

Pharmacy Product System – National (PPS-N)

PPS-N Java version 3.1

Troubleshooting Guide



Version 3.1

(Revised December 2020)

Department of Veterans Affairs (VA)

Office of Information and Technology (OIT)

Revision History

| Date | Version | Change Reference | Author |
|---------------|---------|---|------------------------------------|
| December 2020 | 3.1 | PREN*3.1*3: <ul style="list-style-type: none"> • Updated the Title Page and Footers • Updated software version numbers • Added alt text to the Figures and Tables | Liberty ITS |
| July 2017 | 1.3 | Updated content for PPS-N v1.3 which addresses 2FA Compliance and IAM SSOi integration for PIV authentication. | Enterprise Application Maintenance |
| May 2015 | 1.1.02 | Updated date and version number to 1.1.02. | Enterprise Application Maintenance |
| August 2014 | 1.1.01 | Updated version number to 1.1.01. And made some formatting changes. | Enterprise Application Maintenance |
| November 2013 | 1.0.01 | Updated version number to 1.0.01. | Enterprise Application Maintenance |
| January 2013 | 1.0 | Clerical Modifications made based on NRR review comments. | REDACTED |
| November 2012 | 1.0 | Updated to include a section detailing the steps necessary when getting the test to production error. | REDACTED |
| August 2012 | 1.0 | Updated to include Lyn Teague's comments. Including updating footers, and an acronym list and rewording some sections to make them less ambiguous. | REDACTED |
| July 2012 | 1.0 | Updated for National Release | REDACTED |
| June 2012 | 1.0 | Addition of Browser Troubleshooting | REDACTED |
| March 2012 | 1.0 | Initial Draft | REDACTED |

Table of Contents

| | | |
|----------|--|-----------|
| 1 | Introduction..... | 1 |
| 1.1 | Summary | 1 |
| 1.2 | Purpose | 1 |
| 1.3 | Scope | 1 |
| 1.4 | Acronyms | 1 |
| 2 | System Business and Operational Description | 5 |
| 2.1 | Operational Priority and Service Level | 5 |
| 2.2 | Logical System Description | 5 |
| 2.2.1 | Presentation Tier Overview..... | 6 |
| 2.2.2 | Business Logic Tier Overview..... | 6 |
| 2.2.3 | Data Persistence Tier Overview..... | 6 |
| 2.2.4 | PPS-N Logical System Components..... | 8 |
| 2.3 | Physical System Description | 8 |
| 2.4 | Software Description | 9 |
| 2.4.1 | Background Processes..... | 10 |
| 2.4.2 | Job Schedules | 10 |
| 2.5 | Dependent Systems | 11 |
| 3 | Routine Operations | 13 |
| 3.1 | Administrative Procedures..... | 13 |
| 3.1.1 | System Start-up | 13 |
| 3.1.2 | System Shut-down..... | 14 |
| 3.1.3 | Back-up & Restore..... | 15 |
| 3.2 | Security / Identity Management | 19 |
| 3.2.1 | Identity Management | 19 |
| 3.2.2 | Access Control..... | 20 |
| 3.3 | User Notifications | 22 |
| 3.4 | System Monitoring, Reporting, & Tools | 23 |
| 3.4.1 | Availability Monitoring | 23 |
| 3.4.2 | Performance/Capacity Monitoring..... | 23 |
| 3.5 | Routine Updates, Extracts and Purges..... | 23 |
| 3.6 | Scheduled Maintenance | 24 |

| | | |
|----------|---|-----------|
| 3.7 | Capacity Planning..... | 24 |
| 3.7.1 | Initial Capacity Plan | 24 |
| 4 | Browser Issues and Settings..... | 26 |
| 4.1 | IE9 Developer Tools Settings | 26 |
| 4.1.1 | Required Settings | 26 |
| 4.1.2 | Troubleshooting Some Typical Problems..... | 26 |
| 5 | Exception Handling | 28 |
| 5.1 | Routine Errors | 28 |
| 5.1.1 | Security..... | 28 |
| 5.1.2 | Time-outs..... | 28 |
| 5.1.3 | Concurrency | 29 |
| 5.2 | Significant Errors | 29 |
| 5.2.1 | Application Error Logs..... | 29 |
| 6 | Application Error Messages | 31 |
| 6.1 | Error Messages | 31 |
| 6.1.1 | Validation Errors | 31 |
| 6.1.2 | System Errors | 31 |
| 7 | Infrastructure Errors | 33 |
| 7.1 | Database | 33 |
| 7.2 | Web Server..... | 33 |
| 7.3 | Application Server | 33 |
| 7.4 | Network | 34 |
| 7.5 | Authentication..... | 34 |
| 7.5.1 | User SSOi Logout..... | 34 |
| 7.6 | Dependent System(s)..... | 34 |
| 8 | System Recovery..... | 36 |
| 8.1 | Restart after Non-Scheduled System Interruption | 36 |

List of Tables

| | |
|---|----|
| Table 1: Acronyms | 1 |
| Table 2: WebLogic Application Server | 8 |
| Table 3: Oracle Database Server | 8 |
| Table 4: Software Components for PPS-N | 9 |
| Table 5: System Automation Dependencies..... | 11 |
| Table 6: PRE Pre-Production Steps | 13 |
| Table 7: PRE Production Steps..... | 13 |
| Table 8: Screen Availability Based on User Role | 20 |
| Table 9: User Notification Steps..... | 22 |

List of Figures

| | |
|---|----|
| Figure 1: Logical System Overview | 7 |
| Figure 2: PPS-N Deployment | 9 |
| Figure 3: IAM SSOi Dependent System | 11 |
| Figure 4: SSOi Central Login Page | 19 |

1 Introduction

1.1 Summary

The Pharmacy Product System (PPS) – National (PPS-N) Troubleshooting Guide is written to be a supplement to any Operations Manual that is provided for the support staff, whether it be Field Operations, HealthVet Maintenance (after the product is in production), or the development team that needs to initially support the product.

1.2 Purpose

The purpose of this document is to list the error messages that any user may come across in the application. Some of the messages require that support staff be notified, and these are noted.

1.3 Scope

This scope of this document is limited to the PPS-N application. Any references to external systems are only for describing an interface and how the interface and that system affects the operation of PPS-N, or as a tool that may be used as part of system monitoring or the support and issue resolution system.

1.4 Acronyms

The following is a list of acronyms for this document.

Table 1: Acronyms

| Acronym | Definition |
|---------|--|
| ANR | Automated Notification Reporting. |
| API | Application Programming Interface |
| CDCO | Corporate Data Center Operations |
| CRUD | Create Read Update Delete |
| DBA | Database Administrator |
| NDF-MS | National Drug File – Management System |
| EPL | Enterprise Product List |
| FDB | First Databank |

| Acronym | Definition |
|-----------------------------|---|
| FDB- MedKnowledge Framework | First Databank – MedKnowledge Framework |
| FSS | Federal Supply Schedule |
| HSD&D | Health Systems Design and Development |
| IAM | Identity and Access Management |
| ITC | Information Technology Center |
| JDBC | Java DataBase Connectivity |
| JDK | Java Development Kit |
| JSP | Java Server Pages |
| KAJEE | Kernel Authorization and Authentication for Java Enterprise Edition |
| NDF | National Drug File |
| PPS-N | Pharmacy Product System - National |
| PRE | Pharmacy Re-Engineering |
| PREP | Pre-Production |
| SAN | Storage Area Network |
| SDS | Standard Data Service |
| SLA | Service Level Agreement |
| SSOi | Single Sign On internal |
| STK | Software Toolkit |
| STS | Standards and Terminology Service |
| VA | Veterans Affairs |

| Acronym | Definition |
|---------|---|
| VETS | Veterans Enterprise Terminology Service |
| VHA | Veterans Health Affairs |
| Vista | Veterans Health Information Systems and Technology Architecture |

(This page included for two-sided copying.)

2 System Business and Operational Description

The PPS-N application allows national VA personnel to more easily, quickly and safely manage the VA National Formulary which directs which products (such as medications and supplies) are to be purchased and used by the VA hospital system. This in turn fulfills the overall Pharmacy Enterprise Product Systems objectives of facilitating the improvement of pharmacy operations and patient safety for the VHA.

The PPS-N application supports a platform-independent browser-based interface that allows PPS-N users to keep the application's database (known as the Enterprise Product List or EPL) up to date. PPS-N performs the following major business functions:

- Add/edit/approve medication and supply information
- Manage the national formulary list
- Synchronize the Enterprise Product List (EPL) data with the legacy National Drug File – Management System (NDF-MS) data
- Create national drug reports
- Process First DataBank (FDB) additions and updates
- Search FDB for drug information.
- Interfaces with the Veterans Enterprise Terminology Service (VETS) system (for Standard Med Route information)
- Interfaces with the Federal Supply Schedule (FSS) system (for pricing data)

The Pharmacy Benefits Management group (PBM) is the primary business owner of the application. They are responsible for overseeing customized changes that are necessary for overriding data table updates supplied weekly by First Data Bank.

2.1 Operational Priority and Service Level

The Service Level of the system and the availability of the system are described in the Rough Order of Magnitude (ROM) it provides information to set up and support the PRE PPS-N application at ITC-Austin TX and NDF VistA environments at Albany NY. No formal SLA is available for the PPS-N application.

2.2 Logical System Description

The logical view describes the architecturally significant parts of the design model. The object-oriented decomposition of the PPS-N application can be logically divided into three primary tiers: Presentation Tier, Business Logic Tier, and Data Persistence Tier. Each tier has its own design and implementation framework, and defined points of interaction with the other respective tiers.

2.2.1 Presentation Tier Overview

The presentation tier represents the GUI screens that allow the user to interact with the application, and the logic initiated by user interaction to execute screen functionality. Presentation Tier uses well known Model-View-Controller (MVC) design pattern implemented by the Spring MVC framework using Sun Microsystems JSP pages as the “View” portion of MVC. The MVC framework is used to manage the display screens and to dispatch and delegate requests initiated by the user to a business rule processing business logic tier. The design of the MVC framework as it is used in the PPS-N application leverages an object hierarchy with commonly shared base classes.

2.2.2 Business Logic Tier Overview

The business logic tier is responsible for receiving business rule processing requests from the presentation tier, or other parts of the business logic tier. It is composed of services implemented as Spring beans. Transactional integrity is ensured by using Spring managed transactions.

The main services implemented deal with creation/modification/deletion of customization requests, workflow, queries and custom update generation.

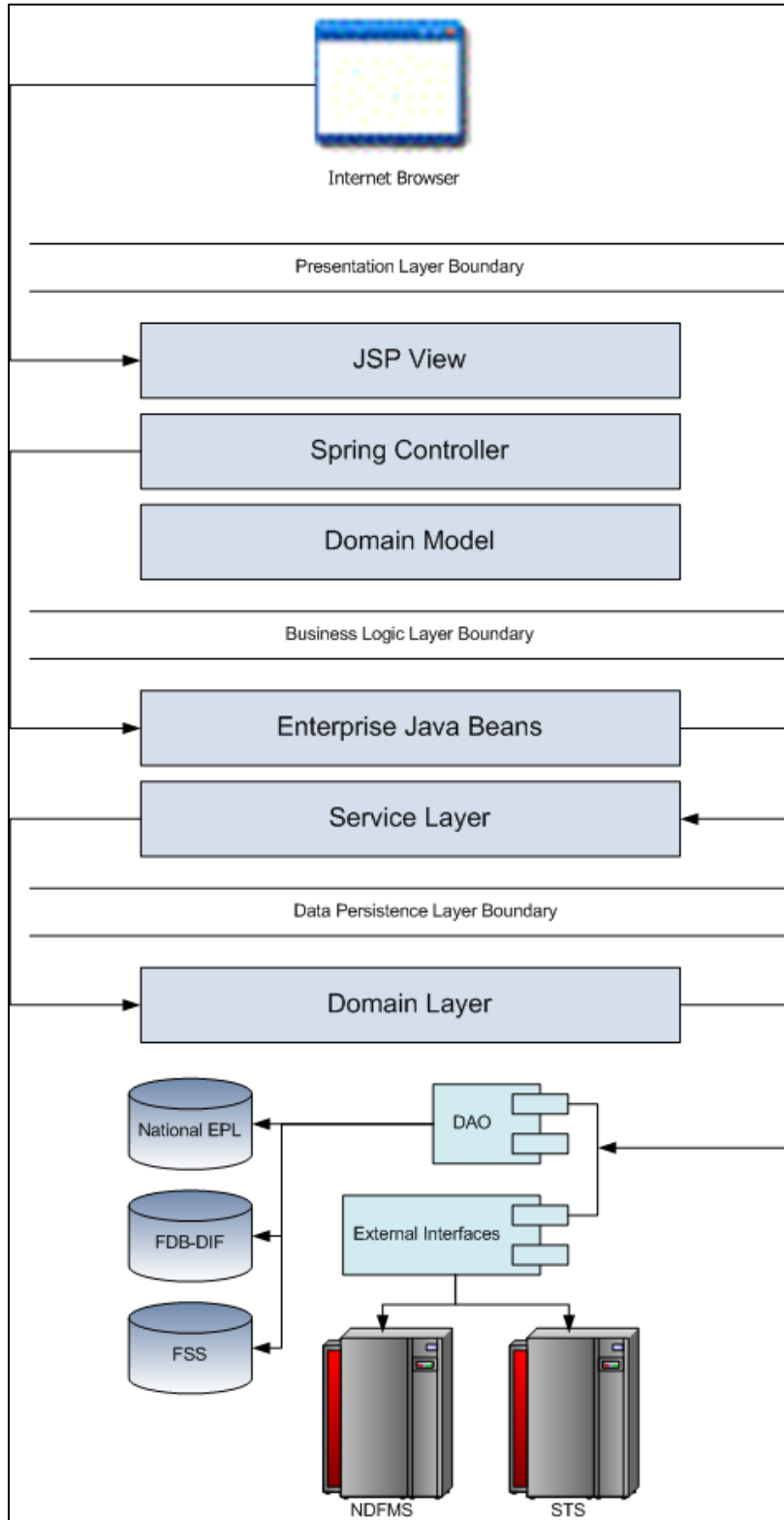
The services encapsulate the business rules governing the creation/modification/deletion of customization requests and their workflow. The services are also responsible for interfacing and abstracting the data persistence tier from the rest of the application logic.

2.2.3 Data Persistence Tier Overview

The data persistence tier is designed and implemented with the open source Hibernate framework. The Hibernate framework is an object-oriented abstraction for database CRUD operations (please see the Hibernate website for further information).

The data persistence tier interfaces with three logical Oracle databases. The first is the PPS-N database (“National EPL”) containing the tables and database objects necessary for the PPS-N application to perform its various functions. The second is the FDB-DIF database, which is the source of various drug information utilized by PPS-N data migrations. The third is the FSS database, which is another data source utilized by PPS-N data migrations. The relevant tables in each of these databases have representative domain model objects and data access objects (DAOs) in the data persistence design. Additionally, PPS-N interacts with two other database systems, NDFMS (via a VistaLink API) and FSS (via a JDBC Connection).

Figure 1: Logical System Overview



2.2.4 PPS-N Logical System Components

The logical system description defines the PPS-N system components. The Logical System components are defined in the PPS-N Software Design Document.

2.3 Physical System Description

PPS-N is a national deployment at the Austin Information Technology Center (AITC). There is no disaster recovery site at AITC. The PPS-N application's components are deployed on two servers: an application server (WebLogic) and a database server (Oracle). The characteristics of these servers are described in more detail below.

Table 2: WebLogic Application Server

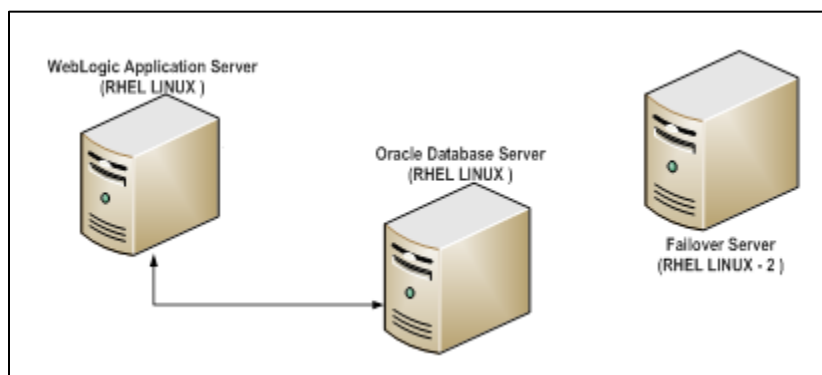
| Parameter | Value |
|---------------------------|--|
| Central Processing Unit | 2 CPU, x86 architecture (Intel x86 or equivalent), 2 GHz or faster |
| RAM | 8 GB |
| Available Hard Disk Space | 70 GB |
| RAID Configuration | RAID 1 |
| Operating System | Red Hat Linux – Enterprise Edition Version 6.8 |
| Mouse | Generic |
| Video Resolution | 640 x 480 pixels |
| Network Interface | dual Gigabit or higher |
| Software | BEA WebLogic 12.1.3 |

Table 3: Oracle Database Server

| Parameter | Value |
|---------------------------|---|
| Central Processing Unit | 4 CPU, i386 architecture (Intel 386 or equivalent), 2 GHz or faster |
| RAM | 16 GB |
| Available Hard Disk Space | 150 GB |
| RAID Configuration | RAID 1 |
| Operating System | Red Hat Linux v6.8 |
| Mouse | Generic |
| Video Resolution | 640 x 480 pixels |
| Network Interface | dual Gigabit or higher |
| Fiber Channel Interface | dual Host Bus Adapters |
| Database | Oracle 11g |

PPS-N is deployed at the national level as a single application server node connected to a database server.

Figure 2: PPS-N Deployment



2.4 Software Description

The PPS-N application conforms to the requirements of the VA in determining the use of third-party tools. Please refer to the HealthVet-VistA Application Architecture Planning TRM Tools list for the approved VA programming APIs and libraries and the VA Web Operations Developer’s Guide.

The three-tiered architecture consisting of an Internet browser based graphical user interface accessing a Spring-based web application/presentation tier, a J2EE based business logic service processing layer, and a Hibernate based data access tier conforms to the design recommended by the HSD&D Core Specifications for Rehosting Initiatives and generally acceptable J2EE implementation recommendations.

PPS-N is a J2EE application deployed on WebLogic v12.1.3 and uses JDK v1.8. It makes use of the following third-party frameworks: Spring 4.2.9, Hibernate 5.1.10 and Log4j 2.10.0. The presentation tier also makes use of the JavaScript library Prototype 1.6.0. As mandated by the VA, PPS-N uses IAM SSOi for user authentication using PIV. User authorization and roles are handled within the PPS-N application using Database tables.

Table 4: Software Components for PPS-N

| Component Name | Vendor | Version | License | Configuration |
|----------------------------|----------------|---------|-------------------------|-------------------------------|
| Operating System | Redhat | 6.8 | | Standard |
| National Database | Oracle | 11g | | See PPS-N Installation Guide. |
| Programming Language | Sun/Oracle | 1.8 | Sun Binary Code License | Standard |
| WebLogic | Oracle | 12.1.3 | | See PPS-N Installation Guide. |
| Drug Information Framework | First Databank | 3.3 | | See PPS-N Installation Guide |

2.4.1 Background Processes

There are several background processes that run on the PPS-N production servers:

- At 7am each morning, a job runs to alert DBAs to service accounts with passwords that will expire in the next 15 days.
- Also, at 7am, a job runs to purge trace files, log files older than a set parameter.
- At 5am, a daily job runs to move audit logs that need to be kept longer to a more permanent location.
- At 6am, a job runs to move old alert logs to a backup directory and start a new log for each day to make troubleshooting and maintenance easier and to free up space for customer data.
- Every night at 11pm, a job runs to gather statistics on each table which are used by the Oracle optimizer to choose data access paths for peak performance.
- A weekly job runs on Sunday to monitor space usage and allow database and system administrators to do capacity planning. A weekly job runs on Thursdays to verify/monitor privileges held by users for security and DBA review.

System Monitoring jobs that monitor the database and application servers are described in Section 3.4.

2.4.2 Job Schedules

A Quartz Scheduler schedules the nightly update processes that execute at a configured time once per day. Whether successful or unsuccessful, the process will execute again on the following day.

There are five scheduled jobs that are scheduled through the Quartz scheduler:

- FDB-DIF Add: Checks the FDB-DIF for any new packaged drugs that have been added since the last time the job ran.
- FDB-DIF Update: Checks the FDB-DIF for any updated drugs that have been updated since the last time the job ran.
- STS Update: Checks the VETS web service API to see if any changes have been made to the Standard Medication Routes since the last time the job ran.
- FSS Update: Checks the Federal Supply Schedule database to see if any pricing information has been updated since the last time the job ran.
- Proposed Inactivation Process: Checks to see if any drugs have reached their proposed inactivation date and processes any that have.

2.5 Dependent Systems

PPS-N depends on IAM SSOi for user authentication. The user authorization and roles are managed within the PPS-N application.

Figure 3: IAM SSOi Dependent System

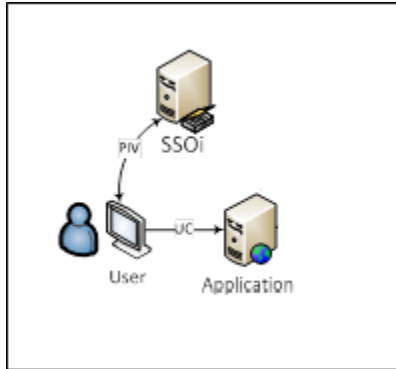


Table 5: System Automation Dependencies

| Dependency Name | Location | Function | Interface Method |
|-----------------|-------------|----------|------------------|
| IAM SSOi | VA Internal | Security | WEB |

(This page included for two-sided copying.)

3 Routine Operations

The PPS-N requires Oracle support of the FDB DIF and Developer tables by a data base administrator. The understanding of Linux and WebLogic is also required.

3.1 Administrative Procedures

3.1.1 System Start-up

The servers are brought online by applying appropriate power and pressing the power button. Once the operating system is loaded and the server is accessible, the DBA is advised and will bring the database online. Once the database is online, the application admin is advised and will bring the application online.

If the server is up and the database is down, the script on the database server, vaXXXXXX, in the directory /u01/oracle/admin/PREP/scripts, is a start-up script which can be run by the Oracle Unix user to start up any database on the server. It is called from that directory as ./startup_db.ksh <database_name>, i.e., ./startup_db.ksh PREP.

WebLogic as pre and post steps.

Table 6: PRE Pre-Production Steps

| PRE Pre-Production | |
|-----------------------------|--|
| WebLogic Install Directory | /u01/app/bea |
| Domain Directory | /u01/app /bea/user_projects/domains/ pps |
| Admin Server Startup Script | /u01/app /bea/user_projects/domains/pps-preprod/startWebLogic.sh |
| Node Manager Startup Script | /u01/app /bea/wlserver_10.3/server/bin/startNodeManager.sh |
| Managed Server Startup | From Admin Console: pps_ms1 |

Table 7: PRE Production Steps

| PRE Production | |
|-----------------------------|--|
| WebLogic Install Directory | /u01/app /bea |
| Domain Directory | /u01/app /bea/user_projects/domains/pps-prod |
| Admin Server Startup Script | /u01/app/bea/user_projects/domains/pps-prod/startWebLogic.sh |
| Node Manager Startup Script | /u01/app /bea/wlserver_10.3/server/bin/startNodeManager.sh |
| Managed Server Startup | From Admin Console: pps_ms1 |

1. Login to server as your user and become the WebLogic user:

i.e.: **`sudo su - weblogic`**

2. See the previous table to identify the script you wish to run for starting the Admin Server or a Node Manager. When running a script, preface all startup scripts with the **`nohup`** command and place in the background.

i.e.: Starting the Admin Server

```
cd /u01/app/bee/user_projects/domains/pps-*  
nohup ./startWebLogic.sh &
```

i.e.: Starting a Node Manager

```
cd /u01/app/bee/wlserver_10.3/server/bin  
nohup ./startNodeManager.sh &
```

Login to the WebLogic GUI Admin console with your LAN ID. If this does not work, check the Password Vault for the environment and use the specified account. Start the requested Managed Servers.

3.1.2 System Shut-down

The application is first taken offline by the application admin and advises the team. The DBA takes the database offline and advises the team. The System Administrator will run “ps -ef” to identify any hung WebLogic or Oracle processes prior to shutdown/reboot of the servers.

If the server is up and the database is up but needs to come down for maintenance on the database or server, the script on the database server, vaXXXXXX, in the directory, /u01/oracle/admin/PREP/scripts, is a shutdown_ script which can be run by the Oracle Unix user to shut down any database on the server. It is called from that directory as ./shutdown_db.ksh <database_name>, i.e., ./shutdown_db.ksh PREP.

- a. Login to the WebLogic GUI Admin console with your LAN ID. If this does not work, check the Password Vault for the environment and use the specified account.

Select all the servers including Admin server and shut them down.

- b. Login to server as your user and become the WebLogic user:

```
i.e.: sudo su - weblogic  
kill <nodemanager PID>
```

- c. Verify if all the servers are stopped.

i.e. **`ps -ef | grep java`**, should not display any WebLogic instances.


```

----vaXXXXX-b PING Statistics----
3 packets transmitted, 3 packets received, 0% packet loss
round-trip (ms) min/avg/max = 0/0/2

=====
Running Command: bpcIntcmd -hn vaXXXXX-b

host vaXXXXX-b: vaXXXXX-b

=====
Running Command: bpccoverage -c vaXXXXX-b -coverage -no_cov_header

CLIENT: vaXXXXX-b

Mount Point          Device                Backed Up By Policy  Notes
-----
/                    /dev/mapper/rootvg-root PRE_prd_sys
/                    /dev/mapper/rootvg-root *PRE_prd_ays
/boot               /dev/sda1             PRE_prd_sys
/boot               /dev/sda1             *PRE_prd_ays
/dev/pts            devpts                 UNCOVERED
/home               /dev/mapper/rootvg-home PRE_prd_sys
/home               /dev/mapper/rootvg-home *PRE_prd_ays
/opt                /dev/mapper/rootvg-opt PRE_prd_sys
/opt                /dev/mapper/rootvg-opt *PRE_prd_ays
/proc/sys/fs/binfmt_misc none                    UNCOVERED
/sys                sysfs                  UNCOVERED
/u01                /dev/mapper/rootvg-u01 PRE_prd_sys
/u01                /dev/mapper/rootvg-u01 *PRE_prd_ays
/usr                /dev/mapper/rootvg-usr PRE_prd_sys
/usr                /dev/mapper/rootvg-usr *PRE_prd_ays
/var                /dev/mapper/rootvg-var PRE_prd_sys
/var                /dev/mapper/rootvg-var *PRE_prd_ays

```

The database server, vaXXXXX, is backed up for a system backup each weekend to tape and the tapes are retained for a month.

Oracle Recovery Manager software is used to perform full backups of the PREP database each Tuesday and Saturday mornings. The tapes are retained offsite for 1 month. Recovery Manager is also used to backup archive logs and the database control file to tape daily, and are also retained offsite for a month. The full database backups run for about 40-45 minutes. The archive log backups are shorter, about 25-30 minutes.

3.1.3.2 Restore Procedures

Recover disk layout and OS version:

1. Refer to one of the following for a filesystem layout:
 - a. cfg2html reports
 - b. Filesystem report stored in /opt/ops/hosts.reports/<hostname>.fs.txt on VEG
 - c. Restore /opt/ops/<hostname>.fs.txt to /tmp/ on REDACTED
2. Refer to one of the following to determine which RedHat version to install:
 - a. cfg2html reports
 - b. Cfg2html output stored in /opt/cfg2html on REDACTED
 - c. RedHat release report stored in /opt/ops/hosts.reports/<hostname>.release.txt on REDACTED
 - d. Restore /etc/redhat-release to /tmp/ on REDACTED

Build server using STK image server

- a. STK image server

Install Netbackup client

- a. NetBackup Client setup document

Rebuild user accounts:

1. Request the NetBackup administrator to restore following files:
 - a. /home
 - b. /etc/passwd
 - c. /etc/shadow
 - d. /etc/group
 - e. /etc/gshadow
2. Run **pwck** to verify password files
3. Run **grpck** to verify group file

Restore customized configuration files and user directories:

1. Request the NetBackup administrator to restore following files/directories:
 - /etc/snmp/snmpd/conf
 - /etc/at.allow
 - /etc/at.deny
 - /etc/cron.allow
 - /etc/cron.deny
 - /etc/hosts
 - /etc/sudoers
 - /etc/security/limits.conf
 - /etc/yum.conf
 - /etc/aliases
 - /etc/hosts.allow
 - /etc/hosts.deny
 - /etc/httpd
 - /etc/sysctl.conf
 - /etc/syslog.conf
 - /opt/ops/acct
 - /opt/ops/bin
 - /etc/cron.daily/passwd_age
 - /etc/cron.monthly/SecurityCheck
 - /usr/local/bin
 - /usr/local/nagios
 - /etc/logrotate.d
 - /etc/logrotate.conf
 - /etc/ntp
 - /etc/ntp.conf
 - /etc/multipath.conf
 - /u0x
 - /var/spool/cron

2. Restart the following services:

- snmpd
- sendmail
- httpd
- syslog
- nptd
- multipathd

Install 3rd Party software

Once the server, vaXXXXXX is restored from tape, including /etc, /var and /u01 with the Oracle software having been restored from tape, the database can be restored using Recovery Manager. The script to do this should have been restored to the /u01/oracle/admin/PREP/rman directory and is called rman_restore_db_from_tape.ksh. It must be run as the Oracle Unix user with the latest full backup of the database in the tape device and the database name as a parameter.

3.1.3.3 Back-up Testing

At the discretion of the Program Manager, random files can be selected to be restored to an alternate location.

Currently, there is no restore testing. The DBA team has requested an extra server to user for this purpose and will implement testing procedures when this server is purchased by AITC.

3.1.3.4 Storage and Rotation

Full Backups are performed on Sundays and kept for a month. This means that at any time, we should have 4 full backup tapes available for each server. Tapes are normally dispatched offsite on Mondays.

Differentials are run for the remainder of the week to capture daily changes and are sent offsite on Mondays.

These are the files that we backup on vaXXXXXX:

- /
- /boot
- /home
- /opt
- /usr
- /var
- /u01

Schedule:

- Diff Mon-Thurs 3 week retention
- Full Fri 3 months retention

3.2 Security / Identity Management

Security used is – IAM SSOi.

The PPS-N application is only accessible by users signed directly into the VA network, or by users signed into the VA network via the RESCUE client. User authentication into the VA network is a precondition of PPS-N application access. Application authentication will be controlled by IAM SSOi using the user PIV card. In order to log into the application, each user must have a PIV or Windows credentials.

Figure 4: SSOi Central Login Page



3.2.1 Identity Management

All VA users can login into the PPS-N application using their PIV. Identity Management is done through IAM SSOi.

Authorization is handled by the PPS-N application using the Database tables. All users will have the default National Viewer role. For higher roles like National Migration User, National Second Approver, National Manager, National Supervisor, users must contact the PBM NDF managers.

3.2.2 Access Control

The user must login with the PIV or Windows credentials at the SSOi login page. The user is authenticated by the IAM SSOi system against the VA Active Directory. The IAM SSOi system will authenticate the user and, if valid, allows the user access to the PPS-N application.

Within the PPS-N application, if the user session times out the user will be redirected to the SSOi central login page. After successful login, the confidentiality statement will be shown to the user. Once the confidentiality statement is accepted, the user will be redirected to the application home page. The confidentiality statement must be accepted at least once per user session.

A user's role will determine the screens and operations that will be accessible. The following table lists a set of permissions that each of the roles will be able to accomplish.

X – indicates edit capabilities

R – indicates read only capabilities

Blank indicates the user does not have this privilege. This will be implemented either as grayed out buttons/links on the page or by elements not being visible on the page. This decision on whether to gray out the item or make in non-visible will be a usability decision.

Table 8: Screen Availability Based on User Role

| Permission | Viewer | 2 nd Approver | Manager | Supervisor | Migrator |
|--------------------------------------|--------|--------------------------|---------|------------|----------|
| View Migration Tab | | | | | X |
| All Migration Permissions | | | | | X |
| View Home Page | R | R | R | X | R |
| Manage PPS Tab | | | | | |
| Simple Search | X | X | X | X | X |
| Advanced Search | X | X | X | X | X |
| Create System Templates | | | | X | |
| Delete other user's search templates | | | | X | |
| Manage personal Search template | X | X | X | X | X |
| Edit Item – Submit Change Request | X | X | X | X | X |
| Edit Item – Submit Change | | | X | X | |
| Add Item | | | X | X | |

| | | | | | |
|---|---|---|---|---|---|
| Requests | X | X | X | X | X |
| Approve Requests Marked for PPS Second Approver | | X | X | X | |
| Approve Requests not marked for PPS Second Approver | | | X | X | |
| Saved Work In Progress | R | X | X | X | R |
| Delete other user's saved works in progress | | | | X | |
| PPS Data Elements | X | X | X | X | X |
| Edit Domain Item | | | X | X | |
| Add Domain Item | | | X | X | |
| PPS Data Requests | X | X | X | X | X |
| Reports | X | X | X | X | X |
| COTS Services | | | | | |
| PMI | X | X | X | X | X |
| FDB Search | X | X | X | X | X |
| Manage COTS VA Mappings | R | R | X | X | R |
| Add Item from FDB Search | | | X | X | |
| New FDB Items Tab | R | R | X | X | R |
| Modified FDB Items Tab | R | R | X | X | R |
| Manage Application | | | | | |
| System Information | X | X | X | X | X |
| Manager External Systems (FSS and STS, Override VistA Synch | R | R | X | X | R |
| User Preferences | X | X | X | X | X |
| Migration | | | | | X |

3.3 User Notifications

User standard CDCO procedures for ANR, etc.

Table 9: User Notification Steps

| Notification Steps | | | | | | | |
|--------------------|---|----------------|---------------|----------|----------|----------|----------|
| Step 1 | <p>Send out email to:</p> <table border="1"> <thead> <tr> <th>AITC Personnel</th> <th>PRE Personnel</th> </tr> </thead> <tbody> <tr> <td>REDACTED</td> <td>REDACTED</td> </tr> <tr> <td>REDACTED</td> <td>REDACTED</td> </tr> </tbody> </table> <ol style="list-style-type: none"> a. Subject: Per REDACTED or REDACTED xxxxx AITC will bring down <ENV> to perform maintenance at hh:mm AM/PM CST b. Email line1: Per REDACTED or REDACTED xxxxx AITC will bring down <ENV> to perform scheduled maintenance at hh:mm AM/PM CST c. Email line2: AITC will send out notice once the <ENV> is back online and ready for smoke test. | AITC Personnel | PRE Personnel | REDACTED | REDACTED | REDACTED | REDACTED |
| AITC Personnel | PRE Personnel | | | | | | |
| REDACTED | REDACTED | | | | | | |
| REDACTED | REDACTED | | | | | | |
| Step 2 | <p>Login to the WebLogic GUI Admin console with your LAN ID, if this does not work, check the Password Vault for the environment and use the specified account.</p> <p>Shutdown the requested Managed Servers or Clusters as listed in the Change Order or Service Request.</p> | | | | | | |
| Step 3 | <p>Verify maintenance/deployment completed</p> <p>Start the requested Managed Servers or Clusters as listed in the Change Order or Service Request.</p> | | | | | | |
| Step 4 | <p>Send out email to:</p> <table border="1"> <thead> <tr> <th>AITC Personnel</th> <th>OED Personnel</th> </tr> </thead> <tbody> <tr> <td>REDACTED</td> <td>REDACTED</td> </tr> <tr> <td>REDACTED</td> <td>REDACTED</td> </tr> </tbody> </table> <ol style="list-style-type: none"> a. Subject: Per REDACTED or REDACTED xxxxx AITC has successfully completed <ENV> maintenance at {time} CST b. Email line1: Per REDACTED or REDACTED xxxxx AITC has successfully completed <ENV> maintenance at {time} CST c. Email line2: <ENV> is back online and ready for smoke test. d. Email line3: Please update this thread with test results and any outstanding issues. | AITC Personnel | OED Personnel | REDACTED | REDACTED | REDACTED | REDACTED |
| AITC Personnel | OED Personnel | | | | | | |
| REDACTED | REDACTED | | | | | | |
| REDACTED | REDACTED | | | | | | |

System downtime due to application or system software upgrades will be planned with AITC. Users will be notified by PRE using the appropriate mailing lists. The notice will be provided at least two hours in advance. Notification will also be provided when the application becomes available again.

3.4 System Monitoring, Reporting, & Tools

Oracle Enterprise Manager and Grid Control are used to monitor availability and performance of the PPS-N database on the REDACTED server. Standard AITC thresholds are set for space monitoring, availability of the database, and network connectivity. Database administrators are alerted immediately if the monitoring tool detects a problem. In addition, if connectivity to the database fails, an incident ticket is created in the User Service Desk software and relayed to AITC management and the primary and secondary database administrator for the project.

System monitoring is done through the following:

1. WebLogic console
2. VistA link console
3. Introscope
4. CEM
5. Xpolog

3.4.1 Availability Monitoring

1. WebLogic console (URL: <http://<machine>:7001/console>) has the entire WebLogic environment configuration.
 - a. We can monitor the admin server, node manager and managed servers running states, and control managed servers start and stop activity.
 - b. Manager servers health and performance, application deployment state, database connection pools, and JMS can also be monitored from here.
2. VistALink console (URL: <http://<machine>:7001/REDACTED>) has the VistA sites connection information.
It gives the ability to add, edit, update, and check the status of each connection configured.
3. Introscope: Monitoring tool. One agent per machine is deployed and it can provide in detail monitoring of all the WebLogic components from that environment. And monitoring alerts and notifications can be generated using this tool.

3.4.2 Performance/Capacity Monitoring

Patrol is utilized by AITC to capture Performance and Capacity activities.

It can monitor the http traffic coming from internet cloud to AITC.

3.5 Routine Updates, Extracts and Purges

Each night data is exported from the PREP production database, and imported into the pre-production database, and to the Software Quality Assurance and Pharmacy Benefits Management database so testers can work with updated data.

3.6 Scheduled Maintenance

Currently, there is no scheduled maintenance window for PRE. This will be needed in the future so AITC has a window to do server patching, etc.

Any normal changes that are initiated by the PRE team will come in a Request for Change form to the AITC Build Manager. These requests will be submitted by 12:00pm CST on Friday for a Monday implementation in the Pre-Production environment. Production requests must be received by 12:00pm on Tuesday for implementation on Wednesday. Emergency change requests will be implemented as soon as possible.

3.7 Capacity Planning

3.7.1 Initial Capacity Plan

The initial Capacity Planning for Storage was done by PRE and EIE team as per the Application requirement. Subsequently, it was decided in concurrence with AITC Architect to add Host Bus Adaptor cards to the Servers, so as PRE Servers have access to SAN Storage. The SAN storage will be used to expand the storage capacity for future use as needed.

(This page included for two-sided copying.)

4 Browser Issues and Settings

This section presents a possible list of issues that may be attributed to browser settings or other configuration values that must be addressed by the end user.

4.1 IE9 Developer Tools Settings

Internet Explorer 9 (IE9) allows users to modify the browser's settings, which in turn affects the browser's interaction with the PPSN application.

A user may view and change the browser settings via the Developer Tools interface that [typically] comes with IE9.

The Developer Tools interface may be accessed from within IE by following either of the following steps:

- Press the **F12** key on the keyboard
- Go to the **Tools** menu, towards the bottom of the menu is **F12 Developer Tools**, click on this

The Developer Tools interface will either appear within the browser window, typically in the bottom portion of the window; or as a separate window. Please note that if it shows up as the former, it may look like a menu bar appears at the bottom of the window. This menu bar provides access to the browser settings.

4.1.1 Required Settings

- Internet Explorer 9 allows the user to change its `Browser Mode`. **Ensure that this value is: IE9.**
- Document Mode is usually set by the page loaded. Unfortunately, the end user may override this, and this can cause “buggy” behavior. **Ensure that this value is IE9 standards.**

4.1.2 Troubleshooting Some Typical Problems

This section details some typical problems that may be encountered due to the browser and must be addressed by the end user.

4.1.2.1 User Search Preferences

The `Search Preferences` page under the `User Preferences` menu has been observed to act “buggy” if the settings in section 4.1.1 are not adhered to.

Behavior: The saving of the selected fields or movement of a field for a search template does not perform in the expected manner.

Fix:

1. Ensure the required settings in section 4.1.1 are adhered to.
2. On the Developer Tools menu, click on `Cache` menu, select `Clear browser cache...`
3. Navigate to any other page within PPSN.
4. Navigate back to the `Search Preferences` page.
5. Repeat the modification(s) to the search template that was attempted earlier.

(This page included for two-sided copying.)

5 Exception Handling

This section presents a list of possible exceptions/errors that may occur during normal operation.

5.1 Routine Errors

The system validates form field values per business rule and data integrity constraints before the form is submitted for processing. If values do not pass user interface validation, the user is redirected back to the wizard form and a message is displayed informing the user of the corrections needed. Please see Alternative Flows in the Software Design Document for data validation errors.

The system receives the value after form validation, and applies the appropriate business rules (if any) to the value. Examples of a business rule validation may include bounds checking, or any interdependencies that may exist between two data values. Please see Alternative Flows in the Software Design Document for data validation errors.

Like most systems, PPS-N may generate a small set of error that may be considered “routine”. These errors are routine in the sense that they have minimal impact on the user and do not compromise the operational state of the system. Most of the errors are transient in nature and only require the user to retry an operation. While the occasional occurrence of these errors may be routine, getting a large number of an individual errors over a short period of time is an indication of a more serious problem. In that case the error needs to be treated as an exceptional condition.

5.1.1 Security

Security is addressed by IAM SSOi. User authentication is handled by the IAM SSOi system.

The PPS-N subsystem does not provide or enforce a security model. However, the system does access other system interfaces which may encounter security violations when accessed. The following known security errors may occur:

1. **Access to STS denied:** The configured STS web logic account is unreachable. This could be because the web server changed hosts or ports.
2. **Access to FSS denied:** The configured FSS JDBC connection is refused. This is most likely the result of a password expiring. The JDBC connection may need to be updated.
3. **Access to FDB-DIF denied:** The configured FDB-DIF JDBC connection is refused. This is most likely the result of a password expiring. The JDBC connection may need to be updated.
4. **Access to “temporary” directory denied:** The WebLogic process does not have sufficient permission to write to the operating system defined temporary directory (e.g., “/tmp”). To resolve this, the WebLogic process should be granted write access to the temporary directory.

5.1.2 Time-outs

Time out may occur when accessing third party Database. Sometimes queries are dependent upon the availability of the database or run out of time if a large results query is requested.

The following process has a known potential timeout in the PPS subsystem:

Hibernate query: A hibernate query will wait for the amount of time configured in the JDBC connection. A large number of timeouts may indicate insufficient system resources or the timeout value may be set to low.

5.1.3 Concurrency

No information at this time.

5.2 Significant Errors

Significant errors can be defined as errors or conditions that affect the system stability, availability, performance, or otherwise make the system unavailable to its user base. The following sub-sections contain information to aid administrators, operators, and other support personnel in the resolution of errors, conditions, or other issues.

5.2.1 Application Error Logs

PPS-N uses the Apache Log4j framework for logging. Log files are accessible to authorized users through the web-based Xpolog tool.

Logs location - /u01/app/bea/user_projects/domains/pps-<Env>/logs/

Maxfilesize=10000KB

Max. backed up files are 10.

Growth rate is capped at 100MB

(This page included for two-sided copying.)

6 Application Error Messages

While navigating through the PPS-N system, the user may encounter two types of errors; System Errors and Validation Errors. System Errors are unplanned errors which are unexpected in normal system operation, and Validation Errors are both expected and commonly occurring in normal system operation.

6.1 Error Messages

This section describes the different kinds of errors a user could encounter while navigating through the PPS-N system in greater detail.

6.1.1 Validation Errors

The most common error the user should encounter is a Validation Error. The user will encounter a Validation Error if she enters a value into an input on a webpage which is not expected by the system. In this case, the system has tried to execute an action, and that action has thrown an expected error based on the user's malformed input. This error is thrown and handled at the Service Layer, passed back up to the Presentation Layer and then displayed to the user on the webpage where they entered the malformed input. The error message is displayed in user-readable and highlighted on the page to inform the user she needs to correct her input before the operation she was trying to perform can proceed.

The following example describes how a user would encounter a Validation Error. The user is updating her user preferences and is changing the default number of rows displayed in results tables. This input is expecting integers from 10-100. She accidentally enters 11a in the input and submits the form. As the system is expecting an integer, it does not update her preferences but instead returns with an error informing her input must only contain whole numbers and numeric digits.

6.1.2 System Errors

System Errors are unplanned errors which occur during system operation. These unplanned errors include Java errors (e.g. null pointer exceptions), database exceptions (e.g. connection errors), and any other error unexpected error the system might encounter. When an unexpected error occurs the system will display the following message to the user, "A System Error has occurred and has been logged. Please contact the system administrator." The system will store the error containing all of the stack trace information in a log on the server, so the administrator may investigate what caused the error.

(This page included for two-sided copying.)

7 Infrastructure Errors

VHA IT systems rely on various infrastructure components. These components will have been defined in the Logical and Physical Descriptions section of this document. Most, if not all of these infrastructure components generate their own set of errors. Each Component has its own sub-section and describes how errors are reported. The sub-sections are typical list of components and are meant to be modified for each individual system.

The sub sections are not meant to replicate existing documentation on the infrastructure component. If documentation is available online then a link to the documentation is appropriate. Each sub-section should contain implementation specific details such and Database names, server names, paths to log files, etc.

PRE Team will work with AITC resources to resolve the Infrastructure errors. AITC will be responsible for System, Network, Database and PRE will provide the support as SME and on PPS-N application.

7.1 Database

Oracle monitoring tools monitor several aspects of the PPS-N databases and alert database administrators via email and create service desk tickets for conditions such as “disk full errors or tablespace full”, archive log directory full, database down, connectivity to database down, etc.

In addition, as with all Oracle databases, errors within the database are recorded in the Oracle alert log for the database and trace files are created that will allow DBAs to review any errors. Any such errors are emailed to the database administrators daily.

7.2 Web Server

At this Time the PPS-N application does not implement a Web server front end, or the WebLogic/Apache Plug-in is not being utilized officially. Apache writes output to Logs Located on the Linux web server, to the directory /var/log/httpd/, unless changed in the httpd.conf configuration file. Access to these usually requires Super User or Root access.

7.3 Application Server

The PPS-N application and WebLogic log in conjunction assist in the Troubleshooting of the App or the WebLogic portal. PPS-N Logs are located in the

`${DOMAIN_HOME}/PPS-NLogs` directory, consisting of the Following Files: `ct_prod.log`, `hibernate.log`, `server.log`, `spring.log`, and `struts.log`.

Assistance from PPS-N Java Developers may be required to parse the Logs files to determine any issues.

The WebLogic application server logs reside in the

`${DOMAIN_HOME}/servers/${Each_Managed_Server_name}/logs/`.

There are 2 primary log files to review:

- `${Each_Managed_Server_name}.log`
- `${Each_Managed_Server_name}.out`.

The WebLogic administrator should be able to parse these files. Assistance from PPS-N Java Developers may be required if out to the scope of the WebLogic Administration skill set.

7.4 Network

Using Orion, a Solar Winds monitoring tool, AITC Service Desk and/or network engineers monitor the layer 2 and layer 3 network switches. If an alarm is generated by Orion, AITC Service Desk will create a service ticket, and then attempt to triage the problem. AITC Service Desk, which operates 24x7, will notify the appropriate personnel. Appropriate personnel will triage the issue and work on the resolution of the issue.

7.5 Authentication

Authentication errors can be reported if IAM SSOi encounters errors in authenticating users with their PIV cards. These errors must be reported to the IAM SSOi team.

User roles-based authorization is managed within the application using Database tables. All users have the default Viewer role.

7.5.1 User SSOi Logout

If the user has issues with the SSOi session, one of the following options can be used to reset the user's SSOi session.

- The user can go to the IAM SSOi Landing page using the link below and click on the Logout button.

<https://ssologon.iam.va.gov/centrallogin/centrallanding.aspx>

- The user can go to the IAM SSOi Logout page using the link below. The user will be logged out of SSOi.

<https://ssologon.iam.va.gov/centrallogin/loggedout.aspx>

- The user can go to the browser Internet Options and under the Content tab, the user can click on the Clear SSL state button.

7.6 Dependent System(s)

The dependent systems are those used for authentication. See Section 2.5, Dependent Systems, for a discussion of errors.

(This page included for two-sided copying.)

8 System Recovery

The following sub-sections define the process and procedures necessary to restore the system to a fully operational state after a service interruption. Each of the sub-sections starts at a specific system state and ends up with a fully operational system.

PPS-N is designated as Routine Support for disaster recovery. This level of support will acquire replacement processing capacity after an AITC disaster declaration. The recovery time objective (RTO) is that it will be operational when the AITC resumes regular processing services or no later than 30 days after a disaster declaration. Data will be restored from the last backup (recovery point objective (RPO)).

System backups of the vaXXXXX server are performed on the following basis:

- Full backups are performed on Sundays and kept for one month. This means that at any time, there should be four full backup tapes available for each server.
- Tapes are normally dispatched offsite on Mondays.
- Differentials are run for the remainder of the week to capture daily changes.
- Differential results are sent offsite on Mondays.
- Oracle Recovery Manager is the application used to perform full backups of the PREP database every Tuesday and Saturday morning. The tapes are retained offsite for one month. Recovery Manager is also used to back up archive logs and the control file database to tape daily and these are also retained offsite for a month. The full database backups run for about 40-45 minutes. The archive log backups are shorter, which run about 25-30 minutes.

This section provides procedures for recovering the application at the alternate site, while Section 5.0 describes other efforts that are directed to repair damage to the original system and capabilities. Backup procedures are also defined in this section.

Procedures are outlined for each team required to complete the recovery. Each procedure should be executed in the sequence it is presented to maintain efficient operations.

The Team Leader or designee will provide hourly recovery status updates to the Austin Service Desk (ASD).

8.1 Restart after Non-Scheduled System Interruption

This section's instructions are identical to those found in Section 3.1, Administrative Procedures.

Software is recovered from images stored on the SAN. The same recovery procedures listed in ACP 4.1 should be followed for a return to original site restoration. An alternate site would need comparable equipment installed and would need to be able to boot from SAN for successful execution of this plan.