

AccuRev® Web Interface

User's Guide

Version 6.2

Copyright and Trademarks

Copyright © Micro Focus 2015. All rights reserved.

This product incorporates technology that may be covered by one or more of the following patents:

U.S. Patent Numbers: 7,437,722; 7,614,038; 8,341,590; 8,473,893; 8,548,967.

AccuRev, **AgileCycle**, and **TimeSafe** are registered trademarks of AccuRev, Inc.

AccuBridge, **AccuReplica**, **AccuSync**, **AccuWork**, **Kando**, and **StreamBrowser** are trademarks of AccuRev, Inc.

All other trade names, trademarks, and service marks used in this document are the property of their respective owners.

Table of Contents

Preface	ix
Using This Book	ix
Typographical Conventions	ix
Contacting Technical Support.....	x
1. Overview	1
Getting Started	1
Accessing the Web UI	1
Logging In	1
Troubleshooting.....	2
Initial Web UI Display	2
The Web UI Toolbar	2
Change Password.....	3
Login and Logout	4
2. Using AccuRev® Features	5
AccuRev® Views in the Web UI.....	5
StreamBrowser™.....	6
Opening the StreamBrowser™.....	6
Filtering the StreamBrowser Display	7
Working with the Graphical Display	10
Working with the Tabular Display	13
Finding Changes in Streams and Workspaces	14
File Browser.....	16
Searching by AccuRev Status.....	18
Folders Pane.....	19
Details Pane	19
Streams Pane.....	20
File Statuses.....	21
History Browser	23
Accessing the History Browser	23
Summary Pane	23
Comment Pane.....	25
Versions Pane.....	25
Version Browser.....	27
Accessing the Version Browser	27
Version Browser Display	27
Changing Display Content.....	28
Version Browser Commands	29
Ancestry Relationships	30
Closest Common Ancestor	32

Diffing Files in AccuRev®	32
Filtering the Display	33
About the Diff Toolbar	33
Diffing Multiple Files	34
Accessing Diff Results Using a URL	35
Diff Against	35
Diff Against Basis	37
Reviewing Changes to Text Files	38
The Transaction Timeline	39
The File Contents Pane	39
Running the Annotate Command	39
Annotate Tab Commands	39
Accessing Annotate Using a URL	40
Adding a Stream to a Depot	40
Choosing a Basis Time	40
Creating a New Stream	41
Using the Open Command	42
Promoting Elements	42
Using Promote	42
Promoting AccuRev Elements	43
Displaying Element Properties	44
mailto Link Buttons	45
Reactivating a Stream	45
Removing a Stream	45
Effect of Remove	45
Save As	46
Displaying Active Transactions	46
Working in the Summary Pane	47
Working in the Versions Pane	47
Submitting AccuRev Elements to Code Review	48
Before You Begin	49
How Elements are Displayed in Crucible	49
Which Versions are Dified	50
Choosing Files for Review	51
Creating a Crucible Review for AccuRev Elements	53
Adding AccuRev Elements to an Existing Crucible Review	55
Starting Crucible from within the Web UI	57
3. Using AccuWork™	59
AccuWork™ Views in the Web UI	59
New Query Tab	60
Displaying the New Query Tab	60
Query Pane	60
Results Pane	62
Creating a Query	62
Working with the Query Builder	64

Editing a Query	67
Renaming a Query	67
Allowed Comparisons and Values	68
Query Browser	70
Query List Pane	70
Query Results Pane	73
Opening the Query Browser	75
Query Editor	76
Opening the Query Editor	76
Using the Query Editor	76
Issue Edit Form	77
Opening the Issue Edit Form	77
Features	77
Working in an Edit Form Tab	78
Relationships Subtab	82
Attachments Subtab	82
Changes Subtab	84
Issue History Subtab	87
Change Package History Tab	88
Searching for Issues	90
How to Search a Depot	90
How Results are Displayed	90
Issue Search Tab	90
Reports About Issues	92
Issue Table Report	93
Issue Details Report	94
Common AccuWork Commands	96
Open Issue	96
Bulk Update	96
Sum Columns	97
Calculate Columns	98
Show Percentages	99
Group Issues by Field	99
Charts	100
Set as Default	103
Set as Public	103
Set as Private	103
Set up Columns	104
Run	105
Save	105
Show Change Package	105
Show Active Issues	106
Diff Against	110
Using Workflow to Manage Issues	114
Overview of Workflow Features	114
What is a Workflow?	114

Changes to the Issue Edit Form	115
Displaying a Copy of the Workflow Diagram	116
Moving an Issue Through the Workflow	117
Filtering Query Results Using a Workflow	118
Reviewing Workflow Rules for a Stream	119

4. Using Workflow to Enforce

SCM Policy	121
What is a Workflow?	121
Workflow Stages	121
Workflow Transitions	122
Benefits of Using Workflow	122
Issue Management Process Automation	122
Release and Development Policy Enforcement	124
Quick Start: Implementing a Simple Workflow	125
Before You Begin	125
Process Overview	125
Step 1: Identify the Workflow Stage Field in Your AccuWork™ Schema	126
Step 2: Create and Activate the Workflow	126
Step 3: Create Workflow Stages and Transitions	127
Step 4: Use the Workflow to Enforce SCM Policies	130
Summing Up: Results of Implementing a Workflow	132
What to Do Next	134
Creating and Managing Workflows	134
Restricting Access to Workflow Administration	134
Creating a Workflow	134
Activating a Workflow: Defining Workflow Conditions	135
Copying a Workflow	136
Opening a Workflow	137
Renaming a Workflow	137
Deleting a Workflow	137
Creating and Managing Workflow Stages	138
Workflow Stage Components	138
Ways to Create Workflow Stages	140
Creating Stages Automatically	141
Creating a Workflow Stage Manually	142
Editing Workflow Stages	143
Using the Conditions Editor	144
Deleting a Workflow Stage	145
Creating and Managing Workflow Transitions	146
Workflow Transition Components	147
Ways to Create Workflow Transitions	147
Editing Workflow Transitions	148
Deleting a Workflow Transition	149
Linking Workflow Stages	150
Destination Stage Transitions	150

Linking Workflow Stages Using Existing Transitions	151
Linking Workflow Stages Using a New Transition	153
Unlinking Workflow Stages.....	155
Specifying Actions for Stages and Transitions	157
Types of Actions	158
Predefined Actions.....	158
How to Specify a Stage or Transition Action	160
Using Workflow to Enforce SCM Policies	161
Types of Restrictions You Can Define for a Stream.....	162
Restricting Entry to a Specific Issue Type.....	163
Restricting Entry to a Specific Workflow Stage.....	163
Enforcing Rules for a Specific Workflow.....	164
Example: Implementing a Workflow.....	164
Overview.....	164
Step 1: Design the Workflow.....	165
Step 2: Modify the AccuWork Schema	165
Step 3: Create Workflow Stages and Transitions.....	166
Step 4: Link Workflow Stages	169
Step 5: Refine the Workflow	170
Step 6: Review Issue Processing Automation	175
Step 7: Use Workflow to Enforce SCM Policies.....	176
Summing Up.....	179
Advanced Topics.....	179
Suspending Workflow	179
When to Consider Schema Validation	180

5. Using URLs to Access

AccuRev® Data.....	183
Obtaining Web UI Links.....	183
User-Specified URLs	184
URLs for AccuRev® Elements	184
URL Format Definition	185
Rendering Web Pages That Contain Relative Links.....	185
URL Permanence	186
URLs for AccuRev® Element Views.....	186
URL Format Definition	186
URLs for Stream History and Transactions.....	188
URL Format Definition	188
URLs for AccuWork™ Queries and Issues	189
URL Format Definition	189
URLs for Queries with Calculated Columns.....	190
Parameters.....	190
Example.....	190
URL for Displaying the Web UI Without a Toolbar.....	190

Glossary..... 191

Index..... 209

Preface

This book is your guide to the AccuRev® Web Interface (Web UI) from AccuRev, Inc. It is intended for AccuRev users who might also be using other AccuRev interfaces and features such as the Java GUI, command line interface (CLI), the integrated AccuWork™ issue tracking system. The AccuRev system administrator will be interested in [Chapter 4 Using Workflow to Enforce SCM Policy](#) if your site plans to implement AccuRev's workflow feature.

Using This Book

This book assumes you are familiar with your operating system and its commands, as well as with general AccuRev and AccuWork concepts. For more information on using the AccuRev Java GUI and CLI, see the user documentation and online help devoted to those products.

The remaining chapters in this book provide an overview of AccuSync and tell you how to create and manage an AccuSync Configuration:

Chapter	Description
Chapter 1 Overview	Describes how to get started using the AccuRev Web UI, including procedures for logging in to AccuRev and what to expect the first time you start the Web UI.
Chapter 2 Using AccuRev® Features	Provides an overview of the main features of the Web UI, including views like the StreamBrowser™, Version Browser, History Browser, and how to use them.
Chapter 3 Using AccuWork™	Describes how to use AccuWork, AccuRev's integrated change management and issue tracking system. Workflow features are also described.
Chapter 4 Using Workflow to Enforce SCM Policy	Describes how to configure and manage workflow to help automate issue processing and enforce SCM and development policies.
Chapter 5 Using URLs to Access AccuRev® Data	Describes how to create URLs that can be used to share issues with other AccuRev Web UI users.
Glossary	Glossary of general AccuRev and Web UI terms.

Typographical Conventions

This book uses the following typographical conventions:

Convention	Description
<code>blue sans-serif</code>	Used for sample code or output.
<code>red monospace</code>	Used for examples.
bold	Used for command names, and button names in the AccuSync Web user interface
<i>light italic</i>	Used for emphasis, book titles, and for first use of important terms

Convention	Description
<i>blue italic</i>	Identifies a hyperlink (to a page or Web URL, for example)

Contacting Technical Support

Micro Focus offers a variety of options to meet your technical support needs as summarized in the following table.

For	Visit
Information about technical support services	http://supportline.microfocus.com/
Information about platforms support	http://supportline.microfocus.com/prodavail.aspx
Product downloads and installations	http://supportline.microfocus.com/websync/productupdatesearch.aspx
Product documentation	http://supportline.microfocus.com/productdoc.aspx
SupportLine phone numbers, listed by country	http://www.microfocus.com/about/contact/support/assistance.aspx

When you contact Micro Focus technical support, please include the following information:

- The version of AccuRev and any other AccuRev products you are using (AccuSync or GitCentric, for example).
 - Your operating system.
 - The version of relevant third-party software (if you are using AccuSync, for example, the version of your ITS).
 - A brief description of the problem you are experiencing. Be sure to include which AccuRev interface you were using (Web user interface, Java GUI, or CLI), any error messages you received, what you were doing when the error occurred, whether the problem is reproducible, and so on.
 - A description of any attempts you have made to resolve the issue.
- A simple assessment of how the issue affects your organization.

1. Overview

This chapter describes how to access the Web UI and provides a brief introduction to AccuRev and AccuWork components displayed on the Web UI when you first start it.

Getting Started

The **AccuRev® Web Interface** (Web UI) provides a convenient way to view information from the AccuRev repository. Using the Web UI, you can access AccuRev and AccuWork™ data.

Note: The Web UI only interacts with data from the AccuRev Server. Data from user workspaces which has not been kept or promoted will not be visible from the Web UI.

Accessing the Web UI

To access the Web UI, use your Web browser to navigate to its location (usually <http://<servername>:<port>/accurev>). You will need to obtain the specific URL from your system administrator. The Web UI requires reasonably recent versions of common web browsers. Refer to the *AccuRev® Installation and Release Notes* for the current list of recommended, supported browsers.

Note: Once you have logged in to the Web UI, do not use the browser's controls to navigate elsewhere or reload the page. These actions will cause your session (see [Login and Logout](#) below) to lose context and history, and you will need to reconstruct your actions.

You can switch to other application windows, or open or close *other* browser tabs and windows, without affecting the status of the Web UI.

Logging In

When you first visit the Web UI, the Login to AccuRev Server dialog box appears.



The screenshot shows a dialog box titled "Login to AccuRev Server". It features three input fields: "Server:" containing "charmed:5051", "User Name:", and "Password:". Below the input fields is a checkbox labeled "Remember my login on this computer". At the bottom of the dialog are "Ok" and "Cancel" buttons.

To log in, enter your AccuRev user name and password and click **Ok**.

If you would like your browser to store a session ID for this login session, select the **Remember my login on this computer** checkbox.

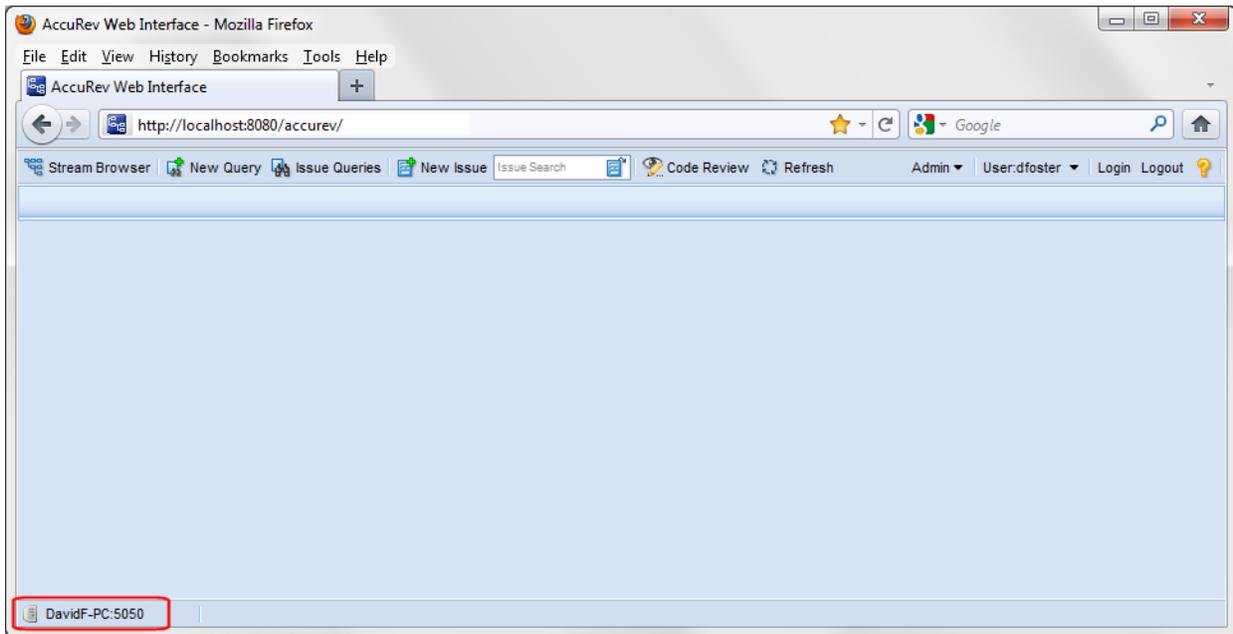
Note: If you need to access a different server than the one shown on the login dialog, contact your Web UI system administrator for assistance.

Troubleshooting

Troubleshooting tips for issues relating to installing or upgrading the Web UI are described in the *AccuRev® Web Interface Administrator's Guide*.

Initial Web UI Display

Once you log in, the AccuRev Web UI appears, as shown below.

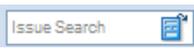
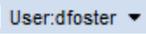


The status bar at the bottom of the window contains information on which AccuRev server and depot (if any) you are currently accessing. In this example, no depot has been accessed.

The Web UI Toolbar

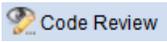
The Web UI toolbar provides access to the top-level AccuRev, AccuWork, and Web UI session functions as summarized in the following table.

Button	Description	For More Information, See
Stream Browser	Displays the StreamBrowser.	StreamBrowser™ on page 6
New Query	Displays the New Query tab, which allows you to define a query that you can run against the current depot.	New Query Tab on page 60
Issue Queries	Displays the Query Browser, which allows you to run saved queries and create new queries	Query Browser on page 70
New Issue	Displays the Issue Edit form, which allows you to enter a new issue in AccuWork.	Issue Edit Form on page 77

Button	Description	For More Information, See
	Allows you to search using an issue number or text string.	Searching for Issues on page 90
	Refreshes the data currently displayed in the AccuRev Web UI. You can also use F5 to perform a refresh. Note: Do not use the Web browser's controls to refresh the page. Doing so will cause your login session to lose its context and history, and you will need to redo the actions that you had previously performed	
	Provides access to the Workflow Editor, which you can use to create new workflows and open existing ones.	Chapter 4 Using Workflow to Enforce SCM Policy
	Allows you to change your password.	Change Password on page 3
	Allows you to log out of AccuRev or log in as another user.	Login and Logout on page 4
	Displays this documentation. Note that an Acrobat icon () at the top of the Help viewer allows you to display this help as a PDF, which you can save and print.	--

Tools for Optional Features

The Web UI toolbar might also contain buttons for optional AccuRev features:

- The **Open Code Review Tool** button () lets you open a code review tool; a related tool () displayed for issue records lets you create a code review or add files to an existing code review. See [Submitting AccuRev Elements to Code Review](#) on page 48 for more information on this optional feature.

Change Password

The Change Password command is available from the User drop-down menu.



Changes to your password do not take effect until the next time you log in to AccuRev (either after logging out or after your current session expires, for example).

To change your password:

1. Select Change Password from the user drop-down menu.

AccuRev displays the Change Password dialog box:

A dialog box titled "Change Password" with a light blue header. It contains three text input fields: "Old Password:", "New Password:", and "Confirm New Password:". Below the fields are two buttons: "Ok" and "Cancel".

2. Enter your current password in the **Old Password** field. Enter the new password in both the **New Password** and **Confirm New Password** fields.
3. Click **Ok** to make the change.

Login and Logout

You use the **Login** button to log in to AccuRev; you use the **Logout** button to log out.

When you log in, the Web UI begins a *session*. Sessions expire after a period of inactivity. Note that a session can expire when:

- The Web server times out
- The AccuRev server times out

When a session expires, there is no immediate visible indication in the Web UI. However, the next time you attempt to access AccuRev data, an error message appears. The content of this message depends on whether the Web server or the AccuRev server has timed out:

- If the web server has timed out, a message similar to the following appears: *Your session has expired. Click Ok to log in and continue. You may need to use the Web UI's Refresh command to update any open tabs.*
- If the AccuRev server has timed out, the error message warns you that "authentication" has failed.

In either case, when you click **Ok** to respond to the message, AccuRev displays the Login to AccuRev Server dialog box so that you can continue your session.

The default time out values for these sessions can be configured by your system administrator. (See "Changing the Default Tomcat Session Length" and "Changing the Default AccuRev Session Length" in the *AccuRev® Web Interface Administrator's Guide*.) However, you can avoid the default web server time out by selecting the **Remember my login on this computer** checkbox the next time you log in.

2. Using AccuRev® Features

This chapter describes views and other features for working with AccuRev repository data in the Web UI.

AccuRev® Views in the Web UI

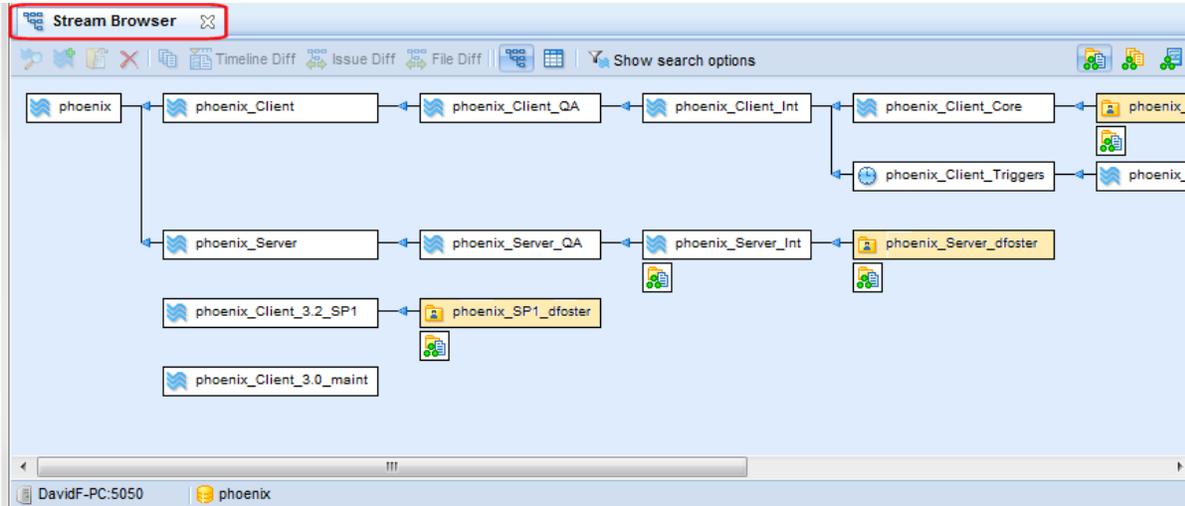
The Web UI includes the following views to help you work with elements under AccuRev control:

- The [StreamBrowser™](#) provides graphical and tabular views of the stream hierarchy in a depot. Filtering options allow you to control which streams AccuRev displays.
- The [File Browser](#) is used to view and monitor the status of elements located in AccuRev streams, and to perform certain stream operations.
- The [History Browser](#) shows the history of elements in a selected stream, or the history of a selected element.
- The [Version Browser](#) displays some or all of an element's [versions](#), using color-coded lines to indicate how versions were created (via a [merge](#) or [promote](#) for example).
- The *Diff tool* compares two versions of a file side by side in resizable panes. See [Diffing Files in AccuRev®](#) on page 32 for more information.
- The *Annotate view* lists the entire contents of the selected version of a text file, annotating each line with the timestamp, transaction number, and user name of the user responsible for the change. See [Reviewing Changes to Text Files](#) on page 38 for more information.

Each of these views is described in greater detail in the following sections of this chapter.

StreamBrowser™

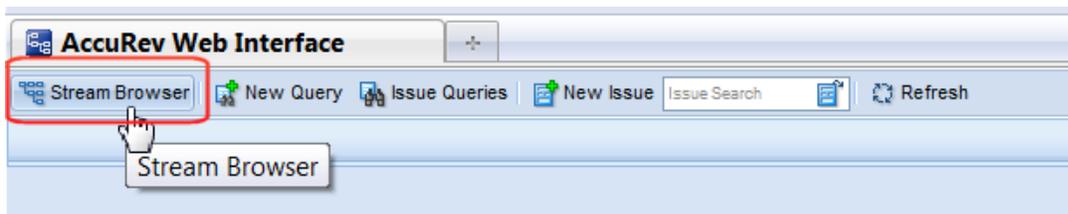
The StreamBrowser™ displays graphical and tabular views of a depot's stream hierarchy. You can use the StreamBrowser to compare streams, promote versions between streams, and perform other stream-based operations. An example of the StreamBrowser graphical display is shown here:



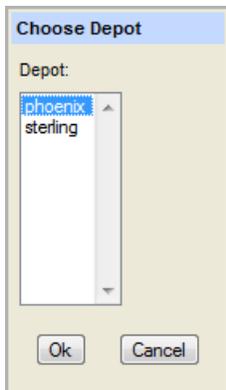
See [Working with the Tabular Display](#) on page 13 for an example of the StreamBrowser tabular display.

Opening the StreamBrowser™

To open the StreamBrowser, click the **StreamBrowser** button on the AccuRev Web Interface toolbar:



If only one depot has been created in the AccuRev repository, the StreamBrowser opens. Otherwise, AccuRev displays the Choose Depot dialog box:



Select the depot whose streams you want to view and click **Ok** to display the StreamBrowser.

Initial StreamBrowser™ Content and Appearance

When you open the StreamBrowser, AccuRev automatically searches the current depot using a filter to determine which streams and workspaces to display. By default, this filter includes only the streams that directly connect the root stream to the visible workspaces associated with the current AccuRev user. If no streams satisfy these criteria (if the current user has not created any workspaces, for example), AccuRev displays only the root stream.

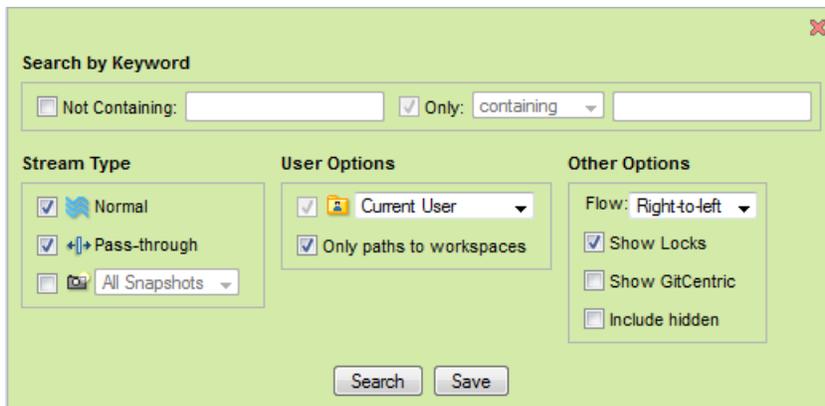
Streams are displayed using the graphical format by default, but you can quickly change to the tabular format using the **Tabular Display** button () on the Web UI toolbar. To change back to the graphical format, click the **Graphical Display** button ().

Note: Changing the display does not cause AccuRev to execute a new search; it simply changes how the currently displayed data is rendered.

Filtering the StreamBrowser Display

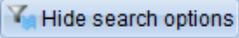
You can modify the filter that AccuRev uses to search the depot and to display streams in the StreamBrowser. For example, you might want to include only streams containing a certain word or phrase, or streams that are associated with a different user.

You make changes to the default search filter using the *search options panel*, shown here:



To modify search filter options:

1. Open the StreamBrowser. See [Opening the StreamBrowser™](#) on page 6 if you need help with this step.
2. Click the **Show search options** button ().
The search options panel appears on the top half of the StreamBrowser tab. The StreamBrowser remains displayed in the lower half of the tab.
3. Make changes to the search filter options as needed. See [Search Filter Options](#) on page 8 for a description of these options.
4. Click the **Search** button to refresh the StreamBrowser display and review the changes.
5. Repeat [Step 3](#) and [Step 4](#) until you are satisfied with the filter settings.
6. If you want to save your changes, click **Save**.

Otherwise, click the **Hide search options** button () to close the search options panel. If you do not save changes, AccuRev uses the default search filter options each time you open the StreamBrowser.

Note: Each depot is associated with its own search filter; any changes you make to search filter options apply to the current depot only.

Search Filter Options

This section describes the search filter options you can use to customize the StreamBrowser display. All options apply to both graphical and tabular displays unless noted otherwise.

Search by Keyword options

Keyword options let you search streams in the depot using a string that you specify.

Setting	Description
Not Containing	When selected, allows you to specify a string that AccuRev uses to search the depot. Any streams that include the specified string are excluded from the display. Searches are case-sensitive; <i>DevStreams</i> and <i>devStreams</i> would yield different results, for example.
Only Containing	When selected, allows you to specify a pattern (a string and a condition) that AccuRev uses to search the depot. For example, you might want to search the depot for any stream that ends with the string <i>_dev</i> . Conditions include <i>containing</i> (the default), <i>starting with</i> , <i>matching</i> , and <i>ending with</i> . To specify a patternless search, clear the Only Containing checkbox. Note that patternless searches can take a long time to execute. In this case, AccuRev prompts you to confirm whether or not you want to continue the search.

Stream Type options

Stream Type options let you choose the types of streams to include in the StreamBrowser.

Setting	Description
Normal	When selected, AccuRev includes normal dynamic streams and time-based streams . By default, normal streams are included in the display.
Pass-through	When selected, AccuRev includes pass-through streams . By default, pass-through streams are included in the display.
Snapshots	When selected, allows you to specify a time period for which you want AccuRev to include a depot's snapshots (all snapshots within the past two week or past month, for example). By default, snapshots are not displayed. (Check the Include hidden checkbox if you want to see snapshots that have been removed.)

Tip: Gated and staging streams are considered "Normal" streams for the purposes of the search filter. If you want to display these types of streams, make sure the **Normal** field is selected.

User options

User options let you filter the search by user and workspaces.

Setting	Description
Current User	<p>The workspaces drop-down list lets you filter the display of the depot's workspaces by user. The default is the current AccuRev user, but you can restrict the search to any registered AccuRev user or group, or choose to display streams for all workspaces. (Check the Include hidden checkbox if you want to see workspaces that have been removed.)</p> <p>Note: If the number of streams retrieved by the search exceeds 1,000 for graphical format or 2,000 for tabular format, AccuRev prompts you to cancel the operation so that you can modify the search filter. Search results that exceed these limits can take an extended time to display. This threshold varies by Web browser.</p>
Only paths to workspaces	<p>When selected, AccuRev displays only the streams that directly connect the root stream to the visible workspaces. While this filter is enabled, the Only containing filter is disabled. Stream paths to workspaces you have hidden are not displayed. See Remove for more information on hiding streams.</p> <p>Note: This setting is available only when the workspaces setting is set to a single user (<i>Current User</i>, for example), so if the workspaces filter is set to <i>All Workspaces</i>, selecting Only paths to workspaces sets the workspaces filter to <i>Current User</i>. You can change <i>Current User</i> to another AccuRev user if you choose.</p>

Other options

These options apply only to the graphical StreamBrowser display.

Setting	Description						
Flow	Allows you to change the display of streams to read from right-to-left (root stream on left) or left-to-right (root stream on right). Arrows indicate the stream flow direction.						
Show Locks	When checked, displays a padlock icon () next to any stream that has a lock defined for it.						
Show GitCentric	<p>When checked, displays a GitCentric™ icon () on streams that have been mapped to a branch in a Git repository using AccuRev GitCentric. When you click the icon, AccuRev displays information about the branches and their repositories mapped to this stream.</p> <div data-bbox="586 1507 1388 1675" data-label="Image"> <table border="1"> <thead> <tr> <th>Git Repo</th> <th>Git Branch</th> </tr> </thead> <tbody> <tr> <td>ProductX.git</td> <td>Master</td> </tr> <tr> <td>ProductX_extras.git</td> <td>Integration</td> </tr> </tbody> </table> </div>	Git Repo	Git Branch	ProductX.git	Master	ProductX_extras.git	Integration
Git Repo	Git Branch						
ProductX.git	Master						
ProductX_extras.git	Integration						
Include Hidden	<p>When selected, AccuRev includes any streams that have been removed. Hidden streams are displayed with a gray background in the tabular display.</p> <p>Note: By default, streams underneath a hidden stream are not displayed, regardless of their own hidden status.</p>						

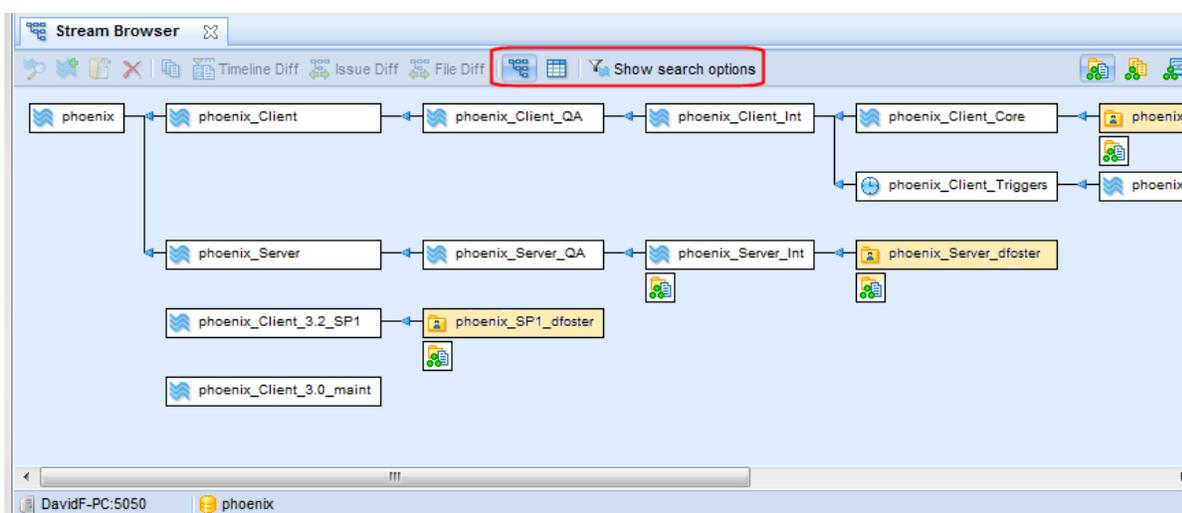
Search From options

These options are displayed on the search options panel only during the Look up Stream operation. See [Look up Stream](#) on page 11 for more information.

Setting	Description
Root Stream	Displays the name of the stream selected for the Look up Stream operation.
Immediate Children Only	When checked, restricts the search to only those streams that are immediate children of the stream displayed in the Search From field.

Working with the Graphical Display

In the StreamBrowser graphical display, each box represents one stream in the current depot. The root stream is always shown; it is displayed on the left by default, and all child streams flow to it, right-to-left, as shown here:



You can change the StreamBrowser flow display to read from left-to-right using the **Flow** option on the search options panel. See [Filtering the StreamBrowser Display](#) on page 7 for more information.

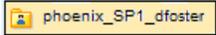
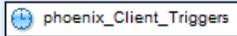
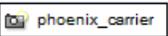
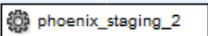
Streams are aligned by column and are sized to accommodate the longest stream name in a column. Hierarchical relationships between streams are shown with connecting lines, and arrows indicate the direction of the stream flow to the root stream. Streams that are not directly related to other stream results are considered "floating" (or "orphan") streams. Floating streams show no connecting lines; instead, they are grouped at the bottom of the display, which is otherwise organized alphabetically.

Tip: Display mode buttons (on the right side of the toolbar) allow you to switch between [Show Active Files](#), [Show Active Transactions](#), and [Show Active Files](#) modes.

How Streams Are Depicted

The following table shows how different stream types are depicted in the StreamBrowser.

Icon	Stream Type
	Dynamic stream

Icon	Stream Type
 phoenix_SP1_dfoster	Workspace
 phoenix_merge	Pass-through stream Note: Pass-through streams are transparent in the AccuRev desktop client GUI.
 phoenix_Client_Triggers	Time basis stream
 phoenix_carrier	Snapshot stream
 phoenix	Gated stream. Note: Gated streams are transparent in the AccuRev desktop client GUI.
 phoenix_staging_2	Staging stream. Note: Staging streams are created automatically as children of gated streams.

Stream and Workspace Colors

By default, dynamic streams have a white background and workspaces have a light yellow background. If you want, you can change a dynamic stream's background color using the CLI **setproperty** command. You might want to manually highlight streams of interest, or use a script to set a stream color based on events - - to set a build stream to red if the build fails, and to green when the build passes, for example.

See the **setproperty** command in the *CLI User's Guide* or the CLI help for more information.

Toolbar and Context Menu

The following tools and context menu items are available in the graphical StreamBrowser display:

Open

Opens the selected stream in a new File Browser tab.

Look up Stream

Opens another instance of the StreamBrowser whose top-level stream (the root stream) is the stream you select, allowing you to easily search streams in the [stream hierarchy](#) below the root stream. Use the **Immediate Children Only** field on the search options panel to restrict the search. See [Search From options](#) on page 10 for more information.

New Stream

Creates a new stream as a child of the selected stream. A [Adding a Stream to a Depot](#) dialog box appears to specify settings for the new stream. This command is not available from a workspace.

Remove

Hides the selected stream from searches. This command is available from the toolbar and also via right-click on a stream. See [Removing a Stream](#) for more information on hiding streams and workspaces.

Reactivate

Allows the selected stream to be shown in searches. Before using this command, make hidden streams visible with the **Show including hidden** checkbox. (Context menu only.) See [Reactivating a Stream](#) for more information on displaying hidden streams and workspaces.

Show Active Files

Shows development activity for the selected stream in a new [File Browser](#) tab. This command is the equivalent of displaying the [default group](#) in the File Browser.

Show Active Transactions

Shows development activity by transaction for the selected stream in a [History Browser](#) tab. A transaction is active in the stream if one or more active elements are part of the transaction.

Show Active Issues

Shows development activity for the selected stream in an Issues tab. An *issue* is active in the stream if one or more active elements have been associated with it (during promote, for example). An *element* is said to be active in a workspace or stream if a new version of the element has been created there, and that version has not been either (1) promoted to the parent stream or (2) purged from the workspace or stream. The set of elements associated with an issue is referred to as a [change package](#). This command is not available from a workspace.

Note: AccuRev determines that an element is 'active' (changed) if its basis version (the version that appears in the backing stream) and head version (the most recent version in the stream) differ. That is, a new version of the element has been created and is still part of that stream's default group.

History

Shows the history of all elements in the selected stream in a [History Browser](#) tab.

Timeline Diff

Allows you to view all changes that occurred in a stream or workspace over the period of time you specify. See [Finding Changes in Streams and Workspaces](#).

Issue Diff

Shows in a [Diff Against](#) the change packages that differ between two selected streams. Click the first stream, then click the **Issue Diff** icon (or the **Issue Diff** context menu item), then click the stream you want to compare. (To cancel the Diff, just right-click the mouse.) See [Diff Against](#).

File Diff

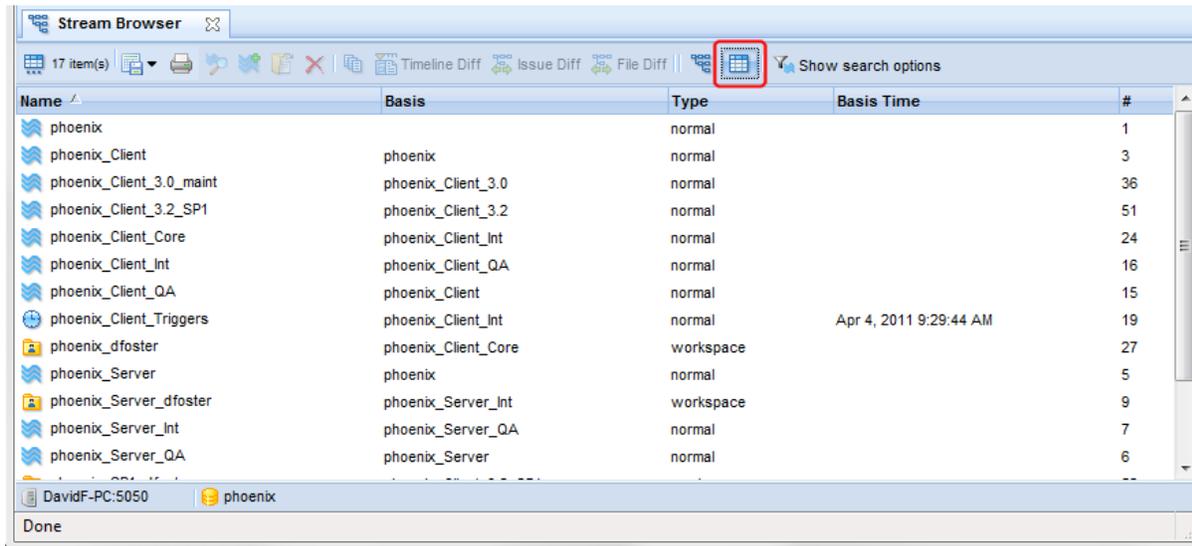
Shows in a [File Diff](#) tab the files that differ between two selected streams. Click the first stream, then click the **File Diff** icon (or the **File Diff** context menu item), then click the stream you want to compare. (To cancel the Diff, just right-click the mouse.)

Save as Default

Captures the current display state of the StreamBrowser so that you can easily restore the same view the next time you log in.

Working with the Tabular Display

In the tabular display, each row displays information about one stream.



Information displayed in the tabular view is summarized in the following table:

Column	Description
Name	The stream's name
Basis	The name of that stream's basis (or backing) stream
Type	The stream's type
Basis time	For snapshot streams, the time selected as the basis. (You can also specify a time basis when creating a dynamic stream. See Choosing a Basis Time on page 40 for more information.)
#	The number for the transaction that created the stream.

Tip: Click on a column heading to sort the table based on that column's data.

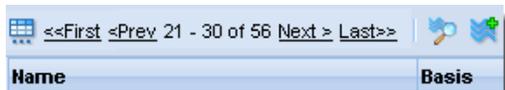
To open a stream, double-click it. Right-click a stream to display its context menu.

Common Table Commands

Most tabular displays throughout the Web UI provide toolbar or context menu access to the following functions:

Table Filter

Searches sometimes return many items (streams, for example), which can make reviewing them difficult. If your search returns many items, consider using the **Table Filter** to specify the number of items to show per page, rather than displaying all search results in one long list. When AccuRev returns more items than the limit you specify, page navigation links appear above the table header. You can use the First, Prev, Next, and Last buttons to navigate the pages in the result set, as shown in the following illustration:



The default number of items per page is 500.

Export

Allows you to export the contents of the current table as either XML or a comma-separated values (CSV) file. In most browsers, you are prompted to view the report or save it to a file. By default, the file name is **Report.ext**, where *ext* is either xml or csv.

To export a table:

1. Click the **Export Actions** button ()
2. Choose **Export to XML** or **Export to CSV** from the drop-down menu.
3. Follow the save or open instructions presented by your Web browser.

Print

Sends the contents of the current table to a printer. When you click the **Print** button, AccuRev displays a standard print dialog box that allows you to specify printer name, page ranges, number of copies, and so on. AccuRev provides identifying header information and formatting for the output. (You cannot customize the report header or formatting.)

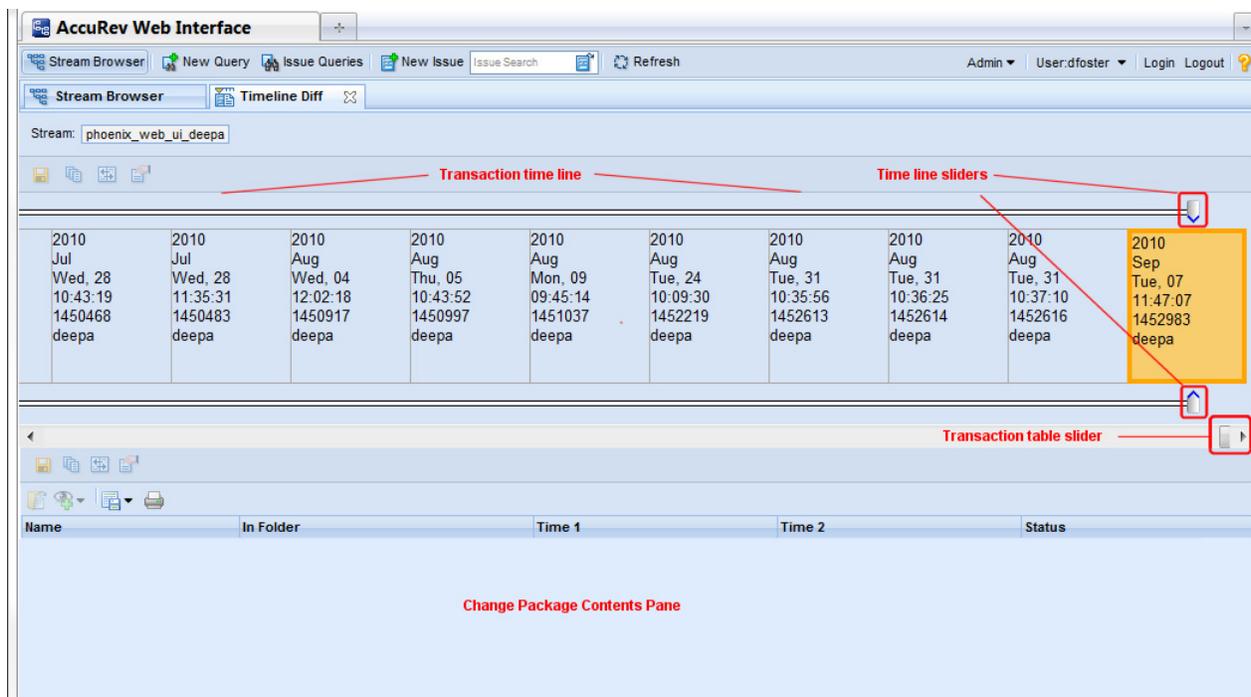
Note: Print functionality for tables that display issues allows you to print the table, or detailed reports for one or more issues. See [Reports About Issues](#) on page 92 for more information.

Finding Changes in Streams and Workspaces

The Timeline Diff operation allows you to view all changes that occurred in a stream or workspace over the period of time you specify. For example, you might find that a build completed without errors on Monday, but fails for reasons you do not understand on Wednesday. The Timeline Diff operation makes it easy to see which files changed over that period of time. You can then perform other AccuRev diff operations (File Diff, for example) to learn exactly what changed in those files.

Specifying a Time Period

When you select a stream or workspace from the StreamBrowser for the Timeline Diff operation, AccuRev displays the Timeline Diff tab. The top of the Timeline Diff tab displays a table listing all the transactions associated with that stream or workspace. Transactions are listed in chronological order (oldest to most recent); information about each transaction includes a timestamp, transaction number, and AccuRev username. By default, AccuRev highlights only the most recent transaction.

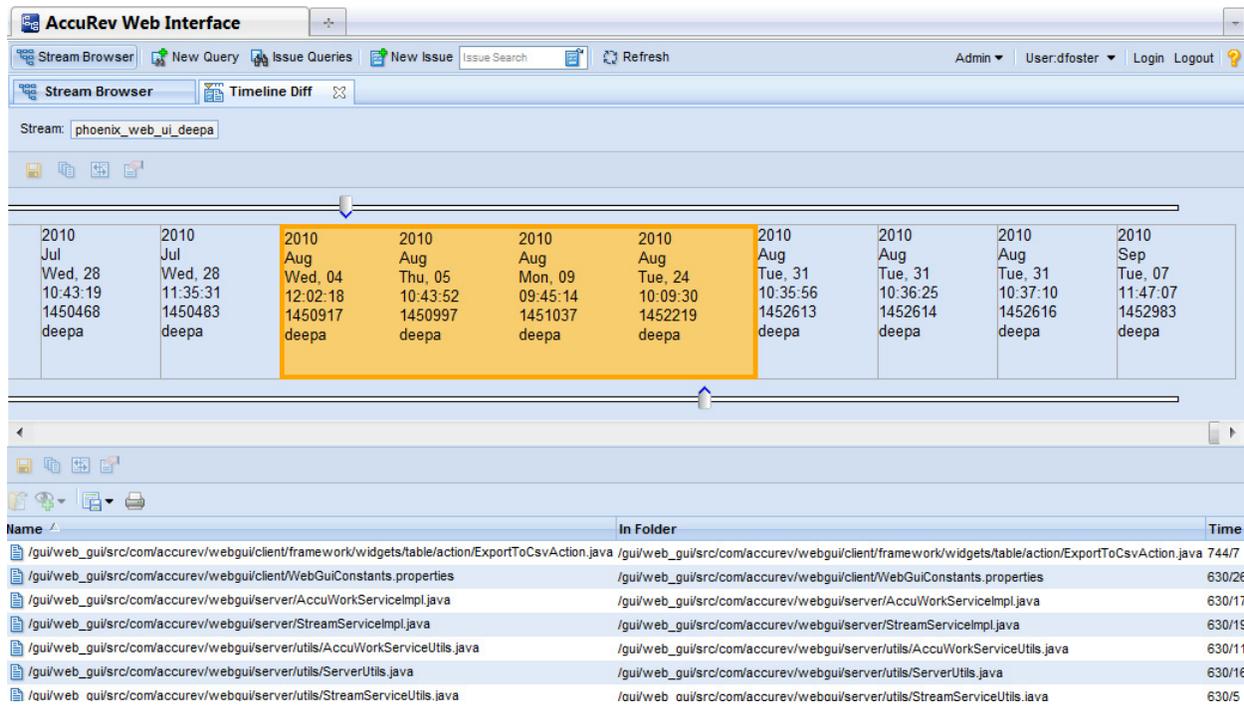


The Change Package Contents pane is empty because no time period has been specified. To specify a time period, you need to select two transactions. AccuRev bases the start and end times for the time period on the timestamp associated with the transactions you select.

There are several ways to select a transaction in the Timeline Diff tab:

- **Click the transaction.** This implicitly starts (or ends) the time period with the time associated with the transaction. Note that all the transactions between it and the currently selected transaction are selected automatically. AccuRev searches all selected transactions for changed files.
- **Click a time line slider rail.** AccuRev selects the transaction above (or below) the place on the time line slider rail you clicked.
- **Drag and drop the time line sliders.** Again, AccuRev selects the transaction above (or below) the time line slider when you release the mouse button.

As soon as you select the second transaction, AccuRev searches all transactions in the time period between the first and last selected transaction, inclusive. Any changed files are displayed in the Change Package Contents pane, as shown in the following illustration:



Note: The time required to perform the search varies based on the number and scale of the transactions you select.

Diffing a Stream or Workspace

To diff a stream or workspace:

1. Open the StreamBrowser and select the stream or workspace whose changes you want to view.
2. Click the **Timeline Diff** button ().

Alternative: Right-click the stream or workspace and choose **Timeline Diff** from the context menu.

The **Timeline Diff** tab appears. The table at the top of the tab displays a summary of all the transactions associated with the stream or workspace you selected in [Step 1](#). By default, the last transaction is selected. Note that each transaction summary includes a timestamp.

3. Select the transactions you want to use to specify the desired time period for the changes you want to review.

Any files that changed for any of the selected transactions appear in the Change Package Contents pane.

File Browser

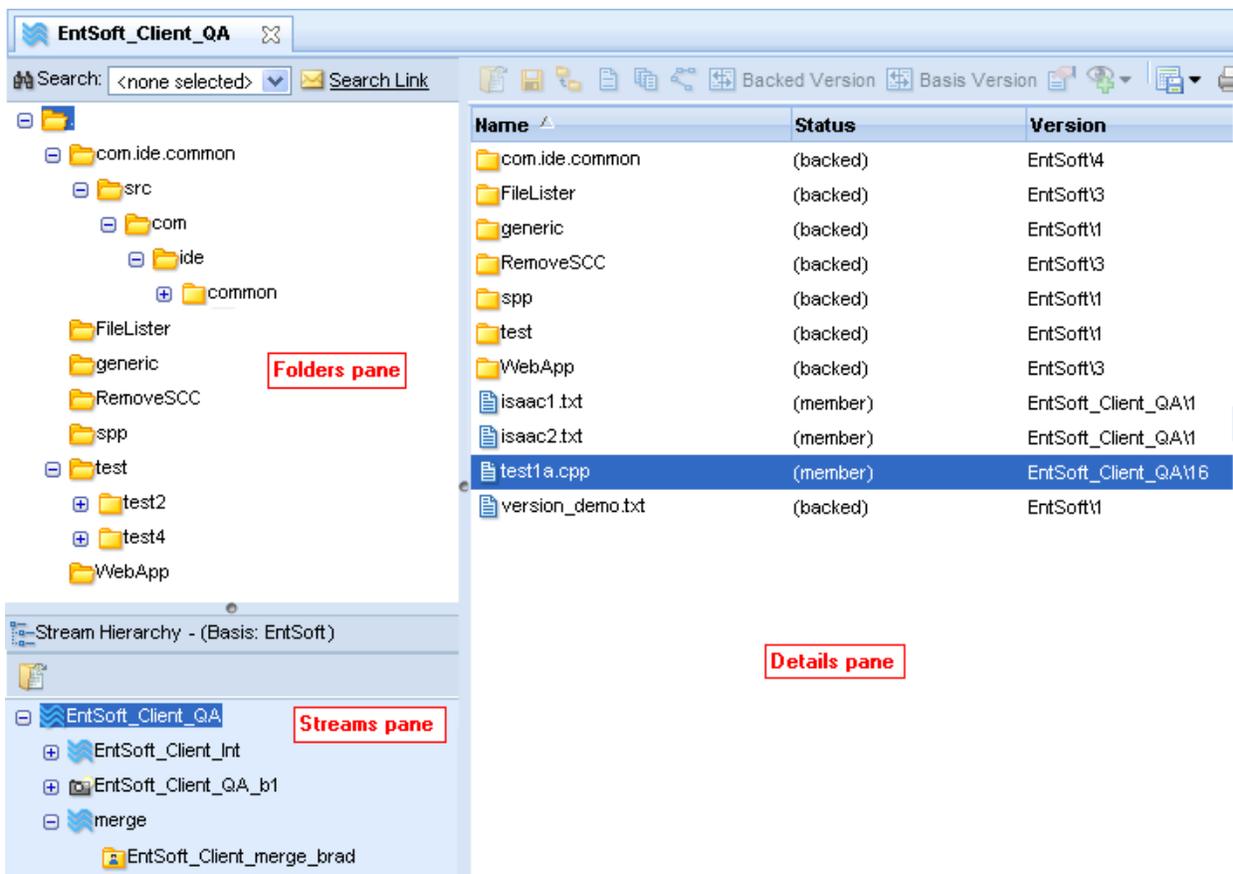
The File Browser is used to view and monitor the status of elements located in AccuRev streams. You can have any number of File Browser tabs open concurrently in the Web UI—each one displaying the contents of a different stream.

The Web UI displays only data stored on the AccuRev Server. Only AccuRev-controlled elements—members of the current AccuRev stream—appear in the File Browser. This means, for example, that files with status **(external)** are not visible, even if the user opens a workspace located on his local machine. See [File Statuses](#) for more information.

Each open stream appears in a separate File Browser tab. If you open a stream, its tab becomes active. The active tab (**brass05_dvt_john** in the following image, for example) is highlighted and shows a click-to-close icon (✕).



When a File Browser tab opens, the root of the current stream () is shown in the Folders pane (see [Folders Pane](#)). From there you can navigate to a location of interest. The Details pane (see [Details Pane](#)) displays the contents of a particular directory (folder) selected in the Folders pane, or the results of an AccuRev search that you've selected from the **Search** drop-down list. The Streams pane (see [Code Review](#)) displays a hierarchy of all the children of the stream displayed in the File Browser.



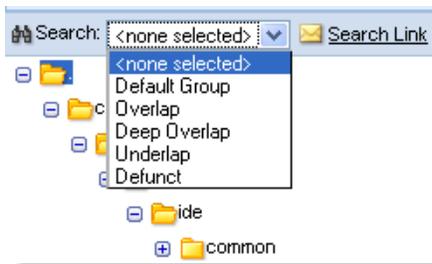
The File Browser display is sorted at each hierarchical level as follows:

- Workspaces, in alphabetical order
- Dynamic and pass-through streams in alphabetical order (capitalized stream names appear before of non-capitalized stream names)
- Dynamic streams and snapshots, which have basis times, ordered by basis time (most recent first)

Searching by AccuRev Status

The File Browser's **Search** command lets you search for elements by AccuRev status. Search response times can be affected by your network connection speed, by AccuRev's response time, and by the total number of elements in the open stream.

If the File Browser is not showing the results of a search, the **Search** field displays **<none selected>**.



See [File Statuses](#) for more information.

Status Types

Choose one of the following types from the status drop-down list to start a new search:

Default Group

Selects elements whose status includes **(member)**.

Overlap

Selects elements whose status includes **(overlap)**, where the current version in the parent stream is not an ancestor of this version. This means there might be changes in the parent stream version that are not present in this version.

Deep Overlap

Selects elements that satisfy the **Overlap** search criterion in the current workspace or stream, along with **Overlap** elements in the *parent* stream, in the *grandparent* stream, and so on, all the way up the stream hierarchy for the current depot.

Underlap

Selects elements whose status includes **(underlap)**, where the current version in the parent stream is not an ancestor of this version, but the parent-stream version already contains all the changes of this version.

Defunct

Selects the elements in the default group of a workspace or dynamic stream whose status is **(defunct)**.

A link to the Web UI URL (see [Obtaining Web UI Links](#)) used to access the current search is shown to the right of the drop-down list.

Folders Pane

You can use the Folders pane to:

- Navigate to a location of interest within a stream or workspace.
- Perform searches on the contents of the current stream or workspace, using the **Search** command.

Details Pane

The Details pane shows either the AccuRev elements in a selected directory, or the results of an AccuRev search. The **Search** field in the Folders pane shows the name of the search, or *<none selected>* if a directory's contents are shown.

Information displayed on the Details pane includes the element's name, AccuRev status, and version. Click a column header to sort items in the list by that column.

The following commands operate on the selected element. You can select only one item at a time.

Open

Opens the selected file.

Save As

Invokes your Web browser's **Open** command, allowing you to open or save the selected file.

Promote

Opens the Promote dialog box to send the current version of the element to the parent of the current stream. See [Promoting Elements](#).

Annotate

Opens the selected file in [Reviewing Changes to Text Files](#).

History

Shows the history of this file in a [History Browser](#).

Version Browser

Opens the [Version Browser](#), showing the versions of this file in the AccuRev repository.

Diff

Compares this file to its basis and shows the results in the [Diffing Files in AccuRev®](#).

Properties

Displays the [Displaying Element Properties](#) dialog box for the selected file.

Code Review

If enabled by your AccuRev administrator, allows you to create a code review for the selected file, or add files to an existing code review. See [Submitting AccuRev Elements to Code Review](#) on page 48 for more information.

Streams Pane

The Streams pane shows the current stream and all of its children in the stream hierarchy. The display shows only the stream's immediate children, but you can expand the nodes to explore the stream hierarchy. The context menu in this pane provides access to the following commands:

Open

Opens the selected stream in a new File Browser tab.

Look up Stream

Opens a Look up Stream tab that can be used to search for streams below the current stream in the [stream hierarchy](#). See [Search From options](#) on page 10 for more information.

Open Basis Stream

Opens the [basis stream](#) of the selected stream in a new File Browser tab.

New Stream

Creates a new stream, based on (that is, as a child of) the selected stream.

A [Adding a Stream to a Depot](#) dialog box appears to specify settings for the new stream. This command is not available from a workspace.

Show Active Issues

Shows development activity for the selected stream in an [Show Active Issues](#). An issue is active in the stream if one or more active elements have been associated with it (during promote, for example). The set of elements associated with an issue is referred to as a [change package](#). This command is not available from a workspace.

Note: AccuRev determines that an element is 'active' (changed) if its basis version (the version that appears in the backing stream) and head version (the most recent version in the stream) differ. That is, a new version of the element has been created and is still part of that stream's default group.

Show Active Transactions

Shows development activity by transaction for the selected stream in a [History Browser](#) tab. A transaction is active in the stream if one or more active elements are part of the transaction.

History

Shows the history of all elements in the selected stream in a History Browser tab.

Issue Diff

Shows the change packages that differ between the selected stream and another (not the backing) stream. When you click this option, the cursor changes to a cross-hair and you can select the target stream against which to diff. To cancel this operation, right-click instead of selecting a target stream.

Diff Against Basis (by Issues)

Shows the change packages that differ between the selected stream and its backing stream in a **Issue Diff** tab. This command is not available from a workspace. See [Diff Against](#).

File Diff

Shows the files that differ between the selected stream and another (not the backing) stream. When you click this option, the cursor changes to a cross-hair and you can select the target stream against which to diff. To cancel this operation, right-click instead of selecting a target stream.

Diff Against Basis (by Files)

Shows the files that differ between the selected stream and its backing stream in a [File Diff](#) tab. This command is not available from a workspace.

File Statuses

Every element under AccuRev control is assigned a *status*, an indicator of that element's state within the AccuRev repository. In the File Browser, an element's file status is displayed in the Details pane as a parenthesized word. For example: **(overlap)(member)**. Note that an element file can have more than one status.

Only AccuRev-controlled elements—that is, members of the current AccuRev stream—are displayed in the File Browser. If an element exists only in the workspace, it is not displayed in the File Browser. For example, an element that has not been promoted to a stream is not displayed in the File Browser. Examples of other workspace-only statuses that are displayed only in the Java GUI include **(external)**, **(missing)**, and **(modified)**.

Note: Each directory element also has a status in each workspace and stream. A subset of the status indicators is used to report directory statuses.

File Statuses Explained

The file statuses displayed by the Web UI can indicate:

- The presence of the element in the stream
- Changes to the element
- Relationship of the element to the version in the parent stream
- Whether or not the element is a link

Presence of the Element in the Stream (defunct)

The element has been marked for removal from the workspace or stream with the Defunct command. The element will be removed from the stream (in the depot) when you promote the element to the parent stream.

(xlinked)

This version of the element appears in the stream by virtue of a cross-link, either on the element itself or on its parent directory or a higher-level directory. (Cross-linking a directory also cross-links the entire subtree below it.)

(twin)

The element is one of multiple elements in the workspace that exist at the same pathname. At most one of these elements can be accessed through the pathname; the others can be accessed through their unique element IDs.

Changes to the Element**(member)**

The element is active in the workspace. Commands that create a new version in the workspace or stream also make the element active there if it is not already.

Relationship to the Version in the Parent Stream**(backed)**

The version in the workspace stream is the same as the version in the backing stream.

(overlap)

The element has changed in this stream and in the parent stream. Overlap elements require a merge operation before you can promote changes to the parent stream. Overlap elements are displayed with a yellow highlight.

(underlap)

The element has changed in this stream and in the parent stream, however the parent stream already contains the changes in this workspace or stream. In many cases, it is most appropriate to remove your changes from this workspace stream. In other cases, you can merge and promote, just as with an overlap element.

Link-Related Indicators**(elink)**

The element is an element link.

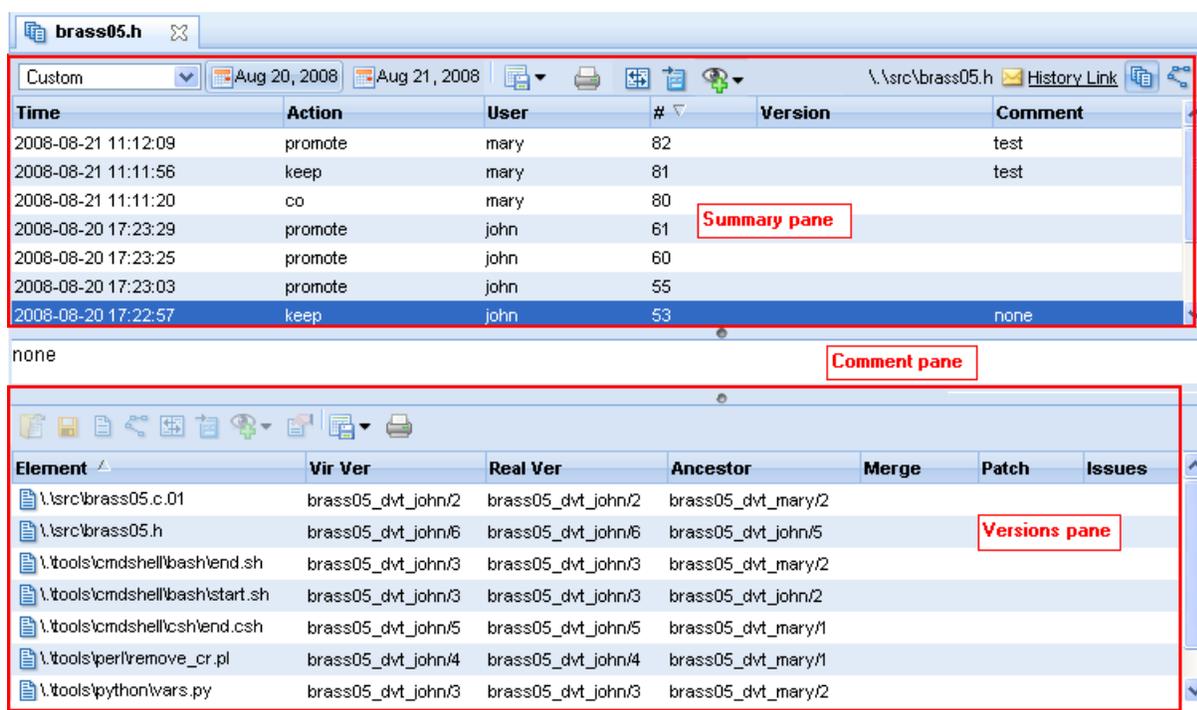
(slink)

The element is a symbolic link.

History Browser

The History Browser shows the history of elements in a selected stream, or the history of a selected element. Within the History Browser, you can inspect AccuRev transactions that make up the history of the selected stream or element and perform operations on one or more files that make up a transaction, such as diff and adding files to an issue.

The History Browser is divided into three panes—Summary, Comment, and Versions. Each of these panes is described in greater detail in the following sections.



Accessing the History Browser

You can access the History Browser by right-clicking an element in the *File Browser*'s Details pane, and choosing the **History** command to view the history of that element. You can also click the History Browser button (📅) for a selected element.

The History Browser opens in a new tab.

Summary Pane

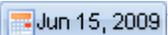
The Summary pane lists the AccuRev *transactions* involving the file whose history you are viewing, one transaction per line. For each transaction, the Summary pane shows the following:

Column Heading	Description
Time	The transaction's timestamp.
Action	The AccuRev action type (promote, keep, and so on).
User	The username of the AccuRev user who executed the transaction.
#	The transaction number.

Column Heading	Description
Version	The element's resulting AccuRev version (displayed for workspace transactions only).
Comment	The comment supplied with the transaction, if any. Note: The comment is also displayed in the Comment pane for a selected transaction.

Display Filters

The left side of the Summary pane toolbar contains controls that let you filter the transactions displayed in the History Browser:

- The transactions drop-down list () lets you specify the maximum number of transactions to display at a time. You can choose numeric values (10, 20, and so on) or you can choose a time period (all transactions within a day or a week, for example).
- The date buttons (for example, ) to the right of the transactions drop-down list let you specify a time period to filter the display to include only transactions occurring during that time period. Using this option causes the transactions drop-down to change to *Custom*.

Note: By default, the dates displayed in the date buttons correspond to the date of the first and last transactions (respectively) displayed in the Summary pane.

Other Summary Pane Toolbar Items

In addition to the display filters described in the previous section, the Summary pane toolbar contains buttons that allow you to perform the following operations:



Export

See [Common Table Commands](#).



Print

Prints the transactions table.



Diff Against Other

Compares two versions shown in the History Browser using the [Diffing Files in AccuRev®](#).



Send files to Issue

Sends all the files for the selected transaction to the change package section (Changes tab) of the issue record you specify. You can also send files to an issue from the transaction's context menu (**Send To > Issue**).

See [Using AccuWork™](#) for more information about issues and change packages.



Code Review

If enabled by your AccuRev administrator, allows you to create a code review for the selected file, or add files to an existing code review. See [Submitting AccuRev Elements to Code Review](#) on page 48 for more information.

Path information

The path and file name of the element in the AccuRev repository. (This is not displayed if you are using the History Browser to view a stream, as opposed to an individual file.)

Send Link and History Link

Tools used to mail or create a Web UI URL you can use to share the element's history with other AccuRev users. See [Obtaining Web UI Links](#) for more information.

Switch to History

Toggles the display to the History Browser. (This button is not displayed if you are using the History Browser to view a stream, as opposed to an individual file.)

Switch to Version Browser

Toggles the display to the [Version Browser](#). (This button is not displayed if you are using the History Browser to view a stream, as opposed to an individual file.)

Comment Pane

When you select a transaction in the Summary pane, the Comment pane shows the comment string applied to that transaction. It can be easier to read comments in the Comment pane than it is in the Summary pane, where column space is more limited.

Versions Pane

When you select a transaction in the Summary pane, the Versions pane shows details for that transaction, including all the elements and versions involved with it.

Column Heading	Description
Element	The element's URL.
Vir Ver	The name and version of the element's <i>virtual version</i> —the version that serves as an alias for a previously created real version.
Real Ver	The name and version of the version of the element that was created in a user's workspace, recording a change to the contents and/or pathname of the element.
Ancestor	The version from which the current version was derived.
Merge	The “from” version of the Merge operation that created the current version. Present only if a Merge command was performed on the element.
Patch	The “from” version of the Patch operation that created the current version. Present only if a Patch command was performed on the element.
Issues	The AccuWork issue to which this version has been added.

Tip: You sort the Versions pane table by column (to invert the sort order, for example) by clicking a the column heading.

Versions Pane Operations

The Versions pane toolbar and context menu provide access to the following commands:

Open

[Using the Open Commands](#) the selected version of this file.

Save As

Invokes your Web browser's **Open** command, allowing you to open or save (see [Save As](#)) the selected file version.

Annotate

Opens the selected version in the [Reviewing Changes to Text Files](#).

Version Browser

Opens the [Version Browser](#), showing the version in the context of its ancestors and children, if any.

Diff Prev. Trans

Compares the selected version against its immediate predecessor using the [Diffing Files in AccuRev®](#).

Send files to Issue

Sends all selected files to the change package section (Changes tab) of the issue record you specify. You can also send files to an issue from the file's context menu (**Send To > Issue**).

See [Using AccuWork™](#) for more information about issues and change packages.

Code Review

If enabled by your AccuRev administrator, allows you to create a code review for the selected file, or add files to an existing code review. See [Submitting AccuRev Elements to Code Review](#) on page 48 for more information.

Properties

Displays the [Displaying Element Properties](#) dialog box for the selected version.

Export

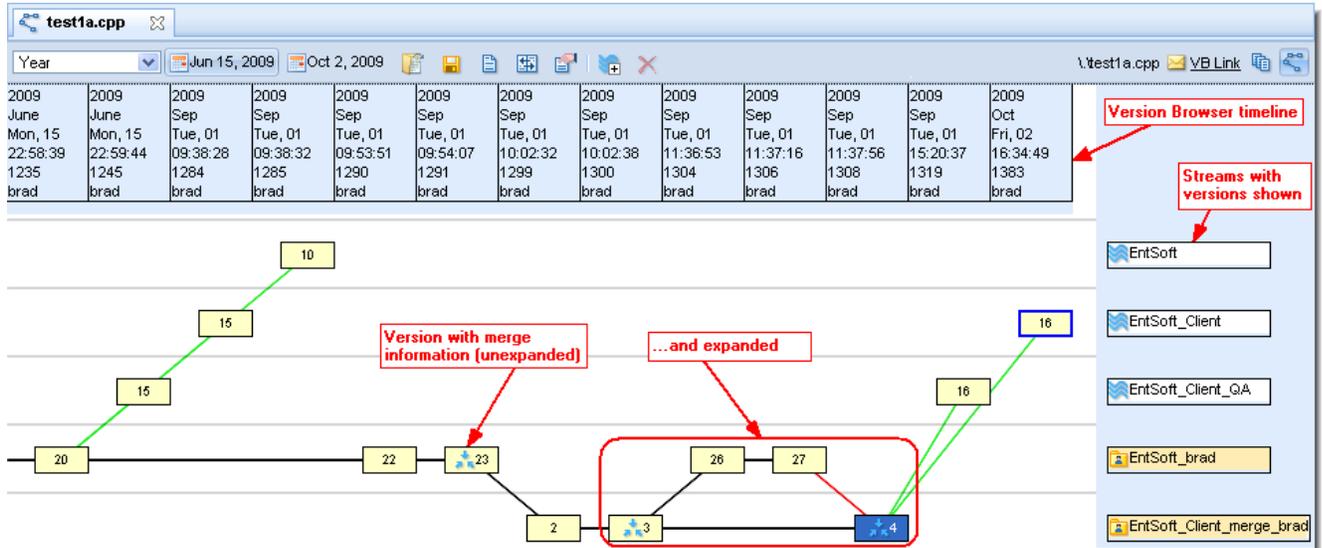
See [Common Table Commands](#).

Print

Prints the transactions table.

Version Browser

The Version Browser displays some or all of an element's versions, using color-coded lines to indicate the way in which each version was created. You can perform various version-related operations, such as comparing any two versions (text files only) and copying any version to your workspace.



Accessing the Version Browser

You can access the Version Browser by right-clicking an element in the *File Browser* and choosing the **Version Browser** from the context menu. You can also click the Version Browser button (🔗).

The Version Browser opens in a new tab.

Version Browser Display

This section describes the display features of the Version Browser and what you can do to change the display.

Transaction Time Line

The transaction time line appears at the top of the Version Browser. Transactions are listed in chronological order (oldest to most recent); information about each transaction includes a timestamp, transaction number, and AccuRev username.

Layout

The Version Browser uses these layout rules to convey information about a version's relationship with streams and transactions:

- Versions belonging to a particular stream are shown horizontally aligned with that stream.
- Versions belonging to a particular transaction are shown vertically aligned with that transaction on the timeline.

You cannot change the layout manually (by dragging and dropping a version, for example). Layout can change, however, when you expand a version. See [Expanding Versions](#) for more information.

Colors

The Version Browser uses colors to convey information about a version's history and ancestry:

- Versions are usually outlined by a thin black line; the version outlined by a thicker **blue** line is the most chronologically recent version with a real ancestor.
- Versions are connected by lines. The colors of these lines indicate something about the versions' ancestry. See [Ancestry Relationships](#) for more information.

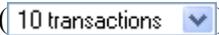
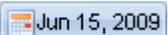
Connecting Line	Description
Black	The version on the left is a direct (real) ancestor of the version on the right.
Green	The version to the right is a virtual version . If a black line connects to the version on the left, that version is the real ancestor of the virtual version. If no black line connects directly to the version on the left (for example, EntSoft_Client\15 in the image above), that version is the virtual ancestor of the version on the right.
Red	The version to the left has undergone a merge operation to become the version on the right.
Orange	The version to the left has undergone a patch operation to become the version on the right.
Blue	The version to the left has undergone a revert operation to become the version on the right.

Changing Display Content

This section describes some of the ways you can change the content of the Version Browser.

Display Filters

The left side of the Version Browser toolbar contains controls that let you filter the display:

- The transactions drop-down list () lets you specify the maximum number of *transactions* to display at a time. You can choose numeric values (10, 20, and so on) or you can choose a time period (all transactions within a day or a week, for example).
- The date buttons (for example, ) to the right of the transactions drop-down list let you specify a time period to filter the display to include only transactions occurring during that time period. Using this option causes the filter to change to *Custom*.

Note: By default, the dates displayed in the date buttons correspond to the date of the first and last transactions (respectively) displayed in the Version Browser.

Expanding Versions

Versions that contain merge, patch, or revert information can be expanded to display versions related to those operations. Merged, patched, or reverted versions include a symbol in addition to the version number, as shown here:



Symbols differ based on the type.

To expand a merged, patched, or reverted version, right-click it and choose **Expand Ancestry** from the context menu.

Adding and Removing Streams

You can add and remove streams from the Version Browser display.

- Use  **Add Stream** to show additional versions of this element from the stream you select. Streams added to the Version Browser will not persist after using the **Refresh** command.
- Use  **Remove Stream** to remove previously-added streams. Workspace streams cannot be removed in this manner.

Other Version Browser Toolbar Items

The right side of the Version Browser toolbar contains:

- The path and file name of the element in the AccuRev repository.
- Tools used to mail or create a Web UI URL you can use to share the element's version information with other AccuRev users. See [Obtaining Web UI Links](#) for more information.
- Buttons used to toggle between the [History Browser](#) and the Version Browser.

Version Browser Commands

The following commands are available in the Version Browser. Commands are available in both the toolbar and context menu unless noted otherwise.

Open

[Using the Open Command](#)s the selected version. This command is also executed when you double-click a version.

Save As

Invokes your Web browser's **Open** command, allowing you to open or save (see [Save As](#)) the selected file version.

Annotate

Opens the selected version in the [Reviewing Changes to Text Files](#).

Diff Against Other

Compares two versions shown in the Version Browser using the [Diffing Files in AccuRev®](#).

Expand Ancestry

Expands the selected version if it contains merge, patch, or revert information. These Version Browser nodes contain a merge icon as well as the version number, for example . This command is available from the context menu only.

Properties

Displays the [Displaying Element Properties](#) dialog box for the selected version.

Add Stream

Show additional versions of the element from the stream you select. This command is available from the Version Browser toolbar only.

Note: Streams added to the Version Browser do not persist after using the **Refresh** command.

Remove

Removes a non-workspace stream previously added to the Version Browser using the **Add Stream** button. Workspace streams cannot be removed in this manner.

Send to Issue

Record the selected versions in the change package section (Changes tab) of an issue record. You are prompted to enter the issue number. This command (**Send To > Issue**) is available from the context menu only.

See [Using AccuWork™](#) for more information about issues and change packages.

Send to Issue (specifying basis)

Similar to **Send to Issue**, except that it allows you to pick the basis version, rather than AccuRev determining it automatically. This command (**Send To > Issue (specifying basis)**) is available from the context menu only.

See [Using AccuWork™](#) for more information about issues and change packages.

Ancestry Relationships

This section describes the types of ancestry relationships displayed in the Version Browser.

Versions Created by Modifying an Existing Version – Direct Ancestors

One of the most common AccuRev operation is making changes to an existing version and then using the **Keep** command to save the changes in a new version. The version in your workspace created by the **Keep** command is called a *real version*, because it represents a change to the element. Other commands (**Rename**, **Defunct**, and **Undefunct**, for example) can create real versions in your workspace, too.

The Version Browser uses a **solid black line** to connect the existing version (called the direct *ancestor* or predecessor) with the new version.

Exception: Versions created by merge, patch, and revert operations are connected using other colors. See [Versions Created by Merge, Patch, and Revert](#) for more information.

Versions Created by Promoting an Existing Version –Virtual Versions

Workspaces contain [real versions](#), which represent changes to elements. By contrast, all versions in dynamic streams are [virtual versions](#), created with the **Promote** command. Each virtual version is an alias (pointer) to some real version in a user's workspace. The Version Browser uses a **solid green line** to connect a virtual version in a dynamic stream to the corresponding real version in a workspace.

Exception: The **Anchor** and **Send to Workspace** commands create a virtual version in a workspace. These commands, available only in the Java GUI and command line interface (CLI), do not represent a change to the element, merely the restoration of an existing version to the workspace.

In a depot with a deep stream hierarchy, it is common to successively promote a particular version to the parent stream, then to the grandparent stream, then to the great-grandparent stream, and so on. All the versions created by this series of **Promote** commands are aliases for the same real version. The Version Browser shows how all the virtual versions are related to the original real version.

Versions Created by Merge, Patch, and Revert

Note that the **Merge** and **Patch** commands are available only in the standalone Java GUI and CLI.

Merge – Merging Two Versions into a New Real Version

A standard **merge** operation combines the contents of two versions of a file:

- The most recently kept version in your workspace stream. This version contains the changes that you have made to the file in your workspace.
- The most recent version in the backing stream. This is the last version that was promoted.

The result file of the merge operation is kept as a new version in the workspace stream. (You can think of merging as a type of text-editing operation; as with any edit to a file, you preserve the results with **Keep**.) This new, merged version has two ancestors: the two versions listed above.

The Version Browser uses a **solid red line** to connect the existing version (called the direct [ancestor](#) or predecessor) with the new version.

AccuRev always records real versions, not virtual versions, as the two ancestors of a new, merged version.

Patch – Selective Inclusion of Another Version's Changes

A [patch](#) operation is similar to a [merge](#) operation. In both, text from another version is incorporated into your workspace's version.

- A merge operation considers the *entire contents* of the "from" version.
- A patch operation considers only *some* of the changes in the "from" version. Typically, these are recent changes made by one user, recorded in one version or a set of consecutive versions.

The Version Browser uses a **solid orange line** to connect the existing version (called the direct [ancestor](#) or predecessor) with the new version.

Revert – Selective Removal of Changes to a Version

A [revert](#) operation is the opposite of a [patch](#) operation. It is sometimes referred to as a 'reverse patch' operation. Whereas a patch *adds* a selected set of changes, a revert *removes* a selected set of changes. A version created by the **Revert** command has two ancestry lines:

- A **solid blue line** indicates the version from which **Revert** removed some changes.
- A **solid black line** indicates the [basis version](#) of the removed patch or change package entry.

Closest Common Ancestor

Blue, black, orange, and red lines trace the ancestry of real versions of an element. You can use the real-version ancestry to determine the closest common ancestor of any two versions. The *closest common ancestor* is the most recent version upon which the two versions are both based, by some combination of direct ancestor and merge connections. (When considering a virtual version in a closest-common-ancestor analysis, first follow the green line back to the corresponding real version.)

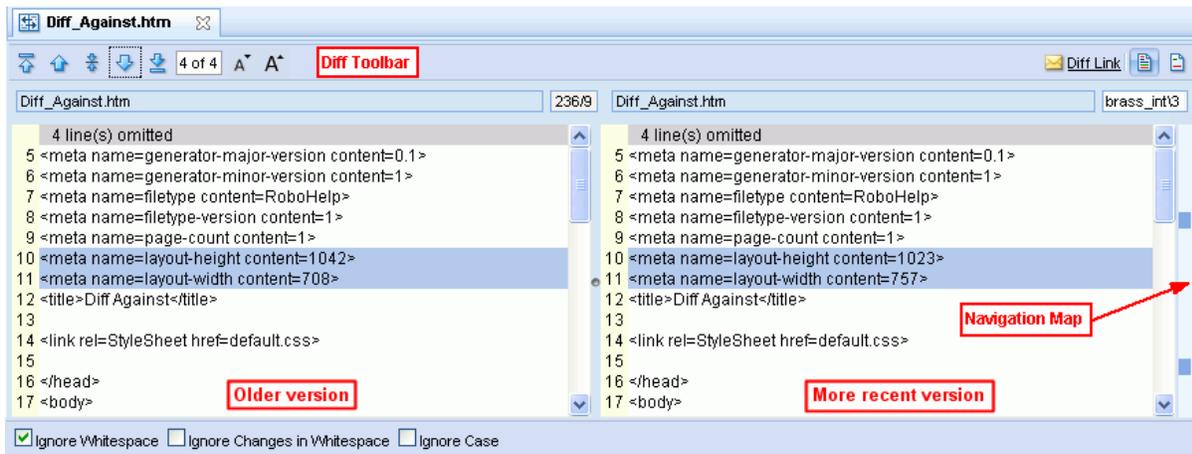
Note: Depending on the version whose closest common ancestor you are trying to find, you might need to add one or more streams to the Version Browser display. See [Adding and Removing Streams](#) for more information.

You can also use the CLI command **accurev anc -c** to find the closest common ancestor of two versions.

In the **Merge** command, AccuRev determines the closest common ancestor of the two versions to be merged, and uses this version to perform a three-way merge. AccuRev tracks patch ancestry separately from merge ancestry. In determining the closest common ancestor of two versions for a merge operation, AccuRev takes into account previous merge operations, but not previous patch or revert operations.

Diffing Files in AccuRev®

By default, AccuRev diffs files using its own Diff Tool. You can also configure AccuRev to use third-party diffing tools. Results from file diffing operations (Diff Against Backed or Diff Against Basis, for example) are always displayed in the Diff tab, shown here:



The Diff tab shows the files being compared side by side in realizable panes. The older version is displayed in the left pane, the more recent version is displayed in the right pane. The differences between the files are color-coded, as shown in the following table:

Color	Meaning
Blue	This line has changed.
Green	This line was added.
Red	This line was deleted.

The *navigation map*, to the right of the vertical scroll bar, shows the relative locations and sizes of the areas that differ between the two files. It uses the same color-coding as the difference sections. Click on any point within the navigation map to scroll directly to that area in the file.

Filtering the Display

You can use the following controls to filter the display of two diffed files:

Ignore Whitespace

Controls whether whitespace is taken into account when comparing text lines.

Ignore Changes in Whitespace

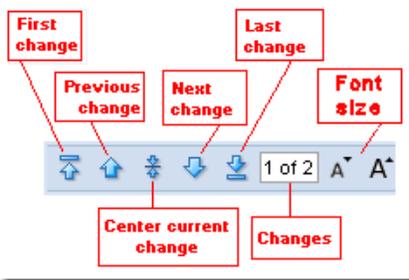
Controls whether a change in the amount of whitespace in a text line is considered to be a change to that line.

Ignore Case

Controls whether uppercase and lowercase characters are considered to be the same when comparing text lines.

About the Diff Toolbar

The Diff tab provides a toolbar with buttons for navigating file changes and changing the font size used for the display, as shown in the following illustration.



Navigation buttons let you quickly jump to the first, last, next, and previous changes in the file being diffed; you can also center the current change in the display, which can make it easier to understand the context for the change. The numeric field to the right of the navigation buttons shows:

- The change in the file that currently has focus (the first number)
- The total number of changes (the second number)

Finally, the two "A" icons allow you to increase or decrease the font size used to display file content, in one pixel increments between 8 and 24 pixels. The font size setting persists between sessions as long as cookies are enabled for your browser.

Diff Tab Display Modes

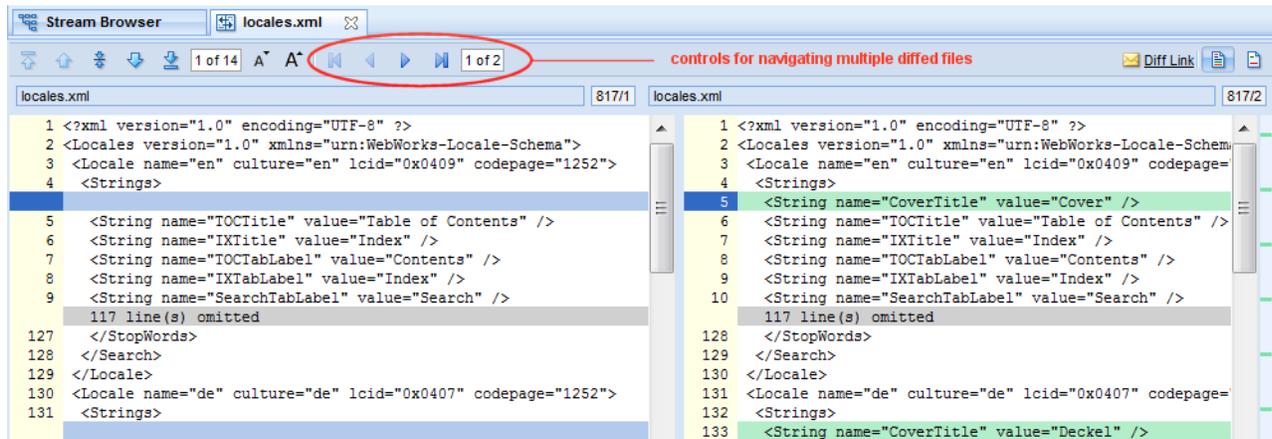
The right side of the toolbar contains two buttons that allow you to toggle between  **Context Diff** and  **Full Diff** display modes:

- Context Diff mode shows each change, including five lines of unchanged text above and below the change to provide context.
- Full Diff mode shows the entire file.

The Diff tab defaults to Context Diff mode for improved performance.

Diffing Multiple Files

You can select multiple text files for diffing at a single time. For example, in the File Browser you might want to choose several files to diff at one time, rather than performing the diff operation on each file individually. When you diff multiple files, AccuRev adds a new set of navigational tools to the toolbar, as shown in the following illustration. Like the tools for a single file diff operation, these tools let you navigate quickly from one diffed file to the next, and show you both how many files in total were diffed, and which diffed file is currently displayed.



In this example, the file currently displayed in the Diff tab is **locales.xml**. One other file was selected for diffing at the same time, as indicated by the value *1 of 2*. In this example, you would use either the **Next Element** or **Last Element** to display the second diffed file.

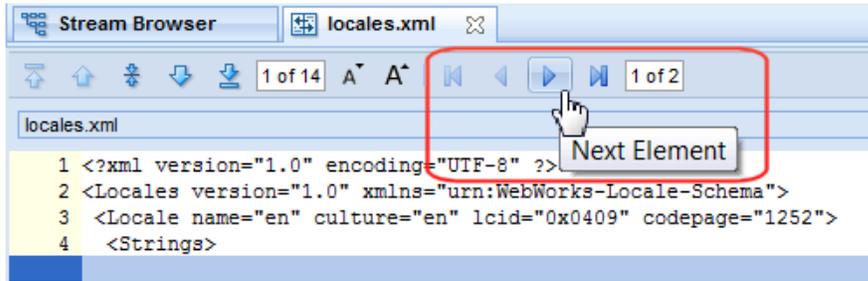
Note: You can diff text files only. Examples of text files include files with .txt, .h, .hpp, .c, and .cpp extensions. You cannot diff binary files. If you select both text and binary files, AccuRev displays a warning and allows you to complete or cancel the diff operation.

To diff multiple files at the same time:

1. Select the files you want AccuRev to diff. You can use Ctrl+ click and Shift+ click to select files.
2. Run the diff operation (Diff Against Basis, for example).

The diff operation is performed against the first of the files you selected. Results are shown in the Diff tab.

- To examine the diffs in the next file you selected in [Step 1](#), click the **Next Element** button, as shown in the following illustration:



The Diff tab displays the next file.

Accessing Diff Results Using a URL

AccuRev automatically builds a URL for diff operation results. This URL can be:

- E-mailed using the default e-mail client configured for your Web browser.
- Opened in a new tab in the Web browser

See [Obtaining Web UI Links](#) for more information on this topic.

Diff Against

The Diff Against command lets you compare two versions of a *text* file. It is available in the File Browser, History Browser, and change package entries on the Issues and Changes tabs. See [Using AccuWork™](#) for more information about issues and change packages.

You can compare file versions in the following contexts:

- Against the *backed* or *basis* version, via the [File Browser](#)
- Against the *basis* version, via the Issue Edit form's [Changes Subtab](#)
- Against the *basis* version, via an issue's Change Package (see [Working in the Changes Subtab](#))
- Against *any other* version in the file's transaction history, via the [History Browser](#)'s Summary pane
- Against the *previous* version in the file's transaction history, via the Versions pane in the History Browser and [Displaying Active Transactions](#).
- Against the *current* version in the file's transaction history, via the [Reviewing Changes to Text Files](#)

In addition, AccuRev provides two **Diff Against > Overlapping Changes** options to help you identify and resolve conflicts between two versions of an element that result in an **(overlap)** status:

- Mine** - Compares your workspace version against the common ancestor in the backing stream. This option identifies the changes in your workspace that did not come from the backing stream; it is the equivalent of diffing against the last version that you merged with.
- Theirs** - Displays only the changes added to the backing stream since the last time you merged with the backing stream. This option is useful for identifying the changes to the backing stream that caused the overlap condition.

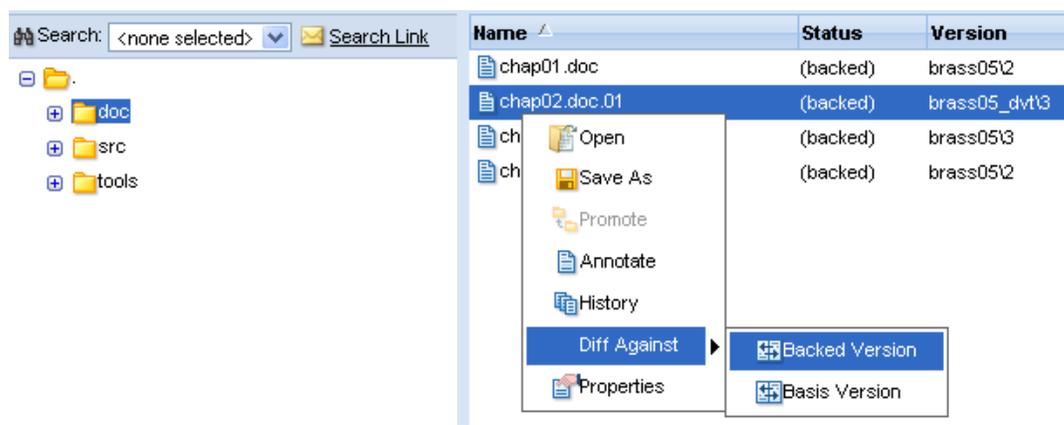
The Overlapping Changes options are available only for elements with an **(overlap)** status.

Once you choose the versions you want to compare, the results are displayed in the Diff tab. See [Diffing Files in AccuRev®](#) for more information.

Diff Against Backed or Basis Version

Compares the selected file to another version from AccuRev. To perform the comparison:

1. In the [File Browser](#), right-click the file you want to diff.
2. Select **Diff Against**, then select **Backed Version** or **Basis Version** from the context menu.



Alternative: Right-click the file you want to diff in the Issue Edit form's [Changes Subtab](#), then choose **Diff Against Basis** from the menu.

Diff Against Other Version

Compares two selected file versions in the [History Browser](#)'s Summary pane.

To perform the comparison:

1. Right-click the transaction you want to diff in the History Browser's Summary pane.
2. Select **Diff Against Other** from the context menu. The cursor changes to a cross when it is over version listings.
3. Navigate to the other version in the Summary Pane and click it.

Diff Against Previous Transaction

Identifies changes to a file that occurred during a specific transaction.

To perform this operation:

1. In the [History Browser](#) or the [Displaying Active Transactions](#), click a line in the Summary pane to select a transaction.

This populates the Versions pane with all files that were part of that transaction.

2. Right-click any file in the Versions pane.
3. Choose **Diff Prev. Trans.** from the context menu to show the changes in that file caused by that transaction alone.

Diff Against Basis

This tab appears when a **Diff Against Basis** command is issued from the context menu in the [File Browser](#) Streams pane.

This command displays the difference between the selected stream and its basis stream. You can display the differences by file or by issue, and switch between the two using the **Issue Diff** and **File Diff** buttons once the initial difference has been displayed.

File Diff

If you choose **Diff Against Basis (by Files)**, the File Diff tab appears. This tab shows the source and destination streams for the comparison, and a list of files which differ between the two streams.



The following commands are available in the File Diff tab. Commands are available in both the toolbar and context menu unless noted otherwise.



Save As

Invokes your Web browser's **Open** command, allowing you to open or save (see [Save As](#)) the selected file.



Promote

Opens the Promote dialog box to send the current version of the element to the parent of the current stream. See [Promoting Elements](#).



Annotate

Opens the selected file in [Reviewing Changes to Text Files](#).



History

Shows the history of this file in a [History Browser](#).



Version Browser

Opens the [Version Browser](#), showing the versions of this file in the AccuRev repository.



Diff

Compares this file to its basis versions and shows the resulting comparison in the [Diffing Files in AccuRev®](#).



Properties

Displays the [Displaying Element Properties](#) dialog box for the selected file.

Open

Using the [Open Commands](#) the selected file.

Code Review

If enabled by your AccuRev administrator, allows you to create a code review for the selected file, or add files to an existing code review. See [Submitting AccuRev Elements to Code Review](#) on page 48 for more information.

Export

See [Common Table Commands](#).

Print

Prints the list of files displayed in the Changes subtab.

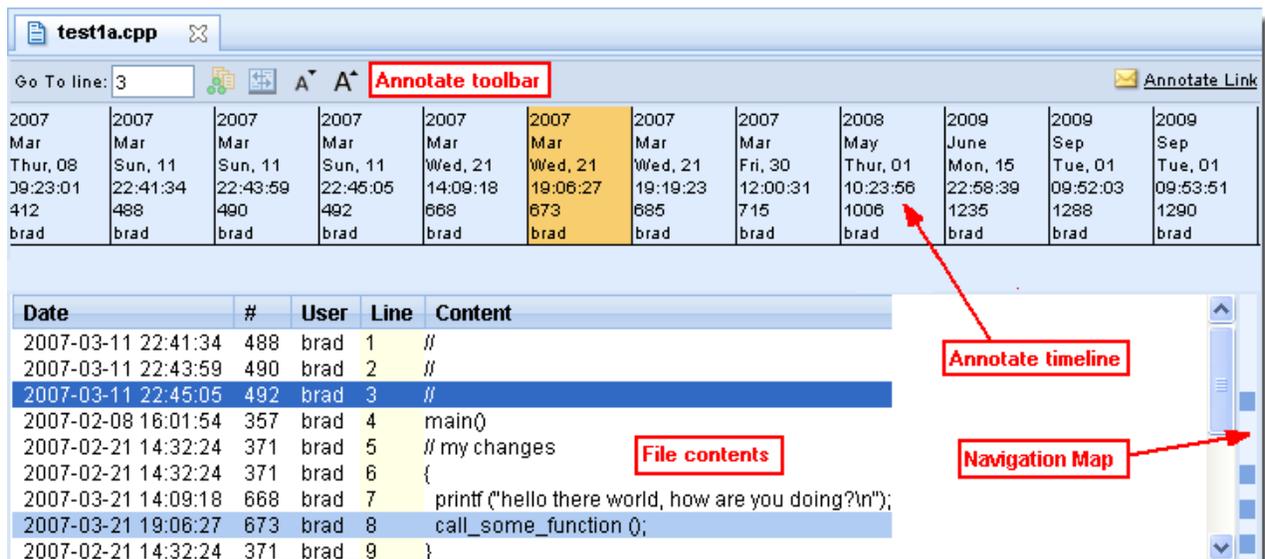
Issue Diff

See [Diff Against](#).

Reviewing Changes to Text Files

You use the **Annotate** command to explore how a text file has changed over time. You cannot use annotate with binary files.

Annotate results are displayed in the Annotate tab. The following example shows the results of Annotate performed against the file test1a.cpp:



The screenshot displays the AccuRev interface for the file test1a.cpp. The top section shows a toolbar with an 'Annotate toolbar' button. Below it is a table with columns for Date, #, User, Line, and Content. The table is divided into two parts: a timeline view and a file contents view. The timeline view shows changes from 2007 to 2009, with the current selection highlighted in yellow. The file contents view shows the code for the file, with the current selection highlighted in blue. Red boxes and arrows highlight the 'Annotate toolbar', 'Annotate timeline', 'File contents', and 'Navigation Map'.

Date	#	User	Line	Content
2007-03-11 22:41:34	488	brad	1	//
2007-03-11 22:43:59	490	brad	2	//
2007-03-11 22:45:05	492	brad	3	//
2007-02-08 16:01:54	357	brad	4	main()
2007-02-21 14:32:24	371	brad	5	// my changes
2007-02-21 14:32:24	371	brad	6	{
2007-03-21 14:09:18	668	brad	7	printf("hello there world, how are you doing?\n");
2007-03-21 19:06:27	673	brad	8	call_some_function();
2007-02-21 14:32:24	371	brad	9	}

The Transaction Timeline

A timeline at the top of the Annotate tab shows all transactions associated with the file you selected. Transactions are listed in chronological order (oldest to most recent); information about each transaction includes a timestamp, transaction number, and AccuRev username.

The File Contents Pane

The *file contents pane* displays all the lines of the file as of the currently selected transaction. Each line appears on its own row. Lines whose content was modified *as of that transaction* are highlighted. The *navigation map*, to the right of the vertical scroll bar, shows the relative locations and sizes of the areas in the file that were modified at the time of the currently selected transaction. Click on any point within the navigation map to scroll directly to that area in the file.

The columns in the file contents pane display the following information for each line in the file:

- **Date:** The timestamp of the version in which the line was modified.
- **#:** The number of the transaction in which that version was created.
- **User:** The AccuRev username of the user who created that version.
- **Line:** The line number of the text in the file.

Tip: Use the Go to Line field in the toolbar to jump to a specific line.

- **Content:** The contents of the text line.

Showing Related Lines

When you click a value in the Date, #, or User columns, AccuRev highlights all the lines whose value in that column matches the value you clicked. This makes it easy to:

- Find all the lines added or changed in a particular version (click in the Date or # column).
- Find all the lines created or modified by a particular user (click in the User column).

Running the Annotate Command

To run the **Annotate** command:

1. Select a text element in the Details pane of the [File Browser](#).
2. Click the Annotate button ()

Alternative: Right-click the text element and select **Annotate** from the context menu.

Annotate Tab Commands

You can perform the following actions on individual lines displayed in the file contents pane of the Annotate tab. Commands are available in both the toolbar and context menu unless noted otherwise

Show Transaction

Opens the [History Browser](#) to display the transaction history of the transaction on the selected line.

Diff Against Current Version

Opens the [Diffing Files in AccuRev®](#) to compare the version of the element from the transaction on the selected line and the most recent version in the current stream.

Annotate this Version

Displays the version of the annotated file on the selected line. This command automatically highlights the corresponding transaction on the Annotate timeline. This command is available only in the context menu.

Accessing Annotate Using a URL

AccuRev automatically builds a URL for annotate. This URL can be:

- E-mailed using the default e-mail client configured for your Web browser.
- Opened in a new tab in the Web browser

See [Obtaining Web UI Links](#) for more information on this topic.

Adding a Stream to a Depot

You can use the **New Stream** command to add a stream to a depot. New streams can be one of three types:

- **Dynamic.** *Dynamic streams* change over time, when new versions are promoted from child workspaces or other dynamic streams. Dynamic streams also inherit versions from their parent stream.
- **Snapshot.** *Snapshot streams* are immutable: they capture the configuration of their parent stream at a particular time. A snapshot stream cannot be renamed or modified in any way (for example, nothing can be promoted to it).
- **Pass-through.** *Pass-through streams* are used to group their child streams. Any version promoted to a pass-through stream is automatically promoted to the pass-through stream's parent.

New streams are always created as the child of an existing stream.

Note: Gated and staging streams are special types of streams. Although they are displayed in the Web UI StreamBrowser, gated streams can be created only using the AccuRev desktop client or CLI; staging streams cannot be created explicitly. (AccuRev creates staging streams automatically as children of gated streams.) For more information, see Chapter 11, Using Streams to Enforce Process in the *AccuRev Administrator's Guide*.

Choosing a Basis Time

When you add a stream to a depot, you have to specify its *basis time*. Among other things, the basis time affects whether or not a stream continues to inherit versions from its parent stream. There are three types of basis times you can assign to a new stream:

- **None:** No basis time. The new stream inherits the versions currently in its parent stream and continues to inherit subsequent versions that are promoted to its parent. This choice is disabled if you specified Snapshot for the stream type.
- **Now:** The basis time is set at the time the stream is created. The new stream inherits the versions currently in its parent stream but does not inherit any subsequent versions promoted to its parent.

Streams with a Now basis are similar to Snapshot streams in this regard, but you cannot promote into a Snapshot. You can promote into a stream with a Now basis.

- **As transaction #:** The basis time is set to the time of the transaction number you enter. A [transaction](#) is the record of a particular change to the repository. The new stream inherits the versions that were in its parent stream at the time the specified transaction was created.

Creating a New Stream

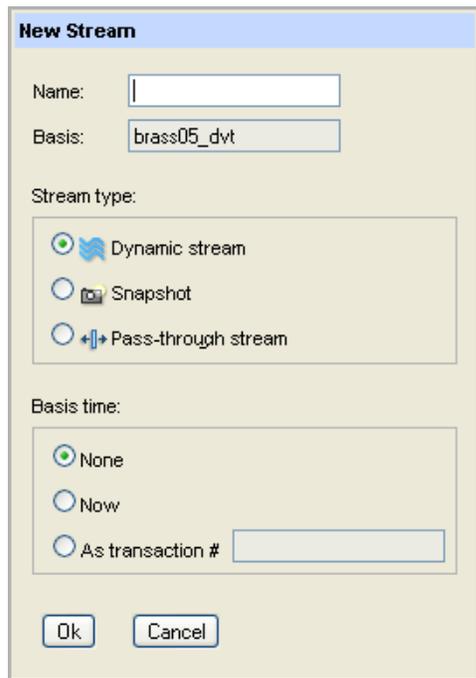
You can create new streams in the [StreamBrowser™](#), or in the Streams pane in the [File Browser](#).

To create a new stream:

1. Navigate to the [StreamBrowser™](#) or the Streams pane in the [File Browser](#).
2. Select the stream that you want as the parent of the new stream you are adding.
3. Right-click the parent stream and choose **New Stream** from the context menu.

Alternative: In the [StreamBrowser™](#), click the New Stream button (📁+) on the toolbar.

The New Stream dialog box appears:



4. Enter a name for the new stream. Stream names can be up to 79 characters long. They can contain upper- or lower-case letters, digits, spaces, hyphens, underscores, periods, and the '+' and '@' characters. Names cannot begin with a digit or a period.

The Basis field displays the parent of the stream you are adding. This field is not editable.

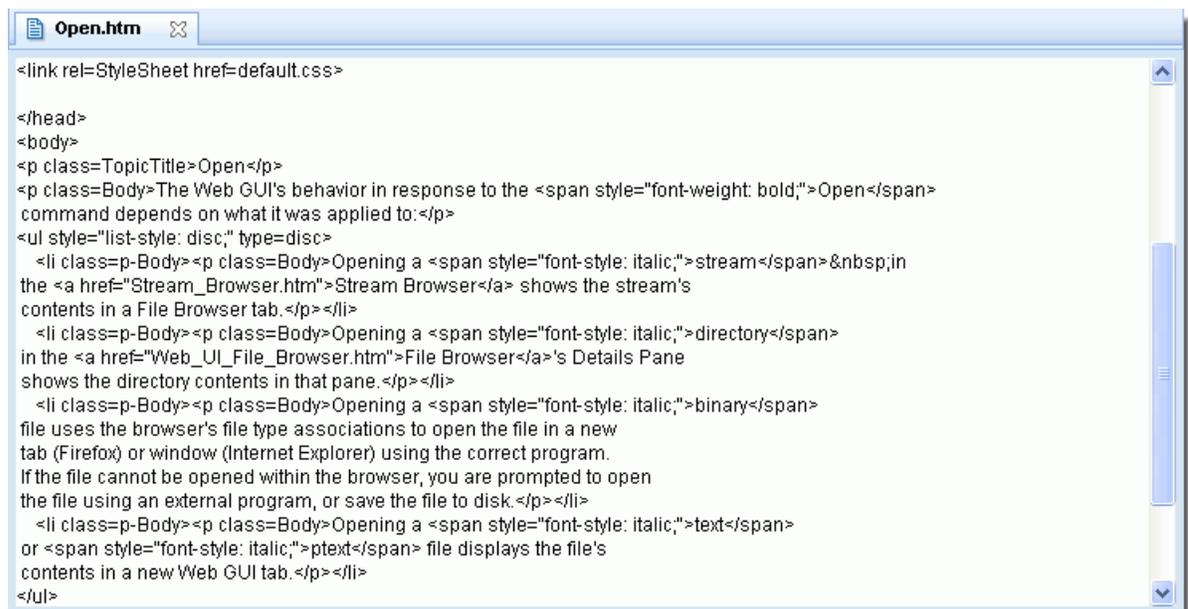
5. Pick a stream type. See [Adding a Stream to a Depot](#) if you need help with this step.
6. Choose a basis time for the new stream. See [Choosing a Basis Time](#) if you need help with this step.
7. Click **Ok**.

The new stream is added to the depot as a child of the stream you chose in [Step 2](#).

Using the Open Command

The **Open** command is available throughout the Web UI. You can use Open to:

- Display a stream's contents in a File Browser tab.
- Open a directory in the [File Browser](#)'s Details Pane to display the directory contents in that pane.
- Open a binary file using the program configured to open that file in your operating system. If the file cannot be opened within the Web browser, you are prompted to open the file using an external program or save the file to disk.
- Open a text or ptext file to display the file's contents in a new Web UI tab, as shown here:



```
<link rel=StyleSheet href=default.css>
</head>
<body>
<p class=TopicTitle>Open</p>
<p class=Body>The Web GUI's behavior in response to the <span style="font-weight: bold;">Open</span>
command depends on what it was applied to:</p>
<ul style="list-style: disc;" type=disc>
  <li class=p-Body><p class=Body>Opening a <span style="font-style: italic;">stream</span> &nbsp;in
the <a href="Stream_Browser.htm">Stream Browser</a> shows the stream's
contents in a File Browser tab.</p></li>
  <li class=p-Body><p class=Body>Opening a <span style="font-style: italic;">directory</span>
in the <a href="Web_UI_File_Browser.htm">File Browser</a>'s Details Pane
shows the directory contents in that pane.</p></li>
  <li class=p-Body><p class=Body>Opening a <span style="font-style: italic;">binary</span>
file uses the browser's file type associations to open the file in a new
tab (Firefox) or window (Internet Explorer) using the correct program.
If the file cannot be opened within the browser, you are prompted to open
the file using an external program, or save the file to disk.</p></li>
  <li class=p-Body><p class=Body>Opening a <span style="font-style: italic;">text</span>
or <span style="font-style: italic;">ptext</span> file displays the file's
contents in a new Web GUI tab.</p></li>
</ul>
</li>
```

Promoting Elements

The **Promote** command sends versions of one or more elements from a stream or workspace to its parent stream, making those versions available to the parent stream. Promoted versions can also be inherited by all dynamic streams and workspaces below the backing stream. Inheritance by dynamic streams is automatic; inheritance by a workspace occurs when the user updates that workspace.

AccuRev creates a single transaction in the depot to record the promotion, regardless of the number of versions promoted to the parent stream.

Using Promote

The typical use of Promote is to take private versions in your workspace and make them public by sending them to the workspace's parent (also referred to as its backing stream). You can also use Promote to send versions from one dynamic stream to another. You cannot use Promote to promote to a stream other than a parent.

Effect of Status on Promote

A file's status affects whether you can promote it:

- You can promote elements from a workspace only if they have a status of (kept).
- You cannot promote any element if it has a status of (overlap). In this case, you must merge the version you want to promote with the version in the backing stream. You can then promote new, merged version.
- The (underlap) status is similar to (overlap)—an element has changed in your workspace and in the backing stream. With (underlap), the changes in your workspace version have already been promoted to the backing stream (from another workspace, or from a stream elsewhere in the depot's stream hierarchy, for example). You can revert the changes in your workspace, or merge and promote as with (overlap) elements.

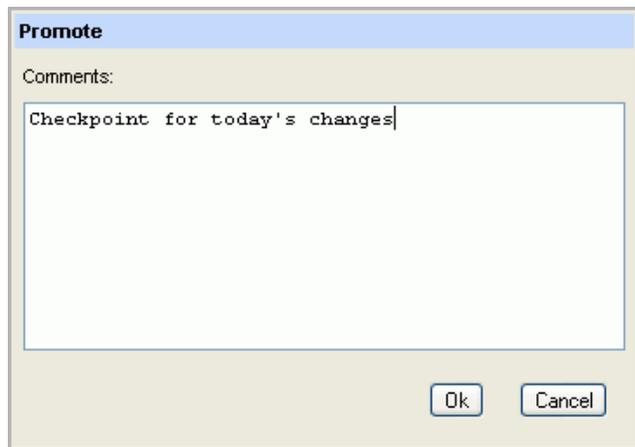
Promoting AccuRev Elements

To promote an AccuRev element in the Web UI:

1. Select the elements you want to promote. You can use Ctrl+ click and Shift+ click to select multiple files.
2. Click the Promote button () in the toolbar.

Alternative: Right-click a selected file and choose **Promote** from the context menu.

The Promote dialog box appears:

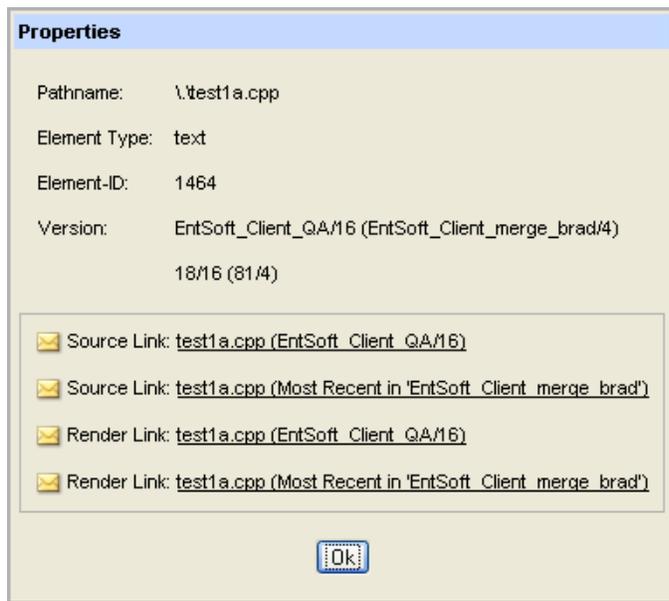


3. Enter a comment for the files you are promoting. The same comment is used for all files you are promoting.

If you have enabled change package integration, you will be prompted to choose an issue to promote the changes to. See [Using AccuWork™](#) for more information about Change Packages.

Displaying Element Properties

The **Properties** command displays a dialog box showing the element's AccuRev properties:



Information displayed by this dialog box includes:

- The path and file name of the element
- The AccuRev element type
- The AccuRev element ID
- The AccuRev status of the element (*for elements displayed in the File Browser only*)
- The version of the element being viewed and, in parentheses, its real version
- The version of the element being viewed and its real version, expressed numerically (*for elements displayed in the Version Browser only*)
- Source links. For text files, the Properties dialog box displays:
 - A link to the current element source
 - A link to the most recent version of the element in the backing stream

Text files are displayed in the Web UI.

- Render links. For binary elements, the Properties dialog box displays:
 - A link to the current element source
 - A link to the most recent version of the element in the backing stream (indicated by "Most Recent in <stream>")

Binary files are displayed in the program associated with the file type by your operating system.

mailto Link Buttons

Each of the links is prefaced with a **mailto** link button (✉). Clicking this button opens a new e-mail message using your system's default e-mail application. The body of the mail contains this version's AccuRev Web UI URL. Recipients can click the link, log into the Web UI, and view the same contents.

Note: The link to the current element source is permanent: it returns the same information no matter when it is used or what happens to the file later. See [URL Permanence](#) for more information.

Reactivating a Stream

You use the **Reactivate** command to restore a removed stream.

When you remove a stream, it is hidden from the StreamBrowser display, and you can no longer perform certain actions (you cannot work in a removed workspace, for example). In order to restore a stream that you have removed so that you can work on it, you must:

1. Make the stream visible in StreamBrowser. You do this using the **Include hidden streams** checkbox.
2. Reactivate the stream. You do this using the **Reactivate** command from the context menu.

Removing a Stream

You use the **Remove** command to hide a stream, snapshot, or workspace in the StreamBrowser. Hidden items do not appear in the StreamBrowser, nor do they appear in searches you invoke using the **Look up Stream** command. Note that the **Remove** command does not remove the object from the depot.

Note the following restrictions for use of the **Remove** command:

- Remove is disabled for parent streams—that is, any stream that has a child stream, snapshot, or workspace.
- To remove a workspace, you must be logged in as the user who owns the workspace.

To invoke the **Remove** command, right-click a stream and choose **Remove** from the context menu.

Effect of Remove

In addition to hiding a stream, snapshot, or workspace in the StreamBrowser, the **Remove** command disables some operations. For example, you cannot work in a removed workspace. You can, however, promote versions to a removed stream.

In order to fully restore a removed stream, snapshot, or workspace, you must reactivate it. See [Reactivating a Stream](#).

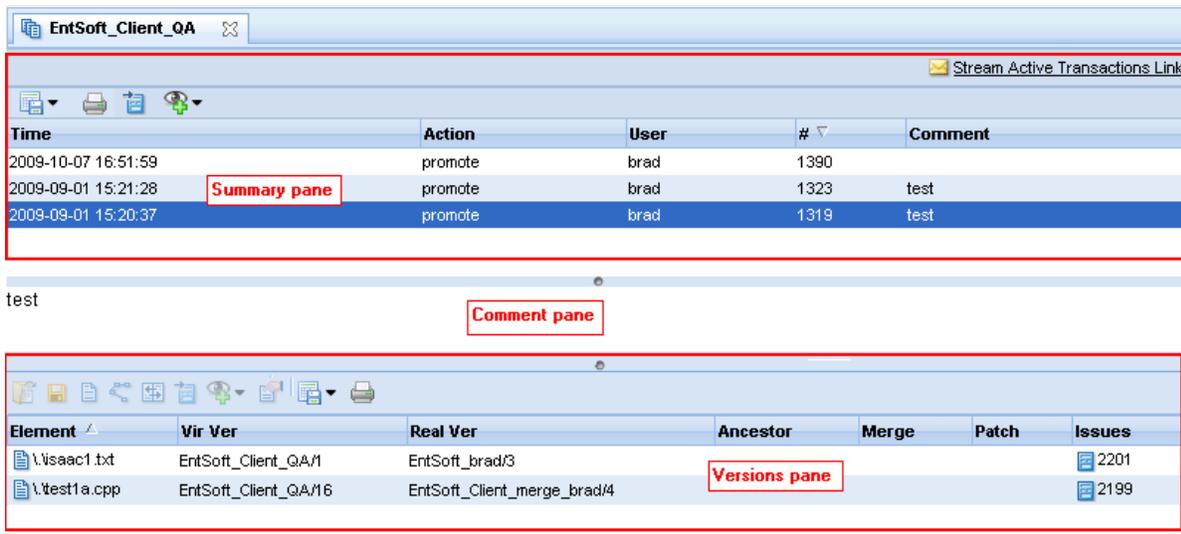
Save As

The **Save As** command invokes your Web browser's **Open** command, allowing you to open or save the selected file.

File associations (if any) and the decision of whether to open or save the file are set in your Web browser's options/preferences.

Displaying Active Transactions

The **Show Active Transactions** command displays the transactions that contain active elements for the current stream. AccuRev displays the results of this command in the Stream Transactions tab, which consists of three panes—Summary, Comment, and Versions—as shown in the following illustration:



No transactions will be shown if you invoke **Show Active Transactions** on a snapshot, since nothing can be promoted to a snapshot.

Accessing Active Transactions Using a URL

AccuRev automatically builds a URL for active transactions. This URL can be:

- E-mailed using the default e-mail client configured for your Web browser.
- Opened in a new tab in the Web browser

See [Obtaining Web UI Links](#) for more information on this topic.

Working in the Summary Pane

The following commands are available from both the toolbar and context menu for any selected transaction.



Export

See [Common Table Commands](#).



Print

Prints the transactions table.



Send files to Issue

Sends all files in the selected transaction to the change package section (Changes tab) of the issue record you specify.

See [Using AccuWork™](#) for more information about issues and change packages.



Code Review

If enabled by your AccuRev administrator, allows you to create a code review for the selected file, or add files to an existing code review. See [Submitting AccuRev Elements to Code Review](#) on page 48 for more information.

Working in the Versions Pane

To display details for a transaction, select it in the Summary pane. Note that the details shown in the Versions pane show *all* elements for the transaction, not just the active elements. The Versions pane lists the file name, version, basis version, and other information for each element in the transaction.

The following commands are available from both the toolbar and context menu for any selected element.



Open

[Using the Open Commands](#) the selected file.



Save As

Saves the selected file to another filename. (See [Save As](#).)



Annotate

Opens the selected version of the file in [Reviewing Changes to Text Files](#).



Version Browser

Opens the [Version Browser](#), showing the version in the context of its ancestors (and children, if any).



Diff Prev. Trans.

Opens the [Diffing Files in AccuRev®](#) and shows the changes in selected file caused by that transaction alone.



Send files to Issue

Sends all selected files to the change package section (Changes tab) of the issue record you specify.

See [Using AccuWork™](#) for more information about issues and change packages.

Code Review

If enabled by your AccuRev administrator, allows you to create a code review for the selected file, or add files to an existing code review. See [Submitting AccuRev Elements to Code Review](#) on page 48 for more information.

Properties

Displays a message box with information about the selected element. (See [Displaying Element Properties.](#))

Export

See [Common Table Commands.](#)

Print

Prints the files table.

Submitting AccuRev Elements to Code Review

The AccuRev Web UI can be installed as an Atlassian Crucible (Crucible) code review system plug-in.

Note: The integration between the AccuRev Web UI and Crucible is only available for versions of Crucible prior to 3.0. If, however, you are using Crucible 3.0 or later, you can add AccuRev contents to a Crucible review by using the AccuRev Plug-In for Atlassian Crucible, which is available at the <http://www.accurev.com/customer-support-resources/downloads/integration-packages> site.

If this integration between AccuRev Web UI and Crucible has been implemented by your AccuRev system administrator, you can:

- Create a Crucible review for any text or binary file under AccuRev control. See [Creating a Crucible Review for AccuRev Elements](#) on page 53 for more information.

Tip: You can specify extensions for the files you wish to be treated as text files in Crucible. See [Review Text File Extensions](#) on page 49 for more information on this topic.

- Add files to an existing Crucible review. You can add different versions of the same file to an existing review over time to create an iterative review. See [Adding AccuRev Elements to an Existing Crucible Review](#) on page 55 for more information.
- Start the Crucible code review system from within the AccuRev Web UI. See [Starting Crucible from within the Web UI](#) on page 57 for more information.

This section describes how to create and add to Crucible code reviews, and how to start Crucible from the Web UI. For more information about working with reviews in Crucible, see your Crucible documentation.

Before You Begin

This section describes factors to consider prior to submitting AccuRev elements to code review.

Review Text File Extensions

Crucible uses the `text/plain` attribute in the `raw-mime.types` file to identify the files in a code review that it can treat as text files. While Crucible recognizes many extensions commonly associated with text files (`.txt` and `.cpp`, for example), consider reviewing the `raw-mime.types` file to ensure that it includes any special files you plan on adding to code reviews. For example, you might want to include log files (`.log`) and configuration files (`.cfg`) in code reviews as text files. If so, you need to add these extensions to the `text/plain` attribute in the `raw-mime.types` file as described in the following procedure.

To specify text file extensions in Crucible:

1. Locate the `raw-mime.types` file in the directory where you installed Crucible.
2. In the `raw-mime.types` file, locate the line that starts with `text/plain`. For example:

```
text/plain      asc txt java jsp asp cs idl cpp cxx c h  pl pod py sh
```
3. Add the extensions you need to this list.
4. Save the `raw-mime.types` file.
5. Restart Crucible.

For more information, see your Crucible documentation.

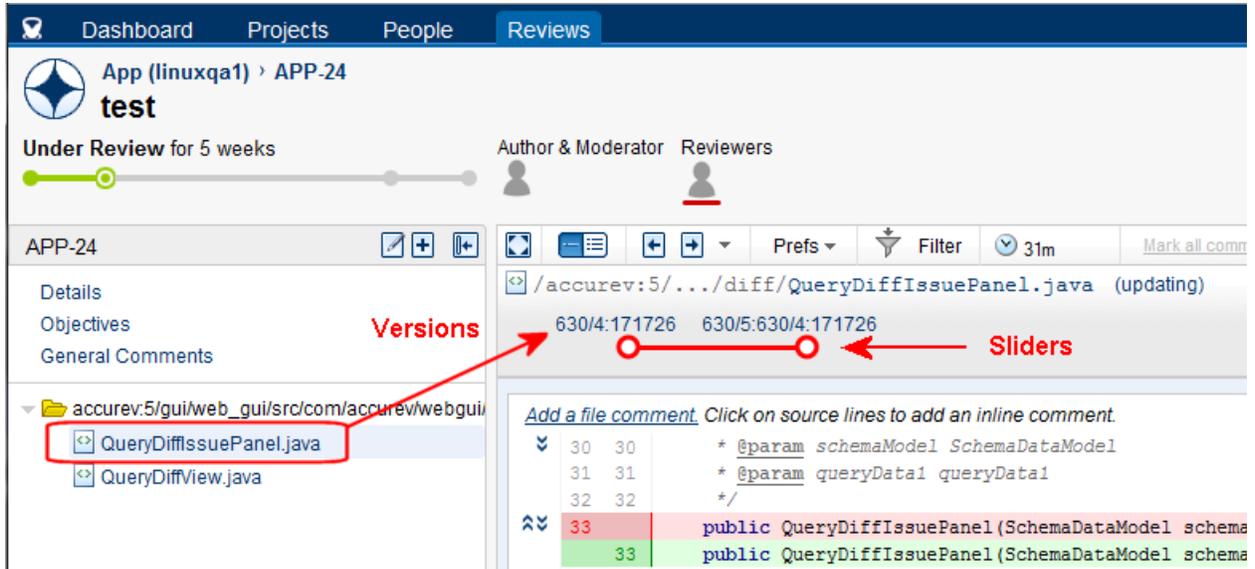
Note: AccuRev determines whether files without an extension are text or binary when you add them to a review or include them in a new review.

Crucible User Account Requirements

Your Crucible administrator must create a Crucible user account using your AccuRev user identity before you can submit an AccuRev element to code review. See your Crucible administrator if you have trouble logging in to Crucible.

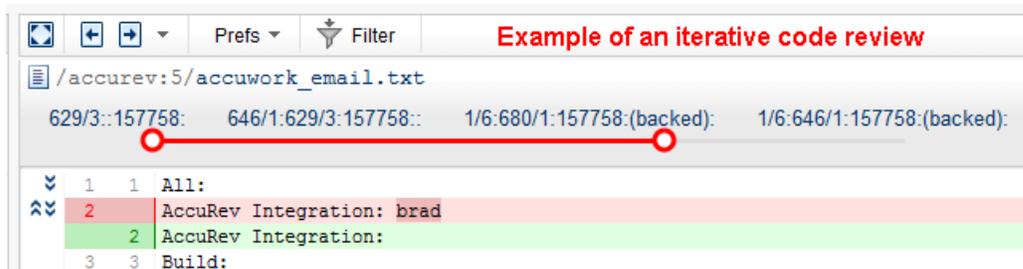
How Elements are Displayed in Crucible

When you submit an element to code review, AccuRev performs a diff operation to allow reviewers to compare versions of that element. As shown in the following illustration, versions used for the diff operation are displayed at the top of the Reviews tab, directly under the file name. Each version is displayed with its stream and version number -- in this example, 630/4 for the basis version and 630/5 for the head. Both versions display the AccuRev element ID (eid) -- in this example, 17726.



As in the AccuRev Diff tool, text is color-coded -- red to indicate text that has been removed from a version, green for text that has been added to a version. Sliders let you collapse the display to show only the contents of given version.

Tip: You can add the same element to an existing review multiple times, to create an iterative review. When you create an iterative review, each version you add is associated with its own entry, as shown in the following illustration:



See [Adding AccuRev Elements to an Existing Crucible Review](#) on page 55 for more information about working with existing Crucible reviews.

Which Versions are Dified

As described in the previous section, AccuRev uses a diff operation to provide versions of a given element to Crucible. In most cases, AccuRev determines which Diff Against operation to use based on the active view at the time you select the element for code review. For example, if you select an element from the Timeline Diff view, AccuRev diffs the versions at the start and end of the time period you specify. The following table summarizes the type of diff operation that AccuRev performs based on the current AccuRev view.

AccuRev View	Type of Diff Performed	Description
Timeline Diff	Diff	Automatically diffs versions of the selected element at the start and end of the specified time period.

AccuRev View	Type of Diff Performed	Description
History Browser	Diff Against Previous Transaction	Automatically diffs the selected element against the version in the most recent transaction in which there was a content change.
Issue Edit Form	Diff Against Basis	Automatically diffs the selected element against the basis version.
Issue Diff View	Diff Against Basis	Automatically diffs the selected element against the basis version.
File Diff View	Diff	Automatically diffs versions of the selected element in the selected streams.
File Browser	User chooses one of the following: <ul style="list-style-type: none"> ▪ Backed ▪ Basis ▪ My Changes 	Allows you to choose which diff operation to use. See Use the File Browser to Choose the Diff Operation for more information.

For more information on AccuRev Diff operations, see [Diffing Files in AccuRev®](#) on page 32.

Use the File Browser to Choose the Diff Operation

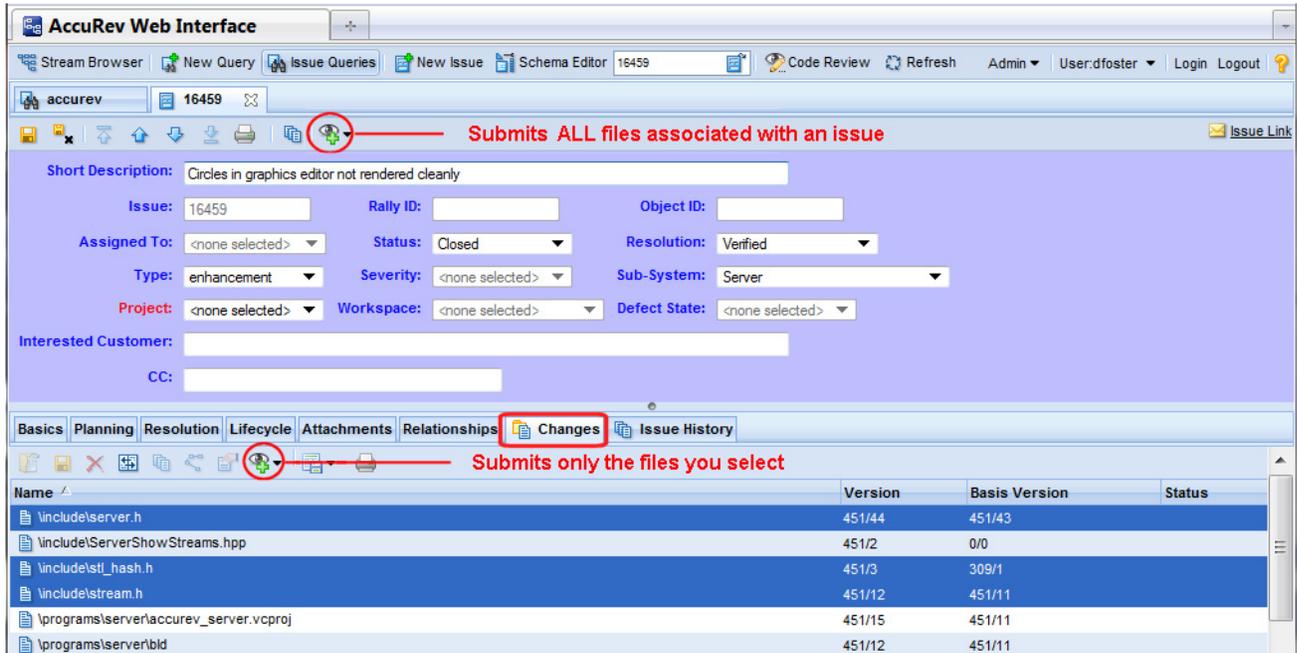
Unlike other views in which AccuRev selects the type of diff operation to perform when submitting elements to code review, when you submit an element to code review from the File Browser you can choose whether you want to diff against backed, basis, or just your changes as described here:

- *Backed Version*: Compares your file with the version currently in the backing stream. For example, you might use this choice to see *all* the changes you have made to this file since you updated your workspace and starting working on the file. (And assuming no one else has promoted a new version to the backing stream in the meantime.) This might include the changes stored in several intermediate versions that you have created with *keep*.
- *Basis Version*: Compares your file with the version that you started working with, before making your "recent" changes.
- *My Changes*: Compares the workspace version with the common ancestor in the backing stream. This option is useful for files that have an **(overlap)** status because it identifies the changes in the workspace that did not come from the backing stream. The My Changes option is the equivalent of diffing against the last version that you merged with.

Choosing Files for Review

AccuRev lets you submit elements to code review both explicitly (as when selecting one or more elements from the File Browser, for example) or implicitly (as when selecting all the elements in a change package associated with an issue, for example).

Consider the Issue Edit form shown in the following illustration. In this example, the Changes subtab is active, and a number of files have been selected:



Notice the two **Code Review** buttons () highlighted in this particular view -- one on the Issue Edit form toolbar, another on the Changes subtab toolbar. AccuRev responds differently depending on which button you click:

- Clicking the **Code Review** button on the Issue Edit form toolbar submits to review *all* the elements associated with the current issue, regardless of whether or not you have selected any elements on the active subtab.
- Clicking the **Code Review** button on the Changes subtab toolbar submits to review only those elements that you explicitly select (**server.h**, **stl_hash.h**, and **stream.h** in the illustration, for example). Note that you can use **Ctrl+** click and **Shift+** click to select multiple elements.

The following table summarizes whether an AccuRev view allows you to select elements implicitly, explicitly, or both.

AccuRev View	Available Element Selection
Timeline Diff	Explicit
History Browser	<ul style="list-style-type: none"> ▪ Explicit ▪ Implicit
Issue Edit Form	<ul style="list-style-type: none"> ▪ Explicit ▪ Implicit
Issue Diff View	<ul style="list-style-type: none"> ▪ Explicit ▪ Implicit
File Diff View	Explicit
File Browser	Explicit

Note: Multiple elements, regardless of whether you select them explicitly or implicitly, are always placed in the same Crucible review.

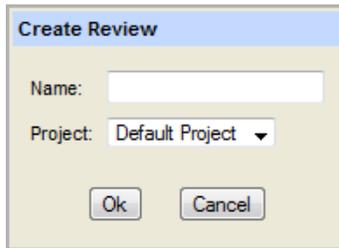
Creating a Crucible Review for AccuRev Elements

Use this procedure to create a new Crucible review for one or more elements under AccuRev control:

1. In AccuRev, navigate to the browser or tab that manages the elements for which you want to create a Crucible review.
2. Select the elements for which you want to create a Crucible review. See [Choosing Files for Review](#) if you need help with this step.
3. Click the **Code Review** button () and choose **Create Review** from the drop-down menu.

Note: If you are working in the File Browser, choose either **Basis**, **Backed**, or **My Changes** from the **Create Review** menu, as appropriate. See [Use the File Browser to Choose the Diff Operation](#) on page 51 for more information.

The **Create Review** dialog box appears:

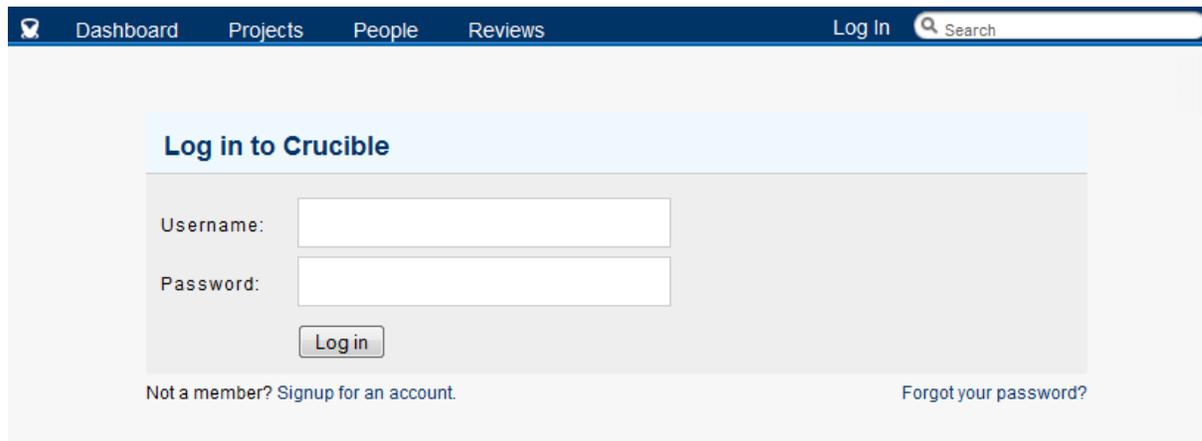


4. In the **Name** field, enter a name for the Crucible review.
5. In the **Project** field, select the Crucible project in which you want to create the review from the drop-down list.
6. Click **Ok**.

Crucible opens in a new browser tab.

- If you are already logged in to Crucible, the Edit Review Details page appears. Go to [Step 8](#).
- If you are not logged into Crucible, the Log in to Crucible page appears. Go to [Step 7](#).

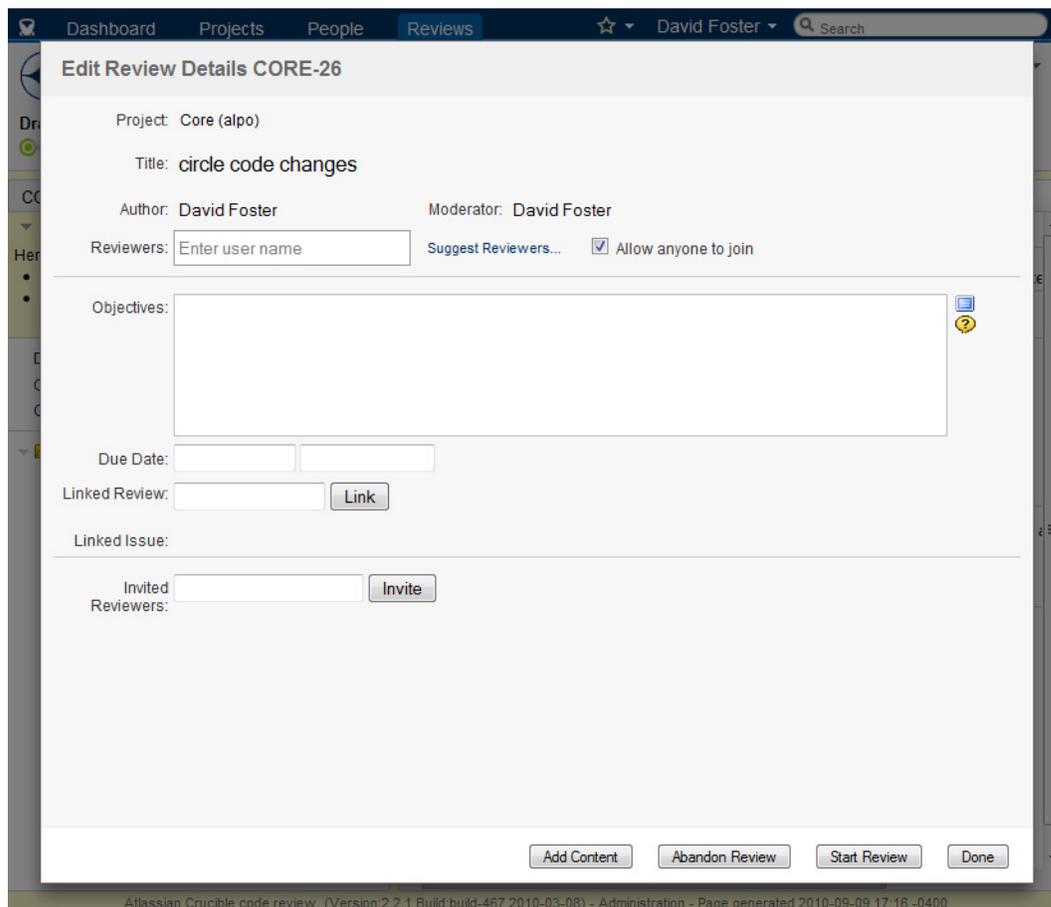
7. In the Log in to Crucible page, enter your AccuRev username and password and click **Log in**.



The Edit Review Details page appears. Go to [Step 8](#).

Note: Your Crucible administrator must create a Crucible user account using your AccuRev user identity. See your Crucible administrator if you have trouble logging in to Crucible.

8. In the Edit Review page, optionally edit information about the review you are creating, including:
 - Adding reviewers
 - Entering a review objective and due date



9. When you are finished describing the review, click:
 - **Start Review** if you want to start the review immediately
 - **Done** if you want to start the review at another time
10. On the Reviews tab, click an element to compare versions.

Adding AccuRev Elements to an Existing Crucible Review

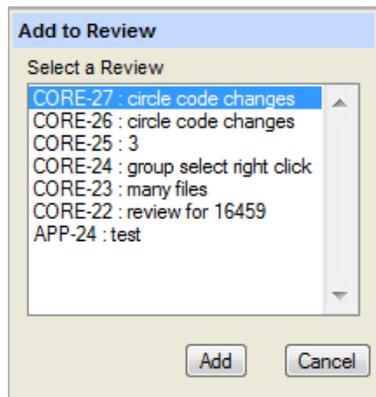
Use this procedure to add one or more elements to an existing Crucible review.

Tip: You can also use this procedure to add a different version of an element that has already been added to a review to create an iterative review of that element.

1. In AccuRev, navigate to the browser or tab that manages the elements you want to add to an existing Crucible review.
2. Select the elements you want to add to the Crucible review. See [Choosing Files for Review](#) if you need help with this step.
3. Click the **Code Review** button () and choose **Add to Review** from the drop-down menu.

Note: If you working in the File Browser, choose either **Basis**, **Backed**, or **My Changes** from the **Add to Review** menu, as appropriate. See [Use the File Browser to Choose the Diff Operation](#) on page 51 for more information.

The **Add to Review** dialog box appears:



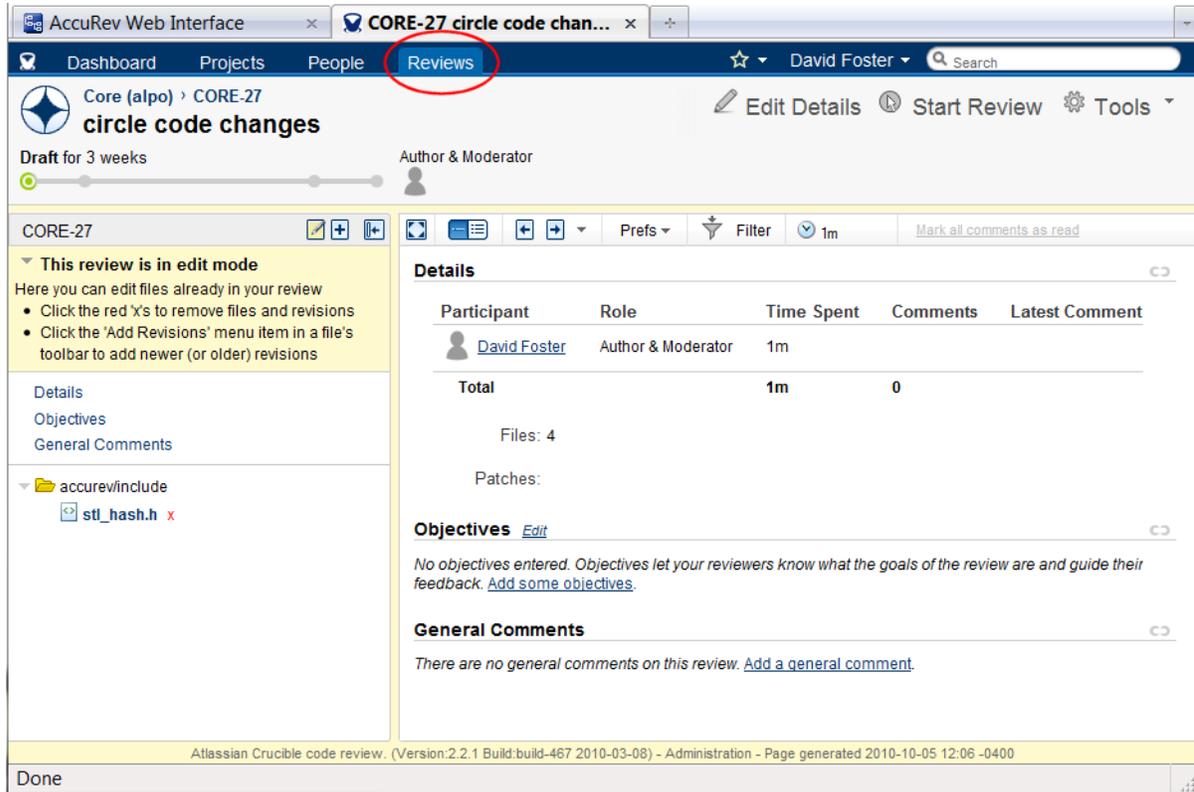
Note: The Add to Review dialog box does not list closed reviews.

4. Select the Crucible review to which you want to add the elements.

5. Click **Add**.

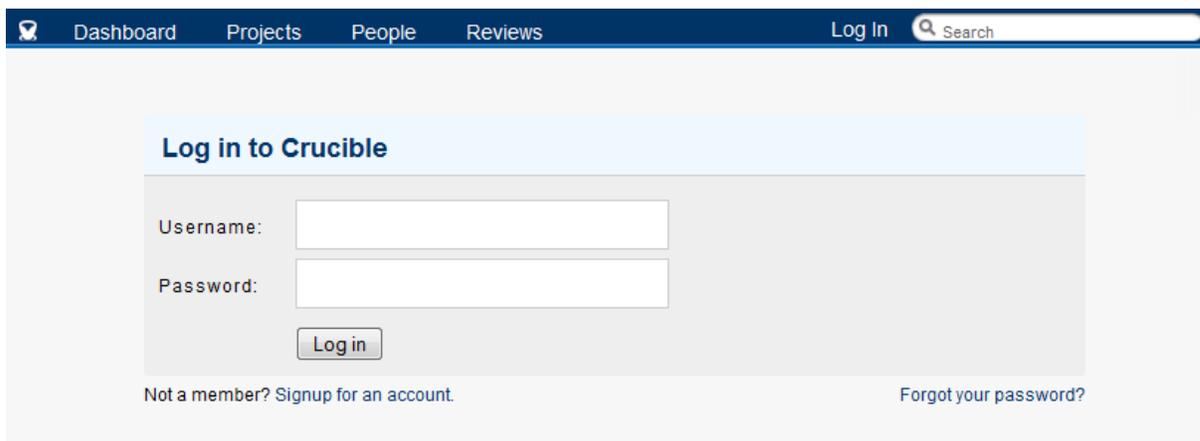
Crucible opens in a new browser tab.

- If you are already logged in to Crucible the Reviews tab appears; you can click the element you added to the review to compare versions:



- If you are not logged into Crucible, the Log in to Crucible page appears. Go to [Step 6](#).

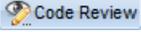
6. In the Log in to Crucible page, enter your AccuRev username and password and click **Log in**.

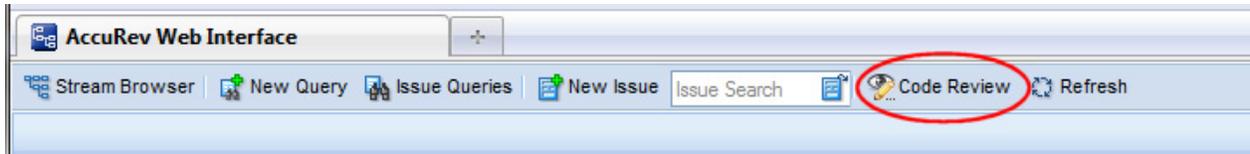


The Reviews tab appears, as shown in [Step 5](#).

Note: Your Crucible administrator must create a Crucible user account using your AccuRev user identity. See your Crucible administrator if you have trouble logging in to Crucible.

Starting Crucible from within the Web UI

If your AccuRev system administrator has configured AccuRev as a Crucible plug-in, the **Code Review** button () appears in the Web UI toolbar, as shown in the following illustration.



To start Crucible from within AccuRev, click the **Code Review** button (). Crucible opens in a new Web browser instance, displaying the login page.

Once you have logged in to Crucible, you can set up reviews for files that are under AccuRev control. See your Crucible documentation for more information on creating reviews in Crucible.

3. Using AccuWork™

AccuWork™ is AccuRev's integrated change management and issue tracking system. It is installed with AccuRev and allows you to associate AccuRev elements with AccuWork issues.

This chapter covers the following topics:

- [AccuWork™ Views in the Web UI](#) on page 59
- [New Query Tab](#) on page 60
- [Query Browser](#) on page 70
- [Query Editor](#) on page 76
- [Issue Edit Form](#) on page 77
- [Searching for Issues](#) on page 90
- [Reports About Issues](#) on page 92
- [Common AccuWork Commands](#) on page 96
- [Using Workflow to Manage Issues](#) on page 114

AccuWork™ Views in the Web UI

You use *AccuWork queries* to define a set of search criteria that is used to select and return issues from the depot. The Web UI includes the following AccuWork views to help you create and manage AccuWork queries and manage the issues those queries return:

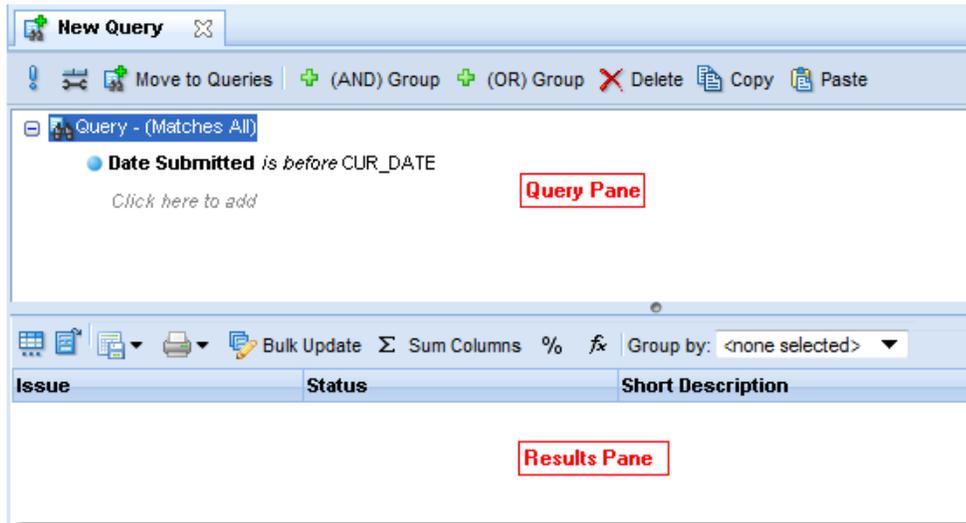
- Use the [New Query Tab](#) to create or modify AccuWork queries. Results returned by the query are displayed directly in the New Query tab, allowing you to easily verify query results and quickly modify the query as needed. You can display the New Query tab from the AccuRev main toolbar.
- Use the [Query Browser](#) to display, manage, and run AccuWork queries. You can also use it to view and print query results.
- Use the [Query Editor](#) to create or modify AccuWork queries. Unlike the New Query Tab, the Query Editor is used only to construct and edit queries; query results are displayed in the Query Browser. You access the Query Editor from the Query Browser.
- Use the [Issue Edit Form](#) to edit AccuWork issues.

In addition to these views, the [Searching for Issues](#) feature allows you to find specific issues based on issue number or issue content.

Note: AccuWork features that are accessed from these and other views are covered in [Common AccuWork Commands](#).

New Query Tab

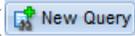
You use the New Query tab to create and edit AccuWork queries, and to view and manage query results. Consider using the New Query tab for initial query development—the query and its results are both displayed within the tab, which makes it easy to quickly check query results, modify the query as needed, and then rerun the query. When you are satisfied that the query is performing as expected, you can move it to the Query Browser and save it for use in future AccuRev sessions.



The New Query tab has two panes, each with its own toolbar:

- The Query pane contains tools used to create, edit, and manage AccuWork queries.
- The Results pane displays the list of issues returned by the query, as well as a set of tools you can use to view and manage query results.

Displaying the New Query Tab

To display the New Query tab, click the **New Query** button () on the AccuRev main toolbar.

Query Pane

You use the Query pane to can create, modify, and run [AccuWork™](#) queries. When you run a [query](#), AccuRev retrieves the set of AccuWork issue records that satisfy the query from the AccuRev depot and displays them in the Results pane.

The Query pane displays a template you use to build a query by clicking on clauses. The clauses that define the query are displayed as an expandable tree. The tree nodes may contain:

- The *query name*, which is always the top node in the tree. The default name for new queries is **New Query N** (where N is a unique number).
- *Simple clauses*, such as **Assigned To is mary** (can appear at any level). Every query has at least one simple clause.
- *Compound clauses*, which start with AND or OR. These clauses can contain any number of other simple or compound clauses.

See [Creating a Query](#) for more information on using the tools in the Query pane to create an AccuWork query.

Commands

You can invoke the following commands from the Query pane toolbar.



Run

Runs the query; results are displayed in the Results pane.



Set up Columns

Allows you to specify which columns (AccuWork fields) are displayed in the Results pane for the selected query. You can optionally save selected columns as a default set to be used to display results for any new queries you create. This command is disabled for public queries created by other AccuRev users. See [Set up Columns](#) for more information.



Move to Queries

Opens the Query Browser and moves the new query to your list of queries. You must save the query once it has been moved if you want to use it in a new AccuRev session.



(AND) Group

Creates an AND compound clause placeholder as a child of the selection. You must select the query title or another compound clause before this button will be enabled. This command is also available from the context menu.



(OR) Group

Creates an OR compound clause placeholder as a child of the selection. You must select the query title or another compound clause before this button will be enabled. This command is also available from the context menu.



Delete

Deletes the selected clause. This command is also available from the context menu.

Tip: The Delete key on your keyboard also performs the delete action.



Copy

Copies the currently selected query node (the current clause and any subordinate clauses) to the clipboard. See [Copying and Pasting Conditions and Clauses](#) on page 66 for more information.



Paste

Pastes the contents of the clipboard into the currently selected query node. See [Copying and Pasting Conditions and Clauses](#) on page 66 for more information.

Results Pane

The Results pane displays the issues returned by the query. You can perform the following actions from the Results pane. Commands are available from both the toolbar and context menu unless noted otherwise.

Set Table Size

Allows you to specify the number of issues you want to display on a single page in the Results pane. If the number of issues returned by the query exceeds the number you specify, AccuRev creates additional pages in the Results pane. Available on the toolbar only.

Bulk Update

Allows you to change field values for multiple issues in a single operation. For example, if you assign an Owner to issues, you can use Bulk Update to change the Owner from *unassigned* to *Henry*. See [Bulk Update](#) for more information.

Σ Sum Columns

Returns the number of issues selected, as well as the sums of all Text fields with numeric-only data and the sums of all Timespan fields. See [Sum Columns](#) for more information.

Calculate Columns

Allows you to perform basic mathematical operations (add and subtract, for example) on any two columns with numeric values. Available from the toolbar only. See [Calculate Columns](#) for more information.

Show Percentage

Toggles the display of percentage information for the grouped issues. Available from the toolbar only. See [Show Percentages](#) for more information.

Group By

Groups the issues shown in the Results pane by the issue field chosen from this drop-down list. Available from the toolbar only. See [Group Issues by Field](#) for more information.

Tip: When you group issues, AccuRev enables graphical reporting tools such as pie charts and bar charts. See [Charts](#) for more information.

Hide Search Query/Show Search Query

Toggles the visibility of the Query pane. Available from the toolbar only.

Creating a Query

You can use the procedure described in this section to create a query from either the:

- New Query tab
- Query Editor

The query building tools are the same in both of these interfaces.

To create a query:

1. In AccuRev, click the **New Query** button () on the main toolbar.

The New Query tab appears.

Alternative: In the Query Browser, click the **New Query** button ().

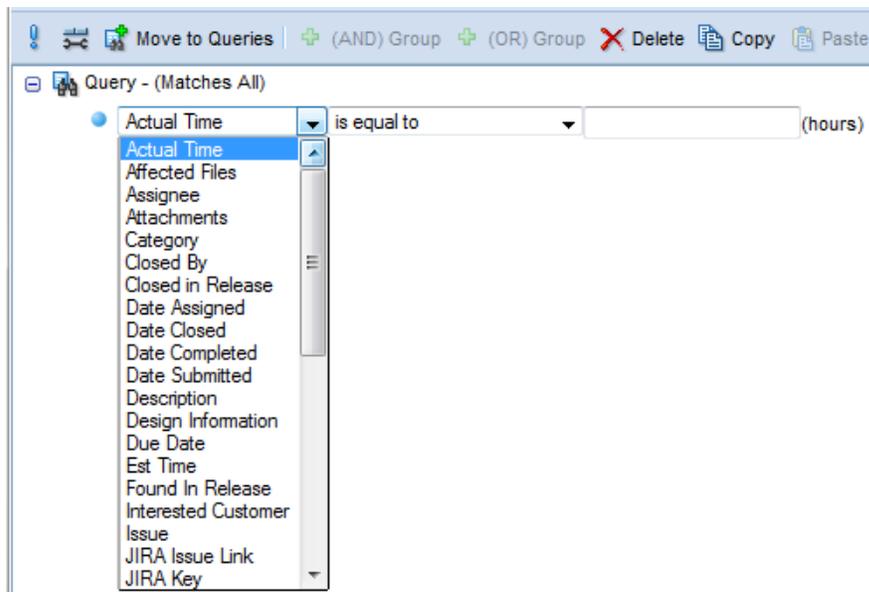
The Query Editor appears.

2. Use the query builder to create new clauses for the query:



3. Click the *Click here to add* link.

AccuWork displays a template for the clause; use the drop-down list to choose the issue field you want to use to construct your first clause:



Tip: Each time you click *Click here to add*, AccuWork displays a new *Click here to add* link, so that one is always available at each level of the query.

4. Use the template to create the simple and compound clauses you want for your query. See [Working with the Query Builder](#) for more information.

Note: Simple clauses at the top level of the query are logically ANDed together by default—that is, an issue in the AccuRev depot must satisfy all of the clauses you specify in order to be returned by the query.

5. When the query is complete:

- If you created the query in the New Query tab, click the Run button (). Results are displayed in the Results pane.

- If you created the query in the Query Editor, click the **Ok** button to save your work. AccuRev runs the query automatically and displays it and its results in the Query Browser.
6. Review the query results. If necessary, modify the query and run it again.
See [Query Results Pane](#) on page 73 to learn about sorting, filtering, and graphing query results.
 7. If you created the query in the New Query tab and want to use it in another AccuRev session, click the **Move to Queries** button ().
The query is moved to the Query Browser. It is selected by default.
 8. Click the **Save** button ().

Working with the Query Builder

The *query builder* is the tool you use to add and modify clauses in new and existing queries. This section describes editing operations supported by the query builder.

Creating a Simple Clause

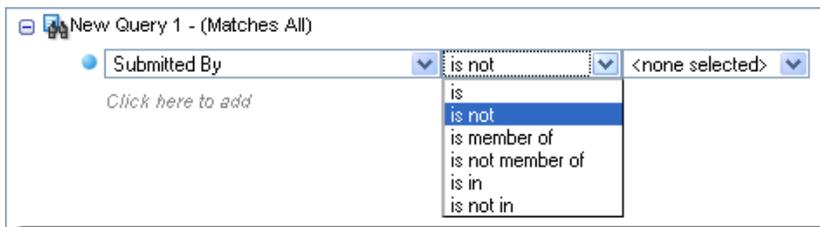
Every query consists at least one simple clause. A simple clause has three parts:

<field-name> <comparison-operator> <value>

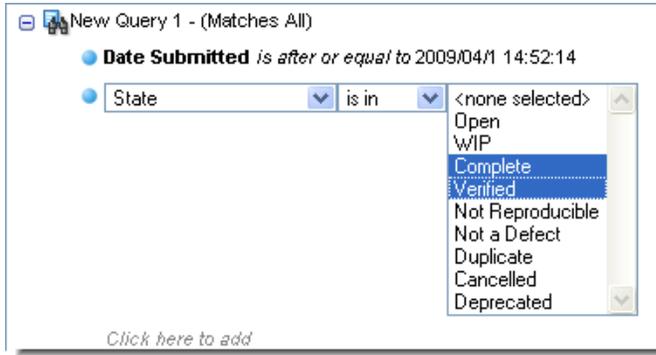
The point-and-click interface makes creating a simple clause easy. Start by clicking one of the *Click here to add* links in the query to add placeholders for each part of the clause.

First, select a field name from the list box containing all the field names. When you select the field name, the Query Editor automatically adjusts the available values for the other parts of the clause, based on the values allowed (see [Allowed Comparisons and Values](#)) for the selected field.

In the example below, the user has selected the **Submitted By** field, and is contemplating which comparison operator to choose.



Note that the comparison operators *<is in>* and *<is not in>* allow multiple values to be selected. After you select the operator, the options appear in a list box, from which you can make multiple selections. The completed clause contains all the selected values, separated by commas, and the individual values are considered to be combined with an OR.



Therefore, the query displayed below would be read as "Show all issues for which the date submitted is after or equal to April 1, 2009 at 14:52:14, AND the issue state is Complete or Verified."



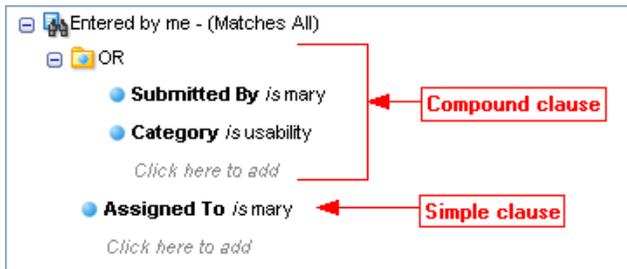
After creating all three parts of the clause, you can create other simple and compound clauses to finish specifying the search criteria for the query.

Note: Date fields contain an icon that inserts the CUR_DATE variable into the value field. This variable ensures that the clause will refer to the current date when the query is being accessed.



Creating a Compound Clause

A *compound clause* combines any number of simple clauses, using the same logical operator: AND or OR. (The NOT operator is not supported.) You can combine both simple and compound clauses.

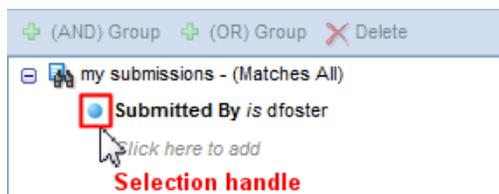


The query builder automatically creates placeholders for simple clauses, but you must explicitly insert a compound-clause placeholder yourself. To do so, select the query title or an existing AND or OR statement, and click one of the **+ (AND) Group** or **+ (OR) Group** buttons. Then, specify the field name, comparison operator, and value for the clause using the *Click here to add* link under the compound-clause placeholder.

Deleting a Clause

To delete a clause, select it using the selection handle and click the **Delete** button (✖). The selection handle is the blue dot that precedes each clause, as shown in the following illustration.

Tip: The Delete key on your keyboard also performs the delete action.



Moving a Clause

To move a clause within a query, click and drag the selection handle, dropping the selected clause on the query title or a compound-clause placeholder. You can move both simple and compound clauses in this way.



Copying and Pasting Conditions and Clauses

When you are building queries, it can be convenient to copy and paste existing AND/OR conditions and individual clauses instead of redefining them manually. The Query Editor copy/paste feature lets you do this.

When you select an AND/OR condition, AccuRev copies the condition and any clauses that have been defined for it to the clipboard. If you select a single clause, only that clause is copied to the clipboard. Items copied in one query definition can be pasted in another.

To copy and paste a query condition or clause:

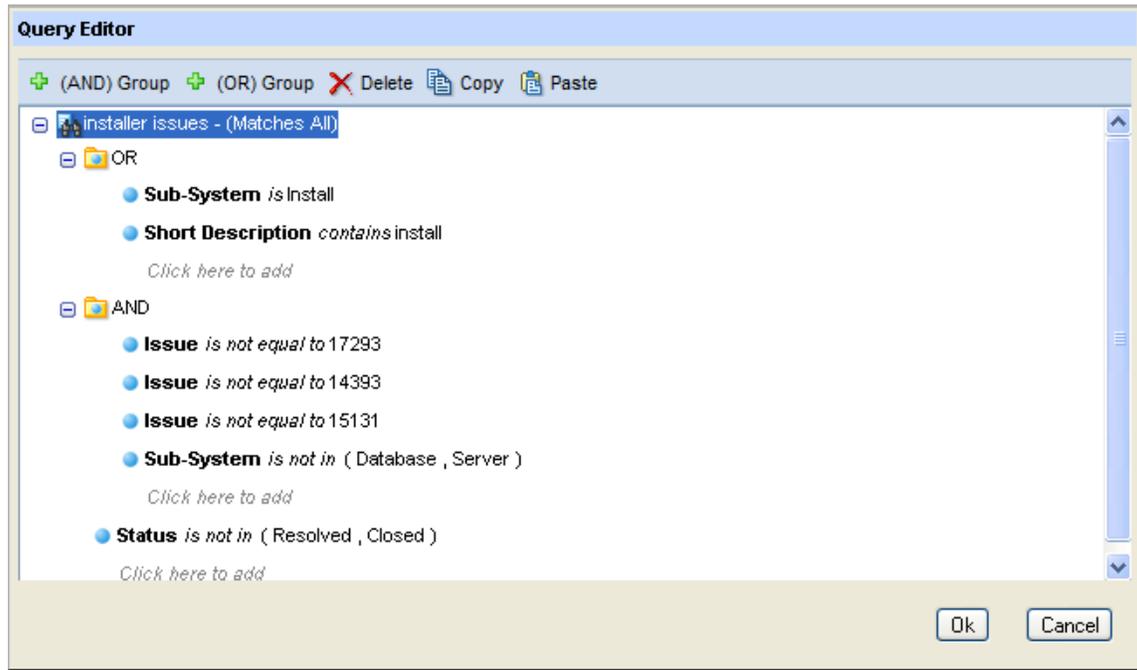
1. Select the AND/OR condition or individual clause you want to copy.
2. Click the **Copy** button (📄) on the toolbar.
Alternative: Right-click the condition or clause and choose **Copy** from the context menu.
3. Select the target for the paste operation. This can be the query name or an AND/OR folder.
4. Click the **Paste** button (📄) on the toolbar.
Alternative: Right-click the target for the paste operation and choose **Paste** from the context menu.
5. Modify the fields in the pasted clauses as needed.

Editing a Query

To edit an existing query:

1. Select the query in the Query Browser.
2. Click the **Edit Query** button ().

The query appears in the Query Editor, as shown in the following illustration.



Generally speaking, you can perform as editing operations any operation you perform to build the query. For example, you can:

- Create simple and compound clauses.
- Edit existing clauses
- Move existing clauses
- Delete existing clauses

See [Working with the Query Builder](#) for more information.

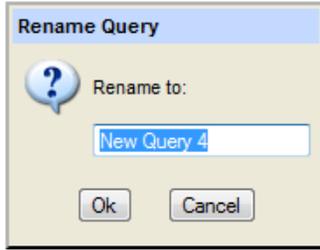
Note: You cannot rename a query using the Edit operation. See [Renaming a Query](#) for more information.

Renaming a Query

To edit an existing query:

1. Select the query in the Query Browser.
2. Click the **Rename Query** button ().

The Rename Query dialog box appears.



3. Change the name and click **Ok**.

The query is renamed and remains selected in the Query Browser.

4. Click the **Save** button (📁).

The query is saved with the new name.

Allowed Comparisons and Values

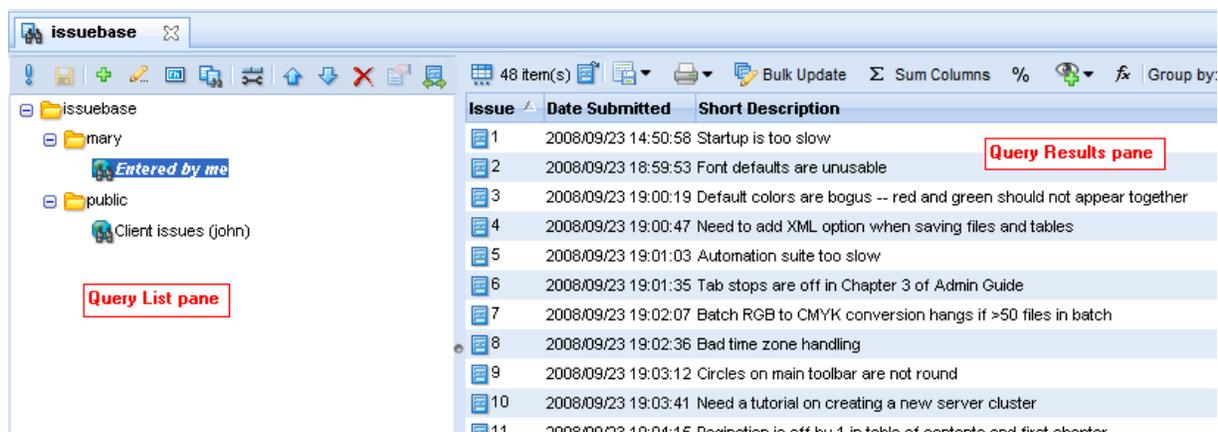
The following table shows all the AccuWork data types, along with the corresponding choices for the *<comparison-operator>* and *<value>* parts of a simple clause.

Field Type	Comparison Operators	Allowed Values
Text	contains matches does not contain does not match equal to not equal to less than less than or equal to greater than greater than or equal to	<p>Any character string. (Do not enclose it in quotes.) The value is always interpreted as a string literal; there is no way to specify the value of some other field here.</p> <p>The comparison is always a case-insensitive string comparison, never a numeric comparison. For example, the value 3 is greater than the value 25.</p> <p>The contains and does not contain operators perform a simple case-insensitive substring search, with no pattern matching.</p> <p>The matches and does not match operators perform case-insensitive pattern matching, using these wild cards:</p> <ul style="list-style-type: none"> * matches 0 or more characters ? matches any 1 character [aekz] matches a, e, k, or z [a-e] matches a, b, c, d, or e (do not mix uppercase and lowercase here) {one,two,seven} matches one, two, or seven \ or / Matches any directory-separator character, even if it is the "wrong one" for the client machine. For example, src/do_*.java matches src\do_something.java on a Windows client. <p>Examples:</p> <p>Rls 4* matches Rls 4 and Rls 4.01, but not Rls 4.2 or Rls 5</p> <p>Rls [2-5]* matches Rls 2, Rls3.04, and Rls 5.3, but not Rls 1.02</p> <p>the -? option matches the -X option and the -4 option, but not the -Op option</p> <p>cop{y,ies} matches copy and copies, but not copy(s)</p>

Field Type	Comparison Operators	Allowed Values
Timespan	equal to not equal to less than less than or equal to greater than greater than or equal to	A numeric value, representing an amount of time.
Choose List	is is not is in is not in	One of the strings specified as valid values for the field in the Schema Editor.
User	is is not is in is not in is member of is not member of	One of the principal-names in the user registry maintained by the AccuRev server. Alternatively, a user-group defined in the registry.
Timestamp	is is not is before is after is before or equal to is after or equal to	An AccuRev timestamp.
Attachments	contains	Any character string. This string is compared to the <i>Names</i> of an issue record's attachments.
internal	equal to not equal to less than less than or equal to greater than greater than or equal to	An integer, identifying a particular AccuWork issue record (<i>Issue</i> field) or a particular AccuRev transaction (<i>Transaction</i> field).

Query Browser

You use the *Query Browser* to create and manage queries and query results:



The Query Browser tab has two panes, each with its own toolbar—the Query List pane and Query Results pane.

Query List Pane

The [Query List Pane](#) displays all of your private and public queries, as well as any public queries created by other users in the depot. (A *public query* is a *private query* that the query author has made available to all users in the depot. All queries you create are private unless you explicitly make them public.

Your queries (both private and public) appear in a folder with your username; different icons are used to distinguish your private and public queries. Public queries created by other AccuRev users appear in a folder named Public. By default, queries are listed in the order in which they are created, but you can move them using the **Move query up** () and **Move query down** () buttons.

Commands

You can invoke the following commands from the Query List pane. Commands are available in both the toolbar and context menu unless noted otherwise. Note that Commands, except where noted, are available only for queries, both public and private, that you own. For example, you cannot rename a public query owned by another AccuRev user.



Run

Runs any private or public query; results are displayed in the Results pane. The columns that appear are those that were included in the query when it was defined or last modified. You can change columns for private queries, and for any public queries you own. See [Set up Columns](#) for more information.

Tip: You can also run a query by double-clicking it.



Save

Saves changes to all queries that you own. This command is available only from the Query List pane toolbar.



New Query

Allows you to create a new query. By default, the query is named **New Query N**, where N is a unique number. Use the **Rename Query** command to rename the new query. This command is available only from the Query List toolbar. See [Creating a Query](#) for more information.



Edit Query

Allows you to edit any of your public or private queries. See [Editing a Query](#) for more information.



Rename Query

Allows you to rename any of your public or private queries. See [Renaming a Query](#) for more information.



Clone Query

Creates a duplicate of the selected query. If you clone a public query, the new query is created as a private query by default.

By default, the cloned query is named **Copy of Query**, where **Query** is the name of the query you cloned. Use the **Rename Query** command to rename the new query. See [Renaming a Query](#) for more information.



Set up Columns

Allows you to specify which columns (AccuWork fields) are displayed in the Results pane for the selected query. You can optionally save selected columns as a default set to be used to display results for any new queries you create. This command is disabled for public queries created by other AccuRev users. See [Set up Columns](#) for more information.



Move Query Up

Moves the query up within the list of queries.



Move Query Down

Moves the query down within the list of queries.



Delete Query

Deletes the query.

Tip: The Delete key on your keyboard also performs the delete action.

Set as Default / Disable as Default

Allows you to specify a query as the *default query*. AccuRev runs the default query automatically when you open the Query Browser. This command is available in the context menu only.

Tip: The name of the default query is displayed in bold italics.

Set as Public / Set as Private

Allows you to make a private query public, and vice versa. This command is available in the context menu only.

Note that you cannot change a public query owned by another AccuRev user to private. If you want to modify a public query, you must first clone it. See [Clone Query](#) for more information.

Properties

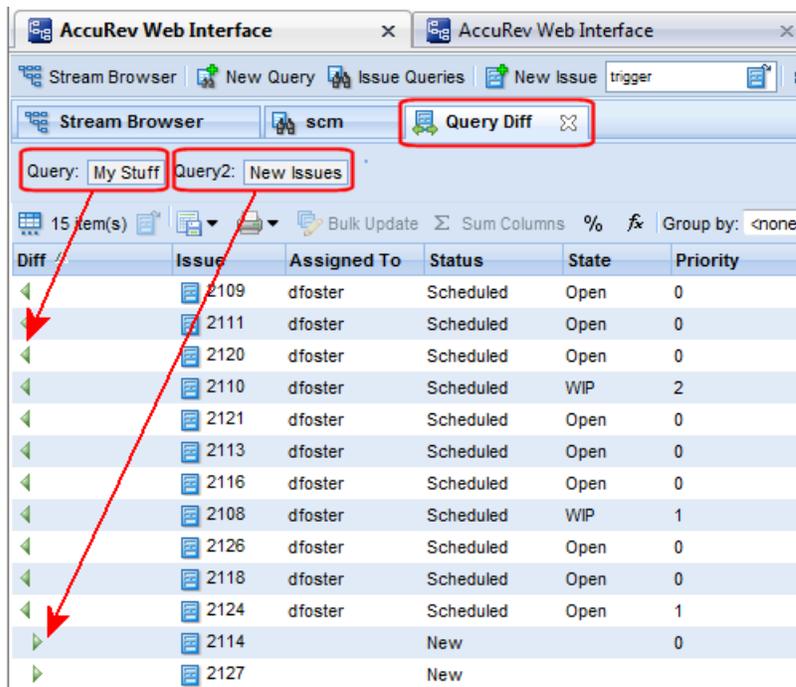
(*Public queries only*) Displays mailto and hypertext links for the selected query. The link reflects the current state of the query; if the issues are grouped, or a chart is displayed (see [Group Issues by Field](#)), the URL will contain parameters to access that view.

The **mailto** link () opens a new e-mail message using your system's default e-mail application. The body of the e-mail contains the query URL (see [URLs for AccuWork™ Queries and Issues](#)). Recipients can click the link and, after logging into AccuRev, view that query.

The **hypertext** link contains the same information as the **mailto** link, in a form useful for book marking or distributing. Navigating to a bookmark saved from AccuRev requires you to log in to AccuRev if you are not already.

Query Diff

Diff the results of two queries; results of the diff operation are displayed in the Query Diff tab. The names of the queries you are diffing are displayed at the top of the tab. Arrows in the Diff column indicate whether an issue was returned by the first query () , the second query () , or both () , as shown in the following illustration:



Diff	Issue	Assigned To	Status	State	Priority
←	2109	dfoster	Scheduled	Open	0
←	2111	dfoster	Scheduled	Open	0
←	2120	dfoster	Scheduled	Open	0
←	2110	dfoster	Scheduled	WIP	2
←	2121	dfoster	Scheduled	Open	0
←	2113	dfoster	Scheduled	Open	0
←	2116	dfoster	Scheduled	Open	0
←	2108	dfoster	Scheduled	WIP	1
←	2126	dfoster	Scheduled	Open	0
←	2118	dfoster	Scheduled	Open	0
←	2124	dfoster	Scheduled	Open	1
→	2114	New		Open	0
↔	2127	New			

See [Diff vs Query](#) to learn about comparing the results of a query against the results of an **Issue Diff** operation.

To diff two query results:

1. Run the first of the two queries you want to diff.
2. Click the **Query Diff** button () .

Alternative: Right-click the query and choose **Query Diff** from the context menu.

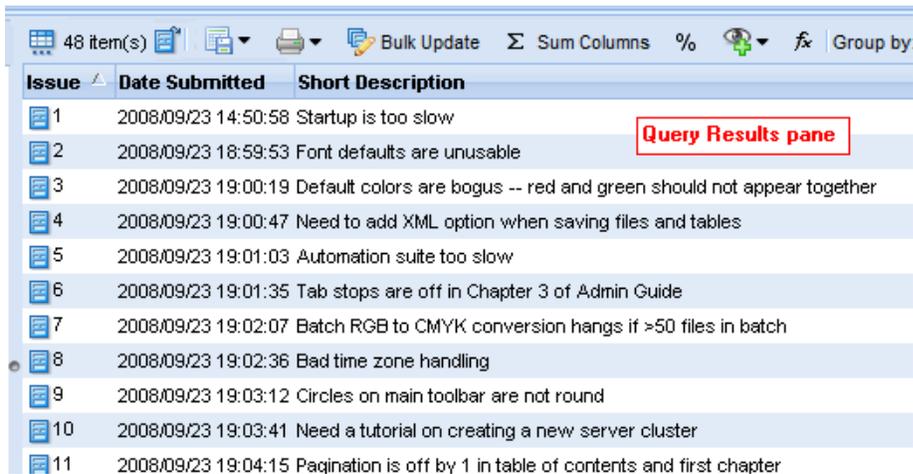
The Query Selection dialog box appears.

3. Select the second of the two queries you want to diff.
4. Click **Ok**.

Results are displayed in the Query Diff tab.

Query Results Pane

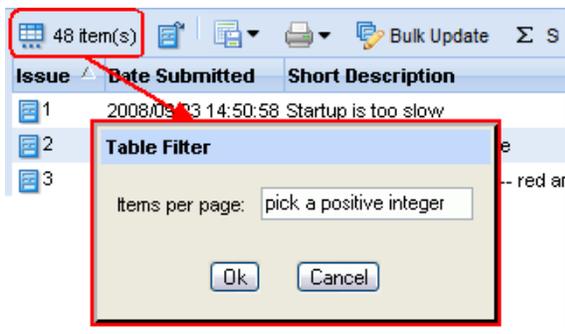
The Query Results pane contains a table that displays the results of a query. Each row of the table displays one issue.



Issue	Date Submitted	Short Description
1	2008/09/23 14:50:58	Startup is too slow
2	2008/09/23 18:59:53	Font defaults are unusable
3	2008/09/23 19:00:19	Default colors are bogus -- red and green should not appear together
4	2008/09/23 19:00:47	Need to add XML option when saving files and tables
5	2008/09/23 19:01:03	Automation suite too slow
6	2008/09/23 19:01:35	Tab stops are off in Chapter 3 of Admin Guide
7	2008/09/23 19:02:07	Batch RGB to CMYK conversion hangs if >50 files in batch
8	2008/09/23 19:02:36	Bad time zone handling
9	2008/09/23 19:03:12	Circles on main toolbar are not round
10	2008/09/23 19:03:41	Need a tutorial on creating a new server cluster
11	2008/09/23 19:04:15	Pagination is off by 1 in table of contents and first chapter

Reducing the Number of Issues Displayed on the Page

Queries sometimes return many results, which can make reviewing issues difficult. You can click the **Table Filter** button () to specify how many issues you want AccuRev to display on the page.



After you set the number of items per page, the issues are shown in pages rather than one long list. The default number of items is 500. When there are more items than the limit, page navigation links appear above the table header as shown here.



Sorting

Another way to simplify the display of the Query Result pane is to sort issues based on a particular column. For example, you might want to sort issues numerically, in either ascending or descending order. To sort issues, just click on the column heading.

Grouping

Grouping allows AccuRev to group all issues based on a particular column. For example, imagine your query returns 750 issues, all of which have been assigned to different individuals on your team. If you want to quickly see which individuals have been assigned issues, you can select *Assigned To* from the **Group By** drop-down list. AccuRev collapses the display to show only unique values in the *Assigned To* column.

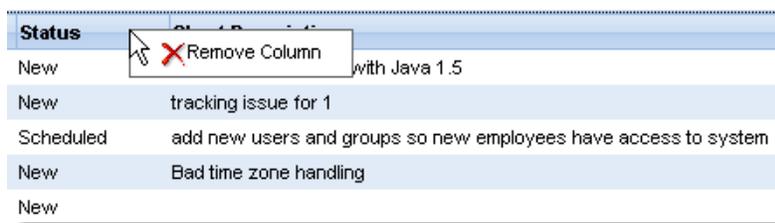
See [Group Issues by Field](#) for more information.

Filtering Query Results by Workflow

If your administrator has enabled a workflow for your depot, you can use that workflow to filter query results. See [Filtering Query Results Using a Workflow](#) on page 118 for more information.

Removing Columns

If you want, you can simplify the displayed results by removing one or more columns: right-click the column heading you want to remove, and choose **Remove Column** from the context menu.



Note that you can remove columns only for your private queries, and any queries you have made public. You cannot remove columns from public queries unless you are the owner. See [Set up Columns](#) on page 104 to learn more about working with columns for query results.

Commands

You can invoke the following commands from the Query Results pane. Commands are available in both the toolbar and context menu unless noted otherwise.

Open Issue

Opens the selected issue in an [Issue Edit Form](#). If a third-party issue tracking tool has been configured to display AccuRev issues, the issue is opened in that tool instead. See [Open Issue](#) for more information.

Show Change Package

Opens a [Changes Subtab](#), which shows the entries in the change package for the selected issue. Each of the entries in a [change package](#) indicates one or more changes made to a version-controlled element to implement a feature or fix a bug. This command is available in the context menu only.

Export

See [Common Table Commands](#).



Print

Allows you to print issue table or issue details reports. See [Reports About Issues](#) for more information.



Bulk Update

Changes field values for the selected issues. See [Bulk Update](#) for more information.



Sum Columns

Returns the number of issues selected, as well as the sums of all *Text* fields with numeric-only data and the sums of all *Timespan* fields. See [Sum Columns](#) for more information.



Show Percentages

Displays percentage information for columns that contain numeric data. See [Show Percentages](#) for more information.



Code Review

If enabled by your AccuRev administrator, allows you to create a code review for the selected file, or add files to an existing code review. See [Creating a Crucible Review for AccuRev Elements](#) on page 53 for more information.



Calculate Columns

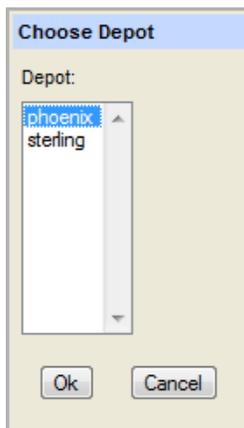
Allows you to perform basic mathematical operations (add and subtract, for example) on any two columns with numeric values. A new column is created to display the results. See [Calculate Columns](#) for more information.

Opening the Query Browser

To open the Query Browser:

1. Click the **Issue Queries** button ( Issue Queries) on the Web UI toolbar.

The Choose Depot dialog box appears:

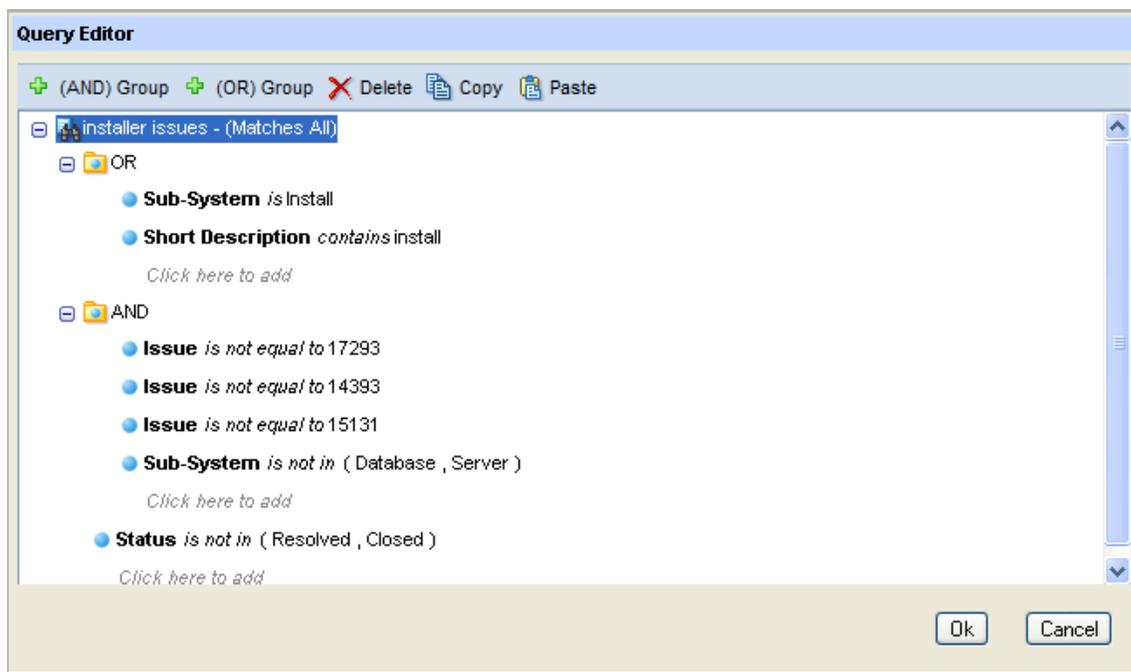


2. Select the depot you want to query and click **Ok**.

The Query Browser appears.

Query Editor

You use the Query Editor dialog box to create and edit queries in the Query Browser.



Opening the Query Editor

To open the Query Editor:

1. Display the Query Browser.

If you want to:

- Create a new query, go to [Step 2](#).
- Edit an existing query, go to [Step 3](#).

2. Click the **New Query** button ().

The Query Editor appears. See [Creating a Query](#) for more information.

3. Select the query you want to edit from the Query List pane.

4. Click the **Edit Query** button ().

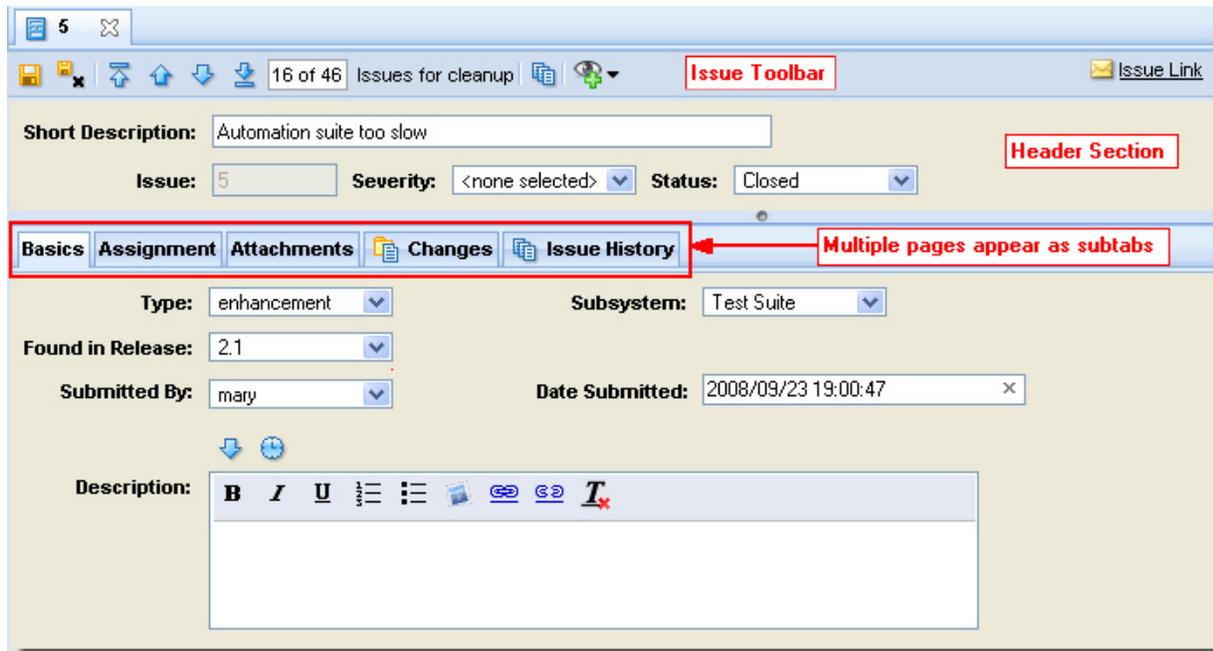
The Query Editor appears; it displays the definition of the query you selected in [Step 3](#). See [Editing a Query](#) for more information.

Using the Query Editor

Tools for working with queries in the Query Editor are the same as those used create queries in the New Query tab. See [Working with the Query Builder](#) for more information.

Issue Edit Form

You use the Issue Edit form to create, view, and edit an *issue record* in an AccuWork *issue database*.



Note: The contents and layout of the Issue Edit form is based on the schema of the associated AccuWork issue database. Because each *depot* can be associated with a different AccuWork issue database, the look and feel of the Issue Edit form might change depending on the depot you are querying. Issue Edit forms and the AccuWork issue database are defined using the Schema Editor in the AccuRev Java GUI.

In addition, the toolbar can display additional buttons for workflow features. See [Changes to the Issue Edit Form](#) on page 115 for more information.

Opening the Issue Edit Form

Use any of the following procedures to open the Issue Edit form:

- Click the  **New Issue** button in the Web UI main toolbar and choose a depot.
- Click the [Searching for Issues](#) field in the Web UI toolbar and enter an issue number.
- For an individual issue:
 - Double-click the issue
 - Right-click the issue and choose **Open Issue** from the context menu.

Features

All Issue Edit forms have these features in common:

- The Issue Edit form consists of one or more *pages*, which appear as subtabs within the overall issue tab. Examples of subtabs in the preceding illustration include Basics, Assignment, and Changes.
- Every Issue Edit form has these two subtabs:

- The [Changes Subtab](#) displays the issue record's [change package](#), and provides commands for analyzing and manipulating the change package's entries. To see the change package in a separate tab, click the  **Change Package History** button on the Issue Toolbar. See [Change Package History Tab](#) for more information.
- The [Issue History Subtab](#) displays details of how the issue record's field values have changed over time.
- Typically, there is a *header section*, which always remains visible as you switch from page to page.
- Each field in the issue database is shown with a descriptive text label to its left. By default, a label in **red** text indicates a required field.
- Every Issue Edit form contains a toolbar with issue-related commands. See [Working in an Edit Form Tab](#) for more information.

Working in an Edit Form Tab

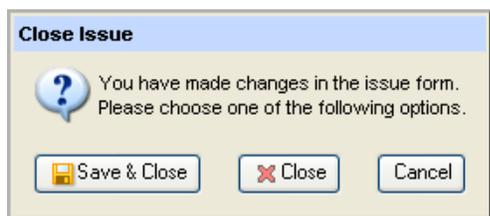
This section describes some of the features supported by AccuWork in the Issue Edit form. Note that the types of fields you see in an Issue Edit form and their behavior (whether or not they are required or are initialized, for example) is determined by how the form was defined in the AccuRev Schema Editor. See [Understanding Issue Form Validation](#) for more information.

Saving or Discarding Your Work

Your changes to an issue in the Issue Edit form are not saved until you click the **Save**  or **Save and Close**  button in the tab's toolbar. When you save an issue record, the issue record is stored in the depot's issue database, within the AccuRev repository. For new issues, AccuWork assigns the next available integer issue number to the new issue record when you save your work. This number cannot be modified.

A transaction of type *dispatch* records the modification to the issue record. You can see the record of changes to a record on the [Issue History Subtab](#).

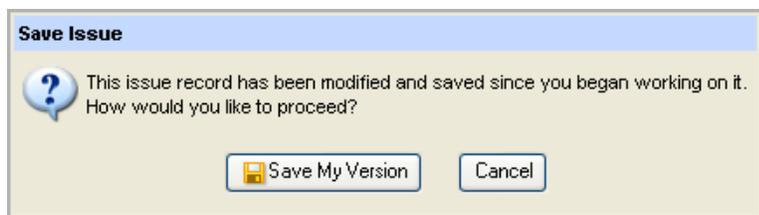
If you attempt to close the Issue Edit form without saving, the AccuRev prompts you to save your changes. If you do not want to save your work, click **Close**.



You are also prompted to save if you attempt to navigate away from a changed issue. See [Navigating Among Issues](#) for more information.

Conflicting Changes

If the issue you are working on has been edited and saved by another user during the time you are making changes, AccuRev notifies you when you attempt to save.



Navigating Among Issues

The Issue toolbar contains a set of controls used to navigate among issues returned by a query, or across the depot:

- If you open an issue from the [Query Results Pane](#) or other list of issues, these buttons navigate among issues in the list; the query name is displayed on the Issue toolbar.
- If you open an issue using the **Issue Search** command, these buttons navigate among all issues in the database.



First Issue

Display the first issue from the query results. This icon is disabled unless you are accessing query results.



Previous Issue

Display the previous issue.



Next Issue

Display the next issue.

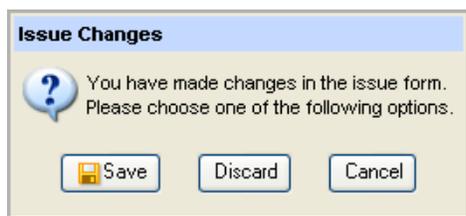


Last Issue

Display the last issue from the query results. This icon is disabled unless you are accessing query results.

The field to the right of the navigation controls (4 of 47) shows which issue in the set is currently displayed, and the total of all issues in the set being navigated.

If you navigate away from an issue using these controls after having made changes to it, the Web UI will prompt you to save your changes.



Creating URLs for Individual Issues

“Mailto” and **Issue Link** () buttons are displayed at the top of each Issue Edit form, allowing you to provide other AccuRev users with access to individual issues. See [Obtaining Web UI Links](#).

Printing Issue Reports

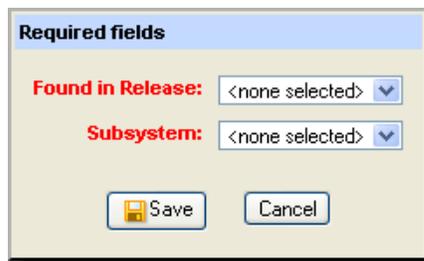
You can print a detailed report about the current issue displayed in the Issue Edit form, including data on its subtabs. See [Reports About Issues](#) for more information.

Understanding Issue Form Validation

Issue Form field definitions—whether or not a field is required, how it is initialized, valid values, and so on—are specified using the AccuRev Schema Editor in the AccuRev Java GUI. As you work in an Issue Edit form, you may notice these effects:

- A new issue has values automatically filled in for certain fields.
- One or more field have automatically been set to a specified value.
- The set of choices available in a list has changed.
- The set of required fields has changed. If a field's label appears in **red**, it is a required field. You cannot **Save** the issue record until every required field has a value (that is, is not empty or in the case of lists, is set to a value other than **<none selected>**). Some required fields may have values set through an automated field initialization.

If you attempt to save the issue record when one or more required fields lack a value, AccuRev displays a dialog box containing a list of the required fields. You must specify a value for all required fields before you can save the issue record.



- The Changes tab has become required. This validation option prevents an issue from being saved unless there are versions associated with the issue.
- One or more fields, tabs, or issues are read-only.
- Setting a field to a certain value requires a type of relationship to another issue. For example, setting State to **Duplicate** requires that you identify the issue that this one is a duplicate of.

Working with Text and Log Fields

Fields with a data type of *Text* and *Log* on the Issue Edit form can have multiple lines, as well as a default height and width. These dimensions are set when the field and the form are designed in the AccuRev Schema Editor. The Web UI displays a scroll bar on text and log fields when the content exceeds the available display. A toggle button () allows you to quickly expand the field; click it again to collapse the field.

Rich text can also be enabled for these fields, provided that they are defined with a height of two or more lines, as shown in the following illustration:



The rich text formatting toolbar allows you to:

- Bold, italicize, and underline text
- Create numbered and bulleted lists
- Add images
- Create and remove links
- Undo formatting

Rich text is typically enabled by the AccuRev administrator. See “Appendix B, AccuWork,” in the *AccuRev On-Line Help Guide* for more information.

If a field has been defined with a *Log* datatype in the AccuRev Schema Editor, the Web UI displays the **Add Timestamped Text** button (🕒). Clicking this button adds a timestamp to the top of the field. The timestamp format is AccuRev username, day, date, time, time zone, and year, as shown in the following example:

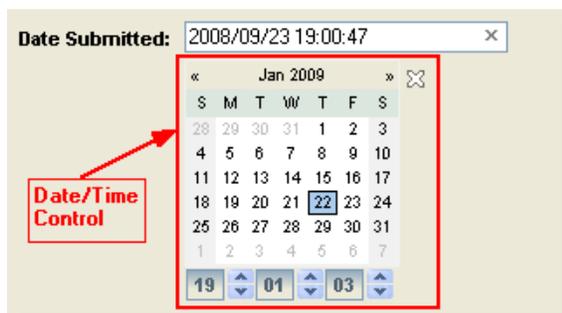
[dfoster, wed Sep 08 10:34:36 GMT-400 2010]

Working with User Fields

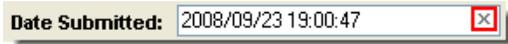
Note that when working with fields containing lists of AccuRev users on an issue form, only active users are typically displayed. Occasionally, a user who has been deactivated in AccuRev is still associated with an issue (as the submitter of the issue, for example). In this case, the user's name is added to the list of users displayed in user fields for that issue.

Working with Date Fields

Date fields in AccuWork issues have an associated date/time control to assist in filling in the field. Click in the field to display the date/time control. This control defaults to the current date and time. Use the navigation arrows (<< and >>) to pick a different month.

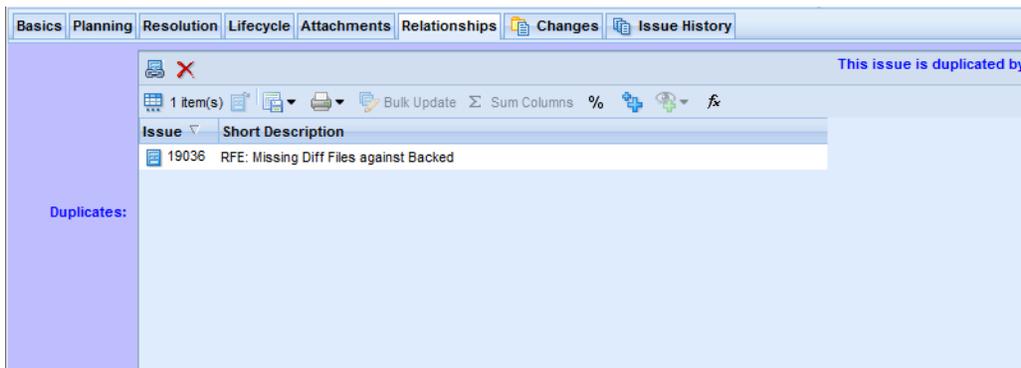


Click a day or adjust the time to put the date and time in the field. To close the control, use the click-to-close icon (✖). To clear an existing value from the date field, click the **Clear** button on the right side of the field.



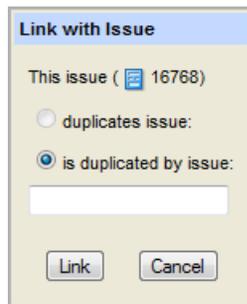
Relationships Subtab

AccuRev supports four types of *relationships* that can be used to link issues: dependencies, duplicates, subtasks, and tracking issues. Each relationship type has its own section on the Relationships subtab, like the Duplicates section shown here:



Link issue

Adds a link to an existing issue. AccuRev displays a dialog box that lets you choose the relationship type and enter the issue number of the issue you are linking to the current issue.



Remove link

Use the **Remove link** command to remove the relationship between the current issue and the selected link. This command is not available before the issue has been saved.

Tip: The Delete key on your keyboard also performs the delete action.

Attachments Subtab

An *attachment field* allows you to attach one or more files and/or Internet resource (URLs) to the current issue record. AccuWork displays the attachments data as a table.

Attachments:

File Name	Date	User	Size	Comment
 overnight_100510b_errors.log	May 13, 2010 11:08:47 AM	btfrederick	20484	See exceptions

In addition to specifying the location of a file or Internet resource, you enter an optional comment. AccuWork automatically fills in your username, the date, and the size of the attached file. (URLs are assigned a size of 0.)

An attachment field has its own toolbar, with these buttons:

 **New Attachment**

Defines a new file attachment for this issue record. An Add Attachment dialog box appears, in which you can specify a file to attach and, optionally, a comment string.



Add Attachment

File path:

Comment:

 **New URL**

Defines a new attachment to be the address (URL) of an Internet resource. A New URL dialog box appears, in which you specify a URL and, optionally, a comment string. AccuWork automatically inserts *http://* in the URL field. You can replace this with another Internet protocol if necessary.



New URL

URL:

Comment:

 **Open Attachment**

Opens the selected attachment. Opening a file uses the browser's file type associations to open the file using the correct program. If the file cannot be opened within the browser, you are prompted to open the file using an external program, or save the file to disk.

Save Attachment As

Creates a copy of the selected file attachment on the client machine. URL attachments cannot be saved in this way.

Delete Attachment

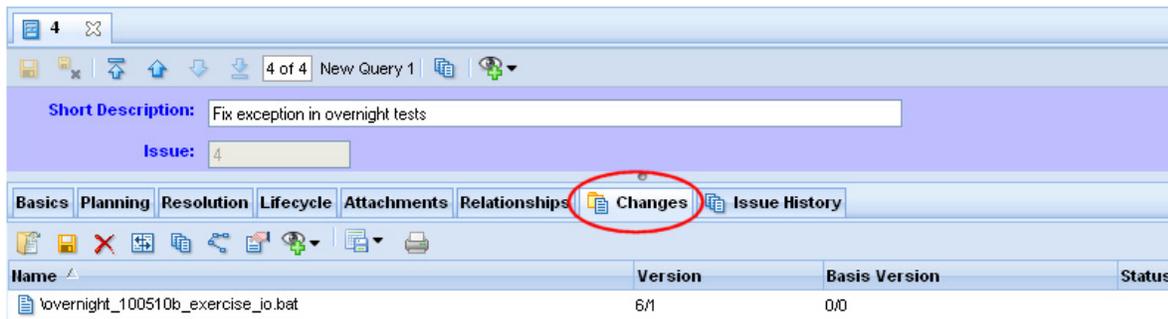
Deletes the attachment from the issue record (and from the depot). A URL attachment can be deleted at any time. A newly added file attachment can be deleted if you have not yet saved the issue record.

Tip: The Delete key on your keyboard also performs the delete action.

When you save the issue record, each file is copied to the depot, so that the data always remains available through the issue record, even if an original file is deleted.

Changes Subtab

The Changes subtab of an *issue record's* edit form shows the *change package* of the issue record. You can invoke commands to see the details of the change package's changes, maintain its entries, and view the transaction and version history of its elements.



Changes Subtab Layout

The Changes subtab contains a table; each row displays information about one change package entry. A given element can have at most one entry in a change package—but this entry can grow over time, as development work continues on the element.

The change package table includes these columns:

Name

The element's path name within the depot.

Version

The *head version* of the change package entry.

Basis Version

The *basis version* of the change package entry.

The head version and basis version are the "endpoints" of the change package entry. That is, the entry consists of all the versions between these two versions. (The head version is included; the basis version isn't.)

Working in the Changes Subtab

The following commands are available for items in the Changes subtab. Commands are available from both the toolbar and context menu unless noted otherwise.

Open

Opens the file.

Save As

Saves the currently selected file to another filename. See [Save As](#) for more information.

Remove

Removes the selected entry or entries from the change package. This change takes effect immediately—you cannot discard the change by closing the tab without invoking the **Save** command.

Tip: The Delete key on your keyboard also performs the remove action.

Diff Against Basis

Compares the selected version with the corresponding basis version, revealing what changes were made to the file. Note that comparisons do not work on binary files. See [Diff Against Backed or Basis Version](#) for more information.

History

Opens a [History Browser](#) tab, which contains the transactions involving the selected element.

Properties

Displays a message box with information about the selected element. See [Displaying Element Properties](#) for more information.

Code Review

If enabled by your AccuRev administrator, allows you to create a code review for the selected file, or add files to an existing code review. See [Creating a Crucible Review for AccuRev Elements](#) on page 53 for more information.

Export

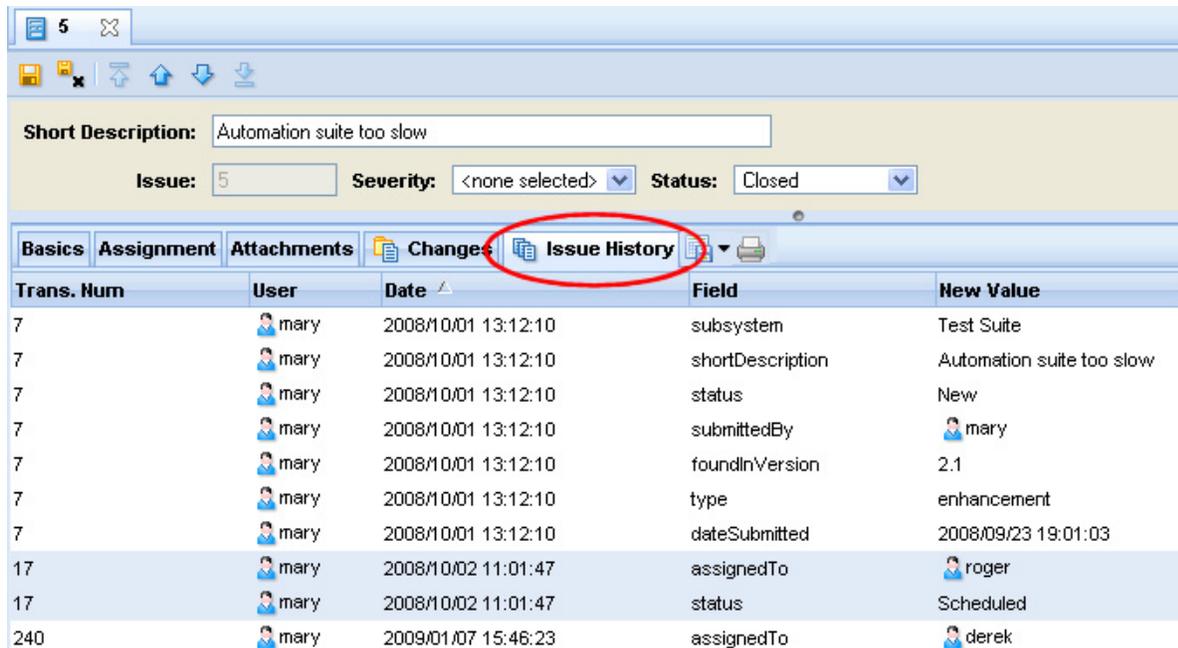
See [Common Table Commands](#).

Print

Prints the list of files displayed in the Changes subtab.

Issue History Subtab

The Issue History subtab of the Issue Edit form shows, on a field-by-field basis, how the issue record has changed over time. Each row corresponds to a field in the issue record.



Short Description: Automation suite too slow

Issue: 5 Severity: <none selected> Status: Closed

Trans. Num	User	Date	Field	New Value
7	mary	2008/10/01 13:12:10	subsystem	Test Suite
7	mary	2008/10/01 13:12:10	shortDescription	Automation suite too slow
7	mary	2008/10/01 13:12:10	status	New
7	mary	2008/10/01 13:12:10	submittedBy	mary
7	mary	2008/10/01 13:12:10	foundInVersion	2.1
7	mary	2008/10/01 13:12:10	type	enhancement
7	mary	2008/10/01 13:12:10	dateSubmitted	2008/09/23 19:01:03
17	mary	2008/10/02 11:01:47	assignedTo	roger
17	mary	2008/10/02 11:01:47	status	Scheduled
240	mary	2009/01/07 15:46:23	assignedTo	derek

The Issue History table contains these columns:

TransNum

The number of the **Save** [transaction](#). (The transaction type is *dispatch*.)

User

The [user](#) who made the change to the issue record.

Date

The time at which the change took place.

Field

The field whose value changed (or was initially created).

New Value

The value to which this transaction changed this field.

Old Value

The value of this field prior to the **Save**. (Empty for the issue record's initial **Save** transaction.)

Working in the Issue History Subtab

The following commands are available for items in the Issue History subtab. Commands are available from both the toolbar and context menu unless noted otherwise.



Export

See [Common Table Commands](#).



Print

Prints the list of transactions displayed in the Issue History subtab.

Change Package History Tab

The Change Package History tab displays the transactions that are part of the current issue's change package. Transactions are displayed in the *transactions pane*. The *change package*—all the items associated with a specific transaction—are displayed in the *change package contents pane* when you select a transaction in the transaction pane. The change package contents pane displays the file name, version, basis version, and status for each element in the change package.

Time	Action	User	#	Comment
2009-11-11 11:01:16	promote	admin	416	testing promote from IE
2009-07-30 09:28:38	promote	admin	111	
2009-07-15 15:00:55	cpk_remove	admin	64	
2009-07-14 15:20:47	promote	admin	57	
2009-07-07 08:55:27	promote	admin	16	

Name	Version	Basis Version	Status
\perlscript.pl	1/2	6/1	

To display the Change Package History tab:

1. Open the Issue Edit form.
2. Click the **Change Package History** button ()

Working in the Change Package Contents Pane

Select any change package entry and invoke any of the commands described below via its context menu. In most cases, the operation is performed on the entry's head version (**Version** column).

Open

Opens the file.

Save As

Saves the currently selected file to another filename. See [Save As](#) for more information.

Remove

This command is not available from the Change Package History tab.

Diff Against Basis

Compares the selected version with the corresponding basis version, revealing what changes were made to the file. Note that comparisons do not work on binary files. See [Diff Against Backed or Basis Version](#) for more information.

History

Opens a [History Browser](#) tab, containing the transactions involving the selected file or directory.

Version Browser

Opens the [Version Browser](#), showing the version from the change package in the context of its ancestors and children, if any.

Properties

Displays a message box with information about the selected element. See [Displaying Element Properties](#) for more information.

Code Review

If enabled by your AccuRev administrator, allows you to create a code review for the selected file, or add files to an existing code review. See [Creating a Crucible Review for AccuRev Elements](#) on page 53 for more information.

Export

See [Common Table Commands](#).

Print

Prints the list of files displayed in the change package contents pane.

Searching for Issues

AccuRev lets you search the current depot for issues using:

- **An issue number.** When you enter an issue number, AccuRev searches the current depot for that number.
- **A text string.** When you enter a text string, AccuRev searches the current depot for any issue with field of data type *Text* that *contains* the string you entered. Text strings must adhere to certain rules. See [Allowed Comparisons and Values](#) for more information.

How to Search a Depot

To search a depot for issues:

1. Enter a value in the **Issue Search** field in the main AccuRev toolbar:



2. Press Enter.

AccuRev searches the current depot using the search value you provided. If there is no current depot in the AccuRev session, AccuRev prompts you to select one before performing the search. Results are displayed in either the Issue Edit form or the Issue Search tab. See [How Results are Displayed](#) for more information.

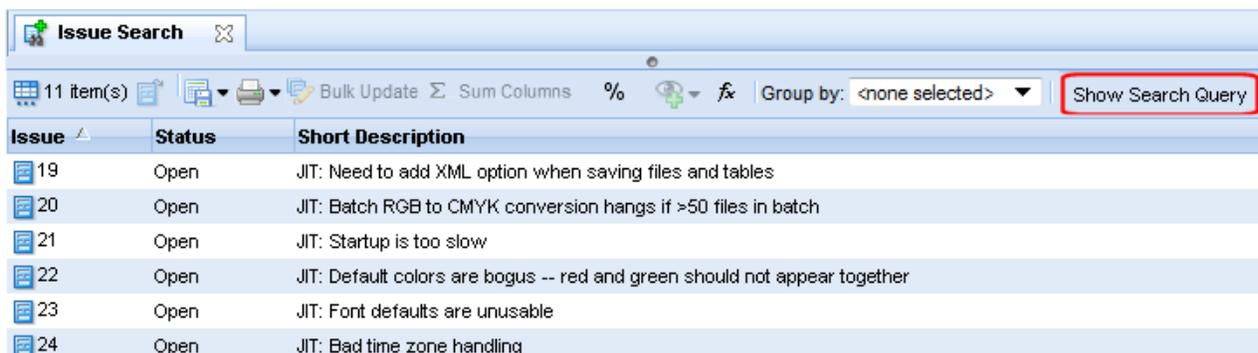
How Results are Displayed

How AccuRev displays the issue search results depends on whether you searched using an issue number or a text string, as summarized in the following table:

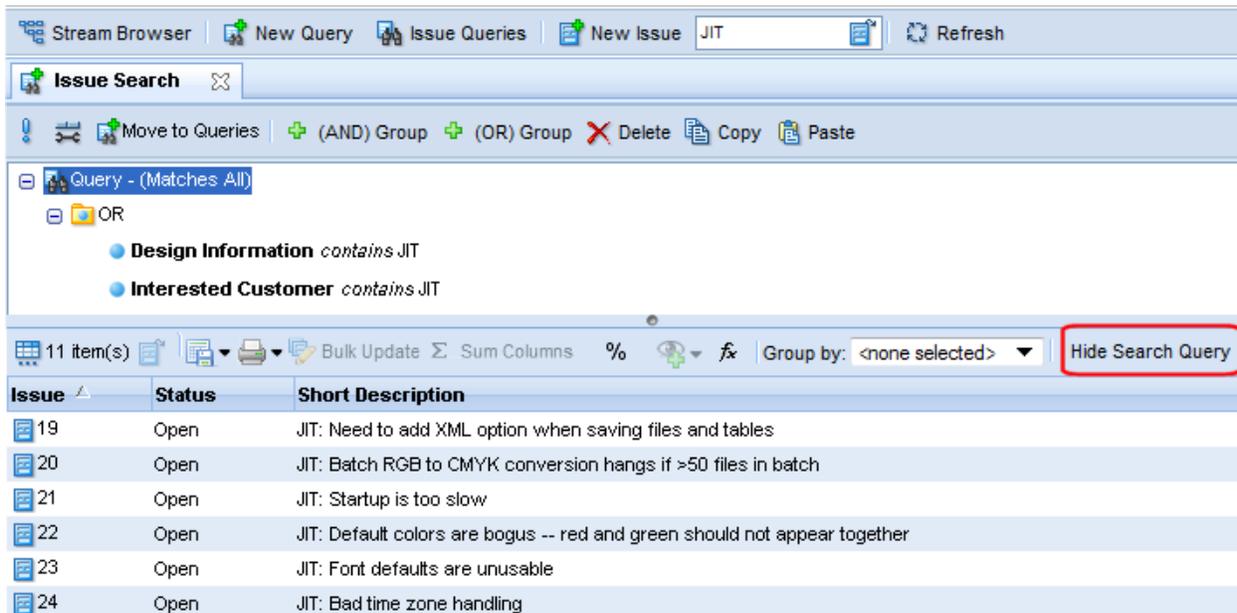
If You Searched Using	AccuRev Displays the Results in the
An issue number	Issue Edit form. See Issue Edit Form for more information.
A text string	Issue Search tab. See Issue Search Tab for more information.

Issue Search Tab

The Issue Search tab displays issues in the current depot with fields that match the text string entered in the **Issue Search** field:



If you want to see, and modify, the query AccuRev used to search the depot, click the **Show Search Query** button on the right side of the toolbar. When you do this, AccuRev adds a panel to the Issue Search tab to display the query:



Click the **Hide Search Query** button to collapse this panel.

You can modify this query as you would any other. See [Using the Query Editor](#) for information on working with queries.

Working with the Issue Search Tab

The following commands are available for items in the Issue Search subtab. Commands are available from both the toolbar and context menu unless noted otherwise.

Open Issue

Opens the selected issue in AccuWork or a third-party issue tracking tool. See [Open Issue](#) for more information.

Show Change Package

Shows the change package contents for the selected issue in a separate tab. This command is available from the context menu only.

Export

See [Common Table Commands](#).

Print

Allows you to print issue table or issue details reports. See [Reports About Issues](#) for more information. This command is available from the toolbar only.

Bulk Update

Changes field values for the selected issues. See [Bulk Update](#) for more information.

Sum Columns

Returns the number of issues selected, as well as the sums of all *Text* fields with numeric-only data and the sums of all *Timespan* fields. See [Sum Columns](#) for more information.

Show Percentages

Displays percentage information for columns that contain numeric data. See [Show Percentages](#) for more information. This command is available from the toolbar only.

Code Review

If enabled by your AccuRev administrator, allows you to create a code review for the selected file, or add files to an existing code review. See [Creating a Crucible Review for AccuRev Elements](#) on page 53 for more information.

Calculate Columns

Allows you to perform basic mathematical operations (add and subtract, for example) on any two columns with numeric values. A new column is created to display the results. See [Calculate Columns](#) for more information. This command is available from the toolbar only.

Group By

See [Group Issues by Field](#).

Reports About Issues

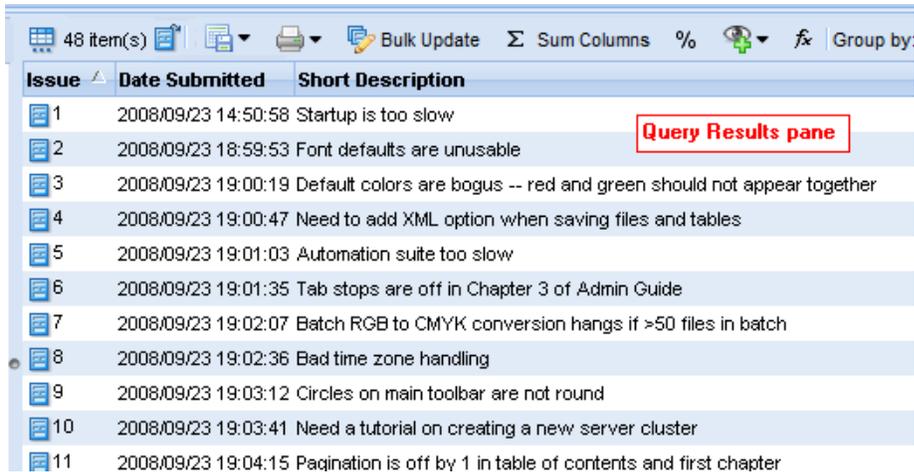
AccuWork provides two types of reports that allow you to print information about issues:

- Issue table reports
- Issue details reports

This section describes these reports and how to print them.

Issue Table Report

The *issue table report* provides summary information about all issues displayed in a table, like the table in the Query Results pane shown here, for example:



Issue	Date Submitted	Short Description
1	2008/09/23 14:50:58	Startup is too slow
2	2008/09/23 18:59:53	Font defaults are unusable
3	2008/09/23 19:00:19	Default colors are bogus -- red and green should not appear together
4	2008/09/23 19:00:47	Need to add XML option when saving files and tables
5	2008/09/23 19:01:03	Automation suite too slow
6	2008/09/23 19:01:35	Tab stops are off in Chapter 3 of Admin Guide
7	2008/09/23 19:02:07	Batch RGB to CMYK conversion hangs if >50 files in batch
8	2008/09/23 19:02:36	Bad time zone handling
9	2008/09/23 19:03:12	Circles on main toolbar are not round
10	2008/09/23 19:03:41	Need a tutorial on creating a new server cluster
11	2008/09/23 19:04:15	Pagination is off by 1 in table of contents and first chapter

Issue tables like the one shown in the preceding illustration are displayed in these places in the Web UI:

- Query Results pane of the [Query Browser](#)
- [Show Active Issues](#)
- [Issue Search Tab](#)
- [Diff Against](#)

Columns Can Differ

Columns displayed for the same issue can differ based on how the issue table was generated. For example, a table generated by a query might show different columns than the table displayed in the Issues tab. This is because query results include columns chosen by the user who wrote the query, while columns displayed in other issue tables are defined by the AccuRev schema.

When you print an issue table report, AccuRev prints the columns that appear in the current table.

Report Format

The format of the issue table report resembles the table on which it is based: each issue appears in its own row; all of the columns displayed in the table are included in the report.

Report Header

Issue table reports include the following fields in a header:

- **Sorted By:** The column and order in which the report was sorted. (*Issue Ascending*, for example.)
- **Total Records:** The total number of issues displayed in the table.
- **User:** The username of the AccuRev user who printed the report.

Header information is printed only on the first page of a report.

Tip: Use your Web browser's print settings to specify output like page numbers, including images, and other information.

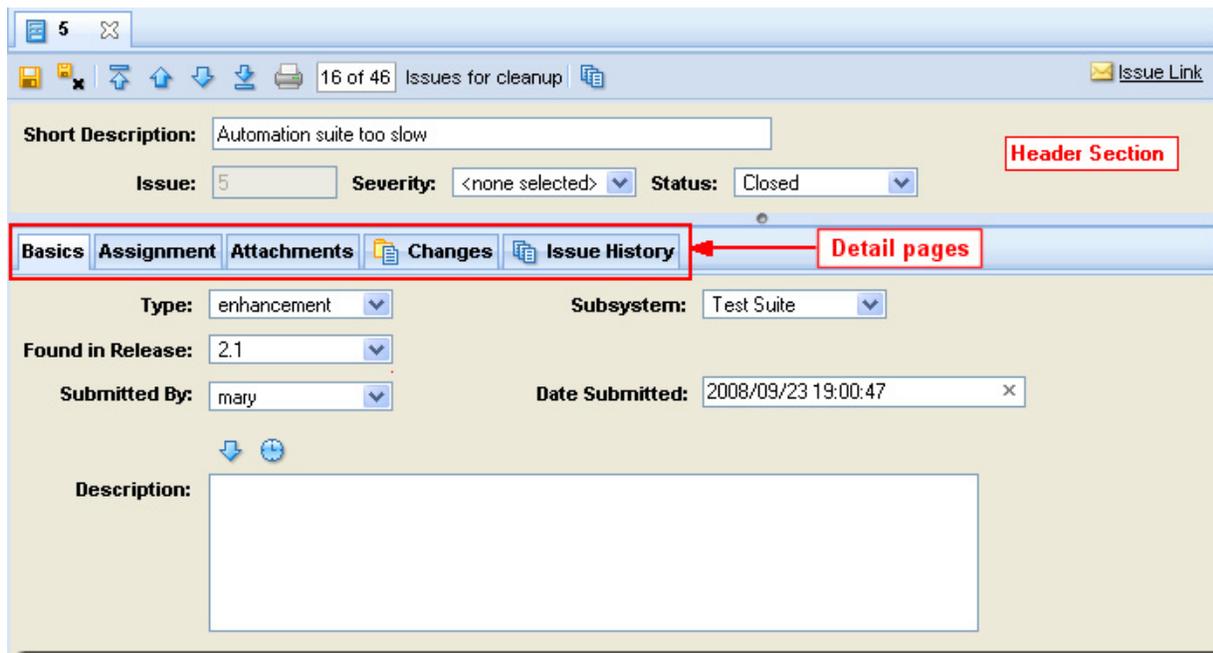
Printing an Issues Table Report

Use this procedure to print all the issues displayed in a table.

1. Display the issues table you want to print. For example:
 - Run a query—the table is displayed in the Query Results pane of Query Browser
 - Display the active issues for a stream—the table is displayed in the Issues tab
2. Click the **Print** button ()
3. Choose **Print Table** from the drop-down menu.
The standard print dialog box appears.
4. Specify print settings as needed and click **OK**.

Issue Details Report

The *issue details report* provides detailed information about one or more individual issues. The information in the report is based on the information that appears on the Issue Edit form, including the header section and most of the Issue Edit form's subtabs—Basics, Assignment, and so on:



The screenshot shows the 'Issue Edit' form for issue 5. The 'Short Description' is 'Automation suite too slow'. The 'Issue' field is 5, 'Severity' is '<none selected>', and 'Status' is 'Closed'. The 'Header Section' is highlighted in red. The 'Basics' tab is selected, and the 'Issue History' subtab is highlighted with a red box and labeled 'Detail pages'. The 'Type' is 'enhancement', 'Subsystem' is 'Test Suite', 'Found in Release' is '2.1', 'Submitted By' is 'mary', and 'Date Submitted' is '2008/09/23 19:00:47'. The 'Description' field is empty.

You can print an issue details report from the following places in the Web UI:

- Issue Edit form, as shown in the preceding illustration
- Any issues table—select the issues you want to print, or print reports for all issues in the table in one step

Report Format

Data for the header section and each tab are separated with a graphic element that includes the name of the section or tab. Data is displayed in a list of name:value pairs. HTML formatting for text fields that support it is preserved in the report.

Note that the following subtabs are not included in an issue details report:

- Attachments
- Changes
- Issue History
- Relationships

Report Header

Issue details reports include the following fields in a header:

- **Depot:** The depot in which the issue is stored.
- **User:** The username of the AccuRev user who printed the report.
- **Query:** The name of the query whose results are reflected in the report. This field is included only if you print the report from the Query Browser.

If your issue details report includes multiple issues, each issue starts on a new page. Complete header information is printed on the first page only.

Tip: Use your Web browser's print settings to specify output like page numbers, including images, and other information.

Printing an Issue Details Report from the Issue Edit Form

To print an issue details report from the Issue Edit form:

1. Click the Print button ().
The standard print dialog box appears.
2. Specify print settings as needed and click **OK**.

Printing an Issue Details Report from an Issues Table

To print an issue details report from an issues table:

1. Display the issues table. For example:
 - Run a query—the table is displayed in the Query Results pane of Query Browser
 - Display the active issues for a stream—the table is displayed in the Issues tab
2. Do you want to print issue details reports for all the issues in the issues table?
If yes, go to [Step 3](#).
If no, go to [Step 4](#).
3. Click the **Print** button () and choose **Print All Issues** from the drop-down menu.
The standard print dialog box appears.
Go to [Step 6](#).

4. Select the issues for which you want to print an issue details report. Use Ctrl+ click and Shift+ click to select the issues.
5. Click the **Print** button () and choose **Print Selected Issues** from the drop-down menu.
The standard print dialog box appears.
6. Specify print settings as needed and click **OK**.

Common AccuWork Commands

The following AccuWork operations can be invoked from multiple locations within the Web UI.

Open Issue

This command can be invoked by right-clicking on any list of issues in the Web UI. These lists can be generated:

- In the Query Results pane in the [Query Browser](#)
- As a result of a **Show Active Issues** (see [Show Active Issues](#)) or **Diff Against Basis (by Issues)** (see [Diff Against](#)) command

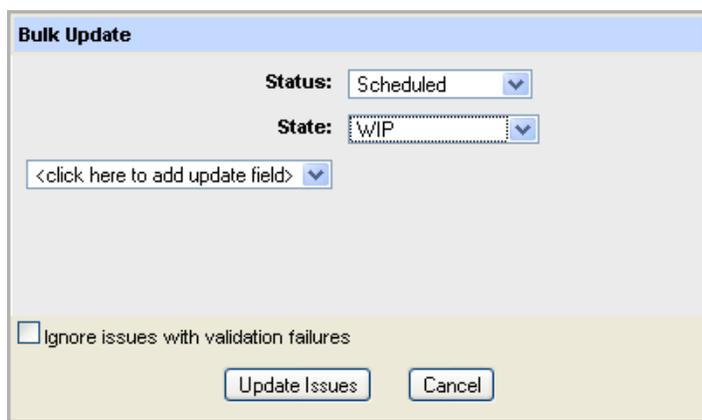
An issue can also be opened by double-clicking it.

The issue opens in one of two places:

- In the [Issue Edit Form](#)
- In a third-party Web-based issue tracking system, if the Web UI has been configured to do so (You can configure the Web UI to use different issue tracking systems; contact your Web UI system administrator for details if this command does not perform as you expect.)

Bulk Update

This command can be invoked via the  button or the context menu (right-click) on any un-grouped issue list shown in the Web UI. The command displays a dialog box, which allows you to specify one or more fields to update, and assign new values to them.



The image shows a 'Bulk Update' dialog box with a light blue header and a light gray body. It contains the following elements:

- Status:** A dropdown menu with 'Scheduled' selected.
- State:** A dropdown menu with 'WIP' selected.
- A dropdown menu with the text '<click here to add update field>'.
- An unchecked checkbox labeled 'Ignore issues with validation failures'.
- Two buttons at the bottom: 'Update Issues' and 'Cancel'.

Click the **Update Issues** button to update these fields in the selected issues with the values you specified.

AccuRev applies validation rules during the bulk update operation, and displays an error if a rule is violated by the bulk update. The **Ignore issues with validation failures** checkbox skips issues with validation errors. See [Understanding Issue Form Validation](#) for more information.

Sum Columns

The **Sum Columns** command allows you to easily sum certain fields for issues displayed in the Web UI. For example, you might want to sum the Dev Est Time field for the issues displayed in the Query Results pane in the Queries tab.

AccuRev sums any fields that have been defined in the AccuRev schema as:

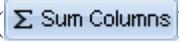
- Text fields, as long as they contain numeric data
- Timespan fields

If the issues you have selected do not contain any fields with these data types, AccuRev displays a warning message. Clear the message and select different issues before trying the sum operation again.

You can sum columns in one or more issues. Use Ctrl+ click and Shift+ click to select the issues whose columns you want to sum.

Summing Columns

To sum columns:

1. Display a tab that lists one or more issues (like the Query Results pane after executing a query, for example).
2. Select the issues whose columns you want to sum.
3. Click the Sum Columns button ().

Alternative: Choose Sum Columns from the context menu (right-click to display) in any issue list shown in the Web UI.

AccuRev displays the Sum Columns dialog box.



The Sum Columns dialog box displays:

- The sum of the columns for selected issues (Dev Est Time and Story Points in the preceding illustration).
 - The number of issues selected (Row Count).
4. Click **Ok** to close the Sum Columns dialog box.

Calculate Columns

The **Calculate Columns** command allows you to perform basic mathematical operations (add and subtract, for example) on any two columns for issues displayed in the Web UI. For example, you might want to subtract the Dev Actual field from the Dev Estimate field for the issues displayed in the Query Results pane in the Queries tab.

When you execute the **Calculate Columns** command, AccuRev adds a new column to the table to display the result of the calculation. You can name this column at the time you specify the calculation.

AccuRev lets you calculate any fields that have been defined in the AccuRev schema as:

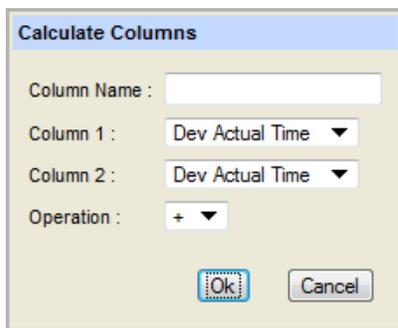
- Text fields, as long as they contain numeric data
- Timespan fields
- Timestamp fields

If the issues do not contain any fields with these data types, AccuRev displays a warning message. Clear the message and choose fields with numeric values before trying the calculate operation again.

How to Calculate Columns

1. Display a tab that lists one or more issues (like the Query Results pane after executing a query, for example).
2. Click the **Calculate Columns** button ().

AccuRev displays the Calculate Columns dialog box.



3. Complete the fields in the Calculate Columns dialog box as follows:

Field Name	Action
Column Name	Enter a name for the column that will display the result of the calculation.
Column 1	Select the first column you want to use in the calculation.
Column 2	Select the second column you want to use in the calculation.
Operation	Select the operation you want AccuRev to perform.

4. Click **Ok**.

AccuRev performs the calculation and displays the results in a new column.

Query URLs

AccuRev automatically builds a URL for queries with calculated columns that includes information about the calculation you specified: the name of the new column, the names of the columns selected for the calculation, and the operation selected for the calculation. If you set your query to Public, you can:

- Send the URL using the default e-mail client configured in your Web browser.
- Render the URL in a new tab in the Web browser. This enables you to copy the URL.

If your query is set to Private, you cannot access the query's URL.

See [Using URLs to Access AccuRev® Data](#) on page 183 for more information on this topic.

To access the query URL:

1. If necessary, set the query to Public: in the Web UI Query Browser, right-click the query and choose **Set as Public** from the context menu.
2. Right-click the query and choose **Query Link** from the context menu.

The Query Link dialog box appears:



3. To send an e-mail containing the query's URL, click the envelope button.

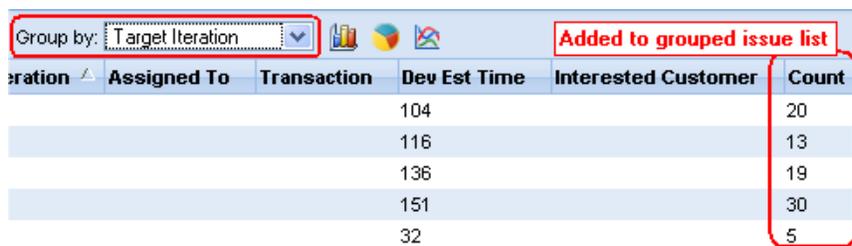
To open a new tab in your Web browser that opens to the query's URL, click the query name.

Show Percentages

Show Percentages () toggles the display of percentage information for columns that contain numeric data. If you have specified the display of Groups (see the next section), the Count column also toggles to percentages. This is useful for columns such as “estimated time” to see which issues in the current table are expected to take up the most development time. See [Group Issues by Field](#) below for more details.

Group Issues by Field

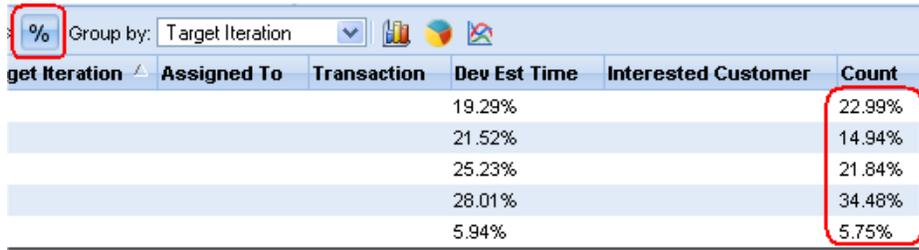
This command can be invoked via the **Group by** drop-down list on the issue list toolbar. The drop-down shows the issue fields that these issues can be grouped by. Choose a field to group the issues by that field.



Iteration	Assigned To	Transaction	Dev Est Time	Interested Customer	Count
			104		20
			116		13
			136		19
			151		30
			32		5

The resulting issue list shows one line for each value of the chosen field. A *Count* column is added to the grouped issue list, which contains the number of issues for each value of the chosen field.

To toggle the display in this column to show percentages, click the  **Show Percentages** button.



get Iteration	Assigned To	Transaction	Dev Est Time	Interested Customer	Count
			19.29%		22.99%
			21.52%		14.94%
			25.23%		21.84%
			28.01%		34.48%
			5.94%		5.75%

Columns in the list will either:

- Show the sum of all values in that column for the value of the chosen field. Text fields with numeric-only data and Timespan fields can be summed in this way. Fields with date information default to grouping by day. For example, there were 20 issues in target iteration 1 (as shown in the first line of the image above), and the sum of the developer's estimated time (Dev Est Time column) for that iteration was 104 hours.
- Show nothing. This means that the field does not contain numeric values which can be summed.

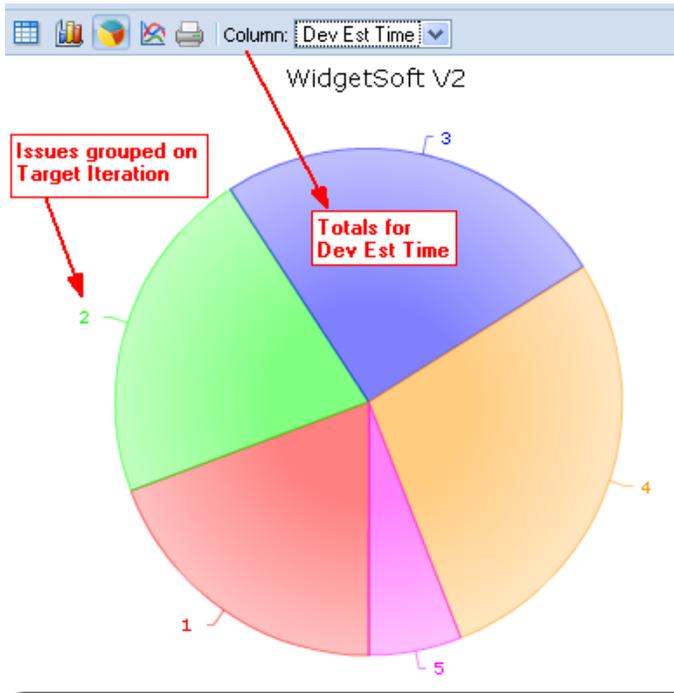
To remove the grouping, choose **<none selected>** from the **Group by** drop-down.

Charts

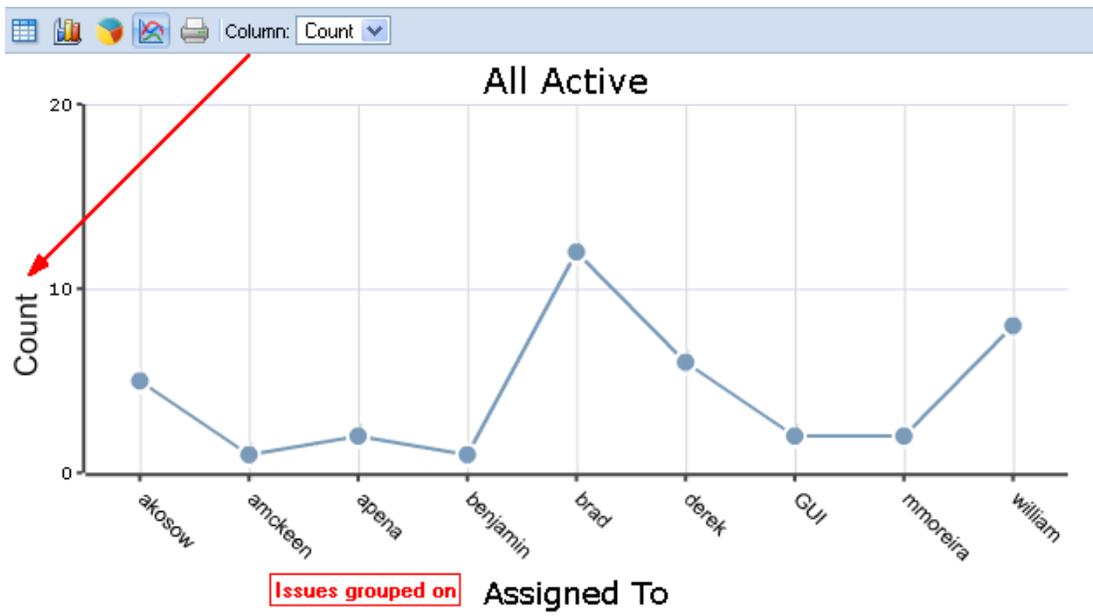
When the **Group By** option is in effect, three graphical chart options—bar, pie, and line—become available on the toolbar and the context menu, allowing you to display query results in a graphical format.



Pie Chart



Line Chart



The field that the issues are grouped by creates the horizontal axis of the bar chart or the labeled sections of the pie chart. The leftmost column with summed data creates the vertical axis of the bar and line charts or the sizing for the wedges of the pie chart. This value can be changed using the **Column** drop-down list on the chart's toolbar.

To return to the list of grouped issues, click the **Show Issue Table**  button on the issue list toolbar. Following are examples of bar, pie, and line charts.

Tip: You can distribute URLs of query results displayed as groups and charts. See [Linking to Charts and Grouped Issues](#).

Printing charts

To send a chart to the printer:

1. Click the **Print** button () on the toolbar.

The chart appears in a separate browser window or tab with its own **Print** button () button.

2. Click the **Print** button () button.

The standard Print dialog box appears.

3. Specify settings as required and click **OK**.

Linking to Charts and Grouped Issues

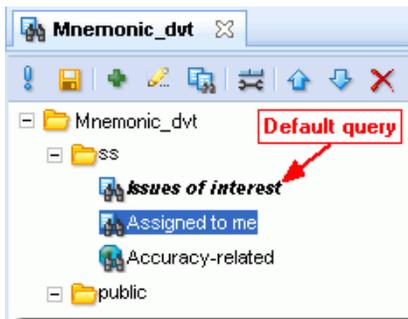
You can distribute URLs for groups and charts created for public query results. For example, you can run a query, group results by a specific field, and then render those results as a pie chart. If you want to share that chart, you can create a URL to provide other AccuRev users with access.

To create the URL, right-click the query and choose **Properties** from the context menu. This allows you to save or email the link for the query result. See [Using URLs to Access AccuRev® Data](#) for more information.

Note: If the field used to create the group changes—if you remove it from the columns displayed for the query results or change the Group By value, for example—the URL will no longer work.

Set as Default

This command allows you to specify a *default query*—the query that is run automatically when you open the Query Browser. The name of a query that has been specified as the default query is bold and italicized in the [Query List Pane](#). You can invoke the Set as Default command from the context menu in the Query List pane.



Set as Public

By default, queries you create are *private*—they are accessible only by you. This command allows you to make a private query a *public* query. Public queries are accessible by all AccuRev users.

Set as Private

This command allows you to make a public query you have created a *private* query. Private queries are accessible only by you.

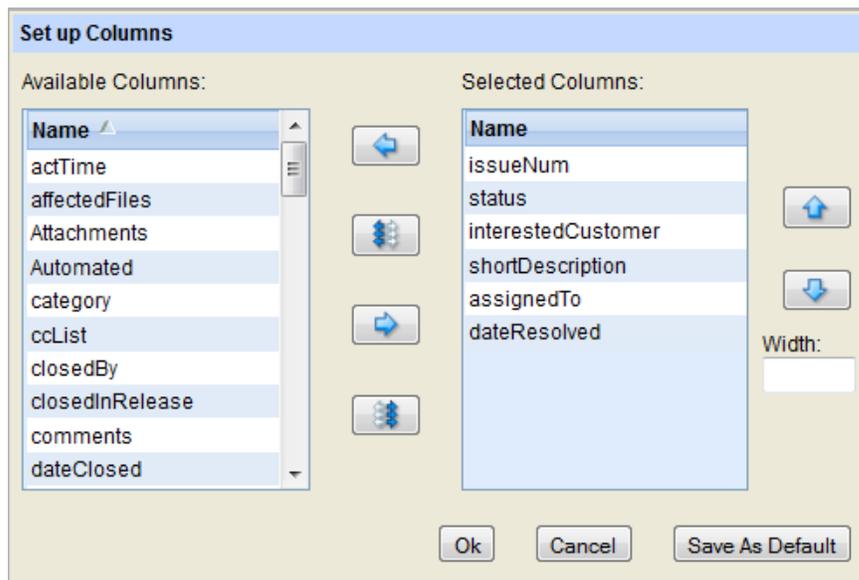
Set up Columns

The Set up Columns dialog box lets you specify the columns to include in query results and, optionally, save the columns you select as a default to be used to display query results for any new queries you create.

You use the **Set up Columns** button () on the [Query List Pane](#) or [Query Pane](#) toolbar to display this dialog box.

You use the Set up Columns dialog box to specify:

- A set of fields from an AccuWork issue database
- The order in which those fields will appear in the results
- Whether or not you want to save selected columns as a default



Choosing Columns

The dialog box contains several buttons to move the fields:

- To move field names from the Available Columns list to the Selected Columns list (or vice-versa), select one or more names, then click the  or  button.
- To move all field names between the lists, click the  or  button.
- To rearrange the Selected Columns list, select one or more names, then click the  or  button.

You can also specify the width of a column in pixels: click on the column in the Selected Columns list, then enter the desired value in pixels in the **Width:** field.

When you click **Ok** to close the dialog box, the changes you have made are reflected immediately in the Query Results pane. Changes to the query's column setup are not saved in the repository until you invoke the [Save](#) command in the Query List pane.

Notes:

- The names displayed in the Set Up Columns dialog box are the AccuWork *field names* as specified in the AccuWork Schema Editor in the Java GUI. The names displayed in query results are the corresponding AccuWork *field labels*.
- You must include at least one field in the Selected Columns list.
- Complete contents from multiple-line text fields are not always visible in the Web UI, but they are included in printed reports. See [Reports About Issues](#) for more information.

Saving Selected Columns as a Default

If you want to save the columns you select as the default set of columns to be used to display query results:

1. Click the **Save as Default** button.
2. Click **Ok**.

The results for the current query are displayed with the columns you selected as the default. In addition, this set of columns is used as the default for any new queries you create.

Run

This command runs the selected query and displays the resulting issues in the [Query Browser](#) or [New Query Tab](#) tab. It is invoked from the toolbar button or the context menu in the Query List pane.

Save

This command saves any changes to queries that you have made in the [Query Browser](#), such as Set as Private/Set As Public commands to change the status of your queries (see [Set as Public](#) and [Set as Private](#)).

If you try to close a Query Browser tab in which you have made changes to one or more queries and have not yet saved them, AccuRev prompts you to save them.

How Queries are Stored

Your private queries are stored in the AccuRev repository within the depot's directory, in an XML-format file:

```
.../storage/<depot-name>/dispatch/config/user/<username>/query.xml
```

Each user's private queries are stored separately. The `<username>` directory in the query storage path name causes the private queries for each user to be stored separately.

Although your queries are stored in the depot, they are not version-controlled in the way AccuRev files are. For example, there is no command that displays or reinstates your queries as you saved them two days ago.

Show Change Package

This command shows the entries currently in the [change package](#) for the selected issue. You can run this command from context menus and toolbars in the [Query Browser](#) and [Show Active Issues](#).

The entries are shown in a Changes tab, which lists the file name, version, and basis version for each element in the change package.

Name	Version	Basis Version
\\tools\cmdshell\cmd	236/2	236/1
\\tools\cmdshell\cmd\end.bat	236/2	236/1
\\tools\cmdshell\cmd\start.bat	236/3	236/2
\\tools\cmdshell\csh	236/8	236/7
\\tools\cmdshell\csh\end.csh	236/2	236/1
\\tools\cmdshell\csh\start.csh	236/2	236/1

Entries are included for elements in the change package only if they were promoted *to* the stream, but have not yet been promoted *from* the stream to its parent. This helps you to concentrate on current programming efforts, rather than those that were completed long ago.

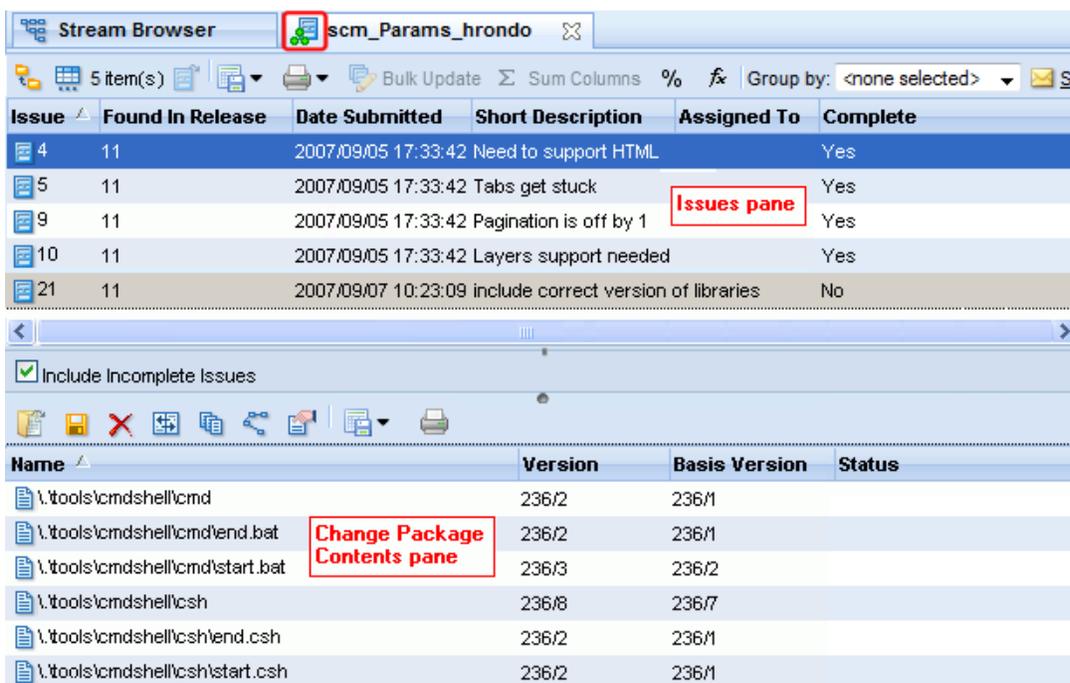
Note: For the purposes of the display on this tab, a **Revert to Backed** operation has the same effect as a **Promote** operation. For a workspace, substitute the phrase "created in" for "promoted to".

Show Active Issues

The **Show Active Issues** command displays in the Issues tab the active issues for the current stream. An issue in a stream is considered to be *active* if the change package associated with the issue has had one or more of its versions promoted *to* the stream, but has not yet been promoted *from* the stream to its parent.

Tip: You can display active issues for an individual stream by choosing **Show Active Issues** from the context menu for that stream. You can also change the display mode for all streams in the StreamBrowser by clicking the **Active Issue Mode** button () on the StreamBrowser.

Note: The Issues tab will not display any issues if you invoke **Show Active Issues** on a snapshot, since nothing can be promoted to a snapshot.



The screenshot shows the Stream Browser interface for the stream 'scm_Params_hrondo'. The top pane displays a list of issues with columns: Issue, Found In Release, Date Submitted, Short Description, Assigned To, and Complete. The bottom pane displays a table of change package contents with columns: Name, Version, Basis Version, and Status. Red boxes highlight the 'Issues pane' and 'Change Package Contents pane' labels.

Issue	Found In Release	Date Submitted	Short Description	Assigned To	Complete
4	11	2007/09/05 17:33:42	Need to support HTML		Yes
5	11	2007/09/05 17:33:42	Tabs get stuck		Yes
9	11	2007/09/05 17:33:42	Pagination is off by 1		Yes
10	11	2007/09/05 17:33:42	Layers support needed		Yes
21	11	2007/09/07 10:23:09	include correct version of libraries		No

Name	Version	Basis Version	Status
\\tools\cmdshell\cmd	236/2	236/1	
\\tools\cmdshell\cmd\end.bat	236/2	236/1	
\\tools\cmdshell\cmd\start.bat	236/3	236/2	
\\tools\cmdshell\csh	236/8	236/7	
\\tools\cmdshell\csh\end.csh	236/2	236/1	
\\tools\cmdshell\csh\start.csh	236/2	236/1	

Click an issue in the Issues pane to display the items currently in its [change package](#) in the Change Package Contents pane. This pane lists the file name, version, and basis version for each element in the change package.

Entries are included for elements in the change package only if they were promoted *to* the stream, but have not yet been promoted *from* the stream to its parent. This helps you to concentrate on current programming efforts, rather than those that were completed long ago.

Note: For the purposes of the display on this tab, a **Revert to Backed** operation has the same effect as a **Promote** operation. For a workspace, substitute the phrase "created in" for "promoted to".

Incomplete issues are shown by default and can be excluded by clearing the **Include Incomplete Issues** checkbox. (An issue is *incomplete* when some, but not all, of its change package entries are in the stream.) When the checkbox is selected, the Complete column appears and shows the incomplete issues with a grey background in the Issues pane. When an incomplete issue is selected, the missing versions will be shown with a grey background on the Change Package Contents pane. In addition, the Status column on that pane will read (**Missing**) for each missing version.

Unaffiliated Changes ("Dark Matter")

It is possible to end up with changes that are not associated with any issue. For example, someone might decide that a file does not belong to an issue and remove it from the change package. Or someone might decide to promote a file in a backing stream, without associating it with an issue. Element versions that are not associated with any issue are considered *unaffiliated* (or "dark matter").

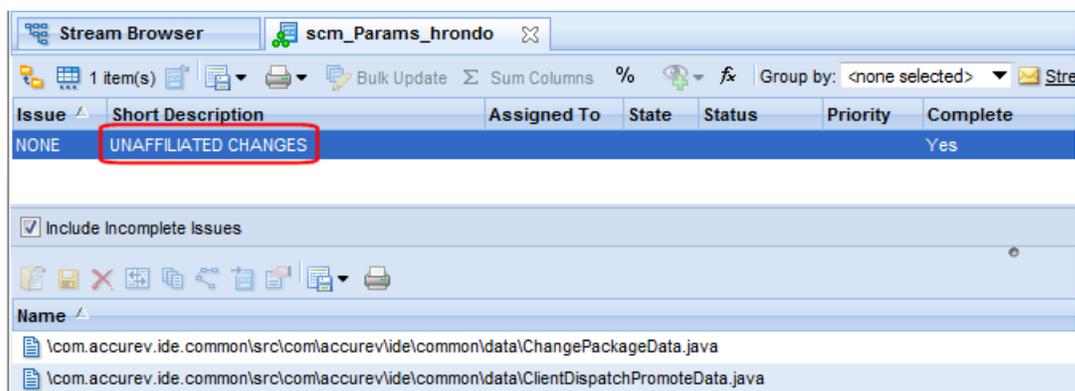
Viewing Unaffiliated Changes. Because such element versions can lead to confusion, AccuRev provides several ways to view unaffiliated changes in the Web UI. You can view unaffiliated changes:

- On the Issues tab (when viewing active issues in a stream; see example)
- On the Issue Diff tab (which appears after diffing two streams)
- On the Diff vs Query tag (which appears after diffing two streams' issues, and then diffing the result against a query you choose)

Example:

1. In the StreamBrowser, change to the Active Issue display mode by clicking the **Active Issue Mode** button (🟢) in the upper right corner of the StreamBrowser.
2. Click the default group icon on the stream you want to review.

AccuRev displays the Issues tab:



Managing Unaffiliated Changes. If any unaffiliated changes exist in the stream, the issue table gains an extra row labeled "NONE". (This is true regardless of how you display the issues table.) If your table layout includes a second column (in this example, the column **Complete**), AccuRev displays "UNAFFILIATED CHANGES" in the row. Clicking anywhere in the row displays the unaffiliated elements. For each unaffiliated element, examine its history to determine how best to manage it—you might decide that you need to promote a file to an issue to correct the problem, for example.

For more information on working with unaffiliated changes, see the topic *Patches and Change Packages* topic in the Java GUI online help.

Accessing the Active Issues via URL

A link to the Web UI URL (labeled "Stream Active Issues Link") used to access this view is shown at the top of the tab. See [URLs for AccuWork™ Queries and Issues](#).

Working in the Issues Pane

Select one or more issues to invoke commands on the issues. Commands are available from both the toolbar and context menu unless noted otherwise.



Promote

This command [promotes](#) the selected issue so that it is active in the parent stream. This command is available from the context menu only.



Table Filter

Displays a dialog box to enable paging in the issue list (see [Query Results Pane](#)). Enter the number of items to display per page. This command is available from the toolbar only.



Open Issue

Opens the selected issue in AccuWork or a third-party issue tracking tool (see [Open Issue](#)).

Show Change Package

Shows the change package contents for the selected issue in a separate tab. This command is available from the context menu only.



Export

See [Common Table Commands](#).



Print

Allows you to print issue table or issue details reports. See [Reports About Issues](#) for more information. This command is available from the toolbar only.



Bulk Update

Changes field values for the selected issues. See [Bulk Update](#) for more information.



Sum Columns

Returns the number of issues selected, as well as the sums of all *Text* fields with numeric-only data and the sums of all *Timespan* fields. See [Sum Columns](#) for more information.

Show Percentages

Displays percentage information for columns that contain numeric data. See [Show Percentages](#) for more information. This command is available from the toolbar only.

Code Review

If enabled by your AccuRev administrator, allows you to create a code review for the selected file, or add files to an existing code review. See [Creating a Crucible Review for AccuRev Elements](#) on page 53 for more information.

Calculate Columns

Allows you to perform basic mathematical operations (add and subtract, for example) on any two columns with numeric values. A new column is created to display the results. See [Calculate Columns](#) for more information. This command is available from the toolbar only.

Group By

See [Group Issues by Field](#). This command is available from the toolbar only.

Working in the Change Package Contents Pane

Select any change package entry to invoke any of the commands described here. In most cases, the operation is performed on the entry's head version (Version column). Commands are available from both the toolbar and context menu unless noted otherwise.

Open

[Using the Open Commands](#) the file.

Save As

Saves the currently selected file to another filename. See [Save As](#).

Remove

Removes the selected entry or entries from the change package.

Tip: The Delete key on your keyboard also performs the remove action.

Diff Against Basis

Compares the selected version or versions with the corresponding basis version, revealing what changes were made to the file (see [Diff Against Basis](#)). If you select multiple files, navigation icons

() appear in the toolbar that allow you to step through the selected files. **NOTE:** If you receive the error message “Diff action is not available for selected elements”, check to see if any of your selections are either binary files, or have a basis version of “0/0”. These elements cannot be diff’ d.

History

Opens a [History Browser](#) tab, containing the transactions involving the selected file or directory.

Version Browser

Opens the [Version Browser](#), showing the version from the change package in the context of its ancestors (and children, if any).

Send files to Issue

Sends the selected files to the change package section (Changes tab) of the issue record you specify. See [Using AccuWork™](#) for more information about issues and change packages.

Properties

Displays a message box with information about the selected element. See [Displaying Element Properties](#).

Export

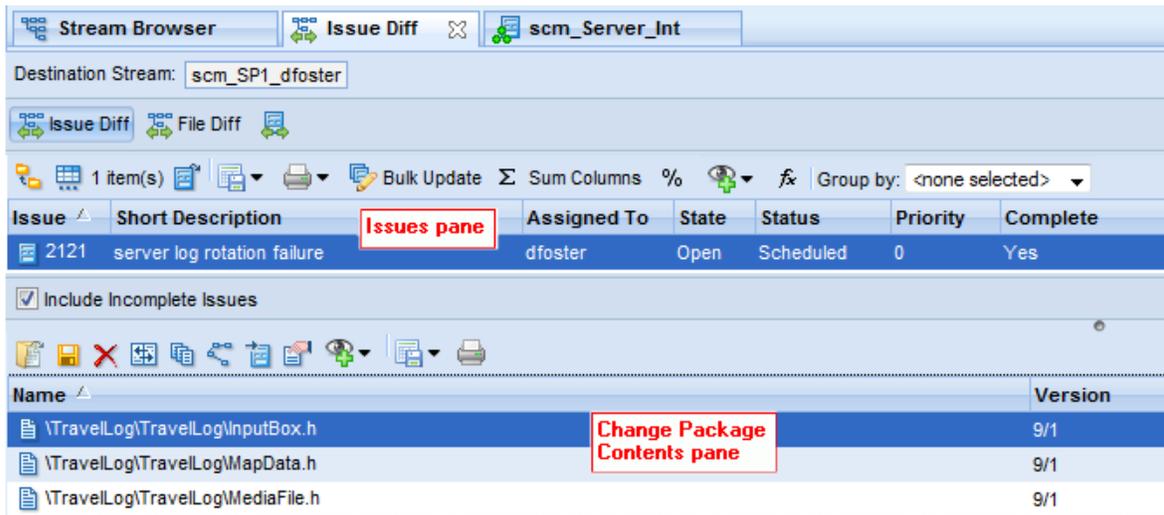
See [Common Table Commands](#). This command is available from the toolbar only.

Print

Prints the list of files displayed in the Change Package Contents pane. This command is available from the toolbar only.

Diff Against

The Issue Diff tab appears whenever you choose one of the many **Diff Against Basis (by Issues)** or **Issue Diff** commands available throughout the Web UI. This tab shows the source and destination streams for the comparison, and a list of issues which differ between the two streams.



The screenshot shows the 'Issue Diff' interface. At the top, the 'Destination Stream' is 'scm_SP1_dfoster'. Below this, there are tabs for 'Issue Diff' and 'File Diff'. A toolbar contains various icons and a 'Group by' dropdown. The main area is divided into two panes. The 'Issues pane' (highlighted with a red box) contains a table with the following data:

Issue	Short Description	Assigned To	State	Status	Priority	Complete
2121	server log rotation failure	dfoster	Open	Scheduled	0	Yes

Below the issues pane is a toolbar with icons for file operations. The 'Change Package Contents pane' (highlighted with a red box) contains a table with the following data:

Name	Version
\\TravelLog\\TravelLog\\InputBox.h	9/1
\\TravelLog\\TravelLog\\MapData.h	9/1
\\TravelLog\\TravelLog\\MediaFile.h	9/1

Working in the Issues Pane

You can invoke the following commands from the Issue Diff main toolbar:

Issue Diff

Displays the issues that differ between the source and destination streams.

File Diff

Displays the files that differ between the source and destination streams.



Diff vs Query

See [Diff vs Query](#).



Promote

This command [promotes](#) the selected issue so that it is active in the parent stream. This command is available from the context menu only.



Table Filter

Displays a dialog box to enable paging in the issue list (see [Query Results Pane](#)). Enter the number of items to display per page. This command is available from the toolbar only.



Open Issue

Opens the selected issue in AccuWork or a third-party issue tracking tool (see [Open Issue](#)).

Show Change Package

Shows the change package contents for the selected issue in a separate tab. This command is available from the context menu only.



Export

See [Common Table Commands](#).



Print

Allows you to print issue table or issue details reports. See [Reports About Issues](#) for more information. This command is available from the toolbar only.



Bulk Update

Changes field values for the selected issues. See [Bulk Update](#) for more information.



Sum Columns

Returns the number of issues selected, as well as the sums of all *Text* fields with numeric-only data and the sums of all *Timespan* fields. See [Sum Columns](#) for more information.



Show Percentages

Displays percentage information for columns that contain numeric data. See [Show Percentages](#) for more information. This command is available from the toolbar only.



Code Review

If enabled by your AccuRev administrator, allows you to create a code review for the selected file, or add files to an existing code review. See [Creating a Crucible Review for AccuRev Elements](#) on page 53 for more information.



Calculate Columns

Allows you to perform basic mathematical operations (add and subtract, for example) on any two columns with numeric values. A new column is created to display the results. See [Calculate Columns](#) for more information. This command is available from the toolbar only.

Group By

See [Group Issues by Field](#). This command is available from the toolbar only.

Include Incomplete Issues

Incomplete issues are shown by default and can be excluded by clearing the Include Incomplete Issues checkbox. (An issue is incomplete when some, but not all, of its change package entries are in the stream.)

Working in the Change Package Contents Pane

Select any change package entry to invoke any of the commands described here. In most cases, the operation is performed on the entry's head version (Version column). Commands are available from both the toolbar and context menu unless noted otherwise.

Open

[Using the Open Commands](#) the file.

Save As

Saves the currently selected file to another filename. See [Save As](#).

Remove

Removes the selected entry or entries from the change package.

Tip: The Delete key on your keyboard also performs the remove action.

Diff Against Basis

Compares the selected version or versions with the corresponding basis version, revealing what changes were made to the file (see [Diff Against Basis](#)). If you select multiple files, navigation icons

() appear in the toolbar that allow you to step through the selected files.

Note: If you receive the error message “Diff action is not available for selected elements”, check to see if any of your selections are either binary files, or have a basis version of “0/0”. These elements cannot be diff’d.

History

Opens a [History Browser](#) tab, containing the transactions involving the selected file or directory.

Version Browser

Opens the [Version Browser](#), showing the version from the change package in the context of its ancestors (and children, if any).

Send files to Issue

Sends the selected files to the change package section (Changes tab) of the issue record you specify.

See [Using AccuWork™](#) for more information about issues and change packages.

Properties

Displays a message box with information about the selected element. See [Displaying Element Properties](#).

Code Review

If enabled by your AccuRev administrator, allows you to create a code review for the selected file, or add files to an existing code review. See [Creating a Crucible Review for AccuRev Elements](#) on page 53 for more information.

Export

See [Common Table Commands](#). This command is available from the toolbar only.

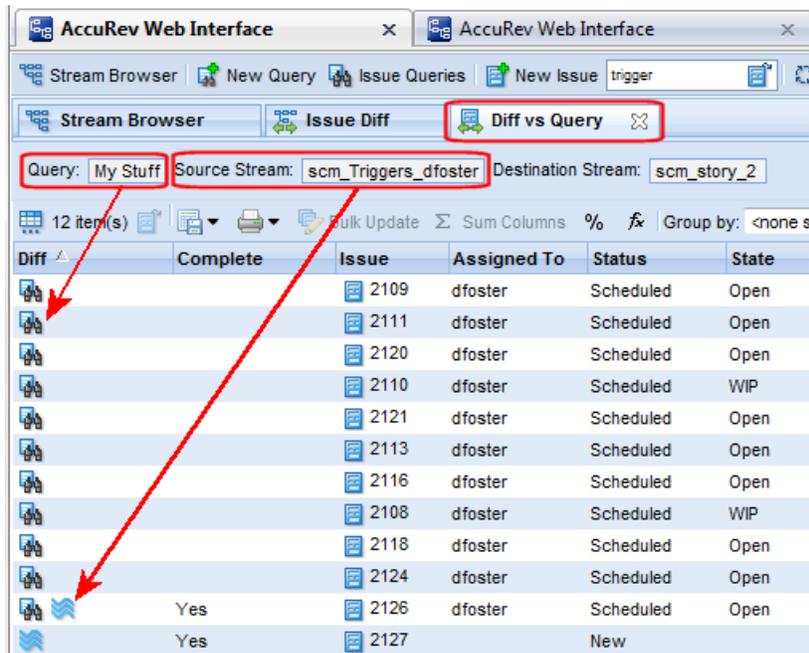
Print

Prints the list of files displayed in the Change Package Contents pane. This command is available from the toolbar only.

Diff vs Query

This feature is available from the Issue Diff tab, and allows you to compare the results of the current **Issue Diff** operation against the results of an issue query. Diff vs Query is useful as an auditing tool, allowing you to verify that the issues that you think are being worked on are those actually being worked on. Make sure that you have a valid issue query defined that can be used with this feature. (See [New Query Tab](#).)

The results of the comparison are displayed on the Diff vs Query tab, with the Query and the Source Stream displayed at the top. Symbols in the Diff column indicate whether an issue was returned by the query () , is present in the source stream () , or both, as shown in the following illustration:



Diff	Complete	Issue	Assigned To	Status	State
		2109	dfoster	Scheduled	Open
		2111	dfoster	Scheduled	Open
		2120	dfoster	Scheduled	Open
		2110	dfoster	Scheduled	WIP
		2121	dfoster	Scheduled	Open
		2113	dfoster	Scheduled	Open
		2116	dfoster	Scheduled	Open
		2108	dfoster	Scheduled	WIP
		2118	dfoster	Scheduled	Open
		2124	dfoster	Scheduled	Open
 	Yes	2126	dfoster	Scheduled	Open
 	Yes	2127		New	

The Complete column indicates whether or not an issue in a stream is complete. (An issue is incomplete when some, but not all, of its change package entries are in the stream.) A value of Yes means the issue is complete; No means the issue is incomplete. If an issue appears only as the result of the query, that is, the issue is not in the source stream, the Complete column is empty.

See [Query Diff](#) to learn how to compare the results of two queries.

To perform a Diff vs. Query operation:

1. In the StreamBrowser, change the display Active Issues Mode () .
2. Perform an Issue Diff operation against two streams.
See [Issue Diff](#) on page 12 if you need help with this step.
3. In the Issue Diff tab, click the **Diff vs Query** button () .
The Query Selection dialog box appears.
4. Select the query whose results you want to compare with the results of the Issue Diff operation, and click **Ok**.
The results are displayed in the Diff vs Query view described earlier in this section.

Using Workflow to Manage Issues

Workflow is AccuRev's issue processing automation and SCM process and policy enforcement tool. Workflow is available only if your AccuRev administrator has created and implemented one or more workflows in your depot.

The remaining sections describe Workflow features and how to use them.

Overview of Workflow Features

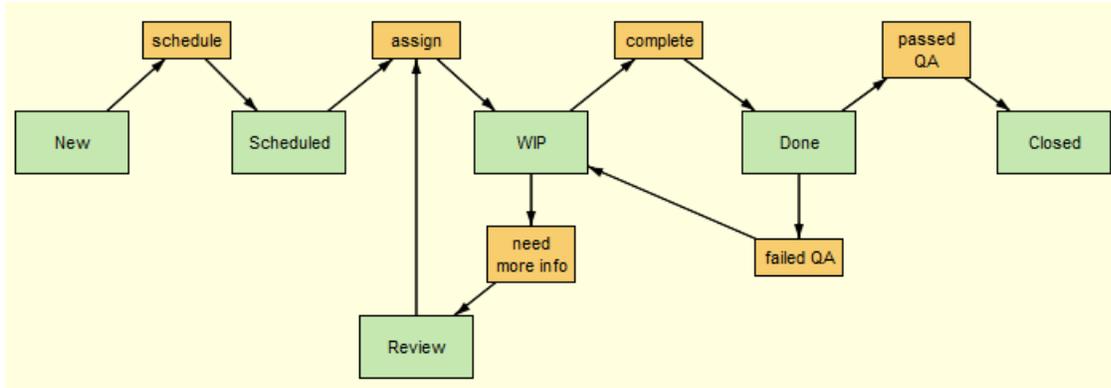
Once your AccuRev administrator has created a workflow for your AccuRev depot, you can take advantage of several features that help automate issue processing and simplify issue management. Using Workflow, you can:

- See which workflow stage a particular issue is in
- Move issues through a workflow
- Examine the workflow associated with the current issue
- Filter query results using a workflow
- Examine the workflow rules associated with a stream

Note: The availability of Workflow features is determined by how your AccuRev administrator configured workflow rules for your depot. If a feature described in this section does not appear to be available to you, contact your AccuRev administrator for more information.

What is a Workflow?

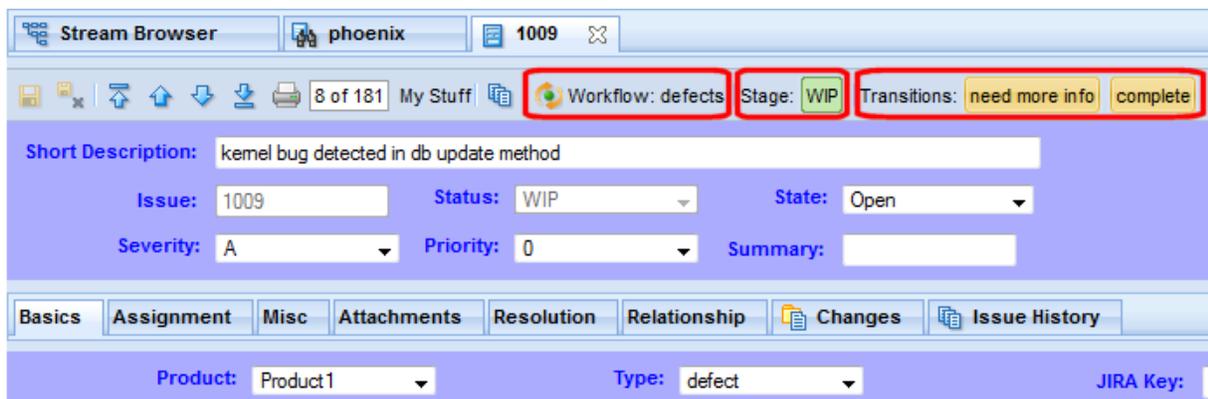
A *workflow* is a model of a software development or release process. In AccuRev, a workflow consists of *stages*, which are represented as green rectangles, and *transitions*, which are represented as orange rectangles; arrows show how transitions move issues from stage to stage through the workflow, as shown in the following illustration:



In this workflow, when a developer finishes work on an issue, she can move the issue from the *WIP* stage to the *Done* stage using the *complete* transition. If she needs more information from, say, the product owner before she can begin work on the issue, she can use the *need more info* transition to move the issue to the *Review* stage, reassigning the issue to the product owner in the process.

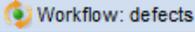
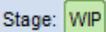
Changes to the Issue Edit Form

Once a workflow has been enabled for your depot, buttons for workflow features can appear on the Issue Edit form toolbar, an example of which is shown here:



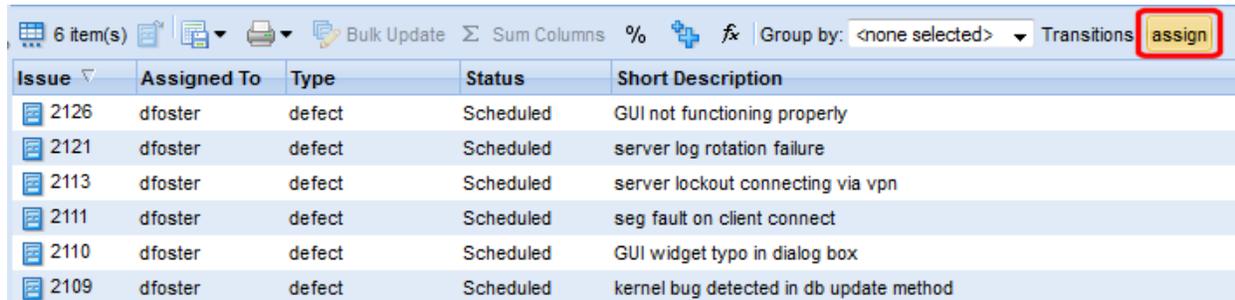
The specific buttons that appear are based on the conditions that have been defined for the workflow, and on the logic that has been defined for individual workflow stages and transitions. The issue in this example is subject to the *defects* workflow. It is currently in the *WIP* workflow stage, from which two transitions are available: *need more info* and *complete*.

Each button is associated with an action, as summarized in the following table.

Workflow Button	What It Does
Workflow: 	Clicking the Workflow button displays a read-only version of the workflow.
Stage: 	Clicking the stage button displays a read-only version of the workflow.

Workflow Button	What It Does
Transitions: Transitions: 	Clicking a transition button executes the transition on the current issue.

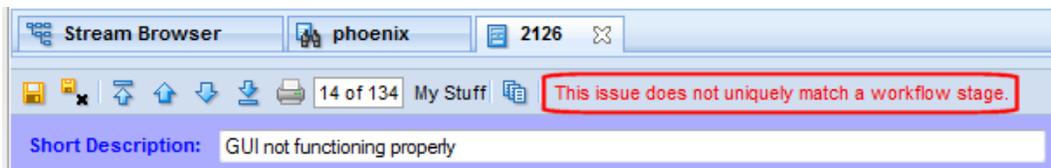
Transition buttons are also displayed on the Results pane.



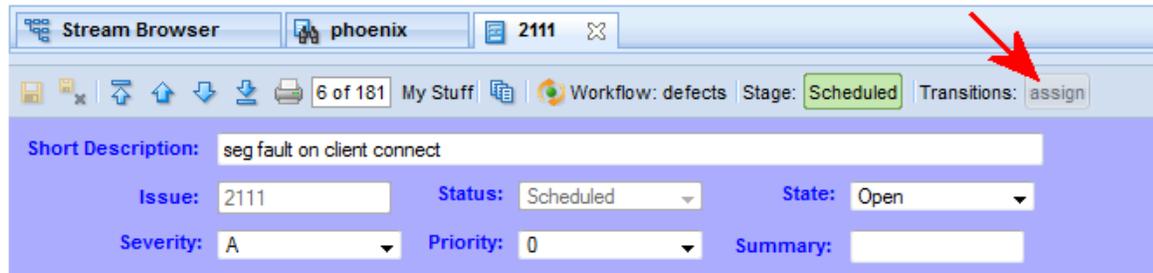
Issue	Assigned To	Type	Status	Short Description
2126	dfoster	defect	Scheduled	GUI not functioning properly
2121	dfoster	defect	Scheduled	server log rotation failure
2113	dfoster	defect	Scheduled	server lockout connecting via vpn
2111	dfoster	defect	Scheduled	seg fault on client connect
2110	dfoster	defect	Scheduled	GUI widget typo in dialog box
2109	dfoster	defect	Scheduled	kernel bug detected in db update method

See [Results Pane](#) on page 62 for more information.

If an issue does not satisfy either the workflow or stage condition, AccuRev displays a message like the one shown here:



Finally, if an issue does not satisfy the conditions for a transition associated with the current stage, AccuRev grays out the transition button, as shown here:



Displaying a Copy of the Workflow Diagram

When you are working with issues in AccuWork, it can be useful to be able to refer to the workflow diagram so that you can gain a sense of where your issue currently resides with regard to other stages in the workflow. If the issue's current stage has more than one available transition, referring to the workflow diagram can help you decide which transition to apply.

To display a copy of the workflow diagram, click either the workflow ( Workflow: defects) or stage ( Stage: WIP) button on the Issue Edit form toolbar.

Note: The copy of the workflow diagram is read-only.

Moving an Issue Through the Workflow

To move an issue through the workflow, click the transition button.

When you do, fields in the issue record are updated based either on the actions specified for the transition or for its new stage, if any. In addition, promoting an issue from one stream to another can cause a workflow transition to be executed depending on the workflow rules your AccuRev administrator has established for the streams in your depot. Examples of the types of changes you might encounter on the Issue Edit form include:

- A new value in the issue's **Status** field
- New stage and transition buttons on the toolbar

If you have questions about the automated changes made to your issue records based on executing a transition, refer to the applicable workflow or see your AccuRev administrator.

Filtering Query Results Using a Workflow

You can use a workflow to filter query results. When you do this:

- Query results are filtered to show only those issues that satisfy the conditions specified for the workflow you select.
- You can select one or more workflow stages from a copy of the workflow diagram to further filter the query results to show only those issues that are in the stages you select.

The following illustration shows the *defects* workflow being used to filter results from the My Stuff query; this query returns all issues assigned to user dfoster. The condition for the *defects* workflow specifies that issues have a **Type** field value of defect. In addition, the Scheduled stage has been selected in the workflow diagram:

The screenshot displays the AccuRev web interface. At the top, the 'Workflow: defects' is selected. A dropdown menu shows 'Filter by Workflow: defects'. Below this, a workflow diagram is shown with stages: New, Scheduled, assign, WIP, complete, passed QA, Closed, Done, failed QA, need more info, and Review. The 'Scheduled' stage is highlighted with a red box, and a red arrow points from it to the 'Transitions: assign' button in the table's toolbar. The table below shows 6 items with columns: Issue, Assigned To, Type, Status, and Short Description.

Issue	Assigned To	Type	Status	Short Description
2126	dfoster	defect	Scheduled	GUI not functioning properly
2121	dfoster	defect	Scheduled	server log rotation failure
2113	dfoster	defect	Scheduled	server lockout connecting via vpn
2111	dfoster	defect	Scheduled	seg fault on client connect
2110	dfoster	defect	Scheduled	GUI widget typo in dialog box
2109	dfoster	defect	Scheduled	kernel bug detected in db update method

Notice that query result operations like bulk update and group by are available for filtered results. In addition, buttons for any applicable transitions are also displayed.

How to Use a Workflow to Filter Query Results

To use a workflow to filter query results:

1. Run a query as you would normally. See [Creating a Query](#) on page 62 if you need help with this step. Issues are displayed in the Query Results pane.
2. Select the workflow you want to use as a filter from the **Filter by Workflow** drop-down list.
A copy of the workflow diagram appears in the Query Results pane; the query results are automatically filtered to display only those issues that satisfy the conditions defined for the workflow you have chosen to use as a filter.
3. If you want to further filter issues based on a particular workflow stage, click the stage in the workflow diagram.

Tip: You can Ctrl+ click or drag select to select multiple workflow stages.

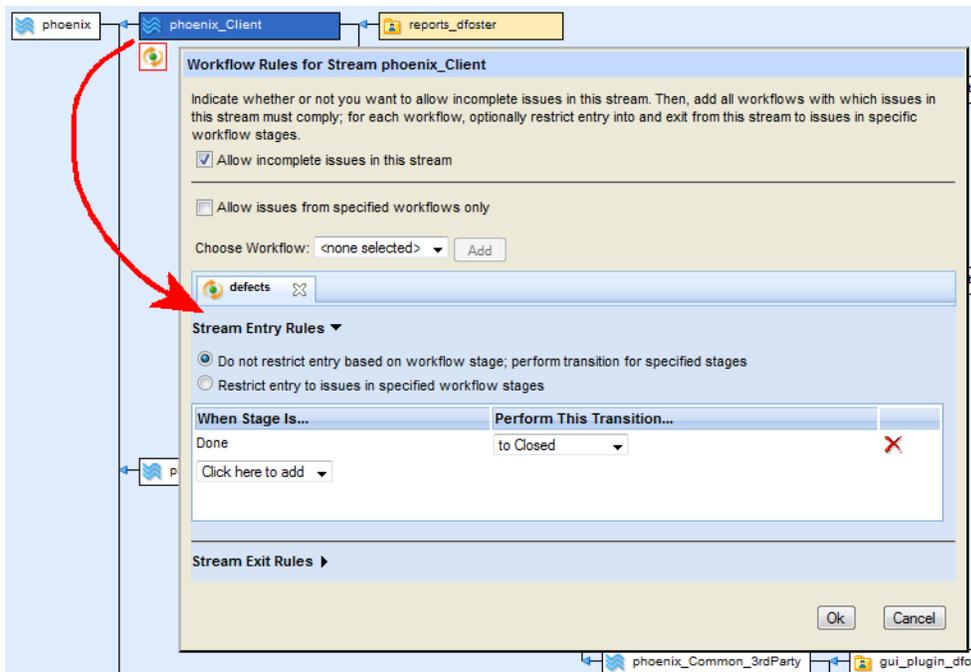
Reviewing Workflow Rules for a Stream

In addition to using Workflow to automate issue management, Workflow can also be used to enforce your organization's SCM policies. For example, your release manager might want to restrict what issues can be promoted into your build stream.

If workflow rules have been set for a stream in your depot, AccuRev displays a workflow icon, like the one on the phoenix_Client stream shown here:



You can click this icon to display the Workflow Rules for Stream dialog box. This dialog box displays the workflow rules specified for a stream:



Security settings established by your AccuRev administrator might restrict users from changing the workflow rules displayed here. See your AccuRev administrator if you have any questions.

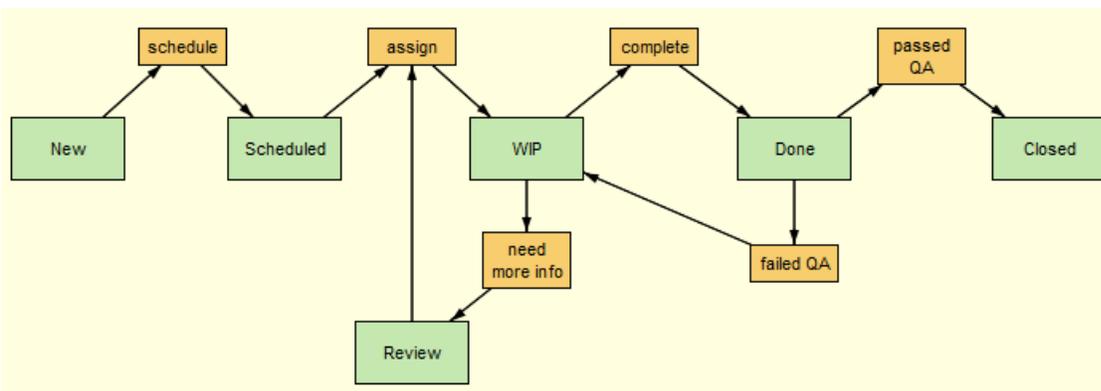
4. Using Workflow to Enforce SCM Policy

This chapter describes *workflow*, the AccuRev issue tracking and SCM feature for process and policy compliance, and how to use it to enforce rules established for your organization’s issue management, development, and release processes.

This chapter is for the AccuRev administrator or the individual responsible for implementing workflow. AccuRev users should refer to [Using Workflow to Manage Issues](#) on page 114 to learn how to use workflow to manage issues in AccuWork.

What is a Workflow?

A *workflow* is a model of a software development or release process. In AccuRev, a workflow consists of *stages*, which are represented as green rectangles, and *transitions*, which are represented as orange rectangles; arrows show how transitions move issues from stage to stage through the workflow, as shown in the following illustration:



In this workflow, when a developer finishes work on an issue, she can move the issue from the *WIP* stage to the *Done* stage using the *complete* transition. If she needs more information from, say, the product owner, she can use the *need more info* transition to move the issue to the *Review* stage, reassigning the issue to the product owner in the process.

You can create multiple workflows for a single AccuRev depot—for example, you might create one workflow to manage issues that are defects, and another to manage issues that are enhancements, or you might decide to use different workflows for different project streams.

Workflow Stages

A *workflow stage* represents a phase in your development or release process. For example, your development process might have New, Scheduled, WIP (work-in-progress), and Closed phases, among others. In a workflow, stages typically correspond to the values of the *status* field in your AccuWork schema, but you can use whatever field in your schema you need to create a workflow to model your organization’s process.

Conditions defined for a stage determine whether or not an issue can be in that stage. For example, the condition for the *WIP* stage might be defined as *Status = WIP* restricts entry into what workflow stage to issue records whose **Status** field is set to *WIP*. A workflow stage must have at least one condition defined for it before an issue can be in that stage.

You can also define actions to perform on the issue when it enters the stage (entry actions), and actions to perform each time the record is saved (validation actions). An example of a validation action might be to ensure that a required field has a value specified for it.

See [Creating and Managing Workflow Stages](#) on page 138 for more information.

Workflow Transitions

A *workflow transition* links stages in a workflow; it represents how an issue may move from one workflow stage to another. For example, a transition named *assign* might link the *Scheduled* and *WIP* workflow stages and be executed when a developer is assigned an issue from the backlog. You can optionally define actions and conditions for transitions. For example, you might define an action for the *assign* transition that sets the issue record's **Assigned To** field to a certain user.

See [Creating and Managing Workflow Transitions](#) on page 146 for more information.

Benefits of Using Workflow

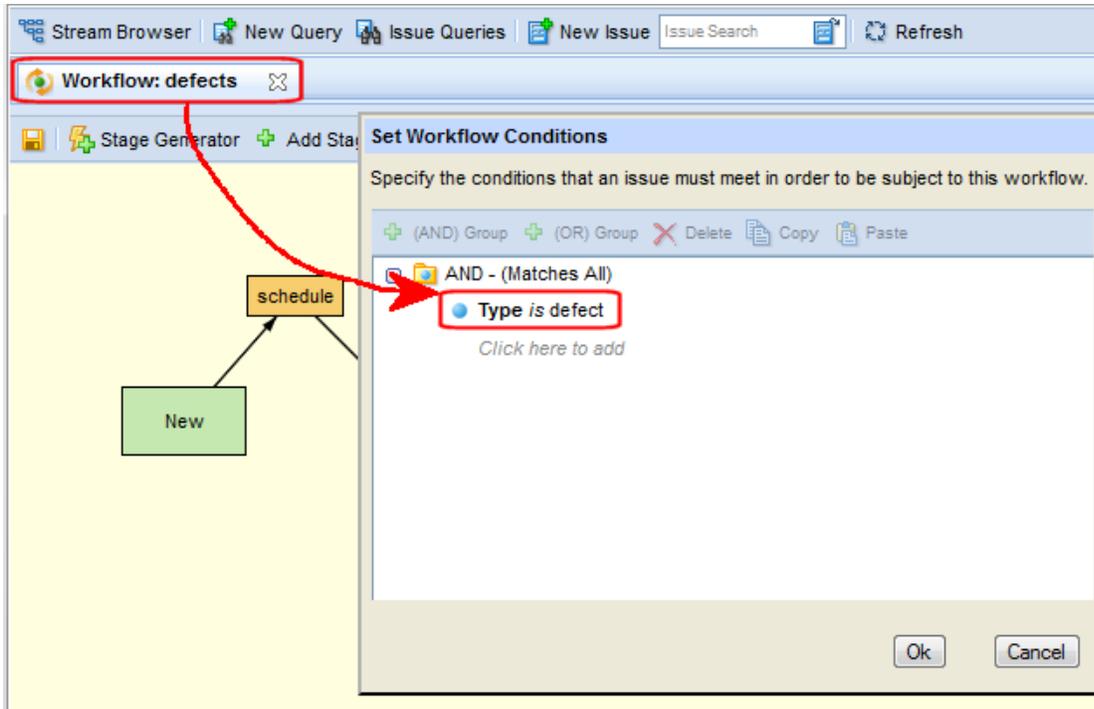
You can use a workflow to:

- Automate issue processing
- Enforce compliance with SCM development and release process policies

This section provides an overview of workflow features that are used to support process automation and policy compliance.

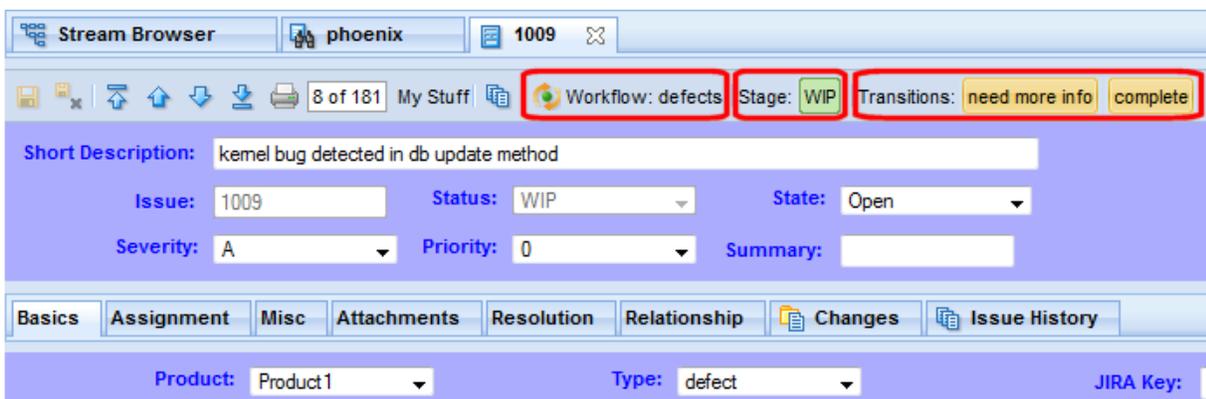
Issue Management Process Automation

Part of creating a workflow includes specifying one or more conditions that an issue must meet in order to be subject to that workflow. For example, if you want to use a workflow to manage defects in your system, you might name that workflow "defects" and create the condition for that workflow as *Issue Type = defect*. By specifying the condition *Issue Type = defect* for the workflow, any issues with a type of defect—and *only* issues with a type of defect—will be subject to the rules you specify in the "defects" workflow. The process of specifying a condition for a workflow is referred to as *activating* the workflow.



How Automation is Supported

Once you have activated a workflow, the Issue Edit form for issues under workflow control displays both the issue's current stage, and the transitions that are available in that stage, as shown in the following illustration:



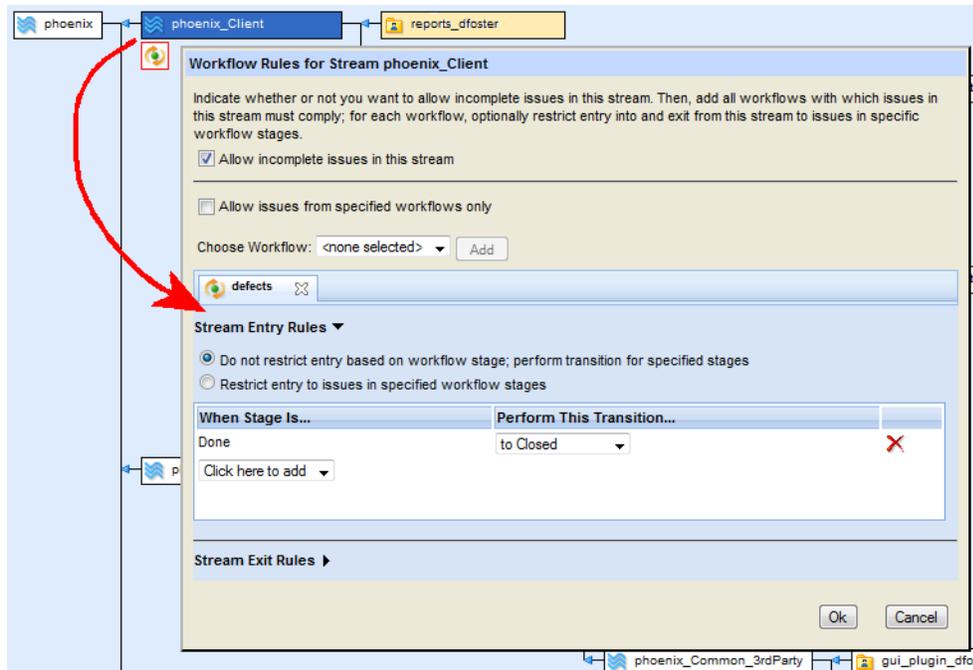
In this example, the user can click either the **complete** or **need more info** transition buttons. If there is a question about the workflow, clicking the stage button (here it is **WIP**) displays a read-only version of the workflow diagram. Only those transitions that are applicable to the current stage are displayed, allowing easy enforcement of your workflow process rules.

Clicking a transition button executes the actions specified in the workflow. For example, clicking the **complete** transition button might change the value of the **Status** field from WIP to Review, and change the value of the **Assigned To** field to a user on the QA team, moving the issue from the WIP to the Done stage in the process.

These tools help reduce errors, improve efficiency, and enforce workflow compliance by preventing users from modifying fields that would remove the issue from the workflow and supplying default values for required fields, for example.

Release and Development Policy Enforcement

The same workflow you use to automate issue processing in AccuWork is used to enforce release and development process policies in your AccuRev streams. In the StreamBrowser, you simply associate the workflow with the stream you want to control, and then specify the workflow rules you want enforced for that stream:



Setting workflow rules for a stream lets you:

- Specify whether or not you want AccuRev to allow incomplete issues to enter the stream.
- Specify whether you want AccuRev to use workflow rules exclusively when determining which issues can be in a stream, or whether you want workflow rules to apply only to issues of a specific type without preventing other issue types from entering the stream.
- Set workflow rules that restrict entry into and/or exit from a stream to issues in a given workflow stage. For example, you might want to restrict entry into your build stream to those issues whose status is Closed.
- Optionally perform a transition for issues when they enter or exit the stream.

By combining AccuRev's streams-based SCM technology with the AccuWork issue-tracking system, workflow provides you with the tools you need to manage the issues, tasks, files, versions, and people associated with projects across the enterprise.

Workflows on Multiple Streams

You can use workflow on multiple streams in a depot. This allows you to define separate workflows—each with its own stages, transitions, and workflow rules—for different development efforts in your

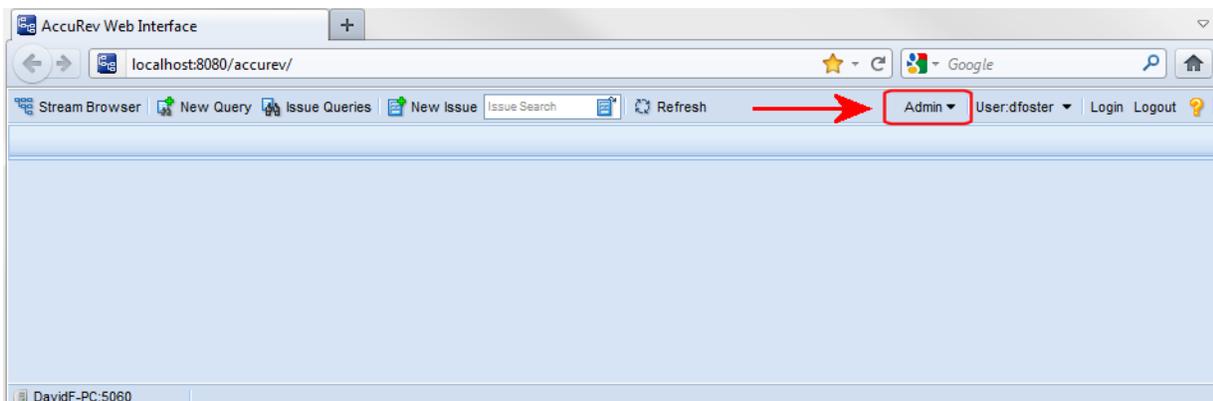
organization that are under AccuRev control. For example, you might want to define a workflow with one set of stages and transitions for new product development and another, with different stages and transitions, for the maintenance efforts associated with existing products. Multiple workflow support is ideal for development organizations that use separate streams to manage development efforts for new and existing software.

Quick Start: Implementing a Simple Workflow

This Quick Start tells you how to implement a simple workflow that enforces both issue management and SCM policies. The Quick Start describes the easiest way to implement a workflow in AccuRev; because of this it makes certain assumptions about the AccuWork schema and the need to customize workflow stages and transitions. Links to more detailed descriptions of each step in the process are provided throughout the Quick Start.

Before You Begin

Tools for creating and implementing a workflow are available only in the Web UI for AccuRev. Before you begin, verify that the **Admin** menu appears on the AccuRev Web UI toolbar:



The **Admin** menu is the starting place for all workflow activities.

Process Overview

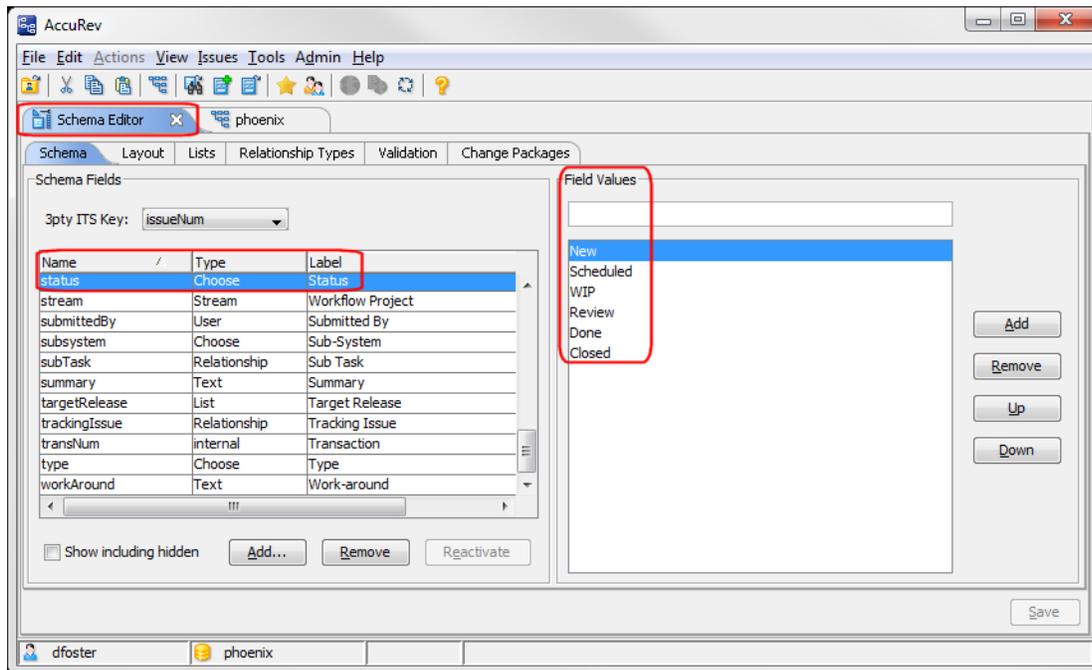
The following table summarizes the process of implementing a workflow in AccuRev:

Step	Description
1	Decide which field in your AccuWork schema you want to use to represent your workflow stages.
2	Give the workflow a name, and specify one or more conditions an issue must meet in order to be subject to the workflow.
3	Use the Stage Generator to automatically generate workflow stages and transitions.
4	Set up workflow rules on the streams for which you to enforce development and release policies.

Step 1: Identify the Workflow Stage Field in Your AccuWork™ Schema

To create a workflow, first identify the field in your AccuWork schema that you want to use to represent the stages in your workflow—you might want your workflow to have *New*, *Scheduled*, *WIP* (work-in-progress), and *Closed* stages, for example.

Chances are good that your AccuWork schema already contains such a field—a field like *Status* or *State*, for example, that you can use for this purpose, but you will have to create one if it does not. You review—and optionally modify—your AccuWork schema using the AccuRev Java GUI, shown here:



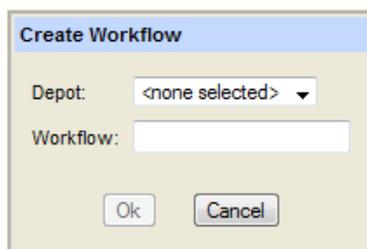
For more information. See the Java GUI online help for more information on using the Schema Editor.

Step 2: Create and Activate the Workflow

Once you know which AccuWork schema field you will use to represent your workflow stages, you can create and activate the workflow.

1. Start the AccuRev Web UI, and choose **Admin > Create Workflow** from the toolbar.

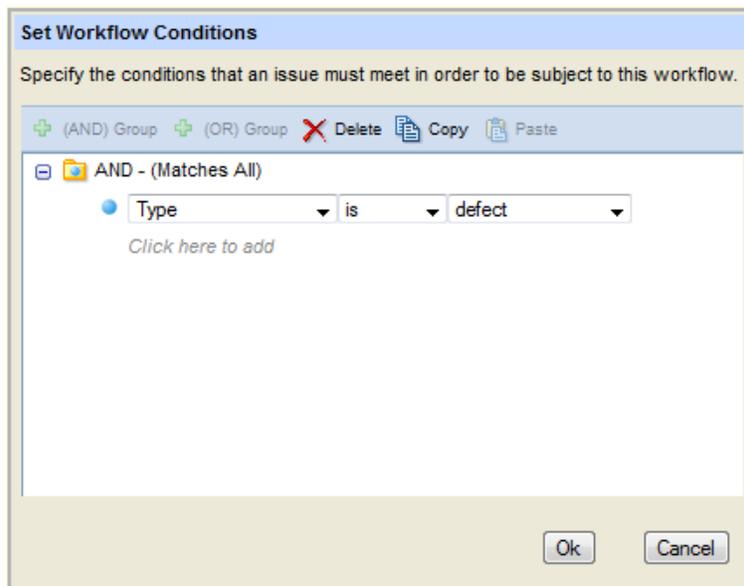
The Create Workflow dialog box appears:



2. Specify the depot in which you want to create the workflow, enter a workflow name, and click **Ok**.

The Set Workflow Conditions dialog box appears.

3. You use the Set Workflow Conditions dialog box to specify the conditions that an issue must meet in order to be subject to the workflow. For example, if you are creating a workflow to manage defects, you might set the workflow condition to *Type is defect*, as shown here:



Workflow conditions can be as simple as the one shown here, but you can use any combination of AND and OR statements you need. Note that *only* those issues that satisfy the conditions you specify here are subject to the workflow. In this example, issues with a type of, say, Enhancement are not subject to this workflow. Finally, the conditions you specify for a workflow must be unique for all workflows within a depot.

When you are finished specifying workflow conditions, click **Ok**. The Workflow Editor—an empty canvas and a toolbar—appears.

Note: A workflow is not *activated* until you set conditions for it. That is, you can fully describe a workflow’s stages and transitions, but you cannot use that workflow to automate issue processing or to enforce SCM policies until you specify the types of issues to which it applies.

For more information. The Set Workflow Conditions dialog box has the same features and uses the same mechanics as the AccuRev Web UI Query Builder. See [Working with the Query Builder](#) on page 64 for more information on this topic.

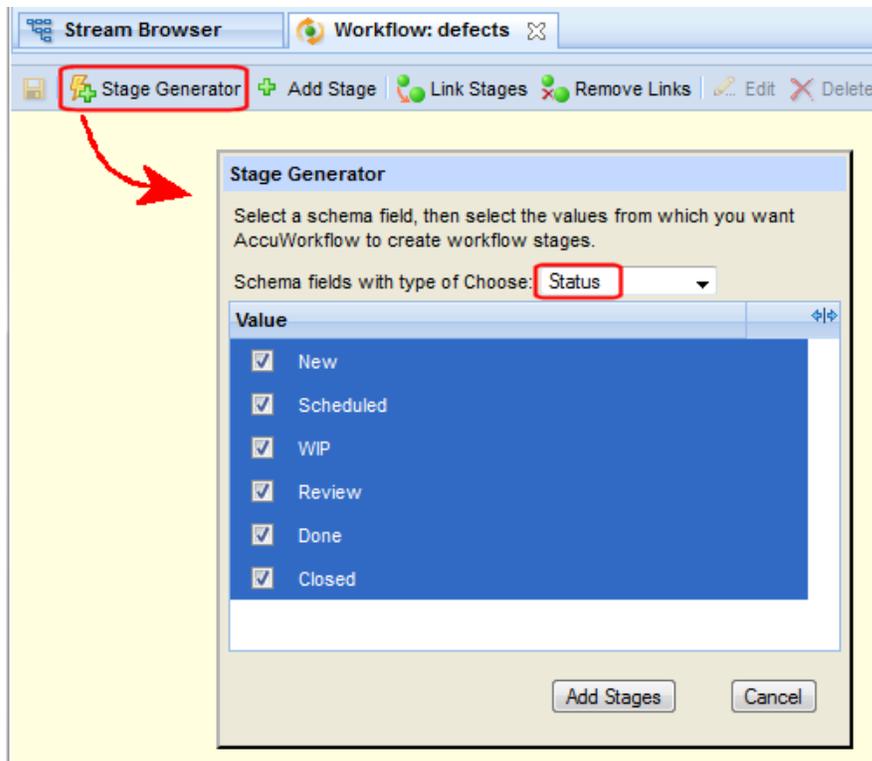
For more detailed information on creating workflows, see [Creating and Managing Workflows](#) on page 134.

Step 3: Create Workflow Stages and Transitions

Now that you have created the workflow and specified conditions for it, you can create workflow stages and transitions. You can create stages and transitions manually, but we will use the Stage Generator to automatically generate these workflow objects for us.

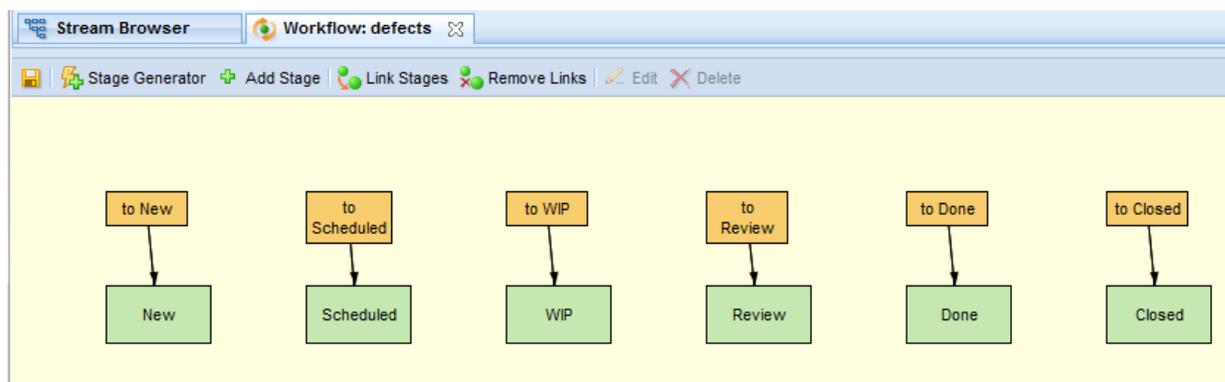
1. In the Workflow Editor toolbar, click the **Stage Generator** () button.

The Stage Generator dialog box appears. You use the **Schema fields with type of Choose** field to specify the field in the AccuWork schema whose values represent your workflow stages. You use the **Value** field to indicate the values for which you want to create workflow stages.



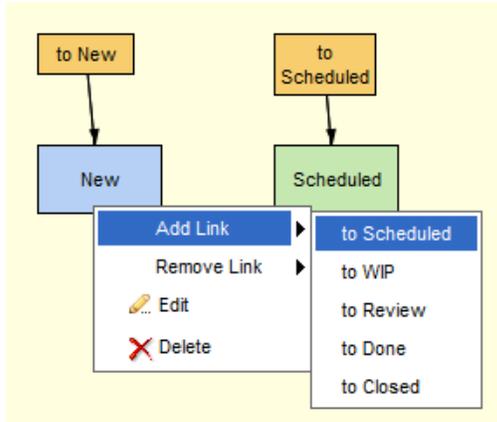
2. Select the desired field and values for your workflow stages (here we have chosen the *Status* field and selected all of the values defined for that field in the AccuWork schema), and click the **Add Stages** button.

AccuRev populates the workflow with one stage for every value selected in the Stage Generator (*New*, *Scheduled*, and so on), and one transition for each stage (*to New*, *to Scheduled*, and so on):

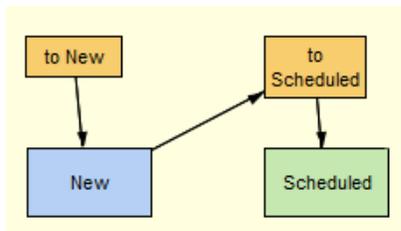


The next step is to use these transitions to link one stage to another to create the workflow.

3. To link the *New* stage to the *Scheduled* stage, for example: right-click the *Scheduled* stage and choose **Add Link > to Scheduled** from the context menu, as shown here:

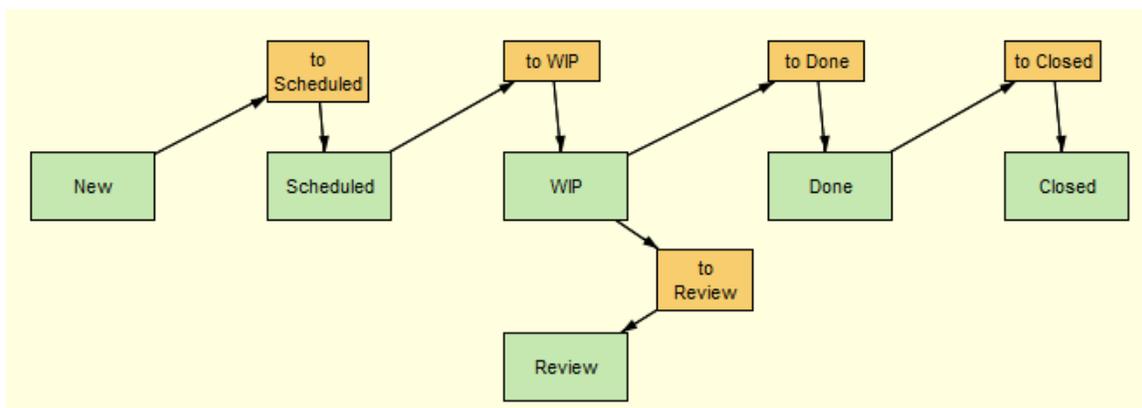


When finished, the workflow diagram for the *New* and *Scheduled* stages looks like this:



4. Repeat this procedure to link the remaining stages in the workflow in the same way—link *Scheduled* to *WIP*, *WIP* to *Done*, and so on.
5. Next, make a few small changes to the workflow diagram so that it more closely reflects the workflow process:
 - Delete the *to New* transition (new issues are created with a Status of *New*, and thus are placed in the *New* stage by default; that is, they do not come from another stage in the workflow).
 - Link the *WIP* and *Review* stages to reflect the process by which an issue is returned to the submitter for more information.
 - Use the Workflow Editor drag-and-drop feature to rearrange the workflow layout as desired.

When finished, the resulting *defects* workflow should look something like this:

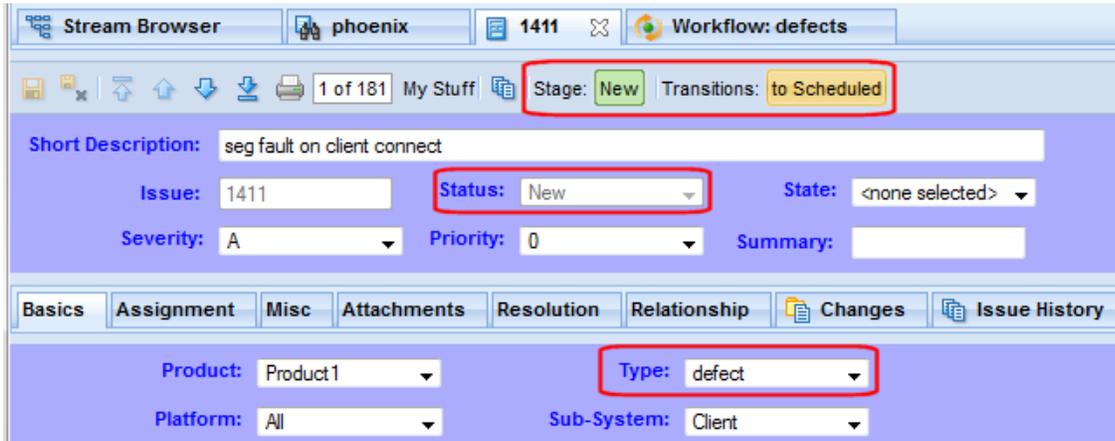


6. Click the **Save** button (💾) to save your work.

Workflow for Issue Management is Complete

At this step of the workflow implementation process, workflow for issue management is complete. Now that the workflow is activated (by specifying the workflow condition as *Type = defect*), and its stages and transitions have been defined, all issues whose **Type** field is set to defect are subject to the rules defined in this workflow.

For the AccuRev user, the Issue Edit form for defects will now display the issue's current stage, and the transitions that can be executed from that stage, as shown here:



The screenshot shows the AccuRev Issue Edit form for a defect. The form is titled "Stream Browser" and "Workflow: defects". The issue number is 1411. The short description is "seg fault on client connect". The issue details include: Issue: 1411, Status: New, State: <none selected>, Severity: A, Priority: 0, and Summary: . The form has tabs for Basics, Assignment, Misc, Attachments, Resolution, Relationship, Changes, and Issue History. The Basics tab is selected, showing Product: Product 1, Platform: All, Sub-System: Client, and Type: defect. The Stage is New and the Transitions are to Scheduled.

Note the ways in which workflow enforces issue processing compliance:

- The issue can be moved through the workflow only by using those transitions that are displayed on the Issue Edit form; a transition's availability is based on the workflow rules, including the workflow's current stage and conditions, if any, you have specified for the transition.
- The AccuRev user cannot manually change the issue's status. When you create a workflow stage using the Stage Generator, AccuRev automatically makes the field you use read-only.

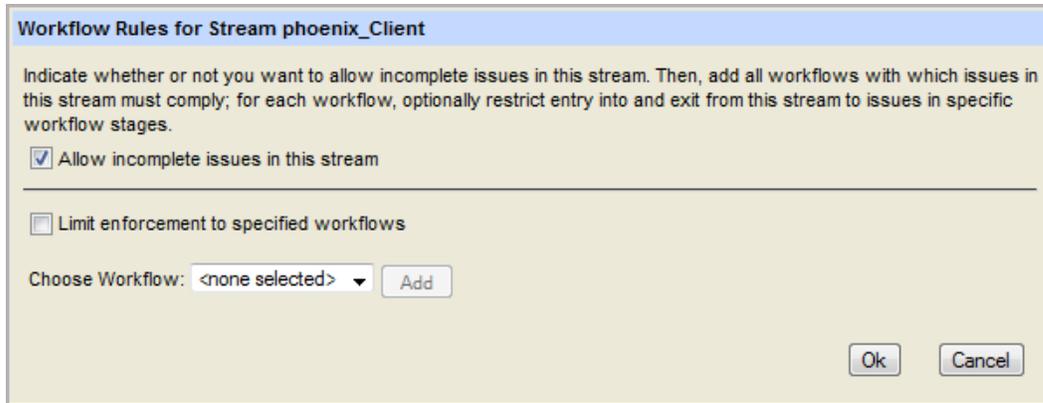
For more information. See [Creating and Managing Workflow Stages](#) on page 138, [Linking Workflow Stages](#) on page 150, and [Creating and Managing Workflow Transitions](#) on page 146 for more information on the topics described in this step.

Step 4: Use the Workflow to Enforce SCM Policies

Once you have created a workflow, you can use it to enforce compliance with your SCM development and release policies. You might want to ensure that only defects in the *Done* stage can be promoted to your QA stream, and that only defects in the *Closed* stage can be promoted to your Production stream, for example. You do this using workflow stages to create rules that restrict entry into and, optionally, exit from a stream.

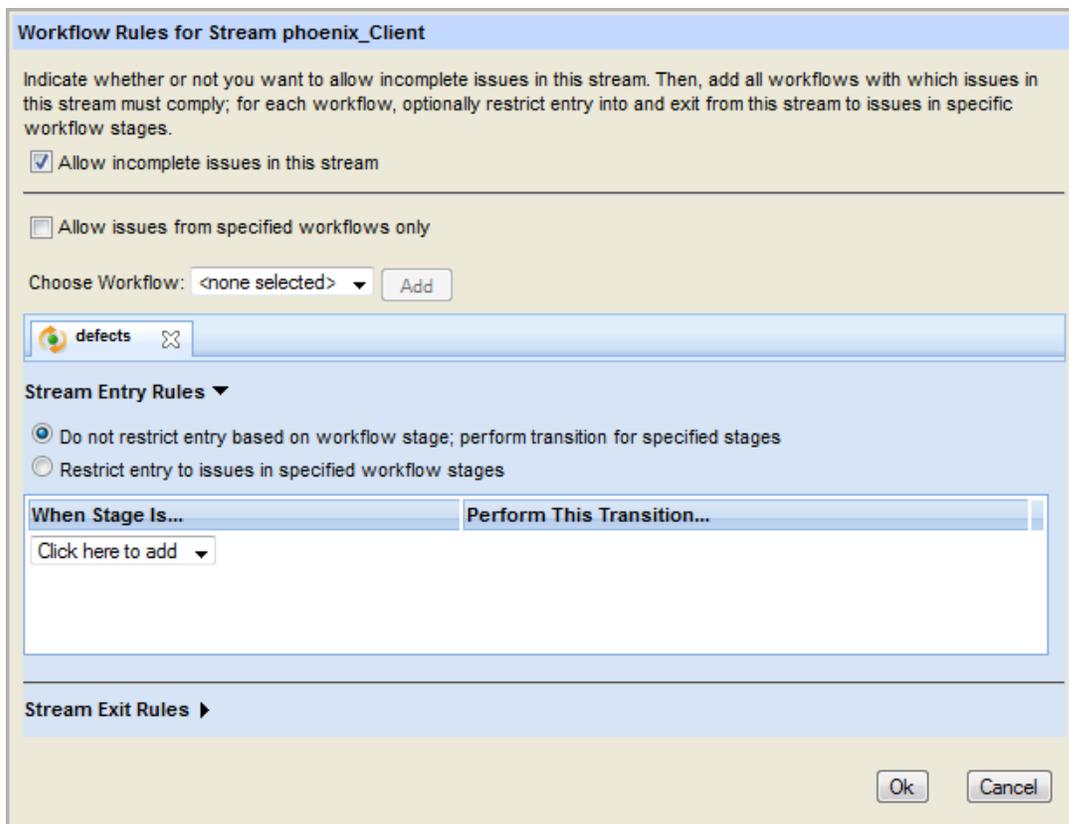
1. Open the StreamBrowser in the AccuRev Web UI.
2. Right-click the stream for which you want to enforce compliance and choose **Workflow Rules...** from the context menu.

The Workflow Rules for Stream dialog box appears.



3. By default, AccuRev allows incomplete issues in a stream. Clear the **Allow incomplete issues in this stream** check box if you want to restrict entry to complete issues.
4. In the **Choose Workflow** field, select the workflow whose stages you want to use to create stream entry and exit rules. In this example, we use the *defects* workflow created earlier and click the **Add** button.

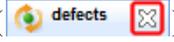
A tab displaying options for stream entry and exit rules for the selected workflow appears.



5. By default, *all* issue types are allowed in the stream; AccuRev uses the specified workflow to enforce rules only on those issues that are subject to that workflow. If you want to restrict entry to this stream to *only* those issues that are subject to this workflow, select the **Allow issues from specified workflows only** check box; stream entry and exit rules, if any, are enforced on those issues.

To *further* restrict entry into or exit from a stream to issues in a specific workflow stage:

1. In the **Stream Entry Rules** section, select the **Restrict entry to issues in specified workflow stages** radio button.
2. In the **When Stage Is** column, select the stage you want an issue to be in before it can be promoted to this stream. For example, you might want to restrict entry to the QA stream to issues whose status is Done—that is, development is finished and the issue is ready to be verified by QA.
3. Optionally, in the **Perform This Transition** field select the transition you want AccuRev to execute when the issue is promoted to the stream for which you are setting workflow rules. For example, when an issue is promoted to the QA stream, you might want to execute the to Closed transition, which changes the issue's **Status** field from Done to Closed.
4. If you choose, you can also specify rules to restrict exit from a stream; click the down arrow next to **Stream Exit Rules** to display those fields.
5. If you want to set rules on this stream for a different workflow, return to [Step 4](#); otherwise, click the **Ok** button on the Workflow Rules dialog box to save the workflow rules for this stream.

Note: Clicking the X icon on the workflow tab () *deletes* the workflow rules for that workflow. It does not simply close the tab.

When you are done, streams for which you have set up workflow rules display a workflow icon, like the one on the phoenix_Client stream shown here:



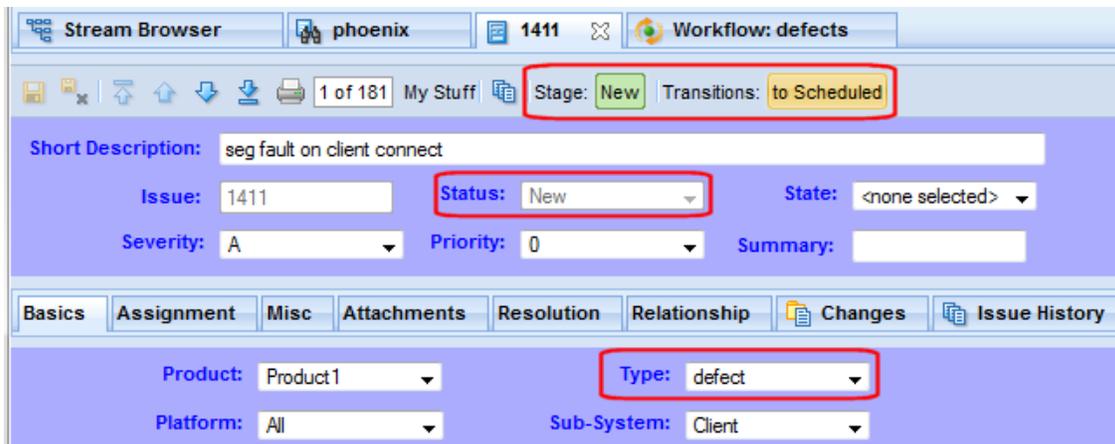
Tip: You can click this icon to display the Workflow Rules for Stream dialog box to review and modify the workflow rules specified for a stream at any time.

For more information. See [Using Workflow to Enforce SCM Policies](#) on page 161 for more information on the topics described in this step.

Summing Up: Results of Implementing a Workflow

Implementing a workflow for issues with the type of defect as described in this Quick Start has resulted in the following behavior:

- Only issues with a **Type** field whose value is set to *defect* come under the control of this workflow.
- For defects, the Issue Edit form displays buttons that identify the issue's current workflow stage, and the transitions that can be executed from that stage.

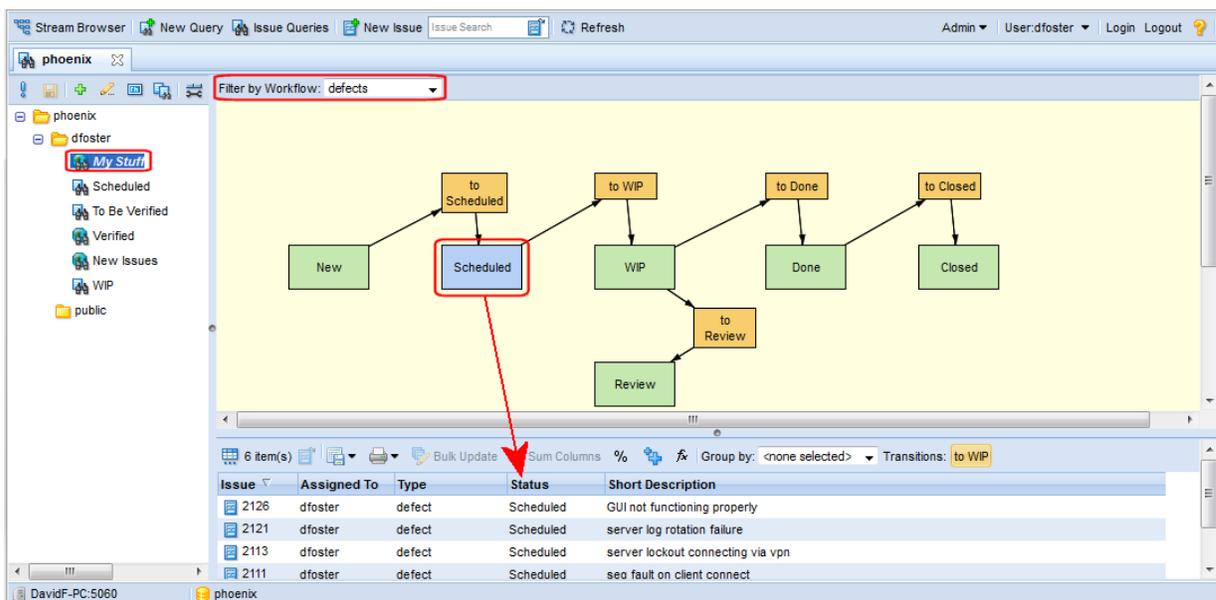


Clicking the stage button (here, it is **New**) displays a read-only version of the workflow diagram, providing users with an understanding of where their issue is relative to other stages in the workflow.

Clicking a transition button (here it is **to Scheduled**, but there might be more than one) moves the issue through the workflow. The availability of a transition is based on the issue's current stage and any conditions you have defined for the transitions—you might specify a condition that makes a particular transition available only to a specific user or group, for example.

Finally, notice that the **Status** field is read-only—it can be updated only by AccuRev based on actions defined for the appropriate workflow stage or transition.

- In addition to issue automation, AccuRev users can now use the workflow to filter query results based on the issue type specified in the workflow condition. Query results can be filtered further by workflow stage. This illustration, for example, shows all defects in the Scheduled stage for the user dfoster:



- Once the *defects* workflow is associated with a stream, *only* issues whose type is defect are allowed in that stream.

- Additional restrictions were defined for issues entering the stream—in the Quick Start example, only issues in the Done stage can be promoted into the QA stream.

What to Do Next

The Quick Start showed you how to use the Stage Generator and tools in the Workflow Editor to quickly create a functional workflow that provides both issue process automation and compliance with development and release process policies. The remaining sections in this chapter revisit each of the steps in the QuickStart in greater detail. Refer to them to learn more about additional workflow features and functionality.

Creating and Managing Workflows

This section describes how to create and manage workflows, including procedures for defining workflow conditions, and opening, renaming, and deleting workflows.

Restricting Access to Workflow Administration

By default, the ability to perform workflow administration operations (creating and deleting, renaming, associating with streams, and so on) is limited to the AccuRev users in your Admin group if you are using the **server_admin_trig** trigger to enforce AccuRev security. To restrict access to workflow operations in this case, simply ensure that the AccuRev users who will be responsible for implementing workflow are members of this group.

For more information on the **server_admin_trig** trigger, see the AccuRev Triggers topic in the AccuRev® *Administrator's Guide*. To learn more about other ways to implement security in AccuRev, see the AccuRev Security Overview topic, which is also in the AccuRev® *Administrator's Guide*.

Creating a Workflow

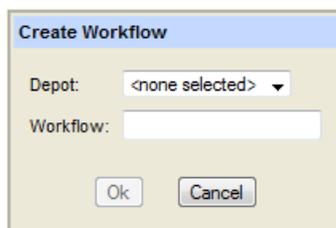
You can create one or more workflows for a depot. Note that a workflow is not activated until you define conditions for it. See [Activating a Workflow: Defining Workflow Conditions](#) on page 135 for more information.

Tip: You can also create a workflow by copying an existing workflow and specifying a unique set of conditions for it. See [Copying a Workflow](#) on page 136 for more information.

To create a workflow:

1. In the AccuRev Web UI, click the **Admin** menu and choose **Create Workflow**.

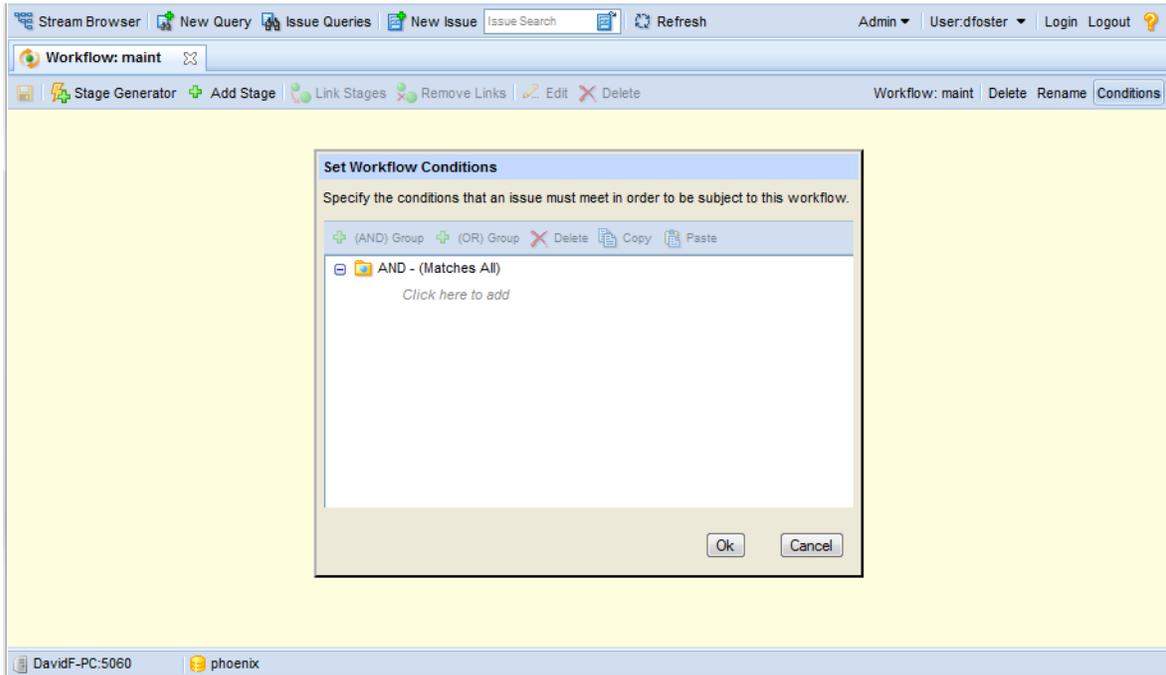
The Create Workflow dialog box appears.



2. In the **Depot** field select the depot for which you want to create a workflow.
3. In the **Workflow** field, enter a name for the workflow. Workflow names are not case-sensitive.

4. Click **Ok**.

The Workflow Editor appears, along with the Set Workflow Conditions dialog box.



If you want to specify workflow conditions now, see [Activating a Workflow: Defining Workflow Conditions](#) on page 135. To specify them another time, click **Cancel**.

The workflow is empty by default. To get started defining your workflow, see [Creating and Managing Workflow Stages](#) on page 138.

Activating a Workflow: Defining Workflow Conditions

In order for AccuRev to use a workflow for issue process automation and SCM policy enforcement, you must *activate* the workflow. You activate a workflow by defining one or more conditions that identify the issues are subject to it. For example, you might decide to create a workflow to manage issues that are defects. In this case, you would define the condition for the workflow as *Type = Defect*. Thereafter, any issue in the depot whose **Type** field has a value of Defect is subject to the rules defined in that workflow.

Note: The conditions you specify for a workflow must be unique for all workflows within a depot.

Where to Define Workflow Conditions

You define workflow conditions using the Set Workflow Conditions dialog box, as shown in [Step 4](#) in [Creating a Workflow](#) on page 134. Workflow conditions can be defined using any simple or compound clauses you need, including nested AND and OR statements.

The Set Workflow Conditions dialog box has the same features and uses the same mechanics as the AccuRev Web UI Query Builder. See [Working with the Query Builder](#) on page 64 for more information.

When to Define Workflow Conditions

You can define workflow conditions at the same time you create the workflow, or later. Remember, however, that a workflow is inactive until you have defined its conditions. AccuRev prompts you to define workflow conditions when you:

- Create a workflow (after you specify the name and depot for the workflow)
- Exit a workflow (if you have not already defined conditions for the workflow)

Displaying the Set Workflow Conditions Dialog Box

You can display the Set Workflow Conditions dialog box for any open workflow by clicking the **Conditions** button on the Workflow Editor toolbar.

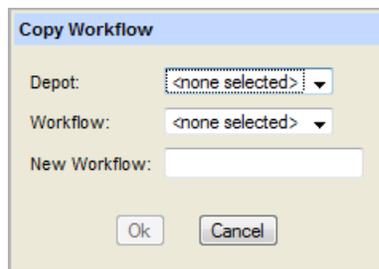
Copying a Workflow

You can create a new workflow by copying an existing workflow and giving it a unique name and unique conditions.

To copy a workflow:

1. In the AccuRev Web UI, click the **Admin** menu and choose **Copy Workflow**.

The Open Workflow dialog box appears.



2. In the **Depot** field, select the depot whose workflow you want to copy.
3. In the **Workflow** field, select the workflow you want to copy.
4. In the **New Workflow** field, enter a name for the new workflow.
5. Click **Ok**.

AccuRev displays a message reminding you that you need to create a unique set of conditions in order to activate the workflow.

6. Click **Ok**.

AccuRev displays the Set Workflow Conditions dialog box.

7. Specify a set of conditions for the new workflow.
8. **Important:** The conditions for this workflow must be unique. See [Activating a Workflow: Defining Workflow Conditions](#) on page 135 for more information.
9. Make any changes needed to the new workflow. See [Creating and Managing Workflow Stages](#) on page 138 and [Creating and Managing Workflow Transitions](#) on page 146 if you need help with this step.

Opening a Workflow

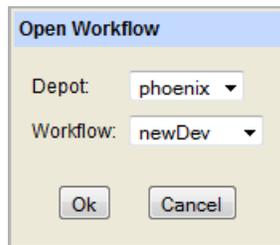
You can open a workflow for the current depot, or for any depot you choose.

Tip: You must open a workflow if you want to rename it or delete it.

To open a workflow:

1. In the AccuRev Web UI, click the **Admin** menu and choose **Open Workflow**.

The Open Workflow dialog box appears.



2. To open a workflow defined in the current depot, select it from the **Workflow** field and click **Ok**.
To open a workflow for a different depot, first change the depot in the **Depot** field, then select the workflow and click **Ok**.

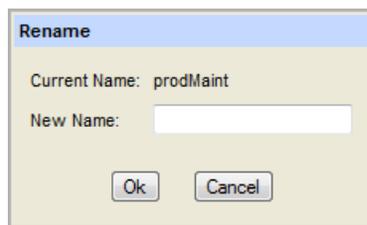
Renaming a Workflow

You can rename a workflow only if it is open in the Workflow Editor. You can rename a workflow even if it is already associated with a stream.

To rename a workflow:

1. Open the workflow you want to rename. See [Opening a Workflow](#) on page 137 if you need help with this step.
2. Click the **Rename** button on the Workflow Editor toolbar.

The Rename Workflow dialog box appears.



3. Enter a name in the **New Name** field and click **Ok**.

The new workflow name appears in the Workflow Editor tab, and in a label in the upper right corner of the Workflow Editor window.

Deleting a Workflow

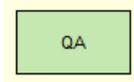
You can delete a workflow only if it is open in the Workflow Editor. Deleting a workflow that is currently associated with a stream removes any workflow rules set on that stream. See [Using Workflow to Enforce SCM Policies](#) on page 161 to learn more about setting workflow rules for a stream.

To delete a workflow:

1. Open the workflow you want to delete. See [Opening a Workflow](#) on page 137 if you need help with this step.
2. Click the **Delete** button on the Workflow Editor toolbar.
AccuRev displays a message asking you to confirm that you want to delete the workflow.
3. Click **Yes** to delete the workflow. Click **No** to cancel the delete operation.

Creating and Managing Workflow Stages

As described previously in this chapter, a workflow stage defines a phase in your development or release process. In AccuRev, a workflow stage is represented as a green rectangle, like the *New* stage shown in the following illustration:



The rest of this section provides more information about the components that make up a stage and the ways to create stages in the Workflow Editor.

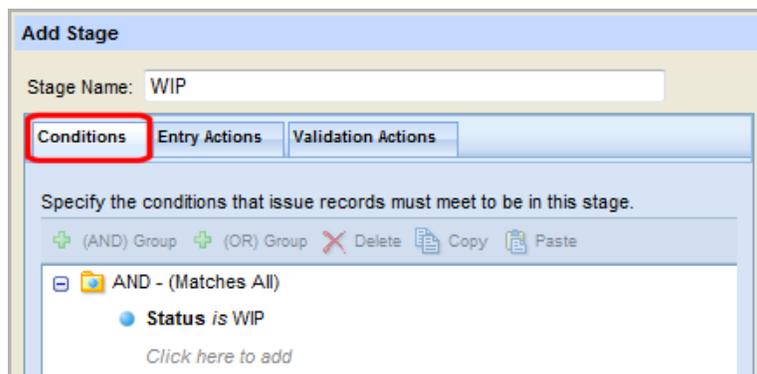
Workflow Stage Components

In AccuRev, a workflow stage consists of a name, conditions, and actions:

- **Name.** Every stage in your workflow should have a name that clearly identifies its role in the workflow—use names like *New* and *WIP* and not *Stage 1* and *Stage 2*, for example. AccuRev enforces uniqueness for stage names. Consider using the names of your development process phases as the names for your workflow stages.

Tip: The AccuRev Stage Generator automatically creates stages based on values from the AccuWork schema. See [Creating Stages Automatically](#) on page 141 for more information for more information on the Stage Generator.

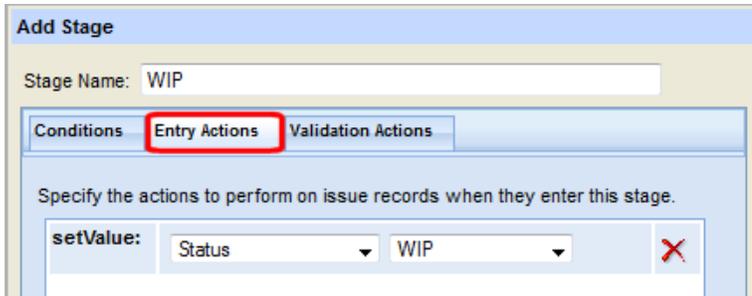
- **Conditions.** Each stage must be defined with one or more conditions; conditions act as a filter that determines whether or not an issue can be in that stage. For example, the condition for a *Scheduled* stage might be as simple as `Status = Scheduled`. Only issues that satisfy that condition—in other words, only issue records whose **Status** field is set to `Scheduled`—can be in the stage.



Conditions are expressed as *field name*, *condition value*, and *field value* and can be grouped using any combination of AND and OR groups. See [Using the Conditions Editor](#) on page 144 for more information.

Tip: The AccuRev Stage Generator automatically creates a default stage condition. See [Creating Stages Automatically](#) on page 141 for more information on using the Stage Generator.

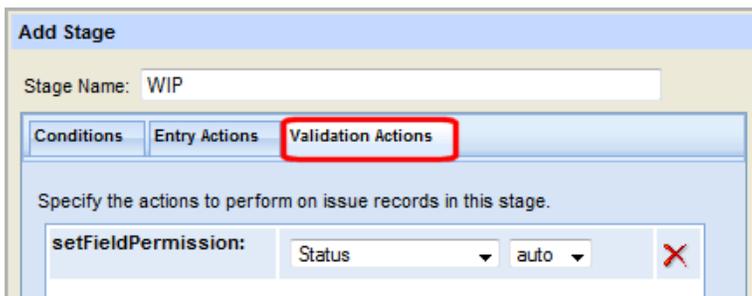
- **Actions.** A stage can be defined with two optional types of actions, entry and validation.
 - **Entry actions** – Entry actions are performed only when an issue enters a stage by transition. For example, an entry action for the WIP stage might set the value of the **Status** field to WIP.



The only entry action you can specify for a stage is `setValue`. To have AccuRev make other changes to issue records in a stage—making one or more fields required, or making a tab on the Issue Edit form read-only, for example, use validation actions.

Tip: The `setValue` entry action is created automatically when you use the Stage Generator; the value is set to the value of the Status field (or whatever field in your schema you are using to represent your workflow stages) that represents the stage. See [Creating Stages Automatically](#) on page 141 for more information on using the Stage Generator.

- **Validation actions** – Unlike entry actions, which are performed only when an issue enters a stage by transition, validation actions are performed when an issue record is opened. Validation actions are typically used to identify required fields or fields that you want to make read-only. For example, the `setFieldPermission` validation action sets the corresponding field to *auto*, which is a special type of read-only that allows only AccuRev to modify the field.



Tip: The `setFieldPermission` validation action is created automatically when you use the Stage Generator; the value of the Status field (or whatever field in your schema you are using to represent your workflow stages) is set to *auto*. See [Creating Stages Automatically](#) on page 141 for more information.

Defining stage actions is optional—you might prefer to define actions for a transition instead. See [Specifying Actions for Stages and Transitions](#) on page 157 for more information.

Note: A stage’s logic—that is, its conditions and any actions you choose to define for it—should be unique. No two stages should have the same set of conditions and actions defined for them. Further, you must ensure that a stage’s logic does not conflict with the logic of any transitions that are linked to that stage.

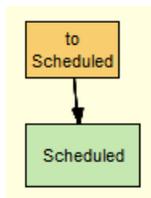
Ways to Create Workflow Stages

There are two ways to create stages in AccuRev:

- **Automatically.** The AccuRev *Stage Generator* automatically creates stages and transitions based on the fields in your schema that you choose to represent the stages in your workflow process. You might want to create stages in your workflow based on the values of your issue record’s **Status** field: New, Scheduled, WIP, Done, and Closed, for example.

When you create stages using the Stage Generator, AccuRev automatically creates the:

- Stage condition (*Status is Scheduled*)
- Entry action (*setValue Status to Scheduled*)
- Validation action (*setFieldPermission Status to auto*)
- And an associated transition (undefined), as shown in the following illustration:

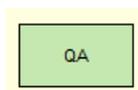


If you want to specify additional conditions, entry actions, or validation actions for a stage, you can edit the stage. See [Editing Workflow Stages](#) on page 143 for more information.

The transition is given a default name that indicates the destination stage (in this example, the transition is named *to Scheduled*). You can rename the transition and create validation actions and conditions as needed. See [Editing Workflow Transitions](#) on page 148 for more information.

Tip: Consider using the Stage Generator to automate workflow stage creation. The Stage Generator is the quickest way to create a workflow and it eliminates the need to manually specify the stage name, conditions and actions, as well as the related transition. See [Creating Stages Automatically](#) on page 141 to learn how to use the Stage Generator.

- **Manually.** If you prefer, you can create stages manually. When you use this approach, you must specify all of the stage components—its name, conditions, and any entry or validation actions you require. When you create a workflow stage manually, it does not create the corresponding transition, as shown in the following illustration:



See [Creating a Workflow Stage Manually](#) on page 142 for more information.

Creating Stages Automatically

Use the Stage Generator to have AccuRev automatically create one or more fully defined workflow stages and their associated transitions based on values in your AccuWork schema. Only schema fields with the type *Choose* are used by the Stage Generator. Examples of schema fields of type *Choose* you might consider using to create workflow stages include Status and State.

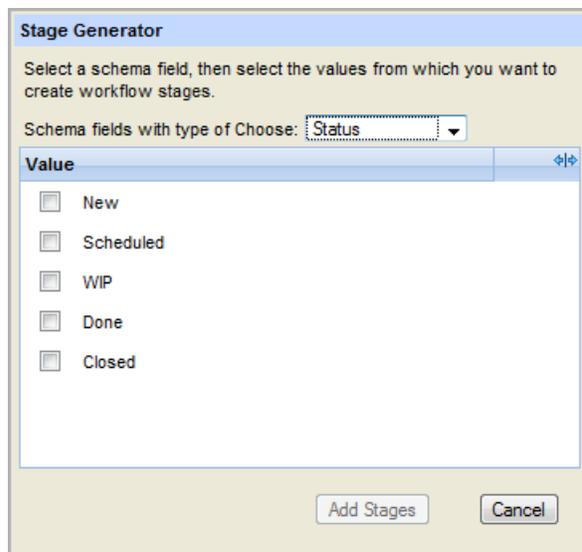
To create stages using the Stage Generator:

1. In the AccuRev Web UI, click the **Admin** menu and choose **Create Workflow** or **Open Workflow**.
2. Choose the depot and the workflow you want to open or create and click **Ok**.

The Workflow Editor appears.

3. Click the **Stage Generator** button ( Stage Generator) in the Workflow Editor toolbar.

The Stage Generator dialog box appears.



4. Select the AccuWork schema field whose values you want to use to create your workflow stages.
Tip: Only schema fields whose values are not already represented as workflow stages are displayed in the Value table.

5. In the Value table, select the values from which you want to create workflow stages.

6. Click the **Add Stages** button.

AccuRev adds a stage and an associated transition to the workflow diagram for each value you select. The transitions are given default names based on the stage. See [Editing Workflow Transitions](#) on page 148 to learn how to rename a transition. See [Linking Workflow Stages](#) on page 150 to learn how to link one stage to another.

Tip: The first stage in a workflow is typically not used as the destination for a transition: a workflow transition seldom results in placing an issue record in the *New* stage, for example. You can leave the default transition associated with the first stage in your workflow if you want (AccuRev ignores it), but you might prefer to delete the transition from the workflow diagram for clarity. See [Deleting a Workflow Transition](#) on page 149 for more information.

7. Click the **Save** button () to save your changes to the workflow.

What to Do Next

Once you have fully defined two or more stages, you can link them as described in [Linking Workflow Stages](#) on page 150.

Creating a Workflow Stage Manually

Use this procedure to create a single stage based on the name you provide and, optionally, conditions and actions that you define.

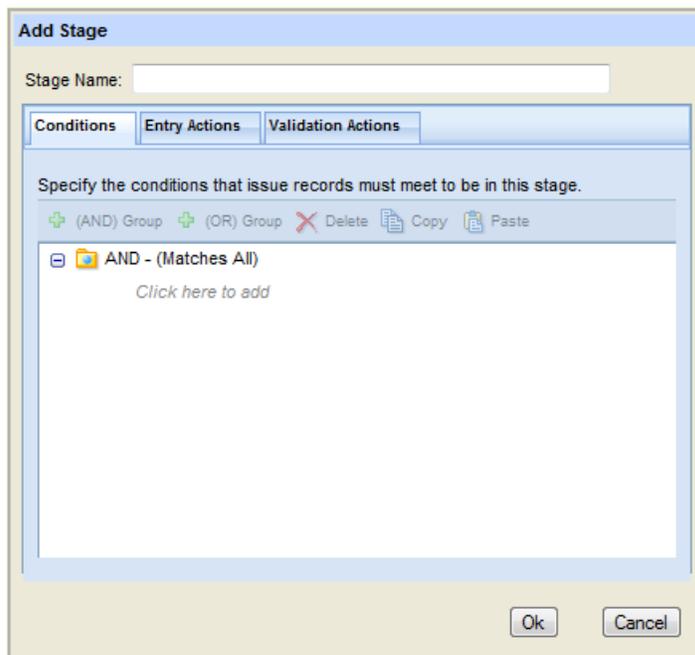
To create a single workflow stage:

1. In the AccuRev Web UI, click the **Admin** menu and choose **Create Workflow** or **Open Workflow**.
2. Choose the depot and the workflow you want to open or create and click **Ok**.

The Workflow Editor appears.

3. Click the **Add Stage** button ( **Add Stage**) in the Workflow Editor toolbar.

The Add Stage dialog box appears.



4. Enter a stage name in the **Stage Name** field.
5. Click the **Conditions** tab to specify a condition for the stage. See [Using the Conditions Editor](#) on page 144 for more information.
6. If you want to specify entry or validation actions, click the appropriate tab. See [Specifying Actions for Stages and Transitions](#) on page 157 for more information.
7. When you have finished specifying the stage, click **Ok**.
The stage appears on the workflow diagram.
8. Click the **Save** button () to save your changes to the workflow.

What to Do Next

Once you have fully defined two or more stages you can link them. See [Linking Workflow Stages](#) on page 150.

Editing Workflow Stages

You can perform the following types of edits on a workflow stage:

- Rename the stage
- Change the stage conditions
- Change the stage entry and validation actions

See [Deleting a Workflow Stage](#) on page 145 to learn about deleting workflow stages.

How to Edit a Workflow Stage

To edit a workflow stage:

1. In the AccuRev Web UI, click the **Admin** menu and choose **Open Workflow**.

The Open Workflow dialog box appears.

2. Choose the depot and the workflow you want to open and click **Ok**.

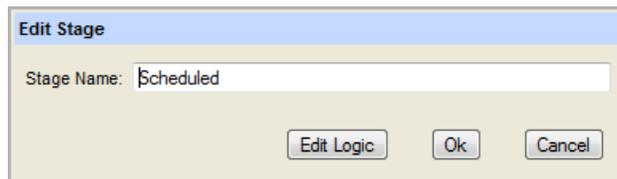
The Workflow Editor appears.

3. In the workflow diagram, select the stage you want to edit.

4. Click the **Edit** button () on the Workflow Editor toolbar.

Alternative: Right-click the stage and choose **Edit** from the context menu.

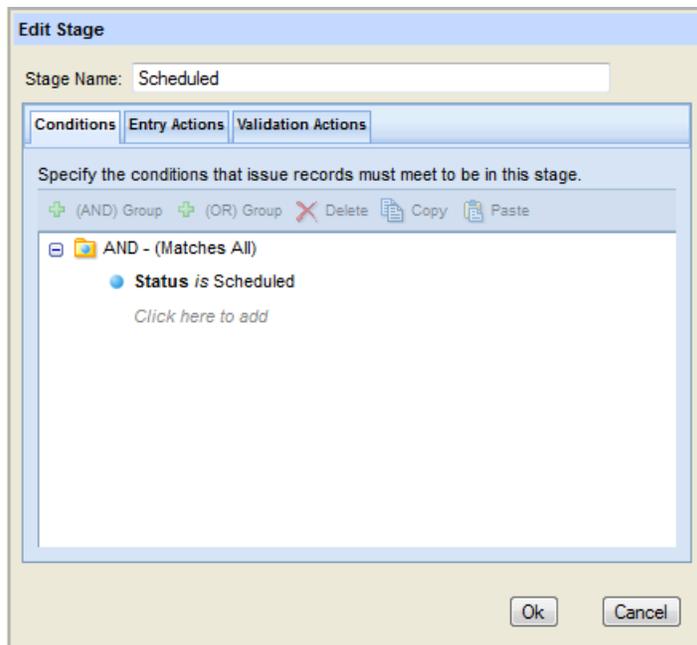
The Edit Stage dialog box appears.



5. To rename the stage, type the new name in the Stage Name field, then click **Ok** and go to [Step 7](#).

To add or modify stage conditions or actions, click the **Edit Logic** button.

The Edit Stage dialog box expands to display the **Condition**, **Entry Actions**, and **Validation Actions** panels.



See [Using the Conditions Editor](#) on page 144 to learn how to specify conditions for a stage. See [Specifying Actions for Stages and Transitions](#) on page 157 to learn about the actions you can specify for a stage's entry and validation actions.

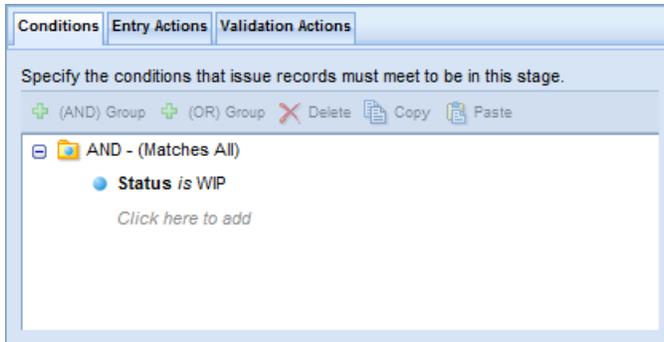
6. When you are done specifying the stage conditions and actions, click **Ok**.
7. Click the **Save** button (💾) to save your changes to the workflow.

Using the Conditions Editor

The Conditions Editor is used in several places in the Workflow Editor:

- Workflows—You activate a workflow by specifying the conditions an issue must meet in order to be subject to that workflow.
- Stages—Most stages are defined with a condition that specifies which type of issue can be in that stage.
- Transitions—Conditions for transitions are optional; you might want to create one that restricts the availability of a transition to a specific user or group, for example.

As shown in the following illustration of the Conditions Editor on the Edit Stage dialog box, this condition ensures that only issue records whose **Status** field is set to *WIP* can be in this stage:

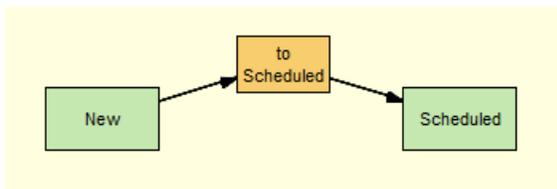


Tip: If you created a stage using the Stage Generator, AccuRev displays the condition that it created for that stage.

The Conditions editor has the same features and uses the same mechanics as the AccuRev Web UI Query Builder. See [Working with the Query Builder](#) on page 64 for more information.

Deleting a Workflow Stage

When you delete a stage from a workflow, you also delete any transitions that refer to it. For example, in the following illustration, deleting the *Scheduled* stage also deletes the *to Scheduled* transition from the workflow:



Deleting the *New* stage, however, affects neither the *to Scheduled* transition nor the *Scheduled* stage.

Tip: AccuRev always displays a confirmation message when you delete a stage.

To learn more about the relationship between transitions and stages, see [Linking Workflow Stages](#) on page 150.

How to Delete a Stage

To delete a stage:

1. In the Workflow Editor, select the stage you want to delete from the workflow diagram.
2. Click the **Delete** button (✖) on the Workflow Editor toolbar.

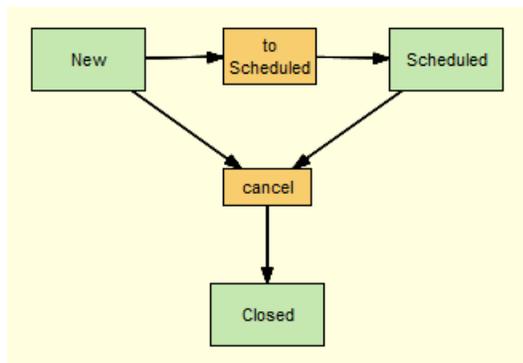
Alternatives: Press the Delete key on your keyboard, or right-click the stage and choose **Delete** from the context menu.

AccuRev displays a message asking you to confirm the delete operation.

3. Click **Yes** to complete the delete operation; click **No** to cancel.
4. Click the **Save** button (💾) to save your changes to the workflow.

Creating and Managing Workflow Transitions

As described previously in this chapter, workflow transitions link stages in a workflow; executing a transition moves an issue record from one workflow stage to another. In AccuRev, a workflow transition is represented as an orange rectangle, like the *to Scheduled* and *cancel* transitions shown in the following illustration:



Note that one transition, like *cancel* in this illustration, can be shared by multiple source stages (*New* and *Scheduled*) but can have only one target stage (*Closed*).

The rest of this section provides more information about the components that make up a transition and the ways to create and edit transitions in the Workflow Editor. To learn how to link one stage to another, see [Linking Workflow Stages](#) on page 150.

Workflow Transition Components

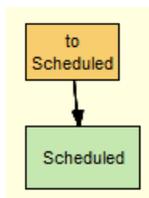
A workflow transition consists of a name and, optionally, conditions and validation actions:

- **Name.** By default, transitions created by the Stage Generator are given the name *to <stage name>*. For example, *to_WIP* and *to_Scheduled*. If you create a transition, or rename a transition created by the Stage Generator, use names like *assign* and *schedule* and not *transition 1* and *transition 2*, for example. AccuRev enforces uniqueness for transition names.
See [Editing Workflow Transitions](#) on page 148 for more information on renaming a transition.
- **Conditions.** By default, transitions created by the Stage Generator are not defined with a condition; none is needed to create a functional workflow. If you want, you can define a condition that is used to determine whether or not the transition is available. For example, you might want to define a condition that restricts use of certain transitions to specific users or groups.
- **Validation Actions.** By default, transitions created by the Stage Generator are not defined with a validation action; none is needed to create a functional workflow. Executing a transition simply moves the issue from the current stage to the destination stage associated with the transition. If you want, you can define validation actions that are performed when the transition is executed. For example, you might define an action for the *assign* transition linking the *Scheduled* and *WIP* stages that automatically sets an issue record's **Assigned To** field to a certain user.

Ways to Create Workflow Transitions

There are two ways to create workflow transitions in AccuRev:

- **Automatically.** When you use the Stage Generator to create stages, AccuRev also creates a transition that uses that stage as its destination stage. For example, if you use the Stage Generator to create a stage based on the *Scheduled* value for your issue records' **Status** field, the Stage Generator automatically creates the *Scheduled* stage and the *to Scheduled* transition, as shown in the following illustration:



The transition is given a default name that indicates the destination stage (in this example, the transition is named *to Scheduled*). You can rename the transition and create actions and conditions as necessary. See [Editing Workflow Transitions](#) on page 148 for more information.

See [Creating Stages Automatically](#) on page 141 to learn how to use the Stage Generator to create workflow stages and transitions.

- **Manually.** When you link one stage to another, you can use existing transitions associated with the destination stage, or you can create a new transition on-the-fly.

See [Linking Workflow Stages](#) on page 150 for more information.

Note: You cannot create a freestanding transition. A transition must always have a destination stage.

Editing Workflow Transitions

You can perform the following types of edits on a transition:

- Rename the transition
- Create or change transition actions and conditions

See [Deleting a Workflow Transition](#) on page 149 to learn about deleting workflow transitions.

How to Edit a Workflow Transition

To edit a transition:

1. In the AccuRev Web UI, click the **Admin** menu and choose **Open Workflow**.

The Open Workflow dialog box appears.

2. Choose the depot and the workflow you want to open and click **Ok**.

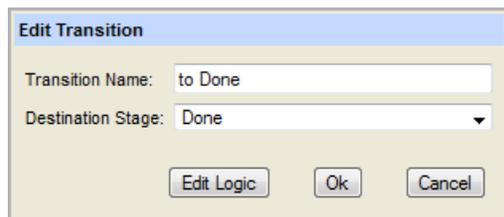
The Workflow Editor appears.

3. In the workflow diagram, select the transition you want to edit.

4. Click the **Edit** button () on the Workflow Editor toolbar.

Alternative: Right-click the transition and choose **Edit** from the context menu.

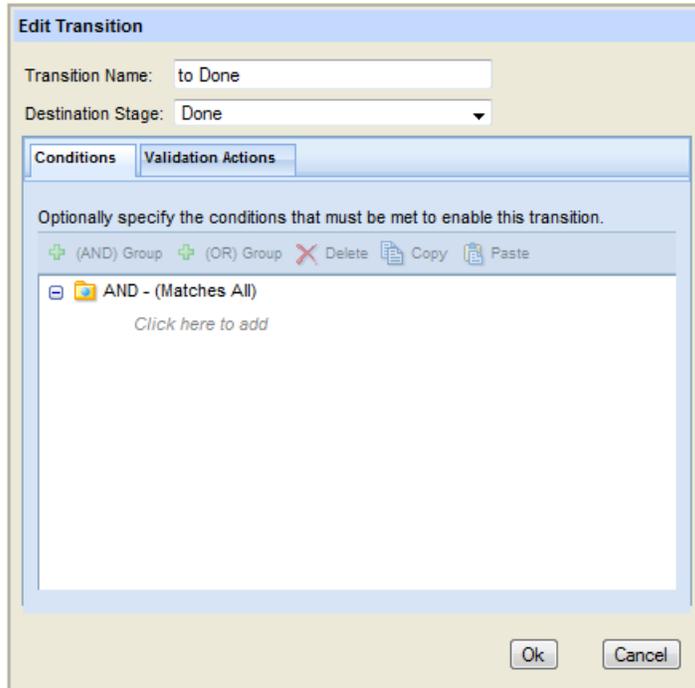
The Edit Transition dialog box appears.



5. To rename the transition or choose a different destination stage, make the required change, then click **Ok** and go to [Step 7](#).

To add or modify transition actions, click the **Edit Logic** button.

The Edit Transition dialog box expands to display the Conditions and Validation Actions tabs.

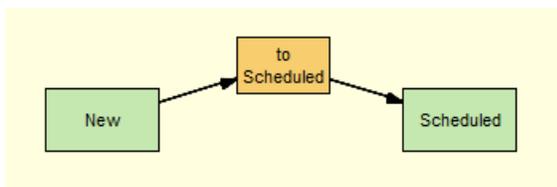


See [Specifying Actions for Stages and Transitions](#) on page 157 for more information on defining actions.

6. When you are done specifying the transition conditions and actions, click **Ok**.
7. Click the **Save** button (💾) to save your changes to the workflow.

Deleting a Workflow Transition

When you delete a transition from a workflow, you also delete the link between the two stages that are joined by that transition. For example, in the following illustration, deleting the *to Scheduled* transition...



... removes any association between the *New* and *Scheduled* workflow stages:



Tip: AccuRev displays a confirmation message when you delete a transition.

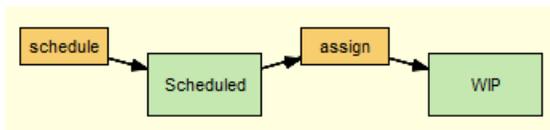
How to Delete a Transition

To delete a transition:

1. In the Workflow Editor, select the transition you want to delete.
2. Click the **Delete** button (✖) on the Workflow Editor toolbar.
Alternative: Right-click the transition and choose **Delete** from the context menu.
AccuRev deletes the transition from your workflow.
3. Click the **Save** button (💾) to save your changes to the workflow.

Linking Workflow Stages

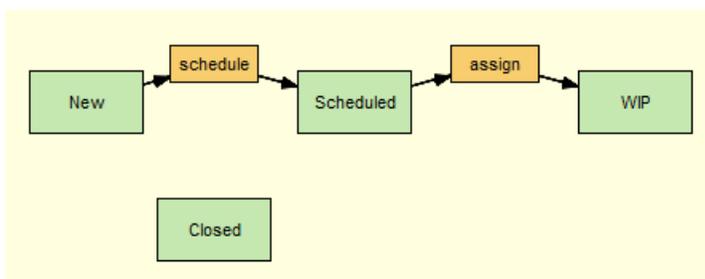
In AccuRev, you use a transition to link one workflow stage to another. The stage from which you are linking is referred to as the *source stage*; the stage to which you are linking is referred to as the *destination stage*. In the following illustration, *Scheduled* is the source stage; it is linked to *WIP*, the destination stage, by the *assign* transition:



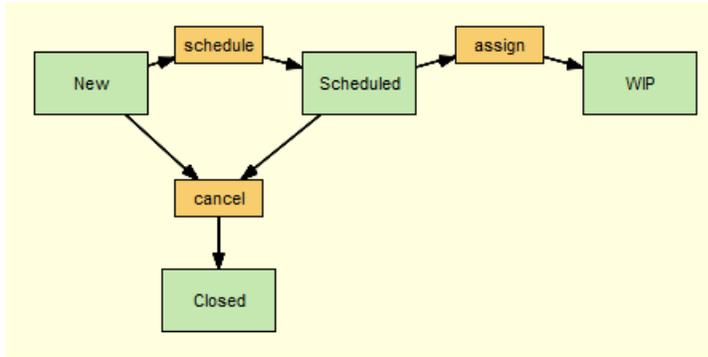
Here, only the *WIP* stage is currently being used as a destination stage. The *Scheduled* stage currently has no source stages linked to it via the *schedule* transition.

Destination Stage Transitions

The destination stage in a pair of linked workflow stages must have a transition associated with it—without it, there is no way for an issue to enter that stage using workflow transitions. In the following example, the *Closed* stage cannot currently be used as a destination stage because it does not have a transition associated with it:



Once the *Closed* stage is associated with a transition, called *cancel*, for example, issues can move to it through the workflow from either the *New* or *Scheduled* stages, as shown here:



Note that a destination stage can be referenced by more than one source stage. In addition, a destination stage may have more than one transition associated with it. You might want to set up your workflow such that an issue can move from *WIP* to *Closed* via a *complete* transition, for example.

Creating Transitions for Destination Stages

In most cases, stages are associated with transitions. When you use the Stage Generator to create workflow stages, for example, AccuRev automatically creates a transition that uses that stage as its destination. AccuRev also lets you create new transitions for destination stages as part of the stage linking process.

Linking Workflow Stages Using Existing Transitions

There are two ways to link workflow stages using existing transitions, as summarized in the following table:

Method	When to Use	For More Information, See
Link Stages dialog box	Use the Link Stages dialog box when your workflow contains many destination stages and transitions. The Link Stages dialog box lets you easily change source and destination stages and it filters available transitions based on the destination you select. <i>Tip:</i> You can also use the Link Stages dialog box to create a new transition for the destination stage. See Linking Workflow Stages Using a New Transition on page 153 for more information.	Using the Link Stages Dialog Box on page 151
Stage context menu (right-click the stage)	Use the stage context menu when your workflow has only a few destination stages and transitions and you can easily see which transition is associated with the destination stage you want to link to the source stage you have selected.	Using the Context Menu on page 152

You can also create a transition at the same time you create the link. See [Linking Workflow Stages Using a New Transition](#) on page 153.

Using the Link Stages Dialog Box

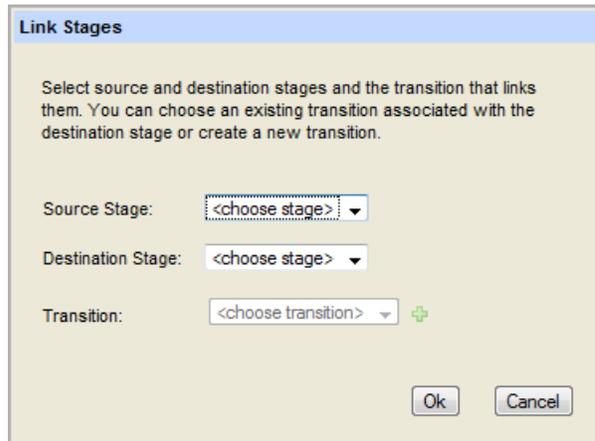
- In the AccuRev Web UI, click the **Admin** menu and choose **Open Workflow**.
The Open Workflow dialog box appears.
- Choose the depot and the workflow you want to open and click **Ok**.

The Workflow Editor appears.

Tip: If you select a stage in the workflow diagram, AccuRev uses that stage as the default source stage in the following step.

3. Click the **Link Stages** button ( **Link Stages**) on the Workflow Editor toolbar.

The Link Stages dialog box appears.



4. Select the source stage and destination stage you want to link from the **Source Stage** and **Destination Stage** fields.

When you select a destination stage, the **Transition** field displays transitions associated with that stage.

5. Select the appropriate transition from the **Transition** field and click **Ok**.

AccuRev links the source and destination stages using the transition you selected.

6. Click the **Save** button () to save your changes to the workflow.

Using the Context Menu

To link two workflow stages using the stage context menu:

1. In the AccuRev Web UI, click the **Admin** menu and choose **Open Workflow**.

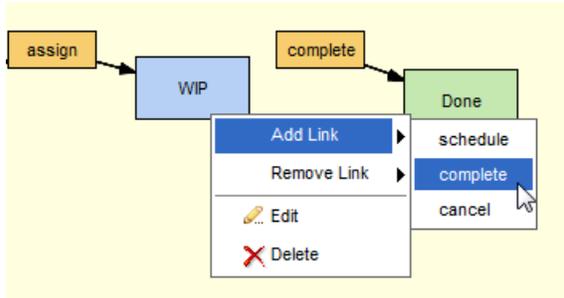
The Open Workflow dialog box appears.

2. Choose the depot and the workflow you want to open and click **Ok**.

The Workflow Editor appears.

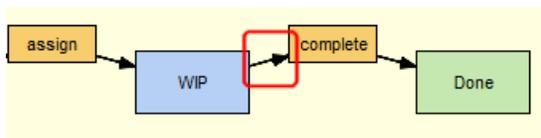
3. In the workflow diagram, right-click the workflow stage you want to specify as the source stage and choose **Add Link** from the context menu.

AccuRev displays a menu listing transitions associated with available destination stages as shown in the following example:



4. Select the transition associated with the desired destination stage.

AccuRev links the source stage you specified in [Step 3](#) with the destination stage associated with the transition you specified in this step. For example:



5. Click the **Save** button (💾) to save your changes to the workflow.

Linking Workflow Stages Using a New Transition

Use this procedure when you want to link two workflow stages using a new transition that you create for the destination stage.

1. In the AccuRev Web UI, click the **Admin** menu and choose **Open Workflow**.

The Open Workflow dialog box appears.

2. Choose the depot and the workflow you want to open and click **Ok**.

The Workflow Editor appears.

3. Click the **Link Stages** button (🔗 Link Stages) on the Workflow Editor toolbar.

The Link Stages dialog box appears.

Link Stages

Select source and destination stages and the transition that links them. You can choose an existing transition associated with the destination stage or create a new transition.

Source Stage:

Destination Stage:

Transition: +

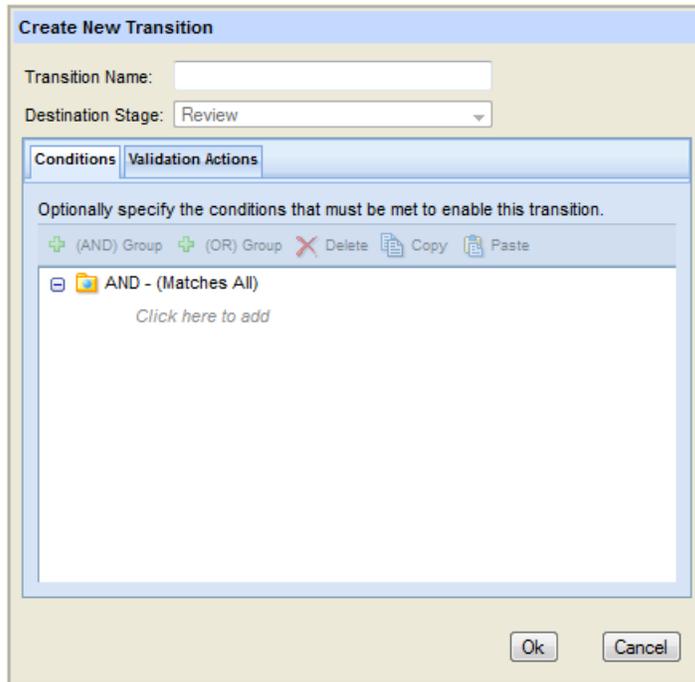
Tip: If you select a stage in the workflow diagram, AccuRev uses that stage as the default source stage in the following step.

4. Select the source stage and destination stage you want to link from the **Source Stage** and **Destination Stage** fields.

When you select a destination stage, the **Transition** field displays the transitions associated with that stage.

5. Click the **Create New Transition** button (+).

The Create New Transition dialog box appears:



Tip: The Destination Stage field displays the name of the destination stage you selected in [Step 4](#).

6. In the **Transition Name** field, enter a name for the transition.
7. On the **Conditions** tab, optionally specify the conditions that the issue record must meet in order for this transition to be enabled. See [Using the Conditions Editor](#) on page 144 if you need help with this step.
8. On the **Validation Actions** tab, optionally specify the actions you want to associate with this transition. See [Specifying Actions for Stages and Transitions](#) on page 157 if you need help with this step.
9. When you are done specifying the transition, click **Ok**.
You are returned to the Link Stages dialog box.
10. Click **Ok** to link the source and destination stages using the new transition.
11. Click the **Save** button () to save your changes to the workflow.

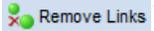
Unlinking Workflow Stages

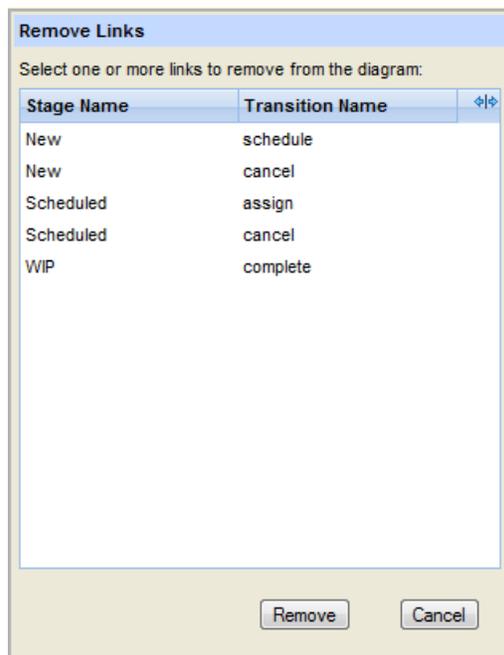
When you *unlink* two workflow stages, you are simply de-coupling the source and destination stages; it has no effect on the transition associated with the destination stage. If you want to delete a transition, see [Deleting a Workflow Transition](#) on page 149.

There are two ways to unlink workflow stages, as summarized in the following table:

Method	When to Use	For More Information, See
Remove Links dialog box	Use the Remove Links dialog box when you want to be able to view all the linked source and destination stages defined for your workflow and, optionally, unlink multiple stages at the same time.	Using the Unlink Stages Dialog Box on page 155
Stage context menu (right-click the stage)	Use the stage context menu when you want to unlink a single pair of source and destination stages.	Using the Source Stage Context Menu on page 156

Using the Unlink Stages Dialog Box

1. In the AccuRev Web UI, click the **Admin** menu and choose **Open Workflow**.
The Open Workflow dialog box appears.
2. Choose the depot and the workflow you want to open and click **Ok**.
The Workflow Editor appears.
3. Click the **Remove Links** button () on the Workflow Editor toolbar.
The Remove Links dialog box appears.



4. Select the pair of source and destination stages you want to unlink. To select more than one pair of source and destination stages, use the Ctrl or Shift key on your keyboard when selecting stages.
5. Click the **Remove** button.

AccuRev unlinks the source and destination stages you selected.

6. Click the **Save** button (💾) to save your changes to the workflow.

Using the Source Stage Context Menu

To unlink two workflow stages using the source stage context menu:

1. In the AccuRev Web UI, click the **Admin** menu and choose **Open Workflow**.

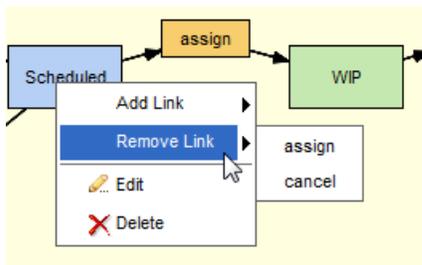
The Open Workflow dialog box appears.

2. Choose the depot and the workflow you want to open and click **Ok**.

The Workflow Editor appears.

3. In the workflow diagram, right-click the source stage you want to unlink and select **Remove Link** from the context menu.

AccuRev displays a menu listing the transitions associated with destination stages as shown in the following example:



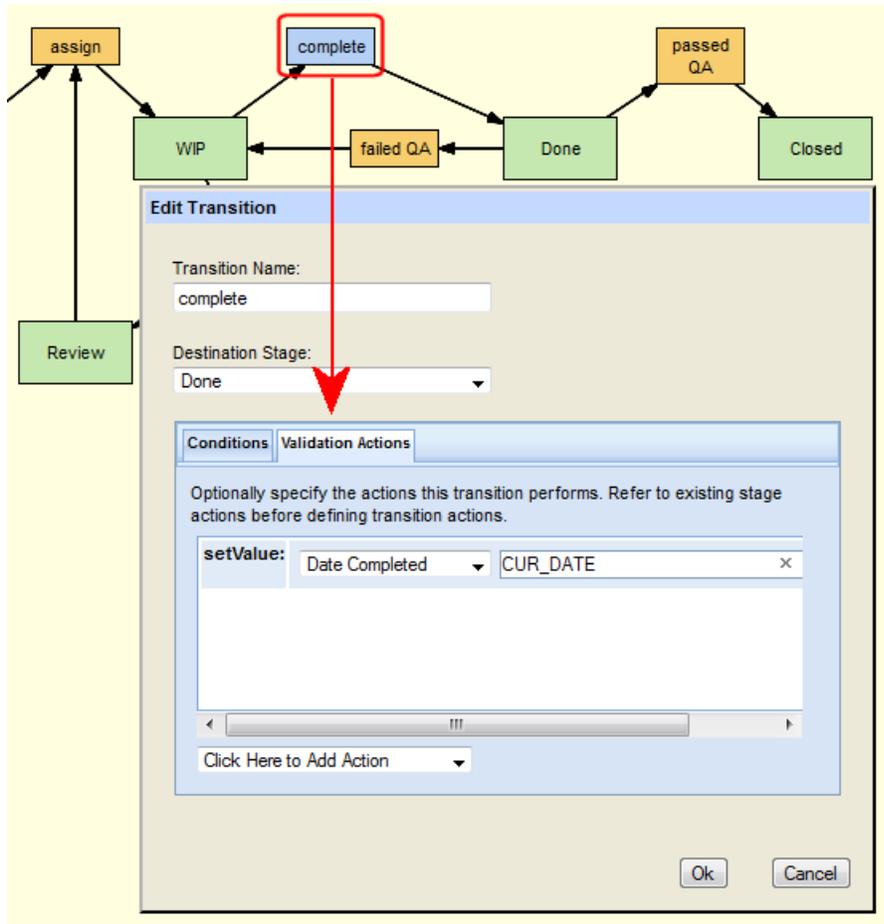
4. Select the transition associated with the destination stage from which you want to unlink the source stage.

AccuRev unlinks the source stage you specified in [Step 3](#).

5. Click the **Save** button (💾) to save your changes to the workflow.

Specifying Actions for Stages and Transitions

The Stage Generator automatically creates the stage actions required to create a functional workflow. There might be occasions, however, when you need to specify additional actions to enforce your desired workflow process. For example, you might decide that you want the *complete* transition to set the **Date Completed** field to the current date. You would do this by specifying the `setValue` action on the Validation Actions tab for the transition, as shown here:



This section describes the types of actions available for stages and transitions and how to specify them.

Types of Actions

The following table summarizes the types of actions you can specify for stages and transitions.

Action Type	Description	Availability
Entry	<p>Describes the action to perform on a field when the issue record enters the stage by transition.</p> <p>Example: You might specify a stage entry action to set the value of the Status field to WIP when an issue enters the WIP workflow stage.</p> <p>Note: Stage entry actions are restricted to setValue. See Predefined Actions on page 158 for a description of setValue and other available actions.</p>	Stages only
Validation	<p>Describes the action to perform on one or more fields in an issue record. Validation actions can be specified for stages and transitions and are performed:</p> <ul style="list-style-type: none"> ▪ Any time the issue record is opened (when the validation action is specified as part of the stage) ▪ Any time a transition is executed on an issue (when the validation action is specified as part of the transition) <p>Example: You might specify a validation action for the WIP stage that sets the Owner field to required.</p> <p>Note: Validation actions for stages and transitions are optional; specify them only if you want AccuRev to perform actions on issue records that the stage entry action is not already performing.</p>	Stages and transitions

Note: If you choose to manually specify actions for a stage and the transition associated with it, you must ensure that the actions do not conflict with each other.

Predefined Actions

AccuRev provides several *predefined actions* that you can use to automate and enforce your workflow process—you can use predefined actions to set field values, make fields required, or restrict access to tabs on the Issue Edit form to a specific user or group, for example.

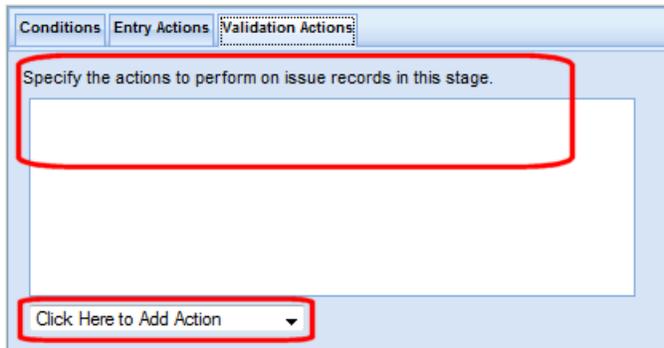
Predefined actions are summarized in the following table. Note that you can repeat some actions in the context of a single stage or transition. For example, you might want the *assign* transition to set the value for both the **Status** and **State** fields. You would do this by specifying two setValue actions for the *assign* transition: one for Status and one for State.

Action	Description	Can be Repeated
setValue	Sets any field on the Issue Edit form to the value you specify. For example, you can use the setValue action to set the Status field to Scheduled.	Yes
setChoices	Restricts fields on the Issue Edit form with a type of Choose to the values you specify. For example, you might want a user to be able to select from only a subset of all the operating systems defined as valid values for the Platform field.	Yes

Action	Description	Can be Repeated
setRequired	Makes the field on the Issue Edit form required: AccuWork highlights the field label in red and prevents the user from saving the issue record until a value for the required field has been specified. To select multiple values, use the Ctrl or Shift key when selecting values.	No
setIssuePermission	Makes the entire Issue Edit form read-only (ro).	No
setTabPermission	Makes any tab of the Issue Edit form you specify (Basics, Assignment, and so on) read-only (ro).	Yes
setFieldPermission	Makes any field on the Issue Edit form you specify read-only (ro).	Yes
setChangesRequired	Prevents the user from saving the current issue record unless there is at least one entry in its change package. The change package is displayed on the Changes tab of the Issue Edit form.	No
setParentRelationshipRequired	Prevents the user from saving the current issue record unless it has been specified as being dependent on another issue record. Valid for any field on the Issue Edit form with a type of Relationship; typically these are Dependencies, Duplicates, Subtasks, and Tracking Issues. (See Relationships Subtab on page 82 for more information on specifying issue dependencies.)	No
setChildRelationshipRequired	Prevents the user from saving the current issue record unless one or more other issue records have been specified as dependents of the current issue record. Valid for any field on the Issue Edit form with a type of Relationship; typically these are Dependencies, Duplicates, Subtasks, and Tracking Issues. See Relationships Subtab on page 82 for more information on specifying issue dependencies.	No

How to Specify a Stage or Transition Action

You specify actions for workflow stages and transitions using the Actions Editor, such as the one on the Validation Actions tab shown here:

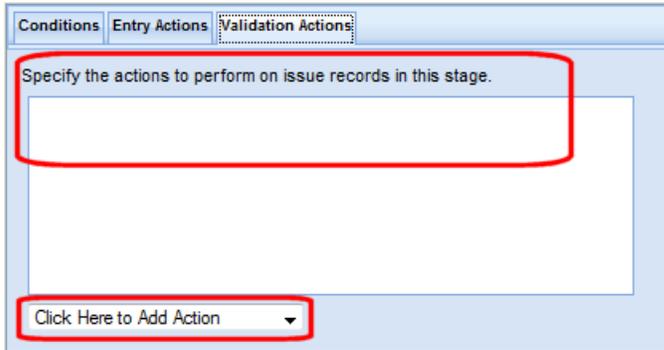


The procedure for defining an action is the same for both workflow stages and transitions—only the location of the Actions Editor varies, as summarized in the following table:

Workflow Object	Dialog Boxes	Location of Actions Editor
Stage	Add Stage Edit Stage	<ul style="list-style-type: none">▪ Entry Actions tab▪ Validation Actions tab
Transition	Create New Transition Edit Transition	<ul style="list-style-type: none">▪ Validation Actions tab

To specify a stage or transition action:

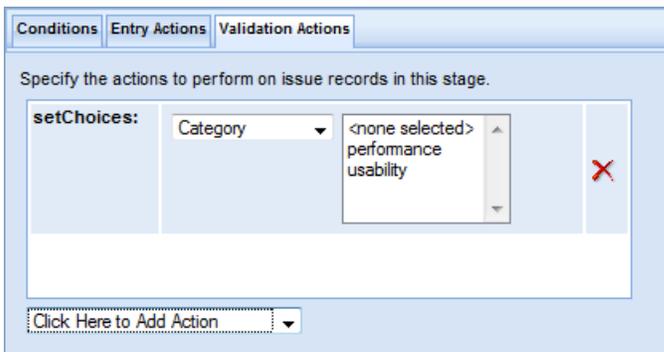
1. In the AccuRev Web UI, click the **Admin** menu and choose **Open Workflow**.
The Open Workflow dialog box appears.
2. Choose the depot and the workflow you want to open and click **Ok**.
The Workflow Editor appears.
3. In the workflow diagram, select the workflow stage or transition whose actions you want to specify.
4. Click the **Edit** button () on the Workflow Editor toolbar.
Alternative: Right-click the workflow stage or transition and choose **Edit** from the context menu.
The Edit dialog box appears for the object you selected.
5. Click the **Edit Logic** button.
The dialog box expands to show additional panels that let you specify advanced settings for the workflow object.
6. For a stage, click the Entry Actions or Validation Actions tab; for a transition, click the Validation Actions tab.



Existing actions are displayed, if any have been specified for the workflow stage or transition.

7. Click **Click Here to Add Action** and select an action from the drop-down list.

The action is displayed in a table, along with fields that let you set its value. The setChoices action is shown here, for example:



8. Set the values for the action.

Tip: You can use drag select or Ctrl+ click to select multiple values from drop-down lists, like the values for the **Category** field in the previous example.

9. Repeat [Step 7](#) and [Step 8](#) to specify additional actions.

Click the **Delete** button (X) to delete an action.

10. Click **Ok** to change the workflow stage or transition actions.

11. Click the **Save** button (💾) to save your changes to the workflow.

Using Workflow to Enforce SCM Policies

If you simply want to automate issue processing and enforce workflow rules for issues of a given type, all you need to do is create and activate a workflow whose condition is based on issue type. No further action is required. For example, if you activate a *defects* workflow whose condition is *Type = Defect*, issues with type Defect are automatically subject to the rules in the *defects* workflow. Issue automation features like stage and transition buttons are then displayed on the Issue Edit form for defects based on the conditions specified in the workflow.

Activating a workflow does not affect which issues can be promoted into or exit from a stream, however. If you want to use a workflow to enforce SCM policies on your streams, you must explicitly specify applicable workflow rules on those streams.

This section describes the different levels of policy enforcement possible with workflow and tells you how to implement them.

Types of Restrictions You Can Define for a Stream

You can use workflow to enforce three types of restrictions for issues in a stream. You can:

- **Restrict a stream to issues of a given type.** For example, you might want to allow only Defects in your Maint stream.
- **Restrict a stream to issues in a specific workflow stage.** For example, you might want to allow only Defects in the *Closed* stage in your Build stream.
- **Enforce workflow rules for a specific workflow.** For example, you might not care which issues enter your Dev stream (Defects, Enhancements, New Features, and so on), but you might want to ensure that if an issue is an Enhancement that it is in the *WIP* stage before it is allowed in the stream.

All SCM policy enforcement for a stream is defined using the Workflow Rules dialog box, shown here for the example phoenix_Client stream. The following sections describe how to implement each of these stream restrictions.

Workflow Rules for Stream phoenix_Client

Indicate whether or not you want to allow incomplete issues in this stream. Then, add all workflows with which issues in this stream must comply; for each workflow, optionally restrict entry into and exit from this stream to issues in specific workflow stages.

Allow incomplete issues in this stream

Allow issues from specified workflows only

Choose Workflow: <none selected> Add

defects

Stream Entry Rules

Do not restrict entry based on workflow stage; perform transition for specified stages

Restrict entry to issues in specified workflow stages

When Stage Is...	Perform This Transition...
Click here to add	

Stream Exit Rules

Ok Cancel

About Incomplete Issues

By default, AccuRev allows incomplete issues to be promoted into a stream, regardless of the type of workflow restrictions you define for the stream. You can change this by clearing the **Allow incomplete issues in this stream** check box at the top of the Workflow Rules for Stream dialog box.

Restricting Entry to a Specific Issue Type

Use this procedure when you want to allow only issues of a certain type in the stream.

1. Create a workflow whose condition is based on issue type.
2. In the StreamBrowser, right-click the stream for which you want to enforce SCM policies, and choose Workflow Rules from the context menu.

The Workflow Rules for Stream dialog box appears. The stream name appears in the dialog box title. The workflow rules you specify apply to this stream only.

3. Optionally, clear the **Allow incomplete issues in this stream** check box.
4. In the Choose Workflow field, select the workflow you want to use to enforce SCM policies on this stream and click the **Add** button.

A tab displaying options for stream entry and exit rules for the selected workflow appears.

5. Click the **Ok** button.

Restricting Entry to a Specific Workflow Stage

Use this procedure when you want to allow only issues in a specific workflow stage to be promoted into or promoted out of the stream.

1. Create a workflow whose condition is based on issue type.
2. In the StreamBrowser, right-click the stream for which you want to enforce SCM policies, and choose Workflow Rules from the context menu.

The Workflow Rules for Stream dialog box appears. The stream name appears in the dialog box title. The workflow rules you specify apply to this stream only.

3. Optionally, clear the **Allow incomplete issues in this stream** check box.
4. In the **Choose Workflow** field, select the workflow you want to use to enforce SCM policies on this stream and click the **Add** button.

A tab displaying options for stream entry and exit rules for the selected workflow appears.

5. To restrict entry into the stream:
 1. Select the **Restrict entry to issues in specified workflow stages** radio button.
 2. In the **When Stage Is...** column, click the **Click here to add** drop-down and select the appropriate workflow stage.
 3. If you want AccuRev to execute a transition when the issue is promoted to this stream, click the **Click here to add** drop-down in the **Perform This Transition...** column and select the desired transition.
 4. Optionally, specify workflow rules for additional stages.
5. To restrict exit from the stream, click the arrow next to the **Stream Exit Rules** label, and then repeat [Step 5](#).
6. To specify rules for another workflow on the same stream, return to [Step 4](#).
7. If you need to delete a workflow rule, click the delete button (✕).
8. Click the **Ok** button.

Enforcing Rules for a Specific Workflow

Use this procedure when you want to enforce rules for issues that are subject to a specific workflow, but you do not care about placing restrictions on issues of any other type.

1. Create a workflow whose condition is based on issue type.
2. In the StreamBrowser, right-click the stream for which you want to enforce SCM policies, and choose Workflow Rules from the context menu.

The Workflow Rules for Stream dialog box appears. The stream name appears in the dialog box title. The workflow rules you specify apply to this stream only.

3. Optionally, clear the **Allow incomplete issues in this stream** check box.
4. Select the **Allow issues from specified workflows only** check box.
5. In the **Choose Workflow** field, select the workflow you want to use to enforce SCM policies on this stream and click the **Add** button.

A tab displaying options for stream entry and exit rules for the selected workflow appears.

6. Specify the stream entry and exit rules as described in [Step 5](#) and [Step 5](#) in [Restricting Entry to a Specific Workflow Stage](#) on page 163.
7. To specify rules for another workflow on the same stream, return to [Step 5](#).
8. If you need to delete a workflow rule, click the delete button (✕).
9. Click the **Ok** button.

Example: Implementing a Workflow

This section describes the process of using workflow to create and implement a workflow for the fictional Rapid Velo company. The example scenario walks you through the design and development stages of the workflow implementation process to illustrate how you can use AccuRev to build a workflow of your own. Some techniques are described in detail, but for complete details on the procedures mentioned in this section, refer to the preceding sections in this chapter.

Overview

The Rapid Velo company currently uses the AccuWork issue tracking system and AccuRev to manage their SCM processes. They want to implement a workflow for its Phoenix product line to integrate their issue tracking and SCM systems, automate issue processing, and enforce their SCM policies.

The workflow created in this example scenario is basic, but it demonstrates all of the workflow features you can use to model, implement, and enforce your organization's SCM policies, no matter how complex.

Step 1: Design the Workflow

The Rapid Velo company's AccuRev administrator meets with her organization's development and release engineering managers and the Phoenix product owner (PO) to discuss and diagram the workflow they want to implement. They identify the workflow stages summarized in the following table:

Workflow Stage	Description
New	Rapid Velo customer support, QA, and the PO create issues in AccuWork to describe a defect in or a requested enhancement to the Phoenix product line. They must specify an issue type before the issue can be saved.
Scheduled	The product owner reviews the issue. If it is considered important, it is scheduled for an upcoming iteration; otherwise it is closed.
WIP	Work on a scheduled issue begins only after it is assigned to (or chosen by) an software engineer. Once work begins, the issue's status is considered to be Work in Progress (or WIP).
Done	When development is finished, the engineer changes the issue's status to Done, where it awaits QA.
Closed	When an issue passes QA, it is closed; otherwise, it is returned to the WIP stage until an engineer picks it up again.

Not coincidentally, each of these workflow stages has already been defined in the AccuWork schema associated with the phoenix depot and is currently being used for issue tracking in AccuWork. This is a good start, but the workflow as described by Rapid Velo's engineering staff has some areas that they want to enhance before exposing workflow to the AccuRev end users:

- There is no representation for the process of managing issues in QA:
 - Issues that pass QA can be successfully closed.
 - Issues that fail QA must be returned to the Scheduled state.
- The workflow does not provide a mechanism for an engineer to request additional details on an issue before starting work on that issue. When an issue is returned to the product owner for more information, that issue's owner should automatically be changed to the product owner.

The pass/fail QA processes can be modeled using workflow transitions—the AccuRev Stage Generator will automatically create these transitions, as you will see in [Step 3: Create Workflow Stages and Transitions](#). The process that allows the engineer to request more information, however, requires changes to the AccuWork schema. How the AccuRev administrator addresses this requirement is described in the following section, [Step 2: Modify the AccuWork Schema](#).

Step 2: Modify the AccuWork Schema

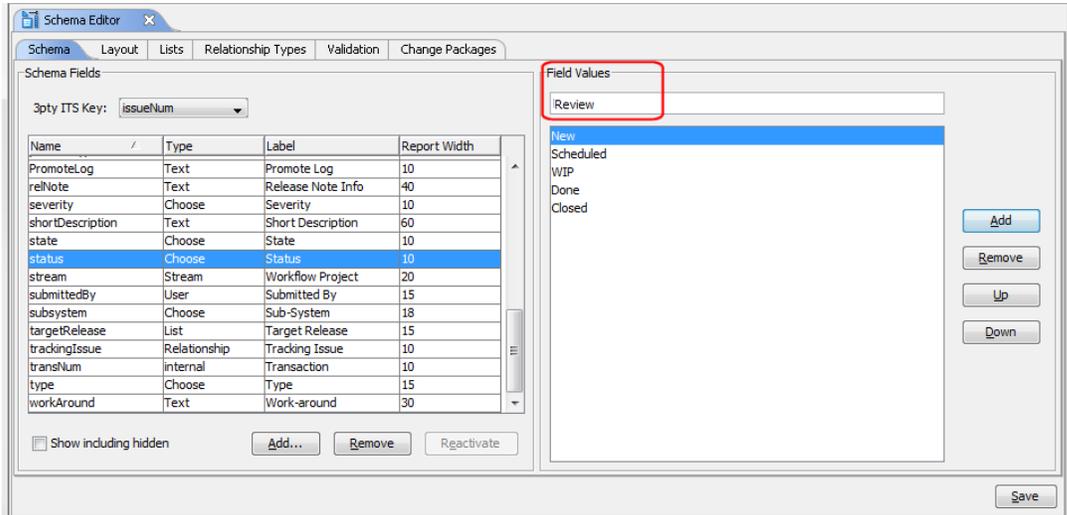
After further discussion, the product owner, development and release managers, and the AccuRev administrator agree that a *Review* stage is needed for the workflow. The first step in creating such a workflow stage is to add a Review value to the *status* field in the AccuWork schema, as described here:

1. In the AccuRev Java GUI, navigate to the Schema tab in the Schema Editor.
2. Select *status* from the **Schema Fields** table.

Currently defined values appear in the **Field Values** list adjacent to the **Schema Fields** table.

Tip: The order of values in the Field Values list is the order in which these values will appear in the **Status** field in the AccuRev Issue Edit form.

3. Type *Review* in the entry field and click the **Add** button.



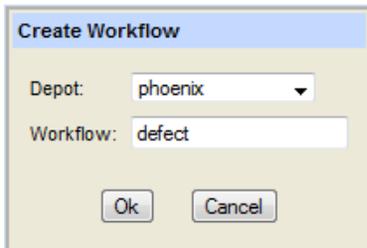
4. Use the **Down** button to move the *Review* value to a more appropriate place in the Field Values list (after *WIP*, for example).
5. Next, add a new field of type *Stream*. Consider giving the stream field a label such as Project or Workflow Project to help convey the conceptual connection between a depot stream and a workflow project.
6. Click the **Save** button to save your changes to the AccuWork schema.

Now that the *status* field has values for all of the stages that the Rapid Velo engineering staff wants to represent in its workflow, they are ready to create workflow stages and transitions.

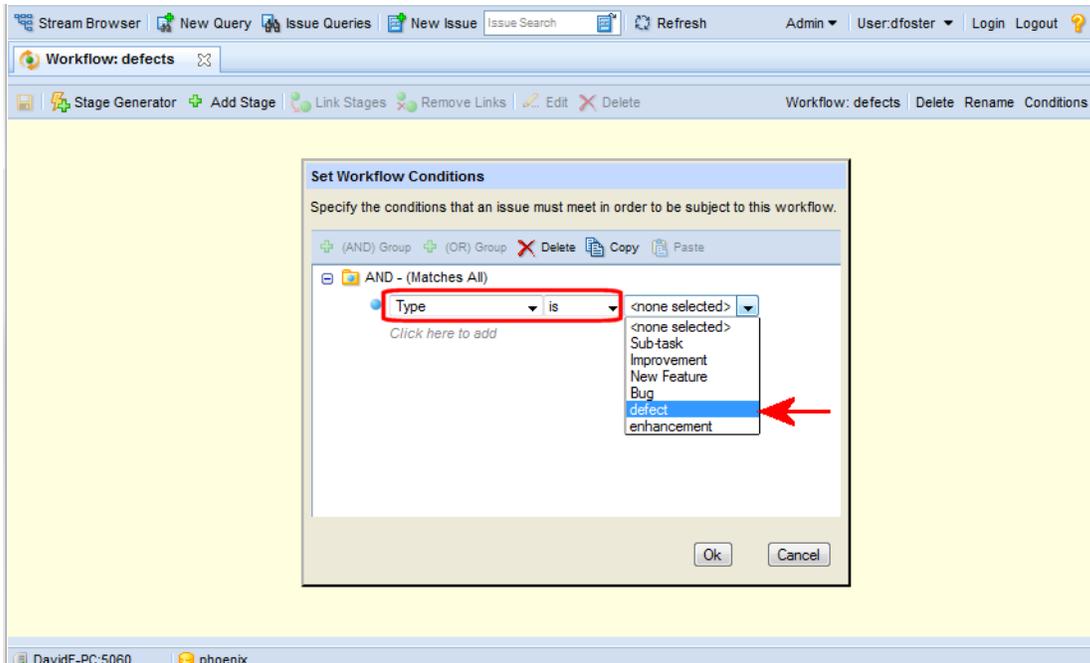
Step 3: Create Workflow Stages and Transitions

After the AccuRev administrator has modified the AccuWork schema as described in [Step 2: Modify the AccuWork Schema](#), she starts the AccuRev Web UI. From there, she opens the phoenix depot, clicks the **Admin** menu, and chooses **Create Workflow**:

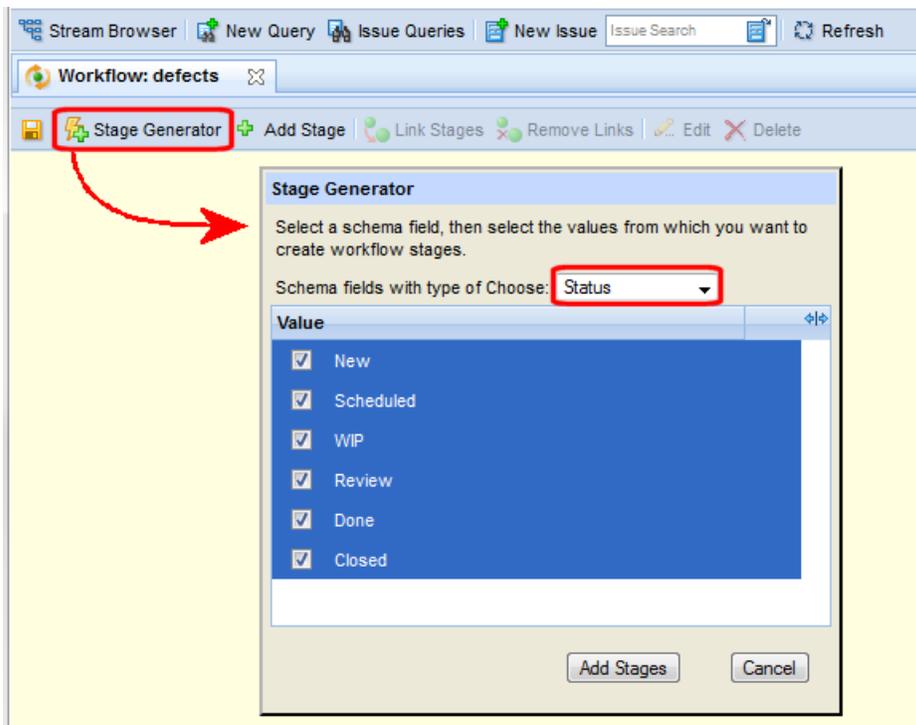
1. In the Create Workflow dialog box, she selects the phoenix depot and enters the name *defect* for the workflow:



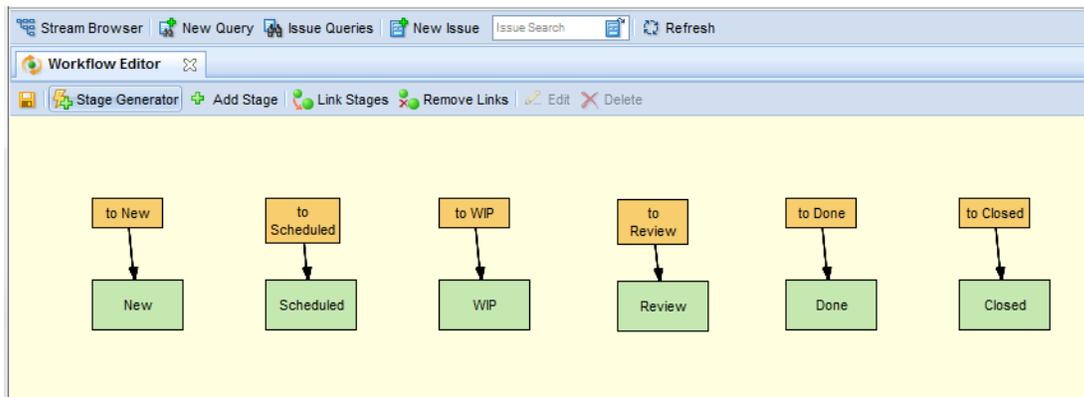
2. When she clicks **Ok**, the Workflow Editor appears, along with the Set Workflow Conditions dialog box. She uses this dialog box to specify that issues must have a type of defect in order to be subject to this workflow:



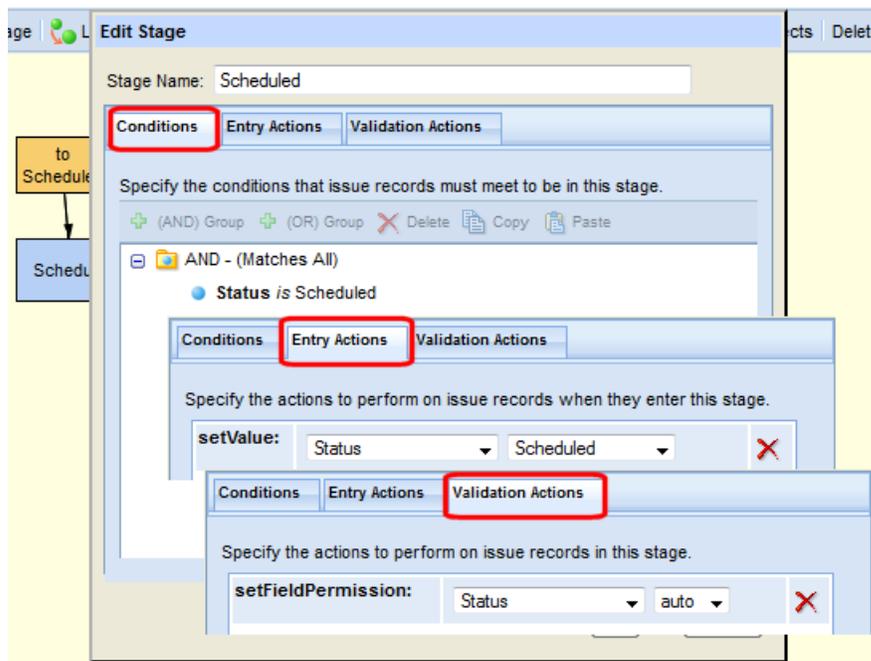
3. When she clicks **Ok** to save the condition settings, the workflow is activated, but the workflow stages and transitions still need to be defined.
4. She clicks the **Stage Generator** button ( **Stage Generator**) and uses it to generate workflow stages based on the values for the Status field in the AccuWork schema:



After choosing *Status* from the **Schema fields with type of Choose** field, she selects all of the values and then clicks the **Add Stages** button. AccuRev automatically creates workflow stages and default transitions for every value in the AccuWork schema's *status* field:



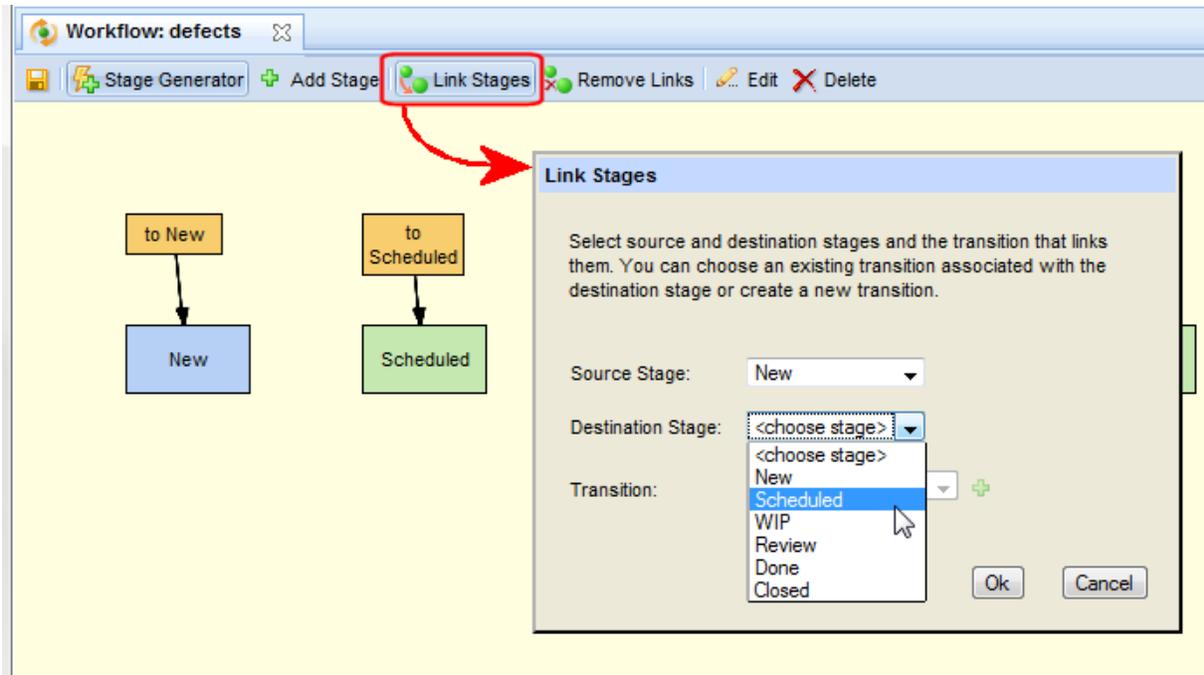
When the AccuRev administrator examines the *Scheduled* workflow stage (she selects the stage in the workflow diagram and clicks the **Edit** button (✎) in the Workflow Editor toolbar), she finds that its logic—its conditions and entry actions—is fully defined, with a condition that describes when an issue can be in that stage, an entry action that describes the changes AccuRev makes to the issue record when it enters that stage by transition, and a validation action that sets the **Status** field to read-only, so that AccuRev users cannot manually remove an issue from the workflow:



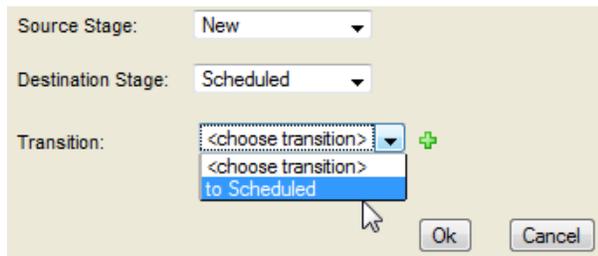
Each of the stages created by the Stage Generator is created with the same conditions, entry actions, and validation actions. All that is left to do now is to configure the workflow by linking one workflow stage to another.

Step 4: Link Workflow Stages

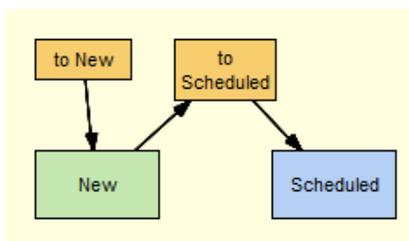
To link workflow stages, the AccuRev Administrator selects a source stage, clicks the **Link Stages** button (), and then chooses the destination stage. In this example, she has chosen the *New* stage as the source and the *Scheduled* stage as the destination:



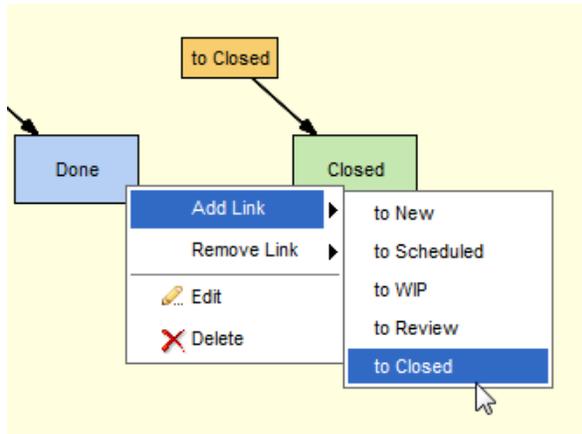
Once the destination stage is selected, AccuRev displays the transitions associated with that stage. She selects to *Scheduled* and clicks **Ok**:



AccuRev updates the workflow diagram with the newly created link between the *New* and *Scheduled* stages.



The AccuRev administrator links the remaining workflow stages, this time using the stage context menu **Add Link**, which displays a list of the transitions to other workflow stages.

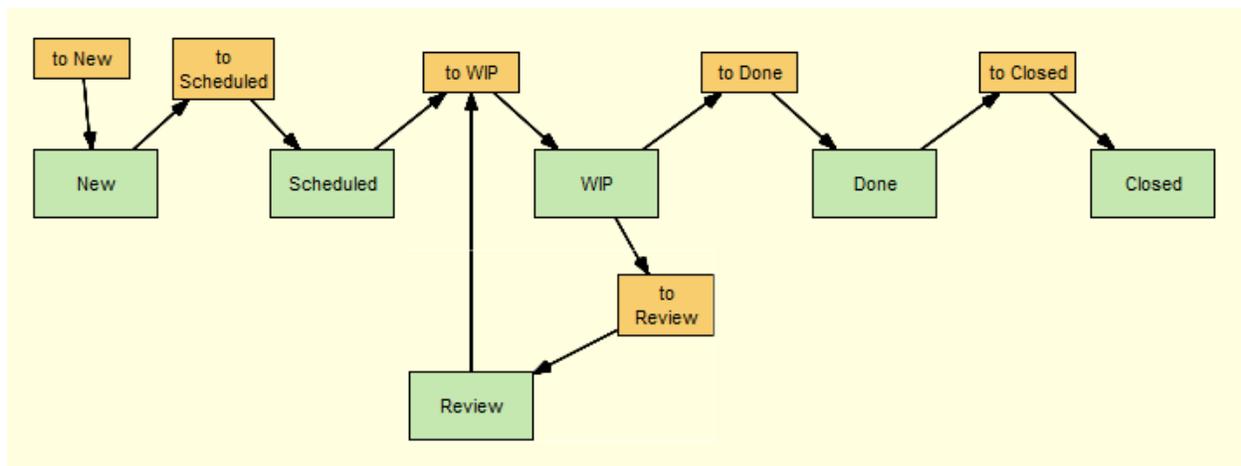


Step 5: Refine the Workflow

Now that all the workflow stages have been linked, some finishing touches can be applied to the *defects* workflow.

Change the Default Layout

The first thing the AccuRev admin does is to use the workflow diagram's drag-and-drop feature to rearrange the workflow to suit her purposes. The workflow for the phoenix depot now looks something like this:



The workflow diagram supports group-select for layout and other operations (like delete, for example).

Remove Unnecessary Transitions

As described elsewhere, the Stage Generator creates a default transition for every stage; most of these transitions are used to link one stage to another, but a transition on the first stage in a workflow is generally not needed. The AccuRev administrator therefore deletes the *to New* transition on the *New* workflow stage.

To do this, she simply selected the transition on the workflow diagram and clicked the **Delete** button (✖); she could have also selected the **Delete** choice on the transition context menu.

Rename Transitions

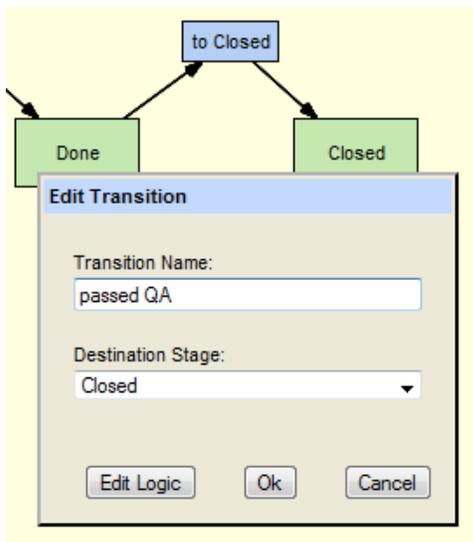
The engineering and release managers mention that they would like to change the default transition names to make the workflow process nomenclature more intuitive for AccuRev users. For example, they would like a QA engineer to click a button that says *passed QA* instead of *to Closed* when an issue passes QA testing and can be closed.

To rename the *to Closed* transition, the AccuRev administrator:

1. Right-clicks the *to Closed* transition and chooses **Edit** from the context menu.

The Edit dialog box for that transition appears.

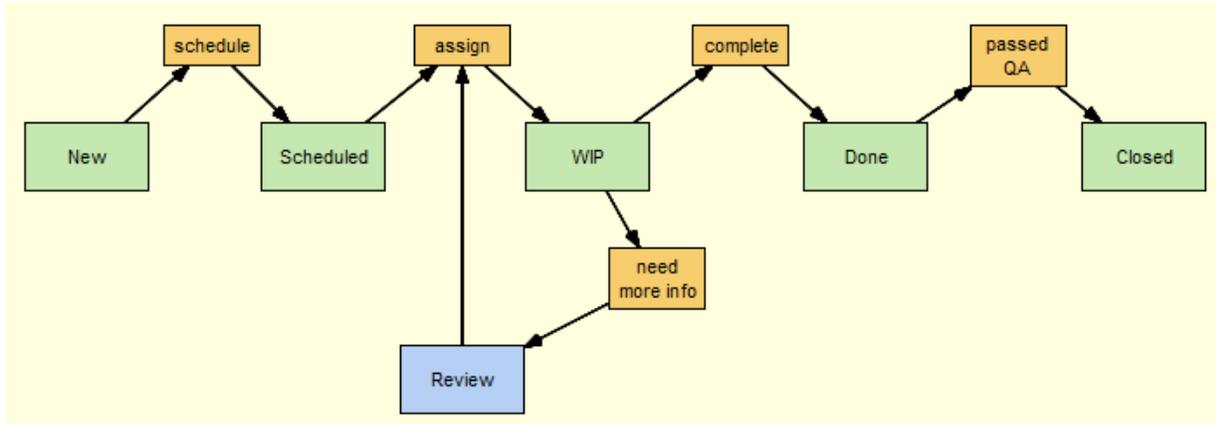
2. In the **Transition Name** field she types *passed QA* and then clicks **Ok** to save the change.



3. She then renames the remaining transitions, as summarized in the following table:

Default Transition Name	Default Transition Name
to Scheduled	schedule
to WIP	assign
to Done	complete
to Review	need more info

4. When she has finished, she clicks the **Save** button (📁) to save her changes to the workflow, which now looks like this:



Specify a Transition Action

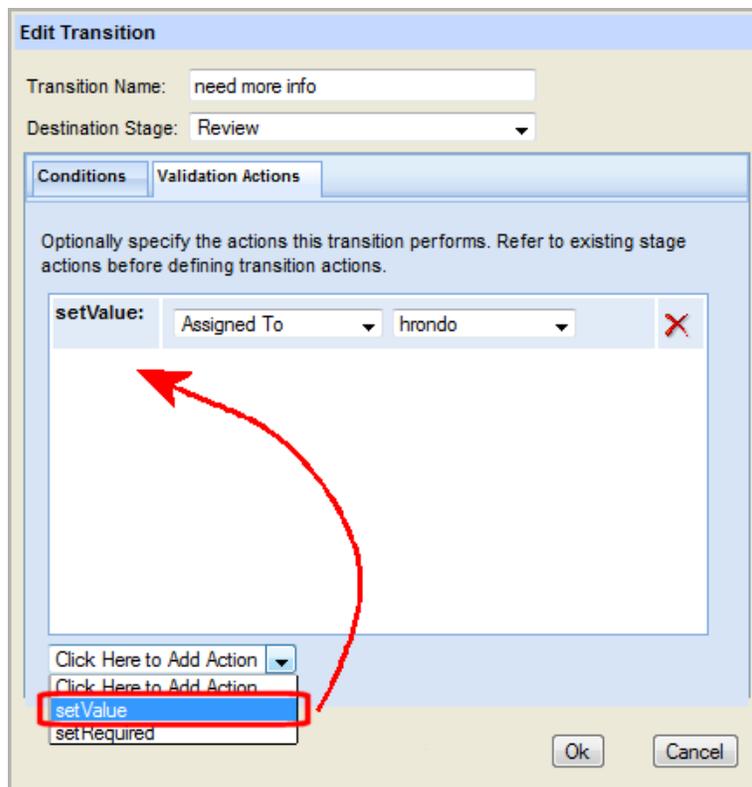
When an engineer returns an issue to the product owner for more information, the **Assigned To** field should change from the engineer's user name to that of the product owner. To accomplish this, the AccuRev administrator creates a `setValue` action for the *need more info* transition:

To specify a transition action, the AccuRev administrator:

1. Right-clicks the *need more info* transition and chooses **Edit** from the context menu.

The Edit dialog box for that transition appears.

2. She clicks the **Edit Logic** button to display the Validation Actions tab, and sets the `setValue` action to *hrondo*, the product owner's user name.

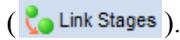


Now, when the user clicks the *need more info* transition button for an issue record, the value of the **Assigned To** field is automatically changed to hrondo.

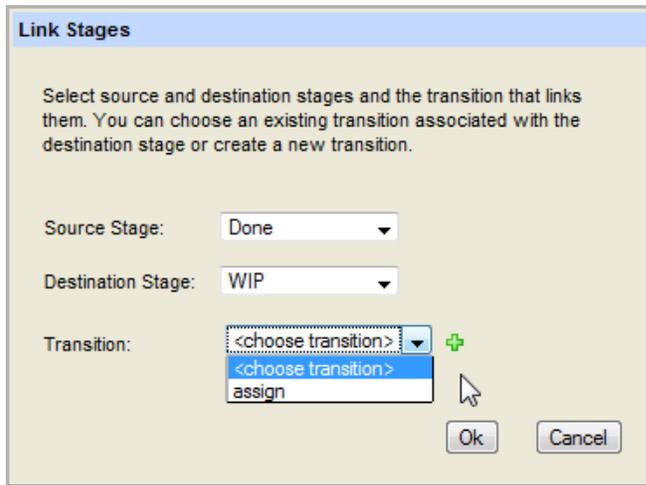
Create a Transition from Scratch

While reviewing the current workflow, the team notices that there is no way for QA to indicate that an issue has failed testing and to return the issue to engineering for more work—that is, to move the issue from *Done* back to *WIP*. To handle this case, the AccuRev administrator creates a new transition, *failed QA*, and uses it to link the *Done* and *WIP* stages:

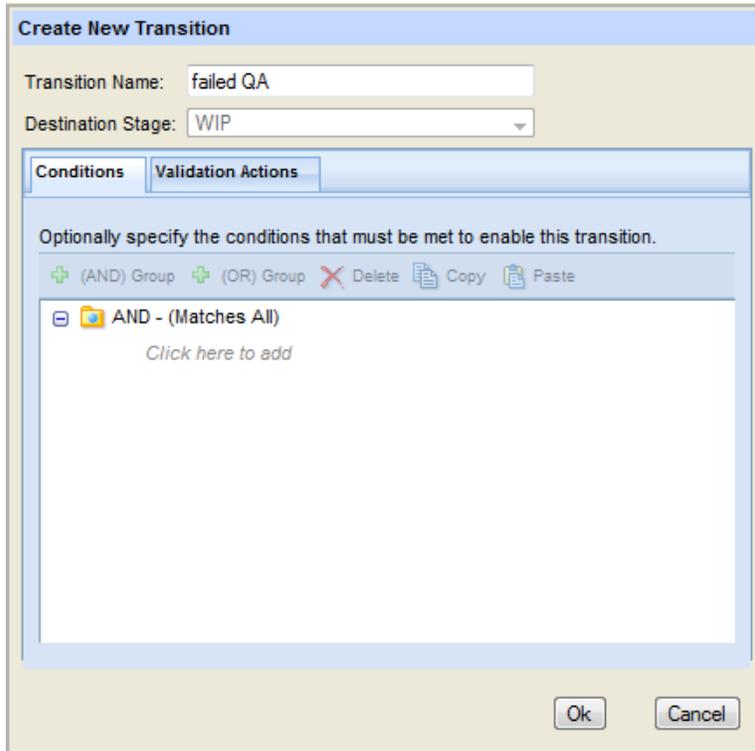
1. She selects the *Done* stage from the workflow diagram and clicks the **Link Stages** button



The Link Stages dialog box appears. *Done* is already specified as the source stage, and she selects *WIP* for the **Destination Stage** field.

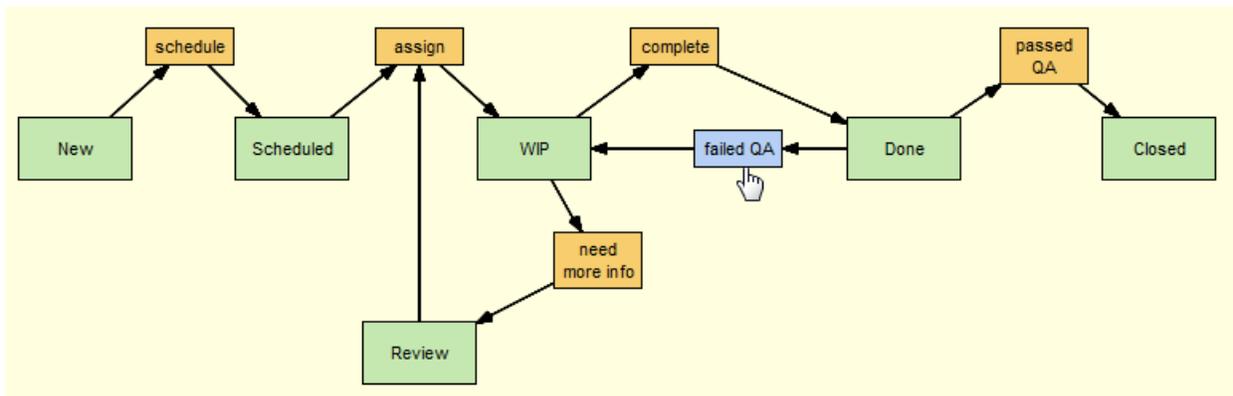


2. The *assign* transition is already being used to move issues from Scheduled to *WIP*, so the AccuRev administrator clicks the **Create New Transition** button ().
3. In the **Transition Name** field of the Create New Transition dialog box, she types *failed QA* and then clicks **Ok** to create the new transition.



4. When the Create New Transition dialog box closes, the AccuRev Administrator clicks **Ok** on the Link Stages dialog box.

The new *failed QA* transition appears on the workflow diagram:



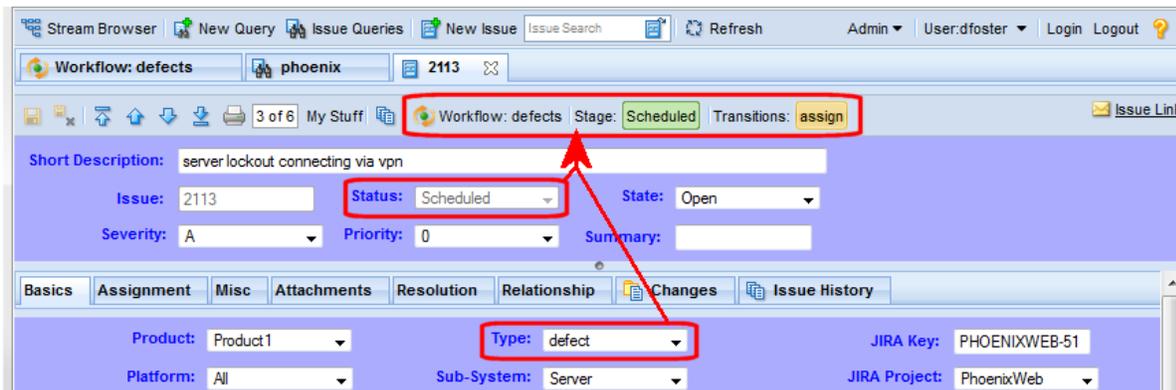
After a final review, the team agrees that the workflow is now ready to be integrated with the phoenix depot.

Step 6: Review Issue Processing Automation

Before using the *defects* workflow to enforce Rapid Velo's SCM policies, the AccuRev administrator wants to quickly review the issue processing features that are already available to her AccuRev users. By simply creating and activating the defects workflow, Rapid Velo's AccuRev users can:

- Quickly determine which workflow stage an issue is in
- Display a read-only view of the workflow to gain a sense of where the issue sits relative to the overall workflow
- Automatically move the issue to the next stage of the workflow by clicking a transition button

All of these features are accessible on the Issue Edit form, shown here:

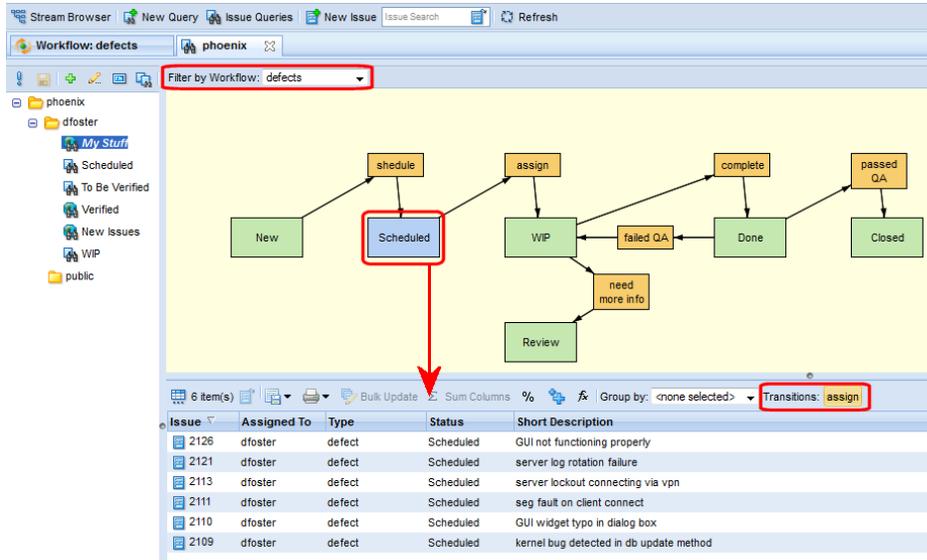


Here, for example, because issue 2113 is type defect, its processing is automated and enforced by the *defects* workflow (whose condition, you might recall, was specified as *Type = defect*). In this example, clicking the **assign** transition button moves the issue to the *WIP* stage, changing the value of the **Status** field from Scheduled to WIP in the process. Any logic defined for the *WIP* stage—an entry action or a validation action, for example—is executed at this time.

Tip: These workflow tools are also available in the Issue Edit form in the AccuRev Java GUI once the workflow has been created and activated.

Using a Workflow as a Query Filter

AccuRev users can now also use the workflow to filter query results, and to quickly view and manage the issues in any workflow stage. As shown here, the *defects* workflow has been used to filter results from the My Stuff query to display only those issues that are defects (and not, say, enhancements).

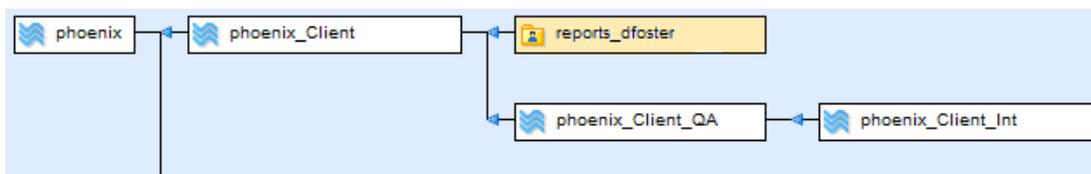


And by clicking a stage in the workflow diagram, users can further filter query results to see which issues returned by the query are in that stage. Multiple stages can be selected, and buttons for applicable transitions are displayed in the query results pane.

Step 7: Use Workflow to Enforce SCM Policies

Satisfied that the *defects* workflow provides the required support for Rapid Velo’s issue processing automation and rules enforcement, the AccuRev administrator is ready to use that workflow to enforce Rapid Velo’s SCM development and release policies. In particular, Rapid Velo’s engineering organization wants to ensure that:

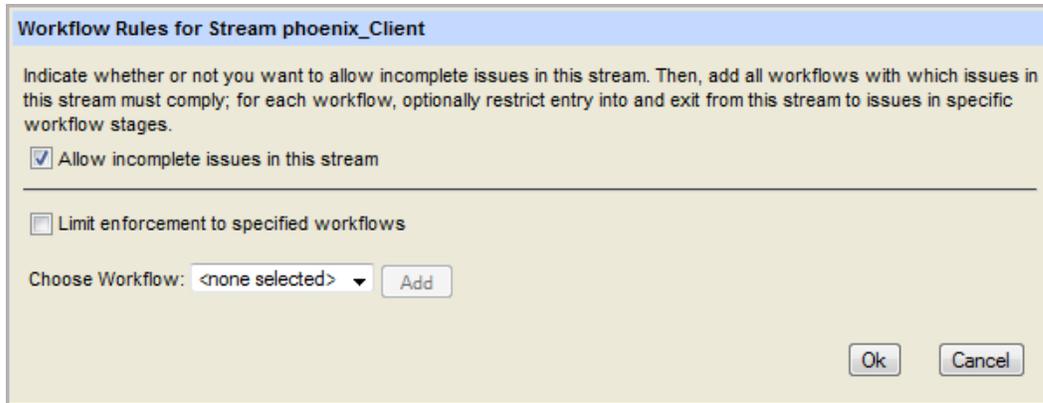
- Only defects that are marked Closed can be promoted into the phoenix_Client build stream
- Any type of issue can be in the phoenix_Client_QA stream, but if it is a defect, it must be marked Done



Restrict Entry Based Exclusively on Workflow Stage

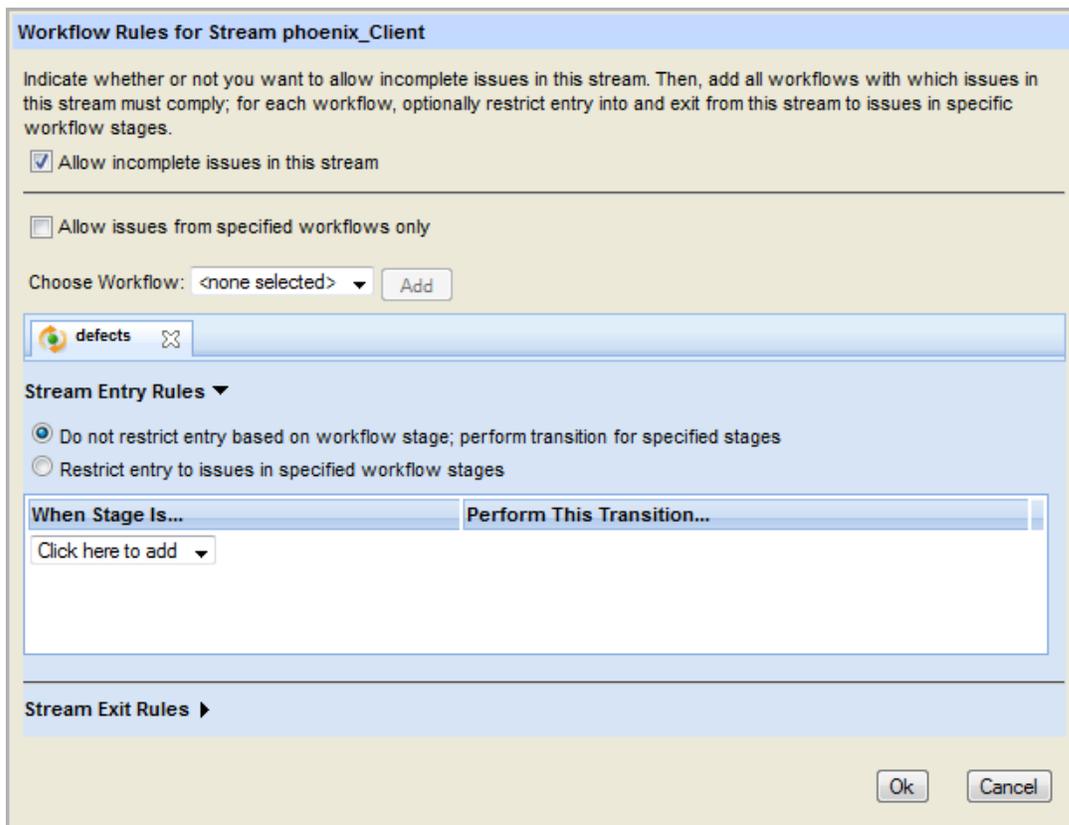
The AccuRev administrator starts by setting workflow rules for the phoenix_Client stream:

1. She right-clicks the phoenix_Client stream and chooses Workflow Rules from the context menu.
The Workflow Rules for Stream dialog box appears.

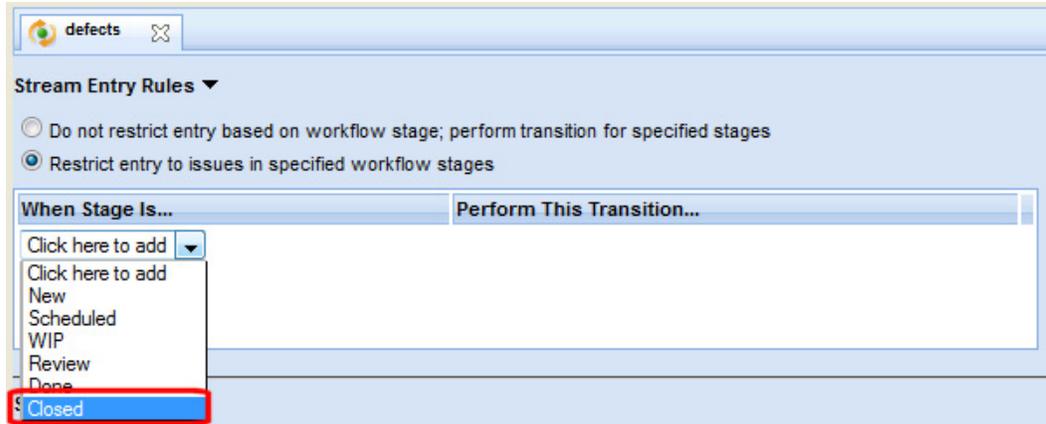


Since she wants to restrict entry to defects, she selects the *defects* workflow from the **Choose Workflow** field and clicks the **Add** button.

The Workflow Rules for Stream dialog box expands, displaying a new tab for the defects workflow.

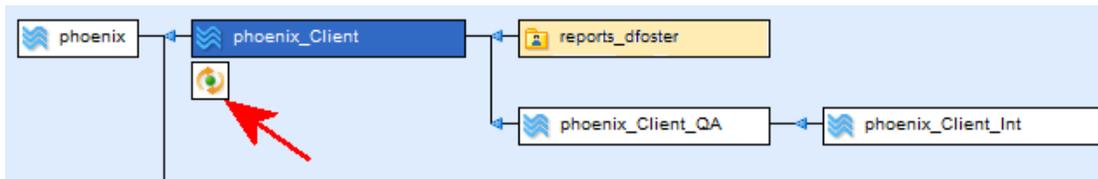


2. To allow *only* defects in the phoenix_Client stream, she selects the **Allow issues from specified workflows only** check box.
3. Next, she changes the default stream entry rule to **Restrict entry to issues in specified workflow stages**, and then specifies Closed for the workflow stage:



(Because *Closed* is the last stage in the workflow, it is not currently defined with a transition to another workflow stage.)

When the AccuRev administrator is done, the phoenix_Client stream in the StreamBrowser displays an icon that indicates that a workflow rule has been specified for this stream.

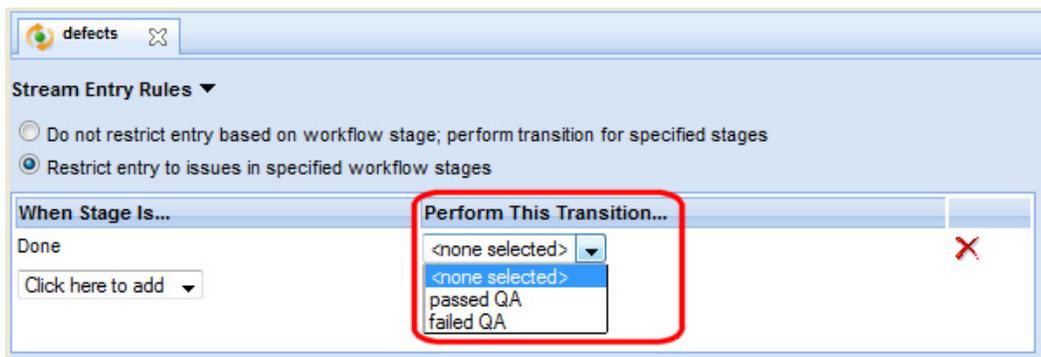


Tip: The workflow rules icon also appears in the StreamBrowser in the AccuRev Java GUI.

Enforce Rules for Specific Issue Types Only

The rules for the phoenix_Client_QA stream are slightly more relaxed: issues of any type—defects, enhancements, and so on—can be in the stream, but if the issue is a defect, it must be marked Done. The procedure for setting this rule on the phoenix_Client_QA stream is the same as that for the phoenix_Client stream with one simple difference: when specifying the rule, the AccuRev administrator leaves the **Allow issues from specified workflows only** check box in its default state (not selected).

Note that the transitions specified as part of the stream entry or exit rule are performed on the issue when it is promoted into the stream. In this case, however, the AccuRev administrator did not select a transition for issues promoted into the phoenix_Client_QA stream because there is no way to determine whether or not the issue will pass QA.



Summing Up

Once the Rapid Velo team identified the stages in the software development and release management processes they wanted to model, creating and activating a fully functional workflow took just a few minutes. The AccuRev administrator used the Stage Generator to create all workflow stages based on values from the *status* field in the AccuWork schema; refining the workflow as new requirements were identified—adding a new transition and changing the value of the **Assigned To** field, for example—was quick and easy. Integrating the finished workflow with the depot to enforce the company’s SCM policies was also accomplished in a few simple steps.

Now that the Rapid Velo team has a workflow in place:

- Issue processing is automated—important fields are write-protected, issues can move only through well-defined paths in the workflow
- AccuRev users can use workflow to help manage their issues—users can tell at a glance which workflow stage an issue is in and use transition buttons to move the issue through the workflow; the workflow can be used as a query filter; users can quickly see—and work on—issues in a specific workflow stage by clicking on a diagram
- SCM development and release policies are enforced—with just a few clicks, entry restrictions were placed on issues being promoted into the phoenix_Client and phoenix_Client_QA streams.

All of this was accomplished in just a few minutes using the intuitive Workflow Editor and familiar tools like the StreamBrowser and Schema Editor.

Advanced Topics

This section describes advanced topics you might want to consider when configuring workflow.

Suspending Workflow

As described in [Creating and Managing Workflows](#) on page 134, a workflow takes effect as soon as it is activated. You activate a workflow by defining one or more conditions an issue must meet in order to be subject to the workflow. Typically, a workflow condition is based on a specific issue type—defect, enhancement, and so on.

There might be occasions in which you want to *suspend* the workflow—as the administrator, you might want to be able to manually update a field that your workflow has defined as read-only, for example. There are two ways to suspend a workflow:

- **Override**—when you override a workflow, the workflow remains in force for the majority of your users, but a select group of users is able to make changes to issues that the workflow rules would otherwise prevent. This is the simplest way to suspend a workflow.
- **Deactivate**—when you deactivate a workflow, AccuRev no longer enforces any workflow rules. Workflow rules are enforced only after the workflow is activated again.

The following sections describe these methods for suspending workflow.

Overriding a Workflow

To override a workflow, you define as one of the workflow conditions the AccuRev users or group to whom the workflow rules do not apply. Overriding is the preferred way of suspending a workflow because

it does not interrupt workflow enforcement for AccuRev users who are not members of the group you specify.

To allow a user or group to override a workflow:

1. Decide which users you want to allow to override a workflow.
2. In the Java GUI, create a group (or use an existing one) and add those users to it.
Tip: Consider creating an Admin group for this purpose if one does not exist already.
3. In the AccuRev Web UI, add the following condition to the workflow:

`CUR_USER is not member of Admin`

See [Activating a Workflow: Defining Workflow Conditions](#) on page 135 if you need help with this step.

4. Click the **Save** button (📁) to save your changes to the workflow.

Now, when users of the Admin group log in to AccuRev, workflow rules are suspended.

Deactivating a Workflow

When you deactivate a workflow, rules for that workflow are no longer enforced in the depot—issue validation is managed by whatever rules you have specified in your AccuWork schema, and streams are under the control of any locks or Access Control Lists (ACLs) you have defined. Use this procedure to suspend workflow rules on an as-needed basis, when you need to address a specific workflow management issue.

To deactivate a workflow:

1. Open the workflow and click the **Conditions** button on the Workflow Editor toolbar to display the Set Workflow Conditions dialog box.
2. Delete all workflow conditions and click **Ok**.
3. Click the **Save** button (📁) to save your changes to the workflow.

AccuRev warns you that you are saving the workflow without having specified any conditions for it and prompts you to specify workflow conditions now.

4. Click **No** to save the workflow without any conditions.

Note: At this point, workflow rules are no longer in force in AccuRev.

5. Perform the activities that prompted you to deactivate the workflow. When you have finished, redefine the workflow conditions. See [Activating a Workflow: Defining Workflow Conditions](#) on page 135 if you need help with this step.

When to Consider Schema Validation

Using the Stage Generator is the quickest way to set up basic validation actions that are keyed off the field you have chosen as the basis for your workflow stages. For example, if you are using the **Status** field for your workflow stages, AccuRev automatically sets the setFieldPermission validation action to *auto* for that field.

You can manually specify other validation actions for individual stages in the Workflow Editor, but if you identify the need to define the same validation action for every stage in your workflow—making the **Severity** field required, for example—consider specifying that setting using the Validation tab in the Schema Editor in the AccuRev Java GUI.

See your AccuRev Java GUI user documentation for more information on working with the Schema Editor.

5. Using URLs to Access AccuRev® Data

The AccuRev® Web UI allows direct access to AccuRev data and views via a customized URL. The purpose of these URLs is to define an AccuRev operation and one or more AccuRev objects to act upon, in URL format. Data which can be accessed in this manner includes:

- AccuRev elements
- AccuWork queries and issues
- AccuRev element views, including:
 - Comparisons between versions of AccuRev elements (Diff Tool)
 - Annotations of an AccuRev element (Annotate Tool)
 - Versions of an AccuRev element (Version Browser)
 - Listings in the File Browser (including searches such as Default Group)
 - History of one or more AccuRev elements (History Browser)

These URLs can be sent via e-mail or inserted on a web page external to the Web UI. When the URL is clicked, the resulting AccuRev data is displayed. (If you are not logged in to the AccuRev Web UI when you click the URL, you will be prompted to do so.)

Note: URLs conform to the case sensitivity of the current AccuRev Server.

Obtaining Web UI Links

The Web UI provides access to its customized URLs via links that generally appear on the right side of a toolbar in the form of a mailto link and a hypertext link.



For security reasons, navigating to these customized URLs will cause the Login dialog to appear if you are not already logged in to the Web UI. After you log in, the element or view referenced by the URL appears in your browser.

- The **mailto** link () opens a new e-mail message (using your system's default e-mail application) when you click it. The body of the e-mail contains the URL corresponding to that link. Recipients can click the link (after logging in to the Web UI) and view the resulting Web UI view or AccuRev element in their browser.
- The *hypertext* link contains the same information as the **mailto** link, in a form useful for bookmarking. Click the link to open it in a separate browser tab. The URL for that link will be displayed in the browser's address bar. Alternatively, you can right-click the link and bookmark or copy it for later use.

Note that links to files are *permanent*: they return the same information no matter when it is used or what happens to those files later.

User-Specified URLs

To construct your own URLs for use with the Web UI, refer to the formats listed below.

- To access the most recent version of a text element, use the format:
`http://<server:port>/accurev/browse/<depot>/<stream>/<path>`
For example:
`http://localhost:8080/accurev/browse/mydepot/wspace1_mary/track/sprints.txt`
- To access the most recent version of a binary element, use the format:
`http://<server:port>/accurev/browse/*render*/<depot>/<stream>/<path>`
For example:
`http://localhost:8080/accurev/browse/*render*/mydepot/wspace1_mary/track/sprints.doc`
- To access a query, use the format:
`http://<server:port>/accurev/query/<depot>/<query-name>`
For example:
`http://localhost:8080/accurev/query/SplinterSoft/41_issues`
- To access an issue, use the format:
`http://<server:port>/accurev/issue/<depot>/<issue-num>`
For example:
`http://localhost:8080/accurev/issue/SplinterSoft/384`
- To access any of the above items while logged in to the Web UI, simply edit the displayed URL to type in the remainder of the URL for the specific item.

Please note that URLs generated by the Web UI may be more complex than these examples; refer to the remainder of this help topic for a full explanation of URL formats used by the Web UI.

URLs for AccuRev® Elements

These URLs will show the content of AccuRev elements. The URL format is:

`http://<server:port>/accurev/browse/<depot>/<stream>/<path>?<parameters>`

Examples:

`http://localhost:8080/accurev/browse/accurev/mars/java/doc/MainApp.html?view=content`

(displays the contents of the most recent version of MainApp.html as text)

`http://localhost:8080/accurev/browse/accurev/mars?view=content&eid=23`

(if '23' is the element ID of MainApp.html, displays the contents of the most recent version of MainApp.html as text)

`http://localhost:8080/accurev/browse/accurev/mars?view=render&eid=23`

(displays the most recent version of MainApp.html in an OS-associated browser)

http://localhost:8080/accurev/browse/*render*/accurev/mars?eid=23

(alternative URL format to display the most recent version of MainApp.html in an OS-associated browser)

URL Format Definition

The parts of the URL are described below:

root

The URL used to access AccuRev objects from the Web UI:

<http://<server:port>/accurev/browse>

depot

The name or numerical ID of a depot.

stream

The name or numerical ID of a stream.

path

(*optional*) The path to an AccuRev element within a stream.

separator

(*required if there are parameters*) The question mark (?) character is used to separate the parameters from the rest of the URL.

parameters

Parameters identify what element versions will be acted on and how. They are shown as **name=value** pairs. Multiple parameters are separated by the ampersand (&) character.

- (*optional*) **view**: The action to be taken on the specified element.
 - **content**: Opens the element in the Web UI. If no **view** parameter is specified, the view defaults to **content**.
 - **render**: Renders the contents of the given element in the browser window if possible; otherwise calls the appropriate program to display the element based on operating system file type associations.
- **eid**: The element ID.
- **version**: The element's virtual version, which must be specified in the proper AccuRev format (<stream#>|<version#>, for example, 148\2). If it is not present, the URL retrieves most recent version of the element in the given stream.

Rendering Web Pages That Contain Relative Links

The **view=render** parameter suffices for many types of content that require external programs to display. Web pages, which contain references to images, stylesheets, and other embedded content, require a different approach. For best results when rendering web pages with embedded content referenced using relative links, remove the **view=render** parameter and construct the URL starting with http://<server:port>/accurev/browse/*render*/.

Example:

```
http://localhost:8080/accurev/browse/*render*/devplans/OurProduct-2.0/plans/DevPlan20.html
```

(renders the contents of the most recent version of DevPlan20.html in a Web browser, including images in the Web page that are stored in the **plans\images** subdirectory)

URL Permanence

Some absolute URLs that reference an AccuRev element or element comparison are constructed so that they always display the same content. These *permanent* URLs, which contain references to both the element ID and version, will always return the same element version regardless of any further work done on the element. To construct a permanent URL, both the **depot** and **stream** must be specified with numerical IDs (not names), and the URL must include both element ID (**eid**) and **version** parameters. The sole exception to this is in the case of an URL referencing a snapshot stream. Since snapshots are immutable, all URLs that specify a snapshot are permanent.

URLs for AccuRev® Element Views

These URLs will display AccuRev elements in the File Browser, History Browser, Version Browser, Annotate Tool, or Diff Tool. The URL format is:

```
http://<server:port>/accurev/browse/<depot>/<stream>/<path>?<parameters>
```

Examples:

```
http://localhost:8080/accurev/browse/1/34?eid=0&streamName=myStream&view=fb
```

(opens the stream in the File Browser, showing the contents of the top-level directory)

```
http://localhost:8080/accurev/browse/1/34/doc/build?eid=474&streamName=myStream&view=fb
```

(opens the stream in the File Browser, showing the contents of the directory specified)

```
http://localhost:8080/accurev/browse/1/34/doc/build/index.html?eid=483&v=173\9&filter=20&view=hist
```

(shows the transaction history for the named element, limiting the view to 20 items)

```
http://localhost:8080/accurev/browse/1/34/doc/build/index.html?eid=483&v=173\9&filter=20&view=vb
```

(shows the transaction history for the named element in the Version Browser, limiting the view to 20 items)

URL Format Definition

The parts of the URL are described below:

root

The URL used to access AccuRev objects from the Web UI:

```
http://<server:port>/accurev/browse
```

depot

The name or numerical ID of a depot.

stream

The name or numerical ID of a stream.

path

The path to an AccuRev element within a stream. This parameter is not used when showing the top level of a stream in the File Browser.

separator

The question mark (?) character is used to separate the parameters from the rest of the URL.

parameters

File Browser parameters: **eid**=<element-ID>&**streamName**=<stream name>&**filter**=<filter name>&**view**=fb

History Browser parameters: **eid**=<element-ID>&**v**=<virtual version>&**fromfilter**=<filter name>&**view**=hist

Version Browser parameters: **eid**=<element-ID>&**v**=<virtual version>&**filter**=<filter name>&**view**=vb

Version Browser parameters (using a Custom filter):

eid=<element-ID>&**v**=<virtual version>&**from**=YYYYMMDD&**to**=YYYYMMDD&**view**=vb

Annotate Tool parameters: **v**=<version using stream name>&**view**=annotate

Diff Tool parameters: **eid**=<element-ID>&**v1**=<virtual version>&**v2**=<virtual version>&**view**=diff

Parameters identify what element versions will be acted on and how. They are shown as **name=value** pairs. Multiple parameters are separated by the ampersand (&) character.

eid: The element ID.

streamName: The name of the stream being displayed.

- **v**: The element's virtual version, for example, 148\2. If it is not present, the URL retrieves most recent version of the element in the given stream. This parameter can be specified using a stream name instead of a stream number when **view** is set to **annotate**.
- **v1**: First (virtual) version to be compared.
- **v2**: Second (virtual) version to be compared.
- **filter**: The name of the filter or search being applied. If this parameter is omitted, the view is not filtered. The **filter** parameter and the **from** and **to** parameters cannot be used together.
- **from, to**: The time range to filter the data by. The **filter** parameter and the **from** and **to** parameters cannot be used together.
- **view**: The name of the view being accessed.

URLs for Stream History and Transactions

The URL format for stream history and stream active transactions is:

```
http://<server:port>/accurev/stream/<depot#>/  
{<stream#>|<transaction#>}?<parameters>
```

Examples:

```
http://localhost:8080/accurev/stream/5/590?streamName=myStream&filter=20&view=hist
```

(opens the stream history in the History Browser, limiting the view to 20 items)

```
http://localhost:8080/accurev/stream/5/590?streamName=myStream&view=act_trans
```

(opens the History Browser and shows the active transactions in the stream)

```
http://localhost:8080/accurev/stream/5/83638?view=trans_hist
```

(opens a view showing the details for the specified transaction)

URL Format Definition

The parts of the URL are described below:

root

The URL used to access AccuRev objects from the Web UI:

```
http://<server:port>/accurev/stream
```

depot

The name or numerical ID of a depot.

stream

The name or numerical ID of a stream.

separator

The question mark (?) character is used to separate the parameters from the rest of the URL.

parameters

Parameters identify what view and filtering options are included in the URL. They are shown as **name=value** pairs. Multiple parameters are separated by the ampersand (&) character.

streamName: The name of the stream being displayed.

- *(optional)* **filter:** The name of the filter being applied. This parameter is used only when **view** is set to **hist**. If this parameter is omitted, the view is not filtered.
- **view:** The name of the view being accessed:
 - **hist:** Opens the stream history in the History Browser.
 - **act_trans:** Shows the active transactions in the stream.
 - **act_issues:** Shows the active issues in the stream.
 - **trans_hist:** Display history for a specific transaction.

URLs for AccuWork™ Queries and Issues

The URL format for AccuRev elements and comparisons between AccuRev elements is:

`http://<server:port>/accurev/<entity-type>/<depot>/<entity-ID>?<parameters>`

Examples:

<http://localhost:8080/accurev/query/SoftProject/My%20Reported%20Issues>

(displays the results of the **My Reported Issues** query from the **SoftProject** depot)

<http://localhost:8080/accurev/issue/SoftProject/33>

(displays issue number **33** from the **SoftProject** depot)

URL Format Definition

The parts of the URL are described below:

root

The URL used to access AccuRev objects from the Web UI: <http://<server:port>/accurev/>

entity-type

The AccuWork entity to display: **query** or **issue**.

depot

The name or numerical ID of a depot.

entity-ID

The query name or issue number.

separator

(required if there are parameters) The question mark (?) character is used to separate the parameters from the rest of the URL.

parameters

(query URLs only) Parameters identify how query results will be displayed if grouping or reporting are used. Query results that are grouped will display **groupBy**, **groupBySort**, and **groupBySortOrder** parameters in the URL. Charts will additionally display **chartType** and **chartCol** parameters. Parameters are shown as **name=value** pairs. Multiple parameters are separated by the ampersand (&) character.

- **mode:** Indicator for Show Percentage mode: **percent**
- **groupBy:** The query results column used to generate groups.
- **groupBySort:** The query results column that rows are sorted on.
- **groupBySortOrder:** Indicator for the sort order: **asc** or **desc**.
- **chartType:** Indicator for the type of chart: **pie**, **bar** or **line**.
- **chartCol:** The query results column used to create the chart.

URLs for Queries with Calculated Columns

AccuRev builds URLs for queries with a calculated column. See [Calculate Columns](#) on page 98 to learn more about adding calculated columns to a query.

Parameters

URLs for queries with calculated columns use the following unique parameters. As with other AccuRev URLs, parameters are separated with an ampersand (&).

op=

The type of operation used to calculate the new column. Valid values are ADD and SUBTRACT.

op_column1=

The name of the first column used in the operation.

op_column2=

The name of the second column used in the operation.

columnName=

The name you gave the new column when you defined it.

Example

The following example shows the URL for a query called *OpenDevIssues* that includes a calculated column named *Est/Actual Delta*. The values in this column were calculated by subtracting value of the *actTime* column (column2) from the *estTime* column (column1).

```
http://localhost:8080/accurev/webGui.jsp?op=SUBTRACT&
op_column1=estTime&queryName=OpenDevIssues&
op_column2=actTime&depot=5&columnName=Est/Actual%20Delta&view=query
```

See [URL Format Definition](#) for more information on the structure of URLs in AccuRev.

URL for Displaying the Web UI Without a Toolbar

You can use the **embedded** parameter to invoke the Web UI without the usual toolbar, which can be useful if you want to embed the Web UI within another application.

```
http://<server:port>/accurev?embedded=yes
```

Note: Administrators and developers may also be interested in the login POST method that AccuRev provides for customizing login displays and for logging in programmatically. Please see Chapter 3, "Integrating the AccuRev® Web Interface with other Applications" in the *AccuRev® Web Interface Administrator's Guide*.

Glossary

A

AccuRev® Server

The program that manages the AccuRev® repository and handles commands issued by AccuRev client programs. See also [client program](#).

AccuWork™

AccuRev's optional and tightly-integrated change package and issue management package.

activate

The process of enabling a [workflow](#) in AccuRev so that the workflow can be used to automate issue processing and enforce compliance with your SCM policies. You activate a workflow by setting conditions that issues must meet in order to be subject to the workflow.

active

An element is said to be active in a workspace or stream if a new version of the element has been created there, and that version has not been either (1) promoted to the parent stream or (2) purged from the workspace or stream. See also [default group](#), [backed](#), [passive](#). An issue record is said to be active in a workspace or stream if the head version of one or more of its change package entries is in the stream's default group.

add

The operation that places a file, located in a user's workspace tree, under version control.

ancestor

In the version graph of an element, version A is an ancestor of version B if there is a direct line of descent (possibly including merges) from A to B. See [predecessor](#) (or [direct ancestor](#)). 'A is an ancestor of B' is equivalent to 'B is a descendant of A'.

ancestry

The entire set of versions of an element. See also [version graph](#).

atomic

An important characteristic of AccuRev transactions: the entire transaction (including all specified files) must be performed successfully; if not, the entire transaction is cancelled, as if it were never attempted.

B

backed

An element has '(backed)' status in a workspace or stream if it is not currently active there. This means that the workspace/stream inherits the version of the element that is currently in the workspace/stream's parent stream (also called the backing stream).

backing chain

The 'path' (sequence of streams) through the depot's stream hierarchy, leading from a particular workspace or stream up to the depot's root stream. See also [stream path](#).

backing stream

(parent stream, basis stream) The stream that is just above a given workspace or stream in a depot's stream hierarchy. The given workspace/stream inherits versions from the backing stream.

base stream

See [root stream](#).

basis stream

See [backing stream](#).

basis time

A date-timestamp setting for a stream, affecting which versions the stream inherits from its parent stream: for each element, the version inherited is the one that was in the parent stream at the basis time. See also [snapshot](#).

basis version

A particular ancestor of the version specified in a **Patch**, **Revert**, **Diff**, or **Send to Issue** command. The series of versions between the basis version and the specified version constitute the 'recent changes' to be patched into (or removed from) the target. Similarly, a change package entry consists of all the versions between a specified basis version and a specified head version.

C

change package

A set of entries, each in the form of a basis-version/head-version pair, recorded on the Changes tab of an issue record. The change package records the changes to one or more elements, made to implement the feature or bug fix described in that issue record. Each entry in the change package describes changes to one element: the changes between the basis version and the head version. See also [patch](#).

change package dependency

A relationship between the change package of an issue record (A) and the change packages of one or more other issue records (B,C,D, ...), expressing the fact that promoting A would also cause some or all of the changes in B,C,D, ... to be promoted.

change section

In a text-file merge (or patch) operation, a location where the two contributors being merged differ from each other. The Merge tool highlights and counts the change sections. It also tracks the conflicting changes (conflicts) -- the subset of change sections in which both contributors differ from

the closest common ancestor. Conflicts must be resolved by human intervention. See also [difference section](#).

checkpoint

Stopping to save a version of an element, then proceeding to make additional changes to the element.

client program

An AccuRev UI through which users submit commands to be executed by the AccuRev Server (the CLI, GUI, and Web UI are all client programs).

closest common ancestor

(of two versions of an element) The most recent version that is an ancestor of two specified versions. Used in a merge operation to minimize the amount of work required to combine the contents of the two specified versions. See also [merge](#), [version graph](#).

concurrent development

(parallel development) The practice of having two or more users concurrently work on the same project -- modifying the same version-controlled elements. See also [serial development](#).

configuration

A set of element versions -- one version of each element. Typically, the set of versions currently in a particular workspace or stream.

conflict

See [conflicting change](#).

conflicting change

The situation in which both contributors to a merge operation differ from the closest common ancestor at the same text line (or set of lines). Also, the situation in which both contributors have pathnames that differ from the closest common ancestor, and from each other.

container file

The ordinary file, located in the file storage area of the AccuRev repository, that contains the permanent copy of a version created in a workspace with the keep command.

content change

A change to the contents of a file element, recorded in a new version created with the Keep command. For a symbolic-link element, a change to the target pathname is a content change. For an element-link element, a change to the target element is not considered a content change to the link. See also [namespace change](#).

contributor

Either of two versions of an element, which are to be combined in a merge operation, producing a new version of the element. This can involve both content changes and namespace changes.

current change

See [current difference](#).

current depot

CLI: the depot associated with the workspace that contains current working directory. GUI: the depot whose data appears in the currently visible tab. The current depot's name is displayed in the status bar at the bottom of the window.

current difference

The currently highlighted difference section (Diff tool) or change section (Merge tool).

current version

The version of an element that currently appears in a particular workspace or stream. (It's also possible that a given workspace/stream might not contain any version of a given element.) The current version can be directly active in the workspace/stream; if not, it is inherited from the parent stream. See also [passive](#).

current workspace

The workspace whose data is displayed in the current tab; or the workspace from which the current tab was invoked.

D

dark matter

The term used to refer to element versions that are not associated with any issue. Also referred to as [unaffiliated changes](#). See [Unaffiliated Changes \("Dark Matter"\)](#) on page 107.

deep overlap

An overlap that is not in the current workspace or stream, but in the parent stream or another stream higher up in the stream hierarchy.

deep underlap

An underlap that is not in the current workspace or stream, but in the parent stream or another stream higher up in the stream hierarchy.

default group

The set of elements that are currently active in a particular workspace or stream.

default query

An AccuWork query that you've designated to be executed automatically in certain situations: when you open a new Queries tab or Query Browser; when AccuRev prompts you to specify one or more issue records in a Send to Issue command; when you execute Promote and AccuRev/AccuWork integration is enabled.

defunct

A particular kind of change to an element in a workspace or stream: that the element is to be deleted. The element disappears from the workspace or stream. Somewhat counter-intuitively, it also becomes active in the workspace or stream, because defuncting is a change that can be promoted to the parent stream (or can be undone with a purge operation). A defunct operation is originally recorded as a new version of the element in some workspace. Promoting this version up the stream hierarchy causes the element to disappear from the higher-level streams.

dependency

See [change package dependency](#).

depot

The portion of the AccuRev repository that stores the entire history of a particular directory tree. See also [element](#), [version](#).

depot-relative pathname

A pathname that begins with `./` (UNIX) or `\\.\\` (Windows), indicating the path from the top-level directory of a depot to a particular element.

descendant

See [ancestor](#).

diff

An operation that compares the contents of two versions of a text-file element.

difference section

In a text-file-comparison operation, a location where the two files (or two versions of the same file) differ from each other. The Diff tool highlights and counts the difference sections. See also [change section](#).

direct ancestor

See [predecessor](#).

directory

(folder) A file system object that can contain files and other directories. Each version of a directory records a change to its name and/or pathname location in the depot's directory hierarchy.

dynamic stream

A stream whose configuration changes over time, with new versions promoted from child workspaces and/or from other dynamic streams. It also inherits versions from its parent stream.

E

edit form

(AccuWork) A UI form for displaying and changing the field values of issue records.

EID

See [element-ID](#).

element

A file or directory that is under AccuRev version control. See also [version](#).

element link

An element that is a pointer to another element, which must be in the same depot. The target element can be a directory element, a file element, another element link, or a symbolic link.

element type

The kind of data stored in versions of a file element. Different versions of the same element can have different element types.

element-ID

The unique, immutable integer identifier by which AccuRev tracks the changes to a particular file element or directory element. An element's name or pathname can change, but its element-ID never changes.

exclusive file locking

An AccuRev feature that enforces serial development: when a file becomes active in one workspace, an exclusive file lock prevents the file from becoming active in sibling workspaces.

executable bits

(UNIX only) The data items in a file's access mode that control the ability of users to invoke the file as an executable program.

external

A file or directory located within a workspace but not yet placed under version control has '(external)' status.

F

File Browser

The GUI tab that shows the contents of a workspace or stream.

file storage area

The portion of a depot in which AccuRev maintains a permanent copy ('storage file') of each newly created file version. See also [metadata](#).

filter

See [search](#).

folder

A file system object that can contain files and other folders. Each version of a folder records a change to its name and/or pathname location in the depot's folder hierarchy. See also [directory](#).

from version

One of the contributor versions in a merge operation. In a typical merge, it is the version in the parent stream that is to be combined with the version in the user's workspace.

G

gated stream

A stream that uses user-defined rules to control whether changes promoted into it can be promoted out of it. Gated streams cannot be created using the Web UI, but they are displayed in the StreamBrowser. See also [staging stream](#).

gateway area

A directory with a depot's slice, but outside the depot's file storage area, where version container files are staged for offline archiving. The gateway area is also used to restore archived versions' storage files.

H

head version

The version of an element that, along with a basis version, specifies that element's entry in a change package. Equivalently, the head-version/basis-version pair specifies a patch to that element.

header section

(AccuWork) The section of a multiple-page edit form that always remains visible as you switch from page to page.

hidden stream

Any stream that has been **Removed** and which by default no longer appears in the StreamBrowser™. Hidden streams can be viewed in a grayed-out state by checking the **Include hidden streams** checkbox.

History Browser

The GUI tab that displays the set of transactions that affect a particular data structure: depot, stream, file, etc.

I

immutable

The 'permanence' property of an AccuRev transaction: the transaction cannot be deleted or modified in any way.

indicator

See [status indicator](#).

inherit

The facility by which versions in higher-level streams automatically propagate to lower-level streams. If an element is not currently active in a stream or workspace, the stream/workspace inherits the version of the element that appears in its parent stream.

invisible

Describes a data structure that has been deactivated (Remove command), and so does not appear in default GUI displays or CLI listings.

issue database

(AccuWork) A set of issue records, each of which implements a bug report, feature description, etc. Each depot can have its own issue database. Each issue database has its own schema.

issue record

(AccuWork) A data record, consisting of values of data fields, stored in an issue database.

K

keep

The operation (Keep command) that creates a new version of a file element in a workspace, permanently recording in the AccuRev repository a change to the contents of the file.

kept

Refers to a version that has been created with a keep operation.

L

lock (dynamic stream)

A control on the ability to perform promote and include/exclude operations involving the stream.

login

Establishing a particular user identity ('username') with the Login command. The username must have been created previously. AccuRev licenses specify a maximum number of currently-active usernames.

M

master repository

The primary data repository that logs all transaction activity processed by the AccuRev master server. All storage depots are created in the master repository, from which they can later be replicated.

master server

The instance of the AccuRev Server process that handles all transactions that change the status of elements in the master repository. Only the master server can write data to the repository. See [replica server](#).

member

An element has '**(member)**' status in a workspace or stream if one of its versions is in the default group of that workspace or stream. An element with '**(member)**' status is said to be active in that workspace or stream; otherwise, it's passive.

merge

An operation that combines the contents of two versions (contributors) of the same element. To merge the contents of text files, AccuRev uses a '3-way merge' algorithm: it compares the two files line-by-line with a third file, the version that is the closest common ancestor of the other two. Merging of namespace changes also takes into account the closest common ancestor.

metadata

Information stored in the AccuRev repository other than the actual contents of file versions. Metadata is stored in the repository database; file contents are stored in the file storage area.

modified

A file element has '(modified)' status in a workspace if the file's contents have changed since the last time the user kept a new version of the file or updated the entire workspace.

N

namespace change

A change to the pathname of a file or directory element: either renaming the element in place or moving the element to a different location in the depot's directory hierarchy.

non-conflicting change

In a merge operation, a change that occurs in just one contributor (not both of them). Such a change can be merged automatically, without requiring a decision from the user.

O

overlap

Version X, in a workspace or stream, has '(overlap)' status if the parent stream's current version of the element contains changes that are not reflected in version X. (That is, the parent stream's version is not an ancestor of version X.) Such a version cannot be promoted to the parent stream; the user must create a new version with a merge operation, combining version X with the parent stream's version. The new, merged version can then be promoted. Similarly, an overlap can exist between the versions in two dynamic streams. See also [deep overlap](#).

P

parallel development

(concurrent development) The practice of having two or more users concurrently work on the same project -- modifying the same version-controlled elements. See also [serial development](#).

parent stream

See [backing stream](#).

passive

An element that is not active in a workspace or stream is said to be passive in that workspace or stream. Passive versions can be overwritten by an update operation.

pass-through stream

When a version is nominally promoted to pass-through stream X, the version automatically 'passes through' X: it is actually promoted to X's parent stream.

patch

A set of versions of a text-file element -- typically, containing the 'recent changes' made in one workspace. Also, the merge-like operation that incorporates those changes into another version of the same element. See also [merge](#), [basis version](#), [head version](#), [change package](#), [reverse patch](#).

pending

An element has '(pending)' status in a workspace if the version in the workspace has changes that have not yet been promoted to the parent stream. The set of pending elements includes both kept elements and modified elements.

predecessor

(direct ancestor) The real version from which a given version was derived. A version and its predecessor are not necessarily located in the same workspace stream. In the Version Browser, a version and its predecessor are connected by a black line. (**Exception:** a version created by the **Revert** command is connected to its predecessor by a dashed blue line.) In the version graph of an element, version A is an ancestor of version B if there is a direct line of descent (possibly including merges) from A to B.

private query

(AccuWork) A query that appears in the Query List pane only for the user who created it. See also [public query](#).

promote

The operation (**Promote** command) that transitions a version from being active in one workspace or stream to being active in the parent stream (or some other stream). This operation creates a new virtual version in the parent stream; the virtual version provides an alias for the real version, which was originally created in some user's workspace. See also [version](#).

public query

(AccuWork) A query that appears in the Query List pane for all users. See also [private query](#).

purge

The operation (CLI: **purge** command; GUI: **Revert to Backed** command) that discards the changes made to an element in a given workspace or stream.

Q

query

A set of search criteria that selects records from an AccuWork issue database, based on the records' field values. Each AccuWork issue database can have one of its queries designated as the 'default query', to be invoked automatically in certain situations calling for the user to specify one or more issue records.

R

real version

A version of an element, created in some user's workspace, recording a change to the contents and/or pathname of the element. See also [version](#), [virtual version](#).

recent changes

A set of versions of a particular file element; representing the changes made to accomplish some task (or any set of related changes). The recent changes start with the current version (or another selected version), termed the head version; they extended backward to (but do not include) the corresponding basis version.

reclaim

An operation that deletes archived storage files from a depot's gateway area, to reduce the amount of disk storage required for the depot's slice.

reparent

The operation that changes the parent stream of a particular workspace or stream.

replica repository

A copy of part or all of the contents of the master repository that must be re-synchronized regularly to remain current. New transaction records are written to the master repository only, making resynchronization necessary.

replica server

The instance of the AccuRev Server process that is associated with a replica repository on the same machine. It can directly service client programs' repository-read requests, but forwards repository-write requests to the master server.

repository

The directory tree that stores all software configuration management data managed by AccuRev. This data is maintained by the AccuRev Server, responding to requests made through AccuRev client programs. Users never manipulate the repository directly.

repository database

The portion of the repository that stores data other than the contents of element versions. See also [file storage area](#).

reverse patch

An operation that removes a selected set of changes from the current version of a text-file element. See also [patch](#), [change package](#).

revert

An operation that 'removes' a selected set of changes from a specified version, by creating a new version that does not contain the change.

root stream

(base stream) The top-level stream in a depot's stream hierarchy.

S

scan threshold

The time at which a workspace's most recent search for modified files was initiated. Such searches are performed by the Update command and by certain File Browser searches. See also [update level](#).

schema

The set of specifications that define the structure of an issue database: data fields and their value types/ranges, edit-form layout, field validations.

SCM

Acronym for software configuration management.

search

An operation that determines all the elements in a workspace or stream that have a particular status.

serial development

The practice of ensuring that multiple users do not work concurrently on the same version-controlled file. See also [parallel development](#).

server

See [AccuRev® Server](#).

sibling

Two or more workspaces or streams that have the same parent stream. Pass-through streams 'don't count' -- that is, all workspaces that promote versions to the same stream are considered siblings, even if some of them are direct children of the stream, while others are children of an intervening pass-through stream.

site slice

The subdirectory tree within the AccuRev repository that stores repository-wide database files (as opposed to depot-specific database files). By default, the top-level directory of this subtree is named `site_slice`. See also repository database.

slice

The subdirectory tree that stores all the data for a particular depot, including the depot's file storage area. By default, the top-level directory of this subtree has the same name as the depot itself.

snapshot

An immutable (frozen, static) stream that captures the configuration of another stream at a particular time. A snapshot cannot be renamed or modified in any way.

stage

In a [workflow](#), an object that represents a phase in a development or release process. For example, your development process might have New, Scheduled, WIP (work-in-progress), and Closed phases, among others.

staging stream

A child of a gated stream that AccuRev creates automatically when you create or reparent a workspace off the gated stream. Staging streams are used to hold changes promoted to the gated stream until the successful completion of any job defined by the trigger associated with the gated stream (like a build or test, for example). You cannot create staging streams explicitly. See also [gated stream](#).

stale

An element has '(stale)' status in a workspace if it is not currently active in the workspace, but a new version of the element has entered the parent stream. An **update** operation will overwrite the stale version with the parent stream's new version.

static stream

An AccuRev snapshot. The term 'static stream' emphasizes the fact that snapshots are part of a depot's stream hierarchy. See also [snapshot](#).

status

The state of an element, from a version-control perspective, in a particular workspace or stream.

status indicator

A keyword (usually enclosed in parentheses) that reports the AccuRev-level status of a particular element in a particular workspace or stream. Commonly, multiple status indicators apply to an element. See also [status](#).

storage file

See [container file](#).

stranded

An element has '(stranded)' status in a workspace or stream if it's currently active, but there is no pathname to the element. This occurs when the element's directory (or a higher-level directory) is removed from the workspace or stream by the **Defunct** command or an exclude rule.

stream

The AccuRev data structure that implements a configuration of the elements in a particular depot. The configuration of a dynamic stream changes over time; the configuration of a snapshot (static stream) never changes. Each workspace has its own private workspace stream. See also [workspace](#), [stream hierarchy](#).

stream hierarchy

The tree-structured collection of streams -- including snapshots and workspace streams -- for a particular depot.

stream lock

See [lock \(dynamic stream\)](#).

stream path

A sequence of streams that starts at the root stream and ends at the stream being referenced.

stream-ID

An integer that uniquely identifies a stream, snapshot, or workspace with its depot. Changing the name of a stream or workspace does not affect its stream-ID.

StreamBrowser™

The GUI tab that provides both graphical and tabular view of a depot's stream hierarchy. It has commands for comparing streams, promoting versions between streams, and other stream-based operations.

symbolic link

(symbolic-link element) An element whose contents is a pathname. The pathname can point to AccuRev data (that is, a location inside a workspace) or non-AccuRev data.

T

target

The file or directory that an element link or symbolic link points to.

target transaction

The most recent transaction at the time of a workspace's most recent update. The Update command attempts to load versions created in transactions up to and including the target transaction.

time-based stream

A stream that has a 'basis time', affecting which versions it inherits from its parent stream. See also [basis time](#), [parent stream](#).

time-spec

A specification of a particular date/time combination, used in various contexts: creating snapshots, viewing portions of the history of an element, etc.

TimeSafe®

The aspect of AccuRev's architecture that guarantees the reproducibility of any previous configuration of a stream, a depot, or the entire repository.

to version

One of the contributor versions in a merge operation. In a typical merge, it's the version in a user's workspace that is to be combined with the version in the parent stream.

transaction

A record in the AccuRev repository database that indicates a particular change: promoting of a set of versions, changing the name of a stream, modification to an issue record, etc. Each transaction has an integer transaction number, which is unique within the depot.

transaction history

The set of transactions related to a particular depot, stream, element, or other AccuRev data structure that changes over time.

transaction level

The number of the most recently completed transaction for a particular depot. See also [update level](#).

transaction-level integration

The AccuRev facility that records the transaction number of a promote operation in a user-specified AccuWork issue record. This facility is enabled on a depot-by-depot basis by a trigger.

transition

In a [workflow](#), an object that links one [stage](#) in a workflow with another; it represents how an issue may move from one workflow stage to another.

trigger

The AccuRev facility that enables user-defined procedures (trigger scripts) to be performed automatically before or after certain operations take place.

trigger script

The executable program that implements a user-defined procedure, to be invoked when a trigger fires. Also called a trigger program.

twins

When two or more repository elements have the same pathname in a dynamic stream. Example: (1) an element is defuncted in a workspace, (2) the element is promoted to the backing stream, (3) another

element is created at the same pathname in the same workspace or a sibling workspace, (4) the new element is promoted to the backing stream.

U

UI

See [client program](#).

unaffiliated changes

The term used to refer to element versions that are not associated with any issue. Also referred to as [dark matter](#). See [Unaffiliated Changes \("Dark Matter"\)](#) on page 107.

undefunct

The operation that undoes the effect of a previous defunct operation, restoring a previously removed element back to a workspace.

underlap

Similar to overlap: for both underlap and overlap, the version in the parent stream is not an ancestor of your version. With an underlap (but not an overlap), your version is an ancestor of the parent stream's version; that is, the parent-stream version already contains all the changes in your version. There can be deep underlaps in the stream hierarchy, just like overlaps.

update

The operation (**Update** command) that copies new versions of elements into a workspace from its parent stream.

update level

The most recent (highest-numbered) transaction whose changes have been incorporated into a workspace, through an update operation. See also [scan threshold](#), [transaction level](#).

user

A person who uses an AccuRev client program to access (read and/or change) the data in the AccuRev repository. Access is granted only to those who login with a 'username' that was previously registered in the AccuRev repository. See also [login](#).

user/group filter

A subset of AccuRev users or groups, which is used to limit the data displayed in parts of the AccuRev GUI or Web UI.

V

validation

(AccuWork) A rule, specified on the Validations subtab of the Schema Editor, that controls a particular edit-form field. This can take various forms, including specifying a default value, making a field required, and modifying the list of choices in a multiple-choice listbox.

version

A particular revision of an element, reflecting a content change (files only) or a namespace change (files and directories). All versions are originally created in workspaces, and can subsequently be

promoted to dynamic streams. The original (workspace) version is termed a 'real version'. Each promotion to a dynamic stream creates a 'virtual version', which serves as an alias for (pointer to) the original real version.

version control

The discipline of keeping track of the changes made over time to one or more files or directories.

version graph

The directed-graph data structure that shows the [ancestry](#) of an [element](#). The nodes are all the [versions](#) of an element, and whose lines indicate how later versions were derived from earlier versions. The Version Browser displays the version graph of an element.

version specification

Identifies a particular version of one or more elements. It can be a version-ID; in many contexts, it can be a stream or workspace name/number, which indicates the version currently in that stream/workspace.

version-ID

The unique identifier for a version, consisting of two parts: (1) the name or number of the workspace or stream in which the version was created; (2) an integer. Examples: talon_dvt_mary/14, 245\19.

virtual version

In a dynamic stream, a version of an element, created by the **Promote** command, which serves as an alias for (reference to) a previously created real version. In a workspace stream, a version created by the **Send to Workspace** or **Anchor** command, referring to the real version that the command 'checked out'.

W

Workflow

AccuRev's issue processing automation and SCM process and policy enforcement tool.

workflow

A model of an organization's software development and release processes that consists of individual stages and the transitions that link them.

workspace

A location in which one or more users perform their work, using files under version control. Each workspace consists of a workspace stream (in the repository) and a workspace tree (in the user's disk storage). See also [workspace stream](#), [workspace tree](#).

workspace name

The name by which users refer to a workspace. A workspace name always ends with `_<user_name>`, indicating the user who owns it. The default workspace naming convention, used by the New Workspace command, is `<backing_stream_name>_<user_name>`.

workspace stream

The private stream that is part of a workspace. All new versions of elements are originally created in workspaces; AccuRev records element versions in workspace streams when the element is added to the depot, kept, or promoted.

workspace tree

The ordinary directory tree, located in the user's disk storage, in which the user performs development tasks and executes AccuRev commands on files and directories under version control.

Index

A

- AccuRev®
 - creating Crucible reviews for AccuRev® files 48
 - features 5
 - logging in 1
 - using URLs to access AccuRev® data 183
- AccuWork™
 - automating issue processing in 122
 - commands 96
 - creating issues 77
 - modifying the schema for workflow validation 180
 - operations 2
 - workflow features for issue processing 114
- actions
 - how to specify workflow stage actions 160
 - how to specify workflow transition actions 160
 - predefined actions for workflow stages and transitions 158
 - specifying workflow stage actions 157
 - specifying workflow transition actions 157
 - types of actions for workflow stages and transitions 158

- Admin menu 3
- ancestry relationships 30
 - alias 31
 - closest common 32
 - direct ancestor 30
 - merge, patch, and revert versions 31
- Annotate 5, 38
 - accessing via URL 40
 - timeline 39
- attachments
 - issue 82

B

- bar charts
 - displaying query results as 100
- blame
 - see* Annotate

- browsers, supported Web browsers 1
- bulk update 96

C

- calculated columns
 - adding to query results 98
 - URLs for queries with calculated columns 190
- change package 88, 105
 - contents pane 109
 - history 88
- change packages
 - unaffiliated changes and 107
- changes
 - finding changes in streams and workspaces 14
 - unaffiliated changes 107
- charts
 - accessing via URL 103
 - displaying query results as a bar chart 100
 - displaying query results as a line chart 101
 - displaying query results as a pie chart 101
 - printing 102
- clauses
 - allowed comparisons and values in queries 68
 - compound clauses in queries 65
 - simple clauses in queries 64
- columns
 - adding columns in query results 98
 - calculating columns in query results 98
 - choosing columns to display in query results 104
 - setting default columns to display query results 105
 - subtracting columns in query results 98
 - summing columns in query results 97
- compliance
 - using workflow to enforce SCM policies 124, 161
- conditions
 - activating a workflow with 135
 - Conditions button 136
 - creating conditions for workflow stages and transitions 144
 - displaying workflow conditions 136

- editing workflow stage conditions 144
- editing workflow transition conditions 144
- specifying workflow conditions 135
- specifying workflow stage conditions 138
- specifying workflow transition conditions 147
- workflow stage condition created by Stage Generator 140

contacting technical support x

copying a workflow 136

creating a workflow 134

creating workflow stages

- automatically 141
- manually 142
- using the Stage Generator 141
- ways to create 140

creating workflow transitions

- ways to create 147

Crucible

- adding files to an existing review 55
- creating a new review 53
- creating reviews for AccuRev® files 48
- starting from the Web UI 57

CSV

- exporting tables as CSV 14

D

dark matter 107

date fields 81

default query

- defined 103

deleting

- a workflow 137
- workflow stages 145
- workflow transitions 149

depots

- displaying AccuRev depots 6
- searching for issues in 90

Diff by Files 110

Diff by Issues 110

Diff Tool

- accessing comparison via URL 35
- comparison options 33
- diff against 35
- diff against basis 37
- navigating file differences 33

- navigating multiple diffed files 34

Diff vs Query 111, 113

diffing

- queries 72
- streams based on time 14
- Timeline Diff tool 14

dynamic streams

- depicted in StreamBrowser 10

E

editing workflow stages 143

editing workflow transitions 148

exporting

- exporting tables as CSV 14
- exporting tables as XML 14

F

file browser 5, 16

- Details Pane 19
- Folders Pane 19
- Search by AccuRev® Status 18
- Stream Pane 20

File Diff 110

files

- creating Crucible reviews for AccuRev® files 48
- diffing multiple files 34

filters

- filtering the StreamBrowser display 7

formatting text

- support for rich text formatting 80

G

gated streams

- definition 196
- depicted in StreamBrowser 10
- displaying 8

Git

- identifying streams mapped to a Git branch 9

GitCentric

- identifying streams mapped to a Git branch 9

grouped issues

- accessing via URL 103

grouped issues by field 99

H

Help 3

History Browser

 Comment Pane 25

 description 5

 overview 23

 Summary Pane 23

 Versions Pane 25

I

issue attachments 82

 accessing via URL 83

issue details report

 description 94

 printing from an issues table 95

 printing from the Issue Edit form 95

Issue Diff 110

Issue Edit form

 changes to the form when workflow is
 implemented 115

 overview 77

 workflow stage button on 115

 workflow transition buttons on 116

Issue Form validation 80

Issue Queries 2

issue queries 70

Issue Search 2

issue search 90

issue table report

 description 93

issues 2

 accessing via URL 108

 automating issue processing with workflow
 122

 creating 77

 displaying incomplete issues 107, 112

 HTML support in log fields 80

 HTML support in text fields in 80

 incomplete issues 107, 112

 issue details report 94

 Issue Edit form and 77

 issue table report 93

 log fields in 80

 moving an issue through a workflow 117

 printing an issue details report from an
 issues table 95

 printing an issue details report from the
 Issue Edit form 95

 printing an issues table report 94

 reports about 92

 rich text support in log fields 80

 rich text support in text fields in 80

 searching a depot 90

 text fields in 80

 timestamps in log fields 81

 unaffiliated changes and 107

 workflow buttons on the Issue Edit form
 115

issues pane 108

issues tab 106

L

line charts

 displaying query results as 101

linking workflow stages 150

log fields

 HTML support 80

 rich text support 80

 timestamps for 81

 tools for working with 80

log in 4

log out 4

logging in 1

N

New Issue 2

New Query 2

New Query tab 60

O

open 42

open issue 96

opening a workflow 137

P

pass-through streams

 depicted in StreamBrowser 10

password

- changing your AccuRev® password 3
- pie charts
 - displaying query results as 101
- print
 - tables 14
- printing
 - charts 102
 - issue details reports 95
 - issues table reports 94
- private query
 - defined 103
- promote 42
- properties 44
- public query
 - defined 103

Q

- queries
 - allowed comparisons and values 68
 - choosing columns to display in results 104
 - compound clauses in 65
 - copy/paste for conditions and clauses 66
 - creating 62
 - default query defined 103
 - diffing 72
 - editing 67
 - issue details report 94
 - issue table report 93
 - New Query tab and 60
 - private queries defined 103
 - public queries defined 103
 - renaming 67
 - reports for query results 92
 - running 105
 - saving 105
 - setting a query as a private query 103
 - setting a query as a public query 103
 - setting a query as the default query 103
 - setting default columns for query results 105
 - simple clauses in 64
 - URLs for queries with calculated columns 190
 - using a workflow to filter query results 118
- query browser 70
- Query Diff 72

- query list pane 70
- query pane 60
- query results
 - adding columns in 98
 - calculating columns in 98
 - choosing columns to display 104
 - displaying as a bar chart 100
 - displaying as a line chart 101
 - displaying as a pie chart 101
 - displaying graphically 100
 - grouping issues by field 99
 - printing an issues table report 94
 - setting default columns for display 105
 - showing percentages in columns 99
 - subtracting columns in 98
 - summing columns in 97
 - updating groups of columns in 96
 - workflow transition buttons and 116
- query results pane 62, 73

R

- reactivate
 - reactivating streams 45
- Refresh 3
- relationship fields 82
- remove
 - removing streams 45
- renaming a workflow 137
- reports
 - issue details report 94
 - issue reports 92
 - issue table report 93
- rich text formatting, support for 80
- running queries 105

S

- save as 46
- saving queries 105
- SCM
 - using workflow to enforce policy compliance 124, 161
- security
 - restricting access to workflow administration 134
- setChangesRequired workflow action 159

- setChildRelationshipRequired workflow action 159
- setChoices workflow action 158
- setFieldPermission workflow action 159
- setIssuePermission workflow action 159
- setParentRelationshipRequired workflow action 159
- setRequired workflow action 159
- setTabPermission workflow action 159
- setValue workflow action 158
- show change package 105
- show percentages 99
- slink 22
- snapshot streams
 - depicted in StreamBrowser 10
- Stage Generator
 - description 140
 - example 127, 167
 - how to use 141
 - Stage Generator button 127
 - workflow transitions created by 140
- staging streams
 - definition 202
 - depicted in StreamBrowser 10
 - displaying 8
- status, AccuRev® 21
 - backed 22
 - Deep Overlap 18
 - Default Group 18
 - defunct 18, 21
 - elink 22
 - member 22
 - overlap 18, 22
 - twin 22
 - underlap 18, 22
 - xlinked 22
- StreamBrowser
 - Active Files 12
 - changing flow direction 10
 - color of streams and workspaces 11
 - context menu 11
 - description 2, 6
 - File Diff 12
 - graphical display 10
 - History 12
 - how streams are depicted 10
 - Issue Diff 12
 - Look Up Stream 11
 - New Stream 11
 - Open 11
 - Reactivate 12
 - Remove 11
 - search filters 7
 - Show Active Issues 12
 - Show Active transactions 12
 - Show GitCentric 9
 - Show Locks 9
 - Streams flow 9
 - tabular display 13
 - Timeline Diff 14
 - working with the graphical display 10
- streams
 - active issue reports 92
 - color of in the StreamBrowser 11
 - creating 40
 - creating gated and staging streams 40
 - depicted in StreamBrowser 10
 - diffing 14
 - diffing based on a time frame 14
 - displaying gated and staging streams 8
 - displaying in the StreamBrowser 7
 - finding changes in 14
 - graphical display in StreamBrowser™ 10
 - how streams are depicted in the StreamBrowser 10
 - identifying streams mapped to a Git branch 9
 - reactivating 45
 - removing 45
 - restricting entry based for a specific workflow 164
 - restricting entry based on issue type 163
 - restricting entry based on workflow stage 163
 - reviewing workflow rules set on a stream 119
 - searching for streams 7
 - setting the background color 11
 - setting workflow rules for 124, 162
 - tabular display in StreamBrowser™ 13
 - transactions in 46
 - using workflow to restrict issues in 124,

- 162
- sum columns 97
- support
 - contacting technical support x

T

- Table Filter 13, 108, 111
- Table Size 13, 108, 111
- tables
 - exporting as CSV 14
 - exporting as XML 14
- technical support
 - contacting x
- text fields
 - HTML support 80
 - rich text support 80
 - tools for working with 80
- time-basis streams
 - depicted in StreamBrowser 10
- Timeline Diff 14
- toolbars
 - navigating file differences in the Diff Tool 33
 - navigating multiple diffed files in the Diff Tool 34
- transactions 46
 - viewing via URL 46
- triggers
 - using triggers to restrict access to workflow administration 134
- typographical conventions ix

U

- unlinking workflow stages 155
- URLs
 - AccuRev® Elements 184
 - for AccuRev® Element Views 186
 - for AccuWork™ queries and issues 189
 - for displaying without a toolbar 190
 - for queries with calculated columns 190
 - for stream history and transactions 188
 - format definition 185
 - obtaining Web UI links 183
 - permanence 186
 - user-specified 184

- using to access AccuRev® data 183
- user fields 81
- username 1

V

- version browser 5, 27
 - display 27

W

- Web browsers
 - supported by the Web UI 1
- Web UI
 - creating Crucible reviews for AccuRev® files 48
 - starting Crucible from 57
 - supported browsers 1
- workflow
 - automating issue processing with 122
 - benefits 122
 - changes to the Issue Edit form 115
 - description 114
 - enforcing SCM policy compliance with 124, 161
 - implementation example 164
 - Quick Start for implementing a workflow 125
 - results of implementing a workflow 132
- workflow actions
 - setChangesRequired action 159
 - setChildRelationshipRequired action 159
 - setChoices action 158
 - setFieldPermission action 159
 - setIssuePermission action 159
 - setParentRelationshipRequired action 159
 - setRequired action 159
 - setTabPermission action 159
 - setValue action 158
- workflow conditions
 - activating a workflow and 127
 - requirements for 127
 - specifying 127
- Workflow Editor
 - Conditions button 136
 - Remove Links button 155
 - Rename button 137

- Stage Generator button 127
- workflow stages
 - action types for 158
 - button displayed on Issue Edit form 115
 - choosing a schema field for 126
 - components of 138
 - condition created by the Stage Generator 140
 - creating automatically 141
 - creating manually 140
 - creating using the Stage Generator 141
 - deleting 145
 - description 121
 - destination stages 150
 - displayed in workflow diagrams 138
 - editing 143
 - editing conditions 144
 - entry actions for 139
 - example of linking 128, 169
 - how to specify actions for 160
 - linking using existing transitions 151
 - linking using new transitions 153
 - linking workflow stages 150
 - naming 138
 - predefined actions for 158
 - source and destination stages 150
 - specifying actions for 139, 157
 - specifying conditions for 138
 - Stage Generator example 127, 167
 - Stage Generator for workflow stages 140
 - unlinking 155
 - validation actions for 139
 - ways to create 140
 - working with 138
- workflow transitions
 - action types for 158
 - buttons displayed for query results 116
 - buttons displayed on Issue Edit form 116
 - components of 147
 - created by Stage Generator 140, 147
 - creating manually 147
 - creating new transitions 153
 - deleting 149
 - description 122
 - destination stages and 150
 - displayed in workflow diagrams 146
 - editing 148
 - editing conditions 144
 - example of linking workflow stages 128, 169
 - how to specify actions for 160
 - linking workflow stages with existing transitions 151
 - linking workflow stages with new transitions 153
 - naming 147
 - predefined actions for 158
 - specifying actions for 147, 157
 - specifying conditions for 147
 - unlinking workflow stages 155
 - validation actions for 147
 - ways to create 147
 - working with 146
- workflow validation
 - when to modify the AccuWork™ schema 180
- workflows
 - activating 135
 - advanced topics for 179
 - automating issue processing with 122
 - choosing a schema field to represent workflow stages 126
 - Conditions button 136
 - copying 136
 - creating 134
 - creating new workflow transitions 153
 - creating workflow stages manually 142
 - creating workflow transitions manually 147
 - deactivating a workflow 180
 - deleting 137
 - deleting workflow stages 145
 - deleting workflow transitions 149
 - description 121
 - displaying the workflow diagram for an issue 116
 - displaying workflow conditions 136
 - editing workflow stages 143
 - editing workflow transitions 148
 - enabling 135
 - enforcing development policies with 124, 161
 - how to specify actions for workflow stages

- and transitions 160
 - implementation example 164
 - implementing a simple workflow 125
 - linking workflow stages 150
 - moving an issue through a workflow 117
 - multiple workflows per depot 124
 - naming workflow transitions 147
 - opening 137
 - overriding workflow rules 179
 - Quick Start for implementing a workflow 125
 - Remove Links button 155
 - Rename button 137
 - renaming 137
 - restricting access to workflow administration 134
 - results of implementing a workflow 132
 - reviewing workflow rules set on a stream 119
 - setting workflow rules for a stream 124, 162
 - specifying actions for workflow stages and transitions 157
 - specifying actions for workflow transitions 147
 - specifying condition for workflow transitions 147
 - specifying conditions for 127
 - Stage Generator button 127
 - stages in 121
 - suspending workflow rules 179
 - transitions created by the Stage Generator 147
 - transitions in 122
 - unlinking workflow stages 155
 - using a workflow to filter query results 118
 - using conditions to activate a workflow 127
 - using the Stage Generator to create stages and transitions 141
 - using triggers to restrict access 134
 - validation for workflow stages 139
 - validation for workflow transitions 147
 - workflow transitions 122
 - workspaces
 - color of in the StreamBrowser 11
 - depicted in StreamBrowser 10
 - finding changes in 14
- X**
- XML
- exporting tables as XML 14