

Cerner Health Information Exchange

SERVLET QUERY (WEB SERVICE CALL)

Version 3.0

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1. Introduction

1.1 Purpose

This document describes how third-party applications that contribute data to Cerner Health Information Exchanges (HIE) can access the Cerner HIE patient record for display within their application keeping patient and user context.

For expediency, the Cerner HIE will return a HTML (HyperText Markup Language) view of the patient record for display in the third party application. Moreover along with the view, JavaScript AJAX technology code will be included to make asynchronous calls to HIE to retrieve additional data and respond to interaction events with the user.

If required the Cerner HIE can return XML (Extensible Markup Language) documents for processing and rendering in the calling application as required.

In addition the Cerner HIE supports a range of [Integrating the Healthcare Enterprise \(IHE\) Integration Profiles](#) (IP) that allows third-party applications native access to the database utilising a secure, mutual, certificate exchange TLS interface.

For details of Actors/Integration Profiles supported please refer to the following link: <http://connectathon-results.ihe.net/index.php> using Cerner Corporation.

2. Pre-requisites

The following prerequisites are necessary to access the Cerner HIE:

- Access to the Cerner HIE is available over the N3 network and it requires stable TCP/IP connectivity. Only Cerner Test HIE environment can be accessed via internet.
- Calls must be encrypted using the Advanced Encryption Standard (AES). If appropriate Cerner can also support the Data Encryption Standard (DES).
- There must be a data sharing agreement between end users to access the full range of patient data held on the Cerner HIE. If not then certain patient data will not be viewable through the Cerner HIE. The process of obtaining and validating data sharing agreements is the responsibility of the healthcare organisation that has contracted for the Cerner HIE.
- It is assumed the third-party application has obtained the relevant permission to view a patient's record in Cerner HIE and this is auditable.
- Cerner will require details of the NAT (Network Address Translation) Internet Protocol (IP) address of the site that will be sending the request to the Cerner HIE to view the virtual patient record.
- The browser minimum requirements are: Internet Explorer 8 though to 11 (recommended). Also support for Chrome 32+and Firefox 17+. The engine rendering the HIE HTML view needs to support and have enabled JavaScript and AJAX technologies.

3. Connectivity and Encryption

3.1 Servlet Requirements

The Encrypted String contains GET parameters. These are used to query the HIE Master Patient Index (MPI). The next section contains a list of parameters allowed in the encrypted string.

The preference is for URL AES encryption.

NOTE: in the following queries there are references to local and external data. Typically, acute information will be stored locally in HIE hence it will be referenced as Local data. The External data will be considered when triggering real time connections to other sources like Secondary Care, Social Care, Mental Health, Community or other HIE systems. The External data coming from external sources will not be permanently stored in HIE.

3.1.1 For URL AES encryption:

To check connectivity to the Cerner HIE you will have to enter the Uniform Resource Locator (URL) into the web browser.

Cerner HIE Test environment

<https://uktestcert.cernerhie.org/hiempages>

or Client specific HIE

https://<SpecificClientURL>.cernerhie.org/hiempages

A page should display stating 'Encryption string is null, so most likely heartbeat message'. This verifies a connection was established.



Encrypted string is null, so most likely heartbeat message.

In order to get access to a patient record a Servlet query is sent through an encrypted string appended at the end of the URL. Please see the examples below.

For URL AES encryption using the test Cerner HIE system:

<https://uktestcert.cernerhie.org/hiempages?<aes-string>>

a. Example of URL AES encryption string requesting the **local** HIE data (?<aes-string>)

<https://uktestcert.cernerhie.org/hiempages?VgLxKCMhCFSKJsgEcP22s4cAl3OEslF5vdmvZAnevSikD/2Q2ouyjH6JCXM7fdcvZwfxUZKWip/NuOpQXO286nSaobo2nNEvmRpFwZ5StmeZWz2+P2CfnT3Xk2HT1vuRqQ3LFfMltdAhf/YhwpNTLPOPad8upBcRdVqTs qWcZfSR5Yv2C6t15Kr3zRy9hGZHC/Clw9l7MeqDrcVgUEkrzRJ10RwXIUOUSWfAGF HBIHx/6KK1mo3dM5cvO5THT8dCyXBAQ==>

After decryption the string resolves into the following servlet query:

```
PAT_CM RN=4853379371&USR_NAME=EMISTest&USR_POSITION=Nurse&USR_ORG=2.16.840.1.113883.2.1.6.3.50003&USR_FAC=2.16.840.1.113883.2.1.6.3.50003.1&PAT_FNAME=SARAH&PAT_LNAME=JORDAN
&PAT_DOB=19220821&PERMISSION=Yes
```

b. Example of URL AES encryption string requesting the **local** and **external data** (External Partners)

<https://uktestcert.cernerhie.org/hiempages?bFiWVpmZmZkuF4SStxt5P0Iho8kKgV4Io6fX2Lf/O1WqNw1TiuzbszsKImXSoDq0S9mreCwTGhm62FtTcInhVp4s3kNL9tMyUSSsOIUa3Gb9DmJUCp+g+nhyglGbF24RuRP1vnkQqxiJTfq50hyyUG1KgCQLMr/c3qJZqeHvAqElw72KMRQrVxAulyAS5r5Zd3JwBwVuxHg3AdlwkW5vnhDIkeWopBfqCT9mILp9e+nh8ZzJx8rO/3vZEs796fzi5Wg9IEwUsllbee1txcMRPvCMKd7dqHkD/i+rMvQETKqInMulUq5GBxS4UqohsPZJ6yfcjkdQTKYb+3gFZkAVW/SYSTJSLKFoSK1K2tIoczkpHYo>

After decryption the string resolves into the following servlet query:

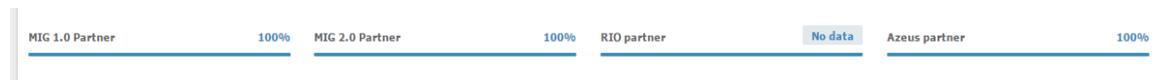
```
PAT_CMРН=4853379371&USR_NAME=EMISTest&USR_POSITION=Nurse&USR_ORG=2.16.840.1.113883.2.1.6.3.50003&USR_FAC=2.16.840.1.113883.2.1.6.3.50003.1&PAT_FNAME=SARAH&PAT_LNAME=JORDAN&PAT_DOB=19220821&EXTERNAL=both&SELECTED_PARTNERS=migPartnerTest|migPartnerTest2|RioTest|AzeusTest&PERMISSION=Yes
```

The External Partners are defined in SELECTED_PARTNERS parameter. As you can see in the example above SELECTED_PARTNERS is followed by an equal sign “=” and then the IDs of the external partners defined in Test HIE are listed divided by pipes “|”.

List of External Partners defined in Test HIE:

IDs	Partner name
migPartnerTest	MIG 1.0 Partner
migPartnerTest2	MIG 2.0 Partner
RioTest	Rio Partner
AzeusTest	Azeus Partner

If your request was successful you should be able to see the following loading Bars:



There are several scenarios at this stage:

- 100 % - HIE have connected and displayed the Patient data from the external provider
- No data - either the “Patient does not exist” or “Patient does not consent” at the External Source.
- Error – the connection between HIE and external partner was not established

3.1.2 For URL DES encryption:

To check connectivity to the Cerner HIE you will have to enter the Uniform Resource Locator (URL) into the web browser

Cerner HIE Test environment

<https://uktestcert.cernerhie.org/desmpages>

or Client specific HIE

<https://<SpecificClientURL>.cernerhie.org/desmpages>

A page should display stating 'Encryption string is null, so most likely heartbeat message'. This verifies a connection was established.



Encrypted string is null, so most likely heartbeat message.

In order to get access to a patient record a Servlet query is sent through an encrypted string appended at the end of the URL. Please see the example below.

For URL DES encryption using the test Cerner HIE system,

<https://uktestcert.cernerhie.org/desmpages?<des-string>>

a. Example of URL DES encryption string requesting the **local** HIE data (?<des-string>)

<https://uktestcert.cernerhie.org/desmpages?szHj+eUwoacPTplUx2PnapNljALKYju7DEGKHvCJOhdFhTA8Q6LTxWpwcWoVFWYVNPdYiBTMMNZqW0CRXrEaKquU2qC4rZPP+0yl9wMgyuW2eTnO8kduLGwWlf5WlbnSNRR6VOakQdlv5EHL7xXmGnTZbVUu0oE2QcbgPgM+hjSfofoY45Zn6fJe66taz3oRzniBMzG/TGU9X+XokaMTwbQpcc02/0PD/tgCA99nRAjxDmdwiCjLQAARx39g2KZOmP6/mJuWLEhh9qXButVHUPA==>

After decryption the string resolves into the following servlet query:

```
PAT_CMARN=4853379371&USR_NAME=EMISTest&USR_POSITION=Nurse&USR_ORG=2.16.840.1.113883.2.1.6.3.50003&USR_FAC=2.16.840.1.113883.2.1.6.3.50003.1&PAT_FNAME=SARAH&PAT_LNAME=JORDAN&PAT_DOB=19220821&PERMISSION=Yes
```

b. Example of URL DES encryption string requesting the **local** and **external data** (External Partners)

<https://uktestcert.cernerhie.org/desmpages?szHj+eUwoacPTplUx2PnapNljALKYju7DEGKHvCJOhdFhTA8Q6LTxWpwcWoVFWYVNPdYiBTMMNZqW0CRXrEaKquU2qC4rZPP+0yl9wMgyuW2eTnO8kduLGwWlf5WlbnSNRR6VOakQdlv5EHL7xXmGnTZbVUu0oE2QcbgPgM+hjSfofoY45Zn6fJe66taz3oRzniBMzG/TGU9X+XokaMTwbQpcc02/0PD/tgCA99nRAjxDmdwiCjLQAT+P4XWfV2OLuVtQ7P/vDjNbBKRnNnOxCMos2gkByMGB5OudRsMTcCT2tCAXemlavYM0xNFNOR1udCEXekS6238pJFV0nRWvCIJHobvvgwcSM7p8nWQDS4DRRe0qsGZK3jiUEzmt7+qpdL>

After decryption the string resolves into the following servlet query:

```
PAT_CMARN=4853379371&USR_NAME=EMISTest&USR_POSITION=Nurse&USR_ORG=2.16.840.1.113883.2.1.6.3.50003&USR_FAC=2.16.840.1.113883.2.1.6.3.50003.1&PAT_FNAME=SARAH&PAT_LNAME=JORDAN&PAT_DOB=19220821&EXTERNAL=both&SELECTED_PARTNERS=migPartnerTest|migPartnerTest2|RioTest|AzeusTest&PERMISSION=Yes
```

The External Partners are defined in SELECTED_PARTNERS parameter. As you can see in the example above SELECTED_PARTNERS is followed by an equal sign "=" and then the IDs of the external partners defined in Test HIE are listed divided by pipes "|".

List of External Partners defined in Test HIE:

IDs	Partner name
migPartnerTest	MIG 1.0 Partner
migPartnerTest2	MIG 2.0 Partner
RioTest	Rio Partner
AzeusTest	Azeus Partner

If your request was successful you should be able to see the following loading Bars:



There are several scenarios at this stage:

- 100 % - HIE have connected and displayed the Patient data from the external provider
- No data - either the “Patient does not exist” or “Patient does not consent” at the External Source.
- Error – the connection between HIE and external partner was not established

3.1.3 XML/CDA Data Retrieval Parameter

To use the query to return CDA formatted clinical data for view/consumption, utilize the ‘XML’ tag in the query string. This will return the patient record that would normally be viewed in the patient summary view as a formatted CDA XML document. This can be used with both the AES and DES encryption methods.

The following is an example using the AES encryption method. Notice that the only change is the inclusion of this specific tag at the end of the query (“XML”).

```
PAT_CMРН=4853379371&USR_NAME=EMISTest&USR_POSITION=Nurse&USR_ORG=2.16.840.1.113883.2
.1.6.3.50003&USR_FAC=2.16.840.1.113883.2.1.6.3.50003.1&PAT_FNAME=SARAH&PAT_LNAME=JORDAN
&PAT_DOB=19220821&PERMISSION=Yes&XML
```

Which encodes to:

```
ecGuVGhoaGjDTgR4glZZTeBJpGQa6v5+5Uc74R44aiMa41lih2h7chPecbZ475N/ApRt
GZG4UF+ZdRUoLLkU+CAzDniul842w0NYMmnYAjek+c4aJ8JBes99B5gBJgid+8+vEO
oalD5Mz8uxzdQpiiEJcKyiaNn1ErB95fBHCKWiWqSkhSi1dSqJb1A6Mdba2vxFZCQSBj
6+WkZOsWkpDjNhHaSHiL8A/4aJ7zC/ATty4jarx1SS5qcNS8RfEnMzZv6mvLWLoVLbP
aoGHDv1fjFKALKksY=
```

And formatted as the URL call to the servlet endpoint:

[https://uktestcert.cernerhie.org/hiempages?
ecGuVGhoaGjDTgR4glZZTeBJpGQa6v5+5Uc74R44aiMa41lih2h7chPecbZ475N/ApRtGZG4U
F+ZdRUoLLkU+CAzDniul842w0NYMmnYAjek+c4aJ8JBes99B5gBJgid+8+vEOoalD5Mz8uxzd
QpiiEJcKyiaNn1ErB95fBHCKWiWqSkhSi1dSqJb1A6Mdba2vxFZCQSBj6+WkZOsWkpDjNhHa
SHiL8A/4aJ7zC/ATty4jarx1SS5qcNS8RfEnMzZv6mvLWLoVLbPaoGHDv1fjFKALKksY=](https://uktestcert.cernerhie.org/hiempages?ecGuVGhoaGjDTgR4glZZTeBJpGQa6v5+5Uc74R44aiMa41lih2h7chPecbZ475N/ApRtGZG4UF+ZdRUoLLkU+CAzDniul842w0NYMmnYAjek+c4aJ8JBes99B5gBJgid+8+vEOoalD5Mz8uxzdQpiiEJcKyiaNn1ErB95fBHCKWiWqSkhSi1dSqJb1A6Mdba2vxFZCQSBj6+WkZOsWkpDjNhHaSHiL8A/4aJ7zC/ATty4jarx1SS5qcNS8RfEnMzZv6mvLWLoVLbPaoGHDv1fjFKALKksY=)

Web page XML can be viewed or easily chosen to 'Save As...' .xml formatted content from browser menu.

This XML file does not appear to have any style information associated with it. The document tree is shown below:

```

▼ <ClinicalDocument xmlns="urn:h17-org:v3" xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:fn="http://www.w3.org/2005/xpath-functions" xmlns:h17="urn:h17-org:v3" xmlns:util="http://www.browsersoft.com/" xsi:schemaLocation="urn:h17-org:v3
../config/h17v3/CCD.xsd">
  <realCode code="US"/>
  <typeId root="2.16.840.1.113883.1.3" extension="POCD_HD000040"/>
  <templateId root="2.16.840.1.113883.10.20.1"/>
  <templateId root="2.16.840.1.113883.10.20.10"/>
  <templateId root="2.16.840.1.113883.10.20.20"/>
  <templateId root="2.16.840.1.113883.10.20.30"/>
  <templateId root="2.16.840.1.113883.10.20.3"/>
  <templateId root="2.16.840.1.113883.3.88.11.32.1"/>
  <templateId root="1.3.6.1.4.1.19376.1.5.3.1.1.1"/>
  <templateId root="2.16.840.1.113883.3.88.11.83.1"/>
  <id root="56200da5-f97e-4894-83d0-137928ff57d9"/>
  <code code="34133-9" codeSystem="2.16.840.1.113883.6.1" displayName="Summarization of episode note"/>
  <title>Continuity of Care Document</title>
  <effectiveTime value="20150108174252"/>
  <confidentialityCode code="N" codeSystem="2.16.840.1.113883.5.25"/>
  <languageCode code="en-US"/>
  <recordTarget>
    ▼ <patientRole>
      <id extension="0000003000" root="2.16.840.1.113883.3.428"/>
      <id extension="7575757" root="2.16.840.1.113883.3.999"/>
      <id extension="4853379371" root="2.16.840.1.113883.2.1.4.1"/>
      ▼ <addr use="HP">
        <streetAddressLine>67 YORK ROAD</streetAddressLine>
        <city/>
        <state/>
        <country/>
        <postalCode>WF12 4LS</postalCode>
      </addr>
      <telecom use="HP" value="07984103736"/>
      ▼ <patient>
        ▼ <name>
          <given>SARAH</given>
          <given/>
          <family>JORDAN</family>
          <suffix/>
        </name>
        <administrativeGenderCode code="F" codeSystem="2.16.840.1.113883.5.1"/>
        <birthTime value="19220821"/>
        <maritalStatusCode nullFlavor="UNK"/>
        <religiousAffiliationCode nullFlavor="UNK"/>
        <raceCode nullFlavor="UNK"/>
        <ethnicGroupCode nullFlavor="UNK"/>
        ▼ <languageCommunication>
          <templateId root="2.16.840.1.113883.3.88.11.83.2"/>
          <templateId root="1.3.6.1.4.1.19376.1.5.3.1.2.1"/>
          <languageCode nullFlavor="UNK"/>

```

3.1.4 Servlet Query Parameters

Create your encrypted string with the parameters below and pass them into your browser. This should return a Cerner HIE view. Cerner has provided a sample set of code for generating the correct string hash, if necessary. See item attached following section 7 of this document.

The Conditional Required parameters are to support your applications ability to pull information from several separate instances of Cerner HIE. These parameters are highlighted in blue below.

Status values:

R = Required

O = Optional

CR = Conditional Required (to support access to External partners)

No	Parameter Name	Description	Status	Example
1	PAT_ASSIGN AUTH	Assigning authority. Facility or Organization OID of the patient record in HIE.	O	PAT_ASSIGNAUTH=2.16.840.1.113883.3.1.2.3.4.5.6.7.8.9.0.1.1
2	PAT_MRN	Appears in conjunction with PAT_ASSIGNAUTH. Patient Medical Record Number in the facility or organization. For DES queries populate with NHS No as well as PAT_CM RN. For AES queries use preferably field 14. PAT_CM RN instead.	O	PAT_MRN=MRN1234
3	USR_NAME*	The username or identifier of the Person accessing the system and viewing the patient's record.	R	USR_NAME=JA12345
4	USR_POSITION	The role of the person accessing the patient's record. Used for Auditing.	R	USR_POSITION=Nurse
5	USR_ORG	Unique identity of the Organisation accessing the system. This value will be recorded in the audit logs. (ODS Code or HL7 OID)	R	USR_ORG=2.16.840.1.113883.3.1.2.3.4.5.6.7.8.9.0
6	USR_FAC	The Facility OID/unique identity of the user accessing the system. This value will be recorded in the audit logs. If there are multiple Facilities at one organisation, this could provide further context of the hierarchy	R	USR_FAC=2.16.840.1.113883.3.1.2.3.4.5.6.7.8.9.0.1

		It can be same value as USR_ORG or a child object of USR_ORG as long as USR_NAME and/or USR_DSPLYNM is also used for auditing.		
7	PPR	The relationship between the person accessing the system and the patient, i.e. Primary Care Provider, Admitting Clinician	O	PPR=PCP
8	USR_DSPLYNM	The display name of the user accessing the patient record. Can be the same value as USR_NAME. Used for Auditing.	R	USR_DSPLYNM=Janice Adams
9	PAT_FNAME	The patient's first name	R	PAT_FNAME=John
10	PAT_LNAME	The patient's last name	R	PAT_LNAME=Smith
11	PAT_DOB*	The patient's date of birth	R	PAT_DOB=YYYYMMDD
12	PAT_GENDER	The patient's gender. Values can be 'F' (Female), 'M' (Male), 'NK' (Not Known) and 'NS' (Not Specified).	O	PAT_GENDER=F
13	PAT_ZIP	The patient's Postcode	O	PAT_ZIP=X99 9XX
14	PAT_CMARN*	The patient's external id, for example NHS Number	R	PAT_CMARN=1231231234
15	XML	No value required. Returns XML of longitudinal patient CDA instead of HTML.	O	XML
16	EXTERNAL	Values are: [no] The normal default value. Returns data stored in the local HIE for the patient. [yes] Only data from configured external partners is returned. [both] All available data from both local HIE and configured external partners (specified in the SELECTED_PARTNERS parameter) is returned.	CR	EXTERNAL=both

17	SELECTED_PARTNERS	To return external aggregated document for given external partners. The parameter should be a list of partner ids separated by “ ” .	CR	SELECTED_PARTNERS=migPartnerTest RioTest AzeusTest
18	ORG_USER	Unique identity of the User Account accessing the system. Can be used to filter the view of the HIE record. Use determined by Trust definition of privilege account logon; must be used with ORG_PASS. [Note, difference in purpose vs. USR_ORG, which is a required field]	CR	ORG_USER=level1 or ORG_USER=hieUser
19	ORG_PASS	Password set to provide authentication on top of the AES/DES encryption key. This will be provided to each Organisation. Must be used with ORG_USER.	CR	Value will be confirmed by Cerner. Password for ORG_USER user/acct to limit view/privileges.
20	PERMISSION	Permission to view HIE record from Calling Application. Values are: [Yes], [No] and [Emergency].	R	PERMISSION=Yes
21	FILTERING_CODE	Value of alias used to define the set of filters used to restrict view of the data based on Organization or Facility OID Pool as defined in Trust Data Sharing Agreements.	CR	FILTERING_CODE=ORG1
22	EMERG_REASON	Alphanumerical string value with the justification for the user to break the glass to access the patient record in an emergency scenario. Used for auditing purposes. The PERMISSION parameter will have the value ‘Emergency’.	O	EMERG_REASON=Patient is unconscious

*Minimum set of parameters for the Query to work.

4. Configuration and Activation of Cerner HIE

The calling clinical application must allow for input of the following parameters to configure and activate how the application to call the Cerner HIE.

Screen Prompt	User Response	Parameter Ref.
<p><i>The following 2/3 parameters are entered once by the system administrator of the clinical application to configure access to the Cerner HIE.</i></p> <p><i>The values will be provided by the Trust HIE contact.</i></p>		
Password	<p>For AES connections allow for entry of up to 35 alpha numeric character field.</p> <p>For DES connections allow for entry of up to 24 alpha numeric character field.</p>	N/A
Initial Vector	<p>Alpha numeric 8 characters</p> <p>This entry is only required if the calling clinical application uses DES encryption.</p> <p>It is not required if AES encryption is used to call the Cerner HIE.</p>	N/A
URL	https://	N/A
<p><i>The following 5 parameters may need to be maintained by the system administrator of the clinical application if access is required to multiple instances of Cerner's HIE.</i></p> <p><i>The values will be provided by the Trust HIE contact.</i></p>		
External	<p>Allow entry of [no] [yes] [both].</p> <p>Default entry is [no].</p>	16
Selected_Partners	<p>Alpha numeric</p> <p>Administrator will be instructed to enter a string that contains a series of characters and pipe to separate the entries.</p> <p>For example, migPartnerTest RioTest AzeusTest</p>	17
User	<p>Alpha numeric</p> <p>HIE User/Role authentication to permit access to HIE records. Administrator will be instructed to enter a user/role identifier.</p> <p>For example, GP12345 or Nurse</p>	18

Password	Alpha numeric Secret string to validate HIE user or role authentication. Administrator will be instructed to enter a secret string. For example, <i>aX4DcTo</i>	19
Filtering Code	Alpha numeric Organization OID or profile code to define and restrict access to specific data sources in HIE according to Data Sharing Agreements. For example. <i>RIO</i> or <i>2.1.4.3883.4.679</i>	21

5. Access to Test Cerner HIE System

5.1 URL of Calling System

To access the test Cerner HIE System you will need a continuous stable internet connection to make the initial HIE view request and any additional information that might be required.

5.2 Connectivity Details

Connectivity details for the test Cerner HIE system are as follows:

Encryption	Server Proxy IP	URL	Password	Initial Vector	Network
URL AES	10.181.192.54	https://uktestcert.cernerhie.org/hiempages?<AES_string>	9cernercep1cert7birdDog8Rock98	<i>Not Required</i>	Internet
URL DES	10.181.192.54	https://uktestcert.cernerhie.org/desmpages?<DES_string>	9cernercep1cert7birdDog8	PB45xDA2	Internet

5.3 Patient records in Test Cerner HIE System

The following test patients are available in the test Cerner HIE system

Patient Name	NHS Number	Date of Birth	Gender
Dorothy Morrison	9620344472	10-Feb-1971	Female
Richard Garner	4160066348	21-Dec-1933	Male
Neil Matthews	5894678846	04-Feb-1939	Male
Graham Henry	6068998983	03-Mar-1965	Male
Sarah Jordan	4853379371	21-Aug-1922	Female

6. Testing Methods and Troubleshooting

It is critical to determine that the encryption method chosen (DES/AES) is correctly hashing your string. Use the included hashing algorithm passphrases and in the case of DES, the Initialization Vector (IV) value to achieve the correct result. Each client and system will use its own passphrase and IV, as needed for the intended encryption method. For example, Client A Test system will have different passphrase, IV and URL than Client B Test system. Likewise, Client A Test will differ from Client A Live.

Once the hashing is known to be successful, it is critical to ensure that each query string will include the required fields listed above. Most of the additional conditionally required fields also need to be accounted for as these are requirements for multi-Trust query functionality, filtering and permission levels. All string values will be different for each client system, so the applicable content will need to be either statically defined or dynamically valued as needed.

Calling the servlet requires that only the applicable tags be hashed by the determined method. The hashed string is appended to the URL to call the correct client endpoint:

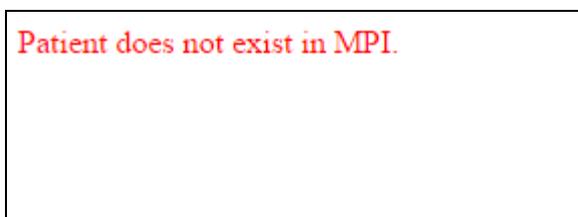
https://uktestcert.cernerhie.org/hiempages?<AES_string>

https://uktestcert.cernerhie.org/desmpages?<DES_String>

The screenshot displays a patient's medical record for JORDAN, SARAH. It includes a header with patient demographics, a disclaimer, and several data sections:

- Loading data for partners:** Shows 100% completion for HIE 3.0 Partner, HIE 2.0 Partner, RSD partner, Access partner, and another 100%.
- GP Reports (10):** Lists various reports like Allergies, Medications, and Discharge Summary with completion dates.
- Allergies (7):** Lists allergies such as Aspirin reaction to Acetaminophen-Containing Enzyme Inhibitors.
- Medications (15):** Lists medications like Aspirin 81mg tablets and Amoxicillin 500mg capsules.
- Lab results (19):** Shows a table of lab tests including Hemoglobin A1c, Blood glucose, and Blood urea nitrogen, with values and units.

If the string is properly hashed, but you receive the following error, this means that the content of the tags does not resolve to find an applicable patient, usually the PAT_CMARN value.



In the event that connectivity does not result in a rendered view similar to the example above,

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ensure that network connectivity is open to the endpoints in question. The commands telnet, tracer and ping can help isolate network issues.

7. Technical Accreditation & Confirmation

Upon successful connection to the test environment, please evaluate and send confirmation of the following items to the Cerner team (emails listed below) for evaluation:

1. Screen capture of the HTML page showing a successful query
2. Un-hashed query text string
3. Hashed query text string
4. Screen capture of end-user configuration and prompts showing the capability to configure the External Partners that will be requested in the query to HIE. This is to ensure scalability in the system on handling multiple HIE instances using multiple and different data sources.
5. Screen capture of patient consent selection and capture.
6. Client-system code versioning.

Please send the above items in a zipped or compressed file-set to Fernando Beraza and David Hartman (fernando.berazameiro@cerner.com and david.hartman@cerner.com) for evaluation.

Sample code for generating hash string for the UK Test environment discussed in this document:



UKTest_HIEMPAGE.zip

7.1 Technical Accreditation Levels

Depending on the level of support provided from the interface connecting to the Cerner HIE API described in this document, the external system will be accredited with one of the following:

- **HIE 'local' Accreditation.** Provider is able to access the HTML aggregated view with locally stored data in HIE – typically acute patient information.
- **HIE 'local + MIG' Accreditation.** Ability to query the aggregated view of the HIE local data and MIG reports. For this it is required to support the SELECTED_PARTNERS and EXTERNAL parameters and include the MIG identifier in the query following the *3.1.4 Servlet Query Parameters* section.
- **HIE 'local + external' Accreditation.** Ability to query the aggregated view of the HIE local data and other external sources based on configuration done locally and individually at the querying system so access to a source is not automatically rolled out to all instances of that system (i.e. GPs) when the provider gets accredited. For this it is required for a user or administrator of the system instance to be able to specify the sources that will be aggregated in the HIE record by defining/setting up their identifiers and updating the SELECTED_PARTNERS and EXTERNAL query parameters following the *3.1.4 Servlet Query Parameters* section.

The different levels of accreditation are dependent mainly but not only on the support of the parameter 16 EXTERNAL and parameter 17 SELECTED_PARTNERS. The configuration of these parameters will ensure the appropriate aggregation of data sources based on data sharing agreements in place with the data providers (Trust, HealthCare Gateway, Servelec, Azeus, etc.).

Revision History

First draft to begin with 0.x; finalized version only to end in x.0

Date	Issue/Version	Description	Author
15-Aug-14	0.1	Based on 45TRGEXT019250 MPage Servlet Requirements	D. Hartman
08-Sep-14	1.0	First Release	D. Hartman
26-Sep-14	1.1	Revisions	D. Hartman
08-Jan-15	2.0	Section 1.1 added link to IHE site. Section 3.1, 3.2 updated samples. Section 4 and 5 revised.	G.Carver, D Hartman
15-Jan-15	2.1	New Section 7	G Carver
01-Jun-15	2.2	Section 3.2 updated Filtering code parameter.	G Carver
11-Jun-15	2.3	Section 1.1 added JavaScript reference. Section 2. revised for Test HIE access and JavaScript support Section 5 updated Network access requirements	F. Beraza
30-Jun-15	2.4	Addition of sample Servlet .js code	G.Carver
12-Sep-15	2.5	Addition of User and Password parameters in section 4. USR_DSPLYNM made mandatory in section 3.1.4 and other small parameter description changes.	F. Beraza
14-Oct-15	2.6	Added valid Gender values in section 3.1.4 Servlet Query Parameters. PAT_MRN made Optional for AES links. DES links have to send it populated with NHS Numbers. PAT_CM RN flagged as Minimum required in section 3.1.4 Servlet Query Parameters. Changed PAT_MRN and PAT_ASSIGNAUTH descriptions.	F. Beraza
29-Oct-15	2.7	Section 4 updated AES and DES password maximum lengths	F. Beraza
23-Jan-16	2.8	Updated content with latest enhancements.	A.Dumbia

		Added screenshots. Updated Servlet Queries. Removed not working Filtering Code queries.	D. Toshev
29-Jan-16	2.9	Added Parameter 22 EMERG_REASON.	F. Beraza
08-Feb-16	3.0	Added Accreditation levels in section 7.1.	F. Beraza

Reviewers List

Date	Issue/Version	Reviewed By	Department

Approvals

Date	Issue/Version	Approved By	Department

Distribution

Date	Issue/Version	Recipient	Department