



**Tutorial: Windows Object API Application  
Development**

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**Sybase Unwired Platform 2.2**

**SP03**

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# Sybase Unwired Platform Tutorials

The Sybase® tutorials demonstrate how to develop, deploy, and test mobile business objects, device applications, online mobile applications (native OData and REST services based), and Hybrid App packages. You can also use the tutorials to demonstrate system functionality and train users.

- Learn mobile business object (MBO) basics, and use this tutorial as a foundation for the Object API application development tutorials:

- *Tutorial: Mobile Business Object Development*

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**Note:** For all Object API tutorials, if you opt to use the Mobile Business Object example project instead of performing the Mobile Business Object Tutorial, you must deploy the mobile application project to Unwired Server as a prerequisite.

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- Create native Object API mobile device applications:
  - *Tutorial: Android Object API Application Development*
  - *Tutorial: BlackBerry Object API Application Development*
  - *Tutorial: iOS Object API Application Development*
  - *Tutorial: Windows Object API Application Development*
  - *Tutorial: Windows Mobile Object API Application Development*
- Create a mobile business object, then develop a hybrid app package that uses it:
  - *Tutorial: Hybrid App Package Development*
- Create an OData mobile application with REST Services
  - *Tutorial: Android OData Application Development with REST Services*
  - *Tutorial: iOS OData Application Development with REST Services*



# Getting Started with Unwired Platform

Install and learn about Sybase Unwired Platform and its associated components.

Complete the following tasks for all tutorials, but you need to perform them only once.

**1. *Installing Sybase Unwired Platform***

Install Sybase Mobile SDK and Unwired Platform Runtime.

**2. *Starting Sybase Unwired Platform Services***

Start Unwired Server, Sybase Control Center, the sample database, the cache database (CDB), and other essential services.

**3. *Starting Sybase Unwired WorkSpace***

Start the development environment, where you can create mobile business objects (MBOs), manage enterprise information system (EIS) datasources and Unwired Server connections, develop Hybrid App applications (Hybrid Apps), and generate Object API code.

**4. *Connecting to Sybase Control Center***

Open Sybase Control Center to manage Unwired Server and its components.

**5. *Learning Sybase Unwired WorkSpace Basics***

Sybase Unwired WorkSpace features are well integrated in the Eclipse IDE. If you are unfamiliar with Eclipse, you can quickly learn the basic layout of Sybase Unwired WorkSpace and the location of online help.

## Installing Sybase Unwired Platform

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Install Sybase Mobile SDK and Unwired Platform Runtime.

Before starting this tutorial, install all the requisite Unwired Platform components. See the Sybase Unwired Platform documentation at <http://sybooks.sybase.com>.

- *Release Bulletin*
- *Installation Guide for Sybase Mobile SDK*
- *Installation Guide for Runtime*

**1. Install these Unwired Platform Runtime components:**

- Data Tier (included with single-server installation)
- Unwired Server

**2. Install Mobile SDK, which includes:**

- Development support for native Object API applications, HTML5/JS Hybrid Apps, and native OData SDK applications.
- Sybase Unwired WorkSpace, the Eclipse-based development environment for MBOs and Hybrid Apps.

## Starting Sybase Unwired Platform Services

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Start Unwired Server, Sybase Control Center, the sample database, the cache database (CDB), and other essential services.

The way in which you start Unwired Platform Services depends on the options you selected during installation. You may need to manually start Unwired Platform Services.

Select **Start > (All) Programs > Sybase > Unwired Platform > Start Unwired Platform Services**.

The following services will be started:

- Sybase Control Center <Version>
- Sybase Unwired Cache DB
- Sybase Unwired SampleDB
- Sybase Unwired Server

Unwired Platform Services enable you to access the Unwired Platform runtime components and resources.

## Starting Sybase Unwired WorkSpace

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Start the development environment, where you can create mobile business objects (MBOs), manage enterprise information system (EIS) datasources and Unwired Server connections, develop Hybrid App applications (Hybrid Apps), and generate Object API code.

Select **Start > Programs > Sybase > Unwired Platform > Sybase Unwired WorkSpace**.

The Sybase Unwired WorkSpace opens in the Mobile Development perspective. The Welcome page displays links to the product and information.

### Next

To read more about Sybase Unwired WorkSpace concepts and tasks, select **Help > Help Contents**.

## Connecting to Sybase Control Center

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Open Sybase Control Center to manage Unwired Server and its components.

From Sybase Control Center, you can:

- View servers and their status



- Start and stop a server
- View server logs
- Deploy a mobile application package
- Register application connections
- Set role mappings
- Assign/Unassign a hybrid application to a device

For information on configuring, managing, and monitoring Unwired Server, click **Help > Online Documentation**.

1. Select **Start > Programs > Sybase > Sybase Control Center**.

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**Note:** If Sybase Control Center does not launch, make sure that the Sybase Control Center service is started in the Windows Services dialog.

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2. Log in by entering the credentials set during installation.

Sybase Control Center gives you access to the Unwired Platform administration features that you are authorized to use.

## Learning Sybase Unwired WorkSpace Basics

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Sybase Unwired WorkSpace features are well integrated in the Eclipse IDE. If you are unfamiliar with Eclipse, you can quickly learn the basic layout of Sybase Unwired WorkSpace and the location of online help.

- To access the online help, select **Help > Help Contents**. Some documents are for Sybase Unwired Platform, while others are for the Eclipse development environment.
- The Welcome page provides links to useful information to get you started.
  - To close the Welcome page, click **X**.
  - Reopen the Welcome page by selecting **Help > Welcome**.
  - To learn about tasks you must perform, select the **Development Process** icon.
- In Sybase Unwired WorkSpace, look at the area (window or view) that you will use to access, create, define, and update mobile business objects (MBOs).

Window	Description
WorkSpace Navigator view	<p>Use this view to create Mobile Application projects, and review and modify MBO-related properties.</p> <p>This view displays mobile application project folders, each of which contains all project-related resources in subfolders, including MBOs, datasource references to which the MBOs are bound, personalization keys, and so on.</p>

Window	Description
Enterprise Explorer view	A view that provides functionality to connect to various enterprise information systems (EIS), such as database servers, SAP® back ends, and Unwired Server.
Mobile Application Diagram	<p>The Mobile Application Diagram is a graphical editor where you create and define mobile business objects.</p> <p>Use the Mobile Application Diagram to create MBOs (including attributes and operations), then define relationships with other MBOs. You can:</p> <ul style="list-style-type: none"> <li>• Create MBOs in the Mobile Application Diagram using Palette icons and menu selections – either bind or defer binding to a datasource, when creating an MBO. For example, you may want to model your MBOs before creating the datasources to which they bind. This MBO development method is sometimes referred to as the top-down approach.</li> <li>• Drag and drop items from Enterprise Explorer to the Mobile Application Diagram to create the MBO – quickly creates the operations and attributes automatically based on the datasource artifact being dropped on the Mobile Application Diagram.</li> </ul> <p>Each new mobile application project generates an associated mobile application diagram.</p>
Palette	The Palette is accessed from the Mobile Application Diagram and provides controls, such as the ability to create MBOs, add attributes and operations, and define relationships, by dragging and dropping the corresponding icon onto the Mobile Application Diagram or existing MBO.
Properties view	Select an object in the Mobile Application Diagram to display and edit its properties in the Properties view. While you cannot create an MBO from the Properties view, most development and configuration is performed here.

Window	Description
Outline view	Displays an outline of the active file and lists structural elements. The contents are editor-specific.
Problems view	Displays validation errors or warnings that you may encounter in addition to errors in the Diagram editor and Properties view. Follow warning and error messages to adjust MBO properties and configurations to avoid problems, and use as a valuable source for collecting troubleshooting information when reporting issues to Customer Service and Support.
Error Log view	Displays error log information. This is a valuable source for collecting troubleshooting information.



# Developing a Windows Application

Generate code for the Windows platform based on the MBOs, add additional code to develop a Windows Mobile device application, and test its functionality.

## Prerequisites

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**Note:** This tutorial was created using Sybase Unwired Platform 2.2 SP02, Microsoft .NET Framework 3.5, and Visual Studio 2008, and executed on Windows 7 Professional SP 1. If you use different versions, some steps may vary.

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- Complete the tasks in *Getting Started with Unwired Platform*.
- Install Visual Studio 2008.
- Install Microsoft .NET Framework 3.5 from <http://www.microsoft.com/en-us/download/details.aspx?id=21>, if it was not installed with Visual Studio.
- Either:
  - create the MBO project by completing *Tutorial: Mobile Business Object Development*, or
  - download and deploy the MBO SUP101 example project (complete project files) from the SAP® Community Network: <http://scn.sap.com/docs/DOC-8803>.

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**Note:** If you upgrade Sybase Mobile SDK after completing the tutorial, you can convert the project to the current SDK by importing the earlier project into the Unwired Workspace and then accepting the confirmation prompt.

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- (Optional) To use as a reference and copy source code when completing this tutorial, download the 2.2 SP02 version of the Windows SUP 101 example project (source code only) from the SAP® Community Network: <http://scn.sap.com/docs/DOC-8803>.

## Task

Create a Windows native application that communicates with the mobile business objects that are deployed to Unwired Server.

## Generating C# Object API Code

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Generate Object API code for Windows Mobile devices.

## Prerequisites

1. Connect to both the sampled database and Unwired Server. Code generation fails if the server-side (run-time) enterprise information system (EIS) data sources referenced by the

MBOs in the project are not running and available to connect to when you generate object API code.

2. Switch to the Advanced developer profile to see advanced options in Sybase Unwired WorkSpace.

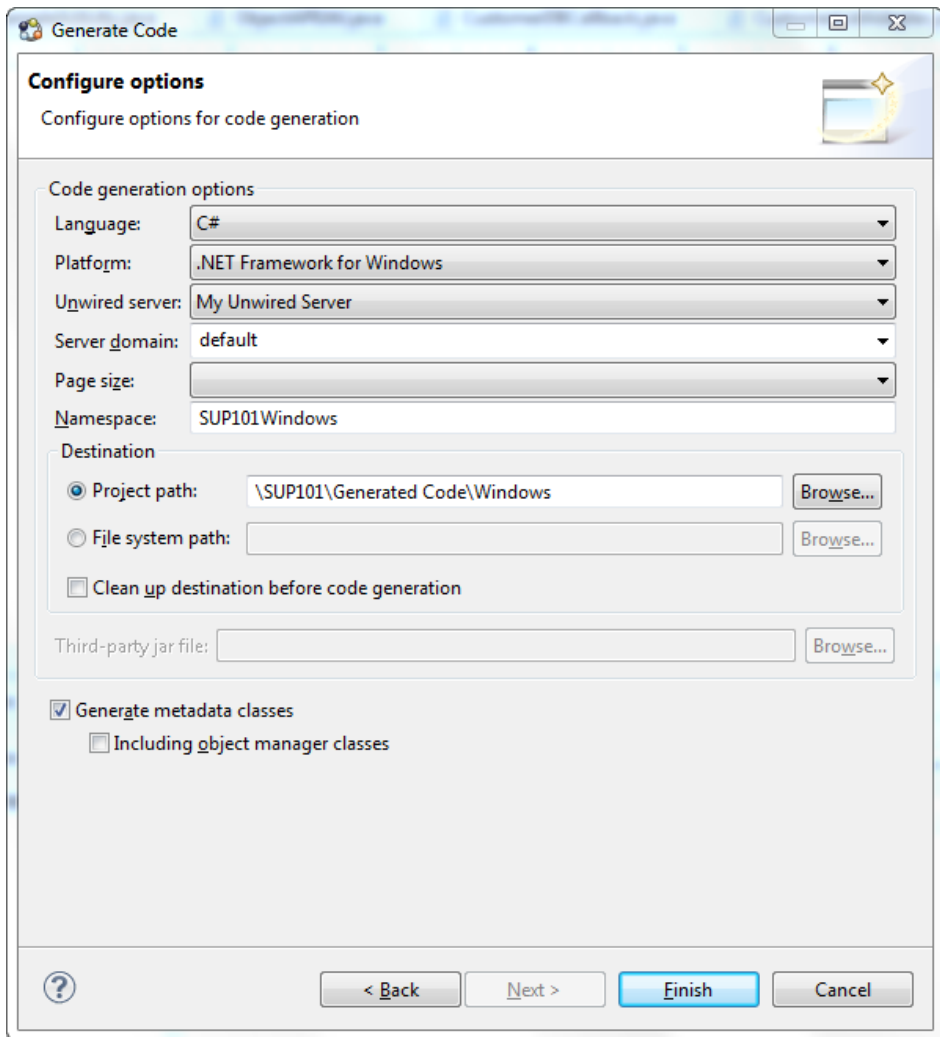
### Task

1. Start Sybase Unwired WorkSpace, using the same workspace location you used when you created the SUP101 project in the MBO tutorial.
2. In Sybase Unwired WorkSpace, open the **SUP101** mobile application project.  
In WorkSpace Navigator, right-click the **SUP101** folder and select **Open in Diagram Editor**.
3. In WorkSpace Navigator, expand SUP101. Under Generated Code, add a folder named Windows.
4. Right-click anywhere in the SUP101 - Mobile Application Diagram and select **Generate Code**.
5. On the Code generation configuration screen, click **Next**.
6. In the Select Mobile Business Objects window, select the Customer MBO, then click **Next**.

Ignore any warning about unresolved mobile business object dependencies.

7. Enter the information for these configuration options:

Option	Description
Language	Select <b>C#</b> .
Platform	Select <b>.NET Framework for Windows</b> .
Unwired Server	Select <b>My Unwired Server</b> .
Server domain	Select <b>default</b> .
Page size	Select <blank> (replacing 1024).
Namespace	Enter SUP101Windows.
Project path	Enter \SUP101\Generated Code \Windows.



**8. Click Finish.**

If you see a success notification dialog, click **OK**.

In the Generated Code directory, you see `Windows\src\SUP101Windows`.

## Creating the User Interface for the Windows Application

Import the SUP101 project in to Visual Studio 2008, configure the project, then download the tutorial code snippets from SAP Community Network (SCN) so you can create the application user interface.

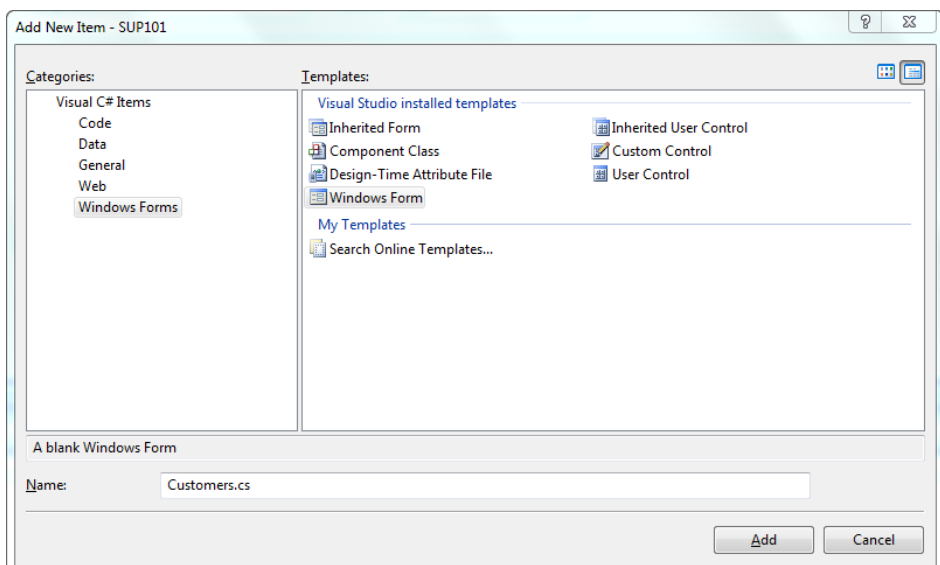
The C# Object API code you generated from the MBO project is located in your Eclipse workspace under `..\SUP101\Generated Code\Windows`.

1. From WorkSpace Navigator, double-click on `\SUP101\Generated Code\Windows\src\SUP101.csproj` to open the project in Visual Studio 2008.
2. Edit the project properties:
  - a) In Solution Explorer, under 'SUP101' (1 Project), right-click **SUP101**, then select **Properties**.
  - b) In the Application tab, set "Output type" to **Console Application**.
  - c) Select **File > Save All**, then save the solution as `SUP101.sln`.

## Creating the Customers Form

Create the user interface for the Customers form.

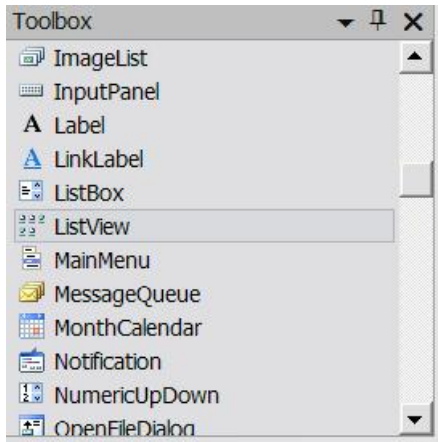
1. In Solution Explorer, under Solution 'SUP101' (1 project), right-click the **SUP101** project and select **Add > New Item**.
2. In the Add New Item Categories section, select **Windows Forms**. From the Templates section, select **Windows Form**. Enter `Customers.cs` as the form name and click **Add**.



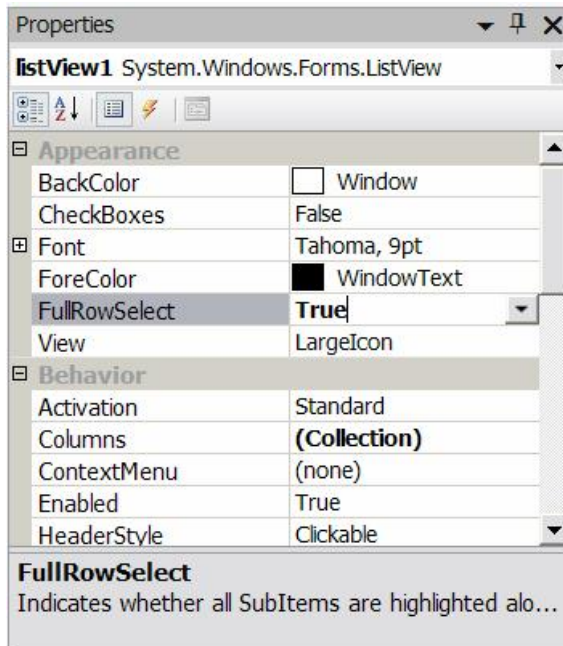


An empty form, **Customers**, appears on the Customers.cs [Design] tab.

3. From the Toolbox, drag and drop three buttons onto the form.
4. Select each button and ,in the Properties view, change the **Text** of the buttons to:
  - button1 – Initialize Application
  - button2 – Load Data
  - button3 – Update Customer
5. In the Toolbox, under Common Controls, drag **ListView** and drop it onto the Customers form.

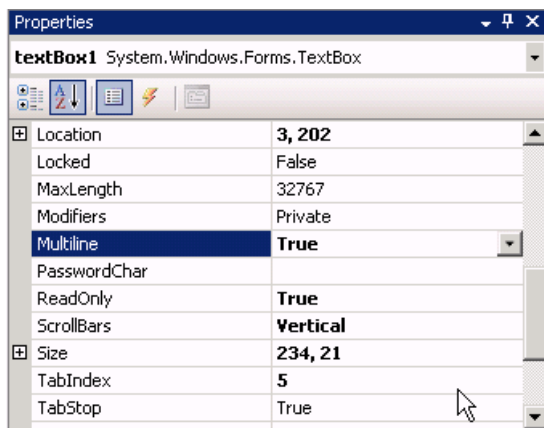


6. In the Toolbox, under Common Controls, drag **Textbox** and drop it onto the Customers form.
7. In the Customers form, click the **ListView** control, then in the Properties pane, set **FullRowSelect** to **True**.

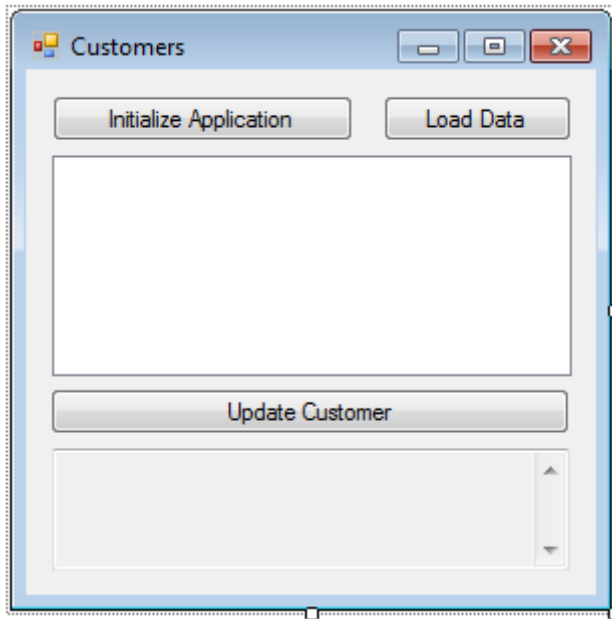


8. In the Customers form, select the **Textbox**, then in the Properties pane, set these properties:

- Multiline – True
- ReadOnly – True
- ScrollBars – Vertical



9. Arrange the controls on the Customers form so they look like this:



10. Save the `Customers.cs` form.
11. In Solution Explorer, in the SUP101 project, right-click **Customers.cs**, then select **View Code**.
12. Replace the code with the source code from the `Customers.cs` file you downloaded from the SAP Community Network (SCN) Web site, also provided below:  
Edit the bolded code lines to match the Sybase Unwired Platform Admin login, password, and host you indicated during installation.

```
using System;
using System.Linq;

using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Text;
using System.Windows.Forms;
using SUP101Windows;
using Sybase.Mobile;
using Sybase.Persistence;
using Sybase.Collections;

namespace SUP101Windows
{
    public delegate void DelegateAddString(String s);
    public delegate void DelegateRefreshItem(long i);
    public partial class Customers : Form
    {
        private const String USERNAME = "supAdmin";
    }
}
```

```

        private const String PASSWORD = "s3pAdmin";
        private const String HOST = "...";
        private const int PORT = 5001;
        private const int TIMEOUT = 600;
        private System.Collections.Generic.Dictionary<string,
long> IdToSK = new System.Collections.Generic.Dictionary<string,
long>();

        internal static
System.Collections.Generic.Dictionary<long, int> SKToIndex = new
System.Collections.Generic.Dictionary<long, int>();

        DelegateAddString m_DelegateAddString;

        DelegateRefreshItem m_refreshItem;

        public Customers()
        {
            InitializeComponent();
            m_DelegateAddString = new
DelegateAddString(this.AddString);
            m_refreshItem = new
DelegateRefreshItem(this.RefreshListItem);
        }

        internal void RefreshListItem(long sk)
        {
            int index = SKToIndex[sk];
            listView1.BeginUpdate();
            ListViewItem item = listView1.Items[index];
            String id = item.Text;

            Customer thisCustomer =
Customer.FindByPrimaryKey(Int32.Parse(id));
            item.SubItems[1].Text = thisCustomer.Fname;
            item.SubItems[2].Text = thisCustomer.Lname;
            listView1.EndUpdate();
        }

        private void AddString(String s)
        {
            textBox1.Text += s + "\r\n";
            textBox1.SelectionStart = textBox1.Text.Length;
            textBox1.ScrollToCaret();
            textBox1.Refresh();
        }

        private void InitializeApplication_Click(object sender,
EventArgs e)
        {
            Sybase.Mobile.Application app =
Sybase.Mobile.Application.GetInstance();
            app.ApplicationIdentifier = "SUP101";
            MyCallbackHandler.textBox1 = textBox1;
            SUP101DB.RegisterCallbackHandler(new
MyCallbackHandler());
            SUP101DB.SetApplication(app);
        }
    
```

```

        SUP101DB.GetSynchronizationProfile().ServerName = HOST;

        ConnectionProperties connProps =
app.ConnectionProperties;
        LoginCredentials loginCredentials = new
LoginCredentials(USERNAME, PASSWORD);

        connProps.LoginCredentials = loginCredentials;
        connProps.ServerName = HOST;
        connProps.PortNumber = PORT;

        if (app.RegistrationStatus !=
RegistrationStatus.REGISTERED)
        {
            AddString("Application registering ... ");
            app.RegisterApplication(TIMEOUT);
            AddString("Application registered");
        }
        else
        {
            AddString("Connecting to server ...");
            app.StartConnection(TIMEOUT);
            AddString("Connected to server");
        }

        if (!SUP101DB.IsSynchronized("default"))
        {
            SUP101DB.DisableChangeLog();
            AddString("Package synchronizing ...");
            SUP101DB.Synchronize(); // Initial Synchronize

            ISynchronizationGroup sg =
SUP101DB.GetSynchronizationGroup("default");
            sg.EnableSIS = true;
            sg.Save();
            SUP101DB.Synchronize();
            AddString("Package synchronized");
        }
        SUP101DB.EnableChangeLog();
        AddListView();
    }

    private void LoadData_Click(object sender, EventArgs e)
    {
        if
(Sybase.Mobile.Application.GetInstance().RegistrationStatus ==
RegistrationStatus.REGISTERED)
        {
            Cursor.Current = Cursors.WaitCursor;
            AddString("Loading data from database ...");
            AddDataToListView();
            Cursor.Current = Cursors.Default;
        }
        else
        {
            AddString("Application is not initialized!");

```

```

    }
}

private void AddListView()
{
    this.listView1.Clear();
    listView1.Columns.Add("Id", listView1.Width / 4,
HorizontalAlignment.Left);
    listView1.Columns.Add("First Name", listView1.Width /
3, HorizontalAlignment.Center);
    listView1.Columns.Add("Last Name", listView1.Width / 3,
HorizontalAlignment.Right);
    listView1.View = View.Details;
    listView1.FullRowSelect = true;
}

private void AddDataToListView()
{
    this.listView1.Clear();
    listView1.Columns.Add("Id", listView1.Width / 4,
HorizontalAlignment.Left);
    listView1.Columns.Add("First Name", listView1.Width /
3, HorizontalAlignment.Center);
    listView1.Columns.Add("Last Name", listView1.Width / 3,
HorizontalAlignment.Right);
    listView1.View = View.Details;
    listView1.FullRowSelect = true;

    Query query = new Query();
    query.Select("x.fname, x.lname, x.surrogateKey, x.id");
    query.From("Customer", "x");
    query.OrderBy("id",
Sybase.Persistence.SortOrder.ASCENDING);

    int index = 0;
    QueryResultSet rs = SUP101DB.ExecuteQuery(query);
    while (rs.Next())
    {
        String fname = rs.GetString(1);
        String lname = rs.GetString(2);
        long sk = rs.GetLong(3);
        String id = rs.GetString(4);

        ListViewItem item = new ListViewItem(id);
        item.SubItems.Add(fname);
        item.SubItems.Add(lname);
        listView1.Items.Add(item);

        IdToSK.Add(id, sk);
        SKToIndex.Add(sk, index++);
    }
}

private void update_Click(object sender, EventArgs e)
{

```

```

        if (listView1.FocusedItem != null)
        {
            Program.setCustomer(listView1.FocusedItem.Text);
            Program.getForm2().Visible = true;
            Program.getForm1().Visible = false;
        }
        else
            MessageBox.Show("Please select a row");
    }
    private void Send_Click(object sender, EventArgs e)
    {
        Customer.SubmitPendingOperations();
    }
    public class MyCallbackHandler :
Sybase.Persistence.DefaultCallbackHandler
    {
        public static TextBox textBox1 = new TextBox();

        private void invokeDelegate(long i)
        {
            Customers f = Program.getForm1();
            f.Invoke(f.m_refreshItem, new Object[] { i });
        }

        public override SynchronizationAction
OnSynchronize(GenericList<ISynchronizationGroup> groups,
SynchronizationContext context)
        {
            if (context.Status ==
SynchronizationStatus.FINISHING || context.Status ==
SynchronizationStatus.ASYNC_REPLAY_UPLOADED)
            {
                Query query = new Query();
                GenericList<IChangeLog> changeLogs =
SUP101DB.GetChangeLogs(query);
                foreach (IChangeLog changeLog in changeLogs)
                {
                    if (changeLog.EntityType ==
EntityType.Customer)
                    {
                        invokeDelegate(changeLog.SurrogateKey);
                    }
                }
            }

            return SynchronizationAction.CONTINUE;
        }
    }
}

```

13. Click the **Customers.cs[Design]** tab to return to the Customers form design view to add event handlers to the buttons.

a) Click the **InitializeApplication** button on the form.

- b) In the Properties view for the button, click the **Event** icon (lightning bolt).
- c) Next to Click, select **InitializeApplication\_Click**.
- d) Repeat these steps for each button, selecting these events for each Click data binding:
  - LoadData – **LoadData\_Click**
  - Update Customer – **update\_Click**

14. Save your changes.

### Creating the Customer Details Form

Create the user interface for the Customer\_Details form.

1. Add another Windows Form, named `Customer_Details.cs`, to the project.
2. From the Toolbox, drag and drop three labels onto the `Customer_Details` form.
3. Align the labels on the left side of the form.

In the Properties view, in the Text field, rename the labels `Cust ID`, `First Name`, and `Last Name`.

4. From the Toolbox, drag and drop three text boxes onto the `Customer_Details` form and align them to the right of each of the three labels.
5. From the Toolbox, drag and drop one button from Common Controls onto the `Customer_Details` form below the labels and text boxes.
6. In the Properties view, in the Text field, rename the button `Submit`.

7. Save the `Customer_Details.cs` form.



8. In Solution Explorer, in the SUP101 project, right-click **Customer\_Details.cs**, then select **View Code**.
9. Replace the existing code with the code from the `Customer_Details.cs` file you downloaded from the SAP Community Network (SCN) Web site, also provided below:

```
using System;

using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Text;
using System.Windows.Forms;

using SUP101Windows;
using Sybase.Collections;
using Sybase.Persistence;

namespace SUP101Windows
{
    public partial class Customer_Details : Form
    {
        Customer thisCustomer;
        public Customer_Details()
        {
            InitializeComponent();
        }

        private void submit_Click(object sender, EventArgs e)
        {
            thisCustomer.Fname = textBox2.Text;
            thisCustomer.Lname = textBox3.Text;
            thisCustomer.Save();
            thisCustomer.SubmitPending();

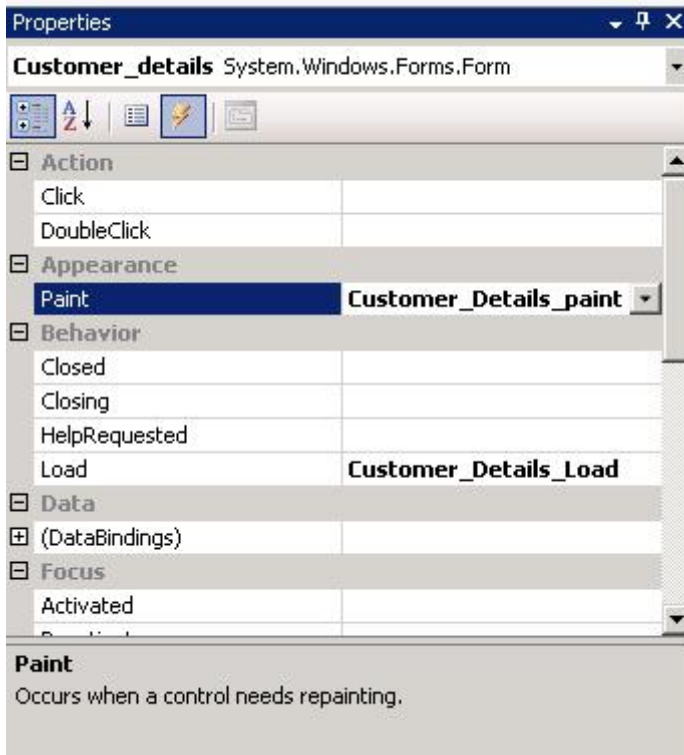
            ISynchronizationGroup sg =
SUP101DB.GetSynchronizationGroup("default");
            GenericList<ISynchronizationGroup> syncGroups = new
GenericList<ISynchronizationGroup>();
            syncGroups.Add(sg);
            SUP101DB.BeginSynchronize(syncGroups, "");

            Program.getForm1().Visible = true;

Program.getForm1().RefreshListItem(thisCustomer.SurrogateKey);
            Program.getForm2().Visible = false;
        }
        private void AddDataToForm()
        {
            textBox1.Text = Program.getCustomer();
            int id = Int32.Parse(Program.getCustomer());
            thisCustomer = Customer.FindByPrimaryKey(id);
            textBox2.Text = thisCustomer.Fname;
            textBox3.Text = thisCustomer.Lname;
        }
    }
}
```

```
private void Customer_Details_Load(object sender, EventArgs e)
{
    AddDataToForm();
}
private void Customer_Details_paint(object sender, PaintEventArgs e)
{
    AddDataToForm();
}
}
```

10. In the Customer\_Details.cs[Design] view, click the **Submit** button, then in the Properties view, click the **Event** icon (lightning bolt). Next to Click, select the submit\_Click event from the drop-down list.
11. Add events to Customer\_Details.cs:
  - a) Click the **Customer\_Details.cs [Design]** tab.
  - b) In Properties view, select **Customer\_Details System.Windows.Forms.Form** from the drop-down list at the top of the view.
  - c) Click the **Events** icon (lightning bolt).
  - d) In Load, add the **Customer\_Details\_Load** event.
  - e) In Paint, add the **Customer\_Details\_paint** event.



12. Save your changes.

## Creating the Main Program File

Create the `Program.cs` file, which is the main entry point for the application.

1. In the Solution Explorer, right-click **SUP101**, then select **Add > New Item**.
2. In Categories, select **Code** and in Templates, select **Code File**.
3. Name the code file `Program.cs`, then click **Add**.

An empty code tab titled `Program.cs` opens.

4. Copy the code from the `Program.cs` file you downloaded from the SAP Community Network (SCN) Web site, also provided below, into the `Program.cs` tab.

```
using System;
using SUP101Windows;
using System.Windows.Forms;

namespace SUP101Windows
{
    static class Program
    {
        /// <summary>
        /// The main entry point for the application.
    }
}
```

```
/// </summary>private static Customers _form1 = new
Form1();
private static Customers _form1 = new Customers();
private static Customer_Details _form2 = new
Customer_Details();
private static string _custid;
public static string getCustomer()
{
    return _custid;
}
public static void setCustomer(string custid)
{
    _custid = custid;
}
public static Customers getForm1()
{
    return _form1;
}
public static Customer_Details getForm2()
{
    return _form2;
}
static void Main(string[] args)
{
    Application.Run(_form1);
}
}
```

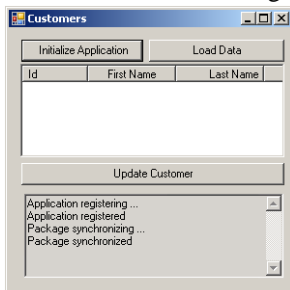
5. Save your changes.
6. Build the project by pressing **Ctrl+Shift+B**.

## Deploying and Running the Device Application

Deploy the application and test its functionality.

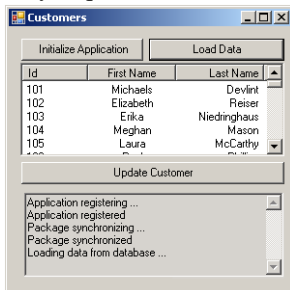
1. In Visual Studio, run the application by pressing **Ctrl+F5**.
2. Click **InitializeApplication**.

Inside `InitializeApplication`, the application is registering and synchronizing data from the backend server. A message displays in the output box below when complete.

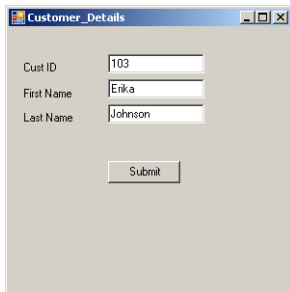


3. Click **LoadData** to populate Customer data in the list view.

To improve performance, SUP101DB.ExecuteQuery queries the customer list, selecting only required columns (fname, lname...) instead of the entire customer object.



4. Highlight a customer record and click **Update Customer**.



5. Make changes, then click **Submit** to return to the Customers List screen.

Inside Submit, customer information is updated and SUP101DB.beginSynchronize is called in the background to avoid blocking the user interface.



# Learn More About Sybase Unwired Platform

Once you have finished, try some of the other samples or tutorials, or refer to other development documents in the Sybase Unwired Platform documentation set.

Check the Product Documentation Web site regularly for updates: <http://sybooks.sybase.com/sybooks/sybooks.xhtml?id=1289&c=firsttab&a=0&p=categories>, then navigate to the most current version.

## *Tutorials*

Try out some of the other getting started tutorials available on the Product Documentation Web site to get a broad view of the development tools available to you.

## *Example Projects*

An example project contains source code for its associated tutorial. It does not contain the completed tutorial project. Download example projects from the SAP® Community Network (SCN) at <http://scn.sap.com/docs/DOC-8803>.

## *Samples*

Sample applications are fully developed, working applications that demonstrate the features and capabilities of Sybase Unwired Platform.

Check the SAP® Development Network (SDN) Web site regularly for new and updated samples: <https://cw.sdn.sap.com/cw/groups/sup-apps>.

## *Online Help*

See the online help that is installed with the product, or available from the Product Documentation Web site.

## *Developer Guides*

Learn best practices for architecting and building device applications:

- *Mobile Data Models: Using Data Orchestration Engine* – provides information about using Sybase Unwired Platform features to create DOE-based applications.
- *Mobile Data Models: Using Mobile Business Objects* – provides information about developing mobile business objects (MBOs) to fully maximize their potential.
- *SAP Mobile WorkSpace: Mobile Business Object Development* – provides information about using SAP Mobile Platform to develop MBOs and generate Object API code that can be used to create native device applications and Hybrid Apps.

Use the appropriate API to create device applications:

- *Developer Guide: Android Object API Applications*
- *Developer Guide: BlackBerry Object API Applications*

## Learn More About Sybase Unwired Platform

- *Developer Guide: iOS Object API Applications*
- *Developer Guide: Windows and Windows Mobile Object API Applications*
- *Developer Guide: Hybrid Apps*
- *Developer Guide: OData SDK*
- *Developer Guide: REST API Applications*

Customize and automate:

- *Developer Guide: Unwired Server Runtime > Management API* – customize and automate system administration features.

Javadoc and HeaderDoc are also available in the installation directory.



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