Home Telehealth Reporting Enhancements (HTRE) Phase 2

Integrated Home Telehealth Application (IHTA)

Production Operations Manual (POM)

September 2017

Version 5.0

Department of Veterans Affairs (VA)

Revision History

Date	Version	Description	Author
9/20/2017	5.0	Build 4 Updates. Removed DMP references. Updated hardware versions. Updated IHTA software versions to the current build.	Celeste Perkins
03/16/2017	4.1	Minor content updates addressing Product Support comments during their review.	Celeste Perkins
03/09/2017	4.0	Minor content updates for Build 2.	Celeste Perkins
12/12/2016	3.0	Updated document with the current HTRE Phase 2, Build 1 information. • Using the VIP template dated March 2016, Version 1.6.	Celeste Perkins
07/21/2016	2.8	Added Care Coordinator and Program Support Assistant roles back as valid permission. Changed Red Hat version	Kate Hula
06/29/2016	2.7	Added System Start-Up and Shut-down, Dataflow Diagrams.	Kate Hula
05/12/2016	2.6	Updates for HTRE R2.5, Increment 4 release. Changed Inventory Tracker to Manage QIRs throughout document and graphics. Updated scope of work.	Kate Hula
12/15/2015	2.5	Additional Updates according to ProPath Template. Removed reference to the retired DMP Module.	Kate Hula
08/17/2015	2.4	Additional Updates according to ProPath Template.	Kate Hula
01/9/2015	2.3	Updates according to Operations Team review January 2015, which include updates to team members contact information, edits to backup testing and network sections, replaced Architectural and Application Components diagrams, and removed Appendices A and B.	Danielle Haile
04/10/2014	2.2	Updates according to Operations Team review March 2014 review (Rashaka Boykin); added Census Activity Reports to permissions table	Katie Shepherd

Date	Version	Description	Author
02/24/2014	2.1	Added the permission/functionality, “Generate Patient Survey Reports” to Tables 5 & 6; reviewed Primary/Secondary Contact Information and updated date	Katie Shepherd
12/6/2013	2.0	Labeled the permission in Table 5, IHTA Permissions (Search Inventory by Patient) as removed from the database (per CCR1094); removed the Search Inventory by Patient functionality from the following roles in Table 6, IHTA Roles: Care Coordinator, National Administrator, VISN/Facility Administrator, and Program Support Assistant.	Katie Shepherd
10/31/2013	1.9	Updated to new ProPath template version 1.1 (March 2013)	Noel Morrison / Chris Woodyard / Katie Shepherd
07/08/2013	1.8	Added specific functionality to the HT Reports module; changed the “NAC POC” role to “OTS Contract Manager”; added the updated Switchover Instructions (per Noel Morrison); added the updated Installation Instructions to Appendix D (per e-mail from Noel Morrison on 7/8)	Katie Shepherd
04/12/2013	1.7	Updated Table 2 to include the new Dell PowerEdge servers at Martinsburg/Hines; updated Figure 2 to include “HT Reports” and the “HDR”; added a brief HT Reports module description to the first paragraph in Section 2; updated the production software in Table 3; added the updated Build Instructions (from Maureen Hafner) to Appendix E; added the HT Reports functionality to the Management role in Table 6 changed references to the Sunshine Telehealth Training Center to the Home Telehealth National Training Center; removed reference to CISS servers in Section 2.3 (In release 5.5, IHTA operates on own servers).	Katie Shepherd
01/15/2013	1.6	Updated the DMP permission in Table 6 to include Add & View Comment functionality and assigned DMP Reviewer role; changed Falling Waters to Martinsburg for production environment.	Katie Shepherd

Date	Version	Description	Author
08/10/2012	1.5	Updates to the DMP permission in Table 6; added the use of the National Service Desk and Remedy to Section 7	Katie Shepherd
03/06/2012	1.4	Added Section 7.2.1 (support procedures for Inventory Tracker) and 7.2.2 (support procedures for the DMP module); added the DMP permissions IDs to Table 6.	Katie Shepherd
01/17/2012	1.3	Updated Table 5 to include all permissions assigned to each role; also added the System Administrator role. Updated Table 6 with a note stating that the marked permissions were removed from database in January 2012.	Katie Shepherd
11/03/2011	1.2	Updated Installation Instructions (Appendix D) to include the reference of the deployment of .dmp.zip On-Line file to all environments; added text to Section 2 describing the DMP module; added Sections 3.4.1 and 3.4.2.	Katie Shepherd
08/31/2011	1.1	Changed project name to Home Telehealth Capability Enhancements (HTRE); updated for Release HTRE 3.5; added the IHTA Installation Instructions as Appendix A and the CCHT-IHTA Build Instructions as Appendix D; updated Section 3.4 to include who is responsible for system monitoring; removed Template Version from the title page.	Katie Shepherd
03/31/2011	1.0	Baseline release	Vu Le

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1. Introduction

The Integrated Home Telehealth Application (IHTA) is a Web-based system, providing a flexible, maintainable, and resilient platform for Home Telehealth (HT) business functions. IHTA facilitates the management of the Department of Veteran Affairs (VA) Quality Improvement Reports (QIR). IHTA is also used for the development, storage, and retrieval of Veteran Health Administration (VHA) data. Finally, the HT Reports module of IHTA allows users to review and search HT census and survey data via various management report options. There are eighteen (18) Veteran Integrated Service Networks (VISN), providing centralized information technology (IT) support to 168 medical centers. IHTA will be used by all VISNs, to ensure a standard way of managing QIRs at all VA facilities.

IHTA comprises two operational systems, one at the Primary Facility and the other at the alternate location at the Secondary Facility. The Primary and Secondary facilities will alternate between the Martinsburg Capitol Region Readiness Center (CRRC) (Martinsburg, WV) and the Hines Information Technology Center (HITC) (Hines, IL). Each site will have equal capacity and will be capable of supporting users as the operational site. IHTA will be accessible from the various VISNs, each accessing the central IHTA and HT databases, facilitating the management of device information.

The IHTA database architecture is configured for complete redundancy. During operational hours, the data is replicated from the Primary to the Secondary Facility, at near real-time. This process ensures that in the event of a catastrophic failure, if the production database cannot be restored, the secondary database can replace the primary database.

Using SQL Server mirroring technology between the database servers, data creation and manipulation between the primary and secondary facilities is maintained in full synchronization and is configured for minimal data loss and quick database recovery in case of failure. In the event that the database at the Primary Facility goes down, the primary database can be shifted to the mirrored database at the secondary Facility via the database-mirroring tool of Microsoft SQL Server. The switch to the redundant database will require manual intervention.

The databases are replicated asynchronously from the Primary to the Secondary Facility site with a maximum transaction replication lag time of 15 minutes. Switching between the two sites is essential to ensure that there is minimal downtime and minimal data loss to the users. A user who is signed in at the time of the switch to the alternate site will be impacted.

Only authorized users will be able to access IHTA. Role-based access control is set up and maintained by an administrator at the National/VISN/Facility level ensuring users have access to the appropriate level of information.

1.1. Operational Priority and Service Level

Support will be performed by the VA IT Enterprise Service Desk (ESD) – Austin (Tier 1 Support), Health Product Support (PD) Team (Tier 2 Support), and the IHTA Support Group (Tier 3 Support).

The IHTA Support Team utilizes the following VA distribution list: VAOITOEDIHTASupport@va.gov

The following team members are included in this list: Jeffrey K. Campbell (Contractor), David Komraus (Project Manager), Kristen Kriwox (Business Analyst), William A. May (Developer), Charles R. Lee (System Administrator), Chris Woodyard (Database Administrator), and Celeste Perkins (Technical Writer).

Tier 1 Support will be provided by the ESD utilizing the CA Service Desk Manager (SDM) system. IHTA users with problems that cannot be resolved locally will call the ESD to open a Service Desk ticket. Issues not resolved by the Tier 1 Support Team will be assigned to Tier 2 Support. Tier 2 Support for IHTA will include assistance from the Office of Information and Technology (OI&T) Enterprise Program Management Office (EPMO) Health Product Support (HPS) team. Issues not resolved by the Tier 2 support team will be assigned to Tier 3 support. Tier 3 support is the highest level of support for IHTA, which includes business analyst, software testers, system administrators, developers, and database administrators who have specialized technical knowledge of IHTA. Tier 3 support will provide services, such as, issue resolution and defect management on all issues/defects that have not been resolved by the Tier 1 and 2 support teams. Any defect found will be logged by Service Desk Manager (SDM) and in Rational Tools Concert (RTC) Jazz (as required).

The following table outlines the incident priority levels and the time frame period for response:

Table 1: IHTA Incident Priority Levels and Time Frame for Response

Priority Level	Call Received and Time Frame for Response	Priority Level Description
Urgent	During business hours: Service Provider will directly contact Requester. During non-business hours: N/A	An urgent incident is a catastrophic incident of an operating environment where production systems are severely impacted, down or not functioning. Under this scenario, one of the following situations may exist: • Loss of production data and no procedural work around exists. • Patient care and/or safety are at risk or damage is incurred. • Complete loss of a core organizational or business process where work cannot reasonably continue.

Priority Level	Call Received and Time Frame for Response	Priority Level Description
High	During business hours: Service Provider will directly contact Requester. During non-business hours: N/A	A high incident is a problem where a system is functioning but in a severely reduced capacity. The situation is causing: • Significant impact to portions of the business operations and productivity. • No loss of production data and / or a procedural work around exists. • The system is exposed to potential loss or interruption of service. Includes incidents that significantly impact development and/or production, but where an alternative operation is available.
Medium	During business hours: Average of two (2) business hours or less. During non-business hours: No After Hours Coverage will be provided.	A medium incident is a medium-to-low impact problem, which involves partial non-critical functionality loss. A medium incident impairs some operations but allows the user or an application to continue to function. This may be a minor incident with limited loss or no loss of functionality or impact to the user's operation and incidents in which there is an easy circumvention or avoidance by the end user.
Low	During business hours: Average of eight (8) business hours or less. During non-business hours: No After Hours Coverage will be provided.	A low incident has no impact on the quality, performance, or functionality of the system. Low incidents have minimal organizational or business impact.

1.2. Logical System Description

Application layering generalizes the various functional layers in the architecture (see Figure 1). For IHTA, its HTML-rendered content implements the standard Struts2 Web framework, injected with Spring components called business services. IHTA uses HTML 5 and JavaScript to render its content and HTTPS requests are tunneled through a servlet (BlazeDS) connected to a Spring controller. The Spring controller will then interact with a Spring business service, rules engine, workflow engine, and Java Persistence Application Programming Interface (JPA) persistent component.

Figure 1: IHTA Architectural Layers

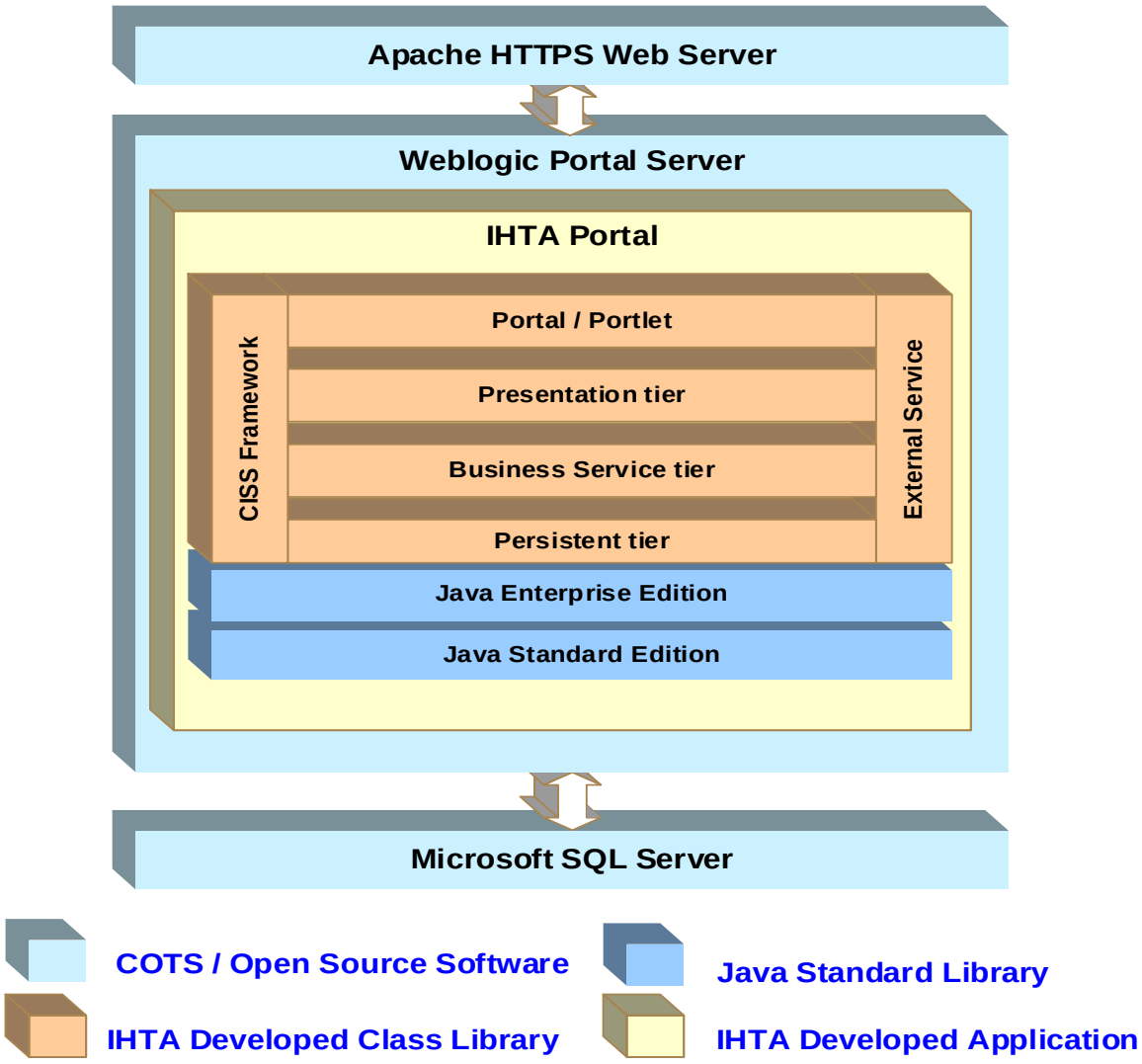
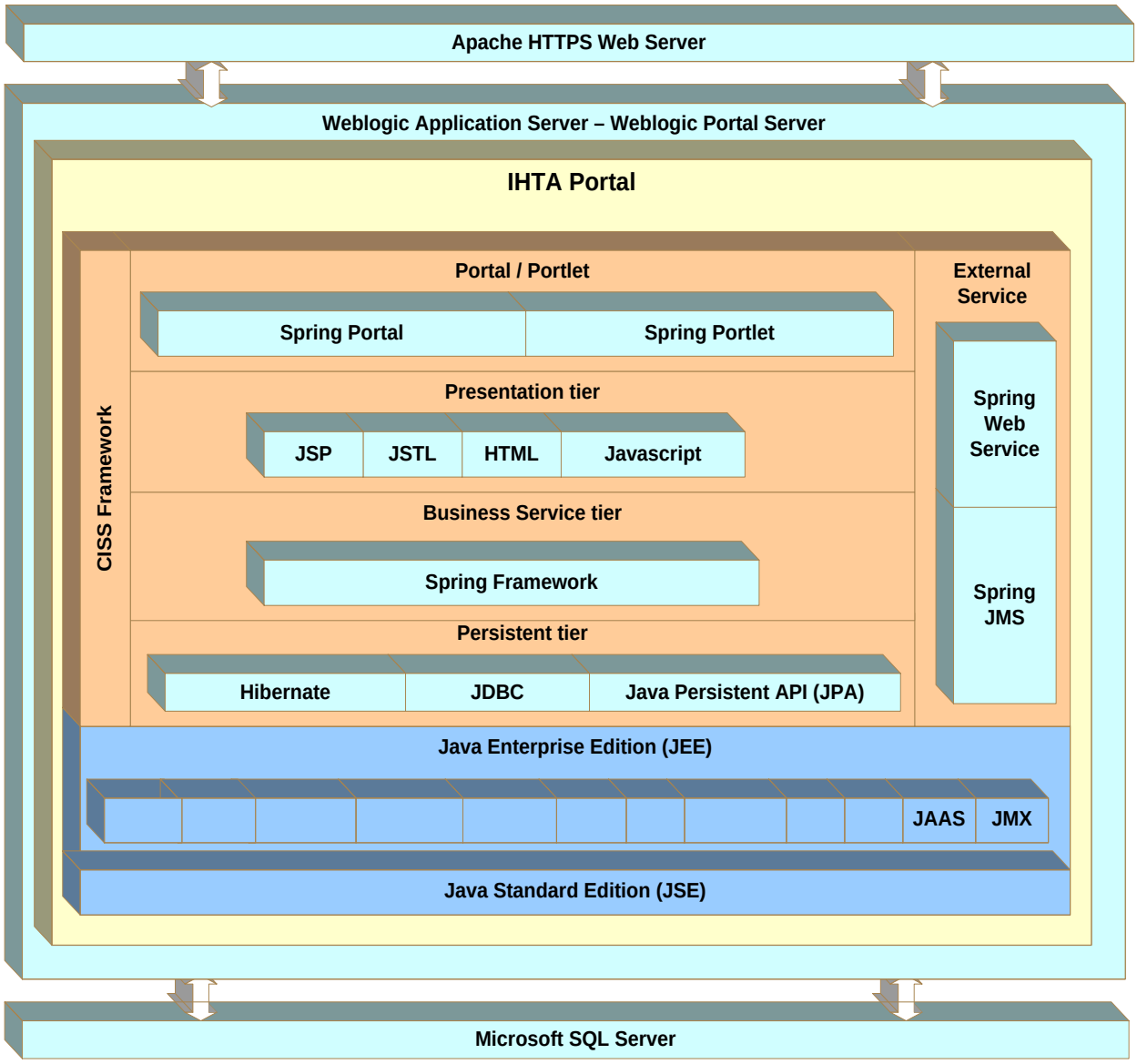


Figure 2 identifies and groups core IHTA technologies.

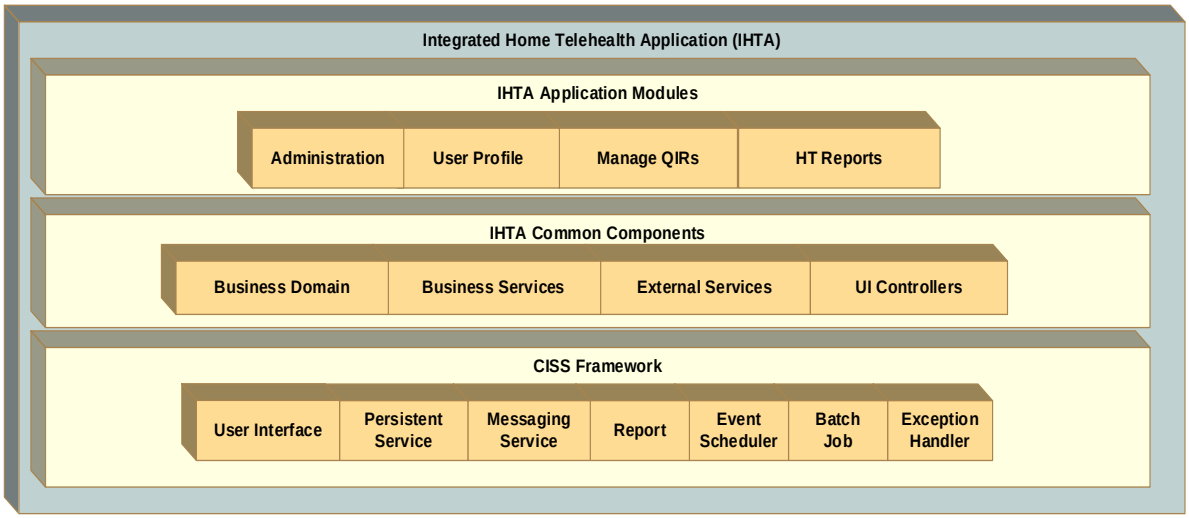
Figure 2: IHTA Technology Stack



1.2.1. Application Components

IHTA modules represent a logical grouping of Java classes and components that are implemented to perform the same or similar business functions. IHTA module codebase uses the IHTA common codebase to ensure a consistent User Interface (UI), well-defined business entities through domain classes, and centralized business logic defined in business services. The following figure depicts IHTA modules and components.

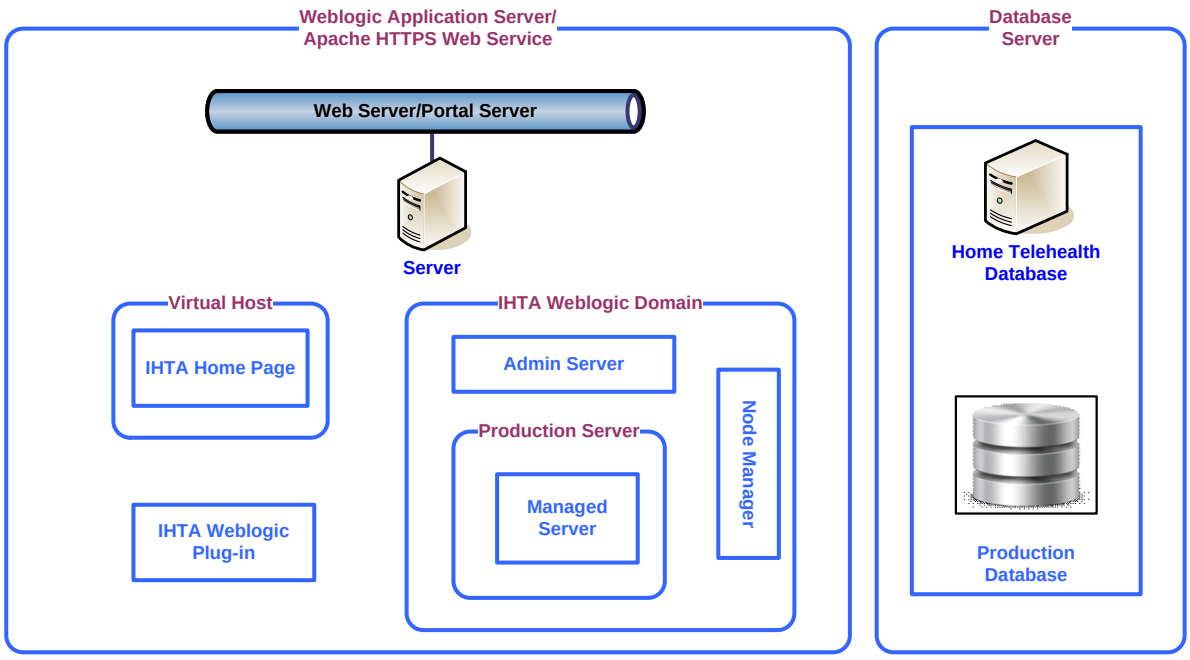
Figure 3: IHTA Application Components



1.3. Physical System Description

Figure 4 provides a high-level overview of the IHTA production environment.

Figure 4: Environment Overview



The computer hardware for the production servers at both Martinsburg and Hines are listed in Table 2. We are in the process of moving towards virtual machines within IT OPS, and will not be renewing the warranty on the below server hardware.

NOTE: These facilities alternate as the Primary and Secondary IHTA production sites.

Table 2: IHTA Server Hardware

Production Site	Manufacturer	Model, Description, Serial Number	Qty	Warranty Expiration Date
Martinsburg	Dell	PowerEdge R510 • Application/Web Server: Serial Number: 7KT6VQ1	2	06/02/2014
Hines	Dell	PowerEdge R510 • Application/Web Server: Serial Number: 9KT6VQ1	2	06/02/2014

1.4. Software Description

Table 3 lists the current software for the IHTA production environment.

NOTE: The following hardening server guidelines are followed for Red Hat Enterprise Linux (RHEL):

Table 3: IHTA Production Software

Required Software	Version	Manufacturer
Microsoft SQL Server	2012	Microsoft
Oracle WebLogic Server	Version 10.3.6	Oracle
Apache Server	Version 2.4.6	Apache
Red Hat Enterprise Linux (RHEL)	7.4	Red Hat

1.4.1. Background Processes

The background processes utilized in IHTA are described in the following subsections.

1.4.2. Job Schedules

Quartz Scheduler is used to manage the scheduled job feature of IHTA. This feature allows administrators to set up and automatically execute various pre-defined scheduled jobs. IHTA currently executes the following scheduled jobs at periodic intervals:

- Purge Completed Reports: Deletes all reports in the application that have expired.
- QIR Vendor Response Due: Generates a notification to the Vendor when the *Vendor Response Due Date* has passed in the QIR functionality.

Java Messaging Services (JMS) is utilized for internal communication between IHTA components to invoke asynchronous tasks, including, but not limited to, user registration, the vendor response due notice, and to schedule reports. The JMS Subscriber distributes e-mails for notification.

1.4.3. Dependent Systems

Figure 5 illustrates the enterprise systems that interface with IHTA. The details of the enterprise services and applications are summarized in Table 4.

Figure 5: Dependent Systems

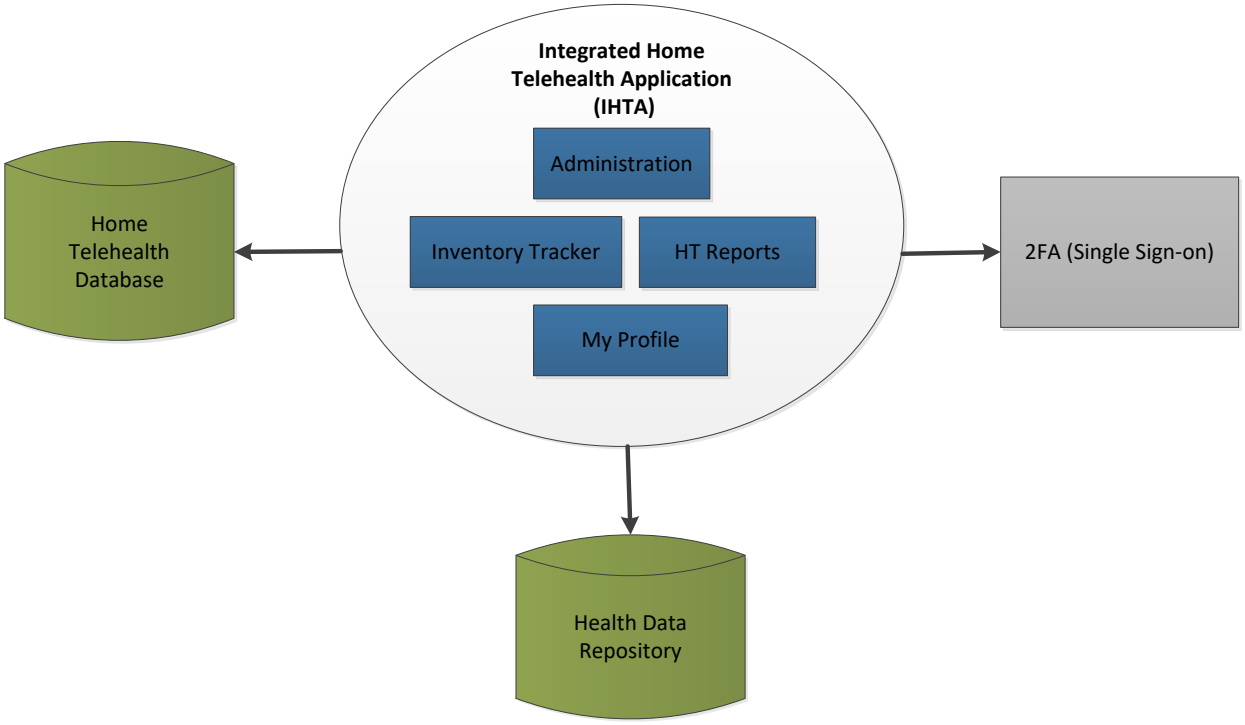


Table 4: Enterprise Service and Application Summary

Service	Category	Integration Technology
Two Factor Authentication (2FA)	Authentication and Authorization	Single Sign-on (SSO)
HT Database	Database for all of HT	Hibernate Java Persistence API (JPA)
Health Data Repository	System of record for HT data	HL7

2. Routine Operations

This section describes, at a high level, what is required of an operator / administrator or other non-business user to maintain the system at an operational and accessible state.

2.1. Administrative Procedures

This section describes the administrative procedures for system start-up and shutdown.

2.1.1. System Start-up

The following steps outline how IHTA is started and brought to an operational state:

Database Start-Up

1. Use system administrative techniques to validate that the database server is operational.
2. Remote sign on to the primary database server as the server administrator.
3. Start the HT Database instance if in a non-started state.
4. Validate that the WL1036_Telehealth and Telehealth Database are running and accessible by the users.

Application Start-Up

1. Start Apache Web Server on each Web server.
2. Start Oracle WebLogic Node Manager Service on each application server.
3. Refer to the *HTRE_Phase2_Deployment_Installation_BackOut_Rollback_Guide*, Section 4, for software installation and configuration. HTRE Phase 2 documentation is stored on the Rational Team Concert (RTC); CCHT_CM Project Area.
4. Start Oracle WebLogic Doman for IHTA.

2.1.1.1. System Start-Up from Emergency Shut-Down

Refer to the *HTRE_Phase2_Deployment_Installation_BackOut_Rollback_Guide*, Section 4.8.2, WebLogic Portal Server Development for more detailed instructions on System Start-up.

2.1.2. System Shut-down

The following outlines the steps for shutting down IHTA:

Application Shut-down

1. Shut down Oracle WebLogic Doman for the IHTA.
2. Shut down Oracle WebLogic Node Manager Service.
3. Shut down the Apache Web Server.

Database Shut-down

1. Open SSMS.
2. Shut down (stop) the IHTA Database instance.
3. Validate that the WL1036_Telehealth and Telehealth databases are no longer running.

2.1.2.1. Emergency System Shut-down

For more detailed instructions on System Shutdown, refer to the Back-Out Procedure section of the *HTRE_Phase2_Deployment_Installation_BackOut_Rollback_Guide.* HTRE Phase 2 documentation is stored on the Rational Team Concert (RTC); CCHT_CM Project Area.

2.1.3. Back-up and Restore

These sections provide a high-level description of the backup and restore strategy for IHTA.

2.1.3.1. Back-Up Procedures

Refer to the *HTRE_Phase2_Deployment_Installation_BackOut_Rollback_Guide* for application back-up and restore.

For **database backup**, refer to the following:

The WL1036 Telehealth and Telehealth databases are backed up daily on a scheduled basis using internal database software routines A full backup is conducted in the off hours (after 6pm pacific time) for both databases. The SQL Agent job that performs all user database backups is UserDatabasesBackup.Subplan_1. Hourly transaction log backups are also scheduled for all user databases. The SQL Agent job that performs the user database transaction log backups is TeleHealthDatabaseLogBackup.Subplan 1.

All backups are performed while the database is in use. The database instance does not have to be in the shutdown state to perform any of the backups described.

The backups are stored in the following folder and files path:

- Telehealth (full): E:\SQL Backups\Telehealth\
- Telehealth (Transaction logs): E:\SQL Backups\LogBackups\ Telehealth\
- WL1036_Telehealth (full): E:\SQL Backups\WL1036_Telehealth\
- WL1036_Telehealth_log_backup (Transaction logs): E:\SQL Backups\LogBackups\WL1036_Telehealth
- The files are copied to external medium and taken to an offsite location.

2.1.3.2. Restore Procedures

Refer to the *HTRE_Phase2_Deployment_Installation_BackOut_Rollback_Guide* for application restore procedures. HTRE Phase 2 documentation is stored on the Rational Team Concert (RTC); CCHT_CM Project Area.

2.1.3.2.1. Database Restore

Only Staff experienced in database recovery techniques should perform database recovery. The form of database recovery followed will depend on the type of database failure that requires a recovery effort to be initiated.

The HT database is mirrored between two database servers (no witness server). At any given time, one of the database servers serves as the primary database in support of the production application. The secondary database maintains a mirrored copy of the primary database and is kept at the same data level using replication. If the primary database loses functionality due to hardware failure, procedures should be followed that activate the secondary database server as the primary database.

2.1.3.2.2. Database Restore – Data Failure

Data failures will impact both the primary and secondary databases. Recovery will require full restore of the primary database from the full and transaction log file backups. The database recovery will be to a point in time prior to the start of the data failure and with minimum data loss. Refer to the Rollback Procedures section of this document for information on recovering the database to a prior point in time.

For more detailed instructions on restore procedures, also refer to the *HTRE_Phase2_Deployment_Installation_BackOut_Rollback_Guide.*

2.1.3.3. Back-Up Testing

2.1.3.3.1. Database Restore Testing – Hardware failure

Since this type of database restore represents database server failover, it should be practiced using production. This is an exception to the normal practice of performing the testing in a separate environment. Performing database failover in production ensures that the participating environments are available to function as expected, which is not something that can be duplicated using a test environment. Database failover must be coordinated with the dependent HT applications and conducted during production off hours.

2.1.3.3.2. Database Restore Testing – Data failure

This recovery test should be performed in a non-production environment using a SQL Server database instance of equivalent release and configuration. Perform a full recovery of the HT database using the most recent full production backup.

- Test Case #1:
    - Capture all data from the dbo.CENSUS table where the 'date_loaded' value is within ten days of the 'CURRENT_TIMESTAMP' value. Take note of the datestamp information provided. Using the date_loaded values, pick a point in time that occurs prior to the most recent value. This will be the point that you want to recover to in your practice test.

Follow the instructions for performing a point-in-time database recovery as outlined in the Rollback Procedures section of this document. At the completion of the recovery, test to the point in time that you picked in Test Case #1. Perform the following test case to validate your efforts:

- Test Case #2
    - Capture all data from the dbo.CENSUS table where the 'date_loaded' value is within ten days of the 'CURRENT_TIMESTAMP' value. Take note of the information given in the 'date_loaded' column. To be successful, there should be no date_loaded values past the point in time that was picked for recovery.

2.1.3.4. Storage and Rotation

Refer to the Standard Operating Procedures (SOP) in place at the Primary and Secondary Facilities for procedures on storage and rotation.

2.2. Security / Identity Management

This section provides a high-level description of IHTA's security and user management.

2.2.1. Identity Management

For VA users, the IHTA Registration Screens capture a user's VA network ID to store it in the designated IHTA database table. Once a user has registered, the application notifies the Facility / VISN Administrator and the National Administrator. The Facility, VISN, or National Administrator will approve the registration and assign roles according to the user's job description (see Table 6: IHTA Roles). The user is then notified by e-mail that his / her registration has been approved. The screens of the Registration Approval Process capture and store IHTA database information about user roles and permissions related to the specific application module of IHTA. The table below lists the various roles and the assigned permissions.

Table 5: IHTA Permissions

Module	Permission Name
Administration	Manage Users Manage Roles Manage Batch Jobs Manage Registrations Create QIR Update QIR Read QIR Approve QIR Close QIR Withdraw QIR Reply QIR Agree QIR
All	Administer system components
HT Reports	Generate Patient Survey Reports Generate Census Activity Reports

Table 6: IHTA Roles

Role ID	Role Name	Description	Module	Assigned Permission(s) (See Table 5, IHTA Permissions)
2010	Application Administrator	An individual who is responsible for unlocking users who have locked themselves out of the application by entering their password incorrectly three times.	Administration	Unlock Users
2011	National Administrator	An individual in the Office of Telehealth Services (OTS) HT Program who is primarily responsible for the administration of IHTA.	Administration	• Manage Registrations • Manage Users • Manage Scheduled Jobs
2011	National Administrator	An individual in the Office of Telehealth Services (OTS) HT Program who is primarily responsible for the administration of IHTA.	HT Reports	Generate Patient Survey Reports Generate Census Activity Reports
2011	National Administrator	An individual in the Office of Telehealth Services (OTS) HT Program who is primarily responsible for the administration of IHTA.	Manage QIRs	Manage QIRs* Approve a QIR Read a Closed or Withdrawn QIR Update a QIR Close a QIR Export List of QIRs *The National Administrator role cannot create/withdraw a QIR in the application.

Role ID	Role Name	Description	Module	Assigned Permission(s) (See Table 5, IHTA Permissions)
2012	VISN Administrator	A Care Coordinator at the VISN level who has been assigned the additional duties of supervising the administration of IHTA for the VISN.	Administration	Manage Registrations Manage Users
2012	VISN Administrator	A Care Coordinator at the VISN level who has been assigned the additional duties of supervising the administration of IHTA for the VISN.	Manage QIRs	Manage QIRs Create a QIR Agree to a Vendor's response to a QIR Withdraw a QIR Update a QIR Read a Closed or Withdrawn QIR
2012	VISN Administrator	A Care Coordinator at the VISN level who has been assigned the additional duties of supervising the administration of IHTA for the VISN.	HT Reports	All functionality
2013	Facility Administrator	A Care Coordinator at a facility who has been assigned the additional duties of supervising the administration of IHTA for that facility.	Administration	Manage Registrations Manage Users
2013	Facility Administrator	A Care Coordinator at a facility who has been assigned the additional duties of supervising the administration of IHTA for that facility.	Manage QIRs	Search Device by Activation Date Search Device by Serial Number Summary Device Inventory Report Vendor Compliance Reports

Role ID	Role Name	Description	Module	Assigned Permission(s) (See Table 5, IHTA Permissions)
2013	Facility Administrator	A Care Coordinator at a facility who has been assigned the additional duties of supervising the administration of IHTA for that facility.	HT Reports	Generate Patient Survey Reports Generate Census Activity Reports All functionality
2014	Care Coordinator	A registered nurse who manages care across the health care continuum for a panel of HT patients.	Manage QIRs	Search Device by Activation Date Search Device by Serial Number Summary Device Inventory Reports
2014	Care Coordinator	A registered nurse who manages care across the health care continuum for a panel of HT patients.	HT Report	All Functionality
2015	Program Support Assistant	An individual who is responsible for establishing and maintaining inventory of all HT equipment at the facility.	Manage QIRs	Search Device by Activation Date Search Device by Serial Number Summary Device Inventory Reports
2015	Program Support Assistant	An individual who is responsible for establishing and maintaining inventory of all HT equipment at the facility.	HT Reports	All functionality
2017	Vendor	One or more individuals who are the authorized representative for a supplier of HT equipment.	HT Reports	All functionality

Role ID	Role Name	Description	Module	Assigned Permission(s) (See Table 5, IHTA Permissions)
2018	OTS Contract Manager	Office of Telehealth Service (OTS) Contract Manager.	Manage QIRs	Manage QIRs Read a QIR
2018	OTS Contract Manager	Office of Telehealth Service (OTS) Contract Manager.	HT Reports	All Functionality
2020	System Administrator	An individual assigned to be a super user of IHTA with access to all functionality in IHTA.	Administration, Manage QIRs, HT Reports	All functionality
2022	QIR Originator	An individual responsible for submitting Quality Improvement Reports (QIR) in the application to document quality and patient safety issues related to HT devices.	Manage QIRs	Create QIR Update QIR Agree QIR Withdraw QIR Read QIR
2023	Reports Only	An individual within Telehealth Services who needs to access Census and Survey reports.	HT Reports	All functionality

2.2.2. Access Control

VA network credentials assigned to the IHTA user are used for IHTA access control. The IHTA architecture leverages the existing Two Factor Authentication (2FA) Single Sign-On (SSO) service to authenticate the IHTA user.

Access to IHTA will be granted upon successful 2FA authentication. It is important to note that logging into IHTA will not grant access to all application modules or embedded systems in IHTA. There will be authorizations that govern access to each of the application modules or embedded systems. There will also be authorizations that govern access within each application module.

2.3. User Notifications

All routine IHTA maintenance will be performed off-hours (not during the normal workweek of Monday through Friday) to minimize impact to IHTA users. A System 404 message, "Application Out of Order", will display when a user attempts to log into IHTA and the application is down. In cases of an extended unscheduled system outage, the IHTA Administrator will distribute a notification via e-mail as soon as practicable notifying all users of the system outage and the efforts that are being made to correct it. A second e-mail will be distributed when the system has returned to a normal operational state (refer to Figure 6: IHTA Outage E-mails).

Figure 6: IHTA Outage E-mails

1 - Extended Unscheduled System Outage

TO: <HT/CCHT VISN and Facility Leads, Care Coordinators, Program Support Assistants>
FROM: IHTA Support
RE: URGENT: IHTA Unavailable - Unscheduled System Outage

The Integrated Home Telehealth Application (IHTA) is currently down. The IHTA Support staff is currently researching the issue. Please look for another e-mail when the application has returned to an operational state.

IHTA Support Team

2 - Status Update – System Outage (After 4 Hours) (If Applicable)

TO: <HT/CCHT VISN and Facility Leads, Care Coordinators, Program Support Assistants>
FROM: IHTA Support
RE: URGENT: Status Update – IHTA Outage

The Integrated Home Telehealth Application (IHTA) continues to be down. The IHTA Support staff continues to research the issue. Please look for another e-mail when the application has returned to an operational state.

IHTA Support Team

3 – Outage Resolved

TO: <HT/CCHT VISN and Facility Leads, Care Coordinators, Program Support Assistants>
FROM: IHTA Support
RE: URGENT:IHTA Now Available - Outage Resolved

The Integrated Home Telehealth Application (IHTA) is now available. The outage has been resolved. Please contact the IHTA Support Team if you experience any issues with accessing the application.

IHTA Support Team

2.3.1. Unscheduled System Outage Procedure

1. The IHTA Support Team is notified that the application is unavailable.
2. After being notified, the IHTA System Administrator (SA) Charles (Chuck) Lee verifies the unscheduled outage.

The IHTA Support Team sends the **Extended Unscheduled System Outage** e-mail message to the VISN, Facility, and National Administrators. The following subject line is used in the e-mail:

URGENT: IHTA Unavailable – Unscheduled IHTA Outage

3. The VISN and Facility Administrators notify their users that IHTA is unavailable and keep them apprised as they receive status updates.

4. The IHTA SA researches the problem and either resolves it or escalates it to the Database Administrator (DBA).
5. The IHTA SA sends the **Outage Status Update** (see Figure 6: IHTA Outage E-mails) e-mail message to the VISN and Facility Administrators and the National Administrator. The message is sent when the technical staff has an estimated time of system restoration or when four hours has passed since the prior message, whichever comes first.
6. The following subject line is used in the **Outage Status Update** e-mail message:

URGENT: Status Update – IHTA Outage

When the problem is resolved, the IHTA SA sends the **Outage Resolved** e-mail message to the VISN and Facility Administrators and the National Administrator. The following subject line is used in the e-mail:

URGENT: IHTA Now Available – Outage Resolved

Refer to the *Home Telehealth O&M Plan*. Also, refer to the SOPs, Disaster Recovery Plans (DRP), and Contingency Plans at the Primary and Secondary Facilities for the standard user notifications in effect.

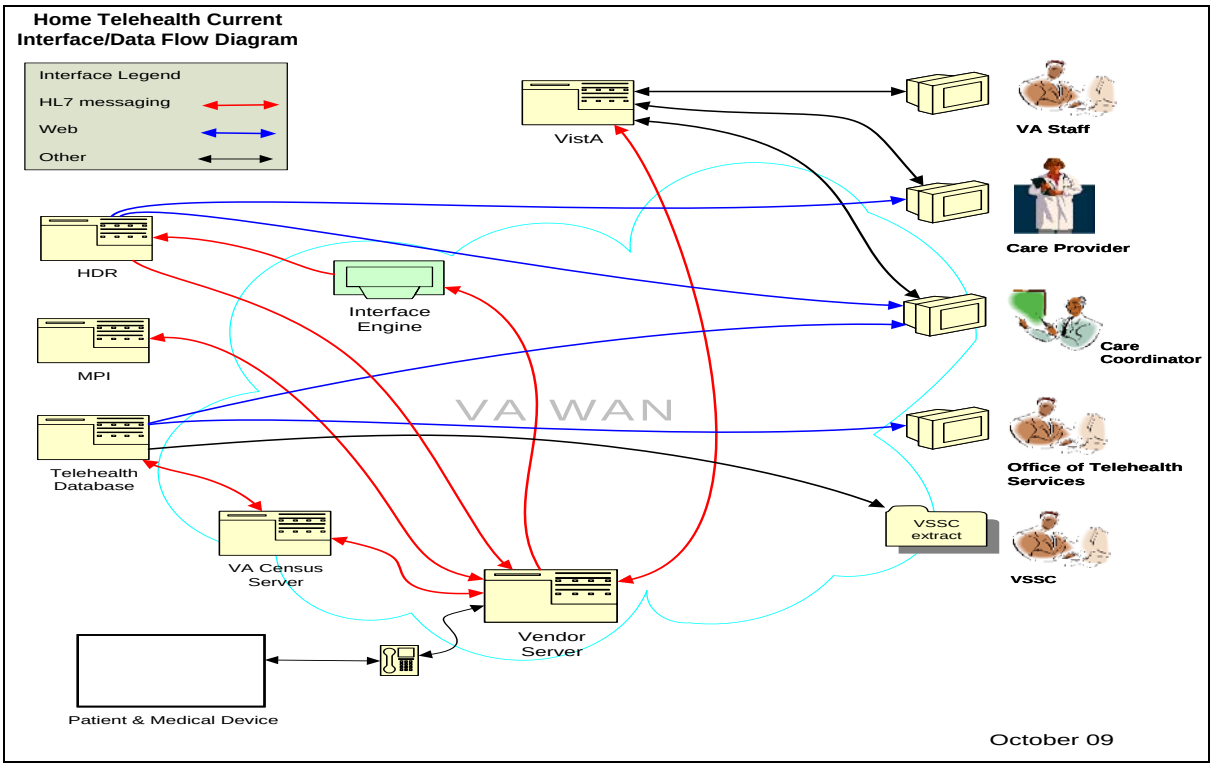
2.4. System Monitoring, Reporting & Tools

Only rudimentary system monitoring and reporting techniques (e.g., ping, manual logins, etc.) are being employed for IHTA as described in the below subsections. The IHTA SA and DBA are responsible for system monitoring. As of this release, no formal monitoring tools are being utilized.

2.4.1. Dataflow Diagram

The figure below describes the interfaces to the HT application, which are messaging-based for data collection and information sharing, web-based for application access to data, and data extraction for information sharing with other business groups.

Figure 7: Current Home Telehealth Interface/Dataflow Diagram



2.4.2. Availability Monitoring

This section is not applicable for IHTA.

2.4.3. Performance/Capacity Monitoring

IHTA monitors system performance utilizing Paessler PRTG Network Monitor. The software runs on a Windows machine within the network and can automatically discover devices and collect various statistics.

2.4.4. Critical Metrics

IHTA utilizes the PRTG Network Monitor Report that is e-mailed when something critical happens to one of the devices we are monitoring.

2.5. Routine Updates, Extracts and Purges

Database updates and manual extracts are currently performed manually by the DBA upon request. Automate data extracts in support of Manage QIRs are completed weekly. The HTRE Phase 2 DBA will do any required database reorganizations and data purges manually.

2.6. Scheduled Maintenance

Following the VA's Monthly OS patching Schedule, the SA, in collaboration with the IHTA Development team, verifies and updates (as required) operating system (OS) patches. All necessary IHTA production maintenance will be performed during off-hours. A “System Not Available” page displays when the application is down. Also, refer to the SOPs in place at the Primary and Secondary facilities.

2.7. Capacity Planning

HTRE Phase 2 will perform a capacity review as part of the planning for each release at three-month intervals. The HTRE-IHTA SA/DBA will be responsible for these reviews.

2.7.1. Initial Capacity Plan

Existing capacity has been deemed adequate for this release of IHTA.

3. Exception Handling

This section provides a high-level overview of how system problems are handled.

3.1. Routine Errors

Like most systems, IHTA may generate a small set of errors that may be considered 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. The following subsections describe these errors, their causes, and what, if any, response an operator needs to take.

While the occasional occurrence of these errors may be routine, getting a large number of an individual error 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.

3.1.1. Security Errors

Please refer to Section 3.2.3.5, Authentication and Authorization for the security errors related to registration and login.

3.1.2. Time-outs

The application automatically logs a user out after 15 minutes of inactivity. Note that this is a system feature, not an error, but is mentioned here for completeness. A warning message displays, counting down from 60 seconds or until the user logs off the application. A user can click the OK button to stop the countdown and continue working.

3.1.3. Concurrency

As a Web-based application, IHTA allows users to share data in a multi-user environment. Data is stored in database tables on a database server (Microsoft SQL Server). In a multi-user environment, more than one person may work with the same record at the same time. Since other users can change or even delete the same data that another user is trying to edit, users may occasionally conflict with others as they work. IHTA keeps track of the status of records as users edit them, and makes sure a user is using the latest data. When two or more people try to edit the same record, IHTA will display a suitable error message to assist with resolving the conflict. In most cases, users will respond to one of these errors by attempting their action again. The concurrency errors in IHTA include the following:

- **optimistic.locking.text**=Database operation failed because object was changed by another session. You will have to re-load it and re-apply your changes.
- **optimistic.locking.title**=Optimistic Locking Error.
- **patient.optimistic.locking.text**=Changes to record could not be saved because it was changed by another user. Please re-submit.
- **role.optimistic.locking.text**=Changes to role could not be saved because it was changed by another user. Please re-submit.

3.2. 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 subsections contain information to aid administrators, operators, and other support personnel in the resolution of errors, conditions, or other issues.

3.2.1. Application Error Logs

Tool: Text editor

Name/Location: DOMAIN_HOME/ccht.log

Configuration file: /ccht_common/src/main/resources/env/ccht_log4j.xml

Info from configuration file:

Max size: 10MB

Growth rate: dependent on log level. Default is ERROR with negligible growth.

Rotation: after Max file size is reached

Retention: 10 iterations of rotation.

Specific configuration from ccht_log4j.xml:

```
      <appender name="ccht.file.appender.detailed"
class="org.apache.log4j.RollingFileAppender">
            <param name="append" value="true" />
            <param name="file" value="ccht.log" />
            <param name="maxFileSize" value="10MB" />
            <param name="maxBackupIndex" value="10" />
            <layout class="org.apache.log4j.PatternLayout">
                  <param name="ConversionPattern" value="[%p] %d{yyyyMMdd hh:mm:ss
aa SSS} %t [%c]%n%m%n%n" />
            </layout>
      </appender>
```

3.2.2. Application Error Codes and Descriptions

Error codes and descriptions are found on the vendor(s) website and referenced as needed.

3.2.3. Infrastructure Errors

The following subsections outline the errors for the various components of IHTA.

3.2.3.1. Database

IHTA processing will include exception handling of database errors, providing user feedback, and logging the error on the application server for troubleshooting support and process traceability.

The HT database is configured to log the appropriate level of detail when an error occurs. Staff administrators will use the logged error information to conduct an evaluation of the database error and perform resolution to make the database software or hardware operational.

3.2.3.2. Web Server

The two log files for the IHTA Web Server are listed below:

1. **access_log**: Logs information related to general IHTA access (e.g., IP address, user, timestamp, etc.).
2. **error_log**: Logs error information related to displaying an IHTA Web page.

NOTE: Refer to the log files for the VA Enterprise LDAP and the HT Database.

3.2.3.3. Application Server

On each application server cluster, errors are logged into a set of log files for each managed server. The seven log files and their descriptions are listed below:

1. The ccht.log file contains log information generated by the IHTA application codes.
2. The MS1.log file contains log information generated by the Manage Server 1.
3. The MS1.out file contains log information directed to the console output of Manage Server 1.
4. The MS2.log file contains log information generated by the Manage Server 2.
5. The MS2.out file contains log information directed to the console output of Manage Server 2.
6. The adminServer.log contains log information generated by the Admin Server.
7. The adminServer.out contains log information directed to the console output of the Admin Server.

3.2.3.4. Network

The following Linux commands are used for identifying errors and resolving network errors:

```
Command in BOLD BLACK
Command prompt in light grey
Output from command in red.
Highlighted are key areas to look for Possible problems.
BLUE UPPERCASE ITALIC are comments



[root@vhacrbwebihta91 ~]# mii-tool -v
      eth0: negotiated 100baseTx-FD, link ok
        product info: vendor 00:50:ef, model 60 rev 8
        basic mode:   autonegotiation enabled
        basic status: autonegotiation complete, link ok
        capabilities: 100baseTx-FD 100baseTx-HD 10baseT-FD 10baseT-HD
        advertising:  100baseTx-FD 100baseTx-HD 10baseT-FD 10baseT-HD flow-
      control
        link partner: 100baseTx-FD 100baseTx-HD 10baseT-FD 10baseT-HD
      eth1:        – This could be a Problem if there was an expectation of
      a ethernet connection established, not an issue in this case, no
      ethernet connected to this NIC
        product info: vendor 00:50:ef, model 60 rev 8
        basic mode:   autonegotiation enabled
        basic status: no link
        capabilities: 100baseTx-FD 100baseTx-HD 10baseT-FD 10baseT-HD
        advertising:  100baseTx-FD 100baseTx-HD 10baseT-FD 10baseT-HD flow-
      control

[root@vhacrbwebihta91 ~]# ethtool eth0
      Settings for eth0:
              Supported ports: [ TP ]
              Supported link modes:   10baseT/Half 10baseT/Full
                                      100baseT/Half 100baseT/Full
```

```
                                1000baseT/Full
        Supports auto-negotiation: Yes
        Advertised link modes:  10baseT/Half 10baseT/Full
                                100baseT/Half 100baseT/Full
                                1000baseT/Full
        Advertised auto-negotiation: Yes
        Speed: 1000Mb/s
        Duplex: Full  – This could be a Problem if set to Half.
        Port: Twisted Pair
        PHYAD: 1
        Transceiver: internal
        Auto-negotiation: on
        Supports Wake-on: g
        Wake-on: d
        Link detected: yes
```

```
[root@vhacrbwebihta91 ~]# lsof –Pni; ###   Depending on the issue, the output is important
```

```
COMMAND    PID        USER   FD   TYPE  DEVICE SIZE/OFF NODE NAME
httpd     2878       apache    3u  IPv6   15015      0t0  TCP *:80 (LISTEN)
httpd     4429       apache    3u  IPv6   15015      0t0  TCP *:80 (LISTEN)
portmap   4653          rpc    3u  IPv4    9593      0t0  UDP *:111
portmap   4653          rpc    4u  IPv4    9594      0t0  TCP *:111 (LISTEN)
sshd      4725         root    3u  IPv4 1857407      0t0  TCP XXX.XXX.XXX.XX:22-
>YYY.YYY.YYY.YYY:55277 (ESTABLISHED)
rpc.statd 4734      rpcuser    3u  IPv4    9894      0t0  UDP *:673
rpc.statd 4734      rpcuser    6u  IPv4    9884      0t0  UDP *:670
rpc.statd 4734      rpcuser    7u  IPv4    9905      0t0  TCP *:676 (LISTEN)
hpiod     6351         root    0u  IPv4   14654      0t0  TCP 127.0.0.1:2208 (LISTEN)
hpssd.py  6356         root    4u  IPv4   14672      0t0  TCP 127.0.0.1:2207 (LISTEN)
sshd      6369         root    3u  IPv6   14708      0t0  TCP *:22 (LISTEN)
cupsd     6378         root    4u  IPv4   14750      0t0  TCP 127.0.0.1:631 (LISTEN)
ntpd      6403          ntp   17u  IPv6   14822      0t0  UDP *:123
ntpd      6403          ntp   18u  IPv6   14823      0t0  UDP
[fe80::7a2b:cbff:fe24:4e68]:123
ntpd      6403          ntp   19u  IPv6   14824      0t0  UDP [::1]:123
ntpd      6403          ntp   20u  IPv4   14825      0t0  UDP 127.0.0.1:123
ntpd      6403          ntp   22u  IPv4   14827      0t0  UDP  XX,XXX,XXXX,XXX,XX69:123
sendmail  6421         root    4u  IPv4   14917      0t0  TCP 127.0.0.1:25 (LISTEN)
snmpd     6733         root    9u  IPv4   15632      0t0  TCP 127.0.0.1:199 (LISTEN)
snmpd     6733         root   10u  IPv4   15633      0t0  UDP *:161
snmpd     6733         root   12u  IPv4   16481      0t0  TCP 127.0.0.1:199-
>127.0.0.1:50913 (ESTABLISHED)
dsm_sa_sn 6989         root    4u  IPv4   16480      0t0  TCP 127.0.0.1:50913-
>127.0.0.1:199 (ESTABLISHED)
```

```
[root@vhacrbwebihta91 ~]# ifconfig -a
```

```
eth0      Link encap:Ethernet  HWaddr 78:2B:CB:24:4E:68
          inet addr:XX.XXX.XXXX.XXX.XX Bcast:XX.XXX.XXXX.XXX.XX Mask:255.255.255.192
          inet6 addr: fe80::7a2b:cbff:fe24:4e68/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:2573375 errors:0 dropped:0 overruns:0 frame:0
          collisions:0 txqueuelen:1000
          RX bytes:211822483 (202.0 MiB)  TX bytes:324341582 (309.3 MiB)
          Interrupt:98 Memory:d6000000-d6012800
```

```
eth1      Link encap:Ethernet  HWaddr 78:2B:CB:24:4E:69
          inet addr:XX.XXX.XXXX.XXX.XX Bcast:XX.XXX.XXXX.XXX.XX Mask:255.255.255.192
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 b)  TX bytes:0 (0.0 b)
          Interrupt:106 Memory:d8000000-d8012800
```

```
[root@vhacrbwebihta91 ~]# ethtool -S eth0
     NIC statistics:
          rx_bytes: 211807772
          rx_error_bytes: 0
          tx_bytes: 324314543
          tx_error_bytes: 0
          rx_ucast_packets: 2568178
          rx_mcast_packets: 0
          rx_bcast_packets: 4993
          tx_ucast_packets: 2565576
          tx_mcast_packets: 6
          tx_bcast_packets: 3
          tx_mac_errors: 0
          tx_carrier_errors: 0
          rx_crc_errors: 0
          rx_align_errors: 0
          tx_single_collisions: 0
          tx_multi_collisions: 0
          tx_deferred: 0
          tx_excess_collisions: 0
          tx_late_collisions: 0
          tx_total_collisions: 0
          rx_fragments: 0
          rx_jabbers: 0
          rx_undersize_packets: 0
          rx_oversize_packets: 0
          rx_64_byte_packets: 423920
          rx_65_to_127_byte_packets: 2109535
          rx_128_to_255_byte_packets: 17144
          rx_256_to_511_byte_packets: 491
          rx_512_to_1023_byte_packets: 1241
          rx_1024_to_1522_byte_packets: 20840
          rx_1523_to_9022_byte_packets: 0
          tx_64_byte_packets: 420077
          tx_65_to_127_byte_packets: 1708868
          tx_128_to_255_byte_packets: 11393
          tx_256_to_511_byte_packets: 422519
          tx_512_to_1023_byte_packets: 886
          tx_1024_to_1522_byte_packets: 1842
          tx_1523_to_9022_byte_packets: 0
          rx_xon_frames: 0
          rx_xoff_frames: 0
          tx_xon_frames: 0
          tx_xoff_frames: 0
          rx_mac_ctrl_frames: 0
          rx_filtered_packets: 1740100
          rx_ftq_discards: 0

          rx_fw_discards: 0
```

```
[root@vhacrbwebihta91 ~]# ping vha.med.va.gov;
       PING vha.med.va.gov (XXX.XXX.XXX.XXX) 56(84) bytes of data.
       64 bytes from vhaxxxxdcv1.vha.med.va.gov (XXX.XXX.XXX.XXX): icmp_seq=1 ttl=119 time=11.0
       ms
       64 bytes from vhaxxxxdcv1.vha.med.va.gov (XXX.XXX.XXX.XXX): icmp_seq=2 ttl=119 time=13.7


       --- vha.med.va.gov ping statistics ---
       2 packets transmitted, 2 received, 0% packet loss, time 1000ms
       rtt min/avg/max/mdev = 11.037/12.398/13.760/1.366 ms
###   Depending on the time in ms, greater than 70-100 is minor
concern, 100+ is medium concern, 150+ beginning of major network
latency issues.
###   Same applies to the traceroute command.

[root@vhacrbwebihta91 ~]# traceroute <HOSTNAME/IP>
```

3.2.3.5. Authentication and Authorization

The following tables lists IHTA-specific implementation of the authentication and authorization component(s) as it relates to errors, error reporting, and other pertinent information on causes and remedy of errors.

Table 7: IHTA Authentication and Authorization for Registration Action

IHTA Registration Action	Error Message
User has previously registered and tries to register again.	user.found=User Name already exists. Please contact your Facility Administrator. registration.approved=You have previously registered. Your registration was approved. Click here to login.
User has previously registered, registration was denied, and tries to register again.	registration.denied=You have previously registered. Your registration was denied. Please contact your Facility Administrator.
User has previously registered, the registration has not been approved, and tries to register again.	registration.pending=You have previously registered. Your registration is pending. Please contact your Facility Administrator.

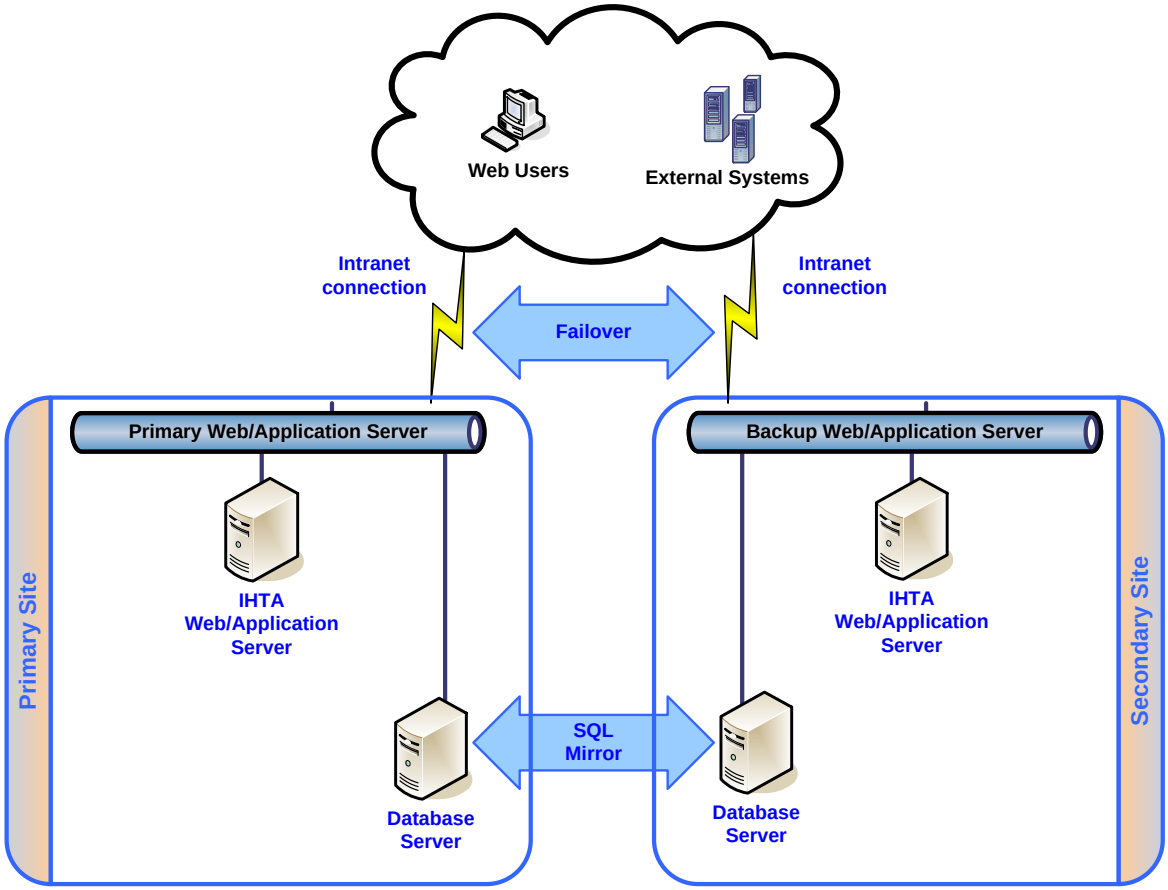
Table 8: IHTA Authentication and Authorization for Login Action

IHTA Login Action	Error Message
User is locked out of the system and tries to log in.	account.locked=You are currently locked out of the system. Please contact your Facility Administrator.
User is inactive in the system and tries to log in.	account.inactive=You are currently inactive in the system. Please contact your Facility Administrator.
User has not registered nor has been approved and tries to log in.	insufficient.privileges=You are not authorized to login to IHTA. Please contact your Facility Administrator.

3.2.3.6. Logical and Physical Descriptions

IHTA and Census and Survey (CNS) employ a standard deployment model, which has one active deployment at the production site and an inactive deployment at the secondary site as Figure 8 depicts. In the event of catastrophic failure at the primary site, incoming requests to the primary site will be failed over to the secondary site, and the application will be activated manually to process incoming requests. Future enhancement will be to implement a database cluster across the production and Disaster Recovery (DR) sites so that the application, deployed at the secondary site, will be automatically activated in the event of failure at the primary site.

Figure 8: IHTA Hardware Architecture



The IHTA architecture implements a standard, standby DR deployment in which near-real-time data replication across the primary and secondary sites are ensured. Although IHTA is deployed to both the primary and secondary sites, IHTA deployment is only activated at the secondary site when there is catastrophic failure of IHTA at the primary site. In the event of catastrophic failure, incoming requests to the primary site's load balancers will be failed over to back-up load balancers at the secondary site. The primary site's main data store is synchronized with the secondary site's back-up data store through database mirroring to ensure near, real-time data replication.

3.3. Dependent System(s)

Dependent system errors are handled by the groups responsible for those systems by referring to the HDR 2FA logs. IHTA support personnel will need to contact these other teams to report such errors and obtain resolution.

For HDR, the IHTA SA/DBA contacts the following:

Mark Broda, HDR Functional Analyst

Mark.Broda@va.gov

317-742-7619

As a rule, if 2FA is down there is nothing that the IHTA team can do until it returns to an operational state. For user-specific 2FA issues, the IHTA team will contact the ESD – Austin and open a CA Service Desk Manager (SMD) ticket (or direct the user to contact Enterprise Service Desk).

3.4. Troubleshooting

This section provides general guidelines for trouble shooting the IHTA system.

3.5. System Recovery

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

3.5.1. Restart After Non-Scheduled System Interruption

This section describes the restart of the system after the crash of the main application.

3.5.2. Restart After Database Restore

This section describes how to restart the system after restoring from a database backup.

Database Start-Up

1. Open SQL Server Management Studio (SSMS).
2. Start the IHTA Database instance.
3. Validate that the WL1036 Telehealth and Telehealth Database are running and accessible by the users.

Application Start-Up

1. Start Apache Web Server on each Web server in the cluster.
2. Start Oracle WebLogic Node Manager Service on each application server in the cluster.
3. Refer to the *HTRE_Phase2_Deployment_Installation_BackOut_Rollback_Guide*, for software installation and configuration. HTRE Phase 2 documentation is stored on the Rational Team Concert (RTC); CCHT_CM Project Area.
4. Start Oracle WebLogic Doman for IHTA cluster.

3.5.3. Back Out Procedures

This section outlines the back out procedures for IHTA.

3.5.3.1. Rollback ccht.ear on WebLogic Portal Server

The following are the steps to rollback ihta.ear deployed on IHTA domain to its previous version for example 10.5.0.00101.

1. Log onto vhacrbappihta91.HTRE.cc.med.va.gov as wlp_user user.
2. Locate the backup version of ccht.ear .<ex.10.5.0.00101> under /u01/domains/ihta_prod/appStage/.
3. Change the backup version of ccht.ear .< ex.10.5.0.00101> under ccht.ear.
4. Run the following command to un-deploy the current version of ccht.ear from IHTA cluster of Managed Servers configured in IHTA Domain "~/bin/stopcluster.sh ~/ prod.properties ; ~/bin/undeploy.sh ~/prod.properties."
5. Wait for the script to complete successfully to proceed to the next step. Contact IHTA System Administrator if you encounter problems.
6. Run the following command to deploy the previous version of ccht.ear onto IHTA cluster of Managed Servers configured in IHTA Domain "~/bin/deploy.sh prod.properties /u01/domains/ihta_prod/appStage/ccht.ear; ~/bin/startcluster.sh ~/ prod.properties."
7. Wait for the script to complete successfully to proceed to the next step. Contact the IHTA System Administrator if you encounter problems.
8. Open a browser to access https://vaww.ihta.cc.med.va.gov/ccht/home.html to check if the deployment completed successfully.

3.5.3.2. Rollback Static Contents on Apache Web Server

The following are the steps to rollback IHTA static content to their previous version for example 10.5.0.00101.

1. Log onto vhacrbwebihta91.HTRE.cc.med.va.gov as ihta user.
2. Traverse to /tmp directory and rename the following files: admin.zip, hdi.zip, main.zip, profile.zip, qir.zip, ihta.zip, register.zip, and reports.zip to admin.zip.< 10.5.0.00101>, hdi.zip.< 10.5.0.00101>, qir.zip.< 10.5.0.00101>, ihta.zip.< 10.5.0.00101>, main.zip.< 10.5.0.00101>, profile.zip.< 10.5.0.00101>, register.zip.< 10.5.0.00101>, and reports.zip <10.5.0.00101>.
3. Rename the following backup files: admin.zip.< 10.5.0.00101>, hdi.zip.< 10.5.0.00101>, main.zip.< 10.5.0.00101>, profile.zip.< 10.5.0.00101>, qir.zip.< 10.5.0.00101 >, ihta.zip.< 10.5.0.00101>, register.zip.< 10.5.0.00101>, and reports.zip. <10.5.0.00101> to admin.zip, hdi.zip, main.zip, profile.zip, register.zip, and reports.zip.
4. Run the following command to deploy the previous version of IHTA static content files onto vhacrbwebihta91 server "~/bin/deploy.sh ~/prod.properties help."
5. Log onto vhacrbwebihta92.HTRE.cc.med.va.gov as ihta user.

6. Traverse to /tmp directory and rename the following files: admin.zip, hdi.zip, main.zip, profile.zip, qir.zip, ihta.zip, and register.zip to admin.zip.< 10.5.0.00101>, hdi.zip.< 10.5.0.00101>, qir.zip.<ve10.5.0.00101 >, ihta.zip.< 10.5.0.00101>, and main.zip.< 10.5.0.00101 >, profile.zip.< 10.5.0.00101>, register.zip.< 10.5.0.00101>, and reports.zip <10.5.0.00101>.
7. Rename the following backup files: admin.zip.< 10.5.0.00101>, hdi.zip.< 10.5.0.00101>, main.zip.< 10.5.0.00101>, profile.zip.<10.5.0.00101 >, qir.zip.< 10.5.0.00101>, ihta.zip.< 10.5.0.00101>, register.zip.< 10.5.0.00101>, and reports.zip <10.5.0.00101 > to admin.zip, hdi.zip, main.zip, profile.zip, register.zip, reports.zip.
8. Run the following command to deploy the previous version of the IHTA static content files (v 10.5.0.00101) onto vhacrbwebihta91 server "~/bin/deploy.sh ~/prod.properties help."
9. Open a browser and check the following links to verify that the deployment completed successfully for the seven help files:

Table 9: IHTA Online Help Files

Help File Name	Zip File Name	Help File Link
Main IHTA Help File	ihta.zip	https://vaww.ihta.cc.med.va.gov/help/ihta/
Administration Help File	admin.zip	https://vaww.ihta.cc.med.va.gov/help/admin/
Manage QIRs Help File	qir.zip	https://vaww.ihta.cc.med.va.gov/help/qir/
Login Issues Help File	main.zip	https://vaww.ihta.cc.med.va.gov/help/main/
Registration Help File	register.zip	https://vaww.ihta.cc.med.va.gov/help/register/
My Profile Help File	profile.zip	https://vaww.ihta.cc.med.va.gov/help/profile/
HT Reports Help File	reports.zip	https://vaww.ihta.cc.med.va.gov/help/reports/

3.5.4. Rollback Procedures

Recovery of the database to a prior pointin time will require restoring the database from a full backup and applying the transaction logs necessary to bring the database state to the point in time decided upon. All due consideration should be given to the impact that this form of database recovery will have as data will be lost. Performing a database rollback recovery should only be considered after all other possible approaches to data correction have been found to have a greater impact than a point-in-time recovery. The following subsections describe the process for rolling back a database to a desired point in time.

3.5.4.1. Backup Selection

Select the full database backup that is prior to and closest to the point in time that the database will be recovered to. If the backup is on external medium, transfer it to a folder on the primary database server so that it is directly available to the database software. Select all transaction log backups that were taken 24 hours prior to the database backup you have selected, and all transaction log backups taken up to and include the point in time that you have targeted, to recover the database to. If the transaction log backups are on external medium, transfer all to a folder on the primary database server so that they are directly available to the database software.

3.5.4.2. Database Recovery Preparation

1. Make sure all application use of the database is shutdown. Place the database in the restricted access mode and clear all current user connections.
2. Shutdown mirroring. Since the secondary database is also affected by the same data issue that is impacting the primary, the mirroring database will need to be rebuilt once the recovery is completed.
3. Though it is the database that needs to be corrected, it also represents the starting point if the recovery effort fails for any reason. Take a full backup of the database. Save the backup in a file just in case it is needed to rebuild and restart the recovery.

3.5.4.3. Database Point in time Restore

1. Connect to the appropriate instance of the Microsoft SQL Server Database Engine.
2. Expand **Databases** and select the database to be recovered.
3. Right-click the database, point to **Tasks**, and then click **Restore**.
4. Click **Database**.
5. On the **General** page, the name of the restoring database appears in the **To database** list box. To create a new database, enter its name in the list box.
    - For the point-in-time option pick **Restore Database:** The **To a point in time** option is in the **Destination for restore** section.
6. In the Point in Time Restore dialog box, click A specific date and time.
    - In the **Date** list box, enter or select a date.
    - In the **Time** list box, enter or select a time.
7. To specify the source and location of the backup sets to restore, select **From device.** Click the browse button and identify the location of the full database and transaction log files that you created earlier. Click **OK** to return to the **General** page.
8. After you have specified a specific point in time, only the backups that are required to restore to that point in time are selected in the **Restore** column of the **Select the backup sets to restore** grid. These selected backups make up the recommended restore plan for your point-in-time restore. You should use only the selected backups for your point-in-time restore operation.

9. In the **Restore options** panel, you choose '**Overwrite the existing database**', '**Preserve the replication settings'** and '**Restrict access to the restored database'.**
10. The **Recovery state** panel determines the state of the database after the restore operation. Keep the default behavior which is:
    - Leave the database ready for use by rolling back the uncommitted transactions. Additional transaction logs cannot be restored. (RESTORE WITH RECOVERY)
11. Start the database recovery.

3.5.4.4. Database Recovery Follow-up – Restart Mirroring; Open Database to User Access

1. Create a full database backup and a backup of the transaction log.
2. Copy the backups to the secondary database server.
3. Perform the steps above to recover the database on the secondary database server but with the options:
    - Restore the database backup without recovering the database (RESTORE DATABASE database_name FROM backup_device WITH NORECOVERY).
    - Continue with the transaction log backup that was created after the backup you just restored, (RESTORE the logs in sequence with NORECOVERY).
        - You want the database to end up in a 'restoring state'.
4. On the primary server, take steps to start database mirroring between the primary and secondary servers.
5. Remove the restricted user access to the primary database.

4. Operations and Maintenance Responsibilities

An understanding of how IHTA is supported by various organizations within the VA is important to operators and administrators of the system. If you are unable to resolve an issue, then it is necessary to understand how to obtain support through OI&T's system support organizations. The following sections describe the support structure and provide procedures on how to obtain support.

The Operations and Maintenance (OM) section defines the roles and responsibilities of each party involved in the delivery and support of the application/service. Precise definition of roles and responsibilities is necessary in a typical shared responsibility environment to avoid confusion over which party is responsible for a specific task or action.

It is not necessary to restate and redefine roles and responsibilities in the OM section for conventional products and services in the Service Strategy and Service Design activities, as they are known. It is only necessary to explicitly state roles and responsibilities in the Service Operation and Continued Service Improvement activities.

Once participating offices have been identified as having an active role in the Operations and Maintenance of IHTA, columns in the linked matrix should be reviewed, updated, and removed as necessary. A detailed RACI (R – Responsible A- Accountable, C – Consulted, I – Informed) Matrix is to be developed for each OM section to show specific roles and responsibilities by environment.

IHTA OM RACI.xlsx

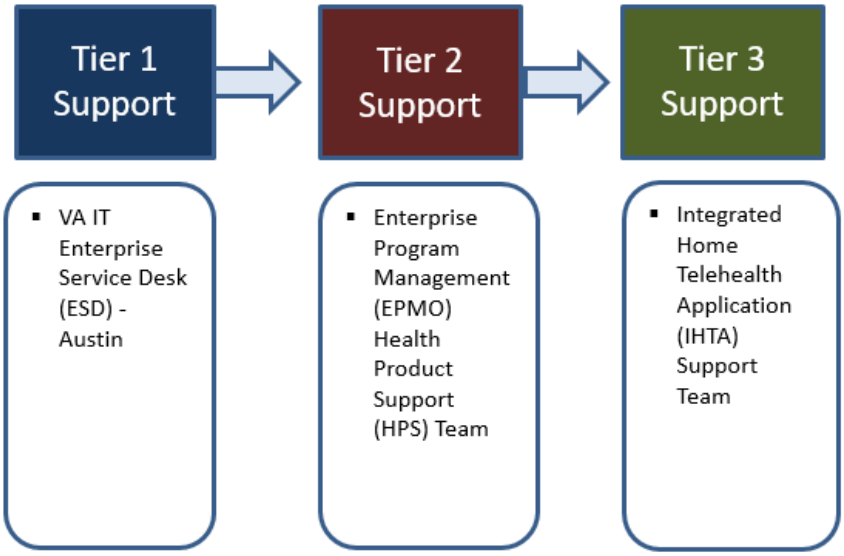
4.1. Support Structure

This section describes the systems support structure as seen from the perspective of operations personnel. The first section defines the support hierarchy through which a support request may navigate. The second section defines the responsibilities for each level of support.

4.1.1. Support Hierarchy

Support for IHTA will be provided by the ESD utilizing the CA SMD. Tier 1, 2, and 3 support will be performed by the groups indicated in the following figure.

Figure 9: Overview of IHTA Support



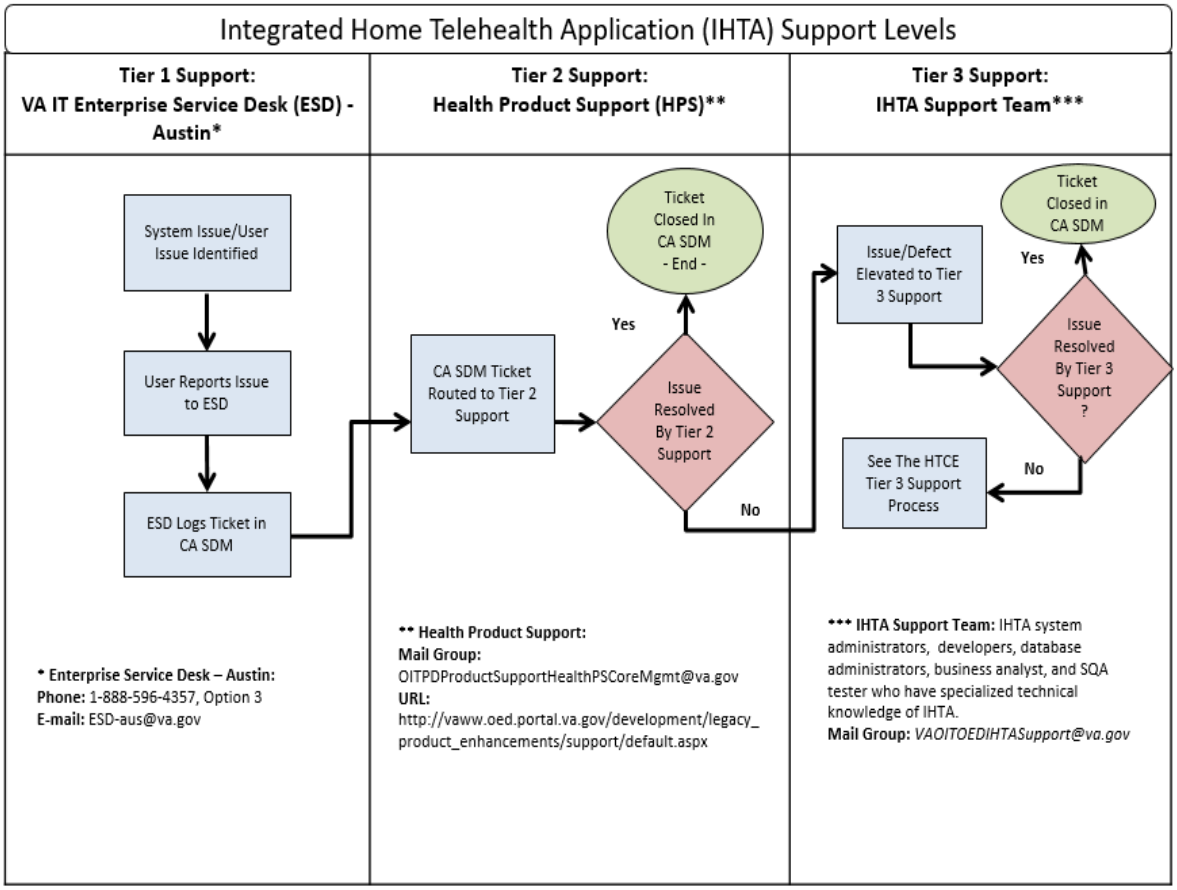
4.1.2. Division of Responsibilities

Tier 1 Support: VA IT ESD - Austin; Tier 2 Support: HPS; Tier 3 Support: IHTA Support Team.

4.2. Support Procedures

Tier 1 support will be provided by the Enterprise Service Desk (ESD) utilizing the CA SDM system. IHTA users with problems that cannot be resolved locally will call the ESD to open a ticket. Issues not resolved by the Tier 1 support team will be assigned to Tier 2 support. Tier 2 support for IHTA will include assistance from the Enterprise Program Management (EPMO) Health Product Support (HPS) team. Issues not resolved by the Tier 2 support team will be assigned to Tier 3 support. Tier 3 support is the highest level of support for IHTA, which includes business analyst, software testers, system administrators, developers, and database administrators who have specialized technical knowledge of IHTA (refer to Figure 10). Tier 3 Support will resolve all issues/defects that have not been resolved by the Tier 1 and 2 support Teams. Issues identified in service desk tickets may also be logged in RTC Jazz (as required).

Figure 10: IHTA Support Levels



NOTE: Tier 2 support will assign SDM tickets to Tier 3 IHTA support team when an issue arises they cannot resolve (refer to Figure 9).

5. Approval Signatures

REVIEW DATE: 09/20/2017

SCRIBE: Celeste Perkins

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Scott Madsen for Donald Sanders, Information Technology Portfolio Manager

Signed: Catherine A Buck 477760 Digitally signed by Catherine A Buck 477760 DN: dc=gov, dc=va, o=internal, ou=people, 0.9.2342.19200300.100.1.1=catherine.buck@va.gov, cn=Catherine A Buck 477760 Date: 2017.09.27 12:44:44 -04'00'

Catherine A. Buck, Product Owner

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Ellen Hans, Integrated Project Team (IPT)/IT Program Manager

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Melissa Mullen-Bomango, Receiving Organization (Product Support)