Microsoft SQL Server 2005

# Editing Transact-SQL Code in SQL Server 2005

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Microsoft SQL Server
SQL Server 2005
SQL Server 2005 Management Studio
Transact-SQL (T-SQL) code

**Summary:** Get an overview of the Transact-SQL development tools available in Microsoft SQL Server 2005 Management Studio.

# Copyright

# Table of Contents

# Introduction

Management Studio is the primary tool for developing Transact-SQL queries in Microsoft® SQL Server™ 2005. This white paper will introduce you to Management Studio Transact-SQL editing facilities, highlighting some of its more interesting and compelling new features for Transact-SQL development. You'll also learn how Management Studio differs from, and improves on, SQL Server 2000 Query Analyzer. You should be familiar with how to start and operate SQL Server 2005 Management Studio, how to connect to a SQL Server 2005 instance, and how manipulate the various windows in Management Studio.

> **Note** All references to Query Analyzer are to the version that comes with SQL Server 2000 SP3.

# General Features of Query Editing in Management Studio

Management Studio integrates query editing across all SQL Server database products. When you start a new query from the **New Query** toolbar button or by selecting **New Query** from the **File** menu, and you will immediately notice that you can create and edit queries for SQL Server, Analysis Services, and SQL Server 2005 Mobile Edition. When you work with SQL Server queries, Management Studio invokes the Transact-SQL code editor. When you work with Analysis Server queries, Management Studio invokes the MDX, DMX, and XMLA editors, and when you work with SQL Server Mobile queries, it invokes a special code editor which covers the mobile subset of the Transact-SQL language. The focus of this paper will be on using Management Studio to edit Transact-SQL queries.

Before focusing in on Transact-SQL queries, it's useful to draw attention to some general features of Management Studio that stand out in contrast to Query Analyzer. One of the more striking features of Management Studio is that you can now edit in either a connected or disconnected mode: when you start a query, you are prompted for a connection, but if you decline you may still continue editing. You can even drop or change a connection during your editing session without having to save and reopen the query. This allows you to develop code offline, or successively connect to multiple SQL Servers while in the same query window.

When you work with queries in a connected mode, Management Studio uses the SQL Native Client to connect to SQL Server, Analysis Server, or SQL Server Mobile. Management Studio is developed using Microsoft Visual Studio® managed code, and while it resembles Visual Studio in many ways, it is a distinct tool. Management Studio supports creating and editing Transact-SQL, Analysis Services, and SQL Server Mobile queries, but you must use Visual Studio to develop SQL CLR code.

You can also open files for editing in Management Studio, and pick from text, query, and XML file types. For example, if you invoke the Open dialog from the **File** menu to open a text file, Management Studio will not prompt you for a connection, and will open a plain text editor.

# Managing Transact-SQL Code

There are two basic ways to edit Transact-SQL code in Management Studio: interactively from the database, or through script files. You can interactively edit database Transact-SQL code objects (such as stored procedures, triggers, and functions) using Object Explorer, or you can edit Transact-SQL scripts saved as disk files and optionally included in projects. Both methods employ the Management Studio query editing utility.

## Directly Editing Database Code

The Management Studio Object Explorer is a natural companion for interactively editing Transact-SQL code, and you will often want to keep it available, whether docked or hidden, while you are editing Transact-SQL queries. You can use Object Explorer to start a new query from the current connection without having to fill in connection information in the Connection Dialog. Just drill down to a user database, right-click the database name, and choose **New Query**.

You can interactively edit the Transact-SQL code embedded in a database using the Management Studio Object Explorer. When you drill down into the Programmability node of a database in Object Explorer, and right-click the stored procedure, trigger, or function node, you can use the **New** option to invoke the Query Template appropriate for that object. When you drill further down to a particular stored procedure, trigger, or function, you can right-click the node, pick the **Modify** option, and edit the object using an ALTER script. When you are creating a new object, the Query Template for the object will be loaded. Figure 1, for example, shows the Object Explorer, the Template Explorer, and the associated CREATE PROCEDURE template for a new stored procedure.

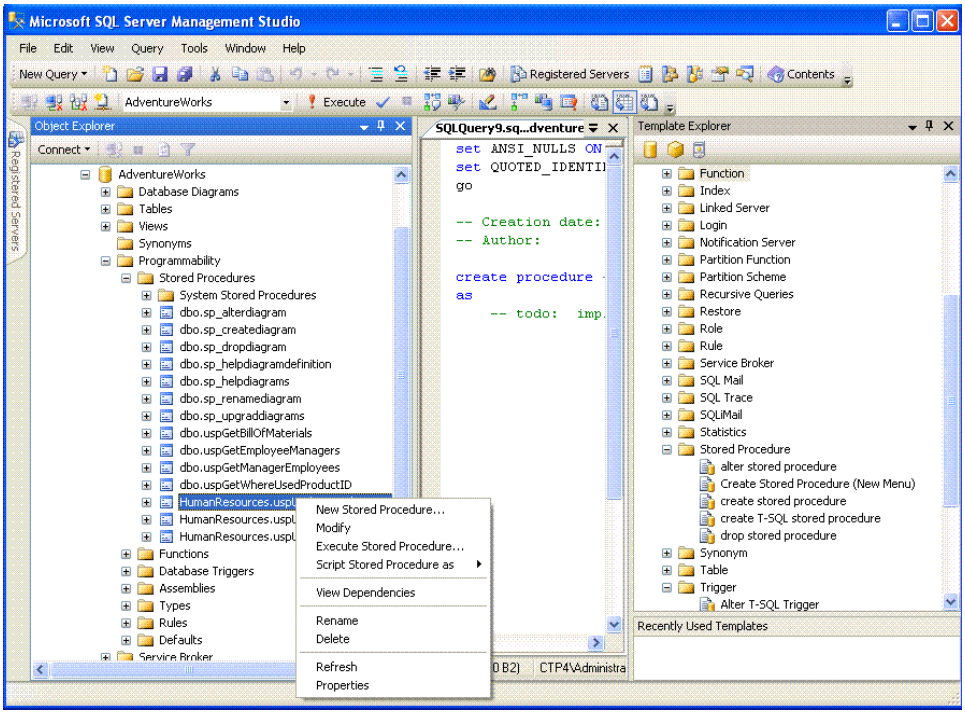


**Figure 1: You can use the Object Explorer to create a new Transact-SQL code object using a query Template.**

When you create a new database code object using Object Explorer, Management Studio invokes the associated template having the (New Menu) notation, as shown in the Template Explorer for the Create Stored Procedure template in Figure 1.

To add a comment or other notation for the code object, click **Properties** on the shortcut menu, and then choose the **Extended Properties** tab. You can also script the object using the **Script <object> as** option on the shortcut menu.

When you use the Object Explorer to create a new or change an existing database code object, you are editing without using a disk-based script file. Therefore you are not associating your code with a project or solution, or with source code control. If you execute the query, your changes will be immediately applied to the database.

You can also edit database code objects using file-based editing facilities in Management Studio. Editing Transact-SQL scripts allows you to develop Transact-SQL code objects that are subject to change-control practices.

## Script File Editing

You can edit Transact-SQL script files individually from disk, or through SQL Server solutions and projects. Just as with Query Analyzer, you can create and modify individual script files, and save a new query as an isolated script file in Management Studio. Also as with Query Analyzer, you can check individual files out of a source code control system before editing, and check them back in when you are finished.

## Solutions and Projects

New in Management Studio is the ability to organize your Transact-SQL script files into solutions and projects, and integrate those solutions and projects with source code control. A Management Studio solution organizes multiple projects as a single unit of work. Each project you create is associated with only one query type: SQL Server, Analysis Services, or SQL Server Mobile. Since every solution must have at least one project, you start a solution by first picking a project. Within a given project, you can store items concerning connection information, query script files, and miscellaneous files.

> **Note** Management Studio solutions and projects are similar to, but not compatible with, Visual Studio solutions and projects.

If you begin a new SQL Server query outside a project, Management Studio will start a new default Solution called "Solution1" with no projects. However, the best way to create a new solution is to start by creating a new project. Just open the **File** menu, select **New**, and then **Project**. The resulting dialog box allows you to choose a new project type, name, and solution name. If you want to include multiple projects in a solution, make sure you give the solution a different name from your project, as shown in Figure 2.

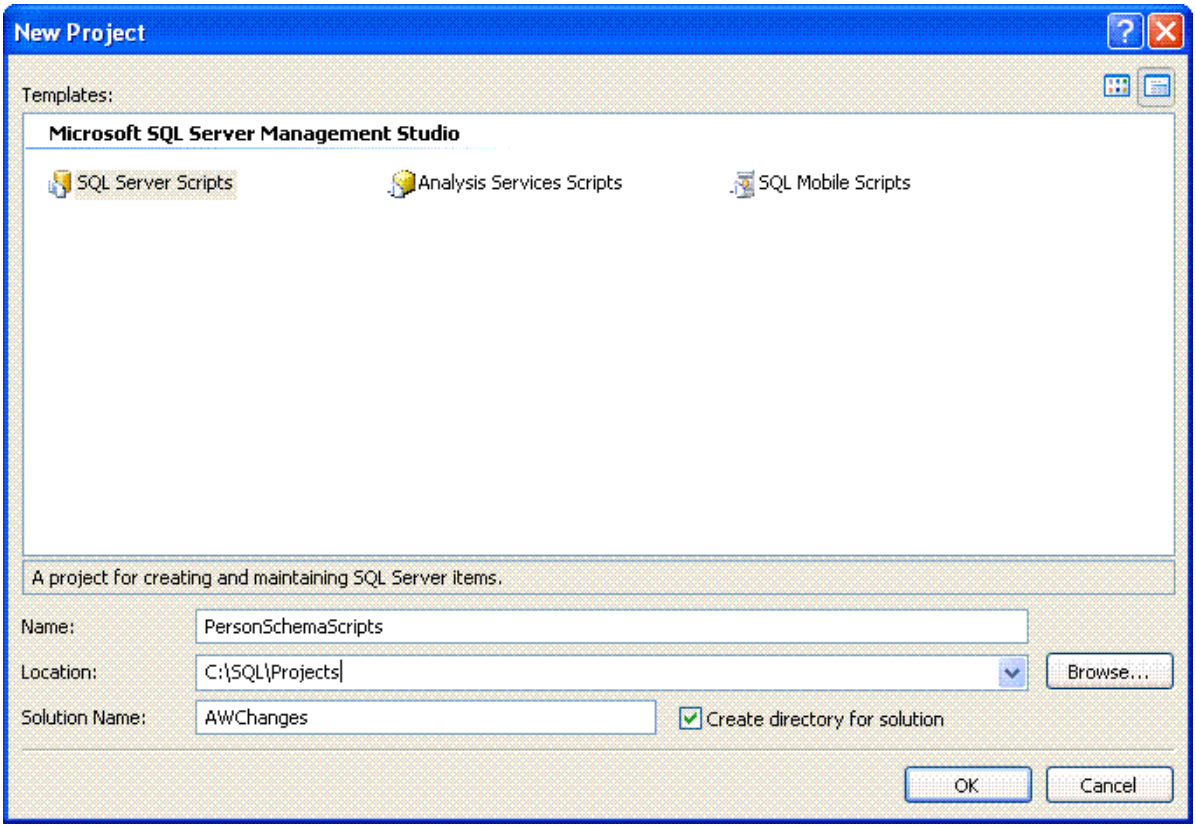


**Figure 2: You can name a new solution when creating a new project, and also specify a solution and project location.**

While you can have only one solution open at a time, any solution can contain multiple projects of any project type. For more information about solutions and projects, see "Introduction to Solutions, Projects, and Items" in SQL Server Books Online.

Management Studio integrates solutions and projects with source code control systems, provided your source code control system provides you with a compatible plug-in. You can then configure the source code control system in the Options dialog box (to display this dialog box, open the **Tools** menu and select **Options**). The Source Control/Plug-in Selection node in the selection tree presents the dialog box where you can specify the current source code control plug-in. Once you have set up integration with source code control, you can add the SQL Server solution to the source code system, and check it back out. You can check out the entire solution or just one project at a time. When you create new SQL Server queries in Solution Explorer, a Pending Checkins dialog box will assist you in determining what files will be checked in.

For example, if you have installed the Microsoft Visual SourceSafe 6.0 client components on your computer, SQL Server 2005 Management Studio will automatically detect that the VSS plug-in is available. As previously noted, you can find the VSS plug-in listed in the Options dialog box, by selecting the Source Control and then Plug-in Selection node. Also, the **Source Control** option on the **File** menu becomes active; from there you can add an existing Management Studio solution to source control, or open a Management Studio directly from source control. You can enable multiple source control systems, and change from one to another.

## SQL CMD Scripts

You can also run and debug SQLCMD queries using the Management Studio Transact-SQL editor. When you toggle the SQLCMD button, Management Studio will recognize and execute SQLCMD-specific commands in addition to Transact-SQL commands. The major SQLCMD commands such as :SETVAR, :CONNECT, and :R are all executed by Management Studio when it is in SQLCMD mode. You can step through SQLCMD scripts batch by batch, or even line by line, effectively using Management Studio as a debugger for SQLCMD scripts.

# Using the Transact-SQL Code Editor

Editing Transact-SQL code in SQL Server 2005 Management Studio is very similar to editing it in SQL Server 2000 Query Analyzer, but you will notice a number of enhancements to the authoring experience.

## Editing Features

When you edit Transact-SQL code in Management Studio, you will see the same color syntax highlighting and editing options that you are familiar with from SQL Server 2000 Query Analyzer. You can now redo an edit, in addition to undoing it. You also have enhanced find and replace dialog boxes, which allow you to search based on regular expressions or wild cards, as well as search and replace across files.

> **Note** Management Studio does not have a tool corresponding to Query Analyzer's Object Search dialog box, but you can filter objects in the Object Explorer view.

Additional editing options on the **Edit** menu in Management Studio include tabify and untabify options (which convert tabs to spaces and back), as well as an option for deleting horizontal white space. Also new is the ability to toggle word wrap on or off, and toggle whether to use a word wrap visual glyph. You can configure word wrap in the by opening the **Tools** menu and selecting **Options**, then **Text Editor**, then **All languages**.

### Keyboard Shortcuts

You can comment and uncomment, and indent and un-indent text using buttons on the default Standard toolbar. However, Management Studio standard keyboard shortcuts for commenting and uncommenting Transact-SQL code have changed. Rather than using CTRL+SHIFT+C to comment, and CTRL+SHIFT+R to uncomment, Management Studio by default uses CTRL+K followed by CTRL+C for commenting, and CTRL+K followed by CTRL+U for uncommenting. To comment code, just hold down the control key, then press K followed immediately by C, without releasing the control key. (See "SQL Server Management Studio Keyboard Shortcuts" in SQL Server Books Online.)

> **Note** You can change the Management Studio keyboard shortcut scheme from Standard to SQL Server 2000 by opening the **Tools** menu and selecting **Options**, then **Environment**, then **Keyboard**. You can define custom keyboard shortcuts in the Query shortcuts pane.

## Window Management

In Management Studio, you can work with two styles of query editing windows: tabbed or MDI Environment. The default setting is for tabbed windows, and you can select any open query window by selecting its tab. You can change the window layout to MDI windows in the Tools/Options dialog, in the Environment option. When you do this, Management Studio will automatically restart, but preserve all your connections and open windows.

> **Note** Because Management Studio has many windows available, you may find it convenient to make the query editing window full screen. You can switch to full screen by using the SHIFT+ALT+ENTER keyboard shortcut, or you can use the **View** menu. To reset your windows back to the default setting, open the **Window** menu and click **Reset Window Layout.**

You can view query windows tiled vertically or horizontally by right-clicking a query window's tab and choosing either **New Horizontal Tab Group** or **New Vertical Tab Group**. Once you have done this, you can use the ALT+SHIFT+ENTER keyboard shortcut to maximize the query windows to get the tiled effect. Figure 3 shows two query windows tiled side by side using the Vertical Tab Group maximized with the ALT+SHIFT+ENTER command.

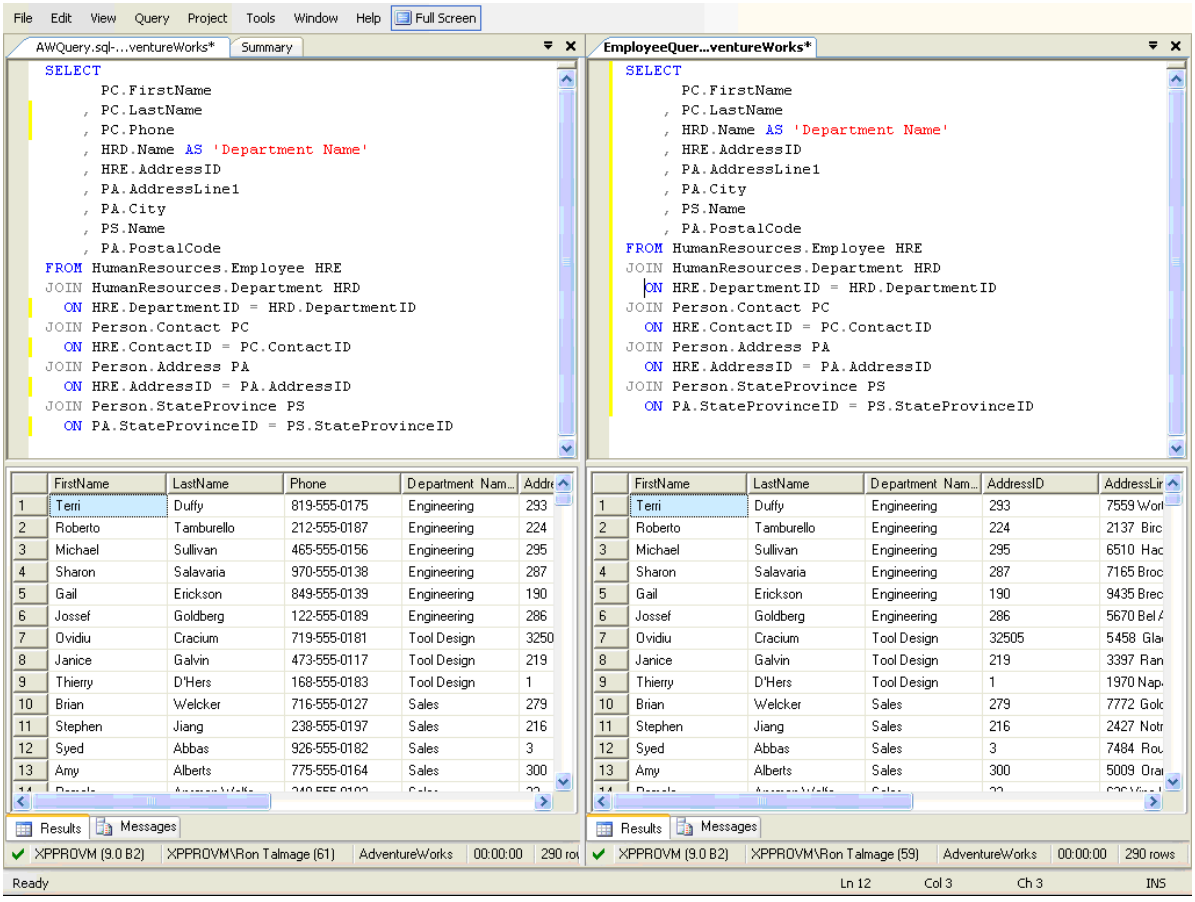


**Figure 3: You can align two or more query windows by right clicking the Query tab and choosing New Horizontal/Vertical Tab Group, and maximize the windows with ALT+SHIFT+ENTER.**

## Working with Query Results

You can still use F5, ALT+X, or CTRL+E to execute queries, in addition to the Execute button on the Query toolbar. Similarly, you can direct results to text, grid, or a file. When you direct results to a grid, you can cause query results to be displayed in a separate tab window, and you can make this change apply to the next opened query window using the Options dialog box (open the Tools menu and select **Options**). In the tree view of that dialog box, drill down to Query Results, SQL Server, and Results to Grid. Then check the **Display results in a separate tab** option. The tabs will then appear at the top of the query window.

Although there is no toolbar icon associated with toggling the results window on or off in Management Studio, as in Query Analyzer, the CTRL+R command will still have the same effect. You can also use the **Hide/Show Results Pane** option on the Window menu.

# Analyzing Queries

Management Studio adds new features in support of query analysis. In addition to the familiar graphical and textual showplan output, you can also direct showplan output to XML. The Database Tuning Advisor replaces the Index Tuning Wizard, and Client Statistics have a couple new features.

## Graphical Query Plans

Just as in Query Analyzer, you can visually inspect the estimated and actual query plans by using buttons on the Standard toolbar, as well as clicking options on the **Query** menu. You will notice that Management Studio shows a revised set of icons for analyzing a query plan. In particular, operators are shown in blue, cursor physical operations in yellow, and language elements in green. The fly-over display on top of each node in the graphical query plan shows the operation's information more plainly, though to find the object (table or index) in question, you need to access the Properties page for the given node. (For a complete list of graphical query plan icons, see "Graphically Displaying the Execution Plan Using SQL Server Management Studio" in SQL Server Books Online.)

> **Note** You can zoom in on a large query plan using the + sign in the lower right hand corner of the graphical query plan window.

You can also direct showplan output to XML. If you invoke the command,

```
SET SHOWPLAN_XML ON
```

and execute a query with results to grid, the results set will contain the XML showplan as an XML document returned in a one-row, one-column table. To view the showplan's XML format, just click on the link in the plan's cell and Management Studio will open the plan in its XML editor.

You can save the query plan in a portable format for viewing graphically. Right-click the internal link in the cell and save it with a .sqlplan extension. You can then open the file by clicking **Open** on the **File** menu, and Management Studio will display the graphical query plan. You can now send query plans in XML output using the .sqlplan extension to others for review without requiring a connection to the actual database.

## The Database Tuning Advisor

The SQL Server 2005 Database Tuning Advisor replaces the legacy Index Tuning Wizard. You can invoke it for selected queries from the **Query** menu, or using the CTRL+I keyboard shortcut. (You can invoke the Database Tuning Advisor directly from the **Tools** menu.)

## Client Statistics

Client statistics are useful in determining how much time the network and client components contribute to the total response time of a query. Management Studio supports collecting client statistics from the SQL Editor Toolbar as well as from the **Query** menu. The Client Statistics utility gives you the option to reset the statistics, as well as to display up to 10 of the most recent trial runs, along with the average values. You can use SHIFT+ALT+S to set client statistics on, or choose the Client Statistics option from the **Query** menu, from which you can also reset client statistics. Each trial result is listed along with the average results over all trials. A new client statistic, total execution time, is added to Time Statistics.

# Configuring Management Studio for Transact-SQL Editing

Management Studio has three major configuration options that affect Transact-SQL query editing.

## The Tools/Options dialog

You will find most Management Studio configuration options in the Options dialog box (open the **Tools** menu and select **Options**). This dialog box serves as a central location for Management Studio default options for all query editing. When you change an option related to SQL Server queries, just as in Query Analyzer, your changes will affect the default settings for all subsequent queries. However, configuration changes vary as to when they take effect. Some of the choices vary depending upon the type of queries (Transact-SQL, Analysis Services, SQL Server Mobile, etc.) that you want to configure. Sometimes changes are applied immediately to all your query windows, sometimes only to subsequent windows, and sometimes Management Studio must restart itself to apply the change.

> **Note** Management Studio does not provide the ability to manage table indexes or table statistics from the **Tools** menu. These operations have been moved to the Object Explorer: just drill down in the Object Explorer to the Indexes or Statistics node of the table in question.

In the General dialog box (open the **Tools** menu, click **All Languages**, then **General**), notice the options for Statement Completion. These options affect IntelliSense® behavior. Here also is where you can specify word-wrap options and permit single-click URL navigation within SQL queries.

> **Note** IntelliSense is not active for Transact-SQL queries in SQL Server 2005 Management Studio. It is active, however, for the XML and MDX editors. (You can further configure XML editing in the Text Editor/XML node of the Options dialog tree.)

## Customizing Toolbars

The **Customize** option on the **Tools** menu in Management Studio invokes the Customize dialog box, which allows you to customize your toolbar appearance. For example, if you would like to have a toolbar button that will toggle the results pane, on the **Commands** tab of the Customize window, select the **Window** category, and scroll down to the **Show Results Pane** command. Select the command and drag it to the location on the desired toolbar.

## Query Options

You can set certain options for the current query window by invoking the Query Options dialog box. You can open this dialog box from the **Query** menu, or by using the CTRL+SHIFT+O keyboard shortcut, or by clicking the Query Options button on the Query toolbar. Use the Query Options dialog box to set options for both the execution of queries and the display of results, but on a query window basis. The options in this dialog box are a subset of the options in the Options dialog box, accessed from the **Tools** menu: the **Execution** options are identical to those found in the Tools/Options/Query Execution/SQL Server dialog box, and the **Results** options are the same as those found in the Query Results/SQL Server dialog box. The difference is that when you set options in the Query Options dialog, you are only affecting the current query window.

# Conclusion

SQL Server 2005 Management Studio offers some compelling enhancements for developing Transact-SQL queries. In particular, you no longer need to have a connection to a physical SQL Server in order to edit a Transact-SQL query, and you can connect, disconnect, or change connections all within the same editing session. You can organize your Transact-SQL script files into solutions and projects, and integrate those solutions with source code control systems. Above all, you can export XML showplan files to disk, saving them with the .sqlplan extension, and reload them to view the graphical query plan. Management Studio is similar enough to Query Analyzer that you will find familiar ground with significant new assistance in editing Transact-SQL code.

**For more information:**

http://www.microsoft.com/sql/