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ComponentOne

# Silverlight SpellChecker

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This manual was produced using [ComponentOne Doc-To-Help™](#).

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# ComponentOne SpellChecker for Silverlight Overview

**ComponentOne SpellChecker™ for Silverlight** is a Silverlight version of **ComponentOne SpellChecker for WinForms™**, a mature component that provides the fastest, easiest to use, and most flexible spell-checking solution available on the market. This is the same engine that drives **ComponentOne IntelliSpell™**, our add-in for Visual Studio that allows you to spell-check your applications for spelling mistakes in forms, web pages, and comments used to generate XML documentation.

The main features in **SpellChecker for Silverlight** are:

**Efficiency:** On typical systems, **SpellChecker for Silverlight** is capable of spell-checking about 400,000 words per second. The spelling dictionaries are compressed and easy to maintain.

**Ease of use:** All it takes to spell check a control is one call to the **CheckControl** method.

**Flexibility:** **SpellChecker for Silverlight** provides several spell-checking services: you can spell-check strings and controls, and get suggestions for misspelled words. The interface-based architecture allows you to spell-check any controls that contain text, to implement custom spell dialog boxes, dictionaries, and text parsers. Finally, **SpellChecker for Silverlight** has a **SpellOptions** property that allows you to fine tune the spell-checking options.

**Multi-language support:** **SpellChecker for Silverlight** ships with over 20 international spell dictionaries, including English, Spanish, French, Italian, German, Portuguese, Dutch, Russian, Danish, Swedish and Greek. You can download spell dictionaries for specific languages from this page:  
<http://www.componentone.com/SuperProducts/SpellCheckerSilverlight/Dictionaries/>

## Getting Started

Get started with the following topics:

- [Key Features](#) (page 18)

- [Spell-Checking Dialog Boxes](#) (page 22)

- [SpellChecker for Silverlight Samples](#) (page 26)

## Installing SpellChecker for Silverlight

The following sections provide helpful information on installing **ComponentOne SpellChecker for Silverlight**.

### SpellChecker for Silverlight Setup Files

The **ComponentOne Studio for Silverlight** installation program will create the following directory: **C:\Program Files\ComponentOne\Studio for Silverlight 4.0**. This directory contains the following subdirectories:

<b>Bin</b>	Contains copies of ComponentOne binaries (DLLs, EXEs, design-time assemblies).
<b>Help</b>	Contains documentation for all Studio components and other useful resources including

XAML files.

## Samples

Samples for the product are installed in the **ComponentOne Samples** folder by default. The path of the ComponentOne Samples directory is slightly different on Windows XP and Windows Vista/Windows 7 machines:

**Windows XP path:** C:\Documents and Settings\\My Documents\ComponentOne Samples\Studio for Silverlight 4.0

**Windows Vista and Windows 7 path:** C:\Users\\Documents\ComponentOne Samples\Studio for Silverlight 4.0

See the [SpellChecker for Silverlight Samples](#) (page 26) topic for more information about each sample.

## System Requirements

System requirements for **ComponentOne SpellChecker for Silverlight** include the following:

1. Microsoft Silverlight 4.0 or later
2. Microsoft Visual Studio 2008 or later

## Installing Demonstration Versions

If you wish to try **ComponentOne SpellChecker for Silverlight** and do not have a serial number, follow the steps through the installation wizard and use the default serial number.

The only difference between unregistered (demonstration) and registered (purchased) versions of our products is that the registered version will stamp every application you compile so a ComponentOne banner will not appear when your users run the applications.

## Uninstalling SpellChecker for Silverlight

To uninstall **ComponentOne SpellChecker for Silverlight**:

1. Open the Control Panel and select Add or Remove Programs (XP) or Programs and Features (Windows 7/Vista).
2. Select ComponentOne Studio for Silverlight 4.0 and click the Remove button.
3. Click **Yes** to remove the program.

## End-User License Agreement

All of the ComponentOne licensing information, including the ComponentOne end-user license agreements, frequently asked licensing questions, and the ComponentOne licensing model, is available online at <http://www.componentone.com/SuperPages/Licensing/>.

## Licensing FAQs

The **ComponentOne Studio for Silverlight** product is a commercial product. It is not shareware, freeware, or open source. If you use it in production applications, please purchase a copy from our Web site or from the software reseller of your choice.

This section describes the main technical aspects of licensing. It may help the user to understand and resolve licensing problems he may experience when using ComponentOne products.

### What is Licensing?

Licensing is a mechanism used to protect intellectual property by ensuring that users are authorized to use software products.

Licensing is not only used to prevent illegal distribution of software products. Many software vendors, including ComponentOne, use licensing to allow potential users to test products before they decide to purchase them.

Without licensing, this type of distribution would not be practical for the vendor or convenient for the user. Vendors would either have to distribute evaluation software with limited functionality, or shift the burden of managing software licenses to customers, who could easily forget that the software being used is an evaluation version and has not been purchased.

## Studio for Silverlight Licensing

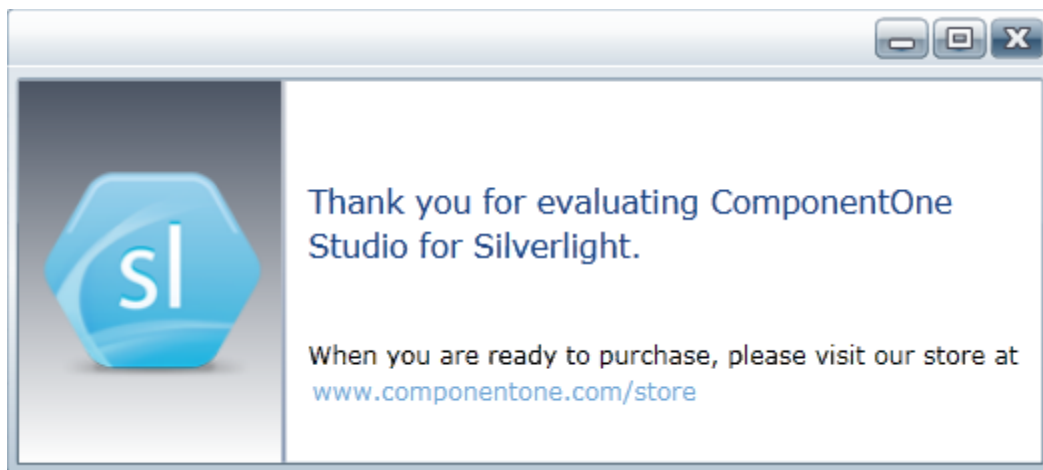
Licensing for **ComponentOne Studio for Silverlight** is similar to licensing in other ComponentOne products but there are a few differences to note.

Initially licensing is handled similarly to other ComponentOne products. When a user decides to purchase a product, he receives an installation program and a Serial Number. During the installation process, the user is prompted for the serial number that is saved on the system.

In **ComponentOne Studio for Silverlight**, when a control is dropped on a form, a license nag dialog box appears one time.

The **About** dialog box displays version information, online resources, and (if the control is unlicensed) buttons to purchase, activate, and register the product.

All ComponentOne products are designed to display licensing information at run time if the product is not licensed. None will throw licensing exceptions and prevent applications from running. Each time an unlicensed Silverlight application is run; end-users will see the following pop-up dialog box:



To stop this message from appearing, enter the product's serial number by clicking the **Activate** button on the **About** dialog box of any ComponentOne product, if available, or by rerunning the installation and entering the serial number in the licensing dialog box. To open the **About** dialog box, right-click the control and select the **About** option:

Note that when the user modifies any property of a ComponentOne Silverlight control in Visual Studio or Blend, the product will check if a valid license is present. If the product is not currently licensed, an attached property will be added to the control (the **C1NagScreen.Nag** property). Then, when the application executed, the product will check if that property is set, and show a nag screen if the **C1NagScreen.Nag** property is set to **True**. If the user has a valid license the property is not added or is just removed.

One important aspect of this of this process is that the user should manually remove all instances of **c1:C1NagScreen.Nag="true"** in the XAML markup in all files after registering the license (or re-open all the files that

include ComponentOne controls in any of the editors). This will ensure that the nag screen does not appear when the application is run.

## Technical Support

ComponentOne offers various support options. For a complete list and a description of each, visit the ComponentOne Web site at <http://www.componentone.com/SuperProducts/SupportServices/>.

Some methods for obtaining technical support include:

- **Online Resources**

ComponentOne provides customers with a comprehensive set of technical resources in the form of FAQs, samples and videos, Version Release History, searchable Knowledge base, searchable Online Help and more. We recommend this as the first place to look for answers to your technical questions.

- **Online Support via our Incident Submission Form**

This online support service provides you with direct access to our Technical Support staff via an [online incident submission form](#). When you submit an incident, you'll immediately receive a response via e-mail confirming that you've successfully created an incident. This e-mail will provide you with an Issue Reference ID and will provide you with a set of possible answers to your question from our Knowledgebase. You will receive a response from one of the ComponentOne staff members via e-mail in 2 business days or less.

- **Peer-to-Peer Product Forums**

ComponentOne peer-to-peer product [forums](#) are available to exchange information, tips, and techniques regarding ComponentOne products. ComponentOne sponsors these areas as a forum for users to share information. While ComponentOne does not provide direct support in the forums, we periodically monitor them to ensure accuracy of information and provide comments when appropriate. Please note that a ComponentOne User Account is required to participate in the ComponentOne Product Forums.

- **Installation Issues**

Registered users can obtain help with problems installing ComponentOne products. Contact technical support by using the [online incident submission form](#) or by phone (412.681.4738). Please note that this does not include issues related to distributing a product to end-users in an application.

- **Documentation**

Microsoft integrated ComponentOne documentation can be installed with each of our products, and documentation is also available online. If you have suggestions on how we can improve our documentation, please email the [Documentation team](#). Please note that e-mail sent to the [Documentation team](#) is for documentation feedback only. [Technical Support](#) and [Sales](#) issues should be sent directly to their respective departments.

**Note:** You must create a ComponentOne Account and register your product with a valid serial number to obtain support using some of the above methods.

## Redistributable Files

**ComponentOne SpellChecker for Silverlight** is developed and published by ComponentOne LLC. You may use it to develop applications in conjunction with Microsoft Visual Studio or any other programming environment that enables the user to use and integrate the control(s). You may also distribute, free of royalties, the following Redistributable Files with any such application you develop to the extent that they are used separately on a single CPU on the client/workstation side of the network:

- C1.Silverlight.SpellChecker

Site licenses are available for groups of multiple developers. Please contact [Sales@ComponentOne.com](mailto:Sales@ComponentOne.com) for details.

## About This Documentation

You can create your applications using Microsoft Expression Blend or Visual Studio, but Blend is currently the only design-time environment that allows users to design XAML documents visually. In this documentation, we will use the **Design** workspace of Blend for most examples.

### Acknowledgements

*Microsoft, Windows, Windows Vista, Visual Studio, and Microsoft Expression are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.*

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### ComponentOne Doc-To-Help

This documentation was produced using [ComponentOne Doc-To-Help® Enterprise](#).

## Silverlight Resources

This help file focuses on **ComponentOne Studio for Silverlight**. For general help on getting started with Silverlight, we recommend the following resources:

- <http://www.silverlight.net>  
The official Silverlight site, with many links to downloads, samples, tutorials, and more.
- <http://silverlight.net/learn/tutorials.aspx>  
Silverlight tutorials by Jesse Liberty. Topics covered include:
  - Tutorial 1: Silverlight User Interface Controls
  - Tutorial 2: Data Binding
  - Tutorial 3: Displaying SQL Database Data in a DataGrid using LINQ and WCF
  - Tutorial 4: User Controls
  - Tutorial 5: Styles, Templates and Visual State Manager
  - Tutorial 6: Expression Blend for Developers
  - Tutorial 7: DataBinding & DataTemplates Using Expression Blend
  - Tutorial 8: Multi-page Applications
  - Tutorial 9: ADO.NET DataEntities and WCF Feeding a Silverlight DataGrid
  - Tutorial 10: Hyper-Video
- <http://timheuer.com/blog/articles/getting-started-with-silverlight-development.aspx>

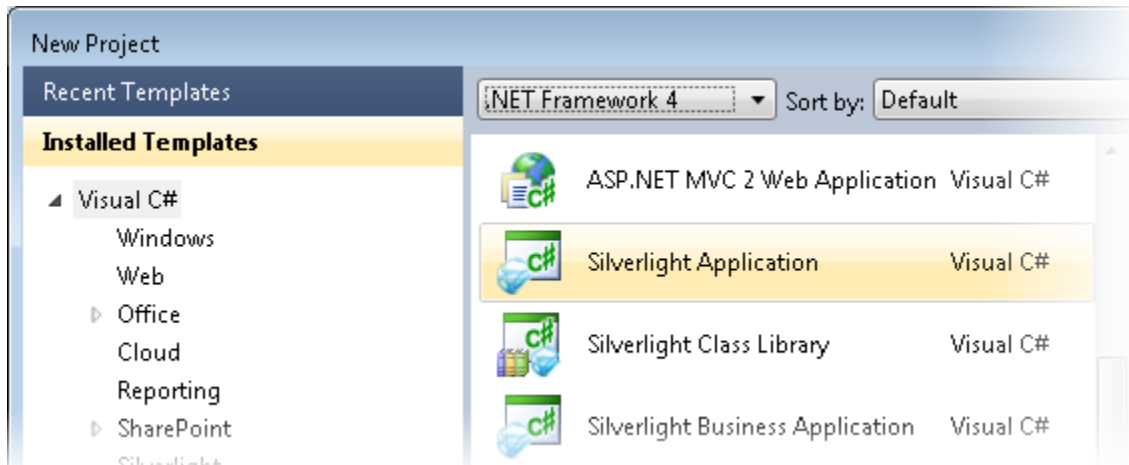
Silverlight tutorials by Tim Heuer. Topics covered include:

- Part 1: Really getting started – the tools you need and getting your first Hello World
- Part 2: Defining UI Layout – understanding layout and using Blend to help
- Part 3: Accessing data – how to get data from where
- Part 4: Binding the data – once you get the data, how can you use it?
- Part 5: Integrating additional controls – using controls that aren't a part of the core
- Part 6: Polishing the UI with styles and templates
- Part 7: Taking the application out-of-browser
- <http://weblogs.asp.net/scottgu/pages/silverlight-posts.aspx>  
Scott Guthrie's Silverlight Tips, Tricks, Tutorials and Links Page. A useful resource, this page links to several tutorials and samples.
- <http://weblogs.asp.net/scottgu/archive/2008/02/22/first-look-at-silverlight-2.aspx>  
An excellent eight-part tutorial by Scott Guthrie, covering the following topics:
  - Part 1: Creating "Hello World" with Silverlight 2 and VS 2008
  - Part 2: Using Layout Management
  - Part 3: Using Networking to Retrieve Data and Populate a DataGrid
  - Part 4: Using Style Elements to Better Encapsulate Look and Feel
  - Part 5: Using the ListBox and DataBinding to Display List Data
  - Part 6: Using User Controls to Implement Master/Details Scenarios
  - Part 7: Using Templates to Customize Control Look and Feel
  - Part 8: Creating a Digg Desktop Version of our Application using WPF
- <http://blogs.msdn.com/corinab/archive/2008/03/11/silverlight-2-control-skins.aspx>  
A practical discussion of skinning Silverlight controls and applications by Corrina Barber.

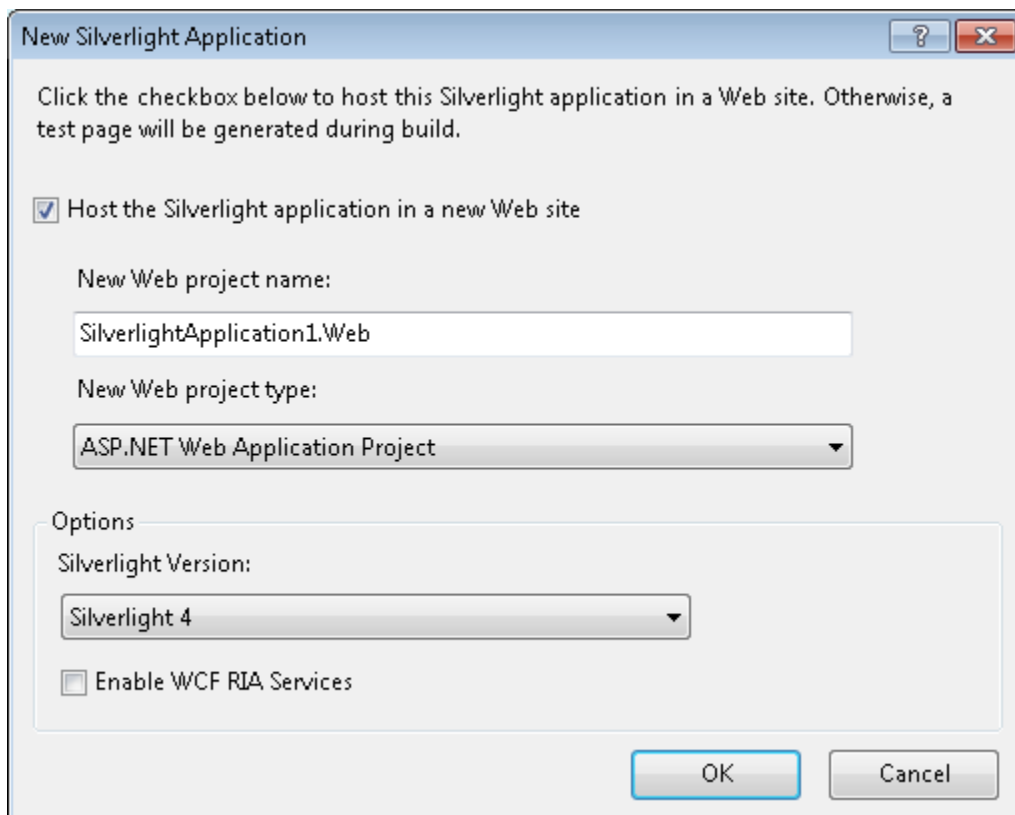
## Creating a Silverlight Project in Visual Studio

Complete the following steps to create a new Silverlight project in Microsoft Visual Studio 2010:

1. Select **File | New | Project** to open the **New Project** dialog box in Visual Studio 2010.
2. In the **Project types** pane, expand either the **Visual Basic** or **Visual C#** node and select **Silverlight**.
3. Choose **Silverlight Application** in the **Templates** pane.



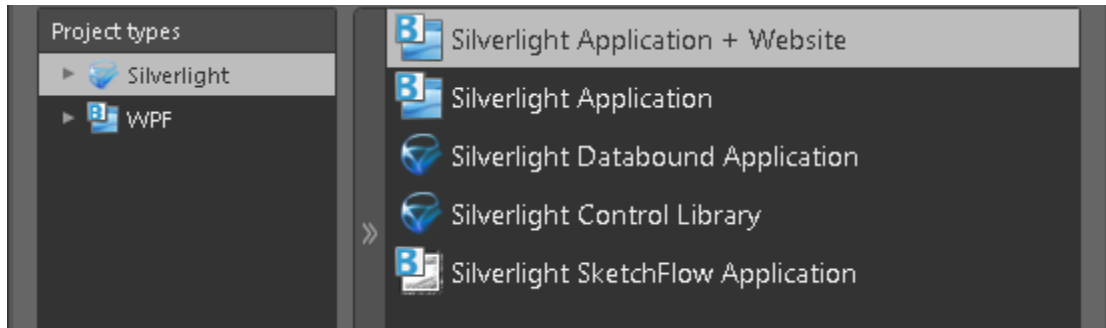
4. Name the project, specify a location for the project, and click **OK**.  
Next, Visual Studio will prompt you for the type of hosting you want to use for the new project.
5. In the **New Silverlight Application** dialog box, select **OK** to accept the default name and options and to create the project.



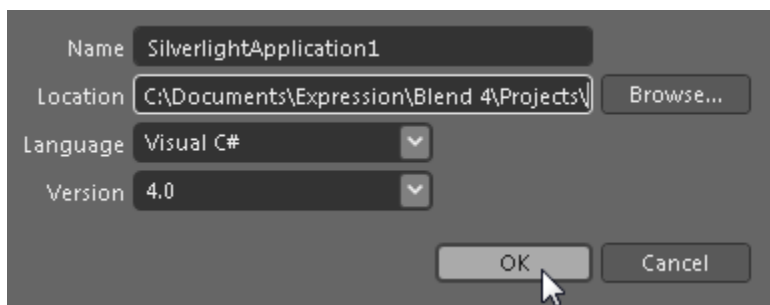
## Creating a Silverlight Project in Expression Blend

Complete the following steps to create a new Silverlight project in Microsoft Expression Blend 4:

1. Select **File | New Project** to open the **New Project** dialog box in Blend 4.
2. In the **Project types** pane, click the **Silverlight** node.
3. In the right pane, choose **Silverlight Application + Website** in the **Templates** pane to create a project with an associated Web site.



4. Name the project, specify a location for the project, choose a language (**Visual C#** or **Visual Basic**), and click **OK**.



Your new project will be created.

### The Project

The solution you just created will contain two projects, **YourProject** and **YourProject.Web**:

- **YourProject**: This is the Silverlight application proper. It will produce a XAP file that gets downloaded to the client and runs inside the Silverlight plug-in.
- **YourProject.Web**: This is the host application. It runs on the server and provides support for the Silverlight application.

## Adding the SpellChecker for Silverlight Components to a Blend Project

To add a reference to the assembly:

1. Select **Project | Add Reference**.
1. Browse to find the **C1.Silverlight.Chart.dll** assembly installed with **Chart for Silverlight**.

**Note:** The **C1.Silverlight.SpellChecker.dll** file is installed to **C:\Program Files\ComponentOne\Studio for Silverlight\bin** by default.

2. Select **C1.Silverlight.SpellChecker.dll** and click **Open**. A reference is added to your project.

### To add a component from the Asset Library:

1. Once you have added a reference to the **C1.Silverlight.SpellChecker.dll**, click the **Asset Library** button in the Blend Toolbox. The **Asset Library** appears.
2. Click the **Controls** drop-down arrow and select **All**.
3. Select **C1SpellChecker**. The component will appear in the Toolbox below the **Asset Library** button.
4. Double-click the **C1SpellChecker** component in the Toolbox to add it to **Window1.xaml**.

## Adding the SpellChecker for Silverlight Components to a Visual Studio Project

When you install **ComponentOne SpellChecker for Silverlight** the **C1SpellChecker** control should be added to your Visual Studio Toolbox. You can also manually add ComponentOne controls to the Toolbox.

**ComponentOne SpellChecker for Silverlight** provides the following control:

- **C1SpellChecker**

To use a **SpellChecker for Silverlight** control, add it to the window or add a reference to the **C1.Silverlight.SpellChecker** assembly to your project.

### Manually Adding SpellChecker for Silverlight to the Toolbox

When you install **SpellChecker for Silverlight**, the following **SpellChecker for Silverlight** control will appear in the Visual Studio Toolbox customization dialog box:

- **C1SpellChecker**

To manually add the **C1SpellChecker** control to the Visual Studio Toolbox, complete the following steps:

1. Open the Visual Studio IDE (Microsoft Development Environment). Make sure the Toolbox is visible (select **Toolbox** in the **View** menu, if necessary) and right-click the Toolbox to open its context menu.
2. To make **SpellChecker for Silverlight** components appear on its own tab in the Toolbox, select **Add Tab** from the context menu and type in the tab name, **C1SpellChecker**, for example.
3. Right-click the tab where the component is to appear and select **Choose Items** from the context menu. The **Choose Toolbox Items** dialog box opens.
4. In the dialog box, select the **Silverlight Components** tab.
5. Sort the list by Namespace (click the *Namespace* column header) and select the check boxes for components belonging to the **C1.Silverlight** namespace. Note that there may be more than one component for each namespace.

### Adding SpellChecker to the Window

To add **ComponentOne SpellChecker for Silverlight** to a window or page, complete the following steps:

1. Add the **C1SpellChecker** control to the Visual Studio Toolbox.
2. Double-click **C1SpellChecker** or drag the control onto the window.

### Adding a Reference to the Assembly

To add a reference to the **SpellChecker for Silverlight** assembly, complete the following steps:

1. Select the **Add Reference** option from the **Project** menu of your project.
2. Select the **ComponentOne SpellChecker for Silverlight** assembly from the list on the **.NET** tab or on the **Browse** tab, browse to find the **C1.Silverlight.SpellChecker.dll** assembly and click **OK**.

3. Double-click the window caption area to open the code window. At the top of the file, add the following **Imports** statements (**using** in C#):  
`Imports C1.Silverlight.SpellChecker`

This makes the objects defined in the **SpellChecker for Silverlight** assembly visible to the project.

## Using Templates

The previous sections focused on the **ComponentOne Studio for Silverlight** controls. The following topics focus on Data and Control Templates, and how they are applied to Silverlight controls in general (including controls provided by Microsoft). If you are an experienced Silverlight developer, this information may be of no interest to you.

### Data Templates

**Data Templates** are a powerful feature in Silverlight. They are virtually identical to the **Data Templates** in WPF, so if you know WPF there's nothing really new about them.

On the other hand, if you have never used WPF and have seen pieces of XAML that contain styles and templates, you may be confused by the concepts and notation. The good news is DataTemplates are very powerful and are not overly complicated. Once you start using them, the concept will make sense in a couple of minutes and you will be on your way. Remember, just reading the tutorial probably won't be enough to fully grasp the concept. After reading, you should play with the projects.

### Create the "Templates" Solution

To illustrate the power of DataTemplates, let's create a new Silverlight solution. Call it "Templates". Complete the following steps:

1. Select **File | New | Project** to open the **New Project** dialog box in Visual Studio 2008.
2. In the **Project types** pane, expand either the **Visual Basic** or **Visual C#** node and select **Silverlight**.
3. Choose **Silverlight Application** in the **Templates** pane.
4. Name the project "Templates", specify a location for the project, and click **OK**.

Next, Visual Studio will prompt you for the type of hosting you want to use for the new project.

5. In the **New Silverlight Application** dialog box, select **OK** to accept the default name ("Templates.Web") and settings and create the project.
6. Right-click the **Templates** project in the Solution Explorer and select **Add Reference**.
7. In the **Add Reference** dialog box locate and select the C1.Silverlight.dll assembly and click **OK** to add a reference to your project.

This is required since we will be adding C1.Silverlight controls to the page.

8. Now, open the **MainPage.xaml** file in the **Templates** project and paste in the XAML below:

```
<UserControl x:Class="Templates.MainPage"
  xmlns="http://schemas.microsoft.com/client/2007"
  xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
  xmlns:C1_Silverlight="clr-
namespace:C1.Silverlight;assembly=C1.Silverlight">

  <Grid x:Name="LayoutRoot" >
    <Grid.Background>
      <LinearGradientBrush EndPoint="0.5,1" StartPoint="0.5,0">
        <GradientStop Color="#FF7EB9F0"/>
      </LinearGradientBrush>
    </Grid.Background>
  </Grid>
</UserControl>
```

```

        <GradientStop Color="#FF284259" Offset="1"/>
    </LinearGradientBrush>
</Grid.Background>

<!-- Grid layout -->
<Grid.RowDefinitions>
    <RowDefinition Height="30" />
    <RowDefinition Height="*" />
</Grid.RowDefinitions>
<Grid.ColumnDefinitions>
    <ColumnDefinition Width="*" />
    <ColumnDefinition Width="*" />
</Grid.ColumnDefinitions>

<!-- Page title -->
<TextBlock Text="Silverlight Templates" Grid.Column="0"
Grid.ColumnSpan="2"
    TextAlignment="Center" FontSize="18" FontWeight="Bold" />

<!-- ListBox on the left -->
<StackPanel Grid.Row="1" Margin="5" >
    <TextBlock Text="ListBox Control" />
    <ListBox x:Name="_listBox" />
</StackPanel>

<!-- C1ComboBoxes on the right -->
<StackPanel Grid.Column="2" Grid.Row="1" Margin="5" >
    <TextBlock Text="C1ComboBox Controls" />
    <C1_Silverlight:C1ComboBox x:Name="_cmb1" Margin="0,0,0,5" />
    <C1_Silverlight:C1ComboBox x:Name="_cmb2" Margin="0,0,0,5" />
</StackPanel>

</Grid>
</UserControl>

```

This creates a page with two columns. The left column has a standard **ListBox** control and the right has two **C1ComboBoxes**. These are the controls we will populate and style in the following steps.

## Populate the Controls

Before we start using templates and styles, let us populate the controls first. To do that, complete the following:

1. Open the **MainPage.xaml.cs** file and paste the following code into the page constructor:

```

public Page()
{
    InitializeComponent();

    // Get list of items
    IEnumerable list = GetItems();

    // Add items to ListBox and in C1ComboBox
    _listBox.ItemsSource = list;
    _cmb1.ItemsSource = list;

    // Show fonts in the other C1ComboBox
    FontFamily[] ff = new FontFamily[]
    {
        new FontFamily("Default font"),

```

```

        new FontFamily("Arial"),
        new FontFamily("Courier New"),
        new FontFamily("Times New Roman"),
        new FontFamily("Trebuchet MS"),
        new FontFamily("Verdana")
    };
    _cmb2.ItemsSource = ff;
}

```

The code populates the **ListBox** and both **C1ComboBoxes** by setting their **ItemsSource** property. **ItemsSource** is a standard property present in most controls that support lists of items (**ListBox**, **DataGrid**, **C1ComboBox**, and so on).

2. Add the following code to implement the **GetItems()** method in the **MainPage** class:

```

List<DataItem> GetItems()
{
    List<DataItem> members = new List<DataItem>();
    foreach (MemberInfo mi in this.GetType().GetMembers())
    {
        members.Add(new DataItem(mi));
    }
    return members;
}

```

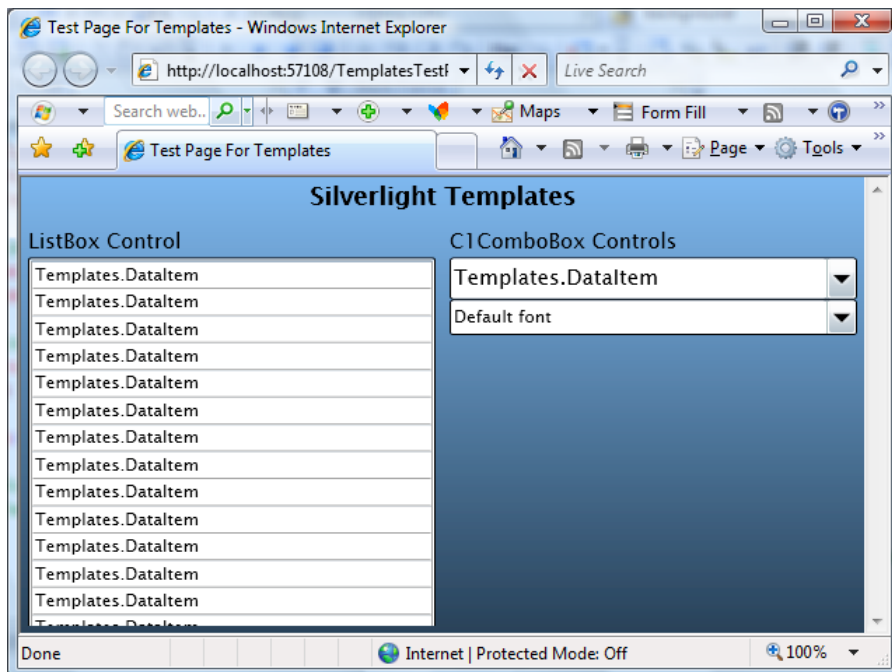
3. Add the definition of the **DataItem** class. to the **MainPage.xaml.cs** file, below the **MainPage** class definition:

```

public class DataItem
{
    public string ItemName { get; set; }
    public MemberTypes ItemType { get; set; }
    public DataItem(MemberInfo mi)
    {
        ItemName = mi.Name;
        ItemType = mi.MemberType;
    }
}

```

If you run the project now, you will see that the controls are being populated. However, they don't do a very good job of showing the items:



The controls simply convert the **DataItem** objects into strings using their **ToString()** method, which we didn't override and by default returns a string representation of the object type ("Templates.DataItem").

The bottom **C1ComboBox** displays the font family names correctly. That's because the **FontFamily** class implements the **ToString()** method and returns the font family name.

It is easy to provide a **ToString()** implementation that would return a more useful string, containing one or more properties. For example:

```
public override string ToString()
{
    return string.Format("{0} {1}", ItemType, ItemName);
}
```

If you add this method to the **DataItem** class and run the project again, you will see a slightly more satisfying result. But there's only so much you can do with plain strings. To represent complex objects effectively, we need something more. Enter Data Templates!

### Defining and Using Data Templates

Data Templates are objects that map regular .NET objects into **UIElement** objects. They are used by controls that contain lists of regular .NET objects to convert these objects into **UIElement** objects that can be displayed to the user.

For example, the Data Template below can be used to map our **DataItem** objects into a **StackPanel** with two **TextBlock** elements that display the **ItemName** and **ItemType** properties of the **DataItem**. This is what the template definition looks like in XAML markup:

```
<UserControl x:Class="Templates.MainPage"
    xmlns="http://schemas.microsoft.com/client/2007"
    xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
    xmlns:C1_Silverlight="clr-
namespace:C1.Silverlight;assembly=C1.Silverlight">

    <!-- Data template used to convert DataItem objects into UIElement
objects -->
```

```

<UserControl.Resources>
  <DataTemplate x:Key="DataItemTemplate" >
    <StackPanel Orientation="Horizontal" Height="30" >
      <TextBlock Text="{Binding ItemType}"
        Margin="5" VerticalAlignment="Bottom" Foreground="Red"
        FontSize="10" />
      <TextBlock Text="{Binding ItemName}"
        Margin="5" VerticalAlignment="Bottom" />
    </StackPanel>
  </DataTemplate>
</UserControl.Resources>

<!-- Page content (same as before)... -->

```

This template tells Silverlight (or WPF) that in order to represent a source data object, it should do this:

1. Create a **StackPanel** with two **TextBlocks** in it,
2. Bind the **Text** property of the first **TextBlock** to the **ItemType** property of the source data object, and
3. Bind the **Text** property of the second **TextBlock** object to the **ItemName** property of the source object.

That's it. The template does not specify what type of control can use it (any control can, we will use it with the **ListBox** and also with the **C1ComboBox**), and it does not specify the type of object it should expect (any object will do, as long as it has public properties named **ItemType** and **ItemName**).

To use the template, add an **ItemTemplate** attribute to the controls where you want the template to be applied. In our example, we will apply it to the **ListBox** declaration in the **MainPage.xaml** file:

```

<!-- ListBox on the left -->
<StackPanel Grid.Row="1" Margin="5" >
  <TextBlock Text="ListBox Control" />
  <ListBox x:Name="_listBox"
    ItemTemplate="{StaticResource DataItemTemplate}" />
</StackPanel>

```

And also to the top **C1ComboBox**:

```

<!-- C1ComboBox on the right -->
<StackPanel Grid.Column="2" Grid.Row="1" Margin="5" >
  <TextBlock Text="C1ComboBox Controls" />

  <!-- C1ComboBox 1 -->
  <C1_Silverlight:C1ComboBox x:Name="_cmb1" Margin="0,0,0,5"
    ItemTemplate="{StaticResource DataItemTemplate}" />

```

Note that we can now change the appearance of the **DataItem** objects by modifying the template in one place. Any changes will automatically be applied to all objects that use that template, making application maintenance much easier.

Before you run the application again, let's add a template to the second **C1ComboBox** as well. This control contains a list of font families. We can use templates to display each item using the actual font they represent.

This time, we will not define the template as a resource. It will only be used in one place, so we can insert it inline, as shown below:

```

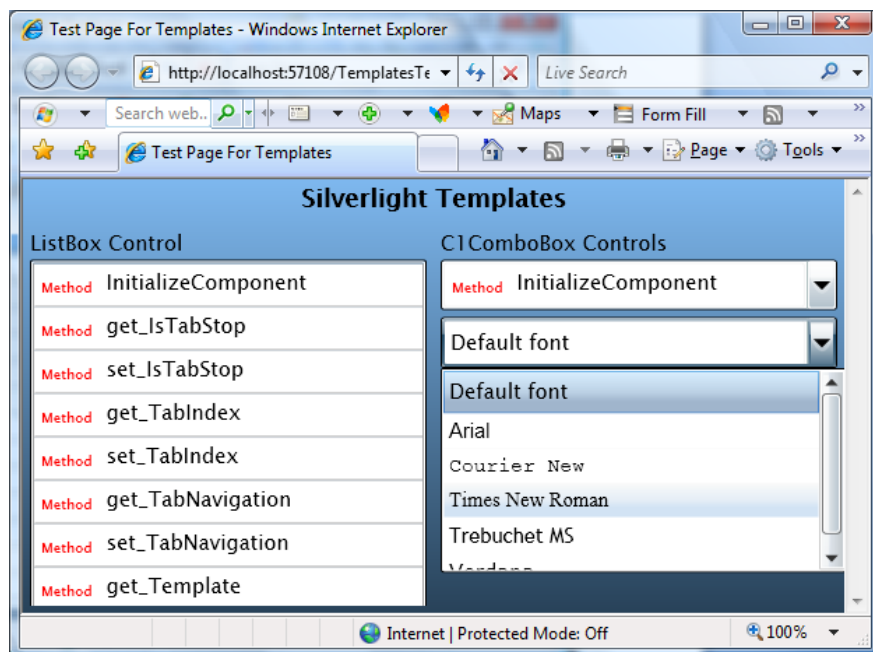
<!-- C1ComboBox 2 -->
<C1_Silverlight:C1ComboBox x:Name="_cmb2" FontSize="12" Margin="0,0,0,5" >
  <C1_Silverlight:C1ComboBox.ItemTemplate>
    <DataTemplate>
      <TextBlock Text="{Binding}" FontFamily="{Binding}" Margin="4" />
    </DataTemplate>
  </C1_Silverlight:C1ComboBox.ItemTemplate>
</C1_Silverlight:C1ComboBox>

```

Don't let the XAML syntax confuse you. This specifies that in order to create items from data, the control should use a **DataTemplate** that consists of a single **TextBlock** element. The **TextBlock** element should have two of its properties (**Text** and **FontFamily**) bound to the data object itself (as opposed to properties of that object).

In this case, the data object is a **FontFamily** object. Because the template assigns this object to the **Text** property and also to the **FontFamily** property, the **TextBlock** will display the font name and will use the actual font.

If you run the project now, you should see this result:



Note that if you assign a **DataTemplate** to the **C1ComboBox**, it will no longer be able to perform text-related tasks such as auto-search and editing. If you want to re-enable those features, you should provide your own **ItemConverter** that is a standard **TypeConverter**.

Styles and Templates are extremely powerful concepts. We encourage you to play and experiment with this sample. Try modifying the templates to show the data in different ways. The more you experiment, the more comfortable you will feel with these concepts and with the Silverlight/WPF application architecture.

## Control Templates

Data Templates allow you to specify how to convert arbitrary data objects into **UIElement** objects that can be displayed to the user. But that's not the only use of templates in Silverlight and WPF. You can also use templates to modify the visual structure of existing **UIElement** objects such as controls.

Most controls have their visual appearance defined by a native XAML resource (typically contained within the assembly that defines the control). This resource specifies a **Style** which assigns values to most of the control's properties, including its **Template** property (which defines the control's internal "visual tree").

For example:

```
<Style TargetType="HyperlinkButton">
  <Setter Property="IsEnabled" Value="true" />
  <Setter Property="IsTabStop" Value="true" />
  <Setter Property="Foreground" Value="#FF417DA5" />
  <Setter Property="Cursor" Value="Hand" />
  <Setter Property="Template">
```

```

<Setter.Value>
  <ControlTemplate TargetType="HyperlinkButton">
    <Grid x:Name="RootElement" Cursor="{TemplateBinding Cursor}">
      <!-- Focus indicator -->
      <Rectangle x:Name="FocusVisualElement" StrokeDashCap="Round"
...=""/>
      <!-- HyperlinkButton content -->
      <ContentPresenter x:Name="Normal"
        Background="{TemplateBinding Background}"
        Content="{TemplateBinding Content}"
        ContentTemplate="{TemplateBinding ContentTemplate}"...=""/>
    </Grid>
  </ControlTemplate>
</Setter.Value>
</Setter>
</Style>

```

This is a very simplified version of the XAML resource used to specify the **HyperlinkButton** control. It consists of a **Style** that begins by setting the default value of several simple properties, and then assigns a value of type **ControlTemplate** to the control's **Template** property.

The **ControlTemplate** in this case consists of a **Grid** (*RootElement*) that contains a **Rectangle** (*FocusVisualElement*) used to indicate the focused state and a **ContentPresenter** (*Normal*) that represents the content portion of the control (and itself contains another **ContentTemplate** property).

Note the *TemplateBinding* attributes in the XAML. These constructs are used to map properties exposed by the control to properties of the template elements. For example, the **Background** property of the hyperlink control is mapped to the **Background** property of the *Normal* element specified in the template.

Specifying controls this way has some advantages. The complete visual appearance is defined in XAML and can be modified by a professional designer using Expression Blend, without touching the code behind it. In practice, this is not as easy as it sounds, because there are logical relationships between the template and the control implementation.

Recognizing this problem, Silverlight introduced a **TemplatePart** attribute that allows control classes to specify the names and types it expects its templates to contain. In the future, this attribute will be added to WPF as well, and used by designer applications such as Blend to validate templates and ensure they are valid for the target control.

For example, the Microsoft **Button** control contains the following **TemplatePart** attributes:

```

/// <summary>
/// Represents a button control, which reacts to the Click event.
/// </summary>
[TemplatePart(Name = Button.ElementRootName, Type =
typeof(FrameworkElement))]
[TemplatePart(Name = Button.ElementFocusVisualName, Type =
typeof(UIElement))]
[TemplatePart(Name = Button.StateNormalName, Type = typeof(Storyboard))]
[TemplatePart(Name = Button.StateMouseOverName, Type =
typeof(Storyboard))]
[TemplatePart(Name = Button.StatePressedName, Type = typeof(Storyboard))]
[TemplatePart(Name = Button.StateDisabledName, Type = typeof(Storyboard))]
public partial class Button : ButtonBase

```

These six template parts constitute a contract between the control implementation and the design specification. They tell the designer that the control implementation expects to find certain elements in the template (defined by their name and type).

Well-behaved controls should degrade gracefully, not crashing if some non-essential elements are missing from the template. For example, if the control can't find a **Storyboard** named *Button.StateMouseOverName* in the template, it should not do anything when the mouse hovers over it.

Well-implemented templates should fulfill the contract and provide all the elements that the control logic supports. Designer applications such as Blend can enforce the contract and warn designers if they try to apply invalid templates to controls.

For the time being, the easiest way to create new templates for existing controls is to start with the original XAML and customize it.

We will not show any actual examples of how to create and use custom control templates here. Instead, we suggest you download the examples developed by Corrina Barber:

<http://blogs.msdn.com/corrinab/archive/2008/03/11/silverlight-2-control-skins.aspx>

The link contains previews and downloads for three 'skins' (bubbly, red, and flat). Each skin consists of a set of **Style** specifications, similar to the one shown above, which are added to the application's global XAML file (App.xaml). The format is similar to this:

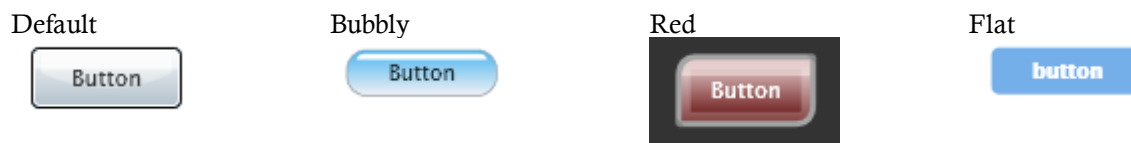
```
<Application xmlns="http://schemas.microsoft.com/client/2007"
  xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
  x:Class="Styles_Red.App"

<Application.Resources>
  <!-- Button -->
  <Style x:Key="buttonStyle" TargetType="Button">
    <Setter Property="IsEnabled" Value="true" />
    <Setter Property="IsTabStop" Value="true" />
    <Setter Property="Foreground" Value="#FF1E2B33" />
    <Setter Property="Cursor" Value="Hand" />
    <Setter Property="TextAlignment" Value="Center" />
  <!-- A lot more XAML follows... -->
```

Once these styles are defined in the **App.xaml** file, they can be assigned to any controls in the application:

```
<Button Content="Button" Style="{StaticResource buttonStyle}"/>
```

If you are curious, this is what the **Button** control looks like after applying each of the skins defined in the reference above:



This mechanism is extremely powerful. You can change what the controls look like and even the parts used internally to build them.

Unlike data templates, however, control templates are not simple to create and modify. Creating or changing a control template requires not only design talent but also some understanding of how the control works.

It is also a labor-intensive proposition. In addition to their normal appearance, most controls have **Storyboards** that are applied to change their appearance when the mouse hovers over them, when they gain focus, get pressed, get disabled, and so on (see the **C1ComboBox** example above).

Furthermore, all controls in an application should appear consistent. You probably wouldn't want to mix bubbly buttons with regular scrollbars on the same page for example. So each 'skin' will contain styles for many controls.

Some controls are designed with custom templates in mind. For example, the **C1ComboBox** has an **ItemsPanel** property of type **ItemsPanelTemplate**. You can use this property to replace the default drop-down **ListBox** element with any other **UIElement** you like.

For examples of using the **ItemsPanel** property, check the **ControlExplorer** sample installed by default with **ComponentOne Studio for Silverlight**.

# Preparing Your Enterprise Environment

Several considerations are important to take into account when planning a corporate deployment of your Silverlight applications in an enterprise environment. For information about these considerations and a description of system requirements and deployment methods as well as the techniques to maintain and support Silverlight after deployment, please see the [Silverlight Enterprise Deployment Guide](#) provided by the Microsoft Silverlight team.

The guide helps you to plan and carry out a corporate deployment of Silverlight, and covers:

- Planning the deployment
- Testing deployment strategy
- Deploying Silverlight
- Maintaining Silverlight in your environment

The [Silverlight Enterprise Deployment Guide](#) is available for download from the Silverlight whitepapers site: <http://silverlight.net/learn/whitepapers.aspx>.

# Key Features

**ComponentOne SpellChecker for Silverlight** allows you to create customized, rich applications. Make the most of **SpellChecker for Silverlight** by taking advantage of the following key features:

- **Easy-to-use, Client-side SpellChecker**  
SpellChecker offers a client-side solution for implementing spell checking on Web pages. This enables you to implement and deploy spell checking with minimal effort. All it takes to spell check a control is one call to the CheckControl method..
- **Most Efficient SpellChecker**  
On typical systems, SpellChecker is capable of spell-checking about 400,000 words per second. The spelling dictionaries are compressed and easy to maintain.
- **Flexible Spell-checking**  
SpellChecker provides several spell-checking services:
  - You can spell-check strings and controls, and get suggestions for misspelled words.
  - The interface-based architecture allows you to spell-check any controls that contain text, to implement custom spell dialogs, dictionaries, and text parsers.
  - SpellChecker has a SpellOptions property that allows you to fine tune the spell-checking options.
- **Multi-language Support**  
SpellChecker ships with 20+ international spell dictionaries, including English, Spanish, French, Italian, German, Portuguese, Dutch, Russian, Danish, Swedish, and Greek.

# Working with SpellChecker for Silverlight

**ComponentOne SpellChecker™ for Silverlight** is a spell-checking engine that you can use to spell-check plain text or controls.

## Introduction to C1.Silverlight.SpellChecker

**ComponentOne SpellChecker™ for Silverlight** is a Silverlight version of **ComponentOne SpellChecker for WinForms™**, a mature component that provides the fastest, easiest to use, and most flexible spell-checking solution available on the market. This is the same engine that drives **ComponentOne IntelliSpell™**, our add-in for Visual Studio that allows you to spell-check your applications for spelling mistakes in forms, web pages, and comments used to generate XML documentation.

The main features in **SpellChecker for Silverlight** are:

- **Efficiency:** On typical systems, **SpellChecker for Silverlight** is capable of spell-checking about 400,000 words per second. The spelling dictionaries are compressed and easy to maintain.
- **Ease of use:** All it takes to spell check a control is one call to the **CheckControl** method.
- **Flexibility:** **SpellChecker for Silverlight** provides several spell-checking services: you can spell-check strings and controls, and get suggestions for misspelled words. The interface-based architecture allows you to spell-check any controls that contain text, to implement custom spell dialog boxes, dictionaries, and text parsers. Finally, **SpellChecker for Silverlight** has a **SpellOptions** property that allows you to fine tune the spell-checking options.
- **Multi-language support:** **SpellChecker for Silverlight** ships with over 20 international spell dictionaries, including English, Spanish, French, Italian, German, Portuguese, Dutch, Russian, Danish, Swedish and Greek.

You can download spell dictionaries for specific languages from this page:

<http://www.componentone.com/SuperProducts/SpellCheckerSilverlight/Dictionaries/>

## Concepts and Main Properties

The following topics outline **Spellchecker for Silverlight**'s concepts and primary properties.

### Spell Dictionaries

**SpellChecker for Silverlight** uses three types of dictionary to check text. Each dictionary is exposed as one of the three following properties: [MainDictionary](#), [UserDictionary](#), or [CustomDictionary](#). The following topics detail each of these three properties.

### MainDictionary

The main dictionary is a read-only, compressed word list that typically contains a few hundred thousand words. The main dictionary is typically loaded when the application starts, using the `LoadAsync` method as illustrated below:

```
public Page()
{
    InitializeComponent();

    // Other initialization...
```

```

// Load main dictionary
SpellDictionary md = c1SpellChecker1.MainDictionary;
md.LoadCompleted += md_LoadCompleted;
md.LoadProgressChanged += md_LoadProgressChanged;
md.LoadAsync("C1Spell_en-US.dct");
}

```

The `LoadAsync` method takes as a single parameter the URL of the spell dictionary, which is typically deployed as part of the application. The example above loads the **C1Spell\_en-US.dct** which is the US English spell dictionary that ships with **SpellChecker for Silverlight**. This dictionary contains about 120,000 words and is about 250k bytes in size.

The `LoadAsync` method loads the main dictionary asynchronously, so your application can start while the dictionary is downloaded from the server. When the download is complete, the **C1SpellChecker** component fires the **LoadCompleted** method which you can use to determine that the **C1SpellChecker** component is ready for work.

You can use the **MainDictionary.State** property to check at any time whether the main dictionary has been successfully loaded.

You can also load the main dictionary from a **Stream** object, so you can customize the loading process if you want.

## UserDictionary

The user dictionary is a read-write word list that contains terms defined by users, such as names and technical jargon (for example "ComponentOne", "Silverlight", and so on). Users can add words to the custom dictionary while spell-checking by clicking the "Add" button in the spell dialog box. You can also add and remove words using code.

The user dictionary is typically stored in the applications isolated storage, rather than on the server. You can load and save the custom dictionary using the `LoadFromIsolatedStorage` and `SaveToIsolatedStorage` methods as shown below:

```

public Page()
{
    InitializeComponent();

    // Other initialization...

    // Load main dictionary
    SpellDictionary md = c1SpellChecker1.MainDictionary;
    md.LoadCompleted += md_LoadCompleted;
    md.LoadProgressChanged += md_LoadProgressChanged;
    md.LoadAsync("C1Spell_en-US.dct");

    // Load user dictionary
    UserDictionary ud = c1SpellChecker1.UserDictionary;
    ud.LoadFromIsolatedStorage("Custom.dct");

    // Save user dictionary when app exits
    App.Current.Exit += App_Exit;
}
void App_Exit(object sender, EventArgs e)
{
    // Save modified user dictionary into compressed isolated storage
    UserDictionary ud = c1SpellChecker1.UserDictionary;
    ud.SaveToIsolatedStorage("Custom.dct");
}

```

The code loads the user dictionary from isolated storage, and attaches an event handler to save any changes when the application exits. The user dictionary is typically small, and it is saved in compressed format, so it does not take up much storage space.

You can also load and save user dictionaries to **Stream** objects, so you can customize the persistence mechanism for the user dictionary if you want.

## **CustomDictionary**

Custom dictionaries are classes that derive from **C1Window** and implement the **ISpellDictionary** interface. This allows you to create dictionaries based on any custom logic that makes sense to your application. For example, you could create a dictionary that looks up words on the web and stores them in a cache, or that looks words up in a proprietary database.

Custom dictionaries are optional.

## **Spell-Checking Modes**

**SpellChecker for Silverlight** supports three modes of spell-checking: Batch Mode, Modal Spell-Checking, and As-You-Type Spell-Checking. The sections below provide information about each mode of spell-checking

### **Batch Mode**

The **CheckText**, **CheckWord**, and **GetSuggestions** methods check strings and get lists of errors and provide spelling suggestions. You can use these methods to spell check text that is not in a control. For example, you could spell-check text that is stored in a database.

The code below illustrates this mode:

```
// Check some text
var someText = "this text contains two errors.";
var errors = c1SpellChecker1.CheckText(someText);
Debug.WriteLine("CheckText(\"{0}\") =", someText);
foreach (var error in errors)
{
    Debug.WriteLine("\t{0}, {1}-{2}",
        error.Text, error.Start, error.Length);
    foreach (string suggestion in
        c1SpellChecker1.GetSuggestions(error.Text, 1000))
    {
        Debug.WriteLine("\t\t{0}?", suggestion);
    }
}
```

### **Modal Spell-Checking**

The **CheckControlAsync** method will spell check controls that implement the **ISpellCheckableEditor** interface. The Microsoft **TextBox** control and the **C1RichTextBox** controls implement this interface out of the box. You can create your own classes to provide spell-checkable wrappers for other controls.

The code below illustrates this mode:

```
// Show modal spell-checking
private void Button2_Click(object sender, RoutedEventArgs e)
{
    // Hook up event handler
    c1SpellChecker1.CheckControlCompleted +=
        c1SpellChecker1_CheckControlCompleted;

    // Spell-check a textbox
    c1SpellChecker1.CheckControlAsync(textBox1);
}
```

```

// Unhook the event handler
c1SpellChecker1.CheckControlCompleted +=
    c1SpellChecker1_CheckControlCompleted;
}
void c1SpellChecker1_CheckControlCompleted(object sender,
    CheckControlCompletedEventArgs e)
{
    Debug.WriteLine("CheckControlCompleted: {0} errors found",
        e.ErrorCount);
    if (e.Cancelled)
        WriteLine("\t(cancelled...)");
}

```

This code shows a spell checking dialog box and highlights each spelling error, providing suggestions and allowing the user to fix or ignore each error. When the process is completed, the `CheckControlCompleted` event fires and provides feedback to the user.

## As-you-type Spell-Checking

This mode monitors a control while the user types, underlining errors with a red wavy line as in the Microsoft Word spell-checker. Right-clicking a misspelled word presents the user with a context menu containing suggestions.

This mode is not yet implemented in **SpellChecker for Silverlight**.

## Spell-Checking Options

The `Options` property allows you to fine-tune the spell checking process. It returns a `SpellOptions` object that contains the following properties:

- **DialogLanguage**: Customizes the language used in the built-in spell dialog box.
- **Ignore**: Specifies whether to ignore words in upper-case, mixed-case, words that contain numbers, html tags, urls, etc.
- **ActiveSpellingEnabled**: Gets or sets whether as-you-type spell-checking is enabled. This property isn't currently supported in **SpellChecker for Silverlight**.
- **ShowSuggestionsInContextMenu**: Gets or sets whether the `C1SpellChecker` component should provide a context menu for misspelled words when as-you-type spell checking is enabled. This property isn't currently supported in **SpellChecker for Silverlight**.
- **MaxSuggestionsInContextMenu**: Gets or sets the maximum number of suggestions to be shown in the context menu associated with misspelled words. This property isn't currently supported in **SpellChecker for Silverlight**.
- **UnderlineColor**: Gets or sets the color used to underline misspelled words in as-you-type mode. This property isn't currently supported in the in **SpellChecker for Silverlight**.

## Spell-Checking Dialog Boxes

When you call the `CheckControlAsync` method, **SpellChecker for Silverlight** displays a dialog box that highlights each of the errors found in the control and allows the user to correct or ignore each error.

**SpellChecker for Silverlight** contains a built-in spell dialog box that is used by default. You can use the built-in dialog box as-is, customize it, or replace it with your own custom version.

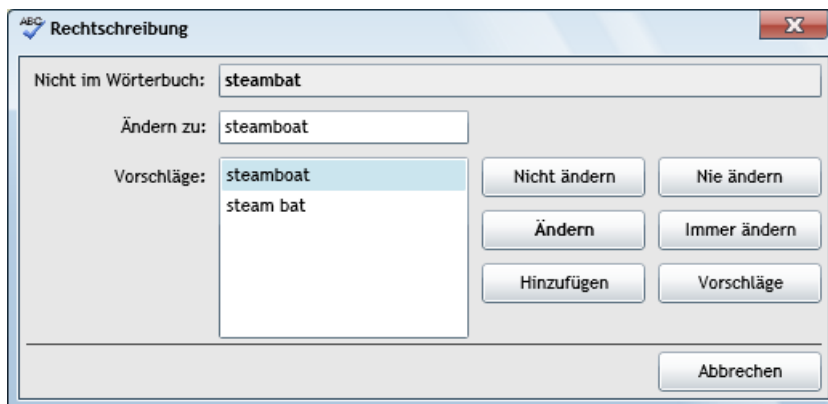
## Using the Built-in Spell Dialog Box

Using the built-in spell dialog box is easy. You don't have to do anything other than call the `CheckControlAsync` method.

The built-in dialog box has built-in localization with support for seven languages. The localization is controlled by the `SpellOptions.DialogLanguage` property. The default setting, `Automatic`, causes the dialog box to be displayed in the language that corresponds to the `CultureInfo.CurrentCulture` property. You can override that as shown below:

```
SpellOptions options = c1SpellChecker1.Options;  
options.DialogLanguage = DialogLanguage.German;
```

Here is the German version of the built-in spell dialog box:



Note that the dialog box language matches the application language and is independent of the current dictionary language. You could write an English application and use it to check German text for example.

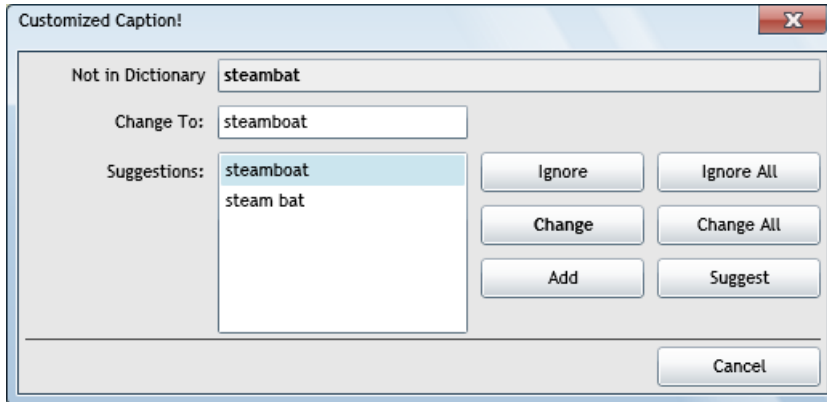
## Customizing the Built-in Spell Dialog Box

The built-in dialog box derives from `C1Window`. You can easily perform minor customizations to the dialog box by instantiating it, modifying its properties, and then passing the customized dialog box to the `CheckControlAsync` method.

For example, the code below modifies the caption of the built-in dialog box:

```
var dlg = new C1SpellDialog();  
  
dlg.Header = "Customized Caption!";  
c1SpellChecker1.CheckControlAsync(textBox1, false, dlg);
```

Here is the customized version of the built-in dialog box:



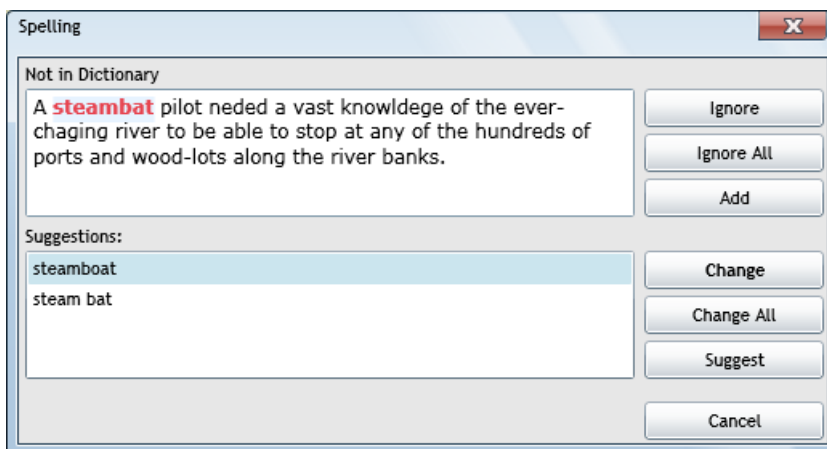
## Using Custom Spell Dialog Boxes

To use custom spell dialog boxes, you have to perform two tasks:

1. Create a class that derives from **C1Window** and implements the **ISpellDialog** interface.
2. Use the overloaded version of the **CheckControlAsync** method that takes the **ISpellDialog** parameter.

To make the first task easier, we provide two dialog boxes that you can use as a starting point when creating your own dialog boxes. One of them is identical to the built-in dialog box, whereas the other is similar to the spell dialog box in Microsoft Word. You can find the source code in the "SpellCheckerSample" application that is installed in the "Samples" folder along with the product.

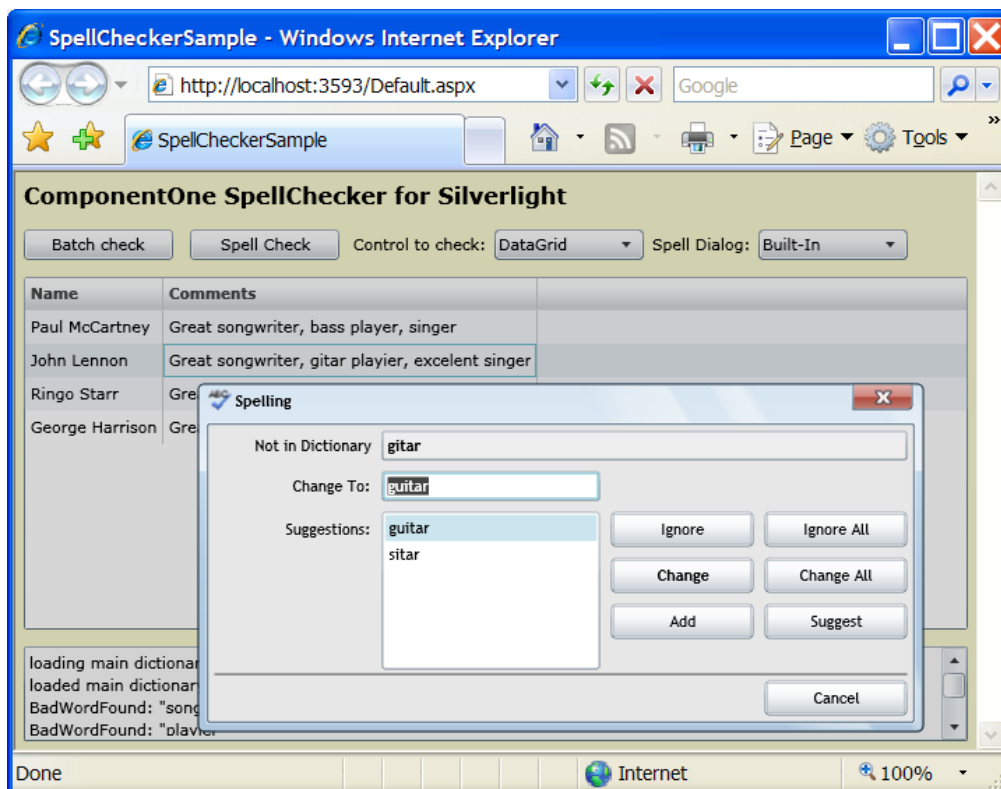
This is what the second custom dialog box looks like:



## Spell-Checking Different Types of Controls

**SpellChecker for Silverlight** can be used to spell check any control that contains text. This support is built-in for the **C1RichTextBox** and Microsoft **TextBox** controls. To spell-check other controls, you need to provide a wrapper class that implements the **ISpellCheckableEditor** interface.

For example, the "SpellCheckerSample" shows how you can spell-check a **DataGrid** control. It does this by creating a class called **DataGridSpellWrapper** that implements the **ISpellCheckableEditor** interface on behalf of the grid. The wrapper class enumerates the grid cells and exposes the text in each cell to the **C1SpellChecker** component. When an error is found, the cell is selected and the spell dialog box shows the error and suggestions as usual. The image below illustrates what the **SpellCheckerSample** sample looks like while spell-checking a **DataGrid**:



## Spell Dictionary Format

The main dictionaries are zip files with a .dct extension. The zip file may contain several word lists, each stored as a UTF-8-encoded text file containing lists of valid words, one per line. All such entries must have a ".words" extension.

Words that start with lowercase characters are assumed to be regular words, which can be used in lower-case or upper-case (for example, "apple", "banana", "cherry"). Words that start with capitals are assumed to be proper names, and will be flagged as spelling mistakes if used in lowercase (for example, "Albert", "Bernoulli", "Cantor").

The .dct file may also include a "rules" entry that specifies rules to apply when spell-checking text in the dictionary language. For example, the French dictionary that ships with **SpellChecker for Silverlight** contains the following rules:

- **IgnorePrefix:** l' d' j' da' m' s' n' qu'
- **IgnoreSuffix:** 's

These tell the spell checker to ignore some common prefixes and suffixes; they are removed before the word is checked. For example:

- l'amour (check 'amour': correct)
- l'amuor (check 'amuor': **incorrect**)
- Maxim's (check 'Maxim': correct)
- Naxim's (check 'Naxim': **incorrect**)

Prefixes and suffixes not included are tagged as spelling errors:

- h'amour (check 'h'amour': **incorrect**)

- x'amuor (check 'x'amuor': **incorrect**)

You can create and edit dictionary files using standard applications such as Notepad and WinZip, or you can use the **C1DictionaryEditor** application that ships with **SpellChecker for Silverlight**.

# SpellChecker for Silverlight Samples

Please be advised that this ComponentOne software tool is accompanied by various sample projects and/or demos, which may make use of other ComponentOne development tools included with ComponentOne Studios.

**Note:** ComponentOne samples are also available at <http://helpcentral.componentone.com>.

## C# SpellChecker Sample

Sample	Description
SpellCheckerSample	Shows how to use the C1SpellChecker object to check plain text, TextBox, and C1RichTextBox controls. The sample shows how to load spell dictionaries, how to spell-check strings (CheckText), how to spell-check controls using a spell dialog (CheckControl), and how to enable as-you-type spell checking on a C1RichTextBox.