Ahsay Backup

Ahsay Online Backup Manager v7

MySQL Database Backup & Restore Linux (CLI)

Ahsay Systems Corporation Limited

30 June 2016

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Trademarks

Disclaimer

Revision History

Date	Descriptions	Type of modification
30 June 2016	First Draft	New

Table of Contents

1 System Requirements

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

FAQ: Ahsay Software Compatibility List (SCL) for version 7.3 or above (5001)
https://forum.ahsay.com/viewtopic.php?f=169&t=13492

2 Requirements and Recommendations

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

1. AhsayOBM is installed on the MySQL database server using the root account.

2. The MySQL database instance is online.

   Example: MySQL on CentOS 6

```
# /etc/init.d/mysql status
SUCCESS! MySQL running (1853)
```

   -OR-

```
# service mysql status
SUCCESS! MySQL running (1853)
```

3. Check the listening port of the MySQL database instance (default is 3306).

```
# netstat -pan|more
tcp        0      0 :::3306     :::*        LISTEN
2977/mysqld
tcp        0      0 :::111      :::*        LISTEN
1483/rpcbind
tcp        0      0 :::22       :::*        LISTEN      1732/sshd
tcp        0      0 ::1:631     :::*        LISTEN
1619/cupsd
tcp        0      0 :::36856    :::*        LISTEN
1552/rpc.statd
```

4. The **mysqldump** utility is installed on the MySQL database server.
   To located the mysqldump utility use the **whereis** command:

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

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

   mysqldump version:

```
#  mysqldump --version
mysqldump  Ver 10.13 Distrib 5.6.16, for Linux (x86_64)
```

   MySQL database version:

```
mysql> select version();
+-----------+
| version() |
+-----------+
| 5.6.16    |
+-----------+
1 row in set (0.00 sec)
```

6. A MySQL database user account with the following privileges must be setup for the backup operation. *For example:*

```
mysql> GRANT ALL PRIVILEGES ON *.* TO 'username'@'localhost'
IDENTIFIED BY 'password';
mysql> GRANT ALL PRIVILEGES ON *.* TO
'username'@'localhost.localdomain' IDENTIFIED BY 'password';
mysql> FLUSH PRIVILEGES;
```

7. 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).

```
# 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=0.025 ms
64 bytes from localhost (127.0.0.1): icmp_seq=2 ttl=64
time=0.043 ms
64 bytes from localhost (127.0.0.1): icmp_seq=3 ttl=64
time=0.042 ms
64 bytes from localhost (127.0.0.1): icmp_seq=4 ttl=64
time=0.047 ms
```

```
# telnet localhost 3306
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
J
5.6.16vB#'8%/kQ3K\n6``Aemysql_native_password
```

8. 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 |
| classicmodels      |
| employees          |
| mysql              |
| performance_schema |
| sakila             |
| world              |
+--------------------+
7 rows in set (0.00 sec)

mysql>
```

9. 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 130% 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.

3 Starting AhsayOBM

To startup AhsayOBM and connect to AhsayCBS you need to use the **RunConfigurator.sh** script, to configure the backup server URL, port and proxy server settings (if applicable) and enter the user id and password.

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

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

Login Name : a1
Password : ********************


Please wait while verifying user account with server...
log4j:WARN No appenders could be found for logger
(org.apache.http.impl.conn.PoolingClientConnectionManager).
log4j:WARN Please initialize the log4j system properly.
log4j:WARN See http://logging.apache.org/log4j/1.2/faq.html#noconfig
for more info.

Your profile has been downloaded and updated.

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 Creating a MySQL Database Backup Set

1. To create a MySQL 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 **(2). MySQL Database** to generate a MySQL Database Backup Set template file to the to **/root/.obm/config** directory.

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

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

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

3. **Configuring MySQL Backup Set Settings**.

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

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

   Please refer to Appendix A, B, C, and D for details and examples on how to create a backup sets using the **backupSet.xml** file.

   Notes:

   i. *Before importing the backupSet.xml file please remove any unused destinations and backup schedule settings. Otherwise the following error will be displayed* ***"Failed to import XML file (Reason: Value of Name is empty!)"*** *when trying to import the backupSet.xml file.*

   ii. *Setup of the following cloud storage destinations; OneDrive, OneDrive For Business, DropBox, and Google Drive are not supported in Linux CLI environment, as these cloud storage destinations require authentication using a web browser.*

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

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

   For example: to create a new MySQL backup set called “MySQL 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

The backup set "MySQL Database 1" is not owned by this computer,
do you want to take the ownership? (Y/N) ? y
New backup set created.
Enable Encryption (Y/N) ? y
Use default encryption settings (Y/N) ? y
XML imported, uploading to server...

XML successfully uploaded to server

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. **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 name "MySQL 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). MySQL Database 1
----------------------------------------
Your Choice: 1

Name                  : MySQL Database 1
Owner                 : cos6x-2-35
Type                  : MySQL
Selected Source       : MySQL/classicmodels
Selected Source       : MySQL/employees
Selected Source       : MySQL/sakila
Selected Source       : MySQL/world
Deselected Source     : MySQL/information_schema
Deselected Source     : MySQL/performance_schema
Encryption Key        :
PE3+Cwglln7XuSzEPniiIMnBrX8jgPj3tHiWhUR9mSw=
Encryption Algorithm : AES
Encryption Mode       : CBC
Encryption Key Length: 256

Press Enter to continue...
```

Congratulations! The backup set configuration is now complete!

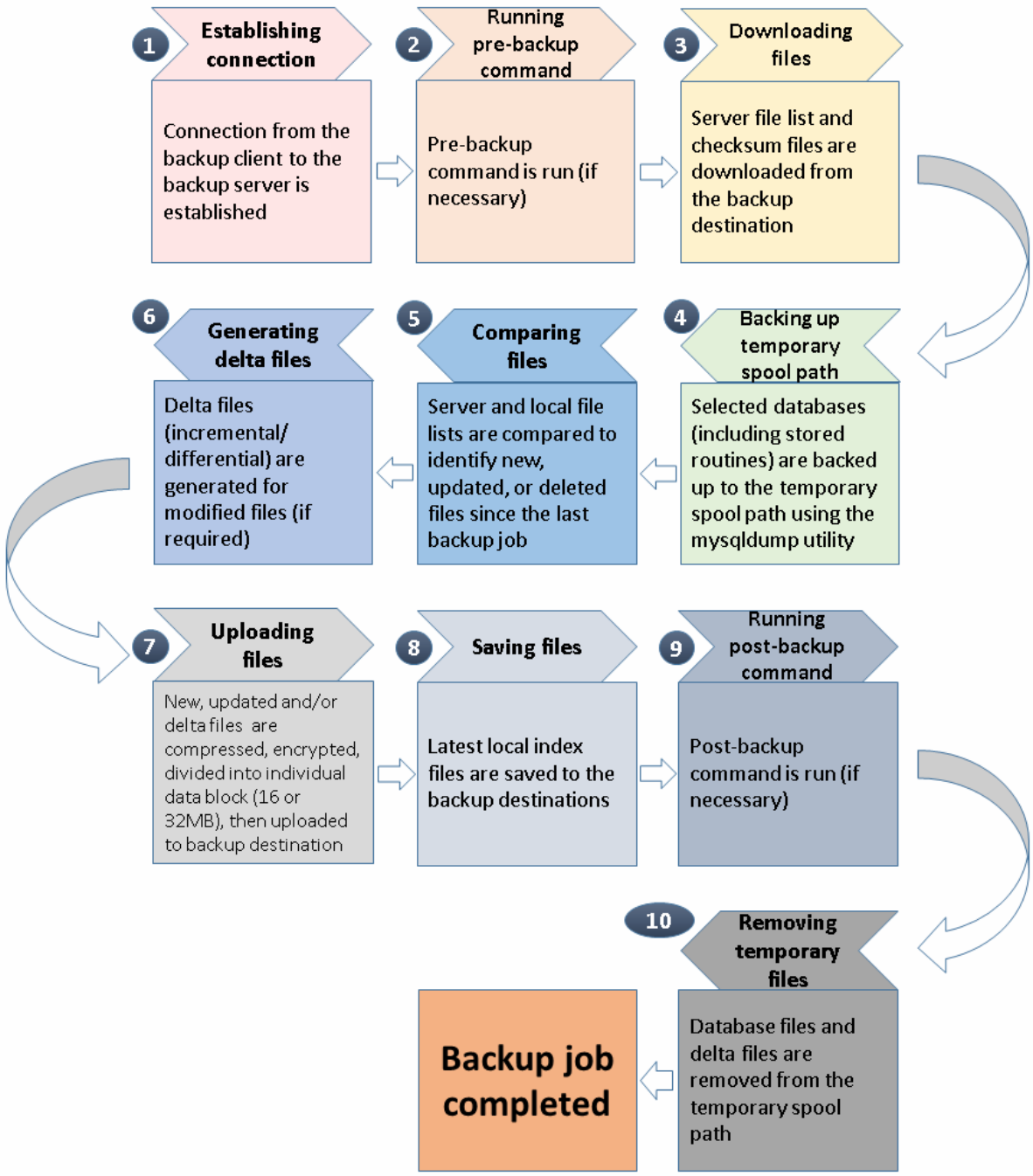
Notes:

i. We would like to stress that it is very important to keep a separate record of your encryption key in a safe place, as you will not be able to restore your data without the correct key.

ii. If you re-install AhsayOBM or install AhsayOBM on another machine the encryption will be required for restoring data from the backup set.

5 Overview on the Backup Process

The following steps are performed during a MySQL database backup job:



6 Running Backup Jobs

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

Example: RunBackupSet.sh <backupset name>

```
# cd /usr/local/obm/bin
# sh RunBackupSet.sh "MySQL Database 1"
-
Using APP_HOME       : /usr/local/obm
Using SETTING_HOME   :
Using JAVA_HOME      : /usr/local/obm/jvm
Using JAVA_EXE       : /usr/local/obm/jvm/bin/java
Using JAVA_OPTS      : -Xrs -Xms128m -Xmx768m -client -
Dsun.nio.PageAlignDirectMemory=true
Using JNI_PATH       : -Djava.library.path=.
Using CLASSPATH      : .:./cb.jar
-
Running Backup Set - 'MySQL Database 1' ...
log4j:WARN No appenders could be found for logger
(org.apache.http.impl.conn.PoolingClientConnectionManager).
log4j:WARN Please initialize the log4j system properly.
log4j:WARN See http://logging.apache.org/log4j/1.2/faq.html#noconfig
for more info.
[2016/06/06 16:58:18] [info] [-] Start [ Linux 2.6.32-279.el6.x86_64
(cos6x-2-35), AhsayOBM v7.7.0.0 ]
[2016/06/06 16:58:18] [info] [-] Saving encrypted backup set
encryption keys to server...
[2016/06/06 16:58:18] [info] [1465203392896] Start Backup ...
Database [In-File Delta: Incremental]
[2016/06/06 16:58:18] [info] [1465203392896] Using Temporary
Directory /tmp/1465203392036/Local@1465203392896
[2016/06/06 16:58:18] [info] [-] Start running pre-commands
[2016/06/06 16:58:18] [info] [-] Finished running pre-commands
[2016/06/06 16:58:18] [info] [1465203392791] Start Backup ...
Database [In-File Delta: Incremental]
[2016/06/06 16:58:18] [info] [1465203392791] Using Temporary
Directory /tmp/1465203392036/OBS@1465203392791
[2016/06/06 16:58:18] [info] [-] [Start] Backing up database
"classicmodels" to
"/tmp/1465203392036/SpoolArea/MySQL/classicmodels.sql"
[2016/06/06 16:58:19] [info] [-] [End]
[2016/06/06 16:58:19] [info] [-] [Start] Backing up database
"employees" to "/tmp/1465203392036/SpoolArea/MySQL/employees.sql"
[2016/06/06 16:58:34] [info] [-] [End]
[2016/06/06 16:58:34] [info] [-] [Start] Backing up database
"sakila" to "/tmp/1465203392036/SpoolArea/MySQL/sakila.sql"
[2016/06/06 16:58:36] [info] [-] [End]
[2016/06/06 16:58:36] [info] [-] [Start] Backing up database "world"
to "/tmp/1465203392036/SpoolArea/MySQL/world.sql"
[2016/06/06 16:58:37] [info] [-] [End]
[2016/06/06 16:58:37] [info] [-] Start running post-commands
[2016/06/06 16:58:37] [info] [-] Finished running post-commands
[2016/06/06 16:58:46] [info] [1465203392791] Downloading server file
list...
[2016/06/06 16:58:46] [info] [1465203392896] Downloading server file
list...
[2016/06/06 16:58:46] [info] [1465203392896] Downloading server file
list... Completed
[2016/06/06 16:58:47] [info] [1465203392896] Reading backup source
from hard disk...
```

```
[2016/06/06 16:58:47] [info] [1465203392896] Reading backup source
from hard disk... Completed
[2016/06/06 16:58:47] [info] [1465203392896] [New Directory]...
MySQL
[2016/06/06 16:58:47] [info] [1465203392791] Downloading server file
list... Completed
[2016/06/06 16:58:47] [info] [1465203392791] Reading backup source
from hard disk...
[2016/06/06 16:58:47] [info] [1465203392791] [New Directory]...
MySQL
[2016/06/06 16:58:47] [info] [1465203392791] Reading backup source
from hard disk... Completed
[2016/06/06 16:58:47] [info] [1465203392896] [New File]... 89% of
"MySQL/classicmodels.sql"
[2016/06/06 16:58:47] [info] [1465203392896] [New File]... 100% of
"MySQL/classicmodels.sql"
.
.
.
[2016/06/06 16:59:11] [info] [1465203392896] [Checksum File]... 97%
of "MySQL/employees.sql"
[2016/06/06 16:59:11] [info] [1465203392896] [Checksum File]... 100%
of "MySQL/employees.sql"
[2016/06/06 16:59:13] [info] [1465203392896] [New File]... 88% of
"MySQL/sakila.sql"
[2016/06/06 16:59:13] [info] [1465203392896] [New File]... 94% of
"MySQL/world.sql"
[2016/06/06 16:59:13] [info] [1465203392896] [New File]... 100% of
"MySQL/world.sql"
.
.
[2016/06/06 16:59:21] [info] [1465203392791] [New File]... 100% of
"MySQL/world.sql"
[2016/06/06 16:59:22] [info] [1465203392791] Total New Files = 4
[2016/06/06 16:59:22] [info] [1465203392791] Total New Directories =
1
[2016/06/06 16:59:22] [info] [1465203392791] Total New Links = 0
[2016/06/06 16:59:22] [info] [1465203392791] Total Updated Files = 0
[2016/06/06 16:59:22] [info] [1465203392791] Total Attributes
Changed Files = 0
[2016/06/06 16:59:22] [info] [1465203392791] Total Deleted Files = 0
[2016/06/06 16:59:22] [info] [1465203392791] Total Deleted
Directories = 0
[2016/06/06 16:59:22] [info] [1465203392791] Total Deleted Links = 0
[2016/06/06 16:59:22] [info] [1465203392791] Total Moved Files = 0
[2016/06/06 16:59:22] [info] [-] Deleting temporary file
/tmp/1465203392036/SpoolArea
[2016/06/06 16:59:22] [info] [1465203392791] Saving encrypted backup
file index to 1465203392036/blocks at destination CBS...
[2016/06/06 16:59:23] [info] [1465203392791] Saving encrypted backup
file index to 1465203392036/blocks/2016-06-06-16-58-05 at
destination CBS...
[2016/06/06 16:59:26] [info] [1465203392791] Deleting temporary file
/tmp/1465203392036/OBS@1465203392791
[2016/06/06 16:59:26] [info] [1465203392791] Backup Completed
Successfully
```

7 Restoring Data

7.1 Automatic MySQL Database Restore

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

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

   - Backup Set Name -> BACKUP_SET=""
   - Backup Destination -> DESTINATION=""
   - Files/Folders to be Restored -> RESTORE_FROM=""
   - Snapshot to be restored ->POINT_IN_TIME=""
   - Applying the original permission to the restore files ->RESTORE_PERMISSION=""

   Note: *RESTORE_TO="" settings must be blank*

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

#!/bin/sh

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

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

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

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

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

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

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

```
SYNC_OPTION="N"

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

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

# ------------------------  FILTER  ------------------------
#  Filter out what files you want to restore
# -Pattern=xxx-Type=yyy-Target=zzz
# where xxx is the filter pattern,
# yyy is the filter type, 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="/tmp"

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

2. Login to MySQL Server

```
# mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 4
Server version: 5.6.16 MySQL Community Server (GPL)

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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>
```

3. Create the database names that need to be recovered.
   Example: classicmodels, employees, sakila, and world.

```
mysql> create database classicmodels;
Query OK, 1 row affected (0.02 sec)
mysql> create database employees;
Query OK, 1 row affected (0.00 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)
```

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

```
# cd /usr/local/obm/bin
# sh Restore.sh
Using APP_HOME:          : /usr/local/obm
Using BACKUP_SET         : MySQL Database 1
Using RESTORE_FROM       : MySQL
Using RESTORE_TO         :
Using POINT_IN_TIME      : Current
Using RESTORE_PERMISSION : N
Using TEMP_DIR           :
Filter Pattern not set, filter would not apply to restore
Temporary directory not set, use the temporary directory in
the backup set
log4j:WARN No appenders could be found for logger
(org.apache.http.impl.conn.PoolingClientConnectionManager).
log4j:WARN Please initialize the log4j system properly.
log4j:WARN See
http://logging.apache.org/log4j/1.2/faq.html#noconfig for more
info.
[2016-06-24 15:39:32] Start [ Linux 2.6.32-279.el6.x86_64
(cos6x-2-35), AhsayOBM v7.7.2.0 ]
[2016-06-24 15:39:32] start,"Start [ Linux 2.6.32-
279.el6.x86_64 (cos6x-2-35), AhsayOBM v7.7.0.0 ]",0,0,0,,0,0
[2016-06-24 15:39:33] Initializing decrypt action...
[2016-06-24 15:39:33] Initializing decrypt action... Completed
[2016-06-24 15:39:33] Creating new directory...
"/tmp/RestoreSet/1466753491713/RestoreDatabase/MySQL"
[2016-06-24 15:39:33] Downloading...
"/tmp/RestoreSet/1466753491713/RestoreDatabase/MySQL/classicmo
dels.sql" (Total 197k bytes)
```

```
[2016-06-24 15:39:34]
file,/tmp/RestoreSet/1466753491713/RestoreDatabase/MySQL/class
icmodels.sql,202106,202106,1466753566000,,1466753973945,146675
3974012
[2016-06-24 15:39:34] Downloading...
"/tmp/RestoreSet/1466753491713/RestoreDatabase/MySQL/employees
.sql" (Total 160.57M bytes)
[2016-06-24 15:39:36] Start restore files to MySQL Server...
"classicmodels"
[2016-06-24 15:39:36] Restoring to MySQL Server Database...
"classicmodels"
[2016-06-24 15:39:37] End restore files to MySQL Server...
"classicmodels"
[2016-06-24 15:39:43]
file,/tmp/RestoreSet/1466753491713/RestoreDatabase/MySQL/emplo
yees.sql,168372980,168372980,1466753580000,,1466753974221,1466
753983009

[2016-06-24 15:39:43] Downloading...
"/tmp/RestoreSet/1466753491713/RestoreDatabase/MySQL/sakila.sq
l" (Total 3.2M bytes)
[2016-06-24 15:39:44]
file,/tmp/RestoreSet/1466753491713/RestoreDatabase/MySQL/sakil
a.sql,3360623,3360623,1466753581000,,1466753983078,14667539841
95
[2016-06-24 15:39:45] Start restore files to MySQL Server...
"employees"
[2016-06-24 15:39:46] Restoring to MySQL Server Database...
"employees"
[2016-06-24 15:41:35] End restore files to MySQL Server...
"employees"
[2016-06-24 15:41:35] Downloading...
"/tmp/RestoreSet/1466753491713/RestoreDatabase/MySQL/world.sql
" (Total 238k bytes)
[2016-06-24 15:41:35]
file,/tmp/RestoreSet/1466753491713/RestoreDatabase/MySQL/world
.sql,243799,243799,1466753582000,,1466754095827,1466754095833
[2016-06-24 15:41:36] Start restore files to MySQL Server...
"sakila"
[2016-06-24 15:41:36] Restoring to MySQL Server Database...
"sakila"
[2016-06-24 15:41:42] End restore files to MySQL Server...
"sakila"
[2016-06-24 15:41:43] Start restore files to MySQL Server...
"world"
[2016-06-24 15:41:43] Restoring to MySQL Server Database...
"world"
[2016-06-24 15:41:43] End restore files to MySQL Server...
"world"
[2016-06-24 15:41:44] Restore Completed Successfully
[2016-06-24 15:41:44] end,RESTORE_STOP_SUCCESS,0,0,0,,0,0
```

5. Check the database status.
   Example: Listing the tables in the database using **show tables**

```
mysql> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| classicmodels      |
```

```
| employees          |
| 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)
```

7.2 Manual MySQL 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=""

```
# sh Restore.sh
Using APP_HOME:           : /usr/local/obm
Using BACKUP_SET          : MySQL Database 1
Using RESTORE_FROM        : MySQL
Using RESTORE_TO          : /restored
Using POINT_IN_TIME       : Current
Using RESTORE_PERMISSION  : N
Using TEMP_DIR            :
Filter Pattern not set, filter would not apply to restore
Temporary directory not set, use the temporary directory in the
backup set
log4j:WARN No appenders could be found for logger
(org.apache.http.impl.conn.PoolingClientConnectionManager).
log4j:WARN Please initialize the log4j system properly.
log4j:WARN See http://logging.apache.org/log4j/1.2/faq.html#noconfig
for more info.
[2016-06-23 18:02:10] Start [ Linux 2.6.32-279.el6.x86_64 (cos6x-2-
35), Fast Tape Pro Backup Client v7.7.0.0 ]
[2016-06-23 18:02:10] start,"Start [ Linux 2.6.32-279.el6.x86_64
(cos6x-2-35), AhsayOBM v7.7.0.0 ]",0,0,0,,0,0
[2016-06-23 18:02:11] Initializing decrypt action...
[2016-06-23 18:02:11] Initializing decrypt action... Completed
[2016-06-23 18:02:11] Creating new directory... "/restored/MySQL"
[2016-06-23 18:02:11] Downloading...
"/restored/MySQL/classicmodels.sql" (Total 197k bytes)
[2016-06-23 18:02:12]
file,/restored/MySQL/classicmodels.sql,202102,202102,1465558226000,,
1466676132253,1466676132339
[2016-06-23 18:02:12] Downloading... "/restored/MySQL/employees.sql"
(Total 163.92M bytes)
[2016-06-23 18:02:12] Downloading full backup file...
MySQL/employees.sql (2016-06-06-16-58-05)
[2016-06-23 18:02:12] Downloading delta backup file...
MySQL/employees.sql (2016-06-06-19-30-00)
[2016-06-23 18:02:12] Downloading delta backup file...
MySQL/employees.sql (2016-06-07-19-30-00)
[2016-06-23 18:02:12] Downloading delta backup file...
MySQL/employees.sql (2016-06-08-19-30-00)
```

```
[2016-06-23 18:02:14] file,[I]
/restored/MySQL/employees.sql,701621,701621,1465299042000,,146667613
4134,1466676134229
[2016-06-23 18:02:14] Downloading delta backup file...
MySQL/employees.sql (2016-06-09-19-30-00)
[2016-06-23 18:02:21] file,[I]
/restored/MySQL/employees.sql,701621,701621,1465212638000,,146667614
1086,1466676141126
[2016-06-23 18:02:21] Downloading delta backup file...
MySQL/employees.sql (2016-06-10-19-30-00)
[2016-06-23 18:02:21] file,[I]
/restored/MySQL/employees.sql,701621,701621,1465385437000,,146667614
1207,1466676141249
[2016-06-23 18:02:21] file,[I]
/restored/MySQL/employees.sql,701621,701621,1465471842000,,146667614
1346,1466676141378
[2016-06-23 18:02:21] file,[I]
/restored/MySQL/employees.sql,701621,701621,1465558238000,,146667614
1401,1466676141428
[2016-06-23 18:02:29]
file,/restored/MySQL/employees.sql,168372976,168372976,1465203514000
,,1466676134256,1466676149234
[2016-06-23 18:02:29] Merging full and delta backup files
(/restored/MySQL/employees.sql)
[2016-06-23 18:02:40] Downloading... "/restored/MySQL/sakila.sql"
(Total 3.2M bytes)
[2016-06-23 18:02:40]
file,/restored/MySQL/sakila.sql,3360619,3360619,1465558239000,,14666
76160891,1466676160937
[2016-06-23 18:02:40] Downloading... "/restored/MySQL/world.sql"
(Total 238k bytes)
[2016-06-23 18:02:40]
file,/restored/MySQL/world.sql,243795,243795,1465558239000,,14666761
60943,1466676160948
[2016-06-23 18:02:41] Restore Completed Successfully
[2016-06-23 18:02:41] end,RESTORE_STOP_SUCCESS,0,0,0,,0,0
```

Verify the files are restored on the machine.

```
# ls -la /restored/MySQL
total 168160
drwxr-xr-x 2 root root      4096 Jun 23 18:02 .
drwxr-xr-x 3 root root      4096 Jun 23 18:02 ..
-rw-r--r-- 1 root root    202102 Jun 10 19:30 classicmodels.sql
-rw-r--r-- 1 root root 168372976 Jun 10 19:30 employees.sql
-rw-r--r-- 1 root root   3360619 Jun 10 19:30 sakila.sql
-rw-r--r-- 1 root root    243795 Jun 10 19:30 world.sql
```

7.2.1 Recovering MySQL Databases

1. Login to MySQL server

```
# mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 4
Server version: 5.6.16 MySQL Community Server (GPL)

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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, employees, sakila, and world.

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

mysql> create database employees;
Query OK, 1 row affected (0.00 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 /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> source /restored/MySQL/employees.sql
Query OK, 0 rows affected (0.01 sec)

Query OK, 24895 rows affected (0.35 sec)
Records: 24895  Duplicates: 0  Warnings: 0

Query OK, 24896 rows affected (0.55 sec)
Records: 24896  Duplicates: 0  Warnings: 0

Query OK, 24896 rows affected (0.59 sec)
Records: 24896  Duplicates: 0  Warnings: 0

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> 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      |
| employees          |
| 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)
```

Appendix

Appendix A MySQL Backup Set XML Template (Raw)

```
<?xml version="1.0" encoding="UTF-8"?>
<Setting>
    <!-- This is the backup set setting -->
    <Key name="Backup Set Setting">
        <!-- Backup set type (Read Only) -->
        <Value data="MySQL" 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) -->
        <!-- Leave the field blank for no compression -->
        <Value data="" name="Compression Type" type="string" />
        <!-- Backup files' permissions -->
        <!-- Y: Yes -->
        <!-- N: No -->
        <Value data="Y" name="Upload files permission" type="boolean"   />
        <!-- Follow link of the backup files -->
        <!-- Y: Yes -->
        <!-- N: No -->
        <Value data="Y" name="Follow links" type="boolean" />
        <!-- This shows the MySQL Database setting -->
        <Key name="MySQL Database Setting">
            <!-- MySQL Login Name -->
            <Value data="" name="Username" type="string" />
            <!-- MySQL Password -->
            <Value data="" name="Password" type="string" />
            <!-- MySQL Host -->
            <Value data="" name="Host" type="string" />
            <!-- MySQL 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">
            <!-- Please enter the path in the format of
            "MySQL/_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">
```

```
            <!-- Please enter the path in the format of
            "MySQL/_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">
                <!-- Name of schedule -->
                <Value data="Daily-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" />
                <!-- Duration of this backup in hours -->
                <!-- 1, 2, 3... -->
                <!-- A value of -1 means run until job finish -->
                <Value data="-1" name="Duration" type="integer" />
            </Key>
            <!-- Weekly settings -->
            <!-- Copy and paste the whole <Key> to add more weekly
            schedules -->
            <Key name="Weekly Schedule Settings">
                <!-- Name of schedule -->
                <Value data="Weekly-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" />
                <!-- Duration of this backup in hours -->
                <!-- 1, 2, 3... -->
                <!-- A value of -1 means run until job finish -->
                <Value data="-1" name="Duration" type="integer" />
                <!-- Backup on these days of the week -->
                <!-- Y: Yes -->
                <!-- N: No -->
                <Value data="Y" name="Sunday" type="boolean" />
                <Value data="Y" name="Monday" type="boolean" />
                <Value data="Y" name="Tuesday" type="boolean" />
                <Value data="Y" name="Wednesday" type="boolean" />
                <Value data="Y" name="Thursday" type="boolean" />
                <Value data="Y" name="Friday" type="boolean" />
                <Value data="Y" name="Saturday" type="boolean" />
            </Key>
            <!-- Monthly settings -->
            <!-- Copy and paste the whole <Key> to add more monthly
            schedules -->
            <Key name="Monthly Schedule Settings">
                <!-- 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" />
            <!-- Duration of this backup in hours -->
            <!-- 1, 2, 3... -->
            <!-- A value of -1 means run until job finish -->
            <Value data="-1" name="Duration" 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">
            <!-- 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" />
            <!-- Duration of this backup in hours -->
            <!-- 1, 2, 3... -->
            <!-- A value of -1 means run until job finish -->
            <Value data="-1" name="Duration" type="integer" />
            <!-- Date for performing custom schedule backup -->
            <!-- Input in the format of YYYY-MM-DD -->
            <Value data="2016-5-4" name="Schedule Date" type="string"
            />
        </Key>
    </Key>
    <!-- This is the collection of destinations -->
    <Key name="Destination Settings">
        <!-- Concurrency level is the number of destinations to run
        backup concurrently -->
        <!-- 2, 3, 4... -->
        <!-- 1 : Backup to destinations one by one sequentially -->
        <!-- -1: Backup to all destinations concurrently -->
        <Value data="1" name="Concurrency Level" type="integer" />
        <!-- CBS destination is where the files are backup to server --
        >
        <Key name="CBS Destination Settings">
        </Key>
```

```
<!-- Local destination means backup files are stored in your
computer -->
<!-- Copy and paste the whole <Key> to add more local
destinations -->
<Key name="Local Destination Settings">
    <!-- Name of your destination -->
    <Value data="" name="Name" type="string" />
    <!-- Directory to store your backup files -->
    <!-- e.g. /tmp -->
    <Value data="" name="Local Path" type="string" />
</Key>
<!-- Aliyun destination for storing files -->
<!-- Copy and paste the whole <Key> to add more Aliyun
destinations -->
<Key name="Aliyun Destination Settings">
    <!-- Name of your destination -->
    <Value data="" name="Name" type="string" />
    <!-- Access key ID -->
    <Value data="" name="Access Key ID" type="string" />
    <!-- Access key secret -->
    <Value data="" name="Access Key Secret" type="string" />
    <!-- Region -->
    <!-- oss-cn-hangzhou   : Hangzhou -->
    <!-- oss-cn-shenzhen   : Shenzhen -->
    <!-- oss-cn-beijing    : Beijing -->
    <!-- oss-cn-qingdao    : Qingdao -->
    <!-- oss-cn-shanghai   : Shanghai -->
    <!-- oss-cn-hongkong   : Hong Kong -->
    <!-- oss-us-west-1     : US Silicon Valley -->
    <!-- oss-ap-southeast-1: Asia Pacific (Singapore) -->
    <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>
<!-- CTYun destination for storing files -->
<!-- Copy and paste the whole <Key> to add more CTYun
destinations -->
<Key name="CTYun Destination Settings">
    <!-- Name of your destination -->
    <Value data="" name="Name" type="string" />
    <!-- Access key ID -->
    <Value data="" name="Access Key ID" type="string" />
    <!-- Access secret key -->
    <Value data="" name="Access Secret Key" type="string" />
    <!-- Select whether to use proxy -->
    <!-- Y: Yes -->
    <!-- N: No -->
    <Value data="N" name="Enable proxy during backup"
    type="boolean" />
</Key>
<!-- AmazonS3 destination for storing files -->
<!-- Copy and paste the whole <Key> to add more AmazonS3
destinations -->
<Key name="AmazonS3 Destination Settings">
    <!-- Name of your destination -->
```

```
            <Value data="" name="Name" type="string" />
            <!-- Access key ID -->
            <Value data="" name="Access Key ID" type="string" />
            <!-- Secret access key -->
            <Value data="" name="Secret Access Key" type="string" />
            <!-- Location -->
            <!-- us-east-1     : US East (N. Virginia) -->
            <!-- us-west-2     : US West (Oregon) -->
            <!-- us-west-1     : US West (Northern California) -->
            <!-- eu-west-1     : EU (Ireland) -->
            <!-- eu-central-1  : EU (Frankfurt) -->
            <!-- ap-southeast-1: Asia Pacific (Singapore) -->
            <!-- ap-northeast-1: Asia Pacific (Tokyo) -->
            <!-- ap-southeast-2: Asia Pacific (Sydney) -->
            <!-- sa-east-1     : South America (Sao Paulo) -->
            <!-- us-gov-west-1 : AWS GovCloud (US) -->
            <!-- cn-north-1    : China (Beijing) -->
            <!-- ap-northeast-2: Asia Pacific (Seoul) -->
            <Value data="" name="Location" type="string" />
            <!-- Select whether to use proxy -->
            <!-- Y: Yes -->
            <!-- N: No -->
            <Value data="N" name="Enable proxy during backup"
            type="boolean" />
        </Key>
        <!-- AWSCompatible destination for storing files -->
        <!-- Copy and paste the whole <Key> to add more AWSCompatible
        destinations -->
        <Key name="AWSCompatible Destination Settings">
            <!-- 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" />
            <!-- Access key ID -->
            <Value data="" name="Access Key ID" type="string" />
            <!-- Secret access key -->
            <Value data="" name="Secret Access Key" type="string" />
            <!-- Bucket to store backup data (please create this bucket
            manually first) -->
            <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>
        <!-- GoogleCloudStorage destination for storing files -->
        <!-- Copy and paste the whole <Key> to add more
        GoogleCloudStorage destinations -->
        <Key name="GoogleCloudStorage Destination Settings">
            <!-- Name of your destination -->
            <Value data="" name="Name" type="string" />
            <!-- Access key -->
            <Value data="" name="Access Key" type="string" />
            <!-- Secret -->
            <Value data="" name="Secret" type="string" />
            <!-- Location -->
            <!-- US  : United States -->
            <!-- EU  : European Union -->
```

```
        <!-- ASIA: Asia -->
        <Value data="" name="Location" type="string" />
        <!-- Select whether to use proxy -->
        <!-- Y: Yes -->
        <!-- N: No -->
        <Value data="N" name="Enable proxy during backup"
        type="boolean" />
    </Key>
    <!-- Windows Azure destination for storing files -->
    <!-- Copy and paste the whole <Key> to add more Windows Azure
    destinations -->
    <Key name="Windows Azure Destination Settings">
        <!-- Name of your destination -->
        <Value data="" name="Name" type="string" />
        <!-- Storage account name -->
        <Value data="" name="Storage Account Name" type="string" />
        <!-- Access key -->
        <Value data="" name="Access Key" type="string" />
    </Key>
    <!-- Rackspace destination for storing files -->
    <!-- Copy and paste the whole <Key> to add more Rackspace
    destinations -->
    <Key name="Rackspace Destination Settings">
        <!-- Name of your destination -->
        <Value data="" name="Name" type="string" />
        <!-- Username -->
        <Value data="" name="Username" type="string" />
        <!-- API key -->
        <Value data="" name="API Key" type="string" />
        <!-- Select whether to use proxy -->
        <!-- Y: Yes -->
        <!-- N: No -->
        <Value data="N" name="Enable proxy during backup"
        type="boolean" />
    </Key>
    <!-- OpenStack destination for storing files -->
    <!-- Copy and paste the whole <Key> to add more OpenStack
    destinations -->
    <Key name="OpenStack Destination Settings">
        <!-- Name of your destination -->
        <Value data="" name="Name" type="string" />
        <!-- Host -->
        <Value data="" name="Host" type="string" />
        <!-- Keystone public port -->
        <Value data="5000" name="Keystone Public Port"
        type="integer" />
        <!-- Username -->
        <Value data="" name="Username" type="string" />
        <!-- Password -->
        <Value data="" name="Password" 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">
        <!-- Name of your destination -->
```

```
                <Value data="" name="Name" type="string" />
                <!-- Host -->
                <Value data="" name="Host" type="string" />
                <!-- Port -->
                <Value data="0" name="Port" type="integer" />
                <!-- Username -->
                <Value data="" name="Username" type="string" />
                <!-- Password -->
                <Value data="" name="Password" type="string" />
                <!-- FTP directory to store backup data -->
                <!-- Leave the field empty to store to ~/Ahsay -->
                <Value data="" name="Directory" type="string" />
                <!-- Select whether to use proxy -->
                <!-- Y: Yes -->
                <!-- N: No -->
                <Value data="N" name="Enable proxy during backup"
                type="boolean" />
            </Key>
        </Key>
        <!-- This shows the in-file delta setting -->
        <Key name="In-file Delta Setting">
            <!-- Enable in-file delta backup -->
            <!-- Y: Yes -->
            <!-- N: No -->
            <Value data="Y" name="Enable" type="boolean" />
            <!-- Default in-file delta type -->
            <!-- D: Differential -->
            <!-- I: Incremental -->
            <Value data="" name="Default Delta Type" type="string" />
        </Key>
    </Key>
</Setting>
```

Appendix B MySQL 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, MySQL 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 AhsayOBM), 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 or No compression.

```
<?xml version="1.0" encoding="UTF-8"?>
<Setting>
<!-- This is the backup set setting -->
    <Key name="Backup Set Setting">
    <!-- Backup set type (Read Only) -->
        <Value data="FILE" 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) -->
        <!-- Leave the field blank for no compression -->
        <Value data="" name="Compression Type" type="string" />
```

MySQL Database Setting

- Configure the login and network settings for the MySQL Database.

```
        <!-- This shows the MySQL Database setting -->
        <Key name="MySQL Database Setting">
            <!-- MySQL Login Name -->
            <Value data="" name="Username" type="string" />
            <!-- MySQL Password -->
            <Value data="" name="Password" type="string" />
            <!-- MySQL Host -->
```

```
        <Value data="" name="Host" type="string" />
        <!-- MySQL Port -->
        <Value data="" name="Port" type="string" />
        <!-- Path to mysqldump -->
        <Value data="" name="mysqldump path" type="string" />
    </Key>
```

Selected Source

- Enter the file path where the files you would like to backup are located.

```
    <!-- This includes the files you want to backup -->
    <!-- Copy and paste the whole <Key> to add more selected
    sources -->
    <Key name="Selected Source">
        <!-- Please enter your file path, e.g. /root/Documents -->
        <Value data="" name="Path" type="string" />
    </Key>
```

Deselected Source

- Enter the file path where files you would like to exclude from the backup.

```
    <!-- This excludes the files from the included source -->
    <!-- Copy and paste the whole <Key> to add more deselected
    sources -->
    <Key name="Deselected Source">
        <!-- Please enter your file path, e.g. /root/Documents -->
        <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 hour** – the starting hour of the backup, from 0-23.
- **Start minute –** the starting minute of the backup, from 0-59.
- **Duration of this backup in hours –** for how long, in hours, you would like this backup to run. Set to -1 if you would like the backup job to run until it finishes.

```
        <!-- Daily settings -->
        <!-- Copy and paste the whole <Key> to add more daily
        schedules -->
        <Key name="Daily Schedule Settings">
            <!-- Name of schedule -->
            <Value data="Daily-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" />
            <!-- Duration of this backup in hours -->
            <!-- 1, 2, 3... -->
            <!-- A value of -1 means run until job finish -->
            <Value data="-1" name="Duration" type="integer" />
        </Key>
```

Weekly Schedule Settings

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

- **Start hour** – the starting hour of the backup, from 0-23.
- **Start minute –** the starting minute of the backup, from 0-59.
- **Duration of this backup in hours –** the duration you would like this backup to perform, in hours. Set to -1 if you would like the backup job to run until it finishes.
- **Backup on these days of the week** – choose to enable or disable backup on each day in week.

```
        <!-- Weekly settings -->
        <!-- Copy and paste the whole <Key> to add more weekly
        schedules -->
        <Key name="Weekly Schedule Settings">
            <!-- Name of schedule -->
            <Value data="Weekly-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" />
            <!-- Duration of this backup in hours -->
            <!-- 1, 2, 3... -->
            <!-- A value of -1 means run until job finish -->
            <Value data="-1" name="Duration" 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.

- **Start hour** – the starting hour of the backup, from 0-23.
- **Start minute –** the starting minute of the backup, from 0-59.
- **Duration of this backup in hours –** the duration you would like this backup to perform, in hours. Set to -1 if you would like the backup job to run until it finishes.

- **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">
    <!-- 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" />
    <!-- Duration of this backup in hours -->
    <!-- 1, 2, 3... -->
    <!-- A value of -1 means run until job finish -->
    <Value data="-1" name="Duration" 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.

- **Start hour** – the starting hour of the backup, from 0-23.
- **Start minute –** the starting minute of the backup, from 0-59.

- **Duration of this backup in hours –** the duration you would like this backup to perform, in hours. Set to -1 if you would like the backup job to run until it finishes.
- **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">
            <!-- 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" />
            <!-- Duration of this backup in hours -->
            <!-- 1, 2, 3... -->
            <!-- A value of -1 means run until job finish -->
            <Value data="-1" name="Duration" type="integer" />
            <!-- Date for performing custom schedule backup -->
            <!-- Input in the format of YYYY-MM-DD -->
            <Value data="2016-4-30" name="Schedule Date"
            type="string" />
        </Key>
    </Key>
```

Destination Settings

- **Concurrency level** – set the number of destinations to run backup job concurrently
- **CBS 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">
            <!-- Concurrency level is the number of destinations to run
            backup concurrently -->
            <!-- 2, 3, 4... -->
            <!-- 1 : Backup to destinations one by one sequentially -->
            <!-- -1: Backup to all destinations concurrently -->
            <Value data="1" name="Concurrency Level" type="integer" />
            <!-- CBS destination is where the files are backup to
            server -->
            <Key name="CBS Destination Settings">
            </Key>
            <!-- Local destination means backup files are stored in
            your computer -->
            <!-- Copy and paste the whole <Key> to add more local
            destinations -->
            <Key name="Local Destination Settings">
                <!-- Name of your destination -->
                <Value data="" name="Name" type="string" />
                <!-- Directory to store your backup files -->
                <!-- e.g. /tmp -->
                <Value data="" name="Local Path" type="string" />
            </Key>
```

- **Aliyun Destination Settings** – if you are using Aliyun as your backup destination, configure the login and network settings in this section.

```
<!-- Aliyun destination for storing files -->
<!-- Copy and paste the whole <Key> to add more Aliyun
destinations -->
<Key name="Aliyun Destination Settings">
    <!-- Name of your destination -->
    <Value data="" name="Name" type="string" />
    <!-- Access key ID -->
    <Value data="" name="Access Key ID" type="string" />
    <!-- Access key secret -->
    <Value data="" name="Access Key Secret" type="string"
    />
    <!-- Region -->
    <!-- oss-cn-hangzhou    : Hangzhou -->
    <!-- oss-cn-shenzhen    : Shenzhen -->
    <!-- oss-cn-beijing     : Beijing -->
    <!-- oss-cn-qingdao     : Qingdao -->
    <!-- oss-cn-shanghai    : Shanghai -->
    <!-- oss-cn-hongkong    : Hong Kong -->
    <!-- oss-us-west-1      : US Silicon Valley -->
    <!-- oss-ap-southeast-1: Asia Pacific (Singapore) -->
    <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>
```

- **CTYun Destination Settings** – if you are using CTYun as your backup destination, configure the login and network settings in this section.

```
<!-- CTYun destination for storing files -->
<!-- Copy and paste the whole <Key> to add more CTYun
destinations -->
<Key name="CTYun Destination Settings">
    <!-- Name of your destination -->
    <Value data="" name="Name" type="string" />
    <!-- Access key ID -->
    <Value data="" name="Access Key ID" type="string" />
    <!-- Access secret key -->
    <Value data="" name="Access Secret Key" type="string"
    />
    <!-- Select whether to use proxy -->
    <!-- Y: Yes -->
    <!-- N: No -->
    <Value data="N" name="Enable proxy during backup"
    type="boolean" />
</Key>
```

- **AmazonS3 Destination Settings** – if you are using AmazonS3 as your backup destination, configure the login and network settings in this section.

```
<!-- AmazonS3 destination for storing files -->
<!-- Copy and paste the whole <Key> to add more AmazonS3
destinations -->
```

```
<Key name="AmazonS3 Destination Settings">
    <!-- Name of your destination -->
    <Value data="" name="Name" type="string" />
    <!-- Access key ID -->
    <Value data="" name="Access Key ID" type="string" />
    <!-- Secret access key -->
    <Value data="" name="Secret Access Key" type="string"
    />
    <!-- Location -->
    <!-- us-east-1     : US East (N. Virginia) -->
    <!-- us-west-2     : US West (Oregon) -->
    <!-- us-west-1     : US West (Northern California) -->
    <!-- eu-west-1     : EU (Ireland) -->
    <!-- eu-central-1  : EU (Frankfurt) -->
    <!-- ap-southeast-1: Asia Pacific (Singapore) -->
    <!-- ap-northeast-1: Asia Pacific (Tokyo) -->
    <!-- ap-southeast-2: Asia Pacific (Sydney) -->
    <!-- sa-east-1     : South America (Sao Paulo) -->
    <!-- us-gov-west-1 : AWS GovCloud (US) -->
    <!-- cn-north-1    : China (Beijing) -->
    <!-- ap-northeast-2: Asia Pacific (Seoul) -->
    <Value data="" name="Location" type="string" />
    <!-- Select whether to use proxy -->
    <!-- Y: Yes -->
    <!-- N: No -->
    <Value data="N" name="Enable proxy during backup"
    type="boolean" />
</Key>
```

- **AWSCompatible Destination Settings** – if you are using AWSCompatible as your backup destination, configure the login and network settings in this section.

```
<!-- AWSCompatible destination for storing files -->
<!-- Copy and paste the whole <Key> to add more
AWSCompatible destinations -->
<Key name="AWSCompatible Destination Settings">
    <!-- 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" />
    <!-- Access key ID -->
    <Value data="" name="Access Key ID" type="string" />
    <!-- Secret access key -->
    <Value data="" name="Secret Access Key" type="string"
    />
    <!-- Bucket to store backup data (please create this
    bucket manually first) -->
    <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>
```

- **GoogleCloudStorage Destination Settings** – if you are using GoogleCloudStorage as your backup destination, configure the login and network settings in this section.

```
<!-- GoogleCloudStorage destination for storing files -->
<!-- Copy and paste the whole <Key> to add more
GoogleCloudStorage destinations -->
<Key name="GoogleCloudStorage Destination Settings">
    <!-- Name of your destination -->
    <Value data="" name="Name" type="string" />
    <!-- Access key -->
    <Value data="" name="Access Key" type="string" />
    <!-- Secret -->
    <Value data="" name="Secret" type="string" />
    <!-- Location -->
    <!-- US  : United States -->
    <!-- EU  : European Union -->
    <!-- ASIA: Asia -->
    <Value data="" name="Location" type="string" />
    <!-- Select whether to use proxy -->
    <!-- Y: Yes -->
    <!-- N: No -->
    <Value data="N" name="Enable proxy during backup"
    type="boolean" />
</Key>
```

- **Windows Azure Destination Settings** – if you are using Windows Azure as your backup destination, configure the login and network settings in this section.

```
<!-- Windows Azure destination for storing files -->
<!-- Copy and paste the whole <Key> to add more Windows
Azure destinations -->
<Key name="Windows Azure Destination Settings">
    <!-- Name of your destination -->
    <Value data="" name="Name" type="string" />
    <!-- Storage account name -->
    <Value data="" name="Storage Account Name"
    type="string" />
    <!-- Access key -->
    <Value data="" name="Access Key" type="string" />
</Key>
```

- **Rackspace Destination Settings -** – if you are using Rackspace as your backup destination, configure the login and network settings in this section.

```
<!-- Rackspace destination for storing files -->
<!-- Copy and paste the whole <Key> to add more Rackspace
destinations -->
<Key name="Rackspace Destination Settings">
    <!-- Name of your destination -->
    <Value data="" name="Name" type="string" />
    <!-- Username -->
    <Value data="" name="Username" type="string" />
    <!-- API key -->
    <Value data="" name="API Key" type="string" />
    <!-- Select whether to use proxy -->
    <!-- Y: Yes -->
    <!-- N: No -->
    <Value data="N" name="Enable proxy during backup"
    type="boolean" />
</Key>
```

- **OpenStack Destination Settings** – if you are using OpenStack as your backup destination, configure the login and network settings in this section.

```
<!-- OpenStack destination for storing files -->
<!-- Copy and paste the whole <Key> to add more OpenStack
destinations -->
<Key name="OpenStack Destination Settings">
    <!-- Name of your destination -->
    <Value data="" name="Name" type="string" />
    <!-- Host -->
    <Value data="" name="Host" type="string" />
    <!-- Keystone public port -->
    <Value data="5000" name="Keystone Public Port"
    type="integer" />
    <!-- Username -->
    <Value data="" name="Username" type="string" />
    <!-- Password -->
    <Value data="" name="Password" type="string" />
    <!-- Select whether to use proxy -->
    <!-- Y: Yes -->
    <!-- N: No -->
    <Value data="N" name="Enable proxy during backup"
    type="boolean" />
</Key>
```

- **FTP Destination Settings** – if you are using FTP as your backup destination, configure the login and network settings in this section.

```
<!-- FTP destination for storing files -->
<!-- Copy and paste the whole <Key> to add more FTP
destinations -->
<Key name="FTP Destination Settings">
    <!-- Name of your destination -->
    <Value data="" name="Name" type="string" />
    <!-- Host -->
    <Value data="" name="Host" type="string" />
    <!-- Port -->
    <Value data="0" name="Port" type="integer" />
    <!-- Username -->
    <Value data="" name="Username" type="string" />
    <!-- Password -->
    <Value data="" name="Password" type="string" />
    <!-- FTP directory to store backup data -->
    <!-- Leave the field empty to store to ~/Ahsay -->
    <Value data="" name="Directory" type="string" />
    <!-- Select whether to use proxy -->
    <!-- Y: Yes -->
    <!-- N: No -->
    <Value data="N" name="Enable proxy during backup"
    type="boolean" />
</Key>
</Key>
```

In-file delta setting

In-File delta technology is an advanced data block matching algorithm with the intelligence to pick up changes (delta) of file content between two files. You can choose between **Differential** and **Incremental** in this setting.

- **Differential** - The delta is generated by comparing with the last uploaded full file only. Delta generated with this method will grow daily and uses more bandwidth. However, for restoration, the full file and a single delta is required to be restored and merged.
- **Incremental** - The delta is generated by comparing with the last uploaded full or delta file. Delta generated with this method is smaller and uses the least bandwidth. However, for restoration, the full file and all deltas chain up to the required point-in-time are required to be restored and merged. This is prone to data lost (e.g. broken delta chain).

```
        <!-- This shows the in-file delta setting -->
        <Key name="In-file Delta Setting">
            <!-- Enable in-file delta backup -->
            <!-- Y: Yes -->
            <!-- N: No -->
            <Value data="Y" name="Enable" type="boolean" />
            <!-- Default in-file delta type -->
            <!-- D: Differential -->
            <!-- I: Incremental -->
            <Value data="" name="Default Delta Type" type="string" />
        </Key>
    </Key>
</Setting>
```

Appendix C Example of MySQL Database Backup Set (1)

Backup set configurations:

Backup Set Name	MySQL Database 1
Temporary Working Directory	/tmp
Remove temporary files after backup	Yes
Compress Type	Fast
Daily schedule	7:30 PM run until completed
Destination	CBS, Local Drive (/localbackup)
Backup mode	Concurrent
Backup Source	MySQL/classicmodels, MySQL/employees, MySQL/sakila, MySQL/world
In-File Delta Type	Differential

MySQL 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">
        <!-- Backup set type (Read Only) -->
        <Value data="MySQL" name="Type" type="string" />
        <!-- Backup set name -->
        <Value data="MySQL Database 1" name="Name" type="string" />
        <!-- Temporary directory for storing backup files -->
        <Value data="/tmp" 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) -->
        <!-- Leave the field blank for no compression -->
        <Value data="GzipBestSpeedCompression" name="Compression Type"
        type="string" />
        <!-- This shows the MySQL Database setting -->
        <Key name="MySQL Database Setting">
            <!-- MySQL Login Name -->
            <Value data="root" name="Username" type="string" />
            <!-- MySQL Password -->
            <Value data="pwd123" name="Password" type="string" />
            <!-- MySQL Host -->
            <Value data="localhost" name="Host" type="string" />
            <!-- MySQL 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">
        <!-- Please enter the path in the format of
        "MySQL/_YOUR_FILE_NAME_" -->
        <Value data="MySQL/classicmodels" name="Path" type="string" />
    </Key>
    <Key name="Selected Source">
        <!-- Please enter the path in the format of
        "MySQL/_YOUR_FILE_NAME_" -->
        <Value data="MySQL/employees" name="Path" type="string" />
    </Key>
    <Key name="Selected Source">
        <!-- Please enter the path in the format of
        "MySQL/_YOUR_FILE_NAME_" -->
        <Value data="MySQL/sakila" name="Path" type="string" />
    </Key>

    <Key name="Selected Source">
        <!-- Please enter the path in the format of
        "MySQL/_YOUR_FILE_NAME_" -->
        <Value data="MySQL/world" 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">
        <!-- Please enter the path in the format of
        "MySQL/_YOUR_FILE_NAME_" -->
        <Value data="MySQL/information_schema" name="Path"
        type="string" />
    </Key>
    <Key name="Deselected Source">
        <!-- Please enter the path in the format of
        "MySQL/_YOUR_FILE_NAME_" -->
        <Value data="MySQL/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">
            <!-- Name of schedule -->
            <Value data="Daily-Schedule" name="Name" type="string" />
            <!-- Start hour -->
            <!-- 0, 1, 2... 23 -->
            <Value data="19" name="Hour" type="integer" />
            <!-- Start minute -->
```

```
                <!-- 0, 1, 2... 59 -->
                <Value data="30" name="Minute" type="integer" />
            </Key>
        </Key>
        <!-- This is the collection of destinations -->
        <Key name="Destination Settings">
            <!-- Concurrency level is the number of destinations to run
            backup concurrently -->
            <!-- 2, 3, 4... -->
            <!-- 1 : Backup to destinations one by one sequentially -->
            <!-- -1: Backup to all destinations concurrently -->
            <Value data="-1" name="Concurrency Level" type="integer" />
            <!-- CBS destination is where the files are backup to server --
            >

            <Key name="CBS Destination Settings">
            </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="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 in-file delta setting -->
        <Key name="In-file Delta Setting">
            <!-- Enable in-file delta backup -->
            <!-- Y: Yes -->
            <!-- N: No -->
            <Value data="Y" name="Enable" type="boolean" />
            <!-- Default in-file delta type -->
            <!-- D: Differential -->
            <!-- I: Incremental -->
            <Value data="D" name="Default Delta Type" type="string" />
        </Key>
    </Key>
</Setting>
```

Appendix D Example of MySQL Database Backup Set (2)

Backup set configurations:

Backup Set Name	MySQL Daily
Temporary Working Directory	/tmp
Remove temporary files after backup	Yes
Compress Type	Fast
Daily schedule	10:00 PM run until completed
Destination	CBS
Backup Source	All MySQL databases
Exclude	MySQL/information_schema, MySQL/performance_schema
In-File Delta Type	Incremental

MySQL 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">
        <!-- Backup set type (Read Only) -->
        <Value data="MySQL" name="Type" type="string" />
        <!-- Backup set name -->
        <Value data="MySQL Daily" name="Name" type="string" />
        <!-- Temporary directory for storing backup files -->
        <Value data="/tmp" 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) -->
        <!-- Leave the field blank for no compression -->
        <Value data="GzipBestSpeedCompression" name="Compression Type"
        type="string" />
        <!-- This shows the MySQL Database setting -->
        <Key name="MySQL Database Setting">
            <!-- MySQL Login Name -->
            <Value data="root" name="Username" type="string" />
            <!-- MySQL Password -->
            <Value data="pwd123" name="Password" type="string" />
            <!-- MySQL Host -->
            <Value data="localhost" name="Host" type="string" />
            <!-- MySQL 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">
        <!-- Please enter the path in the format of
        "MySQL/_YOUR_FILE_NAME_" -->
        <Value data="MySQL" name="Path" type="string" />
    </Key>
    <Key name="Deselected Source">
        <!-- Please enter the path in the format of
        "MySQL/_YOUR_FILE_NAME_" -->
        <Value data="MySQL/information_schema" name="Path"
        type="string" />
    </Key>
    <Key name="Deselected Source">
        <!-- Please enter the path in the format of
        "MySQL/_YOUR_FILE_NAME_" -->
        <Value data="MySQL/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">
            <!-- Name of schedule -->
            <Value data="Daily-Schedule" name="Name" type="string" />
            <!-- Start hour -->
            <!-- 0, 1, 2... 23 -->
            <Value data="22" name="Hour" type="integer" />
            <!-- Start minute -->
            <!-- 0, 1, 2... 59 -->
            <Value data="00" name="Minute" type="integer" />
        </Key>
    </Key>
    <!-- This is the collection of destinations -->
    <Key name="Destination Settings">
        <!-- Concurrency level is the number of destinations to run
        backup concurrently -->
        <!-- 2, 3, 4... -->
        <!-- 1 : Backup to destinations one by one sequentially -->
        <!-- -1: Backup to all destinations concurrently -->
        <Value data="-1" name="Concurrency Level" type="integer" />
        <!-- CBS destination is where the files are backup to server --
        >

        <Key name="CBS Destination Settings">
        </Key>
    </Key>
    <!-- This shows the in-file delta setting -->
```

```
        <Key name="In-file Delta Setting">
            <!-- Enable in-file delta backup -->
            <!-- Y: Yes -->
            <!-- N: No -->
            <Value data="Y" name="Enable" type="boolean" />
            <!-- Default in-file delta type -->
            <!-- D: Differential -->
            <!-- I: Incremental -->
            <Value data="I" name="Default Delta Type" type="string" />
        </Key>
    </Key>
</Setting>
```