



Ahsay Online Backup Manager v8

MySQL Database Backup and Restore for Windows

Ahsay Systems Corporation Limited

11 October 2021

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Revision History

Date	Descriptions	Type of modification
25 January 2021	Updated login steps in Ch. 3; Updated PDIC diagram in Ch. 5	Modifications
7 April 2021	Updated Ch. 5; Added sub-chapters for the detailed process diagrams in Ch. 5.1, 5.2, 5.2.1, 5.2.2 and 5.3	New / Modifications
11 October 2021	Updated login instructions in Ch. 3	Modifications

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1 Overview

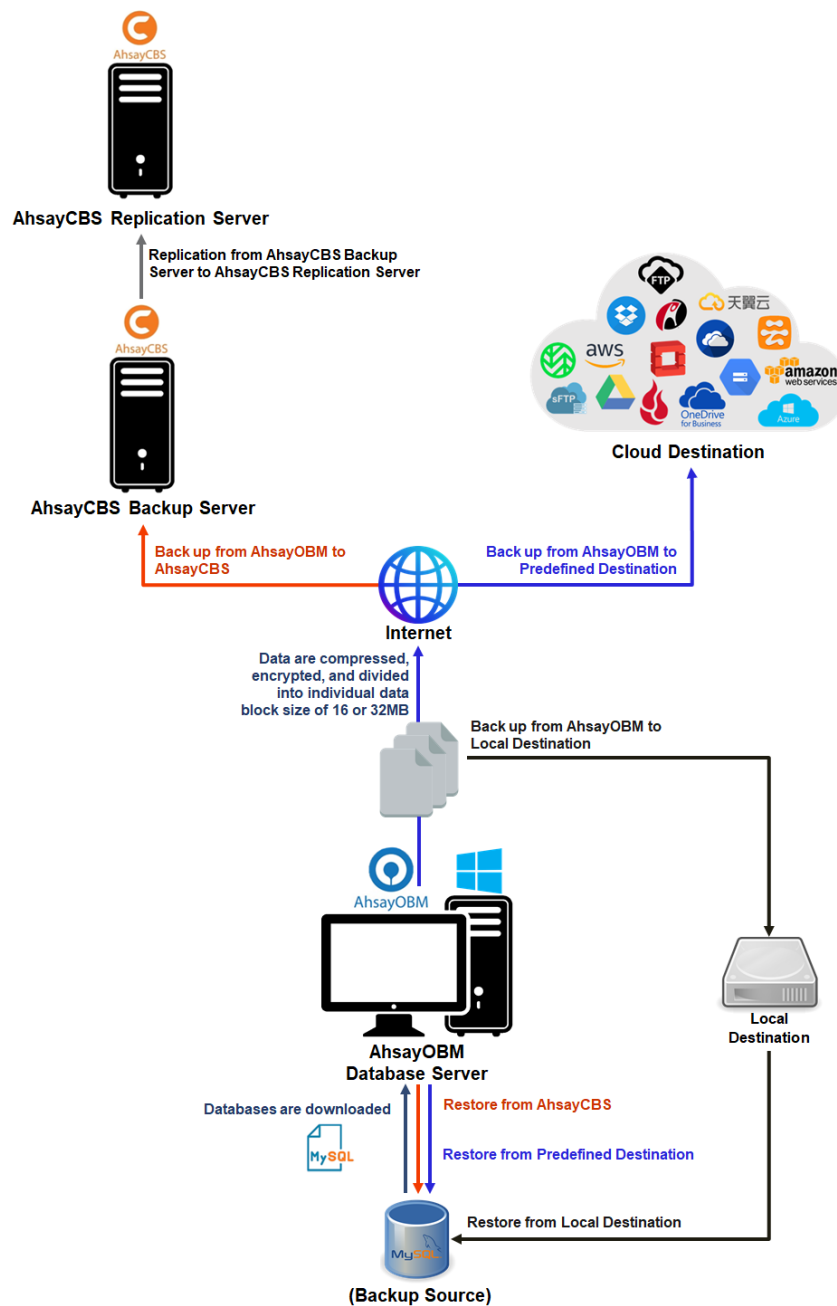
1.1 What is this software?

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

1.2 System Architecture?

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

In this user guide, we will focus on the software installation, as well as the end-to-end backup and restore process AhsayOBM (Agent-based).



2 Preparing for Backup and Restore

2.1 Hardware Requirement

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

[FAQ: Ahsay Hardware Requirement List \(HRL\) for version 8.1 or above](#)

2.2 Software Requirement

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

[FAQ: Ahsay Software Compatibility List \(SCL\) for version 8.1 or above](#)

2.3 Antivirus Exclusion

To optimize performance of AhsayOBM on Windows, and to avoid conflict with your antivirus software, refer to the following Wiki article the list of processes and directory paths that should be added to all antivirus software white-list / exclusion list:

[FAQ: Suggestion on antivirus exclusions to improve performance of Ahsay software on Windows](#)

2.4 AhsayOBM Installation

Make sure that the latest version of AhsayOBM is installed on your computer with Internet access for connection to your MySQL Database Server.

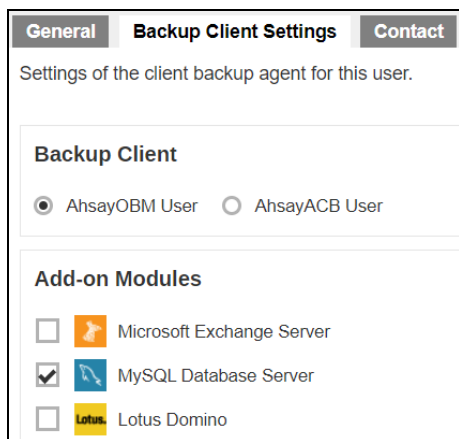
User should also stay up-to-date when newer version of AhsayOBM is released. To get our latest product and company news through email, please subscribe to our mailing list.

http://www.ahsay.com/jsp/en/home/subscribe_mail_list.jsp

2.5 Add-on Module Requirement

Make sure the MySQL Database Server feature has been enabled as an add-on module in your AhsayOBM user account.

Please contact your backup service provider for more details.



The screenshot shows a web interface with three tabs: 'General', 'Backup Client Settings', and 'Contact'. The 'Backup Client Settings' tab is active. Below the tabs, there is a heading 'Settings of the client backup agent for this user.' followed by a section titled 'Backup Client' with two radio button options: 'AhsayOBM User' (selected) and 'AhsayACB User'. Below that is a section titled 'Add-on Modules' with three checkboxes: 'Microsoft Exchange Server' (unchecked), 'MySQL Database Server' (checked), and 'Lotus Domino' (unchecked).

2.5.1 Backup Quota Requirement

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

Please contact your backup service provider for more details.

2.5.2 Java Heap Size

The default Java heap size setting on AhsayOBM is 2048MB. It is highly recommended to increase the Java heap size setting to be at least 4096MB to improve backup and restore performance. The actual heap size is dependent on amount of free memory available on your MySQL Database Server.

2.5.3 Network Drive

The login accounts for network drives must have read and write access permission to ensure that backup and restore would be successful.

2.6 MySQL Database Server Requirements

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

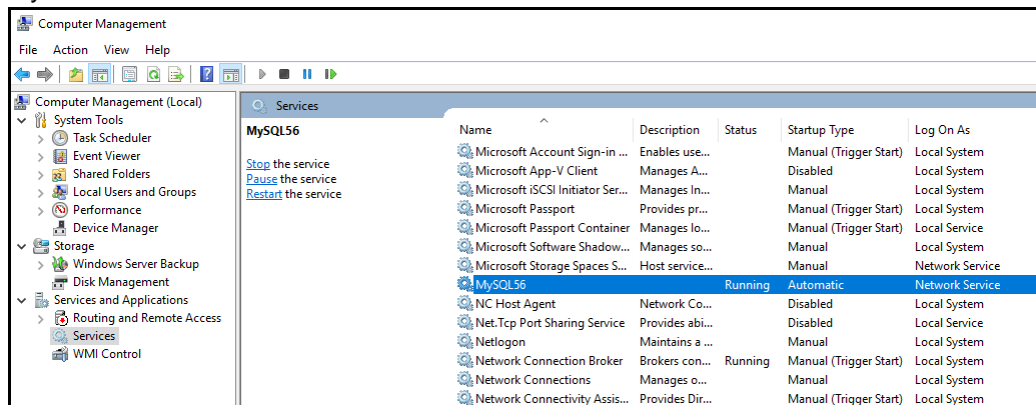
2.6.1 MySQL Version

AhsayOBM is installed on the MySQL database server.

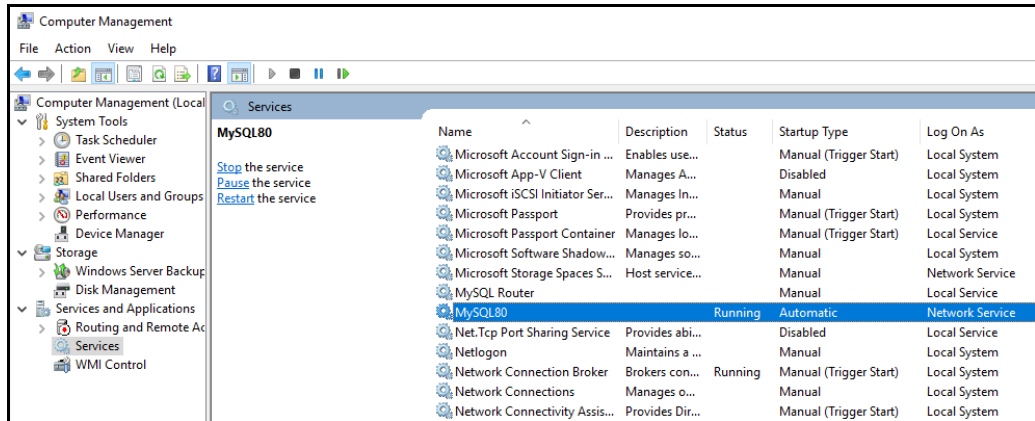
2.6.2 MySQL Database Status

The MySQL database instance is online.

Example: MySQL v5.6 on Windows Server 2016 (64-bit), the default service name is MySQL56.



Example: MySQL v8 on Windows Server 2016, the default service name is MySQL80.



2.6.3 TCP/IP Port

Check the listening port of the MySQL database instance (default is 3306) using the command **netstat -b -a**.

```
C:\>netstat -b -a

Active Connections

    Proto Local Address           Foreign Address         State
    TCP    0.0.0.0:135             w2k16-std:0            LISTENING
    RpcSs
    [svchost.exe]
    TCP    0.0.0.0:445             w2k16-std:0            LISTENING
    Can not obtain ownership information
    TCP    0.0.0.0:2179           w2k16-std:0            LISTENING
    [vmms.exe]
    TCP    0.0.0.0:3306           w2k16-std:0            LISTENING
    [mysqld.exe]
    TCP    0.0.0.0:3389           w2k16-std:0            LISTENING
    TermService
    [svchost.exe]
    TCP    0.0.0.0:5985           w2k16-std:0            LISTENING
    Can not obtain ownership information
    TCP    0.0.0.0:47001          w2k16-std:0            LISTENING
    Can not obtain ownership information
    TCP    0.0.0.0:49664          w2k16-std:0            LISTENING
    Can not obtain ownership information
    TCP    0.0.0.0:49665          w2k16-std:0            LISTENING
    [lsass.exe]
    TCP    0.0.0.0:49666          w2k16-std:0            LISTENING
    EventLog
    [svchost.exe]
    TCP    0.0.0.0:49667          w2k16-std:0            LISTENING
    [spoolsv.exe]
    TCP    0.0.0.0:49668          w2k16-std:0            LISTENING
    SessionEnv
    [svchost.exe]
    TCP    0.0.0.0:49669          w2k16-std:0            LISTENING
    PolicyAgent
```

2.6.4 Mysqldump Utility

The mysqldump utility is installed on the MySQL database server.

Example: the default location for the mysqldump utility for MySQL v5.6.x is located in the following folder **C:\Program Files\MySQL\MySQL Server 5.6\bin**

2.6.5 Mysqldump Utility Version

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

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

Example: MySQL v5.6

```
C:\Program Files\MySQL\MySQL Server 5.6\bin>mysqldump --version
mysqldump Ver 10.13 Distrib 5.6.41, for Win64 (x86_64)

C:\Program Files\MySQL\MySQL Server 5.6\bin>
```

Example: MySQL v8.0

```
C:\Program Files\MySQL\MySQL Server 8.0\bin>mysqldump --version
mysqldump Ver 8.0.12 for Win64 on x86_64 (MySQL Community Server
- GPL)

C:\Program Files\MySQL\MySQL Server 8.0\bin>
```

MySQL database version:

Example: MySQL v5.6

```
mysql> select version();
+-----+
| version() |
+-----+
| 5.6.41-log |
+-----+
1 row in set (0.00 sec)

mysql>
```

Example: MySQL v8.0

```
mysql> select version();
+-----+
| version() |
+-----+
| 8.0.12    |
+-----+
1 row in set (0.00 sec)
mysql>
```

2.6.6 User Account Privileges

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

Example: MySQL v5.6

```
mysql> GRANT ALL PRIVILEGES ON *.* TO "username"@"localhost"
IDENTIFIED BY "password";
Query OK, 0 rows affected (0.00 sec)

mysql> GRANT ALL PRIVILEGES ON *.* TO
"username"@"localhost.localdomain" IDENTIFIED BY "password";
Query OK, 0 rows affected (0.00 sec)

mysql> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.01 sec)

mysql>
```

For MySQL 8 the use of GRANT to define account authentication characteristic is deprecated. For more information please refer to the [MySQL 8.0 Reference Manual](#). As an alternative, you must first create the user and set the authentication characteristic by using CREATE USER before setting the privileges of the user using GRANT.

Example: MySQL v8.0

```
mysql> CREATE USER 'root'@'localhost.localdomain' IDENTIFIED BY
'Abcd123$%';
Query OK, 0 rows affected (0.32 sec)

mysql> GRANT ALL PRIVILEGES ON *.* TO 'root'@'localhost';
Query OK, 0 rows affected (0.01 sec)

mysql> GRANT ALL PRIVILEGES ON *.* TO 'root'@'localhost.localdomain';
Query OK, 0 rows affected (0.12 sec)

mysql> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.01 sec)
```

2.6.7 Localhost

Verify that 'localhost' on the MySQL database server is resolvable and 'localhost' is allowed to access the MySQL database instance on the MySQL service listening port (default 3306).

```
C:\>ping localhost

Pinging 10.90.10.40 with 32 bytes of data:
Reply from 10.90.10.40: bytes=32 time<1ms TTL=64
Reply from 10.90.10.40: bytes=32 time<1ms TTL=64
Reply from 10.90.10.40: bytes=32 time<1ms TTL=64
Reply from 10.90.10.40: bytes=32 time<1ms TTL=64

Ping statistics for 10.90.10.40:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>
```

```
# telnet localhost 3306
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'
J
5.6.31vB#'8%/kQ3K\n6` `Amysql_native_password
```

NOTE

The telnet utility is not installed by default on some Windows versions.

2.6.8 MySQL Virtual System Databases

Exclude the 'information_schema' and 'performance_schema' databases are MySQL virtual system databases, which contains information about the user databases on the MySQL instance. They are read-only and cannot be backed up.

```
mysql> show databases;
+-----+
| Database          |
+-----+
| information_schema |
| mysql             |
| performance_schema |
| sakila            |
| test              |
| world             |
+-----+
6 rows in set (0.00 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 that the temporary directory configured for the MySQL 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.

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.

```
+-----+-----+
| Database          | Size (MB) |
+-----+-----+
| information_schema |    0.01 |
| mysql             |    0.90 |
| performance_schema |    0.00 |
| sakila            |    6.44 |
| world             |    0.77 |
+-----+-----+
5 rows in set (0.53 sec)
```

2.7 Limitations

1. Backup and restore must be to the same MySQL database version.
2. When restoring MySQL databases to an alternate location only one database can be selected and restored at any one time.
3. Cannot restore the MySQL database nodes to original or alternate location.
4. Restoring databases to another machine can only be done using the **Restore raw file** option.

2.8 Best Practices and Recommendations

• Temporary Directory

To ensure an optimal backup/restoration performance, it is highly recommended to set the temporary directory folder to a location with sufficient free disk space. It must be on another location other than Drive C: (e.g. Drive E:).

• Periodic Backup Schedule

The periodic backup schedule should be reviewed regularly to ensure that the interval is sufficient to handle the data volume on the machine. Over time, data usage pattern may change on a production server, i.e. the number of new files created, the number of files which are updated/deleted, and new users may be added etc.

Consider the following key points to efficiently handle backup sets with periodic backup schedule.

- Hardware – to achieve optimal performance, compatible hardware requirements is a must. Ensure you have the backup machine's appropriate hardware specifications to accommodate frequency of backups,
 - so that the data is always backed up within the periodic backup interval
 - so that the backup frequency does not affect the performance of the production server
- Network – make sure to have enough network bandwidth to accommodate the volume of data within the backup interval.
- Retention Policy - also make sure to consider the retention policy settings and retention area storage management which can grow because of the changes in the backup data for each backup job.

3 Logging in to AhsayOBM

Starting with AhsayOBM v8.5.0.0 there are several login scenarios depending on the setting of the account you are using. The different scenarios will be discussed below:

- [Login without 2FA](#)
- [Login with 2FA using authenticator app](#)
- [Login with 2FA using Twilio](#)

3.1 Login to AhsayOBM without 2FA

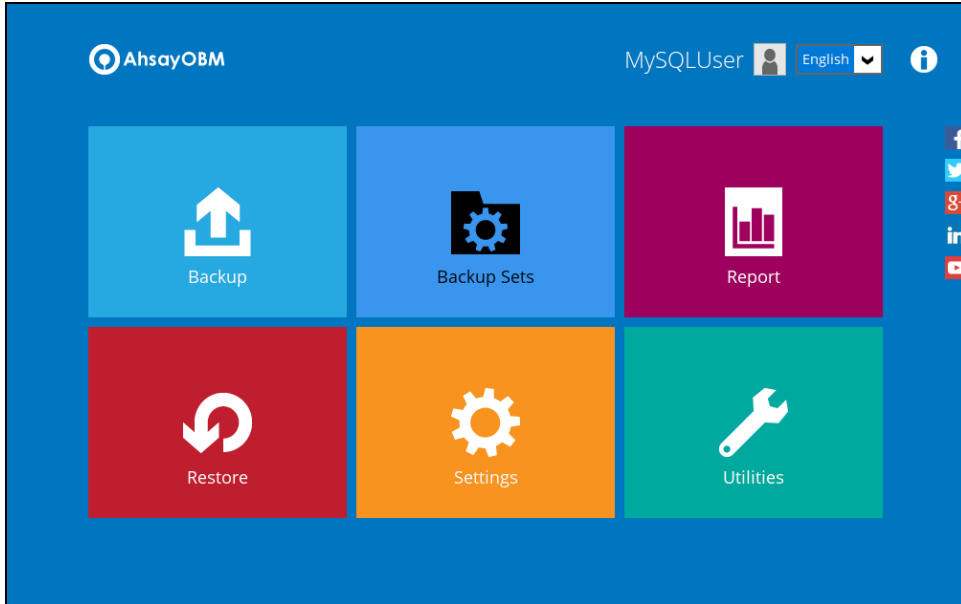
1. A shortcut icon of AhsayOBM should have been created on your Windows desktop after installation. Double click the icon to launch the application.



2. Enter the **Login name** and **Password** of your AhsayOBM account provided by your backup service provider, then click **OK** to login.

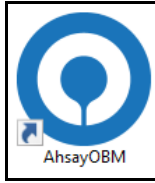
A screenshot of the AhsayOBM login dialog box. The dialog has a dark blue background with the AhsayOBM logo and name at the top. Below the logo, the word 'Login' is displayed. There are two input fields: 'Login name' and 'Password'. Below the 'Password' field, there is a checkbox labeled 'Save password' and a link labeled 'Forgot password'. At the bottom of the dialog, there is a link labeled 'Show advanced option' and an 'OK' button. The dialog is set against a blue geometric pattern background. In the top right corner of the background, there is a language dropdown menu showing 'English'.

3. After successful login, the following screen will appear



3.2 Login to AhsayOBM with 2FA using authenticator app

1. A shortcut icon of AhsayOBM should have been created on your Windows desktop after installation. Double click the icon to launch the application.



2. Enter the **Login name** and **Password** of your AhsayOBM account provided by your backup service provider, then click **OK** to login.

The AhsayOBM login screen. It has a blue background with a geometric pattern. In the top right corner, there is a language dropdown menu set to 'English'. The main content is a dark blue box with the AhsayOBM logo and the text 'Login'. Below this, there are two input fields for 'Login name' and 'Password'. There is a checkbox for 'Save password' and a link for 'Forgot password'. At the bottom of the box, there is a 'Show advanced option' link and an 'OK' button.

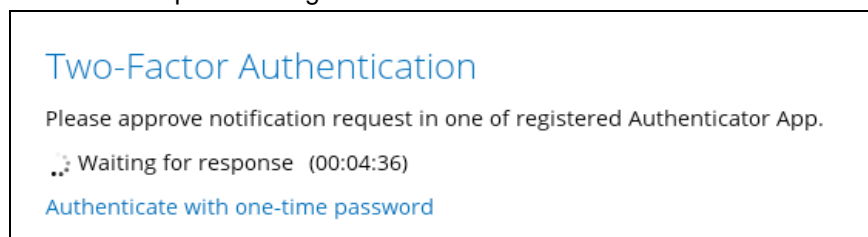
3. One of the two authentication methods will be displayed to continue with the login:

- ⦿ [Push Notification and TOTP when using Ahsay Mobile app](#)
- ⦿ [TOTP only](#)

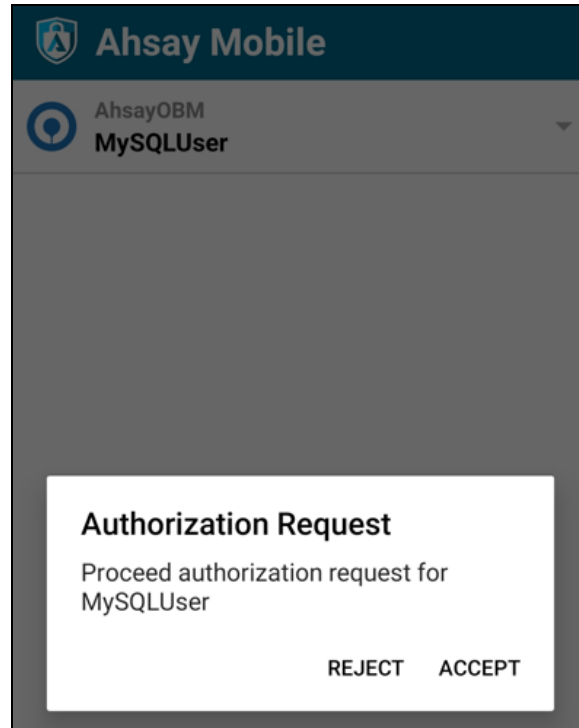
-
- ⦿ If **Ahsay Mobile app** was configured to use Push Notification and TOTP then there are two 2FA modes that can be used:

- Push Notification (default)

Push notification is the default 2FA mode. Accept the login request on Ahsay Mobile to complete the login.

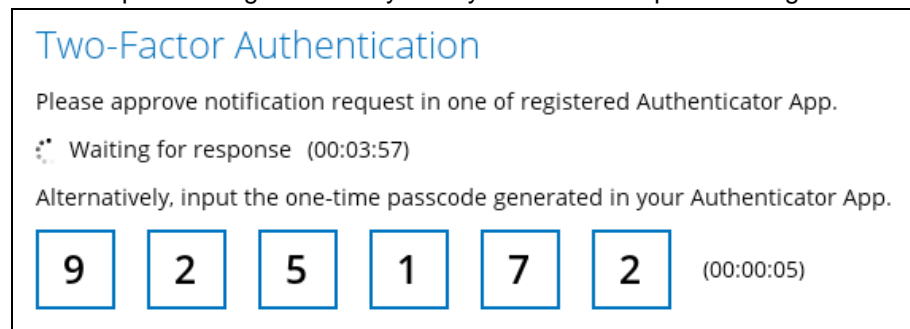


Example of the login request sent to the Ahsay Mobile app.

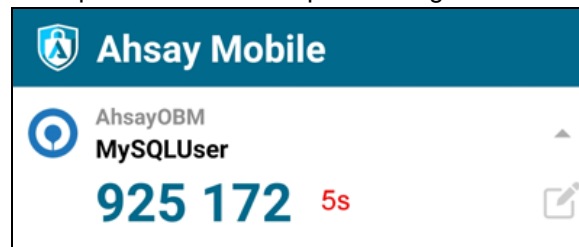


- TOTP

However, if push notification is not working or you prefer to use one-time passcode, click the [Authenticate with one-time password](#) link, then input the one-time passcode generated by Ahsay Mobile to complete the login.

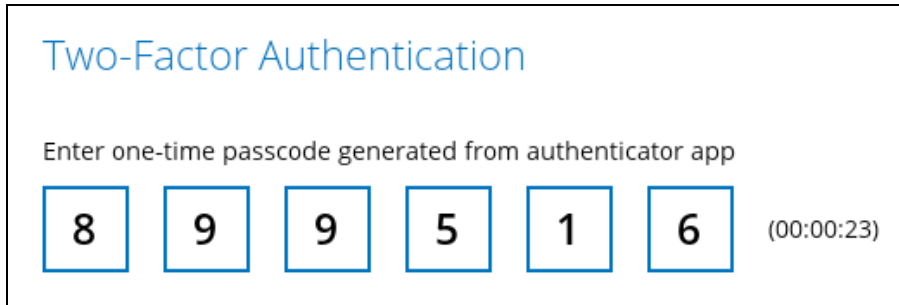


Example of the one-time passcode generated in Ahsay Mobile.

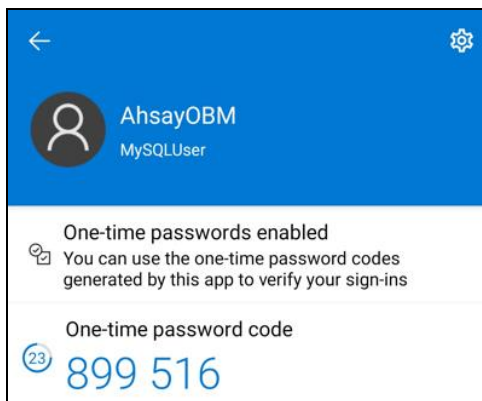


• TOTP only

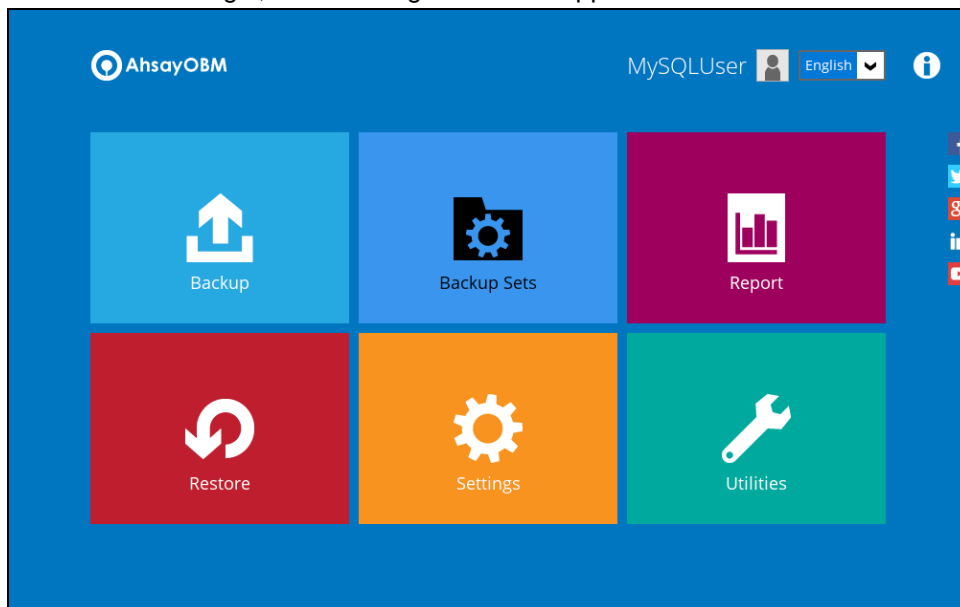
Enter the one-time passcode generated by the authenticator app to complete the login.



Example of the one-time passcode generated in the third party authenticator app Microsoft Authenticator.



4. After successful login, the following screen will appear

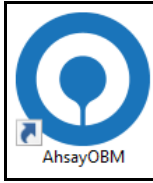


NOTE

If you have trouble logging in using the authenticator app please refer to Chapter 9 of the [AhsayOBM Quick Start Guide for Windows](#) for more information.

3.3 Login to AhsayOBM with 2FA using Twilio

1. A shortcut icon of AhsayOBM should have been created on your Windows desktop after installation. Double click the icon to launch the application.



2. Enter the login name and password of your AhsayOBM account provided by your backup service provider, then click **OK** to login.

The AhsayOBM login screen. It has a blue background with a geometric pattern. In the top right corner, there is a language dropdown menu set to 'English'. The main content area is a dark blue box with the AhsayOBM logo and the text 'Login'. Below this, there are two input fields for 'Login name' and 'Password'. There is a checkbox for 'Save password' and a link for 'Forgot password'. At the bottom of the box, there is a 'Show advanced option' link and an 'OK' button.

3. Select your phone number.

The Two-Factor Authentication screen. It has a white background with a blue header 'Two-Factor Authentication'. Below the header, there is a text prompt: 'Please select phone number to receive passcode via SMS message to continue login.' There are three radio button options, each with a phone icon: 'Austria (+43) - *****6588', 'Philippines (+63) - *****6123', and 'Switzerland (+41) - *****4731'. At the bottom right, there are 'Cancel' and 'Help' buttons.

4. Enter the passcode and click **Verify** to login.

Two-Factor Authentication

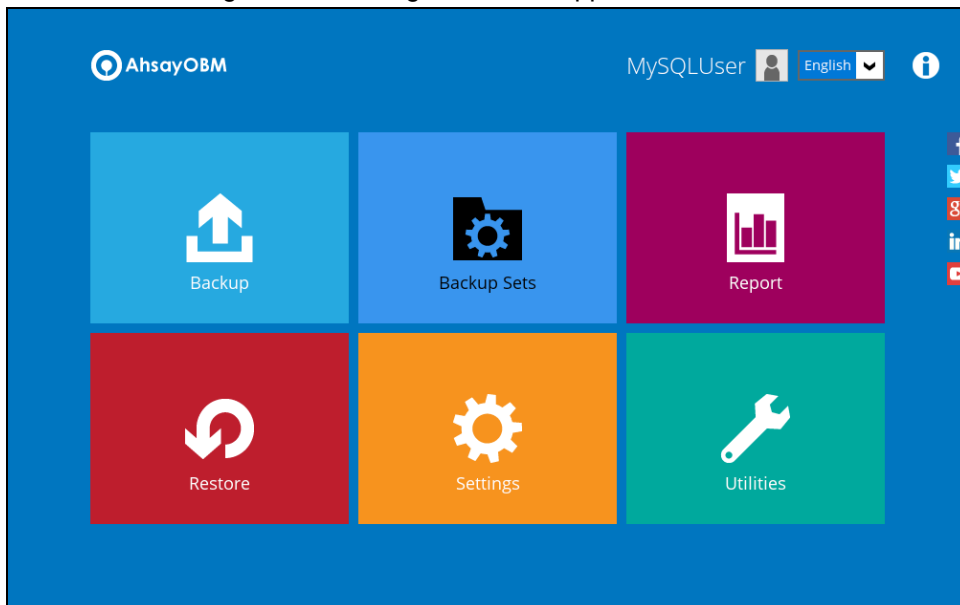
SMS message with a passcode was already sent to the phone number Philippines (+63) - *****6123
Please enter the passcode to continue login.

EUVS - (00:03:59)

Resend passcode

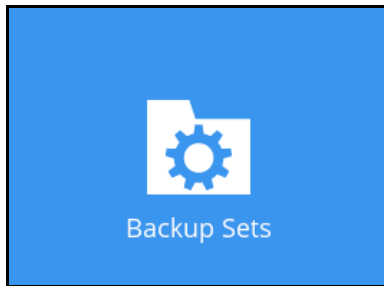
Verify Cancel Help

5. After successful login, the following screen will appear.

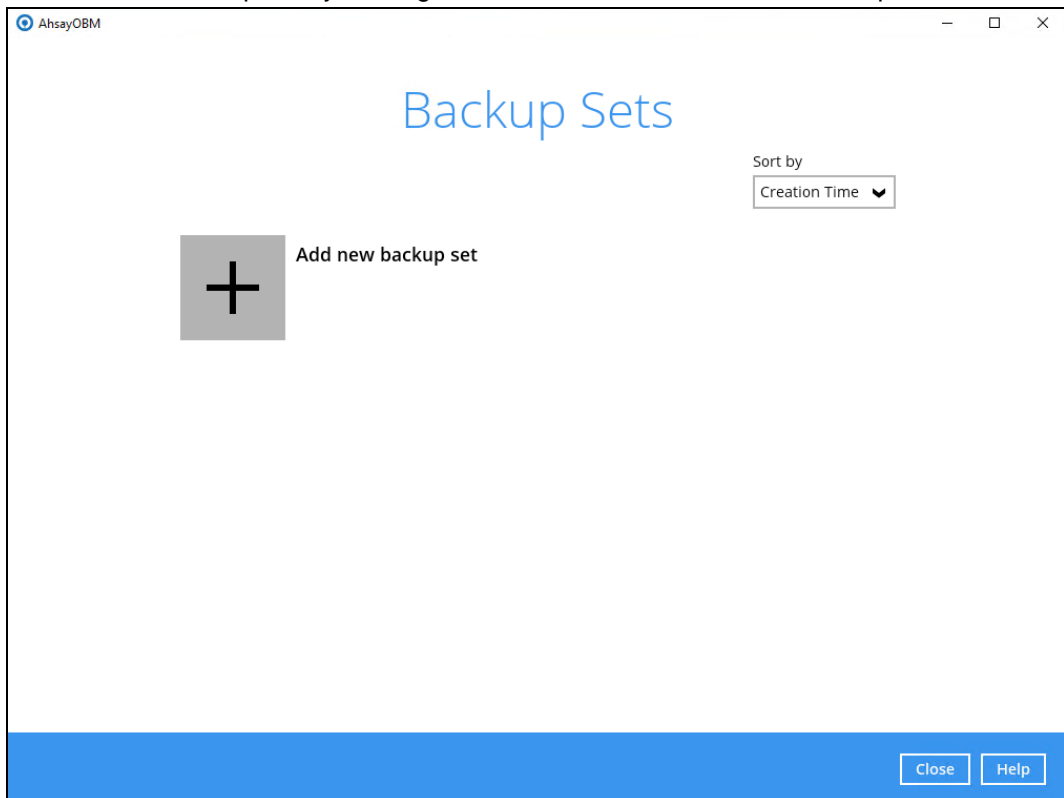


4 Creating a MySQL Database Backup Set

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



2. Create a new backup set by clicking the **Add** button to create a new backup set.



3. Select the **Backup set type** and name your new backup set and enter the login information for the MySQL server then click **Next** to proceed.

AhsayOBM

Create Backup Set

Name
MySQL Database

Backup set type
MySQL Backup

Login ID
root

Password
•••••

Host
localhost

Port
3306

Path to mysqldump
C:\Program Files\MySQL\MySQL Server 5.6\bin\mysqldum **Change**

Next Cancel Help

4. In the Backup Source menu, select the MySQL databases you would like to backup. Click **Next** to proceed.

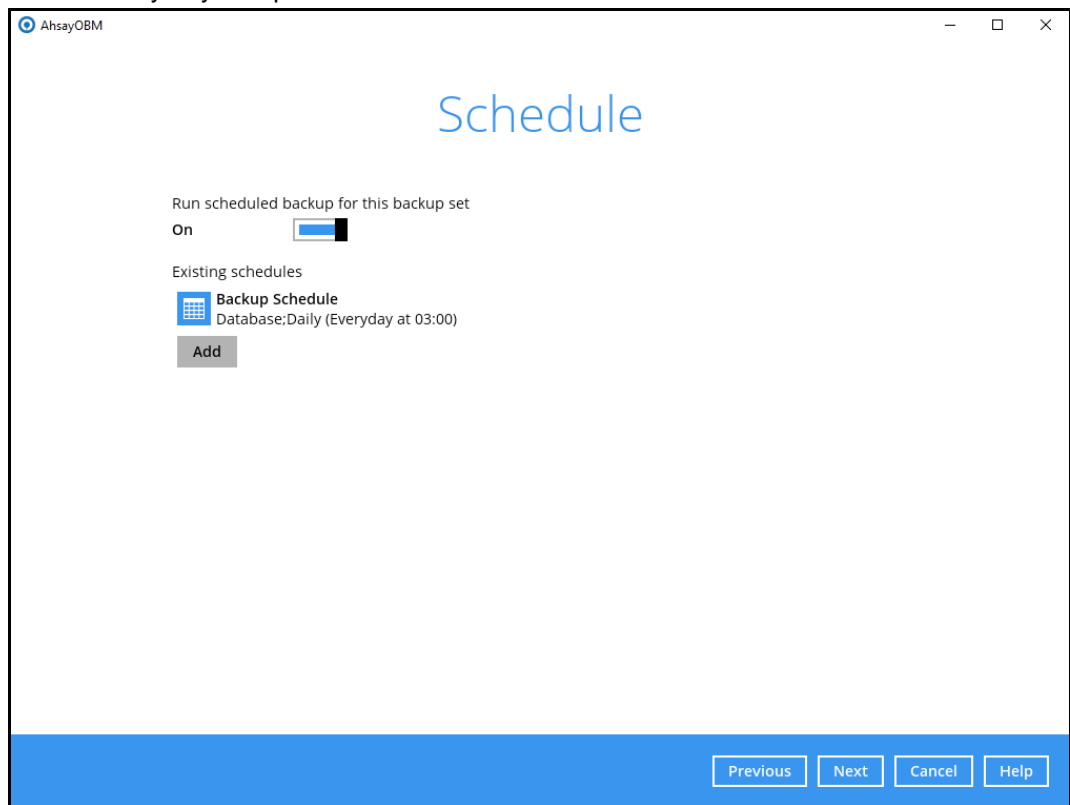
AhsayOBM

Backup Source

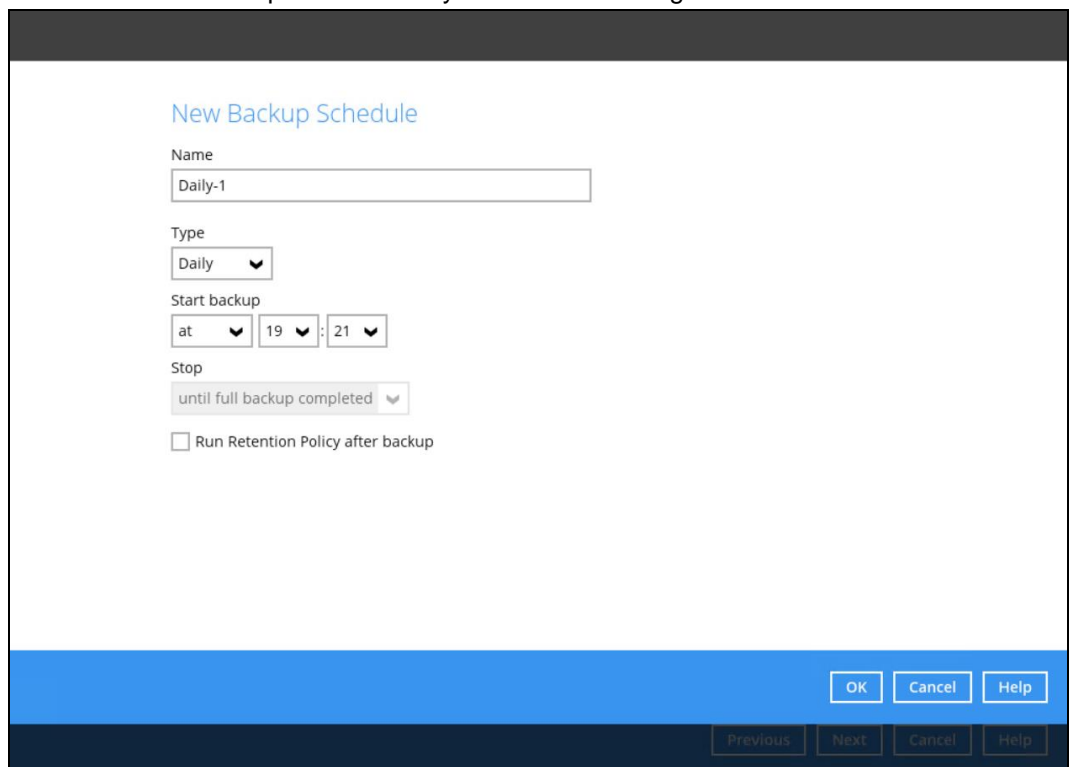
- MySQL
 - information_schema
 - mysql
 - performance_schema
 - sakila
 - test
 - world

Previous Next Cancel Help

5. In the Schedule menu, you can configure a backup schedule for backup job to run automatically at your specified time interval.

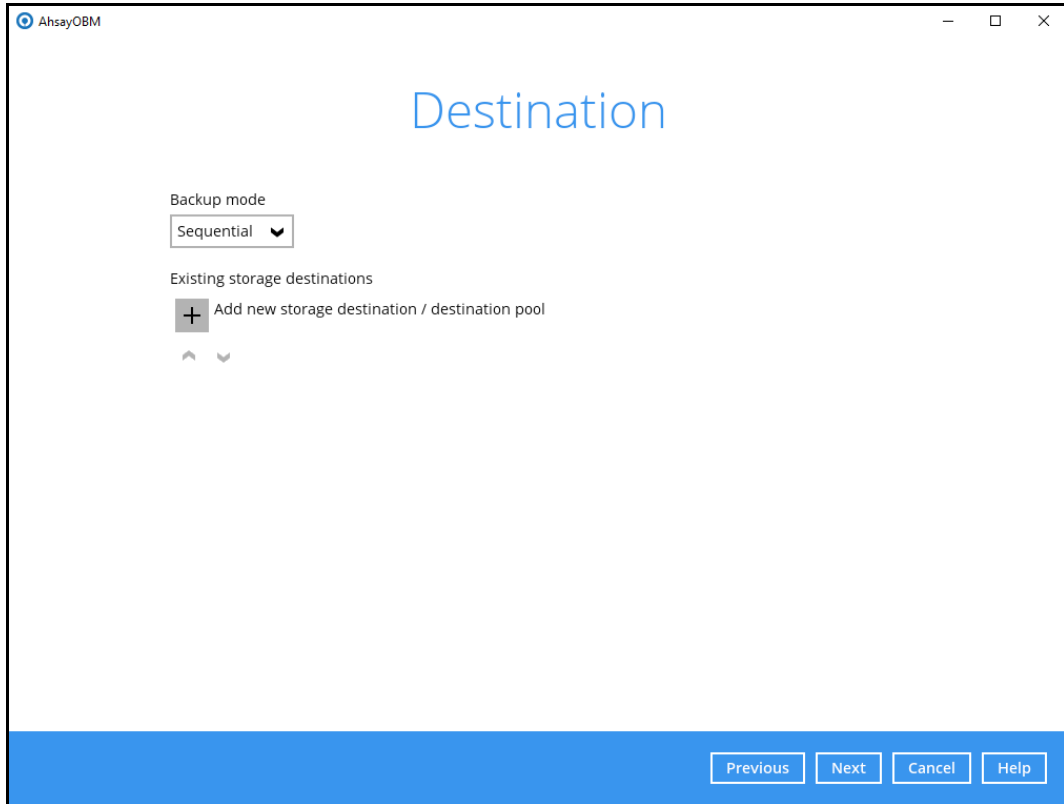


Click **Add** to add a new schedule or double click on the existing schedule to change the values. Click **Next** to proceed when you are done setting.



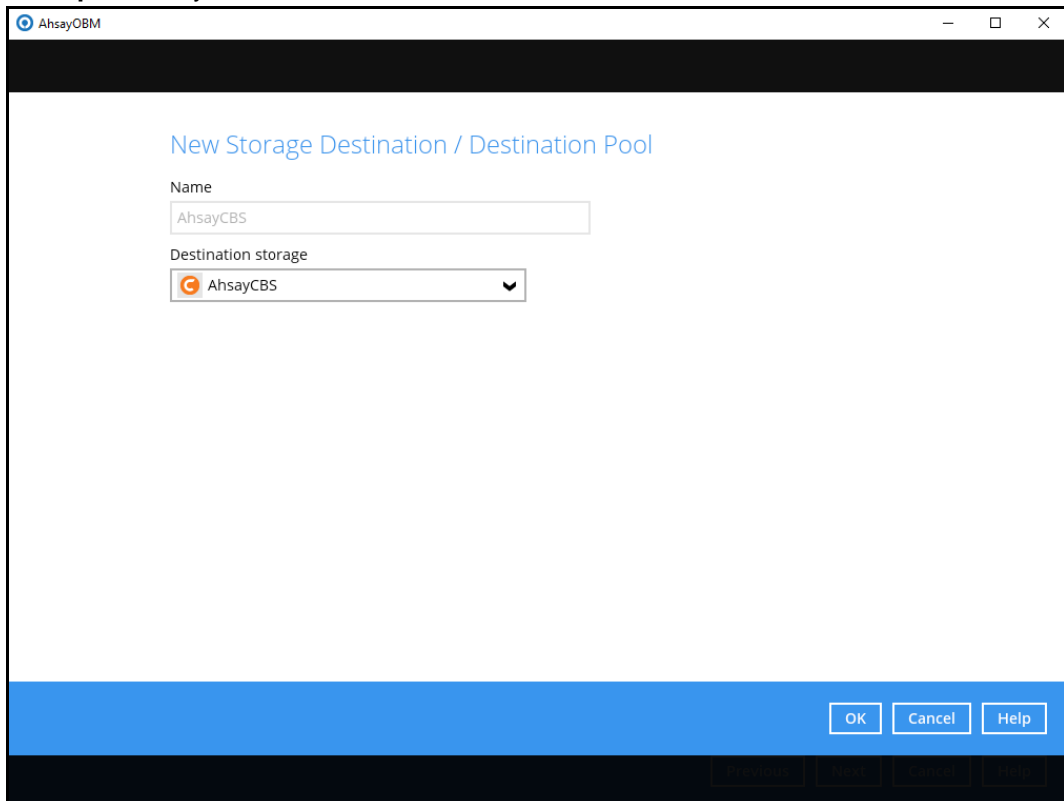
Note: The default backup schedule is daily backup at 03:00 with the backup job will run until completion and the retention policy job will be run immediately after the backup job.

6. Select a backup mode and click the “+” sign icon to select a backup storage destination.

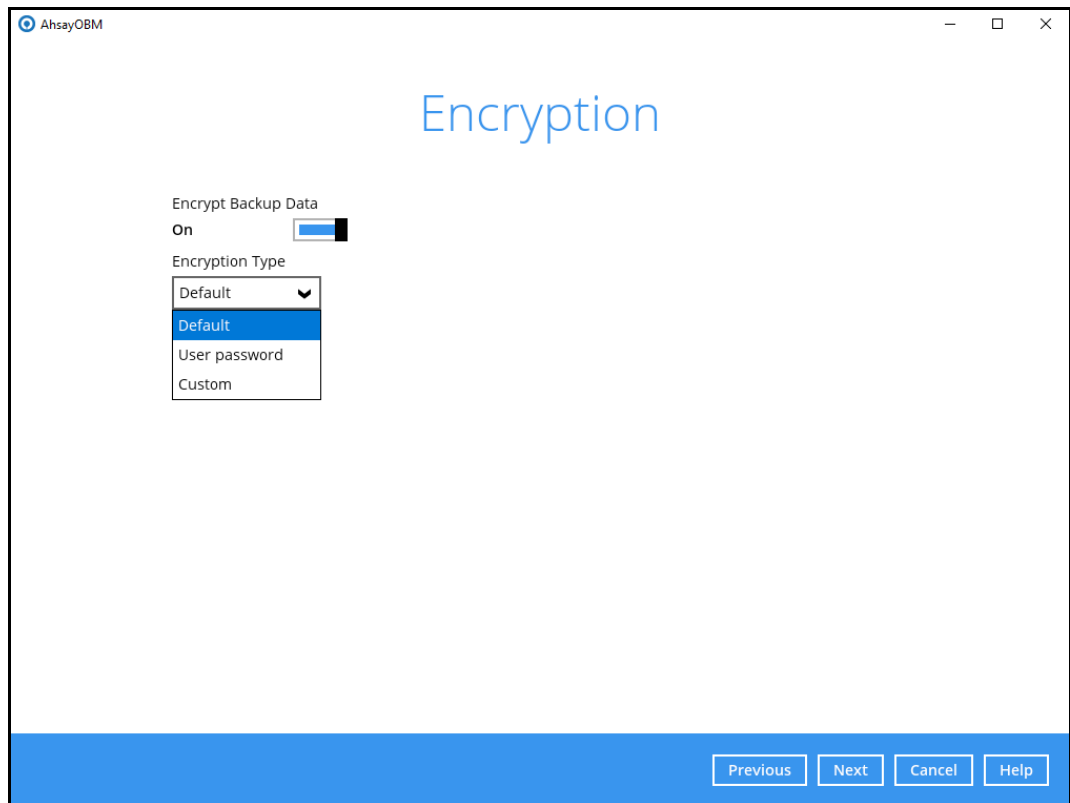


7. Select the backup storage destination. Click on **OK** to proceed.

Example: AhsayCBS server

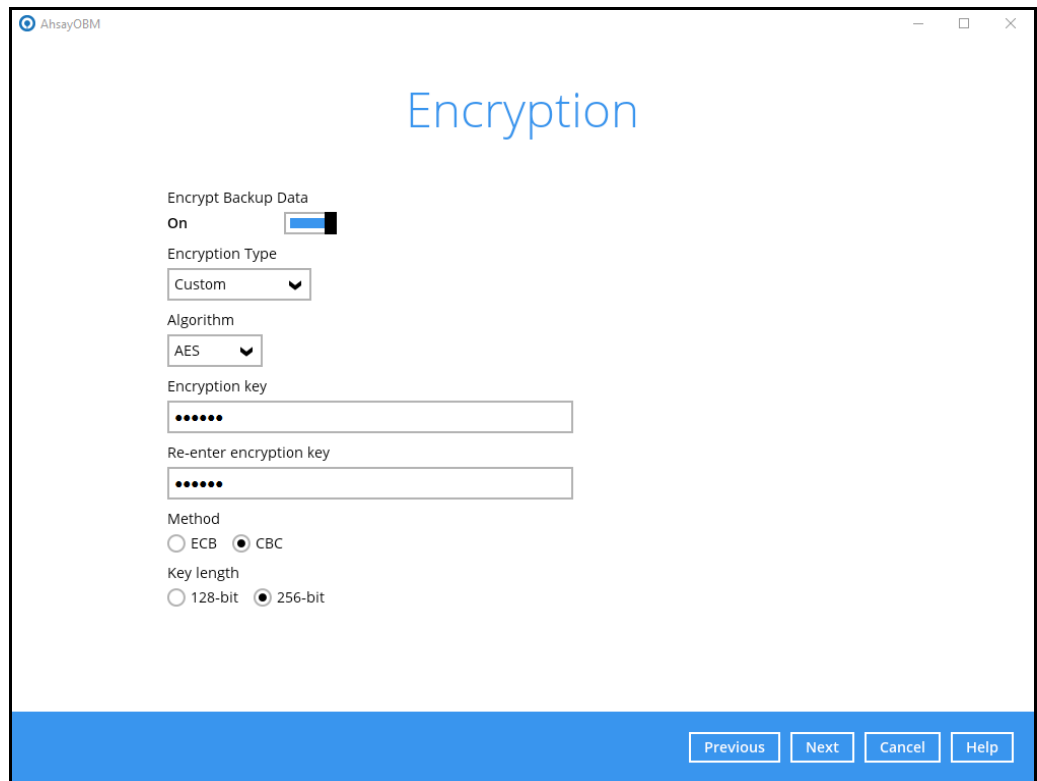


8. In the Encryption window, the default **Encrypt Backup Data** option is enabled with an encryption key preset by the system which provides the most secure protection.



You can choose from one of the following three Encryption Type options:

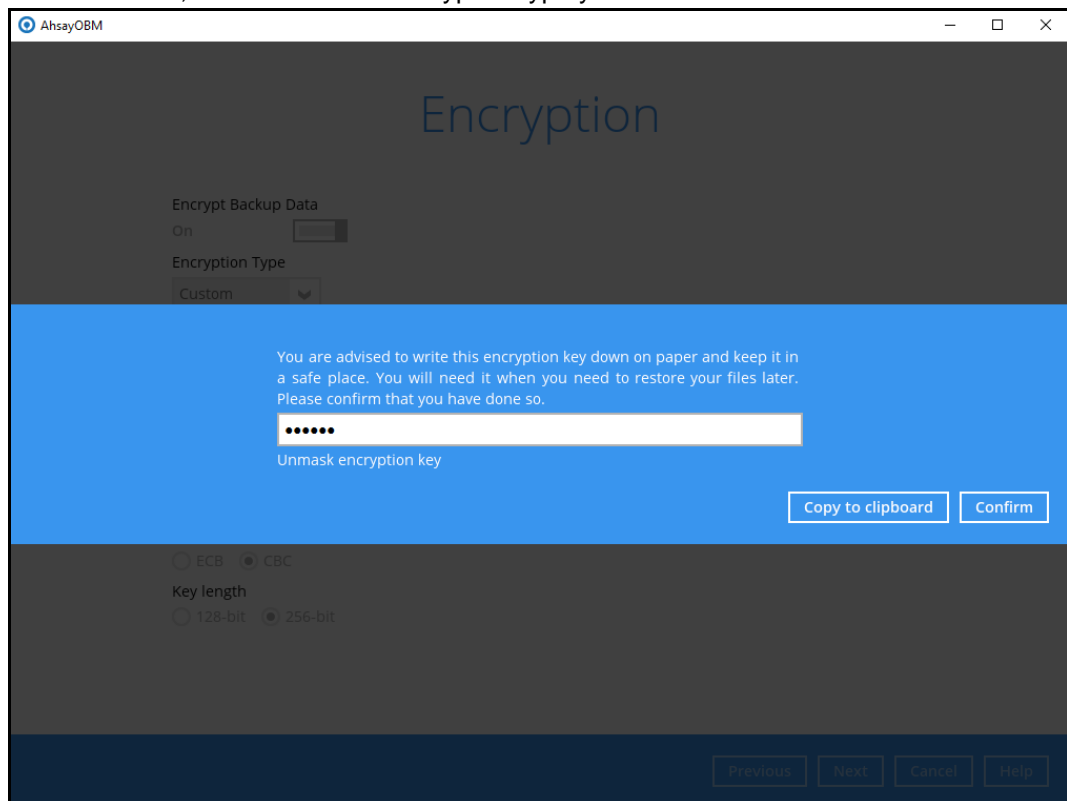
- **Default** – an encryption key with 44 alpha numeric characters will be randomly generated by the system.
- **User password** – the encryption key will be the same as the login password of your AhsayOBM at the time when this backup set is created. Please be reminded that if you change the AhsayOBM login password later, the encryption keys of the backup sets previously created with this encryption type will remain unchanged.
- **Custom** – you can customize your encryption key, where you can set your own algorithm, encryption key, method, and key length.



Note: For best practice on managing your encryption key, refer to the following KB article. <https://forum.ahsay.com/viewtopic.php?f=169&t=14090>

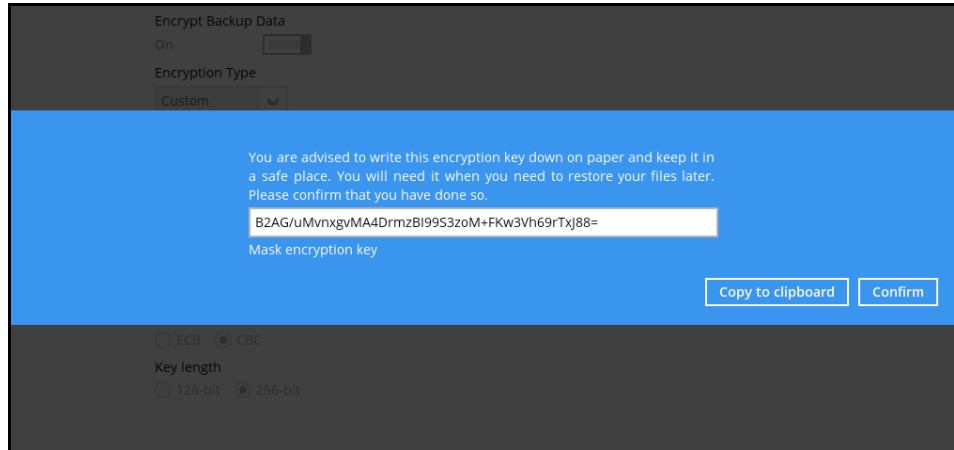
Click **Next** when you are done setting.

9. If you have enabled the Encryption Key feature in the previous step, the following pop-up window shows, no matter which encryption type you have selected.



The pop-up window has the following three options to choose from:

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

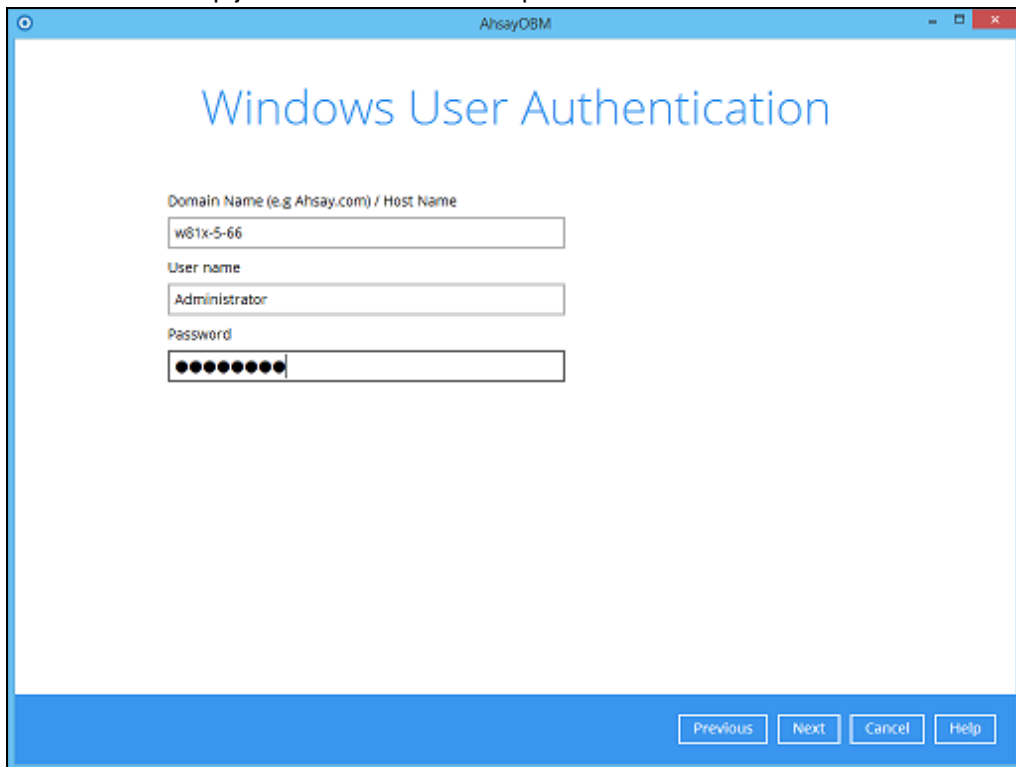


The screenshot shows a pop-up window with a dark grey header and a blue main area. At the top, it says "Encrypt Backup Data" with a toggle switch set to "On". Below that, "Encryption Type" is set to "Custom". The main blue area contains a warning: "You are advised to write this encryption key down on paper and keep it in a safe place. You will need it when you need to restore your files later. Please confirm that you have done so." Below the warning is a text box containing the encryption key: "B2AG/uMvnxgvMA4DrmzBI9953zoM+FKw3Vh69rTxj88=". Below the text box is the label "Mask encryption key". At the bottom right of the blue area are two buttons: "Copy to clipboard" and "Confirm". At the bottom of the window, there are radio buttons for "ECB" (selected) and "CBC", and another set of radio buttons for "Key length" with "128-bit" (selected) and "256-bit".

- **Copy to clipboard** – Click to copy the encryption key, then you can paste it in another location of your choice.
- **Confirm** – Click to exit this pop-up window and proceed to the next step.

10. Windows User Authentication

Enter the Windows login credentials used by AhsayOBM to authenticate the scheduled or continuous backup job and click on **Next** to proceed.

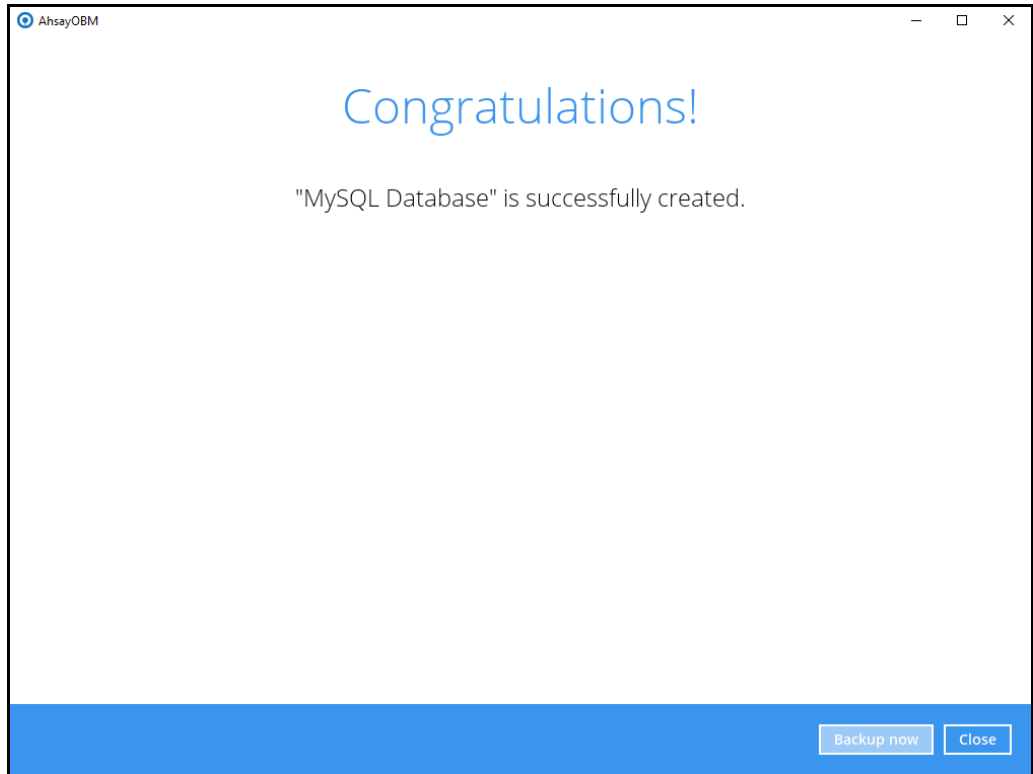


The screenshot shows a dialog box titled "AhsayOBM" with the heading "Windows User Authentication". It contains three input fields: "Domain Name (e.g. Ahsay.com) / Host Name" with the value "w81x-5-66", "User name" with the value "Administrator", and "Password" which is masked with dots. At the bottom right, there are four buttons: "Previous", "Next", "Cancel", and "Help".

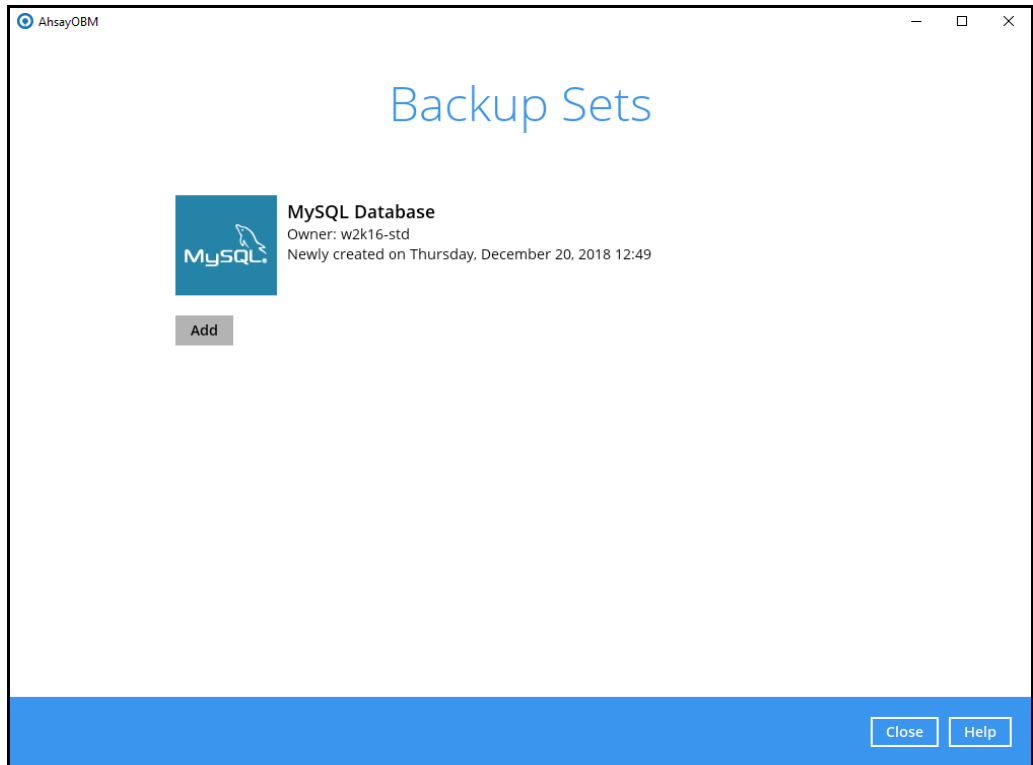
Note: If the backup schedule is turned off for the backup set the Windows User Authentication screen will be automatically skipped. The Windows User Authentication login credentials can be added or updated post backup set creation.

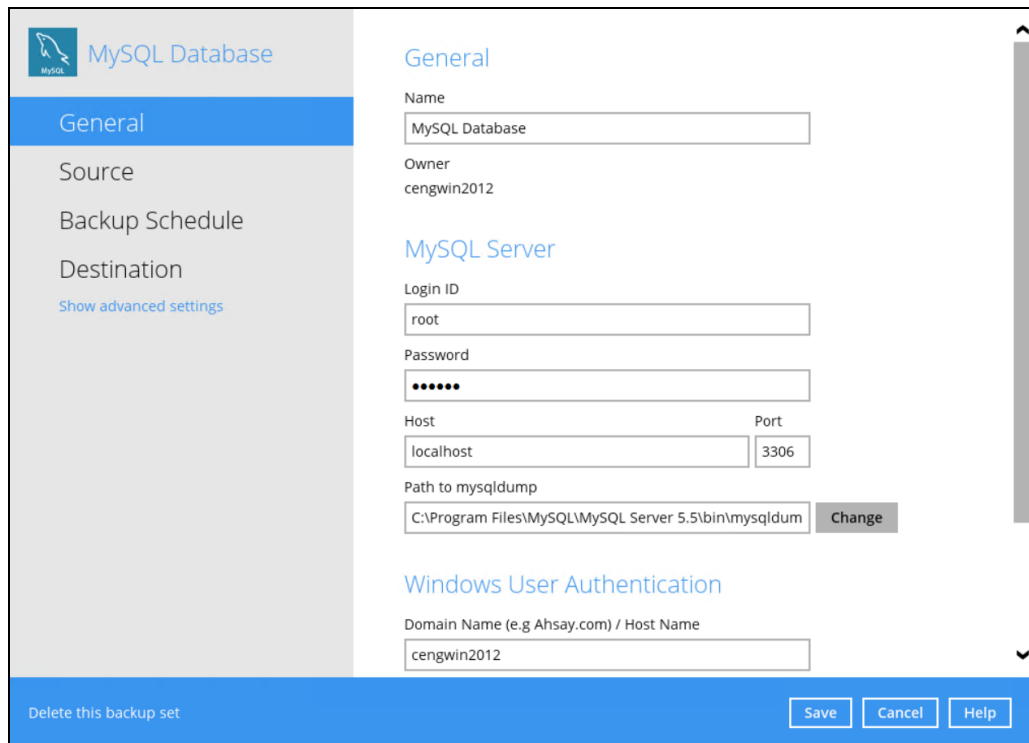
11. Backup set created.

i. To start a manual backup job, click on **Backup now**.



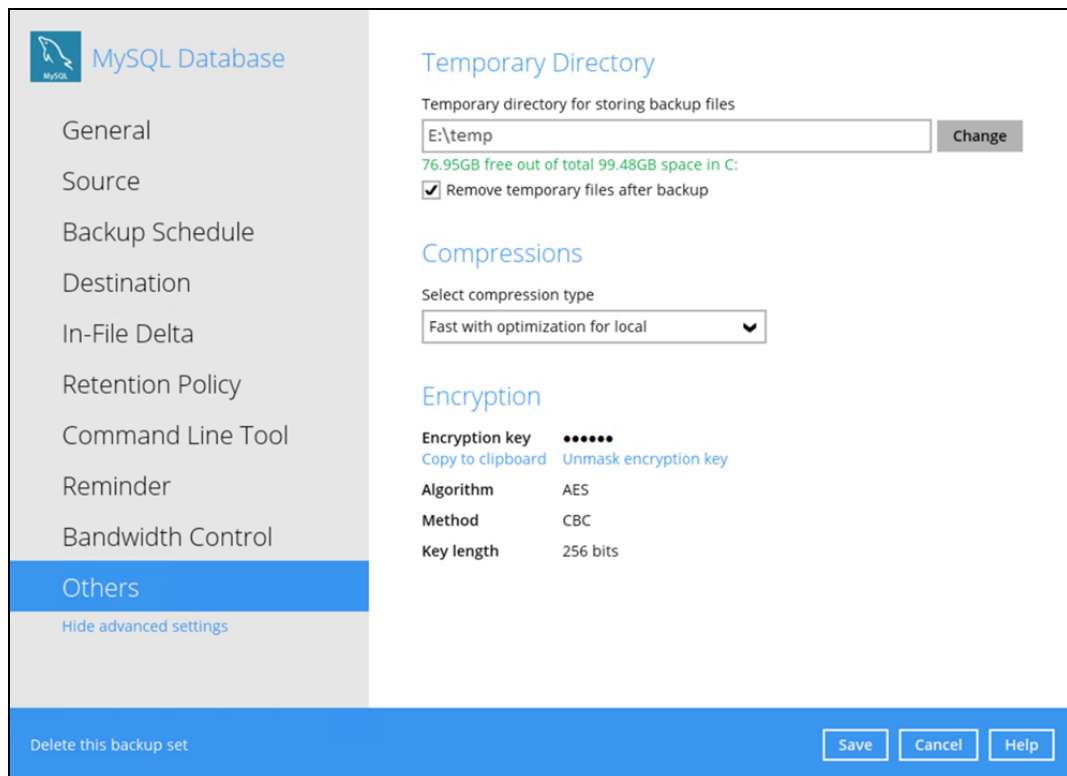
ii. To verify the backup set settings, click on Close and then click on the MySQL backup set to complete the setup.





- It is highly recommended to change the Temporary Directory. Select another location with sufficient free disk space other than Drive C:\Users\Administrator\temp.

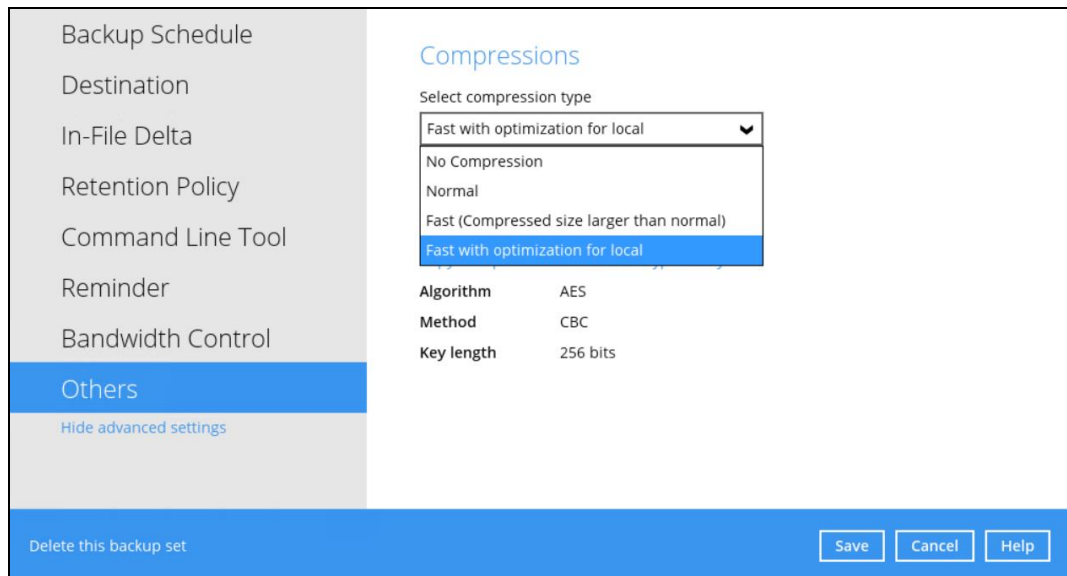
Go to Others > Temporary Directory. Click Change to browse for another location.



13. Optional: Select your preferred **Compression** type. By default, the compression is Fast with optimization for local.

Go to Others > Compressions. Select from the following list:

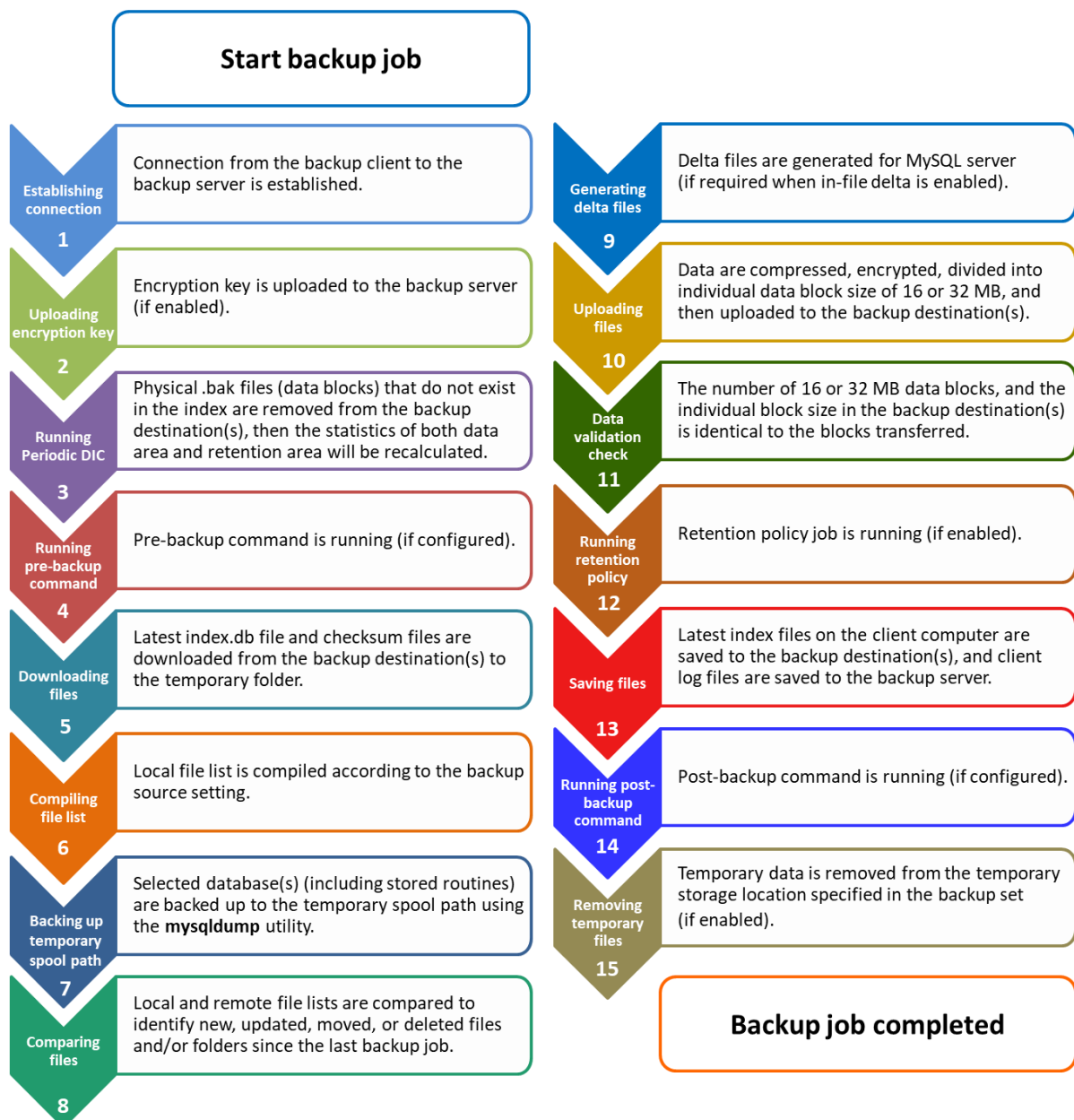
- No Compression
- Normal
- Fast (Compressed size larger than normal)
- Fast with optimization for local



5 Overview on the Backup Process

The following steps are performed during a MySQL Database backup job. For an overview of the detailed process for Steps 3, 5, 11, and 13, please refer to the following chapters.

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



5.1 Periodic Data Integrity Check (PDIC) Process

For AhsayOBM v8.3.6.0 (or above), the PDIC will run on the first backup job that falls on the corresponding day of the week from **Monday to Friday**.

To minimize the impact of the potential load of large number of PDIC jobs running at the same time on the AhsayCBS server, the schedule of a PDIC job for each backup set is automatically determined by the result of the following formula:

PDIC schedule = %BackupSetID% modulo 5
or
%BackupSetID% mod 5

The calculated **result** will map to the corresponding day of the week (i.e., from Monday to Friday).

0	Monday
1	Tuesday
2	Wednesday
3	Thursday
4	Friday

NOTE: The PDIC schedule cannot be changed.

Example:

Backup set ID: 1594627447932

Calculation: 1594627447932 mod 5 = 2

2	Wednesday
----------	------------------

In this example:

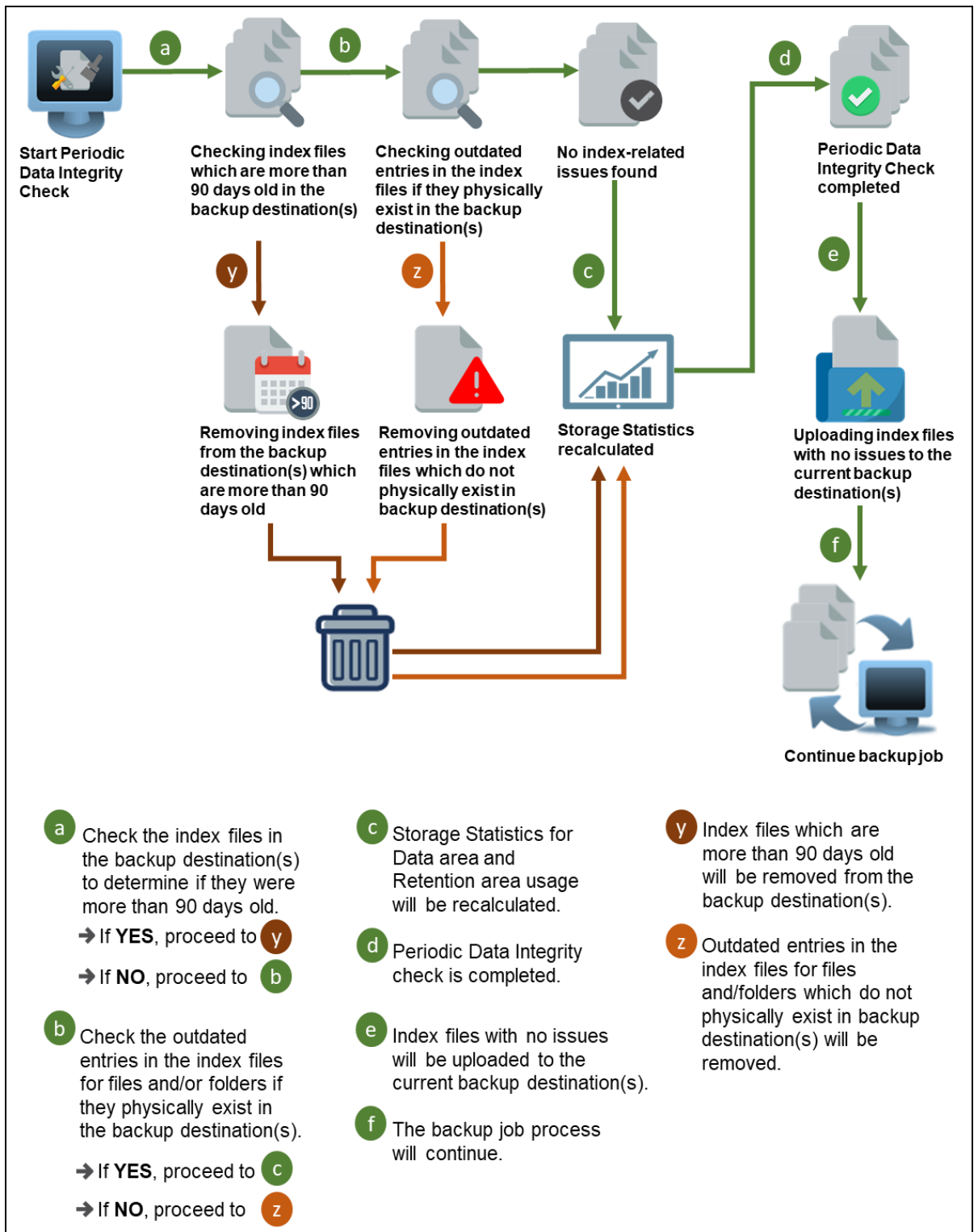
- the PDIC will run on the first backup job that falls on Wednesday; or
- if there is no active backup job(s) running from Monday to Friday, then the PDIC will run on the next available backup job.

NOTE

Although according to the PDIC formula for determining the schedule is ***%BackupSetID% mod 5***, this schedule only applies if the previous PDIC job was actually run more than 7 days prior.

Under certain conditions, the PDIC may not run strictly according to this formula. For example:

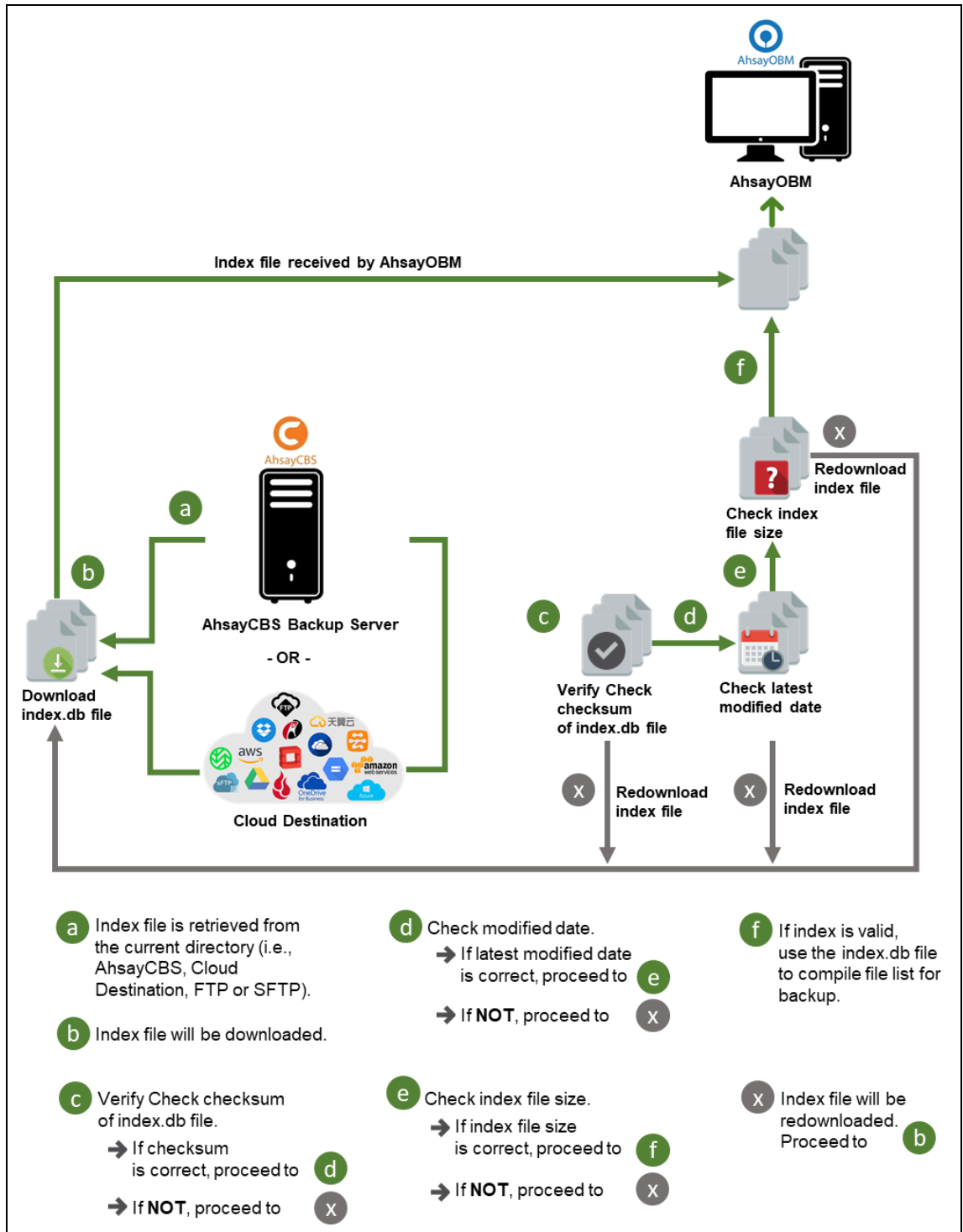
1. If AhsayOBM was upgraded to v8.5 (or above) from an older version v6, v7, or pre-8.3.6.0 version. In this case, the PDIC job will run on the first backup job after upgrade.
2. If backup jobs for a backup set are not run on a regular daily backup schedule (for example: on a weekly or monthly schedule), then the PDIC job will run if it detects that the previous PDIC job was run more than 7 days ago.



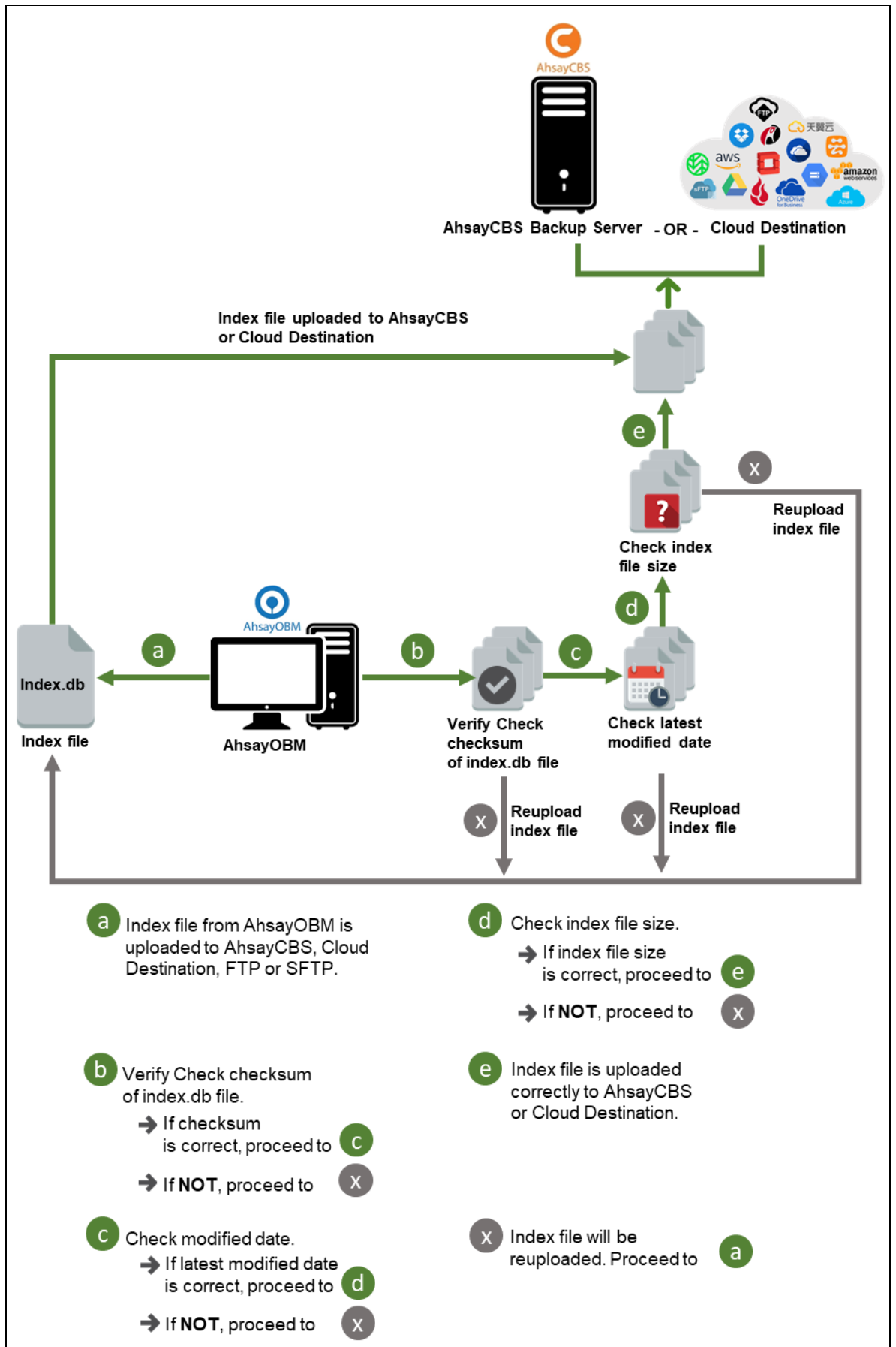
5.2 Backup Set Index Handling Process

To minimize the possibility of index related issues affecting backups, each time index files are downloaded from and uploaded to backup destination(s); the file size, last modified date, and checksum is verified to ensure index file integrity.

5.2.1 Start Backup Job

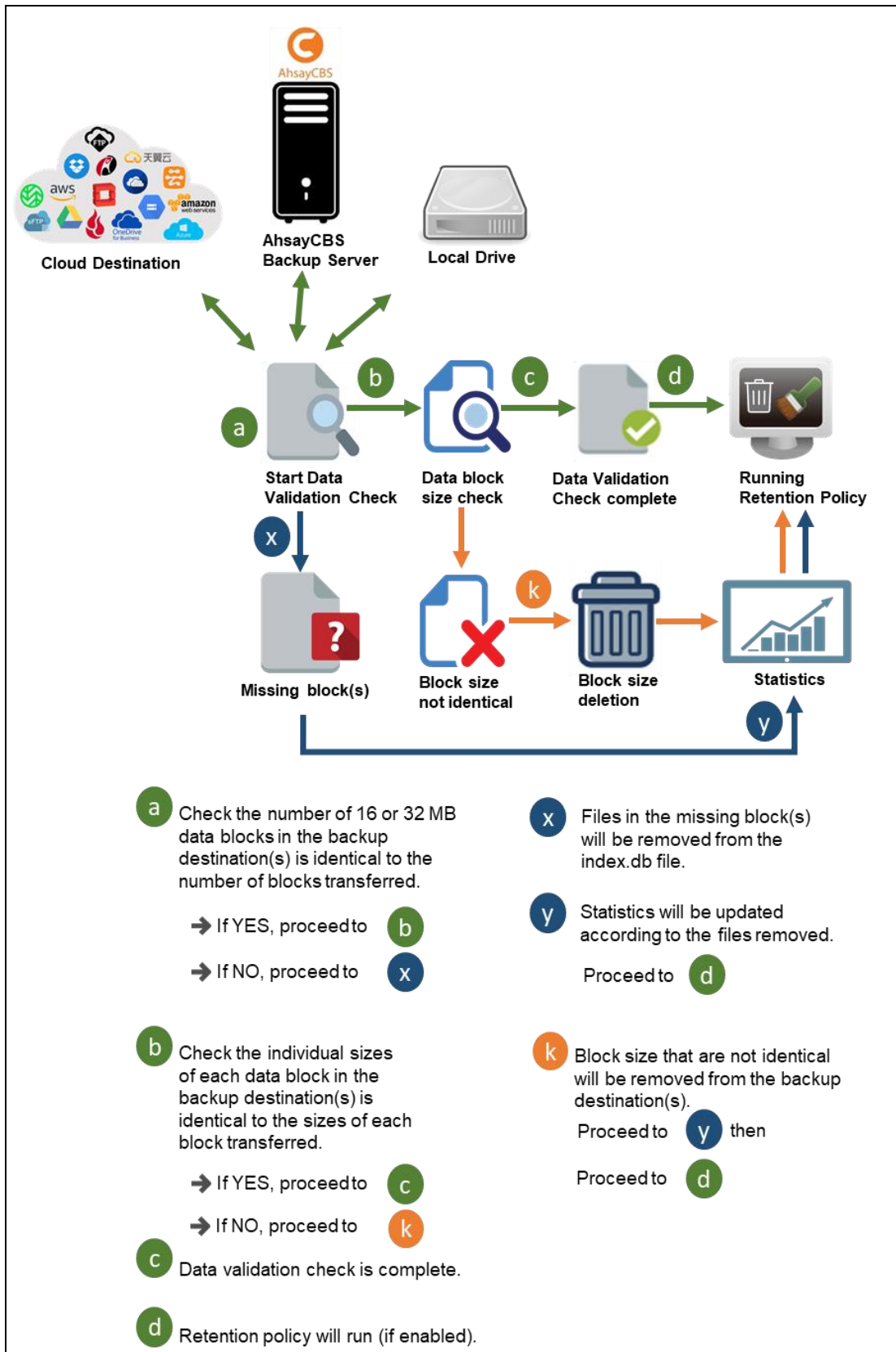


5.2.2 Completed Backup Job



5.3 Data Validation Check Process

As an additional measure to ensure that all files transferred to the backup destination(s) are received and saved correctly, both the number of 16 or 32 MB data block files and the size of each block file are checked again after the files are transferred.



6 Running Backup Jobs

6.1 Login to AhsayOBM

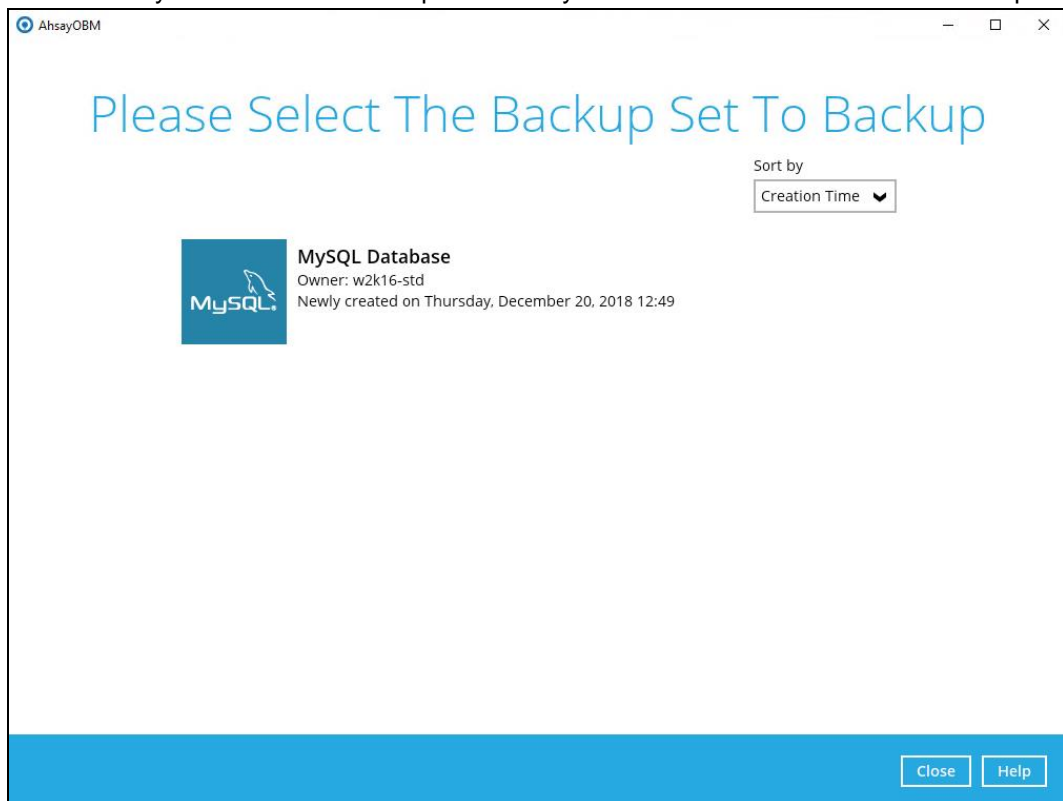
Login to the AhsayOBM application according to the instructions in Chapter 3.1

6.2 Start a Manual Backup

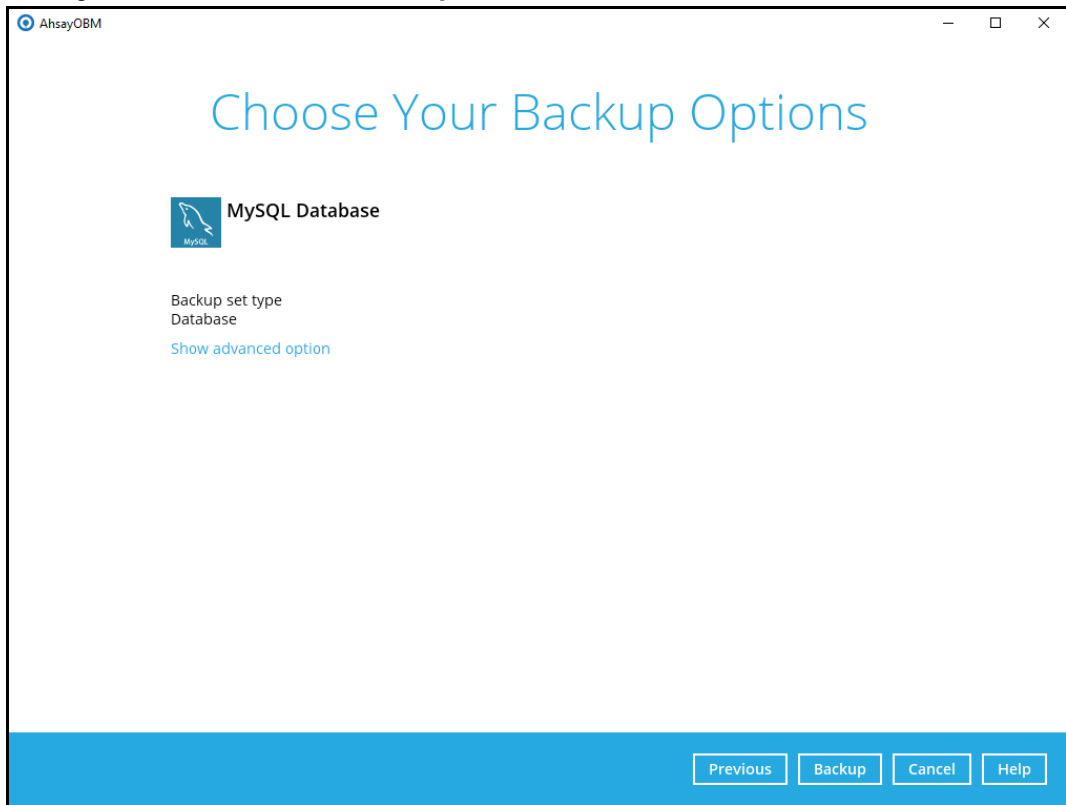
1. Click the Backup icon on the main interface of AhsayOBM.



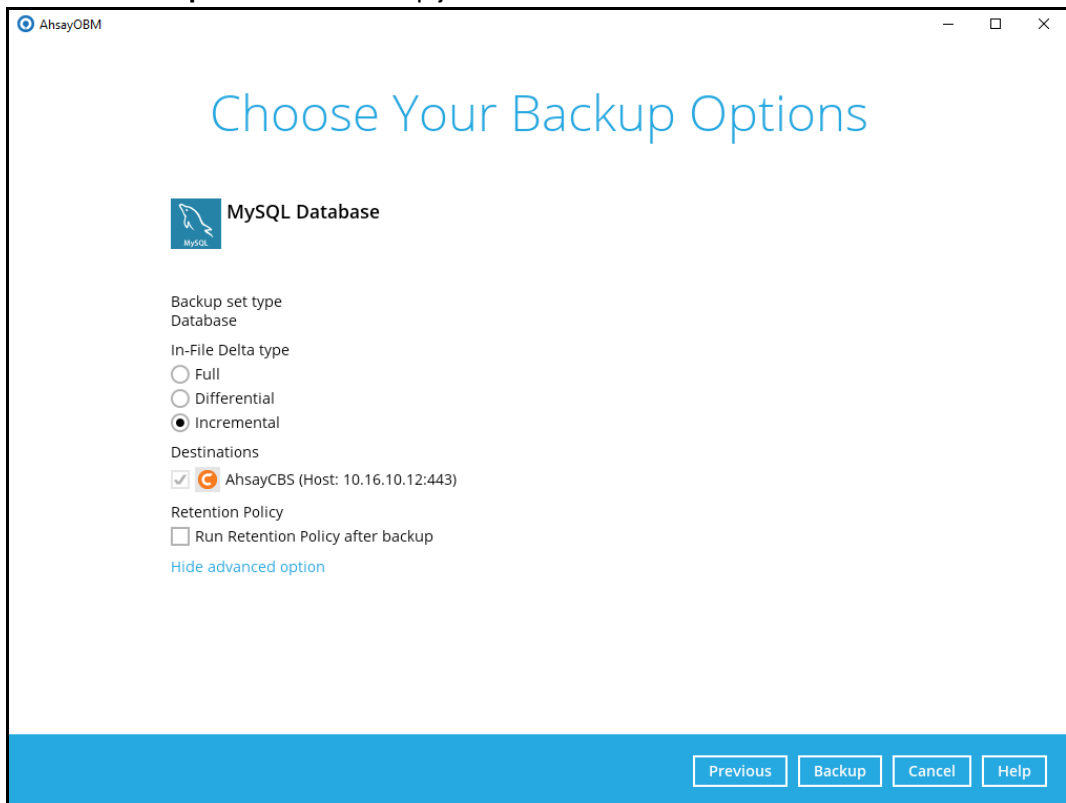
2. Select the MySQL Database backup set which you would like to start a manual backup.



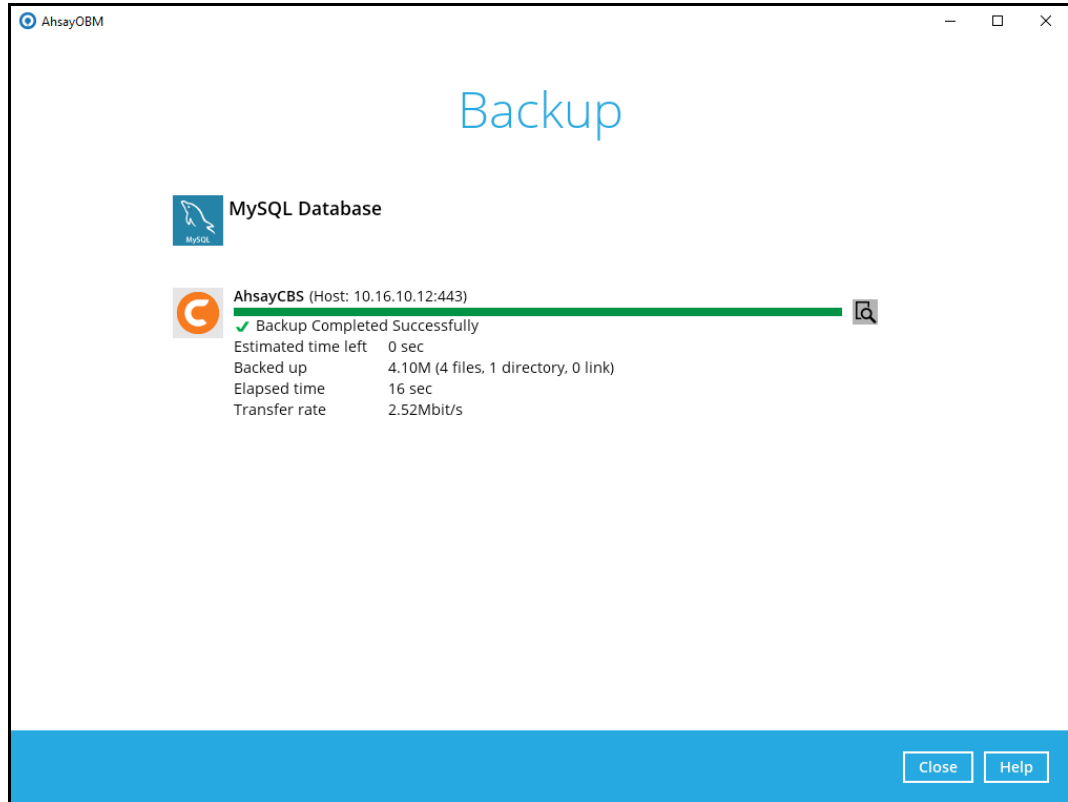
3. If you would like to modify the In-File Delta type, Destinations, or Run Retention Policy Settings, click on **Show advanced option**.



4. Click on **Backup** to start the backup job.

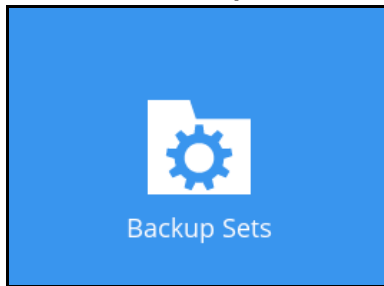


5. Backup job is completed.

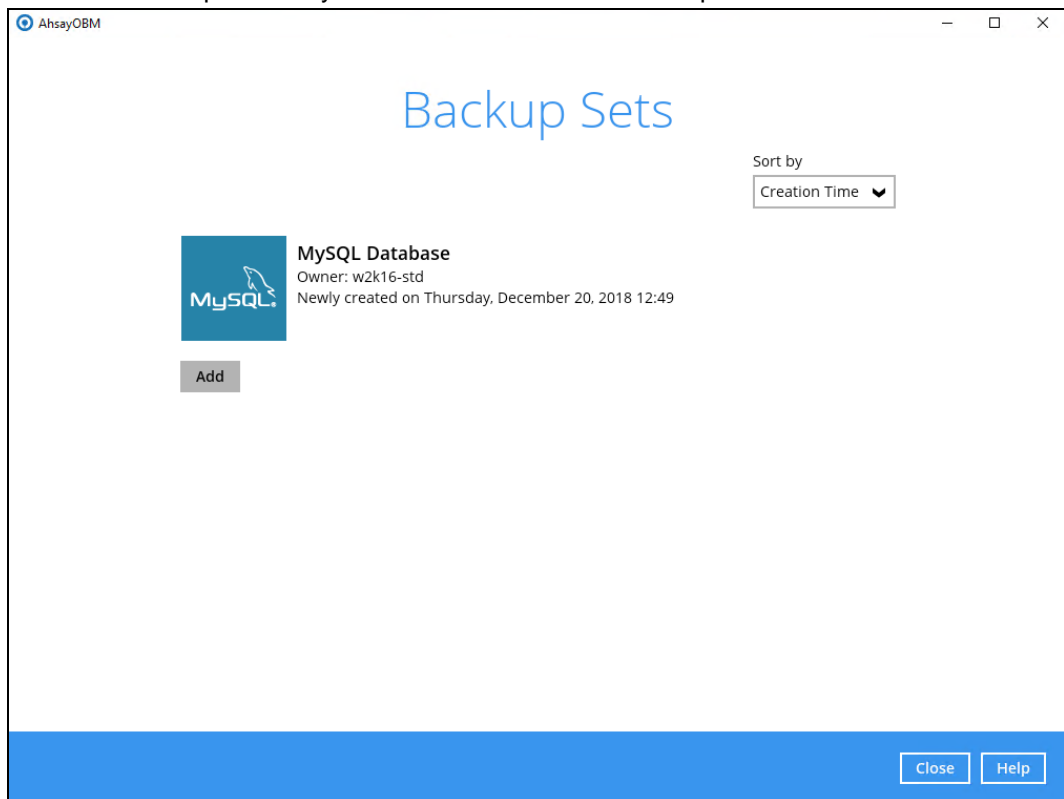


6.3 Configure Backup Schedule for Automated Backup

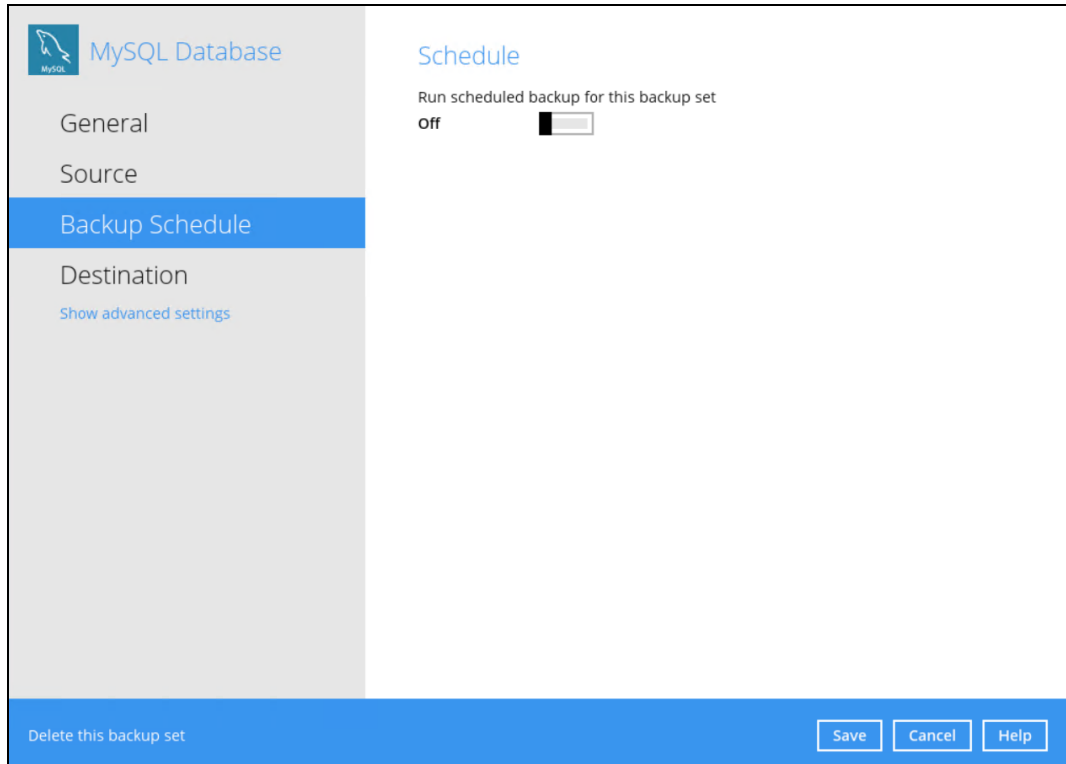
1. Click on the **Backup Sets** icon on the AhsayOBM main interface.



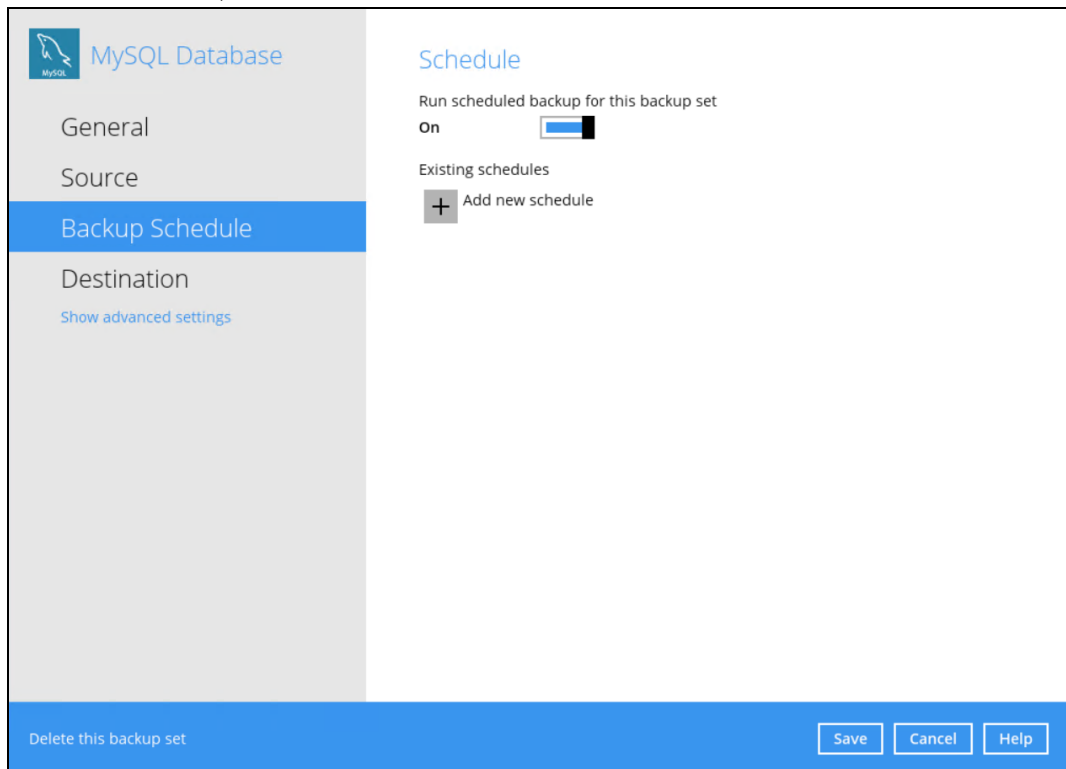
2. Select the backup set that you would like to create a backup schedule for.



3. Click Backup Schedule.



4. Turn on the backup schedule by switching the “Run scheduled backup for this backup set” feature to On, then click the + icon next to Add new schedule.



5. The New Backup Schedule window will appear.

New Backup Schedule

Name
Daily-1

Type
Daily

Start backup
at 13:00

Stop
until full backup completed

Run Retention Policy after backup

In the New Backup Schedule window, configure the following backup schedule settings.

- **Name** – the name of the backup schedule.
- **Type** – the type of backup schedule. There are four (4) different types of backup schedule: Daily, Weekly, Monthly and Custom.
 - **Daily** – the time of the day or interval in minutes/hours which the backup job will run.

New Backup Schedule

Name
Daily-1

Type
Daily

Start backup
at 15:41

Stop
until full backup completed

Run Retention Policy after backup

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

New Backup Schedule

Name

Type

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

Start backup
 at :

Stop

Run Retention Policy after backup

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

New Backup Schedule

Name

Type

Backup on the following day every month
 Day
 First

Start backup at
 : on the selected days

Stop

Run Retention Policy after backup

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

New Backup Schedule

Name: Custom-1

Type: Custom

Backup on the following day once
2020 June 31

Start backup at
23 : 59

Stop
until full backup completed

Run Retention Policy after backup

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

Start backup

every 1 minute

Stop: until full backup completed

Run Retention Policy after backup

Start backup

every 1 minute

Stop: until full backup completed

Run Retention Policy after backup

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

New Backup Schedule

Name: Weekly-1

Type: Weekly

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

Start backup
every 4 hours

Stop
until full backup completed

Run Retention Policy after backup

New Backup Schedule

Name: Weekly-2

Type: Weekly

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

Start backup
at 21 : 00

Stop
until full backup completed

Run Retention Policy after backup

Figure 1.1

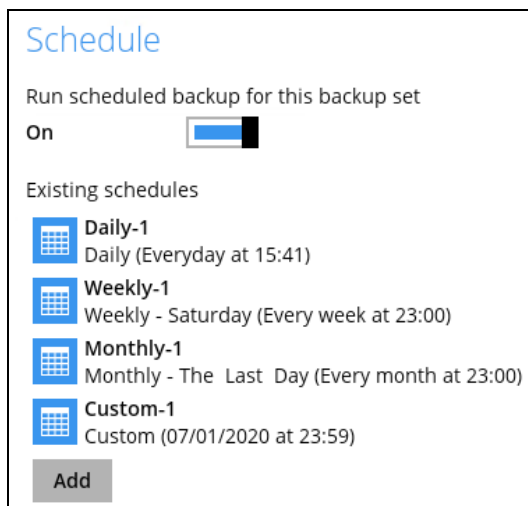
Figure 1.2

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

Figure 1.2 – Normal backup schedule runs at 21:00 or 9:00 PM on Saturday and Sunday on weekend non-business hours

- **Stop** – the stop time of the backup job. This only applies to schedules with start backup “at” and is not supported for periodic backup schedule (start backup “every”)
 - **until full backup completed** – this option will stop a backup job once it is complete. This is the configured stop time of the backup job by default.
 - **after (defined no. of hrs.)** – this option will stop a backup job after a certain number of hours regardless of whether the backup job has completed or not. This can range from 1 to 24 hrs.
- **Run Retention Policy after backup** – if enabled, the AhsayOBM will run a retention policy job to remove files from the backup destination(s) which have exceeded the retention policy after performing a backup job. To save hard disk quote in the long run, it is recommended to enable this option.

As an example, the four types of backup schedules may look like the following:



6. Click **Save** to confirm your settings once done.

7 Restoring Data

The restore options available:

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

7.1 Login to AhsayOBM

Login to the AhsayOBM application according to the instructions in Chapter 3.1 Login to AhsayOBM

7.2 Automatic MySQL Database Restore

Restore files from your backup destination and automatically apply them to the MySQL database server in the original location.

1. Login to MySQL Server using MySQL Command Line Client and verify the database instance is running.

```
Enter password: *****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 36
Server version: 5.6.41-log MySQL Community Server (GPL)

Copyright (c) 2000, 2018, Oracle and/or its affiliates. All rights reserved.

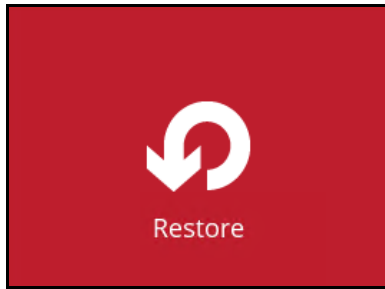
Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.

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

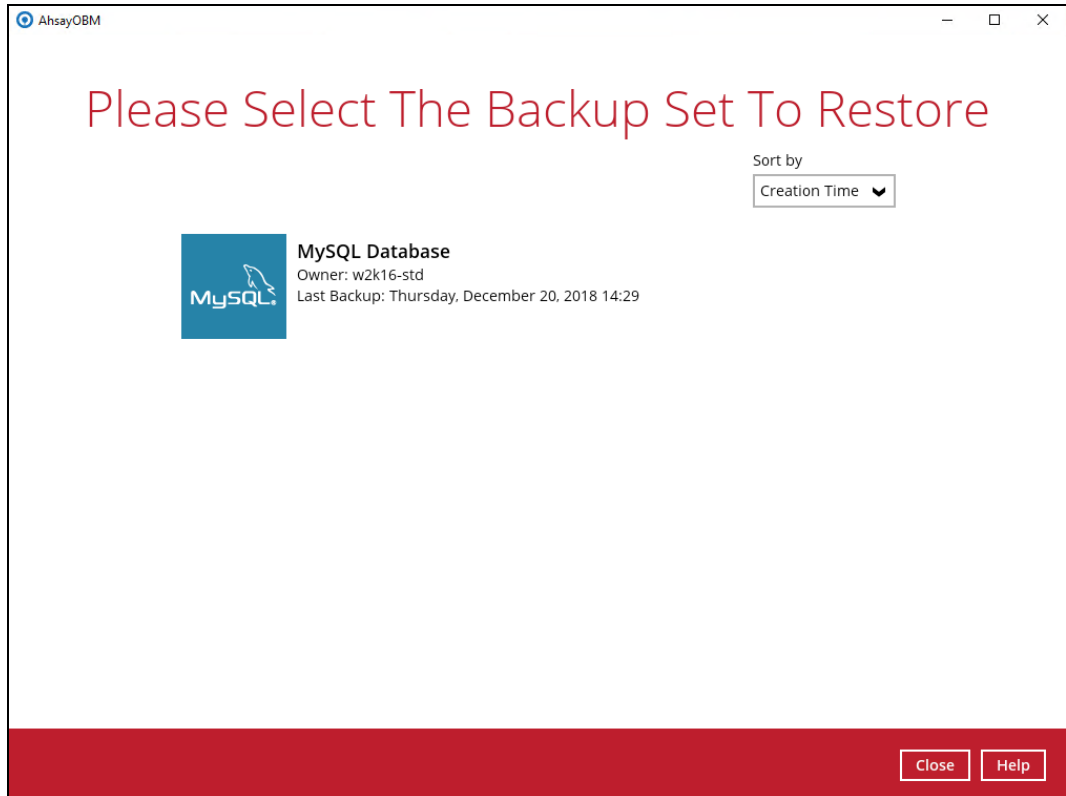
mysql> show databases;
+-----+
| Database          |
+-----+
| information_schema |
| mysql             |
| performance_schema |
| sakila            |
| test              |
| world             |
+-----+
6 rows in set (0.00 sec)

mysql>
```

2. In the AhsayOBM main interface, click the **Restore** icon.



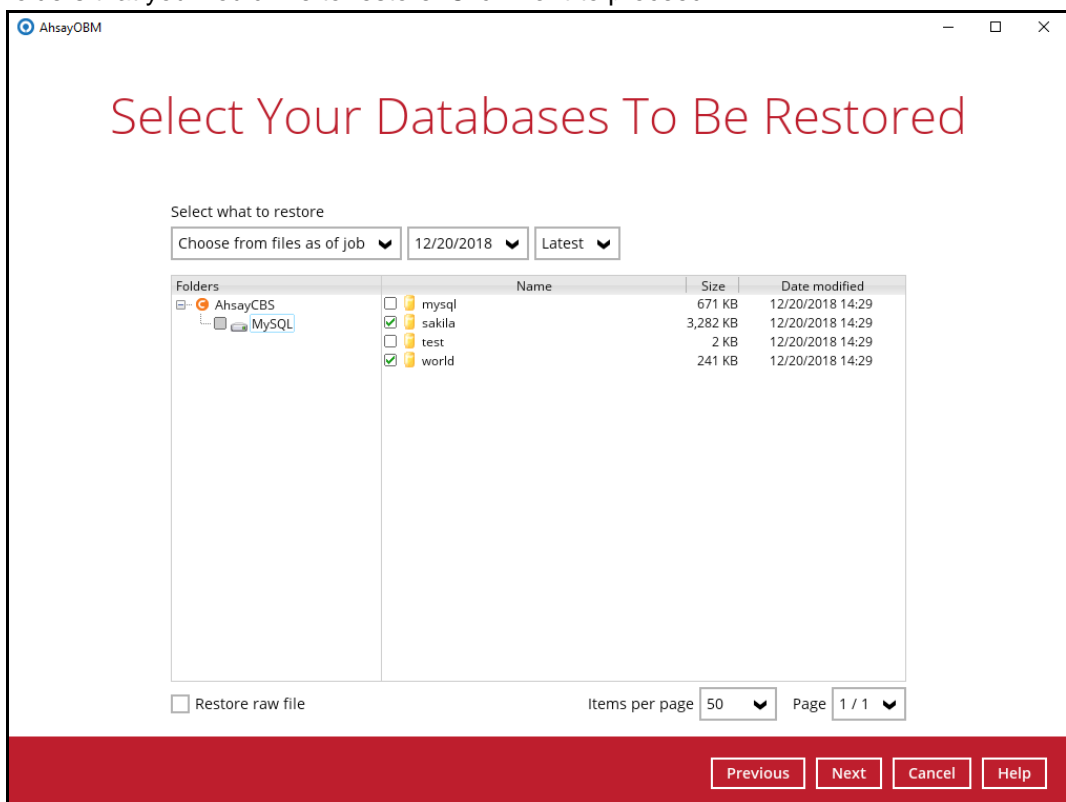
3. Select the backup set that you would like to restore the MySQL Database from.



- Select the storage destination that contains the MySQL databases that you would like to restore from.

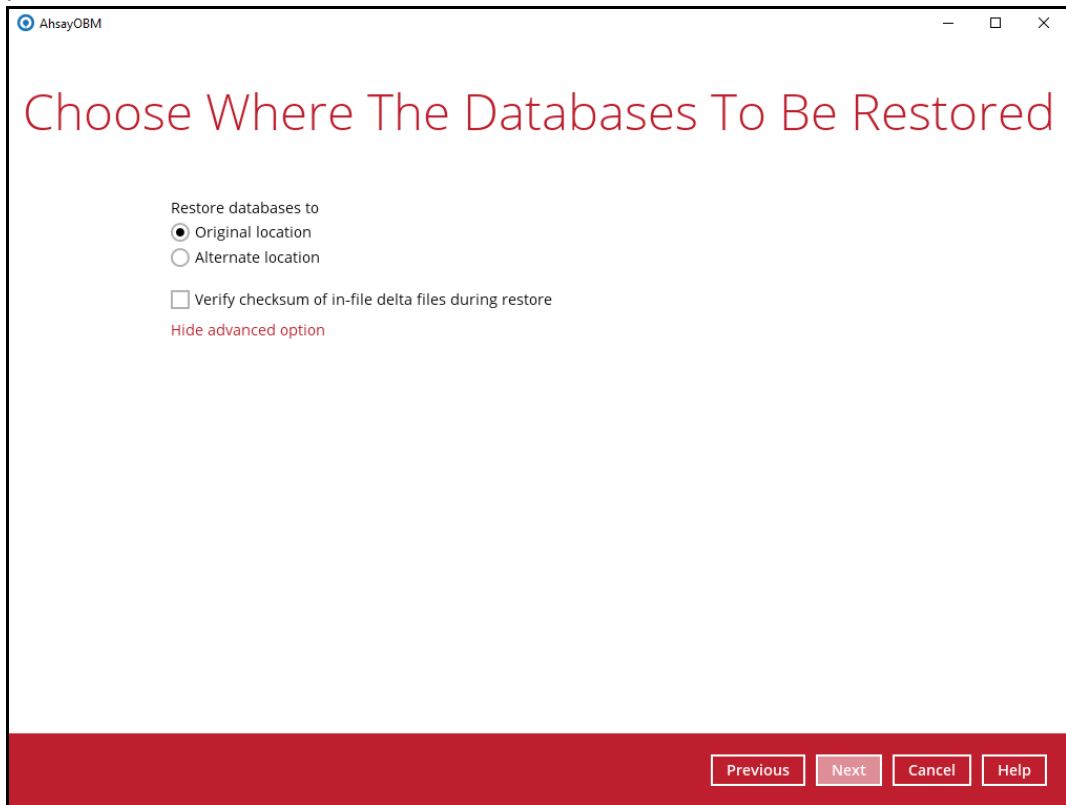


- Select to restore the MySQL node from a specific backup job then select the files or folders that you would like to restore. Click **Next** to proceed.

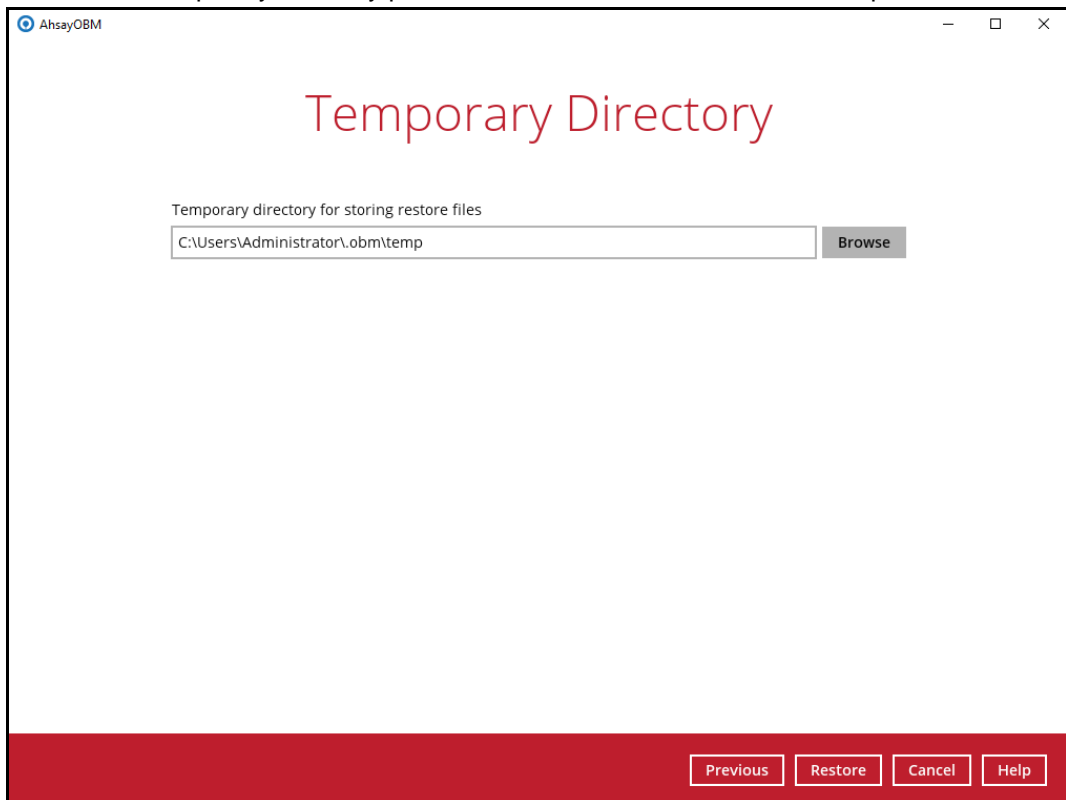


Note: To restore to either original or alternate location please unselect the MySQL data node and only select the databases only.

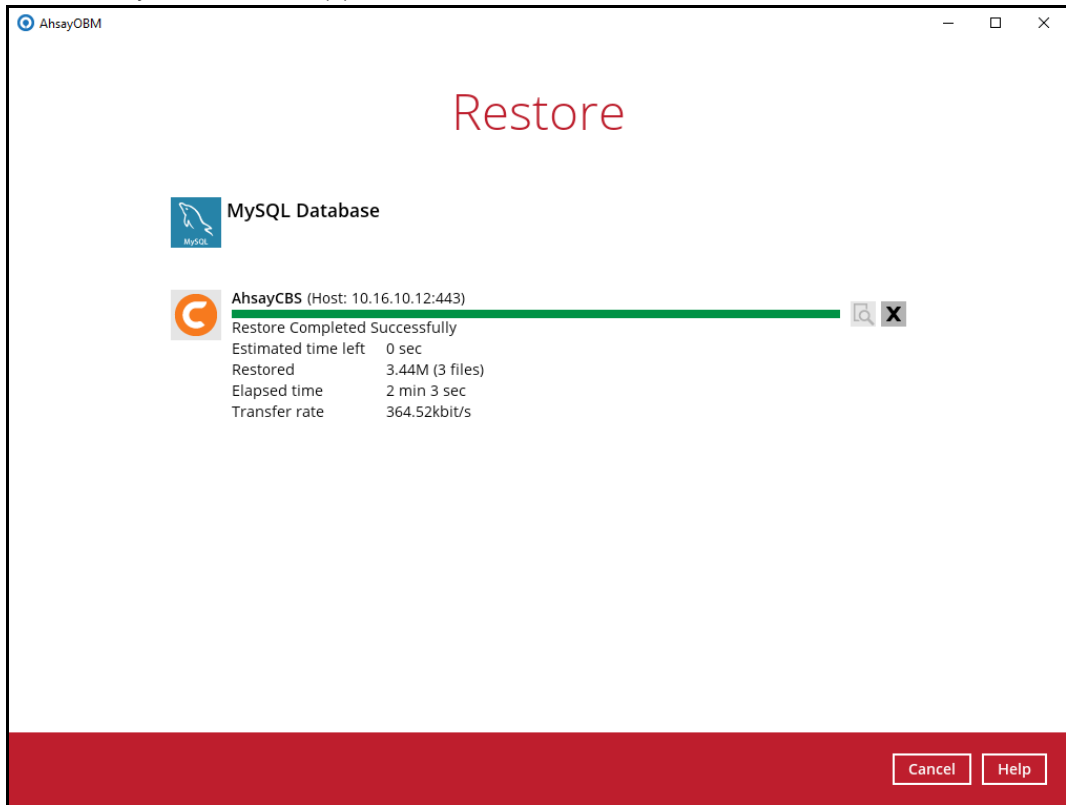
6. Select to restore the MySQL Databases to the Original location and click **Next** to proceed.



7. Confirm the temporary directory path is correct and then click **Restore** to proceed.



8. After the MySQL database(s) has been restored.



9. Using MySQL Command Line Client, you can list the restored databases and tables.

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

```
mysql> show databases;
+-----+
| Database          |
+-----+
| information_schema |
| mysql             |
| performance_schema |
| sakila            |
| test              |
| world             |
+-----+
6 rows in set (0.00 sec)

mysql> show tables in sakila;
+-----+
| Tables_in_sakila  |
+-----+
| actor             |
| actor_info        |
| address           |
| category          |
| city              |
| country           |
| customer          |
| customer_list     |
| film              |
| film_actor        |
| film_category     |
| film_list         |
| film_text         |
| inventory         |
| language          |
| nicer_but_slower_film_list |
| payment           |
| rental            |
| sales_by_film_category |
| sales_by_store    |
| staff             |
| staff_list        |
| store             |
+-----+
23 rows in set (0.00 sec)

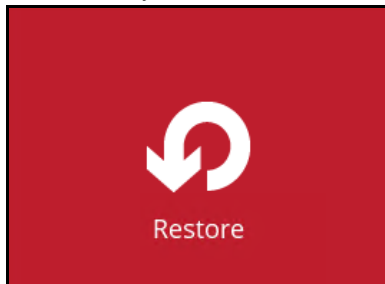
mysql> show tables in world;
+-----+
| Tables_in_world   |
+-----+
| city              |
| country           |
| countrylanguage   |
+-----+
3 rows in set (0.00 sec)

mysql>
```

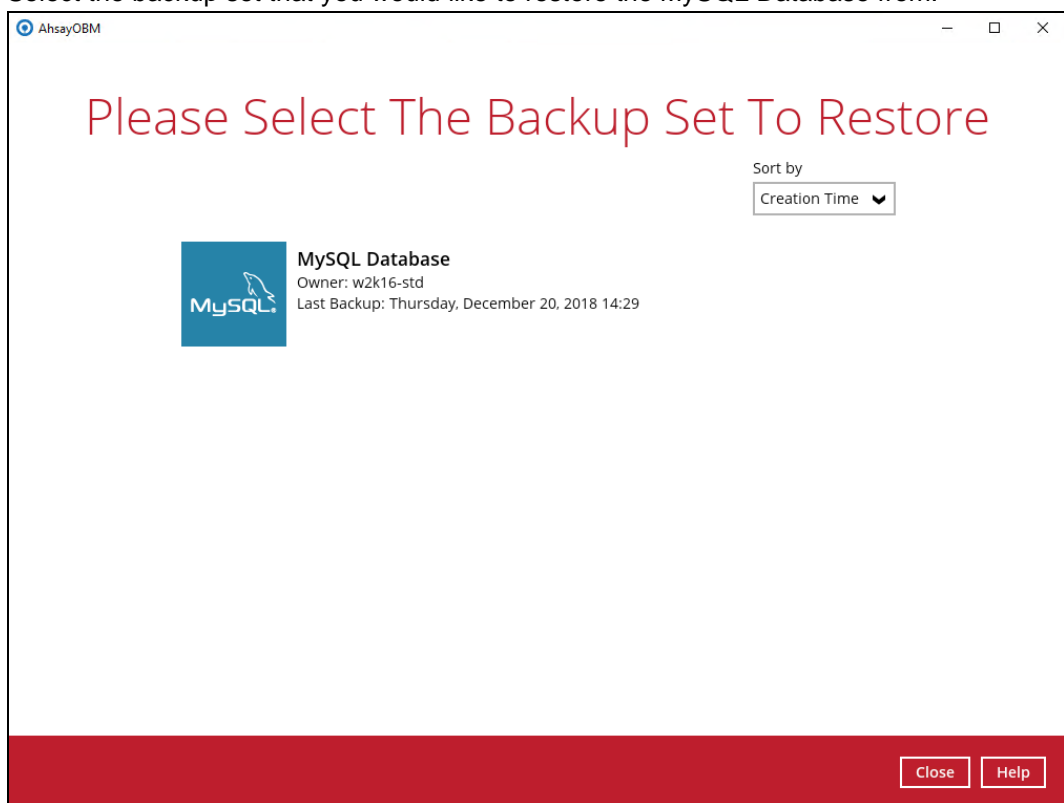
7.3 Manual MySQL Database Restore

To restore the MySQL databases from your storage destination to a location on disk and manually recover the databases.

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



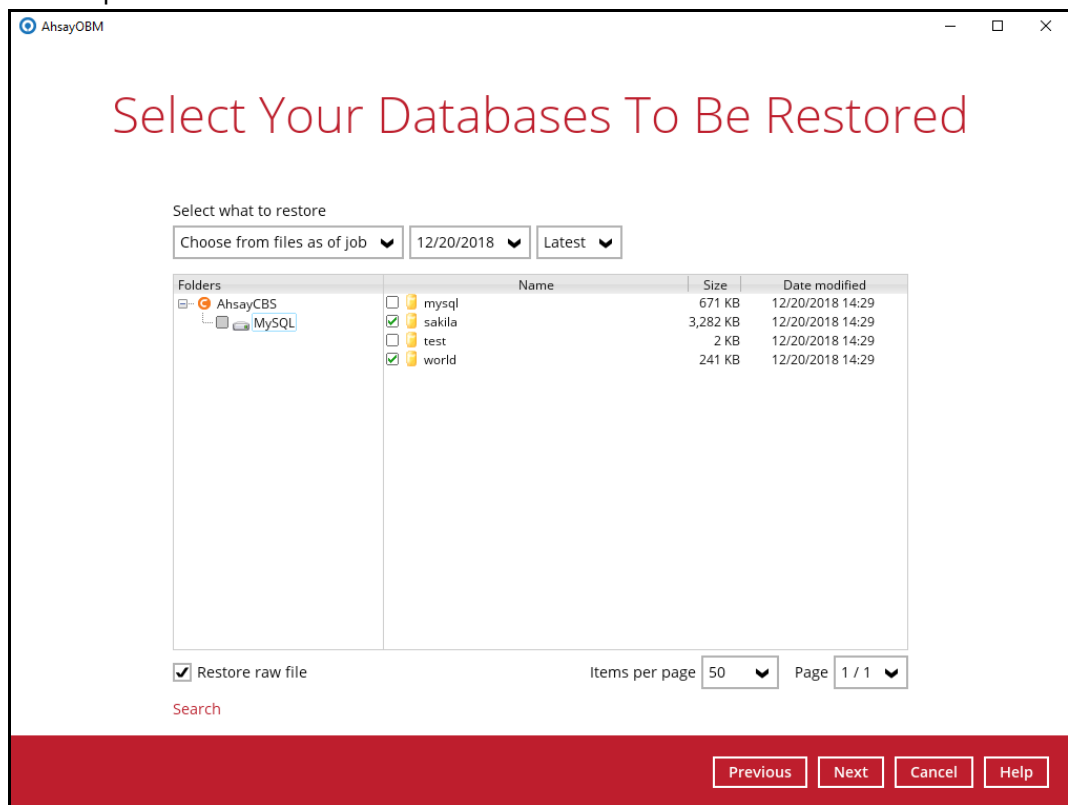
2. Select the backup set that you would like to restore the MySQL Database from.



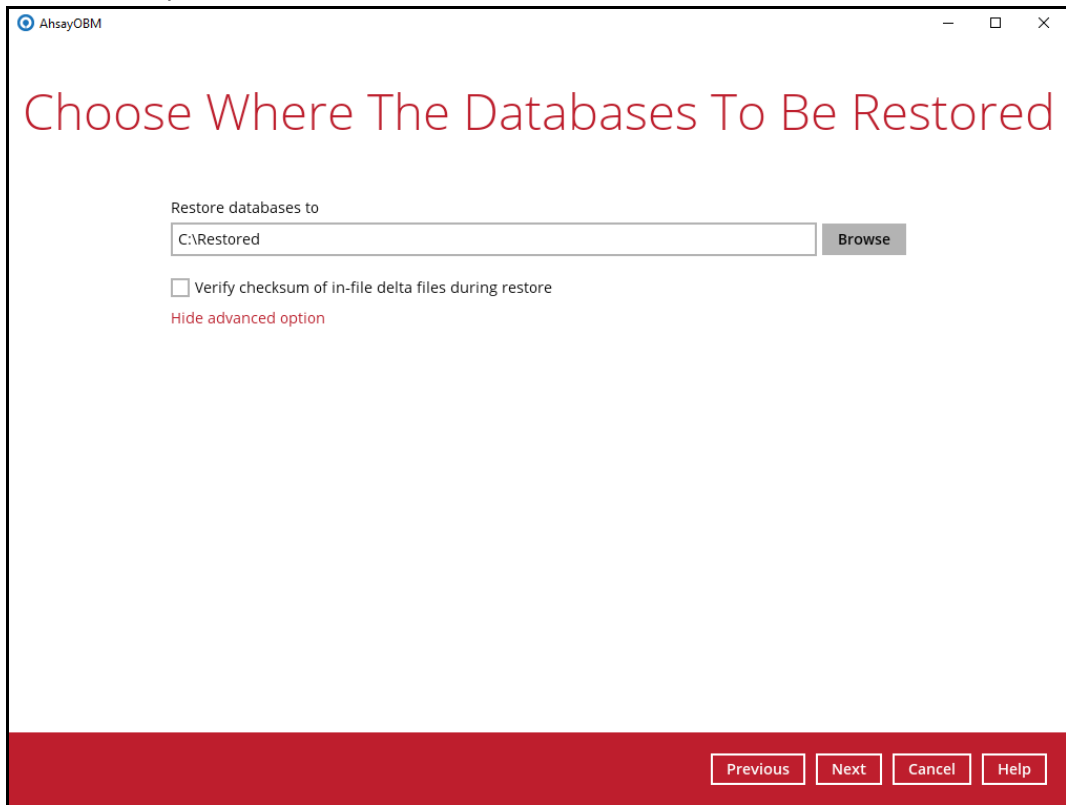
3. Select the storage destination that contains the MySQL databases that you would like to restore from.



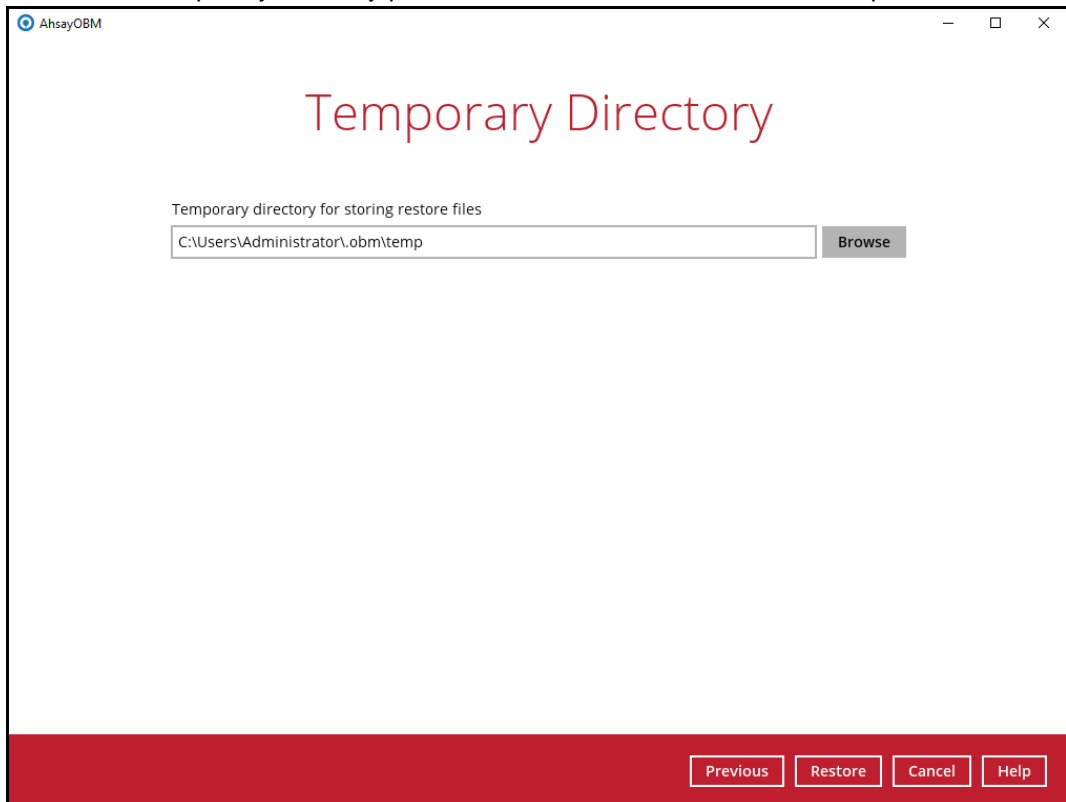
4. Select to restore the MySQL database(s) from a specific backup job then select the files or folders that you would like to restore and select the **Restore raw file** option. Click **Next** to proceed.



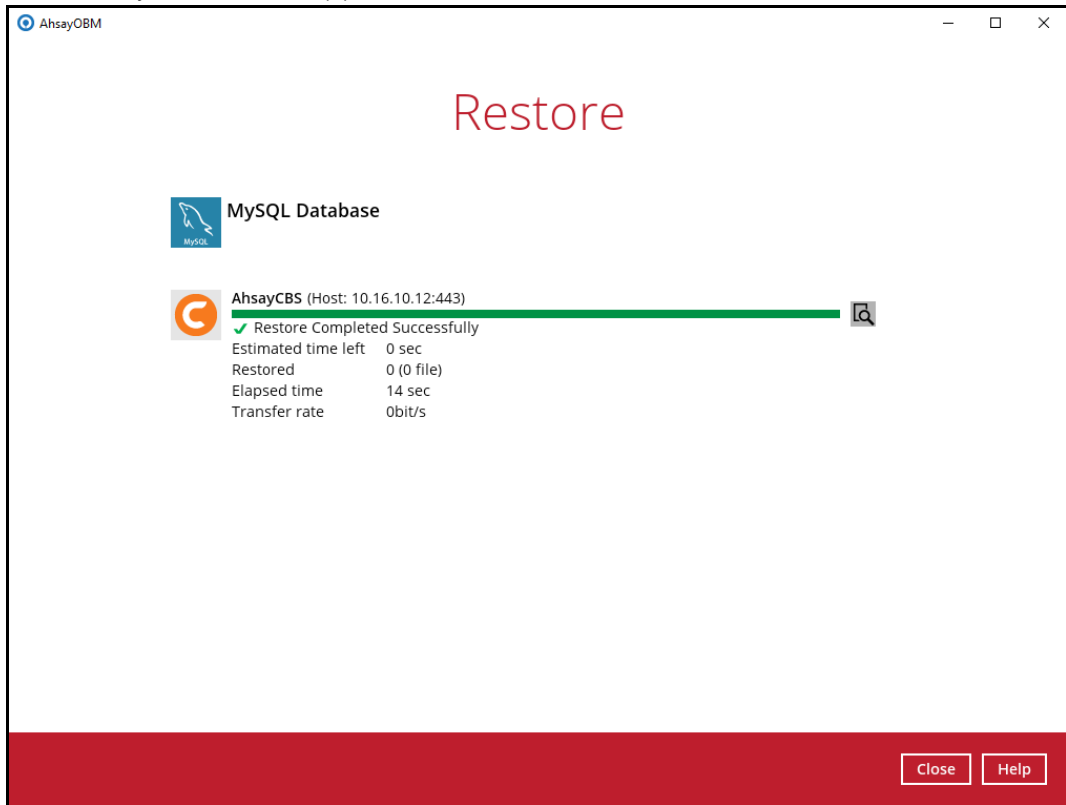
5. Select the location on the local machine you wish to restore the MySQL database files to. Click **Next** to proceed.



6. Confirm the temporary directory path is correct and then click **Restore** to proceed.

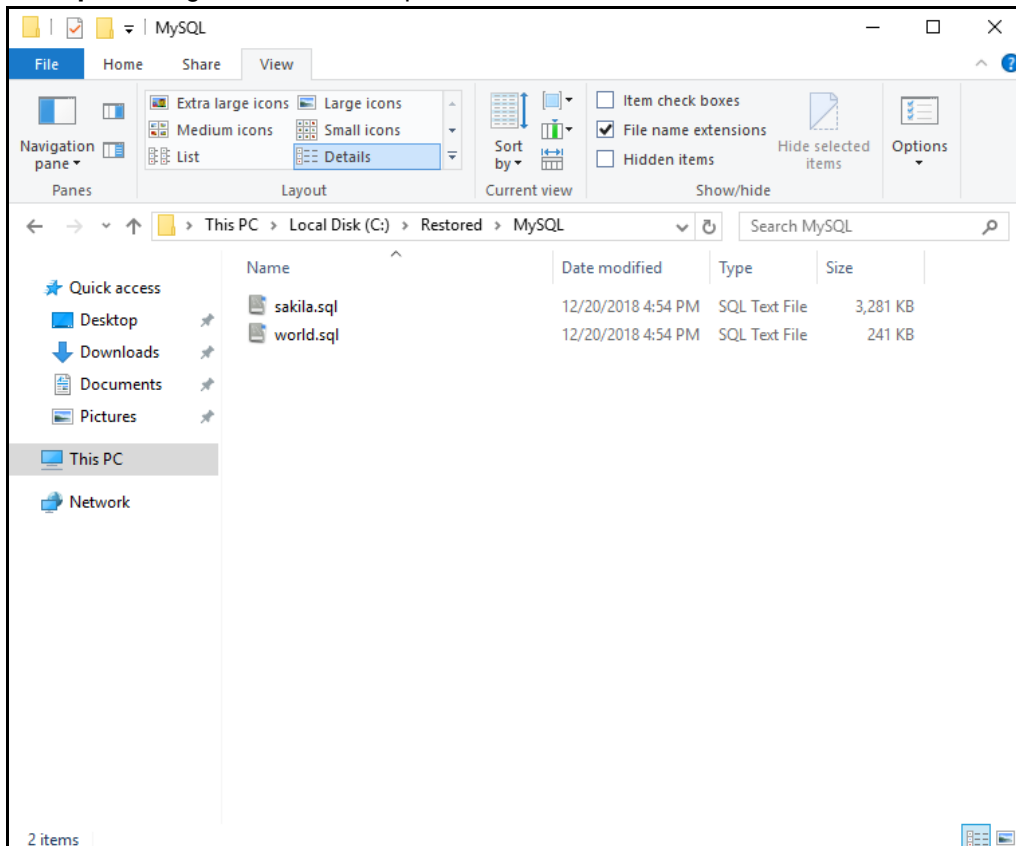


7. After the MySQL database(s) has been restored.



8. Check the location on the local machine to verify the MySQL database files have been restored.

Example: Using Windows File Explorer



7.3.1 Recovering MySQL Databases

1. Login to MySQL Server using MySQL Command Line Client and verify the database instance is running.

```
Enter password: *****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 10
Server version: 5.6.31-log MySQL Community Server (GPL)

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Oracle is a registered trademark of Oracle Corporation
and/or its
affiliates. Other names may be trademarks of their
respective
owners.

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

mysql> show databases;
+-----+
| Database          |
+-----+
| information_schema |
| mysql             |
| performance_schema |
+-----+
3 rows in set (0.00 sec)

mysql>
```

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

Example: classicmodels, sakila, and world.

```
mysql> create database classicmodels;
Query OK, 1 row affected (0.02 sec)

mysql> create database sakila;
Query OK, 1 row affected (0.00 sec)

mysql> create database world;
Query OK, 1 row affected (0.00 sec)
```

3. Recover Databases

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

```
mysql> use classicmodels;
mysql> source d:\restored\MySQL\classicmodels.sql
Query OK, 0 rows affected (0.01 sec)

Query OK, 7 rows affected (0.00 sec)
Records: 7 Duplicates: 0 Warnings: 0

Query OK, 110 rows affected (0.00 sec)
Records: 110 Duplicates: 0 Warnings: 0

Query OK, 122 rows affected (0.00 sec)
Records: 122 Duplicates: 0 Warnings: 0
```



```

mysql> use sakila;
mysql> source /restored/MySQL/sakila.sql
Query OK, 0 rows affected (0.01 sec)

Query OK, 148 rows affected (1.9 sec)
Records: 148 Duplicates: 0 Warnings: 0

mysql> use world;
mysql> source /restored/MySQL/world.sql

Query OK, 0 rows affected (0.00 sec)

Query OK, 4079 rows affected (0.03 sec)
Records: 4079 Duplicates: 0 Warnings: 0

Query OK, 0 rows affected (0.01 sec)

```

4. Check the database status

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

```

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| classicmodels |
| mysql |
| performance_schema |
| sakila |
| world |
+-----+
7 rows in set (0.06 sec)

mysql> show tables in world;
+-----+
| Tables_in_world |
+-----+
| city |
| country |
| countrylanguage |
| departments |
| dept_emp |
| dept_manager |
| employees |
| salaries |
| titles |
+-----+
9 rows in set (0.00 sec)

mysql> show tables in classicmodels;
+-----+
| Tables_in_classicmodels |
+-----+
| actor |
| actor_info |
| address |
| category |
| city |
| country |

```

```
| countrylanguage |
| customer        |
| customer_list   |
| customers       |
| departments     |
| dept_emp        |
| dept_manager    |
| employees       |
| film            |
| film_actor      |
| film_category   |
| film_list       |
| film_text       |
| inventory       |
| language        |
| nicer_but_slower_film_list |
| offices         |
| orderdetails    |
| orders          |
| payment         |
| payments        |
| productlines    |
| products        |
| rental          |
| salaries        |
| sales_by_film_category |
| sales_by_store  |
| staff           |
| staff_list      |
| store           |
| titles          |
+-----+
37 rows in set (0.00 sec)
```

7.4 Automatic MySQL Database Restore (Alternative Location)

1. Login to MySQL Server using MySQL Command Line Client and verify the database instance is running.

```
Enter password: *****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 10
Server version: 5.6.31-log MySQL Community Server (GPL)

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rights reserved.

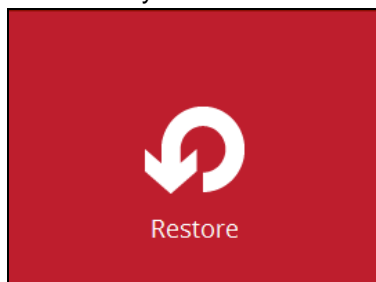
Oracle is a registered trademark of Oracle Corporation
and/or its
affiliates. Other names may be trademarks of their
respective
owners.

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

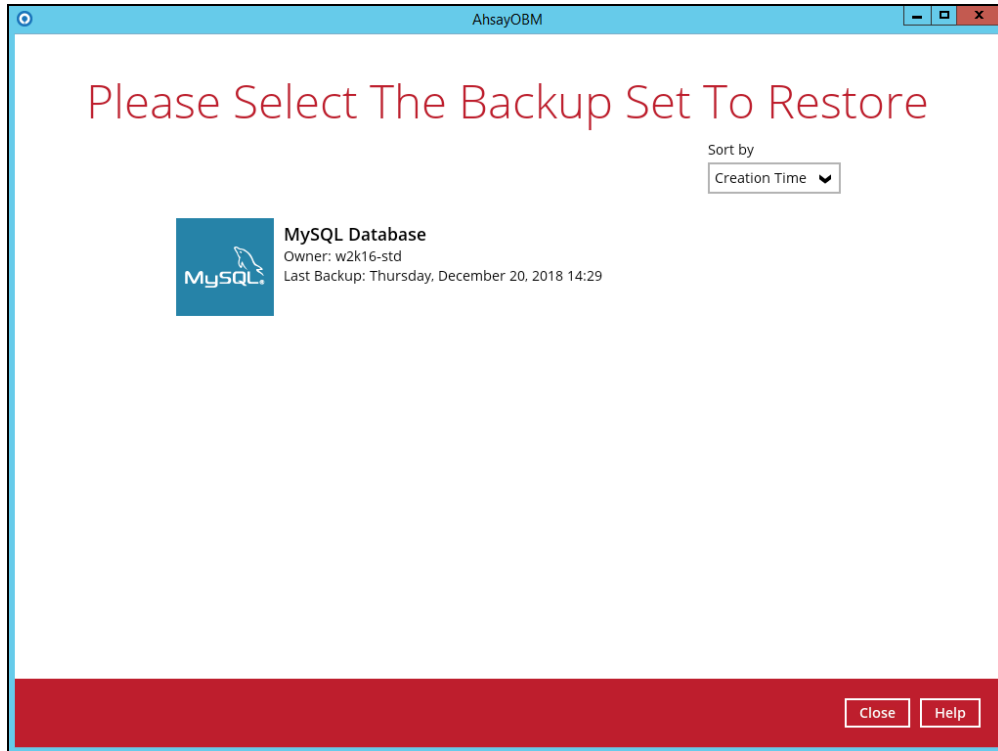
mysql> show databases;
+-----+
| Database          |
+-----+
| information_schema |
| mysql              |
| performance_schema |
+-----+
3 rows in set (0.00 sec)

mysql>
```

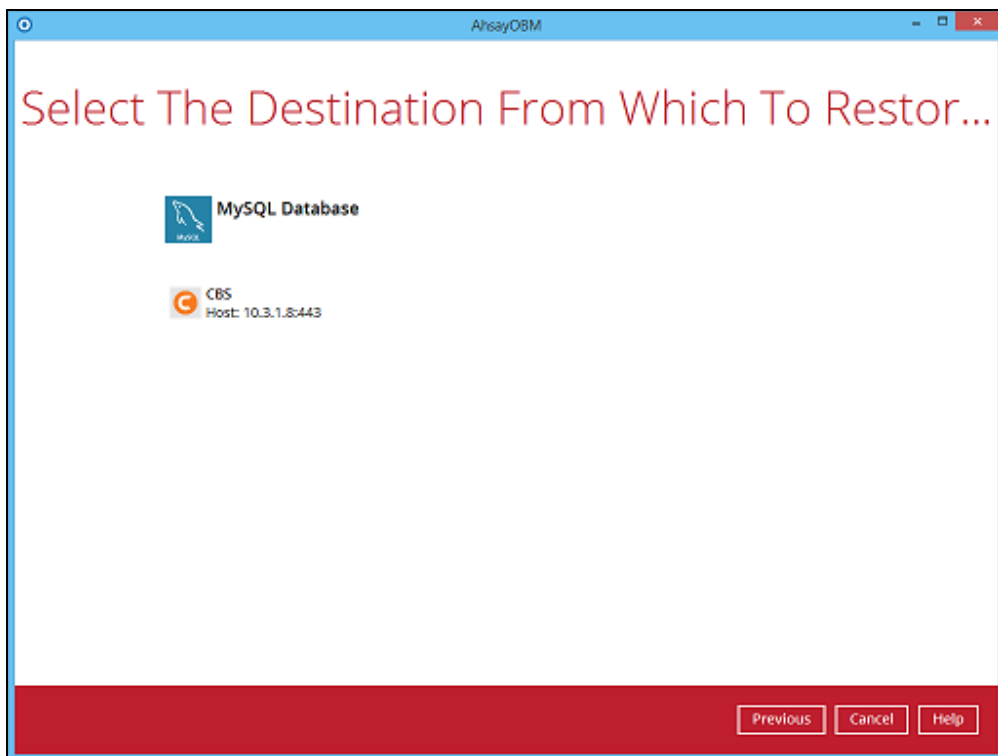
2. In the AhsayOBM main interface, click the Restore icon.



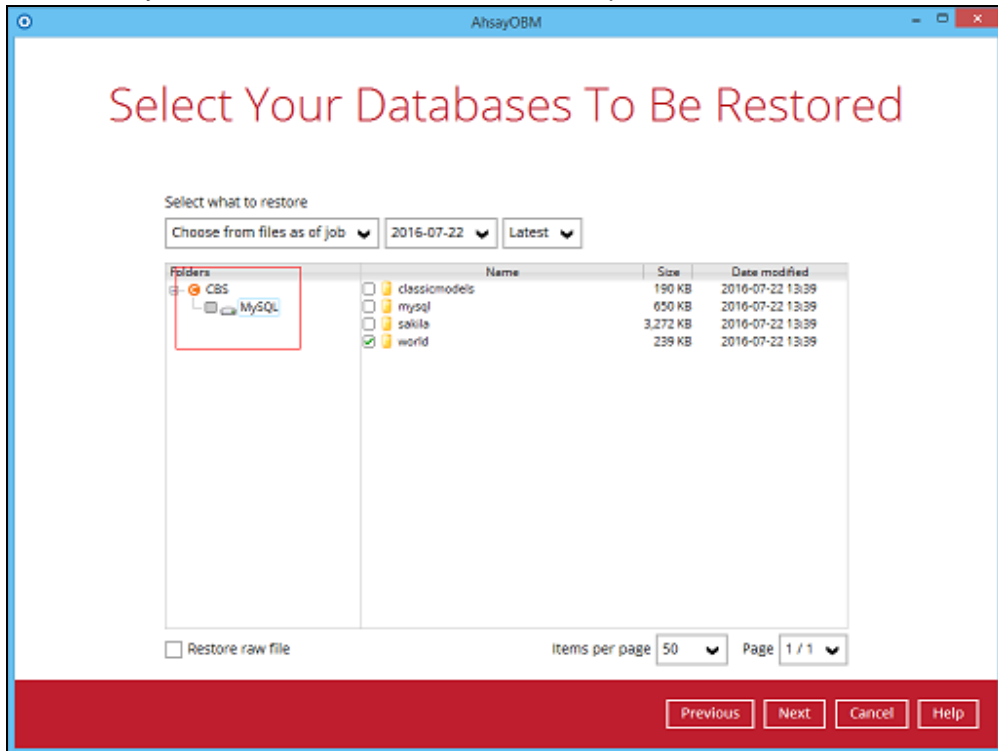
3. Select the backup set that you would like to restore the MySQL Database from.



4. Select the storage destination that contains the MySQL databases that you would like to restore from.

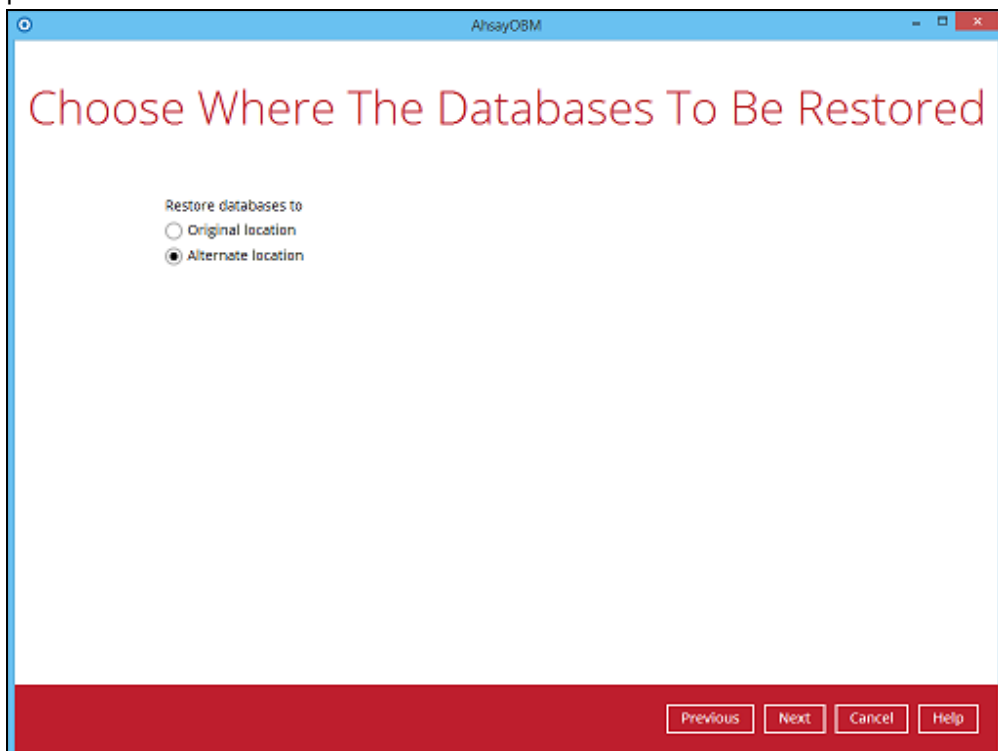


5. Select to restore the MySQL node from a specific backup job then select the files or folders that you would like to restore. Click **Next** to proceed.



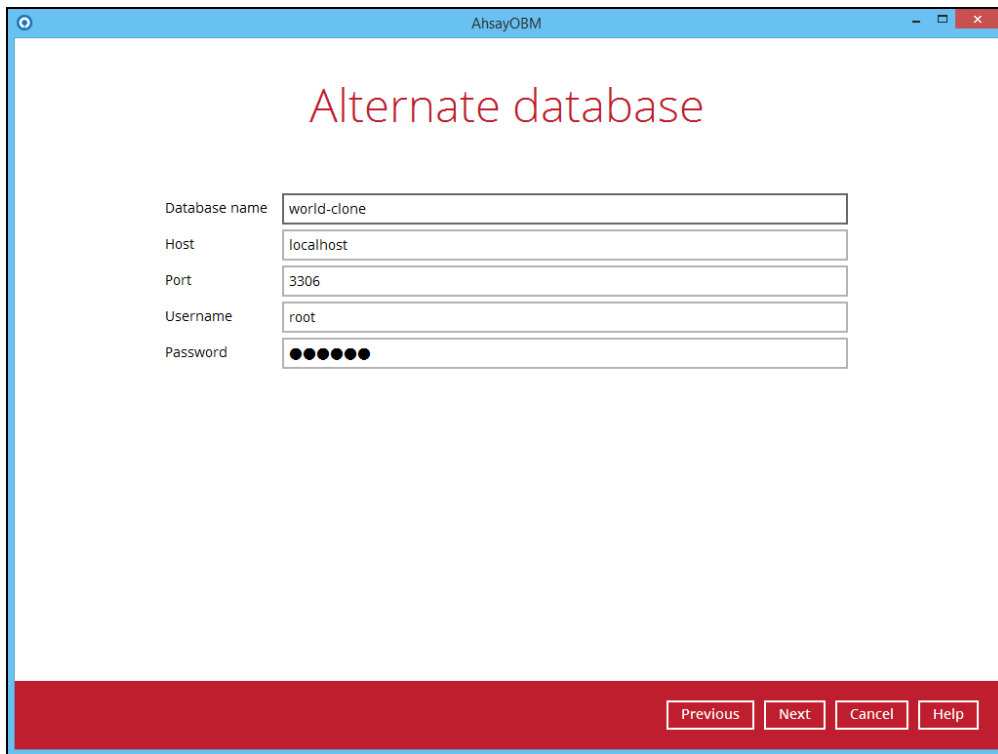
Note: To restore to either original or alternate location please unselect the MySQL data node and only select the databases only.

6. Select to restore the MySQL Databases to the alternate location and click Next to proceed.



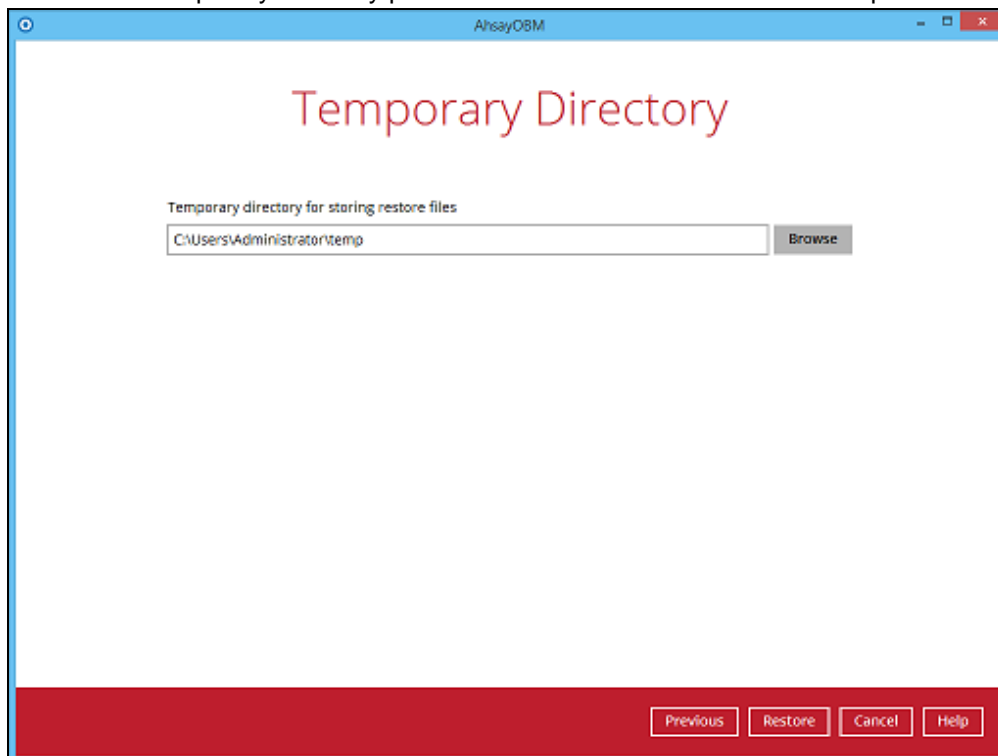
7. Confirm the MySQL database details such as Database name, Host, Port, Username, and Password.

Example: To restore and clone a copy of the **world** database on the original server with new name **world-clone**.



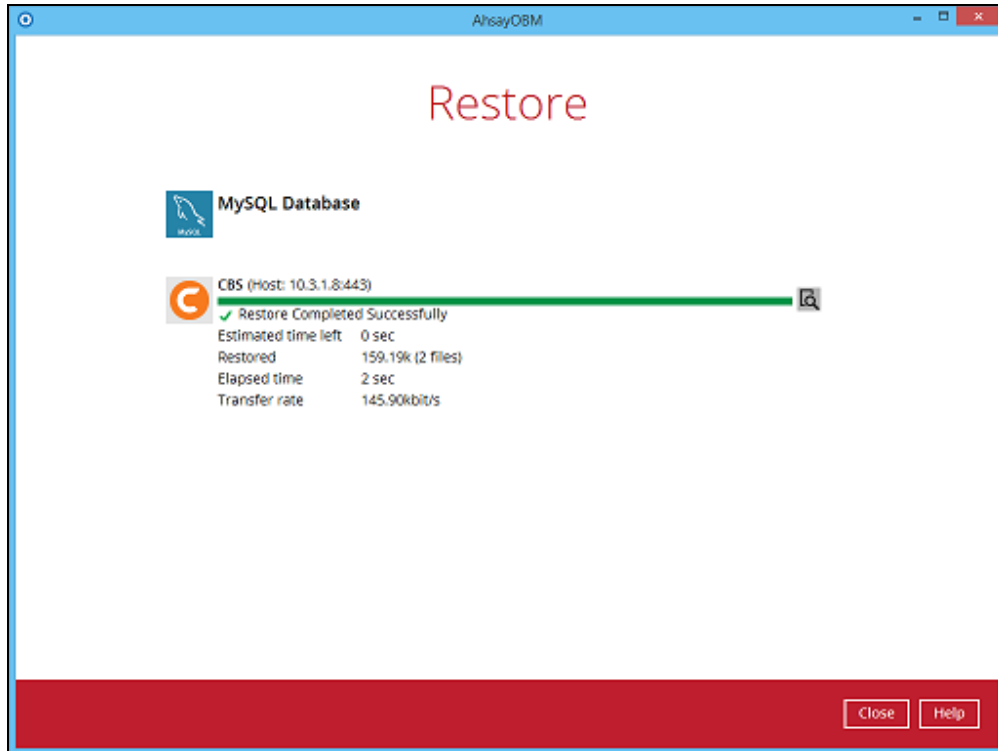
The screenshot shows a window titled "AhsayOBM" with the heading "Alternate database". Below the heading are five input fields for database configuration: "Database name" (world-clone), "Host" (localhost), "Port" (3306), "Username" (root), and "Password" (masked with six dots). At the bottom right, there are four buttons: "Previous", "Next", "Cancel", and "Help".

8. Confirm the temporary directory path is correct and then click **Restore** to proceed.



The screenshot shows a window titled "AhsayOBM" with the heading "Temporary Directory". Below the heading is a label "Temporary directory for storing restore files" and a text input field containing the path "C:\Users\Administrator\temp". To the right of the input field is a "Browse" button. At the bottom right, there are four buttons: "Previous", "Restore", "Cancel", and "Help".

9. After the MySQL database(s) has been restored.



10. Using MySQL Command Line Client, you can list the restored databases and tables.

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

```
mysql> show databases;
+-----+
| Database                |
+-----+
| information_schema      |
| classicmodels           |
| mysql                   |
| performance_schema     |
| sakila                  |
| world                   |
| world-clone             |
+-----+
6 rows in set (0.06 sec)

mysql> show tables in `world-clone`;
+-----+
| Tables_in_world-clone  |
+-----+
| city                   |
| country                |
| countrylanguage        |
+-----+
3 rows in set (0.00 sec)

mysql>
```

8 Contact Ahsay

8.1 Technical Assistance

To contact Ahsay support representatives for technical assistance, visit the Partner Portal:
<https://www.ahsay.com/partners/>

Also use the Ahsay Wikipedia for resource such as Hardware Compatibility List, Software Compatibility List, and other product information:
<https://wiki.ahsay.com/>

8.2 Documentation

Documentations for all Ahsay products are available at:
https://www.ahsay.com/jsp/en/downloads/ahsay-downloads_documentation_guides.jsp

You can send us suggestions for improvements or report on issues in the documentation by contacting us at:
<https://www.ahsay.com/partners/>

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