Symphony Framework Academy

# Combo Box

## Introduction.

The Symphony Framework is a set of Synergy .NET assemblies that help you to build powerful Windows Presentation Foundation Applications utilizing your Synergy Repository Structures and existing Synergy Language code.

This tutorial demonstrates how easy it is to implement Combo Box selection fields within your Windows Presentation Foundation user interface. The Combo Box provides the user the ability to select a single entry from a pre-defined number of selections. The available selections can be either compiled from selection list entries stored against a field in your Synergy Repository or directly from a data file. This tutorial will demonstrate how easy it is to utilize a Combo Box in your WPF applications. Welcome to the Symphony Framework Academy!

To complete this tutorial your system must have the following components installed:

- Microsoft Visual Studio 2010 SP1 or higher
- The Symphony Framework is better experienced when using Synergy/DE version 10!
- Synergy DBL Integration for Visual Studio (same version as Synergy/DE).
- Microsoft .NET Framework 4.0 or higher.
- The Symphony Framework requires the Microsoft Expression Blend Software Development Kit (SDK) for .NET 4 which can be downloaded from http://www.microsoft.com/en-us/download/details.aspx?id=10801
- Symphony Framework 2.1.0.0 or higher.
  - Download from http://symphonyframework.codeplex.com/releases.
- CodeGen version 4.2.6 or higher
  - Download from http://codegen.codeplex.com/releases.

## Tutorial Setup.

There are no initial setup requirements for this tutorial

## Empowering your Applications with Combo Box Selections.

This tutorial will walk you through the few steps required to define selection data and provide a Combo Box user selection capability.

The first task of this tutorial is to load Visual Studio. From the start menu locate and run Microsoft Visual Studio 2010.

- ☐ From the file menu select File→New→Project.
- ☐ Within the New Project dialog locate the Synergy\DE → Windows entry in the Installed Templates list (on the left of the dialog).
- ☐ In the project types list (center list in the dialog) locate the **WPF Application** entry.
- ☐ In the **Name** entry give the project a name of **ComboSelection**.
- ☐ So you can find the project when you continue through further tutorials it is recommended that you place the project in a folder in your "**My Documents**" area. Click the **Browse** button.
  - Navigate to your **My Documents → Visual Studio 2010 → Projects** folder.
  - If the **SymphonyAcademy** folder exists, select it.
  - If the **SymphonyAcademy** folder does not exist, click the **New folder** button to create a folder and name it **SymphonyAcademy**.
  - Click the **Select Folder** button.
- ☐ Uncheck the **Create directory for solution** check box.
- ☐ Click the **OK** button to create the project.

The project creation wizard will run and your WPF application will be created. Because our application will be utilizing the Symphony Framework our first task is to reference the Symphony Framework assemblies.

- ☐ From the **Project** menu, select the **Add Reference…** menu entry.
- ☐ From the **Add Reference** dialog, click on the **Browse** tab. Visual Studio may take a few moments to respond.
- ☐ Browse your local hard drive for the Symphony Framework assemblies. The default installation location is `C:\Program Files\Synergex\SymphonyFramework\Bin\`. If you have a 64bit operating system the default installation location is `C:\Program Files (x86)\Synergex\SymphonyFramework\Bin\`.
- ☐ From within the folder, highlight and select only the four required assemblies:
  - **SymphonyAdapter.dll**
  - **SymphonyConductor.dll**
  - **SymphonyCore.dll**
  - **SymphonyCrescendo.dll**

- ☐ Click the **OK** button to add the assemblies to your project.

Now we need to reference the required .NET assemblies that let us handle user interface interactions.

- ☐ From the **Project** menu, select the **Add Reference…** menu entry.
- ☐ From the **Add Reference** dialog, click on the **.NET** tab. Visual Studio may take a few moments to respond.
- ☐ Search the list for the **System.Windows.Interactivity** assembly and ensure you select the framework 4.0 version.
- ☐ Click **OK** to add the assembly to the project.

To build a Synergy based application we will fully utilize the Synergy Repository. The Synergy Repository contains the structure and file definitions that allow us to code generate much of the required code. We are going to create a Synergy Repository so we can define the required field types.

- ☐ Within Visual Studio, right click the **ComboSelection** project in the **Solution Explorer** window.
  - If you don't have the **Solution Explorer** window visible, from the **View** menu column, select the **Solution Explorer** entry.
- ☐ From the dropdown context menu select the **Add** entry and then select the **New Folder** entry.
- ☐ Enter a name of **Repository**.

Now we can define the required environment variables to define the location of our repository files.

- ☐ From the **Project** menu, select the **ComboSelection Properties…** entry.
- ☐ Click the **Environment Variables** tab.
- ☐ In the **Name** column, add a new entry called **RPSMFIL**.
- ☐ In the corresponding **Value** column, define the location of the repository main file. Enter the value **$(ProjectDir)Repository\rpsmain.ism**.
- ☐ In the **Name** column, add a new entry called **RPSTFIL**.
- ☐ In the corresponding **Value** column, define the location of the repository text file. Enter the value **$(ProjectDir)Repository\rpstext.ism**.
- ☐ Save the project files by selecting the **Save All** entry on the **File** menu column.
- ☐ It is recommended that you close and re-open Visual Studio at this time, and re-open the **ComboSelection** project to ensure that all the environment variables are correctly set.

We can now create our new repository data files, define a structure and create the required fields that we are going to expose as Combo Box selection controls.

- ☐ Within Visual Studio, from the **Tools** menu column, select the **Synergy Repository** entry.
- ☐ Once in the Synergy Repository select the **Utilities** menu column, and then select the **Create New Repository**.
- ☐ Confirm the file specifications are correct. They should reference the following folder:
  - **"My Documents\Visual Studio 2010\Projects\SymphonyAcademy\ComboSelection\Repository\"**.
- ☐ Click the **OK** button.
- ☐ Click the **OK** button to confirm the creation of the repository data files.

Now we can create a new repository structure and define the required data fields.

- ☐ From the **Modify** column, select **Structures**.
- ☐ On the list, click the **Add** button.
- ☐ In the **Structure name** field enter a name of **COMBO**.
- ☐ Define the **File type** of **ASCII**.
- ☐ Enter a **Description** of **Combo selection example structure**.
- ☐ Select a **Tag type** of **None**.
- ☐ Click the **Attributes** button.

We are going to create 2 fields. One field will be a selection list and we will define the available selections within the repository. The second will be a selection window, and the available options will be built from a data file.

- ☐ From the **Attributes** menu column select the **Fields** entry.
- ☐ From the list, click the **Add** button.
- ☐ Define the **Field name** as **RPSLIST**.
- ☐ Define the **Description** as **Selection list defined in the RPS**.
- ☐ From the available selections, define the **Type** as **Decimal**.
- ☐ Assign the **Size** field a value of **1.**
- ☐ Click on the **Display** tab.
- ☐ In the **Prompt** field enter the value **Available selections**.
- ☐ Click on the **Validation** tab.
- ☐ Change the **Selections?** Entry to **List**.

- ☐ You will now be prompted for the available list entries.
    - Enter the first list item as **Bought-in**. Press the **CTRL+L** key combination to enter another list entry.
    - Enter the second list item as **Made in house**. Press the **CTRL+L** key combination to enter another list entry.
    - Enter the third list item as **Self-assembly**. Press the **CTRL+L** key combination to enter another list entry.
    - Enter the forth list item as **Partial assembly**. Click the **OK** button to complete the selections.
- ☐ Change the **Enumerated?** Selection to **Yes**.
- ☐ Enter a **Length** of **30**.
- ☐ Enter a **Base** of **1.**
- ☐ Enter a **Step** of **1.**
- ☐ Click the **OK** button.

The second field will be based on a selection window. The entries will be built and made available at runtime, not defined in the repository.

- ☐ From the list, click the **Add** button.
- ☐ Define the **Field name** as **GROUPLIST**.
- ☐ Define the **Description** as **Selection of groups**.
- ☐ From the available selections, define the **Type** as **Alpha**.
- ☐ Assign the **Size** field a value of **20**.
- ☐ Click on the **Display** tab.
- ☐ In the **Prompt** field enter the value **Groups**.
- ☐ Click on the **Validation** tab.
- ☐ Change the **Selections?** Entry to **Window**.
- ☐ In the **Name** field enter **GROUP**.
- ☐ Click the **OK** button.

This is our repository structure definition completed. You can close the Synergy Repository and confirm to save the changes!

Our first coding task is to create the Data Object class so we can define within the Symphony Framework the data elements.

- ☐ Within Visual Studio, right click the **ComboSelection** project in the **Solution Explorer** window.
- ☐ From the dropdown context menu select the **Add** entry and then select the **New Folder** entry.
- ☐ Enter a name of **Model**.

In the **Model** folder we are going to create classes that define the required Data Objects.

We are going to code generate all the **Model** elements so we will create a script file to perform the code generation tasks.

- ☐ Within Visual Studio, right click the **Model** folder in the **Solution Explorer** window.
- ☐ From the dropdown context menu select the **Add** menu entry, and then select the **New Item…** entry.
- ☐ In the **Installed Templates** view ensure that the **Synergy** entry is highlighted.
- ☐ In the **Items** list, locate the **Text File** entry.
- ☐ Change the **Name** to **MakeModel.bat**.
- ☐ Click the **Add** button.

The code generation templates are stored in a folder under the Symphony Framework root folder. We are going to the "Symphony_Data" template which will code generate the required data objects.

- ☐ In the **MakeModel.bat** script file start the script by defining the command **@SETLOCAL**.
- ☐ Define the logical **CODEGEN_TPLDIR** to reference the **%SYMPHONYTPL%** folder.
- ☐ Execute the **codegen** program passing the following command line options:
  - **–t Symphony_Data** *this defines the template to use.*
  - **–r** *denotes to replace any existing files.*
  - **–n ComboSelection.Model** *is the namespace declaration.*
  - **–prefix m** *defines the field prefix value*
  - **–s COMBO** *specifies the repository structure to use.*
- ☐ Because the layout of the data in the file we are going to link against is stored in another repository we are going to define the repository logical in the script.
- ☐ Define the logical **RPSMFIL** to reference the **%SYMPHONYRPS%\rpsmain.ism**.
- ☐ Define the logical **RPSTFIL** to reference the **%SYMPHONYRPS%\rpstext.ism.**
- ☐ Execute the **codegen** program passing the following command line options:
  - **–t Symphony_Data** *this defines the template to use.*
  - **–r** *denotes to replace any existing files.*
  - **–n ComboSelection.Model** *is the namespace declaration.*

- **–ut RPSDATAFILES=”’SYMPHONYRPSLIB’”** *this denotes the local repository files*
- **–prefix m** *defines the field prefix value*
- **–s GROUP** *specifies the repository structure to use.*

☐ Defining the command **@ENDLOCAL**.

☐ Save your changes.

Your script file should contain:

```
@SETLOCAL

set CODEGEN_TPLDIR=%SYMPHONYTPL%

codegen -t Symphony_Data -r -n ComboSelection.Model -prefix m -s COMBO

set RPSMFIL=%SYMPHONYRPS%\rpsmain.ism
set RPSTFIL=%SYMPHONYRPS%\rpstext.ism

codegen -t Symphony_Data -r -n ComboSelection.Model -ut RPSDATAFILES="'SYMPHOPNYRPSLIB'" -prefix m -s GROUP

@ENDLOCAL
```

From the **Tools** menu select the **Command Prompt** entry. This will open a command window.

☐ In the command window, navigate to the “**C:\Users\*userName*\Documents\Visual Studio 2010\Projects\SymphonyAcademy\ComboSelection\Model**” folder.
- Replace *username* with your user name.
- If you have not adopted the recommended folder structure, navigate to the **Model** folder under your main project folder.

☐ Execute the **MakeModel.bat** script.

The files will have been created by the code generator.

You can leave the command window open, but move back to Visual Studio.

☐ Within Visual Studio, right click the **Model** folder in the **Solution Explorer** window.

☐ From the dropdown context menu select the **Add** menu entry, and then select the **Existing Item…** entry.

☐ Navigate to the **Model** folder.

☐ Holding down the shift key, click and highlight the two generated files, **Group_Data.CodeGen.dbc** and **Combo_Data.CodeGen.dbc**.

☐ Click the **Add** button.

☐ To confirm all is in order you can perform a build of the application. You should not encounter any errors. If you do, resolve them. Close the **MakeModel.bat** tab window.

Our next task is to create the File access classes that will allow our application to load data from the Synergy DBMS data files and populate the selection lists.

- ☐ Within Visual Studio, right click the **ComboSelection** project in the **Solution Explorer** window.
- ☐ From the dropdown context menu select the **Add** entry and then select the **New Folder** entry.
- ☐ Enter a name of **DataIO.**

In the **DataIO** folder we are going to create classes that define FileIO capabilities.

We are going to code generate all the **DataIO** elements so we will create a script file to perform the code generation tasks.

- ☐ Within Visual Studio, right click the **DataIO** folder in the **Solution Explorer** window.
- ☐ From the dropdown context menu select the **Add** menu entry, and then select the **New Item…** entry.
- ☐ In the **Installed Templates** view ensure that the **Synergy** entry is highlighted.
- ☐ In the **Items** list, locate the **Text File** entry.
- ☐ Change the **Name** to **MakeDataIO.bat**.
- ☐ Click the **Add** button.

The code generation templates are stored in a folder under the Symphony Framework root folder. We are going to use the "Symphony_FileIO" template which will create a class to perform basic file operations.

- ☐ In the **MakeDataIO.bat** script file start the script by defining the command **@SETLOCAL**.
- ☐ Define the logical **CODEGEN_TPLDIR** to reference the **%SYMPHONYTPL%** folder.
- ☐ Because the layout of the data in the file we are going to link against is stored in another repository we are going to define the repository logical in the script.
- ☐ Define the logical **RPSMFIL** to reference the **%SYMPHONYRPS%\rpsmain.ism**.
- ☐ Define the logical **RPSTFIL** to reference the **%SYMPHONYRPS%\rpstext.ism.**
- ☐ Execute the **codegen** program passing the following command line options:
  - **–t Symphony_FileIO** *this defines the template to use.*
  - **–r** *denotes to replace any existing files.*
  - **–n ComboSelection.DataIO** *is the namespace declaration.*
  - **–ut RPSDATAFILES='SYMPHONYRPSLIB'** *is the namespace declaration.*
  - **–s GROUP** *specifies the repository structure to use.*

- ☐ Defining the command **@ENDLOCAL**.
- ☐ Save your changes.

Your script file should contain:

```
@SETLOCAL

set CODEGEN_TPLDIR=%SYMPHONYTPL%

set RPSMFIL=%SYMPHONYRPS%\rpsmain.ism
set RPSTFIL=%SYMPHONYRPS%\rpstext.ism

codegen -t Symphony_FileIO -r -n ComboSelection.Model -ut RPSDATAFILES="'SYMPHOPNYRPSLIB'" -s GROUP

@ENDLOCAL
```

Return to your command window.

- ☐ Navigate back up a folder and then into the DataIO folder.
- ☐ Execute the **MakeDataIO.bat** script.

The file will have been created by the code generator.

You can leave the command window open, but move back to Visual Studio.

- ☐ Within Visual Studio, right click the **DataIO** folder in the **Solution Explorer** window.
- ☐ From the dropdown context menu select the **Add** menu entry, and then select the **Existing Item…** entry.
- ☐ Navigate to the **DataIO** folder.
- ☐ Click and highlight the generated file **Group_FileIO.CodeGen.**dbc.
- ☐ Click the **Add** button.
- ☐ To confirm all is in order you can perform a build of the application. You should not encounter any errors. If you do, resolve them. Close the **MakeDataIO.bat** tab window.

We are now going to code generate the required classes that will build the selection list options. These classes will be exposed through to the user interface and be presented as the selectable options within the Combo Box.

- ☐ Within Visual Studio, right click the **ComboSelection** project in the **Solution Explorer** window.
- ☐ From the dropdown context menu select the **Add** entry and then select the **New Folder** entry.
- ☐ Enter a name of **Content**.

In the **Content** folder we are going to create classes that will contain the available selections associated with the fields.

We are going to code generate all the Content elements so we will create a script file to perform the code generation tasks.

- ☐ Within Visual Studio, right click the **Content** folder in the **Solution Explorer** window.
- ☐ From the dropdown context menu select the **Add** menu entry, and then select the **New Item…** entry.
- ☐ In the **Installed Templates** view ensure that the **Synergy** entry is highlighted.
- ☐ In the **Items** list, locate the **Text File** entry.
- ☐ Change the **Name** to **MakeContent.bat**.
- ☐ Click the **Add** button.

The code generation templates are stored in a folder under the Symphony Framework root folder. We are going to use two templates. The first template is "Symphony_Collection" which will code generate the collection classes for the fields in the repository structure that are defined as having selection lists assigned to them. The second template is called "Symphony_CollectionFromFile" which will load the collection with entries from a Synergy DBMS data file.

- ☐ In the **MakeContent.bat** script file start the script by defining the command **@SETLOCAL**.
- ☐ Define the logical **CODEGEN_TPLDIR** to reference the %**SYMPHONYTPL**% folder.
- ☐ Execute the **codegen** program passing the following command line options:
  - **–t Symphony_Collection** *this defines the template to use.*
  - **–r** *denotes to replace any existing files.*
  - **–n ComboSelection.Content** *is the namespace declaration.*
  - **–s COMBO** *specifies the repository structure to use.*
- ☐ Because the layout of the data in the file we are going to link against is stored in another repository we are going to define the repository logical in the script.

☐ Define the logical **RPSMFIL** to reference the **%SYMPHONYRPS%\rpsmain.ism**.

☐ Define the logical **RPSTFIL** to reference the **%SYMPHONYRPS%\rpstext.ism**.

☐ Execute the **codegen** program passing the following command line options:

- **–t Symphony_CollectionFromFile** *this defines the template to use.*
- **–r** *denotes to replace any existing files.*
- **–n ComboSelection.Content** *is the namespace declaration.*
- **–ut RPSDATAFILES='SYMPHONYRPSLIB'** *defines the location of the repository files.*
- **–ut SELECTIONFIELD=group_id** *is the name of the field defined as the selection value.*
- **–ut SELECTIONDESCRIPTION=description** *is the name of the field to display in the list.*
- **–s GROUP** *specifies the repository structure to use.*

☐ Defining the command **@ENDLOCAL**.

☐ Save your changes.

Your script file should contain: (please note the second codegen line is split across two lines for legibility and should only be on a single line in your script!)

```
@SETLOCAL

set CODEGEN_TPLDIR=%SYMPHONYTPL%

codegen -t Symphony_Collection -r -n ComboSelection.Content -s COMBO

set RPSMFIL=%SYMPHONYRPS%\rpsmain.ism
set RPSTFIL=%SYMPHONYRPS%\rpstext.ism

codegen -t Symphony_CollectionFromFile -r -n ComboSelection.Content -ut RPSDATAFILES="'SYMPHOPNYRPSLIB'"
    -ut SELECTIONFIELD=groupid -ut SELECTIONDESCRIPTION=description -s GROUP

@ENDLOCAL
```

*note that the second codegen line should be on a single line.

Return to your command window.

☐ Navigate back up a folder and then into the Content folder.

☐ Execute the **MakeContent.bat** script.

The files will have been created by the code generator.

You can leave the command window open, but move back to Visual Studio.

☐ Within Visual Studio, right click the **Content** folder in the **Solution Explorer** window.

☐ From the dropdown context menu select the **Add** menu entry, and then select the **Existing Item…** entry.

☐ Navigate to the **Content** folder.

- ☐ Holding down the shift key, click and highlight the two generated files, **Combo_Collection.CodeGen.**dbc and **Group_CollectionFromFile.CodeGen.**dbc.
- ☐ Click the **Add** button.
- ☐ To confirm all is in order you can perform a build of the application. You should not encounter any errors. If you do, resolve them. Close the **MakeContent.bat** tab window.

The Symphony Framework makes it very easy to build a rich user interface by using the Synergy Repository field definitions to style how input controls appear and how they function. To create these styles we will again use the repository definitions and code-generate the styles for each individual field.

- ☐ Within Visual Studio, right click the **ComboSelection** project in the **Solution Explorer** window.
- ☐ From the dropdown context menu select the **Add** entry and then select the **New Folder** entry.
- ☐ Enter a name of **Resources**.

In the **Resources** folder we are going to create our "styles" resources. There are two classes we are going to code generate here. The first is the Content class. By utilizing the Synergy Repository we can identify fields that have selection lists associated with them and this code generated file will contain references to the selection classes, which will be presented as combo dropdown lists. The second class is the Style resource. This file will define the UI appearance and data binding capabilities of each field in your repository structure.

We are going to code generate all the Resource elements so we will create a script file to perform the code generation tasks.

- ☐ Within Visual Studio, right click the **Resources** folder in the **Solution Explorer** window.
- ☐ From the dropdown context menu select the **Add** menu entry, and then select the **New Item…** entry.
- ☐ In the **Installed Templates** view ensure that the **Synergy** entry is highlighted.
- ☐ In the **Items** list, locate the **Text File** entry.
- ☐ Change the **Name** to **MakeResources.bat**.
- ☐ Click the **Add** button.

The code generation templates are stored in a folder under the Symphony Framework root folder. We are going to use two templates. The first is called "Symphony_Content" which will identify all fields with selection lists assigned and generate the required resource references. The second is "Symphony_Style" which will code generate styles for each individual field for our chosen repository structure.

- ☐ In the **MakeResources.bat** script file start the script by defining the command **@SETLOCAL**.
- ☐ Define the logical **CODEGEN_TPLDIR** to reference the **%SYMPHONYTPL%** folder.
- ☐ Execute the **codegen** program passing the following command line options:
  - **–t Symphony_Content** *this defines the template to use.*
  - **–r** *denotes to replace any existing files.*
  - **–n ComboSelection.Content** *is the namespace declaration.*
  - **–ut ASSEMBLYNAME=ComboSelection** *is the name of the holding namespace.*
  - **–s COMBO** *specifies the repository structure to use.*
- ☐ Execute the **codegen** program passing the following command line options:
  - **–t Symphony_Style** *this defines the template to use.*
  - **–r** *denotes to replace any existing files.*
  - **–n ComboSelection.Content** *is the namespace declaration.*
  - **–ut ASSEMBLYNAME=ComboSelection** *is the name of the holding namespace.*
  - **–s COMBO** *specifies the repository structure to use.*
- ☐ Defining the command **@ENDLOCAL**.
- ☐ Save your changes.

Your script file should contain:

```
@SETLOCAL

set CODEGEN_TPLDIR=%SYMPHONYTPL%

codegen -t Symphony_Content -r -n ComboSelection.Content -ut ASSEMBLYNAME=ComboSelection -s COMBO
codegen -t Symphony_Style -r -n ComboSelection.Content -ut ASSEMBLYNAME=ComboSelection -s COMBO

@ENDLOCAL
```

Return to your command window.

- ☐ Navigate back up a folder and then into the Resources folder.
- ☐ Execute the **MakeResources.bat** script.

The files will have been created by the code generator.

You can leave the command window open, but move back to Visual Studio.

- ☐ Within Visual Studio, right click the **Resources** folder in the **Solution Explorer** window.
- ☐ From the dropdown context menu select the **Add** menu entry, and then select the **Existing Item…** entry.
- ☐ Navigate to the **Resources** folder.

☐ Holding down the shift key, click and highlight the two generated files, **Combo_Content.CodeGen.xaml** and **Combo_Style.CodeGen.xaml**.

☐ Click the **Add** button.

There are additional steps required:

☐ Highlight the recently added **Combo_Content.CodeGen.xaml** file. Right click and select **Properties**. Locate the **Build Action** in the list of properties and change this to be **Resource**.

☐ Highlight the recently added **Combo_Style.CodeGen.xaml** file. Right click and select **Properties**. Locate the **Build Action** in the list of properties and change this to be **Resource**.

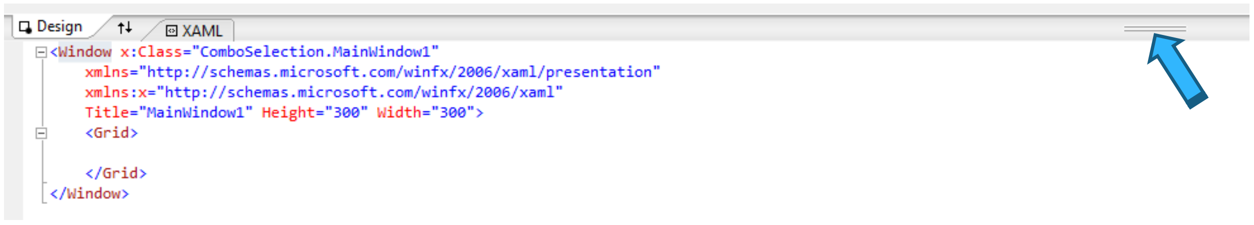
☐ To confirm all is in order you can perform a build of the application. You should not encounter any errors. If you do, resolve them. Close the **MakeResources.bat** tab window.

We have now generated all the main elements that enable your Symphony Framework based application to present your repository based and file based selections. We are now going to apply these to our user interface.

We will now write the XAML code that utilizes all the code generated elements and presents the available selection lists in the form of Combo Box control.

☐ Within Visual Studio, double click the MainWindow1.xaml file to bring the window into the visual designer.

☐ All our coding is going to be in the xaml editor. You can gain additional space by grabbing the splitter bar upwards to reveal a larger xaml editing region.



```
<Window x:Class="ComboSelection.MainWindow1"
    xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
    xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
    Title="MainWindow1" Height="300" Width="300">
    <Grid>

    </Grid>
</Window>
```

To utilize the Symphony Framework we first need to reference it within our xaml code.

☐ At the top of the xaml code, locate the *Title="MainWindow1"* attribute.

☐ Above this line, create a new blank line.

☐ Enter the namespace details that allows us to reference the Symphony Framework elements, **xmlns:symphonyControls="clr-namespace:Symphony.Conductor.Controls;assembly=SymphonyConductor"**

- Please note this is all one line!

☐ locate the *Title="MainWindow1"* attribute and change its value to **"Combo Selection"**.

- ☐ Locate the *Width="300"* attribute and change its value to **"500"**.

```
<Window x:Class="ComboSelection.MainWindow1"
    xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
    xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
    xmlns:symphonyControls="clr-namespace:Symphony.Conductor.Controls;assembly=SymphonyConductor"
    Title="Combo Selection" Height="300" Width="500">
    <Grid>

    </Grid>
</Window>
```

Now we need to add the resources we have code generated that allow us to locate and present the selection list details as combo box controls.

- ☐ In the xaml editor, before the start <Grid> tab add a few blank lines to make the code more readable.
- ☐ Define the **<Window.Resources></Window.Resources>** tags.
- ☐ Within the <Window.Resources></Window.Resources> tags define the **<ResourceDictionary></ResourceDictionary>** tags.
- ☐ Within the <ResourceDictionary></ResourceDictionary> tags define the **<ResourceDictionary.MergedDictionaries></ResourceDictionary.MergedDictionaries>** tags.
- ☐ Within the <ResourceDictionary.MergedDictionaries></ResourceDictionary.MergedDictionaries> tags define the following references.
  - <ResourceDictionary Source="pack://application:,,,/SymphonyConductor;component/Resources/Styles.xaml" />
  - <ResourceDictionary Source="pack://application:,,,/SymphonyConductor;component/Resources/Converters.xaml" />
  - <ResourceDictionary Source="pack://application:,,,/ComboSelection;component/Resources/Combo_Content.Codegen.xaml" />
  - <ResourceDictionary Source="pack://application:,,,/ComboSelection;component/Resources/Combo_Style.Codegen.xaml" />

You resource dictionary referencing code should look like this:

```
<Window.Resources>
    <ResourceDictionary>
        <ResourceDictionary.MergedDictionaries>
            <ResourceDictionary Source="pack://application:,,,/SymphonyConductor;component/Resources/Styles.xaml"/>
            <ResourceDictionary Source="pack://application:,,,/SymphonyConductor;component/Resources/Converters.xaml"/>
            <ResourceDictionary Source="pack://application:,,,/ComboSelection;component/Resources/Combo_Content.CodeGen.xaml"/>
            <ResourceDictionary Source="pack://application:,,,/ComboSelection;component/Resources/Combo_Style.CodeGen.xaml"/>
        </ResourceDictionary.MergedDictionaries>
    </ResourceDictionary>
</Window.Resources>
```

Now we can begin to utilize the code generated styles and content and build our user interface.

- ☐ Our next task is to create a grid layout. Please note that xaml is case sensitive. Allow the editor to assist you.
  - Within the <Grid></Grid> tags define the **<Grid.RowDefinitions></Grid.RowDefinitions>** tags.
  - Within the <Grid.RowDefinitions></Grid.RowDefinitions> tags add four **<RowDefinition>** tags
    - Define the height of the first row as **"*"**.
    - Define the height of the second row as "**auto**".
    - Define the height of the third row as "**auto**".
    - Define the height of the forth row as **"*"**.

You xaml should now look like:

```
<Grid>
    <Grid.RowDefinitions>
        <RowDefinition Height="*"></RowDefinition>
        <RowDefinition Height="auto"></RowDefinition>
        <RowDefinition Height="auto"></RowDefinition>
        <RowDefinition Height="*"></RowDefinition>
    </Grid.RowDefinitions>
</Grid>
```

- ☐ Below the end </Grid.RowDefintions> tag, before the end <Grid> tag, we are going to define the column layout.
  - Define the **<Grid.ColumnDefinitions></Grid.ColumnDefinitions>** tags.
  - Within the <Grid.ColumnDefinitions></Grid.ColumnDefinitions> tags add five **<ColumnDefinition>** tags
    - Define the width of the first column as **"*"**.
    - Define the width of the second column as "**auto**".
    - Define the width of the third column as "**auto**".
    - Define the width of the forth column as "**auto**".
    - Define the width of the fifth column as **"*"**.

You xaml should now look like:

```
<Grid.ColumnDefinitions>
    <ColumnDefinition Width="*"></ColumnDefinition>
    <ColumnDefinition Width="auto"></ColumnDefinition>
    <ColumnDefinition Width="auto"></ColumnDefinition>
    <ColumnDefinition Width="auto"></ColumnDefinition>
    <ColumnDefinition Width="*"></ColumnDefinition>
</Grid.ColumnDefinitions>
```

We can now define the prompts and field controls that allow us to present and process the Combo selections.

- ☐ Below the end </Grid.ColumnDefinitions> tag and above the end </Grid> tag add the following xaml.
- ☐ Define a **<Label>** control, setting the following attributes.
  - Set the **Grid.Row** to a value of **"1"**.
  - Define the **Grid.Column** to **"1"**.
  - Assign the **Style** property a value of **"{StaticResource Combo_Rpslist_prompt}"**.
  - Data bind the **DataContext** property to **"{Binding Path=PrimaryData}"**.
- ☐ Define a **<symphonyControls:FieldControl>** control, setting the following properties.
  - Set the **Grid.Row** to a value of **"1"**.
  - Define the **Grid.Column** to **"2"**.
  - Assign the **Style** property a value of **"{StaticResource Combo_Rpslist_style}"**.
  - Data bind the **DataContext** property to **"{Binding Path=PrimaryData}"**.
- ☐ Define a second **<Label>** control, setting the following attributes.
  - Set the **Grid.Row** to a value of **"2"**.
  - Define the **Grid.Column** to **"1"**.
  - Assign the **Style** property a value of **"{StaticResource Combo_Grouplist_prompt}"**.
  - Data bind the **DataContext** property to **"{Binding Path=PrimaryData}"**.
- ☐ Define a second **<symphonyControls:FieldControl>** control, setting the following properties.
  - Set the **Grid.Row** to a value of **"2"**.
  - Define the **Grid.Column** to **"2"**.
  - Assign the **Style** property a value of **"{StaticResource Combo_Grouplist_style}"**.
  - Data bind the **DataContext** property to **"{Binding Path=PrimaryData}"**.

The resulting xaml should look like:

```
<Label Grid.Row="1" Grid.Column="1"
       Style="{StaticResource Combo_Rpslist_prompt}" DataContext="{Binding Path=PrimaryData}" />
<symphonyControls:FieldControl Grid.Row="1" Grid.Column="2"
        Style="{StaticResource Combo_Rpslist_style}"
        DataContext="{Binding Path=PrimaryData}">
</symphonyControls:FieldControl>

<Label Grid.Row="2" Grid.Column="1"
       Style="{StaticResource Combo_Grouplist_prompt}" DataContext="{Binding Path=PrimaryData}" />
<symphonyControls:FieldControl Grid.Row="2" Grid.Column="2"
        Style="{StaticResource Combo_Grouplist_style}"
        DataContext="{Binding Path=PrimaryData}">
</symphonyControls:FieldControl>
```

To ensure that our backing fields have the correct values in, we shall also display the "raw" storage data.

- ☐ Below previous lines of code add the following xaml.
- ☐ Define a **<TextBlock>** control, setting the following attributes.
    - Set the **Grid.Row** to a value of **"1"**.
    - Define the **Grid.Column** to **"3"**.
    - Specify a **Margin** of **"10,0,0,0"**.
    - Assign the **Text** property to a value of **"{Binding Path=PrimaryData.Rpslist}"**.
- ☐ Define a second **<TextBlock>** control, setting the following attributes.
    - Set the **Grid.Row** to a value of **"2"**.
    - Define the **Grid.Column** to **"3"**.
    - Specify a **Margin** of **"10,0,0,0"**.
    - Assign the **Text** property to a value of **"{Binding Path=PrimaryData.Grouplist}"**.

The resulting xaml should look like:

```
<!--now display the "raw" data-->
<TextBlock Grid.Row="1" Grid.Column="3" Margin="10,0,0,0" Text="{Binding Path=PrimaryData.Rpslist}"></TextBlock>
<TextBlock Grid.Row="2" Grid.Column="3" Margin="10,0,0,0" Text="{Binding Path=PrimaryData.Grouplist}"></TextBlock>
```

The final step is to create and data bind the View Model.

- ☐ Within Visual Studio, right click the **ComboSelection** project in the **Solution Explorer** window.
- ☐ From the dropdown context menu select the **Add** entry and then select the **New Folder** entry.
- ☐ Enter a name of **ViewModel**.

In the **ViewModel** folder we are going to create a class that defines our view model.

- ☐ Within Visual Studio, right click the **ViewModel** folder in the **Solution Explorer** window.
- ☐ From the dropdown context menu select the **Add** menu entry, and then select the **New Item…** entry.
- ☐ In the **Installed Templates** view ensure that the **Synergy** entry is highlighted.
- ☐ In the **Items** list, locate the **Class** entry.
- ☐ Change the **Name** to **ComboViewModel.dbc**.
- ☐ Click the **Add** button.

The created class file will be added to the project and opened in the code editor.

- ☐ Above the *namespace* declaration we need to import the required Symphony Framework namespaces.
  - Import the **Symphony.Conductor.ViewModel** namespace.
  - Import the **ComboSelection.Model** namespace.

Your imports should look like:

```
import Symphony.Conductor.ViewModel
import ComboSelection.Model
```

- ☐ Move the cursor to the **public class** declaration. After the class name of **ComboViewModel** we need to extend the class by referencing the base **MaintenanceViewModel** class defined in the Symphony.Conductor.ViewModel namespace.
- ☐ Within the class definition we are going to create a constructor. The constructor is called when an instance of the class is created. To create the constructor we can use the **ctor** code snippet. Type **ctor <TAB><TAB>** to create the constructor code.
- ☐ The base MaintenanceViewModel class requires that we inject the "view" or "window" which the View Model object is being bound to. To enable this requirement we need to create a single parameter directly below the constructor method definition, above the *endparams* statement. The parameter has the following settings.
  - Make the parameter **inbound**.
  - Classify the parameter as **required**.
  - Name the parameter as **sender**.
  - Make the type **@System.Windows.FrameworkElement**.
- ☐ Below the *endparams* in the data division we can pass this parameter to the base MaintenanceViewModel base class constructor. We are also going to pass a new instance of our Combo_Data data object class. This is the data the window is data bound to.
  - Call the base MaintenanceViewModel class constructor by using the keyword **parent**.
  - Pass the **sender** parameter as the first argument to the **parent** constructor.
  - Pass a **new** instance of the **Combo_Data()** class.

Your class code should look like:

```
public class ComboViewModel extends MaintenanceViewModel

    public method ComboViewModel
        in req sender   ,@System.Windows.FrameworkElement
        endparams
        parent(sender, new Combo_Data())
    proc

    endmethod

endclass
```

The final step is to data bind our View Model to View – our MainWindow1.xaml.

- ☐ In the solution explorer expand the MainWindow1 entry so that you can locate the MainWindow1.xaml.dbl file. Double click this file to bring it into the edit window.
- ☐ Above the namespace declaration add an **import** of the **ComboSelection.ViewModel**.
- ☐ Below the line that reads *this.InitializeComponent()* data bind the ViewModel by assigning the windows **DataContext** property to a **new** instance of the **ComboViewModel()** class. The **ComboViewModel** constructor requires the injection of the View, so pass in **this**.

The resulting code should look like:

```
import ComboSelection.ViewModel

namespace ComboSelection

    public partial class MainWindow1 extends Window

        public method MainWindow1
            endparams
        proc
            this.InitializeComponent()
            this.DataContext = new ComboViewModel(this)
        endmethod

    endclass
endnamespace
```

You should now be able to build the completed solution. If you encounter any errors correct them. When you run the program the user interface will comprise of two combo selection drop-down controls. As you select items from the drop-down lists you will see the raw backing field data being updated.

Congratulations, you have completed the “Combo Box” tutorial. As you can see, with the Symphony Framework and the CodeGen tool you can rapidly create powerful user components that you can re-use throughout your application.