IBM Rational ClearQuest FAQs: working with databases and schemas

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The IBM® Rational® ClearQuest® administrator manages the required databases and works with the schemas that define the process for working with records in ClearQuest. If you have a question about some aspect of working with databases and schemas, you may find it answered here. These FAQs were compiled from Tech Notes.

You may also want to refer to the Administering Rational ClearQuest guide and to the ClearQuest Designer online Help. The online Help is divided into topics, which are grouped into books. You can print a topic or an entire book. To print a specific topic, right-click in the topic and choose Print or Print Topic from the shortcut menu. To print all the topics in a book, choose a book in the Contents tab in the Help Topics window and then click Print.

For more information, contact Technical Support.

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Section 1. Creating and managing databases

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1.1. Which database is recommended for use with ClearQuest?

ClearQuest supports Microsoft Access and Sybase SQL Anywhere (both supplied with ClearQuest), as well as Microsoft SQL Server and Oracle (NT and UNIX). For specific supported versions, refer to the ClearQuest Release Notes in `Rational\doc\clearquest_readme.htm`.

Use these general guidelines to decide which database vendor to use:

- For initial testing and evaluation or for small groups (fewer than five users), use the entry-level database, Microsoft Access.
- For small- to medium-size groups (five to twenty users), use the mid-level database, SQL Anywhere.
- For larger groups (more than twenty users), large amounts of data, or to achieve better performance, use one of the high-end databases, SQL Server or Oracle.

You can use more than one: for example, you might want to use high-end databases for your schema repository and user databases, and an entry-level or mid-level database for your test database.

Note that it makes no difference which edition of SQL Server (Enterprise or Standard) you use: ClearQuest will run with either of these.

- Enterprise is the version to get if you're planning to run it on Windows NT Server Enterprise Edition.
- Standard is the version to get if you're planning to run it on Windows NT Server (the regular version).

1.2. How do I set up SQL Server 7 databases with ClearQuest?

ClearQuest requires at least two databases:

- the schema repository or master database, where ClearQuest stores schemas
• one or more user databases to contain the data entered into the system by the users of ClearQuest and ClearQuest Web

To use SQL Server 7 with ClearQuest, you must first do the following:

• Have the SQL Server 7 ODBC driver on your machine. The driver is normally installed automatically with ClearQuest.
• Create an empty database in SQL Server for each ClearQuest database desired. (See the next question for details.)

You create the master database first, using the ClearQuest Maintenance Tool, option 2. The tool will prompt for three logins, for backward compatibility with SQL Server 6.5. With SQL Server 7, just specify your one login three times (and then similarly two times when creating each user database). Then you log in to the master database with ClearQuest Designer, decide which schema to base your user database on, and choose Database > New Database to create the client user database.

1.3. How do I create an empty SQL Server 7 database?

If you select SQL Server as a database vendor, every ClearQuest schema repository and client user database (such as the optional SAMPL database) must have its equivalent empty database set up in SQL Server 7. The steps to set up SQL Server databases are outlined in the documentation found in the ClearQuest Information Center.

1.4. How do I do a ClearQuest-specific upgrade from SQL Server 6.5 to SQL Server 7?

When ClearQuest databases for SQL Server 6.5 were created, they were designed using three "system" passwords (admin user, read/write user, and read-only user). When Microsoft developed SQL Server 7, their security methodology changed to an Oracle-like database owner login. Since this is the case, these steps must be followed when you perform an SQL Server upgrade:

1. Install SQL Server 7 on a separate machine from the current ClearQuest server.
2. Create an empty database for the schema repository and for each user database. (See the previous question for details.)
3. Use the ClearQuest Maintenance Tool to move the schema repository to the new server.
4. Use ClearQuest Designer to move the user databases to their new location.

1.5. How do I set up an SQL Anywhere database with ClearQuest?

The SQL Anywhere client and server software from Sybase are included on the Rational CD. The client component is installed automatically when you install ClearQuest, while the server
software must be installed separately, from the CD, by choosing the Sybase server component. The server software can be installed on a machine separate from ClearQuest and doesn't require a ClearQuest license to run. SQL Anywhere implements individual databases as NT files having a .db file extension, located on the machines/directories of your choice.

Detailed instructions on setting up an SQL Anywhere database are given in Tech Note #10773.

**1.6. How do I move my SQL Anywhere database to a new server and a new service?**

For step-by-step instructions on how to move an SQL Anywhere database to a new server and a new service, see Tech Note #13911.

**1.7. How do I create tablespaces in Oracle?**

A tablespace is an area of the disk comprised of one or more files where Oracle keeps the tables, indexes, and clusters that have been defined. An empty tablespace must be created for each database that you want to set up in Oracle. For step-by-step instructions on how to use the SQL Plus Builder tool that comes with Oracle in order to create these tablespaces, see Tech Note #14957 and Tech Note #15496.

**1.8. How do I create a new DB2 database?**

You need to set up one empty DB2 database for the ClearQuest schema repository and one empty DB2 database for each ClearQuest user database (such as the optional SAMPL database). Step-by-step instructions on how to create a DB2 database are given in Tech Note #14972.

**1.9. Do I need a "test" user database?**

Yes! When developing and testing schema changes, it's vitally important to have at least two user databases:

- A production database, into which your users enter real data such as defect records. This database remains associated with the latest version of the schema that's known to be good and has passed some kind of acceptance testing.
- A "test" user database, which may be associated with later versions of the schema (versions that are actively under development/testing).

Schema changes should never be tested using your production database.
1.10. Can I install SQL Server and Internet Information Server on the same machine?

The ClearQuest installation documentation recommends installing the IIS server on a separate machine from the database server but doesn't say why. The first reason is that it's impossible to obtain acceptable performance with these two servers running on the same machine. The second reason is that due to an anomaly in the Microsoft installation programs, unpredictable problems may result when IIS, SQL Server, and SQL Server Service Packs are installed on the same machine. If you have such problems and you absolutely have to install the two servers on the same machine, you may be able to rectify the problems by reinstalling the current SQL Server Service Pack after all other products are installed.

1.11. How do I access an SQL Server database in another domain?

If your ClearQuest schema repository or user databases are on an SQL Server on a machine in a different Windows NT domain from the machine on which you've installed the ClearQuest software, you'll get errors when trying to create or connect to the databases. There are a variety of workarounds for this issue, each of which requires some effort to implement, and one of which will be more appropriate than the others given your circumstances. For a full discussion of this issue and the workarounds, see Tech Note #8148.

1.12. How do I move ClearQuest databases or convert between database vendors?

Be sure to back up your current schema repository and user databases before moving them. To move the schema repository (master) database or convert it between database vendors, you use the ClearQuest Maintenance Tool. Select the "Move an existing schema repository" option and follow the dialogs, specifying the properties of the new database location. If you're using SQL Server or Oracle, you'll need to create an empty target database first, as the destination of the move. After the move, tell ClearQuest client users the new schema repository information so they can connect to the new schema repository. All logins remain the same.

To move a user database or convert it between database vendors, open ClearQuest Designer and choose Database > Database Properties. Select the user database to move and follow the dialogs, changing the existing database properties to the target database properties. When asked if you'd like ClearQuest to move the database, say yes. If you're using SQL Server or Oracle, you'll need to create an empty target database first, as the destination of the move.

1.13. How do I delete records from my database?

To delete records from a ClearQuest database, the DELETE action must exist in the record type(s) of the schema. This will allow users to select the Delete action and delete records one by one.
or do a batch delete. It is not supported to delete records manually from the database back-end (unless advised by IBM Rational Support).

1.14. How do I undelete a record set to the Delete action state?

The Delete action is a true delete. There's no way to undelete this record, as this action deletes the record from the database.

1.15. How do I remove references to deleted repositories/projects from my ClearQuest database?

Unfortunately, you can't remove references to deleted repositories and projects from a ClearQuest database. This is a known bug and has been filed under the number RATL00015916.

1.16. Will creating indexes on some tables in my database positively affect performance?

We already put indexes on the most important tables in the database to improve performance. You're free to create indexes on other tables, but the performance gain will be negligible and these settings will be lost every time you perform a database upgrade.

Section 2. Importing and exporting data

1. How do I export SQL Anywhere data into Access format?
2. How do I import my defect records?
3. How do I import my defect record history?
4. How do I export my defect records?
5. Is it possible to reuse existing reports, queries, and charts in multiple databases?
6. Can data, forms, and state transitions be imported from Rational DDTS product?

2.1. How do I export SQL Anywhere data into Access format?

Copying ClearQuest-related tables from a caller's SQL Anywhere database over to an Access database involves two steps:

1. Creating a DSN within the ODBC Machine Datasources of the user's operating system
2. Importing the data from this DSN into a blank Access database

See Tech Note #11582 for detailed instructions on performing these steps.
2.2. How do I import my defect records?

Here's the procedure for importing your defect records, using the ClearQuest 2.0 Defect record type as an example:

1. Invoke the ClearQuest Import Tool. Select Defect as the destination record type.
2. Select the State field to match the "Imported field with State information:" requested.
3. Select the old_id field to match the "ClearQuest field containing original id:" field that the Import Tool asks for. (If you have an alternate field in your target defect database that you’re using to hold original IDs, use that field instead.)
4. Click Next once and change the mapping so that the destination field stays old_id, but the source field needs to be id. The default mapping has old_id for both.
5. Click the Import button. This will complete with no errors.
6. Exit the ClearQuest Import Tool. Enter the ClearQuest Windows client.
7. Log in to the target database as a user. Create a query with "old_id," "id," and "Headline." You'll now see your old defects under the new defect ID, matched with the old_id field.

2.3. How do I import my defect record history?

You must first import your defect records, as described above. Here's the procedure for importing your history records, using the ClearQuest 2.0 Defect record type as an example:

1. Invoke the ClearQuest Import Tool. Browse to the file where your history.txt file (or wherever you stored your defect history) is located. Click Next.
2. Select Defect as the destination record type.
3. Select the History field to match the Import information requested.
4. Select the old_id field to match the "ClearQuest field containing original id:" field that the Import Tool asks for. (If you have an alternate field in your target defect database that you’re using to hold original IDs, use that field instead.)
5. Click Next once and change the mapping. The history file will map the defect ID to the display_name field. This is the value to be used in the Source Field Label field. The Target Field Label field should display the old_id field. Click Next again.
6. Click the Import button. This will complete with no errors.
7. Exit the ClearQuest Import Tool. Enter the ClearQuest Windows client.
8. Log in to the target database as a user. Create a query with "old_id," "id," and "Headline." You'll now see your old defects under the new defect ID, matched with the old_id field.

2.4. How do I export my defect records?

Here's the procedure for exporting your defect records, using the ClearQuest 2.0 Defect record type as an example:

1. Using the ClearQuest Export Tool, run the export for the Defect record type. Click the radio button "Export all records."
2. When prompted for the fields to export records, select Add All >>.
3. Select the defaults for the names of the files in which the defect records are to be stored.
4. Click Next and take the defaults to select all records in a comma-delimited text file. Click Finish to execute the export operation.
5. Invoke the ClearQuest Import Tool. Select Defect as the destination record type.
6. Select the State field to match the "Imported field with State information:" requested.
7. Select the old_id field to match the "ClearQuest field containing original id:" field that the Import Tool asks for. (If you have an alternate field in your target defect database that you're using to hold original IDs, use that field instead.)
8. Click Next twice. The default mapping is OK.
9. Click the Import button. This will complete with no errors.
10. Exit the ClearQuest Import Tool. Enter the ClearQuest Windows client.
11. Log in to the target database as a user. Create a query with "old_id," "id," and "Headline." You'll now see your old defects under the new defect ID, matched with the old_id field.

2.5. Is it possible to reuse existing reports, queries, and charts in multiple databases?

Yes. Queries, reports, and report formats can be reused to save time in the development, maintenance, and use of multiple databases. The user databases need to have been built from the same schema (ideally, the same version of the same schema), however. Given that this is true, here are the steps:

1. Open the source database from the ClearQuest client.
2. Select a query, report, or report format to move and choose the corresponding Export option from the drop-down menu. Save the results.
3. Repeat step 2 for all desired components.
4. Open the target database.
5. Select the folder you want the component placed in.
6. Right-click and choose Import Query, then select the file that the query was saved as. If you exported reports or report formats, you'll need to change the Files of Type window to select those formats. Import Report won't appear on the drop-down menu.
7. Repeat steps 5 and 6 for all desired components.

Charts can be transferred using this method, though they're seen as queries for import and export.

2.6. Can data, forms, and state transitions be imported from Rational DDTS product?

Only data can be imported into ClearQuest from DDTS. This is done by creating an import file format that the ClearQuest Import Tool understands, such as the comma-separated format, where all field values must be enclosed by double quotes. The Import Tool also recognizes other delimiters, such as the colon or tab.
Forms and state transitions must be created manually in ClearQuest Designer.

**Section 3. Working with schemas**

1. **How do I register or install packages in the schema repository?**
2. **How do I make packages visible in the Package Wizard list?**
3. **How do I import the Defect Tracking Schema template from a newer version of ClearQuest?**
4. **How can I view parent records from a child record?**
5. **How do I create an API hook including a parent-child relationship and a stateless record type?**
6. **How do I debug my ClearQuest hooks?**
7. **Can I copy forms from one schema to another or from one record type to another?**
8. **What is the Test Work feature and how do I use it?**
9. **How do I manually undo a schema checkout?**
10. **How do I export or import my schemas?**

**3.1. How do I register or install packages in the schema repository?**

To make a package available from the list of packages in ClearQuest Designer, you need to add it to the schema repository. You do this manually via the `packageutil installintoschemarepo` utility, with this string of commands:

```
packageutil installintoschemarepo [-help] [-dbset dbset-name] clearquest-login
                             clearquest-password package-name package-version |
                             package-folder-path [-checkin | -nocheckin]
```

You'll find a list of packages, including names and versions, under the ClearQuest installation folder / packages.

**3.2. How do I make packages visible in the Package Wizard list?**

Follow these steps to make a package visible in the Package Wizard list:

1. In the Registry Editor, choose Start > Run and type in `regedit32`.
2. Opening up `HKEY_LOCAL_MACHINE\Software\Rational Software\ClearQuest Packages`, locate the package to be installed and find the appropriate version of the package.
3. Open the version folder, choose Keywords, and remove the keyword `Hide_me`.

The package should now be visible when you choose the More Packages option in the Package Wizard. If not, run the following command from the DOS prompt:

```
packageutil installpackage clearquest-login clearquest-password package-name package-
version package-folder-path
```
3.3. How do I import the Defect Tracking Schema template from a newer version of ClearQuest?

You want to import the Defect Tracking Schema template from a newer version of ClearQuest into a version of the master schema that's been upgraded from an older version. You first need to make sure that you don't already have a schema called Defect Tracking, or the import will fail. Then you need to run `cqload importschema` on the `DefectTracking.schema` in the schema subdirectory off of ClearQuest home.

```
cqload importschema clearquest-login clearquest-password path-to-import.txt
```

You'll likely get errors complaining about missing packages, and you'll be able to add most of these packages into the schema using the Package Wizard. If you get an error about the `defecttrackingsetup` package, run the following command from ClearQuest home to get around it:

```
packageutil installpackage admin password defecttrackingsetup 1.0 cqhome\packages \defecttrackingsetup
```

3.4. How can I view parent records from a child record?

To view parent records from a child record, do the following:

1. In ClearQuest Designer, choose the `REFERENCE_LIST` type of field and right-click on Field Properties.
2. In the Back Reference Field box, type the name of a back-referencing field.
3. From the Field list, drag and drop the `REFERENCE_LIST` onto the child form.

3.5. How do I create an API hook including a parent-child relationship and a stateless record type?

For a detailed example with instructions, see Tech Note #15286.

3.6. How do I debug my ClearQuest hooks?

When you start writing your own hooks, there are several methods of debugging them. The ClearQuest API method `outputDebugString` can be used to create a message that can be displayed in a debugger or similar tool. `Dbwin32.exe`, included in the ClearQuest installation, is one tool capable of displaying these messages. ( `Dbwin32.exe` doesn't display debugging information on Windows 95 or 98.) If you use Internet Explorer 4.0, the Microsoft Script Debugger (available for downloading) can also be used to debug hooks. If you place a "stop" statement in ClearQuest hook code, the debugger will be invoked when the "stop" command is seen.
3.7. Can I copy forms from one schema to another or from one record type to another?

It's functionally possible to copy forms from one schema to another or from one record type to another within a schema, but certain conditions must be met for the form to work correctly with the new schema or record type. Since a form contains references to ClearQuest fields (by name and by specific characteristics such as type and length), these factors must be the same between the two schemas or record types. Failure to work within this constraint will result in various runtime difficulties when trying to use the form in the new schema or record type.

That said, here's how to copy a form from one schema to another:

1. In ClearQuest Designer, with the first schema checked out, expand the workspace view to show the form.
2. Right-click the form and choose Export Form. Specify a filename.
3. Check out the second schema, navigate to the Forms folder under the desired record type, right-click, and choose Import Form. Navigate to the file you created in step 2.

For a discussion of form-copying scenarios that will and will not work, see Tech Note #8314.

3.8. What is the Test Work feature and how do I use it?

The Test Work feature provides an easy and efficient way to make schema changes and test them. When used correctly, the feature can speed up schema development and facilitate the maintenance of schema versions. On the other hand, when used incorrectly, the feature can corrupt your production database and cause downtime for ClearQuest users. For complete instructions on how to develop schemas using the Test Work feature, see Tech Note #8270.

3.9. How do I manually undo a schema checkout?

If a schema version becomes corrupt/unusable and you want to delete it and revert to an earlier schema version, you won't be able to do this in ClearQuest Designer if someone has the schema checked out. In this case, you may want to manually undo the schema checkout. But be forewarned that you should only do this as a prelude to deleting a schema version, and you should back up all your databases (both schema and user data) before attempting it.

After backing up your databases, connect to the schema repository using either your database vendor's native SQL facility or the ClearQuest pdsql command. Then execute the following SQL command:

```
update master_schemas
set status=1, checked_out_rev_dbid=0, check_out_login=null
where name=schema-name;
```

Then invoke ClearQuest Designer and delete the problematic schema version.
3.10. How do I export or import my schemas?

ClearQuest's command-line utility \texttt{cqload} enables you to export or import an entire schema from or into your schema repository. To use \texttt{cqload}, you must be at the command prompt in the ClearQuest directory. In addition, the schema to be exported must not be checked out. Also, if you run \texttt{cqload} while ClearQuest Designer is running, you'll need to exit Designer and log in again to see your changes.

Use the \texttt{exportschema} subcommand to export an entire schema to a text file. This can be used to create files that can be used by \texttt{importschema}. The syntax is as follows:

\texttt{>cqload exportschema \texttt{cq-login} \texttt{cq-password} \texttt{schema-name} \texttt{schema-path}}

Use the \texttt{importschema} subcommand to import an entire schema from a textual representation and add it to your schema repository. It can be useful if you want to share entire schemas with sites that can't access your schema repository or that have a different schema repository. The syntax is as follows:

\texttt{>cqload importschema \texttt{cq-login} \texttt{cq-password} \texttt{schema-path}}

Section 4. Working with forms and fields

1. How do I create dynamic pick lists?
2. How do I refresh a dynamic pick list if I change the value of the field that the list depends on?
3. How do I create a list box where several objects from a constant list can be selected?
4. How do I display a constant list in the order in which I entered the list rather than in ascending order?
5. How do I eliminate the time component from the DATE_TIME field?
6. How do I get the button on my form to output the value of one of the fields on my form to the Debug Window?
7. How do I change the tab order of fields on a form?
8. How do I set the tab index on a form?
9. How do I set permissions on a particular field in the ClearQuest schema?
10. Is it possible to modify a form's contents via VBScript?
11. Can I set default field values on a per-user basis? Per project? Per group?

4.1. How do I create dynamic pick lists?

Dynamic lists are helpful when you want to add values to a list without editing the schema. If you have administrative privileges, you can add values to a dynamic choice list from the ClearQuest client. For instructions on how to do this, see \texttt{Tech Note #13115}. 
4.2. How do I refresh a dynamic pick list if I change the value of the field that the list depends on?

If you're creating the choice list for the first time, make sure you check the "Recalculate choice list" box. If you have an existing choice list and it's not refreshing, reselect the type from the choice list pulldown and it will give you the opportunity to check the "Recalculate choice list" box.

4.3. How do I create a list box where several objects from a constant list can be selected?

To create a list box where several objects from a constant list can be selected, start with a field of the multiline text string type. Then drag a List Box control onto the form and set it to your new field.

4.4. How do I display a constant list in the order in which I entered the list rather than in ascending order?

This is controlled by the properties of the list box on the form. Go to the form and right-click. Choose Properties > Extended tab and uncheck "Auto Sort." Your selections should now appear in the order in which they were entered.

4.5. How do I eliminate the time component from the DATE_TIME field?

In the ClearQuest GUI, the DATE_TIME field always displays the date and time by default. You can change this to display only the date by changing the field properties on the form. On the Submit/Record form for the property sheet, right-click on the DATE_TIME field and then in the DATE_TIME tab, and uncheck the Time check box.

4.6. How do I get the button on my form to output the value of one of the fields on my form to the Debug Window?

For step-by-step instructions on how to do this, see Tech Note #16174.

4.7. How do I change the tab order of fields on a form?

Follow these steps:

1. Check out the desired schema and open the form in ClearQuest Designer.
2. Choose Form Layout > Set Tab Order. You'll be shown how the form is currently ordered.
3. Click the field that you'd like to tab to first. This field will now be labeled as 1.
4. Click the field that you'd like to tab to second, then the one you'd like to tab to third, and so on.
   If you make a mistake in the process, start again at step 1.
5. Save the changes and test your work to make sure that the tabs are now working as desired.
6. Check in the schema and choose Database > Upgrade Database to save the changes to your
production database.

4.8. How do I set the tab index on a form?

Follow these steps:

1. Open the form in ClearQuest Designer, choosing the tab whose order you want to change.
   Then open Tab Properties by either double-clicking the tab or right-clicking and choosing Tab
   Properties.
2. From Tab Properties, select a new index number (0 indicates the first tab) reflecting the order
   in which you want the tab to open. Then close the form and reopen it. You'll see that the tab
   you selected has moved to its new position.
3. Repeat this procedure for any other tab(s) whose order you want to change.

4.9. How do I set permissions on a particular field in the ClearQuest schema?

If you want to set field behavior with a permission hook, you need to do two things:

1. In the Permission column of the Fields grid, select BASIC, and write the hook that returns the
   desired permission in the hook function name.
2. In the Behaviors grid, set the behavior for the field to USE_HOOK for the desired states.

After you write the hook (1), you need to tell ClearQuest where to use it (2).

4.10. Is it possible to modify a form's contents via VBScript?

The physical layout of a form (number of tabs, the fields that appear in a tab, and such) can't
be altered via VBScript. However, if you're trying to limit tab visibility, you can do this in the Tab
Properties dialog. See "Adding tab-level access" in the ClearQuest Designer online Help.

If you're trying to dynamically alter a field's behavior (for example, by making it mandatory or read-
only on a per-user or per-group basis), you can do it with VBScript using the Field Permission
hook. The contents of a field can also be altered dynamically via hooks. This is typically done in
the Default Value hook.

4.11. Can I set default field values on a per-user basis? Per project? Per
   group?

Yes. This can be done in the Field Default Value hook, which sets the initial value of the field
during a Submit action. You can either use VBScript or SQL, or supply a Constant value. You
can set initial field values during the initialization of any other action as well, using the Action Initialization hook, with a call to the `SetFieldValue()` method. A typical Default Value hook might look something like this:

```vbs
Dim submitter Dim session Set session = GetSession submitter = session.GetUserLoginName() If submitter="reviewer1" then      SetFieldValue("assign_to", "reviewer2") Else      SetFieldValue("assign_to", "reviewer1") End if
```

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