nehta

HIPS UI Release 1.0.0
Web Deployment Guide

18 February 2014

Approved for external use

National E-Health Transition Authority

Document Information

Key Information

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Document Version History

Version	Date	Release comments
1.0.0	18 February 2014	Release 1.0.0

Table of Contents

1. Introduction

1.1 Context

The Healthcare Identifier and PCEHR System (**HIPS**) is a middleware and communications solution provided by the National eHealth Transition Authority (NEHTA) to enable Patient Administration Systems (PAS) and Clinical Information Systems (CIS) to interact with the National eHealth Record System. The solution can interface with the Enterprise Service Bus (ESB) / Health Integration Broker (HIB) to receive HL7 records from the PAS systems for patient and episode information and IHI lookups, and CDA documents from the clinical systems for upload to PCEHR. The solution can also be used as a broker to the PCEHR without the need of an interface to an ESB/HIB for upload and retrieval of documents from the PCEHR.

As an extension of the core services provided by the HIPS product, the **HIPS-UI** product packages mobile and web-based user interfaces for fulfilling common interaction requirements with the PCEHR, including features such as:

- **Assisted Registration**, to facilitate processing of PCEHR Assisted Registrations and Assisted Dependant Registrations.

- **HPI-I Search**, to facilitate searching for or validating HPI-Is

- **PCEHR View**, providing patient search, clinical document viewing and combined prescription and dispense views.

1.2 Purpose

This document provides instructions for deploying a specific packaged release of the HIPS-UI Web product into a target implementation environment. Specifically, the document describes:

- The resources, responsibilities and access required to deploy the release.

- The intended target implementation environment and any environment-specific configuration items.

- Any assumptions that may affect the deployment.

- Detailed instructions for deploying the release into the target environment and for performing product verification testing.

- Rollback steps in the case that the deployment is unsuccessful.

1.3 Target Release

This document provides instructions for the deployment of **Release 1.0.0** of the HIPS-UI Web product. Refer to the HIPS-UI Web Release Notes [RR-1] for further information regarding this release.

1.4 Related Resources

ID	Document	Description
RR-1	HIPS-UI Web Release Notes	Provides a history of releases of the HIPS-UI Web product.

2. Resources and Roles

The table below lists key resources involved in the deployment of the product into the target environment and the access they require.

Resource	Role	Access
Server Administrator	Implementation and configuration of server and operating system requirements.	"Administrator" access to the operating system on each target server node.
Database Administrator	Deployment of required database objects and data and subsequent configuration tasks.	"sysadm" access to the target SQL Server instance on the **HIPS-UI Web Database Server** node.
Web Administrator	Deployment of required web site components and subsequent configuration tasks.	"Administrator" access to the operating system on the **HIPS-UI Web Application Server** node.
Product Owner	Product verification testing following deployment.	

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3. Target Environment

3.1 Client Operating Environment

The following constraints are assumed to be placed upon the operating environment of the **client system** from which end-users will utilise the PCEHR Web Viewer:

- Supported client devices:
    - PC, laptop, tablet running a supported operating system natively
- Supported client platforms (operating system):
    - Windows 7, Windows 8
- Supported client web browsers:
    - Microsoft Internet Explorer 10+
    - Google Chrome 30+
    - Mozilla Firefox 24+
- Configuration required to meet CCA conformance requirements for rendering systems (CDAR_RS_01):
    - Web browser configuration:
        - Printing:
            - The window title must be printed as the page header on every printed page.
            - The page footer must include the "Page N of T" marker on every printed page.
            - Background colours and images must be printed.
            - Content must be shrunk to fit the printed page.
        - The web browser must not allow users to override the presentation and style of documents rendered as HTML (eg via "developer tools").
    - Client system configuration:
        - The client system must have appropriate software installed in order to open and view document attachments including HTML, PDF, RTF and Plain Text.
        - The client system's screen resolution must be at least 1024x768 pixels.

3.2 Deployment Variables

The table below describes a number of deployment variables representing implementation or environment specific items that will be referenced throughout this document. Where possible the value for the "Value" column in the table should be determined prior to deployment execution.

Deployment Variable	Description	Value
HIPS-UI Web Database Server	Server node that hosts the SQL Server database engine instance into which the HIPS-UI Web database will be deployed.	
HIPS-UI Web Database	Database hosted by the HIPS-UI Web Database Server into which HIPS-UI Web database objects and data will be deployed.	
HIPS-UI Web Application Server	Server node that hosts the IIS instance into which the HIPS-UI Web web site components will be deployed.	
HIPS-UI Web App Pool	IIS application pool used as a thread pool by the HIPS-UI Web Site.	
HIPS-UI Web Site	IIS web site used to host the HIPS-UI Web web site components.	
HIPS-UI Web Site Folder	Filesystem folder containing the HIPS-UI Web web site components.	
HIPS-UI Web Service Account	Active Directory domain service account used as the identity of the IIS application pool.	
HIPS-Core Application Server	Server node that hosts the HIPS-Core product to be utilised by the HIPS-UI Web product.	
HIPS-Core Endpoint Base	Base endpoint at which HIPS-Core services are provided, in format protocol://host:port/site/.	

3.3   Infrastructure Roles

The table below lists the roles of the infrastructure nodes to which the product will be deployed in a target environment. Although not recommended, the same node may perform more than one role. The table also lists prerequisite components that are expected to have been installed and configured on each node.

Infrastructure Role	Description	Prerequisites
HIPS-UI Web Database Server	Server node that hosts the SQL Server database engine instance into which the HIPS-UI Web database, database objects and data will be deployed.	SQL Server 2008 R2 Database Engine
HIPS-UI Web Application Server	Server node that hosts the IIS instance into which the HIPS-UI Web web site components will be deployed.	Internet Information Services 7.5 .NET Framework 4.5
HIPS-Core Application Server	Server node that hosts the HIPS-Core product to be utilised by the HIPS-UI Web product.	HIPS-Core 4.1.0 (Internal Version: 4.1.0.5)

IMPORTANT NOTE:

Due to the use of memory-based caching by the HIPS-UI Web product, it is recommended that it **not** be deployed in a "web farm" (eg a network load balancing (NLB) cluster) where multiple distinct servers may service a particular request.

3.4   HIPS-UI Web Application Server Configuration

The following features are expected to be configured and available on the **HIPS-UI Web Application Server** (via the Web Server role configured through Server Manager):

- Web Server
  - Common HTTP Features
    - Static Content
    - Default Content
    - Directory Browsing
    - HTTP Errors
    - HTTP Redirection
  - Application Development
    - ASP.NET
    - .Net Extensibility
  - Health and Diagnostics
    - HTTP Logging
    - Logging Tools
    - Request Monitor
    - Tracing
  - Security
    - Basic Authentication
    - Windows Authentication
    - Client Certificate Mapping Authentication
    - IIS Client Certificate Mapping Authentication
    - URL Authorization
    - Request Filtering
    - IP and Domain Restrictions
  - Performance
    - Static Content Compression
    - Dynamic Content Compression
- Management Tools
  - IIS Management Console
  - IIS Management Scripts and Tools
  - Management Service

3.5   Service Accounts

The HIPS-UI Web product utilises an Active Directory domain service account as the identity the **HIPS-UI Web App Pool** IIS application pool and to connect to remote resources such as databases and HIPS-Core.

This service account will be referred to as the **HIPS-UI Web Service Account**.

4.   Assumptions

The deployment instructions within this document assume the following:

- The HIPS-UI Web product *has not* been previously deployed to the target environment, or if it has been previously deployed then it has been *removed* following the instructions provided in Rollback.

- The deployment instructions are performed by suitably trained personnel with appropriate privileges to perform each activity, as described in Resources & Roles.

- The target environment has been built and configured as described in Target Environment.

- The relevant release of HIPS-Core has previously been deployed, configured and verified on the **HIPS-Core Application Server**, as described in Target Environment.

- Domain firewall rules allow inbound connections to the **HIPS-Core Application Server** from the **HIPS-UI Web Application Server**.

5. Deployment Instructions

5.1 Deployment Summary

The table below defines the key activities for deploying the product components and estimated timing for each activity. It is assumed that each activity is completed sequentially, with each later activity dependent upon the successful completion of earlier activities.

Activity	Description	Duration (Hours)
Prerequisites	Execution of prerequisite steps such as confirming the configuration of the target environment and ensuring current backups exist.	0.25
Database Objects & Data	Creation of required databases, database objects and data on the **HIPS-UI Web Database Server**.	0.5
Web Site	Deployment of required web components to the **HIPS-UI Web Application Server**.	0.5
Configuration	Configuration of deployed components to reflect the target environment.	0.25

5.2 Prerequisites

Perform the following steps in the target environment:

1. Ensure you have current and valid backups of the target environment (server, database).

2. Review the configuration of the target environment and confirm it matches the expectations described in Target Environment.

3. Review the assumptions listed in Assumptions and ensure they are valid.

5.3 Database Objects & Data

This section provides instructions for creating required databases, database objects, data and permissions on the **HIPS-UI Web Database Server** in the target environment. All steps should be performed via SQL Server Management Studio connected to the relevant database engine instance on the **HIPS-UI Web Database Server**.

1. Create a new database in the target SQL Server instance.

    a. The database may be named as required.

    b. The database will be referred to in subsequent steps as the **HIPS-UI Web Database**.

2. Open the "01 - Database Server - Schemas.sql" script from the "01 - Database" subfolder of the Deployment Package and connect to the **HIPS-UI Web Database**. Execute the script and ensure it completes without error. This will create the following schemas:

    a. hipsui

3. Verify the schemas listed in the preceding step are created.

4. Open the "02 - Database Server - hipsui - Tables.sql" script from the "01 - Database" subfolder of the Deployment Package and connect to the **HIPS-UI Web Database**. Execute the script and ensure it completes without error. This will create the following tables:

    a. hipsui.IdentityVerificationMethod

    b. hipsui.IndigenousStatus

    c. hipsui.IvcDeliveryMethod

    d. hipsui.MedicareConsent

    e. hipsui.Setting

    f. hipsui.Sex

5. Verify the tables listed in the preceding step are created.

6. Open the "03 - Database Server - hipsui - Roles.sql" script from the "01 - Database" subfolder of the Deployment Package and connect to the **HIPS-UI Web Database**. Execute the script and ensure it completes without error. This will create the following database roles:

    a. RunStoredProcedure

7. Verify the database roles listed in the preceding step are created.

8. Open the "10 - Database Server - hipsui - Data.sql" script from the "01 - Database" subfolder of the Deployment Package and connect to the **HIPS-UI Web Database**. Execute the script and ensure it completes without error. This will insert data into the following tables:

    a. hipsui.IdentityVerificationMethod: 10 records

    b. hipsui.IndigenousStatus: 5 records

    c. hipsui.IvcDeliveryMethod: 4 records

    d. hipsui.MedicareConsent: 6 records

    e. hipsui.Setting: 5 records

    f. hipsui.Sex: 3 records

9. Verify data is inserted into the tables listed in the preceding step.

10. Open the "ELMAH-1.2-db-SQLServer.sql" script from the "01 - Database" subfolder of the Deployment Package and connect to the **HIPS-UI Web Database**. Execute the script and ensure it completes without error. This will create the following database objects required by the ELMAH framework:

    a. Tables:

        i. dbo.ELMAH_Error

    b. Stored Procedures:

        i. dbo.ELMAH_GetErrorXml

        ii. dbo.ELMAH_GetErrorsXml

        iii. dbo.ELMAH_LogError

11. Verify the database objects listed in the preceding step are created.

12. Open the "ELMAH-1.2-db-SQLServer__Permissions.sql" script from the "01 - Database" subfolder of the Deployment Package and connect to the **HIPS-UI Web Database**. Execute the script and ensure it completes without error. This will assign the RunStoredProcedure database role the execute permission for the stored procedures required by the ELMAH framework (created in the previous step).

13. Add the **HIPS-UI Web Service Account** as a login to the target SQL Server database engine instance.

14. Add the **HIPS-UI Web Service Account** as a user to the **HIPS-UI Web Database**, and assign it membership in the following database roles:

   a. db_datareader

   b. db_datawriter

   c. RunStoredProcedure

5.4   Web Site

This section provides instructions for deploying web components to the **HIPS-UI Web Application Server** in the target environment. All steps should be performed via a Remote Desktop session connected to the **HIPS-UI Web Application Server**.

1. Open Computer Management.

   a. Ensure the **HIPS-UI Web Service Account** is a member of the local "IIS_USRS" group.

2. Open File Explorer.

   a. Copy the contents of the "02 - Web" subfolder of the Deployment Package to a suitable filesystem location on the **HIPS-UI Web Application Server**, for example "C:\WWWSites\HIPS.UI.Web". This folder will be referred to as the **HIPS-UI Web Site Folder**.

   b. Ensure the **HIPS-UI Web Service Account** has Full Control permissions to the folder and its contents.

3. Open IIS Manager.

   a. Review the list of application pools. If not previously created, create a new application pool to be utilised by the HIPS-UI Web web components.

      i. Name: **HIPS-UI Web App Pool**

      ii. General:

         1. .NET Framework Version: v4.0

         2. Managed Pipeline Mode: Integrated

      iii. Process Model:

         1. Identity: **HIPS-UI Web Service Account**

         2. Load User Profile: True

      iv. Recycling:

         1. Regular Time Interval (minutes): 10080

   b. Create a new web site to host the HIPS-UI Web web components.

      i. Site Name: **HIPS-UI Web Site**

      ii. Physical Path: **HIPS-UI Web Site Folder**

      iii. Application Pool: **HIPS-UI Web App Pool**

      iv. Bindings: HTTP and/or HTTPS, ports & host headers as desired

      v. Logging:

         1. Enabled

         2. Schedule: Daily

         3. Use Local Time: True

> vi. Authentication:
>
> > 1. All: Disabled
> >
> > 2. Windows Authentication: Enabled
>
> c. Ensure the application pool and web site are started.

4. Open Windows Firewall.

   a. Create rules to allow inbound connections to the ports utilised by the previously created web site.

5.5 Configuration

This section provides instructions for configuring the HIPS-UI Web components prior to first use.

Perform the following steps via SQL Server Management Studio connected to the relevant database engine instance on the **HIPS-UI Web Database Server**.

1. Open the hipsui.Setting table in the **HIPS-UI Web Database**. Review and modify where relevant the value of the [Value] column for each setting.

   a. The table below describes each setting:

Feature	Setting	Description	Suggested Value
All	DefaultHospitalCodeSystem	The default hospital code system used by the application.	pasFacCd
PCEHR View	PcehrViewServiceDateDocumentClasses	CSV of document class codes for which service dates should be displayed. Used when displaying document metadata in the document lists.	18842-5
PCEHR View	PcehrViewFromDateOffsetMonths	Negative integer value representing the number of months the "From" date criterion for the Prescription Dispense View will be offset from the current date by default.	-24
PCEHR View	PcehrViewPDDocumentClasses	CSV of document class codes for the Prescription and Dispense document classifications.	100.16764,100.16765
PCEHR View	PcehrViewPatientDaysDischarged	The number of days since the patient has been discharged to still consider a patient to be "currently in hospital". Used when retrieving the list of patients currently in hospital.	0

   b. It is expected the default values for each setting row will <u>not</u> be required to be modified.

Perform the following steps via a Remote Desktop session connected to the **HIPS-UI Web Application Server**.

1. Open File Explorer.

   a. Browse to the **HIPS-UI Web Site Folder** in the filesystem of the **HIPS-UI Web Application Server**.

   b. Open the Web.config file in Notepad.

   c. Locate and modify the following configuration settings as relevant to the target environment:

i. *connectionStrings*: Ensure the value for the *connectionString* attribute of child *add* elements reflects the target environment. In particular, ensure

1. "data source=<mark>dbserver</mark>" is replaced with the name of the target SQL Server database engine instance on the **HIPS-UI Web Database Server**.

2. "initial catalog=<mark>db</mark>" is replaced with the name of the **HIPS-UI Web Database**.

ii. *system.serviceModel/client*: Ensure the value for the *address* attribute of child *endpoint* elements reflects the target environment. In particular, ensure

1. "<mark>net.tcp</mark>://<mark>host</mark>:<mark>port</mark>/<mark>site</mark>/" is replaced with the protocol, host, port and site (where relevant) of each endpoint provided by the **HIPS-Core Application Server**, as per the **HIPS-Core Endpoint Base**.

iii. *applicationSettings/HIPS.Web.UI.Properties.Settings*: Modify the value of the *value* element for child *setting* elements as required, based on the following description of each setting (referenced by its *name* attribute):

Setting Name	Description	Suggested Value
SettingsRepository _AbsoluteExpiratio nOffset	Provides a timespan value that represents the absolute amount of time application settings will be cached in memory. Format: *hh*:*mm*:*ss*, where *hh* represents the number of hours, *mm* represents the number of minutes, and *ss* represents the number of seconds.	02:00:00
HospitalRepository _AbsoluteExpiratio nOffset	Provides a timespan value that represents the absolute amount of time the list of hospitals available for selection within the application will be cached in memory. Format: *hh*:*mm*:*ss*, where *hh* represents the number of hours, *mm* represents the number of minutes, and *ss* represents the number of seconds.	02:00:00
PatientRepository_ AbsoluteExpiration Offset	Provides a timespan value that represents the absolute amount of time patient data will be cached in memory. Format: *hh*:*mm*:*ss*, where *hh* represents the number of hours, *mm* represents the number of minutes, and *ss* represents the number of seconds.	00:05:00
PcehrViewReposito ry_AbsoluteExpirat ionOffset	Provides a timespan value that represents the absolute amount of time PCEHR data for a patient (such as document metadata, document and view content) will be cached in memory. Format: *hh*:*mm*:*ss*, where *hh* represents the number of hours, *mm* represents the number of minutes, and *ss* represents the number of seconds.	00:05:00
AssistedRegistratio nReferenceReposit ory_AbsoluteExpir ationOffset	Provides a timespan value that represents the absolute amount of time reference data used for assisted registration will be cached in memory. Format: *hh*:*mm*:*ss*, where *hh* represents the number of hours, *mm* represents the number of minutes, and *ss* represents the number of seconds.	00:05:00
PatientsWithoutPc ehrRepository_Abs oluteExpirationOffs et	Provides a timespan value that represents the absolute amount of time patient data for assisted registration will be cached in memory. Format: *hh*:*mm*:*ss*, where *hh* represents the number of hours, *mm* represents the number of minutes, and *ss* represents the number of seconds.	00:05:00

d. Save and close the file.

2. Open Command Prompt (as Administrator).

a. Execute the following command: iisreset

6. Product Verification Testing

Perform the following steps to verify the correct behaviour of the HIPS-UI Web product.

NOTE: Specific steps performed are dependent upon the local policies of the implementing organisation and upon the state of integration between the organisation's PAS and CIS, HIPS-Core, and the PCEHR.

1. Open a web browser (eg Internet Explorer).

2. Browse to the HIPS-UI Web site.

3. Provide valid authentication credentials when prompted.

4. Verify the Home page is displayed and provides the following menu items:

    a. Assisted Registration

    b. HPI-I Search

    c. PCEHR View

5. Verify behaviour of the Assisted Registration feature:

    NOTE: This does not test HIPS connectivity. However, performing an actual PCEHR registration is not desirable.

    a. Click the "Assisted Registration" menu item and select the "Current Patients" option.

    b. Select a hospital and click "Select Hospital".

    c. Select a patient and click "Register". Verify the form loads without error.

        NOTE: Depending on the state of integration at the implementing organisation, no patients may be available for selection.

    d. Click the "Assisted Registration" menu item and select the "New Applicant" option. Verify the form loads without error.

    e. Click the "Assisted Registration" menu item and select the "New Dependant" option. Verify the form loads without error.

6. Verify behaviour of the HPI-I Search feature:

    a. Click the "HPI-I Search" menu item and select the "HPI-I Validation" option.

    b. Enter search criteria and click "Search by Identifier".

    c. Verify an HPI-I result is found and returned.

    d. Click the "HPI-I Search" menu item and select the "HPI-I Validation" option.

    e. Enter search criteria and click "Search by Demographics".

    f. Verify an HPI-I result is found and returned.

7. Verify behaviour of the PCEHR View feature:

    a. Click the "PCEHR View" menu item.

    b. Verify the "Patient List" screen is displayed and allows selection of a hospital.

    c. Upon selecting a hospital, verify a list of patients at the selected hospital is displayed.

    d. Click the "View Patient Summary" button for a particular patient.

e. Verify the "Patient Summary" screen is displayed and displays a list of documents for the selected patient.

f. Click the "View Document" button for a particular document.

g. Verify the "Document View" screen is displayed and displays the contents of the selected document.

h. Return to the "Patient Summary" screen for the selected patient via the back button or breadcrumb navigation.

i. Verify the "Prescription and Dispense View" is displayed together with the list of documents for the patient.

7. Rollback

In the case that rollback is required, perform the following steps in order to remove the components previously deployed via the instructions in [Deployment Instructions](#).

1. Web Site:

   a. Windows Firewall:

      i. Remove inbound rules.

   b. IIS Manager:

      i. Remove **HIPS-UI Web Site**.

      ii. Remove **HIPS-UI Web App Pool**.

   c. File Explorer:

      i. Delete **HIPS-UI Web Site Folder**.

   d. Computer Management:

      i. Remove **HIPS-UI Web Service Account** from "IIS_USRS" group.

2. Database Objects & Data:

   a. Delete **HIPS-UI Web Database**.

   b. Remove **HIPS-UI Web Service Account** login.