PHARMACY PRODUCT SYSTEM – NATIONAL (PPS-N)

INSTALLATION GUIDE

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Department of Veterans Affairs
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1 PROJECT SCOPE

1.1 Project Identification

This installation guide applies to the PPS-N v1.3 release, which is an enhancement to PPS-N v1.2. PPS-N v1.3 complies with the VA mandate on two factor authentication (2FA).

1.2 Project Description

Pharmacy applications and systems are some of the oldest technologies in the Veterans Health Information Systems and Technology Architecture (VistA) system. The Veterans Health Administration (VHA) has identified system limitations and cumbersome, inconsistent pharmacy processes as a weakness in its ability to provide efficient pharmaceutical services across the VHA continuum. In 2001, First Consulting Group, an external contractor, conducted a functionality assessment of pharmacy applications and operations to determine the viability of maintaining the status quo of current technology supporting VHA Pharmacy operations, taking into account agency goals and priorities. This analysis, presented in the Final Report of the Veterans Affairs (VA) Pharmacy Application Assessment Project (dated July 20, 2001), identified several fundamental problems with the current system and recommended that VHA Pharmacy Systems technology and operational processes change from a dispensing and labeling focus to a patient-centric care focus. A proposal to proceed with the VHA Pharmacy Re-Engineering (PRE) project was presented to VHA and subsequently approved on April 16, 2002.

The Future Business Process Model (FBPM), published in September 2004, presents the overall operational concept for the pharmacy processes which the overall PRE project supports. The design of the operational concept presented in the FBPM focuses on achieving an enterprise-wide patient-centric pharmacy care system. The operational concept includes:

- ✓ Integrating Inpatient and Outpatient Pharmacy Care – This results in a single, combined view of a patient's healthcare. The combined view provides the caregiver with quick access to pertinent information about a patient's outpatient and inpatient medications.
- ✓ Integrating On-Site and Off-Site Pharmacy Care – This addresses a new capability to access and incorporate pertinent healthcare information from VHA and non-VHA healthcare facilities, providing the caregiver a complete picture of the Patient's Medication Profile.
- ✓ Integrating Pharmacy into the Patient Care Team – This specifically addresses the vision of fully integrating pharmacy operations with the various other operations dealing with patient care, such as order entry, administration, and clinical monitoring.
- ✓ Integrating Inventory and Supply Management in Patient Healthcare – This incorporates inventory and supply concepts (e.g., par levels, reorder points, usage data, forecasting) to ensure that required medical supplies are available in the right form, at the right time, and in the right place.
- ✓ Integrating Process Management into Patient Healthcare – This provides the capability to assess the status of pharmacy operations and to make improvements continuously based on evidence garnered throughout the pharmacy processes.

Implementing the operational concept outlined above will help transform the current pharmacy from a supply-fill-deliver organization to a *OneVA* pharmacy (providing world-class service to Veterans and their families through the effective management of people, technology, process, and financial resources) that is a valued member of the VHA's patient-care team. PRE Project Goals and Objectives

The objective of the PRE project is to facilitate the improvement of pharmacy operations, customer service, and patient safety for the VHA. The PRE project will help address the identified goals and vision for the VHA Pharmacy System.

The goal for the overall PRE project is a seamless and integrated nationally supported system that is an integral part of the Health***e***Vet-VistA environment. To meet this goal, the PRE project will enhance pharmacy data exchange, as well as clinical documentation capabilities, in a truly integrated fashion to improve operating efficiency and patient safety. Additionally, it will provide a flexible technical environment to adjust to future business conditions and to meet patient needs in the clinical environment. Achieving this goal will enable resolution of current pharmacy issues, improve patient safety, and facilitate long-term process stability.

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The goal for the overall PRE project is a seamless and integrated nationally supported system that is an integral part of the new VA SOA environment. To meet this goal, the PRE project will enhance pharmacy data exchange, as well as clinical documentation capabilities, in a truly integrated fashion to improve operating efficiency and patient safety. Additionally, it will provide a flexible technical environment to adjust to future business conditions and to meet patient needs in the clinical environment. Achieving this goal will enable resolution of current pharmacy issues, improve patient safety, and facilitate long-term process stability.

The PRE project has been broken down in multiple projects. Previous phases of PRE have concentrated on order checks (MOCHA) automated updates (DATUP) and customizing the drug interactions (PECS). The Pharmacy Product System – National (PPS-N) and the Pharmacy Product System – National Migration (PPS-N Migration) projects are the two projects that are covered by this Installation Guide. This guide will cover the installation of the scripts, VistA Patches and Java artifacts and configurations necessary to run the PPS-N applications. This includes configurations for accessing the Federal Supply Schedule (FSS), The Veterans Enterprise Terminology Service (VETS) and the First Database Drug Information Framework (FDB-DIF) data repository.

2 DOCUMENT OVERVIEW

The information contained in this PPS-N Installation Guide applies to the PPS-N Version 1.3. This section defines the layout of this document and provides an outline of the document structure.

The purpose of this Installation Guide (IG) is to define the pre-requisites for the PPS-N application to function, the artifacts that must be deployed and the configuration of those artifacts. The deployable artifacts associated with this project will be the PPS-N Enterprise Product List (EPL), the PPS-N deployable Enterprise Archive (EAR) file and the Massachusetts General Hospital Utility Multi-Programming System (MUMPS) patches that will be deployed on the NDF MS system. Additionally, the documentation associated with this project will discuss the interfaces to the NDF MS system, the interfaces to the FDB-DIF, the interface to the VETS system and the methodology for connecting to the FSS database. The coding for the NDF MS system and FDB-DIF interfaces will be done by the contractor. The VETS system will be maintained by VETS personnel and the FSS database will be maintained by FSS personnel.

2.1 Document Background

This document details the steps required to install and configure the PPS-N v1.3 software, the terminology used for the configuration and deployment of the software, and the assumptions for installing the software. Additionally, this document details how to install and configure the database environment. The PPS-N v1.3 Version Description Document is delivered as a companion document to this Installation Guide.

2.2 Overview

The following list provides a brief description of the sections included in this document:

Section 1:	Provides introductory material delineating the purpose of the PRE Initiative and the PPS projects.
Section 2:	Presents an overview of the document
Section 3:	Presents the installation instructions for PPS-N.
Section 4:	Presents functionality tests to confirm that the installation was successful

Text in a `Courier New` font indicates text, commands, or settings that must be typed, executed, or configured to complete the installation.

3 INSTALLATION INSTRUCTIONS

The following sections detail the steps required to install the PPS-N software. Section 3.1 details the terminology used for the configuration and deployment of the software. Section 3.2 outlines the assumptions for installing the software. While the system may be configured to run outside the given assumptions, doing so requires modifications that are not detailed in this document. Section 3.3 describes how to install and configure the Oracle databases. Section 3.4 describes installation and configuration of the VistA patches. Section 3.6 describes how to install and configure the PPS-N software in WebLogic. Finally, Section 3.7 describes how to upgrade an existing PPS-N v1.2 installation to PPS-N v1.3, thereby incorporating the VA mandate on two factor authentication (2FA).

In order to understand the installation and verification process, the reader should be familiar with the WebLogic console shown in Figure 3-1. The WebLogic console is a Web page viewable from any Internet browser; however, Internet Explorer, Version 11, is recommended. The WebLogic console is generally divided into two columns. The left column contains the `Change Center`, the `Domain Structure`, and other informational panels. The right column displays panels containing additional options or configuration details.

Note: With the exception of the `Change Center` and `Domain Structure`, all WebLogic console panels shown in the figures contained in this document are found in the right column of the WebLogic console. Whenever examples are given with the text, “For example,” the given value may be different depending on the specific server configuration. When the text, “For example,” is not provided, the text supplied must be entered exactly as specified for the PPS-N application to operate properly.

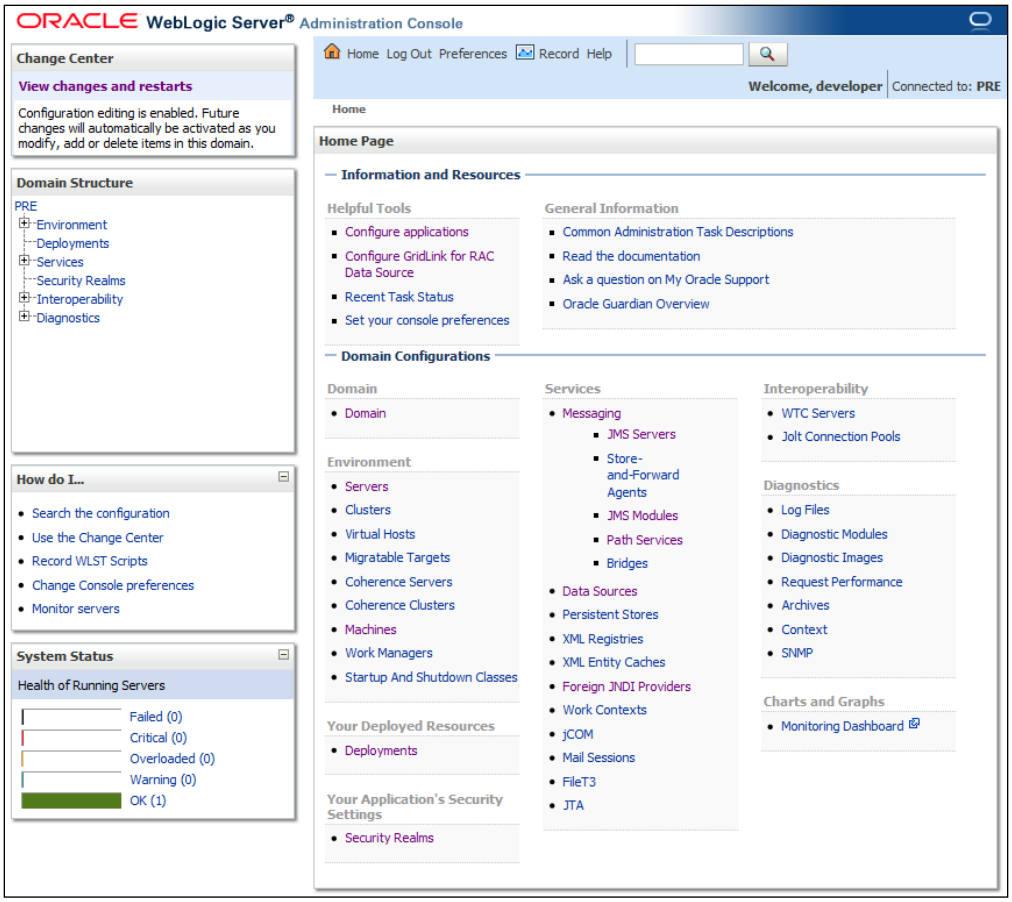

Figure 3-1. WebLogic Console

3.1 Terminology

In an effort to make these installation instructions as general as possible for installation at any site, a few terms are used throughout the installation instructions with the intent that they be replaced with site-specific values. Table 3-1 contains a list of those terms used only within this document as well as sample site-specific values for each term.

Table 3-1. Terminology

Term	Definition	Sample
Database Server	Machine on which Oracle is installed and runs	`PPS-N-DB`
Deployment Server	WebLogic managed server where PPS-N is deployed	`NationalPharmacyServer`
Deployment Server Port	Port on which the Deployment Server is listening	`8021`

Term	Definition	Sample
Deployment Server class path directory	Folder location on the Deployment Server where libraries on the class path are located (see WebLogic documentation for instructions on setting a WebLogic managed server class path)	`/opt/oracle/middleware/domains/PRE/lib`
Java Database Connectivity (JDBC) Universal Resource Locator (URL)	URL to connect to Oracle database	`jdbc:Oracle://pps-n-DB:1521/FDB_DIF`

3.2 Assumptions

Hardware specifications for PPS-N are found in the PPS-N v1.3 Version Description Document which is delivered as a companion document to this Installation Guide.

The installation instructions found within this guide are intended to be performed on a clean installation of WebLogic 12.1.3, with a separate managed server to act as the Deployment Server. For details on completing the installation of the following items, please refer to each item's installation and configuration documentation for WebLogic supplied by Oracle.

For successful deployment of the PPS-N software at a site, the following assumptions must be met:

- The Deployment Server is configured and running via the WebLogic Node Manager.
- WebLogic is configured to run with the Java Standard Edition Development Kit, Version 1.8.0_92 (or better).
- Access to the WebLogic console is by means of any valid administrative user name and password.
- Oracle 11g database driver libraries are present on the class path for the respective Deployment Servers.
- Red Hat Enterprise Linux is properly installed.
- Installation instructions are followed in the order presented within this Installation Guide.
- SiteMinder Web Agent is installed on the Apache web server in the PPS-N environment and SSL is enabled.
- SiteMinder Web Agent on the Apache server must be configured to communicate with the IAM Policy server. IAM SSOi service is up and available.
- All Active Directory users have read-only or Viewer access to PPS-N. The users must have their VAUID, first and last names set in Active Directory and in the IAM Provisioning Server.

3.3 Database Tier Installation

This section describes the operating system and software for the PPS-N Database Tier installation and configuration. Initially, install and configure the operating system and software according to the manufacturer's specifications. Then configure as specified in Section 3.3.1 through Section 3.3.2 for PPS- to function properly. An Oracle database is implemented at the national level. **The installation**

instructions in Section 3.3.1 should be carried out by a qualified individual, such as a certified Database Administrator (DBA).

3.3.1 Oracle Database (National)

The National PPS-N EPL is designed to be operating system independent but these installation instructions have been tested only on the Red Hat Linux operating system. Oracle 11g Enterprise Edition Release 11.2.0.1.0 – Production must be properly installed and configured. The following sections describe the installation, features, user creation, and configuration for the Oracle database.

3.3.1.1 Oracle Installation

A 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 SQL*Plus and Oracle Enterprise Manager, can be used to connect to the instance through Transparent Network Substrate alias.

3.3.1.2 Oracle Components

During the installation of Oracle, described in the *Oracle 11g Quick Installation Guide*, several components are selected for optional installation, as listed below. Given the platform independent nature of these installation instructions for the database, platform dependent components are not listed here. Instead, generic features and functions of the Oracle 11g database are identified.

The following features are required by the PPS-N system:

- Procedural Language/Structured Query Language (PL/SQL) Native Compilation
- PL/SQL API to LDAP – DBMS_LDAP

The following additional features have been tested with the PPS-N system:

- Fail Safe
- Integrated Clusterware
- Automatic Workload Management
- Password Management
- Comprehensive eXtensible Markup Language (XML) Support in the Database
- Enterprise Manager
- Automatic Memory Management
- Automatic Storage Management
- Automatic Undo Management
- Server Managed Backup and Recovery

The following features are not required and were not tested with the PPS-N system:

- Flashback Query
- Table, Database, and Transaction Query
- Data Guard
- Java Native Compilation
- Encryption Toolkit
- Virtual Private Database

- Fine Grained Auditing
- Java Support
- JDBC Drivers on server
- PL/SQL Server Pages
- Java Server Pages
- COM (Component Object Model) Automation
- Microsoft Transaction Server/COM+ Integration
- Open Database Connectivity (ODBC) DB on server
- Object Linking and Embedding, Database (OLE DB) on server
- Data Compression
- Transportable Tablespaces
- Star Query Optimization
- Summary Management
- Materialized View Query Rewrite
- Oracle Streams
- Advanced Queuing
- Workflow
- Distributed Queries
- Distributed Transactions
- Database Workspace Management
- Ultra Search
- interMedia
- Text
- Oracle Analytic Functions
- Demonstration Files

The following functions are not required and were not tested with the PPS-N system:

- Replication
- Materialized Views
- Remote Authentication
- Quotas
- Profiles
- Resource Plans
- Stored Outlines

3.3.1.3 Oracle User Creation

Two users must be created within the Oracle database to support PPS-N. Table 3-2 presents example username and password for each Oracle user. Note that user names and passwords used must match exactly those used to configure the JDBC data sources in Section 3.6.4.

Table 3-2. Oracle Users

Username	Password
PPSNEPL	pharmacy
FDB_DIF	FDB_DIF123

The `ppsnepl` user is the owner of the PPS-N schema. The `FDB_DIF` user is the owner of the `FDB_DIF` schema.

Both users must have the following roles and privileges:

- CONNECT
- RESOURCE
- CREATE SESSION
- CREATE VIEW
- SELECT_CATALOG_ROLE
- UNLIMITED TABLESPACE

3.3.1.4 Oracle Configuration

The PPS-N Oracle Database is the primary data repository for the PPS-N application on the National PPS-N instance. The database should be installed and configured appropriately for the PPS-N operating environment.

Two schemas must be created. If not already installed, the `FDB_DIF` schema can be created by running a script, provided with the First DataBank software. Upon creation, the tables may be populated using First DataBank Data Updater Installation. Update instructions are available in the *FDB Data Updater Software Users Guide.*

The EPL schema must also be created in the database instance. The EPL table creation and population scripts are run from a separate process. For instructions on loading the EPL data, refer to Section 3.3.2.

3.3.1.4.1 Oracle Database Parameters

The following Oracle database parameters are required for the PPS-N application:

- NLS Language = American
- NLS Territory = America

  Character Set = WE8ISO8859P1

3.3.1.4.2 Oracle Tablespaces

The PPS-N application data is contained in two tablespaces. The size of each tablespace is shown in Table 3-3.

Table 3-3. PPS-N Tablespaces

Tablespace Name	Size (MB)
TEMP	188
USERS	3,000

3.3.2 EPL Data Load

The following instructions should be followed to install the base EPL Data Load. Prior to following any of the installation instructions, the dependencies in Section 3.3.2.1 must be installed. After the dependencies have been installed, follow the instructions in Section 3.3.2.2 to load the data using the Ant build.

3.3.2.1 Dependency Installation

Two other software packages must be installed prior to loading the EPL data.

Prior to installing the dependencies, follow these steps:

1. Copy the `PPSN-1.x.xx_SourceCode.zip` file to the chosen target folder. This file is provided by Configuration Management along with the Version Description Document. No particular location is required.
2. Unzip the file.

This will create the following folder structure:

```
PS_PPS_Bld\PS_PPS_bld
PS_PPS_Bld\PS_PPS_lib
PS_PPS_Dev\PS_PPS_common
PS_PPS_Dev\PS_PPS_interface
PS_PPS_Dev\PS_PPS_domain
PS_PPS_Dev\PS_PPS_srv
PS_PPS_Dev\PS_PPS_ui
```

The `PS_PPS_Dev\PS_PPS_domain` folder contains the files necessary to create and load the EPL tables.

3.3.2.1.1 Java SE Development Kit (JDK) Installation

Java SE Development Kit (JDK) Version 1.8.0_92 or greater, must be installed prior to loading the PPS-N EPL data load. PPS-N was tested with the current JDK release (as of August 2016), 1.8.0_92. Please follow the installation instructions provided by Sun to complete the installation. For the Microsoft Windows operating system, refer to https://docs.oracle.com/javase/8/docs/technotes/guides/install/install_overview.html#A1096936; for the Linux operating system, refer to https://docs.oracle.com/javase/8/docs/technotes/guides/install/install_overview.html#A1097144. Once complete, this new installation of Java must be set as the default Java distribution (i.e., the installation folder must be set as `JAVA_HOME`).

3.3.2.1.2 Apache Ant Installation

Apache Ant, **version 1.9.1** must be installed prior to loading the PPS-N EPL data load. Please follow the installation instructions provided by Apache in the Apache Ant Installation Manual. Once complete, a user must be able to execute Ant by typing `ant` at the command line from any folder on the system (i.e., Ant's `bin` folder must be on the system's path).

3.3.2.2 Ant Build Data Load

Please complete these steps to load the PPS-N data.

1. Navigate to the folder where the source was extracted from RTC.
2. Navigate to the `PS_PPS_Dev/PS_PPS_common/etc/build/template/properties` folder.
3. Open the `project.properties` file for editing.
4. Change the `deploy.environment` attribute's value to `dataload`. For example: `deploy.environment=dataload`
5. Save the changes and close the `project.properties` file.
6. Navigate to the `PS_PPS_Dev/PS_PPS_common/etc/build/template/properties/deploy` folder.
7. Open the `dataload.properties` file for editing.
8. Change the `local.hosts` attribute value to an empty value. For example: `local.hosts=`
   This prevents the dataload from attempting to load the Local data, which is not applicable at this time.
9. Change the `nationalserver.database.url.host` attribute value to the hostname of the database server. The default value is `localhost`. For example: `nationalserver.database.url.host=localhost`
   This value pertains to the attribute key names for the `user`, `password` and `schema` in the next step.
10. Change all attribute key names of `localhost` under the nationalserver properties section to the name of the database server used in step 9. For example: `localhost.EPLN.user=ppsnepl` should change to `<database>.EPLN.user=ppsnepl`, `localhost.EPLN.password` becomes `<database>.EPLN.password` and `localhost.EPLN.schema` becomes `<database>.EPLN.schema`.
11. With respect to the previous step (which may have changed the key names to something other than `localhost`), change `localhost.EPLN.user`, `localhost.EPLN.password` and `localhost.EPLN.schema` attribute values to the correct values for the National PPS-N database. For example: `localhost.EPLN.user=ppsnepl` and `localhost.EPLN.password=pharmacy`.
12. If the database name used on the install was not `EPLN`, change the `nationalserver.national.database.names` attribute value to the name of the National EPL database. For example:

    `nationalserver.national.database.names=EPLN`

Ensure all instances of "EPLN" occurring within key names of step 10 are also changed. For example, if step 10 changed `localhost` to `dbserver` and this step changed `EPLN` to `EPLNAT`, the following would be the final result:

```
dbserver.EPLNAT.user=ppsnepl
dbserver.EPLNAT.password=pharmacy
dbserver.EPLNAT.schema=ppsnepl
```

13. Save the changes and close the `dataload.properties` file.
14. Navigate to the `PS_PPS_Dev/PS_PPS_domain/etc/build/template/properties` folder.
15. Open the `oracle.properties` file for editing.
16. If the port on which Oracle is listening is not port `1521`, change the `database.url.port` attribute value to the correct port. For example: `database.url.port=1522`
17. Save the changes and close the `oracle.properties` file.
18. Navigate to the `PS_PPS_Dev/PS_PPS_domain` folder.
19. Run the ant build target desired.
    - `refreshDatabase` – Refresh the database with data used for non-migration test procedures.
      command: `ant refreshDatabase`

After the build completes, the current PPS-N EPL database instance has both its tables created and data loaded.

3.4 VistA/M System Installation

This section details the steps required to install patches, and install remote procedure calls (RPCs) to the PPS-N VistA instance.

This code release also includes the `PPSN_11_17.KID` (Migration) and the `PPSNS_11_17.KID` (UFT2 Synchronization) patch that installs a version of the migration the Synchronized RPC code. These KID patches need to be installed on the NDF server using the standard Kernel Installation & Distribution Systems Option.

This release contains 3 new Remote Procedure Calls "PPS NDFMS MIGR" RPC", "PPS NDFMS MIGR SYNC and "PPS NDFMS SYNC. These new RPCs must be added to the XOBV VISTALINK TESTER option. The PPS proxy user, for example PPUSER, APPLICATION PROXY must have the XOBV VISTALINK TESTER option as a secondary menu option. VistALink 1.6 must be installed on the NDF and the VistALink listener must be up and running.

A line must be included in the /opt/oracle/middleware/domains/PRE/CommonServices/VL-1.6/ gov.va.med.vistalink.connectorConfig.xml file on the WebLogic server with the ip and port of the VistALink listener; the primary station id of the NDF; the access and verify codes for the user being used for the connection, for example the XOBV VISTALINK TESTER; and other information necessary for the connection to be made to the VistALink listener in the NDF.

The DUZ and division of the PPS-N PROXY USER(the system user account capable of accessing the RPC), the division where that user exists, the connection specification to be used (for example DUZ) and

the RPC timeout (for example 60 seconds) must be entered into the PPS-NConfig.xml in the …/domains/PRE/Config directory on the WebLogic server. The configuration file is shown in Section 6

3.5 Install SQL Load Script Files

The database is reset to a known starting point as part of user performing the migration process. This is done by the J2EE application running a series of SQL scripts to drop the old data and load the starting data when the user chooses the start migration activity from the PPS-N GUI. These SQL script files must be located in the `config` directory of the PRE domain. There are 15 files named PPSEPLRefreshDF1.sql through PPSNEPLRefreshDB15.sql. These are located in the PPSNEPLRefreshDBv1.1.10.zip file located on the delivered CD.

3.6 WebLogic Installation Instructions

This section details the steps required to configure and deploy PPS-N onto WebLogic.

3.6.1 WebLogic Listen Address

PPS-N is installed on a managed server (e.g. NationalPharmacyServer), and WebLogic 12.1.3 requires that the Listener Address field be set on the servers. Set this value on the server's `General Settings` tab. For reference, see Figure 3-3. Note: **Listen Address** should be *empty*!

Note: The port that the application is installed on must also be set in the Configuration file shown in Section 6 because the JNDI lookup is site specific. If the port is not also defined in the configuration file the application will not work correctly.

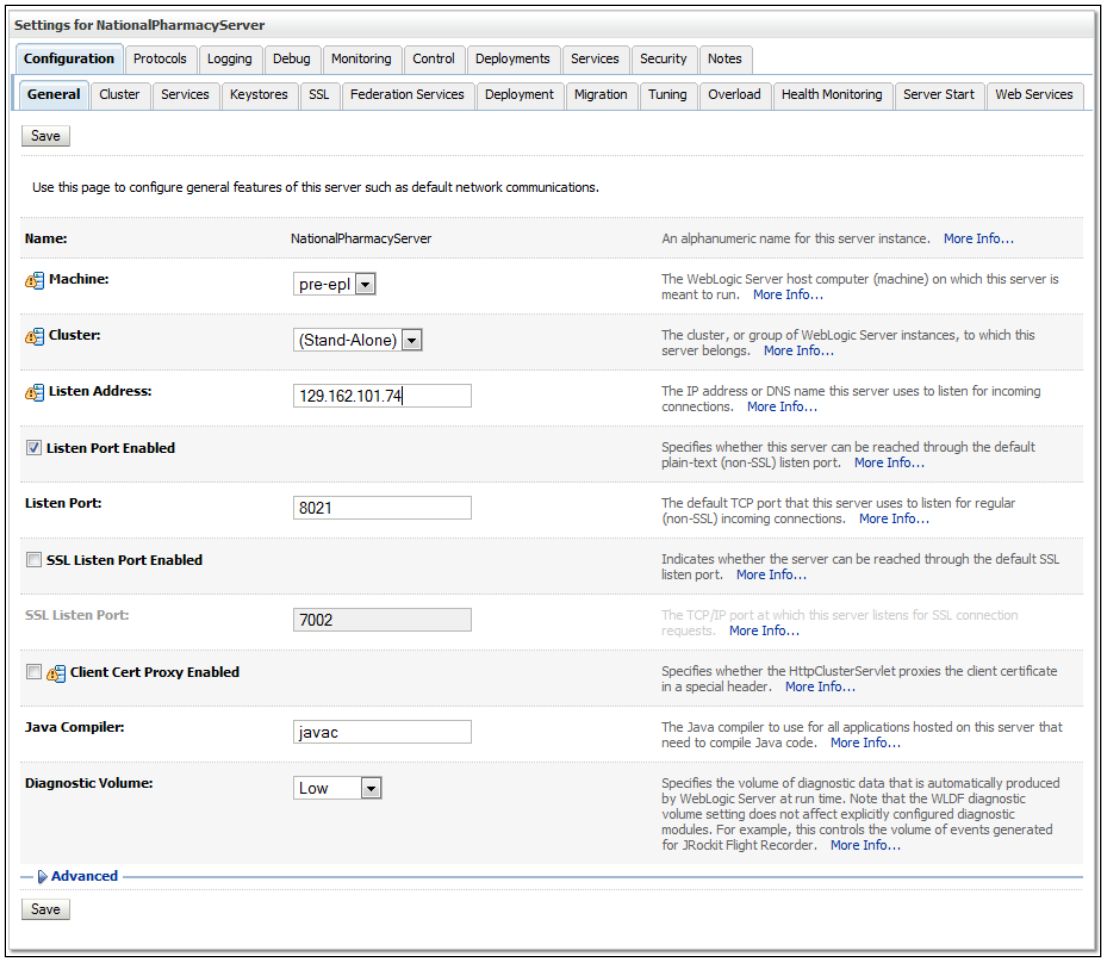

Figure 3-2. Listen Address

3.6.2 Dependency Installation

VistALink, Version 1.6.0.028 software package must be installed prior to deployment of PPS-N on to WebLogic. Follow the respective installation guides supplied by the VA for this software prior to continuing with the PPS-N installation. The Vista Link Connector Deployment order should be 99.

3.6.3 Class Path

In order for the JDBC data sources to be added to the WebLogic configuration, the JDBC driver must first be added to the Deployment Server's class path. Use the JDBC driver provided within the Oracle distributions and the WebLogic documentation provided by Oracle (formerly BEA) to add the driver to the class path.

Important: Third-party database drivers, e.g. JDBC drivers for MS SQL Server from Microsoft, will need to be deployed onto the WebLogic server's classpath, `${WL_HOME}/server/lib`. Additionally, any such third-party drivers will also need to be prepended to the `WEBLOGIC_CLASSPATH` variable definition in the `${WL_HOME}/common/bin/commEnv.sh` file. E.g. "`WEBLOGIC_CLASSPATH="${WL_HOME}/server/lib/sqljdbc4.jar${CLASSPATHSEP}` ……(rest of definition)." Any modification here requires the entire WebLogic server system to be restarted. E.g. AdminServer and any Managed Servers.

- The MS SQLServer JDBC driver can be extracted from the application,
  - `PPSN-1.x.xx.ear\lib\database\sqljdbc4.jar`
  - Or from the source zip file: `Common\lib\database\sqljdbc4.jar`

The PPS-N EAR file contains all the remaining required libraries for the proper functioning of the application. If any other applications have been deployed to the Deployment Server, there may be conflicting third-party libraries in the Deployment Server's class path directories that will cause the PPS-N application to operate differently than expected. If versions on the Deployment Server's class path differ from those defined in the PPS-N v1.3 Version Description Document, then the preferred solution would be to remove the library from the Deployment Server's class path. If that is not possible, replace the libraries with the PPS-N versions.

Two JAXB version 2.1.10 libraries must be at the very beginning of the class path due to PPS-N incompatibility with the JAXB version bundled with WebLogic, JAXB version 2.1.9. The jaxb-api.jar and jaxb-impl.jar files are available within the PPS-N EAR with this code drop. These JAR files must come before any WebLogic JAR files, as the classes found within the JAR files supersede the original WebLogic supplied classes.

3.6.4 JTA Transaction Timeout

The default WebLogic Java Transaction API (JTA) timeout is 30 seconds. This time is sufficient for all transactions in PPS-N, with the exception of the FDB DIF update process, which can take several minutes, and the copay tier migration process, which can take up to three hours. Follow the instructions below to set the JTA timeout to 25,200 seconds, or seven hours. If either of the long-running transactions times out even after seven hours, additional time can be allotted to the timeout setting by following the same process. This value should be set back to the standard 600 seconds once initial migration activities have been completed

Perform the following instructions for each WebLogic domain where PPS-N will be deployed.

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. Within the `Domain Structure` panel found in the left column of the WebLogic console, click on the WebLogic domain's node. In Figure 3-5, the WebLogic domain is named `PRE`.

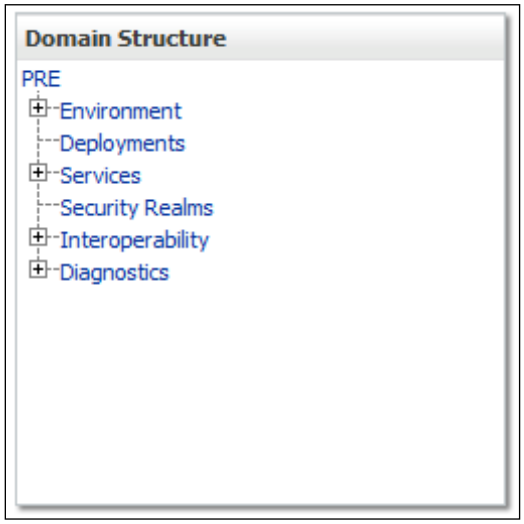

Figure 3-3. Domain Structure

3. WebLogic will now display the panel `Settings for PRE` in the right column of the console, where details of the WebLogic domain are set. For reference, see Figure 3-5.

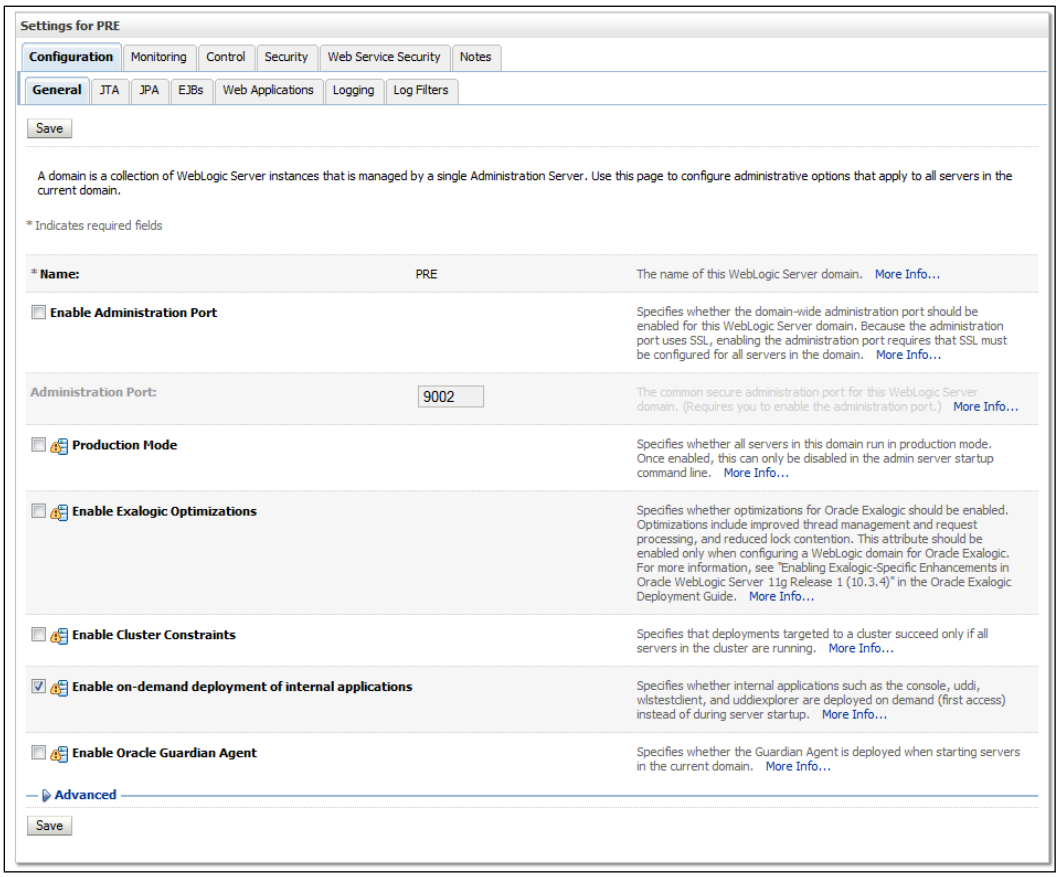

Figure 3-4. Settings for PRE

4. Select the `JTA` tab.

5. WebLogic will now display the panel `Settings for PRE` in the right column of the console. Within the panel is `JTA` within the `Configuration` tab, where the JTA timeout will be configured. For reference, see Figure 3-6.

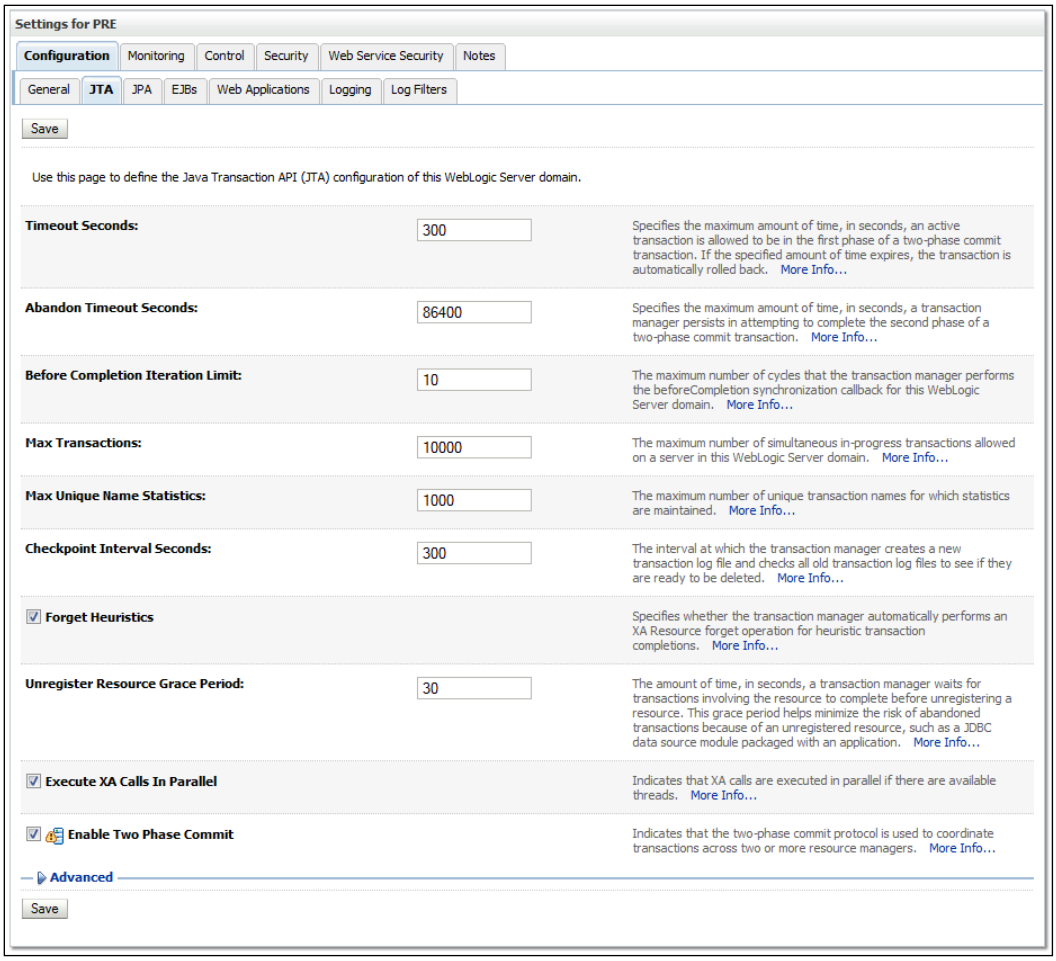

Figure 3-5. JTA Timeout Seconds

6. For the `Timeout Seconds`, type 25,200. Please note this has changed since v1.1.
7. Click `Save`

3.6.5 JDBC Data Source Configuration

PPS-N uses database connections by means of JDBC data sources to FDB DIF and to the Local EPL or the National EPL. Repeat the following instructions at each deployment location to create a new data source for each database. The databases required at each deployment location as well as their respective database driver and JNDI name settings are provided in Table 3-4.

Table 3-4. Deployment Location Database Configuration

Deployment Location	Database	Database Type	Database Driver	Transaction Options	JNDI Name
National	FDB DIF	Oracle	Oracle's Driver (Thin XA) Versions: 9.0.1 and later	Supports Global Transactions	datasource/FDB-DIF
	National EPL	Oracle	Oracle's Driver (Thin XA) Versions: 9.0.1 and later	Supports Global Transactions	datasource/NationalEPL
	FSS	MS SQL Server	Microsoft's MS SQL Server Driver (Type 4) Versions: 2005	Supports Global Transactions Emulate Two-phase Commit	datasource/PRE-FSS
	SDS	Oracle	Oracle's Driver (Thin XA) Versions: 9.0.1 and later	Supports Global Transactions	jdbc/gov.va.med.term.access.Database

1. Open and log on to the WebLogic console, using an administrative user name and password. The WebLogic console is located at: `http://<Deployment Machine>:7001/console`.
2. Within the `Domain Structure` panel found in the left column of the WebLogic console, click on the `Services > Data Sources` node. For reference, see Figure 3-7.

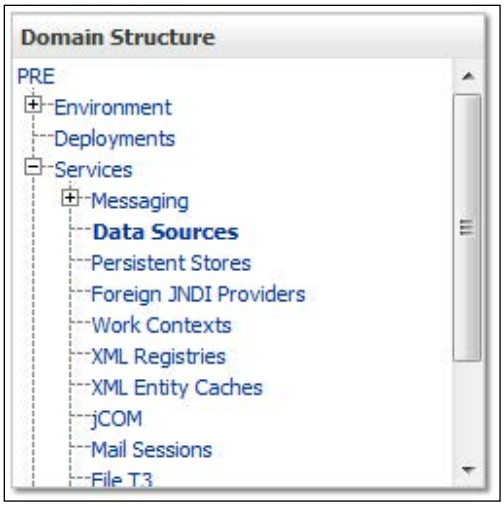

Figure 3-6. Domain Structure

4. Click `New` in the `Summary of JDBC Data Sources` panel found in the right column of the WebLogic console and choose `Generic Datasource` from the drop down list. For reference, see Figure 3-8.

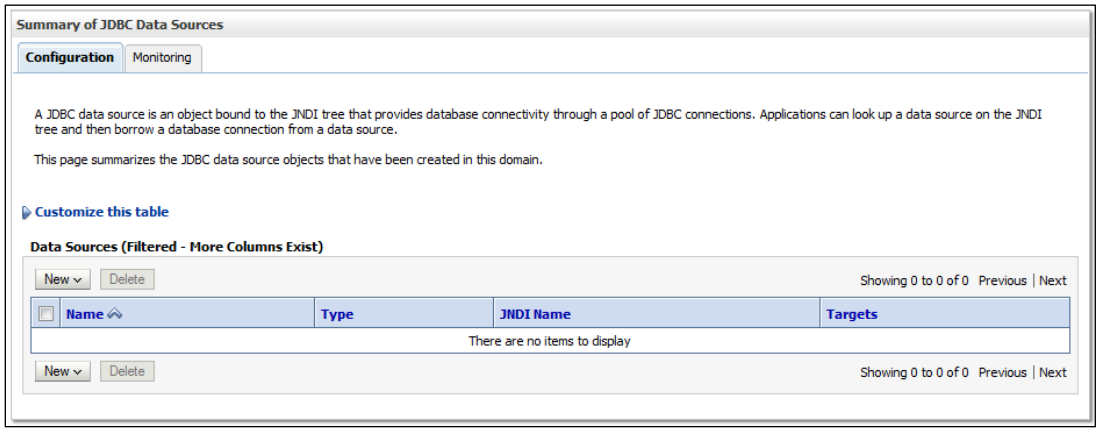

Figure 3-7. Summary of JDBC Data Sources

5. WebLogic will now display the panel `Create a New JDBC Data Source` in the right column of the console, where details of the new data source are set. For reference, see Figure 3-9.

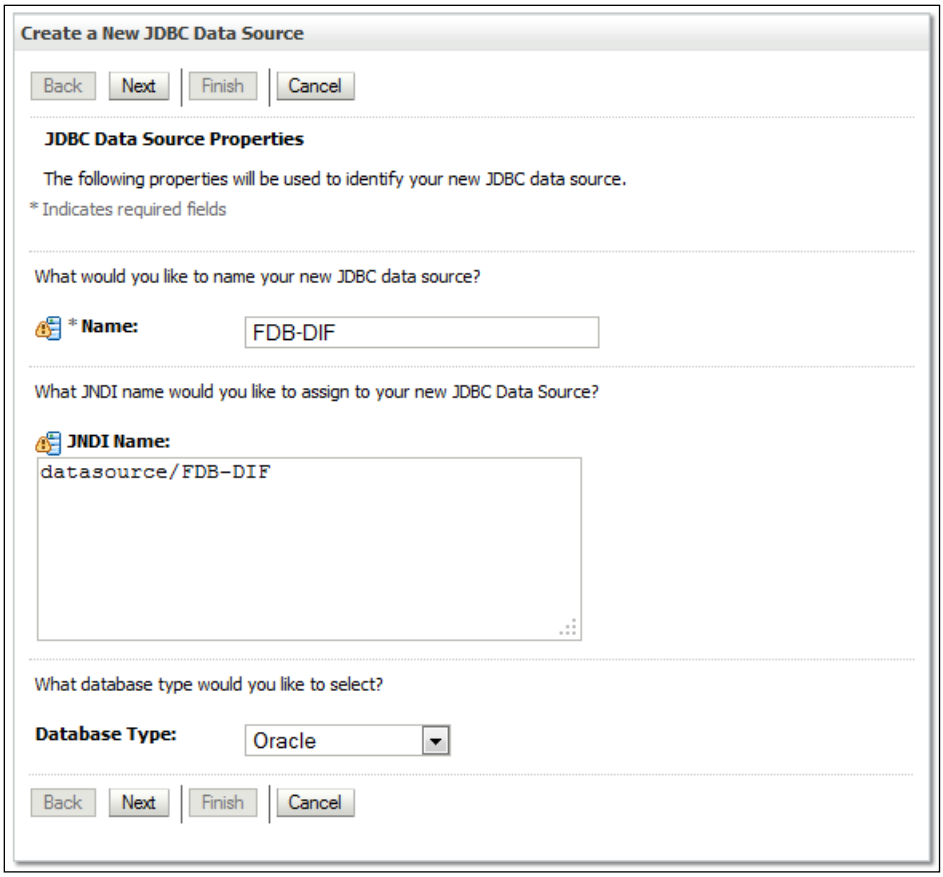

Figure 3-8. JDBC Data Source Properties

6. For the `Name`, type a unique name. For example, `FDB-DIF`.
7. For the `JNDI Name`, type the appropriate JNDI found in Figure 3-9. For example, `datasource/FDB-DIF`.
8. For the `Database Type`, select the appropriate type found in Table 3-4. For example, `Oracle`.
9. Click `Next`.
10. For the `Database Driver`, verify that the correct driver is selected as found in Table 3-4. For example, `Oracle's Driver (Thin XA) Version: 9.0.1 and later`.
11. Click `Next`.
12. WebLogic will now display the panel `Transaction Options` in the right column of the console, where the transaction information for this data source is displayed. For reference, see Figure 3-10.

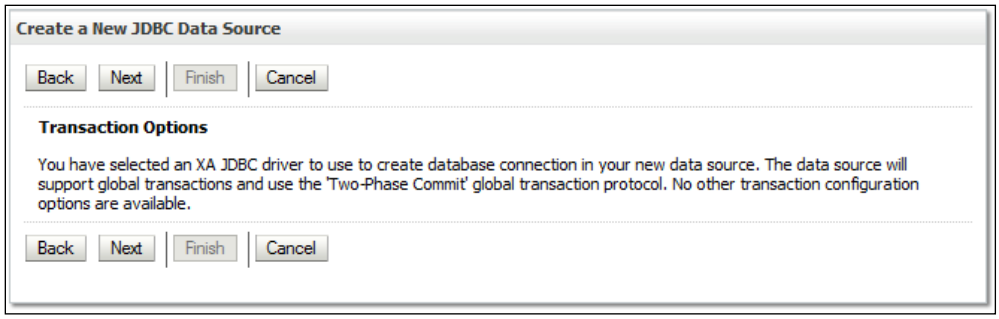

Figure 3-9. Transaction Options

13. Click `Next`.
14. WebLogic will now display the panel `Connection Properties` in the right column of the console, where the connection pool attributes are set. For reference, see Figure 3-11.

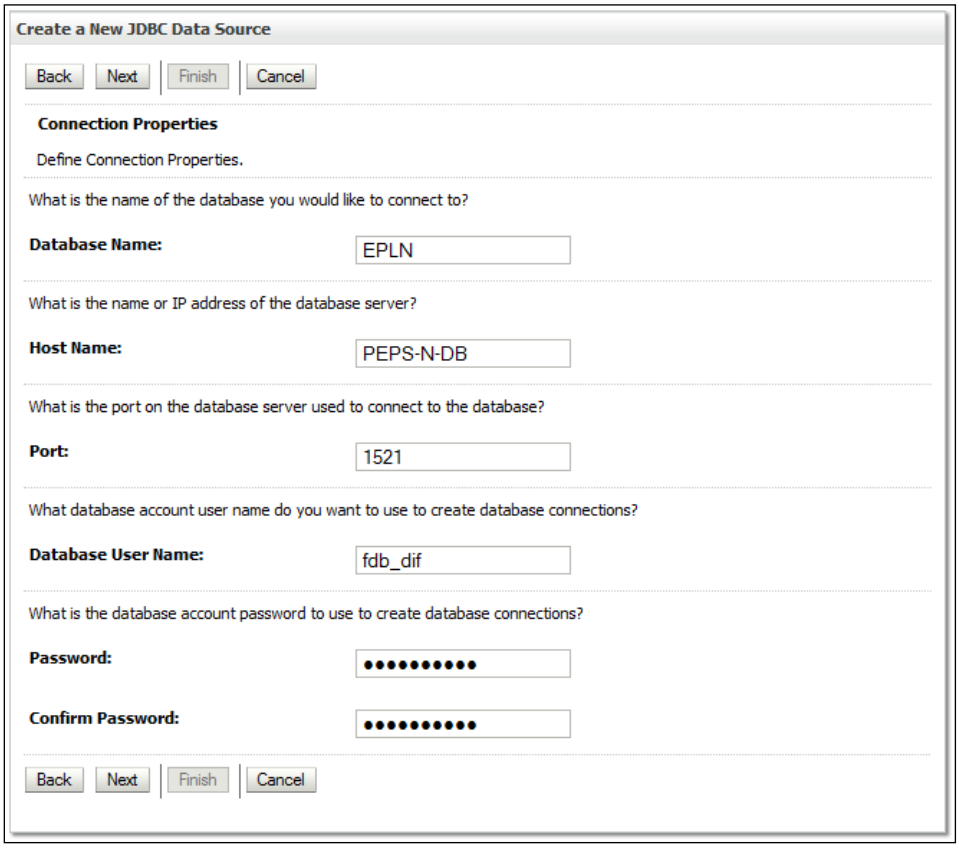

Figure 3-10. Connection Properties

15. For `Database Name`, type the name of the database to which PPS-N will connect. For example, `EPLN`.
16. For `Host Name`, type the name of the machine on which the database is running. For example, `PPS-N-DB`.
17. For `Port`, type the port on which the database is listening. For example, `1521`.

18. For `Database User Name`, type the user to connect to the FDB database. For example, `fdb_dif`. The user entered should be the same as the user configured in Section 3.3.1.3. For `Password` and `Confirm Password`, type the password for the user given previously. For example, `fdb_dif123`.
19. Click `Next`.
20. WebLogic will now display the panel `Test Database Connection` in the right column of the console, where the new data source can be tested. For reference, see Figure 3-12.

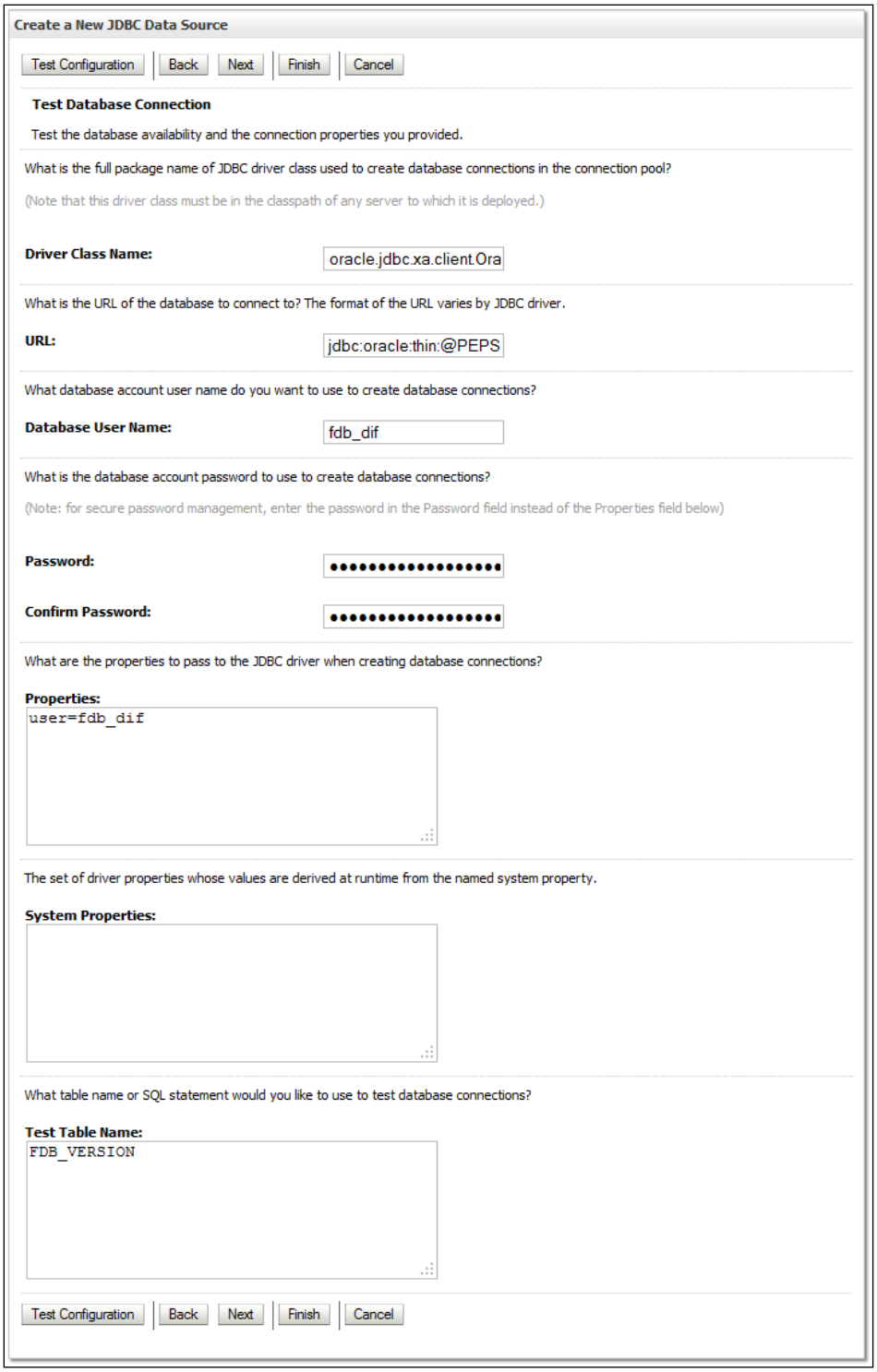

Figure 3-11. Test Database Connection

21. Leave all values as set by default, with the exception of `Test Table Name.` For FDB DIF databases, type `fdb_version`. For EPL databases, type `epl_products`.
22. For the FSS datasource, you will be connecting to an MS SQL Server database, so items listed in **Figure 3-12. Test Database Connection** will be slightly different and require changing to the following:
    URL: `jdbc:sqlserver://hostname:1433`
    Driver Class Name: `com.microsoft.sqlserver.jdbc.SQLServerDriver`
    Test Table Name: `DI_DRUGITEMNDC`
23. Click `Next`.
24. WebLogic will now display the panel `Select Targets` in the right column of the console, where the target server is selected for the new data source. For reference, see Figure 3-13.

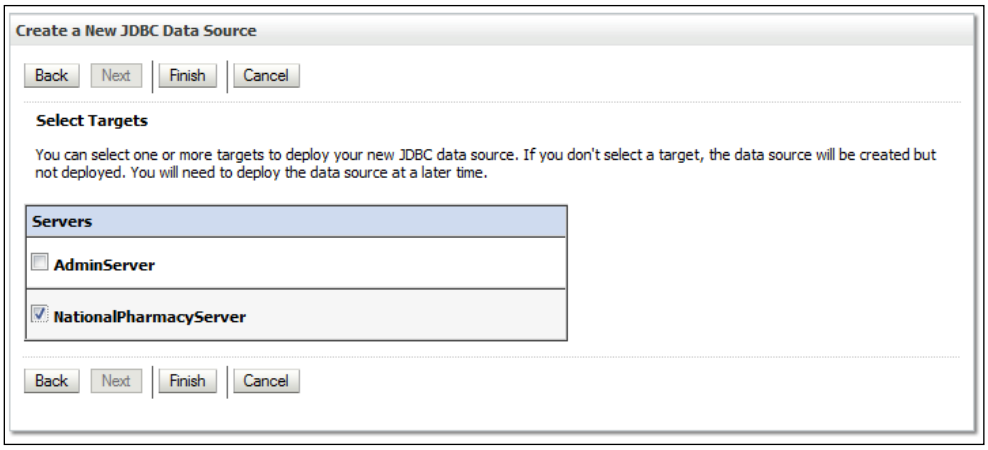

Figure 3-12. Select Targets

25. Select the Deployment Server as the target. For example, `NationalPharmacyServer`.
26. Click `Finish`.
27. WebLogic will now display the panel `Summary of JDBC Data Sources` in the right column of the console, where the newly created data source is displayed.
28. On these summary page, click on the JDBC source that was just created. Click on the **Connection Pool** tab. The **Maximum Capacity** value is likely set to 15 by default; adjust this value to what is appropriate for the environment. A recommended value of 30 (or more) for NationalEPL, FDB-DIF, and FSS should be sufficient for most cases.
29. After completing the previous steps, remember to repeat all the steps for each database listed in Table 3-4.

3.6.6 Server Logs and Log4J configuration

PPS-N uses Log4j to provide debug and error logs. Although the application will function without Log4j installed, using it can be helpful to troubleshoot potential issues. Because PPS-N can operate without Log4j configured, all instructions within this section are only required if debugging deployed code.

If the installation of Log4j is desired, the Java Archive (JAR) file can be found within the PPS-N EAR, or it can be downloaded from the Internet. Please refer to the PPS-N 1.2 Version Description Document for the version required.

3.6.6.1 Warning: Application Server' Disk Space and Log Files

Due to the sheer volume of log statements issued by the application, the log files can become very large in a very short amount of time. In order to prevent the loss of log information, it is advisable that the application server's logging feature(s) be configured to "rollover" log files at 10MB and at restart with retention [of older logs] set to 10 or less. Failure to observe this may result in the application behaving in an unexpected, sluggish or error-prone manner as the log files can fill up the disk partition which may in turn inhibit correct functionality of the server and/or the application.

Additionally, WebLogic has "standard out" log files for each server. **This file does not get rotated**. If the `log4j.xml` configuration file has a "ConsoleAppender" and at least one logger that utilize this appender, these log statements will be directed to the server's out file, e.g. *`domain`*`/servers/NationalPharmacyServer/logs/NationalPharmacyServer.out`.
It is absolutely critical to ensure that an appender reference to a ConsoleAppender is not listed in the <root> section of the `log4j.xml` file, this can cause the "standard out" log file to grow at an exceedingly fast rate.
A log4j.xml configuration that does not use a Console appender will produce no additional output to the "standard out" log file.

3.6.6.1.1 Domain Logging

Domain-level logging should have a limited number of retained files, and set rotation size as well.

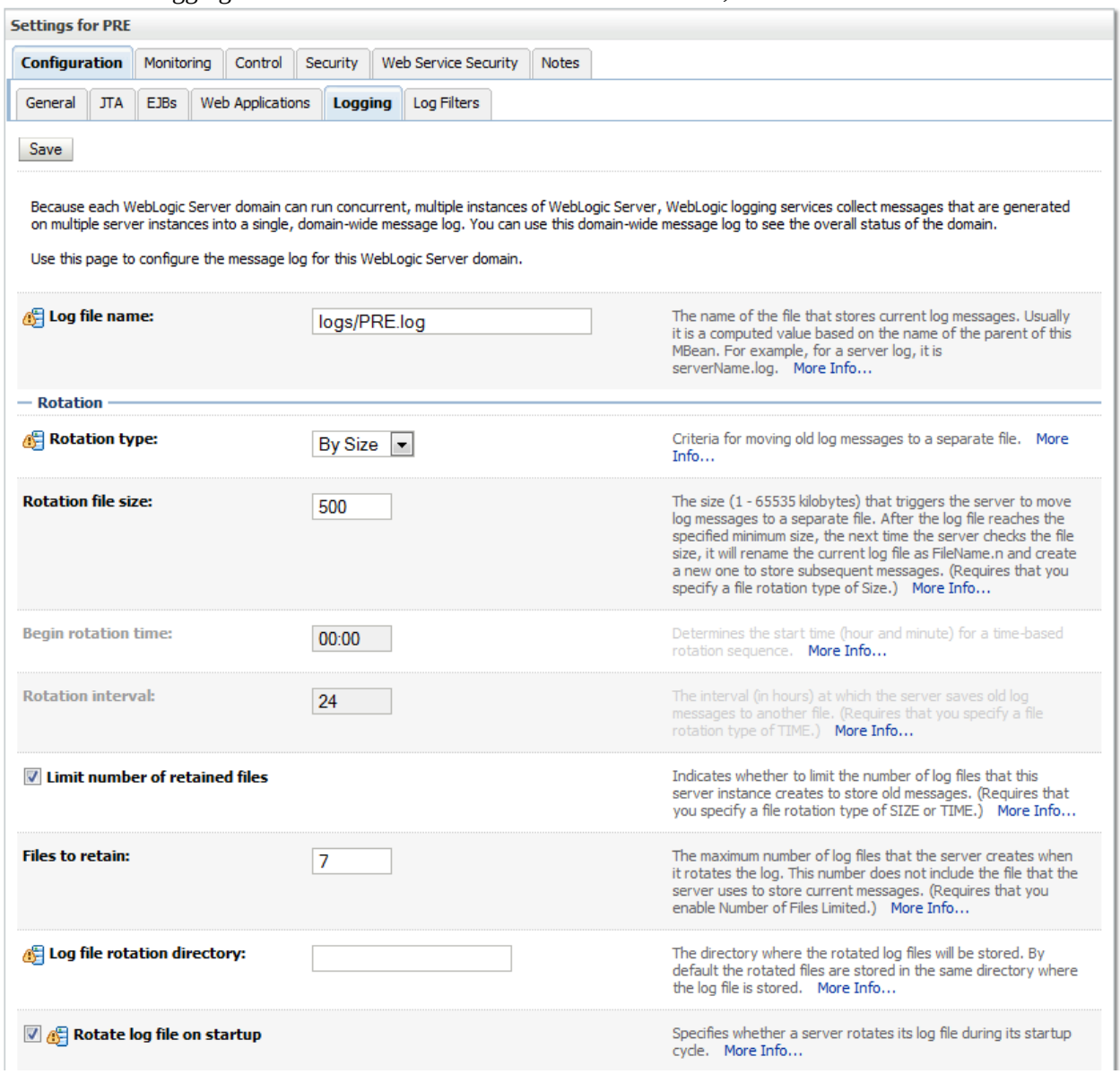

Figure 3-13. Domain Log File Settings

3.6.6.1.2 Managed Server Logging

The managed server also allows the additional specification of log file settings. See the figures below as a means of a reference *example* only.

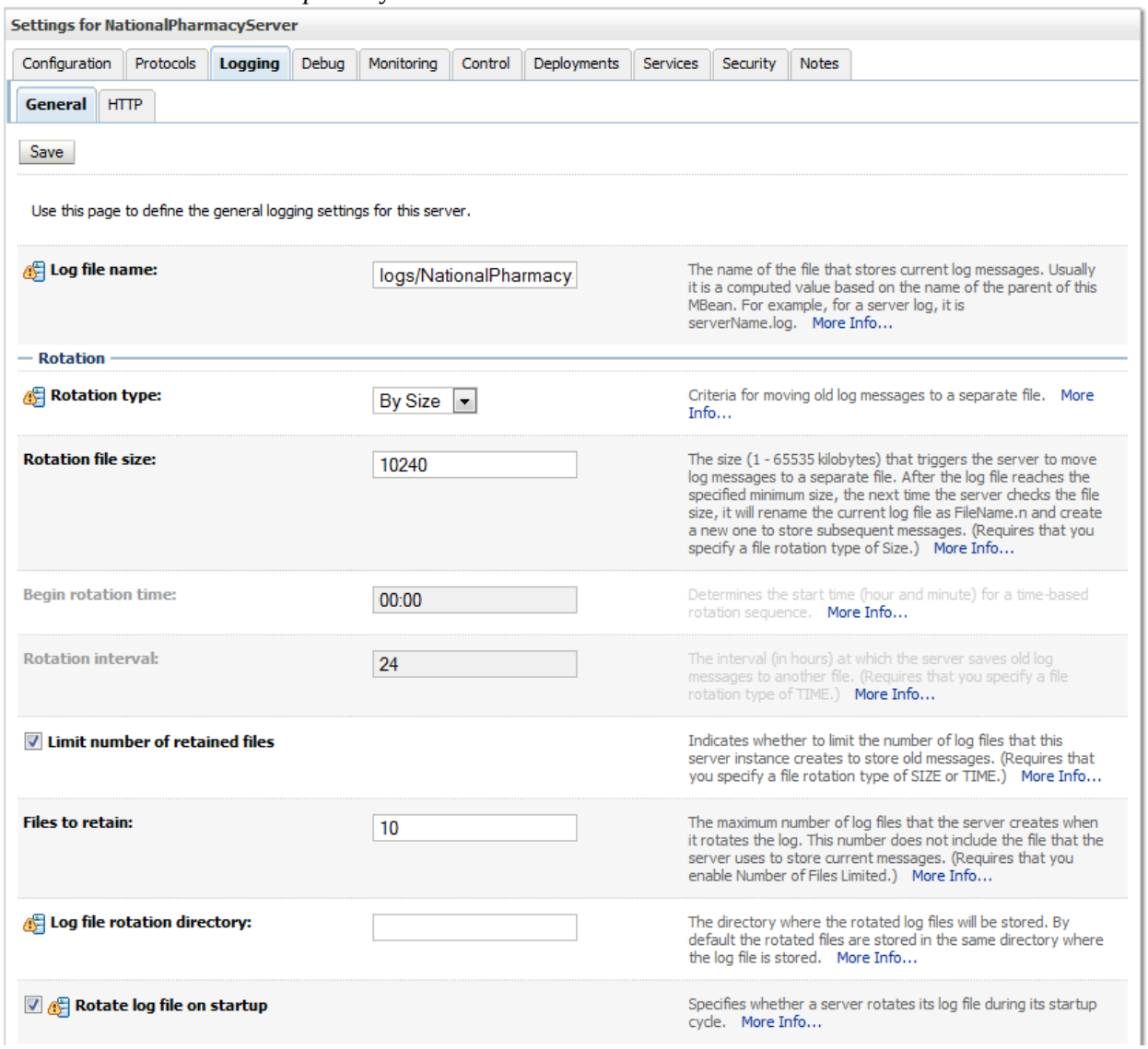

Figure 3-14. Managed Server Log File Settings

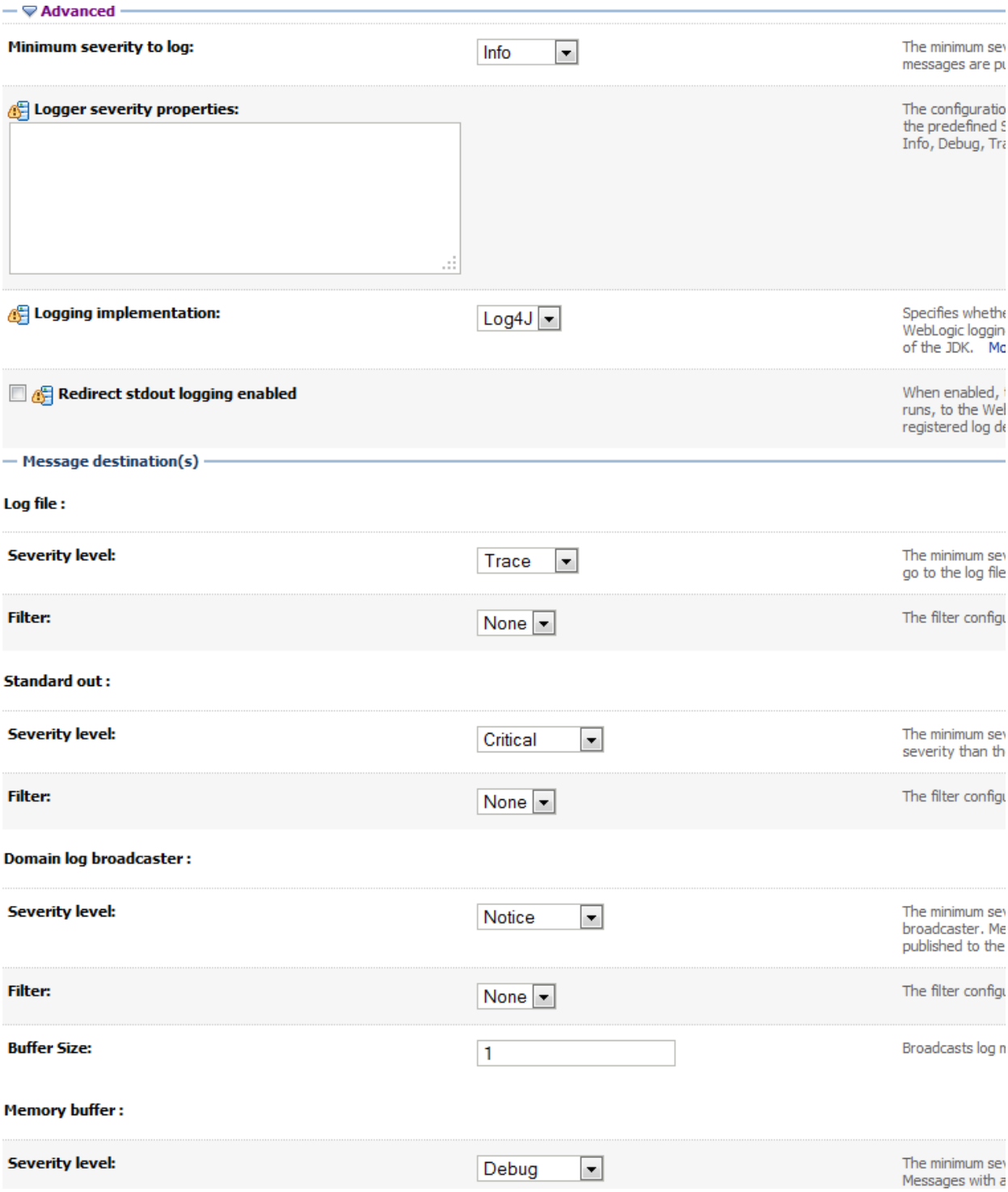

Figure 3-15. Managed Server Advanced Log File Settings

3.6.6.2 Installation of Log4J

To install Log4j, the Log4j JAR must be placed on the Deployment Server's class path and the `log4j.xml` must be edited to include the PPS-N appenders and loggers. Follow the instructions below to place the Log4j library on the Deployment Server's class path. If Log4j is already installed on the Deployment Server, these steps do not need to be completed.

1. Locate the Deployment Server's Class Path Directory.
2. Copy the `log4j-1.2.14.jar` file into a folder within the class path.
3. Configure WebLogic to include the Log4j library in the Deployment Server's class path. Please refer to the WebLogic documentation provided by Oracle to complete this step.
4. Restart the Deployment Server to load Log4j.

With Log4j installed on the Deployment Server, the `log4j.xml` file must be modified to include the PPS-N configuration. Note that the appenders place the logs under a `log` folder. This folder must be created at the same directory level at which the Deployment Server is running. For example, `/opt/oracle/domains/PRE/log`. Without this folder, Log4j will not be able to create the log files specified in the PPS-N configuration. Alternatively, the file locations could be altered to be placed in a different location. Also note that the `${log4j.logs.dir}` Java system property found within the Log4j configuration in Step 2 must either be set or these values must be replaced with the appropriate path to a `logs` directory. Follow these steps to complete this process:

1. Locate the `log4j.xml` file used for the Deployment Server. If Log4j has not yet been configured on the Deployment Server, either create a new `log4j.xml` file that is located in a folder on the Deployment Server class path or use the `log4j.configuration` Java system property to set the location of the file. Please refer to the WebLogic documentation provided by BEA for configuring the Deployment Server's class path and the Log4j documentation provided by Apache to complete any of these operations.
2. Add the following configuration to the `log4j.xml` file:

```
   <appender                                          name="FileAppender"
class="org.apache.log4j.RollingFileAppender">
        <param name="File" value="${log4j.logs.dir}/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="${log4j.logs.dir}/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="SpringAppender"
class="org.apache.log4j.RollingFileAppender">
        <param name="File" value="${log4j.logs.dir}/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="${log4j.logs.dir}/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>

    <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>

<root>
    <priority value="debug" />
    <appender-ref ref="FileAppender"/>
</root>
```

3. If profiling is turned on and should be recorded, add the following configuration to the `log4j.xml` file:

```
<appender name="ProfileAppender"
class="org.apache.log4j.RollingFileAppender">
<param name="File" value="log/profile.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>
<logger name="gov.va.med.pharmacy.peps.common.utility.profile"
additivity=”false”>
    <level value="info" />
    <appender-ref ref="ProfileAppender" />
</logger>
```

4. Restart the Deployment Server to load the Log4j configuration.

3.6.7 Site Deployment Configuration

After configuring the application, the result should be EAR deployment files with the exact same file structure as delivered, but with site specific configurations made. The `weblogic.xml` files now have the correct values for deployment. Use the original files located on the disk distributed with the PPS-N v1.3 Version Description Document to verify that the file structure is the same. Also, the `gov.va.med.pharmacy.peps.siteConfig.properties` file will be populated with the correct values and placed on the Deployment Server's class path.

3.6.8 Deployment

The following steps detail the deployment of the PPS-N application. All previous sections must be complete prior to proceeding with the deployment. In addition, the Deployment Server and its WebLogic domain must be restarted to load the changed configuration. Please refer to Section 3.3, Section 3.4, and Section 3.6 for instructions concerning these configuration items.

After successfully modifying the PPS-N deployment file in Section 3.6.7, repeat the following steps to deploy the application at all National PPS-N instances.

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. Within the `Domain Structure` panel in the left column of the WebLogic console, click the `Deployments` node. For reference, see Figure 3-17.

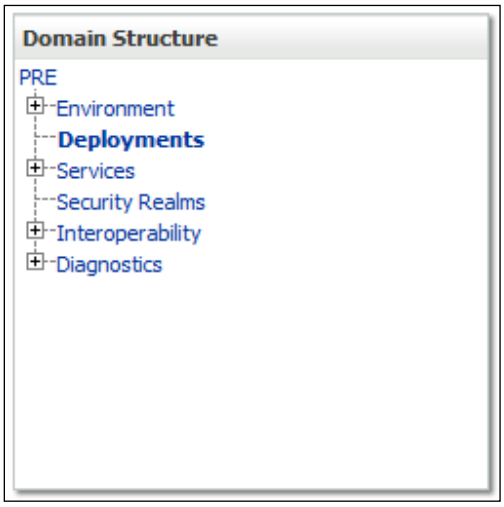

Figure 3-16. Deployments

3. Select the currently deployed PPS-N ear file. Click `Stop` in the `Deployments` panel in the right column of the WebLogic console.
4. Click `Install` found in the `Deployments` panel in the right column of the WebLogic console. For reference, see Figure 3-18.

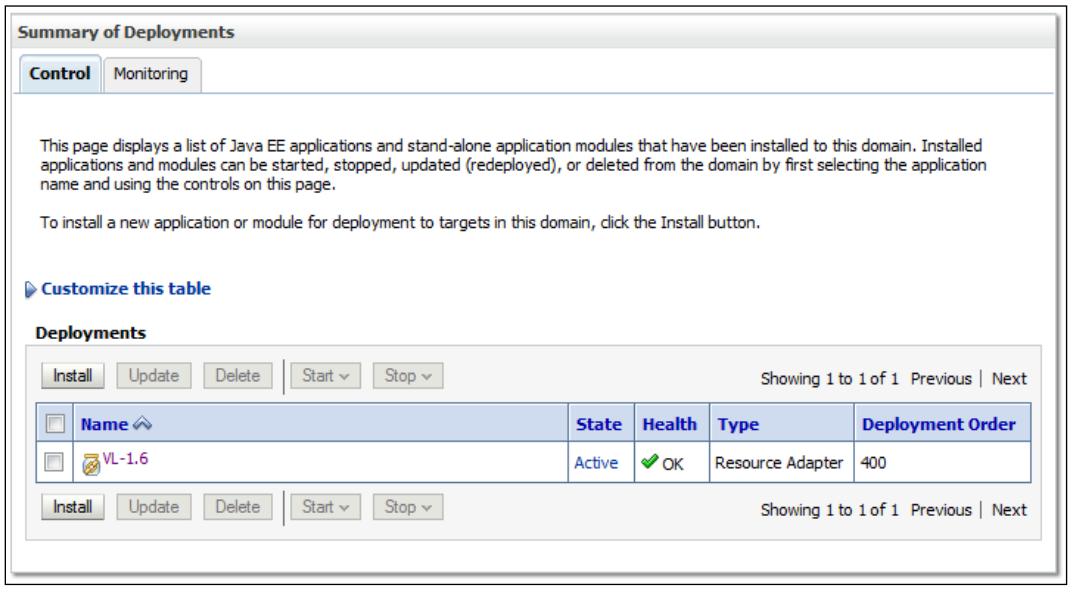

Figure 3-17. Install Deployment

5. WebLogic will now display the panel `Install Application Assistant` in the right column of the console, where the location of the PPS-N deployment will be found. For reference, see Figure 3-19.

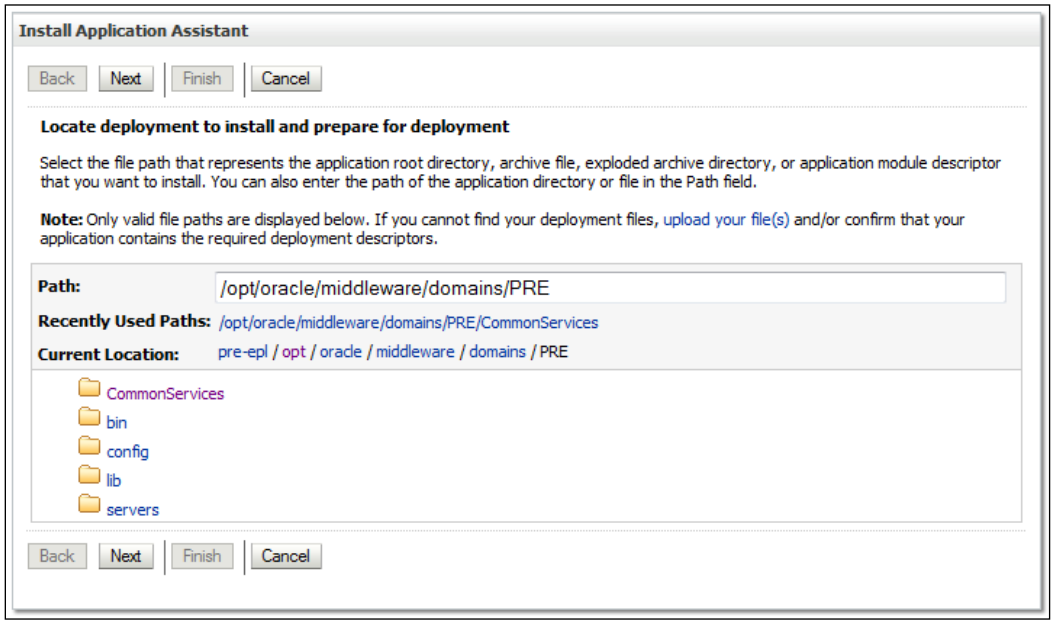

Figure 3-18. Install Application Assistant

6. Select the site-specific archive for the PPS-N deployment.

   a) If the PPS-N deployment has already been transferred to the Deployment Machine, navigate to the deployment file location using the links and file structure displayed within the `Location` panel within the `Install Application Assistant` in the right column of the console. For reference, see Figure 3-20.

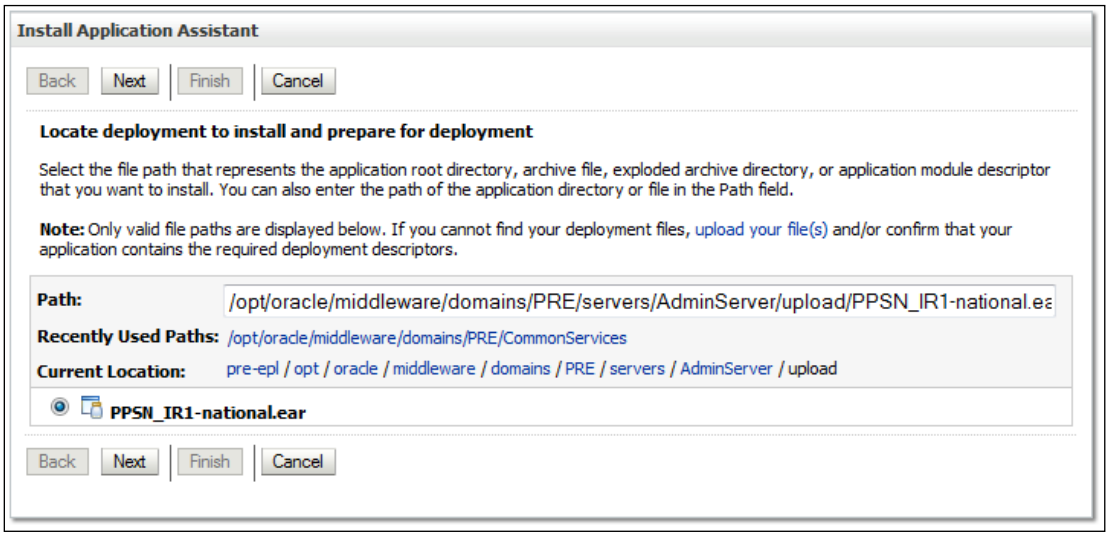

Figure 3-19. Locate Deployment to Install and Prepare for Deployment

   b) If the PPS-N deployment has not been transferred to the Deployment Machine:

(1) Click on the `upload your file(s)` link in the `Install Application Assistant` panel in the right column of the console. For reference, see Figure 3-20.

(2) Click the `Deployment Archive Browse` to use the `Choose file` dialogue to select the `Deployment Archive` to deploy.

(3) Click `Next` in the `Upload a Deployment to the admin server` panel in the right column of the WebLogic console to return to the `Locate deployment to install and prepare for deployment` panel within the `Install Application Assistant` in the right column of the console. For reference, see Figure 3-21.

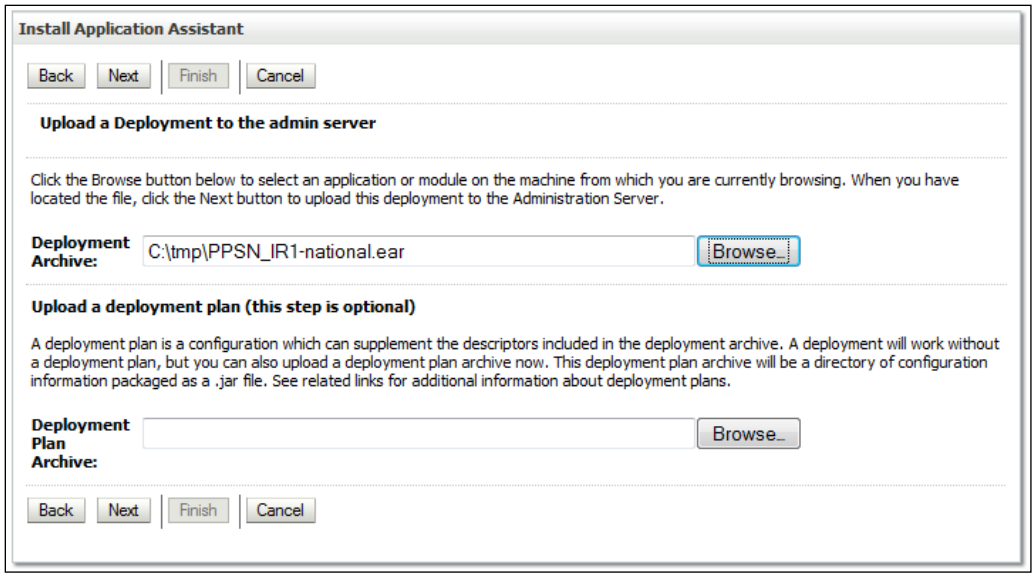

Figure 3-20. Upload a Deployment to the admin server

7. Once the PPS-N deployment is located and selected, click `Next`.

8. WebLogic will now display the panel `Choose targeting style` within the `Install Application Assistant` in the right column of the console. For reference, see Figure 3-22.

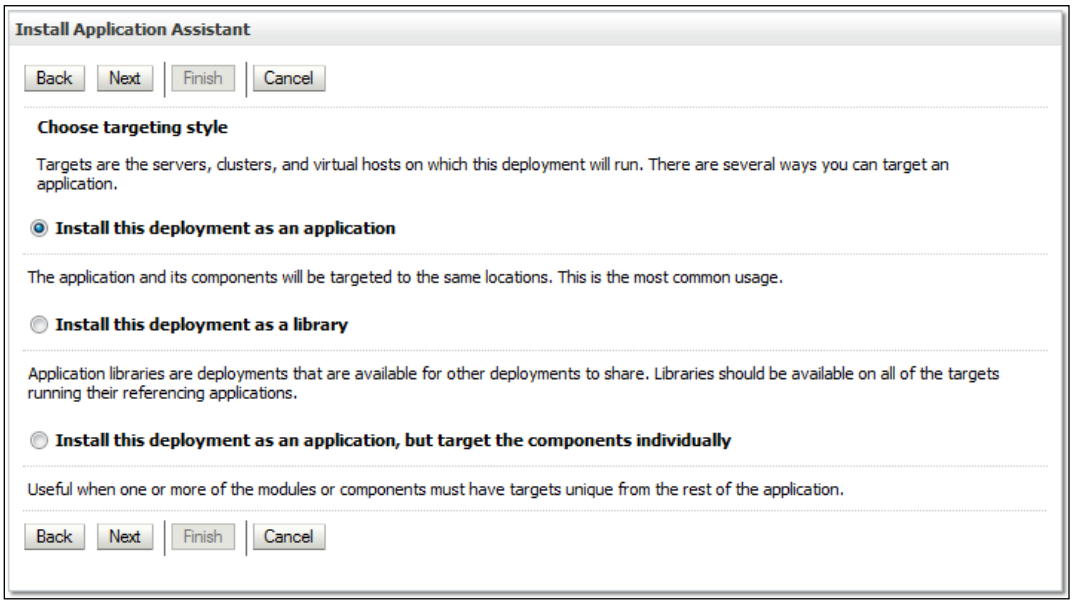

Figure 3-21. Choose Targeting Style

9. For `Choose targeting style`, leave the default value selected, `Install this deployment as an application`.
10. Click `Next`.
11. WebLogic will now display the panel `Select deployment targets` within the `Install Application Assistant` in the right column of the console, where the Deployment Server will be selected as the target in the next step. For reference, see Figure 3-23.

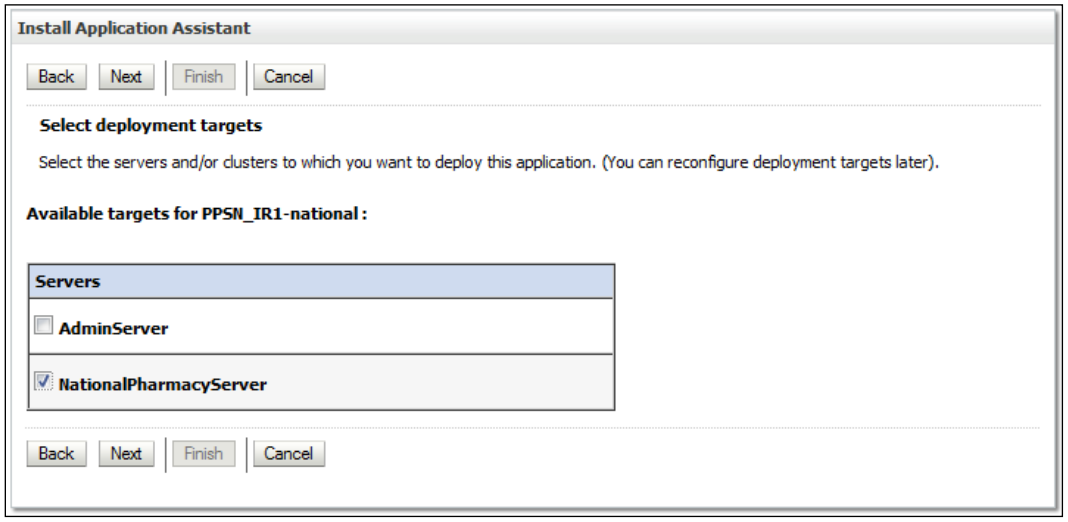

Figure 3-22. Select Deployment Targets

12. For the `Target`, select the Deployment Server. For example, `NationalPharmacyServer`.
13. Click `Next`.

14. WebLogic will now display the panel `Optional Settings` within the `Install Application Assistant` in the right column of the console, where the name of the deployment and the copy behavior are chosen. For reference, see Figure 3-24.

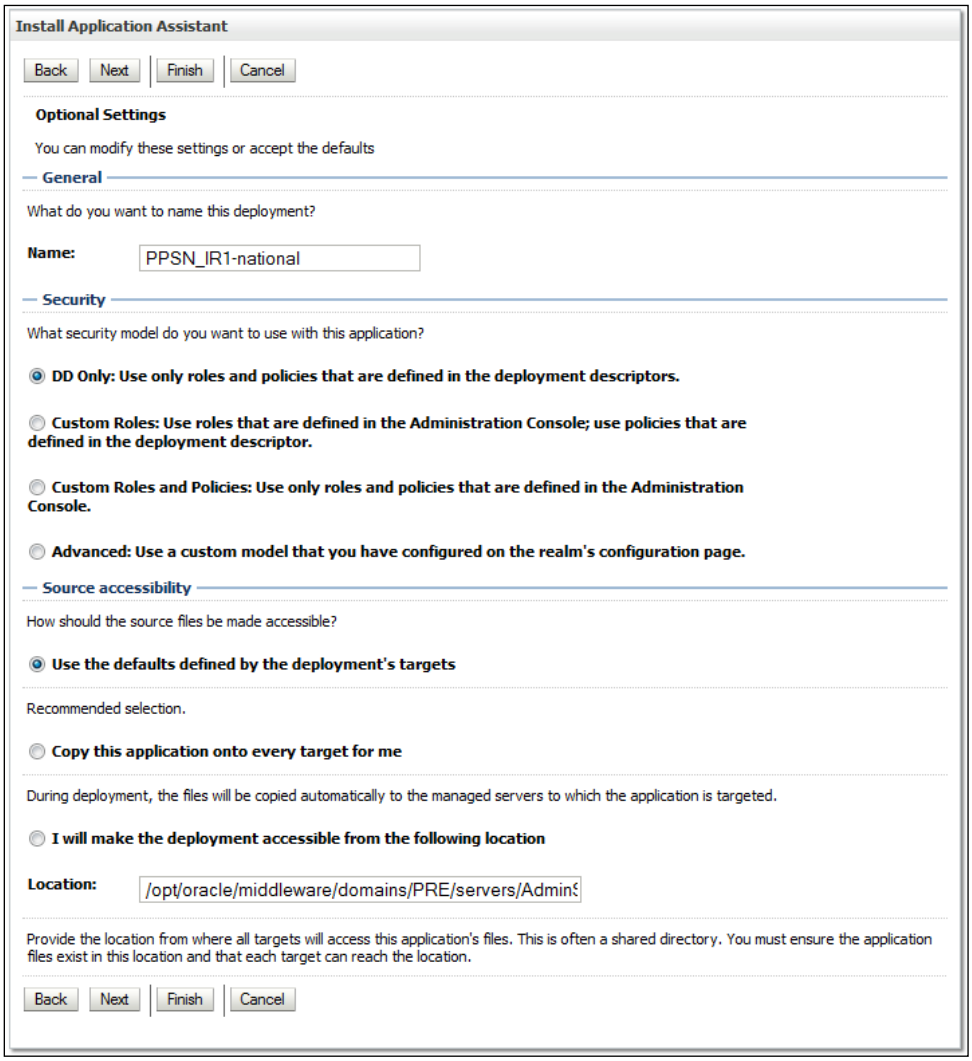

Figure 3-23. Optional Settings

15. Enter the `Name` for the deployment. For example, `PPSN_1.3-national`.
16. Verify that the following default option for `Security` is selected:

    `DD Only: Use only roles and policies that are defined in the deployment descriptors.`
17. Verify that the following default option for `Source accessibility` is selected:

    `Use the defaults defined by the deployment's targets.`
18. Click `Next`.
19. WebLogic will now display the panel `Review your choices and click Finish` within the `Install Application Assistant` in the right column of the console, which summarizes the steps completed above. For reference, see Figure 3-25.

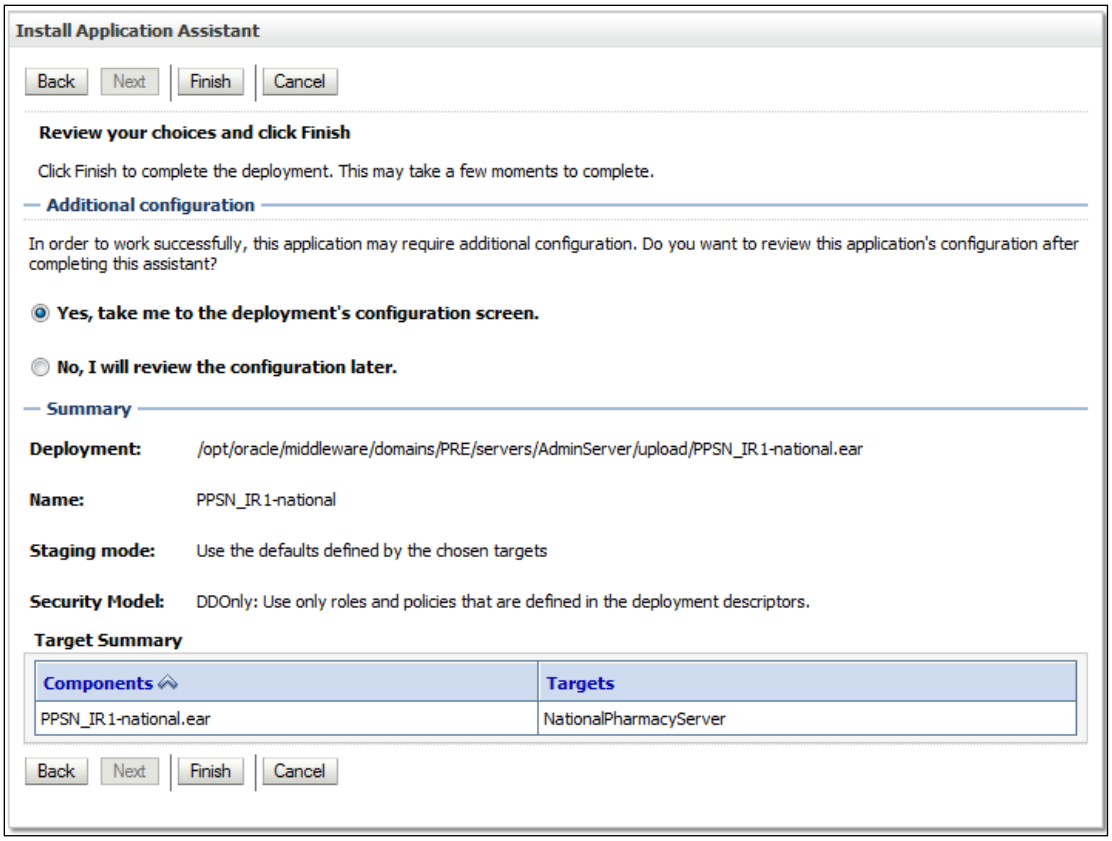

Figure 3-24. Review Your Choices and Click Finish

20. Verify that the values match those entered in Steps 6 through 19.
21. For `Additional configuration`, leave the default value `Yes, take me to the deployment's configuration screen` set.
22. Click `Finish`.
23. WebLogic will now display the panel `Settings for PPSN_1.3-national` in the right column of the console, where the values previously entered are available as well as a setting to change the deployment order. For reference, see Figure 3-26.

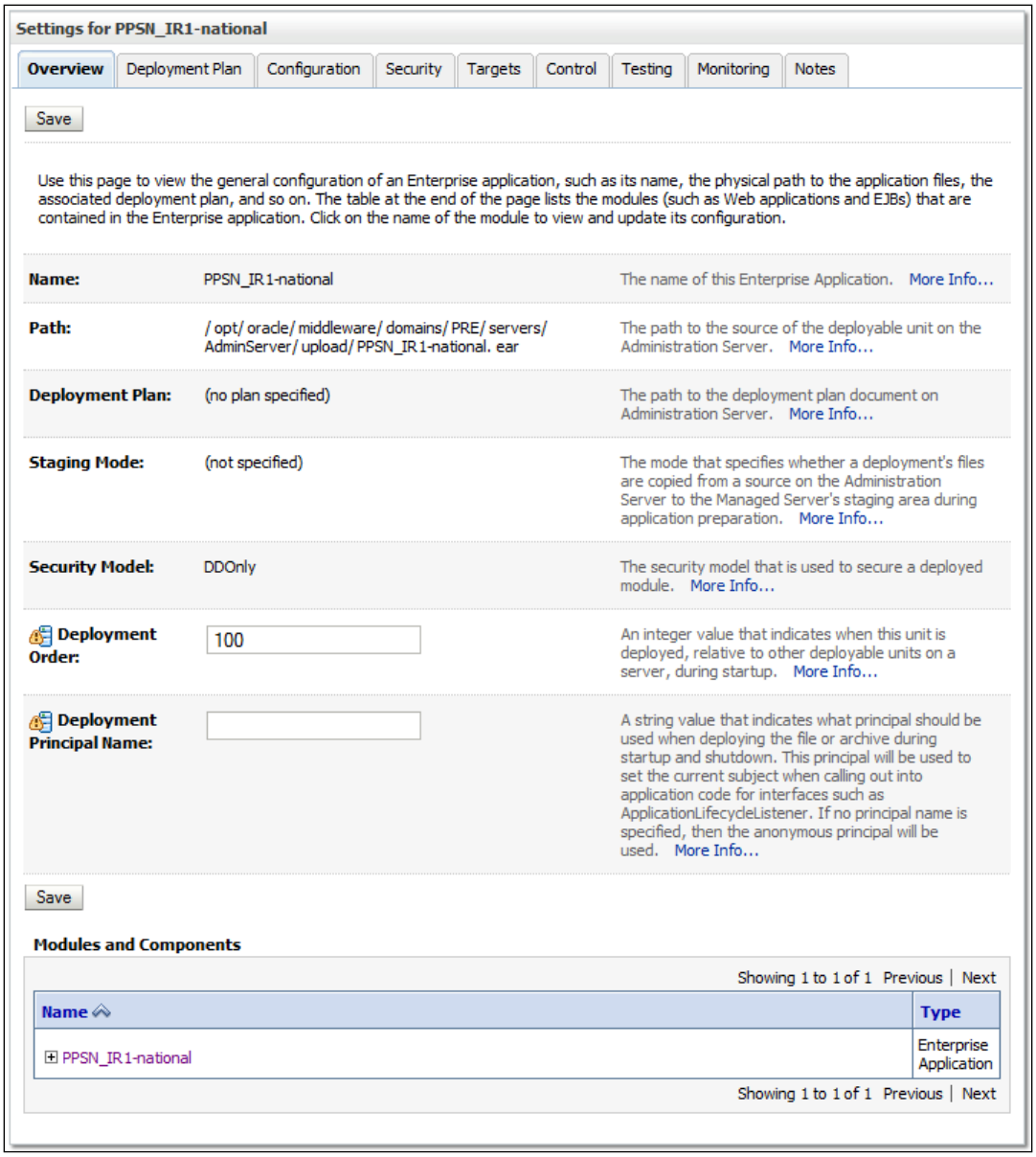

Figure 3-25. Settings for PPSN_IR1-national (PPS-N Ear Deployment)

24. Leave all the values as defaulted by WebLogic and click Save.

25. Within the `Domain Structure` panel in the left column of the WebLogic console, click the `PRE` > `Deployments` node. For reference, see Figure 3-27.

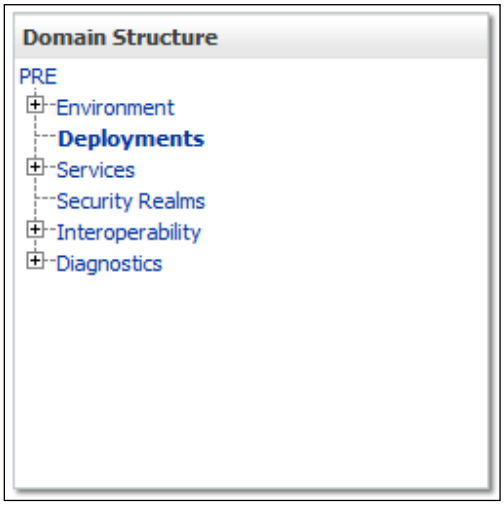

Figure 3-26. Domain Structure

26. WebLogic will now display the panel `Summary of Deployments` in the right column of the console, where all deployments for the WebLogic domain are listed. For reference, see Figure 3-28.

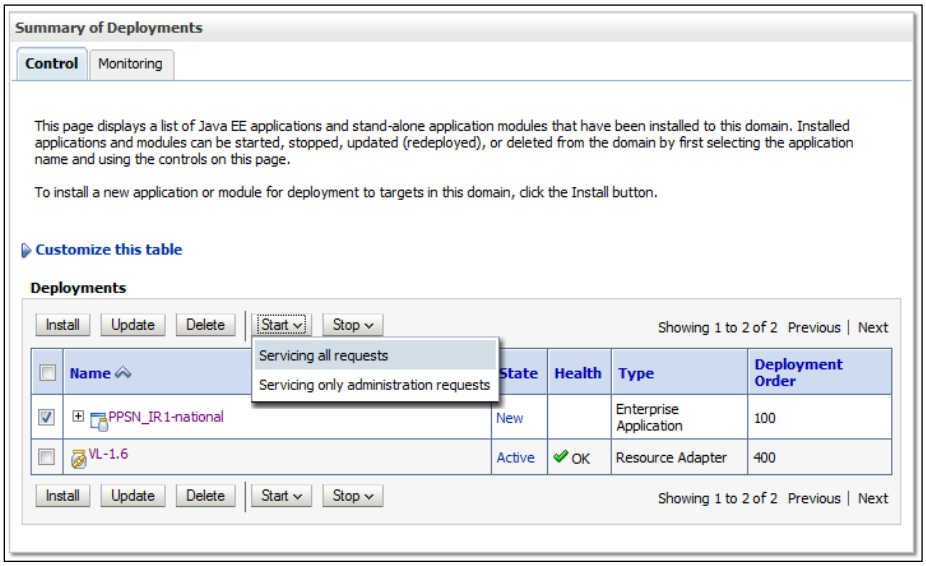

Figure 3-27. Summary of Deployments

27. Select the previously deployed `PPSN-1.2` deployment, and click `Start`, selecting `Servicing all requests` from the drop-down list box. Please note this may take an extended amount of time (two or more minutes) depending on server hardware resources.

28. WebLogic now returns to the `Summary of Deployments` panel in the right column of the console. For reference, see Figure 3-29.

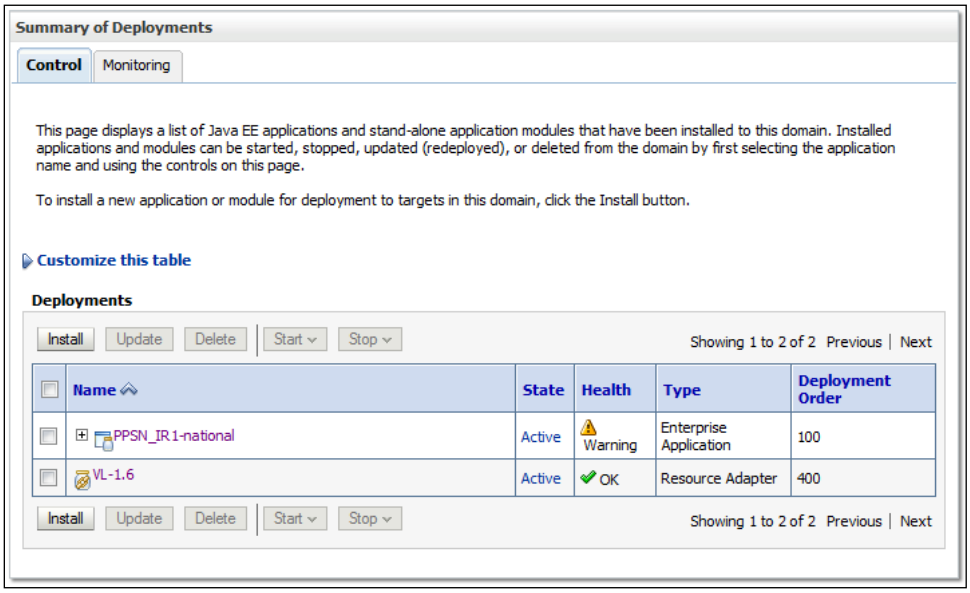

Figure 3-28. Summary of Deployments - PPS-N Deployment Active

29. Verify that the `State` of the current PPS-N deployment is `Active`. For example, `PPSN_1.3-national` is in the `Active` state in Figure 3-29. The browser window may need to be refreshed multiple times before the deployment reaches the `Active` state.

3.6.9 Instructions to Undeploy

The following steps detail how to undeploy the PPS-N application:

1. Open and log into the WebLogic console. This is located at: `http://<Deployment Machine>:7001/console`.
2. Within the `Domain Structure` panel in the left column of the WebLogic console, click the `Deployments` node.
3. Within the `Change Center` panel in the left column of the WebLogic console, click `Lock & Edit`.
4. In the panel `Summary of Deployments` in the right column of the console, select the previously deployed PPS-N deployment, click `Stop`, and then select `Force Stop Now` from the drop-down list box.
5. WebLogic will now display the panel `Force Stop Application Assistant` in the right column of the console for confirmation to start servicing requests. Click `Yes` in the `Force Stop Application Assistant` panel in the right column of the WebLogic console.
6. WebLogic now returns to the `Summary of Deployments` panel in the right column of the console. Verify that the `State` of the PPS-N deployment is `Prepared`. Select the previously deployed PPS-N deployment, and then click `Delete`.

7. WebLogic will now display the panel `Delete Application Assistant` in the right column of the console for confirmation to start servicing requests. Click `Yes` in the `Delete Application Assistant` panel in the right column of the WebLogic console.
8. WebLogic now returns to the `Summary of Deployments` panel in the right column of the console. Verify that the PPS-N deployment is deleted and no longer present.
9. Within the `Change Center` panel in the left column of the WebLogic console, click `Activate Changes`.

3.6.10 Installation of FDB_Images

FDB_Images is the name of the deployment that contains the images utilized by PPS-N for the display of images associated with various items within the application. FDB_Images is an open-directory type deployment that needs to be added to the server so that PPS-N works correctly. As a separate and open-directory deployment, this allows the modification of the image contents within the deployment, such as adding monthly image updates from First Data Bank.

3.6.10.1 Deployment of FDB_Images

Deploying the FDB_Images directory consists of the following:

1. Click on the Deployments link
2. Click Install button
3. Navigate to the directory that contains FDB_Images. E.g. `/opt`. It should have an entry listed as "FDB_Images (open directory)."
4. Click on "FDB_Images (open directory)" radio button to its left.
5. Click the Next button.
6. Click "Install this deployment as an application"
7. Click Next
8. Select the server(s) this should be deployed to, e.g. "NationalPharmacyServer"
9. Click Next.
10. Optional settings:
    - Name: "FDB_Images" - required
    - Security, click "DD Only: Use only roles…"
    - Source accessibility, click "I will make the deployment accessible from the following location". The location listed should suffice. This tells WebLogic to use this directory directly and to *not* copy it, so adequate permissions will be needed on the directory so that it and its contents are readable to the web.
11. Click Next.
12. Click "Yes, take me to the deployment's configuration screen"
13. Click Finish.
14. On the configuration screen, change Deployment Order to "200"

15. Click Save.

If a different deployment name is used, you will need to account for this by specifying the name in the PPS-N configuration file's `FDBImageLocation` element. See Section 6, PPS-N Configuration File.

3.7 Upgrading to v1.2 for Fixed Medication Copayment Tiers

This section describes how to upgrade an existing v1.1 installation of PPS-N to v1.2, in order to incorporate changes for the FMCT project.

3.7.1 Prerequisites

In order to upgrade to v1.2 of PPS-N, the following prerequisites are required:

1. The existing system must be a fully-functioning installation of PPS-N v1.1.
2. The VistA patches for v1.2 must have been installed and verified.

3.7.2 Upgrade Instructions

To upgrade to PPS-N v1.2, perform the steps in the following sub-sections in the order described.

3.7.2.1 Prepare the Deployment Server

Un-deploy the PPS-N v1.2 EAR file from the Deployment Server.

1. Select the currently deployed PPS-N ear file. Click `Stop` and select `Force Stop Now` in the `Deployments` panel in the right column of the WebLogic console.

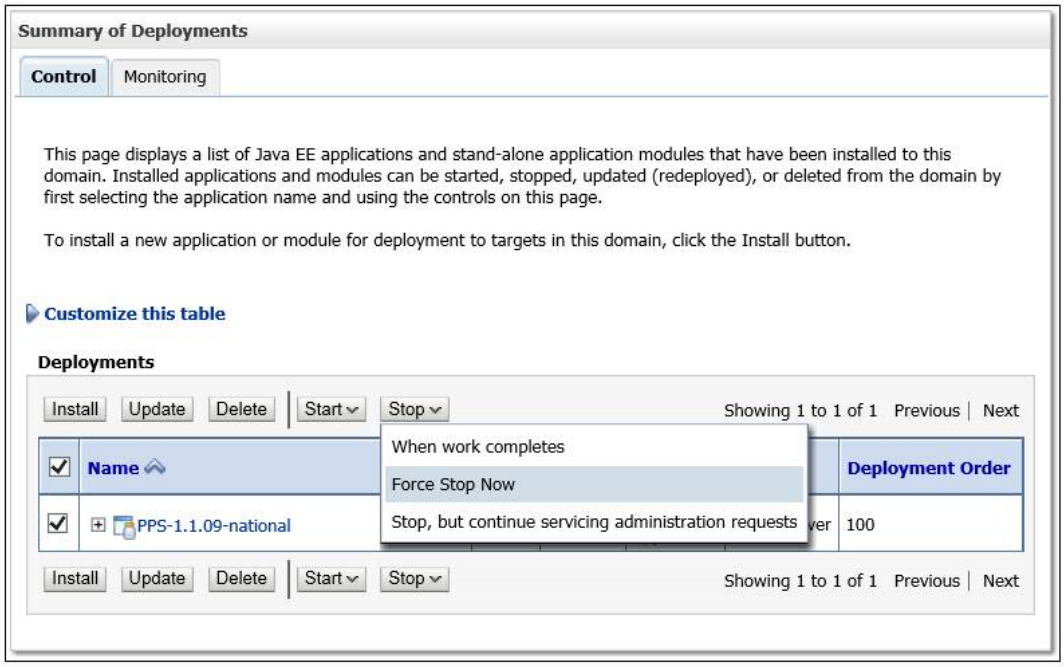

Figure 3-29. Stop Deployment

2. Click `Yes` to stop the deployment.

Figure 3-30. Complete Stop Deployment

3. Once the deployed ear file is in the `Prepared` state, click on `Lock and Edit` in the upper left `Change Center` panel.

Figure 3-31. Lock and Edit

4. In the Deployments panel of the WebLogic console, select the deployed ear file and click `Delete`.

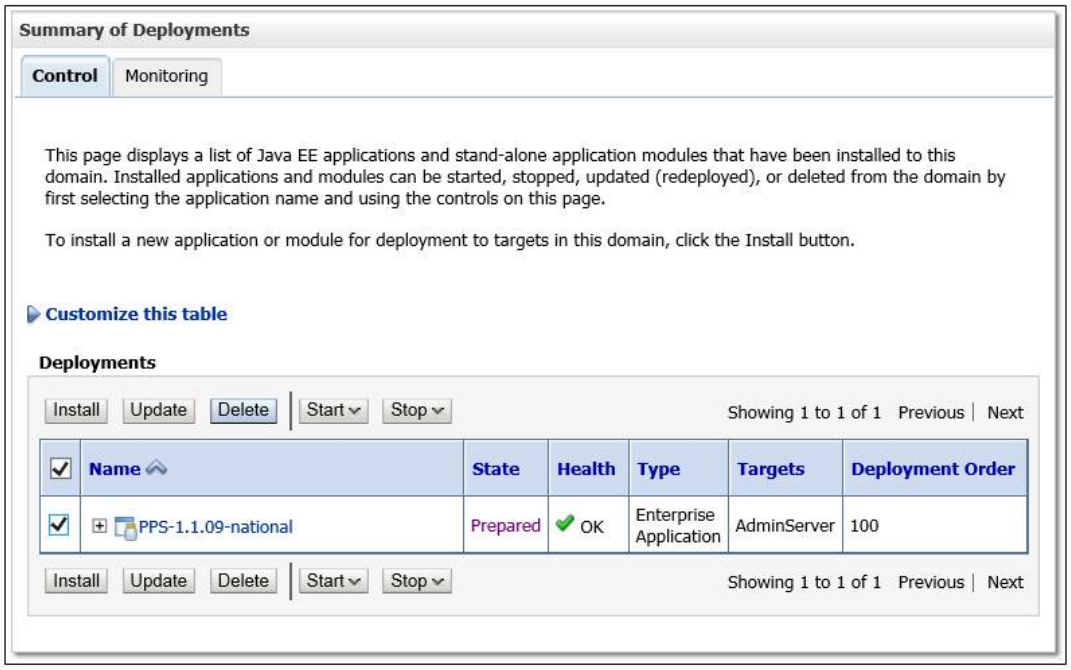

Figure 3-32. Delete Deployment

5. Once the deployed ear file has been deleted, click on `Activate Changes` in the upper left `Change Center` panel.

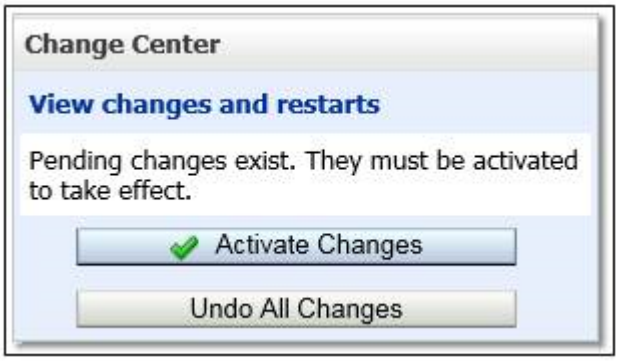

Figure 3-33. Activate Changes

6. Shutdown WebLogic on the Deployment Server.

3.7.2.2 Apply database updates

Prior to migrating PPS-N v1.1 database schema to PPS-N v1.2 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. PPS-N v1.1 consists of two database schemas: PPSNEPL, FDB_DIF. To backup the PPS-N v1.2 database using Oracle DataPump utility, issue the following command logged in as a USER with DBA privileges:

- **expdp DUMPFILE**=<dumpfilename.dmp> **SCHEMAS**=PPSNEPL,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 PPS-N v1.1 database to PPS-N v1.2 compatibility, the Oracle listener for the PPS-N 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 PPS-N v1.1 database schema to PPS-N v1.2 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 step check the log file for any errors or anomalies in processing the required transactions.

List of PPS-N 1.2 Driver SQL Script

List of PPS-N 1.2 Driver SQL Scripts			
Script Description	File Name	User	Log File
PPS-N Migration Driver script	FMCT_migration.sql	PPSNEPL	FMCT_migration.log

List of PPS-N 1.2 Driver SQL Scripts			
Script Description	File Name	User	Log File
Recompile schemas and update statistics	Recompile_Schema.sql	SYSTEM	Output
Grant role based access to FDB objects	Script_to_Grant_FDB_READ_ONLY_ROLE_TO_PPSNEPL.sql	SYSTEM	Output

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

1. Backup database as SYSTEM (if not previously performed)
    a. **expdp DUMPFILE**=<dumpfilename.dmp> **SCHEMAS**=PPSNEPL,FDB_DIF **CONTENT**=ALL **LOGFILE**=<logfilename.log>
2. Login to the SQL client using the PPSNEPL user account.
3. Execute the "FMCT_migration.sql" script.
4. Open the "FMCT_migration.log" file and search the log file for any errors.
5. Login to the SQL client using the SYSTEM user account.
    - Execute Script_to_Grant_FDB_READ_ONLY_ROLE_TO_PPSNEPL.sql
    - Execute Recompile_Schema.sql
7. Verify grant creation and recompile actions were successful

After all the migration steps have been completed without error, the Oracle listener for the PPS-N 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.

List of PPS-N 1.2 SQL Scripts

PPS-N 1.2 Driver Scripts	Description	Purpose
FMCT_migration.sql	Driver Script to migrate from PPS-N 1.1 to PPS-N 1.2 schema	Database Migration Driver Scripts
PPS-N 1.2 Components	**Definition**	**Purpose**
Script_to_Drop_EPL_NOTIFICATION_STATUS_Table_RTC329836.sql	Script to drop table	Drop table no longer needed in PPSN 1.2
Script_to_Drop_EPL_REDUCED_COPAY_Table_RTC356696.sql	Script to drop table	Drop table no longer needed in PPSN 1.2
PPSNEPL_EPL_NATIONAL_SETTINGS_RTC287205.sql	Apply national settings for PPS-N 1.2	Modifications for PPS-N 1.2
Script_to_Create_EPL_VA_DRUG_CLASSES_Field_Excluded.ddl	Add new field for PPS-N 1.2	Modifications for PPS-N 1.2
Script_to_Populate_EPL_VA_DRUG_CLASSES_Field_Excluded.ddl	Populate new field for PPS-N 1.2	Modifications for PPS-N 1.2

Script_to_Create_EPL_COPAY_TIER.ddl	Create new table	New in PPS-N 1.2
Script_Report_Copay_Tier_Change.sql	Create new stored procedure	New in PPS-N 1.2
Purge_Recyclebin.sql	Purge recycle bin	Cleanup activity
Recompile_Schema.sql	Recompile schemas and update statistics	Cleanup activity
Script_to_Create_EPL_COPAY_TIER_3_PRODUCTS_View_RTC287207.sql	Create new view	New in PPS-N 1.2
Script_to_Grant_FDB_READ_ONLY_ROLE_TO_PPSNEPL.sql	Script to apply role based access to FDB objects	New in PPS-N 1.2

3.7.2.3 Update WebLogic Settings

1. Start WebLogic on the Deployment Server.
2. Modify WebLogic JTA timeout to enable the copay tier migration. See section 3.6.4 for instructions.
3. Restart WebLogic on the Deployment Server.

3.7.2.4 Deploy the v1.2 EAR file

Install PPS-N v1.2 EAR file on the Deployment Server. See section 3.6.8 for instructions on deploying the EAR file.

3.7.3 Back Out Instructions

To back out PPS-N v1.2 and roll back to PPS-N v1.1, perform the steps in the following sub-sections in the order described.

3.7.3.1 Prepare the Deployment Server

1. Un-deploy the PPS-N v1.2 EAR file from the Deployment Server using the WebLogic console.
2. Shutdown WebLogic on the Deployment Server.

3.7.4 PPS-N v1.2 Database Migration Rollback

Prior to migrating the PPS-N v1.1 database schema to PPS-N v1.2 compatibility, a backup of the database is performed to ensure rollback capability. This section addresses the steps needed to rollback to PPS-N v1.1 using the secured backup.
Procedures for restoring/loading production data include the following steps:

- Prepare database for restoring production data
    - Drop existing schema objects (tables, sequences) for each schema
- Import each schema by issuing the following commands logged in as a USER with DBA privileges preferably SYSTEM:

    - **impdp DUMPFILE**=<dumpfilename.dmp> **SCHEMAS**=FDB_DIF **LOGFILE**=<logfilename.log> **CONTENT**=ALL **TABLE_EXISTS_ACTION**=REPLACE

    - **impdp DUMPFILE**=<dumpfilename.dmp> **SCHEMAS**=PPSNEPL **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.

- Recompile schemas and update statistics by issuing the following commands logged in as a USER with DBA privileges preferably SYSTEM:
    - Recompile_Schema.sql

3.7.4.1 Rollback Java 1.8 and WebLogic 12.1.3

1. Shutdown WebLogic 12.1.3 – (The WebLogic domain for PPS-N v1.2)
2. Optionally uninstalling Java 1.8 and/or WebLogic 12.1.3 for PPS-N v1.2

3.7.4.2 Verify the WebLogic Settings

1. Start WebLogic 10.3.6 (The WebLogic domain for PPS-N v1.1) on the Deployment Server.
2. Verify the WebLogic JTA timeout is 600 seconds.

3.7.4.3 Deploy the v1.1 EAR file

Install the v1.1 EAR file on the Deployment Server. See section 3.6.8 for instructions on deploying the EAR file, but deploy the v1.1 EAR instead of the v1.2 EAR.

3.8 Upgrading to v1.3 for Two Factor Authentication

This section describes how to upgrade an existing v1.2 installation of PPS-N to v1.3, in order to incorporate changes for Two Factor Authentication.

3.8.1 Prerequisites

In order to upgrade to v1.3 of PPS-N, the existing system must be a fully-functioning installation of PPS-N v1.2 on WebLogic 12.1.3 and Java 1.8.

3.8.2 Upgrade Instructions

To upgrade to PPS-N v1.3, perform the steps in the following sub-sections in the order described.

3.8.2.1 Undeploy the v1.2 EAR file

Un-deploy the PPS-N v1.2 EAR file from the Deployment Server. See section 3.6.9 for instructions on undeploying the EAR file.

3.8.2.2 Apply database changes

Prior to migrating PPS-N v1.2 database schema to PPS-N v1.3 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. PPS-N v1.2 consists of two database schemas: PPSNEPL, FDB_DIF. To backup the PPS-N v1.2 database using Oracle DataPump utility, issue the following command logged in as a USER with DBA privileges:

- **expdp DUMPFILE**=<dumpfilename.dmp> **SCHEMAS**=PPSNEPL,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.

PPS-N v1.3 is integrated with IAM SSOi through the SiteMinder Web Agent for PIV authentication. PPS-N no longer uses KAAJEE and VistA for user authentication. The user name and VAUID from Active Directory are stored in the PPS-N database and the user roles are managed within the PPS-N application.
The following Database changes are needed for PPS-N v1.3:

- A new column VAUID has been added to the PPS-N User table.
- The initial set of PBM NDF users with all the roles must be inserted into the PPS-N User table.

The following steps should be followed to alter the PPS-N User table:

1. Login to the SQL client using the PPSNEPL user account.
2. Execute the “PPSN13_Alter_EPL_USERS_Table.sql” script.
3. Open the log file and search the log file for any errors.

The following steps should be followed to insert the initial set of users into the PPS-N User table:

1. Login to the SQL client using the PPSNEPL user account.
2. Execute the “PPSN13_Insert_PBM_Users_EPL_USERS_Table.sql” script.
3. Open the log file and search the log file for any errors.

3.8.2.3 Update WebLogic Settings

1. Start WebLogic on the Deployment Server.
2. Modify WebLogic JTA timeout. See section 3.6.4 for instructions.
3. Restart WebLogic on the Deployment Server.

3.8.2.4 Deploy the v1.3 EAR file

Install PPS-N v1.3 EAR file on the Deployment Server. See section 3.6.8 for instructions on deploying the EAR file.

3.8.3 Back Out Instructions

To back out PPS-N v1.3 and roll back to PPS-N v1.2, perform the steps in the following sub-sections in the order described.

1. Un-deploy the PPS-N v1.3 EAR file from the Deployment Server using the WebLogic console. See section 3.6.9 for instructions on undeploying the EAR file.
2. Deploy the v1.2 EAR file on the Deployment Server. See section 3.6.8 for instructions on deploying the EAR file.

3.8.4 PPS-N v1.3 Database Changes Rollback

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

- Prepare database for restoring production data
  - Drop existing schema objects (tables, sequences) for each schema
- Import each schema from the dump file created in section 3.8.2.2 by issuing the following commands logged in as a USER with DBA privileges preferably SYSTEM:

  - **impdp DUMPFILE**=<dumpfilename.dmp> **SCHEMAS**=FDB_DIF
    LOGFILE=<logfilename.log> **CONTENT**=ALL
    TABLE_EXISTS_ACTION=REPLACE

  - **impdp DUMPFILE**=<dumpfilename.dmp> **SCHEMAS**=PPSNEPL
    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.

- Recompile schemas and update statistics by issuing the following commands logged in as a USER with DBA privileges preferably SYSTEM:
  - Recompile_Schema.sql

4 FUNCTIONALITY TEST

The following instructions define a method of verifying the installation performed in Section 3. These steps are not required to complete the PPS-N installation; they provide a way to verify that the installation is complete and operational.

4.1 Assumptions

Prior to completing any of the deployment verification instructions in the remaining section of this document, the following assumption must be met: The PPS-N Web interface is accessed using Internet Explorer, Version 11.

4.2 Deployment Verification

The following instructions detail how to verify that the PPS-N system was deployed successfully. The instructions do not verify all functionality of the application; they are only a simple way to show that the deployment was successful.

For each deployment environment, follow these steps:

16. Store the `SampleNDC.csv` file in a directory on the computer that will run the Web browser.
17. Open a Web browser.
18. Navigate to `http://<Deployment Machine>:<Deployment Server Port>/PRE/`
19. Login using the following username: `PNM1N1`
20. Verify that the PPS-N home page appears.
21. Select the `Migrate` tab. Verify the `Migration Start` page appears.
22. Start a migration as follows:
    - Select the `SampleNDC.csv` file stored in step 1.
    - Select `Start Migration` button.
23. Wait for a partial migration (Drug Units and Dispense Units only) to complete. Press Stop button if migration time exceeds two minutes.
24. On Migration Report page, review Drug Unit and VA Dispense Unit detailed reports by selecting the appropriate links.

If the Web pages do not appear or the flow is not fully operational, verify that all the steps listed in Section 3 were completed correctly.

5 BACKOUT PROCEDURES

The current PPS-N Application is hosted on the NDF Management Server. When PPS-N goes online; the users will simply stop using the MUMPS user interface in the NDF Management Server and begin using the web interface to manage drug items. As new drugs items are added into PPS-N and existing items are updated, the PPS-N java application will be automatically updating the NDF Management System in the background.

If, at any time, the users decide to stop using the PPS-N web application and go back to using the NDF Management user interface, it is simply a matter of stopping using the web service and starting using the NDF interface. Since the PPS-N web interface keeps the NDF Management System updated in real-time then no rollback procedure is to be performed.

There is already a procedure in place that is used to back up the NDF Management Server and that process will continue as is with no changes. The periodic backup of the PPS-N EPL database is described in the Productions Operational Manual.

6 PPS-N CONFIGURATION FILE

This configuration file (PPS-NConfig.xml) needs to be in the directory structure of the application server. It must be in the /config directory of the deployed domain (i.e. ../domains/PRE/config/).

```
<?xml version = "1.0" encoding = "UTF-8"?>
<PPS-NConfigFile>
      <NationalPort>8021</NationalPort>
      <TransactionTimeout>60</TransactionTimeout>
      <NDFDivision>521</NDFDivision>
      <NDFProxyUserIEN>355</NDFProxyUserIEN>
      <ConnectionSpecName>DUZ</ConnectionSpecName>
      <RPCTimeout>60000</RPCTimeout>
      <FDBImageLocation>/FDB_Images/</FDBImageLocation>
</PPS-NConfigFile>
```

Please note that the `FDBImageLocation` element is optional, as a default value of "/FDB_Images/" is used if it is not specified.

***Note: On Windows, the PPS-NConfig.xml file should be copied to the following directory: ../domains/PS_PPS_common/etc/xml.