



Upgrading from 5.5 to 6.2 in a High Performance
Environment - Nightmares with End of Life Machines
(ELM)

Venkat Kanakam
2013 OTM User Conference

Agenda

- About OFFICEDEPOT
- System Overview
- Explain the upgrade process of OTM from version to 6.2.5 especially in a performance critical environment with a mix of old and new hardware.
- Explain the issues faced in forced upgrade of older hardware, especially test systems, to meet the certification requirements and the challenges posed by new hardware.
- Upgrade of SOA/BPEL integration processes to suit the new OTM version.
- Actual Upgrade
- Lessons learned
- Q&A

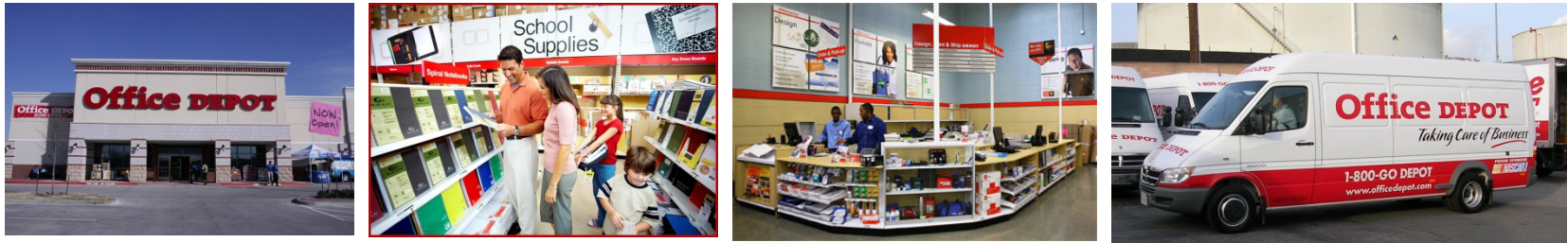
Office Depot

Company Facts



- **Office Depot, Inc.** is a global supplier of office products and services. The company was incorporated in 1986 with the opening of our first retail store in Fort Lauderdale, Florida. In fiscal year 2012, we sold \$10.7 billion of products and services to consumers and businesses of all sizes through our three business segments:
 - North American Retail Division
 - North American Business Solutions Division
 - International Division
- Sales are processed through multiple channels, consisting of office supply stores, a contract sales force, an outbound telephone account management sales force, internet sites, direct marketing catalogs and call centers, all supported by our network of supply chain facilities and delivery operations.

Office Depot



4 Easy Ways to Shop

- Shop Online 24 Hours a day: www.officedepot.com
- Call 24 Hours a day: 1-888-GO-DEPOT (Includes Speech-Activated Quick Order)
- Fax 24 Hours a day: 1-800-685-5010
- Locate a Store: 1-888-GO-DEPOT



Upgrade – Why is it needed?

- Upgrade Database to 11g, as an enterprise goal.
- Since OTM 5.5 is not certified with 11g RAC, OTM Application to upgrade to Latest (as of mid-2012)
- Future Business Processes that will be enabled on OTM platform needs improved functionalities.
- Upgrading the BPEL integration code from 10g to 11g. It is initially considered in scope but later removed to reduce complexity and reliability of delivery.
- It is cool to Upgrade Enterprise Applications 😊

The Team

- In-house Application Leads/Developers
- In-house System Architects, OAS Admin, SOA Admin, Engg., Project Manager
- Oracle Consulting – need based, at various stages

Upgrade Approach

- Thoroughly review upgrade steps, as advised on Oracle Support.
- Identify activities by team – App Dev, OAS Admin, DBA, Open Systems, Network Engg., Security etc.
- Plan Time Line
-  Pretty Simple and execute the plan!! 

Upgrade Exit Criteria

- Business Impact
 - Must complete upgrade within 40 hrs (Start Friday 9:00PM and complete by Sunday 12:00PM), factoring in enough time for restore by 6:00PM.
- Performance
 - Criteria
 - A throughput of 15,000 orders in 1 hr end-to-end. (Planning scenario is 1 OrderRelease = 1 Buy Shipment)
 - Must sustain 100,000 Order load in 1 day
 - Must sustain same throughput for 1 week (without bouncing)
- No new functionality to be used during upgrade and current planning scenario to maintain
- Data Purge.

Code Module upgrade

- Business Data import file templates(CSV)
- OTM Objects Specs, Agents
- SOA BPEL Processes to incorporate 6.2 wsdl. The 6.2 wsdl has inline schema compared to reference to GlogXML.xsd in 5.5
- Purge programs
 - Shipment Purge
 - Order Release Purge
 - Transmission purge (partitions)
 - The NEW OUTBOUND5 partition purge

The Nightmares

- OTM 5.5 (Production) running on Solaris 9 on 2 Sun v890 box (One Active and One passive node).
- To Upgrade OTM to 6.2(.5), OS needed to be upgraded to Solaris 10. However, we had challenges with Solaris 10 in-place upgrade. So we had to procure a parallel hardware. (Including Test systems)
- Hunt for new hardware within data center - Found 2 Sun v490 boxes (repurposed hardware to avoid buying new hardware due to cost constraints)
- v490 supports Solaris 10, so OTM 6.2 can live on it.
- BUT, OTM 5.5 could not be installed on Solaris 10 due to supportability so we couldn't clone 5.5 App Server on Solaris 10 to start upgrade and retire v890.
- SO, the upgrade has to be done as two step approach- Upgrade from 5.5 to 5.6 (App+DB) on old hardware, fresh install 6.0 (App) on new hardware and continue patching the DB, then install 6.2.5 patch.
- DB runs on Linux and Database Hardware/OS is not upgraded. Only DB version and cluster is upgraded from 10g to 11g.

The Nightmares (Cont...)

- It is observed that performance initially is good but by 4th day and 5th day, it is severely degrading and unacceptable.
- Upon research, experimentation and further tests, it is identified that 2-node SCA architecture (load based SCA, not functionality based) is causing the degradation due to communication over the network. The degradation does not happen when the performance is tested on SINGLE NODE mode.
- However, a SINGLE NODE on v490 is not meeting the performance bench mark.

The Nightmares (Cont...)

- Upgrade encountered several issues

- Issue 1 -> Jrockit JDK

- Running OTM 6.2 on Solaris with JRockit JDK did not yield efficient results. We were seeing frequent JVM crashing during load testing. After discussing with Oracle, we were asked to move to Sun JDK which provided better results on Solaris platform.

- Issue 2 → V490 running at 99-100% CPU

- During OTM 6.2 load testing, we saw 99% CPU utilization on the servers. This issue was resolved by switching to Sun JDK.

- Issue 3 → Some of Oracle delivered scripts failed.

- We had to manually added few changes to the scripts to make sure they ran successfully.

The Solution !!

- Considering the future expansion of Transportation Management platform and various future business plans, a LANDMARK decision to acquire new power full hardware is made.
 - T4-2 Solaris hardware using Solaris ZONEs/LDOMs.
 - Single Node App/Web server. No SCA.
 - Sun JDK

Go Live - Preparation

- Perform production simulated on PERF instance. The PERF Instance is very close to Production Hardware (T4 box and related infrastructure). It is found that with new configuration the Exit criteria is met.
- Repeat the upgrade steps in real time (with no pause) and accurately monitor the time for each step to calculate total time for entire upgrade.
- Identify any opportunities for reduction in time. (Run scripts parallel, DB tuning etc).
- Purge as much transactional data as possible
- Weekend Go Live to not impact business
- Backup plans
- Back Out Plan
-

Go Live – The Climax

- After Business is done, Upgrade started at 9:00PM Friday.
- Monitoring the progress of Upgrade Stages:
 - Stage I – 5.5 to 5.6 In-place upgrade
 - Stage II – 6.2 upgrade on new Hardware.
 - The upgrade scripts running slow – on demand tuning of database (drop PN triggers, create indexes etc)
 - Enough data could not be purged (2 weeks data instead of 1week as planned)
 - Network issues with new machines/architecture. New Policies needed to be pushed ad-hoc.
 - Team is motivated and upbeat but it is tiring to work 36 hrs *continuous*.
 - Stage III – 36 hours later....upgrade is done.
 - Business started testing after upgrade and Order batches run to verify functionality and performance and every thing is satisfactory.
- **HAPPY ENDING...** 😊

Lessons Learned

- Procure competent Hardware for any major upgrades to prevent nightmares with Hardware [End of Life Machines]
- Purge as much data as possible to reduce the upgrade time.
- Always include the Backout plan as part of the complete upgrade plan.
- Plan for at least couple of Mock upgrades on Production-Like Systems to make sure the upgrade steps and timelines are realistic.
- Resource contingency.
- Constantly adjust the methodology and as you gain experience throughout the Project Lifecycle
- Upgrade projects could take a longer time than planned....REALITY CHECK!!!
- Good Luck!!

The End



Q&A

- Where can I buy Office Supplies, Office Equipment, Ink/Toner, Furniture, Printing Services etc.? 😊
 - **OfficeDepot is the go-to place for these and many more.**
 - **4 Easy Ways to Shop**
 - Shop Online 24 Hours a day: www.officedepot.com
 - Call 24 Hours a day: 1-888-GO-DEPOT (Includes Speech-Activated Quick Order)
 - Fax 24 Hours a day: 1-800-685-5010
 - Locate a Store: 1-888-GO-DEPOT

- ???

Thank You

Venkat Kanakam
Venkat.kanakam@officedepot.com