Aperio LIS Connectivity

Overview

MAN-0429, Revision C | March 2022

Copyright Notice

Customer Resources

- For the latest information on Leica Biosystems Aperio products and services, please visit www.LeicaBiosystems.com/Aperio.

Disclaimers

- Use normal care in maintaining and using Aperio servers. Interrupting network connections or turning off the servers while they are processing data (such as when they are analyzing eSlides or generating an audit report) can result in data loss.
- This manual is not a substitute for the detailed operator training provided by Leica Biosystems Imaging or for other advanced instruction. Leica Biosystems Imaging Field Representatives should be contacted immediately for assistance in the event of any instrument malfunction. Installation of hardware should only be performed by a certified Leica Biosystems Imaging Service Engineer.
- ImageServer is intended for use with eSlides created by scanning glass slides with the scanner. Educators will use Aperio software to view and modify eSlides in Composite WebSlide (CWS) format.
- The barcode decoding software used by Aperio scanners was provided by Honeywell International, Inc.

Contact Information – Leica Biosystems Imaging, Inc.

Headquarters	Customer Support	General Information
Leica Biosystems Imaging, Inc. 1360 Park Center Drive Vista, CA 92081 USA Tel: +1 (866) 478-4111 (toll free) Direct International Tel: +1 (760) 539-1100	Contact your local support representative with any query and service request. https://www.leicabiosystems.com/service-support/technical-support/	US/Canada Tel: +1 (866) 478-4111 (toll free) Direct International Tel: +1 (760) 539-1100 Email: ePathology@LeicaBiosystems.com

REF 23ESMLISINT

Customer Service Contacts

Please contact the office for your country for technical assistance.

Australia:
96 Ricketts Road
Mount Waverly, VIC 3149
AUSTRALIA
Tel: 1800 625 286 (toll free)
Between 8:30 AM-5 PM, Monday-Friday, AEST
Email: lbs-anz-service@leicabiosystems.com

Austria:
Leica Biosystems Nussloch GmbH
Technical Assistance Center
Heidelberger Strasse 17
Nussloch 69226
GERMANY
Tel: 0080052700527 (toll free)
In-country Tel: +43 1 486 80 50 50
Email: support.at@leicabiosystems.com

België/Belgique:
Tel: 0080052700527 (toll free)
In-country Tel: +32 2 790 98 50
Email: support.be@leicabiosystems.com

Canada:
Tel: +1 844 534 2262 (toll free)
Direct International Tel: +1 760 539 1150
Email: TechServices@leicabiosystems.com

China:
17F, SML Center No. 610 Xu Jia Hui Road, Huangpu District
Shanghai, PRC PC:200025
CHINA
Tel: +86 4008208932
Fax: +86 21 6384 1389
Email: service.cn@leica-microsystems.com
Remote Care email: tac.cn@leica-microsystems.com

Danmark:
Tel: 0080052700527 (toll free)
In-country Tel: +45 44 54 01 01
Email: support.dk@leicabiosystems.com

Deutschland:
Leica Biosystems Nussloch GmbH
Technical Assistance Center
Heidelberger Strasse 17
Nussloch 69226
GERMANY
Tel: 0080052700527 (toll free)
In-country Tel: +49 6441 29 4555
Email: support.de@leicabiosystems.com

Eire:
Tel: 0080052700527 (toll free)
In-country Tel: +44 1908 577 650
Email: support.ie@leicabiosystems.com

España:
Tel: 0080052700527 (toll free)
In-country Tel: +34 902 119 094
Email: support.spain@leicabiosystems.com

France:
Tel: 0080052700527 (toll free)
In-country Tel: +33 811 000 664
Email: support.fr@leicabiosystems.com

Italia:
Tel: 0080052700527 (toll free)
In-country Tel: +39 0257 486 509
Email: support.italy@leicabiosystems.com

Japan:
1-29-9 Takadanobaba, Shinjuku-ku
Tokyo 169-0075
JAPAN

Nederland:
Tel: 0080052700527 (toll free)
In-country Tel: +31 70 413 21 00
Email: support.nl@leicabiosystems.com

New Zealand:
96 Ricketts Road
Mount Waverly, VIC 3149
AUSTRALIA
Tel: 0800 400 589 (toll free)
Between 8:30 AM-5 PM, Monday-Friday, AEST
Email: lbs-anz-service@leicabiosystems.com

Portugal:
Tel: 0080052700527 (toll free)
In-country Tel: +35 1 21 388 9112
Email: support.pt@leicabiosystems.com

The Russian Federation
BioLine LLC
Pinsky lane 3 letter A
Saint Petersburg 197101
THE RUSSIAN FEDERATION
Tel: 8-800-555-49-40 (toll free)
In-country Tel: +7 812 320 49 49
Email: main@bioline.ru

Sweden:
Tel: 0080052700527 (toll free)
In-country Tel: +46 8 625 45 45
Email: support.se@leicabiosystems.com

Switzerland:
Tel: 0080052700527 (toll free)
In-country Tel: +41 71 726 3434
Email: support.ch@leicabiosystems.com

United Kingdom:
Tel: 0080052700527 (toll free)
In-country Tel: +44 1908 577 650
Email: support.uk@leicabiosystems.com

USA:
Tel: +1 844 534 2262 (toll free)
Direct International Tel: +1 760 539 1150
Email: TechServices@leicabiosystems.com

Contents

1 Introduction

This document provides an overview of the Aperio LIS Connectivity solution, showing how it helps to integrate your Laboratory Information System (LIS) with Aperio eSlide Manager, a digital slide management system.

We discuss the features of Aperio LIS Connectivity, the benefits it provides, and how it optimizes the efficiency of your user workflow.

IT Managers may find this document helpful in explaining how Aperio LIS Connectivity fits into their network environment, and how it connects the LIS and Aperio eSlide Manager to provide an integrated solution.

About This Guide

- This chapter contains a product overview and introduction to Aperio LIS Connectivity.
- *"Chapter 2: System Design" on page 11* gives an in-depth look at the design of Aperio LIS Connectivity.
- *"Chapter 3: Product Capabilities" on page 17* gives more details on the capabilities of Aperio LIS Connectivity along with installation options.
- *"Appendix A: Aperio LIS Connectivity Technical Specification" on page 19* contains detailed information on the HL7 message formats used by Aperio LIS Connectivity.

References

For additional information on the Aperio LIS Connectivity environment, refer to:

- *Aperio eSlide Manager Administrator's Guide*, MAN-0044
- *Aperio Cybersecurity and Network Recommendations,* MAN-0355

Contact Us

Do you have questions or need assistance? Contact us at LeicaBiosystems.com.

Product Overview

The Aperio eSlide Manager LIS Connectivity Solution ("Aperio LIS Connectivity") enables pathologists or other users of laboratory information systems to access digitally scanned slide images of a patient case from within the LIS system.

Aperio LIS Connectivity offers a tightly coupled integration between Aperio eSlide Manager and LIS systems that enables the launch of Aperio eSlide Manager digital viewers through the LIS interface. The integration also ensures that the viewer launching the images is always synchronized with the case open on the LIS. This gives the users of the LIS confidence that they are launching and viewing the appropriate results and images in the Aperio eSlide Manager digital viewer.

Figure 1: Overview of the Integration System

Above is a simple representation of what the integration looks like. Aperio LIS Connectivity offers bi-directional messaging between the LIS and Aperio eSlide Manager.

Aperio LIS Connectivity is responsible for handling message transformations between the systems. In other words, Aperio LIS Connectivity accepts information from the LIS through HL7 2.x messages, internally transforms that using Leica-Aperio eSlide Manager specifications, and transmits the data to Aperio eSlide Manager to save in its database. Conversely, when physical slides are scanned by an Aperio scanner, the information is sent via Aperio LIS Connectivity to the LIS in a format that it understands.

There are two major components within the Aperio LIS Connectivity solution as shown in Figure B, the Integration Engine that accepts HL7 messages from the LIS, transforms them into Leica-Aperio eSlide Manager specifications and hands them to the Aperio eSlide Manager Sync Hub. Aperio eSlide Manager Sync Hub is responsible for taking inputs from the integration engine and updating the Aperio eSlide Manager database, to ensure synchronization between Aperio eSlide Manager and the LIS. In other words, all changes made to a patient order/case on the LIS will be routed to Aperio eSlide Manager via Aperio LIS Connectivity to avoid data mismatch between systems.

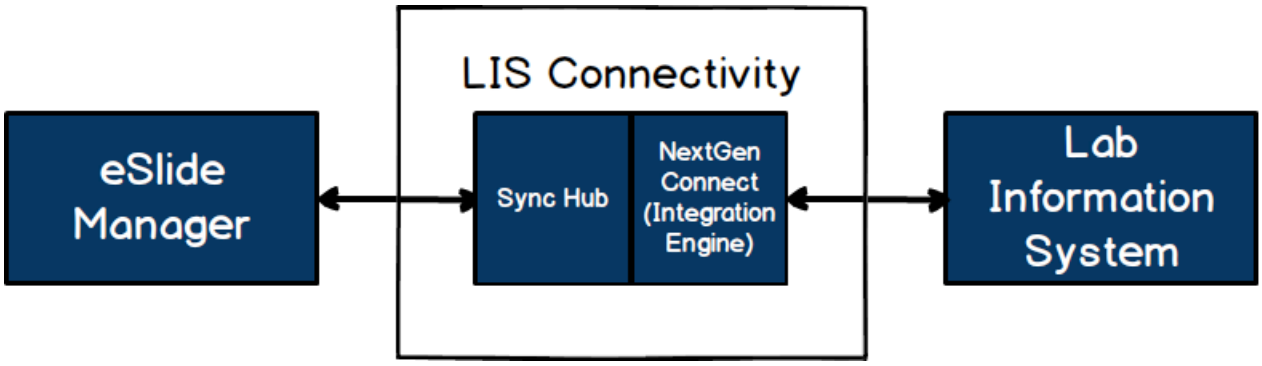

Figure 2: Aperio LIS Connectivity Components

Figure C below shows how the integrated solution benefits workflow efficiency. As shown at the top of the illustration, the users previously used multiple subsystems to perform their routine workflow, accessing the LIS separately and launching Aperio eSlide Manager as a separate application to view the digital images of the same case being viewed in the LIS. This lead to risks of incorrect and delayed assessment as launching two different subsystems disrupts the workflow.

Integrating these systems with Aperio LIS Connectivity enables a single system to view all the information by launching Aperio viewers from within the LIS. This enhances the user experience and avoids incorrect and delayed assessment by synchronizing the viewer with the case being viewed in the LIS. So, at any given time, the user accesses only a single patient case.

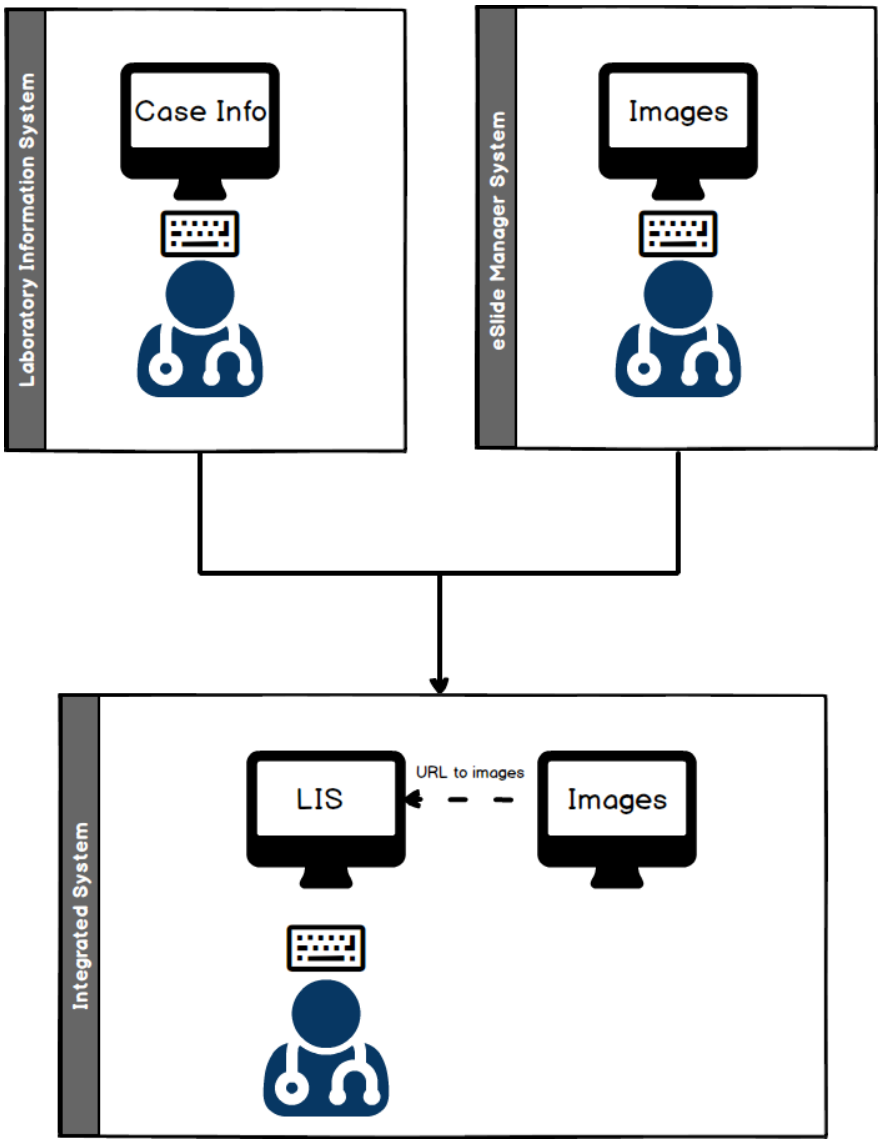

Figure 3: Aperio LIS Connectivity Solution Benefit

Additional Features

Other benefits of Aperio LIS Connectivity include:

- To avoid unauthorized access, users accessing the system are authenticated and authorized through Aperio eSlide Manager credentials while accessing the digital slide viewer.
- Information exchange between systems is encrypted so that there is no misuse of patient information while information is being transfered between Aperio eSlide Manager and the LIS.
- Aperio LIS Connectivity installations are automated with minimal configuration, which saves time and enables a quicker start to optimized lab workflow.

2 System Design

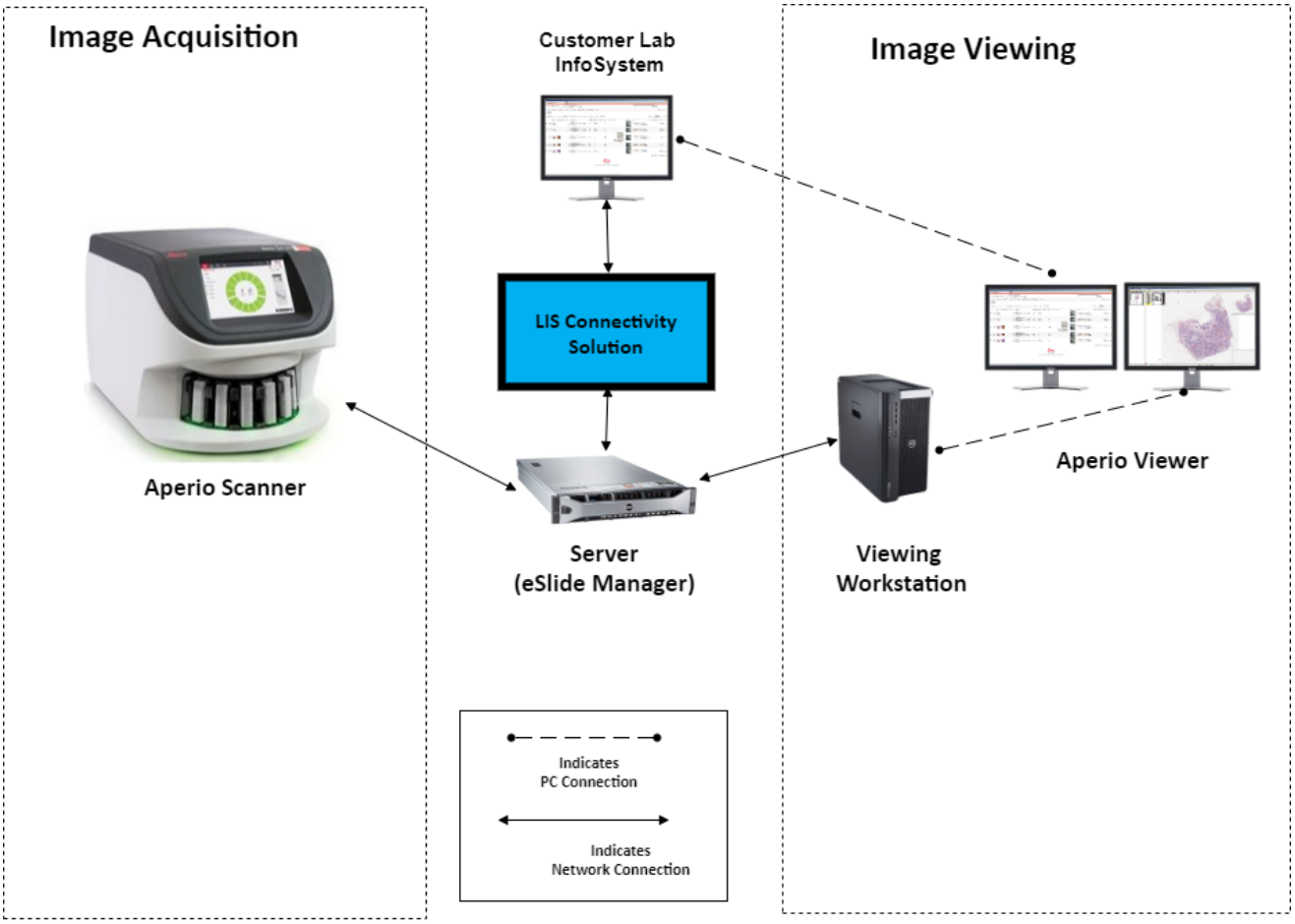

Figure 4: Overall System Design

The illustration above shows how Aperio LIS Connectivity fits into your system.

Workflows

This section shows different workflows supported by Aperio LIS Connectivity.

Order First Scan Next Workflow

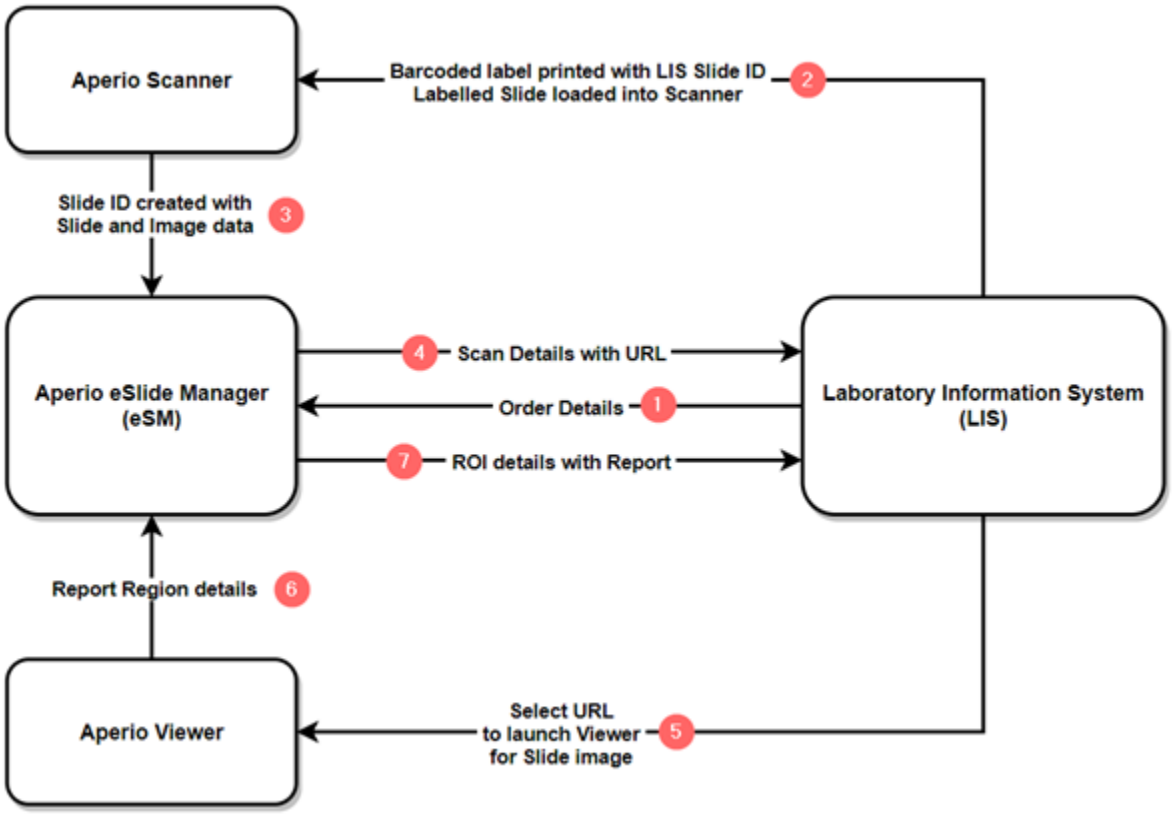

Figure 5: Order First Scan Next Workflow

The Order First Scan Next Workflow initiates the scan order request from the LIS. The data from the order gets saved in Aperio eSlide Manager as Case, Specimen, Cassette/Block, and/or Slide in the Clinical hierarchy; as Project, Specimen, Cassette/Block and/or Slide in the Research hierarchy; and as Course, Lesson, Specimen, Cassette/Block and/or Slide in the Educational hierarchy for orders.

The scan response only triggers if the slide has a valid barcode label and ID (also known as unique slide ID) that the Aperio scanner can recognize.

1. LIS user enters slide order into the LIS. The LIS creates and sends a slide order message to the Aperio eSlide Manager interface with case, specimen, cassette/block, slide and barcode data in the Clinical hierarchy; project, specimen, cassette/block, slide and barcode data in the Research hierarchy; and course, lesson, specimen, cassette/block, slide and barcode data in the Educational hierarchy.
2. Using the LIS or equivalent system the user prints labeling information to the slide including the slide identifier barcode.
3. Aperio Scanner decodes the slide barcode and captures image. (All Aperio scanners can be represented in this workflow). The slide image is stored in the Aperio eSlide Manager image location. The previously created case,

project, course, lesson, specimen, cassette/block or slide record is married up to scanned image by way of the decoded slide barcode.

4. Viewing (URL) links are now available for case, project, course, lesson, specimen, cassette/block or slide level and are sent from the Aperio eSlide Manager interface to the LIS.
5. If the Viewing link is available in the LIS the user selects the link which will open in the web browser (Chrome or Internet Explorer) the Aperio eSlide Manager login screen and subsequently the Slide image(s). With the slide images now viewable the Pathologist/User reviews the slide images as required.

The user launching the viewer from the LIS has the ability to draw a region of interest in the viewer as part of their reporting workflow. Aperio eSlide Manager shares the ROI information with the LIS application. The LIS can use the ROI image and information to fit its workflow.

The workflow also supports updating an existing order or canceling the information for any hierarchy level. Update and Cancel orders are separate work orders and should not be combined in a single order.

Scan First Order Next Workflow

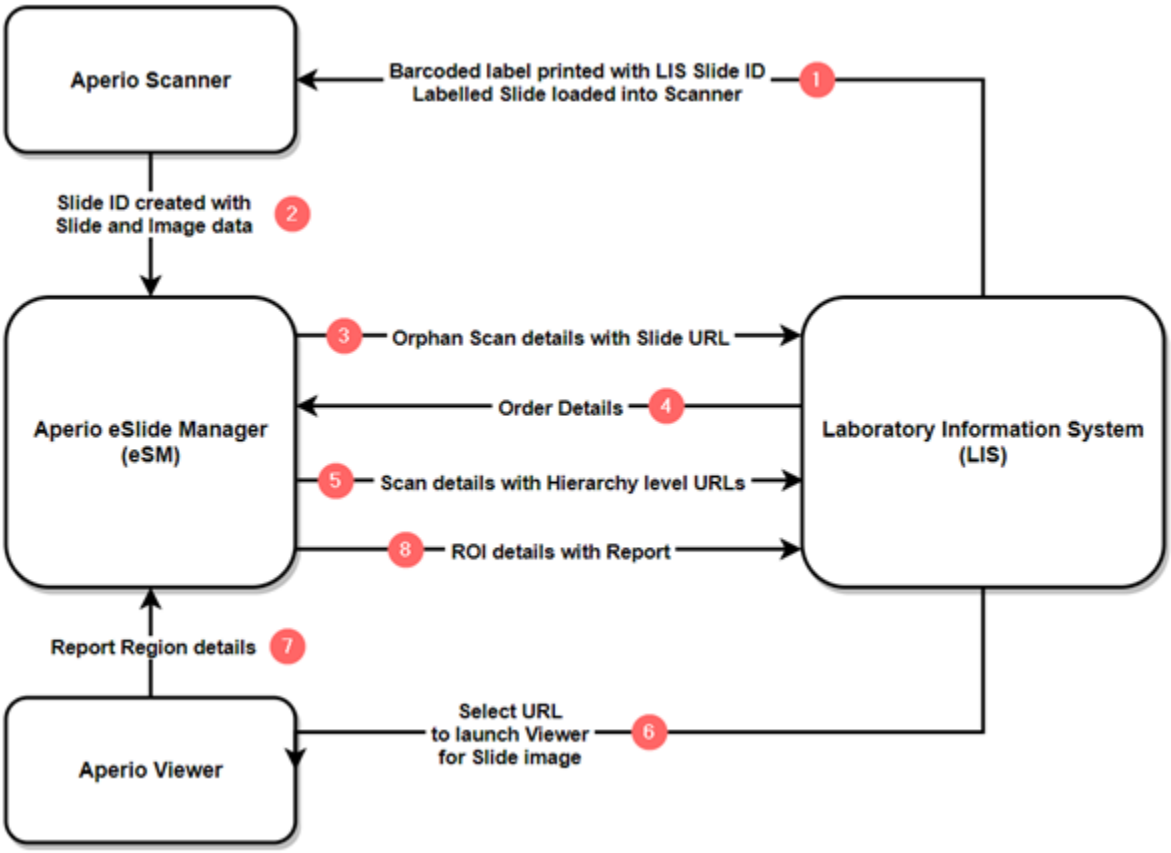

Figure 6: Scan First Order Next Workflow

Most of the Scan First Order Next Workflow follows the same steps as the Order First Workflow except that the scan of the physical slides happens as a first step and then the order is shared by the LIS. Aperio eSlide Manager associates the images to the incoming case as in the first workflow.

1. LIS user enters slide order into the LIS. Using the LIS or equivalent system the user prints labeling information to the slide including the slide identifier barcode.
2. Aperio Scanner decodes barcode and captures image. (All Aperio scanners can be represented in this workflow) Slide image is stored in the Aperio eSlide Manager image location.
3. A parent Slide record is created from the barcode ID for the captured slide image. A slide level response message with optional slide level URL can be sent to the LIS.
4. The LIS processes the slide level response message and subsequently sends a message with the slide's case and specimen data to the Aperio eSlide Manager interface which is then stored as case, specimen, block and slide data into the appropriate Aperio eSlide Manager fields.
5. If the Viewing link is available in the LIS the user selects the link which will open in the web browser (Chrome or Internet Explorer) the Aperio eSlide Manager login screen and subsequently the Slide image(s). With the slide images now viewable the Pathologist/User reviews the slide images as required.

Manual Deletion of Slide in Aperio eSlide Manager Workflow

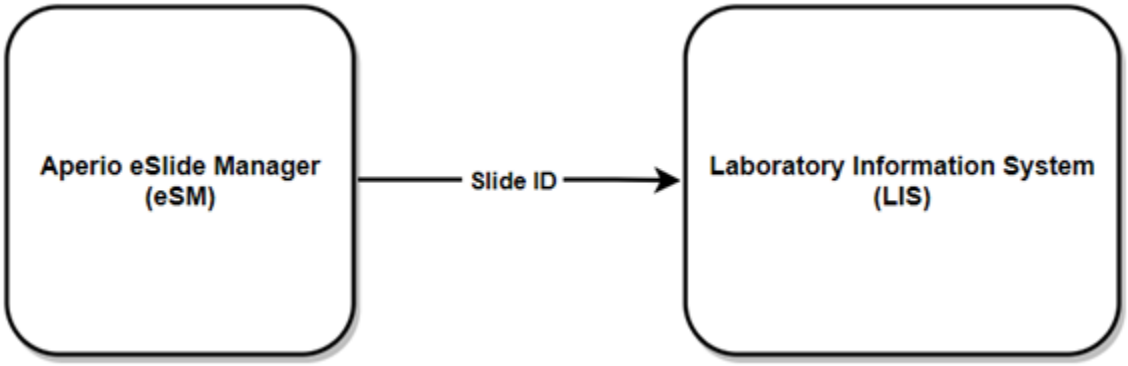

Figure 7: Manual Deletion of Slide in Aperio eSlide Manager Workflow

The slide delete message is triggered to LIS when any slide or its parent is deleted manually in Aperio eSlide Manager. The delete message is generated upon deletion of a Case, Project, Course, Lesson, Specimen, or Slide in eSlide Manager. The message contains one slide's information. Bulk delete will trigger multiple delete responses, and not a single message containing information for all slides.

Detailed Design

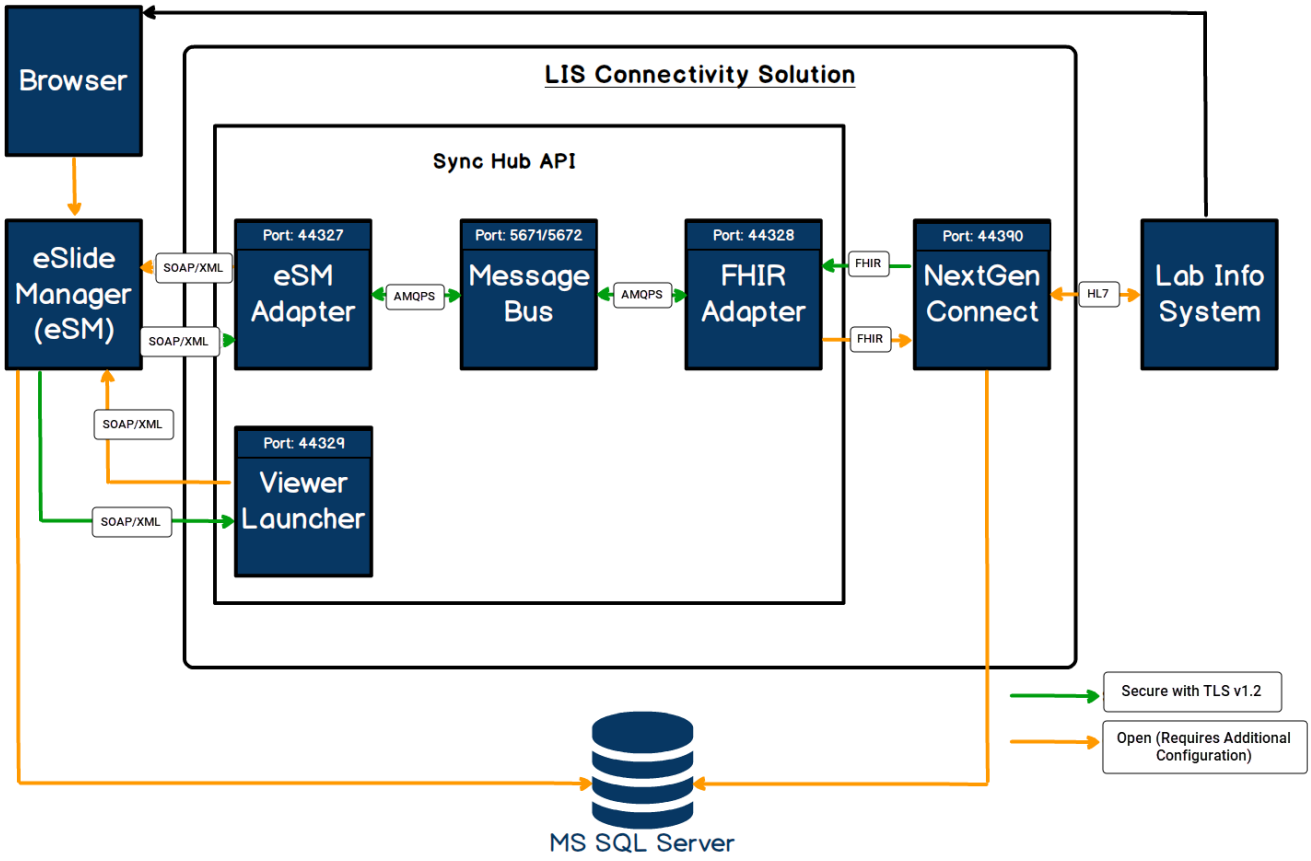

Figure 8: Detailed System Design

The detailed design diagram above illustrates the components of Aperio LIS Connectivity, the mode of communication between the components, and the standard ports they use for transporting information.

NextGen Connect is a cross-platform interface engine that validates, accepts and relays portable messages between Sync Hub and the LIS.

All communications marked with green arrows are secure using TLS v1.2. All communications marked with orange arrows are configurable for cybersecurity. If the LIS vendor's LIS is not SSL compatible, we recommend the customer purchase a NextGen Connect (Mirth) license to secure the connection between NextGen Connect and the LIS. NextGen Connect requires an SSL license to connect securely to a secured LIS application. Please visit NextGen.com for details.

Protocol	Definition
HL7	Health Level Seven or HL7 refers to a set of international standards for transfer of clinical and administrative data between software applications used by various healthcare providers.
SOAP/XML	SOAP (abbreviation for Simple Object Access Protocol) is a messaging protocol specification for exchanging structured information in the implementation of web services in computer networks. SOAP provides a means for systems to package and exchange messages encoded in XML

Table 1: Protocol Definitions

Message Types

Aperio LIS Connectivity uses the message types as shown in the below diagram.

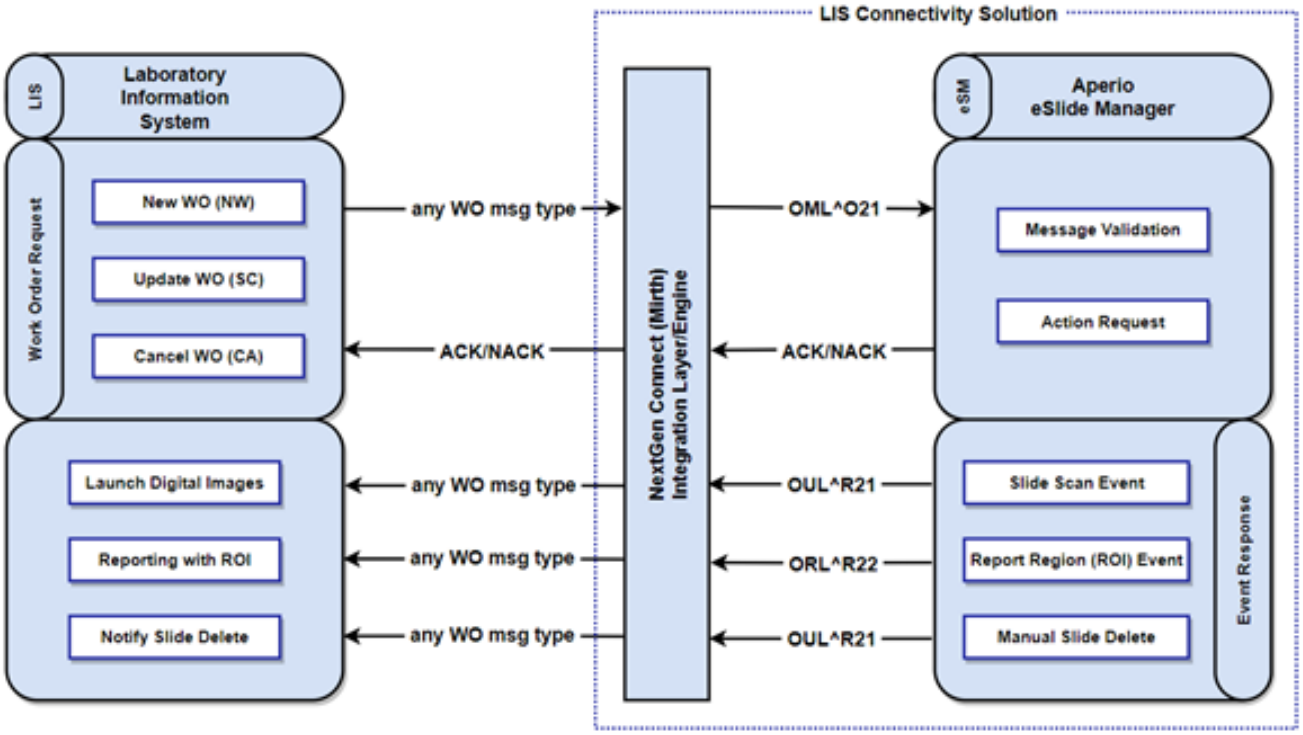

Figure 9: Message Types

Message types shown above between the LIS and Integration Engine can be any Work Order (WO) HL7 message type but when they enter Aperio LIS Connectivity, the message types are Leica standard.

OML^021	Incoming Order from LIS converted into Aperio eSlide Manager specification (HL7)
ACK/NACK	Acknowledgment/Negative Acknowledgment
OUL^R21	Response shared by Leica once a digital slide is registered/deregistered in Aperio eSlide Manager
ORL^022	ROI response shared by Leica when report region is drawn on the Viewer

3 Product Capabilities

This chapter gives additional information on Aperio LIS Connectivity features and installation details.

Integration Engine

Aperio LIS Connectivity uses NextGen Connect (Mirth) for message transformations between an LIS and Aperio eSlide Manager. Aperio LIS Connectivity supports version 3.8.1 of Mirth. A free version of Mirth is installed as part of Aperio LIS Connectivity deployment.

If the LIS vendor's LIS is not SSL compatible, we recommend the customer purchase a NextGen Connect license to secure the connection between NextGen Connect and the LIS. Please visit NextGen.com for details.

Supported HL7 Versions

Aperio LIS Connectivity supports all HL7 2.x versions. All communication sent and received by Aperio LIS Connectivity is through HL7 Lower Level Protocol (LLP). Incoming and outgoing IP addresses and ports can be configured.

Environment Description

Aperio LIS Connectivity is installed alongside Aperio eSlide Manager on one server and users connect through client machines. Pathologists who are remote can continue launching Aperio eSlide Manager and its WebViewer from their LIS depending on network security via VPN or DMZ configuration.

Aperio LIS Connectivity has logs created at every stage of the communication between the LIS and Aperio eSlide Manager to ensure traceability and auditability.

Licensing

Aperio LIS Connectivity uses a perpetual license mode and is dependent on the Aperio eSlide Manager license being available.

Additionally, if the LIS vendor's LIS is not SSL compatible, we recommend the customer purchase a NextGen Connect license to secure the connection between NextGen Connect and the LIS. NextGen Connect requires an SSL license to connect securely to a secured LIS application. Please visit NextGen.com for details.

Key Configurations

- The site can be configured to set the default Aperio viewer for launching digital images. The choices are Aperio ImageScope, Aperio ImageScope DX or Aperio WebViewer.
- Aperio eSlide Manager can configured to be set up over SSL so that all communication between the integration engine and Aperio eSlide Manager is secure.
- An HL7 Mapper is used to map information between LIS HL7 fields to Leica-standard HL7 fields during implementation.
- Aperio LIS Connectivity supports organization of digital slides from one to four levels for Clinical Hierarchy (Case/Specimen/Block/Slide) and a unique ID is required for each level.
- Aperio LIS Connectivity supports organization of digital slides from one to four levels for Research Hierarchy (Project/Specimen/Block/Slide) and a unique ID is required for each level.
- Aperio LIS Connectivity supports organization of digital slides from one to five levels for Educational Hierarchy (Course/Lesson/Specimen/Block/Slide) and a unique ID is required for each level.

Data Group

- Datagroup field position is MSH.8 (Security) in HL7 message.
- Datagroup field is an optional field.
- Datagroup authorizes the user to access the details in eSM.
- Default value of the configuration is false.
- Behaviour of datagroup for the configuration are:

#	DataGroup	Default (CreateDataGroupIfNotExists: false)	Customized (CreateDataGroupIfNotExists: true)
1	1. DataGroup valued 2. DataGroup exists in Aperio eSlide Manager	Maps to requested in HL7	Maps to requested in HL7
2	1. DataGroup valued 2. DataGroup absent in Aperio eSlide Manager	Maps to DataGroup “Default”	Creates and maps to requested in HL7
3	DataGroup not sent (empty/null)	Maps to DataGroup “Default”	Mapt to DataGroup “Default”

A Aperio LIS Connectivity Technical Specification

This appendix contains detailed information on the format of the HL7 messages that LIS Connectivity sends between Aperio eSlide Manager and your LIS. For a general overview of the LIS Connectivity product, refer to the earlier chapters in this document.

HL7 Overview

Each HL7 message consists of one or more segments, and each segment consists of one or more composites (also known as fields). A pipe (|) character is normally used to separate one composite from another. If a composite contains other composites, these sub-composites (or sub-fields) are normally separated by up caret (^) and ampersand (&) characters.

Fields are specified following an alphanumeric syntax that specifies the segment name and the position of the data. In the message below, the patient's first name can be found in the second slot of the 5th field of the PID segment. We would specify patient first name as "PID.5.2". The patient's gender is specified in PID.7.1, but since there are no subfields it can also be represented as simply "PID.7". Up to 3 field specifiers are supported.

Sample HL7 Messages

Clinical Hierarchy

New Order

MSH|^~\&|LIMS||LEICA|CH|20210921010203123|Default|OML^021|20210921010203123|P|2.5.1|

PID|||13015^^^^MR||Doe^James||19900101|M|||||||||||||U|

PV1|||^^^NYP||||123456^Hippocrates^Harold^^Jr^Dr^^123.456.7890|234567^Herophilus ^Henry^^III^PhD^^234.567.8901|456789^Dioscorides^Pedanius^^Anazarbeus^Dr^^456.789.0123|

ORC|NW|

SAC|20H1024|

NTE|1||Patient has liver disease symptoms|C|

NTE|2||Liver cancer identified|S|

NTE|3||Abdominal pain and swelling.|CH|

NTE|4||Liver with too much fat will swell and become inflamed.|FD|

SPM|1|20H1024.1|||||Laparoscopic|Liver|||||||20210921010203123|20210921010203123||||

NTE|1||Hereditary hemochromatosis|C|

ZBL|20H1024.1.A|

OBR|1|||20H1024.1.A.1|

OBX|1|TX|MAG||40|

OBX|2|TX|STN||PAS^Periodic Acid Stain|

OBX|3|TX|Custom^Case|PatientHobbies|Wildlife Photography|

OBX|3|TX|Custom^Specimen|RiskCode|Aggressive|

OBX|3|TX|Custom^Block|Block_SlideNumber|A 1|

OBX|3|TX|Custom^Slide|ScarType|Hypertrophic|

NTE|1||Alpha-1 antitrypsin deficiency|C|

Update Order

```
MSH|^~\&|LIMS||LEICA|CH|20210921010203123|Default|OML^021|20210921010203123|P|2.5.1|
PID|||13015^^^^MR||Doe^James||19900101|M|||||||||||||U|
PV1|||^^^NYP||||123456^Hippocrates^Harold^^Jr^Dr^^123.456.7890|234567^Herophilus
^Henry^^III^PhD^^234.567.8901|456789^Dioscorides^Pedanius^^Anazarbeus^Dr^^456.789.0123|
ORC|SC|
SAC|20H1024|
NTE|1||Patient has liver disease symptoms|C|
NTE|2||Liver cancer identified|S|
NTE|3||Abdominal pain and swelling.|CH|
NTE|4||Liver with too much fat will swell and become inflamed.|FD|
SPM|1|20H1024.1|||||Laparoscopic|Liver|||||||20210921010203123|20210921010203123||||
NTE|1||Hereditary hemochromatosis|C|
ZBL|20H1024.1.A|
OBR|1|||20H1024.1.A.1|
OBX|1|TX|MAG||40|
OBX|2|TX|STN||PAS^Periodic Acid Stain|
OBX|3|TX|Custom^Case|PatientHobbies|Wildlife Photography|
OBX|3|TX|Custom^Specimen|RiskCode|Aggressive|
OBX|3|TX|Custom^Block|Block_SlideNumber|A 1|
OBX|3|TX|Custom^Slide|ScarType|Hypertrophic|
NTE|1||Alpha-1 antitrypsin deficiency|C|
```

Cancel Order (Case Level)

```
MSH|^~\&|LIMS||LEICA|CH|20200211114956075|Default|OML^021|20200909114956075|P|2.5.1|
PID|||13015^^^^MR||Doe^James||19900101|M|||||||||||||U|
PV1|||^^^NYP||||123456^Hippocrates^Harold^^Jr^Dr^^123.456.7890|234567^Herophilus
^Henry^^III^PhD^^234.567.8901|456789^Dioscorides^Pedanius^^Anazarbeus^Dr^^456.789.0123|
ORC|CA|
SAC|20H1024|
```

Cancel Order (Specimen Level)

```
MSH|^~\&|LIMS||LEICA|CH|20200211114956075|Default|OML^021|20200909114956075|P|2.5.1|
PID|||13015^^^^MR||Doe^James||19900101|M||||||||||||U|
PV1|||^^^NYP||||123456^Hippocrates^Harold^^Jr^Dr^^123.456.7890|234567^Herophilus
^Henry^^III^PhD^^234.567.8901|456789^Dioscorides^Pedanius^^Anazarbeus^Dr^^456.789.0123|
ORC|CA|
SAC|20H1024|
SPM|1|20H1024.1|||||Laparoscopic|Liver|||||||||20200211114956075|20200211114956075||||
```

Cancel Order (Block Level)

```
MSH|^~\&|LIMS||LEICA|CH|20200211114956075|Default|OML^021|20200909114956075|P|2.5.1|
PID|||13015^^^^MR||Doe^James||19900101|M||||||||||||U|
PV1|||^^^NYP||||123456^Hippocrates^Harold^^Jr^Dr^^123.456.7890|234567^Herophilus
^Henry^^III^PhD^^234.567.8901|456789^Dioscorides^Pedanius^^Anazarbeus^Dr^^456.789.0123|
ORC|CA|
SAC|20H1024|
SPM|1|20H1024.1|||||Laparoscopic|Liver|||||||||20200211114956075|20200211114956075||||
ZBL|20H1024.1.A|
```

Cancel Order (Slide Level)

```
MSH|^~\&|LIMS||LEICA|CH|20200211114956075|Default|OML^021|20200909114956075|P|2.5.1|
PID|||13015^^^^MR||Doe^James||19900101|M||||||||||||U|
PV1|||^^^NYP||||123456^Hippocrates^Harold^^Jr^Dr^^123.456.7890|234567^Herophilus
^Henry^^III^PhD^^234.567.8901|456789^Dioscorides^Pedanius^^Anazarbeus^Dr^^456.789.0123|
ORC|CA|
SAC|20H1024|
SPM|1|20H1024.1|||||Laparoscopic|Liver|||||||||20200211114956075|20200211114956075||||
ZBL|20H1024.1.A|
OBR|1|||20H1024.1.A.1|
```

Slide Scan

```
MSH|^~\&|LBS|CH|LIS||20211115222804722|Default|OUL^R21|cfdc10ad-b60e-4703-9700-
858598cbf5a5|P|2.5.1
PID|||13015||Doe^James||19900101|M||||||||||||U
PV1|||^^^NYP||||^Hippocrates^Harold^^Jr^Dr^^123.456.7890|^Herophilus^Henry^^III^PhD^^234.567.8901|
^Dioscorides^Pedanius^^Anazarbeus^Dr^^456.789.0123|
ORC|RE|
SAC|20H1024
SPM||20H1024.1|||||Laparoscopic|Liver|||||||||20210921010203000|20210921010203000
NTE|1||Hereditary hemochromatosis
ZBL|20H1024.1.A
OBR||||20H1024.1.A.1
NTE|1||Alpha-1 antitrypsin deficiency
OBX|1|ST|URL|CASE|http://pi-v2-16-02/view/v2/LApi.Case/20H1024||||||F
OBX|2|ST|URL|SPECIMEN|http://pi-v2-16-02/view/v2/LApi.Specimen/20H1024.1||||||F
OBX|3|ST|URL|BLOCK|http://pi-v2-16-02/view/v2/LApi.Block/20H1024.1.A||||||F
OBX|4|ST|CUSTOM^BLOCK|Block_SlideNumber|A 1||||||F
OBX|4|ST|URL|SLIDE|http://pi-v2-16-02/view/v2/LApi.Slide/20H1024.1.A.1||||||F
OBX|5|ST|STN||PAS^Periodic Acid Stain||||||F
OBX|6|ST|THUMBNAIL|Base64|<Base64 Data>||||||F
OBX|7|ST|LABEL|Base64|<Base64 Data>||||||F
OBX|8|ST|MACRO|Base64|<Base64 Data>||||||F
OBX|9|ST|MAG|REQUEST|40||||||F
NTE|1||Patient has liver disease symptoms|C
NTE|2||Abdominal pain and swelling.|CH
NTE|3||Liver with too much fat will swell and become inflamed.|FD
NTE|4||Liver cancer identified|S
```

ROI

```
MSH|^~\&|LBS|CH|LIS||20211115223201882|Default|ORL^O22|e4189ea3-8a61-4553-a7b6-
ecc6de8aaece|P|2.5.1
PID|||13015||Doe^James||19900101|M||||||||||||U
PV1|||^^^NYP||||^Hippocrates^Harold^^Jr^Dr^^123.456.7890|^Herophilus^Henry^^III^PhD^^234.567.8901|
^Dioscorides^Pedanius^^Anazarbeus^Dr^^456.789.0123|
ORC|RE
SAC|20H1024
SPM||20H1024.1|||||Laparoscopic|Liver|||||||||20210921010203000|20210921010203000
NTE|1||Hereditary hemochromatosis
ZBL|20H1024.1.A
OBR||||20H1024.1.A.1
NTE|1||Alpha-1 antitrypsin deficiency
OBX|1|ST|URL|CASE|http://pi-v2-16-02/view/v2/LApi.Case/20H1024||||||F
OBX|2|ST|URL|SPECIMEN|http://pi-v2-16-02/view/v2/LApi.Specimen/20H1024.1||||||F
OBX|3|ST|URL|BLOCK|http://pi-v2-16-02/view/v2/LApi.Block/20H1024.1.A||||||F
OBX|4|ST|CUSTOM^BLOCK|Block_SlideNumber|A 1||||||F
OBX|4|ST|URL|SLIDE|http://pi-v2-16-02/view/v2/LApi.Slide/20H1024.1.A.1||||||F
OBX|5|ST|STN||PAS^Periodic Acid Stain||||||F
OBX|6|ST|REPORT|FILE|C:/Mailbox/ReportRegions/RR_71713d60-6b4b-47b9-a3d7-e313d4399e37.
jpeg||||||F
OBX|7|ST|MAG|REQUEST|40||||||F
NTE|1||Patient has liver disease symptoms|C
NTE|2||Abdominal pain and swelling.|CH
NTE|3||Liver with too much fat will swell and become inflamed.|FD
NTE|4||Liver cancer identified|S
```

ACK

```
MSH|^~\&|LEICA|CH|LIMS||20211115223122|Default|ACK^021|20211115223122318|P|2.5.1
MSA|AA|20210921010203123|Message processed successfully
```

Research Hierarchy

New Order

```
MSH|^~\&|LIMS||LEICA|RH|20210921010203123|Default|OML^021|20210921010203123|P|2.5.1|

PID|||||^Shefali||||||||924.664.8892^^^Contact@research.org||||||||||||||||||||||Species|

PV1||||||||||||||||||||||||||||||||||||||||||||20210921010203123|20210922010203123|

ORC|NW||||CM|||||||ReferenceLab|||||||||||8023456789|

SAC|Project-RH61441|ProjectName

NTE|1||Project Comments|C

NTE|2||Project Description|S

SPM|1|Specimen-RH61441a|||||Procedure-Clinical|Liver|||||||||20210921010203123|20210922010203123||||

NTE|1||Specimen 61441a Comment|C

ZBL|Block-RH61441a

OBR|1|||Slide-RH61441a

OBX|1|ST|MAG||20

OBX|2|ST|STN||PAS^Periodic Acid Stain

NTE|1||Slide1a Comment|C

OBX|2|ST|CUSTOM^Project|ProjectType|Pharma ResearchRH1444

OBX|3|ST|CUSTOM^Specimen|SpecimenExtractionType|OperationRH1444

OBX|4|ST|CUSTOM^Block|Block_SlideNumber|A1RH1444

OBX|5|ST|CUSTOM^Slide|SlideBarcodeType|TypeRH1444a
```

Update Order

```
MSH|^~\&|LIMS||LEICA|RH|20210921010203123|Default|OML^021|20210921010203123|P|2.5.1|
PID|||||^Shefali|||||||924.664.8892^^^Contact@research.org|||||||||||||||||||||Species|
PV1|||||||||||||||||||||||||||||||||||||||||||||||||||||||20210921010203123|20210922010203123|
ORC|SC||||CM|||||||ReferenceLab||||||||||8023456789|
SAC|Project-RH61441|ProjectName
NTE|1||Project Comments|C
NTE|2||Project Description|S
SPM|1|Specimen-RH61441a|||||Procedure-Clinical|Liver|||||||||20210921010203123|20210922010203123||||
NTE|1||Specimen 61441a Comment|C
ZBL|Block-RH61441a
OBR|1|||Slide-RH61441a
OBX|1|ST|MAG||20
OBX|2|ST|STN||PAS^Periodic Acid Stain
NTE|1||Slide1a Comment|C
OBX|2|ST|CUSTOM^Project|ProjectType|Pharma ResearchRH1444
OBX|3|ST|CUSTOM^Specimen|SpecimenExtractionType|OperationRH1444
OBX|4|ST|CUSTOM^Block|Block_SlideNumber|A1RH1444
OBX|5|ST|CUSTOM^Slide|SlideBarcodeType|TypeRH1444a
```

Cancel Order (Project Level)

```
MSH|^~\&|LIMS||LEICA|RH|20210921010203123|Default|OML^021|20210921010203123|P|2.5.1|
PID|||||^Shefali|||||||924.664.8892^^^Contact@research.org|||||||||||||||||||||Species|
PV1|||||||||||||||||||||||||||||||||||||||||||||||||||||||20210921010203123|20210922010203123|
ORC|CA||||CM|||||||ReferenceLab||||||||||8023456789|
SAC|Project-RH61441|ProjectName|
```

Cancel Order (Specimen Level)

```
MSH|^~\&|LIMS||LEICA|RH|20210921010203123|Default|OML^021|20210921010203123|P|2.5.1|
PID|||||^Shefali|||||||924.664.8892^^^Contact@research.org|||||||||||||||||||Species|
PV1|||||||||||||||||||||||||||||||||||||||||||20210921010203123|20210922010203123|
ORC|CA||||CM|||||||ReferenceLab||||||||||8023456789|
SAC|Project-RH61441|ProjectName
NTE|1||Project Comments|C
NTE|2||Project Description|S
SPM|1|Specimen-RH61441a|||||Procedure-Clinical|Liv
er|||||||||20210921010203123|20210922010203123||||
```

Cancel Order (Block Level)

```
MSH|^~\&|LIMS||LEICA|RH|20210921010203123|Default|OML^021|20210921010203123|P|2.5.1|
PID|||||^Shefali|||||||924.664.8892^^^Contact@research.org|||||||||||||||||||Species|
PV1|||||||||||||||||||||||||||||||||||||||||||20210921010203123|20210922010203123|
ORC|CA||||CM|||||||ReferenceLab||||||||||8023456789|
SAC|Project-RH61441|ProjectName
NTE|1||Project Comments|C
NTE|2||Project Description|S
SPM|1|Specimen-RH61441a|||||Procedure-Clinical|Liv
er|||||||||20210921010203123|20210922010203123||||
NTE|1||Specimen 61441a Comment|C
ZBL|Block-RH61441a
```

Cancel Order (Slide Level)

```
MSH|^~\&|LIMS||LEICA|RH|20210921010203123|Default|OML^021|20210921010203123|P|2.5.1|
PID|||||^Shefali|||||||924.664.8892^^^Contact@research.org|||||||||||||||||||Species|
PV1|||||||||||||||||||||||||||||||||||||||||||20210921010203123|20210922010203123|
ORC|CA||||CM|||||||ReferenceLab||||||||||8023456789|
SAC|Project-RH61441|ProjectName
NTE|1||Project Comments|C
NTE|2||Project Description|S
SPM|1|Specimen-RH61441a|||||Procedure-Clinical|Liv
er|||||||||20210921010203123|20210922010203123||||
NTE|1||Specimen 61441a Comment|C
ZBL|Block-RH61441a
OBR|1|||Slide-RH61441a
```

Slide Scan

```
MSH|^~\&|LBS|RH|LIS||20211115223702748|Default|OUL^R21|05716b41-63fc-43eb-adca-f85082f930a4|P|2.5.1
PID|||||^Shefali||||||||924.664.8892^^^Contact@research.org||||||||||||||||||||||Species
PV1||||||||||||||||||||||||||||||||||||||||||||20210921010203000|20210922010203000
ORC|RE||||CM|||||||ReferenceLab||||||||||8023456789
SAC|Project-RH61441|ProjectName
SPM||Specimen-RH61441a|||||Procedure-Clinical|Liver|||||||||20210921010203000|20210922010203000
NTE|1||Specimen 61441a Comment
ZBL|Block-RH61441a
OBR||||Slide-RH61441a
NTE|1||Slide1a Comment
OBX|1|ST|URL|PROJECT|http://pi-v2-16-02/view/v2/LApi.Project/Project-RH61441||||||F
OBX|2|ST|URL|SPECIMEN|http://pi-v2-16-02/view/v2/LApi.Specimen/Specimen-RH61441a||||||F
OBX|3|ST|CUSTOM^SPECIMEN|SpecimenExtractionType|OperationRH1444||||||F
OBX|3|ST|URL|BLOCK|http://pi-v2-16-02/view/v2/LApi.Block/Block-RH61441a||||||F
OBX|4|ST|CUSTOM^BLOCK|Block_SlideNumber|A1RH1444||||||F
OBX|4|ST|URL|SLIDE|http://pi-v2-16-02/view/v2/LApi.Slide/Slide-RH61441a||||||F
OBX|5|ST|STN||PAS^Periodic Acid Stain||||||F
OBX|6|ST|MACRO|Base64|<Base64 Data>||||||F
OBX|7|ST|LABEL|Base64|<Base64 Data>||||||F
OBX|8|ST|THUMBNAIL|Base64|<Base64 Data>||||||F
OBX|9|ST|CUSTOM^SLIDE|SlideBarcodeType|TypeRH1444a||||||F
OBX|10|ST|MAG|REQUEST|20||||||F
NTE|1||Project Comments|C
NTE|2||Project Description|S
```

ROI

```
MSH|^~\&|LBS|RH|LIS||20211115223728887|Default|ORL^O22|6ef75f21-9660-4e34-aeb6-83b14c837ced|P|2.5.1
PID|||||^Shefali||||||||924.664.8892^^^Contact@research.org||||||||||||||||||||Species
PV1||||||||||||||||||||||||||||||||||||||||||||20210921010203000|20210922010203000
ORC|RE||||CM||||||ReferenceLab||||||||||8023456789
SAC|Project-RH61441|ProjectName
SPM||Specimen-RH61441a|||||Procedure-Clinical|Liver|||||||||20210921010203000|20210922010203000
NTE|1||Specimen 61441a Comment
ZBL|Block-RH61441a
OBR||||Slide-RH61441a
NTE|1||Slide1a Comment
OBX|1|ST|URL|PROJECT|http://pi-v2-16-02/view/v2/LApi.Project/Project-RH61441||||||F
OBX|2|ST|URL|SPECIMEN|http://pi-v2-16-02/view/v2/LApi.Specimen/Specimen-RH61441a||||||F
OBX|3|ST|CUSTOM^SPECIMEN|SpecimenExtractionType|OperationRH1444||||||F
OBX|3|ST|URL|BLOCK|http://pi-v2-16-02/view/v2/LApi.Block/Block-RH61441a||||||F
OBX|4|ST|CUSTOM^BLOCK|Block_SlideNumber|A1RH1444||||||F
OBX|4|ST|URL|SLIDE|http://pi-v2-16-02/view/v2/LApi.Slide/Slide-RH61441a||||||F
OBX|5|ST|STN||PAS^Periodic Acid Stain||||||F
OBX|6|ST|REPORT|FILE|C:/Mailbox/ReportRegions/RR_baf039f8-c877-41a6-bbc2-d41a56230bf2.jpeg||||||F
OBX|7|ST|CUSTOM^SLIDE|SlideBarcodeType|TypeRH1444a||||||F
OBX|8|ST|MAG|REQUEST|20||||||F
NTE|1||Project Comments|C
NTE|2||Project Description|S
```

ACK

```
MSH|^~\&|LEICA|RH|LIMS||20211115223519|Default|ACK^021|20211115223519768|P|2.5.1
MSA|AA|20210921010203123|Message processed successfully
```

Educational Hierarchy

New Order

```
MSH|^~\&|LIS||LBS|EH|20200131150045|Default|OML^021|RH61447|P|2.5.1
ORC|NW||||CM
SAC|Course-RH61441a^CourseName|Instructor^Department|
NTE|1||Course Comments|S
ZLS|Lesson-RH61441a|LessonNotes|
SPM|1|Specimen-RH61441a|||||Procedure-Clinical|Liver|||||||||20200227140045|20200228140045||||
NTE|1||Specimen 61441a Comment|C
ZBL|Block-RH61441a
OBR|1|||Slide-RH61441a
OBX|1|ST|MAG||20
OBX|2|ST|STN||PAS^Periodic Acid Stain
NTE|1||Slide1a Comment|C
OBX|1|ST|CUSTOM^Course|CourseType|StageRH1444
OBX|2|ST|CUSTOM^Lesson|LessonType|Pharma ResearchRH1444
OBX|3|ST|CUSTOM^Specimen|SpecimenExtractionType|OperationRH1444
OBX|4|ST|CUSTOM^Block|Block_SlideNumber|A1RH1444
OBX|5|ST|CUSTOM^Slide|SlideBarcodeType|TypeRH1444a
```

Update Order

```
MSH|^~\&|LIS||LBS|EH|20200131150045|Default|OML^021|RH61447|P|2.5.1
ORC|SC||||CM
SAC|Course-RH61441a^CourseName|Instructor^Department|
NTE|1||Course Comments|S
ZLS|Lesson-RH61441a|LessonNotes|
SPM|1|Specimen-RH61441a|||||Procedure-Clinical|Liver|||||||||20200227140045|20200228140045||||
NTE|1||Specimen 61441a Comment|C
ZBL|Block-RH61441a
OBR|1|||Slide-RH61441a
OBX|1|ST|MAG||20
OBX|2|ST|STN||PAS^Periodic Acid Stain
NTE|1||Slide1a Comment|C
OBX|1|ST|CUSTOM^Course|CourseType|StageRH1444
OBX|2|ST|CUSTOM^Lesson|LessonType|Pharma ResearchRH1444
OBX|3|ST|CUSTOM^Specimen|SpecimenExtractionType|OperationRH1444
OBX|4|ST|CUSTOM^Block|Block_SlideNumber|A1RH1444
OBX|5|ST|CUSTOM^Slide|SlideBarcodeType|TypeRH1444a
```

Cancel Order (Course Level)

```
MSH|^~\&|LIS||LBS|EH|20200131150045|Default|OML^021|RH61447|P|2.5.1
ORC|CA||||CM
SAC|Course-RH61441a^CourseName|Instructor^Department|
```

Cancel Order (Lesson Level)

```
MSH|^~\&|LIS||LBS|EH|20200131150045|Default|OML^021|RH61447|P|2.5.1
ORC|CA||||CM
SAC|Course-RH61441a^CourseName|Instructor^Department|
NTE|1||Course Comments|S
ZLS|Lesson-RH61441a|LessonNotes|
```

Cancel Order (Specimen Level)

```
MSH|^~\&|LIS||LBS|EH|20200131150045|Default|OML^021|RH61447|P|2.5.1
ORC|CA||||CM
SAC|Course-RH61441a^CourseName|Instructor^Department|
NTE|1||Course Comments|S
ZLS|Lesson-RH61441a|LessonNotes|
SPM|1|Specimen-RH61441a|||||Procedure-Clinical|Liver|||||||||20200227140045|20200228140045|||||
```

Cancel Order (Block Level)

```
MSH|^~\&|LIS||LBS|EH|20200131150045|Default|OML^021|RH61447|P|2.5.1
ORC|CA||||CM
SAC|Course-RH61441a^CourseName|Instructor^Department|
NTE|1||Course Comments|S
ZLS|Lesson-RH61441a|LessonNotes|
SPM|1|Specimen-RH61441a|||||Procedure-Clinical|Liver|||||||||20200227140045|20200228140045||||
NTE|1||Specimen 61441a Comment|C
ZBL|Block-RH61441a
```

Cancel Order (Slide Level)

```
MSH|^~\&|LIS||LBS|EH|20200131150045|Default|OML^021|RH61447|P|2.5.1
ORC|CA||||CM
SAC|Course-RH61441a^CourseName|Instructor^Department|
NTE|1||Course Comments|S
ZLS|Lesson-RH61441a|LessonNotes|
SPM|1|Specimen-RH61441a|||||Procedure-Clinical|Liver|||||||||20200227140045|20200228140045||||
NTE|1||Specimen 61441a Comment|C
ZBL|Block-RH61441a
OBR|1|||Slide-RH61441a
```

Slide Scan

```
MSH|^~\&|LBS|EH|LIS||20211115223825155|Default|OUL^R21|84ed5805-31d4-4f6b-8967-751fd76cfc5f|P|2.5.1
ORC|RE||||CM
SAC|Course-RH61441a^CourseName|Instructor^Department
ZLS|Lesson-RH61441a|LessonNotes
SPM||Specimen-RH61441a|||||Procedure-Clinical|Liver|||||||||20200227140045000|20200228140045000
NTE|1||Specimen 61441a Comment
ZBL|Block-RH61441a
OBR||||Slide-RH61441a
NTE|1||Slide1a Comment
OBX|1|ST|URL|COURSE|http://pi-v2-16-02/view/v2/LApi.Course/Course-RH61441a||||||F
OBX|2|ST|CUSTOM^COURSE|CourseType|StageRH1444||||||F
OBX|2|ST|URL|LESSON|http://pi-v2-16-02/view/v2/LApi.Lesson/Lesson-RH61441a||||||F
OBX|3|ST|CUSTOM^LESSON|LessonType|Pharma ResearchRH1444||||||F
OBX|3|ST|URL|SPECIMEN|http://pi-v2-16-02/view/v2/LApi.Specimen/Specimen-RH61441a||||||F
OBX|4|ST|CUSTOM^SPECIMEN|SpecimenExtractionType|OperationRH1444||||||F
OBX|4|ST|URL|BLOCK|http://pi-v2-16-02/view/v2/LApi.Block/Block-RH61441a||||||F
OBX|5|ST|CUSTOM^BLOCK|Block_SlideNumber|A1RH1444||||||F
OBX|5|ST|URL|SLIDE|http://pi-v2-16-02/view/v2/LApi.Slide/Slide-RH61441a||||||F
OBX|6|ST|STN||PAS^Periodic Acid Stain||||||F
OBX|7|ST|LABEL|Base64|<Base64 Data>||||||F
OBX|8|ST|MACRO|Base64|<Base64 Data>||||||F
OBX|9|ST|THUMBNAIL|Base64|<Base64 Data>||||||F
OBX|10|ST|CUSTOM^SLIDE|SlideBarcodeType|TypeRH1444a||||||F
OBX|11|ST|MAG|REQUEST|20||||||F
NTE|1||Course Comments|S
```

ROI

```
MSH|^~\&|LBS|EH|LIS||20211115223825155|Default|OUL^R21|84ed5805-31d4-4f6b-8967-751fd76cfc5f|P|2.5.1
ORC|RE||||CM
SAC|Course-RH61441a^CourseName|Instructor^Department
ZLS|Lesson-RH61441a|LessonNotes
SPM||Specimen-RH61441a|||||Procedure-Clinical|Liver|||||||||20200227140045000|20200228140045000
NTE|1||Specimen 61441a Comment
ZBL|Block-RH61441a
OBR||||Slide-RH61441a
NTE|1||Slide1a Comment
OBX|1|ST|URL|COURSE|http://pi-v2-16-02/view/v2/LApi.Course/Course-RH61441a||||||F
OBX|2|ST|CUSTOM^COURSE|CourseType|StageRH1444||||||F
OBX|2|ST|URL|LESSON|http://pi-v2-16-02/view/v2/LApi.Lesson/Lesson-RH61441a||||||F
OBX|3|ST|CUSTOM^LESSON|LessonType|Pharma ResearchRH1444||||||F
OBX|3|ST|URL|SPECIMEN|http://pi-v2-16-02/view/v2/LApi.Specimen/Specimen-RH61441a||||||F
OBX|4|ST|CUSTOM^SPECIMEN|SpecimenExtractionType|OperationRH1444||||||F
OBX|4|ST|URL|BLOCK|http://pi-v2-16-02/view/v2/LApi.Block/Block-RH61441a||||||F
OBX|5|ST|CUSTOM^BLOCK|Block_SlideNumber|A1RH1444||||||F
OBX|5|ST|URL|SLIDE|http://pi-v2-16-02/view/v2/LApi.Slide/Slide-RH61441a||||||F
OBX|6|ST|STN||PAS^Periodic Acid Stain||||||F
OBX|7|ST|LABEL|Base64|<Base64 Data>||||||F
OBX|8|ST|MACRO|Base64|<Base64 Data>||||||F
OBX|9|ST|THUMBNAIL|Base64|<Base64 Data>||||||F
OBX|10|ST|CUSTOM^SLIDE|SlideBarcodeType|TypeRH1444a||||||F
OBX|11|ST|MAG|REQUEST|20||||||F
NTE|1||Course Comments|S
```

ACK

```
MSH|^~\&|LBS|EH|LIS||20211115223824|Default|ACK^021|20211115223824410|P|2.5.1
MSA|AA|RH61447|Message processed successfully
```

Orphan Slide Scan

```
MSH|^~\&|LBS||LIS||20211115224039139|Default|OUL^R21|23c6940e-33f8-4791-b15c-6625dd5d223c|P|2.5.1
ORC|RE
ZBL|OrphanSlideBlock
OBR||||OrphanSlide
NTE|1||OrphanSlide Comments
OBX|1|ST|URL|BLOCK|http://pi-v2-16-02/view/v2/LApi.Block/OrphanSlideBlock||||||F
OBX|2|ST|URL|SLIDE|http://pi-v2-16-02/view/v2/LApi.Slide/OrphanSlide||||||F
OBX|3|ST|STN||PAS^Periodic Acid Stain||||||F
OBX|4|ST|THUMBNAIL|Base64|<Base64 Data>||||||F
OBX|5|ST|LABEL|Base64|<Base64 Data>||||||F
OBX|6|ST|MACRO|Base64|<Base64 Data>||||||F
```

Manual Slide Delete

```
MSH|^~\&|LBS||LIS||20211115223304508|Default|OUL^R21|a7c1d2e0-5325-4278-bf1d-a87bf17c93b5|P|2.5.1
ORC|CA||||CA
OBR||||20H1024.1.A.1
```

Message Types

Aperio eSlide Manager is focused on accepting Case/Project/Course information from the LIS, covering:

- Basic Case details (MRN, patient name, patient ID, Physician)
- The specimen belonging to a Case/Project/Course or Lesson that the laboratory accepts and the associated body site
- The slides and stains required to process the Case's specimens
- Cases and case items need to be identified uniquely by the LIS system

Aperio eSlide Manager will send case item information to LIS, covering:

- Request Mag, Stain name, Image quality factor
- Slide thumbnail image; Case, Project, Course, Lesson, Specimen, Cassette/Block, or Slide URL to view the slide image from LIS
- Label, Macro and Report image data, scan date, ScanScopeID

LIS > Aperio eSlide Manager (ORM/OML)

HL7 Message Type	Workflow	Information in Message	Aperio eSlide Manager Expected Behavior
New Order	Both Scan First and Order First	Slide level details including but not limited to: Patient name, MRN, DOB, Gender, barcode ID, specimen ID, Stain, Body Site, Block, and LIS Case/Project/ Course ID.	Creates a slide, specimen and case/project/course record
Update Order	Both Scan First and Order First	Updated slide level details including but not limited to: Patient name, MRN, DOB, Gender, barcode ID, specimen ID, Stain, Body Site, Block, and LIS Case/ Project/Course ID.	Updates fields data found on the slide, specimen and case/project/course record
Cancel Order	Both Scan First and Order First	Any hierarchy level details like barcode ID, specimen ID, block ID or LIS Case/Project/Course ID.	Deletes the bottommost hierarchy level such as Case, Project, Course, Lesson, Specimen, Block or Slide. Refer to “Cancel Order Scenarios” on page 37 for detailed information.

Aperio eSlide Manager (ORU/OUL) > LIS

HL7 Message Type	Workflow	Information in Message	Aperio eSlide Manager Expected Behavior
Slide scanned	First Scan	Request Mag, Stain name, Image quality factor, Slide thumbnail image, Slide URL to view the slide image from LIS Label, Macro and Report image data, scan date, ScanScopeID	Slide barcode ID and Image attach to slide record
Slide scanned	Order First	Request Mag; Stain name; Image quality factor; Slide thumbnail image; Case, Project, Course, Lesson, Specimen, Cassette/ Block Or Slide URL to view the slide image from LIS; Label, Macro and Report image data; scan date; ScanScopeID	Slide barcode ID and Image attached to slide record

HL7 Message Type	Workflow	Information in Message	Aperio eSlide Manager Expected Behavior
Region of interest captured at viewer station	Only when creating a ROI in the Viewer	Serialized JPEG/TIFF file or URL to selected region.	Create Link to or preview or ROI image
Response Message (ACK/NACK)	Both Scan First and Order First	Acknowledges that the destination has received the HL7 message	N/A
Slide Delete	Manual Slide Delete	Manually deleted slide ID	N/A

Cancel Order Scenarios

1. If order contains only Case then deletes Case and its children like Specimen, Cassette/Block and Slide.
2. If order contains only Case, Specimen then deletes Specimen and its children like Cassette/Block and Slide.
3. If order contains only Case, Block then deletes Block and its children like Slide.
4. If order contains only Case, Slide then deletes Slide.
5. If order contains only Project then deletes Project and its children like Specimen, Cassette/Block and Slide.
6. If order contains only Project, Specimen then deletes Specimen and its children like Cassette/Block and Slide.
7. If order contains only Project, Block then deletes Block and its children like Slide.
8. If order contains only Project, Slide then deletes Slide.
9. If order contains only Course then deletes Course and its children like Lesson, Specimen, Cassette/Block and Slide.
10. If order contains only Course, Lesson then deletes Lesson and its children like Specimen, Cassette/Block and Slide.
11. If order contains only Course, Specimen then deletes Specimen and its children like Cassette/Block and Slide.
12. If order contains only Course, Block then deletes Block and its children like Slide.
13. If order contains only Course, Slide then deletes Slide.
14. If order contains only Specimen, Block then deletes Block and its children like Slide.
15. If order contains only Specimen, Slide then deletes Slide.
16. If order contains only Block, Slide then deletes Slide.
17. If order contains only Lesson then deletes Lesson and its children like Specimen, Cassette/Block and Slide.
18. If order contains only Specimen then deletes Block and its children like Slide.
19. If order contains only Block then deletes Block and its children like Slide.
20. If order contains only Slide then deletes Slide.

Message Structure and Field Locations

Below is the expected mapping structure for the Order, Scan creation/Response, and Acknowledgment messages. Messages in this format are required to populate in the Aperio eSlide Manager as expected.

If a site is unable to send data in the expected format, the Aperio eSlide Manager integration package can be configured to align with the site's message structure.

Order Request Message

Message Structure [OML^O21 grammar]

```
MSH
[PID]
[PV1]
ORC
[SAC]
[{NTE}]
[{
  [ZLS]
  [{
    [SPM]
    [{NTE}]
    [{
      [ZBL]
      [{
        [OBR]
        [{
          [OBX]
          [NTE]
        }]
      }]
    }]
  }]
}]
```

The SAC, ZLS, SPM, ZBL, and OBR segments correspond to Case/Project/Course, Lesson, Specimen, Block, and Slide, respectively, in Aperio eSlide Manager. All are all optional fields, but if they are provided, they must also provide an ID in the ID segment. See below for details.

Constraints

In addition to the field constraints called out in the mapping details sections, the following constraints are placed on the system:

- Identifiers from the LIS are used to synchronize data with Aperio eSlide Manager. As such, all identifiers sent from the LIS must be unique.
  - IDs should be unique across the entire database.
  - If the LIS re-uses an ID, the old record will be overwritten in Aperio eSlide Manager.

- Constraints for auto-generated ID in Aperio eSlide Manager for Specimen and Lesson:
  - LIS Connectivity automatically creates Specimen in Clinical hierarchy when this ID is absent in HL7 Order message.
    - Placeholder of Specimen ID in HL7 is SPM.2
    - "lapi-" is prefixed to Case-ID value received in SAC.1
  - LIS Connectivity automatically creates Specimen in Research Hierarchy when this ID is absent in HL7 Order message.
    - Placeholder of Specimen ID in HL7 is SPM.2
    - "lapi-" is prefixed to Project-ID value received in SAC.1
  - LIS Connectivity automatically creates Lesson and Specimen in Educational Hierarchy when these IDs are absent in HL7 Order message.
    - Placeholder of Lesson ID in HL7 is ZLS.1
    - "lapi-Lesson-" is prefixed to Course-ID value received in SAC.1
    - Placeholder of Specimen ID in HL7 is SPM.2
    - "lapi-" is prefixed to Course-ID value received in SAC.1
- Within a message, all container identifiers must be unique. For example:
  - Two specimens cannot have the same ID.
  - A specimen and a slide or block cannot have the same ID, as illustrated in the following example scenarios.
    - Scenario 1:
      Case ID: H20-12345
      Specimen ID: A
      Block ID: 1
      Slide ID: 1

      ✗ Block ID and Slide ID are *not* unique.
    - Scenario 2:
      Case ID: C20-1315
      Specimen ID: C20-1315.A
      Block ID: C20-1315.A.1
      Slide ID: C20-1315.A.1.1

      ✓ All IDs are unique.
    - Scenario 3:
      Project ID: C20-1315
      Specimen ID: C20-1315.A
      Block ID: C20-1315.A.1
      Slide ID: C20-1315.A.1.1
      Specimen ID: C20-1416.A
      Block ID: C20-1416.A.1
      Slide ID: C20-1416.A.1.1

      ✓ All IDs are unique.

Mapping Details - Clinical Hierarchy

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Clinical Hierarchy Expected Value or Constraint
MSH.1	Y	Field Separator N/A	|
MSH.2	Y	Encoding Characters N/A	^~\&
MSH.3.1	Y	Sending Application Namespace Id N/A	(LIS Name)
MSH.5.1	Y	Receiving Application Namespace Id N/A	LBS
MSH.6.1	N	Receiving Facility Namespace Id N/A	CH – Clinical Hierarchy No value – Clinical Hierarchy
MSH.7.1	N	Date/Time of Message N/A	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS
MSH.8.1	N	Data Group Name N/A	> 2 chars and ≤ 40 chars
MSH.9.1	Y	Message Type Message Code N/A	OML
MSH.9.2	Y	Message Type Trigger Event N/A	O21
MSH.10	Y	Message Control ID N/A	Unique number should be of ASCII characters
MSH.11.1	N	Processing Id N/A	P
MSH.12.1	Y	Version Id N/A	2.x
PID.3.1	N	Patient Identifier Case.Patient ID	≤ 64 chars
PID.5.1	N	Patient Family Name Case.PatientName	≤ 64 chars
PID.5.2	N	Patient Given Name Case.PatientFirstName	≤ 35 Chars
PID.5.4	N	Patient Suffix Case.PatientNameSuffix	≤ 35 Chars
PID.5.5	N	Patient Prefix Case.PatientTitle	≤ 35 Chars
PID.7.1	N	Patient Date/Time of Birth Case.PatientDOB	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Clinical Hierarchy Expected Value or Constraint
PID.8.1	N	Patient Gender Case.PatientGender	≤ 16 Chars M – Male F – Female U – Unknown Any other value – Other
PID.22.1	N	Ethnic Group Identifier Case.PatientEthnicity	≤ 32 Chars
PV1.3.4	N	Assigned Patient Location.Facility Case.Location	≤ 64 Chars
PV1.7.2	N	Attending Doctor Family Name Case.PhysicianName	Combined length ≤ 60 chars
PV1.7.3	N	Attending Doctor Given Name Case.PhysicianName	
PV1.7.5	N	Attending Doctor Suffix Case.PhysicianName	
PV1.7.6	N	Attending Doctor Prefix Case.PhysicianName	
PV1.7.8	N	Attending Doctor Contact Info Case.PhysicianPhone	≤ 32 Chars
PV1.8.2	N	Referring Doctor Family Name Case.AdmittingPhysicianName	Combined length ≤ 60 chars
PV1.8.3	N	Referring Doctor Given Name Case.AdmittingPhysicianName	
PV1.8.5	N	Referring Doctor Suffix Case.AdmittingPhysicianName	
PV1.8.6	N	Referring Doctor Prefix Case.AdmittingPhysicianName	
PV1.8.8	N	Referring Doctor Contact Info Case.AdmittingPhysicianPhone	≤ 32 Chars
PV1.9.2	N	Consulting Doctor Family Name Case.SurgeonName	Combined length ≤ 60 chars
PV1.9.3	N	Consulting Doctor Given Name Case.SurgeonName	
PV1.9.5	N	Consulting Doctor Suffix Case.SurgeonName	
PV1.9.6	N	Consulting Doctor Prefix Case.SurgeonName	
PV1.9.8	N	Consulting Doctor Contact Info Case.SurgeonPhone	≤ 32 Chars

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Clinical Hierarchy Expected Value or Constraint
ORC.1	Y	Order Control N/A	NW – New Order SC – Update Order CA – Delete Order
SAC.1	Y, if SAC present	Placer Order Number.Entity Identifier Case.ExternalId	≤ 64 Chars
SPM.2.1	Y, if SPM present	Specimen ID. Placer Assigned Identifier Specimen.AccessionNumber	≤ 255 Chars
SPM.7.1	N	Specimen Collection Method Specimen.Procedure	≤ 64 Chars
SPM.8.1	N	Specimen Source Site Specimen BodySite.Name	≤ 128 Chars
SPM.17.1	N	Specimen Collection Date/Time Specimen.CollectedDate	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS
SPM.18.1	N	Specimen Received Date/Time Specimen.ReceivedDate	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS
ZBL.1	Y, if ZBL present	Block ID Slide.BlockId	≤ 50 Chars
OBR.4.1	Y, if OBR present	Universal Service Identifier.Identifier Slide.BarcodeId	≤ 255 Chars
OBX.3.1	N	Observation Identifier N/A	MAG – Magnification STN - Stain CUSTOM – Custom field
OBX.3.2	N	Observation Identifier.Text N/A	eSM Database Table Name if Custom Fields exists Case, Project, Specimen, Block or Slide
OBX.4.1	N	Observation Sub-ID N/A	Custom Field Name (Column is not prefixed) Block_ is referred as Block Custom Field
OBX.5.1	N	Observation Value (Based on OBX.3.1) MAG: Slide.RequestedMag STN: Stain.ShortName CUSTOM: <DB Table>.Field Name	(Based on OBX.3.1) MAG: Number > 0 STN: ≤ 50 Chars Custom Field Value as per Column DataType in DB

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Clinical Hierarchy Expected Value or Constraint
NTE.3.1	N	Comments (based on NTE.4) C: Case/Specimen/Slide.Comment S: Case.Summary CH: Case.ClinicalHistory FD: Case.FinalDiagnosis	No constraints. Values other than those listed are ignored
NTE.4.1	N	Comment Type	C – Comment for Case, Specimen or Slide S – Summary for Case CH – Clinical History for Case FD – Final Diagnosis for Case

Mapping Details - Research Hierarchy

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Research Hierarchy Expected Value or Constraint
MSH.1	Y	Field Separator N/A	|
MSH.2	Y	Encoding Characters N/A	^~\&
MSH.3.1	Y	Sending Application Namespace Id N/A	(LIS Name)
MSH.5.1	Y	Receiving Application Namespace Id N/A	LBS
MSH.6.1	N	Hierarchy Type N/A	RH – Research Hierarchy
MSH.7.1	N	Date/Time of Message N/A	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS
MSH.8.1	N	Data Group Name N/A	> 2 chars and ≤ 40 chars
MSH.9.1	Y	Message Type Message Code N/A	OML
MSH.9.2	Y	Message Type Trigger Event N/A	O21
MSH.10	Y	Message Control ID N/A	Unique number should be of ASCII characters
MSH.11.1	N	Processing Id N/A	P

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Research Hierarchy Expected Value or Constraint
MSH.12.1	Y	Version Id N/A	2.x
PID.5.2	N	Patient Given Name Project.ContactName	≤ 32 Chars
PID.13.1	N	Phone Number – Home Project.ContactPhone	≤ 32 Chars
PID.13.4	N	Email Address Project.ContactEmail	≤ 32 Chars
PID.35.1	N	Species Code Project.Species	≤ 128 Chars
PV1.44.1	N	Admit DateTime Project.StartDate	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS NOTE: eSM has a limitation to display only yyyyMMdd but in DB full value is stored in format yyyyMMddHHmmssSSS
PV1.45.1	N	Discharge DateTIme Project.CompletionDate	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS NOTE: eSM has a limitation to display only yyyyMMdd but in DB full value is stored in format yyyyMMddHHmmssSSS
ORC.1	Y	Order Control N/A	NW – New Order SC – Update Order CA – Delete Order
ORC.5.1	N	Order Status Project.Status	DC or ER or HD – Disapproved Any other value or empty – Active
ORC.12.1	N	Ordering Provider.Id Number Project.ReferenceLab	≤ 64 Chars
ORC.23.1	N	Ordering Facility Phone Number.Telephone Number Project.ReferenceLabContact	≤ 64 Chars
SAC.1	Y, if SAC present	Placer Order Number.Entity Identifier Project.ExternalId	≤ 32 Chars
SAC.2.1	N	Accession Identifier.Entity Identifier Project.Name	≤ 255 Chars

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Research Hierarchy Expected Value or Constraint
SPM.2.1	Y, if SPM present	Specimen ID. Placer Assigned Identifier Specimen.AccessionNumber	≤ 255 Chars
SPM.7.1	N	Specimen Collection Method Specimen.Procedure	≤ 64 Chars
SPM.8.1	N	Specimen Source Site Specimen BodySite.Name	≤ 128 Chars
SPM.17	N	Specimen Collection Date/Time Specimen.CollectedDate	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS
SPM.18	N	Specimen Received Date/Time Specimen.ReceivedDate	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS
ZBL.1	Y, if ZBL present	Block ID Slide.BlockId	≤ 50 Chars
OBR.4.1	Y, if OBR present	Universal Service Identifier.Identifier Slide.BarcodeId	≤ 255 Chars
OBX.3.1	N	Observation Identifier N/A	MAG – Magnification STN - Stain CUSTOM – Custom field
OBX.3.2	N	Observation Identifier.Text N/A	eSM Database Table Name if Custom Fields exists Project, Specimen, Block or Slide
OBX.4.1	N	Observation Sub-ID N/A	Custom Field Name (*Column* is not prefixed) *Block_* is referred as Block Custom Field
OBX.5.1	N	Observation Value (Based on OBX.3.1) MAG: Slide.RequestedMag STN: Stain.ShortName CUSTOM: <DB Table>.Field Name	(Based on OBX.3.1) MAG: Number > 0 STN: ≤ 50 Chars Custom Field Value as per Column DataType in DB
NTE.3.1	N	Comments (based on NTE.4) C: Specimen/Slide/Project.Comment S: Project.Summary	No constraints. Values other than those listed are ignored
NTE.4.1	N	Comment Type	C or S for Project C for Specimen or Slide

Mapping Details - Educational Hierarchy

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Educational Hierarchy Expected Value or Constraint
MSH.1	Y	Field Separator N/A	|
MSH.2	Y	Encoding Characters N/A	^~\&
MSH.3.1	Y	Sending Application Namespace Id N/A	(LIS Name)
MSH.5.1	Y	Receiving Application Namespace Id N/A	LBS
MSH.6.1	N	Hierarchy Type N/A	EH – Educational Hierarchy
MSH.7.1	N	Date/Time of Message N/A	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS
MSH.8.1	N	Data Group Name N/A	> 2 chars and ≤ 40 chars
MSH.9.1	Y	Message Type Message Code N/A	OML
MSH.9.2	Y	Message Type Trigger Event N/A	O21
MSH.10	Y	Message Control ID N/A	Unique number should be of ASCII characters
MSH.11.1	N	Processing Id N/A	P
MSH.12.1	Y	Version Id N/A	2.x
ORC.1	Y	Order Control N/A	NW – New Order SC – Update Order CA – Delete Order
ORC.5.1	N	Order Status Project.Status	DC or ER or HD – Disapproved Any other value or empty – Active
SAC.1.1	Y, if SAC present	Placer Order Number.Entity Identifier Course.CourseNumber	≤ 64 Chars
SAC.1.2	N	Placer Order Number.Namespace Id Course.CourseName	≤ 255 Chars
SAC.2.1	N	Accession Identifier.Entity Identifier Course.Instructor	≤ 64 Chars

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Educational Hierarchy Expected Value or Constraint
SAC.2.2	N	Accession Identifier.Entity Identifier Course.Department	≤ 64 Chars
ZLS.1.1	Y, if ZLS provided	LessonName Lesson.LessonName	≤ 255 Chars
ZLS.2.1	N	LessonNotes Lesson.LessonNotes	No constraints.
SPM.2.1	Y, if SPM present	Specimen ID. Placer Assigned Identifier Specimen.AccessionNumber	≤ 255 Chars
SPM.7.1	N	Specimen Collection Method Specimen.Procedure	≤ 64 Chars
SPM.8.1	N	Specimen Source Site Specimen BodySite.Name	≤ 128 Chars
SPM.17	N	Specimen Collection Date/Time Specimen.CollectedDate	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS
SPM.18	N	Specimen Received Date/Time Specimen.ReceivedDate	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS
ZBL.1	Y, if ZBL present	Block ID Slide.BlockId	≤ 50 Chars
OBR.4.1	Y, if OBR present	Universal Service Identifier.Identifier Slide.BarcodeId	≤ 255 Chars
OBX.3.1	N	Observation Identifier N/A	MAG – Magnification STN - Stain CUSTOM – Custom field
OBX.3.2	N	Observation Identifier.Text N/A	eSM Database Table Name if Custom Fields exists COURSE, LESSON, SPECIMEN, BLOCK OR SLIDE
OBX.4.1	N	Observation Sub-ID N/A	Custom Field Name (Column is not prefixed) Block_ is referred as Block Custom Field
OBX.5.1	N	Observation Value (Based on OBX.3.1) MAG: Slide.RequestedMag STN: Stain.ShortName CUSTOM: <DB Table>.Field Name	(Based on OBX.3.1) MAG: Number > 0 STN: ≤ 50 Chars Custom Field Value as per Column DataType in DB

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Educational Hierarchy Expected Value or Constraint
NTE.3.1	N	Comments (based on NTE.4) C: Specimen/Slide.Comment S: Course.CourseDescription	No constraints. Values other than those listed are ignored
NTE.4.1	N	Comment Type	S for Course C for Specimen or Slide

Scan or Report Region Response Message

Message Structure [OUL^R21 (Scan) and ORL^O22 (ROI) grammar]

```
MSH
[PID]
[PV1]
ORC
[SAC]
[ZLS]
[SPM]
[{NTE}]
[ZBL]
OBR
[
  [{OBX}]
  [{NTE}]
]
```

The SAC, ZLS, SPM, ZBL, and OBR segments correspond to Case/Project/Course, Lesson, Specimen, Block, and Slide, respectively, in the Aperio eSlide Manager. All are all optional fields, but if they are provided, they must also provide an ID in the ID segment. The trigger event for Scan message is OUL^R21 and for Report Region message the trigger event is ORL^O22. ROI images are transferred to LIS in Base64 format or path of jpeg file based on configuration. See below for details.

Mapping Details - Clinical Hierarchy

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Clinical Hierarchy Expected Value or Constraint
MSH.1	Y	Field Separator N/A	|
MSH.2	Y	Encoding Characters N/A	^~\&
MSH.3.1	Y	Sending Application Namespace Id N/A	LBS
MSH.4.1	N	Sending Facility Namespace Id N/A	CH – Clinical Hierarchy
MSH.5.1	Y	Receiving Application Namespace Id N/A	(LIS Name)
MSH.7.1	N	Date/Time of Message N/A	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS
MSH.8.1	N	Data Group Name N/A	> 2 chars and ≤ 40 chars
MSH.9	Y	Message Type N/A	OUL^R21 - Scan Response ORL^O22 - ROI Response
MSH.10	Y	Message Control ID N/A	Unique number should be of ASCII characters
MSH.11.1	N	Processing Id N/A	P
MSH.12.1	Y	Version Id N/A	2.5.1
PID.3.1	N	Patient Identifier Case.Patient ID	≤ 64 chars
PID.5.1	N	Patient Family Name Case.PatientName	≤ 64 chars
PID.5.2	N	Patient Given Name Case.PatientFirstName	≤ 35 Chars
PID.5.4	N	Patient Suffix Case.PatientNameSuffix	≤ 35 Chars
PID.5.5	N	Patient Prefix Case.PatientTitle	≤ 35 Chars
PID.7	N	Patient Date/Time of Birth Case.PatientDOB	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS
PID.8	N	Patient Gender Case.PatientGender	≤ 16 Chars

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Clinical Hierarchy Expected Value or Constraint
PID.22.1	N	Ethnic Group Identifier Case.PatientEthnicity	≤ 32 Chars
PV1.3.4	N	Assigned Patient Location.Facility Case.Location	≤ 64 Chars
PV1.7.2	N	Attending Doctor Family Name Case.PhysicianName	Combined length ≤ 60 chars
PV1.7.3	N	Attending Doctor Given Name Case.PhysicianName	
PV1.7.5	N	Attending Doctor Suffix Case.PhysicianName	
PV1.7.6	N	Attending Doctor Prefix Case.PhysicianName	
PV1.7.8	N	Attending Doctor Contact Info Case.PhysicianPhone	≤ 32 Chars
PV1.8.2	N	Referring Doctor Family Name Case.AdmittingPhysicianName	Combined length ≤ 60 chars
PV1.8.3	N	Referring Doctor Given Name Case.AdmittingPhysicianName	
PV1.8.5	N	Referring Doctor Suffix Case.AdmittingPhysicianName	
PV1.8.6	N	Referring Doctor Prefix Case.AdmittingPhysicianName	
PV1.8.8	N	Referring Doctor Contact Info Case.AdmittingPhysicianPhone	≤ 32 Chars
PV1.9.2	N	Consulting Doctor Family Name Case.SurgeonName	Combined length ≤ 60 chars
PV1.9.3	N	Consulting Doctor Given Name Case.SurgeonName	
PV1.9.5	N	Consulting Doctor Suffix Case.SurgeonName	
PV1.9.6	N	Consulting Doctor Prefix Case.SurgeonName	
PV1.9.8	N	Consulting Doctor Contact Info Case.SurgeonPhone	≤ 32 Chars
SAC.1	Y, if SAC present	Placer Order Number.Entity Identifier Case.ExternalId	≤ 64 Chars
ORC.1	N	Order Control N/A	RE – Reply

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Clinical Hierarchy Expected Value or Constraint
OBR.4.1	Y, if OBR present	Universal Service Identifier.Identifier Slide.BarcodeId	≤ 255 Chars
OBX.2	N	Value Type N/A	ST
OBX.3.1	N	Observation Identifier N/A	One of MAG, STN, QF, URL, LABEL, MACRO, REPORT, THUMBNAIL, DATE, SCANSCOPEID or CUSTOM
OBX.3.2	N	Observation Identifier.Text N/A	eSM Database Table Name if Custom Fields exists one of the value CASE, SPECIMEN, BLOCK OR SLIDE
OBX.4.1	N	Observation Sub-ID N/A	One of REQUEST, SCAN, SCANNED, Base64, CASE, SPECIMEN, BLOCK, SLIDE, FILE or Custom Field Name (Column is not prefixed)
OBX.5.1	N	Observation Value (based on OBX.3.1) MAG: Slide.RequestedMag STN: Stain.ShortName QF: Image.QualityFactor URL: N/A (opens viewer) LABEL: Label Image Data MACRO: Macro Image Data REPORT: Report Image Data THUMBNAIL: Thumbnail Image Data DATE: Image.ScanDate SCANSCOPEID: Image.ScanScopeId CUSTOM: Custom Field Value of OBX.4.1	(based on OBX.3.1) MAG: Number > 0 STN: ≤ 50 Chars QF: (Number) URL: (URL) LABEL: (base64 image) MACRO: (base64 image) REPORT: (base64 image) THUMBNAIL: (base64 image) DATE: yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS SCANSCOPEID: (Number) CUSTOM: Custom Field Value
OBX.5.2	N	Observation Value Description Stain.LongName	≤ 200 Chars
OBX.11	N	Observation Result Status N/A	F
SPM.2.1	Y, if SPM provided	Specimen ID. Placer Assigned Identifier Specimen.AccessionNumber	≤ 255 Chars
SPM.7.1	N	Specimen Collection Method Specimen.Procedure	≤ 64 Chars

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Clinical Hierarchy Expected Value or Constraint
SPM.8	N	Specimen Source Site Specimen BodySite.Name	≤ 128 Chars
SPM.17	N	Specimen Collection Date/Time Specimen.CollectedDate	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS
SPM.18	N	Specimen Received Date/Time Specimen.ReceivedDate	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS
ZBL.1	Y, if ZBL provided	Block ID Slide.BlockId	≤ 50 Chars
NTE.3	N	Comments (based on NTE.4) C: Case.Comment S: Case.Summary CH: Case.ClinicalHistory FD: Case.FinalDiagnosis	No constraints. Note that Case-level notes will always appear at the end of a message
NTE.4	N	Case Comment Type	C or S or CH or FD for Case Omitted when NTE is a child of Specimen (SPM) or Slide (OBR)

Mapping Details - Research Hierarchy

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Research Hierarchy Expected Value or Constraint
MSH.1	Y	Field Separator N/A	|
MSH.2	Y	Encoding Characters N/A	^~\&
MSH.3.1	Y	Sending Application Namespace Id N/A	LBS
MSH.4.1	N	Sending Facility Namespace Id N/A	RH – Research Hierarchy
MSH.5.1	Y	Receiving Application Namespace Id N/A	(LIS Name)
MSH.7.1	N	Date/Time of Message N/A	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS
MSH.8.1	N	Data Group Name N/A	> 2 chars and ≤ 40 chars

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Research Hierarchy Expected Value or Constraint
MSH.9	Y	Message Type N/A	OUL^R21 - Scan Response ORL^O22 - ROI Response
MSH.10	Y	Message Control ID N/A	Unique number should be of ASCII characters
MSH.11.1	N	Processing Id N/A	P
MSH.12.1	Y	Version Id N/A	2.5.1
PID.5.2	N	Patient Given Name Project.ContactName	≤ 32 Chars
PID.13.1	N	Phone Number – Home Project.ContactPhone	≤ 32 Chars
PID.13.4	N	Email Address Project.ContactEmail	≤ 32 Chars
PID.35.1	N	Species Code Project.Species	≤ 128 Chars
PV1.44.1	N	Admit DateTime Project.StartDate	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS NOTE: eSM has a limitation to display only yyyyMMdd but in DB full value is stored in format yyyyMMddHHmmssSSS
PV1.45.1	N	Discharge DateTIme Project.CompletionDate	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS NOTE: DB has a limitation to display only yyyyMMdd but in DB full value is stored in format yyyyMMddHHmmssSSS
ORC.1	Y	Order Control N/A	RE – Reply
ORC.5.1	N	Order Status Project.Status	CM - Active DC – Disapproved
ORC.12.1	N	Ordering Provider.Id Number Project.ReferenceLab	≤ 64 Chars

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Research Hierarchy Expected Value or Constraint
ORC.23.1	N	Ordering Facility Phone Number.Telephone Number Project.ReferenceLabContact	≤ 64 Chars
SAC.1	Y, if SAC present	Placer Order Number.Entity Identifier Project.ExternalId	≤ 32 Chars
SAC.2.1	N	Accession Identifier.Entity Identifier Project.Name	≤ 255 Chars
SPM.2.1	Y, if SPM provided	Specimen ID. Placer Assigned Identifier Specimen.AccessionNumber	≤ 255 Chars
SPM.7.1	N	Specimen Collection Method Specimen.Procedure	≤ 64 Chars
SPM.8	N	Specimen Source Site Specimen BodySite.Name	≤ 128 Chars
SPM.17	N	Specimen Collection Date/Time Specimen.CollectedDate	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS
SPM.18	N	Specimen Received Date/Time Specimen.ReceivedDate	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS
ZBL.1	Y, if ZBL provided	Block ID Slide.BlockId	≤ 50 Chars
OBR.4.1	Y, if OBR present	Universal Service Identifier.Identifier Slide.BarcodeId	≤ 255 Chars
OBX.2	N	Value Type N/A	ST
OBX.3.1	N	Observation Identifier N/A	One of MAG, STN, QF, URL, LABEL, MACRO, REPORT, THUMBNAIL, DATE, SCANSCOPEID or CUSTOM
OBX.3.2	N	Observation Identifier.Text N/A	eSM Database Table Name if Custom Fields exists one of the value PROJECT, SPECIMEN, BLOCK or SLIDE
OBX.4.1	N	Observation Sub-ID N/A	One of REQUEST, SCAN, SCANNED, Base64, PROJECT, SPECIMEN, BLOCK, SLIDE, FILE or Custom Field Name (Column is not prefixed)

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Research Hierarchy Expected Value or Constraint
OBX.5.1	N	Observation Value (based on OBX.3.1) MAG: Slide.RequestedMag STN: Stain.ShortName QF: Image.QualityFactor URL: N/A (opens viewer) LABEL: Label Image Data MACRO: Macro Image Data REPORT: Report Image Data THUMBNAIL: Thumbnail Image Data DATE: Image.ScanDate SCANSCOPEID: Image.ScanScopeId CUSTOM: Custom Field Value of OBX.4.1	(based on OBX.3.1) MAG: Number > 0 STN: ≤ 50 Chars QF: (Number) URL: (URL) LABEL: (base64 image) MACRO: (base64 image) REPORT: (base64 image) THUMBNAIL: (base64 image) DATE: yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS SCANSCOPEID: (Number) Custom Field Value
OBX.5.2	N	Observation Value Description Stain.LongName	≤ 200 Chars
OBX.11	N	Observation Result Status N/A	F
NTE.3	N	Comments (based on NTE.4) C: Project.Comment S: Project.Summary	No constraints. Note that Project-level notes will always appear at the end of a message
NTE.4	N	Comment Type	C or S for Project Omitted when NTE is a child of Specimen (SPM) or Slide (OBR)

Mapping Details - Educational Hierarchy

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Educational Hierarchy Expected Value or Constraint
MSH.1	Y	Field Separator N/A	|
MSH.2	Y	Encoding Characters N/A	^~\&
MSH.3.1	Y	Sending Application Namespace Id N/A	LBS
MSH.4.1	N	Sending Facility Namespace Id N/A	EH – Educational Hierarchy
MSH.5.1	Y	Receiving Application Namespace Id N/A	(LIS Name)

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Educational Hierarchy Expected Value or Constraint
MSH.7.1	N	Date/Time of Message N/A	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS
MSH.8.1	N	Data Group Name N/A	> 2 chars and ≤ 40 chars
MSH.9	Y	Message Type N/A	OUL^R21 - Scan Response ORL^O22 - ROI Response
MSH.10	Y	Message Control ID N/A	Unique number should be of ASCII characters
MSH.11.1	N	Processing Id N/A	P
MSH.12.1	Y	Version Id N/A	2.5.1
ORC.1	Y	Order Control N/A	RE – Reply
ORC.5.1	N	Order Status Project.Status	CM - Active DC – Retired
SAC.1.1	Y, if SAC present	Placer Order Number.Entity Identifier Course.CourseNumber	≤ 64 Chars
SAC.1.2	N	Placer Order Number.Namespace Id Course.CourseName	≤ 255 Chars
SAC.2.1	N	Accession Identifier.Entity Identifier Course.Instructor	≤ 64 Chars
SAC.2.2	N	Accession Identifier.Entity Identifier Course.Department	≤ 64 Chars
ZLS.1.1	Y, if ZLS provided	LessonName Lesson.LessonName	≤ 255 Chars
ZLS.2.1	N	LessonNotes Lesson.LessonNotes	No constraints.
SPM.2.1	Y, if SPM provided	Specimen ID. Placer Assigned Identifier Specimen.AccessionNumber	≤ 255 Chars
SPM.7.1	N	Specimen Collection Method Specimen.Procedure	≤ 64 Chars
SPM.8	N	Specimen Source Site Specimen BodySite.Name	≤ 128 Chars
SPM.17	N	Specimen Collection Date/Time Specimen.CollectedDate	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Educational Hierarchy Expected Value or Constraint
SPM.18	N	Specimen Received Date/Time Specimen.ReceivedDate	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS
ZBL.1	Y, if ZBL provided	Block ID Slide.BlockId	≤ 50 Chars
OBR.4.1	Y, if OBR present	Universal Service Identifier.Identifier Slide.BarcodeId	≤ 255 Chars
OBX.2	N	Value Type N/A	ST
OBX.3.1	N	Observation Identifier N/A	One of MAG, STN, QF, URL, LABEL, MACRO, REPORT, THUMBNAIL, DATE, SCANSCOPEID or CUSTOM
OBX.3.2	N	Observation Identifier.Text N/A	eSM Database Table Name if Custom Fields exists one of the value COURSE, LESSON, SPECIMEN, BLOCK or SLIDE
OBX.4.1	N	Observation Sub-ID N/A	One of REQUEST, SCAN, SCANNED, Base64, COURSE, LESSON, SPECIMEN, BLOCK, SLIDE, FILE or Custom Field Name (Column is not prefixed)
OBX.5.1	N	Observation Value (based on OBX.3.1) MAG: Slide.RequestedMag STN: Stain.ShortName QF: Image.QualityFactor URL: N/A (opens viewer) LABEL: Label Image Data MACRO: Macro Image Data REPORT: Report Image Data THUMBNAIL: Thumbnail Image Data DATE: Image.ScanDate SCANSCOPEID: Image.ScanScopeId CUSTOM: Custom Field Value of OBX.4.1	(based on OBX.3.1) MAG: Number > 0 STN: ≤ 50 Chars QF: (Number) URL: (URL) LABEL: (base64 image) MACRO: (base64 image) REPORT: (base64 image) THUMBNAIL: (base64 image) DATE: yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS SCANSCOPEID: (Number) Custom Field Value
OBX.5.2	N	Observation Value Description Stain.LongName	≤ 200 Chars

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Educational Hierarchy Expected Value or Constraint
OBX.11	N	Observation Result Status N/A	F
NTE.3	N	Comments (based on NTE.4) S: Course.CourseDescription	No constraints. Note that Course-level notes will always appear at the end of a message
NTE.4	N	Comment Type	S for Course Omitted when NTE is a child of Specimen (SPM) or Slide (OBR)

Slide Delete Response Message

Message Structure

```
MSH
ORC
OBR
```

The delete message is generated on deleting Case, Project, Course, Lesson, Specimen or Slide in eSlide Manager. Message contains one slide information. Bulk delete will trigger multiple delete responses but not all slide info in one single message.

Mapping Details – Slide Delete on Aperio eSlide Manager

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Expected Value or Constraint
MSH.1	Y	Field Separator N/A	|
MSH.2	Y	Encoding Characters N/A	^~\&
MSH.3.1	Y	Sending Application Namespace Id N/A	LBS
MSH.5.1	Y	Receiving Application Namespace Id N/A	(LIS Name)
MSH.7.1	N	Date/Time of Message N/A	yyyyMMdd or yyyyMMddHHmmss or yyyyMMddHHmmssSSS

HL7 Field	Required?	HL7 Field Name Aperio eSlide Manager Field Name	Expected Value or Constraint
MSH.8.1	N	Security Slide.DataGroup	> 2 chars and ≤ 40 chars
MSH.9.1	Y	Message Type Message Code N/A	OUL
MSH.9.2	Y	Message Type Trigger Event N/A	R21
MSH.10	Y	Message Control ID N/A	Unique number should be of ASCII characters
MSH.11.1	N	Processing Id N/A	P
MSH.12.1	Y	Version Id N/A	2.5.1
ORC.1	Y	Order Control N/A	CA
ORC.5.1	N	Order Status N/A	CA
OBR.4.1	Y	Universal Service Identifier.Identifier Slide.BarcodeId	≤ 255 Chars

Acknowledgment Message

Message Structure

```
MSH

MSA
```

Mapping Details

HL7 Field	Required?	HL7 Field Name	Expected Value
MSH.1	Y	Field Separator	|
MSH.2	Y	Encoding Characters	^~\&
MSH.3.1	Y	Sending Application.Namespace ID	Sending Application Name
MSH.5.1	Y	Receiving Application.Namespace ID	Receiving Application Name
MSH.7.1	N	Date/Time of Message	yyyyMMdd[HHmmss[SSS]]
MSH.9.1	Y	Message Type.Message Code	ACK
MSH.9.2	Y	Message Type.Trigger Event	021 or R21 or O22
MSH.10	Y	Message Control ID	Should be unique number
MSH.11.1	Y	Processing ID	P or T or D
MSH.12.1	Y	Version ID	2.x
MSA.1	Y	Acknowledgment Code	AA or AR or AE
MSA.2	Y	Message Control ID	Message Control ID of received message
MSA.3	Y	Text Message	In case of AE or AR, reason is provided

HL7 Escape Characters

In the HL7 message if the delimiters exist as part of field or component or sub-component value then the delimited characters must be framed in HL7 escaped characters as part of the HL7 message.

Characters

The characters are well known as common delimiters in Healthcare while transferring the data in HL7 format. The characters are 5 which are of field delimiter and encoding characters. They are listed in below table and how each character should be represented in HL7 message.

Number	Character	HL7 Character	Character Type	Character Name
1	|	\F\	Field Delimiter	Pipe
2	^	\S\	Component Delimiter	Carat
3	&	\T\	Sub-Component Delimiter	Ampersand
4	~	\R\	Repeat Separator	Tilde
5	\	\E\	Escape Character	Backslash

Example

Assume the field value as “abc~XYZ^123&456\pqr|Company Name”. The value should be passed from LIS as “abc\R\XYZ\S\123\T\456\E\pqr\F\Company Name”. Note the same value should be received in LIS as part of response. LIS will send/receive the value as “abc\R\XYZ\S\123\T\456\E\pqr\F\Company Name” and it should be stored in eSlide Manager as “abc~XYZ^123&456\pqr|Company Name”.

Custom Fields

Prerequisite

Custom fields should be created in Data Server database prior to LIS sending message. If not, the custom field value will not be populated in Data Server database.

Points to Remember

- No need to prefix Column for Custom Field Name.
- Custom fields related to Block level should start with Block_ (BlockUnderscore) otherwise the field mapping is ignored.
- OBX.3.1 should be Custom (not case sensitive)
- OBX.3.2 should be respective Data Server database table name (not case sensitive)
  - Permitted values are Case, Project, Course, Lesson, Specimen, Block, Slide.
- Data Server database table standard fields can’t be passed through custom fields approach.
- Invalid Custom Field Value (OBX.5.1) data type will be ignored.
  - The custom field value passed in different data type mentioned in Data Server database will be ignored.
- Custom fields are ignored if other hierarchy type custom fields are passed.

Syntax

- OBX|<SetId>|<DataType>|Custom^<Table Name>|<Custom Field Name>|<Custom Field Value>|

Example for Slide Custom Field

- OBX|1|ST|Custom^Slide|AnimalNumber|A-123

Example for Block Custom Field

- OBX|1|ST|Custom^Block|Block_BlockSlideNumber|123

Example for Specimen Custom Field

- OBX|1|ST|Custom^Specimen|RiskCode|Aggressive

Example for Lesson Custom Field

- OBX|1|ST|Custom^Lesson|StartDate|20210223

Example for Course Custom Field

- OBX|1|ST|Custom^Course|StartDate|20210428

Example for Project Custom Field

- OBX|1|ST|Custom^Project|SubmissionDate|20220110

Example for Case Custom Field

- OBX|1|ST|Custom^Case|PatientHobbies|Wildlife Photography

Placement of OBX (Custom Field) segment

Case/Project/Course

- The custom fields related Case can be placed under any of its sub-sections (Specimen, Block, Slide).
- The custom fields related Project can be placed under any of its sub-sections (Specimen, Block, Slide).
- The custom fields related Course can be placed under any of its sub-sections (Lesson, Specimen, Block, Slide).

Lesson

- The custom fields related Lesson can be placed under any of its sub-sections (Specimen, Block, Slide).

Specimen

- The custom fields related Specimen can be placed under any of its sub-sections (Block, Slide).

Block

- The custom fields related Block can be placed under any of its sub-sections (Slide).

Slide

- The custom fields related Slide can be placed under it.

Scope of Clinical Hierarchy Custom Fields

The custom fields should be mentioned at the scope provided for the Clinical hierarchy level, as shown in the sample message below. The custom fields should be mentioned at the OBX segment placeholder as per the HL7 Message Structure.

Scope of Custom Fields	Clinical Hierarchy Sample Message
	MSH|..segment fields..|
	PID|..segment fields..|
	PV1|..segment fields..|
	ORC|..segment fields..|
	SAC|..segment fields..|
	NTE|..segment fields..|
	SPM|..segment fields..|
	NTE|..segment fields..|
	ZBL|..segment fields..|
Specimen	OBR|..segment fields..|
Block Slide	OBX|..segment fields..|
	NTE|..segment fields..|
	SPM|..segment fields..|
	NTE|..segment fields..|
	ZBL|..segment fields..|
Specimen	OBR|..segment fields..|
Block	OBX|..segment fields..|
Case Slide	NTE|..segment fields..|
	SPM|..segment fields..|
	NTE|..segment fields..|
	ZBL|..segment fields..|
	OBR|..segment fields..|
Block	OBX|..segment fields..|
Slide	NTE|..segment fields..|
	ZBL|..segment fields..|
Specimen	OBR|..segment fields..|
	OBX|..segment fields..|
Slide	NTE|..segment fields..|
Block	OBR|..segment fields..|
	OBX|..segment fields..|
Slide	NTE|..segment fields..|

Scope of Research Hierarchy Custom Fields

The custom fields should be mentioned at the scope provided for the Research hierarchy level, as shown in the sample message below. The custom fields should be mentioned at the OBX segment placeholder as per the HL7 Message Structure.

<table>
<tr><th colspan="4">Scope of Custom Fields</th><th>Research Hierarchy Sample Message</th></tr>
<tr><td colspan="4" rowspan="5"></td><td>MSH|..segment fields..|</td></tr>
<tr><td>PID|..segment fields..|</td></tr>
<tr><td>PV1|..segment fields..|</td></tr>
<tr><td>ORC|..segment fields..|</td></tr>
<tr><td>SAC|..segment fields..|</td></tr>
<tr><td rowspan="26">Project</td><td colspan="3" rowspan="2"></td><td>NTE|..segment fields..|</td></tr>
<tr><td>SPM|..segment fields..|</td></tr>
<tr><td rowspan="5">Specimen</td><td colspan="2" rowspan="2"></td><td>NTE|..segment fields..|</td></tr>
<tr><td>ZBL|..segment fields..|</td></tr>
<tr><td rowspan="3">Block</td><td></td><td>OBR|..segment fields..|</td></tr>
<tr><td rowspan="2">Slide</td><td>OBX|..segment fields..|</td></tr>
<tr><td>NTE|..segment fields..|</td></tr>
<tr><td colspan="3"></td><td>SPM|..segment fields..|</td></tr>
<tr><td rowspan="5">Specimen</td><td colspan="2" rowspan="2"></td><td>NTE|..segment fields..|</td></tr>
<tr><td>ZBL|..segment fields..|</td></tr>
<tr><td rowspan="3">Block</td><td></td><td>OBR|..segment fields..|</td></tr>
<tr><td rowspan="2">Slide</td><td>OBX|..segment fields..|</td></tr>
<tr><td>NTE|..segment fields..|</td></tr>
<tr><td colspan="3"></td><td>SPM|..segment fields..|</td></tr>
<tr><td rowspan="12">Specimen</td><td colspan="2" rowspan="2"></td><td>NTE|..segment fields..|</td></tr>
<tr><td>ZBL|..segment fields..|</td></tr>
<tr><td rowspan="3">Block</td><td></td><td>OBR|..segment fields..|</td></tr>
<tr><td rowspan="2">Slide</td><td>OBX|..segment fields..|</td></tr>
<tr><td>NTE|..segment fields..|</td></tr>
<tr><td colspan="2"></td><td>ZBL|..segment fields..|</td></tr>
<tr><td rowspan="6">Block</td><td></td><td>OBR|..segment fields..|</td></tr>
<tr><td rowspan="2">Slide</td><td>OBX|..segment fields..|</td></tr>
<tr><td>NTE|..segment fields..|</td></tr>
<tr><td></td><td>OBR|..segment fields..|</td></tr>
<tr><td rowspan="2">Slide</td><td>OBX|..segment fields..|</td></tr>
<tr><td>NTE|..segment fields..|</td></tr>
</table>

Scope of Educational Hierarchy Custom Fields

The custom fields should be mentioned at the scope provided for the Educational hierarchy level, as shown in the sample message below. The custom fields should be mentioned at the OBX segment placeholder as per the HL7 Message Structure.

Scope of Custom Fields	Educational Hierarchy Sample Message
	MSH|..segment fields..|
	PID|..segment fields..|
	PV1|..segment fields..|
	ORC|..segment fields..|
	SAC|..segment fields..|
Course	NTE|..segment fields..|
Course	ZLS|..segment fields..|
Course, Lesson	SPM|..segment fields..|
Course, Lesson	NTE|..segment fields..|
Course, Lesson, Specimen	ZBL|..segment fields..|
Course, Lesson, Specimen, Block	OBR|..segment fields..|
Course, Lesson, Specimen, Block, Slide	OBX|..segment fields..|
Course, Lesson, Specimen, Block, Slide	NTE|..segment fields..|
Course	ZLS|..segment fields..|
Course, Lesson	SPM|..segment fields..|
Course, Lesson	NTE|..segment fields..|
Course, Lesson, Specimen	ZBL|..segment fields..|
Course, Lesson, Specimen, Block	OBR|..segment fields..|
Course, Lesson, Specimen, Block, Slide	OBX|..segment fields..|
Course, Lesson, Specimen, Block, Slide	NTE|..segment fields..|
Course, Lesson	SPM|..segment fields..|
Course, Lesson	NTE|..segment fields..|
Course, Lesson, Specimen	ZBL|..segment fields..|
Course, Lesson, Specimen, Block	OBR|..segment fields..|
Course, Lesson, Specimen, Block, Slide	OBX|..segment fields..|
Course, Lesson, Specimen, Block, Slide	NTE|..segment fields..|
Course, Lesson, Specimen	ZBL|..segment fields..|
Course, Lesson, Specimen, Block	OBR|..segment fields..|
Course, Lesson, Specimen, Block, Slide	OBX|..segment fields..|
Course, Lesson, Specimen, Block, Slide	NTE|..segment fields..|
Course, Lesson, Specimen, Block	OBR|..segment fields..|
Course, Lesson, Specimen, Block, Slide	OBX|..segment fields..|
Course, Lesson, Specimen, Block, Slide	NTE|..segment fields..|

Viewer Link Format

Display of eSlide images associated to a case, project, course, lesson, specimen, block/cassette and/or slide can be launched in WebViewer or ImageScope via a URL link. The LIS can store such links to allow the LIS user to trigger this viewer display. The table below defines the URL link format used. It is based on the case, project, course, lesson, specimen, cassette/block or slide identifiers sent to Aperio eSlide Manager in an LIS order message. The special character in case, project, course, lesson, specimen, cassette/block or slide identifier will be converted into the encoded value as per the table; alphanumeric values will remain the same.

Character Name	Character	Encoded Value
Dollar	$	%24
Ampersand	&	%26
Plus	+	%2B
Comma	,	%2C
Forward Slash/Virgule	/	%2F
Colon	:	%3A
Semi-colon	;	%3B
Equals	=	%3D
Question Mark	?	%3F
'At' symbol	@	%40
Space		%20
Quotation Mark	"	%22
Less Than	<	%3C
Greater Than	>	%3E
Pound	#	%23
Percent	%	%25
Left Curly Brace	{	%7B
Right Curly Brace	}	%7D
Vertical Bar/Pipe	|	%7C
Backslash	\	%5C
Caret	^	%5E
Left Square Bracket	[	%5B
Right Square Bracket	]	%5D

Case Level Display URL

- http(s)://<hostname>/view/v2/LApi.Case/<encoded Case ID>

Example:

https://pi-v2-16-11/view/v2/LApi.Case/Case-ABC

Project Level Display URL

- http(s)://<hostname>/view/v2/LApi.Project/<encoded Project ID>

Example:

https://pi-v2-16-11/view/v2/LApi.Project/Project%20ABC

Course Level Display URL

- http(s)://<hostname>/view/v2/LApi.Course/<encoded Course ID>

Example:

https://pi-v2-16-11/view/v2/LApi.Course/Course%7EABC

Lesson Level Display URL

- http(s)://<hostname>/view/v2/LApi.Lesson/<encoded Lesson ID>

Example:

https://pi-v2-16-11/view/v2/LApi.Lesson/Lesson%40ABC

Specimen Level Display URL

- http(s)://<hostname>/view/v2/LApi.Specimen/<encoded Specimen ID>

Example:

https://pi-v2-16-11/view/v2/LApi.Specimen/Specimen%3AABC

Cassette/Block Level Display URL

- http(s)://<hostname>/view/v2/LApi.Block/<encoded Block ID>

Example:

https://pi-v2-16-11/view/v2/LApi.Block/Block%2CABC

Slide Level Display URL

- http(s)://<hostname>/view/v2/LApi.Slide/<encoded Slide ID>

Example:

https://pi-v2-16-11/view/v2/LApi.Slide/Slide.ABC

Symbols

The following symbols may appear on your product label or in this user's guide:

	Consult instructions for use
	Manufacturer
	Date of manufacture (year - month - day)
	European Union Authorized Representative
	In vitro diagnostic device
	Serial number
	Catalog number
	Relative humidity range
	Biological risks
	Storage temperature range
	Electronic and electrical equipment waste disposal
	The exclamation point within an equilateral triangle is intended to alert you to the presence of important operating and maintenance (servicing) instructions. *Le point d'exclamation dans un triangle équilatéral vise à avertir l'utilisateur qu'il s'agit d'instructions d'utilisation et d'entretien importantes.*
	The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert you to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons. *Le symbole de l'éclair avec la pointe de flèche dans un triangle équilatéral vise à avertir l'utilisateur que le boîtier du produit présente une « tension dangereuse » non isolée d'une amplitude suffisante pour constituer un risque d'électrocution.*
	The flat surface with waves symbol within an equilateral triangle is intended to alert you to the presence of hot surfaces which could cause burn damage. *Le symbole d'une surface plane et de vagues dans un triangle équilatéral vise à avertir l'utilisateur de la présence de surfaces chaudes qui peuvent causer des brûlures.*
	The UV lamp within an equilateral triangle is intended to alert you to the presence of UV light within the product's enclosure that may be of sufficient magnitude to constitute a risk to the operator. *La lampe UV dans un triangle équilatéral vise à avertir l'utilisateur de la présence de rayonnement UV dans le boîtier du produit qui peut être d'une amplitude suffisante pour constituer un risque pour l'utilisateur.*

www.LeicaBiosystems.com/Aperio

Leica
BIOSYSTEMS