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Release Notes –Version 3.0.0

HL7Kit Pro Toolkit
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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 DSR SVC 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")

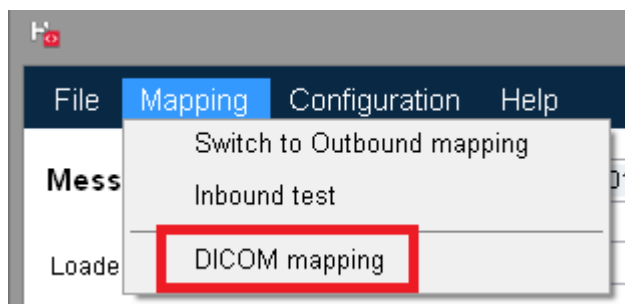
Detailed Release Notes

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.

DICOM definitions

List of all DICOM definitions

Create new definition from file

Name	Edit
------	------

New DICOM definition

DICOM structure

DICOM

SpecificCharacterSet (CS)

ImageType (CS)

sopClassUid (UI)

sopInstanceUID (UI)

StudyDate (DA)

SeriesDate (DA)

AcquisitionDate (DA)

ContentDate (DA)

StudyTime (TM)

SeriesTime (TM)

AcquisitionTime (TM)

ContentTime (TM)

AccessionNumber (SH)

Modality (CS)

Manufacturer (LO)

InstitutionName (LO)

InstitutionAddress (ST)

Drag DICOM tags from the left panel to selected tags list

Save

Name: CT Image

Selected tags

Tag	Value
Modality	CT
InstitutionName	Anonymous Hospital

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:

DICOM definitions

List of all DICOM definitions

Create new definition from file

Name	Edit
<div>CT Image</div> <div>Edit</div>	Edit

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>
  
```

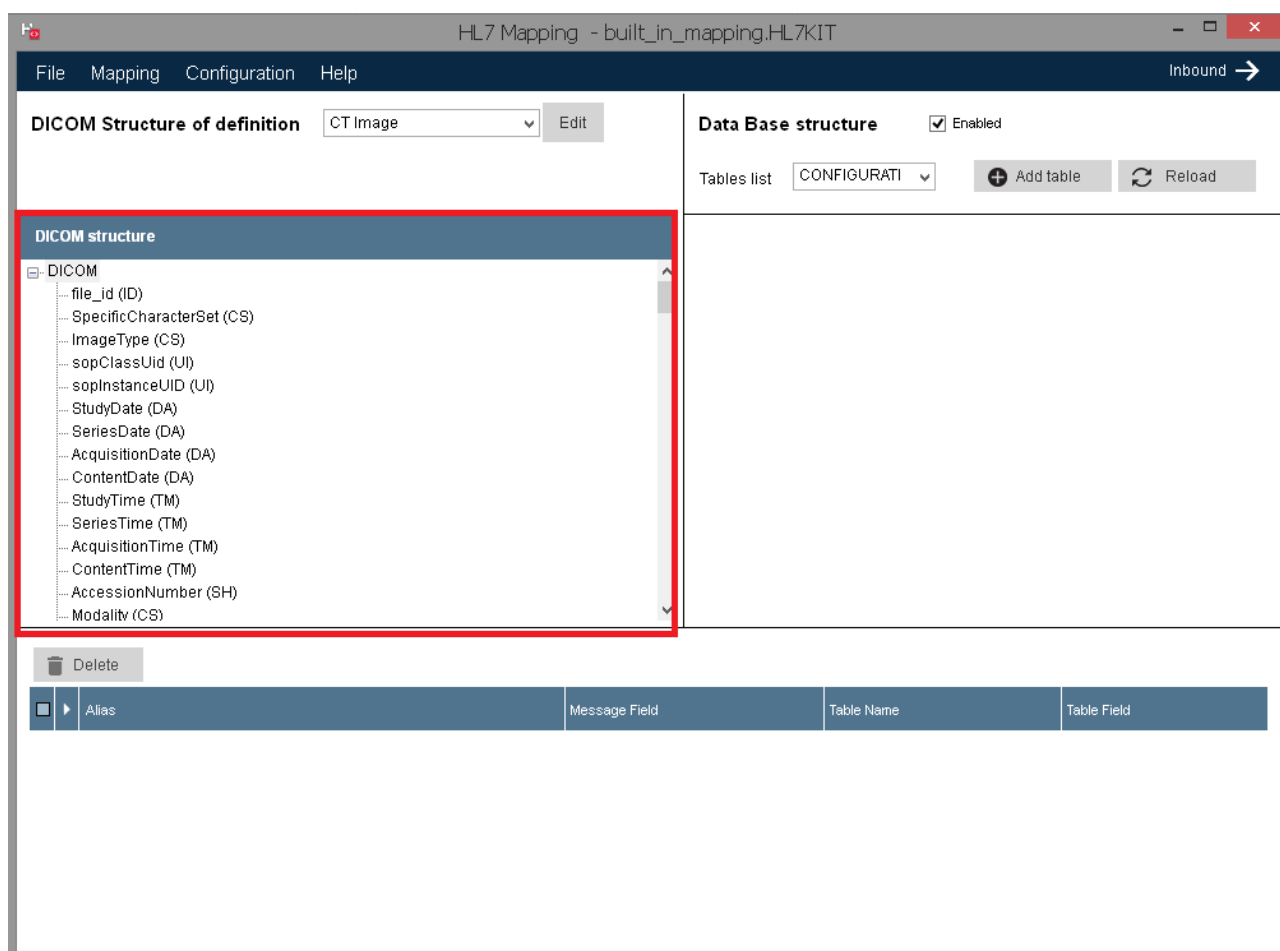
```

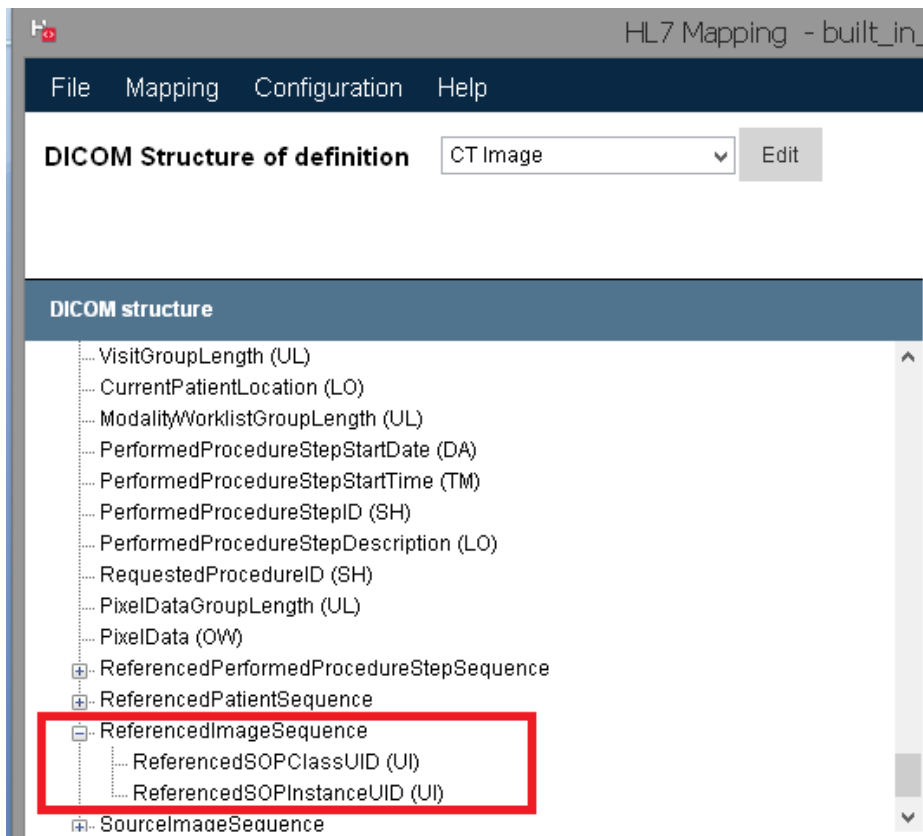
<Name>CT Image</Name>
<PathToSource>C:\HL7Kit\DICOMTemplates\DICOMDefinition_1.dcm</PathToSource>
<Fields>
  <Field>
    <Tag>Modality</Tag>
    <Value>CT</Value>
  </Field>
  <Field>
    <Tag>InstitutionName</Tag>
    <Value>Anonymous Hospital</Value>
  </Field>
</Fields>

```

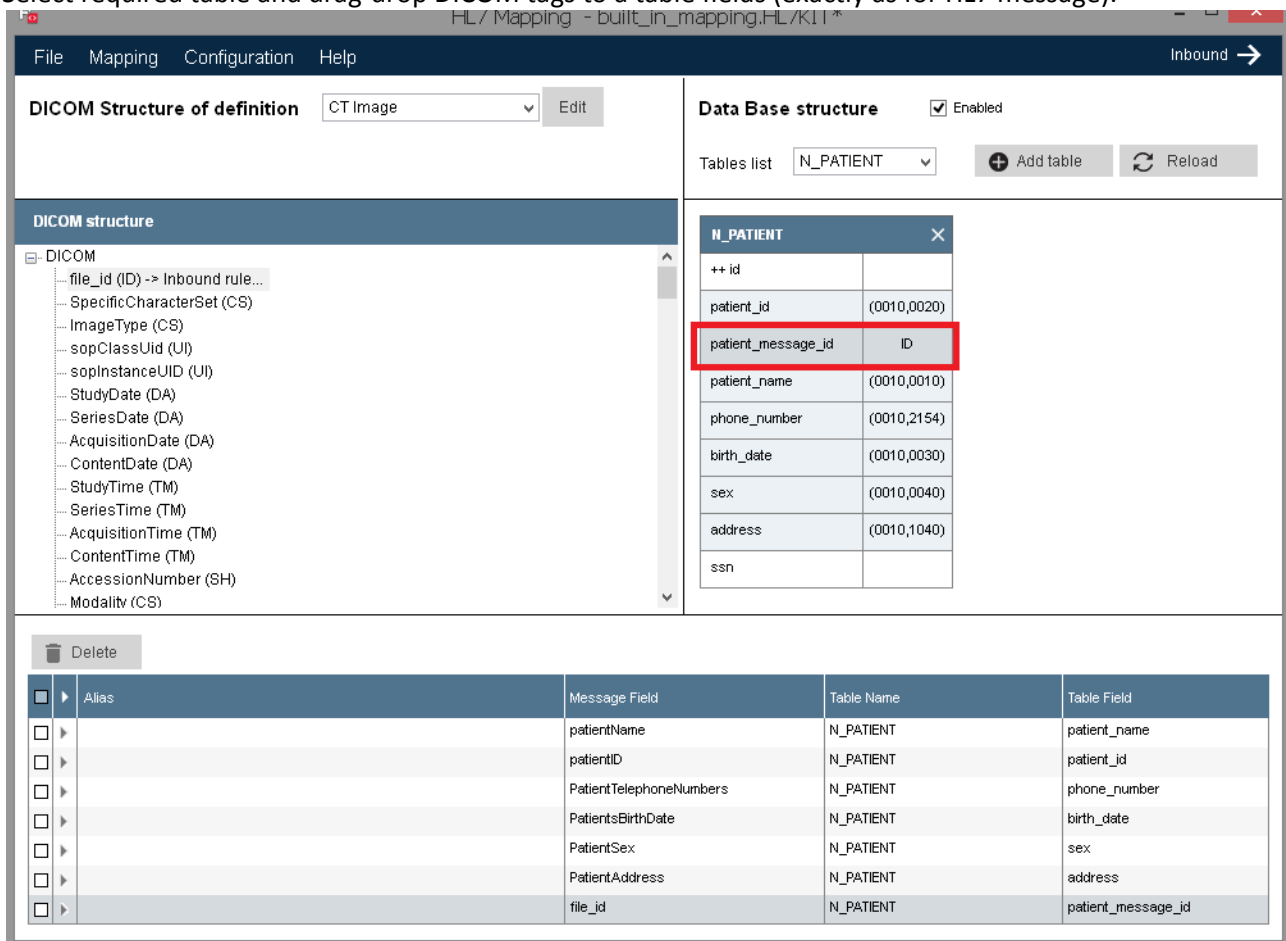
To delete definition - click "X" button in the grid row.

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 DSR SVC

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	\DSR SVC	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 processed 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" />
  </tables>
</TablesToScan>
```

```

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

```

If you want to process 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\SQL...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 processed by DICOM mapper	
DM_MPPS_last_id	8	Last ID processed 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\SQL...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):

The screenshot shows the HL7 Mapper interface with the title bar 'HL7 Mapping - built_in_mapping.HL7KIT'. The 'Outbound' button is in the top right. The 'Data Base structure' section is active, showing a list of tables. The 'REPORT_ITEMS' table is selected, and its fields are displayed in a table below. The 'Open ACK mapping' button is highlighted with a red box, and the 'Map ACK to DB' checkbox is also visible. The 'Wait for response' checkbox is unchecked, and the 'of type' dropdown is set to 'MESSAGE'.

Table Name	Field Name	Field Value
REPORT_ITEMS	++ report_item_id	
REPORT_ITEMS	reportitem_report_id	
REPORT_ITEMS	set_id	OBX 1
REPORT_ITEMS	value_type	OBX 2
REPORT_ITEMS	observation_idenfier	OBX 3
REPORT_ITEMS	observation_results	OBX 5
REPORT_ITEMS	units	OBX 6
REPORT_ITEMS	reference_range	OBX 7
REPORT_ITEMS	abnormal_flags	OBX 8
REPORT_ITEMS	observ result status	OBX 11

B table / field:

☐ Map ACK to DB ☐ Wait for response of type

Message Field	~	^	&	Table Name	Table Field
SendingApplication				MESSAGES	sending_application
...				MESSAGES	...

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

ACK mapping for outbound message of type ORUR01

Save

X

Messages structure of event type

ACK

Event type structure

ACK

MSH

1. Field Separator
2. EncodingCharacters (ST)
3. SendingApplication (ST)
4. SendingFacility (ST)
5. ReceivingApplication (ST)
6. ReceivingFacility (ST)
7. DateTimeofMessage (TS) -> Inbound rule...
8. Security (ST)
9. MessageType (ID)
10. MessageControlID (ST) -> Inbound rule...
11. ProcessingID (ID)
12. VersionID (NM)
13. SequenceNumber (NM)
14. ContinuationPointer (ST)

MSA

1. AcknowledgementCode (ID)

Data Base structure

Tables list

REPORT_ITEMS

+

Add table

REPORTS

++ report_id

report_patient_id

set_id

placer_order_no

fillers_order_no

universal_service_id

MSH 10

observation_date_time

MSH 7

ordering_provider

result_status

prin_result_interpreter

REPORT_ITEMS

++ report_item_id

reportitem_report_id

set_id

value_type

observation_identifier

observation_results

units

reference_range

abnormal_flags

observ_result_status

MSA 3

Delete

	Alias	Segm.	Seq#	Message Field	~	^	&	Table Name	Table Field
<input type="checkbox"/>		MSA	3	TextMessage				REPORT_ITEMS	observ_result_status
<input type="checkbox"/>		MSH	10	MessageControlID				REPORTS	universal_service_id
<input type="checkbox"/>		MSH	7	DateTimeofMessage				REPORTS	observation_date_time

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>

```

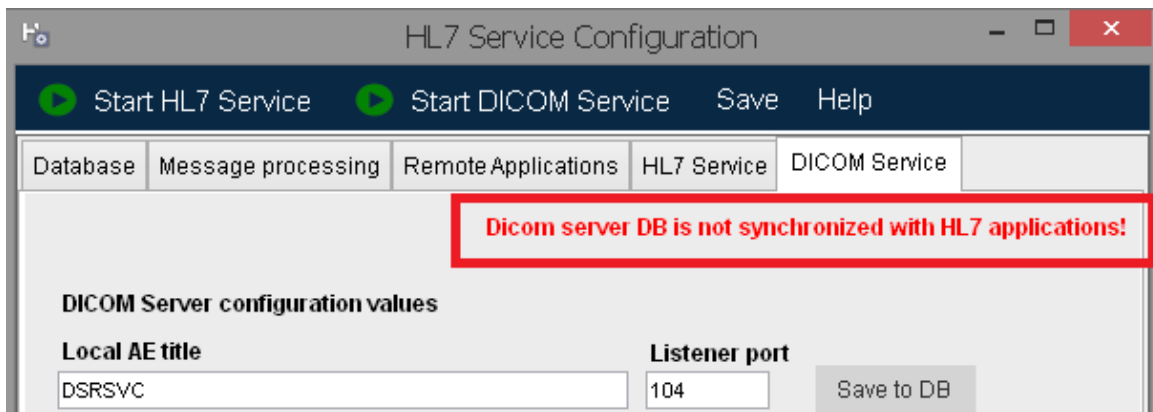
When outbound thread of the HL7 Service receives ACK it checks in the current rule for ACK mapping existence and if exists and received ACK is of defined type - inserts ACK content to DB

1381 - Support of SQLite

The screenshot shows the 'HL7 Service Configuration' window. At the top, there are buttons for 'Start HL7 Service', 'Start DICOM Service', 'Save', and 'Help'. Below these are tabs for 'Database', 'Message processing', 'Remote Applications', 'HL7 Service', and 'DICOM Service'. The 'Database' tab is active, showing the 'Data Base Engine' section with three radio buttons: 'MSSQL', 'MySQL', and 'SQLite'. The 'SQLite' option is selected and highlighted with a red rectangle. Below this is the 'Connection string' section with a text box containing 'Data Source=C:\HL7Kit\DicomServer.db; Version=3;'. To the right of the text box are two buttons: 'Check Connection' and 'Select Data Base'. At the bottom of the configuration area is the 'Queue Table Name' section with a text box containing 'HL7_QUEUE'. A dark blue bar at the very bottom of the window contains a small blue square icon and the text 'Field was changed'.

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.

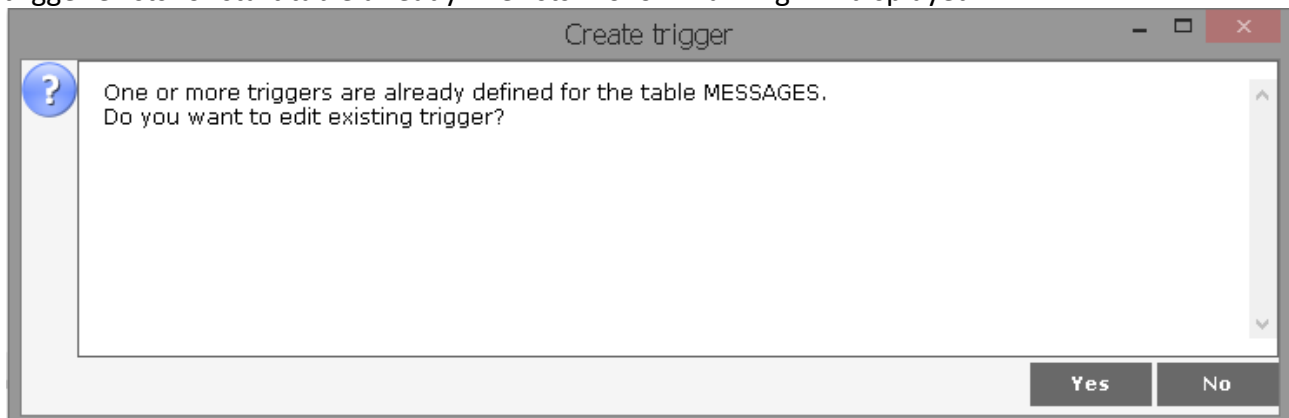
NOTE: DICOM Server can work with built-in data base file ONLY . So if user selects another one - HL7Kit applications (HL7 Service, HL7 Mapper, Worklist Manager) and DicomServer will not be synchronized (warning will appear on "DICOM Server State" tab)



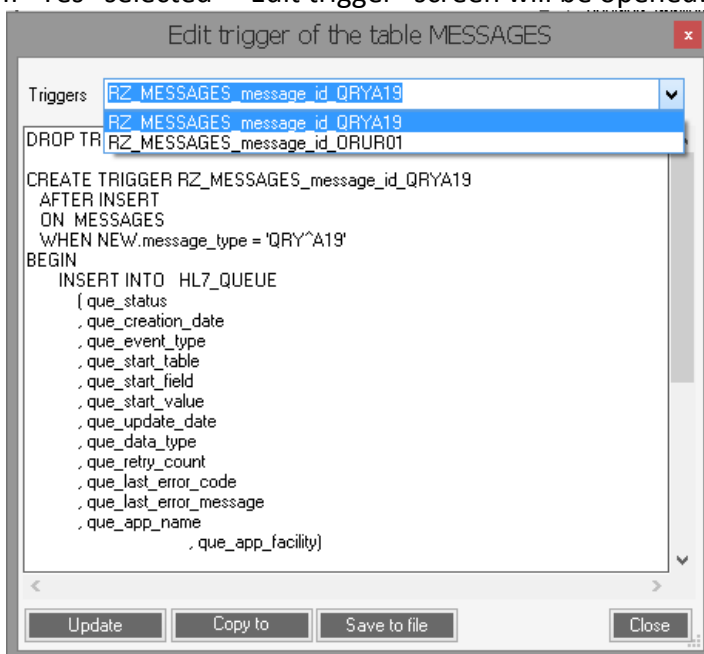
NOTE: After HL7Kit installation SQLite built-in Data Base is set as current DB. You can change it to MSSQL or MySQL.

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:

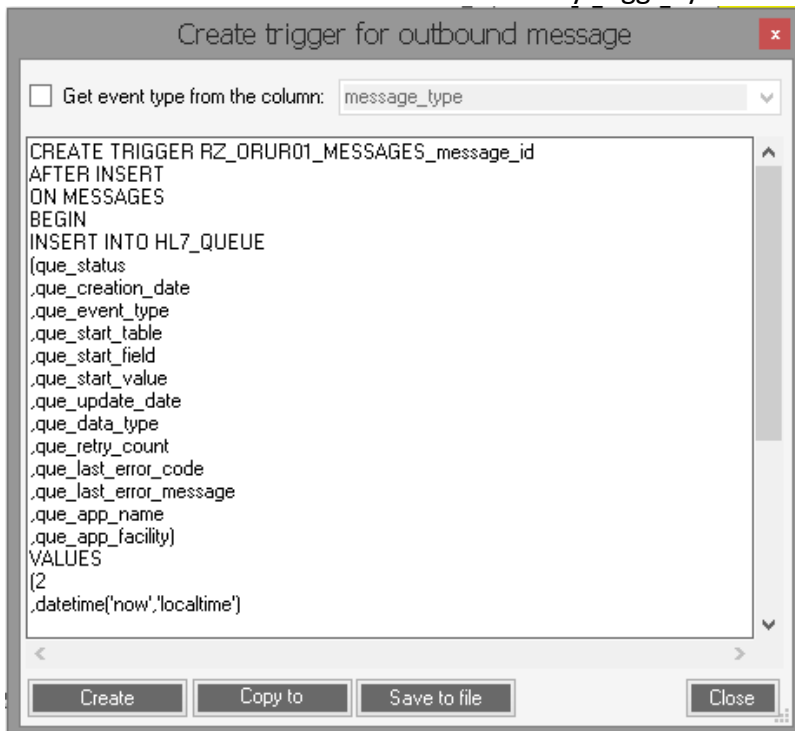


If "Yes" selected - "Edit trigger" screen will be opened:



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:



Create trigger for outbound message

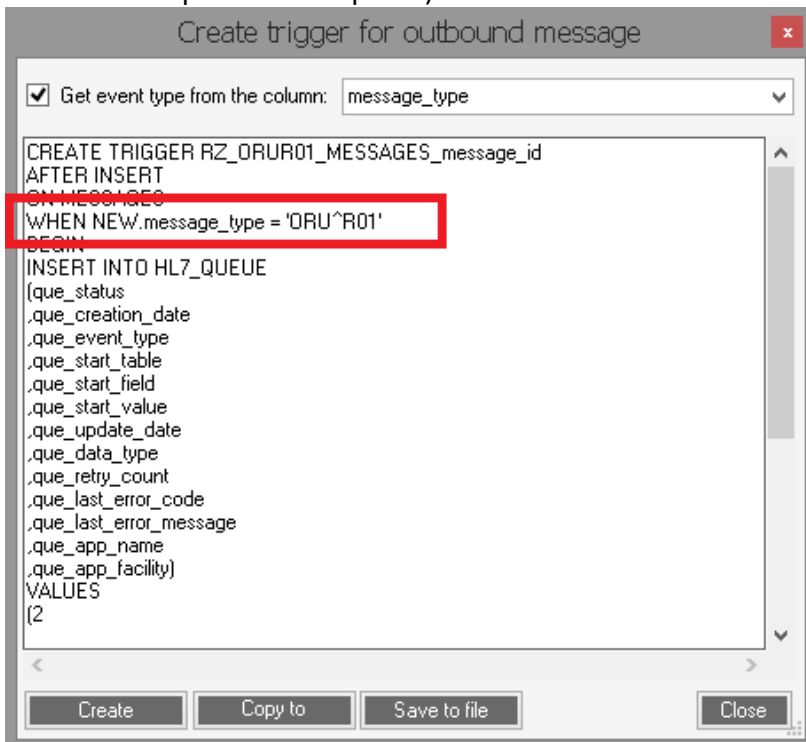
☐ Get event type from the column: message_type

```
CREATE TRIGGER RZ_ORUR01_MESSAGES_message_id
AFTER INSERT
ON MESSAGES
BEGIN
INSERT INTO HL7_QUEUE
(que_status
,que_creation_date
,que_event_type
,que_start_table
,que_start_field
,que_start_value
,que_update_date
,que_data_type
,que_retry_count
,que_last_error_code
,que_last_error_message
,que_app_name
,que_app_facility)
VALUES
(2
,datetime('now','localtime')
```

Create Copy to Save to file Close

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):



Create trigger for outbound message

☒ Get event type from the column: message_type

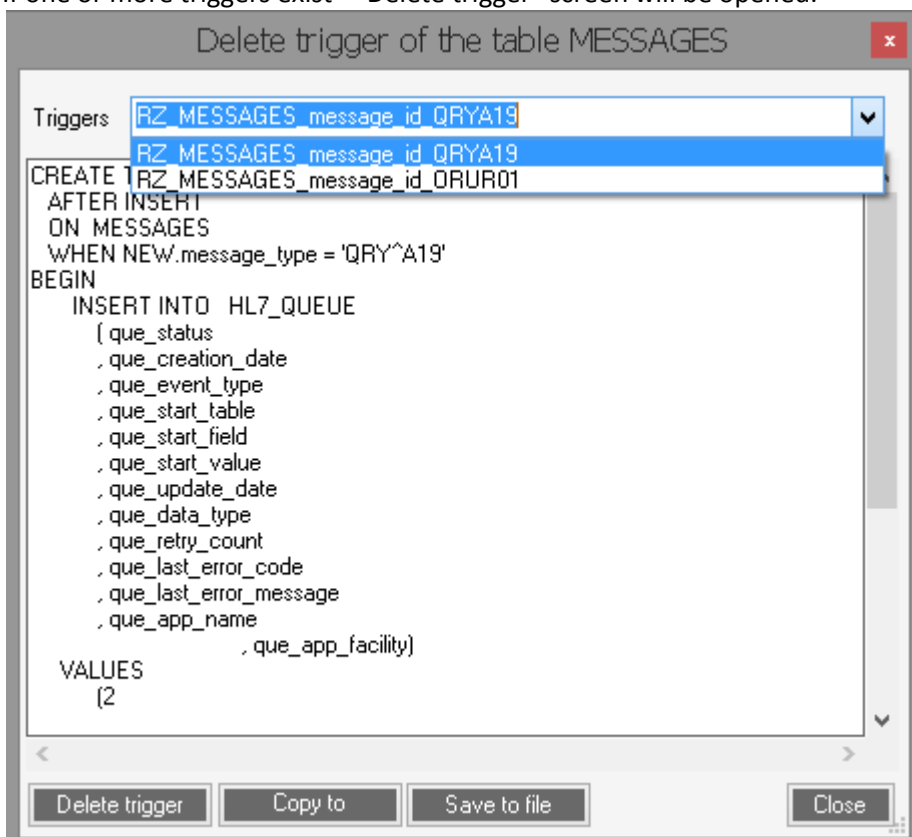
```
CREATE TRIGGER RZ_ORUR01_MESSAGES_message_id
AFTER INSERT
ON MESSAGES
WHEN NEW.message_type = 'ORU^R01'
BEGIN
INSERT INTO HL7_QUEUE
(que_status
,que_creation_date
,que_event_type
,que_start_table
,que_start_field
,que_start_value
,que_update_date
,que_data_type
,que_retry_count
,que_last_error_code
,que_last_error_message
,que_app_name
,que_app_facility)
VALUES
(2
```

Create Copy to Save to file Close

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

The screenshot shows the 'HL7 Service Configuration' window. The 'HL7 Service' tab is selected. The configuration includes fields for 'Default XML mapping file' (set to 'built_in_mapping.HL7KIT'), 'Default protocol version' (set to '.251'), 'Max.message length' (set to '16384'), and 'Segment separator' (set to '0xD'). There are checkboxes for 'V2.XML representation' (unchecked), 'Log full text' (checked), and 'Save message in: D:\Temp' (checked and highlighted with a red box). Other options include 'Set Sending Facility in ACK by Receiving Facility from incoming' (unchecked) and 'Unmapped messages get a success ACK' (unchecked). A 'Field was changed' notification is visible at the bottom right.

HL7 Service Configuration

Start HL7 Service Start DICOM Service Save Help

Database Message processing Remote Applications HL7 Service DICOM Service

Default XML mapping file

built_in_mapping.HL7KIT

Default protocol version

.251 Open Message Rules for edit Open Segment Definitions for edit

Max.message length

16384

Segment separator

0xD

☐ V2.XML representation

☒ Log full text

☒ Save message in: D:\Temp

☐ Set Sending Facility in ACK by Receiving Facility from incoming

☐ Unmapped messages get a success ACK

Field was changed

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:

The screenshot shows the application interface for building inbound mapping from an existing HL7 message. The interface includes a menu bar (File, Mapping, Configuration, Help) and a toolbar with buttons '1' and '2'. The 'Messages structure of event type' panel shows a loaded file 'C:\HL7Kit\Examples\ADTA01.hl7'. The 'Current message structure' panel displays a tree view of the message structure, including 'patient' and 'PID' segments. The 'Event type structure' panel shows a tree view of the event type structure. The 'Data Base structure' panel shows a table list with 'CONFIGURATION' selected. The 'MESSAGES' and 'N_PATIENT' tables are displayed, showing fields like 'message_id', 'message_date_time', 'message_type', 'message_control_id', 'sending_application', 'receiving_application', 'receiving_facility', 'id', 'patient_id', 'patient_message_id', 'patient_name', 'phone_number', 'birth_date', 'sex', 'address', and 'ssn'. A green bar at the bottom indicates 'Message is valid'. A table at the bottom shows the mapping rules, including 'Alias', 'Segm.', 'Seq#', 'Message Field', 'Table Name', and 'Table Field'.

Alias	Segm.	Seq#	Message Field	Table Name	Table Field
	MSH	7	DateofMessage	MESSAGES	message_date_time
	MSH	9	MessageType	MESSAGES	message_type
	MSH	10	MessageControlID	MESSAGES	message_control_id
patient	PID	5	PatientsName	N_PATIENT	patient_name
patient	PID	7	DateofBirth	N_PATIENT	birth_date
patient	PID	8	Sex	N_PATIENT	sex

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.

The screenshot shows the HL7 Mapper interface. On the left, a list of event types is displayed, with 'ORM001' highlighted by a red box. On the right, the 'Data Base structure' panel is visible, featuring a red box around the 'Enabled' checkbox. Below this, a 'Tables list' shows 'CONFIGURATION'. A 'SCHED_PROC_STEP' window is also open, displaying a table with fields like 'id', 'modality', 'scheduled_station_ae_ti', 'start_date_time', 'end_date_time', 'perf_phys_name', and 'sched_proc_step_desc'.

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.

Delete									
	Alias	Segm.	Seq#	Message Field	~	^	&	Table Name	Table Field
<input type="checkbox"/>		MSH	7	DateTimeofMessage				MESSAGES	message_date_time
<input type="checkbox"/>	Comments: Message arriving date								
<input type="checkbox"/>		MSH	9	MessageType				MESSAGES	message_type
<input type="checkbox"/>		MSH	10	MessageControlID				MESSAGES	message_control_id

Rules comments are stored in the mapping XML file

1595 - Interactive preview of the outbound message

File Mapping Configuration Help ← Outbound

Messages structure of event type QRYA19

☒ Interactive preview value of this event type field: 7

Output message structure

- 2. QueryFormatCode (ID)
- 3. QueryPriority (ID)
- 4. QueryID (ST)
- 5. DeferredResponseType (ID)
- 6. Def.RespDateTime (TS)
- 7. QuantityLimitedRequest (CQ)
- 8. WhoSubjectFilter (ST)
- 9. WhatSubjectFilter (ID)

Event type structure

- 3. QueryPriority (ID) <- Outbound r ^
- 4. QueryID (ST) <- Outbound rule...
- 5. DeferredResponseType (ID)
- 6. Def.RespDateTime (TS)
- 7. QuantityLimitedRequest (CQ) <-
- 8. WhoSubjectFilter (ST) <- Outboi
- 9. WhatSubjectFilter (ID) <- Outboi

ding test(Sending test facility)Receivir
3111507.000[R]1123||1^RD2295044|D

Data Base structure ☒ Enabled

Tables list: Awaiting_REQUESTED_PROCEDURES_VIEW + Add table Reload

MESSAGES		
++ message_id		7
message_date_time	MSH 7	26/11/2017 11...
message_type	MSH 9	QRY^A19
message_control_id	MSH 10	12345
sending_application	MSH 3	Sending test
sending_facility	MSH 4	Sending test ...
receiving_application	MSH 5	Receiving test
receiving_facility	MSH 6	Receiving tes...

QUERY_DEFINITION		
++ query_def_id		1
query_message_id		7
query_date_time	QRD 1	26/11/2017 11
query_format_code	QRD 2	R
query_priority	QRD 3	I
query_id	QRD 4	123
quantity_limited_restrict	QRD 7	1^RD
who_subject_filter	QRD 8	2295044
what_subject_filter	QRD 9	DEM

Delete **Start message building from this DB table / field:** MESSAGES message_id

OpenACK mapping ☐ MapACK to DB **Wait for response** ☒ of type ADRA19 Go to response

	Alias	Segm.	Seq#	Message Field	~	^	&	Table Name	Table Field
<input type="checkbox"/>		MSH	6	ReceivingFacility				MESSAGES	receiving_facility
<input type="checkbox"/>		QRD	1	QueryDateTime				QUERY_DEFINITION	query_date_time
<input type="checkbox"/>		QRD	2	QueryFormatCode				QUERY_DEFINITION	query_format_code
<input type="checkbox"/>		QRD	3	QueryPriority				QUERY_DEFINITION	query_priority
<input type="checkbox"/>		QRD	4	QueryID				QUERY_DEFINITION	query_id
<input type="checkbox"/>		QRD	7	QuantityLimitedRequest				QUERY_DEFINITION	quantity_limited_restrict
<input type="checkbox"/>		QRD	8	WhoSubjectFilter				QUERY_DEFINITION	who_subject_filter

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:

File Mapping Configuration Help ← Outbound

Switch to Inbound mapping
Outbound test
Create Trigger
Delete Trigger
DICOM mapping

9. MessageType (ID) <- Outbound rule...
10. MessageControlID (ST) <- Outbound rule...
11. ProcessingID (ID)
12. VersionID (NM)
13. SequenceNumber (NM)
14. ContinuationPointer (ST)
GRD
1. QueryDateTime (TS) <- Outbound rule...
2. QueryFormatCode (ID) <- Outbound rule...
3. QueryPriority (ID) <- Outbound rule...
4. QueryID (ST) <- Outbound rule...
5. DeferredResponseType (ID)
6. Def.RespDateTime (TS)
7. QuantityLimitedRequest (CQ) <- Outbound rule...
8. WhoSubjectFilter (ST) <- Outbound rule...
9. WhatSubjectFilter (ID) <- Outbound rule...
10. WhatDeptDataCode (ST)
11. WhatDataCdValueQua (ST)

Data Base structure ☒ Enabled

Tables list: AWAITING_REQUESTED_PROCEDURES_VIEW + Add table Reload

MESSAGES		QUERY_DEFINITION	
++ message_id		++ query_def_id	
message_date_time	MSH 7	query_message_id	
message_type	MSH 9	query_date_time	GRD 1
message_control_id	MSH 10	query_format_code	GRD 2
sending_application	MSH 3	query_priority	GRD 3
sending_facility	MSH 4	query_id	GRD 4
receiving_application	MSH 5	quantity_limited_restrict	GRD 7
receiving_facility	MSH 6	who_subject_filter	GRD 8
		what_subject_filter	GRD 9

Delete Start message building from this DB table / field: MESSAGES message_id

Open ACK mapping ☐ Map ACK to DB Wait for response ☒ of type ADRA19 Go to response

Alias	Segm.	Seq#	Message Field	~	^	&	Table Name	Table Field
<input type="checkbox"/>	QGRD	1	QueryDateTime				QUERY_DEFINITION	query_date_time
<input type="checkbox"/>	QGRD	2	QueryFormatCode				QUERY_DEFINITION	query_format_code
<input type="checkbox"/>	QGRD	3	QueryPriority				QUERY_DEFINITION	query_priority
<input type="checkbox"/>	QGRD	4	QueryID				QUERY_DEFINITION	query_id
<input type="checkbox"/>	QGRD	7	QuantityLimitedRequest				QUERY_DEFINITION	quantity_limited_restrict
<input type="checkbox"/>	QGRD	8	vWhoSubjectFilter				QUERY_DEFINITION	who_subject_filter
<input type="checkbox"/>	QGRD	9	vWhatSubjectFilter				QUERY_DEFINITION	what_subject_filter

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

Data Base structure ☒ Enabled

Tables list: CONFIGURATION + Add table Reload

MESSAGES		SERVICE_REQUEST		REQUESTED_PROCEDURE	
++ message_id		++ id		++ id	
message_date_time	MSH 7	accession_number	OBR 18	study_instance_uid	ZDS 1
message_type	MSH 9	referring_physicians_na	PV1 8	req_proc_desc	OBR 15
message_control_id	MSH 10	requesting_physician	PV1 7	req_proc_id	OBR 2
sending_application	MSH 3	requesting_service		service_request_id	
sending_facility	MSH 4			patient_internal_id	
receiving_application	MSH 5			RequestedProcedureCo	
receiving_facility	MSH 6				

II PATIENT	
++ id	
patient_id	PID 3
patient_message_id	
patient_name	PID 5
phone_number	
birth_date	PID 7
sex	PID 8

SCHED_PROC_STEP	
++ id	
modality	OBR 24
scheduled_station_ae_t	
start_date_time	OBR 36
end_date_time	
perf_phys_name	PV1 17
sched_proc_step_desc	
sched_proc_step_id	OBR 19
req_proc_id	

Visual representation of Foreign Keys: Arrows show relationships from child tables to parent tables. For example, from SERVICE_REQUEST to REQUESTED_PROCEDURE, and from II PATIENT to SCHED_PROC_STEP.

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

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

HL7 Service Configuration

Start HL7 Service Start DICOM Service Save Help

Database Message processing Remote Applications HL7 Service DICOM Service

Application name	Connection timeout (msec.)		Maximum Retries
HL7	Send 15000	Receive 15000	3
Application facility	Interconnection pause (msec.)		Retry Frequency
FAC	0		5
Listener port	MLP Envelope prefix		Out Poll Seconds
8080	0xB		30
	MLP Envelope suffix		Basic Security
	0x1C 0xD		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

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

HL7 Service Configuration

Start HL7 Service Start DICOM Service Save Help

Database Message processing Remote Applications HL7 Service DICOM Service

Application name	Connection timeout (msec.)		Maximum Retries
HL7	Send 15000	Receive 15000	3
Application facility	Interconnection pause (msec.)		Retry Frequency
FAC	0		5
Listener port	MLP Envelope prefix		Out Poll Seconds
8080	0xB		30
	MLP Envelope suffix		Basic Security
	0x1C 0xD		None

☒ Outbound thread enabled ☒ 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:

Field was changed

1616 - New layout of HL7 service configuration

The screenshot shows the 'HL7 Service Configuration' window with the 'Database' tab selected. The window has a title bar with standard OS controls and a menu bar with 'Start HL7 Service', 'Start DICOM Service', 'Save', and 'Help'. The 'Database' tab is active, showing options for the 'Data Base Engine' (MSSQL, MySQL, SQLite), a 'Connection string' text area, and a 'Queue Table Name' text field. A status bar at the bottom indicates 'Field was changed'.

HL7 Service Configuration

Start HL7 Service Start DICOM Service Save Help

Database Message processing Remote Applications HL7 Service DICOM Service

Data Base Engine

☐ MSSQL

☐ MySQL

☒ SQLite

Connection string

Data Source=C:\HL7Kit\DicomServer.db; Version=3;

Check Connection Select Data Base

Queue Table Name

HL7_QUEUE

Field was changed

The screenshot shows the 'HL7 Service Configuration' window with the 'HL7 Service' tab selected. The window has a title bar with standard OS controls and a menu bar with 'Start HL7 Service', 'Start DICOM Service', 'Save', and 'Help'. The 'HL7 Service' tab is active, showing options for 'Default XML mapping file', 'Default protocol version', 'Max.message length', 'Segment separator', and several checkboxes for logging and message handling. A status bar at the bottom indicates 'Field was changed'.

HL7 Service Configuration

Start HL7 Service Start DICOM Service Save Help

Database Message processing Remote Applications HL7 Service DICOM Service

Default XML mapping file

built_in_mapping.HL7KIT

Default protocol version

.251

Open Message Rules for edit Open Segment Definitions for edit

Max.message length

16384

Segment separator

0xD

☐ V2.XML representation

☒ Log full text

☐ Save message in:

☐ Set Sending Facility in ACK by Receiving Facility from incoming

☐ Unmapped messages get a success ACK

Field was changed

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
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Remote APP	Remote FAC	localhost	8085	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

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 Update application

Remote application host name
localhost

Remote application port
8085 - 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

Maximum Retries
3

Interconnection pause (msec.)
0

Retry Frequency
5

MLP Envelope prefix
0xB

MLP Envelope suffix
0x1C 0xD

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