Software Development, Maintenance, Releases and Tech Transfer

RiverWare User Group Meeting
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Software Development Team

- ➢ **Professional software engineers**
  - Continuity and institutional knowledge
  - Variety of complimentary backgrounds
- ➢ **Professional water resource engineers**
  - Engineering methods
  - User support
- ➢ **Professional support staff**
  - Software configuration management (licensing, releases)
  - Hardware maintenance

Software Development Process

Our goal is to deliver professional quality software applications which meet our users' needs:

➢ Requirements analysis

➢ Requirements document

➢ High level design document

➢ Estimates

➢ Other documents as appropriate

➢ Document reviews

Software Development Process

➢ Write code

➢ Unit test (may include writing test code)

➢ Peer code review (correctness, efficiency, coding standard conformance, readability, maintainability),

➢ Integration testing (including regression tests, memory analysis)

Software Maintenance

➤ Bug fixing

  ● Critical bugs fixed for next patch release

  ● Non-critical bugs deferred to next major release

  ● Before major release thorough review of bug list to identify bugs to fix for release

➤ RiverWare development requires many software packages:

  ● Applications or libraries

  ● Commercial

  ● Open Source

  ● Home Grown (Java, Perl, Python, Tcl/Tk)

Software Maintenance

- ➢ **Operating Systems:**
  - Windows: XP, Vista (No more 2000 or NT),
  - Solaris: 2.6-2.9
- ➢ **RiverWare Functionality:** Qt, Qwt, RogueWave, CPLEX, Concert, FlexLM, HecGen, heclib, Oracle, MODFLOW, Tcl, zlib (No more Galaxy!)
- ➢ **Source Control, Builds, Regression Tests, Releases:** CVS, TkCVS, rw-checkout, rw-config, rw-update, rw-build, rw-rt, modelcomp, cvs-copy.pl, InstallShield, rw-release, rw-install
- ➢ **Compilers, Debuggers, Performance Analysis:** Microsoft Visual Studio, Sun Studio, Intel Fortran, Rational Purify and Quantify
- ➢ **Bug Tracking, User Support:** Gnats, Perl CGI scripts, SupportTool
- ➢ **Web Pages, Online Payment System:** DreamWeaver, Photoshop, Perl and Python CGI scripts

Software Maintenance

➢ Many pieces to the puzzle and many dependencies between the pieces

➢ New versions of third-party software are continually released
  - Monitor and evaluate new versions
  - New versions may be compatible with RiverWare or they may require substantial RiverWare code changes
  - New versions may affect other third-party software
  - Estimate effort and schedule upgrade to new version, keeping in mind release schedule

➢ Keeping current requires **significant** effort

User Support

➢ **User Support Procedure**

- All user support questions should be sent to:

  riverware-support@colorado.edu

- Multiple support staff receive email and most appropriate or available person can respond

Releases

➢ Typically two releases each year, with additional patch releases as necessary

➢ Numbering: RiverWare Major.Minor.Patch
where Major = major version number (currently 5)
   Minor = minor version number (currently 0)
   Patch = patch level number (currently 1)

➢ Downloading
  - From the web site:
    http://cadswes.colorado.edu/users/
  - From the ftp site:
    ftp cadswes2.colorado.edu
  - For either site, log in as: rwuser
  - For passwords contact RiverWare tech support:
  - riverware-support@colorado.edu

Releases

- Major and minor releases: RiverWare 5.0
  - Generated from latest development
  - Fully tested and verified (usually including a pre-release)
  - Include updated online documentation and release notes
  - Users notified by e-mail and encouraged to upgrade
- Patch releases: RiverWare 5.0.1
  - Generated from last full release with minor enhancements
  - Tested and verified (usually without a prerelease)
  - May include updated online documentation
    - Usually minor enhancements/fixes mentioned in email (also under "notes" link on web site)
  - Users notified by e-mail but may choose not to upgrade

Snapshots

➤ Development snapshots:

RiverWare 5.1 Development

- Generated from previous night's development area
- Should only be used to test new development
  Should NEVER be used for operations or model building
- Only tested by overnight regression tests
- Does not include updated online documentation or notes
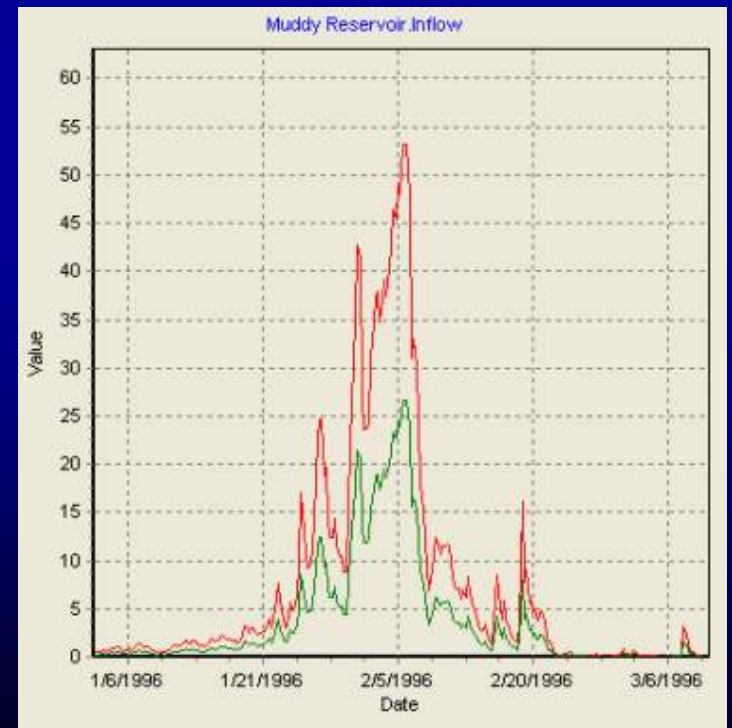- Concerned users are notified by phone or email

Other Tools available

➤ **Modelcomp – RiverWare model comparison tool**
- **Execute from command line**
  ```
  modelcomp model1.mdl model2.mdl
  ```
- **Model files are compared line by line**
- **Slot differences include convergence check**
- **Graphing Options**
  - Both sets of data (-g)
  - Differences only (-d)
  - Scaled Differences (-s)
- **Largest differences are shown first**

Muddy Reservoir.Inflow

Other Tools available

- ➢ GPAT – Graphical Policy Analysis Tool
- ➢ Excel Writer – Writes Excel files from RDF
- ➢ YAPP – Yearly Aggregation Post Processor

- ➢ All are available on website

Bugs

➢ Filing Should be done by users, even if CADSWES verifies

➢ Include information to reproduce the bug

- Events leading to the bug
- Exact text of any errors or messages
- Model, ruleset, and/or dmi in which bug is manifested
- Send model to riverware-support@colorado.edu
- ftp models to ftp://cadswes2.colorado.edu/

Bugs

> ## Follow-up

- Filer is contacted by automated email
- Bug tracking system notifies filer when status changes (closed, info added, reassigned)
- Enhanced web lookup now available
- Closed bugs documented in release notes or patch e-mail

Training Schedules

➢ **Typically two Intro to Simulation and two Rules classes per year**

➢ **Intro to Simulation**

  - Classes held when there is enough interest / demand
  - Class dates chosen to accommodate participants' schedules

➢ **Rulebased Simulation**

  - Typically held a month or two after the Intro class
  - Need to have completed Intro to Simulation class

➢ **Accounting Class**

  - Currently under development