

MYSQL

MYSQL

- Open Source Enterprise DBMS
- Hugely popular
- Features:
 - Runs on Windows, Mac OS, Linux, Solaris, FreeBSD
 - Client/server architecture
 - Concurrent, multiuser access

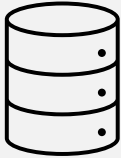
MYSQL INSTALLATION OPTIONS

- Install MySQL on your laptop
- Install Docker on your laptop and run MySQL in a container
- Setup MySQL in the cloud

DATABASE ARCHITECTURE

DIRECT FILE ACCESS

Client Program



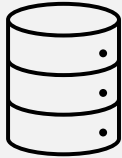
Database File

CLIENT/SERVER

Client Program



Database Server Process



Database File

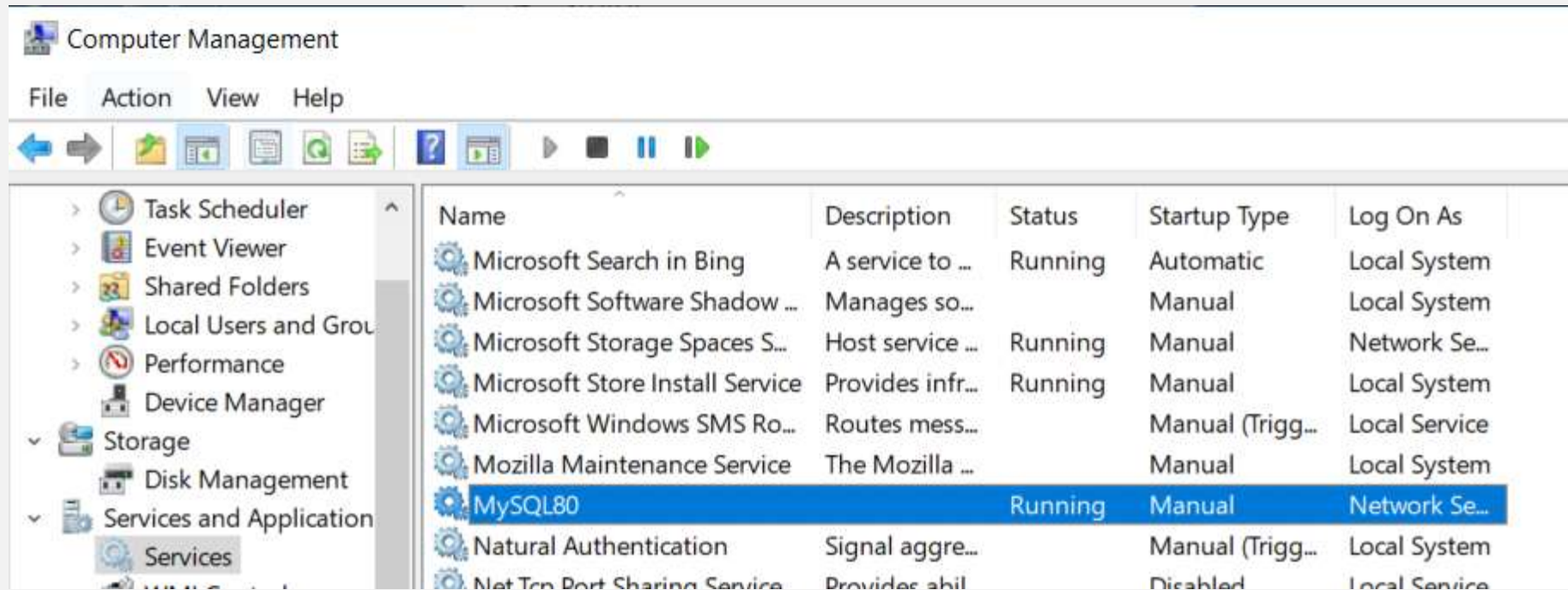
MYSQL ARCHITECTURE

- Server listens on configured TCP/IP port and processes SQL requests from clients
 - Manages a collection of databases
- Windows: Runs as Windows Service
 - Use standard Windows administration tools to start/stop MySQL server
- Linux: Runs as a background daemon

ADMINISTRATION TOOLS

- Command Line:
 - Windows: mysql.exe
 - Linux: mysql command line utility
- GUI:
 - MySQL Workbench
- Understand the difference between these administration tools and MySQL service

MYSQL WINDOWS SERVICE



The screenshot shows the Windows 'Computer Management' console. The left-hand navigation pane is expanded to 'Services and Applications' > 'Services'. The main pane displays a list of system services. The 'MySQL80' service is highlighted in blue, indicating it is selected. The service is currently in a 'Running' state with a 'Manual' startup type and is configured to run as a 'Network Service'.

Name	Description	Status	Startup Type	Log On As
Microsoft Search in Bing	A service to ...	Running	Automatic	Local System
Microsoft Software Shadow ...	Manages so...		Manual	Local System
Microsoft Storage Spaces S...	Host service ...	Running	Manual	Network Se...
Microsoft Store Install Service	Provides infr...	Running	Manual	Local System
Microsoft Windows SMS Ro...	Routes mess...		Manual (Trigg...	Local Service
Mozilla Maintenance Service	The Mozilla ...		Manual	Local System
MySQL80		Running	Manual	Network Se...
Natural Authentication	Signal aggre...		Manual (Trigg...	Local System
Net Top Port Sharing Service	Provides abil		Disabled	Local Service

COMMAND LINE MYSQL

COMMAND LINE TOOLS

- Windows has two shells
 - Powershell
 - Command shell (cmd)
- We'll use command shell
 - Works better with MySQL

CONFIGURE PATH

- We'll use two command line programs to work with MySQL:
 - mysql
 - mysqldump
- These commands aren't immediately available for use
- Configure PATH environment variable so you can use these commands

MYSQL COMMAND LINE CLIENT

- Usage (Linux and Windows):
 - `mysql -u root -p`
 - `-u` is the username (should be **root**)
 - `-p` prompts for the password (the password you configured when installing MySQL)
- Example:
 - `mysql -u root -p`

TROUBLESHOOTING

- 'mysql' is not recognized as an internal or external command, operable program or batch file.
 - Solution: Setup PATH environment variable
- ERROR 2003 (HY000): Can't connect to MySQL server on 'localhost:3306' (10061)
 - Solution: Start MySQL Service
- ERROR 1045 (28000): Access denied for user 'root'@'localhost' (using password: YES)
 - Solution: Type correct password

SAVE YOUR PASSWORD

- Use **mysql_config_editor** command to store your MySQL username and password
 - Example: `mysql_config_editor set --user=root --password`
- Now you can run `mysql` without any options, like this:
 - `mysql`

MYSQL DATABASES

- From mysql command line:
 - SHOW DATABASES;
- To create an empty database:
 - CREATE DATABASE *databasename*;
- To work with a database, first execute the USE command:
 - USE *databasename*;
 - All SQL commands executed in the query session now refer to the specified database
- To discover tables in currently selected database from command line:
 - SHOW TABLES;

IMPORTING DATA

To import an entire database:

1. Create an empty database (ex. univdb)
2. Use mysql command to execute the exported SQL script to populate the database

Example: `mysql univdb < univdb.sql`

EXPORTING DATA

- Use **mysqldump** command to export a database to a SQL script
- At Windows command prompt (NOT mysql command prompt):
 - cd Documents
 - `mysqldump univdb > univdb.sql`
Exports entire database

IMPORTING AND EXPORTING TABLES

- MySQL can import and export individual tables
- Command:
 - `cd Documents`
 - `mysqldump univdb faculty > faculty.sql`
Exports faculty table from univdb database
 - `mysql univdb < faculty.sql`
Imports faculty table into univdb

USING MYSQL WORKBENCH

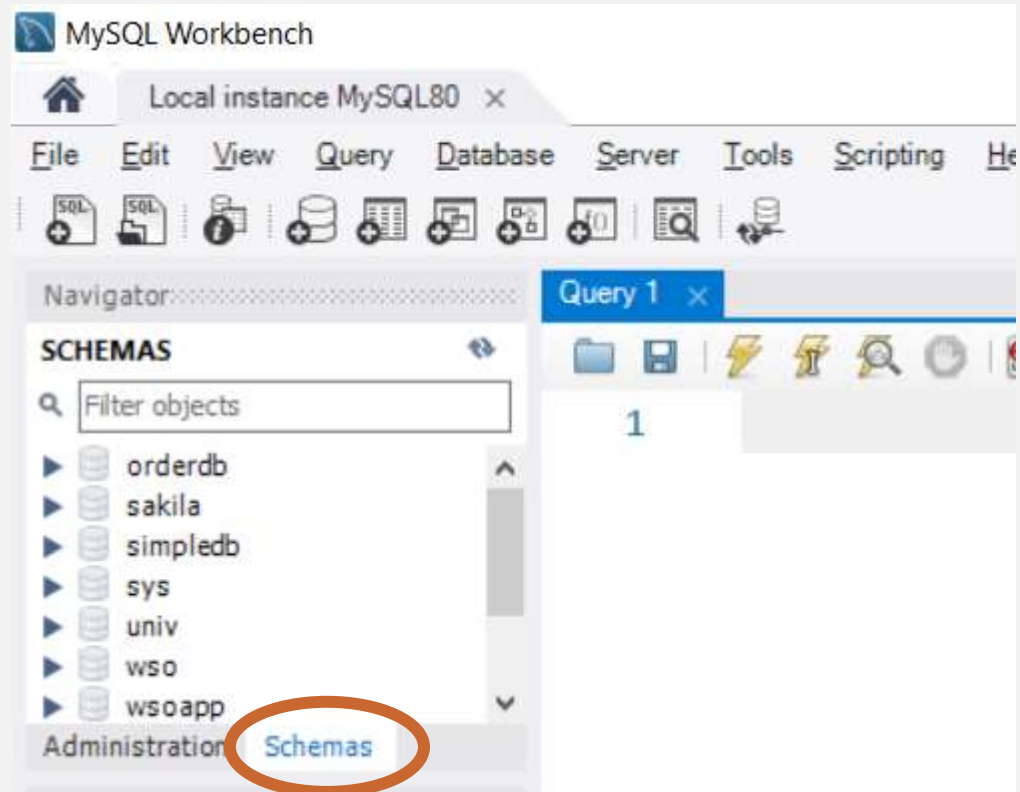
MYSQL WORKBENCH

- Connect to MySQL Server
- View databases
- Modify data
- Create a new database
- Execute queries and scripts
- Export and Import databases and tables

CONNECT TO MYSQL SERVER

VIEW DATABASES

- Select the Schemas tab to view databases



MODIFY DATA

CREATE A NEW DATABASE

EXECUTE QUERIES AND SCRIPTS

EXPORT AND IMPORT DATABASES