

Tuning Oracle Workflow

Karen Brownfield
April 2008





OAUG
oracle applications users group

Knowledge Factory™

Educate. Network. Influence.

Are you
in the
know?

<http://oaug.org/resources/knowledgefactory/index.html>



Audience Profile

- Job Role
 - DBA
 - System or Workflow Administrator
 - Functional
- EBS Version
 - Prior to Release 11i.10
 - On ATG_PF.H?
 - Release 11i.10 – ATG_PF.H RUP level?
 - Release 12 – RUP level?
 - Not EBS

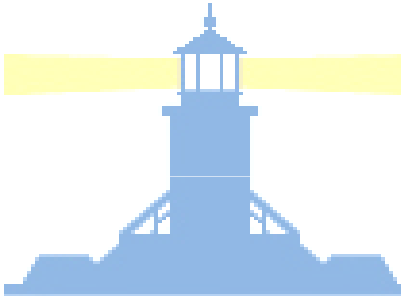




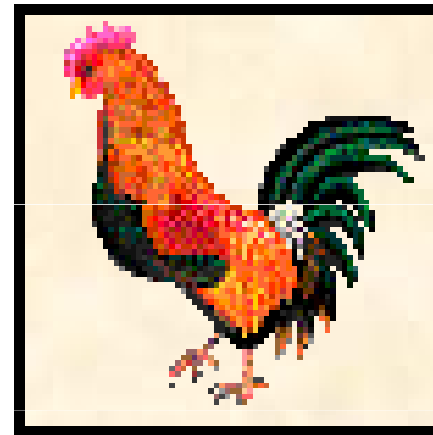
Audience Profile

- Database Level
 - 9i/any version
 - 10gR1
 - 10gR2
 - 11g





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 'Care and Feeding of Workflow – What's New' for latest ATG, workflow, HR, AME, Diagnostic patches
 - Subscribe your MetaLink Headlines to Workflow and AME



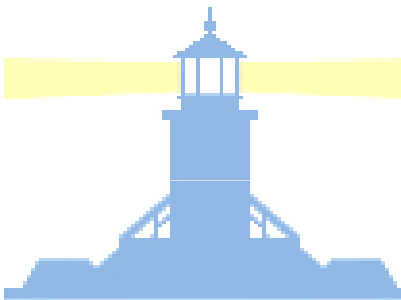


Clean up Errors

- Perform following query

```
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  item_type
          ,activity_name;
```





Clean up Errors

| COUNT(*) | ITEM_TYPE | ACTIVITY_NAME | MIN(ITEM_BEGIN_DATE) | MAX(ITEM_BEGIN_DATE) |
|----------|-----------|-----------------------------|----------------------|----------------------|
| 749 | ADSSALES | NOTIF | 11/9/2005 4:15 | 12/5/2005 1:52 |
| 2 | APINVAPR | ESCALATE_DOC_APPROVAL | 10/31/2007 15:54 | 11/1/2007 14:36 |
| 9861 | FTEPSUPD | INVOICE_STATUS_UPDATE | 3/23/2005 0:46 | 11/14/2007 13:51 |
| 805 | GMDQMSMC | GMDQMSMC_VERIFY | 3/15/2004 15:04 | 8/11/2004 11:56 |
| 463 | IBC_WF | IBC_CITEM_APPROVAL | 7/14/2003 16:15 | 7/3/2007 13:17 |
| 8 | OECH | WAIT | 4/2/2001 12:30 | 5/21/2001 11:29 |
| 1 | OEOL | BRANCH_ON_SOURCE_TYPE | 1/17/2002 10:36 | 1/17/2002 10:36 |
| 1 | OEOL | SHIP_LINE | 1/17/2002 10:36 | 1/17/2002 10:36 |
| 1 | REQAPPRV | APPROVE_REQUISITION | 7/24/2003 9:07 | 7/24/2003 9:07 |
| 3 | REQAPPRV | BUILD_DEFAULT_APPROVAL_LIST | 8/2/2006 0:11 | 8/2/2006 0:11 |
| 1 | REQAPPRV | LAUNCH_CREATE_PO_WF | 10/12/2005 12:21 | 10/12/2005 12:21 |
| 4 | REQAPPRV | PO_REQ_APPROVED | 7/5/2004 6:06 | 7/6/2004 1:00 |
| 1 | REQAPPRV | REMOVE_REMINDER_NOTIF | 1/15/2003 2:23 | 1/15/2003 2:23 |
| 464 | REQAPPRV | RESERVE_DOCUMENT | 2/19/2003 12:38 | 8/8/2006 1:02 |
| 1 | REQAPPRV | RETURN_REQ_NO_APPROVER | 8/6/2003 13:02 | 8/6/2003 13:02 |
| 1 | REQAPPRV | VERIFY_APPROVER_AUTHORITY | 5/16/2000 11:47 | 5/16/2000 11:47 |
| 44 | SERVEREQ | GET_REQUEST_ATTRIBUTES | 9/17/2004 23:56 | 4/22/2005 11:46 |
| 1 | SERVEREQ | NTFY_UPDATE_FAILED | 11/30/2005 3:26 | 11/30/2005 3:26 |

- Triage – Most Recent, Highest Numbers
- It isn't enough to clean up the errored workflows





Clean up Associated Error Item Types

- Perform following query

```
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', 'PARMATRX', '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

| ITEM_TYPE | PARENT_ITEM_TYPE | ERROR_TYPE_STATUS | COUNT(*) |
|-----------|------------------|-------------------|----------|
| DOSFLOWE | DOSFLOWE | CLOSED | 1 |
| ECXERROR | OKLLPLBO | CLOSED | 10 |
| HRSSA | HRSSA | CLOSED | 12 |
| OMERROR | OEHOH | OPEN | 36 |
| OMERROR | OEOL | OPEN | 1 |
| PARMATRX | PARMATRX | OPEN | 1 |
| POERROR | REQAPPRV | CLOSED | 5 |
| POERROR | REQAPPRV | OPEN | 3 |
| WFERROR | ECXERROR | CLOSED | 14 |
| WFERROR | HRSSA | CLOSED | 8 |
| WFERROR | HXCEMP | CLOSED | 1 |
| WFERROR | OEHOH | OPEN | 8 |
| WFERROR | OEOL | CLOSED | 34 |
| WFERROR | OMERROR | CLOSED | 37 |
| WFERROR | REQAPPRV | CLOSED | 262 |
| WFERROR | REQAPPRV | OPEN | 206 |

- Can't purge while Error Item Type still open
- WFERROR not the only Error Item Type
- Notice chain OEHOH→OMERROR→WFERROR
OEHOH→OEOL→WFERROR





Clean up Event Errors

- Perform following query

```
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

| COUNT(*) | TEXT_VALUE | MIN(I.BEGIN_DATE) | MAX(I.BEGIN_DATE) |
|----------|---|-------------------|-------------------|
| 7 | oracle.apps.ap.event.invoice.approval | 2/25/2007 6:33 | 9/4/2007 12:15 |
| 4 | oracle.apps.ar.hz.Location.create | 2/8/2006 7:19 | 8/5/2007 19:53 |
| 227 | oracle.apps.wf.notification.receive.error | 11/3/2007 20:58 | 11/7/2007 13:51 |
| 19 | oracle.apps.wf.notification.send | 11/3/2007 18:54 | 1/7/2008 20:40 |
| 6 | sb.apps.xxhr.employee.create | 9/4/2007 20:01 | 9/7/2007 13:19 |

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





Purge!!!

Workflow Purge: a510vis3

Requests Summary
[Show](#)

Completed Work Items
[Hide](#)

Filter: Work Item Type [v] Contains [v] []
 Last Updated: 07-09-2007 13:49:44 []

Select a work item type and ... [View Details](#)

| Select | Work Item Type | Persistence Type | Retention Period | Count | Purgeable |
|----------------------------------|---|------------------|------------------|-------|-----------|
| <input checked="" type="radio"/> | ADS HR Custom Workflows | PERM | 0 | 7 | 0 |
| <input type="radio"/> | AP Invoice | TEMP | 0 | 4 | 4 |
| <input type="radio"/> | Change Action | PERM | 0 | 2 | 0 |
| <input type="radio"/> | Change Workflow Routing Step | PERM | 0 | 1 | 0 |
| <input type="radio"/> | Dossier Approval Flow Enhanced | TEMP | 0 | 1 | 0 |
| <input type="radio"/> | GMS Workflow | PERM | 0 | 2 | 0 |
| <input type="radio"/> | HR | TEMP | 0 | 9 | 0 |
| <input type="radio"/> | Knowledge Management Workflow Process | SYNC | 0 | 34 | 0 |
| <input type="radio"/> | Knowledge Management Workflow Process (New) | SYNC | 0 | 40 | 0 |
| <input type="radio"/> | OAM Business Exception | TEMP | 0 | 88 | 88 |
| <input type="radio"/> | OKL - AM : Termination Quote Acceptance | PERM | 0 | 1 | 0 |
| <input type="radio"/> | OM Order Header | TEMP | 0 | 3 | 1 |
| <input type="radio"/> | OM Order Line | TEMP | 0 | 870 | 0 |

1-15 of 20 [Next 5](#)

Purgeable for PERM always 0

- Need schedule for Temporary and for Permanent
- If Temp = 0, ensure child/parent workflows closed





Purge

- Schedule Nightly
- Parameters
 - Leave Item Type/Item Key blank
 - Age – recommended 7
 - Persistence Type
 - One Schedule Temporary, one Permanent
 - Core Workflow Only – Set to Y
 - Weekly, run schedule set to N
 - Commit Frequency – leave at default – 500 (that's 500 workflows, not 500 records)
 - Signed Notifications – Customer choice



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
- 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



Purge – What Happens

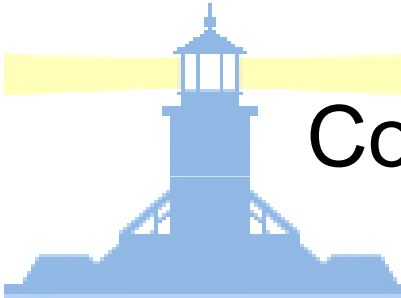
- If Core Workflow Only = N
 - Purges WF_ACTIVITIES table where END_DATE is not NULL and activity_id not referenced in active workflow
 - End-dates, then deletes notifications not referenced in WF_ITEM_ACTIVITY_STATUSES, _H
 - Any notification from finished concurrent program
 - Alerts



If Catching up on Purging

- Purge by Item Type to avoid exceeding Rollback size
- Each run may take hours
- Run with Core Workflow Only = N
- If on 9/database, after all purging finished
 - Export/Import to reset high water marks
 - WF_ITEM_ACTIVITY_STATUSES, _H
 - WF_ITEM_ATTRIBUTE_VALUES
 - WF_NOTIFICATIONS
 - WF_ITEMS





Configure (Setup) Seeded Workflows

- Read the documentation
 - Setup
 - How the workflow behaves
 - MetaLink white papers, notes
- Setup not just Builder
 - Profile Options
 - Approvals Management Engine (AME)
 - Hierarchies
 - Other Screens





Check Profile Options

- 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'





Check Profile Options

- HR:Defer Update After Approval
 - If set to 'Yes', all database commits are held until next Background Engine
 - MetaLink Doc. ID: 317002.1 and 469617.1
 - Adjust AME FYI rules according to MetaLink Doc. ID: 472387.1





Background Engines

- Run Engine for Stuck separately at most once/day
 - Parameters NULL,NULL,NULL,No,No,Yes
- 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
 - Parameters Order Line,NULL,NULL,Yes,No,No
 - Run generic every 15–60 minutes
 - Parameters NULL,NULL,NULL,Yes,No,No
 - MetaLink Doc. IDs: 466535.1, 369537.1
 - ENQ_TIME, DEQ_TIME in WF_DEFERRED_TABLE_M





Background Engine Runs a Long Time

- MetaLink Doc. ID: 186361.1
- Determine the Item Type Causing the Issue
 - SQL Trace
 - Monitor WF_DEFERRED_TABLE_M before running (order by PRIORITY, ENQ_TIME, STATE=0) the 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



WF_DEFERRED Performance

- Subscriptions to Events Phase > 100
- MetaLink Doc. IDs: 334348.1, 468650.1
- Determine Events in queue – see SQL in Doc. ID: 334348.1
 - For State = 0, if time in queue > 2X sleep time for queue
 - Ensure code called by Event Subscription is tuned
 - Workflows started by Event – Defer 1st Activity
 - Increase 'Inbound Thread Count' (PROCESSOR_IN_THREAD_COUNT) by 1 until performance acceptable

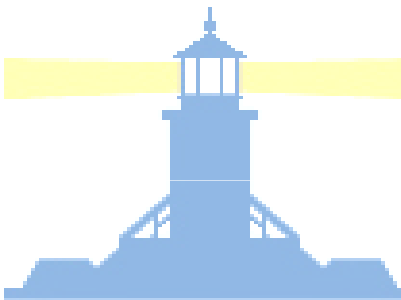




WF_DEFERRED Performance

- Queue may be corrupt
 - Receiving Errors 'ORA-24033: No Recipients for Message'
 - Rebuild using instructions in MetaLink Doc. ID 286394.1





Diagnostic Workflow Status and Purgeable Items

| | | |
|---|--|--|
| Oracle Diagnostics Information | Product Installation Status and Patchset Level | Parameters |
| Environment Variables | Patchset Levels | Execution of Seeded SQL Scripts |
| Tablespace Size | Workflow Table Sizes | Open and Closed Items Annually |
| Large Activity History | Workflow GSM Component Queue Status | Concurrent Program FNDWFPRG Schedule |
| Workflow Background Engine Status | Concurrent Program FNDWFBKG Schedule | Workflow Deferred Events Status |
| Workflow Errors Status | Recommendations | References |

- Large Activity History
- Open and Closed Items Annually
- Workflow Background Engine Status
- Concurrent Program FNDWFBKG Schedule
- Recommendations, References





Diagnostic Workflow Status and Purgeable Items

Large Activity History [\[Top\]](#)

| Item Type | Item Key | Count | Root Activity | Version | Begin Date | End Date | Description |
|-----------|-----------------------------|-------|----------------------|---------|-------------|-------------|--------------------|
| CNCOMPPR | 11590--03-aug-2001 11:34:31 | 4394 | CN_COMP_PLAN_PROCESS | 4 | 03-AUG-2001 | 19-DEC-2007 | 11590 |
| OEOH | 45185 | 1720 | R_STANDARD_HEADER | 6 | 02-APR-2001 | | Sales Order 777788 |
| OEOH | 45187 | 1720 | R_STANDARD_HEADER | 6 | 02-APR-2001 | | Sales Order 777789 |
| OEOH | 45188 | 1720 | R_STANDARD_HEADER | 6 | 02-APR-2001 | | Sales Order 777790 |
| OEOH | 45189 | 1720 | R_STANDARD_HEADER | 6 | 02-APR-2001 | | Sales Order 777791 |
| OEOH | 45190 | 1720 | R_STANDARD_HEADER | 6 | 02-APR-2001 | | Sales Order 777792 |
| OEOH | 45352 | 1720 | R_STANDARD_HEADER | 8 | 21-MAY-2001 | | Sales Order 777795 |
| OEOH | 45354 | 1720 | R_STANDARD_HEADER | 8 | 21-MAY-2001 | | Sales Order 777797 |
| OEOH | 45355 | 1720 | R_STANDARD_HEADER | 8 | 21-MAY-2001 | | Sales Order 777798 |
| SERVEREQ | 18860-1371 | 960 | CUG_GENERIC_WORKFLOW | 2 | 22-AUG-2003 | | |

10 rows retrieved

- [See SQL](#)

- Large Activity History
 - Lists individual workflows where single activity executes > 300 times
 - Can click [See SQL](#) for code used





Diagnostic

Workflow Status and Purgeable Items

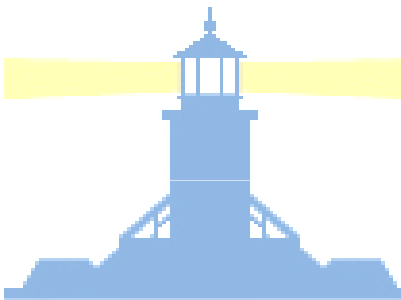
Workflow Background Engine Status [\[Top\]](#)

| Workflow Background Engine Status | | |
|-----------------------------------|-------------|-------|
| Corrid | State | Count |
| APPSOEOH | 0 = Ready | 215 |
| APPSOEOH | 1 = Delayed | 8 |
| APPSPACRMUPD | 0 = Ready | 5 |

3 rows retrieved

- [See SQL](#)

- 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 for next execution of Background Engine



Diagnostic Workflow Status and Purgeable Items

Concurrent Program FNDWFBKG Schedule [\[Top\]](#)

| Concurrent Program FNDWFBKG Schedule | | | | | | | | |
|--------------------------------------|-----------------------------|----------|-----------|-----------------------|------------------------|---------------|----------------------|---------------|
| Request Id | Program | Status | Phase | Actual Start Date | Actual Completion Date | Total Minutes | Time to Run | Arguments |
| 6980690 | Workflow Background Process | C=Normal | Completed | 2006-05-08 04:37:09.0 | 2006-05-08 04:37:10.0 | .02 | 0:hrs 0:Mins 1:Secs | , , , Y, N, N |
| 6980689 | Workflow Background Process | C=Normal | Completed | 2006-05-08 04:32:09.0 | 2006-05-08 04:32:09.0 | 0 | 0:hrs 0:Mins 0:Secs | , , , Y, N, N |
| 6980687 | Workflow Background Process | C=Normal | Completed | 2006-05-08 04:27:08.0 | 2006-05-08 04:27:09.0 | .02 | 0:hrs 0:Mins 1:Secs | , , , Y, N, N |
| 6980686 | Workflow Background Process | C=Normal | Completed | 2006-05-08 04:22:08.0 | 2006-05-08 04:22:08.0 | 0 | 0:hrs 0:Mins 0:Secs | , , , Y, N, N |
| 6980684 | Workflow Background Process | C=Normal | Completed | 2006-05-08 04:17:07.0 | 2006-05-08 04:17:08.0 | .02 | 0:hrs 0:Mins 1:Secs | , , , Y, N, N |
| 6980683 | Workflow Background Process | C=Normal | Completed | 2006-05-08 04:12:03.0 | 2006-05-08 04:12:04.0 | .02 | 0:hrs 0:Mins 1:Secs | , , , Y, N, N |
| 6980681 | Workflow Background Process | C=Normal | Completed | 2006-05-08 04:07:02.0 | 2006-05-08 04:07:02.0 | 0 | 0:hrs 0:Mins 0:Secs | , , , Y, N, N |
| 6980680 | Workflow Background Process | C=Normal | Completed | 2006-05-08 04:02:01.0 | 2006-05-08 04:02:01.0 | 0 | 0:hrs 0:Mins 0:Secs | , , , Y, N, N |
| 6980678 | Workflow Background Process | C=Normal | Completed | 2006-05-08 03:57:00.0 | 2006-05-08 03:57:01.0 | .02 | 0:hrs 0:Mins 1:Secs | , , , Y, N, N |
| 6980677 | Workflow Background Process | C=Normal | Completed | 2006-05-08 03:51:57.0 | 2006-05-08 03:51:57.0 | 0 | 0:hrs 0:Mins 0:Secs | , , , Y, N, N |
| 6765866 | Workflow Background Process | C=Normal | Completed | 2006-04-20 21:00:20.0 | 2006-04-20 21:00:39.0 | .32 | 0:hrs 0:Mins 19:Secs | , , , Y, Y, Y |

- Concurrent Program FNDWFBKG Schedule
 - Note run times where no item type is specified, if small, no targeted engines needed
 - Note that running with Y,Y,Y increases runtime to 30 minutes or more – this is due to the last Y





Diagnostic Workflow Status and Purgeable Items

Recommendations [\[Top\]](#)

ATTENTION - To improve performance on the instances where Workflow is used intensively please purge runtime data either by running 'Purge APIs' or by running 'Purge Obsolete Workflow Runtime Data' concurrent request. For best performance, run WF_PURGE.TOTAL frequently, and WF_PURGE.TOTALPERM periodically, but be aware of site's policy on status history retention.

References [\[Top\]](#)

- Note [144806.1](#) Purging Workflow Runtime Tables
- Note [132254.1](#) Speeding up and Purging Workflow
- Note [139745.1](#) A System Administrators' Guide: Oracle Applications 11i Workflow
- Note [277124.1](#) FAQ on Purging Oracle Workflow Data
- Note [141853.1](#) Workflow Performance is Very Slow And Workflow Background Tables Are Large

- Recommendations
 - Example above points out need to purge
- References
 - Notes applicable to sections in this Diagnostic





Diagnostic Workflow Performance

| | | |
|--|-------------------------------------|--|
| Oracle Diagnostics Information | Parameters | Product Installation Status and Patchset Level |
| Key Profile Options | Workflow Item Types | Activity Statuses |
| Historical Activity Statuses | Notifications | Notification Mails * |
| Item Attribute Values | Miscellaneous | Recommendations |
| References | | |

- Key Profile Options
- Activity Statuses in conjunction with Historical Activity Statuses, Item Attribute Values, Notifications
- Miscellaneous
- Recommendations and References





Diagnostic Workflow Performance

Profile Options

| PO:Workflow Processing Mode | | | | | | | |
|-----------------------------|---------------------------|----------------|--------------------------------|---------------|------------|-------------------|------------|
| Long Name | Short Name | Level | Level Value | Profile Value | Profile Id | Updated Date | Updated By |
| PO:Workflow Processing Mode | PO_WORKFLOW_APPROVAL_MODE | Site | Site | ONLINE | 3012 | 08-DEC-1997 15:08 | FIN15 |
| PO:Workflow Processing Mode | PO_WORKFLOW_APPROVAL_MODE | Responsibility | Purchasing Rio de Janeiro (BR) | ONLINE | 3012 | 12-FEB-2003 14:30 | MOLIVEIRA |
| PO:Workflow Processing Mode | PO_WORKFLOW_APPROVAL_MODE | Responsibility | Purchasing Sao Paulo (BR) | ONLINE | 3012 | 12-FEB-2003 14:38 | MOLIVEIRA |
| PO:Workflow Processing Mode | PO_WORKFLOW_APPROVAL_MODE | Responsibility | Purchasing, Vision China | ONLINE | 3012 | 03-OCT-2003 03:02 | CHINA |

4 rows retrieved

- Shows values at all levels
- Shows other Profile Options not pictured





Diagnostic Workflow Performance

| Closed Item Types | | | | | | | | |
|-------------------|------------------|------------------|-------|--------------|----------------|----------|----------|--|
| Item Type | Persistence Type | Persistence Days | Count | Average Life | Deviation Life | Min Life | Max Life | Statement Suggestion |
| XDPWFSTD | PERM | | 5374 | 482.04 | 22.48 | 63.95 | 1102.79 | exec WF_PURGE.ITEMS ('XDPWFSTD',NULL,SYSDATE,FALSE); |
| XDPPROV | PERM | | 7 | 149.75 | 20.86 | 119.22 | 161.96 | exec WF_PURGE.ITEMS ('XDPPROV',NULL,SYSDATE,FALSE); |
| ENGCACT | PERM | | 2 | 656.05 | 0 | 656.05 | 656.05 | exec WF_PURGE.ITEMS ('ENGCACT',NULL,SYSDATE,FALSE); |
| GMSWF | PERM | | 2 | 218.88 | 12 | 210.39 | 227.36 | exec WF_PURGE.ITEMS ('GMSWF',NULL,SYSDATE,FALSE); |
| ADSCUSTM | PERM | | 1 | 0 | 0 | 0 | 0 | exec WF_PURGE.ITEMS ('ADSCUSTM',NULL,SYSDATE,FALSE); |
| ENGCSTEP | PERM | | 1 | 11.95 | 0 | 11.95 | 11.95 | exec WF_PURGE.ITEMS ('ENGCSTEP',NULL,SYSDATE,FALSE); |
| OKLAMPPT | PERM | | 1 | .01 | 0 | .01 | .01 | exec WF_PURGE.ITEMS ('OKLAMPPT',NULL,SYSDATE,FALSE); |
| CS_KB_W1 | SYNC | 0 | 40 | 0 | 0 | 0 | 0 | exec WF_PURGE.ITEMS ('CS_KB_W1',NULL,SYSDATE,FALSE); |
| CS_KB_WF | SYNC | 0 | 34 | 490.78 | 8.38 | 447.81 | 496.07 | exec WF_PURGE.ITEMS ('CS_KB_WF',NULL,SYSDATE,FALSE); |

- Closed Item Types
 - PERM won't show Persistence Days
 - Shows Count, Average Live, Min/Max Life





Diagnostic Workflow Performance

Activity Statuses [\[Top\]](#)

Closed

| Item Type | Count | Statement Suggestion |
|-----------|-------|---|
| OEOL | 21415 | exec WF_PURGE.ITEMS('OEOL',NULL,SYSDATE,FALSE); |
| XDPWFSTD | 16166 | exec WF_PURGE.ITEMS('XDPWFSTD',NULL,SYSDATE,FALSE); |
| WFERROR | 1888 | exec WF_PURGE.ITEMS('WFERROR',NULL,SYSDATE,FALSE); |
| OAM_BE | 1055 | exec WF_PURGE.ITEMS('OAM_BE',NULL,SYSDATE,FALSE); |
| REQAPPRV | 660 | exec WF_PURGE.ITEMS('REQAPPRV',NULL,SYSDATE,FALSE); |
| CNCOMPPR | 270 | exec WF_PURGE.ITEMS('CNCOMPPR',NULL,SYSDATE,FALSE); |
| CS_KB_WF | 244 | exec WF_PURGE.ITEMS('CS_KB_WF',NULL,SYSDATE,FALSE); |

- Activity Statuses – Closed
 - Correlates with Closed Item Types
 - Shows number of records that will be purged from WF_ITEM_ACTIVITY_STATUSES, _H





Diagnostic Workflow Performance

| Opened Item Types | | | | | | | |
|-------------------|------------------|------------------|-------|--------------|----------------|----------|----------|
| Item Type | Persistence Type | Persistence Days | Count | Average Life | Deviation Life | Min Life | Max Life |
| XDPPROV | PERM | | 39 | 2386.53 | 143.92 | 2225.02 | 2555.07 |
| OKLLPLBO | PERM | | 14 | 1788.89 | 116.76 | 1701.55 | 1966.93 |
| HRBISWF | PERM | | 9 | 1697.8 | 28.16 | 1622.74 | 1707.67 |
| STR_IBD2 | PERM | | 6 | 2703.73 | 71.83 | 2557.17 | 2735.2 |
| ADSSALAP | PERM | | 4 | 2290.39 | 95.98 | 2241.08 | 2434.33 |
| GMSWF | PERM | | 3 | 2610.18 | .13 | 2610.1 | 2610.33 |
| ENGC ACT | PERM | | 2 | 1700.64 | .78 | 1700.09 | 1701.19 |
| XDPWFSTD | PERM | | 2 | 155.26 | 58.88 | 113.63 | 196.9 |
| ENGCRT | PERM | | 1 | 1700.08 | 0 | 1700.08 | 1700.08 |
| ENGCSTEP | PERM | | 1 | 1688.13 | 0 | 1688.13 | 1688.13 |
| GHR_SF52 | PERM | | 1 | 2441.38 | 0 | 2441.38 | 2441.38 |
| IBEALERT | PERM | | 1 | 1688.24 | 0 | 1688.24 | 1688.24 |
| OKLAMERR | PERM | | 1 | 1702.2 | 0 | 1702.2 | 1702.2 |
| OKLCSCRM | PERM | | 1 | 1701.24 | 0 | 1701.24 | 1701.24 |
| SERVEREQ | PERM | | 1 | 1685.31 | 0 | 1685.31 | 1685.31 |
| CS_KB_WF | SYNC | 0 | 114 | 2013.53 | 97 | 1881.1 | 2234.31 |
| HRSSA | TEMP | 0 | 1138 | 2117.71 | 345.64 | 239.37 | 2995.35 |
| OEOL | TEMP | 0 | 339 | 1784.45 | 369.51 | 237.92 | 2843.17 |
| OEOL | TEMP | 0 | 336 | 1683.4 | 356.83 | 56.87 | 2842.44 |

- Open Item Types
 - Shows workflows that are either in error status (and ignored) or that may be abandoned
 - Shows Count, Min/Max Life





Diagnostic Workflow Performance

Opened

| Item Type | Count |
|-----------|-------|
| HRSSA | 5638 |
| OEOL | 4436 |
| OEOH | 3019 |
| REQAPPRV | 1448 |
| POWFRQAG | 1430 |

- Activity Statuses – Open
 - Correlates with Open Item Types
 - Shows number of records in WF_ITEM_ACTIVITY_STATUSES, _H due to open workflows



Diagnostic Workflow Performance

Miscellaneous [\[Top\]](#)

Statistic Statements

Statement Suggestion

```
EXEC DBMS_STATS.DELETE_TABLE_STATS(ownname=>'APPLSYS' , tabname=>'WF_ITEM_ACTIVITY_STATUSES');
EXEC FND_STATS.GATHER_TABLE_STATS(ownname=>'APPLSYS' , tabname=>'WF_ITEM_ACTIVITY_STATUSES' ,
percent=>10 , granularity=>'PARTITION' );
EXEC DBMS_STATS.DELETE_TABLE_STATS(ownname=>'APPLSYS' , tabname=>'WF_ITEM_ACTIVITY_STATUSES_H');
EXEC FND_STATS.GATHER_TABLE_STATS(ownname=>'APPLSYS' , tabname=>'WF_ITEM_ACTIVITY_STATUSES_H' ,
percent=>10 , granularity=>'PARTITION' );
EXEC DBMS_STATS.DELETE_TABLE_STATS(ownname=>'APPLSYS' , tabname=>'WF_ITEM_ATTRIBUTE_VALUES');
EXEC FND_STATS.GATHER_TABLE_STATS(ownname=>'APPLSYS' , tabname=>'WF_ITEM_ATTRIBUTE_VALUES' ,
percent=>10 , granularity=>'DEFAULT' );
EXEC DBMS_STATS.DELETE_TABLE_STATS(ownname=>'APPLSYS' , tabname=>'WF_ITEMS');
EXEC FND_STATS.GATHER_TABLE_STATS(ownname=>'APPLSYS' , tabname=>'WF_ITEMS' , percent=>10 ,
granularity=>'DEFAULT' );
EXEC DBMS_STATS.DELETE_TABLE_STATS(ownname=>'APPLSYS' , tabname=>'WF_NOTIFICATIONS');
EXEC FND_STATS.GATHER_TABLE_STATS(ownname=>'APPLSYS' , tabname=>'WF_NOTIFICATIONS' , percent=>10 ,
granularity=>'DEFAULT' );
EXEC DBMS_STATS.DELETE_TABLE_STATS(ownname=>'APPLSYS' , tabname=>'WF_NOTIFICATION_ATTRIBUTES');
EXEC FND_STATS.GATHER_TABLE_STATS(ownname=>'APPLSYS' , tabname=>'WF_NOTIFICATION_ATTRIBUTES' ,
percent=>10 , granularity=>'DEFAULT' );
```

- Miscellaneous – Statistic Statements
 - Stats don't reflect tables are partitioned, or proper percent and granularity



Diagnostic Workflow Performance

Histogram Statements

- Check/create a histogram for ACTIVITY_STATUS in WF_ITEM_ACTIVITY_STATUSES table

Statement Suggestion

```
begin
FND_STATS.LOAD_HISTOGRAM_COLS(
action=>'INSERT'
,appl_id=>0
,tablename=>'WF_ITEM_ACTIVITY_STATUSES'
,colname=>'ACTIVITY_STATUS'
);
FND_STATS.GATHER_TABLE_STATS(
ownname=>'APPLSYS'
,tablename=>'WF_ITEM_ACTIVITY_STATUSES'
);
end;
```

- Check/create a histogram for MAIL_STATUS and STATUS in WF_NOTIFICATIONS table

Statement Suggestion

```
begin
FND_STATS.LOAD_HISTOGRAM_COLS(
action=>'INSERT'
,appl_id=>0
,tablename=>'WF_NOTIFICATIONS'
,colname=>'MAIL_STATUS'
);
FND_STATS.LOAD_HISTOGRAM_COLS(
action=>'INSERT'
,appl_id=>0
,tablename=>'WF_NOTIFICATIONS'
,colname=>'STATUS'
);
FND_STATS.GATHER_TABLE_STATS(
ownname=>'APPLSYS'
,tablename=>'WF_NOTIFICATIONS'
);
end;
```

- Histogram Statements
 - Recommendations for large tables
 - WF_ITEM_ACTIVITY_STATUSES
 - WF_NOTIFICATIONS

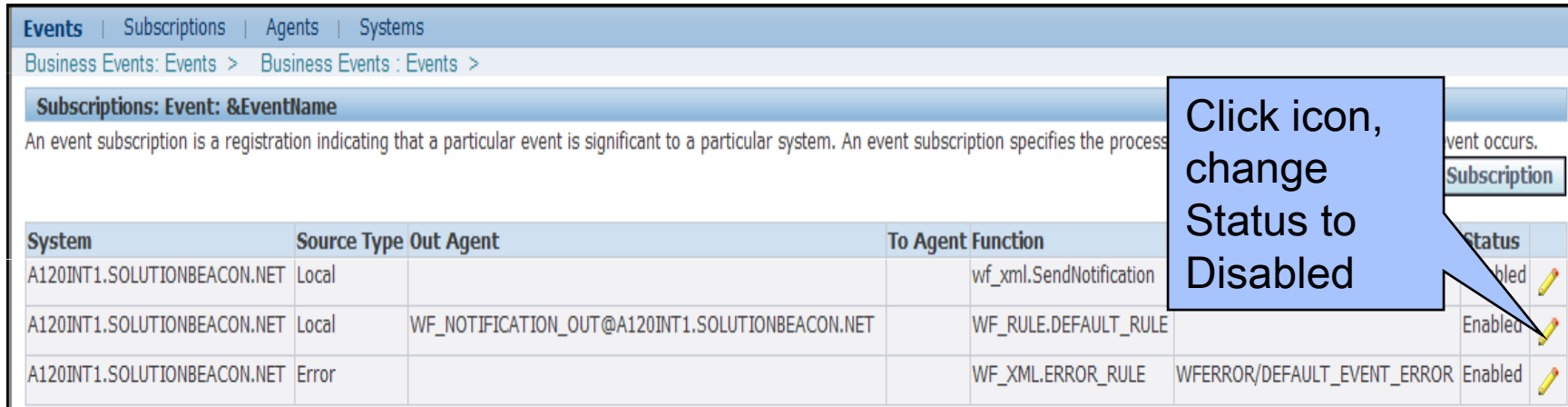


Diagnostic Workflow Performance

- Other Sections
 - Record counts for WF_NOTIFICATIONS, WF_ITEM_ATTRIBUTES
 - Doesn't break out by open/closed
 - Recommendations and References






Notification Mailer



Events | Subscriptions | Agents | Systems
Business Events: Events > Business Events : Events >

Subscriptions: Event: &EventName

An event subscription is a registration indicating that a particular event is significant to a particular system. An event subscription specifies the process that occurs when the event occurs.

| System | Source Type | Out Agent | To Agent Function | Status |
|-----------------------------|-------------|---|-------------------------|---|
| A120INT1.SOLUTIONBEACON.NET | Local | | wf_xml.SendNotification | Disabled  |
| A120INT1.SOLUTIONBEACON.NET | Local | WF_NOTIFICATION_OUT@A120INT1.SOLUTIONBEACON.NET | WF_RULE.DEFAULT_RULE | Enabled  |
| A120INT1.SOLUTIONBEACON.NET | Error | | WF_XML.ERROR_RULE | WFERROR/DEFAULT_EVENT_ERROR Enabled  |

- If global preference is 'Do Not Send Me Mail'
 - Use Framework Personalization to prohibit override using Preferences link
 - Ensure records in FND_USER_PREFERENCES updated to QUERY
 - Disable Local subscription to event
oracle.apps.wf.notification.send.group
- Remember Alert uses the workflow Mailer as of ATG_PF.H.delta.4



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
 - MetaLink Doc. ID: 463777.1
 - Create new Mailer
 - ATG_PF.H.delta.4 – set Correlation id = ALR%
 - ATG_PF.H.delta.5 – set Correlation id = ALR:%



Notification Mailer

| | |
|---|------------------------------|
| ID | 10006 |
| Status | ✓ Running |
| Name | Workflow Notification Mailer |
| * Container | Workflow Mailer Service |
| * Max Error Count | 10 |
| * Inbound Thread Count | 0 |
| * Outbound Thread Count | 1 |
| Log Level | Error |
| * Processor Read Wait Timeout | 10 |
| * Processor Min Loop Sleep | 5 |
| * Processor Max Loop Sleep | 60 |
| * Processor Error Loop Sleep | 60 |
| <input checked="" type="checkbox"/> Processor Close on Read Timeout | |

- Increase Inbound Polling Interval – Processor Min Loop Sleep (seconds) – ensure Processor Max Loop Sleep at least 5*Processor Min Loop Sleep
 - MetaLink Doc. ID: 315748.1

Notification Mailer

Edit Workflow Mailer: Details: a120int1

Cancel Back Step 2 of 8 Next

| | |
|---|------------------------------|
| ID | 10006 |
| Status | ✓ Running |
| Name | Workflow Notification Mailer |
| * Container | Workflow Mailer Service |
| * Max Error Count | 10 |
| * Inbound Thread Count | 0 |
| * Outbound Thread Count | 1 |
| Log Level | Error |
| * Processor Read Wait Timeout | 10 |
| * Processor Min Loop Sleep | 5 |
| * Processor Max Loop Sleep | 60 |
| * Processor Error Loop Sleep | 60 |
| <input checked="" type="checkbox"/> Processor Close on Read Timeout | |

- Processor Close on Read Timeout
 - Doc. ID: 315748.1 – unclick for performance
 - Doc. ID: 422870.1 – unless clicks, not removed from Process folder
 - Doc. ID: 332152.1 – must be clicked if running multiple mailers using same SMTP Server (Outbound Server Name) or will get contention and locking
 - Doc. ID: 437086.1 – must be clicked or messages get stuck in Inbox



Notification Mailer

- Mailer Log shows `java.lang.OutOfMemoryError`
 - MetaLink Doc. ID: 467516.1
 - 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"
 - MetaLink Doc. ID: 414376.1
 - For user assigned to Mailer
 - Must be workflow admin or have workflow admin responsibility
 - Profile Options to ensure Mailer session persists
 - ICX:Session Timeout 12000
 - ICX: Limit time 192
 - ICX: Limit connect 1000000
 - Bounce Mailer at least weekly
 - Can schedule events to perform this





Notification Mailer

Send

| | |
|----------------------------|---|
| * From | Workflow Mailer |
| * Reply-to Address | vis1200int1@solutionbeacon.net |
| * HTML Agent | http://vis1200int1.solutionbeacon.net:80/pls/a120int1 |
| * Message Formatter | oracle.apps.fnd.wf.mailer.NotificationFormatter |
| * Framework User | 0 |
| * Framework Responsibility | 20420 |
| * Framework Application ID | 1 |
| * Framework URL timeout | 120 |

Attach images to outbound emails
 Attach stylesheet to outbound email
 Autoclose FYI
 Direct response
 Reset NLS
 Inline Attachments
 Send warning for unsolicited e-mail
 Send e-mails for canceled notifications

0 is SYSADMIN

- "You Have Insufficient Privileges" (cont)
 - Framework URL timeout = 120
 - See "Care and Feeding of Workflow – What's New" for detailed explanation





Notification Mailer

- Tag Files
 - Out of Office – set to Ignore
 - Prior to ATG_PF.H.delta.5, Delivery Status Notification, set to Ignore (MetaLink Doc. ID: 388709.1, 431359.1)
- Uncheck Mailer parameter 'Send e-mails for canceled notifications'
- ATG_PF.H.delta.3
 - Uncheck Mailer parameter 'Send warning for unsolicited e-mail'





Advanced Queuing Performance

- MetaLink Doc. ID: 271855.1 – Procedure to manually coalesce all the IOTs/indexes associated with Advanced Queuing tables to maintain Enqueue/Dequeue performance and reduce QMON resource usage
- MetaLink Doc. ID: 284692.1 – How to Reduce the Highwater Mark for Advanced Queuing objects using truncate in pre –10g databases
- MetaLink Doc. ID: 285692.1 – How To Rebuild Queue Tables via Export/Import for pre–10g Databases





Control Queue Statistics Programs

- Control Queue
 - Run 'Control Queue Cleanup' every 12 hours
 - MetaLink Doc. ID 469045.1
 - Discussion of this queue
 - Scripts to run to ensure subscribers are valid and dead subscribers are removed properly
- Workflow Statistics Concurrent Programs
 - Agent Activity, Mailer, Work Items
 - Run Once/Day just before Admin starts work
 - Admin must remember to refresh queries





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 MetaLink Doc. ID: 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
 - MetaLink Doc. ID: 301171.1 – "Toolkit for dynamic marking of Library Cache objects as Kept (PIND)"
 - Requires large SGA and memory



Miscellaneous Parameters

- Init.ora
 - job_queue_processes s/b 10
 - Oracle seeds this value to 2
 - aq_tm_processes s/b 1 or higher
 - If = 0, and database 9i, background engine fails

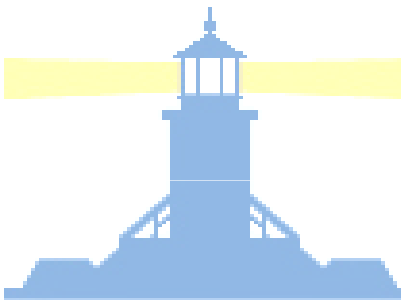




Partition Tables

- 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)





Partition Tables – 11/

- MetaLink Doc. ID: 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>
<ult_dir_location>
- Script only has to be performed once
- Uses DDL operations running in nologging mode
 - rollback not possible
 - Failure requires restore of tables





Run 64-bit Database

- Memory is critical, 32-bit can't address enough
- Intelligent pinning – WF_ packages
- 10.2.0.[3,4] database is recommended
 - Now 11g is certified
- If running 9.2.0.[5,6,7], apply patch 4519477
- If running 11.5.9 w/o ATF_PF.H, apply patch 3940679





Wffngen.sql

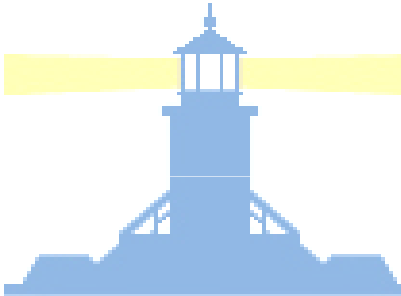
- Translates activity function calls into static calls
 - According to Oracle, 25% increase in performance
- Look for variable itemTypeList_t
 - Seeded := itemTypeList_t ('WFSTD','FNDFFWF')
 - Add following item types (after configuration complete)
 - WFERROR, POERROR, OMERROR
 - Other workflows with 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

- MetaLink Doc. IDs
 - 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





Oracle Recommendations I Disagree With

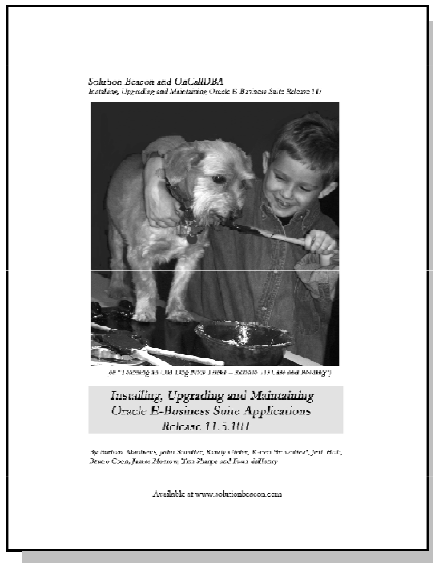
- Given at talk at Open World
- Disable retention on Workflow Queues
 - WF_DEFERRED
 - WF_NOTIFICATION_IN
 - WF_NOTIFICATION_OUT
 - WF_JAVA_DEFERRED
 - Hinders Ability to Troubleshoot, Performance Tune
 - Contradicts MetaLink Doc. ID: 468850.1
 - Retention Set to 1 Day (86400 Seconds)
- If using WF_REPLAY_IN/OUT and WF_IN/OUT, reduce retention from 1 Week (604800 Seconds) to 1 Day



Available at
www.solutionbeacon.com

Got Oracle? Get the Books!

Order or Reserve Your Copy Today!

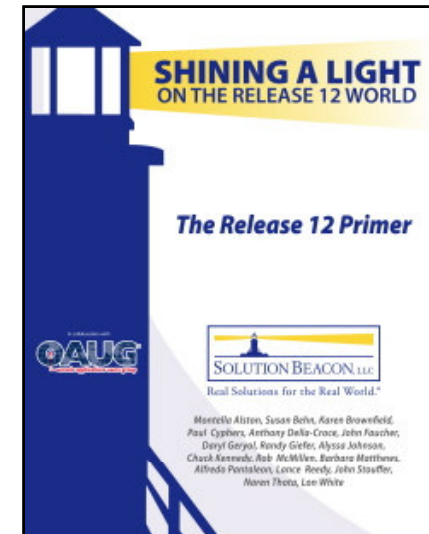


Installing, Upgrading and
Maintaining Oracle E-Business
Suite Applications 11.5.10.2+



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

Copyright 2008 Solution Beacon, LLC All Rights Reserved Any other commercial
product names herein are trademark, registered trademarks or service marks of
their respective owners.



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





Questions and Answers

Thank You!

Karen Brownfield

kbrownfield@solutionbeacon.com

www.solutionbeacon.com

Real Solutions for the Real World®



Copyright 2008 Solution Beacon, LLC All Rights Reserved Any other commercial product names herein are trademark, registered trademarks or service marks of their respective owners.

