Implementing a formal review process in quality management

Chad Meadows, IBM
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Build basis: Rational Quality Manager 4.0.1

This article describes how to utilize the new customizable formal review process in this release of Rational Quality Manager. The focus will be towards the purpose, theory and usage scenarios around formal reviews.

What are formal reviews?

Formal reviews encompass the concepts of having reviews and/or approvals performed for testing artifacts. The formal reviews capability allows for a process to be defined to ensure defined quality standards are achieved for the construction and/or execution of test artifacts by utilizing peers to inspect or approve the content of an artifact prior to that artifact progressing in the testing process workflow. Formal reviews by themselves do not enforce compliance. The reviews are managed by the test team and compliance to any team defined criteria is manually achieved through manual governance.

How can formal review process be enforced?

Formal review process enforcement is achieved by leveraging the jazz process capabilities with the formal review advisor provided by Rational Quality Manager. By enabling the formal review advisor the manual governance can now become enforced through mechanisms within the application. Using the formal review advisor will allow the application to govern when an artifact is allowed to transition to the next state in the workflow.

What are the contents of a formal review?

The formal review section of a test artifact contains any number of approval groups and each group may contain 1 or more approvals.

The approval group represents a collection of approvals for a specific topic of which can be described in the approval groups description. The approval group is categorized by two types. It's type is either that of 'review' or 'approval'. The type is only a categorization. The process behavior related to each type is dependent on how you define the process. 1 or more approvals may be added to an approval group. The effect any approval has is determined by how you define your process.

Each approval group has an overall state for the group based on the individual states of the approvals within the group.

The following rules apply to the determination of the approval group state:

- If all approvals within the group are in state 'pending' then the group state is 'pending'.
- If 1 or more approvals within the group are set to 'approved' then the group state is 'approved'.
- If any of the approvals within the group are set 'rejected' this takes precedence and overrides any other group state so that the group state is 'rejected'.
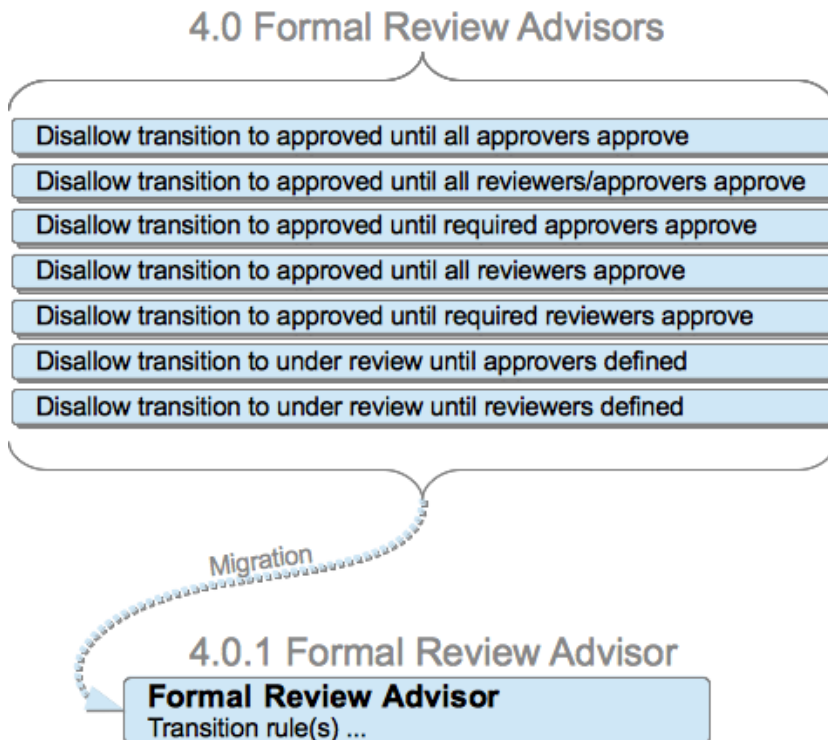

What is the default formal review process?

In version 4.0 there was a default precondition added for any newly created project area which enforced that all approval groups must be in state approved for test plan or test case to transition to state approved.

In version 4.0.1 there is no longer a default precondition set as the user now has full capability to customize the approval process. The user now opts into the behavior they want by adding the 'Required Approvals' precondition to the desired test artifact.

What happened to the formal review advisors from 4.0?

In 4.0 there were seven advisors introduced to enforce formal review process in different ways. These previous advisors were not configurable and the options available for users to enforce process limited. With the release of 4.0.1 there is now the capability to customize advisors. Therefore all of the previous advisors relating to formal review have been merged into a single advisor which has all the combined capabilities of the previous plus additional features.


If you are migrating to 4.0.1 from 4.0 then all of your process advisors you may have configured relating to formal review will be converted to a customization of the new formal review advisor.

What is a formal review process?

The formal review process is a workflow related set of constraints which are determined by the state of the approvals on the formal review section of a test artifact. The implementation utilizes jazz preconditions so that the capabilities of jazz process can be leveraged when applying a formal review process.

The 'Required Approvals' precondition allows for defining a set of transition rules which will be evaluated when an attempt is made to transition a test artifact from one state to another in the workflow. If the requirements of the defined rule or rules are not met then the artifact will not be transitioned to the requested state.

The diagram below shows the default out of the box workflow and how the transition rules are evaluated in between every possible state transition.
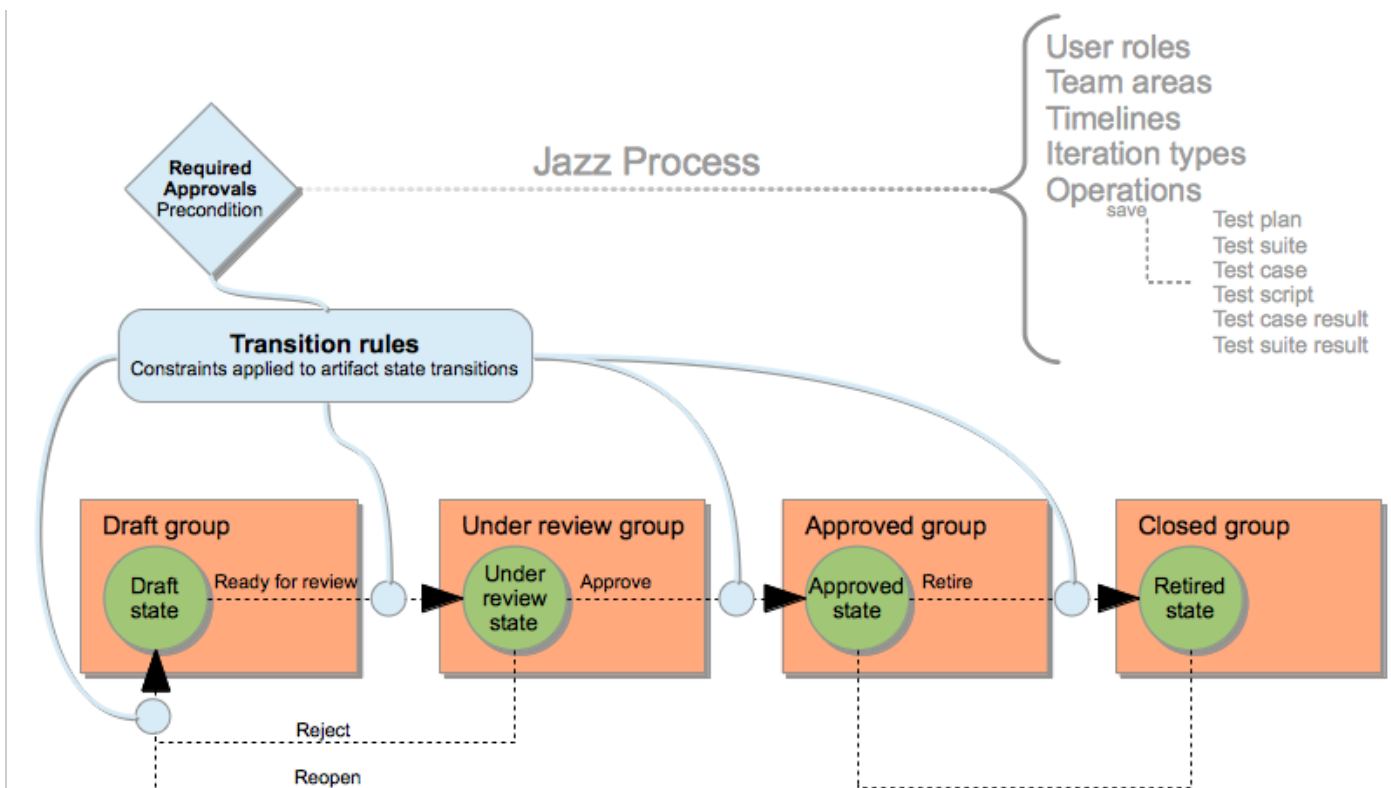
Selecting who and what is governed by the process

Leveraging the jazz process configuration for preconditions we can select to apply the formal review process to users by their role, team areas, a specific time frame using iterations, or an iteration type. The precondition is enabled by adding the 'Required Approvals' precondition to the save operation of any of the supported test artifacts which are test plan, test case, test suite, test script, test case result, test suite result.

Defining the process rules

The 'Required Approvals' precondition is a configurable preconditions which allows the user to determine how the process will be applied when interpreting the state of the approvals within the formal review section of the test artifact.

Using the 'Required Approvals' precondition we will be able to configure the process as to the following:

1. The artifact state or state group which may not be transitioned to until requirements defined in the precondition are fulfilled.
2. The approval group type which will be used to determine if precondition requirements are fulfilled.
3. The number of approvers required by their assigned role.
4. Use the newest approval group only or consider all approvals in all groups.
5. No approvals can remain in 'pending' which enforces a response from all approvers.
6. Any 'rejected' approvals will veto the overall approval state otherwise rejected is considered information only.

The following diagram illustrates the configuration options of the precondition.

How does the 'Required Approvals' precondition evaluate the transition rules?

A set of transition rules can be created and configured within the 'Required Approvals' precondition. In the following sections we will see in detail how these transition rules are evaluated in relation to the formal review approvals.

### Evaluating the transition rule

A transition rule will be defined for either an approval type of 'review' or an approval type of 'approval'. The transition rule will only consider approvals that have been defined with that type. Any approvals that exist not in the selected type are ignored by that transition rule. In the diagram below we have 2 transition rules defined for the precondition. The transition rule depicted on the left is applied for the approval type of 'review'. Below the depiction of the transition rule are all of the approval groups of type 'review'. These are the only approval groups which will be considered when this transition rule is evaluated. The transition rule to the right is of type 'approval' and the approval groups shown below it are also of the type 'approval'.

All transition rules which are defined to the same artifact state or state group transition must meet their defined criteria in order for the transition to be successful. In the following diagram the attempted state transition is to the 'Under review' artifact state. There are two transition rules defined for this state and both must pass in order for our state transition to be successful.

The first transition rule defines that it requires 1 Tester and 1 Test Lead. The transition rule will look through all the approval groups of the same approval type in order to determine if the requirement for the number of approvers and their role has been met. In the diagram we can see that we find 1 Tester and 1 Test lead defined. Notice that they do not need to be defined within the same approval group. As long as there is 1 Tester and 1 Test Lead within any of the approval groups of type 'review' then we have met the requirement for this transition rule. Also take note that by default any 'pending' or 'rejected' approvals do not have an effect on the outcome of the transition rule.

The second transition rule defines that it requires 1 Team Lead. The requirement for this transition rule is also met as shown below. Since both transition rules pass then the transition to 'Under review' for this artifact will succeed.

The 'Precondition options' on the diagram is shown as a central point where all the transition rules connect as these options apply to all transition rules which are created within the instance of the precondition.
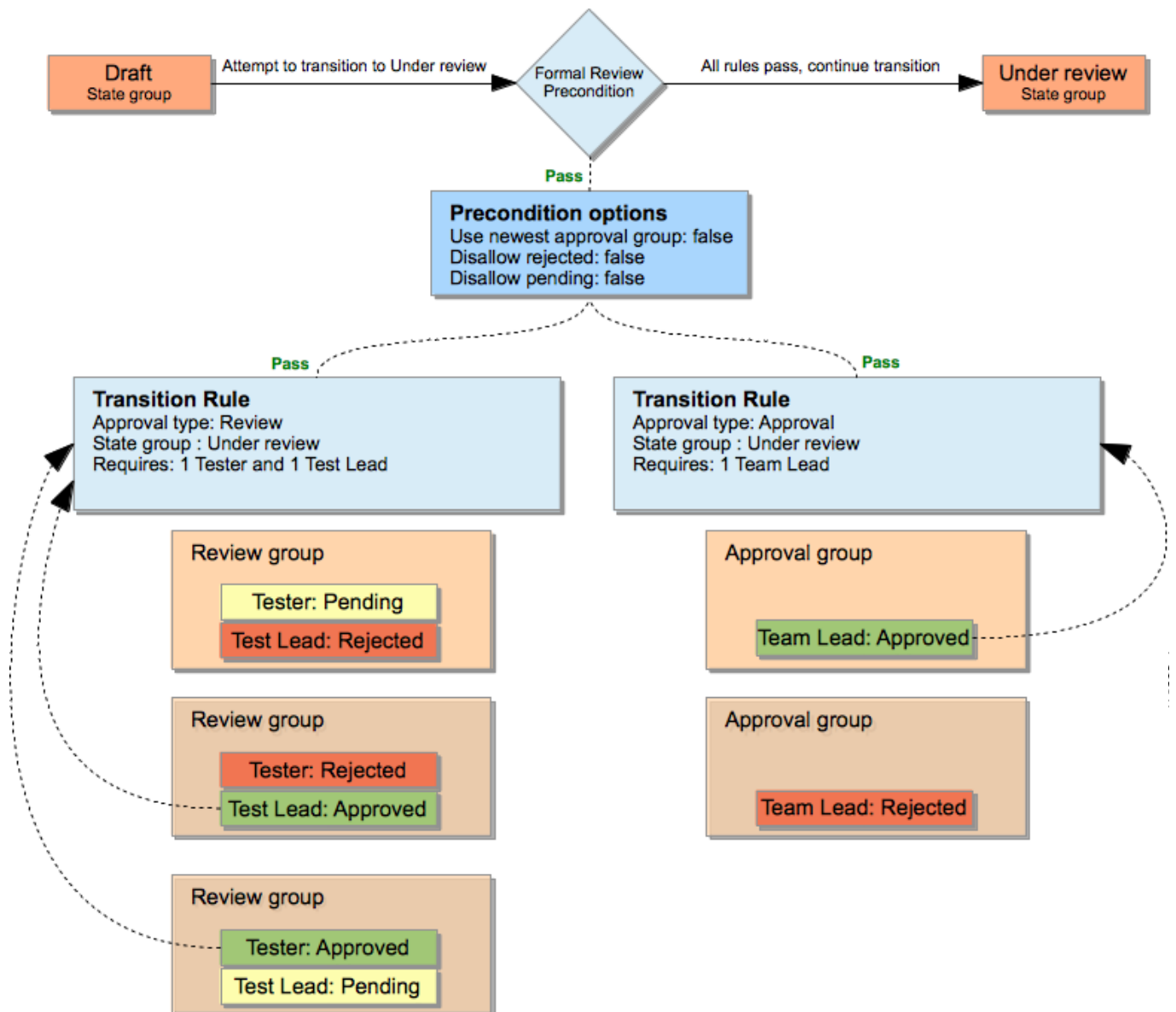
Disallowing rejected and pending approvals

In the following configuration there are two advanced options which we have enabled. They are the following:

- Fail if pending approvals exist from required approval roles. 'Disallow pending' on the diagram below
- Allow 'vetoes' from users with required approval roles. 'Disallow rejected' on the diagram below

The transition rule on the left side of the diagram now fails due to the rejected and pending approvals. The transition rule still has the required approvers; however, any rejected or pending approvals result in the transition rule failing.

The transition rule to the right has met the requirements defined and passes. Notice there is a rejected approval, but it does not result in failure of the transition rule. The transition rule does not fail because in this instance the approver who rejected is not of the role 'Team Lead' of which the transition defines as the required role. Any approvers who are not members of the required role will not affect the outcome of the transition rule. They are still allowed to post their approvals, but they are treated is informational only and will not change the evaluation of the rule.
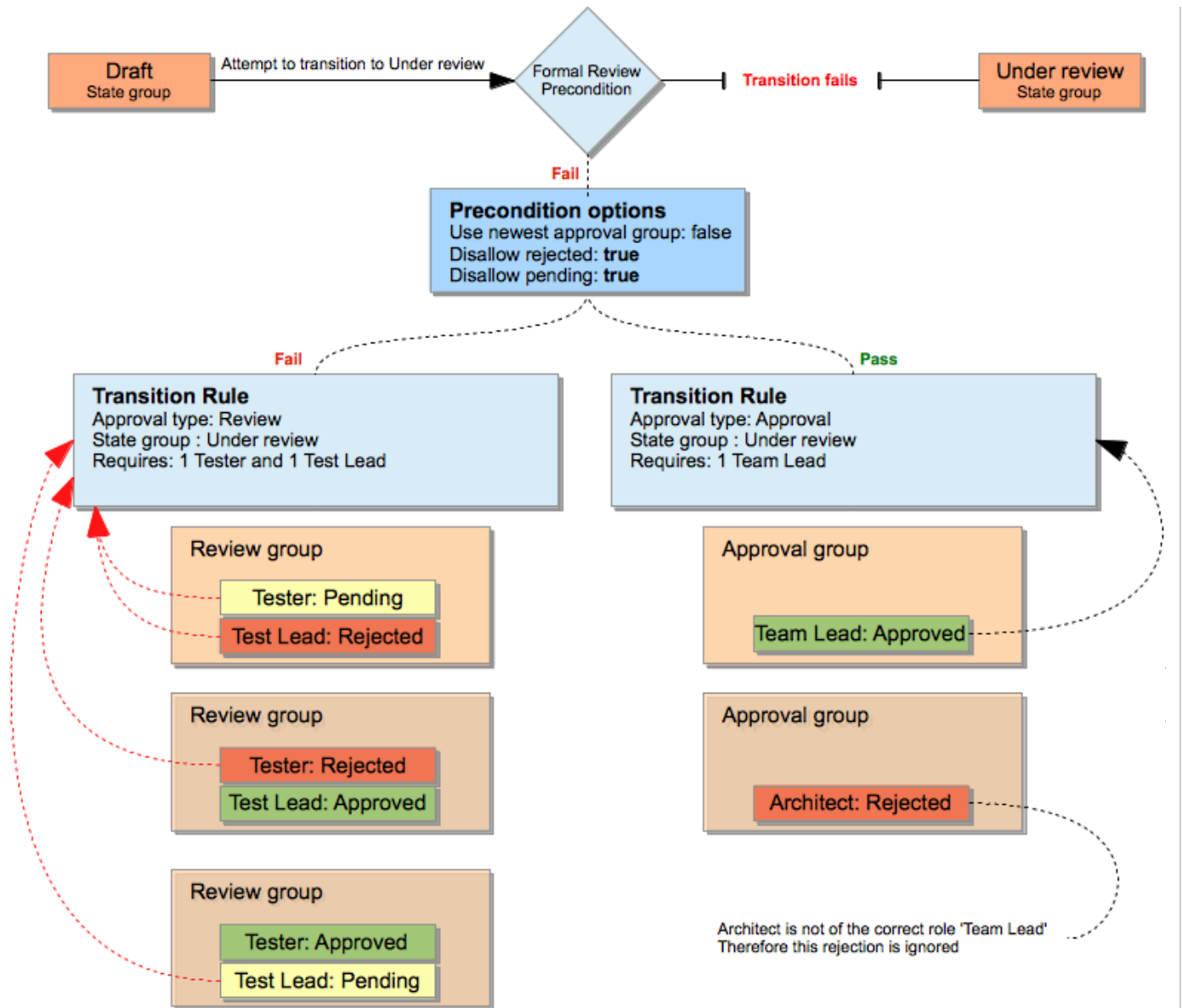
Using the newest approval group

In this configuration we have set the following advanced option:

- Use only the latest approval group. Shown on diagram as 'Use newest approval group: true'

In the diagram, the approval groups are ordered from top to bottom starting with the newest approval group. All of the older approval groups are indicated in the diagram by the shading which covers that older set of approvals and is annotated with 'Older approval groups are ignored'.

Using this configuration, the only approval groups which are considered when evaluating the requirements of the transition rules will be the newest created approval groups. The left side transition in this diagram fails since the needed requirements are not found within its newest approval group. The right side transition does pass since its requirements are met by the newest approval group for that transition rule.
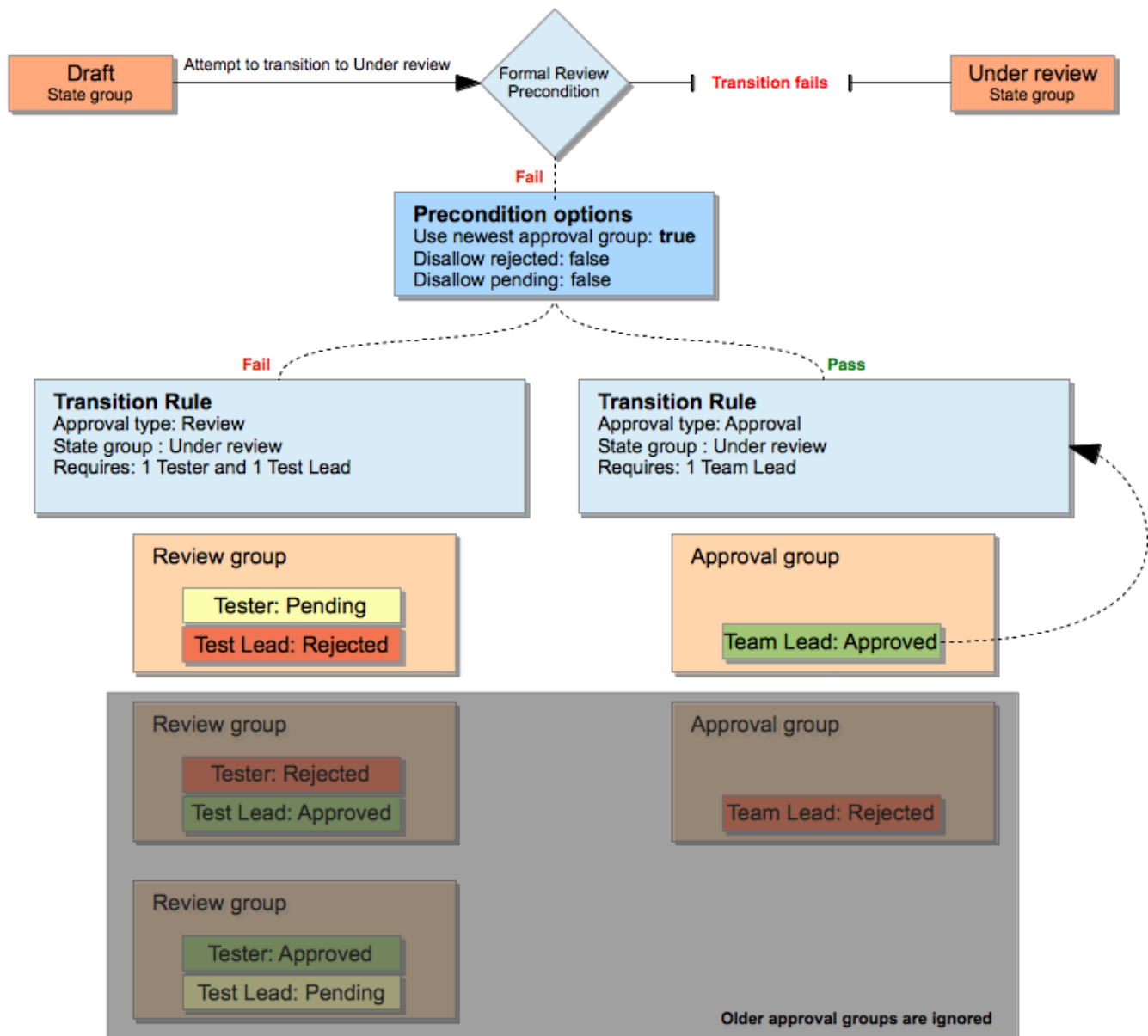
Archiving approval groups

The user can exercise a greater detail of control over how the approval groups are evaluated by utilizing the capability of archiving approval groups. This feature allows the user to precisely which approval groups will be used in the transition rule evaluation and which will be ignored.

The formal review section provides two mechanisms by which you may archive an approval group. You can simply select to archive the group at which time the group will become read only and will be grayed out in the list of approval groups. You may also select to copy an existing approval group which will duplicate the approval group including all approvers. All approvals of the copy will be reset to the pending state and the original approval group will automatically be archived.

In the following diagram we have archived two approval groups. The archived groups are indicated on the diagram by the shading and attached annotation. These groups are ignored when each transition rule evaluates if the defined requirements for the rule are met. In this case, since each archived group contained a necessary approver to meet the requirements of the transition rule, the transition failed since the archived approval group is not considered in the evaluation.
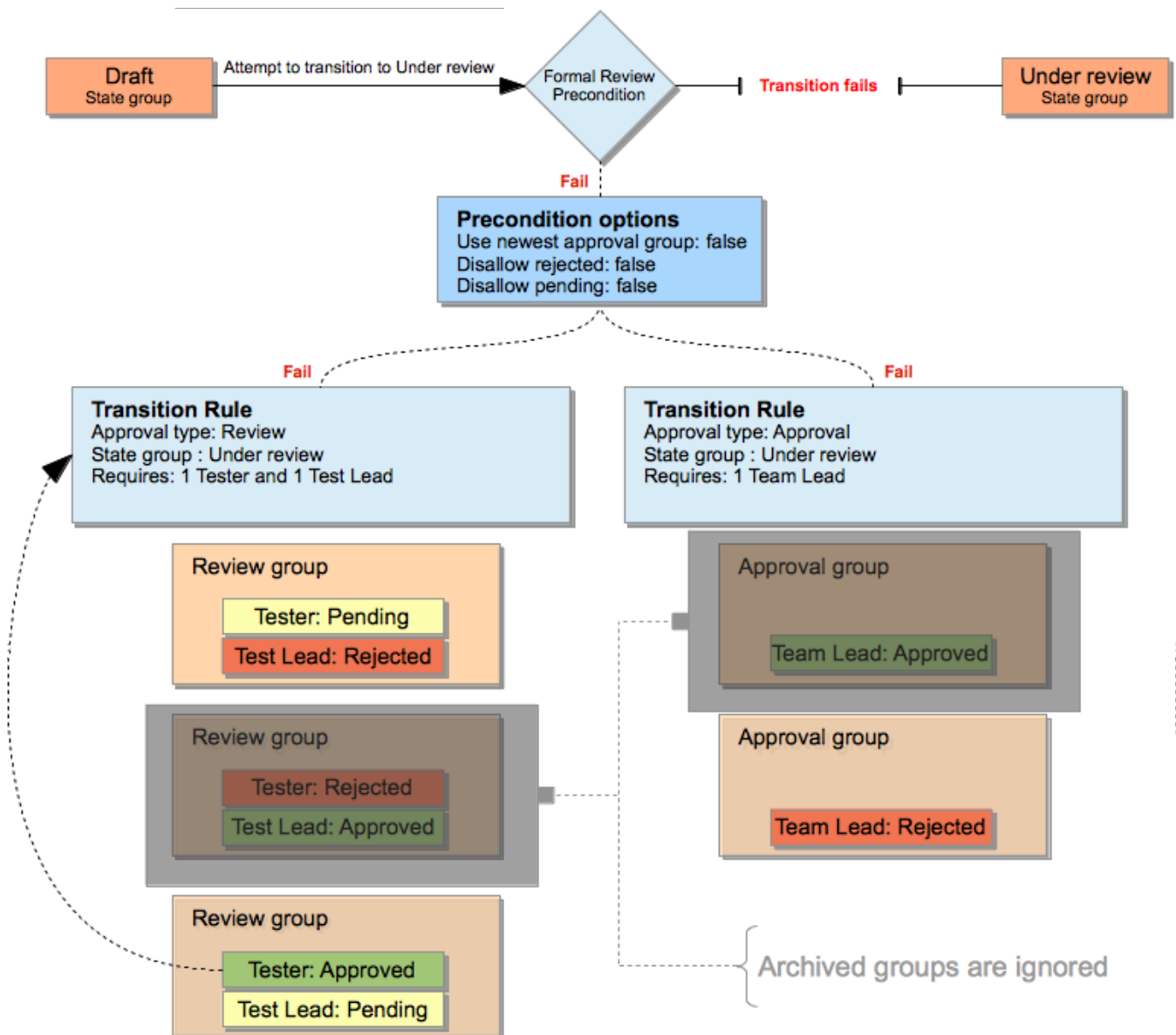
Using multiple precondition configurations

By assigning multiple 'Required Approvals' preconditions to the same artifact save operation, it is possible to have transition rules for the same artifact that use different advanced options. This would allow for example, as indicated in the diagram below, a set of transition rules which apply only to the newest approval group and a second set of transition rules defined in the 2nd

precondition configuration which evaluates all approval groups.
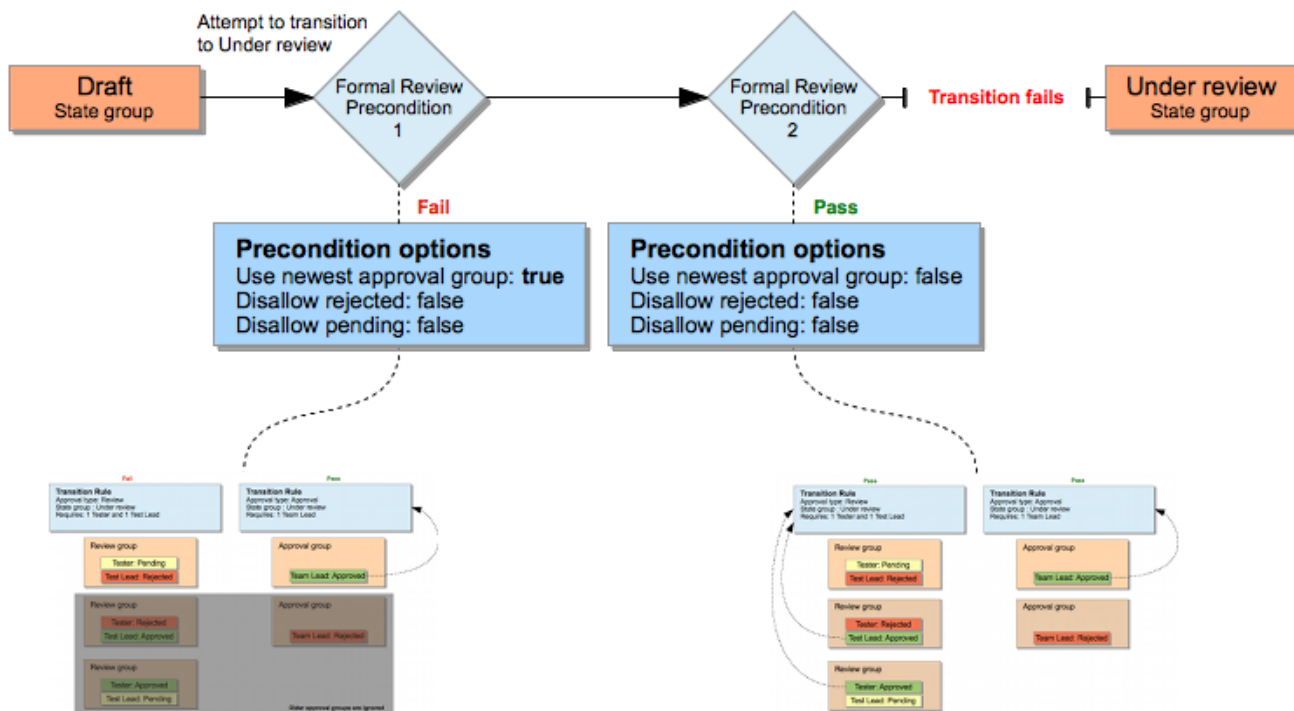
Summary of transition rule evaluation

The following are the logical set of constructs used to evaluate transition rules

- The transition rule is to prevent transitions to a specified state or state group
- Multiple transition rules can be created pertaining to the same state or state group
- All transition rules must have their requirements met in order for the transition to succeed
- A transition rule evaluates only approvals within the approval groups of the type determined by the transition rule
- Archived groups are ignored by transition rules
- Approvers who do not have the required role as defined by the transition rule can provide approvals, but the approvals will be for information only and will not be used in the evaluation of the rule
- An approver who has multiple required roles will count towards the total required approvals for each role that matches the transition rule requirement

For more information

- Defining custom workflows for test artifacts

About the author

Chad Meadows is a developer on Rational Quality Manager in Durham, NC. He can be contacted at cmeadows@us.ibm.com.