



First Look: The Java Gateway and InterSystems Products

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First Look: The Java Gateway and InterSystems Products

This First Look explains how to use the Java Gateway to interoperate with Java components in InterSystems IRIS® data platform. In this exploration, you will first create a sample JAR file. You will then create and start a Java Gateway in the InterSystems IRIS Management Portal. You will programmatically import the sample JAR file that you created. Finally, you will create and manipulate some proxy classes and objects in ObjectScript.

To give you a taste of the Java Gateway without bogging you down in details, we've kept this exploration simple. These activities are designed to only use the default settings and features, so that you can acquaint yourself with the fundamentals of the feature without having to deal with details that are off-topic or overly complicated. When you bring the Java Gateway to your production systems, there may be things you will need to do differently. Be sure not to confuse this exploration of the Java Gateway with the real thing! The sources provided at the end of this document will give you a good idea of what is involved in using the Java Gateway in production.

To browse all of the First Looks, including those that can be performed on a free Community Edition instance as described below, see [InterSystems First Looks](#).

1 Why the Java Gateway is Important

The Java Gateway provides an easy way for InterSystems IRIS to interoperate with Java components. After importing a JAR file using the Java Gateway, you can instantiate an external Java object and manipulate it as if it were a native object within InterSystems IRIS. You will have access to your Java classes and methods from within InterSystems IRIS and ObjectScript!

Internally, the Java Gateway generates one-to-one ObjectScript proxies for each and every Java class. In general, the best approach to using the Java Gateway is to build a small Java wrapper class that exposes just the functionality you want, and then to create a proxy for this wrapper.

2 Exploring the Java Gateway

We have developed a brief demo that shows you how to work with the Java Gateway and InterSystems IRIS. (Want to try an online video-based demo of InterSystems IRIS Java development and interoperability features? Check out the [Java QuickStart!](#))

2.1 Before you Begin

To use the procedure, you will need a system to work on, with version 1.8 of the JDK and a Java IDE of your choice installed, and a running InterSystems IRIS instance to connect to. Your choices for InterSystems IRIS include several types of licensed and free evaluation instances; the instance need not be hosted by the system you are working on (although they must have network access to each other). For information on how to deploy each type of instance if you do not already have one to work with, see [Deploying InterSystems IRIS](#) in *InterSystems IRIS Basics: Connecting an IDE*. Connect your

IDE to your InterSystems IRIS instance using the information in [InterSystems IRIS Connection Information](#) and [Java IDEs](#) in the same document.

2.2 Creating a JAR File

Create a Person class in Java using an IDE of your choice. Use the following sample code:

```
public class Person {  
    public int age;  
    public String name;  
  
    //constructor  
    public Person (int startAge, String Name) {  
        age = startAge;  
        name = Name;  
    }  
  
    public void setAge(int newAge) {  
        age = newAge;  
    }  
  
    public String getName() {  
        return name;  
    }  
  
    public int getAge() {  
        return age;  
    }  
  
    public static void main(String []args) {  
        Person myPerson = new Person (5, "Tom");  
        System.out.println(myPerson.getName());  
        System.out.println(myPerson.getAge());  
    }  
}
```

Compile the Person class. Then, open a Command Prompt window and navigate to the directory containing your Person.class file. Use the following command to generate a Person.jar file:

```
jar cf Person.jar Person.class
```

Note the location of the file.

2.3 Starting a Java Gateway

In order to start a Java Gateway, follow these steps:

1. Open the Management Portal for your instance in your browser, using the [URL described for your instance](#) in *InterSystems IRIS Basics: Connecting an IDE*.
2. Navigate to the **Object Gateways** page. (**System Administration** > **Configuration** > **Connectivity** > **Object Gateways**)
3. Select **Create New Gateway**.
4. Select the **Java** radio button.
5. Enter JavaGatewayTest for **Gateway Name** and 55555 for **Port**.
6. Click **Save**.
7. In the row for your new Java Gateway, click **Start**.

2.4 Generating Proxy Classes

Create a new ObjectScript class in the **USER** namespace (or another that you have created in your installed instance) called `CreateProxyClasses.cls` with package name `JavaGatewayTest`. Paste in the following code, substituting the [connection information for your InterSystems IRIS instance](#) (as described in *InterSystems IRIS Basics: Connecting an IDE*) for the arguments to `gwyConn.&Connect`. You can specify the **USER** namespace as shown, or you can choose another that you have created on your instance. Replace `YOUR FILEPATH HERE` with the complete file path of your `Person.jar` file, enclosed in double quotes.

```
Class JavaGatewayTest.CreateProxyClasses Extends %Persistent
{
ClassMethod run()
{
    // get a connection to the Java Gateway
    set gwyConn = ##class(%Net.Remote.Gateway).%New()
    set status = gwyConn.%Connect("127.0.0.1", 55555, "USER")
    if $$$ISERR(status) {
        write !,"error: "._$system.OBJ.DisplayError(status)
        quit
    }

    // add the jar to the classpath
    set classpath = ##class(%ListOfDataTypes).%New()
    do classpath.Insert("YOUR FILEPATH HERE")
    set status = gwyConn.%AddToCurrentClassPath(classpath)
    if $$$ISERR(status) {
        write !,"error: "._$system.OBJ.DisplayError(status)
        quit
    }

    // create the proxy ObjectScript classes that correspond to the Java classes in the jar file
    set status = gwyConn.%Import("Person",,,,1)
    if $$$ISERR(status) {
        write !,"error: "._$system.OBJ.DisplayError(status)
        quit
    }

    // close the connection to the Java gateway
    set status = gwyConn.%Disconnect()
    if $$$ISERR(status) {
        write !,"error: "._$system.OBJ.DisplayError(status)
        quit
    }
}
}
```

Compile and build the class.

Open the InterSystems Terminal using the [procedure described for your instance](#) in *InterSystems IRIS Basics: Connecting an IDE*, and switch to the namespace you specified in the code if necessary. Execute the `run()` method with the following command:

```
do ##class(JavaGatewayTest.CreateProxyClasses).run()
```

2.5 Manipulating Java Objects in ObjectScript

Create a new ObjectScript class in the namespace you are using called `ManipulateObjects.cls` with package name `JavaGatewayTest`. Paste in the following code, being sure to substitute the [connection information for your InterSystems IRIS instance](#) for the arguments to `gwyConn.&Connect` and update the namespace field if you are not using **USER**.

```
Class JavaGatewayTest.ManipulateObjects Extends %Persistent
{
ClassMethod run()
{
    // get a connection to the Java Gateway
    set gwyConn = ##class(%Net.Remote.Gateway).%New()
    set status = gwyConn.%Connect("127.0.0.1", 55555, "USER")
    if $$$ISERR(status) {
        write !,"error: "._$system.OBJ.DisplayError(status)
    }
}
```

```
        quit
    }

    // manipulate some proxy objects
    set person = ##class(User.Person).%New(gwyConn,5,"Tom")
    write !,"Name: "_person.getName()
    write !,"Age: "_person.getAge()
    write !,"setting age to 100"
    do person.setAge(100)
    write !,"Age: "_person.getAge()

    // close the connection to the Java Gateway
    set status = gwyConn.%Disconnect()
    if $$$ISERR(status) {
        write !,"error: "_$system.OBJ.DisplayError(status)
        quit
    }
}
}
```

Compile and build the class.

Open the InterSystems Terminal and navigate to the namespace you specified. Execute the **run()** method with the following command:

```
do ##class(JavaGatewayTest.ManipulateObjects).run()
```

You should see the following output:

```
Name: Tom
Age: 5
setting age to 100
Age: 100
```

Now that you have successfully completed the exercise, stop the Java Gateway that you created. Return to the **Object Gateways** page in the Management Portal, locate your `JavaGatewayTest` gateway, and select **Stop**.

3 Learn More About the Java Gateway

To learn more about the Java Gateway and InterSystems IRIS, see:

Using the Java Gateway