Tutorial 1

DBMS's Application

COMP3278C
Introduction to Database Management Systems
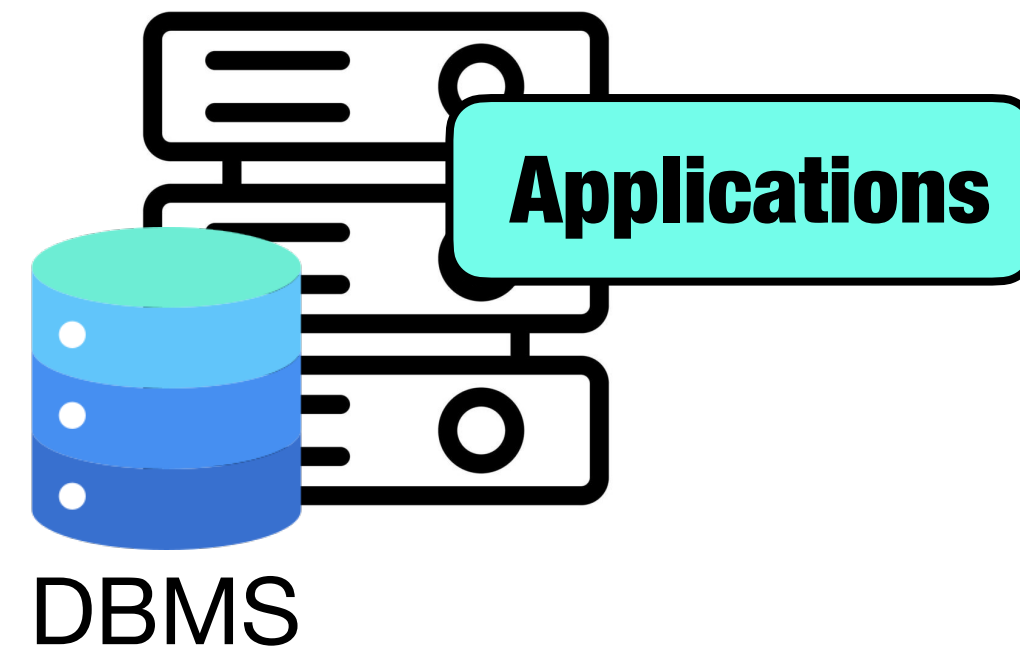
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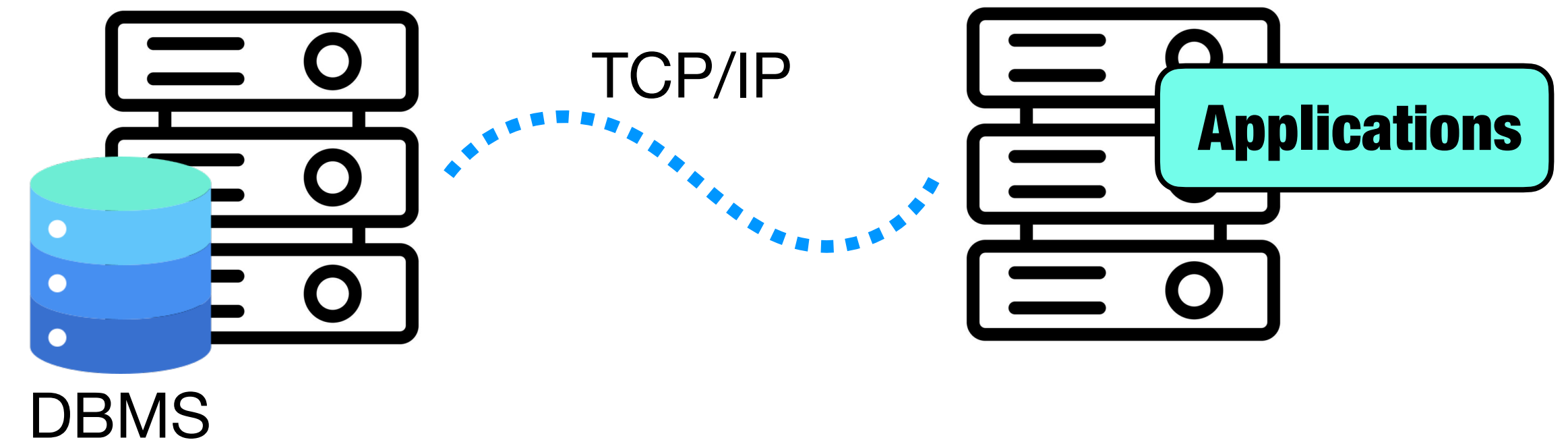School of Computing & Data Science, The University of Hong Kong

1. Local Connection

DBMS / Applications

Examples:

- Local development and testing
- Data scientist
- Mobile app
- Offline data storage
- Embedded device

2. Network Connection

DBMS — TCP/IP — Applications

Examples:

- Web application
- Mobile app
- DBMS Remote management
- Cloud service
- Distributed system

1. Shell

mysql -u *username* -p *my_database*

mysql -h *IP_address* -P *port* -u *username* -p *my_database*

e.g., mysql -h sophia -u chenyi1 -p

2. Python

```python
import mysql.connector

# Connect to MySQL database
conn = mysql.connector.connect(
    host="localhost",       # Database server address (local or remote)
    user="your_username",  # MySQL username
    password="your_password",  # MySQL password
    database="your_database"  # Database name
)

# Create a cursor object
cursor = conn.cursor()

# Execute a SELECT query
query = "SELECT * FROM employees;"  # Query to fetch all data from the employees table
cursor.execute(query)

# Fetch all results
rows = cursor.fetchall()

# Iterate and print query results
for row in rows:
    print(row)

# Close the cursor and database connection
cursor.close()
conn.close()
```

3. C

```c
#include <mysql/mysql.h>  // Include MySQL C API header
#include <stdio.h>

int main() {
    // Declare MySQL connection and result variables
    MYSQL *conn;
    MYSQL_RES *res;
    MYSQL_ROW row;

    // Database connection details
    const char *server = "localhost";  // Change to remote IP if needed
    const char *user = "your_username";
    const char *password = "your_password";
    const char *database = "your_database";

    // Initialize MySQL
    conn = mysql_init(NULL);

    // Connect to MySQL server
    mysql_real_connect(conn, server, user, password, database, 0, NULL, 0);

    // Execute a SELECT query
    mysql_query(conn, "SELECT id, name FROM employees");

    // Store and fetch result
    res = mysql_store_result(conn);

    // Print result
    while ((row = mysql_fetch_row(res))) {
        printf("ID: %s, Name: %s\n", row[0], row[1]);
    }

    // Clean up
    mysql_free_result(res);
    mysql_close(conn);
    return 0;
}
```

2. Php

```php
<?php
// Database connection details
$servername = "localhost";   // Change to remote IP if needed
$username = "your_username";
$password = "your_password";
$dbname = "your_database";

// Connect to MySQL database
$conn = mysqli_connect($servername, $username, $password, $dbname);

// Check connection
if (!$conn) {
    die("Connection failed: " . mysqli_connect_error());
}

// Execute SELECT query
$sql = "SELECT id, name FROM employees";
$result = mysqli_query($conn, $sql);

// Fetch and display results
while ($row = mysqli_fetch_assoc($result)) {
    echo "ID: " . $row["id"] . " – Name: " . $row["name"] . "<br>";
}

// Close connection
mysqli_close($conn);
?>
```

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END

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