CADSWES Maintenance Accomplishment Report Compilation -- March 2014 -- edit 4-15-2014

The report includes:

* Substantive content from: Jessica, Neil and David
* Bug-fix items from: Phil, Patrick, and Bill (with bug details).
* (Mitch and Tim indicated that they had nothing to report this month).

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| (II) RiverWare Software Maintenance1. Releases, Patches and Snapshots
2. Software Updates, Bug fixes (not associated with newdevelopment)
3. Development tool improvements; issue tracking software; modelcomp
4. Enhancements or changes to regression tests (not part of development tasks)
5. Download, Install and Release Processes
6. Updates to license software/procedures
7. Updates to download/install/configure user documentation
8. Modification to Web pages for downloads and installs
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**(II.A) Releases, Patches and Snapshots**

The following RiverWare 6.4 patch was made. Release notes are included:

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| **RiverWare 6.4.7** was released on March 19, 2014. **Bugs** The following bugs were fixed:* 5451 and 5462: Import of Aggregate Series Slot data from Excel DMI was incorrectly interpreting units.
* 5463: Importing a table column did not allow a NaN to be imported.
* 5464: In the step response reach routing methods, if the first routing coefficient was zero, an incorrect computation could occur at pre-simulation timesteps.

**Distributed MRM**  The following issues and bugs were fixed for Distributed Concurrent MRM: * When running input Excel DMIs, the Excel file was being accessed by multiple instances of RiverWare. Under certain circumstances, this led to the import not working when a read-only warning was issued by Excel.
* 5458: Under certain system configurations, distributed MRM was not running correctly.
* 5469: Distributed MRM did not run if a global function RPL set was saved in the model file.
* 5472: Distributed MRM did not support environment variables in the working directory or configuration files.
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**(II.B) Software Updates, Bug fixes (not associated with new development)**

**The following bugs were fixed:**

* Bug 3977: Output Manager slot lists need to be export/importable.
* Bug 5451: Excel Input DMI requires NONE in columns after first
* Bug 5456: Plot Page Output Device Configuration Dialog: Can't paste Periodic Slots
* Bug 5462: In Excel DMI, all columns don’t come in with same units
* Bug 5468: If RIVERWARE\_HOME isn't set distributed MRM generates bad XML\*
* Bug 5469: Distributed MRM generates bad XML if Global Function Set is saved in model file\*
* Bug 5472: MRM distributed run working directory specification cannot use environment variable\*
* Bug 5473: Parser stack error loading a ruleset
* Unfiled: When running input Excel database DMIs from multiple traces simultaneously during a distributed MRM run, an interactive message was generated from one of the hidden Excels that was stopping the run because it was waiting for a response.

\*details for three particular bugs are provided below.

**Bug 5468 Detail:** If RIVERWARE\_HOME isn't set distributed MRM generates bad XML

RiverWare writes the RIVERWARE\_HOME environment variable to the XML file which defines a distributed multiple run:

 <env>RIVERWARE\_HOME\_464=C:/Program Files/CADSWES/RiverWare 6.4.6</env>

However, if RIVERWARE\_HOME isn’t set RiverWare wrote bad XML:

 <env>=C:/Program Files/CADSWES/RiverWare 6.4.6</env>

This caused the distributed MRM controller’s starting RiverWare to fail with a cryptic "Cannot start" error message. The fix was to make the <env> element optional and only present when RIVERWARE\_HOME is set. (The environment variable is probably unnecessary now that distributed multiple runs are constrained to one computer. It was previously necessary because there was no guarantee RIVERWARE\_HOME was set on other computers.)

**Bug 5469 Detail:** Distributed MRM generates bad XML if Global Function Set is saved in model file

RiverWare writes the currently open global functions sets to the XML file which defines a distributed multiple run; if the global function set was saved in the model file RiverWare wrote:

<gfs>Global Function Set 1 (from model file)</gfs>

The distributed MRM controller translated this to a batch mode command which attempted to open the file "Global Function Set 1 (from model file)" which not surprisingly failed. The fix is to make the <gfs> element optional and only present when the global function set is in an external file.

**Bug 5472 Detail:** MRM distributed run working directory specification cannot use environment variable

The distributed MRM configuration requires a working directory where working files associated with the distributed multiple run are written. The configuration didn’t allow environment variables in the directory path, for example:

$CRSS\_DIR/temp

which was inconvenient for BOR, whose CRSS model is defined in terms of $CRSS\_DIR. The directory path now allows environment variables.

**HDB Server Removed / OracleConnect and HdbConnect Integrated into RiverWare:**

With the port to Qt4, RiverWare and server code had to be rewritten to use Qt4 socket classes. When the HDB server was modified and rebuilt to include HDB ensemble functionality, it was noted that “phantom” commands seemed to be intermittently reflected from the RiverWare client back to the server over the socket. With testing by Reclamation that involved moving a lot of data via the ensemble functionality, the server commands would get out of sync with the RiverWare client and the server would hang. It was strongly suspected that these phantom commands were causing the out of sync problem. To address this problem, the client/server mechanism was taken out of the communication process, and the code to connect to the HDB Oracle database was incorporated directly into RiverWare as described below.

The OracleConnect Visual Studio project that was in the HDB server was moved to the RiverWare Visual Studio Solution (this contains the Oracle C++ Call Interface code that connects to HDB for the OracleConnect and HdbConnect classes, as well as the OracleError class).  The RwOracle and RwHdb classes in RiverWare were modified to contain a static instance of OracleConnect and HdbConnect, respectively, Functions in RwOracle and RwHdb were modified to call the connect code directly through these static instances. Code was added to RwOracle and RwHdb classes to process Oracle error and warning messages returned from the connection code and add these messages to the DMI handler as well as posting them as RiverWare warnings. Diagnostic messages for illuminating the interactions with HDB were in the HdbClient and OracleClient classes under the diagnostic category of ClientServer. These were moved to the RwOracle and RwHdb classes under the category of Dmi Dataset.

Compilation of the new RiverWare code with Oracle libraries produced errors with type definitions of the word “boolean”.  Investigation found that Oracle include files will typedef “boolean” as an int if it is not already defined. A windows library was later declaring it as a typedef of unsigned char creating the multiple definition error. The solution was to ensure that the Windows file wtypes.h is included before the Oracle file occi.h so that the Windows definition happens first and then Oracle does not attempt to define it.

A server timeout value could be set and saved with each HDB dataset that defined the amount of time before an error was declared if the RiverWare client did not hear back from the HDB server. This was needed for the situation where the communication link between client and server became inoperable. The HDB dataset dialog was modified to remove the widgets and handler code for setting the timeout values, as these are no longer needed with the new code arrangement. The RiverWare help was modified to delete description of the server timeout functionality.

A release build of the new code was tested to ensure that the HDB functionality works correctly. Input and output DMIs as well as input and output ensembles were run to exercise all of the methods that connect to HDB. The posting of diagnostics and error messaging were also tested to verify proper operation. A snapshot of the new executable will be sent to Reclamation at Loveland for user testing.

**(II.C) Development tool improvements; issue tracking software; modelcomp**

*None reported for March 2014.*

**(II.D) Enhancements or changes to regression tests (not part of development tasks)**

The regression tests continue to be maintained on a daily basis. This involves updating the regression tests to exercise new developments in the code. Also, as new code is added to the development area, the model comparisons performed in the nightly regression tests usually show differences (for example, because a new method category may have been added). When this occurs, the regression tests need to be updated to reflect the current state of the development area so model comparisons do not fail. In addition, every week, the daily history of each regression test is analyzed to determine if the run time or model size has significantly changed because of new development. In March, the tests failed when the new HDB/oracle client work was implemented. The tests were analyzed and the testing machines were updated so the tests ran again.

**(II.E) Download, Install and Release Processes**

* Created a new special email file describing why RiverWare default installation is designed to have each release installed into different install directory, based on Mike Mamales’s question and David’s input.
* Working on the configuration of the four newly converted InstallShield 2013 project files. Verifying the changes and testing the installation of the setup files built.

**(II.F) Updates to license software/procedures**

* Maintaining RiverWare licenses for internal development systems. This is an ongoing task.
* Downloaded and installed the three (32-bit, 64-bit, and Solaris) setup files of the new RLM version 11.0 release. Working on the configuration and building the new developer kits. In the meantime also updating the RLM Configuration and Build Guide document, with the new RLM tool kit download procedure (due to the changes from Reprise download site and procedure), new location for tool kit storage folders and build folders.

**(II.G) Updates to download/install/configure user documentation**

* Updated the document “RiverWare Solaris License Server Configuration Guide.” Added table of contents, added section “RiverWare Floating License File,” and updated with some minor details. Re-formatted the entire document so it is in sync with other license/install online document. Removed TVA specific information and replaced them with general wording and examples for all RiverWare users.
* Working on updating the License Server Configuration Guide (Regular Windows version). Added Table of Content page. Reviewing the entire document and made changes based on the changes since last update.

**(II.H) Modification to Web pages for downloads and installs**

*None reported for March 2014.*

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