About the Speaker

- Oracle Ace
- Oracle Certified Specialist (EBS and Fusion)
- Over 20 years E-Business Suite support
- Member ATG Customer Advisory Board
- Co-Chair Oracle EBS User Management SIG
- Over 100 presentations worldwide
- Co-author multiple books on E-Business Suite
- Visit us at booth 933
- Established in 2001
- SBA 8(a) Small Business disadvantaged company
- GSA Schedule contract GS-35F-0680V
- Texas State HUB vendor
- For more information, check out our web site at www.Infosemantics.com
  - R12.1.3, R12.2, OBIEE public vision instances
  - Posted presentations on functional and technical topics
Agenda

- Audience Profile and Introduction
- Purge
  - The Process
  - Affect on Workflow Tables
  - Issues
  - My Oracle Support Notes
Audience Profile
Introduction
Audience Profile

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

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

- **EBS Version**
  - Release 11i10
  - Release 12.0.6
  - Release 12.1.n
  - Release 12.2

- **Not EBS**
Workflow Analyzer

- 1369938.1 “Workflow Analyzer script for E-Business Suite Workflow Monitoring and Maintenance [Video]”
  - Better than R12 Workflow Health Check Diagnostic or 11i Workflow Status and Purgeable Items or Workflow Performance
  - SQL Script – Updated frequently
  - Run as concurrent request – note 1425053.1
  - FAQ – note 1452224.1
  - Focuses on Administration and Performance
  - https://blogs.oracle.com/oracleworkflow/entry/e_business_suite_proactive_support
This Workflow Analyzer script (Note 1169938.1) reviews the current Workflow Footprint, analyzes runtime tables, profiles, settings, and configurations for the overall workflow environment, providing helpful feedback and recommendations on Workflow Best Practices for any areas for concern on this instance (A1211NT1).

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- HRMS - HRMS Human Resources
- PO - Purchasing
- INV - Inventory (coming soon)
- PA - Payables (coming soon)

References
Workflow Community

- Go to the Oracle Support Community tab
- Enter “Workflow” to go to the workflow sub-space
Workflow Community

- Sign up for email notifications
Process – It’s Repetitive

- Patch Current
- Run Workflow
  - Run Workflow Statistics programs first so counts will be accurate
- Clean Up Old / Errored Workflows
  - See “Workflow Troubleshooting in R12”
- Purge
- Verify tables have not exceeded recommended % empty
- Run Gather Schema Stats
- Repeat from Top (check periodically for new patches)
Purge
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
  ▪ Oracle recommends nightly
■ 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 w/ value set to N
  ▪ Commit Frequency – leave at default – 500 (that’s 500 workflows, not 500 records)
  ▪ Signed Notifications – Customer Choice
  ▪ (R12.2) Other Cached Data
Purge – What Happens

- Aborts WFERROR where PARENT_ITEM_TYPE matches Item Type parameter and where linked activity (PARENTCONTEXT) no longer in error status
  - But not POERROR, OMERROR or other error types
  - Remember… set “Attempt to Close” = Y in the ”Purge Order Management Workflows” concurrent program to try to close OMERROR/WFERROR

- 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

■ (R12.2) Other Cached Data = Y
  ▪ Purges records from WF_ATTRIBUTE_CACHE
    — When user record is created/updated, stores 16+ records of data about the user (name, email, mailer preference, description, etc)
      — Does not store old/new values
      — If table purged, does not rebuild when user signs in
    — If using OID, contains record when OID sync event is raised (MOS note 380487.1)
    — Used as intermediate table for LDAP sync (MOS note 150832.1)
  ▪ MOS note 846989.1 “How to Purge the Wf_attribute_cache table?” recommends periodically removing obsoleted data but doesn’t define “obsolete”

■ Hint: To purge just WF_ATTRIBUTE_CACHE, use item_type System: Mailer (as will never be in runtime history)
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 (orphaned)
    - 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
Orphaned Notifications (From Workflow Analyzer)

- Run purge with “Core Workflow Only” = N will get rid of expired notifications

<table>
<thead>
<tr>
<th>MESSAGE TYPE</th>
<th>MESSAGE NAME</th>
<th>COUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>IRC_NTF</td>
<td>IRC_MESSAGE</td>
<td>183</td>
</tr>
<tr>
<td>PONAUCT</td>
<td>NEGOTIATION.Closed.early</td>
<td>20</td>
</tr>
<tr>
<td>HRWPM</td>
<td>HR_WPM_GENERIC_NTF.MSG</td>
<td>15</td>
</tr>
<tr>
<td>SERVEREQ</td>
<td>CS_SR_NTFY_OWNER_UPDATE_FAILED</td>
<td>15</td>
</tr>
<tr>
<td>OAM_BE</td>
<td>EX_MSG_ERROR</td>
<td>10</td>
</tr>
<tr>
<td>CS_MSGS</td>
<td>FYI_MESSAGE</td>
<td>7</td>
</tr>
<tr>
<td>EDRPSIGF</td>
<td>PSIG_EREC_MESSAGE.BLAf</td>
<td>5</td>
</tr>
<tr>
<td>CS_MSGS</td>
<td>ACTION_REQUEST_MSG</td>
<td>4</td>
</tr>
<tr>
<td>POAPPRV</td>
<td>PO_SUPPLIER_SIGNATURE</td>
<td>3</td>
</tr>
<tr>
<td>FNDCMMSG</td>
<td>SIMPLE_REQ_COMPLETION</td>
<td>1</td>
</tr>
<tr>
<td>FNDCMMSG</td>
<td>REQ_COMPLETION_W_URL</td>
<td>1</td>
</tr>
<tr>
<td>WFMAIL</td>
<td>USER_PREF_UPDATE_REPORT</td>
<td>1</td>
</tr>
</tbody>
</table>

From Finished Concurrent Requests
Catch Up Purging – Be Careful!

- Purge by Item Type or Age to reduce time of each run
  - Commit keeps rollback from being an issue
- Run with “Core Workflow Only” = Y
- After catching up, run one more time with “Core Workflow Only” = N to purge old design data and orphaned notifications
  - Then only need “N” once/week (orphan notifications)
- While 10g, 11g automatically reset high water marks, export/import may still be recommended
Rebuild or Not To Rebuild Workflow Tables

Starting Point

After “Catch-up” Purge

More Activity Regular Purges

More Activity Regular Purges

After “Catch-up” Purge Export/Import

More Activity Regular Purges

More Activity Regular Purges
Rebuild or Not – Workflow Analyzer

**Workflow Footprint**

![Workflow Footprint Diagram](image)

<table>
<thead>
<tr>
<th>Workflow Table Name</th>
<th>Logical Table Size</th>
<th>Physical Table Data</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>WF_COMMENTS</td>
<td>57</td>
<td>44</td>
<td>13</td>
</tr>
<tr>
<td>WF_DIGSIGS</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>WF_ITEMS</td>
<td>15</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>WF_ITEM_ACTIVITY_STATUSES</td>
<td>146</td>
<td>60</td>
<td>85</td>
</tr>
<tr>
<td>WF_ITEM_ACTIVITY_STATUSES_H</td>
<td>889</td>
<td>830</td>
<td>59</td>
</tr>
<tr>
<td>WF_ITEM_ATTRIBUTE_VALUES</td>
<td>780</td>
<td>500</td>
<td>280</td>
</tr>
<tr>
<td>WF_NOTIFICATIONS</td>
<td>122</td>
<td>107</td>
<td>15</td>
</tr>
</tbody>
</table>

**Volume of Workflow Runtime Data Tables (in MegaBytes)**

*Attention*

The Workflow Runtime Tables logical space which is used for all full-table scans is only at 23% greater than the physical or actual tablespace being used. It is recommended at levels above 30% to re-size these tables to maintain or reset the table High Water Mark for optimum performance. Please have a DBA monitor these tables going forward to ensure they are being maintained at optimal levels.

Please review [Note 588571.1](#) - How to Reorganize Workflow Tables, on how to manage workflow runtime tablespaces for optimal performance.
Rebuild or Not – Workflow Analyzer

Workflow Footprint

Volume of Workflow Runtime Data Tables (In Megabytes)

<table>
<thead>
<tr>
<th>Workflow Table Name</th>
<th>Logical Table Size</th>
<th>Physical Table Data</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>WF_COMMENTS</td>
<td>29</td>
<td>1</td>
<td>28</td>
</tr>
<tr>
<td>WF_DKG_SIGS</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>WF_ITEMS</td>
<td>15</td>
<td>1</td>
<td>15</td>
</tr>
<tr>
<td>WF_ITEM_ACTIVITY_STATUSES</td>
<td>150</td>
<td>11</td>
<td>139</td>
</tr>
<tr>
<td>WF_ITEM_ACTIVITY_STATUSES_H</td>
<td>48</td>
<td>35</td>
<td>13</td>
</tr>
<tr>
<td>WF_ITEM_ATTRIBUTE_VALUES</td>
<td>750</td>
<td>55</td>
<td>725</td>
</tr>
<tr>
<td>WF_NOTIFICATIONS</td>
<td>52</td>
<td>1</td>
<td>50</td>
</tr>
<tr>
<td><strong>TOTALS</strong></td>
<td>1074</td>
<td>104</td>
<td>970</td>
</tr>
</tbody>
</table>

Warning:
The Workflow Runtime Tables logical space which is used for all full-table scans is 30% greater than the physical or actual tablespace being used. It is recommended to have a DBA resize these tables to reset the HighWater Mark. There are several ways to coalesce, drop, recreate these workflow runtime tables.

Please review [Note 388672.1](#) - How to Reorganize Workflow Tables, for more details on ways to do this.
Purge Issues
Synchronous Persistence Type

- Synchronous is not a choice for Persistence Type
- Lookup code, Persistence Type, is Access Level System (i.e. can’t add codes)

Solution

- Help | Diagnostics | Examine
  - Field: CUSTOMIZATION_LEVEL
  - Value: E

- Add Lookup Code for Sync

<table>
<thead>
<tr>
<th>SYNC</th>
<th>Synchronous</th>
<th>Synchronous Item Status</th>
<th>26-JUL-1999</th>
</tr>
</thead>
</table>

- Restore CUSTOMIZATION_LEVEL to S
Purge Issues Completed With Errors

- ‘Completed with Errors’ – end date is set in WF_ITEMS but at least one activity exists in WF_ACTIVITY_STATUSES with status of ERROR or ACTIVE
  - Can’t abort, can’t purge, and if linked to parent or child, parent or child cannot be purged

```
SELECT COUNT(*), item_type, item_type_display_name,
activity_display_name, activity_status_code
,MIN (TRUNC (item_begin_date)) Earliest_begin_date
,MAX (TRUNC (item_begin_date)) Most_Recent_begin_date
FROM apps.wf_item_activity_statuses_v
WHERE item_end_date is not null
AND activity_status_code in ('ACTIVE', 'ERROR')
GROUP BY item_type, item_type_display_name,
activity_display_name, activity_status_code
ORDER BY 7 DESC, 1, 2;
```

Same workflow Each Error has at least 1 Active
Purge Issues
Completed With Errors

- Modified version of $FND_TOP/sql/wfrmtype.sql

```sql
PROMPT
PROMPT Enter NUMBER OF days OF OPEN history TO KEEP
ACCEPT nopens prompt "Enter number of days of open history to keep."

ACCEPT TYPE prompt "Enter internal workflow name to purge Completed with Error."

IF &TYPE = 'WFEERROR'
   THEN
   UPDATE wf_items
      SET parent_item_type = '',
          parent_item_key = '',
      WHERE item_type = '&TYPE'
      AND item_key IN (
         SELECT item_key
            FROM wt_item_activity_statuses_v asv
            WHERE asv.item_type = '&TYPE'
            AND asv.item_end_date is not null
            AND asv.activity_status_code = 'ERROR');
```
Purge Issues
Completed With Errors

UPDATE `wf_item_activity_statuses`
SET `end_date` = SYSDATE-&NODAYS-1
,`activity_status` = 'COMPLETE'
,`activity_result_code` = '#FORCE'
WHERE `item_type` = '&type'
AND (`end_date` IS NULL
OR `activity_status` <> 'COMPLETE')
AND `item_key` IN (
    SELECT `item_key`
    FROM `wf_item_activity_statuses_v` `asv`
    WHERE `asv.item_type` = '&type'
    AND `asv.item_end_date` IS NOT NULL
    AND `asv.activity_status_code` = 'ERROR'
)

UPDATE `wf_notifications`
SET `end_date` = SYSDATE-&NODAYS-1
,`status` = 'CANCELED'
WHERE `end_date` IS NULL
AND `GROUP_ID` IN (
    SELECT `notification_id`
    FROM `wf_item_activity_statuses`
    WHERE `item_type` = '&type'
    AND `item_key` IN (
        SELECT `item_key`
        FROM `wf_item_activity_statuses_v` `asv`
        WHERE `asv.item_type` = '&type'
        AND `asv.item_end_date` IS NOT NULL
        AND `asv.activity_status_code` = 'ERROR'
    )
)

UPDATE `wf_item_activity_statuses_h`
SET `end_date` = SYSDATE-&NODAYS-1
,`activity_status` = 'COMPLETE'
,`activity_result_code` = '#FORCE'
WHERE `item_type` = '&type'
AND (`end_date` IS NULL
OR `activity_status` <> 'COMPLETE')
AND `item_key` IN (
    SELECT `item_key`
    FROM `wf_item_activity_statuses_v` `asv`
    WHERE `asv.item_type` = '&type'
    AND `asv.item_end_date` IS NOT NULL
    AND `asv.activity_status_code` = 'ERROR'
)

UPDATE `wf_notifications`
SET `end_date` = SYSDATE-&NODAYS-1
,`status` = 'CANCELED'
WHERE `end_date` IS NULL
AND `GROUP_ID` IN (
    SELECT `notification_id`
    FROM `wf_item_activity_statuses_h`
    WHERE `item_type` = '&type'
    AND `item_key` IN (
        SELECT `item_key`
        FROM `wf_item_activity_statuses_v` `asv`
        WHERE `asv.item_type` = '&type'
        AND `asv.item_end_date` IS NOT NULL
        AND `asv.activity_status_code` = 'ERROR'
    )
)

COMMIT;
BEGIN
    `vf_purge.total`('&type', NULL, SYSDATE-&NODAYS);
END;
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”
- 144806.1 “A Detailed Approach to Purging Oracle Workflow Runtime Data”
- 277124.1 “FAQ on Purging Oracle Workflow Data”
- 787228.1 “Cannot Abort Old Open Items in Workflow Manager Because Errored Items are not Returned”

Note: Most referenced patches already in 11i.10 and R12
Purge – MOS Notes for Parent/Child problems

752383.1 “Purge Obsolete Workflow Runtime Data Concurrent Request (FNDWFPR) Is Not Purging Data”

```sql
SELECT c.item_type child,
       DECODE (c.end_date, NULL, 'OPEN', 'CLOSED') child_status,
       c.parent_item_type parent,
       DECODE (c.parent_item_type, NULL, 'NOPARENT',
               DECODE (p.end_date, NULL, 'OPEN',
                       'CLOSED')) parent_status,
       COUNT (*)
FROM wf_items p, wf_items c
WHERE p.item_type(+)= c.parent_item_type
     AND p.item_key(+)= c.parent_item_key
GROUP BY c.item_type, DECODE(c.end_date, NULL, 'OPEN', 'CLOSED'),
       c.parent_item_type,
       DECODE (c.parent_item_type, NULL, 'NOPARENT',
               DECODE (p.end_date, NULL, 'OPEN', 'CLOSED'))
ORDER BY c.item_type, c.parent_item_type;
```

### Business Event Errors

<table>
<thead>
<tr>
<th>Child</th>
<th>Child Status</th>
<th>Parent</th>
<th>Parent Status</th>
<th>Count(*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WFEERROR</td>
<td>CLOSED</td>
<td>REQAPPRV</td>
<td>OPEN</td>
<td>1550</td>
</tr>
<tr>
<td>WFEERROR</td>
<td>OPEN</td>
<td>REQAPPRV</td>
<td>OPEN</td>
<td>10</td>
</tr>
<tr>
<td>WFEERROR</td>
<td>CLOSED</td>
<td>SERVEREQ</td>
<td>OPEN</td>
<td>45</td>
</tr>
<tr>
<td>WFEERROR</td>
<td>CLOSED</td>
<td>WIPISHFW</td>
<td>OPEN</td>
<td>1</td>
</tr>
<tr>
<td>WFEERROR</td>
<td>OPEN</td>
<td>NOPARENT</td>
<td>113873</td>
<td></td>
</tr>
<tr>
<td>WIPISHFW</td>
<td>OPEN</td>
<td>NOPARENT</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>WSHDEL</td>
<td>OPEN</td>
<td>NOPARENT</td>
<td>277</td>
<td></td>
</tr>
</tbody>
</table>

**Business Event Errors**
Purge – MOS Notes for Parent/Child Problems

- 1378954.1 “bde_wf_process_tree.sql – For analyzing the Root, Children, Grandchildren Associations of a Single Workflow”
Purge – MOS Notes Specific to Products

Order Management

- 751026.1 “FNDWFPR – Purge Obsolete Workflow Runtime Data – OEOH / OEOL Performance Issues”
  - Scripts to help close attached children
- 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”
- 878032.1 “How To Use Concurrent Program “Purge Order Management Workflow””
  - 11i.10 – Patch 9845873
  - 12.1.2+ – included (not available for 12.0.x)
  - Purges closed lines even when header still open
  - “Attempt to Close” – purges OMERROR / WFERROR that are orphan or attached to no-longer-error nodes
Purge – MOS Notes Specific to Products

- Purchasing
  - 45886.1 “How To Diagnose Issues Related To Purge Of Purchasing Workflow Data That Remain Even After Running The ‘Purge Obsolete Workflow Runtime Data’ Concurrent Program?”
  - Scripts to help close attached children
Product Specific Help – Workflow Analyzer

HR added v4.09, PO v5.01
Inv, AP Coming soon
Thank you!!

Karen.Brownfield@Infosemantics.com
Please complete the session evaluation (#15318)
We appreciate your feedback and insight

You may complete the session evaluation either on paper or online via the mobile app