

Diagnostics Output Message Display Filtering

Version 1 for RiverWare 6.3

Authors: Phil Weinstein, Patrick Lynn, Tim Magee / CADSWES

This document describes an enhancement to the RiverWare Diagnostics Output Window to support display filtering of diagnostics messages.

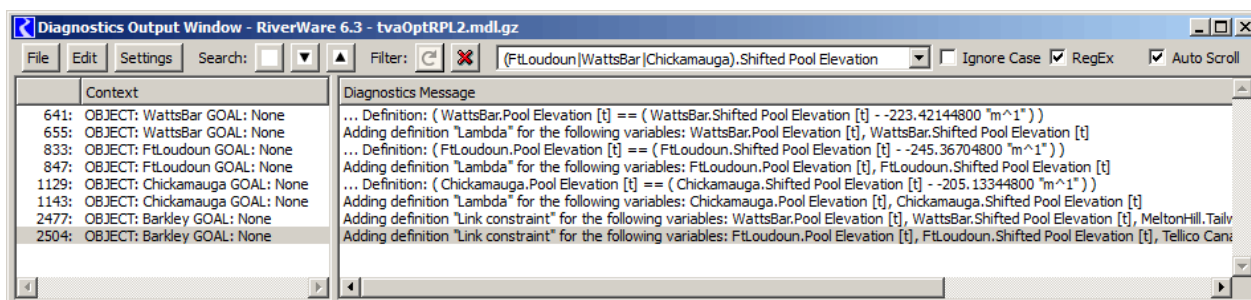
0.1 Document Status

08-30-2012: Ready for review.

08-31-2012: Minor edits.

0.2 Contents

1.0 Overview	2
2.0 Message Search and Filter Controls	3
2.1 Search Controls	3
2.2 Filter Controls	4
2.3 Search / Filter Parameter Controls	4
3.0 Search and Filter Pattern Matching	5
4.0 Automatic Width Enhancements	6



The screenshot above illustrates use of this Regular Expression example:

(FtLoudoun|WattsBar|Chickamauga).Shifted Pool Elevation

... However, the period should have been preceded by a back-slash ("\\").

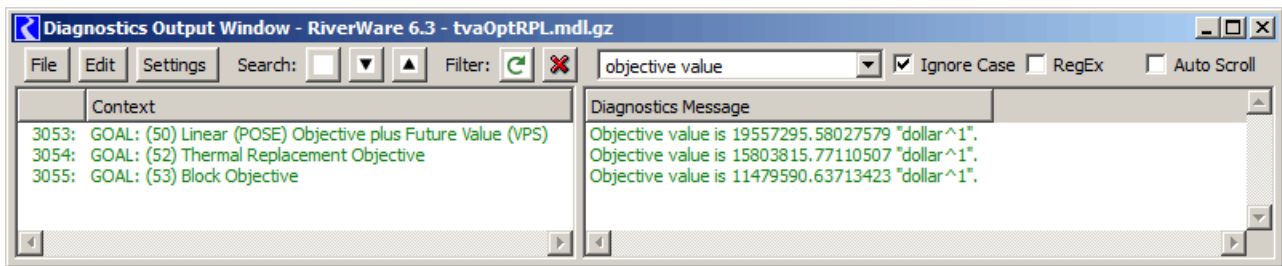
... In this example, it works the same.

1.0 Overview

The RiverWare Diagnostics Output Window has been enhanced to provide user-controlled *display filtering* of diagnostics messages. Filtering is supported in parallel with this dialog's previously available "search" capabilities. For filtering, only *character string* matching is supported -- that is, not the search feature's *message type* matching (e.g. warning vs. error) capability.

Additional enhancements to the Diagnostic Output Window include:

- Improvements in pattern matching capabilities for both search and filter functions. This includes support for non-case-sensitive matches, "regular expression" pattern syntax, and improved support for "wildcard" pattern syntax.
- Search pattern history menu (implemented using an editable combo box).
- Automatic width adjustment options.



The sort of filtering supported with this enhancement -- *display filtering* -- has a temporary effect on the display of the internally maintained set of generated diagnostic messages. It does not remove any generated diagnostic messages, nor does it prevent the generation of any particular new diagnostic messages. All generated messages can be displayed again by clearing the filter, and a different filter operation can be applied (in place of a previously applied filter).

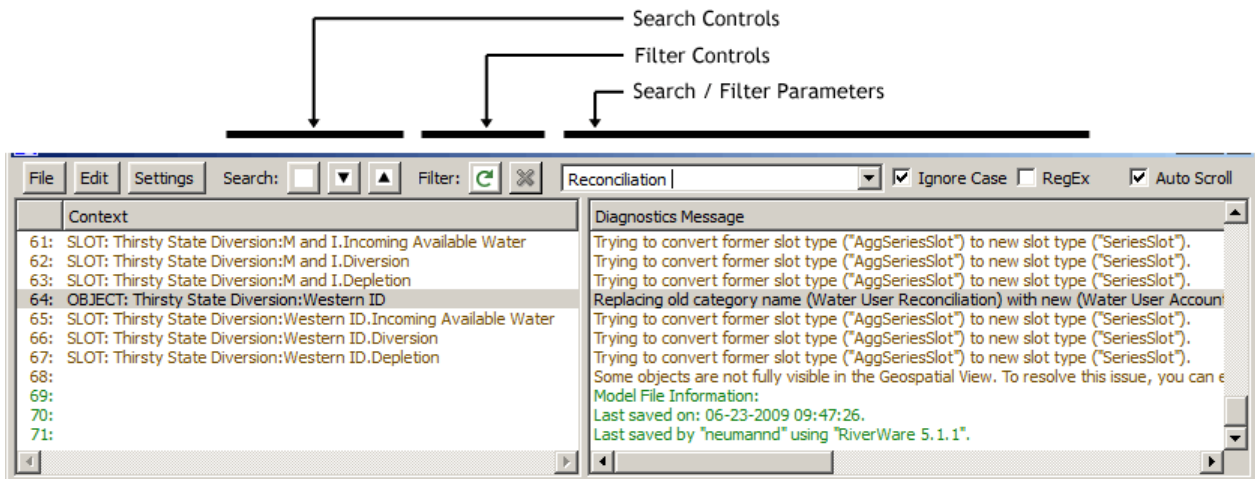
Message *display filtering* is different from the diagnostic message *generation filtering* specified within the Diagnostic Configuration Dialogs accessible from the Diagnostics Manager dialog. See the "Diagnostics" section of RiverWare online help for a description of message generation filtering supported by those configuration dialogs.

When applying a display filter to messages, all previously generated messages "failing" (not matching) the specified filter pattern are hidden, as are newly generated messages failing the pattern. A diagnostic message matches the pattern if the "context" and "message" components of the message -- together -- *contain* the matching pattern.

The following "high priority" messages are always shown, regardless of the active filter specification:

- Errors
- Internal Errors

2.0 Message Search and Filter Controls



Formerly, only the Search function was available. Its “pattern” entry field is now shared with the new Filter function, along with two new checkboxes to modify the application of the entered pattern.

2.1 Search Controls

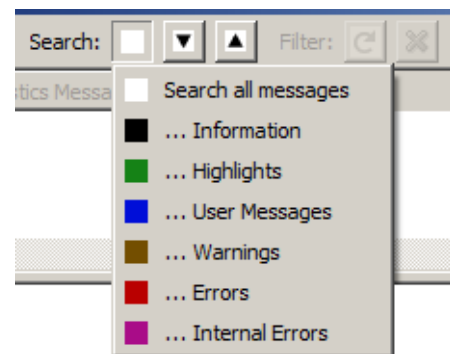
The **Search controls** (not changed from the prior implementation) include:

1. **Message Type** (color coded) **Drop-Down** menu.
2. **Search Forward** button (down arrow)
3. **Search Backward** button (up arrow)

The colors shown in the Message Type drop-down menu match the *text color* of messages of those respective types.

The Search Forward and Search Backward operations cause the subsequent or prior message row matching the entered pattern text (and optionally, also matching a selected message type) -- with respect to the currently selected row -- to be selected and scrolled into view. (Only single-row selection is supported within the message list). Clicking these buttons when no message row matches the current pattern and optional message type criteria causes an audible “beep”.

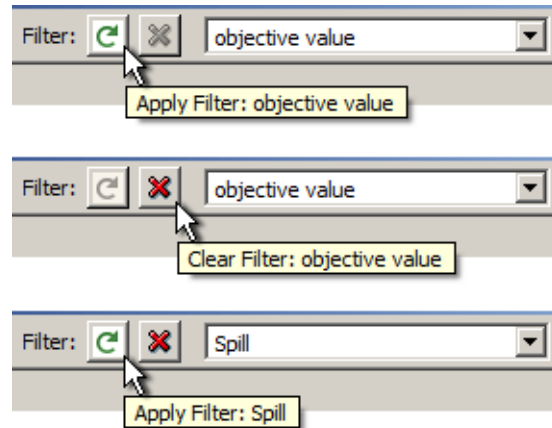
TIP: The “Add entered text as User Message” operation in the Edit menu can be used to effectively append a “bookmark” to the end of the message list. That text can later be recalled from the history menu of the entry field, and used to scroll to the various instances of that bookmark within the message list using the Search functions.



2.2 Filter Controls

The **Filter controls** include these two buttons.

1. The **Apply Filter** button applies the entered text as the active filter pattern. Message rows not matching the pattern are hidden. This button is *disabled* when the search / filter parameters already match the currently active filter (or when the entered text is empty). Clicking this button causes it to become disabled until either the search / filter parameters are changed or the Clear Filter button is clicked.
2. The **Clear Filter** (red “X”) button clears filtering -- causing all message rows which had been hidden to become visible again. This button is enabled only when filtering is active. Clicking this button causes it to become disabled until the Apply Filter button is clicked again.



The only direct indication that messages are being filtered is the Clear Filter (red “X”) button being enabled. (Seeing discontinuous line numbers in the message list also implies active filtering).

In general, the active filter pattern is visible only as the Clear Filter button's *tooltip*. It happens to be true that the entered text *is* the active filter pattern *when* the Apply Filter button is disabled and the Clear Filter button is enabled -- see the middle example, above.

When applying or clearing a filter, the view is re-scrolled to the currently selected item (when that item remains non-hidden). So, it is possible to use filtering to locate a diagnostic message (and “click” that message), and then view that message in the context of all generated messages by turning filtering off.

2.3 Search / Filter Parameter Controls

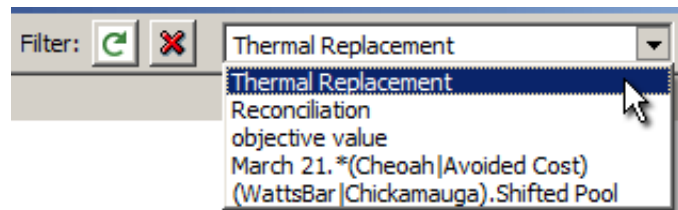
The **Search / Filter Parameter Controls** are used for those functions at the time of clicking these buttons:



- Search Forward (down arrow)
- Search Backward (up arrow)
- Apply Filter (green circle-arrow symbol)

The effect of the “Apply Filter” operation remains active until filtering is cancelled or a different filter criteria is applied. Changing the entered pattern or the “Ignore Case” or “RegEx” checkboxes does not effect the currently applied filter results. Rather, such parameter control changes can be used to *search* the *filtered* messages using a different criteria (pattern and syntax settings). Of course, the search functions skip over messages which have been hidden by filtering).

The pattern entry control was changed to an editable “combo box” in order to support a history of recently applied patterns. (*See illustration*).



When typing in the entry field, hitting **Enter** is equivalent to clicking the “Search Forward” button, and hitting **Shift-Enter** is equivalent to clicking the “Search Backward” button.

The Ignore Case and “RegEx” options are new enhancements. They apply to both the Search and Filter functions.

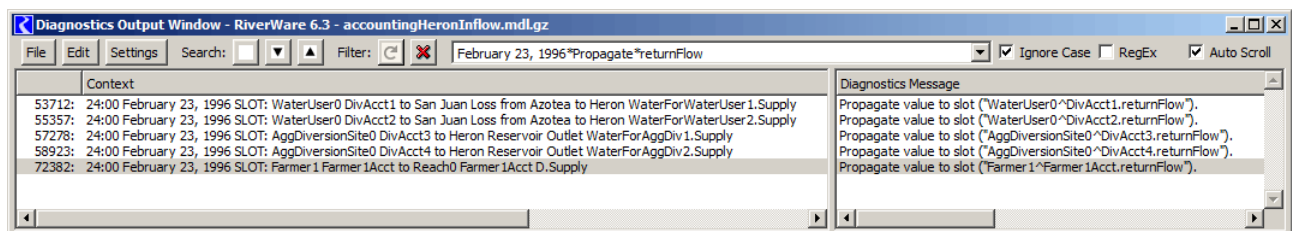
- The **Ignore Case** checkbox causes upper/lower case differenced to be ignored when comparing the pattern text to message text.
- The **“RegEx”** checkbox changes the interpretation of the pattern text from “Wild Card” to “Regular Expression” syntax. (See the following section).

3.0 Search and Filter Pattern Matching

A given message line matches the current matching pattern if the line text *contains* the pattern. (This is different from the pattern matching the entire line of text). Apart from addition of the *filter* function, the following *enhancements* have been made to pattern matching, which now applies to both the *search* and *filter* functions:

- Addition of the “Ignore Case” and “RegEx” options. (*See above*).
- When in Wildcard (not RegEx) mode, use of a variant which supports “escaping” of the wildcard characters with a back-slash ('\'). (In Qt documentation, this is referred to as “Wildcard Unix” pattern syntax).
- *With patterns for which this would be relevant (both non-trivial wildcard and regex patterns) ...* application of the pattern match computation to the *concatenation* of the “context” and “message” parts of the message row, rather than independently to those two parts. This makes possible, for example, a wildcarded expression which matches pieces from both the context and message parts of the message line, as illustrated here:

February 23, 1996*Propagate*returnFlow



The Qt4 documentation provides the following definition for “Wild Card” pattern syntax:

- Any character represents itself apart from those mentioned below.
- “?” (question mark) matches any single character. It is the same as “.” (period) in regular expressions.

- “*” (asterisk) matches zero or more of any characters. It is the same as “.*” (period asterisk) in regular expressions.
- Sets of characters can be represented in square brackets [...].

With the change to “Wildcard Unix” pattern syntax, as mentioned above, it is now possible to match a question mark, asterisk, or square bracket by preceding (“escaping”) those characters with a back-slash (“\”).

Regular Expression (“regex” or “regexp”) pattern syntax is an advanced, potentially complex pattern matching format developed originally with Unix-based tools. It’s not described further in this document.

4.0 Automatic Width Enhancements

The Settings menu now includes two new options controlling automatic width adjustments.

The **Automatic Width Adjustments** checkbox supports the disabling of this feature. When it’s enabled, the “Context” portion of the message list (on the left side) is given the full width necessarily to display its content for all non-hidden messages.

The **Extra Width Fix** option is intended to compensate for our inability to correctly measure the text content on *certain Windows machines*. When this option is on, automatically adjusted widths are increased by about 12%.

Note that the **Settings** menu also has items for the “Ignore Case” and “Use Regular Expressions” pattern matching options. These are another way to view and set those new options represented in the toolbar.

During development, it had been discovered that “**Ignore Case**” had been capitalized differently in the two places it appeared in this dialog. The item under the Settings menu originally had a lower-case “c”.

--- (end) ---

