

DAT300 : MySQL Administration

Code : DAT300 **Duration :** 5 days

Category : Databases

Audience :

Persons who need to administer, monitor and support MySQL databases and servers.

Prerequisites :

To join this course knowledge of the SQL query language and databases is needed.

Realization :

The subject matter is treated on the basis of presentation slides. Demos are used to clarify the theory and exercises are used to bring the theory into practice. The course material is in English. This course fulfils the requirements for the Oracle MySQL 5 Database Administrator certification.



MySQL Administration



Contents :

This MySQL Database Administration course is designed for MySQL Database Administrators who have a basic understanding of a MySQL database and SQL commands. The course provides practical experience in setting up and maintaining a MySQL server, including back up, recovery, configuration and optimization. Participants will learn to install, start and shutdown the MySQL server, learn to configure MySQL components and to use different storage engines supported in MySQL. They will also learn to maintain security of a MySQL installation via user management and access rights. Finally they will learn to work with the MySQL Administrator Graphical User Interface to perform backup and restore operations using multiple MySQL tools and to perform database replication in MySQL.

Module 1 : Intro MySQL

- Introduction
- Client Program Limitations
- mysql
- MySQL Admin
- What is Metadata?
- The mysqlshow Utility
- The SHOW and DESCRIBE Commands
- The Information_Schema Database
- MySQL Server Options and Variables
- MySQL Status Variables
- MySQL Distributions

Module 2 : Configuring MySQL

- Installing on Windows
- Installing on Linux and UNIX
- Starting and Stopping on Windows
- Starting and Stopping on UNIX/Linux
- Log and Status Files
- The Default SQL Mode
- Time Zone Tables
- Some Security Issues
- MySQL Error Messages
- The SHOW Statement
- SQL Modes
- The PERROR Utility
- The Log
- The Error Log
- The Slow Query Log

Module 3 : MySQL Architecture

- Client/Server Overview
- Communication Protocols
- The SQL Parser and Storage Engine Tiers
- How MySQL Uses Disk Space and Memory
- Table Properties
- Creating and altering Tables
- Dropping and emptying Tables
- Obtaining Table Metadata
- Column Attributes
- Bit and Numeric Data Types
- Character String Data Types
- Binary String Data Types
- Enum and Set Data Types
- Temporal Data Types
- Auto_Increment
- Handling Missing or Invalid Data Values
- Performance Issues with Character sets

Module 4 : Storage and Locking

- Locking Concepts
- Explicit Table Locking
- Advisory Locking
- Preventing Locking Problems
- Introduction
- The MYISAM Engine
- Locking with MYISAM Tables
- The Merge Engine
- Other Engines: Archive, Memory, Federated, Blackhole, NDBCluster

Module 5 : Table Maintenance

- Features of Innodb
- Transactions
- Referential Integrity
- Physical Characteristics of Innodb Tables
- Tablespace Configuration
- Log File and Buffer Configuration
- Innodb Status
- Table Maintenance Operations
- Check Table
- Repair Table
- Analyze Table
- Optimize Table
- MySQL Check
- MYISAMCHK
- Repairing Innodb Tables
- Enabling MYISAM AutoRepair

Module 6 : Backup and Recovery

- Planning and Implementing a Backup and Recovery Strategy
- Defining a Disaster Recovery Plan
- Testing a Backup and Recovery Plan
- The Advantages and Disadvantages of Different Methods
- Binary Backups of MYISAM Tables
- Binary Backups of Innodb Tables
- Recovery
- Import and Export Operations
- Exporting Using SQL
- Importing Using SQL
- Exporting from the Command Line using mysqldump
- Importing from the Command Line using mysqlimport

Module 7 : Security

- User Accounts
- Creating Users
- Renaming Users
- Changing Passwords
- Dropping Users
- Granting Privileges
- The User Table
- Connection Validation
- Types of Privileges
- Revoking Privileges
- Resource Limits
- The MySQL Database
- The Show Grants Command
- Privileges
- Security Issues
- Operating System Security
- Filesystem Security
- Log Files and Security
- Network Security
- Upgrade-related Security Issues
- Upgrading the Privilege Tables
- Security-Related SQL_Mode Values

Module 8 : Stored Procedures and Triggers

- User Variables
- Prepared Statements
- Types of Stored Routines
- Benefits of Stored Routines
- Stored Routines Features
- Stored Routine Maintenance
- Stored Routine Privileges and Execution
- Security
- DML Triggers
- The Create Trigger Statement
- Managing Triggers

Module 9 : Optimization

- Optimization Overview
- Optimization Process
- Planning a Routine Monitoring Regime
- Setting Suitable Goals
- Identifying Candidates for Query Analysis
- Using Explain to Analyze Queries
- Meaning of Explain Output
- Using Explain Extended
- Indexes for Performance
- Creating and Dropping Indexes
- Obtaining Index Metadata
- Indexing and Joins
- MyIsam Index Caching
- Normalisation
- General Table Optimizations
- MyIsam Specific Optimizations
- Innodb Specific Optimizations
- Other Engine Specific Optimizations
- Measuring Server Load
- System Factors
- Server Parameters
- Query Optimizer Performance
- The Query Cache

Module 10 : Environment Optimization

Choosing the Platform
Hardware Configurations
Disk Issues on Linux
Symbolic Links
Optimizing the Operating System
Exercises: Optimizing the Environment
Event scheduler concepts
Event scheduler configuration
Creating, altering and dropping events
Event scheduler monitoring
Events and privileges

Module 11 : Scaling MYSQL

Partitioned tables concepts
Range partitioning
Hash partitioning
Key partitioning
List partitioning
Composite partitioning or subpartitioning
Maintenance of partitioned tables
Using Multiple Servers
Replication

Module 12 : MySQL Workbench

Installation
Connecting
Server Information
Service Control
User Administration
Privileges
Health
Backup and Restore
Catalogs