

# NILREAD HL7 CONFIGURATION GUIDE

---

**Document Number:** 941-07107

**Revision Number:** Rev 1.0

**Product Name(s):** NilRead

**Product Version(s):** 4.X; 5.X

**Date:** December 2020

# 1 OVERVIEW

NilRead accepts the following HL7 ADT messages types:

- ADT\_A08 Update patient information
- ADT\_A18 Merge patient information
- ADT\_A31 Update patient information
- ADT\_A34 Merge patient information - Patient ID only
- ADT\_A40 Patient merge

Upon the message's arrival, if the matching studies are found, NilRead will initiate data correction tasks to apply the changes.

The NilRead HL7 service is hosted in the NilRead backend service (Nil DICOM service).

A license includes the "HL7" feature is required to enable the NilRead HL7 service.

## HL7 Path

In this document, the following notion is used to reference a field/component in an HL7 message.

{<Segment>.<Element Index>[filter].<Component Index>} (the indices are 1-based)

e.g. in a ADT\_A08 message

{PID.5.1} - patient's family name

{PID.3[@4=MRNX].1} - patient id with the assigning authority of "MRNX", @4 is the index to the assigning authority

## 2 CONFIGURATION

### Shared configurations

The following NilHub settings apply to all NilRead tenants.

#### Hub > Licenses

The "HL7" license is required to enable the NilRead HL7 service and configuration pages, please ensure the license include the "HL7" feature.

The screenshot shows the NilHub interface with a dark header. The header contains the NilHub logo and navigation links: Sites, Licenses, Settings, and Logout. Below the header, a breadcrumb trail reads "Hub / Licenses / License". The main content area is titled "License #36587". Below the title, there is a checkbox labeled "DEFAULT" which is checked. Under the heading "NAME", there is a text input field containing "devLicWithHL7". Under the heading "MAX USERS", there is a text input field containing "2147483647". Under the heading "FEATURES", there is a list of features: cineLoop, collaboration, dataQualityControl, dicomRt, DicomSrCreation, fusionProtocols, hangingProtocols, HL7, and keyImagescreation. The "HL7" feature is highlighted in blue.

#### Hub > Settings > Host

- HL7 port  
The HL7 service port, default 2575
- HL7 port (TLS)  
The HL7 TLS port, default 0 (disabled)
- HL7 TLS protocols  
NilRead supports ssl3 (48), tls (192), tls1.1 (768), tls1.2 (3072), tls1.2 is recommended.

Doc #941-07107; rev 1.0

- TLS certificate thumbprint (shared with DICOM service)  
NilRead uses the thumbprint to load the certificate from the Windows certificate store.

#### Note

The NilRead backend service account requires access permission to the certificate's private key.

The screenshot shows the NilHub Settings page. The top navigation bar includes 'NilHub', 'Sites', 'Licenses', 'Settings', and 'Logout'. The 'Settings' page has a sidebar with 'Hub', 'Identity Provider', and 'Host' sections. The 'Host' section is active, displaying a list of configuration fields with their current values:

| Configuration Field        | Value   |
|----------------------------|---|
| NIL Identity               |   |
| Storage SCP Port           | 1100  |
| Storage SCP Port (TLS)     | 2762  |
| Streaming Broker Host      |   |
| Streaming SCP AE Title     | {0}   |
| Streaming SCP Port         | 11104   |
| Streaming SCP Port (TLS)   | 0   |
| Ssl Protocols (DICOM)      | 3072  |
| TLS Certificate Thumbprint | fc 13 17 12 f6 35 5f 8b 82 8e 6b c7 b4 e0 e9 c4 be c6 43 97 |
| UDP Broadcast Port         | 1107  |
| HL7 Port                   | 2575  |
| HL7 Port (TLS)             | 52575   |
| Ssl Protocols (HL7)        | 0   |
| State Update Period, sec   | 60  |

## Per-tenant configurations

The HL7 configuration page (NilRead > Settings > Devices > HL7) contains the settings for the selected tenant.

Settings

DICOM Activity
Upload New Study
Studies
Collaboration
Settings
Help
Logoff

NilRead  
by Hyland

Settings > Devices > HL7

HL7 Service

Enabled ☒

NilRead Application Name (AE Title)
NILAE

Receiving Application Path
{MSH.5.2}

HL7 Port
2575

HL7 Port (TLS)
52575

HL7 Server Certificate (TLS)
fc 13 17 12 f6 35 5f 8b 82 8e 6b c7 b4 e0 e9 c4 be c6 43 97

Send Acknowledgment
true

NilRead uses the 'Receiving Application' (default MSH.5.2) field to identify the recipient tenant of the HL7 message. The value of the field needs to match the recipient tenant's AE title.

Patient Update

ADT\_A08 - Update Patient Information

Matching

☒ Patient ID (0010,0020)
{PID.3[@4=MRNX].1}

☒ Issuer of Patient ID (0010,0021)
{PID.3[@4=MRNX].4}

Applying

☒ Patient's Name (0010,0010)
{PID.5.1}^{PID.5.2}^{PID.5.3}^{PID.5.5}^{PID.5.4}

☐ Patient ID (0010,0020)
{PID.3.1}

☐ Issuer of Patient ID (0010,0021)
{PID.3.4}

☒ Patient's Birth Date (0010,0030)
{PID.7.1}

☒ Patient's Sex (0010,0040)
{PID.8.1}

Options

☒ Delete original instances (required if use the IOCM workflow)

☒ Copy to new study

NilRead will substitute the configured placeholders with the values extracted from the HL7 message using the specified path.

Save

Reset

## Enabled

Enable or disable the HL7 functionality for the tenant

## NilRead Application Name (AE Title) (Read-only)

NilRead uses this value to identify the intended tenant.

The value is the same as the tenant's DICOM AE title. The HL7 sending applications should set the message's "Receiving Application Name" {MSH.5.1} to this value. If NilRead cannot find a tenant that matches the value, NilRead will return an AR response with an "unknown receiving application" error.

## NilRead Application Path (Read-only)

The HL7 path NilRead loads the "Receiving Application Name."

Doc #941-07107; rev 1.0

(In the current version, NilRead load the "Receiving Application Name" from {MSH.5.1}. However, the path is displayed incorrectly as {MSH.5.2}. It is a known issue that will be addressed in the following releases.)

## HL7 Port, HL7 Port(TLS), HL7 Server Certificate (TLS) (Read-only)

See the corresponding sections in the "Shared Configurations."

## Send Acknowledgement (Read-only)

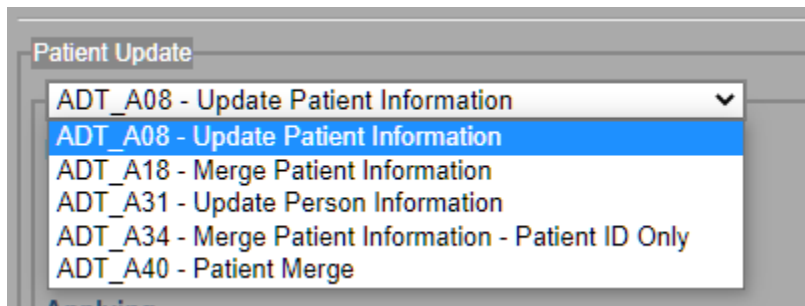
In the current version, NilRead always sends the ACK in response.

## Patient Update

Settings that control how NilRead matches & extracts the values and handle different type of the HL7 messages.

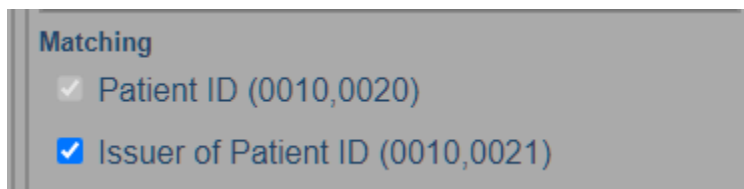
### HL7 Message type dropdown list

Select the type of message to configure.



## Matching

The DICOM attributes NilRead use to query the intended studies in the NilRead repository (local only)



## Applying

The DICOM attributes to be applied to the matching studies.

#### Applying

- ☒ Patient's Name (0010,0010)
- ☐ Patient ID (0010,0020)
- ☐ Issuer of Patient ID (0010,0021)
- ☒ Patient's Birth Date (0010,0030)
- ☒ Patient's Sex (0010,0040)

#### Note

NilRead will substitute the HL7 path placeholders in the configured path with the values extracted from the HL7 message.

e.g.

If a message contains patient ID "ABCD" at PID.3.1 and the path configured is "1.2.3.4|{PID.3.1}", NilRead will use the filter "1.2.3.4|ABCD" to query the studies in the repository

If an attribute is unchecked, the attribute will not participate in the matching or applying processes

## Options

### Delete original instance

It can only be enabled with "Copy to a new study" if enabled, the original study will be deleted from NilRead cache.

#### Note

As the IOCM rejection notes can only apply to the deleted studies, this option needs to be enabled to support the IOCM workflow.

### Copy to a new study

If enabled, NilRead will copy the modified images into new studies.

#### Note

Because new studies have different study/series/instance UIDs, enabling this option may break the referential integrity.

## System internal settings

Doc #941-07107; rev 1.0

## HL7ReceivingApplicationFallback

Suppose the HL7 sending application cannot specify the receiving application name in the messages to match the tenant's DICOM AE title. In that case, the site can use this setting to specify a default tenant. The settings only apply to the messages without the receiving application names.

### Note

This is an internal settings, please contact the support team to apply the configuration changes.

## 3 TROUBLESHOOTING

### Nil Dicom Service log

Check for any HL7 related errors or warnings

### NilRead DICOM Activity

Check the status of the HL7 initiated data correction tasks in the "Data Correction Operations" table

| Patient Study Directory  |            |               |               |                     |                     |       |
|--|------------|---------------|---------------|---------------------|---------------------|-------|
| <div>  DICOM Activity            Upload New Study            Collaboration            Settings            Help            Logout           <b>NilRead</b><br/>by Hyland         </div> |            |               |               |                     |                     |       |
| Data Correction Operations   |            |               |               |                     |                     |       |
| Patient Name   | Patient ID | Accession No. | Source Device | Started             | Ended               | Total |
| OldName^^^^  | AAAAA88888 | ACC9990012    | Local         | 12/2/2020 3:56:31 P | 12/2/2020 3:56:32 P | 2     |
| OldName  |            | 990012        | Local         | 12/2/2020 3:46:22 P | 12/2/2020 3:46:22 P | 1     |
| FHIR_AF  |            | 990012        | Local         | 12/2/2020 3:06:29 P | 12/2/2020 3:06:29 P | 2     |
| NEW^NA   |            | 990012        | Local         | 12/2/2020 1:46:26 P | 12/2/2020 1:46:26 P | 2     |
| OldName  |            | ACC9990012    | Local         | 12/2/2020 1:46:09 P | 12/2/2020 1:46:10 P | 1     |

### NilRead Event Audit Trail

Settings > Analytics > Event audit trail

Check for "DICOM Data Corrected" events with initiator "AdtDataCorrectionTask"

| Settings  |                    |            |                   |  |        |         |  |
|---|--------------------|------------|-------------------|--|--------|---------|--|
| <div>  DICOM Activity            Upload New Study            Studies            Collaboration            Settings            Help            Logout           <b>NilRead</b><br/>by Hyland         </div> |                    |            |                   |  |        |         |  |
| Settings > Analytics > Event audit trail  |                    |            |                   |  |        |         |  |
| <div>           Event: <span>DICOM Data Corrected</span> </div>   |                    |            |                   |  |        |         |  |
| <div>           Period: <span>Last 30 Days</span> </div>  |                    |            |                   |  |        |         |  |
| <div>           Generate         </div>   |                    |            |                   |  |        |         |  |
| <div>           1 of 1         </div>   |                    |            |                   |  |        |         |  |
| <div>           Event Audit Trail           <div>             Event: DICOM Data Corrected<br/>             From: 11/4/2020 to: 12/4/2020           </div> </div>  |                    |            |                   |  |        |         |  |
| User Id   | Patient Id         | Acc. No.   | Event Time        | Resource   | Action | Outcome | Details  |
| NT<br>AUTHORITY\NETWORK<br>SERVICE@c47d7214-<br>09e1-4a5e-9693-<br>ccfa9095042  | AAAAA88888^^^MRNX  | ACC9990012 | 12/2/2020 3:56 PM | 1.2.826.0.1.3680043.214.46377183701200623639349115445385162424 | Update | Success | ApplyPatientLevel:True<br>DeleteOrigin:True<br>NewUid:True<br>New Patient Id:AAAAA88888<br>Initiator:AdtDataCorrectionTask   |
| NT<br>AUTHORITY\NETWORK<br>SERVICE@c47d7214-<br>09e1-4a5e-9693-<br>ccfa9095042  | ADTA08PID^^^Hyland | ACC9990012 | 12/2/2020 3:46 PM | 1.2.826.0.1.3680043.214.50006079770802417954243400515019021971 | Update | Success | ApplyPatientLevel:False<br>DeleteOrigin:False<br>NewUid:False<br>New Patient Id:ADTA08PID<br>Initiator:AdtDataCorrectionTask |



Doc #941-07107; rev 1.0

## **HAPI TestPanel**

<https://hapifhir.github.io/hapi-hl7v2/hapi-testpanel/>

A standalone test tool can be used to create & send HL7 messages

## **Wireshark**

A Wireshark capture can be helpful for troubleshooting the connectivity issues.