Rational Software Corporation®

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the software development company

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Technical Acknowledgments

This software and documentation is based in part on BSD Networking Software Release 2, licensed from the Regents of the University of California. We acknowledge the role of the Computer Systems Research Group and the Electrical Engineering and Computer Sciences Department of the University of California at Berkeley and the Other Contributors in its development.

This product includes software developed by Greg Stein <gstein@lyra.org> for use in the mod_dav module for Apache (http://www.webdav.org/mod_dav/).

Preface

Rational ClearCase is a comprehensive configuration management (CM) system that manages multiple variants of evolving software systems. ClearCase maintains a complete version history of all software development artifacts, including code, requirements, models, scripts, test assets, and directory structures. It performs audited system builds, enforces site-specific development policies, offers multiple developer workspaces, and provides advanced support for parallel development. ClearCase includes Unified Change Management (UCM), an optional, out-of-the-box process for organizing software development teams and their work products.

About This Manual

This manual guides software developers through everyday development tasks using either UCM or customizable features of ClearCase.

Organization

The manual is divided into two parts:

- *Working in UCM*. Read this part only if your development team uses UCM to implement its development process.
- *Working in Base ClearCase*. Read this part only if your development team uses customizable ClearCase features to implement its own development process.

Recommended Reading Paths

Use this manual as a guide during your first few weeks of developing software with ClearCase. We recommend this sequence for proceeding:

- Skim through this manual to understand at what points in the development cycle you'll need to use ClearCase. Consider skipping the sections titled *Under the Hood*, which describe advanced concepts and technical details.

- Read through this manual carefully and follow the procedures.

- As you become familiar with ClearCase, read the sections titled *Under the Hood*.

The manual describes using ClearCase primarily from ClearCase Explorer. ClearCase is integrated with ClearCase Explorer and Windows Explorer via shortcut menus (for ClearCase objects) and with many authoring and development environments. Read this manual to understand the basics of using ClearCase; then refer to ClearCase online help for information on using ClearCase from your authoring or development environment. For a complete list of ClearCase integrations, refer to the Rational Web site at **www.rational.com**.

Assumptions

This manual assumes:

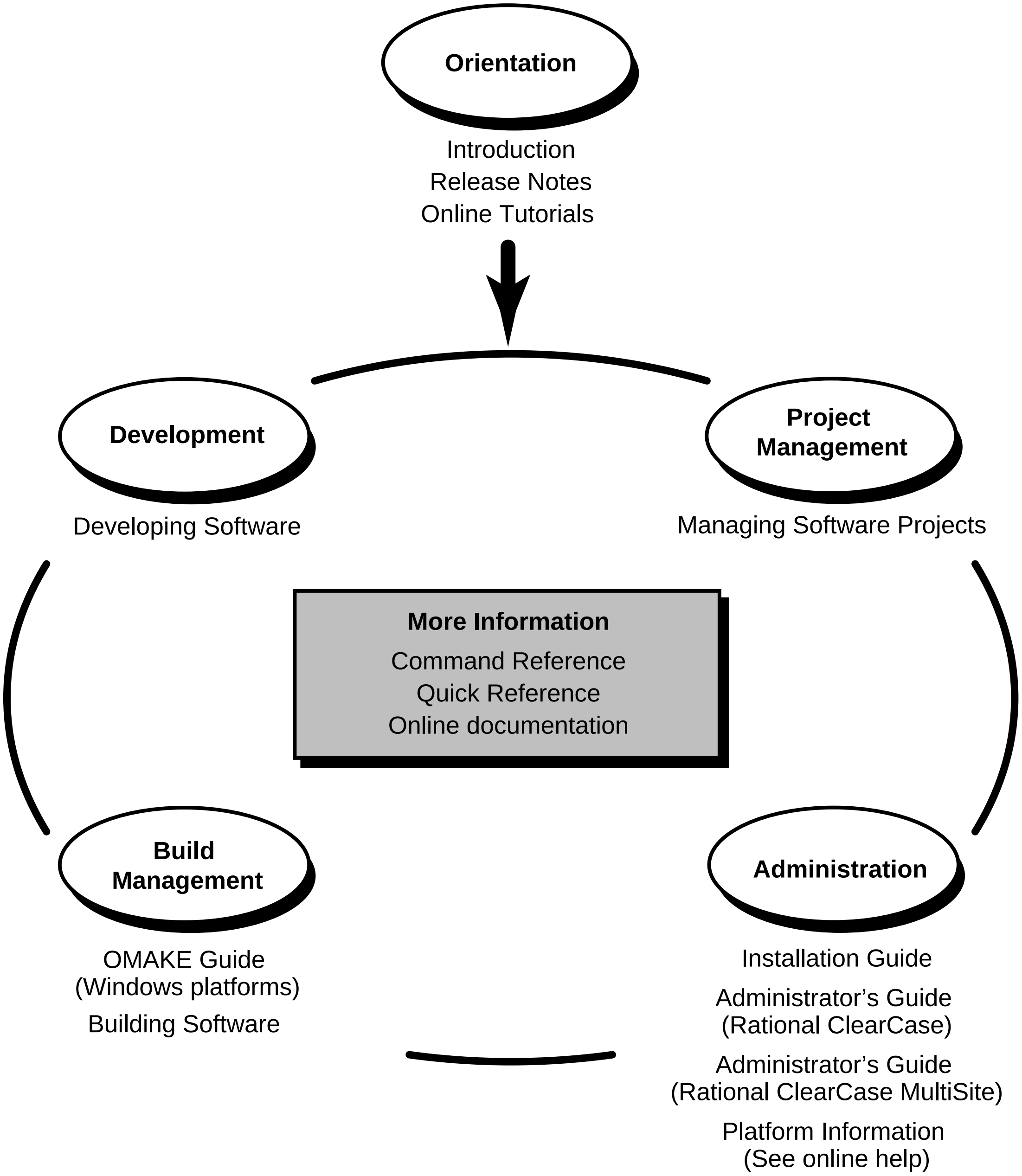
- ClearCase has been installed and configured on your computer. For information on installing ClearCase, see the *Installation Guide* for the ClearCase Product Family.

- One or more *versioned object bases* (VOBs), which are the repositories for ClearCase data, exist in your organization.

- If your development team uses ClearCase UCM, your project manager has set up a UCM *project*.

- Your organization has established some other development strategy using base ClearCase as the configuration-management system, and you are familiar with this strategy.

ClearCase Documentation Roadmap



Typographical Conventions

This manual uses the following typographical conventions:

- *ccase-home-dir* represents the directory into which the ClearCase Product Family has been installed. By default, this directory is **/usr/atria** on UNIX and **C:\Program Files\Rational\ClearCase** on Windows.

- *attache-home-dir* represents the directory into which ClearCase Attache has been installed. By default, this directory is **C:\Program Files\Rational\Attache**, except on Windows 3.*x*, where it is **C:\RATIONAL\ATTACHE**.

- **Bold** is used for names the user can enter; for example, all command names, file names, and branch names.

- *Italic* is used for variables, document titles, glossary terms, and emphasis.

- `A monospaced font` is used for examples. Where user input needs to be distinguished from program output, **bold** is used for user input.

- Nonprinting characters are in small caps and appear as follows: **<EOF>**, **<NL>**.

- Key names and key combinations are capitalized and appear as follows: SHIFT, CTRL+G.

- [ ] Brackets enclose optional items in format and syntax descriptions.

- { } Braces enclose a list from which you must choose an item in format and syntax descriptions.

- | A vertical bar separates items in a list of choices.

- ... In a syntax description, an ellipsis indicates you can repeat the preceding item or line one or more times. Otherwise, it can indicate omitted information.

  NOTE: In certain contexts, ClearCase recognizes "**...**" within a pathname as a wildcard, similar to "*" or "?". See the **wildcards_ccase** reference page for more information.

- If a command or option name has a short form, a "medial dot" (·) character indicates the shortest legal abbreviation. For example:

  lsc·heckout

  This means that you can truncate the command name to **lsc** or any of its intermediate spellings (**lsch**, **lsche**, **lschec**, and so on).

Online Documentation

The ClearCase graphical interface includes a standard Windows help system.

There are three basic ways to access the online help system: the **Help** menu, the **Help** button, or the F1 key. **Help** > **Help Topics** provides access to the complete set of ClearCase online documentation. For help on a particular context, press F1. Use the **Help** button on various dialog boxes to get information specific to that dialog box.

ClearCase also provides access to full "reference pages" (detailed descriptions of ClearCase commands, utilities, and data structures) with the **cleartool man** subcommand. Without any argument, **cleartool man** displays the **cleartool** overview reference page. Specifying a command name as an argument gives information about using the specified command. For example:

```
> cleartool man                   (display the cleartool overview page)

> cleartool man man               (display the cleartool man reference page)

> cleartool man checkout          (display the cleartool checkout reference page)
```

ClearCase's **–help** command option or **help** command displays individual subcommand syntax. Without any argument, **cleartool help** displays the syntax for all **cleartool** commands. **help checkout** and **checkout –help** are equivalent.

```
> cleartool uncheckout –help
Usage: uncheckout | unco [-keep | -rm] [-cact | -cwork ] pname ...
```

Additionally, the online *ClearCase Tutorial* provides important information on setting up a user's environment, along with a step-by-step tour through ClearCase's most important features. To start the *ClearCase Tutorial*, choose **Tutorial** in the ClearCase folder off the **Start** menu.

Technical Support

If you have any problems with the software or documentation, please contact Rational Technical Support via telephone, fax, or electronic mail as described below. For information regarding support hours, languages spoken, or other support information, click the **Technical Support** link on the Rational Web site at **www.rational.com**.

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Europe, Middle East, and Africa	+31-(0)20-4546-200 Netherlands	+31-(0)20-4546-201 Netherlands	**support@europe.rational.com**
Asia Pacific	61-2-9419-0111 Australia	61-2-9419-0123 Australia	**support@apac.rational.com**

Working in UCM

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Working in UCM

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1 The UCM Workflow

Unified Change Management (UCM) structures the efforts of your software development team into a defined, repeatable process. This chapter describes the UCM workflow and how it affects your work as a developer.

1.1 Recommended Reading Paths

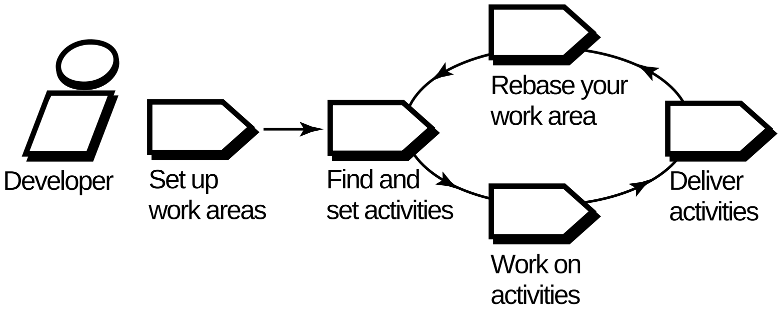
Read this chapter first. Then, if you want to start working immediately, use the online help and tutorials to learn as you go. Or, if you prefer a more structured approach, use the remainder of *Working in UCM* as a guide through the development cycle.

Until you are familiar with using Rational ClearCase, consider skipping the sections titled *Under the Hood*, which describe advanced concepts and technical details.

Working in UCM refers to tasks performed by both project managers and integrators as well as by developers. For information about tasks performed by other individuals within the UCM workflow, see *Managing Software Projects*.

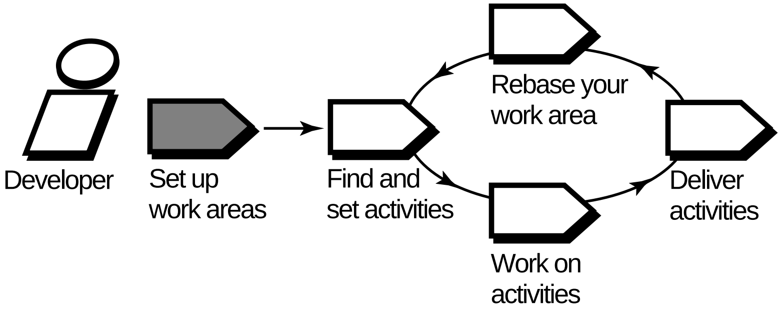
1.2 The UCM Workflow

When your project uses UCM, your work as a software or information developer follows a cycle.



Your project manager creates a UCM object called a project. To access your project's source files, you set up work areas. As you modify source files, you use activities to organize and identify your work. Other developers on the project do not see your changes until you deliver your work to a shared work area. Periodically, the integrator for your project incorporates activities in the shared work area into baselines, which are sets of activities that represent a significant change. Then, you synchronize (or rebase) your work area with the activities in the new baseline.

Setting Up Work Areas



To contribute work to a UCM project, you must set up work areas. This involves joining the project and setting up two work areas:

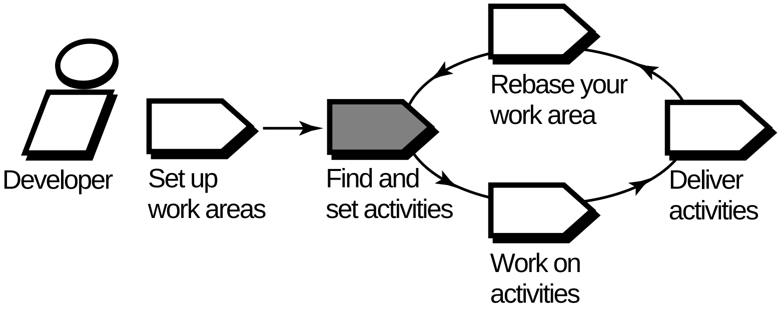
- A private work area for working on activities in isolation

- A shared work area for testing the activities you deliver.

Each work area consists of a view and a stream. A view is a directory tree that shows a single version of each source file in your project for you to modify. A stream is a ClearCase administrative object that keeps track of activities and baselines and determines which versions of elements appear in your view. For more information, see *Views and Streams* on page 11.

You can access your views and activities through ClearCase Explorer, your primary interface with ClearCase.

Finding and Setting Activities

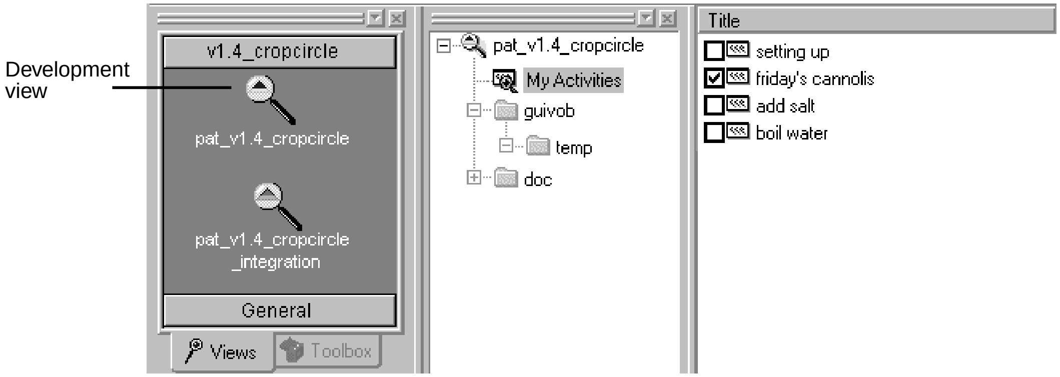


After you set up your work areas, find any activities that your project manager or other team members have assigned to you; if necessary, you can add new ones.

Finding Activities

Clicking the **MyActivities** icon in ClearCase Explorer shows the activities that are in your work area (Figure 1). If your project uses Rational ClearQuest as its change-request management system, you can use ClearQuest queries such as MyToDoList to find activities that are assigned to you but are not yet in your work area. For more information, see *UCM-Enabled Record Types and ClearCase Activities* on page 24 and *Queries* on page 26.

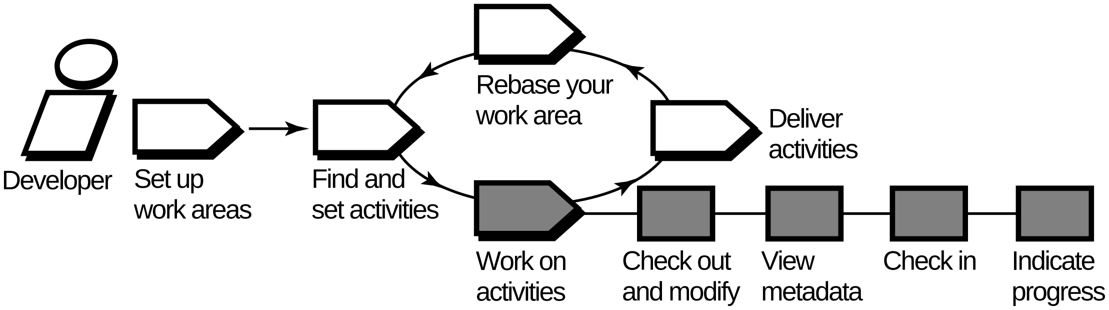
Figure 1 MyActivities in ClearCase Explorer



Setting Activities

Setting your view to an activity instructs ClearCase to assign any versions of source files you create to the activity's change set. You must set your view to an activity before you can work on an activity.

Working on Activities



To work on activities, you check out source files, modify them, and test your modifications. You may also need to enter information in your change-request management system to communicate your progress.

Checking Out and Modifying Source Files

Checking out a file makes it writable in your view. Then you can use any editing tool to modify it.

Viewing Metadata

Metadata is information that ClearCase and ClearQuest keep about your activities and source files. While working with checked-out files (checkouts), you may want to use ClearCase and ClearQuest to view the following types of metadata:

➤ The revision history of an element
➤ A comparison between versions of an element
➤ A list of versions that are checked out to your work area

Checking In and Testing Source Files

When you want to keep a record of a file’s current state, check it in. Any work you check in from your development view is not available to other team members until you deliver it.

Build and test the work in your development view, especially after you rebase the stream and before you deliver activities, to reduce the amount of merging needed when you deliver your work.

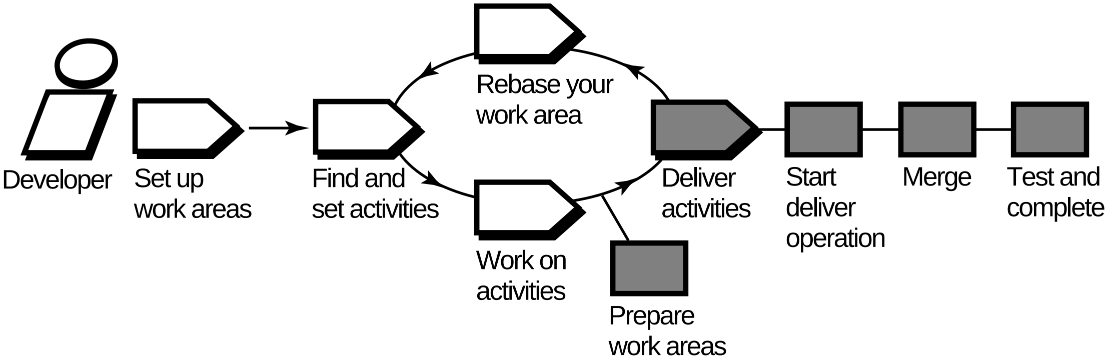
Indicating Your Progress

If your project is enabled for ClearQuest, you can indicate your progress on an activity in several ways:

➤ Modifying information in ClearQuest
➤ Closing an activity
➤ Using schema-specific actions

You may need to reassign or delete an activity, regardless of whether your project is enabled for ClearQuest. For more information, see *Indicating Your Progress* on page 76. When you’re ready to make your work available to the rest of the team, deliver it.

Delivering Activities



When you're ready to make one or more activities available to the project team, prepare your work areas.

Preparing Your Work Areas

To prepare your work areas:

- If your project integrator has created a new recommended baseline since you last rebased, rebase your development area.
- Find, compare, and check in the work you want to deliver.

Starting the Deliver Operation

After preparing your work areas, start the deliver operation.

Merging

As part of the deliver operation, ClearCase merges the work in your development stream with the work in the shared work area. It completes trivial merges for you. If it encounters merge conflicts, it prompts you to resolve them.

Testing

Your integration view contains the merge results. To make sure that your delivered work is compatible with the work in the shared work area, build and test the files in the integration view.

As part of building and testing, you may need to perform other operations:

- Edit the checked-out versions to resolve build errors.
- Check out and edit additional files.

  NOTE: We recommend that you do not check in any of your changes until you are ready to complete the operation. Checking in complicates efforts to undo the deliver operation.

- Update your integration view to see the work other developers have delivered since you started the deliver operation.

Completing the Deliver Operation

When you are satisfied with your test builds, complete the delivery. ClearCase checks in your modifications and changes the state of your stream.

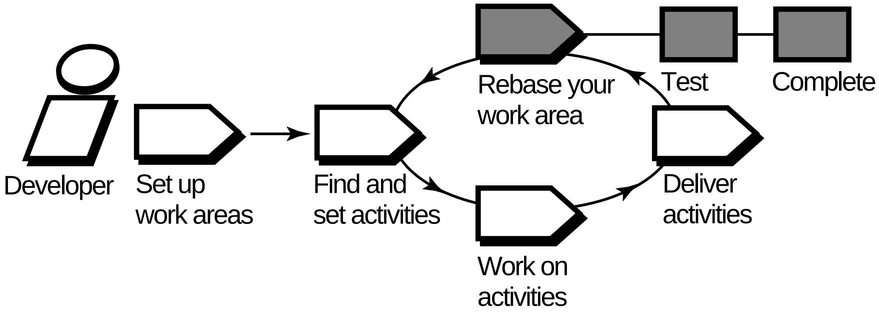
Other Considerations for Deliveries

If your project uses Rational ClearCase MultiSite to share source data with developers in other geographical locations, you may use a different method for delivering activities. If a different site is responsible for controlling your project's source data, you do the following:

- Post a deliver operation to the integration stream's replica.
- Notify the integrator at the site that controls your project's source data.

The integrator at the other site merges your activities to the integration stream and tests your work.

Rebasing Your Development Work Area



The integrator organizes delivered activities into baselines. Usually, baselines go through a cycle of testing and fixing bugs until they reach a satisfactory level of stability. When a baseline reaches this level, your integrator designates it as a *recommended* baseline.

To work with the set of versions in the recommended baseline, you rebase your development work area. To minimize the amount of merging necessary when you deliver activities, rebase your development work area with each new recommended baseline as it becomes available.

After you rebase, be sure to build and test the source files in your development view to verify that your undelivered activities build successfully with the versions in the baseline.

1.3 Under the Hood: ClearCase UCM Concepts

This section describes fundamental ClearCase UCM concepts:

- Projects
- Elements, components, and baselines
- Activities
- Views and streams
- Delivering, creating baselines, and rebasing

Reading this section isn't necessary to start working on a UCM project, but it does provide a basis for understanding how UCM works and may be helpful if you need to diagnose problems.

Projects

A *project* is the ClearCase object that defines a set of development policies and a set of configurations used in a significant development effort. Your organization may create a project for each product it develops, for a group of products, for a subset of a product's functionality, or for a product release.

A project's policies govern how developers access and modify sets of source files and directories (called components). To record and configure the development work that proceeds on components, projects use other ClearCase objects:

- Baselines
- An integration stream
- Development streams

➤ Activities

Because ClearCase supports parallel development, different projects can work concurrently with different versions of the same set of source files.

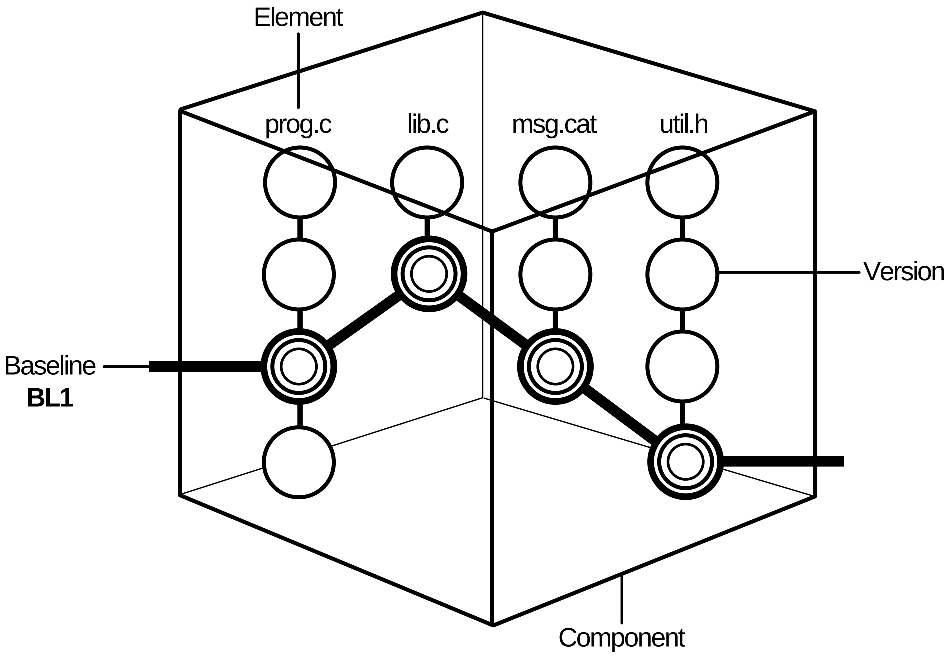
ClearCase stores projects in a data repository called a *PVOB* (project versioned object base).

Elements, Components, and Baselines

Your project manager places files and directories under ClearCase version control (or source control). Files and directories under source control are called elements. Each checked-in revision of an element is called a version. The project manager organizes these elements into components. Usually, components can be built into functional units of software.

To keep track of different configurations of versions, your project manager or integrator creates a baseline, which records one version of each element in a component. In effect, a baseline is a version of a component (Figure 2).

Figure 2 Elements, Components, and Baselines



ClearCase stores elements (and their versions) in data repositories called *VOBs* (versioned object bases); it stores component and baseline definitions in PVOBs. For more information about components, see *Managing Software Projects*.

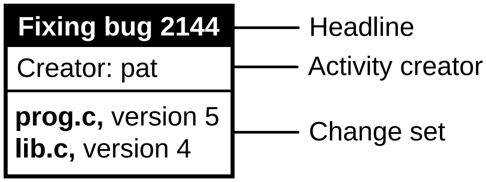
Activities

To create a version in a ClearCase UCM project, you must first assign it to an activity. An activity is a ClearCase object that identifies the versions created to complete a development task. For example, the versions you create to fix a defect that is stored in your change request management system may constitute an activity. Your organization determines the scope of its activities.

The ClearCase activity object includes a text headline, which describes the task, the user ID of the activity creator, and a change set, which identifies all versions that you create or modify while working on the task (Figure 3).

NOTE: In a project that is enabled for ClearQuest, ClearQuest includes a field to describe the activity owner. This activity owner and the ClearCase activity creator are two different data points; the former is stored in ClearQuest and the latter in ClearCase.

Figure 3 Activity Object



An activity object belongs to a single stream and cannot be moved to another to another stream. (If you assign one or more versions to the wrong activity or if you create new activities to better represent your work, you can assign the versions to a different activity. For more information, see *Moving Versions to a Different Activity* on page 72.)

When you deliver an activity, ClearCase merges the versions in the activity's change set to the integration stream, but does not move the activity object to the integration stream. Instead, it creates an integration activity to identify the versions created as a result of the merge. For more information, see *Under the Hood: Integration Activities and Baselines* on page 92.

In a project that is enabled for ClearQuest, ClearCase links its activity objects to UCM-enabled records in ClearQuest. For more information, see *UCM-Enabled Record Types and ClearCase Activities* on page 24.

Views and Streams

To create new versions of elements in a component, you use a view; to keep track of the versions you create, you use a stream.

Views

A view provides a directory tree of one version of each file in one or more components. In the view, you modify source files, compile them into object modules for testing purposes, format them into documents, and so on. Figure 4 shows a view named **pat_v1.4_cropcircle** as seen from ClearCase Explorer.

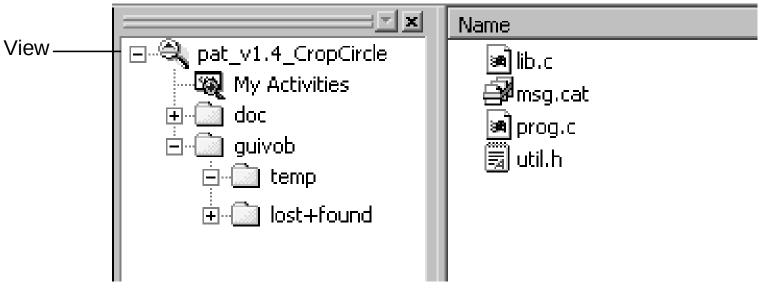
ClearCase offers two kinds of views:

➤ *Snapshot views*, which copy files from VOBs to your computer.

➤ *Dynamic views*, which provide immediate, transparent access to the data in VOBs. (Dynamic views are not available on all platforms. For more information, see the ClearCase online help.)

An associated stream determines which versions of elements are in the view.

Figure 4 A View as Seen from ClearCase Explorer

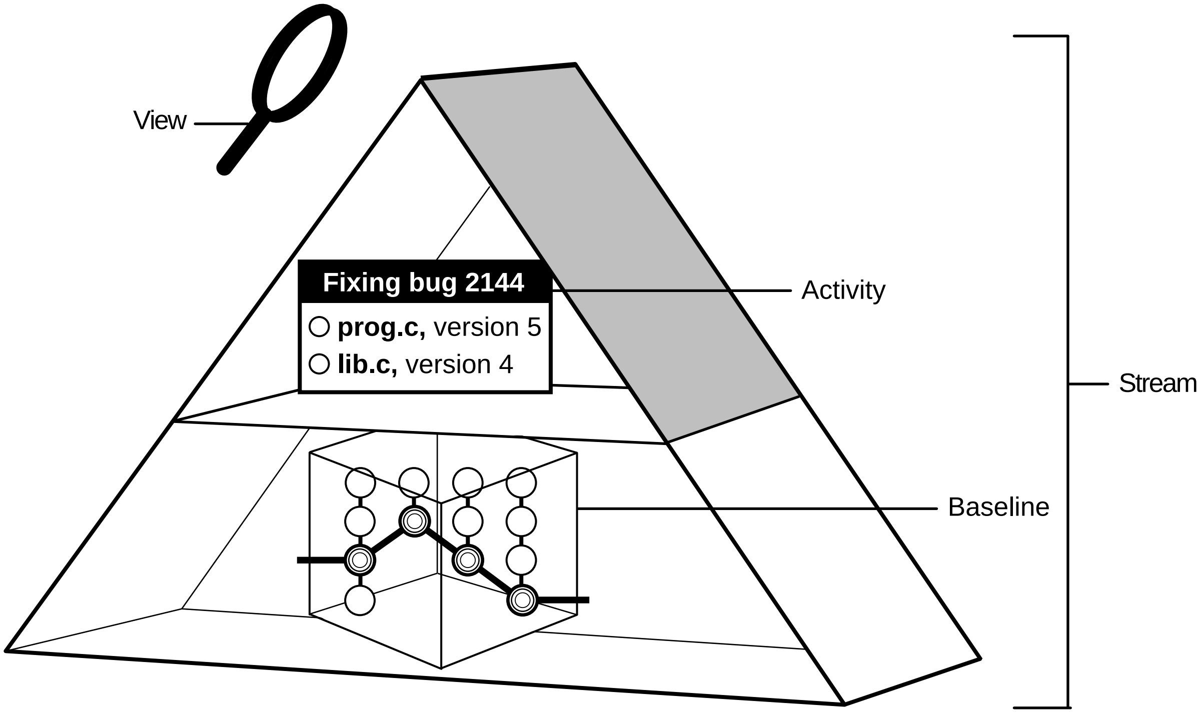


Streams

A stream is a long-lived ClearCase object. It is a member of a single UCM project and is a mechanism for creating and recording configurations. A stream identifies the exact set of versions currently available for you to view, modify, or build.

UCM uses baselines and activities to encapsulate a stream's configuration. When you create a stream, its original configuration is the same as a baseline (that is, it identifies a single version of each element in a component). When you create new versions of elements, you assign the new versions to one or more activities. Hence, a stream's configuration is a given baseline plus one or more activities (Figure 5).

Figure 5 A Stream's Configuration



Your view accesses versions of elements provided by a stream. The view you use is said to be attached to the stream. Your view for your private work area is called a development view and the related stream is called a development stream.

The following actions modify a stream's configuration:

- Checking in versions from a view attached to the stream. (Multiple views may be attached to a stream.)
- Rebasing, which replaces the baseline in the stream's configuration with a more recent one.

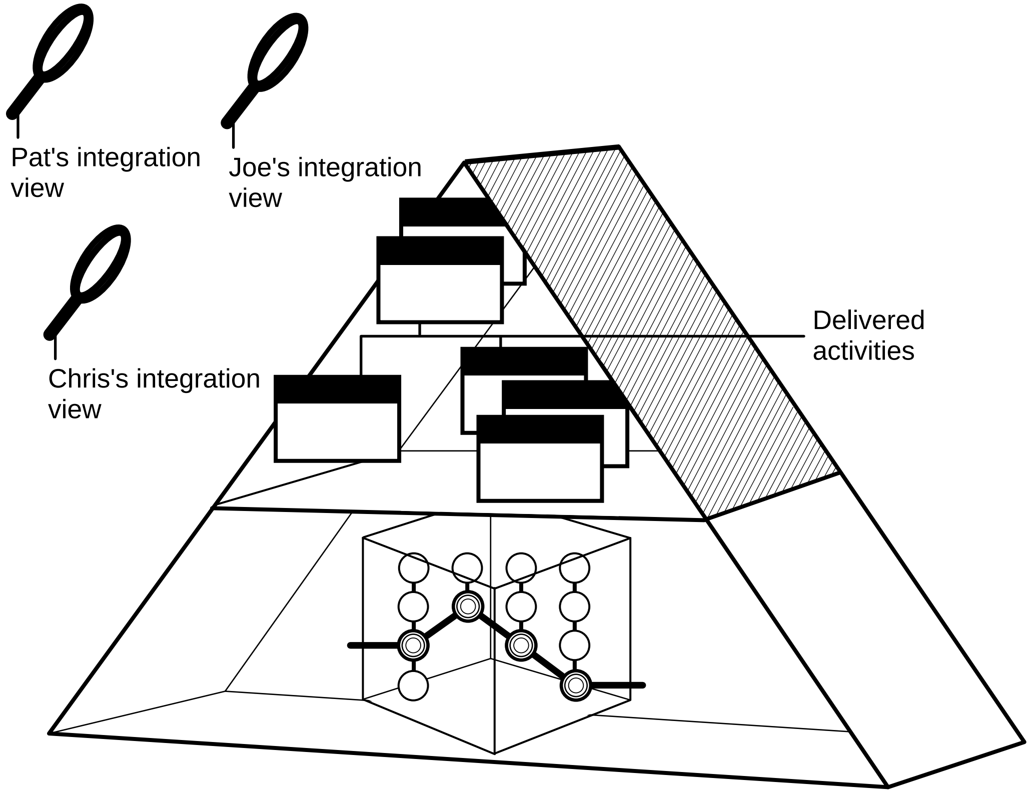
- ➤ Delivering activities, which changes the configuration of the shared work area by adding activities that were previously available only to the contributing development stream. (Delivering activities does not modify the development stream.)
- ➤ Delivering baselines.

A project includes two kinds of streams: an integration stream and development streams.

The Integration Stream

A project contains one integration stream, which is the project's main shared work area (Figure 6).

Figure 6 Project Integration Stream

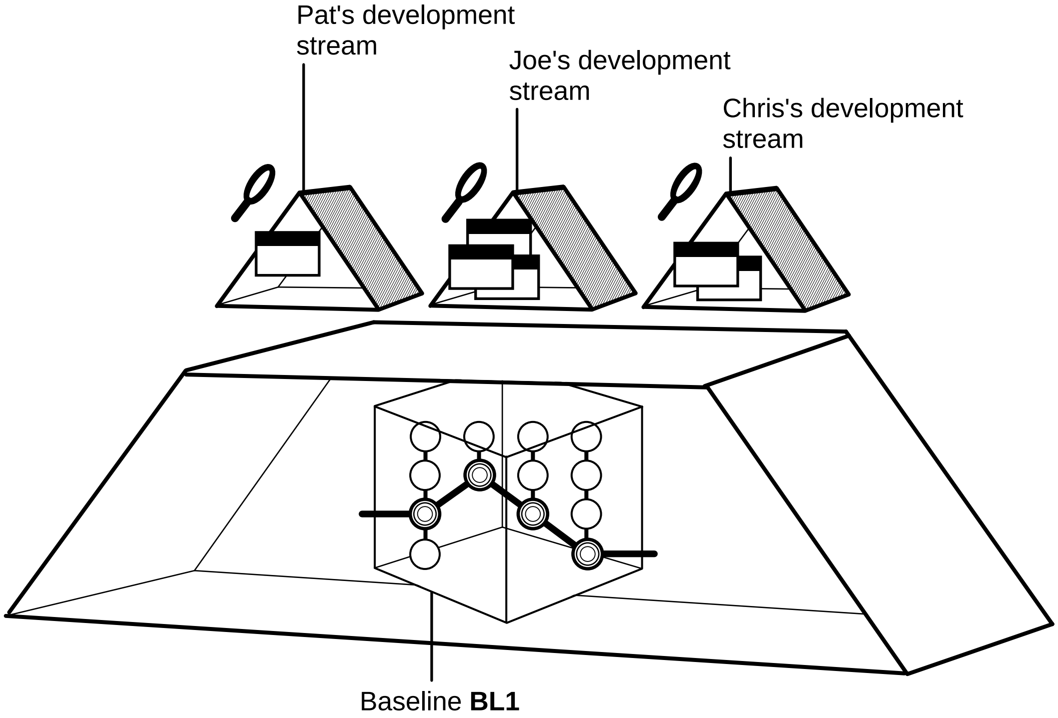


Many integration views can be attached to the project integration stream. The project integration stream records the project's baselines and enables access to all versions of the project's shared elements. It collects all the work that all team members deliver from their development streams.

Development Streams

Typically, each project includes many development streams, one for each developer on the project (Figure 7.)

Figure 7 Many Development Streams



All development streams start from a baseline. As a private work area, your development stream evolves separately from other development streams as you add activities.

Feature-Specific Development Streams

In the basic UCM process, the integration stream is the project's only shared work area. However, a project may have additional shared work areas for developers who work together on specific parts of the project. Using the UCM development stream hierarchy feature, the project can have multiple shared work areas.

A project manager can set up a stream hierarchy in which multiple development streams can have child streams. Each parent development stream supports a small team of developers which develops a specific feature. The parent development stream serves as the shared work area for the feature development. For more information about stream hierarchies, see *Managing Software Projects*.

When you join the project, you can create your development stream under a different parent stream than the integration stream, that is, under a feature-specific development stream.

Your Parent Stream

When you join a project, you specify from which stream you will be working. Typically, you join a project at its integration stream. If your project uses feature-specific development streams, you can join the project at the level of the parent development stream rather than at the integration stream.

The stream at which you join the project becomes the parent stream to your development stream and serves as your shared work area. Therefore, if you join the project at its integration stream, the project integration stream becomes your shared work area.

The integration view that you use is attached to your parent stream. Therefore, the integration view shows the baseline for the parent stream and all delivered activities in that stream.

The parent and child relationship defines the default deliver and rebase relationship between the streams. The default deliver relationship says that the child stream delivers to its default target, its parent stream. The default rebase relationship says that the child rebases with the recommended baselines of the parent stream. The default relationships are not modifiable. However, you can deliver your work to a target stream other than the default target.

When it comes time to deliver your work, by default, you deliver to the parent stream. Periodically, the project integrator incorporates the delivered work into new baselines. Then, you rebase your development stream to the parent stream’s new recommended baseline.

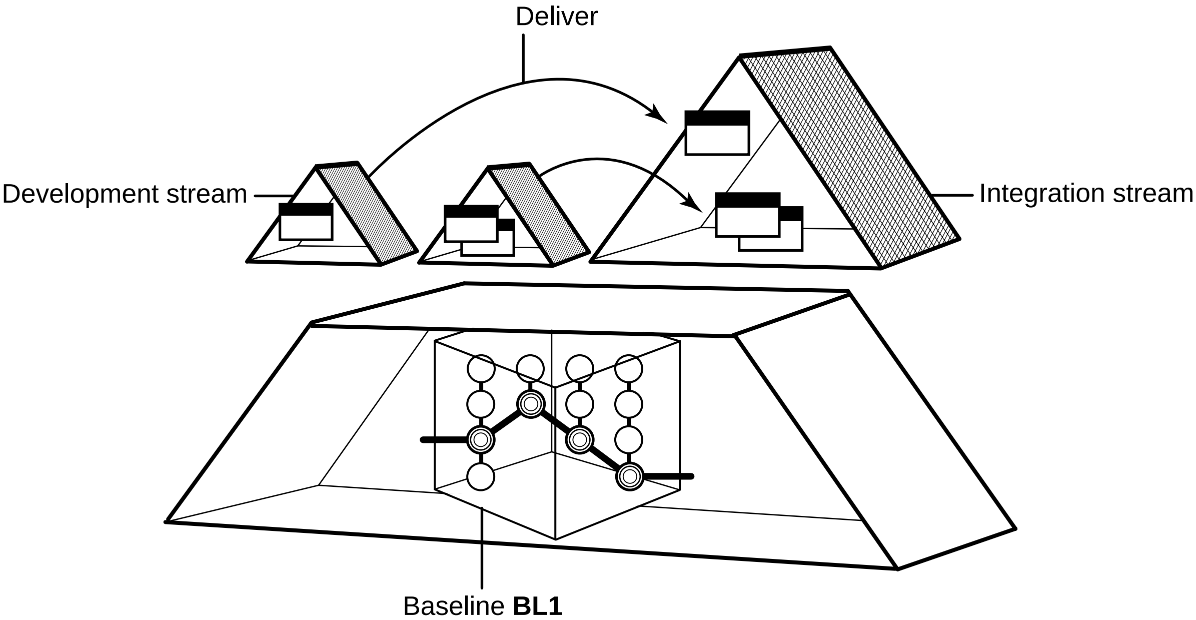
If you are working from a parent development stream and all the developers finish working on the feature, they deliver their last work to the parent development stream. The integrator then incorporates their delivered work into a final set of baselines. A parent development stream is an intermediate integration area, the changes in which migrate upward to the integration stream.

Delivering Your Work

You start work from a baseline of your parent stream, which becomes your shared work area. To facilitate delivering activities, you have a separate integration view attached to your parent stream. Your integration view shows the baseline for your parent stream and all delivered activities for that stream. By default, you deliver activities from your development stream to your parent stream. The parent stream is the default target for delivering your work.

If your parent stream is the project integration stream, the default target for your deliver operation is the integration stream (Figure 8).

Figure 8 Delivering to the Integration Stream



The integration stream identifies a shared set of versions to be used for projectwide building and testing.

If your parent stream is another development stream, the default target for your deliver operation is that development stream (see *Your Parent Stream* on page 15). When you deliver your work, you merge it with the work in your parent development stream rather than with the integration stream. Work from multiple developers is delivered to the parent stream and tested.

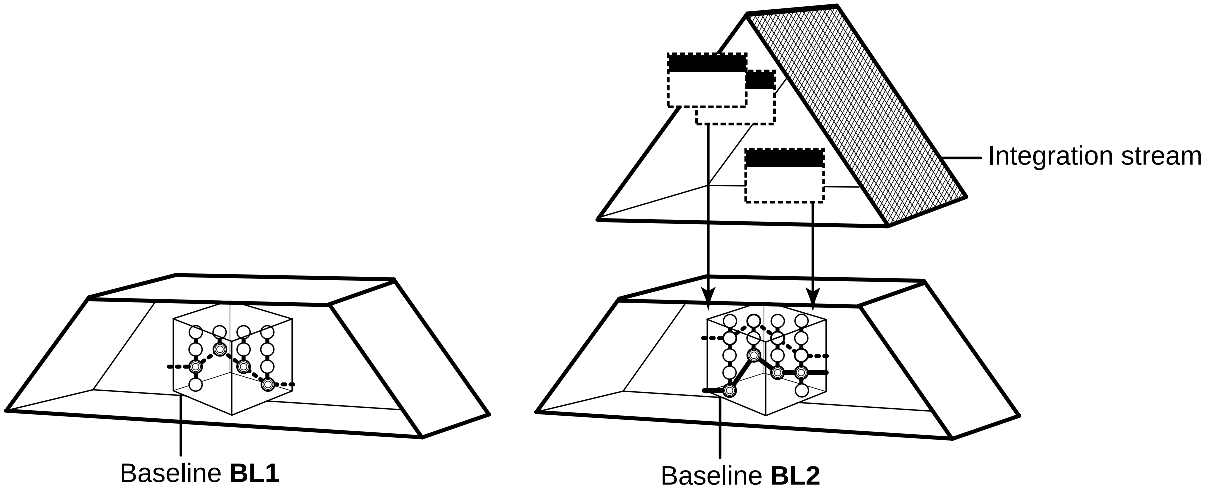
When all the work in the parent development stream is complete, that work is delivered to its parent stream.

Eventually, the integrators merge all the work from all development streams into the project integration stream.

Baseline Creation

Integrators incorporate the work delivered to parent streams into new baselines. If the parent stream is the project integration stream, the baseline applies to the child development streams of the integration stream (Figure 9).

Figure 9 Creating a Baseline for the Integration Stream

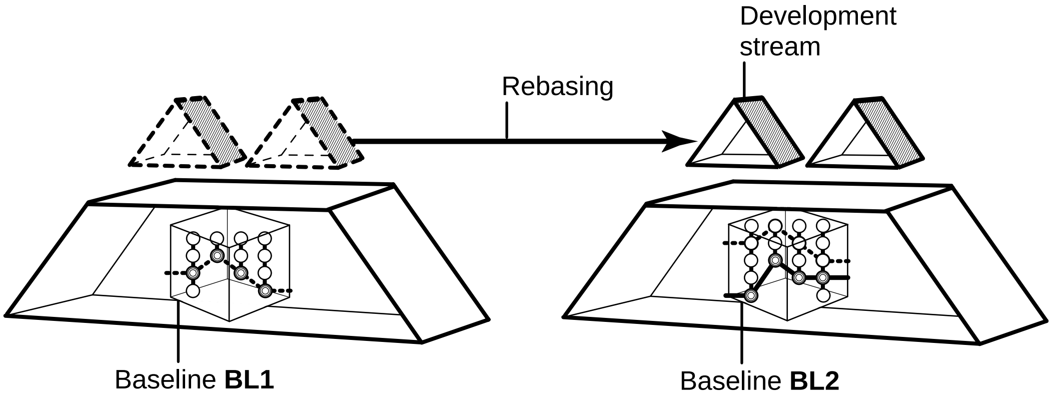


When the integrators build and test these new baselines according to the criteria established for the project, they characterize as recommended the specific baselines that include stable and significant changes. The recommended baseline becomes the new stable configuration for the parent stream. For example, if the integration stream recommends these baselines, they become the required configuration for all development streams whose parent stream is the integration stream. Similarly, for a parent development stream, integrators must recommend new baselines to establish stable configurations for their child development streams.

Rebasing Your Work Area

You update your development work area with a new baseline by performing a rebase operation. This operation merges files and directories from the parent stream to your development stream and allows you to see the new work identified by the recommended baselines. After rebasing, a development work area shows the versions specified by the baseline, plus any of your undelivered activities (Figure 10.)

Figure 10 Rebasing Your Work Area



This allows you to stay in sync with other team member’s work. By rebasing often, you minimize the overhead of merging excessive numbers of changes.

1.4 About Rational ClearCase Explorer

Rational ClearCase Explorer is a developer’s tool that supplies a coherent, adaptable, and customizable interface to your software environment, providing:

- Organization of ClearCase developer tools
- Access to the ClearCase environment
- Flexible navigation mechanisms

Using a Windows Explorer-like interface with dockable panes, ClearCase Explorer supports shortcuts to ClearCase tools, to ClearCase documentation, and to ClearCase objects.

The ClearCase Explorer Window

In its initial state, the ClearCase Explorer window has three panes. The leftmost pane, called the Shortcut pane, is dockable and provides the **Views** tab to access ClearCase objects and the **Toolbox** tab to start ClearCase tools and configurable user tools. In the Toolbox page, rectangles at the top and bottom provide a paging mechanism to access hidden tool icons.

The middle pane, called the Folder pane, is dockable and contains the tree control that displays the directory hierarchy for a given view.

The rightmost pane, called the Details pane, is not dockable and contains the list control that displays the contents of a selected folder.

An optional pane, called the Information pane, is not dockable. It provides context-dependent ClearCase state and processing information and access to introductory online help topics.

ClearCase Explorer Tool Organization

ClearCase Explorer supports access to tools by clicking a tab in the Shortcut pane or by right-clicking in the Folder pane or Details pane.

Toolbox Tab

In the Shortcut pane, ClearCase Explorer provides the **Toolbox** tab for finding and running both ClearCase tools and user-selectable tools and for accessing documentation. Tools are organized by tool groups divided into two pages, **UCM** for project-related tools and **Base ClearCase** for tools not related to UCM projects. The tools provided by default are classified as developer tools. Other ClearCase tools classified as project manager or administrator tools are accessible in the Windows Taskbar by clicking **Start** > **Programs** > **Rational ClearCase Administration**.

The **Toolbox** tab also presents a **Getting Started** page that provides access to online help information, online versions of printed documentation, and tutorials.

Shortcut Menu Support

ClearCase Explorer provides two types of shortcut menus:

- For the ClearCase integration in the Folder pane and in the Details pane
- For customizing the Shortcut pane

If you right-click in the Folder pane or the Details pane, a context-sensitive shortcut menu appears offering access to file handling operations and ClearCase functions. The shortcut menu commands are activated based on the state of the item you select. You can also add tool shortcuts to your **Send To** folder to access your favorite integrated development environment (IDE), your favorite editor, or a command shell. Any tool shortcuts newly added to your **Send To** folder appear on the shortcut menu **Send To** command the next time ClearCase Explorer starts.

If you right-click in the Shortcut pane, another type of context-sensitive shortcut menu appears enabling you to add your own tool groups and tool shortcut icons. In the **Toolbox** tab, the shortcut menu commands enable you to add shortcuts to your favorite tools and URLs and add page controls for your own tools. In the **Views** tab, with the shortcut menu, you can add and remove view shortcuts and add pages to organize view shortcut icons. And you can perform some ClearCase operations on views. The ways to do this are described in the online help.

Tool Context

A tool started from the Shortcut pane or from a shortcut menu command can have view context, if applicable. For example, starting the History Browser shows the event log for the currently selected element. If you start a project file (for example, a .DSW or a .VPB file) from within ClearCase Explorer, you can perform ClearCase functions from within the IDE. As you are working with ClearCase objects within the IDE, you can refresh the ClearCase Explorer display to see the state change of the elements in the Details pane.

ClearCase Explorer Navigation

Through the **Views** tab in the Shortcut pane, ClearCase Explorer provides means for accessing and navigating among ClearCase UCM projects and views.

UCM Project Access

If you access a UCM project by clicking on its page in the **Views** shortcut pane, the shortcut bar for the active page slides to the position immediately above the page contents. In the Folder pane appears the shortcut icons for the development view and integration view. Clicking the icon for the development view displays the view contents in the Folder pane.

In a Folder pane for a project are folders for the selected view. Under a view are subfolders for components of the project. The title bar shows the path of the selected view. The status bar shows the view-tag associated with the current view, the number of items listed in the Details pane, and the number of listed items that are selected.

One of the folders for a project is labeled **My Activities**. Under this folder, you see all activities that are in your stream. The status bar displays the name of the current activity.

In a project enabled for ClearQuest, you can also see associated change requests. A plus sign (+) designates all unresolved change requests assigned to you and not bound to a UCM activity. Every view shows the same list of unassigned change requests. When a change request is bound to an activity, it is then listed only under the associated activity.

View Access

You access a non-UCM view by clicking the **General** page in the **Views** shortcut pane. In the **General** page are icons for views that you own.

Clicking a view icon activates (starts) the view. ClearCase Explorer displays in the Folder pane a folder hierarchy rooted at the view-tag, and, as subfolders under the view, the contents of the view. For a dynamic view, the subfolders are for all mounted VOBs. For a snapshot view, the subfolders are for all VOBs rooted at the view. By default, in a snapshot view, only loaded elements are visible. You can change this default so that unloaded elements are displayed. The title bar shows the currently selected path within the view.

As you click a subfolder, the subordinate elements display in the Details pane showing ClearCase details about the items, element and version information. In the Details pane, elements possessing unique characteristics (like a file under version control or an eclipsed version) display with visual characteristics familiar in other ClearCase tools.

History of Visited Locations

As you move within the Folder pane from one location to another, ClearCase Explorer stores the path for each of your visits. To return to a previously visited location, click **File** and, from the numbered list of pathnames (ordered most recently visited to first visited), select the pathname.

Access to ClearCase Information

The tree control provided in the Folder pane provides navigation to ClearCase objects in a view.

Display of ClearCase Information

Each view is represented as a top-level folder in the Folder pane. Expanding the subfolders provides details about the ClearCase objects accessible in the view. Selecting a folder displays fields of file system and ClearCase information in the Details pane. You can customize which fields are displayed. Because gathering some data for display takes more processing time and affects tool performance, you may not want to display all possible fields. You can also sort the data in the columns using standards Windows techniques. Any customizations you make are persistent across invocations of the tool.

Initial Use and Appearance

If you start ClearCase Explorer on a computer without any projects or views defined, the Shortcut pane under the **Views** tab contains only the **General** page. If you join a project, the tool creates a page under the **Views** tab with the project name.

If you create a view associated with a project from within ClearCase Explorer, the tool creates a shortcut for that view on the page for that project. If you introduce into ClearCase Explorer a view that is associated with a project that does not have a page, the tool creates a shortcut bar for that page.

For any view that you own that is not associated with a project, the tool adds to the **General** page an icon with the view-tag. (There is no way to tell ClearCase Explorer not to create an icon for a view that you own.) When ClearCase Explorer exits, it stores, as the default view, information about the view that you last worked in. When ClearCase Explorer starts again, it restores the default view.

Ongoing Use and Appearance

Use the **View** menu to adjust the window appearance. Click the check boxes to toggle the display of window panes and bars. Click the **Refresh** commands to have ClearCase Explorer examine the system for the latest state information and re-display the information in the Folder pane and Details pane.

If you remove a view that you own, its shortcut in ClearCase Explorer is removed. If you remove all the views for a project, its page in ClearCase Explorer is removed. To remove a shortcut for a view that you do not own, remove its view-tag from the registry.

Features for a New User

For new users, ClearCase Explorer offers an Information pane whose contents depend on the context of your work. The Information pane presents workflow help topics that outline the stages required while working in different ClearCase environments.

As you work with ClearCase objects, the Information pane displays contextual information about a selected element. Included is brief information about a selected element and its current state. For example, if you select a file, the Information pane shows two columns, one listing the details of your selection and the other offering, under the heading **About**, informative text or, under the heading **Uses**, tips on some of the operations that you can perform with the selected object.

In a view context in ClearCase Explorer, you can work in the Details pane where you can create a new file or directory. If you select the newly created file or directory, the Information pane tells you that you can add it to source control. If you add the file or directory to source control, the Information pane keeps the item selected and tells you that you can check it out. If you are working within a UCM project, you can select an activity; or, if you are checking an element out, you can create a new activity. If the project is enabled for ClearQuest, you can select a change request.

After you become used to the environment, you can hide the Information pane to reclaim the screen area.

1.5 Under the Hood: UCM ClearQuest Concepts

Rational ClearQuest is a change-request management system that can integrate with UCM projects to provide extended functionality. This section describes fundamental concepts for the UCM-ClearQuest integration:

- ClearQuest schema
- UCM-enabled record types and ClearCase activities
- Queries
- State types and state transitions

Reading this section isn’t necessary to start working on a UCM project that is enabled for ClearQuest, but it does provide a basis for understanding how ClearQuest implements the integration and may be helpful if you need to diagnose problems.

The UCM-ClearQuest Schema

ClearQuest stores change requests as records in a database. A *schema* defines the types of records in the database, the states available to each type of record, and other attributes of the database.

ClearQuest supplies two UCM-enabled schemas: Unified Change Management and Enterprise. Your project manager can set up a custom UCM-enabled schema. To support the UCM-ClearQuest integration, a ClearQuest database must use one of these UCM-enabled schemas.

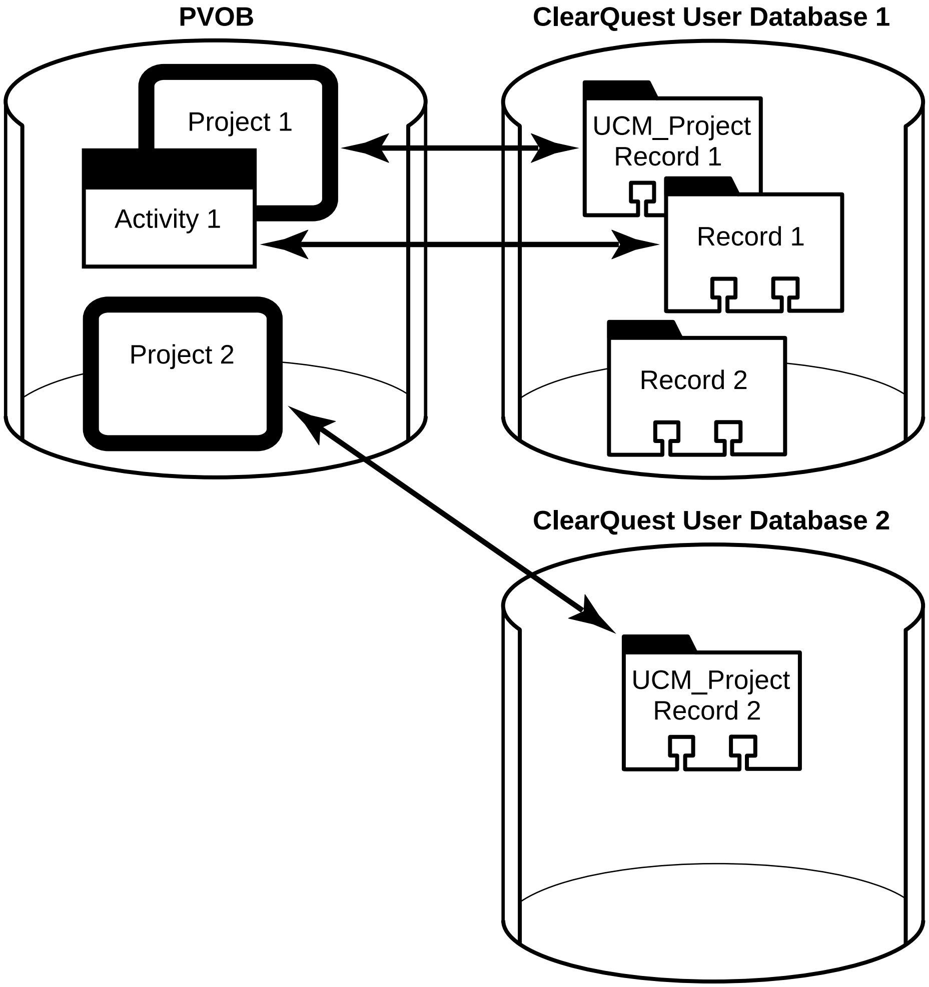
ClearQuest stores all schemas in a schema repository, which is a master database of schemas. The schema repository does not contain any user-owned data or change request data. Change-request data is stored in a user database.

UCM-Enabled Record Types and ClearCase Activities

A UCM-enabled record type is a template for ClearQuest records. It includes definitions for a set of fields that store information about ClearCase activities. Your ClearQuest database may include different UCM-enabled record types for different purposes (such as tracking defects and enhancement requests), and it may include other record types that are not UCM enabled.

In a project that uses the UCM-ClearQuest integration, records based on a UCM-enabled record type can be linked with ClearCase activity objects (Figure 11).

Figure 11 Activities and UCM-Enabled Records



This link enables ClearQuest to display information about the ClearCase activity (such as its change set, its stream, and whether it is currently set in any view). It also enables policies that govern when you can deliver an activity in ClearCase and when you can close an activity in ClearQuest. Because of the close association between linked UCM-enabled records and ClearCase activities, the UCM documentation usually refers to both linked entities as *activities*.

At any point in a project, your ClearQuest database may contain UCM-enabled records that are not linked to a ClearCase activity object. For example, a newly created record may not be linked to a ClearCase activity. You must explicitly complete an action (for example, by clicking **Action** > **WorkOn** in ClearQuest) to link a UCM-enabled record to a ClearCase activity.

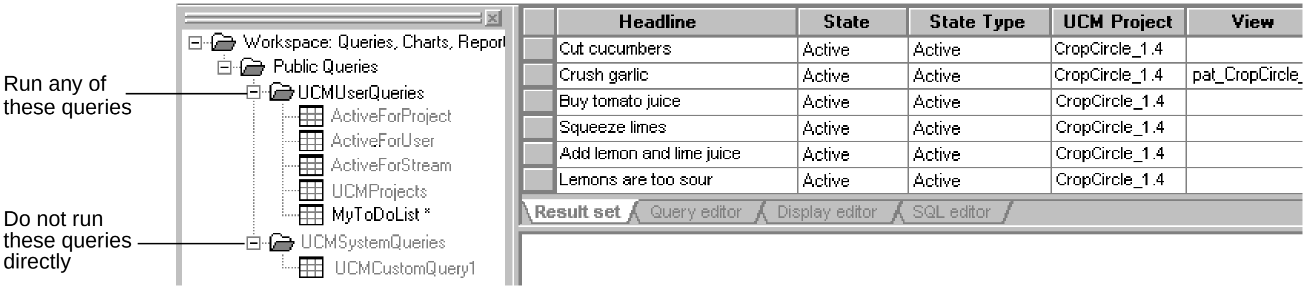
Each ClearCase activity in a UCM project that is enabled for ClearQuest must be linked to a ClearQuest record. You cannot create a ClearCase activity object without linking it to a UCM-enabled record in a ClearQuest database.

Queries

Queries are the vehicle for navigating through the ClearQuest database. Before viewing or modifying records, you must query the database to find the records you are interested in. For example, you may want to see only activities that are assigned to you or that are associated with your project, or you may want to see activities created before or after a particular date.

A UCM-enabled schema includes a set of queries that you can use to find UCM-enabled records. ClearQuest places the queries into two categories in the ClearQuest Public Queries folder (Figure 12).

Figure 12 UCM-Enabled Queries in ClearQuest



Run any of these queries

Do not run these queries directly

Headline	State	State Type	UCM Project	View
Cut cucumbers	Active	Active	CropCircle_1.4	
Crush garlic	Active	Active	CropCircle_1.4	pat_CropCircle_
Buy tomato juice	Active	Active	CropCircle_1.4	
Squeeze limes	Active	Active	CropCircle_1.4	
Add lemon and lime juice	Active	Active	CropCircle_1.4	
Lemons are too sour	Active	Active	CropCircle_1.4	

You can run queries in the UCMUserQueries folder and modify them when necessary. You can save in your Private Queries folder any public query that you modify.

Do not run queries in the UCMSystemQueries folder from ClearQuest; they are intended to be run by the ClearQuest and ClearCase system only.

This section describes the following queries:

- MyToDoList
- UCMCustomQuery1
- Other queries

In addition to the queries included in the database schema, you and your project manager can create your own queries.

MyToDoList

The MyToDoList query finds UCM-enabled records that match all of the following criteria:

- They are assigned to you.
- They are in a state whose state type is Ready or Active.

You or your project manager can modify this query.

UCMCustomQuery1

The UCMCustomQuery1 query finds UCM-enabled records that match any of the following criteria:

- In a state whose state type is Ready and match all of the following criteria:

  - Are assigned to you
  - Have not yet been assigned to a UCM project
  - Have not yet been worked on

- In a state whose state type is Ready or Active and match all of the following criteria:

  - Are assigned to you
  - Have been assigned to the UCM project associated with the current view
  - Have not yet been worked on

- In a state whose state type is Active and match all of the following criteria:

  - Are assigned to you
  - Have been assigned to the UCM project associated with the current view
  - Have been worked on already in the stream to which the current view is attached

MyActivities in ClearCase Explorer and the **Check Out**, **Check In**, and **Add to Source Control** dialog boxes in ClearCase present the activities that UCMCustomQuery1 finds. Although you can also see this query from ClearQuest, it is not designed to be run outside the context of a ClearCase view.

Your project manager can modify this query.

Other Queries

A UCM-enabled schema also supplies the queries described in Table 1. You can run any of these queries.

Table 1 Other Queries in the Unified Change Management Schema

Query	Description
ActiveForProject	For one or more specified projects, selects all activities in an active state type.
ActiveForStream	For one or more specified streams, selects all activities in an active state type.
ActiveForUser	For one or more specified developers, selects all assigned activities in an active state type.
UCMProjects	Selects all UCM-project records in ClearQuest user database.

State Types and State Transitions

Change requests move through a pattern, or life cycle, from submission through resolution. In ClearQuest, each stage in this life cycle is called a *state*, and each movement from one state to another is called a *state transition*.

As with record types and records, a state type is a template that defines actions and other attributes associated with a state. The states in a UCM-enabled schema must be based on one of the following state types:

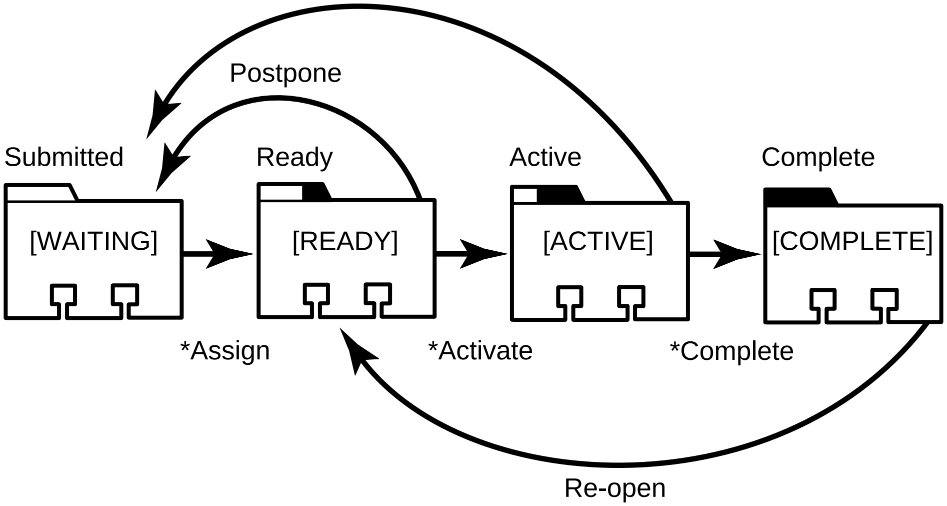
- Waiting
- Ready
- Active
- Complete

Your project manager may give the states in your UCM-enabled schema different names and may create multiple, different states based on the same state type. For example, your UCM-enabled schema may contain the states Scheduled and Deferred, both of which are based on the Active state type but have different associated actions and meanings.

State Transitions

Schemas include rules for changing records from one state type to the next. Some examples of state transitions are shown in Figure 13.

Figure 13 Example of ClearQuest State Transitions



In a UCM-enabled schema, records must follow these state-transition rules:

- **Waiting**. Creating an activity places it in a state based on this state type to indicate, for example, that the work is waiting for someone to resolve dependencies and that it is not ready to be scheduled. Activities in this state do not appear in MyActivities or MyToDoList; they may or may not contain a value in the owner field and may or may not contain a value in the UCM project field. The schema in Figure 13 bases its Submitted and Postpone states on the Waiting state type.

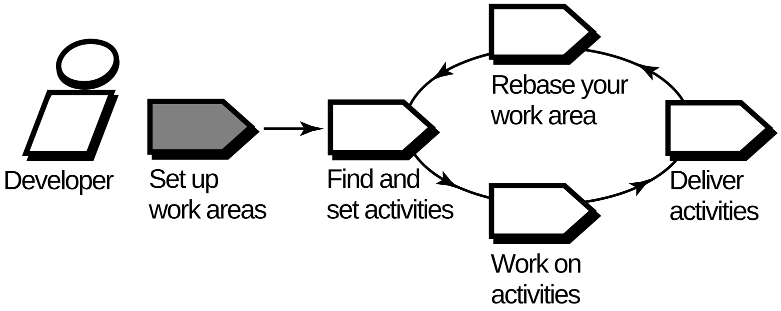
- **Ready**. Assigning an activity usually places it in a state based on this state type to indicate that the work is pending. Activities in this appear in the activity owner's MyActivities and MyToDoList, but are not part of the owner's stream. The schema in Figure 13 bases its Ready and Re-open states on the Ready state type.

- **Active**. Setting your view to an activity usually places the activity in a state based on this state type to indicate that the work is in progress. Setting your view to an activity also links the ClearQuest UCM-enabled record to the ClearCase activity. After the activity is linked, you can change the ClearQuest record's owner but you cannot change the ClearCase stream that contains the activity. For more information, see *Reassigning Activities* on page 79.

The **ucm_stream** field in a UCM-enabled record displays the stream to which an activity is linked, and the **ucm_view** field indicates whether an activity is currently set in a view. (Figure 19 on page 51) The schema in Figure 13 bases its Active state on the Active state type.

➤ **Complete**. When you have completed and delivered an activity, you change it to a state based on the Complete state type. Activities in this state do not appear in MyToDoList, but do appear in **MyActivities** and remain a permanent part of your stream. The schema in Figure 13 bases its Complete state on the Complete state type.

2 Setting Up Work Areas



To set up work areas, you must complete the following tasks:

- Starting the Join Project Wizard
- Choosing a project
- Verifying stream names
- Setting up views
- Choosing components to load into snapshot views
- Accessing your development view
- Connecting to the UCM-ClearQuest integration (only for projects that use the UCM-ClearQuest integration)

2.1 Starting the Join Project Wizard

The Join Project Wizard assists you in each step of joining a project. Start the Join Project Wizard and use this chapter to complete the steps.

To Start the Join Project Wizard

1. Start ClearCase Explorer by clicking the shortcut on your desktop. If you did not install the shortcut, click **Start** > **Programs** > **Rational ClearCase** > **ClearCase Explorer**.

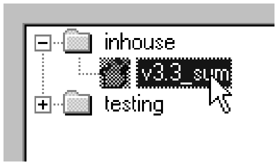
2. In the ClearCase Explorer Shortcut pane, click **Toolbox**. Then click **UCM** > **Join Project**.

The **Choose a Project** dialog box opens.

2.2 Choosing a Project

In this step of the Join Project Wizard, choose a project. Navigate the list of PVOBs, folders, and projects and click the project you want to join (Figure 14).

Figure 14 List of Projects



To see a description of a project, select it and click **Properties**.

After you select a project to join, click **Next** to verify stream names.

2.3 Verifying Stream Names

After you choose a project, this step of the Join Project Wizard opens the **Create a Development Stream** dialog box, which presents the two streams that Rational ClearCase uses to keep track of your work on this project. Take note of the stream names when the wizard presents them; they are permanent objects that keep track of your work on the project.

Development Stream

If you do not have any streams defined, the Join Project Wizard gives your development stream a name based on the following convention: *userID_project-name*. For example, Pat's development stream for the 1.4 release of the Cropcircle project is titled **pat_1.4_cropcircle**. If you want to add a comment to describe the stream that you are creating, click **Advanced Options** and, in the **Comment** box, enter your description. If you have development streams, a dialog box lists the stream names. If you want to work on activities in an existing development stream, click **Advanced Options**, click **Use existing development stream**, and choose a development stream.

If ClearCase cannot determine your user ID, it substitutes the name of the ClearCase host from which you are creating the stream.

Although you can change the name of your development stream on this step of the Join Project Wizard, we recommend that you do not, unless your project manager has requested it. Following consistent conventions facilitates project management.

Integration Stream

Your project manager creates the integration stream as part of creating the project. This is the stream to which you typically deliver your work and from which you update your work area. The Join Project Wizard presents the name of the project's integration stream as a default. The integration stream becomes your parent stream for this project. It is the stream to which your integration view will be attached. This stream also is the default target to which you deliver your work and from which you update your work area.

After you verify your stream names, you set up your views (see *Setting Up Your Views* on page 34).

Choosing a Different Parent Stream

If your project uses feature-specific development streams, you can join the project at the development stream level rather than the integration stream level (see *Feature-Specific Development Streams* on page 14). To use one of these parent development streams, click the ellipsis button to the right of the default integration stream name. In the **Select a parent stream** dialog box, navigate to and select one of the development streams listed.

This development stream, rather than the integration stream, becomes your parent stream for this project. Your integration view is attached to this parent stream. This stream also is the default target to which you deliver your work and from which you update your work area.

2.4 Setting Up Your Views

In the next steps of the Join Project Wizard, you set up your development view and integration view by specifying the following information:

- Which type of view to create for your development view and integration view
- Locations for snapshot views
- Drive letter mapping for a dynamic view folder (optional)
- Locations for dynamic view storage directories

We recommend that you accept the defaults the Join Project Wizard presents until you are familiar with UCM. For example, the default naming conventions for your views are intended to distinguish your development view from your integration view.

Determining the View Types

As described in *Views* on page 11, you can use either a snapshot view or a dynamic view to create a directory tree of source files. Your project manager determines the default view types that the Join Project Wizard presents.

Work in a snapshot view when any of these conditions is true:

- Your computer does not support dynamic views.

- You want to optimize build performance to achieve native build speed.

- You want to work with source files under ClearCase control when you are disconnected from the network that hosts the VOBs.

- You want to access a view from a computer that is not a ClearCase host.

- Your development project doesn’t use the ClearCase *build auditing* and *build avoidance* features.

Work in a dynamic view when any of these conditions is true:

- Your development project uses build auditing and build avoidance.
- You want to access elements in VOBs without copying them to your computer.

Because a dynamic view can show changes in its attached stream at all times without requiring an update, we recommend that you use dynamic views for your integration views whenever they are available.

The two view types behave slightly differently, so remember the type of view you create.

Your project manager, or someone else in your organization, determines the types of views the Join Project Wizard uses for a default when you first join a project. The default is typically based on network configuration and performance needs. For a detailed comparison of snapshot views and dynamic views, see the ClearCase online help and the **view** reference page in the *Administrator’s Guide* for Rational ClearCase.

Locations for Snapshot Views

When creating a snapshot view, you must specify a view directory into which ClearCase loads, or copies, versions of source files from VOBs into the snapshot view at the directory you specify.

When choosing a directory, consider these constraints:

- The view’s root directory must be located on a disk with enough space for the files loaded into the view and any other files you add.

- Your organization may restrict where you can create a view. For example, you may be required to use a disk that is part of a data-backup scheme.

- If you want to access the view from other computers, it must be located in a shared directory.

If your makefiles or other files require absolute pathnames with a drive letter, you can map the folder for a view to a specific drive letter. See *Assigning Snapshot Views to Drive Letters* on page 122.

Under the Hood: A Snapshot View Storage Directory

Every snapshot view has a *view storage directory* in addition to the directory tree of source files that it loads from VOBs. ClearCase uses the view storage directory to keep track of such information as which files are loaded into your view and which versions are checked out to it. The view storage directory is for ClearCase administrative purposes only. Do not modify anything in it.

For every 1,000 elements loaded into the view, ClearCase uses about 400 KB of disk space for the view storage directory.

Locations for Snapshot View Storage Directories

Usually, your ClearCase administrator sets up a storage location, which is a directory on a ClearCase server host on UNIX or Windows, and by default ClearCase locates snapshot view storage directories in the storage location. If your ClearCase administrator sets up more than one storage location, ClearCase selects one of these locations as the default location when you create a view.

If your ClearCase administrator does not set up storage locations, ClearCase sets a directory under the root directory of the snapshot view as the default location for the view storage directory.

You can override the default location. If your administrator sets up multiple storage locations, you can select one explicitly. If your ClearCase host is set up to store view storage directories (which happens when you install ClearCase), you can place the view storage directory under the root directory of the snapshot view. Or you can choose another location.

If you place the view storage directory under the root directory of the view, be aware of the following recommendations:

- Do not choose this configuration if you use the view when disconnected from the network. You can corrupt the data in the view storage directory if you disconnect it from the network while the view's **view_server** process is running.
- Make sure that the view storage directory is accessible to any data backup schemes your organization institutes.

If you override the default location and place the view storage directory under a directory other than the root directory of the view, the directory must follow these conditions:

- Be below a shared network directory on a ClearCase host (for example, a computer running Windows NT or Windows 2000). (A view process runs on the computer that physically stores the view storage directory, and only a ClearCase host can run a view process.)

- Must remain connected to the network.

- The pathname for the directory must not use a Windows special share name, for example, the share that is designated by *drive-letter*$ and allows an administrator access to a drive over the network.

- The directory cannot be on a removable storage device or on a laptop.

NOTE: If you plan to work while disconnected from the network, or if your ClearCase host is not set up to store view storage directories, your administrator must set up storage locations.

To Override the Default Snapshot View Storage Location

1. When creating a view, on the step of the wizard that asks you to choose a location for a snapshot view, click **Advanced Options**.

2. In the **Advanced View Options** dialog box, do **one** of the following:

   - If **Use Server Storage Location** is selected and your administrator created multiple locations, ClearCase selects one for you. To choose a different one, click the name of the location.

   - If your computer is set up to hold view storage locations and you want to place the view storage directory in the root directory of the snapshot view or choose another location, select **Use explicit path.**

     Do not select this option if you plan to use the view while disconnected from the network.

3. If you select **Use explicit path**, do **one** of the following:

   - Accept the default path displayed in the **View storage location** box.
   - Edit the path in the **View storage location** box to specify a valid location.
   - Click **Browse** and choose a valid location.

4. Click **OK** to return to the view location step of the wizard.

Drive Letter Mapping for Dynamic Views

If your makefiles or other files require absolute pathnames, map the folder for your view to a drive letter. When you use a wizard to create a view, ClearCase prompts you to assign the dynamic view to a drive letter. After creating a view, if you want to change a drive-letter assignment or assign a drive letter to a team member's view, you can create or modify the assignment by using the view shortcut menu in ClearCase Explorer.

In addition, you can create or modify drive-letter assignments from Windows Explorer. Any changes you make to a view's drive-letter assignments outside ClearCase Explorer will invalidate the view's shortcut in ClearCase Explorer.

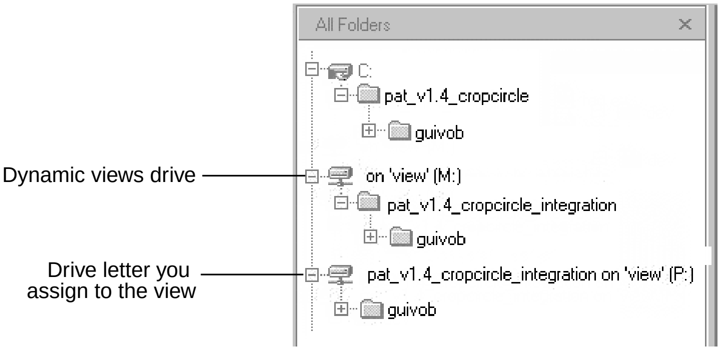
Pathname Differences

You can access any dynamic view that is started on your computer from the *dynamic-views-drive* (by default, drive M:) in Windows Explorer. However, when you access a view from the dynamic-views drive, its pathname includes one more component than when you access a view from an assigned drive letter (Figure 15).

For example, both of the following pathnames are available to an element in the **pat_v1.4_cropcircle dynamic** view that is assigned to drive P:

```
M:\pat_v1.4_cropcircle\guivob\prog.c
P:\guivob\prog.c
```

Figure 15 Dynamic Views Started on a Host


All Folders
C:
pat_v1.4_cropcircle
guivob
Dynamic views drive
on 'view' (M:)
pat_v1.4_cropcircle_integration
guivob
Drive letter you assign to the view
pat_v1.4_cropcircle_integration on 'view' (P:)
guivob

Under the Hood: View Storage for Dynamic Views

The first time you create a dynamic view, the wizard provides a default pathname for the storage directory. Click **Advanced Options** to provide a different pathname for the view storage directory. The location you choose becomes the default for other dynamic views that you create. Every view has a view storage directory. For dynamic views, ClearCase uses this directory to keep track of which versions are checked out to your view and to store view-private objects. The view storage directory is for ClearCase administrative purposes only. Do not modify anything in it.

The size of the view storage directory depends on the following factors:

- Whether you use the **clearmake** or **omake** *build auditing* and *build avoidance* features
- The size and number of view-private files

For more information, see the **clearmake** and **omake** reference pages in the *Command Reference*.

Valid Locations for Dynamic View Storage Directories

If your computer is set up to store view storage directories, ClearCase reduces communication over the network by locating the view storage directory on your computer.

Consider the following restrictions when choosing a dynamic view storage directory:

- The directory must be a subdirectory of a shared network resource on a ClearCase host (for example, on a Windows NT or Windows 2000 computer). View processes (specifically, **view_server** processes) run on the computer that physically stores the view storage directory, and only ClearCase hosts on Windows NT and Windows 2000 can run view processes. The pathname for the directory must not use a Windows special share name. Special share names usually include the dollar sign ($), such as the driveletter$ share name that allows an administrator to gain access to a drive over the network. For example, **\\bread\c$\view\pat_1.4_cropcircle.vws** is not a valid pathname.

- To maintain data integrity, the view storage directory must remain connected to the network. For example, do not locate the view storage directory on a removable storage device.

- If you locate the view storage directory on a laptop and then disconnect the laptop from the network, all of the following restrictions apply:

  - You cannot use the dynamic view.

-
    - Team members who try to start your view from their hosts will receive error messages from ClearCase.
    - Any **clearmake** or **omake** process that attempts to wink in a derived object from your view will spend some amount of time trying to contact your view. If it cannot contact your view, it will not consider derived objects in your view as *winkin* candidates for 60 minutes. (You can change the amount of time by setting the **CCASE_DNVW_RETRY** environmental variable.) For more information, see the **clearmake** reference page.
- If your ClearCase administrator sets up storage locations (which are directories on ClearCase server hosts), you can locate your dynamic view storage directory in a storage location. However, for best performance, we recommend that you locate dynamic view storage directories on your local host.

We recommend that you make the view storage directory accessible to any data backup schemes that your organization institutes.

To Choose a Location for a Dynamic View Storage Directory

1. On the step of the wizard that asks you to specify a view-tag, click **Advanced Options**.
2. In the **Advanced Options** dialog box, do **one** of the following:
    - Select **Use Explicit Path** and provide a UNC pathname to a shared directory on a ClearCase host on Windows NT or Windows 2000. For best performance, we recommend this option.

      The first time you create a view with the wizard, ClearCase presents a template: `\\`*current-hostname*`\<Share>\`*view-tag*`.vws`

      To locate the view storage directory on your computer (recommended), replace `<Share>` with the name of a shared directory on your computer. For example, **\\bread\view_storage\pat_v1.4_cropcircle.vws**
    - Select **Use Server Storage Location**. If your administrator created more than one location, ClearCase selects one for you. You can choose a different one if you prefer.

Under the Hood: Activating VOBs for a Dynamic View

Dynamic views provide transparent access only to the VOBs that are active on your computer. ClearCase activates the VOBs associated with your project when you finish the Join Project Wizard, each time you log on, and when you start ClearCase Explorer. You can deactivate VOBs that you don't use frequently and reactivate VOBs. For information on activating and deactivating VOBs, see *Activating or Deactivating VOBs for Dynamic Views* on page 121.

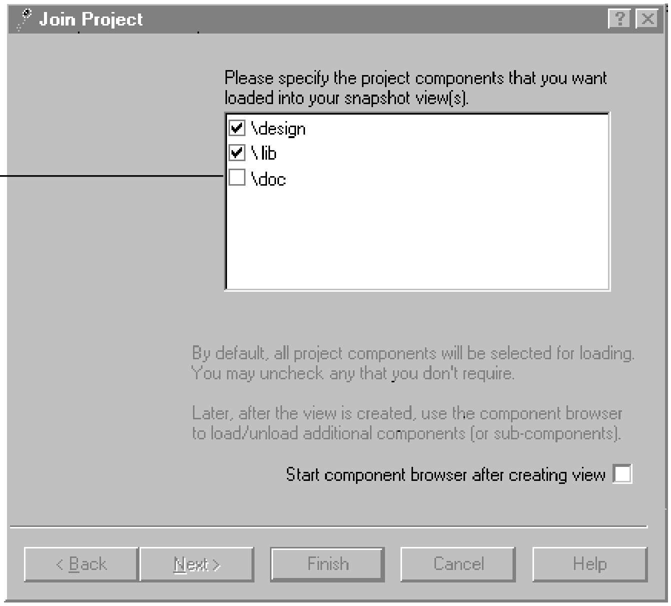
2.5 Choosing Components to Load into Snapshot Views

If you choose to create any snapshot views, the Join Project Wizard prompts you to choose the components to load.

Refining the List of Source Files

To save disk space, to reduce the time needed for the initial loading operation, and to reduce time needed for rebase operations, clear the check box for any components that you do not need to complete your work (Figure 16).

Figure 16 Clear Check Boxes for Unused Components



Clear the check box for any component you do not want loaded into your snapshot view

Please specify the project components that you want loaded into your snapshot view(s).

☑ \design
☑ \lib
□ \doc

By default, all project components will be selected for loading. You may uncheck any that you don't require.

Later, after the view is created, use the component browser to load/unload additional components (or sub-components).

Start component browser after creating view □

To further refine the list of files and directories that are loaded into your view, select **Start component browser after creating the view**. With the Component Browser, you can specify individual directory and file elements to load.

UNIX VOBs and Case-Sensitivity

If you're selecting elements from VOBs located on a UNIX host, you may encounter problems that are due to case-sensitivity. Because native file systems for UNIX are case-sensitive, it is possible to create two elements from a UNIX host whose names differ only in capitalization. For example, in a UNIX VOB, these two elements are distinct:

```
/design/func_specs/bas
/design/func_specs/Bas
```

However, Windows does not support case-sensitive file lookups and does not distinguish the two elements in the previous example. If you were to load these two elements, only one of them would have the correct data when copied into the view; duplicated files are reported as *hijacked*. (Hijacked files are discussed throughout Appendix A, *Working in a Snapshot View While Disconnected from the Network*.)

The *Administrator's Guide* for Rational ClearCase discusses case-sensitivity issues in depth. We suggest that you not use mixed-case names for elements that you store in VOBs.

Loading Elements

After you choose components to load into the view, the Join Project Wizard displays your choices. When you confirm your choices and finish the wizard, ClearCase loads the views with the elements you selected. As ClearCase loads files and directories into each view, it shows a progress indicator in the **Snapshot View Update** dialog box. The complete list of files copied into your view appears in the Snapshot View Update window.

2.6 Accessing Your Development View

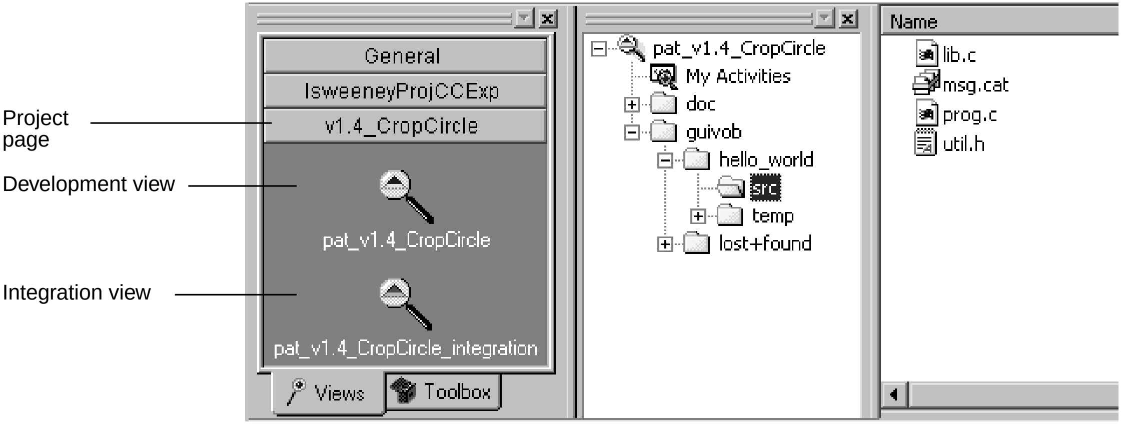
ClearCase Explorer provides access to the projects that you join and the views that you create with the Join Project Wizard or View Creation Wizard.

To access your development view, see the following sections.

Accessing Your Development View from ClearCase Explorer

The **Views** tab in ClearCase Explorer provides access to your projects views (Figure 17).

Figure 17 Development View in ClearCase Explorer



When ClearCase Explorer first starts, it creates on the **Views** tab a page for each project that you join and places view shortcuts on the associated project's page. If ClearCase Explorer is running when you join a project, click **View** > **Refresh View Shortcuts**. A page for the new project is added on the **Views** tab, and the view shortcuts are added under the project page. Click the project page to open the Shortcut pane and click the shortcut to start the view. By convention, your development view is named *username_project-name*, and your integration view is named *username_project-name*_**integration**.

In a UCM project, ClearCase activates all VOBs that contain components for any of the projects you have joined. For more information, see *Activating or Deactivating VOBs for Dynamic Views* on page 121. If you want to access files in other VOBs, you must activate those VOBs (see *Under the Hood: Activating VOBs for a Dynamic View* on page 40). For more information, see ClearCase online help.

Starting the view also starts a **view_server** process, which maps the data in the VOBs that are activated on your computer into a directory tree. VOBs that you activate appear as subdirectories of a view. Then you browse a VOB as you would any other directory.

The ClearCase Explorer title bar shows the location of the view in your computer's namespace. Any command you issue from ClearCase Explorer that requires a pathname uses the pathname displayed in the title bar. To assign a different pathname to a view (for example, to change the drive letter that is mapped to a folder for a view), modify the view's shortcut. If you do not have to map the folder for a view to a drive letter.

To access a team member's view from ClearCase Explorer, add a view shortcut to the **Views** tab. For information on creating or modifying shortcuts in ClearCase Explorer, see the ClearCase Explorer online help.

To access a dynamic view that was created from a UNIX host, first use the Region Synchronizer to import the view's view-tag into your Windows network region. Then, in ClearCase Explorer, click **View** > **Refresh View Shortcuts**; the shortcut is added under the **General** page in the **Views** tab. Click the shortcut to start the view.

If you want to perform ClearCase operations in a view that you do not own without adding a shortcut to the view in ClearCase Explorer, see *Registering a Snapshot View* on page 125.

Accessing a Snapshot View from Windows Explorer

A snapshot view is a directory tree in a standard file system (plus some hidden, administrative files). You can access it through Windows Explorer as you would access any other directory tree in a file system. To assign a snapshot view to a drive letter, see *Assigning Snapshot Views to Drive Letters* on page 122.

Accessing Someone Else's Snapshot View from Windows Explorer

You can access someone else's snapshot view as you would access any other directory on another computer. If the directory's owner has shared the directory and set up the proper permissions, you can use Network Neighborhood to access the view.

Accessing Dynamic Views from Windows Explorer

You can access any view that you have started on your computer from the *dynamic-views-drive* (by default, drive M:) in Windows Explorer. If you assign the folder for the view to a drive letter, you can also access the view from the drive letter in Windows Explorer.

For information on assigning dynamic views to drive letters, see ClearCase online help.

Starting Dynamic Views and Activating VOBs

To access a dynamic view from Windows Explorer, you must start the view. If you assign the folder for a view to a drive letter, ClearCase starts the view when you log on to your computer.

To start the view, navigate to the view in your network folder and expand the view. For example, on Windows 2000, click **My Network Places** > **Entire Network** > **ClearCase Dynamic Views** > **All Views**, right-click on the folder for the view, and click **ClearCase** > **Start View**. On the **Properties** dialog box, click **Start View**.

In a UCM project, ClearCase activates all VOBs that contain components for any of the projects you have joined. If you want to access files in other VOBs, you must activate the VOBs. For more information, see *Activating or Deactivating VOBs for Dynamic Views* on page 121 and ClearCase online help.

Starting the view also starts a **view_server** process, which maps the data in the VOBs that are activated on your computer into a directory tree. VOBs that you activate appear as subdirectories of a view. Then you browse a VOB as you would any other directory.

If you are unable to start a dynamic view that is on another host, check with your administrator to make sure that you can access the view's view storage directory. For more information, see the *Administrator's Guide* for Rational ClearCase.

2.7 Connecting to the UCM-ClearQuest Integration

If your project uses the UCM-ClearQuest integration, complete the following tasks to set up your computer for the integration:

- Connecting to a UCM-enabled schema repository. (Your ClearQuest administrator may have done this for you.)

- Logging on to a ClearQuest user database.

To determine whether your project is enabled for ClearQuest:

1. In the ClearCase Explorer Shortcut pane, click **Toolbox**. Then click **UCM** > **Project Explorer**.

2. In Project Explorer, select your project and click **File** > **Properties**.

3. In the project's **Properties** dialog box, click the **ClearQuest** tab. If the **Project is enabled for ClearQuest** check box is selected, the project is enabled for ClearQuest.

Connecting to a UCM-Enabled Schema Repository

A schema repository is a master database that contains data associated with ClearQuest schemas. To use the UCM-ClearQuest integration, you must connect ClearQuest to a schema repository that contains UCM-specific data. (For more information, see *The UCM-ClearQuest Schema* on page 24.)

Your ClearQuest administrator can create a database profile, which simplifies the process of connecting. If such a profile exists, you must know its name and location. If there is no profile, you must know the properties of the database designated as the schema repository (location, name, and vendor type, as well as password information, and so on).

To Connect to a Schema Repository

1. On your Windows desktop, click **Start** > **Programs** > **Rational ClearQuest** > **Rational ClearQuest Maintenance Tool**.

2. In ClearQuest Maintenance Tool, click **Connect to Existing Schema Repository**. Then click **Next**.

3. Do **one** of the following:

   ➢ If your ClearQuest administrator created a database profile, click **Load Profile**. In the **Open** dialog box, select the profile and click **Open**.

   ➢ In the **Vendor** box, select the database vendor for the repository and enter the database properties.

4. Complete any remaining steps in the wizard.

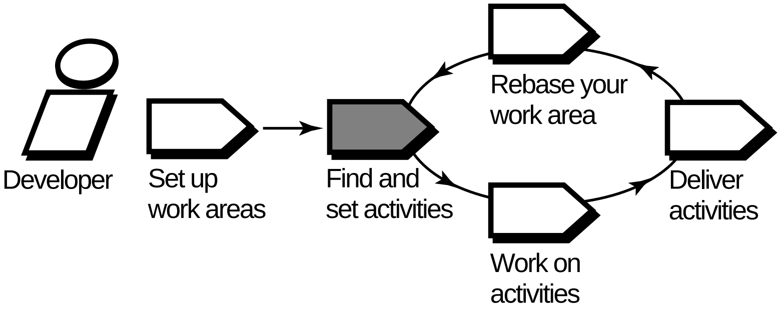
Logging On to a ClearQuest User Database

The first time you perform a ClearCase operation that involves the UCM-ClearQuest integration, such as setting your view to an activity, ClearQuest prompts you to enter your ClearQuest user ID and password.

ClearQuest keeps its own database of user IDs and passwords. (ClearCase uses your standard network user ID and password.) Make sure your ClearQuest administrator has added a user ID and password to the ClearQuest user database for you.

When ClearQuest prompts you, be sure to enter your ClearQuest user ID in this dialog box; ClearQuest stores your login information as part of your Windows user account so it doesn’t need to prompt you again during ClearCase operations.

3 Finding and Setting Activities



Before you start work on the project, find any *activities* that your project manager or other team members assigned to you; if necessary, add new ones to indicate the scope and amount of work scheduled for the project. This chapter describes the following tasks:

- Finding activities
- Creating activities
- Assigning activities in a project that is enabled for ClearQuest
- Setting activities

NOTE: Both Rational ClearCase and Rational ClearQuest provide a Web interface through which you can complete some of the tasks described in this and subsequent chapters. (You cannot set an activity or issue other ClearCase commands from the ClearQuest Web interface.) Ask your system administrator how to access the Web interfaces. Then use the Web interface's online help for more information.

3.1 Finding Activities

UCM provides several locations from which to find activities:

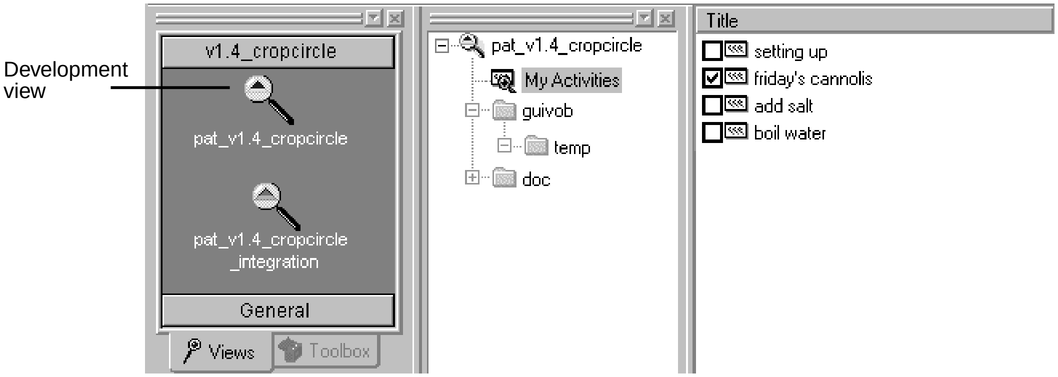
- MyActivities in ClearCase Explorer
- MyToDoList and other ClearQuest queries (only for projects that are enabled for ClearQuest)
- Project Explorer
- ClearCase dialog boxes

Finding Activities with MyActivities

In ClearCase Explorer, MyActivities shows the activities in your work area (Figure 18).

In a project that is enabled for ClearQuest, MyActivities shows the results of the UCMCustomQuery1 query. (For more information, see *UCMCustomQuery1* on page 27.) In a project that does not use the UCM-ClearQuest integration, MyActivities shows the list of activity objects that are in your stream.

Figure 18 MyActivities in ClearCase Explorer



To Open MyActivities

1. In ClearCase Explorer, click the **Views** tab.
2. Click the page for your project. Then select your development view.
3. In the Folder pane, click **MyActivities**.

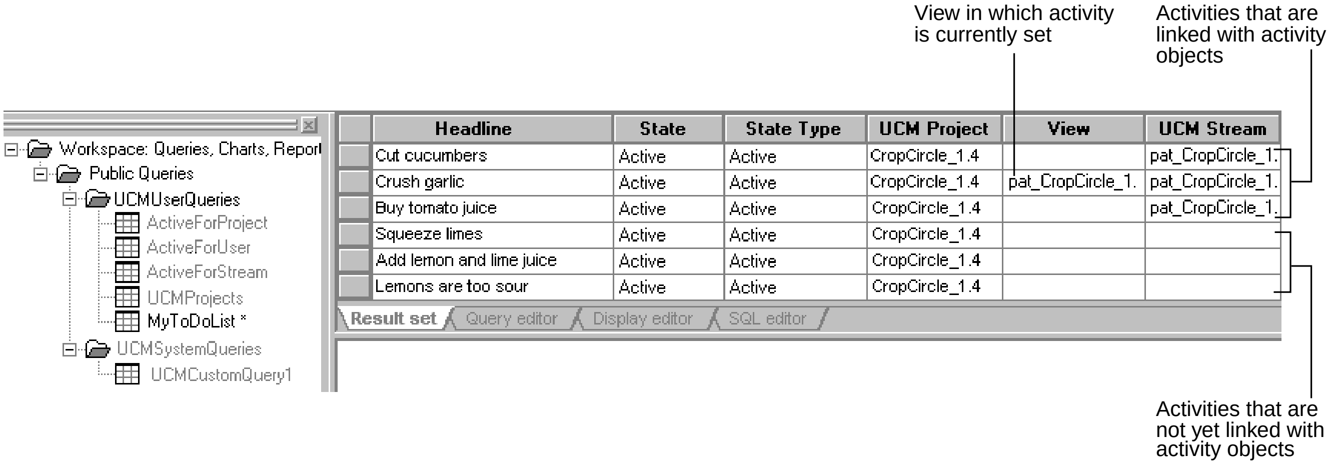
Finding Activities with MyToDoList and Other ClearQuest Queries

If your project is enabled for the UCM-ClearQuest integration, you can use ClearQuest to find activities.

Using MyToDoList

The MyToDoList query finds all UCM-enabled records that are assigned to you in ClearQuest, even if they have not been linked with activity objects or if they have been linked with activity objects in someone else's stream (Figure 19). For more information, see *Queries* on page 26 and *UCM-Enabled Record Types and ClearCase Activities* on page 24.

Figure 19   Linked Activities in ClearQuest MyToDoList



View in which activity is currently set

Activities that are linked with activity objects

Activities that are not yet linked with activity objects

Headline	State	State Type	UCM Project	View	UCM Stream
Cut cucumbers	Active	Active	CropCircle_1.4		pat_CropCircle_1.
Crush garlic	Active	Active	CropCircle_1.4	pat_CropCircle_1.	pat_CropCircle_1.
Buy tomato juice	Active	Active	CropCircle_1.4		pat_CropCircle_1.
Squeeze limes	Active	Active	CropCircle_1.4		
Add lemon and lime juice	Active	Active	CropCircle_1.4		
Lemons are too sour	Active	Active	CropCircle_1.4		

To Open MyToDoList

1. On the Windows desktop, click **Start** > **Programs** > **Rational ClearQuest** > **ClearQuest**.

2. In ClearQuest, in the left pane, click **Workspace** > **Public Queries** > **UCMUserQueries**. Then run the **MyToDoList** query.

   ClearQuest displays the query results in the Query results pane (Figure 19).

3. To arrange the list by information displayed in a column, right-click the column heading and select a sort order from the shortcut menu. For example, to arrange activities alphabetically,

right-click **Headline** (the first column's heading) and on the shortcut menu, click **Sort Ascending**.

4. To see more information about an item on your to do list, select it. ClearQuest displays the record's details in the Record form pane.

Creating Your Own ClearQuest Query

If none of the existing queries suits your needs, you can create a new one. When creating a query to find UCM-enabled records, note the following:

- To search across all UCM-enabled record types, in the **Choose a Record** dialog box, select **All_Ucm_Activities**. This selection limits your query to fields common to all UCM-enabled record types.
- You cannot use a ClearQuest query to find ClearCase change-set information.

For more information about creating a query, see ClearQuest online help.

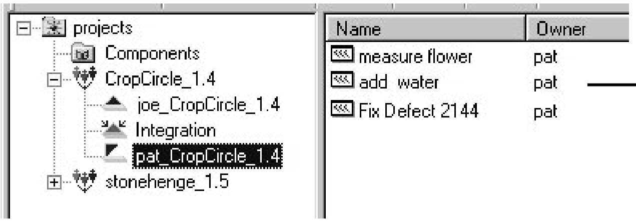
Finding Activities with Project Explorer

The Project Explorer arranges activities hierarchically by stream and by project. It shows only the ClearCase activity objects that are in the currently selected stream.

In a project that is enabled for ClearQuest, each activity in a stream is linked to a UCM-enabled record in ClearQuest (Figure 20). For more information, see *UCM-Enabled Record Types and ClearCase Activities* on page 24.

To start the Project Explorer, in the ClearCase Explorer Shortcut pane, click **Toolbox**. Then click **UCM** > **Project Explorer**.

Figure 20 Activities in Project Explorer



Name	Owner
measure flower	pat
add water	pat
Fix Defect 2144	pat

Activities in **pat_CropCircle_1.4** stream

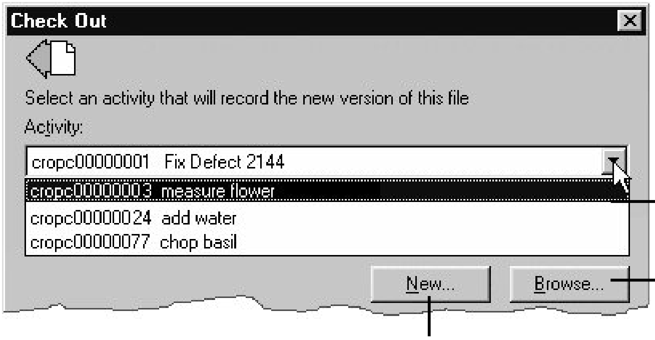
Finding Activities with ClearCase Dialog Boxes

During the checkin, checkout, and add-to-source control operations, a dialog box opens for you to enter a version creation comment and to set an activity.

In a project that is enabled for ClearQuest, the dialog boxes display the headlines of activities found by the UCMCustomQuery1 query. (For more information, see *UCMCustomQuery1* on page 27.) You can click **Browse** to use or create a different query (Figure 21).

In projects that do not use the UCM-ClearQuest integration, the dialog boxes show the IDs of activity objects in the stream to which is attached the view from which you issued the command. You can click **Browse** to see the activities that other team members have created in your stream.

Figure 21 Activities in the Check Out Dialog Box (Project Is Enabled for ClearQuest)



Check Out

Select an activity that will record the new version of this file

Activity:

cropc00000001 Fix Defect 2144

cropc00000003 measure flower

cropc00000024 add water

cropc00000077 chop basil

Activities found by **UCMCustomQuery1**

Click to choose or create a different query

Click to add an activity

3.2 Creating Activities

Your organization may have policies regarding the scope of an activity. For example, these policies may require that all activities refer to a change request in your change-request management system. The process for creating activities differs, depending on whether your project uses the UCM-ClearQuest integration.

This section describes the following tasks:

- Creating activities in a project that is enabled for ClearQuest
- Creating activities in a project that is not enabled for ClearQuest

Creating Activities in a Project Enabled for ClearQuest

In a project that is enabled for ClearQuest, an *activity* usually refers to two objects that are linked together: a ClearCase activity object and a UCM-enabled record in a ClearQuest database. The process of creating an activity in a project that is enabled for ClearQuest entails the creation of two objects in a specific order:

1. You create ClearQuest records (based on a UCM-enabled record type). You can create ClearQuest records from ClearCase Explorer, ClearQuest, or ClearCase dialog boxes.

2. When you set a view to an activity (which you can do by clicking **Actions** > **WorkOn** for a ClearQuest record), ClearCase creates an activity object in the stream to which the view is attached and links the activity object to the UCM-enabled record in ClearQuest. You do not create ClearCase activity objects directly.

To Create Activities from ClearQuest

NOTE: You can create and use a template of default values for the ClearQuest Submit form. Such a template can save time and be helpful when you are entering multiple, related records. For information on using a template, see ClearQuest online help.

1. On the Windows desktop, click **Start** > **Programs** > **Rational ClearQuest** > **ClearQuest**.

2. In ClearQuest, click **Actions** > **New**.

3. In the **Choose a Record Type** dialog box, select an appropriate UCM-enabled record type. (Your project manager sets up the record types that are in your ClearQuest database.) Then click **OK**.

   ClearQuest highlights in red the required fields and the fields that contain invalid values. If a field contains an invalid value, you can right-click the field and then click **Error Message** to see any message or explanation that your project manager may have included. If you have questions about what type of information a field requires, right-click the field and then click **Help** on the shortcut menu.

4. Complete the required fields in the ClearQuest Submit form.

5. In the **UCM Project** list, select your project. (Your project manager determines the location for this list when she creates the corresponding record type.) Then click **OK**.

After you create an activity from ClearQuest, you must complete an additional procedure to make the activity appear in MyToDoList or MyActivities. (See *To Make Activities Appear in MyActivities and MyToDoList* on page 57.)

To Create Activities from ClearCase Dialog Boxes

In a project enabled for ClearQuest, this procedure accomplishes these tasks:

- Creates a UCM-enabled record in the ClearQuest database and assigns the activity to you.
- Creates an activity object in the stream to which the view is attached and links the activity object to the UCM-enabled record in ClearQuest.
- Sets your view to the activity.

To create activities:

1. In the **Check Out**, **Check In**, or **Add to Source Control** dialog box (which opens as part of the corresponding operation), click **New**.
2. From the **New** menu, select a record type. (All record types on the **New** menu are UCM-enabled.)
3. In the **Submit** dialog box, complete the required fields, which are highlighted in red.
4. To create a UCM-enabled record and assign the activity to yourself, click **OK**.
5. To add this activity to your stream and set your view to the activity, select it in the **Check Out**, **Check In**, or **Add to Source Control** dialog box and click **OK**.

Creating Activities in a Project Not Enabled for ClearQuest

In UCM projects that do not use the UCM-ClearQuest integration, you create activity objects directly in a specific stream.When you add an activity, it remains in your stream unless you use the **rmactivity** command to remove it.

To Create Activities from ClearCase Dialog Boxes

In a project not enabled for ClearQuest, follow these steps to create an activity when you process an element:

1. In the **Check Out**, **Check In**, or **Add to Source Control** dialog box (which open as part of the corresponding operation), click **New**.

2. In the **New Activity** dialog box, enter the headline of the activity. The activity ID is automatically generated.

3. Click **OK**.

When you add an activity from the **Check Out**, **Check In**, or **Add to Source Control** dialog box, ClearCase sets your view to the activity.

To Add Activities from the View Properties Dialog Box

In a project not enabled for ClearQuest, add an activity from the view properties.

1. Open a view's properties dialog box. For example, in ClearCase Explorer, right-click the root directory of the view, and on the shortcut menu, click **Properties of View**.

2. On the **General** tab of the **Properties** dialog box, click **Change**.

3. In the **Select Activity** dialog box, click **New**.

4. In the **New Activity** dialog box, enter an activity headline and click **OK.**

5. In the **Select Activity** dialog box, click **OK**. The activity headline appears in the **Properties** dialog box under **Current default activity for this view**.

6. In the **Properties** dialog box, click **OK**.

3.3 Assigning Activities in a Project Enabled for ClearQuest

The concept of assigning an activity applies only to UCM-enabled records. In general, *assigning* an activity means making a person responsible for some portion of an activity's development. An activity assignment may change several times during a development cycle. For example, a project manager may take initial responsibility for an activity. When she sets the schedule for a given project, she assigns the activity to a developer on the project. After you begin work on an activity, the activity assignment usually doesn't change.

ClearQuest records include fields to keep track of an activity's current owner. Your organization may restrict who can change the value in the owner field.

NOTE: ClearCase activity objects exist in a particular stream. They record the activity creator, but the creator information cannot be changed, and has no relationship to the concept of activity assignment that is used in ClearQuest.

To Make Activities Appear in MyActivities and MyToDoList

By default, the MyToDoList query and MyActivities find records that are both in a Ready or Active state type and assigned to you. To make an activity appear in MyActivities or MyToDoList, you must change its state type and owner.

1. In ClearQuest, run a query to find an activity. Then click the activity in the Query editor pane.
2. In the Record form pane, click **Actions** and choose a command that moves the activity to a state based on the Ready state type.
3. In the **Owner** list, select your user ID.
4. To see the activity in MyToDoList, in the left pane, click **Workspace** > **Public Queries** > **UCMUserQueries**. Then run the MyToDoList query.

   To see the activity in MyActivities, start ClearCase Explorer and select your view from the Shortcut pane. Then click **MyActivities** in the Folder pane.

3.4 Setting Your View to an Activity

To work on an activity, you must set your development view to that activity. ClearCase associates all work in your view to the currently set activity, adding each version you create in your view to the activity's change set.

You can set activities from the following locations:

- ClearCase Explorer
- MyToDoList or the results of any other ClearQuest query (only for projects that are enabled for ClearQuest)
- Dialog boxes that open during checkout, checkin, and add to source control operations

This section also describes the following tasks:

- Unsetting an activity
- Seeing which activity is currently set in the view

Setting Activities from ClearCase Explorer

1. In ClearCase Explorer, click the **Views** tab.
2. Click the page for your project. Then select your development view.
3. In the Folder pane, click **MyActivities**.
4. In the Details pane, select the check box next to the activity you want to set.

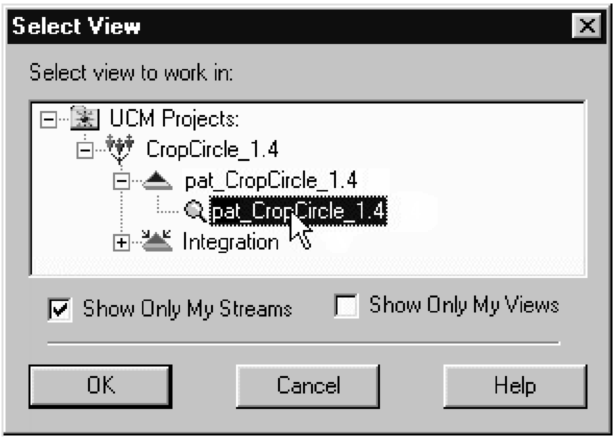
Setting Activities from ClearQuest

1. In ClearQuest, do **one** of the following:
   - Display MyToDoList by clicking **Start** > **Programs** > **Rational ClearQuest** > **ClearQuest**. Then in the left pane, click **Workspace** > **Public Queries** > **UCMUserQueries** and run the MyToDoList query.
   - Use another query to find the activity you want to set.
2. In the Query results pane, click the activity you want to set.
3. In the Record form pane, if it isn't already selected, select your project in the **UCM Project** list. (Your project manager determines the location for this list when she creates the corresponding record type.)
4. Click **Actions** > **WorkOn**.
5. In the **Select View** dialog box, select **Show Only My Streams**.
6. Click the plus sign (**+**) next to your stream; then select your development view and click **OK**.

The status bar in ClearQuest indicates that your view is being set to the activity.

To start working on your project's source files, navigate to your view and check out the source files.

Figure 22 Select Your View



Setting Activities from ClearCase Dialog Boxes

During the checkin, checkout, and add-to-source control operations, ClearCase opens a dialog box that prompts you to enter a version creation comment and to set an activity.

In a project that is enabled for ClearQuest, the dialog boxes list the headlines of activities found by the UCMCustomQuery1 query. (For more information, see *UCMCustomQuery1* on page 27.) You can click **Browse** to use or create a different query (Figure 21).

In projects that do not use the UCM-ClearQuest integration, the dialog boxes show the headlines of activity objects in the stream to which is attached the view from which you issued the command. You can click **Browse** to see the activities that other team members have created in your stream.

Unsetting Your View from an Activity

You can change any view to have no currently set activities, for example, if you need to remove the view or remove the activity currently set in the view.

To Unset Activities from ClearCase Explorer

1. In ClearCase Explorer, display your work area and click **MyActivities**.
2. In the Details pane, clear the check box next to the currently set activity.

To Unset Activities from a Command Prompt

1. At a command prompt, change to any directory in your view.
2. Enter the following command:

   ```
   cleartool setactivity –none
   ```

To See Which Activity Is Currently Set

Use either ClearCase Explorer or a command window.

From ClearCase Explorer

In ClearCase Explorer, display your work area and click **MyActivities**.

The Details pane shows a check mark next to the currently set activity.

From a Command Prompt

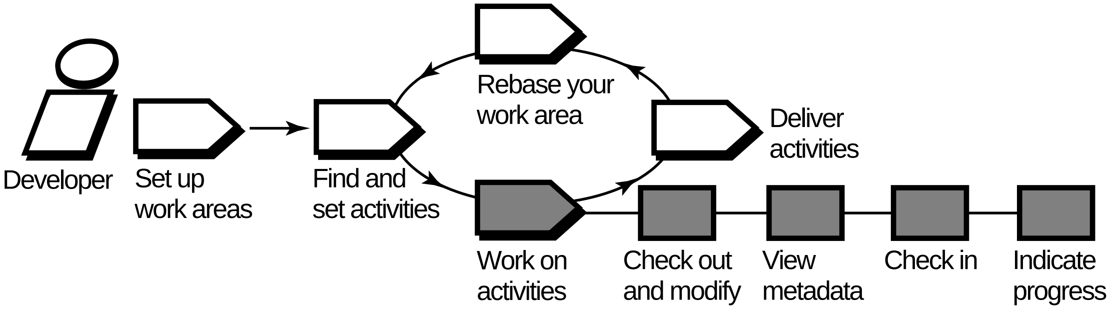
1. At a command prompt, change to any directory in your view.
2. Enter the following command:

   ```
   cleartool lsactivity –cview
   ```

A message displays the date of creation, the activity headline, and owner of the current activity.

4

Working on Activities



Working on activities involves the following tasks:

- Checking out files
- Working with checkouts
- Canceling checkouts
- Checking in files
- Testing your work
- Indicating your progress

The work in your development work area is unavailable to other team members until you deliver it.

4.1 Checking Out Files

To modify files under source control, you must check them out and make sure that you have set your view to an *activity*. Checking out does not add a version to the activity's change set. (Checking in creates a new version, which Rational ClearCase adds to the activity's change set.)

NOTE: For information about accessing your development view, see *Accessing Your Development View* on page 42.

If your project uses the UCM-ClearQuest integration, your project manager may enable a Rational ClearQuest policy called **Check Before Work On**. This policy runs a customized ClearQuest script when you attempt to work on an activity. For example, your project manager may create a script that checks whether your user name matches the name in the ClearQuest record Owner field. Before you can work on the activity, you have to meet all criteria established by the **Check Before Work On** policy.

To Check Out Files and Set Activities

You can check out files and set activities in a ClearCase context or using a ClearCase shortcut menu.

From ClearCase Explorer

To check out files and set activities in a ClearCase context, use ClearCase Explorer.

1. In ClearCase Explorer, navigate to the directory in your development view that contains the files you want to check out. Then select the files.

2. Right-click one of the selected files. On the shortcut menu, click **Check Out**.

   ClearCase opens the **Check Out** dialog box with the currently set activity selected in the Activity list.

3. To set a different activity (or, if you have not set the view to an activity), do the following:

   a. Select one from the **Activity** list. To filter the list, click **Browse**.

   b. If an appropriate activity doesn't exist, create and set a new one by clicking **New**. If your project is enabled for ClearQuest, select a record-type from the shortcut menu that appears when you click **New**. ClearQuest changes the activity state to an **Active** state type, and ClearCase adds the version you check out to the activity's change set.

4. Describe the modifications you plan to make in the **Checkout Comment** box. Use comments to describe modifications to individual versions within an activity's change set. Your comments are displayed as part of the element's history and the version's properties.

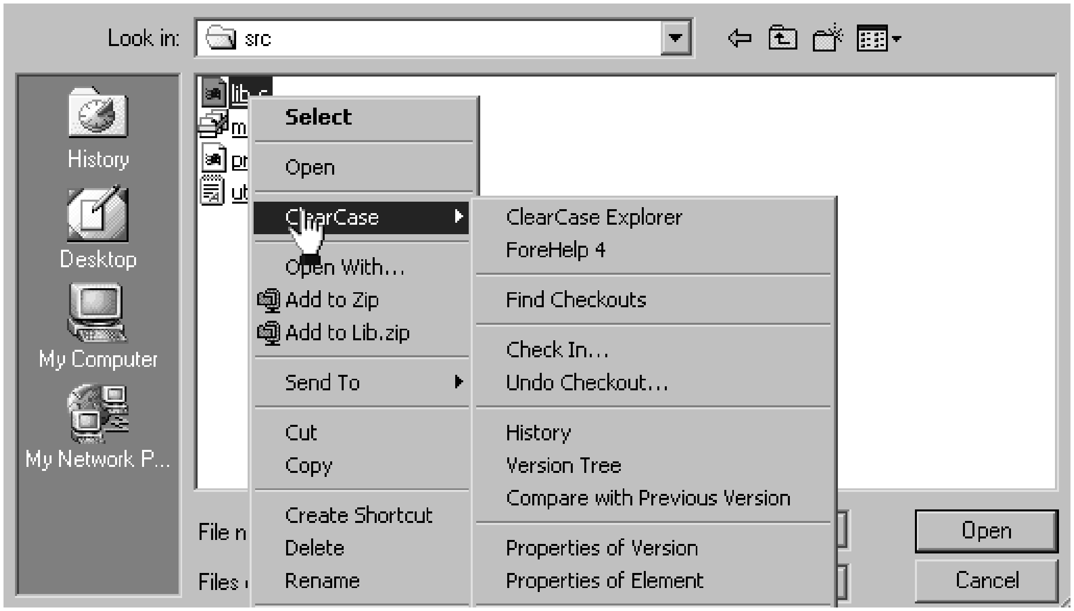
5. Click **OK**.

For information on checking out VOB links in a snapshot view, see *Loading Elements* on page 42.

From the ClearCase Shortcut Menu

Access the ClearCase shortcut menu from the **Open** dialog box that many applications use. As illustrated in Figure 23, right-clicking a loaded version of a ClearCase element in the **Open** dialog box displays the ClearCase shortcut menu.

Figure 23 The ClearCase Shortcut Menu from the Open Dialog Box



To check out a file from an **Open** dialog box:

1. In an application such as Microsoft Notepad, click **File** > **Open**.
2. In the **Open** dialog box, navigate to the file or directory that is under source control.
3. Right-click the file; then click **ClearCase** > **Check Out**.

Checking Out Directories

Directories, as well as files, are under ClearCase source control, yet you rarely need to check out a directory explicitly. ClearCase checks out and checks in a file's parent directory when you add the file to source control.

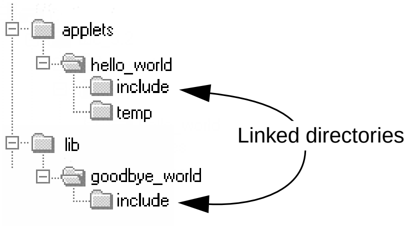
What does it mean for a directory to be under source control? In a version-controlled directory, ClearCase creates a new version of the directory when you add or rename a file element under source control. Having versions of directories can be helpful if, for example, you rename a source file used in a particular release and then modify your makefile to reflect this change. If you need to rebuild a previous release, you can set up your view to select the version of the directory that contains the file under its previous name.

NOTE: When you issue commands from a command-line interface (CLI), such as an MS-DOS command prompt, ClearCase does not check out directories automatically. When using a CLI to change a directory element, you need to check out the directory explicitly. For more information on checking out files and directories from a CLI, see the **checkout** reference page in the *Command Reference*.

Under the Hood: VOB Links

A VOB link makes a file element or directory element accessible from more than one location in the VOB namespace. There are two kinds of VOB links: *symbolic links*, which are available for file and directory elements, and *hard links*, which are available for file elements only. We recommend that you use VOB symbolic links instead of VOB hard links whenever possible. In Figure 24, the directory element **include** is linked.

Figure 24 VOB Link



You use the **cleartool ln** command to create VOB links. For more information, see the **ln** reference page in the *Command Reference*.

Symbolic Links and Hard Links in Dynamic Views

In *dynamic views* (which use the MVFS, or multiversion file system), VOB links behave similarly to symbolic links or hard links in a UNIX file system: symbolic links point to a file or directory element in a different location, and hard links are alternate names for a single file element.

You cannot check out a VOB symbolic link; you must check out the symbolic link target.

When you check out a hard-linked element from a specific pathname, ClearCase considers other pathnames for the element as “checked out but removed.” That is, to prevent you from modifying the element from multiple pathnames, ClearCase executes standard checkout behavior at only one pathname (the one from which you entered the **checkout** command), but does not create view-private files at other pathnames. For information about standard checkout behavior, see the **checkout** reference page in the *Command Reference*.

In ClearCase Explorer, the shortcut menu for a symbolic link includes the **Symlinks** command, which allows access to the target (**Warp to Symlink Target**) or provides commands to perform ClearCase operations on the target (**Symlink Target Operations**). Use one of these commands to find and check out the link target. When you check in the modified link target, ClearCase updates all associated symbolic links. Return to the directory containing the symbolic link by clicking **File** and the history entry of the location.

Symbolic Links in Snapshot Views

Snapshot views created from a ClearCase host running Windows software do not support links. ClearCase approximates VOB symbolic link behavior in the following ways:

- If a *load rule* selects a symbolic link, ClearCase copies the link target into the view at the link’s pathname.

We recommend that you do not load a linked directory more than once in your view unless it is necessary for build purposes. Although ClearCase keeps track of multiply loaded elements accurately, you may become confused and modify the wrong copy of a file, losing information upon checkin. For more information, see *Caution: Losing Data Because of VOB Hard Links*.

- ➤ You cannot check out a file element from a symbolic link pathname; you must check out the link target.

  In ClearCase Explorer, the shortcut menu for a symbolic link includes the **Symlinks** command, which allows access to the directory containing the target (**Warp to Symlink Target**) or provides commands to perform ClearCase operations on the target (**Symlink Target Operations**). Use one of these commands to find and check out the link target. When you check in the modified link target, ClearCase updates all associated symbolic links loaded in your view. Return to the directory containing the symbolic link by clicking **File** and the history entry of the location.

  Unlike directory link targets, a file link target can be checked out only if it is loaded in your view.

- ➤ The **Add to Source Control** command (available from ClearCase GUIs) checks out, modifies, and checks in the link target directory whether you issue the command from a directory symbolic link or from the link target (and whether or not the target directory is loaded into the view).

  If you issue the **cleartool checkout** command from a symbolic link directory, you must use the following syntax:

  cleartool checkout .

  A **checkout** command issued for the current directory checks out the link target whether or not the target directory is loaded into the view.

  However, if you use the **cleartool checkout** *dirname* form of the command to check out a different directory, *dirname* must be a link target.

  When either you or ClearCase checks in a link target directory, ClearCase updates the associated symbolic links that are loaded in your view.

- ➤ If you *hijack* a file symbolic link, the Update Tool detects it. However, you cannot check out the hijacked symbolic link. To add your hijacked changes to the VOB, you must check out and modify the link target.

Hard Links in Snapshot Views

Each time a load rule selects a hard link, ClearCase loads the element into the view as a standard file.

Caution: Losing Data Because of VOB Hard Links

If you load multiple instances of a hard-linked element into a snapshot view, you must be careful to check out, modify, and check in only one instance of the file.When you check in a hard-linked file (or a file below a symbolic-linked directory), ClearCase updates all other instances in your view, which could result in loss of data if you modified multiple copies of the same file. (Note that, when updating instances of files because of a checkin, ClearCase renames any *hijacked* file to *filename*.**keep** before updating it.)

For example, the following sequence of events will lead to lost data:

1. You check out the hard-linked file **src\util.h**.
2. ClearCase removes the read-only attribute from **util.h** in the **src** directory only (which is the location from which you issued the **checkout** command).
3. You modify **src\util.h** but do not check it in.
4. Later, you lose track of which file you checked out. You then remove the read-only attribute and modify **util.h** in the **temp** directory.
5. You check in **temp\util.h**. Even though you checked out and modified **src\util.h**, ClearCase does not prevent you from checking in **temp\util.h**; with a VOB hard link, **temp\util.h** is just another name for **src\util.h**.
6. Any changes you made to **src\util.h** are lost upon checkin because ClearCase updates all copies of duplicated files when you check in an element. Note that ClearCase does not consider any copy of **util.h** to be hijacked (even if you change attributes), because you checked out the element in the VOB.

Resolving Checkout Problems

You can encounter problems when attempting to check out an element. Table 2 suggests ways to resolve common problems.

Table 2 Resolution of Checkout Problems

Problem	**Likely cause**	**Suggested resolution**
Snapshot view is out of date	You are checking out a nonexplicit version, and the snapshot view is not up-to-date with the VOB. If the element being checked out were updated, a different version would be loaded.	Update the element and then check out the updated version.
Target branch is already reserved	Another view holds a reserved checkout of the target branch.	Check out the branch as unreserved.
Non-**LATEST** version selected	You are checking out a nonexplicit version, the config spec selects a version that is not the **LATEST** on the branch, and there is no **mkbranch** rule. This can occur because a label or a time rule selects elements.	Check out the **LATEST** version.
File is hijacked and does not correspond to the selected version	The file is in the `hijacked/nocheckout` state or the checkout explicitly specifies a different version.	Check out the hijacked file; or merge the hijacked version and the selected version, and use the merge result as the checkout data.
A **mkbranch** rule in the view's config spec fails and automatic branch creation fails	The branch exists. The config spec does not select the branch before specifying that the branch should be created (as it should). Or, for a dynamic view, a time rule prevents it from seeing the branch. Or, for a snapshot view, the branch was created after the view was lasted updated.	Check out the **LATEST** version on the branch; for an out-of-date snapshot view, this means an update of the element followed by a checkout of **LATEST**.

4.2 Working with Checkouts

After you check out a file, you do not need to use ClearCase until you're ready to check it in. However, you may want to use some ClearCase tools for the following tasks:

➤ Viewing an element's history
➤ Comparing versions of elements
➤ Tracking checked-out versions

- Viewing an activity’s change set
- Moving versions to a different activity

Viewing an Element’s History

The History Browser displays the history of an element’s modifications, including version-creation comments (entered when someone checks out or checks in an element).

To View an Element’s History

In ClearCase Explorer, right-click an element; on the ClearCase shortcut menu, click **History**.

Comparing Versions of Elements

As you modify source files, you may want to compare versions to answer such questions as these:

- What changes have I made in my checked-out version?

- How does my checked-out version differ from a particular historical version or from the version that another developer is using?

To Compare with a Predecessor

In ClearCase Explorer, right-click a file. On the ClearCase shortcut menu, click **Compare with Previous Version**.

To Compare with a Version Other Than the Predecessor

1. In ClearCase Explorer, right-click a file and click **Version Tree**.

2. In the Version Tree Browser, right-click a version and click **Compare** > **with Another Version**.

   The cursor changes to a target icon.

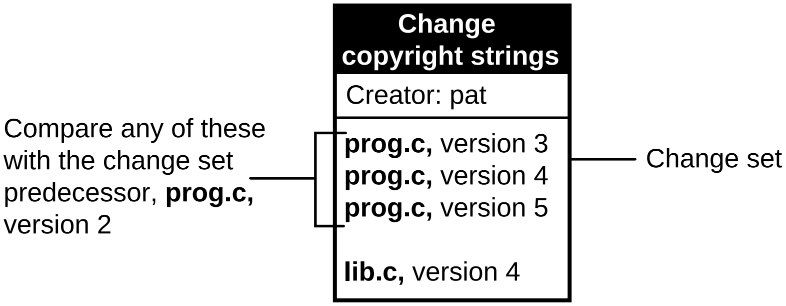
3. Click the version you want to compare.

Comparing with a Change-Set Predecessor

A change set lists all versions you have created while working on a specific activity. In some cases, you create more than one version of an element for a specific activity. For example, for the activity **Change copyright strings** you check in a version of **prog.c** and realize later that you missed a string in the file. You then set your view to the activity **Change copyright strings**, check out **prog.c**, modify the string, and check in the file.

To see the changes you have made to an element while working on an activity, you can compare a version in the activity's change set with the version that immediately precedes the change set. In Figure 25, the change set predecessor of **prog.c** is version 2. You can compare any version of **prog.c** in the change set with version 2.

Figure 25 Compare with Change Set Predecessor



To Compare with a Change-Set Predecessor

1. Display an activity's properties sheet. For example:

   a. In ClearCase Explorer, select your work area and click **MyActivities**.

   b. Right-click the activity and click **Properties**.

2. In the activity's properties sheet, click the **Change Set** tab.

3. Right-click the version you want to compare, and, on the shortcut menu, click **Compare with Change Set Predecessor**.

Tracking Checked-Out Versions

Depending on how you work, you may forget exactly how many and which files are checked out. To list all the files and directories you currently have checked out to your view:

1. In the ClearCase Explorer Folder window (middle), right-click a folder for a versioned directory and click **Find Checkouts**.

2. In the **Find Criteria** dialog box, edit the path from the root directory of the snapshot view in the **Search folder** box.

3. Under **Include additional folders?**, select **Include subfolders**.

4. Click **OK**.

Viewing an Activity's Change Set

You can see which versions are in an activity's change set from ClearQuest, ClearCase Explorer, or Project Explorer.

To View an Activity's Change Set from ClearQuest

1. Use a query to find the activity. For example, to use MyToDoList:

   a. Click **Start** > **Programs** > **Rational ClearQuest** > **ClearQuest.**

   b. In the left pane, click **Workspace** > **Public Queries** > **UCMUserQueries** and run the **MyToDoList** query.

      ClearQuest displays MyToDoList list in the Query builder pane. (Figure 19 on page 51.)

2. In the Query builder pane, select a record.

3. In the Record form pane, display the **Change Set** list. Your project manager determines the location of this list when she designs the record's record type.

To View an Activity's Change Set from ClearCase Explorer

1. From MyActivities in ClearCase Explorer, right-click an activity.

2. On the shortcut menu, click **Properties**.

To View an Activity’s Change Set from Project Explorer

1. In the ClearCase Explorer Shortcut pane, click **Toolbox**. Then click **UCM** > **Project Explorer**.
2. In Project Explorer, select a stream and right-click an activity in the stream; on the shortcut menu, click **Properties**.
3. In the **Properties** dialog box, click the **Change Set** tab.

Moving Versions to a Different Activity

You can move versions from a ClearCase properties sheet or from ClearQuest if your project is enabled for ClearQuest.

To Move Versions within a ClearCase Context

1. Display an activity’s change set. (For more information, see *Viewing an Activity’s Change Set* on page 71.)
2. On the **Change Set** tab, select one or more elements.
3. Right-click a selected element, and on the shortcut menu, click **Move to Activity**.

To Move Versions within a ClearQuest Context

1. Display an activity’s change set in ClearQuest. For more information, see *To View an Activity’s Change Set from ClearQuest* on page 71.
2. Select one or more elements from the **Change Set** list.
3. Right-click a selected element, and on the shortcut menu, click **Move to Activity**.
4. Follow the ClearCase prompts.

4.3 Canceling Checkouts

If you check out a file but don’t want to check in your changes or want to start with a fresh copy, you can cancel the checkout as follows:

1. In the ClearCase Explorer Details pane, select one or more checkouts. Then right-click.
2. On the shortcut menu, click **Undo checkout**.
3. Click **Yes** in the **Confirm Undo Checkout** dialog box. You can choose to save any of your changes in the file *filename***.keep**.

Under the Hood: Canceling Checkouts

When you cancel the checkout of a file element, ClearCase handles the request as follows:

1. It prompts you to rename the file in your view to *filename***.keep**.
2. It notifies the VOB that you no longer have the version checked out in your view.
3. In a snapshot view, it copies from the VOB the version that was in your view when you performed the checkout operation.

   In a dynamic view, it uses the config spec's version-selection rules to select a version.

Canceling Directory Checkouts

Although you rarely need to check out a directory explicitly, if you do and then cancel the checkout, ClearCase notifies the VOB that you no longer have the version of the directory checked out to your view. ClearCase does not prompt you to rename a canceled directory checkout to *directory-name***.keep**.

If you cancel a directory checkout after changing its contents, any changes you made with **cleartool rmname**, **mv**, and **ln** are lost. Any new elements you created with **mkelem** or **mkdir** become orphaned. (When you create elements from the GUI with the **Add to source control** command, ClearCase checks out the directory, adds the element, and checks in the directory, avoiding the creation of orphaned elements.) ClearCase moves orphaned elements (and any data that exists in the view at the pathname of the new element) to the VOB's **lost+found** directory under names of the form: *element-name.UUID*.

In such cases, **uncheckout** displays this message:

```
cleartool: Warning: Object "prog.c" no longer referenced.
cleartool: Warning: Moving object to vob lost+found directory as
"prog.c.5f6815a0a2ce11cca54708006906af65".
```

In a snapshot view, ClearCase does not remove *view-private objects* or start the update operation for the directory in the view. To return the directory in your view to its state before you checked it out, you must start the Update Tool. For information on starting the Update Tool, see ClearCase online help.

In a dynamic view, ClearCase does not remove view-private objects, but it does revert the view to its previous state.

To move an element from the **lost+found** directory to another directory within the VOB, use the **cleartool mv** command.

To permanently delete an element in the **lost+found** directory, take note of the orphaned element's name and use this command:

cleartool rmelem *VOB-pathname***lost+found***orphaned-element-name*

For example, from a dynamic view:

```
cleartool rmelem \guivob\lost+found\prog.c.5f6815a0a2ce11cca54708006906af65
```

From a snapshot view:

```
cd c:\pat_v1.4_cropcircle_sv
cleartool rmelem guivob\lost+found\prog.c.5f6815a0a2ce11cca54708006906af65
```

NOTE: In a snapshot view, ClearCase treats the **lost+found** directory, which is located immediately below the root directory of a VOB, as any other directory. To load the directory in your view, you must use a load rule that specifies either the element's parent directory or the directory itself. However, as with any other directory in a snapshot view, you do not need to load the **lost+found** directory to issue ClearCase commands for elements in the directory.

Canceling the Checkout of a Deleted File

If you check out a file element and then delete that file from your view (by using, for example, the **Delete** command in ClearCase Explorer), use this procedure to cancel the checkout:

1. In ClearCase Explorer, right-click the directory containing the deleted file.

2. On the shortcut menu, click **Find Checkouts**.

3. Complete the **Find Criteria** dialog box.

4. In the Find Checkouts window, select the file whose checkout you want to cancel and click **Undo Checkout**.

4.4 Checking In Files

Check in a file when you want to keep a record of the file in its current state. When you check in from your development view, ClearCase records the new version in your development stream; even though the new version is a permanent part of the element, the modifications are unavailable to the project team until you deliver them.

To Check In Files

1. In ClearCase Explorer, select one or more files.
2. Right-click a selected file. On the shortcut menu, click **Check In**.
3. In the **Check In** dialog box, ClearCase displays the comments you entered when you checked out the file. You can reuse these comments or modify them.

Try to enter meaningful comments. Comments are a valuable part of keeping track of your work. You can search for text in comments to identify a specific version.

Snapshot View: Checking In VOB Links

When you issue a **checkin** command from a snapshot view, ClearCase handles the request as follows:

1. It copies your modifications to the VOB as a new version.

   The version you check in remains in the view, regardless of the view's config spec.

2. It removes write permission for the file.

For any other instance of the file loaded into a snapshot view, ClearCase copies the new version from the VOB into your view. (If your load rules specify an element that appears in more than one VOB location, the element is copied into each of the appropriate locations in your view's directory tree.)

When you check in a symbolic-linked directory from a snapshot view, ClearCase does not update any other instances of the directory loaded in your view. As you add file elements to source control, ClearCase adds a copy of the element to all instances of a parent directory loaded in your view.

4.5 Testing Your Work

To reduce the amount of merging needed when you deliver your work, you should build and test the modifications in your development stream, especially after you rebase the stream and before you deliver your work. If your organization uses **clearmake** or **omake**, you can use these ClearCase build tools for your test builds; however, the *build auditing* and *build avoidance* features are available only from dynamic views.

For more information, see *Building Software* and the **clearmake** or **omake** reference pages in the *Command Reference*.

4.6 Indicating Your Progress

If your project is enabled for ClearQuest, you can complete the following tasks to indicate your progress on an activity:

- Modifying information in ClearQuest
- Closing an activity
- Using schema-specific actions
- Reassigning an activity
- Deleting an activity

You may need to reassign or delete an activity whether or not your project is enabled for ClearQuest.

Modifying Information in ClearQuest

Your ClearQuest activities may include fields for keeping additional information. For example, an activity record form may contain an **Attachments** tab to link to supporting documents written in other applications. The form may also contain fields to describe a defect's symptoms. Adding or modifying such information does not change the activity's state or have any effect on the corresponding activity in your stream.

For information on adding information to multiple activities, see ClearQuest online help.

To Modify ClearQuest Information

1. Use a query to find the activity. For example, to use MyToDoList:

   a. Click **Start** > **Programs** > **Rational ClearQuest** > **ClearQuest.**

   b. In the left pane, click **Workspace** > **Public Queries** > **UCMUserQueries** and run the MyToDoList query.

      ClearQuest displays MyToDoList in the Query builder pane. (Figure 19 on page 51.)

2. In the Query builder pane, select a record.

3. In the Record form pane, click **Actions** > **Modify**.

   Your project manager can include help for the record form. To see information about a field, right-click it and then click **Help** on the shortcut menu.

4. In the Record form, make your changes. (Changing the Owner field reassigns the activity; for information on reassigning an activity, see *Reassigning Activities* on page 79.)

5. To save your changes, click **Apply**. To clear changes you made without saving them, click **Revert**.

Closing Activities

Your project manager may have set up a policy for your project that closes activities in ClearQuest when you deliver them. If the policy is not in effect for your project, close your activity when you have completed the associated work (which is usually when you deliver it).

Completed activities do not appear on MyToDoList, but they remain in your stream and appear in your stream's properties even after you deliver them.

To Close a ClearQuest Activity

Your project manager may have customized your database schema to implement various ways to move an activity to a state based on the Complete state type. The following procedure assumes that your database schema includes an action to close activities:

1. Use a query to find the activity. For example, to use MyToDoList:

   a. Click **Start** > **Programs** > **Rational ClearQuest** > **ClearQuest.**

   b. In the left pane, click **Workspace** > **Public Queries** > **UCMUserQueries** and run the **MyToDoList** query.

      ClearQuest displays MyToDoList in the Query builder pane. (Figure 19 on page 51.)

2. In the Query builder pane, select a record.

3. In the Record form pane, click **Actions** and select an action that closes activities.

   Your project manager can include help for the record form. To see information about a field, right-click it and then click **Help** on the shortcut menu.

4. Click **Apply**.

Using Schema-Specific Actions

Your ClearQuest database schema, which your project manager can customize (see *The UCM-ClearQuest Schema* on page 24), may support these common change-request management actions:

- ➤ Marking activities as duplicate
- ➤ Reopening closed activities
- ➤ Postponing activities

Your database schema may provide various ways to use these actions. For example, record types that can be postponed may have a **Postpone** command that you can use after clicking **Actions** in the record's Record form pane.

Keep the following UCM-ClearQuest integration concepts in mind while using any schema-specific actions:

- Your project manager can set up each UCM-enabled record type to behave differently; some actions may not be available for all record types.

- You cannot move an activity from one development stream to another. However, you can move versions in an activity's change set to another activity in the same stream (see *To Move Versions within a ClearCase Context* on page 72) or to an activity in a different stream (see *Moving Work from a Development Stream* on page 124).

- You cannot delete an activity that is either currently set in a view or that contains versions in its change set. The UCM View field in the ClearQuest Query results pane indicates whether an activity is currently set. (Figure 19 on page 51.) The **Change Set** list, which is available from the ClearQuest Record form pane or from the activity's properties sheet, displays the activity's change set.

- We recommend against working in a development stream that contains activities you do not intend to deliver. Keeping undelivered activities in your development stream increases the risk that, after a rebase operation, your development stream does not contain a cohesive set of versions. If you begin working on an activity and then postpone it until the next release, we recommend that you move the work to the new project, and then create and work in a new development stream. (For more information, see *Moving Work from a Development Stream* on page 124.)

Reassigning Activities

You can assign an activity on MyToDoList to another project team member by changing the activity's owner, unless your project manager has enabled the UCM policy **Check Before Work On**, which prevents you from assigning your work to someone else.

If the ClearQuest activity has been linked with a corresponding activity in your stream (which occurs when you set your view to the activity), you can change the owner in ClearQuest, but you cannot move the ClearCase activity to the new owner's development stream. The UCM Stream field in the ClearQuest Query results pane indicates whether an activity is linked with a stream. (Figure 19 on page 51.)

To reassign an activity that is linked with a stream, change the activity's owner in ClearQuest, and then do one of the following:

- If you have not created versions for the activity (that is, the activity's change set is empty), you can remove the activity in your development stream. (See *To Delete a ClearCase Activity* on page 81.) Then, when the new activity owner sets his view to the activity, ClearCase creates a new activity in the new owner's stream. The activity's **Change Set** list, which is available from the ClearQuest Record form pane or from an activity's properties sheet, displays its change set.

➤ If the activity's change set is not empty, the new owner can create and work in a view attached to the stream containing the activity. For information on attaching a new view to an existing stream, see ClearCase online help.

To Change an Activity's Owner

1. Use a query to find the activity. For example, to use **MyToDoList**:

   a. Click **Start** > **Programs** > **Rational ClearQuest** > **ClearQuest.**

   b. In the left pane, click **Workspace** > **Public Queries** > **UCMUserQueries** and run the **MyToDoList** query.

      ClearQuest displays MyToDoList in the Query builder pane. (Figure 19 on page 51.)

2. In the Query builder pane, select an activity.

3. In the Record form pane, click **Actions** > **Modify**.

4. In the **Owner** field, select the new owner.

5. Click **Apply**.

Deleting Activities

NOTE: Your project manager determines whether you can delete ClearQuest records of any specific record type.

If a ClearQuest activity is linked with a ClearCase activity (which happens if you set a view to the activity) and if the ClearCase activity contains versions in its change set, you must delete the ClearCase activity first.

The UCM Stream field in the ClearQuest Query results pane indicates whether an activity is linked with a stream. (Figure 19 on page 51.) The activity's **Change Set** list, which is available from the ClearQuest Record form pane or from the activity's properties sheet, displays its change set.

To Delete a ClearCase Activity

NOTE: You cannot delete an activity if the change set contains one or more versions. We recommend that you use some other action for an activity with a nonempty change set. For example, you can deliver all other activities in the stream, abandon the stream, and create a new one to keep track of your work on the project. But if no other action is appropriate, you must first use **cleartool rmversion** to remove the versions from the VOB. Note that removing versions from the VOB is irreversible and may have unintended consequences, for example, if there are dependencies on the versions that you remove.

1. In ClearCase Explorer, from the Shortcut pane, click **Toolbox** > **UCM** > **Project Explorer**.
2. In Project Explorer, navigate to your project.
3. Select the stream that contains the activity.
4. In the right pane, select the activity and click **File** > **Delete**. If the activity is linked with a record in ClearQuest, you must delete the ClearQuest record from the ClearQuest GUI.

To delete an activity from a command prompt, use **cleartool rmactivity**. For more information, see the **rmactivity** reference page in the *Command Reference*.

To Delete a ClearQuest Activity

1. Use a query to find the activity. For example, to use MyToDoList:

   a. Click **Start** > **Programs** > **Rational ClearQuest** > **ClearQuest.**

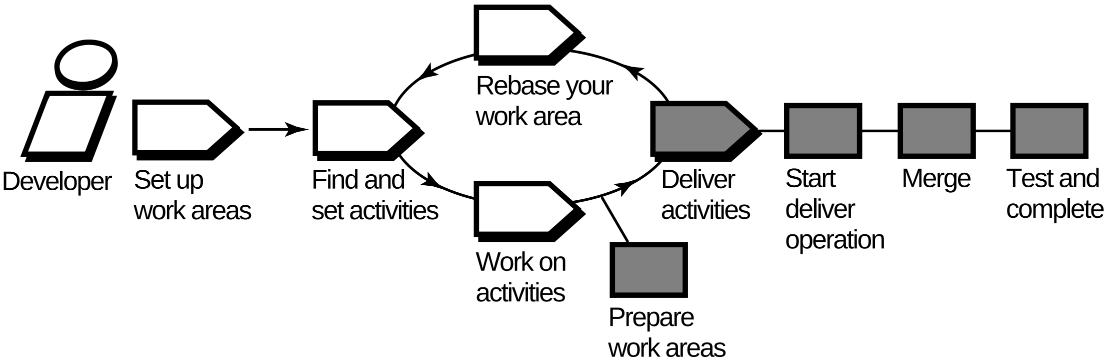
   b. In the left pane, click **Workspace** > **Public Queries** > **UCMUserQueries** and run the MyToDoList query.

   ClearQuest displays the records in the **Result set** tab in the Query builder pane. (Figure 19 on page 51.)

2. In the Query builder pane, select an activity.
3. In the Record form pane, click **Actions** > **Delete**. If a ClearQuest activity is linked with a ClearCase activity (and the activity's change set is empty), ClearQuest deletes the activity in the stream as well.
4. Click **Apply**.

Delivering Activities

5



When you're ready to make work in your development stream available to the project team (for example, to contribute to official project builds), you deliver your work. Delivering your work involves the following tasks:

- Preparing your work areas
- Starting the deliver operation
- Selecting activities and baselines
- Merging versions
- Testing your work
- Completing the deliver operation

NOTE: If your project uses Rational ClearCase MultiSite to share source data with developers in other geographical locations and if the project's streams are mastered at a different site, you complete only the first three tasks; the project integrator completes the remaining tasks. For more information, see *MultiSite: Posting Work to Deliver* on page 98.

5.1 Preparing Your Work Areas

Before you start the deliver operation, prepare your work areas as follows:

- If your project integrator has created a new *recommended baseline* since you last rebased, rebase your development work area to minimize the amount of merging needed during the deliver operation. For information on rebasing, see Chapter 6, *Rebasing Your Work Area*.
- In your development work area, find, compare, and check in all the work you want to deliver.
- If your integration view is a snapshot view, update it and resolve any *hijacked files*.

Finding, Comparing, and Checking In Work from Your Development View

Rational ClearCase delivers only checked-in changes. In addition, your project manager may have set a project policy that requires you to check in all files and directories in your development view before starting the deliver operation.

To Find, Compare, and Check In Your Work

1. In the ClearCase Explorer Folder window (middle), right-click a folder for a versioned directory and then click **Find Checkouts**.
2. In the **Find Criteria** dialog box, select these criteria:
   - **Under Include additional folders?,** select **Include subfolders.**
   - **Under Search only for your checkouts**, select **Yes**.
   - **Under Search only for checkouts in the current view,** select **Yes.**
3. Then click **OK**.

   Find Checkouts produces a list of file or directory versions checked out to your development view and indicates which activity each checked-out version belongs to.
4. To see which changes are in a checked-out version:
   - To see the differences between the previously checked-in version and the current version, click **Tools** > **Compare with Previous Version**.
   - To see checkin comments, click **Tools** > **History**.

5. Do **one** of the following:

   ➢ To deliver changes for a specific file, check it in by selecting it and clicking **Tools** > **Check In**.

   ➢ To undo your changes for a file, cancel its checkout by selecting it and clicking **Tools** > **Undo Checkout**.

   During the cancel checkout operation, you can choose to save your changes in a *view-private file*.

6. To keep your changes without delivering a file, leave it checked out.

If you leave a file checked out, ClearCase delivers the predecessor version in the activity's change set. If the checked-out version is the only version in the change set, ClearCase does not deliver any version of the element.

Updating Your Integration View

During the deliver operation, use your integration view to make sure that your delivered work builds successfully with the work other team members have delivered to the target stream.

If your integration view is a snapshot view, update it and resolve any *hijacked files* to ensure that it contains the latest versions delivered to the target stream. For more information, see ClearCase online help and the *Administrator's Guide* for Rational ClearCase.

To Update a Snapshot View and Resolve Hijacked Files

1. In ClearCase Explorer, right-click the root directory of the view and click **Update View**.

2. In the **Start Update** dialog box, click **Advanced** and select an option for resolving *hijacked files*. (See the online help for information on each option.)

3. To see the actions needed to update the view without actually updating, click **Preview only** on the **View** tab.

4. Click **OK**.

   ClearCase displays its progress as it updates the view (or previews the update).

5. In the Update window, check out or undo any hijacked files. For more information, see ClearCase online help.

5.2 Starting the Deliver Operation

In UCM, you can deliver your work as activities or as baselines. Typically, in a single project environment, you work on activities and deliver your completed activities. Some UCM environments manage parallel work on the same components. The project integrators in such environments deliver baselines to the project's integration stream to incorporate changes in components. For information on delivering baselines, see *Managing Software Projects*. This section covers delivering activities.

You can deliver your work to either the default target (the parent stream of your development stream) or a nondefault target. The policies on the project and on the target stream determine what target is allowed. When you start the deliver operation, the target stream policy settings are checked to determine whether the deliver operation is allowed. The project policy determines the settings for streams in the project; the project policy may defer the setting to the target stream policy. See *Managing Software Projects* for information on project and stream policies.

If your organization uses ClearCase MultiSite and your site does not master the target of your delivery, you can only post your work (see *MultiSite: Posting Work to Deliver* on page 98).

Deliveries and the UCM-ClearQuest Integration

If your project uses the UCM-ClearQuest integration, your project manager may enable a Rational ClearQuest policy called **Check Before ClearCase Delivery**. This policy runs a customized ClearQuest script when you start the deliver operation. For example, your project manager may create a script that checks for dependencies between ClearQuest records. Before you can continue the deliver operation, you must satisfy any requirements established by the **Check Before ClearCase Delivery** policy.

If your organization uses MultiSite and the UCM-ClearQuest integration, the activity object and its ClearQuest record must be mastered locally before you can work on, set, or change an activity.

Delivering to the Default Target

If you deliver your work to the default target, the target of the delivery is your parent stream (see *Your Parent Stream* on page 15).

To Start the Deliver Operation to the Default Target

You can start the delivery from either ClearCase Explorer or Windows Explorer.

From ClearCase Explorer

Do **one** of the following:

➤ Use the Toolbox.

  a. In the ClearCase Explorer Shortcut pane, click **Toolbox**. Then click **UCM** > **Deliver from Stream**.

  b. Select your development stream and click **OK**.

➤ Right-click the root directory of your development view and select **Deliver from Stream to Default**. (For more information, see *Accessing Your Development View* on page 42.)

From Windows Explorer

Right-click the root directory of your development view and then click **ClearCase** > **Deliver from Stream to Default**.

When the deliver operation starts, you have to select what to deliver (see *Selecting Activities* on page 88).

Delivering to a Nondefault Target

If you are delivering your work to a nondefault target, you can choose a stream in the same project (intraproject delivery) or a stream in another project (interproject delivery). The policies on the target stream (intraproject) or on the target project (if you are doing an interproject delivery) determine what target is allowed. You can attempt to deliver from any stream in a project to any other stream in the same project, including the integration stream. Whether the operation can proceed depends on the applicable policy settings. See *Managing Software Projects* for details on policies.

To Start the Deliver Operation to a Nondefault Target

You can start the delivery to a nondefault target from either ClearCase Explorer or Windows Explorer.

From ClearCase Explorer

1. In the ClearCase Explorer, access your view and right-click the root directory of your development view. (For more information, see *Accessing Your Development View* on page 42.)

2. Then click **Deliver from Stream to Alternate Target.**

3. In the **Deliver from Stream** dialog box, select the target stream and click **OK**.

From Windows Explorer

1. Right-click the root directory of your development view and then click **ClearCase** > **Deliver from Stream to Alternate Target**.

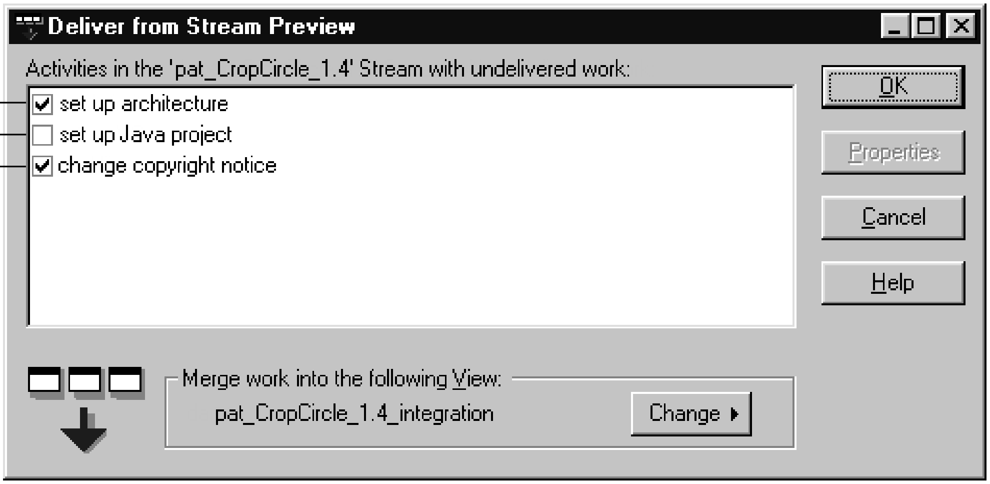
2. In the **Deliver from Stream** dialog box, select the target stream and click **OK**.

The **Deliver from Stream Preview** dialog box opens. Now you select activities to deliver (see *Selecting Activities* on page 88).

5.3 Selecting Activities

After you start the deliver operation and, optionally, specify the target, ClearCase opens the **Deliver from Stream Preview** dialog box to display the activities in your development stream that have never been delivered or that include versions created since the last deliver operation (Figure 26).

Figure 26 Undelivered Activities



Activities with new versions

Deliver from Stream Preview

Activities in the 'pat_CropCircle_1.4' Stream with undelivered work:

☑ set up architecture
□ set up Java project
☑ change copyright notice

Merge work into the following View:

pat_CropCircle_1.4_integration

The caption in the dialog box shows the target context of your delivery.

You can select all activities in the dialog box or a subset. If you select a subset of the activities, ClearCase checks for dependencies between versions in the change sets before continuing the operation. If your selection does not meet dependency requirements, ClearCase prompts you to change your selection.

To see an activity's change set, select the activity, click **Properties**, and click the **Change Set** tab in the **Properties** dialog box.

Controlling Merge Behavior

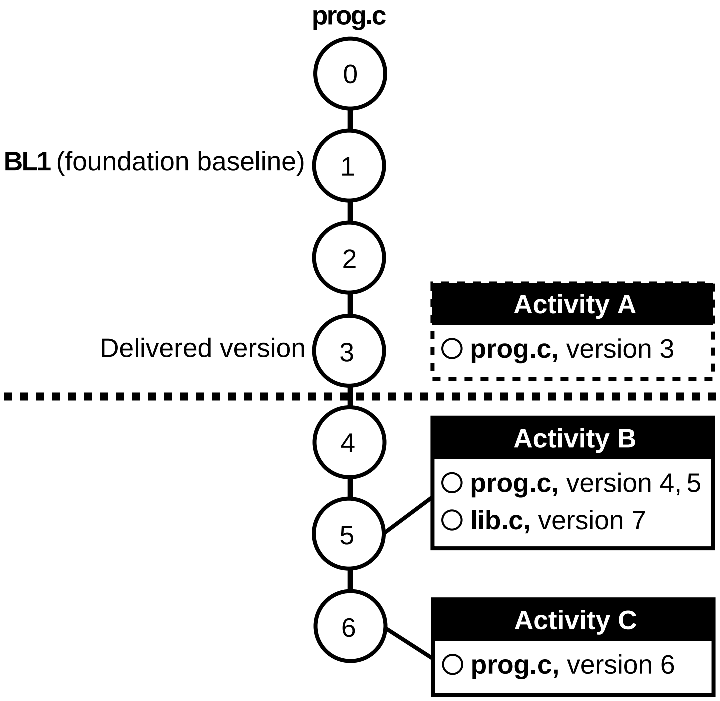
ClearCase tries to do the merge automatically. However, you often want to perform other operations before the automatic merge or know whether a file will cause merge problems. To handle any such needs, in the **Deliver from Stream Preview** dialog box, select **Pause before merging files**. If you select this option, the merge operation stops after it identifies the versions that require merging, checks out all versions, and performs all directory merges. You can then perform any operations related to the merge. When you are finished, continue the deliver operation (see *To Stop and Resume the Deliver Operation* on page 95).

Activity Dependencies in the Deliver Operation

For any given element in an activity’s change set, you must deliver all versions in your stream in the range between the version in the change set and either the version most recently delivered or the version in the stream’s *foundation baseline* (whichever is later). For example, in Figure 27, because version 3 of **prog.c** was delivered in a previous deliver operation, the dependencies between Activities B and C, which contain versions of **prog.c**, are as follows:

- You can deliver Activity B without delivering Activity C.
- To deliver Activity C, which contains version 6, you must also deliver Activity B, which contains the versions between **6** and the most recent delivery of **prog.c**.
- Because Activity B also contains versions of **lib.c**, you may be required to deliver other activities to satisfy dependencies for **lib.c**. For example, if Activity D (not shown in Figure 27) contained an undelivered version 6 of **lib.c**, delivering Activity B would require you to deliver Activity D as well.

Figure 27 Activity Dependencies



5.4 Merging Versions

NOTE: If your project uses ClearCase MultiSite to share source data with developers in other geographical locations, and if the project's streams are mastered at a different site, you do not merge versions. For more information, see *MultiSite: Posting Work to Deliver* on page 98.

After selecting activities, click **OK** in the **Deliver from Stream Preview** dialog box to start merging versions in your development view with versions in the integration view. As it merges files and directories, ClearCase displays its progress in the **Delivering to View** dialog box.

For each new version delivered to the integration view, ClearCase merges all nonconflicting differences. As it merges versions, ClearCase changes the value in the Merged column of the **Delivering to View** dialog box to **Yes**. If versions in your development view contain changes that conflict with the corresponding versions in the integration view, If the file is a text file, ClearCase starts Diff Merge, a tool that helps you resolve conflicting differences. If the file is an XML type, XML Diff Merge starts.

Under the Hood: Concurrent Deliver Operations

ClearCase allows developers to deliver work concurrently. However, if another team member's deliver operation has checked out an element, you cannot deliver any changes to that element until that deliver operation is completed or canceled.

When delivering activities, ClearCase follows a specific order:

1. It evaluates each directory sequentially, checking out and merging changes to the target stream when needed. If it encounters a reserved directory checkout in the target stream, it stops the deliver operation (but does not undo any successful directory merges).

2. It then attempts to check out each element that requires a merge. If it encounters an element that it cannot check out (for example because another team member's deliver operation has checked out the element), it skips the element and attempts to check out the remaining elements.

   If it is unable to check out an element, it does not proceed to the following step. In this case, you have two options:

   - Wait until the other developer completes or cancels her deliver operation, and then restart your deliver operation. Note, however, that with a deliver operation in progress, any new versions you create in your development stream are not delivered until the next deliver operation.

- ➢ Undo your deliver operation and continue working on your activities. For more information, see *To Undo a Deliver Operation* on page 97.

3. After successfully checking out all elements, it merges each element, starting Diff Merge and requesting your input when it encounters merge conflicts.

Under the Hood: Integration Activities and Baselines

ClearCase uses a special kind of activity, an integration activity, to keep track of the changes that occur during deliver and rebase operations. ClearCase creates the integration activity and adds versions to it; you do not need to create or maintain it. You may want to view an integration activity's properties to see exactly which versions were merged and created during a deliver or rebase operation. You can view an integration activity's properties from the Project Explorer; the activity name is of the form *deliver.stream-name.date-stamp*.

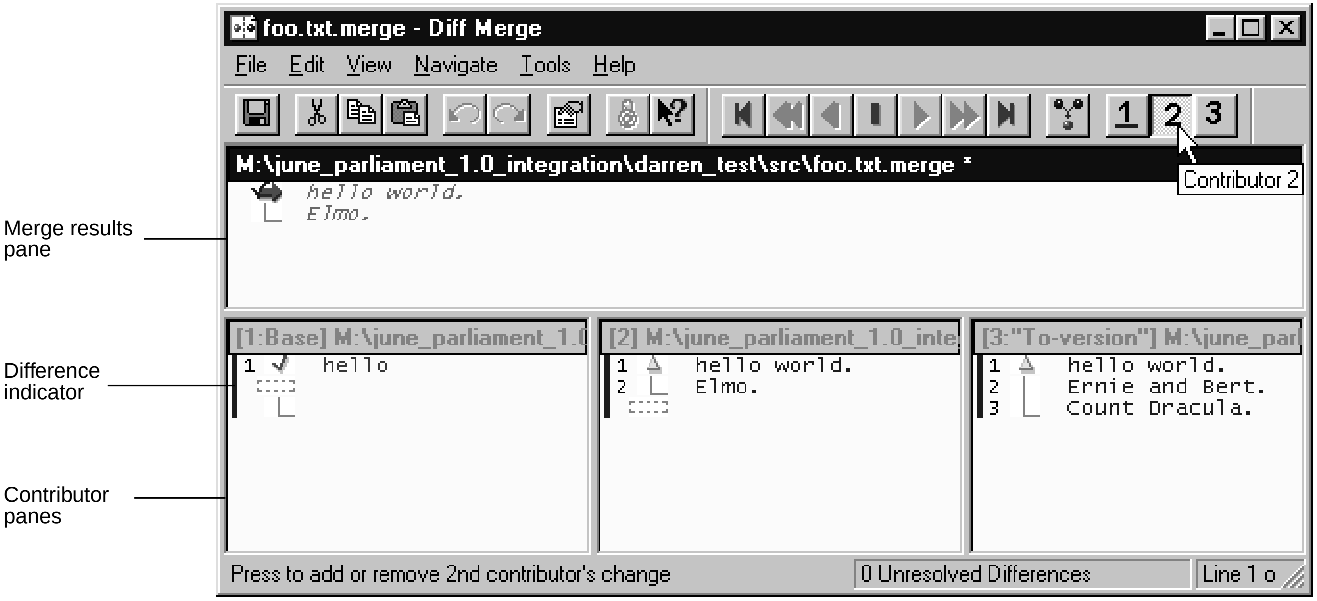
If your project uses the UCM-ClearQuest integration, ClearQuest links a UCM-enabled record based on the UCMUtilityActivity record type with the ClearCase activity. During the deliver operation or the rebase operation, the activity is in a state based on the Active state type. After the operation, ClearQuest moves the activity to a Complete state type.

As an intermediate step in the delivery, ClearCase creates a baseline in your development stream that identifies the state of your stream at the time of delivery. You can browse this baseline and its properties in the Component Browser. For more information, see *Managing Software Projects*.

Using Diff Merge to Resolve Differences

When Diff Merge starts, it indicates that it has resolved all nonconflicting differences. Then, it highlights the first unresolved difference with a vertical blue line at the left edge of the contributor panes (Figure 28).

Figure 28 Diff Merge Window



M:\june_parliament_1.0_integration\darren_test\src\foo.txt.merge *

```
hello world.
Elmo.
```

[1:Base] M:\june_parliament_1.0

```
1    hello
```

[2] M:\june_parliament_1.0_inte

```
1    hello world.
2    Elmo.
```

[3:"To-version"] M:\june_par

```
1    hello world.
2    Ernie and Bert.
3    Count Dracula.
```

Press to add or remove 2nd contributor's change | 0 Unresolved Differences | Line 1 o

To Resolve Differences

1. In Diff Merge, compare the differences in the contributor panes and click the numbered button on the navigation toolbar that corresponds to the contributor pane number containing the resolution you prefer.

   For example, Figure 28 shows that clicking **2** moves the difference region in contributor pane 2 to the results pane.

   In some cases, you can click more than one numbered button to include changes from multiple contributor panes. In addition, after you select a contributor to resolve the difference, you can edit the results pane directly.

2. Click **Navigate** > **Next Unresolved Difference**.

3. Repeat Step 1 and Step 2 until you have resolved all unresolved differences.

4. Click **File** > **Save** and then click **File** > **Exit**. When you complete the deliver operation, ClearCase checks in the merge results.

NOTE: For more information on using Diff Merge, choose a command from the Diff Merge **Help** menu.

After you exit Diff Merge, ClearCase continues merging the versions in your activities.

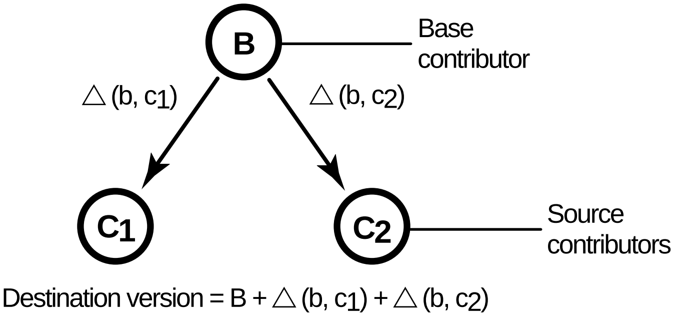
Under the Hood: How ClearCase Merges Files and Directories

A merge combines the contents of two or more versions into a single new version. During a deliver operation, the ClearCase merge algorithm involves the following versions:

- The source contributors: one version from your development stream and one version from the target stream.
- The base contributor: the common ancestor of the source versions.
- The destination version: the merge output, which becomes a new version in the target stream.

As illustrated in Figure 29, ClearCase starts with the base contributor and adds changes that are present in the source contributors.

Figure 29 ClearCase Merge Algorithm



If the two source contributors contain conflicting changes (for example, if each contains a line that is different from the base contributor), ClearCase starts Diff Merge so you can choose which change to add to the destination version.

Handling a Binary File in a Deliver Operation

If you have a binary file in any of your activities when you perform the deliver operation, and your organization does not have a type manager for that file type, ClearCase generates an error when it encounters the binary file during the delivery. The error occurs because there is no type manager that can merge the version of the file in your development stream with the version of the file in the integration stream. Your project manager can overcome this problem by creating a special element type for the binary file type and associating that element type with the binary file in the VOB. This special element type can tell the ClearCase system not to attempt merging the file. For more information, see *Managing Software Projects*.

To Stop and Resume the Deliver Operation

You can stop the deliver operation temporarily by clicking **Stop** in the **Delivering to View** dialog box. If you select **Pause before merging files**, the deliver operation stops after directories are merged (see *Controlling Merge Behavior* on page 89).

To resume the deliver operation, click **Resume** or right-click the root directory of the view in ClearCase Explorer and click **Deliver from Stream**.

5.5 Testing Your Work

At this point in the delivery, when all versions are merged, the deliver operation is still in progress. The destination versions (the new versions resulting from the merges) are checked out and visible only in your integration view.

Your integration view shows your delivered work and the work that other team members have delivered. To make sure that your work is compatible with other delivered work, we recommend that you test the work in your integration view before you complete the deliver operation.

To go to your integration view, click **OK** in the **Merges Complete** dialog box. ClearCase opens your integration view in ClearCase Explorer.

An additional dialog box, **Deliver Status**, remains open. Consider leaving it open to facilitate completing the deliver operation after you build and test.

Your organization can use **clearmake** or **omake** as ClearCase build tools; however, the *build auditing* and *build avoidance* features are available only from dynamic views. For more information about **clearmake** or **omake**, see *Building Software* and the reference pages in the *Command Reference*.

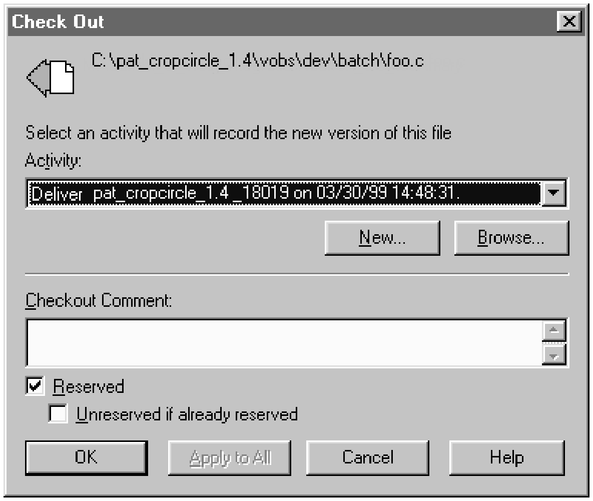
In addition to building and testing, you may need to do the following:

➤ Edit the versions checked out to your integration view to resolve build errors
➤ Check out and edit additional elements to resolve build errors
➤ Update your integration view
➤ Undo a deliver operation

Checking Out Versions During Testing

In the process of building and testing, you may need to check out versions in your integration view and modify them to resolve build errors. As described in *Under the Hood: Integration Activities and Baselines* on page 92, ClearCase adds any modifications you make during the deliver operation to an integration activity (Figure 30).

Figure 30 Integration Activity



Check Out

C:\pat_cropcircle_1.4\vobs\dev\batch\foo.c

Select an activity that will record the new version of this file

Activity: Deliver pat_cropcircle_1.4 _18019 on 03/30/99 14:48:31.

Checkout Comment:

☑ Reserved

□ Unreserved if already reserved

NOTE: We recommend that you postpone checking in your modifications until you complete the delivery. Checking in complicates efforts to undo the deliver operation, if you find it necessary to do so.

Under the Hood: Checking Out Versions from Snapshot Views

If you and other project members perform concurrent deliveries and if your integration view is a snapshot view, the view becomes out of date when other team members deliver to the target stream. If you try to check out a version that is not the latest in the target stream, ClearCase prompts you to check out the latest version in the target stream and then loads it into your view.

Undoing a Deliver Operation

At any time before you complete the deliver operation, you can undo changes made as a result of the deliver operation. This undo procedure is valid only if you have started a deliver operation, have not checked in modifications in the target view, and have not completed the deliver operation.

To Undo a Deliver Operation

1. If you started Diff Merge, close it.

2. If the **Deliver Status** dialog box is open, click **Close**.

3. In ClearCase Explorer, right-click the view's root directory and click **Deliver from Stream**.

4. In the dialog box, click **Undo the delivery** and click **OK**.

ClearCase cancels all checkouts in the integration view and removes all merge arrows created during the current deliver operation. (ClearCase uses merge arrows in VOBs to keep a history of merges.)

If you checked in any versions to the integration view, clicking **Cancel** is not sufficient to undo the deliver operation. You must either complete the operation (recommended) or use **cleartool rmver –hlink** to remove the versions you checked in before canceling the operation. Because **rmver** erases part of your organization's development history, your organization may not allow individual developers to use it. Because it may have unintended consequences, be very conservative in using this command, especially with the **–hlink** option. For more information, see the **rmver** reference page in the *Command Reference*.

5.6 Completing the Deliver Operation

Because the deliver operation is not instantaneous (for example, you may need to build, test, and correct errors several times during a deliver operation), ClearCase imposes a simple state model: deliveries are either *in progress* or *complete*, and you cannot start a new deliver operation from a development stream when one is already in progress for the stream.

To Complete a Deliver Operation

1. Open the **Deliver Status** dialog box as follows:

   In ClearCase Explorer, right-click the view's root directory and click **Deliver from Stream**.

2. In the dialog box, click **Complete the delivery** and click **OK.**

The **Deliver Status** dialog box can remain open during the deliver completion to report status as ClearCase attempts to place the deliver operation in the complete state.

What Happens When You Complete a Deliver Operation

When you issue the **complete** command for a deliver operation, ClearCase does the following:

1. It checks in the merge results in the target stream.
2. If your project is enabled for ClearQuest and your project manager has enabled the Do ClearQuest Action After Delivery policy, ClearCase executes a ClearQuest script. If the script returns an error, ClearCase stops the deliver operation. You must correct the error before ClearCase can continue.
3. It changes the state of the operation to Complete.

5.7 MultiSite: Posting Work to Deliver

If your organization uses ClearCase MultiSite to distribute development among multiple geographical sites, your project may share source files with developers at other sites. Each site has its own replica of project *components*, and developers work in site-specific replicas. Each replica controls (masters) a set of streams, and only developers at that replica's site can modify them.

If your site does not master a stream, you cannot complete deliver operations to that stream. UCM provides a variation of the deliver operation called a *remote deliver*. You must post your work to deliver. If the target stream is mastered by the local PVOB replica, the deliver operation is local.

After you deliver your work and the delivery is in the posted state, the project integrator at the site that masters the target stream completes the remote deliver operation.

To Deliver to a Nonmastered Target Stream

To make your work on a remote stream available in the target stream:

1. Prepare your work areas (see *Preparing Your Work Areas* on page 84).
2. Start the deliver operation (see *Starting the Deliver Operation* on page 86).

   In a remote deliver operation, the source stream must be a development stream.
3. Select activities (see *Selecting Activities* on page 88).
4. Deliver the work so that it can be posted.

The deliver operation determines whether your development and target streams are mastered at different replicas. If they are mastered at different replicas, a remote deliver operation is put into effect. ClearCase changes mastership of the development stream object to match that of the target stream object, and it notifies you that it has assigned the development stream the posted status.

When your development stream has the posted status, notify the project integrator at the site that masters the target stream's replica. The project integrator can then find posted deliver operations and either continue the operation or cancel it to return the development stream to its previous state. Note that, after you post your work, only someone at the master site can cancel or complete the operation.

You can create activities and perform checkins and checkouts for your development stream while the remote deliver is in process. However, you cannot add, remove, or create baselines; add or remove components; or rebase the development stream. The delivery completes when the posted deliver operation is merged with the target stream.

Remote Deliveries with the UCM-ClearQuest Integration

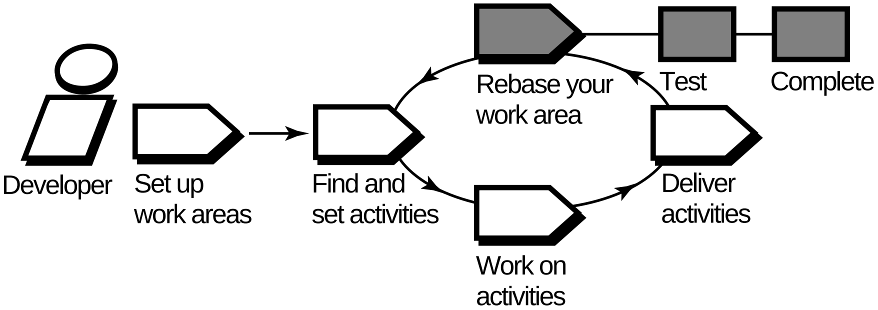
In a project that uses the UCM-ClearQuest integration, the project manager may set the Do ClearQuest Action After Delivery policy on a project (see *Deliveries and the UCM-ClearQuest Integration* on page 86). This policy transitions activities in ClearQuest to a Complete state when the deliver operation completes successfully. For this policy to work in a MultiSite environment, all activities being delivered must be mastered by the same PVOB replica that masters the target stream.

In a MultiSite environment that uses the UCM-ClearQuest integration, the project manager sets the Check Mastership Before Delivery policy on a project to have the software check the mastership of all activities being delivered. If the deliver operation is local and all activities being delivered are not mastered locally, the deliver operation fails.

For a remote deliver operation, the Check Mastership Before Delivery policy causes the following behavior:

- If all activities are mastered by the remote replica, the deliver operation proceeds.
- If the deliver operation contains activities that are mastered by the local replica, MultiSite transfers mastership of those activities to the remote replica. After the project integrator at the remote site completes the deliver operation, MultiSite transfers mastership of the activities back to the local replica.
- If the deliver operations contains activities that are mastered by a third replica, the deliver operation fails.

6 Rebasing Your Work Area



Periodically, your project manager or project integrator incorporates delivered work into new baselines. Some of these baselines constitute a stable and significant source configuration, and your project manager recommends the baseline.

Rebasing has several benefits:

- You stay up-to-date with other developers' work.
- You reduce the number of merges and minimize the time required to merge versions.
- You identify integration problems early.

Each time your project manager recommends a new baseline for your parent stream, rebase your development work area.

Rebasing involves these tasks:

- Preparing your development view
- Starting the rebase operation

- Testing your development work area
- Completing the rebase operation

6.1 Preparing Your Development View

Before you start a rebase operation, check in all files and directories in your development view. You cannot start a rebase operation from a view that contains checkouts.

To Prepare Your Development View

1. In the ClearCase Explorer Folder window, right-click the view's root directory and then click **Find Checkouts**.

2. In the **Find Criteria** dialog box, select these criteria:

   - **Include subfolders**
   - **Search only for your checkouts**
   - **Search only for checkouts in the current view**

3. Click **OK**.

   Find Checkouts produces a list of file or directory versions checked out to your development view and indicates which activity each checked-out version belongs to.

4. To see which changes are in a checked-out version:

   - To see the differences between the previously checked-in version and the current version, click **Tools** > **Compare with Previous Version**.

   - To see checkin comments, click **Tools** > **History**.

5. Do **one** of the following:

   - To write to the VOB the changes for a given file, check it in. Select the file and click **Tools** > **Check In**.

   - To undo your changes for a file, cancel its checkout. Select the file and click **Tools** > **Undo Checkout**.

During the cancel checkout operation, you can choose to save your changes in a *view-private file*.

6.2 Starting the Rebase Operation

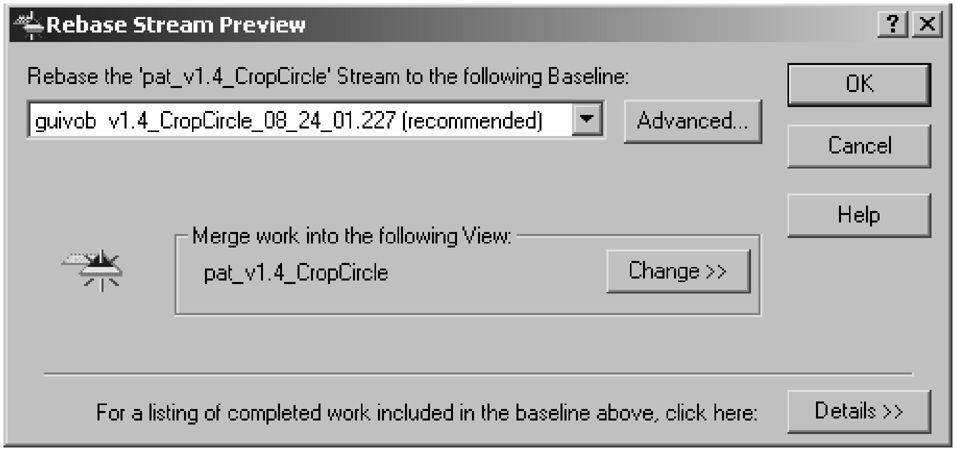
After you prepare your development view (see *Preparing Your Development View* on page 102), you can start the rebase operation. By default, you rebase your development stream either to baselines recommended by the parent stream or to baselines created by the parent. Typically, these recommended baselines are created by other streams in the project.

To Start the Rebase Operation

To start the rebase operation, right-click the root directory of the development view in ClearCase Explorer and click **Rebase Stream**.

The **Rebase Stream Preview** dialog box opens (Figure 31), showing the name of the stream you are using.

Figure 31 Rebase Stream Preview Dialog Box



Rebase the 'pat_v1.4_CropCircle' Stream to the following Baseline:

guivob v1.4_CropCircle_08_24_01.227 (recommended)

Merge work into the following View:

pat_v1.4_CropCircle

For a listing of completed work included in the baseline above, click here:

By default, the **Rebase Stream Preview** dialog box presents the parent stream recommended baseline.

You can also do the following in the **Rebase Stream Preview** dialog box:

- Verify that the dialog box displays your development view under **Merge work into the following view**. If you attached multiple views to your development stream, click **Change** and choose one view to use for the rebase operation.

  You cannot deliver or rebase from other views attached to the development stream until you complete the operation. However, you can check out, check in, and run most other ClearCase commands.

- To see the changes that will be available in your development stream after rebasing to the displayed baseline, click **Details**. The dialog box expands to show the list of activities in the baseline. To see more information about an activity, select it and click **Properties**.

  In the expanded area, select **Show integration activities** to see the baseline's integration activities. An integration activity records a change set for a deliver or rebase operation.

To continue the rebase operation, click **OK**. To rebase to baselines other than recommended, see *Rebasing to Baselines Other Than Recommended*.

Rebasing to Baselines Other Than Recommended

The rules for rebasing to baselines other than recommended are different for integration streams and development streams. For an integration stream, you can only rebase to baselines from streams in other projects. The rules differ slightly for modifiable and non-modifiable components.

For a development stream, you can rebase to baselines other than recommended if the baselines chosen do not cause your stream to strand changes. If you make changes in a development stream that is based on the stream's current foundation baseline, rebasing to some baselines in the project can cause the changes to be invalid. Rebasing to these baselines would strand your changes and is therefore not allowed. If you observe this restriction, you can rebase to baselines from:

- The parent stream

- The parent stream's foundation

- Other streams in the same project if the baselines were delivered to (and are contained in) your parent stream and contain the foundation baseline of your current stream.

The rebase restriction ensures that, when you deliver from your stream, you deliver only changes made in your stream and ensures that you do not strand changes in your stream's foundation baseline.

To Rebase to Baselines Other Than Recommended

To rebase to baselines other than recommended, start the rebase operation (see *To Start the Rebase Operation* on page 103).

1. In the **Rebase Stream Preview** dialog box, click **Advanced**. In the **Advanced Baseline Configuration** dialog box, specify the list of baselines.

2. Click **Add**; in the **Add Baselines** dialog box, select baselines to be added to the list.

3. Select a listed baseline and do **one** of the following:

   ➢ To remove it from the list, click **Remove**.

   ➢ To modify the baseline, click **Change**. And, in the **Change Baseline** dialog box, select another baseline.

When you complete the list of baselines, click **OK** to quit the **Advanced Baseline Configuration** dialog box and click **OK** to continue the rebase operation.

Rebasing Your Development Work Area

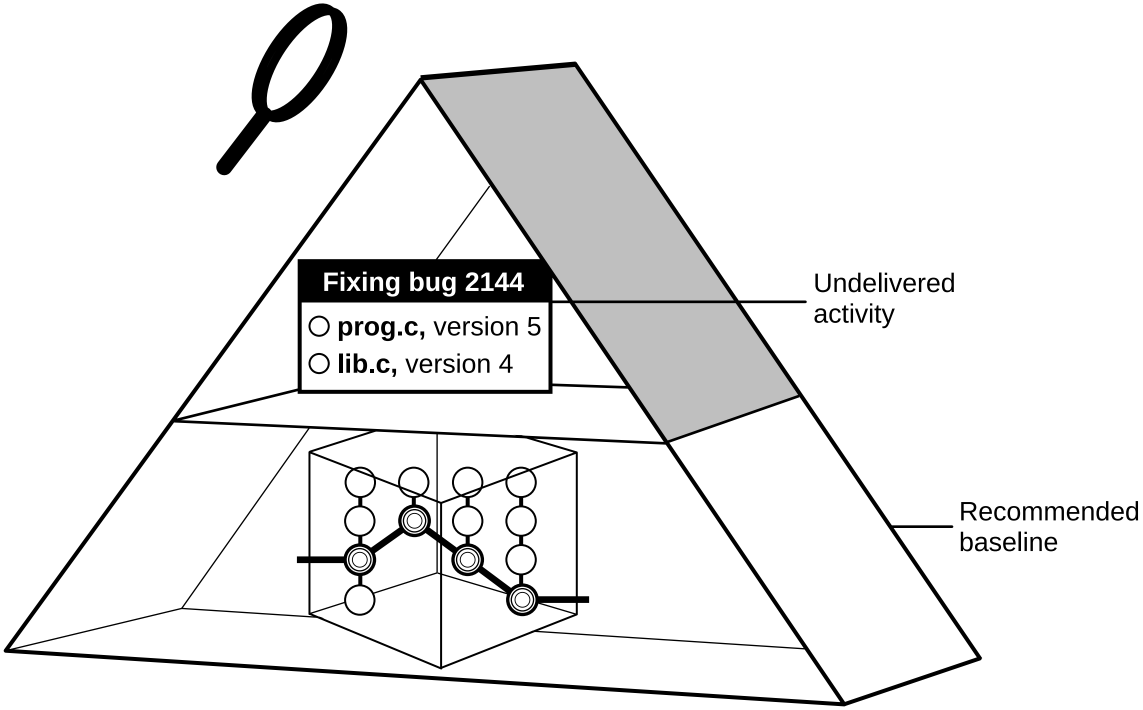
In rebasing your work area to the recommended baseline, Rational ClearCase takes the following actions:

➤ It changes your development stream's configuration to select the new recommended baseline. The stream's configuration continues to select any activities created in the development stream (Figure 32).

➤ For development views that are *snapshot views*, it starts an update operation to copy versions in the new baseline into your view.

  If other snapshot views are attached to your development stream, you must update them so that they contain the changes in the stream. Development views that are dynamic views show versions in the new baseline without requiring an update operation.

Figure 32 Development Work Area After Rebasing



As it rebases your development work area, ClearCase displays its progress in the **Rebasing Stream** dialog box.

To Stop and Resume the Rebase Operation

You can stop the rebase operation temporarily by clicking **Stop** in the **Rebasing Stream** dialog box. To resume the operation, click **Resume** in the **Rebasing Stream** dialog box or right-click the root directory of the view in ClearCase Explorer and then click **Rebase Stream**.

Merging Versions

For any version you modify in your development stream, if another team member has modified and delivered a version of the same element, you must merge when you rebase to a baseline that contains the delivered version.

For example:

1. As part of working on an activity, you check in a version of **prog.c** from your development view.
2. Another developer checks in and delivers a new version of **prog.c** to the parent stream.
3. Your project manager adds the new version to the recommended baseline.
4. You rebase your development stream. As part of the rebase operation, you must merge the other developer's version into your development stream.

As it does during the deliver operation, ClearCase merges all nonconflicting differences. If versions in the baseline contain changes that conflict with the corresponding versions in your development work area, ClearCase prompts you to start Diff Merge so that you can resolve the conflicts. For information on using Diff Merge to resolve conflicting differences, see *Using Diff Merge to Resolve Differences* on page 92.

6.3 Testing Your Development Work Area

After ClearCase changes your stream's configuration and completes any needed merges, verify that any undelivered work builds successfully with the versions in the new baseline by initiating a test build in your development view. If your organization uses **clearmake** or **omake**, you can use these ClearCase build tools for your builds; however, the *build auditing* and *build avoidance* features are available only from dynamic views.

For more information, see *Building Software* and the **clearmake** or **omake** reference pages in the *Command Reference*.

In addition, you may need to do the following:

- Check out elements
- Undo a rebase operation

Checking Out Elements

In the process of building and testing, you may need to check out elements in your development view and modify them. As described in *Under the Hood: Integration Activities and Baselines* on page 92, ClearCase creates an integration activity to record any modifications you make during the rebase operation.

NOTE: We recommend that you postpone checking in your modifications until you complete the rebase operation. Checking in complicates efforts to undo the rebase operation, if you find it necessary to do so.

Undoing a Rebase Operation

At any time before completing the rebase operation, you can undo changes made as a result of the operation. This undo procedure is valid only if you have started a rebase operation and have not completed it.

To Undo a Rebase Operation

1. If you started the Diff Merge tool, close it.
2. Close the **Rebase Status** dialog box, if open.
3. In ClearCase Explorer, right-click the view's root directory and click **Rebase Stream**.
4. In the **Rebase Stream** dialog box, select **Undo the rebase** and click **OK**.

ClearCase cancels all checkouts in the development view and removes all *merge arrows* created during the current operation. (ClearCase uses merge arrows in VOBs to keep a history of merges.)

If you checked in any versions to the development view, you must remove them using the **cleartool rmver** command. Because **rmver** erases part of your organization's development history, your organization may not allow individual developers to use it. Be very conservative in using this command. For more information, see the **rmver** reference page in the *Command Reference*.

6.4 Completing the Rebase Operation

As with the deliver operation, ClearCase imposes the following state model: rebase operations are either *in progress* or *complete*, and you cannot start a new operation for a development stream when one is in progress.

Completing a rebase operation consists of two tasks: checking in any merge results and changing the state of the operation to Complete.

After testing your work, click **Complete** in the **Rebase Status** dialog box. ClearCase checks in any versions checked out to your development view and notifies your development stream that the rebase operation is complete. During the rebase completion, the **Rebase Status** dialog box remains open.

If you closed the **Rebase Status** dialog box before completing the operation, complete it as follows:

1. In ClearCase Explorer, right-click the view’s root directory and click **Rebase Stream**.
2. In the dialog box, click **Complete the rebase** and click **OK**.

The rebase operation is placed in the Complete state.

7 Other Development Tasks

Chapter 4, *Working on Activities*, describes tasks that you perform daily or weekly. You may need to perform some of the tasks described in this chapter less often:

- Adding files and directories to source control
- Moving, removing, and renaming elements
- Accessing elements not loaded into a snapshot view
- Adjusting the scope of a view
- Assigning a snapshot view to a drive letter
- Moving work from a development stream to another project
- Registering a snapshot view
- Moving views
- Accessing views and VOBs across platform types
- Regenerating the **view.dat** file

7.1 Adding Files and Directories to Source Control

You can add files or directories to source control (version control) at any time during the development cycle (see *Elements, Components, and Baselines* on page 9).

Usually, you add a few files to a directory that is already under source control. Less frequently, you may need to add an entire directory tree to source control.

This section explains the following tasks:

- Adding files and directories to an existing directory
- Adding a directory tree to source control

To Add Files and Directories to an Existing Directory Tree

You can add files and directories to source control to an existing directory tree. Do the following:

1. In ClearCase Explorer, navigate to the view used for your development task.

2. Navigate to the parent directory to which you want to add the files or directories.

3. If the files or directories are not present, drag them to the parent directory.

4. Select the files and directories you want to add to source control.

   If you specify a comment, upon checkin, the software adds the comment to all of the elements you selected.

   If specify a comment and do not select the parent directory in the list of elements to add to source control, the software uses the default ClearCase comment for the parent directory. If you specify a comment and do select the parent directory, the software uses that comment for the parent directory.

5. Right-click one of the selected objects. On the shortcut menu, click **Add to Source Control**.

   We recommend you select items that are the furthest from the root of the directory tree: the **Add to Source Control** command for any given file or directory also adds any parent directories (up to the VOB root directory) that are not already *elements*.

   ClearCase opens the **Check Out** dialog box with the currently set activity selected in the **Activity** list.

6. To set a different activity (or, if you have not set the view to an activity), do the following:

   a. Select one from the **Activity** list. To filter the list, click **Browse**.

   b. If an appropriate activity doesn't exist, create and set a new one by clicking **New**. If your project is enabled for ClearQuest, choose a record-type from the shortcut menu that appears when you click **New**. ClearQuest changes the activity to an Active state type, and ClearCase adds the version you check out to the activity's change set.

7. Click **OK**.

Under the Hood: What Happens When You Add a File or Directory to Source Control

The **mkelem** or **Add to Source Control** command always creates an element and initializes its version tree by creating a single branch (named **main**) and a single, empty version (version 0) on that branch. The following arguments for the **mkelem** command or options in the **Add to Source Control** dialog box determine optional ClearCase behavior:

- Selecting the **Keep checked out** check box or using **mkelem** with no arguments checks out the element. Any view-private data that corresponds to the element pathname remains in your view only and is added to version 1 in the VOB when you check in (Figure 33).

- Clearing the **Keep checked out** check box or using **mkelem –ci** checks in the element, using any existing view-private data that corresponds to the element pathname as the content for version 1. Your view's config spec determines the branch on which ClearCase creates version 1.

- Using **mkelem –nco** suppresses automatic checkout; **mkelem** creates the new element, along with the **main** branch and version **\main\0**, but does not check it out. If *element-pathname* exists, it is moved to a **.keep** file.

- (Replicated VOBs only) Selecting the **Make current replica the master of all newly created branches** check box or using **mkelem –master** assigns to your *current replica* mastership of all branches created during element creation. You will be able to create new versions on the branches.

  Clearing this check box or using **mkelem** without the **–master** option assigns mastership of a new branch to the VOB replica that masters the associated branch type. If this replica is not your current replica, you cannot create new versions on the branch.

  You can set the default for mastership assignment in the **User Options** dialog box:

  a. In ClearCase Explorer, click **Tools** > **Options**.

  b. In the **User Options** dialog box, click **ClearCase Options**.

  c. In the **ClearCase User Options** dialog box, click the **Operations** tab.

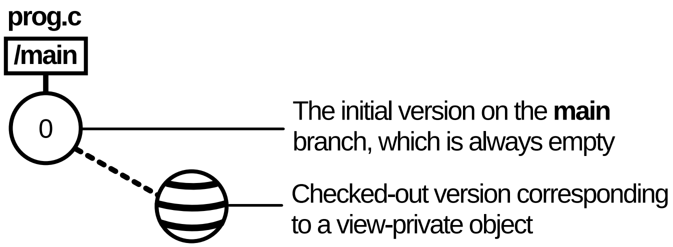
  d. Click **Advanced Options**.

e. Select the **When creating an element in a replicated VOB, make current replica the master of all newly created branches** check box.

f. Click **OK**.

Other views do not see the element until you check in the element's parent directories (the **Add to Source Control** command does this for you) and check in the file or directory.

Figure 33 Creating an Element


prog.c
/main
0
The initial version on the **main** branch, which is always empty
Checked-out version corresponding to a view-private object

NOTE: *VOB links* make it possible to have more than one copy of a directory in a snapshot view. When you add a file or directory to a snapshot view, ClearCase updates all other instances of the parent directory that are loaded into your view.

To Add Elements for a New Development Task

NOTE: This procedure assumes that a VOB exists. For information on creating VOBs, see *Managing Software Projects*.

1. In ClearCase Explorer, navigate to the view you created for the development task.

2. If you work in a snapshot view, create a folder in the view that corresponds to each VOB to which you want to add files and directories.

   If you work in a dynamic view, make sure that each VOB to which you want to add files and directories is accessible from your view. If a VOB isn't accessible, activate it on your computer by clicking **Start** > **Programs** > **Rational ClearCase Administration** > **Mount VOB**.

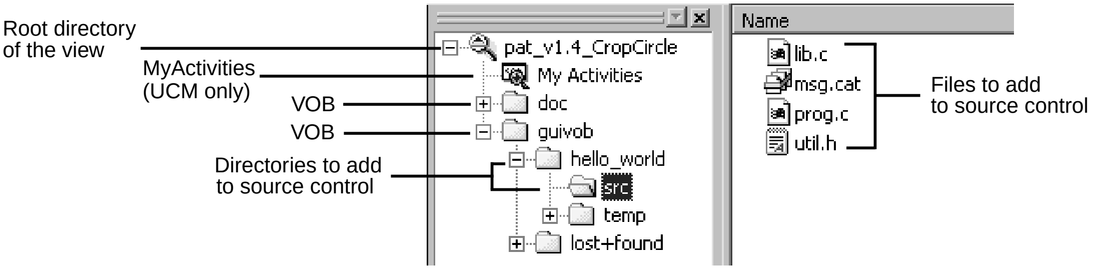
3. Under each VOB, do **one** of the following:

   ➢ Create a directory structure.

- ➢ If files and directories already exist, copy them into the appropriate location within the directory tree.

When you are finished, the view resembles Figure 34.

Figure 34 Directory Structure in a Snapshot View



4. In the right upper pane of ClearCase Explorer, select files and directories.

   We recommend that you select items that are the farthest from the root of the directory tree: the **Add to Source Control** command for any given file or directory also adds any parent directories (up to the VOB root directory) that are not already *elements*. For example, in Figure 34, if neither **\guivob\hello_world** nor **\guivob\hello_world\src** are elements, you can add both directories to source control by adding **\guivob\hello_world\src** to source control.

5. Right-click one of the selected objects. On the shortcut menu, click **Add to Source Control**.

Importing Files

If you're adding a large number of files and directories to source control, use the **clearfsimport** command (or **clearexport** command) and **clearimport** command. For more information, see the **clearfsimport** and **clearimport** reference pages in the *Command Reference*.

7.2 Moving, Removing, and Renaming Elements

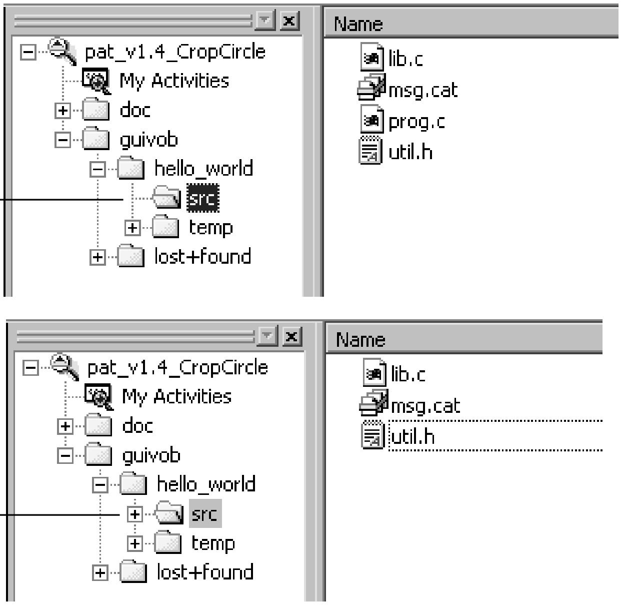
This section explains how to move, remove, and rename elements.

Moving and Removing Elements

Because directories as well as files are under ClearCase control, you can move or remove elements from specific versions of directories without affecting the element itself. Moving or removing elements creates new versions of the parent directories to record the modifications.

For example, version 4 of **\gui_vob\hello_world\src** contains an element named **prog.c**. If you remove **prog.c** from the **hello_world\src** directory, ClearCase creates version 5 of **\gui_vob\hello_world\src**, which does not contain the **prog.c** file element. The element **prog.c** itself is not modified (Figure 35).

Figure 35 Removing an Element Name from a Directory



Version 4 of **src**, which contains **prog.c**

Version 5 of **src**, which shows that **prog.c** has been removed from this and subsequent versions of the directory

Before you move or remove an element name from a directory, verify with your project manager that your changes will not adversely affect other team members or break projectwide builds.

To Move an Element Within a VOB

Do **one** of the following:

➤ In the ClearCase Explorer Details pane, drag an element to its destination directory in the Folder pane.

- In the ClearCase Explorer Details pane, right-click an element and click **Cut**. Then, right-click the destination directory and click **Paste**.

Moving an Element to Another VOB

You cannot move an element in a UCM component VOB to another VOB.

To Remove an Element Name from a Directory

In the ClearCase Explorer Details pane, right-click an element and click **Delete**.

Other Methods for Removing Elements

Removing an element from its parent directory does not affect the element itself, but two other types of a removal operation do irrevocably affect an element, and we recommend that you be very conservative in using these operations:

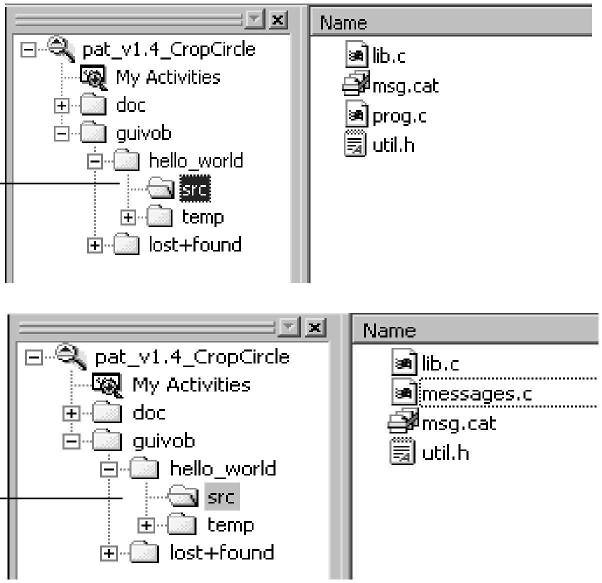
- Removing a version from an element's version tree. For more information, see the **rmver** reference page in the *Command Reference*.

- Removing an element from a VOB. For more information, see the **rmelem** reference page in the *Command Reference*.

Renaming Elements

Renaming an element creates a new version of the parent directory to catalog the new element name. The element uses its new name in subsequent versions of its parent directory, but previous versions of the parent directory refer to the element by its previous name (Figure 36).

Figure 36 Renaming an Element



In version 4 of **src**, element is named **prog.c**

In version 5 and subsequent versions, element is named **messages.c**

Before you move or remove an element name from a directory, verify with your project manager that your changes will not adversely affect other team members or break project builds.

To Rename an Element

1. In the ClearCase Explorer Details pane, right-click an element and click **Rename**.
2. In the Details pane, type a new name for the element
3. Press ENTER.

7.3 Accessing Elements Not Loaded into a Snapshot View

While working with source files in a snapshot view, you may need to see the contents of elements that are not loaded into the view or see ClearCase information about these nonloaded elements. For example, you may have chosen not to load a VOB that contains functional-specification documents. However, you may want to check periodically whether the functional specifications have been modified by reviewing the element’s ClearCase history.

Listing All Elements in the VOB Namespace

You can set up ClearCase Explorer to provide a directory listing of nonloaded file and directory elements. ClearCase Explorer displays the version of the element that would be selected if the element were loaded in the view. The Version column in the Details pane indicates which version the view is selecting. Then, you can display the nonloaded element's history, version tree, and properties sheet, and compare versions of the element.

To See Nonloaded Elements from ClearCase Explorer

1. In ClearCase Explorer, click **Tools** > **Options**.
2. In the **Options** dialog box, under **Snapshot View Options**, select **Show Unloaded Snapshot View Elements**.
3. Click **OK**.

   The Details pane uses an icon and the State column to indicate which versions are not loaded.

To See Metadata for Nonloaded Versions

Metadata is information that ClearCase keeps about elements under source control. To see metadata for a nonloaded version, click the version in the Details pane and select commands from the **Tools** menu.

Viewing the Contents of a Nonloaded Version

You can view nonloaded files or copy them into your view for build purposes, but you cannot check them out. Only file elements that are loaded into the view can be checked out.

To see the contents of a nonloaded version, you can do either of the following:

- Use the **Send To** command from the version's shortcut menu in the Version Tree Browser. The **Send To** command uses the set of shortcuts in your Send To folder, which is a function that the Windows operating system provides. For information about your Send To folder, see Windows online help.
- Copy the version into your view with the **cleartool get** command.

NOTE: You cannot use the **Send To** command or **cleartool get** for directory elements.

To Copy a Nonloaded Version with cleartool get

1. In the ClearCase Explorer Details pane, in the Version column, note the *version-extended pathname* of the unloaded element, which is displayed in the Version column.

2. Right-click the parent directory and from the shortcut menu, click **Command Prompt** to display a **cleartool** prompt.

3. Type the **cleartool get** command using the following syntax:

   get –to *filename version-extended-pathname*

   For example, **get –to prog.c.previous.version prog.c@@\main\v3.1_fix\10** copies **prog.c@@\main\v3.1_fix\10** into your view under the name of **prog.c.previous.version**.

7.4 Adjusting the Scope of a View

At any time during a development cycle, you may need to change the set of elements available to your view. For example, if you work in a snapshot view, you can reduce the amount of time required for deliver and rebase operations by narrowing your view's scope to include only the set of elements related to your activities. (The fewer elements in your snapshot view, the less time needed to update it.) Note, however, that to test your work during the deliver operation, your view must include any files required to satisfy build dependencies.

To adjust the scope of a view, you can do the following:

- ➤ Change which elements are loaded into a snapshot view
- ➤ Activate or deactivate VOBs for dynamic views

Adjusting the scope of a view does not affect the view's stream or any other views that are attached to the stream. For example, if a recommended baseline includes a new set of files and directories, rebasing your development stream makes the new files and directories available to your stream, but they may not be visible in your development view, depending on the view's scope.

To Change Which Elements Are Loaded into a Snapshot View

1. In the ClearCase Explorer Shortcut pane, click **Toolbox. Then** click **Base ClearCase** > **Edit View Properties**.

2. In the **Edit View Properties** dialog box, select the view and click **Edit**.
3. In the **Properties** dialog box, click the **Load Rules** tab.
4. On the **Load Rules** tab, click **Edit Load Rules**.
5. In the **Choose Elements to Load** dialog box, click **Add** to load another element into the view, or click **Remove** to unload a file or directory from the view.
6. Click **OK**.

Activating or Deactivating VOBs for Dynamic Views

Activating a VOB on your computer makes its files and directories available to your dynamic views. Deactivating a VOB frees your computer's mount points.

To Activate VOBs

NOTE: Usually, ClearCase mounts all VOBs that contain versions of elements in a project baseline when you start a dynamic view that is attached to a project stream. However, you may need to follow this procedure if you deactivate a VOB and then want to remount it.

1. On the Windows desktop, click **Start** > **Programs** > **Rational ClearCase Administration** > **Mount VOB**.
2. In the **Mount VOB** dialog box, select the VOBs containing your source files.
3. Select **Reconnect at Logon** to activate the VOBs when you log on.
4. Click **OK**.

To Deactivate VOBs

1. On the Windows desktop, click **Start** > **Programs** > **Rational ClearCase Administration** > **Unmount VOB**.
2. In the **Unmount** dialog box, select one or more VOBs.
3. Click **Unmount**.

7.5 Assigning Snapshot Views to Drive Letters

If your makefiles or other files require absolute pathnames with a specific drive letter, map the folder for your snapshot view to a drive letter.

Depending on your computer's configuration, two methods are available:

- Make the root directory of the snapshot view shared and then assign it to a drive letter.
- Use the **subst** command.

Assign Only the Root Directory. You must assign only the snapshot view's root directory to a drive letter. The root directory of the snapshot view contains a hidden file named **view.dat**. ClearCase searches for this file to determine whether the current directory is in a snapshot view.

If you assign a directory below the view's root to a drive letter, ClearCase cannot find the view's **view.dat** file and assumes that the current directory is not a snapshot view.

Making a Directory Shareable and Assigning a Driver Letter

From ClearCase hosts running either Windows NT or Windows 2000, you can make a snapshot view root directory shareable (see *To Enable Sharing on the Snaphsot View Root Directory*) and assign it to a drive letter (see *To Assign the Snapshot View Shared Directory to a Drive Letter*). With this method, other team members can access your snapshot view through either My Network Places or Network Neighborhood, but the performance is slightly slower than if you use the **subst** command to assign the view to a drive letter (see *Using the subst Command for Snapshot View Access* on page 123).

From ClearCase hosts running Windows 98, you can assign a shared directory to a drive letter only if the directory is on some other host; for example, you can use this method to assign someone else's snapshot view to a drive letter.

To Enable Sharing on the Snaphsot View Root Directory

NOTE: If you want to share a directory on a Windows 98 computer (for example, so team members can assign your view to a drive letter on their computers), you must enable file sharing using this procedure.

1. In Windows Explorer, click the snapshot view's root directory; then click **File** > **Sharing**.

2. On the **Sharing** tab, click **Shared As**.

3. For the sake of consistency, accept the default value in the **Share Name** box. (Make the share name the same as the leaf name of the snapshot view's root directory.)

4. Click **OK**.

Other team members can now assign a drive letter on their computers to this snapshot view root directory (see *To Assign the Snapshot View Shared Directory to a Drive Letter*) or can create a shortcut to the view in ClearCase Explorer (see *To Access Another's Snapshot View from ClearCase Explorer* on page 125).

To Assign the Snapshot View Shared Directory to a Drive Letter

If the root directory of the snapshot view is shareable (see *To Enable Sharing on the Snaphsot View Root Directory*), you can assign the directory to a drive letter on your computer.

NOTE: If you prefer to use the command line, you can use the **net use** command.

1. From Windows Explorer, click **Tools** > **Map Network Drive**.

2. In the **Map Network Drive** dialog box, select a drive letter from the **Drive** box.

3. In the **Folder** box, enter the path to the shared folder of the snapshot view root directory or click **Browse** and navigate to the view's root directory in My Network Places or Network Neighborhood.

4. Click **Finish**.

Using the subst Command for Snapshot View Access

Assigning a snapshot view root directory to a drive letter with the **subst** command provides slightly better performance than making the snapshot view a shared directory (see *Making a Directory Shareable and Assigning a Driver Letter* on page 122). However, only shared directories are accessible through My Network Places or Network Neighborhood. (To assign your own view to a drive letter on Windows 98 computers, you must use the **subst** command.)

1. Open a command shell.

2. Enter **subst** *driveletter*: *view's-path*. For example, the command

   ```
   subst  Y:  C:\library\pat_v1.4_cropcircle
   ```

   maps the **pat_v1.4_cropcircle** snapshot view root directory to drive Y.

Assign only the view's root directory to a drive letter. For more information on the **subst** command, type **help subst** in a command shell.

7.6 Moving Work from a Development Stream

Under normal circumstances, project managers and integrators use baselines to share work between projects. But if you start work on an activity in your development stream and then determine that you cannot complete the work for the current project, we recommend that you move the work to the project in which you intend to complete it. To facilitate the merge process, move the work to the new project as soon as you determine that you cannot complete it in the original project. (The longer you wait to merge the work, the less you may remember about it and the greater the potential for merge conflicts.)

We recommend against working in a development stream that contains activities you do not intend to complete for the current project; doing so may prevent the rebase operation from synchronizing your development stream with the work in the baseline.

To Move Work from a Development Stream to Another Project

1. Get the activity's activity-selector:

   a. Find the activity. For example, use **MyActivities** in ClearCase Explorer.

   b. Right-click the activity and on the shortcut menu, click **Properties**.

      On the **General** tab of the **Properties** dialog box, the **ID** box displays the activity's activity-selector.

   c. Write down the activity-selector or copy it to the clipboard.

   d. Quit the Properties Browser.

2. Join the project in which you intend to complete the work. (See Chapter 2, *Setting Up Work Areas*.)

3. Decide whether to add the work to the new project's integration stream or to another development stream in the new project.

4. From your view in the original project, deliver the work to a nondefault target (the stream in the new project in which you intend to complete the work). (See *Delivering to a Nondefault Target* on page 87.)

5. Lock obsolete your development stream for the original project.

6. Remove your development view for the original project.

7.7 Registering a Snapshot View

When you create a snapshot view or click a view shortcut in ClearCase Explorer, ClearCase registers it in your Windows User Profile. The ClearCase integration with ClearCase Explorer and Windows Explorer recognizes the files and directories below a registered snapshot view as ClearCase objects.

If a view is not registered in your Windows User Profile and you access the view through Network Neighborhood, the ClearCase integration with Windows Explorer does not recognize the files or directories as ClearCase objects. For example, if you use Windows Explorer to navigate to a team member's view on a different computer and right-click a file in the view, ClearCase options are not available. If you want to perform ClearCase operations in this view, you must register the snapshot view.

NOTE: You cannot register a snapshot view that was created from a UNIX host (see *Accessing Views Across Platform Types* on page 129).

To Access Another's Snapshot View from ClearCase Explorer

You can use ClearCase Explorer to perform ClearCase operations on the files in a team member's snapshot view. To access another's snapshot view, create a view shortcut in ClearCase Explorer. If the root directory of the snapshot view is shareable (see *To Enable Sharing on the Snaphsot View Root Directory* on page 122), follow these steps on your computer:

1. On the **Views** tab of the Shortcut pane, right-click and click **Add View Shortcut**.

2. In the **Add a New View Shortcut** dialog box, click the ellipsis button to the right of the **Snapshot Location** text box; navigate to and select the shareable root directory under My Network Places or Network Neighborhood; and click **OK**.

3. Click **OK**.

This registers the view in your Windows User Profile. Click the view shortcut to access the snapshot view.

To Register Another’s Snapshot View for Windows Explorer Use

If you want to use Windows Explorer to perform ClearCase operations on the files in another team member’s snapshot view, register the view. If the root directory of the snapshot view is shareable (see *To Enable Sharing on the Snaphsot View Root Directory* on page 122), proceed as follows:

1. In Windows Explorer, navigate to the root directory of the view you want to register.

2. Right-click the root directory of the view.

ClearCase registers the view by adding an entry to your Windows User Profile.

7.8 Moving Views

This section discusses the following tasks:

- Changing the physical location of a snapshot view’s directory tree
- Moving a view storage directory

For information on changing a view-tag, see the **mktag** reference page in the *Command Reference*.

Changing the Physical Location of a Snapshot View

If the snapshot view storage directory is in a storage location, you can use standard Windows commands (such as **Cut** and **Paste** commands or drag and drop operations in Windows Explorer) to move it. You can move the view to a different computer, but the computer must run a Windows operating system.

CAUTION: If the view storage directory is located below the root directory of the view, **do not use** standard Windows commands to move the snapshot view. Instead, see *Moving a View Storage Directory*.

To Find the Location of the View Storage Directory

1. In ClearCase Explorer, right-click the view's root directory and click **Properties of View**.

2. In the **View Properties** dialog box, click **Advanced**.

   The **Host Path** box displays the pathname for the view storage directory.

Update After Moving

After moving a snapshot view, you must update any view shortcuts in ClearCase Explorer that use the old pathname to the view. If you did not create a ClearCase Explorer shortcut for the view and you move a view to a different computer, you must register its new location. Until you register its new location, the ClearCase user interface continues to present the old location.

Moving a View Storage Directory

Each dynamic view and snapshot view includes a view storage directory, which ClearCase uses to maintain the view. **Do not use** standard Windows commands (such as **Cut** and **Paste** commands or drag and drop operations) to move a view storage directory for the following reasons:

- The view storage directory includes a database. Moving the database without first shutting down the view's **view_server** process can corrupt the database.

- ClearCase stores the location of view storage directories in its own set of registries. The information in these registries must be correct for you to perform ClearCase operations in your views. In a dynamic view, the location in ClearCase registries must be correct for you to access any file or directory in the view.

We suggest that you ask your ClearCase administrator to move view storage directories because it may affect other, potentially many other, ClearCase users at your site. The *Administrator's Guide* for Rational ClearCase describes the procedure for moving view storage directories.

CAUTION: You will lose data (including view-private files in a dynamic view) if you move a view storage directory without following the procedure described in the *Administrator's Guide*.

7.9 Accessing Views and VOBs Across Platform Types

ClearCase supports environments in which some ClearCase hosts use a Microsoft Windows operating system and others use a UNIX operating system.

This section discusses the following topics:

- Creating views across platform types
- Accessing views and VOBs across platform types
- Developing software across platform types

Creating Views Across Platform Types

Your administrator can set up storage locations on Windows and UNIX server hosts. Any snapshot view that you create can use one of these storage locations, regardless of the platform type of the server host. For more information about storage locations, see the **mkstgloc** reference page in the *Command Reference*.

For a dynamic view, the view storage directory must be located on a host of the same platform type as the host from which you create the view. If you create a dynamic view from a UNIX host, you must locate the view storage directory on a ClearCase host on UNIX; if you create a dynamic view from a Windows host, you must locate the view storage directory on a ClearCase host that runs Windows software and is set up to store view storage directories. We recommend that you locate dynamic view storage directories on the host from which you most often use the view.

Snapshot View Characteristics and the Operating System

For snapshot views, the operating system from which you create the view determines view characteristics; the operating system that hosts the files and processes related to a snapshot view do not affect the view's behavior.

For example, it is possible to create a snapshot view from a Windows host and locate the view directory tree and the view storage directory on a ClearCase host on UNIX (assuming that you use third-party software to access UNIX file systems from Windows computers). Even though all files related to the view are on a UNIX workstation, because you created the view from a Windows host, the view behaves as if its files are located on a Windows computer: it does not create symbolic links if the load rules encounter a VOB symbolic link, and you can issue ClearCase commands for the view only from Windows hosts. (ClearCase hosts on UNIX do not recognize the directory tree as a snapshot view.)

Accessing Views Across Platform Types

This section describes support for accessing a view residing on a platform that differs from the platform from which it is being accessed.

Accessing UNIX Snapshot Views from Windows Hosts

ClearCase supports a set of third-party products for accessing UNIX file systems from Windows computers. If your organization uses one of these products, you can access UNIX snapshot views from Windows Explorer (or a command prompt) just as you would access any other directory tree on a UNIX workstation.

You can access snapshot views across platforms, but you cannot issue ClearCase commands across platforms. For example, you cannot check out files in UNIX snapshot views from Windows hosts nor can you create shortcuts to UNIX snapshot views from ClearCase Explorer.

If, from a Windows host, you hijack a file in a UNIX snapshot view, ClearCase detects the hijack when you update the view from a ClearCase host on UNIX.

Accessing Windows Snapshot Views from UNIX Hosts

ClearCase does not support accessing Windows file systems from UNIX workstations.

Accessing UNIX Dynamic Views from Windows Hosts

ClearCase supports a set of third-party products for accessing UNIX file systems from Windows computers. If your organization uses one of these products, you can complete the following tasks to access UNIX dynamic views from Windows computers:

1. On the UNIX system, create the UNIX view with the proper text mode. For more information, see *Developing Software Across Different Platforms* on page 131.

2. On the Windows system, use Region Synchronizer to import the UNIX view's view-tag into your Windows network region.
3. In ClearCase Explorer, refresh view shortcuts. ClearCase Explorer detects the view-tag, starts the view, and creates a view shortcut for you.

Accessing Windows Dynamic Views from UNIX Hosts

ClearCase does not support products for accessing Windows file systems from UNIX workstations. You cannot access Windows views from UNIX hosts.

Accessing VOBs Across Different Platforms

Your administrator sets up VOBs on hosts running Windows or UNIX software and creates *VOB-tags* in each ClearCase network region that needs to access the VOBs. (For information about registering UNIX VOB-tags on a Windows computer, see the *Administrator's Guide* for Rational ClearCase.) Then, from any ClearCase host running Windows or UNIX software, you can create snapshot views to load elements from VOBs that have tags in your network region.

From dynamic views and snapshot views on a ClearCase host on a Windows computer that supports dynamic views, you can access VOBs on Windows computers and UNIX workstations. To access VOBs on UNIX workstations from dynamic views on Windows computers, you must use third-party software that provides access to UNIX file systems from Windows computers.

From dynamic views on a ClearCase host on a UNIX workstation, you cannot access VOBs on Windows computers. Table 3 summarizes your options for accessing VOBs across platform types.

Table 3 ClearCase VOB Access Across Different Platforms

ClearCase Host Platform	Platform on Which VOB Is Located	Type of View from Which You Can Access Source Files
Windows computer	Windows computer or UNIX workstation	Snapshot view or dynamic view
UNIX workstation	Windows computer	Snapshot view
UNIX workstation	UNIX workstation	Snapshot view or dynamic view

Developing Software Across Different Platforms

You need an interop text-mode view to access text files using a UNIX view on a Windows host. Before a VOB can be accessed from an interop text-mode view, the system administrator must enable the VOB for interop text-mode support.

If developers check in source files from views created on hosts running either Windows and UNIX, consider creating your views in **insert_cr** or **strip_cr** text mode. The text modes change how a view manages line terminator sequences. For more information about choosing a text mode for a view, see the *Administrator's Guide* for Rational ClearCase.

7.10 Regenerating the view.dat File

The root directory of a snapshot view contains a hidden file, **view.dat**. If you delete this file inadvertently, ClearCase no longer identifies the view as a ClearCase object, and you can no longer perform ClearCase operations on files or directories loaded in the view.

To Regenerate the view.dat File

1. Open a command shell.

2. Type this command:

   ccperl *ccase-home-dir***\etc\utils\regen_view_dot_dat.pl**
   ^ [**–tag** *snapshot-view-tag*] *snapshot-view-pathname*

   For example:

   ccperl c:\atria\etc\utils regen_view_dot_dat.pl
   ^ –tag pat_v1.4_cropcircle
   ^ c:\pat_v1.4_cropcircle

   If the view storage directory is under the root directory of the view, you do not need to use the **–tag** *snapshot-view-tag* argument.

A

Working in a Snapshot View While Disconnected from the Network

If you need to work with your source files from a computer that is disconnected from the network of Rational ClearCase hosts and servers, you can set up a snapshot view for disconnected use.

This chapter describes the following tasks:

- Setting up a view for your hardware configuration
- Preparing the view
- Disconnecting the view
- Working in the view
- Reconnecting to the network
- Using the Update Tool

NOTE: While disconnected from the network, you cannot access ClearCase information about the files in your view or issue most ClearCase commands. If you want to work from a remote location and continue to access ClearCase information and issue ClearCase commands, consider using the ClearCase Web interface. Ask your ClearCase administrator whether the ClearCase Web interface has been configured at your site and what URL you need to supply to your Web browser to access it. For information about using the Web interface, see the Web interface online help.

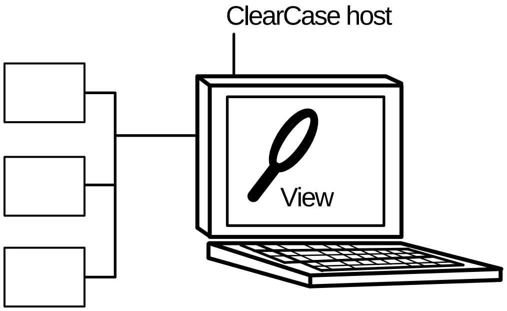
A.1 Setting Up a View for Your Hardware Configuration

You can use one of several hardware configurations to work in a snapshot view that is disconnected from the network.

This chapter describes the following recommended configurations:

➤ Creating and using the view on a laptop computer that periodically connects to the network (Figure 37).

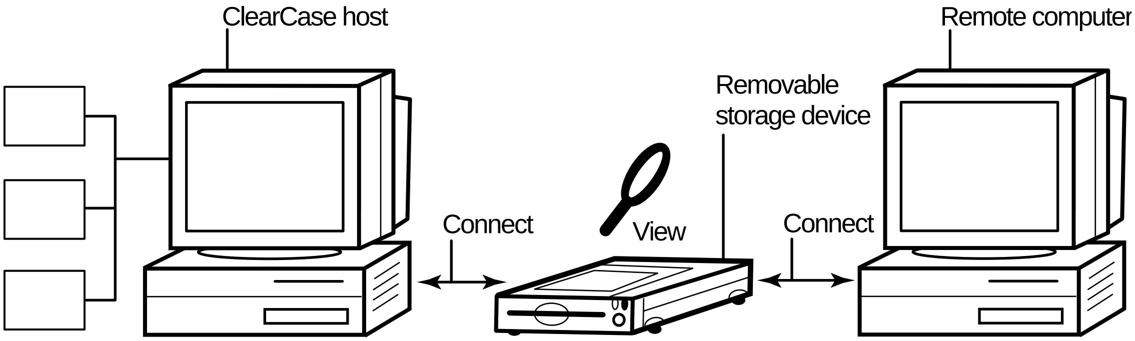
Figure 37 View on a Laptop



NOTE: The laptop computer must run a Windows operating system.

➤ Creating and using the view on a removable storage device such as an external hard drive or some other device (such as a Jaz drive) that provides satisfactory read/write performance (Figure 38).

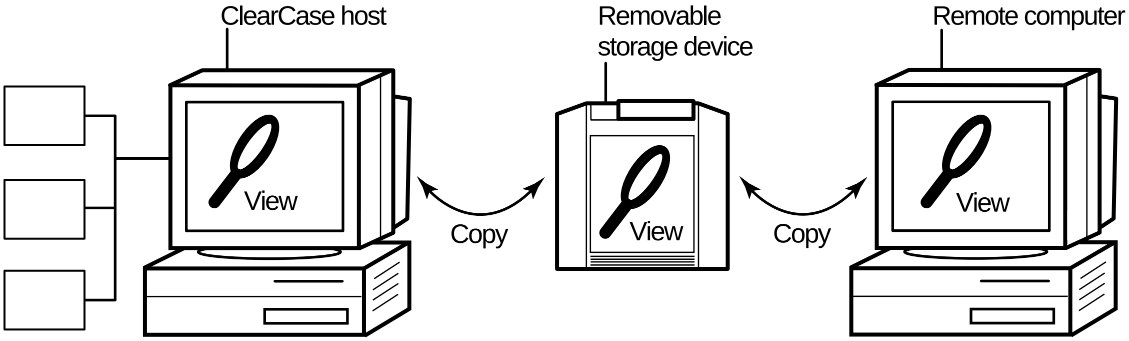
Figure 38 View On a Removable Storage Device



NOTE: The remote computer must run a Windows operating system.

- Copying the view from a ClearCase host to a temporary, removable storage device such as a diskette or a tape drive, which usually does not provide satisfactory read/write performance, and then copying the view from the storage device to a computer that is disconnected from the network (Figure 39).

Figure 39 Copy the View



NOTE: The remote computer must run a Windows operating system.

Under the Hood: Location of the View Storage Directory in Disconnected-Use Configurations

In all the configurations recommended for disconnected use, the snapshot view storage directory is in a server storage location. We recommend (and in the case of a removable storage device, we enforce) this configuration because a view's **view_server** process runs on the host that contains the view storage directory. A **view_server** is a long-lived process that manages activity for a specific view. If the view storage directory is in the root directory of the snapshot view and you disconnect the view from the network while the **view_server** process is writing to the storage directory, you can corrupt the data ClearCase uses to maintain your view.

A.2 Preparing the View

Before you disconnect the view from the network, complete these tasks:

- Update the view to establish a checkpoint. (For information on updating the view, see *Updating the View* on page 143.)

- Check out the files you expect to modify. After you're disconnected from the network, you cannot check out files, although there are workarounds. (See *Hijacking a File* on page 138.)

When you are no longer connected to the network, you cannot use most ClearCase commands. At this point, the disconnected computer does not distinguish a snapshot view directory from any other directory in the file system.

A.3 Disconnecting the View

How you disconnect the view depends on which hardware configuration you use. This section describes disconnecting the view for the following hardware configurations:

- View on a laptop
- View on a removable storage device
- View Copied to a storage device

Hardware Configuration: View on a Laptop

If the view is located on a laptop, you must deactivate the ClearCase integrations with Windows Explorer and other developer tools before you disconnect the view. Most ClearCase operations communicate with various ClearCase servers. Even if you install view server software on your host, almost any time you start a ClearCase operation (even an operation as simple as displaying the ClearCase shortcut menu in Windows Explorer), your host must connect to the ClearCase license server. The ClearCase integration with Microsoft Visual Studio attempts to connect to the license server periodically. If you are disconnected from the network, the application that attempts to connect to the ClearCase license server locks for several seconds until it returns an error message. Although the application doesn't fail, such interruptions are unnecessary.

To Deactivate ClearCase Integrations

1. In Control Panel, click **ClearCase**.

2. Click the **Options** tab and clear the **Connect to network for ClearCase operations** check box.

3. Disconnect the laptop from the network.

Deactivating the integrations removes ClearCase commands from the Windows Explorer shortcut menus.

Hardware Configuration: View on a Removable Storage Device

If the view is located on a removable storage device, disconnect the removable storage device from the network computer and reconnect the media to the remote computer.

Hardware Configuration: View Copied to a Storage Device

If you do not have a storage device with satisfactory read/write performance, use the **xcopy** command to copy files from your view to the storage media and from the storage media to the remote computer as follows

xcopy *path\snapshot-view-directory destination* [**/D** [**:***m-d-y*] | **/M**] **/S /K /R**

For example, **xcopy c:\Library\pat_v1.4_cropcircle e:\temp /D /S /K /R**

The command options accomplish the following:

- ➤ The **/D** option instructs **xcopy** to copy only the files that have changed, which is useful if you frequently alternate between the network computer and the nonnetwork computer. Use **/D** if you configured the Update Tool to set the time stamp of updated files to the time at which the files are loaded into the view. You can view or change the Update Tool's time stamp option on the **Advanced** tab of the **Start Update** dialog box. For more information, refer to Step #3 of *Updating the View* on page 143.

  If you set the Update Tool to create time stamps based on the version-creation time, consider using the **/M** option, which causes **xcopy** to copy the files with the archive attribute set. The **/M** option is less reliable than the **/D** option, because some applications alter the archive attribute without writing the file.

- ➤ The **/S** option instructs **xcopy** to copy all subdirectories of the snapshot view.
- ➤ The **/K** option keeps the read-only file attribute as established by ClearCase.
- ➤ The **/R** option allows **xcopy** to overwrite read-only files.

A.4 Working in the View

You cannot use most ClearCase commands when disconnected from the network. Yet you may need to work on files that you did not check out or locate files you have modified. This section provides workarounds for these ClearCase operations.

Hijacking a File

If you need to modify a loaded file element that you have not checked out, you can *hijack* the file. ClearCase considers a file hijacked when you modify it without checking it out. For more information, see *Under the Hood: How ClearCase Determines Whether a File is Hijacked* on page 143.

When you reconnect to the network, you use the Update Tool to find the files you hijacked. You can do the following with a hijacked file:

- Check out the file. You can then continue to modify it and, when you're ready, check in your changes.
- Undo the hijack. For more information, see *To Undo a Hijack* on page 142.

To Hijack a File

1. In Windows Explorer, right-click the file you want to hijack.
2. On the shortcut menu, click **Properties** to display the file's property sheet.
3. On the **General** tab, clear the **Read-only** check box.

Finding Modified Files While Disconnected

You can use Windows Explorer to find all files that have been modified after a specified date.

1. In Windows Explorer, click **Tools** > **Find** > **Files or Folders**.
2. In the **Find: All Files** dialog box, type the path to the view or to a specific directory in the view in the **Look In** box.
3. Use the **Date Modified** tab to define your search criteria.

4. Click **Find Now**.

   The **Find: All Files** dialog box expands to display the files and directories it finds.

A.5 Reconnecting to the Network

When you return to the office and can access the network directly, do one of the following, depending on your hardware configuration.

Hardware Configuration: View on a Laptop

If you're using the view on a laptop, connect the laptop to the network. If ClearCase is installed on the laptop, activate the ClearCase integrations as follows:

1. In Control Panel, click **ClearCase**.
2. Click the **Options** tab and select the **Enable ClearCase network operations** check box.

Hardware Configuration: View on a Removable Storage Device

If you're using the view on a removable storage device, connect the removable storage device to the computer on the network.

Hardware Configuration: View Copied to a Storage Device

If you copied the view onto removable media, use **xcopy** with the [**/D** | **/M**] **/S /K /R** options to copy files back to the original location on the network computer.

A.6 Using the Update Tool

When you're connected to the network, use the Update Tool for the following tasks:

- ➤ Determine how to handle hijacked files
- ➤ Update the view

Determining How to Handle Hijacked Files

Handling hijacked files involves the following tasks:

- ➤ Finding hijacked files
- ➤ Comparing a hijacked file to the version in the VOB
- ➤ Checking out a hijacked file
- ➤ Merging changes to a hijacked file
- ➤ Undoing a hijack
- ➤ Choosing other ways to handle hijacked files

To Find Hijacked Files

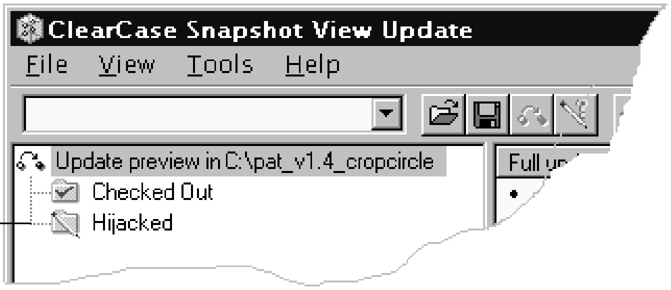
1. In ClearCase Explorer, right-click the root directory of the snapshot view.

2. On the shortcut menu, click **Find Modified Files**.

Select **Display results when closed** and quit the **Modified File Search Complete** window.

3. If any hijacked files are in your view, the ClearCase Snapshot View Update window displays a folder in the left pane titled **Hijacked** (Figure 40). Select **No** for the option asking whether you want to check out the hijacked files now.

Figure 40 Hijacked Files in the Results Window


ClearCase Snapshot View Update
File
View
Tools
Help
Update preview in C:\pat_v1.4_cropcircle
Checked Out
Hijacked
Full up

Hijacked folder

To Compare a Hijacked File to the Version in the VOB

You can use the Diff Merge tool to see how the hijacked file differs from the checked-in version of the file:

1. In the right pane of the ClearCase Snapshot View Update window, right-click a hijacked file.
2. On the shortcut menu, click **Compare with Original Version**. For information on using the Diff Merge tool, see the online help.

To Check Out a Hijacked File

To keep the modifications in a hijacked file, check out the file:

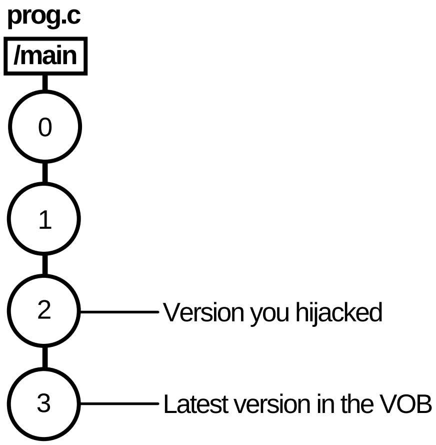
1. In the right pane of the ClearCase Snapshot View Update window, right-click a hijacked file.
2. On the shortcut menu, click **Check Out**.
3. ClearCase treats a checked-out hijacked file as it does any other checkout.

When you’re ready, you can check in the file.

Merging the Latest Version to a Hijacked File

If you’re working with a shared set of versions and someone has checked in a newer version of the file while it was hijacked in your view (Figure 41), ClearCase prevents you from checking in the file.

Figure 41 Hijacked Version May Not Be the Latest Version



You have to merge the latest version in the VOB with the checked-out file before ClearCase allows the checkin.

When you issue the **Check In** command for a nonlatest version, ClearCase opens the dialog box to ask whether you want to merge the file now. If you choose to merge, ClearCase attempts to merge automatically, starting the Diff Merge tool if it needs your input to complete the merge. For information about using Diff Merge, see ClearCase online help. After the merge, ClearCase prompts you to check in the file.

To Undo a Hijack

If, for specific hijacked files, you want to discard your changes and get a fresh copy of the version from the VOB, you can undo the hijack.

1. In the right pane of the ClearCase Snapshot View Update window, select one or more hijacked files.

2. Right-click the selected files, and, on the shortcut menu, click **Undo Hijacked File**.

ClearCase overwrites the hijacked file with the version that was loaded in the view. If you want to overwrite hijacked files with the versions the config spec selects in the VOB, see Step #3 in *Updating the View* on page 143.

Under the Hood: How ClearCase Determines Whether a File is Hijacked

To keep track of file modifications in a snapshot view, ClearCase stores a loaded file's size and last-modified time stamp (as reported by the Windows file system). ClearCase updates these values each time you check out a file, check in a file, or load a new version into the view.

To determine whether a file is hijacked, ClearCase compares the current size and last-modified time stamp of a non-checked-out file with the size and time stamp recorded in the view database. If either value is different from the value in the view database, ClearCase considers the file hijacked.

Changing a non-checked-out file's read-only attribute alone does not necessarily mean ClearCase considers the file hijacked.

Other Ways to Handle Hijacked Files

While updating the view, you can handle hijacked files in any of the following ways:

- Leave hijacked files in place
- Rename the hijacked files and load the version from the VOB
- Overwrite hijacked files with the version the config selects in the VOB

See *Updating the View* for more information.

Updating the View

1. In ClearCase Explorer, select the snapshot view's root directory.

2. Right-click to display the shortcut menu and click **Update View**.

3. To configure the Update Tool for handling hijacked files, in the **Start Update** dialog box click the **Advanced** tab and select a method for handling the remaining hijacked files. You have these choices:

   - Leave hijacked files in place
   - Rename the hijacked files and load the selected version from the VOB
   - Delete hijacked files and load the selected version from the VOB

4. To start the update, click **OK**.

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