



Rational software

Simplifying application lifecycle management with IBM Rational ClearQuest software.

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The critical role of ALM in boosting team performance

The need to streamline team efficiency and govern without impeding progress is greater today than it has been at any point in the history of software delivery. The life span of software applications is getting shorter, and demand has increased dramatically. Software delivery teams are being asked to improve product quality and accelerate time to market, even as software products and software development environments become more complex. The number of stakeholders in the software delivery process has grown and teams are often dispersed globally.

In response to this new landscape, teams must collaborate and understand the needs of the business. Gone are the days of practitioners using a single set of tools to complete work in a vacuum. Business analysts are more involved in the development process. Developers must understand stakeholder needs and the business processes, while also designing assets for reuse and implementing and testing the system. Testers must closely align with business analysts to ensure high-quality applications. The project manager needs to have confidence that requirements have been implemented and tested with sufficient rigor before delivering the solution.

Application lifecycle management (ALM) not only brings these roles together, it also drives the transparency of team progress and governs how the team works. In the current software development environment, teams cannot function without it.

Highlights

The IBM Rational ClearQuest ALM schema helps development teams collaborate across disciplines and enables better understanding of the relationships between software artifacts.

The fundamental goal of ALM is to streamline a team's ability to deliver software. At the heart of ALM lies coordinated collaboration among team members. This coordination involves people, processes, information and tools that help teams:

- *Connect stakeholders and contributors throughout the application delivery process.*
- *Ensure that the results of their work are traceable to the originating requests.*
- *Streamline processes by automating noncreative, repetitive tasks.*
- *Continuously assess progress and results to improve performance.*

The IBM Rational® ClearQuest® software includes an out-of-the-box ALM schema that is both role based and process driven, allowing organizations to manage and improve software delivery through ALM. This white paper defines the core concepts of this schema. It then highlights how the offering helps teams provide a security-rich project context, coordinate work throughout the software development lifecycle, support regulatory compliance initiatives, and empower project managers and team leads to adapt configurations to meet project needs.

Core concepts of the Rational ClearQuest ALM schema

The challenge for software development teams is not in creating a single artifact (source code, requirement or test case), but rather in collaborating across disciplines and understanding the relationships between artifacts. To enable this understanding, the Rational ClearQuest ALM schema is based on three essential concepts:

The Rational ClearQuest ALM schema is based on three concepts.

- *Projects provide context, roles and security.*
- *Work is completed in the context of a project.*
- *There are system-wide settings that you can modify without having to change the schema.*

Highlights

The first concept is that projects provide context, roles and security.

In the ALM schema, projects define user access and role-based actions, which work types will be used by the project team, and whether the work will be managed in phases and iterations. Projects can have relationships to other projects to organize work effort. Parent/child relationships can be used to group projects that are related in a single, larger effort. And next/previous relationships can be used to identify related projects over time.

Work is managed in the context of a project, and it can be assigned to team members who are either colocated or distributed. Work records keep track of the requests, tasks and activities that the team needs to address during the development cycle.

All work begins with some form of request. This request describes the identified need and is owned by the stakeholder. Tasks represent the commitment to address the request in a specific project and describe the work required to complete the request. Activities are assignments to individuals that, when completed cumulatively, complete the task. In addition, build and baseline records help the team keep track of the status of each build along with which activities are delivered in the baselines. By linking activities to baselines, test teams can determine which tests to run on each new build.

Second, work is completed in the context of a project.

All of these records are linked, pioneering a new level of traceability and transparency. You can see how much work is required with each request; what projects are involved; how much of the work is completed; and the status of work still in process.

Highlights

The third ALM schema concept says that there are system-wide settings that can be modified without having to change the schema.

Many times project teams have special requests that create a backlog of work for the Rational ClearQuest administrators who modify the schema. These requests can range from adding new roles or accommodating a team's vocabulary to providing new record types with custom state transitions. With the ALM packages for Rational ClearQuest, system administrators can empower project managers to complete these requests themselves.

A set of system-wide settings are provided to empower project managers to configure a project according to their needs. They can modify the vocabulary, choose the work types their teams act on, and customize the process for their project. Additionally, security policies are system-wide settings that can be established by users with the SecurityAdmin privilege. By adding users to the ALMAdmin record, Rational ClearQuest administrators define which users are allowed to modify the system-wide settings.

Support diverse project types with the right balance of flexibility and process consistency

With previous Rational ClearQuest versions that do not have the ALM package, you only had two approaches to meeting diverse project needs. The first was to create one large, complex schema designed to satisfy every project team (and usually satisfying none), and the second was to create multiple schemas, which consume administrative time in design and maintenance. With the ALM package, you can support virtually every type of project with one out-of-the-box schema. The system can scale from the smallest of teams to larger teams with increased levels of process ceremony.

Highlights

Project managers and team leads are empowered to define roles and allowable actions, as well as customize their processes and vocabularies to suit how their teams work.

Empower project managers

Every project, and every project team, differs. They differ in size, roles, process, work types and vocabularies. A core capability of the ALM solution for Rational ClearQuest is to support a range of initiatives, from small teams working on a single project to an enterprise-wide team of teams contributing to many related projects.

Project managers can be empowered to define roles, both in name and in the range of allowable actions for a particular project. These role definitions can change from project to project, and a single user can perform different roles across many projects.

Additionally, projects can be configured to support a wide variety of work processes, and project managers can choose the set of work types and how they relate to the project at hand.

Many times project teams simply want to use a different vocabulary. Label records allow users to create their own vocabularies, thus giving them freedom to customize their projects to suit their own culture and processes. Labels can also enable the organization to transparently enforce enterprise-wide naming conventions by restricting who is able to create and see labels.

By using roles, work configurations, types and labels, project managers and team leads can now be empowered to configure projects without changing the ALM schema.

Highlights

The ALM schema is delivered with work configuration records that enable administrators to transparently enforce best practices enterprise wide, regardless of whether teams use high or low process ceremony.

Enable process consistency and flexibility

If your organization has standardized on a process such as the IBM Rational Unified Process® (RUP®) or the IT Infrastructure Library® (ITIL®) framework, you can introduce the vocabulary and process definition into your projects. Teams that use the Open Unified Process (OpenUP) from the Eclipse Process Framework have an added advantage: The ALM schema is delivered with samples demonstrating the OpenUP process.

To ensure that the required activities are performed, the ALM schema provides work configuration records that enable the administrator or process lead to configure default sets of activities required to complete specific task types. When one of those task types is created, the default activity records are generated and automatically linked to the task. Each project can have its own process definition to suit its needs.

However, not all projects require formalized process. There may be projects that simply need to manage a list of activities. In this model, an activity acts like a work queue, where a work item is assigned and completed. This approach can be used for Agile teams or small, short-lived projects where team members simply want to know, “What work do I have to do?”

Whether teams use high process ceremony, or low ceremony Agile techniques, the ALM schema can be configured to support every team’s needs.

Highlights

Administrators can help project managers create highly secure projects quickly by providing templates and establishing security policies that control which groups are authorized to see which projects.

Streamline project creation

Many times new projects are similar to existing projects. Your organization may have different types of projects. Or, a project can have characteristics similar to its predecessor, and a child project can share the characteristics of the parent project. With the ALM solution in Rational ClearQuest, you can use the *copy project* command to copy the structure of any project. Once you have a copy, you can then make whatever modifications are needed.

You can allow project managers to copy any project, or you can set up projects to act as templates that capture best practices for particular types of projects. Copying projects not only provides a powerful means of creating new projects quickly and efficiently, but it also helps to ensure consistency in settings across projects.

Provide a role-based and security-rich context for work

The ALM schema helps ensure project security by defining which users and groups have access to the project and what actions they can perform. Security policies are used to define who can see the project and its related artifacts in the Rational ClearQuest database. Roles define allowable actions for users or groups for each project.

Establishing security policies

If access to projects is a concern, you can create security policies that control which groups are authorized to see which projects. For example, an organization that works with a third-party provider could create a security policy that grants access to only those projects the provider is authorized to see, while restricting access to those the provider is not allowed to see.

Highlights

The IBM ClearQuest ALM schema gives organizations the flexibility to define different roles for different projects.

With the ALM schema, administrators can delegate the task of defining roles to project managers.

Administrators with SecurityAdmin privilege define security policies that are available to all system users. Project managers are then free to choose the appropriate policy by making a selection from a drop-down list when projects are created. In this way, security can be set on a project-by-project basis without having to involve administrative staff.

If new security issues arise that require policy additions, the administrator simply defines a new security policy and it is immediately available system wide via the drop-down security policy menu on the project record.

Defining roles

Many organizations need to define roles differently for different projects. The ALM solution provides a role record to define which users and groups can perform which actions on a project. Role records are project specific, which means the definition of a role for one project can differ from that of another.

Additionally, individuals can have multiple roles on various projects without affecting the Rational ClearQuest users and groups. For example, a user may perform the role of architect on one project and the role of reviewer on another. The user name is the same, but the role and the allowed actions are different as defined by the project in which the role is assigned.

Administrators can empower project managers to define new roles and allowed actions for their projects. Each project manager or team lead determines which roles are included and which practitioner performs each role.

Role names are configurable. A role label provides a naming mechanism for roles that can either be shared across the enterprise or changed from project to project. When a role is created for a project, a choice of role labels is provided to identify the role.

Highlights

With full visibility into how activities roll up into tasks and requests, managers can easily determine how much work remains to be completed at any time in the project lifecycle.

Enable an unprecedented level of traceability and transparency

The ALM solution for Rational ClearQuest provides the transparency and traceability you need to effectively manage software projects and improve team collaboration. By maintaining the relationship between requests, tasks and activities (as defined in figure 1), project managers have full visibility into the amount of work needed to complete a project. Additionally, for teams that develop iteratively, tasks can be associated to iterations, allowing managers to balance work across the project to help ensure a healthy workload.

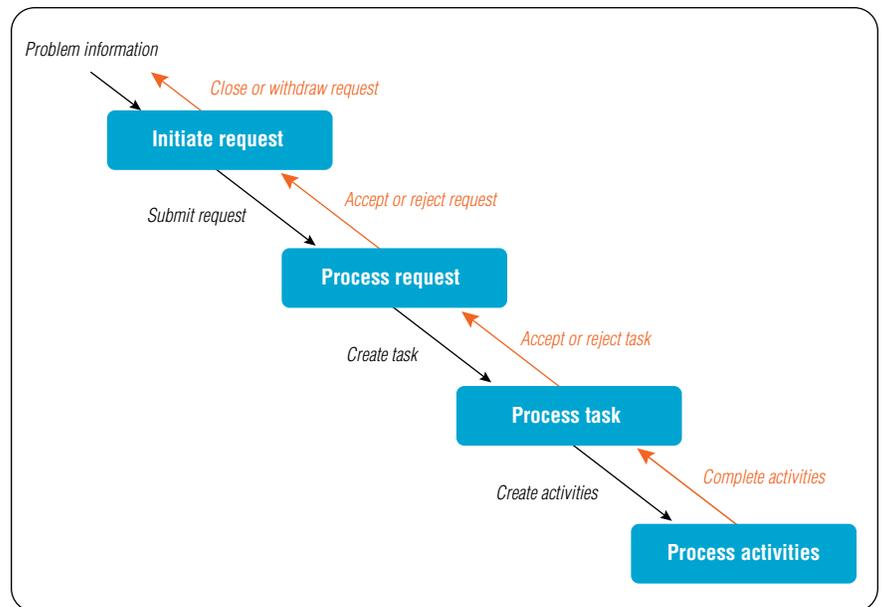


Figure 1: In the ALM schema, work activities are traceable to the original request and to the project that implemented the request.

Highlights

The ALM schema supports a process model where developers, release engineers and testers all work in parallel.

For those who need to support compliance with industry standards and government regulations, this linking of work makes it easier to create reports that identify what project work was completed and by whom. Because tasks link back to the originating requests, project managers have a better way of defining what changes were addressed in their project. Whatever the requirement, the ALM schema enables you to quickly access the information required to effectively manage work, complete reports and pass audits.

Improve team coordination across the application delivery lifecycle

The ALM schema supports a process model where iterative parallel development, building and testing occur. The model focuses on work completed in the context of a project. Requests are planned as tasks. Developers deliver changes after they work on and complete development activities. Release engineers create baselines, run builds, and validate and promote these builds. Testers work on and complete test activities.

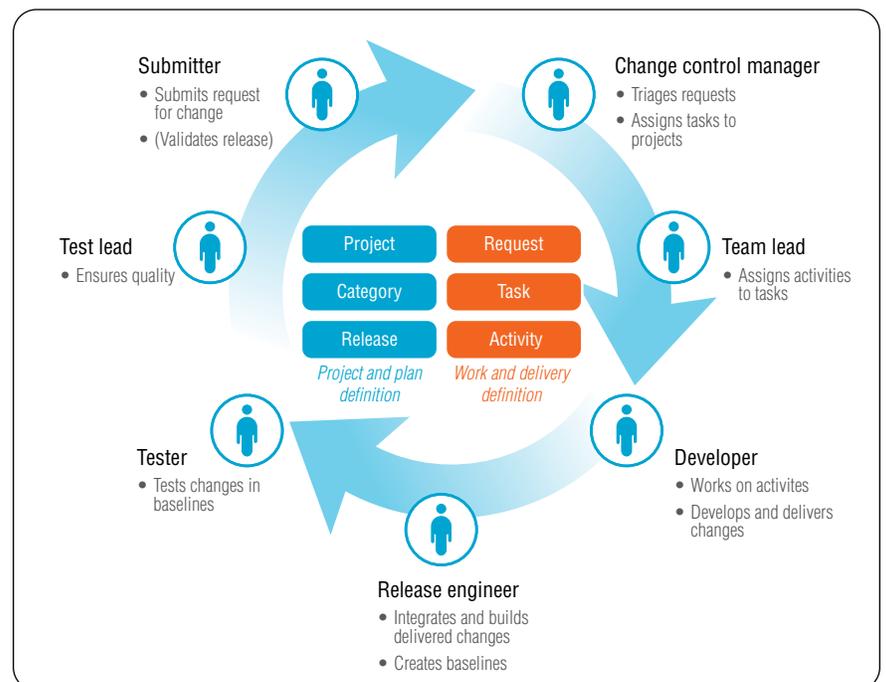


Figure 2: The ALM schema improves coordination and collaboration across the delivery lifecycle.

Highlights

The new ALM schema allows you to manage a single request across multiple projects using a set of activities that each project team can define.

As shown in figure 2, the ALM schema supports the coordination of requests, tasks, activities, baselines and builds — no matter which team members are performing the work or where they are located.

There is an important context switch that deserves a little more attention. Prior to the release of the ALM schema, work in Rational ClearQuest was managed by creating a record type and a set of state transitions to route the record from team member to team member throughout the development lifecycle. This structure is somewhat problematic when a single request affects more than one project. And, because most project teams work differently, defining a state transition model that all teams will adopt can be difficult. With the new ALM schema, you can now manage a single request that can be addressed in more than one project using the same or different set of activities, which are defined by each project team.

To illustrate the switch, figure 3 uses a defect as an example. In previous versions of Rational ClearQuest, a defect record managed all defects found in an application or system. State transitions were used to move the record through the development lifecycle while passing ownership to various team members. In effect, each state could represent a single unit of work by an individual on the team. In this example, the first state is *develop* and is assigned to a developer. The next state is *validate* and is assigned to a tester.

Highlights

Previous work structures couldn't accommodate separate teams that wanted different sets of state transitions.

Now, tasks can be separated from requests, enabling two different project teams to fulfill the same request.

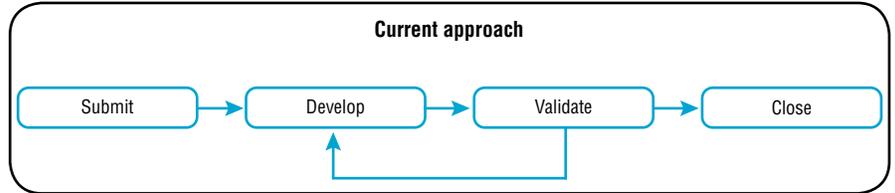


Figure 3: Prior to Rational ClearQuest, Version 7.0, state transitions were used to move a single record through multiple sets of practitioners.

As shown in figure 3, when the developer completes his or her work, the defect record is transitioned to the next state, causing the record to change ownership to the tester. This model worked well until you had two separate teams, each wanting a different set of state transitions. What then? You had three choices: Create a new record type for the second team; modify the state transitions of the existing defect record type and make everyone adhere; or ignore the request completely.

With the ALM schema, the model changes (see figure 4). A request can be fulfilled by more than one project. If it can be addressed in a particular project, a task is created for that project and associated with the request. This separation of request and task enables two different project teams to fulfill the same request: Each team creates a task for its project and relates it back to the request.

The task also references all activities required for completion. And the activities required for each task can also be defined on a project-by-project basis. Ownership of the task is assigned to the person responsible for overseeing the work, and each activity is assigned to a specific team member to contribute to the completion of the task.

Highlights

For the example shown in figure 4, the new model starts with a request type defect. All teams can use this record type. It has a simple state transition model (open, activate, complete) and is used to capture information about the defect and the project within which it is found.

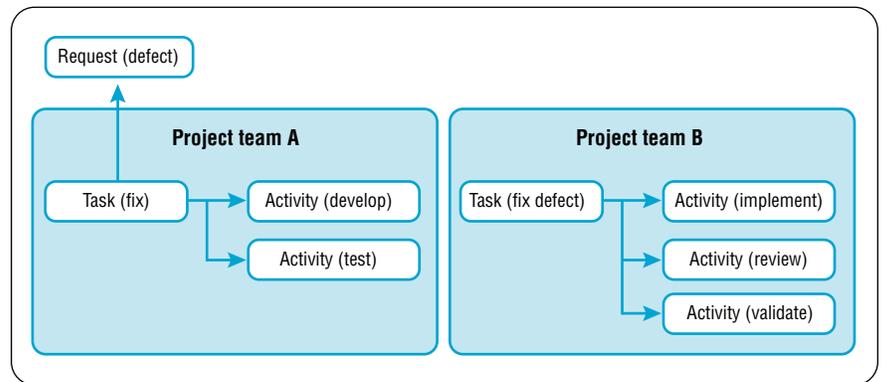


Figure 4: The ALM schema replaces state transitions with activities to provide a clearer context for work.

Using the ALM schema, you can move a single record through the development lifecycle without using complex state transition diagrams.

Next, you create a task and identify which project will complete the task. The selection of the project type determines what task types are available. In turn, choosing a task type determines the activities that are needed to complete it. You no longer need to use complex state transition diagrams to move a single record through multiple sets of practitioners. Instead, you have clear visibility into the status of each activity.

Highlights

Built for fast implementation, the ALM schema includes frameworks that can reduce deployment time by 50 percent or more.

By applying the ALM packages, you can take advantage of your existing Rational ClearQuest database to realize benefits without affecting users.

In this model, two project teams can define a different set of activities to complete the work, thus freeing an administrator from having to modify state transition diagrams in the Rational ClearQuest designer.

Reduce time to deployment

The ALM schema is designed and built for rapid implementation. It provides a majority of the functionality needed by most teams, and it captures ALM best practices. These best practices can be used as is or extended and applied to existing and new Rational ClearQuest implementations. Also included are fundamental building blocks and frameworks that can cut deployment time by 50 percent or more. The support for projects, security policies and roles gives administrators a framework that they can extend, without having to create and maintain it themselves.

Extend what you already have in place

Because Rational ClearQuest ALM is provided as a set of packages (in addition to a schema), you can apply the packages to an existing Rational ClearQuest database and begin enjoying the benefits without impacting your users. Instead of attempting to migrate all of your data, you can start by bringing new project teams into the new model. This facilitates a smooth transition as teams complete current projects and start new ones. Because all of your data can coexist in the same database, you can continue to run queries, create records and generate reports as you always have.

Highlights

The Rational ClearQuest ALM schema integrates with numerous tools in the Rational portfolio to help you ease activities throughout the development lifecycle.

As shown in figure 5, the ALM schema in Rational ClearQuest is integrated with the IBM Rational portfolio. Through the existing IBM Rational RequisitePro[®] integration with Rational ClearQuest, requirements can be linked to the request, task or activity records.

Unified change management (UCM) users can continue working with activities that map to file changes. The only difference is that they now work the ALMAActivity. The solution works with both base IBM Rational ClearCase[®] software and UCM, but neither is required.

If you use IBM Rational Team Concert or IBM Rational Quality Manager software, the tasks in the ALM schema can be mapped to work items that interoperate between the products. This method is described in the IBM Redbooks[®] article “Collaboration Application Lifecycle Management with Rational Products.” (www.redbooks.ibm.com/redpieces/abstracts/sg247622.html)

IBM Rational Build Forge[®] software already provides an integration with Rational ClearQuest. This integration can be extended to automate the creation of the baseline and build records in the ALM solution for Rational ClearQuest. Integrations with IBM Rational Asset Manager software also exist to publish and reuse corporate assets. Additionally, the Rational ClearQuest project tracker package can be applied to the task or activity records to support the integration with Microsoft[®] Project software.

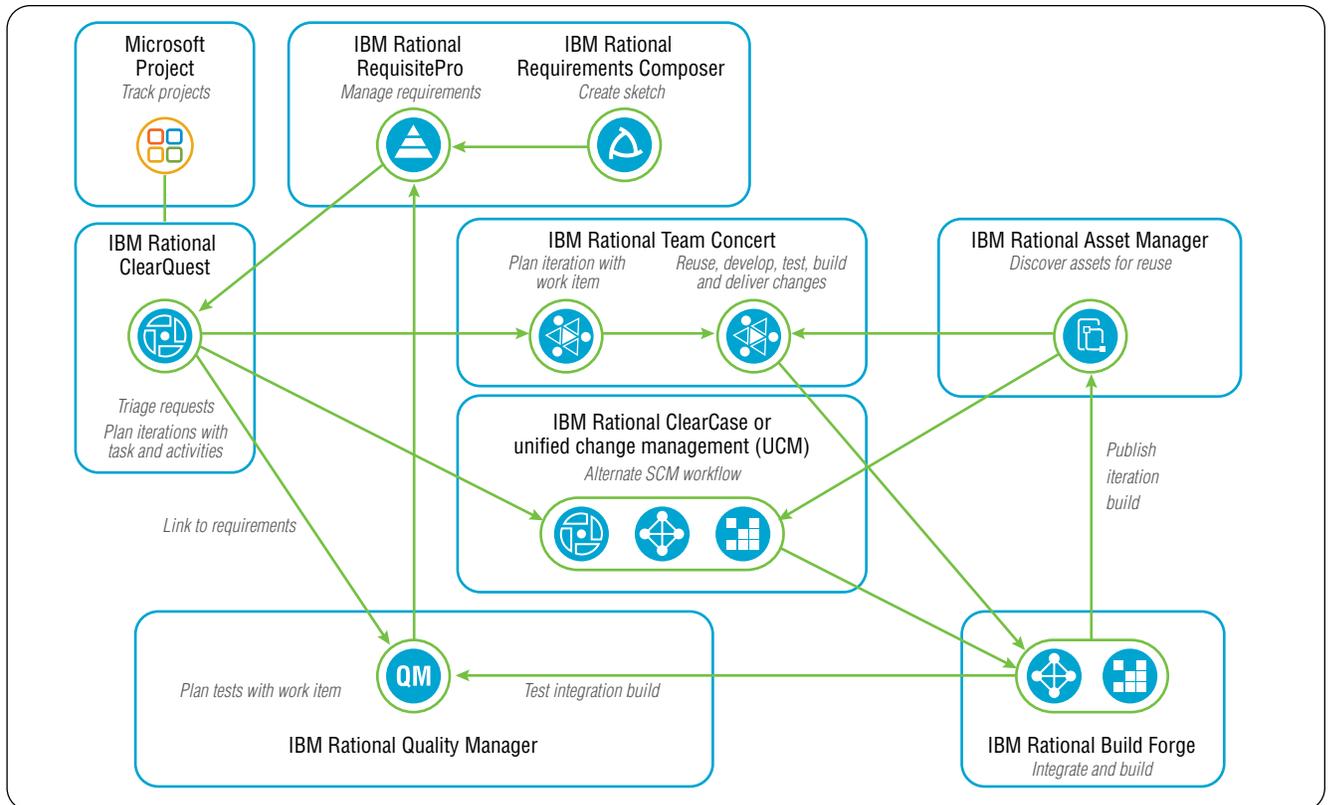


Figure 5: The ALM schema in Rational ClearQuest is integrated with the IBM Rational portfolio.

While providing a solid foundation for development, the ALM schema is flexible enough to allow you to customize projects.

Build a solid foundation for scalable ALM

The ALM schema and packages provided with Rational ClearQuest offer a scalable workflow solution that captures the best practices of software development. They provide a solid foundation for managing development projects with flexibility to customize each project. Because you no longer need to get all project teams to agree on record types and state transitions, the requirements-gathering

Highlights

You can let teams define their own processes and enable administrators to spend more time on higher-level work.

process is streamlined. You can let each team define its own process and work types. And, because the complexity of individual record types and state transitions is significantly reduced, your administrators can spend less time on maintenance activities. They can put that time to better use creating security policies, category trees and system labels. For the first time, your internal process guidance (such as your custom version of RUP) can become actionable by translating the core concepts into your role, type and work configurations.

The ALM packages for Rational ClearQuest, Version 7.0.1 are available as a free download from the Rational ClearQuest page on the IBM developerWorks® site at http://www.ibm.com/developerworks/rational/downloads/08/cq_almpackage/index.html?S_TACT=105AGX15&S_CMP=LP. The download includes the ALM packages to apply to an existing Rational ClearQuest instance; online help in the form of an Adobe® PDF file; and a tutorial with three documented labs and a sample database.

The solution will be included in IBM Rational ClearQuest, Version 7.1.0.0 at no additional charge.

Highlights

*Learn more by downloading
white papers or by trying out
the ALM packages.*

For more information

To learn more about how IBM Rational ClearQuest software streamlines ALM, contact your IBM representative or IBM Business Partner, or visit:

ibm.com/developerworks/rational/library/edge/08/mar08/pampino-pierce/index.html

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To download the packages available for Rational ClearQuest, Version 7.0.1 visit:

ibm.com/developerworks/rational/downloads/08/cq_almpackage



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