Final Assignment - Database Administration - Part 2

Estimated time needed: **45** minutes.

About This SN Labs Cloud IDE

This Skills Network Labs Cloud IDE provides a hands-on environment for course and project related labs. It utilizes Theia, an open-source IDE (Integrated Development Environment) platform, that can be run on desktop or on the cloud. To complete this lab, we will be using the Cloud IDE based on Theia and MySQL database running in a Docker container.

Important Notice about this lab environment

Please be aware that sessions for this lab environment are not persisted. Every time you connect to this lab, a new environment is created for you. Any data you may have saved in the earlier session would get lost. Plan to complete these labs in a single session, to avoid losing your data.

Scenario

You have assumed the role of database administrator for the MySQL server and will perform the tasks like configuration check, recovery of data. You will use indexing to improve the database performance. You will identify which storage engines are supported by the server and which table uses which storage engine. Optionally You will also automate backup tasks.

Objectives

In part 2 of this assignment you will be working on the following aspects of Database Administration.

- Installing/Provisioning
- Configuration
- Recovery
- Indexing
- Storage Engines
- Automation of routine tasks

Note - Screenshots

Throughout this lab you will be prompted to take screenshots and save them on your own device. These screenshots need to be uploaded for peer review in the next section of the course. You can use various free screengrabbing tools to do this or use your operating system's shortcut keys to do this (for example *Alt+PrintScreen* in Windows).

Exercise 2.1 - Set up the lab environment

Before you proceed with the assignment, start the MySQL Server.

Exercise 2.2 - Recovery

Task 2.2.1- Restore MySQL server using a previous backup

Download the backup file https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DB0231EN-SkillsNetwork/labs/Final%20Assignment/billingdata.sql.

Restore this file onto MySQL server.

List the tables in the `billing` database.

Take a screenshot of the list of tables.
Name the screenshot as **database-restore.jpg**. (images can be saved with either .jpg or .png extension)

Task 2.2.2 - Find the table data size

Find the data size of the table billdata.

Take a screenshot of the command you used and the output.

Name the screenshot as **table-data-size.jpg**. (images can be saved with either .jpg or .png extension)

Exercise 2.3 - Indexing

Task 2.3.1 - Baseline query performance

Write a query to select all rows with a billedamount > 19999 in table billdata.

Take a screenshot of the command you used and the output along with the query time.
Name the screenshot as **query-base-line.jpg**. (images can be saved with either .jpg or .png extension)

Task 2.3.2 - Create an index

Your customer wants to improve the execution time of the query you wrote in Task 2.3.

Create an appropriate index to make it run faster.

Take a screenshot of the command you used and the output.
Name the screenshot as **index-creation.jpg**. (images can be saved with either .jpg or .png extension)

Task 2.3.3 - Document the improvement in query performance

Find out if the index has any impact on query performance.

Re-run the baseline query of **Task 2.3.1** after creating the index.

Take a screenshot of the command you used and the output along with the query time.
Name the screenshot as **query-indexed.jpg**. (images can be saved with either .jpg or .png extension)4

Exercise 2.4 - Storage Engines

Task 2.4.1 - Find supported storage engines

Run a command to find out if your MySQL server supports the `MyISAM` storage engine.

Take a screenshot of the command you used and the output.
Name the screenshot as **storage-engines.jpg**. (images can be saved with either .jpg or .png extension)

Task 2.4.2 - Find the storage engine of a table

Find the storage engine of the table `billdata`.

Take a screenshot of the command you used and the output.
Name the screenshot as **storage-engine-type.jpg**. (images can be saved with either .jpg or .png extension)

Exercise 2.5- OPTIONAL Exercise (Non-graded) Automation of routine tasks

Bonus Task 2.5.1 - Write a bash script that performs a backup of all the databases

`mysqldump` is a command line tool that performs logical backups of a database.

Its generic syntax is `mysqldump db_name > backup-file.sql`

Its extended syntax is `mysqldump --all-databases --user=root --password=NzA4Ny1y > backup-file.sql`

Write a bash script named `mybackup.sh`that performs the following tasks.

- Perform the backup of all databases using the mysqldump
- Store the output in the file all-databases-backup.sql
- In the /tmp directory, create a directory named after current date like YYYYMMDD. For example, **20210830**
- Move the file all-databases-backup.sql to `/tmp/mysqldumps/<current date>/` directory

Take a screenshot of the bash script with the entire code clearly visible.
Name the screenshot as **bash-script.jpg**. (images can be saved with either .jpg or .png extension)

End of assignment - Part 2.

Authors

Ramesh Sannareddy

Other Contributors

Rav Ahuja

Copyright (c) 2023 IBM Corporation. All rights reserved.