

# RiverWare 5.3 ListSlot Enhancements

**Author: Phil Weinstein**

This document describes several enhancements made to ListSlots in RiverWare 5.3.

## 0.1 Document Status

02-26-2010: Ready for review.

## 1.0 Overview

There are currently about twenty different uses of ListSlots in RiverWare -- deployed on particular Engineering Object Types and Account Types -- but not on user-defined Data Objects. Various types of ListSlots can contain either a particular type of Simulation Object (currently Reservoirs or Control Points) or Accounts, though that can easily be extended to other item types. ListSlots can be populated with items programmatically, and can be edited by the user with the Open ListSlot Dialog.

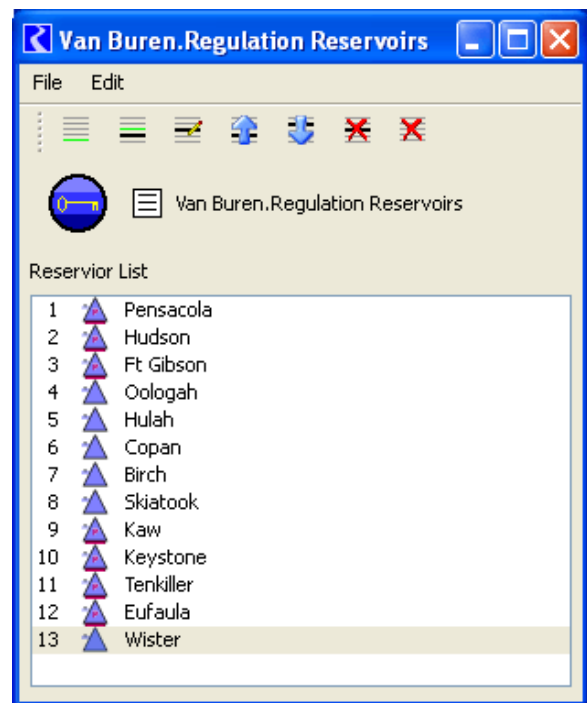
**Two functional enhancements** to ListSlots were developed for RiverWare 5.3 as part of the “Alternate Execution Times for Object Level Account Methods” project, in particular for the new “Target Account” ListSlot used in the “Copy Slot to Slot Inflow” object-level accounting method. These functional enhancements are:

- **ListSlot Item Count Limit:** optionally limits the number of items placed on a ListSlot. Any number is supported, but there is special GUI support for a limit of *one*.
- **“On Host SimObj Only” ListSlot Constraint:** optionally restricts the items (e.g. Accounts) on a ListSlot to those on (or under) the Simulation Object on which the ListSlot resides.

These enhancements are implemented as properties on ListSlot instances. The current implementation is intended for static application to ListSlot entities on Engineering Objects or Accounts (and not on user-defined Data Objects). The values of these properties are not user-editable and are *not saved* in the RiverWare model file or Object export file (as part of the ListSlot serialization).

Also, the following **implementation feature** has been developed:

- Automatic removal of ListSlot items in response to the deletion of the objects (Simulation Objects or Accounts) to which those items refer.



---

## 2.0 ListSlot Functional Enhancements

### 2.1 ListSlot Item Count Limit

ListSlots can be configured with a maximum number of items allowed in the list. By default, there is no limit.

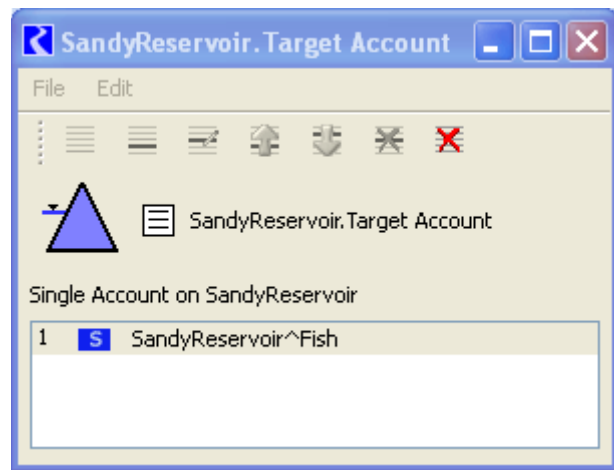
The limit for a particular ListSlot (or ListSlotProxy) can be configured and queried with the use of these C++ methods (on either ListSlots or ListSlotProxies):

- `void setItemCountLimit (int maxItems); // (0 == No Limit)`
- `int itemCountLimit() const;`

The user is prevented from adding more items than the configured limit -- generally through the disabling of certain controls in the Open ListSlot dialog. In the case of repeatedly using the “Apply” button in selector dialog (aka GUS: Grand Unified Selector), an error popup message is shown when the ListSlot is “full”.

Also, in the case of a limit of ONE (1), the following changes to the GUI appearance and behavior apply:

- In the Open ListSlot Dialog (*see illustration*), the list entity label states that the list represents a “Single” item, identified with the name of the item entity (e.g. “Account” or “Reservoir”). *Compare this illustration with the one on the prior page.*



Also, *as illustrated*, if the “On Host SimObj Only” property is set on the ListSlot -- *described in the next section* -- the list entity label also indicates the name of the Simulation Object constraint.

- The selector (GUS) dialog is shown without the “Apply” button. Only the “Ok” and “Cancel” buttons are made available.

### 2.2 “On Host SimObj Only” ListSlot Constraint

A flag can be set on ListSlots indicating that items (e.g. Accounts) in the list are limited to those that are on the same Simulation Object as that of the ListSlot itself. For ListSlots on Accounts, the relevant Simulation Object is the Object containing that Account. If the Simulation Object is an Aggregate Object (e.g. an Aggregate Reach), items on any of that Object’s element objects are included as acceptable list items -- i.e. regarded as being *on* the Aggregate Object.

This “On Host SimObj Only” ListSlot flag can be configured and queried with the use of these C++ methods (on either ListSlots or ListSlotProxies):

- `void setOnHostSimObjOnly (bool onHostOnly);`
- `bool onHostSimObjOnly() const;`

---

In the Open ListSlot Dialog, if this flag is set, the list entity label indicates the name of the Simulation Object constraint. The label will have one of the following two forms, depending on whether or not a ListSlot Item Count Limit of *one* is also imposed -- *for example*:

- “Accounts on SandyReservoir”
- “Single Account on SandyReservoir”

When bringing up the selector (GUS) dialog to add or replace a list item, if the “On Host SimObj Only” ListSlot flag is set, the selector is initialized to the ListSlot’s Simulation Object. The user *can* navigate to a different Simulation Object, but the following error is reported if an item (for example, an Account) on a different Simulation Object is selected by the user:

- “The selected Account is not on the proper simulation object.”

### 3.0 Automatic Removal of ListSlot Items in Response to Object Deletion

A potentially common coding error in RiverWare created the possibility of a crash after the user deleted a Simulation Object or Account which was referred to within a ListSlot. The crash was due to such items not being removed from the ListSlot. **See Gnats 4862.**

The ListSlot now automatically removes list items for objects that have been deleted. For this to work, the object containing the ListSlot (the “client object”) must register a *callback handler* on the ListSlot, but that callback handler doesn’t have to do anything in response to a deletion callback (at least, for the purpose of removing the corresponding item from the ListSlot).

Additionally, the following error is generated -- and reported to diagnostics -- if the client object doesn’t register a callback on the ListSlot.

- “ListSlot <name> needs ListSlotCb<C,T> -- See Gnats 4862”

This error represents a C++ coding error in the ListSlot container -- a Simulation Object or Account.

--- (end) ---