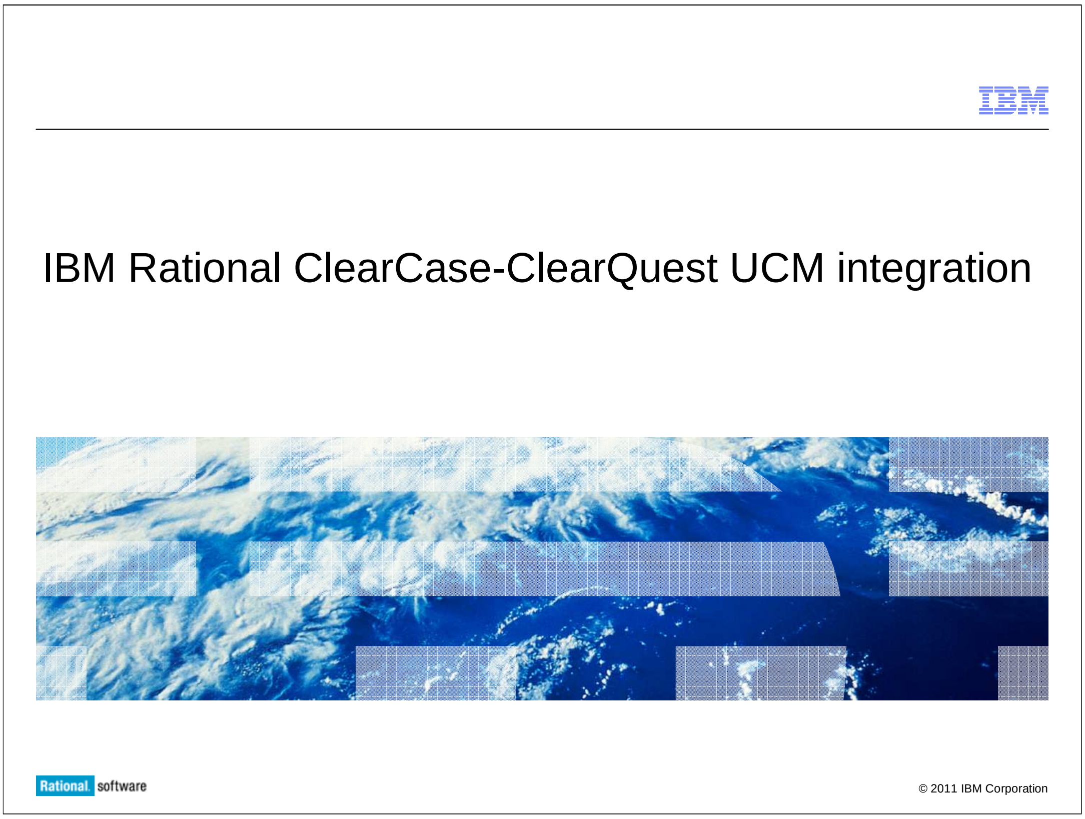


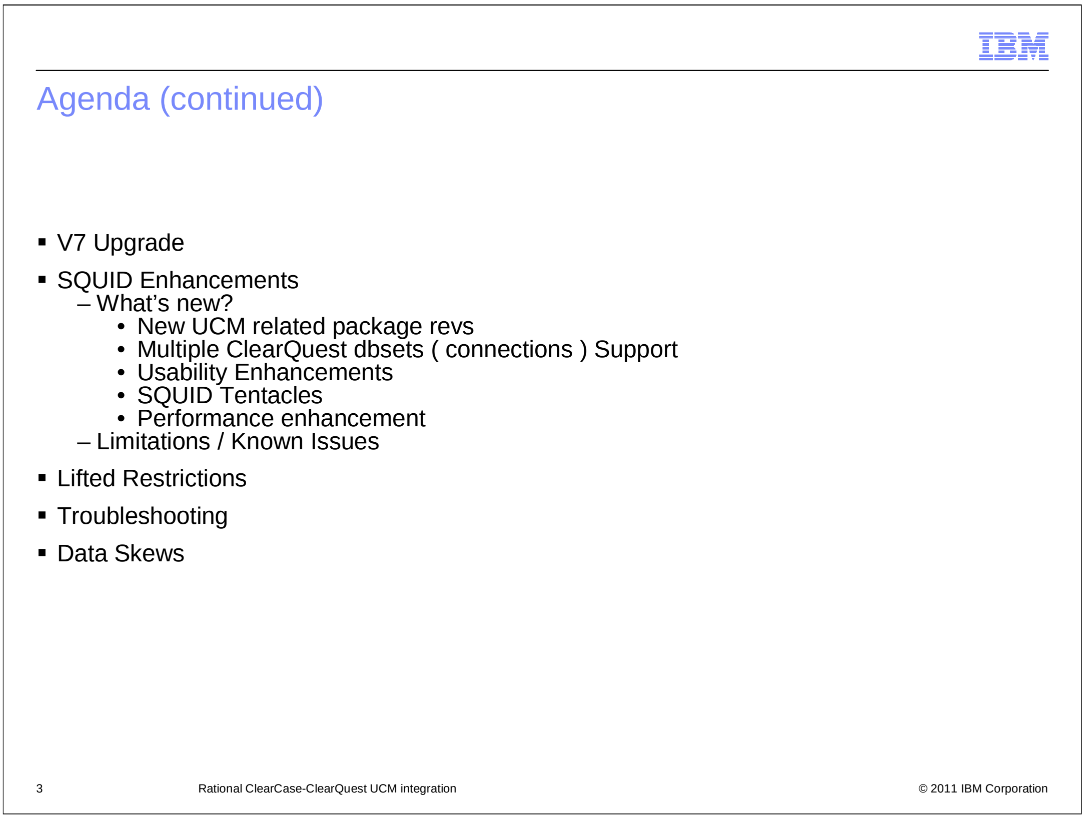
IBM Rational ClearCase-ClearQuest UCM integration

This module will instruct you on how to setup and use the integration between IBM Rational ClearCase UCM and IBM Rational ClearQuest for version 7 and higher.

Agenda

- SQUID Overview
  - SQUID definition
  - Configuration
  - Package overview
  - Components
  - Use Cases
  - Policies

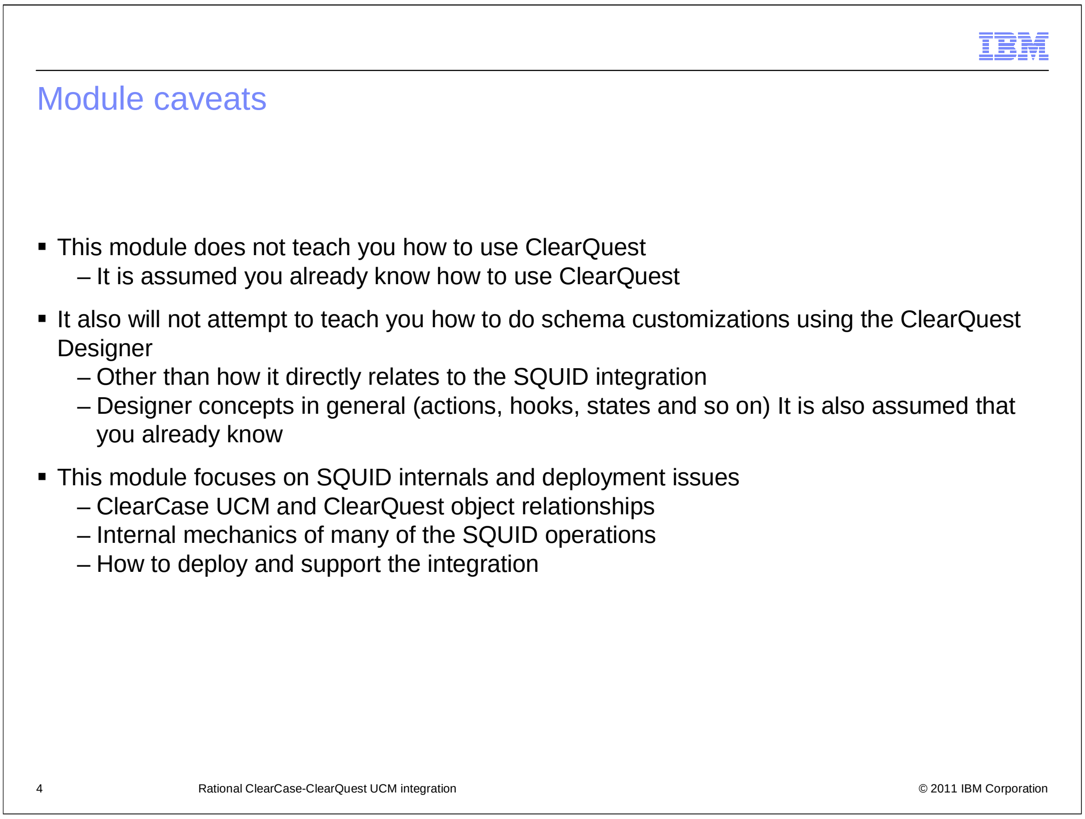
In this module, you will learn what the “SQUID” process is and how the UCM-ClearQuest integration uses it. You will also learn how to configure the integration; specifically what packages need to be added to your ClearQuest schema in order to get this integration to work. Finally, you will see some specific use cases in the UCM-ClearQuest integration as well the “Policies” that this integration introduces into your UCM environment



Agenda (continued)

- V7 Upgrade
- SQUID Enhancements
  - What’s new?
    - New UCM related package revs
    - Multiple ClearQuest dbsets (connections) Support
    - Usability Enhancements
    - SQUID Tentacles
    - Performance enhancement
  - Limitations / Known Issues
- Lifted Restrictions
- Troubleshooting
- Data Skews

The SQUID enhancements made in V7 in addition to known issues and limitations will be discussed. The restrictions which have been lifted from previous versions of this integration, some troubleshooting techniques, and information regarding data skew will also be discussed.

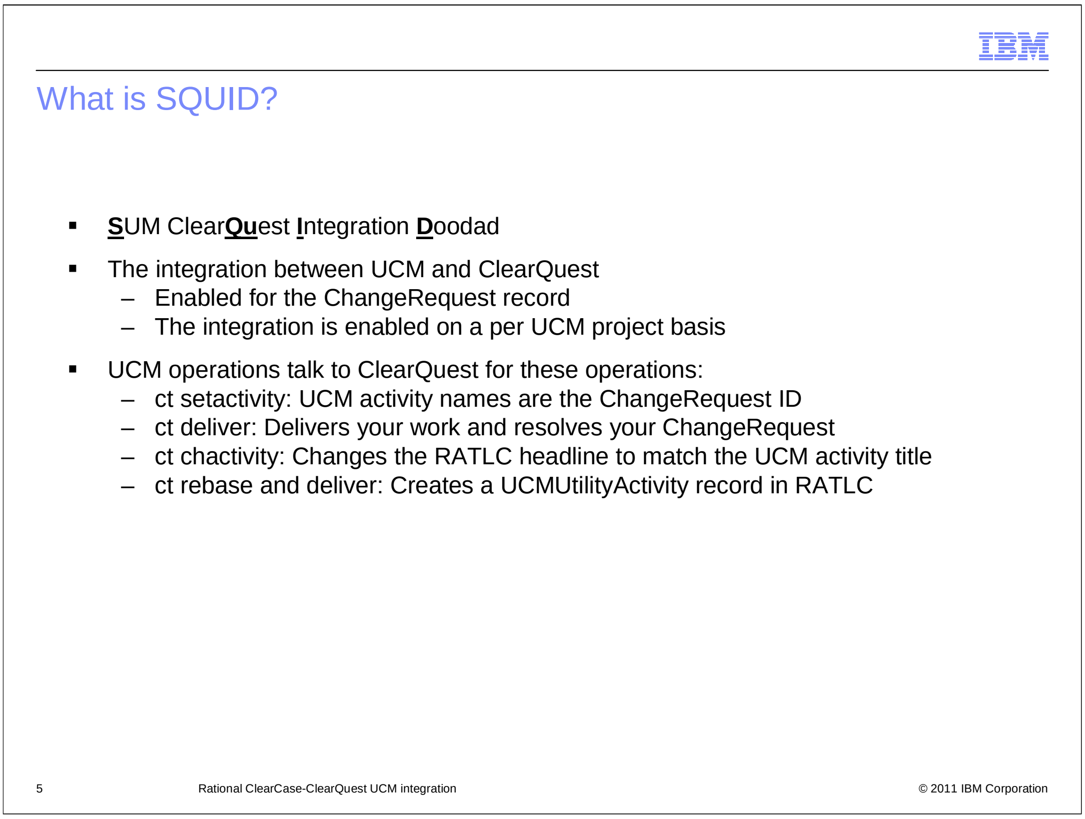


Module caveats

- This module does not teach you how to use ClearQuest
  - It is assumed you already know how to use ClearQuest
- It also will not attempt to teach you how to do schema customizations using the ClearQuest Designer
  - Other than how it directly relates to the SQUID integration
  - Designer concepts in general (actions, hooks, states and so on) It is also assumed that you already know
- This module focuses on SQUID internals and deployment issues
  - ClearCase UCM and ClearQuest object relationships
  - Internal mechanics of many of the SQUID operations
  - How to deploy and support the integration

4 Rational ClearCase-ClearQuest UCM integration © 2011 IBM Corporation

Viewers of this module should already have basic knowledge of ClearCase UCM and ClearQuest. This module will focus on SQUID and how it relates to the UCM-ClearQuest Integration. It will also cover how to deploy this integration.

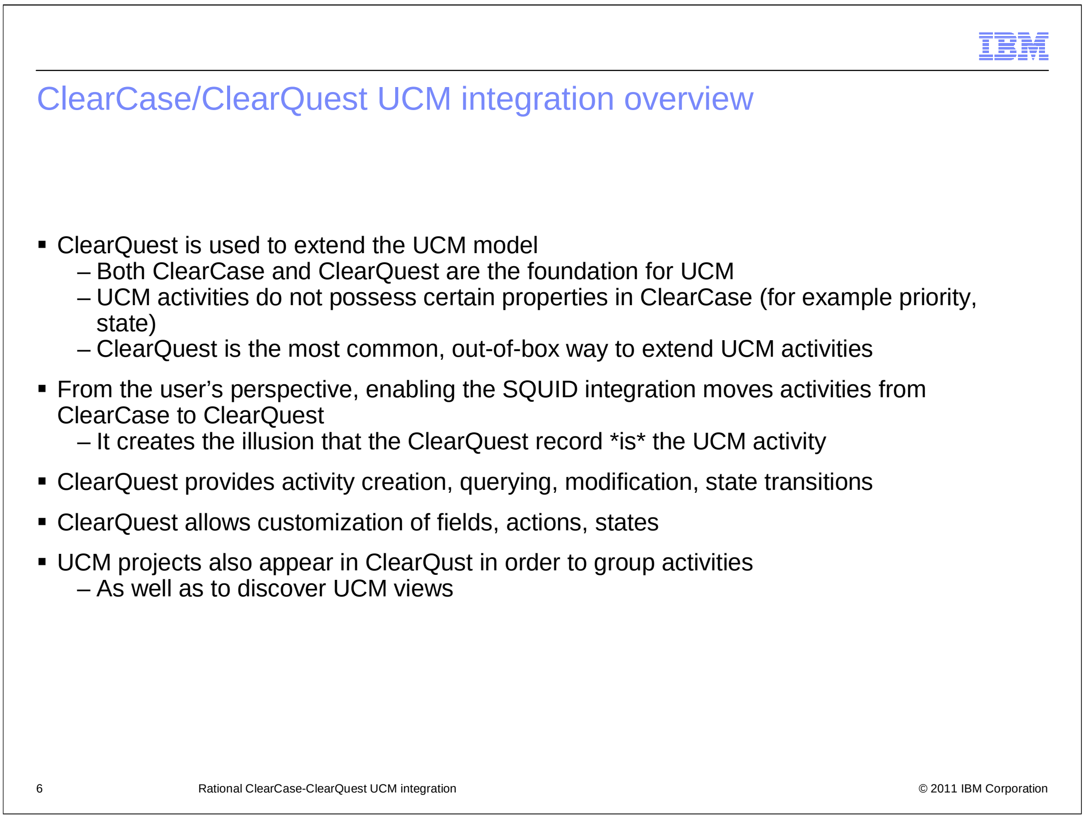


What is SQUID?

- **S**UM Clear**Qu**est **I**ntegration **D**oodad
- The integration between UCM and ClearQuest
  - Enabled for the ChangeRequest record
  - The integration is enabled on a per UCM project basis
- UCM operations talk to ClearQuest for these operations:
  - ct setactivity: UCM activity names are the ChangeRequest ID
  - ct deliver: Delivers your work and resolves your ChangeRequest
  - ct chactivity: Changes the RATLC headline to match the UCM activity title
  - ct rebase and deliver: Creates a UCMUtilityActivity record in RATLC

5 Rational ClearCase-ClearQuest UCM integration © 2011 IBM Corporation

The word “SQUID” as it pertains to Rational products is an acronym for “**S**um Clear**QU**est **I**ntegraiton **D**oodad. SQUID is the process that drives the UCM-ClearQuest integration. This UCM-ClearQuest integration is enabled on a per project basis. This means that you can have some projects that are ClearQuest enabled and others that are not ClearQuest enabled stored in the same UCM project VOB. Some examples of UCM operations that make use of “SQUID” in order to communicate with ClearCase are: cleartool setactivity, where the UCM activity name is the ClearQuest change request ID; or a cleartool deliver, which delivers code from one stream to another, resolving the change request. Other examples can be seen in this slide.

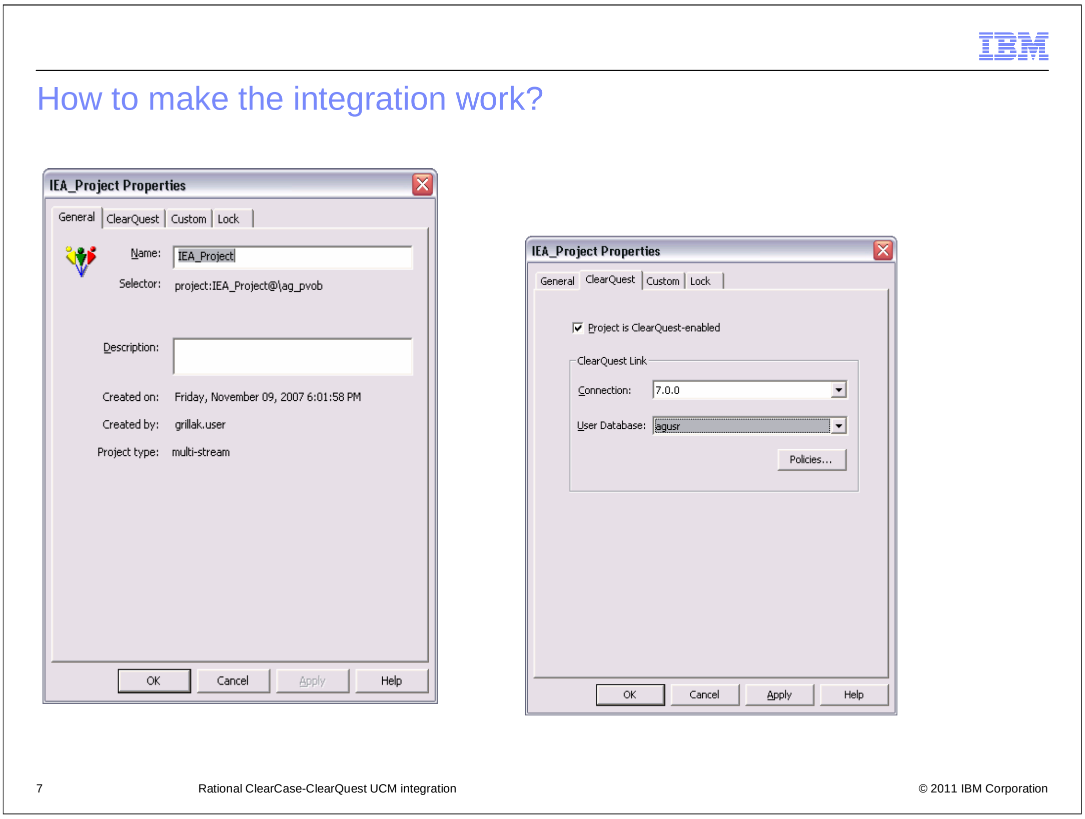


ClearCase/ClearQuest UCM integration overview

- ClearQuest is used to extend the UCM model
  - Both ClearCase and ClearQuest are the foundation for UCM
  - UCM activities do not possess certain properties in ClearCase (for example priority, state)
  - ClearQuest is the most common, out-of-box way to extend UCM activities
- From the user’s perspective, enabling the SQUID integration moves activities from ClearCase to ClearQuest
  - It creates the illusion that the ClearQuest record *is* the UCM activity
- ClearQuest provides activity creation, querying, modification, state transitions
- ClearQuest allows customization of fields, actions, states
- UCM projects also appear in ClearQust in order to group activities
  - As well as to discover UCM views

6 Rational ClearCase-ClearQuest UCM integration © 2011 IBM Corporation

ClearQuest is in essence an extension of the ClearCase UCM model. When a UCM project is ClearQuest enabled, ClearCase activities become ClearQuest records. ClearQuest records possess properties that are not present in base UCM activities. Properties such as fields for priority, severity, owner and so forth. It also provides, querying, modification, and state transitions for UCM activities. A UCM_Project record is created in the ClearQuest user database when a project is ClearQuest enabled. This UCM project record is used to group activities (that is ClearQuest records) in Clearquest.



How to make the integration work?

IEA_Project Properties

General | ClearQuest | Custom | Lock

Name: IEA_Project

Selector: project:IEA_Project@\ag_pvob

Description:

Created on: Friday, November 09, 2007 6:01:58 PM

Created by: grillak.user

Project type: multi-stream

IEA_Project Properties

General | ClearQuest | Custom | Lock

☑ Project is ClearQuest-enabled

ClearQuest Link

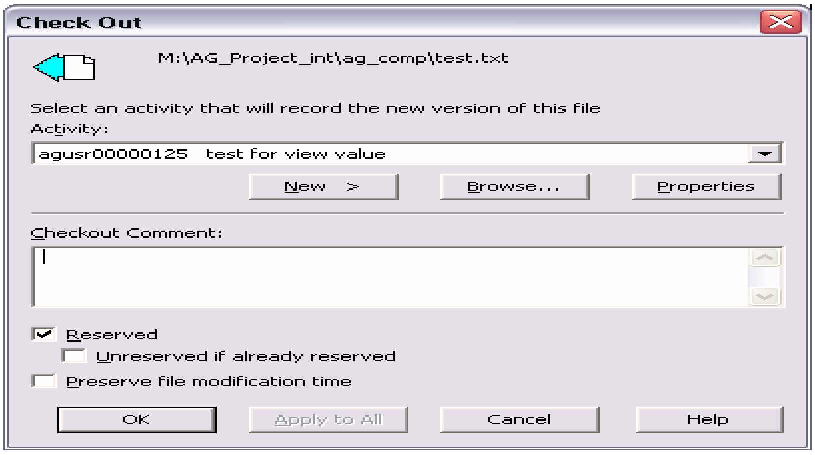
Connection: 7.0.0

User Database: agusr

Policies...
OK
Cancel
Apply
Help

In order to make a UCM project ClearQuest enabled, you need to do go through a few steps. First, right-click the project in project explorer and select properties. In the properties window, go to the ClearQuest tab and check off the box next to “Project is ClearQuest Enabled”. Finally, go ahead and select the appropriate ClearQuest connection and user database.

How it works from Windows ClearCase explorer



Check Out

M:\AG_Project_int\ag_comp\test.txt

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

Activity: agusr00000125 test for view value

Checkout Comment:

☑ Reserved

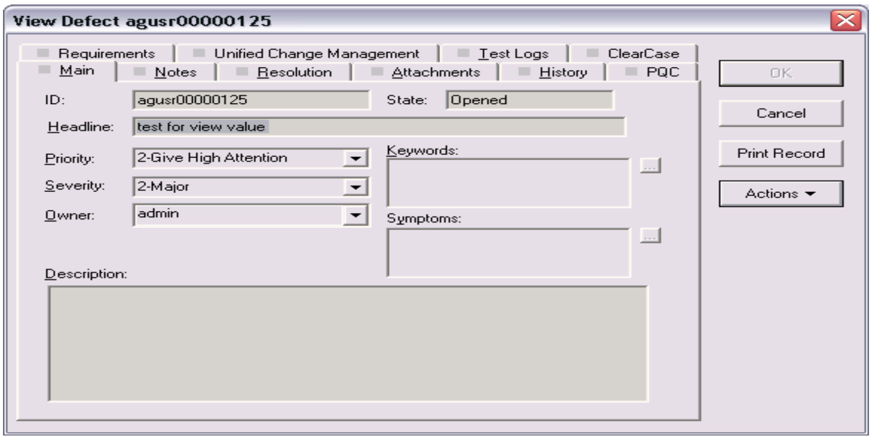
☐ Unreserved if already reserved

☐ Preserve file modification time

When performing a checkout in ClearCase explorer it initially looks like a base UCM environment. You are presented with a dialogue in which you must choose an activity to perform your operation. Just as in a non-ClearQuest enabled project you get an option to either use an existing activity or create a new activity (in the example above you are going to use an existing activity). However, as mentioned in a UCM-ClearQuest environment, UCM activities are actually ClearQuest records. You can see this in the next slide.

How it works from Windows ClearCase explorer (continued)

- This is an example of what the properties of a UCM activity looks like in a UCM-ClearQuest environment



View Defect agusr00000125

ID: agusr00000125

State: Opened

Headline: test for view value

Priority: 2-Give High Attention

Severity: 2-Major

Owner: admin

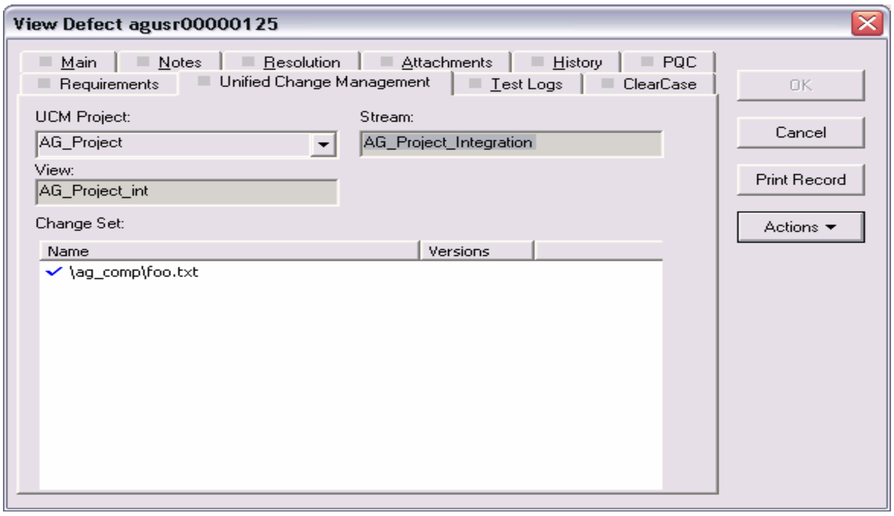
Keywords:

Symptoms:

Description:

Looking at the illustration here you notice that when you pull up the properties of UCM activity you are actually looking at a ClearQuest record. As stated earlier in this module, UCM activities are actually ClearQuest records in a ClearQuest enabled UCM project. The key aspect to this is that the ClearQuest records used in the integration contain a “Unified Change Management” tab as seen in the screen capture above. This tab is installed into the ClearQuest schema when the Unified Change Management package is applied to the schema. The Unified Change Management tab is discussed in the next slide.

How it works from Windows ClearCase explorer (continued)



View Defect agusr00000125

UCM Project: AG_Project

Stream: AG_Project_Integration

View: AG_Project_int

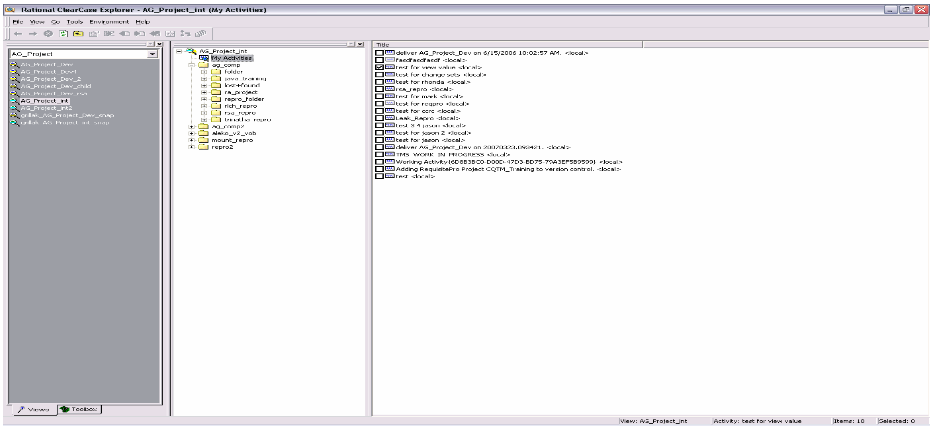
Change Set:

Name	Versions
✓ \ag_comp\foo.txt	

The Unified Change Management tab contains three fields. First, the UCM project field which is where the UCM project that this ClearQuest record is linked to is defined. Note that a ClearQuest record can only be tied to one project. Once it has been linked to a UCM project it cannot be linked to any other project. Next there is the stream field. This is where the particular UCM stream that this ClearQuest record is linked to is defined. Also note that a ClearQuest record can only be linked to one stream at a time. The View field is where you can see which view is currently “set” to this ClearQuest record. This field is only populated when a view is currently set to the ClearQuest record.

How it works from windows ClearCase explorer (continued)

- Selecting ‘My Activities’ shows the activities assigned to you and the one ‘checked’ is the current activity set in the view



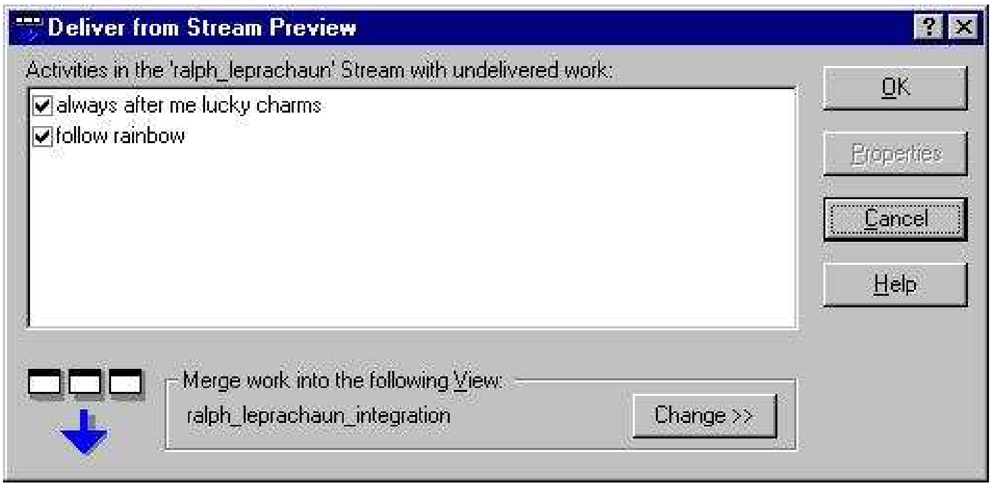
Rational ClearCase Explorer - AG_Project_int (My Activities)

☐ deliver AG_Project_Dev on 6/15/2006 10:02:57 AM. <local>
☐ fasdfasdfasdf <local>
☑ test for view value <local>
☐ test for change sets <local>
☐ test for rhonda <local>
☐ rsa_repro <local>
☐ test for mark <local>
☐ test for reqpro <local>
☐ test for ccrc <local>
☐ Leak_Repro <local>
☐ test 3 4 jason <local>
☐ test for jason 2 <local>
☐ test for jason <local>
☐ deliver AG_Project_Dev on 20070323.093421. <local>
☐ TMS_WORK_IN_PROGRESS <local>
☐ Working Activity{6D8B3BC0-D00D-47D3-BD75-79A3EF5B9599} <local>
☐ Adding RequisitePro Project CQTM_Training to version control. <local>
☐ test <local>

View: AG_Project_int | Activity: test for view value | Items: 18 | Selected: 0

As mentioned in the previous slide each ClearQuest record can be assigned to only one UCM project and stream. In ClearCase explorer clicking on my activities displays all the activities that are linked to this particular view. Just as in a non-ClearQuest enabled project, the activity that is checked off is the one that is currently set in your view.

SQUID provides ClearCase/ClearQuest conveniences


Deliver from Stream Preview

Activities in the 'ralph_leprachaun' Stream with undelivered work:

☑ always after me lucky charms

☑ follow rainbow

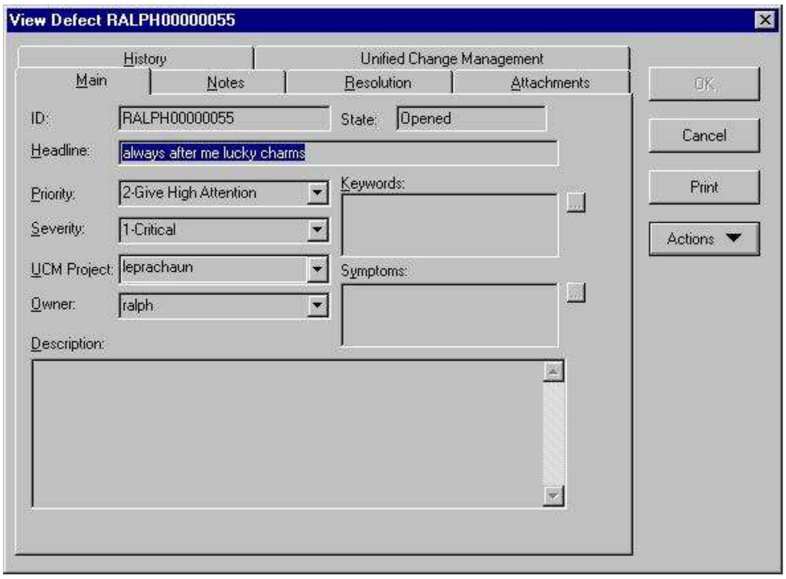
Merge work into the following View:

ralph_leprachaun_integration

12 Rational ClearCase-ClearQuest UCM integration

One of the goals of the SQUID integration is to gray the line between ClearCase and ClearQuest. To that end, much of SQUID's graphical user interface (or GUI) functionality warps from ClearCase to ClearQuest, then back to ClearCase – perhaps unbeknownst to the user. This creates the illusion that "bound" ClearQuest records and UCM activities are one and the same. Here you are looking at a deliver preview from ClearCase. In the deliver preview you see the UCM activities that are involved in the deliver. What you are looking at are actually the "headlines" of ClearQuest records. It looks as though you are looking at UCM activities when you are actually looking at ClearQuest records.

Headline field



View Defect RALPH00000055

ID: RALPH00000055

State: Opened

Headline: always after me lucky charms

Priority: 2-Give High Attention

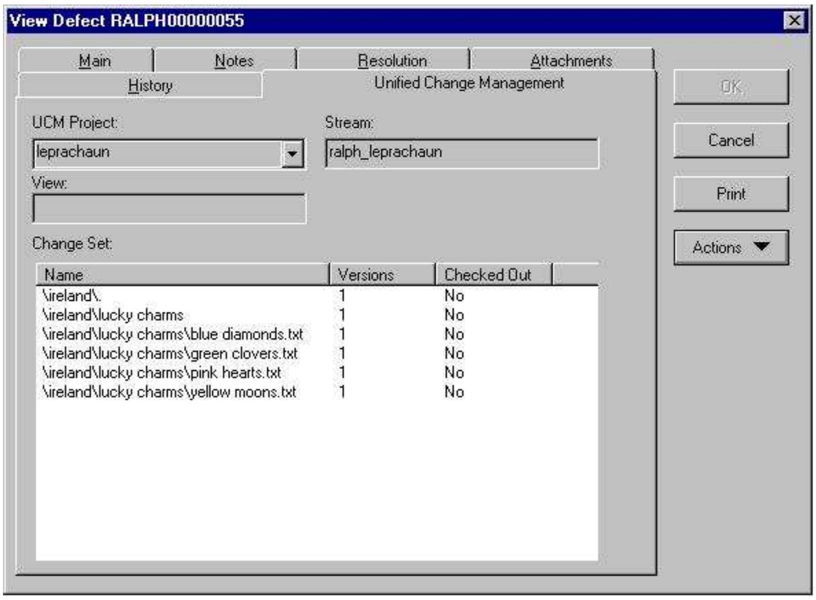
Severity: 1-Critical

UCM Project: leprachaun

Owner: ralph

As mentioned previously, in a UCM-ClearQuest integration, the headline field is what shows up in the ClearCase project explorer. When you highlight a stream in the project explorer the headline for all the ClearQuest records appear on the left pane. In addition, when you bring up the properties for these records you are looking at the ClearQuest record.

The UCM tab



UCM Project: leprachaun

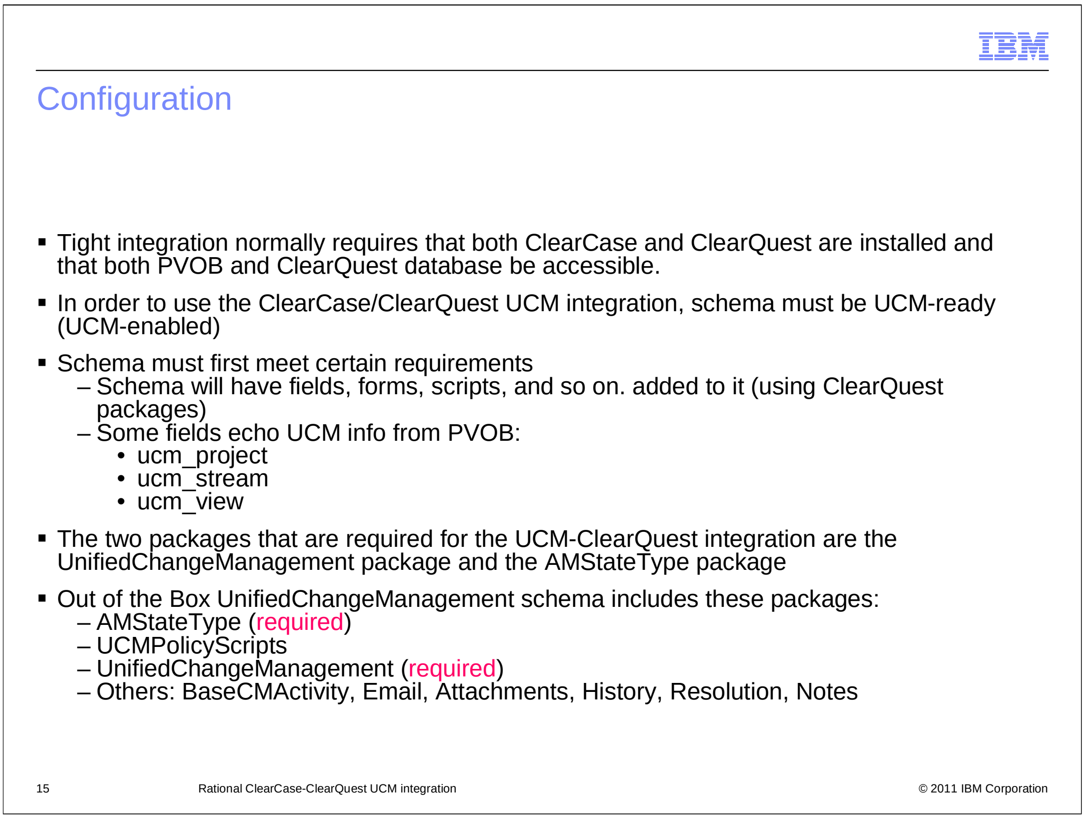
Stream: ralph_leprachaun

View:

Change Set:

Name	Versions	Checked Out
\ireland\.	1	No
\ireland\lucky charms	1	No
\ireland\lucky charms\blue diamonds.txt	1	No
\ireland\lucky charms\green clovers.txt	1	No
\ireland\lucky charms\pink hearts.txt	1	No
\ireland\lucky charms\yellow moons.txt	1	No

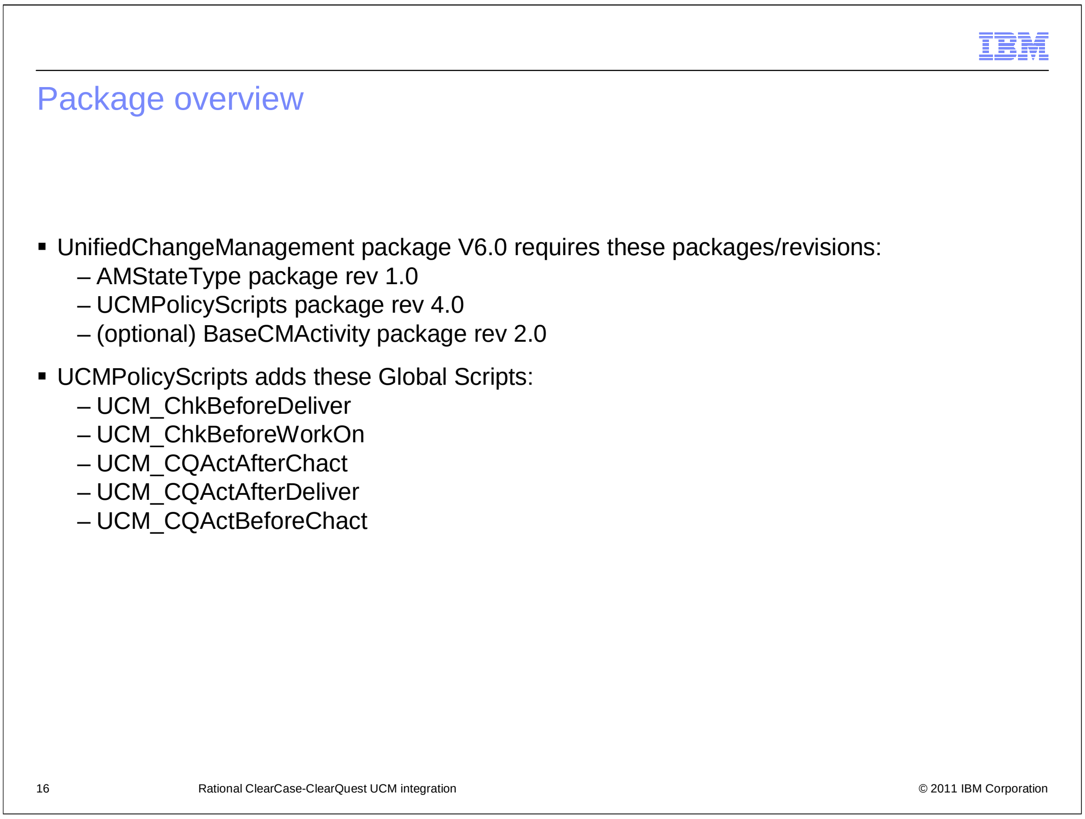
Again, every ClearQuest record that is used in UCM has a Unified Change Management tab. This is where you can see all the relevant UCM project information. You can see the UCM project that is being used, and the UCM stream it is linked to. Also if the ClearQuest record is currently set to a UCM view, the view field is populated with the view name. Finally the change set section is where the ClearQuest record catalogues all the ClearCase change sets tied to that record. If you right click any of these change sets you are able to bring a up a version tree of the element and compare the element with it's previous versions.



Configuration

- Tight integration normally requires that both ClearCase and ClearQuest are installed and that both PVOB and ClearQuest database be accessible.
- In order to use the ClearCase/ClearQuest UCM integration, schema must be UCM-ready (UCM-enabled)
- Schema must first meet certain requirements
  - Schema will have fields, forms, scripts, and so on. added to it (using ClearQuest packages)
  - Some fields echo UCM info from PVOB:
    - ucm_project
    - ucm_stream
    - ucm_view
- The two packages that are required for the UCM-ClearQuest integration are the UnifiedChangeManagement package and the AMStateType package
- Out of the Box UnifiedChangeManagement schema includes these packages:
  - AMStateType (required)
  - UCMPolicyScripts
  - UnifiedChangeManagement (required)
  - Others: BaseCMActivity, Email, Attachments, History, Resolution, Notes

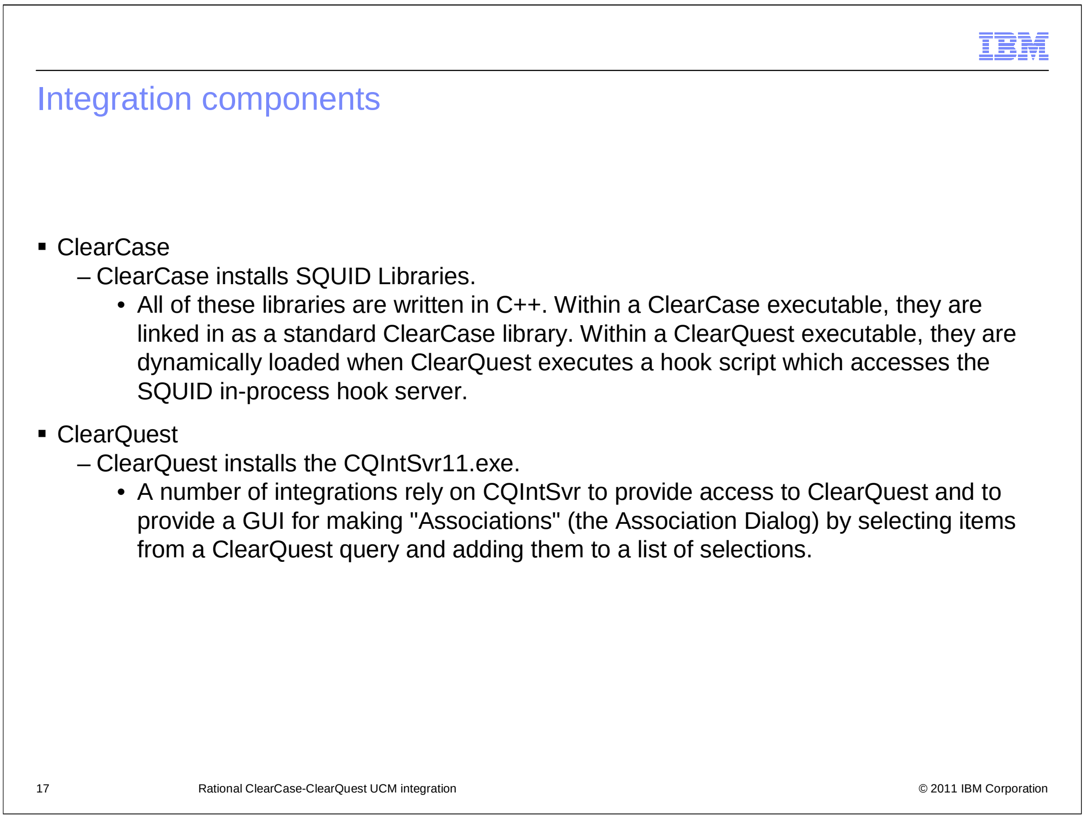
In order for a ClearQuest schema to be able to support the UCM integration you must add the AMStatType and UnifiedChangeManagement packages to it. The out of the box UnifiedChangeManagement is pre-configured to support the integration. The UnifiedChangeManagement package is what adds the previously mentioned Unified Change Management tab to your ClearQuest records. To avoid having to add the required ClearQuest packages manually, you can apply the out of the box Unified Change Management package to your schema. Note the package contents in this slide.



Package overview

- UnifiedChangeManagement package V6.0 requires these packages/revisions:
  - AMStateType package rev 1.0
  - UCMPolicyScripts package rev 4.0
  - (optional) BaseCMActivity package rev 2.0
- UCMPolicyScripts adds these Global Scripts:
  - UCM_ChkBeforeDeliver
  - UCM_ChkBeforeWorkOn
  - UCM_CQActAfterChact
  - UCM_CQActAfterDeliver
  - UCM_CQActBeforeChact

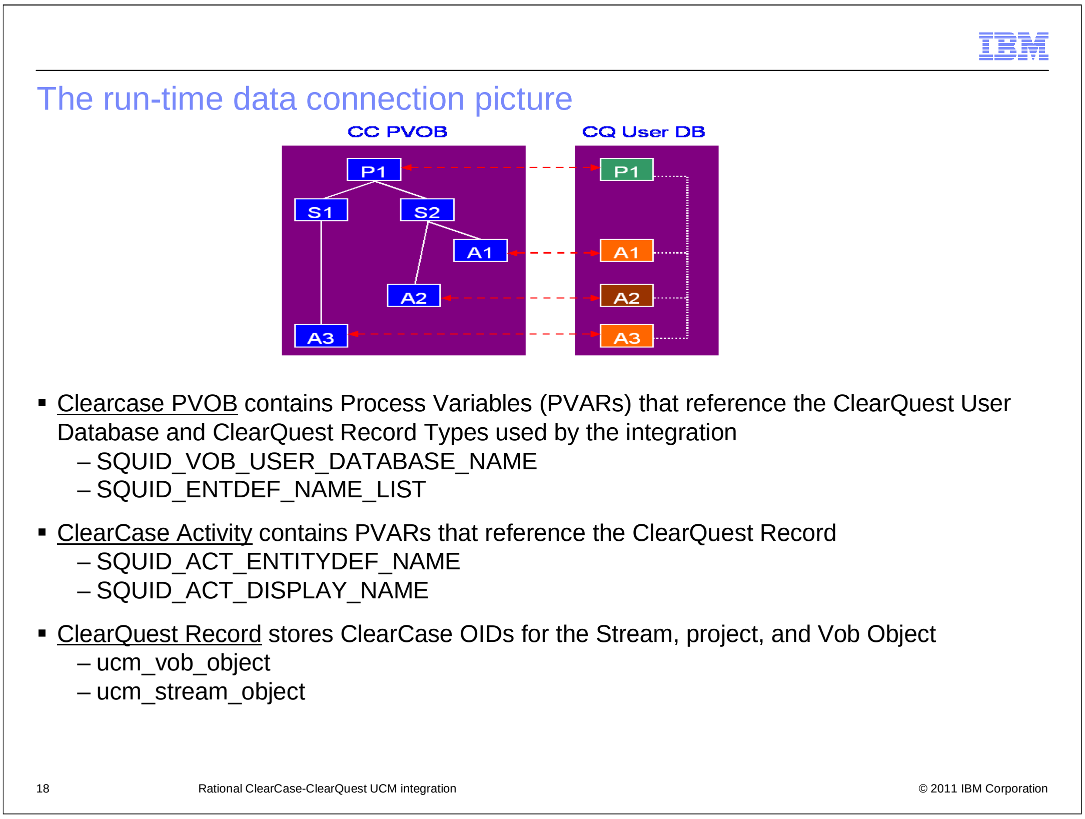
This slide shows the UnifiedChangeManagement package V6.0 overview, including the requirements.



Integration components

- ClearCase
  - ClearCase installs SQUID Libraries.
    - All of these libraries are written in C++. Within a ClearCase executable, they are linked in as a standard ClearCase library. Within a ClearQuest executable, they are dynamically loaded when ClearQuest executes a hook script which accesses the SQUID in-process hook server.
- ClearQuest
  - ClearQuest installs the CQIntSvr11.exe.
    - A number of integrations rely on CQIntSvr to provide access to ClearQuest and to provide a GUI for making "Associations" (the Association Dialog) by selecting items from a ClearQuest query and adding them to a list of selections.

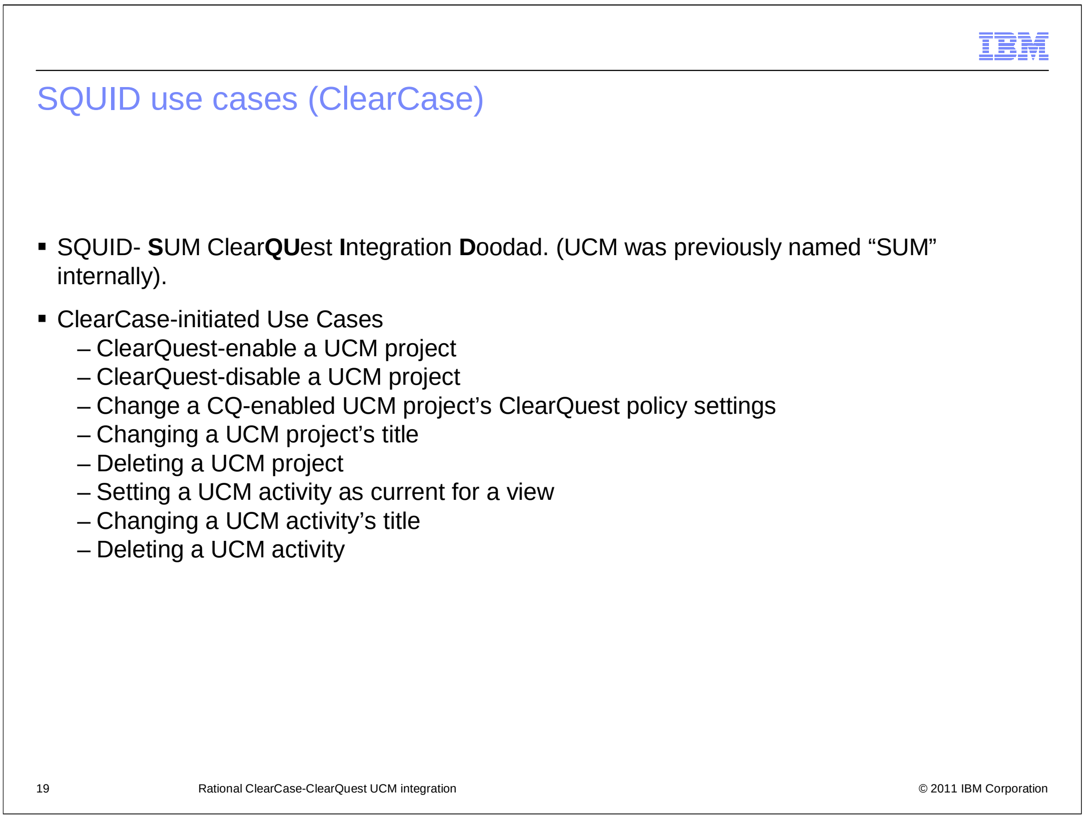
This slide depicts the overview of the integration components. There is ClearCase and ClearQuest. ClearCase installs SQUID libraries. All of these libraries are written in C++. Within a ClearCase executable, they are linked in as a standard ClearCase library. Within a ClearQuest executable, they are dynamically loaded when ClearQuest executes a hook script which accesses the SQUID in-process hook server. ClearQuest installs the CQIntSvr11.exe (CQ-int-server-eleven dot e-x-e). A number of integrations rely on CQIntSvr to provide access to ClearQuest and to provide a GUI for making "Associations" (the Association Dialog) by selecting items from a ClearQuest query and adding them to a list of selections.



The run-time data connection picture

- Clearcase PVOB contains Process Variables (PVARs) that reference the ClearQuest User Database and ClearQuest Record Types used by the integration
  - SQUID_VOB_USER_DATABASE_NAME
  - SQUID_ENTDEF_NAME_LIST
- ClearCase Activity contains PVARs that reference the ClearQuest Record
  - SQUID_ACT_ENTITYDEF_NAME
  - SQUID_ACT_DISPLAY_NAME
- ClearQuest Record stores ClearCase OIDs for the Stream, project, and Vob Object
  - ucm_vob_object
  - ucm_stream_object

This slide gives you an overview of how the ClearCase PVOB communicates with the ClearQuest user database. The PVOB contains Process Variables (PVARs) that reference the ClearCase user database and ClearQuest record types used by the integration.



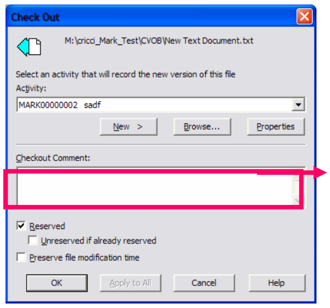
SQUID use cases (ClearCase)

- SQUID- **S**UM Clear**QU**est **I**ntegration **D**oodad. (UCM was previously named “SUM” internally).
- ClearCase-initiated Use Cases
  - ClearQuest-enable a UCM project
  - ClearQuest-disable a UCM project
  - Change a CQ-enabled UCM project’s ClearQuest policy settings
  - Changing a UCM project’s title
  - Deleting a UCM project
  - Setting a UCM activity as current for a view
  - Changing a UCM activity’s title
  - Deleting a UCM activity

This slide shows some examples of ClearCase commands that use “SQUID” to communicate with ClearQuest.

SQUID use cases (ClearCase)

- Checkout, Checkin, Add-To-Source dialog boxes:



Check Out

M:\cricci_Mark_Test\CVOB\New Text Document.txt

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

Activity: MARK00000002 sadf

Checkout Comment:

☑ Reserved

□ Unreserved if already reserved

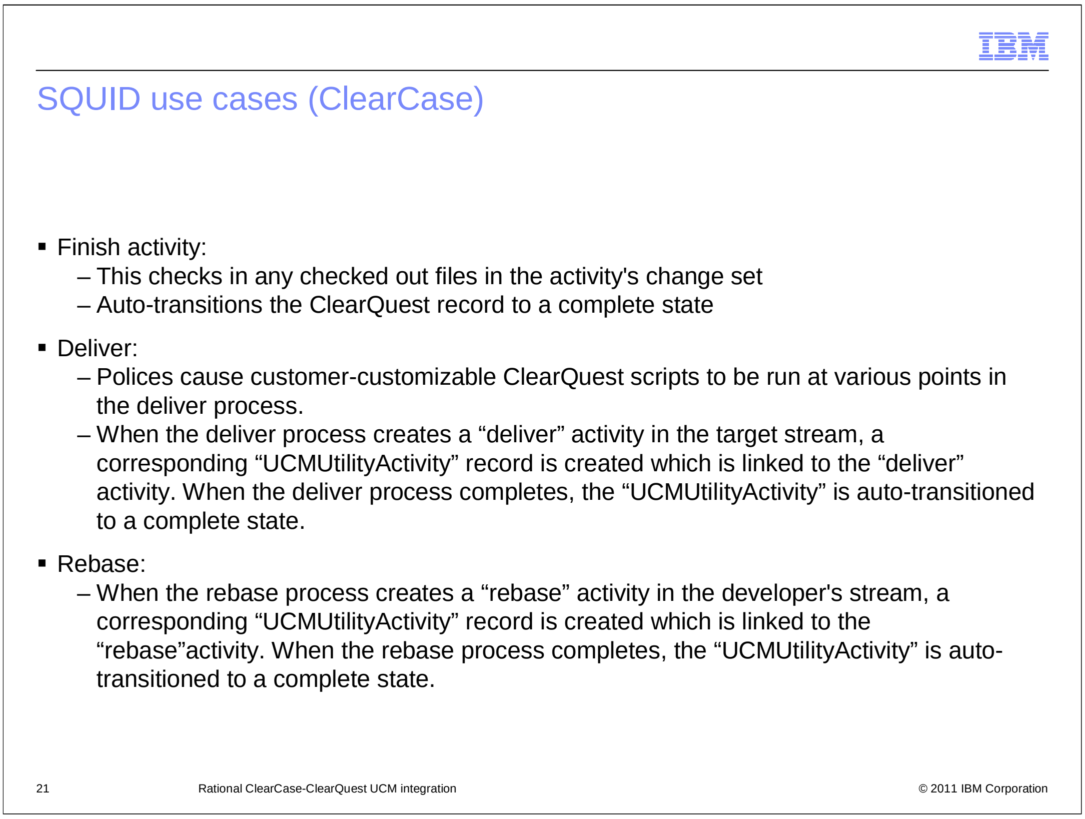
□ Preserve file modification time

- View Activity Properties: Instead of the UCM activity properties dialog, a ClearQuest Record form in view-mode is displayed (displaying the ClearQuest record that the UCM activity is linked to). This is a fully functional ClearQuest form.

Here you see the use case for checkout, checkin, and add-to-source dialog boxes. The list of “activities” in the stream (really UCM-enabled ClearQuest records) from which you can select one to be worked on, can be generated in two different ways. First, by running the special “UCMCustomQuery1” ClearQuest query. By default, this query displays all UCM-enabled records which are in READY or ACTIVE states which are assigned to the current ClearQuest user. Second, by displaying the ClearQuest query browser dialog, then using it to explicitly choose an arbitrary ClearQuest query to be executed. If you try to create a new “activity”, the integration displays a ClearQuest submit form. After you fill in the necessary fields and selects save, the currently selected “activity” in the dialog is updated to reflect the newly created “activity” (really a UCM-enabled ClearQuest record).

After you select an “activity” to work on and clicks OK, if the selected record is not already linked to a UCM activity, the record is auto-transitioned to an ACTIVE state. During this process, if the system encounters a state which has required fields which are missing, it displays a ClearQuest Record form in edit-mode -- the fields with the missing values are highlighted in red. It then waits until the user supplies the missing values and saves their changes. Then, continues the auto-transitioning until the record reaches an ACTIVE stateA, a new UCM activity is created and linked to the record. The newly-created UCM activity is set as current for the user's view.

Instead of the UCM activity properties dialog, a ClearQuest record form in view-mode is displayed (displaying the ClearQuest record that the UCM activity is linked to). This is a fully functional ClearQuest form.



SQUID use cases (ClearCase)

- Finish activity:
  - This checks in any checked out files in the activity's change set
  - Auto-transitions the ClearQuest record to a complete state
- Deliver:
  - Polices cause customer-customizable ClearQuest scripts to be run at various points in the deliver process.
  - When the deliver process creates a “deliver” activity in the target stream, a corresponding “UCMUtilityActivity” record is created which is linked to the “deliver” activity. When the deliver process completes, the “UCMUtilityActivity” is auto-transitioned to a complete state.
- Rebase:
  - When the rebase process creates a “rebase” activity in the developer's stream, a corresponding “UCMUtilityActivity” record is created which is linked to the “rebase”activity. When the rebase process completes, the “UCMUtilityActivity” is auto-transitioned to a complete state.

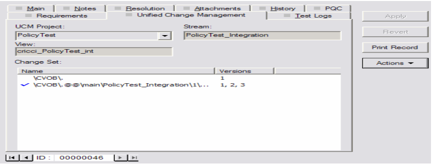
The finish activity action checks in any checked out files in the activity's change set. It then auto-transitions the ClearQuest record to a complete state. If the system encounters a state which has required fields that are missing, it displays a ClearQuest record form in edit-mode, and the fields with the missing values are highlighted in red. The action then waits until you supply the missing values and saves their changes. The auto-transitioning continues until the record reaches an complete state.

There are policies which, when enabled, cause customer-customizable ClearQuest scripts to be run at various points in the deliver process. The “Transition To Complete After Delivery” policy causes the ClearQuest records linked to the delivered activities to be auto-transitioned to a complete state. For each such delivered activity, if the system encounters a state which has required fields which are missing, it first displays a ClearQuest record form in edit-mode -- the fields with the missing values are highlighted in red. It then waits until you supplies the missing values and saves their changes. Then, it continues the auto-transitioning until the record reaches an COMPLETE state. An example of such a field is the “Resolution” field in the out of the box DefectTracking schema. When the deliver process creates a “deliver” activity in the target stream, a corresponding “UCMUtilityActivity” record is created which is linked to the “deliver” activity. When the deliver process completes, the “UCMUtilityActivity” is auto-transitioned to a complete state.

When the rebase process creates a “rebase” activity in the developer's stream, a corresponding “UCMUtilityActivity” record is created which is linked to the “rebase” activity. When the rebase process completes, the “UCMUtilityActivity” is auto-transitioned to a COMPLETE state.

SQUID use cases (ClearQuest)

- These actions in ClearQuest, cause the corresponding change to be made in the corresponding UCM project or activity:
  - Changing the UCM_Project record’s name
  - Changing the UCM_Project record’s ClearQuest policy settings
  - Deleting the UCM_Project record
  - Changing the UCM-enabled record’s headline
  - Deleting the UCM-enabled record
- On a UCM-enabled ClearQuest record form and on the Unified Change Management tabbed-page, you can see this ClearCase information about the corresponding ClearCase activity:
  - UCM project, stream and view (display-only)
  - Change set versions (some interfaces also support ClearCase operations on the versions in the change set)



UCM Project: PolicyTest

Stream: PolicyTest_Integration

View: cricci_PolicyTest_int

Change Set:

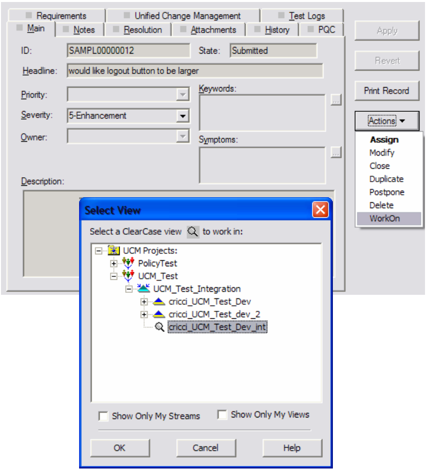
Name	Versions
\CVOB\.	1
✓ \CVOB\.@@\main\PolicyTest_Integration\1\...	1, 2, 3

ID : 00000046

These actions in ClearQuest, when made to a linked UCM_Project record, cause the corresponding change to be made in the corresponding UCM project: Changing the UCM project record’s name, changing the UCM_Project record’s ClearQuest policy settings, and deleting the UCM_Project record. These actions in ClearQuest, when made to a linked UCM-enabled record, cause the corresponding change to be made in the corresponding ClearCase activity: Changing the UCM-enabled record’s headline and deleting the UCM-enabled record. On a UCM-enabled ClearQuest record form, on the Unified Change Management tabbed-page, you can see this ClearCase information about the corresponding ClearCase activity: the UCM project, stream and view (display-only) in addition to change set versions. A UCM-enabled ClearQuest record form has a special “Work On” menu action. If you choose this menu action for a record that is not already linked to UCM activity, it displays a dialog box which prompts you to select a ClearCase view under the UCM project. When you select a view and clicks OK, the record is auto-transitioned to an active state. A UCM activity is created and linked to the UCM-enabled record and the newly-created UCM activity is set as current for the selected view.

SQUID Use Cases (ClearQuest)

- A UCM-enabled ClearQuest record form has a special “Work On” menu action.
  - – If you choose this menu action for a record that is not already linked to UCM activity
    - It displays a dialog box which prompts you to select a ClearCase view under the UCM project.
  - – When you select a view and click OK
    - The record is auto-transitioned to a ACTIVE state.
    - A UCM activity is created and linked to the UCM-enabled record
    - The newly-created UCM activity is set as current for the selected view



ID: SAMPL00000012

State: Submitted

Headline: would like logout button to be larger

Priority:

Severity: 5-Enhancement

Owner:

Keywords:

Symptoms:

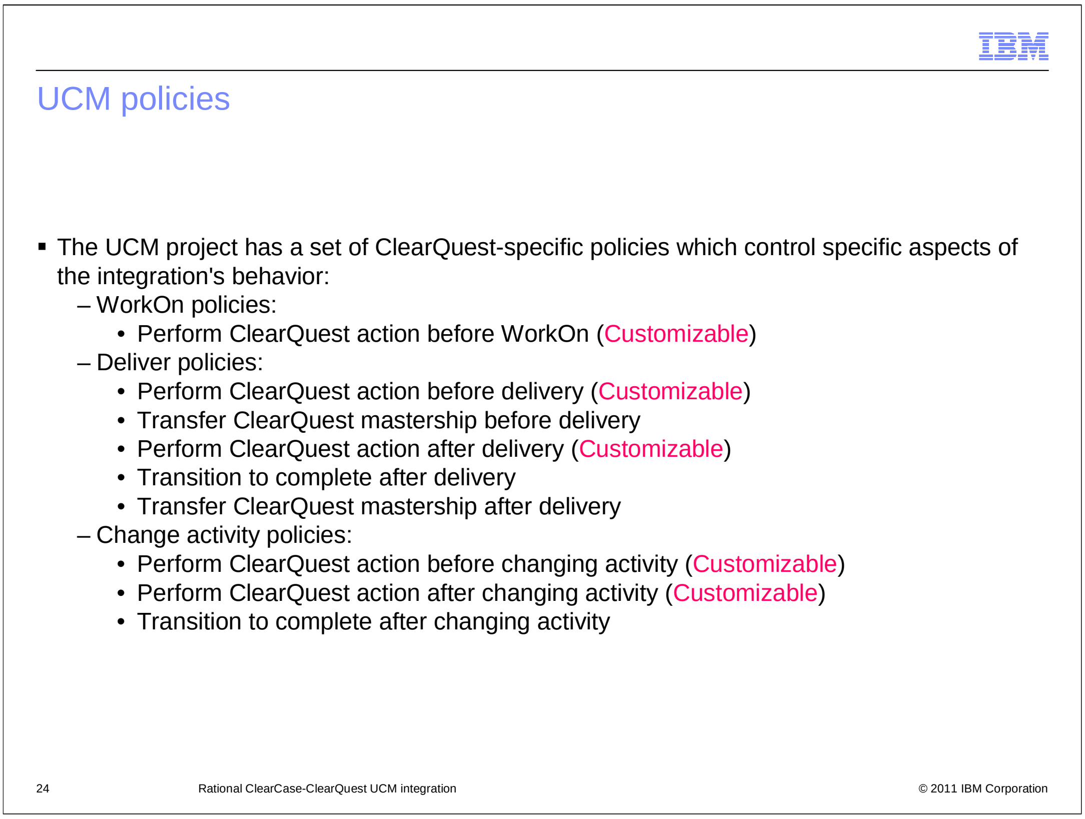
Description:

Select View

Select a ClearCase view to work in:

□ Show Only My Streams □ Show Only My Views

Every UCM-enabled record has a “WorkOn” option off of the action menu. When you perform a “WorkOn”, the record is auto-transitioned to an active state. A UCM activity is created and linked to the UCM-enabled record. The newly-created UCM activity is then set as current for the selected view.



UCM policies

- The UCM project has a set of ClearQuest-specific policies which control specific aspects of the integration's behavior:
  - WorkOn policies:
    - Perform ClearQuest action before WorkOn (Customizable)
  - Deliver policies:
    - Perform ClearQuest action before delivery (Customizable)
    - Transfer ClearQuest mastership before delivery
    - Perform ClearQuest action after delivery (Customizable)
    - Transition to complete after delivery
    - Transfer ClearQuest mastership after delivery
  - Change activity policies:
    - Perform ClearQuest action before changing activity (Customizable)
    - Perform ClearQuest action after changing activity (Customizable)
    - Transition to complete after changing activity

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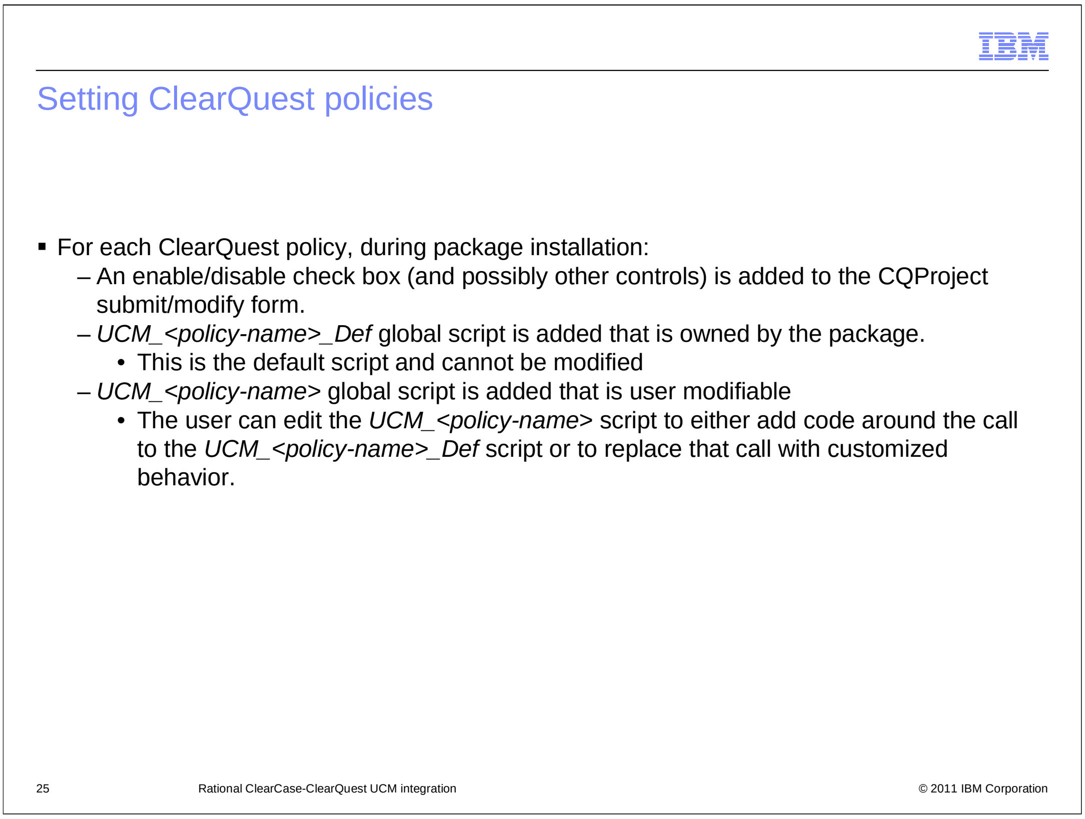
The UCM project has a set of ClearQuest-specific policies which control specific aspects of the integration's behavior.

WorkOn policies perform ClearQuest action before WorkOn (Customizable)

Deliver policies perform ClearQuest actions before delivery (Customizable), transfer ClearQuest mastership before delivery, perform ClearQuest actions after delivery (Customizable), transition to complete after delivery, and transfer ClearQuest mastership after delivery

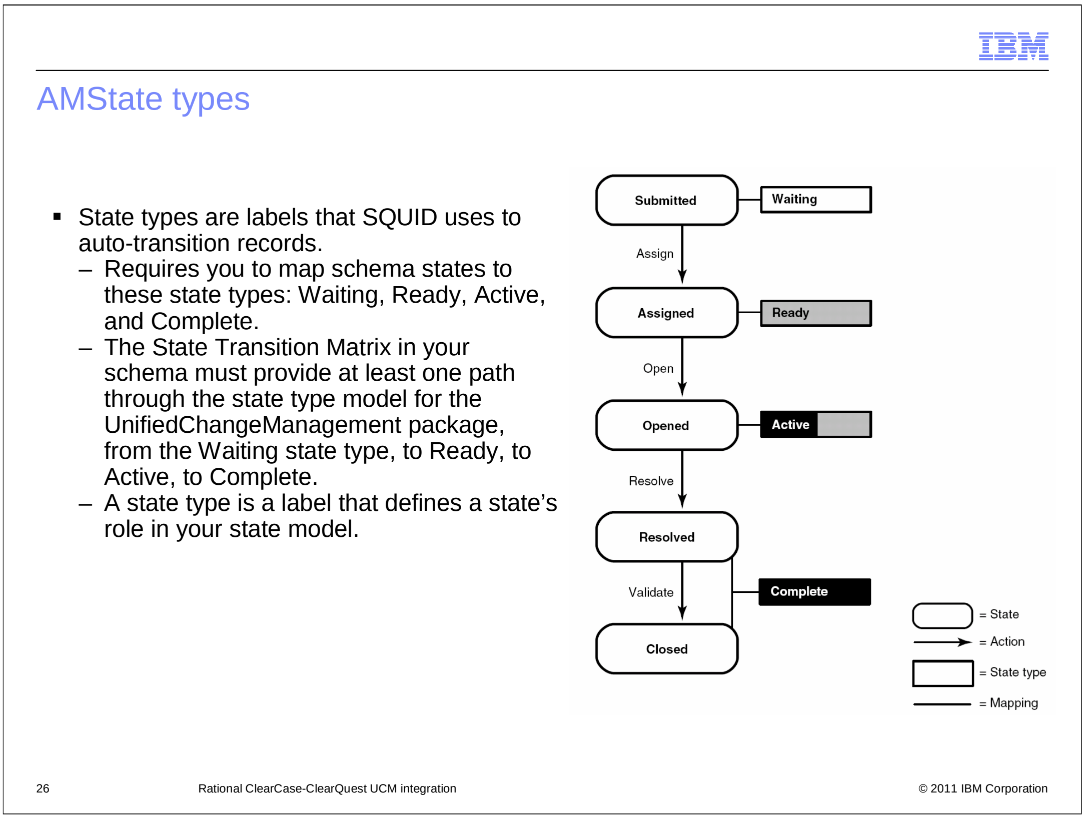
Change activity policies perform ClearQuest actions before changing activity (Customizable), perform ClearQuest actions after changing activity (Customizable), and transition to complete after changing activity.



Setting ClearQuest policies

- For each ClearQuest policy, during package installation:
  - An enable/disable check box (and possibly other controls) is added to the CQProject submit/modify form.
  - *UCM_<policy-name>_Def* global script is added that is owned by the package.
    - This is the default script and cannot be modified
  - *UCM_<policy-name>* global script is added that is user modifiable
    - The user can edit the *UCM_<policy-name>* script to either add code around the call to the *UCM_<policy-name>_Def* script or to replace that call with customized behavior.

For each ClearQuest policy, during package installation, an enable/disable check box (and possibly other controls) are added to the ClearQuest Project submit/modify form. A global script is added which is owned by the package. It implements the default behavior for the policy (example, what happens if you do not customize the policy). At run-time, whenever a policy is invoked, if the policy is disabled (on the project page's check box), the system does what is covered in each policy's Disabled behavior section.



AMState types

- State types are labels that SQUID uses to auto-transition records.
  - Requires you to map schema states to these state types: Waiting, Ready, Active, and Complete.
  - The State Transition Matrix in your schema must provide at least one path through the state type model for the UnifiedChangeManagement package, from the Waiting state type, to Ready, to Active, to Complete.
  - A state type is a label that defines a state’s role in your state model.

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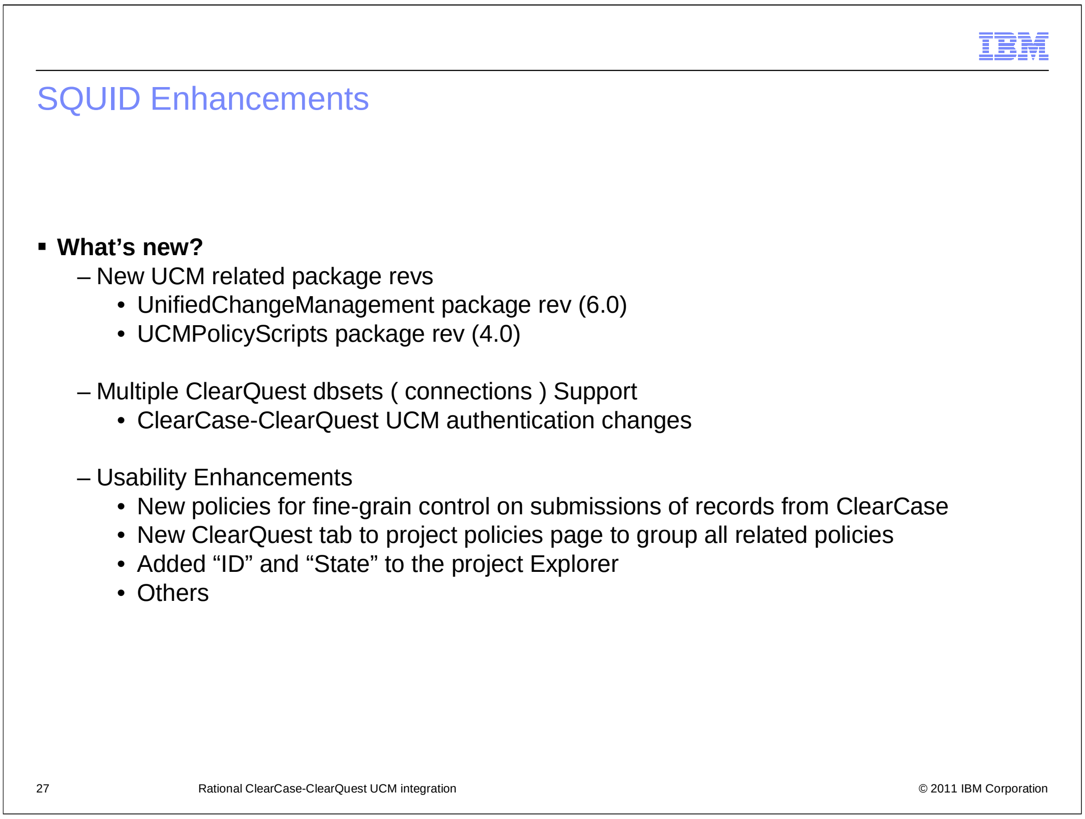
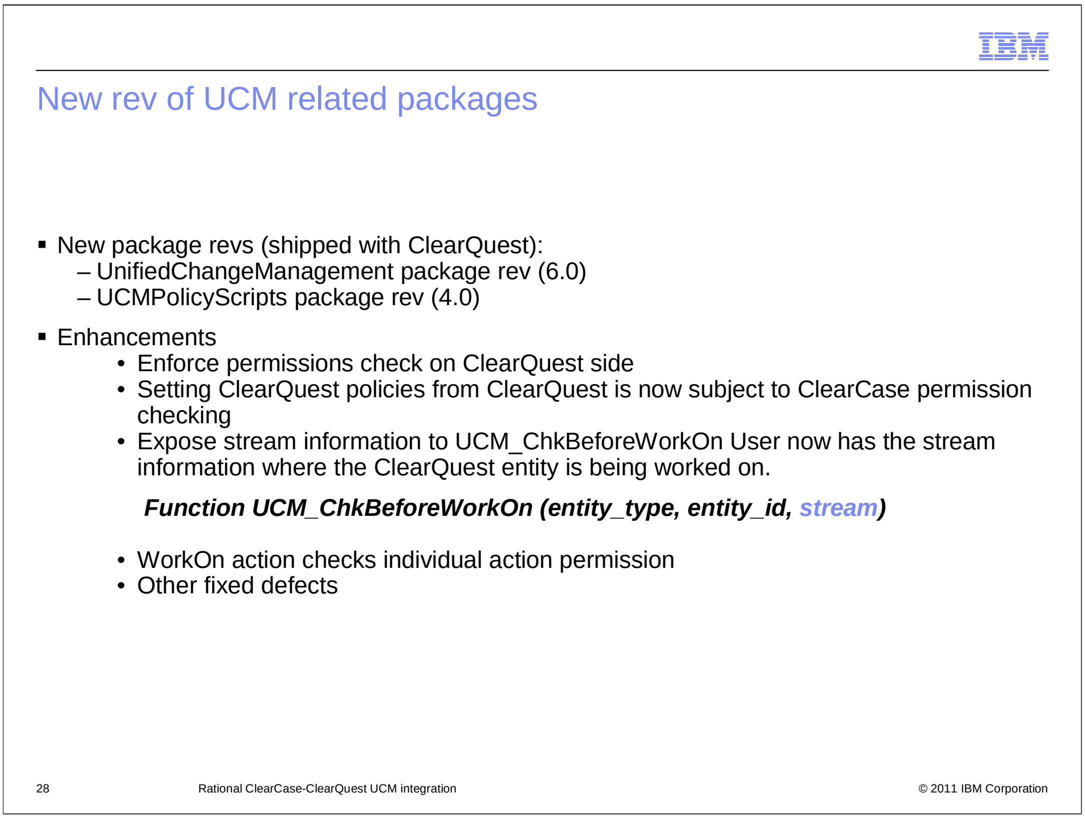
State Types are labels that SQUID uses to auto-transition records. The UCM-ClearQuest integration requires you to map schema states to these state types: Waiting, Ready, Active, and Complete. The state transition matrix in your schema must provide at least one path through the state type model for the UnifiedChangeManagement package; from the Waiting state type, to Ready, to Active and finally to Complete.



SQUID Enhancements

- **What’s new?**
  - New UCM related package revs
    - UnifiedChangeManagement package rev (6.0)
    - UCMPolicyScripts package rev (4.0)
  - Multiple ClearQuest dbsets (connections) Support
    - ClearCase-ClearQuest UCM authentication changes
  - Usability Enhancements
    - New policies for fine-grain control on submissions of records from ClearCase
    - New ClearQuest tab to project policies page to group all related policies
    - Added “ID” and “State” to the project Explorer
    - Others

Some of the the SQUID enhancements in V7.0 include a new UCM Package: UnifiedChangeManagement package rev (6.0), a new UCMPolicyScripts package, multiple ClearQuest dbsets support, and ClearCase/ClearQuest UCM authentication changes. Usability enhancements include new policies for fine-grain control on submissions of ClearQuest records from ClearCase and a new ClearQuest tab to project policies page to group all ClearQuest related policies.



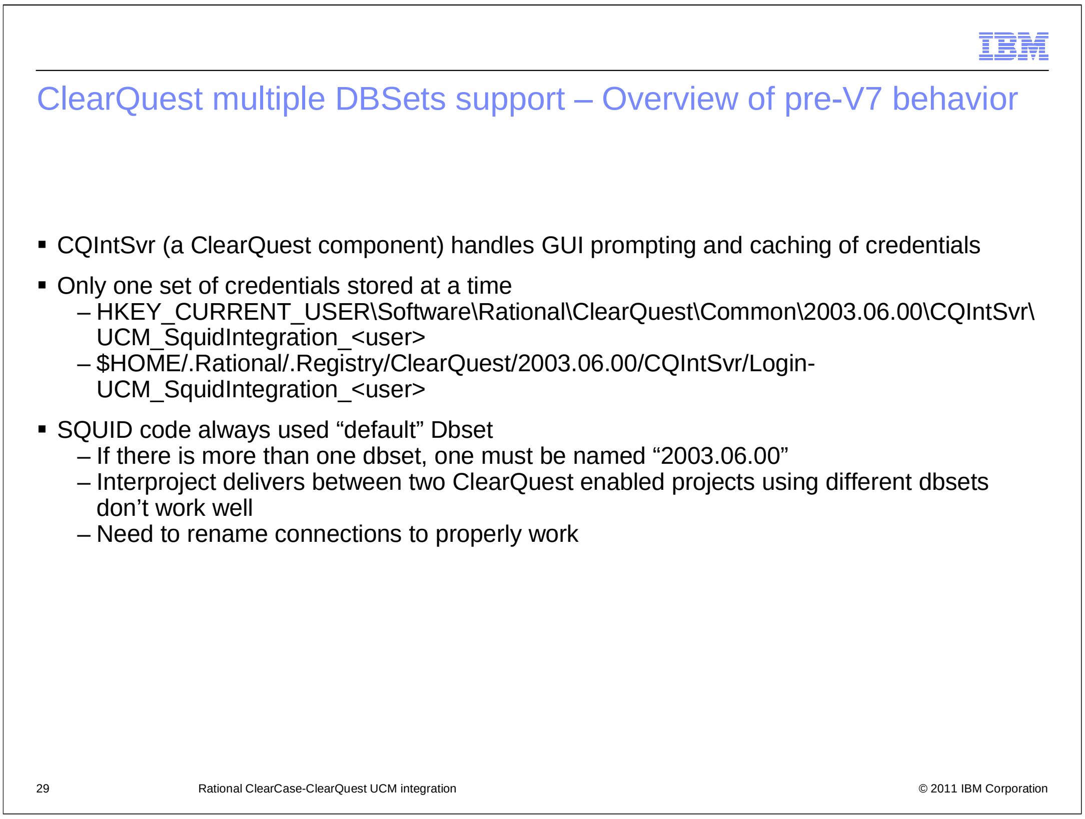
New rev of UCM related packages

- New package revs (shipped with ClearQuest):
  - UnifiedChangeManagement package rev (6.0)
  - UCMPolicyScripts package rev (4.0)
- Enhancements
  - Enforce permissions check on ClearQuest side
  - Setting ClearQuest policies from ClearQuest is now subject to ClearCase permission checking
  - Expose stream information to UCM_ChkBeforeWorkOn User now has the stream information where the ClearQuest entity is being worked on.

    Function UCM_ChkBeforeWorkOn (entity_type, entity_id, stream)

  - WorkOn action checks individual action permission
  - Other fixed defects

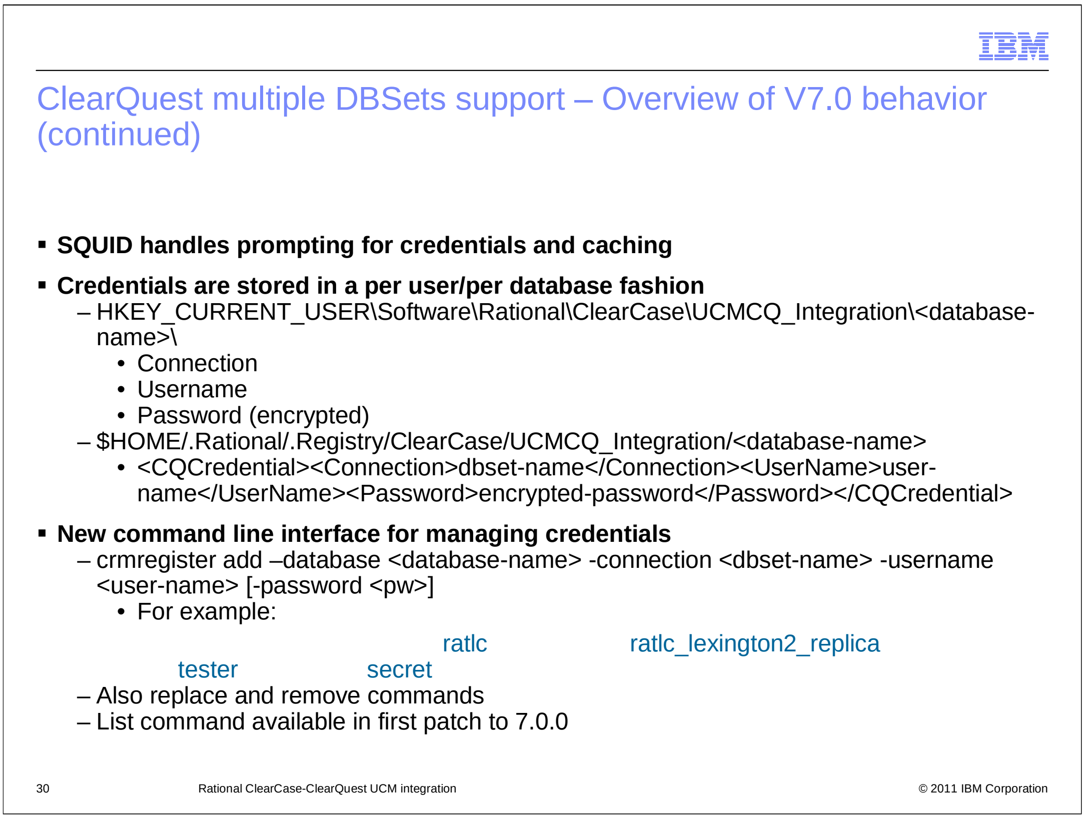
Here are some of the enhancements included in the new UCM package. You can now enforce permissions checks on the ClearQuest side. Setting ClearQuest policies from ClearQuest is now subject to ClearCase permission checking. ClearQuest allows bound UCM project records to be deleted. Also, ClearQuest on Linux/UNIX requires ClearCase to be installed for non-SQUID-sensitive operations.



ClearQuest multiple DBSets support – Overview of pre-V7 behavior

- CQIntSvr (a ClearQuest component) handles GUI prompting and caching of credentials
- Only one set of credentials stored at a time
  - HKEY_CURRENT_USER\Software\Rational\ClearQuest\Common\2003.06.00\CQIntSvr\UCM_SquidIntegration_<user>
  - $HOME/.Rational/.Registry/ClearQuest/2003.06.00/CQIntSvr/Login-UCM_SquidIntegration_<user>
- SQUID code always used “default” Dbset
  - If there is more than one dbset, one must be named “2003.06.00”
  - Interproject delivers between two ClearQuest enabled projects using different dbsets don’t work well
  - Need to rename connections to properly work

Before V7 the limitations shown in this slide were placed on the UCM-ClearQuest integration.



ClearQuest multiple DBSets support – Overview of V7.0 behavior (continued)

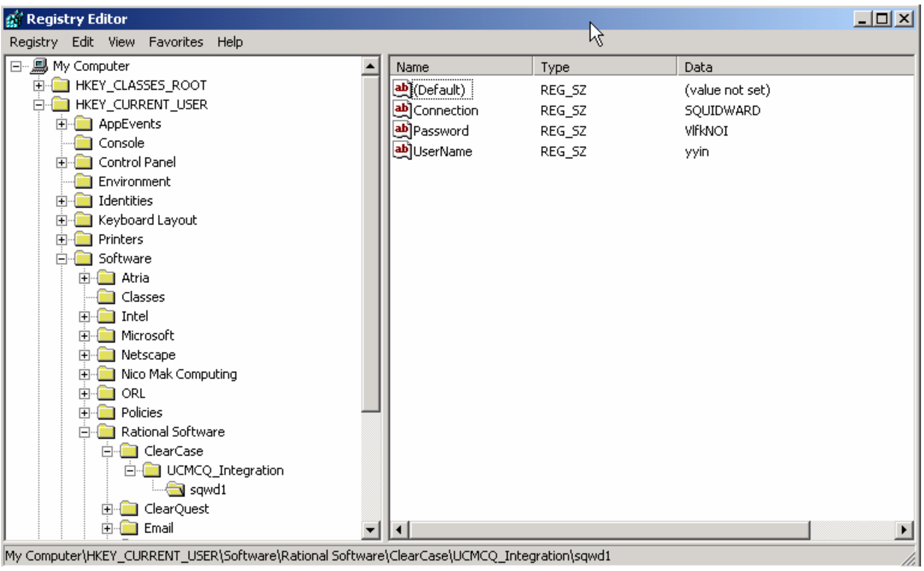
- **SQUID handles prompting for credentials and caching**
- **Credentials are stored in a per user/per database fashion**
  - – HKEY_CURRENT_USER\Software\Rational\ClearCase\UCMCQ_Integration\<database-name>\
    - Connection
    - Username
    - Password (encrypted)
  - – $HOME/.Rational/.Registry/ClearCase/UCMCQ_Integration/<database-name>
    - <CQCredential><Connection>dbset-name</Connection><UserName>user-name</UserName><Password>encrypted-password</Password></CQCredential>
- **New command line interface for managing credentials**
  - – crmregister add –database <database-name> -connection <dbset-name> -username <user-name> [-password <pw>]
    - For example:

      ratlc ratlc_lexington2_replica

      tester secret
  - – Also replace and remove commands
  - – List command available in first patch to 7.0.0

Now in V7 credentials are stored in a per user/per database fashion. They are stored on windows in the location shown in this slide. There is also a new command line interface for managing credentials. The command is called “ crmregister”.

ClearQuest multiple DBSets support – Windows registry



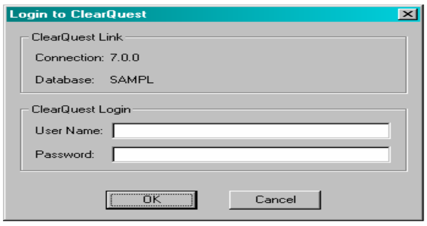
Name	Type	Data
(Default)	REG_SZ	(value not set)
Connection	REG_SZ	SQUIDWARD
Password	REG_SZ	VlfkNOI
UserName	REG_SZ	yyin

My Computer\HKEY_CURRENT_USER\Software\Rational Software\ClearCase\UCMCQ_Integration\sqwd1

In V7 the ClearQuest login credentials are now cached at in the location shown in this slide. Again, this version supports the use of multiple DBsets. In previous versions this functionality was not present. The **crmregister** interface provides functionality for manipulating the ClearQuest credential registry. For example, it is used to register the ClearQuest credentials of a user for a specific database

ClearQuest multiple DBSets support - Upgrade behavior

- Very first use after an upgrade will look for credentials in the new location
  - ClearQuest credential previously cached by CQIntSvr is no longer used and the entry should be cleaned away by installer
- Command Line Interface users
  - run “crmregister add” to cache your ClearQuest credential
  - mkproject/chproject now also have “–connection” option
- GUI users:
  - Provide ClearQuest credential through this Login dialog
  - Project creation wizard and properties dialog have added dbset selection boxes (see GUI enhancements section)



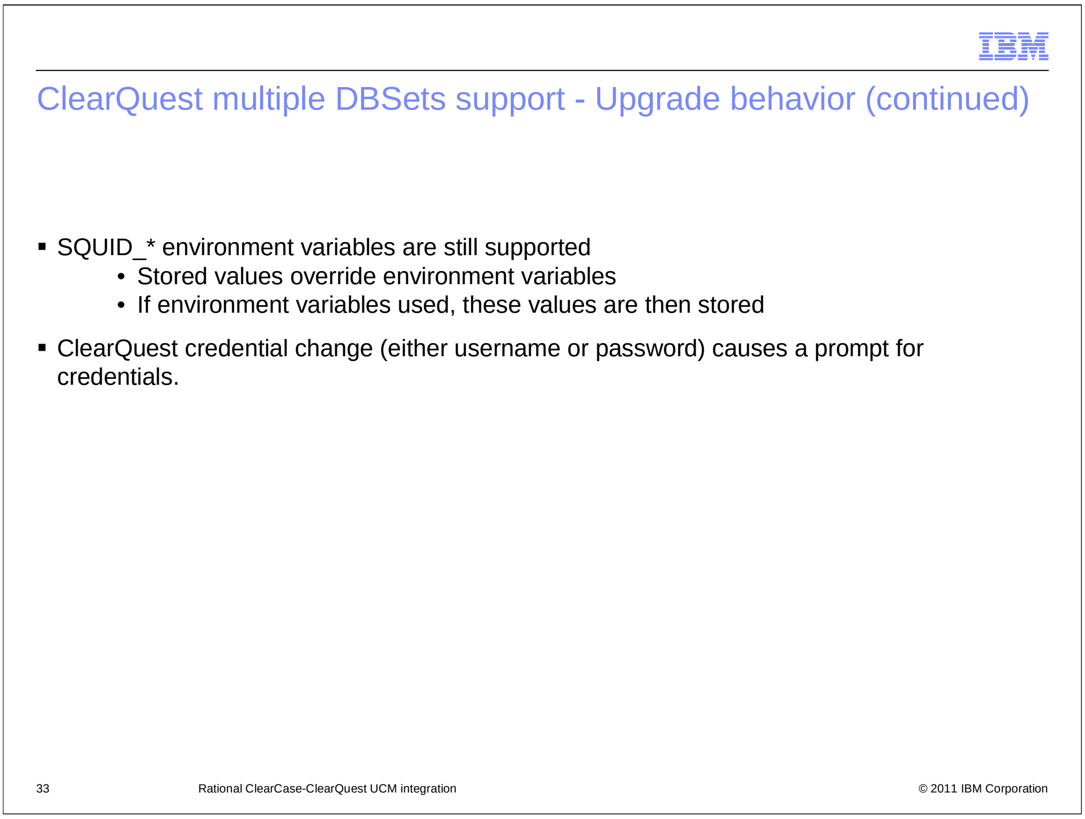
Connection: 7.0.0

Database: SAMPL

User Name:

Password:

As mentioned previously the integration now supports multiple DBSets. The first time you use the integration you receive the login prompt seen in this slide. From the command line you can register and cache your credentials by using the crmregister command



ClearQuest multiple DBSets support - Upgrade behavior (continued)

- SQUID_* environment variables are still supported
  - Stored values override environment variables
  - If environment variables used, these values are then stored
- ClearQuest credential change (either username or password) causes a prompt for credentials.

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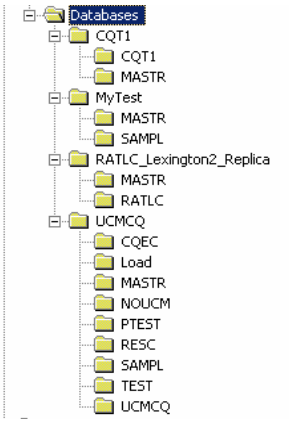
The use of SQUID environment variable is still permitted, and stored values override environment variables. Any change in your ClearQuest credentials causes a prompt for the SQUID login.

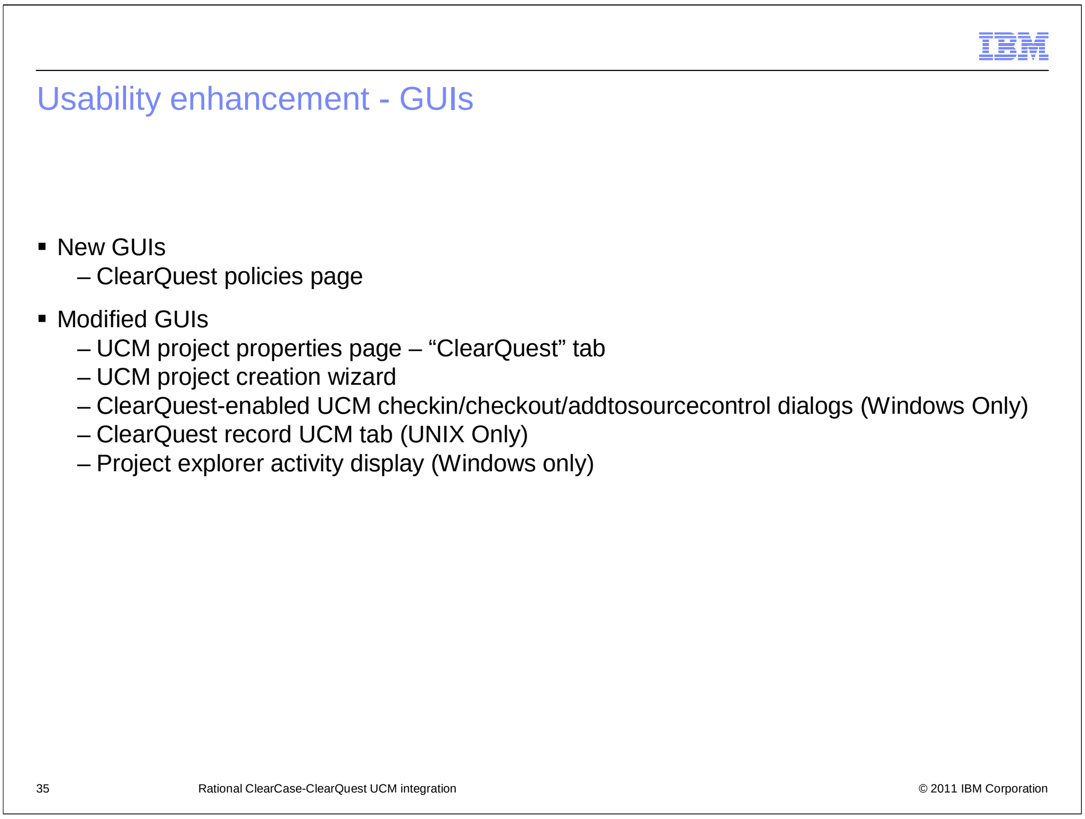
ClearQuest multiple DBSets support - Limitations

- Database name must be unique across all registered dbsets
  - When a dbset lookup is required, SQUID searches all registered dbsets for a match
- To look at the cached ClearQuest credential:
  - Windows:use regedit
  - Linux/UNIX:use ls/cat
  - “crmregister list” command is available in the first patch
    - It will only show database, connection and username, not the password



```
Databases
  CQT1
    CQT1
    MASTR
  MyTest
    MASTR
    SAMPL
  RATLC_Lexington2_Replica
    MASTR
    RATLC
  UCMCQ
    CQEC
    Load
    MASTR
    NOUCM
    PTEST
    RESC
    SAMPL
    TEST
    UCMCQ
```

A limitation when using multiple DBSets is that all database names must be unique across all registered database sets. This means that you cannot have two user databases with the same name across multiple DBSets. To see which ClearQuest credentials are currently cached use Regedit on Windows. On UNIX and Linux use ls/cat

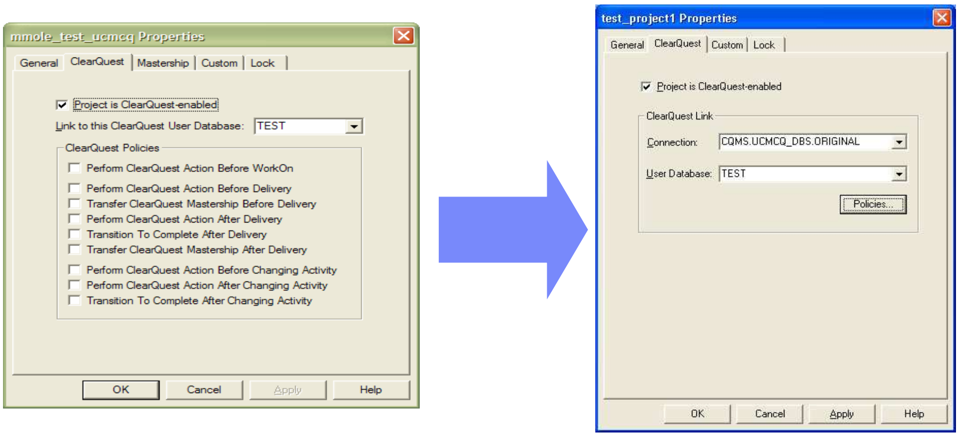


Usability enhancement - GUIs

- New GUIs
  - ClearQuest policies page
- Modified GUIs
  - UCM project properties page – “ClearQuest” tab
  - UCM project creation wizard
  - ClearQuest-enabled UCM checkin/checkout/addtosourcecontrol dialogs (Windows Only)
  - ClearQuest record UCM tab (UNIX Only)
  - Project explorer activity display (Windows only)

There are several GUI enhancements in the version. These are discussed in the upcoming slides.

UCM project properties page – “ClearQuest” tab



☑ Project is ClearQuest-enabled

Link to this ClearQuest User Database: TEST

ClearQuest Policies

□ Perform ClearQuest Action Before WorkOn
□ Perform ClearQuest Action Before Delivery
□ Transfer ClearQuest Mastership Before Delivery
□ Perform ClearQuest Action After Delivery
□ Transition To Complete After Delivery
□ Transfer ClearQuest Mastership After Delivery
□ Perform ClearQuest Action Before Changing Activity
□ Perform ClearQuest Action After Changing Activity
□ Transition To Complete After Changing Activity

☑ Project is ClearQuest-enabled

ClearQuest Link

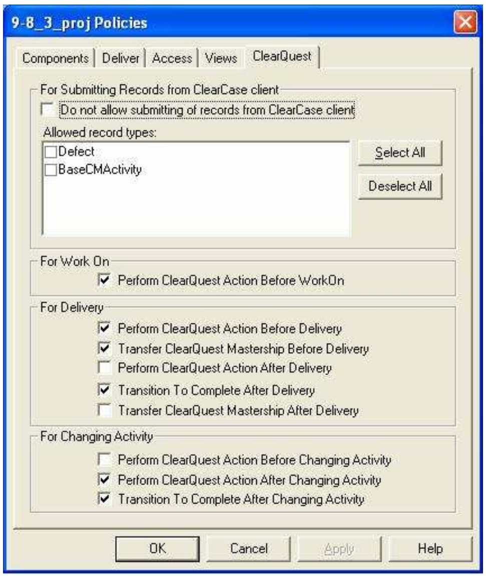
Connection: CQMS.UCMCQ_DBS.ORIGINAL

User Database: TEST

- ”ClearQuest” policies removed from this page
- “ClearQuest” policies can now be reached by pressing the “Policies” button
- Displays ClearQuest DBset (connection)
- To reach this GUI, in project explorer, right-click a project -> Properties -> Select “ClearQuest” tab

There is a new and improved ClearQuest policies page. It can be accessed by going to the properties page of your UCM project and selecting the policies button. It now displays the ClearQuest DBSET otherwise known as the connection name. This is what allows the support for multiple DBSETS in the UCM-ClearQuest integration.

ClearQuest policies page



For Submitting Records from ClearCase client

☐ Do not allow submitting of records from ClearCase client

Allowed record types:

☐ Defect
☐ BaseCMActivity

For Work On

☑ Perform ClearQuest Action Before WorkOn

For Delivery

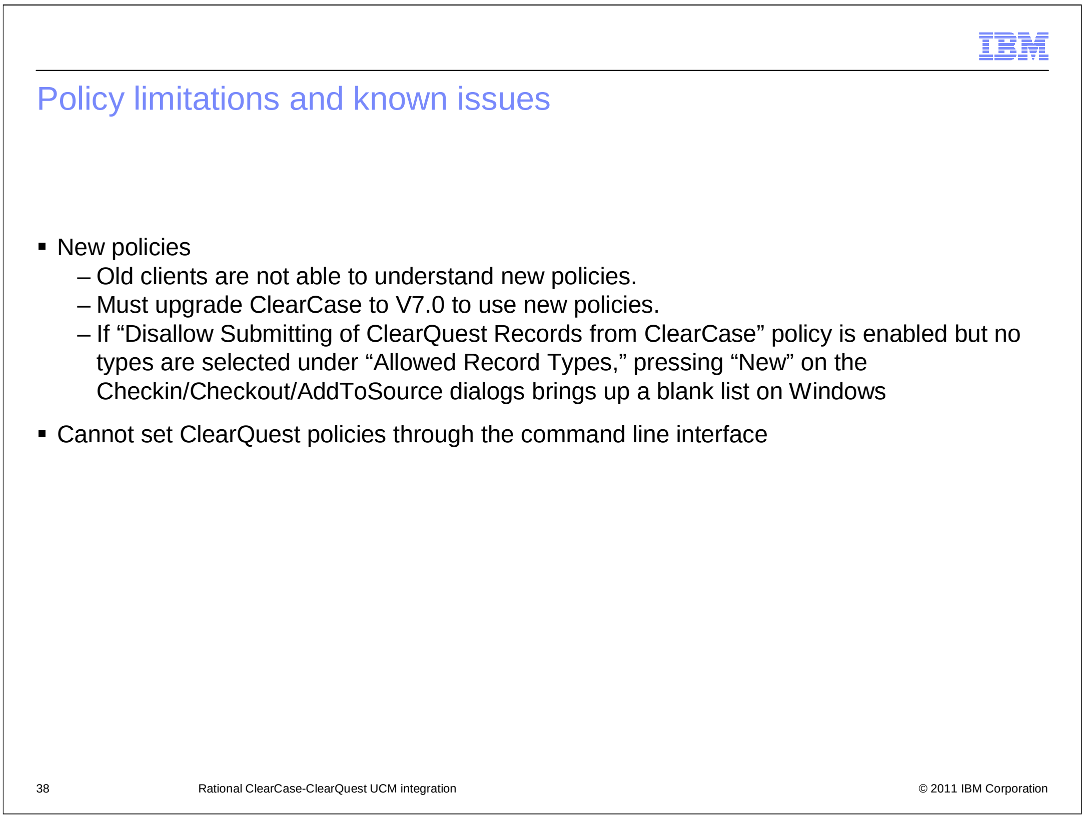
☑ Perform ClearQuest Action Before Delivery
☑ Transfer ClearQuest Mastership Before Delivery
☐ Perform ClearQuest Action After Delivery
☑ Transition To Complete After Delivery
☐ Transfer ClearQuest Mastership After Delivery

For Changing Activity

☐ Perform ClearQuest Action Before Changing Activity
☑ Perform ClearQuest Action After Changing Activity
☑ Transition To Complete After Changing Activity

- **OLD POLICIES LOCATION** - UCM project properties page – “ClearQuest” tab AND project creation wizard step five
- **NEW POLICIES LOCATION** - UCM project policies page – “ClearQuest” tab (shown left)
- New policies
  - “Do not allow submitting of records from ClearCase client”
  - “Allowed record types”
- All UCM-package enabled record types are allowed by default
- To reach this GUI:
  - Right-click project in project explorer -> policies
  - Or, press “Policies” button in project properties –> “ClearQuest” tab
  - Or, press “Policies” button in Step five of project creation wizard

The old policies location was located on the UCM project properties page -> “ClearQuest” tab and project creation wizard step five. The new policies location is found on the UCM project policies page –> “ClearQuest” tab. All UCM-package enabled record types are allowed by default. To deselect a record type from being available in the integrations, place a checkmark in the box next to the record type in the GUI above. Do not allow submitting of records from ClearCase client and the allowed record types selection. If a record type is left unchecked in the “Allowed Record Types” section, users in ClearCase are not able to create a new ClearQuest record of that type from within the ClearCase explorer during a ClearCase operation such as checkout and checkin.



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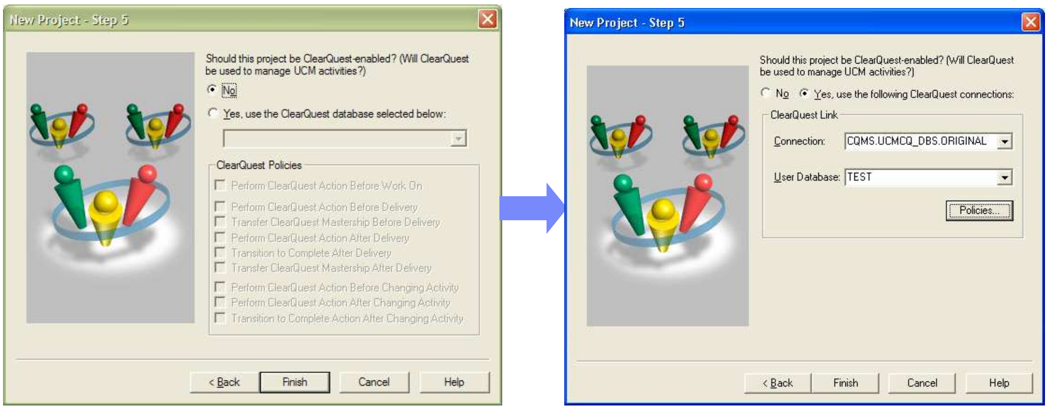
Policy limitations and known issues

- New policies
  - Old clients are not able to understand new policies.
  - Must upgrade ClearCase to V7.0 to use new policies.
  - If “Disallow Submitting of ClearQuest Records from ClearCase” policy is enabled but no types are selected under “Allowed Record Types,” pressing “New” on the Checkin/Checkout/AddToSource dialogs brings up a blank list on Windows
- Cannot set ClearQuest policies through the command line interface

There are a couple of considerations to keep in mind when you are planning your upgrade to V7. If you upgrade your server, clients running an older version of ClearCase are not able to understand the new policies. You must upgrade to the new ClearCase version to understand the new policies. Also If “Disallow Submitting of ClearQuest Records from ClearCase” policy is enabled but no types are selected under “Allowed Record Types,” pressing “New” on the Checkin/Checkout/AddToSource dialogs brings up a blank list on Windows. Also, you cannot set ClearQuest policies through the command line.

UCM project creation wizard



New Project - Step 5

Should this project be ClearQuest-enabled? (Will ClearQuest be used to manage UCM activities?)

● No

○ Yes, use the ClearQuest database selected below:

ClearQuest Policies

□ Perform ClearQuest Action Before Work On
□ Perform ClearQuest Action Before Delivery
□ Transfer ClearQuest Mastership Before Delivery
□ Perform ClearQuest Action After Delivery
□ Transition to Complete After Delivery
□ Transfer ClearQuest Mastership After Delivery
□ Perform ClearQuest Action Before Changing Activity
□ Perform ClearQuest Action After Changing Activity
□ Transition to Complete Action After Changing Activity

New Project - Step 5

Should this project be ClearQuest-enabled? (Will ClearQuest be used to manage UCM activities?)

○ No ● Yes, use the following ClearQuest connections:

ClearQuest Link

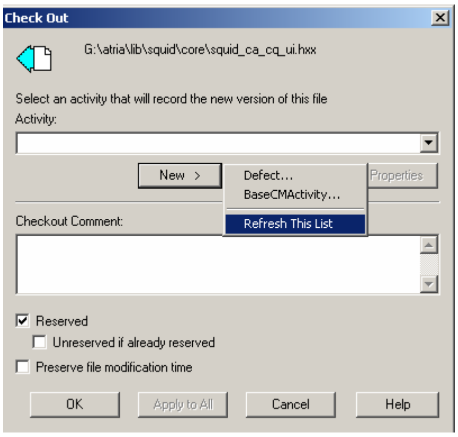
Connection: CQMS.UCMCQ_DBS.ORIGINAL

User Database: TEST

- “ClearQuest” policies are removed
- “ClearQuest” policies can by reached by pressing “policies” button
- Displays ClearQuest DBset (connection)

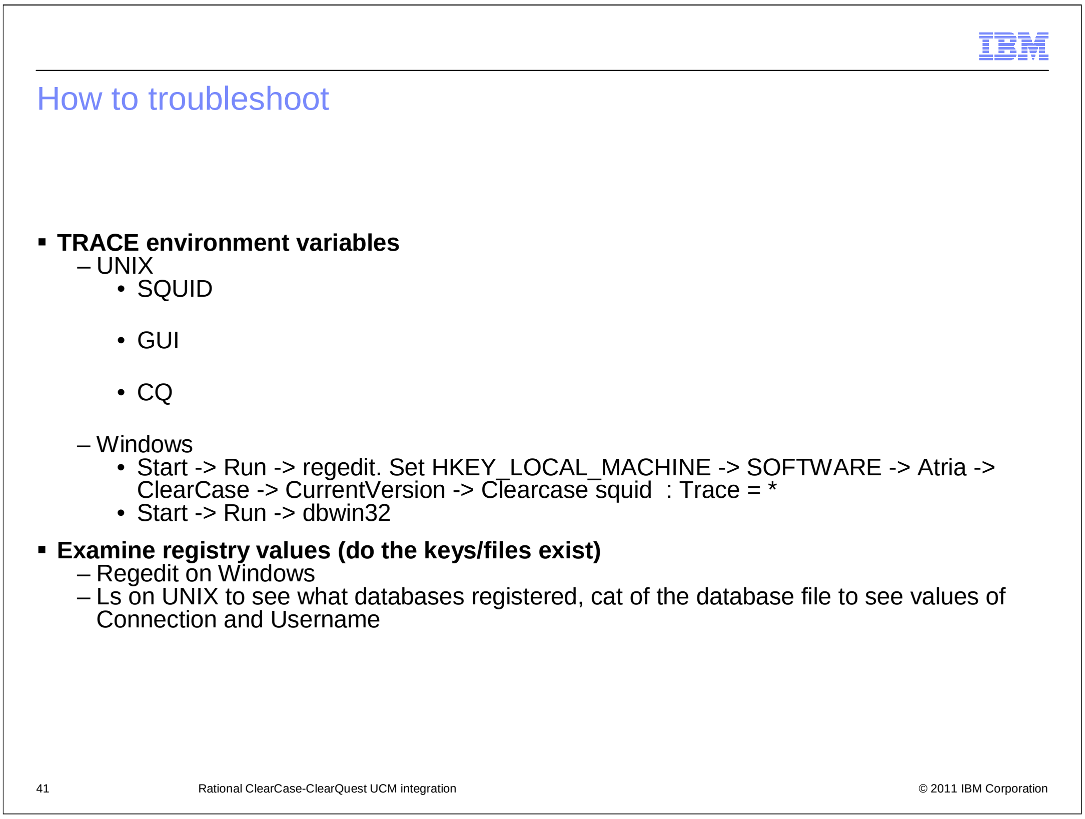
In the new project creation wizard, the ClearQuest policies are now removed from the top-level screen. They can be reached by hitting the policies button. Also, as mentioned before, the ClearQuest connection name is now displayed on the ClearQuest configuration page.

ClearQuest-enabled UCM checkin/checkout/AddToSourceControl dialogs (Windows only)


Check Out
G:\atria\lib\squid\core\squid_ca_cq_ui.hxx
Select an activity that will record the new version of this file
Activity:
New >
Defect...
BaseCMActivity...
Refresh This List
Properties
Checkout Comment:
☑ Reserved
□ Unreserved if already reserved
□ Preserve file modification time
OK
Apply to All
Cancel
Help

- "Refresh This List" has been removed
- "New" button is invisible if the policy, "Disallow Submitting of Records from ClearCase," is enabled
- Record types (for example, Defect and BaseCMActivity) made available when pressing "New" button are determined by "Allowed Record Types" policy

In V7 the checkout/checkin/Add to Source Control buttons have been modified. The New button is not available if the "Disallow Submitting of Records from ClearCase" is enabled. The "Refresh This List" option has now been removed.



How to troubleshoot

- **TRACE environment variables**
  - UNIX
    - SQUID
    - GUI
    - CQ
  - Windows
    - Start -> Run -> regedit. Set HKEY_LOCAL_MACHINE -> SOFTWARE -> Atria -> ClearCase -> CurrentVersion -> Clearcase squid : Trace = *
    - Start -> Run -> dbwin32
- **Examine registry values (do the keys/files exist)**
  - Regedit on Windows
  - Ls on UNIX to see what databases registered, cat of the database file to see values of Connection and Username

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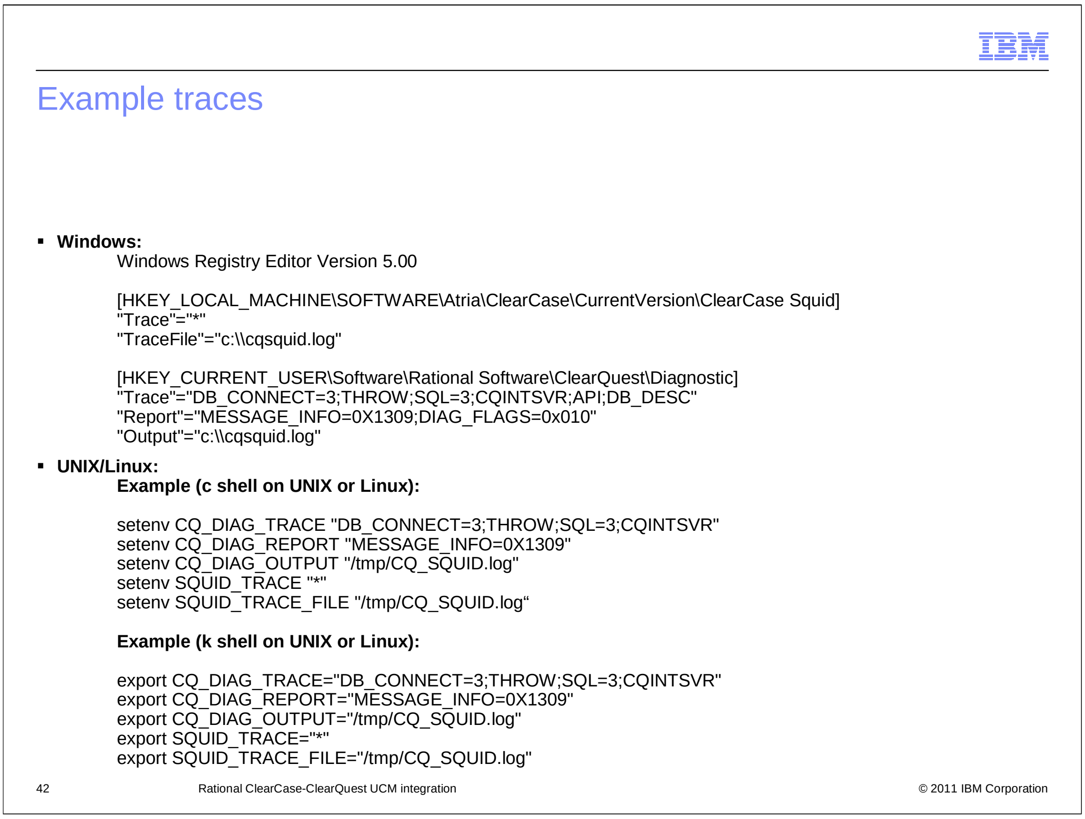
This slide talks about how to troubleshoot UCM-ClearQuest problems on UNIX. The examples here are environment variables that you can set on UNIX to trace different operations on a UNIX host in the hopes of troubleshooting problems with the integration. To troubleshoot the integration, input the this text into a registry key and then import that key into your client. To do that, open up notepad and copy the text below in the file. After you have copied the text, save the file with a .reg extension. Then double-click the .reg file to import it into your system. You can see some example traces for both UNIX and Windows in the next slide.



Example traces

- **Windows:**

```
Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SOFTWARE\Atria\ClearCase\CurrentVersion\ClearCase Squid]
"Trace"="*"
"TraceFile"="c:\\cqsquid.log"

[HKEY_CURRENT_USER\Software\Rational Software\ClearQuest\Diagnostic]
"Trace"="DB_CONNECT=3;THROW;SQL=3;CQINTSVR;API;DB_DESC"
"Report"="MESSAGE_INFO=0X1309;DIAG_FLAGS=0x010"
"Output"="c:\\cqsquid.log"
```

- **UNIX/Linux:**

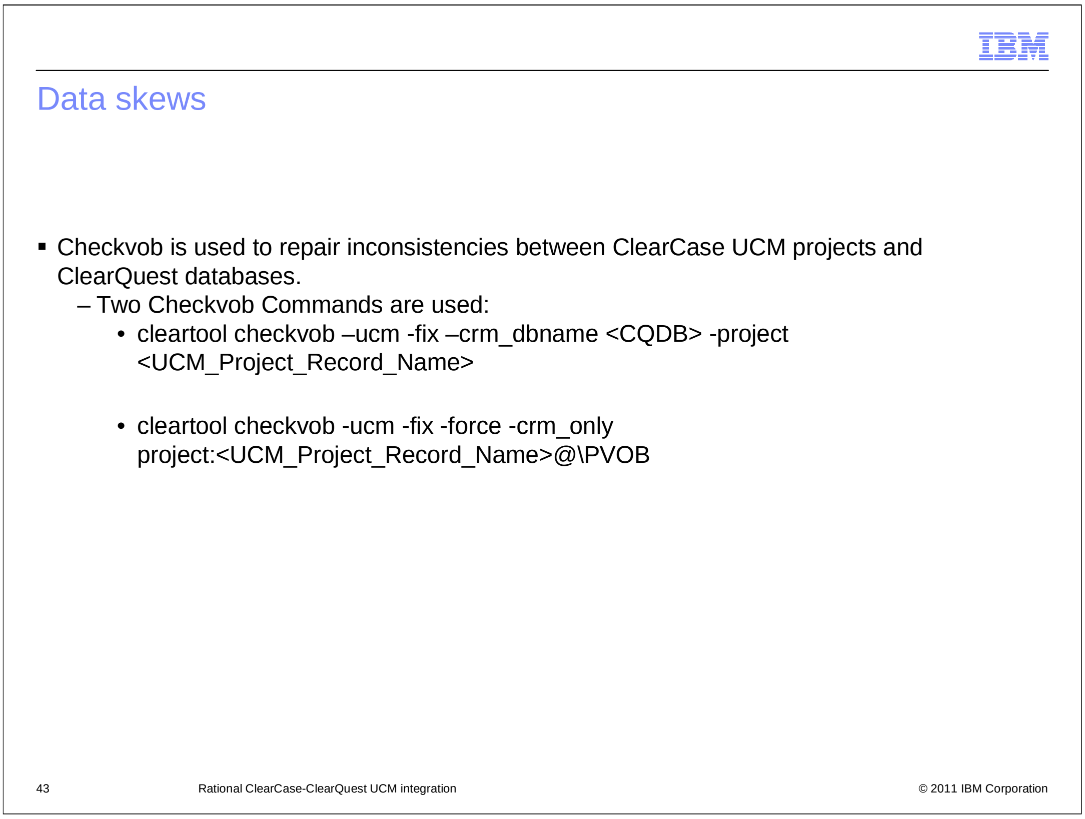
Example (c shell on UNIX or Linux):

```
setenv CQ_DIAG_TRACE "DB_CONNECT=3;THROW;SQL=3;CQINTSVR"
setenv CQ_DIAG_REPORT "MESSAGE_INFO=0X1309"
setenv CQ_DIAG_OUTPUT "/tmp/CQ_SQUID.log"
setenv SQUID_TRACE "*"
setenv SQUID_TRACE_FILE "/tmp/CQ_SQUID.log“
```

Example (k shell on UNIX or Linux):

```
export CQ_DIAG_TRACE="DB_CONNECT=3;THROW;SQL=3;CQINTSVR"
export CQ_DIAG_REPORT="MESSAGE_INFO=0X1309"
export CQ_DIAG_OUTPUT="/tmp/CQ_SQUID.log"
export SQUID_TRACE="*"
export SQUID_TRACE_FILE="/tmp/CQ_SQUID.log"
```

This slide tells you how to troubleshoot the integration on a Windows host. The example in this slide gives you an example of a Windows registry key that you can import. This key traces all UCM-ClearQuest operations and produces a log for you to look at in order to see where exactly the integration is failing.

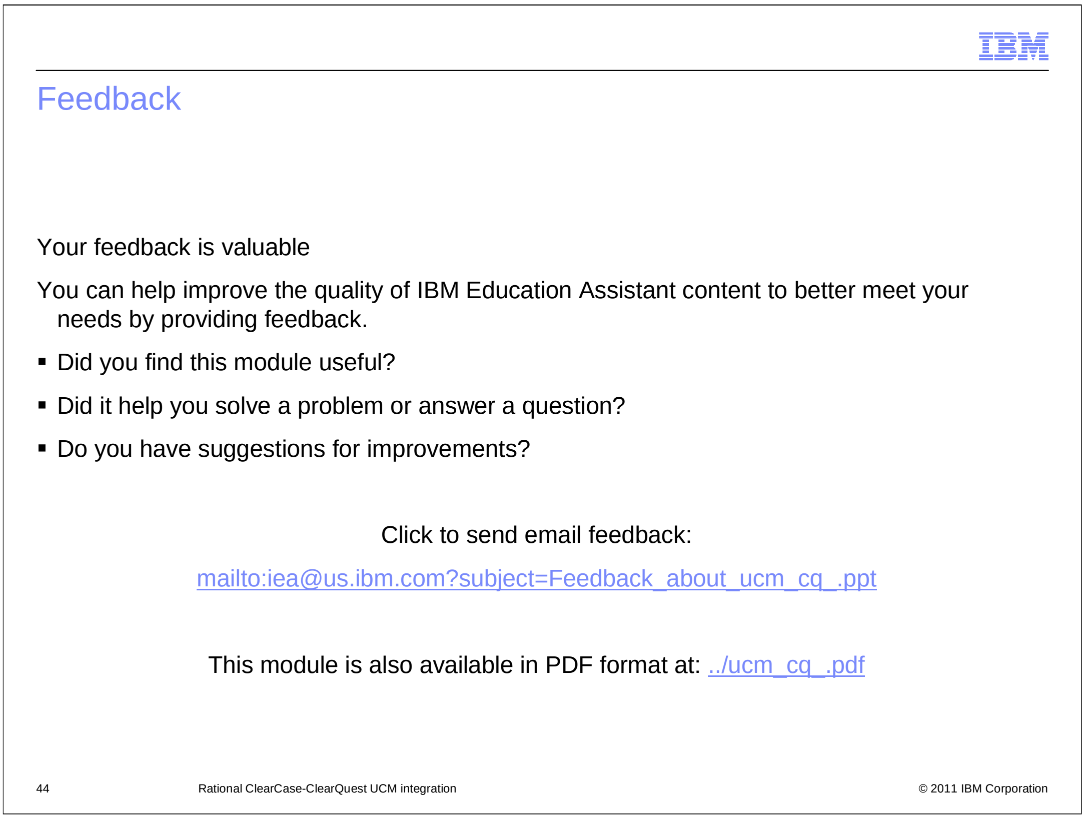


Data skews

- Checkvob is used to repair inconsistencies between ClearCase UCM projects and ClearQuest databases.
  - Two Checkvob Commands are used:
    - cleartool checkvob –ucm -fix –crm_dbname <CQDB> -project <UCM_Project_Record_Name>
    - cleartool checkvob -ucm -fix -force -crm_only project:<UCM_Project_Record_Name>@\PVOB

43 Rational ClearCase-ClearQuest UCM integration © 2011 IBM Corporation

Checkvob is used to repair inconsistencies between ClearCase UCM projects and ClearQuest databases. There are two checkvob commands that are most commonly used to fix data skews between ClearQuest and ClearCase. See the examples in this slide.



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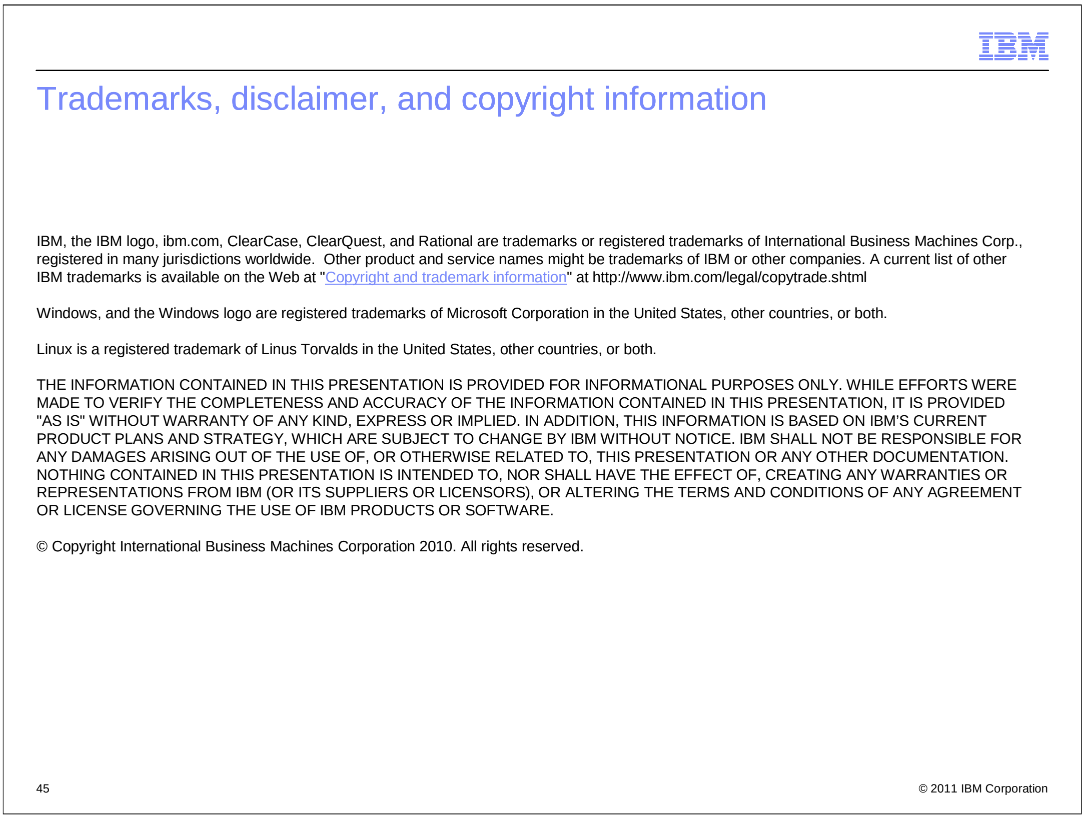

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