

Codonics Virtua HL7 Reports

Overview

This document provides the instructions for configuring the HL7 Patient Reports features of the Codonics® Virtua® Medical Disc Publisher. This document covers the configuration for HL7 Reports, and it covers the general operations of Virtua Reports.

Operational Description

Patient Reports are generated when a radiologist reads a study and enters the results into a computer system. HL7 patient reports are initially stored on a Radiology Information System (RIS) system. These reports can be sent to Virtua. When Virtua receives a report, it converts the data found inside the report to an internal format that is used to present the report in a viewable format on the disc. The final format of the report can be customized by making changes to the report template. HL7 reports requires Version 2.3.0 software or greater.

HL7 Operational Description

Health Level 7 is a standards organization that defines a messaging standard called HL7 that is used for most system communications within a hospital. HL7 is used to communicate messages in a wide variety of data, ranging from patient billing to radiology reports. Radiology reports residing on the RIS can be sent to Virtua using HL7.

Medical images, which are usually stored as studies on a PACS, use the DICOM protocol instead of HL7. Typically, radiology reports and the associated DICOM studies are stored on two different systems and transferred over a network using different protocols.

To combine a radiology report with a diagnostic study, Virtua accepts both HL7 from the RIS and DICOM from the PACS. Once Virtua receives both the report and study, it will match the them together and record both on a disc.

Enabling HL7 Reports

HL7 reports requires a feature key on the Virtua SmartDrive. Contact Codonics Technical Support or your Codonics representative to purchase this feature.

In addition to the feature key, HL7 Reports must be enabled using the parameter `doEnableHL7Reports` in the HL7 Server profile `/profiles/report/hl7.server.txt`.

Report Profile Settings

Virtua settings for Patient Reports are defined in the Report Profile, which is the file `/profiles/report/report.default.txt` on the SmartDrive. Below is a list of the parameters used by the Patient Reports feature, their default values, and a short description of their use.

Parameter:	doIncludeXMLReport
Settings:	True or False
Default:	True
Description:	This must be set to True for HL7 reports.
Parameter:	doIncludeStructuredReport
Settings:	True or False
Default:	False
Description:	This must be set to False for HL7 reports.
Parameter:	reportTemplateFileName
Settings:	Report_Template
Default:	template.default.xsl
Description:	The name of the template file that contains the report layout. The profile must be located on the SmartDrive in the <code>/profiles/report</code> directory.
Parameter:	reportSeriesNumber
Settings:	1 to 65535
Default:	8192
Description:	Controls the series number of the DICOM Report Image attached to the study. This should be changed only if a site would like the report image to have a different series number.
Parameter:	doKeepOnlyLatestReport
Settings:	True or False
Default:	True
Description:	Determines whether or not to keep only the most recently received copy of a report, or all versions of a report.

The following is a sample report profile:

report.default.txt
doIncludeXMLReport = True
doIncludeStructuredReport = False
reportTemplateFileName = template.default.xml
reportImageTemplateFileName = template.image.xml
reportSeriesNumber = 8192
doKeepOnlyLatestReport = True

RIS Configuration

HL7 reports require proper configuration of both the RIS and Virtua. The RIS administrator must configure the RIS or Interface Engine to send radiology reports to Virtua. The following information is required:

- ◆ The preferred HL7 port number
- ◆ The location of the accession number within the HL7 message
- ◆ The uniqueness of the accession number

NOTE: Each RIS system is different. This document relies on the RIS administrator to handle configuration details of their particular RIS.

HL7 Server Profile Settings

Virtua settings for HL7 are defined in the HL7 Server Profile, which is the file `/profiles/report/hl7.server.txt` on the SmartDrive. Below is a list of the parameters used by HL7, their default values, and a short description of their use. Virtua can accept only HL7 messages from a single RIS.

Parameter: **doEnableHL7Reports**
Settings: **True or False**
Default: **False**
Description: Enables the HL7 Report interface. When set to **False**, HL7 reports are disabled and Virtua does not accept incoming HL7 report messages. When set to **True**, Virtua receives and processes HL7 reports.

Parameter: **portNumber**
Settings: **1 to 65535**
Default: **2575**
Description: Determines the port used for HL7 communications. This should be set to the value provided by the RIS administrator.

Parameter: **HL7AccessionSegment**
Settings: **HL7_Message_Segment_Name**
Default: **OBR**

Description: Identifies to Virtua which segment of the HL7 message contains the accession number. This should be set to the value provided by the RIS administrator.

Parameter: **HL7AccessionFieldNumber**
Settings: **1 to 255**
Default: **3**

Description: Identifies which field of the given segment contains the accession number. This should be set to the value provided by the RIS administrator.

Parameter: **doMatchAccessionNumber**
Settings: **True or False**
Default: **True**

Description: Determines whether or not the software will use the accession number to match reports with studies. This is the preferred matching method.

Parameter: **doMatchExamDate**
Settings: **True or False**
Default: **False**

Description: Determines whether or not the software will use the exam date to match reports with studies.

NOTE: This setting can be safely set to **False** if `doMatchAccessionNumber` is **True** and accession numbers are unique to each study.

Parameter: **maxReportAge**
Settings: **0 to 365**
Default: **90**

Description: Used by Virtua to remove old reports from the system. Reports that are older than the number of days specified will be removed by Virtua. When set to **0**, all reports will be kept until the `maxNumberOfReports` is reached.

Parameter: **maxNumberOfReports**
Settings: **1 to 120000**
Default: **60000**

Description: Defines the maximum number of unmatched reports to store. Unmatched reports are maintained in a first-in, first-out organization. The oldest reports are deleted after this limit is reached.

Parameter: **doUpdateReceivedTime**
Settings: **True or False**
Default: **False**

Description: If this is set to **True**, then the study associated with an incoming report are promoted to the top of the studies list. If it is **False**, then the received date is not changed and the study remains in its

interface Studies tab.

Parameter: **doDisconnectAtEndOfMessageChar**
Settings: **True** or **False**
Default: **False**
Description: HL7 messages end with an “End of Message” character. If the RIS holds the connection open after the message is sent, this parameter can be set to **True** to force Virtua to close the connection.

Parameter: **connectionTimeout**
Settings: **0** to **65535**
Default: **0**
Description: The number of seconds the Virtua will keep a connection open while waiting for communication from the RIS. The RIS can open a new connection after this one closes. When set to **0**, the connection will be held open until the RIS closes it.

Parameter: **matchPatientUsing**
Settings: Any three of the patient field designations **name**, **id**, **dob**, or **sex**, as a string separated by an underscore (_) character (e.g., **name_id_dob**)
Default: **id_only**
Description: The patient demographic fields to use when matching a report to a study. This setting overrides the **matchPatientUsing** setting in the Job Profiles only when matching reports to studies. **id_only** is the recommended setting and will be used in conjunction with the **doMatchAccessionNumber** and **doMatchExamDate** settings when attaching reports to studies.

The following is a sample HL7 Server Profile:

hl7.server.txt
doEnableHL7Reports = True
portNumber = 2575
HL7AccessionSegment = OBR
HL7AccessionFieldNumber = 3
doMatchAccessionNumber = True
doMatchExamDate = False
maxReportAge = 90
maxNumberOfReports = 60000

hl7.server.txt (cont.)
doUpdateReceivedTime = False
doDisconnectAtEndOfMessageChar = False
connectionTimeout = 0
doDisconnectAtEndOfMessageChar = False

HL7 Report Matching

Virtua matches a report to a study as follows:

1. Matches the patient information in the HL7 report to the patient information in the DICOM study. The information used for matching is controlled by the **matchPatientUsing** parameter in the HL7 Server Profile.
2. If the patient information matches, then the **doMatchAccessionNumber** and **doMatchExamDate** fields in the HL7 Server Profile are used to match a specific report to a study.

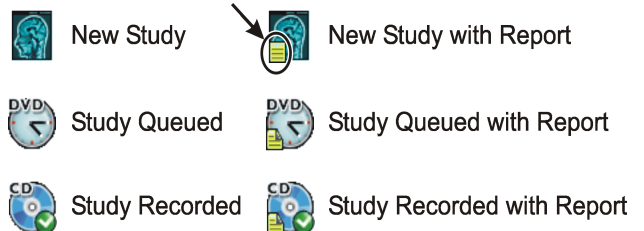
Report Template and Logo

The final format of the report is controlled by the report template file, **template.default.xml**, located in the SmartDrive folder **/profiles/report**. This file is in a format similar to HTML and can be edited by an experienced user to create a layout tailored to a specific facility.

The report logo that is placed on the patient report is the image named **logo.jpg** in the SmartDrive folder **/profiles/report/images**. This file should be replaced with another image to create a custom report logo for each facility.

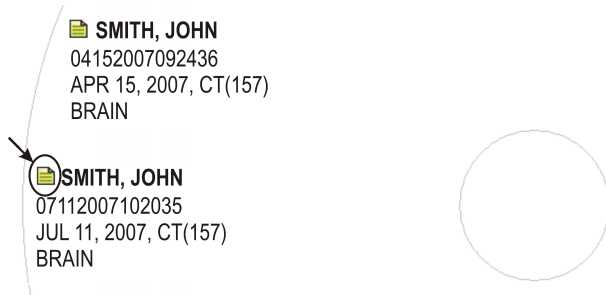
User Interface Report Indicators

The Virtua user interface indicates when a study includes a report by placing a small, yellow “page” in the bottom-left corner of icons on the Status column of the Studies and Discs tabs:



Disc Label Report Indicators

The standard Virtua disc labels have been modified to include graphics that indicate when a study includes a report. A small, yellow “page” icon is placed in front of the text that describes the study:



To enable the new graphics on disc labels, it is necessary to upgrade the labels in the SmartDrive \labels directory. Contact Codonics Technical Support for additional information.

Viewing Reports

Discs produced by Virtua include a LaunchPad that allows reports to be viewed in a web browser.



When a disc that includes a report is mounted in a PC, the LaunchPad starts automatically and provides controls for selecting the report or study images. When the report is selected, a web browser is launched and the report is displayed as an HTML web page.

Troubleshooting

Variations in RIS systems and configuration problems in Virtua HL7 settings can cause problems. Refer to the following information to troubleshoot problems.

No HL7 messages are being received

1. Verify that Virtua HL7 settings are correct. All parameters in the Virtua HL7 profile are case-sensitive and must be spelled exactly as shown in this document.
2. Verify that Virtua is receiving valid HL7 report messages.

The report may not have been received or accepted. View the HL7 log named HL7Server.001.0.log. Look for the following line:

```
Received a Valid Report Message, Creating Report File
```

If the line does not exist, contact Codonics Technical Support. If the line does exist, then continue troubleshooting.

3. Verify that the patient information contained in the HL7 report matches the DICOM study.

The patient information may be different between the study and the report.

Look for the following lines in the HL7 Server log file:

```
Querying database for: PatientRecord:  
name = APPLE^CANDY^  
id = ID011235  
dob = 19720905
```

Compare the information in the HL7 server log to the Study Details tab. If it matches, continue troubleshooting. If it is not identical [except for the caret (^) characters], then the match failed on the patient information. Change the value of matchPatientUsing in the HL7 Server Profile to exclude the unmatched parameter and try again. If the information still does not match, contact Codonics Technical Support.

4. Verify that the accession number is formatted the same way in the HL7 report and the DICOM study.

The match may fail when comparing the exam date or accession number. To determine if this is the problem, change both doMatchAccessionNumber and doMatchExamDate in the HL7 Server Profile to **False**. Delete the study, then re-send the study and the report to Virtua. If the match still fails, contact Codonics Technical Support.

If the match succeeds, then you must determine how to configure the `doMatchAccessionNumber` and `doMatchExamDate` settings. At least one of these parameters must be **True** for proper operation.

- a. Record the study to a disc.
 - b. Compare the exam date and accession number in the report to those on the **Studies** tab.
 - c. If the accession numbers do not match, then set `doMatchExamDate` to **True**.
 - d. If the accession numbers do match, then set `doMatchAccessionNumber` to **True**.
 - e. Delete the study and try sending the report and study again.
 - f. If the match is not successful, contact Codonics Technical Support.
7. Verify that the RIS is properly formatting and sending data fields in the HL7 reports.

Reports are missing information or are improperly formatted

If the reports appear to be missing information or are improperly formatted, there could be a number of reasons.

- ◆ Some data may not be sent by the RIS. It is possible that several of the data fields are blank when received by Virtua.
- ◆ Some of the fields may be incorrectly filled by the RIS. For example, the RIS may place a random number in the Modality field.
- ◆ Some fields may be poorly formatted. For example, the observation text may be formatted for fixed width display, not variable width display.

The only way to know what is being sent is to examine the log files and the original message. Contact Codonics Technical Support to do this. The most likely solution will be to change the report template file, `report.default.txt`, to properly format fields and to hide fields that have missing or incorrect data.

Technical Support

If problems occur that are not covered by this Technical Brief, contact Codonics Technical Support between the hours of 8:30AM and 5:30PM EST (weekends and U.S. holidays excluded).

Phone: 440-243-1198
Email: support@codonics.com
Website: www.codonics.com

Get it all with just one call
1-800-444-1198

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