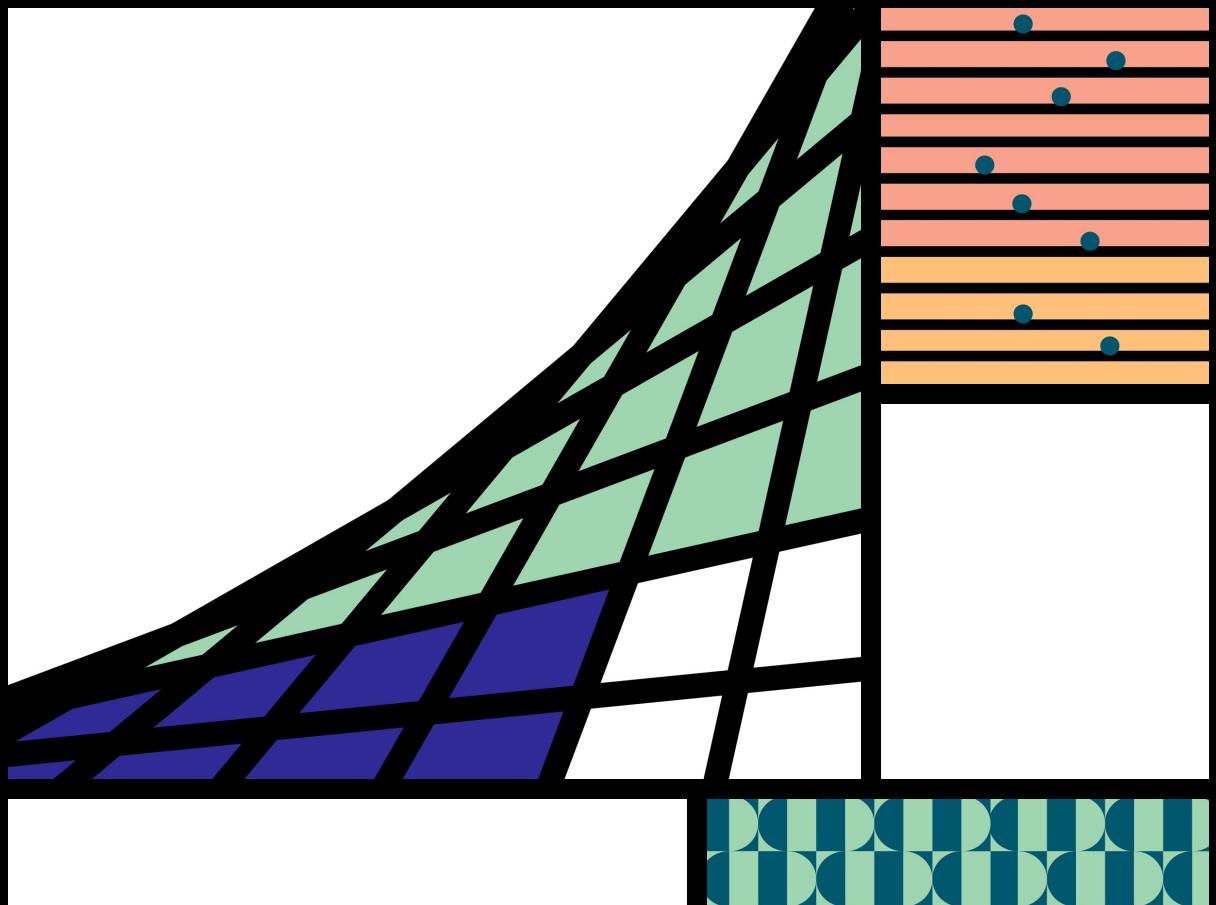
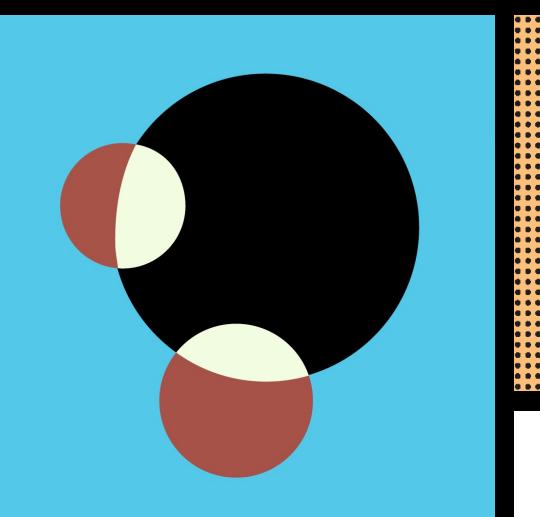
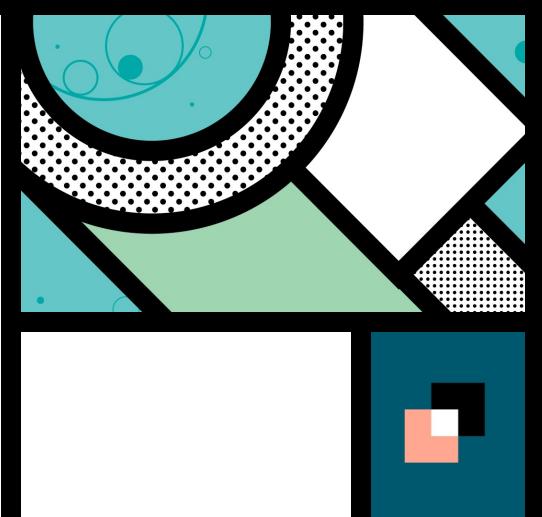


IRIS For Health Training



Guillaume Rongier

SALES ENGINEER



Index

Introduction

Installation

- VsCode
- Client/Server
- Git

Premier flux HL7v2

- Service
- Router
- Operation
- DTL

Transformation HL7v2 to FHIR

- Introduction

Transformation HL7v2 -> SDA3

- En code
 - Globals
 - ObjectScript
- En graphique
 - DTL

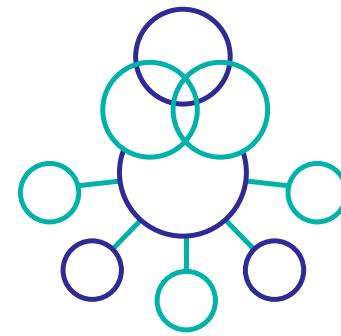
Transformation SDA3 -> FHIR

- Graphique
 - DTL
 - Tips and tricks

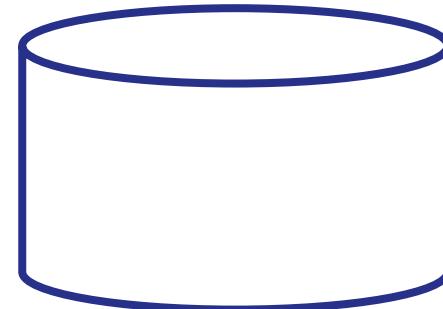


Introduction

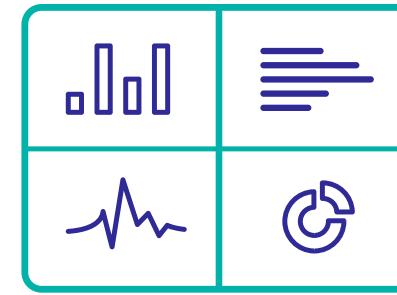
Unifier pour Simplifier



Interopérabilité



Stockage



Décisionnel



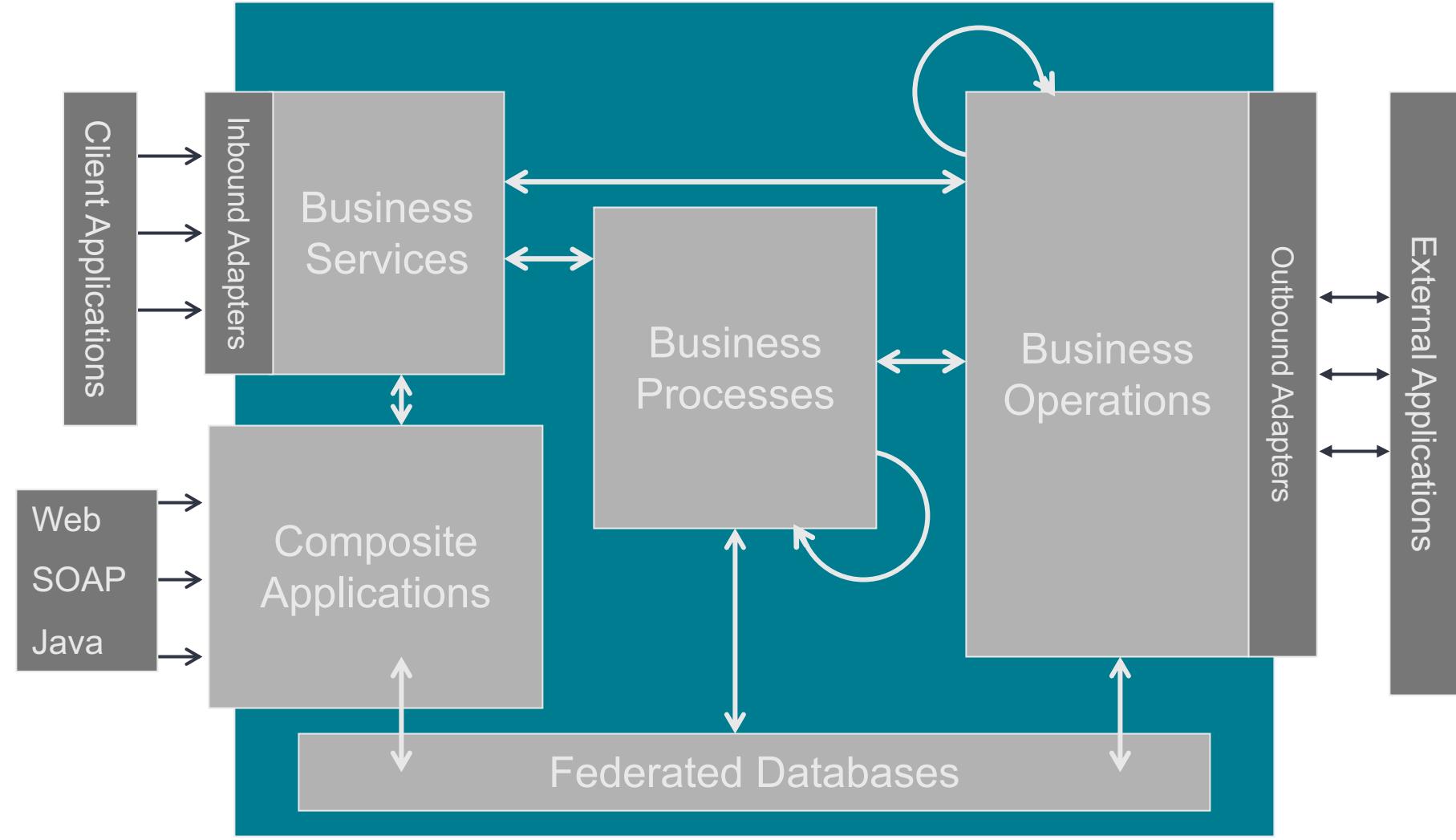
IRIS Mantra

Bring code to data

Not data to code



Interoperability Framework



Installation

Dockerfile

```
ARG IMAGE=intersystemsdc/irishealth-community:2020.4.0.547.0-zpm
FROM $IMAGE

ARG IRIS_PASSWORD

USER root
WORKDIR /opt/irisapp
RUN chown ${ISC_PACKAGE_MGRUSER}: ${ISC_PACKAGE_IRISGROUP} /opt/irisapp
USER ${ISC_PACKAGE_MGRUSER}

COPY . /opt/irisapp
COPY iris.script /tmp/iris.script

# run iris and initial
RUN iris start IRIS \
&& iris session IRIS < /tmp/iris.script \
&& iris stop IRIS quietly
```

Iris.script

```
zn "%SYS"

Do ##class(Security.Users).UnExpireUserPasswords("*")

zn "HSLIB"
// Install a Foundation namespace and change to it
Do ##class(HS.HC.Util.Installer).InstallFoundation("TRAINING")
zn "TRAINING"

// Install FHIR repo
Set appKey = "/api/fhir"
Set strategyClass = "HS.FHIRServer.Storage.Json.InteractionsStrategy"
Set metadataConfigKey = "HL7v40"
```

Docker-compose

```
version: '3.6'

services:
  iris:
    build:
      context: .
      dockerfile: dockerfile
    args:
      - IRIS_PASSWORD=$IRIS_PASSWORD

    restart: always

    env_file:
      - .env

    ports:
      - 32782:1972
      - 32783:52773
      - 32784:53773

    volumes:
      - ./:/irisdev/app
```

Lunch it !

Docker compose up



Premier flux HL7v2



First HL7 TCP Service

InterSystems™
IRIS Data Platform

Management Portal

Home Health About Help Logout

Menu

Server 6123464b3017 Namespace TRAINING Switch User SuperUser Licensed To InterSystems IRIS Community Instance IRIS

Interoperability > Production

Production

Production Running

Services +

FHIR_Http_Service

BUSINESS SERVICE WIZARD

Add a new Business Service to this Production.

All Services **HL7 Input** X12 Input Business Metric

Input Type TCP File FTP HTTP SOAP

HL7 Service Name HL7_Tcp_Service

Display Category

Comment

Enable Now

HL7 Service Target* Create New Router Choose From List None for Now

New Rule Package

HL7 Schema Category* 2.5.1

Port Number* 22222

*Default applies if no value

Cancel OK

Sort: Name Status Number View:

Production Settings

Settings Queue Log Messages Jobs Actions

Apply Search:

Informational Settings

Basic Settings

Actor Pool Size
2

Additional Settings

Alerting Control

Development and Debugging

These are the Production settings.
To view item settings, click on a configuration item.

This screenshot illustrates the process of setting up an HL7 TCP service within an InterSystems production environment. The main focus is the 'Business Service Wizard' dialog box, which guides the user through creating a new business service. The 'Input Type' is specified as 'TCP', and the service is named 'HL7_Tcp_Service'. The 'Port Number' is set to 22222. The background shows the 'Production Settings' page, where basic configurations like 'Actor Pool Size' (set to 2) and various alerting and development settings are visible.

HL7 Operation

InterSystems™ IRIS Data Platform Management Portal Home Health About Help Logout Menu

Server 6123464b3017 Namespace TRAINING Switch User SuperUser Licensed To InterSystems IRIS Community Instance IRIS

BUSINESS OPERATION WIZARD
Add a new Business Operation to this Production.

All Operations **HL7 Output** X12 Output Workflow

Output Type TCP File FTP HTTP SOAP

HL7 Operation Name HL7_File_Operation

Display Category

Comment

Enable Now

File Path * /tmp/

Filename * %f_%Q%!+(_a)

*Default applies if no value

Cancel OK

Production Settings **Add**

local_Operation
trace.Operations

Sort: Name Status Number View:

Production Settings

Settings Queue Log Messages Jobs Actions

Apply Search:

Informational Settings

Basic Settings

Actor Pool Size: 2

Additional Settings

Alerting Control

Development and Debugging

These are the Production settings.
To view item settings, click on a configuration item.

The screenshot shows the InterSystems Management Portal interface. On the left, a modal window titled 'BUSINESS OPERATION WIZARD' is open, prompting to add a new business operation to a production. It includes tabs for All Operations, HL7 Output (which is selected and highlighted with a red circle), X12 Output, and Workflow. Under 'Output Type', 'File' is selected (also highlighted with a red circle). The 'HL7 Operation Name' field contains 'HL7_File_Operation'. Below it are fields for 'Display Category', 'Comment', and 'Enable Now'. At the bottom are 'File Path' and 'Filename' fields, both marked with an asterisk indicating they are required. A note at the bottom states '*Default applies if no value' with a checkbox. On the right, the main dashboard shows 'Production Settings' for a specific production named 'local_Operation'. The dashboard includes sections for 'Informational Settings', 'Basic Settings' (with an 'Actor Pool Size' of 2), 'Additional Settings', 'Alerting Control', and 'Development and Debugging'. A note at the bottom of the dashboard says 'These are the Production settings. To view item settings, click on a configuration item.' Navigation links at the top include Home, Health, About, Help, Logout, and a 'Menu' button. The top bar also displays the server ID (6123464b3017), namespace (TRAINING), user (SuperUser), license information (Licensed To InterSystems IRIS Community), and instance (IRIS).

HL7 router

InterSystems™
IRIS Data Platform

Management Portal

Home Health About Help Logout

Menu

Server 6123464b3017 Namespace TRAINING Switch User SuperUser Licensed To InterSystems IRIS Community Instance IRIS

Interoperability > Production Configuration - (TRAININGPKG.FoundationProduction)

Production Configuration

Start Stop Sort: Name Status Number View:

Production Running Services Processes Operations

Category: All Legend Production Settings

Services: FHIR_Http_Service, HL7_Tcp_Service

Processes: FHIR_Router, HL7_Tcp_Service_Router

Operations: FHIR_Local_Operation, HL7_File_Operation, HS.Util.Trace.Operations

HL7_Tcp_Service_Router

Settings Queue Log Messages Jobs Actions

Apply Search:

Informational Settings

Basic Settings

Enabled:

Validation: dm-z

Business Rule Name: TRAININGPKG.HL7TcpServiceRoutingRule 

Additional Settings

Alerting Control

Development and Debugging



HL7 router

InterSystems™ IRIS Data Platform Management Portal Home Health About Help Logout Menu

Server 6123464b3017 Namespace TRAINING Switch User SuperUser Licensed To InterSystems IRIS Community Instance IRIS

Interoperability > Rule Editor - (TRAININGPKG.HL7TcpServiceRoutingRule)*

Rule Editor

New Open Save Save As Contract Expand Open new windows 100%

```
graph LR; ruleSet[ruleSet] --> name1[name]; ruleSet --> disabled[disabled]; ruleSet --> constraint[constraint]; ruleSet --- name1;
```

ruleSet: (#1) test

ruleAssistant

The selected item is a rule. This defines a set of conditions and actions for each condition. You can select the name field following it to view or edit the name. Double click on enabled/disabled field to change.

+ Click on a button below to add an item to the diagram.

assign Add an assign action.

return Add a return action.

trace Add a trace action.

debug Add a debug action.

comment Add a comment.

Test It !

1. Create an Operation

1. Name : HL7_Tcp_Operation
2. Port : 2222
3. Host : localhost



Test It !

InterSystems™
IRIS Data Platform

Management Portal

Home Health About Help Logout

Menu

Server 6123464b3017 Namespace TRAINING Switch User SuperUser Licensed To InterSystems IRIS Community Instance IRIS

Interoperability > Production Configuration - (TRAININGPKG.FoundationProduction)

Production Configuration

Start Stop Sort: Name Status Number View: List Grid Equal

Production Running Services Processes Operations

Category: All Legend Production Settings

HL7_Tcp_Operation

Settings Queue Log Messages Jobs Actions

Action buttons: Test (highlighted), Start, Stop, Restart

Legend:

- FHIR_Http_Service
- HL7_Tcp_Service
- FHIR_Router
- HL7_Service_Router
- FHIR_Local_Operation
- HL7_File_Operation
- HL7_Tcp_Operation
- HS.Util.Trace.Operations

Actions:

- Test this item
- Start this item if temporarily stopped
- Stop this item temporarily
- Restart this item

Client/Server

Client / Server

Save you work in git.

First remember the mantra :

- Bring code to data
- Not data to code

Second :

- Its a database



Client / Server

The screenshot shows a Microsoft Visual Studio Code (VS Code) interface with the following details:

- File Explorer:** Shows the project structure for "IRIS-HEALTH-TR...". It includes a ".vscode" folder, a "data/samples" folder containing "ADT_A01Massie.hl7", "Arturo_Delvalle_76a9851b-9015-4c1e-961c-e...", "export_rdv.hl7", and "Livia_Masson_060a6bd5-5146-4b08-a916-0..."; a "misc" folder; and a "src" folder containing ".dockerignore", ".env", ".gitattributes", ".gitignore", "dev.md", "docker-compose.yml", "dockerfile", "iris.script", "LICENSE", and "README.md".
- Editor:** The main editor window displays the file "export_rdv.hl7" with its content:

```
You, 6 days ago | author (You)
1 MSH|^~\&|XPLORE|PPR|ORBIS|ORBIS|201809121548||SIU^S14|A25335484220154822|P|2.3.1|||||8859/1
2 SCH|A25335451569|||^APT|||||^201809121548|||||4827^SMITH^JOHN|||^8712&EM Neuro Pédiatrie PPR&L|CSCHIR^|||^PPR&Hôpital Pierre-Pa
3 NTE|1||Priority: S, test|GI
4 PID|||031570943^^CNV^PI||TESTBPE^BIO||TESTBPE|20100101|M|||^
5 PV1||C|9231|||4827^SMITH^JOHN|9383^DOE^MARY||PPR|||539622843
6 RGS|1|U
7 AIS|1|U|SCANCEA^RDV_CHU^EDL^RDV_CH|201809120815|||35|MIN
```
- Terminal:** The terminal window shows logs from an "iris_1" container:

```
04/16/21-14:17:56:852 (377) 0 [Utility.Event] Initializing Interoperability during system startup
04/16/21-14:17:56:852 (377) 0 [Utility.Event] Interoperability: Starting production 'TRAININGPKG.FoundationProduction' in namespace 'TRAINING'.
[INFO] ...started InterSystems IRIS instance IRIS
04/16/21-14:18:19:499 (549) 0 [Database.MountedRW] Mounted database /usr/irissys/mgr/TRAININGX0001R/ (SFN 11) read-write.
04/16/21-14:18:19:509 (549) 0 [Database.MountedRW] Mounted database /usr/irissys/mgr/TRAININGX0001V/ (SFN 12) read-write.
04/16/21-14:18:19:510 (549) 1 [Generic.Event] DB(/usr/irissys/mgr/zpm/) might be in use from (buildkitsandbox) sfn(5)
04/16/21-14:18:19:568 (549) 0 [Database.MountedRW] Mounted database /usr/irissys/mgr/zpm/ (SFN 13) read-write.
04/16/21-14:19:24:804 (589) 0 [Utility.Event] %SYS.Task.FeatureTracker transferred data to ats.intersystems.com
04/16/21-15:18:26:280 (536) 0 [Utility.Event] [SYSTEM MONITOR] Alert state cleared.
04/17/21-01:10:17:866 (368) 1 [Generic.Event] Warning: Alternate and primary journal directories are the same
04/17/21-01:10:17:942 (3644) 0 [Generic.Event] INTERSYSTEMS IRIS JOURNALING SYSTEM MESSAGE
iris_1 Journaling switched to: /usr/irissys/mgr/journal/20210417.001
04/17/21-01:10:18:055 (3648) 0 [Utility.Event] Purging old application errors
04/18/21-01:33:57:058 (368) 1 [Generic.Event] Warning: Alternate and primary journal directories are the same...(repeated 1 times)
04/18/21-01:33:57:114 (6127) 0 [Generic.Event] INTERSYSTEMS IRIS JOURNALING SYSTEM MESSAGE
iris_1 Journaling switched to: /usr/irissys/mgr/journal/20210418.001
04/18/21-01:33:57:278 (6134) 0 [Utility.Event] Purging old application errors
04/18/21-02:59:08:205 (6129) 1 [Utility.Event] %SYS.Task.FeatureTracker failed to transfer data
04/19/21-00:19:43:830 (368) 1 [Generic.Event] Warning: Alternate and primary journal directories are the same...(repeated 1 times)
04/19/21-00:19:43:844 (7849) 0 [Generic.Event] INTERSYSTEMS IRIS JOURNALING SYSTEM MESSAGE
iris_1 Journaling switched to: /usr/irissys/mgr/journal/20210419.001
04/19/21-02:59:57:819 (7855) 0 [Utility.Event] Purging old application errors
04/19/21-02:59:57:892 (7853) 0 [Utility.Event] DELETE: /usr/irissys/mgr/journal/20210413.001
```
- Status Bar:** The status bar at the bottom shows the current file is "main*", the Docker container is "docker:iris:32783[TRAINING]", the HL7 schema is "v2.3.1", and other status information like "You, 6 days ago", "Ln 7, Col 58 (525 selected)", and "Spaces: 4 UTF-8 CRLF HL7".

DTL

Server 6123464b3017

Namespace TRAINING

[Switch](#)User [SuperUser](#)

Licensed To InterSystems IRIS Community Instance IRIS

Welcome, SuperUser

View:  

Search



- [!\[\]\(79f872e62d1050e1b744e4338200a3cf_img.jpg\) Home](#)
- [!\[\]\(107f01272782fead924f4dbecd7b4054_img.jpg\) Health](#)
- [!\[\]\(1b84a179a60db761acfc15f66012d3e0_img.jpg\) Analytics](#)
- [!\[\]\(4fdbbd0b1cc777f4efe4c9726db74ccb_img.jpg\) Interoperability](#)
- [!\[\]\(07b89588dcae85905157f575bb3e5469_img.jpg\) System Operation](#)
- [!\[\]\(4548645fd5a2ecc7d9aa736d4fb901b6_img.jpg\) System Explorer](#)
- [!\[\]\(73673c61e969f345e7b85271628c53df_img.jpg\) System Administration](#)

Configure >	Business Processes
Build >	Data Transformations
View >	Business Rules
List >	Record Maps
Monitor >	CSV Record Wizard
Manage >	Complex Record Maps
Interoperate >	Java Business Hosts
Test >	

DATA TRANSFORMATIONS

Create, View, or Edit Data Transformations

[Go](#)[Add to favorites](#)

System Resource(s)

%Ens_Code:READ
%Ens_DTL:READ

Custom Resource

-

[Assign](#)

SYSTEM INFORMATION

General details on this system

[View System Dashboard](#)

System Up Time
2d 18h 43m

PRODUCTIONS

Productions running on this system

TRAININGPKG.FoundationPkg in TRAINING

Running
[View details](#)

InterSystems™
IRIS Data Platform

Management Portal

Home Health About Help Logout

Menu

Server 6123464b3017 Namespace TRAINING Switch User SuperUser Licensed To InterSystems IRIS Community Instance IRIS

Interoperability > Data

New

source

- MSH
- SCH
- TQ1()
- NTE()
- PIDgrp()
- RGSgrp()

Actions

Action Condition

1 set

2 set

DATA TRANSFORMATION WIZARD

Create a new Data Transformation definition.

Package
Training.DTL.SIU
Class package containing this Data Transformation

Name
AllToSCH
Name of this Data Transformation

Description

Source Type
 All Messages HL7 X12 ASTM EDIFACT XML
Source Class
EnsLib.HL7.Message

Source Document Type
2.5.1:SIU_S12

Target Type
 All Messages HL7 X12 ASTM EDIFACT XML
Target Class
EnsLib.HL7.Message

Target Document Type
2.5.1:SIU_S12

Cancel OK

Message J_S12

View:

»

Transform Action Tools

Details for the selected action

No action selected

Select an action (connecting line) within the diagram using the mouse. Alternatively, you can select an item in the Actions table beneath the diagram.

DTL

InterSystems™
IRIS Data Platform

Management Portal

Home Health About Help Logout

Menu

Server 6123464b3017 Namespace TRAINING Switch User SuperUser Licensed To InterSystems IRIS Community Instance IRIS

Interoperability > Data Transformation Builder - (Training.DTL.SIU.AIStoSCH)*

New Open Save Save As Compile 100% -Add Action- View:

Source
EnsLib.HL7.Message
2.5.1:SIU_S12

Target
EnsLib.HL7.Message
2.5.1:SIU_S12

Actions

#	Action	Condition	Property	Value	Key / Transform
1					

Transform Action Tools

Details for the overall data transformation

Name: Training.DTL.SIU.AIStoSCH.dtl

Create: copy

Source Class: EnsLib.HL7.Message

Source Doc Type: 2.5.1:SIU_S12

Target Class: EnsLib.HL7.Message

Target Doc Type: 2.5.1:SIU_S12

Language: objectscript

Report Errors:

Ignore missing source segments and properties:

Treat empty repeating fields as null:

DTL

InterSystems™
IRIS Data Platform

Management Portal

Home Health About Help Logout

Menu

Server 6123464b3017 Namespace TRAINING Switch User SuperUser Licensed To InterSystems IRIS Community Instance IRIS

Interoperability > Data Transformation Builder - (Training.DTL.SIU.AIStoSCH)*

New Open Save Save As Compile 100% -Add Action- View:

RGS

AISgrp()

AIS

1: SetIDAIS

2: SegmentActionCode

3: UniversalServiceIdentifier

4: StartDateTime

5: StartDateTimeOffset

6: StartDateTimeOffsetUnits

7: Duration

8: DurationUnits

9: AllowSubstitutionCode

5: ScheduledID

6: EventReason

7: AppointmentReason

8: AppointmentType

9: AppointmentDuration

10: AppointmentDurationUnits

11: AppointmentTimingQuantity()

12: PlacerContactPerson()

13: PlacerContactPhoneNumber

14: PlacerContactAddress()

15: PlacerContactLocation

16: FillerContactPerson()

Actions

Action Condition Property Value Key / Transform

1 set target.{SCH:AppointmentDuration} source.{RGSGrp().AISgrp().AIS:Duration} ""

2 set target.{SCH:AppointmentDurationUnits} source.{RGSGrp().AISgrp().AIS:DurationUnits} ""

View:

»

Transform Action Tools

Details for the selected action

assign

Set the value of a target property.

View documentation

Action

set

Property

target.{SCH:AppointmentDurationUnits}

Property whose value will be set. Double-clicking on a target property in the diagram will place that property in this field.

Value

source.{RGSGrp().AISgrp().AIS:DurationUnits}

Value to assign to the property. Double-clicking on a property in the diagram will place that property in this field.

Key

""

For collection properties, this string specifies the member of the collection that is the target of this assignment.

Disabled

Control whether this action and its children should be disabled.

Description

Test It !

1. Compile
2. Test It !
 1. Tools Tab
 1. Test
3. Add DTL to router
 1. Test It !



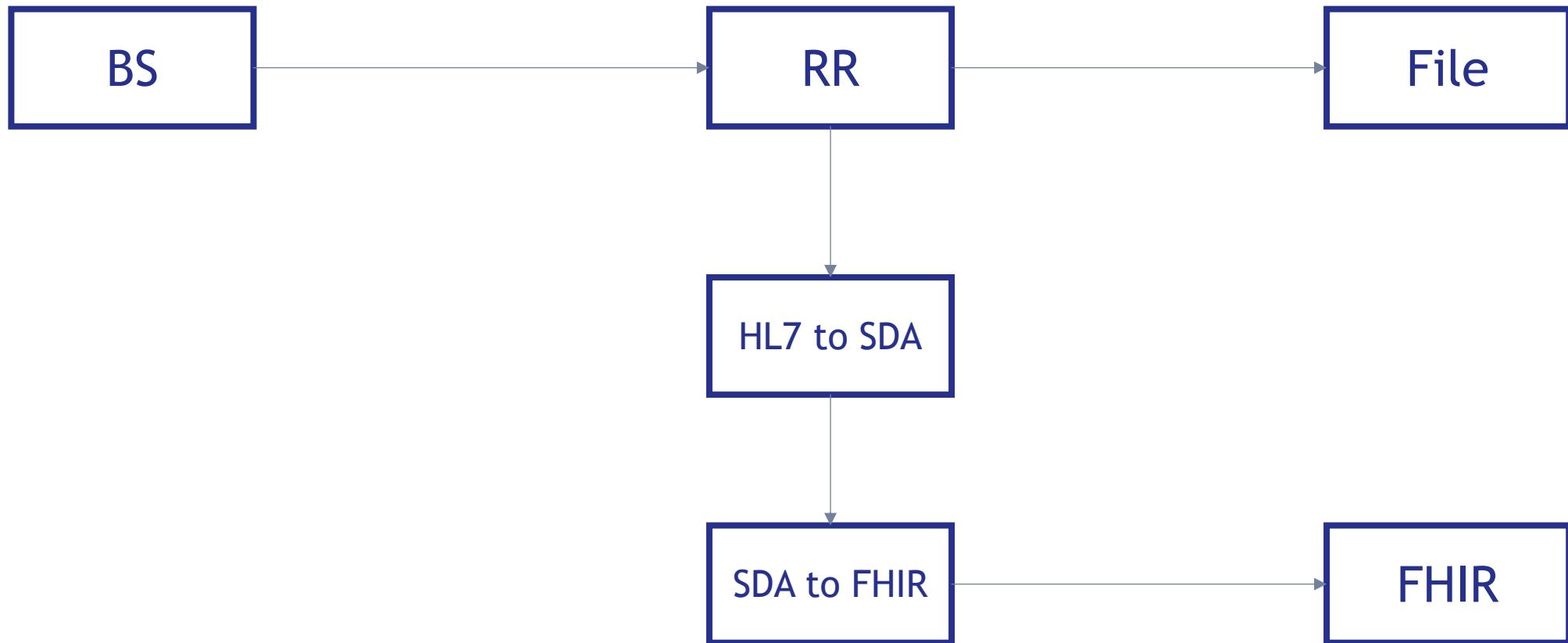
HL7v2 To FHIR



Overview, what we have done



Overview, what we plan to do



Instantiate the new BPs

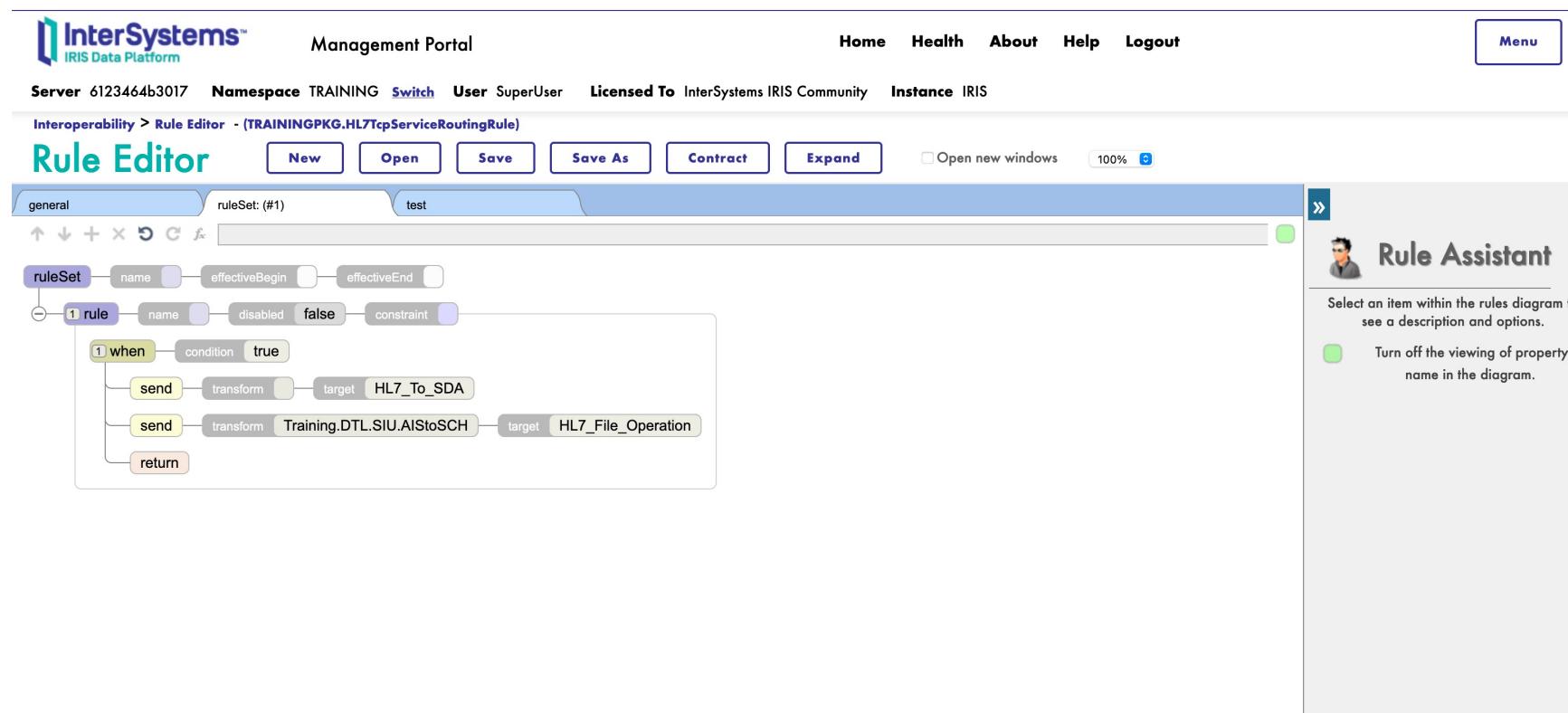
Instantiate Training.BP.HL7ToSDA3 as HL7_To_SDA

The screenshot shows the InterSystems Management Portal interface. The top navigation bar includes links for Home, Health, About, Help, and Logout, along with a Menu button. The main header displays the server information (Server 6123464b3017), namespace (TRAINING), user (SuperUser), and instance (IRIS). A banner at the top left reads "Interoperability > Production". The left sidebar lists services: FHIR_Http_Service and HL7_Tcp_Service. The central area features a "Business Process Wizard" dialog box titled "BUSINESS PROCESS WIZARD" with the sub-instruction "Add a new Business Process to this Production." It contains fields for "Business Process Class" (Training.BP.HL7ToSDA3), "Business Process Name" (HL7_To_SDA), "Display Category" (dropdown menu), "Comment" (text input), "Enable Now" (checkbox), and "Pool Size" (input field set to 1). To the right of the wizard is a "Production Settings" dialog box. This dialog includes a toolbar with "Sort" options (Name, Status, Number) and "View" buttons (grid, list, details). The settings are organized into sections: "Informational Settings" (Description), "Basic Settings" (Actor Pool Size set to 2), "Additional Settings" (Shutdown Timeout set to 120, Update Timeout set to 10), and "Alerting Control". Buttons for "Cancel" and "OK" are located at the bottom of both dialog boxes.

Instantiate the new BPs

Instantiate HS.FHIR.DTL.Util.HC.SDA3.FHIR.Process as SDA_To_FHIR

Add route to HL7_To_SDA to TRAININGPKG.HL7TcpServiceRoutingRule



Test It !

What happen ?

VISUAL TRACE

Use the helper tools in Training.BP.HL7ToSDA3

The helper is Training.Tools.HL7toSDA3Demographics who extends
HS.Hub.Standalone.HL7.HL7ToSDA3

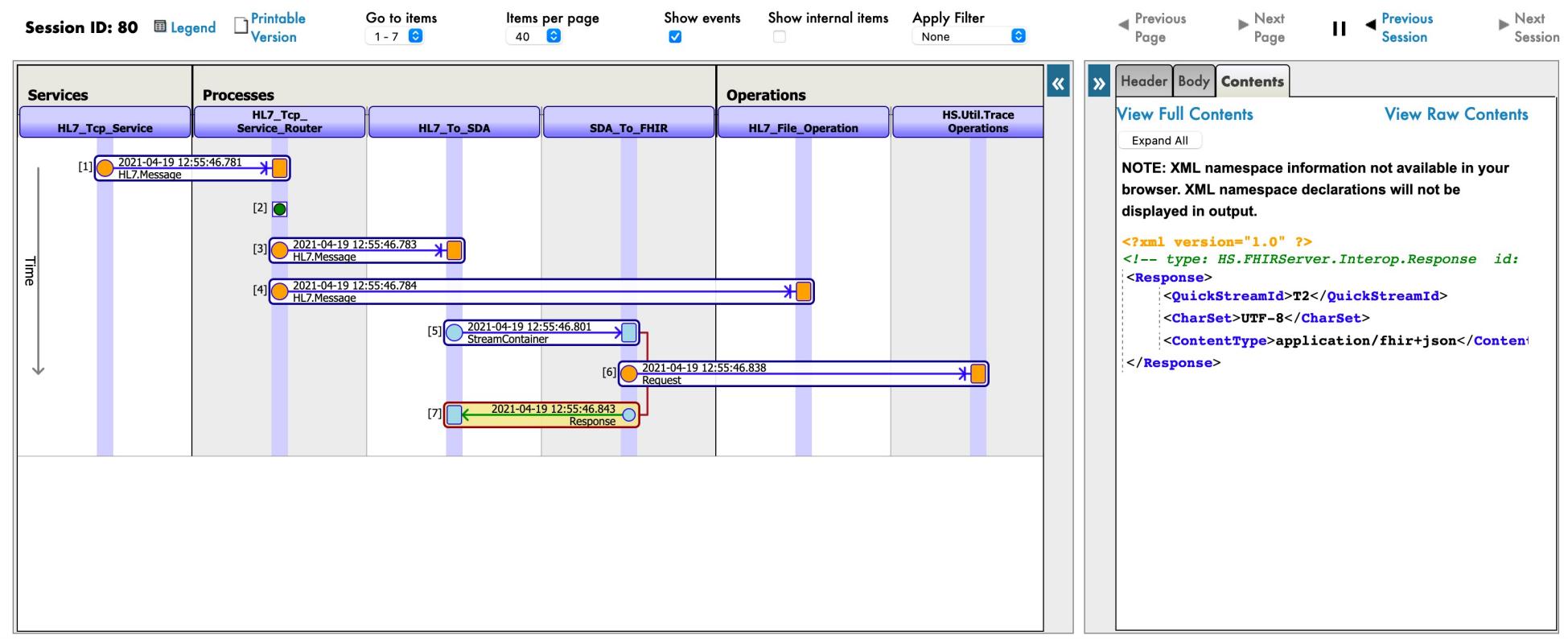
```
/// Transforms an HL7 message to SDA, an internal healthcare format for
InterSystems IRIS for Health.
Method OnRequest(pRequest As EnsLib HL7.Message, Output pResponse As
Ens.Response) As %Status
{
set tSC = $$0K
try {
//set tSC = ##class(Training.Gateway.HL7.HL7ToSDA3).GetSDA(pRequest,.tSDA)
//set tSC=
##class(Training.Hub.Standalone.HL7.HL7ToSDA3).GetSDAContainer(pRequest,.t
Container)
//set tSC = tContainer.ToQuickXMLStream(.tSDA)
//set tSC =
..SendRequestSync(..TargetConfigName,##class(Ens.StreamContainer).%New(tSD
A),.pResponse)
} catch ex {
set tSC = ex.AsStatus()
}
quit tSC
}
```

```
/// Transforms an HL7 message to SDA, an internal healthcare format for
InterSystems IRIS for Health.
Method OnRequest(pRequest As EnsLib HL7.Message, Output pResponse As
Ens.Response) As %Status
{
set tSC = $$0K
try {
//set tSC =
##class(Training.Gateway.HL7.HL7ToSDA3).GetSDA(pRequest,.tSDA)
set tSC=
##class(Training.Tools.HL7toSDA3Demographics).GetSDAContainer(pRequest,.t
Container)
set tSC = tContainer.ToQuickXMLStream(.tSDA)
set tSC =
..SendRequestSync(..TargetConfigName,##class(Ens.StreamContainer).%New(tS
DA),.pResponse)
} catch ex {
set tSC = ex.AsStatus()
}
quit tSC
}
```

Test It !

What happen ?

VISUAL TRACE



Plugins



CI/CD

