



Demo: Embedding Java GUI elements inside a .NET Windows Form

Version 6.0

JNBridge, LLC
www.jnbridge.com

COPYRIGHT © 2002–2011 JNBridge, LLC. All rights reserved.

JNBridge is a registered trademark and JNBridgePro and the JNBridge logo are trademarks of JNBridge, LLC.

Java is a registered trademark of Oracle and/or its affiliates. Microsoft, Visual Studio, and IntelliSense are trademarks or registered trademarks of Microsoft Corporation in the United States and other countries. Apache is a trademark of The Apache Software Foundation.

All other marks are the property of their respective owners.

April 26, 2011

Introduction

This document shows how a Java GUI element (an AWT or Swing component – SWT is not currently supported in this scenario) can be embedded inside a .NET Windows Form. If you are unfamiliar with JNBridgePro, we recommend that you work through one of the other demos first. We recommend working through the “Log demo,” which will work through the entire process of generating proxies and setting up, configuring, and running an interop project. This current document assumes such knowledge, and is mainly a guided tour of the code and configuration information necessary to embed Java GUI elements inside GUI-based .NET applications.

The Java GUI component

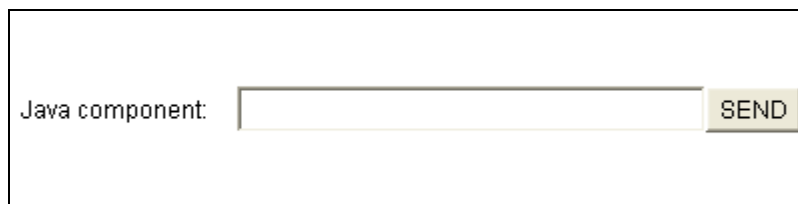
In this example, we have provided a simple AWT-based Java component, `jInN.JavaComponent`. (Swing components will work as well, but embedding SWT components inside .NET Windows Forms is not currently supported.)

```
public class JavaComponent extends Panel {
    public TextField javaTextBox;
    Button btn;

    public JavaComponent() {
        setSize(400, 100);
        setLayout(new GridBagLayout());
        add(new Label("Java component: "));
        javaTextBox = new TextField(30);
        btn = new Button("SEND");
        add(javaTextBox);
        add(btn);
    }

    public void addActionListener(ActionListener l)
    {
        btn.addActionListener(l);
    }
}
```

Any Java GUI component to be embedded inside a WinForm must be derived from `java.awt.Component`. The `JavaComponent` class above is derived from `java.awt.Panel`, which is a subclass of `java.awt.Component`. `JavaComponent` contains a `TextField` and a button; the `TextField` is public, so outside code can get and set the field’s text, and a public method makes it possible to add an `ActionListener` for the button. `JavaComponent` should look like the following:

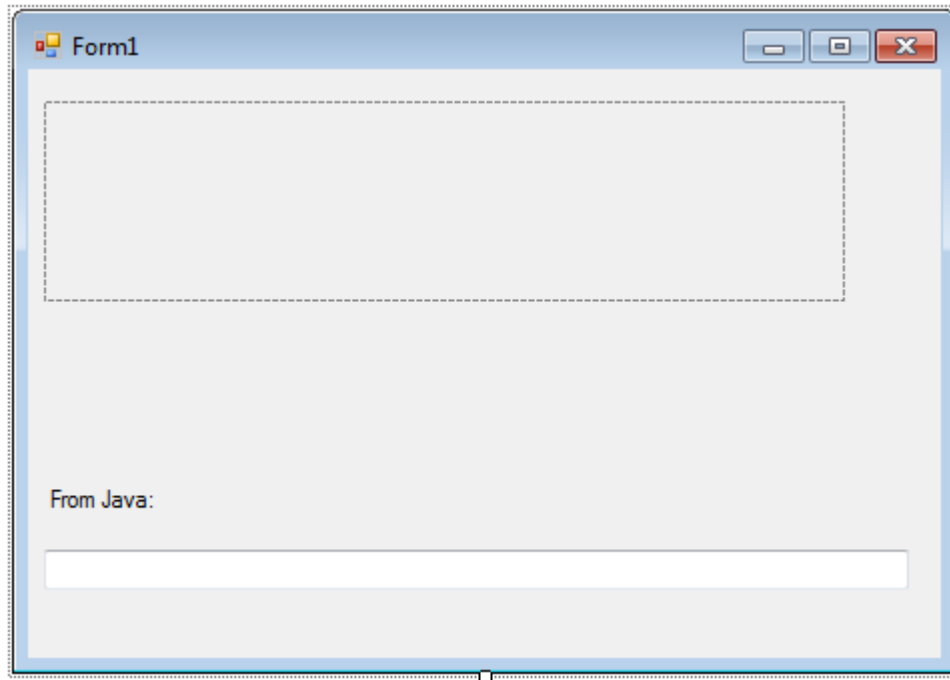


Generating the proxies

We have provided a proxy assembly `javaComponentProxies.dll`, which contains the proxies for `jInN.JavaComponent`, plus all supporting classes. However, it is straightforward to generate the proxies oneself.

Embedding the Java component inside the Windows Form

We have prepared a .NET Windows Form to contain the embedded Java component:



Note that the form contains a WinForms Panel component (highlighted), named `javaHolder`, which is the same size as the Java component, which will be embedded inside the panel.

Inside the form's constructor, we have added the following lines:

```
JavaComponent jcp = new JavaComponent();  
jc = new JavaControl(jcp, 400, 100);  
javaHolder.Controls.Add(jc);
```

The code first instantiates the proxy for the Java component (`JavaComponent`), then embeds it inside a special wrapper, `com.jnbridge.embedding.JavaControl`, which inherits from `System.Windows.Forms.Control`, and which allows the Java component to be used wherever a .NET Control is expected. Note that the Java component's size (400 pixels wide and 100 pixels high) must be supplied to the `JavaControl` constructor. Finally, the wrapped Java component is added to the `javaHolder` panel.

We have also created a callback class that implements `java.awt.event.ActionListener`, and which will be executed whenever the Java component's button is clicked:

```
[AsyncCallback("java.awt.event.ActionListener")]  
public class DotNetActionListener : ActionListener
```

```
{
    private java.awt.TextField javaTextBox;
    private TextBox dotNetTextBox;

    public DotNetActionListener(java.awt.TextField jTB, TextBox dNTB)
    {
        javaTextBox = jTB;
        dotNetTextBox = dNTB;
    }

    public void actionPerformed(ActionEvent p1)
    {
        string s = javaTextBox.getText();
        dotNetTextBox.Text = s;
    }
}
```

The callback code extracts the text from the Java TextField, and writes it to the .NET TextBox. The callback is instantiated and registered with the Java component as an ActionListener by the following line in the form's constructor:

```
jcp.addActionListener(
    new DotNetActionListener(jcp.javaTextBox, dotNetTextBox));
```

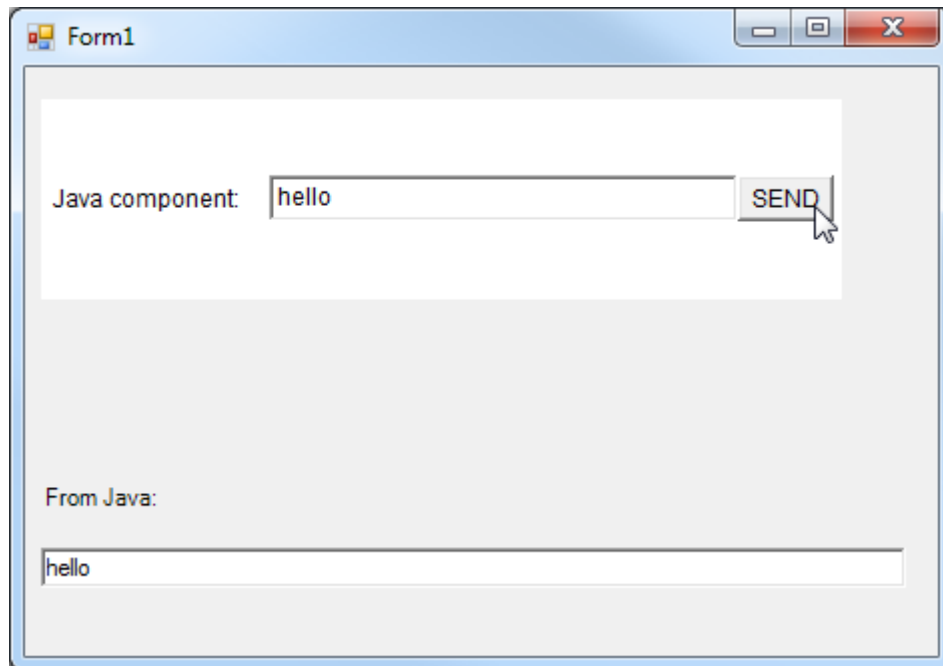
Configuring and running the application

The project is constructed in the same way as other .NET-to-Java interop projects. The communications mechanism must be shared memory:

```
<jnbridge>
<dotNetToJavaConfig scheme="sharedmem"
  jvm="C:/Program Files/Java/jre6/bin/client/jvm.dll"
  jnbcore="C:/Program Files/JNBridge/JNBridgePro v6.0/jnbcore/jnbcore.jar"
  bcel="C:/Program Files/JNBridge/JNBridgePro v6.0/jnbcore/bcel-5.1-jnbridge.jar"
  classpath="../../../../Java"
/>
</jnbridge>
```

The one other special consideration is that copies of the files jawt.dll and jnbjavaentry.dll must be placed in the same folder as the .NET .exe file. If either is not there, an exception will be thrown. A copy of jawt.dll can be found in the jre\bin folder (if you are using a J2SDK) or in the bin folder (if you are using a JRE).

When the .NET application is run, the Java component appears embedded in the WinForms application, and when text is entered in the Java component's text field and the SEND button is clicked, the text will appear in the .NET form's text box, illustrating how the .NET and Java GUI elements communicate.



Summary

The above example shows how simple it is to embed a Java GUI component inside a .NET Windows Form. This embedding can be accomplished in four steps:

- Proxy the Java component and the supporting classes
- Create a panel of the proper size in the .NET Windows Form.
- Write code to wrap the Java component's proxy in the special JavaControl wrapper class, and add that JavaControl object to the .NET panel.
- Create .NET classes to implement any ActionListeners, and register them with the Java component's proxy,