



MySQL Administration and Performance Tuning

32 hours

Course Overview:

Naya Academy provides extensive overview about the world's most popular open source database - MySQL RDBMS.

The course will cover the fundamental concepts of MySQL as well as advanced features such as Performance Tuning, High Availability, Replication, Scaling and much more.

The students will acquire a skill set and tools to run, manage, tune and perform basic tasks such as backup and recovery to advanced elements such as identifying and dealing with bottlenecks.

This course combines a strong and up to date theory knowledge over MySQL RDBMS as well as practical demonstrations and examples from real-world use cases.

Course Objectives

- Understand MySQL Architecture
- Understand The Use Of Storage Engines
- Configure Network And Security Elements
- Learn MySQL Management Concepts Regarding Users / System Variables
- Learn Configuration File Best Practices (my.cnf)
- Learn MySQL Administration Using MySQL Built-In Tools
- Understand MySQL Locks Mechanism
- Perform Backup And Restore Operations
- Creating and Managing Master-Slave Replication Environment
- Improve And Optimize database performance And Enhance Reliability
- Perform Installations And Upgrades Tasks Step By Step
- Practicing In MySQL Development Using SQL Code, Procedures, Built-In and User Defined Functions And Events (Optional)

Who Should Attend:

DevOps, Database Administrators, System Administrators, Web Application Developers, Architecture Designers

Required Skills:

- Linux Basic Knowledge
- ANSI SQL Basic Knowledge
- RDBMS Basic Understanding



Course Contents:

General Overview and Basic Elements

History and Introduction

- Overview
- Real Examples and Use Cases of Customers Using MySQL Database

Architecture Overview

- Sever
- Client

Storage Engines

- Engines Types
- Engines Characteristics
- InnoDB and MyISAM Extensive Overview

Networking and Security

- Operating System
- File System Security
- Network Security

MySQL with Linux Overview

- Basic Commands

Installation (Linux Only)

- Linux RPM Installation
- Linux Binary Installation
- Source Installation

Users Management

- User Account Management
- User Privileges
- Administrative Privileges
- Database Access Privileges

Database Management / Tables Maintenance / Backup & Recovery / High Availability Solutions

Database Management

- System Variables
- Altering Database Variables at Session / Global Level

Configuration File Best Practices (my.cnf)

- InnoDB Memory Buffers
- Log file size and log buffer
- Memory Consumption
- Memory Limitations

Using MySQL Built-In Tools

- MySQLAdmin
- MySQLBinlog



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- MySQLDump
- MySQLImport

Table Maintenance

- Analyze Table
- Check Table
- Checksum Table
- Optimize Table
- Repair Table
- Moving Tables between Schemas / Servers / Tablespaces

Locking in MySQL

- MySQL Locking Overview
- Table Level Locking
- Row Level Locking
- Internal / External Locking
- Dead Locks

Backup and Recovery

- MySQL Backup
- MySQL Backup Types
- MySQL Backup and Recovery Tools
- Load data infile & select into outfile

Basic Replication

- Replication Architecture
- Replication Basics
- Replication Types
- Master-Slave Replication Setup
- Master-Slave Replication Filters

MariaDB and Galera Replication Architecture

- Master-Master Replication

Upgrading

- Pre Upgrade Steps
- Upgrade Steps and Check List
- Post Upgrade Commands

Database Monitoring / Performance Tuning Overview and Workshop

Monitoring Database Activity

- Working with Information Schema and Performance Schema

Various Logs in MySQL

- Error Log
- Query Log
- Slow Query Log
- Binary Log

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הנדיב 71, הרצליה | טלפון: 0732865544 | פקס: 0732865417 | www.naya-college.co.il



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- Relay Log
- General Query Log

Identifying Slow Queries

- Slow-Query-Log
- ProcessList
- InnoDB_TRX
- Using Show Warnings

Optimizing Queries

- Explaining the EXPLAIN
- Server Variables Check

Development

- Basic MySQL Queries
- Join / Sub-Query / Union
- Build-In Functions
- User Defined Functions
- Procedures