

**Environments Management**

**Document**

For MRP-IT –

Retail Modernization Program:

Oracle Retail v16.0.1 Implementation

Version 0.1

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# Project Details

|  |  |
| --- | --- |
| Project Name | Oracle Retail ERP |
| Phase | All the phases (Incremental Updates in the respective phase, if required) |
| Project Sponsor |  |
| Organization | Mr. Price Group |
| Portfolio Manager | Reece Williamson |

# Project Objective

Mr. Price (MRP) has decided to Implement Oracle Retail ERP version 16.0.1 in multiple phases.

Tech Mahindra (TechM) being its System integration partner for Oracle Retail Implementation under MRP Programme, MRP has requested TechM to provide consultancy and implementation services.

# Purpose of the Document

The purpose of this document is to provide a structured approach on installing and maintaining the environments necessary to support the Oracle Retail implementation at Mr. Price. The Environment and Patch Management document is designed to meet the following goals:

* Ensure that all environments are suitable before the actual phase’s starts. This minimizes the risk within the overall solution and implementation.
* It provides an idea about the environment persistence and ownership.
* This document describes the purpose of each of the environments.
* Enforce a discipline of using approved, current setups for all development and reference activities.
* Details of the patch management process.
* The structured approach for source control process.

# Glossary of Terms

Technical Specific Terminology

| **Acronym** | **Description** |
| --- | --- |
| APP | Application |
| ASM | Automatic Storage Management |
| IDM / OIDM | Oracle Identity Management |
| JDBC | Java Database Connectivity |
| LDAP | Lightweight Directory Access Protocol |
| OS | Operating System |
| RAC | Oracle Real Application Cluster |
| DB | Database |
| SSO | Single Sign On |
| SGA | Shared Global Area |
| FRA | Flash Recovery Area |

Table 2 – Technical Specific Terminology

Project Specific Terminology

| **Acronym** | **Description** |
| --- | --- |
| ALLOC | Oracle Retail Allocation Application |
| FMW | Fusion Middleware |
| LB | Load Balancer |
| ReSA | Retail Sales Audit |
| RIB | Retail Integration Bus |
| RMS/MOM | Retail Merchandising System/Merchandising Operations Manager |
| REIM | Retail Invoice Matching |
| RPM | Retail Price Management |

# Environment Overview

Implementing Oracle Retail will require several system environments that will be used to test different sets of data and objects at various stages or lifecycles of deployment. This is required so that work done in one environment does not affect another. Mr. Price has decided to implement Oracle Retail 16.x or as the agreed version. So for any future version upgrade refer [section 10](#_Version_Upgrade_stages) in this document.

**The Environment Principles:**

* Define the Right name of the environment.
* Role and Responsibility of MRP and Tech Mahindra.
* Schedule of Environment Availability.
* Upgrade Strategy
* Patch implementation
* Custom Schema Creation

The following are environments that are going to be prepared for Oracle Retail Implementation project

* Sandbox - Vanilla / reference environment
* Development
* Data Conversion Development
* System Test
* System integration testing End to end / Test 1
* System integration testing internal / Test 2
* User Acceptance Test (UAT)
* Production

# Environment

The following environments shall be build and the respective details are mention for each environment.

### Sandbox

|  |  |
| --- | --- |
| **Name** | **Sandbox** |
| Purpose | Use for CRP purposes at start of project to introduce the Mr. Price to Oracle Retail applications. |
| Creation strategy | Base install with Oracle sample data |
| Data population strategy | Only contains base code and configuration |
| Application list | Retail merchandising system & Retail invoice matching. |
| Version | 16.x / as per the agreed version with Mr. Price. |

### Development

|  |  |
| --- | --- |
| **Name** | **Development environment** |
| Purpose | To perform POC (Proof of Concept) for any new functionality that needs to be added to the system.. Error resolution environment to trace code through the system without affecting the users.  Full application control must be available to the Development team for the  Patches deployment and deployment tests to ensure there is no invalid objects.  Conversion and Integration development also done on this environment. Unit Test will also be hosted on this environment Configuration and custom development. |
| Creation strategy | Base install with MRP custom objects deployment to meet the requirement of MRP |
| Data population strategy | Base scripts and developing custom objects |
| Application list | Retail merchandising system, Retail invoice matching and Retail integration bus |
| Version | 16.x / as per the agreed version with Mr. Price. |

### Data Conversion Development Environment

|  |  |
| --- | --- |
| **Name** | **Data Conversion Development environment** |
| Purpose | To deploy the conversion code/scripts and do component test across all the phases of implementation. |
| Creation strategy | Base install with MRP custom objects deployment for Client validation. |
| Data population strategy | Base scripts and load from LREP |
| Application list | Retail merchandising system, Retail invoice matching and Retail integration bus |
| Version | 16.x / as per the agreed version with Mr. Price. |

### System Test Environment

|  |  |
| --- | --- |
| **Name** | **System Test environment** |
| Purpose | To verify the integration testing with third party application that sends or receives the data to/from Oracle Retail Database. |
| Creation strategy | Initial clone from clean development, or base install if not. Custom modifications added during build phase. |
| Data population strategy | Base scripts and user data  Conversion data when available |
| Application list | Retail merchandising system, Retail invoice matching and Retail integration bus |
| Version | 16.x / as per the agreed version with Mr. Price. |

### End to End / System integration test Environment

| **Name** | **Integration / End to End environment** |
| --- | --- |
| Purpose | Used for testing full system integration to external / third party systems.  Used to test the flow of data between systems integrating with the Oracle Retail environment.  Used for integration tests linked to the RIB and any flat file interfaces. |
| Creation strategy | Base install and all custom modifications added during build phase. |
| Data population strategy | Conversion data when available  Custom data sets |
| Application list | Retail merchandising system, Retail invoice matching and Retail integration bus |
| Version | 16.x / as per the agreed version with Mr. Price. |

### System integration test (internal) / Test 2

| **Name** | **Internal SIT** |
| --- | --- |
| Purpose | This environment is used for internal team (Tech Mahindra) to validate system integration testing. |
| Creation strategy | Base install and custom modifications or cloned from a clean test environment |
| Data population strategy | Conversion data or custom data sets refreshed regularly as needed |
| Application list | Retail merchandising system, Retail invoice matching and Retail integration bus |
| Version | 16.x / as per the agreed version with Mr. Price. |

### User acceptance test (UAT)

| **Name** | **User Acceptance Test (UAT)** |
| --- | --- |
| Purpose | Final end-to-end test before changes go into production.  Proper sign-off process for each patch/release  Copy of Production from Architecture point of view |
| Creation strategy | Base install and all custom modifications |
| Data population strategy | Conversion data |
| Backup requirement | Daily backups |
| Application list | Retail merchandising system and Retail integration bus |
| Version | 16.x / as per the agreed version with Mr. Price. |

### Production

|  |  |
| --- | --- |
| **Name** | **Production** |
| Purpose | Final environment for live system.  Performance testing is also typically done on this environment End state for all code and data migration efforts. In a phased implementation approach the environment will go back to the project for cutover(s) for the next planned Divisional go-live |
| Creation strategy | Clean build |
| Data population strategy | Conversion based on cut over plan. |
| Backup requirement | Daily backups |
| Application list | Retail merchandising system and Retail integration bus |
| Version | 16.x / as per the agreed version with Mr. Price. |

# Environment Components

The following section describes the database and application server components as certified by Oracle for Oracle Retail 16.0.1 implementation. Versions may vary depending on the latest release and recommendation from oracle.

### Database Server requirements

| **Supported On** | **Versions Supported** |
| --- | --- |
| Database Server OS | OS certified with Oracle Database 12cR1 Enterprise Edition.  Options are:   * Solaris 11.x SPARC (Actual hardware or logical domains) |
| Database Server 11gR2 | Oracle Database Enterprise Edition 12cR1 (12.1.0.2) with the following specifications:  Components:   * Oracle Partitioning * Examples CD   Oneoffs:   * 20846438: ORA-600 [KKPAPXFORMFKK2KEY\_1] WITH LIST PARTITION * 19623450: MISSING JAVA CLASSES AFTER UPGRADE TO JDK 7 * 20406840: PROC 12.1.0.2 THROWS ORA-600 [17998] WHEN PRECOMPILING BY 'OTHER' USER * 20925154: ORA-39126: WORKER UNEXPECTED FATAL ERROR IN KUPW$WORKER GATHER\_PARSE\_ITEMS JAVA * 19672263: Patch 19672263: GTT SESSION LEVEL STATISTICS RETURNS ORA-20006   RAC only:   * 21260431: APPSST 12C : GETTING ORA-4031 AFTER 12C UPGRADE * 21373473: INSTANCE TERMINATED AS LMD0 AND LMD2 HUNG FOR MORE THAN 70 SECS   Other components:   * Perl interpreter 5.0 or later * X-Windows interface * JDK 1.7 |

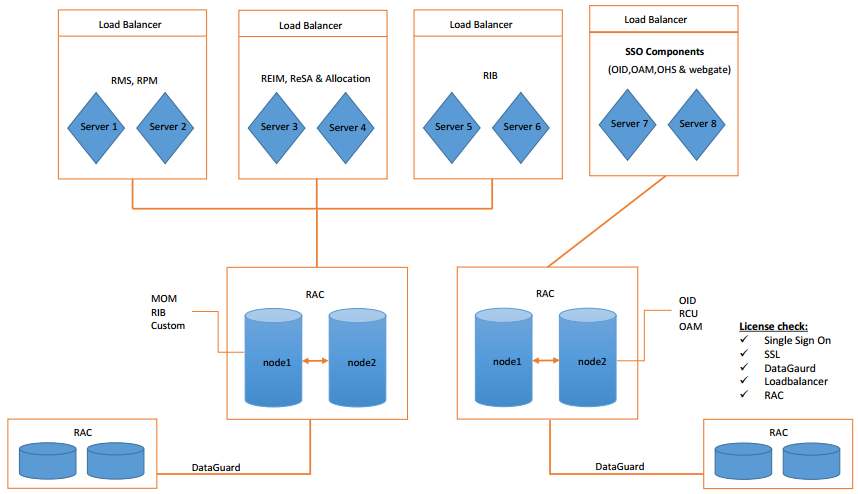
### Application Server Requirements

|  |  |
| --- | --- |
| **Supported On** | **Versions Supported** |
| Application Server OS | OS certified with Oracle Fusion Middleware 12.2.1.2.0   * Solaris 11.2 SPARC (Actual hardware or logical domains) |
| Application Server | Oracle Fusion Middleware 12.2.1.2.0  Components:   * FMW 12.2.1.2.0 Infrastructure (WLS and ADF included) * 24490566: The Patch(p24490566\_122120\_Generic) -INTERMITTENT DEADLOCK IN WLS STARTUP DURING ADF-SHARE-DEPLOYED-TESTS * Oracle Enterprise Manager Fusion Middleware Control 12.2.1.2.0 * BI Publisher 12.2.1.2.0 for legacy reports * Oracle Identity Management 11g Release 1 (11.1.1.9)   Note: Oracle Internet Directory (OID) is the supported LDAP directory for Oracle Retail products. For alternate LDAP directories, refer to Oracle WebLogic documentation set.  Java:   * JDK 1.8+ 64 bit   Optional (required for SSO)   * Oracle WebTier (12.2.1.2.0) * Oracle Access Manager 11g Release 2 (11.1.2.3)   Note: A separate WebLogic 10.3.6 installation is required for Oracle Access Manager 11.1.2.3   * Oracle Access Manager Agent (WebGate) 11g Release 2 (11.1.2.3)   Optional (for running RMS batch from Application Server)   * Oracle Client 12.1.0.2\_PSUx (including its dependencies)   Note: Oracle supports running RMS batch from the Application Server. Mr Price may choose this option, but it is also recommended that App and DB servers are co-located to reduce latency between the servers. |

# Environment Design

### Production Server Design

**Diagram 1: Production design**



**Design overview**

In Retail version 16x, the usage of RCU and ADF libraries/component is high. Therefore, each retail application will have its own WebLogic domain and RCU (Repository creation Utility) user will configure each domain. In addition, ReSA application has separated from RMS application and this application requires an individual domain. So based on that, Tech Mahindra has designed the architecture to segregate the load on the database & application server.

### Sizing Strategy

The sizing and performance parameters will be based on Oracle recommendations. Mr Price will provide the basic information/data points for the sizing assessment.

# Patch management

Application code enhancements and patches play a very crucial role in the deployment of Oracle Retail. The patches may include performance updates, bug fixes and product enhancements. Regardless of the reason for applying a patch, a standard process in Oracle Retail needs to be followed.

### Patch Application Flow

Once a patch has been approved for implementation, it should typically follow an implementation flow across environments as set out by the following

|  |  |  |
| --- | --- | --- |
| 1 | Development | * Approved patches will be applied initially in the Development environment . * Patch application information will get recorded in the patch log. * Retrofitting must be completed * Initial testing of the patch is done (If custom code was retrofitted) |
| 2 | System/Unit Test | * After technical approval, the patch will be implement in the system test environment to evaluate functional evaluate, testing bug fixes, functional enhancements or regressions. |
| 3 | Conversion environment \ System Integration environment \ UAT environment | * The patch is then applied to these environments to be tested in general system use with a more realistic data set. * Conversion must have the patch in order to make use of the latest database objects and to ensure their conversion checks are producing valid results. |
| 4 | Production | * The patch is rolled out to the production system |

For each Oracle Retail patch application, the deployment team will conduct a validation of successful patch application, and update the patch log.

For Operating system, Web Logic Server (WLS) and DB batches the environment build team should keep a separate log to ensure the all environments are on the same patch versions. It is the responsibility of the Functional team to conduct functional testing of the patch to validate that expected results have been achieved before promoting the patch to the next environment.

# Version Upgrade stages

The following points need to be considered before any future version upgrades are implemented -

* Certification upgrade (that is underlying components version should be considered)
* MRP to agree on the upgrade functionalities.
* Separate testing effort should be considered while doing upgrade. The re-test effort for all the functionalities at a high level should be factored.
* Specific time should be allocated in the project plan to upgrade the Oracle retail version.

The below chart is a current design and it may be updated based on the future changes if any.

**Diagram 3: Upgrade stages**

**SIT(Test1)**

**SIT (Test2)**

**UAT**

**PRODUCTION**

**ST**

**DEV2**

**SANDBOX**

### Upgrade stages overview

Stage 1: **SANDBOX** – Validating the upgrade fashion for vanilla/base environment as per oracle standard.

Stage 2: **DEV2** – Upgrading the development environment with MRP requirement.

Stage 3: **ST** - We will validate upgrade in the migrated environment with MRP requirement.

Stage 3: **SIT** - Validating the upgrade with MRP requirement and production dataset.

Stage 4: **SIT internal** – SIT internal is alias name for TEST2 environment and we will perform the same activity as SIT for second exercise.

Stage 5: **UAT** - Validating the upgrade with MRP requirement, production dataset and production structure.

Stage 6: **PROD** – Upgrading the production environment.

# Document Reference

### Environment check list



### Oracle Retail Installation



### Consolidated Environment Detail



# Out of Scope

The below features are out of scope for tech Mahindra to deploy the environment:

* Operating system installation & administration.
* Database & FMW installation
* Backup & restore operation
* Oracle Business Intelligence Enterprise Edition (OBIEE) installation and configuration.