XML element - Commands

Only in DbVisualizer Pro

This document and the Database Profile Framework in general is appropriate only when using the licensed DbVisualizer Pro edition.

The **Commands** element is a simple grouping element for **Command** elements.


```
<Commands extends="true">

  <Command id="profileName.xxx">
    ...
  </Command>

</Commands>
```

The **extends="true"** attribute specifies that the list of commands will extend the list of commands defined in the profile being extended.

XML element - Command

The main purpose with the **Command** element is to run a single **SQL statement** or a **script** of SQL statements. In most cases, the script should return a result set with 0 or multiple rows with the exception for actions which not necessarily need to return a result set, e.g., a "drop" action). The following show the command element, its attributes with default values, and valid sub elements.

```
<Command     id="sybase-ase.getLogins"
         method="dynamic"
       exectype="script"
 processmarkers="true"
     autocommit="true"
    whensuccess="commit"
      whenerror="rollback">

   <SQL>
      ...
   </SQL>

   <Input>
      ...
   </Input>

   <Output>
      ...
   </Output>

   <Filter>
      ...
   </Filter>

   <ProcessDataSet>
      ...
   </ProcessDataSet>

   <ProcessSQLWarning>
      ...
   </ProcessSQLWarning>


</Command>
```

Attribute	Description
id	The command element is identified with a unique **id** attribute. This id is referred in ObjectsTreeDef, ObjectsViewDef and ObjectsActionDef definitions using the **idref** attribute. The id naming convention for command elements is to prefix with the name of the profile and a dot. Example **oracle.xxx**, **sqlserver.xxx**, and so on.
method	• **dynamic** this is the default value and define that the SQL is a dynamic SQL statement as opposed to setting it to JDBC which defines that the SQL is really a JDBC meta data call rather than SQL, • jdbc See description for dynamic, • runBeforeConditionsEval this value is only considered if the command is define in the InitCommands section.
exectype	• **script** • asis • explain The default behavior is that the SQL may contains multiple SQL statements each delimited by a semi colon (';'). Set this attribute to false to disable multiple SQL statements.
autocommit	• **true** • false
whensuccess	• commit • rollback • ask
whenerror	• commit • rollback • ask • ignore

The following command queries login information in Sybase ASE.

```
<Command id="sybase-ase.getLogins">
   <SQL>
      <![CDATA[
SELECT name "Name", suid "SUID", dbname "Default Database", fullname "Full Name",
language "Default Language", totcpu "CPU Time", totio "I/O Time", pwdate "Password Set"
FROM master.dbo.syslogins ORDER BY 1
      ]]>
   </SQL>
</Command>
```

The id for this command is **sybase-ase.getLogins**. The reason for prefixing the id with the name of the profile is that profiles can be extended and id's need to be unique.

This SQL example show a command with a **SELECT** statement using **column aliases**. If no aliases are specified the column names should be used to refer the data.

Result Set

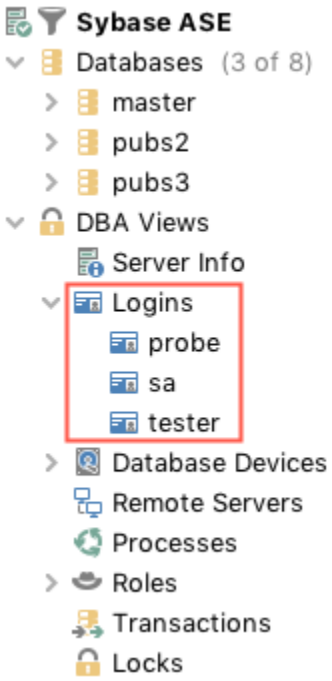
This is the result set for the previous query:

Name	SUID	Default Database	Full Name	Default Language	CPU Time	I/O Time	Password Set
probe	3	master	(null)	(null)	0	10	2009-12-22 09:53:50
sa	2	subsystemdb	(null)	(null)	0	0	2009-12-22 08:37:35
tester	1	master	(null)	(null)	182	168723	2009-12-22 08:36:54

How DbVisualizer handle the result set depends on whether the command is executed as a request in the database objects tree (ObjectsTreeDef) or in the object view (ObjectsViewDef). If executed in the database objects tree, each row in the result set will be represented by a node in the tree. If executed in the object view, it is the viewer component that decide how the result will be displayed.

Another important difference between the database objects tree and the object view is that the tree is a hierarchical structure of objects while the object view presents information about a specific object. An object that is inserted in the database objects tree is a 1..1 mapping to a row from the result set. The end user will see these objects (nodes) by some descriptive label, as defined in the ObjectsTreeDef. All data for the row from the original result set is stored with the object in the tree and may be used in the **label**, **variables**, **conditions**, etc. This is not the case in the ObjectsViewDef.

The following example put some light on this. Consider the previous result set and that it is used to create objects in the database objects tree. The end user will see the following in DbVisualizer. (The label for each row is the name column in the result set.):



Each of the **probe**, **sa,** and **tester** nodes have all their respective data from the result set associated with the nodes. The data is referenced as **commandId.columnName**, i.e., **sybase-ase.getLogins.Name**, **sybase-ase.getLogins.Default Database,** etc. All associated data for the **sa** node in the example is listed next:

```
sybase-ase.getLogins.Name = sa
sybase-ase.getLogins.suid = 1
sybase-ase.getLogins.Default Database = master
sybase-ase.getLogins.Full Name = (null)
sybase-ase.getLogins.Default Language = (null)
sybase-ase.getLogins.CPU Time = 182
sybase-ase.getLogins.I/O Time = 168716
sybase-ase.getLogins.Password Set = 2009-12-22 08:36:54.576
```

The DataNode element definition presenting **probe**, **sa,** and **tester** nodes in the previous screenshot use the associated data for the **label** as follows:

```
<DataNode type="Login" label="${sybasease.getLogins.Name}" isLeaf="true">
   <SetVar name="objectname" value="${sybasease.getLogins.Name}"/>
   <Command idref="sybasease.getLogins">
      <Output id="sybasease.getLogins.Name" index="1"/>
      <Output id="sybasease.getLogins.suid" index="2"/>
   </Command>
</DataNode>
```

XML element - Input

The **Input** sub element for a Command is only used when a command is being referred with the **idref** attribute in any of ObjectsActionDef, ObjectsTreeDef or ObjectsViewDef. It has no effect specifying it for a Command in the Commands section.

There are two types of commands, with and without dynamic input. The difference is that dynamic commands accepts input data that is typically used to form the **WHERE** clause in SELECT SQLs. The previous example illustrates a static SELECT statement (without dynamic data).

To allow for dynamic input, just add variables at the positions (can be anywhere) in the SQL statement that should be replaced with dynamic values. The following is an extension of the previous example that allows for dynamic input.

```
<Command id="sybase-ase.getLogins">
   <SQL>
      <![CDATA[
SELECT name "Name", suid "SUID", dbname "Default Database", fullname "Full Name",
language "Default Language", totcpu "CPU Time", totio "I/O Time", pwdate "Password Set"
FROM master.dbo.syslogins WHERE name = '${name}' and suid = '${suid}' ORDER BY 1
      ]]>
   </SQL>
</Command>
```

This example add two input variables: **${name}** and **${suid}**. Values for these variables should then be supplied wherever the command is referred for execution via the Input element.

The following is an example from the ObjectsTreeDef that specify the **Input** sub elements to **map values** to the variables defined in the SQL.

```
<GroupNode type="Logins" label="Logins">
  <DataNode type="Login" label="${sybase-ase.getLogins.Name} isLeaf="true">
    <SetVar name="objectname" value="${sybase-ase.getLogins.Name}">
    <Command idref="sybase-ase.getLogins">
      <Input name="name" value="sa">
      <Input name="suid" value="${sybase-ase.getProcesses.suid}">
    </Command>
  </DataNode>
</GroupNode>
```

(Note that the Command element refer the command via the **idref** attribute which is then matched with the corresponding **id** for the Command).

The **${name}** variable in the SQL will be replaced with string **sa**.

The value for the **${suid}** variable will in this case get the value of another variable, **sybase-ase.getProcesses.suid**. So where is this variable defined? As explained in the Result Set section, all the data for a row in the result set is associated with the corresponding node in the database objects tree. In addition, it is possible to use all the data kept by the node and even its parent nodes (as presented in the objects tree) in the input to commands. So to evaluate the **${sybase-ase.getProcesses.suid}** variable, DbVisualizer first look for the variable in the current node. If it doesn't exist, it continues to look through the parent nodes until it reaches the root, which is the **Connections** node in the objects tree. If the variable is not found, it will be set to the string representation for null, which is **(null)** by default. Whenever a matching variable is found, DbVisualizer use its value and stops searching.

XML element - Output

As mentioned earlier, a specific column value in a result set row is referenced by the name of the column and then prefixed by the command id. Sometimes this is not desirable and the **Output** definition can be used to change this behavior. The following identifies a column in the result set by its **index number**, starting from 1, and then force its name to be set.

```
<Output index="1" name="sybase-ase.getLogins.Name"/>
<Output index="2" name="sybase-ase.getLogins.suid"/>
```

(The index attribute accepts either the name of the column or index number in the result set starting from the first column at index 1).

Filter

The Filter element assists the Database Objects Tree filtering what fields are available for the user to filter on. The label attribute for DataNode is always available for filtering. Declaring a specific Filter is useful if for example using the label1 attribute to show additional information about an object and it should be possible to filter its label.

Here is an example of the Column sub-node to Table objects showing a filter definition:

```
<GroupNode type="Columns" label="Columns">
   <DataNode type="Column" label="${getColumnDefinitions.COLUMN_NAME}"
             label1="${getColumnDefinitions.TYPE_NAME}" isLeaf="true"
             icon="#dataMap.get('getColumnDefinitions.IS_PRIMARY_KEY') eq true ? 'PrimaryKey' : 'Column'">
      <SetVar name="objectname" value="${getColumnDefinitions.COLUMN_NAME}"/>
      <Command idref="getColumnDefinitions">
         <Input name="schema" value="${schema}"/>
         <Input name="objectname" value="${theTableName}"/>
         <Filter index="TYPE_NAME" label="Type"/>
      </Command>
   </DataNode>
</GroupNode>
```

Above is filter is defined for the **TYPE_NAME** column in the result set. The label for it as it will appear in the filtering pane in DbVisualizer is **Type**.

The **Show Default Database/Schema** pre-defined filter in DbVisualizer requires a Filter for the **DataNode type="schema"** command. The label for this filter must be **Name**:

```
<DataNode type="Schema" label="${oracle.getSchemas.TABLE_SCHEM}">
   <SetVar name="schema" value="${oracle.getSchemas.TABLE_SCHEM}"/>
   <Command idref="oracle.getSchemas">
      <Filter index="TABLE_SCHEM" label="Name"/>
   </Command>

 ...
```

ProcessDataSet

The ProcessDataSet element is used to process the result set generated by a command. This process is performed just after the result set has been retrieved and before any **Output** elements are handled. Examples:

```
<ProcessDataSet action="addcolumn"  index="Added Column" value="Add column with value 'Static string ${dbvis-
jdbcURL}'"/>
<ProcessDataSet action="addrow" index="first" value="${#db.loginDatabase}"/>
<ProcessDataSet action="convertnullvalues" index="1" value=""/>
<ProcessDataSet action="convertsqlwarningtodataset"/>
<ProcessDataSet action="distinct" index="Country"/>
<ProcessDataSet action="dropcolumn" index="AUTO_INCREMENT"/>
<ProcessDataSet action="dropidenticalcolumns" name="datname"/>
<ProcessDataSet action="movecolumn" index="datname" value="first"/>
<ProcessDataSet action="printdataset"/>
<ProcessDataSet action="removeisnullrows" index="VALUE"/>
<ProcessDataSet action="removerowsifequalto" index="DATA_LENGTH" value="16384"/>
<ProcessDataSet action="renamecolumn" index="2" name="NewName"/>
<ProcessDataSet action="sortcolumn" index="LAST_NAME, FIRST_NAME"/>
<ProcessDataSet action="trimcolumn" index="PAD_COLUMN"/>
<ProcessDataSet action="truncatedataset" value="keeplast 5"/>
```

Explanation of the actions. The index attribute for actions that process columns, the start index is 1, while actions processing rows start with index 0.

action	Description
addcolumn	Adds a new column to all rows with the value specified in the value attribute. The value may contain variables using the ${...} notation
addrow	Adds a new row in the result set at the specified position which can be "first", "last" or a specific row index starting at 0. The value attribute is a TAB separated list of column values. The first element will go into column 0 in the result set, the second in column 1, and so on. Variables may be used in the value.
convertnullvalues	Converts any null values in the specified column to the literal specified in the value attribute.
convertsqlwarningtodataset	Converts any SQL Warnings generated by the command to a result set
distinct	This action is used to remove all duplicates identified by the specified column index. What rows are removed may be different from time to time since matching is done on a single column value

dropcolumn	Drops the specified column
dropidenticalcolumns	Drops identically named columns (keeps first)
movecolumn	Moves the column specified by the index attribute by index or name to the position specified by the value attribute. The latter can be expressed as "first", "last" or a specific column index.
printdataset	Prints the result set to the debug log which is useful during profile development. Debug DbVisualizer must be enabled in the Tool->Debug Window.
removeisnullrows	Removes the row if the value in the specified result set column is null
removerowsifequalto	Removes the row if the data in the specified column is equal to the specified value
renamecolumn	Renames the result set column identified by the index
sortcolumn	Enter one or several column names (or indexes) separated with command (',') which are used to sort the result set
trimcolumn	Trims the data in the specified column index by removing all leading and trailing whitespaces
truncatedataset	Truncates, i.e. removes a number of rows, from the start or the end of the result set: • keepfirst <n> • keeplast <n> • removefirst <n> • removelast <n> truncatedataset is useful in for example **<DataNode ... viewer="graph">** uses.

Convert SQL Warning to DataSet

The **convertsqlwarningtodataset** element will look for any SQLWarning raised during execution of the command and convert it to a result set.

```
<InitCommands extends="true">
   <Command id="netezza.supportsMultipleSchemas">
      <SQL>
         <![CDATA[
show enable_schema_dbo_check
         ]]>
      </SQL>
      <ProcessDataSet action="convertsqlwarningtodataset"/>
      <Output index="1" name="SUPPORTS_MULTIPLE_SCHEMAS"/>
   </Command>
</InitCommands>
```

Note: The SQLWarning support is quite brute as it will remove any other data sets produced by the command, and insert the SQLWarning alone as the only data set having a single 0,0 cell with the complete warning string.

The <If> condition based on the output from the previous InitCommand is:

```
<If test="#SUPPORTS_MULTIPLE_SCHEMAS.matches('^.*ENABLE_SCHEMA_DBO_CHECK is [12]$')">
   ...
</If>
```