

## Bug : Illogical Addition of Tuples into the 'Attributes' Relvar of the Meta DB

### Summary

When RAQUEL statements are executed, afterwards additional tuples are found in the 'Attributes.txt' file (which is used to physically store the value of the 'Attributes' relvar.

The statements themselves are always executed correctly.

The problem is that the 'Attributes' relvar gradually accumulates irrelevant tuples.

(N.B. The 'Attributes' relvar itself has 3 attributes, which hold the name of the DB relvar concerned, the name of an attribute in that relvar, and the logical type of that attribute. Thus a DB relvar of x attributes has x tuples in 'Attributes' that define its attributes).

### Tests carried out

- **s <--Retrieve Parts**

Afterwards **no** tuples have been added.

- **s <--Retrieve Suppliers**

Afterwards 2 tuples have been added :

|              |          |        |
|--------------|----------|--------|
| <i>blank</i> | PartName | Text;  |
| <i>blank</i> | PType    | Int32. |

These tuple values correspond to the 2 tuple values that define the attributes of the 'Parts' relvar, except that the relvar name is replaced with a blank.

The 2 tuples relate to the previous statement executed, not the statement that has just been executed.

- **s <--Retrieve Customers**

Afterwards 4 more tuples have been added :

|              |              |        |
|--------------|--------------|--------|
| <i>blank</i> | SupplierName | Text;  |
| <i>blank</i> | SID          | Text;  |
| <i>blank</i> | PType        | Int32; |
| <i>blank</i> | Location     | Text.  |

These tuple values correspond to the 4 tuple values that define the attributes of the 'Suppliers' relvar, except that the relvar name is replaced with a blank.

The 4 tuples relate to the previous statement executed, not the statement that has just been executed.

- **s <--Retrieve Parts Join[ PType ] Suppliers Restrict[ PType >= 2 ]**

Afterwards 4 more tuples have been added :

|              |              |        |
|--------------|--------------|--------|
| <i>blank</i> | CustomerName | Text;  |
| <i>blank</i> | CID          | Text;  |
| <i>blank</i> | Address      | Text;  |
| <i>blank</i> | CreditLimit  | Int32. |

These tuple values correspond to the 4 tuple values that define the attributes of the 'Customers' relvar, except that the relvar name is replaced with a blank.

The 4 tuples relate to the previous statement executed, not the statement that has just been executed.

- **s <--Retrieve Parts**

Afterwards 5 more tuples have been added :

|              |              |        |
|--------------|--------------|--------|
| <i>blank</i> | PartName     | Text;  |
| <i>blank</i> | PType        | Int32; |
| <i>blank</i> | SupplierName | Text;  |
| <i>blank</i> | SID          | Text;  |
| <i>blank</i> | Location     | Text.  |

These tuple values correspond to the 2 tuple values that define the attributes of the 'Parts' relvar and 3 of the 4 tuples that define the 'Supplier' relvar, except that relvar names are always replaced with a blank.

In the previously executed statement, the attribute 'PType' appeared as a parameter to both operators; it is the attribute 'PType' that has not been added when adding the tuples describing 'Suppliers'.

- **s <--Retrieve Suppliers Gen[ SID = CID ] Customers Restrict[ CustomerName Length = 6 ]**

Afterwards 2 more tuples have been added :

|              |          |        |
|--------------|----------|--------|
| <i>blank</i> | PartName | Text;  |
| <i>blank</i> | PType    | Int32. |

As usual, they pertain to the previously executed statement.

- **s <--Retrieve Suppliers**

Afterwards 5 more tuples have been added :

|              |              |        |
|--------------|--------------|--------|
| <i>blank</i> | Location     | Text;  |
| <i>blank</i> | CustomerName | Text;  |
| <i>blank</i> | CID          | Text;  |
| <i>blank</i> | Address      | Text;  |
| <i>blank</i> | CreditLimit  | Int32. |

As usual, they pertain to the previously executed statement.

One tuple relates to the 'Suppliers' relvar, the other 4 to the 'Customers' relvar.

- Shutdown the 'RaquelTeachingTool' application, and re-start it.

Then execute :

- **s <--Retrieve Parts Join[ PType ] Suppliers Restrict[ PType >= 2 ]**

Afterwards **no** tuples have been added.

Therefore whatever appears to carry over data about the previous statement is empty when the 'RaquelTeachingTool' application starts.

- **s <--Retrieve Suppliers Gen[ SID = CID ] Customers Restrict[ CustomerName Length = 6 ]**

Afterwards 5 more tuples have been added :

|              |              |        |
|--------------|--------------|--------|
| <i>blank</i> | PartName     | Text;  |
| <i>blank</i> | PType        | Int32; |
| <i>blank</i> | SupplierName | Text;  |
| <i>blank</i> | SID          | Text;  |
| <i>blank</i> | Location     | Text.  |

These are the same 5 tuples as were added before when the same statement was the previous statement.

- **s <--Retrieve Suppliers Gen[ SID = CID ] Customers Restrict[ CID Find[ '3' ] ]**

Afterwards 8 more tuples have been added :

|              |              |        |
|--------------|--------------|--------|
| <i>blank</i> | SupplierName | Text;  |
| <i>blank</i> | SID          | Text;  |
| <i>blank</i> | PType        | Int32; |
| <i>blank</i> | Location     | Text;  |
| <i>blank</i> | CustomerName | Text;  |
| <i>blank</i> | CID          | Text;  |
| <i>blank</i> | Address      | Text;  |
| <i>blank</i> | CreditLimit  | Int32. |

The first 4 tuples describe relvar 'Suppliers' and the last 4 relvar 'Customers'.

- Shutdown the 'RaquelTeachingTool' application, and re-start it.

Then execute :

**s <--Retrieve Suppliers Gen[ SID = CID ] Customers**  
**Restrict[ CID Find[ '3' ] ]**

Afterwards **no** tuples have been added.

- **s <--Retrieve Suppliers Gen[ SID = CID ] Customers**  
**Restrict[ CustomerName Length = 6 ]**

Afterwards 8 more tuples have been added :

|              |              |        |
|--------------|--------------|--------|
| <i>blank</i> | SupplierName | Text;  |
| <i>blank</i> | SID          | Text;  |
| <i>blank</i> | PType        | Int32; |
| <i>blank</i> | Location     | Text;  |
| <i>blank</i> | CustomerName | Text;  |
| <i>blank</i> | CID          | Text;  |
| <i>blank</i> | Address      | Text;  |
| <i>blank</i> | CreditLimit  | Int32. |

The first 4 tuples describe relvar 'Suppliers' and the last 4 relvar 'Customers'.

- **s <--Retrieve Parts Join[ PType ] Suppliers Restrict[ PType >= 2 ]**

Afterwards 8 more tuples have been added :

|              |              |        |
|--------------|--------------|--------|
| <i>blank</i> | SupplierName | Text;  |
| <i>blank</i> | SID          | Text;  |
| <i>blank</i> | PType        | Int32; |
| <i>blank</i> | Location     | Text;  |
| <i>blank</i> | CustomerName | Text;  |
| <i>blank</i> | CID          | Text;  |
| <i>blank</i> | Address      | Text;  |
| <i>blank</i> | CreditLimit  | Int32. |

The first 4 tuples describe relvar 'Suppliers' and the last 4 relvar 'Customers'.

- **s <--Retrieve Parts**

Afterwards 5 more tuples have been added :

|              |              |        |
|--------------|--------------|--------|
| <i>blank</i> | PartName     | Text;  |
| <i>blank</i> | PType        | Int32; |
| <i>blank</i> | SupplierName | Text;  |
| <i>blank</i> | SID          | Text;  |
| <i>blank</i> | Location     | Text.  |

These are the same 5 tuples as were added before when the same statement was the previous statement.

- In order to check the accumulation of additional tuples, occasionally **all** the additional tuples are removed from 'Attributes.txt'. This does not cause any problems when the next statement is executed, regardless of whether the 'RaquelTeachingTool' application has been re-started or not.