Pharmacy Reengineering

Pharmacy Enterprise Customization System (PECS) v6.0.01

Installation Guide

May 2016

Department of Veterans Affairs
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Revision History

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Table of Contents

1. Introduction

This document describes the process used to install the Department of Veterans Affairs (VA) Pharmacy Enterprise Customization System (PECS) application on an instance of a WebLogic server. The PECS software is a Web-based application, packaged as a J2EE standardized Enterprise Application Archive (EAR) file, which is then deployed on the WebLogic server using the server's standard deployment process. The installation described in this document also outlines the steps necessary to install and configure the application's database. This includes the installation of the database schema on an Oracle server, and loading data into configuration tables. The document outlines the configuration of two datasources, and the deployment of the EAR file on the WebLogic server. The installation of the PECS application assumes that the servers necessary to execute the software are configured and running as per any applicable VA standards.

In order to understand the installation and verification process, the installer should be familiar with the WebLogic console administration and Oracle 11g Database configuration.

1.1 Assumptions

For successful deployment of the Pharmacy Reengineering (PRE) PECS software at a site, the following assumptions must be met:

- Red Hat Enterprise Linux 5 operating system is properly installed.
- The WebLogic Server 12.1.1 is configured and running.
- Access to the WebLogic console is by means of a valid administrative user name and password.
- Oracle 11g Database Server is configured and running.
- Java JDK version used is 1.7.0_51.
- FDB (First Databank) DIF (Drug Information Framework) v3.3 database is installed. Installation instructions are provided in FDB-DIF Installation/Migration guide. Contact the PRE Configuration Manager who should be identified on the project's Technical Services Project Repository (TSPR) site for a copy of the guide and installations/migration scripts.
- Kernel Authentication & Authorization for J2EE (KAAJEE) security Application Program Interface (API) setup and configured on the WebLogic Server.
- REDACTED
- REDACTED
    - Please note that KAAJEE installation includes the KAAJEE security provider System Design Specifications (SDS) datasource on the target WebLogic server. The KAAJEE and SDS database should be configured as specified in the KAAJEE and SDS install guides respectively.
    - For Configuring SDS Datasource, please contact the Technical PRE-PECS point of contact at Austin Information Technology Center (AITC). (The Uniform Resource Locator (URL), username, password will be provided).
    - The above links are provided as reference; the Install Guides and Documentation are maintained by respective projects – KAAJEE, VistALink, SDS. If you are not able to reach the link (or any issue with documentation), please contact the respective group. (PRE-PECS team can also help to co-ordinate with above groups if required).
- The installation instructions are followed in the order that the sections are presented within this Installation Guide.

1.2 Scope

Installation steps in scope include:

- Installation of the PECS database staging schema on an existing Oracle server, and a data load into configuration tables.
- Configuration of database datasources on an existing WebLogic application server.
- Deployment of the PECS application EAR file on a configured WebLogic application server.

Processes out of scope include:

- Installation and configuration of server environments, including the operating system, database server, and application server, and/or any other network component as may be required to host the PECS application on the VA network.
- KAAJEE security API setup and configuration on the WebLogic server.
- FDB-DIF database installation/migration or update process.
- Process to add or configure users in the VistA application for authentication and authorization to the PECS application.
- Process to check out the PECS codebase from the ClearCase repository and/or the build process.
- Installation details of the Java Runtime environment.
- Initial load of Pharmacy Benefits Management (PBM) customized order checks.

1.3 Definitions, Acronyms, and Abbreviations

Here is a list of terms and acronyms and their definitions.

1.3.1 Definitions

Table 1: Definitions

Term	Definition
%DATAFILE_LOCATION%	The directory location where the PECS database schema file will be located.
Data Definition Language	A computer language for describing the records, fields, and "sets" making up a database.
Datasource	Database connection definition, including connection pool on an application server.
Deployment Archive	A compressed file organized in the J2EE deployment standard.

1.3.2 Acronyms

Table 2: Acronyms

Term	Definition
AITC	Austin Information Technology Center
API	Application Program Interface
CT	Custom Table
DBA	Database Administrator

Term	Definition
DDL	Data Definition Language
EAR	J2EE Enterprise Application Archive file.
FDB-DIF	First Databank Drug Information Framework database
FTP	File Transfer Protocol
GUI	Graphical User Interface
J2EE	Java 2 Enterprise Edition
JMS	Java Messaging Service
KAAJEE	Kernel Authentication and Authorization for J2EE
PECS	Pharmacy Enterprise Customization System
PBM	Pharmacy Benefits Management
PRE	Pharmacy Reengineering
RDBMS	Relational Database Management System
SDS	System Development Support
SQL	Structured Query Language
SSPI	Security Service Provider Interface
TSPR	Technical Services Project Repository
URL	Uniform Resource Locator
VA	Department of Veterans Affairs

1.4 Overview

The steps necessary to install and configure the components required by the PECS application are outlined in the following pages. The order that the components appear in the outlined steps is the suggested installation order. Installation Prerequisites should be installed or verified on the build environment first, followed by the installation of the database schema, application server configuration, and the deployment of the PECS application.

2. Installation Prerequisites

- Installation and configuration of server environments, including the operating system, database server, and application server, and/or any other network component as may be required to host the PECS application on the VA network.
- Target production VistA implementation must have PECS users and their security keys installed.
- KAAJEE Security Service Provider Interface (SSPI) Software, VistALink Software, and the KAAJEE Security Provider installed on the WebLogic application server.
- The target production FDB-DIF database is available.

3. Database Tier Installation

This section describes the operating system and software for the PRE PECS V.6.0 Database Tier installation and configuration. Initially, install and configure the operating system and software according to the manufacturer's specifications.

3.1 Oracle Database

The Custom Table (CT) staging schema or PECS Database is designed to be operating system independent. The only constraint is that Oracle 11g Database Enterprise Edition Release 11.2.0.4 – Production must be properly installed and configured. The following sections describe the installation, features, user creation, and configuration for the Oracle database.

NOTE:	*The PECS staging database user should be configured as "CTSTAGING" (CTSTAGING schema) and the FDB-DIF database user should be configured as "FDB_DIF" (FDB_DIF schema).*

3.1.1 Oracle Installation

Proper installation of the Oracle Relational Database Management System (RDBMS) is one in which the Oracle Universal Installer was used to perform an error-free installation and a general purpose instance was created. A properly configured Oracle RDBMS is one in which the associated Oracle application development and configuration tools, namely Structured Query Language (SQL)*Plus and Oracle Enterprise Manager, can be used to connect to the instance through a Transparent Network Substrate alias.

3.1.2 Oracle Configuration

The CT staging schema or PECS Database is the primary data repository for the PECS application. The database should be installed and configured appropriately for the PECS operating environment.

Two schemas must be created for the PECS Environment within the same database instance: FDB_DIF and CTSTAGING. Prior to creation of the schemas, logical and physical environment structures must be set up for storage of the schemas database objects: tablespaces and data files. For the PECS database configuration, data and index storage are separated for each schema. Separating indexes and table data is considered an Oracle best practice and provides improved run-time performance, reporting/monitoring, and manageability.

NOTE:	*For PECS v6, since there is no FDB change, this would involve installation of PECS v6 component only unlike in PECS v5.*

[Not Applicable for PECS 6: There are two components to PECS 5.0 National database installation process. The first component involves the installation of the FDB_DIF v3.3. The second component installation of the PECS 5.0 schema. The first component, installation of FDB_DIF v3.3, must be completed prior to moving forward with the PECS 5.0 installation component. Installation instructions are provided in FDB-DIF Installation/Migration guide. Contact the PRE Configuration Manager who should be identified on the project's Technical Services Project Repository (TSPR) site for a copy of the guide and installations/migration scripts.]

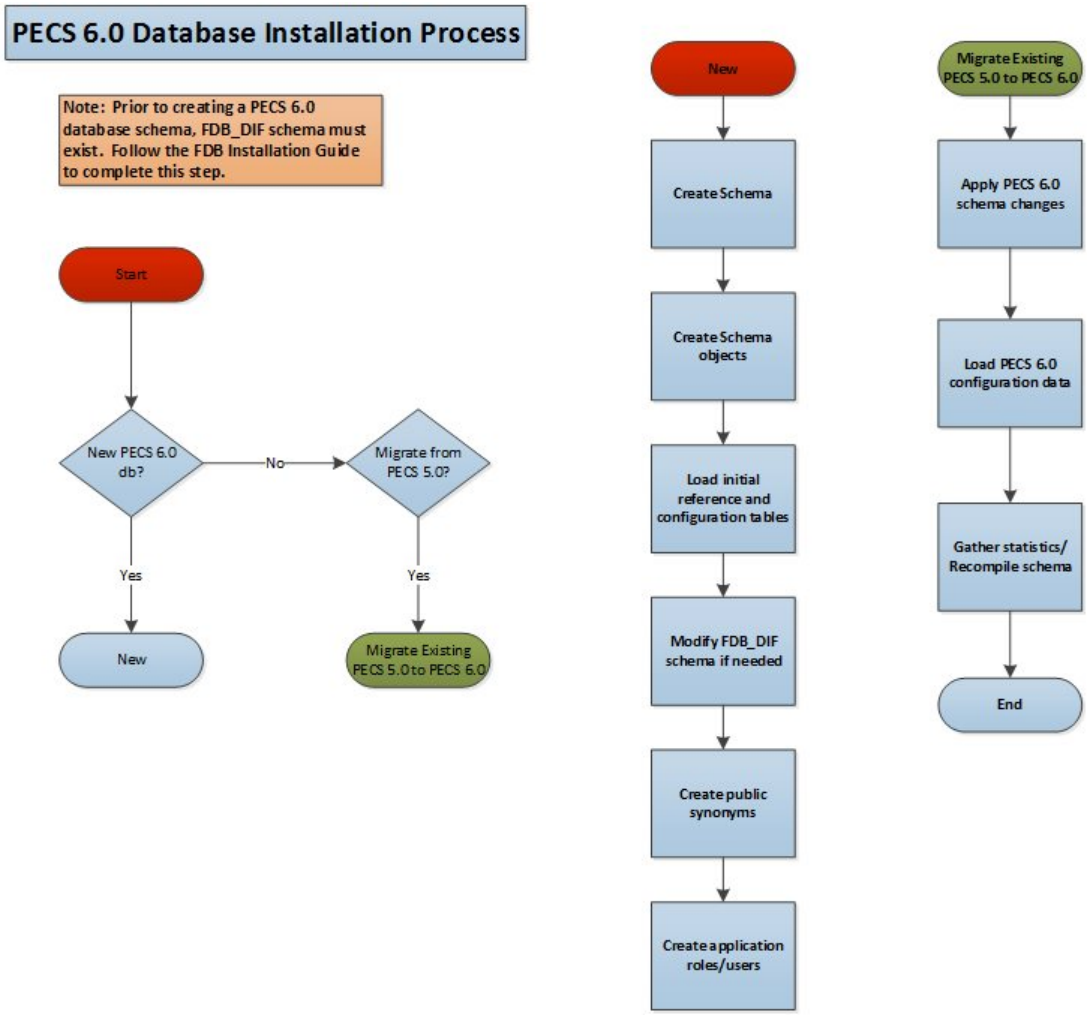
Below are the procedures to accomplish the installation of the PECS 6.0 component.

3.2 CTSTAGING Installation Instructions

This section describes the database scripts necessary for the installation of the PECS CTSTAGING database, and the order in which they should be executed. It is highly recommended that the PECS staging database user be configured as "CTSTAGING" and the FDB-DIF database user be configured as "FDB_DIF" as that is the usernames that are used throughout the remainder of the PECS installation documentation. **Executing steps 3.2.1 – 3.2.5 in this section will result in the creation of a PECS 6.0 database. Executing step 3.2.6 will migrate an existing PECS v5 database to PECS v6 compatibility.**

If you are migrating from an existing PECS 5.0 schema with production data, skip to 3.2.6 to migrate to PECS 6.0 compatibility. The complete PECS Database Installation Process is graphically depicted below and in Appendix E – The PECS Database Installation Process.

Figure 1: PECS 6.0 Database Installation Process



NOTE: *To migrate an existing PECS 5.0 database schema, skip to Section 3.2.6 – PECS 5.0 Database Migration.*

Prior to executing the following sections, the Oracle 11g database needs to be installed and a Database Administrator login generated with sys_dba privileges is generated. The DBA login is necessary to run the first database script to create the tablespaces and user accounts for the remainder of the installation.

NOTE: *To get Install Scripts, please contact the PRE Configuration Manager, who should be identified on the project's TSPR site.*

3.2.1 Create the Users

Prior to creation of the schemas, logical and physical environment structures must be setup for storage of the schemas database objects: tablespaces and data files. For the PECS Database configuration data and

index storage are separated for each schema. For the CTSTAGING schema two tablespaces must be created:

- CTSTAGING_DATA
- CTSTAGING_INDEX
- LOB_DATA
- LOB_INDEX

In addition, user profiles are used to standardize resource limits for PECS schemas. There are two user profiles that have to be created:

- SERVICE_ACCOUNT
- USER_ACCOUNT

Before the user profiles can be created the script **utlpwdmg.sql** has to be executed. The script is located in the RDBMS\ADMIN directory within your installation home. Consult Oracle installation manual for the full directory path for the proposed environment.

To create the users in the database for the PECS application, the database administrator will need to execute the **pecs5_creation_pkg1.sql** script as **SYSTEM**. This script will execute other scripts that will create the tablespaces, user profiles and create the CT Staging User:

- `PECS5_Create_CTSTAGING_Tablespaces.sql`
- `pecs5_create_user_profiles_ddl.sql`
- `pecs5_create_user_modified.sql`

Prior to running the scripts, modifications should be made to tailor for the current installation environment. The following steps should be followed:

1. Open a text editor and open the PECS5_Create_CTSTAGING_Tablespaces.sql script. **`Replace %DATAFILE_LOCATION% with the data file directory`** the directory entered should already exist on the database server.

NOTE: *If you are creating a development environment, use PECS5_Create_CTSTAGING_Tablespaces_Dev.sql instead.*

2. Login to the SQL client using a database account that has sys_dba privileges.
3. Execute the "`pecs5_creation_pkg1.sql`" script.
4. Open the "`pecs5_creation_pkg1.log`" file and search the log file for any errors.
5. This process creates the temporary file `dif5ctstaging.sql`. Open this file and scroll to the bottom and verify the following entry at the bottom of the file '`GRANT SELECT ON FDB_DIF.FDB_VERSION TO CTSTAGING`'. This will ensure that all necessary privileges were granted to the FDB tables that the CTSTAGING user needs to access.

3.2.2 Create Staging Tables and Database Objects

To create the CTSTAGING database for the PECS application, the administrator will need to execute the **pecs5_creation_pkg2.sql** script. This script will execute 39 other scripts that create the CTSTAGING tables and populate those tables with some initial data values. The following steps should be followed:

1. Login to the SQL client using the CTSTAGING user account.

2. Execute the “pecs5_creation_pkg2.sql” script.
3. Open the pecs5_creation_pkg2.log file and search the log file for any errors.

3.2.3 Modification of the FDB_DIF Database

To modify the FDB-DIF data repository to work with the PECS application, the administrator will need to execute the **fdb_modification_pkg3.sql** script. This script will create a new table in the FDB-DIF data repository and modify one of the existing tables to change the constraints add an index.

1. Login to the sql client using the FDB_DIF user account.
2. Execute the “fdb_modification_pkg3.sql” script.
3. Open the fdb_modification_pkg3.log file and search the log file for any errors.

3.2.4 Create Public Synonyms

The PECS application access spans both FDB_DIF and CTSTAGING schema objects. Public synonyms are utilized to provide seamless application access across PECS application components. To create the public synonyms, the administrator will need to execute the **PECS5_Create_Public_Synonyms.sql** script. This scripts executes two scripts: **`PECS5_Create_FDB_Synonyms.sql`**, **`PECS5_Create_CTSTAGING_Synonyms.sql`**. The following steps should be followed:

1. Login to the SQL client using the SYSTEM account.
2. Execute the “PECS5_Create_Public_Synonyms.sql” script.
3. Open the PECS5_Create_Public_Synonyms_create_ public_synonyms.log file and search the log file for any errors.

3.2.5 PECS Application Users

The PECS database schemas have been devised to provide separation of ownership and CRUD data access levels thru the use of user/schemas and access roles assigned. Schemas/Roles that are required by the application are depicted in the cross-reference table listed below:

Table 3 - Database Users and Roles

User	Schema	Access Level	Assigned Role
FDB_DIF	**FDB_DIF**	**Schema Owner**	
FDB_DIF_APP_USER	FDB_DIF	Read Only user	FDB_DIF_READ_ONLY_ROLE
FDB_DIF_UPDATE_USER	FDB_DIF	CRUD user	FDB_DIF_UPDATE_USER_ROLE
CTSTAGING	**CTSTAGING**	**Schema Owner**	
CTSTAGING_READ_ONLY	CTSTAGING	Read Only user	CTSTAGING_READ_ONLY_ROLE
CTSTAGING_UPDATE_USER	CTSTAGING	CRUD user	CTSTAGING_UPDATE_USER_ROLE FDB_DIF_READ_ONLY_ROLE
PECSJMS	PECSJMS	Schema Owner	
PECSJMS_APP_USER	PECSJMS	CRUD user	PECSJMS_APP_USER_ROLE

Both FDB_DIF and CTSTAGING schema owners have been created prior to this step, however, additional users are required by the application. To create the PECS application user roles and users, the administrator will need to execute the **PECS5_Create_Application_Roles_Users.sql** script. This script will execute scripts that create the required PECS user roles and application users. Additionally, the script will create the PECSJMS schema objects that are required by the PECS application by executing **pecs_create_jms_process.sql** script.

Prior to running the driver script, **PECS5_Create_Application_Roles_Users.sql,** modifications should be made to **CreateTablespacePECSJMS.sql** to tailor for the current installation environment. .

The following steps should be followed:

1. Open a text editor and open the CreateTablespacePECSJMS.sql script. Replace %DATAFILE_LOCATION% with the data file directory for the current installation environment. The directory entered should already exist on the database server.
2. Login to the SQL client using the SYSTEM account.
3. Execute the "**PECS5_Create_Application_Roles_Users**_create_application_roles_users.sql" script.
4. Open the "PECS5_Create_Application_Roles_User.log" file and search the log file for any errors.

VA Standard Data Services (SDS) has created and maintains standardized tables in an Oracle database (e.g., VA Institutions). These tables must be accessible to PECS as a Web-based application. Please refer to the SDS Database Installation Guide for the information necessary to install the SDS Data Service database tables, indexes and data.

KAAJEE makes internal API calls to the SDS Database/Tables located on an Oracle database. PECS is KAAJEE-enabled. The KAAJEE user ID, schema, and SSPI tables must be accessible to PECS as a Web-based application. Please refer to the KAAJEE Database Installation Guide for the information necessary to install the KAAJEE database tables, indexes and data.

A complete listing of the PECS Schema Creation SQL Scripts invoked from the driver scripts are listed below.

Table 4. List of PECS Schema Creation SQL Scripts (TBD)

Script Description	File Name
A Master script to create the tablespace and user package script.	pecs5_creation_pkg1.sql
Master script to create the ct staging tables and database objects package script.	pecs5_creation_pkg2.sql
Master script to modify the FDB schema package script.	fdb_modification_pkg3.sql

3.2.6 PECS v5.0 Database Migration

Prior to migrating PECS v5.0 database schema to PECS v6.0 compatibility, a backup of the database should be performed either using RMAN or Oracle 11g DataPump export utility. Securing a backup of the database is integral to the database rollback procedures in the event that the upgrade/migration needs to revert back to the prior version. Oracle DataPump utilities provide more granularity to backup specific schemas. PECS v5.0 consists of two database schemas: CTSTAGING, FDB_DIF. To back up the PECS v5.0 database using Oracle DataPump utility, issue the following command logged in as a USER with DBA privileges:

- **expdp DUMPFILE**=<dumpfilename.dmp> **SCHEMAS**=CTSTAGING,FDB_DIF **CONTENT**=ALL **LOGFILE**=<logfilename.log>

When prompted, enter the SYSTEM userid and password to complete the export and note the dump and log files for future use.

Prior to performing the steps needed to migrate a PECS v5.0 database to PECS v6.0 compatibility, the Oracle listener for the PECS database instance should be brought down to ensure consistency and limit

access during the conversion efforts. As an Oracle Administrator, the following command can be issued from the LINUX command prompt to stop the listener for the current instance: **lsnrctl stop**.

To migrate PECS v5.0 database schema to PECS v6.0 compatibility, the database administrator will need to execute the following database scripts as the USER specified below. Each of these scripts acts as a driver script to initiate and log migration activities. At the completion of each of the steps. Check the log file for any errors or anomalies in processing the required transactions.

Table 5: List of PECS 5.0 Driver SQL Script

Script Description	File Name	User	Log File
PECS Migration Driver script	PECS6_migration.sql	CTSTAGING	PECS6_migration.log

Step by Step procedure to accomplish the migration is as follows:

1. Login to the sql client using the CTSTAGING user account.
2. Execute the "PECS6_migration.sql" script.
3. Open the "PECS6_migration.log" file and search the log file for any errors.

After all the migration steps have been completed without error, the Oracle listener for the PECS database instance should be restarted. As an Oracle Administrator, the following command can be issued from the LINUX command prompt to start the listener for the current instance: **lsnrctl start**.

A complete listing of the scripts invoked from the driver scripts are listed below.

Table 6: List of PECS 6.0 SQL Scripts

PECS 6.0 Driver Scripts	Description	Purpose
PECS6_migration.sql	Driver Script to migrate from PECS 5.0 to PECS 6.0 schema	Database Migration Driver Scripts

3.2.7 PECS v6.0 Database Migration Rollback

Prior to migrating PECS v5.0 database schema to PECS v6.0 compatibility, a backup of the database was performed to ensure rollback capability. This section addresses the steps needed to rollback to PECS v5.0 using the secured backup.

To restore the PECS v5.0 schema from the backup taken prior to the migration, follow the procedures outlined in the Data Import Guide for platform specific instructions (Unix, Windows).

Procedures for restoring/loading production data include the following steps regardless of platform:

- Prepare database for restoring production data
  - Drop existing schema objects (tables, sequences) for each schema using the Build_Script_to_Drop_CTSTAGING_objects.sql to drop all the database objects in the CTSTAGING schema. Execute the Build_Script_to_Drop_CTSTAGING_objects.sql script using the SYSTEM id and password.
- Import the CTSTAGING schema by issuing the following commands logged in as a USER with DBA privileges preferably SYSTEM:
  - **impdp DUMPFILE**=<dumpfilename.dmp> **SCHEMAS**=CTSTAGING **LOGFILE**=<logfilename.log> **CONTENT**=ALL **TABLE_EXISTS_ACTION**=REPLACE

  When prompted, enter the SYSTEM userid and password to complete the import. Review log files for each import to verify the successful completion of the rollback.

NOTE: *The migration and rollback process for the PECS database does not impact the FDB_DIF schema.*

4. Users

PECS uses the KAAJEE framework for user authorization. KAAJEE authenticates users against the Local VistA. Access to PECS is limited to the users in the PECS VistA that are configured to have the PECS security keys. When a new users need to be added, contact an experienced Local VistA administrator. Provide the administrator with a list of users that will be needed along with their required security keys. PECS security keys are discussed in Appendix C.

5. WebLogic Application Server Configuration

The WebLogic server configuration assumes that there is an existing WebLogic server installed and domain configured for use by the PECS application. Configuration steps to set up datasources will depend on the version of the WebLogic server. Furthermore, it is assumed that the installation of the WebLogic server and domain follows existing standards for a production environment installation. The configuration steps detailed below include the configuration of two datasources and the deployment of the PECS EAR archive.

5.1 Dependency Installation

VistALink Version 1.6.0.028 and KAAJEE Version 1.1.0.007 software packages must be installed prior to deployment of PECS on the WebLogic server. Follow the respective installation guides supplied by the VA for this software prior to continuing with this installation.

Please read Appendix C and ensure the administrative KAAJEE user is installed prior to installing the PECS EAR file.

NOTE: *Prior to the PECS EAR file deployment, the KAAJEE station ID configuration information must be updated to refer to the target VistA server. This information is updated in the <station-number> section of the WEB-INF\kaajeeConfig.xml file that is in the EAR deployment archive. Example steps to perform this process are outlined below (*NIX based):*

Explode the CT_EAR.ear file, explode CT_WEB.war inside the exploded CT_EAR.file, then edit CT_EAR.ear/CT_WEB.war/WEB-INF/ kaajeeConfig.xml to set the institution IDs.

The steps described above would literally translate to the following Linux commands:

```
Edit the file:

cp CT_EAR.ear /tmp
cd /tmp
mkdir CT_EAR
cd CT_EAR
jar -xvf ../CT_EAR.ear
jar -xvf CT_WEB.war WEB-INF/kaajeeConfig.xml
vi WEB-INF/kaajeeConfig.xml

Save and restore the modified EAR file:

jar -uvf CT_WEB.war WEB-INF/kaajeeConfig.xml
rm -rf WEB-INF/
mv ../CT_EAR.ear ../CT_EAR.ear.orig
```

```
jar -cvf ../CT_EAR.ear *
cd ..

rm -rf CT_EAR
```

5.2 Configure WebLogic Datasources

There are two datasources that need to be configured on the WebLogic administration server for the PECS application. Configuration values for the URL, Username, and Password will be dependent on where the FDB and STAGING databases have been installed. The configuration for each datasource is summarized below:

NOTE: *Contact the DBA for the HOST_SERVER, DATABASE_SID and passwords used below. These items are bolded surrounded by percent signs below. When entering the information, do not enter the percent signs.*

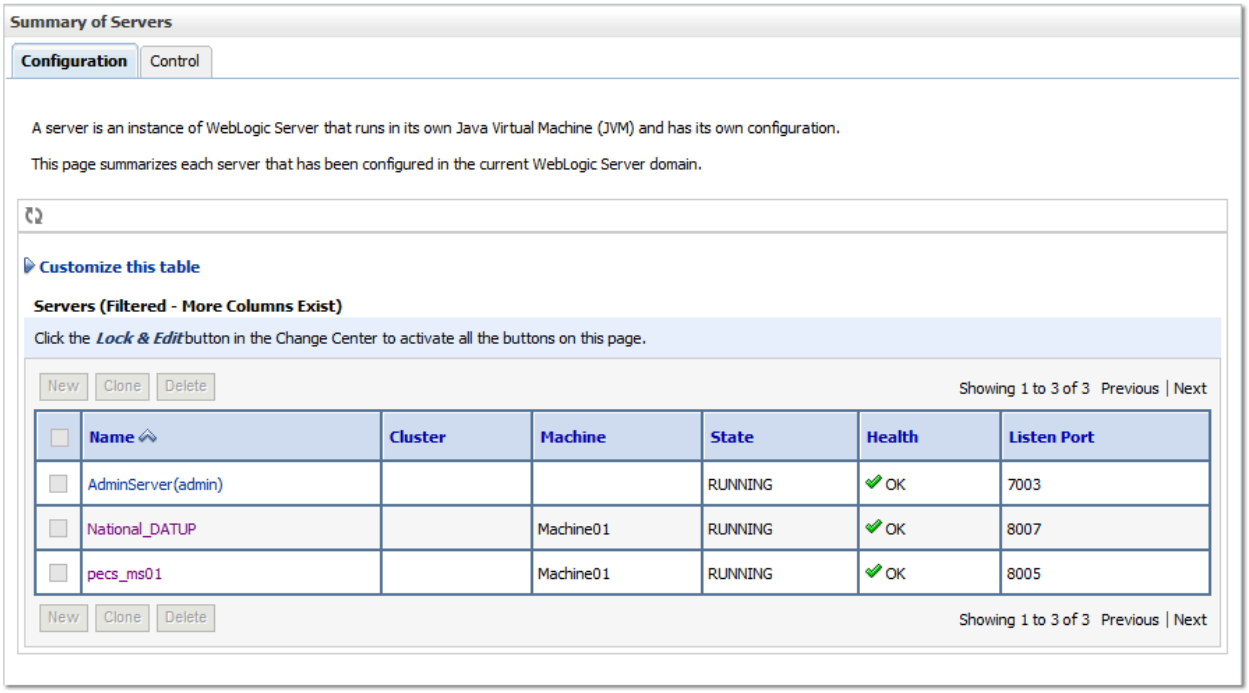
```
Name: CTFdbDataSource
JNDI Name: jdbc/CTFdbDataSource
URL: jdbc:oracle:thin:@%HOST_SERVER%:%port%:%DATABASE_SID%
Driver: oracle.jdbc.xa.client.OracleXADataSource
Username: FDB_DIF_APP_USER
Password: %FDB_DIF_APP_USER_PASSWORD%

Name: CTStagingDataSource
JNDI Name: jdbc/CTStagingDataSource
URL: jdbc:oracle:thin:@%HOST_SERVER%:%port%:%DATABASE_SID%
Driver: oracle.jdbc.xa.client.OracleXADataSource
Username: CTSTAGING_UPDATE_USER
Password: %CTSTAGING_UPDATE_USER_PASSWORD%
```

5.3 WebLogic Server Startup Configuration

PECS requires additional arguments added to the WebLogic Server's Server Start properties. This section details the steps to add the arguments to the server .

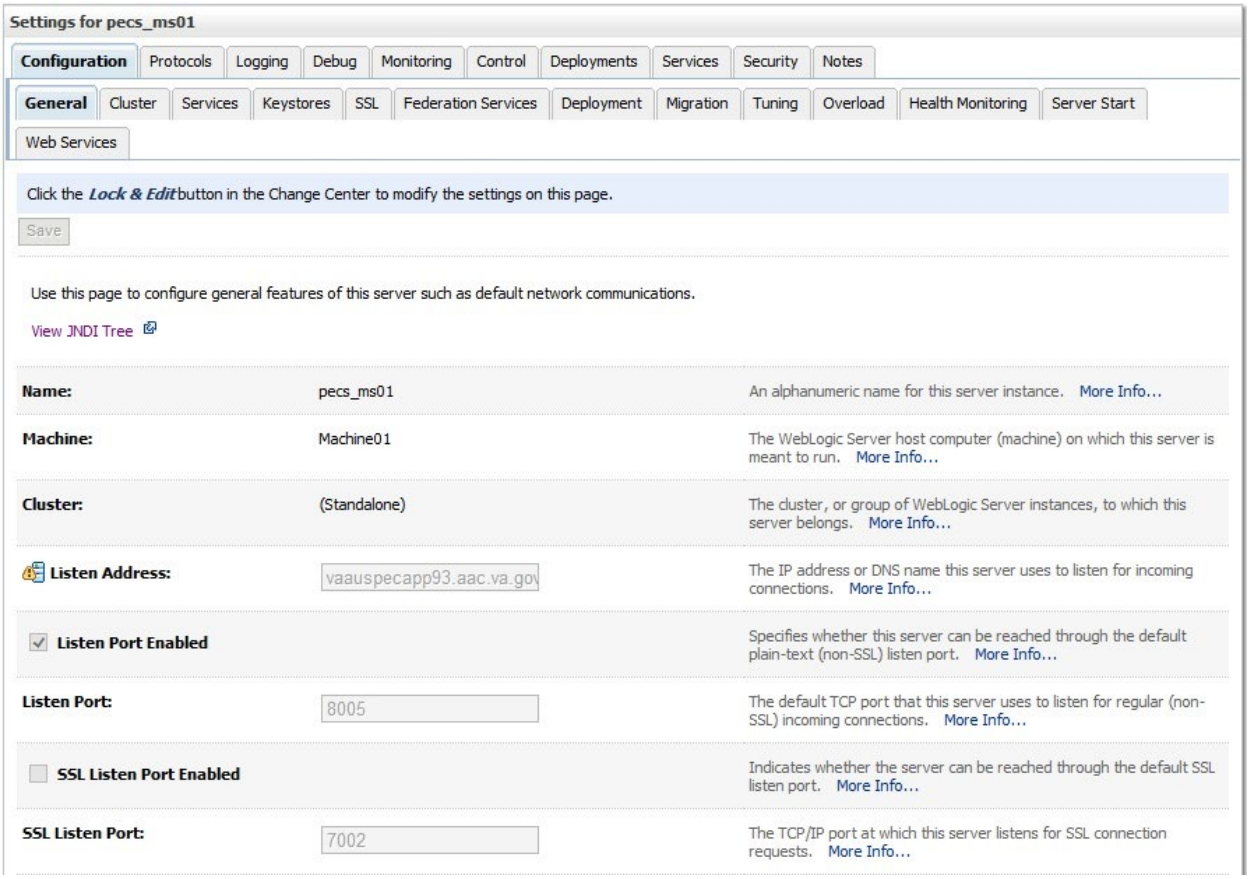
1. Open and log into the WebLogic console, using an administrative user name and password. The WebLogic console is located at: `http://<Deployment Machine>:7001/console`.
2. Click on **Environment** and then **Servers** on the panel found in the right column of the WebLogic console. Click on the server name corresponding to the deployment server in the **Summary of Servers** panel found in the right column of the WebLogic console. **For reference only**, see the figure below.

Figure 2: Summary of Servers



3. WebLogic will now display the panel **Settings for Deployment Server** in the right column of the console, where configuration of the Deployment Server are set. For reference, see the figure below.

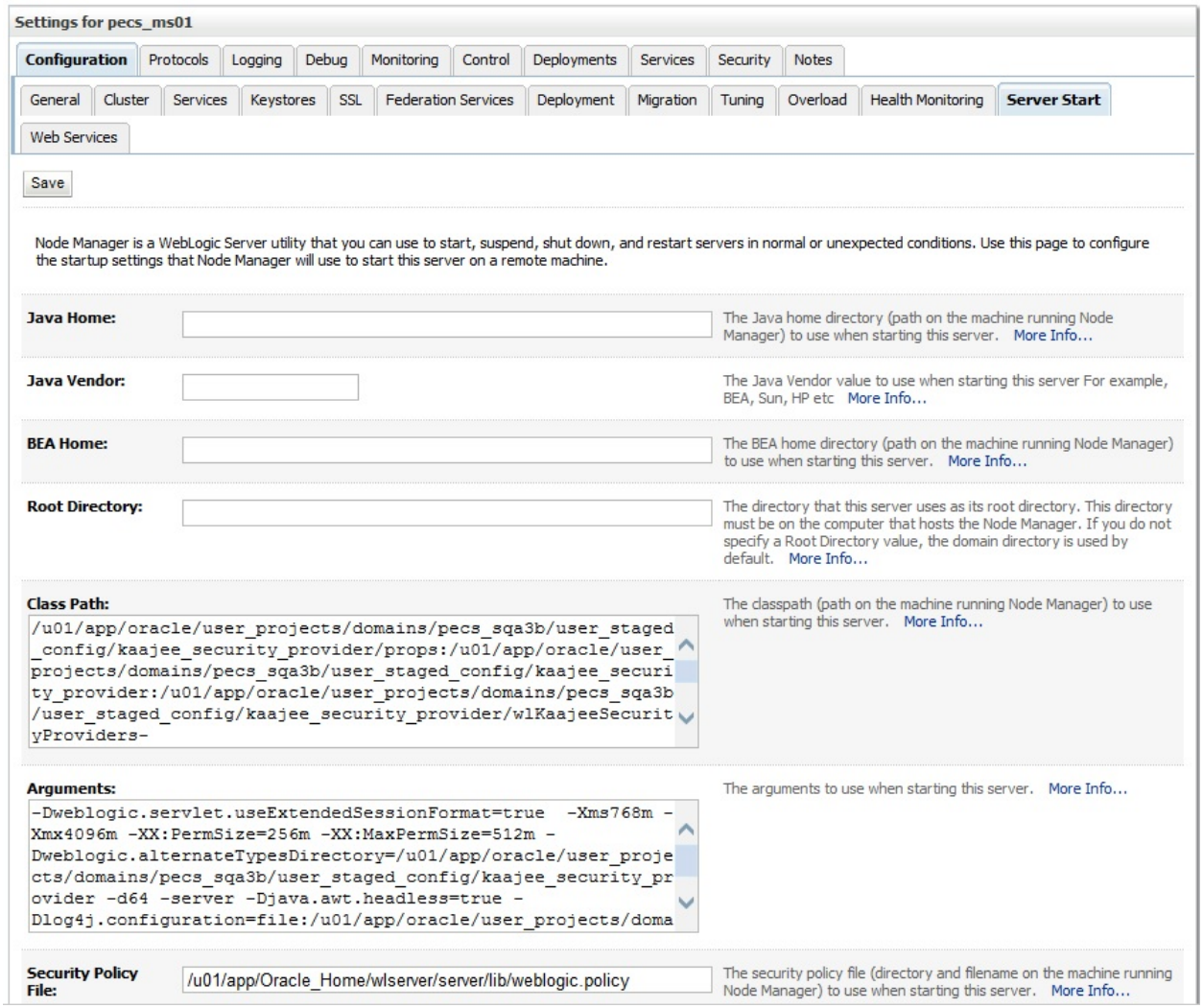
Figure 3: Settings for Deployment Server



4. Click on the **Server Start** tab.

5. WebLogic will now display the panel Server Start tab in the **Settings for Deployment Server** in the right column of the console, where configuration of the Deployment Server is set. For reference, see the figure below.

Figure 4: Server Start Tab



6. Insert the following text in the **Arguments** box:

   -d64 -server -Xms768m -Xmx4096m -XX:PermSize=256m -XX:MaxPermSize=512m -Djava.awt.headless=true

   Also add an argument for Log4j file. (See example below. Modify path per your server configuration.)

   -Dlog4j.configuration=file:/u01/app/user_projects/domains/sqa_PECS/log4j.xml

7. Click **Save**.

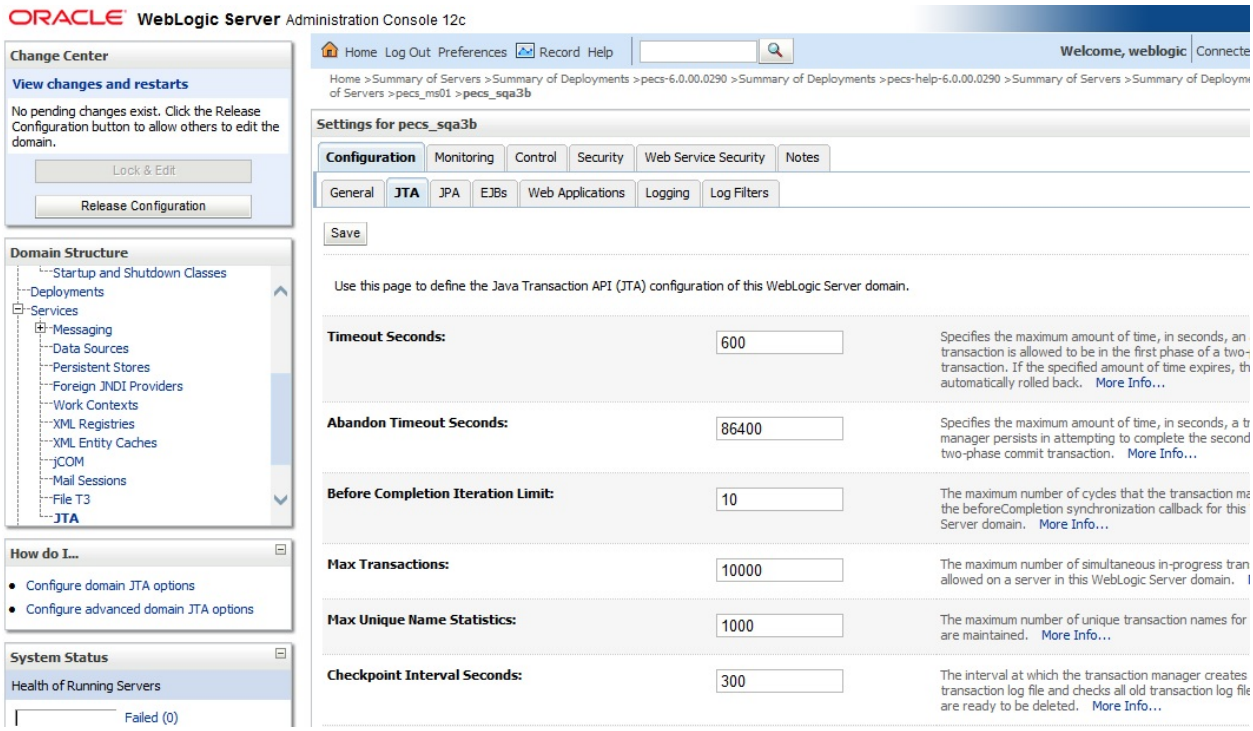
5.4 Configure WebLogic JTA

The application requires the Setting the JTA Transaction Timeout for processing of reports.

1. In the WebLogic Administration Console, expand **Services**.
2. Click on **JTA**.
3. On the Configuration tab, for "Timeout Seconds", change the value to **600** (see below Console screen).
4. Click the **Save** button.

The WebLogic Administration Console screen should look similar to the following:

Figure 5: WebLogic Console Screen -- Completion



5.5 Configure exportfile.properties

One functional piece of PECS allows a Release Manager to export data from the Oracle database so that it can be imported at various sites to support the Order Check process. The export file can be downloaded to the user's desktop, but a copy needs to be sent to an File Transfer Protocol (FTP) server so that it can be utilized in other server processes. To know where to place the file, a property file named exportfile.properties needs to be created. This file should reside in the DOMAIN_HOME/user_staged_config directory and be readable by the user who runs the WebLogic application server.

Configure the parameters in this file to match the settings of the particular environment into which you are installing. The `export.file.server, export.file.dir, export.user.name`, and `export.user.pw` much match the configuration of the sftp server.

The `export.file.name.fragment` and `export.file.search.type` values should both be set for the production values in the production environment, and to the Non-production values for all other environments.

The `fdb.flag.provider.url` value should be configured with the servername and port where DATUP National is running.

This sample exportfile.properties file is provided as an example. All parameter values should be configured for the particular environment where PECS is installed.

```
# Configure the following 4 sftp connection parameters to match
# the sftp server properties
export.file.server=vaauspresftp02.aac.REDACTED
export.file.dir=/home/presftp/pecs_ioc/fdb_dif
export.user.name=presftp
export.user.pw=password

# Cron hour 0-23
scheduled.time.hour=06
# Cron minute 0-59
scheduled.time.minute=00

#Production Value File Name
#export.file.name.fragment=UPD

#Production Values Search type
#export.file.search.type=contains


#Non-production Value File Name
export.file.name.fragment=I

#Non-production Values Search type
export.file.search.type=starts_with

fdb.flag.provider.url=t3://vaauspecapp60.aac.REDACTED:8007
```

5.6 Application Deployment

The following sections explain how to deploy the PECS Application and the PECS Help Application.

5.6.1 PECS Application Deployment

Specific deployment steps will vary depending on the version of the WebLogic server the PECS application will be deployed on. The PECS application is a J2EE application packaged in a standard EAR file format. The application should be deployed following the recommended process for deploying EAR files for the WebLogic server version platform. Use default values to deploy the Ear file and associate it with domain/server as per WebLogic install for PECS.

See Appendix G for recommended steps when upgrading from a previous release of PECS.

NOTE:	*You must associate the application with the target server, and activate the application after deployment, before it can service any requests.*

5.6.2 PECS Help Application Deployment

Specific deployment steps will vary depending on the version of the WebLogic server the PECS Help application will be deployed on. The PECS Help application is a RoboHelp application packaged in a standard EAR file format. The Help application should be deployed following the recommended process for deploying EAR files for the WebLogic server version platform. Use default values to deploy the Ear file and associate it with domain/server as per WebLogic install for PECS. Some recommended pointers for install of pecs-hlp.xxx.ear file:

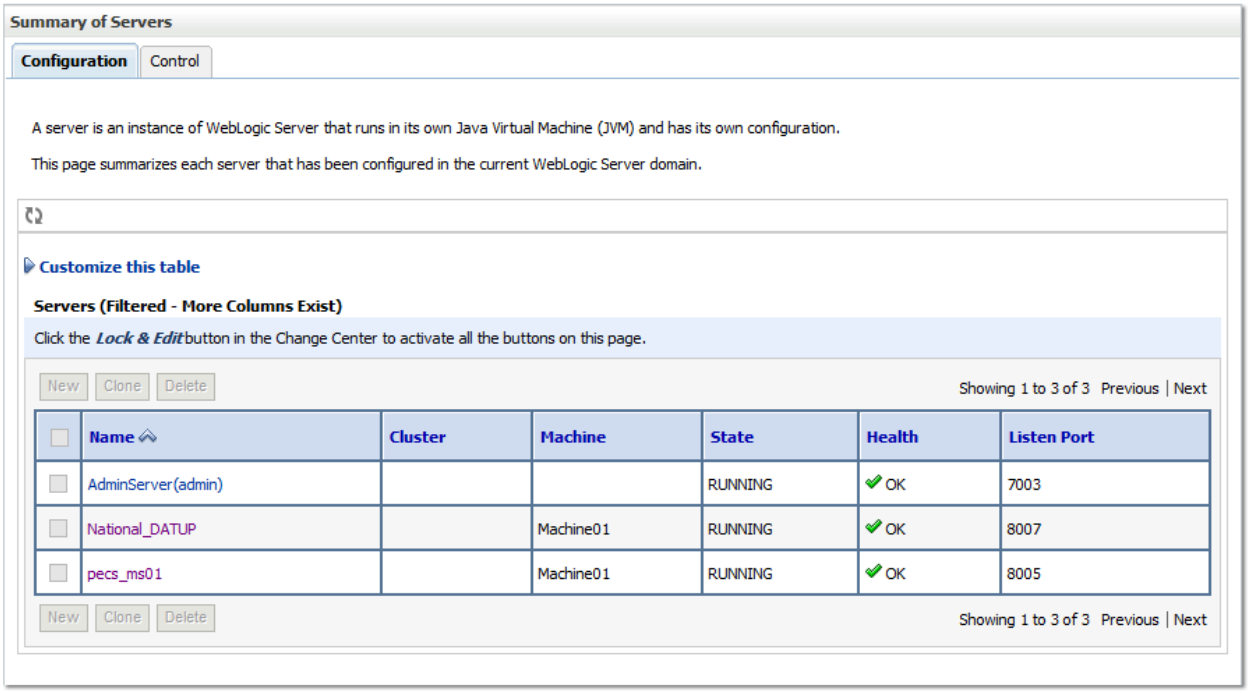
- Install the deployment as an application (PECS Help application is accessible at the context root "pecsHelp").
- On deployment targets page, select the PECS managed server.
- On Optional Settings page, name the deployment – "pecs-Help".

NOTE: *You must associate the Help application with the target server, and activate the application after deployment, before it can service any requests.*

5.7 Configure log4j.properties

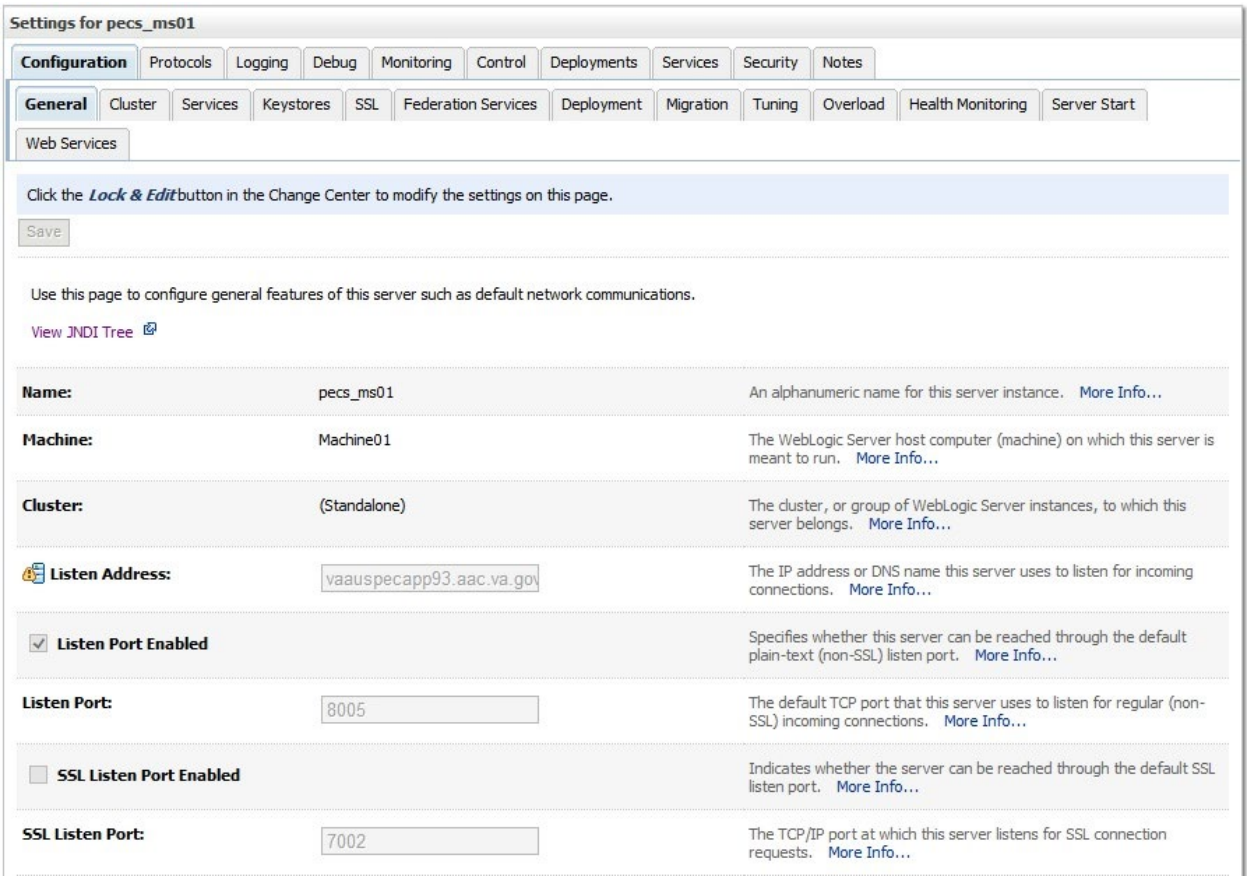
1. Copy log4j-1.2.17.jar to server/lib folder where WebLogic is installed - /u01/app/Oracle_Home/wlserver/server/lib, for example.
2. Follow the steps in Section 5.3 to add the path to the log4j-1.2.17.jar and wllog4j.jar on the Server Start tab of the PECS managed server.
3. Example: /u01/app/Oracle_Home/wlserver/server/lib/log4j-1.2.17.jar:/u01/app/Oracle_Home/wlserver/server/lib/wllog4j.jar
4. Follow the steps in Section 5.3 to add the follow argument on the Server Start tab of the PECS managed server: **-Dweblogic.log.Log4jLoggingEnabled=true.**
5. Open and log into the WebLogic console, using an administrative user name and password. The WebLogic console is located at: http://<Deployment Machine>:7001/console.
6. Click on **Environment** and then **Servers** on the panel found in the right column of the WebLogic console. Click on the server name corresponding to the deployment server in the **Summary of Servers** panel found in the right column of the WebLogic console. **For reference only**, see the figure below.

Figure 6: Summary of Servers



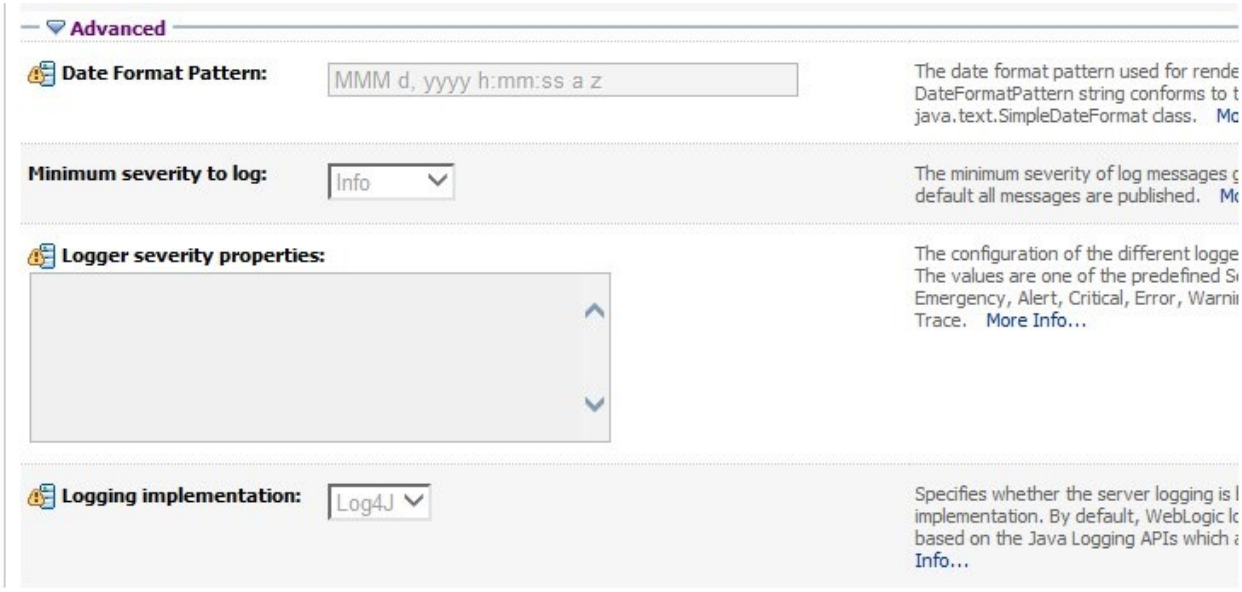
7. WebLogic will now display the panel **Settings for Deployment Server** in the right column of the console, where configuration of the Deployment Server are set. For reference, see the figure below.

Figure 7: Settings for Deployment Server



8. Click on the **Logging** tab.
9. Click Advanced to expand the advanced settings.
10. Select Log4J as the Logging Implementation.

Figure 8: Advanced Logging Settings



11. Click Save.

The PECS application uses log4j loggers to create and write log information to application event logs. The logging properties for the PECS application are included in Appendix A. Logger and appender configuration is included for the PECS application, and optionally the Hibernate API. Update logging properties as appropriate to the host server:

- Set logging level to "info" for production mode.
- Set "File" properties to the identified log directory on the server.
- Set "ConversionPattern" to the standard VA pattern.

The properties in Appendix A should be inserted into the existing log4j properties file that exists at the beginning of the WebLogic server classpath. (please use log4j.xml for reference from Appendix A).

6. Post-Installation Notes

NOTE:	*Due to policy constraints, active links cannot be included in this document. Please copy and paste the URLs into your browser.*

The entrance URL for the application is: http://%SERVER%:%PORT%/ct/public/Welcome.html.

This is a generic URL for PECS. You need to replace the %SERVER% and %PORT% with the server name and port number assigned to your deployment.

For example, the entrance URL for the AITC SQA server is as follows:
http://vaww.oed.portal.REDACTED/projects/pre/PRE_IPT_Rev/PRE_IPT_Rev_PECS2-1/default.aspx

Appendix A: log4j Properties

```
<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE log4j:configuration SYSTEM "log4j.dtd">

<log4j:configuration xmlns:log4j="http://jakarta.apache.org/log4j/">

      <appender name="STDOUT" class="org.apache.log4j.ConsoleAppender">
            <layout class="org.apache.log4j.PatternLayout">
                  <param name="ConversionPattern" value="%d %-5p [%t] %C{2}
(%F:%L) - %m%n"/>
            </layout>
      </appender>

      <appender name="FileAppender"
class="org.apache.log4j.RollingFileAppender">
        <param name="File" value="PECSLogs/server.log"/>
        <param name="Append" value="false"/>
        <param name="MaxBackupIndex" value="10"/>
        <layout class="org.apache.log4j.PatternLayout">
            <param name="ConversionPattern" value="%d{dd MMM yyyy hh:mm:ss
a} %-5p [%c:%M] %m%n"/>
        </layout>
    </appender>

    <appender name="HibernateAppender"
class="org.apache.log4j.RollingFileAppender">
        <param name="File" value="PECSLogs/hibernate.log"/>
        <param name="Append" value="false"/>
        <param name="MaxBackupIndex" value="10"/>
        <layout class="org.apache.log4j.PatternLayout">
            <param name="ConversionPattern" value="%d{dd MMM yyyy hh:mm:ss
a} %-5p [%c:%M] %m%n"/>
        </layout>
    </appender>

   <appender  name="PepsAppender"  class="org.apache.log4j.RollingFileAppender">
      <param name="File" value="PECSLogs/peps.log"/>
      <param name="Append" value="false"/>
      <param name="MaxBackupIndex" value="10"/>
      <layout class="org.apache.log4j.PatternLayout">
         <param name="ConversionPattern" value="%d{dd MMM yyyy hh:mm:ss a} %-
5p [%c:%M] %m%n"/>
      </layout>
   </appender>



    <appender name="SpringAppender"
class="org.apache.log4j.RollingFileAppender">
        <param name="File" value="PECSLogs/spring.log"/>
        <param name="Append" value="false"/>
        <param name="MaxBackupIndex" value="10"/>
        <layout class="org.apache.log4j.PatternLayout">
```

```
            <param name="ConversionPattern" value="%d{dd MMM yyyy hh:mm:ss
a} %-5p [%c:%M] %m%n"/>
        </layout>
    </appender>

    <appender name="StrutsAppender"
class="org.apache.log4j.RollingFileAppender">
        <param name="File" value="PECSLogs/struts.log"/>
        <param name="Append" value="false"/>
        <param name="MaxBackupIndex" value="10"/>
        <layout class="org.apache.log4j.PatternLayout">
            <param name="ConversionPattern" value="%d{dd MMM yyyy hh:mm:ss
a} %-5p [%c:%M] %m%n"/>
        </layout>
    </appender>

      <appender name="CT" class="org.apache.log4j.RollingFileAppender">
            <param name="file" value="PECSLogs/ct_prod.log"/>
                  <param name="MaxFileSize" value="10000KB"/>
                  <param name="MaxBackupIndex" value="10"/>
            <layout class="org.apache.log4j.PatternLayout">
              <param name="ConversionPattern" value="%d %5p %l - %m%n"/>
            </layout>
      </appender>

      <appender name="PECS" class="org.apache.log4j.RollingFileAppender">
            <param name="file" value="PECSLogs/pecs_prod.log"/>
                  <param name="MaxFileSize" value="10000KB"/>
                  <param name="MaxBackupIndex" value="10"/>
            <layout class="org.apache.log4j.PatternLayout">
              <param name="ConversionPattern" value="%d %5p %l - %m%n"/>
            </layout>
      </appender>

      <appender name="QuartzAppender"
class="org.apache.log4j.RollingFileAppender">
             <param name="file" value="PECS_logs/quartz_Scheduler.log" />
                   <param name="Append" value="false" />
                   <param name="MaxFileSize" value="10000KB" />
                   <param name="MaxBackupIndex" value="10" />
             <layout class="org.apache.log4j.PatternLayout">
               <param name="ConversionPattern" value="[%p] %d{yyyyMMdd
hh:mm:ss aa SSS} %t [%c]%n%m%n%n" />
             </layout>
      </appender>

      <logger name="REDACTED.pharmacy.ct" additivity="false">
        <level value="warn"/>
        <appender-ref ref="CT" />
      </logger>

      <logger name="REDACTED.pharmacy.pecs" additivity="false">
       <level value="warn"/>
       <appender-ref ref="PECS" />
      </logger>

      <logger name="REDACTED.pharmacy.ct.web" additivity="false">
```

```
       <level value="warn"/>
       <appender-ref ref="CT" />
      </logger>


  <!-- INFO-level logger: turn on to record timing audit information -->

      <logger name="REDACTED.monitor.time.AuditTimer" additivity="false" >
                  <level value="warn" />
                  <appender-ref ref="FileAppender"/>
      </logger>

      <logger
name="org.apache.beehive.netui.pageflow.internal.AdapterManager"
additivity="false" >
                  <level value="warn" />
                  <appender-ref ref="FileAppender"/>
      </logger>

    <logger name="org.apache.log4j">
        <level value="info" />
    </logger>

    <logger name="org.hibernate" additivity="false">
        <level value="info" />
        <appender-ref ref="HibernateAppender"/>
    </logger>

    <logger name="org.hibernate.type" additivity="false">
        <level value="warn" />
        <appender-ref ref="HibernateAppender"/>
    </logger>

    <logger name="org.hibernate.loader" additivity="false">
        <level value="warn" />
        <appender-ref ref="HibernateAppender"/>
    </logger>

    <logger name="org.hibernate.impl" additivity="false">
        <level value="warn" />
        <appender-ref ref="HibernateAppender"/>
    </logger>

    <logger name="org.springframework" additivity="false">
        <level value="error" />
        <appender-ref ref="SpringAppender"/>
    </logger>

    <logger name="org.apache.struts2" additivity="false">
        <level value="error" />
        <appender-ref ref="StrutsAppender" />
    </logger>

    <logger name="com.opensymphony.xwork2" additivity="false">
        <level value="error" />
        <appender-ref ref="StrutsAppender" />
    </logger>
```

```
    <logger name="org.apache.commons.digester" additivity="false">
        <level value="error" />
        <appender-ref ref="StrutsAppender" />
    </logger>

    <logger name="freemarker.cache" additivity="false">
        <level value="error" />
        <appender-ref ref="StrutsAppender" />
    </logger>

    <logger name="org.apache.tiles" additivity="false">
        <level value="error" />
        <appender-ref ref="StrutsAppender" />
    </logger>

    <logger name="net.sf.navigator" additivity="false">
        <level value="error" />
        <appender-ref ref="StrutsAppender" />
    </logger>

    <logger name="org.displaytag" additivity="false">
        <level value="error" />
        <appender-ref ref="StrutsAppender" />
    </logger>

    <logger name="org.apache.commons">
        <level value="warn" />
    </logger>

   <logger name="REDACTED.pharmacy.peps" additivity="false">
       <level value="error" />
       <appender-ref ref="PepsAppender"/>
   </logger>

   <logger name="org.quartz" additivity="false">
      <level value="error" />
      <appender-ref ref="QuartzAppender" />
   </logger>

    <root>
        <priority value="info" />
        <appender-ref ref="FileAppender"/>
        <appender-ref ref="HibernateAppender"/>
        <appender-ref ref="SpringAppender"/>
        <appender-ref ref="StrutsAppender"/>
        <appender-ref ref="STDOUT"/>
        <appender-ref ref="CT"/>
        <appender-ref ref="PECS"/>
    </root>

</log4j:configuration>
```

Appendix B: Custom Update File Installation

B.1 Introduction

This appendix describes the process to load the FDB-DIF and PECS update files into an existing FDB-DIF Oracle database using the FDB Updater Tool. The FDB-DIF update file is received on a schedule from FDB every two weeks and must be loaded in sequence. The PECS update file can be generated from the PECS application interface at any time by a user in the Release Manager role, and loaded with the FDB Update Tool.

B.2 Scope

This appendix will include the process to update the FDB-DIF Oracle database with the FDB and PECS Update files using the FDB Update Tool.

Processes in scope will include:

- The process to load the FDB-DIF file using the FDB Update Tool.
- The process to load the PECS update file using the FDB Update Tool.
- The process to recover the FDB-DIF FDB_CUSTOM_* tables if a Custom Tables update file load failure should occur.

Processes out of scope will *include*:

- The process to receive the FDB-DIF update file from FDB.
- The process to generate the PECS update file from the Custom Tables application.
- The process to recover the FDB-DIF database if a FDB-DIF update file load failure should occur.

B.3 Update Process Prerequisites

- The FDB Updater Tool is installed on the machine performing the update process.
- The FDB and PECS update files are available and/or have been generated.
- The FDB-DIF update file must be loaded in sequence. The version number of the new file must be the next in sequence.
- The user performing Oracle operations must have sufficient rights to delete data, drop, and create tables.
- The PECS preparation and recovery SQL scripts are available.
- An Oracle tool such as SQLPlus, must be installed on the machine executing the FDB Updater tool.

B.4 Apply FDB-DIF Update File

This section lists the steps necessary to apply the FDB-DIF Update file.

B.4.1 Execute FDB Update Tool

Here are the steps required to execute the FDB update tool (four steps):

Obtain the FDB-DIF Update File

Either download the update file from the FTP directory, or insert the update CD into drive.

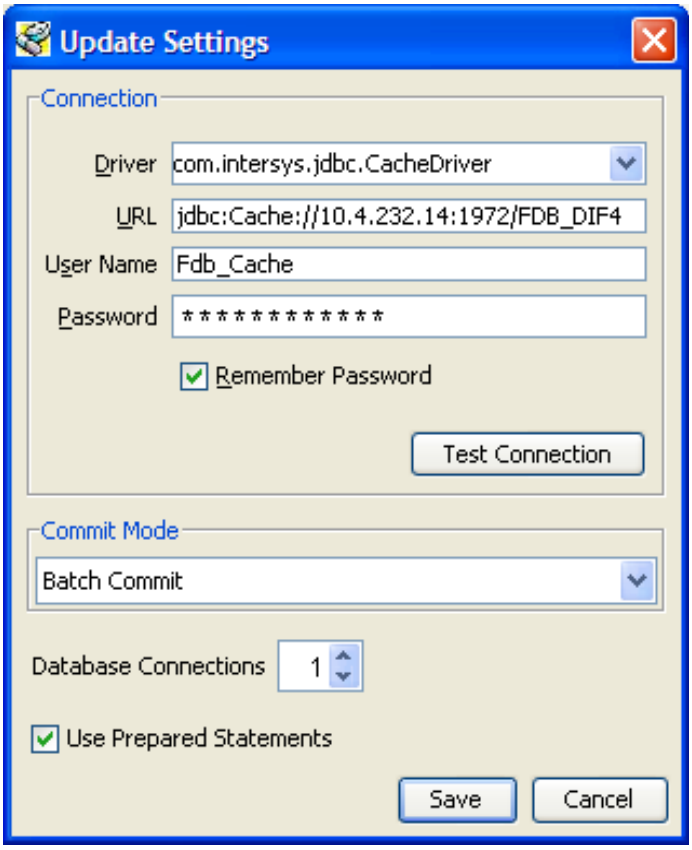
Start FDB Update Tool GUI

Navigate to where the FDB Update Tool has been installed, and click on the GUI.bat file.

Configure Connection

Select the View -> Setting menu option on the GUI and input the connection data relevant to your location and click the “Save” button. A sample screen is shown.

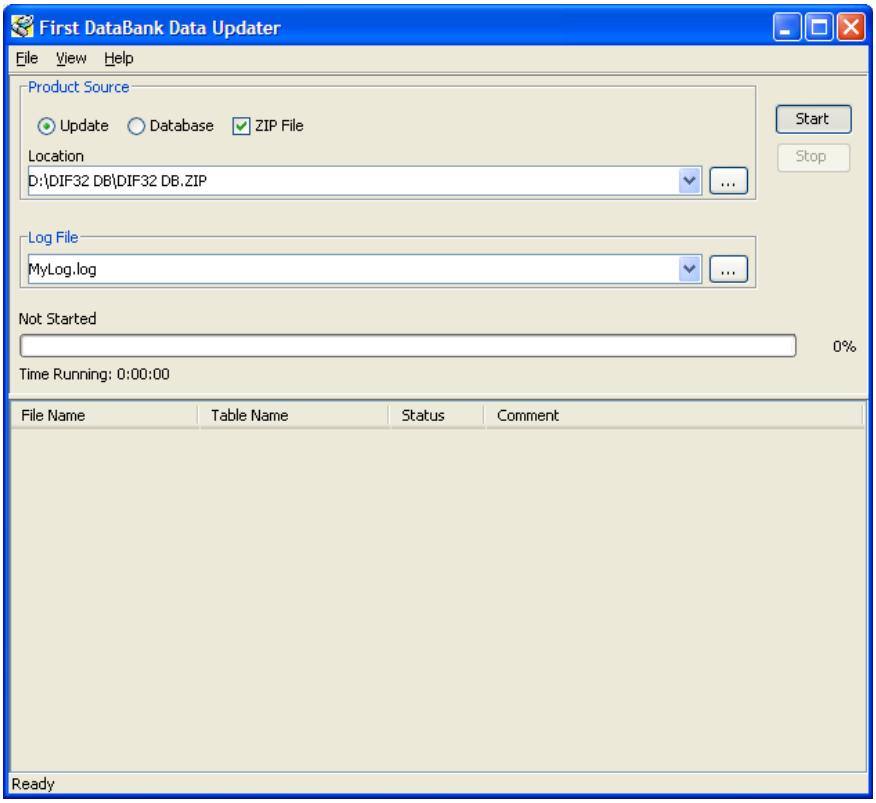
Figure 6: Update Settings - Configure Connection



Provide File Paths

Enter the path to the update and log files relevant to your location. Select whether the update is incremental or complete. Click the Start button. A sample screen is shown:

Figure 7: Add Paths to FirstDatabank Data Updater



B.5 Apply Custom Tables Update File

This section describes the two major steps necessary to apply the Custom Tables Update File.

B.5.1 Verify CT_VERSION Table

The CT_VERSION table is an additional table added to the FDB schema (as recommended by FDB) to track the PECS update file version. If the table does not exist, execute the following DDL:

```
CREATE TABLE FDB.CT_VERSION
(
     VERSIONKEY NUMBER(6) NOT NULL,
     DBVERSION VARCHAR2(5) NULL,
     BUILDVERSION VARCHAR2(5) NULL,
     FREQUENCY VARCHAR2(1) NULL,
     ISSUEDATE VARCHAR2(8) NULL,
     VERSIONCOMMENT VARCHAR2(80) NULL,
     DBTYPE VARCHAR2(10) NULL
)

CREATE UNIQUE INDEX PKCTVERSION ON FDB.CT_VERSION(VERSIONKEY)
```

B.5.2 Execute FDB Update Tool

The steps to apply the Custom Tables Update file are the same steps as outlined in Apply FDB DIF Update File. Instead of entering the path to the FDB-DIF update file, enter the path to the Custom Tables Update file, relevant to your location. Select whether the update is incremental or complete. Click the Start button.

B.6 Recover FDB-DIF Custom Tables from Load Failure

The recover process may be necessary if a failure has occurred during the application of the PECS Update file (see Apply Custom Tables Update File step). The recovery process involves the execution of a SQL script, and verification that the data has been recovered.

B.6.1 Execute Recovery

The recovery entails the deletion of any data that may have been loaded to the FDB_CUSTOM_* tables during the execution of the update process.

B.6.2 Verify Data Recovery

Verify that the data in the FDB_CUSTOM_* tables has been deleted.

B.6.3 Generate Full PECS Update File

After logging into the PECS application, a user in the Release Manager role will navigate to the Custom Update tab, and click the Download New Full Update button. This will generate a PECS update file with all currently approved order check customizations.

Appendix C: KAAJEE

PECS uses the KAAJEE framework for user authorization and authentication. KAAJEE authenticates users against the Local VistA. Access to PECS is limited to known users with the security role. If new users need to be added, contact an experienced Local VistA administrator. Provide the administrator with a list of users that will be needed along with their required security keys. PECS security keys are discussed in the next section.

C.1 Security Keys

After a user is authenticated, KAAJEE retrieves his or her security keys from VistA and maps them to WebLogic security roles. The PECS application is secured so that only users running with the PECS security roles may access the PECS application.

PECS relies on the following four security keys, which must be added to VistA:

- PSS_CUSTOM_TABLES_ADMIN
- PSS_CUSTOM_TABLES_APPROVER
- PSS_CUSTOM_TABLES_REL_MAN
- PSS_CUSTOM_TABLES_REQUESTOR

PRE will rollout VISTA Patch, PSS*1*147 which exports the Security Keys, and those Security Keys are technically in the PSS namespace. These security keys have to be associated with the user accounts that will be set up on a VistA M server. The process for setting up the user accounts and the security keys is a part of the VistALink API setup mentioned in the VistALink Installation Manual available with the API software at: *http://vista.med.REDACTED/kernel/kaajee/download_9-10.asp#vista_m_server*

NOTE:	*Due to policy constraints, active links cannot be included in this document. Please copy and paste the URLs into your browser.*

C.2 Administrator User Role

PECS is configured to use the KAAJEE administrator user role by default. This requires the creation of a KAAJEE administrator account in WebLogic if one does not exist.

C.3 Resource Adapter

Use Resource Adapter with the supporting jars included in it and do not deploy jars as library files. The deployment order for the Resource Adapter must be at a lower number than the deployment order for PECS. This is to make sure the Resource Adapter is loaded and that the classes in the Resource Adapter are available when PECS is started. It is recommended to set the deployment order for the Resource Adapter to 95 or 99. This is because the default deployment order is 100.

Appendix D: PECS Logical Deployment Architecture

D.1 Logical Deployment Design – PECS

Application Server:

The WebLogic Application Server 12.1.1 will host PECS and its business services.

Database Server:

The Database Server- Oracle 11g will have Red Hat Linux Enterprise version RHEL5 as it OS. It will host the Custom Table Staging database and FDB-DIF database.

Failover Server:

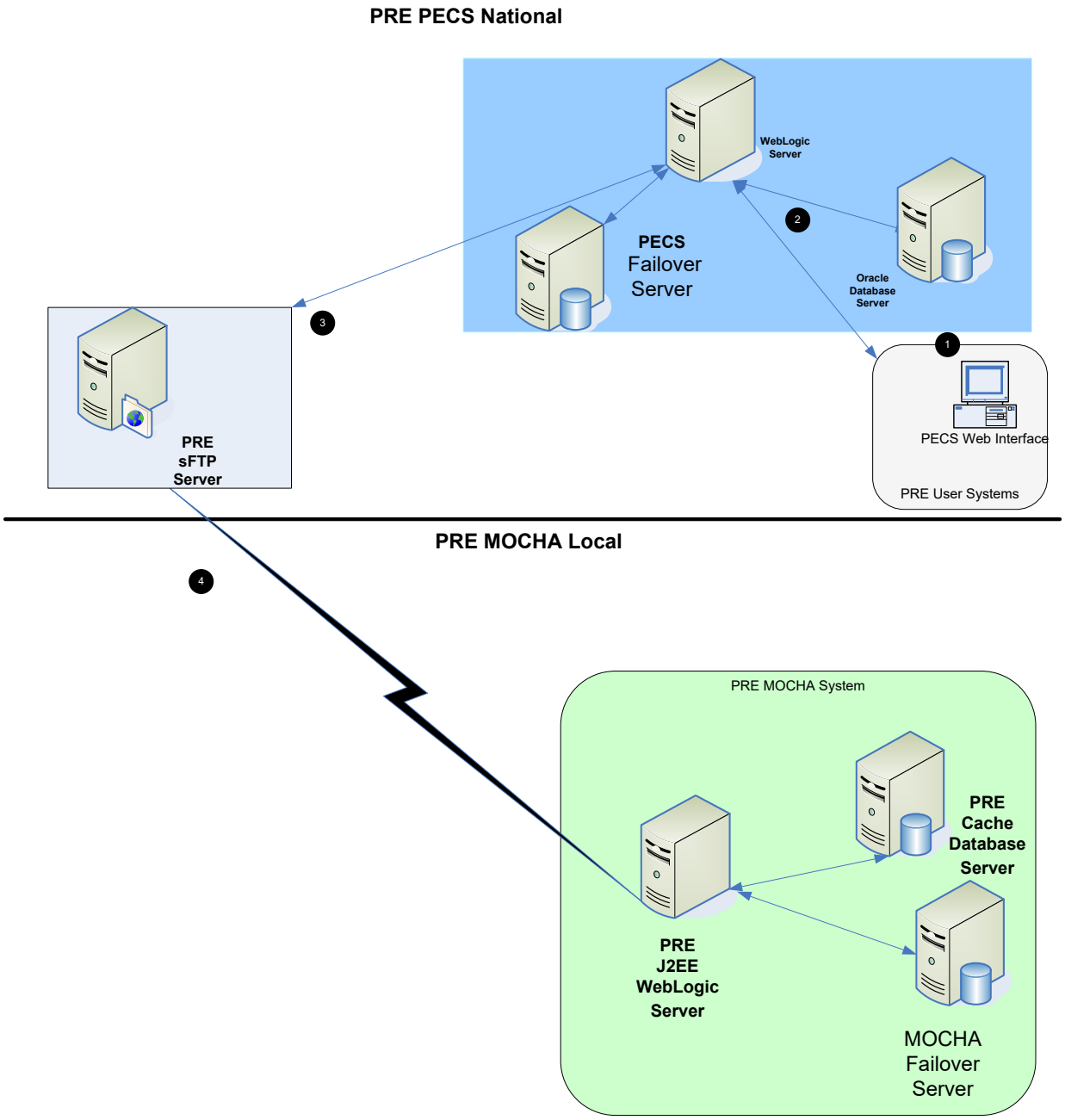
There will be a Failover server. It will host both Oracle WebLogic Application Server and Oracle Database Server to provide redundancy.

Legacy Interface:

There will be an existing VistA server which will host legacy KAAJEE and VistALink interface.

The figure below shows the overview of Logical Deployment Design for the PRE PECS Application.

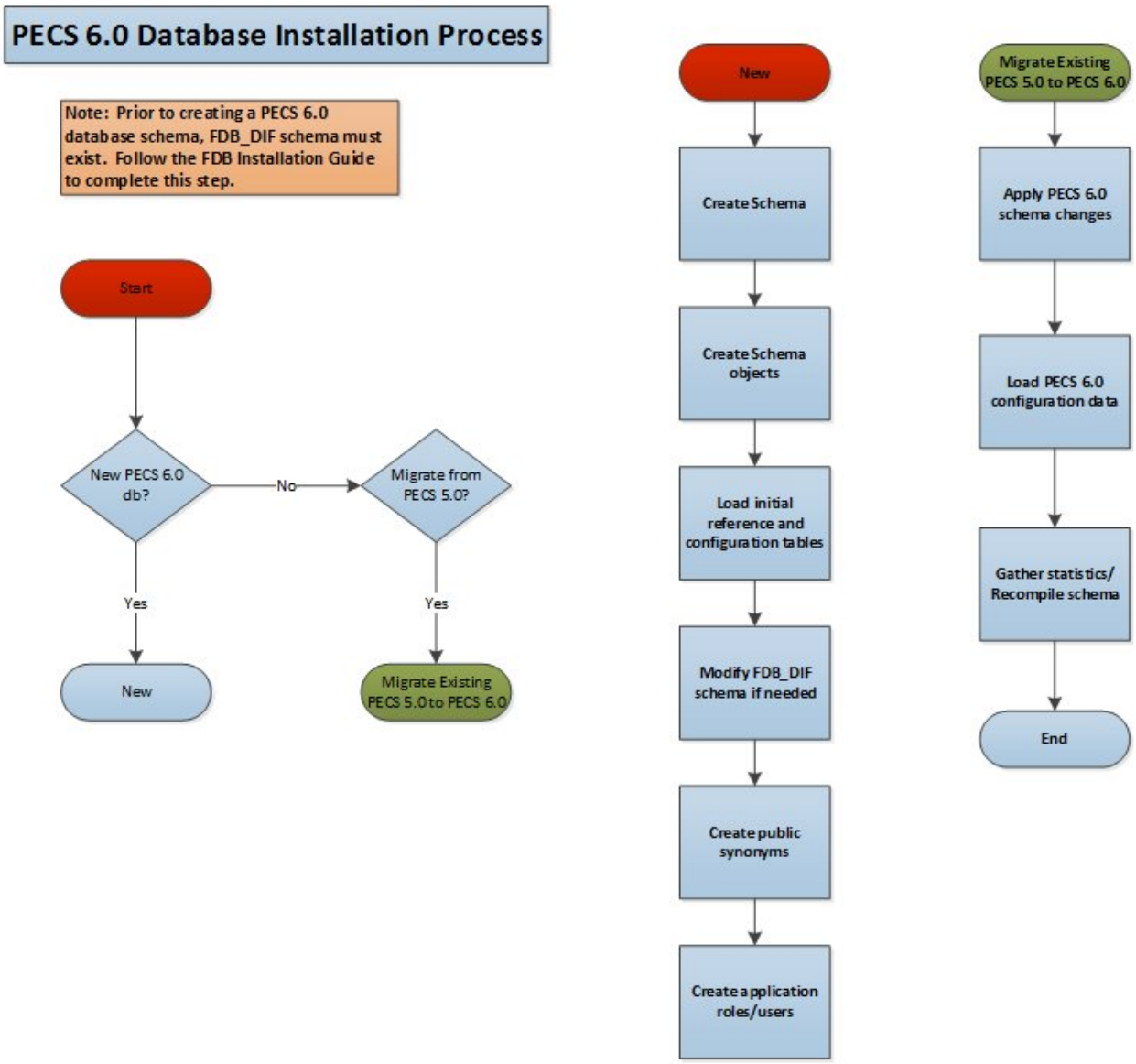
Figure 8: PECS Deployment



Appendix E: PECS Database Installation Process

E.1 Database Installation Process Flow – PECS

Figure 9: Database Installation Process



Appendix F: Rollback Process

If the installation process must be stopped when updating an environment from a previous version of PECS, use the following to determine and follow the steps outlined in order to rollback the application.

If both the database and the application have been deployed:

1. Shutdown the WebLogic domain.
2. Follow the instructions in section 3.2.7 PECS v6.0 Database Migration Rollback in this document.
3. Start the WebLogic domain.
4. Deploy the prior version of PECS using the instructions in section 5.6 Application Deployment in this document.

If only the database has been deployed

1. Shutdown the WebLogic domain.
2. Follow the instructions in section 3.2.7 PECS v6.0 Database Migration Rollback in this document.
3. Start the WebLogic domain.

Appendix G: PECS Upgrade Installation Instructions

1. Stop the WebLogic managed server.
2. Delete the previous PECS deployment.
3. From the Linux server, navigate to the managed server directory that contains the tmp and stage folders. For example:
   /u01/app/user_projects/domains/DEVPHARMACYPECS/servers/PECS_MS1
4. Remove the tmp and stage folders and their contents from this directory.
5. Start the managed server.
6. Stop the managed server.
7. Proceed with the deployment of the new PECS ear file.