

Host Integration Guide
Oracle Banking APIs
Release 20.1.0.0.0

Part No. F30660-01

May 2020

ORACLE®

Host Integration Guide

May 2020

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1. Preface

1.1 Intended Audience

This document is intended for the following audience:

- Customers
- Partners

1.2 Documentation Accessibility

For information about Oracle's commitment to accessibility, visit the Oracle Accessibility Program website at <http://www.oracle.com/pls/topic/lookup?ctx=acc&id=docacc>.

1.3 Access to Oracle Support

Oracle customers have access to electronic support through My Oracle Support. For information, visit

<http://www.oracle.com/pls/topic/lookup?ctx=acc&id=info> or visit

<http://www.oracle.com/pls/topic/lookup?ctx=acc&id=trs> if you are hearing impaired.

1.4 Structure

This manual is organized into the following categories:

Preface gives information on the intended audience. It also describes the overall structure of the User Manual.

The subsequent chapters describes following details:

- Introduction
- Preferences & Database
- Configuration / Installation.

1.5 Related Information Sources

For more information on Oracle Banking APIs Release 20.1.0.0.0, refer to the following documents:

- Oracle Banking APIs Installation Manuals

2. Introduction

2.1 Overview (OBAPI-FCUBS Integration)

This document is intended to outline the integration of OBAPI (Oracle Banking APIs) with FCUBS (Oracle FLEXCUBE Universal Banking).

OBAPI is the digital banking solution platform that enables single-view of a customer's entire banking world.

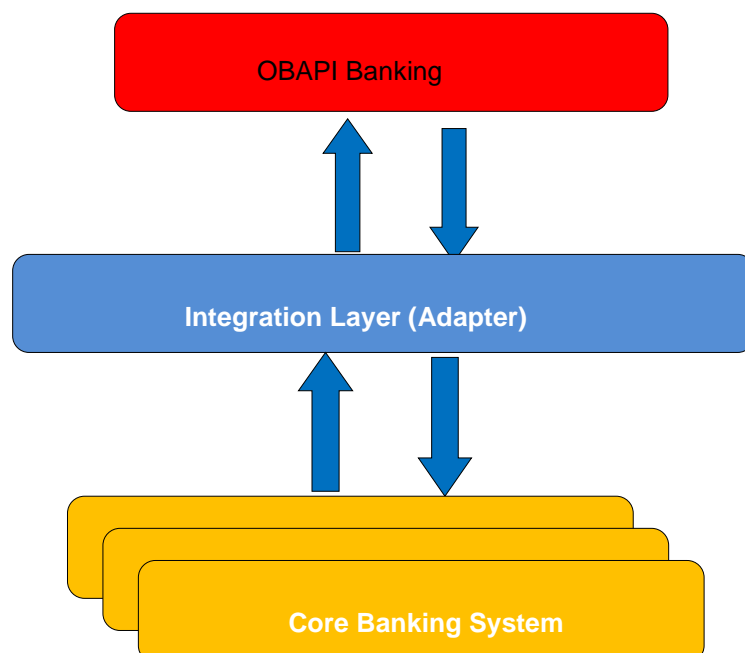
It ensures that the program is closely aligned to the business strategies identified and provides accelerated path towards realizing business value.

It provides the prerequisite operations to be performed on the customer banking world, which is exposed in the form of REST web service API's to decouple presentation and service layer. OBAPI needs to be integrated with one of core banking systems to retrieve the customer banking details and execute the set of operations on the core banking system as per the service requirement.

OBAPI has adapter layer to integrate with core banking operations. It provides a set of adapter specifications (Java Interfaces) which can be implemented for host specific service invocation. Adapter layer decouples the services from core banking operation. Any number of core banking system can be integrated with OBAPI by implementing adapter classes, Adapter layer is responsible for mapping service request /response with host specific request and response.

This document exhibits the integration between core system & OBAPI including the basic attributes involved in integration process.

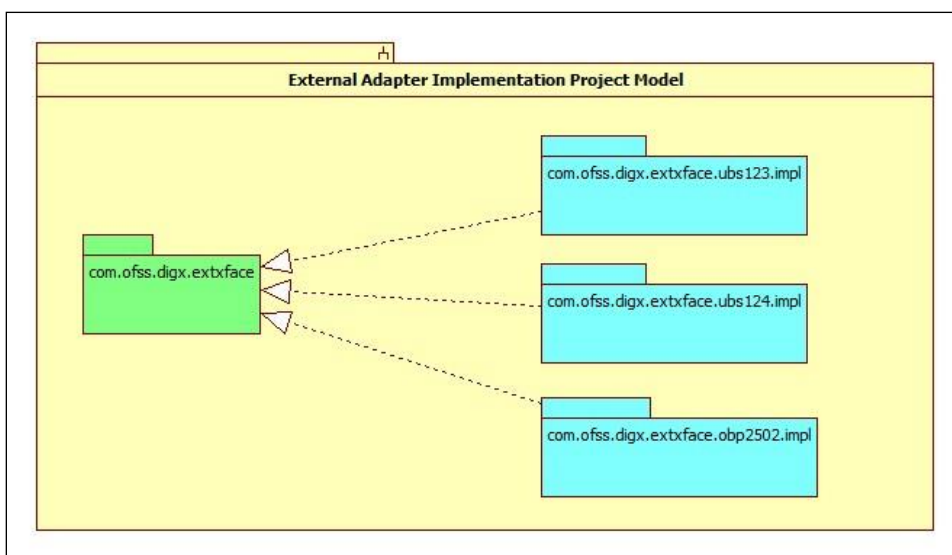
2.2 OBAPI Integration Model



2.3 OBAPI Adapter Project Model

Above [Integration model](#) depicts the OBAPI adapter integration with core banking system, Integration can be accomplished by concrete adapter implementations.

Following model illustrates OBAPI adapter specifications and its concrete adapter implementation relationship project model.



In above model, project **com.ofss.digx.extxface** contains all the adapter specifications (Java Interface) for external facing adapters. The concrete implementation classes of the adapter interfaces will reside in the host specific adapter implementation project.

Example: To integrate with FCUBS 12.4 core banking system, adapter interfaces should be implemented for host specific service invocation and concrete implementation adapter classes will reside in **com.ofss.digx.extxface.ubs124.impl** project.

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3. FCUBS Adapter Implementation

To process the request with FCUBS core banking system, OBAPI has set of adapter specifications which would be implemented for host specific services invocation. Concrete implementation adapter classes need to be created by implementing respective adapters interface and interface defining methods should be implemented.

Concrete adapter defining methods may have two types of operation:

- Inquiry Operation
- Transactional Operation

Inquiry operation is process to interchange data between OBAPI and FCUBS core banking system without altering customer banking state. It queries on the host system to fetch needed information required for tracking, summarizing the details or processing the transactional operation.

Example: Fetch Customer detail, Accounts detail.

Transactional operation will request to host system for altering/creating end user banking states.

Example: Payments, Account Opening.

3.1 Guideline to Implement Adapter

1. Adapter implementation class must implement the respective interface and provide implementations for all methods defined in the interface.
2. Any exception while invoking core banking services must be translated into OBAPI exception (`com.ofss.digx.infra.exceptions.Exception`) and host error code(s) should be mapped to an OBAPI error code.

3.2 Inquiry Operation on FCUBS

To inquire data on core banking system, FCUBS provides a set of database view/synonyms object to inquire the required information. A connector schema is required which hosts the required views, synonyms, functions and procedures for querying data in FCUBS. OBAPI relies on a middleware API packaged as "com.ofss.extsystem.ubs" which provides host adapters that interact with the connector schema to fetch the required information. To invoke these host adapters, the static Java method

```
com.ofss.extsystem.ubs.business.extsystems.HostAdapterManager.processRequest(HostRequestDTO)
```

needs to be invoked from within OBAPI adapter implementation. The `HostRequestDTO` class must be provided with the required request information.

All the FCUBS middleware adapters are configured with unique a request id in the database table `MSTHOSTINTERFACE`. `HostAdapterManager` identifies the adapter class for given request id configured in `MSTHOSTINTERFACE` table and invoke the `processRequest()` method of respective adapter class.

Following steps are required to invoke the host adapter:

1. Create the Request DTO object and fill required fields.
2. Build host request by calling `com.ofss.extsystem.ubs.business.extsystems.HostAdapterHelper.buildHostRequest (RequestDTO)` method.
3. Invoke `HostAdapterManager.processRequest (HostRequestDTO)` with the `HostRequestDTO` created by invoking the method in step 2.

Reference:

```

HostRequestDTO hostRequest= null;
HostResponseDTO hostResponse = null;
AccountDetailsRequest AccountDetailsRequest = new
AccountDetailsRequest ();

    AccountDetailsRequest.userContext = new UserContextDTO ();
    AccountDetailsRequest.userContext.idEntity = "B001";
    AccountDetailsRequest.userContext.idTxn = "PAR";
    AccountDetailsRequest.userContext.idRequest =
"PARTYACCOUNTREL";

    AccountDetailsRequest.userContext.serviceVersion = 0;
    AccountDetailsRequest.userContext.refIdEntity = "B001";
    AccountDetailsRequest.userContext.userType = "EN1";
    AccountDetailsRequest.account = new AccountNoInputDTO ();
    AccountDetailsRequest.account.idCustomer = partyId;
    AccountDetailsRequest.account.acctType = accountType;

    hostRequest =
HostAdapterHelper.buildHostRequest (AccountDetailsRequest);

try {
HostResponse = HostAdapterManager.processRequest (hostRequest);
    } catch (java.lang.Exception e) {
    logger.log (Level.SEVERE, formatter.format.Message ("<exception
message with request parameter>"));
    }

```


3.3 Transactional operation on FCUBS

For processing transactional operations, FCUBS core banking system exposes SOAP web services. To invoke the SOAP web services, SOAP client stubs need to be generated with the help of WSDL exposed by FCUBS. The thus generated client stubs should be included in classpath and configure database entries in `DIGX_FW_CONFIG_OUT_WS_CFG_B` table. Create instance of FCUBS Soap client service using `com.ofss.fc.infra.ws.JAXWSFactory.createServiceStub(String, String)` and invoke the respective methods with required request payload.

`com.ofss.fc.infra.ws.JAXWSFactory.createServiceStub(String, String)` method will instantiate the respective SOAP client services by passing the service and operation name. It uses the `DIGX_FW_CONFIG_OUT_WS_CFG_B` database table to retrieve the SOAP WSDL URL, End point service name and proxy services name for instantiating the client services, so all the relevant database entries should be configured in database table for each service operations.

Following step to invoke the soap service:

1. Generate SOAP client stubs from WSDL file.
2. Insert the database entry in `DIGX_FW_CONFIG_OUT_WS_CFG_B` table for the respective service and operation.
3. Get the SOAP client services instance by invoking `com.ofss.fc.infra.ws.JAXWSFactory.createServiceStub(String, String)` method.
4. Create request header instance and fill the mandatory fields.
5. Create request body instance and fill the essential detail.
6. Invoke the respective SOAP method by passing the request parameter containing request header and body.

3.3.1 Create FCUBS SOAP Client Instance

Create an instance of soap client services by invoking `JAXWSFactory.createServiceStub` method by passing service id and operation name arguments to identify the service.

Important: A database entry must be available for respective service and operation in `DIGX_FW_CONFIG_OUT_WS_CFG_B` database table.

```
FCUBSAccServiceSEI) JAXWSFactory.createServiceStub(WebserviceConstants.FCUBS_ACCOUNT_SERVICE_SPI,
WebserviceConstants.CREATE_TD_ACCOUNT);
```

3.3.2 Get FCUBSHeader Values

Each and every FCUBS soap request requires header object of class FCUBSHeaderType.

The class `com.ofss.digx.ubs.adapter.impl.RequestHeader`, provides all properties to set in FCUBS SOAP request header object.

A `RequestHeader` object should be instantiated by invoking `AbstractAdapterHelper.getRequestHeader` method and set all the required properties in FCUBS soap request header object.

```
com.ofss.digx.FCUBS.adapter.impl.AbstractAdapterHelper.getRequestHeader
(String, String, String)
```

Create the Adapter helper instance and retrieve Request Header Object.

```
AbstractAdapterHelper helper = AbstractAdapterHelper.getInstance();

RequestHeader header = helper.getRequestHeader("IA", "FCUBSAccService",
"ModifyIATDCustAcc");
```

Instantiate the request header and fill the essential details:

```
MODIFYTDCUSTACCFDFSREQ createTDRequest = new
MODIFYTDCUSTACCFDFSREQ();

FCUBSHEADERType fcUBSHeaderType = new FCUBSHEADERType();
fcUBSHeaderType.setUserid(header.getUserid());
fcUBSHeaderType.setCORRELID(header.getCorrelid());
fcUBSHeaderType.setMSGID(header.getMsgid());
fcUBSHeaderType.setDESTINATION(header.getDestination());
fcUBSHeaderType.setMSGSTAT(MsgStatType.fromValue(header.getMsgstat
()));
fcUBSHeaderType.setSOURCE(header.getSource());
fcUBSHeaderType.setBRANCH(helper.getHostBranchId(termDeposit.getTe
rmDepositAccountId().getValue()));
fcUBSHeaderType.setUBSCOMP(UBSCOMPType.fromValue(header.getUbscomp
()));
fcUBSHeaderType.setMODULEID(header.getModuleid());
fcUBSHeaderType.setSERVICE(header.getService());
fcUBSHeaderType.setOPERATION(header.getOperation());
fcUBSHeaderType.setSOURCEOPERATION(header.getSourceoperation());
createTDRequest.setFCUBSHEADER(fcUBSHeaderType);
```

Invoke the FCUBS SOAP service

```
FCUBSAccServiceSEI clientProcess = (FCUBSAccServiceSEI)
JAXWSFactory.createServiceStub(WebServiceConstants.FCUBS_ACCOUNT_SERVIC
E_SPI, WebServiceConstants.CREATE_TD_ACCOUNT);

MODIFYTDCUSTACCFSFSRESresponse =
clientProcess.modifyTDCustAccFS(createTDRequest);
```

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4. OBAPI-FCUBS Configuration/ Installation

1. To inquire the banking information, FCUBS provides a set of database views/synonyms. These are created on a connector schema which is created at the time of installation of the product.

A datasource must be created on the application server where the application has been deployed. The name of the datasource must be specified in the jdbc.properties file for the property name FCON.A1.JNDI.NAME, FCON.AP.JNDI.NAME and FCON.B1A1.JNDI.NAME.

Below properties should be define in config/jdbc.properties file

```
FCAT.WEBSERVER.ID=ZZ
FCAT.APPSERVER.ID=ZZ
FCAT.ROUTER.DAEMON.NAME=ROUTER
DISPLAY.MESSAGE.ID=N
FCAT.LDB.DATABASE.NAME=ORACLE

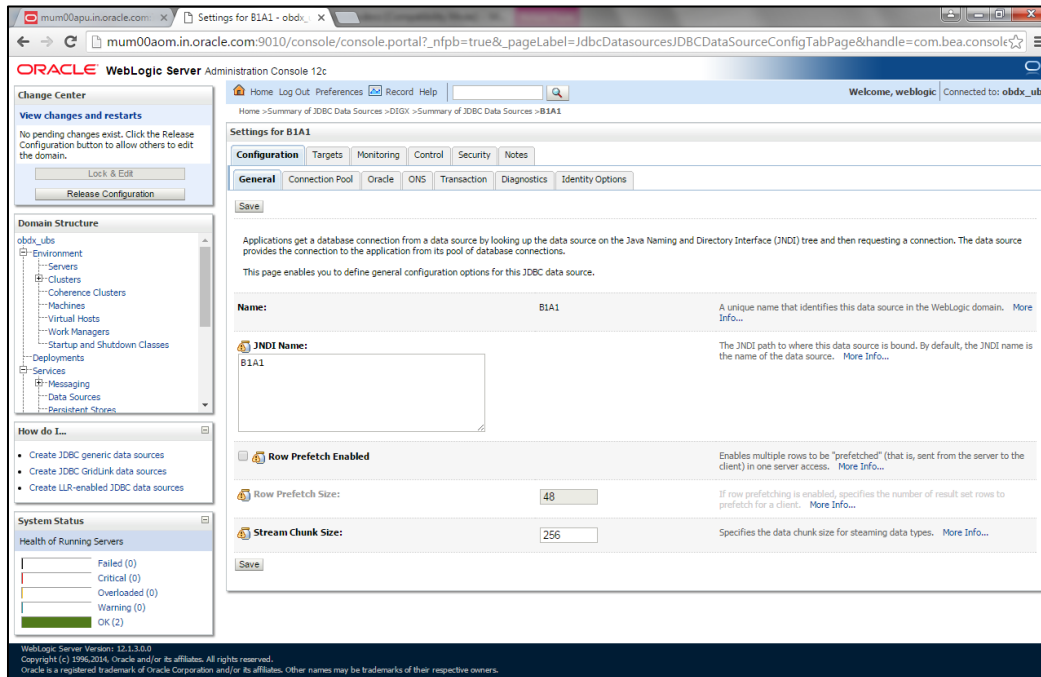
FCON.A1.LDB.DRIVER=oracle.jdbc.driver.OracleDriver
FCON.A1.LDB.URL=%%DB_CONNECT_STRING%%
FCON.A1.JNDI.NAME=B1A1
FNDI.A1.ABCD=

FCON.AP.LDB.DRIVER=oracle.jdbc.driver.OracleDriver
FCON.AP.LDB.URL=%%DB_CONNECT_STRING%%
FCON.AP.JNDI.NAME=B1A1
FNDI.AP.ABCD=

B001.A1=B1A1
FNDI.B1A1.ABCD=
FCON.B1A1.JNDI.NAME=B1A1
FCON.B1A1.LDB.DRIVER=oracle.jdbc.driver.OracleDriver
FCON.B1A1.LDB.URL=%%DB_CONNECT_STRING%%
```

4.1 Server Setup

4.1.1 Create Data source with JNDI name as defined in config/jdbc.properties file.



Please note that in case of multi entity scenario, the JNDI name should be in the format <ENTITY_ID>_B1A1. For example, for entity identifier as 'UBDX_BU', the JNDI name will be OBDX_BU_B1A1.

4.1.2 Server Arguments

```
-Dfcatt.jvm.id=1
```

4.2 Deployment

We have FCUBS deployable ear containing all the jar files required to invoke the FCUBS adapter.

Following deployable should be deployed on OBAPI server:

obapi.extsystem.domain.ear

It contains all the related libraries required to process FCUBS system request.

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5. Configuration for Integration of FCUBS Interaction with OBAPI Mailbox

Out of the box installation OBAPI provided with the mailbox to interact within OBAPI i.e. Back Office user of the banks in the OBAPI will be able to access the mail send by the customer.

If the OBAPI Mails by the customer need to be integrated with the FCUBS Interaction module then the below steps should be taken care of.

Assumption:- Installation of OBAPI has been completed and configuration of all the entity requires in the system has been completed.

Execute below scripts in the OBAPI Admin Schema to configure entity specific integration of mailbox with interaction module in FCUBS.

```
Insert into DIGX_FW_CONFIG_ALL_O
(PROP_ID,PREFERENCE_NAME,PROP_VALUE,DETERMINANT_VALUE,CREATED_BY,CRE
ATION_DATE,LAST_UPDATED_BY,LAST_UPDATED_DATE) values
('MAILBOX_PROCESSOR','MailboxProcessor','com.ofss.digx.app.collaboration.service.mailbox.
message.mail.processor.RemoteMailboxProcessor','OBDX_BU1','superadmin',sysdate,'superad
min',sysdate);
```

```
Insert into DIGX_FW_CONFIG_ALL_O
(PROP_ID,PREFERENCE_NAME,PROP_VALUE,DETERMINANT_VALUE,CREATED_BY,CRE
ATION_DATE,LAST_UPDATED_BY,LAST_UPDATED_DATE) values
('MAIL_REPOSITORY_ADAPTER','RepositoryAdapterFactories','com.ofss.digx.domain.collabora
tion.entity.mailbox.message.mail.repository.adapter.RemoteMailRepositoryAdapter,com.ofss.digx
.domain.collaboration.entity.mailbox.message.mail.repository.adapter.LocalMailRepositoryAdapte
r','OBDX_BU1','superadmin',sysdate,'superadmin',sysdate);
```

Highlighted values can be varied based on the entity configuration require to be integrated with FCUBS interaction module.

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6. Configuration for Attachments in OBAPI Mailbox or Interaction Module

By default the mailbox attachment will be integrated to OIPM. If the Bank wants to change this then below are

the configuration steps.

1) If bank want to use local database to save uploaded document i.e. other than OIPM then below script

need to be executed on OBAPI Admin schema. This will point content service to the local data base for

mailbox attachment specifically.

```
UPDATE DIGX_FW_CONFIG_ALL_B SET PROP_VALUE
```

```
='com.ofss.digx.domain.content.entity.repository.adapter.LocalContentRepositoryAdapter'  
WHERE
```

```
PROP_ID = 'IM_CONTENT_REPOSITORY_ADAPTER'
```

2) If bank want to use OIPM server to manage uploaded document then below script need to be executed

on OBAPI Admin schema. This will point content service to the OIPM server for mailbox attachment specifically.

```
UPDATE DIGX_FW_CONFIG_ALL_B SET PROP_VALUE
```

```
='com.ofss.digx.domain.content.entity.repository.adapter.RemoteContentRepositoryAdapter'  
WHERE
```

```
PROP_ID = 'IM_CONTENT_REPOSITORY_ADAPTER'
```

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7. Configurations for OBRH Integration

Use the following guidelines to integrate with OBRH from the OBAPI adapter.

To call OBRH endpoint from adapter, add entry of

OBRHEndPoint(`com.ofss.digx.extxface.impl.endpoint.OBRHEndPoint`) against your "interfaceld" in `digx_fw_config_all_b` for Category id as "ExtXfaceConfig". The "interfaceld" should be the unique service name defined in the OBRH for specific consumer.

To configure which serializer and deserializer should be called for your Request,

Add `prop_id` entry in `digx_fw_config_all_b` as "`com.ofss.digx.extxface.impl.endpoint.OBRHEndPoint_<interfaceld>`" and `prop_value`, as which Serializer Deserializer should be used (JSON or XML)

For JSON: "`com.ofss.digx.extxface.impl.endpoint.serde.JsonSerDe`" (this is the default class picked if no specific entry is made)

For XML: "`com.ofss.digx.extxface.impl.endpoint.serde.XmlSerDe`"

Category id is "ExtXfaceConfig".

The following configurations are maintained for OBRH-OBAPI integration.

2. DIGX_FW_CONFIG_ALL_B

To generate encrypted password

```
java -jar CryptoUtils.jar <Clear text password> <Encryption Key (AES) as in OBDX connector>
```

The user used for connectivity to OBRH (Eg. OBDX) should not be used for OBRH app-shell login

The OBRH_EXPIRYTIME should be as maintained in OBMA security schema

Category Id	Prop_id	Prop_Value (Default_value)
CredentialPropertyStore	OBRH_USER_NAME	OBAPI
CredentialPropertyStore	OBRH_USER_PASSWORD	27753d4e463db94b64ab096f acb916ff24670adfa0b5769ad 9
authenticationConfig	OBRH_ENCODING	Base64

Category Id	Prop_id	Prop_Value (Default_value)
authenticationConfig	OBRH_EXPIRYTIME	\${OBRH_EXPIRYTIME}
authenticationConfig	OBRH_TOKEN_PATH	token
ExtXfaceConfig	com.ofss.digx.extxface.impl.endpoint.OBRHEndPoint_<interfaceld >	com.ofss.digx.extxface.impl.endpoint.serde.JsonSerDe (JSON is default value, you can SerDe you want for this request)
ExtXfaceConfig	<interfaceld>	com.ofss.digx.extxface.impl.endpoint.OBRHEndPoint

3. DIGX_FW_CONFIG_VAR_B

Prop_id	Prop_Value (Default_value)	ENV_ID
OBRH_HOST_IP	whf00lse.in.oracle.com	OBAPI
OBRH_HOST_PORT	7002 <api-gateway port of OBRH>	OBAPI
OBRH_EXPIRYTIME	300	OBAPI

4. DIGX_FW_CONFIG_ADAPTER_PROP_B

HOST_ID	TRANSACTION_TYPE	PROP_ID	PROP_VALUE(Default_value)
OBRH	ALL	APP_ID	CMNCORE
OBRH	ALL	USER_ID	OBAPI
OBRH	ALL	BRANCH_CODE	004
OBRH	ALL	SERVICE_CONSUMER	OBAPI

OBRH	ALL	TOKEN_APP_ID	SECSRV001
OBRH	ALL	SOURCE_CODE	Value to be provided by HOST. Row to be deleted if header not required

5. DIGX_FW_CONFIG_OUT_RS_CFG_B

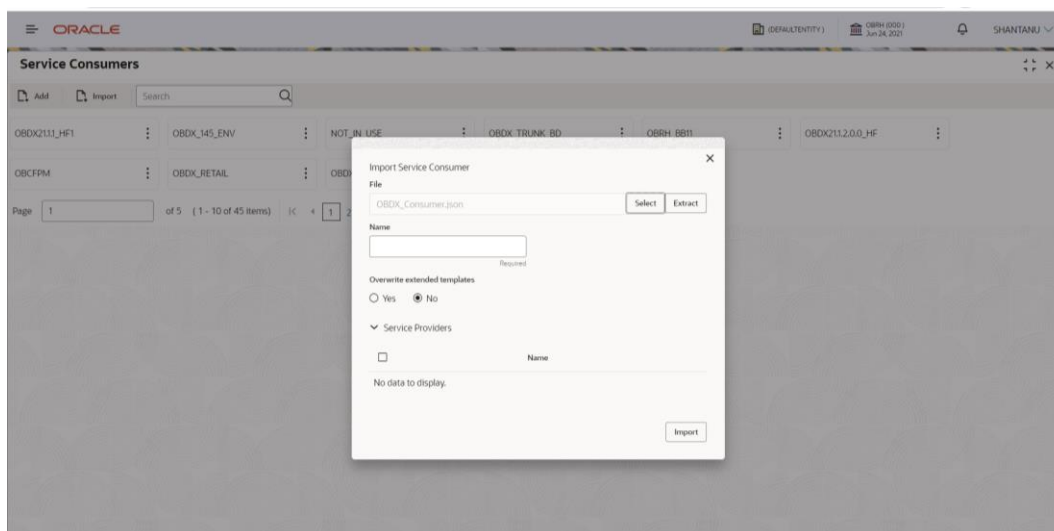
Service Id	CONTEXT_URL	SERVICE_URL
tokenOBRH	http://\${OBRH_HOST_IP}:\${OBRH_HOST_PORT}	api-gateway/platojwtauth
serviceOBRH	http://\${OBRH_HOST_IP}:\${OBRH_HOST_PORT}	api-gateway/cmcc-obr-services/route/dispatch

Apart from above predefined properties, we have provision to add additional headers. Kindly add your additional headers as a key-value pair in newly added variable "headersMap" of "com.ofss.digx.extxface.impl.dto.ExternalSystemRequest". Refer OBRH User Manual for its usage.

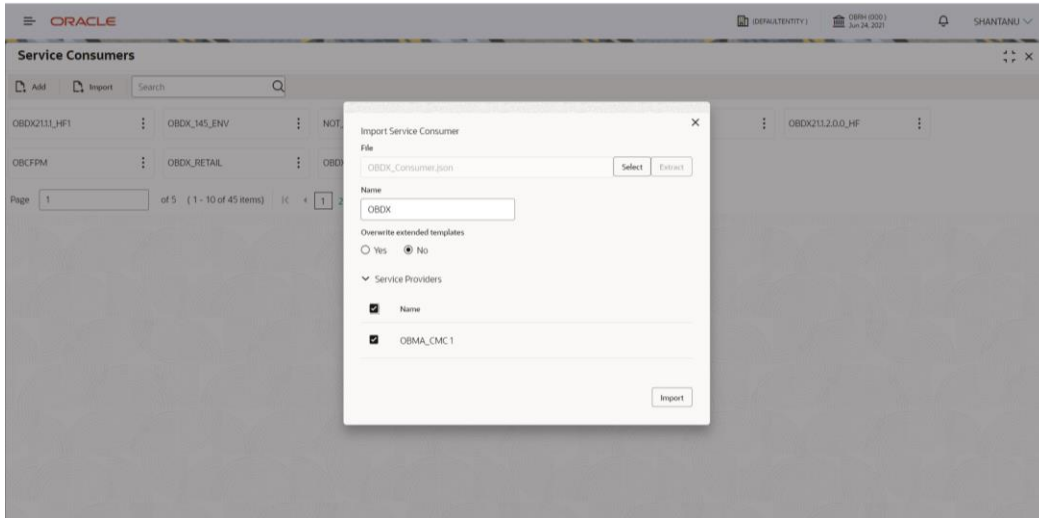
6. Importing OBRH Config JSON

Login in OBMA app-shell

Menu > Core Maintenance > Routing Hub > Service Consumers > Import

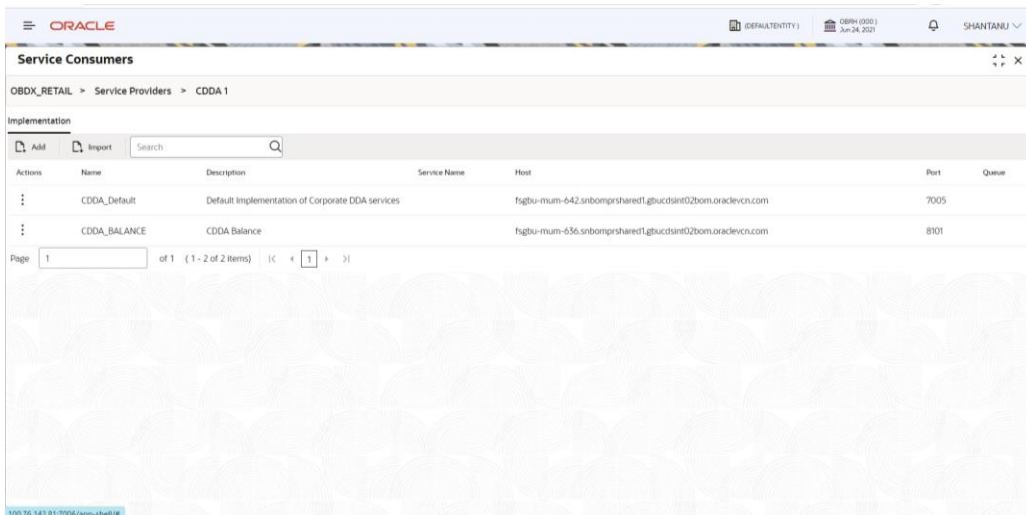


Select the JSON provided in OBDX installer/patchset > Extract > Select all/required service providers



Click Import. The same consumer name should be maintained in SERVICE_CONSUMER of Pt 4 above

In each service provider configure the host/port and authentication settings (if required) as shown below



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