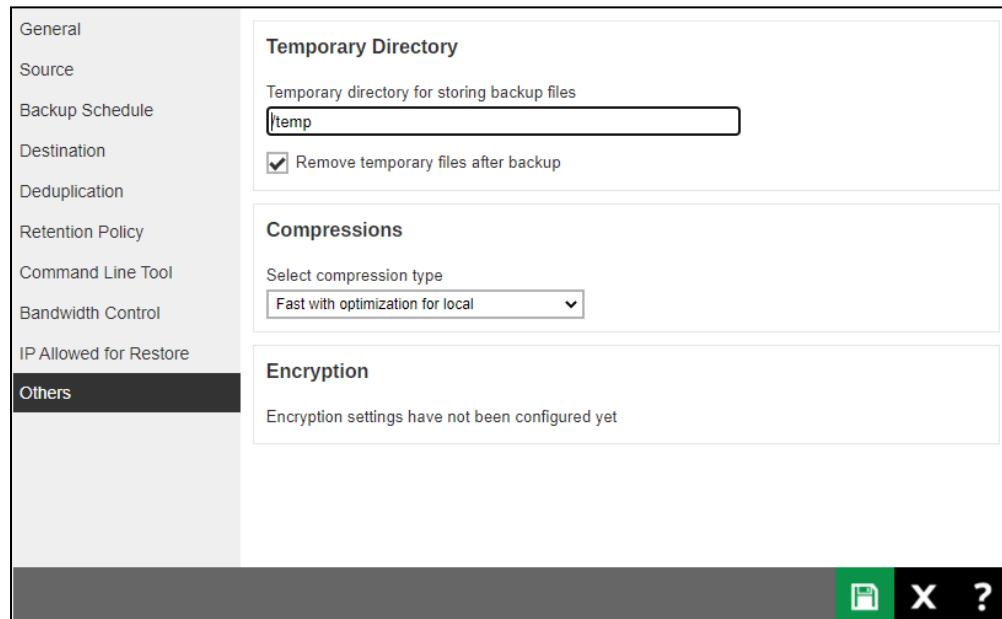
9. Open ssh session in the Linux machine and execute the RunConfigurator.sh script. The Login Menu will be displayed. Select **(1). Login** then press Enter to login. Input your Login Name and Password. Set the encryption setting for the backup set.

```
# cd /usr/local/B247Pro/bin
# sh RunConfigurator.sh
Startup Backup247 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 B247CBS 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     : B247CBS, 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/.B247Pro/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/. B247Pro/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 B247CBS web console if MariaDB Password and Encryption setting was successfully added.

General

General	
Source	
Backup Schedule	
Destination	
Deduplication	
Retention Policy	
Command Line Tool	
Bandwidth Control	
IP Allowed for Restore	
Others	

General

ID
1643355672811

Name
MariaDB Daily

Owner
localhost.localdomain

Backup set type
MariaDB Backup

MariaDB Backup

Login ID
root

Password

Host
localhost

Port
3306

Path to mysqldump
/usr/bin/mysqldump

X ?

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
/temp

☑ Remove temporary files after backup

Compressions

Select compression type
Fast with optimization for local

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/. B247Pro/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/.B247Pro/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/.B247Pro/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 Backup247 Advanced Client (B247PRO)**

   After you have edited the backupSet.xml file with your chosen backup settings you need
   to import the settings back to Backup247 Advanced Client (B247PRO), so they can be
   uploaded to B247CBS 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 'B247CBS'...
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   : B247CBS, 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 Backup247 Advanced Client (B247PRO) or install Backup247 Advanced Client (B247PRO) 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 Backup247 Advanced Client (B247PRO) 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)**

Start backup job

Establishing connection 1	Connection from the backup client to the backup server is established.
Uploading encryption key 2	Encryption key is uploaded to the backup server (if enabled).
Running Periodic DIC 3	Physical .bak files (data blocks) that do not exist in the index are removed from the backup destination(s), then the statistic of both data area and retention area will be recalculated.
Running pre-backup command 4	Pre-backup command is running (if configured).
Downloading files 5	Latest index.db file and checksum files are downloaded from the backup destination(s) to the temporary folder.
Compiling file list 6	Local file list is compiles according to the backup source setting.
Backing up temporary spool path 7	Select database(s) (including stored routines) are backed up to the temporary spool path using the mysqldump utility.
Comparing files 8	Local and remote file lists are compared to identify new, updated, moved or deleted files and/or folders since the last backup job.

Data deduplication 9	A checksum verification of each backup file which was split into several blocks of varying size is performed where its contents are compared, and the duplicated data are removed. (if enabled)
Uploading files 10	Data are compressed, encrypted, divided into individual data block size of 32 or 64 MB, and then uploaded to the backup destination(s).
Data validation check 11	The number of 32 or 64 MB data blocks and the individual block size in the backup destination(s) is identical to the blocks transferred.
Running retention policy 12	Retention policy job is running (if enabled).
Saving files 13	Latest index files on the client computer are saved to the backup destination(s) and client log files are saved to the backup server.
Running post-backup command 14	Post-backup command is running (if configured).
Removing temporary files 15	Temporary data is removed from the temporary storage location specified in the backup set (if enabled).

Backup job completed

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5 Running Backup Jobs

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

Example: RunBackupSet.sh <backupset name>

```
#cd /usr/local/B247Pro/bin
#sh RunBackupSet.sh "MariaDB Database 1"
-
Using APP_HOME      : /usr/local/B247Pro
Using SETTING_HOME  :
Using JAVA_HOME      : /usr/local/B247Pro/jvm
Using JAVA_EXE       : /usr/local/B247Pro/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 [ Backup247 Advanced Client
(B247PRO) 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 "B247CBS"...
[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 "B247CBS"
[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
B247CBS...
[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
```
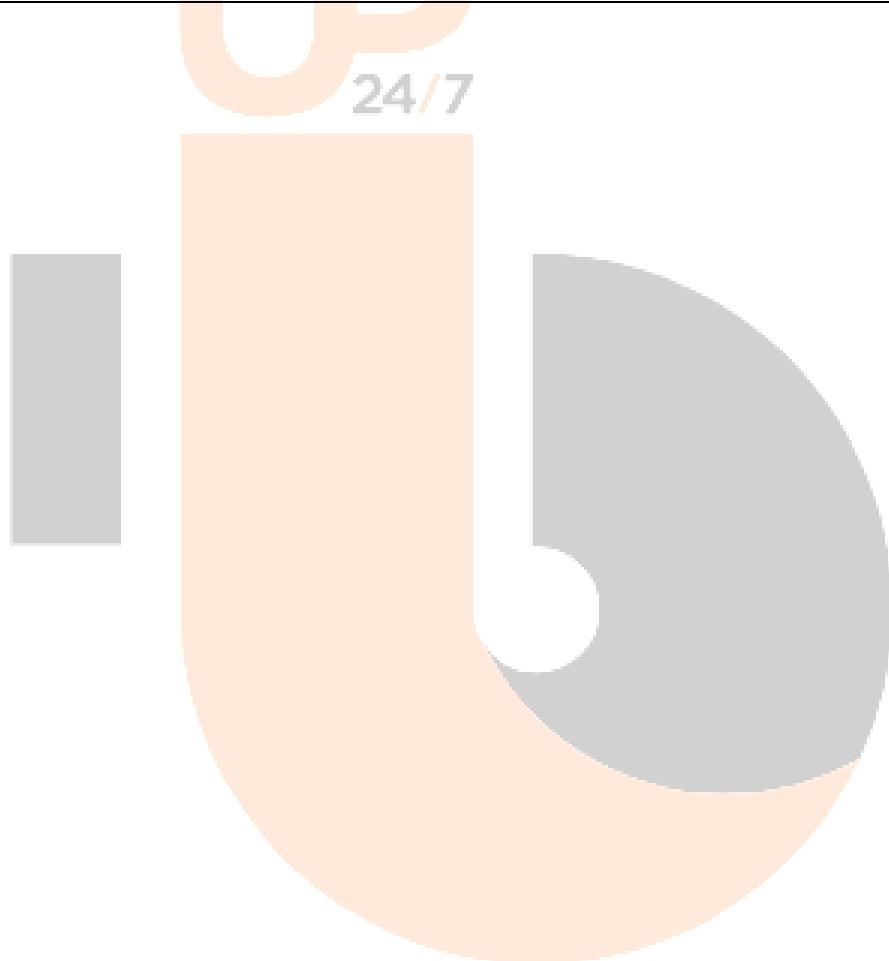
6 Restoring Data

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

O 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.

O 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:

   - **O** Backup Set Name -> BACKUP_SET=""

   - **O** Backup Destination -> DESTINATION=""

   - **O** Files/Folders to be Restored -> RESTORE_FROM=""

   - **O** Snapshot to be restored ->POINT_IN_TIME=""

   - **O** Applying the original permission to the restore files ->RESTORE_PERMISSION=""

   - **O** 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/B247Pro/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 ${HOME}/.B247Pro when not set.                         |
# |
# | e.g. SETTING_HOME="${HOME}/.B247Pro"                              |
# |
# --------------------------------------------------------------------
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, whice 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/B247Pro/bin
# sh Restore.sh
Using APP_HOME:          : /usr/local/B247Pro
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 [ Backup247 Advanced Client (B247PRO)
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 [ Backup247 Advanced Client (B247PRO)
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/B247Pro
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 [ Backup247 Advanced Client (B247PRO)
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 [ Backup247 Advanced Client (B247PRO)
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 Backup247

7.1 Technical Assistance

To contact Backup247 support representatives for technical assistance, visit our website https://backup247.com.au/Support.php

7.2 Documentation

Documentations for all Backup247 modules, user guide and QuickStart are available on our website. Alternatively, email us on support@backup247.com.au for technical demo.

247
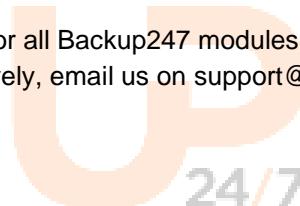
Appendix

Appendix A   MariaDB Backup Set XML Template (Raw)

```xml
<?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 -->
```

```xml
    <!-- 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" />
```

```xml
            <!-- 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" />
        <!-- B247CBS destination is where the files are backup to server -->
        <Key name="B247CBS 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" />
```

```xml
            <!-- Directory to store your backup files -->
            <!-- e.g. /tmp -->
            <Value data="" name="Local Path" type="string" />
        </Key>
        <!-- Hot Cloud destination for storing files -->
        <!-- Copy and paste the whole <Key> to add more Hot Cloud destinations
        -->
        <Key name="Hot Cloud 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 ~/Backup247 -->
            <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.

- ◉ **Backup set type** – enter the backup set type, for instance, File, MariaDB etc.

- ◉ **Backup set name** – name your backup set.

- ◉ **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 Backup247 Advanced Client (B247PRO), remote file list, local file list, temporary delta file and other files of temporary nature.

- ◉ **Remove temporary files after backup** – choose whether to remove temporary files after you finish backup.

- ◉ **Select compression type** – choose the backup compression mode among Normal, Fast, Fast with optimization for local or No compression.

```xml
<?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" />
```

MariaDB Setting

- 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

- 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

- 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

- 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).

- **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".

```
            <!-- 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.

```xml
<!-- 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.

- **Name of schedule** – name of the backup schedule.

- **Start hour** – the starting hour of the backup, from 0-23.

- **Start minute –** the starting minute of the backup, from 0-59.

- **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.

- **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.

- 🔹 **Name of schedule** – name of the backup schedule.

- 🔹 **Start hour** – the starting hour of the backup, from 0-23.

- 🔹 **Start minute –** the starting minute of the backup, from 0-59.

- 🔹 **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

- 🔹 **B247CBS Destination Settings** – this option allows backup files to be stored on the server.

- 🔹 **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" />
    <!-- B247CBS destination is where the files are backup to
    server -->
    <Key name="B247CBS 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>
```

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	B247CBS, 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
<?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" />
```

```xml
            <!-- 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 -->
```

```xml
            <!-- 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>
        </Key>
        <!-- This is the collection of destinations -->
        <Key name="Destination Settings">
            <Value data="-1" name="concurrency-level" type="integer" />
            <!-- B247CBS destination is where the files are backup to server -->
            <Key name="B247CBS 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	B247CBS
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" />
```

```xml
        <!-- 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" />
```

```xml
            <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" />
        <!-- B247CBS destination is where the files are backup to server -->
        <Key name="B247CBS 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>
```