

# MariaDB Database Administration

## *Session 1: THE SERVER, CLIENTS AND TOOLS*

- Introduction
- The versions of MariaDB
- An Overview of MariaDB Architecture
- MySQL Server
- MySQL Client Connections
- MySQL Client Programs
- Mysql Command Line
- Mysqladmin

## *Session 2: MYSQL WORKBENCH*

- Installation of MySQL Workbench
- Connecting to MySQL Workbench
- MySQL Workbench Screens

## *Session 3: OBTAINING METADATA*

- What is Metadata?
- The mysqlshow Client Program
- The SHOW and DESCRIBE Commands
- The Information\_Schema
- Show Command and Information\_Schema Differences
- Exercises: Obtaining Information about MariaDB

## *Session 4: CONFIGURE THE SERVER*

- Start and Stop the Server
- Status Files
- Time Zone Tables
- An Overview of MySQL Storage Engines
- MariaDB Server Options and Variables
- MariaDB Status Variables
- Configuring MariaDB Enterprise Audit

## *Session 5: SQL MODES, LOG FILES AND BINARY LOGGING*

- Error Messages
- The SHOW Errors Statement
- The SHOW Warnings Statement
- SQL Modes
- Note Messages
- The perror Utility
- The General Log
- The Error Log
- The Slow Query Log
- The Binary Logs

## ***Session 6: MARIADB ARCHITECTURE***

- Communication Protocols used to connect a Client to the Server
- The SQL Parser and Storage Engine Tiers
- Installing and Uninstalling Plugins
- How MariaDB Uses Disk Space
- How MariaDB Uses Memory
- Exercises: Examining the Architecture

## ***Session 7: THE INNODB STORAGE ENGINE***

- Features of InnoDB
- Transactions and Referential Integrity
- Physical Characteristics of InnoDB Tables
- The System Tablespace Configuration
- File per Table Tablespace
- Log File and Buffer Configuration
- Undo Logs and Undo Tablespaces
- Temporary Table Tablespaces
- InnoDB Shutdown Options
- InnoDB Status

## ***Session 8: OTHER STORAGE ENGINES***

- Check Engine Usage
- The MYISAM Engine
- The Merge Engine
- Other Engines: Archive, Aria, Memory, Blackhole, CSV
- Mixing Storage Engines
- Overview of the ColumnStore, MyRocks and Spider Engines

## ***Session 9: TABLE MAINTENANCE***

- Table Maintenance Operations
- Check Table
- Repair Table
- Analyze Table
- Optimize Table
- MySQL Check
- MyISAM Table Maintenance and Repair Utilities

## ***Session 10: BACKUP AND RECOVERY***

- The Advantages and Disadvantages of Different Backup Methods
- Overview of Backup Tools
- Binary Backups of MYISAM Tables
- Binary Backups of InnoDB Tables
- Performing Hot Backups
- Performing Recovery
- Import and Export Operations
- Exporting and Importing using SQL
- Exporting from the Command Line using mysqldump
- Importing from the Command Line using mysqlimport
- Additional Backup Tools

## ***Session 11: USER MANAGEMENT***

- Introduction
- User Accounts
- Creating Users
- Renaming Users
- Change a User Password
- Dropping Users
- Granting Privileges
- The User Table
- Connection Validation
- Password Validation Plugins

## ***Session 12: PRIVILEGES***

- Types of Privileges
- Granting Privileges
- Revoking Privileges
- Resource Limits
- Resource Management
- Role Management
- The mysql Database
- The Show Grants Command
- Role management

## ***Session 13: TRANSACTIONS AND LOCKING***

- Locking Concepts
- Levels of Locking
- Implicit Table Locking with MyISAM and InnoDB
- Explicit Table Locking
- Advisory Locking
- Monitoring Locks
- Turning Autocommit on and off
- Using Transaction Blocks
- Handling Concurrency Problems and Deadlocks

## ***Session 14: TUNING AND TABLES***

- General Table Optimizations
- Myisam Specific Optimizations
- Innodb Specific Optimizations
- Other Engine Specific Optimizations

## ***Session 15: TUNING THE SERVER***

- Status Variables
- Server Variables
- System Variables
- Per Client Variables
- Performance Schema Overview
- The Query Cache

## ***Session 16: THE EVENT SCHEDULER***

- Event scheduler concepts
- Event scheduler configuration
- Creating, altering and dropping events
- Event scheduler monitoring
- Events and privileges

## ***Session 17: MARIADB SERVER INSTALLATION AND UPGRADE***

- Installing MariaDB on Linux and UNIX
- Upgrade the MariaDB Server
- Deployment Security
- Database Server Access

## ***Session 18: OVERVIEW OF HIGH AVAILABILITY***

- High Availability Goals
- High Availability Concepts
- Design for High Availability
- Definition of Availability
- High Availability Terminology

## ***Session 19: CONFIGURE MASTER SLAVE REPLICATION***

- Replication Overview
- When to Use Replication
- Disadvantages of Replication
- Replication Architecture
- Complex Replication Topologies
- Testing Replication
- Excluding Databases or Tables from Replication
- Example: Setting Up a Master Slave Replication
- Replication Using GTIDs
- Controlled Switchover

## ***Session 20: ADMINISTER A REPLICATION TOPOLOGY***

- Replication Files and Threads
- Lagging Slave
- Monitoring Replication
- Troubleshooting Replication
- Semi-synchronous Replication
- Failover
- Replication and Failover Utilities