



COLLABORATE17
TECHNOLOGY AND APPLICATIONS FORUM
FOR THE ORACLE COMMUNITY

Upgrading to 12.2.5

A Case Study

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<IOUG> OAUG Quest

#C17LV

Who Am I?

Over 22 years experience with Oracle Database

Over 18 years experience with E-Business Suite

Chair, OAUG Database SIG

Co-Founder AppsPerf

Oracle ACE



OAUG Member of the Year 2013

Applications DBA, BlueStar



Agenda

- Overall Approach
- Technical Upgrade
- Moving from Discoverer to a custom solution in Applications Express
- Moving custom applications from the EBS iAS



Overall Approach

Overall Approach

- BlueStar is an international distributor
 - Part numbers dictated by the manufacturer
 - Manufacturer Rebates
 - Retailer/Manufacturer price levels
 - Regularly need to match purchasing/receiving with orders/shipping
 - Extensive use of spreadsheets
 - NLS: French Canadian and Latin American Spanish
- BlueStar using an off-shore group for most development and functional support
 - Most IT employees in Hebron, KY
 - DBAs are remote
- 11.5.10.2 decisions
 - Heavily customized – did not follow best practices
 - All reports in Discoverer
- R12.2 was to maintain functionality
- GOAL: development was to conform to best practices
- GOAL: Eliminate Discoverer

Overall Approach

- Needed a tool to track code migrations, configurations, custom objects, and testing
 - ConfigSnapshot
 - Panaya
 - Our choice
 - Decided fixing customizations and test tracking were our major issues
 - Has been a great choice for use in our project
- Needed a way to track issues and upgrade plan between employees in Kentucky, North Carolina, Florida, and Canada as well as our off-shore resources in India.
 - Using Google Sheets
- 11.5.10.2 environment is 32-bit Oracle Linux 5 applications tier (4 nodes), 64-bit Oracle Linux 5 Database tier
- 12.2.5 is 64-bit Oracle Linux 7 applications tier, 64-bit Oracle Linux 6 Database tier

Overall Approach

- Go-live was scheduled to start after shipping Dec 30, 2016 and to be completed before start of business on Jan 3, 2017 (roughly 80 hours).
 - The business postponed the go-live at the last minute because of some new contracts starting in January 2017.
 - Go-live rescheduled for July.
 - Decision was made to carry forward with some of our changes now
 - Replaced Discoverer
 - Replacing how we load spreadsheets
 - Released 11i Code Freeze



Technical Upgrade

General Upgrade Concepts

- Read the documentation
 - 12.2 is a new starting point for the technical team
- Have an upgrade notebook
 - Many Oracle documents are live, keep copies
 - MOS Notes
 - Documentation
 - All decisions
 - Who and Why
 - Every Issue in every pass through the upgrade
 - Timing information on each step

High Level Upgrade Steps

- Current environment EBS 11.5.10.2, DB 11.2.0.4
- Before the upgrade
 - Go through the functional pre-upgrade steps
 - **Preparing for the Upgrade** chapter in *Oracle E-Business Suite Upgrade Guide: Release 11i to 12.2*
 - Ensure all code changes in 11i are also made in R12.2
- Prestage the 12.2 apps tier, including apps tier ETCC identified patches
- Downtime
 - Final pass through pre-upgrade steps
 - Database patches
 - Preupgrade patches in 12.2
 - Upgrade to 12.2.0
 - Convert to online patching
 - Apply 12.2.5
 - Sign the JAR files
 - Apply post upgrade patches and migrate custom code
 - Complete post upgrade functional steps

Technical Upgrade

- Once the downtime starts
 - BlueStar has over 150 steps in the upgrade script
 - Database
 - Apply outstanding database patches
 - Business decision: time in downtime v. cost of full 11i regression test if patches are installed preupgrade
 - Switch to 12.2 init.ora parameters
 - Size for the upgrade (job_queue_processes and parallel_max_servers maxed for hardware)
 - Changes to UTL_FILE_DIR
 - APPLPTMP on apps tier must point to a location on the app tier that can be accessed using the same path from the database tier via UTL_FILE.
 - 11i apps were NFS mounted from database server
 - We chose to change the in R12.2
 - Disable custom triggers
 - Add required datafile space

Technical Upgrade

- Apps Tier
 - Initially like any other patch
 - Enable Maintenance Mode
 - AD must switch to R12
 - Run adgrants.sql on the database server
 - Merge the ad patches (make sure you remember –admode)
- Apply pre-install patches
 - MOS Note 1448102.1
 - Includes a wget.sh script to download the patches

Technical Upgrade

Pre-install patches for R12.2 upgrade

This report has been generated on: Tue Feb 21 02:16:21 2017

Reference: Please see MOS note: [1448102.1](#)

Product Family:

E-Business Suite Release 12.2 Consolidated Update Pack 7 (CUP7) is now available as patch 22742071:12.2.0. Apply 12.2.0 CUP7 during the upgrade.

IBY	-	1	-	-	1
OKL	11	-	1	-	12
XLA	-	-	2	-	2
ZX	-	-	-	1	1
TOTAL	11	1	4	1	17

PRC	Upgrade script failure	Data corruption	Performance issue	Upgrade integrity fix	TOTAL
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No Pre-Install Fixes Found

BIS	Upgrade script failure	Data corruption	Performance issue	Upgrade integrity fix	TOTAL
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Following preinstall patches are required on top of 12.2.0 CUP7

NOTE: New patches compared to the prior version of the report are displayed with a different background color.

Upgrade script failure - EBS

SL.NO	PRODUCT	PATCH	RELEASED DATE	PATCH ABSTRACT
01	OKL	23732886	2016-07-08	KLE_ID MUST BE DECLARED IN OKLVARAST.SQL WHEN APPLYING 23338200 VIA 10124646
02	EGO	23639024	2016-07-19	After applying this patch, replace EGOEXTUPG.sql hard code apps schema name
03	OKL	23556242	2016-09-12	OKLRINV.ODF FAILED DURING PATCH

Technical Upgrade

- Merge the preinstall patches with the 12.2.0 driver
 - `cd $AU_TOP/patch/115/drv`
 - `admrgpch -d . -preinstall -master u10124646.drv`
- Apply fixes for known issues
- VNC
 - `adpatch options=nocopyportion,nogenerateportion`
 - `u_merged.drv`
 - List of known issues and fixes in notebook
 - For example
 - About 3.5 hours into the upgrade, `pycofuna.ldt` fails
 - MOS Note 1615918.1 says to skip if not using payroll
- Disable Maintenance Mode
- Migrate autoconfig to the database tier

Technical Upgrade

- In VNC, run rapidwiz to configure the apps tier
 - About 1 time in 3, no domains are configured
 - \$FMW_HOME/webtier/instances or is empty
 - MOS Note 1953456.1
 - cd \$FND_TOP/patch/115/bin
 - perl txkEBSDomainConfig.pl
- Enable Custom Triggers
- Enable Online Patching
- Apply AD/TXK Delta 8
 - Run checkMTpatch.sh from ETCC to store the results in the database
 - Migrate autoconfig to database tier

Technical Upgrade

- Apply 12.2.5 (19676458) in downtime mode
 - adop phase=apply apply_mode=downtime patches=19676458
- Sign the JAR files
- Start the apps tier
- Complete patching cycle by running cleanup
 - adop phase=cleanup
- Update the current snapshot using adadmin
- Switch to Framework Simplified home page
- Setup Corporate Branding to use BlueStar logo
- Deregister and adsplice custom schema

Technical Upgrade

- Apply the rest of the 12.2/12.2.5 post upgrade patches
- Update the snapshot
- Get and apply the NLS synchronization patches
 - All further patches require all languages
- Complete the patch cycle
- Migrate the customizations
 - For BlueStar this includes
 - Changes to 11i customizations
 - Fixes to R12 issues
 - Move applications installed in 11i iAS to Glassfish
- Apply some additional patches that were not included before the NLS generation
- Turn over to the functional team to complete post upgrade setups

Technical Upgrade

- Complete Historical Data Upgrade
- Set up for cloning
 - adpreclone.pl
- Take full backup
- Clone from backup to create support, DEV and TEST instances
 - Keep one R12 instance from previous upgrade cycle for a couple of weeks



Replacing Discoverer

Oracle Applications Express

- Using Oracle Applications Express 5.1, ORDS, and Glassfish Community Server
- Discoverer used Oracle Applications login
- 12.2 has hooks to allow a similar capability in Oracle Applications Express (Apex)
- Decided to use EBS user authentication, but not responsibilities since hooks do not exist between Apex and 11i
- Use an application alias and a URL forward to access
 - <http://ebsrpt.bluestarinc.com> =>
http://pdbdb1.bluestarinc.com:8080/ebs/f?p=EBS_REPORTS_11i
 - After upgrade is live, will change to EBS_REPORTS_R12

Authentication

- Create a custom function under apps to validate logins
 - This will just call `fnd_user_pkg.validatelogin`
 - The `fnd_user_pkg` contains operations that you do not want to release to another schema, by writing a wrapper function we can just grant execute on the specific features that are required.
- At BlueStar we set the organization at the responsibility level
 - In Discoverer, this was used to set the org for a report
 - In the Reporting app, we decided to allow the user to select from a list of allowed orgs (or in some cases to select all allowed orgs).
 - We did this by taking the userid and finding the list of allowed orgs

Authorization

- In Apex, you can restrict access to menu items, pages, and even objects on pages based up Authorization rules.
 - As we took the reports from Discoverer, we broke them down by the users that had access into job categories
 - Sales
 - Purchasing
 - Marketing
 - Etc
 - We further added levels to these since there are reports that are appropriate for managers but not a sales person.
 - Users that have access to define access in the EBS also have the ability to assign EBS responsibilities to the report authorization levels

Home Page

BlueStar EBS ReportsHomeLogout

Home Reports Administration

Home

E-Business Suite Reports

Sales

Sales MTD	Daily Sales
Sales MTD	Daily Sales

Menus

BlueStar EBS Reports

Home Reports Administration


- Sales Reports
 - 2008 Master Salesout share
 - 2008 Master Salesout share BMX Corp.Rate
 - 2008 Master Salesout share with PO
 - 2013 Master Salesout CAN
 - B - Customer Contact info
- Marketing Reports
- Receivables Reports
- Purchasing Reports
- GL Reports


Example Report

BlueStar EBS ReportsHomeLogout

Home**Reports**Administration

Report Parameters

Beginning Invoice Date
 

Ending Invoice Date
 

Operating Unit

- ☐ BlueStar US
- ☐ Bluestar Canada
- ☐ Bluestar Latin America
- ☐ Bluestar Mexico

2008 Master Salesout share

Example Report

BlueStar EBS ReportsHomeLogout

HomeReportsAdministration

Report Parameters

Beginning Invoice Date
17-JAN-2011

Ending Invoice Date
20-JAN-2011

Operating Unit
☒ BlueStar US
☐ Bluestar Canada
☐ Bluestar Latin America
☐ Bluestar Mexico

Clear Run

2008 Master Salesout share

GoActionsExport to Excel

Operating Unit Name	OE Line Source Type	Corp Rate	Sales Rate	Invoice Currency Code	Organization Code	Invoice Number	Invoice Date	Territory Name	Salesrep Name	Account Number	Cust Name	Price Level	Order Number
---------------------	---------------------	-----------	------------	-----------------------	-------------------	----------------	--------------	----------------	---------------	----------------	-----------	-------------	--------------

Export to Excel

- Built in download produces a csv
 - Does not work well for BlueStar
- Wanted to export to xlsx
 - Anton Scheffer wrote a utility (as_xlsx) to convert a query to xlsx
 - <https://technology.amis.nl/2011/02/19/create-an-excel-file-with-plsql/>
 - You can also pull the query behind an interactive report and the bind variables using the builtin apex_ir package.
 - Used the get_report_sql from <http://deneskubicek.blogspot.com/2013/05/getting-interactive-report-query.html>
 - Used a couple of application level items and a page to implement a routine that could be called from any interactive report to produce an xlsx file
 - The xlsx is built in the large pool, make sure it is large enough

Internals

- Some lessons learned
 - Identify the queries so you can deal with performance issues easier:
 - SELECT /* Page 156, 2008 Master Salesout share */
 - Discoverer produces some ugly code
 - Make sure filter locations make sense
 - Check for allowed orgs

```
((xss.OPERATING_UNIT_ID = :P156_ORG) and (:P156_ORG > 0))  
OR  
((nvl(:P156_ORG,-1)<0)  
AND xss.OPERATING_UNIT_ID IN (select organization_id  
                                from apps.xxbsi_allowed_sales_org  
                                where user_name=:APP_USER)))
```

Export to Excel

- Create an After Submit process to fire when the Export button is pressed:

```
DECLARE
```

```
  v_sql  VARCHAR2 (32767);
```

```
  v_name varchar2(200);
```

```
BEGIN
```

```
  v_sql := xbsi.xx_get_report_sql (:app_id, :app_page_id, FALSE);
```

```
  select PAGE_TITLE into v_name from APEX_APPLICATION_PAGES  where PAGE_ID =  
v('APP_PAGE_ID') and APPLICATION_ID = v('APP_ID');
```

```
  APEX_UTIL.set_session_state(p_name => 'IR_SQL', p_value => v_sql);
```

```
  APEX_UTIL.set_session_state(p_name => 'IR_NAME', p_value => v_name);
```

```
  APEX_UTIL.REDIRECT_URL('f?p=' || v('APP_ID') || ':179:' || v('SESSION'));
```

```
END;
```

Export to Excel

- Export Page

- Create a Pre-Rendering Before Header process

```
DECLARE
```

```
    v_mime VARCHAR2(100);
```

```
    v_length NUMBER;
```

```
    v_file_name VARCHAR2(2000);
```

```
    file_blob BLOB;
```

```
BEGIN
```

```
    xxbsi.as_excel.query2sheet(v('IR_SQL'));
select xxbsi.as_excel.finish,v('IR_NAME') || '.xlsx'
```

```
    into file_blob,v_file_name
```

```
    from dual;
```

```
    v_mime:='application/vnd.openxmlformats-officedocument.spreadsheetml.sheet';
```

```
    SELECT DBMS_LOB.GETLENGTH(file_blob)
```

```
    INTO v_length
```

```
    FROM dual;
```

```
    owa_util.mime_header( nvl(v_mime,'application/octet'), FALSE,'UTF-8');
```

```
    http.p('Content-length: ' || v_length);
```

```
    http.p('Content-Disposition: attachment; filename="' || v_file_name || '"');
```

```
    owa_util.http_header_close;
```

```
    wpg_docload.download_file( file_blob );
```

```
    apex_application.stop_apex_engine;
```

```
end;
```



Custom Java Applications

Custom Java

- We allow certain customers to update their information using SOAP
- We also found that our credit card processor did not support 12.2
- Already using glassfish on db tier
 - Installed glassfish on apps tiers
 - One benefit is that this can just be another applications tier migration
- Used proxy server to keep customer side URLs the same

Cloning

- Glassfish is not impacted by the clone
- Means development is not overwritten by production
 - Generally good since I restore development code as much as possible with a refresh
- However, in all other environments, I want production code after cloning
- Our solution:
 - We have a known location (that is refreshed during cloning) which contains all the war files installed in the glassfish server.
 - For the most recent version of each war, there is another file file.MIGRATION that links back to the migration directory
 - Post Cloning, we review the files in war files and reinstall them using the instructions in the appropriate migration directory.



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Q&A

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