



CADSWES University of Colorado

Center for Advanced Decision Support for Water and Environmental Systems

Qt Migration

RiverWare User Group Meeting
February 6 - 7, 2007

Status of our Galactic Exodus

Replacing Galaxy with Qt

Galaxy has no future

- Visix bankruptcy / Ambiencia purchase
- No updates or maintenance
- Shrinking user-base
- No Support for new OS versions

Qt (*selected after extensive study*)

- Platform independent (Windows, Solaris, Linux, Mac)
- Substantial user-base
- Reasonable cost and licensing
- Commercial and non-commercial Open Source
- Object-oriented
- GUI builder tool
- Integration with Galaxy



Benefits of Qt over Galaxy

- More advanced GUI components
... e.g. support for integrated icons, tool tips, status bars, context menus.
- Faster development
- Better maintainability
... due to object oriented software structure
- Migration path to Linux and 64-bit computing

Prior Completed Qt Development

- Workspace and new Accounting View
- Open Object and Open Slot Dialogs
- SCT 2.0
- DMI Dialogs
- Output Manager & Plot Dialog
- Run Control and MRM and Run Progress
- RPL interface and Rules Analysis Dialog
- Diagnostics Window
- Scenario Manager
- Selectors
- Account and Supply Managers

Recent Completed Qt Ported Dialogs

➤ Accounting

- Open Account Dialog (slot list and configuration)
- Account Editor (series data editor)
- Object Account Summary Dialog

➤ Run Analysis Dialogs

- Simulation / SimObj Dispatch & Solution Detail
- Rulebased Simulation

Object Acct Summary Dialog

Object Account Summary - LeakyReach

File Edit View TimeStep I/O Config Adjust

Single Object: **LeakyReach** Select Object ...

Columns: Acct Slots TimeSteps

Account Types: Storage InstreamFlow Diversion PassThrough

Account Slot Entity: **Inflow**

Accounts (3 of 3) List All Accounts

Sum	Ord	Object	Account	Type	Water Type	Water Owner
<input checked="" type="checkbox"/>	1	LeakyReach	Farmers	Pass	Private	RedRiver
<input checked="" type="checkbox"/>	2	LeakyReach	Fish	Pass	State	Fish
<input checked="" type="checkbox"/>	3	LeakyReach	Municipal	Pass	State	RedRiver

Select All Accounts Set Selection ↑ ↓ Set Order

Value: 0.10989010989 cfs Flow Scroll: January 2, 2005

	LeakyReach - SUM Inflow cfs	LeakyReach ^Farmers Inflow Total cfs	LeakyReach ^Fish Inflow Total cfs	LeakyReach ^Municipal Inflow Total cfs
12-31-2004 Fri	0.00	P	P	
01-01-2005 Sat	80.05	0.00 R	80.00 R	0.05 I
01-02-2005 Sun	80.11	0.00 R	80.00 R	0.11 I
01-03-2005 Mon	80.16	0.00 R	80.00 R	0.16 I
01-04-2005 Tue	80.22	0.00 R	80.00 R	0.22 I
01-05-2005 Wed	80.27	0.00 R	80.00 R	0.27 I
01-06-2005 Thu	80.33	0.00 R	80.00 R	0.33 I
01-07-2005 Fri	80.38	0.00 R	80.00 R	0.38 I
01-08-2005 Sat	80.44	0.00 R	80.00 R	0.44 I

Show empty Slots

LeakyReach^Municipal Inflow (SandiaReservoir Municipal to LeakyReach Municipal)
1 value: 0.11 [cfs]

Object Account Summary - LeakyReach

File Edit View TimeStep I/O Config Adjust

Single Object: **LeakyReach** Select Object ...

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<input checked="" type="checkbox"/>	3	LeakyReach	Municipal	Pass	State	RedRiver

Select All Accounts Set Selection ↑ ↓ Set Order

TimeSteps (5 of 366) List All TimeSteps

Sort: Weekday

TimeStep	Month	W-Day	W-Day
<input checked="" type="checkbox"/>	01-02-2005	Jan	2 Sun
<input checked="" type="checkbox"/>	01-09-2005	Jan	9 Sun
<input checked="" type="checkbox"/>	01-16-2005	Jan	16 Sun
<input checked="" type="checkbox"/>	01-23-2005	Jan	23 Sun
<input checked="" type="checkbox"/>	01-30-2005	Jan	30 Sun

Set Selection

Value: 0.10989010989 cfs Flow Scroll: January 2, 2005

	01-02-2005 Sun	01-09-2005 Sun	01-16-2005 Sun	01-23-2005 Sun	01-30-2005 Sun
Farmers	0.00 R	0.00 R	0	0	0
Fish	80.00 R	80.00 R	0	0	0
Municipal	0.11 I	0.49 I	0.88 I	1.26 I	1.65 I
SUM	80.11 O	80.49 O	0.88 O	1.26 O	1.65 O

Show empty Slots

LeakyReach^Municipal Inflow (SandiaReservoir Municipal to LeakyReach Municipal)
1 value: 0.11 [cfs]

Rules Run Analysis

Model Run Analysis / Rules Effects -- Rulebased Simulation

File View Object Color Test

Sort: Name Scroll: January 1, 2005

Details Rules Detach

= Succeeded at 01-09-2005

Priority	Rule
0	User Input
✓ 1	RedRiverAcct
✓ 2	SandiaAcctOutflows
✓ 3	SandiaWeekendOutflow
✓ 4	SandiaWeekdayOutflow
✓ 5	RedRiver
6	Farmers March 1 Allocation

ControlPoint0	↑3	↑3	↑4	↑4	↑4	↑4	↑4	↑3	↑3	↑4	↑4	↑4	↑4	⊘	⊘
LeakyReach	↑3R	↑3R	↑4R	↑4R	↑4R	↑4R	↑4R	↑3R	↑3R	↑4R	↑4R	↑4R	↑4R	⊘	⊘
RedRiver	↑3	↑3	↑4	↑4	↑4	↑4	↑4	↑3	↑3	↑4	↑4	↑4	↑4	⊘	⊘
RedRiverUsers	4/5R	4/5R	4/5R	4/5R	4/5R	4/5R	4/5R	4/5R	4/5R	4/5R	4/5R	4/5R	4/5R	⊘	⊘
SandiaReservoir	↑0/↓3R	↑0/↓3R	↑0/↓4R	↑0/↓4R	↑0/↓4R	↑0/↓4R	↑0/↓4R	↑0/↓3R	↑0/↓3R	↑0/↓4R	↑0/↓4R	↑0/↓4R	↑0/↓4R	⊘	⊘

SandiaReservoir at 01-09-2005
 Method 'solveMB_givenInflowOutflow' Dispatched at Priority 3, governed by Slots:
 Outflow (Priority 3R) and Inflow (0 = User Input)

Close

Frame Cells: "R" Effects Only
 Senior To Priority: 4

Remaining Galaxy Dialogs to be Ported to Qt

- Exchange Dialogs (Accounting)
- Diagnostics Configuration
- Snapshot Manager
- Multi-Object Method Selector
- SubBasin Management Dialog
- SimObj Synchronization Control
- Unit Converter
- File Selectors (switch to use of Qt File Dlg)

Benefits of Full Qt Migration

- Linux
 - 64-bit OS
 - Unix on Intel hardware
- 64-bit Windows
- No Future Galaxy OS Conflicts
- Remove Integration Mechanism

Other Migration Tasks

- Removal of Rogue Wave Library
 - Needed for Linux and for 64-bit
... to avoid unreasonable licensing cost.
 - Very limited use in RiverWare:
... String class and Regular Expression processing
- Port from Qt 3 to Qt 4
 - Non-trivial effort, but well supported migration.
 - Short term Qt 3 development can be optimized to ease transition to Qt 4.

Goal for Galaxy to Qt Port Completion

- Percent complete: Approx 90% +
- Goal for completion: FY2008
... depending on funding, competing work
and staffing.