Workflow Performance Tuning in Release 12

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About the Speaker

• Oracle Ace
• Over 35 years System Design and Support
• Over 20 years E-Business Suite support
• 14 years Oracle Workflow design and support
• Former OAUG President
• Over 100 presentations at multiple venues
• Co-Author *The ABCs of Oracle Workflow for E-Business Suite Release 11i and Release 12*
Audience Profile

- **Job Role**
  - DBA
  - System or Workflow Administrator
  - Functional

- **Database Level**
  - 10gR2
  - 11gR1
  - 11gR2

- **EBS Version**
  - Release 11i.10
  - ATG_PF.H RUP6
  - ATG_PF.H RUP7
  - Release 12.0.6
  - Release 12.1.n
  - Not EBS
Which Are You?

The opposite of the ostrich is the rooster who is alert and awake early to see what is on the horizon. Rather than fear, he crows loudly a warning to be heeded by all.

Source: http://users.cybertime.net/~ajgood/ostrich.html
Patch Current

• It's not just the RUPs, one-offs are important
• Workflow is dependant on HR, AME
  • Diagnostics are important also
• Product workflow fixes are provided by product team, not ATG patches
• See Workflow SIG site for list of one-off patches for 11i
  • All included in RUP7
  • http://workflowsig.oaug.org/reference_info.html
• Only 1 known one-off for 12.1.3 – 9773716
  • Selector Function not re-executed for same type
Clean up Errors

- Perform following query

```sql
SELECT COUNT (*)
, item_type
, activity_name
, MIN (item_begin_date)
, MAX (item_begin_date)
FROM wf_item_activity_statuses_v
WHERE activity_status_code = 'ERROR'
    AND item_end_date IS NULL
GROUP BY item_type
 , activity_name
ORDER BY 3 DESC, 1 DESC, 2;
```
### Clean up Errors

<table>
<thead>
<tr>
<th>COUNT(*)</th>
<th>ITEM_TYPE</th>
<th>ACTIVITY_NAME</th>
<th>MIN(ITEM_BEGIN_DATE)</th>
<th>MAX(ITEM_BEGIN_DATE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>REQAPPRV</td>
<td>PO_REQ_APPROVED</td>
<td>7/5/2004 6:06:53 AM</td>
<td>10/1/2008 10:42:02 AM</td>
</tr>
<tr>
<td>2</td>
<td>APINVAPR</td>
<td>ESCALATE_DOC_APPROVAL</td>
<td>10/31/2007 3:54:00 PM</td>
<td>11/1/2007 2:36:07 PM</td>
</tr>
</tbody>
</table>

- Triage – Most Recent, Highest Numbers
- It isn't enough to clean up the errored workflows
Clean up Associated Error Item Types

• Perform following query

```sql
SELECT   item_type,
         parent_item_type,
         DECODE (end_date, NULL, 'OPEN', 'CLOSED')
         error_type_status,
         COUNT (*)
FROM     wf_items
WHERE    parent_item_type is not null
         AND item_type in ('CUNNLWF','DOSFLOW','DOSFLOWE','ECXERROR','HRSSA','HRSTAND','HXCEMP','IBUHPSUB','OKLAMERR','OMERROR','PARMAAP','PARMATRIX','POERROR','WFSTD','XDPWFSTD','ZPBWFERR', 'WFERROR')
GROUP BY item_type,
         parent_item_type,
         DECODE (end_date, NULL, 'OPEN', 'CLOSED')
ORDER BY item_type, parent_item_type;
```
Clean up Associated Error Item Types

- Purge now closes WFERROR for closed workflows
- WFERROR not the only Error Item Type
- Can’t purge if children open
- Notice chains OEOH → OMERROR → WFERROR
  OEOH → OEOL → WFERROR
Clean up Event Errors

• Perform following query

```sql
SELECT COUNT (*), v.text_value, min(i.begin_date), max(i.begin_date)
FROM wf_item_attribute_values v, wf_items i
WHERE v.item_key = i.item_key
  AND v.item_type = i.item_type
  AND v.item_type = 'WFERROR'
  AND v.NAME = 'EVENT_NAME'
  AND v.text_value IS NOT NULL
GROUP BY text_value
ORDER BY text_value;
```
Clean up Event Errors

<table>
<thead>
<tr>
<th>COUNT(*)</th>
<th>TEXT_VALUE</th>
<th>MIN(I.BEGIN_DATE)</th>
<th>MAX(I.BEGIN_DATE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>oracle.apps.ap.payment</td>
<td>7/30/2007 10:52:02 PM</td>
<td>11/14/2007 1:54:15 PM</td>
</tr>
</tbody>
</table>

- Find and fix what causes event to error
- Message to SYSADMIN can re–raise event if still needs processing, else abort WFERROR
Purge!!!

11.5.10 Purgeable for PERM always 0

- Need schedule for Temporary and for Permanent
- If Purgeable = 0, ensure child/parent workflows closed
Purge Obsolete Workflow Runtime Data

• Schedule Nightly or at minimum Weekly
• Parameters
  • Leave Item Type/Item Key blank
  • Age – recommended at least 7, no more than 60
  • Persistence Type
    • One Schedule Temporary, one Permanent
  • Core Workflow Only – Set to Y
    • At least monthly, run schedule set to N
  • Commit Frequency – leave at default – 500 (that's 500 workflows, not 500 records)
  • Signed Notifications – Customer choice
Purge My Oracle Support Notes

- 337923.1 "A closer examination of the Concurrent Program Purge Obsolete Workflow Runtime Data"
- 132254.1 "Speeding Up And Purging Workflows"
- 298550.1 "Troubleshooting Workflow Data Growth Issues"
- 780446.1 "Is It Possible To Run Multiple "Purge Obsolete Workflow Runtime Data" Programs Simultaneously With Different Item Type value.?
- 144806.1 “A Detailed Approach to Purging Oracle Workflow Runtime Data"

Note: Referenced patches already included in 11i.10, R12
Purge – What Happens

- Aborts WFERROR where PARENT_ITEM_TYPE matches Item Type parameter and where linked activity (PARENT_CONTEXT) no longer in error status
  - But not POERROR, OMERROR or other error types
- Purges Item Types matching Item Type parameter if END_DATE is not NULL and not linked to open parent or child workflow
Purge – What Happens

- If "Core Workflow Only" = N
  - Purges WF_ACTIVITIES table where END_DATE is not NULL and ACTIVITY_ID is not referenced in active workflows
  - End–dates, then deletes notifications not referenced in WF_ITEM_ACTIVITY_STATUSES, _H
    - Example: notifications from finished concurrent programs
  - Purges ad–hoc roles where ORIG_SYSTEM = 'WF_LOCAL_ROLES' or 'WF_LOCAL_USERS' and not referenced in WF_ROLE_HIERARCHIES or WF_NOTIFICATIONS or WF_ITEMS.OWNER_ROLE
If Catching up on Purging

• Purge by Item Type to avoid exceeding Rollback size
  • Alternative, purge by age with increasingly smaller values (diagnostic will give year started)
• Each run may take hours
• Run with "Core Workflow Only" = Y
• Note: 10g, 11g automatically reset high water marks, so export/import no longer required
• After catching up on purging, run one more time with “Core Workflow Only” = N
  • Running with this value should only be necessary once/month
If Catching up on Purging

• Unreferenced Notifications
  • 266614.1 "Troubleshooting Workflow Issues in Applications 11i", section "Purging Unreferenced Notifications"
• Referenced patch included in 11i.10
• Wfntfprg.sql
  • Note instructions to purge messages from FNDCMMSG (notifications of finished concurrent requests)
Configure (Setup) Seeded Workflows

• Read the documentation
  • Setup
  • How the workflow behaves
  • My Oracle Support white papers, notes
• Setup not just Builder
  • Profile Options
  • Approvals Management Engine (AME)
  • Hierarchies
  • Other Screens
Background Engines

- Run Engine for Stuck separately
  - Parameters: NULL, NULL, NULL, No, No, Yes
  - Run once/week or once/month
- Run Engine for Timed Out activities separately based on criticality of timeout
  - If average timeout = 1 day, run once/day
  - Parameters: NULL, NULL, NULL, No, Yes, No
Background Engines

• Run Engine for Deferred activities separately based on criticality of activity
  • Except for OEOL, very few workflows need moving more than every 15 minutes
  • If Order volume high, run "targeted" engine for OEOL every 5 minutes
    • Parameters: Order Line,NULL,NULL,Yes,No,No
  • Run generic every 15–60 minutes
    • Parameters: NULL,NULL,NULL,Yes,No,No
Background Engines

- Activities in queue table WF_DEFERRED_TABLE_M
  - Time to process = DEQ_TIME – ENQ_TIME where STATE=2
- 369537.1 "How to Monitor the FNDWFBG – Workflow Background Program"
  - Scripts: what’s in queue, what will be dequeued next
- 466535.1 "How to Resolve the Most Common Workflow Background Engine Problems"
  - If using 10.2.0.4 and RAC, apply patch 6600051
Background Engine Runs a Long Time

- 186361.1 "WF 2.x: Workflow Background Process Performance Troubleshooting Guide"
- Determine the Item Type Causing the Issue
  - SQL Trace
  - Monitor WF_DEFERRED_TABLE_M before running (order by PRIORITY, ENQ_TIME, STATE=0) then after running (STATE=2)
- Review Status Monitor for Item Types processed, usually activity in workflow is the culprit, not Background Engine
- Loop in Workflow – see Large Activity History from 'Workflow Status and Purgeable Items' Diagnostic (R11i) or Heath Check Diagnostic (R12) or WF Analyzer script (MOS note 1369938.1)
Background Engine Runs a Long Time

• 560144.1 "11.5.10.4: Workflow Background Process Seems To Take Longer After Rup4"
  • Don't use re-submit time < 5 minutes
  • AQ_TM_PROCESSES must be at least 1
    • Notes – see next page for advice
      • 746313.1 "What should be the Correct Setting for Parameter AQ_TM_PROCESSES in E-Business Suite Instances"
      • 428441.1 ""Warning: Aq_tm_processes Is Set To 0" Message in Alert Log After Upgrade to 10.2.0.3 or Higher"
      • 396009.1 “Database Initialization Parameters for Oracle E-Business Suite Release 12"
Background Engine Runs a Long Time

• AQ_TM_PROCESSES
  • 746313.1 – dated September 2010
    • As of 10g, database can “autotune”
    • Never set > 9
    • If not set, common workflow diagnostics will return 0 value
    • Recommends still setting the value
  • 428441.1 – dated December 2011
    • Details how to check whether parameter = 0 or is set to autotune
  • 396009.1 – dated February 2012
    • Autotuning not tested with EBS, don’t use – bad info, ignore
Background Engine Runs a Long Time

- **560144.1** "11.5.10.4: Workflow Background Process Seems To Take Longer After Rup4" (cont)
  - Perform regular rebuilds/coalescences on all the indexes/IOTS
  - Follow steps in MOS note 271855.1 "Procedure to manually Coalesce all the IOTs/indexes Associated with Advanced Queuing tables to maintain Enqueue/Dequeue performance, reduce QMON CPU usage and Redo generation"
- **JOB_QUEUE_PROCESSES** at least 5
  - OAM recommends value of 10
  - Oracle seeds this to 2, it should be changed ASAP
  - 396009.1 – dated February 2012
    - Recommends value of 2 – this is wrong, ignore
Background Engine Runs a Long Time

- 578831.1 “How to determine the correct setting for JOB_QUEUE_PROCESSES”
  - Ideal setting – number of jobs that would run concurrently plus a few more
  - Explains how to monitor and set this
  - Recommends periodic review of monitoring
    - Check during heavy periods of use: last day of month, month end
Advanced Queuing Performance

- 469009.1 "Troubleshooting Workflow Agent Listener's failure to start"
- 741087.1 "High Logging Messages on WF_EVENT_OJMSTEXT_QH procedure"
  - Verify Profile options (issue is level 2, 3 messages)
    - FND: Debug Log Level – Unexpected (level 6)
    - Note: 1107970.1 recommends setting
      - FND: Debug Log Enabled – Yes
      - FND: Debug Module = %
  - Set Log Level for each Listener to Error, then stop and restart Workflow Agent Listener Container
Advanced Queuing Performance

• Memory insufficient or Containers consuming all available memory
  • 444939.1 "How do you Change the Maximum Memory Size taken by Workflow Service Container"
• Retention
  • Increases performance if = 0, but destroys ability to tune, troubleshoot
  • Recommend 1 day – 86400 seconds
    • Decrease WF_IN/OUT WF_REPLAY_IN/OUT
    • Increase WF_ERROR, WF_JAVA_ERROR
    • Dbms_aqadm.alter_queue(queue_name=>'<queue >', retention_time=>86400);
WF_CONTROL

• Controls all other queues
• Run 'Control Queue Cleanup' every 12 hours
• Note 469045.1 "Troubleshooting WF_CONTROL Agent Issues"
  • Discussion of this queue
  • Scripts to run to ensure subscribers are valid and dead subscribers are removed properly
WF_DEFERRED Performance

- Subscriptions to Events Phase > 100
- Workflows started by events
- 334348.1 "Low Performance Processing Messages in WF_DEFERRED Queue"; 468650.1 "Troubleshooting WF_DEFERRED Agent Listeners Performance"
  - Use SQL to determine Events in queue
  - Identify if events not being dequeued in timely fashion
    - time in queue > 2X sleep time for queue
  - Identify Events with long processing time
  - Trace code and identify issues (bugs, tuning, etc)
WF_DEFERRED Performance

- 334348.1 "Low Performance Processing Messages in WF_DEFERRED Queue"; 468650.1 "Troubleshooting WF_DEFERRED Agent Listeners Performance" (cont)
  - Identify Events with high volume
  - Create additional generic agent listeners
  - Create specific agent listeners
  - Increase 'Inbound Thread Count' (PROCESSOR_IN_THREAD_COUNT) by 1 until performance acceptable
  - Temporarily set retention time to 0
WF_DEFERRED Performance

- Queue may be corrupt
- Receiving Errors "ORA–24033: No Recipients for Message"
- Rebuild using instructions in MOS note 286394.1 "How to rebuild the WF_DEFERRED queue"
Workflow Analyzer

- MOS note 1369938.1 “Workflow Analyzer script for E-Business Suite Workflow Monitoring and Maintenance”
  - Better than R12 Workflow Health Check Diagnostic or 11i Workflow Status and Purgeable Items or Workflow Performance
  - SQL script introduced Dec 6, 2011
  - Author, Bill Burbage, working on instructions to register as concurrent program
  - Updated frequently
  - Use it, follow it, rerun it until your dashboard is green, then at least once a quarter
Workflow Analyzer

Table of Contents

Workflow Analyzer Overview
- E-Business Suite Version
- Workflow Database Parameter Settings

Workflow Administration
- Verify the Workflow Administrator Role
- SYSADMIN Worklist Access
- Verify AutoClose FYI Setting
- E-Business Suite Profile Settings
- Workflow Profile Settings
- Verify Error Messages
- Verify #STUCK Activities
- Totals for Notification Preferences
- Check the Status of Workflow Services

Workflow Footprint
- Volume of Workflow Runtime Data Tables
- Verify Closed and Purgeable TEMP Items
- SUMMARY Of Workflow Processes By Item Type
- Check the Volume of Open and Closed Items Annually
- Average Volume of Opened Items In the past 6 Months, Monthly, and Daily
- Total Items Opened Over 90 Days Ago
- Check Top 30 Large Item Activity Status History Items

Workflow Concurrent Programs
- Verify Concurrent Programs Scheduled to Run
- Verify Workflow Background Processes that ran
- Verify Status of the Workflow Background Engine Deferred Queue Table
- Verify Workflow Purge Concurrent Programs
- Verify Workflow Control Queue Cleanup Programs

Workflow Notification Mailer
- Check the status of the Workflow Services
- Check the status of the Workflow Notification Mailer(s)
- Check Status of WF NOTIFICATIONS Table
- Check Status of WF_NOTIFICATION_OUT Table
- Check for Orphaned Notifications

Workflow Patch Levels
- Applied ATG Patches
- Known 1-Off Patches on top of ATG Rollups
- Verify Status of Workflow Log Levels
- Verify Workflow Services Log Locations

References
WF Analyzer Dashboard

Workflow Analyzer Overview

Workflow Runtime Data Table Gauge

Your overall Workflow HealthCheck Status is in need of Immediate Review!
The WF_ITEMS Table has obsolete workflow runtime data that is older than 3 years.
WF Analyzer – Profile Options

<table>
<thead>
<tr>
<th>ID</th>
<th>PROFILE_OPTION_NAME</th>
<th>PROFILE</th>
<th>VALUE</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1002246</td>
<td>CONC_GSM_ENABLED</td>
<td>Concurrent/GSM Enabled</td>
<td>Y</td>
<td>Enable Generic Service Management</td>
</tr>
<tr>
<td>1005209</td>
<td>FND_VALIDATION_LEVEL</td>
<td>FND Validation Level</td>
<td>ERROR</td>
<td></td>
</tr>
<tr>
<td>1002286</td>
<td>AMPOOL_ENABLED</td>
<td>FND: Application Module Pool Enabled</td>
<td>Y</td>
<td>Application Module Pool Enabled. If this is No ('N') then application module pooling will be disabled.</td>
</tr>
<tr>
<td>1002247</td>
<td>AFLOG_ENABLED</td>
<td>FND: Debug Log Enabled</td>
<td>Y</td>
<td>Log Enabled. If this is No ('N') then logging &amp; alerting will not occur at runtime.</td>
</tr>
<tr>
<td>3099</td>
<td>AFLOG_LEVEL</td>
<td>FND: Debug Log Level</td>
<td>6</td>
<td>Minimum level for Logging, if this profile isn't set, the default level is 6 (UNEXPECTED).</td>
</tr>
<tr>
<td>1005247</td>
<td>AFLOG_BUFFER_MODE</td>
<td>FND: Debug Log Mode</td>
<td>2</td>
<td>Asynchronous Logging Mode</td>
</tr>
<tr>
<td>3100</td>
<td>AFLOG_MODULE</td>
<td>FND: Debug Log Module</td>
<td>%</td>
<td>Module filter(s) for logging. This is a space separated list of modules. If there is no value for this profile, all modules will be logged.</td>
</tr>
<tr>
<td>1004600</td>
<td>FND_FWK_COMPATIBILITY_MODE</td>
<td>FND: Framework Compatibility Mode</td>
<td>11.5.10</td>
<td>Used to ensure backward compatibility. Specifies which framework version behavior should be retained.</td>
</tr>
<tr>
<td>1000993</td>
<td>FND_MIGRATED_TO_JRAD</td>
<td>FND: Migrated To JRAD</td>
<td>N</td>
<td>Profile option to indicate whether the application has been migrated to JRAD</td>
</tr>
<tr>
<td>1005308</td>
<td>WF_VALIDATE_NTF_ACCESS</td>
<td>WF: GUEST Access to Notification</td>
<td>N</td>
<td>Users can access the notification detail page without logging on to the Oracle E-Business Suite</td>
</tr>
<tr>
<td>1002379</td>
<td>WF_NTF_REASSIGN_MODE</td>
<td>WF: Notification Reassign Mode</td>
<td>REASSIGN</td>
<td>Specify whether Notification User Interface(s) provides access to full Reassign capability, including Delegate and Transfer, or merely Delegate</td>
</tr>
<tr>
<td>1005362</td>
<td>WF_ROUTE_RULE_ALLOW_ALL</td>
<td>WF: Vacation Rules - Allow All</td>
<td>Y</td>
<td>Profile option to enable/disable display of 'All' option in Routing Rules Item Types dropdown.</td>
</tr>
</tbody>
</table>

Note: Profile "Concurrent/GSM Enabled" is enabled as expected.
The profile "Concurrent/GSM Enabled" is currently set to Y to allow GSM to enable running workflows.
This is expected as GSM must be enabled in order to process workflow.
Please review Note 1191400.1 - Troubleshooting Oracle Workflow Java Notification Mailer, for more information.

<table>
<thead>
<tr>
<th>ID</th>
<th>PROFILE_OPTION_NAME</th>
<th>PROFILE</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1003652</td>
<td>APPS_FRAMEWORK_AGENT</td>
<td>Application Framework Agent</td>
<td><a href="http://ora12mgapps2.pgworks.com:8080">http://ora12mgapps2.pgworks.com:8080</a></td>
</tr>
<tr>
<td>1005307</td>
<td>WF_MAIL_WEB_AGENT</td>
<td>WF: Workflow Mailer Framework Web Agent</td>
<td>NOT SET - Replace with specific Web Server URL (non-virtual) if using load balancers</td>
</tr>
</tbody>
</table>
Profile Options - Others

• Account Generator: Run in Debug Mode
  • Except when experiencing an issue with Account Generator, set it to 'No'
  • Make sure when problem fixed to purge workflows and reset

• PO: Workflow Processing Mode
  • If set to 'Online', screen does not return control to Buyer until workflow ends or notification requiring response is encountered
  • If Buyers cannot self–approve POs, set to 'Background'

WARNING - Enable profile option WF_EnableBulkNotificationResponse by setting to Yes at Site level, and bounce the middle tier to accept the new System Profile setting
ACTION - If this profile option is not set, apply Patch 6722406 on top of 11i_ATG_PF_H.RUP6 environment or apply Patch 6241631 11i_ATG_PF_H.RUP7. Please see note 9760386.1
Profile Options - Others

- **HR: Defer Update After Approval**
  - If set to 'Yes', all database commits are held until next Background Engine
  - 317002.1 "Approval Is Delayed In Defer Thread Activity", 469617.1 "Appraisals Remain In Pending Approval Status", and 466339.1 "Approved Enrollment Still In Requested Status When Class Status Is Normal"
- Adjust AME FYI rules according to MOS note 472387.1 "FYI Notifications Closed Automatically and Not Showing Up on Worklist"
WF Analyzer – Background Queue

- Workflow Background Engine Status
  - Lists Activities waiting for Deferred Background Engine
  - Note counts of Ready, run SQL and see if queue is steady or growing
    - If always empty, increase wait time (sleep time) for next execution of Background Engine
**WF Analyzer – Large Activity History**

- Large Activity History
  - Lists individual workflows where single activity executes > 500 times
  - Can click See SQL for code used
WF Analyzer – Annual Counts

- Open and Closed Items Annually
- Verify Persistence
- Stats to help with Background Engine balancing
WF Analyzer – Closed, Can’t Purge

<table>
<thead>
<tr>
<th>CLOSED ITEMS</th>
<th>PURGEABLE</th>
<th>ITEM TYPE</th>
<th>DISPLAY NAME</th>
<th>PERSISTENCE DAYS</th>
</tr>
</thead>
<tbody>
<tr>
<td>133,193</td>
<td>133,082</td>
<td>POAPPRV</td>
<td>PO Approval</td>
<td>0</td>
</tr>
<tr>
<td>125,520</td>
<td>125,515</td>
<td>POXML</td>
<td>PO Xml Delivery</td>
<td>0</td>
</tr>
<tr>
<td>83,690</td>
<td>83,690</td>
<td>CREATEPO</td>
<td>PO Create Documents</td>
<td>0</td>
</tr>
<tr>
<td>31,973</td>
<td>31,949</td>
<td>REQAPPRV</td>
<td>Requisition</td>
<td>0</td>
</tr>
<tr>
<td>173</td>
<td>173</td>
<td>OAM_BE</td>
<td>OAM Business Exception</td>
<td>0</td>
</tr>
<tr>
<td>157</td>
<td>152</td>
<td>POERROR</td>
<td>PO Approval Error</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>AMEUPDUN</td>
<td>AME update FND user name</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>WFERROR</td>
<td>System: Error</td>
<td>0</td>
</tr>
</tbody>
</table>

• Closed Items not eligible for purging – MOS note 186361.1 “WF 2.x: Background Process Performance Troubleshooting Guide”
• If global preference is 'Do not send me mail' (QUERY)
  • Use Framework Personalization – prohibit override from Preferences link
    • Ensure records in FND_USER_PREFERENCES updated to QUERY
  • Disable Local subscription event oracle.apps.wf.notification.send.group
  • 453137.1 "Oracle Workflow Best Practices Release 12 and Release 11i"
• Remember Alert now uses the workflow Mailer
Notification Mailer

- If global preference is 'Do Not Send Me Mail' and not running Alert
  - Don't Start Mailer
  - Set Startup mode for following listeners to Manual or On Demand
    - Workflow Deferred Notification Agent Listener
    - Workflow Inbound Notifications Agent Listener
- Monitor WF_NOTIFICATION_IN, _OUT
- Monitor WF_DEFERRED for oracle.apps.wf.notification.% events
Notification Mailer

• If Inbound Processing is not checked and not running
  Alert inbound processing
  • Set Startup mode for following listeners to Manual or On Demand
    • Workflow Inbound Notifications Agent Listener
  • Monitor WF_NOTIFICATION_IN
Notification Mailer

• Mailer only for Alert
  • 463777.1 "How to Disable all Workflow related Email Notifications Except for the Ones Sent from Oracle Alerts?"
  • Create new Mailer
    • ATG_PF.H.delta.5+ – set Correlation id = ALR:%
Notification Mailer

- Increase Inbound Polling Interval – Processor Min Loop Sleep (seconds) – ensure Processor Max Loop Sleep at least 5*Processor Min Loop Sleep
- Note 315748.1 "How To Change The Java Workflow Mailer Inbound Polling Interval"
Notification Mailer

- Processor Close on Read Timeout
  - 315748.1 – unclick for performance
  - 422870.1 – unless clicks, not removed from Process folder
  - 332152.1 – must be clicked if running multiple mailers using same SMTP Server (Outbound Name) or will get contention and locking
  - 437986.1 – must be clicked or messages get stuck in Inbox
Notification Mailer

• Mailer Log shows java.lang.OutOfMemoryError
• 467516.1 "Users suddenly (sic) Stop Receiving Email Notifications"
  • Insufficient Heap Size (Xmx and Xms)
  • Edit $APPL_TOP/admin/adovars.env
    • Add/change following
      • APPSJREOPT="–Xms128m –Xmx3072m"
      • export APPSJREOPT
• Bounce Concurrent Managers
Notification Mailer

- "You Have Insufficient Privileges"
- 414376.1 "You Have Insufficient Privileges For The Current Operation" On Reqappreqv Notif"
- Create dedicated user for the mailer
- Framework URL timeout = 120
Notification Mailer

• Setup separate user to run the Mailer
  • Must be a workflow administrator
  • Will force administrator to be a responsibility
  • Should have following responsibilities only
    • System Administrator
    • Responsibility used as workflow administrator
  • Should not be a user with other duties

• Why not SYSADMIN
  • Performance: SYSADMIN usually has too many of own emails due to WFERROR emails
  • Manageability: Enabling log for SYSADMIN includes many other functions than mailer thus hampering troubleshooting
Notification Mailer

• Tag Files
  • Out of Office, Undeliverable – set to Ignore
  • 388709.1 "Email Notification Failures Are Causing The Email Servers To Crash"
• Uncheck Mailer parameter "Send warning for unsolicited e-mail"
  • 431359.1 "Setting up a Tag in the Mailer configuration files to handle unsolicited mail"
• Uncheck Mailer parameter 'Send e-mails for canceled notifications'
Workflow Statistics Programs

• The programs
  • Workflow Mailer Statistics Concurrent Program
  • Workflow Work Items Statistics Concurrent Program
  • Workflow Agent Activity Statistics Concurrent Program

• Run Once/Day
  • Admin must remember to refresh queries

• 787228.1 "Cannot Abort Old Open Items in Workflow Manager Because Errored Items are not Returned"
  • 12.0.4 – wf_item_types.num_error = 0, won't show
  • 12.0.6 – click refresh button and is re-calculated
Workflow Concurrent Managers

- **WFMGSMS** (Workflow Summary Mailer) and **Workflow Mailer** (WFMGSMD) concurrent managers are for old mailer and must be disabled
  - If enabled, follow instructions MOS note 434161.1 "When Attempting To Stop the Concurrent Managers – All Services are Terminated Except FNDSM and WFMLRGSM"
- **Workflow Agent Listener Service** (WFALSNRSVC) must be enabled and active – always
- **Workflow Mailer Service** (WFMLRSVC) must be enabled if emailing notifications or running Alert
- **Workflow Document Web Services Service** (WFWSSVC) must be enabled to use Web Services
Pinning

- Objects "pinned" into memory so they do not need to be constantly reloaded from disk, flushed out of memory and reloaded
  - PIND
  - 301171.1 "Toolkit for dynamic marking of Library Cache objects as Kept (PIND)"
- Requires large SGA and memory
Run 64-bit Database

- Memory is critical, 32-bit can't address enough
- Intelligent pinning – WF_ packages
- 11g database is recommended
  - 10.2.0.5 in Extended Support
- If running lower version of database, upgrade
Partition Tables

• Perform after Purge cleanup
  • Doing this replaces need to export/import
• Backup following tables
  • WF_ITEM_ACTIVITY_STATUSES
  • WF_ITEM_ACTIVITY_STATUSES_H
  • WF_ITEM_ATTRIBUTE_VALUES
  • WF_ITEMS
• Ensure have free space in same tablespace slightly more than currently used (incl. indices)
• Move to OATM first – MOS note 402720.1 “OATM Migration fails with ORA-14257 when moving list partitioned tables”
Partition Tables – 11i

- 260884.1 "How to Partition tables in OWF.G", no longer wfupartb.sql
- Script $FND_TOP/patch/115/sql/WFPART.sql
  Sqlplus: <apps_user>/<passwd> @wfpart <fnd_user> <fnd_passwd> <apps_user> <apps_passwd> <utl_dir_location>
- Script only has to be performed once
- Uses DDL operations running in nologging mode – rollback not possible
  - Failure requires restore of tables
Partition Tables Issues

- WFPART.sql does not create required index WF_ITEM_ACTIVITY_STATUSES_N4 and WF_ITEM_ACTIVITY_STATUSES_H_N3
  - 11i.10 - Patch 7252442
    - 749105.1 "Index WF_ITEM_ACTIVITY_STATUSES_N4 Is Not Created When Using wfpart.sql"
  - Requires FND.H, not in RUP6
- R12 – Patch 8241676
  - 789528.1 "Missing Index WF_ITEM_ACTIVITY_STATUSES_H_N3 and WF_ITEM_ACTIVITY_STATUSES_N4 Using wfpart.sql"
  - Requires 12.0.6
Wffngen.sql

- Translates activity function calls into static calls
  - According to Oracle, 25% increase in performance
- Look for variable itemtypeList_t
  - Seeded := itemtypeList_t ('WFSTD','FNDFFWF')
  - Add following item types (after configuration complete)
    - WFERROR, POERROR, OMERROR
    - Other workflows with high (current) count in WF_ITEMS
Item Attributes "As Needed"

- By default, when workflow initiated, runtime copy of each item attribute created
- 66% of item attributes have no value (and that excludes Event attributes)

SELECT COUNT (*)
, v.item_type
FROM wf_item_attribute_values v
, wf_item_attributes a
WHERE a.item_type = v.item_type
AND a.NAME = v.NAME
AND a.TYPE <> 'EVENT'
AND v.text_value IS NULL
AND v.number_value IS NULL
AND v.date_value IS NULL
GROUP BY v.item_type
ORDER BY 1 DESC;
Item Attributes "As Needed"

• #ONDEMANDATTR
  • Process Activity Attribute
  • Assign to top-level runnable process activity
  • Can be any type, doesn't need a value, workflow engine just detects the presence of this attribute
  • Do not assign an item attribute as the value
  • Runtime copy only created when SetItemAttr<> used
    • If referenced prior to this call, default value used
  • Experiment with a particular workflow
    • HRSSA, XDPWFSTD, OEOL, WFERROR, APEXP, POWFRQAG, REQAPPRV
Help for OEOH/OEOL

- My Oracle Support Notes
  - 398822.1 "Order Management Suite – Data Fix Script Patch"
  - 405275.1 "How to Detect Data Corruption and Purge More Eligible OEOH/OEOL Workflow Items for Order Management Workflow"
- Contain scripts to close unneeded OEOH/OEOL with associated OMERROR and WFERROR as well as close the records in the Order Management tables
Release 12.2

• Deferred Worklist Processing
  • Behavior when responding to notifications through worklist
    • Old – control not returned to screen until workflow ended or reached next deferred activity
    • New – control returned immediately, workflow continues when background engine runs again
  • Configurable by item type
• RAC Affinity for item types whose processes are either launched and completed in one online session or deferred once and completed later by a background engine – WF_RAC_ENABLED_TYPES
Release 12 Books by Rolta Employees

The ABCs of Workflow for Oracle E-Business Suite Release 11i and Release 12

The Release 12 Primer – Shining a Light on the Release 12 World

Available from Amazon.com, Barnes & Noble (bn.com) Lulu.com
Questions?

Thank You

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