

OBIEE Metadata Repository Deployment Guide
Oracle FLEXCUBE Universal Banking
Release 12.87.06.0.0
[May] [2020]



Table of Contents

1. OBIEE METADATA REPOSITORY DEPLOYMENT GUIDE.....	1-1
1.1 INTRODUCTION.....	1-1
1.1.1 <i>Layers in RPD</i>	1-1
1.1.2 <i>FCUBS OBIEE RPD</i>	1-2
1.2 PREREQUISITES.....	1-2
1.2.1 <i>Hardware / Software Required</i>	1-2
1.3 DEPLOYMENT IN OBIEE 10G.....	1-2
1.3.1 <i>RPD Deployment Steps</i>	1-2
1.3.2 <i>Web Catalog Deployment Steps</i>	1-10
1.3.3 <i>Web Catalog Permissions Changes</i>	1-11
1.4 DEPLOYMENT IN OBIEE 11G.....	1-15
1.4.1 <i>Rpd Connection Changes</i>	1-15
1.4.2 <i>Deploying RPD using Enterprise Manager</i>	1-20
1.5 DEPLOYMENT IN OBIEE 12C.....	1-29
1.5.1 <i>Rpd Connection Changes</i>	1-29
1.5.2 <i>Merge Repositories</i>	1-33
1.5.3 <i>Deploying RPD using putty</i>	1-35

1. OBIEE Metadata Repository Deployment Guide

1.1 Introduction

The Oracle Business Intelligence Server is a stand-alone process that maintains the logical data model which it provides to BI Presentation Services via ODBC. Metadata is maintained for the data model in a local proprietary file called the repository file (rpd). On the back-end, the BI Server connects to customer data stores via data source adaptors.

1.1.1 Layers in RPD

The Physical layer defines the data sources to which Oracle BI Server submits queries and the relationships between physical databases and other data sources that are used to process multiple data source queries. The recommended way to populate the Physical layer is by importing metadata from databases and other data sources. The data sources can be of the same or different varieties. You can import schemas or portions of schemas from existing data sources. Additionally, you can create objects in the Physical layer manually.

When you import metadata, many of the properties of the data sources are configured automatically based on the information gathered during the import process. After import, you can also define other attributes of the physical data sources, such as join relationships, that might not exist in the data source metadata. There can be one or more data sources in the Physical layer, including databases, spreadsheets, and XML documents. In this example, you import and configure tables from the sample SH schema included with the Oracle 10g database.

The Business Model and Mapping layer of the Administration Tool defines the business, or logical, model of the data and specifies the mappings between the business model and the Physical layer schemas. This is where the physical schemas are simplified to form the basis for the users' view of the data. The Business Model and Mapping layer of the Administration Tool can contain one or more business model objects. A business model object contains the business model definitions and the mappings from logical to physical tables for the business model.

The main purpose of the business model is to capture how users think about their business using their own vocabulary. The business model simplifies the physical schema and maps the users' business vocabulary to physical sources. Most of the vocabulary translates into logical columns in the business model. Collections of logical columns form logical tables. Each logical column (and hence each logical table) can have one or more physical objects as sources.

There are two main categories of logical tables: fact and dimension. Logical fact tables contain the measures by which an organization gauges its business operations and performance. Logical dimension tables contain the data used to qualify the facts.

The Presentation layer is built after the Physical layer and Business Model and Mapping layer and adds a level of abstraction over the Business Model and Mapping layer. It is the view of the data seen by end users in client tools and applications, such as Oracle BI Answers. The Presentation layer provides a means to further simplify or customize the Business Model and Mapping layer for end users. For example, you can organize columns into catalogs and folders.

Simplifying the view of the data for users makes it easier to craft queries based on users' business needs because you can expose only the data that is meaningful to the users, organize the data in a way that aligns with the way users think about the data, and rename data as necessary for the set of users.

You typically create Presentation layer objects by dragging objects from the Business Model and Mapping layer. Corresponding objects are automatically created in the Presentation layer. Presentation layer objects can then be renamed and reorganized.

1.1.2 **FCUBS OBIEE RPD**

In FCUBS OBIEE we have module specific RPDs. They are named in the format Module Name.RPD (for example FT.RPD, SI.RPD etc.). In this document we will see how merge all module specific RPDs to FCUBS Metadata RPD. We will also see how to deploy sample dashboards generated using these RPDs.

1.2 **Prerequisites**

1.2.1 **Hardware / Software Required**

Server	Oracle 10G AS 10.1.3.3, OBI 10.1.3.3.1, Oracle 10g client, OBIEE 11.1.1.6.0
Client Workstations	Internet Explorer 6.0, Win2K/Windows XP

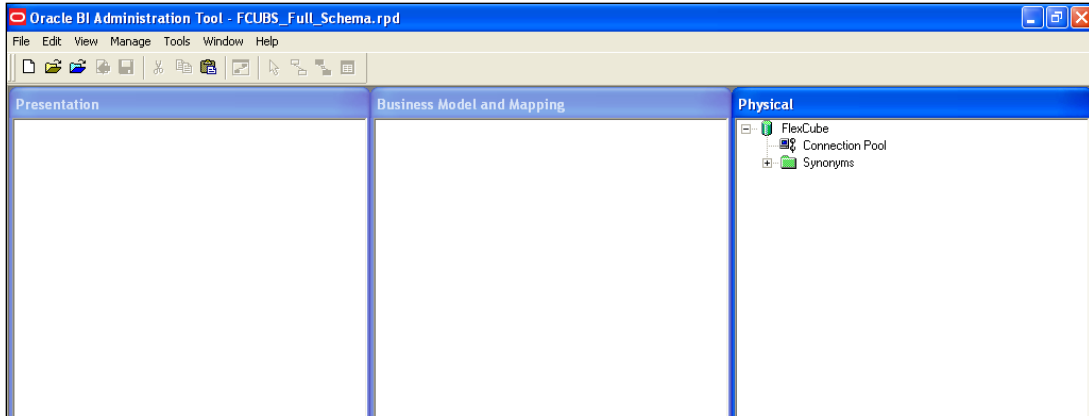
1.3 **Deployment in OBIEE 10g**

There are two major steps in deploying an OBIEE Dashboard, first we need to create the data object metadata (.rpd file) in the OBIEE Administration tool. Then, using the OBIEE Web, we create the Answers based on the .rpd file and assemble them in a Dashboard.

If the OBIEE server is present in Linux machine then merging of module specific repositories should be done using OBIEE Administration Tool installed on Windows machine and the merged repository should be copied from Windows to Linux machine in binary mode.

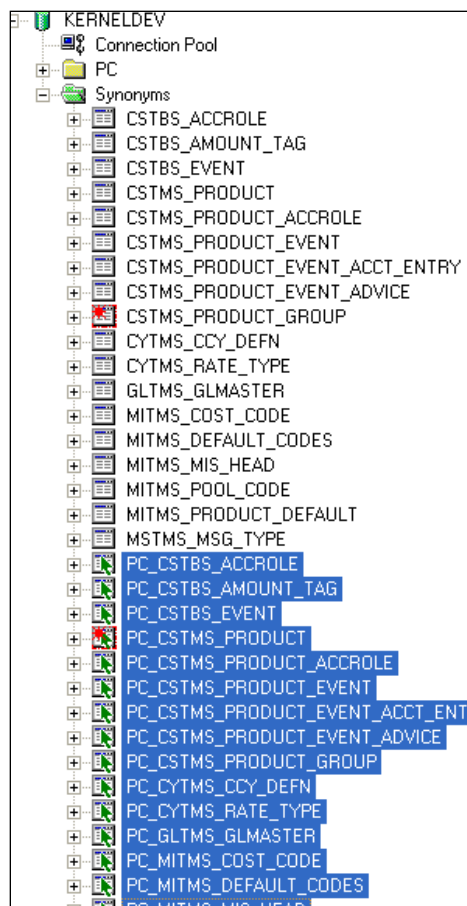
1.3.1 **RPD Deployment Steps:**

1. Open the following shipment media directory for RPD files. For the modules where modularity has been done, the RPDs will be under
 <<ShipmentMedia>>\SOFT\FLEXCUBE_Kernel\<Release_Folder>\MAIN\<<Module Code>>\OBIEE
 For example,
 <<ShipmentMedia>>\SOFT\FLEXCUBE_Kernel\<Release_Folder>\MAIN\BC\OBIEE
 For the modules where modularity has not been done, the RPDs will be under
 <<ShipmentMedia>>\SOFT\FLEXCUBE_Kernel\<Release_Folder>\MAIN\Other_Modules\OBIEE
2. Copy and paste the released .rpd files into local installation directory (D:\OBIEE\RPD). If the released .rpd files already there in the local installation directory overwrite them with the newly released files.
3. Open the FCUBS_Full_Schema.RPD using OBIEE Administration Tool, which will have following tree structure in it.

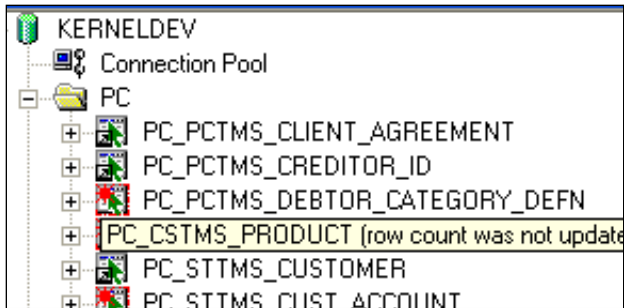


- Open each remaining module specific RPDs (Ex. FT.rpd, PC.rpd, FX.rpd Etc.), one at a time using Administration Tool and do the following. (Username/Password : Administrator/Administrator)

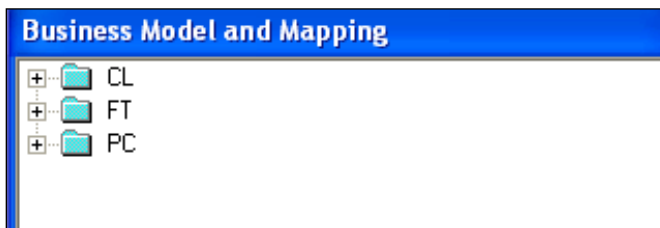
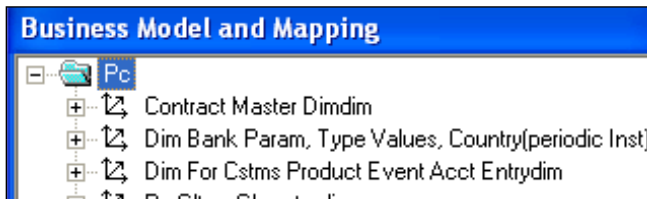
Copy the aliases in the Synonyms folder and paste it to Synonyms folder of 'FCUBS_Full_Schema.RPD'.



- Copy and paste the module specific physical folder to the destination repository under database in the physical layer.



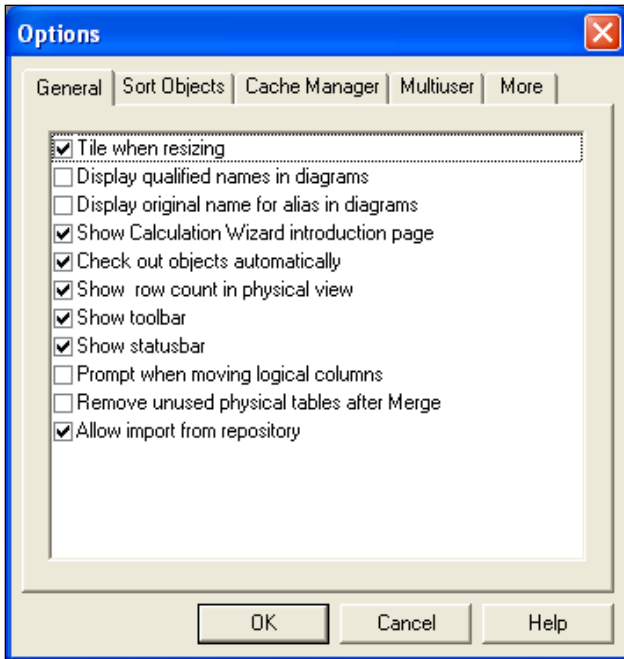
6. Copy and paste the module specific business model to the business model and mapping layer of Full schema repository.



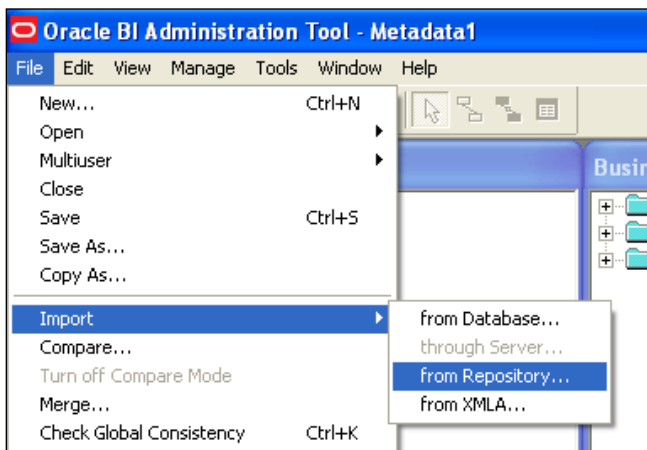
7. Copy and paste the module specific presentation catalog(s) to the presentation layer of Full schema repository.



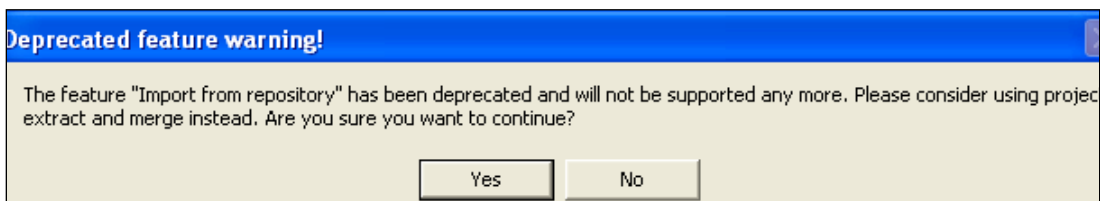
8. Close the repository and continue with other module repositories.
9. Save the Full Schema repository.
10. Import Initialization Blocks and Variables
11. From Full Schema RPD do the following
12. Enable the 'Import from Repository' by checking the option in Tools->Options as follows.



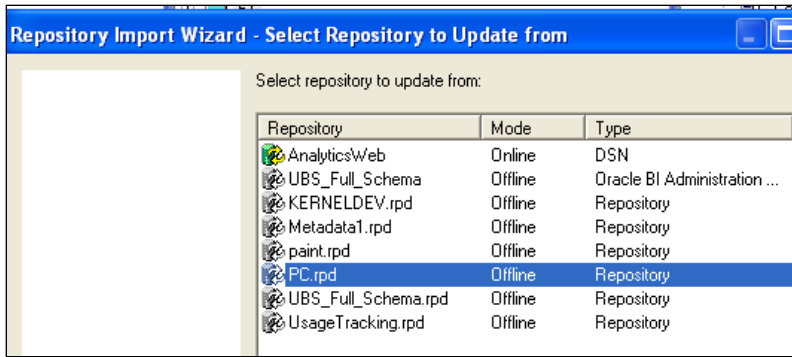
13. Click 'OK' and the following screen is displayed:



14. Ignore the following alert and click 'Yes'.

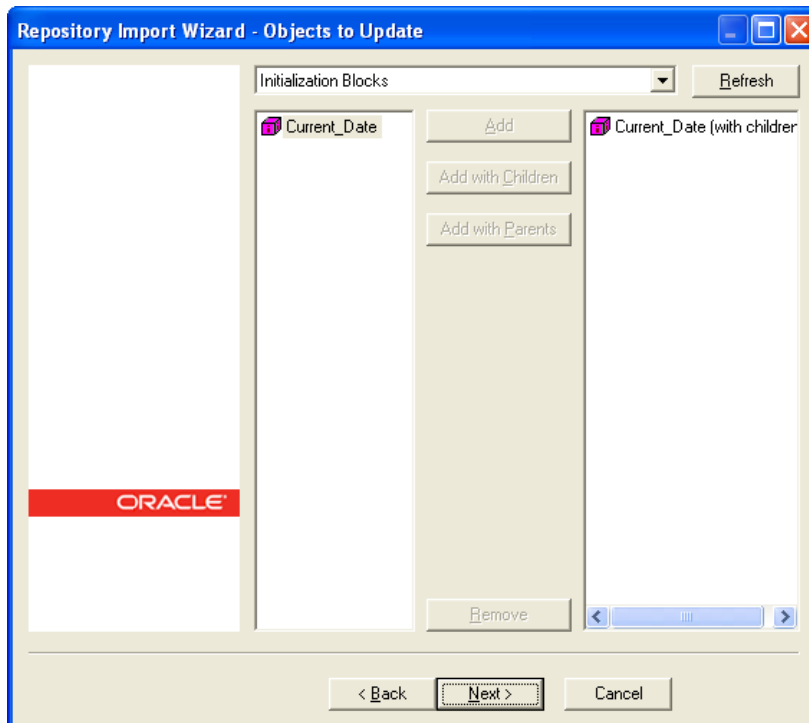


15. Select the module specific source repository from the select repository to update from window as follows:

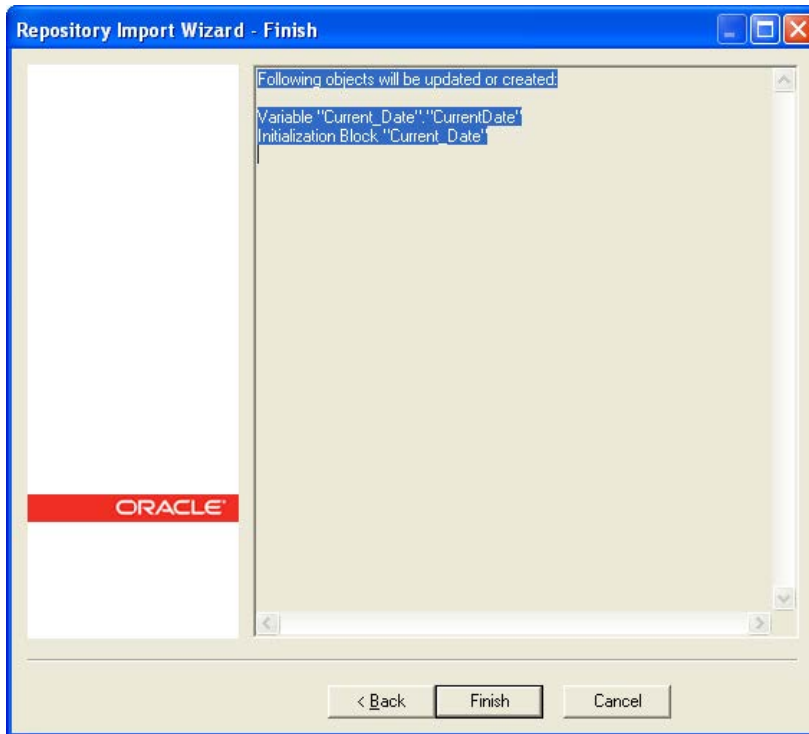


Note: Select Repository to update the list of repositories available in OracleBI\server\Repository only. So, temporarily keep module specific repositories in this location and remove the repositories once this step is completed.

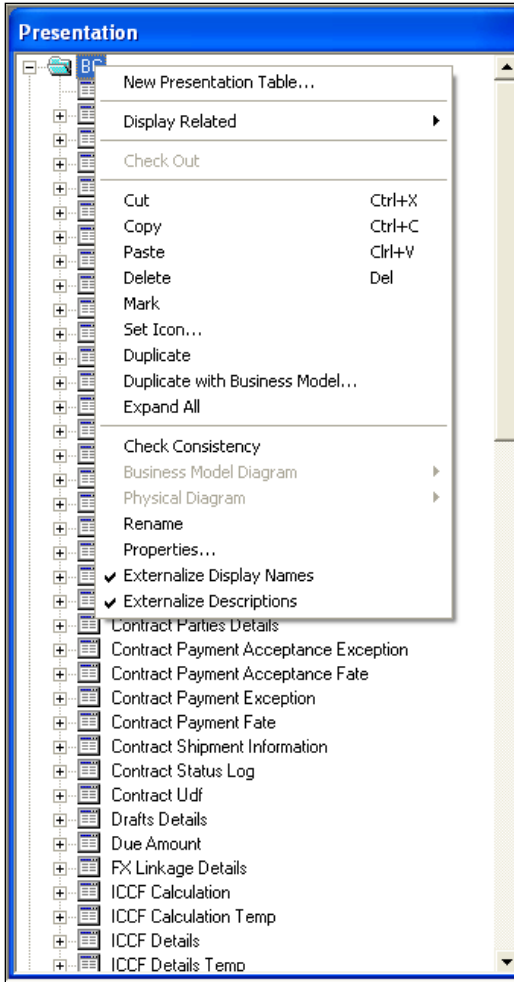
- Click 'Next', will show you the objects needs to be imported. Select 'Initialization Block' from the drop-down menu and click on 'Add with Children'.



- Click 'Next' and click 'Finish'.

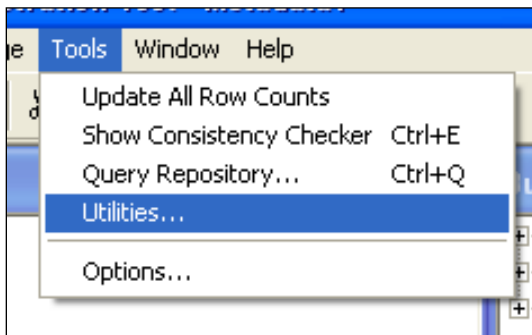


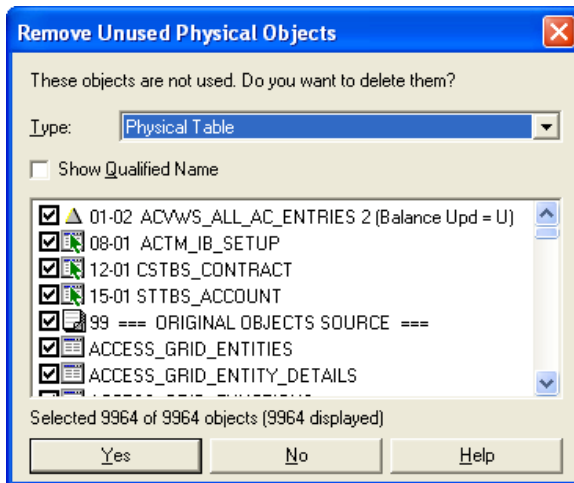
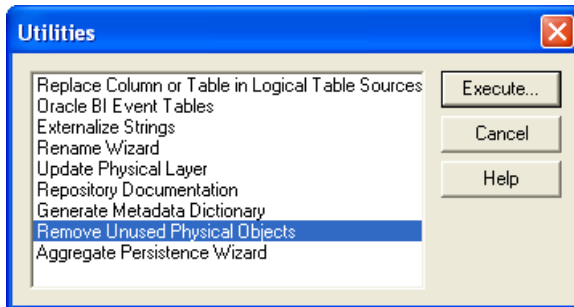
18. If labels need to be NLS enabled, externalize the each presentation catalog as follows.



19. Save the Full Schema repository.

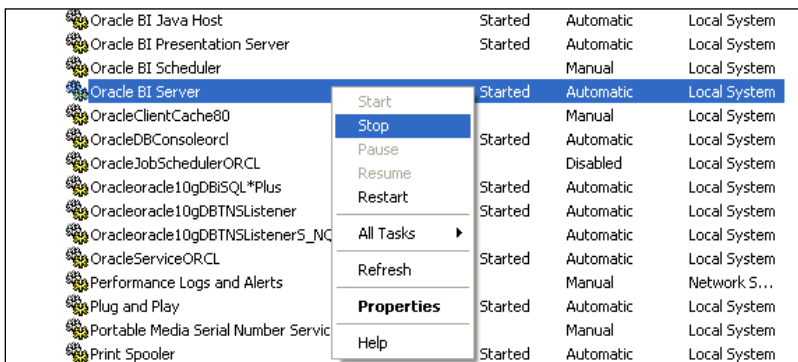
20. Remove Unused Physical Objects as follows:





21. Click 'Yes'

22. Stop the Oracle BI Server & Oracle BI Presentation server services from services window.



23. If server is present in Linux then go to <InstallDrive>/OracleBI/setup folder and execute the following command to stop BI Server and BI Presentation Server.

```
./run-sa.sh stop
```

```
./run-saw.sh stop
```

24. Rename the repository to FlexCube.rpd and put in following location:

```
OracleBI\server\Repository
```

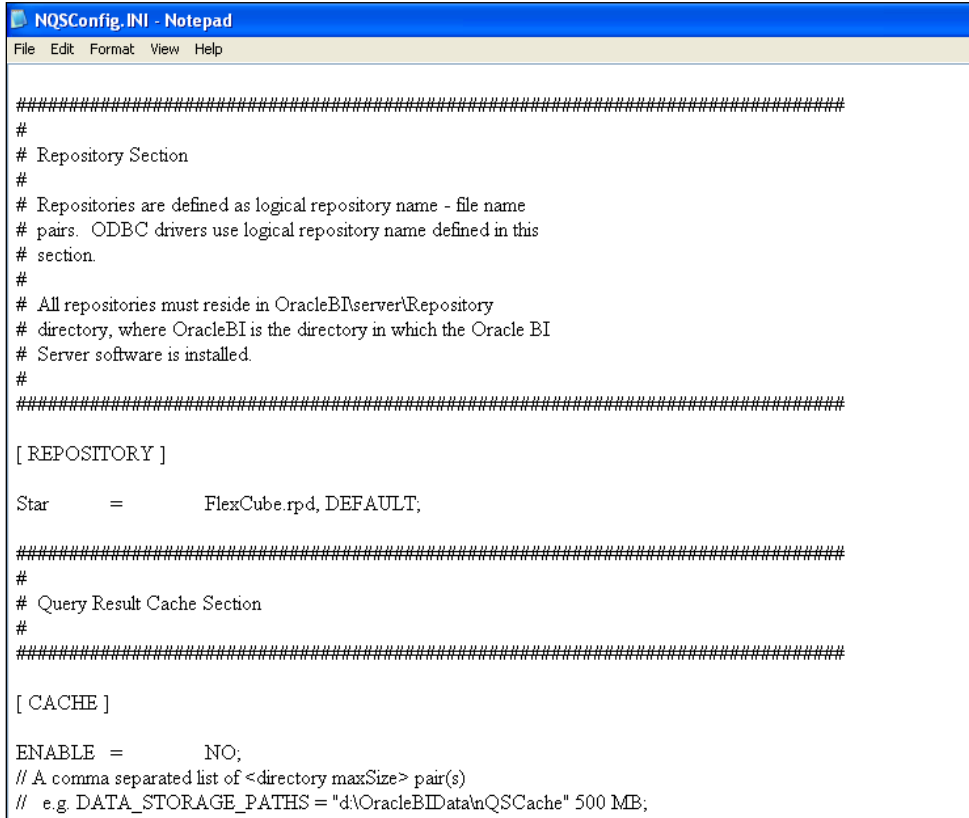
If Server is present in Linux machine then copy FlexCube.rpd in binary mode to:

```
<OracleBI InstallDir>\server\Repository
```

25. Open OracleBI\server\config\NQSConfig.INI and change the property as below:

Star=FlexCube.rpd, DEFAULT;

Under CACHE set ENABLE = NO



```
#####
#
# Repository Section
#
# Repositories are defined as logical repository name - file name
# pairs. ODBC drivers use logical repository name defined in this
# section.
#
# All repositories must reside in OracleBIserver\Repository
# directory, where OracleBI is the directory in which the Oracle BI
# Server software is installed.
#
#####

[ REPOSITORY ]

Star      =      FlexCube.rpd, DEFAULT;

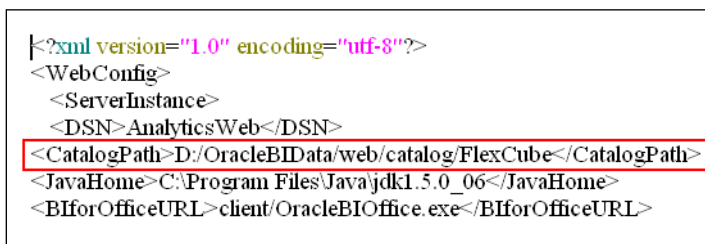
#####
#
# Query Result Cache Section
#
#####

[ CACHE ]

ENABLE =      NO;
// A comma separated list of <directory maxSize> pair(s)
// e.g. DATA_STORAGE_PATHS = "d:\OracleBIData\NQSCache" 500 MB;
```

1.3.2 Web Catalog Deployment Steps

In OracleBIData\web\catalog create a folder called 'FlexCube'. Change catalog path in OracleBIData\web\config\instanceconfig.xml to point to FlexCube as follows.

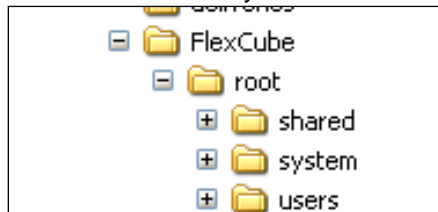


```
<?xml version="1.0" encoding="utf-8"?>
<WebConfig>
  <ServerInstance>
    <DSN>AnalyticsWeb</DSN>
    <CatalogPath>D:/OracleBIData/web/catalog/FlexCube</CatalogPath>
    <JavaHome>C:\Program Files\Java\jdk1.5.0_06</JavaHome>
    <BIforOfficeURL>client/OracleBIOffice.exe</BIforOfficeURL>
```

1. Restart the presentation services.

Oracle BI Cluster Controller			Manual	Local S
Oracle BI Java Host	Started		Automatic	Local S
Oracle BI Presentation Server	Started		Automatic	Local S
Oracle BI Scheduler			Manual	Local S
Oracle BI Server	Started		Automatic	Local S
OracleClientCache80			Manual	Local S
OracleDBConsoleorcl	Started		Automatic	Local S
OracleJobSchedulerORCL			Disabled	Local S
Oracleoracle10gDBISQL*Plus	Started		Automatic	Local S
Oracleoracle10gDBTNSListener	Started		Automatic	Local S
Oracleoracle10gDBTNSListener5_NQ_SCHED			Automatic	Local S
Oracleoracleas1ASControl	Started		Automatic	Local S
Oracleoracleas1ProcessManager	Started		Automatic	Local S
OracleServiceORCL	Started		Automatic	Local S

- If server is present in Linux then go to <InstallDrive>/OracleBI/setup folder and execute the following command to start BI Presentation Server.
./run-saw.sh start
- You will see directory created in following structure in OracleBIData\web\catalog.

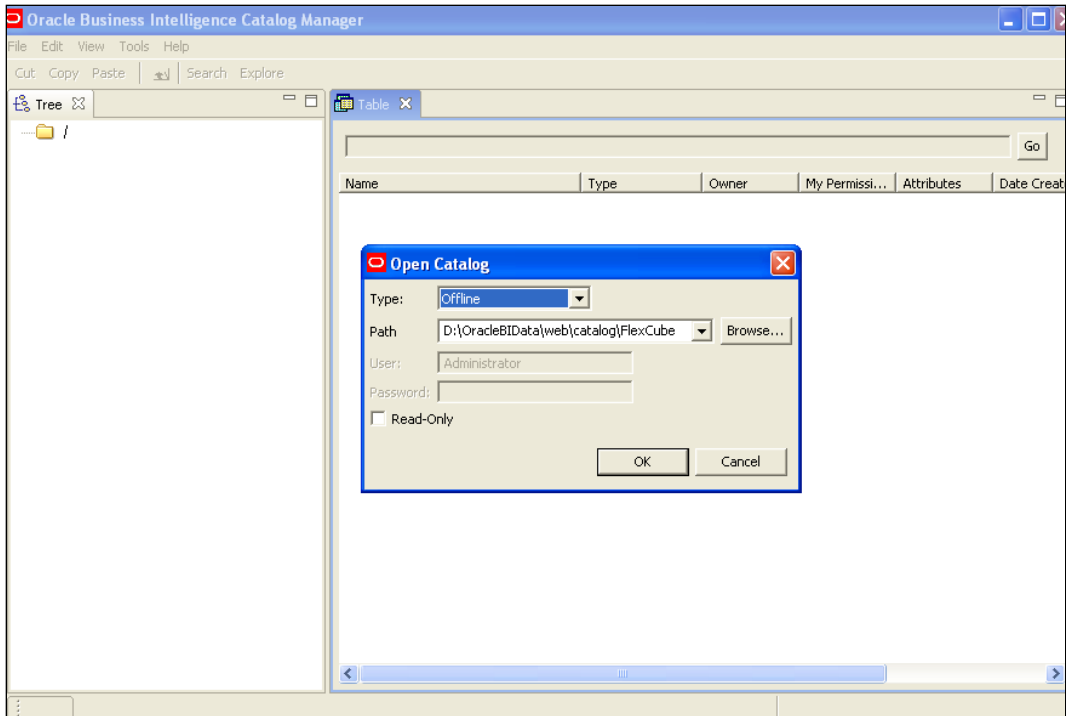


- Open the following shipment media directory for Web catalogs.
<<Shipment Media>>\SOFT\FLEXCUBE_Kernel\<Release_Folder>\<<Module Code>>\OBIEE
- Copy and paste the released .zip files into local directory (D:\OBIEE\WebCatalog). Overwrite with released files, if files already exist.
- Extract all the zip files.
- Copy and paste the extracted files (Except .xml files) into OracleBIData\web\catalog\FlexCube\root\shared

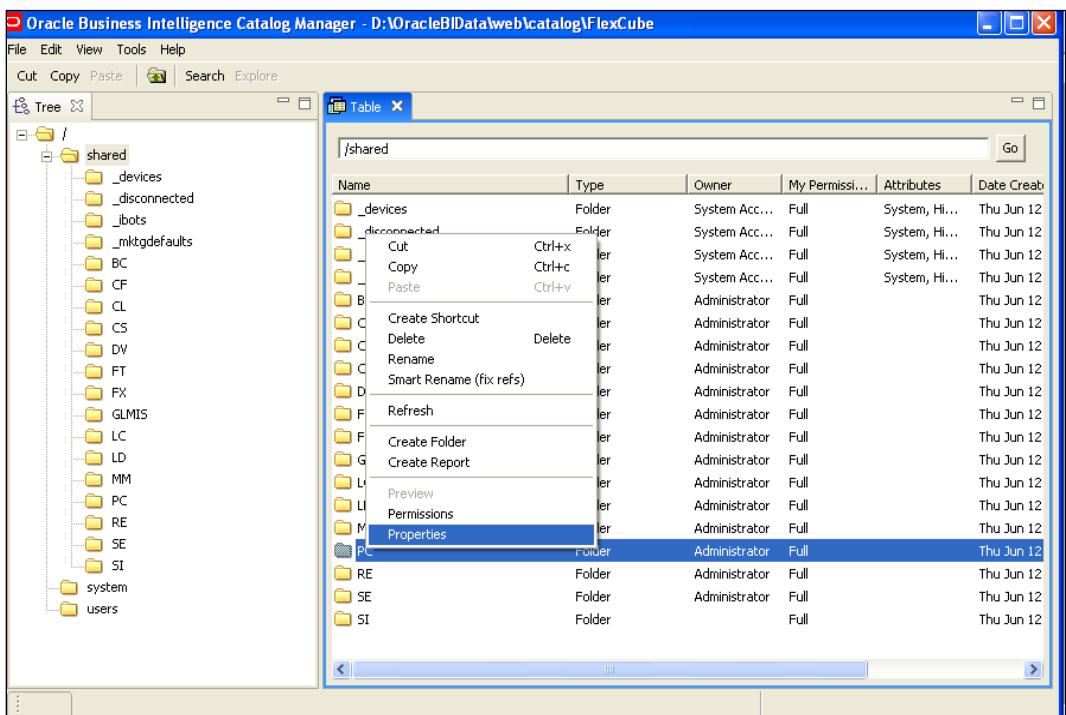
Copy and paste the .xml files into OracleBI\web\msgdb\customMessages.

1.3.3 Web Catalog Permissions Changes

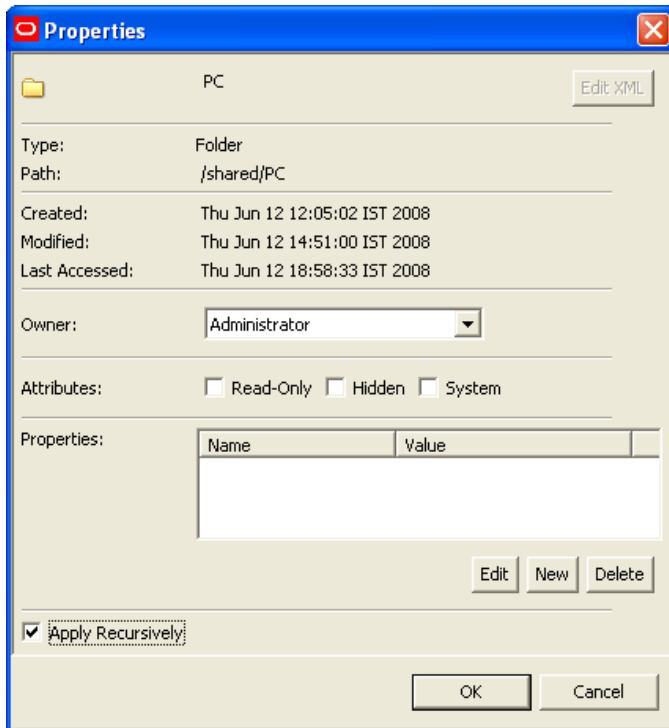
- Once all the module specific web catalogs are extracted to the above location, use catalog manager to change the permissions of all presentation objects. This is required if the user wants to edit the saved answers and dashboard.



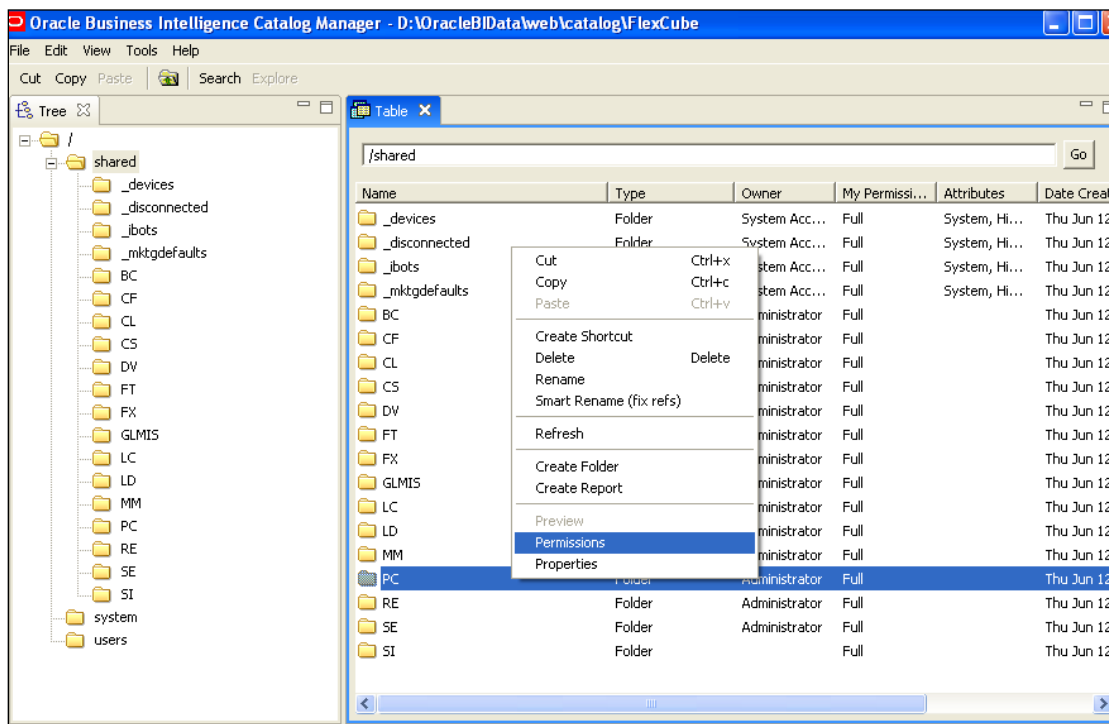
- Open FlexCube catalog in the offline mode as shown above and change the permissions as shown below.
- Select each module folder and right-click and select 'Properties' – Select the owner as 'Administrator' and Check the 'Apply Recursively' enabled as follows:



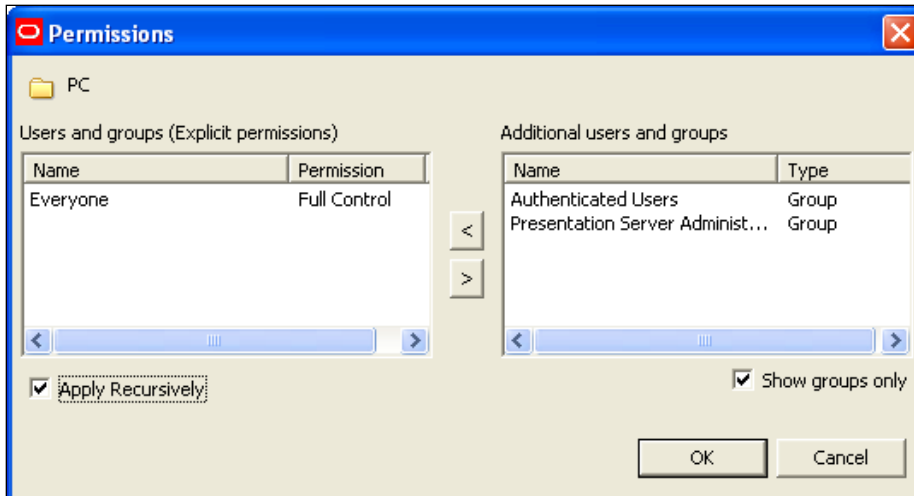
- Select 'Properties' and the following screen appears:



Again, select the folder, right-click and select 'Permissions'.



- Change the permissions by selecting the 'Everyone' in left and change the permission to 'Full Control' and Check the 'Apply Recursively' enabled like below:



If the server is present in Linux Machine then zip the catalogs which are present in

OracleBIData\web\catalog\FlexCube\root\shared

Except the default folders (ie _devices, _disconnected, _ibots, _mktgdefaults and the corresponding .atr files) from windows and copy it to

OracleBIData\web\catalog\FlexCube\root\shared in Linux machine

- Once all the above steps done, start the Oracle BI Server, Oracle BI Presentation Server services from Services window.

If server is present in Linux then go to <InstallDrive>/OracleBI/setup folder and execute the following command to start BI Server and BI Presentation Server.

```
./run-sa.sh start
```

```
./run-saw.sh start
```

- Start OC4J from Programs->Oracle Business Intelligence->Start OC4J

In Linux go to <InstallDrive>/OracleBI/oc4j_bi/bin and execute the following commands to restart the OC4J

```
oc4j -stop
```

```
oc4j -start
```

- Login to Presentation services from Programs->Oracle Business Intelligence->Presentation Services.

- Enable 'Write Back option to Database' by going to:

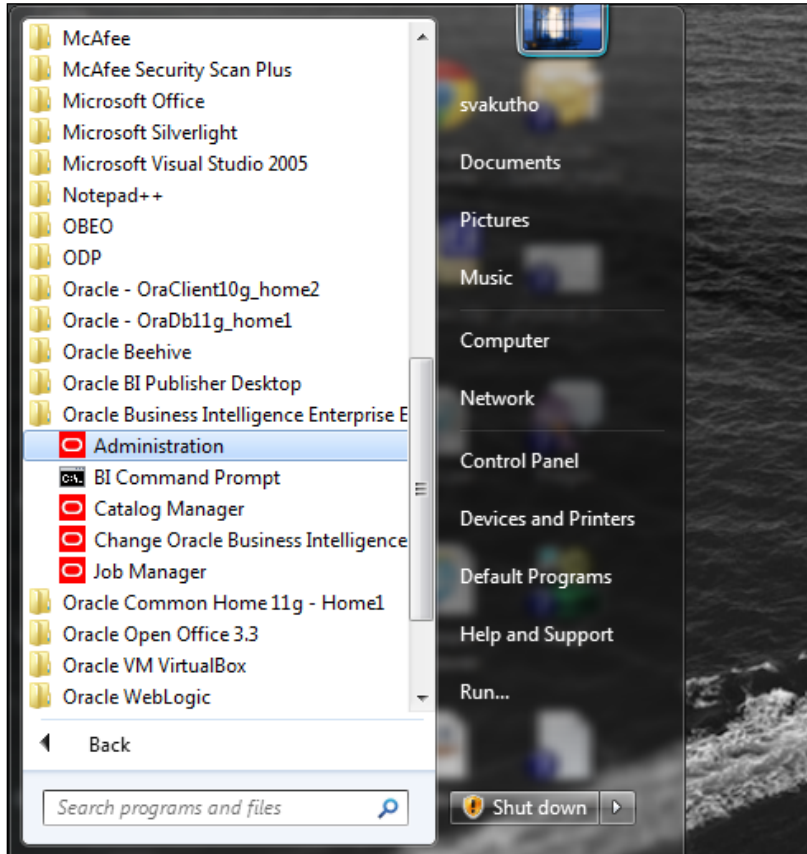
Settings->Administration->Manage Privileges->Write Back to Database

- Provide privilege for Presentation Service Administrator.

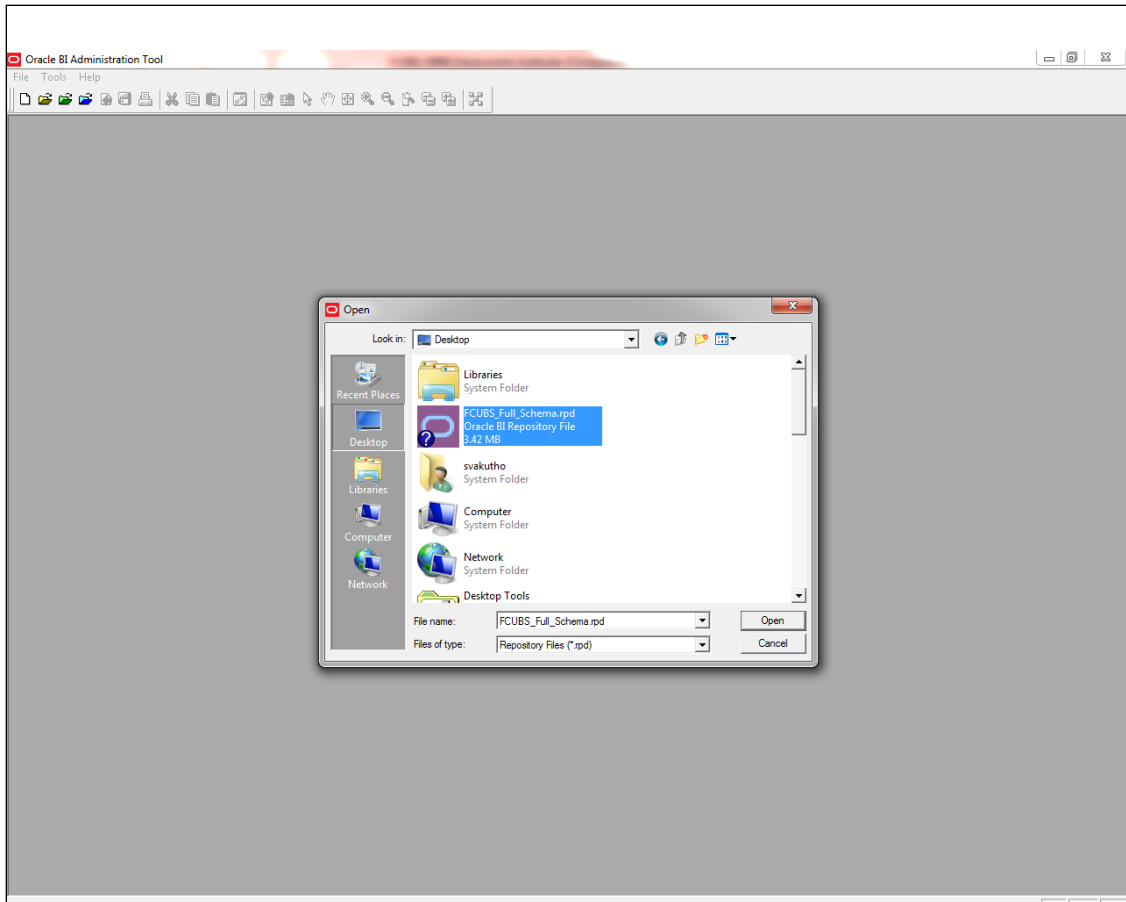
1.4 Deployment in OBIEE 11g

1.4.1 Rpd Connection Changes

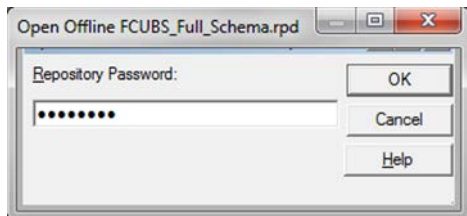
1. Open 'OBIEE Administration tool'.



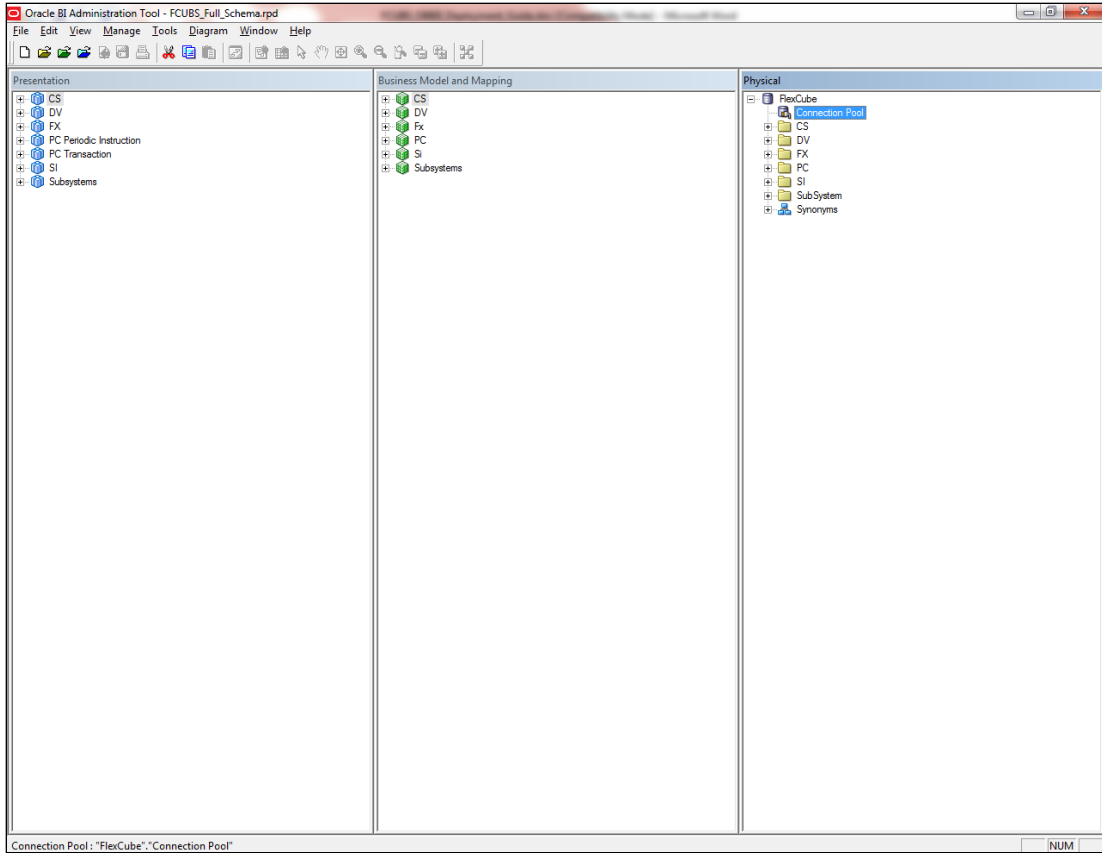
2. Open rpd in the offline mode.



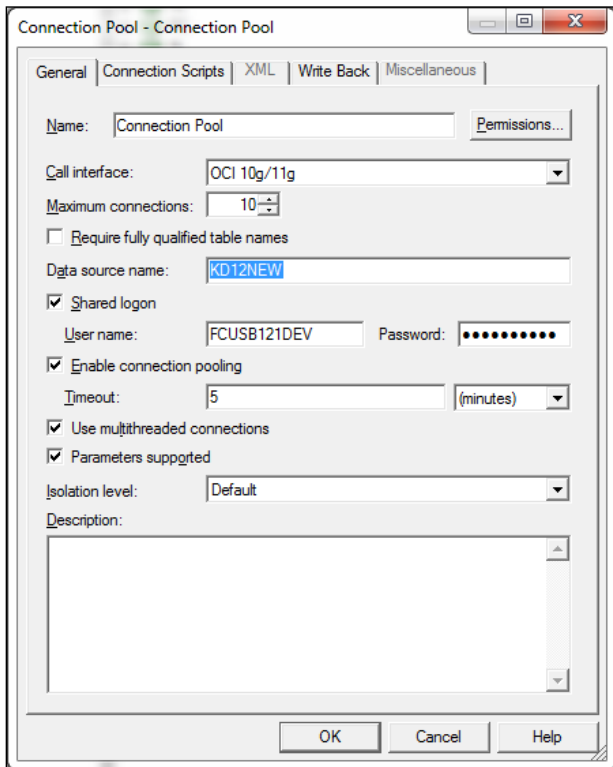
3. Enter the Password: Admin123 and click 'OK'.



4. Double-click on connection pool.

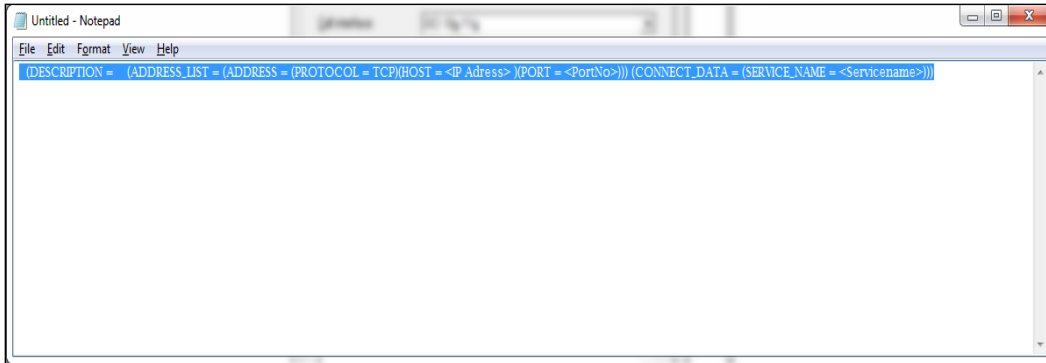


5. Change the Data source name.

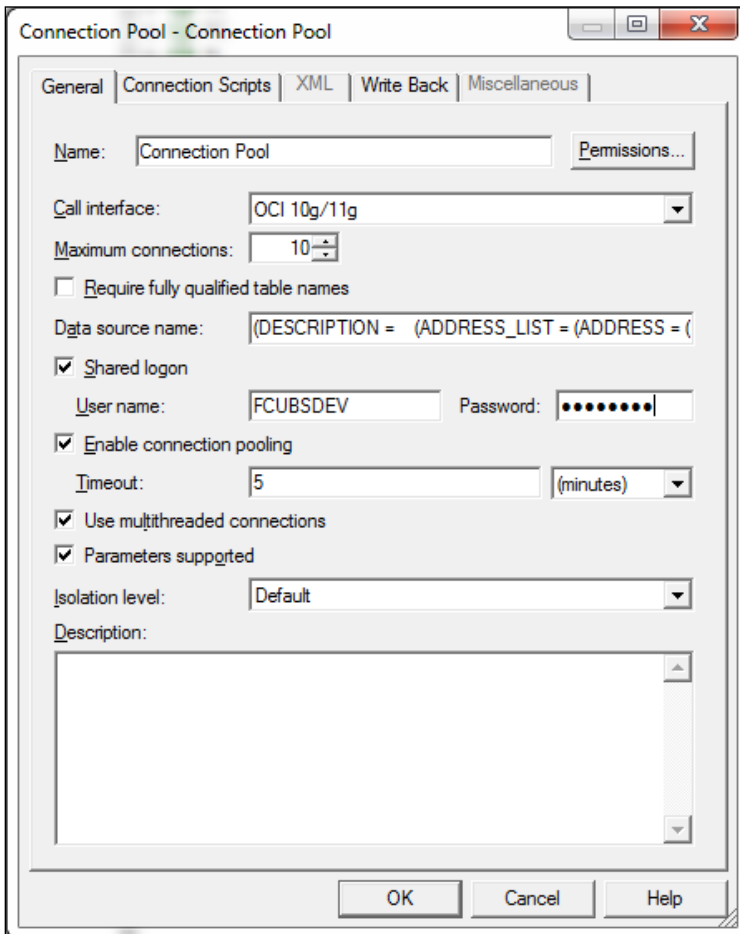


Change Data source name for the marked info given in the below format:

(DESCRIPTION = (ADDRESS_LIST = (ADDRESS = (PROTOCOL = TCP)(HOST = <Host Address>)(PORT = <Port>)))(CONNECT_DATA = (SERVICE_NAME = <Servicename>))



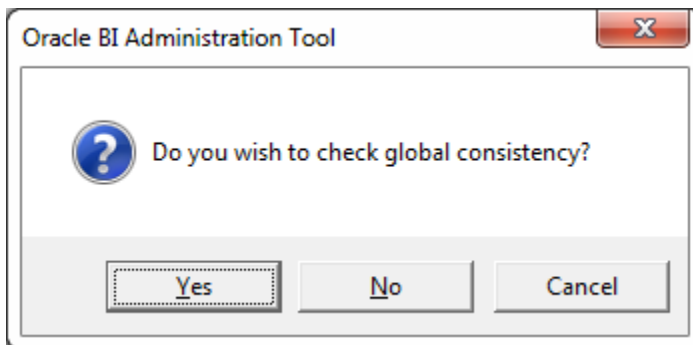
6. Enter the User ID and Password and click OK. Again, enter the same password when it prompts. Save the Rpd changes.



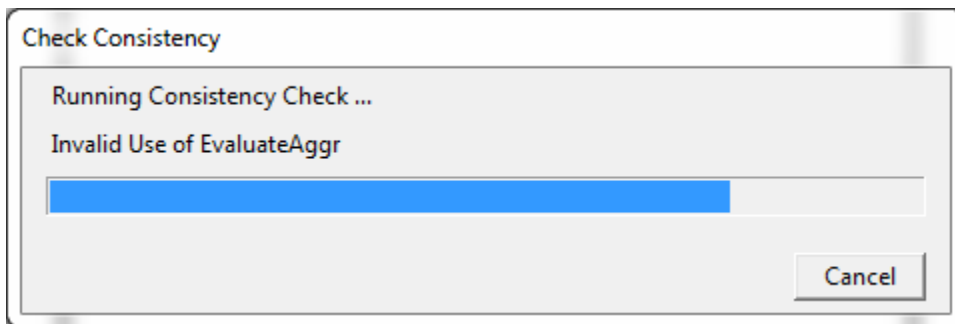
7. Click 'OK' and the following screen is displayed:



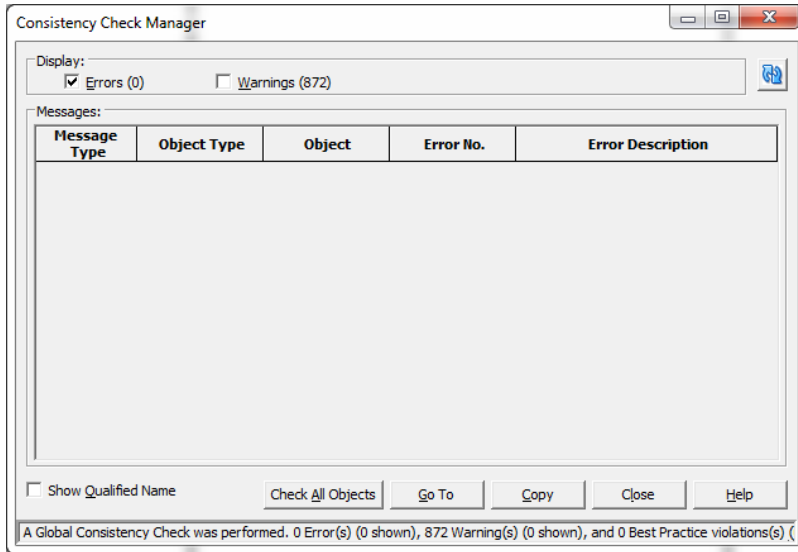
8. Click 'OK' and the following screen is displayed:



9. Click 'Yes'.



10. Click 'Close' in below window.



1.4.2 Deploying RPD using Enterprise Manager

1. Login to OBIEE Enterprise Manager using OBIEE Admin User ID and Password.

Oracle Enterprise Manager 11g
Fusion Middleware Control

11g

Login to Oracle Fusion Middleware Control

Form: Farm_bifoundation_domain

* User Name:

* Password:

Enhanced User Experience

- Menu Based Navigation
Finding a feature in Enterprise Manager is now easy with menus. Well-designed menu navigation makes the product easy to learn and remember.
- Interactive Correlation Charts
- Dynamic Context Menu
- Context Sensitive Help

New Features

- SOA Management
You can manage, monitor and diagnose the SOA infrastructure, as well as the composite applications you deploy. You can configure service engines such as EPL, Mediator, Human Work Flow and can deploy and manage SCA composite applications.
- Identity Management
- WebCenter Management
- Complete Security and Audit Management
- Configure Logging and Search Log Files

Did you know...

Manage SOA/MDS/ADF Applications
You can deploy and manage SOA, MDS, ADF and Java EE applications. The rich set of metrics and monitoring information allows you to proactively manage the health of the application and diagnose performance bottlenecks.

Copyright © 1996, 2011, Oracle. All rights reserved.
Oracle is a registered trademark of Oracle Corporation and/or its affiliates.
Other names may be trademarks of their respective owners.

100%

2. Click on core application under Business Intelligence Folder as shown.

The screenshot displays the Oracle Enterprise Manager 11g Fusion Middleware Control interface. The left-hand navigation pane shows the hierarchy: Farm_bifoundation_domain > Application Deployments > WebLogic Domain > Business Intelligence > coreapplication. A green circle highlights the 'coreapplication' in this tree. The main content area shows the 'Deployments' view for the selected application, with a green circle highlighting the 'coreapplication' status indicator (Up (23)). Below this, a table lists various application deployments with their status and target.

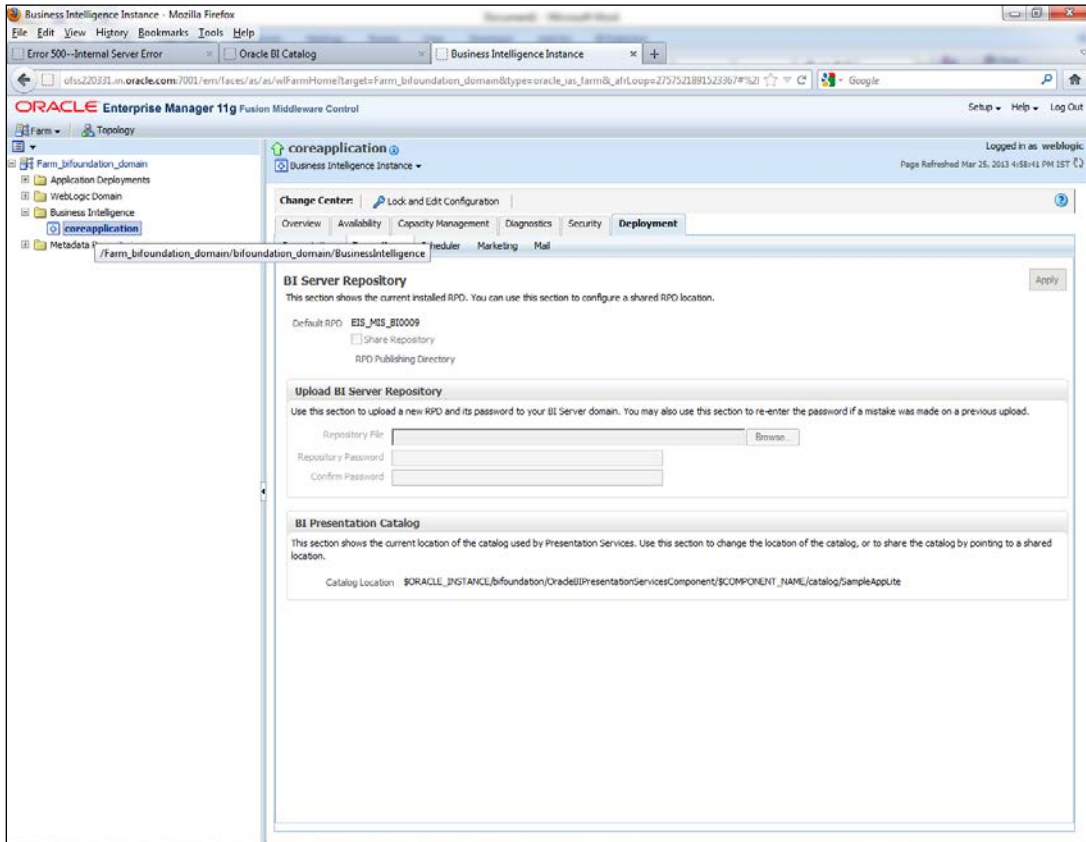
Name	Status	Target
Application Deployments		
Internal Applications		
adminservice(11.1.1)	Up	bi_cluster
analytics(11.1.1)	Up	bi_cluster
analytics(11.1.1)	Up	bi_server 1
biadminutils(11.1.1)	Up	AdminServer
bicontentserver(11.1.1)	Up	bi_cluster
bicontentserver(11.1.1)	Up	bi_server 1
bilocadmin(11.1.1)	Up	bi_cluster
bilocadmin(11.1.1)	Up	bi_server 1
bmiddleware(11.1.1)	Up	bi_cluster
bmiddleware(11.1.1)	Up	bi_server 1
bioffice(11.1.1)	Up	bi_cluster
bioffice(11.1.1)	Up	bi_server 1
biofficedient(11.1.1)	Up	bi_cluster
biofficedient(11.1.1)	Up	bi_server 1
bipublisher(11.1.1)	Up	bi_cluster
bipublisher(11.1.1)	Up	bi_server 1
bsearch(11.1.1)	Up	bi_cluster
bsearch(11.1.1)	Up	bi_server 1
ESSAPP	Up	bi_server 1
ESSAPP	Up	bi_server 1
mapviewer(11.1.1)	Up	bi_server 1
mapviewer(11.1.1)	Up	bi_server 1
OracleRTN(11.1.1)	Up	bi_server 1

The right-hand pane shows the 'Fusion Middleware' view, with a green circle highlighting the 'coreapplication' status indicator (Up (3)). Below this, a table lists the components of the Fusion Middleware stack, including the WebLogic Domain, AdminServer, and various clusters and servers.

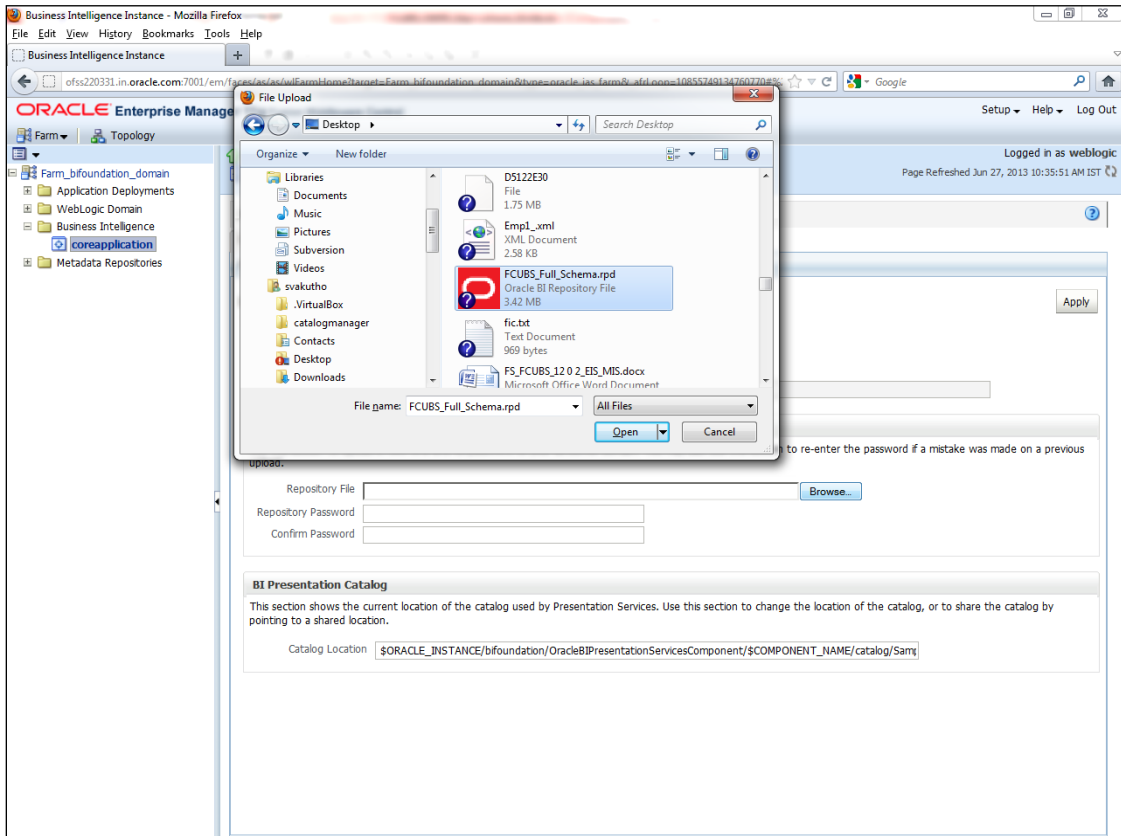
Name	Status	Host	CPU Usage (%)
WebLogic Domain			
bifoundation_domain	Up	ofss220331.in.oracle	0.22
AdminServer	Up	ofss220331.in.oracle	0.29
bi_cluster	Up		
bi_server 1	Up	ofss220331.in.oracle	0.29
Business Intelligence	Up		
coreapplication	Up		
Metadata Repositories			
mds-ovsm	Up	ofss220331.in.oracle	

The bottom right pane shows the 'Farm Resource Center' with links to documentation and forums.

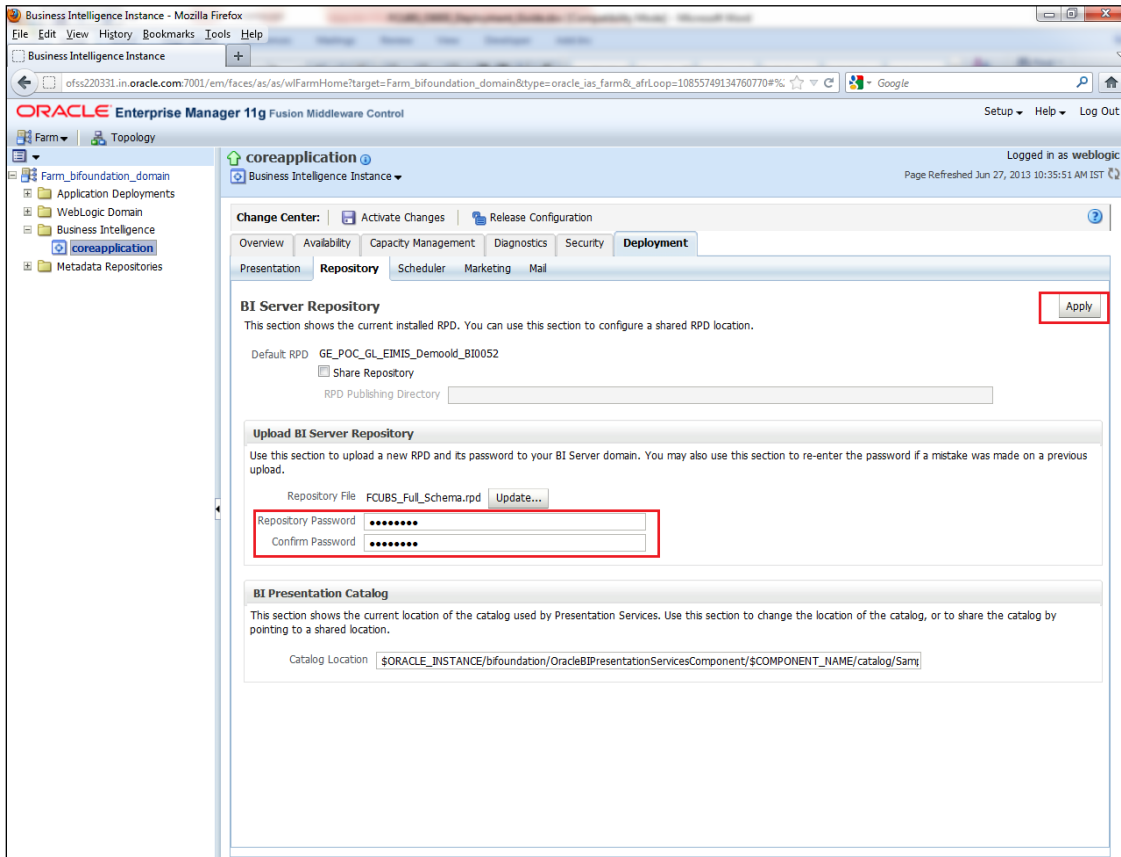
3. Click on Lock and Edit and go to Deployment Tab.



4. Click on Browse and select the Rpd to make it online.



5. Enter the Repository password and Confirm Password as Admin123/Admin123.



6. Click 'Apply'.
7. Click 'Activate Changes'.

Business Intelligence Instance - Mozilla Firefox
ofs:220331.in.oracle.com:7001/em/faces/as/wiFarmHome?target=Farm_bifoundation_domain&type=oracle_ias_farm&_afrcLoop=10855749134760770#%# Google

ORACLE Enterprise Manager 11g Fusion Middleware Control Setup Help Log Out

coreapplication Business Intelligence Instance
Logged in as weblogic
Page Refreshed Jun 27, 2013 10:35:51 AM IST

Change Center: **Activate Changes** Release Configuration

Overview Availability Capacity Management Diagnostics Security **Deployment**

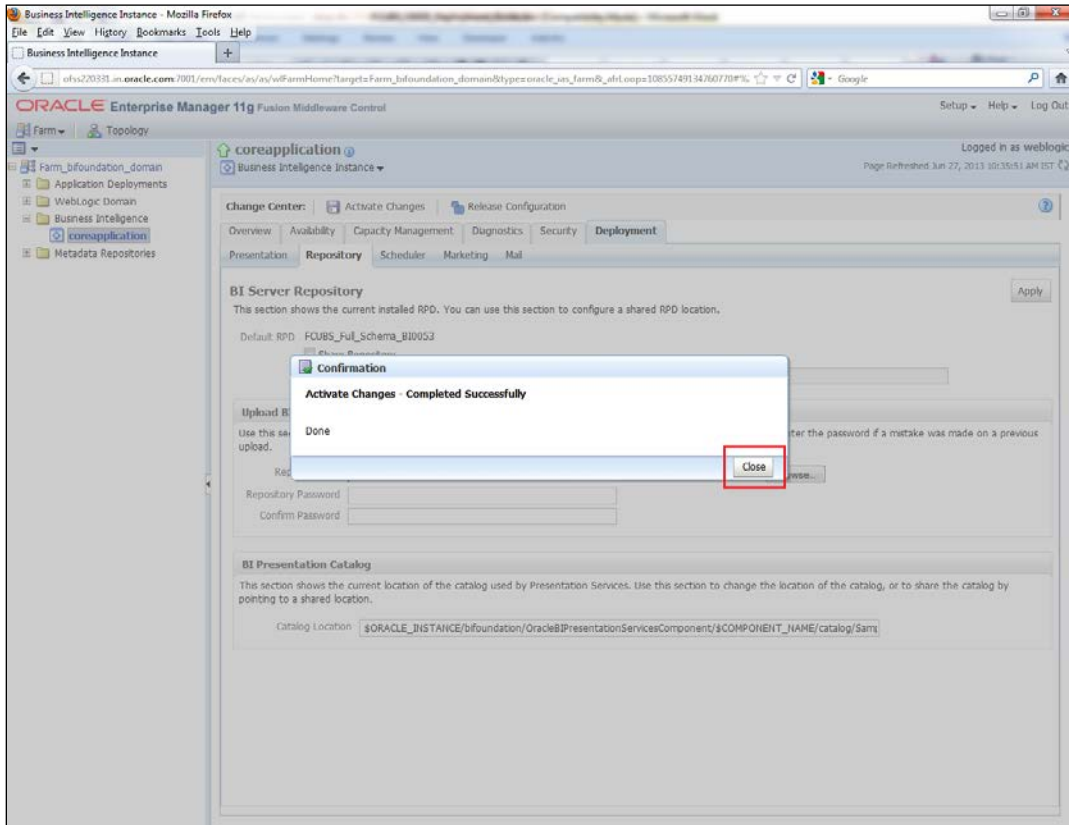
Presentation **Repository** Scheduler Marketing Mail

BI Server Repository Apply
This section shows the current installed RPD. You can use this section to configure a shared RPD location.
Default RPD: FCUBS_Full_Schema_BI0053
 Share Repository
RPD Publishing Directory:

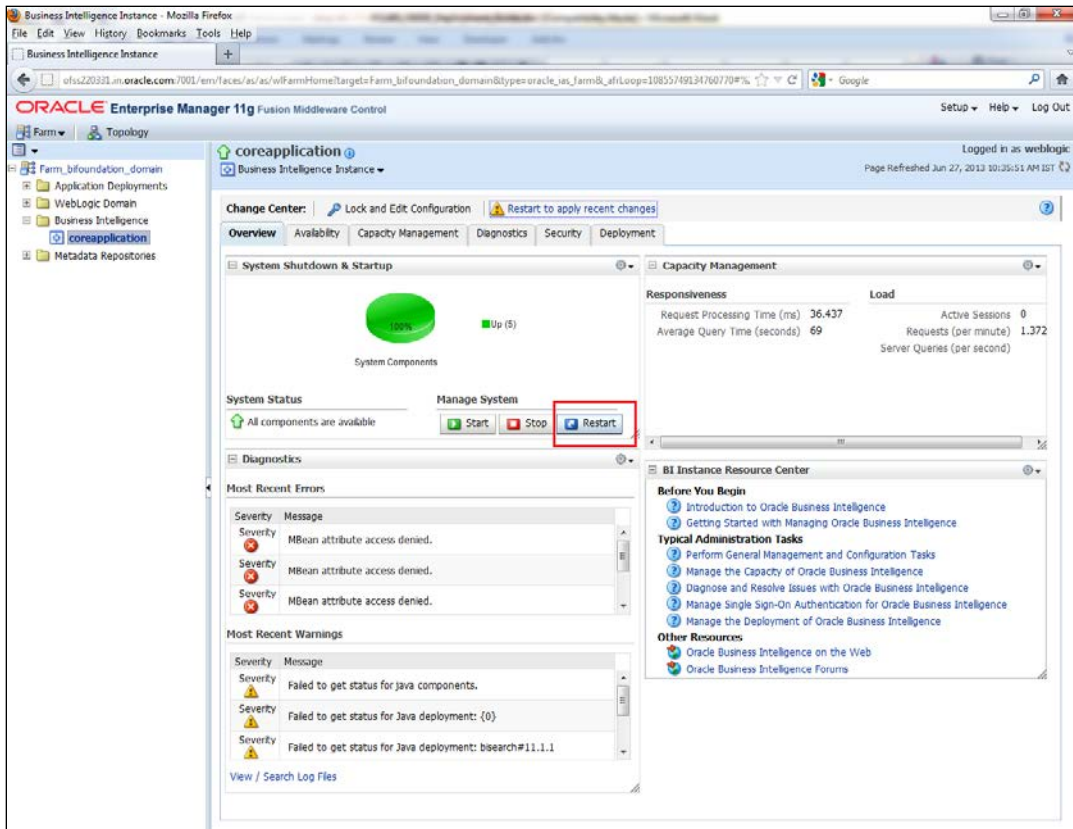
Upload BI Server Repository
Use this section to upload a new RPD and its password to your BI Server domain. You may also use this section to re-enter the password if a mistake was made on a previous upload.
Repository File: Browse...
Repository Password:
Confirm Password:

BI Presentation Catalog
This section shows the current location of the catalog used by Presentation Services. Use this section to change the location of the catalog, or to share the catalog by pointing to a shared location.
Catalog Location:

8. Let the below process to complete and click 'Close'.



9. Click 'Restart' the instance to take the effect of changes.

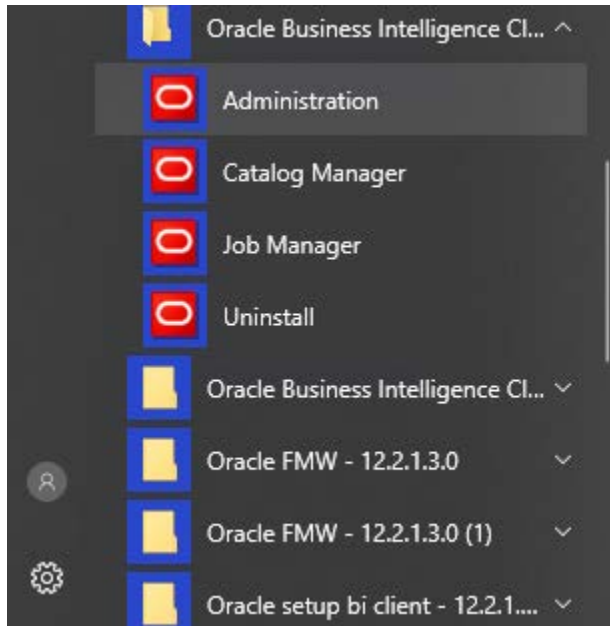


This completes the deployment.

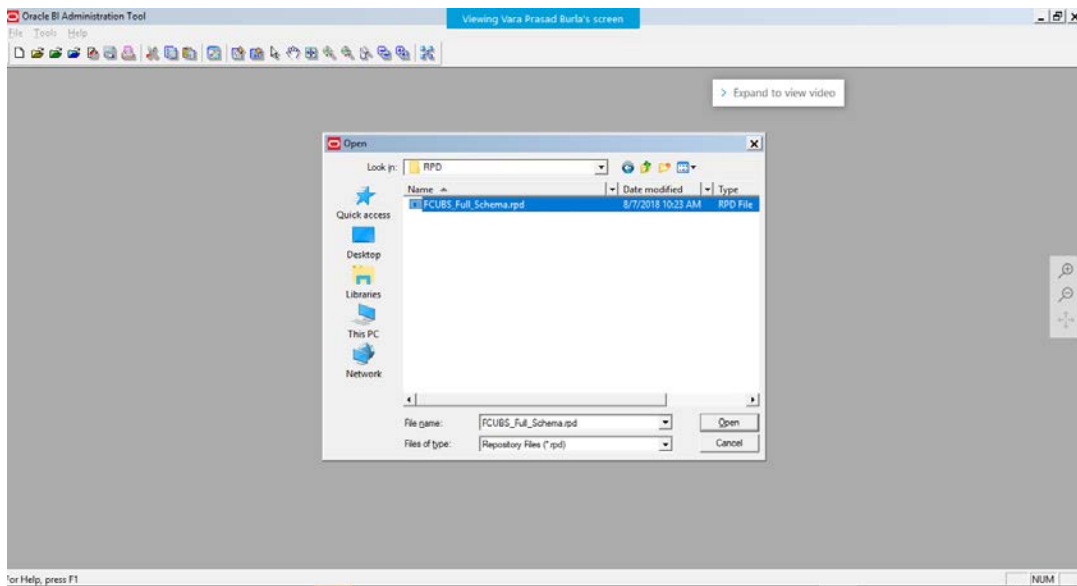
1.5 Deployment in OBIEE 12c

1.5.1 Rpd Connection Changes

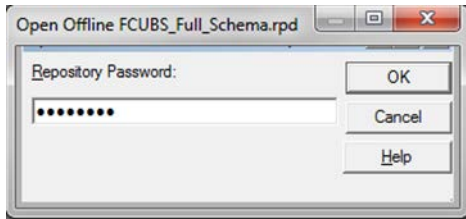
1. Open OBIEE 'Administration' tool.



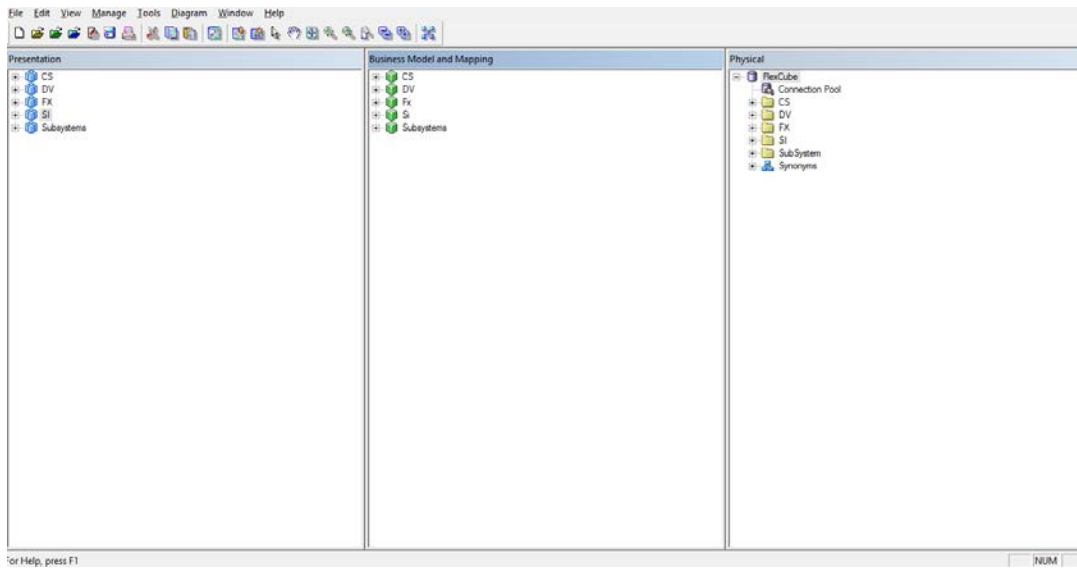
2. Open rpd in the offline mode.



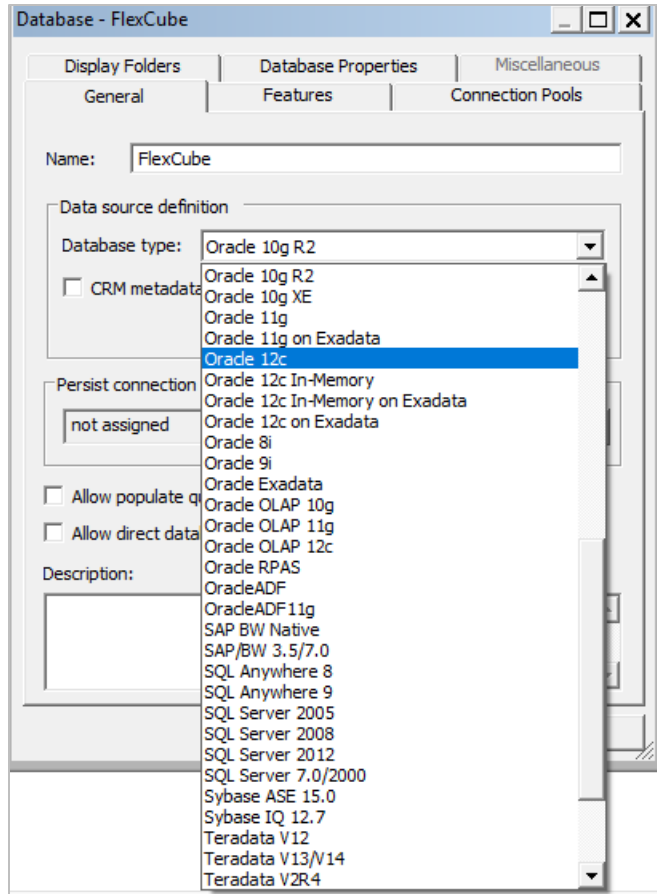
3. Enter the password as Admin123 and click 'OK'.



4. Double-click on the Flexcube in the physical layer present on the right. It opens the database properties.



5. In the Database Properties, change the Database Type to 'Oracle12c'.

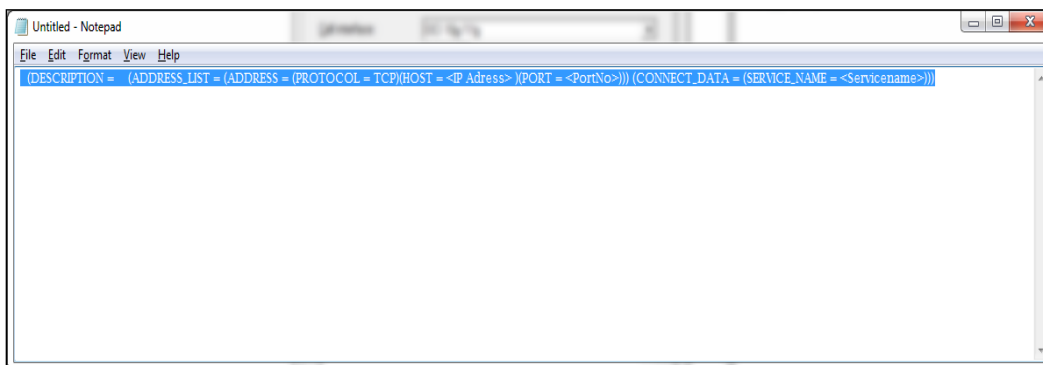


1. Change Data source name for the marked info given in the below format:

(DESCRIPTION = (ADDRESS_LIST = (ADDRESS = (PROTOCOL = TCP)(HOST = <Host Address>)(PORT = <Port>)))(CONNECT_DATA = (SERVICE_NAME = <Servicename>)))

Eg:

(DESCRIPTION=(ADDRESS_LIST =(ADDRESS = (PROTOCOL = TCP)(HOST = whf00brs.in.oracle.com)(PORT = 1522)))(CONNECT_DATA =(SERVICE_NAME = FC142DEVpdb2)))



2. Enter the User ID and password and click OK. Again enter the same password when it prompts. Save the Rpd changes.

Connection Pool - Connection Pool

General | Connection Scripts | XML | Write Back | Miscellaneous

Name:

Call interface:

Maximum connections:

Require fully qualified table names

Data source name:

Shared logon

User name: Password:

Enable connection pooling

Timeout: (minutes)

Use multithreaded connections

Parameters supported

Isolation level:

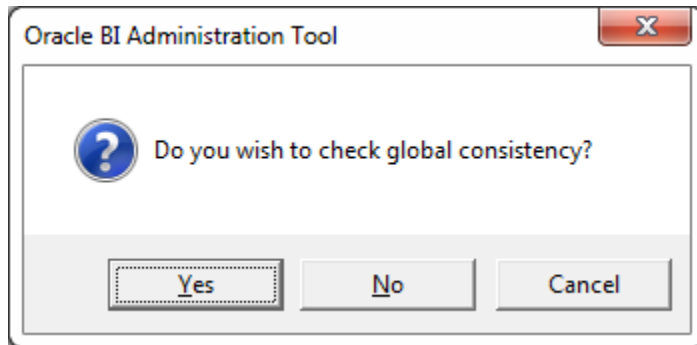
Description:

3. Click 'OK' and the following screen is displayed:

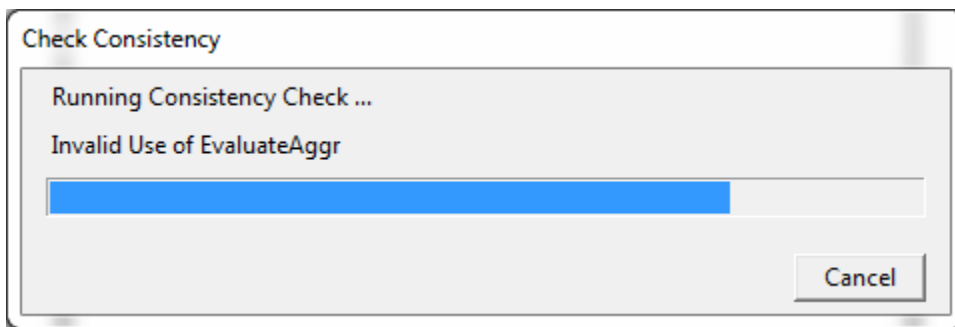
Confirm Password

Password:

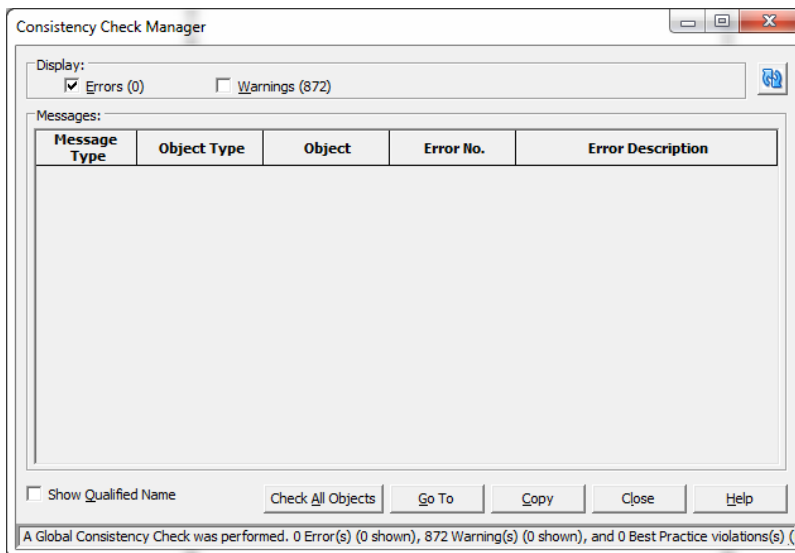
- Click 'OK' and the following screen is displayed:



- Click 'Yes'.



- Click 'Close' in below window.



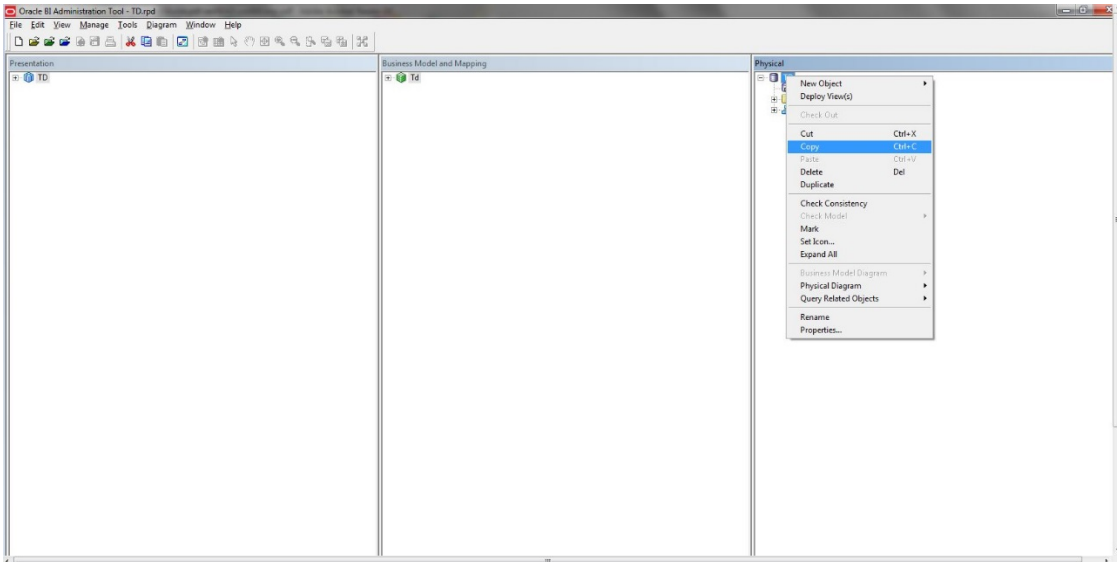
1.5.2 Merge Repositories

To Merge Repositories and to make FCUBS_Full_Schema.rpd we need to follow below steps.

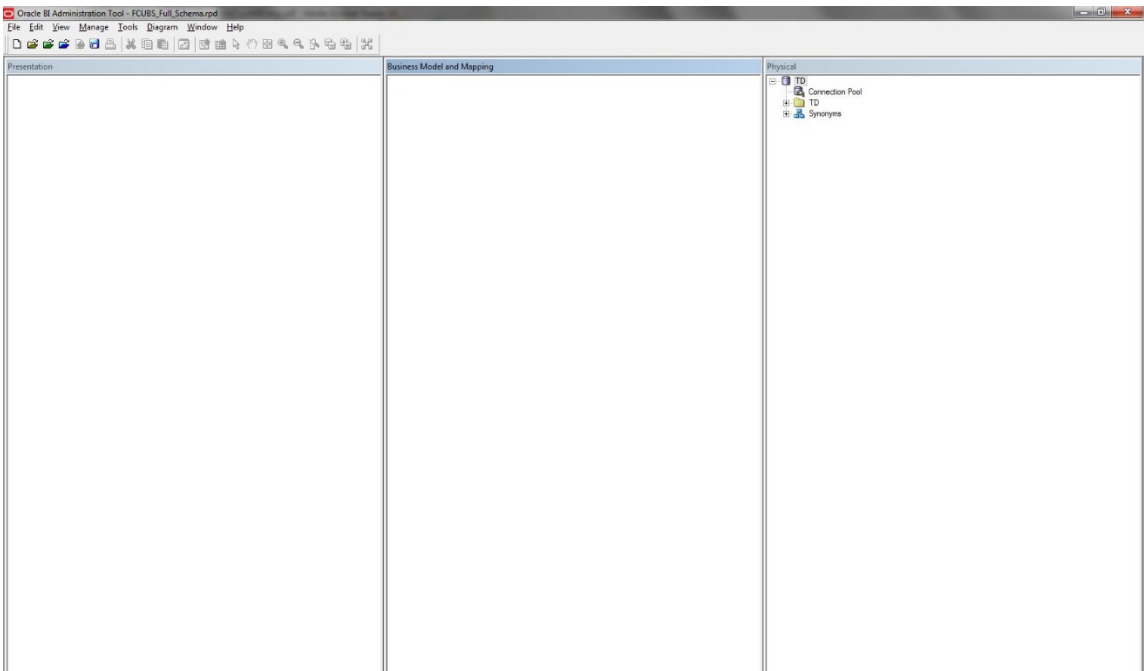
All the OBIEE repositories are in MAIN/<Module>/OBIEE_11g

- Open the 'FCUBS_Full_Schema.rpd' from svn. This is an empty repository.

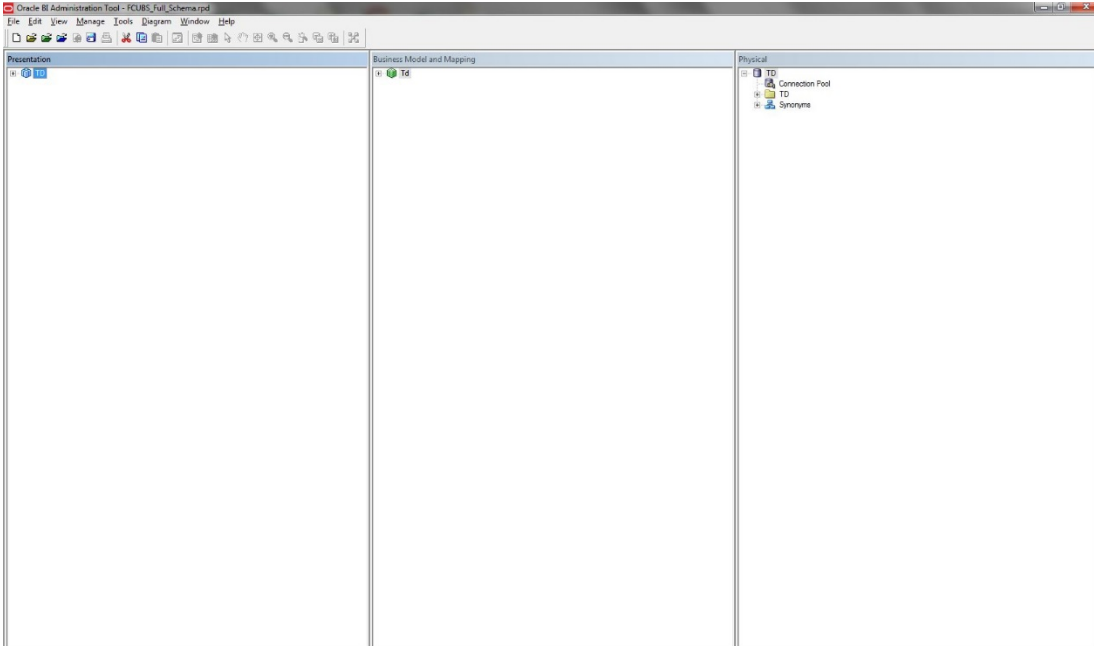
2. Open the repository to be merged eg TD.rpd
3. Copy TD folder under Physical layer in TD rpd and paste in physical layer of FCUBS_Full_Schema.rpd.



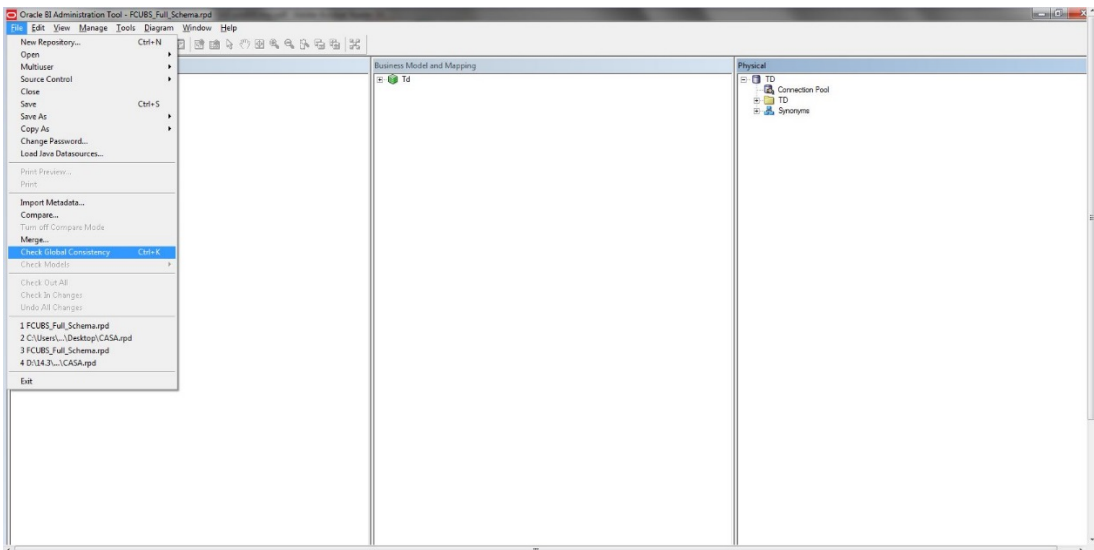
4. After pasting, FCUBS_Full_Schema.rpd would look like below:



5. Similarly copy the folders from Business model and Presentation layer from 'Td.rpd' to 'FCUBS_Full_Schema.rpd'. Then 'FCUBS_Full_Schema.rpd' would like below:



6. Please follow the order of Physical, Business Model and Presentation layer to paste in 'FCUBS_Full_Schema.rpd'.
7. Save the repository and do a global consistency check to see 0 errors. Similarly repeat the merging process for all modules.



1.5.3 Deploying RPD using putty

1. Copy the rpd in the below path in OBIEE server.

Path : <Oracle_Home>/user_projects/domains/bi/bitools/bin

Example Path : /scratch/app/obi12213/user_projects/domains/OBIEE12C/bitools/bin

2. Run putty and then go to path:

```
cd <Oracle_Home>/user_projects/domains/bi/bitools/bin
```

```
Example cd /scratch/app/obi12213/user_projects/domains/OBIEE12C/bitools/bin
```

3. Run the below command from the putty to deploy RPD.

Syntax:

```
sh data-model-cmd.sh uploadrpd -I <RPDname> [-W <RPDpwd>] -SI <service_instance> -U  
<cred_username> [-P <cred_password>] [-S <hostname>] [-N <port_number>] [-SSL] [-H]
```

Example:

```
sh datamodel.sh uploadrpd -I FCUBS_Full_Schema -W Admin123 -SI ssi -U weblogic -P  
weblogic123
```



OBIEE Metadata Repository Deployment Guide
[May] [2020]
Version 12.87.06.0.0

Oracle Financial Services Software Limited
Oracle Park
Off Western Express Highway
Goregaon (East)
Mumbai, Maharashtra 400 063
India

Worldwide Inquiries:
Phone: +91 22 6718 3000
Fax: +91 22 6718 3001
<https://www.oracle.com/industries/financial-services/index.html>

Copyright © 2007, 2020, Oracle and/or its affiliates. All rights reserved.

Oracle and Java are registered trademarks of Oracle and/or its affiliates. Other names may be trademarks of their respective owners.

U.S. GOVERNMENT END USERS: Oracle programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, delivered to U.S. Government end users are "commercial computer software" pursuant to the applicable Federal Acquisition Regulation and agency-specific supplemental regulations. As such, use, duplication, disclosure, modification, and adaptation of the programs, including any operating system, integrated software, any programs installed on the hardware, and/or documentation, shall be subject to license terms and license restrictions applicable to the programs. No other rights are granted to the U.S. Government.

This software or hardware is developed for general use in a variety of information management applications. It is not developed or intended for use in any inherently dangerous applications, including applications that may create a risk of personal injury. If you use this software or hardware in dangerous applications, then you shall be responsible to take all appropriate failsafe, backup, redundancy, and other measures to ensure its safe use. Oracle Corporation and its affiliates disclaim any liability for any damages caused by use of this software or hardware in dangerous applications.

This software and related documentation are provided under a license agreement containing restrictions on use and disclosure and are protected by intellectual property laws. Except as expressly permitted in your license agreement or allowed by law, you may not use, copy, reproduce, translate, broadcast, modify, license, transmit, distribute, exhibit, perform, publish or display any part, in any form, or by any means. Reverse engineering, disassembly, or decompilation of this software, unless required by law for interoperability, is prohibited.

The information contained herein is subject to change without notice and is not warranted to be error-free. If you find any errors, please report them to us in writing.

This software or hardware and documentation may provide access to or information on content, products and services from third parties. Oracle Corporation and its affiliates are not responsible for and expressly disclaim all warranties of any kind with respect to third-party content, products, and services. Oracle Corporation and its affiliates will not be responsible for any loss, costs, or damages incurred due to your access to or use of third-party content, products, or services.