Introducing Rational ClearQuest

support@rational.com
http://www.rational.com

Rational®
the e-development company™

IMPORTANT NOTICE

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Contents

Welcome to Rational ClearQuest

ClearQuest is a customizable defect and change tracking system designed for the dynamic environment of software development. With ClearQuest, you can manage every type of change activity associated with software development, including enhancement requests, defect reports, and documentation modifications.

ClearQuest shortens development cycles by unifying your entire team in the process of managing software change:

- ***Development engineers*** can identify and prioritize action items that pertain to their section of code.
- ***Test engineers*** can track the status and resolution of change requests to verify software quality.
- ***Project leaders*** and ***managers*** can get information at a glance to help them allocate development resources, streamline work flow, and accurately determine release dates.
- ***Administrators*** can integrate ClearQuest with existing tools and customize it to fit your organization's workflow.

This guide provides an overview of how to use ClearQuest on the job and a brief example of how your ClearQuest administrator can customize ClearQuest to fit your workflow. For instructions on how to install ClearQuest, see the *Installing Rational ClearQuest* guide that came with your product.

What is ClearQuest?

ClearQuest consists of several components that work in a client-server environment.

Component	Used by	Use to
Client tools		
ClearQuest for Windows	Everyone	Submit, modify, and track change requests, and to analyze project progress by creating and updating queries, charts, and reports.
ClearQuest for UNIX	Everyone	Submit, modify, and track change requests, and support project analysis by creating and updating queries.
ClearQuest Web	Everyone	Access ClearQuest across multiple platforms through Netscape Navigator® or Microsoft's Internet Explorer to submit, modify, and track change requests, and support project analysis by creating and updating queries and reports.
Administrator tools		
ClearQuest Designer	ClearQuest administrator	Customize ClearQuest, manage ClearQuest schemas and databases, and administer users and user groups.
ClearQuest Import Tool	ClearQuest administrator	Import data including records, history, and attachments from other change request systems and between ClearQuest databases.
ClearQuest Export Tool	ClearQuest administrator	Export ClearQuest data from one ClearQuest user database to another user database.
ClearQuest Maintenance Tool	Everyone	Set up and connect to the schema repository during installation and when you upgrade to a new ClearQuest version.
Rational E-mail Reader	ClearQuest administrator	Enable ClearQuest users to submit and modify records by e-mail. For more information, see Chapter 9, "Administering ClearQuest E-mail" in *Administering Rational ClearQuest*.

Ready-to-use defect tracking system

ClearQuest includes predefined schemas that provide ready-to-use change and defect tracking processes and integration with various Rational Software products. You can use ClearQuest schemas as is or customize them to fit your organization's workflow. For a list of ClearQuest predefined schemas, see "Selecting a ClearQuest schema" on page 33.

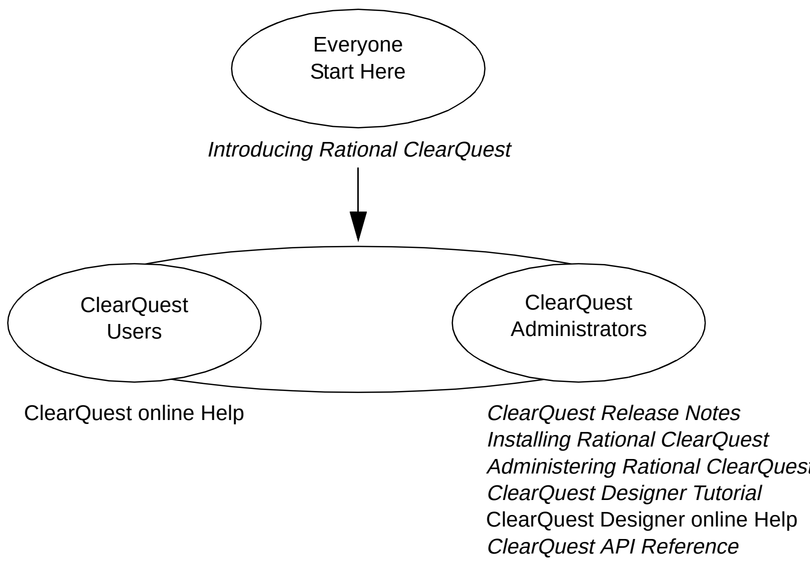
Support for your development environment

ClearQuest provides the following support for your software development environment:

- Supports Microsoft Access® (included with ClearQuest), Sybase SQL Anywhere (included with ClearQuest), Microsoft SQL Server®, Oracle relational databases, and IBM DB2.
- Integrates with Rational ClearCase and Microsoft Visual SourceSafe so you can associate change requests directly with changes in your evolving software.
- Integrates with Rational TeamTest, VisualTest, Purify, PureCoverage, and Quantify, allowing you to submit change requests to ClearQuest directly from these testing tools.
- Includes Seagate's Crystal Reports Professional Edition™ so you can create custom reports from ClearQuest data.
- Allows you to integrate with other standard Windows tools, such as Microsoft Excel and Word through an advanced COM interface.
- Provides access to Rational Unified Process through the ClearQuest **Help > Rational Extended Help** menu.
- Supports Microsoft IIS web server.

Where to get more information

ClearQuest includes the following documentation:



On the job with ClearQuest

This chapter is for all ClearQuest users. It introduces the basic concepts of using ClearQuest, including information on how to:

- Submit a change request
- Work with change requests
- Track change requests
- Gather project metrics

If you're reading this chapter as a ClearQuest administrator, look for the ClearQuest Designer icon next to suggestions for how you can customize ClearQuest to fit your organization's workflow. For more information, read "Administering and customizing ClearQuest" on page 19.

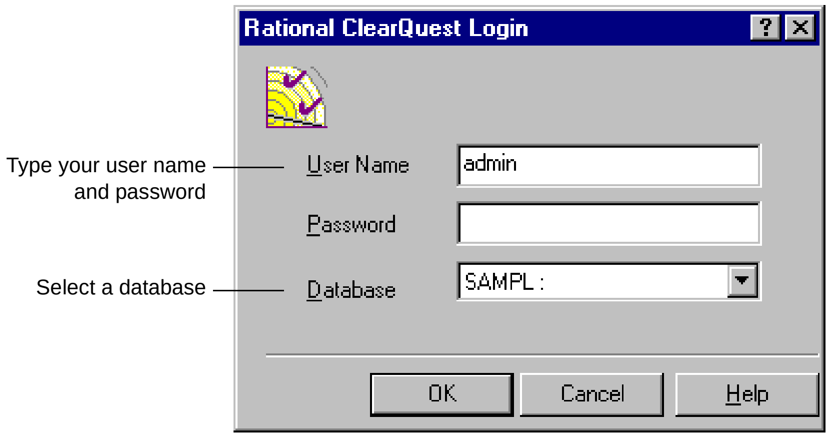
Note: The examples in this chapter show the `DefectTracking` schema and `SAMPL` database that are included with ClearQuest. This represents only one model for using ClearQuest. For more information, see "Selecting a ClearQuest schema" on page 33.

Getting started

To start using ClearQuest:

1. Select **Rational ClearQuest** from the Start menu.
2. Log into ClearQuest. You can use the ClearQuest predefined user name (*admin*) to get started. You do not need to type a password.

   Select the `SAMPL` database to experiment with a working user database that already contains many change request records.



During installation, you create and configure user databases for your site; their names appear in the drop-down list of databases when users log in. See *Installing Rational ClearQuest*. You use ClearQuest Designer to set up user login accounts and to define user access privileges. See Chapter 6, “Administering users” in the *Administering Rational ClearQuest* guide.

Getting around in ClearQuest

The ClearQuest main window consists of a Workspace, a Query Builder, and a Record form.

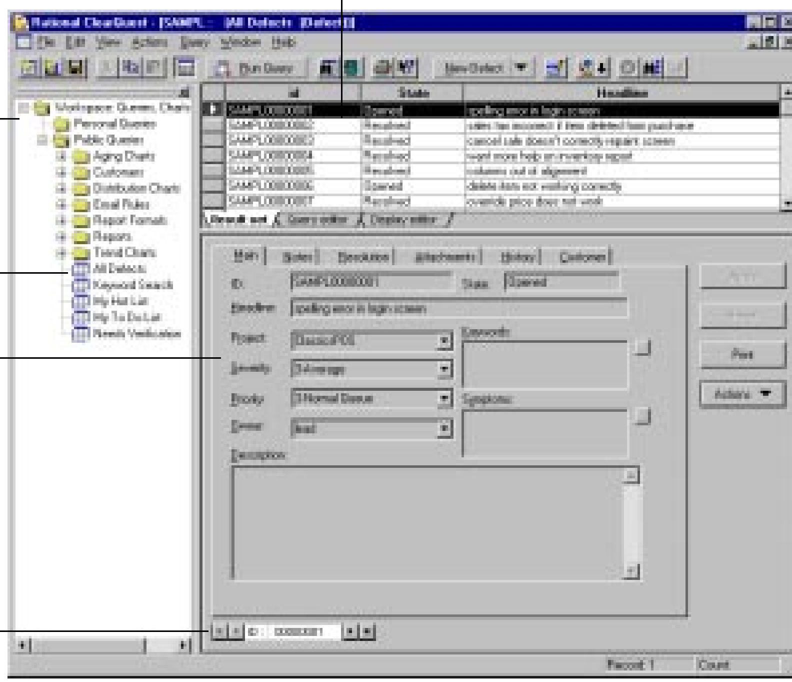
The Query Builder displays the results of a query. Click a record to display its data in the Record form below.

The Workspace lists the queries, charts, and reports that are available

Double-click a query to locate records in the database

Use the Record form to view and modify records

Scroll through multiple records from the same query or type the number of the record you want to locate



The Public Queries folder in the Workspace contains the queries, charts, and reports that are included in ClearQuest, as well as any that your ClearQuest administrator creates. You can drag any query, chart, or report to your Personal Queries folder and modify it to suit your needs.

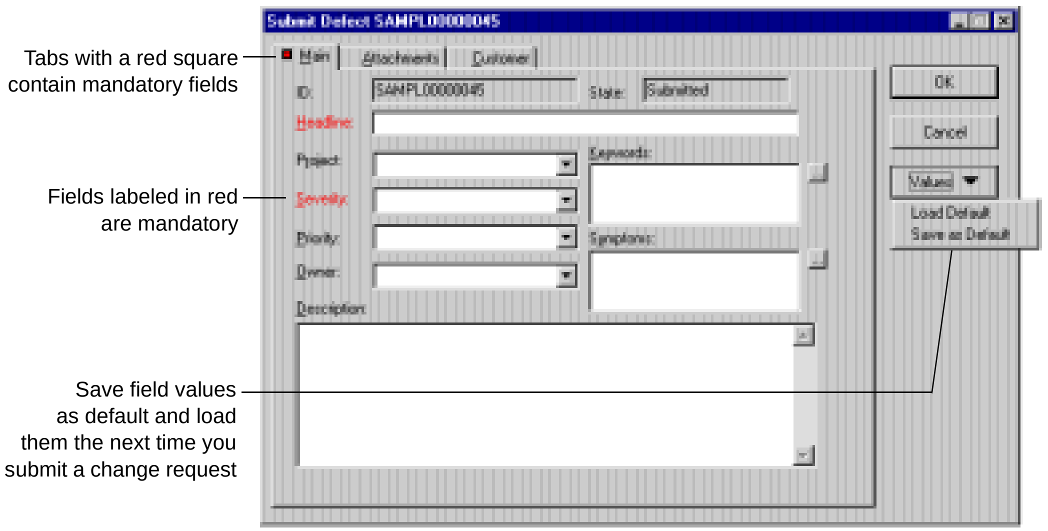
You can click **Print** to print a single record. To do this you must have a report format associated with the record type. Look up *Print Single Record* in the ClearQuest Designer Help index.

More information? Select **Help > Contents > Getting around ClearQuest**.

Submitting a change request

You begin using ClearQuest by submitting a change request. This creates a record in the user database that everyone on the team can track as your software development and testing evolves.

To submit a change request, click New Defect in the toolbar.



Use the various tabs on the Submit Defect form to describe the change request in detail, including attaching code fragments and other supporting information. Some tabs contain fields that are mandatory. For example, the Headline field requires a short sentence describing the problem, and you must select a value for the Severity field.

You can save frequently used field values as defaults so you don't have to re-enter them each time you submit a change request. Fill in the fields you want to save and select **Values > Save as Default**.

Note: You can submit a change request directly to ClearQuest from Rational TeamTest, Purify, PureCoverage, Quantify, and Visual Test. You can also use ClearQuest Web and ClearQuest

UNIX to submit and modify change requests or submit change requests via email.

As a ClearQuest administrator, you can create additional record types. For example, you might want separate record types for hardware defects, software defects, and enhancement requests. You can also customize record forms, including adding tabs and fields and defining their behavior. See Chapter 5, “Customizing a schema” in the *Administering Rational ClearQuest* guide.

More information? Select **Help > Contents > Working with records**.

Receiving automatic e-mail notification

Your ClearQuest administrator can configure ClearQuest to automatically send e-mail to various team members when a change request is submitted or changed. To take advantage of automatic e-mail notification, all ClearQuest users must set up their e-mail options. Select **View > E-mail Options**.

More information? Select **Help > Contents > Using ClearQuest > Setting up e-mail notification**.

ClearQuest’s Email_rule record type makes it easy to define the rules for sending automatic e-mail notification to ClearQuest users. The Email_rule record type is part of the E-mail package included in every ClearQuest out-of-the-box schema. You can also use the Rational E-mail Reader to configure your e-mail settings so that ClearQuest users can submit and modify records by e-mail.

More information? In ClearQuest Designer, select **Help > Contents > Using e-mail features**. Read Chapter 9, “Administering ClearQuest E-mail” in the *Administering Rational ClearQuest* guide.

Working with change request records

You work with change request records by moving them through various stages, or "states." In each state, you can perform actions such as modifying the record or moving it to another state. The Actions menu lists the actions that you can perform on the record while it is in any given state.

Here's an example of a typical workflow:

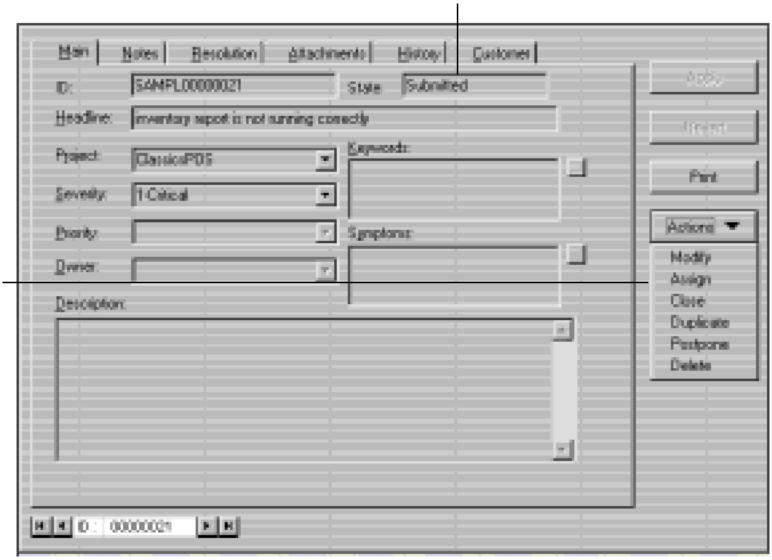
Assigning a change request

A change request record usually starts out in the Submitted state. The first thing to do is to assign the change request to the engineer responsible for that section of code.

The record is in the Submitted state

Select
Actions > Assign . . .

. . . then fill in the information on each tab of the record form



The Assign action changes the state of the record to Assigned.

The exact process of working with records, including the states the record can be in and the actions available in each state, depends on the ClearQuest schema you are using and any customizations you have made to it. See "Customizing a schema" on page 22.

Modifying a change request

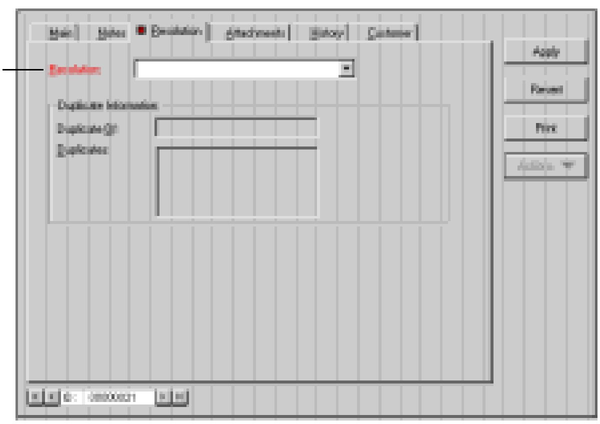
Not all actions change the state of a change request. You can select **Actions > Modify** to change some information on a change request without actually changing its state.

Opening and resolving a change request

If you're the engineer assigned to the change request, you begin work by selecting **Actions > Open**. This changes the record's state to Opened; now the rest of the team can see that you're working on the problem.

When you finish your work, select **Actions > Resolve** to change the record's state to Resolved.

When you change the record state to Resolved, you must fill in the Resolution field



In this example, the ClearQuest administrator has configured ClearQuest to send an automatic e-mail notification to the Quality Assurance team as part of the Resolve action. A quality assurance engineer can then verify that the problem is fixed and change the record state to Closed.

As a ClearQuest administrator, you can restrict actions to specific user groups. For example, you might allow everyone on the team to resolve a change request, but restrict the Verify action to members of the Quality Assurance group.

Tracking change request records

ClearQuest queries make it easy for everyone on your team to track change request records as they move through your system.

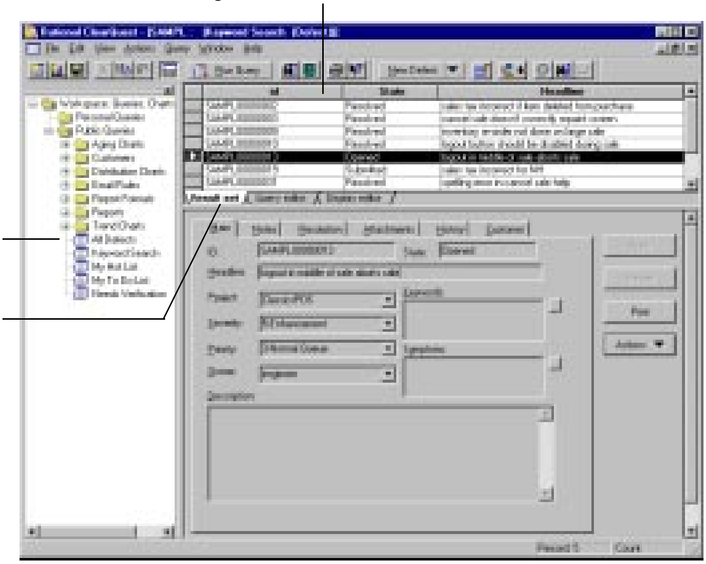
Using public queries

ClearQuest includes ready-to-use queries that help you locate records by project or component, by assigned engineer, by level of severity, and so on. For example, when you discover a defect in your software, you can check to see if the defect has already been submitted. Select **Public Queries > All Defects** to display all the records in the database, or use the **Keyword search** query to locate records containing a specific word in the Headline or Description field.

These records are the result of the a keyword search for records containing the word *sale*

Double-click **Keyword search** and type a keyword in the Dynamic Filters dialog

The Result set tab displays the records for the query



During a session of submitting new defects, you can select **Query > RecentlySubmitted** to see a list of the defects you have submitted since you logged in.

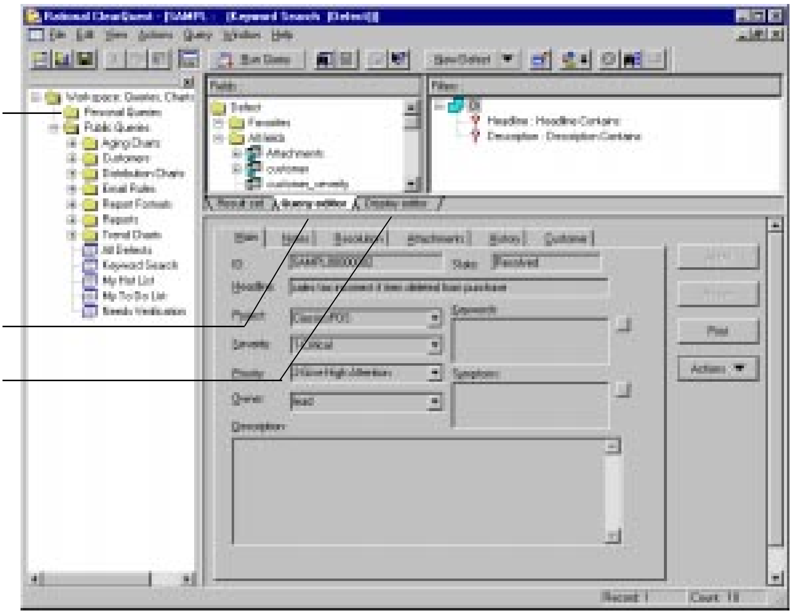
Modifying queries

To modify a query, first drag the query to your Personal Queries folder and then use the Query editor and Display editor tabs.

Drag a query to your Personal Queries folder before modifying it

Select the **Query editor** tab to change the filtering criteria for a query

Select the **Display editor** tab to set up how the query results are displayed



Building a new query

To build a new query from scratch or from an existing query, select **Query > New Query**. The ClearQuest Query Wizard steps you through the process of building a query.

More information? Select **Help > Contents > Working with queries.**

As a ClearQuest administrator, you can save queries to the Public Queries folder and can assign this privilege to other users. See Chapter 6, “Administering users” in the *Administering Rational ClearQuest* guide.

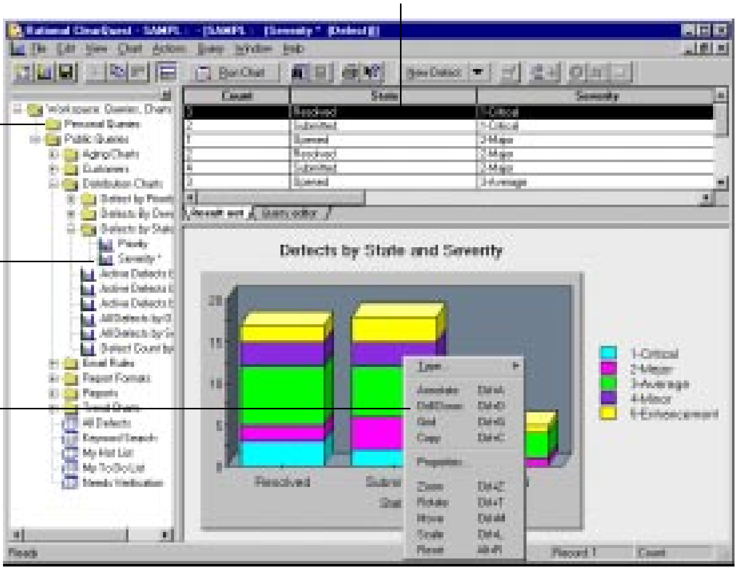
Gathering project metrics

ClearQuest provides predefined charts and reports that you can run on Windows and on ClearQuest Web to view the status of your project at a glance. On Windows, you can modify these charts and reports to fit your own needs. ClearQuest UNIX does not support the creation of charts or reports.

Using ClearQuest charts

ClearQuest charts display record data graphically: Distribution charts show the current status of data; trend and aging charts show historical information.

For example, you can see how the workload is distributed among the engineers on your team by running a distribution chart that displays the defects assigned to each engineer. Or, you can see the defect records graphed by state and severity.

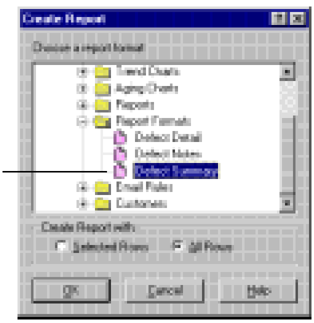


There are two ways to modify the contents of a chart: Select **Edit > Properties** to define how the data is displayed, or use the Query editor tab to filter the records included in the chart.

Creating reports from ClearQuest data

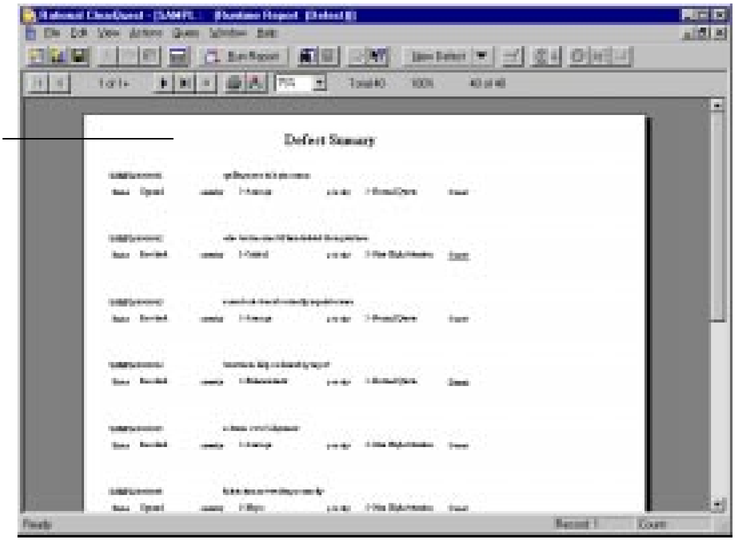
ClearQuest includes reports and report formats that you can use to create reports from ClearQuest data. To create a report on the current query results set, first run a query such as All Defects, then click  to open the Create Report dialog.

Select a report format



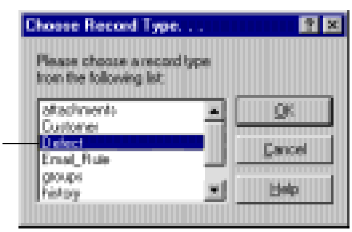
This creates a report in the selected format from the data in the query result set. Click  to export the report output to another format, such as HTML or Excel.

ClearQuest displays the data in the report format you selected



To create a new report that you can reuse, run a query that you want to create a report from, and then select **Query > New Report**.

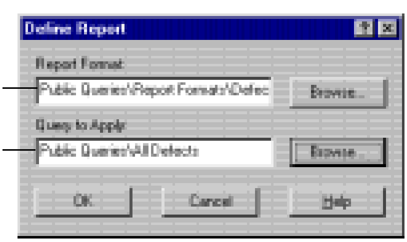
Select a record type



Select a report format and then associate the format with a query.

Select a report format

Select a query



This creates a report from the query data you selected. You can save this report in your Personal Queries folder and run it at any time.

You can use Crystal Reports Professional Edition to create new report formats. You can save these formats in your Personal Queries folder and use them to format ClearQuest reports.

More information? See **Help > Contents > Working with reports**.

Now you're ready to put ClearQuest to work. Remember that ClearQuest Help contains detailed information to assist you every step of the way. For context-sensitive Help, click  and then click the item you want information about.

Be sure to read the next chapter, "Administering and customizing ClearQuest."

Administering and customizing ClearQuest

This chapter is for ClearQuest administrators. It begins with an overview of ClearQuest databases and schemas, then provides a brief example of how to perform the primary task of an administrator—customizing a ClearQuest schema to fit your workflow.

Note: For complete information about administering ClearQuest, including a description of how to get your ClearQuest users up and running, see the *Administering Rational ClearQuest* guide that came with your ClearQuest product. To take the tutorial, select **ClearQuest Designer Tutorial** from the Start menu.

Overview of ClearQuest databases and schemas

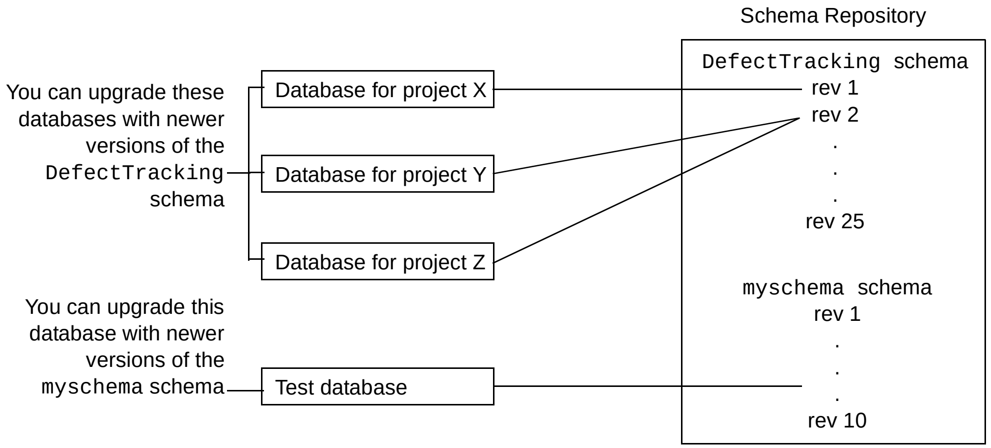
A ClearQuest *schema* contains the metadata that defines the process for how users work with records in ClearQuest.
It includes:

- Record type definitions
- Forms used to submit and modify a record
- Field definitions and behavior
- States a record can be in
- Actions used to modify or change the state of a record
- Hooks written in Visual Basic Script™ or Perl that further customize fields and actions.

Note: ClearQuest includes several predefined schemas that you can use as is or customize to fit your workflow. For a list of these schemas, see “Selecting a ClearQuest schema” on page 33.

ClearQuest stores schemas in a *schema repository*. A ClearQuest installation usually consists of one schema repository and one or more user databases. You can have separate user databases for each project, or group several projects together into one database. If you want to generate reports and charts across several projects, you should put the projects in the same database. Projects that share a database must use the same schema.

Here's an example of how a schema repository with two schemas can work with several user databases:



Note: Once a database is associated with a schema, it can only be upgraded with a *newer* version of that same schema. It cannot use an older version of the schema or a completely different schema.

In the above example, you can:

- Upgrade the databases for projects X, Y, or Z with newer versions of the `DefectTracking` schema.
- Upgrade the Test database with newer versions of `myschema`.
- Apply any version of the `DefectTracking` schema or the `myschema` schema to a new database.

More information? For a complete description of how to work with schemas and databases, see Chapter 4, "Working with ClearQuest schemas" in the *Administering Rational ClearQuest* guide.

Starting ClearQuest Designer

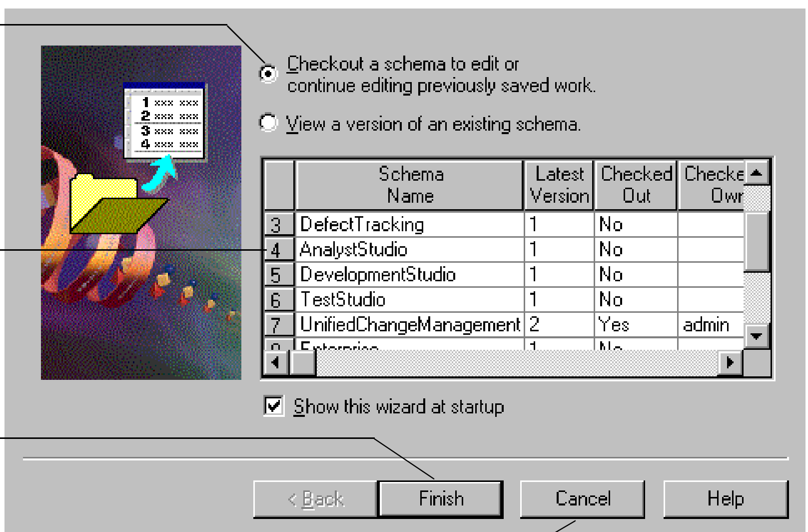
To start ClearQuest Designer:

1 Select **Rational ClearQuest Designer** from the Start menu.

ClearQuest provides a default User Name (*admin*) that you can use to get started. Do not type in a password. The *admin* user account is set up with the access privileges you need to perform all ClearQuest administrator functions. To change the *admin* account, select **Tools > User Administration**, then select the **admin** user and click **Edit**.

More information? See Chapter 6, “Administering users” in the *Administering Rational ClearQuest* guide.

2 ClearQuest Designer displays the Open Schema dialog. Check out a schema if you are planning to modify it and click Finish; otherwise click **Cancel** to continue.



Click to check out a schema

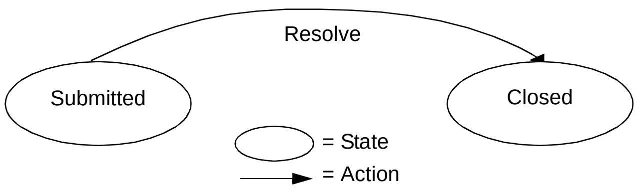
Select a schema

Click if you are checking out a schema

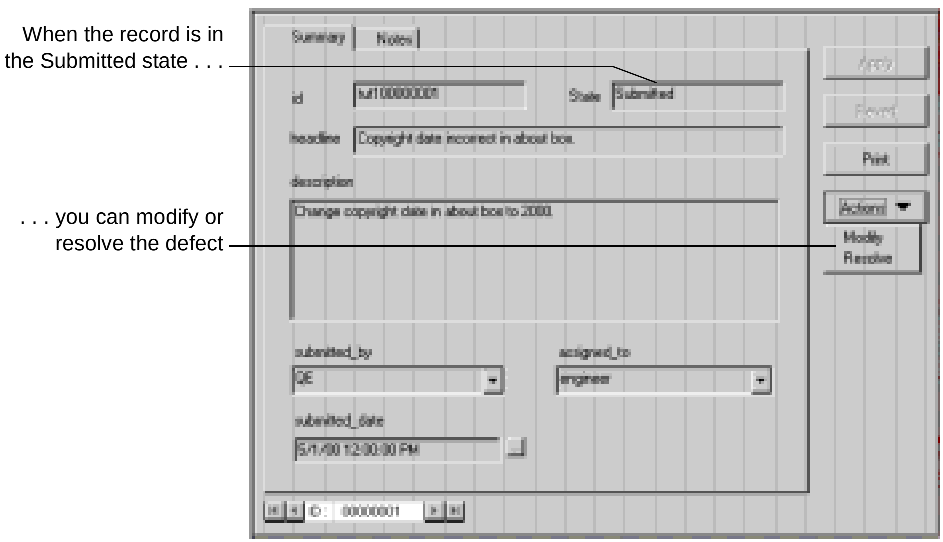
Click if you are not checking out a schema

Customizing a schema

This section provides a brief example of how to customize a schema. Suppose you have a simple defect record with only two states (Submitted and Closed) and three actions (Submit, Modify, and Resolve). The process of working with this record is shown in the state model below:

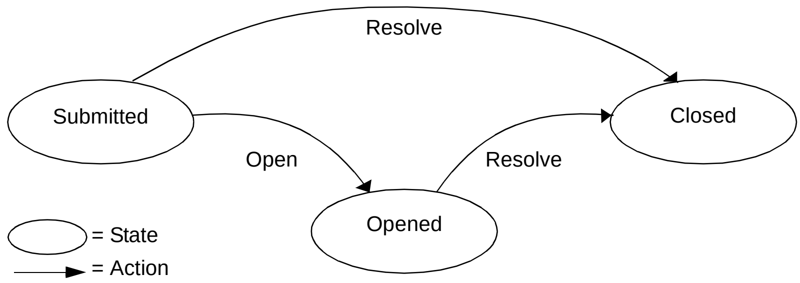


The defect record begins in the Submitted state; from there you can select **Actions > Resolve** to change the record state to Closed, or **Actions > Modify** to modify the record without changing its state. The record form looks like this:



The process of working with a record, along with the record form and fields, is defined by the ClearQuest schema.

In this example, you modify the process of working with the defect record by adding an Opened state so that the state model looks like this:



To customize the schema to fit this new workflow, you will:

- Add a new state, *Opened*, between the Submitted and Closed states.
- Add a new action, *Open*, that changes the state of the record from Submitted to Opened.
- Add a field, *planned_fix_date*, to the record form.
- Define the behavior of the planned_fix_date field.
- Create a Visual Basic hook that automatically sets the *planned_fix_date* field equal to three days from today's date.

Checking out the schema

To customize a schema, you must first check it out of the schema repository. Select **File > Open Schema**. For complete instructions on working with schemas, including setting up a test database to test your schema customizations, see Chapter 4, “Working with schemas,” in the *Administering Rational ClearQuest* guide.

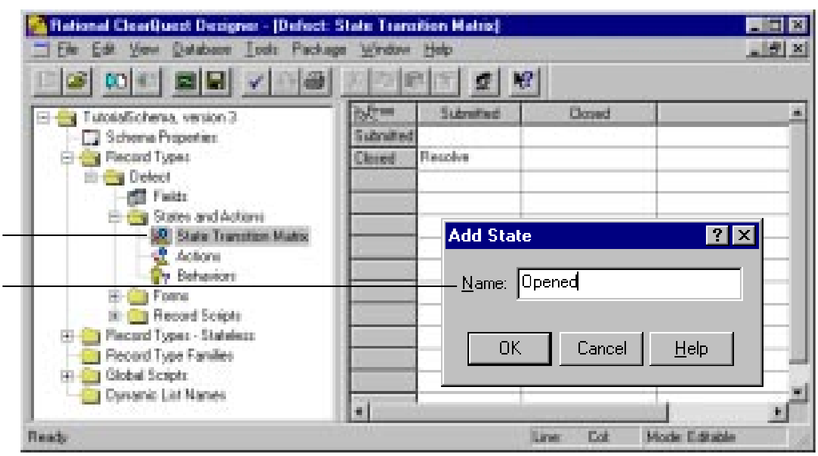
Adding a new state

The ClearQuest Designer State Transition Matrix shows the various states that a record can be in and the actions that move the record from one state to another. In this example, it shows that the Resolve action changes the record from the Submitted state to the Closed state.

To add a new state, open the State Transition Matrix and then select **Edit > Add State**.

Double-click to open the State Transition Matrix

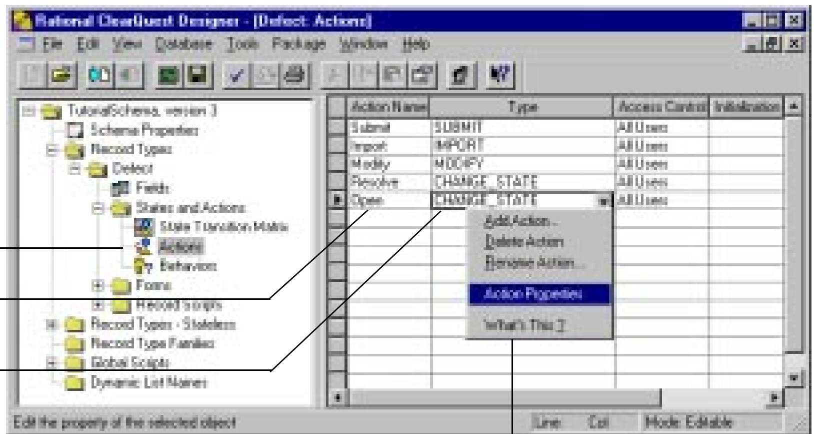
Click **Edit > Add State** and type **Opened**



More information? Look up *states, creating* in the ClearQuest Designer Help index.

Adding a new action

The Actions grid shows all of the actions that can be performed on a record. To add a new action, you first add the action to the Actions grid and then associate it with the appropriate states.



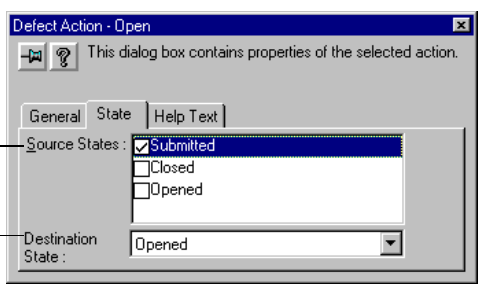
1. Double-click to open the Actions grid

2. In the Action Name column, type **Open**

3. In the Type column, select **CHANGE_STATE**

4. Right-click the Open action and select **Action Properties** from the shortcut menu

To get more information, select **What's This?**



5. In the State tab, select **Submitted** for the source state . . .

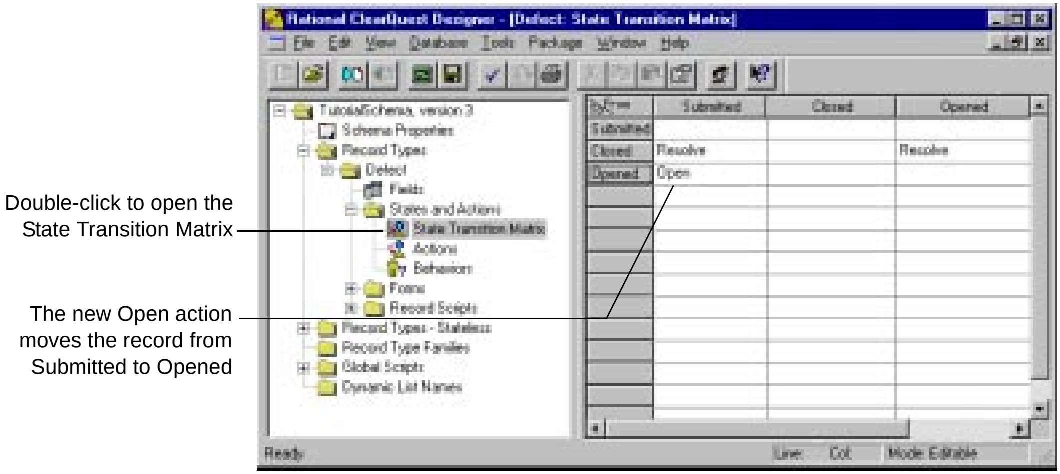
. . . and **Opened** for the destination state

This adds the Open action to the ClearQuest Actions menu. Now, when the record is in the source state (Submitted), you can select **Actions > Open** to move the record to the destination state (Opened).

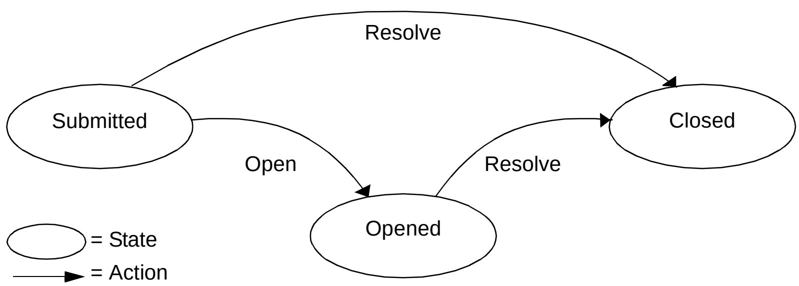
You should also modify the existing Resolve action to add Opened as a legal source state.

More information? Look up *actions, adding* in the ClearQuest Designer Help index.

Look at the State Transition Matrix again. It now shows that the Open action moves the record from the Submitted state to the Opened state, as intended.



You can see how the State Transition Matrix implements the new state model.



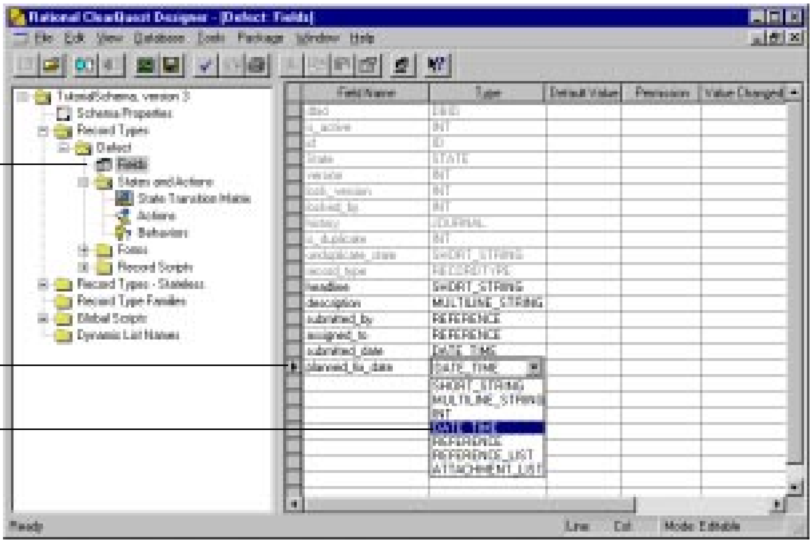
In the Submitted state, you can select **Actions > Open** to change the state to Opened. In both the Submitted state and the Opened state, you can select **Actions > Resolve** to change the record to Closed.

More information? Look up *state transitions* in the ClearQuest Designer Help index.

Creating a new field

Now, create a new field for the record form called *planned_fix_date* that lets you enter the date when you expect to resolve the defect.

To create a new field, open the Fields grid. The Fields grid shows all of the fields on the record form, their type, and their default values.



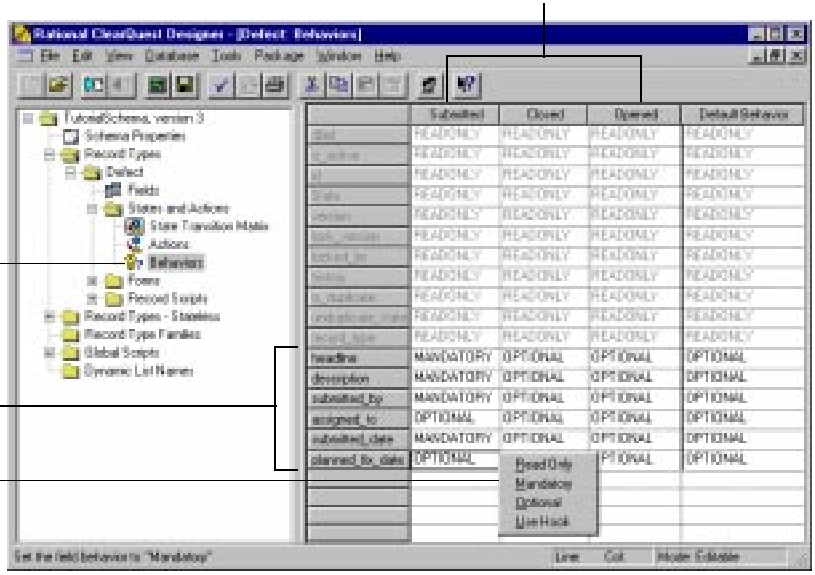
More information? Look up *fields, adding to schemas* in the ClearQuest Designer Help index.

Defining the behavior of the new field

The Behaviors grid shows how fields behave when the record is in each state. You can define whether a field is read-only, mandatory, or optional in each state, or define default behavior for all states. You can also create a use-hook behavior that restricts user access to the field. For more information, refer to the *ClearQuest API Reference*.

Open the Behaviors grid, then right-click and use the popup menu to define the behavior of the planned_fix_date field.

You can define the behavior of the field in each state



Double-click to open the Behaviors grid

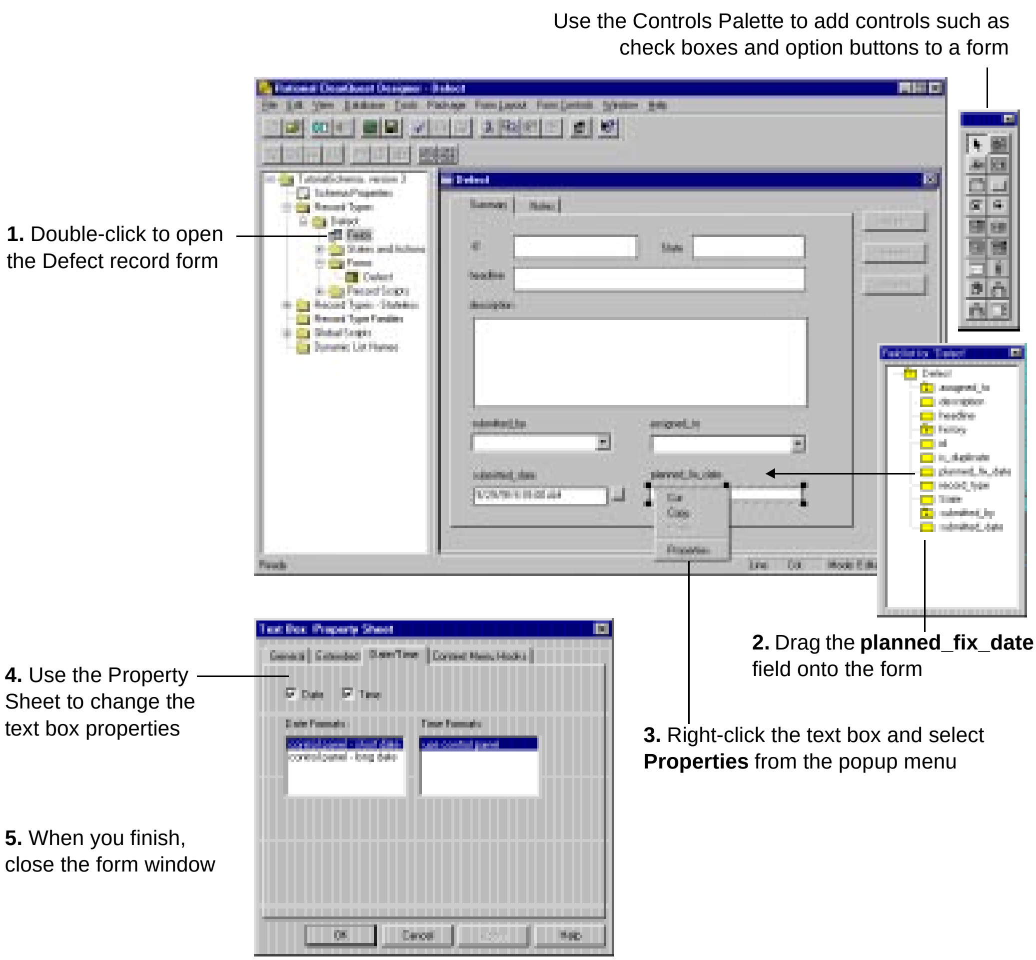
The record form contains these fields

Right-click to define the behavior of the planned_fix_date field in each state

More information? Look up *fields, behaviors* in the ClearQuest Designer Help index.

Adding the new field to the record form

After creating a field, you must add it to the record form. To add the planned_fix_date field to the record form, open the Defect form. In the Workspace, select **Record Types > Defect > Forms > Defect**.



More information? Look up *controls, adding to forms* in the ClearQuest Designer Help index.

Creating an action hook

Hooks are triggers for pieces of code that ClearQuest executes at specified times to more fully implement your workflow. ClearQuest provides many predefined hooks that you can easily modify to suit your needs.You can also use the ClearQuest application programming interface (API) to write hook code in Microsoft VBScript or Perl.

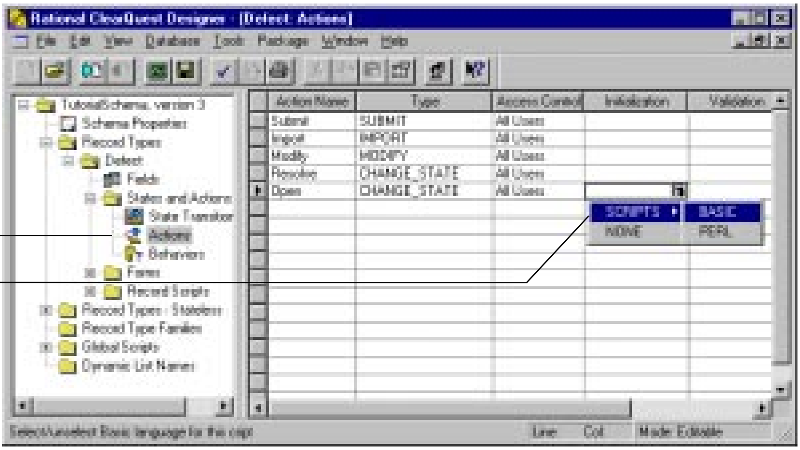
ClearQuest supports four types of hook code:

- Field hooks provide a way to validate the contents of a field or to assign field values.
- Action hooks implement tasks at key points in the life cycle of a record.
- Record scripts allow you to associate a hook with a control, such as a push-button or shortcut menu option, on a single record.
- Global scripts allow you to reuse hook code in other hooks.

In this example, you modify the predefined ACTION_INITIALIZATION hook for the Open action so that it initializes the value of the planned_fix_date field.

Double-click **Actions** to open the Actions grid

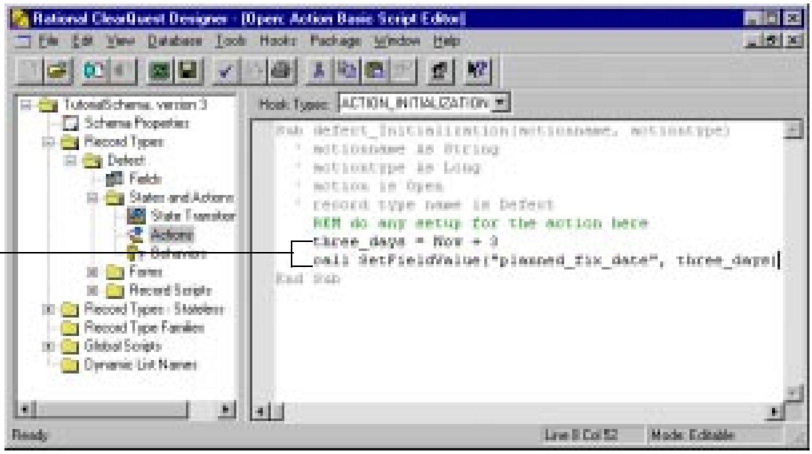
Click the Initialization column for the Open action and select **Scripts > Basic**



This opens the ClearQuest Script Editor.

Use the ClearQuest Script Editor to edit the ACTION_INITIALIZATION hook so that it initializes the value of the planned_fix_date field to the current date + three days.

Add these lines to the script



More information? Look up *hooks, overview* in the ClearQuest Designer Help index. Read Chapter 7, "Using hooks to customize your workflow," in the *Administering Rational ClearQuest* guide.

Checking in the schema

At any time while working on a schema, you can select **File > Test Work** to test your work in progress. This upgrades the test database with your latest changes, providing a quick way to test your changes in the ClearQuest client without affecting your production user database.

When you're satisfied that your schema changes are working correctly, select **File > Check in** to check the schema into the schema repository. Once the schema is checked in, you can use it to upgrade your user database. Select **Database > Upgrade Database**. ClearQuest prompts you to back up the schema repository and the database before upgrading.

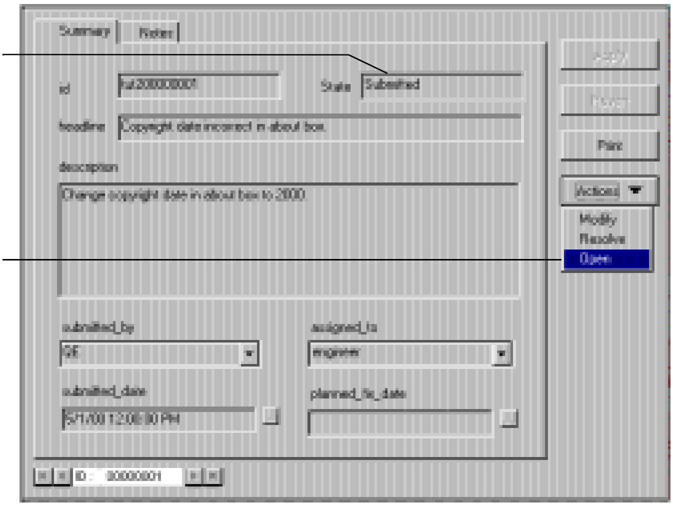
More information? Read Chapter 4, "Working with schemas," in the *Administering Rational ClearQuest* guide.

Working with the new record form

After upgrading the user database with the customized schema, the defect record form works like this:

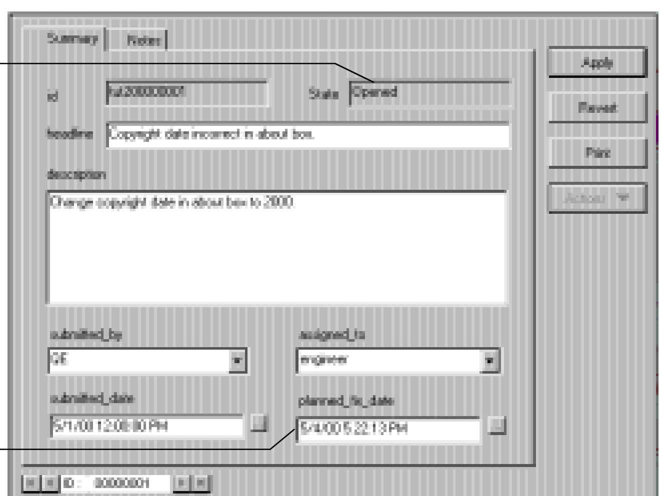
With the record is in the Submitted state . . .

. . . click **Open** to change the record state to Opened



The Open action changes the state of the record to Opened and automatically fills in the planned_fix_date field.

The record state changes to Opened



The planned_fix_date field is filled in automatically

Selecting a ClearQuest schema

Below is a list of the predefined schemas that are included in ClearQuest. ClearQuest schemas consist of various packages that provide specific functionality. You can add individual packages to an existing ClearQuest schema or to your own customized schema. For complete descriptions of ClearQuest schemas and packages, see your *Administering Rational ClearQuest* guide.

Schema	Description
AnalystStudio	Compatible with Rational Suite Analyst Studio. Contains customization for use with Rational RequisitePro.
Blank	Contains only system fields. Use this schema to create a schema from scratch.
Common	Contains metadata that is common to all of the ClearQuest schemas.
DefectTracking	Contains the fields necessary to start using ClearQuest to track defects in a software-development environment.
DevelopmentStudio	Compatible with Rational Suite DevelopmentStudio. Contains fields and rules that work with Rational Purify, Quantify, and PureCoverage.
Enterprise	For use with Rational Suite EnterpriseStudio. Contains fields and hooks that work with all Rational products.
TestStudio	Compatible with Rational Suite TestStudio. Contains fields and rules that work with Rational TeamTest, RequisitePro, Purify, Quantify, and PureCoverage.
UnifiedChangeManagement	Supports the UCM process by providing integration with Rational ClearCase.

Now, you're ready to begin using ClearQuest Designer. Remember that ClearQuest Designer Help contains detailed information to assist you every step of the way. For context-sensitive Help, click  and then click the item you want information about.

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