Upgrading to Oracle E-Business Suite Release 12: Best Practices and Lessons Learned

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Topics

- Top Reasons to Upgrade to E-Business Suite R12?
- EBS Upgrade Options
- Critical Upgrade Decisions
- Platform Migration Scenarios
    - Tru64 UNIX to Integrity/HP-UX
    - PA-RISC to Integrity/HP-UX
    - Virtualized your server environment
- Best Practices - lessons learnt
- Where to get more information

ORACLE
E-BUSINESS SUITE

Top 7 Reasons for EBS R12 Upgrade

- New application features & functionalities
- Application availability on platform of choice
- Application EOL
- Capacity for future growth
- Performance
- IT Consolidation
- Road to Oracle Fusion Apps

Reason #1- New EBS R12 Features

- E-Business Suite 12 - The global business release
  - Think, Work, and Manage Globally to make the right decisions
  - R12 Improves Global Decision Making by Supporting All Types of Reporting/Analysis
  - Accelerate global roll-outs with simplified user interface and business flows
- Dramatically Lower IT Costs through System Consolidation
- 18 new products with 2443 enhancements
- Based on the latest technology stack - Oracle AS 10g, Oracle DB 10gR2
- Significantly improved user experience based on PeopleSoft Enterprise best practices

Reason #2 - Application availability on Platform of Choice - HP Integrity

The entire stack of EBS R12 has been available on HP-UX/Integrity since January 2007

Oracle E-Business Suite Technology Stack	HP-UX Integrity	Linux Integrity	Windows Integrity	HP Proliant x86
Oracle E-Business Suite R12 RUP4	Yes	Split *	Split *	Yes
Oracle E-Business Suite R12	Yes	Split *	Split *	Yes
Oracle E-Business Suite 11i	Split *	Split *	Split *	Yes

- **Split Configuration - Only DB Tier is supported**

Note: Please refer to Oracle Metalink Notes:304489.1, 356839.1, 369693.1, 456197.1 and 311717.1 for the most up to date application certification Information

Reason #3 - Application EOL - Desupport Roadmap – Extended Support Costs

Oracle E-Business Suite Releases

Release	GA Date	Premier Support Ends	Extended Support Ends	Sustaining Support Ends
11.0.3	May 1999	Feb 2007	Not Offered	Jan 2009
11*i*1	May 2000	Jul 2006	Not Offered	Indefinite
11*i*2	Oct 2000	Jul 2006	Not Offered	Indefinite
11*i*3	Jan 2001	Jul 2006	Not Offered	Indefinite
11*i*4	Jun 2001	Jul 2006	Not Offered	Indefinite
11*i*5	Sep 2001	Jul 2006	Not Offered	Indefinite
11*i*6	Jan 2002	Jul 2006	Not Offered	Indefinite
11*i*7	May 2002	May 2007	Not Offered	Indefinite
11*i*8	Nov 2002	Nov 2007	Not Offered	Indefinite
11*i*9	Jun 2003	Jun 2008	Not Offered	Indefinite
11*i*10	Nov 2004	Nov 2009	Nov 2012	Indefinite
12	Jan 2007	Jan 2012	Jan 2015	Indefinite

Support retirement dates have already been announced for releases 11.0.3 and 11*i*1 through 11*i*6.
Oracle E-Business Suite releases11*i*10 and 12 will each have a direct path to the Oracle Fusion Applications.

Reason #3 - Oracle Applications Desupport

Key Feature	Premier Support (5 Years)	Extended Support (3 Years)	Sustaining Support (Infinite)
Major Product and Technology Releases	•	•	•
Technical Support	•	•	•
Access to Support Portal	•	•	•
Updates and Fixes	•	•	Pre-existing
Security Alerts	•	•	Pre-existing
Upgrade Scripts	•	•	Pre-existing
Critical Patch Updates	•	•	
Tax, Legal, and Regulatory Updates	•	•	
Certification with Existing third-party Products/versions	•	•	
Certification with most new Oracle products	•	•	
Certification with most new third-party	•		

Policy Applies to EBS 11.5.10

Reason #4 - Business Growth & Capacity

- Customer Business Growth - YoY growth, and planning for future
- Additional EBS module/product implementations
- Enterprise-wide deployment of EBS - new hardware and storage requirements
- EBS availability on scalable, industry standard, enterprise class HP platforms

Reason #5 - Performance Considerations

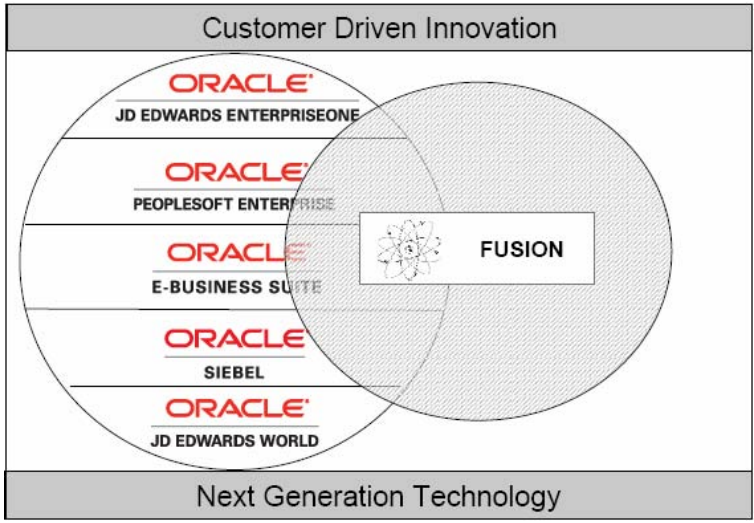
- Ability to Access up-to-the-minute information at any time
- Time to market crucial to the competitive advantage of the Business
- Business requirement for the IT infrastructure to support the vast amounts of information requested by the various business units
- Service Level Agreements (SLA) critical for customer satisfaction, not being met with the current deployments.
- With global rollout of business solutions and round the clock demands on the IT systems, long and unacceptable response times

Reason #6 - Consolidation & Cost Considerations

- Dramatically lower IT costs through system consolidation and virtualization
- Significantly improved overall management of the IT infrastructure with platform consolidation
- Standardization on Industry Standard Solutions reduces the overall cost of maintenance, interoperability, and future upgrade paths
- Virtualization capabilities allow for most optimal resource utilization
- Flexibility to dynamically reallocate resources based on changing business requirements

Reason #7- Road to Oracle Fusion Apps

- Based on the 11g database
- First release later 2008
- Upgrades from 11.5.10.2/R12 to be supported

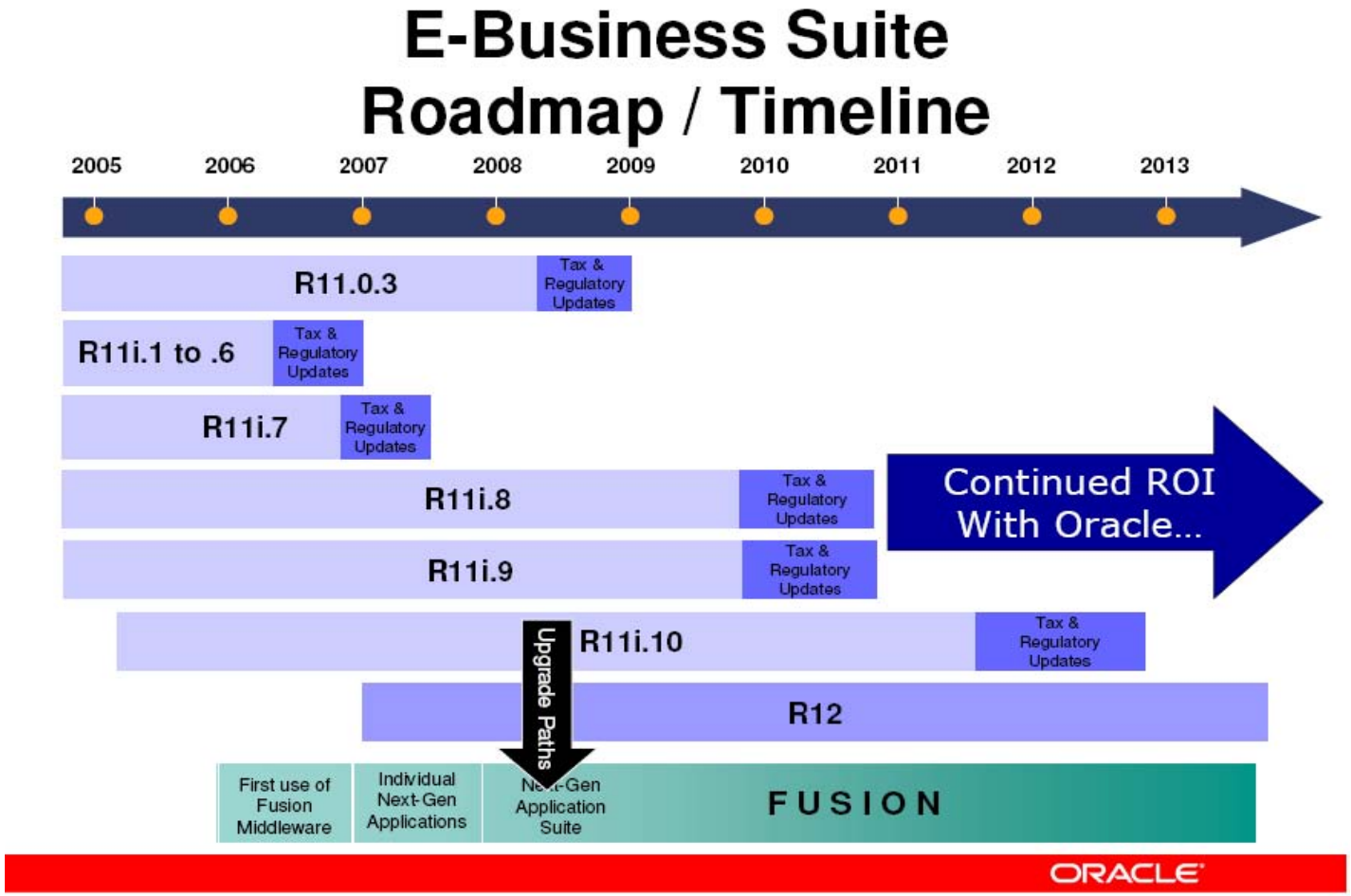


- Migration from 11i will involve both a middle-tier (Fusion middle-ware) and db-tier (11g) upgrade
- Upgrade from 11.5.8 to 11.5.10.2 will involve a db-tier upgrade and the application of the 11.5.10.2 maintenance pack

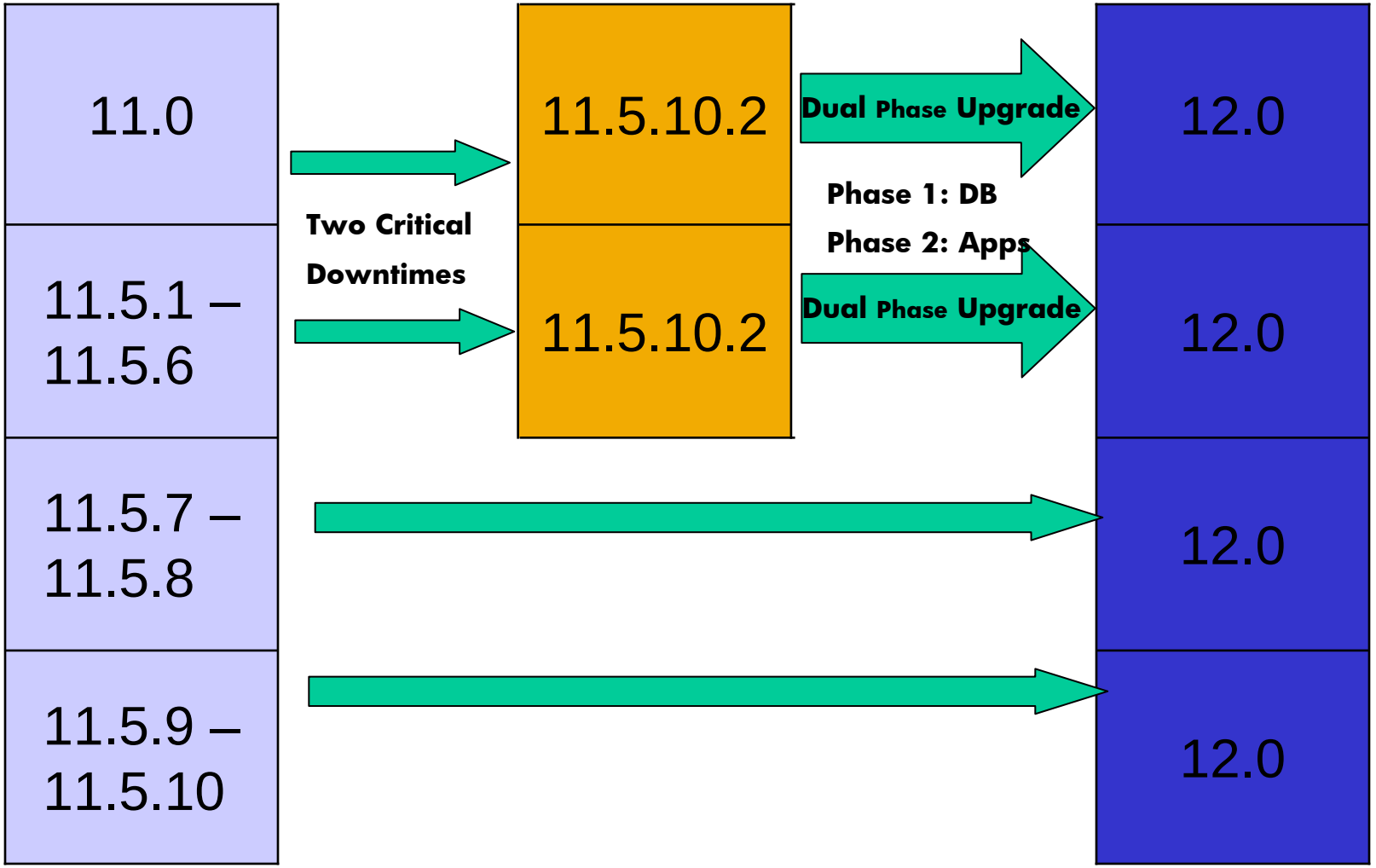
EBS Upgrade Options - 3 Major Decisions

- Upgrade the EBS Version - 11.5.10.2 or R12?
  - Move from an older 11i version to 11.5.10.2
  - Move from an older 11i version all the way to R12
- Split Configuration or Single Platform
  - Advantages of Split Configurations
  - Choices for Split & Single Platform Configurations
- Hardware Platform Migrations
  - Tru64 UNIX/Alpha Server to HP-UX/Integrity
  - HP-UX/PA-RISC to HP-UX/Integrity or HP-UX/PA-RISC
- HP Recommendations

EBS 11i/Release 12



Upgrade Roadmap to EBS 12



Should I Upgrade to R12 Questions

- What are the differences in Release 11i and Release 12 functionality for your end users?
- What business advantages, process improvements, and new organizational capabilities will be possible with the new Release 12 features?
- What investments have you made in adapting your organization to Release 11i, and vice versa? This might include:
    - Employee, partner, vendor, and supplier training
    - Customizations and personalization's, including custom Forms, OA Framework screens, workflows, concurrent programs, and reports
    - Integrations with third-party systems

Upgrade to R12 Questions (cont)

- Which of your customizations, extensions, and personalization's can be replaced with new Release 12 features?
  - What savings will these represent?
  - How much of those investments will carry over to Release 12?
- How will Release 12 help reduce your operational costs?
- What are the incremental costs of Release 12 infrastructure, relative to your current Release 11i infrastructure costs?
  - These costs might include server, storage, and networking hardware and licensing.

Decision to Upgrade to R12

Pros

- Greater functionality
- Reduce current customizations
- Latest technology advantage
- Better performing hardware
- Reduce extended support costs for older EBS versions
- Better platform to Fusion
- Available for more than a year
- Fewer tech stack changes between 11i and R12 than between 10.7 and 11i
- Integrity VSE support for Dev/test
- Easier Patch Management (New Patch Wizard)

Cons

- Learning curve for new technology stack and EBS user interface
- Not a lot of implementation expertise
- Maybe more bug fixes for a new release
- Bugs may take longer to fix in a new release (current RUP4)
- Impact on year end business higher
- Need to provide a gap assessment

Decision to Upgrade to 11.5.10.2

Pros

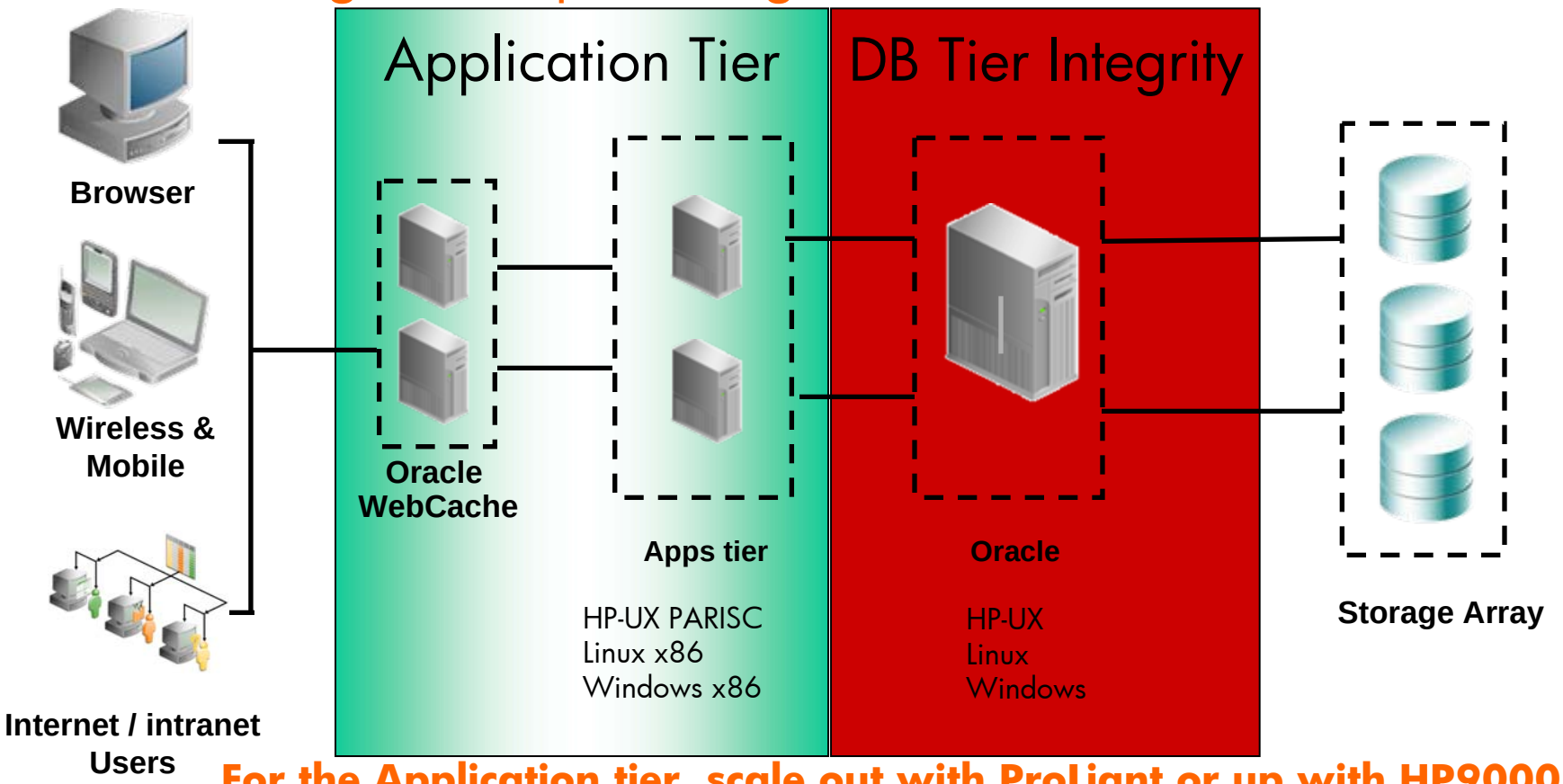
- Stable environment
- Lowest risk
- Lots of consulting available
- Already familiar with 11i
- No new user interface – lower training costs
- Reduce extended support costs for older EBS versions

Cons

- May not reduce the number of customizations
- Stay with older hardware with less performance
- Will go off premier support in two years – 2009 Upgrade to R12 or Fusion will be a big step later
- Future of 11i migration to Fusion uncertain
- Eventually a big outage to move to R12 in future anyway

Split-configuration architecture

High-level split-configuration architecture



For the Application tier, scale out with ProLiant or up with HP9000.
For the Database tier, scale up with HP-UX Integrity.

Benefits of Split Configuration

- Flexibility to choose between 11i and R12
- Customers running 11i can experience proven performance advantages of HP Integrity servers for the database
- Ideal for customers desiring to run EBS R12 on Linux or Microsoft® Windows®
  - Implement the database tier on HP Integrity servers & the app tier on HP ProLiant servers
- Utilize the latest EBS versions architected for multi-tier split configurations
- Leverage existing investment for apps tier
- Take advantage of HP-UX virtualization options

Oracle EBS Support on Tru64 Platform

- Oracle EBS Release 11.5.10.2 is the terminal release for HP Tru64 UNIX
- Supported with Standard & Extended Support until at least 2011

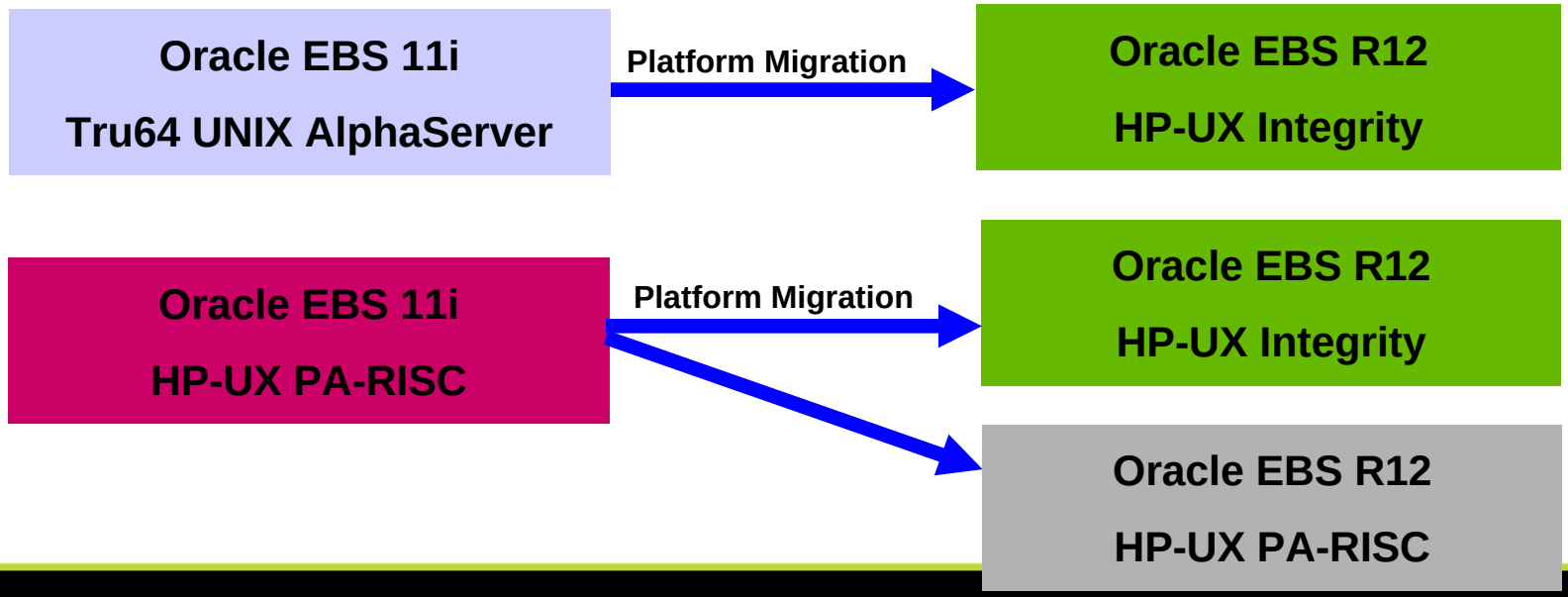
HP Tru64 UNIX Version	E-Business Suite Version	Database Version
5.1a-b	11.5.7	9*i*R2
5.1a-b	11.5.8	9*i*R2
5.1a-b	11.5.9	9*i*R2
5.1a-b	11.5.9	10*g*R2
5.1a-b	11.5.10.x	9*i*R2
5.1a-b	11.5.10.x	10*g*R2

Upgrade from Tru64 Alpha to HP Integrity

- EBS 11.5.9 (CU2) or 11.5.10.2
- Remain on EBS 11i
  - Use a phased approach
    - Move the db tier to HP-UX Integrity
      - 9iR2 database use export & import migration
      - 10gR2 database use Data Pump migration
    - Verify system stability
    - Move apps tier to Linux x86
- Upgrade to EBS R12 on HP-UX Integrity
    - Upgrade to 10gR2 if needed
    - Use Data Pump migration to move db to Integrity
    - Run R12 Rapid Install on HP-UX Integrity

Platform Migration during R12 Upgrade

- Upgrading fromTru64 UNIX/AlphaServer - Two step process
  - Step 1 - Platform Migration to Integrity
  - Step 2 - R12 Upgrade
- Upgrading from HP-UX/PA-RISC -Two options
  - Platform Migration to Integrity and perform an R12 Upgrade
  - Stay on PA-RISC platform and perform the R12 Upgrade



Data Migration to Oracle 9*i* or 10*g* on Integrity Servers

- Migration from HP PA-RISC
  - no export and import required
- Migrating from a 32-Bit System Linux
  - no export and import required
- Migrating from a 32-Bit System Windows
  - no export and import required

Migrating Oracle DB from HP-UX on PA-RISC to HP-UX on Itanium

- **Upgrade to Oracle 9i R2 on PA-RISC if necessary**
- **Install new binaries on Itanium server**
- **Shutdown database on HP PA-RISC server**
- **Copy your existing config files to the new ORACLE_HOME**
- **Copy database files from HP PA-RISC to the Itanium2 server or plug your external storage into the new Itanium server**
- **Re-create control file (a single SQL statement)**
  SQL> ALTER DATABASE BACKUP CONTROLFILE TO TRACE;
- **Startup database on the Itanium2 server**
- **Re-compile Java (a single SQL script)**
  SQL >create or replace java system;
- **Done!**

Migration white paper on Metalink Note:266220.1; 402497.1; 266220.1

HP Upgrade Recommendations

- **Upgrade to R12 with 100% HP Integrity servers**
- Upgrade to R12 with Split Configuration
  - Database tier on Integrity
  - Applications tier on supported/existing platforms for investment protection
- Upgrade to 11.5.10.2 or R12 with PA-RISC
  - PA8900 dual core last processor
  - sx2000 based servers available through ~ 2009
  - Support for 5 years after last availability
- Upgrade to 11.5.10.2 with split configuration
  - Applications architected for multi tier split configurations
  - Price/performance gains with Integrity servers for the database
  - Utilize existing PA-RISC investment for apps tier

HP Recommendations - Certified combinations *

	Current	Primary recommendation	Secondary recommendation	Less recommended
	Legacy	All Integrity Servers	Split Configuration	Legacy/PA Servers
E-Business Suite	≤11.5.8	EBS R12	11.5.10 or EBS R12	11.5.10 or EBS R12
RDBMS	9iR2	10gR2 11g - when supported	10gR2	10gR2
OS - HP-UX	HP-UX v1	HP-UX V3	HP-UX V3	HP-UX V3/V2
OS - Tru64 UNIX	Tru64 v5.1B	HP-UX V3	HP-UX V3	HP-UX V3/V2
Chipset - PA	PA-RISC Server	Itanium	DB = Itanium App = Intel Xeon, AMD, PA-RISC	PA-RISC
Chipset - Alpha	AlphaServer	Itanium	DB = Itanium App = Intel Xeon, AMD, PA-RISC	Alpha/Tru64 with 11.5.10

*Note: Please refer to Oracle Metalink for the most up to date application certification Information

Critical Upgrade Decisions

- Platform and Architecture Decision
- Hardware sizing for R12
- Customizations
- Evaluate R12 Functional Changes
- Overall Customer Preparedness for the Upgrade
- When to convert to OATM
- When to upgrade historical data
- Phased Implementation Approach

Platform and Architecture Decision

Keep the following factors in mind while making Hardware Platform and Architecture decisions:

- Current business and technology requirements
  - Supported platforms, Tested technology, Certified solutions
- Future business expansion
  - Scalable architecture, Easy expansion, Provision for additional business growth
- Ease of manageability of the overall solution
  - Platform standardization, Manageability tools, Interoperability of the various solution components

Platform and Architecture Decision - cont.

- Flexibility and Adaptability of the Architecture to meet current and future business needs
  - New EBS module implementations, Global deployments.
  - Capability of the current solution to integrate with new/different business processes
- ROI and Investment Protection
  - Return On Investment from better business decisions, access to real time and accurate information
  - Industry Standard Hardware and Software, Service and Support for the IT infrastructure

Hardware Sizing for EBS R12

Keep in mind the following hardware differences between 11i and R12 while sizing for R12

- Storage
  - New installations add 10% for the seed database
  - For upgraded database from an existing EBS version add about 20%
- CPU
  - add 10%
- Memory
  - add 12%

Note: requirements for CPU, memory, and disk space (for log files and backup) are typically much larger during an Upgrade process than during normal operation

Rethink Your Customization Strategy

- Take inventory
  - What customizations do you have?
  - How were they built?
  - Are they still required?
  - Do new features make them obsolete?
  - Is there business value in keeping them?
- Engineer for the future
  - Configure rather than customize
  - Build any new custom applications conforming to Oracle Fusion Architecture

- ↓ **Cost** - Cut engineering and maintenance costs
- ↓ **Risk** - Reduce chances of regression
- ↑ **Agility** - Faster upgrades and maintenance

Evaluate R12 Functional Changes

Evaluate the Custom Code that will require changes:

- Forms
- Report
- C Code
- Java Code
- Framework
- Autoconfig Configuration file customizations
- New Development tools – compilers, Forms/Reports builder 10.1.2, Jdev 10.1.3
- User Interfaces – New look and Feel (End-user Training)

R12 Functional Changes - Forms

- Forms personalization's upgrade smoothly
- Backup Forms Custom library before upgrading
- Custom library needs to be manually upgraded
- Most changes can be identified at build time, but a few changes can be identified at run time only
    - Needs testing of all the forms

R12 Functional Changes - Reports

- Reports that generate HTML needs conversion to XML publisher
- Reports server will be accessible only from Concurrent Manager – standalone reports need to be modified
- Oracle Graphics is replaced with OAF/BI Beans
- Any integration of graphics with reports need reimplementation with OAF/BI Beans and XML publisher

R12 Functional Changes - C-Code

C-code Tasks

Re-build your c/c++ code with the new compilers, linkers, and technology stack:

- C compiler: icc 7.1.032
- C++ compiler: g++ 3.2.3
- RSF Level: 10.1.0.5
- Platform: Linux RH AS 3

R12 Functional Changes - Framework

- Framework Personalization upgrades transparently
  - Recommend review
- Framework custom application code should run with new OC4J without any upgrade; nevertheless we recommend
  - opening custom code with new JDeveloper: this is a one way upgrade process
  - recreating JDeveloper projects (easier than migrating old projects)
- Generic Java code changes include:
  - New JDK version and JSP spec restrictions
  - Servlet entry points need to be explicitly aliased
  - JServ Thread API incompatibility with OC4J

When to convert to OATM

- Oracle Application Tablespace Model (OATM) - A new model based on database object type instead of the old product affiliation model.
  - Greatly reduces the total number of tablespaces required by EBS
  - Makes it simpler to manage the tablespaces and operating system files
  - Release 12 uses OATM Tablespace Migration utility for existing objects
  - OATM Conversion can be done Before, During, or After the R12 upgrade
  - OATM Conversion can also be done while upgrading to EBS 11.5.10
- Converting existing customer data to OATM can take considerable amount of time leading to extended downtime
- Recommended that each customer evaluate their unique downtime constraints and determine the best time to convert to OATM

See MetaLink note 248857.1

When to Upgrade Historical Data

- This decision is important for customers with large amounts of historical data
- R12 Upgrade has an option to postpone/omit the upgrade of historical data from the initial upgrade process
- Historical data can be upgraded anytime later when the system is up or down
- Historical data for the following products can be upgraded later
  - Financials and Procurement
  - Projects
  - Supply Chain Management
  - CRM (run manual scripts)

Phased Implementation Approach

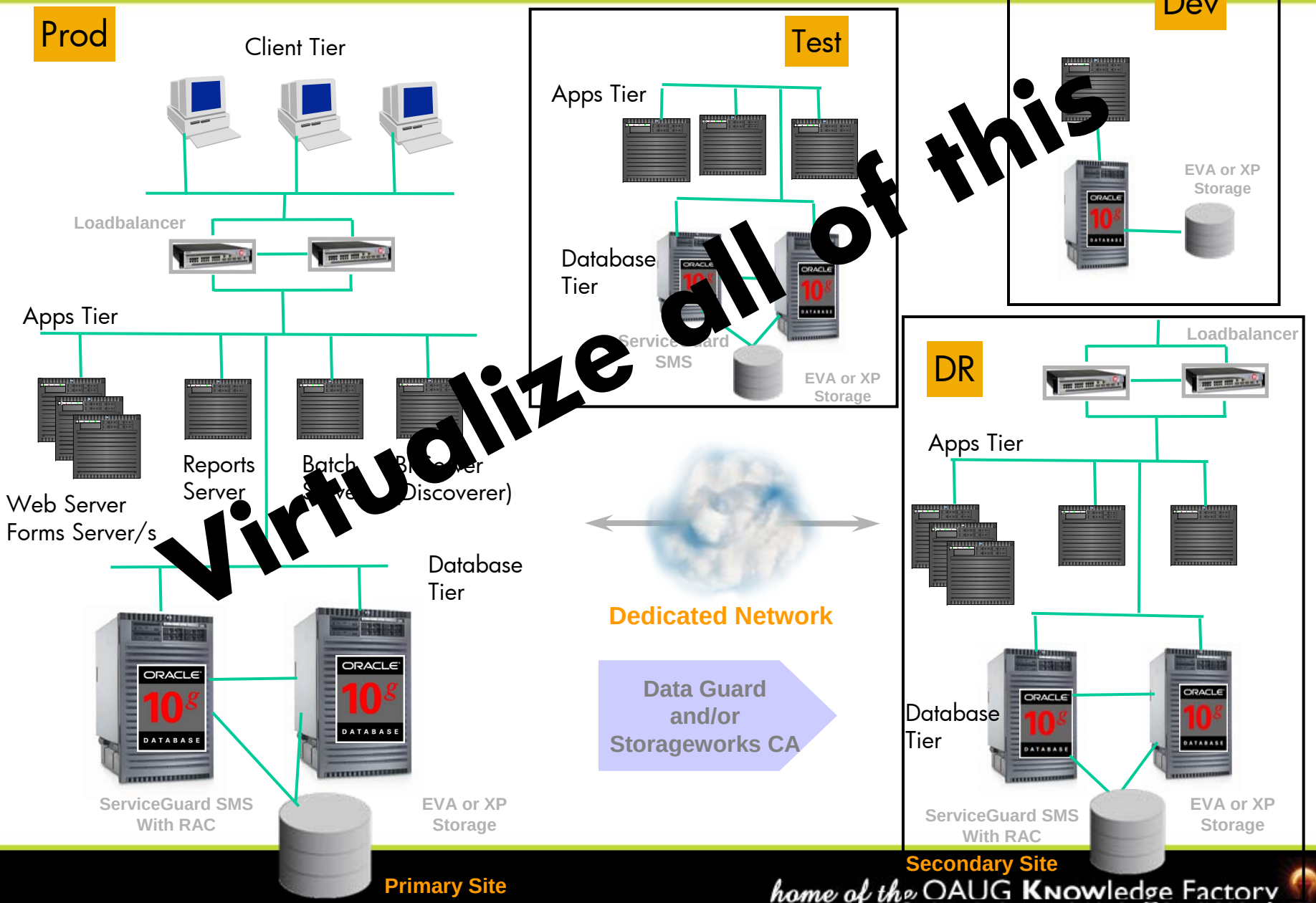
- Ideal for customers looking for shorter (multiple) Downtimes vs. one extended Downtime
- Implementation can be a multiple phase process:
  - OATM Conversion
  - Platform Migration
  - Pre upgrade steps - Patches etc.
  - Upgrade the DB tier (upgrade 9i to 10gr2)
  - Upgrade the Application tier (to R12)
  - Upgrade the Historical data
- Test plan in place for each phase upgrade
- After each phase the EBS environment should be in a supported configuration to be brought back into production
- During the test-runs customers need to measure the amount of time it takes to complete each phase and determine if they prefer a phased approach or a single extended downtime implementation

Overall Customer Preparedness for the Upgrade

- Executive Sponsorship Critical to the success of the R12 Upgrade project
- Buy-in from different Business Units being impacted by the Upgrade implementation
- Upgrade Assessment Analysis
- Selection of an experienced Implementer for the R12 Upgrade
    - In-house implementation, System Integrators, HP and Oracle Partners
- Project Management Preparation
    - Architecture design, project planning, resource allocation, test schedules, test runs, downtimes, production implementation, and go-live schedules

Virtualize the Environment

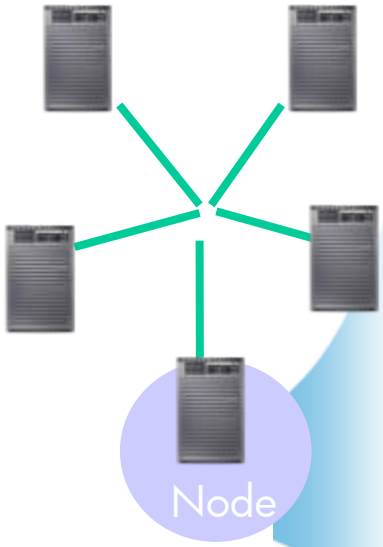
EBS R12 Architecture Design



HP Integrity server advantages: Partitioning capabilities

Unmatched partitioning capabilities

Single Physical
Node Single OS image per node within a cluster



nPartitions
Hard partitions within a node

nPar 1
- OS image with HW fault isolation
- Dedicated CPU, RAM & I/O

nPar 2
- OS image with HW fault isolation
- Dedicated CPU, RAM & I/O

nPar 3

nPar n
- OS image with HW fault isolation
- Dedicated CPU RAM & I/O

Virtual Partitions & HP Integrity Virtual Machines
Hard partitions within a node

Hard Partition 1

vPar 1
- OS + SW fault isolation
- Dedicated CPU, RAM

vPar 2
- OS + SW fault isolation
- Dedicated CPU, RAM

Hard Partition 2

Virtual Machine 1
- OS + SW fault isolation
- Virtual + Shared CPU, I/O
- Virtualized Memory

Virtual Machine 2
- OS + SW fault isolation
- Virtual + Shared CPU, I/O
- Virtualized Memory

Secure Resource Partitions – Partitions within a single OS image with security containment

Application 1
- Guaranteed compute resources (shares or percentages)

Application 2
- Guaranteed compute resources (shares or percentages)

Application 3

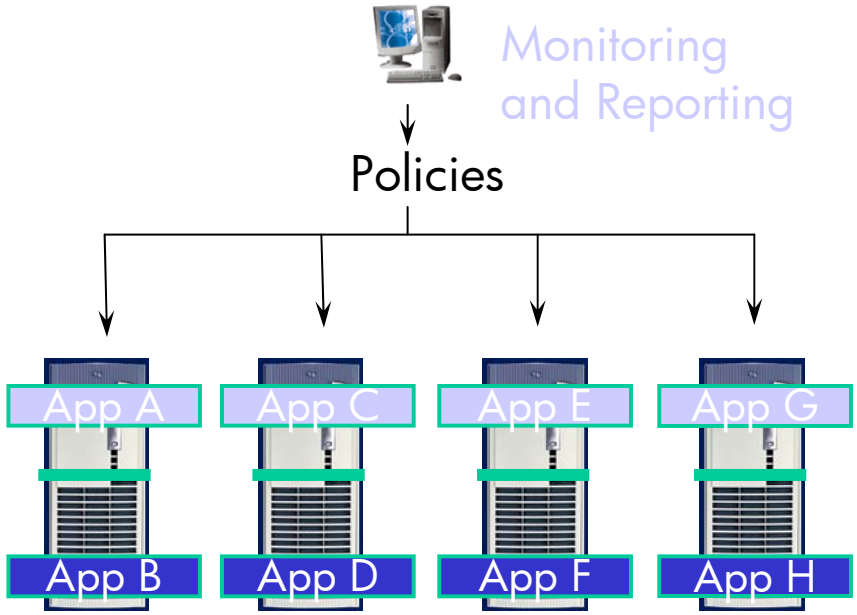
Application n
- Guaranteed compute resources (shares or percentages

Isolation ⟷ **Flexibility**

HP Integrity Essentials Global Workload Manager

Manage and automate large, multi-system VSEs

- Intelligent policy engine
  - For managing workloads across multiple systems simultaneously
- Easy to use management
  - Integrated with HP Systems Insight Manager and other VSE management tools
- Enables centralized-IT to deliver an IT utility
  - Supporting multiple LOBs Resources can be assigned to LOB based on:
    - Own/borrow/lend model
    - Fixed entitlement model
    - CPU utilization model
    - Service level objectives



Supports HP-UX 11i, Windows*, Linux* and OpenVMS environments

Virtualization/Provisioning drives down TCO

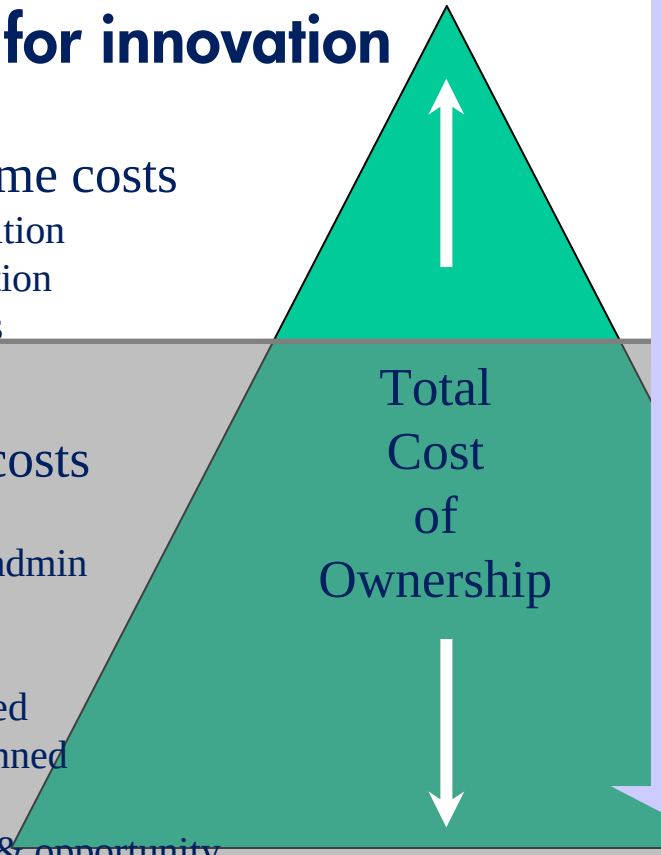
Freeing resources for innovation

~25%

Direct one-time costs
Hardware acquisition
Software acquisition
Support contracts

~75%

+ On-going costs
Support costs
IT operations & admin
Facility costs
Change costs
Downtime planned
Downtime unplanned
Security
Business impact & opportunity



Lower costs through:

Virtualization; optimized asset utilization, availability & control lowers cost & risk of unplanned downtime
Utility pricing; increased capacity & bandwidth on-demand
Availability; dynamic tunables, clustering, disaster tolerance & recovery
Security; prevent, detect, and contain
Management; seamless single asset view & control
Engineering: relentless design focus to lower power, cooling, and space
Agility

Best Practices - Lessons Learned

- Executive Sponsorship & Project Management
- Planning, planning, planning….
- Crucial Pre Upgrade Steps
- Repeated Testing - Practice Runs
- Phased Implementation Approach
- Extra Resource Requirements
- OATM
- Applying Patches
- Customizations - TBD based on Liberty experiences
- Issue Identification
- Issue Escalations
- Miscellaneous Suggestions

Executive Sponsorship and Overall Project Management

- Crucial to have Executive Sponsorship and Overall Project Management for the complete EBS Upgrade project from “start to finish”
- The complex nature of the EBS implementation requires strong buy-in, coordination, and support from various organizations
- Project planning and effective execution are critical to the success of the project
- Effective communication and partnership are required among the following teams:
  - Solution Architects - for servers, software, storage, network
  - Technical stack implementers (DBA & EBS experts)
  - Functional stack implementers (EBS customizations)
  - QA/Test/Performance Teams
  - Business Users

Planning, planning, planning.....

Detailed and effective planning are critical to the success of the EBS R12 Upgrade

- Architecture Planning
  - Optimal hardware & software for production
  - Additional hardware available for test-runs
  - Backup strategies
- Resource Planning
  - Identify and obtain resources required for project management, technical stack upgrade, functional upgrade, infrastructure support, testing, and escalation
- Schedule Management
  - Provide time estimate for R12 Upgrade based on initial assessment
  - Consider activities that can be conducted in parallel
  - Revise time estimates based on test-runs
  - Production downtime management with Phased Implementation Approach

Crucial Pre Upgrade Steps

- Carefully plan the pre upgrade process to identify the critical and non-critical steps
- Based on the first few test-runs decide which non-critical steps will be part of the final pre upgrade process
- Prepare the EBS database tier and the Application tier
  - Highly recommend that EBS be upgraded to 11.5.10.2 and Oracle DB 10.2.0.3
  - Install the latest patches and utilities
  - Purge/Archive non-critical historical data/reports
  - Perform housecleaning - analyze stale/invalid objects
  - Gather Statistics – use gather_auto

Repeated Testing - Practice Runs

- Plan on conducting 2-3 test-runs before actually upgrading the production environment
- Backup the environment at different stages to ensure all the work is not lost if there are some issues in a specific step/phase
- The first test-run would take the maximum amount of time as this is the time when the various issues with the database, applications customizations, etc. will surface. The focus of the first test run should be to complete the upgrade successfully and document all the issues and fixes.
- Start timing the different upgrade phases in the second test-run to identify the most time consuming tasks
- Test various options to reduce the time taken for different upgrade steps
  - AutoPatch options
  - Environment Cloning to test various options in parallel
  - Efficient Backup strategies to reduce the time taken to backup in between phases
- Based on the findings from the practice runs and time recordings for the various phases, create an optimal project plan for the final upgrade
- Create and test backup plans before implementing the final upgrade on the production environment

Phased Implementation Approach

- Determine the total production downtime required based on the R12 Upgrade test-runs
- Determine if it is acceptable for the business to go with a single extended downtime or if a phased approach with smaller but multiple downtimes is required
- Break down the various Upgrade tasks into phases, and ensure that at the end of each phase the complete EBS environment is in a supported configuration
- Plan on running additional testing at the end of each phase to ensure the validity of the EBS environment
- At the end of each phase the environment will be put back in production. The subsequent phase will be started at the next scheduled downtime
- This approach may take more time and planning but is ideal for customers who can not afford to be down for an extended period of time

Need more details on the phased steps that are deferred until later with examples

Extra Resource Requirements

Temporary addition of resources to reduce the time to complete the upgrade phases

- Additional CPUs may be required during upgrade process
  - There typically will be potential CBO performance differences in environments
  - The DB server could be a bottleneck at the time of the upgrade as a lot of activity takes place at the DB tier. Adding cpus will help distribute the load
  - Additional cpus will also help during the MP and RUP4 patching phase of the Upgrade process by using additional worker threads
- Additional Storage
  - In our experience we found lack of additional storage to be a critical roadblock to the R12 upgrade
  - Additional storage will be required for platform migration as well
  - Planned Backup activities during the upgrade phases will also require more storage
  - OATM conversion will double the DB storage requirements temporarily
  - Cloning is recommended for faster backup & restore of the environment

Extra Resource Requirements - cont.

Temporary addition of resources to reduce the time to complete the upgrade phases

- Additional IT infrastructure resources
  - R12 Upgrade puts heavy demand on the customer's IT resources with requests for architectural changes, system configuration changes, creating backups, restores, network changes, etc.
  - Prioritize the R12 Upgrade IT requests
  - Assign additional people resources for assisting with these tasks

- May require additional copies of the EBS environment for different development and test activates

OATM

- Recommend that customer move to Oracle Application Tablespace Model
  - Significantly decreases the number of tablespaces required by EBS
  - Dramatically reduces the overhead of managing hundreds of tablespaces, raw device files or OS files.
- OATM conversion can take considerable time depending upon the size of the customer's EBS database
  - A few terabytes of DB can take a few days to convert
- Schedule OATM conversion Before OR After the R12 Upgrade
  - As the actual R12 Upgrade can take substantial amount of time, an extended downtime may not be available to do both R12 Upgrade & OATM conversion during the same downtime
- Highly recommend that OATM conversion be done BEFORE the R12 Upgrade if a platform migration is also involved
  - Will reduce the complexity of moving large number of data files from one platform to another
  - Also recommended if moving from raw devices to filesystem

OATM Sample Timings

- Applications Tablespace Migration Utility
  - MetaLink note 248857.1
  - ARU # is 3942506
- Migration timings: (complete migration)
  - 1.4 Terabyte customer DB
    - 24 hours
    - New size of DB after migration (850 GB)
  - 180 GB customer DB
    - 4 hours
    - New size of DB after migration (120 GB)
- Performance based on number of CPUs and I/O configuration

Applying Upgrade Patches

- The R12 MP and RUP4 patches take considerable time to complete
- Reducing the time taken for these patches will significantly reduce the overall R12 Upgrade time
- Test AutoPatch options with different values to determine the options optimal for your specific EBS upgrade
- Adding more CPUs to create additional worker threads during patching will reduce the time taken for the patch completion

Customization Upgrades

- Conduct comprehensive initial customization upgrade assessment to determine the extent of customization
  - Determine customizations that can easily be upgraded
  - Determine alternatives/options for customizations that need to be totally replaced
  - Change business process to reduce or minimize carry over customizations
- A bulk of the effort/time is spent on customization upgrades
- Skill set required for upgrading customization
  - Need to understand the customer's current business logic
  - Also understand the new R12 Customization capabilities

Issue Identification

Due to the complexity of the EBS environment and the amount of time it takes to complete various upgrade tasks, it is a challenge to identify the cause of a problem

- The overall upgrade process can make quite a few changes to the customer environment - Servers, Storage, Platform, OS type/versions, DB tier versions, Application tier, customizations, etc.
- If a problem arises, all the changes make it very difficult to isolate the component/process causing the problem
- Need to follow a very systematic approach to eliminate the potential changes causing the problem, to drill down to the root cause
- May require to rollback/re-run certain upgrade steps to isolate the problem

Issue Escalation

- Escalate potential upgrade issues through appropriate Oracle Support Channels
- If a problem arises during the upgrade, realize that the issue could reside in the Application tier or the DB tier, so address it from both ends
- Any new component/feature in the architecture could be a suspect, so would need to work diligently through the process to eliminate potential suspects
- Due to the complexity of the EBS environment, it may take some time and effort to identify the problem. So comprehensive planning and documentation are key to quick and effective escalation.
- Detailed process documentation help in retracing the steps to reproduce and isolate a problem
  - If you cannot determine if the issue is in the software or the OS then use the joint HP/Oracle support agreement

Miscellaneous suggestions

- Turn Off monitoring of SYS tablespace objects during the DB upgrade, otherwise the upgrade process would fail
- If using shared APPL_TOP on NFS, make sure that the filesystems being accessed exclusively by specific nodes are mounted with -llock option
- Set up all the suggested HP-UX OS kernel parameters correctly
- Install all the HP-UX OS patches recommended by HP and Oracle for the DB and Application tiers
- DB and Application tiers should be co-located on an isolated private virtual GB Ethernet network
- Review the recommended performance patches on Metalink note 244040.1

Oracle's Own experience -

- Most Code Upgraded seamlessly

- % of files manually touched
  - Forms – 10% of forms and libraries
  - Reports – 1%
  - C Code – 20%
  - Java Code – 1%
  - JSP – 50% of JSPs needed changes

- Each customer implementation is unique

Sample Upgrade Times

- **Database Size Historical Data Downtime**
- ORAPROD 6.5TB 3 years
  48 hours
- ORAPROD 6.5TB 12 years
  72 hours
- VISION 110GB 6 months 15 hours

Additional Information

References

- HP - Oracle Applications Alliance Site – http://www.hporacleapps.com
- HP Reference Configurations - www.hp.com/go/Oracle
- http://metalink.oracle.com
- **HP Solutions Demo Portal**
  - **http://www.hp.com/products1/solutioncenters/demoportal**
- **Note:399362.1** - R12 Upgrade Sizing and Best Practices
- **Note:403339.1 & 467778.1** - Oracle 10gR2 Database Preparation Guidelines for an E-Business Suite Release 12 Upgrade
- **Note:402307.1** - Oracle Applications Installation and Upgrade Notes Release 12 (12.0) for HP-UX Itanium
- **Note:394692.1** - Oracle Applications Documentation Resource, Release 12
- **Note:374398.1** - Preparing Custom Development for Next Oracle E-Business Suite Release

HP Oracle eNewsletter – quarterly customer distribution

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Hot News

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Thank You

Backup Slides

HP-UX Integrity requirements for EBS R12

- HP-UX Itanium 11.23 - QPKBASE B.11.23.0609.051 or later
-
- JDK 5.0 – Patch PHKL_35029
  - Check the HP Web site for any updates to the JDK 5.0 requirements http://h18012.www1.hp.com/java/patches/index.html

  – Install the HP C/aC++ Developer's Bundle - A.06.05 or higher
    - Download and install the 60-day trial version.
    - Only requires linker portion which can be used beyond 60-day trial
    - http://h21007.www2.hp.com/dspp/tech/tech_TechSoftwareDetailPage_IDX/1,1703,10176,00.html

  – Verify the owner of Oracle Application & Database server file systems have the following 'ulimit' values:
    – time (seconds) = unlimited
    – file (blocks) = unlimited
    – data (kbytes) = 2015464 or higher
    – stack (kbytes) = 131072 or higher
    – memory (kbytes) = unlimited
    – coredump (blocks) = unlimited
    – nofiles (descriptors) = 65536

HP-UX Integrity requirements for EBS R12

- Configure kernel parameter
  - If the current value for any parameter is higher than the recommended value then do not change the value of that parameter
  - Install the latest Oracle Rapid Install Patch - Doc ID: 405293.1

After Installation of R12

- Set the correct path for LD_LIBRARY_PATH and SHLIB_PATH on the applications

R12 Upgrade Performance Improvements

- Application Tier
  - JDK 1.5.0 ~15% faster, more scalable, better garbage collection
  - 10gR2 JDBC Thin Driver reduces roundtrips by close to 50%
  - OC4J maintains a Java thread pool which avoids expensive thread creation on each request
  - Use Garbage Collection Tools to display the data graphically
  - HPjmeter
    - -verbose:gc -Xloggc:/logs/gc.out
    - http://www.hp.com/products1/unix/java/hpjmeter/index.html
  - Use the HP JVM diagnostic guide to analyze issues
    - http://h18012.www1.hp.com/java/support/JTGv2.pdf

R12 Upgrade Performance Improvements

- Database Tier Performance
  - OC4J maintains a Java thread pool which avoids expensive thread creation on each request
  - Faster, hash based sorting & grouping
  - Cost Based Optimizer improvements
  - 2x PL/SQL runtime performance improvement
  - Set all init.ora parameters as per notes 216205.1 & 396009.1
  - Recommend installing 10.2.0.3
  - Once the db upgrade is complete, gather stats for the dictionary and fixed objects via DBMS_STATS gather_fixed_object_stats & gather_dictionary_stats