INTEGRATION SPECIFICATIONS FOR HOSPITALS (PRESCRIBERS)

2021-03-15

Version 1.0.9

(KMEHR 1.28)

TABLE OF CONTENTS

EXTERNAL REFERENCES

Ref ID	Name	URL
1.	Barcode Symbology	Specified in ISO/IEC 15417:2007
2.	Non addressed Encryption	https://www.ehealth.fgov.be/nl/support/basisdiensten/systeem-voor-end-end- vercijfering
3.	Addressed Encryption	https://www.ehealth.fgov.be/nl/support/basisdiensten/systeem-voor-end-end- vercijfering
4.	STS Cookbook	https://www.ehealth.fgov.be/nl/support/sts-secure-token-service https://www.ehealth.fgov.be/fr/support/sts-secure-token-service
5.	eHealth certificates	https://www.ehealth.fgov.be/nl/support/basisdiensten/ehealth-certificaten https://www.ehealth.fgov.be/fr/support/services-de-base/certificats-ehealth
6.	eMed-ecare Use cases	https://www.ehealth.fgov.be/nl/support/basisdiensten/systeem-voor-end-end- vercijfering
7.	Barcode print guideline	Specified in ISO/IEC 15416

1. INTRODUCTION TO RECIP-E

1.1. RECIP-E SOLUTION

The Recip-e solution concerns the generic (i.e. valid for all types of prescription: pharmaceutical, physiotherapist, nursing, ...) transfer of prescriptions from the prescriber to the care provider, for example from the general practitioner (GP) to the pharmacist or from a general hospital to the pharmacist, chosen freely by the patient or from the specialist to the physiotherapist.

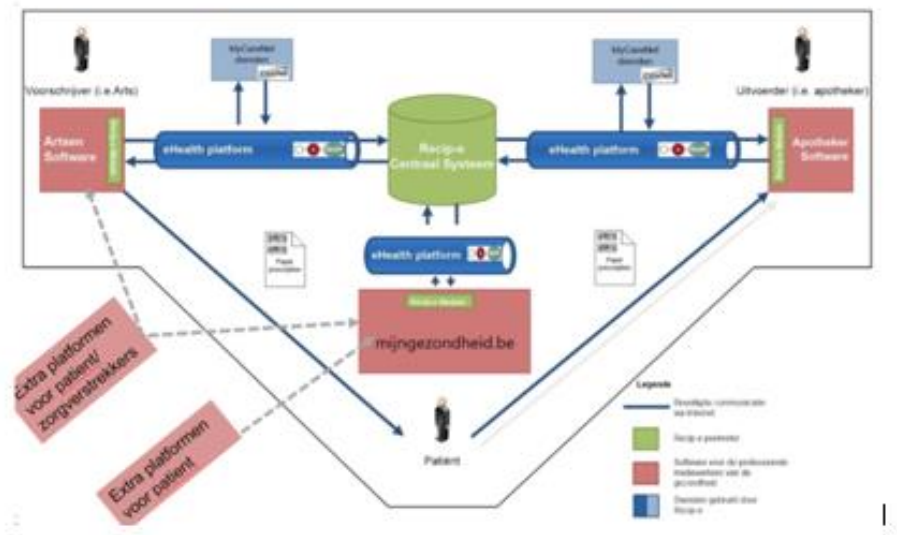
With the Recip-e solution, data can be sent between various actors with a high level of security. This technological innovation also offers improvements for everyone involved in the project. Below is a list of the added value that the Recip-e solution offers:

- Ensure roles and responsibilities of everyone;
- Integration with medical platforms for the identification of the actors, the security of the data and the control of the insurability of patients to ensure (e.g. eHealth, MyCareNet)
- Improving the administrative process and reduce administrative burdens
- Reduce erroneous prescriptions (errors in prescriptions)
- Relationship between the electronic and the paper stream is guaranteed
- Traceability of the data between the different actors.
- Traceability of the data access (consult) for privacy logging

There are also immeasurable positive impacts foreseen thanks to the solution:

- Enhancing of the process (less fraud by avoiding patients to create fake prescriptions);
- …

Technically speaking Recip-e is not only a system that manages non-addressed messages in the health sector. Recip-e is also a system that provides advanced functionality such as prescription state, prescription validation, unique document numbering…



1.2. DESCRIPTION AND PURPOSE OF THE INTEGRATION SPECIFICATIONS

This document establishes a set of requirements for the interface between Prescription Software and the RECIP-E system. It identifies agreed-upon design requirements and constraints that must be satisfied by the interfacing software. This document is intended for use by the developers of the applications identified, and by the test organizations responsible for the testing of these applications.

1.3. DOCUMENT SCOPE

This document outlines the interface requirements to support the following business events for Prescription Software (doctors, dentists, hospitals, …)

- Create Prescription
- Cancel a prescription
- Read a feedback for a prescription
- Send a prescription notification
- List/Read Prescription

The document also details the requirements to support the following technical events:

- Encryption
- Authentication

Changes are required in Prescription software to integrate with RECIP-E. This document will detail the integration procedure expected to be implemented by the Software Providers of said software.

For all integrators is required to read and consult the document Recip-e_dematerialisation_general_doc-Recip-e.pdf from the Recip-e documentation package !

2. RESPONSIBILITIES

The software provider / implementer of the Recipe prescribing services will have to make sure that his application fulfills a set of requirements. These are documented as part of this chapter.

2.1. ENCODING

All Recip-e messages (prescriptions, feedback and notifications) should use the **UTF-8** encoding.

2.2. IDENTIFICATION OF THE PATIENT

The Patient must be identified by his INSS number (also named NISZ, NISS, and SSIN). Therefore, the health care software has the responsibility to provide a verified/validated INSS number.

2.3. PRESCRIPTION FORMAT

A prescription is defined as being a specific XML KMEHR message (Kind Message for Electronic Healthcare Record) of type pharmaceutical prescription. This format is further described on eHealth website: https://www.ehealth.fgov.be/standards/kmehr/.

On the one hand, the prescription software has the responsibility to generate a valid KMEHR prescription. On the other hand, executor software must be able to load such valid prescription.

The validation of the prescription consists in a two-step validation process:

- XSD validation
- Additional validation

The validation must be performed, by the integrating software, before a prescription is submitted.

The XML schema defining the KMEHR standard (XSD file) is provided in the Recip-e-client package and can be found on eHealth website at this URL: https://www.ehealth.fgov.be/standards/kmehr/.

At this moment, the prescription must be compliant with the version “20190301-kmehr”(version 1.28.0) of the XSD definition (XSD packaged in a zip can be downloaded at this URL:
https://www.ehealth.fgov.be/standards/kmehr/en/page/xschema
The file is called xsd-kmehr-1.28.0.zip

2.3.1. ADDITIONAL VALIDATION

The kmehr standard defines many different type of message regarding the healthcare sector. In the first stage of Recip-e (pilot), only pharmaceutical prescription is accepted. However, in the next phases, the system will accept other kind of prescription (new version of this document will be available).

For pharmaceutical prescription, additional verifications must be performed before uploading the prescription in the Recip- e system.

The table below describes the different checks to be performed. For each check, a XML XPATH is defined. The result of the XPATH query must return the result defined in column "Expected Number of record".

The files used for the XSD and XPATH validation can be found in the Recip-e prescriber SDK.

- validation.properties
- xsd-kmehr-1.28.0

For more information about XPATH queries, please refer to http://www.w3.org/TR/xpath/.

Recip-e also provides an on-line validator at: https:///kmehr-validation.recip-e.be/

2.3.2. SAMPLE PRESCRIPTION

In following example, the sam-v2 version and the SAMPROOF parameters are purely fictious, in acceptance or in production, these parameters should be filled-in carefully, from the adequate SAM-v2 database, which is in use at that moment by the prescriber package.

```
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
<kmehrmessage xmlns="http://www.ehealth.fgov.be/standards/kmehr/schema/v1">
   <header>
      <standard>
         <cd S="CD-STANDARD" SV="1.29">20190301</cd>
      </standard>
      <id S="ID-KMEHR" SV="1.0">14675011004.20090110090000000</id>
      <id S="LOCAL" SL="ID-MEDISOFT" SV="version 1.23.0">8e1c4ea4-3825-48e4-
bcc2b8cadfa7a897</id>
      <date>2019-12-01</date>
      <time>09:00:00</time>
      <sender>
            <hcparty>
                  <id S="ID-HCPARTY" SV="1.0">19006951001</id>
                        <cd S="CD-HCPARTY" SV="1.15">orghospital</cd>
                              <name>Great_Hospital</name>
             </hcparty>
             <hcparty>
                  <cd S="CD-HCPARTY" SV="1.15">application</cd>
                  <name>MySoftware</name>
                  <telecom>
                          <cd S="CD-ADDRESS" SV="1.1">work</cd>
                          <cd S="CD-TELECOM" SV="1.0">phone</cd>
                          <telecomnumber>02/100.11.12</telecomnumber>
                  </telecom>
                  <telecom>
                            <cd S="CD-ADDRESS" SV="1.1">work</cd>
                            <cd S="CD-TELECOM" SV="1.0">email</cd>
                            <telecomnumber>tom@mysoftware.com</telecomnumber>
                   </telecom>
              </hcparty>
      </sender>
      <recipient>
      <hcparty>
         <id S="ID-HCPARTY" SV="1.0">RECIPE</id>
         <cd S="CD-HCPARTY" SV="1.0">orgpublichealth</cd>
         <name>Recip-e</name>
      </hcparty>
      </recipient>
      <externalsource>
               <source>
                     <cd SV="1.0" S="CD-EXTERNALSOURCE">samv2</cd>
                     <version>W20200725</version>
               </source>
      </externalsource>
   </header>
   <folder>
      <id S="ID-KMEHR" SV="1.0">1</id>
      <patient>
         <id S="ID-PATIENT" SV="1.0">87990949113</id>
         <firstname>Fred</firstname>
         <familyname>Flintstone</familyname>
         <birthdate>
            <date>1933-10-23</date>
         </birthdate>
         <sex>
            <cd S="CD-SEX" SV="1.0">male</cd>
         </sex>
      </patient>
         <transaction>
            <id S="ID-KMEHR" SV="1.0">1</id>
            <cd S="CD-TRANSACTION" SV="1.1">pharmaceuticalprescription</cd>
```

```
<date>2010-08-01</date>
<time>09:00:00</time>
<author>
   <hcparty>
      <id S="ID-HCPARTY" SV="1.0">14675011004</id>
      <cd S="CD-HCPARTY" SV="1.0">persphysician</cd>
      <name>Dr. Duck Donald</name>
   </hcparty>
</author>
<iscomplete>true</iscomplete>
<isvalidated>true</isvalidated>
<expirationdate>2020-09-01</expirationdate>
<heading>
   <id S="ID-KMEHR" SV="1.0">1</id>
   <cd S="CD-HEADING" SV="1.1">prescription</cd>
   <item>
      <id S="ID-KMEHR" SV="1.0">1</id>
      <cd S="CD-ITEM" SV="1.1">medication</cd>
      <content>
         <medicinalproduct>
            <intendedcd S="CD-DRUG-CNK" SV="2.0">0318717</intendedcd>
            <intendedname>Adalat Oros 30 (c) 30mg</intendedname>
         </medicinalproduct>
      </content>

      <content>
          <cd SV="1.0" S="LOCAL" SL="SAMPROOF">
                 UjBS56789012345678901234567890123456789012345678901234
          </cd>
      </content>

      <lifecycle>
         <cd S="CD-LIFECYCLE" SV="1.0">prescribed</cd>
      </lifecycle>
      <quantity>
         <decimal>1</decimal>
      </quantity>
      <frequency>
         <periodicity>
            <cd S="CD-PERIODICITY" SV="1.0">D</cd>
         </periodicity>
      </frequency>
      <dayperiod>
         <cd S="CD-DAYPERIOD" SV="1.0">evening</cd>
      </dayperiod>
      <posology>
         <text L="nl">1x</text>
      </posology>
   </item>
   <item>
      <id S="ID-KMEHR" SV="1.0">2</id>
      <cd S="CD-ITEM" SV="1.1">medication</cd>
      <content>
         <medicinalproduct>
            <intendedcd S="CD-DRUG-CNK" SV="2.0">1085885</intendedcd>
            <intendedname>Actrapid HM Penfill (c) 100IU/ml</intendedname>
         </medicinalproduct>
      </content>
      <content>
          <cd SV="1.0" S="LOCAL" SL="SAMPROOF">
                 BrWj56789012345678901234567890123456789012345678901234
          </cd>
      </content>
         <lifecycle>
            <cd S="CD-LIFECYCLE" SV="1.0">prescribed</cd>
         </lifecycle>
      <quantity>
         <decimal>1</decimal>
      </quantity>
      <posology>
         <text L="nl">2x/d 12E voor de maaltijd SC</text>
      </posology>
   </item>
   <item>
```

```
                <id S="ID-KMEHR" SV="1.0">3</id>
                <cd S="CD-ITEM" SV="1.1">medication</cd>
                <content>
                   <medicinalproduct>
                      <intendedcd S="CD-DRUG-CNK" SV="2.0">1077718</intendedcd>
                      <intendedname>Insulatard HM Penfill (c) 100IU/m</intendedname>
                   </medicinalproduct>
                </content>
                <content>
                    <cd SV="1.0" S="LOCAL" SL="SAMPROOF">
                           CfRj56789012345678901234567890123456789012345678901234
                    </cd>
                </content>
                <lifecycle>
                   <cd S="CD-LIFECYCLE" SV="1.0">prescribed</cd>
                </lifecycle>
                <quantity>
                   <decimal>1</decimal>
                </quantity>
                <posology>
                   <text L="nl">1x/d 7E voor het slapen</text>
                </posology>
             </item>
             <item>
                <id S="ID-KMEHR" SV="1.0">4</id>
                <cd S="CD-ITEM" SV="1.1">medication</cd>
                <content>
                   <medicinalproduct>
                      <intendedcd S="CD-DRUG-CNK" SV="2.0">1057959</intendedcd>
                      <intendedname>Spironolactone E.G. (c) 100mg</intendedname>
                   </medicinalproduct>
                </content>
                <content>
                    <cd SV="1.0" S="LOCAL" SL="SAMPROOF">
                           DeFk56789012345678901234567890123456789012345678901234
                    </cd>
                </content>
                <lifecycle>
                   <cd S="CD-LIFECYCLE" SV="1.0">prescribed</cd>
                </lifecycle>
                <quantity>
                   <decimal>1</decimal>
                </quantity>
                <frequency>
                   <periodicity>
                      <cd S="CD-PERIODICITY" SV="1.0">D</cd>
                   </periodicity>
                </frequency>
                <dayperiod>
                   <cd S="CD-DAYPERIOD" SV="1.0">morning</cd>
                </dayperiod>
                <posology>
                   <text L="nl">1x/d</text>
                </posology>
             </item>
          </heading>
       </transaction>
    </folder>
</kmehrmessage>
```

Example of a “product” medication item:

```
<item>
   <id SV="1.0" S="ID-KMEHR">1</id>
   <cd SV="1.2" S="CD-ITEM">medication</cd>
   <content>
      <medicinalproduct>
         <intendedcd SV="2010-07" S="CD-DRUG-CNK">1484229</intendedcd>
         <intendedname>panadol tab 50x 1 g</intendedname>
      </medicinalproduct>
```

```
        </content>
        ...
</item>
```

Example of a “substance” medication item:

```
<item>
        <id SV="1.0" S="ID-KMEHR">1</id>
        <cd SV="1.2" S="CD-ITEM">medication</cd>
        <content>
           <substanceproduct>
              <intendedcd SV="2010-07" S="CD-INNCLUSTER">8038747</intendedcd>
              <intendedname>paracetamol 1 g</intendedname>
           </substanceproduct>
        </content>
        ...
</item>
```

“Magistral prescription”: non-standardized (textual description):

```
<item>
        <id SV="1.0" S="ID-KMEHR">1</id>
        <cd SV="1.2" S="CD-ITEM">medication</cd>
        <content>
           <compoundprescription L="FR">Prescription magistrale</compoundprescription>
        </content>
        ...
</item>
```

2.3.3. CHECKING/SETTING THE AUTHOR OF THE PRESCRIPTION

The author of the prescription must correspond to the medical professional (doctor) prescribing the medication.

2.3.4. PRESCRIPTION TYPE

When the prescription software is creating a prescription, the attribute “prescription type” must be correctly defined.

Currently we have defined following 2 types of pharmaceutical prescriptions

- P0: Pharmaceutical prescription for non reimbursable product
- P1: Pharmaceutical prescription for reimbursable product

The software providers have to implement the distinction between P0 and P1.
This distinction can be made by looking at the SAMv2 database for the prescribed medication.

Sample data from SAMv2:

```
<Dmpp DeliveryEnvironment="P" Code="3606134" CodeType="CNK"
ProductId="o3P2mYhx6kGR94gZFFSiGyMjTF0Ja32OUCVz+jfwrxI=" StartDate="2019-12-17+01:00">
  <Price>2.6200</Price>
  <Reimbursable>false</Reimbursable>
</Dmpp>
```

In general is expected from software provider to implement a solution open to any future updates of this prescription type.

Note: this prescription type is important because it is used by the Recip-e system to define access rights for executors. The executor will only be able to read (decrypt) messages of types to which he has access. (e.g. a pharmacist has access to pharmaceutical prescriptions).

2.4. NOTIFICATION FORMAT

When a prescriber creates a complex prescription, he has the possibility to send a notification message to a specific executor containing indication regarding the content of the prescription to be prepared or ordered (however, a notification message does not guarantee that the patient will come to this dedicated pharmacy). The notification can also contain a copy of the prescription itself. The Notification message before encryption is a XML message that must be compliant with following description.

2.4.1. XSD VALIDATION

The File Notification.xsd describes the format of a notification.

Content of the file:

```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema"
xmlns:km="http://www.ehealth.fgov.be/standards/kmehr/schema/v1"
xmlns="http://services.recipe.be" targetNamespace="http://services.recipe.be">
    <xs:import namespace="http://www.ehealth.fgov.be/standards/kmehr/schema/v1"
    schemaLocation="../20100601-kmehr/ehealth-kmehr/XSD/kmehr_elements.xsd"/>
    <xs:element name="notification">
       <xs:complexType>
          <xs:sequence>
             <xs:element name="text" type="xs:string" maxOccurs="1" minOccurs="0"/>
             <xs:element name="kmehrmessage" type="km:kmehrmessageType" maxOccurs="1"
             minOccurs="0"/>
          </xs:sequence>
       </xs:complexType>
    </xs:element>
</xs:schema>
```

2.4.2. SAMPLE FILE

```
<?xml version="1.0" encoding="UTF-8"?>
<p:notification xmlns:p="http://services.recipe.be"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://services.recipe.be notification.xsd">
    <text>this is a notification</text>
    <kmehrmessage>[the Kmehr prescription]</kmehrmessage>
</p:notification>
```

2.5. FEEDBACK FORMAT

When requested by the prescriber, a Feedback may be sent back by the prescription executor (pharmacist) once prescription is delivered. The Feedback before encryption is a XML message that must be compliant with following description.

2.5.1. XSD VALIDATION

The File Feedback.xsd describes the format of a feedback.

Content of the file:

```
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema" xmlns="http://services.recipe.be"
targetNamespace="http://services.recipe.be">
    <xs:element name="feedback">
       <xs:complexType>
          <xs:sequence>
             <xs:element name="text" type="xs:string" maxOccurs="1"/>
          </xs:sequence>
       </xs:complexType>
    </xs:element>
</xs:schema>
```

2.5.2. SAMPLE FILE

```
<?xml version="1.0" encoding="UTF-8"?>
<p:feedback xmlns:p="http://services.recipe.be" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance" xsi:schemaLocation="http://services.recipe.be feedback.xsd">
    <text>this is a feedback</text>
</p:feedback>
```

2.6. BARCODE SPECIFICATION

On top of the prescription, a new barcode will be found that contains the Recip-e ID of the prescription. This barcode needs to be compatible with the current barcode readers found in pharmacies.

2.6.1. FORMAT RECIP-ID

The Recip-ID (or RID) has format BEPPXXXXXXXX where

- BE is a 2-character alphanumerical id that stands for the country (BE = Belgium)
- P[01] is a 2-character alphanumerical id that stands for the type of prescription (allowed values are P0, P1). Refer to section Prescription types for more informationXXXXXXXX an 8-character alphanumerical sequence ID

The alphanumerical characters can be numbers or uppercase letters:

- Possible characters are 0123456789ABCDEFGHKLMNPRSTVWXYZ
- Due to possible ambiguity letters O, Q, I, J, U and V are not used

The Recip-ID will be provided by eHealth during the creation of a prescription.

2.6.2. FORMAT BARCODE

The 128A format is used for the barcode. The barcode symbology is specified in ISO/IEC 15417:2007

Example:

2.7. PRINT PRESCRIPTION (FOR PRESCRIBERS)

2.7.1. BARCODE

The Prescription software must print the prescription ID as a barcode on the paper “proof of electronic prescription”. The proof of prescription layout is defined on the INAMI/RIZIV website and is shown below.

With the mandatory use of Kmehr 1.28 the “Einddatum van uitvoerbaarheid” or “Date de fin pour l’exécution” should mention the same date as the KMEHR element <expirationdate>, by default (when the prescriber does not change this): the creation date + 3 months – 1 day.
When the prescriber desires another expiration date (between 1 day and 1 year, starting at the day of creation of the prescription), then this date must be filled-in on the electronic prescription’s header, in the KMEHR message element <expirationdate> and on the “proof of electronic prescription”.

The print quality of the barcode must be compliant with the ISO15416 specification (Bar Code Print Quality Guideline: this specification describes requirement in term of quiet zones, reflectance, contrast, …).

PREUVE DE PRESCRIPTION ÉLECTRONIQUE

Veuillez présenter ce document à votre pharmacien pour scanner le code-barres et vous délivrer les médicaments prescrits.

Prescripteur Prénom Nom
Nr INAMI 01234567890

Bénéficiaire Prénom Nom
Nr NISS 01234567890

Contenu de la prescription électronique

paracétamol 1 g comprimé effervescent (or.)
1x/jour
date de début de traitement: 25/09/2021

Attention: aucun ajout manuscrit à ce document ne sera pris en compte.

Date: 20/09/2021

Date de fin pour l'exécution: 19/12/2021

BEWIJS VAN ELEKTRONISCH VOORSCHRIFT

Gelieve dit document voor te leggen aan uw apotheker om de barcode te scannen en de voorgeschreven geneesmiddelen af te leveren.

Voorschrijver Voornaam Naam
RIZIV nr 01234567890

Rechthebbende Voornaam Naam
INSZ nr 01234567890

Inhoud van het elektronisch voorschrift

paracetamol 1 g bruistablet (or.)
1x/dag
startdatum van de behandeling: 25/09/2021

Opgelet: met manuele toevoegingen op dit document zal geen rekening gehouden worden

Datum: 20/09/2021

Einddatum van de uitvoerbaarheid: 19/12/2021

2.7.2. MEDICATIONS

For the dematerialization phase of Recip-e, only 1 item prescriptions are allowed.

Exception to this rule are documented in the package and can be found in document “Recip-e 1-item list information.pdf”

2.8. AUTHENTICATION AND AUTHORIZATION

The Recip-e services are exposed via eHealth-platform and the general principles and standards used for accessing eHealth-platform services are followed. This implies that the secure Recip-e services require a valid SAML-token provided by the Secure Token Service (STS) of eHealth-platform.

In this document, what is named the “session” is in practice a SAML token generated by eHealth-platform STS. Once obtained by the care provider, this token allows calling each one of the Recip-e services (and other eHealth services). The validity of this token is limited in time, after expiration the SAML-token will not be accepted and a new token should be requested via STS.

More information on how to obtain a SAML-token via the Secure Token Service (STS) of eHealth-platform can be found on the eHealth-platform website:

- NL: https://www.ehealth.fgov.be/nl/support/sts-secure-token-service
- FR: https://www.ehealth.fgov.be/fr/support/sts-secure-token-service

2.8.1. SPECIFICATIONS OF THE REQUIRED SAML-TOKEN FOR HOSPITALS (DELIVERED BY THE SECURE TOKEN SERVICE (STS) OF EHEALTH-PLATFORM)

The SAML-token request is secured with the eHealth-platform certificate of the hospital. The certificate used by the Holder-Of-Key verification mechanism is the same eHealth certificate.

The required attributes are the following (Attribute namespace: "urn:be:fgov:identification-namespace"):

- The NIHII number of the hospital:
  - urn:be:fgov:ehealth:1.0:certificateholder:hospital:nihii-number
  - urn:be:fgov:ehealth:1.0:hospital:nihii-number

Hospital must also specify which information must be asserted by eHealth-platform (designators):

- The NIHII number as identifier of the hospital (Attribute namespace: urn:be:fgov:identificationnamespace):
  - urn:be:fgov:ehealth:1.0:certificateholder:hospital:nihii-number
  - urn:be:fgov:ehealth:1.0:hospital:nihii-number
- To have access to the eHealth consent web service, the hospital must be a recognized hospital (Attribute Namespace: urn:be:fgov:certified-namespace:ehealth):
  - urn:be:fgov:ehealth:1.0:certificateholder:hospital:nihii-number:recognisedhospital:Boolean
  - urn:be:fgov:ehealth:1.0:hospital:nihii-number:recognisedhospital:Boolean

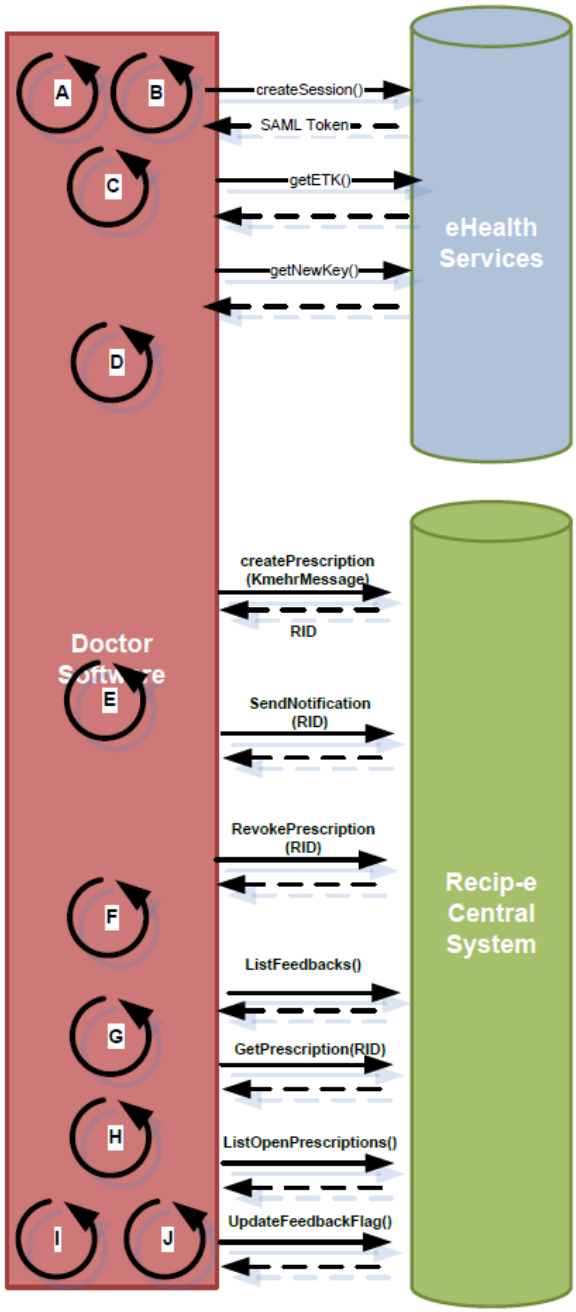
Please note that the certificate used for signing the prescription (encryption for storage) must be identical to the certificate used as Holder of Key certificate in the SAML-token.

3. INTEGRATION VIA THE RECIP-E WEBSERVICES (AS PRESCRIBER)

3.1. OVERVIEW

The section below describes the technical scope of the development work, concerning functionalities to foresee by the Software Provider in the software of the Software Provider to integrate with the Recip-e system and eHealth-platform for prescribers.

The figure below shows all the actions to be performed by the Software Provider's software and the way it is to be integrated with the Recip-e system.



The red rectangle represents the software of the Software Provider for Prescribers. The green/blue rectangle represents the Recip-e central system and eHealth-platform common services.

Two types of functionalities are considered:

- Communication functionality to be implemented by the Software Provider, based on this document: arrows between the green/blue and red rectangles
- Internal functionality within the Software Provider software: circle-arrows within the rectangle

Communication functionality

1. **Create Session (STS)**: Send a SAML request to eHealth and receive a SAML token.
2. **Encryption Key Retrieval for addressed encryption (ETK Depot)**: retrieve encryption keys in ETK depot of messages recipient.
3. **Encryption Key Generation (KGSS)**: request encryption keys.
4. **Create Prescription**: Send a prescription to the Recip-e Integration module. The software receives in return the RID (Recip-e ID). The prescriber can decide if want to get a feedback from the executor.
5. **Send Notification**: The prescriber has the option to send a prescription directly to an executor. This could for instance contain a prescription to prepare or a personal message
6. **List Feedback**: Ask for feedback sent by executor. In return the software receives all feedbacks addressed to him.
7. **Revoke Prescription**: If the prescriber chooses so, he can revoke/cancel a prescription. The cancellation of a prescription by the prescriber should be communicated to the Recip-e system. The cancellation request is sent to the module with the Recip-e unique identification number (RID). The prescriber receives a confirmation that the prescription has been cancelled.
8. **List Open Prescriptions**: The Software Provider software requests an update from the Recip-e central system concerning the status of its prescriptions. It gets returned a list of prescription with their status.
9. **Get Prescription**: The Software Provider can retrieve prescription previously created.
10. **Update Feedback Flag**: the software provider change the feedback flag set previously (Action 1)
11. Additional RECIP-E CALL (VISI-FLAG)

Internal functionality

A. Identify the patient through
   - the NISS/NISZ number found on the patients ID card
   - information on the patients mutuality sticker
   - directly into the system the executor (if the patient is already in the system)

B. Encrypt messages using addressed encryption framework provided by eHealth

C. Encrypt/decrypt prescription using non-addressed encryption framework provided by eHealth

D. Use MyCareNet services such as patient insurability (this is currently not in scope of the integration specifications, but is included here for clarity sake)

E. Create a prescription in the Software Provider software and attach it to the patient record in the Software Provider software

F. Add the unique identification number (Recip-e ID) of the electronic prescription (received from Recip-e) to the prescription, and print the prescription with RID on it in barcode format

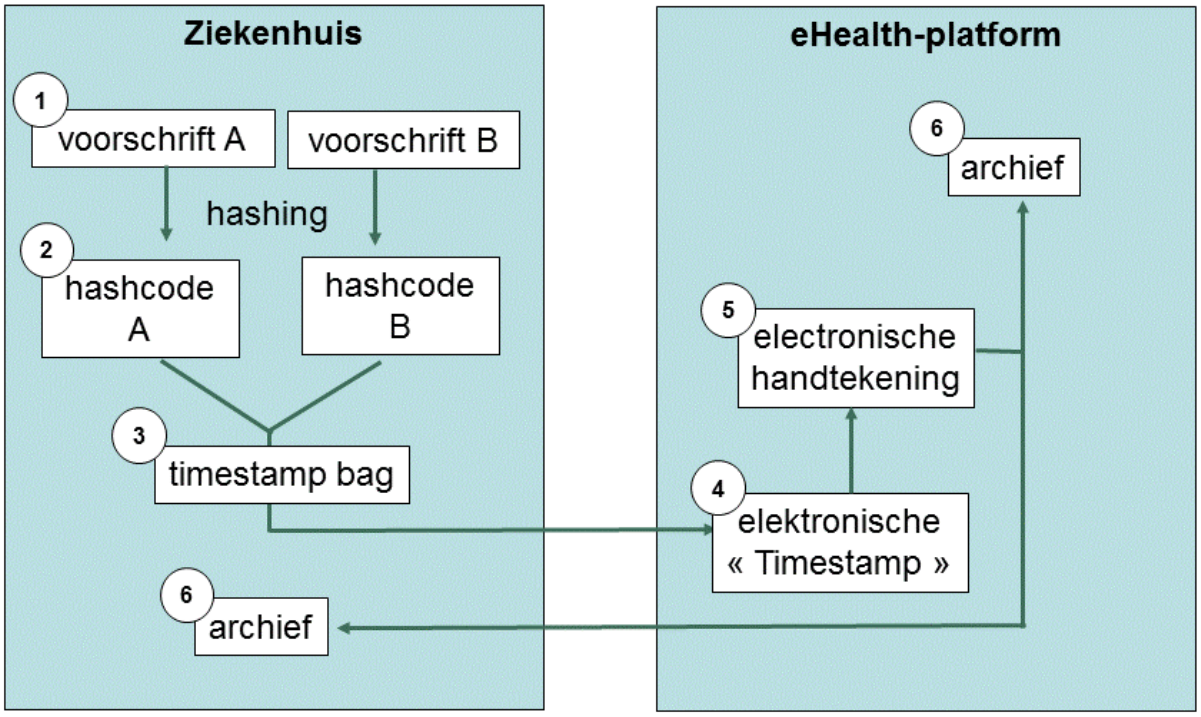
G. The prescriber has the option to send a message directly to an executor. This could for instance contain a prescription to prepare or a personal message. The Service Supplier software needs to allow the prescriber to input such a message

H. Insert the received feedback into the patient record in the Software Provider software

I. Cancel the prescription from the patient record in the Software Provider software (only when requested by the prescriber)

J. For performance reasons, the prescriptions and their status (in process, delivered ...) need to be stored in the Service Supplier software. The prescription status (and the content of the prescription) can be updated in batch mode (e.g. once a day).

Remark: hospitals are encouraged to use the eHealth-platform timestamping service to officially timestamp the (electronic) prescriptions.



3.2. IMPLEMENTATION DETAILS

3.2.1. AUTHENTICATION OF THE HOSPITAL

Authentication of the care provider (hospital) is performed by eHealth-platform thanks to the Secure Token Service (STS). This service takes as an input the hospitals eHealth-platform certificate to generate a SAML token that can be used for Single Sign On.

Please refer to section “2.8.1 ” of this document for more information about the required contents of the SAML token.

Once the SAML assertion is retrieved from STS, it must be added to the SOAP header of each outgoing message addressed to Recip-e. Refer to the document http://docs.oasis-open.org/wss/oasis-wss-saml-token-profile-1.0.pdf for more information about SAML and WS-Security.

3.2.2. MESSAGING AND ENCRYPTION

3.2.2.1. OVERVIEW OF MESSAGE CREATION

Health Care Software must communicate with Recip-e using message based communications. These messages must be highly secured with encryption. Three different types of encryption must be implemented:

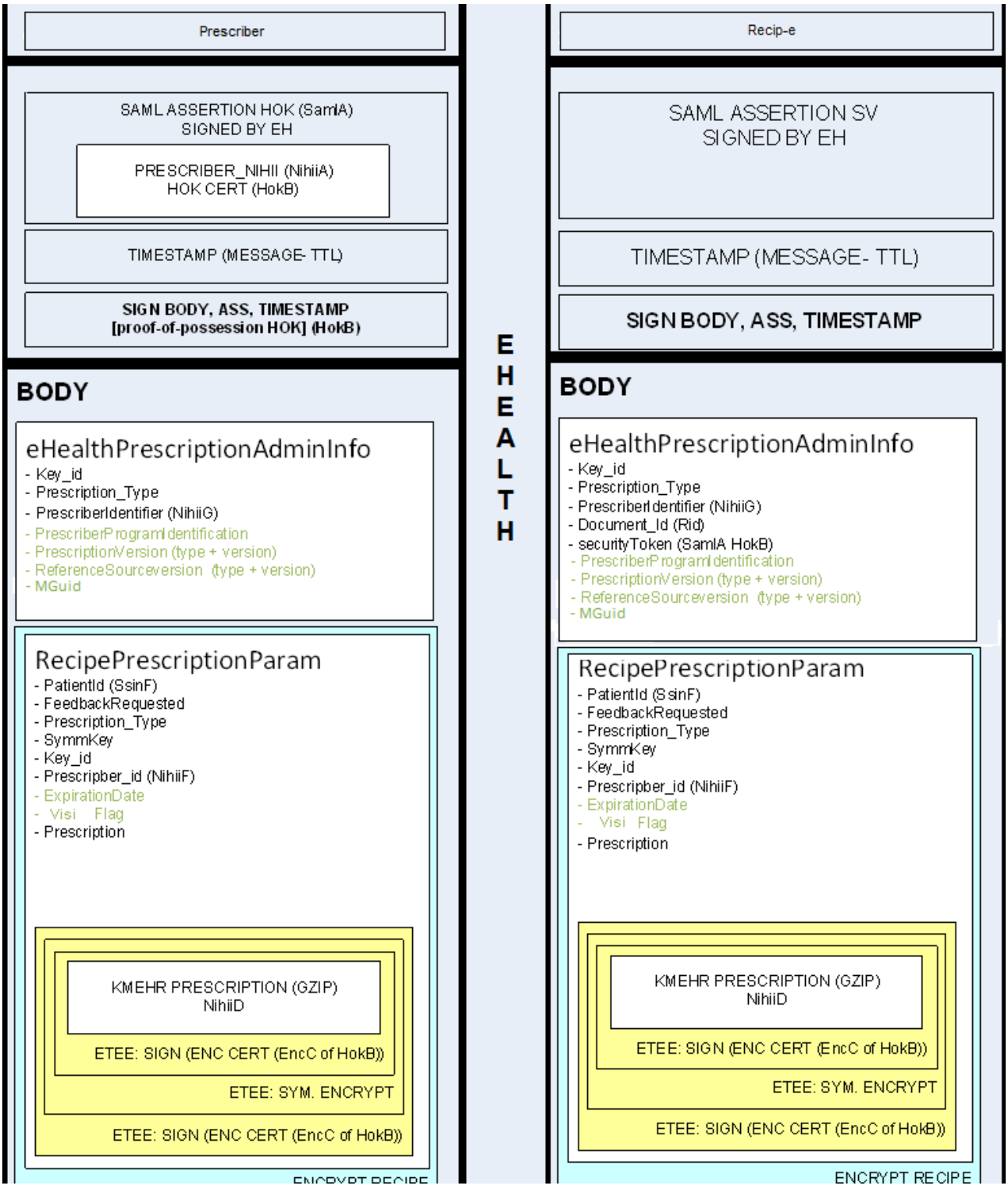
- **Encryption for transport**: this kind of encryption concerns all type of messages. This encryption is based

on the ETEE encryption framework provided by eHealth. It consists in encrypting the message so that only Recip-e can read it. This is based on Public key/Private key encryption.

- **Encryption for storage**: this encryption type is used to secure the storage of the message in Recip-e. Only allowed systems/recipients can decrypt these messages (Recip-e can't decrypt them), There is two type of storage encryption :
  - Non-addressed Encryption for Prescriptions: Prescriptions are encrypted using the non-addressed encryption framework.
  - Addressed Encryption for Feedbacks/Notifications: these messages are encrypted, only the recipient can encrypt the message.

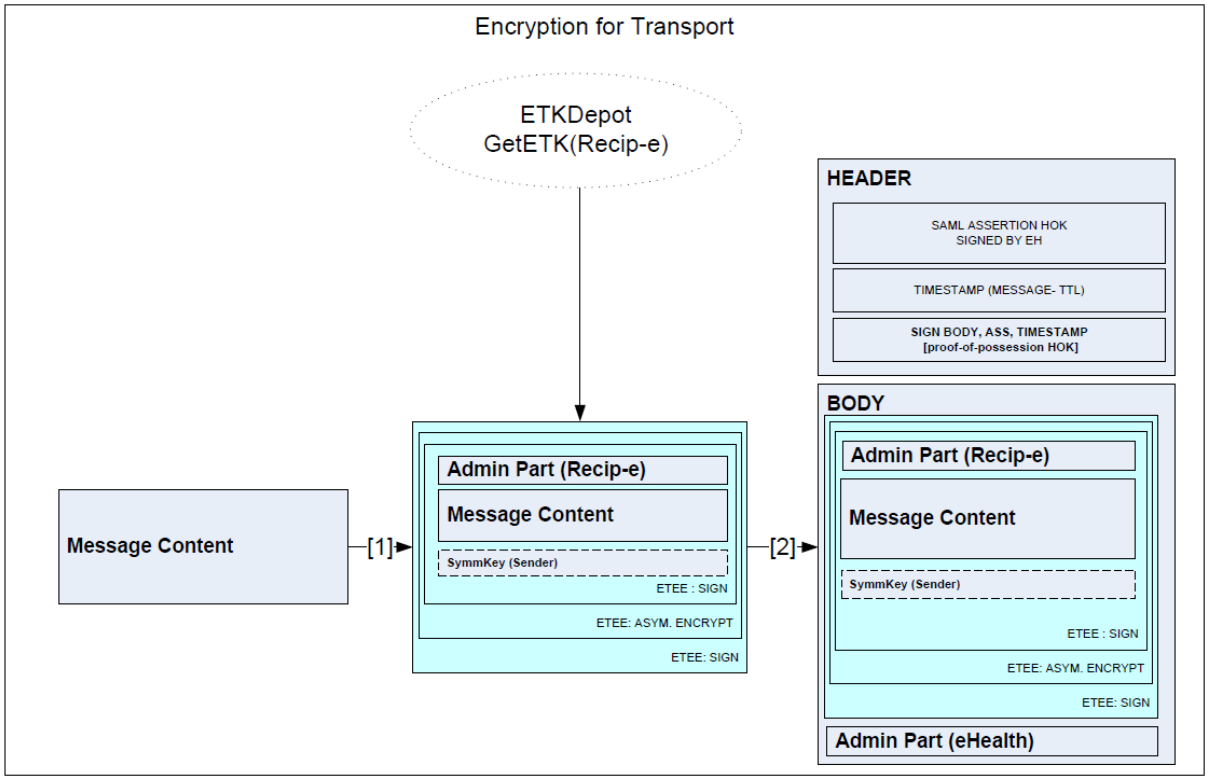
Please note that the certificate used for signing the prescription (encryption for storage) must be identical to the certificate used as Holder of Key certificate in the SAML-token.

The following section describes the different types of encryption needed to create messages in Recip-e. The steps to decrypt messages are identical (except the reverse order).


Prescriber
SAML ASSERTION HOK (SamlA)
SIGNED BY EH
PRESCRIBER_NIHII (NihiiA)
HOK CERT (HokB)
TIMESTAMP (MESSAGE- TTL)
SIGN BODY, ASS, TIMESTAMP
[proof-of-possession HOK] (HokB)
BODY
eHealthPrescriptionAdminInfo
- Key_id
- Prescription_Type
- PrescriberIdentifier (NihiiG)
- PrescriberProgramIdentification
- PrescriptionVersion (type + version)
- ReferenceSourceversion (type + version)
- MGuid
RecipePrescriptionParam
- PatientId (SsinF)
- FeedbackRequested
- Prescription_Type
- SymmKey
- Key_id
- Prescripber_id (NihiiF)
- ExpirationDate
- Visi Flag
- Prescription
KMEHR PRESCRIPTION (GZIP)
NihiiD
ETEE: SIGN (ENC CERT (EncC of HokB))
ETEE: SYM. ENCRYPT
ETEE: SIGN (ENC CERT (EncC of HokB))
ENCRYPT RECIPE
EHEALTH
Recip-e
SAML ASSERTION SV
SIGNED BY EH
TIMESTAMP (MESSAGE- TTL)
SIGN BODY, ASS, TIMESTAMP
BODY
eHealthPrescriptionAdminInfo
- Key_id
- Prescription_Type
- PrescriberIdentifier (NihiiG)
- Document_Id (Rid)
- securityToken (SamlA HokB)
- PrescriberProgramIdentification
- PrescriptionVersion (type + version)
- ReferenceSourceversion (type + version)
- MGuid
RecipePrescriptionParam
- PatientId (SsinF)
- FeedbackRequested
- Prescription_Type
- SymmKey
- Key_id
- Prescripber_id (NihiiF)
- ExpirationDate
- Visi Flag
- Prescription
KMEHR PRESCRIPTION (GZIP)
NihiiD
ETEE: SIGN (ENC CERT (EncC of HokB))
ETEE: SYM. ENCRYPT
ETEE: SIGN (ENC CERT (EncC of HokB))
ENCRYPT RECIPE

3.2.2.2. ENCRYPTION FOR TRANSPORT

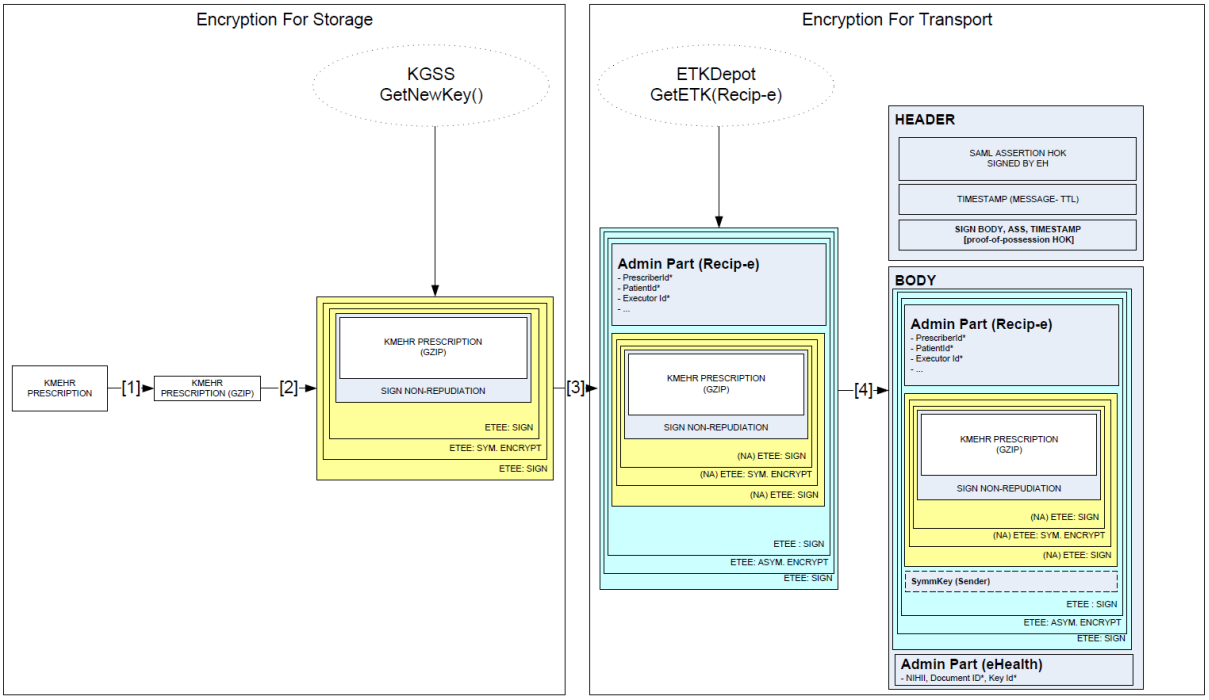
Following diagram illustrates the different steps of the transformation process to be implemented:



1. Message Content is encrypted using the public Key of Recipe (ETK: encryption token), this ETK is retrieved from eHealth service ETK depot.

2. Message is sent to Recip-e including a random SymmKey that only the sender knows. This SymmKey will be used by Recip-e to encrypt the response. This SymmKey should only be provided when a response is expected (optional for “void” API).

3.2.2.3. NON-ADDRESSED MESSAGE ENCRYPTION FOR STORAGE (ONLY FOR PRESCRIPTION)

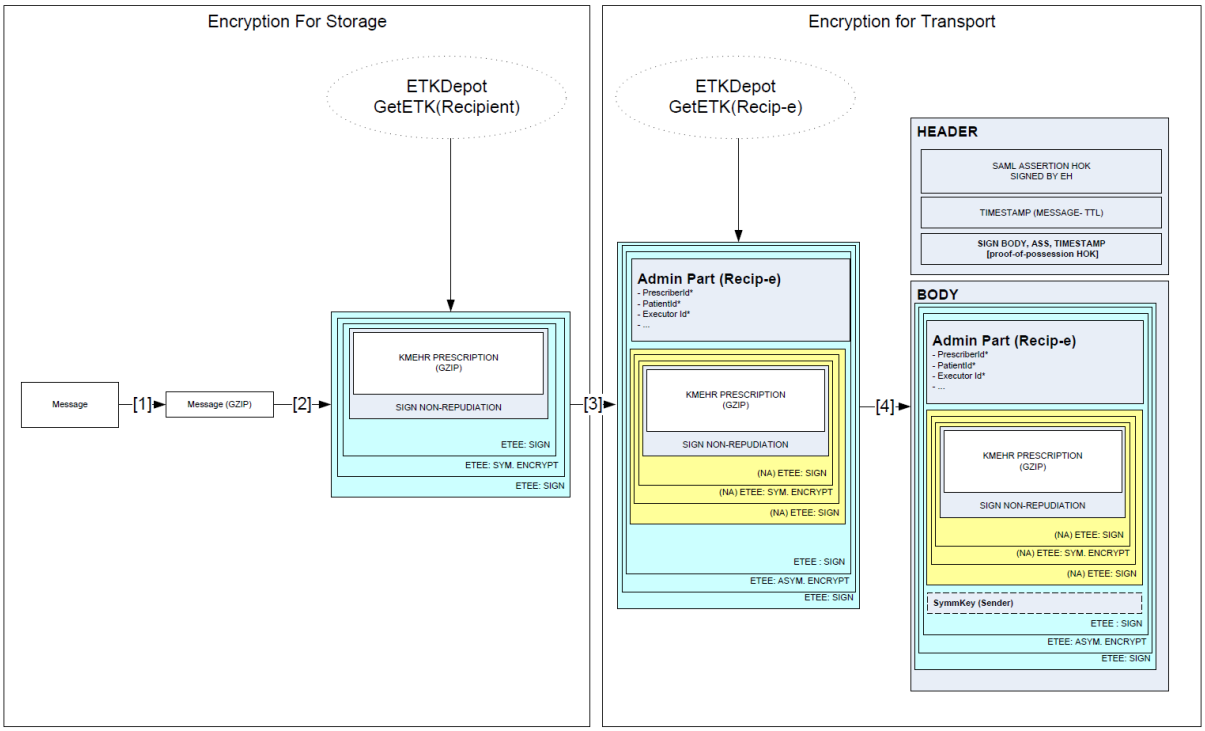


1. Private Message Content (KMEHR prescription) is compressed using GZIP algorithm

2. Private Message is sealed using non-addressed encryption, the symmetric encryption key is retrieved from eHealth service KGSS.get[New]Key(). (The message will be stored as-is by Recip-e)

3. The message is enriched with non-confidential data (patient ID, Prescriber ID), “Encryption for Transport” described in previous section is then applied to secure the data transfer between the care provider workstation and the Recip-e central server. The overall is then included in a SOAP message secured by SAML authentication.

3.2.2.4. ADDRESSED ENCRYPTION FOR STORAGE (ONLY FOR FEEDBACKS AND NOTIFICATIONS)



1. Private Message Content (xml) is compressed using GZIP algorithm (more details in section).

2. Private Message is sealed using addressed encryption, the public encryption key of the recipient is retrieved from eHealth service ETKdepot.getETK(). (The message will be stored as-is by Recip-e)

3. The message is enriched with non-confidential data (patient ID, Prescriber ID), “Encryption for Transport” described in previous section is then applied to secure the data transfer between the care provider workstation and the Recip-e central server. The overall is then included in a SOAP message secured by SAML authentication.

3.2.2.5. FOCUS ON COMPRESSION

To decrease bandwidth consumption, xml messages are compressed using GZIP standard. (Only XML KMEHR prescription, XML notification & XML feedbacks are concerned).

Following Java code illustrates how the message must be compressed:

```
import java.util.zip.GZIPOutputStream;

public static byte[] compress(byte[] input) throws Exception {
    ByteArrayOutputStream outstream = new ByteArrayOutputStream();
    GZIPOutputStream out = new GZIPOutputStream(outstream);
    out.write(input);
    return outstream.toByteArray();
}
```

This compression is specified by standards RFC 1950; RFC 1951 and RFC 1952 (Refer to http://www.ietf.org/ for more information about these specifications).

3.2.2.6. FOCUS ON NA ENCRYPTION

See Ref 2 for generic information about NA Encryption.

As defined in previous mentioned document, the Process for NA Encryption is defined as follow:

1. The ETK (public Key) of KGSS system is retrieved from ETK depot (Key Id “CBE=0809394427”, Application ID : “KGSS”)
2. The New Key Request is created defining the Access Control List
3. The New Key Request is sealed using addressed encryption (public key of KGSS used)
4. The KGSS.GetNewKey() service is invoked

In the Recip-e specific case, the Access Control List (AllowedReader attribute of the GetNewKeyRequestContent message) must be defined as an Encrypted XML document. Only those three types of parties must be defined in the Access Control List:

- The Prescriber (prescribing doctor and/or hospital)
- The Patient
- All the Pharmacists (for “pharmaceutical” prescriptions).

(This list is used later on to allow a physical person reading the content of a prescription)

Sample Access Control List before encryption (**to be replaced with correct values based on the actual prescription**):

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<getNewKeyRequestContent xmlns:ns2="urn:be:fgov:ehealth:etee:kgss:1_0:protocol">
    <AllowedReader>
        <Namespace>urn:be:fgov:certifiednamespace:ehealth</Namespace>
        <Name>urn:be:fgov:person:ssin:ehealth:1.0:doctor:nihii11</Name>
        <Value/>
    </AllowedReader>
    <AllowedReader>
        <Namespace>urn:be:fgov:certifiednamespace:ehealth</Namespace>
        <Name>urn:be:fgov:ehealth:1.0:pharmacy:nihiinumber:recognisedpharmacy:boolean</Name>
        <Value>true</Value><
    /AllowedReader>
    <AllowedReader>
        <Namespace>urn:be:fgov:identificationnamespace</Namespace>
        <Name>urn:be:fgov:person:ssin</Name>
        <Value>72081061175</Value>
    </AllowedReader>
    <AllowedReader>
        <Namespace>urn:be:fgov:certified-namespace:ehealth</Namespace>
        <Name>urn:be:fgov:ehealth:1.0:hospital:nihii-number:recognisedhospital:boolean
        </Name>
        <Value>true</Value>
    </AllowedReader>
    <AllowedReader>
        <Namespace>urn:be:fgov:identification-namespace</Namespace>
        <Name>urn:be:fgov:ehealth:1.0:hospital:nihii-number</Name>
        <Value/></AllowedReader>
        <symmKey>[base64 symmKey]</symmKey>
</getNewKeyRequestContent>
```

3.2.2.7. FOCUS ON END TO END ENCRYPTION

See Ref 3 for generic information about end to end (ETE) encryption.

As defined in previous mentioned document, the process for ETE Encryption follows three steps:

1. The Public Key (ETK) of Recip-e is retrieved from ETK depot. (This step can pre-fetch, result can be cached)
2. The message is sealed using the Recip-e ETK
3. The Recip-e createPrescription() service is invoked

Recip-e ETK is retrieved from ETKDepot using KeyID “CBE=0823257311”.

Addressed encryption process has to be applied to all outgoing messages addressed to Recip-e. To allow Recip-e to unseal the message, the ETK (signed public key) of the care provider must be attached to the message (only if a response from Recip-e is expected).

That is why all messages addressed to recipe defined in the WSDL have the same structure:

- Request Message
  - SealedContent : the crypt request
  - ETK : the Encryption Token of the sender to be used by Recip-e to encipher the message

- Response Message
  - SealedContent: the crypt response (to be decrypted).

3.2.3. PRESCRIBER WEB SERVICES

The Recip-e Prescriber web service is described in a WSDL and XML schema. All required information, including the service URL is available via the eHealth-platform registry.

More information related to the eHealth-platform service registry is available on their website:

https://www.ehealth.fgov.be/ehealthplatform/nl/service-registry

The following links can be used to access the registry in the acceptance and production environment directly:

- Acceptance: https://services-acpt.ehealth.fgov.be/registry/uddi/bsc/web
- Production: https://services.ehealth.fgov.be/registry/uddi/bsc/web

The Recip-e prescriber service is known as “Recip-ePrescriber v4” in the registry.

Please note that the web service URL differs between the acceptance and production environment.

3.2.4. ERROR MANAGEMENT

Each service may throw different type of error. The two types are:

- Business error for Functional Exception : indicates a functional error (such as missing information)
- SOAP Fault for Technical Exception: indicates a technical error due to the infrastructure (such as database unavailable, communication protocol issue).

For more information about SOAP Fault, please refer to http://www.w3.org/TR/soap12-part1/#soapfault

Sample Business error:

```
<?xml version="1.0" encoding="UTF-8"?>
<n1:AliveCheckResponse xmlns:n1="urn:be:fgov:ehealth:recipe:protocol:v1"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="urn:be:fgov:ehealth:recipe:protocol:v1 ..\ehealth-recipe-
services\XSD\recipeservices_protocol-1_0.xsd">
    <Status>
       <Code>500</Code>
       <Message Lang=”FR”>Erreur inattendue</Message>
       <Message Lang=”EN”>Unexpected error</Message>
    </Status>
</n1:AliveCheckResponse>
```

The message part contains the reference to the error message.

The label associated to the error message is also added in the detail of the fault in 4 languages (En, Fr, Nl, and Ge). The software provider can then choose the appropriate language for the error message.

3.2.5. USE OF EHEALTH-PLATFORM SERVICES

As described throughout this document, several eHealth-platform services must be integrated by the client software, e.g. Secure Token Service, ETK depot and KGSS. Detailed information related to these services is provided by eHealth-platform and might be available via the eHealth Technical Connector.

- **Secure Token Service (STS)**
  - NL: https://www.ehealth.fgov.be/nl/support/sts-secure-token-service
  - FR: https://www.ehealth.fgov.be/fr/support/sts-secure-token-service

- **ETK Depot and KGSS**
  - NL: https://www.ehealth.fgov.be/nl/support/basisdiensten/systeem-voor-end-end-vercijfering
  - FR: https://www.ehealth.fgov.be/fr/support/services-de-base/systeme-de-cryptage-end-to-end

3.3. SERVICE INVENTORY

This section lists all available services and operations as provided for prescribers. For each operation, the section “Implementation specification” details the different implementation steps.

Inputs/Outputs are also described for each service:

- Input XML of the WS (Crypt Part of the message - Before Encryption process): corresponds to the XML message to be generated before the encryption process.
- Output XML of the WS (Encrypted Part of the message - After decryption process): corresponds to the output that the Health Care Software will receive after decryption of the message.

3.3.1. ADMINISTRATIVE INFORMATION

Several requests should contain an AdministrativeInformation part next to the crypted content. This administrative part will be described for each operation (if applicable).

Example:

```
<xs:complexType name="CreatePrescriptionRequestType">
    <xs:complexContent>
       <xs:extension base="protocol:RequestType">
          <xs:sequence>
             <xs:element name="SecuredCreatePrescriptionRequest"
type="rc:SecuredContentType"/>
             <xs:element name="AdministrativeInformation"
             type="rc:CreatePrescriptionAdministrativeInformationType"/>
          </xs:sequence>
       </xs:extension>
    </xs:complexContent>
</xs:complexType>
```

3.3.2. PARTY IDENTIFICATION

Several outgoing messages addressed to Recip-e require an “IdentifierType” (i.e identification of a party) as part of the AdministrativeInformation, this should be defined as follows:

```
<xs:complexType name="IdentifierType">
    <xs:sequence>
```

```
        <xs:element name="Id" type="xs:string"/>
        <xs:element name="Type" type="xs:string"/>
        <xs:element name="SubType" type="xs:string" minOccurs="0"/>
    </xs:sequence>
</xs:complexType>
```

Where :

- Id is the unique identification number of the party
- Type is the type of the identification number (NIHII, SSIN)

This part of the message is used by eHealth for different purpose:

- Logging: the information is logged by eHealth.
- Orchestration: eHealth can start complex processing based on those IDs (such as retrieving patient insurability).

Even if that information is not mandatory, Software vendors are encouraged to fill in those IDs when the information is known (ex: patientId and prescriberId should be filled in for the message “createPrescription”).

3.3.3. PRESCRIBER SERVICE OPERATIONS

On overview of all the prescriber operations can be found in the Recip-e documentation package in the file Prescriber_Documentation_eHealth_API_v<date>.docx
This is always updated when new functions are added or changed.

4. APPENDIX: FREQUENTLY ASKED QUESTIONS

Following is a list of frequently asked questions concerning the implementation of the integration specifications and the use of the integration modules.

Question	Answer
Doesn’t it make more sense to add a string in front of the Recipe ID to indicate it is a Recip-e ID (instead of immediately beginning with BEP0 or BEP1)	This is currently not foreseen.
Which doctor id should we use, the one in the Kmehr message, or the one in the header?	The INAMI/RIZIV number
Is it possible to store more than one prescription in the same Kmehr message?	NO
Can e-health provide a service to get public keys of doctors?	Use the ETK depot service.
In the notification, do we have to encapsulate the full Kmehr message in notification xml message?	The field Is optional
The feedback is in text (without code CNK?). In our application, we need to flag delivered drugs. How can make something with text when receiving the feedback ?	The feedback is linked to the overall prescription. No link is foreseen with delivery items.

should the software provider maintain a list of executors (pharmacists) with correct IDs or are they available on e- Health?	Currently neither Recip-e nor e-Health provides a pharmacist inventory. So at this time, implement it in the software itself.
When do we need to signal the prescription as delivered? After one of the items has been delivered, or after all of the items have been delivered?	If 1 of the items is delivered, the complete prescription is considered as delivered, and the MarkAsDelivered functionality should be called.
Which encoding should be used?	All Recip-e messages (prescriptions, feedback and notifications) should use the UTF-8 encoding.