



WEB APPLICATION ENGINEERING II

Lecture #7

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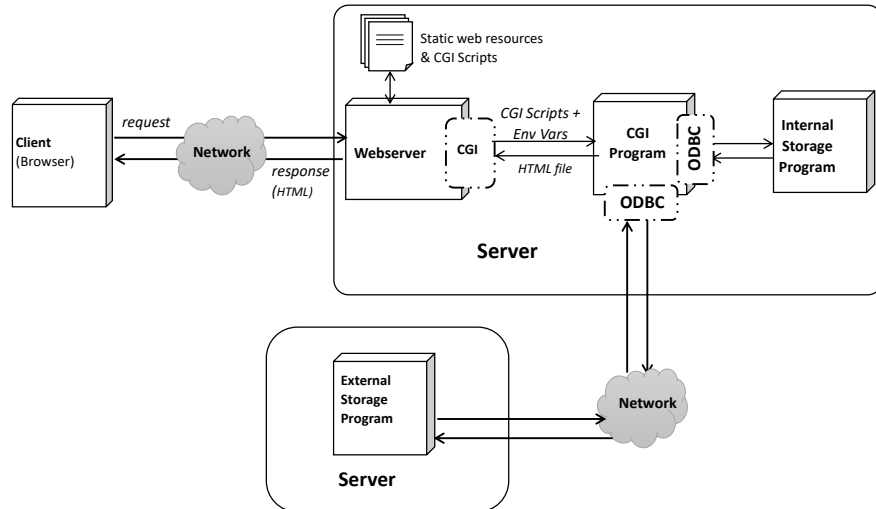
Objectives

- Gain knowledge on how to interact with database using PHP.



Persisting and Retrieving Data

- Recall:



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Persisting and Retrieving Data

- To persist and retrieve data from databases, CGI programs interact with storage engines
- Standard interface for interaction is the Open Database Connectivity (ODBC)
- Available as extensions to CGI programs like PHP
- Such extensions exposes several classes and methods that allow web developers perform traditional database queries.

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MySQL Database Server

- In this course, our choice of storage engine is MySQL
 - It is Free
 - Integrates will with PHP and Apache
 - It is part of the software suite in XAMPP and WAMP
 - Runs on many platform
 - Rich documentation
 - Supports SQL standard



Review of SQL

- SQL stands for Structured Query Language.
- Most RDBMS understands SQL.
- SQL can be used to perform CRUD operations on databases
- SQL statements can be categorised as follows:
 - DDL- Data Definition Language
 - DML – Data Manipulation Language
 - DCL – Data Control Language



DDL

- These statements are mostly used to manage databases and its entities (tables, views, indexes..)
- CREATE, ALTER, TRUNCATE, DROP and RENAME statements belong to this category.

```
CREATE TABLE users (
    userid int(10) unsigned NOT NULL,
    username varchar(20) NOT NULL AUTO_INCREMENT,
    upassword varchar(40) NOT NULL,
    fullname varchar(80) NOT NULL,
    email varchar(40) NOT NULL,
    Status enum('active','inactive') NOT NULL
) ENGINE=InnoDB DEFAULT CHARSET=latin1;
```



DML

- These statements are used to perform CRUD operations on data and records.
- INSERT, UPDATE, DELETE, REPLACE and MERGE statements fall into this category.

```
INSERT INTO users
(username, upassword, fullname, email, status)
VALUES
('umari', SHA1('mypassword'), 'Ibrahim Umar', 'contactenesi@gmail.com',
'active');
```



DCL

- These statement are used to manage aspects of database relating to security.
- GRANT and REVOKE are the two main statements that belong to this category.

```
GRANT SELECT, UPDATE ON users TO root;
```



PHP MySQL Database Extensions

- There are three main database extensions that enables interaction with MySQL database server.
 - mysql Extension (deprecated)
 - mysqli Extension
 - PHP Data Objects (PDO)
- mysqli extension provides both procedural and object-oriented interface
- PDO provides only object-oriented interface.
- Lets concentrate on the procedural approach of mysqli extension.



Connecting to MySQL Database

- **Basic Syntax:**

```
mysqli_connect(host, user, password, database)
```

e.g.

```
$conn = mysqli_connect("localhost", "root", "", "test")
```



Executing SQL Statements

- **Basic Syntax:**

```
mysqli_query(conn, sqlquery)
```

The return value of this function is:

- A `mysqli_result` object if `sqlquery` is a `SELECT`, `EXPLAIN`, `SHOW` OR `DESCRIBE` query
- Boolean otherwise.



Note on `mysqli_result` Object

- `mysqli_result` object implements Traversable interface of SPL.
- Traversable objects can be traversed using `foreach` loop
- In addition, `mysqli_result` contains various useful methods.

Querying `mysqli_result`



`mysqli` provides several methods for querying `mysqli_result`.

- `mysqli_fetch_row()` –fetch a record as an indexed array from `mysqli_result` object.
- `mysqli_fetch_assoc()` –fetch a record as an associative array from `mysqli_result` object.
- `mysqli_fetch_array()` –fetch a record from `mysqli_result` object.
- `mysqli_fetch_all()` –fetch all records from a `mysqli_result` object



Querying `mysqli_result` (cont.)

- `mysqli_free_result()` – eliminates `mysqli_result` object.
- `mysqli_num_rows()` – returns number of rows in `mysqli_result` object.
- `mysqli_escape_string()` – escape characters that have special meaning in MySQL.
- `mysqli_multi_query()` – executes one or more queries separated by semi-colon.
- `mysqli_store_result()` – returns a `mysqli_result` object for last query.
- `mysqli_more_result()` – checks if there are more results to be returned from a multi-query
- `mysqli_next_result()` – prepares next result from a multi-query.

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Closing Connection

- By default, non persistent MySQL connection is automatically destroyed when PHP script finishes execution.
- But connections can be (and should be) closed explicitly:

```
mysqli_close($conn)
```

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Key Point

- The feature that enable PHP interact with databases is provided by PHP extensions.
- PHP supports a wide range of vendor specific database drivers.
- The most common PHP extensions for interacting with MySQL RDBMS are mysqli and PDO.
- PDO provides only object-oriented API for interacting with Database.
- It is a good practice to free all database resources when it is no longer needed.



Reference

- PHP Documentation Manual
- Murach PHP and MySQL
- <http://www.sqlcourse.com/intro.html>
- <http://www.sanwebe.com/2013/03/basic-php-mysqli-usage>