

Module 3:

Table-Valued Parameters (TVPs)

Introducing Table-Valued Parameters

- **Process a set of rows as a single entity**
 - Select or join against a TVP
 - Similar to temp tables, table variables, and CTEs
- **Populate a TVP, and then pass it around**
 - It's a *single* parameter
 - Pass from procedure to procedure on the server
 - Pass from client to server across the network
- **Based on User-Defined Table Types**
 - Defines the schema, just like an ordinary table
 - Simply declare a variable as the type to get a TVP
- **Stored in tempdb**
 - Created and destroyed automatically behind the scenes
 - Can be indexed

Creating a User-Defined Table Type

```
CREATE TYPE CustomerUdt AS TABLE  
    (Id int,  
     CustomerName nvarchar(50),  
     PostalCode nvarchar(50))
```

```
DECLARE @BestCustomers AS CustomerUdt
```

Demo

- Getting Started with TVPs

Passing TVPs Using ADO.NET

- **Marshal multiple rows of data from your client application to SQL Server**
 - All in a single round-trip
 - No custom client or server -side logic required
 - Use ordinary ADO.NET
- **Mark the ADO.NET parameter as a TVP**
 - Just set the SqlParameter object's SqlDbType property to *SqlDbType.Structured*
 - Also set the type name to the user-defined table type in SQL Server, if invoking a parameterized T-SQL statement
- **Pass any sequence of rows**
 - Generic DataTable
 - Strongly-typed DataTable
 - Any DbDataReader (SqlDataReader, OracleDataReader, etc.)
 - Any IEnumerable<SqlDataRecord> object

Demo

- Passing TVPs from ADO.NET

Demo

- **Passing TVPs from collections of business objects**

Demo

- Using TVPs for Bulk Operations

TVP Limitations

- **TVPs are read-only, once populated and passed**
 - You must apply the READONLY keyword when declaring TVPs in stored procedure signatures
 - OUTPUT keyword cannot be used
 - You cannot update, insert or delete
- **No ALTER TABLE...AS TYPE statement**
 - To change the schema, it must be dropped and re-created
 - All dependent objects must also be dropped and re-created
- **Statistics are not maintained on TVPs**