SST: JUnit IdentityIQ Helper User Guide

Document Revision History

Revision Date	Written/Edited By	Comments
June 2017	Christian Cairney	Initial release with SSD v4
June 2018	Christian Cairney	Updates to the tools to improve performance and document alternative paths to getting an IdentityIQ Context.

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Overview

The JUnit IdentityIQ Helper classes allow you to leverage the JUnit framework for unit testing an IdentityIQ implementation in an IDE. The helper classes allow the unit tester to easily access the SailPointContext and some of the functionality of the IdentityIQ Console to reduce the time taken to implement unit tests.

Installation and Configuration

No components are necessary to be deployed to the IdentityIQ instance; the JUnit and helper classes are meant to be deployed to your IDE of choice. This helper library has been tested using Eclipse Neon.

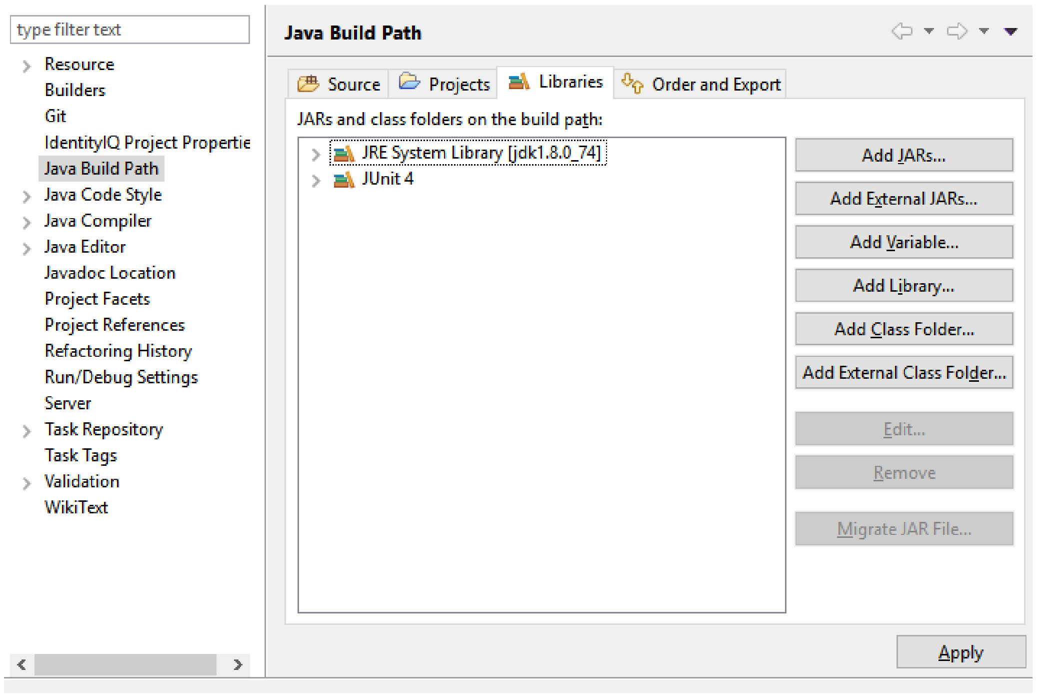
Filename	Description
IdentityIQJUnitHelper.jar	The JUnit helper classes

Eclipse Configuration

It is assumed that JUnit has already been configured in the Eclipse IDE. JUnit is usually installed as part of the J2EE version of Eclipse and should not require any further configuration.

The Eclipse class path and jar files will need to be configured to enable the helper classes; the following steps allow Eclipse to reference the IdentityIQ jars and database configuration.

1. Open up Eclipse. The Java Build Path for your project needs to be modified to include the IdentityIQ.jar and support libraries.
2. Right click on your project in the Package Explorer view and select “Java Build Path”:

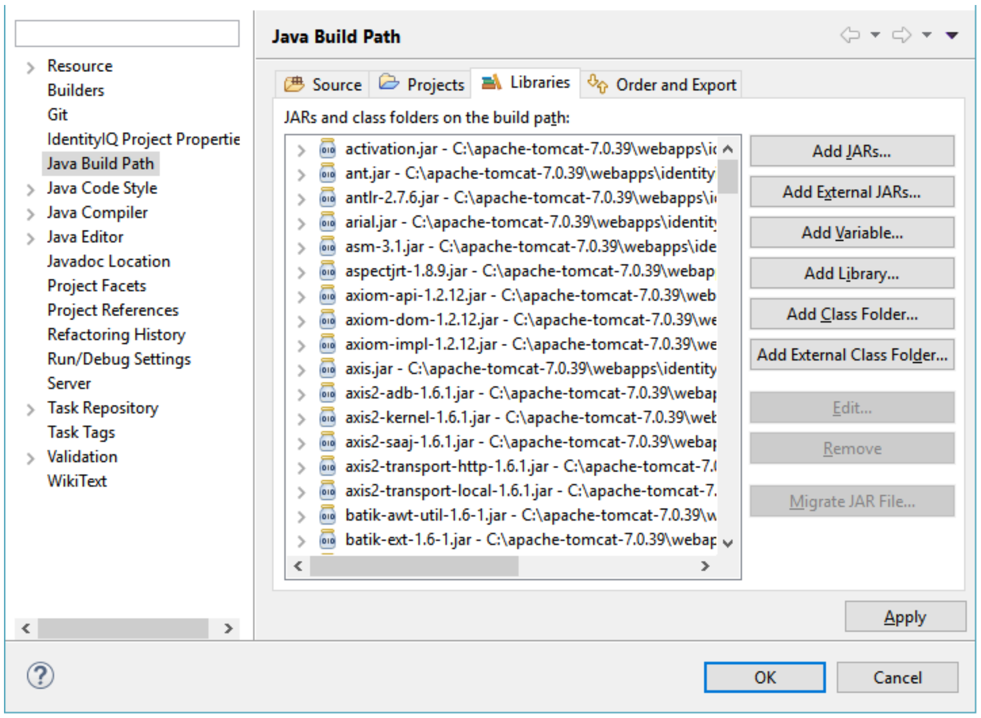


JARs and class folders on the build path:

JRE System Library [jdk1.8.0_74]

JUnit 4

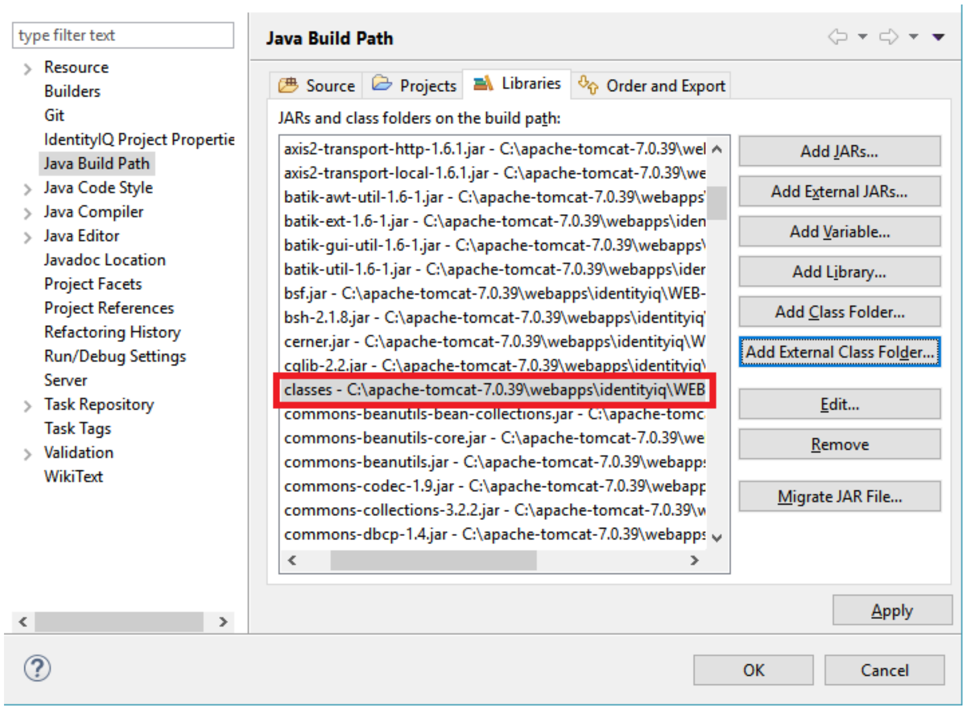
3. Add the IdentityIQ jar files so that an instance can be instantiated in Eclipse. Click the “Add External JARs…” button and navigate to the instance of IdentityIQ on your local machine. Select the WEB-INF\lib folder and all the JARs in that folder:



JARs and class folders on the build path:

```
activation.jar - C:\apache-tomcat-7.0.39\webapps\ic
ant.jar - C:\apache-tomcat-7.0.39\webapps\identity
antlr-2.7.6.jar - C:\apache-tomcat-7.0.39\webapps\i
arial.jar - C:\apache-tomcat-7.0.39\webapps\identit
asm-3.1.jar - C:\apache-tomcat-7.0.39\webapps\ide
aspectjrt-1.8.9.jar - C:\apache-tomcat-7.0.39\webap
axiom-api-1.2.12.jar - C:\apache-tomcat-7.0.39\web
axiom-dom-1.2.12.jar - C:\apache-tomcat-7.0.39\we
axiom-impl-1.2.12.jar - C:\apache-tomcat-7.0.39\we
axis.jar - C:\apache-tomcat-7.0.39\webapps\identity
axis2-adb-1.6.1.jar - C:\apache-tomcat-7.0.39\webap
axis2-kernel-1.6.1.jar - C:\apache-tomcat-7.0.39\wel
axis2-saaj-1.6.1.jar - C:\apache-tomcat-7.0.39\webap
axis2-transport-http-1.6.1.jar - C:\apache-tomcat-7.
axis2-transport-local-1.6.1.jar - C:\apache-tomcat-7.
batik-awt-util-1.6-1.jar - C:\apache-tomcat-7.0.39\w
batik-ext-1.6-1.jar - C:\apache-tomcat-7.0.39\webap
```

4. Next add the Class folder, click “Add External Class Folder…” and navigate to the instance of IdentityIQ on your local machine. Select the WEB-INF\classes folder:



JARs and class folders on the build path:

```
axis2-transport-http-1.6.1.jar - C:\apache-tomcat-7.0.39\wel
axis2-transport-local-1.6.1.jar - C:\apache-tomcat-7.0.39\we
batik-awt-util-1.6-1.jar - C:\apache-tomcat-7.0.39\webapps
batik-ext-1.6-1.jar - C:\apache-tomcat-7.0.39\webapps\iden
batik-gui-util-1.6-1.jar - C:\apache-tomcat-7.0.39\webapps\
batik-util-1.6-1.jar - C:\apache-tomcat-7.0.39\webapps\ider
bsf.jar - C:\apache-tomcat-7.0.39\webapps\identityiq\WEB-
bsh-2.1.8.jar - C:\apache-tomcat-7.0.39\webapps\identityiq
cerner.jar - C:\apache-tomcat-7.0.39\webapps\identityiq\W
cglib-2.2.jar - C:\apache-tomcat-7.0.39\webapps\identityiq\
classes - C:\apache-tomcat-7.0.39\webapps\identityiq\WEB
commons-beanutils-bean-collections.jar - C:\apache-tomc
commons-beanutils-core.jar - C:\apache-tomcat-7.0.39\we
commons-beanutils.jar - C:\apache-tomcat-7.0.39\webapp:
commons-codec-1.9.jar - C:\apache-tomcat-7.0.39\webapp
commons-collections-3.2.2.jar - C:\apache-tomcat-7.0.39\w
commons-dbcp-1.4.jar - C:\apache-tomcat-7.0.39\webapps
```

5. Finally, you should reference the IdentityIQJUnitHelper.jar file; you can copy the JAR file to a folder in your project or reference it externally. It can be found in the following location in the SSD file structure:
   externaltools/SST_JUnitIdentityIQHelper/jar/IdentityIQJUnitHelper.jar

After these steps have been completed you should be ready to implement the JUnit helper class.

Instantiating the Helper Classes

There are a number of ways the Junit classes can be leveraged to help test your testing units; these will be outlined in this section.

SailPointJUnitTestHelper

The SailPointJUnitTestHelper class allows for an instance of IdentityIQ to be run inside your IDE. The JUnit class used to test functionality must extend the Helper class.

```
public class MyUnitClass extends SailPointJUnitTestHelper
```

The constructor of the JUnit class must be used to authenticate to the instance of IdentityIQ in the IDE, by calling the Super class inherited from extending the SailPointJUnitTestHelper.

```
public class MyUnitClass extends SailPointJUnitTestHelper {

       public MyFirstJUnitTest() throws Exception {
              super("spadmin", "admin");
       }
```

The new JUnit class will now have access to the following additional variables:

- `context` - The SailPointContext
- `console` – The console helper class

The SailPointJUnitTestHelper class also exposes methods which can be used in a JUnit class. Javadocs have been generated for these classes and can be found under `doc/JavaDoc/JUnitIdentityIQHelper` in the SSD file structure.

Auto Close settings

The SailPointJUnitTestHelper class has a static attribute which augments how the IdentityIQ Context session is handled. This allows the connection to persist either:

- Per Test
- Per Class

By default, it has been set to “Class” to allow for the best performance. The IdentityIQ Context is persisted for all tests in a given class. Setting this option to “Test” means for each test run, the IdentityIQ context is refreshed and a new context is created.

To set these values you can set the static variable in this way:

```
SailPointJUnitTestHelper.setGlobalAutoClose(AutoClose.AfterClass);
SailPointJUnitTestHelper.setGlobalAutoClose(AutoClose.AfterTest);
```

Or in the Constructor of your test class:

```
public class MyUnitClass extends SailPointJUnitTestHelper {

        public MyFirstJUnitTest() throws Exception {
                super("spadmin", "admin", AutoClose.AfterClass);
        }
```

Or:

```
public class MyUnitClass extends SailPointJUnitTestHelper {

        public MyFirstJUnitTest() throws Exception {
                super("spadmin", "admin", AutoClose.AfterTest);
        }
```

SailPointConnectionFactory

An alternative way of getting a SailPointContext is by calling the supplied SailPointConnectionFactory class. If you do not wish to extend your JUnits with the SailPointJUnitTestHelper, then you can manage the connection yourself:

```
SailPointConnectionFactory factory = SailPointConnectionFactory.getInstance();
SailPointContext context = factory.getContext( username, password );
```

These two lines will create an instance of IdentityIQ and return a context.

Subsequent calls to `factory.getContext();` will send a pointer to the current context object and not create a new instance of IdentityIQ.

You must close the context when you have finished with it, otherwise precious resources will be tied up. To release the context use:

```
SailPointConnectionFactory factory = SailPointConnectionFactory.getInstance();
Factory.closeContext();
```

This will release the context and shut down the IdentityIQ instance.

Console Class

The Console Class is available as a Helper class with some functionality you would normally have in the IdentityIQ Console. This class is available as a `console` variable when extending a test class with SailPointJUnitTestHelper.

The Console class can also be instantiated with:

```
SailPointConnectionFactory factory = SailPointConnectionFactory.getInstance();
SailPointContext context = factory.getContext( username, password );
Console console = new Console( context );
```

My first JUnit

The following example shows the testing of a simple rule in IdentityIQ from a JUnit test.

When we start to build a JUnit test with this helper, we must first initialize the Helper class with authentication details for your implementation. This is done in the Class's constructor by calling the Super Class's constructor as highlighted below:

```
import java.util.HashMap;
import java.util.Map;
import org.apache.log4j.Logger;
import org.junit.Test;
import sailpoint.object.Rule;
import sailpoint.services.standard.junit.SailPointJUnitTestHelper;
import sailpoint.tools.GeneralException;

public class MyFirstJUnitTest extends SailPointJUnitTestHelper {

	private static Logger log = Logger.getLogger(MyFirstJUnitTest.class);

	public MyFirstJUnitTest() throws Exception {
		super("spadmin", "admin");
	}
}
```

Next, I want to test my rule which is currently imported into IdentityIQ. The rule I am testing is:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE Rule PUBLIC "sailpoint.dtd" "sailpoint.dtd">
<Rule language="beanshell" name="Add values rule" >
  <Source><![CDATA[

	return value1 + value2;

]]></Source>
</Rule>
```

This rule simply adds two values together. My JUnit test method looks like:

```
	@Test
	public void addValuesTest() throws GeneralException {

		Rule rule = console.getObjectByName(Rule.class, "Add values rule");
		Map<String,Object> args = new HashMap<String,Object>();

		int value1 = 1;
		int value2 = 2;

		args.put("value1", value1);
		args.put("value2", value2);
```

```
            int count = (int) console.runRule(rule, args);
            log.debug("Add " + value1 + " + " + value2 + " ==  " + count + ".");

            assert(count == (value1 + value2));

        }
```

Note the @Test annotation used by JUnit. The method fetches the “Add values rule” and runs the rule using the JUnit Helper’s console runRule method. The returning object is cast back to an integer and the assert statement ensures the result is value1 + value2.

If the assert method fails at this point, then this method will fail on the unit test.