HL7 Conformance Statement

for Image Management Family of Products:

vnaPlus and imageGateway

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Contents

1. Introduction

This section outlines the purpose of this document, its expected audience, and presents a brief background on the intended use of the documented HL7 interfaces. It also lists several high-level prerequisites for deploying the interfaces in the enterprise environment.

1.1 Purpose and Intended Audience

The purpose of this document is to describe the incoming and outgoing HL7 interfaces exposed by Leafsprout's Image Management Family of Products – namely *vnaPlus* and *imageGateway* – used in the process of (1) archiving, (2) publishing and (3) pre-fetching of imaging exams and reports. The document details the products' default usage of data elements found in the HL7 Standard. It covers only those elements of the HL7 Standard that are applicable to the Leafsprout products referenced by this document.

The intended audience of this document is the user who is involved with system integration and/or software design. We assume that the reader is familiar with the terminology and concepts that are used in HL7 2.x standard and the IHE Radiology Technical Framework. Full versions of the HL7 Standard (not specific to vendor implementation) can be found at http://www.HL7.org.

1.2 Background

The Leafsprout Image Management Family of Products (IM) encompasses the following two product lines:

1) ***vnaPlus*** (the VNA) for archiving of imaging exams. The VNA accepts imaging studies from DICOM-compliant sources and persists them in its permanent storage for future discovery and retrieval by client systems. The VNA also processes and archives HL7 imaging orders, reports, and patient demographics updates for all exams under its management. From the functional perspective, *vnaPlus* fulfills the roles of the IHE Image Manager and IHE Image Archive.

2) ***imageGateway*** (the Gateway) for distribution of imaging exams. The Gateway interfaces with existing RIS/PACS or VNA systems in order to allow its connected enterprises to participate in sharing of diagnostic imaging information via a cross-enterprise health information exchange. The Gateway is offered in the following flavors:

1. **Exam Publisher (imageGateway/Publisher)** – accepts imaging studies and reports from the associated RIS/PACS/VNA and publishes them to the XDS Infrastructure. While publishing studies or reports, the relevant local vocabularies (e.g., procedure codes, body parts) are translated by *imageGateway* to their regional/global equivalents.
2. **Exam Prefetcher (imageGateway/Prefetcher)** – intercepts local imaging orders and locates relevant priors which it subsequently automatically imports into the associated local PACS. In the process of importing, *imageGateway* optionally creates an HL7 order for each foreign exam to be brought in. It subsequently imports the exam (comprising imaging studies and reports) into the local PACS. While bringing in foreign exams, imageGateway localizes each exam to the environment of the destination PACS.

Note: Not all product flavors and features are offered in all geographies. Contact Leafsprout for more details.

1.3 HL7 Prerequisites

The following HL7-related considerations apply to all sections of this document.

1.3.1 Version

The Leafsprout vnaPlus/imageGateway supports HL7 Standard, Version 2.3.1, as recommended by IHE. Other versions of the standard may be supported via configuration changes (check with the manufacturer).

1.3.2 Transport and Encoding

All HL7 messages transmitted to vnaPlus/imageGateway by enterprise-level systems must be transported using Minimal Lower Level Protocol (MLLP) operating in a TCP/IP network environment. Secure message transport (TLS) is also supported. HL7 messages must conform to the following format:

- Each HL7 message starts with 0x0B and ends with 0x1C and 0x0D.
- Each HL7 segment is terminated by 0x0D.

1.3.3 Data Types

The following are the values of the column Type in the HL7 ADT, ORM, ORU message descriptions later in the document. Additional details can be found in the HL7 Standard v2.3.1 specification.

AD	Address	**PL**	Person location
CD	Channel definition	**PN**	Person name
CE	Coded element	**PPN**	Performing person time stamp
CF	Coded element with formatted values	**PT**	Processing type
CK	Composite ID with check digit	**QIP**	Query input parameter list
CM	Composite	**QSC**	Query selection criteria
CN	Composite ID number and name	**RCD**	Row column definition
CNE	Coded with no exceptions	**RI**	Repeat interval
CP	Composite price	**RP**	Reference pointer
CQ	Composite quantity with units	**SAD**	Street Address
CWE	Coded with exceptions	**SCV**	Scheduling class value pair
CX	Extended composite ID with check digit	**SI**	Sequence ID
DLN	Driver's license number	**SN**	Structured numeric
DR	Date/time range	**SRT**	Sort order
DT	Date	**ST**	String
ED	Encapsulated data	**TM**	Time
EI	Entity identifier	**TN**	Telephone number
FC	Financial class	**TQ**	Timing/quantity
FN	Family name	**TS**	Time stamp
FT	Formatted text	**TX**	Text data
HD	Hierarchic designator	**VH**	Visiting hours
ID	Coded values for HL7 tables	**VID**	Version identifier
IS	Coded value for user-defined tables	**XAD**	Extended address
JCC	Job code/class	**XCN**	Extended composite ID number and name
MA	Multiplexed array	**XON**	Extended composite name & ID number for organizations
MO	Money	**XPN**	Extended person name
NA	Numeric array	**XTN**	Extended telecommunications

			number

1.4 Customizations

The various HL7 mappings described in this Conformance Statement are the default implementation of the HL7 connectivity in Leafsprout's vnaPlus/imageGateway. These mappings come with the turn-key version of the product.

A different set of mappings can be supported in the context of a specific project. If this is required, contact the manufacturer for details.

2. Inbound Messages

The set of supported inbound HL7 v2 messages as well as their constituent segments and fields have been outlined below.

2.1 Supported Inbound Message Types

The following inbound messages are supported:

Message Type	*Event Code*	*Trigger Event*
ADT	A01	Patient admission
	A04	Patient registration
	A05	Patient pre-admission
	A08	Patient information update
	A40	Patient merge
ORM	O01	Order (request of service)
ORU	R01	Observation message

The following inbound messages are used by:

Exam Archive (VNA): ADT, ORM, ORU
Exam Publisher: ADT, ORM, ORU
Exam Pre-fetcher: ADT (recommended but not mandatory*), ORM

(*) See Section 2.4 for a discussion of whether ADTs must be received by the Exam Pre-fetcher.

2.2 Common Inbound Segments

The segments listed below are common to all inbound messages.

2.2.1 MSH – Message Header Segment

Field	*Name*	*Type*	*Usage*	*Comments*
MSH-1	Field Separator	ST	R	|
MSH-2	Encoding Characters	ST	R	^~\&
MSH-3	Sending Application	HD	R	Set by the sender
MSH-4	Sending Facility	HD	R	Set by the sender
MSH-5	Receiving Application	HD	R	Configurable HL7 Application Name for vnaPlus/imageGateway
MSH-6	Receiving Facility	HD	R	Configurable HL7 Facility Name for vnaPlus/imageGateway
MSH-7	Date/Time of Message	TS	R	YYYYMMDDHHMMSS

MSH-9	Message Type	CM	R	ADT^A01, ADT^A04, ADT^A05, ADT^A08, ADT^A40, ORM^O01, ORU^R01
MSH-10	Message Control ID	ST	R	
MSH-11	Processing ID	PT	R	P for Production
MSH-12	Version ID	ID	R	2.3.1
MSH-18	Character Set	IS	O	Default is ASCII

2.2.2 PID – Patient Identifier Segment

Field	*Name*	*Type*	*Usage*	*Comments*
PID-3	Patient Identifier List	CX	R	PIDs present in PID-3 and PID-4 are collectively evaluated by vnaPlus/imageGateway in order to deter-mine the type of each identifier (local vs. global vs. other). This is done to extract the relevant local patient ID (MRN) and the relevant global patient ID, if present, from the set of the identifiers in the message. Based on its configuration, the vnaPlus/imageGateway will use either CX.4 (Assigning Authority) or the CX.5 (Universal ID Type Code) to determine the local and global patient identifiers. Local patient ID (MRN) must always be present in the message and must be the same ID that is used by the PACS. Global patient ID (e.g., a provincial or national identifier) may or may not be present. If identifiers in the PID segment are neither qualified with CX.4 nor CX.5, and if their type is instead determined via a site-specific convention (e.g., the order of patient identifiers in the list),
PID-4	Alternate Patient ID	CX	O	

				vnaPlus/imageGateway can be customized to accommodate these cases – contact the manufacturer if your site's identifiers are not qualified.
PID-5	Patient Name	R	XPN	
PID-6	Mother's Maiden Name	O	XPN	
PID-7	Date of Birth	O	TS	
PID-8	Administrative Sex	O	IS	
PID-10	Race	O	IS	
PID-11	Patient Address	O	XAD	
PID-13	Patient Phone - Home	O	XTN	
PID-14	Patient Phone - Business	O	XTN	
PID-22	Ethnic Group	O	IS	

2.3 Acknowledgements

The vanPlus/imageGateway will send HL7 acknowledgements (positive and negative) to each inbound response. The acknowledgement message will contain the following segments:

Segment	*Description*
MSH	Message Header
MSA	Message Acknowledgement
[ERR]	Error Segment

2.3.1 MSH – Message Header Segment

Field	*Name*	*Type*	*Usage*	*Comments*
MSH-1	Field Separator	ST	R	|
MSH-2	Encoding Characters	ST	R	^~\&
MSH-3	Sending Application	HD	R	Configurable HL7 Application Name for vnaPlus/imageGateway
MSH-4	Sending Facility	HD	R	Configurable HL7 Facility Name for vnaPlus/imageGateway
MSH-5	Receiving Application	HD	R	Copied from MSH-3 in the inbound message
MSH-6	Receiving Facility	HD	R	Copied from MSH-4 in the inbound message
MSH-7	Date/Time of Message	TS	R	YYYYMMDDHHMMSS
MSH-9	Message Type	CM	R	The first component will be ACK. The second component will be the

				Event Code of the inbound request. The third component will be ACK. E.g., ACK^A04^ACK
MSH-10	Message Control ID	ST	R	Copied from MSH-10 in the inbound message
MSH-11	Processing ID	PT	R	P for Production
MSH-12	Version ID	ID	R	2.3.1
MSH-18	Character Set	IS	O	The same character set used in the inbound message

2.3.2 MSA – Message Acknowledgement Segment

Field	*Name*	*Type*	*Usage*	*Comments*
MSA-1	Acknowledgement Code	ID	R	AA – Application Accept AE – Application Error AR – Application Reject
MSA-2	Message Control ID	ST	R	Copied from MSH-10 in the inbound message
MSH-3	Text Message	ST	O	Optional text message describing the result (e.g., error details)

2.3.3 ERR – Error Segment

Field	*Name*	*Type*	*Usage*	*Comments*
ERR-1	Error Code and Location	ID	R	Error

2.4 Inbound ADT

Inbound ADT feeds must always be received by the Exam Archive and by the Exam Publishing Gateway. These feeds are recommended (but not mandatory) for the Exam Pre-fetching Gateway.

Inbound ADT Feed applicability for the Exam Pre-fetching gateway: The Pre-fetcher gateway embeds the local patient ID (from a local order) into all foreign prior reports and studies that are being brought into the local site. If the local patient ID is merged into another patient ID before the foreign priors are fetched, then the Pre-fetcher may use an out of date (subsumed) patient ID. To alleviate this, imageGateway should either be sent the Inbound ADT feed or it should be sent an updated/new order (ORM) if the departmental RIS is capable of issuing those whenever patient merges or patient demographics changes occur.

2.4.1 ADT Segments Processed

The following segments are processed when an ADT message is received:

MSH
[EVN]
PID
[MRG]

2.4.2 ADT Message – Supported Fields

The segments MSH and PID must be present in all supported ADT messages. Additionally, the Patient Merge messages – namely ADT^A40 – must include the MRG segment.

The designations “R” and “O” denote the required and optional fields, as seen from the perspective of vnaPlus/imageGateway. The VNA and the Gateway use both types of fields in their operation. Deployment environments may designate other HL7 fields, not listed below, as required or optional in all exchanged messages. These additional fields, if present, will be ignored by vnaPlus/imageGateway.

2.4.2.1 MSH – Message Header Segment

The MSH segment in inbound ADT messages must adhere to the format described in 2.2.1.

2.4.2.2 EVN – Event Type Segment

The EVN segment in inbound ADT messages, if present, must adhere to the format below.

Field	*Name*	*Type*	*Usage*	*Comments*
EVN-2	Recorded Date/Time	TS	R	Recorded Date/Time YYYYMMDDHHMMSS

2.4.2.3 PID – Patient Identifier Segment

The PID segment in inbound ADT messages must adhere to the format described in 0.

2.4.2.4 MRG – Merge Patient Information Segment

The MRG segment present in ADT^A40 message must adhere to the format below.

Field	*Name*	*Type*	*Usage*	*Comments*
MRG-1	Prior Patient Identifier List	CX	R	Subsumed patient ID The ID must be qualified either with the assigning authority (CX.4) and/or type (CX.5).

2.5 Inbound ORM

Inbound ORM messages are processed by vnaPlus as well as the two flavors of imageGateway: Exam Publisher and Exam Pre-fetcher.

2.5.1 ORM Segments Processed

The following segments are processed when an ORM message is received:

MSH
PID
PV1
{ORC
OBR}
[ZDS]

2.5.2 ORM Message – Supported Fields

The designations "R" and "O" denote the required and optional fields, as seen from the perspective of vnaPlus/imageGateway. The VNA and the Gateway use both types of fields in their operation. Deployment environments may designate other HL7 fields, not listed below, as required or optional in all exchanged messages. These additional fields, if present, will be ignored by vnaPlus/imageGateway.

2.5.2.1 MSH – Message Header Segment

The MSH segment in inbound ORM messages must adhere to the format described in 2.2.1.

2.5.2.2 PID – Patient Identifier Segment

The PID segment in inbound ORM messages must adhere to the format described in 0.

2.5.2.3 PV1 – Patient Visit Segment

Field	*Name*	*Type*	*Usage*	*Comments*
PV1-2	Patient Class	IS	R	E – Emergency, I – Inpatient, O – Outpatient, P – Preadmit, R – Recurring, B – Obstetrics
PV1-7	Attending Doctor	XCN	O	
PV1-8	Referring Doctor	XCN	O	
PV1-16	VIP Indicator	IS	O	Y for VIP

2.5.2.4 ORC – Common Order Segment in ORM

Field	*Name*	*Type*	*Usage*	*Comments*
ORC-1	Order Control	ID	R	NW – New Order XO – Change existing order SC – Change order status
ORC-2	Placer Order Number	EI	R	Can be Accession Number when OBR-18 is not used.
ORC-3	Filler Order Number	EI	R	Can be Accession Number when OBR-18 is not used.
ORC-5	Order Status	ID	R	SC – procedure scheduled IP – procedure in progress CM – procedure completed, results not available ZR – procedure completed, results available CA – cancelled
ORC-12	Ordering Provider	XCN	O	Requesting Physician vnaPlus/imageGateway will look at both ORC-12 as well as OBR-16 (in this order) to extract the Requesting Physician.
ORC-17	Entering Organization	CE	O	

2.5.2.5 OBR – Observation Request Segment in ORM

Field	*Name*	*Type*	*Usage*	*Comments*
OBR-1	Set ID – OBR	SI	R	Default value: 1 Multiple OBR segments may be present in an inbound ORM message (associated with multiple requested procedures) as long as the segments are referencing a single order (Accession Number).
OBR-2	Placer Order Number	EI	R	Generated by the Sender
OBR-3	Filler Order Number	EI	R	Generated by the Sender If this field is missing, vnaPlus/ imageGateway will automatically assign the value of OBR-2 to it.
OBR-4	Universal Service ID	CE	R	Procedure Code (Scheduled) The expected formats are: - Code or - Code^Desc or - Code^Desc^CodingScheme

OBR-15	Specimen Source	CM	O	Body Part The expected formats are: - Code or - Code^Desc or - Code^Desc^CodingScheme
OBR-16	Ordering Provider	XCN	O	Requesting Physician vnaPlus/imageGateway will look at both ORC-12 as well as OBR-16 (in this order) to extract the Requesting Physician.
OBR-18	Placer Field 1	EI	R	Accession Number The expected formats are: - AccNumber (ST) or - AccNumber^Issuer where Issuer is the namespace identifying the issuer of the accession number. The accession number must match that used by the PACS.
OBR-19	Placer Field 2	ST	O	Procedure ID Required if there is more than one procedure in a single order.
OBR-24	Diagnostic Service Section ID	ID	O	DICOM Modality The expected formats are: - Code (ST) or - Code^Desc or - Code^Desc^CodingScheme, e.g., CT or MR^^DCM
OBR-27	Quantity/Timing	TQ	O	Scheduled Time (OBR-27.4) If time is missing it is assumed to be the current time. Priority (OBR-27.6) The following priority values can be used: S – for STAT H – for HIGH priority R – for ROUTINE priority M – for MEDIUM priority L – for LOW priority When priority is missing, it is assumed to be ROUTINE.
OBR-31	Reason For Study	CE	O	Reason For Study

OBR-34	Technician	CM	O	Operator's name, e.g., 8431&Klein&Nadia&M&&&&&IHA
OBR-44	Procedure Code	CE	O	Procedure Code (Requested) The expected formats are: - Code (ST) or - Code^Desc or - Code^Desc^CodingScheme

2.5.2.6 ZDS – Custom Z Segment

Field	*Name*	*Type*	*Usage*	*Comments*
ZDS-1	Study Instance UID	RP	O	Study Instance UID (component 1)

2.6 Inbound ORU

Inbound ORU messages are processed by vnaPlus and the Exam Publishing gateway only. The Gateway extracts the imaging report from the message (preliminary or final) and registers it as a CDA document in the XDS Infrastructure.

2.6.1 ORU Segments Processed

The following segments are processed when an ORU message is received:

MSH
PID
[PV1]
OBR
{OBX}

2.6.2 ORU Message – Supported Fields

The designations "R" and "O" denote the required and optional fields, as seen from the perspective of vnaPlus/imageGateway. The VNA and the Gateway use both types of fields in their operation. Deployment environments may designate other HL7 fields, not listed below, as required or optional in all exchanged messages. These additional fields, if present, will be ignored by imageGateway.

2.6.2.1 MSG – Message Header Segment in ORU

The MSH segment in inbound ORU messages must adhere to the format described in 2.2.1.

2.6.2.2 PID – Patient Identifier Segment in ORU

The PID segment in inbound ORU messages must adhere to the format described in 0.

2.6.2.3 PV1 – Patient Visit Segment in ORU

Field	*Name*	*Type*	*Usage*	*Comments*
PV1-2	Patient Class	IS	R	E – Emergency, I – Inpatient, O – Outpatient, P – Preadmit, R – Recurring, B – Obstetrics
PV1-8	Referring Doctor	XCN	O	
PV1-7	Attending Doctor	XCN	O	
PV1-16	VIP Indicator	IS	O	

2.6.2.4 OBR – Observation Request Segment in ORU

Field	*Name*	*Type*	*Usage*	*Comments*
OBR-1	Set ID – OBR	SI	R	
OBR-2	Placer Order Number	EI	R	Generated by the Sender
OBR-3	Filler Order Number	EI	R	Generated by the Sender
OBR-4	Universal Service ID	CE	O	Procedure Code (Scheduled) The expected formats are: - Code or - Code^Desc or - Code^Desc^CodingScheme
OBR-6	Requested Date Time	TS	O	YYYYMMDDHHMMSS Service (Exam) Date/Time
OBR-7	Observation Date Time	TS	O	YYYYMMDDHHMMSS Report Date/Time vnaPlus/imageGateway will look at both OBR-7 and OBX-14 (in this order) to extract Report Date /Time. Assigned the current time if not present.
OBR-16	Ordering Provider	XCN	O	Requesting Physician
OBR-18	Placer Field 1	EI	R	Accession Number The expected formats are: - AccNumber (ST) or - AccNumber^Issuer where Issuer is the namespace identifying the issuer of the accession number. The Accession Number must match that used by the PACS.
OBR-19	Placer Field 2	ST	O	Procedure ID
OBR-25	Result Status	ID	R	F – Final C – Correction/Addendum D – Deleted P – Preliminary vnaPlus/imageGateway will look at both OBR-25 and OBX-11 (in this order) to extract Result Status. Either OBX-11 or OBR-25 must be present.
OBR-32	Principal Result Interpreter	CM	R	Reporting radiologist, e.g., 7237&Smith&Mark&H&&&&IHA
OBR-44	Procedure Code	CE	O	Procedure Code (Requested) The expected formats are:

				- Code or - Code^Desc or - Code^Desc^CodingScheme

2.6.2.5 OBX – Observation Result Segment in ORU

Field	*Name*	*Type*	*Usage*	*Comments*
OBX-1	Set ID – OBX	SI	R	Default value: 1 This represents the OBX sequence number. If the result contains multiple OBX segments, each OBX segment will be numbered in an incremental fashion.
OBX-2	Value Type	ID	R	Value: TX All observations must be sent as TX.
OBX-3	Observation Identifier	CE	O	
OBX-5	Observation Value	ST	O	Report text can be sent in the following two formats: (*) Single OBX segment with lines separated using the repeating fields separator (~). This is the preferred format. (*) Each report line/paragraph is provided in a separate OBX segment.
OBX-11	Observe Result Status	ID	R	F – Final C – Correction/Addendum D – Deleted P – Preliminary vnaPlus/imageGateway will look at both OBR-25 and OBX-11 (in this order) to extract Result Status. Either OBX-11 or OBR-25 must be present.
OBX-14	Date/Time of the Observation	TS	O	YYYYMMDDHHMMSS Report Date/Time vnaPlus/imageGateway will look at both OBR-7 and OBX-14 (in this order) to extract Report Date/Time. Assigned the current time if not present.

3.Outbound Messages

Outbound HL7 messages are sent by the Exam Pre-fetching gateway only. These messages are used to:

- create a local import order for a foreign imaging exam that is being pre-fetched from a remote enterprise into the local PACS /VNA, and to
- import the report(s) associated with each pre-fetched exam into the local PACS/VNA.

By doing the above, localized foreign DICOM studies and associated imaging reports can be sent to the local PACS/VNA without triggering exceptions.

The Exam Publishing gateway does not send any outbound HL7 messages to local enterprise systems.

3.1 Supported Outbound Message Types

The following outbound messages are supported:

Message Type	*Event Code*	*Trigger Event*
ORM	O01	Order (request of service)
ORU	R01	Observation message

The following outbound messages are used by:

Exam Publisher: None

Exam Pre-fetcher: ORM, ORU

3.2 Common Outbound Segments

The segments listed below are common to all inbound messages.

3.2.1 MSH – Message Header Segment

Field	*Name*	*Type*	*Usage*	*Comments*
MSH-1	Field Separator	ST	R	|
MSH-2	Encoding Characters	ST	R	^~\&
MSH-3	Sending Application	HD	R	Configured in imageGateway
MSH-4	Sending Facility	HD	R	Configured in imageGateway
MSH-5	Receiving Application	HD	R	Configured in imageGateway
MSH-6	Receiving Facility	HD	R	Configured in imageGateway
MSH-7	Date/Time of Message	TS	R	YYYYMMDDHHMMSS
MSH-9	Message Type	CM	R	ORM^O01, ORU^R01
MSH-10	Message Control ID	ST	R	Generated by imageGateway
MSH-11	Processing ID	PT	R	P for Production

MSH-12	Version ID	ID	R	2.3.1
MSH-18	Character Set	IS	O	Default is ASCII

3.2.2 PID – Patient Identifier Segment

Field	*Name*	*Type*	*Usage*	*Comments*
PID-3	Patient Identifier List	CX	R	imageGateway will put both the local patient ID (MRN) and the global patient ID (e.g., a provincial or national identifier) in this field. Based on its configuration, image-Gateway will format the identifiers to include the identifier, name-space and optionally the identifier type. E.g., R0012345^^^XYZHOSP, or R0012345^^^XYZHOSP^PI
PID-4	Alternate Patient ID	CX	O	
PID-5	Patient Name	R	XPN	
PID-6	Mother's Maiden Name	O	XPN	
PID-7	Date of Birth	O	TS	
PID-8	Administrative Sex	O	IS	
PID-10	Race	O	IS	
PID-11	Patient Address	O	XAD	
PID-13	Patient Phone - Home	O	XTN	
PID-14	Patient Phone - Business	O	XTN	
PID-22	Ethnic Group	O	IS	

3.3 Outbound ORM

Outbound ORM messages are sent by the Exam Pre-fetching gateway only. They will also be referred to as “import orders”.

3.3.1 ORM Segments Sent

The following segments are sent when imageGateway generates an outbound ORM message:

MSH
PID
PV1
{ORC
OBR}
[ZDS]

3.3.2 ORM Message – Supported Fields

The designations “R” and “O” denote the required and optional fields that may be present in messages sent by imageGateway. The required fields are guaranteed to be present in outbound messages. The optional fields may or may not be present.

3.3.2.1 MSH – Message Header Segment

The MSH segment in outbound ORM messages adheres to the format described in 3.2.1.

3.3.2.2 PID – Patient Identifier Segment

The PID segment in outbound ORM messages adheres to the format described in 3.2.2.

3.3.2.3 PV1 – Patient Visit Segment

Field	*Name*	*Type*	*Usage*	*Comments*
PV1-2	Patient Class	IS	R	E – Emergency, I – Inpatient, O – Outpatient, P – Preadmit, R – Recurring, B – Obstetrics Will use the value PV1-2 present in the inbound ORM that triggered the pre-fetch.
PV1-3	Assigned Patient Location	PL	R	The component Facility (PV1-3.4) is populated with the name

				(configurable mnemonic) of the foreign accession number issuer, as defined in the imageGateway configuration.
PV1-8	Referring Doctor	XCN	O	
PV1-7	Attending Doctor	XCN	O	
PV1-16	VIP Indicator	IS	O	Y for VIP

3.3.2.4 ORC – Common Order Segment in ORM

Field	*Name*	*Type*	*Usage*	*Comments*
ORC-1	Order Control	ID	R	NW – New Order (sent at the beginning of the pre-fetch, before importing any DICOM objects or reports) SC – Change Status (sent at the end of the pre-fetch, after importing of all DICOM objects and/or reports)
ORC-2	Placer Order Number	EI	R	Generated by imageGateway.
ORC-3	Filler Order Number	EI	R	Generated by imageGateway.
ORC-5	Order Status	ID	R	SC – Scheduled CM – procedure completed, results not available ZR – procedure completed, results available At the beginning of the pre-fetch, an ORM message may be sent with Order Status “SC”. At the end of the pre-fetch, another ORM message may be sent with Order Status “CM” when no foreign report was imported; or “ZR” when one or more reports were imported.

3.3.2.5 OBR – Observation Request Segment in ORM

Field	*Name*	*Type*	*Usage*	*Comments*
OBR-1	Set ID – OBR	SI	R	Default value: 1 Multiple OBR segments may be present (associated with multiple requested procedures) as long as the segments are referencing a single order (Accession Number).
OBR-2	Placer Order Number	EI	R	Generated by imageGateway.
OBR-3	Filler Order Number	EI	R	Generated by imageGateway.
OBR-4	Universal Service ID	CE	R	Contains Procedure Code (Scheduled) for the import order. It will be set to the same value as OBR-44 (Procedure Code, Requested). The code format is: - Code^Desc^CodingScheme
OBR-6	Requested Date Time	TS	R	YYYYMMDDHHMMSS Service (Exam) Date/Time of the imported exam
OBR-15	Specimen Source	CM	O	Body Part code associated with the import order. This is the local Body Part that is derived from the local Procedure Code (if this optional mapping has been defined). The code format is: - Code^Desc^CodingScheme, e.g., HEAD^^SRT
OBR-16	Ordering Provider	XCN	O	Requesting Physician of the imported exam
OBR-18	Placer Field 1	EI	R	Accession Number is generated by imageGateway by using the accession number of the remote exam and prefixing/suffixing it with a configurable mnemonic of the source enterprise. The accession number format is: NewAccNumber^Issuer, where Issuer is the configured namespace of the local accession number.

OBR-19	Placer Field 2	ST	R	Procedure ID
OBR-24	Diagnostic Service Section ID	ID	O	DICOM Modality The code format is: - Code^Desc^CodingScheme e.g., CT^^DCM
OBR-27	Quantity/Timing	TQ	O	Scheduled Time (OBR-27.4) Priority (OBR-27.6) The default outgoing priority used in outbound order messages is: R – for ROUTINE priority
OBR-44	Procedure Code	CE	R	Procedure Code (Requested) – local procedure code translated by imageGateway from the remote procedure code associated with the remote exam. The code format is: - Code^Desc^CodingScheme

3.3.2.6 ZDS – Custom Z Segment

Field	*Name*	*Type*	*Usage*	*Comments*
ZDS-1	Study Instance UID	RP	R	Study Instance UID (component 1) of the associated foreign study that is being pre-fetched.

3.4 Outbound ORU

Outbound ORU messages are sent by the Exam Pre-fetching gateway only. The Gateway uses these messages to forward (localized) remote imaging report to the local PACS.

3.4.1 ORU Segments Processed

The following segments are sent when imageGateway generates an outbound ORU message:

MSH
PID
[PV1]
OBR
{OBX}

3.4.2 ORU Message – Supported Fields

The designations "R" and "O" denote the required and optional fields that may be present in messages sent by imageGateway. The required fields are guaranteed to be present in outbound messages. The optional fields may or may not be present.

3.4.2.1 MSG – Message Header Segment in ORU

The MSH segment in outbound ORU messages adheres to the format described in 3.2.1.

3.4.2.2 PID – Patient Identifier Segment in ORU

The PID segment in outbound ORU messages adheres to the format described in 3.2.2.

3.4.2.3 PV1 – Patient Visit Segment in ORU

Field	*Name*	*Type*	*Usage*	*Comments*
PV1-2	Patient Class	IS	R	E – Emergency, I – Inpatient, O – Outpatient, P – Preadmit, R – Recurring, B – Obstetrics, Will use the value PV1-2 present in the inbound ORM that triggered the pre-fetch.
PV1-3	Assigned Patient Location	PL	R	The component Facility (PV1-3.4) is populated with the name (configurable mnemonic) of the

				foreign accession number issuer, as defined in the imageGateway configuration.
PV1-7	Attending Doctor	XCN	O	
PV1-8	Referring Doctor	XCN	O	
PV1-16	VIP Indicator	IS	O	

3.4.2.4 OBR – Observation Request Segment in ORU

Field	*Name*	*Type*	*Usage*	*Comments*
OBR-1	Set ID – OBR	SI	R	
OBR-2	Placer Order Number	EI	R	Generated by imageGateway.
OBR-3	Filler Order Number	EI	R	Generated by imageGateway.
OBR-4	Universal Service ID	CE	R	Same value as OBR-4 in the outbound import order message (ORM).
OBR-6	Requested Date Time	TS	R	YYYYMMDDHHMMSS Service (Exam) Date/Time of the imported exam
OBR-7	Observation Date Time	TS	R	YYYYMMDDHHMMSS Report Date/Time
OBR-16	Ordering Provider	XCN	O	Requesting Physician of the imported exam
OBR-18	Placer Field 1	EI	R	Accession Number is generated by imageGateway by using the accession number of the remote exam and prefixing/suffixing it with a configurable mnemonic of the source enterprise. The accession number format is: NewAccNumber^Issuer, where Issuer is the configured namespace of the local accession number.
OBR-19	Placer Field 2	ST	O	Procedure ID
OBR-25	Result Status	ID	R	F – Final C – Correction/Addendum P – Preliminary
OBR-32	Principal Result Interpreter	CM	O	Reporting radiologist, e.g., 7237&Smith&Mark&H&&&&&IHA
OBR-44	Procedure Code	CE	R	Procedure Code – local procedure code translated by imageGateway from the remote procedure code

				associated with the foreign exam.

3.4.2.5 OBX – Observation Result Segment in ORU

Field	*Name*	*Type*	*Usage*	*Comments*
OBX-1	Set ID – OBX	SI	R	Value: 1 Only one segment will be present unless the length of OBX-5 exceeds 64KB.
OBX-2	Value Type	ID	R	Value: TX All observations will be sent as TX.
OBX-3	Observation Identifier	CE	O	Set by imageGateway.
OBX-4	Observation Sub-ID	ST	R	Value:1
OBX-5	Observation Value	ST	R	Unless the length of the value is less than 64KB, the report text will be sent as a single OBX segment. Lines will be separated using the repeating fields separator (~).
OBX-11	Observe Result Status	ID	O	Same as OBR-25
OBX-14	Date/Time of the Observation	TS	O	YYYYMMDDHHMMSS Report Date/Time

4.Other HL7 Interfaces

In addition to the HL7 interfaces described in Sections 2 and 3, certain configurations of vnaPlus/imageGateway may use the HL7 Standard-based PIX and PDQ IHE profiles in order to communicate with a Master Patient Index (MPI) system. The description of the PIX and PDQ interfaces is beyond the scope of this document. Detailed specifications of these interfaces can be found in the IHE ITI specifications.

Custom implementations of Leafsprout vnaPlus/imageGateway may use protocols other than PIX and PDQ to communicate with a MPI system.