Feature Analysis: LBOA 1.4 SCT Tasks, RiverWare 7.2, July 2017

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This document proposes specific new RiverWare SCT features for these four requested capabilities:

- 1. Time scrolling the model and SCT to a Symbolic DateTime: (a) when the model opens, and (b) as a script action.
- 2. Support full editing of the new Text Series Slots.
- 3. Easier way to apply an entered value to a time range on a Series Slot, with Interpolation option.
- 4. Operations to set SCT slot labels to the slots' name or slot column name.

See also the Development Estimates section at the end of this document.

Time scrolling the model and SCT to a Symbolic DateTime: (a) when the model opens, and (b) as a script action.

Setting the RiverWare **"Global Time Scroll"** DateTime scrolls all "time navigation" DateTime Spinners in open dialogs to that DateTime. The Global Time Scroll is *also* applied to such dialogs (e.g. Open Object dialogs, and SCTs) when they are first opened. We propose the following two new features to set the RiverWare session's Global Time Scroll DateTime:

- A. Option in the Initial Workspace Appearance dialog to set the Global Time Scroll to a specified Symbolic DateTime. (This value persists in the model file).
- B. New RiverWare Script Action to set the Global Time Scroll to a specified Symbolic DateTime.

Note that a Symbolic Date Time specification can be the name of a **Global RPL Function** (a RPL Function in a Global RPL Set). Note also that, in the contexts of the features proposed below, **"Current Timestep"** in a Symbolic DateTime expression refers to the timestep containing the current **"wall clock"** time.

RiverWare 7.1 contains two uses of an advanced Symbolic DateTime editor presenting a drop down menu with sixteen (16) syntax templates, and selectors for existing Global RPL Functions and constant DateTime values (a conventional timestep DateTime spinner popup dialog). The two features outlined below would make use of this advanced editor. The *current* uses are:

- 1. The Plot Axis Configuration Dialog's time axis widgets for "Time Scaling" settings.
- 2. Script Dashboard widgets for Set Slot Value actions for DateTime-unit slots. (pictured below in 1B).

(1A) Option in the Initial Workspace Appearance dialog to set the Global Time Scroll to a specified Symbolic DateTime.

The currently supported (RiverWare 7.1) **Initial Workspace Appearance dialog** is shown to the right. To this dialog we could add an optional **Symbolic DateTime specification**, persistent in the model file. When loading a model file containing this specification, it is evaluated and applied to the Global Time Scroll.

If this Symbolic DateTime is defined, its value will be added to the **"Global Time Scroll" menu** in **time navigation DateTime Spinners** (but only if its value is distinct from the other menu items). That menu currently has only two *timestep value* items, *as pictured here:*

_ □ ×						
					Global Time Scroll	
6/16	10/7/16 Fri	10/8/ Sat			"N Run Start Oct 1, 2016	
					Run Finish Dec 31, 2017	
80.00	80.00		90	П		
98.10	101.90		99			
400.00	400.00	1	00			

R Initial Workspace Appear
Open Model in View:
Last Saved Workspace View
O Specified View:
Simulation View 🔻
Zoom: 100% 🔻
Location:
O Lower Left Corner
Last Save Location
O Center-Most Object
Ocenter on Object:
🖄 Stampede 🛄
Set from Current View OK

(1B) New RiverWare Script Action to set the Global Time Scroll to a specified Symbolic DateTime.

A new "Global Time Scroll" Script Action type will be provided. This is similar to the Set Slot Value script actions for DateTime-unit slots (also mentioned above). The following is an example of such an action, shown in the Script Dashboard.

C Enter the Ne	w Ops Start Date (Tomorrow)	^
Use: Cur	rrent Timestep	24:00 July 24, 2017
Current:	24:00 July 20, 2017	_
 Enter the Ne 	w Ops Start Date (Tomorrow)	
Use: Cur	rrent Timestep	24:00 July 24, 2017
Curre	Constant Datetime Editor	
✓ Input Da	HH:00 MMM DD, YYYY	
Load Nev	Current Timestep	
	Current Timestep + N Timesteps	
Set Obse	Current Timestep - N Timesteps	×
Execution	Start Timestep	
	Start Timestep + N Timesteps	
Status: Rei	Start Timestep - N Timesteps	not executing
	Finish Timestep	
	Finish Timestep + N Timesteps	
	Finish Timestep - N Timesteps	
	00:00 Jan 1, Start Year	
	00:00 Jan 1, Start Year + N Timesteps	
	00:00 Jan 1, Start Year - N Timesteps	
	Dec 31, Finish Year	
	Dec 31, Finish Year + N Timesteps	
	Dec 31, Finish Year - N Timesteps	
	Global RPL Function	

(2) Support full editing of the new Text Series Slots

Text Series Slots were introduced in the recent RiverWare 7.1 release. The SCT's support for this new slot type (internally, actually a mostly hidden unit type) lacks these two capabilities:

- A. Editing of Text Series Slot timestep values and flags.
- B. Column width operations taking into account the display width of text values.

This development will complete those features.

Technical: Even when a single selected cell is edited by the user, a "list" of selected slot/timestep cells is processed using the *"visitor pattern"* by visitor classes which correspond to particular slot/timestep-value modification operations. Examples of these visitors include these classes defined in the SctDialog class: ValueSetter, ValueAdjuster, FlagSetter, NoteSetter, etc. For editing operations on Text Series Slots, either the ValueSetter visitor could be augmented with a string (text) value, or a new "TextValueSetter" visitor could be defined.

(3) Easier way to apply an entered value to a time range on a Series Slot, with Interpolation option

Added to the SCT's series data table's context menu (right-click on a slot/timestep cell) will be a "**Set Values over Time Range...**" menu item. *This shows the following dialog*. This context-menu item will be enabled only when *exactly one* cell is selected (which would always be the case unless the user holds down the SHIFT key when right-clicking in a cell).

🕵 Set Slot Val	ues over Time Rang ? ×	
First Timestep:	Oct 2, 2016	
Last Timestep:	Date/Time Timestep Spinner 主	
Timestep Count: 22		
Set Values To 31.50 acre-ft/month	Interpolate To : Select Cells Cancel	

Of course, given a fixed "First Timestep", the "Last Timestep" and "Timestep Count" inputs are mutually dependent; editing one causes the computation of the other. The step size of the "Last Timestep" timestep spinner matches that of the SCT from which this dialog was shown; that's typically the run controller's timestep size, but it doesn't have to be. As these inputs are changed, the slot/timestep cell selection in the SCT's series data table -- and the computed "Selection Statistics" (along the bottom of the SCT) -- are **dynamically updated.** The numeric value entered by the user is in the current display units of the selected series slot.

The four buttons presented here all dismiss the dialog ...

- 1. Set Values To ... sets the full specified time range to the specified value.
- 2. Interpolate To ... sets the final timestep to the specified value, and interpolates all of the values in between.

(This is enabled only if the initial value was non-NaN).

- 3. Select Cells ... dismisses the dialog, with the new specified cell selection active.
- 4. Cancel ... dismisses the dialog, with just the original cell selected.

(4) Operations to set SCT slot labels to the slots' name or slot column name

Added to the SCT's Edit Series Slot List (*see the following image*) will be the following four operations. These will be applied to all of the selected slot items.

- Set Labels to
 - Full Slot Names
 - Slot Names
 - Slot Column Names
 - Slot and Column Names.

In this example, the slot labels happen to be Slot Column Names on an AggSeries Slot (named "FR").

1		c	CT TROA_SCT_Library.sct	_ □	×	
-	-1 -		,			- 1
	Slots		DMI Run Scripts Diagnostics Go To			- 1
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Series Slots	E	Edit Series Slot List Scalar Slots	Other Slots Object Grid			
Add / De	lete	/ Move Series Slot 🔘 Configure	Color Alerts			
Slot or Divi	der Li	abel	Slot Name	Unit Type	St ^	
	Δ1	WQAboveFRCredHoldback	Imperfect Operations Accounting.Farad Tolerance_AggSer	Flow	1[
	44	WQAboveFRInflowRelease	Imperfect Operations Accounting, Farad Tolerance_AggSer	Flow	1[
	44	WQFRCredHoldback	Imperfect Operations Accounting.Farad Tolerance_AggSer	Flow	1[
	44	WQOutflow	Imperfect Operations Accounting.Farad Tolerance_AggSer	Flow	1[
Process		ts				
▲ FR				_		
		Boca	PartyReservoirCapacities.FR.Boca	Flow	1[
		Donner	PartyReservoirCapacities.FR.Donner	Flow	1[
		Independence	PartyReservoirCapacities.FR.Independence	Flow	1[
		Martis	PartyReservoirCapacities.FR.Martis	Flow	1[
		Prosser	PartyReservoirCapacities.FR.Prosser	Close All Groups		
		Stampede	PartyReservoirCapacities.FR			
4 Field		Tahoe utflow	PartyReservoirCapacities.FR.Tahoe	Insert Slots.		
- 115	M		PartyReservoirCapacities.FishW.Boca	Insert Slot D	Divider	
	M	Independence	PartyReservoirCapacities.FishW.Independence	Insert Shee	t Divide	r
	M.	Prosser	PartyReservoirCapacities.FishW.Prosser			
		Stampede	PartyReservoirCapacities.FishW	Reassign Slo		
	M	Tahoe	PartyReservoirCapacities.FishW.Tahoe	Remove 7 S	lots	
<	H			Copy 7 Slots		
•				Cut 7 Slots		
1		Move Groups	✓ Show both SI			
				Insert Copie	d Slots	
Insert	•	Append 🔻 Create Similar G	roups Re	Append Cop	ied Slo	ts
				Open 7 Slot		
				Open 7 Slot	Descrip	otions

Development Estimates

Task	Est Hours	Description
1A	16.0	Initial Workspace Appearance Settings: Optional Global Time Scroll
1B	8.0	New Script Action: Global Time Scroll
2A	16.0	Text Series Slots: Editing
2B	6.0	Text Series Slots: Column Width Operations
3	16.0	"Set Values over Time Range" dialog and operation
4	5.0	Operations to set SCT slot labels to slots' names / column names
	67.0	Total [Hours] - Phil (7-25-2017).

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