## Securing Your IBM Rational ClearQuest Environment

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What keeps me Rational?











#### **Overall Goal**

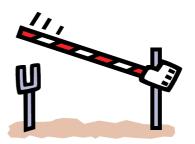
- Open and Secure Lines of:
  - Communication
  - Collaboration
- Leverage Out-Of-The-Box (OOTB) functionality:
  - Schemas and Schema Capabilities
  - Security features
- Auditability
- Traceability





## **Terminology**

- What Do We Mean By "Security"?
  - Traditional Sense
    - Put under lock and Key
    - Access Control
      - Authentication / Authorisation
  - Wider Sense
    - Privacy
    - Confidentiality
    - Abstraction
      - Data Hiding
      - Different Views of Data
  - Process Security
    - Traceability / Auditability













## Scenario Background

#### Large Enterprise

- Implementing ClearQuest across the entire organization
- 10-15 distributed project teams
- Their Security Concerns are:
  - 1. Authentication & Authorisation
    - Ability to control who can login and what they can do
  - 2. Role Based Access ("Trusted" Zone)
    - Ability to view and modify records, but transitioning state is role based
  - 3. Confidentiality Between Projects and Project Teams ("Trusted" Zone)
    - Only members of designated teams can view their records
  - 4. Vendor/Contractor/Customer Access to ClearQuest ("Untrusted" Zone)
    - Ability for vendors/contractors/customers to submit and only view records that pertain to their organization.





## ClearQuest and LDAP What is LDAP?

- The Lightweight Directory Access Protocol (LDAP) is an open industry standard that computers and networked devices can use to access common information over a network.
- LDAP is both an information model and a protocol for querying and manipulation.
- Originally developed to provide easy access to X.500 directories.
- LDAP is designed to run over the TCP/IP stack.
- LDAP is optimised for high volume read access.

LDAP is an access protocol that shares data using a particular information model.

LDAP Programming, Management, and Integration by Clayton Donley





## ClearQuest and LDAP Authentication VS Authorisation



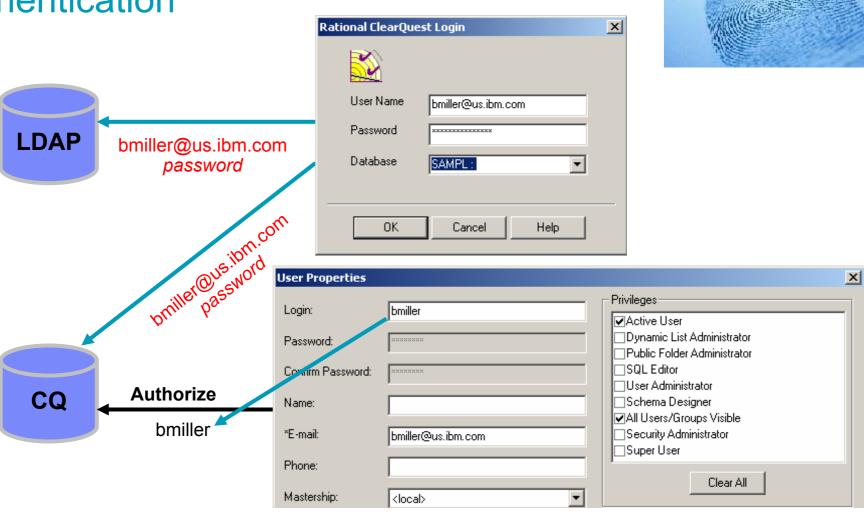
- Authentication => Who are you? What is your Identity?
  - Login Name
  - Password

- Authorisation => What are you allowed to do?
  - UserDB Access
  - ▶ Privileges (Super User, Schema admin, Public Folder admin...)
  - Groups



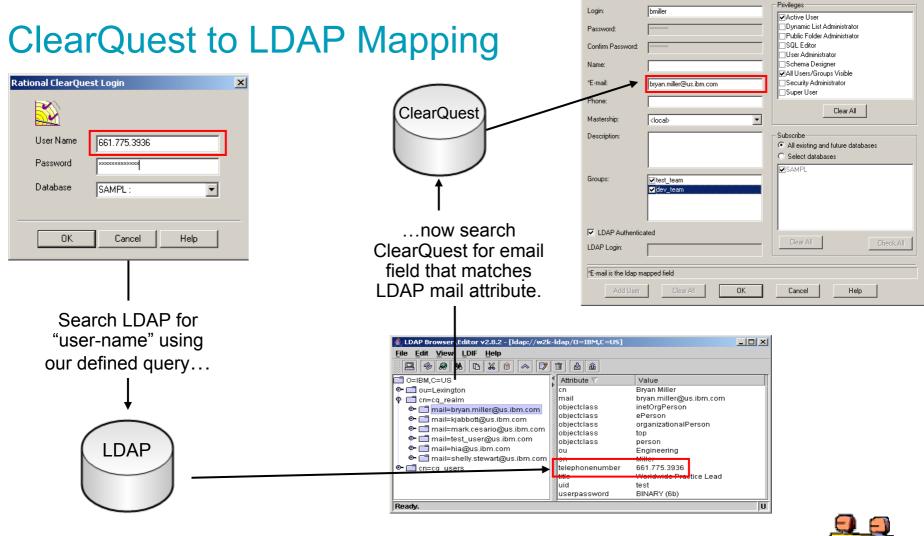


### Authentication









...a match will return an LDAP record...

User Properties





## Why Use LDAP?

- Users have the same Login ID as for other Corporate Intranet Services
- LDAP Managed Centrally so:
  - Password reset requests no longer fall to ClearQuest Administrator
  - Accounts can be enabled / disabled centrally
  - Corporate Password Policies can be enforced
    - Strength
    - Aging
- Can be configured to use Secure LDAP for extra Security
- Supports LDAP servers that support protocol Version 3:
  - ▶ IBM® Lotus® Domino® LDAP Server
  - ▶ IBM Tivoli® Directory Server
  - Microsoft® Active Directory Server
  - Novell eDirectory Server
  - Sun Java™ System Directory Server

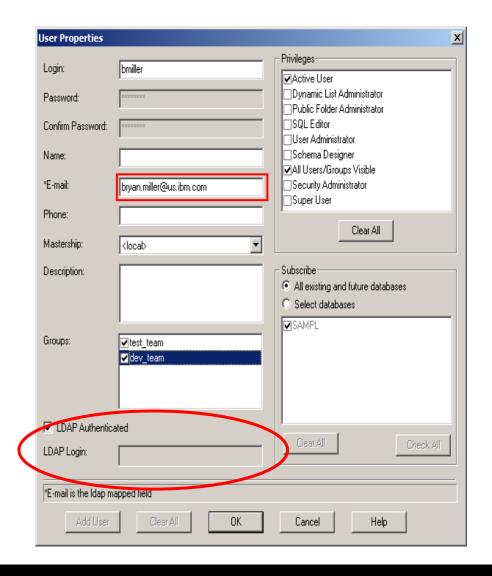




### LDAP Map Lookup

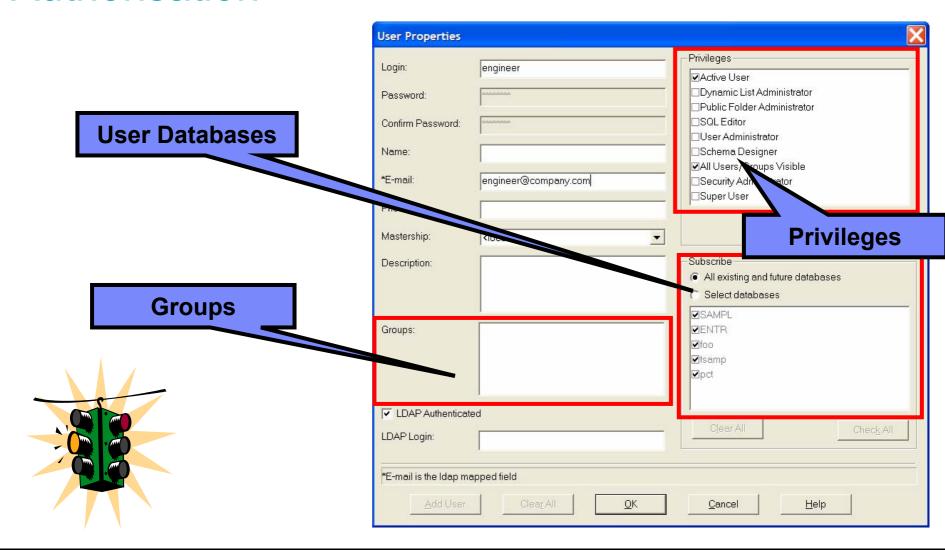
The User Properties window also contains an LDAP Login field. If you enter the user's LDAP login name, and a connection to the LDAP server exists, IBM Rational ClearQuest copies the value of the LDAP mapping attribute to the corresponding Rational® ClearQuest mapping field when you click OK or Add User







### **Authorisation**





#### Role Based Access

#### Use Case:

Some teams are building reusable assets. Everyone should have access to view and comment on their defects and RFEs. They can submit defects and RFEs, but cannot transition them. Only specific roles within the organization can transition records.

#### Security Requirement:

Action level security

#### Implementation: 2 Possible Approaches

- Create users/groups and define basic roles through User Administration tool
  - Roles Based on ClearQuest Privileges
- Define roles for the users/groups in the context of actions using designer tool
  - Define roles through group membership
  - Programmatically through hooks



RFE – Request for Enhancement





## Role Based Access Implementation Details

- Create users and groups and define their basic roles
  - Define users and groups with appropriate privileges through user administration tool
- Graphically define roles for action level security
  - Grant or revoke permissions on actions to all users or specific groups
- Programmatically define roles for action level security
  - Grant or revoke permission on actions to a single user
  - Grant or revoke permission on actions to a whole group or a part of the group
  - Grant or revoke permission on actions to users and groups based on any criteria

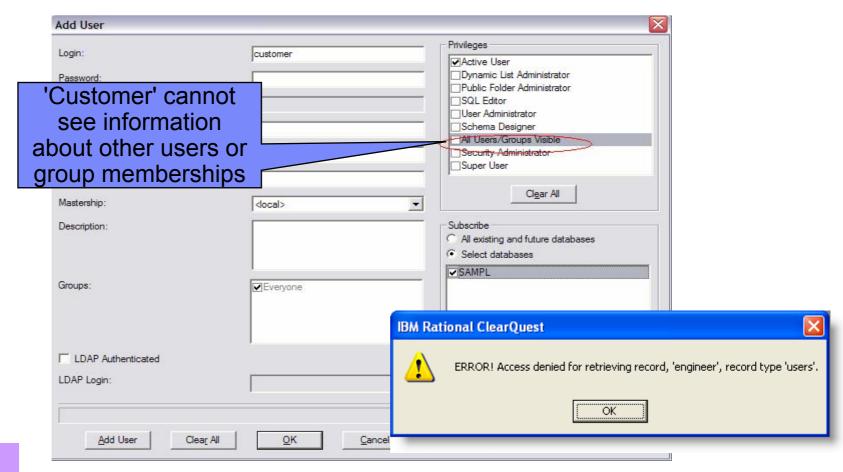




### Role Based Access Example

#### Create users and define their roles

Create user 'customer' without all user/groups visible privilege



**Privacy** 



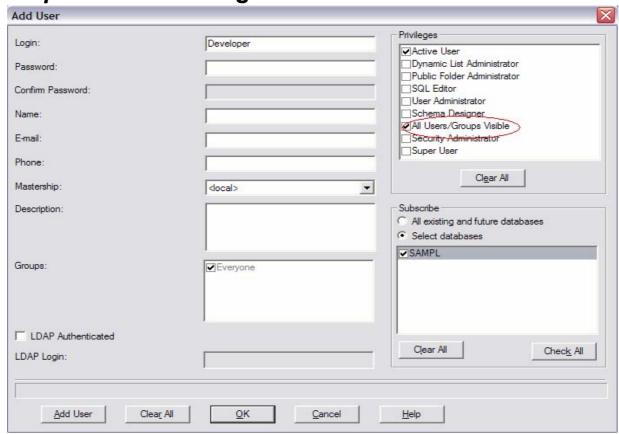


### Role Based Access Example

Create additional users



 Create users 'Developer' and 'Tester' with All Users/Groups Visible Privilege





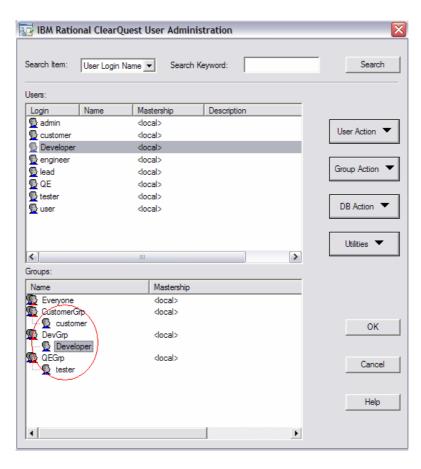


### Role Based Access Example

Create additional groups

Create CustomerGrp , DevGrp and QEGrp for their respective

users



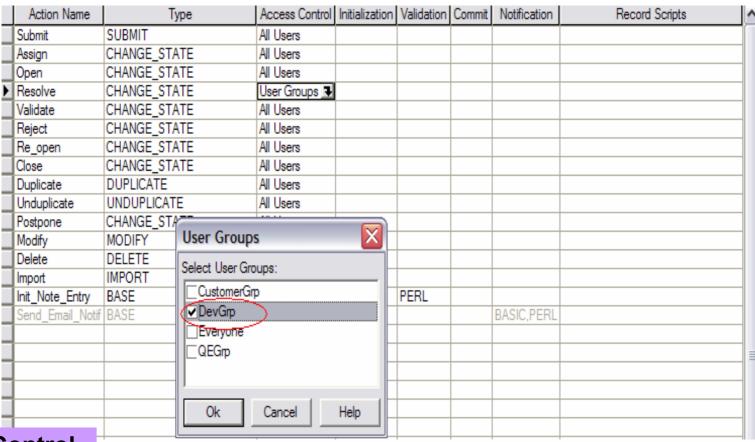




## Role Based Access Example Graphically define roles for action level security



Restrict "Resolve" actions to "DevGrp" Members only



**Access Control** 





## Role Based Access Example Graphically define roles for action level security



Restrict "Close" action to Members of the group "QEGrp"

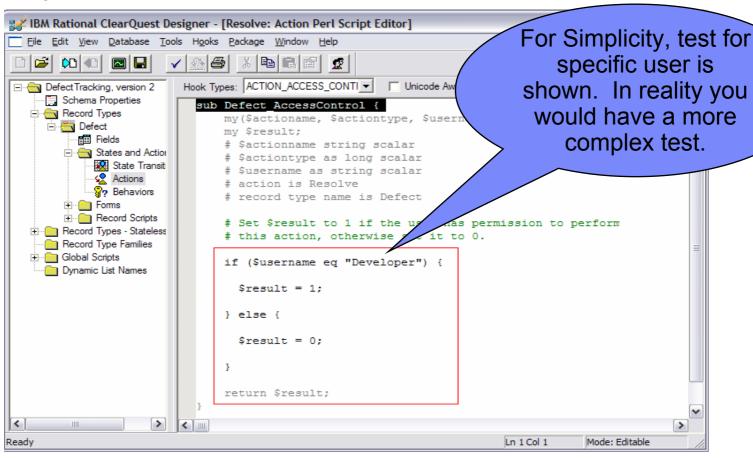
Action Name	Туре		Access Control	Initialization	Validation	Commit	Notification	Record Scripts
Submit	SUBMIT		All Users					
Assign	CHANGE_STATE		All Users					
Open	CHANGE_STATE		All Users					
Resolve	CHANGE_STATE		User Groups					
Validate	CHANGE_STATE		All Users					
Reject	CHANGE_STATE		All Users					
Re_open	CHANGE_STATE		All Users					
Close	CHANGE_ST/	\TE	User Groups 🗷					
Duplicate	DUPLICATE		All Users					
Unduplicate	UNDUPLICATE		All Users					
Postpone	CHANGE_ST/							
Modify	MODIFY User Groups			X				
Delete	DELETE	Salact Hear Gro						
Import	IMPORT	Select User Groups:						
Init_Note_Entry	BASE	CustomerGn	Þ		PERL			
Send_Email_Notif	BASE	□DevGm					BASIC,PERL	
		Everyone						
		<b>⊘</b> QEGrp	)					
			<b>,</b>					
		Ok	Cancel	Help				



# Role Based Access Example Programmatically define roles for action level security



Allow only "Developer" to execute Resolve action

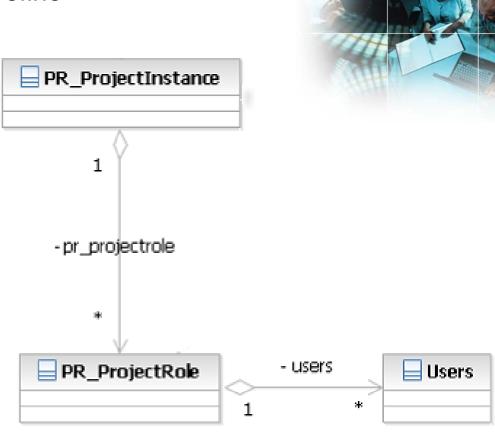






### Project Role Example

- Uses Stateless Records to Define
  - List of Possible Roles
  - List of Projects
  - Roles Associated with a project
  - Members of a Role for a Project
- Useful in Environments where
  - Many Projects
  - Individuals work on one or more projects





### Confidentiality Between Projects and Project Teams

#### Use Case:

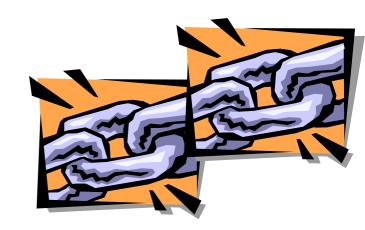
▶ Team X manages the corporate portal, their work is confidential and requires a highly secure and auditable environment. Defects and RFEs cannot be seen by other project teams and Customers can only see there own.

#### Security Requirements:

- Record Hiding
- Workspace ACLs
- Audit Trail and e-Signature

#### Implementation:

- Security context
- Set ACLs on project folders
- Apply Audit Trail and e-Signature packages



#### Confidentiality

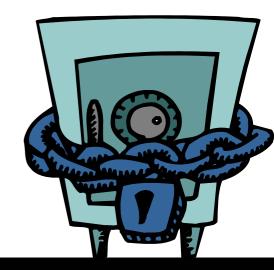




# Confidentiality Between Projects and Project Teams Implementation Details

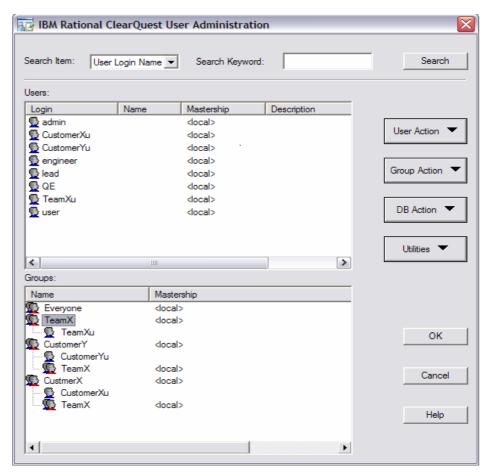
#### Security Context:

- Enables record hiding:
  - Decide which record types to control
  - Create user groups that align with your user access privileges
  - Decide which record type to use as the security context
    - The security context field must be a Reference field type
  - Submit records for each security context
  - Editing records to allow user access





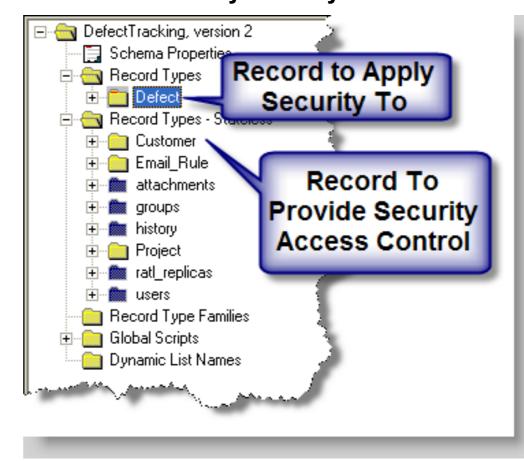
- Create Groups
  - TeamX
  - CustomerX
  - CustomerY
- Create Users and make group members
  - TeamXu,
  - CustomerXu
  - CustomerYu





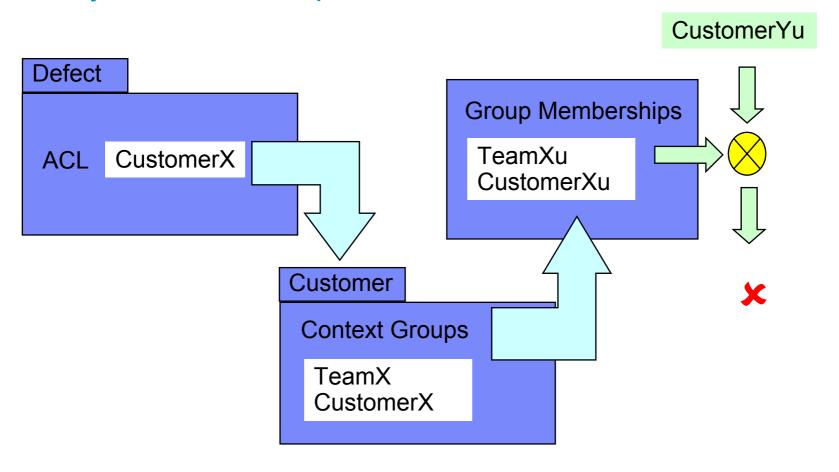
Select Record type defect to be controlled by security context record

of type customer





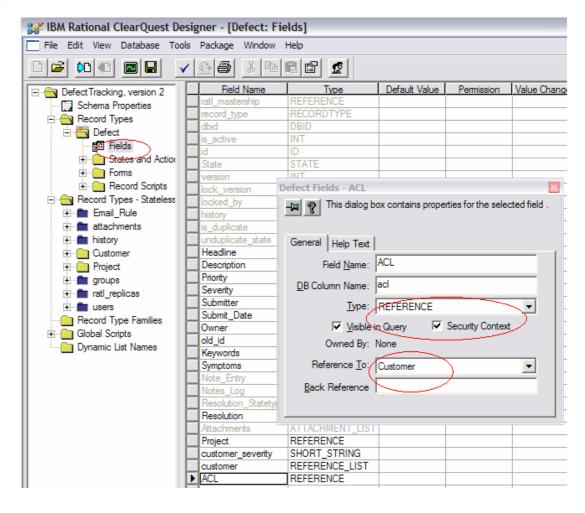






 Create a security context field of type REFERENCE which refers to Customer record type

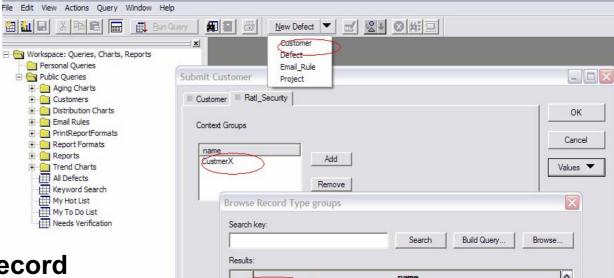






IBM Rational ClearQuest - SAMPL :





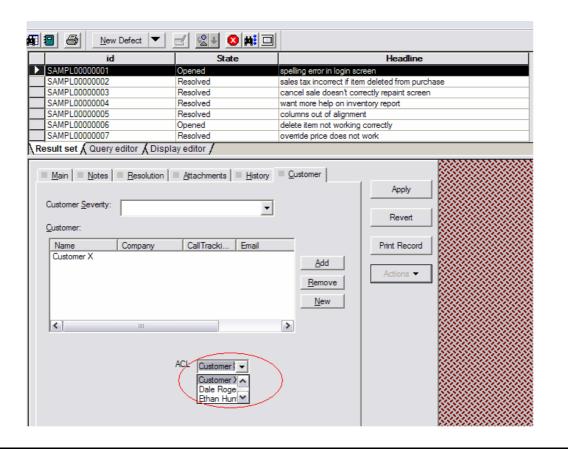
Customer

Everyone TeamX

- Submit a 'Customer' Record
- Associate the 'CustomerX'
   Group with the Security
   Context for the record



Edit Existing Records to Identify which Customer they belong to



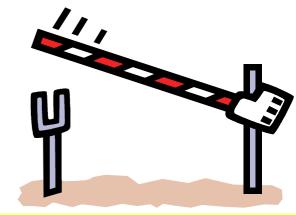




# Confidentiality Between Projects and Project Teams Implementation Details

#### Public Queries (Folder) ACLs:

- Sets CRUD permissions to:
  - Limit access/visibility to Public Queries (folders)
  - Limit cross-group/project visibility
  - Restrict customer access within Public Queries
  - Enable folder management by individual groups
  - Hiding existence of other group folders
  - Cleanups Workspace



**New in ClearQuest 7.0.1** 

**Privacy + Access Control** 

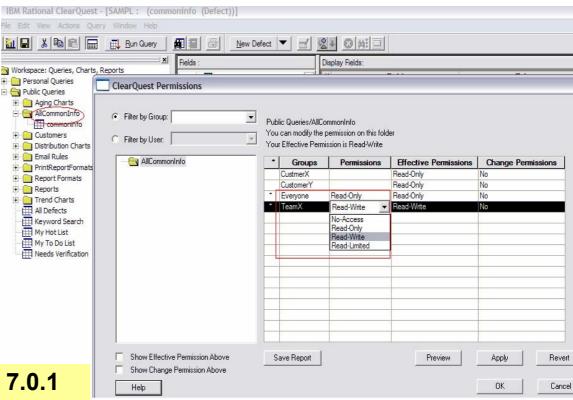




### Confidentiality Between Projects and Project Teams Limit access/visibility to Public Queries (folders)

 TeamX wants to share one of its private folders "AllCommonInfo" with CustomerX and CustomerY granting limited access.

 TeamX will have complete access to the content of folder "AllCommonInfo"



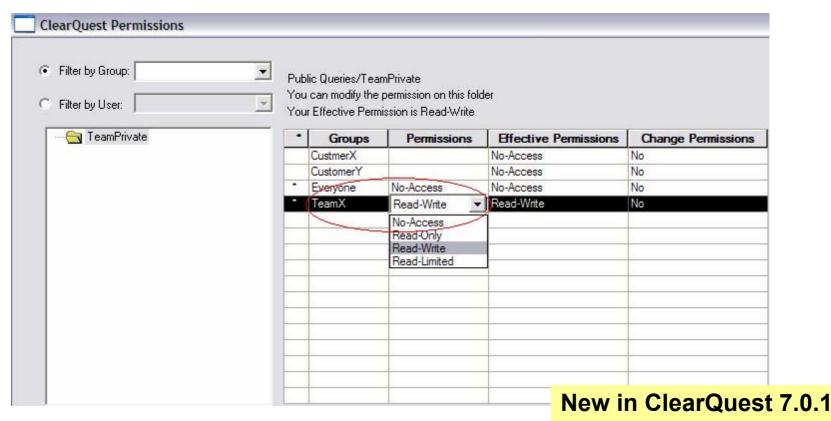
**New in ClearQuest 7.0.1** 





## Confidentiality Between Projects and Project Teams Limit cross-group/project visibility

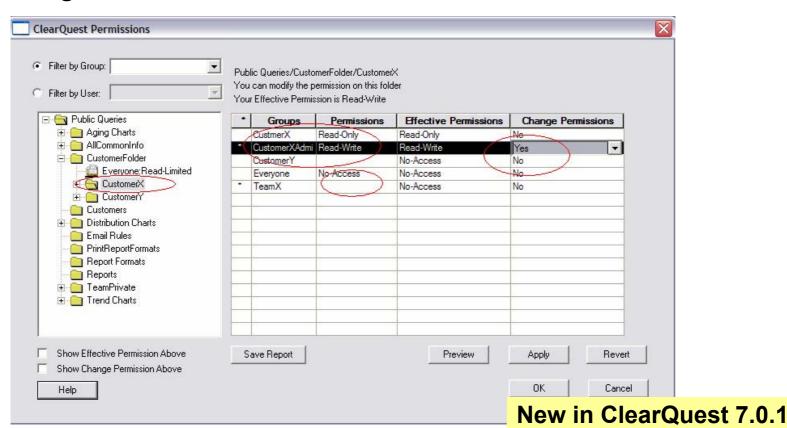
 TeamX wants to create a folder "TeamPrivate" whose contents should be only visible to TeamX where other groups can see the folder but not its content





### Confidentiality Between Projects and Project Teams Enable folder management for individual groups

 Administrator wants to enable CustomerX and CustomerY to be able to Manage their own folders themselves

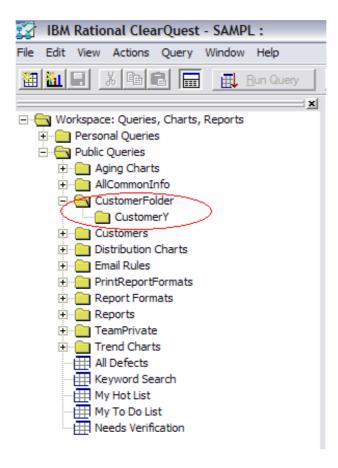






# Confidentiality Between Projects and Project Teams Hiding existence of other group folders

Hide CustomerX folders from CustomerY and vice versa



**New in ClearQuest 7.0.1** 





### **Ensuring Process Traceability & Auditability**

- Apply AuditTrail and eSignature packages:
- AuditTrail:
  - Specifies that certain records are to be audited when they are created or changed
  - Can be configured to determine what fields to audit
- eSignature:
  - Requires users to add their electronic signatures to records when certain State Transitions occur
  - Can be configured to determine actions/state transitions that need to be signed and who can sign.



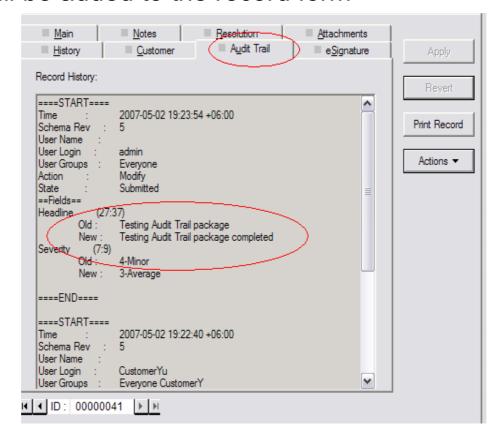
**Process Security** 





# Ensuring Process Traceability & Auditability Audit Trail Example

- After applying the AuditTrail package and enabling a record type An Audit Trail tab will be added to the record form
- Content of Audit Trail can be Customised
  - Can Choose which fields to audit
  - Can Choose format of audit trail content







# Ensuring Process Traceability & Auditability e-Signature Example

After applying the package to schema, you must configure it

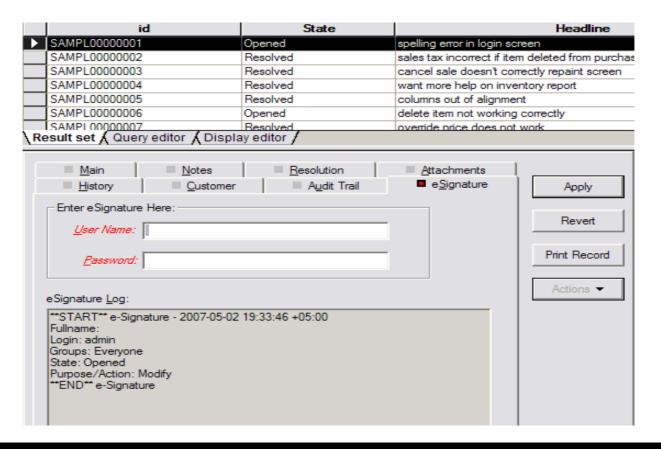
Submit eSig_Config	
eSignature Configuration  Record Type:  Defect  Sign by State:  States:	 OK Cancel Values ▼
Sign by Action	





### Ensuring Process Traceability & Auditability e-Signature Example

During a Modify operation it prompts for user name and password





#### Vendor/Contractor/Customer Access to ClearQuest

#### Use Case:

▶ Team Y is working with external vendors. Team Y needs to file Defects and RFEs for the vendors. The vendors require access to submit Defects and RFEs

#### Security Requirements:

- Record Hiding
- Workspace ACLs
- External IDs not in corporate LDAP directory

#### Implementation:

- Leverage ClearQuest Web client
  - Restricted mode





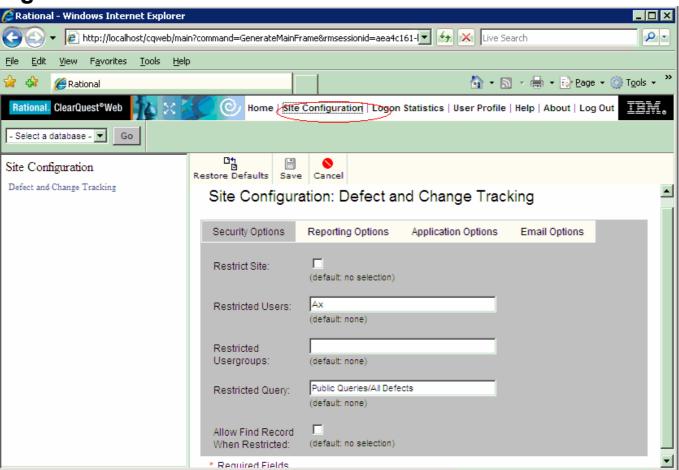
### Vendor/Contractor/Customer Access to ClearQuest Implementation Details

- Restricted Mode: Provides a layer of user privilege control in addition to that provided in the underlying schema
  - Configuring Restricted Mode access:
    - Restrict Site: All users run in restricted mode
    - Restricted Users: Specific users are restricted
    - Restricted User Groups: Specific user groups are restricted
    - Restricted Query: Users in restricted mode can access only one Query predefined by the administrator
    - Administrator can choose whether to Allow Find Record When Restricted: Users in restricted mode can use the Find Record feature (subject to s enforcement rules)
    - Administrator can choose whether to allow restricted users to Modify Records



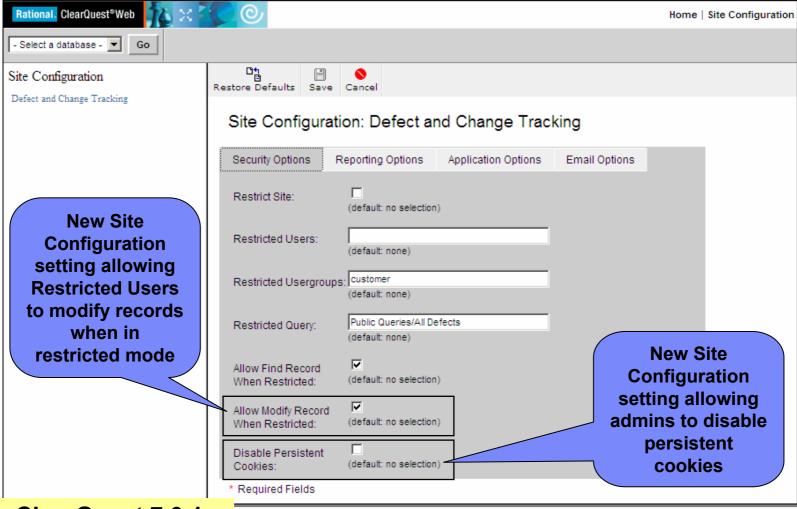


Configuring restricted mode access





#### **Enhanced Web Security Improvements!**

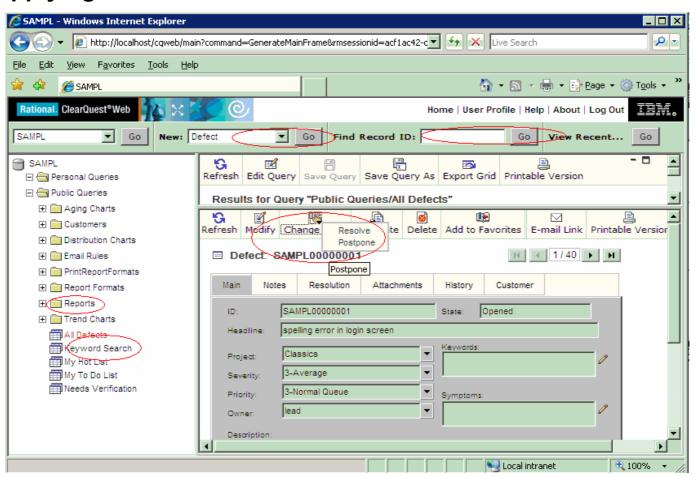


**New in ClearQuest 7.0.1** 



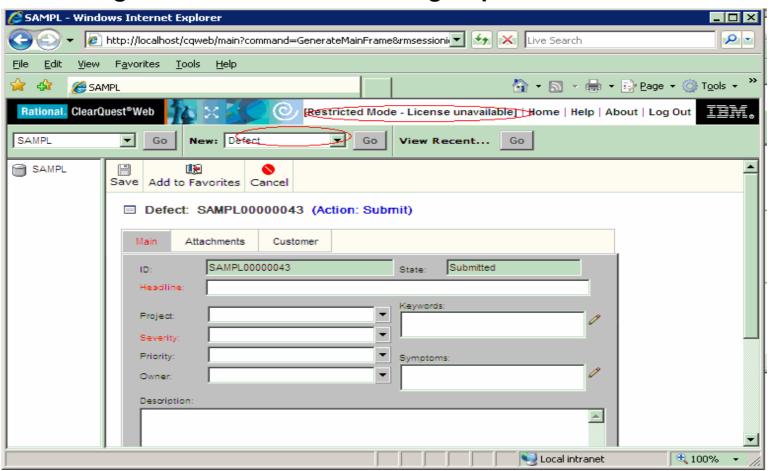


Before applying Restricted mode



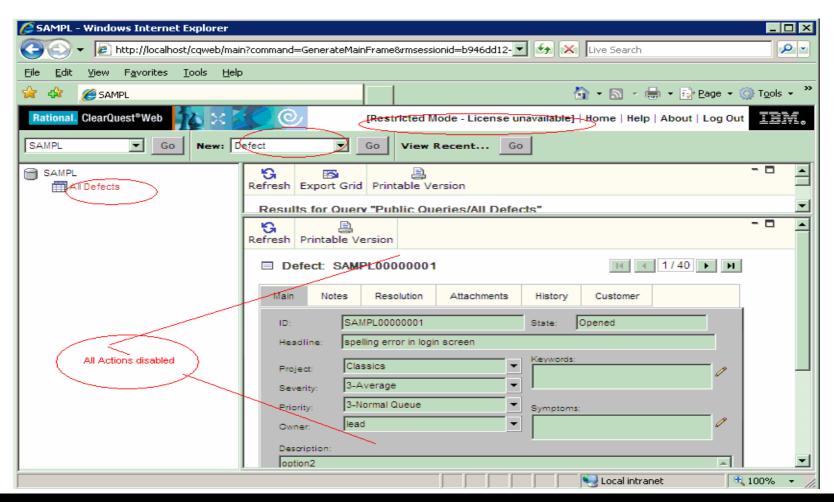


After enabling Restrict Site for All users/groups



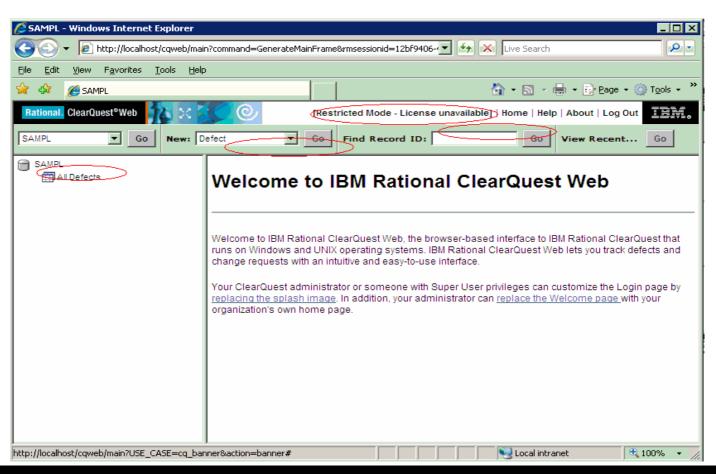


Example after enabling Restrict Site with Restricted Query





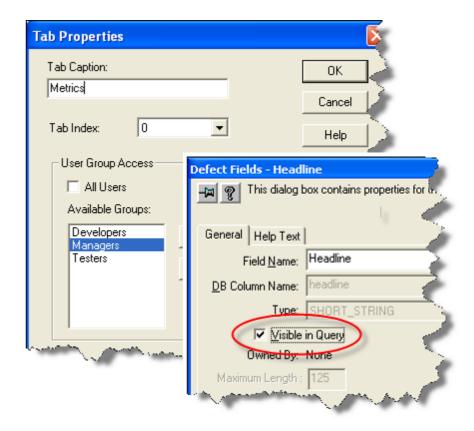
Example after enabling Restrict Site with Find Record and Restricted Query





#### Miscellaneous Security Features in ClearQuest

- In Addition to above security features ClearQuest provides the following features which can be applied to ClearQuest change management system
  - Restricting Access to Fields
  - Hiding fields in a Query
  - Restricting Access to Actions
  - Restrict Access to Dialog Tabs
  - Password Fields
  - Granular Folder level Permissions in Workspace ACL





#### Server-Side SMTP Email Notification



- The existing client-side email notification approach is executed on client desktops
  - This approach tends to be problematic for many customers due to increased IT infrastructure security rules
    - Many IT organizations only permit SMTP mail to be sent via a select set of IP addresses
    - MAPI 'Broken' by Security Patches requesting user confirmation for all emails
- The answer Rational Field Services!
  - Greatly enhanced email notification reliability and audit capabilities
  - Full replacement of client-side email notification
  - Adds a "Postoffice" stateless record to any existing schema
  - No client-side / Web server configuration or maintenance required
  - Completely flexible email content generation
  - For further info contact: Alan Murphy or David J. Trent (alan.murphy@uk.ibm.com or ditrent@us.ibm.com)









# Questions







# Thank You

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