MICRO FOCUS

AccuRev®

Installation and Release Notes

Version 7.4

Revised 31-March-2020

Copyright and Trademarks

© Copyright 2020 Micro Focus or one of its affiliates.

The only warranties for products and services of Micro Focus and its affiliates and licensors ("Micro Focus") are set forth in the express warranty statements accompanying such products and services. Nothing herein should be construed as constituting an additional warranty. Micro Focus shall not be liable for technical or editorial errors or omissions contained herein. The information contained herein is subject to change without notice.

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 Micro Focus.

AccuBridge, **AccuReplica**, **AccuSync**, **AccuWork**, **AccuWorkflow**, **Kando**, and **StreamBrowser** are trademarks of Micro Focus.

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

Table of Contents

Introduction **1**
What's New in AccuRev Release 7.4 1
AccuRev Git Server 1
Hosting Client-Side Triggers on the AccuRev Server 14
Schema: Read-Only Log Entries in an Issue 15
Eliminating Issue Dependencies and Variants Created By Merges 16
GUI Features and Changes 20
CLI Changes 21
XML Command Changes 22

AccuRev Installation Notes **23**
Compatibility with Previous Versions 23
System Requirements 23
Browser Requirements 24
Installation Overview 25
Installation Packages 25
The Mosquitto MQTT Message Broker 26
Installation Wizards 26
Post-installation Administrative Scripts 26
Preparing for Installation 26
Get an AccuRev License 26
Determine Configurable Elements 27
Download the Installation Packages 28
What to Do Next 29
Installing or Upgrading an AccuRev Server 30
Before You Begin 30
Running the AccuRev Installation Wizard 31
Server and Database Upgrades 38
Upgrading a Server from a 5.7 or 6.x Version 38
Upgrading a Replica Server 38
Installing or Upgrading an AccuRev Client 39
Installation Methods 39
Before You Begin 39
Using the AccuRev Client-only Installation Package 40
Using "Silent" Installations 43
Overview 43
Creating the Response File 45
Running a "Silent" Installation 45
Installing or Upgrading the AccuRev Web Server 46
Before You Begin 46
How to Run the AccuRev Web Server Installation Wizard 46
Starting, Stopping, and Testing the AccuRev Web Server 49
Testing the AccuRev Web UI 49
Post-Installation Information 50

Configuring AccuRev with Pulse Code Review ... 50
AccuRev Configuration ... 50
Pulse Configuration ... 52
Rollout to Users ... 61
Using Pulse Code Review with Replica AccuRev Servers ... 61
Setting up Pulse to Run on a Standalone AccuRev Web Server ... 62
Configuring Database Tuning Parameters ... 63
Using the 'maintain dbupgrade' Command ... 65
Performing a "Trial Run" Upgrade ... 65
Understanding maintain dbupgrade Messages ... 66
Messages from dbupgrade_i18n_report.html ... 69
Performing the Actual Database Upgrade ... 70
Starting and Stopping AccuRev Servers ... 70
Starting and Stopping the AccuRev Server ... 70
Starting and Stopping the AccuRev Database Server ... 71
Starting and Stopping the AccuRev Tomcat Server and Mosquitto MQTT Message Broker ... 71
Summary of Start and Stop Operations ... 72
Platform Support Notes ... 72
Platform Support Matrix ... 72
Java Compatibility ... 73
(UNIX/Linux only) Workaround for Java Runtime Library Problems ... 73
Linux ... 73
Solaris ... 73
Windows ... 74
macOS ... 74
Uninstalling AccuRev ... 75

AccuRev 7.4 Release Notes ... 77
Discontinued and Deprecated Platforms ... 77
Changes in AccuRev Release 7.4 ... 78
Corrections and Changes to the Documentation ... 84
Known Issues ... 84

AccuRev 7.3 Release Notes ... 85
Discontinued and Deprecated Platforms ... 85
What's New in AccuRev Release 7.3 ... 85
Pulse Code Review ... 85
GUI: Filtering Active Issues by Field Values ... 92
GUI: Filtering History by Stream ... 93
GUI: New Operations for Snapshot Streams ... 94
GUI: Demote Locks ... 95
GUI: Displaying Third Party Issue IDs ... 97
GUI: Transaction Details in the Annotate Tab ... 98
New Unix Extras: rsyncAccuRev and autoRestoreAccuRev ... 99
Pulse Code Review FAQ ... 101
Changes in AccuRev Release ... 103
Corrections and Changes to the Documentation ... 108
Known Issues ... 108

AccuRev 7.2 Release Notes ... 111

Discontinued Platforms ... 111
What's New in AccuRev Release 7.2 ... 111
AccuRev Git Client ... 111
Calculated Timespan Schema Field Type ... 112
(subtwin) Element Status ... 112
Update Workspace and (member)(overlap) Files ... 113
"Diff Against" Dropdown Menu in Outgoing Mode ... 113
Merge GUI: Selecting Multiple Sources ... 114
Changes in AccuRev Release 7.2 ... 114
Corrections and Changes to the Documentation ... 120
Known Issues ... 120

AccuRev 7.1 Release Notes ... 122
Deprecated Platforms ... 122
What's New in AccuRev Release 7.1 ... 122
Enhanced Filtering in the History Browser ... 122
Admin Command Permissions GUI ... 124
Push Notifications ... 130
Changes in AccuRev Release 7.1 ... 132
Corrections and Changes to the Documentation ... 136
Known Issues ... 136

AccuRev 7.0.1 Release Notes ... 139
Deprecated Platforms ... 139
What's New in AccuRev Release 7.0.1 ... 139
Version Browser: Highlighted Version Relationships and Show Promotion Path ... 139
Sync Stream Wizard in the GUI ... 141
Styling Individual Issue Fields in the Schema Editor ... 142
Crucible Connection in the GUI ... 143
Archive Enhancements ... 144
License Management Enhancements ... 145
Changes in AccuRev Release 7.0.1 ... 146
Corrections and Changes to the Documentation ... 153
Known Issues ... 153

AccuRev 7.0 Release Notes ... 156
What's New in AccuRev Release 7.0 ... 156
Disaster Recovery - Replica Rollback ... 156
License Manager ... 156
Change Package Usability Enhanements ... 156
GUI Improvements ... 157
Database Upgrade ... 158
Changes in AccuRev Release 7.0 ... 158
Corrections and Changes to the Documentation ... 161
Known Issues ... 162
Known Issues in AccuRev ... 162

Introduction

Micro Focus proudly introduces AccuRev Version 7.4, helping you unleash the power of software development teams to deliver superior results.

What's New in AccuRev Release 7.4

Highlights of new developments in AccuRev 7.4 are captured here. The following sections describe the new AccuRev Git Server, hosting of client-side triggers on the AccuRev server, how to define read-only Log entries in a schema, changes in overlap resolution, and several enhancements to the AccuRev GUI and CLI.

AccuRev Git Server

AccuRev 7.4 introduces the *AccuRev Git Server*, a new web application that enables developers to clone, push, and pull source code to and from AccuRev depots and streams using Git or any Git-compatible IDE or desktop application. Using the Git Server's web interface, developers can browse for project repos, select stories to work on, and perform peer code reviews. Team leads and administrators can configure the Git Server, create new repos, view user access permissions, and read and download repo access logs.

The AccuRev Git Server offers the following benefits over the AccuRev Git Client, which was introduced in release 7.2:

- Requires no client-side software other than Git version 2.18 (or higher)
- Supports branches and tags
- Provides Git users with a full transaction history from AccuRev from the time that the AccuRev Git Server was instantiated
- Performs better than the AccuRev Git Client

Overview

The AccuRev Git Server is included in the AccuRev 7.4 full server and web server installs. No installation is required on client machines. The Git Server sits between Git users and the AccuRev server, and it interacts with AccuRev through the AccuRev Git Client. The Git Server is configurable via a web interface, and it has no dependency on triggers.

AccuRev streams are accessed using Git HTTP/S URLs. The system administrator creates a Git repo for an AccuRev stream, and then users can clone that repo. The Git Server supports task-based development using AccuRev change packages -- in both the web interface and the CLI, users can select issues to associate with push operations.

The commit history is shared between AccuRev and Git users. Commits on the master branch are pushed to the AccuRev stream corresponding to the Git repo and are visible in stream and element histories. Conversely, a fully materialized transaction history from AccuRev is visible to Git users -- the Git Server creates commits to reflect the changes inherited from upstream changes or from crosslinks. (This requires that the NOTIFICATION_LEVEL in acserver.cnf be set to 15.) The "git log" command shows the full history since the Git repo was created.

Access control over Git repos is based on AccuRev stream ACLs. Access logs, visible to Administrators in the web interface, provide an audit trail of clone, push, and pull operations.

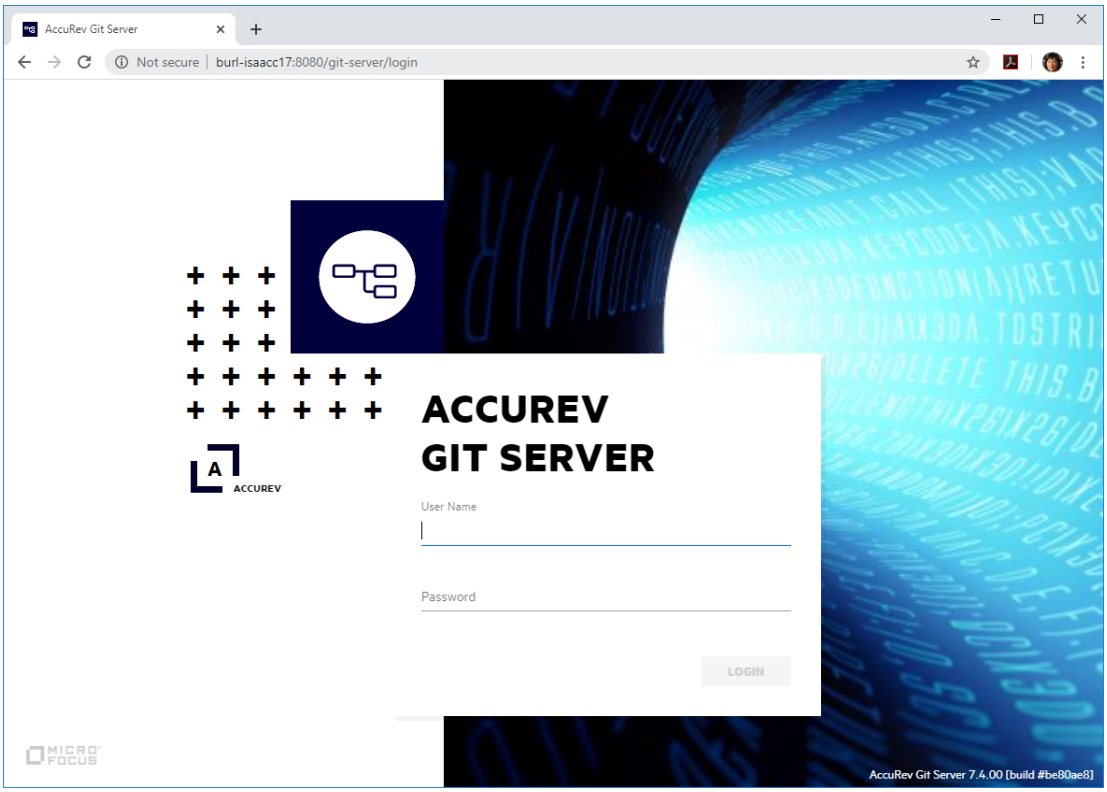
Pulse Code Review, initially introduced in release 7.3, is also included with 7.4 full and web-only installs. It enables users to easily conduct code reviews on AccuRev issues (change packages). Code reviews are accessible through Pulse's web interface, and also through the AccuRev GUI (AccuWork) and the AccuRev Git Server web interface. The Git Server displays the latest status of code reviews for issues in a repo's change package.

Developers

To work with the AccuRev Git Server, a Git user must have an AccuRev account. Users can clone AccuRev streams using Git HTTP/S URLs. Using the web interface, they can set up change packages so that subsequent "git push" commands are associated with the configured issue(s).

Logging In

Log in to the AccuRev Git Server's web interface at ***<host>:<port>/git-server*** using your AccuRev user credentials:

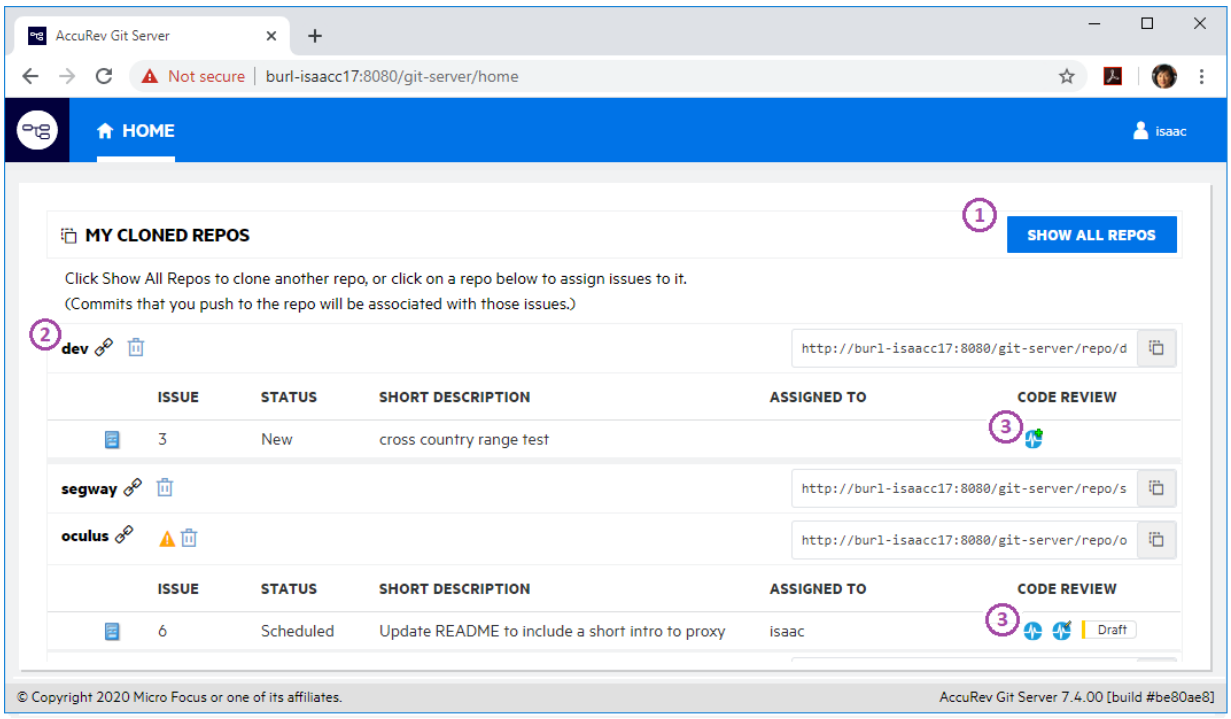


Home Page

The Git Server's home page displays the Git repos that you have cloned on your local system, along with the issues that you have selected to associate with commits pushed to those repos.

You can do the following on the Home page:

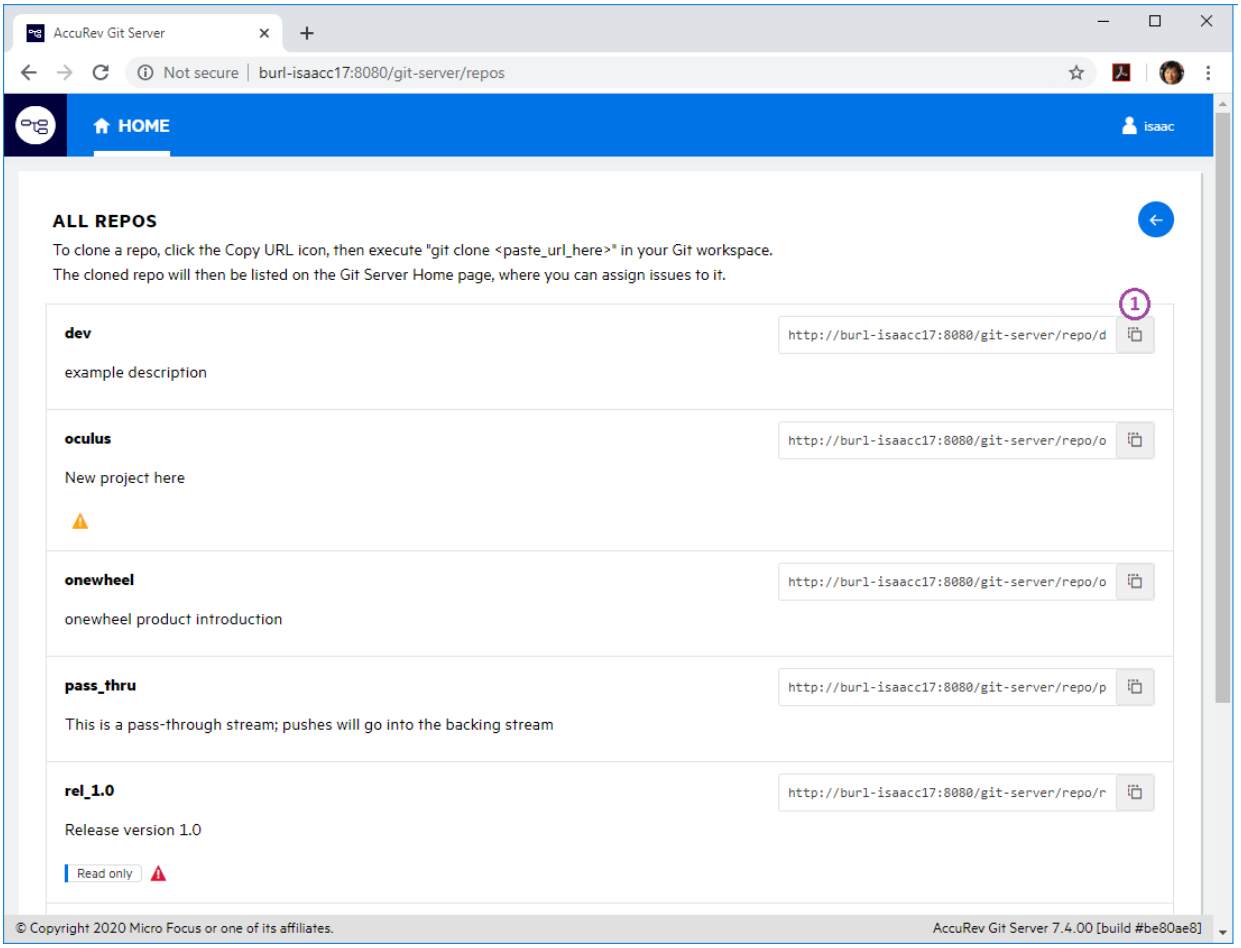
1. Click the SHOW ALL REPOS button to go to a page where you can clone another repo.
2. Click on a repo name to manage what issues are associated with commits pushed to that repo.
3. Click one of the Pulse code review icons to create a new code review, update an existing code review, or open a code review in the Pulse web interface.



All Repos Page

The All Repos page displays all the repos created from AccuRev streams that are ready to be cloned by Git users. On this page, take this action to clone a repo:

1. Click the Copy URL button and then execute “git clone <paste URL here>” in your Git workspace.



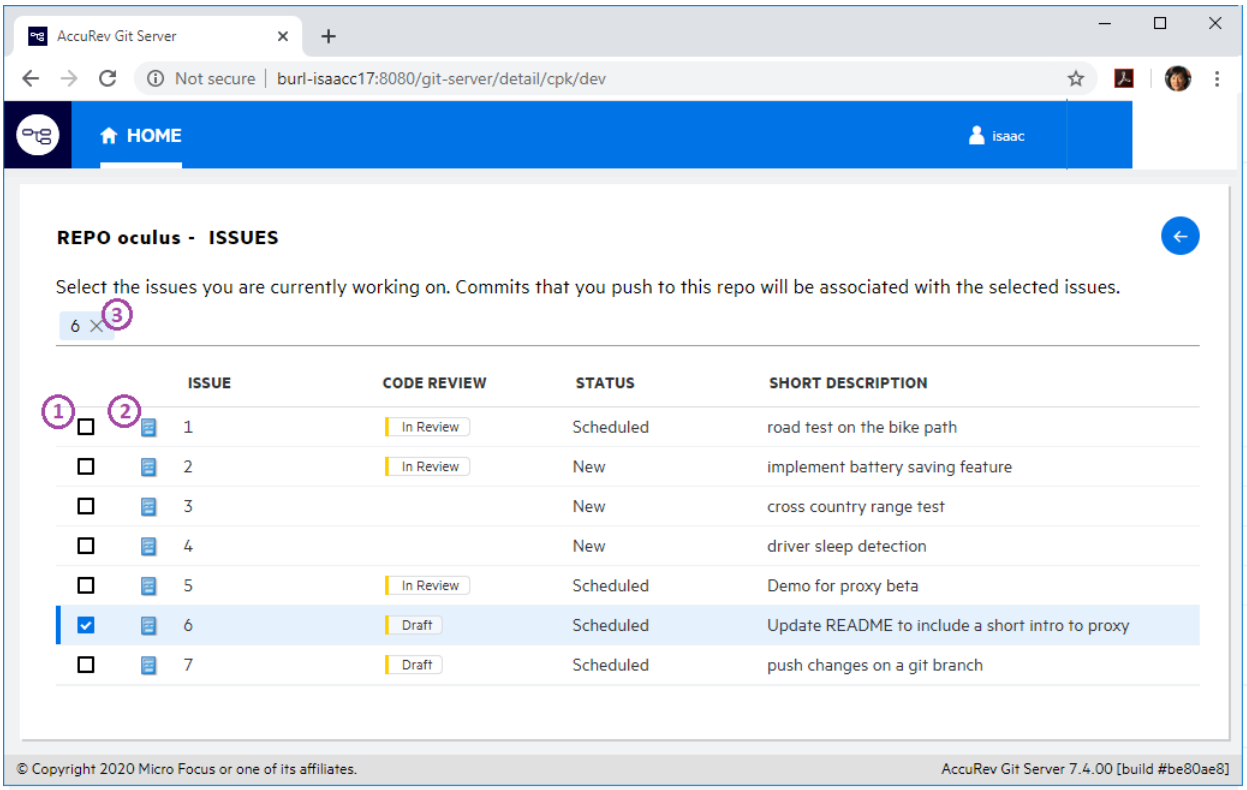
The cloned repo will then be listed on the Home page.

Issues Page

Clicking on a repo name on the Home page brings you to the Issues page, where you see issues that are, or can be, associated with commits that you push to the repo. The selected issues are used for subsequent pushes to the repo until they are de-selected on this page.

You can do the following on the Issues page:

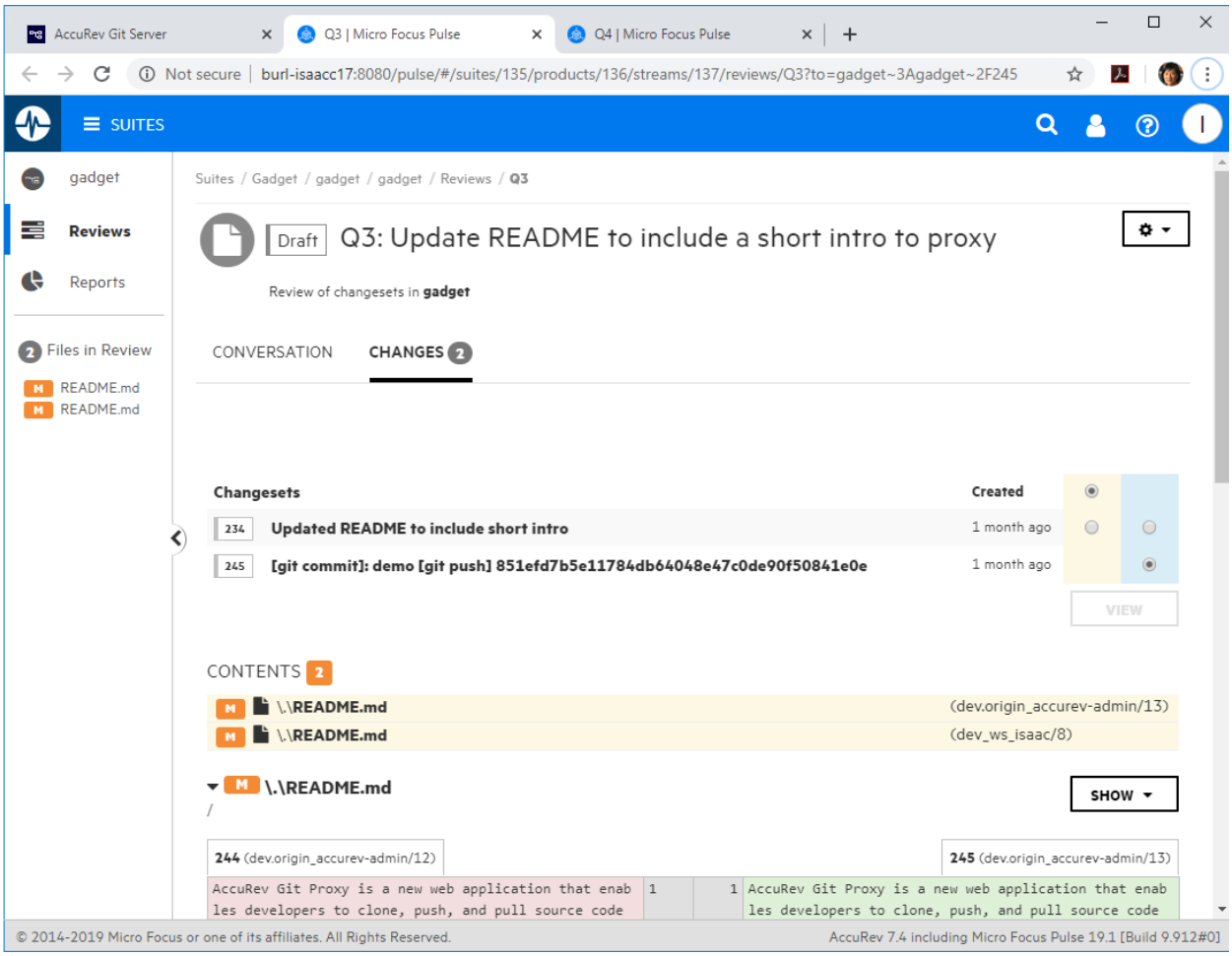
1. Click a checkbox to select or de-select an issue.
2. Click the issue icon to view the issue in the AccuRev WebUI.
3. Click the 'X' next to an issue number to remove that issue from the list of selected issues.



(***Admin Note:*** The columns in the table are configured in the Change Package Triggers part of the schema for the AccuRev stream from which the repo was created.)

Pulse Code Review Page

From the Home page, you can open a Pulse Code Review for an issue associated with your cloned repo. The files under review are listed on the left side of the page. On the right side, you can click on different tabs to see code diffs and comments from reviewers.



For more details on Pulse Code Review, see *Pulse Code Review* on page 85.

Administrators

Administration of the AccuRev Git Server is simple and fast. No changes to AccuRev triggers or security (users, ACL, EACL) are required.

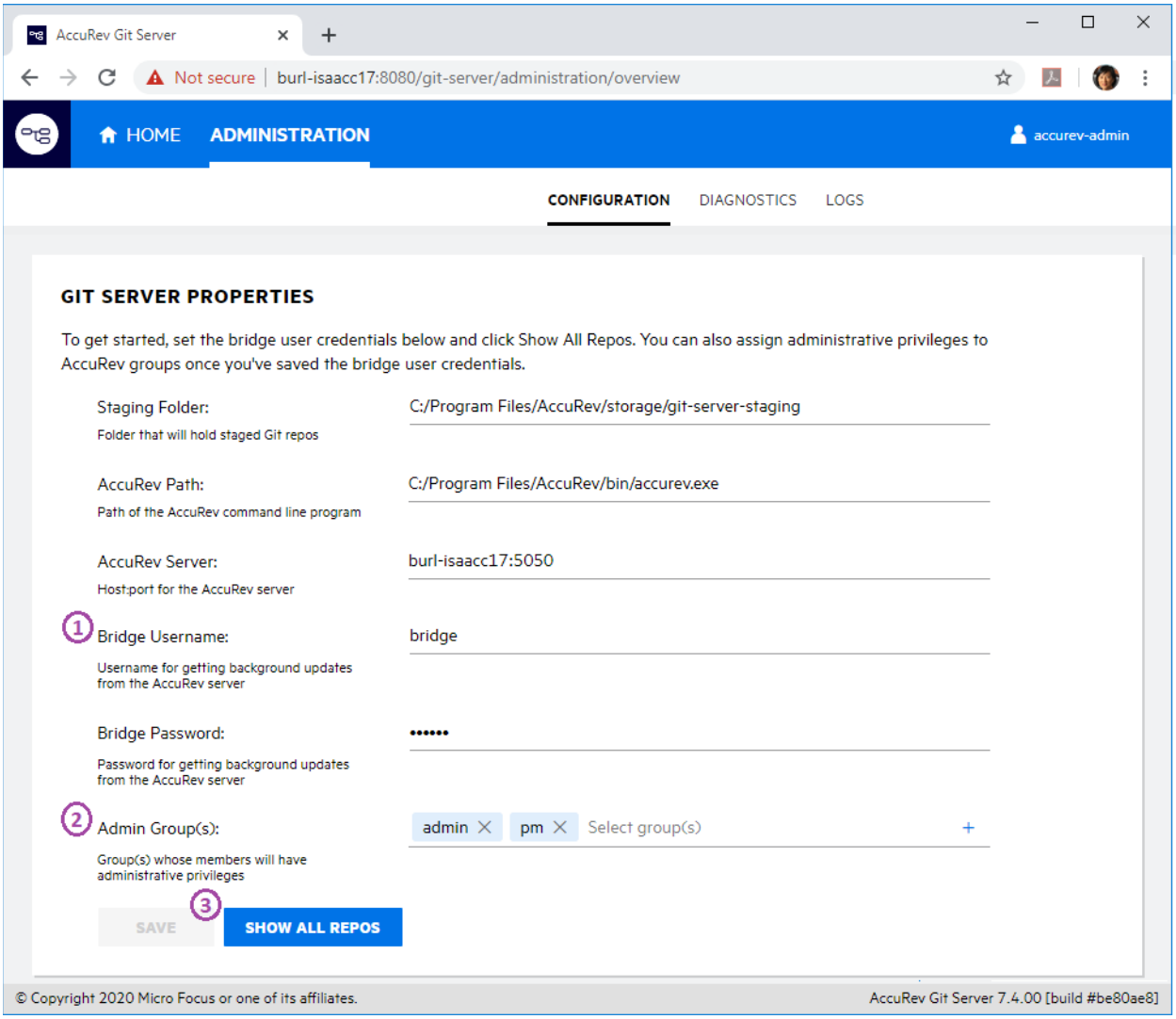
Important Notes:

- Initial configuration of the Git Server must be done by the ***accurev-admin*** user, which must first be created in AccuRev. After the initial configuration, any member of specified admin groups can create repos from streams, view ACLs, and review diagnostics and repo access logs in order to debug problems.
- Git version 2.18 or higher must be installed on the system by the normal OS means. None of the AccuRev installers installs the native Git software.

Configuration Page

The ***accurev-admin*** user must login at ***`<host>:<port>/git-server`*** and perform these tasks on the Administration Configuration page to get the Git Server ready for use by developers:

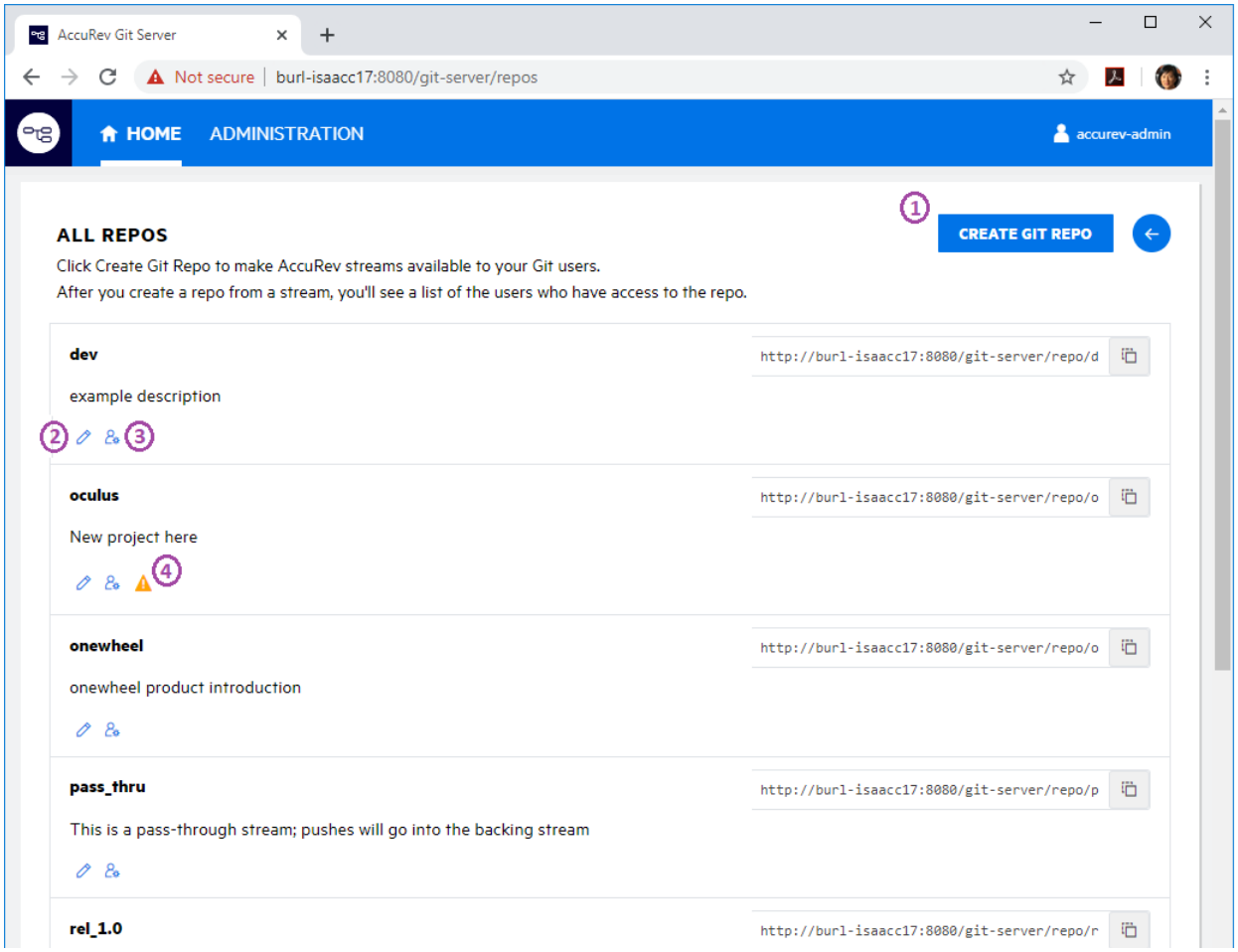
1. Set up an AccuRev user in whose name the Git Server will get background updates from the AccuRev server. This AccuRev user is known as the *bridge user*.
2. (optional) After saving the bridge user credentials, specify AccuRev groups whose members will have administrative privileges in the Git Server.
3. Click Show All Repos to create repos that developers can clone.


AccuRev Git Server
Not secure
burl-isaacc17:8080/git-server/administration/overview
HOME
ADMINISTRATION
accurev-admin
CONFIGURATION
DIAGNOSTICS
LOGS
GIT SERVER PROPERTIES
To get started, set the bridge user credentials below and click Show All Repos. You can also assign administrative privileges to AccuRev groups once you've saved the bridge user credentials.
Staging Folder:
Folder that will hold staged Git repos
C:/Program Files/AccuRev/storage/git-server-staging
AccuRev Path:
Path of the AccuRev command line program
C:/Program Files/AccuRev/bin/accurev.exe
AccuRev Server:
Host:port for the AccuRev server
burl-isaacc17:5050
1
Bridge Username:
Username for getting background updates from the AccuRev server
bridge
Bridge Password:
Password for getting background updates from the AccuRev server
2
Admin Group(s):
Group(s) whose members will have administrative privileges
admin
pm
Select group(s)
3
SAVE
SHOW ALL REPOS
© Copyright 2020 Micro Focus or one of its affiliates.
AccuRev Git Server 7.4.00 [build #be80ae8]

All Repos Page

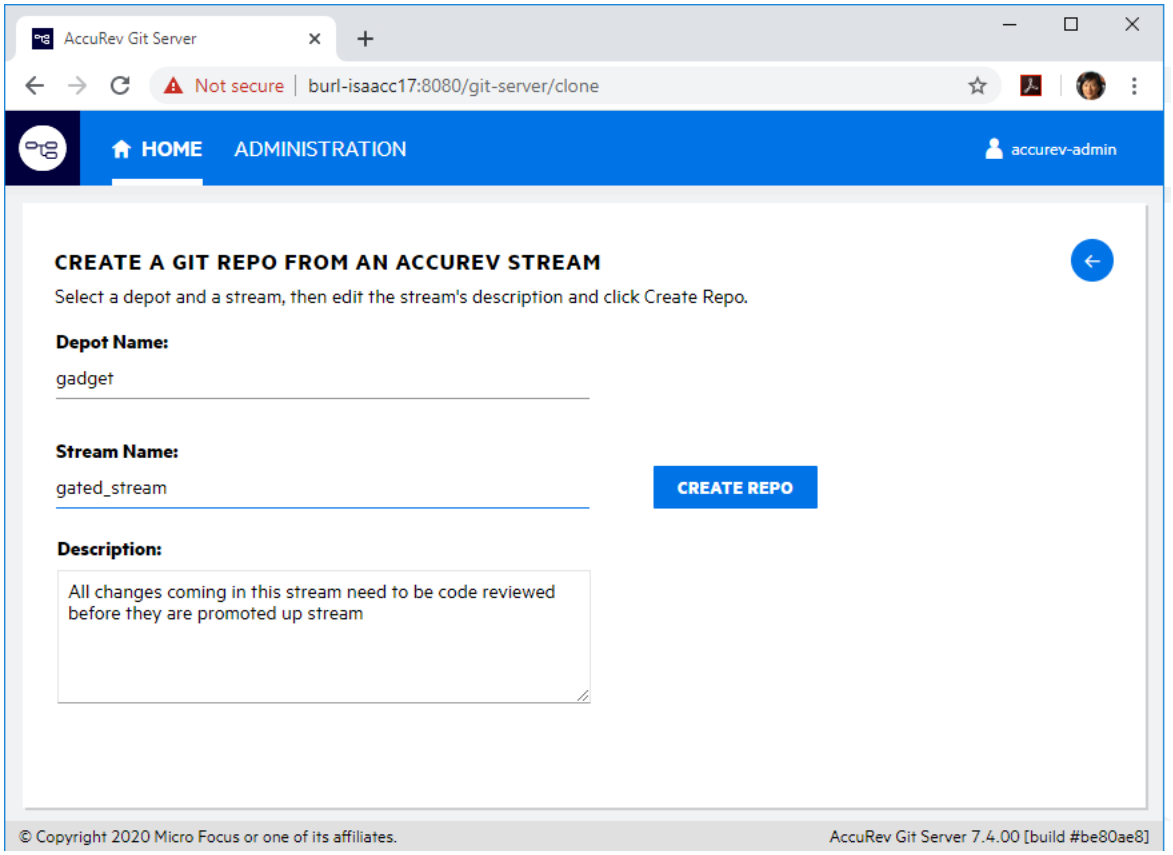
The All Repos page displays all the repos created from AccuRev streams that are ready to be cloned by Git users. On this page, an administrator can:

1. Click the Create Git Repo button to create a repo for users to clone.
2. Click the Edit Description button to modify a repo's description.
3. Click the Show ACL button to see what groups and users can access a repo.
4. Click a warning or error icon to find out about overlap in a stream or a failed push to the repo.



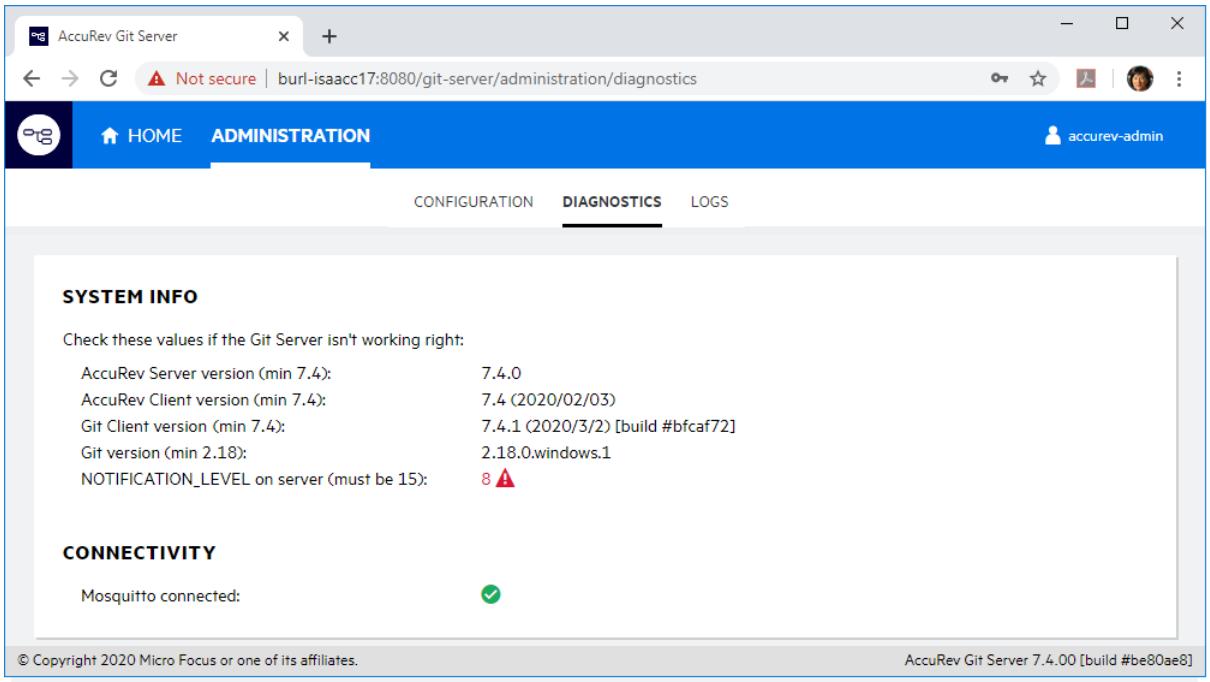
Create Git Repo Page

On the Create Git Repo page, an administrator can create a repo from an AccuRev stream in a selected depot. They can also write a description for the repo, which will help developers find the repo that they want to clone. After clicking the Create Repo button, the administrator sees a list of all the AccuRev groups and users who have access to the new repo. (Access is dictated by stream ACL settings in AccuRev.)



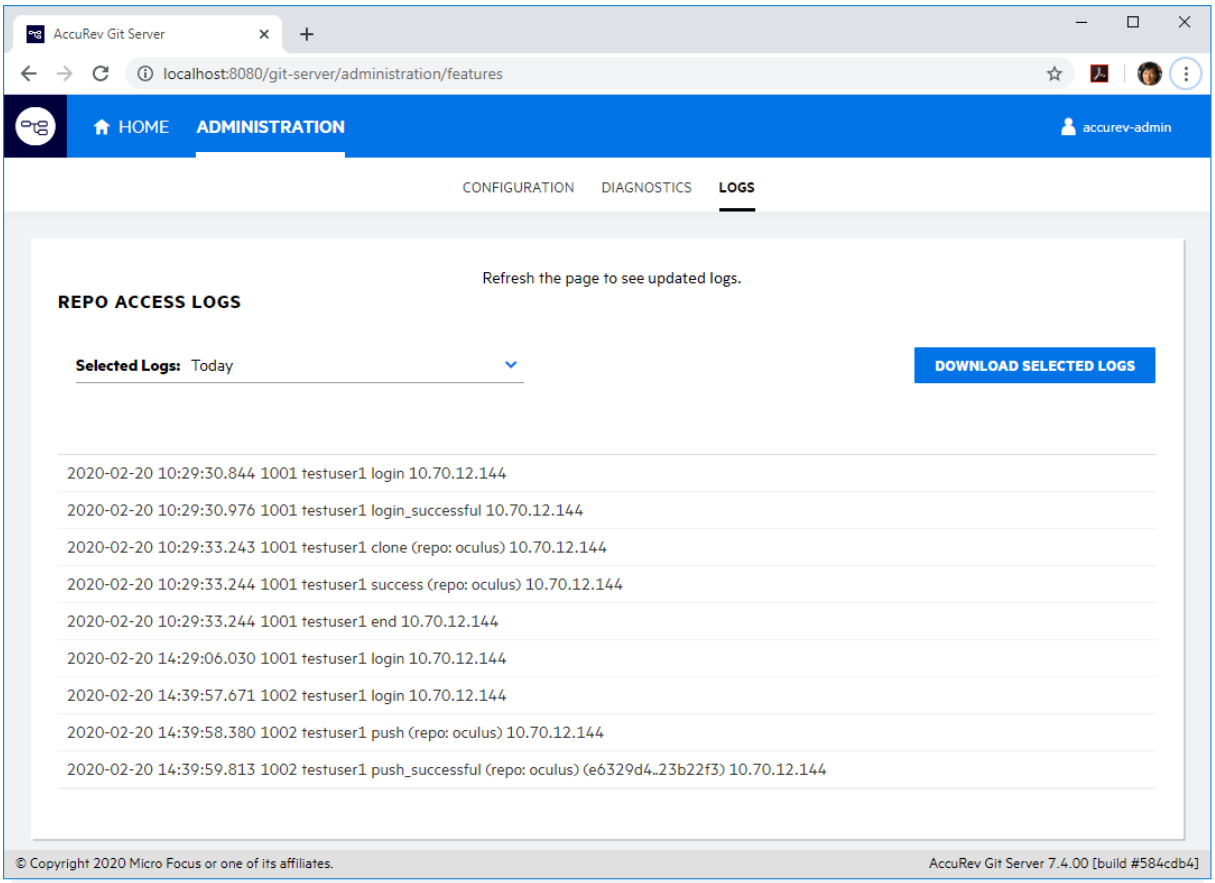
Diagnostics Page

The Administration Diagnostics page facilitates finding and fixing problems when the Git Server is not working as expected. It displays installed system software versions, along with the minimum versions required. Any value that does not meet the required minimum is flagged with a clickable error icon. The page also shows connectivity status for receiving background updates from AccuRev.



Logs Page

The Administration Logs page displays repo access logs for clone, pull, and push operations. Logs can be downloaded to the local file system.



Known Issues: Git Server

This section describes known issues in the AccuRev Git Server.

Cannot create a Git repo for a stream whose name contains spaces

In AccuRev 7.4, it is not possible to create a Git repo for a stream whose name contains spaces. This issue will be fixed in the next AccuRev release.

AccuRev Git Server is not supported on CentOS 6

The AccuRev Git Server is not supported on CentOS 6 because the underlying AccuRev Git Client requires glibc v2.14, and CentOS 6 only supports glibc v2.12. If your AccuRev server is installed on CentOS 6, you can provide support for Git users by doing a separate AccuRev *Web Server* install on a different platform and having it connect to the CentOS 6 AccuRev server.

In Chrome browser, cannot stay logged in to Git Server web interface

Due to a recent update in the Chrome browser, you might find that after you login to the Git Server, you are quickly bounced back to the Login page. To work around this Chrome issue, take the following steps:

1. Uninstall Chrome.
2. Remove the Chrome folder, e.g., C:\Program Files (x86)\Google\Chrome on Windows.
3. Download and re-install Chrome.
4. Set these two Chrome flags to Disabled, then relaunch the browser:

   `chrome://flags/#same-site-by-default-cookies`

   `chrome://flags/#cookies-without-same-site-must-be-secure`

Hosting Client-Side Triggers on the AccuRev Server

AccuRev 7.4 supports hosting of client-side triggers on the AccuRev server; the triggers are downloaded to client machines at execution time. This allows administrators to manage client-side triggers at a central location on the server. Triggers can be an executable or interpreted files (Perl, Ruby, Python, BASH, bat...).

If a client-side trigger returns with an exit code of zero (0), indicating success, the AccuRev command finishes executing. If, however, the trigger fails to execute (e.g., because a required Perl module is not on the AccuRev client machine), a message stating why the trigger failed is displayed in a dialog box. A non-zero exit code causes the AccuRev command to fail.

How to Configure Client-Side Triggers to Be Hosted on the Server

1. In the depot triggers folder on the server, create an OS platform context folder for every client platform that you want configured to use client-side triggers. There are currently six supported platforms. The staging folders representing these platforms are:
   - *`<ac-install>`*`/storage/depots/mydepot/triggers/x64_win`
   - *`<ac-install>`*`/storage/depots/mydepot/triggers/i386_nt`
   - *`<ac-install>`*`/storage/depots/mydepot/triggers/x86_64_linux`
   - *`<ac-install>`*`/storage/depots/mydepot/triggers/i386_linux`
   - *`<ac-install>`*`/storage/depots/mydepot/triggers/x86_64_solaris`
   - *`<ac-install>`*`/storage/depots/mydepot/triggers/ub_macosx` (only for 64-bit binaries)
2. Trigger Files:

   There are five types of client pre-action triggers that can be staged. The trigger file must be placed in the OS platform folder on the server that corresponds to the client platform where the trigger will run, and it must have one of the following names:
   - pre-create-trig
   - pre-keep-trig
   - pre-promote-trig
   - pre-demote-trig
   - pre-promote-change-packages-trig

   As an example, if you have a trigger that should execute on macOS clients whenever a promote occurs, you should stage that pre-promote-trig trigger on the server in *`<ac-install>`*`/storage/depots/mydepot/triggers/ub_macosx`.
3. Trigger File Extensions

   For Windows, use one of the following file extensions for the triggers:

   a) .exe

   b) .com

   c) .bat

   d) .cmd

   For all other platforms, use one of the following:

   a) .pl

b) no file extension at all

The search order for trigger file extensions is as listed above. If you stage both an .exe and a .bat trigger on Windows, the .exe trigger will be used, and the .bat trigger will not be used.

Details About Client-Side Trigger Execution

If the pre-action trigger is staged properly on the server, the staged file for the client platform is downloaded to the client the next time the trigger needs to execute. That file is stored in the workspace's top hidden `.accurev` folder. It is downloaded only if the existing file on the client is not executable or if it has been updated on the server in any way (new extension, new size, new CRC). For example, the trigger staged on the server in `C:\Program Files\accurev\storage\depots\mydepot\triggers\x64_win\pre-create-trig.bat` will be downloaded to the workspace the first time a user executes the **accurev add filename** command from a 64-bit Windows client.

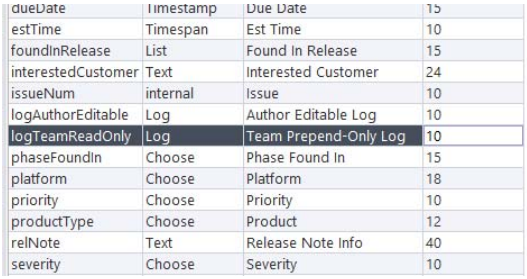
The downloaded trigger file remains in the `.accurev` folder until either:

- it is updated by a subsequent download because it's time to execute the trigger again, but the staged trigger file has been updated on the server, or
- it is deleted by the AccuRev client because it's time to execute the trigger again and the staged trigger file has been deleted on the server.

Staged trigger files override the *"accurev mktrig"* configuration. However, if no trigger is staged, the AccuRev server falls back to using the existing trigger that was configured with mktrig, if one exists.

Schema: Read-Only Log Entries in an Issue

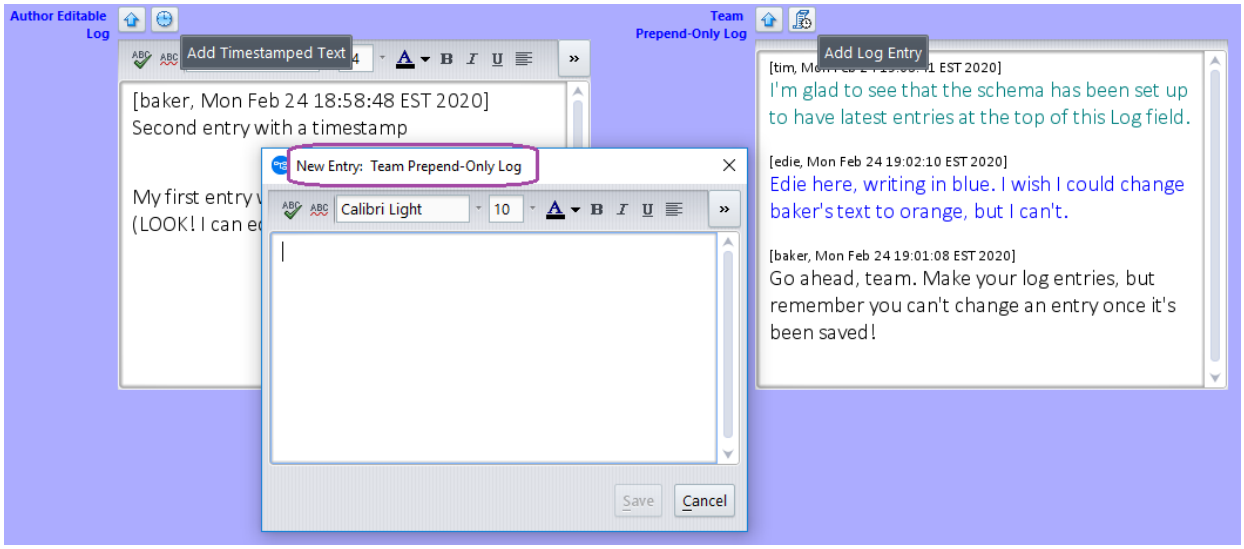
In AccuWork, Log-type schema fields can now be configured to prevent users from editing past log entries in the field. To make a Log field's old entries read-only, uncheck the **Allow Users to Edit Existing Contents of Log** checkbox for that field in AccuWork's Schema Editor.



dueDate	Timestamp	Due Date	15
estTime	Timespan	Est Time	10
foundInRelease	List	Found In Release	15
interestedCustomer	Text	Interested Customer	24
issueNum	internal	Issue	10
logAuthorEditable	Log	Author Editable Log	10
logTeamReadOnly	Log	Team Prepend-Only Log	10
phaseFoundIn	Choose	Phase Found In	15
platform	Choose	Platform	18
priority	Choose	Priority	10
productType	Choose	Product	12
relNote	Text	Release Note Info	40
severity	Choose	Severity	10

If the checkbox is unchecked, the Log field itself is read-only in AccuWork. You can click the log entry icon and type a new log entry into the modal "New Entry" dialog that is displayed. When you click the Save button in the dialog, your new entry is displayed either prepended or appended (as configured) to the existing log contents in the read-only Log field.

Up until the time you save the issue, you can click the log entry icon again to modify the log entry that you created earlier. The entry's contents and timestamp are updated when you click Save in the Edit Entry dialog. Once you save the issue, however, it is no longer possible to edit previous log entries.



When a pre-7.4 schema is edited in the 7.4 Schema Editor, existing Log fields are displayed with the checkbox *unchecked*. That is, existing Log fields will be treated as read-only logs unless the administrator manually checks the checkbox and saves the schema.

Eliminating Issue Dependencies and Variants Created By Merges

How the Merge Operation Has Evolved

Suppose you've been working on a fix for an issue and you've modified and kept multiple files in your workspace. However, before you can promote the files to your issue, your colleagues promote conflicting changes for other issues into the backing stream. Since your workspace files now have Overlap status, you must do a **merge**, combining each file's workspace version with the parent stream's version to create a new, merged version. After the merge, the changes in your workspace are a combination of your original changes for your bug fix and changes made to resolve overlap between the various issues. What issue(s) should you promote your merged files to?

Sometimes users have resorted to promoting against a brand new issue just to document the fact that they needed to resolve overlap. That action, unfortunately, creates new dependencies among the issues involved in the merge. AccuRev 7.3 helped to eliminate those unnecessary issue dependencies by enhancing the **merge** algorithm to *automatically send overlap resolution to the appropriate issues*. This algorithm, however, created new variants of the issues being merged. Sometimes it created variants of issues that were in the backing stream, causing issues that had been promoted to appear active again.

Release 7.4 includes a further enhancement to **merge** that eliminates the creation of issue variants. Whenever it is necessary to *resolve overlap in the backing hierarchy*, AccuRev performs what is called a ***rebased merge***. The changes in your workspace are merged into the changes in the parent stream, and the results of the merge are kept in a new version. AccuRev keeps track of the overlap resolution details without needing to create variants for issues in the backing stream *or* in the workspace.

Version Browser: New *Rebased Merge* Ancestry Line

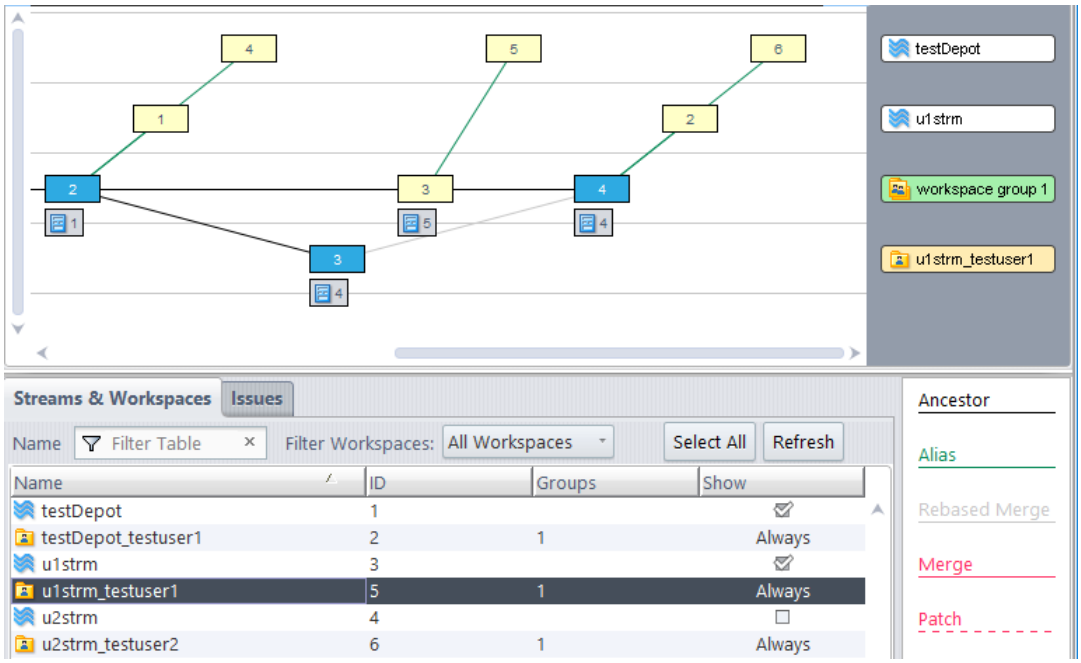
The Version Browser in the 7.4 GUI and the WebUI displays a *rebased merge* line in light gray, in contrast to a regular merge line, which is displayed in red.

A *rebased merged* version, which results from *resolving overlap in the backing hierarchy,* has:

- a black *Ancestor* line leading to the real version that was promoted into the parent stream, and
- a light gray *Rebased Merge* line leading to the workspace version that was merged into the parent stream's version.

For example, the following Version Browser screenshot shows the version tree of Package.java after this sequence of actions has occurred:

a) testuser1 edited Package.java to fix issue 4. She did a Keep of the file in her workspace, followed by Send To Issue for issue 4.
b) testuser2, working on issue 5, edited Package.java and promoted his change to issue 5. That Promote caused Package.java to have (overlap) status in testuser1's workspace.
c) testuser1 switched to Conflicts mode in the Workspace Explorer and merged testuser2's changes with her own changes. This operation was a *rebased merge* because it resolved overlap in the backing hierarchy. The rebased merge did *not* create variants of issue 4 or issue 5.
d) testuser1 promoted her fix for issue 4 up the stream hierarchy.

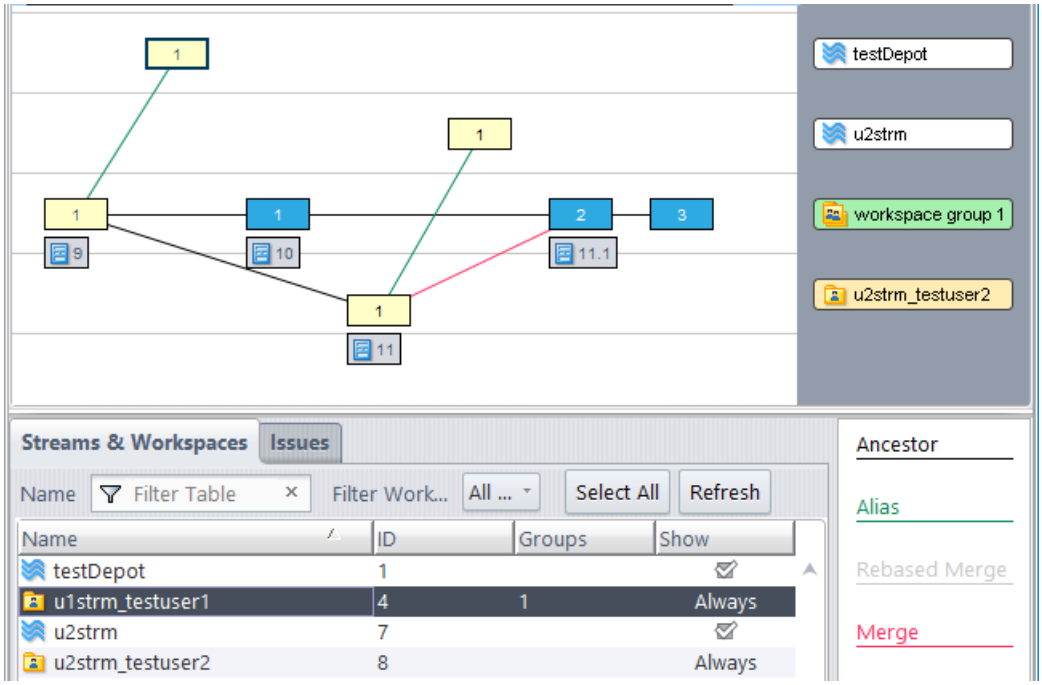


Contrast that with a *regular merged* version that results from a cross-promote in the presence of conflicting changes. That type of merged version has:

- a black *ancestor* line leading to the most recently kept version in the workspace, and
- a red *merge* line leading to the real version that was promoted into the source stream of the cross-promote; this version was merged into the workspace version.

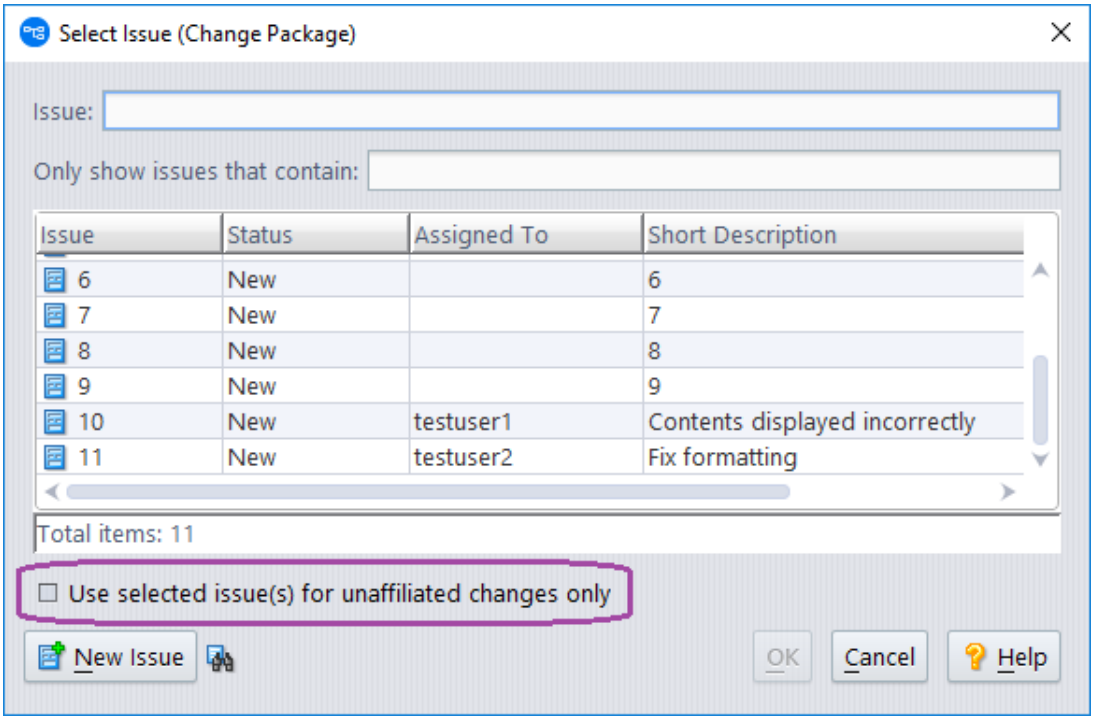
Here is an example of a regular merged version:

a) testuser1 edited Contents.java to fix issue 10. She did a Keep of the file in her workspace, followed by Send To Issue for issue 10.
b) testuser2, working on issue 11, edited Contents.java and promoted his change to issue 11. u2strm is *not* in the backing stream hierarchy of u1strm, so this Promote did not cause overlap in testuser1's workspace.
c) testuser1 cross-promoted issue 11 to her workspace to get testuser2's changes. <u>This operation was a *regular merge* because it did *not* resolve overlap in the backing hierarchy. This regular merge created variant 11.1 of issue 11.</u>
d) testuser1 made another small change to Contents.java and then did a Keep of the file again.



New Promote Option to Promote Unaffiliated Changes to an Issue

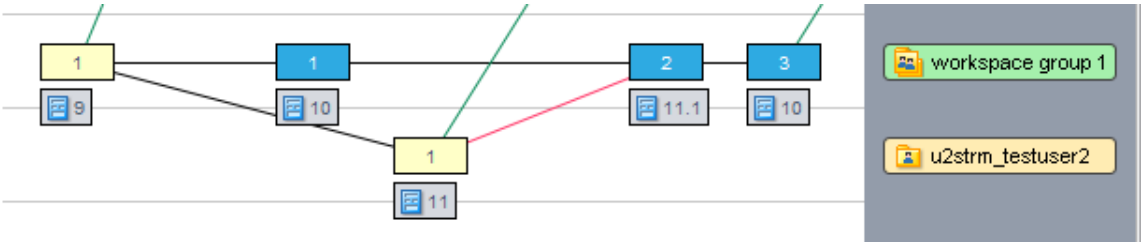
When you do a Promote in the 7.4 AccuRev GUI, you will see that the **Select Issue (Change Package)** dialog contains a new checkbox labeled "**Use selected issue(s) for unaffiliated changes only"**. If you check that checkbox, then only the versions that have not yet been assigned to an issue will be promoted to the issue(s) you select in the dialog. Using that option helps to keep issue dependencies to a minimum.



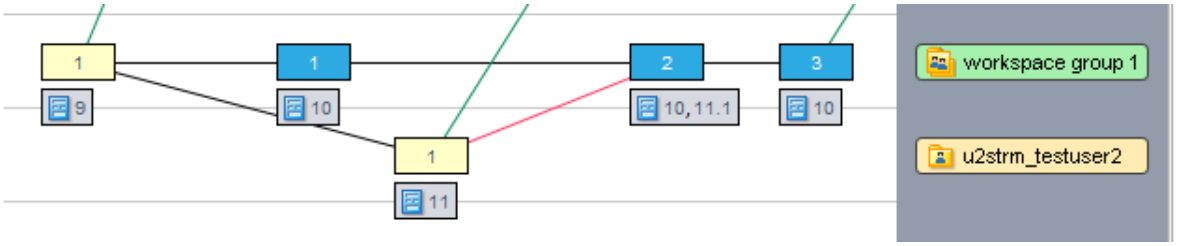
Using the checkbox allows you to send only your own workspace changes to an issue, even if you've merged other issues into your workspace.

Let's go back to our *regular merge* example from the preceding section and consider what happens when testuser1 promotes her fix for issue 10. In workspace u1strm_testuser1, version 2 was created by the cross-promote operation and was assigned to issue variant 11.1. Version 3 contains some of the changes for issue 10, but they haven't been assigned to an issue yet; therefore, version 3 contains *unaffiliated changes*. Suppose testuser1 now promotes Contents.java and selects issue 10 in the **Select Issue (Change Package)** dialog:

- If she *checks* the **Use selected issue(s) for unaffiliated changes only** checkbox and clicks OK, then the Promote operation will assign version 3 to issue 10. Issue 10 will include the fixes for issue 10, but not the merged changes from issue 11.



- If she *unchecks* the **Use selected issue(s) for unaffiliated changes only** checkbox and clicks OK, then the Promote operation will assign versions 1, 2, and 3 to issue 10. Issue 10 will include the fixes for issue 10 *and* the merged changes from issue 11.



GUI Features and Changes

Please see *Version Browser: New Rebased Merge Ancestry Line* on page 17 and *New Promote Option to Promote Unaffiliated Changes to an Issue* on page 19 for descriptions of changes in the Version Browser and in the dialog for promoting to an issue, respectively.

Stream Diff (Issues) View Displays Only Real Issue Differences

The GUI's Stream Diff (Issues) view (displayed by the **Show Diff By Issues** operation) now hides issue differences that only exist to merge or patch an issue into a new context. A variant that was created by AccuRev in order to merge/patch an issue will not be displayed as an issue difference unless more changes were added to the variant after the merge/patch. A new checkbox labeled "**Show all issue variant differences**" allows you to see those "merge/patch only" version differences in the Stream Diff (Issues) view if you really want to.

Stream Browser: New Expand/Collapse All Buttons

The Stream Browser in the AccuRev 7.4 GUI supports new **Expand All** and **Collapse All** operations on streams. Holding the Ctrl key down while expanding a stream (Ctrl-left-click on the stream's '+' button) expands that stream and all of its descendant nodes so that the entire stream hierarchy rooted at that stream is visible.

Holding the Ctrl key down while collapsing a stream (Ctrl-left-click on the stream's '-' button) collapses that stream and all of its descendant nodes. Note that if you then expand that stream by clicking '+' *without holding the Ctrl key down*, only the immediate child streams will become visible; each of them will still be collapsed.

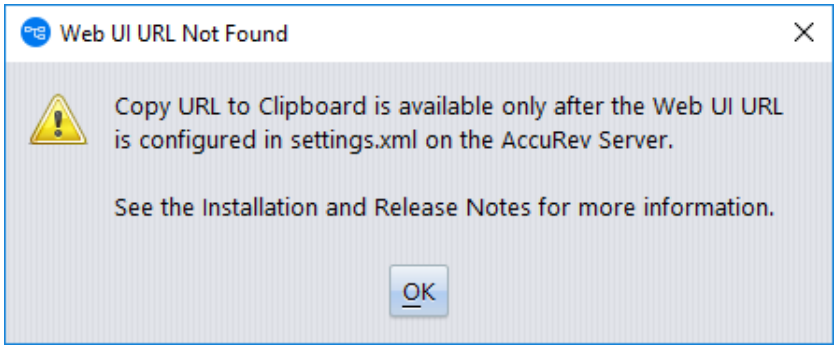
URL/HTTP Links for Files

You can now send someone a link to a file by clicking on the GUI's new **Copy URL to Clipboard** item in the file's context menu. This copies the file's URL to the system clipboard. You can then paste the URL into an email or code review request, etc. The person who clicks on the link will be prompted to login to the AccuRev WebUI; after login, the file will be displayed in whatever way the browser sees fit. The file will *not* be displayed in a tab of the WebUI.

Note: This feature requires that the webui url be configured in `<ac-install>/storage/site_slice/dispatch/config/settings.xml`, e.g.:

```
<webui url="http://server3:8080/accurev"/>
```

If it is not, you will see this popup:



GUI Log File

The GUI log file, `accurev.log`, is now written to the user's `.accurev` profile directory so that administrator privileges are not required to write to the file.

CLI Changes

AccuRev 7.4 supports new options for the **show streams** command and the include/exclude commands, and it also supports four new commands: ***isallowed, show allowed, show denied,*** and ***lsmarks***.

show -k [(]<workspace,normal,snapshot,gated,staging,passthrough>[)] streams

To limit what kinds of streams are *included* in **show streams** output, use the new *–k* option with a comma-separated list of the desired stream types, e.g., `-k normal,snapshot`. You can use spaces or tabs as separators, instead of using commas, if you surround the list of types with double quotes, e.g., `-k "normal snapshot"`. To *exclude* specific kinds of streams from the output, surround the list with parentheses, e.g., `-k (normal,snapshot)` or `–k ("normal snapshot")`.

New "*-c <comment>*" option for *clear, incl, incldo, excl* commands

With the new *–c* option, you can now write an explanatory comment when you change include/exclude rules. The AccuRev GUI also provides a dialog for entering a comment with these operations.

isallowed *-u <user> -s <stream> [-p <depot>]*

Use the new **isallowed** command to check a user's stream ACLs. The command returns 1 if the specified user is allowed to access the specified stream, and 0 otherwise.

show *-s <stream> [-p <depot>] [-fx]* allowed

The new **show allowed** command identifies the users and groups that are allowed to access the specified stream. The returned list of users and groups is fully expanded – every user that is a member of an allowed group is included in the XML output. If the *-fx* option is specified, the XML output is formatted like this:

```
<AcResponse Command="show allowed" TaskId="123">
  <Principal name="mike" id="1234"></Principal>
  <Principal name="dev" id="12" isGroup="true"></Principal>
</AcResponse>
```

show *-s <stream> [-p <depot>] [-fx]* denied

The new **show denied** command identifies the users and groups that are *not* allowed to access the specified stream. The returned list of users and groups is fully expanded – the XML output includes every user who is (a) a member of a denied group *and* (b) *not* a member of any explicitly allowed group. If the *-fx* option is specified, the XML output is formatted like this:

```
<AcResponse Command="show denied" TaskId="123">
  <Principal name="mike" id="1234"></Principal>
  <Principal name="dev" id="12" isGroup="true"></Principal>
</AcResponse>
```

XML Command Changes

Input Request Changes

The **issuediff** XML input command has a new *show_variant_diff* attribute. If this attribute is set to *"true"*, then the *issuediff* output includes differences that exist only because two versions were merged together. If it is set to *"false"* (the default), the output excludes those differences.

*Motivation for the new **show_variant_diff** attribute:*
When a merge happens, the resulting version is technically a variant of all of the issues that were merged into the basis version. If any of those issues were already in the version history, the new version is not actually adding those issues into the stream again. By default (*show_variant_diff="false"*), the AccuRev GUI does not display such variants in the **issuediff** result set. This makes it easier for a user to verify that all of the issues they wanted merged or patched into other streams are not "missing" from those streams.

The **cpkdescribe** XML input command also supports the new *show_variant_diff* attribute, but the attribute defaults to *"true"* for **cpkdescribe**.

Output Changes

In the XML output for the **hist** command, if a merged version was created by AccuRev to resolve overlap, the new *rebased* attribute is specified, i.e., '`<version rebased="yes">`'. This tells the Version Browser to display the new light grey *rebased-merge* ancestry line for overlap resolution. (See *Version Browser: New Rebased Merge Ancestry Line* on page 17.)

AccuRev Installation Notes

This chapter describes how to install and upgrade AccuRev 7.4 software at your site. In addition to installation procedures, it provides information about installation package options, considerations for upgrading, and post-installation procedures. AccuRev 7.4 is intended for new customers and for all existing customers who wish to upgrade to the latest AccuRev release.

For a high-level summary of new features in Release 7.4, see *What's New in AccuRev Release 7.4* on page 1. For a detailed list of changes, see *Changes in AccuRev Release 7.4* on page 78.

This chapter is intended for the AccuRev administrator responsible for installing and upgrading AccuRev. Users responsible for installing or upgrading their individual AccuRev client installations will probably be most interested in the material discussed in *Installing or Upgrading an AccuRev Client* on page 39.

Compatibility with Previous Versions

The general rule for compatibility between AccuRev servers and clients is that the AccuRev server must be the same version as, or newer than, the AccuRev client. Use of an AccuRev client that is newer than the AccuRev server is not supported.

The 7.4 AccuRev server is compatible with AccuRev clients from Releases 6.2.0 through 7.4.

Also, AccuRev Replicas must run the same version of AccuRev that is running on the AccuRev Server.

IMPORTANT NOTE ABOUT LICENSES: Because AccuRev 7.0 introduced a new license manager and license file format, it is necessary to obtain a new AccuRev license before upgrading from a pre-7.0 release to AccuRev 7.4. For instructions on that procedure, see *Get an AccuRev License* on page 26.

See the *AccuRev Administrator's Guide* for a full description of the license management scheme introduced in AccuRev 7.0.

System Requirements

AccuRev has the following system requirements:

Client

- Microsoft Windows 8.1 (32-bit and 64-bit)
- Microsoft Windows 10 (64-bit)
- Microsoft Windows Server 2012 R2 (64-bit)
- Microsoft Windows Server 2016 (64-bit)
- Apple macOS High Sierra 10.13 (64-bit)
- Apple macOS Mojave 10.14 (64-bit)
- Apple macOS Catalina 10.15 (64-bit)
- Linux Red Hat Enterprise 6 (32-bit and 64-bit)

- Linux Red Hat Enterprise 7 (64-bit)
- Linux Red Hat Enterprise 8 (64-bit)
- Linux SUSE 12+ (64-bit)
- Linux Fedora 30+ (64-bit)
- Linux Ubuntu 16.04 LTS, 18.04 LTS, 19.10+ (32-bit and 64-bit)
- Linux CentOS 6 (64-bit)
- Linux CentOS 7 (64-bit)
- Linux CentOS 8 (64-bit)
- Unix Solaris 10 (Intel 64-bit)
- Unix Solaris 11 (Intel 64-bit)

Server (AccuRev has supported only 64-bit servers since Release 6.2.3)

- Microsoft Windows 8.1 (64-bit)
- Microsoft Windows 10 (64-bit)
- Microsoft Windows Server 2012 R2 (64-bit)
- Microsoft Windows Server 2016 (64-bit)
- Linux Red Hat Enterprise 6 (64-bit)
- Linux Red Hat Enterprise 7 (64-bit)
- Linux Red Hat Enterprise 8 (64-bit)
- Linux SUSE 12+ (64-bit)
- Linux Fedora 30+ (64-bit)
- Linux Ubuntu 16.04 LTS, 18.04 LTS, 19.10+ (64-bit)
- Linux CentOS 6 (64-bit)
- Linux CentOS 7 (64-bit)
- Linux CentOS 8 (64-bit)

NOTE ABOUT WINDOWS SERVER 2019: AccuRev 7.4 runs on the Microsoft Windows Server 2019 platform; however, there are problems with the installer on that platform. The Windows Server 2019 installer will be fixed in the next AccuRev release. If you would like to manually update your AccuRev software to release 7.4, please contact Customer Support.

Browser Requirements

AccuRev has the following browser requirements:

- Microsoft Edge 42 and later
- Mozilla Firefox 68 and later
- Google Chrome 80 and later

- Apple Safari 12 and later

Installation Overview

Generally speaking, installing AccuRev involves downloading an installation package from the Micro Focus Web site and running it on the target machines at your site. One machine should be designated as the AccuRev Server machine -- the one that runs the AccuRev Server and Web Server processes and hosts the AccuRev data repository. Other machines can access the AccuRev Server after you install the AccuRev Client software on them.

You can also have one or more *replica servers* in your environment. AccuRev replica servers enable you to provide access to remote users spread across multiple geographic sites. Replication can also enable you to distribute the load off a single server.

Installation Packages

AccuRev provides two installation packages: the AccuRev installation package, and the AccuRev Client-only installation package.

- **The AccuRev installation package** lets you install either:
  - *The AccuRev Server and Web Server* - This is the correct choice for a new customer setting up the AccuRev infrastructure for the first time.
  - *The AccuRev Web Server only* - This is appropriate for users who wish to install the AccuRev Web UI, the AccuRev Git Server, and Pulse Code Review.

  Both installation types can be used to install AccuRev components for the first time, or to upgrade existing AccuRev components. They can be run in either graphical (GUI) or text-based (console) interactive modes.
- **The AccuRev Client-only installation package** lets you install or upgrade *just* the AccuRev Client. The client-only installation is useful if you just need to perform a simple client installation to use with an existing, up-to-date AccuRev Server. In addition to graphical (GUI) and text-based (console) interactive install modes, the Client-only installation package also supports a "silent" install mode. The "silent" install requires the presence of a *response file*, which contains a record of responses to prompts from an earlier installation. See *Using "Silent" Installations* on page 43 for more information.

  If you are installing the AccuRev Client for the first time, or if you are upgrading from a previous version of AccuRev, you must download the AccuRev Client-only installation package for your client's platform from the Micro Focus SupportLine download page.

  If you are upgrading an *existing* client from AccuRev 5.7 or higher, however, consider using the **Upgrade Client** feature. See *Installing or Upgrading an AccuRev Client* on page 39 for more information.

AccuRev and AccuRev Client-only installation packages are available on the Micro Focus SupportLine page (*http://supportline.microfocus.com/*).

The Mosquitto MQTT Message Broker

AccuRev supports Message Queue Telemetry Transport (MQTT) message broker communications. By using an MQTT message broker, the AccuRev GUI client can automatically receive messages about dynamic changes occurring in Gated Streams from the AccuRev Server.

As of AccuRev 6.2, the Mosquitto MQTT message broker is automatically installed on Windows, Linux, and Solaris platforms so that the AccuRev server can update the AccuRev client with changes from the AccuRev server. MQTT automatically starts after the install. However after a reboot, the administrator should ensure that the process has been restarted or start it manually as required.

In a Windows environment, the Mosquitto message broker runs as a new service. By default, AccuRev attempts to access port number 1883 to use this message broker. If this port number is already in use or if your firewall denies access, the Mosquitto message broker does not work and the AccuRev GUI client has to be refreshed manually.

Installation Wizards

AccuRev Installation Wizards guide you through the AccuRev installation process. The Installation Wizard can be run in either a graphical (GUI) or text-based (console) mode.

Post-installation Administrative Scripts

AccuRev installation packages provide the ability to invoke a script or executable. To configure this feature you simply set environment variable ACCUREV_POST_INSTALL to the fully-qualified path of the script or executable. The AccuRev installer will execute that script as the last step of the installation process.

Preparing for Installation

This section describes the steps to take to prepare for installing AccuRev 7.4, as summarized in the following table.

Table 1. Preparing to Install AccuRev

Step	Action	Comments
1	**Update the Operating System**	Install all applicable updates for your operating system. This will ensure successful installation of AccuRev.
2	*Get an AccuRev License*	You do not need a license to install just the AccuRev Client or the AccuRev Web Server.
3	*Determine Configurable Elements*	The installation instructions use generic names. Refer to this section to determine values appropriate for your site prior to installation.
4	*Download the Installation Packages*	If you are installing just the AccuRev Client, check with your AccuRev administrator to see if the Upgrade Client feature is available at your site.

Get an AccuRev License

In order to install AccuRev 7.4, you need an **aclicense.txt** license file. You do not need a license file to install the AccuRev Web Server or AccuRev Client.

The process for getting an **aclicense.txt** license file varies based on several factors, including your current license type and whether or not you are currently under maintenance, as summarized in the following table.

Table 2. Getting an AccuRev License

Type of Installation	Current License Type	Procedure	Comments
New	n/a	Use the License Request form at *http://supportline.microfocus.com/licensing/AccuRevLicensing.aspx* to get a license for any new AccuRev installation.	*None*

Upgrade	**accurev.lic** or **aclicense.txt**	If you are currently under maintenance, use the License Request form at *http://supportline.microfocus.com/licensing/AccuRevLicensing.aspx* to get a new AccuRev license.
		
		If you are not currently under maintenance, contact a sales representative.
			To determine whether or not you are still under maintenance:
			▪ If you have an **aclicense.txt** file:
			  ▪ If you have access to SupportLine, then you are still under maintenance.
			  ▪ If you cannot access SupportLine, this means that your maintenance has expired.
			▪ If you have an **accurev.lic** file:
			  ▪ In **accurev.lic,** check the maintenance expiration date shown in each license section as **replace options=<date>**.
			
			Note: Use the AccuRev CLI command **hostinfo** to obtain the name of the License Manager host machine (Host name), which is required by the License Request form. (*On 6.x systems*, be sure to use the "Host name(RLM)" value, which may be different from the "Host name" value.)

See the *AccuRev Administrator's Guide* for a full description of license management in AccuRev 7.4.

Determine Configurable Elements

The installation and setup process involves a number of configurable elements. For simplicity and clarity, the instructions consistently use a set of generic names, using ***<this font>***. When you see a generic name in a procedure, you must replace that name with the value that is appropriate for your site. For example, you might replace ***<ac-install>*** with `C:\Program Files\AccuRev`.

Tip: Use the **Name at Your Site** column in the following table to record the names you plan to use.

Table 3. Generic and actual names used during installation

Generic Name	Name at Your Site	Description
<installer-loc>		Location of the downloaded AccuRev installation package.

Generic Name	Name at Your Site	Description
<ac-install>		Location that AccuRev is installed to. Defaults to: ▪ (Windows) **C:\Program Files\AccuRev** (64-bit) or **C:\Program Files (x86)\AccuRev** (32-bit) ▪ (UNIX/Linux) **<*homeDirectory*>/accurev**
<ac-storage>		Location of the AccuRev database and container files. Defaults to: ▪ (Windows) **C:\Program Files\AccuRev\storage** (64-bit) ▪ (UNIX/Linux) **<*homeDirectory*>/accurev/storage**
<ac-host>		Hostname of the AccuRev Server.
<ac-port>		Port number that the AccuRev Server runs on. Defaults to **5050**.
<ac-user>		Name of the operating-system user that runs the AccuRev Server. Defaults to: **acserver**.
<ac-pass>		Password for *<ac-user>*.
<db-port>		Port number that the database server runs on. Defaults to **5075**.
<db-admin-name>		Name of the database superuser. Defaults to **postgres**. **Note**: AccuRev recommends that you retain the default value, **postgres**. If you create a different value for the database superuser, it must be lowercase.
<db-admin-pass>		Password for *<db-admin-name>*. **Note**: The database password must be lowercase.

Download the Installation Packages

On the Micro Focus supportline page (*http://supportline.microfocus.com/websync/productupdatessearch.aspx*), download the appropriate AccuRev installation package for your operating system to a local directory (referred to as *<installer-loc>* throughout this document).

Users can install AccuRev by downloading the AccuRev installation package to the client machine and manually running the installation package executable. Users can also start the installation automatically by selecting **Help** > **Upgrade Client** in the GUI or by using the `accurev upgrade_client` in the CLI, if someone (typically, the system administrator) has already downloaded the installation package to the AccuRev server, copied it to the appropriate location, and renamed it as described in *Enabling the Client Upgrade feature* on page 41.

If you download a compressed package (**.zip** or **.gz** file), first extract the files from the package before continuing. Many extraction tools are freely available and the **unzip** and **gunzip** programs are standard on many UNIX/Linux systems. The macOS operating system does not require any special software for **.zip** files -- just double-click the file to extract the install package.

What to Do Next

What to do next depends on whether you are installing or upgrading AccuRev, the AccuRev Client, or the AccuRev Web Server, as summarized in the following table.

Table 4. Next Steps in the Installation Process

If You Are Installing or Upgrading	Go To
The AccuRev Server	*Installing or Upgrading an AccuRev Server* on page 30
Just the AccuRev Client	*Installing or Upgrading an AccuRev Client* on page 39
Just the AccuRev Web Server	*Installing or Upgrading the AccuRev Web Server* on page 46

Installing or Upgrading an AccuRev Server

The procedure for installing AccuRev is largely the same whether you are installing AccuRev for the first time or you are upgrading an existing AccuRev installation. Note, however, that there are several important considerations and prerequisites for users *upgrading* to AccuRev 7.4. See *Server and Database Upgrades* on page 38 for more information on this topic.

Before You Begin

Whether you are performing a new AccuRev Server installation or upgrading an existing installation, before installing AccuRev 7.4 you should:

1. Read the *Platform Support Notes* on page 72 for your operating system before proceeding, and follow the instructions there.
2. If you are installing a new AccuRev Server on a UNIX/Linux machine, run the **adduser** command to make an OS-level user (***<ac-user>***). You should set ***<ac-install>*** as the home directory for this user. The AccuRev Server cannot be installed by root on UNIX/Linux platforms.
3. Acquire an **aclicense.txt** license file if you have not already done so. See *Get an AccuRev License* on page 26 for more information.

   Note: You *must* have an **aclicense.txt** file in order to install AccuRev 7.4.
4. If you are *upgrading* an existing AccuRev Server:
   - **IMPORTANT: Perform a full backup of your AccuRev data.** This includes backing up any replica servers. For detailed instructions, see the section titled “Backing Up the Repository” in the *AccuRev Administrator’s Guide* for your existing release. MAKE SURE TO USE THE CORRECT BACK UP PROCEDURES FOR YOUR EXISTING INSTALLATION.
   - Read through the upgrade information that applies to your current AccuRev installation in *Server and Database Upgrades* on page 38 *before* you start the installation process.
   - Plan a maintenance window for this upgrade and data migration, during which clients will not be able to connect to the server. See the instructions at *Upgrading a Replica Server* on page 38 for running a trial upgrade and estimating the time to complete the process.
5. Before starting the installation on UNIX/Linux, ensure that the LC_ALL environment variable is set to a UTF-8 locale (such as "en_US.UTF-8", NOT "en_US.latin".) Windows installations are not affected, however proceeding with a non UTF-8 locale on UNIX/Linux can lead to a failed, partially-complete installation. Use the **locale** command to determine your current locale setting, and **locale -a** to determine what locales are available. See the documentation for your operating system for details about how to install and change locale settings.

Considerations for AccuRev Replication Servers

Before deciding to install a replica server, see the "Replication of the AccuRev Repository" and "License Management" chapters in the *AccuRev Administrator’s Guide*. Before proceeding with replica server installation, contact AccuRev Support Services for more information.

Use Native Shells

AccuRev recommends using only shells that are native to/installed with the OS. Avoid using third-party shells as they do not always work as expected.

Running the AccuRev Installation Wizard

This section describes how to run the AccuRev Installation Wizard. It assumes you have already downloaded the correct installation package for your platform as described in *Download the Installation Packages* on page 28.

Overview

The AccuRev wizard guides you through steps for installing a new AccuRev Server or upgrading an existing server. If the Installation Wizard discovers that an AccuRev server already exists in the location you specify, it will prompt you through the upgrade process.

Upgrading to 7.4 from a pre-7.0 AccuRev release requires a database upgrade, independent of the installation process. The complexity of the database upgrade depends on the release from which you are upgrading. See *Server and Database Upgrades* on page 38 for more information.

If the Installation Wizard determines that you have an existing, *nonstandard* 5.x database installation (for example, if you installed your own copy of PostgreSQL, or you have multiple instances running on the same machine), the installer will not continue. Nonstandard database installations are not supported. You need to contact Micro Focus SupportLine (https://supportline.microfocus.com) to continue.

At the end of the installation, make sure that you tune your database parameters as described in *Configuring Database Tuning Parameters* on page 63. You must reboot the database for the tuning parameters to take effect.

Before You Begin

Before running the AccuRev Installation Wizard:

1. **Log in** -- Log in to the machine on which you will be installing AccuRev. Log in as ***<ac-user>*** (UNIX/Linux) or a user with installation privileges (Windows). (See *Before You Begin* on page 30 to learn about creating ***<ac-user>*** on UNIX/Linux machines.)

   Note: For security reasons, you CANNOT install the AccuRev server on UNIX/Linux if you are logged in as **root**.

2. **Stop the AccuRev Server and AccuRev DB Server** -- If you are upgrading an existing AccuRev Server, you must stop the AccuRev Server and the AccuRev DB Server before you can install the current version. See *Starting and Stopping AccuRev Servers* on page 70 if you need help with this step.

   Tip: Stopping the AccuRev DB Server also stops the AccuRev Server.

3. **Stop the AccuRev Tomcat Server and the Mosquitto MQTT Message Broker** -- If you are upgrading an existing AccuRev Server, you must stop the AccuRev Tomcat Server and the Mosquitto MQTT Message Broker.

4. **IMPORTANT: Verify that the Tomcat process has stopped** -- The Tomcat process sometimes continues even when the Tomcat service has been stopped. Manually terminate the process if necessary.

How to Run the AccuRev Installation Wizard

This section describes how to install AccuRev using the AccuRev Installation Wizard.

Note: The specific prompts that you see and the order in which you see them can vary depending on your particular installation and the options that you select. Not all users will see all the prompts described in the following procedure, which focuses on the graphical version of the Installation Wizard but provides information about console mode in [*brackets*].

To run the AccuRev Installation Wizard:

1. **Start the Installation Wizard** -- Start the AccuRev Installation Wizard you downloaded from the Micro Focus web site by double-clicking the installer icon, or by entering the installer name on the command line as summarized in the following table. Note that the installation program can be run with a graphical user interface (GUI) or as a console (text-only) application.

Table 5. Starting the AccuRev Installation Wizard

Platform	Installation Mode	Run This Procedure
Windows	GUI	**accurev-n.n.n-windows.exe** where *_n_n_n* is the AccuRev version number **accurev--windows.exe**, for example
	Console (text-based)	**accurev-*n.n.n*-windows.exe -i console** where *_n_n_n* is the AccuRev version number **accurev--windows.exe -i console**, for example
UNIX/Linux	GUI	**sh accurev-n.n.n-platform.bin** where: ▪ *-n.n.n* is the AccuRev version number ▪ *platform* is the UNIX/Linux platform name **sh accurev--linux-x86.bin**, for example
	Console (text-based)	**sh accurev-*n.n.n-platform*.bin - i console** where: ▪ *-n.n.n* is the AccuRev version number ▪ *platform* is the UNIX/Linux platform name **sh accurev--linux-x86.bin - i console**, for example

Tip: If you are installing AccuRev from the console you can type:

- "**back**" to return to the previous prompt in the installation program
- "**quit**" to exit the installation program

2. **License Agreement** -- Before you can proceed, you must click “I accept the terms of the License Agreement.” and then click **Next** to continue. *[Console: You can type "**y**" to agree, "**n**" to refuse, or press **Enter** to page through the license agreement.]*

3. **Confirm Administrator Privileges** -- If the installer prompts you for this information:

   - Windows: Specify whether or not the current user has Administrator privileges on the current machine. Note that Windows requires that you have Administrator privileges.
   - UNIX/Linux: Specify whether the current user is **root**. Note that for security reasons, you CANNOT install the AccuRev server on UNIX/Linux if you are logged in as **root**.

4. **Choose Install Folder** -- Specify a different directory if you do not want to use the ***<ac-install>*** defaults: ***<homeDirectory>***`/accurev` on UNIX/Linux, `C:\Program Files\AccuRev` on Windows. See *Determine Configurable Elements* on page 27 if you are not familiar with the values represented by ***<ac-install>*** and ***<homeDirectory>***.

   - If you are installing software for the first time, and do not wish to use the default location, specify a location where you have write permission.
   - If you are upgrading and the existing installation is not at the default location, specify your existing AccuRev installation directory.

Click **Next** to accept the default and continue. *[Console: Press **Enter** to accept the default and continue.]*

5. **Choose Installation Type** *(for new installs only)* -- Select one of the following:

   - **AccuRev Server and Web Server** -- Installs the AccuRev Server, the AccuRev Web Server, and a local AccuRev Client. Note that the AccuRev Web Server includes an Apache Tomcat web server. *[Console: Press **Enter** to install the AccuRev Server and Web Server.]*
   - **Web Server only** -- Installs only the AccuRev Web Server and AccuRev Client. If you choose this installation option, click **Next** and go to *Installing or Upgrading the AccuRev Web Server* on page 46 to complete the installation. *[Console: Type "**2**" and press **Enter** to install the Web Server only.]*

6. **Install Replication** *(for new installs only)* [*Console: "Choose Replication Type"*] -- Choose **No replication** *[Console: type "**1**" for None]* unless you have already determined (along with AccuRev Support Services) that your site will be implementing one or more replica servers. If you have any questions about AccuRev replication servers, refer to *Considerations for AccuRev Replication Servers* on page 30 before continuing.

   If you know for a fact that your site is implementing replica servers, select either:

   - "**Yes, this is the master**" for the site that will be sending elements out to the replica [*Console: type "**2**" for Master*.]
   - "**Yes, this is the replica**" for the site (typically remote) that will be connecting to a master server to receive files *[Console: type "**3**" for Replica*.]

   Proceed through the remainder of the installation program. When prompted for replication options, confirm your choice of master server or replica server as appropriate.

   To upgrade an existing replica server, see *Upgrading a Replica Server* on page 38.

   Note: Installing the replica software is only part of the process. Before you can use a newly-installed replica server, you need to configure both it and the master server. Configuration and licensing information about replica servers is located in the "Replication of the AccuRev Repository" and "License Management" chapters in the *AccuRev Administrator's Guide*.

7. **Choose a Folder for AccuRev Server Data Storage** *(for new installs only)* -- If you do not want to use the ***`<ac-storage>`*** default (`<homeDirectory>/accurev/storage` on UNIX/Linux, `C:\Program Files\AccuRev\storage` on Windows), specify a different directory in the **Please Choose a Folder** field. AccuRev creates the folder you specify if it does not already exist.

   Note: Ensure that the path you specify is LOCAL disk storage (not a network drive) and that it has plenty of space.

   Click **Next** to continue. *[Console: Press **Enter** to accept the default and continue.]*

8. **Choose a Folder for AccuRev Server Database** *(not displayed for 7.x.x-to- upgrades)* -- If you do not want to use the default (`<homeDirectory>/accurev/postgresql/9.5` on UNIX/Linux, `C:\Program Files\AccuRev\postgresql\9.5` on Windows), specify a different directory in the **Please Choose a Folder** field. AccuRev creates the folder you specify if it does not already exist.

   Note: Ensure that the path you specify is LOCAL disk storage (not a network drive) and that it has plenty of space.

   Click **Next** to continue. *[Console: Press **Enter** to accept the default and continue.]*

9. **Configure Database Port and User** *(not displayed for 7.x.x-to- upgrades)* -- Enter the values for the **Database Port** (`<db-port>`) and **Superuser Name** (`<db-admin-name>`) fields. *[Console: Prompts for these values individually.]*

   Unless the default database port "5075" conflicts with something else on your machine, you should not change the value in the **Database Port** field. Likewise, AccuRev recommends that you keep the default value "postgres" for the **Superuser Name** unless you have a specific reason to change it.

   Note: If you create a different value for the database superuser, it must be lowercase.

10. **Configure Database Password** *(not displayed for 7.x.x-to- upgrades)* [*Console: "Set Database Superuser Password"*.] -- In the **Superuser Password** field, enter the value for `<db-admin-pass>` that you chose in *Table 3* on page 27. Enter it again in the **Confirm Superuser Password** field. Make sure that you record this password in a secure location for later use.

    Note: The database password must be lowercase.

11. **Specify License Source** *(not displayed for replica server installations)* -- Select one of the following:

    - **Local License File** -- This means that license information should be obtained from a local license file. *[Console: type "**1**" for Local License File.]*
    - **Remote License Server** -- This means that a different AccuRev master server will serve AccuRev licenses to this AccuRev server. *[Console: type "**2**" for Remote License Server.]*

12. **Specify AccuRev License Location** *(only if "Local License File" was specified as the license source)* -- Specify the full path of your local **aclicense.txt** license file. If the Installation Wizard detects an existing aclicense.txt file where you have chosen to install AccuRev, it initialized the field to that location. *[Console: Press **Enter** to accept the default and continue.]*

    For more information about licensing, see the "License Management" chapter in the *AccuRev Administrator's Guide*.

13. **Configure Remote License Server** (*only if "Remote License Server" was specified as the license source)* -- Enter values for the following:

    - **Host** -- The host name of the AccuRev master license server (which will serve licenses to this AccuRev server)
    - **Port** -- The port that the master license server will listen on (typically port 5050)
    - **Username** -- The username associated with the Remote License User account on the master license server
    - **Password** -- The password for the Remote License User account on the master license server

14. **Upgrade install detected** *(for upgrade installs only)* -- For an upgrade install, the Installation Wizard collects all the remaining information that it needs from the existing installation. Click **Next** and go to the Pre-Installation Summary (*Step 17* below). *[Console: Press **Enter** to go to the Pre-Installation Summary.]*

15. **Configure: Set Host and Port** *(for new installs only) [Console: Choose Hostname and Port number]* -- Review the default values for the **Host** and **Port** fields for the AccuRev Server. You should accept the default values chosen by the Installation Wizard unless you have a good reason to change them. *[Console: Review the host name value, then press **Enter** to continue; then review the port value and press **Enter** to continue.]*

    Click **Next** to continue.

16. **Adjust System PATH Variable** *(for new installs only)* -- Responding **Yes** enables the AccuRev Installation Wizard to modify the PATH environment variable on your system so that you do not need to specify a full path on the command line when using AccuRev commands. Click **Install** to continue. *[Console: Type "**y**" and press **Enter** to continue.]*

    Note: You might need to reboot after installation before changes to the PATH environment variable take effect.

17. **Pre-Installation Summary** -- At this point, the Installation Wizard displays all the installation parameters garnered from user input or a previous installation. Click **Install** to continue; otherwise, click **Previous** to change a value. *[Console: Press **Enter** to continue; otherwise, type "**back**" and then press **Enter** to change a value.]*

18. **Installing AccuRev** -- The Installation Wizard displays a splash screen *[Console: displays "Installing" with a progress bar]* while it installs the software on your local machine. It displays a Please Wait message while it performs configuration tasks.

19. **Database Tuning** -- The Installation Wizard reminds you that you can use database tuning parameters to improve performance. See *Configuring Database Tuning Parameters* on page 63 for more information. Click **Next** to continue. *[Console: Press **Enter** to continue.]*

20. **Reminder** *(for 7.x.x-to- upgrades only)* -- If you are upgrading from an earlier 7.x release to 7.4, the Installation Wizard reminds you to run **maintain dbupgrade** to migrate to the database version that is installed with AccuRev 7.4. Click **Next** to continue. *[Console: Press **Enter** to continue.]*

21. **Configure: Start AccuRev Server** *(for new installs only)* -- In a new installation, the Installation Wizard prompts you to start the AccuRev Server. Accept the default value (**Yes**) unless you want to start it later. Click **Next** to continue.

    Note: See *Starting and Stopping AccuRev Servers* on page 70 if you choose to start the AccuRev Server at a later time.

22. **Install Complete** -- The Installation Wizard displays a message when the installation is complete. To exit, click **Done**. *[Console: Press **Enter**.]*

23. **Postgresql Upgrade Required** *(for upgrade installs from a pre-7.0 version)* -- If you are upgrading from AccuRev 5.7 or 6.x, the Installation Wizard reminds you to run **maintain migratepg** to migrate to the new database version.

    To exit, click **Done**. *[Console: Press **Enter**.]*

What to Do Next

After the 7.4 full installer completes, you should reboot the machine to make sure that the PATH is updated correctly.

Note to Linux administrators: Please see the additional `/etc/init.d` files in ***<ac-install>***`/extras/unix`, which can be used to automatically start AccuRev, Mosquitto, and Tomcat upon reboot. See the `README` file in the directory for details.

What to do next depends on whether you performed a new installation or an upgrade, as summarized in the following table:

Table 6. Upgrading to AccuRev

Installation Type	Next Steps	For More Information
New	If you chose not to start the AccuRev Server as part of the installation process, you must start it before you can use AccuRev.	See *Starting and Stopping AccuRev Servers* on page 70
Upgrade	After upgrading to AccuRev 7.4, you need to: ▪ Run a command to migrate your database to the current version installed with AccuRev: ▪ **maintain migratepg**, if you are upgrading from a pre-7.0 version of AccuRev ▪ **maintain dbupgrade**, if you are upgrading from an earlier 7.x version ▪ Start the AccuRev Server	Go to: ▪ *Upgrading a Server from a 5.7 or 6.x Version* on page 38 ▪ *Using the 'maintain dbupgrade' Command* on page 65 ▪ *Starting and Stopping AccuRev Servers* on page 70

Considerations for the AccuRev Git Server

To ensure that the AccuRev Git Server functions properly, take these additional steps:

1. Check the setting of **NOTIFICATION_LEVEL** in `<ac-install>/bin/acserver.cnf`. If the line is not commented out and the value is not 15, change the value to 15 and restart the AccuRev Server so it picks up the new value.
2. Ensure that `<ac-install>/bin` is on the PATH for the account that the AccuRev Tomcat service runs on.
3. If you have SSL enabled on your AccuRev Server, login to the Git Server machine using the account that the Tomcat service runs on and execute: **accurev enable_ssl -H <host>:<port>**

Tomcat Customization and AccuRev Upgrades

The AccuRev Web UI uses the Tomcat web server. The following table shows what Tomcat version is installed with what AccuRev version:

AccuRev Version	Tomcat Version
7.4	8.5.51
7.2 through 7.3	8.5.29
7.1	8.0.47
7.0.1	8.0.43
7.0	8.0.33
6.1 through 6.2.3	7
Pre-6.1	6

If you customized the Tomcat web server (e.g., by modifying the **server.xml** file) for an earlier release of AccuRev and are now upgrading to AccuRev 7.4, you must migrate your Tomcat changes to the Tomcat 8.5.51 version that is installed with AccuRev 7.4.

To help you with this process, the upgrade install moves your previous Tomcat installation from the **<*AccuRev_install*>\WebUI\tomcat** directory to **<*AccuRev_install*>\WebUI\tomcat.old**. You can examine your old customizations in **tomcat.old** and make comparable changes in the **tomcat** directory.

If you have not customized Tomcat at all, you can safely remove the **tomcat.old** directory after the upgrade install has completed.

Server and Database Upgrades

This section contains instructions for upgrading AccuRev databases from previous releases to 7.4. Note that if you have existing replica servers, you must also follow the instructions in *Upgrading a Replica Server* on page 38. AccuRev strongly recommends that you first perform a trial upgrade of your production data on a separate test machine to determine if you will encounter any issues, and to estimate how long the upgrade is likely to take so that you will know how long your servers will be unavailable to your users.

AccuRev 7.4 supports upgrades from existing 5.7 and later installations. In order to upgrade from a pre-5.7 version, you must first perform an upgrade installation to 5.7 or a 6.x version. (We recommend the latest pre-7.0 version, which is 6.2.3.) Refer to the release notes associated with that release for more detailed information on upgrading from prior versions.

Upgrading a Server from a 5.7 or 6.x Version

The upgrade process from an AccuRev version 5.7 or 6.x includes a PostgreSQL update. To do this update, you must manually run the **maintain migratepg *<db_admin>*** command after the installer completes:

1. Make sure that you have performed the log in and back up steps described in *Before You Begin* on page 30 and *Running the AccuRev Installation Wizard* on page 31.
2. After the upgrade installation completes, PostgreSQL 9.5 should be running. The AccuRev server will not be running and cannot be started until the migration completes successfully.
3. Run the **maintain migratepg *<db_admin>*** command and be sure to specify the same database password (***<db-admin-pass>***) that is used by your existing database. On Windows, this will require opening the CMD window using the "Run as administrator" menu item.
4. Confirm the PostgreSQL 8.4 database location. Typically this is ***<ac-storage>***`/db/`.
5. Confirm the location of the pg_dump backup file. This defaults to ***<ac-storage>***`/site_slice/backup/`. The backup file will be roughly equivalent in size to your database, so be sure that you have enough free disk space in the selected location.
6. The migratepg process will then perform the following steps:
   - Start PostgreSQL 8.4 server.
   - Backup the 8.4 metadata.
   - Stop the PostgreSQL 8.4 server.
   - Start PostgreSQL 9.5 if it is not already running.
   - Restore the 8.4 metadata into 9.5.
   - Upgrade the database schema if needed.
   - Move the PostgreSQL 8.4 binaries to ***<ac-install>***`/postgresql/8.4/`.
   - Move the ***<ac-storage>***`/db/` directory to ***<ac-install>***`/postgresql/8.4/db/`. (If unable to move, the db directory will be renamed.)

Upgrading a Replica Server

Use these instructions to upgrade an existing AccuRev replica server:

1. Perform a full backup and ensure that you have enough disk space as discussed above in *Before You Begin* on page 30.

   If your site uses AccuWork: For every replicated depot that has AccuWork issues, copy the entire `<ac-storage>/depots/<depotName>/dispatch` directory from the master server to each replica server. *Tip*: Run "`accurev show slices`" to see the exact locations of your depots.

2. Proceed with the installation as if the replica server were a master server. See *Upgrading a Server from a 5.7 or 6.x Version* on page 38.

3. After the upgraded replica server has started, execute the following command against the replica server:

   accurev replica sync

Installing or Upgrading an AccuRev Client

This section describes the methods available to install and upgrade AccuRev Client software. Throughout this section, any instructions or comments about the UNIX/Linux platform apply to Linux, Solaris, and macOS platforms.

Note: In release 7.4, the AccuRev Git Client is no longer supported on macOS platforms, and it is deprecated on Windows and Linux client platforms. In the release following 7.4, the AccuRev client installers will no longer install the AccuRev Git Client.

Installation Methods

There are two methods for installing or upgrading the AccuRev Client:

- An *interactive* AccuRev Client-only installation requires the user to run an Installation Wizard and provide information during the installation process. There are two possible ways to accomplish this:
  - If you download the Client-only installation package to the client machine and run the installation executable manually, you can run the installation package with a graphical user interface (GUI) or as a console (text-only) application. See *Using the AccuRev Client-only Installation Package* on page 40 for more information.
  - If you are upgrading an AccuRev version 5.7 (or later) client, and someone (typically, the system administrator) has already downloaded the installation package to the AccuRev server, copied it to the appropriate location, and renamed it as described in *Enabling the Client Upgrade feature* on page 41, then you can automatically start the installation by selecting the **Help -> Upgrade Client** option in the AccuRev GUI or by using the `accurev upgrade_client` in the CLI.
- A *"silent"* AccuRev Client installation is typically used by the AccuRev administrator to automate the client installation or upgrade process in a distributed or networked environment. "Silent" installations are run from the command line and do not require any interaction by the end-user. See *Using "Silent" Installations* on page 43 for more information.

  Tip: Ask your AccuRev administrator if the "silent" client installation method has been implemented at your site.

Before You Begin

Regardless of which installation method you use, review the following steps before installing or upgrading the AccuRev Client:

1. Read the *Platform Support Notes* on page 72 for your operating system before proceeding, and follow the instructions there.
2. (*macOS users only*) If you are installing the AccuRev Client on macOS, make sure the Gatekeeper feature is set to allow applications to be downloaded from **Anywhere**. To access this setting from the Apple menu, go to **System Preferences…** > **Security & Privacy** > **General** tab.

   If the **Anywhere** option is not available, the following workaround is required:

   - Open a Terminal with appropriate privileges (**sudo bash** to make you root on most systems).
   - Enter the following command (specify the appropriate path to the AccuRev installer): **xattr -cr AccuRevClientInstall.app**

Tip: The AccuRev Client displays a notification message if it requires upgrading. This can happen when the AccuRev Server has been upgraded but the AccuRev Client has not. The notification message gives the user the option of downloading the AccuRev Client-only installation package directly from the AccuRev Server.

Uninstalling Existing AccuRev Clients

If you are upgrading an AccuRev client, you do not need to uninstall any existing software. The AccuRev Installation Wizard lets you preserve your development data and configuration files, and installs the upgrade in the same place as your existing version.

Using Native Shells

AccuRev recommends using only shells that are native to/installed with the OS.

Using the AccuRev Client-only Installation Package

The AccuRev Client-only installation package lets you install a new AccuRev Client or upgrade an existing installation.

Downloading the Client-only Installation Package

If you have not already done so, take the following steps to download AccuRev client-only installation packages:

1. Navigate to Product Updates on the Micro Focus Support Line page:

   http://supportline.microfocus.com/
2. Select a search mechanism, then click **Find Updates**.
3. Check the license agreement, and then expand the **Product** and **Version** tabs to locate the appropriate AccuRev release.
4. Locate the client-only installation packages you require and click the download button.
5. Depending on the installation package you have chosen, the downloaded file is a

   - **.exe** file for Windows,
   - **.bin** file for UNIX/Linux, or
   - **.zip** file for macOS.

   Save this file to the appropriate location, which depends on your preferred method of installation:

- If you are a user planning to install AccuRev on your client machine manually, save the file to your client machine.
- If you are an administrator who intends to make the file available to your users so that they can get the file, copy it to their client machines, and run it manually, then save the file to some location and inform your users where they can get the file to install it themselves.
- If you are an administrator and you want to enable the **Client Upgrade** feature for users who have an existing installation of AccuRev 5.7 or later, then save the file to the appropriate location on the AccuRev server and rename the file as described in the following section, *Enabling the Client Upgrade feature*.

Enabling the Client Upgrade feature

If you are an administrator and you want to enable the **Client Upgrade** feature, take the following steps:

1. Download the client as described in *Downloading the Client-only Installation Package*.
2. When prompted, rename the file you just downloaded according to the operating system

   Table 7. Operating System and Names

Operating System	File Name
Windows	**AccuRevClientInstall.exe**
UNIX/Linux	**AccuRevClientInstall.bin**
macOS	**AccuRevClientInstall.zip**

   and copy it to the appropriate appropriate directory under <ac-install>/bin/installers. For example, if you downloaded **accurev--windows-clientonly.exe** on a Windows machine, then save it to **c:\Program Files\AccuRev\bin\installers\Windows\AccuRevClientInstall.exe**.

   Important : Client-only install packages must be named as mentioned in table *Operating System and Names* or they will not be recognized by the client upgrade feature.

   The client-only installation package is now available for AccuRev users, who can automatically upgrade their AccuRev client by selecting **Help** > **Upgrade Client** in the GUI or by using the `accurev upgrade_client` in the CLI.

Running the Client-only Installation Package

To run the AccuRev Client-only installation package, take the following steps:

1. Start the installation:
   - If you are running the installation manually on your client, proceed to step 2.
   - If the Client Upgrade feature has been enabled as described in the previous section, *Enabling the Client Upgrade feature*, start the installation by selecting **Help** > **Upgrade Client** in the GUI or by using the `accurev upgrade_client` in the CLI.

2. If you are manually installing AccuRev on your client machine, start the AccuRev Client Installation Wizard using the applicable procedure:

Table 8. Starting the AccuRev Client Installation Wizard

Platform	Installation Mode	Run This Procedure
Windows	GUI	**accurev-*n.n.n*-windowsclientonly.exe** where *-n.n.n* is the AccuRev version number **accurev--windowsclientonly.exe**, for example
	Console (text-based)	**accurev-*n.n.n*-windowsclientonly.exe -i console** where *-n.n.n* is the AccuRev version number **accurev--windowsclientonly.exe -i console**, for example
UNIX/Linux	GUI	**sh accurev-*n.n.n-platform*.bin** where: ▪ *-n.n.n* is the AccuRev version number ▪ *platform* is the UNIX/Linux platform name **sh accurev--linuxclientonly-x86.bin**, for example
	Console (text-based)	**sh accurev-*n.n.n-platform*.bin - i console** where: ▪ *-n.n.n* is the AccuRev version number ▪ *platform* is the UNIX/Linux platform name **sh accurev--linuxclientonly-x86.bin** **- i console**, for example
macOS	GUI	Double-click the accurev-n.n.n-macosx-clientonly.zip to extract the AccuRevClientInstall install package where: ▪ *-n.n.n* is the AccuRev version number. Double-click AccuRevClientInstall install package to launch the installer.
	Console (text-based)	Double-click the accurev-n.n.n-macosx-clientonly.zip to extract the AccuRevClientInstall install package where: ▪ *-n.n.n* is the AccuRev version number. On the command line, run: **AccuRevClientInstall.app/Contents/MacOS/AccuRevClientInstall**

Tip: If you are installing the AccuRev Client from the console you can type:

- "**back**" to return to the previous prompt in the installation program
- "**quit**" to exit the installation program

Shutdown Existing AccuRev Apps -- When you start the AccuRev Client Installation Wizard, it first reminds you to shut down any existing AccuRev applications. Click **Next** to continue. *[Console: Press **Enter** to continue.]*

3. **License Agreement** -- Before you can proceed, you must click "I accept the terms of the License Agreement." and then click **Next** to continue. *[Console: You can type "**y**" to agree, "**n**" to refuse, or press **Enter** to page through the license agreement.]*

4. **Choose Install Folder** -- Specify a different directory if you do not want to use the ***<ac-install>*** defaults: ***<homeDirectory>***`/AccuRevClient` on UNIX/Linux, `C:\Program Files\AccuRevClient` on 64-bit Windows, `C:\Program Files (x86)\AccuRevClient` on 32-bit Windows. (See *Determine Configurable Elements* on page 27 if you are not familiar with the values represented by ***<ac-install>*** and ***<homeDirectory>***.)

- If you are installing software for the first time and do not wish to use the default location, specify a location where you have write permission.
- If you are upgrading and the existing installation is not at the default location, specify your existing AccuRev installation directory.

Click **Next** to accept the default and continue. *[Console: Press **Enter** to accept the default and continue.]*

5. **Configure: Set Host and Port** *[Console: Choose What Server to Connect To]* -- Specify the values for the **Host** and **Port** fields for the AccuRev Server to which this client will connect. You should accept the default value for the server port chosen by the Installation Wizard unless you have a good reason to change it. Click **Next** to continue. *[Console: Prompts for these values individually. Type a value for the host name and press **Enter** to continue. Review the value for the port number and press **Enter** again to continue.]*
6. **Adjust System PATH Variable** -- Responding **Yes** enables the AccuRev Client Installation Wizard to modify the PATH environment variable on your system so that you do not need to specify a full path on the command line when using AccuRev commands. Click **Next** to continue. *[Console: Enter "**y**" and press **Enter** to continue.]*

   Note: You might need to reboot after installation before changes to the PATH environment variable take effect.
7. **Pre-Installation Summary** -- At this point, the Installation Wizard displays a summary of the choices you have made regarding your installation. Click **Install** to continue; otherwise, click **Previous** to change a value. *[Console: Press **Enter** to continue; otherwise, type "**back**" and then press **Enter** to change a value.]*
8. **Installing AccuRevClient** -- The Installation Wizard displays a splash screen *[Console: displays "Installing..." and a progress bar]* while it installs the software on your local machine. It displays a Please Wait message while it performs configuration tasks.
9. **Installation Complete** -- The Installation Wizard displays a message when the installation is complete. Click **Next** to exit the program. *[Console: Press **Enter** to exit the program.]*

   Note: If you are using the GUI installation wizard, when the installation is complete you are given the opportunity to start the AccuRev user interface. To start the AccuRev user interface, accept the default value of **Yes** and click **Done**. Otherwise, select **No** and click **Done**.

Using "Silent" Installations

So-called "silent" installations allow the AccuRev software to be installed or upgraded in an automated fashion, without requiring any interaction or input by the user on whose machine the AccuRev is being installed. "Silent" installations are particularly useful when AccuRev Client installations or upgrades can be performed by a centralized software distribution mechanism. "Silent" client installations provide a highly efficient mechanism for large AccuRev deployments to keep pace with current versions of AccuRev.

Note: The "silent" upgrade is not supported for macOS clients.

Overview

A "silent" installation starts by running the installer from the command line. For client installs, the installation package can be pushed to each client machine. Then, AccuRev is installed manually on a single

machine using a command line option to create a *response file*. The response file records choices made during installation of AccuRev, including:

- Installation directory
- The host (or IP address) and port number associated with the AccuRev Server
- Whether or not "***<ac-install>***/bin" should be added to the user's path. See *Determine Configurable Elements* on page 27 if you are not familiar with the value represented by ***<ac-install>***.

The response file resulting from the manual installation can then be used as input by the "silent" installer to automate the installation process. Note that if you have AccuRev on multiple platforms (Windows and Linux, for example), you must perform one manual installation on each of them to create platform-specific response files.

Sample Response File. An example response file for a Windows client installation is shown here:

```
# Wed Aug 01 17:50:06 EDT 2012
# Replay feature output
# ---------------------
# This file was built by the Replay feature of InstallAnywhere.
# It contains variables that were set by Panels, Consoles or Custom Code.

#Choose Install Folder
#---------------------
USER_INSTALL_DIR=C:\\Program Files\\myAccuRev

#Configure: Set Host and Port
#----------------------------
HOST_NAME_INPUT=localhost
HOST_PORT_INPUT=5050

#Adjust System PATH Variable
#---------------------------
ADD_TO_PATH_INPUT_RESULTS=\"Yes\",\"\"
ADD_TO_PATH_INPUT_RESULTS_1=Yes
ADD_TO_PATH_INPUT_RESULTS_2=
ADD_TO_PATH_INPUT_RESULTS_BOOLEAN_1=1
ADD_TO_PATH_INPUT_RESULTS_BOOLEAN_2=0

#Install
#-------
-fileOverwrite_C\:\\Program\ Files\\myAccuRev\\bin\\UninstallerData\\Uninstall\
AccuRev.lax=Yes
-fileOverwrite_C\:\\Program\
Files\\myAccuRev\\bin\\UninstallerData\\resource\\iawin32.dll=Yes
```

```
-fileOverwrite_C\:\\Program\
Files\\myAccuRev\\bin\\UninstallerData\\resource\\win64_32_x64.exe=Yes

-fileOverwrite_C\:\\Program\
Files\\myAccuRev\\bin\\UninstallerData\\resource\\remove.exe=Yes

-fileOverwrite_C\:\\Program\ Files\\myAccuRev\\bin\\vcredist_x86_2010.exe=Yes

-fileOverwrite_C\:\\Program\ Files\\myAccuRev\\bin\\vcredist_x64_2010.exe=Yes

-fileOverwrite_C\:\\Program\ Files\\myAccuRev\\bin\\acgui.lax=Yes

-fileOverwrite_C\:\\Program\ Files\\myAccuRev\\bin\\acdiffgui.lax=Yes

-fileOverwrite_C\:\\Program\ Files\\myAccuRev\\bin\\acclient.cnf=Yes

-fileOverwrite_C\:\\Program\ Files\\myAccuRev\\LICENSE.TXT=Yes


#Start AccuRev User Interface

#----------------------------

START_UI_INPUT_RESULTS=\"\",\"No\"

START_UI_INPUT_RESULTS_1=

START_UI_INPUT_RESULTS_2=No

START_UI_INPUT_RESULTS_BOOLEAN_1=0

START_UI_INPUT_RESULTS_BOOLEAN_2=1
```

Creating the Response File

To create the response file, run the AccuRev installer from the command line. Use the **-r** <*filename*> option to specify the full path of the response file. Note that if you have AccuRev on multiple platforms (Windows and Linux, for example), you must run the installation procedure on one machine on each platform in order to create platform-specific response files.

Windows client install example

```
<installer_loc>\accurev--windowsclientonly.exe –r c:\tmp\ac_win_install.out
```

UNIX/Linux full install example

```
<installer_loc>/accurev--linux-x86-x64.bin –r /tmp/ac_linux_install.out
```

Running a "Silent" Installation

Once you have created the response file for a given platform, you can use it to perform automated "silent" installations on other clients for that platform. To run a "silent" installation, invoke the AccuRev Client-only installation package from the command line. Use the **-i silent** option to specify the installation type, and the **-f** <*filename*> option to specify the full path of the response file to use as input.

Windows client install example

```
<installer_loc>\accurev--windowsclientonly.exe -i silent
–f c:\tmp\ac_win_install.out
```

UNIX/Linux full install example

```
<installer_loc>/accurev--linux-x86-x64.bin -i silent
–f /tmp/ac_linux_install.out
```

Installing or Upgrading the AccuRev Web Server

This section provides background information and procedures for installing or upgrading the AccuRev Web Server as a standalone installation using the AccuRev Installation Wizard.

This section is intended for the AccuRev administrator. If you are an end user and want to use the Web UI *client*, you simply need to open a supported Web browser and point it to an existing Web Server using URL information provided to you by your administrator.

Note: If you have already installed AccuRev as described in *Step 5* of *Running the AccuRev Installation Wizard* on page 31, the AccuRev Web Server is already installed. Go to *What to Do Next* on page 48.

Before You Begin

Before running the AccuRev Installation Wizard:

1. **Log in** -- Log in to the machine on which you will be installing the AccuRev Web Server. Log in as ***<ac-user>*** (UNIX/Linux) or a user with installation privileges (Windows). (See *Before You Begin* on page 30 to learn about creating ***<ac-user>*** on UNIX/Linux machines.)

   Note: For security reasons, you CANNOT install the AccuRev server on UNIX/Linux if you are logged in as **root**.

2. **Stop the AccuRev Tomcat Server** -- If you are upgrading an existing AccuRev Web Server, you must stop the AccuRev Tomcat Server.

3. **IMPORTANT: Verify that the Tomcat process has stopped** -- The Tomcat process sometimes continues even when the Tomcat service has been stopped. Manually terminate the process if necessary.

How to Run the AccuRev Web Server Installation Wizard

This section describes how to install the AccuRev Web Server using the AccuRev Installation Wizard. If you are running the Installation Wizard in console mode, instructions are displayed in italicized brackets, *[Like this.]*

To run the AccuRev Installation Wizard:

1. **Start the Installation Wizard** -- Start the AccuRev Installation Wizard you downloaded from the Micro Focus SupportLine web site by double-clicking the installer icon, or by entering the installer name on the command line as summarized in the following table. Note that the installation program can be run with a graphical user interface (GUI) or as a console (text-only) application.:

Table 9. Starting the AccuRev Installation Wizard

Platform	Installation Mode	Run This Procedure
Windows	GUI	**accurev-*n.n.n*-windows.exe** where -*n.n.n* is the AccuRev version number **accurev--windows.exe**, for example
	Console (text-based)	**accurev-*n.n.n*-windows.exe -i console** where -*n.n.n* is the AccuRev version number **accurev--windows.exe -i console**, for example

Table 9. Starting the AccuRev Installation Wizard

Platform	Installation Mode	Run This Procedure
UNIX/Linux	GUI	**sh accurev-*n.n.n-platform*.bin** where: ▪ *-n.n.n* is the AccuRev version number ▪ *platform* is the UNIX/Linux platform name **sh accurev--linux-x86**, for example
	Console (text-based)	**sh accurev-*n.n.n-platform*.bin - i console** where: ▪ *-n.n.n* is the AccuRev version number ▪ *platform* is the UNIX/Linux platform name **sh accurev--Linux_x86 - i console**, for example

Tip: If you are installing AccuRev from the console you can type:

- "**back**" to return to the previous prompt in the installation program
- "**quit**" to exit the installation program

2. **License Agreement** -- Before you can proceed, you must click "I accept the terms of the License Agreement." and then click **Next** to continue. *[Console: You can type "**y**" to agree, "**n**" to refuse, or press **Enter** to page through the license agreement.]*

3. **Choose Install Folder** -- Specify a different directory if you do not want to use the ***<ac-install>*** defaults: ***<homeDirectory>***`/accurev` on UNIX/Linux, `C:\Program Files\AccuRev` on Windows. (See *Determine Configurable Elements* on page 27 if you are not familiar with the values represented by ***<ac-install>*** and ***<homeDirectory>***.)

   - If you are installing software for the first time, and do not wish to use the default location, specify a location where you have write permission.
   - If you are upgrading and the existing installation is not at the default location, specify your existing AccuRev installation directory.

   Click **Next** to accept the default and continue. *[Console: Press **Enter** to accept the default and continue.]*

4. **Upgrade install detected** *(for upgrade installs only)* -- For an upgrade install, the Installation Wizard collects all the remaining information that it needs from the existing installation. Click **Next** and go to the Pre-Installation Summary (Step 9 below). *[Console: Press **Enter** to go to the Pre-Installation Summary.]*

5. **Choose Installation Type** -- Select **Web Server only** and then click **Next** to continue. *[Console: Type "**2**" and press **Enter** to continue.]*

6. **Configure: Set Host and Port** -- In the **Host** and **Port** fields, set values for the AccuRev Server that the Web UI will use and click **Next** to continue. *[Console: Prompts for these values individually. Type a value and press **Enter** to continue.]*

7. **Configure Database Host and Port** -- In the **Host** and **Port** fields, set values for the AccuRev database server that Pulse Code Review will access and click **Next** to continue. *[Console: Prompts for these values individually. Type a value and press **Enter** to continue.]*

8. **Adjust System PATH Variable** -- Responding **Yes** enables the AccuRev Installation Wizard to modify the PATH environment variable on your system so that you do not need to specify a full path on

the command line when using AccuRev commands. Click **Next** to continue. *[Console: Type "**y**" and press **Enter** to continue.]*

Note: You may need to logout and login again after installation in order for changes to the PATH environment variable to take effect.

9. **Pre-Installation Summary** -- At this point, the Installation Wizard displays all the installation parameters garnered from user input or a previous installation. Click **Install** to continue; otherwise, click **Previous** to change a value. *[Console: Press **Enter** to continue; otherwise, type "**back**" and then press **Enter** to change a value.]*
10. **Installing AccuRev** -- The Installation Wizard displays a splash screen *[Console: displays "Installing" with a progress bar]* while it installs the software on your local machine. It displays a Please Wait message while it performs configuration tasks.
11. **Install Complete** -- The Installation Wizard displays a message when the installation is complete. Click **Done** to exit. *[Console: Press **Enter** to exit.]*

What to Do Next

After the 7.4 web server installer completes, you should reboot the machine to make sure that the PATH is updated correctly.

Note to Linux administrators: Please see the additional `/etc/init.d` files in ***<ac-install>***`/extras/unix`, which can be used to automatically start AccuRev, Mosquitto, and Tomcat upon reboot. See the `README` file in the directory for details.

The following table summarizes tasks you should consider performing after installing the AccuRev Web Server. See also *Tomcat Customization and AccuRev Upgrades*.

Table 10. After Installing the AccuRev Web Server

Task	Comments
Start the Web Server.	The installation process automatically starts the Web Server. If you have manually stopped it, you need to start the Web Server again to make the AccuRev Web UI, Git Server, and Pulse Code Review available to your users. See *Starting, Stopping, and Testing the AccuRev Web Server* on page 49 for more information.
Test the Web UI	Before informing your users that the AccuRev Web UI is available, perform a simple test to make sure that it is working as you expect. See *Testing the AccuRev Web UI* on page 49.
Configure the Web Server to make it accessible by IDE plug-ins for AccuRev.	AccuRev has plug-ins for numerous IDEs like Eclipse and Visual Studio. To be able to access the AccuRev Web UI in these IDEs, you need to create a `settings.xml` configuration file on the AccuRev Web Server. Refer to the installation and release notes for specific AccuRev integrations (Eclipse and Visual Studio plug-ins, for example) for additional information specific to your third-party IDE.
Review advanced configuration settings.	You can use a configuration file to change the default session timeout, provide access to multiple AccuRev Servers, and more. These and other advance topics are described in the *AccuRev Web Interface Administrator's Guide*. See *Post-Installation Information* on page 50.

Considerations for the AccuRev Git Server

To ensure that the AccuRev Git Server functions properly, take these additional steps:

1. Ensure that `<ac-install>/bin` is on the PATH for the account that the AccuRev Tomcat service runs on.
2. If you have SSL enabled on your AccuRev Server, login to the Git Server machine using the account that the Tomcat service runs on and execute: **accurev enable_ssl -H <host>:<port>**

Tomcat Customization and AccuRev Upgrades

The AccuRev Web UI uses the Tomcat web server. The following table shows what Tomcat version is installed with what AccuRev version:

AccuRev Version	Tomcat Version
7.4	8.5.51
7.2 through 7.3	8.5.29
7.1	8.0.47
7.0.1	8.0.43
7.0	8.0.33
6.1 through 6.2.3	7
Pre-6.1	6

If you customized the Tomcat web server (e.g., by modifying the **server.xml** file) for an earlier release of AccuRev and are now upgrading to AccuRev 7.4, you must migrate your Tomcat changes to the Tomcat 8.5.51 version that is installed with AccuRev 7.4.

To help you with this process, the upgrade install moves your previous Tomcat installation from the **<*AccuRev_install*>\WebUI\tomcat** directory to **<*AccuRev_install*>\WebUI\tomcat.old**. You can examine your old customizations in **tomcat.old** and make comparable changes in the **tomcat** directory.

If you have not customized Tomcat at all, you can safely remove the **tomcat.old** directory after the upgrade install has completed.

Starting, Stopping, and Testing the AccuRev Web Server

Linux shell (**.sh**) and Windows batch (**.bat**) scripts are provided for stopping and starting the Tomcat web server for the AccuRev Web UI:

```
<ac-install>/WebUI/tomcat/bin/[ startup | shutdown ].[ sh | bat ]
```

Testing the AccuRev Web UI

To test the AccuRev Web UI, open a browser and enter the following URL:

```
http://<webui-host>:8080/accurev
```

If this does not display an AccuRev login window, try restarting the AccuRev Web UI Tomcat server. (See *Starting, Stopping, and Testing the AccuRev Web Server* above.) If the Web UI appears as expected, you can make this URL available to users to whom you want to provide access to the AccuRev Web UI.

Also, if you want to make the Web UI accessible through your users' AccuRev GUI, you should ensure that the AccuRev installation is included in their PATH setting. If they try to open the Web UI from the AccuRev GUI (using the **View** > **Open in Web** choice on the AccuRev GUI menu, for example) and the

Web UI login screen appears but does not display a valid server to connect to, the PATH is probably not set correctly.

Post-Installation Information

See the *AccuRev Web Interface Administrator's Guide* for post-installation configuration information.

If you want to run Pulse on the web server, see *Setting up Pulse to Run on a Standalone AccuRev Web Server* on page 62.

Configuring AccuRev with Pulse Code Review

In order for AccuRev users to perform code reviews in Pulse, configuration must first be done in both AccuRev and Pulse.

AccuRev Configuration

Check settings.xml

Ensure that the settings configured in file ***<ac-install>***`/storage/site_slice/dispatch/config/settings.xml` include a Pulse URL and ID. (Both settings are installed by default with AccuRev 7.4.)

```
<settings>
  <webui url="http://myserver:8080/accurev"/>
  <pulse url="http://myserver:8080/pulse"
         id="b9c4cb28-ff59-41a6-9b42-d81bf3a1bed5"/>
</settings>
```

Note: The ID can be any 128-bit globally unique identifier (GUID or UUID).

Install User Schema

Install a user schema to support email and display name:

1. Create a file `userSchema.xml` with the following contents:

```
<?xml version="1.0" encoding="utf-8"?>
<properties>
  <property kind="config" propertyName="userSchema">
    <fields>
      <field name="Display Name"/>
      <field name="Email Address"/>
    </fields>
  </property>
</properties>
```

2. Install the userSchema with the following command:

```
# accurev setproperty -c -r userSchema -l userSchema.xml
```

3. Start (or restart) the AccuRev GUI and open the list of users (located under **Admin | Security**). Edit all the users and ensure that each has a Display Name and Email Address:

Note: If you use field names other than "Display Name" and "Email Address", please update the following values to match in *<ac-install>*/`pulse/conf/startup.properties`:

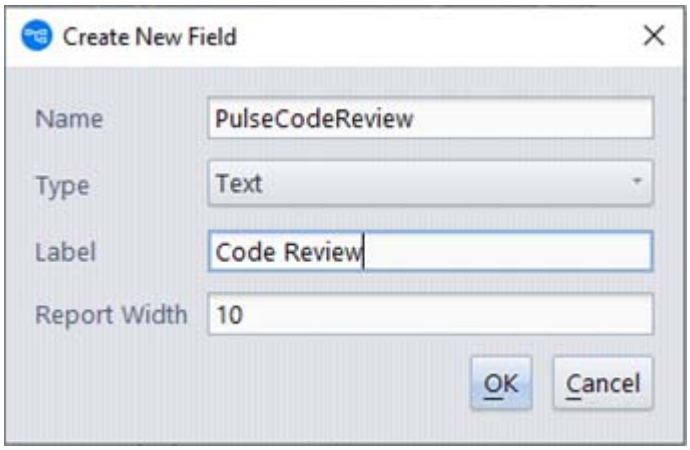
```
accurev.displayname.propname=Display Name
accurev.emailaddress.propname=Email Address
```

These values default to "Display Name" and "Email Address".

Create "PulseCodeReview" Schema Field

Use AccuRev's Schema Editor to create a PulseCodeReview schema field:

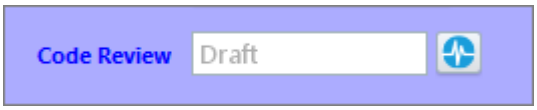
1. For any depot that you want to configure for Pulse Code Reviews, use the Schema Editor to add a field called "PulseCodeReview" to the depot's schema:



   The field must be named "PulseCodeReview", and it must be of type "Text". The display name can be anything that is appropriate.

2. In the Schema Editor's **Layout** tab, add the PulseCodeReview field to the issue layout. Then **Save** the schema.

In AccuRev's issue form, the PulseCodeReview field will display the code review status (if available) of the current issue, and it will have a button link that takes the user directly to the review in Pulse.

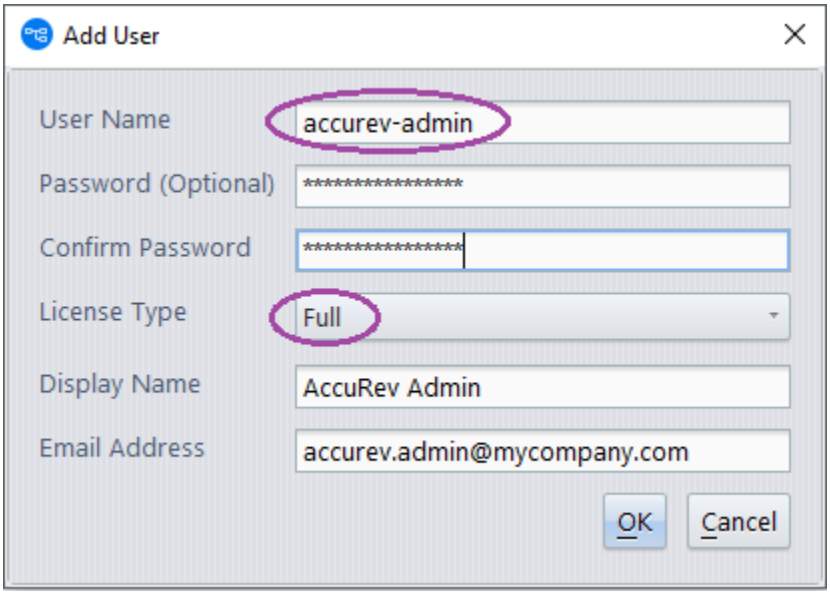


Create accurev-admin User in AccuRev

You must be a Pulse administrator in order to execute the Pulse configuration steps described in the following section called *Pulse Configuration*. A Pulse administrator can also disable or lock other users out from accessing Pulse.

The AccuRev installation process creates a single Administrator user named "accurev-admin" in Pulse. *Pulse users are authenticated against AccuRev*, so you must create the "accurev-admin" user in AccuRev also.

In the AccuRev GUI, under **Admin | Security**, add a new user called "accurev-admin". Be sure to assign a *full license* to this user:



Pulse Configuration

When working with the Pulse web application, keep in mind the following terms:

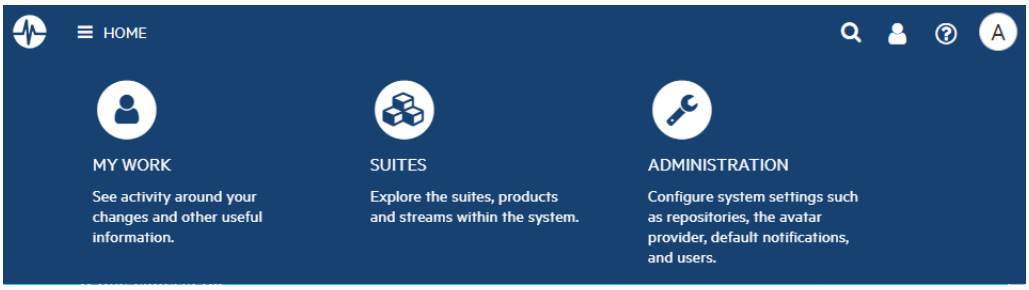
Pulse term	Equivalent term in AccuRev
Product	Depot
Changeset	Transaction
Request	Issue (or Change Package)

If you need further information about any Pulse functionality, you can click on the question mark icon located in the upper-right corner of every Pulse page to bring up the online help for Micro Focus Pulse:

Also, you can find additional information about using Pulse Code Review with AccuRev in the *Pulse Code Review FAQ* on page 101.

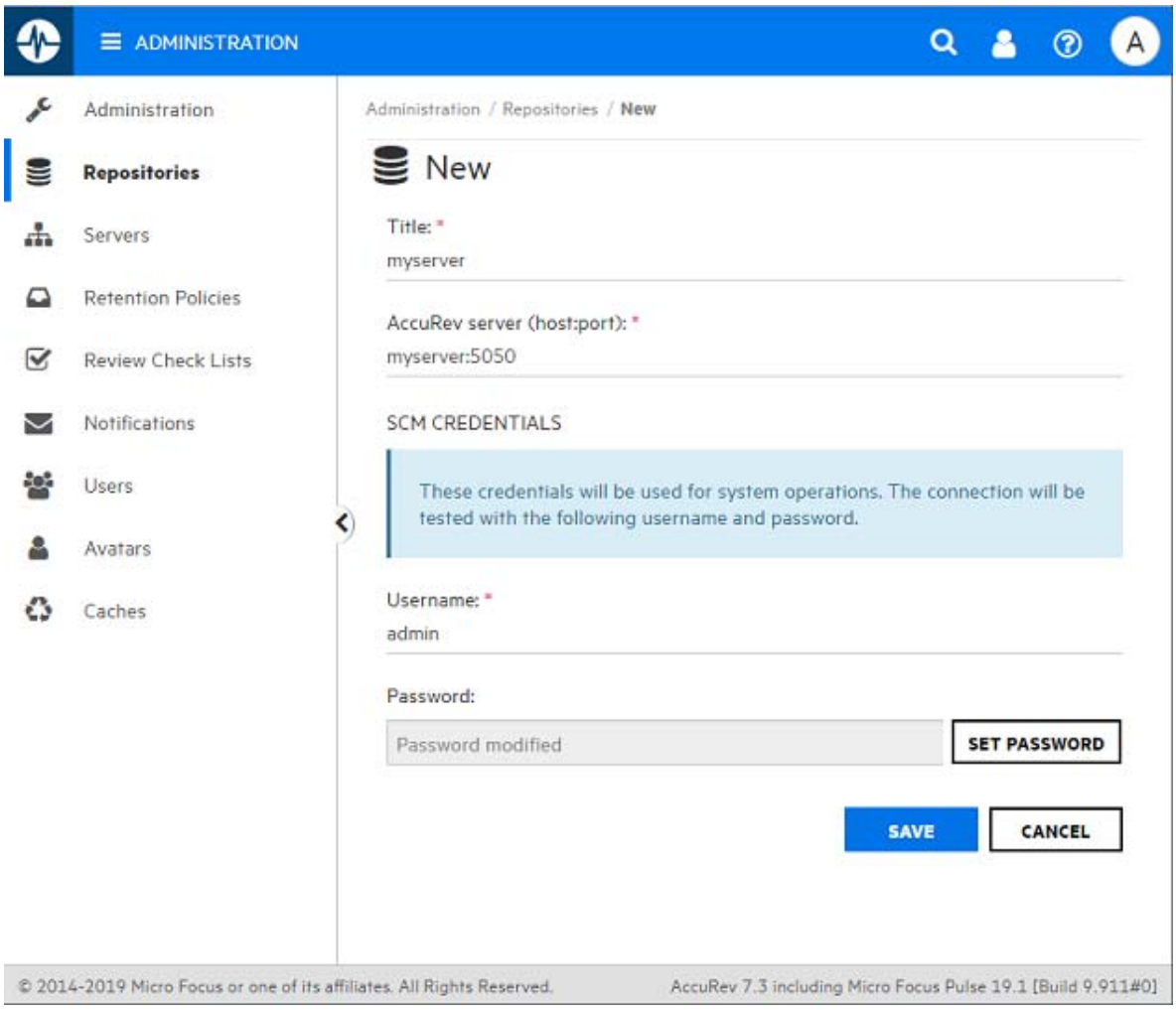
Configure the AccuRev Repository in Pulse

1. Log into `http://myserver:8080/pulse` as a Pulse administrator.
2. Click on the top bar of the Pulse page to open the main navigation bar:



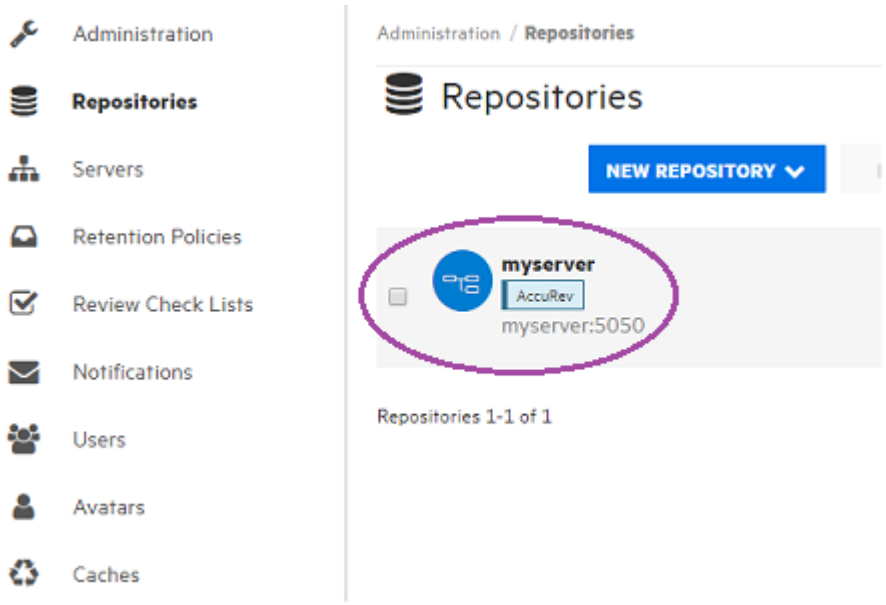
   Note: If you do not see **Administration** in the navigation bar, you are not a Pulse administrator.

3. Navigate to **Administration | Repositories | New Repository | AccuRev**.
4. Enter the following data:
   - Title for the repository, e.g., myserver
   - Host:port for the AccuRev server, e.g., myserver:5050
   - Username and password for an AccuRev admin user. (Click the **Set Password** button to enter the password.)


ADMINISTRATION
Administration
Repositories
Servers
Retention Policies
Review Check Lists
Notifications
Users
Avatars
Caches
Administration / Repositories / New
New
Title: *
myserver
AccuRev server (host:port): *
myserver:5050
SCM CREDENTIALS
These credentials will be used for system operations. The connection will be tested with the following username and password.
Username: *
admin
Password:
Password modified
SET PASSWORD
SAVE
CANCEL
© 2014-2019 Micro Focus or one of its affiliates. All Rights Reserved.
AccuRev 7.3 including Micro Focus Pulse 19.1 [Build 9.911#0]

5. Click **Save**.

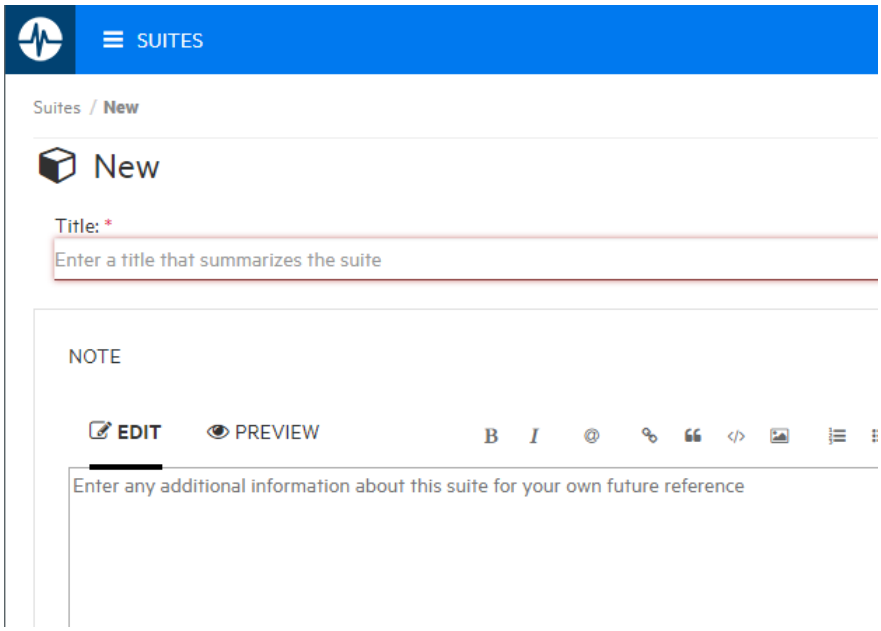
If the repository was created successfully and Pulse was able to authenticate with AccuRev using the configured username and password, then the AccuRev repository will be listed under **Repositories**, as shown here:



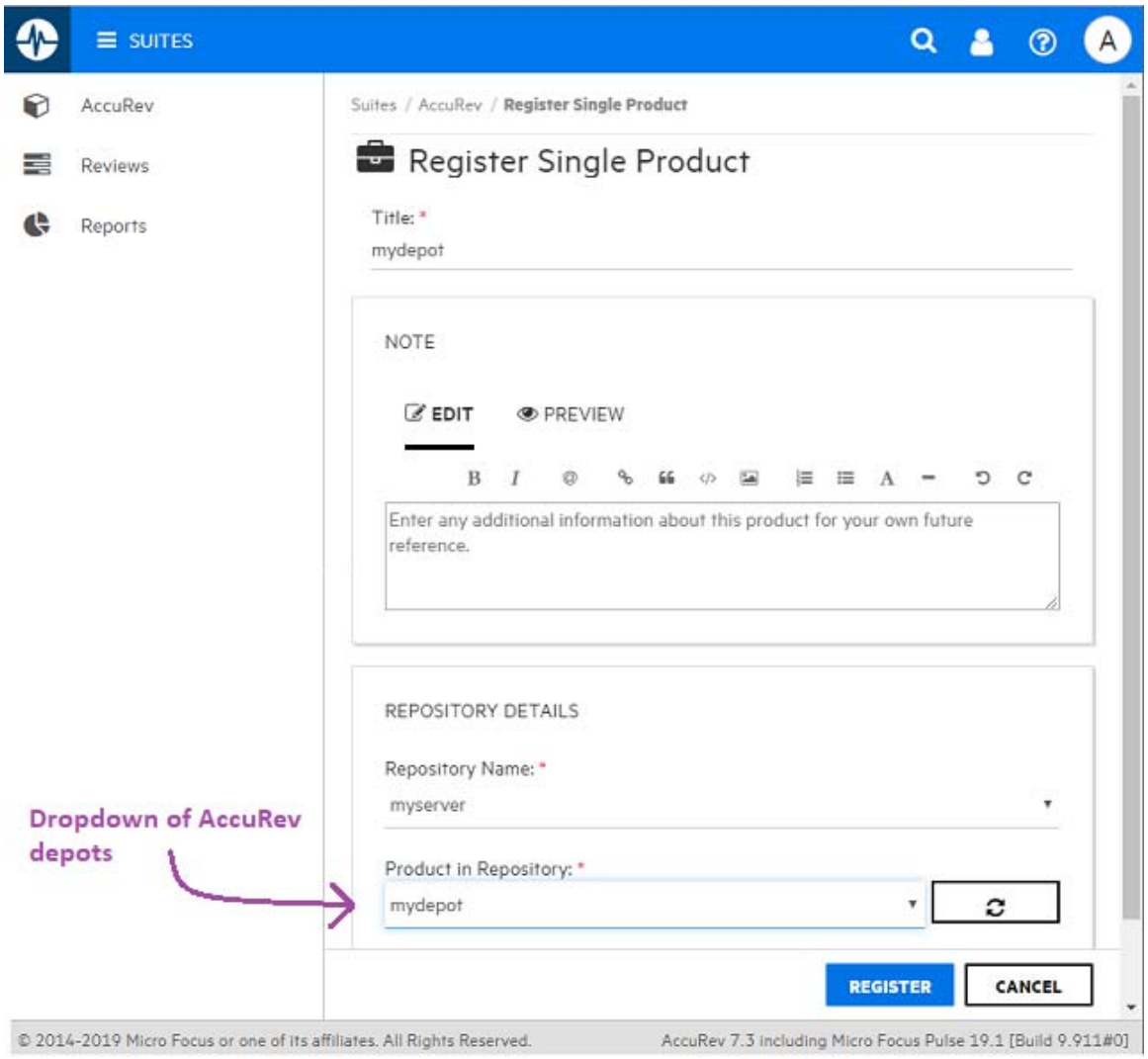
Register the Depot

In order for users to be able to do code reviews in an AccuRev depot, you must register the depot in Pulse:

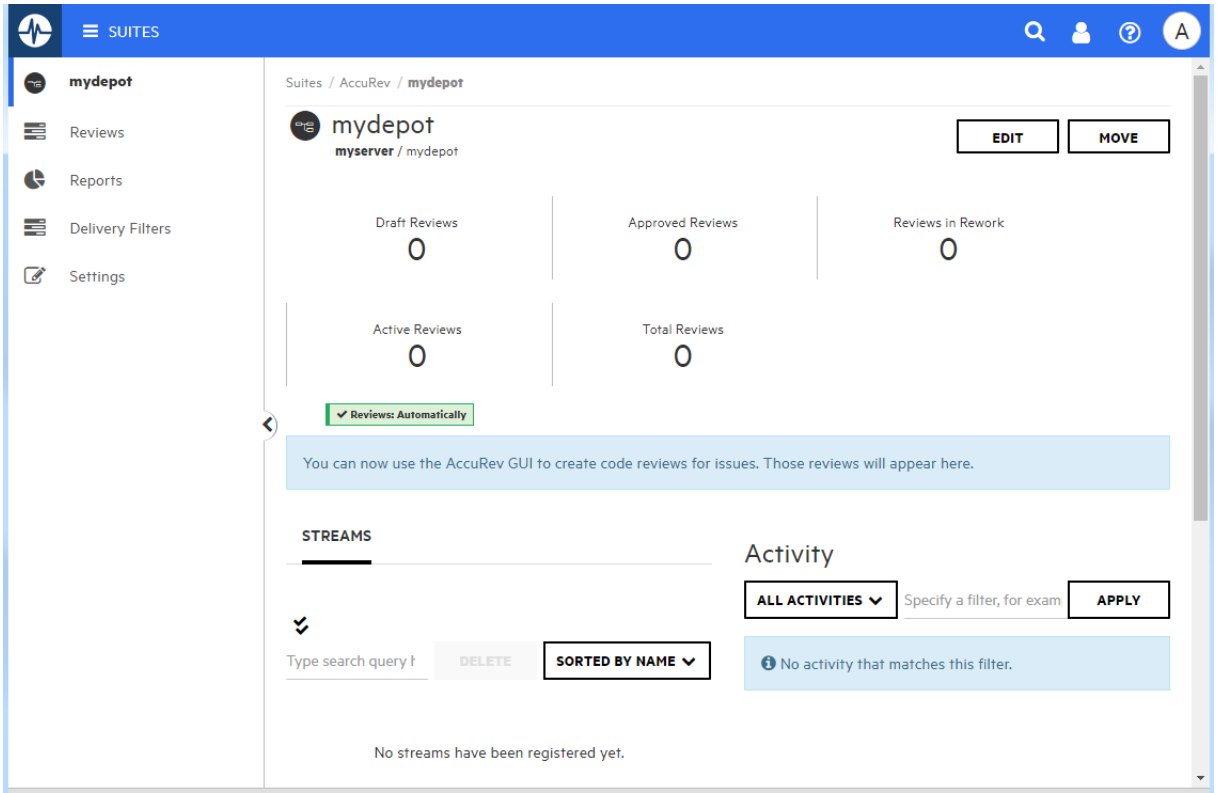
1. First, create a Pulse **Suite**, which is a grouping of depots:
   Using the main navigation bar at the top of the page, navigate to **Suites | Create a Suite**.
   If you have only one depot that will perform code reviews, you could title the Suite simply "AccuRev".



2. Next, **Register a Product** for each AccuRev depot that will perform code reviews. You can register a **Single Product** (depot) at a time, or you can bulk-select depots and register **Multiple Products**):



After you click **Register**, you will see a page like this:



Ask Users to Login to Pulse

Users who will be configured as Pulse administrators or designated as code reviewers must first be registered in Pulse. You should encourage such users to login to Pulse as soon as possible. Each user's first login automatically registers them in Pulse.

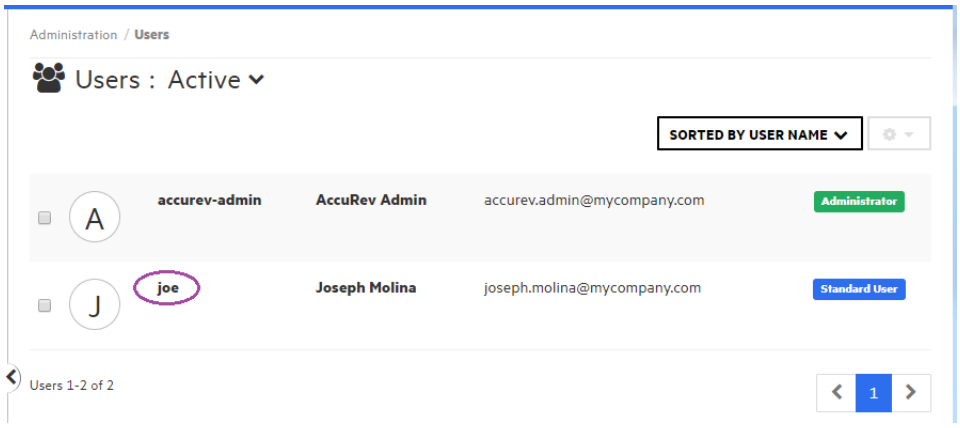
Configure Additional Pulse Administrators (optional)

The **accurev-admin** user can designate other Pulse users as administrators.

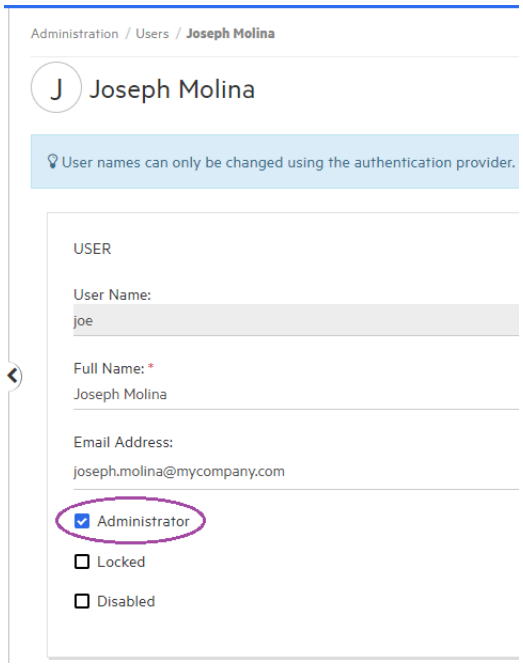
Be sure that all users who are designated as Pulse administrators have a "full" license in AccuRev. You can check this by editing the user in the AccuRev GUI or by executing "**accurev show -fv users**" on the command line.

To designate a Pulse user as a Pulse administrator, follow these steps:

1. Navigate to **Administration | Users**.
2. Click on the User Name of the user whom you would like to make an administrator:



3. In the User dialog that opens up, check the **Administrator** checkbox and then click **Save:**



Once other administrators are configured, you can "retire" the accurev-admin user, if desired, by having another Pulse administrator edit the accurev-admin user in Pulse and check the **Disabled** checkbox.

Configure Email Notifications

Pulse uses email notifications to inform users of changes in code reviews that they are involved in. The Pulse administrator must first configure SMTP email settings for the system and then configure what notifications are enabled for the organization. Then individual users can configure what notifications they want to receive.

1. The SMTP email settings are configured by manually editing the file `<ac-install>/pulse/conf/startup.properties`. You must configure these settings once after installation and then restart the AccuRevTomcat service in order for Pulse to pick up the new values. The minimum settings are:

```
server.mail.channels=smtp
server.mail.from=myserver@mycompany.com
server.smtp.host=smtp.mycompany.com
server.smtp.port=25
server.smtp.auth=false
```

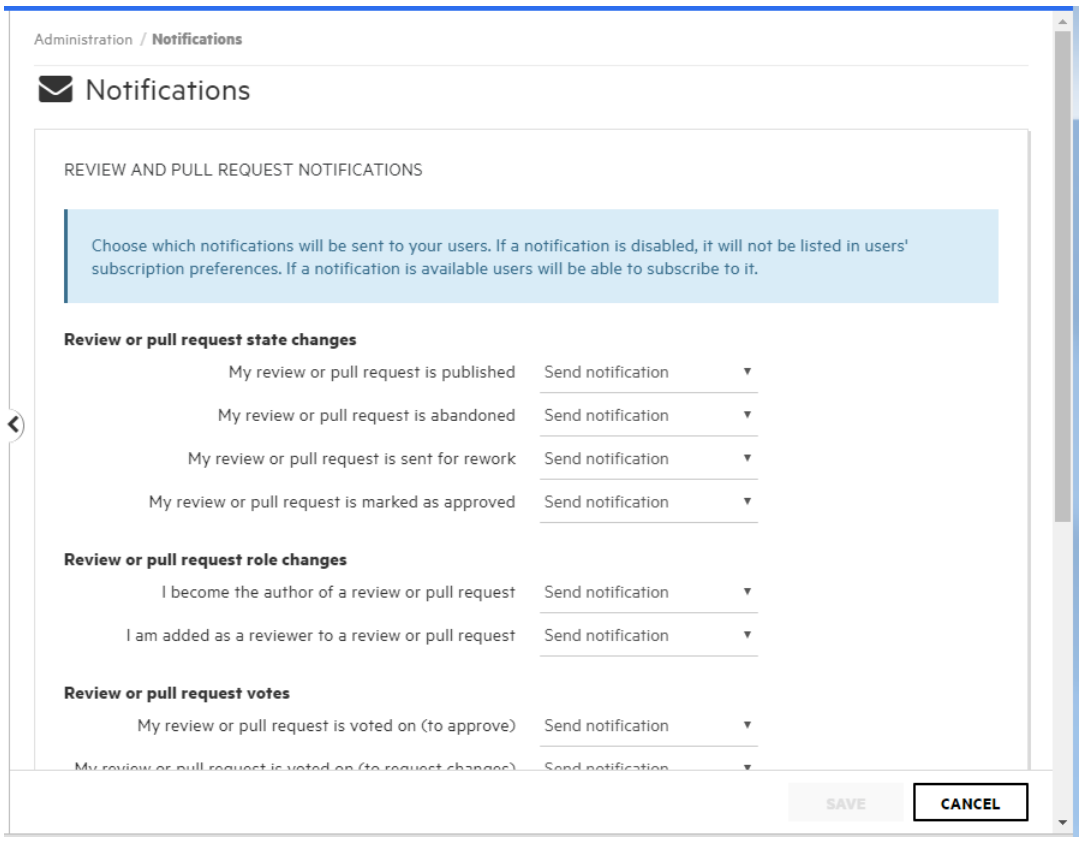
The other, optional settings depend on your organization's SMTP server configuration:

```
server.smtp.username=<username>
server.smtp.password=<password>
server.smtp.quitwait=<true or false>
server.smtp.starttls.enable=<true or false>
server.smtp.starttls.required=<true or false>
```

Notes:

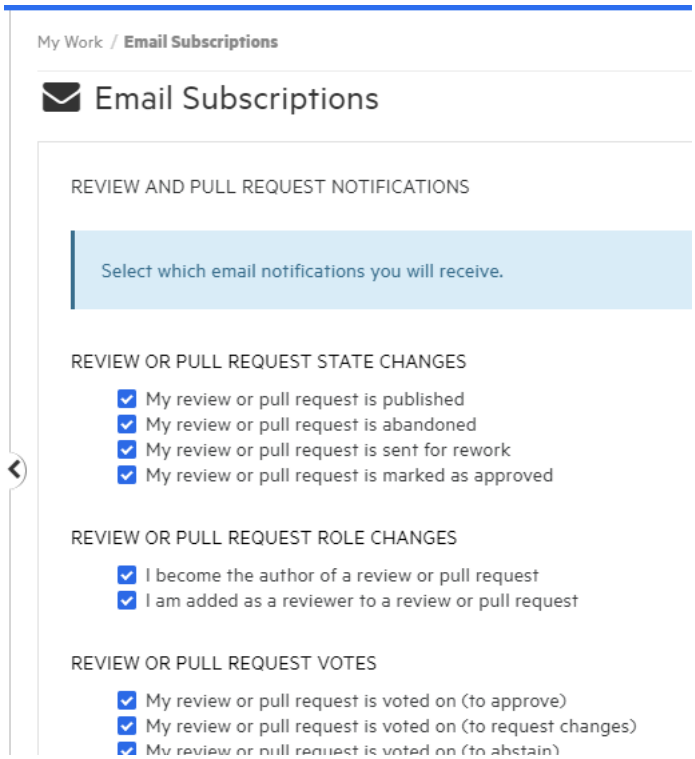
- Contact your IT department to confirm that your settings in `startup.properties` match the SMTP server settings for your organization.
- Remember to restart AccuRevTomcat so that Pulse picks up the new settings.

2. Login to Pulse as an administrator and navigate to **Administration | Notifications**. Use the dropdowns to select what kinds of notifications will be available to users in your organization. By default, all notifications are enabled.



- **Send notification** means that the notification is sent to users by default, but users can choose to unsubscribe from it.
- **Do not send notification** means that the notification is *not* sent to users by default, but users can override this setting by subscribing to the notification.
- **Disabled** means that the notification is not available for users to subscribe to.

3. Individual users can then control which code review notifications they receive by navigating to **My Work | Email Subscriptions** in Pulse and selecting the appropriate checkboxes:



Rollout to Users

Once you have completed the above configuration steps for AccuRev and Pulse, users can begin using Pulse Code Review with AccuRev. Notify AccuRev users that they should login to Pulse as soon as possible (using their AccuRev credentials) so that they can be designated as code reviewers. Information about how to use Pulse Code Reviews can be found in *Pulse Code Review* on page 85.

Using Pulse Code Review with Replica AccuRev Servers

If you will be using Pulse with a replica AccuRev server, you can use one of two configurations:

1. **Run Pulse on the same machine as the master AccuRev server** – Configure the Pulse repository to use the master AccuRev server. Copy the master server's `<ac-install>/storage/site_slice/dispatch/config/settings.xml` file onto the replica server. (**Note:** If the AccuRev Web Server is running on the replica machine, then copy just the `<pulse>` element in the `settings.xml` file instead of copying the entire file.)

This setup is appropriate if users use the GUI to connect to both the replica and the master AccuRev servers. Code reviews can be created with GUIs connected to either the master or replica servers.

2. **Run Pulse on each replica AccuRev server** – Configure the Pulse repository to use the replica AccuRev server on the same machine. Each replica server will have its own Pulse instance with its own set of code reviews.

   This setup is appropriate for geographically disparate teams that connect to different replica servers. It is still possible, however, for one code review to include reviewers from different locations. That is, a user on one replica server can participate in reviews created in the local Pulse instance and in reviews created in Pulse instances on other replica servers.

Setting up Pulse to Run on a Standalone AccuRev Web Server

The best way to configure Pulse to run on a standalone AccuRev Web Server (separate from the AccuRev Server) is first to set up Pulse to run on the AccuRev server machine, and *then* to set up Pulse to run on the Web Server machine (shutting down Tomcat on the AccuRev server).

The proper sequence of steps is:

- ***On the AccuRev server machine:***

  1. Follow all the steps in *AccuRev Configuration* on page 50 to prepare AccuRev to work with Pulse *running on the AccuRev server machine*.
  2. Follow all the steps in *Pulse Configuration* on page 52 to set up Pulse *to run on the AccuRev server machine*.
  3. Create some test users in AccuRev and have them login to Pulse. Confirm that they can start a code review from AccuWork, click the Pulse button to view the code review in Pulse, publish the code review in Pulse, and see the updated code review status ("In Review") in AccuWork.
  4. Shut down Tomcat on the AccuRev server.

- ***On the AccuRev web server machine:***

  5. Do a Web Server-only AccuRev installation (if not already done).
  6. Start Tomcat on the Web server machine.

- ***On the AccuRev server machine,*** configure files to enable communication between Pulse on the web server and Postgres on the AccuRev server:

  7. Examine the file `<ac-install>/storage/site_slice/dispatch/config/settings.xml` and confirm that it has a **url** for **webui** and a **url** and **id** for **pulse**. The URLs should include the *AccuRev server* hostname, e.g.:

```
<settings>
    <webui url="http://<accurev_server_hostname>:8080/accurev"/>
    <pulse url="http://<accurev_server_hostname>:8080/pulse"
           id="da2c56a9-691e-46ff-9a82-802fc0e57dc4"/>
</settings>
```

  8. Edit the file `<ac-install>/postgresql/9.5/db/postgresql.conf`. *Uncomment* **listen_addresses** and set it to '*':

```
listen_addresses = '*'  # what IP address(es) to listen on;
                    # comma-separated list of addresses;
                    # defaults to 'localhost'; use '*' for all
                    # (change requires restart)
```

9. Edit the file ***<ac-install>***/postgresql/9.5/db/**pg_hba.conf** to allow connections from the *web server* host. Add a line that contains either "<*web_server_IP*>/32" or "<*web_server_hostname.domain*>".

```
# TYPE  DATABASE        USER            ADDRESS                 METHOD

# IPv4 local connections:
host    all             all             127.0.0.1/32            md5
host    all             all             <web_server_IP>/32      md5

#host   all             all             <web_server_hostname.domain>  md5
                    # what IP address(es) to listen on;
                    # comma-separated list of addresses;
                    # defaults to 'localhost'; use '*' for all
                    # (change requires restart)
```

10. Restart the AccuRev DB Server on the AccuRev server machine.

At this point, you should be able to use Pulse on the web server:

Configuring Database Tuning Parameters

Use these instructions to set the database tuning parameters that will allow the database to make the best use of your system resources. You should do this after installing AccuRev but before starting the server and before running the **maintain migratepg** or **migrate dbupgrade** command.

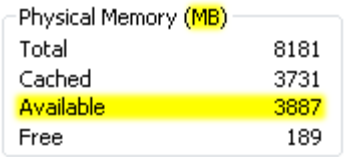
1. Log in as ***<ac-user>***.
2. Ensure that the database server is stopped using the procedures described in *Starting and Stopping AccuRev Servers* on page 70.
3. To improve database performance you may elect to increase the amount of memory allocated exclusively to PostgreSQL by editing ***<ac-storage>***/**db/postgresql.conf**.
   - *(non-Windows platforms)* Note that editing **postgresql.conf** could also require you to alter part of your operating system's kernel configuration and possibly reboot your system. Read the section applicable to your operating system at ***http://www.postgresql.org/docs/9.5/static/kernel-resources.html*** for more information.
   - `shared_buffers` – Change to 512MB or 25% of total physical memory installed on the machine running AccuRev, whichever is less.
   - `effective_cache_size` – Set to 75% of free physical memory reported by the operating system when both AccuRev and the database are stopped (see *Starting and Stopping AccuRev Servers* on page 70).

     Free physical memory can be estimated as follows:

     - UNIX/Linux (expressed in MB): Run the `ac_free` script to compute shared_buffers and effective_cache_size:

       <ac-install>/extras/unix/bin/ac_free

- Windows Server 2008/Windows 7 or later (expressed in MB): Access the Performance tab on the Windows Task Manager. Use only the Available value under “Physical Memory”.



- Other operating systems: You may be able to use the **top** command; refer to your operating system vendor’s documentation.

Note: On 64-bit operating systems with more than 4GB of memory, the `effective_cache_size` is not limited to 4GB, as it does not reflect memory allocated by PostgreSQL. This setting is an estimate of the amount of memory available to the operating system for filesystem caching.

4. Start the AccuRev Database Server process according to the instructions in *Starting and Stopping AccuRev Servers* on page 70.

Using the ‘maintain dbupgrade’ Command

The **maintain dbupgrade** command is used to upgrade your existing AccuRev database after you have upgraded your AccuRev server. This command is used when upgrading to any pre-7.0 release *or* when upgrading from an earlier 7.x version to 7.4.

NOTE: Upgrading from a 5.7 or 6.x version to 7.0 or later requires the use of **maintain migratepg** instead of **maintain dbupgrade**. See *Upgrading a Server from a 5.7 or 6.x Version* on page 38 for information about **maintain migratepg**.

For 4.x databases (4.7 or higher), **dbupgrade** performs these tasks:

- Performs validation and cleanup of 4.x metadata records.
- Converts the metadata to UTF-8 for proper internationalization support.
- Imports the metadata to the third-party database used with AccuRev 5.x.

For 5.0.1 and higher databases, **dbupgrade** upgrades the AccuRev database schema. (5.0.5 and 5.2 databases are already internationalized, so they do not require UTF-8 conversion.)

IMPORTANT: Before performing the **dbupgrade** operation, ensure that you have tuned your database as described in *Configuring Database Tuning Parameters* on page 63, and have restarted your database so that the tuning parameters take effect. Also ensure that you have left yourself an adequate window of time: each **dbupgrade** run can take several hours, particularly if you are performing trial runs and upgrades on a test machine that is not particularly fast.

You will be prompted to perform the **dbupgrade** process in two steps:

1. In "trial run" mode, to evaluate how the upgrade process will succeed.
2. In "force" mode, where your database will actually be converted.

See the "The ‘maintain’ Utility" chapter of the AccuRev *Administrator’s Guide* for more details about this utility.

Performing a "Trial Run" Upgrade

To begin the upgrade process, change to the `<ac-install>/bin` directory and enter the following at the command line:

```
maintain dbupgrade <db-admin-name>
```

You will be prompted for *<db-admin-pass>*, and then asked whether you want to run the upgrade as a “trial run”, using a default codepage of “CP1252” (a superset of ISO-8859-1). Performing the conversion as a trial run means that your database will not be changed, but you will be notified of any issues so you can determine whether or not to repeat the upgrade in non-trial mode (and actually convert your database).

The codepage specification allows **dbupgrade** to attempt a reasonable conversion of your existing data to UTF-8. The default CP1252 codepage (“Western European”), although considered as “Windows” codepage, is a superset of ISO-8859-1 and is a reasonable starting point for both Windows and Linux servers, especially in mixed environments. Only specify a different codepage if you know for certain that you use a different one at your site.

When prompted whether or not you wish to proceed with a trial run, answer **Y** to perform the trial upgrade. (**N** *performs a real upgrade that will modify your data*.)

The upgrade process can take several hours, depending on factors such as your hardware, the size of your database, system load, etc. All information is captured in the following log files:

- ***<ac-storage>***/site_slice/logs/dbupgrade.log
- ***<ac-storage>***/site_slice/logs/dbupgrade_i18n_report.html

If you make multiple **dbupgrade** runs, any existing log files are backed up with time-stamp names. It is critical that you get a successful trial run, and review the logs for any problems prior to performing an actual database upgrade. If you have any questions about the results, you should contact Micro Focus SupportLine (https://supportline.microfocus.com).

See *Understanding maintain dbupgrade Messages* on page 66 for descriptions of messages that appear during the upgrade.

Understanding maintain dbupgrade Messages

During the data migration, several AccuRev tables will be altered, resulting in some or all of the messages described in this section.

Messages from maintain dbupgrade

When the upgrade completes successfully, a message like the following appears at the end of the output:

```
AccuRev 4.x to 5.x metadata migration completed without errors in 0.11
minutes.


*** The AccuRev database has been upgraded.

    The AccuRev Server is ready to be started.
```

If errors are detected during the migration, a message similar to the one shown below will appear at the end of the output:

```
AccuRev 4.x to 5.x metadata migration completed with errors in 0.11 minutes.


*** Errors were detected during the 4.x to 5.x metadata migration
processing.

    See /opt/accurev/storage/site_slice/logs/dbupgrade.log for details.

    The AccuRev Server WILL NOT start until the upgrade is successful.

    Please contact AccuRev Service for assistance.
```

Additional details are available in the file ***<ac-storage>***/site_slice/logs/dbupgrade.log.

See the following section, *Messages from the dbupgrade.log File*, for details on locating and interpreting the reasons for any failures.

Messages from the dbupgrade.log File

Note: Please store the *<ac-storage>*/`site_slice/logs/dbupgrade.log` file in a safe place. It contains information that could assist AccuRev Support Services with troubleshooting any data migration or database upgrade issues.

The `dbupgrade.log` file consists of log entries of the following severity levels, in ascending order:

- **INFO** -- Status messages indicating what the **dbupgrade** utility is doing at a particular point in time. The intended audience for this category of messages is primarily AccuRev Support Services.
- **NOTICE** -- Messages that record information about the **dbupgrade** operation that might be of interest to the user. Example: `Translations of non-ASCII characters from CP1252 to UTF-8 will be reported in C:/Program Files/AccuRev/storage/site_slice/logs/dbupgrade_i18n_report.html`
- **WARNING** -- These messages indicate that **maintain dbupgrade** encountered an issue that may require your attention but does not necessarily constitute a reason to fail the data migration/upgrade. You must evaluate any WARNING messages and determine if you can proceed with the results of the **dbupgrade** operation. See the examples and additional information in *Warning Messages* on page 67.
- **FATAL** -- These messages indicate that **maintain dbupgrade** encountered a serious problem that prevented it from completing. You must address any FATAL issue (usually with the help of AccuRev Support Services) and rerun **dbupgrade** before proceeding.

As an end-user, you should only be concerned with WARNING and FATAL entries.

Warning Messages

Warning message example #1:

```
0 Unable to find storage location for depot: depot_name: /path-to-storage/depots/
depot_name

-Error- 1 - prj.c:211 - Unable to initialize depot - System Error: 2 No such file or
directory

WARNING: Depot 'depot_name' skipped: Unable to initialize: No such file or
directory: OS error: see above
```

Explanation:

Ensure that the depot is supposed to still be active, and that the data for the depot is actually present on the system. You may need to use either the **chslice** or **rmdepot** AccuRev commands to remedy the problem. This condition is most likely to occur during a trial run on a test machine (as opposed to "in-place").

Warning message example #2:

```
WARNING: Would migrate site... FAILED
WARNING: Would migrate depot 'depot_name'... FAILED
WARNING: Migrating site... FAILED
WARNING: Migrating depot 'depot_name'... FAILED
WARNING: Would upgrade site... FAILED
WARNING: Would upgrade depot 'depot_name'... FAILED
WARNING: Upgrading site... FAILED
WARNING: Upgrading depot 'depot_name'... FAILED
```

Explanation:

One or more errors have occurred which prevented the site **slice/depot** in question from being migrated or upgraded. One or more corresponding log entries with severity FATAL should be present in `dbupgrade.log` prior to this WARNING entry, with the specific reasons for the errors.

Warning message example #3:

```
WARNING: AccuRev 4.x to 5.x metadata migration trial run completed without errors in
X minutes. *** The AccuRev Server WILL NOT start after the migration trial run.
```

Explanation:

You have successfully completed a trial migration from AccuRev 4.x to 5.x, but you must analyze the results and re-run the migration “for real” in order for the AccuRev Server to start. You must now review the `dbupgrade_i18n_report.html` file for correctness (see the "*Messages from dbupgrade_i18n_report.html* on page 69"). Then, if all highlighted characters in `dbupgrade_i18n_report.html` are correct, proceed to perform the actual migration as described in *Performing the Actual Database Upgrade* on page 70. Test your installation. If you were doing the upgrade on a test machine, now complete the upgrade on your production machine.

Warning message example #4:

```
WARNING: Would change database encoding to UTF-8: cannot proceed any further without
making changes to the database, stopping
WARNING: Would create a UTF-8 case-insensitive index: cannot proceed any further
without a UTF-8 database, stopping
WARNING: AccuRev database upgrade trial run completed without errors in X minutes.
*** No changes were made to the database during the upgrade trial run.
```

Explanation:

You are performing a trial upgrade from 5.0.x/5.1 to 6.2, which adds internationalization (I18N) support. Everything up to the point where the database is switched to UTF-8 has completed successfully, but the actual switch cannot occur during a "trial" run. You must now review the `dbupgrade_i18n_report.html` file for correctness (see *Messages from dbupgrade_i18n_report.html* on page 69). Then, if all highlighted characters in `dbupgrade_i18n_report.html` are valid, proceed to perform the migration "for real" (see *Performing the Actual Database Upgrade* on page 70, and *Upgrading a Server from a 5.7 or 6.x Version* on page 38.)

Fatal Messages

Fatal message example #1:

```
FATAL: AccuRev 4.x to 5.x metadata migration completed with errors in X minutes. ***
Errors were detected during the 4.x to 5.x metadata migration processing. See /path-
to-/dbupgrade.log for details. The AccuRev Server WILL NOT start until the upgrade
is successful. Please contact AccuRev Service for assistance.
```

```
FATAL: AccuRev database upgrade completed with errors in X minutes. *** Errors were
detected during the database upgrade processing. See %s/%s for details. No changes
were made to the database. Please contact AccuRev Service for assistance.
```

Explanation:

One or more errors have occurred which prevented the migration or upgrade from completing. Additional log entries with severity FATAL should be present in `dbupgrade.log` with the specific reasons for the errors.

Fatal message example #2:

```
FATAL: File not found - /path-to-storage/depots/depot-name/table-name.ndb
```

Explanation:

You are migrating from 4.x to 6.2 and the 4.x ndb file in question cannot be found. If the file is part of a depot that is no longer active, you may want to first **rmdepot** *depot-name* in 4.x, then retry the migration.

Fatal message example #3:

```
FATAL: Depot contains AccuWork issues, but the corresponding schema.xml definition
could not be found or loaded
```

Explanation:

The AccuWork `schema.xml` file is missing from the *`<ac-storage>`*`/depots/`*`depot-name`*`/dispatch/config` directory.

Fatal message example #4:

```
FATAL: Database error: ...
FATAL: Retrieving list of depots from database: Database error: ...
FATAL: table 'X' rowcount mismatch: expected Y, got Z
FATAL: LOC width X not supported!
```

Explanation:

If you receive any of these errors, contact Micro Focus SupportLine (https://supportline.microfocus.com).

Messages from dbupgrade_i18n_report.html

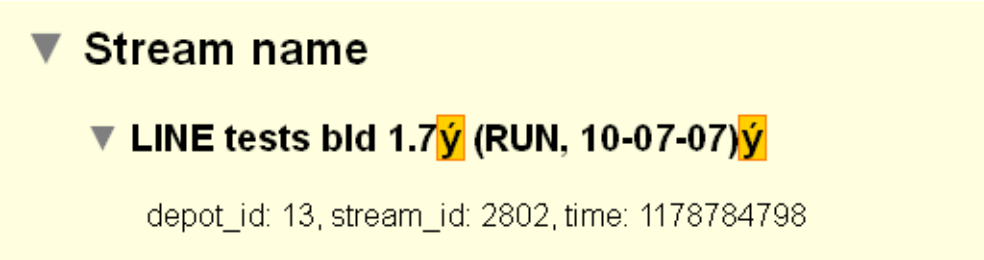
Note: Store the *`<ac-storage>`*`/site_slice/logs/dbupgrade_i18n_report.html` file in a safe place. It contains information that could assist AccuRev Support Services with troubleshooting any data migration or database upgrade issues.

The information in dbupgrade_i18n_report.htm contains the results of the UTF-8 conversion based on the code page that you specified. Open this report in a web browser and look for any highlighted characters -- these represent non-ASCII characters found during the conversion.

Some highlighted characters can be ignored. For example, accents and umlauts may have been introduced when adding a foreign document to the depot. Likewise, some highlighted characters may be simple non-ASCII punctuation characters like em dashes ("—"). However, if a highlighted character does not look valid, it probably needs to be corrected.

To research the origin of suspect entries, use the information in the report to find the characters in your existing, running AccuRev installation (4.x, 5.0.x, or 5.1):

1. Click on the triangular handle next to any highlighted entry to see where it is being referenced (depot, stream, etc.). For example, in the illustration below, clicking on the handle next to "Stream name" reveals that two non-ASCII characters appear in the stream name that begins "LINE tests bld". Clicking on the handle for this entry narrows down the location to depot_id 13 and stream_id 2802.



2. Use the displayed information (depot_id, stream_id, issue_num, etc.) to navigate to the suspect entry in your existing (4.9, 5.0.x, or 5.1) AccuRev UI.

3. Compare the appearance of the suspect entry in the report against how it appears in your existing AccuRev installation.

Here are some general rules for interpreting these results:

- **All highlighted characters are correct.** Your data will convert cleanly, and you can proceed to perform the actual upgrade without a trial run:

  ```
  maintain dbupgrade -f -E CP1252 <db-admin-name>
  ```

  (**Note:** Use the exact same maintain **dbupgrade** command on the replica servers, if any.)
- **Some highlighted characters are incorrect.** Determine whether or not these characters are acceptable, or if you can fix them after the upgrade. For example, you might be able to rename a stream or a file. **Note:** Because of AccuRev's TimeSafe® feature, snapshots and time-based streams will preserve the pre-rename, incorrect information.) If in doubt about how to proceed, please contact Micro Focus SupportLine (https://supportline.microfocus.com).
- **There are many incorrect highlighted characters and the problem seems to be consistent.** If you can identify a recurring, common problem, you probably need to use a different code page. For more information about code pages, start with *http://en.wikipedia.org/wiki/Character_encoding*.

Performing the Actual Database Upgrade

Once you have fixed any issues reported by the "trial run" upgrade, you can perform the actual database upgrade by re-running the **maintain dbupgrade** command as described in the previous section, but responding **N** when prompted whether or not you wish to run in trial mode, and confirm your choice.

Starting and Stopping AccuRev Servers

This section describes the procedures you can use to start and stop the AccuRev Server and the AccuRev Database Server.

Starting and Stopping the AccuRev Server

Use the procedures below to start and stop the AccuRev Server.

Starting

Platform	Interface	Start Procedure
Windows	GUI	Services window > Locate service, right-click, choose **Start Service**
	Command line	`net start accurev`
UNIX/Linux	Command line	`cd <ac-install>/bin` `./acserverctl start`

Stopping

Platform	Interface	Stop Procedure
Windows	GUI	Services window > Locate service, right-click, choose **Stop Service**
	Command line	`net stop accurev`
UNIX/Linux	Command line	`cd <ac-install>/bin` `./acserverctl stop`

When you start the AccuRev Server, the database is automatically started first.

Starting and Stopping the AccuRev Database Server

Use the procedures below to start and stop the AccuRev Database Server.

Starting

Platform	Interface	Start Procedure
Windows	GUI	Services window > Locate service, right-click, choose **Start Service**
	Command line	`net start "accurev db server"`
UNIX/Linux	Command line	`cd <ac-install>/bin` `./acserverctl dbstart`

Stopping

Platform	Interface	Stop Procedure
Windows	GUI	Services window > Locate service, right-click, choose **Stop Service**
	Command line	`net stop "accurev db server"`
UNIX/Linux	Command line	`cd <ac-install>/bin` `./acserverctl dbstop`

When you stop the AccuRev Database, the AccuRev Server is automatically shut down first.

Starting and Stopping the AccuRev Tomcat Server and Mosquitto MQTT Message Broker

Use the procedures below to start and stop the AccuRev Tomcat Server and Mosquitto MQTT Message Broker.

Starting

Platform	Interface	Start Procedure
Windows	GUI	Services window > Locate service, right-click, choose **Start Service**
	Command line	`net start AccuRevTomcat` `net start "AccuRev Mosquitto"`

UNIX/Linux	Command line	For Tomcat:
		`<ac-install>/WebUI/tomcat/bin/startup.sh >> <ac-install>/storage/site_slice/logs/accurev_tomcat_startstop.log 2>&1 &`
		
		For Mosquitto:
		`cd <ac-install>/mosquitto`
		`./mosquitto --daemon -c ./mosquitto.conf >> <ac-install>/storage/site_slice/logs/mosquitto.log 2>&1 &`

Stopping

Platform	Interface	Stop Procedure
Windows	GUI	Services window > Locate service, right-click, choose **Stop Service**
	Command line	`net stop AccuRevTomcat` `net stop "AccuRev Mosquitto"`

UNIX/Linux	Command line	For Tomcat:
		`<ac-install>/WebUI/tomcat/bin/shutdown.sh >> <ac-install>/storage/site_slice/logs/accurev_tomcat_startstop.log 2>&1 &`
		
		For Mosquitto:
		`pkill -x mosquitto`

Summary of Start and Stop Operations

In summary:

- Starting the AccuRev Server will automatically start the AccuRev Database if it is not already running.
- Stopping the AccuRev Server will NOT automatically stop the AccuRev Database.
- Starting the AccuRev Database will NOT automatically start the AccuRev Server.
- Stopping the AccuRev Database will also stop the AccuRev Server, but only if you say "**Y**" to the prompt. Otherwise, neither will be stopped.

See "Controlling Server Operation" in the AccuRev *Administrator's Guide* for more information, and for setting up your system to automatically start the AccuRev processes at boot time.

Platform Support Notes

The following sections contain important information about installing AccuRev software on specific hardware/software platforms.

Platform Support Matrix

For the most up-to-date list of supported platforms, go to *http://supportline.microfocus.com/supportresources/AccurevSupportMatrix.aspx*.

Important Notes:

1. The Platform Support Matrix lists the platforms that have been tested for the AccuRev 7.4 server and client. We will investigate and attempt to address issues reported on other platforms, but we reserve the right to request that you reproduce the problem on a supported platform.
2. We will investigate and attempt to address issues reported on virtualization platforms not supported by AccuRev, but we reserve the right to request that you reproduce the problem on one of the supported OS platforms listed in the Platform Support Matrix, running in a non-virtualization environment.

Java Compatibility

AccuRev 7.4 is compatible with the Java Runtime Environment (JRE), Versions 1.8.0_242 and higher.

(UNIX/Linux only) Workaround for Java Runtime Library Problems

The AccuRev Installation Wizard and the AccuRev GUI fail on some UNIX/Linux platforms because of Java library problems. Use this procedure to work around these problems:

1. Run the Installation Wizard with environment variable LIBXCB_ALLOW_SLOPPY_LOCK set to the value 1.
2. Fix the runtime library file in the new AccuRev installation area:

```
> cd ac-install/jre/lib/i386/xawt
> sed -i 's/XINERAMA/FAKEEXTN/g' ./libmawt.so
```

Linux

- On Fedora Linux, after the AccuRev installer has completed, be sure to execute **yum update** to update system packages on the machine.
- PostgreSQL may fail to function properly when SELinux mode is set to "Enforcing". See *http://docs.fedoraproject.org/en-US/Fedora/13/html/SELinux_FAQ/#id2963608* for more information. To find out the current SELinux mode run **getenforce** (as **root**). To set SELinux mode to "Permissive", run **setenforce PermissiveEdit**.
- Linux systems require `glibc` version 2.4 or higher. To determine your `glibc` version, run **rpm -qi glibc** in a command shell. Ubuntu systems require libc6-i386.
- The AccuRev Installation program and the AccuRev GUI fail on some older UNIX/Linux platforms because of Java library problems. Use this procedure to work around these problems:
  - Set the environment variable LIBXCB_ALLOW_SLOPPY_LOCK to the value 1.
  - Run the installation program.
  - Fix the runtime library file in the new AccuRev installation area:

```
> cd <ac-install>/jre/lib/i386/xawt
> sed -i 's/XINERAMA/FAKEEXTN/g' ./libmawt.so
```

Solaris

- The AccuRev Client is supported on Solaris x64.
- If you upgrade the AccuRev Client using the console mode, you are not prompted to provide values for host, port, and path. AccuRev uses values from your existing AccuRev Client installation to perform the upgrade.
- The following shared library must be accessible, both by the AccuRev Installation Wizard and by the installed AccuRev executables. The pathname below shows the typical location for this shared library.

  `/usr/sfw/lib/libgcc_s.so.1`

  Note: It is recommended that the LD_LIBRARY_PATH environment variable *not* be set, as it can interfere with the loading of libraries from *<ac-install>*`/bin`.

The library above is typically part of the following SUN package:

- SUNWgccruntime

Restrictions on the Use of AccuRev Clients in Solaris Zones

The following restrictions apply to the use of AccuRev clients in Solaris zones:

- Workspaces can only be created on zones with private host names.
- Workspaces in the non-global zone cannot be used from the global zone.
- Workspaces on NFS mounts (not recommended) must be NFS-mounted directly from the non-global zone, not through a loopback mount in the non-global zone to an NFS mount in the global zone.
- Solaris requires operating system patches, as described on the Oracle Technology Network (`http://www.oracle.com/technetwork/systems/patches/index.html`).

Windows

- Disable anti-virus checking for the ***<ac-storage>*** directory and all directories beneath it to avoid performance problems associated with anti-virus checks.

macOS

- AccuRev Release 7.4 supports only the AccuRev client software on the macOS platform.
- The following is a recommended method for getting all required executables into the PATH for macOS:

  Create the following three files using "sudo":

  ```
  sudo echo "/Applications/AccuRev/bin" > /etc/paths.d/AccuRev
  ```

  ```
  sudo echo "/Applications/AccuRev/bin/acdiffgui.app/Contents/MacOS" >
      /etc/paths.d/Acdiffgui
  ```

  ```
  sudo echo "/Applications/AccuRev/bin/acgui.app/Contents/MacOS" >
      /etc/paths.d/Acgui
  ```

- To enable the AccuRev **diff** GUI tool (`acdiffgui`) to work stand-alone as well as from an IDE integration such as Eclipse, do the following:

  1. Make a backup copy of `acdiffgui`:

  ```
  cd /Applications/AccuRev/bin/acdiffgui.app/Contents/MacOS
  ```

  ```
  mv acdiffgui acdiffgui.orig
  ```

  2. Create a new `acdiffgui` file with the following content:

  ```
  #!/usr/bin/perl
  my $acbin = '/Applications/AccuRev/bin';
  my @jars = qw(oro.jar xercesImpl.jar xml-apis.jar fw.jar werken.opt.jar diff.jar
  accurev-common.jar);
  my $cp = join(':', map {"$acbin/$_"} @jars);
  my @args = ('java', "-Duser.dir=$acbin", '-Xms32M', '-Xmx512M', '-classpath', $cp,
  'diff.DiffApp', @ARGV);
  system (@args);
  ```

  3. Create the following link:

  ```
  ln -s /Applications/AccuRev/bin/acdiffgui.app/Contents/MacOS/acdiffgui
        /Applications/AccuRev/bin/acdiffgui
  ```

  4. Close any shells.

5. Open a new shell.

Running `acdiffgui` should now bring up the AccuRev graphical **diff** tool, and it should also work from within any integrated IDE.

Uninstalling AccuRev

On Windows, we recommend that you run ***<ac-install>***`\bin\UninstallerData\Uninstall AccuRev.exe` to ensure that the AccuRev services and registry entries are removed cleanly. Back up and remove any folders and files left under ***<ac-install>***.

On UNIX/Linux, simply halt and remove any AccuRev services, and back up and remove any folders and files left under ***<ac-install>***.

Note: If you are planning to upgrade either your AccuRev client or your AccuRev server, we recommend that you *not* uninstall AccuRev. Instead, just install over the existing AccuRev content.

AccuRev 7.4 Release Notes

This chapter describes changes and other information related to AccuRev 7.4.

Notes:

- **To ensure AccuRev's successful installation and optimal performance, install all applicable updates for your operating system before installing or upgrading AccuRev.**
- **If you are upgrading from an earlier release, we recommend that you install 7.4 over the existing AccuRev content.**
- **AccuRev clients from releases 6.2.0 through 7.4 can be used with the 7.4 server, but *only clients from 7.2 and later can be used to modify schemas.***
- **You should reboot your machine after installing AccuRev 7.4. This will ensure that the PATH is updated correctly.**
- ***Windows Server 2019 platform*: AccuRev 7.4 runs on Windows Server 2019; however, there are problems with the installer on that platform. The Windows Server 2019 installer will be fixed in the next AccuRev release. If you would like to manually update your AccuRev software to release 7.4, please contact Customer Support.**

Discontinued and Deprecated Platforms

The following platforms are past end of life and are no longer supported as AccuRev platforms:

- Microsoft Windows 7 SP1
- Microsoft Windows Server 2008 SP2
- Linux Fedora 28, 29
- Linux Ubuntu 14.04.5
- Apple macOS Sierra 10.12
- Unix IBM AIX 6.x
- Unix IBM AIX 7.x
- Unix Solaris 10 (Intel 64-bit) - server only
- Unix Solaris 11 (Intel 64-bit) - server only

The following platforms are deprecated in AccuRev 7.4 and will not be supported in the next release of AccuRev:

- all 32-bit Windows platforms
- all 32-bit Linux platforms
- Linux CentOS 6

Note: In release 7.4, the AccuRev Git Client is not supported on Solaris or macOS platforms, and it is deprecated on Windows and Linux platforms. In the release following 7.4, the AccuRev client installers will no longer install the AccuRev Git Client.

Changes in AccuRev Release 7.4

AccuRev Release 7.4 includes the following new features and bug fixes.

> **Note:** In the issue titles below, issue IDs outside parentheses are issue numbers in the AccuWork issue tracking system. Issue IDs inside parentheses are issue numbers in the SupportLine system used by Customer Care.

26991 (1115619) - RFE: GUI: Provide a way to collapse all streams and expand all streams

Hold the Ctrl key down while clicking a stream's '-' or '+' button to collapse all or expand all streams. See *Stream Browser: New Expand/Collapse All Buttons* on page 20 for further information.

29084 (1117746) - RFE: GUI/CLI: Ability to provide a comment for rules, incl, incldo, excl, clear

With the new *-c* option, you can now write an explanatory comment when you change include/exclude rules via *incl*, *incldo*, *excl*, and *clear* commands. The AccuRev GUI also provides a dialog for entering a comment with these operations.

43458 (1106791) - Upgrade installer sets incorrect DB_PASS

The upgrade installer retains the existing value for DB_PASS (the password for DB_USER). It no longer resets DB_PASS to its default value.

47855,130907,131135 (1111535) - RFE: Customer requests append/prepend-only text field be supported in AccuWork Schema

Release 7.4 supports *read-only log entries* in an issue. If the administrator configures a Log-type issue field as read-only (by *unchecking* "Allow Users to Edit Existing Contents of Log") in the Schema Editor, then users can add entries to a Log field, but they cannot edit earlier entries in that field. For details, see *Schema: Read-Only Log Entries in an Issue* on page 15.

50023 (1113500) - GUI: Login failure due to bad password closes all tabs, which are not reestablished on valid login

If you are logging in to the AccuRev GUI after a session timeout, entering an *incorrect* password used to result in all the AccuRev tabs being closed. Now, entering the wrong password has no impact on the displayed tabs.

50024 (1113504) - GUI: Multiple login dialogs displayed after session timeout

This problem has been fixed. Only a single login dialog is displayed to the GUI user after a session timeout has occurred.

130855 (1116592) - New file in new directory doesn't inherit correct EACL setting

EACL support has been fixed so that a new directory and any files in it all correctly inherit the EACLs of the new directory's parent directory.

130906 - Holding down the up/down arrow key while in Stream History issues many server commands

In the AccuRev GUI, if you scroll through a history table by repeatedly clicking or holding down the up- or down-arrow key, now the GUI doesn't issue a server command until the scrolling has stopped and you have selected a row in the table. This reduces the number of commands sent to the server and improves performance.

130935 - GUI sometimes hangs on double-click of merge or patch icons in the change palette

The GUI no longer hangs if you repeatedly click the Merge or Patch buttons in the Change Palette view.

130944,131278 - Output Client log requires administrator permission

The GUI log file, *accurev.log*, is now written to the user's *.accurev* profile directory so that administrator privileges are not required to write to the file.

130949 (1116807) - GUI using wrong "from" version when file has both workspace and deep overlaps

This erroneous behavior was caused by a defect related to the **Include Deep Overlaps** checkbox in the GUI's Conflicts view -- Previously, if you *unchecked* that checkbox, you had to click **Refresh View** to get the display to change. That defect has been fixed in release 7.4.

130959 - issuediff returns incorrect file names and issue content for snapshots and no name for eids only in xlink hierarchy

In previous releases, issuediff returned incorrect results for snapshot streams, and *stat -e* failed to find the names of elements that only exist in the xlink hierarchy by element ID. Both of these defects have been fixed in release 7.4.

131014,131267 - GUI: Patching tracking issue into destination when already included versions exist results in incomplete issue

Before release 7.4, patching a tracking issue into a destination resulted in an incomplete issue if some of the tracked issues were in the source stream ("already included"), but not the destination stream, prior to the patch. This problem has been fixed in 7.4.

131026 (1116936) - server_admin_trig - addmember passes group information in new XML layout

server_admin_trig has been updated to correctly process group information passed in for the mkgroup, ismember, addmember, and rmmember commands. The relevant trigger parameters are:

principal

AccuRev username of the person invoking the command. Also, for (addmember, rmmember), <add> or <remove> elements can contain additional <principal> subelements, which specify group members to be added or removed.

user

(mkuser**,** chuser, chpasswd, ismember) The AccuRev user being operated on. For (ismember), <user> can specify the name of an AccuRev user *or group*. **NOTE:** If the name of an AccuRev *group* is modified, the XML input for server_admin_trig actually has <command> set to *"chuser"* and <*user*>

set to the name of the group being modified. (Renaming a user and renaming a group are identical operations to the AccuRev server.)

group

The AccuRev group being operated on. For (addmember, rmmember), which can modify multiple groups, the <group> elements are contained in a single <*groups*> element.

131027 (1116942) - mkrules doesn't work when a Windows client sends element locations with Windows slashes to a Linux server

This defect has been fixed. On a Linux platform, the AccuRev server now converts Windows slashes to POSIX slashes when processing XML input for a mkrules command.

131066 - eacl history erroneously contains ignored elements

A history of EACL transactions no longer includes ignored elements. It includes only elements that were actually processed with a new EACL permission.

131153 - Direct revert does not populate stream1 preop trigger input

The Revert Change Package operation now correctly populates the "stream1" input of server_preop_trig.

131196 - Change Palette should not require already resolved twins to be resolved again

In cases where a file name already exists in the destination of a patch, the Change Palette in issue mode used to mark the element as a twin even if the patch included the resolution for the twin. In 7.4, the patch or merge of the issue into the destination can be done without needing to resolve the twin a second time.

131274 - Merge window always inserts an LF in the yellow-highlighted conflicted line of result

When there are conflicts in a merge, the GUI displays a yellow-highlighted blank line until the user chooses which of the conflicting changes to take. If the user does not take any of the conflicting changes, but instead manually types text over the yellow line, releases prior to 7.4 used to terminate that line with a LF character even if the files being merged had CRLF line endings.

In release 7.4, the GUI uses a line-end character (LF or CRLF) that matches the one in the first line of the left side of the merge.

131295 (1117390) - GUI: Too small font in plain text fields in 7.3

The font size for plain text fields in issues has been increased in the 7.4 GUI.

131316 (1117474) - Resolving overlap introduces variants in backing stream unnecessarily

AccuRev 7.4 does a “rebased merge” to resolve overlap. This keeps track of overlap resolution details without creating variants of the issues. See *Eliminating Issue Dependencies and Variants Created By Merges* on page 16 for details.

131325 (1117505) - setParentRelationshipRequired action not working as expected during workflow transition

A defect fix in release 7.3 resulted in validation actions being applied properly during workflow transitions to ensure that the destination stage of each workflow transition represents a valid issue as defined by the

schema's validation actions. However, the server validated parent/child relationships in the opposite direction from users' intuitive expectations.

In 7.4, the server's validation of parent/child relationships has been reversed to align with customer expectations, so validation works as expected during workflow transitions.

131351 - GUI: Create/Open Issue often throws java.util.ConcurrentModificationException

A coding error that was introduced in the 7.2 GUI has been fixed in 7.4 to resolve this problem.

131352 (1117645) - RFE: GUI: Add URL/HTTP link to file properties

In the GUI, the file context menu now includes a new item: **Copy URL to Clipboard**. Such a URL can be sent to another user, who can then view the file after logging into the AccuRev WebUI. For more information, see *URL/HTTP Links for Files* on page 20.

131390 - Dual-pattern merge should not be treated as trivial merge - Always use gnu diff3 for determining if a 3-way diff involves only trivial changes

Release 7.4 uses the GNU diff3 tool to determine if a three-way diff involves only trivial changes.

131391 - If a patch is multi-segment and the first segment is a simple checkout, the first segment might not be included in the final result

This defect has been fixed in 7.4 so that all segments are included in the final result of a patch operation.

131411 (1117745) - RFE: Host client-side triggers on server; download at execution time

AccuRev 7.4 supports hosting of client-side triggers on the AccuRev server; the triggers are downloaded to client machines at execution time. This allows administrators to manage client-side triggers at a central location on the server. See *Hosting Client-Side Triggers on the AccuRev Server* on page 14 for details.

131454 - File handle leak exists on server

The AccuRev server code had some file handle leaks related to its handling of temporary files. These leaks have been eliminated in 7.4.

131470 (1117972) - AccuRev allows user to click Promote without selecting an issue; error message is confusing

This problem in the Active Issues iew has been resolved in the 7.4 GUI. The **Promote** button is not enabled now until the user selects one or more issues to promote.

131503 - Add file name to the putconfig trace-event messages

When a *putconfig* event notification message is posted due to an issue schema change, that message now includes the name of the resource file that was modified (schema.xml, logic.xml, lists.xml, layout.xml, etc.).

131568 (1118009) - Error message in client upgrade log on Windows: 'Cannot run program "C:\Program": CreateProcess error=2, ...'

This problem has been fixed in the 7.4 installers.

131608 - In a ptext-type file, trivial merge converts "LF" newlines to "CRLF" newlines

A trivial merge operation no longer converts LF to CRLF in ptext files.

131626 (1118464) - Server hangs when cpkremove is run and server is configured with triggers

This problem was caused by a deadlock. The deadlock scenario has been eliminated in 7.4.

131640 (1118481) - AccuRev Client should run on MacOS Catalina Release 10.15

AccuRev 7.4 supports the macOS Catalina 10.15 platform.

131699 - “oldValue” not displayed in Schema Editor (except when editing condition)

The GUI’s Schema Editor now correctly displays “oldValue(fieldname)” in the Validation tab and in the Edit Logical Expression dialog.

131700 - WebUI doesn’t display new field value of " " after update via modifyIssue.xml

A “refresh” of the WebUI now correctly displays the updated, blank value of a Text- or Log-type field after modifyIssue was executed to set the field value to ‘ ‘ (a single space).

131702 - WebUI: Typing into a disabled or read-only issue field causes the Save button to be enabled even though field value does not change

This defect has been fixed in 7.4. Trying to type into a disabled or read-only field no longer enables the Save button.

131703 - WebUI: setRequired fails if issue initialization sets field to empty (none selected)

This defect has been fixed. The 7.4 WebUI now correctly executes setRequired(fieldname) validation actions or workflow actions when the schema initializes the named field to empty (none selected).

131736 (1118725) - Update UNIX extras rsyncAccuRev and autoRestoreAccuRev to work in a Pulse configuration

The **rsyncAccuRev** and **autoRestoreAccuRev** tools have been updated in 7.4 in the following ways:

- **autoRestoreAccuRev** now shuts down WebUI/ before running the **maintain restore** command, and then it starts up WebUI/ again afterward. (If WebUI/ were up, the open connection between Pulse Code Review and PostgreSQL would prevent the **maintain restore** from running.)
- **autoRestoreAccuRev**'s argument to **inotifywait** now uses both MOVED_TO and CLOSE_WRITE.
- **rsyncAccuRev** now pushes only the "*accurev backup"* file created instead of the entire directory content of ***<ac-install>***`/storage/site_slice/backup`. It also provides an option to backup the `postgresql.conf` file.
- The RSYNCoptions variable is now generated at run-time so that the RSYNCexclude variable is properly interpreted
- The example *.cnf files used by these two shell scripts have been updated.

131740 (1118744) - RFE: Script to determine the Linux setting for shared_buffers and effective_cache_size

Prior to 7.4, you could run "`free -m | awk '/buffers.cache/{print $4}'`" on a Linux system to estimate the amount of free physical memory. However, the output format for free(1) has changed, making that method unusable. AccuRev 7.4 provides a new bash script, ***<ac-install>***`/extras/unix/bin/ac_free`, which computes the shared_buffers and effective_cache_size settings on Linux systems.

131818 (1118984) - pop -v "" -L ... crashes the accurev_server

Prior to 7.4, executing the **pop** command with the **-v** option set to the empty string caused the AccuRev server to crash. In 7.4, the server does not crash; the command results in the output message:

```
Unknown depot: (null)
```

131841,131872 (1119193) - The backing version is the regular ancestor, the tip version is the merge ancestor for deep overlap resolution

Beginning with release 7.4, in overlap or deep overlap resolution, the changes in the source (child) stream are merged into the changes in the destination (parent) stream. Therefore, the merged version's regular ancestor is the version in the parent stream, and its rebased-merge ancestor is the version in the child stream. See *Version Browser: New Rebased Merge Ancestry Line* on page 17 for more information.

131843 - Server: Enable deep overlap conflict resolution for defuncted elements

It is now possible to perform deep overlap conflict resolution for an element that is defunct in both the stream where the overlap exists and its backing stream.

131849 - GUI: Don't prompt the user to undefunct elements during Sync Stream wizard usage

During the Sync Stream operation, the GUI no longer asks the user if a defunct element should be undefuncted. This fix causes the element to be in the proper defunct state after the Sync Stream operation, and it eliminates creation of an extra version of the element.

131860 - NOTIFICATION_LEVEL (in acserver.cnf) now defaults to level 15

In a fresh install of release 7.4, the *acserver.cnf* file explicitly sets NOTIFICATION_LEVEL to 15. Also, the AccuRev server now uses a default level of 15 if no value is specified in *acserver.cnf*.

131876 - CpkDisplayDependency XML result is incorrect for issues with variants

The **CpkDisplayDependency** XML command, which retrieves detailed change package version dependency information, now correctly identifies all of the dependencies for issue variants. In the Issue Dependencies tab, the "Selected Issue Depends On Issue(s)" column in the lower pane now displays the correct contents even when the selected issue in the upper pane has variants.

131896 (1119206) - Allow stream property values to contain any character except the less-than sign

Stream property values can now contain any character except '<'. The following characters that used to be proscribed are now permissible:

```
>    "    '    &
```

131957 (1119407) - addmember message is incorrect

The **addmember** command now returns a confirmation message that correctly identifies the executed actions, whether they were adding members, removing members, or both adding and removing members.

Corrections and Changes to the Documentation

Please note the following corrections and changes to the AccuRev 7.4 documentation:

130484 (1115852) - AccuRev 7.2 install documentation for "effective_cache_size" - reference to free(1) no longer valid

Configuring Database Tuning Parameters on page 63 has been updated to suggest use of the new bash script `<ac-install>/extras/unix/bin/ac_free`, provided with 7.4, to compute the shared_buffers and effective_cache_size settings on Linux systems. (See issue 131740 above.)

131388 (1117025) - DOC: Update required to the Installation and Release Notes for 7.3 in terms of Pulse

The 7.4 documentation about installing Pulse states that all users designated as Pulse administrators should be assigned "full" license in AccuRev. Also, we have added a note that the SMTP settings for Pulse must match the SMTP server settings for the organization.

Known Issues

This section describes known issues in AccuRev, the AccuRev Web UI, and Pulse Code Review.

(1118961) GUI is rendered too small on a Linux machine with a 4K Monitor

The small rendering of the AccuRev GUI is caused by a setting in OpenJDK 8 that prevents the O/S from taking care of scaling. The user can switch the monitor to 1080P resolution to make the GUI appear larger.

AccuRev 7.3 Release Notes

This chapter describes changes and other information related to AccuRev 7.3.

Notes:

- **To ensure AccuRev's successful installation and optimal performance, install all applicable updates for your operating system before installing or upgrading AccuRev.**
- **If you are upgrading from an earlier release, we recommend that you install 7.3 over the existing AccuRev content.**
- **AccuRev clients from releases 6.2.0 through 7.2 can be used with the 7.3 server, but *only clients from 7.2 and later can be used to modify schemas.***

Discontinued and Deprecated Platforms

The following platforms are past end of life and are no longer supported as AccuRev platforms:

- Linux Fedora 26, 27
- Apple Mac OS X Yosemite 10.10
- Apple Mac OS X El Capitan 10.11

The following platforms are deprecated in AccuRev 7.3 and will not be supported in the next release of AccuRev:

- Linux Ubuntu 14.04.5
- Unix IBM AIX 6.x
- Unix IBM AIX 7.x

What's New in AccuRev Release 7.3

Highlights of new developments in AccuRev 7.3 are captured here. The following sections describe the new Pulse Code Review feature, several enhancements to the AccuRev GUI, and some new Unix tools for backup and restore.

Pulse Code Review

AccuRev 7.3 provides an exciting new way to do code reviews. AccuRev is now integrated with Micro Focus Pulse, a web-based application, and together, they enable users to easily perform code reviews on AccuWork issues (change packages). This section gives an overview of how Pulse Code Reviews work.

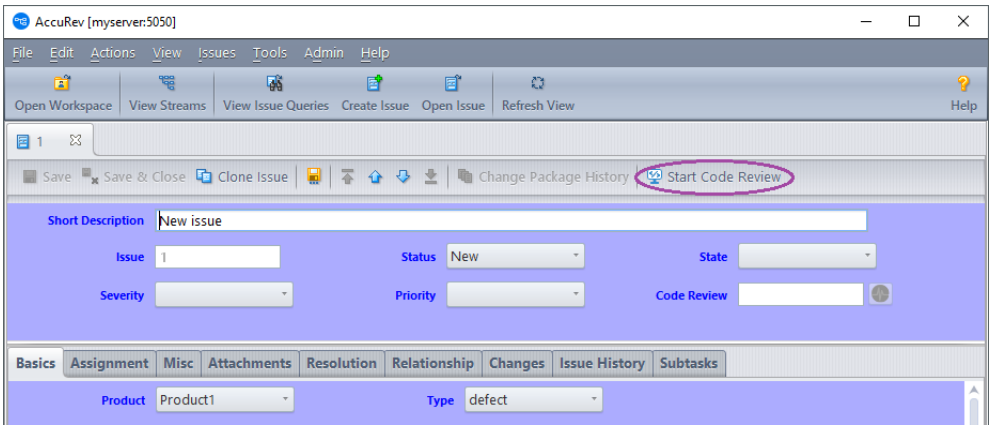
Code Review can be enabled on a per-depot basis. Before users can work with Pulse Code Reviews, the site administrator must configure AccuRev with Pulse. For instructions, see *Configuring AccuRev with Pulse Code Review* on page 50.

Additional information about using Pulse Code Review is available in the *Pulse Code Review FAQ* on page 101.

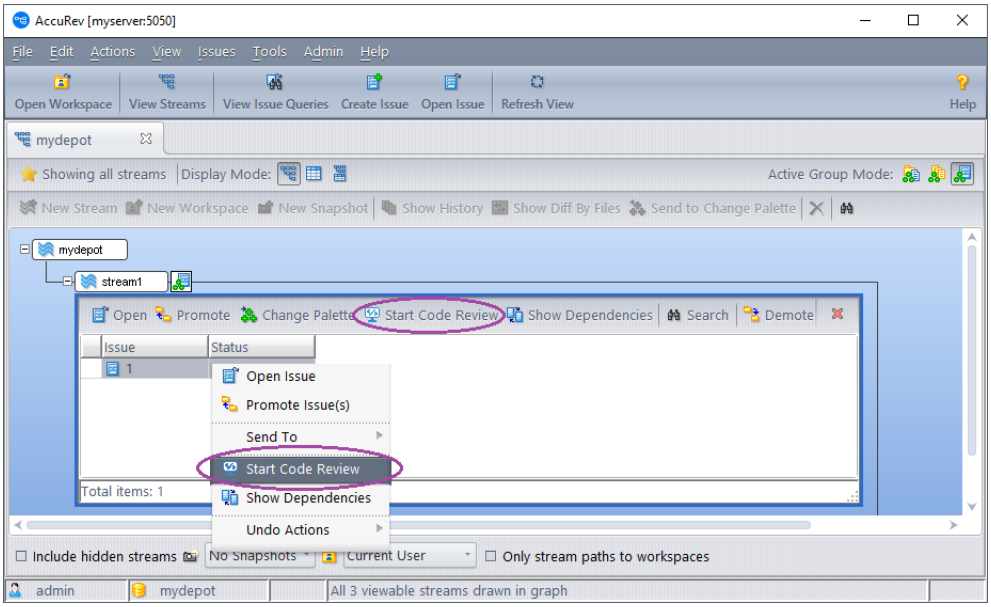
Creating Code Reviews in the GUI

Code Reviews can be created from several different places in the AccuRev GUI:

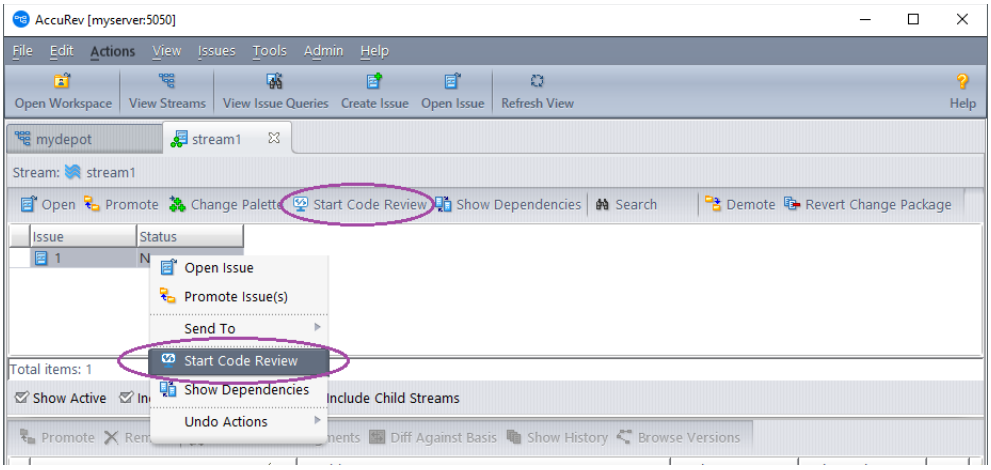
1. In AccuWork's issue form (toolbar):



2. In the Stream Browser's Active Issues default group (toolbar and context menu):

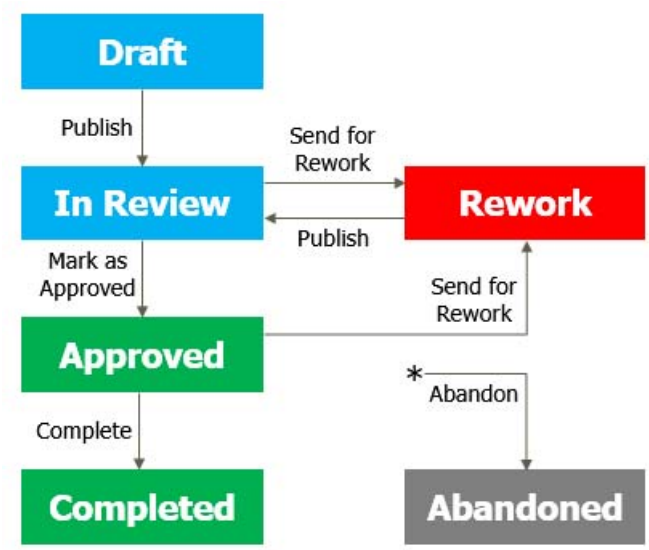


3. In the Show Active Issues view (toolbar and context menu):



Code Review States

A Pulse Code Review can be in one of several states. Those states and the transitions between them are shown here:



The states are:

- **Draft**: The review is being modified by the user who is the author.
- **In Review**: The review has been published. Reviewers can add comments and vote on the review.
- **Approved**: The review's changes have been accepted.
- **Rework**: The review has been sent back to its author with suggestions for improvement.

- **Completed**: If there are no problems, the **Approved** review is normally marked as **Completed** by the author.
- **Abandoned**: A review can be changed to **Abandoned** at any time by an administrator. The review is closed and removed from circulation.

Updating Existing Code Reviews

Each AccuWork issue (change package) can have only one Pulse Code Review. The code review initially contains the change package's transactions as of the time the code review was created. (Change package transactions can be viewed in the issue's **Change Package History** in AccuWork). As additional transactions (e.g., **Promote**, **Send to Issue**) involving the change package occur, users can update the code review in Pulse:

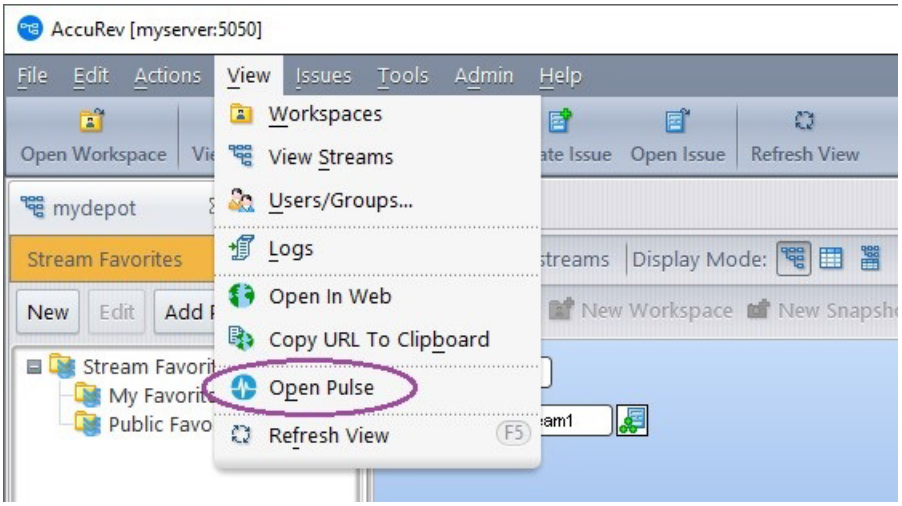
- If a code review is in **Draft** state (unpublished), it can be updated any number of times.
- If a code review is **In Review** or **Approved**, it must first be sent for **Rework** before it can be updated.
- If a code review is **Completed** or **Abandoned**, it can never be updated. Changes should be moved to a new issue to be reviewed.

In AccuWork, the **Start Code Review** button/menu item changes to **Update Code Review** for issues that already have a code review associated with them.

Accessing Pulse

There are several ways you can access Pulse to view and edit code reviews:

1. Open `http://myserver:8080/pulse` in a browser.
2. Select **Open Pulse** in the AccuRev GUI's top-level **View** menu:

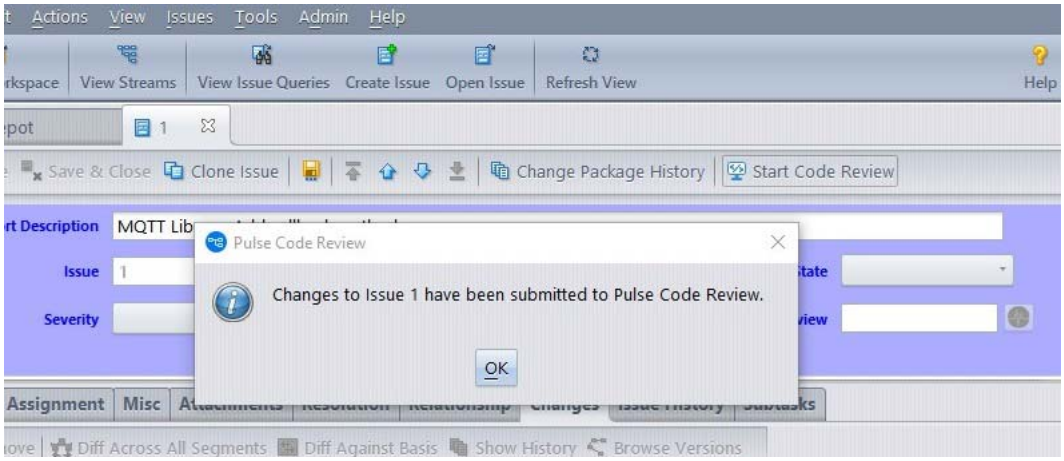


3. When viewing an AccuWork issue that has an associated code review, click the Pulse button next to the **Code Review** field to open the default browser directly on that code review:

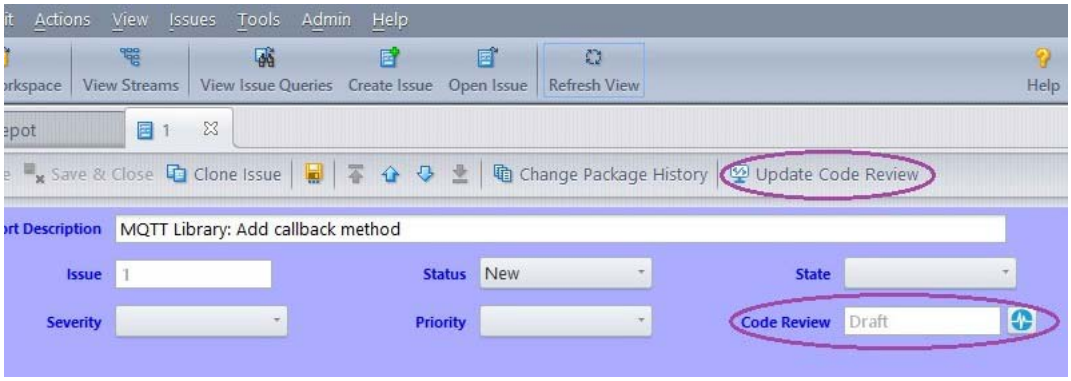
Use your AccuRev credentials to login to Pulse.

Example: User Logan Creates His First Pulse Code Review

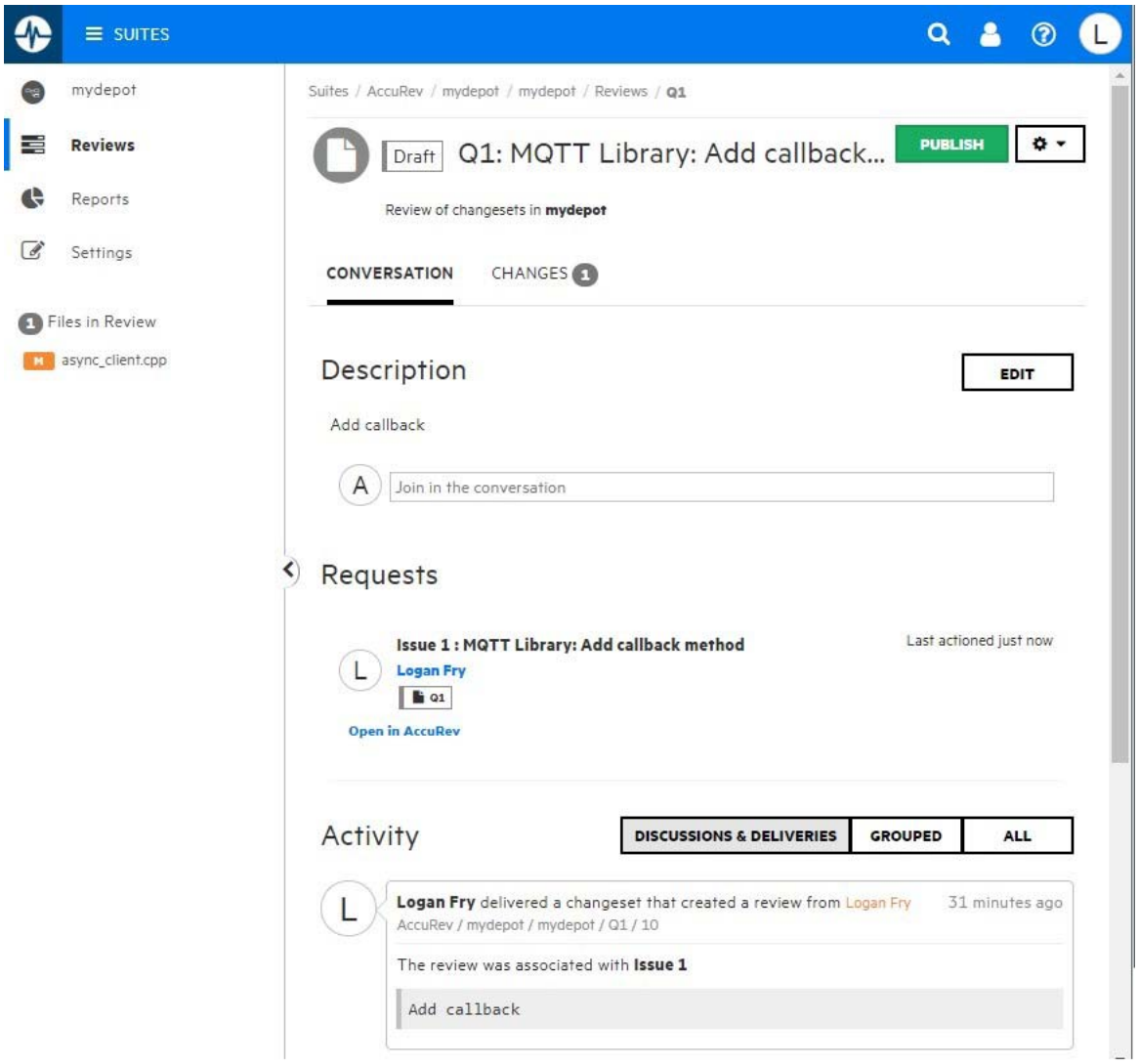
1. Logan modifies an existing file, promotes it to issue #1, and clicks **Start Code Review:**



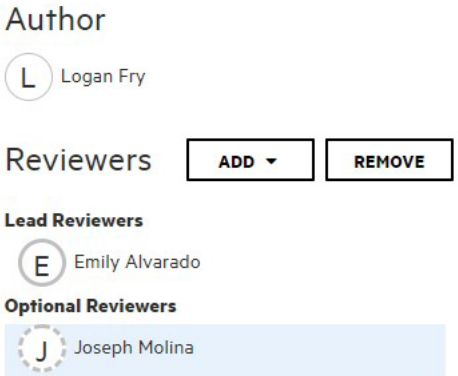
2. He clicks the **Refresh View** button and sees that the code review is in **Draft** state, and the **Pulse** button is enabled. (You might need to allow a few moments for the code review to be created):



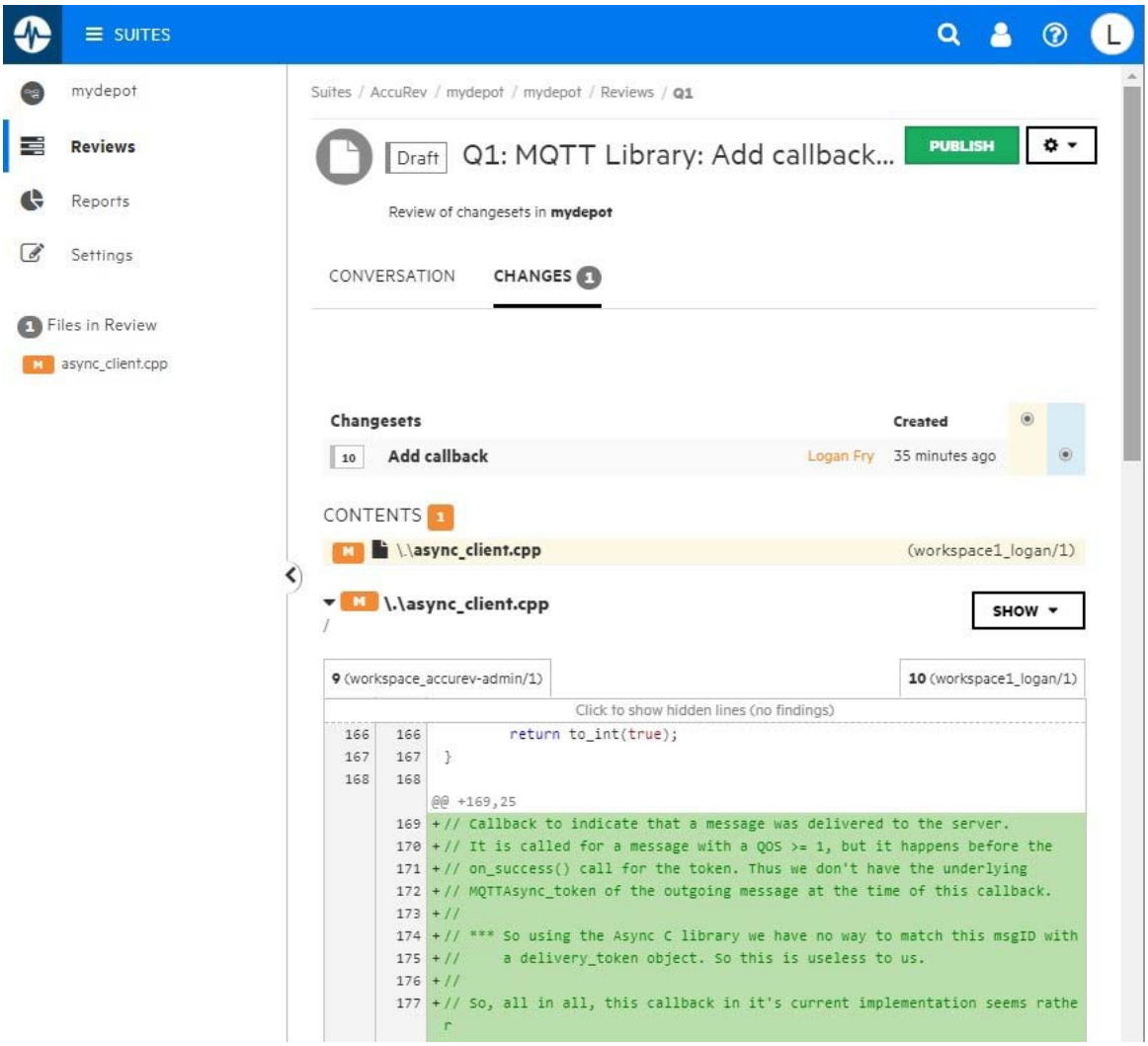
3. Logan clicks the **Pulse** button, logs in to Pulse, and the code review is displayed:



4. Logan adds Emily and Joseph as reviewers:



5. Then he looks over his code changes:



6. Finally he clicks **Publish**. The review is now **In Review**, and that state is reflected in the associated AccuWork issue.
7. The review is now routed to Emily and Joseph for review. It will appear under **My Work | Reviews: Waiting on review** for both Emily and Joseph. If email notifications have been enabled, they will receive an email notifying them that a review has been published for their review.

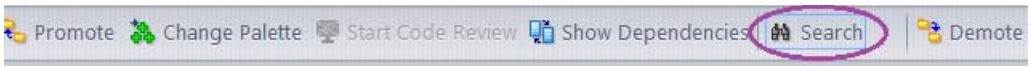
Pulse Documentation

To learn more about Pulse, refer to the online help -- available through the question mark icon in the upper right corner of every Pulse web page -- or view the information directly at:

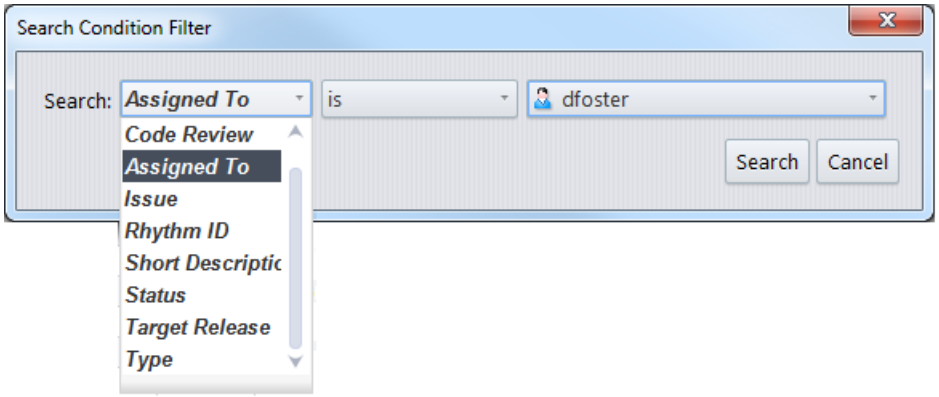
`http://myserver:8080/pulse-doc/AccuRev_MF_Pulse_User_Guide.pdf`

GUI: Filtering Active Issues by Field Values

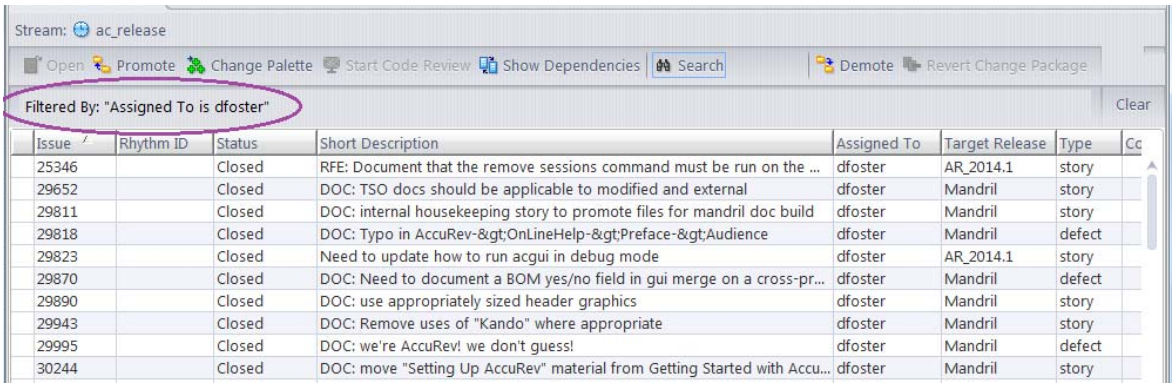
AccuRev 7.3 allows you to filter active issues so that you can quickly focus on the issues that interest you. The AccuRev GUI has a new **Search** button in the Active Issues views that enables filtering of active issues tables by field value:



In the Active Issues tab or in the Stream Browser's Active Issues default group, clicking the **Search** button displays the **Search Condition Filter** dialog. There you can enter a search condition based on any issue field that is displayed in a column of the issue table:

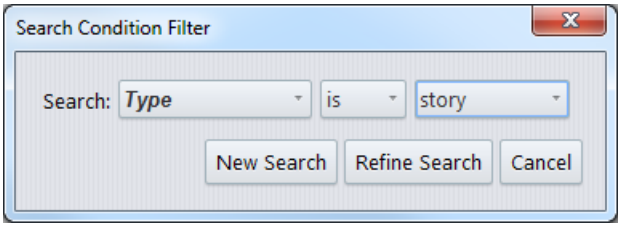


When you click the **Search** button in the dialog, the GUI displays only those issues that satisfy the specified condition. The search condition is displayed above the table:



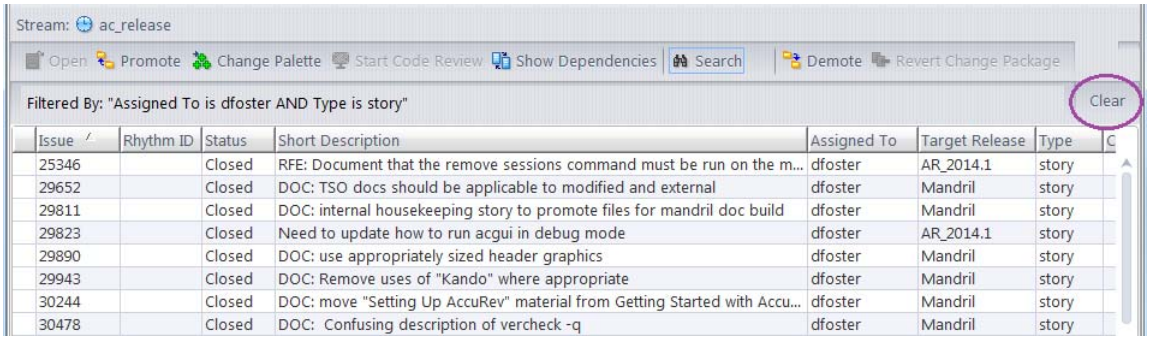
Issue	Rhythm ID	Status	Short Description	Assigned To	Target Release	Type	Cc
25346		Closed	RFE: Document that the remove sessions command must be run on the ...	dfoster	AR_2014.1	story	
29652		Closed	DOC: TSO docs should be applicable to modified and external	dfoster	Mandril	story	
29811		Closed	DOC: internal housekeeping story to promote files for mandril doc build	dfoster	Mandril	story	
29818		Closed	DOC: Typo in AccuRev->OnLineHelp->Preface->Audience	dfoster	Mandril	defect	
29823		Closed	Need to update how to run acgui in debug mode	dfoster	AR_2014.1	story	
29870		Closed	DOC: Need to document a BOM yes/no field in gui merge on a cross-pr...	dfoster	Mandril	defect	
29890		Closed	DOC: use appropriately sized header graphics	dfoster	Mandril	story	
29943		Closed	DOC: Remove uses of "Kando" where appropriate	dfoster	Mandril	story	
29995		Closed	DOC: we're AccuRev! we don't guess!	dfoster	Mandril	defect	
30244		Closed	DOC: move "Setting Up AccuRev" material from Getting Started with Accu...	dfoster	Mandril	story	

If you click **Search** again, you can refine the search by specifying an additional search condition:



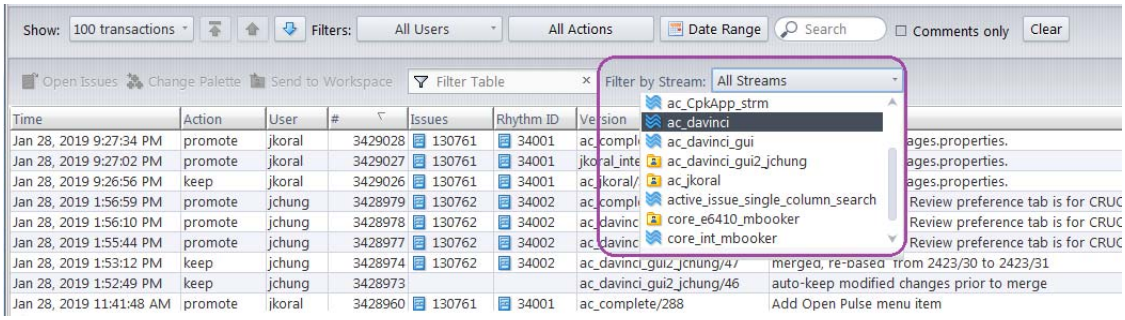
You can click **Refine Search** to further refine your original search, or you can click **New Search** to start a fresh search using just this new search condition.

To end the search and return to seeing the full issue table, just click the **Clear** button:

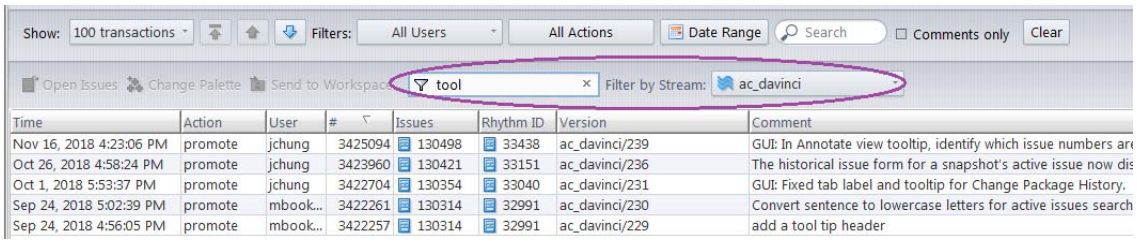


GUI: Filtering History by Stream

Another new filtering option available in Release 7.3 is the ability to filter a History table by stream. The **File History** and **Depot History** views in the GUI include a new **Filter by Stream** dropdown that lists all the streams that are referenced in the full (unfiltered) History table. If you select a stream in the dropdown, the GUI displays only the table rows for versions in that stream. This allows you to more quickly find transactions that interest you.



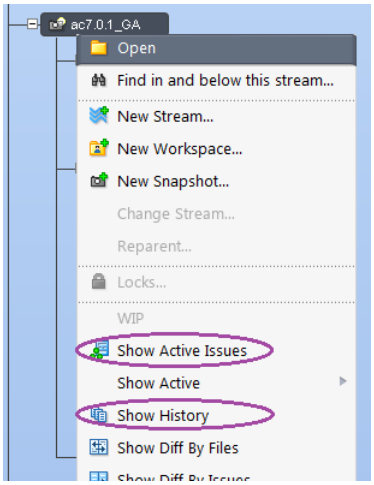
Filter by Stream can be used in conjunction with the History table's comment filter (the filter control labeled **Filter Table**) to zero in on specific transactions:

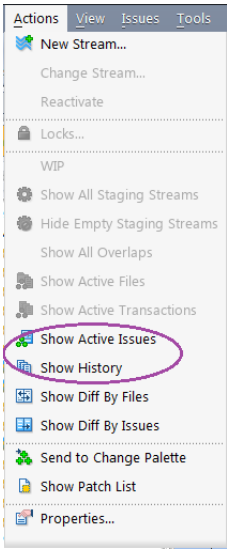


Clicking the **Clear** button or **Refresh View** clears the table's comment and stream filters. Changing the number of transactions or the user or action filters for the History view also clears the comment and stream filters.

GUI: New Operations for Snapshot Streams

The 7.3 GUI now supports the frequently used commands **Show Active Issues** and **Show History** for snapshot streams. These commands are available in the stream context menu, as well as in the **Actions** menu in the Stream Browser toolbar:





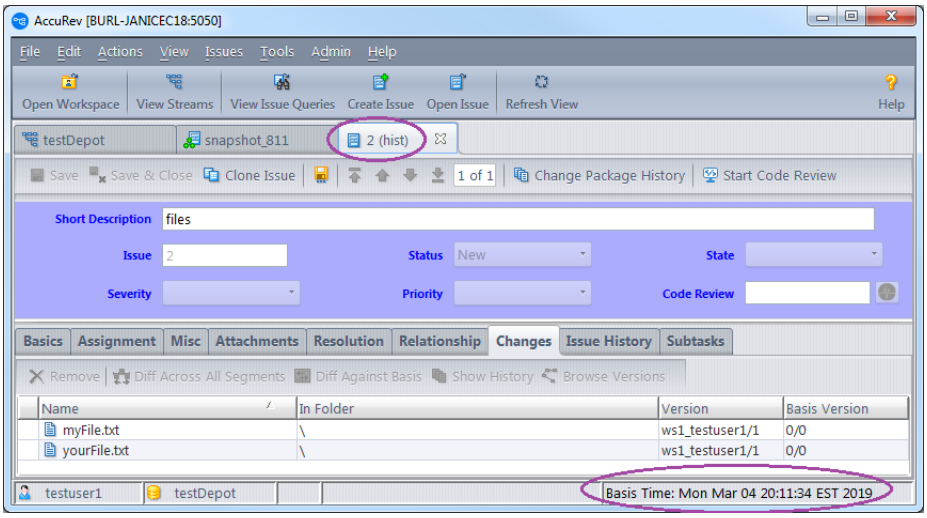
Show Active Issues for Snapshot Streams

The **Show Active Issues** command answers the question "Was issue X fixed in this particular stream/release?" If you execute **Show Active Issues** for a snapshot stream, the GUI displays an Active Issues tab that lists all the issues that were active in the snapshot stream's backing stream at the snapshot's basis time. This tab is just like the Active Issues tab for a regular, dynamic stream; you can click on an issue in the top pane to see the contents of the change package in the bottom pane. You can also open an active issue to see what its contents were *at the snapshot's basis time*.

Notes:

- The Stream Browser does not display Default Group icons for snapshot streams.
- In the Active Issues tab for a snapshot stream, the **Open Issue** command in an issue's context menu is replaced by **Open Historical Issue**. Also, the tooltip for the **Open** button is "Open Historical Issue" instead of "Open Issue".

- If you execute **Open Historical Issue**, the GUI labels the issue tab with the issue number followed by "(hist)", and it displays the snapshot stream's basis time in the lower-right corner. These serve as reminders that you are looking at the issue's contents as they were at a time in the past; field values may have changed since then.



Show History for Snapshot Streams

For users who do not use change packages in AccuRev, the **Show History** command answers the question "Was this fix included in the snapshot?" Executing **Show History** for a snapshot stream shows you the transactions that were executed in the snapshot's backing stream up until the snapshot's basis time.

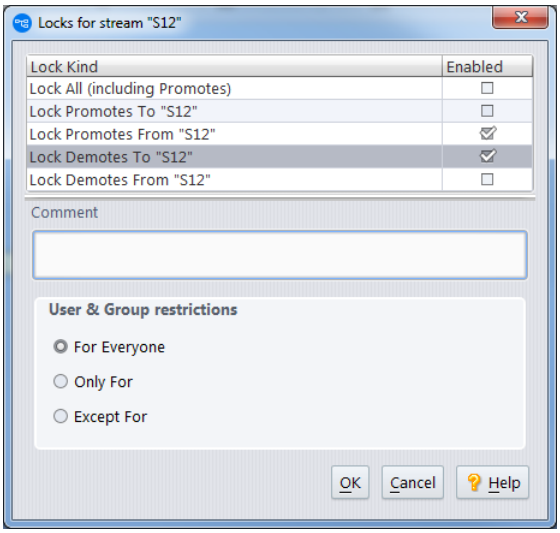
GUI: Demote Locks

Release 7.3 extends the **lock** command to control Demote operations, in addition to Promotes, include/exclude, and the ability to modify the stream's settings.

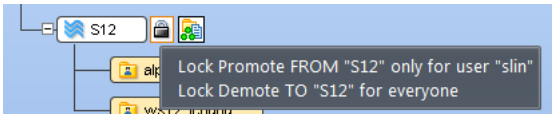
The CLI **lock** command has two new **-k** options to prevent demote-to and demote-from actions:

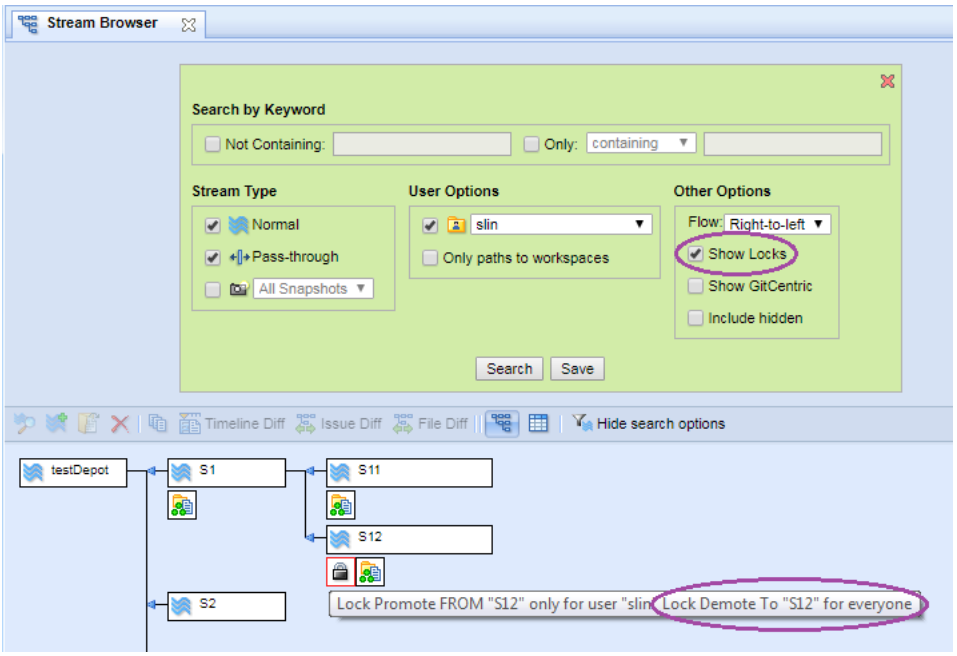
- **-kdt** option: Prevents demotes to the stream. Versions cannot be added to the stream's default group via a **demote** from the backing stream.
- **-kdf** option: Prevents demotes from the stream. Versions cannot be removed from the stream's default group via a **demote** from the stream to a child stream or workspace.
- With no **–k** option at all: Creates an "all" lock, which prevents demotes to and from the stream, promotes to and from the stream, purge, incl/excl/incldo, and chstream operations on the stream.

In the GUI's Stream Browser, the Locks dialog contains two new checkboxes for **Lock Demotes To** and **Lock Demotes From** the stream:



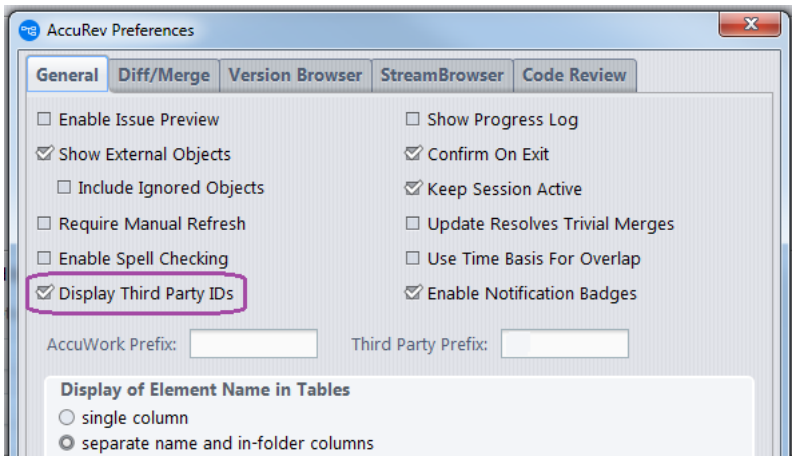
Demote locks are visible in both the GUI and the WebUI:





GUI: Displaying Third Party Issue IDs

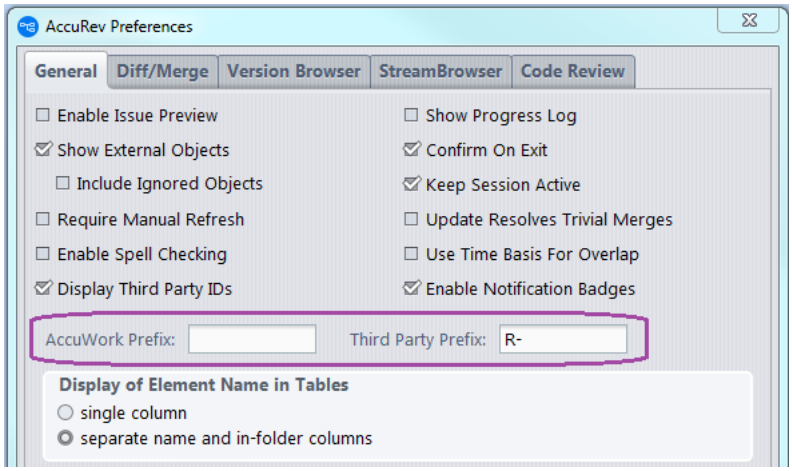
When working in a depot whose schema defines a third-party issue field (via the **3pty ITS Key** dropdown in the Schema Editor), users can now specify preferences about when and how third party issue IDs are displayed in the GUI:



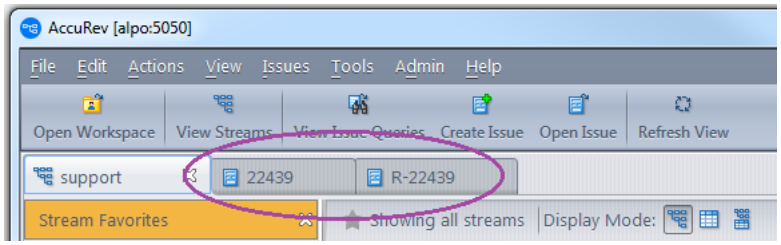
The **Display Third Party IDs** preference indicates which IDs should be shown when the GUI displays issue IDs in a *non-tabular* format, e.g., in AccuWork tabs and Version Browser issue boxes. (In tables of issues, the column headers indicate the kind of issue IDs that are shown.)

If the **Display Third Party IDs** checkbox is checked *and* an issue has a third-party ID assigned to it, then the GUI displays the third party ID for that issue; otherwise, the GUI shows the issue's AccuWork ID.

If some issues have third party IDs and some do not, it can be hard to know whether the ID you see is an AccuWork ID or a third party ID. The **AccuWork Prefix** and **Third Party Prefix** preferences address that problem. Users can specify different prefixes that will distinguish AccuWork IDs from third party IDs.

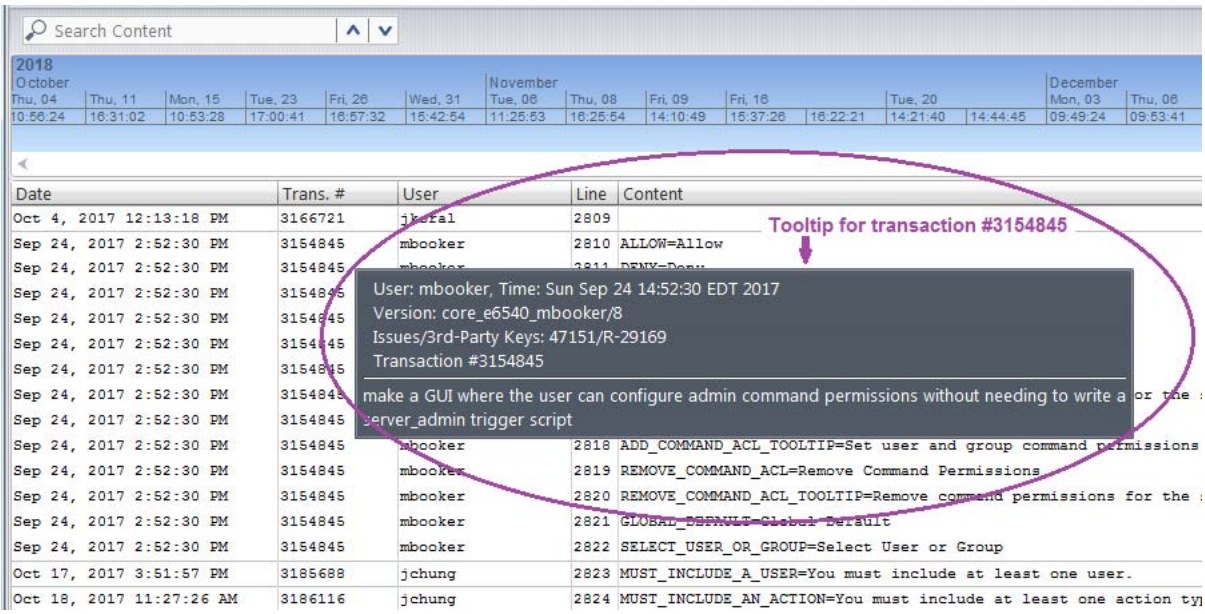


Here is an example that shows how types of issue IDs are distinguished by their prefixes (or lack thereof):

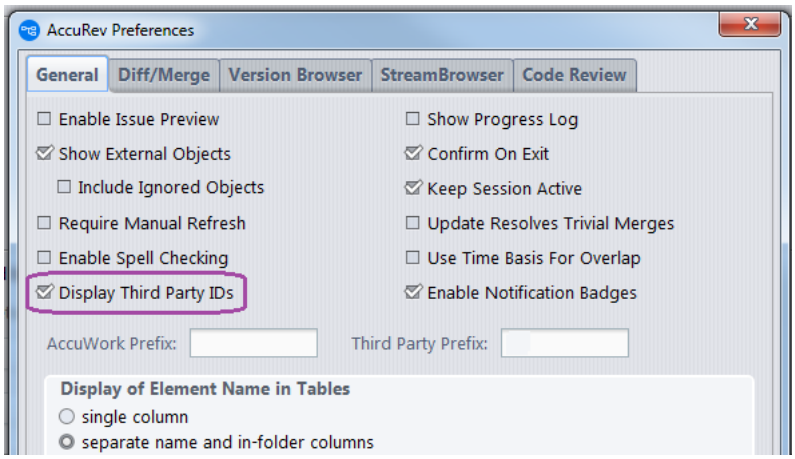


GUI: Transaction Details in the Annotate Tab

In Release 7.3, the GUI's **Annotate** tab makes additional information available to the user. The tooltip for each line in the **Annotate** view now displays all the version information that is visible in the GUI's Version Browser: transaction information, including real version numbers and comment text, and change package information. The tooltip appears if you hover the mouse over the "Trans. #" column of the table, and it disappears after about five seconds or if you move the mouse out of the transaction column.



The tooltip can be configured to display either just AccuWork issue IDs, or both AccuWork issue IDs and third party ITS keys. You can configure this with the AccuRev GUI preference called **Display Third Party IDs**. (See *GUI: Displaying Third Party Issue IDs* above on page 97.)



If the **Display Third Party IDs** checkbox is *unchecked*, issue numbers are displayed in the Annotate tooltip as a single line starting with the prefix "Issues:", followed by a comma-delimited list of AccuWork issue numbers. For example:

Issues: 30724, 31989, 40028

If **Display Third Party IDs** checkbox is *checked*, issue numbers are displayed in the Annotate tooltip as a single line starting with the prefix "Issues/3rd-Party Keys:", followed by a comma-delimited list of AccuWork/third-party ID pairs. For example:

Issues/3rd-Party Keys: 30724/49115, 31989, 40028/31729

(AccuWork issue 31989 has no associated third-party key in this example.)

Note: Prefixes can be configured for the AccuWork and/or third party issue IDs using the **AccuWork Prefix** and **Third Party Prefix** fields in the **AccuRev Preferences** dialog.

New Unix Extras: rsyncAccuRev and autoRestoreAccuRev

Release 7.3 includes two new Unix tools that make it easier to backup and restore an AccuRev server: **rsyncAccuRev** and **autoRestoreAccuRev**. These tools can be found in `<ac-install>/extras/unix/bin/`.

rsyncAccuRev

rsyncAccuRev allows an AccuRev administrator running on a UNIX/Linux OS to back up an AccuRev Server or AccuRev Replica either to a remote machine or to a local file system on the same machine. Backing up to the same machine does not provide good disaster recovery, unless the backed up drive is removed and stored elsewhere or it is backed up itself. Backing up to a remote machine is more useful; the remote machine could be a file server that itself is backed up, or it could be a test or hot fail AccuRev server.

Connections to a remote server are via ssh(1). The machines involved should have already exchanged ssh keys in order to prevent prompts to enter passwords. (Search the web for "ssh key exchange" to get further information about this.)

How to Use and Set Up rsyncAccuRev

Start by copying the file ***<ac-install>***`/extras/unix/bin/rsyncAccuRev` to a directory that is already in the Linux/UNIX OS user <ac-user>'s PATH. Then run "`rsyncAccuRev -m`". This will output a man(1) page detailing the tool's functionality, use and configuration.

As with other Micro Focus/AccuRev-provided scripts, there is a section of the file that you can customize - See the "CUSTOMIZE ME" section and the variables with the setting of "change me". You can also choose to set the variables via the command line, or more conveniently by providing an input file. In this last method you would run "`rsyncAccuRev -c yourLocalConfigurationFile`" to run a backup. Example input files are found in ***<ac-install>***`/extras/unix/`. The files named `rsyncAccuRev-local.cnf` and `rsyncAccuRev-remote.cnf` can be copied and modified for your site's configuration.

At execution time, if any variable is still set to "change me", the **rsyncAccuRev** script exits without creating a backup.

Sample Output

Here is a sample of output from the command: `rsyncAccuRev -c rsyncAccuRev-remote.cnf -m` (The text on the right side explains each line of output.):

```
Fri Jun 15 08:54:00 EDT 2018 -"Run Time Configuration" Configuration AccuRev 7.2 (2018/04/24)
 ACCUREV_ROOT          : /opt/accurev         == Where AccuRev is installed
 BACKUPserverUser      : acserver             == User running the backup on this machine
 BACKUPserverType      : remote               == Type of backup
 BACKUPserverMachine   : 192.168.49.82        == Machine to backup to if BACKUPserverType = remote
 BACKUPserverDirectory : /AccuRev-backup      == Destination file system of the backup
 BACKUPmetaDataFilename: backup-5-Friday.md   == AccuRev backup filename
 BACKUPincludeCNF      : true                 == Include the acserver.cnf and acclient.cnf files?
```

autoRestoreAccuRev

autoRestoreAccuRev can be used in conjunction with **rsyncAccuRev**. It enables an AccuRev admin to automate the restoration of an AccuRev backup file that **rsyncAccuRev** has created and pushed to a remote test/fail-over/disaster recovery (DR) machine.

When **autoRestoreAccuRev** detects a newly created PostgreSQL custom database dump file in the ***<ac-install>***`/storage/site_slice/backup` directory, it executes the following sequence of steps:

8. Shut down the AccuRev client process
9. Restore the PostgreSQL database dump file
10. Reconfigure the PostgreSQL parameters for the test/fail-over/DR machine
11. Start the AccuRev client
12. Run "`accurev info`" and "`accurev show streams`"

Pulse Code Review FAQ

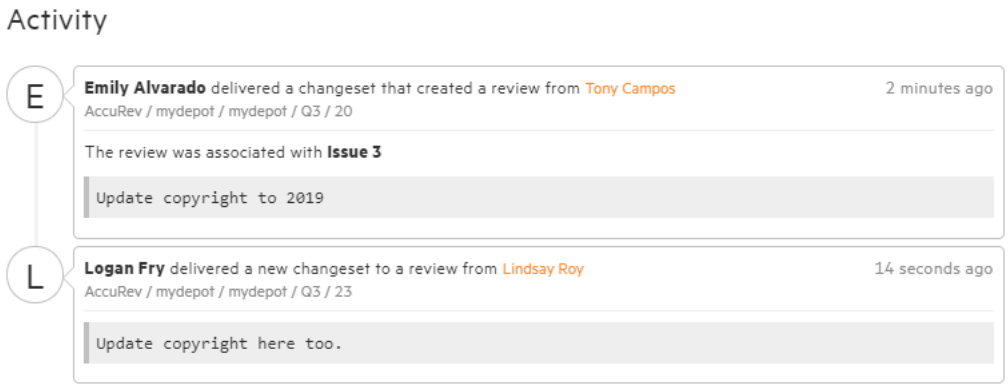
In this section we present answers to some frequently asked questions about Pulse Code Review.

Q: Who can start (or update) a Pulse Code Review?

A: Any user who can access the depot, stream and/or issue can start (update) a Code Review.

Q: How can I tell who created (or updated) my Code Review?

A: In the Activity section of the review, you can see who committed what changes to the review:



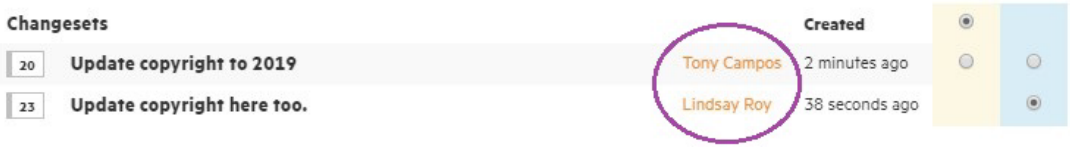
In this case, Emily started the code review, and the author of the transaction was Tony. The code review was then updated by Logan, and the author of that transaction was Lindsay.

Q: When adding reviewers to a Code Review, why don't I see all AccuRev users listed?

A: AccuRev users must have logged into Pulse at least once to be available as a reviewer. It's possible the user you are looking for has never logged into Pulse. A Pulse administrator can see which users have logged into Pulse.

Q: Can Code Reviews contain changes from multiple users? How can I tell which user made which change? If there are multiple contributors, who is the owner of the review?

A: Yes, Pulse Code Reviews can contain changes from multiple users (just as an AccuWork issue can contain transactions from multiple users). The author of the change will be listed next to each transaction in the review:



The owner of the Code Review will be the author of the first transaction. In this case, the owner is Tony.

Q: How do my depot and element ACLs work with Pulse? I don't want users to see code that is restricted in AccuRev.

A: Pulse Code Reviews respect all ACLs. Elements that are part of a review will not appear for users that do not have access. It is possible a review will appear empty if the user does not have access to any element. It is up to the author to select appropriate reviewers who have access to the elements of the code review.

Q: How are removed versions represented in a Code Review? We regularly remove versions of elements from our issue change packages, via the GUI and via the CLI cpkremove command.

A: When versions are removed from a change package, the elements do not disappear from the Code Review. Rather, they are marked as **CPK Removed** with a strike through the element name. Removing a version constitutes a distinct transaction in the Change Package History, and it is represented as a distinct changeset in the Pulse Code Review.

Q: Does the "Code Review" tab in the AccuRev GUI's Preferences dialog pertain to Pulse Code Review?

A: No, the GUI preferences for Code Review relate only to Crucible Code Review (a third party product). There are no GUI preferences or settings relating to Pulse Code Review (a Micro Focus product that is bundled with AccuRev 7.3 and later).

Q: In the Requests section where I see information about my issue, what issue fields are displayed? Can I change which fields are displayed?

A: The Requests section displays information about the associated issue. It also contains a link to open the issue in the WebUI. The issue information that is displayed comes from these four default schema fields:

These defaults are specified in the following properties defined in ***<ac-install>***`/pulse/conf/startup.properties`:

```
accurev.request.title.fieldname=shortDescription
accurev.request.body.fieldname=description
accurev.request.createdby.fieldname=assignedTo
```

You can specify different issue fields (except for issueNum) by editing the `startup.properties` file. For example, if your company prefers to display the user who created the issue rather than the user to whom the issue is assigned, you can just change the last line shown above to:

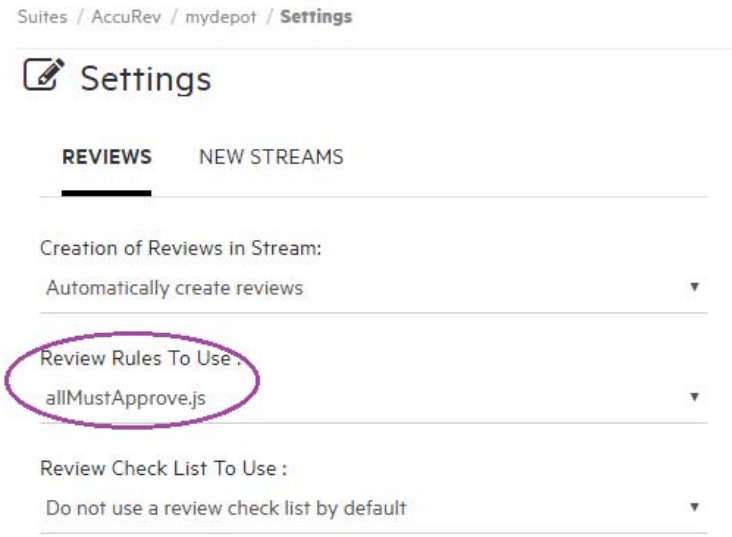
```
accurev.request.createdby.fieldname=submittedBy
```

Note: These settings are global for Pulse and must be made by a system administrator. They are not specific to an AccuRev server or to a depot.

Q: How can I control the voting on reviews and whether reviews are automatically approved or rejected?

A: Pulse defines four different "rules" to control this logic. Pulse administrators can configure different rules for different depots. The four rules available are:

- **defaultRule.js -** approve/reject based on first reviewer's opinion
- **leadsOnly.js -** approve/reject based on first lead reviewer's opinion
- **majorityDecides.js -** approve/reject based on majority of reviewers' opinions
- **allMustApprove.js -** approve if all reviewers like it (i.e., approve); send for rework if any reviewer doesn't like it (i.e., requests changes)



Q: How can I use the Code Review state to control which issues get promoted through my stream hierarchy?

A: For streams that have workflow rules defined, the Code Review state can be incorporated into stream entry or exit rules in order to restrict issue promotion to only those issues that have passed code review.

The Code Review state can also be queried in the **server_preop_trig** trigger to restrict issue promotion.

Changes in AccuRev Release

AccuRev Release 7.3 includes the following new features and bug fixes.

> **Note:** In the issue titles below, issue IDs outside parentheses are issue numbers in the AccuWork issue tracking system. Issue IDs inside parentheses are issue numbers in the SupportLine system used by Customer Care.

13552 (1103394) - GUI: In Version Browser, Save As and Open operations are disabled for binary files

The **Save As** and **Open** operations in the Version Browser are now enabled for binary files.

34379 (1094937) - RFE: Ability to filter element history by stream

When viewing an element's history in the GUI, the user can use the new **Filter by Stream** control to select the stream whose transactions should be displayed in the history table. Transactions in the element's history that occurred in other streams are hidden from view. For further information, see *GUI: Filtering History by Stream* on page 93.

36104 (1097007) - RFE: The Annotate tool of the Java GUI should show transaction details

In the GUI's Annotate view, placing the mouse cursor over the "Trans. #" column now displays details about the transaction for that row. The display includes AccuWork issue numbers and third-party ITS keys associated with transactions. See *GUI: Transaction Details in the Annotate Tab* on page 98 for further information.

36440 (1097546) - RFE: Request for mechanism to limit AccuWork file attachment size

The server_preop_trig trigger now fires for the **putfile** command, and these additional parameters are supplied for **putfile**:

- file_name: the name of the attachment file
- file_size: the size of the attachment file (in bytes)

37000 (1114205) - Core: Flaw in server's EACL logic can cause "Access denied" result for name command if elements have been moved

Prior to 7.3, if an element had been moved, but a directory that *used to be* in the element's path was not accessible to a user due to EACL settings, then the user did not have access to the element. This defect has been fixed in 7.3. EACLs of directories that are no longer in an element's path no longer affect the accessibility of the element itself.

38682 (1100634) - GUI: AccuWork required field dialog box too small

The maximum width of the **Required fields** dialog has been increased.

38754 (1095942, 1099798) - RFE: Add a trigger that will disallow users to perform a move or rename

The server_preop_trig trigger now fires for the **move** command,

45143 (1108569) - GUI: Promote from Issue Dependencies tab not working

In Release 7.3, users can now promote issues from the Issue Dependencies tab. Only one of the context menu items -- **Promote Issue(s)** and **Promote Issue(s) with All Dependencies** -- is enabled, depending on whether the selected issues have any dependencies or not. If the selected issues have dependencies, the user is NOT given the option of promoting without dependencies.

46618 (1109968) - RFE: Restrict access to Schema Editor by Depot and Principal/User

The depot name has been added as a parameter to the server_admin_trig trigger. (The principal and IP address were already being passed to the trigger.) This additional information allows denying access to the Schema Editor based on depot and principal.

47038 (1110531) - RFE: Add support for Demote locks

Release 7.3 includes support for locks on the Demote-to and Demote-from operations. See *GUI: Demote Locks* on page 95 for further information.

47588,129256 (1111390) - Example server_admin_trig.pl needs updating for addmember and rmmember changes

The **addmember** and **rmmember** CLI commands can modify multiple groups (as of Release 7.0). The example server_admin_trig.pl file has been updated to process a <groups> XML element instead of a <group> element for the **addmember** and **rmmember** commands.

50282 - WebUI: filterByRelatedGroup - Wrong user list is displayed in user field when related group field is changed to empty group

If a group field and a user field in an issue are related by the filterByRelatedGroup validation action, then manually setting the group field to an empty group now correctly results in the user field getting set to an empty dropdown.

80984 (633869, 1106848) - Can’t merge ptext-type elements with Twin Status Resolution Wizard

The Twin Status Resolution Wizard can now be used to merge ptext-type elements.

81547 - Promoting an issue into a stream via change palette fails if the destination has defuncted element in backing hierarchy

Cross-promoting an issue into a stream used to fail if any of the elements in the issue were not visible in the destination stream because they had been defuncted in the stream’s backing hierarchy. This defect has been fixed in Release 7.3.

81558, 130435 (1114130) - GUI doesn’t display stream background color set via setproperty command

This defect has been fixed. "**accurev setproperty -r streamStyle"** can be used to set the background color of a stream and have that color be visible in both the GUI and the WebUI.

81559 (1113892) - hist command to find all dispatch transactions hangs

Due to performance improvements made in Release 7.3, a **hist** command to find all dispatch transactions no longer appears to hang.

81565, 130479, 130626 (1113231) - Issue operations are slow in AccuRev

Server code for query execution has been modified to optimize processing of schema files and to eliminate an unnecessary lookup of third party issue keys. GUI code for query execution and opening issues has also been optimized, resulting in increased speed and decreased memory usage on the client machine.

In addition to providing better performance for issue queries, Release 7.3 includes a defect fix related to what happens when the user manually collapses a parent issue in the results table and then re-expands it:

- In Release 7.2, the GUI responded by displaying *all* of the parent issue’s subtasks, regardless of whether they satisfied the issue query. That involved sending an additional command to the server.
- In Release 7.3, the GUI displays only those subtasks that satisfy the issue query. No additional server commands are issued.

81589 - Sync should succeed on (defunct)(overlap)(member) file which resolved twin

In AccuRev 7.2, the Sync Stream wizard could not resolve defunct files that were in an overlap state. Users had to undefunct those files and promote them to the stream being synchronized before invoking the Sync Stream wizard. In AccuRev 7.3, the Sync Stream wizard has been updated to handle overlap resolution of defunct files as part of the normal sync process. It is no longer necessary to undefunct files before invoking the Sync Stream wizard.

81595 - RFE: Add filtering to GUI's Active Issues view

In Release 7.3, the Active Issues default group and the Active Issues tab include a new **Search** button, which enables the user to filter the table of issues by field value. For more information, see *GUI: Filtering Active Issues by Field Values* on page 92.

81602, 130308 - RFE: Implement Show History and Show Active Streams for snapshot streams

See *GUI: New Operations for Snapshot Streams* on page 94 for a description of these two new operations for snapshot streams.

129360, 130606 - GUI, WebUI: Unchanged timestamp field should not be modified when issue is saved either in a different timezone or after changing the values of other fields

Prior to Release 7.3, the value of a timestamp field with a granularity greater than seconds (i.e., minute, hour, day, month, year) was modified whenever the issue was saved (1) in a different timezone or (2) after changing the value of other fields. This defect has been fixed in both the GUI and the WebUI of Release 7.3.

129361 - In File Explorer, merge against backing stream fails if workspace version has status (defunct)(overlap)(member)

A file is said to be in a state of "defunct overlap" if it has been defuncted in a workspace and then another user has modified the file and promoted that change to the backing stream. In AccuRev 7.2 and earlier, the only way to resolve defunct overlap was to execute a three-step process:

13. Undefunct the file from the command line.
14. In Conflicts mode of the GUI's File Browser, merge the overlap changes into the workspace.
15. Re-defunct the file in the workspace and promote.

In the AccuRev 7.3 GUI, executing Merge from the File Browser's Conflicts tab automatically takes care of resolving the overlap of defunct files, in the same way that normal overlap is resolved. Additional manual steps are no longer necessary.

129364 (1100421) - RFE: GUI: Ability to deselect a stream in the Stream Browser

The user can now click on the Stream Browser's background in order to deselected a selected stream.

129425, 129956 - Eliminate issue dependencies for Merge

1. During a Merge (or Patch) operation in File Mode, AccuRev now automatically assigns merged (or patched) versions to change package variants of the issues associated with the merged-from (or patched-from) versions.

2. A related change has been made in the GUI's Promote dialog to handle scenarios in which multiple files are being promoted out of a workspace, with some of those files being the result of a Merge or Patch operation.

   The Promote dialog includes a new checkbox labeled "Use selected issue(s) for unaffiliated changes only":

   - The checkbox is unchecked by default. In this case, AccuRev assigns every version being promoted out of the workspace to the issue(s) selected for the Promote operation.
   - If the user clicks (checks) the checkbox, this reduces the creation of issue dependencies by allowing AccuRev to intelligently assign only new (unassigned) versions to the issue(s) selected for the Promote operation. Any version that was previously assigned to another issue remains assigned to only that other issue when it is promoted out of the workspace.

129554, 130607 - RFE: Provide a simple way to allow access to only one stream in a depot

In Release 7.3, it is easier to give users access to a single stream while denying access to all other streams in the depot. If an administrator assigns for a set of users an inheritable "none" ACL to the depot, along with a non-inheritable "all" ACL to a particular stream in that depot, then those users can create workspaces under (or reparent existing workspaces to) that specified stream and have full access to the stream's contents. In addition, those users have access to any snapshot streams that are directly under that stream. However, they cannot access any other streams in the depot.

Essentially, snapshot streams and workspaces assume the same ACL as their backing streams (unless an ACL has been explicitly set on the workspace).

129615 - Installer: Install Azul OpenJDK instead of Oracle JDK

As of Release 7.3, AccuRev installers (both server and client-only installers) install Azul OpenJDK instead of Oracle JDK. The version that is installed with AccuRev 7.3 is Azul OpenJDK 1.8.0_192.

129741 - For StarTeamMerge, the same change made in both versions should not be considered a conflict

As of Release 7.3, if identical line additions or changes were made in both versions of a file, StarTeam Merge considers this a trivial merge instead of a conflict.

129788 - RFE: Enable Send To => Issue command for stranded files

In the GUI's File Browser, **Send To => Issue** is now enabled in the context menu of stranded elements.

129850, 130218 - Adding lines in merge resolution window for a ptext file always inserts LF endings even if file is windows CRLF format

Prior to Release 7.3, if a user merged a ptext-type file and entered new lines (either empty lines or lines containing text) in the merge resolution window of the AccuRev merge tool, then AccuRev inserted UNIX-style LF line endings in the file even if the rest of the file contained Windows-style CRLF line endings. In Release 7.3, AccuRev inserts line endings that match those used in the rest of the file.

129851 - Sometimes GUI appears to hang when bringing up StarTeam merge tool

Prior to 7.3, under certain circumstances, the StarTeam merge tool could be drawn in an invisible part of the screen, making it appear that the GUI had hung. This defect has been fixed in 7.3. Now the GUI ensures that the StarTeam merge tool is always drawn in a visible portion of the screen.

129880 (1114841) - WebUI hangs on Create Issue if new-issue validation logic sets a Timespan field that was defined pre-7.2

This defect has been fixed in Release 7.3. It is now possible to create an issue using the WebUI, even if the new-issue validation logic sets the value of a Timespan-type field that was defined in a release prior to 7.2.

130065 - RFE: WebUI: Shouldn't allow concurrent execution of multiple issue queries

The WebUI now displays a modal progress dialog while an issue query is executing. This prevents the user from executing multiple queries concurrently (intentionally or not).

130332 (1115456) - Silent installs fail for full installer

Running the full installer in console mode with the **-r** option now generates a complete, correct response file. A subsequent silent install referring to that response file now properly processes the file and completes successfully.

130359 (1115486) - CLI: pop -L resulting file path too long

Prior to 7.3, if a directory path being created by **pop** was exactly 248 characters long, creation of the path failed, and files under that path were not populated. This defect has been fixed in Release 7.3.

130650 - Workspace Update operation is very slow

Database queries done for the Update operation have been optimized in Release 7.3, making the operation complete much more quickly.

130652 - A tracking issue should be considered complete if all of the changes it is tracking are already in the stream

If all of the versions being merged into a stream by a tracking issue are already in the target stream, the actual "merge" version that is assigned to the tracking issue is now considered "Already included" in the stream, and the tracking issue itself is considered complete. The tracking issue is considered incomplete only if one (or more) of the versions being merged is missing from the stream.

Corrections and Changes to the Documentation

Please note the following corrections and changes to the AccuRev 7.3 documentation:

130647 (1116194) - Installation instructions should specify "Run as administrator" for 'maintain migratepg' command

The installation instructions for 7.3 now correctly state that Windows users should start a CMD window with "Run as administrator" privileges in order to execute the **maintain migratepg** command. This prevents "Access is denied" errors from occurring.

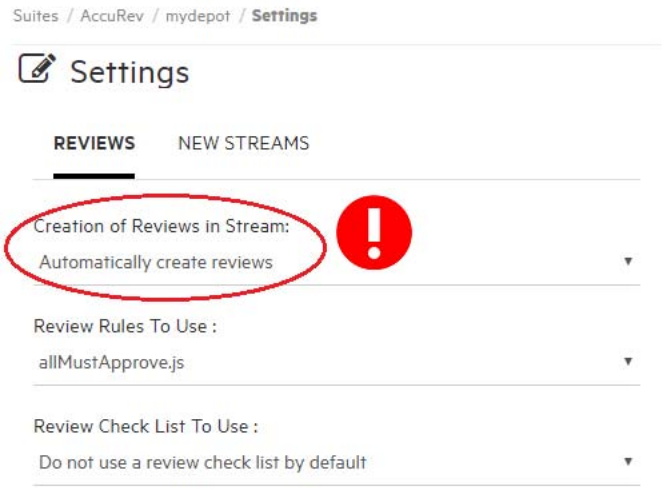
Known Issues

This section describes known issues in AccuRev, the AccuRev Web UI, and Pulse Code Review.

Pulse setting "Creation of Reviews in Stream" must not be changed

Pulse administrators may notice the **Creation of Reviews in Stream** setting in the products (depots) and streams. This setting defaults to "Automatically create reviews" and it should **NEVER** be

changed. If the value is changed, the integration of Pulse with AccuRev will no longer function. If the value is changed and change package transactions are subsequently sent to Pulse (via **Start Code Review** or **Update Code Review**), those transactions can never be made part of a review.



Non-author can create a code review, but then cannot view it in Pulse

AccuRev allows users other than the author of a code change to create a review. If the creator of a code review is neither the author of the change nor a Pulse administrator, then the creator will not be able to see the code review in Pulse. The author of the code change, however, can view the code review and add reviewers to it.

No email notification for creation of a Pulse code review

Pulse does not support email notification for code review creation events. So if a code review is created by someone other than the author of the code changes, the author will not receive an automatic notification that the code review exists. The code review will be visible, in **Draft** state, in the author's list of reviews in Pulse; the author can then add reviewers and publish the review.

Change package variants are ignored in Pulse code reviews

Pulse code reviews currently ignore variants of a change package. If a multi-variant change package is sent for code review, only the base variant (0) is sent for review.

AccuRev 7.2 Release Notes

This chapter describes changes and other information related to AccuRev 7.2.

Notes:

- **To ensure AccuRev's successful installation and optimal performance, install all applicable updates for your operating system before installing or upgrading AccuRev.**
- **If you are upgrading from an earlier release, we recommend that you install 7.2 over the existing AccuRev content.**
- **AccuRev clients from releases 6.2.0 through 7.1 can be used with the 7.2 server, but *only 7.2 clients can be used to modify schemas.***

Discontinued Platforms

Beginning with AccuRev Release 7.2, the Microsoft Windows 8 platform is no longer supported. This is consistent with our directive to install all applicable updates to your operating system before installing AccuRev. Applying all updates to a Windows 8 platform upgrades it to a Windows 8.1 platform.

Linux Fedora 25 is also no longer supported. Packages in the Fedora 25 repositories no longer receive security, bugfix, or enhancement updates.

What's New in AccuRev Release 7.2

Highlights of the new developments in AccuRev 7.2 are captured here.

AccuRev Git Client

AccuRev 7.2 introduces a new client -- the AccuRev Git Client -- that works by using native Git commands to interact with the AccuRev server. The client can be invoked via the Git command line or via third-party Git GUI applications. This new client allows Git users to work within an existing AccuRev infrastructure to pull and push changes from an AccuRev stream, just as the AccuRev GUI and command line client work with **update** and **promote** commands.

The AccuRev Git Client is installed by the AccuRev client-only installers for 64-bit Windows, 64-bit Linux, and macOS 10.13+ platforms. The installer does not install the native Git program; that must be done separately.

Note that no installation or configuration changes to the existing AccuRev server are required in order to use the AccuRev Git Client. Furthermore, all triggers, ACL, EACL, locks, and user access functionality work with the new Git client in the same way they work with the AccuRev GUI (acgui), command line, and WebUI.

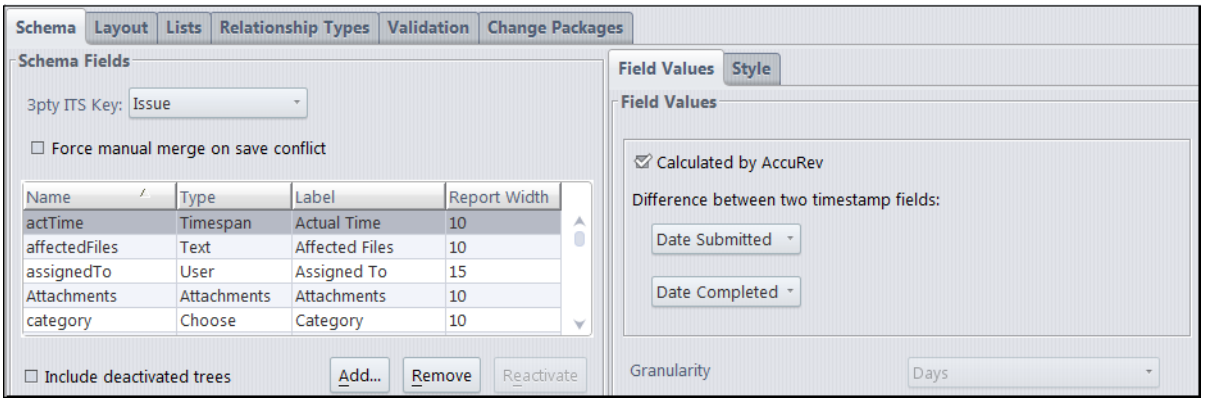
For detailed information, consult the `AccuRev_Git_Client_Release_Notes.pdf` document in the *`<ac-install>`*`/doc/` directory (installed by the AccuRev client-only installer).

Calculated Timespan Schema Field Type

A new type of schema field called “calculated timespan” dynamically calculates the time difference either between two timestamp fields or between a timestamp field and the current time. Such a field can be viewed and used in issues, active issues tables, issue queries and results, validation conditions and actions, and workflow conditions.

The Timespan field type can be used to define either an “editable timespan” field or a “calculated timespan” field in the schema editor. The editable timespan field type was available prior to 7.2. It allows you to type in any non-negative numeric value and choose a granularity of days or hours for the value. If you enter an integer value (e.g., 45), it is automatically converted to a decimal (45.0).

To create a *calculated timespan* field, check the **Calculated by AccuRev** checkbox and choose the two timestamp fields whose difference will be reflected in the calculated timespan value.



Here are some important notes about calculated timespan fields:

- They are read-only. You cannot type a value into a calculated timespan field.
- The granularity for a calculated timespan field is automatically set to days.
- The value of a calculated timespan field in an issue is updated when an issue is first displayed and whenever the issue is saved.
- If a timestamp field associated with a calculated timespan field does not have a value, the current date and time are used in its place for the calculation. The value of the calculated timespan field is then fluid, i.e., it is recalculated by AccuRev each time the issue is displayed or refreshed.
- If a calculated timespan field is synchronized to a third-party issue tracking system (ITS), its value will be static on that system. This conflicts with the potential fluidity of the calculated timespan field’s value. For this reason, **calculated timespan fields should not be used with AccuSync, Micro Focus Connect, and other synchronization products.**
- The expansion of the existing Timespan field type to support calculated timespans imposes the following constraint: **Pre-7.2 AccuRev clients cannot be used to make schema changes; *a 7.2 client must be used in order to modify a schema.***

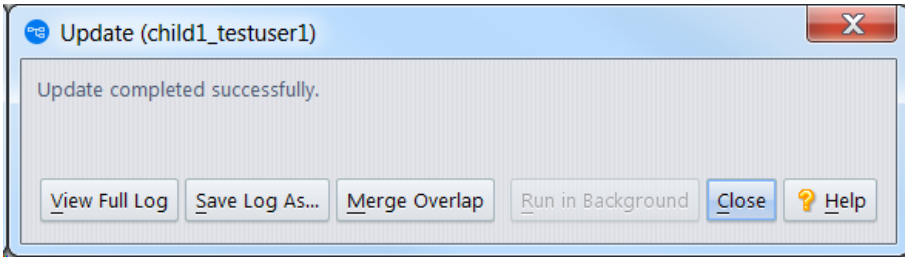
(subtwin) Element Status

Release 7.2 introduces a new element status called “**(subtwin)**”. An element has **(subtwin)** status if one of the directories in its path has **(twin)** status. Only one of the **(twin)** directories and its content can be

accessed through the pathname; the other(s) can be accessed through their unique element-IDs. To resolve **(subtwin)** status, the actual **(twin)** parent directory must be resolved by renaming and/or defuncting all but one of the twin directories.

Update Workspace and (member)(overlap) Files

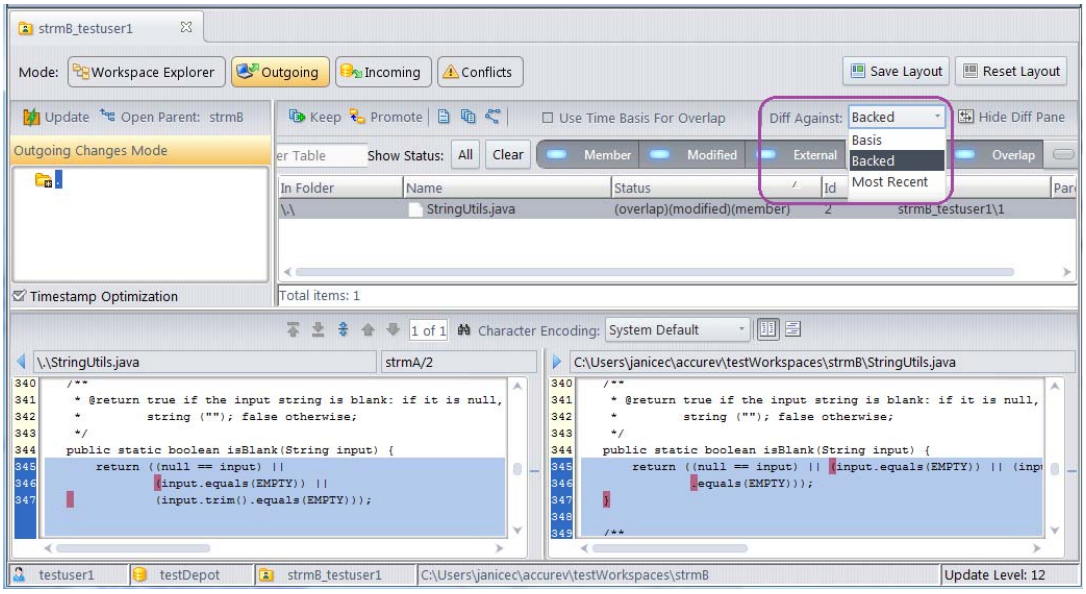
The **Update** operation has been expanded to support merging of files with (member)(overlap) status after the update has completed. A new **Merge Overlap** button has been added to the Update progress dialog:



The **Merge Overlap** button becomes active after the update completes, if there are only *non-twin* overlaps in the workspace. Clicking the button initiates a process of merging the overlapped files against the backing stream (equivalent to manually initiating a bulk-merge of the overlapped files). The user can opt to have trivial merges kept automatically. Non-trivial merges are always displayed in a graphical merge window so that the user can manually resolve conflicts.

"Diff Against" Dropdown Menu in Outgoing Mode

The File Browser has a new dropdown menu called **Diff Against** in Outgoing mode:



The **Diff Against** menu allows you to choose which version you want to diff your changes against in the Diff pane. The choices are:

- Basis - The version that you began your work with, i.e., the result of your most recent **Update** or **Promote** operation, whichever came later.
- Backed - The version of the file in the backing stream.
- Most Recent - The result of your most recent **Keep** operation. If you haven't done any **Keep**s, this is the basis version. (This option is not offered for a stream or an inaccessible workspace.)

Making a selection in this dropdown menu is equivalent to choosing among **Diff Against => Basis Version, Backed Version,** and **Most Recent Version** in the file context menu, except that the difference is displayed in the Diff pane of Outgoing mode instead of in a separate tab.

The dropdown menu defaults to the **Basis** value. However, you can change your default value by selecting a different value and then clicking the **Save Layout** button.

Merge GUI: Selecting Multiple Sources

The Merge tool now supports a more convenient way to include changes from multiple sources in a conflict section. Prior to 7.2, you had to hold down the **Ctrl** key while you clicked on conflict-resolution buttons (i.e., *Theirs*, *Common Ancestor*, or *Mine*) in the desired sequence. In 7.2, you click that same sequence of conflict-resolution buttons *without* holding down the **Ctrl** key. The buttons you clicked are displayed in the "on" state, and they are annotated with numbers to indicate the order that you selected:

You can remove any block that you added to the merged version by clicking the corresponding button again to turn it "off".

Notes:

- You cannot remove an inserted block once you've performed a manual edit because doing a manual edit resets all the conflict-resolution buttons to the "off" state.
- Any manual changes that you've made to a section will be overwritten if you return to that section and click a conflict-resolution button.

Changes in AccuRev Release 7.2

AccuRev Release 7.2 includes the following new features and bug fixes.

> **Note:** In cases where an issue is identified with two numbers, such as 10721 (1098410), the first number is the issue number in the AccuWork issue tracking system, and the second, in parentheses, is the issue number in the SupportLine system used by Customer Care.

16552 (1103468) - Annotate doesn't work if file has ever been binary

The **annotate** command now works properly on a text or ptext file whose file type was binary at some time in the past, as long as the file does not contain any binary data.

30839 (1103465) - In change palette, hitting Escape in the Promote dialog promotes file

Hitting the Escape key in the Promote dialog now closes the dialog and aborts the **Promote** operation.

34233, 49372, 49373 (1094833, 1111536) - RFE - AccuWork field type to calculate durations

Release 7.2 provides a new type of schema field called “calculated timespan”, which dynamically calculates the time difference either between two timestamp fields or between a timestamp field and the current time. Such a field can be viewed and used in issues, active issues tables, issue queries and results, validation conditions and actions, and workflow conditions.

See *Calculated Timespan Schema Field Type* on page 112 for further information on the calculated timespan field type.

> **Note:** The expansion of the existing Timespan field type to support calculated timespans imposes the following constraint: **Pre-7.2 AccuRev clients cannot be used to make schema changes; *a 7.2 client must be used in order to modify a schema.***

34448 (1095054) - Change Palette does not show twins

A new element status called “**(subtwin)**” has been defined to indicate that one of the element’s parent directories is a **(twin)**. See *(subtwin) Element Status* on page 112 for more information.

36022 (1096859) - Cursor entry point goes to second line when clicking into rich text field

This problem does not occur in Release 7.2. The rich text field control has been upgraded since this defect was reported.

37284 (1099323) - Running mkws on replica does not produce error for non-replicated depot

Prior to 7.2, the command "**accurev mkws**" on a replica machine would succeed even if the specified backing stream was in a non-replicated depot. (The workspace was not usable until the depot was replicated.) In 7.2, such a **mkws** command fails with an error message: "Unknown stream or ver spec".

37579 (1100233) - Web Interface: Clicking clock button next to text field label does nothing

The **Add Timestamped Text** control is applicable only to log fields, not to text fields. The button has been removed from issue text fields in the WebUI.

42485 (1105845) - AccuWork: On transition, "Required Fields" popup doesn't fill in AssignedTo field in main Issue panel

In 7.0 and earlier releases, as the user entered values in AccuWork’s Required Fields dialog, those values were reflected in the issue form behind the dialog. Due to a defect, however, if the required field was a User-type field, the value that was set in the Required Fields dialog was *not* shown in the issue form until the Save button was pressed.

This issue is not applicable to 7.0.1 and later releases. Now, values set in the Required Fields dialog are not shown in the issue form until the clicks the Save button in the dialog. The Required Fields dialog displays this text: "Please enter a value for each required field below. The values will be displayed in the issue form when you click Save."

46621 (611819, 1098982) - GUI: AccuRev is unable to update the acclient.cnf file in the AccuRev bin folder

Beginning with Release 7.1, the AccuRev install process places a template for acclient.cnf into the ***<ac-install>***/bin folder, and the AccuRev GUI then copies that file into each user's %ACCUREV_HOME%/.accurev (or $HOME/.accurev) folder. Placing the file in this folder enables modifications by non-admin users.

46827 (633941) - GUI should run Sync Stream wizard after reparenting a time-based stream

AccuRev now runs the Sync Stream wizard whenever a time-based stream is reparented, regardless of whether the time basis was removed or retained.

47475 - WebUI doesn't display issue field styling that is configured in the GUI

AccuRev 7.0.1 introduced schema field styling in the GUI. Individual fields can be styled in the schema editor. That styling is now visible in the WebUI.

47777 (633890) - Issue history doesn't track changing a field's value to none-selected or empty string

The issue history display now includes transactions in which a field's value was changed to be blank (formerly <none selected>).

48002 (633936) - WebUI: Issue history does not display old values of fields

The issue history display in the WebUI now displays both the old and new values of fields that have changed.

48333 (633939) - setValue in WebUI workflow does not work correctly when switched to English locale

AccuRev used to store locale-specific strings for "<none selected>" in workflows, schemas, and issues, and this caused problems for users who worked in different locales. In Release 7.2, locale-specific "<none selected>" strings have been replaced with a blank value (i.e., empty string). Please see Issue *49014 - <none selected> replaced by blank value in GUI and WebUI comboboxes*.

48349 (633937) - GUI: Issue history does not display if an issue field contains more than 84 multibyte Unicode characters

Issue history is now properly displayed even when a field contains more than 84 multibyte Unicode characters.

48420 (1112124) - AccuRev server dumps core when server_master_trig calls the setproperty command

There was an intermittent crash when broadcasting Mosquitto/MQTT notification messages to subscribers. This defect has been fixed in 7.2.

48442 - Query results exported from the WebUI in XML format are not properly formatted

The WebUI now converts spaces in field labels to underscores when it is exporting in XML format.

48534 (633935) - Use StarTeam diff tool to identify conflict if StarTeam merge tool will be used to resolve merge

In earlier versions of AccuRev, when versions being merged contained changes in adjacent lines of text, GNU diff identified this as a conflict while StarTeam Diff did not, and this caused the StarTeam merge tool to be invoked when there were actually no conflicts to be resolved. AccuRev 7.2 avoids this problem by using the StarTeam Diff tool to identify conflict whenever the user preference specifies that StarTeam be used as the merge tool.

In addition, 7.2 defines a new preference called "Auto-Keep Trivial Merges". Setting this preference means that, for all merge operations, an automatic merge will be done (i.e., the merge tool's GUI will not be displayed) if there are only non-conflicting changes between the two versions being merged. Clearing the preference means that the GUI will ask the user at the beginning of each bulk merge operation if trivial merges should be automatically resolved and kept.

48562 (633940) - GUI: Edit Query displays usernames instead of display names in User field dropdown

The Edit Query dialog now correctly uses the configured Display Property when displaying a User-type field and its dropdown. The same is true for the Query Parameters dialog (which allows the user to specify values for dynamic query parameters).

48563 (633938) - Error dialog is displayed repeatedly after opening version browser

This problem occurred because the selected number of transactions to display were all eacl transactions, so there was nothing to display in the version browser. This defect has been fixed by excluding from the version count those operations that have no corresponding version (eacl, defcomp).

48818 (633946) - Remove client backward compatibility

As of Release 7.2, the accurev.exe client cannot communicate with older AccuRev servers. Old clients can talk to new servers, but new clients cannot talk to old servers.

48828 (633945) - RFE: Allow the user to switch servers instead of upgrading a client

The Upgrade Client dialog now has three buttons: Download, Change Servers, and Exit GUI. As an alternative to clicking Download to upgrade the AccuRev GUI, the user can now click Change Servers to connect to a different AccuRev server (one that is compatible with the GUI).

48991 (633942) - null message in sync stream wizard failure panel

This defect has been fixed; the null message no longer appears.

48992 (633948) - Sync Stream wizard should not quit on encoding error

Failure during a trivial merge (for example, due to an encoding problem) no longer causes termination of the Sync Stream wizard. Instead, the file whose trivial merge failed is queued up to be displayed to the user during the manual merge resolution phase after all trivial merges have completed.

48993 (633944) - Resolving several backing overlaps in the workspace leads to unaffiliated changes

AccuRev's merge algorithm has been modified to avoid creating unaffiliated changes - it now identifies all of the issues that are being merged and automatically assigns the result to the appropriate issues.

49014 - <none selected> replaced by blank value in GUI and WebUI comboboxes

In both the GUI and the WebUI, the locale-specific "<none selected>" string in comboboxes has been replaced with a selectable blank value. The following areas are affected:

- AccuWork in the GUI and the WebUI - issue fields
- Schema Editor in the GUI - validation conditions and actions; change package triggers
- Workflow editing in the WebUI - workflow conditions, stage conditions and actions, transition conditions and actions
- Workflow execution in the GUI and the WebUI

  Note: In the WebUI, because of the typeahead filter feature for User-type fields, one must use a different technique to set a User field to blank: Simply click on the grey 'x' to the left of the triangle that opens the dropdown.

AccuRev Release 7.2 correctly handles newly created issues and workflows as well as existing issues and workflows that have locale-specific "none selected" values stored in them. The locale-specific "none selected" values are treated like the blank value, and are written out as the blank value if the issue/workflow is saved again.

49146 (1110357) - RFE: A way to switch between "diff against backed" and "diff against basis" in Outgoing mode

In Outgoing mode of the File Browser, a new dropdown menu called **Diff Against** allows you to choose which version you want to diff your changes against in the Diff pane. The choices are: Basis (default), Backed, and Most Recent.

For more information, see *"Diff Against" Dropdown Menu in Outgoing Mode* on page 113.

49156 - modifyIssue XML command cannot set a field to [no value] if replaceAll="false"

When an XML command (newIssue, modifyIssue, applyTransition) is issued with **replaceAll="false"**:

- If a field is omitted from the XML, its value does not change.
- If a field is included in the XML without a value, its value *is now cleared*. For example, the following command will clear the value of the targetRelease field:

```
<modifyIssue issueDB="test" replaceAll="false">
<issue>
<issueNum fid="1">36322</issueNum>
</issue>
<values>
<status fid="3">Completed</status>
<assignedTo fid="14">jthomas</assignedTo>
<targetRelease fid="21"></targetRelease>
</values>
</modifyIssue>
```

  Note: With replaceAll="false", the presence of a field without a value in the XML was effectively a no-op prior to 7.2; in 7.2 it has the effect of clearing the field's value. Customers are advised to review and adjust existing XML command files to account for this change.

49213 - RFE: Merge and Patch should allow multiple issues

Multiple issues can now be merged or patched at the same time without requiring a tracking issue. AccuRev identifies which issues are being merged or patched and automatically assigns new file versions to variants of the appropriate issue(s).

Elimination of the tracking issue prevents the creation of artificial dependencies between the issues that are concurrently merged/patched.

49214 - Upgrade JRE to v8 update 162

In this release, the Java Runtime Environment has been upgraded to 1.8.0_162.

49255 (632069) - RFE: Support csv format when -ft (header) option for hist command is specified

The **hist** CLI command supports a new **-fc** option (applicable only with **-ft**) to specify that header info should be returned in csv (comma-separated values) format.

49263 (632070) - GUI: Edit workspace appears to hang

The **Edit workspace** dialog now appears more quickly, whether it's invoked from the Stream Browser or from the **View > Workspaces** tab.

49264 (632071) - RFE: Workspace update in GUI should also merge (member)(overlap) files

The **Update** operation has been expanded to support merging of files with (member)(overlap) status after the update has completed. See *Update Workspace and (member)(overlap) Files* on page 113 for more information.

49266 (632072) - When reparenting in Stream Browser, wrong stream is used as parent when user selects desired parent stream from search results table

This problem no longer occurs in Release 7.2.

49310 (1105245) - WebUI bulk update cannot update multi-line Text fields

Bulk update in the WebUI now works on multi-line Text fields. The text specified in the bulk update is appended to existing text in the field.

49337 (633949) - RFE: Merge should have the ability to select both changes for conflicts, i.e., theirs-then-mine, mine-then-theirs

Pre-7.2 releases did support selecting both changes for conflicts in the Merge tool, but Release 7.2 provides a more convenient, intuitive method. Prior to 7.2, you had to hold down the **Ctrl** key while you clicked on conflict-resolution buttons (i.e., *Theirs*, *Common Ancestor*, or *Mine*) in the desired sequence. In 7.2, you click that same sequence of conflict-resolution buttons *without* holding down the **Ctrl** key. See *Merge GUI: Selecting Multiple Sources* on page 114 for more information.

49866 - Misspelled code review preference "CodeReviewEanbled"

When code review functionality is invoked in the GUI, AccuRev corrects the misspelling by changing "CodeReviewEanbled" to "CodeReviewEnabled" in the user's preferences.xml file.

49997 - Upgrade the Tomcat used by the WebUI

The AccuRev 7.2 WebUI is installed with and runs on Tomcat 8.5.29.

50283 - AccuRev client should ignore ACCUREV_SERVER environment variable if no port number is specified

The AccuRev client now ignores the ACCUREV_SERVER environment variable if its value does not contain a colon (':'); instead, the client uses the server specified in the first line of the user's acclient.cnf file.

50298 (1113690) - (stranded) status is not displayed in GUI

The GUI now correctly displays stranded elements in Outgoing mode when the Stranded filter is enabled.

50310 (634022) - Incorrect element status in the workspace after promoting a twin element that was resolved by renaming and defuncting the workspace version of the element

Release 7.2 reports the correct element status in the workspace. While recursing upward through the stream hierarchy to find the element by name, if the element was renamed and promoted out of the workspace, AccuRev now uses the Promote transaction instead of the Update transaction to correctly identify the element that currently owns that name.

Corrections and Changes to the Documentation

Please note the following corrections and changes to the AccuRev 7.2 documentation:

41582 (1111389) - Update doc for addmember, rmmember, and server_admin_trig trigger

The Help entries for CLI commands *addmember* and *rmmember* have been updated to describe how the commands can now modify multiple groups. In the description of the parameters file for the server_admin_trig trigger, the <group> XML element has been changed to <groups>. (See *Format of the "server_admin_trig" Trigger Parameters File* in the *AccuRev Triggers* chapter of the *Administrator's Guide*.)

49568 - ACCUREV_BIN and ACCUREV_SERVER environment variables

The documentation of the ACCUREV_BIN and ACCUREV_SERVER environment variables has been updated on the *ENV_VARS* page of the *AccuRev® Command-Line Reference* chapter in the 7.2 *CLI User's Guide*.

49662 - Negative numbers are not supported in editable Timespan issue fields

The Help text now states that only non-negative, decimal values are permitted in editable Timespan fields.

49904 - Move Admin GUI documentation into Admin Guide

For documentation about the Admin GUI, see the section *Admin Command Permissions GUI* in the chapter *AccuRev Security Overview* of the 7.2 *Administrator's Guide*.

Known Issues

This section describes known issues in AccuRev and in the AccuRev Web UI.

AccuRev Git Client is incompatible with some recent Git releases

A defect/regression that was introduced in Git version 2.15 results in merge commits being skipped during a push operation. Because of this, the AccuRev Git Client is compatible with Git 2.13 and 2.14, but incompatible with Git 2.15.x, 2.16.x, and 2.17.0. A fix has been submitted to the Git community

and will be released in an upcoming Git patch. Please contact Customer Care for the most up-to-date information about Git versions that are compatible with the AccuRev Git Client.

AccuRev Git Client is incompatible with pre-10.13 versions of macOS

The AccuRev Git Client supports macOS High Sierra 10.13 and higher.

Calculated timespan fields should not be synced

Because the value of calculated timespan fields can be fluid, calculated timespan fields should not be used with AccuSync, Micro Focus Connect, and other synchronization products. Please see the notes in the section on *Calculated Timespan Schema Field Type* on page 112.

Failure to update Linux PATH with the AccuRev binaries directory

The installer tries to update the PATH environment variable on Linux systems by appending to shell startup files. It uses the SHELL environment variable to determine which startup files to modify. Often it will modify .profile, which is used by Bash and sh.

However, if the user is running Bash and has created a .bash_profile script, the .profile is never read. Also, if the user has no SHELL environment variable set, or if the setting is blank, the installer will not know which shell scripts to modify. Both of these situations will result in the PATH not being modified to include the AccuRev bin directory.

Workaround: The user must manually add the AccuRev bin directory to PATH.

AccuRev 7.1 Release Notes

This chapter describes changes and other information related to AccuRev 7.1.

Notes:

- **To ensure AccuRev's successful installation and optimal performance, install all applicable updates for your operating system before installing or upgrading AccuRev.**
- **If you are upgrading from an earlier release, we recommend that you install 7.1 over the existing AccuRev content.**

Deprecated Platforms

No platforms have been deprecated in AccuRev 7.1.

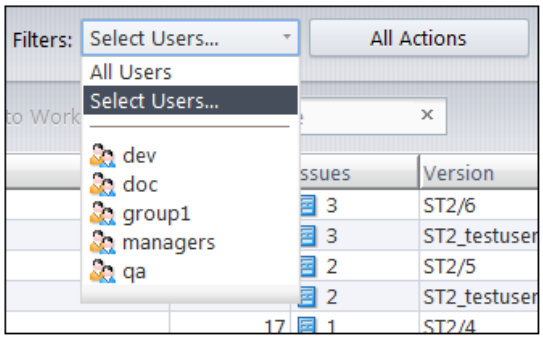
What's New in AccuRev Release 7.1

Highlights of the new developments in AccuRev 7.1 are captured here.

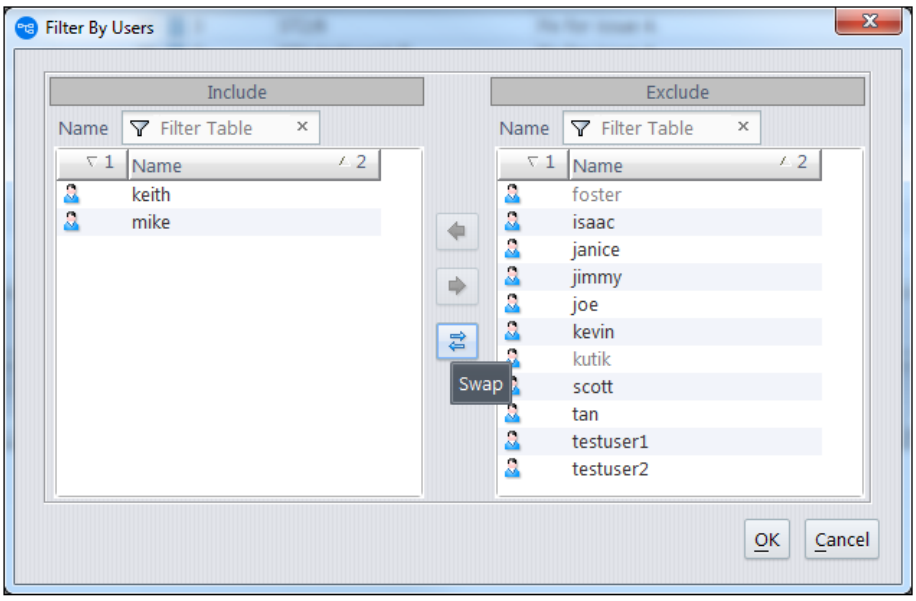
Enhanced Filtering in the History Browser

AccuRev 7.1 offers enhanced filtering capabilities in the History Browser to enable you to hone in on the transaction information that is of interest to you. In previous releases of AccuRev, the History Browser's table of transactions could be filtered to display only the transactions performed by a specific user. AccuRev 7.1 expands upon that, providing filtering by users, groups, and actions.

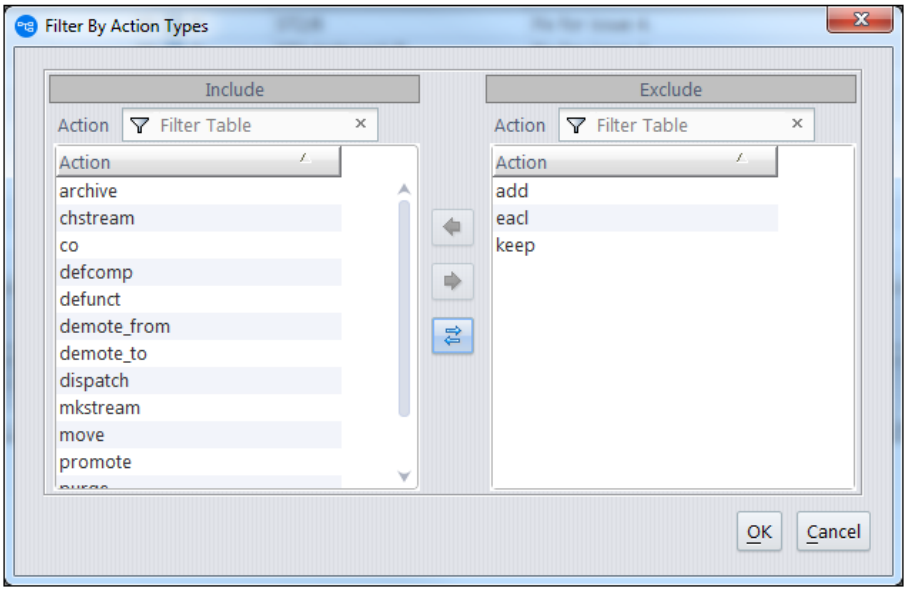
In the Users filter, you can now elect either to see transactions by all users or to filter by users or groups.



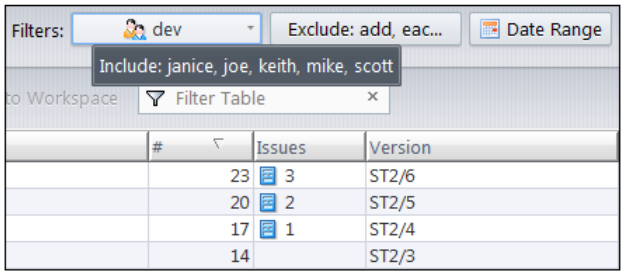
AccuRev groups are displayed at the bottom of the dropdown menu. You can select any one of the groups in order to see what transactions were executed by members of that group. If you choose "Select Users…" instead, a dialog will appear and allow you to divide the set of AccuRev users into an Included list (the users whose transactions will be displayed in the History Browser) and an Excluded list (the users whose transactions will be hidden from view). Left- and right-arrows move selected users from one table to the other, and the Swap button performs a quick exchange of the two tables' contents.

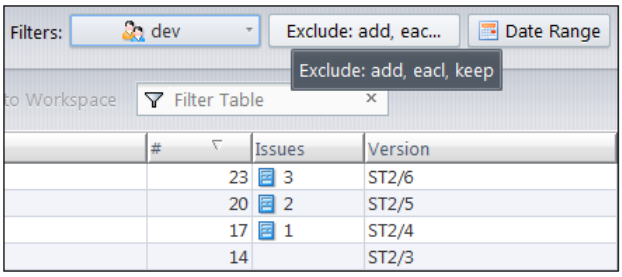


The new Actions filter in the History Browser allows you to select what types of actions you want to see listed in the transactions table. Again, you use the arrow buttons to divide the set of action types into an Included list and an Excluded list and then click on the OK button.



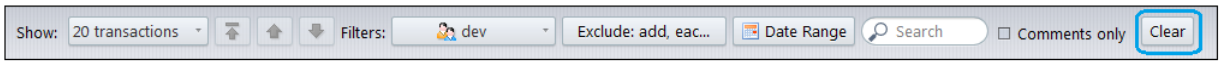
The tooltips for the Users and Actions filters identify how the history display is currently being filtered. For example:





As shown in the examples above, the Users and Actions filters can be used in conjunction to focus on select actions committed by a specific set of users.

A new Clear button resets all the filters located to the left of the button back to their default state:

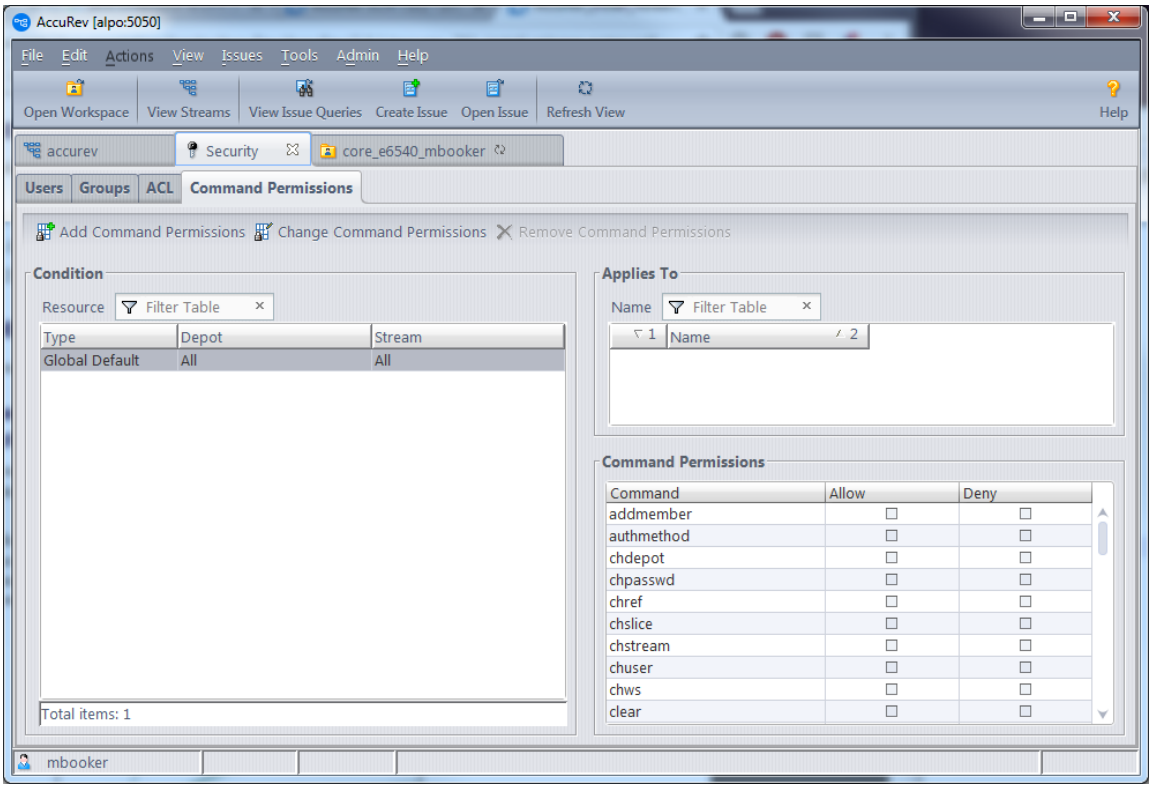


Note: The Active Transactions default group in the Stream Browser no longer contains a Users filter. Instead, you can filter active transactions by user via the advanced filters now available in the Active Transactions tab.

Admin Command Permissions GUI

A new graphical user interface has been implemented to enable the AccuRev administrator to configure which users are allowed to execute a variety of administrative level commands. Previously, the way to do this was to write perl script in the **server_admin_trig.bat** or **server_admin_trig.pl** files installed in the **<*ac-install*>/storage/site_slice/triggers** directory.

Here is a look at the new GUI:



This configuration page is accessible from the “Admin” menu underneath the “Security” option. The “Global Default” Condition allows you to configure admin command permissions for the entire site. Command permissions can apply to an individual user or to a specific group of users. You can also apply permissions broadly to the two built-in groups:

- anyuser - All users without a password
- authuser - All users with a password

In the case that permissions have been configured for both a user directly and a group that the user is a member of, the permission setting closest to the user is the one that applies. For example, if a user is a member of the “qa” group and the “qa” group is denied access to the “chstream” command, but the user is specifically configured to be allowed permission to the “chstream” command, the user’s own permission is the one that applies.

Configuring a Superuser

In order to set or remove admin command permissions, you must either be a superuser or have been granted explicit “allow” permission for the “setcmdacl” and “rmcmdacl” commands. To designate a user as the superuser, the AccuRev administrator must use the maintain utility:

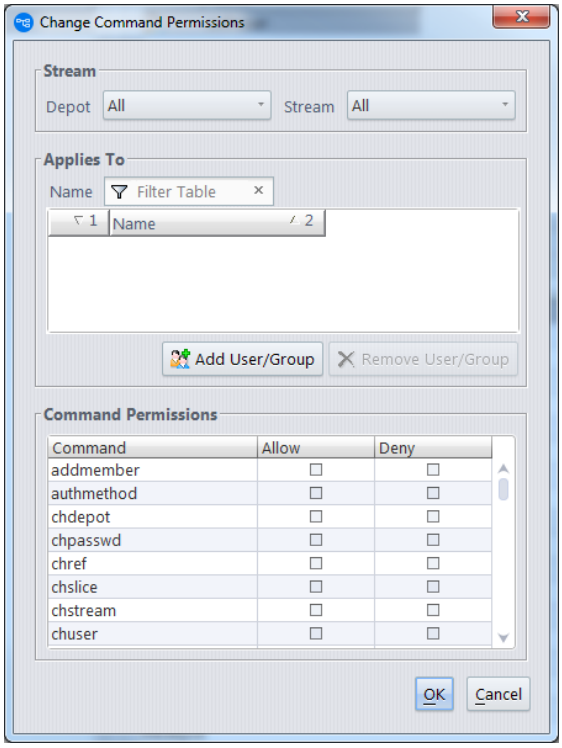
```
maintain su -a <username>
```

Changing Command Permissions

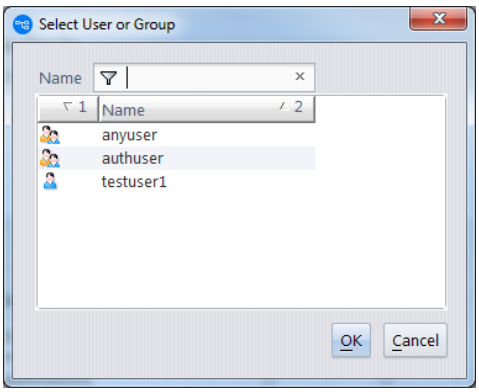
To edit command permissions, you must either select one of the existing conditions that you want to edit or add a new condition. The conditions are either the site-wide “Global Default” command permissions or command permissions set on a specific stream. Only commands that apply to a stream or stream hierarchy

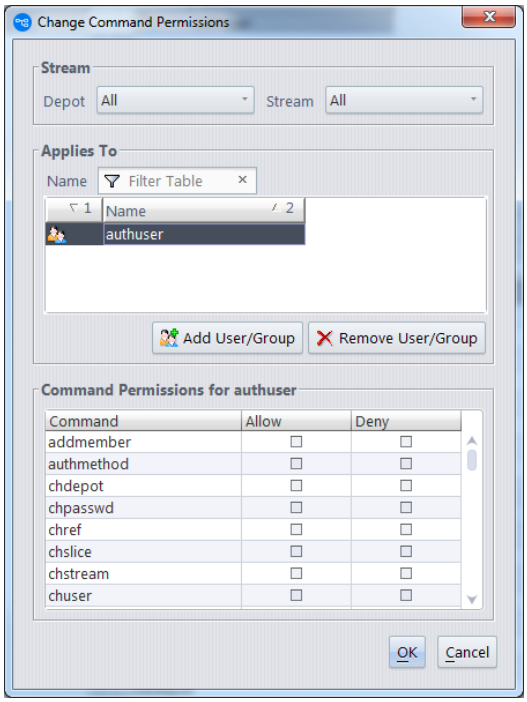
can be configured at the stream level. Examples of commands that are configurable by stream are: setting stream properties, mkstream, and chstream.

Either highlight the condition you want to edit and click the “Change Command Permissions” button, double-click on the condition, or right-click on the condition and choose the “Change Command Permissions” context menu option. The following dialog will appear:

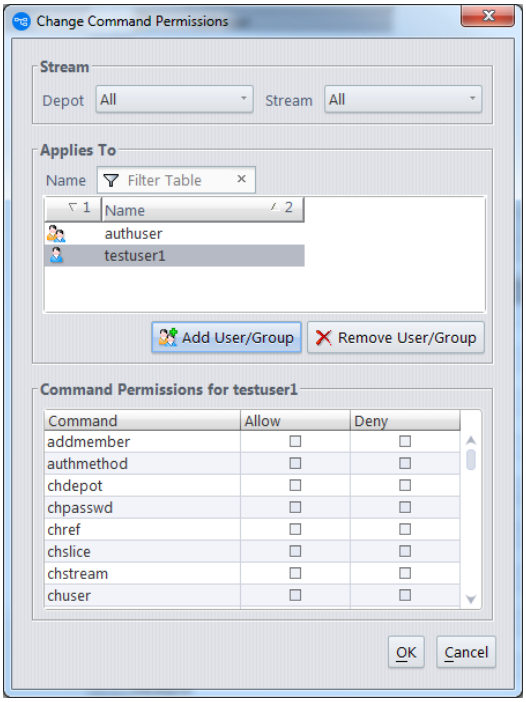


Now you need to add the user or group whose command permissions you want to configure. Command permissions are configured for one single user or one specific group of users at a time. This is similar to how Windows file permissions can be configured. You can add multiple users to the “Applies To” section of the dialog, but the “Command Permissions” that you configure apply only to the currently highlighted user or group:

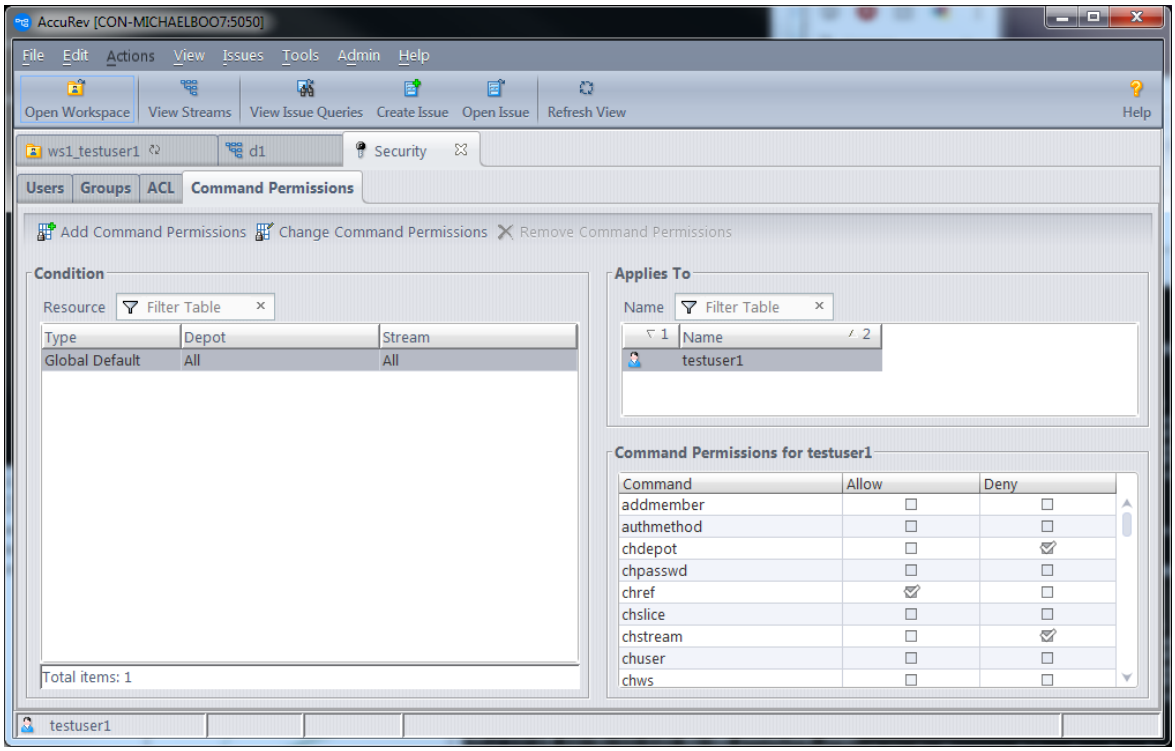




Notice that the title of the “Command Permissions” section identifies the user or group whose permissions are being configured.

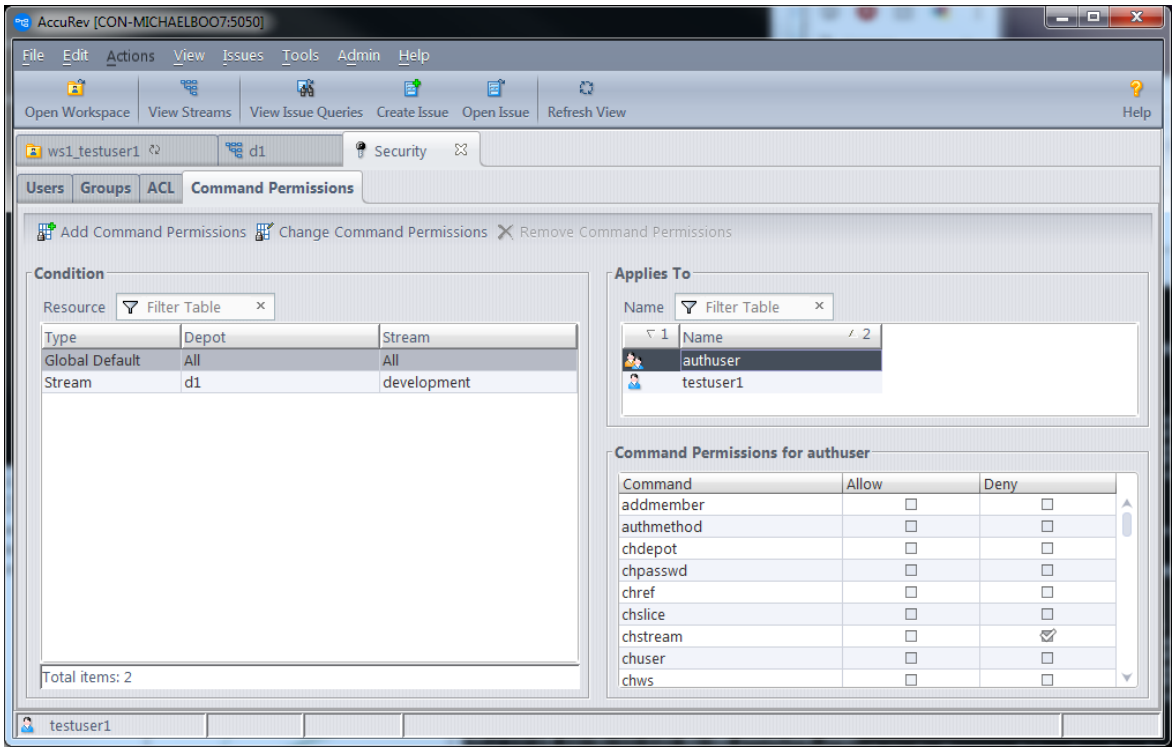


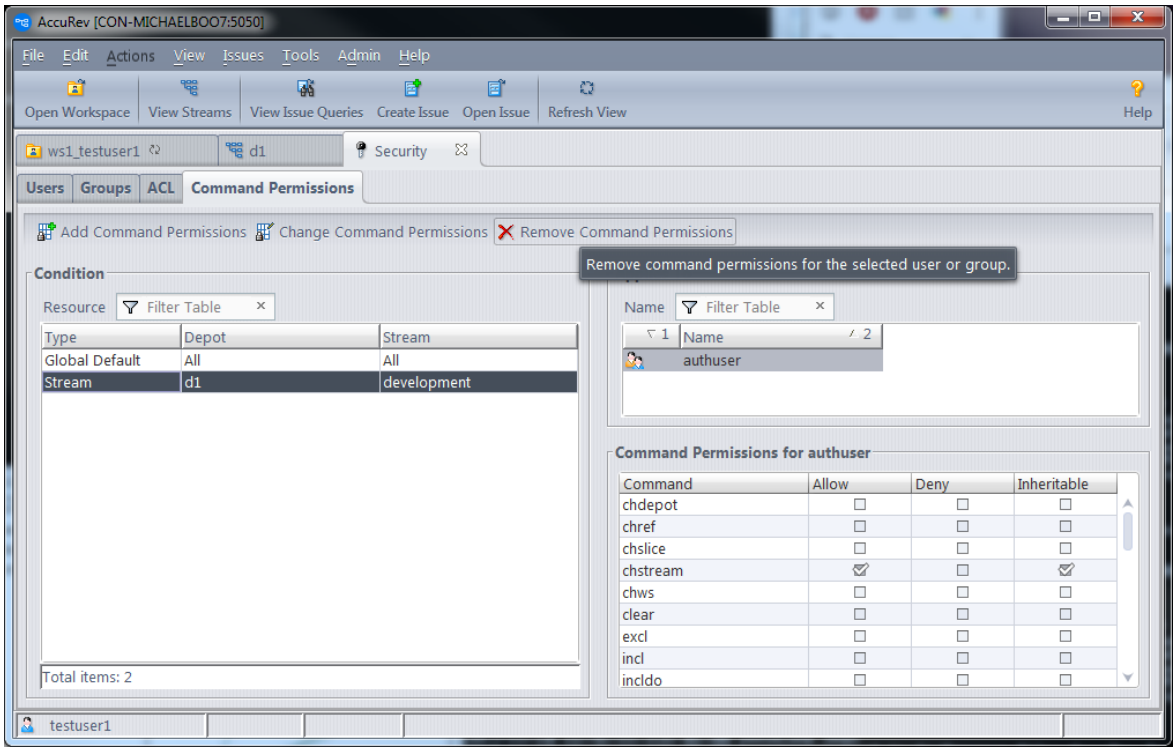
If you add testuser1 to the Applies To section, you can see that the command permissions for “testuser1” can also be configured now. Once you configure permissions for the desired set of users and groups, click OK to save your changes.



Stream-Aware Command Permissions

For commands that apply to a stream or stream hierarchy, you can add a new condition for that stream and configure command permissions that you want to apply to it only. You can also choose to make your command permission setting inheritable so that it applies to the entire stream hierarchy below the specified stream. For example, suppose you want to allow users to change the streams in the "development" stream hierarchy, but you don’t want anyone to change streams above that level. To accomplish this, you could deny access to chstream in the global default, but set an explicit inheritable "allow" permission for the chstream command on the “development” stream:


AccuRev [CON-MICHAELBOO7:5050]
File Edit Actions View Issues Tools Admin Help
Open Workspace
View Streams
View Issue Queries
Create Issue
Open Issue
Refresh View
Help
ws1_testuser1
d1
Security
Users
Groups
ACL
Command Permissions
Add Command Permissions
Change Command Permissions
Remove Command Permissions
Condition
Resource
Filter Table
Type
Depot
Stream
Global Default
All
All
Stream
d1
development
Total items: 2
Applies To
Name
Filter Table
authuser
testuser1
Command Permissions for authuser
Command
Allow
Deny
addmember
authmethod
chdepot
chpasswd
chref
chslice
chstream
chuser
chws
testuser1


AccuRev [CON-MICHAELBOO7:5050]
File Edit Actions View Issues Tools Admin Help
Open Workspace
View Streams
View Issue Queries
Create Issue
Open Issue
Refresh View
Help
ws1_testuser1
d1
Security
Users
Groups
ACL
Command Permissions
Add Command Permissions
Change Command Permissions
Remove Command Permissions
Remove command permissions for the selected user or group.
Condition
Resource
Filter Table
Type
Depot
Stream
Global Default
All
All
Stream
d1
development
Total items: 2
Name
Filter Table
authuser
Command Permissions for authuser
Command
Allow
Deny
Inheritable
chdepot
chref
chslice
chstream
chws
clear
excl
incl
incldo
testuser1

Removing Command Permissions

To remove a condition entirely (except for the Global Default Condition), highlight the condition and click the “Remove Command Permissions” button. To remove command permissions for a specific user or group from a condition, highlight that condition and select “Change Command Permissions”. In the dialog that pops up, remove the users and groups that you no longer want permissions to be set for.

By default, if no permission is set for a user or any group he is a member of or the built-in group that he is a member of, the user is implicitly granted "allow" permission for that command.

Push Notifications

In Release 7.1, the AccuRev server generates push notifications for all write operation events. These notifications are published through the Mosquitto MQTT Broker, which was introduced in AccuRev 6.2 for use with Gated Streams. The notifications are configurable at the server side, consumed by the GUI, and available to users at the client level via the CLI.

Server

A new setting called **NOTIFICATION_LEVEL** in the acserver.cnf file configures the type of notifications that are published.

All notifications are classified into the following four categories:

- Streams (e.g., keep, promote, chstream)
- AccuWork (e.g., create/edit an issue, cpkadd)
- Depot (e.g., mkdepot, mktrig)
- Site (e.g., mkuser, chgroup)

```
# Push notifications, 0=Off, 1=Streams, 2=AccuWork, 4=Depot, 8=Site, 15=All (1+2+4+8)
NOTIFICATION_LEVEL = 1
```

To specify which notifications get published, add the values for each desired category together. Streams and AccuWork notifications would be 3, for example; all notifications would be 15. To turn the feature off, set the notification level to 0.

The default notification level is 1 -- stream-type notifications only.

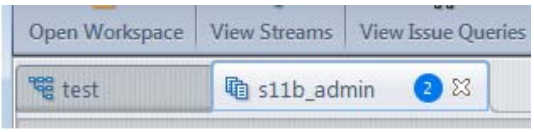
GUI

The views that a user has open in the GUI can become out-of-date as other AccuRev users execute operations. In 7.1, the GUI uses the server-generated stream notifications to display “notification badges,” which give the user a hint that activity has occurred in the stream(s) they are viewing.

The GUI displays notification badges in the tab header of the following types of views:

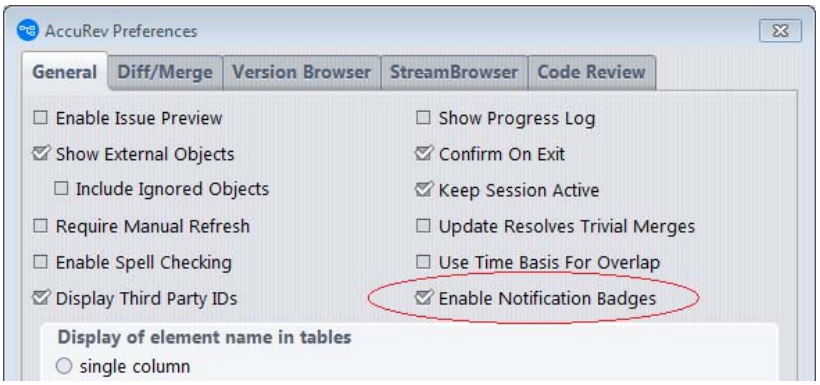
- Stream Browser
- History (depot, stream/workspace, transactions)
- File Browser

In the screenshot below, the badge indicates that two new transactions have occurred in this Stream (Workspace) History view.



Badge notification counts increment for each new applicable transaction that has occurred since the view was generated or refreshed. Refreshing the view clears the badge (since the view then includes the latest transactions).

Notification badges are configured via a preference setting. There is one global setting for all types of views:



CLI

The new **trace-event** CLI command listens for the server-generated notification events and can print them to the screen, output them to a log file, or pass the values to a script to take some user-defined action.

trace-event has arguments to filter notifications based on category or notification kind, by depot, stream, or user. If you specify no arguments, **trace-event** listens and prints all push notifications generated by the server.

```
# accurev trace-event
Trace Event: Connected to server myserver:1883
Trace Event: Subscribing to 'accurev/info/notifications/+'
```

Note: *Unlike other AccuRev commands,* ***trace-event*** *continues to listen until it is interrupted with a Ctrl+C or Ctrl+Break signal.*

Refer to the *CLI User's Guide* for additional details on the command arguments and examples.

Site administrators can control access to the **trace-event** command through the new *Admin Command Permissions GUI* or through the traditional **server_admin_trig** trigger. Users without access to the **trace-event** command will see the error message "`You are not authorized to perform this operation.`"

Changes in AccuRev Release 7.1

AccuRev Release 7.1 includes the following new features and bug fixes.

> **Note:** In cases where an issue is identified with two numbers, such as 10721 (1098410), the first number is the issue number in the AccuWork issue tracking system, and the second, in parentheses, is the issue number in the SupportLine system used by Customer Care.

7071 - "hist -t" often returns transactions outside the -t bounds

hist -t now returns the set of transactions that are within the specified boundaries and does not include any transactions outside those boundaries.

13165 (1096984) - RFE: Add "pop"option to specify EOL terminators when copying elements to a non-workspace location

The **pop -v -L** command now supports two new options, **--eol=unix** and **--eol=windows**, which allow the user to specify what kind of line endings to use when copying a version of an element into a non-workspace location.

22438 - GUI: Incorrect information is displayed for date interval in Show History of a stream

hist -t now returns the correct set of transactions when the user gets a stream history within a specified date interval and then changes one of the dates in that interval.

27702 (1098155) - Bulk merge tool should not convert EOLs in file to platform-specific EOL

Prior to Release 7.1, a bulk merge of files that contained only trivial merges automatically converted all end-of-line sequences to the platform-specific end-of-line sequence. This conversion is no longer done in 7.1.

34585 (1095258) - Add a recursive switch for a directory history

The **hist** command has a new **-R** option, which displays the history of transactions that affect the specified folder and all files and folders in the subtree beneath it.

36319 (1096259) - WebUI does not display stream colors

The WebUI now correctly displays stream colors that have been configured by setting the "streamStyle" stream property.

41045 (1104197) - RFE: GUI: A way to limit the number of active transactions displayed for a stream

A GUI user can use a new dropdown in the Active Transactions default group and tab to select the number of active transactions (20, 50 or 100) or the number of months of active transactions (1, 3, or 6) to display. The user can also elect to show *all* active transactions by choosing "Everything" in the dropdown.

41126 (1095129) - GUI: Allow ESC from pop-up window

The Find and Format Columns dialog boxes can now be closed by hitting the ESC key.

44107 - RFE: GUI: Add ability to sort items in the Workspace Explorer by file extension

The Workspace Explorer mode of the File Browser view now has a column called "Extension", which displays the extension of file names. Sorting in either direction can be done on this column.

44137 - ACLs should not block diff/merge/annotate with version from an access-restricted stream

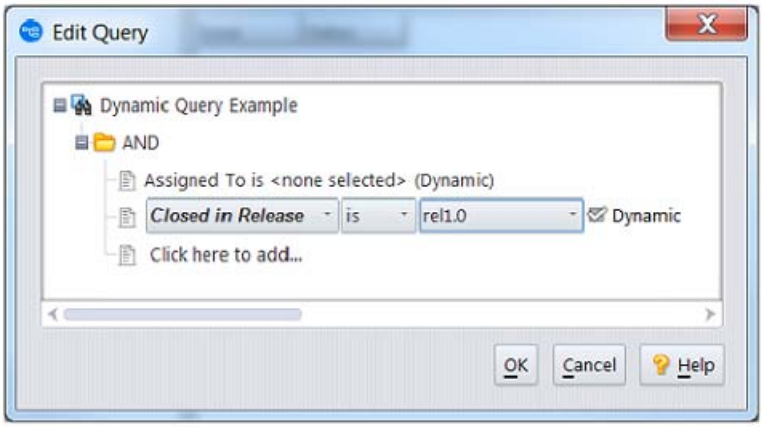
As of Release 7.1, a user can perform diff, merge, and annotate operations on files even if ACLs restrict the user's access to streams containing ancestor versions that are involved in the operations.

44139 - RFE: GUI displays aliases for servers instead of their IP addresses and host names

From the GUI login dialog, the user can now edit a server and define an alias for it. That alias will be displayed instead of the server's IP address and hostname in the GUI's list of available servers.

44187, 47314 - RFE: GUI/WebUI: Ability to specify search values dynamically at the time of query execution

When defining an issue query in either the GUI or WebUI, the user can mark one or more query fields as "dynamic". This is done by (a) optionally specifying a default value for the field, and (b) checking the field's checkbox labeled "Dynamic". Then, when the query is executed, the user will have the opportunity to change the value of all the query's dynamic fields before the query actually executes.



44266 (1107583) - WebUI: Created or modified issue query fails to retain selected entries

The WebUI now correctly stores issue queries that contain multiple clauses for the same user-type field.

44415 (1107786) - EACL: Failure to set eacl when there are duplicate files/directories listed in input file

The **eacl** command now functions properly even if its input file contains duplicate entries for an element (file or directory).

46495 (1109762) - GUI: Editing a user takes several minutes to display the Edit User dialog

In the Admin => Security tab, the Edit User dialog opens much more quickly now due to use of a faster algorithm for finding the groups to which the user belongs.

46621 (1096036, 1100809) - RFE: Save acclient.cnf file in a location that is accessible to non-admin users in Windows

The AccuRev install process places a template for acclient.cnf into the **<*ac-install*>**/bin folder, and the AccuRev 7.1 GUI then copies that file into each user's %ACCUREV_HOME%/.accurev folder. Placing the file in this folder enables modifications by non-admin users.

46653 - RFE: GUI: Add support for new Clone relationship type

Release 7.1 supports a new type of relationship called **Clone** in the Schema Editor. It is now possible to add a field of Relationship type Clone to the schema. This enables users to see in AccuWork what issues were created as clones of other issues.

46785 - RFE: Support client auto-upgrade via custom MSI, etc.

The client upgrade command, available via **Help > Upgrade Client** in the GUI or "**accurev upgrade_client**" on the command line, now supports custom-created installers such as Windows MSI files. Administrators must deploy their custom installers on the AccuRev server machine in the folder **<*ac-install*>**/bin/installers/<OS>, alongside the standard AccuRev installers, and then add corresponding entries to the acserver.cnf file.

> **Note:** This feature works only with clients running AccuRev 7.1 or later. Clients running older versions of AccuRev cannot use custom installers.

For each custom installer, the administrator must add a line of the following format to acserver.cnf:

```
<OS>_INSTALLER=<installer>
```

where <OS> is one of the following: `WIN, LINUX, SOLARIS, MAC`

As an example, to make the AccuRev server use an MSI file called OurCustomerINST.msi, add this line to acserver.cnf:

```
WIN_INSTALLER=OurCustomerINST.msi
```

Do not specify the full path; the MSI file must be located in the **<*ac-install*>**/bin/installers/Windows or Windows64 folder.

If the file specified in a custom installer entry does not exist, the AccuRev server will look for the default AccuRev installer (AccuRevClientInstaller) appropriate for the operating system.

If a custom installer requires command line parameters, they can be specified in a second entry in the acserver.cnf file, using this format:

```
<OS>_INSTALLER_PARAMS=<parameters>
```

Note that these changes to acserver.cnf can be made without stopping the AccuRev Server service. The AccuRev Server checks the file for these installer entries each time that a client upgrade is performed.

46793, 46883 - GUI, WebUI: Show all relationship changes in Issue History

Changes in issue relationships are now tracked in AccuWork's Issue History tab and are visible in both the GUI and WebUI issue displays.

46928, 47061, 47539 - GUI: Display an issue field's label, if it exists, instead of the field name

The AccuRev GUI now displays issue field labels instead of issue field names in the Query Editor, AccuWork's Issue History tab, and in the Schema Editor's Validation tab and New/Edit Promote Trigger dialog.

47015 - WebUI should export Display Property of User-type fields in query results

Query results exported by the AccuRev 7.1 WebUI now use the configured Display Property for user-type fields instead of the AccuRev user name. For example, if the schema defines the Display Property for the "Assigned To" field to be the user's email address, then the "Assigned To" column in the exported query

results will list email addresses for all users that have one defined, and it will list the AccuRev user name for users that do not have an email address.

47313 - RFE: GUI: Export issue attachments when issue query results are exported

The GUI can now export issue attachments when exporting issue query results. If an Attachments-type field is configured as a column in the query results table and an issue has attachments in that field, then after the results table is exported, a "Save Attachments As" dialog prompts the user to save an archive of all issue attachments. If the user accepts or edits the name of the archive, the attachments are exported as a zip archive, sorted by issue. This is an optional step of the Export Table operation -- if the user clicks Cancel in the dialog, the Export operation completes successfully and opens the exported table. This applies to all export types (html, xml, csv).

47317 - Update the scripts delivered in the accurev/extras/unix folder

The scripts installed on the AccuRev server in **accurev/extras/unix** have been updated, and new scripts have been added. All the scripts now will **su(1)** prior to starting or stopping any of the AccuRev processes that the script runs. The updated contents of **accurev/extras/unix** are:

- **accurev** - AccuRev Server startup, where the server can be an AccuRev Master, AccuRev Replica, or AccuRev Remote License Server
- **accurev_mqtt** - AccuRev Mosquitto service / Message Queue Telemetry Transport (MQTT)
- **accurev_replica** - AccuRev Replica: Creates AccuRev login sessions, possibly via an SSH tunnel or your own custom configuration. Used in conjunction with the **accurev** script.
- **accurev_web** - AccuRev Web Service
- **accurevSetLinks** - Script to create links in /etc/init.d to start and stop the above processes. See the documentation in this file for instructions on how to use this script.
- **README** - General documentation
- **acserver.cnf-ssh** and **acserver.cnf-notSecure** - Example reference files to aid in configuring an AccuRev Replica when using the **accurev_replica** script

47593 (1111427) - GUI: Diff/Merge must honor file's type (text/ptext) and not probe file to see if its contents are binary

The GUI no longer displays a warning message "Unable to diff binary files" when a user tries to diff a ptext file that contains binary content. AccuRev 7.1 allows the user to diff binary files.

47935, 48107 - GUI: Diff/Merge enhancements

The following diff/merge enhancements have been made in Release 7.1:

- diff of image files is supported.
- If a third-party diff tool is configured, binary file diff is enabled.
- BeyondCompare v3 and v4 are supported on Windows, Linux, and macOS.
- Araxis is supported on macOS.
- TkDiff no longer has to be located in the AccuRev bin directory.
- Preferences for custom third-party diff or merge tools are now sticky, allowing the user to switch back and forth between tools without losing their configuration.

47961 - Upgrade the Tomcat version used by the WebUI

The AccuRev 7.1 WebUI is installed with and runs on Tomcat 8.0.47.

48092 - Add transaction values to client-side pre-promote trigger

Transaction IDs are now passed to the pre-promote trigger when a user executes a Promote By Transaction operation.

48365 (1112125) - GUI: Refresh View does not refresh Stream Browser

This defect has been fixed, and Refresh View correctly refreshes the Stream Browser view now.

Corrections and Changes to the Documentation

Please note the following corrections and changes to the AccuRev 7.1 documentation:

47191 - DOC: Installation Notes: Update Mac OS X section about running acdiffgui on Mac

In the "Mac OS X" section of the Installation Notes, accurev-common.jar has been added to the jar file list in the perl script for running acdiffgui on Mac platforms.

Known Issues

This section describes known issues in AccuRev and in the AccuRev Web UI.

Installation on Windows with User Account Control (UAC) enabled displays confusing dialog

If installation of the AccuRev 7.1 server or client is attempted on a Windows system while User Account Control (UAC) is enabled, the installer will open a "User Account Control" dialog that displays the program name as "Micro Focus International plc" instead of the name of the AccuRev installer executable. The user can safely click on the Yes button to continue with the AccuRev installation.

Switching servers in GUI stops display of notification badges

If a user switches the GUI from one AccuRev server to a different AccuRev server (via **Tools** => **Login...**), notification badges will no longer be displayed.

Workaround: Instead of using **Tools** => **Login...** in the GUI to switch from server A to server B, take the following steps:

1. Exit the GUI instance that is connected to server A.
2. Execute **accurev logout** from the command line to terminate the session with server A.
3. Start the GUI and login to server B.

WebUI export of issue query results generates incorrect XML

If any of the exported issue fields have labels that contain spaces, then the XML generated by the WebUI will be incorrectly formatted, and the query results will not display correctly in a browser.

Workaround: Edit the generated XML and change all spaces in issue field labels to underscores. For example:

Original XML:

```
<?xml version="1.0" encoding="UTF-8"?>
```

```
<table>
<Issue>
<Issue>38747</Issue>
<Assigned To>John Moore</Assigned To>
<Short Description>Sorting is done on wrong field</Short Description>
</Issue>
</table>
```

Edited XML:

```
<?xml version="1.0" encoding="UTF-8"?>
<table>
<Issue>
<Issue>38747</Issue>
<Assigned_To>John Moore</Assigned_To>
<Short_Description>Sorting is done on wrong field</Short_Description>
</Issue>
</table>
```

AccuRev 7.0.1 Release Notes

This chapter describes changes and other information related to AccuRev 7.0.1.

Note: To ensure optimal performance, install all applicable updates for your operating system.

Deprecated Platforms

The following platforms are deprecated in AccuRev 7.0.1 and will not be supported in the next release of AccuRev:

- Linux Red Hat Enterprise 5
- Linux Ubuntu 12, 13
- Linux Fedora 23, 24

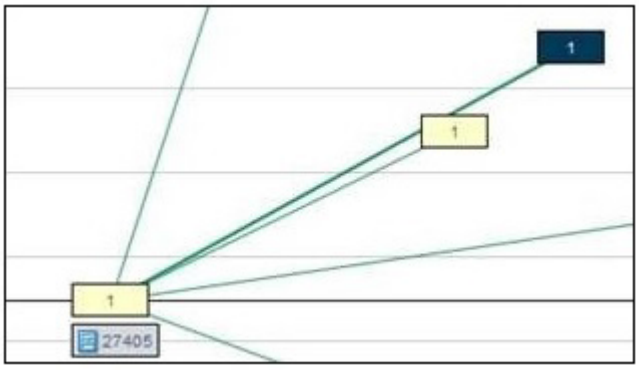
What's New in AccuRev Release 7.0.1

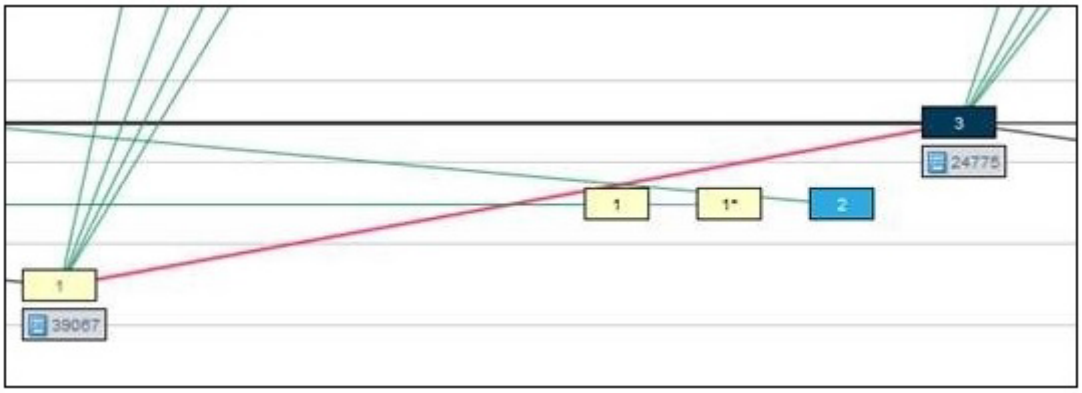
Highlights of the exciting new developments in AccuRev 7.0.1 are captured here.

Version Browser: Highlighted Version Relationships and Show Promotion Path

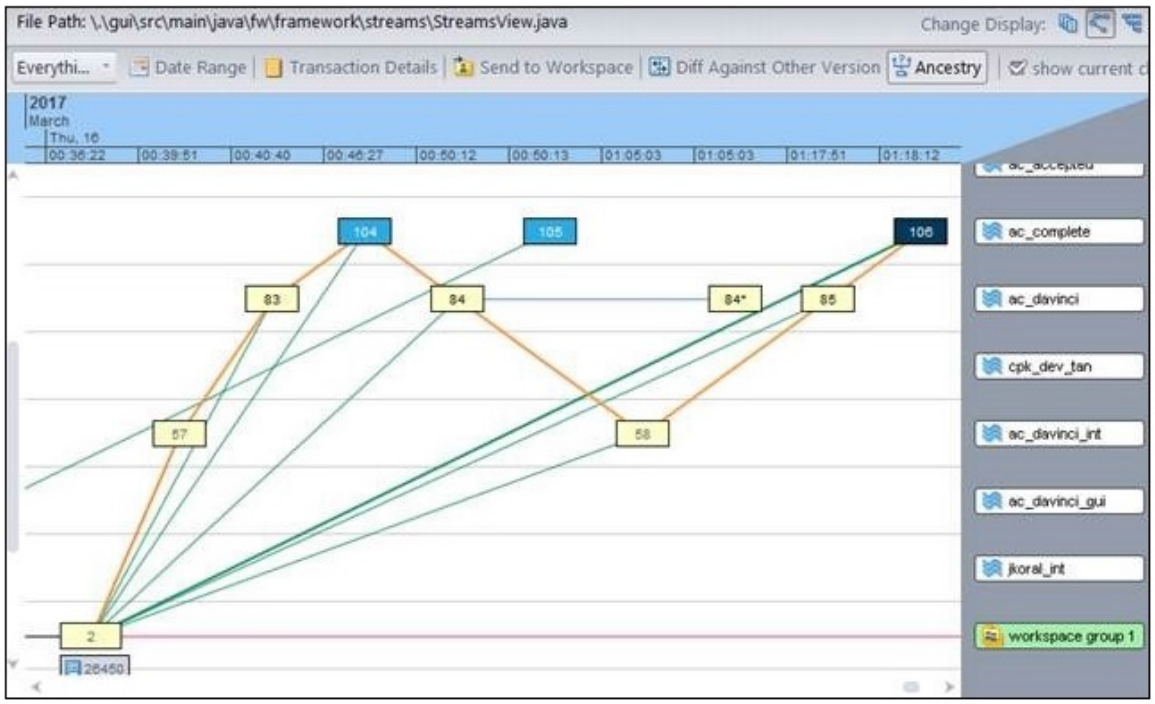
The Version Browser has been enhanced with two new features to help the user visualize the flow of changes in the system: (1) highlighting of version relationship lines, and (2) the new **Show Promotion Path** operation.

When the user clicks on a version to select it, the Version Browser now highlights the box representing that version *and all lines leading directly from earlier versions to the selected version*. The highlighted lines are drawn with a heavier weight line, but still in the appropriate color to identify the type of relationship. Two examples showing highlighted relationship lines follow:



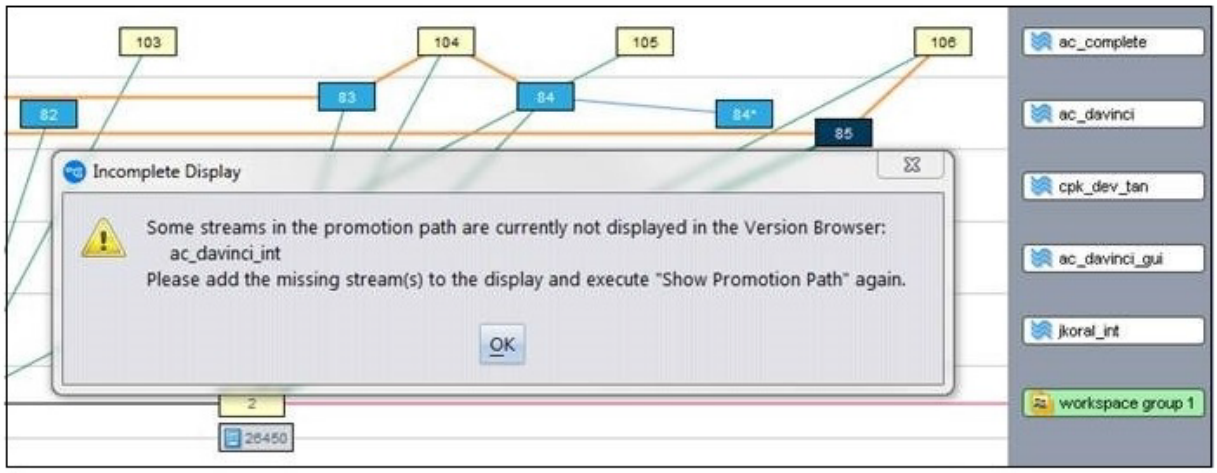


Show Promotion Path is a new operation available in the context menu of versions that were created by a Promote or Demote operation. Show Promotion Path uses a solid orange line to display the sequence of promotions and demotions leading from a real (kept) version all the way to the selected virtual version. For example:



AccuRev will draw a horizontal line going off the left edge of the window if the left endpoint version is not displayed (due to the current transaction range or swim lane choices). If streams in the promotion path have been filtered out of the version browser display (causing the promotion path line to be discontinuous),

AccuRev will display a dialog telling the user which streams to add to the display in order to see the full promotion path:



The user can clear the promotion path from the display by doing one of the following:

- clicking Refresh View
- changing the transaction range
- executing Show Ancestry
- clicking on a different stream in the bottom panel of the version browser

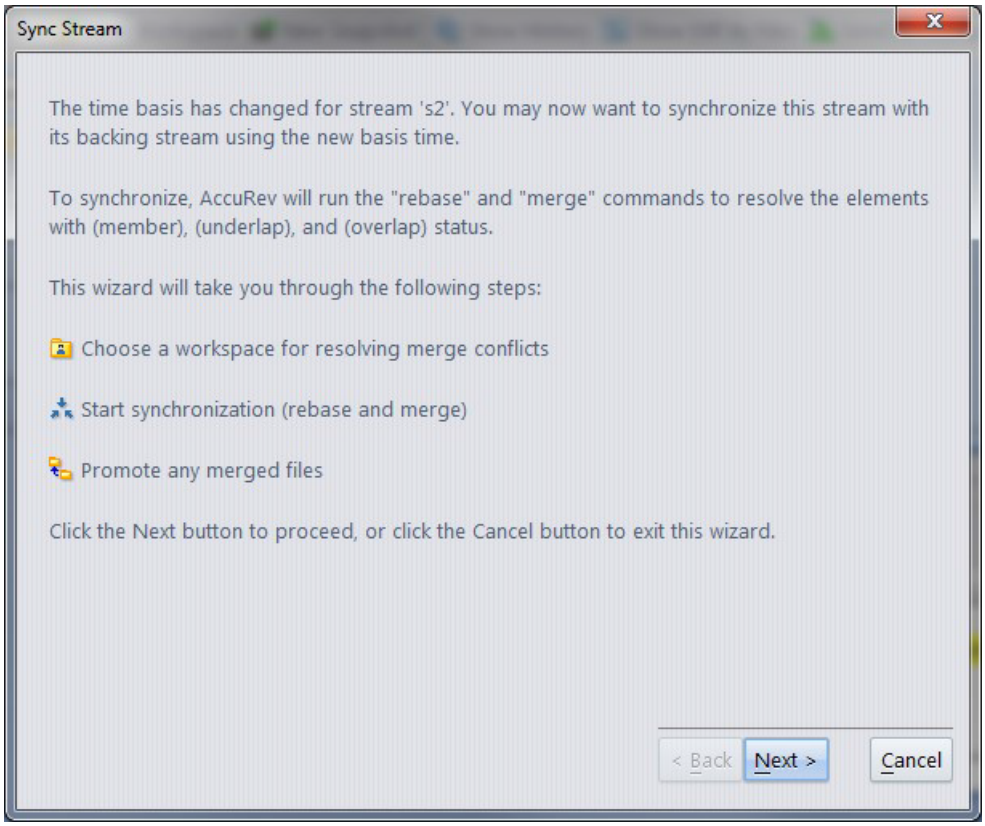
Scrolling around the panel or dragging versions around the display will not make the promotion path disappear. This allows the user to move versions around to clarify the display.

Sync Stream Wizard in the GUI

When a stream's time basis is modified, there may be newly visible changes in the backing stream that need to be merged with the changes in the time-based stream. The new "Sync Stream wizard" in the GUI takes care of this situation by running **rebase** and **merge** operations to sync the stream with its backing stream. This wizard is invoked automatically when the user changes a stream's time basis in the Stream Browser. It can also be invoked manually on any stream by clicking the Sync button in the File Browser view.

The Sync Stream wizard first runs the **rebase** command to resolve elements with (member) and (underlap) status. If the stream contains any files with (overlap) status, the wizard then executes the **merge** command, resolving any merge conflicts in a workspace that is selected by the user. Autokeep is automatically enabled, so trivial conflicts are resolved and kept without requiring user input. As its final step, the wizard prompts the user to promote all the resolved conflicts from the workspace up to the stream.

The initial screen of the Sync Screen wizard looks like this:

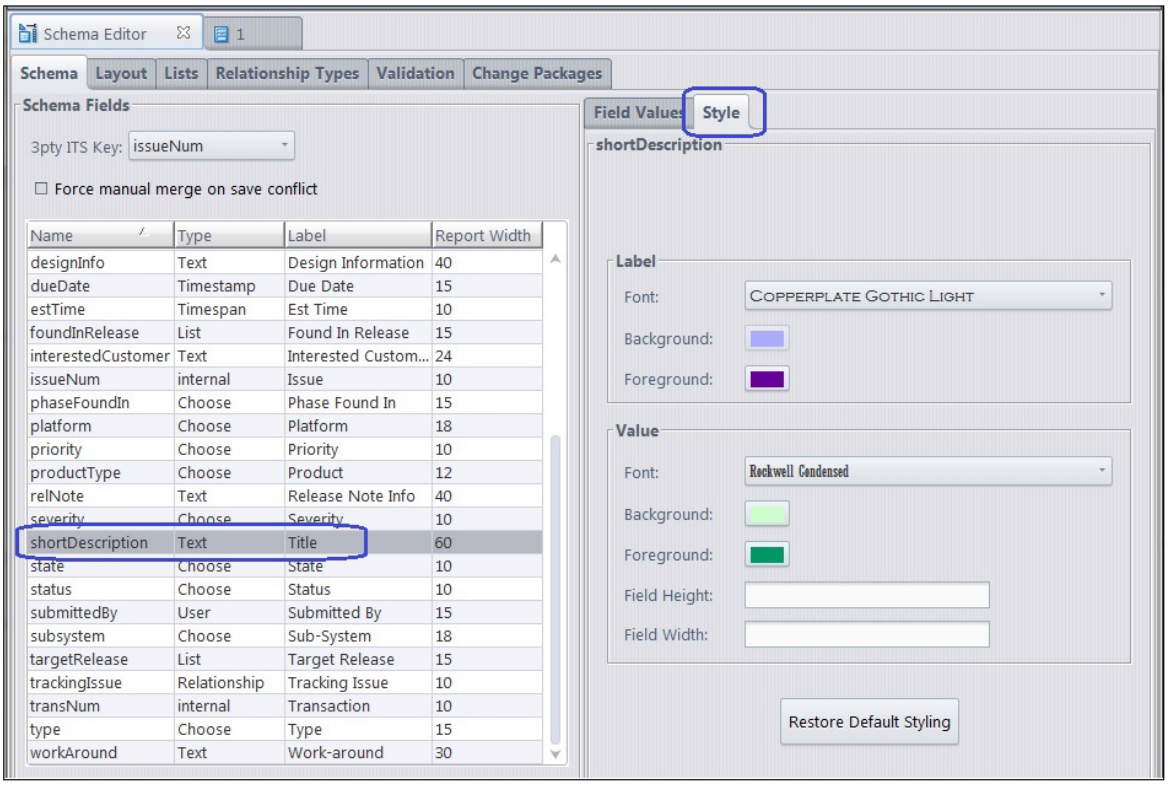


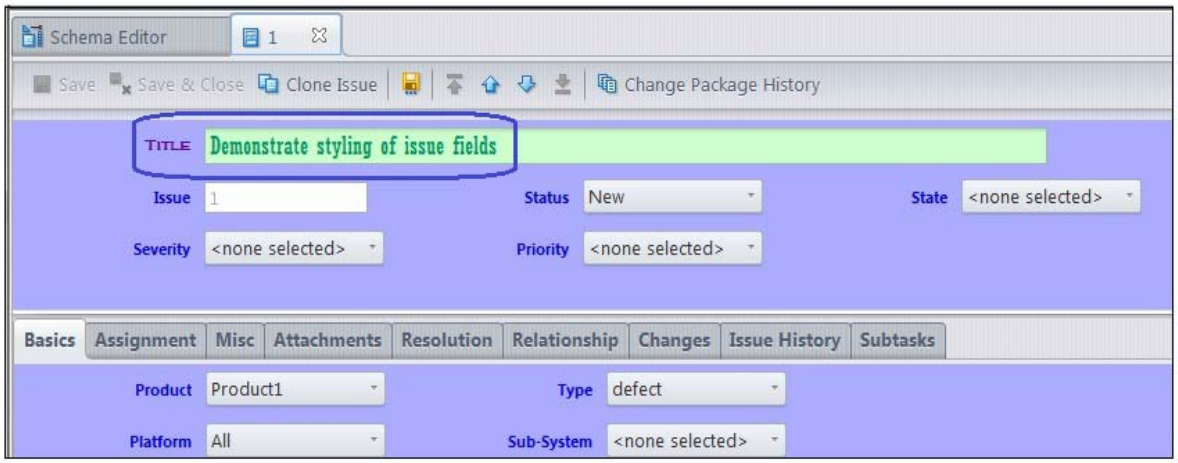
Styling Individual Issue Fields in the Schema Editor

Previous releases of AccuRev provided limited abilities to style AccuWork issues – the administrator could only specify the colors to be used for all field labels, required field labels, and the issue background. Release 7.0.1 enables more extensive styling of individual issue fields. Depending on the type of the issue field, it may be possible to specify the font style and foreground color for the field label and the field value, as well as the background color for the field value. For certain types of fields, the width and height of the value can be specified too.

Styling of an issue field is done in the new **Style** subtab of the Schema Editor's **Schema** tab. The **Restore Default Styling** button gives the user the option of returning to the default styling parameters for the current issue field.

The following screenshots depict how one might style the "Title" issue field and the resulting appearance of the field:





Crucible Connection in the GUI

The AccuRev GUI now supports integration with Atlassian Crucible servers via a new AccuRev feature called **Crucible Connection**. This integration improves developer productivity and alleviates performance issues native to the Atlassian Crucible server related to creating and modifying code reviews using the Crucible web browser and accessing the web application. By using the REST API provided by the

Crucible application and the AccuRev Plugin for Crucible, the AccuRev GUI can now integrate with Crucible by using HTTP and secure HTTPS connections (i.e., TLS v1.2).

Note: Crucible Connection works with Crucible 4.1.2 using **AccuRev Plugin for Crucible** version 2017.1. The **AccuRev Plugin for Crucible** must be installed as a managed add-on for the Crucible server in order for Crucible Connection to work properly; the plugin allows Crucible to interact with the AccuRev server.

To enable the Crucible Connection feature, enter Crucible server and user information in the Code Review panel of the AccuRev GUI's Preferences dialog. If the "Enable code review integration" checkbox is selected, the GUI displays new menu items in various views to send active file changes, transactions, and/or issues to "New Reviews" and "Existing Reviews." Crucible project and review information is retrieved from the Crucible server and is filtered in the GUI based on the depot that is active in each AccuRev view.

Archive Enhancements

Release 7.0.1 introduces two new convenient ways of dealing with files that either need to be archived or have already been archived. The first helps to identify which files the user would benefit most from archiving, and the second provides a mechanism by which the AccuRev server can access an archived file without actually unarchiving it.

Identifying Which Files to Archive

An administrator who wants to free up disk space can execute the **maintain verinfo** command on the server to identify which files to archive. Each time a file is modified and kept, a new version of that file is created and stored on the server in a "storage container file." The **verinfo** command indicates, for each element on the system, how many different, unarchived versions of the element are currently in storage and the total amount of space occupied by all of those storage container files. The results are sorted in descending order of amount of space occupied; therefore, the best candidates for archiving (i.e., those whose storage containers use the most disk space on the server) are returned first.

The **verinfo** command is also available on the client side via **accurev verinfo**. This enables administrators to issue the **verinfo** command from any client machine instead of having to login to the AccuRev server machine.

Accessing an Archived File

Sometimes a storage container file that has already been archived is required again. A user might want to patch an old issue that requires that container file, or perhaps he just wants to see how that file changed over time using **annotate** or **diff**. Whatever the reason, he needs a way to gain visibility to the content that was in the archived file.

The **unarchive** CLI command could be used to restore the archived storage container file to its original location in the depot's file storage area. However, the container file's status would change from *archived* to *normal*, and the user might then need to re-**archive** the file if he no longer needed it.

Release 7.0.1 offers a simpler alternative – a new trigger called **server_archFiles_trig**, which provides a way to access an archived file on an as needed basis, without unarchiving the file. When installed, the trigger gets called whenever a container file is missing from the depot's storage location. The trigger is passed the name of the depot and the file being accessed, along with the file's original storage path. The trigger can be written to access the data directly from the archive location and copy that data into a

temporary file that the server can access. That temporary file only exists for the duration of the command that required access to the file content. A sample script is included in the examples folder.

License Management Enhancements

License management has been enhanced in several ways in 7.0.1. The following sections describe how.

Note: If you are upgrading to 7.0.1 from a version older than 7.0, you will need to obtain a new license file as we changed our license technology starting with version 7.0. See *Get an AccuRev License* on page 26 for more information.

Master License Server

If you have multiple AccuRev master servers, one of those servers can be configured to be the *master license server*, which serves licenses to all of the other master servers.

During a fresh 7.0.1 install or an upgrade to 7.0.1, the installer asks whether license information should be obtained from a local license file or a remote license server. On the machine that is to be the master license server, select the local license file option.

On the other master server machines, select the remote license server option. You will then be prompted to enter the following values for the remote license server:

1. **Host**: The host name of the AccuRev master license server (which will serve licenses to the other master servers)
2. **Port**: The port that the master license server is configured to listen on (typically port 5050)
3. **Username**: The name of a user configured on the master license server. This username is used to verify that the local master server is authenticated and authorized to request licenses from the master license server.
4. **Password**: The password for the Remote License User account on the master license server

Note: When one of the master servers is configured as the master license server, then *all* of the master servers must be configured such that either:

- SSL is *enabled* on the master license server and all the AccuRev master servers that obtain licenses from it

or:

- SSL is *disabled* on the master license server and all the AccuRev master servers that obtain licenses from it.

Sharing Licenses Across Clients

Each master server uses its own pool of licenses, but *within* a single master server, licenses are shared by user name. This means that if a single user logs into the same master server from many different clients, he still consumes only a single license. However, if that same user logs into a different master server, a second license is consumed for that second master server login.

Replica Server Installation

The installation process for a replica server no longer prompts for license information. Replica servers do not need to be configured with licenses because they get their license information from the master server they are replicating.

User Account Credentials on Master License Server

If the user account credentials on the master license server are modified, the other master servers can be updated via the **maintain** utility:

- maintain setcnf REMOTE_LICENSE_USER <user_name>
- maintain setcnf REMOTE_LICENSE_PASS <user_password>

These settings are stored in the acserver.cnf file on the local master server. The password is encrypted in the same way as the DB_PASS password for accessing the PostgreSQL database.

"accurev licenses –fxv" Output

The output of the **accurev licenses –fxv** command has been enhanced in the following ways:

- The *last_renewed_time* attribute in the *user* tag has been renamed to *last_accessed_time* for clarity.
- A new *host* attribute in the *user* tag identifies the master server that the license was checked out for.
- A new *port* attribute in the *user* tag identifies the port that the master server is listening on.
- A new *type* attribute in the *license* tag distinguishes between "floating" and "named" licenses. (Currently only floating licenses are sold.)

Here is an example of the enhanced output:

```
<acResponse>
  <licenseCounts>
    <license
      name="AccuRev"
      count="250"
      usage_count="1"
      type="floating"
      min_checkout="1440"/>
     <user
        name="testuser1"
        host="myhost"
        port="5050"
        checkout_time="2017/05/08 11:11:03"
        last_accessed_time="2017/05/08 11:18:17"/>
   </license>
  </licenseCounts>
</acResponse>
```

Changes in AccuRev Release 7.0.1

AccuRev Release 7.0.1 includes the following new features and bug fixes.

> **Note:** In cases where an issue is identified with two numbers, such as 10721 (1098410), the first number is the issue number in the AccuWork issue tracking system, and the second, in parentheses, is the issue number in the SupportLine system used by Customer Care.

10721 (1098410) - GUI: User's public queries are sometimes not displayed

In previous releases, saving one's public queries could cause those queries to disappear from the display if other users were also saving their public queries at the same time. This defect has been fixed in 7.0.1.

16371 (1097082) - GUI: Add ability to remove another user's workspace (already possible on command line using rmws –s)

The GUI now provides the ability to remove another user's workspace (by executing "Remove" in the workspace's context menu). The confirmation dialog identifies the user who owns the workspace.

27275, 41817 (1098163, 1098121) - GUI: Clicking a row in the Stream Browser search results table does not locate stream in collapsed tree

Clicking on a row in the table of search results at the bottom of the Stream Browser view should locate and select the corresponding stream in the graphical display in the top part of the Stream Browser view. Prior to 7.0.1, this function did not work if the stream was located in a collapsed subtree of the stream hierarchy. The 7.0.1 GUI correctly handles the situation by expanding the collapsed subtree and highlighting the selected stream.

33724 (1094949) - GUI: The preferences.xml file may not be valid after an upgrade from 5.x to 6.x, causing Save Layout to fail.

The upgrade from AccuRev 5.x to 6.x required that a user's .accurev/preferences.xml file (found in the $HOME or %ACCUREV_HOME% directory) be removed after the upgrade in order for the Save Layout functionality to work properly in the 6.x GUI.

This problem does not exist for upgrades to Release 7.0.1.

36137 (1097059) - Tasks are not being completed due to locks on workspace files

In previous releases, a client command (**update**, **stat**) could become unresponsive if multiple commands were running simultaneously in the same workspace. This was due to a contention problem within the workspace's local TSO database. These hung client commands would show up in the server tasks tab as long running tasks. This issue has been fixed in 7.0.1.

36858 (1098352) - GUI: Cancelling the Required Fields dialog should result in no changes to issue form

When a user saves an issue without providing values for some required fields, the GUI displays the Required Fields dialog. In 7.0.1, the values entered in the Required Fields dialog are not written to the issue form until the user clicks Save. That way, if the user clicks Cancel in the Required Fields dialog, the issue form remains completely unchanged.

38631 (1100416) - GUI: Support change workspace functionality in Stream Browser

In the 7.0.1 GUI Stream Browser, the context menu for workspaces now includes "Edit", which displays the "Edit workspace" dialog.

38727 (1100721) - "accurev issuelist" result omits issues that have subtasks

In previous releases, the list of issues returned by the "**accurev issuelist -s**" CLI command omitted an issue that was active in the stream if that issue had a subtask issue that was not complete in the stream. This defect has been fixed in 7.0.1 – active issues are included in the result regardless of their subtask issues' status.

38927 (1101346) - GUI: Differentiate more clearly between Promote and Demote

In order to prevent accidental execution of the **Demote** command instead of the **Promote** command, the 7.0.1 GUI makes a clearer distinction between the two commands in these ways: (a) the buttons for **Promote** and **Demote** are horizontally separated by a large space, and (b) in the context menu, **Demote**, along with the **Revert** operations, have been moved into a submenu called "**Undo Actions**".

38999 (1101615) - GUI unable to display issue history

In the past, the GUI was unable to display Issue History if an issue contained a field that (a) held a lot of data (e.g., a very large body of text) and (b) had been modified many times. In 7.0.1 the method for identifying modified fields has been streamlined and made more efficient. As a result, this GUI defect has been resolved.

39425 (1102853) - AccuRev metadata backup doesn't include all stream favorites information

Prior to 7.0.1, stream favorites information was stored in .sto files under the server's **<*ac-install*>**/storage/depots directory, and references to the .sto files were stored in the database. Consequently, restoring AccuRev metadata did not restore the .sto files, and this caused the GUI to hang as it started up after a restore. In 7.0.1, stream favorites information is stored in the database and is therefore restored along with other metadata. During an upgrade to 7.0.1, the data in existing .sto files is copied into the database. (The .sto files are not deleted during upgrade; they are left intact.)

41703, 41708 (1105061) - Many backed files shown with (external) status in Outgoing mode of File Browser

Prior to 7.0, backed files were sometimes shown with (external) status in the GUI. This was caused by a defect in the **files** CLI command. If an element argument to the command either started or ended with a path separator (e.g., '/'), then AccuRev would sometimes incorrectly mark some elements as external. This defect in the **files** command has been fixed in Release 7.0.1.

44085, 44287, 44674 (1097691) - Archive enhancements

AccuRev 7.0.1 includes several enhancements to the way that users can interact with files that have been archived. These enhancements help to identify which files the user would benefit most from archiving, and they provide a mechanism by which the AccuRev server can access files that have been archived.

See *Archive Enhancements* under *What's New in AccuRev Release 7.0.1* for more complete information.

44109 - GUI: Choose schema fields by label instead of name when creating a query

AccuRev's web interface allows the user to select issue fields by label rather than by name when creating or editing an issue query. As of 7.0.1, the GUI's query editor does the same. This is especially useful to users whose display language is something other than English (since the field labels are in English).

44111 - GUI: In Schema Editor, add ability to configure max number of displayed items in List and Choose fields

It is now possible to configure the maximum number of rows displayed in the dropdown list for an issue field of type List or Choose. The value is set in the "Number of Items Visible" field on the new Style sub-tab of the Schema Editor's Schema tab. (If the number of items in the list exceeds the configured value, a scrollbar is displayed with the dropdown list.)

44112 - GUI/Web UI: Support line breaks in schema field labels

Long schema field labels are automatically wrapped when an issue is displayed in either the GUI or Web UI. In 7.0.1 it is also possible to force a line break at a particular place in the label by inserting "\n" in the text of the label.

44113 - GUI: Support Undo in text fields

Release 7.0.1 supports Undo functionality in text fields in the GUI.

44114 - GUI: Merge operation in issue change palette appears to succeed even though a locked file prevents the merge from completing successfully

When a merge operation was executed from the issue change palette in previous releases, if a file lock prevented the content of a file from being updated after the merge completed, the GUI still removed the file's (overlap) status and reported the merge operation as a success even though the file's contents hadn't changed.

AccuRev 7.0.1 now treats this scenario as a failed merge, displaying appropriate error messages to the user and displaying files in the issue change palette with their original, unchanged status. When multiple files are being merged, the entire operation is treated as a single transaction. If the merge of one file fails due to some error, then AccuRev halts the operation, undoes any merges that have already been completed, and reports the merge operation as a failure. All the files are restored to their original contents and status.

44115 - Request localization and support of the AccuRev client on Mac OS in Japan

AccuRev 7.0.1 supports the "ja" locale on Mac OS.

44118, 44556 - GUI: Support styling of individual issue fields

Beginning with Release 7.0.1, it is possible to style the label and value of individual issue fields. Style parameters can be configured in the new Style subtab of the Schema Editor's Schema tab.

See *Styling Individual Issue Fields in the Schema Editor* under *What's New in AccuRev Release 7.0.1* for more complete information.

44119 (1105115) - Web UI: Query browser's "Set up Columns" dialog lists a maximum of 100 available columns

The Web UI's query browser used to display only 100 items in the Available Columns list of the "Set up Columns" dialog. This limit has been removed in Release 7.0.1.

44120 - Failed login attempts should be identified in acserver.log

In previous releases, acserver.log gave no clear indication of whether login attempts succeeded or failed. Now each acserver.log login entry includes either "login_successful" or "login_failed".

44121 - GUI: AccuWork "Save Attachment As" should request confirmation before overwriting existing file

In the GUI, if the user attempts to save an AccuWork issue attachment to a path that already exists on the client machine, AccuWork now displays a confirmation dialog instead of immediately overwriting the existing file.

44124 - GUI: Login dialog or warning message goes unnoticed because there is no AccuRev icon in Windows taskbar

Prior to 7.0.1, the AccuRev icon did not appear in the Windows taskbar until the user was successfully logged in to AccuRev. This made it difficult for users to find the AccuRev dialog if it was buried under other windows on the desktop. In 7.0.1, the AccuRev icon appears in the Windows taskbar immediately when the GUI is invoked.

44125, 44147 - Add client-side setting to use time basis to determine overlap status

The **stat** and **merge** CLI commands have a new option called "--use_time_basis_for_overlap", which instructs AccuRev to identify overlap using a workspace's update level or a stream's time basis instead of using the current time. When this option is used, AccuRev shows (overlap) status for a file only if the file was overlapped at the time indicated by the workspace's update level or the stream's time basis.

The GUI equivalent of the "--use_time_basis_for_overlap" option is a new preference called "Use Time Basis For Overlap", visible on the General tab of the AccuRev Preferences dialog. In addition, the File Browser displays a new checkbox called "Use Time Basis For Overlap". If the user changes the value of the preference, the checkbox value is updated accordingly, and vice versa.

44126 - Define server-side USE_MOD_TIME setting to control default file timestamps

Earlier AccuRev releases support a client-side setting called ACCUREV_USE_MOD_TIME, which can be set either as an environment variable or in the preferences.xml file in the user's .accurev directory. A value of 1 indicates that a file copied from the repository into a workspace by the AccuRev commands **co**, **pop**, **purge**, **revert**, or **update** will have a timestamp equal to the original Keep time of the version in AccuRev. If ACCUREV_USE_MOD_TIME is set to a value other than 1 on the client machine, the timestamp of the file will indicate the time that the copy was created.

In addition to that client-side setting, AccuRev 7.0.1 also supports a new server-side setting called USE_MOD_TIME, which can be set in the acserver.cnf file. If set to TRUE (case-insensitive), a file copied from the repository into a workspace will have a timestamp equal to the version's original Keep time. If USE_MOD_TIME is set to any other value or is not set at all on the server, the timestamp of a file copied into a workspace will indicate the time that the copy was created.

Important note: If ACCUREV_USE_MOD_TIME is set to any value on the client machine, that client-side value overrides the value of USE_MOD_TIME on the server. If ACCUREV_USE_MOD_TIME is not set on the client machine, then the value of USE_MOD_TIME on the server is applied. If no variable is set on the client or server, then the file timestamp will indicate the time that the copy was created.

44127 - GUI: Attaching a file to an issue and making a workflow transition without first saving the issue causes the file to be saved as a link path

Prior to Release 6.2.2, attaching a file to an issue and then transitioning to another workflow stage without first saving the issue resulted in AccuWork:

- *not* attaching the file to the issue, and
- displaying the local path of the file as the File Name in the Attachments table.

This problem has been resolved in 7.0.1.

44128 - GUI: Add confirmation dialog to prevent accidental creation of parent-child issue relationship

In earlier releases, users could unintentionally create a parent-child relationship between two issues by dragging and dropping one record to another in AccuWork's query result panel. Release 7.0.1 resolves this problem by displaying a confirmation dialog before executing the operation.

44129 (1096645) - server_dispatch_post trigger not reporting all issues changed in bulk update

In previous releases, when a bulk update in the Web UI fired the server_dispatch_post trigger, the resulting email notification reported only one issue as having been changed. In Release 7.0.1, the email notification now properly identifies all the issues that were modified by the trigger.

44130 - GUI: Add ability to use custom user properties (like Display Name) when exporting query results to a CSV file

AccuRev 6.2.3 introduced the ability to display a custom user property instead of an AccuRev username in a field of type User in an issue form; however, the AccuRev username was still displayed when editing queries and viewing and exporting issue query results. With release 7.0.1, the configured custom user property is used instead of the AccuRev username in all of these scenarios.

44132 - GUI: Impossible AccuWorkflow transition can be selected in pull-down menu

In this release, AccuWorkflow transitions that cannot be made from the current stage are greyed out and disabled in the combobox that lists all the transitions.

44134 - GUI: Highlight lines related to selected version in Version Browser

In the Version Browser, all lines leading directly into the left side of the selected version are now drawn with a heavier weight line (but still in the appropriate color) to make it easier to view relationships between versions.

44135 - Support depot and stream names that start with a digit

Depot names and stream names may now contain a digit anywhere in the name, including at the beginning, but the name must contain at least one non-digit character.

44136 - Web UI: Improve Issue Form Performance

In previous releases, issue form validation in the Web UI could take a long time (over five seconds) if the issue schema contained many fields; this was especially true for the Microsoft Internet Explorer browsers. The 7.0.1 Web UI has been modified to improve issue form validation performance. In many common cases where validation used to take five seconds or more, the new Web UI has reduced that time to less than a second.

44138 - GUI: Support pasting of multiple values into List Values or Field Values box of Schema Editor

In the Schema Editor, it is now possible to paste a list of strings into the List Values or Field Values box for a schema field of type List or Choose, respectively. If duplicate values exist, the user is notified via a warning dialog, and the duplicate values are omitted from the schema field's list of permissible values.

44140 - GUI, Web UI: Display warning dialog when user inputs an unsupported character

When an invalid character is typed into an issue field, the AccuRev GUI and Web UI now display a warning message in the status bar. The GUI also plays a beep sound.

44141 - GUI: Export attachment files with other issue data from query results table

In this release, if a user exports a query results table containing an Attachments column, the GUI will prompt the user to enter an attachment archive file name. The GUI will save all files that are attached to the exported issues in a zip archive file, with a separate directory for each exported issue.

44144 - GUI: Support forward slash character in List and Choose values in schema

It is now possible for configured values of Choose- and List-type schema fields to contain the following characters: '/', '&', '>', '<', and '"' (double quote).

44149 - maintain: discard regular streams and workspaces that have no version history

The new **discard** command in the *maintain* utility permanently deletes any type of stream (including snapshot and workspace), provided that the following criteria are true:

5. The stream has no child streams.
6. If the stream ever had any child streams, all of those child streams have already been discarded.
7. No other streams have cross-links into the stream.
8. No versions were ever kept in or promoted to the stream.
9. The stream is not the most recently created stream on the system.

If any of these criteria are not satisfied, the **discard** will fail.

Once **discard** deletes a stream, it is not possible to reactivate the stream. However, it is possible to create a new stream that has the same name as the discarded stream.

44157 - Core: Add ability to lock users after "N" number of failed logins

The new trigger **server_login_trig** gives AccuRev administrators the ability to lock out users after a certain number of failed login attempts. A sample script is included in the examples folder.

44158 - GUI: Make bulk merge work for StarTeam merge

The StarTeam merge tool now works properly in bulk merge mode. That is, if the user elects to auto-keep trivial merges, the StarTeam merge tool appears only for files that have non-trivial (i.e., conflicting) changes.

44419, 45211 - Create wizard to update a stream after a time basis change

The "Sync Stream wizard" introduced in the 7.0.1 GUI syncs a stream with its backing stream by running rebase and merge operations. The wizard is invoked automatically when the user changes a stream's time basis. It can also be invoked manually on any stream by clicking the **Sync** button in the File Browser view.

See *Sync Stream Wizard in the GUI* under *What's New in AccuRev Release 7.0.1* for more complete information.

44443 - GUI Version Browser: Show the promotion path leading to a version

The GUI Version Browser has a new context menu item called "Show Promotion Path" for versions that were created by a Promote or Demote operation. Show Promotion Path displays a solid orange line to

trace the sequence of promotions and demotions leading from a real (kept) version all the way to the selected virtual version. This path helps the user visualize the flow of changes in the system.

The user can clear the promotion path from the display by taking any of the following actions:

- clicking Refresh View
- changing the transaction range
- executing Show Ancestry
- clicking on a different stream in the bottom panel of the version browser

See *Version Browser: Highlighted Version Relationships and Show Promotion Path* under *What's New in AccuRev Release 7.0.1* for more complete information.

44906 - Remove restrictions about Japanese characters in stream names in Japanese locale

Release 7.0.1 supports the use of Japanese characters in stream names and depot names.

45756 (1108535, 1109132) - GUI: Promote from workspace to backing stream fails after backing stream has been renamed

In previous releases, promoting a file from a workspace to its backing stream would fail if the backing stream had been renamed. (Doing the promotion from the command line would succeed, however.) This defect in the GUI has been fixed in Release 7.0.1.

Corrections and Changes to the Documentation

Please note the following corrections and changes to the AccuRev 7.0.1 documentation:

37526 (1100041) - DOC: "Enabling the Client Upgrade feature" in Installation and Release Notes does not cover Mac OS X, Solaris, HP

The Installation and Release Notes section on "Enabling the Client Upgrade feature" has been updated to address Windows, Linux, Solaris, AIX, and Mac OS X platforms. 7.0.1 does not support the HP platform.

Known Issues

This section describes known issues in AccuRev and in the AccuRev Web UI.

The GUI and Web UI for older AccuRev releases don't support later schema enhancements

- If the schema contains (or ever contained) any fields of type Group, issue creation and editing must be done using the GUI or Web UI of Release 6.2.3 or later. A schema containing Group-type fields is incompatible with releases prior to 6.2.3.
- (minor) The Display Property for User-type issue fields is ignored in the GUI or Web UI of any pre-6.2.3 release. The AccuRev username is displayed instead of the configured Display Property.

- (minor) Styling of individual issue fields is ignored in the GUI of releases older than 7.0.1.
- (minor) The “\n” newline notation in a field label is displayed as the string “\n” instead of as a newline in the GUI and Web UI of releases older than 7.0.1.

Context-sensitive help does not open on CentOS 6 machine

On a CentOS 6 machine (client or full install), clicking the "?" icon or the **Help => Help** menu item has no effect; context-sensitive help information is not displayed. (CentOS6 uses Gnome 2.28.2.)

Settings on the machine are as follows:

- the default web browser in the desktop environment is set to Firefox:

```
[auser@localhost bin]$ xdg-settings --list
Known properties:
  default-web-browser           Default web browser
[auser@localhost bin]$ xdg-settings get default-web-browser
firefox.desktop
```

- **Online Help Browser** is set to "<Default Browser>" in the GUI’s AccuRev Preferences dialog.

If **Online Help Browser** is set to "firefox" instead, then context-sensitive help gets displayed properly.

AccuRev 7.0 Release Notes

This chapter describes changes and other information related to AccuRev 7.0.

Note: To ensure optimal performance, install all applicable updates for your operating system.

What's New in AccuRev Release 7.0

AccuRev 7.0 contains new features designed to increase productivity among software development teams, including several change package usability enhancements and a new Show Ancestry feature in the GUI's Version Browser. AccuRev 7.0 also provides replica rollback capability, performance improvements, a database upgrade, and a new built-in license manager.

Disaster Recovery - Replica Rollback

Replica rollback streamlines disaster recovery operations in a replicated environment. When the master AccuRev server has been restored to a previous backup, the **replica sync** command detects the change and initiates the rollback. The operation calculates how far back the replica must roll, removing database transactions and unused storage containers in depot slices. It then performs the normal sync to bring the replica in sync with the master.

License Manager

AccuRev 7.0 replaces the Reprise RLM license manager with a new built-in license manager. The new license manager supports named and floating licenses. The license file is now named ***aclicense.txt*** instead of ***accurev.lic***.
Note: In order to upgrade to AccuRev 7.0, you must first obtain a new license. For instructions on that procedure, see *Get an AccuRev License* on page 26.
See the *AccuRev Administrator's Guide* for a full description of license management in AccuRev 7.0.

Change Package Usability Enhanements

Promote and Demote an Issue Variant

AccuRev 7.0 provides the ability to promote or demote an issue variant in certain use cases. The prerequisites for promoting or demoting an issue variant are the same as those for operating on a regular (non-variant) issue: no dependencies on other issues; no overlap; the basis version must be in the backing stream; and the version must coalesce with the backing stream versions.

Show Diff By Issues

In AccuRev 7.0 the **Show Diff by Issues** operation can display differences in issue variants.

Change Package Dependencies

AccuRev 7.0 can display change package dependencies of an issue variant. That is, it can display the issues that a particular issue variant depends on, ignoring the issues that other variants might depend on.

Merge with Backing Stream

For the *merge with backing stream* operation, AccuRev 7.0 has switched the "Merge-from" version and the direct ancestor version in the Version Browser display. The red merge line now originates at a workspace version instead of a backing stream version. This change enables a rebase merge to occur without losing any change package information. This change affects only Merge operations executed in 7.0 and later; it does not modify Merge operations recorded prior to 7.0.

New "*Already Included*" Change Package Element Status

In the GUI's **Show Active Issues** tab, clicking on an issue in the top pane causes the bottom pane to display data about the elements in that issue's change package, including the version and status of each element. In AccuRev 7.0, the status of an element might be displayed as **"Already Included"**. This means that the exact version that is part of the change package is not in the stream, but a variant of it is. The version in the stream (the variant) is either a merge ancestor or a path ancestor of the version in the change package.

GUI Improvements

Show Ancestry Feature of Version Browser

The Version Browser's new **Show Ancestry** feature helps the user see through the clutter of a complex, crowded version tree. The new **Ancestry** button in the Version Browser allows the user to select a version in the display and then toggle between displaying only the ancestor versions of the selected version (along with related virtual versions) and displaying all of the element's versions. The **Show Ancestry** context menu item enables the user to continually refine the display by viewing the ancestors of one version, then the ancestors of one of those ancestors, etc.

Stream Browser Performance

AccuRev 7.0 accomplishes a significant improvement in Stream Browser performance by implementing lazy rendering of versions in the Stream Browser display. As the user scrolls to different parts of the version tree, the versions in those parts are rendered in the display and then cached. This approach dramatically speeds up opening a Stream Browser in a depot that has thousands of streams.

Rich Text Editor

A new rich text editor is included in AccuRev 7.0. It resolves some defects related to pasting text into the editor, and it supports the new Spell Checking feature.

Spell Checking

Spell checking functionality has been added to the AccuRev GUI. A new AccuRev preference called **Enable Spell Checking** toggles spell checking functionality in Text- and Log-type issue fields and in the comment field for operations like Keep and Promote. Toggling the value affects tabs that are opened from that time forward; tabs that are already open are not affected.

Spell checking functionality:

- Potential misspellings are highlighted by a red underline. The case of the first letter of any word is not significant during dictionary lookup.
- Spell checking can be done either from the context menu or by pressing the **F7** key to bring up a dialog.
- In rich-text fields, correcting a spelling error removes any formatting of the word.
- Users can define their own dictionaries and change the language used for spell checking. Currently supported languages are: English, German, Spanish, French, and Portuguese.

Database Upgrade

AccuRev 7.0 upgrades the PostgreSQL version from 8.4.3 to 9.5.3. The *db* directory is no longer under the *storage* directory; instead, it is now located under *postgresql/9.5/*, conforming to PostgreSQL convention. After upgrading AccuRev to version 7.0, the system administrator must upgrade the database by running **maintain migratepg <*db_admin*>**.
See the *AccuRev Administrator's Guide* for more information.

Changes in AccuRev Release 7.0

AccuRev Release 7.0 includes the following new features and bug fixes.

> **Note:** In cases where an issue is identified with two numbers, such as 26649 (1094789), the first number is the issue number in the AccuWork issue tracking system, and the second, in parentheses, is the issue number in the SupportLine system used by Customer Care.

New License Manager

In AccuRev 7.0 the Reprise RLM license manager has been replaced with a new built-in license manager, which supports standard and flexible licenses. In order to upgrade to AccuRev 7.0, you must first obtain a new license file named ***aclicense.txt***. For instructions on that procedure, see *Get an AccuRev License* on page 26.

See the *AccuRev Administrator's Guide* for a full description of license management in AccuRev 7.0.

24355 (609971) -- CLI: Hist command does not show filename that was 'removed' from the issue

Output from the Hist command now includes the names of files that have been removed from an issue.

26649 (1094789) -- GUI: In the Schema Editor, removing a field can result in an invalid logic.xml file

Previously, the GUI would sometimes behave erratically in the Queries tab if a schema field had been manually deleted from the schema.xml file. *(Manual changes to any of the AccuRev schema files are highly discouraged.)* With this release, the GUI instead writes an error log message to the GUI log and ignores any references to the manually deleted field.

33753 (1102274) -- xlink on xlink fails if both are snapshots

Previously, when displaying the elements in a directory cross-linked to another cross-linked directory, where both are snapshots, the status of the elements was displayed as "no such element". With this release, the correct status of those elements is displayed.

34936 (1095751) -- RFE: Request for way to disable Admin Menu button on Web GUI toolbar

One can now hide the “Admin” menu in the WebUI toolbar by adding a “disableAdmin” tag inside the “security” tag in the wui_config.xml file and then restarting Tomcat. An example of the new “disableAdmin” tag:

```
<security>
    <userName minLength = "0" minDigitCount = "0" minLetterCount = "0"/>
    <password minLength = "0" minDigitCount = "0" minLetterCount = "0"/>
    <disableAdmin>true</disableAdmin>
</security>
```

35176 (1096053) -- RFE: Use stream names in the WebUI rather than stream numbers

The WebUI issue form now displays stream names instead of stream numbers in the Version and Basis Version columns of the Changes tab.

35350 (1096166) -- RFE: Ability to add a user to multiple groups via a single CLI command

The CLI "addmember" command now supports adding a member to multiple groups. The group names must be specified in a comma-separated list that is the last argument of the command.

35818 (1096586) -- GUI: AccuWork query for dates has issues when comparing against current date

Previously, for a Timestamp-type field with a granularity of days, an “is before or equal to” comparison of the field against “CUR_DATE” would not yield the proper results. With this release, the comparison is done correctly.

35839 (1096610) -- GUI: Pasting text into a rich text field in AccuWork destroys existing layout of the field being pasted into

A new WYSIWYG editor has been introduced in AccuRev 7.0. Pasting text into a rich text field no longer inserts extra line breaks into the text.

37473 (1099867) -- GUI: Pasting text that starts with a slash '/' fails in text and log fields

A new WYSIWYG editor has been introduced in AccuRev 7.0. Pasting in text that starts with a slash causes no problems.

39139 (1101999) -- Correct directory element not showing after defuncting evil twin directory

Previously, after defuncting an evil twin directory and promoting it to the backing stream, the backing stream's Stream Explorer still showed the defuncted directory element, with a status of "(twin)(member)". With this release, the Stream Explorer shows the directory element that was not defuncted.

39235 (1102322) -- GUI: Version Browser displays the wrong issue number

Previously, under certain circumstances, the Version Browser would display only the last few digits of an issue number associated with a version. With this release, the full issue number is always displayed.

39250 (1102389) -- GUI: Diff Prev Trans opens diff with wrong version

Previously, executing "Diff Prev Trans." on the first version of a file in a stream would sometimes bring up a Diff window comparing that first version with another version of the file. With this release, that operation will result in a dialog window saying "Previous transaction cannot be found for selected version."

39540 (1103182) -- User did a revert on a link from a replica and it crashed the server

The server used to crash if this sequence of operations was executed: Link to a file (via “accurev ln”), promote, change the link to point to a different file, promote the link again, then revert the last promote in the backing stream. With this release, the Revert operation executes successfully.

39568 (1103306) -- AccuRev is reporting a protocol mismatch when client runs out of disk space

The error message has been improved. It now reads:

"A problem occurred writing to the file system. There is not enough space on the disk."

41134 (609864) -- RFE: Request to have timestamps in Postgres log by default

A timestamp is now added to each record in the postgresql*.log file.

41140 (1095548) -- RFE: Stream Favorites search should be case-insensitive

The Create/Edit Stream Favorite dialogs and the Find dialog in the Stream Browser now have a "Case-Sensitive" checkbox that controls whether searches are case-sensitive or case-insensitive. The setting of this checkbox is sticky, and it is shared across the Create, Edit, and Find dialogs.

41161 (1104364) -- RFE: Request to be able to view and interact with issue 0

AccuRev 6.x removed the ability for users to view and to promote changes against issue 0. AccuRev 7.0 restores the ability to promote changes against issue 0, either from the command line or in the GUI, as a way of indicating that the changes are not associated with any issue. It is not possible to view issue 0 in AccuRev 7.0.

41231, 43104 (1104539) -- RFE: Stream history menu option to use time model in addition to transactions

Previously, the History Browser's "Show:" menu listed options for 20 transactions, 50 transactions, 100 transactions, and "Everything". AccuRev 7.0 supports additional options -- 1 month, 3 months, and 6 months -- allowing the user to specify the amount of history to see as a number of months.

41266 (1103111) -- RFE: Upgrade tomcat used by WUI (to Tomcat 8.0.33)

The AccuRev 7.0 WebUI is installed with and runs on Tomcat 8.0.33.

41799 (1100524) -- Values are not populated to trigger parameter file for Revert action

For the Revert operation, the stream name and change package ID are now passed in the trigger parameter file so that they are available to the trigger.

41802 (1096649) -- CLI: anc -1 -v returns an invalid version number

Previously, if the command “anc -1 -v” was executed for the first version of a file in a stream, an invalid version number would be returned. With this release, the correct answer of “0/0” is returned.

41807 (1102080) -- RFE: lsrules '-fmx' option to be used with -d command option

The "lsrules" command now supports the use of the "-d" option with the "-fmx" option to list only the rules that were explicitly set for the workspace (or stream), excluding rules that are inherited from higher-level streams.

41812 (1101574) -- RFE: Ability to use more than one type when using the -k switch with the hist command

The CLI "hist" command now supports specifying multiple types of transactions. The transaction types must be specified in a comma-separated list after the "-k" option flag.

41814 (1102504) -- GUI: Search button not active on Find box

Pasting text into the Stream Browser's Find text box now enables the Search button properly.

41816 (1103844) -- RFE: Annotate from Active Transaction/History view in GUI

The Annotate command has been added to the context menu of the Versions pane (the lower pane) in the History Browser.

41903 (621027) -- GUI: No label on CPK Dialog Box for Issue field

In the "Send to Issue" operation, the issue number field in the "Select Issue (Change Package)" dialog used to be unlabeled. Now the field is labeled "Issue:".

43422 (1106840) -- Core: show streams performance issue because of extended backing stream info on passthrough streams

The performance problem has been resolved. The "show streams" command now builds stream hierarchy information only for the Demote operation, which requires that information.

43895 (1107122) -- GUI: Remove logback.xml from fw.jar

The logback.xml file has been removed from the fw.jar file and is now installed directly in the `<ac-install>/bin/` directory.

Corrections and Changes to the Documentation

Please note the following corrections and changes to the AccuRev 7.0 documentation.

25496, 43031 (1100525) -- DOC: Trigger documentation needs improvement

Appendix B, "Trigger Commands and Parameters", has been added to the Administrator's Guide. It lists the parameters that are passed to trig_server_all and trig_server_preop for each command.

36259 (1097551) -- DOC: hist option -f3 missing from the hist man page

The Help page for the "hist" CLI command now describes the -f3 option.

37124 (1103084) -- DOC: Add documentation about the ability to set max size of files within AccuRev

In the 7.0 Administrator's Guide, the section called "Server-Side Triggers" describes the ability to enforce a maximum file size for the "add" and "keep" commands. An example is provided in the server_preop_trig.pl sample file, which is installed in the AccuRev examples folder. The sample trigger file defines a maximum file size and compares that to the file sizes that AccuRev passes in as parameters to the trigger file.

39773 (1103740) -- DOC: CLI - mkuser doc page is missing GitCentric in the "Description" field for a “full” license

The mkuser doc page has been corrected.

39797 (1103792) -- DOC: 6.2.2 client install fails with "api-ms-win-crt-runtime-l1-1-0.dll is missing" error

The System Requirements have been amended to state that Windows 7 SP1 is required. SP1 resolves the missing dll error.

42016 (1105390) -- DOC: Document support for custom user properties that was introduced in 6.2.3

Discussion of custom user properties and other enhanced user management features (group-type issue fields, new validation actions, forward matching) has been added to these sections of the documentation:

- "setproperty" in the *CLI User's Guide*

- "The History Browser" in *On-Line Help*

- "Schema Tab" in *The Schema Editor*

- "Validation Tab" in *The Schema Editor*

- "Working with Issues" and "Issue Form" in *AccuWork*

Known Issues

This section describes known issues in AccuRev and in the AccuRev Web UI.

Known Issues in AccuRev

GitCentric server is incompatible with AccuRev 7.0

GitCentric releases from 2015 and earlier are not compatible with AccuRev 7.0. An upcoming release of GitCentric will resolve the incompatibility. If you have GitCentric Server, we recommend that you wait for the next release of GitCentric before you install AccuRev 7.0.

Upgrade install ignores user-entered configuration information

During an upgrade install (i.e., an install on top of an existing AccuRev bin directory), the installer prompts the user to enter the same configuration information that it asks for during a fresh (non-upgrade) install. However, for an upgrade install, the information entered by the user is actually ignored, and the installer instead uses the values that are already stored in the `<ac-install>/bin/acserver.cnf` file.

Cannot upgrade AccuRev client on macOS

macOS: Because the package name for the client installer has changed from AccuRev to AccuRevClient in 7.0, there is no way to upgrade earlier macOS clients. Uninstall the previous client (or simply discard the Applications/AccuRev directory) and do a fresh install of AccuRevClient 7.0.

No master license server in AccuRev 7.0

AccuRev 7.0 has replaced the standalone Reprise License Manager (RLM) with a new license manager directly built into the AccuRev server. A side effect of this change is that each master AccuRev server now needs to be issued its own license file.* The issue of a master license server will be addressed in a future release of AccuRev.

*(Replica servers do not need their own license files; they get licenses from their master servers.)

Issues synced to JIRA show HTML formatting tags in rich text issue fields

Because of the new rich text editor control used in AccuRev 7.0, rich text issue fields that are edited in AccuWork display HTML formatting tags in JIRA after the issue is synced to JIRA. If users commonly use JIRA to edit issues, the impact is minimal. However, if users mostly use AccuWork to edit issues, we recommend upgrading to AccuSync 2016.2 in order to reduce the number of tags that are visible in JIRA.

Issuelist incorrectly marks an issue as incomplete if a defuncted element was promoted to the backing stream

The “issuelist” command incorrectly marks an issue as incomplete if all of the following are true:

1. The stream hierarchy has cross-links in it

2. The issue contains a defuncted element that has been promoted to the current stream’s backing stream

3. Other changes for the issue are still active in the current stream

In this scenario, the defuncted element is incorrectly labeled as "missing".