External Language Server in 2021.1

Now that IRIS 2021.1 is available as a preview version, I would like to demonstrate a "new" feature. The Java Gateway has been around for a while now but in 2021.1 it has new skills. External Language Servers are available for Java, DotNet, and Python. Here is a quick - very quick - demo of using the External Java Server. Please don't focus solely on what this demo is doing but rather on what is happening in this demo. First, I acquire a gateway connection oref. This gateway connection is connected to the External Java Server - one of the External Language Servers.

```java
set java = $system.external.getJavaGateway()
```

Next, I need to add my jar file to the class path:

```java
do java.addToPath("~/projects/external/java/iris-external/target/iris-external-1.0-SNAPSHOT.jar")
```

I have a method in my external.test.Horizons class that queries the Sample.Person table in some IRIS instance.

```java
public static ExternalResult getPersons(int rowcount) throws SQLException {
    return new ExternalResult(getPersonsResults(rowcount));
}
```

```java
private static ResultSet getPersonsResults(int rowcount) throws SQLException {
    Properties properties = new Properties();
    properties.put("user", "_SYSTEM");
    properties.put("password", "SYS");
    Connection connection = DriverManager.getConnection(IRIS_URL, properties);
    Statement statement = connection.createStatement();
    ResultSet result = statement.executeQuery("select top " + rowcount + " name, dob, ssn, home_street, home_city, home_state, home_zip from sample.person order by name");
    return result;
}
```

Simply invoke this method using the ELS invoke method:

```java
set persons = java.invoke("external.test.Horizons","getPersons",10)
```

In my example, persons is holding a reference to an instance of my external.test.ExternalResult Java class. This class is a wrapper around a JDBC Result Set. I've implemented a renderTable() method that displays the contents of the ResultSet using an AsciiTable library:

```java
do persons.renderTable()
```

And the output:
<table>
<thead>
<tr>
<th>Name</th>
<th>DOB</th>
<th>SSN</th>
<th>Home_Street</th>
<th>Home_City</th>
<th>Home_State</th>
<th>Home_Zip</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adam, Barb X.</td>
<td>1990-08-15</td>
<td>568-33-3285</td>
<td>Clinton Court</td>
<td>Boston</td>
<td>ID</td>
<td>67314</td>
</tr>
<tr>
<td>Adam, Milhouse K.</td>
<td>1989-07-05</td>
<td>797-35-8746</td>
<td>Franklin Blvd</td>
<td>Youngstown</td>
<td>AR</td>
<td>31403</td>
</tr>
<tr>
<td>Ahmed, Al S.</td>
<td>1985-01-22</td>
<td>623-94-2440</td>
<td>Main Court</td>
<td>Oak Creek</td>
<td>TN</td>
<td>96256</td>
</tr>
<tr>
<td>Ahmed, Barb R.</td>
<td>1956-12-13</td>
<td>373-71-8424</td>
<td>Clinton Avenue</td>
<td>Newton</td>
<td>CT</td>
<td>56929</td>
</tr>
<tr>
<td>Ahmed, Charlotte P.</td>
<td>1947-05-09</td>
<td>944-70-3491</td>
<td>Second Place</td>
<td>Oak Creek</td>
<td>VT</td>
<td>54476</td>
</tr>
<tr>
<td>Ahmed, Debby W.</td>
<td>2005-05-20</td>
<td>611-75-3175</td>
<td>First Court</td>
<td>Ukiah</td>
<td>HI</td>
<td>93961</td>
</tr>
<tr>
<td>Ahmed, Yan V.</td>
<td>1949-07-22</td>
<td>552-24-3419</td>
<td>Madison Drive</td>
<td>Denver</td>
<td>OH</td>
<td>12175</td>
</tr>
<tr>
<td>Allen, Geoffrey D.</td>
<td>1963-09-21</td>
<td>956-84-9269</td>
<td>Madison Place</td>
<td>Vail</td>
<td>MT</td>
<td>86032</td>
</tr>
<tr>
<td>Allen, Howard B.</td>
<td>1943-01-09</td>
<td>79834-27-9607</td>
<td>Clinton Court</td>
<td>Vail</td>
<td>GA</td>
<td>769486</td>
</tr>
</tbody>
</table>

DotNet and Python External Language Servers work similarly.

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