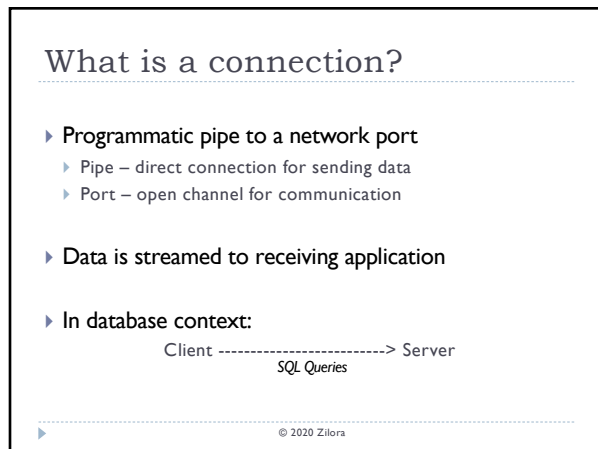
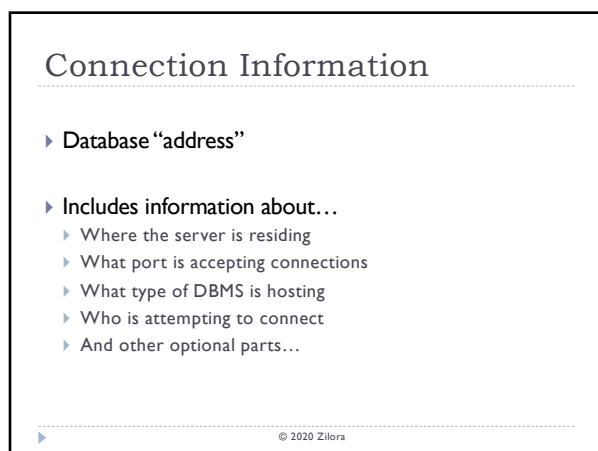


1



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Addressing the Database

- ▶ Four basic methodologies
 - ▶ Data Source Name (DSN)
 - ▶ Connection String containing tokens and values
 - ▶ Uniform Resource Identifier
 - ▶ Connection functions

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Addressing the Database

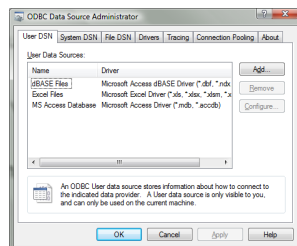
- ▶ Four basic methodologies
 - ▶ Data Source Name (DSN)
 - ▶ Connection String containing tokens and values
 - ▶ Uniform Resource Identifier
 - ▶ Connection functions

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Data Source Name (DSN)

- ▶ A (usually) local name or alias
- ▶ Varyingly scoped
- ▶ Essentially a properties file.
- ▶ Used with ODBC



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Addressing the Database

- ▶ Four basic methodologies
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Connection String Example C# .NET

```
String dsnString =
    "Provider=OraOLEDB.oracle; Data Source=
    myOracledb; User Id=myUsername; Password=
    myPassword;";
```

```
OleDbConnection conn =
    new OleDbConnection(dsnString);
```

```
conn.Open();
```

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Addressing the Database

- ▶ Four basic methodologies
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Uniform Resource Identifier (URI)

- ▶ Similar to a URL on the web
- ▶ More easily manageable than a long DSN
- ▶ When portions not specified, defaults used
- ▶ Example:
jdbc:mysql:username/password@//yourdbserverhere/
yourdbnamehere

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URI Example - JDBC

```
String oracleDriver = "oracle.jdbc.OracleDriver";

// driver type can be one of: thin, oci, kprb
String oracleURI =
    "jdbc:oracle:<drivertype>:<username/password>@<database>";

Class.forName(oracleDriver);

Connection conn = DriverManager.getConnection(oracleURI);
```

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Addressing the Database

- ▶ Four basic methodologies
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 - ▶ Connection String containing tokens and values
 - ▶ Uniform Resource Identifier
 - ▶ Connection functions

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Connection Functions

- ▶ Some abstractions provide connection functions
- ▶ Arguments for each part of URI
- ▶ PHP:
dbObj.connect(server, dbname, username, password)



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And the Result...

- ▶ Connection objects
 - ▶ Maintain "handle" to database connection
 - ▶ Usually contain useful properties about connection
 - ▶ Database address
 - ▶ Authenticated user
 - ▶ Name
 - ▶ And provide facility for querying database



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Remember...

- ▶ Need a "handle" to the database
 - ▶ Similar to a file handle
 - ▶ Referred to as a "connection"
- ▶ Connection needs to be
 - ▶ Created (Instantiated)
 - ▶ Opened
 - ▶ Worked with
 - ▶ Closed



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Remember...



- ▶ $n \text{ languages} * m \text{ methods} * q \text{ DBMS's} \Rightarrow \text{lots of possibilities}$
 - ▶ Focus on abstract methods
 - ▶ Use connection strings

www.connectionstrings.com (now only .NET)

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Examples

- ▶ Java
- ▶ C#
- ▶ PHP

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Java

- ▶ **Download driver**
 - ▶ <http://www.devx.com/tips/Tip/28818> - list of drivers only, no downloads
- MySQL DB = mysql-connector-java-5.1.36-bin.jar (number will change)
- Oracle DB = ojdbc7.jar (number will change)
- ▶ Add to classpath
- ▶ **Import appropriate libraries**
 - ▶ java.sql.*
- ▶ **Load driver (optional, but very helpful for debugging)**
 - ▶ Class.forName(driver)
 - ▶ Throws ClassNotFoundException
- ▶ **Get connection**
 - ▶ Connection conn = DriverManager.getConnection(url, userId, password)
 - ▶ Throws SQLException

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C# (Native) for MySQL DB

- ▶ Download driver from provider
 - ▶ Add to References
- ▶ Add Namespace
 - ▶ using MySql.Data.MySqlClient;
- ▶ Create connection
 - ▶ connString = "Server=w;Database=x;Uid=y;Pwd=z";
 - ▶ MySqlConnection conn = new MySqlConnection(connString);
 - ▶ See www.connectionstrings.com for help
- ▶ Open connection
 - ▶ conn.open();

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C# (SQL Server)

- ▶ Download driver from provider
 - ▶ Add to References
- ▶ Add namespace
 - ▶ Using System.Data.OleDb;
- ▶ Create connection
 - ▶ String ConnString = "Provider=w; Data Source=x; User id=y; Password=z";
 - ▶ OleDbConnection Conn = new OleDbConnection(ConnString);
 - ▶ See www.connectionstrings.com for help
- ▶ Open connection
 - ▶ Conn.Open();

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PHP (Native)

- ▶ Configure server
 - ▶ In PHP.ini, enable php_mysqli.dll
 - ▶ Add libmysql.dll to the PATH environment variable
- ▶ Create connection
 - ▶ \$conn = mysqli_connect(\$dbhost, \$dbuser, \$dbpass) or die ('Error connecting to mysql');

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PHP (PDO)

▶ Create connection string

▶ MySQL example:

```
$connStr = "mysql:host=localhost:3306;dbname=myDb"
```

▶ Create connection

```
$dbConn = new PDO($connStr, $userId, $pswd) or die  
('Error connecting to database');
```



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