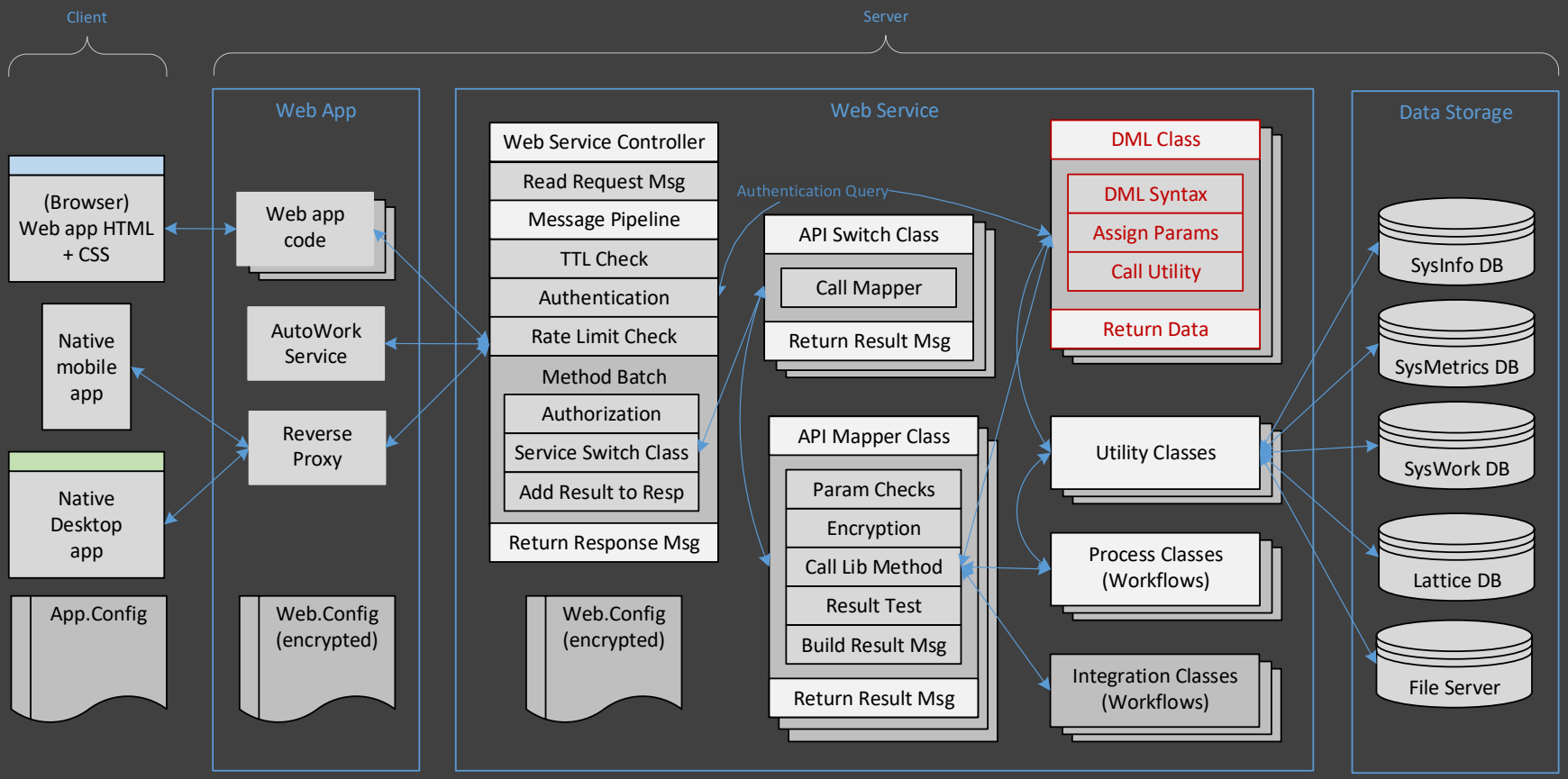

There are 3 types of data classes: 1) Schemaname_ddl classes, 2) Schemaname_data classes, and 3) Schemaname_dml classes.

The DDL and data classes are used by the DB Setup application to maintain the schemas and core data, while the DML classes contain the SQL syntax used by the web service API's.

The DML classes are “builders” used to correctly configure a SqlCommand object, which is then passed into a utility method to be executed. Some of the logic needed to enforce the immutable append-only patterns are built into the SQL syntax of the DML classes, and the rest of the logic is implemented in the utility methods that execute the SqlCommand objects.

One important rule is that the SQL syntax is immutable with respect to user input. In other words, all SQL syntax is parameterized to ensure that the system is immune to SQL-injection attacks, and user input can only be assigned as the value of a parameter. The DML methods are the other location where optional parameters and default values can be managed in the system.

The methods of the DML classes are basically similar to stored procedures, with a twist. The SQL syntax can be customized based on state value input parameters within the C# code in ways that would be very difficult to implement using T-SQL. Also, it is much easier to maintain, test and deploy the SQL syntax when it is embedded in the middle tier compared to using stored procedures.

However, DGP is able to use stored procedures in a way that is almost identical to the current DML methods. The difference is that the SQL syntax would be contained in the stored procedures, the SqlCommand parameters and assignment of input values would be the same, and the SqlCommand object would be configured to call a stored procedure instead of executing dynamic DML.

All SQL syntax is developed and tested in SSMS before it is embedded within the C# code of a DML method. In the same way, SSMS is used to analyze the execution plans and optimize the SQL syntax accordingly. The obvious focus is on the Select queries, but the Insert, Update and Delete SQL syntax also contains queries checking for duplicates, and those need to be optimized as well.