Workflow Troubleshooting in Release 12

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Abstract

Oracle provides multiple ways to troubleshoot workflow errors in the latest 11i releases and Release 12 including Oracle Applications Manager, Workflow Administration and Diagnostic Reports. Learn the most effective way for both the functional and technical users to resolve workflow issues and keep the applications running smoothly.

Introduction

Workflow troubleshooting is one of the best examples of the ability to get to the same end result by following several different paths in the E-Business Suite. While providing many paths with the same result can be confusing, it also offers the ability for users with different skill sets to combine their own knowledge with appropriate tools with appropriate levels of security so that the majority of issues can be resolved by people who are best able to solve them. When functional users are provided with tools to manage their own applications, the business as a whole becomes more efficient. Better efficiencies save money thereby increasing profit. The goal of this white paper is to describe the various troubleshooting methods utilized by users with various roles – from the end user to the DBA. Almost everyone can benefit from the information provided.

Scope

Workflow functionality in Release 11.5.10.2 patched to RUP6 is nearly identical to Release 12 except where specifically noted. Any screens displayed in the presentation are from a Release 12.0.6 vision environment. The forms may look different due to the new swan interface in Release 12, but the functionality is the same. I have not included the screen shots in this white paper since they are available in the powerpoint. It will be beneficial to have the powerpoint presentation handy as you are reading this white paper.

Workflow Troubleshooting for End Users and Superusers

Functional users typically know their own processes and data the best. The person closest to the root cause of the issue is generally in the best position to intuitively pinpoint the cause and ultimately know the correct resolution. For that reason, I recommend issue resolution start with the functional users and progress to the technical support team after basic triage has already occurred. This will result in less unnecessary emails throughout the company and faster resolution. The troubleshooting tools I will cover in this section include the ability to personalize the notification page, the status monitor, specific concurrent programs and diagnostic reports.

Personalizing the Notification Page

The personal worklist is not included on any seeded menus but it can be added to any menu by adding the function “Personal Worklist.” This function provides more features than the standard worklist. There is a “Simple Search” button which provides more options for searching for specific notifications. There is also an “Export” button which will export the items in the worklist to a comma delimited .csv file. The best feature on the personal worklist page is the “Personalize” button. This button allows the user to create different views. If this particular user views their most critical task as approving requisitions, they can create a view including only requisitions. In this example, we have chosen to create a view to display errors from workflows. Similarly a view can be created for errors from events. As a prerequisite to these particular error views, the workflow administrator would need to create worklist flexfields to display the error message fields in the worklist. This process to create worklist flexfields is described in the workflow

administration section later in this paper. For this example we will assume the worklist flexfields have been created.

To create a personal worklist view for errored workflows, click the "Personalize" button on the personal worklist page. Choose to create a new view or duplicate an existing view and modify the view. Move columns from the "Available Columns" list to the "Columns Displayed" list. Make sure the flexfield columns are selected. In this example, these are Text_Attribute1, Text_Attribute2, and Text_Attribute3. Click the "Rename Columns" button to rename these text attributes to "Errored Workflow Type", "Error Message" and Error Stack." In the "Search Query to Filter Data" section, filter the data by limiting the "Type Internal Name" to "WFERROR." Apply your changes and choose this new view to display any error messages from your own workflows in error. This is a much more efficient way to review all errors rather than drilling down through the diagram until the errored node is reached.

Status Monitor for End Users

The Workflow User Web Applications responsibility includes the self service workflow page consisting of the home page tab, status monitor tab and notifications tab. The status monitor tab allows the user to monitor workflows they own. This key to this feature of course is to establish the owner of the workflow. Keep in mind that the owner attribute in some workflows must be set as part of the configurations tasks.

Choose a workflow by clicking the radio button next to a workflow item on this tab. From this point, the user can choose to drill down to the notification history page, the status diagram or notification responses.

The notification history page displays all notifications sent by the workflow item selected. The recipient's name is a hyperlink to the email address. This is one way to easily verify that the email address is valid if the recipient has not yet responded. If the user knows the recipient will not be available to respond to the email or the email should have gone to a different person, the user can use the reassign button from this page to reassign the notification to another user.

The status monitor tab shows a graphical display for the flow of the workflow process from node to node. The individual nodes are typically identified with a user friendly name which is fairly intuitive. As the workflow progresses, the flow is depicted by a bright green line. It may be necessary to drill down to sub-processes by double clicking in the process icon where the green line ends. If a process icon is bordered in red, that process encountered an error.

If an error is encountered, the user can click the process icon then click on the status tab below the diagram. The status tab shows who was notified if the node is a notification and will also show any applicable error message. A very common error message is "No performer." In this case, the workflow stopped because it didn't know who to send the notification to. This occurs when an employee is terminated and the notification simply needs to be reassigned. Other reasons may be a directory services corruption problem or a missing workflow configuration. It the error is due to one of the later two reasons, it would be appropriate to escalate this issue to the technical team.

The third button on the status monitor table is the "Participant Responses" button. This tab shows responses to all the notifications for a workflow process. The user can easily view where the workflow is in the approval chain.

Concurrent Programs

There are multiple workflow specific concurrent programs provided by Oracle to assist with correcting workflow issues. Add these concurrent programs to request groups and provide proper training to run these programs with the proper parameters and with consideration to the risks.

Resend Failed/Error Workflow Notifications

Workflow notifications fail to be sent for multiple reasons. The workflow mailer can hang due to server issues. The email address can be incorrect. The recipient's mailbox may be full. The Resend Failed/Error Workflow Notifications will send any notifications based on the parameters selected where

the mail_status = 'MAIL.' The risk is that old notifications may be sent for workflows that are no longer valid. The user must carefully enter parameters to resend notifications only for a specific day or a specific workflow item. Alternatively, execute a SQL statement to set the mail_status to null where the status = 'CLOSED' or 'CANCELLED' prior to running this concurrent program.

Workflow Directory Services User/Role Validation
This concurrent program is a data fix for user/role associations in the table WF_LOCAL_ROLES and fixes two common issues. If this table is missing information, users will often not receive emails. It also can result in missing responsibilities. This program must be run twice with a different combination of parameters. This is explained in detail in MetaLink Doc Id: 418765.1. The first time, set she parameters Fix Dangling User/Roles=Yes and Add Missing User/Role assignments=No. This removes the association from WF_LOCAL_USER_ROLES if the corresponding user or corresponding role is missing. The second time, these parameters are flipped to add missing associations to WF_LOCAL_USER_ROLES to have corresponding user/role assignments in WF_USER_ROLE_ASSIGNMENTS.

Synchronize Workflow Roles
This concurrent program is specifically related to CRM modules. If a workflow errors with the message "'x' is not a valid role or user name", this concurrent program will synchronize the attributes and records in the WF_LOCAL_* table with mismatching records in the Resource manager tables to eliminate this error.

Synchronize WF LOCAL tables
If a user is not receiving emails, I typically will immediately run this concurrent program as a first step. This program synchronizes application data from specific modules with the WF_LOCAL_ROLES and WF_LOCAL_USER_ROLES tables. There are a lot of problems with directory services corruption prior to 11.5.10.2 RUP4. If you are on an earlier release, then schedule this program to run nightly.

Diagnostic Reports

Oracle has provided a user interface to run diagnostic reports that were previously available only as sql scripts typically run by the technical team. In 11i, simply assign the Oracle Diagnostic Tool Responsibility. Starting in release 12.0.6, Role Based Access Control (RBAC) is utilized for Diagnostics. See MetaLink Note Id: 358831.1 for information about the RBAC setup. There are many workflow related tests appropriate for end users. For example, there are diagnostic tests for most of the account generators. There are also diagnostic tests for many of the approval processes such as PO Approval. Since the diagnostic test functionality includes built in security, there is no reason not to provide this to the end user. For example, a user must have a valid GL responsibility to run a GL test. The workflow scripts available for Developers and DBAs in $FND_TOP/sql are now included in the diagnostic tool as well. See MetaLink Note Id: 342459.1 for a full catalog of diagnostic tests describing inputs and outputs for each test by module. Also refer to the presentation/white paper titled *Maximize Efficiency of Oracle E-Business Suite Release 11i/12 Through Diagnostics* also presented at this conference for more detail related to diagnostics.

Workflow Troubleshooting for Administrators

Some workflow errors are the result of issues not easily resolved by the user community. In addition to troubleshooting specific errors, the person designated at the workflow administrator should be proactively monitoring the workflow system for errors and should also keep old workflows purged on a periodic basis. The troubleshooting tools covered in this section include Worklist Flexfield creation, the Oracle Applications Manager (OAM) workflow page and the workflow administration menus.

Worklist Flexfields

In the troubleshooting section for end users, I discussed the ability to set up a personal worklist view to display errors from either events or workflow processes. This is obviously a beneficial view for workflow administrators as well. A prerequisite for building this view is setting up the worklist flexfields to make the

error fields, which are attributes in the message body, available as fields for the notification worklist. This functionality was released in 11.5.10.2 RUP3.

Worklist flexfields are created by navigating to Workflow Administrator Web Applications → Worklist Flexfield Rules and clicking the "Create Rule" button. Provide a name and description for the rule, enter 100 for the Phase, Application Object Library as the Owner name and FND as the owner tag and click "Next." Select the workflow type "System: Error" and click "Next." All the attributes will appear that are available for that workflow type. Move the Error Item Type, Error Message, Error Stack, and Event Name attributes from the Available Attributes box to the Selected Attributes box and click "Next." Then map the message attributes to a column that has not been previously used. This is similar to the setup for descriptive flexfields for which most administrators are familiar. Choose the correct data type for the attribute – text, date or number based on the type. Then click the "Find Conflicts" button to confirm there are no duplicate mappings from other rules. When the personal worklist view is created, the user will need to know which attribute maps to which field. For example, they need to know that "Text_attribute1" is mapped to the Error Item Type attribute so they can change the column name heading for the view.

Workflow Administration Menus

The Workflow Administration menus are best utilized to troubleshoot specific errors for specific workflow items or specific notifications. This is the place to go when a user calls and says "I have a problem with a specific workflow item." The specific troubleshooting tools are in the Status Monitor and Administration tabs.

Search for specific workflows in the status monitor tab by selecting the item type, specific item keys, date started or other search criteria. If the user does not have the item key, which is generally the internal id such as the invoice id for the invoice approval process, I typically search for errored workflows for the current day. Once the correct item is found, the tools available to the administrator include the status monitor diagram, activity history, workflow attributes and participate responses. These features are described in other sections in this paper and therefore won't be repeated here.

On the workflow administration tab, there is a notification search to allow the administrator to search for any notification sent by others or delivered to others. The administrator has the ability to respond to this notification, forward or reassign. I frequently use this feature in conference room pilots to approve notifications as a supervisor when users are testing other functionality such as requisition entry in iProcurement. This is also the place to go to reassign all notifications for a terminated employee or an employee on leave.

Oracle Applications Manager

The Oracle Applications Manager (OAM) Workflow Page is the best place to monitor the workflow system as a whole. The workflow administrator should go to this page daily to check the status of the mailer, make sure queues and agents are active and processing, make sure the notification mailer is sending emails and research all errors.

The top of the OAM Workflow page shows a dashboard for the notification mailer, agent listeners, service components, background engines, purge processes and control queue cleanup. If the notification mailer is being utilized, all dashboard items should show an icon with a green check mark indicating this function is active and working properly. If the notification mailer is not being utilized and users are required to go to the notification page within Oracle to process notifications, the notification mailer and service components will not show a green check icon. This is acceptable. If purge processes, control queue cleanup and the background engine concurrent programs are not scheduled, these items will display a red X icon. This is not acceptable. Schedule control queue cleanup to run every 12 hours. Schedule purge processes to purge closed workflow items over 30 days old. Schedule the background engines as appropriate for your business needs.

The OAM Work Items section is a graphical display of active, deferred, suspended and Errored processes. Hover the mouse over the bar to display the exact count of items. Click on the bar to drill down to details showing the number of items in error for each workflow type. The workflow administrator

should start analyzing workflow items with the highest error count. Each workflow item type is a hyperlink which drills down to a page showing the specific processes that are in error for that item type. Each process name is also a hyperlink to drill down further to the specific workflow items. The key feature on this page that is not available through workflow administration is the two buttons available to either Retry All or Abort All. If the workflow administrator determines all errors are for the same reason and the problem has been corrected, it may be appropriate to Retry All to clear all the errors at one time. It also might be appropriate to abort all of these processes, but careful research should be done before aborting workflows. The administrator can also launch the workflow monitor to view the diagram from this page. The workflow monitor includes the links to the activity history, participant responses and workflow detail which is also available in the administration menus. The key functionality not available in OAM is the ability to search for a specific item key. That's why the workflow administration menus are more appropriate for troubleshooting specific issues based on a call from an end user.

In release 11.5.10.2 RUP6, Oracle introduced new enhancements to the activity history page. This page now displays a hierarchical structure where child workflows appear beneath the parent. These workflow processes are hyperlinks that allow drill down. Notifications can be viewed from this page by clicking the notification icon if available in the notification column. On the participant responses page, the response to notifications can also be viewed which includes the detail along with any notes entered by the responder. The workflow attributes page shows the value of all attributes related to the workflow process including error messages. This is a good place to review specific error messages through OAM but it's a little more tedious that the notification worklist view created as an example earlier in this paper.

Going back to the OAM workflow page, near the bottom of the page, the workflow administrator should periodically click on the Throughput icon. If the mailer is down, the notifications waiting bar will continue to grow. This is common in cloned environments where the mailer is turned off, but notifications still have the status of "MAIL." It is more efficient to set all the users in cloned environments to "Do not send me mail" or set up a workflow override email address to minimize items continuing to be placed in the notification_out queue which will not be mailed.

Workflow Troubleshooting for Developers and DBAs

Some workflow errors are the result of programmatic errors, data integrity errors, workflow system failures, directory services corruption or other errors that are not easily resolved without developer or DBA assistance. Additionally, some workflows require configuration as defined in the installation guide for specific modules. This requires a developer to modify the workflow using the workflow builder client tool. The troubleshooting tools covered in this section include configuring workflow and specific tips with applicable MetaLink notes related to known issues. The tools covered in other sections also apply to developers and DBAs.

Configuring Workflows

Some examples of configuration required for specific workflows are as follows:
In the requisition approval workflow, REQAPPRV, set the timeouts for approval processes. They are currently set to "No Timeout." In the AP Expense approval workflow, APEXP, identify who should be informed if an expense report is rejected by assigning a value to the performer for the notification. If Oracle projects is used, account generators must be modified in 11i to add processes to determine project accounting. The CREATEPO and POERROR workflows need defaults set for several attributes such as Auto Create Allowed, Auto Approval Allowed and Is Contact Required.

Tips

1. Improve performance by closing orphan WFERROR and POERROR workflows using the bde_wf_clean_worklist script available in MetaLink Note Id: 255048.1. This closes the WFERROR and POERROR child workflows where the parent is complete. This makes the workflow eligible for purging.
2. Schedule purge processes to purge completed workflows over 30 days old.

3. Schedule the Control Queue Cleanup concurrent program to run every 12 hours to remove inactive subscriptions that occur when a middle tier process dies.
4. Review MetaLink Note Ids: 398822.1 and 405275.1 for data fixes for OEOH and OEOL workflows. These notes contain scripts to close unneeded processes and close records in the OM tables.
5. Set the workflow administrator to a responsibility – either Workflow Administrator or System Administrator. The default is the user SYSADMIN. See MetaLink Doc Id: 274842.1 for instructions on how to set the workflow administrator role back to a responsibility when auto config runs so that this will not be set back to SYSADMIN after patching.
6. Grant worklist access to SYSADMIN's worklist to those people in your organization acting as the workflow administrator. Do not allow users to login as SYSADMIN for maintenance tasks.
7. 11.5.10.2 RUP5 has several workflow related problems. If you are on RUP5, upgrade to RUP6 as soon as possible. If you are not on RUP5, skip it and go directly to RUP6.
8. For installations that run 24/7, the mailer needs to be shut down and re-started once per week. See MetaLink Doc Id: 443643.1 for instructions on how to automatically restart workflow processes regularly.

Conclusion

It was the intent of this paper to provide the reader with tools to enable users in various roles to troubleshoot workflow issues. The closer the user is to the source of the problem, the better that user is able to intuitively interpret the root cause of an error. Enabling all users with tools to help them do their job will make the company more efficient as a whole. Remember that this document will be much more useful if read along with a copy of the powerpoint presentation to refer to the screen shots. There are also a few items in the powerpoint such as specific MetaLink notes and a few SQL statements that are not included in the white paper. Finally, refer to the recently published workflow book titled *The ABCs of Workflow for E-Business Suite Release 11i and Release 12* for a much more information about workflow, AME and BPEL.

About the Author

Susan Behn has 24+ years experience developing, implementing, upgrading, customizing and managing enterprise applications for government and commercial industries. Susan has worked with Oracle Applications since 1993 in many technical and functional roles including system administration, development, training, project management, and engagement management. Susan presents frequently at local, regional and national conferences (OAUG/OOW/IOUG/ODTUG) on both functional and technical topics and has co-authored two books: *The ABCs of Workflow for E-Business Suite Release 11i and Release 12* and *The Release 12 Primer*. Susan is currently the Vice President of Technical Delivery at Solution Beacon and can be reached by email at sbehn@solutionbeacon.com.

