

T-SQL & CLR

Integrating the .NET Framework into SQL Server



Overview

- .NET extends functionality of SQL Server
- Visual Studio integration
- Security, reliability, scalability ~ T-SQL
- Extensions to SQL Server
 - user defined functions

T-SQL calls .NET methods

- .NET language of your choice
 - some restrictions
- Supports subset of .NET framework

```
-- T-SQL
SELECT @mm = dbo.InToMillimeter(@inches);

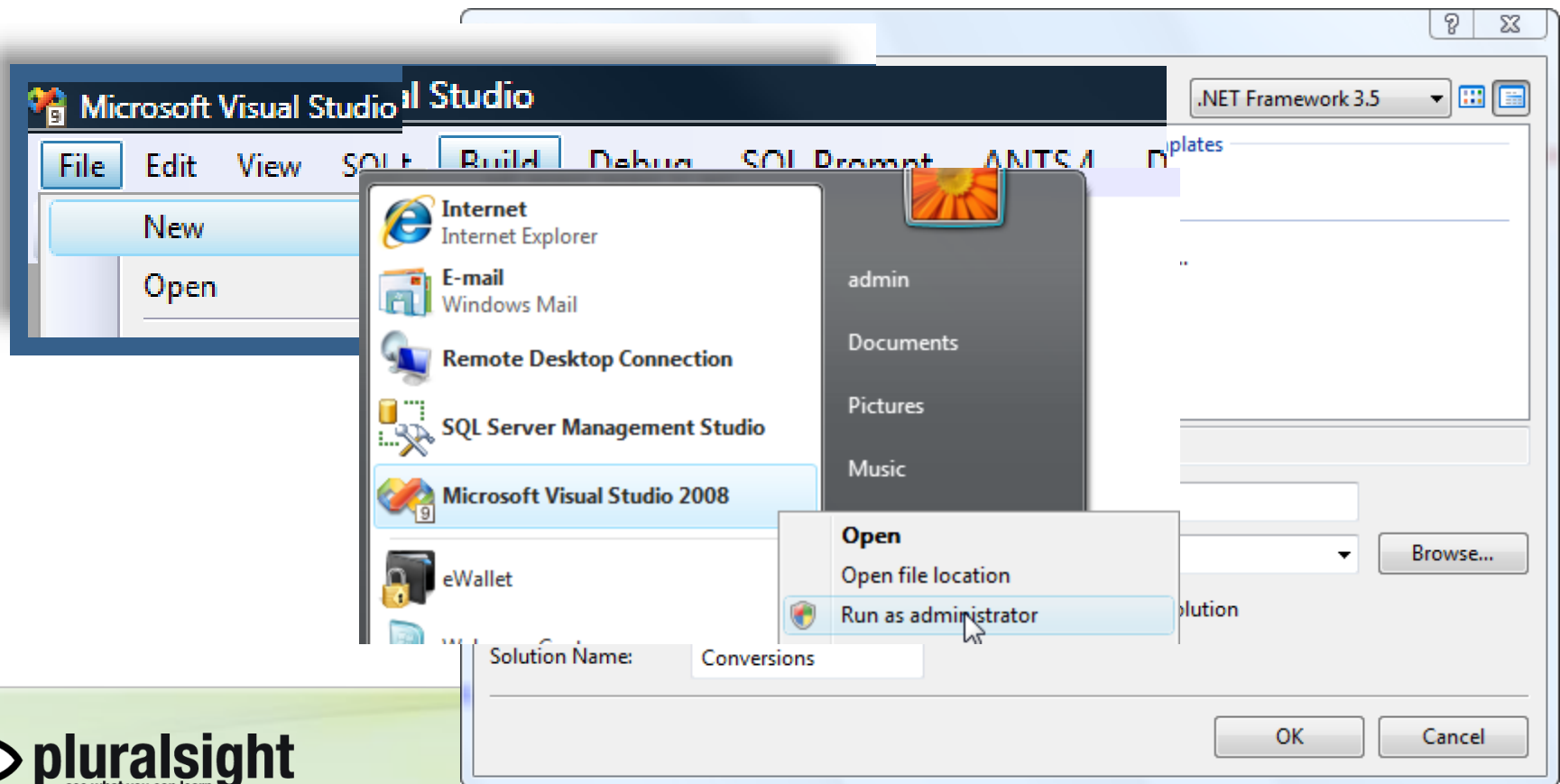
// c#
[SqlFunction]
public static float InToMillimeter(float inches)
{}
```

Why?

- Access system resources
- Shared code base
- Expertise
- Performance *maybe!*

Visual Studio SQL Server Projects

- Language specific
- Manages assembly build and deployment
- Debugging environment

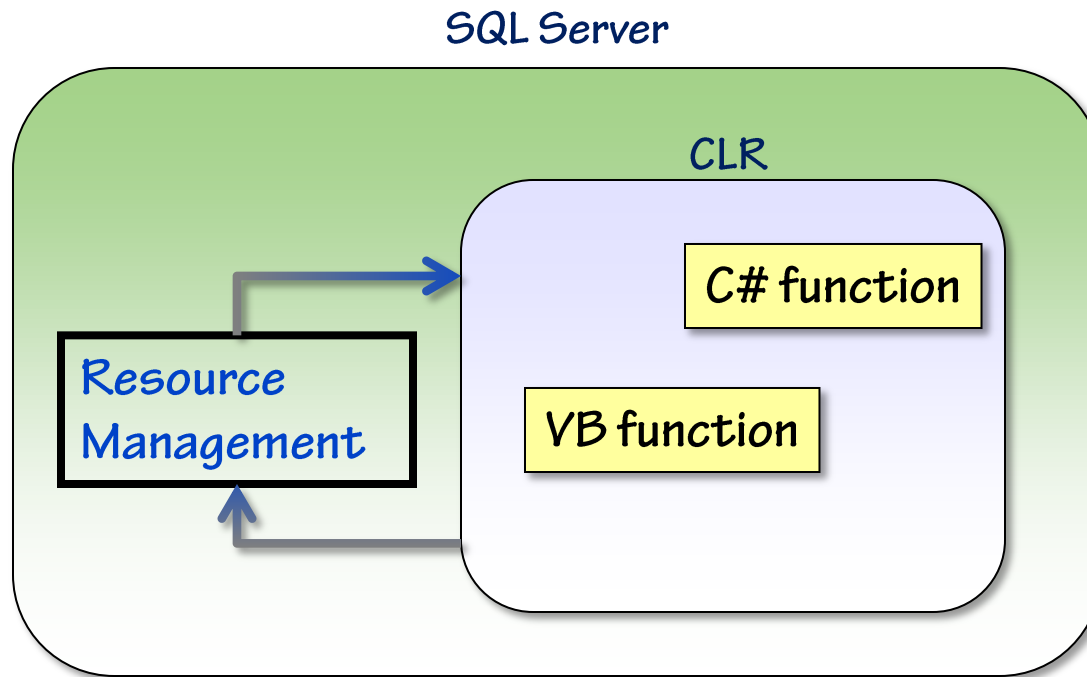


Assembly Permission

- Safe ~~Grant~~ ~~Application~~ ~~CREATE ASSEMBLY~~
- External ~~File~~ ~~Network~~ ~~EXTERNAL ACCESS ASSEMBLY~~
- Unsafe ~~Katya~~ ~~bar~~ ~~the~~ ~~door~~

CLR in a Box

- Restrictions insure **Security**, **Reliability**, and **Scalability**
 - dba can lift restrictions *at great peril!*

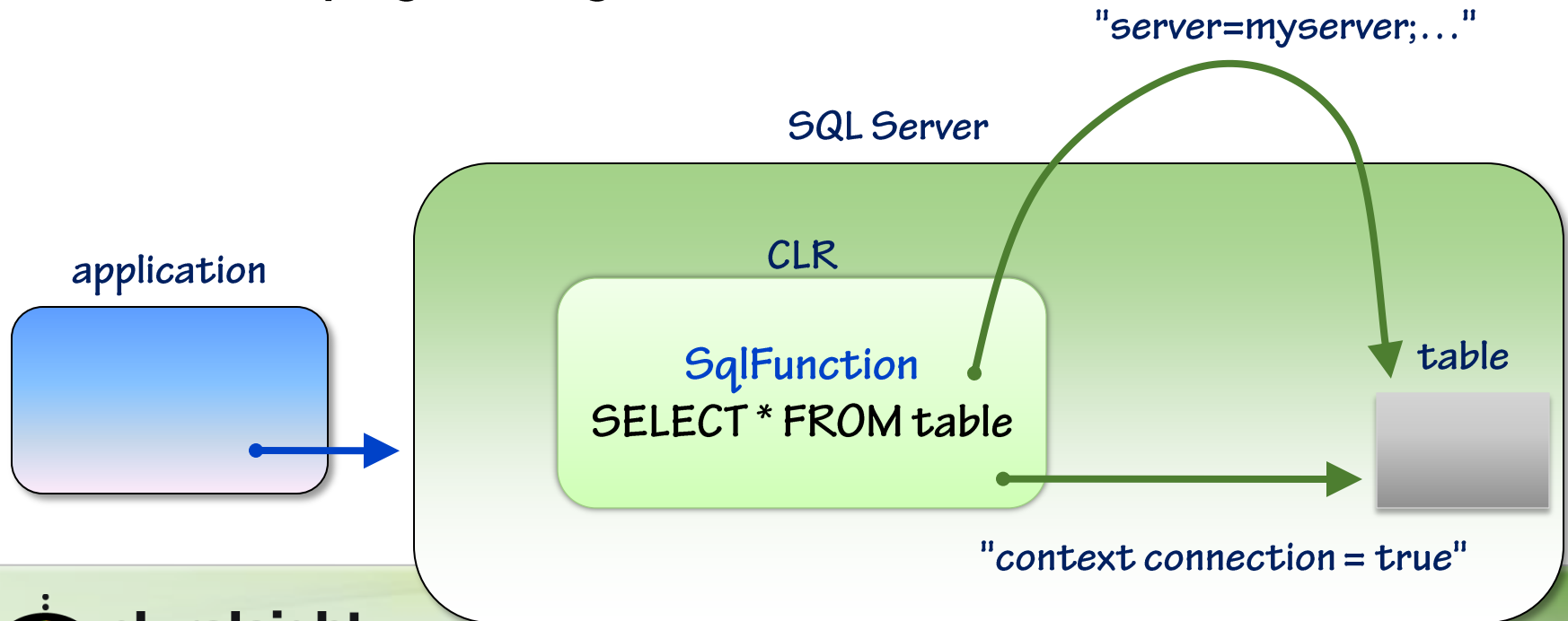


SqlFunction (scalar)

- **Name**
 - deployed name
- **IsDeterministic**
 - consistent input -> return
- **IsPrecise**
 - no floating point

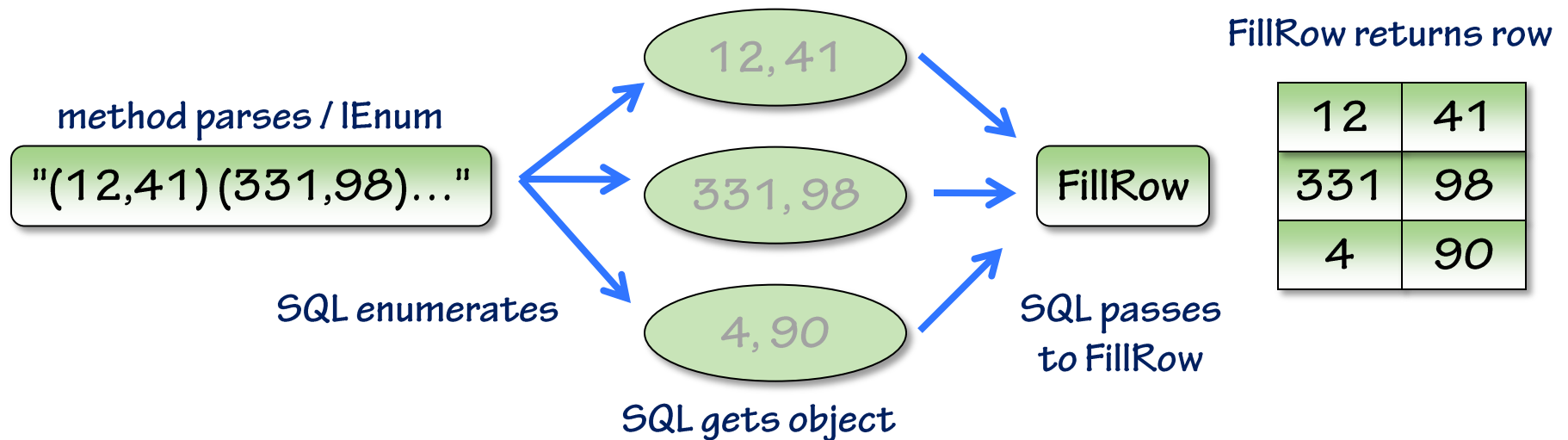
SqlFunction (data access)

- **DataAccess = read**
 - user tables
- **SystemDataAccess = read**
 - system tables
- **ADO.NET programming model**



SqlFunction (table valued)

- **TableDefinition**
 - returns table *just like T-SQL*
- **Method return enums objects**
- **FillRowMethodName**
 - produces row from object



Summary

- **SQL Server Extensions**
 - Assembly + Functions
- **User Defined Functions**
 - public static method in public class
 - SqlFunction attribute
- **Implementation information**
 - SqlFunction properties
- **ADO.NET model for database access**
- **Table valued functions return enumerator**

References

- **Extras**

- <http://pluralsight-free.s3.amazonaws.com/dan-sullivan/SQLCourseExtras/CLR1.zip>

- **Katy**

- http://en.wikipedia.org/wiki/Catherine_Douglas

- **Process Explorer**

- <http://technet.microsoft.com/en-us/sysinternals/bb896653.aspx>

- **.NET Reflector**

- <http://www.red-gate.com/products/reflector/index.htm>

- **Gort**

- [http://en.wikipedia.org/wiki/Gort \(The Day the Earth Stood Still\)](http://en.wikipedia.org/wiki/Gort_(The_Day_the_Earth_Stand_Still))