AccuRev Plugin for IntelliJ IDEA 2018.1

User's Guide

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Contents

Introduction

This document describes the AccuRev Plug-In for IntelliJ IDEA, the integration of AccuRev with JetBrains' IntelliJ IDEA Integrated Development Environment (IDE). The integration is implemented as a standard plug-in enabling IntelliJ IDEA users to access AccuRev version-control functionality using IntelliJ IDEA's own menu structure.

Note: Prior to Release 2014.1, AccuRev Plug-In for IntelliJ IDEA was called *AccuBridge for IntelliJ IDEA*.

AccuRev Plug-In for IntelliJ IDEA extends the IDE in many ways, as described in the sections that follow.

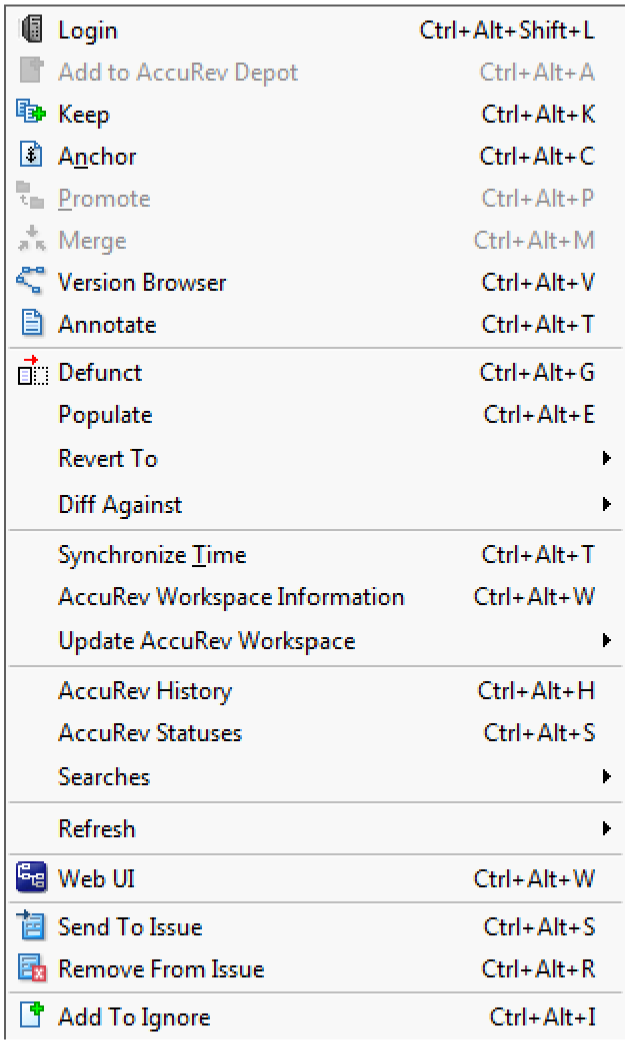
AccuRev Status Indicators

Files managed by AccuRev acquire icon decorations in the **Project tool** subwindow list showing their AccuRev status. Icons for directories are not decorated, even though they are under AccuRev version control, as well.

For a listing of icon decorations, see *AccuRev Statuses*.

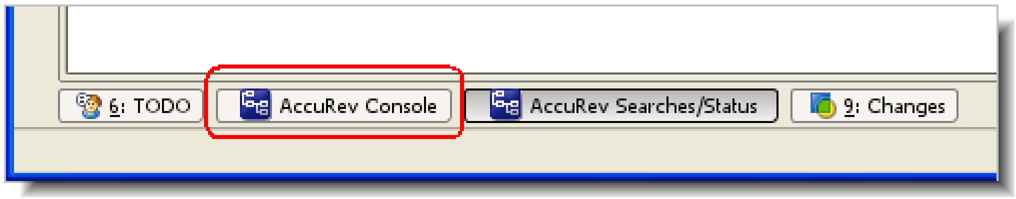
AccuRev Commands

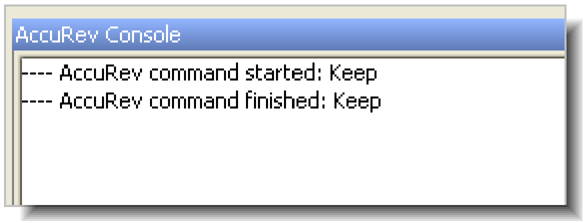
You can run AccuRev's version-control commands from context menus and from the **Version Control** > **AccuRev** menu. For a complete reference to the commands available in AccuRev Plug-In for IntelliJ IDEA, see *Executing AccuRev Commands*. When you right click on an element and select **AccuRev**, the following context menu appears:



AccuRev Console Subwindow

Many AccuRev commands generate messages, which are displayed in the **AccuRev Console** tool subwindow. This subwindow is hidden by default. To open or close it, click its button at the bottom of the IDE window, or click **Window** > **Tool Windows** > **AccuRev Console**.

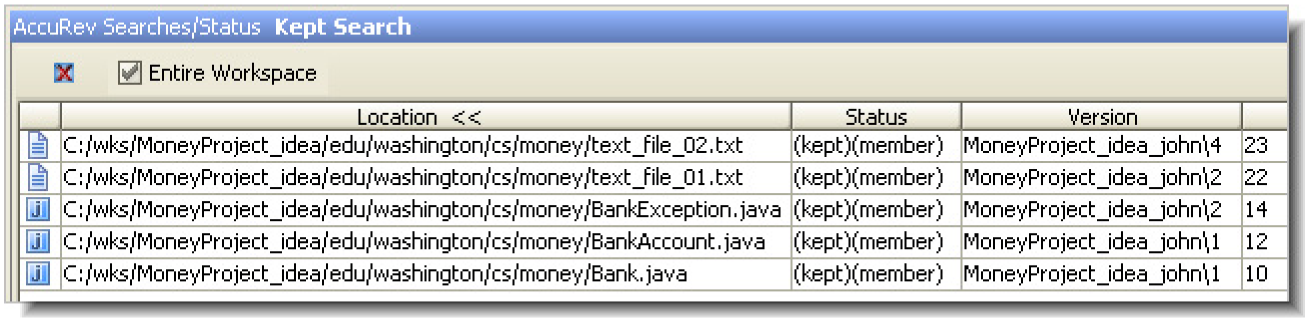




```
---- AccuRev command started: Keep
---- AccuRev command finished: Keep
```

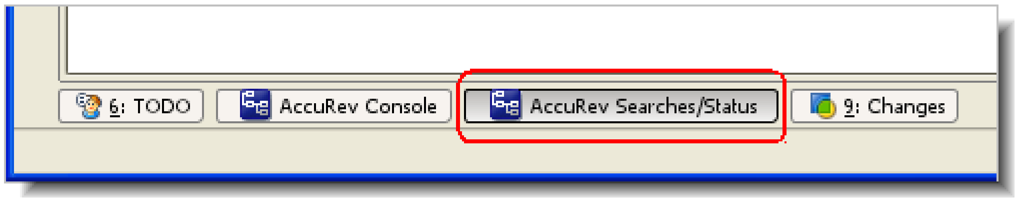
AccuRev Searches/Status Subwindow

The AccuRev `Statuses` command and the various forms of the AccuRev `Searches` command display their results in the **AccuRev Searches/Status** tool subwindow:



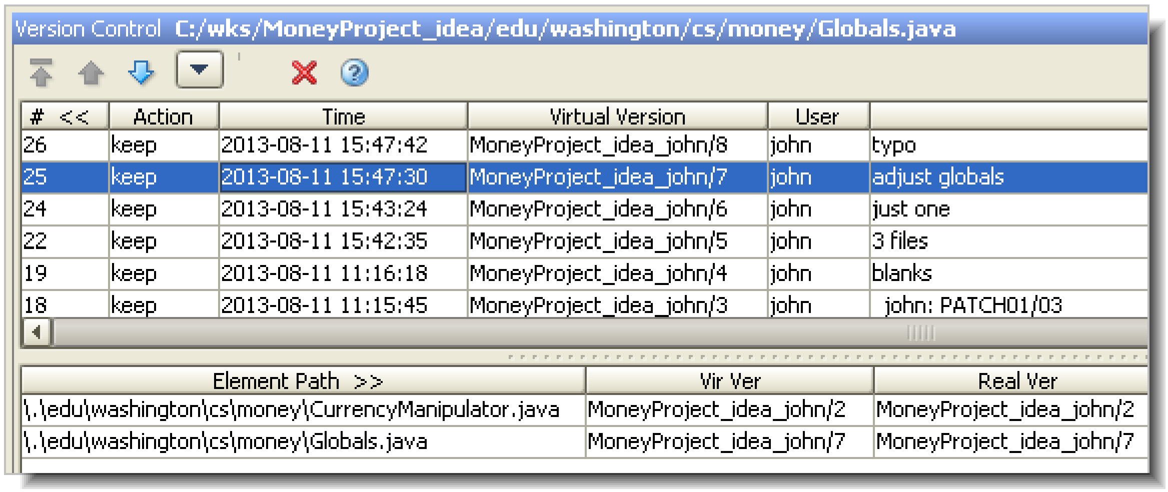
Location <<	Status	Version	
C:/wks/MoneyProject_idea/edu/washington/cs/money/text_file_02.txt	(kept)(member)	MoneyProject_idea_john\4	23
C:/wks/MoneyProject_idea/edu/washington/cs/money/text_file_01.txt	(kept)(member)	MoneyProject_idea_john\2	22
C:/wks/MoneyProject_idea/edu/washington/cs/money/BankException.java	(kept)(member)	MoneyProject_idea_john\2	14
C:/wks/MoneyProject_idea/edu/washington/cs/money/BankAccount.java	(kept)(member)	MoneyProject_idea_john\1	12
C:/wks/MoneyProject_idea/edu/washington/cs/money/Bank.java	(kept)(member)	MoneyProject_idea_john\1	10

To open and close this subwindow, click its button at the bottom of the IDE window, or click **WindowTool WindowsAccuRev Searches/Status**.



AccuRev Element History

The **AccuRev History** command displays the set of transactions involving a selected element in the **Version Control** subwindow.


Version Control C:/wks/MoneyProject_idea/edu/washington/cs/money/Globals.java

# <<	Action	Time	Virtual Version	User	
26	keep	2013-08-11 15:47:42	MoneyProject_idea_john/8	john	typo
25	keep	2013-08-11 15:47:30	MoneyProject_idea_john/7	john	adjust globals
24	keep	2013-08-11 15:43:24	MoneyProject_idea_john/6	john	just one
22	keep	2013-08-11 15:42:35	MoneyProject_idea_john/5	john	3 files
19	keep	2013-08-11 11:16:18	MoneyProject_idea_john/4	john	blanks
18	keep	2013-08-11 11:15:45	MoneyProject_idea_john/3	john	john: PATCH01/03

Element Path >>	Vir Ver	Real Ver
\.\edu\washington\cs\money\CurrencyManipulator.java	MoneyProject_idea_john/2	MoneyProject_idea_john/2
\.\edu\washington\cs\money\Globals.java	MoneyProject_idea_john/7	MoneyProject_idea_john/7

Checkout from Version Control for AccuRev

The command **Version Control** > **Checkout from Version Control** > **AccuRev** creates a new AccuRev workspace populating it with files already under version control in a particular AccuRev depot. Then, it converts the workspace into an IntelliJ IDEA project.

Getting Started

This chapter describes tasks that get you up and running with AccuRev Plug-In for IntelliJ IDEA.

Establishing Your Identity

All AccuRev commands must be executed by an AccuRev user. To use the AccuRev Plug-In for IntelliJ IDEA, you must establish your identity to AccuRev. AccuRev has two schemes for authenticating users:

1. Using the traditional user-authentication scheme: AccuRev defaults to using your operating-system username as your AccuRev username. Your AccuRev password must be stored in the `authn` file in the `.accurev` subdirectory of your operating-system `home` directory. (On Microsoft Windows, this is `%HOMEDRIVE%\%HOMEPATH%`.)

   To customize this behavior, set either or both of the following environment variables before starting the IDE (Microsoft Windows users should set user-level, not system-level variables):

   - To use a different username, set `ACCUREV_PRINCIPAL` to that username.
   - To place your `.accurev` directory elsewhere, set `ACCUREV_HOME` to the new location.
2. Using the `accurev_login user-authentication` scheme, you must perform an explicit login at the AccuRev level. You can do this before starting IntelliJ IDEA . When you create a workspace in the IDE, you are prompted to log in if you aren't already logged in. When working within an IDE project, you can use the **AccuRev** > **Login** command to log in. It's available on context menus in the **Project** tool subwindow or under **VCS** on the main menu. In the **Login** dialog box, select an AccuRev Server, and enter a username/password pair. Then click **Ok**.

Placing Projects Under Version Control

AccuRev Plug-In for IntelliJ IDEA provides access to AccuRev version control commands within IntelliJ IDEA . The commands executed by the Integration move data between a central source-code repository (a depot) and a personal AccuRev work area (a workspace). AccuRev can manage an IDE project's files if (and only if) the project's location on disk is within an AccuRev workspace. It doesn't matter which is created first, the IDE project or the AccuRev workspace.

Also relevant is this aspect of AccuRev's data architecture: AccuRev does not automatically version control every file within an AccuRev workspace. For example, version-controlling text-editor backup files would be a waste of resources. Files created in a workspace initially have (external) status. They become version-controlled elements when explicitly processed with the **Add to AccuRev Depot** command.

Given these facts, it makes sense to consider the following use cases. Before performing any of the procedures, make sure that AccuRev depots and streams have been created and properly configured. These operations cannot be performed within IntelliJ IDEA .

Case 1: An IntelliJ IDEA project already exists and you want to make AccuRev its version control provider

Perform the procedure in the section *Making AccuRev the Version Control Provider for an Existing IDE Project*.

Case 2: Your sources are already under AccuRev version control and you want to use IntelliJ IDEA for development

If you have access to an AccuRev workspace containing the sources, perform the procedure in *Creating a New IDE Project in a Workspace*.

If you need to create a new AccuRev workspace containing the sources, perform the procedure in *Creating a New Workspace for Sources that are Already Under AccuRev Version Control*.

Case 3: Your sources are located in an AccuRev workspace and an IntelliJ IDEA project exists for the sources

Click **File** > **Open Project**, navigate to the project file (`.ipr`), and click **OK**.

Making AccuRev the Default Version Control Provider for New IDE Projects

After you perform this procedure, AccuRev version control will be enabled automatically for any project created with the **New Project** command, as long as the specified **project file location** for the new project is within an existing AccuRev workspace.

1. Close any open projects.
2. Click **File** > **Settings** from the IntelliJ IDEA main menu.
3. Expand the **Version Control** node.
4. In the **Version Control** list, select `AccuRev`.

Making AccuRev the Version Control Provider for an Existing IDE Project

You might want to use AccuRev selectively, for some new projects but not others. Or you might have existing projects to be used with AccuRev. This procedure handles both of these cases:

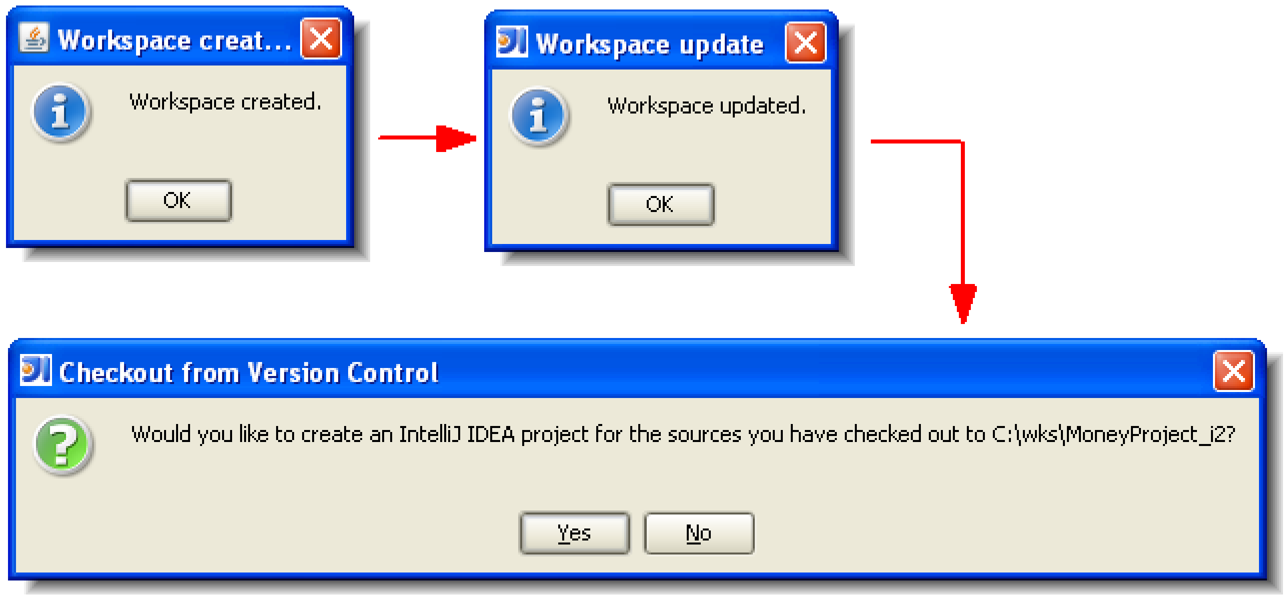
1. Arrange for the project files to be located within an existing AccuRev workspace, in either of these ways:
    - Move all the project files from their current location to a location within an existing AccuRev workspace.
    - Use the AccuRev GUI to convert the project's current disk location, or a higher-level directory, into a new AccuRev workspace (**File** > **New** > **Workspace** command).

    In either case, the project's root directory need not be the top-level directory of the workspace.
2. Open the project in IntelliJ IDEA .
3. Click **File** > **Settings** from the IntelliJ IDEA main menu.
4. Expand the **Version Control** node.
5. In the **Version Control** list, select `AccuRev`.
6. If you moved data into an existing workspace or created a new workspace, as outlined in Step 1, you must place the project's files under version control. See *Converting external-Status Files to Version-Controlled Elements*.

Creating a Workspace for Sources that are Already Under AccuRev Version Control

Use this procedure if someone has already placed a set of development files under AccuRev version control on his or her own machine. This procedure creates a new workspace for your personal use, and *updates* the new workspace with the latest versions of the development files.

1. Click **Version Control** > **Checkout from Version Control** > **AccuRev** or select **Checkout from Version Control** > **AccuRev** from the IntelliJ IDEA **Quick Start** menu. If you are using the `accurev_login` authentication mode, you might be required to log in at this time.
2. On the **Checkout From Version Control** screen, specify an AccuRev depot, a stream within that depot, and a name for the new workspace. AccuRev automatically adds your username as a suffix to the name you enter (unless you type the suffix yourself). Click **Next**.
3. On the **Workspace Properties** screen, accepting the defaults is often most appropriate. See the description of the *Anchor* command for a discussion of the exclusive file locking and anchor required features. Click **Next**.
4. On the **Workspace Directory** screen, click the **Browse** button and navigate to an existing directory. The new workspace will be created as a subdirectory at the location you specify. The subdirectory name is the same as the workspace name you specified on the first wizard screen.
5. IntelliJ IDEA automatically proceeds to create an IDE project in the new AccuRev workspace:



Workspace created.

Workspace updated.

Would you like to create an IntelliJ IDEA project for the sources you have checked out to C:\wks\MoneyProject_i2?

6. Click **Yes** to complete the process.

Creating a New IDE Project in a Workspace

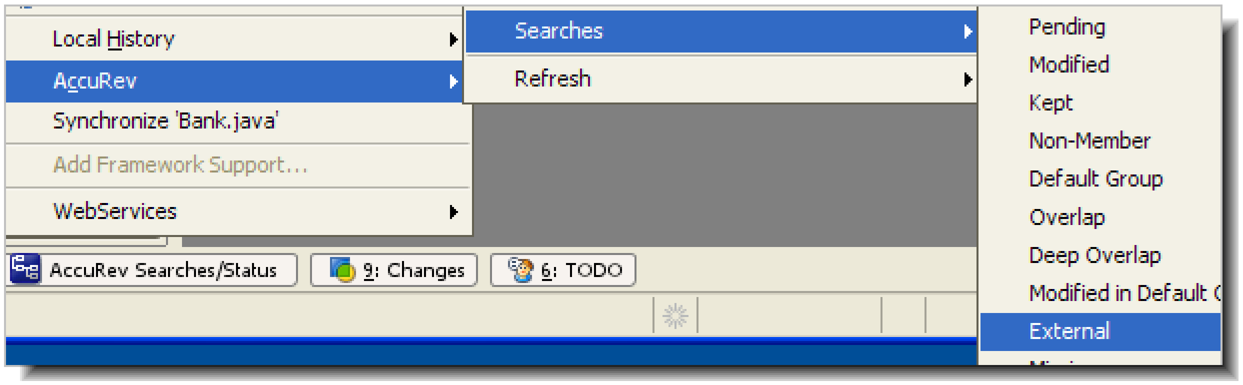
This is essentially the standard IntelliJ IDEA procedure for creating a new project, with a little extra work at the end.

1. Choose **Create New Project** from the **Quick Start** menu, or click **File** > **New Project** on the IDE's main menu. The **New Project** dialog box appears.
2. Enter a **Project name**, and specify a **Project location** that is within an existing AccuRev workspace. You can create the project in the workspace's top-level directory, or in a subdirectory.
3. Continue through the wizard's screens, ending with Finish.
4. Make sure that AccuRev is the version control provider for the new project. See *Making AccuRev the Version Control Provider for an Existing IDE Project*.
5. Make sure that the files in the project are version-controlled elements. See *Converting external-Status Files to Version-Controlled Elements*.

Converting (external) Status Files to Version-Controlled Elements

AccuRev does not automatically version-control every file within an AccuRev workspace. For example, version-controlling text-editor backup files would be a waste of resources. Initially, files created in, or copied into, a workspace have (external) status. You can convert such files to version-controlled elements with the Integration's **Add to AccuRev Depot** command. Use the following procedure when you've copied a set of files into a workspace (or, perhaps, unpacked a ZIP archive containing development data).

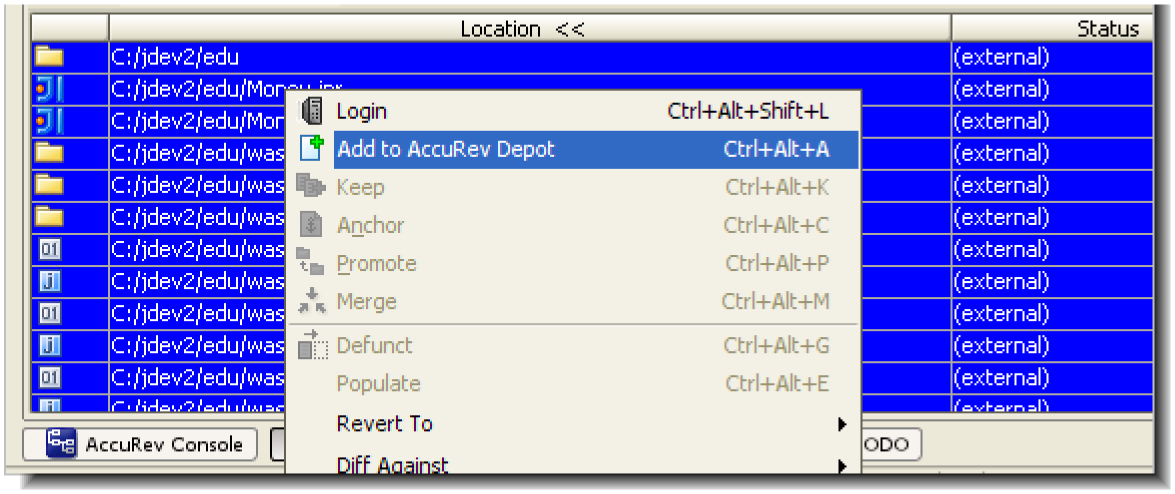
1. Click **AccuRev** > **Searches** > **External** to list the workspace's external files at the bottom of the IDE window.



2. Select the `(external)`-status files that you want to convert to version-controlled elements.

   Tip: You may want to click **Edit** > **Select All**.

3. Click **Add to AccuRev Depot**.



The newly created elements have `(kept)` status.

Executing AccuRev Commands

You run AccuRev commands in the IDE from the **AccuRev** menu. This menu is available under **Version Control** on the IDE's main menu, or from context menus in several places within the IDE, including the **Project**, **Version Control**, and **AccuRev Searches**/**Status** subwindows.

To run an AccuRev command:

1. Right-click a file or directory, or select multiple items, then right-click the selection.
2. Choose **AccuRev**.
3. Select an AccuRev command from the context menu, or from a cascading submenu. (Commands are enabled only if they are valid for your selection.)

The AccuRev commands are described in this section. Certain of the IDE's own commands (that is, commands that are not on the **AccuRev** menu) automatically invoke AccuRev commands in order to keep the IDE synchronized with AccuRev. This is discussed in section *IDE Namespace Commands and AccuRev*.

Login

If AccuRev is configured to use the `accurev_login` `user-authentication` scheme, you must log in before performing any AccuRev operation on a file in an AccuRev workspace. If the login is invalid or fails, then no AccuRev operation can be performed.

Add to AccuRev Depot

Converts the selected files in the project into AccuRev version-controlled elements. The directory containing the files is also converted to an element, if necessary.

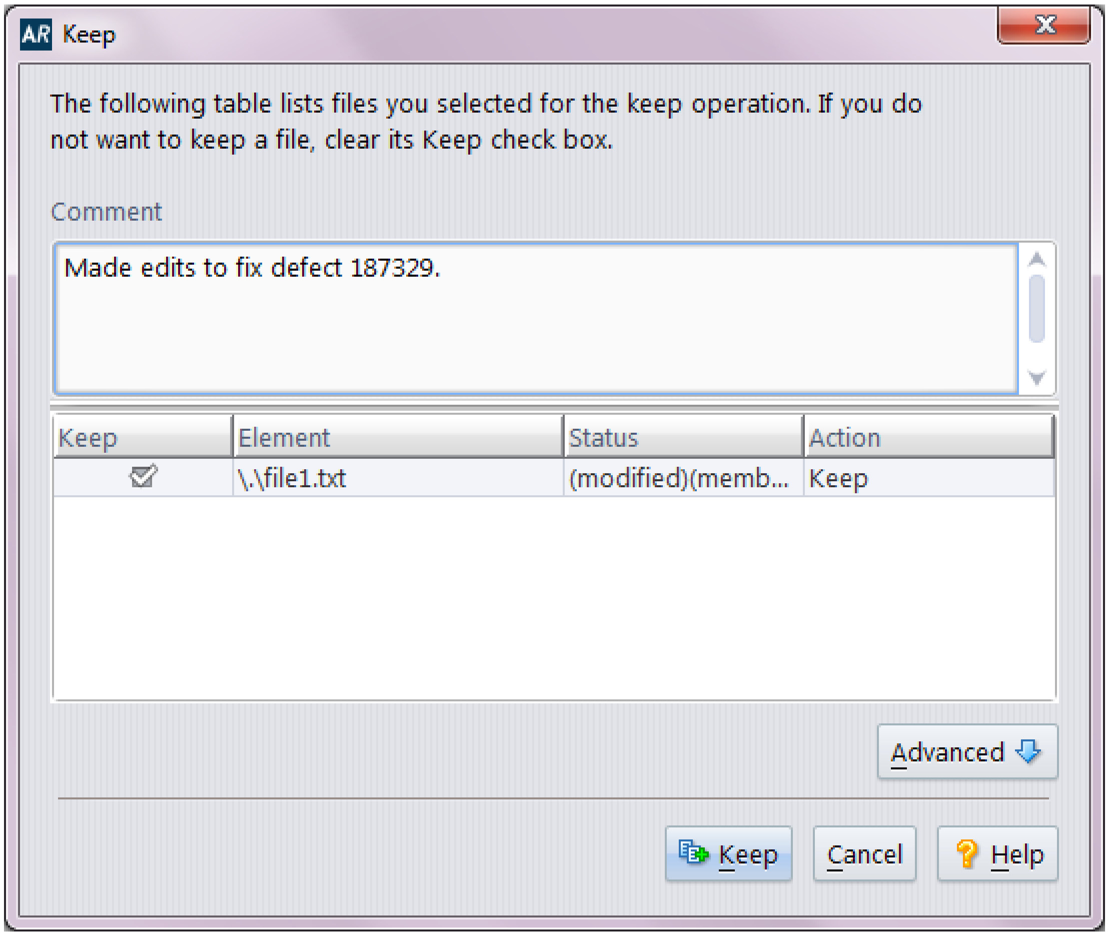
You can undo the effect of this command with the **Revert to** > **Backed Version** command. This removes the selected files from the IDE project, if you have not yet Promoted them.

Note: It is not necessary to place the IDE project files (`.iws`, `.ipr` and `.iml`) under version control.

Keep

The `Keep` command saves the changes you have made to one or more files as `private` versions in the AccuRev repository. These versions are visible only in your workspace, not in the "public" backing stream or in other users' workspaces.

A dialog box appears, in which you can enter a comment string to be stored as part of the Keep transaction. The dialog makes it easy to reuse comment strings that you previously specified.



The following table lists files you selected for the keep operation. If you do not want to keep a file, clear its Keep check box.

Comment

Made edits to fix defect 187329.

Keep	Element	Status	Action
✓	\.\file1.txt	(modified)(memb...	Keep

Advanced Keep Options

You can use advanced options when keeping files. Click the **Advanced** button ON the **Keep** dialog box to display these choices:

Choose File Type	By default, AccuRev determines the element type for the newly created version automatically (`text` or `binary`). You can override the default by specifying either of these types or `ptext` (a variant of text).
Choose Lock Type	Choosing **Enable File Locking** places a lock on the element to enforce serial development in sibling workspaces for that element. This ensures that users in sibling workspaces will not have to merge their work on this element. The lock remains on the element until you (or someone else) changes this value to **Disable File Locking** in a subsequent `Keep` command.

See *Keep: Preserving Changes in Your Private Workspace* and your AccuRev user documentation for more information.

Do not confuse the versions of a file created by `Keep` with the "local history" copies of the file created when you close the editor.. Local history copies are maintained by Eclipse itself in the local file system. Versions created with `Keep` are saved permanently in the AccuRev repository.

Anchor

Many version control systems force you to perform a `check out` command that makes a file writable so that you can edit it. The AccuRev default is that your files are always writable.

The AccuRev `Anchor` is similar to a typical checkout. However, anchoring a file does not change whether it is writable. Rather, it *activates* the file in your workspace by adding them to the workspace's default group..

One effect of anchoring a file is that it ensures that the file is not overwritten by an **Update AccuRev Workspace** command. Under normal circumstances, you rarely need to invoke the `Anchor` command.

If the AccuRev workspace uses the AccuRev “exclusive file locking” or “anchor-required” feature, files are initially read-only. Before editing a file, you must `Anchor` it, making it writable.

Promote

The `Promote` command converts private versions into public versions. It takes versions that you previously created in your workspace with `Keep` and sends them to the backing stream. If you have modified a file, this command first performs a `Keep` and then promotes the kept file.

See also *Promote: Making Your Private Changes Public*.

Implicit Keep and Promote

If you execute a `Promote` command on files which have changed since they were last preserved in the repository with `Keep`, meaning they have `(modified)` status, the AccuRev Plug-In for IntelliJ IDEA runs a sequence of AccuRev commands on the selected files:

1. Performs a `Keep` on all the files in the selection with `(modified)` status.
2. Performs a `Promote` on all the files in the selection that now have `(kept)` status.

Merge

The `Merge` command merges your version of the file with the version in the backing stream. This command is the equivalent of `Resolve` in other source code management terminologies.

If the element type is `binary`, you can elect to `Keep` your version or the backed version. AccuRev does not support merging binary files.

If the element type is text, executing `Merge` brings up a merge tool. By default, the merging of text-file contents is performed by AccuRev's own `Merge` tool, which uses a three-way merge algorithm.

A successful `Merge` ends with a `Keep` command, creating a new version of a file in your workspace.

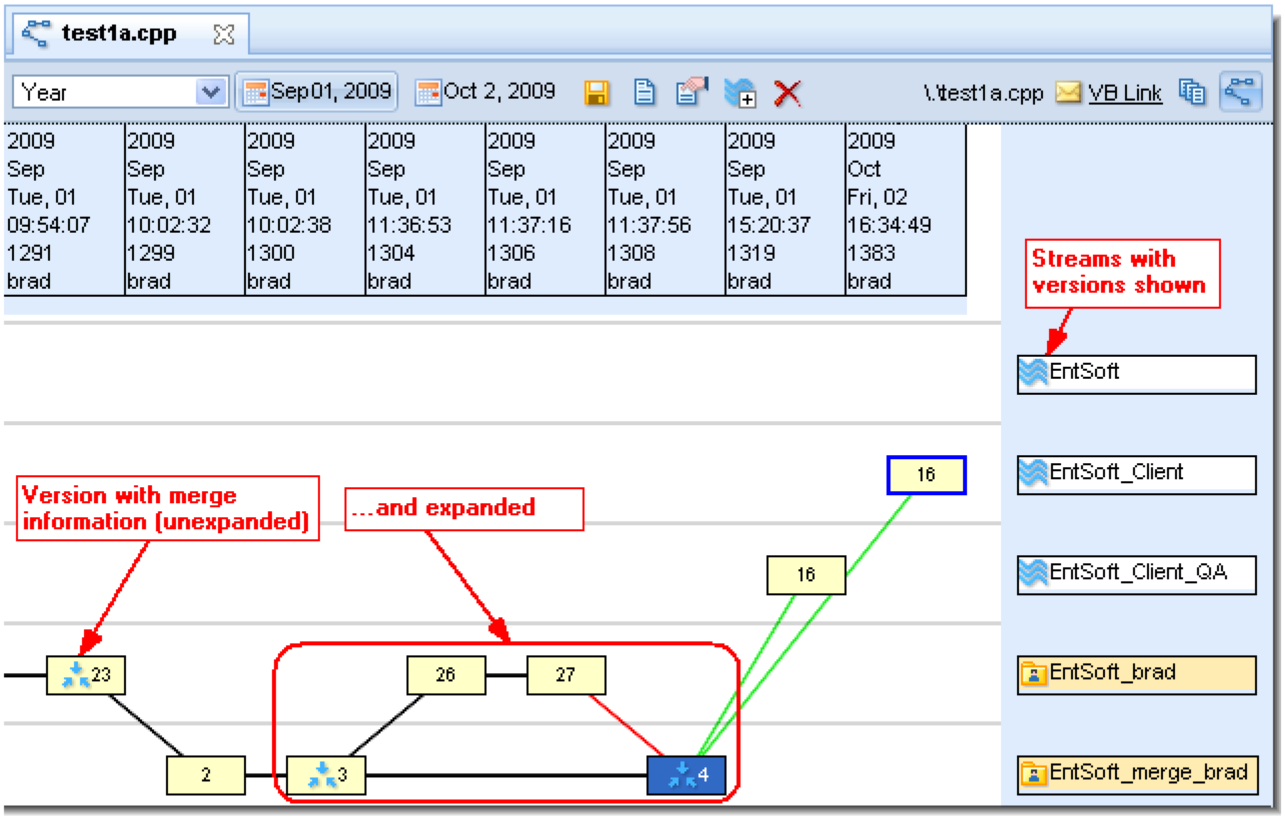
Note: AccuRev uses a separate executable to perform `Merge` operations. Check that your environment variables and system path are correctly defined so this executable is available to the Integration.

See also *Merge: When Changes Would Collide*.

Version Browser

Shows the ancestry for each element you select in the **Version Browser**. It displays the current version of the selected element, the real ancestors of that version, and the virtual versions that have one of those ancestors as a parent. By default, data for 20 transactions is shown in the list of filters on the **Version Browser** toolbar.

The **Version Browser timeline** shows when each transaction took place, as well as the number and user associated with the transaction. Note that the **timeline** proceeds left-to-right, therefore, the most recent versions will be visible on the right side of the **Version Browser**.



2009	2009	2009	2009	2009	2009	2009	2009
Sep	Sep	Sep	Sep	Sep	Sep	Sep	Oct
Tue, 01	Tue, 01	Tue, 01	Tue, 01	Tue, 01	Tue, 01	Tue, 01	Fri, 02
09:54:07	10:02:32	10:02:38	11:36:53	11:37:16	11:37:56	15:20:37	16:34:49
1291	1299	1300	1304	1306	1308	1319	1383
brad	brad	brad	brad	brad	brad	brad	brad

Note: Available only if the AccuRev Plug-In for IntelliJ IDEA has been configured to provide access to the AccuRev Web UI.

Annotate

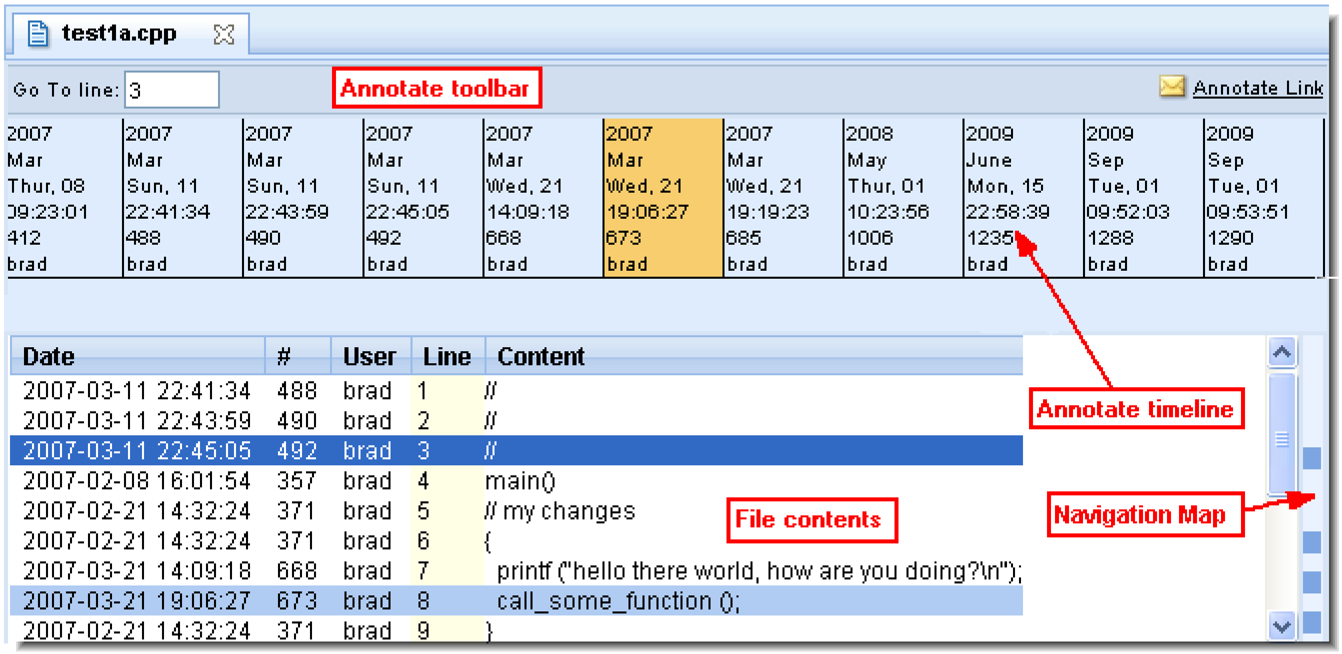
Shows the contents of the selected version of a text file, annotating each line with:

- The timestamp of the version in which that line was added to the file.
- The number of the transaction in which that version was created.
- The user who performed that transaction.
- A line number

You can use the annotations to explore how the file has changed over time. When you click on an item in the **Date**, **#**, or **User** columns, all the lines whose value in that column matches the value of the item you clicked are highlighted. 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 by a particular user (click in the `User` column).

A **timeline** is shown above the file contents. Each transaction involving the annotated file is represented on the **timeline**. Click a transaction to show the file as of that transaction. The lines of the file that have been added or changed by that transaction are highlighted.



2007	2007	2007	2007	2007	2007	2007	2008	2009	2009	2009
Mar	Mar	Mar	Mar	Mar	Mar	Mar	May	June	Sep	Sep
Thur, 08	Sun, 11	Sun, 11	Sun, 11	Wed, 21	Wed, 21	Wed, 21	Thur, 01	Mon, 15	Tue, 01	Tue, 01
09:23:01	22:41:34	22:43:59	22:45:05	14:09:18	19:06:27	19:19:23	10:23:56	22:58:39	09:52:03	09:53:51
412	488	490	492	668	673	685	1006	1235	1288	1290
brad	brad	brad	brad	brad	brad	brad	brad	brad	brad	brad

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	}

Note: Available only if the AccuRev Plug-In for IntelliJ IDEA has been configured to provide access to the AccuRev Web UI.

Defunct

Deletes a file from your disk, and also marks it as having `(defunct)` status in the AccuRev workspace. A comment dialog enables you to enter comments for the defuncted element.

Other users will continue to see the file in their workspaces. When you `Promote` a defunct element to the backing stream, it disappears entirely from the workspace stream, and from the **File Browser** display. The element then becomes `(defunct)`, hence also active, in the backing stream.

You can also `Defunct` a directory. But before doing so, consult the description of the `Defunct` command in the *AccuRev Command Line Interface User's Guide*.

Note: The IDE's `Delete` command does not run AccuRev's `Defunct` command. See *Using the IDE's Delete Command*.

Populate

Restores a file with `(missing)` status to your project. To locate such files, use the *AccuRev Search/Status View*.

The `Populate` command copies the version currently in the workspace stream (in the AccuRev repository) to the workspace. For more information, see *What's the Difference between Populate and Update?* in the *AccuRev Technical Notes*.

Revert To

The commands on the **Revert To** menu allow you to discard changes to a file in your workspace, replacing them with another version.

Revert to > Most Recent Version	Replaces your file with the version in the workspace stream (in the AccuRev depot). Typically, the workspace stream contains the version you most recently created with `Keep`. Or it might contain the version you brought into your workspace with **Update AccuRev Workspace**.
Revert to > Backed Version	Replaces your file with the version that was in the backing stream at the time of your most recent**Update AccuRev Workspace**, or the last version you `Promoted`, whichever is more recent.

Diff Against

Compares your file with another version. Only text files can be compared.

Diff Against > Backed Version	Compares your file with the version currently in the workspace's backing stream.
Diff Against > Most Recent Version	Compares your file with the version in the workspace stream (in the AccuRev depot). Typically, the workspace stream contains the version you most recently created with `Keep`, so this command helps answer the question, “What have I changed since my last Keep?” The workspace stream might contain the version you brought into your workspace with **Update AccuRev Workspace**, or the version you recently `Promoted`. In these cases, the command is equivalent to **Diff Against** > **Backed Version**.
Diff Against > Basis Version	Compares your file with the version you most recently brought into your workspace with **Update AccuRev Workspace**. However, if you have `Promoted` the file since the update, the comparison is with your most recently promoted version.
Diff Against > File on Disk	Allows you to compare a text file in your workspace with some other file (either on the hard disk, or available via a networked machine).

Ignore Options for AccuRev Diff

You can specify whether or not you want AccuRev to ignore one or more of the following:

- Whitespace (whitespace is ignored by default)
- Changes in whitespace
- Case

Synchronize Time

The `Synchronize Time` command changes a client machine’s system clock to match the clock on the AccuRev Server. Some commands are disabled if the client’s time does not match the server’s time within a preset tolerance.

Note: You must have `root` (on Linux/UNIX) or `Administrator` (on Microsoft Windows) privileges to change the system time.

AccuRev Workspace Information

The **AccuRev Workspace Information** command displays a message box containing information about the current AccuRev context: your user name, your AccuRev workspace name and location, and so on. It also indicates whether the integrations between AccuRev's configuration management and issue management capabilities are enabled.

Update AccuRev Workspace

Update AccuRev Workspace > Entire Workspace	Copies versions from your workspace's backing stream into your workspace. This has the effect of incorporating other people's changes, which they have promoted to the backing stream, into your workspace.
Update AccuRev Workspace > Preview	Shows which files have changed and would be copied to your workspace if you issue the **Update AccuRev Workspace** > **Entire Workspace** command.

AccuRev History

Displays the transactions for the selected file or directory element in the **Version Control** tool window. AccuRev tracks the complete history of each version-controlled element (file, directory, or link). This history consists of the set of transactions involving that element. Most changes to a depot are logged by transactions.

This command is disabled if multiple elements are selected.

The top pane of the **Version Control** tool window (**transactions pane**) shows the transactions that this element was part of. If you select a transaction, a list of all elements involved in that transaction appears in the bottom pane (**elements pane**). The comment for the selected transaction is displayed separately in a **comments pane** to the right of the elements pane.

Typically, most of an element’s transactions are created by `Keep` and `Promote` commands, as shown in the **Action** column in the transactions pane. Transactions are also logged in several other situations, for example:

- When an element is first added to an AccuRev depot (add).
- When you rename it or move it to a different directory (move). This action occurs when you use the IDE to move or rename a file, for example in a refactoring operation.
- When you incorporate someone else’s changes into your work (merge), and some others.

The toolbar at the top of the **Version Control** tool window contains navigation buttons to move among groups of transactions: first group, previous group, and next group, and a list that controls how many transactions are displayed at a time. Right click an item to perform actions.

AccuRev Statuses

Displays a table listing information about each element in the current selection:

- Element’s **Location** within the depot.
- AccuRev **Status** (one or more indicators).
- **Version** ID of this version.
- **Element ID**.

Icon Decorations in the Project Tool

Each file or directory object displayed in the Project tool subwindow has an AccuRev-level status, expressed as a set of status indicators, for example, `(kept)(member)`. The Project tool does not display these status indicators, but it does display corresponding icon decorations.

The status indicators are not mutually exclusive. For example, a file’s status can include both the `(modified)` and `(member)` indicators. But the IDE uses only one decoration on each icon or each filename. The following precedence order of the AccuRev statuses determines which decoration appears:

`(overlap)` highest precedence
`(stale)`
`(missing)`
`(modified)`
● `(member)`
`(backed)` lowest precedence

AccuRev Searches

Searches your workspace for files whose AccuRev status matches the criterion you specify: `Pending`, `Modified`, and so on. The results appear in the **AccuRev Searches/Status** window, replacing the current contents (if any).

You can select one or more elements in this window and right-click to display the **AccuRev** context menu and perform any valid AccuRev command. This makes it easy to perform such operations as:

- Promoting elements that are pending promotion.
- Keeping and Promoting `(modified)` elements.
- Promoting elements in the workspace's default group.
- Placing `(external)` files under version control.

By default, a search is conducted through the entire workspace containing the IDE project. If the project occupies a subtree of the workspace, the search results might contain files that are not in the IDE project. Clear the **Entire Workspace** checkbox to restrict the search scope to the IDE project only.

Refresh

Makes a call to the AccuRev Server and refreshes the statuses of the selected files and directories. Two options are available.

Refresh > Selected Content Roots	Refreshes the selection and (if it includes a directory) the subdirectories.
Refresh > Project	Refreshes the status of all AccuRev-controlled elements in the project.

The AccuRev icon decorations of the selected items are refreshed, too. If you have version-controlled items that are modified by the IDE or an external process, this command can help you to detect such changes to those items.

Web UI

Displays the AccuRev Web UI, providing a convenient way to view information from the AccuRev repository.

Note: The `Web UI` command is available only if the plug-in has been configured to provide access to the AccuRev Web UI. See the *Plug-in Installation and Release Notes* for more information on this process.

Send To Issue

Adds the selected element to the change package of an AccuWork issue that you specify. When you right-click a selected element and choose **AccuRev** > **Send To Issue** from the context menu, a list of issues returned by your AccuWork default query appears in the **Select Issue** dialog box. You can select an issue and click **Ok** to add the element to the issue's change package.

Remove From Issue

Removes the selected element from the change package of an AccuWork issue that you specify. When you right-click on a selected element and choose **AccuRev** > **Remove From Issue** from the context menu, a list of issues returned by your AccuWork default query appears in the Select Issue dialog box. Select an issue and click **Ok** to remove that element from the change package associated with the issue.

Add To Ignore

AccuRev's pathname optimization facility provides for faster performance by allowing certain objects to be ignored during various commands, notably (external)-status objects during whole-workspace searches. AccuRev supports specification of objects to be ignored on a per-directory basis so that one or more directories in a workspace can contain a text file named `.acignore`.

If you right-click on selected files that you want to ignore and choose **AccuRev** > **Add To Ignore** from the context menu, AccuRev creates an `.acignore` file in that directory configured with the files you selected. If a `.acignore` file already exists in that directory, the AccuRev Plug-In for IntelliJ IDEA updates it with the names of the files.

An `.acignore` file applies only to its own directory. In particular, it does not apply recursively to lower-level directories.

Running Commands in the Background

Only long-running commands like `Searches`, `Refresh`, and `Diff Against` can be run in the background. When the command begins execution, a window appears with a **Background** button.

Click it to close the pop-up window and displays a command-specific message and progress indicator at the bottom of the IntelliJ IDEA window.

IDE Namespace Commands and AccuRev

IntelliJ IDEA provides a method for changing the pathname of a file or directory:

- To rename an object, right-click it and select **Refactor** > **Rename** from the object's context menu.
- To move an object to a different directory, right-click it and select **Refactor** > **Move** from the object's context menu.

After either of the above operations completes, the AccuRev Plug-In for IntelliJ IDEA automatically runs the AccuRev `Rename` command to record the pathname change in the repository. As usual, the results are displayed in the AccuRev **Console** tool window.

If you are not logged in, the IDE's `Refactor` command proceeds, but no AccuRev `Rename` command can be executed. In this case, a warning box appears, explaining that the old name will have `(missing)` status and the new name will have `(external)` status.

A similar result occurs if you use the `Move` command to move an object from one IDE project to another project that is part of the same AccuRev workspace. The object will be moved, but no AccuRev `Rename` command will be invoked. The object will have `(missing)` status in the source location and `(external)` status in the destination location.

Using the IDE’s Delete Command

Executing the IDE’s **Edit** > **Delete** command on an element does not automatically invoke the AccuRev `Defunct` command. The element is removed from the IDE project, but gets the AccuRev status `(missing)`.

To resolve a `(missing)` status after using the `Delete` command, take the following steps:

1. Click **AccuRev** > **Searches** > **Missing** to list the deleted element.
2. Run one of these AccuRev commands from the context menu of the deleted element:

Defunct	Removes the element at the AccuRev level as well. (You need to `Promote` the element to make the removal public. You can do this after listing the element with a **Defunct**, **Pending**, or **Default Group** search.)
Populate	Undoes the `Delete` command restoring the element to the IDE project. (But any recent changes that you did not preserve with `Keep` will be lost.)

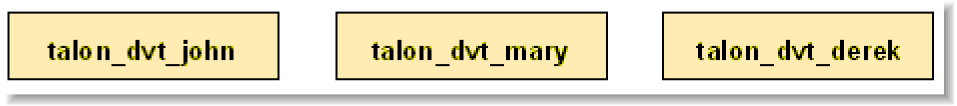
AccuRev Usage Model

This section introduces the basic AccuRev concepts and procedures that will enable you to be comfortable and productive using AccuRev on day one. More detailed information is always just a click away: pressing F1 or clicking the help button anywhere in the AccuRev GUI provides you with access to the entire AccuRev documentation set in both HTML and PDF formats.

AccuRev's flexibility makes it easy to use for a variety of development scenarios. But like every software system, it has usage models that were foremost in the minds of its architects. This section describes the most common usage model.

AccuRev is a software configuration management (SCM) system, designed for use by a team of people who are developing a set of files. This set of files might contain source code, images, technical and marketing documents, audio/video tracks, or any other digital content the user puts into the system. The files and directories in AccuRev are said to be "version-controlled" or "under source control".

For maximum productivity, the team's members must be able to work independently of each other, sometimes for just a few hours or days, other times for many weeks. Accordingly, each user has his own private copy of the version-controlled files. The private copies are stored on the user's own machine (or perhaps in the user's private area on a public machine), in a directory tree called a *workspace*. We can picture the independent workspaces for a three-user team comprised of John, Mary, and Derek as follows:



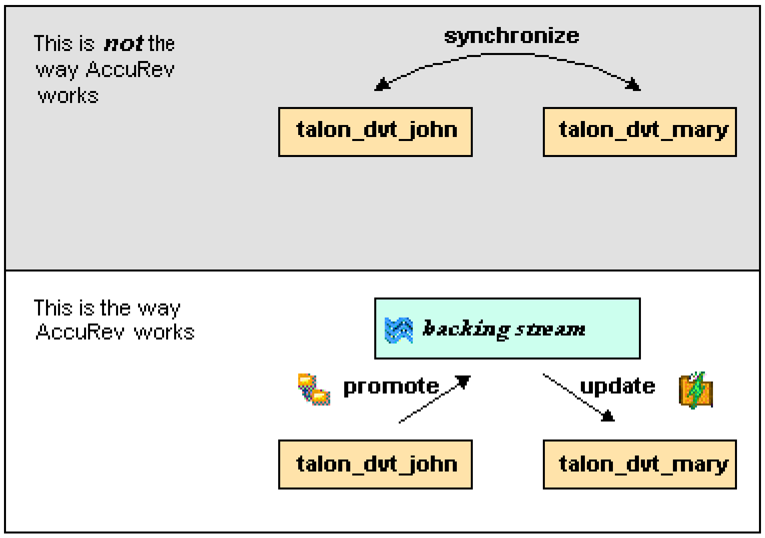
This set of users' workspaces uses the convention of having like names, suffixed with the individual usernames. AccuRev GUI enforces this username-suffix convention. In this example, talon_dvt might mean "development work on the Talon product"; john, mary, and derek would be the users' login names.

From AccuRev GUI's perspective, development work in this set of workspaces is a continual back-and-forth between getting "*in sync*" and "*out of sync*":

- Initially, the workspaces are completely synchronized: each workspace has copies of the same set of version-controlled files.
- The workspaces become unsynchronized as each user makes changes to some of the files.
- Periodically, users share their changes with each other. When john incorporates some or all of mary's changes into his workspace, their two workspaces become more closely (perhaps completely) synchronized.

You might assume that the workspace synchronization process involves the direct transfer of data from one workspace to another. But this is not the way AccuRev GUI organizes the work environment. Instead of transferring data directly between private areas (that is, between users' workspaces), AccuRev GUI organizes the data transfer into two steps:

1. One user makes his changes public, available to all the other members of his team. This step is called *promoting*.
2. Whenever they wish, other team members incorporate the public changes into their own workspaces. This step is called *updating*.



The first step involves a public data area, called a *stream*. A stream is an AccuRev GUI structure with two very important features that support and simplify parallel development. First, as implied by the preceding illustration, numerous individual contributors can create workspaces on a single stream, allowing them to easily share their work with others, and to get changes from them when they wish. As you will see later, AccuRev GUI has numerous safeguards that prevent one user from overwriting another user's changes, and tools that help you resolve conflicting changes when they occur. Second, in a stream hierarchy, inheritance lets child streams automatically inherit changes from the parent streams above them, reducing the need for tedious merges that might otherwise be required when several developers are working on the same code.

AccuRev GUI has several kinds of streams, but the most common one is the backing stream. Later, we will show you how the data in this public stream "is in back of" or "provides a backstop for" all the private workspaces of the team members.

Change and Synchronization: The Four Basic Commands

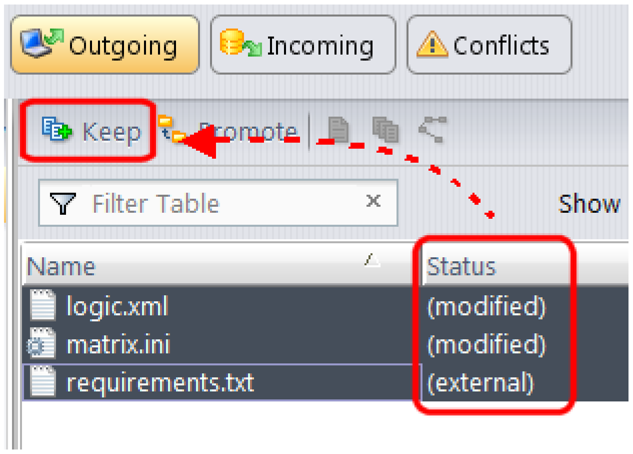
With the usage model described above, you will be able to accomplish most of your work with four simple commands: `Keep`, `Promote`, `Update`, and `Merge`. These commands are described in the following sections.

Keep: Preserving Changes in Your Private Workspace

A workspace is just a normal directory tree in which you make changes to version-controlled files. You can work with the files using text editors, build and test tools, IDEs, and so on, just as if the files were not version-controlled at all. For example, you might edit a source file and invoke the editor's `Save` command a dozen times over the course of an hour or two. These operations do not involve AccuRev at all, the operating system changes the contents and the timestamp of the file in your workspace.

You do not need to perform a *check out* operation or otherwise get permission before editing a file in your workspace. (Some legacy SCM systems do impose such a regimen, and AccuRev can be configured to require checkouts, if your organization requires them.)

Every so often, you want AccuRev to preserve the current contents of the file as an official new version of the file. You accomplish this using the `Keep` command.



Name	Status
logic.xml	(modified)
matrix.ini	(modified)
requirements.txt	(external)

This figure shows how to invoke the `Keep` command from the **File Browser** toolbar. `Keep` is also available from the **Actions** and context (right-click) menus. You can also keep new files, like `requirements.txt` in the preceding illustration, its status is `external` because it has not yet been added to AccuRev.

Tip: The **File Browser** helps organize your workspace using **Outgoing Changes** (your work), **Incoming Changes** (others' work), and **Conflicts** modes (conflicting changes in your work and that of a teammate).

You can continue modifying the file, using `Keep` to preserve the latest changes, as often as you like. Other team members will not complain about "thrashing" because these new versions stay within your workspace and do not affect any other user's workspace. AccuRev retains all the versions that you *Keep*. This makes it possible for you to roll back to any previous version you created.

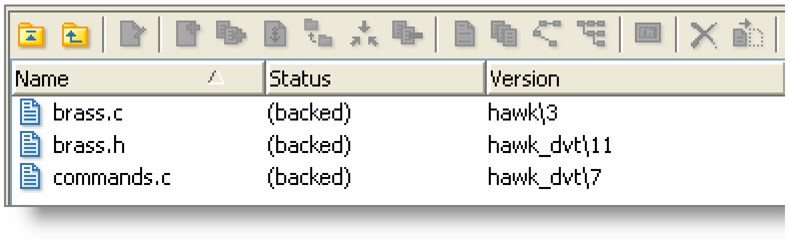
Several other operations are similar to *Keep* in that they create a new version of a file in your workspace, without affecting any other user's workspace. The most important of these are:

Rename and Move	You can rename a file or move it to a different directory (or both), using AccuRev commands. Other users will continue to see the file at its original pathname in their workspaces.
Defunct	You can remove a file from your workspace with the `Defunct` command. When you promote a *defuncted* file, other users will continue to see the file until they update their workspaces, at which point the file will be removed. (`Defunct` differs from a simple *delete* in that `Defunct` removes the file from your workspace, while `Delete` removes the physical file from your local directory.)

More About Keep

AccuRev retains all of the versions that you `Keep`. Each time you `Keep` a file, its current contents are copied to the AccuRev repository, located on the machine where the AccuRev Server runs. You do not need to care about the name and precise location of this copy. Each version you create has a `version-ID`, such as `myWorkspace\2` (which translates as "the 2nd version of this file created in the `myWorkspace` workspace").

AccuRev keeps track of the status of each file in a workspace. After you `Keep` a file, the **Status** column in the **File Browser** contains the indicator (kept). It also contains the indicator (member), meaning that the file belongs to the set of files you are actively working on. (See *Active and Inactive Files* in Promote for more information). The **Version** column displays the `version-ID`.



Name	Status	Version
brass.c	(backed)	hawk\3
brass.h	(backed)	hawk_dvt\11
commands.c	(backed)	hawk_dvt\7

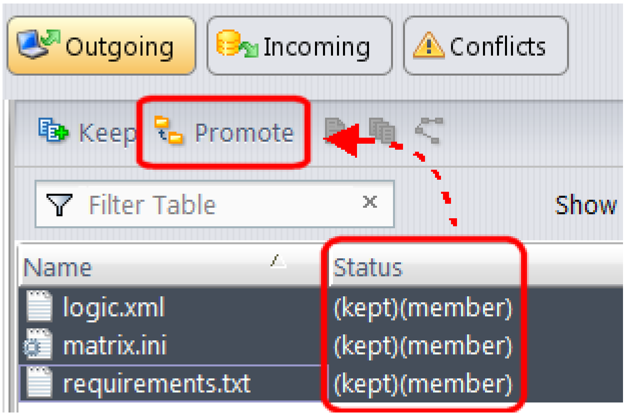
A change to the data within a file, recorded by `Keep`, is termed a *content change*. The change made by `Rename`, `Move` or `Defunct` is termed a *namespace change*. (Many SCM systems do not handle namespace changes at all, or have very limited capabilities in this area.) As noted previously, AccuRev Server saves a new copy of the file in the repository whenever you make a content change. But it does not need to copy the file when you make a namespace change, rather, the AccuRev Server just records the change in its database.

To perform version control on directories, AccuRev Server only needs to keep track of namespace changes, such as renaming, moving, or deleting a directory. Unlike some legacy SCM systems, AccuRev does not need to record a new directory version when you make a content change. For example, when adding a new file to the directory.

Promote: Making Your Private Changes Public

At some point, after you have used `Keep` to create one or more new, private versions of a file in your workspace, you typically want to share the changes you have made with the other team members. To make your (most recent) new version *available to the public*, you *promote* it.

The following figure shows how to run the `Promote` command from the **File Browser** toolbar. `Promote` is also available from the **Actions** and context (right-click) menus.



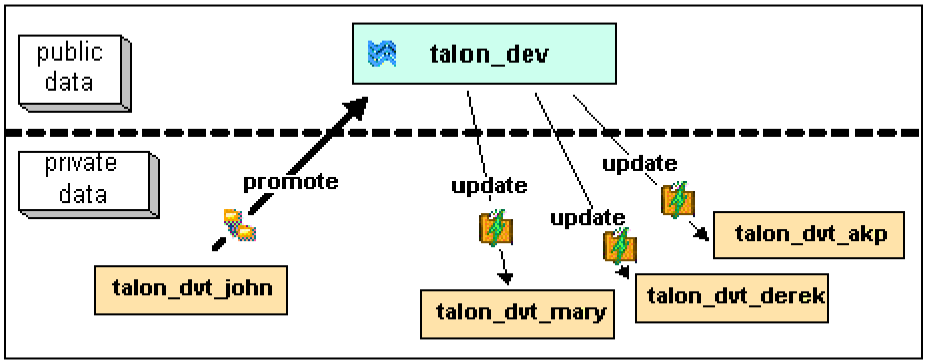
Name	Status
logic.xml	(kept)(member)
matrix.ini	(kept)(member)
requirements.txt	(kept)(member)

Tip: You can `Promote` files that you have not yet kept. AccuRev performs the necessary `Keep` action for you. In the case of new files, AccuRev first adds the file to the AccuRev repository.

Promoting your new version of a file does not automatically *push* it into the workspaces of the other team members. When a user decides that she is ready to incorporate versions of files that other team members have promoted, she *pulls* them into her workspace with the Update command. This process is described in *Update: Incorporating Others' Changes into Your Workspace*.

Streams

The `Promote` command sends data to, and the `Update` command gets data from, an AccuRev data structure called a *stream*.



The stream (named `talon_dev` in this illustration) acts as a central data exchange for the set of workspaces used by a development team. A stream also has a bit of "traffic controller" built in, preventing team members' efforts from colliding and providing other mechanisms to control the flow of data.

A stream is not, as you might initially suppose, a set of copies of promoted files. Rather, it is more like a list of version-IDs.

- The 4th version created in workspace `talon_dvt_akp` of file `logic.xml`.
- The 7th version created in workspace `talon_dvt_mary` of file `matrix.ini`
- Etc...

In SCM vernacular, a stream is a configuration of a collection of version-controlled files. The term stream is apt, because it implies the ongoing changes happening in a development project. Each time a user promotes a version of file `logic.xml`, the stream configuration changes for that file, for example, from `the 5th version created in workspace talon_dvt_derek` to the `7th version created in workspace talon_dvt_mary`.

Promotion and Parallel Development

Sometimes, AccuRev does not allow you to promote a file to the development team's stream, because another team member has already promoted the same file (after modifying it in their own workspace). AccuRev prevents you from overwriting your colleague's change to the team's shared stream. This situation is called an overlap: two users working at the same time on the same goal, to create the stream's next version of a particular file.

Before you can promote your changes to the stream, you must first perform a merge on the file that has an overlap. This command is described in *Merge: When Changes Would Collide*.

Active and Inactive Files

As you work with a file using the commands described above, AccuRev considers the file to alternate between being active in your workspace and inactive:

- The file is initially inactive.
- When you create a new version in your workspace, using `Keep`, `Rename`, `Move`, or `Defunct`, the file becomes active.
- When you make your private version public, using the `Promote` command, the file becomes inactive again.

Later, you might restart this cycle, making the file active again by creating another new version of it. Alternatively, updating your workspace might overwrite your inactive file with a newer version that another team member promoted.

AccuRev keeps track of the set of active files in your workspace. Officially, this set is called the default group. You might find it easier to think of it as the workspace's "active group".

More About Promote

The `Promote` command does not copy the promoted version to the AccuRev repository. It does not need to. Promotion just gives an additional name to a version that already exists in the repository, having been placed there by a previous `Keep` command (or `Rename`, `Move`, or `Defunct`). For example, promoting `the 7th version created in workspace talon_dvt_mary` might give that version the additional name `the 3rd version promoted to stream talon_dvt`.

Just to emphasize the previous point: a stream does not reside in the file system, but in the database used by the AccuRev Server. Promoting a version to a stream does not create a copy of a file, it just creates an additional file-reference in the database.

It might seem strange at first that deleting a file with the `Defunct` command makes the file active. The **File Browser** continues to list the file, with a `defunct` status, even though the file has been removed from your workspace's disk storage. This design feature enables AccuRev to implement the file-deletion operation using the same private-change/public-change scheme as all other changes.

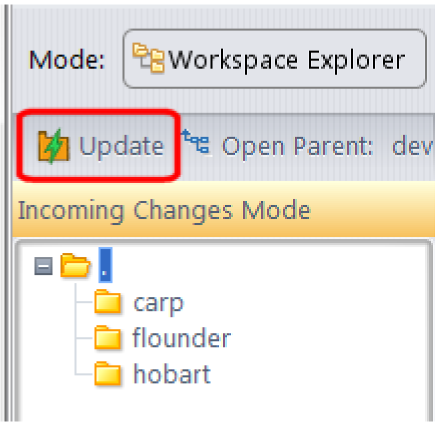
We have discussed the stream that is the basis for a set of workspaces. But a typical development project has many streams, organized into a hierarchy. Promoting a version to a higher-level stream from a lower level stream makes that version "even more public", for example, available to users outside your local development team.

Update: Incorporating Others' Changes into Your Workspace

As users work independently of each other, the contents of their workspaces increasingly diverge. Typically, some of the differences between workspaces are inconsistencies. For example, changes that John makes in a report-library routine might cause errors in the report program that Mary is writing. To minimize the time and effort required to resolve inconsistencies during the integration phase of a project, it makes sense to have users synchronize their workspaces on a regular basis.

Synchronization does not mean incorporating data into your workspace directly from one or more other workspaces. Instead, synchronization involves copying data into the workspace from the stream to which all team members `Promote` their changes.

This figure shows how to invoke the `Update` command from the **File Browser** toolbar. `Update` is also available from the **File** and context (right-click) menus.



Tip: You can Update your workspace from any File Browser mode, but the **Incoming Changes Mode** shows you exactly how your workspace will change.

Note: The stream's role as a provider of data, through `Update` operations, to a set of workspaces motivates the term *backing stream*. Think of restocking a store's shelves with merchandise retrieved from "the back room".

Note:

So updating your workspace copies versions of certain files from the backing stream to the workspace, overwriting/replacing the files currently in the workspace. But which files? Update changes a file if:

- There is a newer version in the backing stream, and
- The file is not currently active in your workspace.

Update will not overwrite an active file, even if there is a new version of it in the backing stream. No matter how good someone else's code is, you do not want his changes to wipe out the changes that you have been making! This situation is another instance of an overlap, which was introduced in *Promote: Making Your Private Changes Public*. You can encounter an overlap during a promote (if you are trying to make your private changes public), or during an update (if you are trying to bring already public changes into your private workspace). You can use the merge operation to resolve all such overlap situations. See *Merge: When Changes Would Collide*.

Update handles namespace changes as well as content changes. Thus, if your colleague renamed a file and promoted the change, an update will cause the file to be renamed in your workspace. And if your colleague removed a file using the `Defunct` command, an update will cause the file to disappear from your workspace.

More About Update

Here is how AccuRev prevents an update from overwriting your changes: the first thing Update does is to analyze your workspace, determining whether each version-controlled file is `active` or `inactive`. Initially, all the files in a workspace are inactive, each one is a copy of some version in the repository. (For each version-controlled file, AccuRev keeps track of which particular version.)

A file is deemed to be `active` in your workspace if you have created a new version of it, using the `Keep`, `Rename`, `Move`, or `Defunct` command. (There are other commands that "activate" a file.) When `Update` copies versions from the repository into your workspace, it skips over all active files.

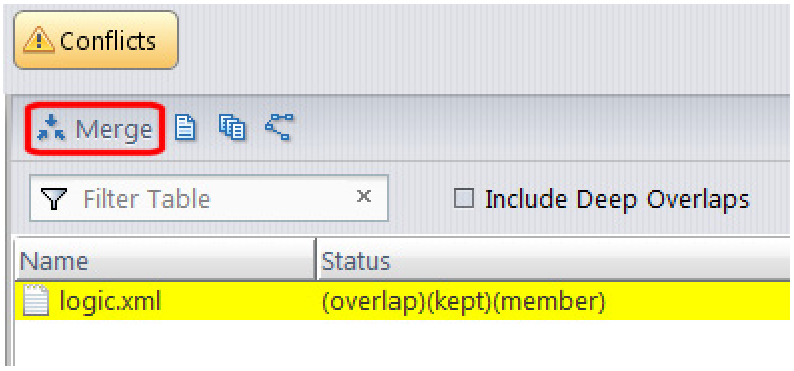
Note: Update can tell if you have modified a file but have not yet stored the changes in the repository as a new *Keep* version. It uses *time-stamps* and *checksums* to determine this. The presence of such files prevents the update from proceeding if updating would overwrite one or more of them with the backing-stream versions. You can use the `Anchor` command to activate such files, enabling `Update` to do its work.

Merge: When Changes Would Collide

The preceding sections on the `Promote` and `Update` commands both discuss the situation in which two users concurrently work on the same file. Their changes to the file are said to overlap. Both `Promote` and `Update` decline to process a file with `(overlap)` status because doing so would cause one user's changes to overwrite another's changes. For example:

- Team members John and Mary both Keep one or more new private versions of `logic.xml` in their respective workspaces.
- Mary `Promotes` her latest new version of `logic.xml` to the backing stream.
- At this point, AccuRev:
  - Will not allow John to `Promote` his version of `logic.xml` to the backing stream (there is no reason to assume that John's changes should take precedence over the changes Mary has already made and promoted).
  - Will not overwrite John's copy of `logic.xml` when he updates his workspace (again, AccuRev does not assume that a version in the backing stream should take precedence over changes made to the version in the workspace). The `Update` command skips over this file, but continues its work on other files.
  - Flags the overlap condition by highlighting `logic.xml` in yellow.

Before John can either promote or update `logic.xml`, he must incorporate, or merge, the version in the backing stream, which contains Mary's changes, into his own copy of the file. The `Merge` command is essentially a text editor, which combines the contents of two versions of a text file. The resulting *merged version* replaces the file in John's workspace.



Name	Status
logic.xml	(overlap)(kept)(member)

This figure shows how to run the `Merge` command from the **File Browser** toolbar. `Merge` is also available from the **Actions** and context (right-click) menus.

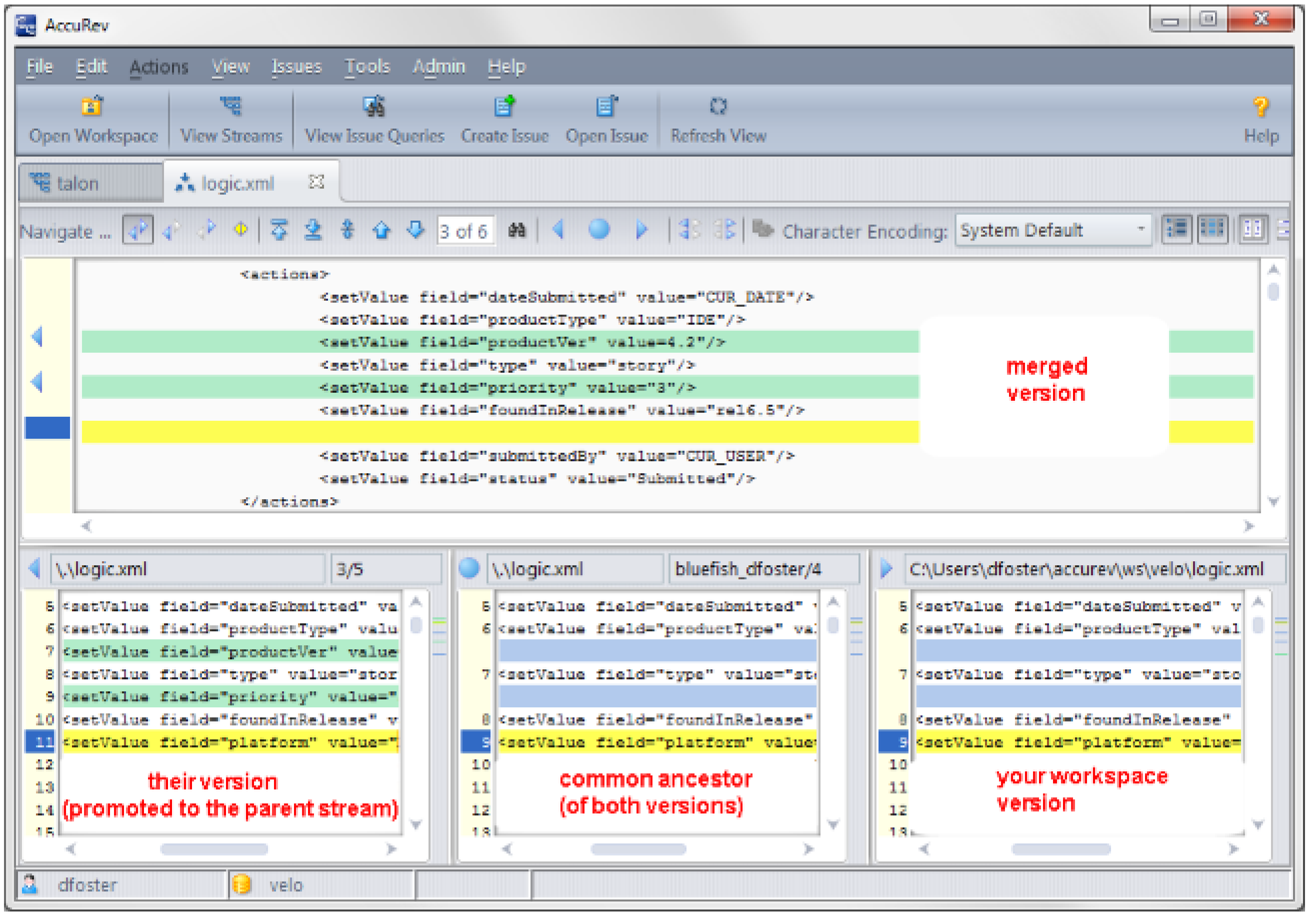
Tip: Use the **File Browser Conflicts** mode to view overlap and other conditions that prevent files from being updated and promoted.

Often, a merge operation is unambiguous, and so can be performed automatically. For example, suppose Mary's changes to file `logic.xml` all occur in lines `30–50`, and all of John's changes occur in lines `125–140`.

In this case, merging the two versions involves replacing some or all of John's 20 lines with Mary's. Now, the edited version of `logic.xml` in John's workspace contains both users' changes.

Note: We do not claim that the two sets of changes are semantically consistent with each other. That is what the build-and-test cycle is for!

If both John and Mary have made changes to the same part of the file, say, lines `2-10`, then John must decide how to resolve this conflict. The graphical `Merge` tool makes this easy.



```
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        <setValue field="dateSubmitted" value="CUR_DATE"/>
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        <setValue field="productVer" value=4.2"/>
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        <setValue field="priority" value="3"/>
        <setValue field="foundInRelease" value="rel6.5"/>

        <setValue field="submittedBy" value="CUR_USER"/>
        <setValue field="status" value="Submitted"/>
</actions>
```

```
<setValue field="dateSubmitted" va
<setValue field="productType" valu
<setValue field="productVer" value
<setValue field="type" value="stor
<setValue field="priority" value="
<setValue field="foundInRelease" v
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<setValue field="platform" value=
```

After performing a merge, AccuRev automatically `Keeps` the merged version to preserve the results of the merge operation. You can then `Promote` the merged version to the backing stream. After that, other team members can use `Update`, perhaps in conjunction with `Merge`, to bring all the changes into their workspaces.

More About Merge

The graphical **Merge** tool performs a *three-way merge*, which uses the common ancestor of the two versions being merged. This algorithm helps to automate the merge operation, often completely eliminating the need for human intervention. AccuRev performs merge operations on text files only. Binary files are merged by choosing which version to take.

AccuRev keeps track of all merge operations. This greatly simplifies subsequent merge operations on files that have been merged previously: you do not need to resolve the same conflicts over and over again.

The most common overlap situation happens when AccuRev prevents you from promoting a file, because someone else "got there first" in creating a version in the backing stream. AccuRev can also detect deep overlaps, in which another user "got there first" in creating a version in the parent of the backing stream, or in other higher-level streams.

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