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Release Notes –Version 3.0.0

HL7Kit Pro Toolkit
10 April 2018

Summary

Number	Created on	Summary
		New features
1551	04/05/2016	DICOM to Database Mapping
1369	17/01/2017	Option to map ACK messages to DB
1381	26/02/2017	Support of SQLite Data Base in HL7Kit
1392	12/03/2017	New flow of "Insert to queue" triggers building/deleting
1486	30/05/2017	HL7 Service has new option to save all incoming messages in the pre-defined folder
1487	01/06/2017	Allow to build inbound mapping from existing HL7 message
1508	20/06/2017	User can mark specific mapping as "Disabled", HL7 Service will not process incoming messages if their mapping is disabled
1512	21/06/2017	User can add comments to each mapping rule in the HL7 Mapper
1595	24/08/2017	Interactive preview of the outbound message
14	15/11/2017	Visual representation of Foreign Keys in the tables view in the Mapper
47	19/03/2018	Evaluation mode changed from restricted-actions to time-limited (HL7Kit works with full functionality for one month)
53	29/03/2019	DICOM Mapping can be executed as part of the HL7Service
		Improvements
1415	09/04/2017	Button "Echo" added to DICOM application settings panel
1416	09/04/2017	Don't auto-start services after installation
1435	30/04/2017	Created SIUS12 HL7 Message (Notification of new appointment booking) Mapping. Rules added to built in mapping file
1507	20/06/2017	New structure of the mapping examples: all rules are included to the built-in file right under HL7Kit installation folder, example messages and read me files are in the "Examples" folder
1511	20/06/2017	If there is DB error while inbound/outbound test - text of the failed DB query is displayed in the error message
1602	06/09/2017	Option to disable Inbound thread or Outbound thread of HL7 service
1616	26/09/2017	New layout of HL7 service configuration
28	08/01/2018	DB creation script splitted into few files by functionality
30	22/01/2018	StudyUID is generated as standard DICOM value in the DicomDB_INSERT_MWL_TEST_DATA_SCRIPT.sql
42	24/02/2018	All configuration table values are available for editing on the control panel (not only Local AE Title and port)

		Bugs fixed
1165	10/05/2016	Entire XML was entered to DB with converted XML special characters
1248	29/06/2016	Worklist Manager crashed when started from HL7Kit Installation connected to existing MSSQL data base
1260	05/07/2016	Wrong error message if segment is missing in SegDefs file and message type is substitution (like "ADTA08;ADTA01")
1481	25/05/2017	When there's a parsing error and "log full text" is selected - entire message doesn't appear in the system log
1485	29/05/2017	HL7 Sender stuck when sent message is not parsed by the service
1528	28/06/2017	HL7 Mapper outbound test displayed an error result with no text if start point is not defined. Now outbound test is disabled until start point will be defined
1533	03/07/2017	Inbound test stuck after changing and saving setting in config screen of the HL7 Mapper
1568	23/07/2017	Everything/Awaiting status filters don't work in MWL Manager
1572	25/07/2017	Filtering on modality is not working in MWL Client
1576	29/07/2017	HL7 Runtime Configuration can't save main values if last attempt to start HL7 Service failed
1579	30/07/2017	Sending MPPS from MWL Client to DSRSVC fails when StudyInstanceUID is empty
1603	11/09/2017	Constant values and values from parent table are not inserted to second etc. child row while building outbound message
22	18/12/2017	Uninstall doesn't stop services and control panel
33	25/01/2018	Date/time format fixed in all CFIND and CMOVE Views (DICOM format: Date: YYYYMMDD Time: HHMMSS.TTT)
41	22/02/2018	Format "date" type as "yyyyMMdd" in outbound message (instead of "yyyyMMddHHmmss.fff")

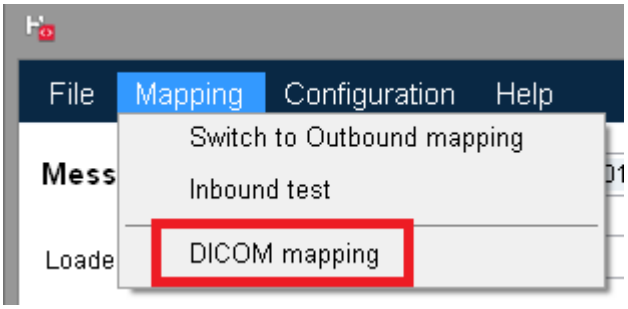
Detailed Release Notes

1551 – DICOM to Database Mapping

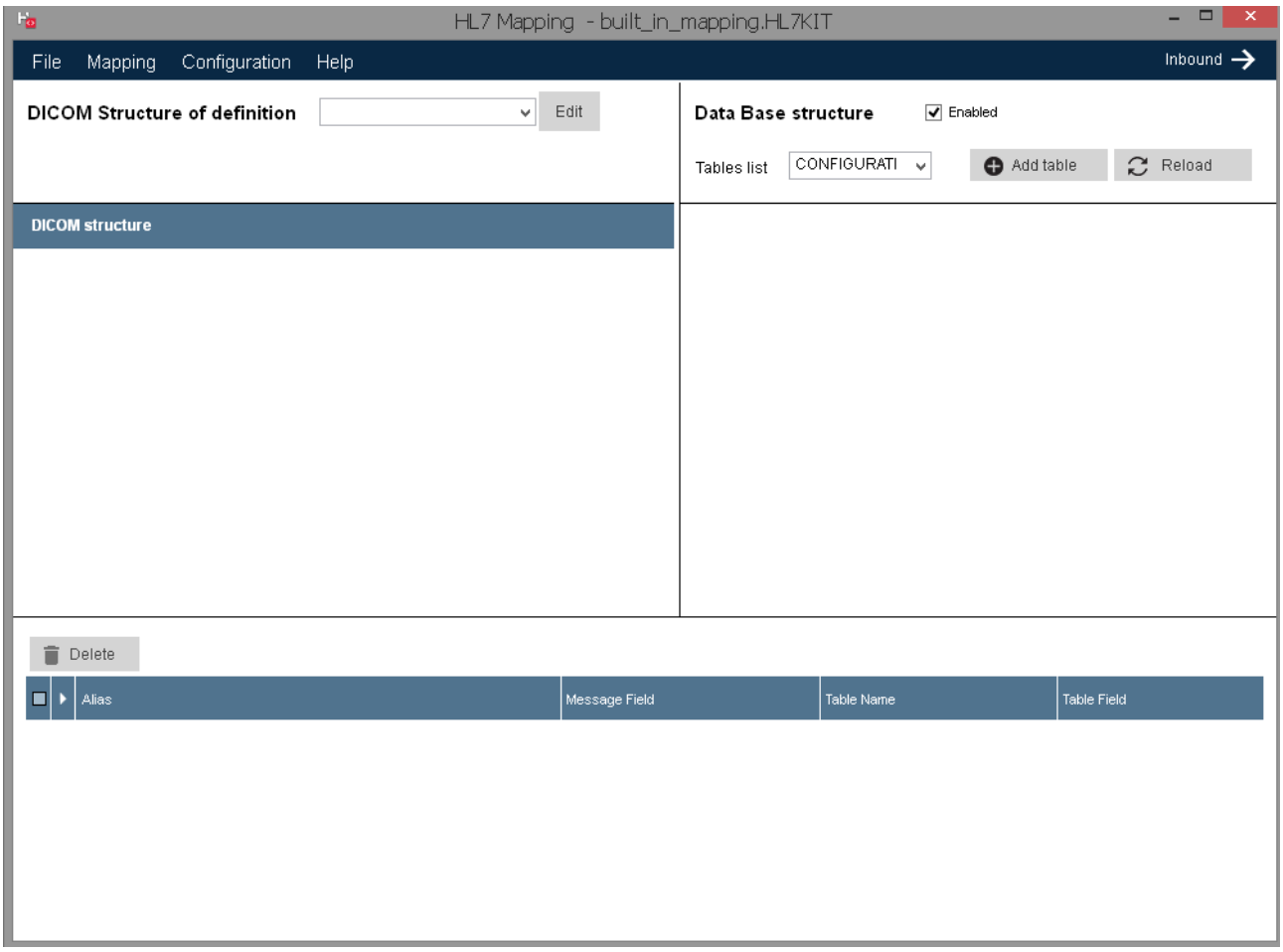
Hl7 Kit has now an option to proceed all DICOM files stored by DICOM server and insert extracted info into Data Base.

How to create DICOM mapping in the HL7 MAPPER application

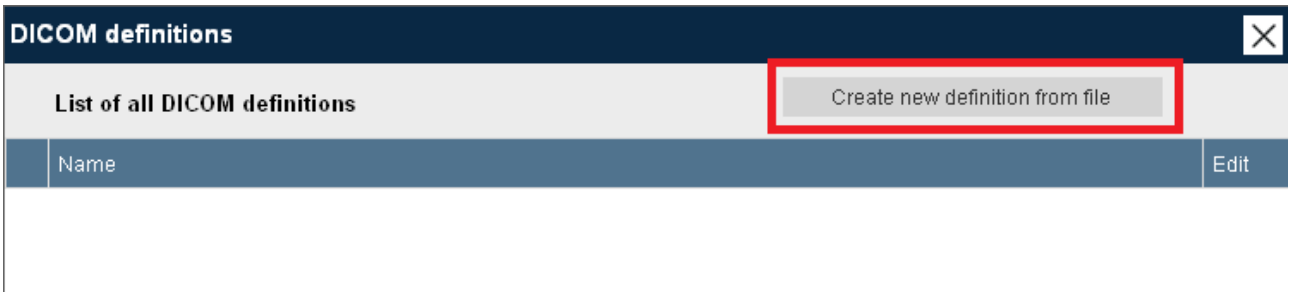
To switch from HL7 mapping to DICOM, click "DICOM mapping" menu:



Next screen will be opened

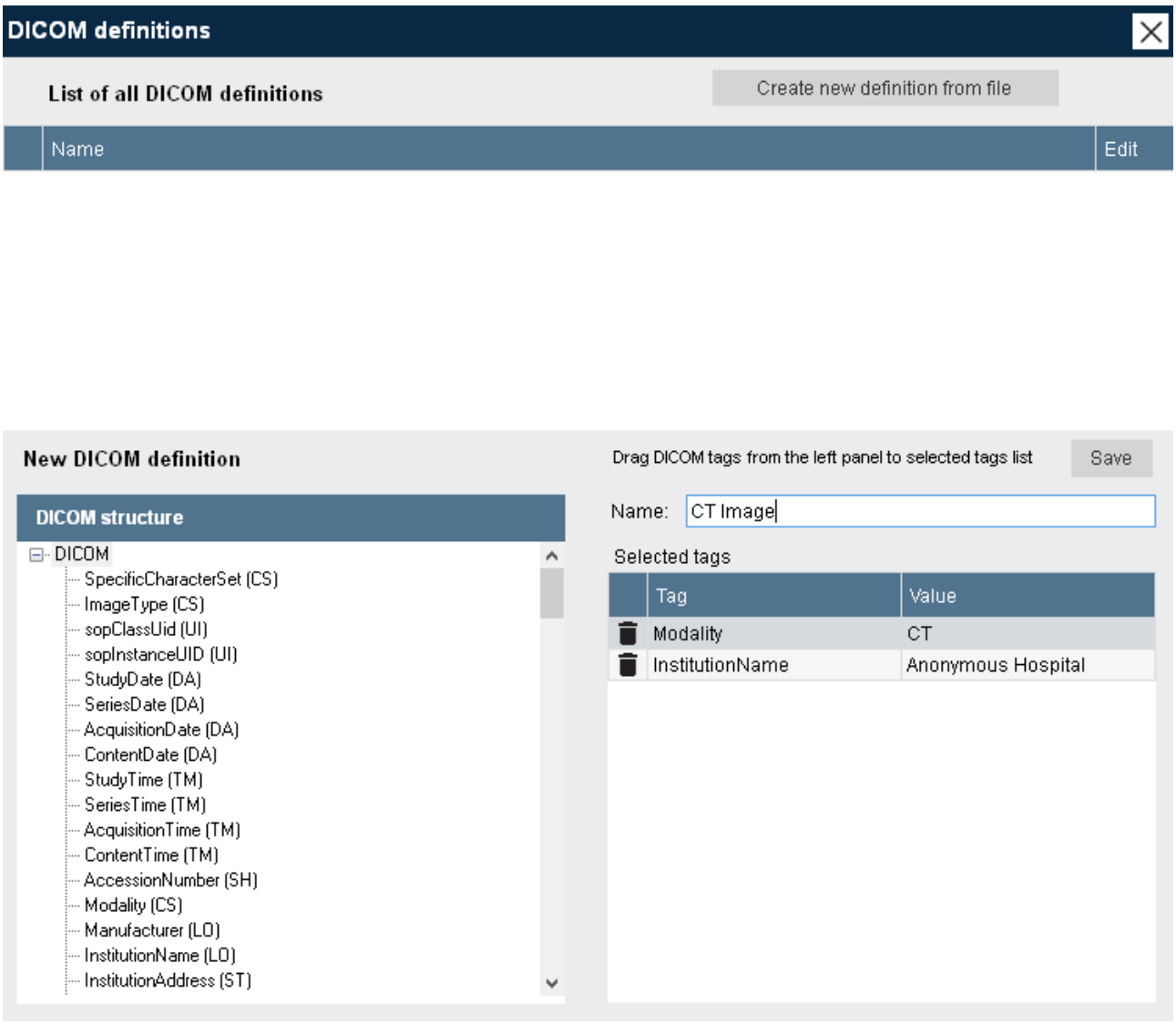


Click "Edit" to start DICOM definitions editing (screen allowing to define by what tags incoming DICOM file will be identified by mapping mechanism, similar to event type of HL7 message):



Click "Create new definition from file" to add new DICOM definition and select template DICOM file (one containing tags you want to use to identify all incoming DICOM files of one type, for example CT images or Structured Reports).
All tags will be displayed in the left panel. Drag-drop required tags to the right panel to add them to the list. Enter some meaningful name to display in the list of DICOM definitions on the main screen. Click "Save" to add it to the list of all definitions or just close the form.

NOTE: you can save definitions without any DICOM tag selected, but this definition will NOT be checked when identifying incoming DICOM file.



Saved definition will appear in the list. You can edit any existing definition (change name, add/remove fields) by clicking "Edit" in the grid row:

Template DICOM file will be copied into C:\HL7Kit\DICOMTemplates folder with name as "DICOMDefinition_1.dcm"

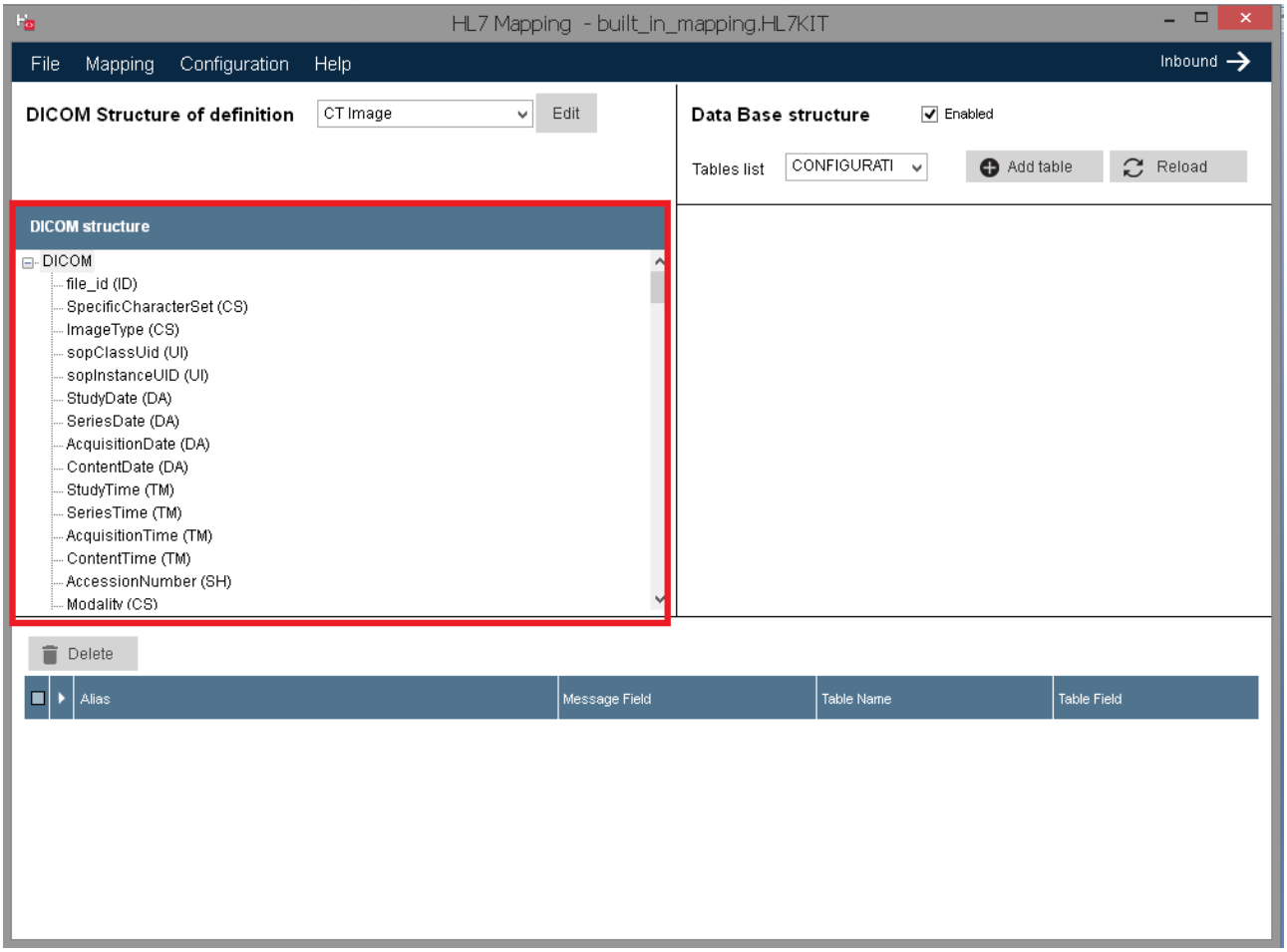
All DICOM definitions are stored in the file C:\HL7Kit\DICOMDefinitions.xml :

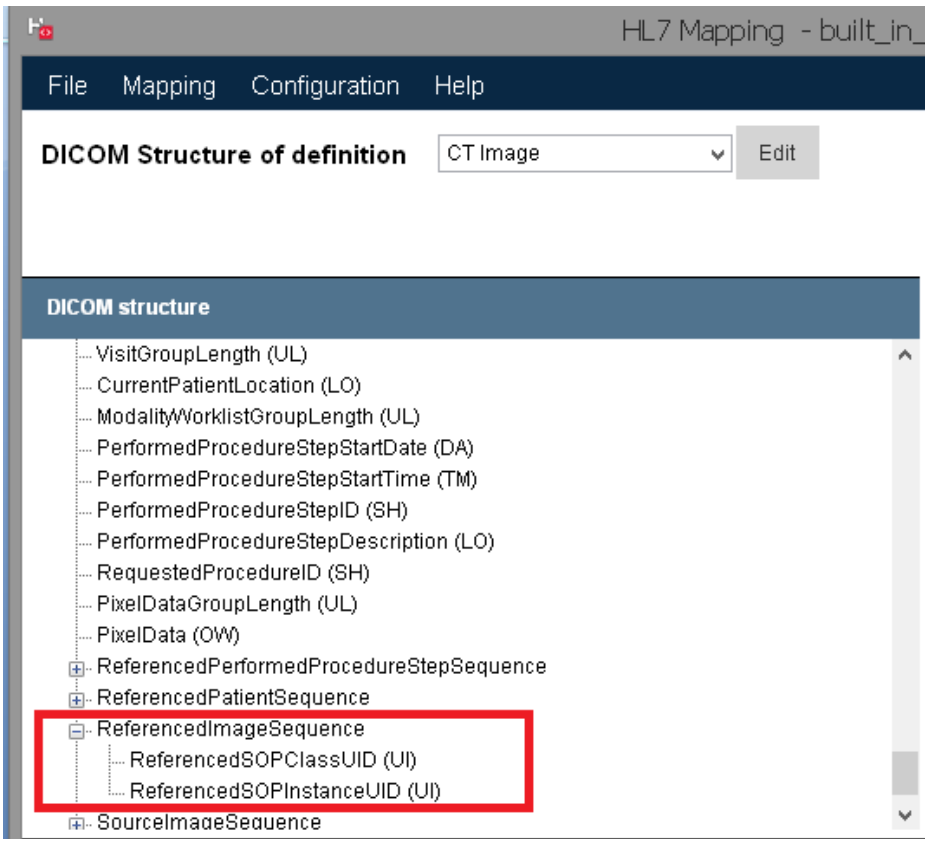
```
<DICOMDefinitions>
 <Definition>
  <ID>DICOMDefinition_1</ID>
```

```
<Name>CT Image</Name>
<PathToSource>C:\HL7Kit\DICOMTemplates\DICOMDefinition_1.dcm</PathToSource>
<Fields>
 <Field>
  <Tag>Modality</Tag>
  <Value>CT</Value>
 </Field>
 <Field>
  <Tag>InstitutionName</Tag>
  <Value>Anonymous Hospital</Value>
 </Field>
</Fields>
```

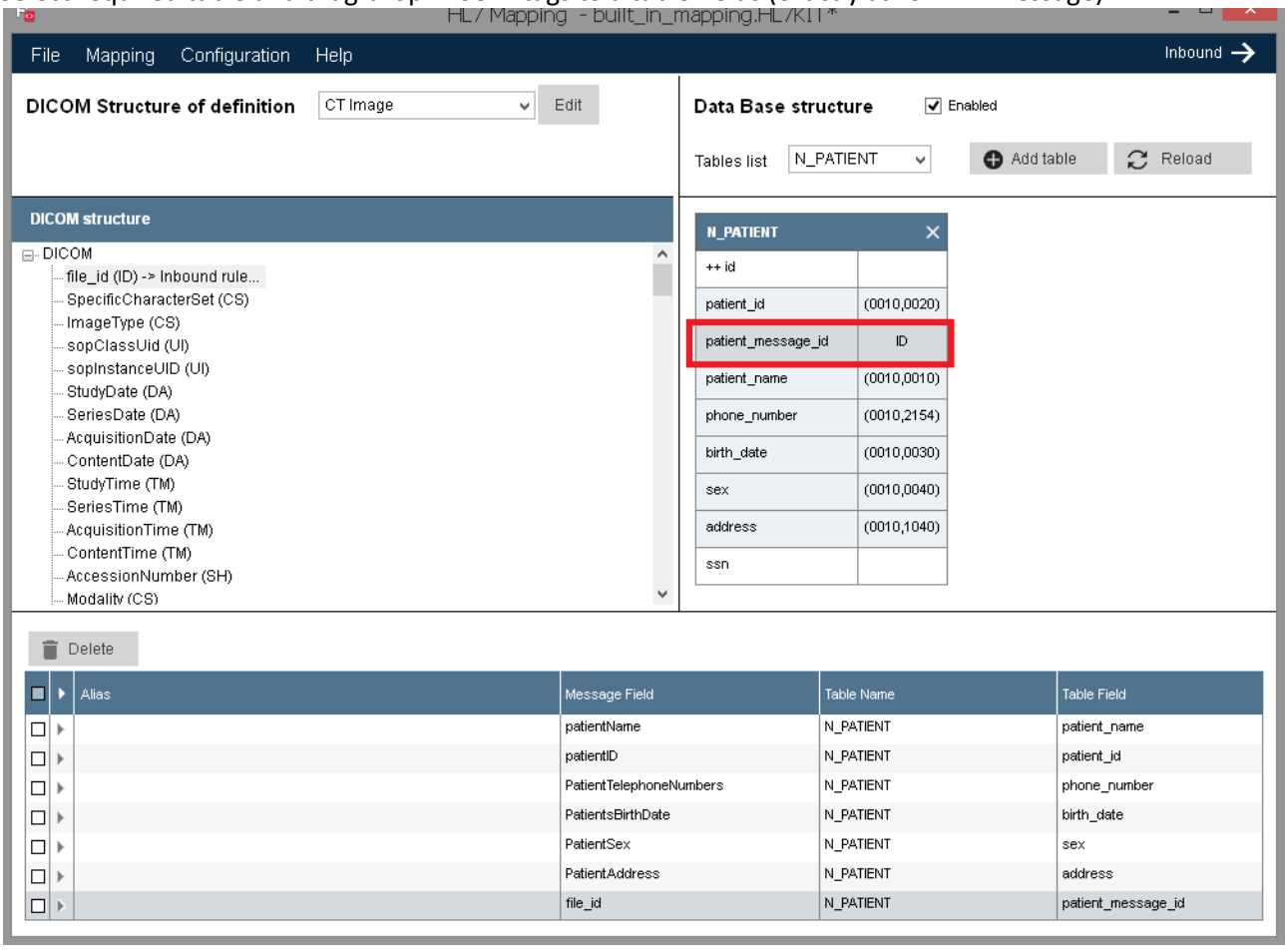
To delete definition - click "X" button in the grid row.

Click on "Close" to return to the main screen, new definition will appear in the list and all tags from the template DICOM file will be loaded to "DICOM structure" tree view (including sequences which are used as aliases of the HL7 messages)





Select required table and drag-drop DICOM tags to a table fields (exactly as for HL7 message):



NOTE: "file_id" of the DICOM structure is not real DICOM tag but value of the "file_id" field from the row of DICOM_FILES table (or id field of MPPS table and so on) .
If you want to connect your custom table to the DICOM_FILES table filled by DICOM server - map first node of the DICOM tree (file_id which is values of the PK field of the DICOM_FILES) into corresponding column of your table.

Mapping will be saved in the file (for example default built_in_mapping.HL7KIT) as:

```
  <DICOMDefinition_1 Response="">
    <Rule MsgAlias="" MsgSegment="" MsgField="file_id" SeqNum="-1001" Component="-1" Repetition="-1" SubComponent="-1" TblName="CTImages" TblField="file_id" />
    <Rule MsgAlias="" MsgSegment="" MsgField="sopInstanceUID" SeqNum="524312" Component="-1" Repetition="-1" SubComponent="-1" TblName="CTImages" TblField="sopInstanceUID" />
    <Rule MsgAlias="" MsgSegment="" MsgField="InstanceNumber" SeqNum="2097171" Component="-1" Repetition="-1" SubComponent="-1" TblName="CTImages" TblField="InstanceNumber" />
    <Rule MsgAlias="" MsgSegment="" MsgField="ImagePositionPatient" SeqNum="2097202" Component="-1" Repetition="-1" SubComponent="-1" TblName="CTImages" TblField="ImagePositionPatient" />
    <Rule MsgAlias="" MsgSegment="" MsgField="ImageOrientationPatient" SeqNum="2097207" Component="-1" Repetition="-1" SubComponent="-1" TblName="CTImages" TblField="ImageOrientationPatient" />
  </DICOMDefinition_1>
```

where name of the node (DICOMDefinition_1) is ID from the DICOMDefinitions.xml

How to process DICOM files received by DSRSVC

If you intend to use existing DataBase (default RZ_DICOM_HL7 for example) you need to run SQL script Update_06_21_2016.sql (it adds new "Mapping_state" column to DICOM_FILES and MPPS tables and inserts new value to CONFIGURATION table):

	MaxDICOMFilesToMap	100	How many DICOM files to insert into DB on one pass
	port	104	Listener port
	retry_seconds	180	The number of seconds to wait before retrying a failed task
	root_dir	\DSRSVC	Working file system directory
	scm_max_retry	3	The maximum number of retries for sending back commit responses

There is new console DICOMMapper application in the HL7 Kit installation folder. Its config file contains connection string to DB and path to mapping file which will be updated automatically when you define correspondent properties on HL7 Runtime Configuration panel. But they also can be changed manually if for example you want to use separate mapping files for HL7 service and DICOM files processing. Just open DICOMMapper.exe.config in the Notepad and change path to mapping file in the:

```
 <appSettings>
  <add key="MappingXMLName" value="built_in_mapping.HL7KIT"/>
 </appSettings>
```

Config file also contains list of all tables containing info about DICOM files which will be proccessed by DICOMMapper. By default this list includes DICOM_FILES table as "active" and MPPS table as "not active":

```
 <TablesToScan>
  <tables>
   <add TableName="DICOM_FILES" IDField="file_id" StatusField="mapping_state" RelPathField="rel_path" />
```

```
    <!--<add TableName="MPPS" IDField="id" StatusField="mapping_state" RelPathField="rel_path" />-->
  </tables>
 </TablesToScan>
```

If you want to proccess MPPS table too - just remove "<!--" and "-->"

You can add any other table which has unique ID field, integer field for storing mapping state (initial value must be 0) and field containing relative path to a DICOM file inside folder defined in CONFIGURATION table as "root_dir"

To process all new rows in all tables - run DICOMMapper.exe (recommended way to do it - add DICOMMapper to the system scheduler). All rows from each table with mapping_state value 0 (ready for mapping) will be processed: DICOM files will be opened and checked against all DICOM definitions defined in Mapper. If DICOM file contains all tags of the definitions and values of these tags are the same - application will search for found definition in the selected mapping file. If mapping is found - all tags from DICOM files defined in the mapping rules will be inserted to the correspondent tables.

After all new rows are processed corresponding value in the CONFIGURATION table will be updated so next time only rows added after last processed file will be fetched:

EVGENIA\SQ...NFIGURATION

Key	Value	Description
ae_title	DSRSVC	Local ae title
dicom_log	0	When this value is 1, detailed logging is on
DM_DICOM_FILES_last_id	367	Last ID proccessed by DICOM mapper
DM_MPPS_last_id	8	Last ID proccessed by DICOM mapper
MaxDICOMFilesToMap	100	How many DICOM files to insert into DB on one pass
port	104	Listener port
retry_seconds	180	The number of seconds to wait before retrying a failed task
root_dir	\DSRSVC	Working file system directory
scm_max_retry	3	The maximum number of retries for sending back commit responses

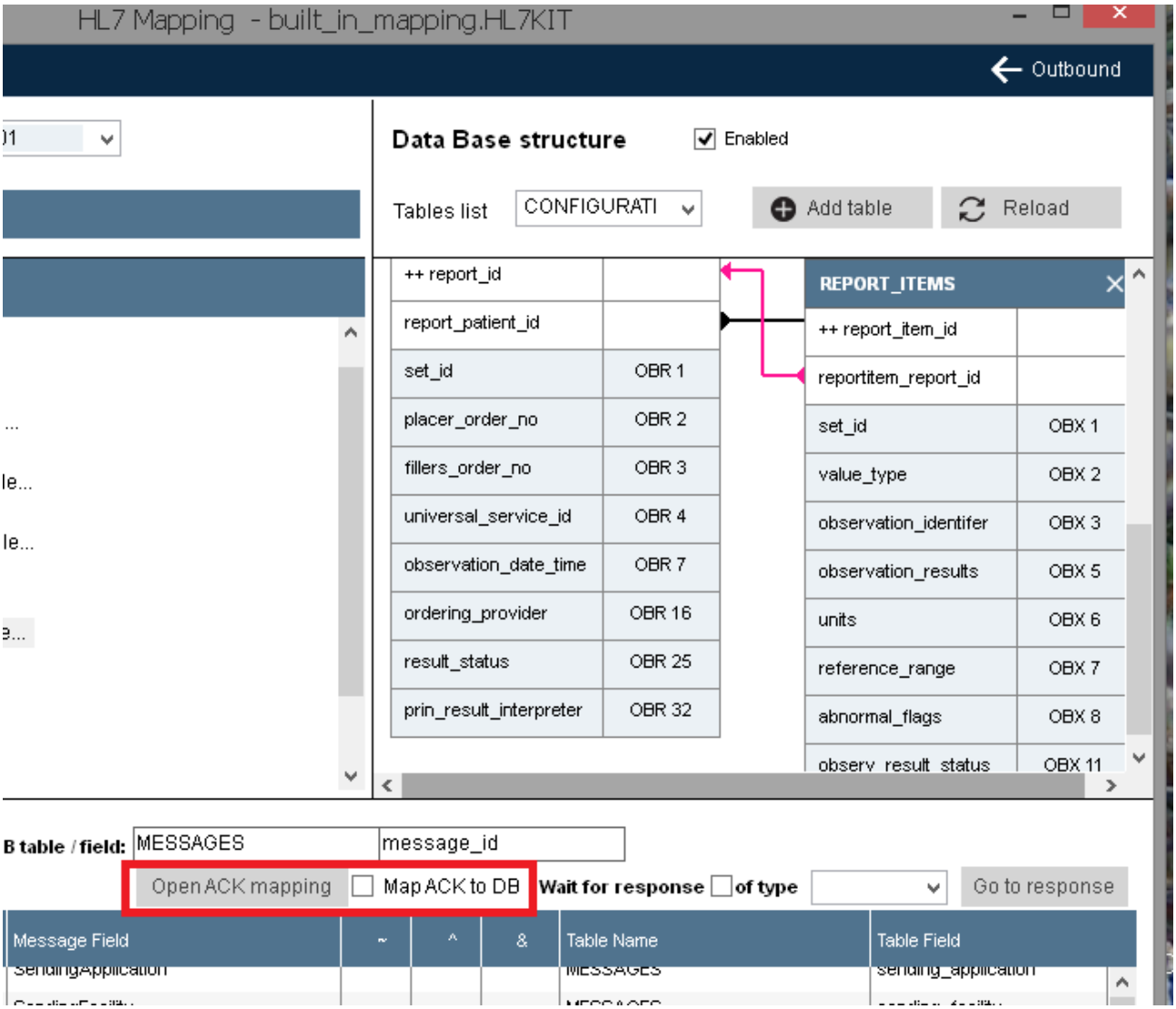
Value of the mapping_state field of each processed row will be updated accordingly to mapping result: 1- mapped OK, 2 - mapping failed, 3- DICOM definition or mapping rule was not found. If result is not OK - message will saved in system EventLog ("RZHL7Pro" log)

EVGENIA\SQL...DICOM_FILES | EVGENIA\SQ...NFIGURATION

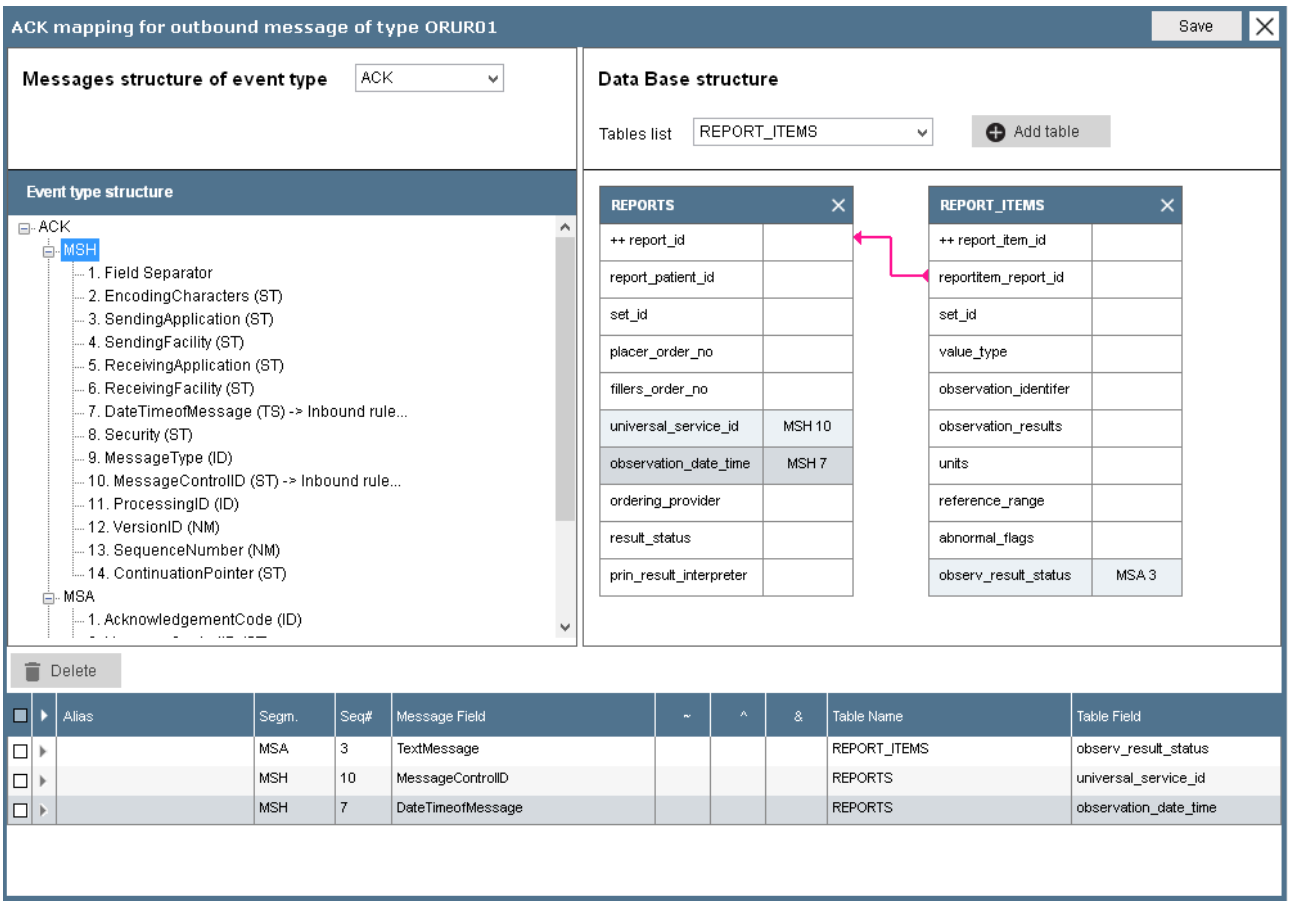
ty	series_nu...	series_ins...	instance_...	sop_class...	sop_insta...	source_a...	rel_path	task_id	mapping...
	3	2.16.124....	1	1.2.840.1...	2.16.124....	RZDCX	2016/06/0...	NULL	1
	1	2.16.124....	1	1.2.840.1...	2.16.124....	RZDCX	2016/06/0...	NULL	1
	1	2.16.124....	NULL	1.2.840.1...	2.16.124....	RZDCX	2016/06/0...	NULL	1
	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

1369 - Option to map ACK messages to DB

There is now option to insert data from ACK message received by HL7 Service into Data Base.
In the bottom part of the HL7 Mapper screen, near "Wait for response" checkbox, there is new checkbox "Map ACK to DB" and button "Open ACK mapping" (enabled when "Map ACK to DB" selected):



On "Open ACK mapping" click - pop-up window will be opened, allowing to define inbound mapping rules for selected ACK type.



If user clicks on "Save" - ACK mapping will be stored as XML node inside original outbound rule node like:

<ORUR01 StartTable="MESSAGES" StartField="message_id" ACKMappingEvent="ACKXXX" Response="">

<ACKXXX>

<Rule MsgAlias="" MsgSegment="MSH" MsgField="SendingApplication" SeqNum="2" Component="-1" Repetition="-1" SubComponent="-1" TblName="ACKParentTable" TblField="ACKParentField" />

<Rule MsgAlias="" MsgSegment="MSA" MsgField="AcknowledgementCode" SeqNum="1" Component="-1" Repetition="-1" SubComponent="-1" TblName="ACKChild" TblField="ACKChildText" />

</ACKXXX>

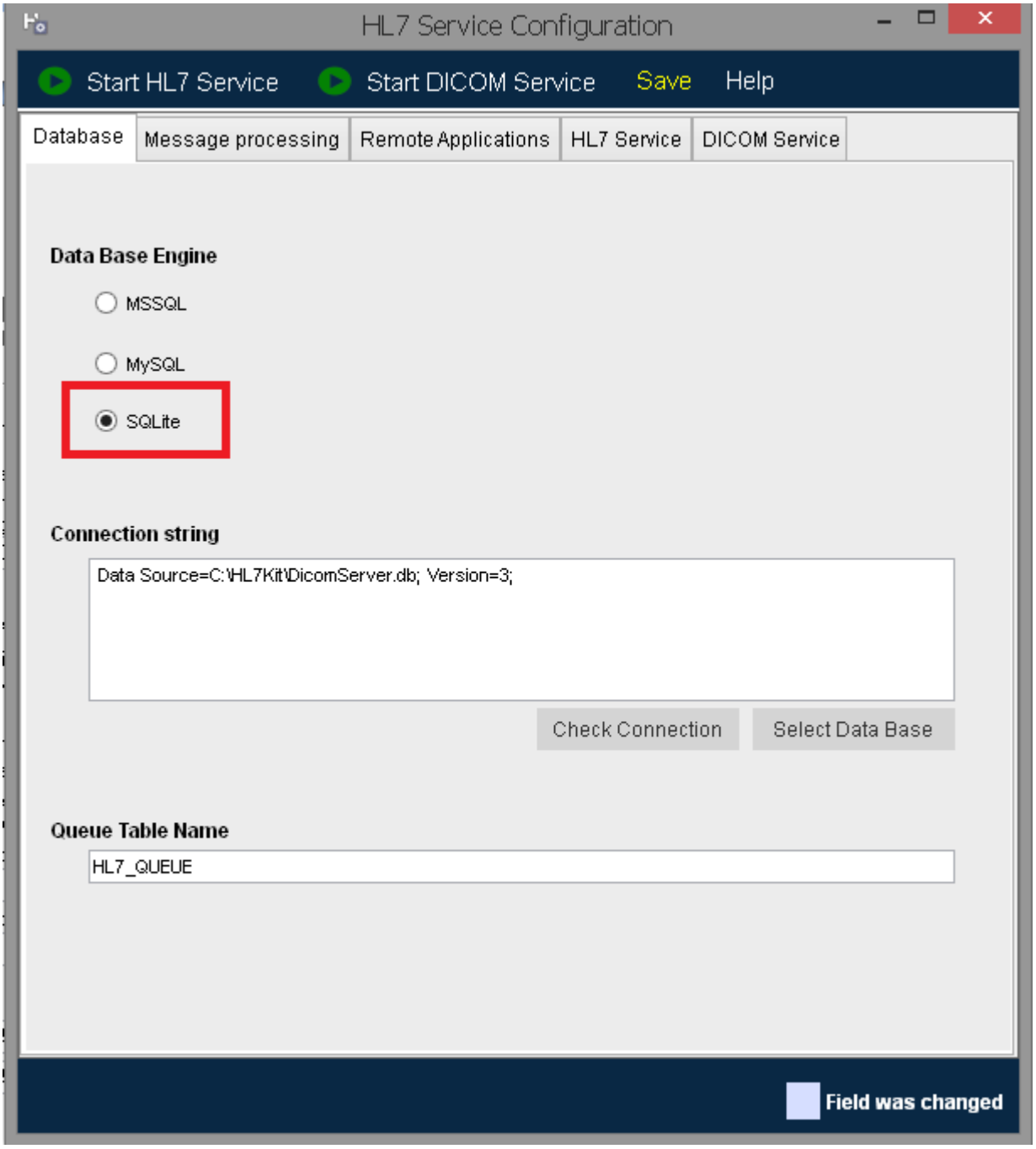
<Rule MsgAlias="" MsgSegment="MSH" MsgField="SendingApplication" SeqNum="2" Component="-1" Repetition="-1" SubComponent="-1" TblName="MESSAGES" TblField="sending_application" />

.....

</ORUR01>

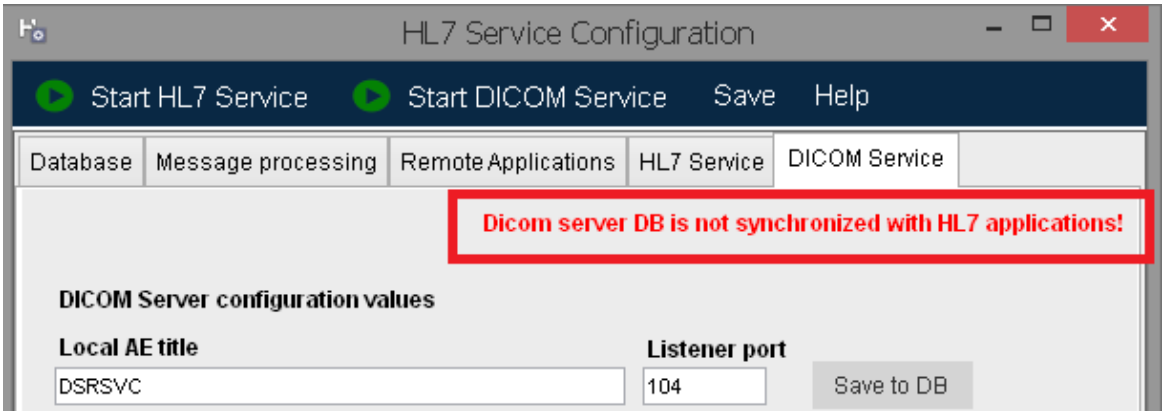
When outbound thread of the HL7 Service receives ACK it checks in the current rule for ACK mapping existence and if exists and received ACK is of defined type - inserts ACK content to DB

1381 - Support of SQLite



Select SQLite option - by default built-in data base DicomServer.db will be selected. To set another SQLite DB file - click on "Select Data Base" button and select path to the file.

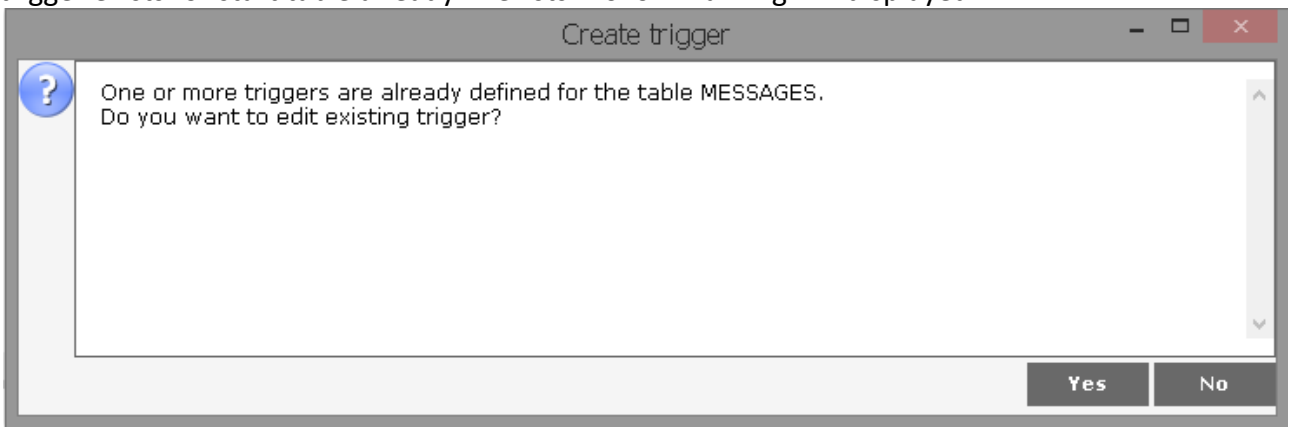
NOTE: DICOM Server can work with built-in data base file ONLY . So if user selects another one - HL7Kit applications (HL7 Service, HL7 Mapper, Worklist Manager) and DicomServer will not be synchronized (warning will appear on "DICOM Server State" tab)



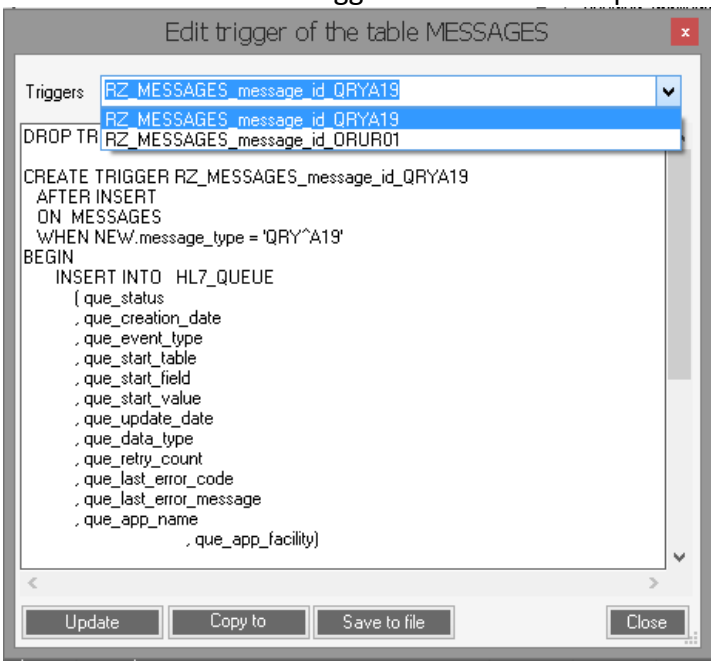
NOTE: After HL7Kit installation SQLite built-in Data Base is set as current DB. You can change it to MSSQL or MySQL.

1392 - New flow of "Insert to queue" triggers building/deleting

When user clicks on "Create trigger" row under "Mapping" menu - application checks whether any trigger exists for start table already. If exists - follow warning will displayed:

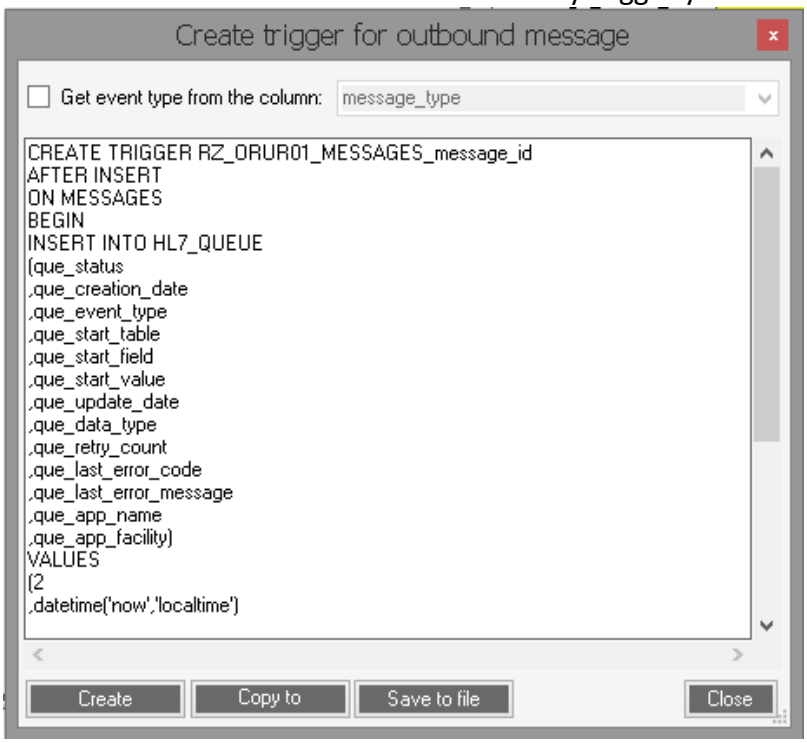


If "Yes" selected - "Edit trigger" screen will be opened:

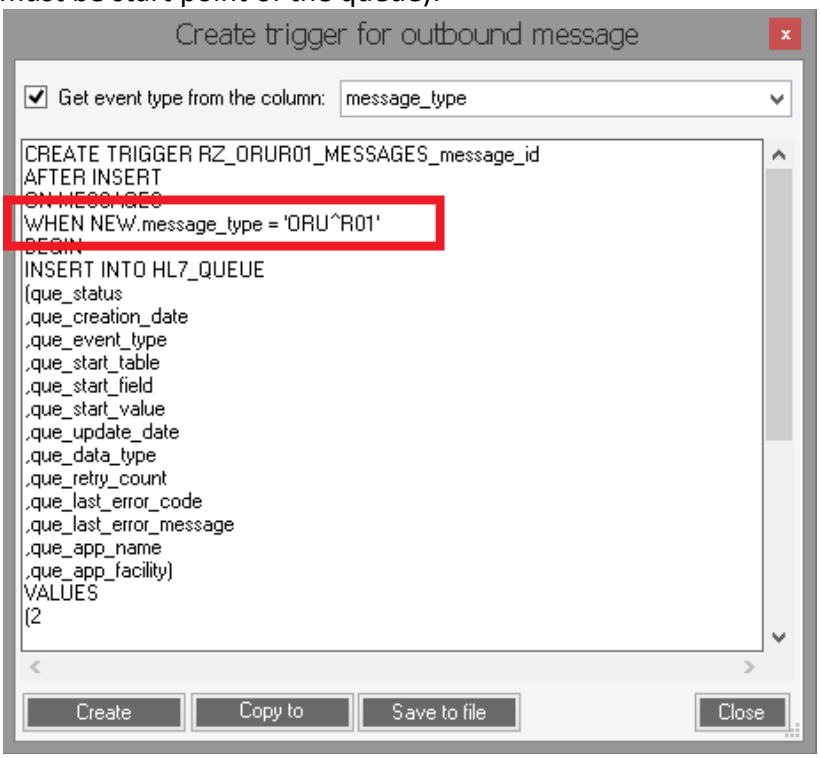


User can select trigger from the list, change it's "CREATE" clause and update trigger in DB.

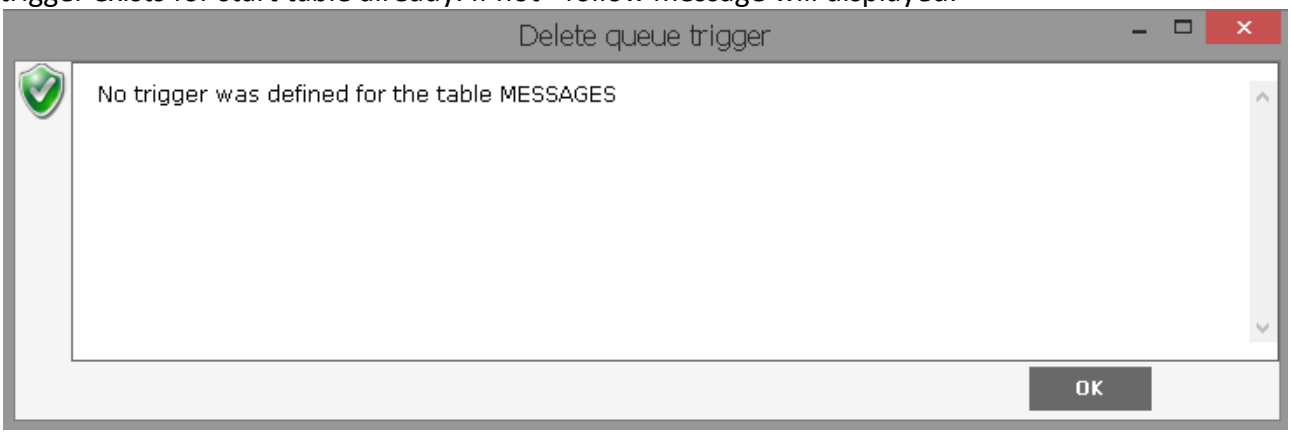
If user selects "No" or table doesn't have any trigger yet - "Create trigger" screen will be opened:



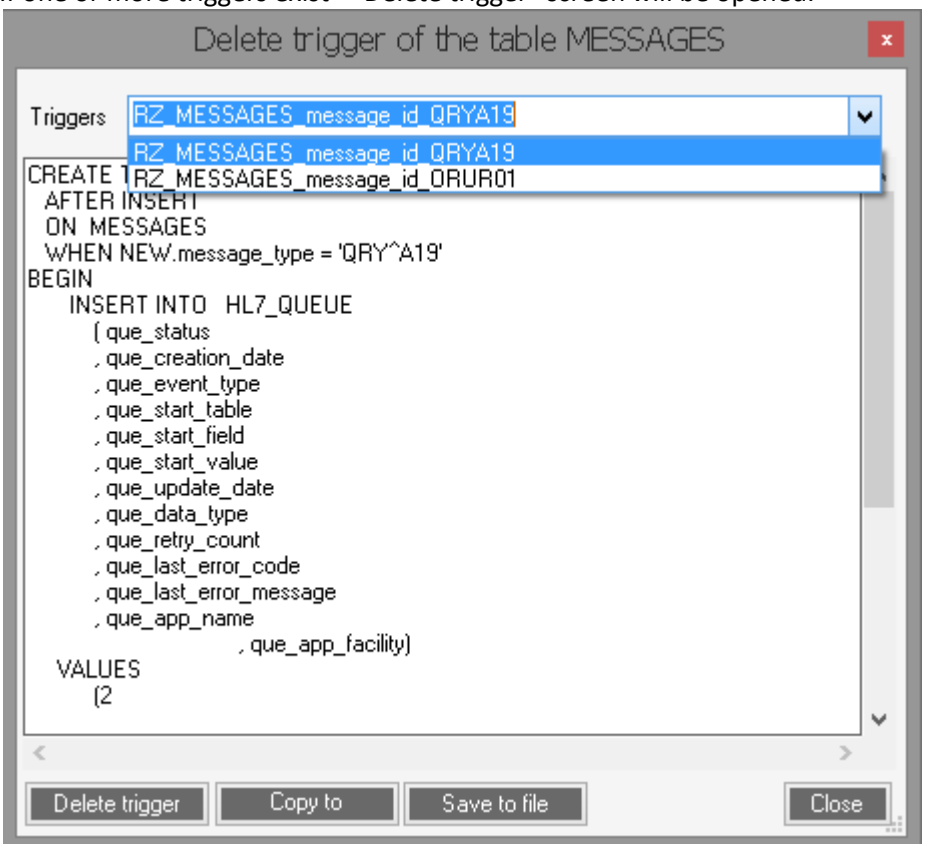
By default application tries to create trigger which will fire on each inserted row, but there is option to build trigger that checks inserted message type.
For that user has to check "Get event type from the column" box and select required DB column (for example if messages of several types might be inserted to start table but only part of them must be start point of the queue):



When user clicks on "Delete trigger" row under "Mapping" menu - application checks whether any trigger exists for start table already. If not - follow message will displayed:

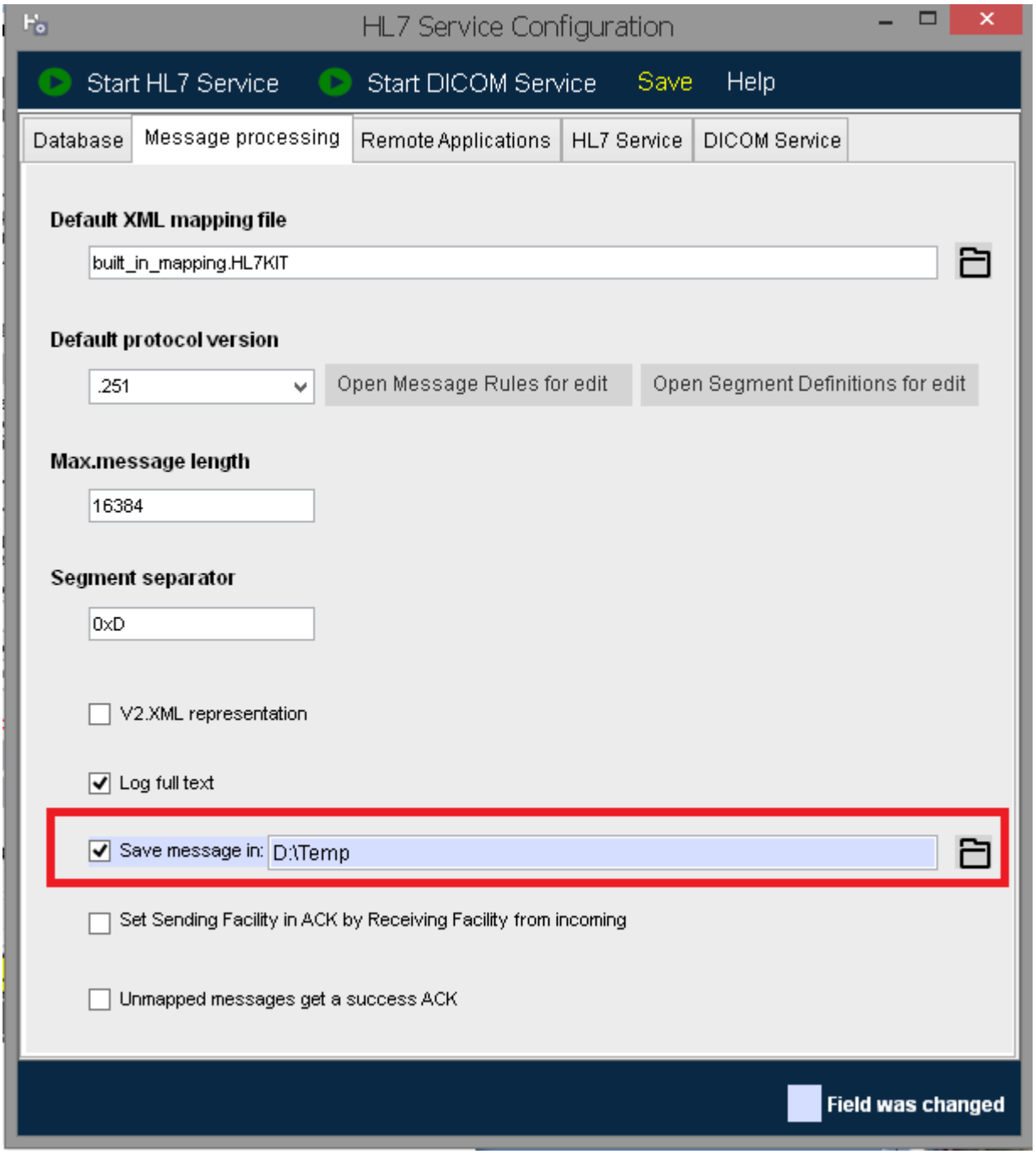


If one or more triggers exist - "Delete trigger" screen will be opened:



User can select trigger from the list and delete it in DB.

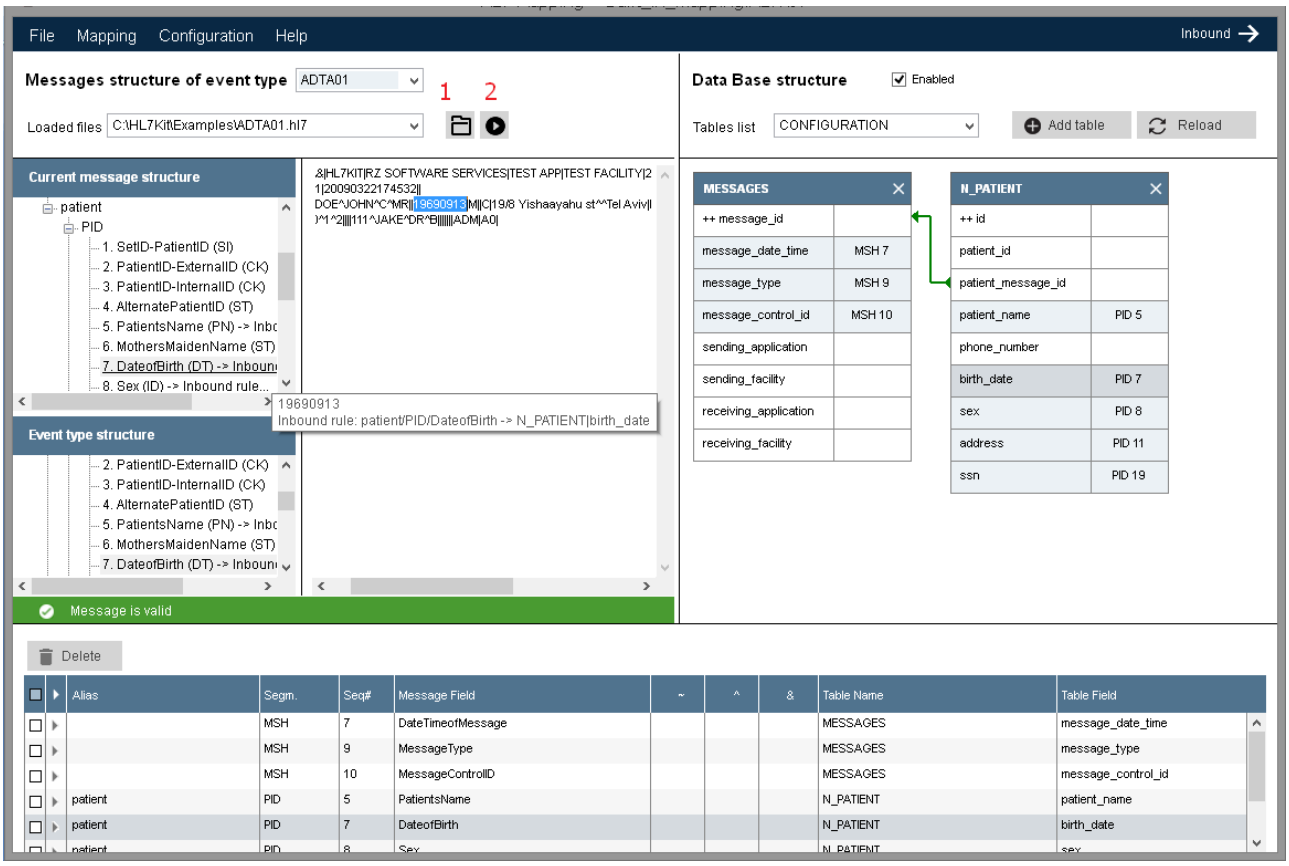
1486 - HL7 Service has new option to save all incoming messages in the pre-defined folder



NOTE: This option works only if "Log full text" is selected

1487 - Allow to build inbound mapping from existing HL7 message

Now user can map incoming messages to DB not only by message structure defined in msgRules and segDefinitions files, but also by opening existing message as in HL7 Sender:



User has few options to create mapping rules:

1. Open message file by clicking on "1" button.
2. Copy-paste message text into right panel
3. Select event type in the combo and use "Event type structure" tree

User can test inbound mapping from opened message by clicking "2" button

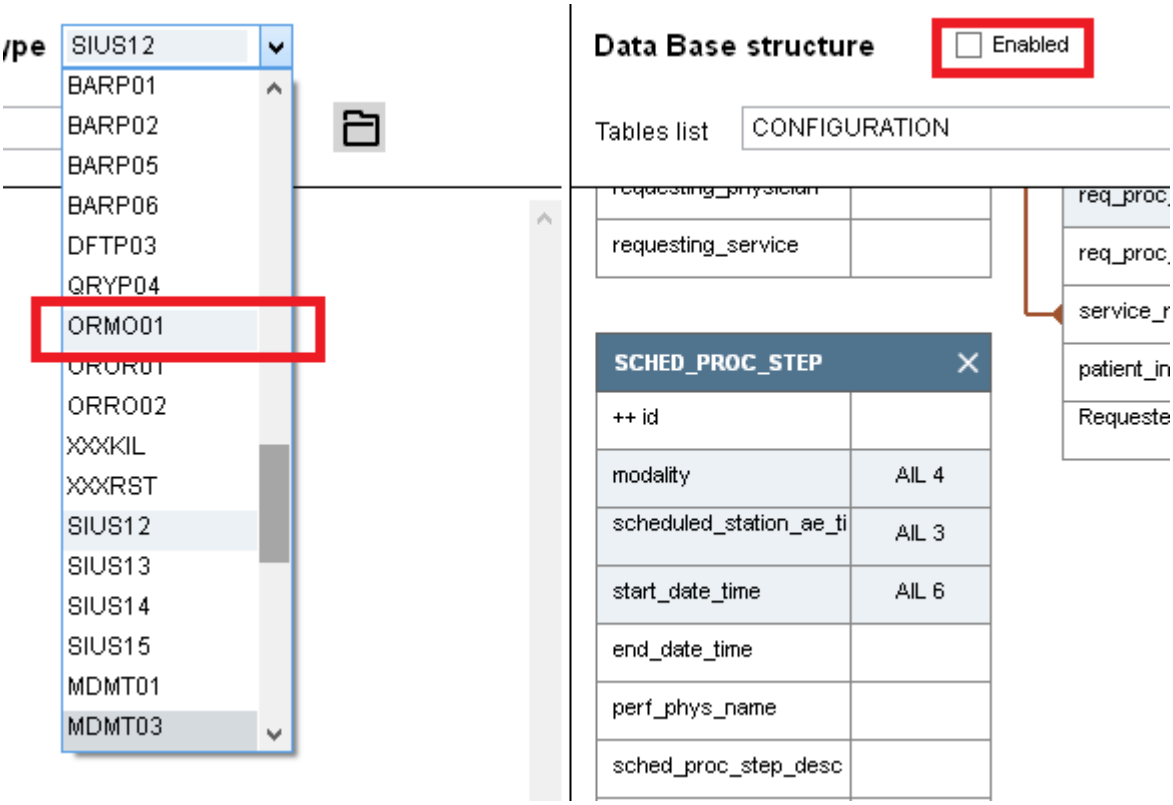
Paths to all opened files are stored in the mapping XML file so when next time user open application they will be displayed in the "Loaded files" list for user to select and open.

1508 - User can mark specific mapping as "Disabled"

HL7 Service will not process messages if their mapping is disabled (entry will be added to System event log)

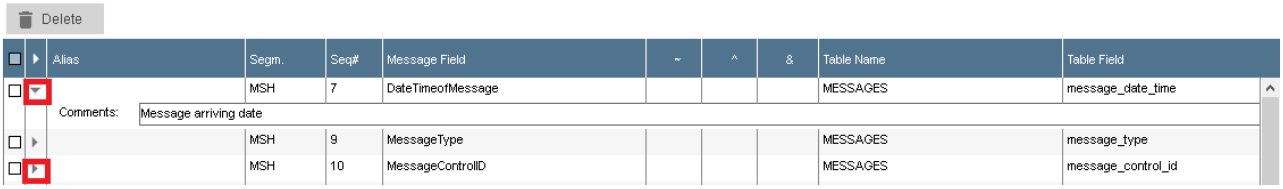
To mark any mapping as "Disable" user has to un-check "Enabled" check box. By default new mapping is enabled.

Existing mappings are marked by grey in the event types list. If there is no mapping for event type - its background in the list is white.



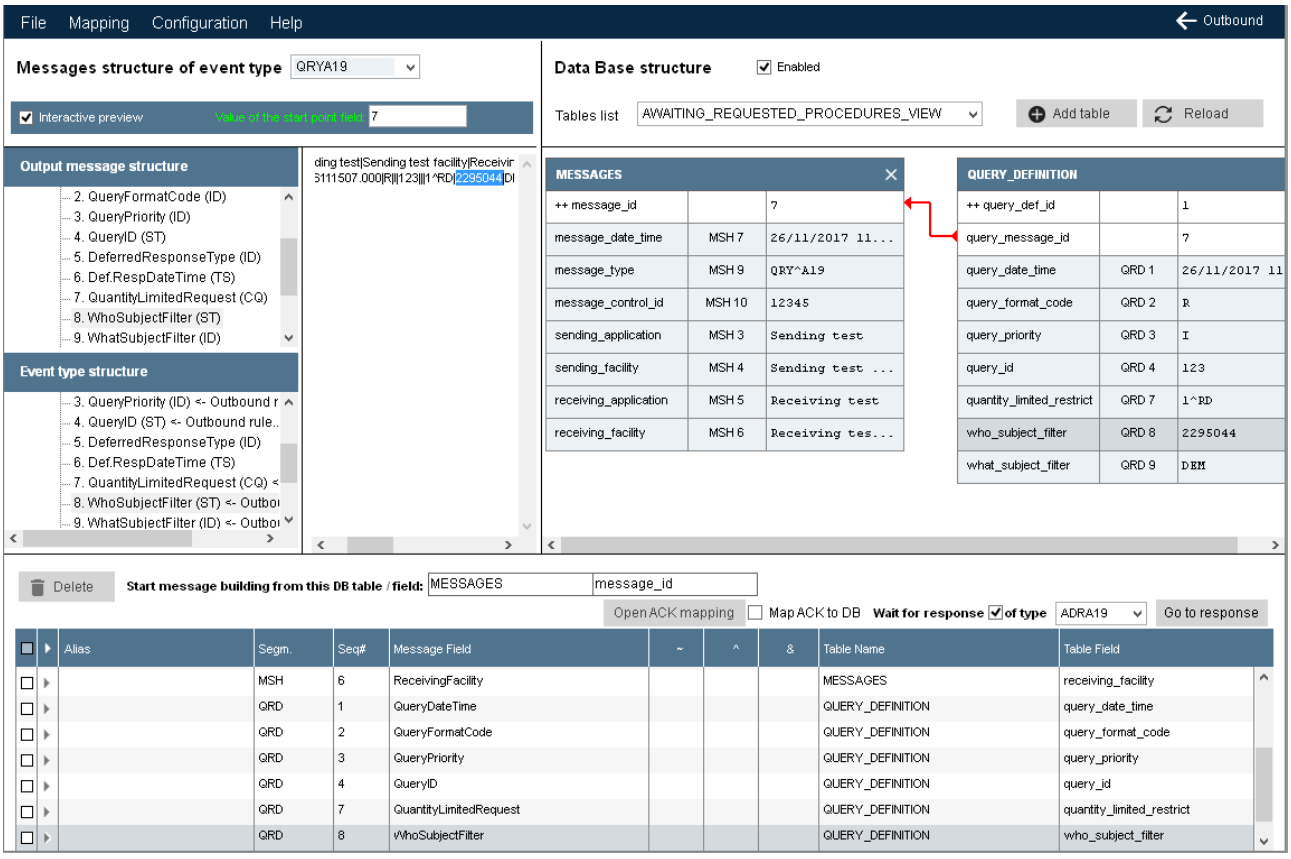
1512 - User can add comments to each mapping rule in the HL7 Mapper

Click on "Arrow left"/ "Arrow down" button in the rule line to open/close rule comment.



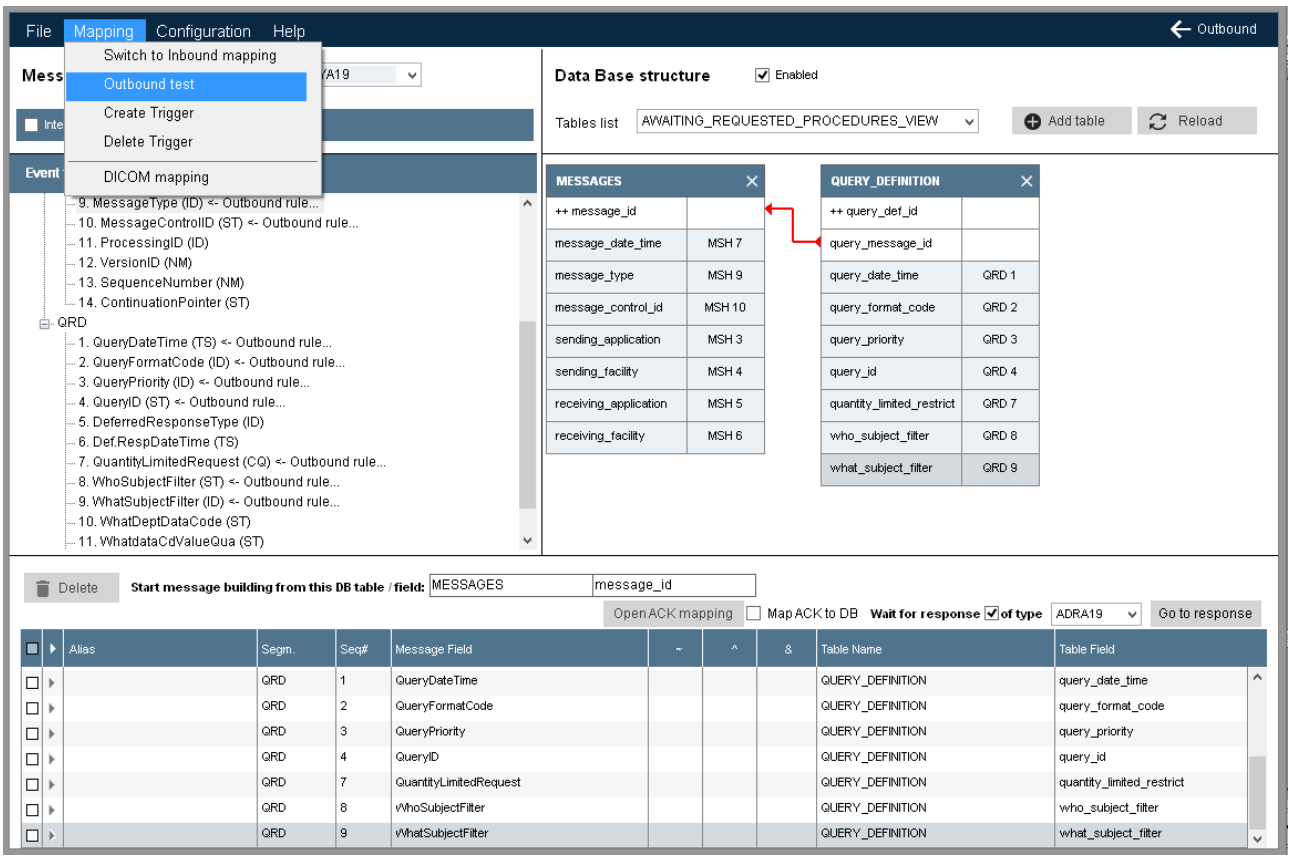
Rules comments are stored in the mapping XML file

1595 - Interactive preview of the outbound message

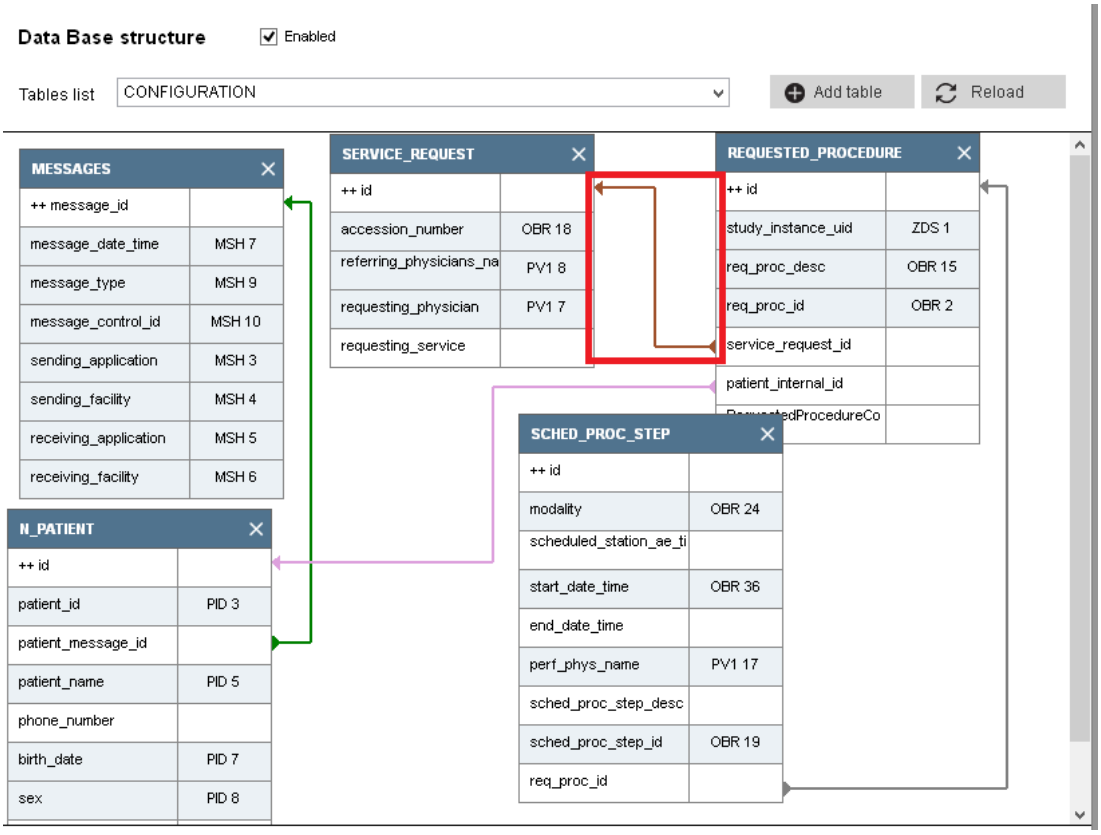


If "Interactive preview" check box is marked - example of the current outbound message will be built on-the-fly using some data from the DB. Also all values from DB will be displayed as most right column of each table control in the "Data Base structure" area.

If user doesn't want to use this option - un-check "Interactive preview" and use "Outbound test" action:

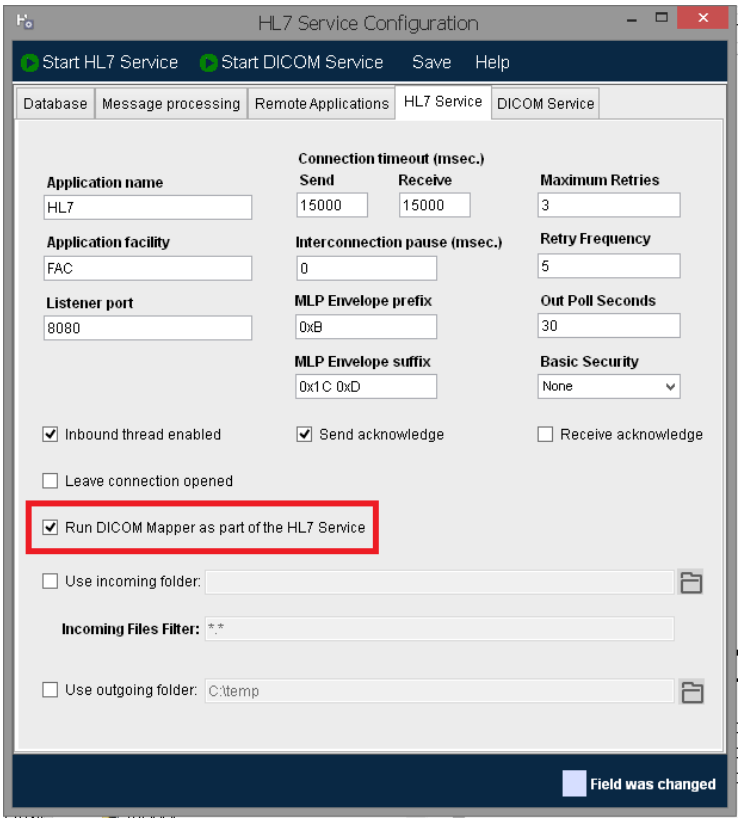


14 - Visual representation of Foreign Keys in the tables view in the Mapper

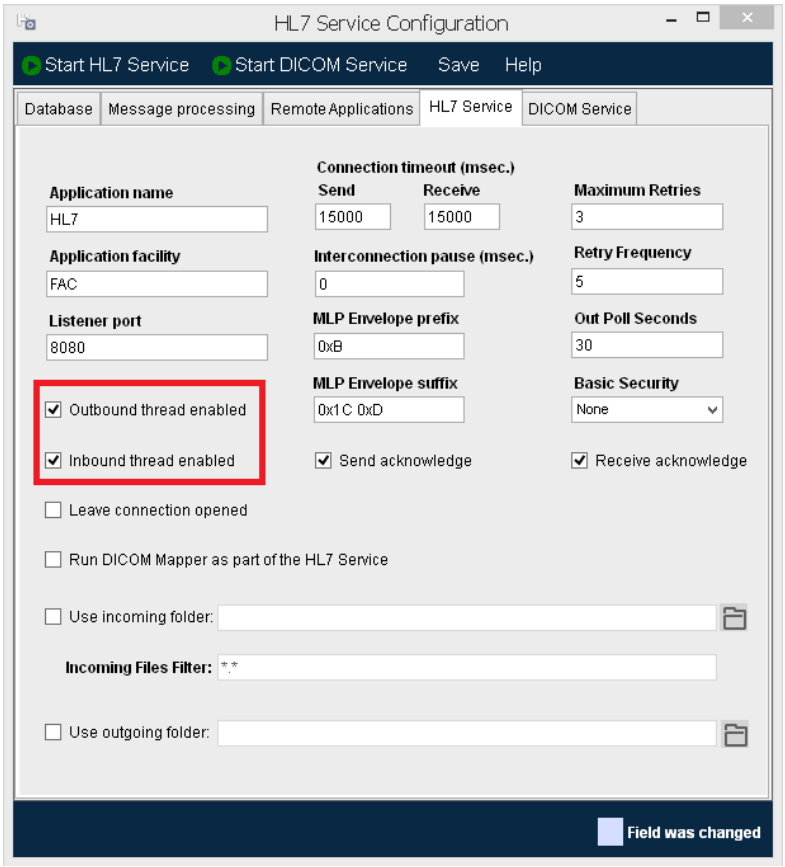


All Foreign Keys are represented as path from child table to parent table.

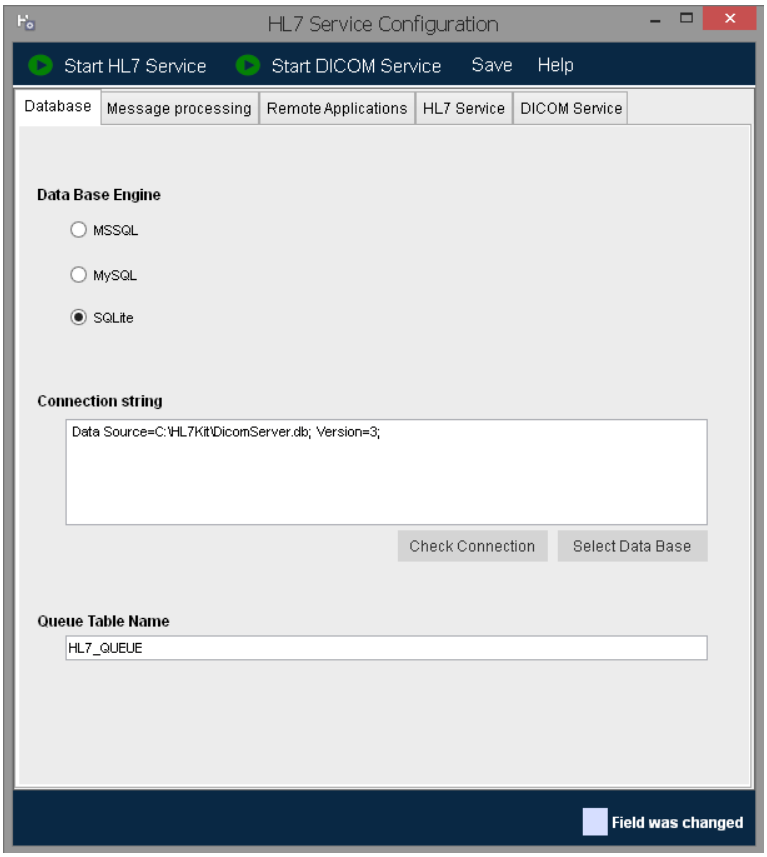
53 - DICOM Mapping can be executed as part of the HL7Service

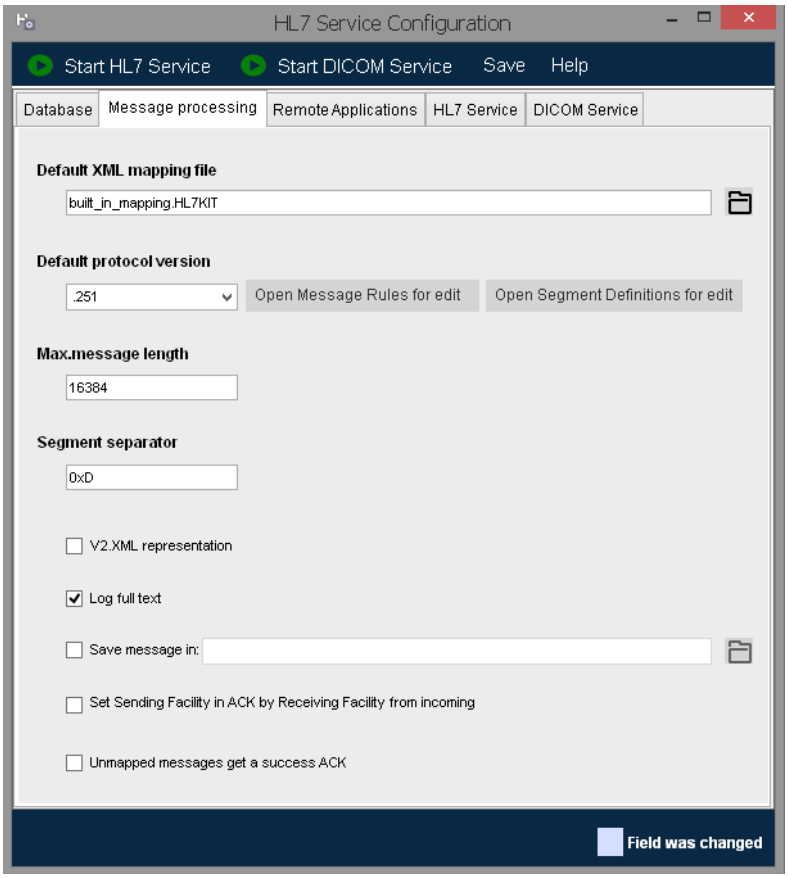


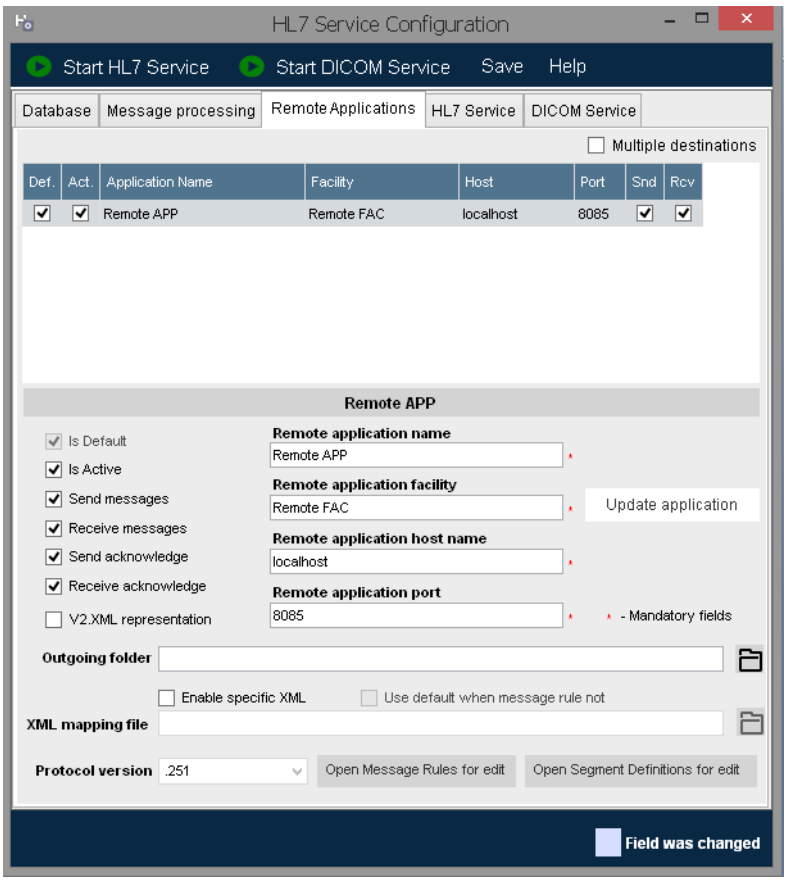
1602 - Option to disable Inbound thread or Outbound thread of HL7 service

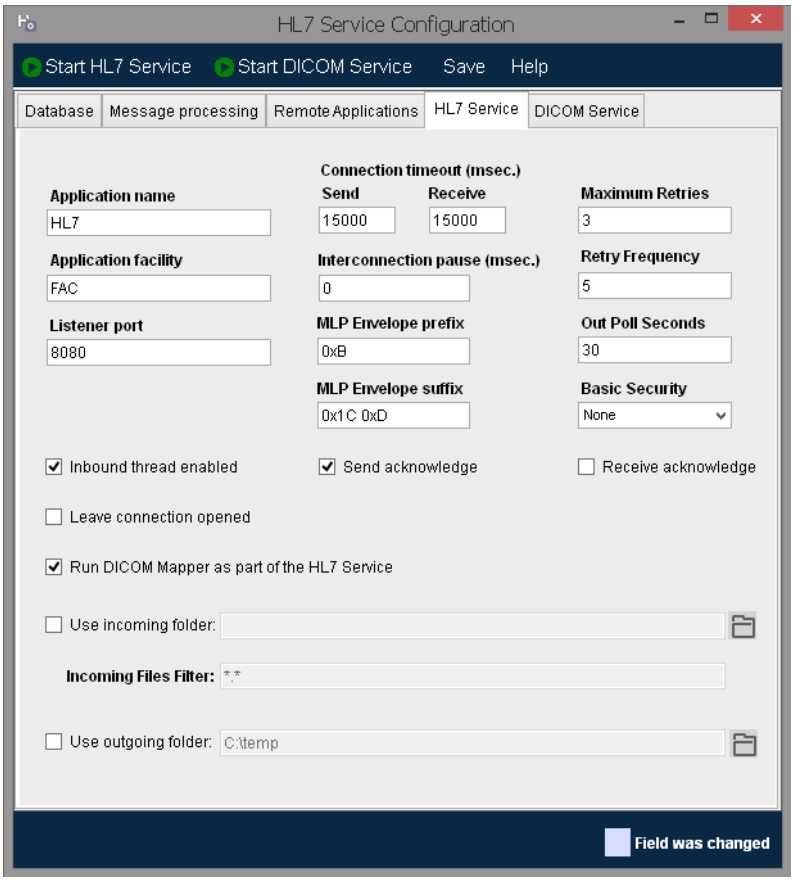


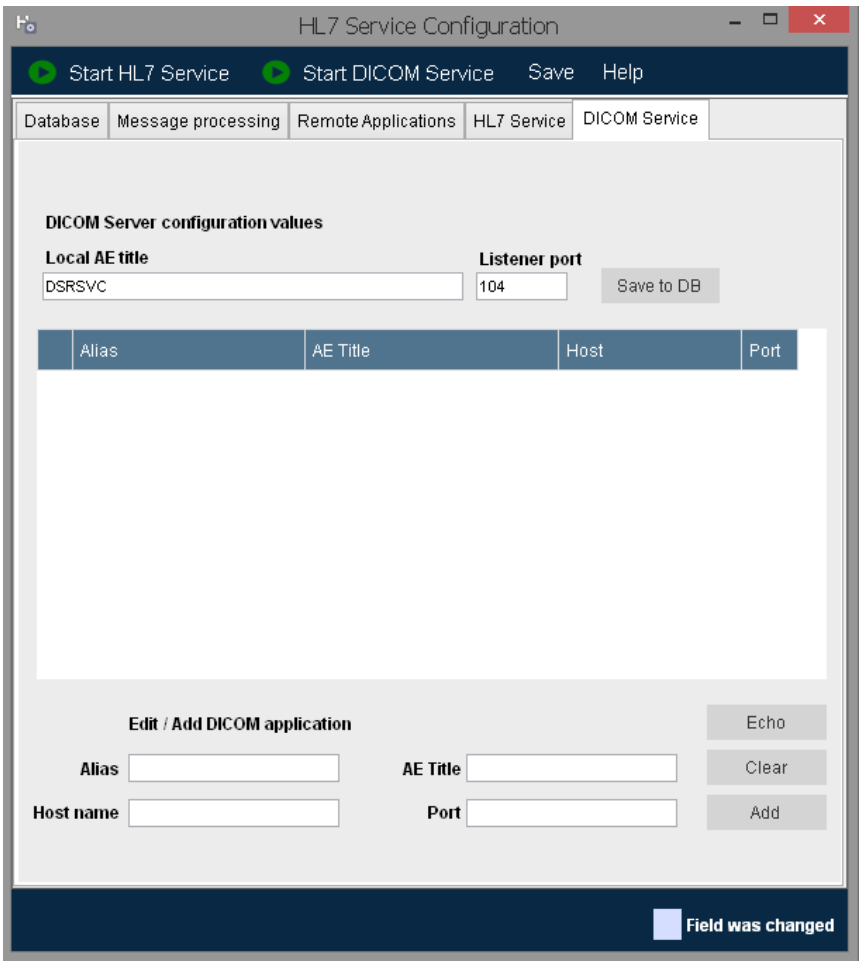
1616 - New layout of HL7 service configuration






HL7 Service Configuration
Start HL7 Service
Start DICOM Service
Save
Help
Database
Message processing
Remote Applications
HL7 Service
DICOM Service
Multiple destinations
Def.
Act.
Application Name
Facility
Host
Port
Snd
Rcv
Remote APP
Remote FAC
localhost
8085
Remote APP
Is Default
Is Active
Send messages
Receive messages
Send acknowledge
Receive acknowledge
V2.XML representation
Remote application name
Remote APP
Remote application facility
Remote FAC
Remote application host name
localhost
Remote application port
8085
Update application
- Mandatory fields
Outgoing folder
Enable specific XML
Use default when message rule not
XML mapping file
Protocol version
.251
Open Message Rules for edit
Open Segment Definitions for edit
Field was changed


HL7 Service Configuration
Start HL7 Service
Start DICOM Service
Save
Help
Database
Message processing
Remote Applications
HL7 Service
DICOM Service
Application name
HL7
Application facility
FAC
Listener port
8080
Connection timeout (msec.)
Send
15000
Receive
15000
Interconnection pause (msec.)
0
MLP Envelope prefix
0xB
MLP Envelope suffix
0x1C 0xD
Maximum Retries
3
Retry Frequency
5
Out Poll Seconds
30
Basic Security
None
Inbound thread enabled
Send acknowledge
Receive acknowledge
Leave connection opened
Run DICOM Mapper as part of the HL7 Service
Use incoming folder:
Incoming Files Filter:
.
Use outgoing folder:
C:\temp
Field was changed


HL7 Service Configuration
Start HL7 Service
Start DICOM Service
Save
Help
Database
Message processing
Remote Applications
HL7 Service
DICOM Service
DICOM Server configuration values
Local AE title
DSRSVC
Listener port
104
Save to DB
Alias
AE Title
Host
Port
Edit / Add DICOM application
Alias
AE Title
Host name
Port
Echo
Clear
Add
Field was changed