

Introduction

When implementing interfaces, Cerner uses Cerner Implementation Methodology, commonly referred to as CIM. CIM is an event-based methodology that was developed by Cerner for use and reuse company wide in implementation of Cerner solutions. CIM includes detailed information that is used to create site-specific project plans. Included in CIM is information that pertains to the installation of interfaces.

You can obtain access to CIM through a CD or the Internet, providing you have a CKN sign-on. For more information pertaining to CIM, please e-mail CIM@cerner.com.

Purpose and Structure

The purpose of this guide is to provide a high-level overview of what is involved in the implementation process for interfaces. This guide is based on the Cerner Implementation Methodology used for implementation of interfaces by Cerner. The steps below should be followed by each interface installation.



Note

The letter and number combinations that precede the headings are the CIM events to which the interface events correspond, along with a description of the activity.

P01 – Pre-Contract Signing

When you want to implement a new interface, you need to contact your client manager for a quote. The client manager contacts the appropriate associates and has an agreement letter (AL) written.

During this time, depending on number of interfaces requested and complexity, a request may be made to have you complete an interface questionnaire. This questionnaire provides basic information to the person drafting the agreement letter and can later provide information to the Interface Architect assigned to provide the specifications for the interfaces.

E3 – FSI Specification Development

Foreign System Interfaces represent a significant amount of risk in any project. To minimize this risk, Cerner begins analysis and planning at the beginning of the project. Interfaces are confirmed and a functional scope is established during the beginning stages of a project. The scope is fully specified during the specification meeting.

Specification Meeting

The Foreign System Interface (FSI) Specification meeting is scheduled prior to the Project Executive/End-User Introduction and lays the groundwork for the specification and design of all system interfaces and data uploads. This event requires input from your organization (including interface engine representative, if applicable) and Cerner project teams and possibly representatives from 3rd party suppliers from whom Cerner interfaces or accepts/sends electronic data.

The following people from the your organization's team should be involved in the specification process: an Application Specialist (to provide knowledge of how the organization is using the applications), an Interface Architect (person responsible for the interfaces for the organization to assist with the interface specific technical discussion), project management (scope control, staffing commitments), and the organization's domain experts (for example, if it is a billing interface, someone from the billing system should be present).

From Cerner, the following people should be involved in the specification process: an Interface Architect (responsible for leading the meeting, providing the technical interface knowledge for *Cerner Millennium*, and for writing the specification document), an Application Specialist (to provide detail product info/Core), project management (to provide scope control and staffing requirements and commitments), and a Project Architect. It should be noted that in smaller projects all of these participants might not be required. The interface architect can provide the specifics of what participants they expect for the particular project.

The main objective of the specification meeting is to create a specification that can be used as a blue print by the FSI System Analyst (FSI-SA) and as a

site-specific reference for your organization. It details configurable settings associated with each interface for the your organization. It is important to remember that the specifications are working documents and may need to be modified throughout the build and testing. It is at this time a person should be made responsible for keeping track of updates to the specification throughout the process of installing the interfaces.

As a basis for the discussion, the organization is provided with Cerner's Universal Interface Specifications (UI) to provide a framework for discussing the use of HL7 2.3 for clinical data exchange. Cerner assumes that all interfaces use an Interface Engine and that all interfaces are HL7 software compliant. If the organization does not have an interface engine and the foreign vendor cannot meet the *Cerner Millennium* Universal Interface specifications, additional hours for scripting by the FSI-SA need to be provided in the agreement letter or an additional agreement letter needs to be written after the scope is fully defined in the specification meeting. For history uploads, the organization is asked for the specific data to be transferred, the approximate number of records, and the current format of the data in advance to facilitate the Specification meeting.

The following is a list of possible FSI topics, depending on the interfaces included in this project that are discussed during this event:

- Receiving applications
- Functionality of the interfaced system at this site
- Technical processing
- Physical communications link
- Admissions, Transfers, and Discharges
- Results processing
- Order processing
- Charge processing
- Downtime considerations

After the Specification Meeting

The Interface Architect or Senior FSI-SA prepares the specifications that are submitted to the organization and the Cerner project team. The purpose of the specification is to document the decisions made and address questions outstanding from the specification meeting. Where applicable, answers to questions raised in the Specification meeting should be documented.

All parties present at the Specification meeting should be allowed to review the document that was created and make comments and/or corrections. It is especially important that your organization look over these specification documents to ensure that all questions are documented to ensure resolution.

Specification Approval

Each party to the specification (your organization, Cerner, other system) needs to approve the specification. Approval states that all parties agree that this document outlines the functionality and scope of the interface at the time of approval. Minor changes to these documents can be made in order to keep track of details of the interface. Scope and functionality should not be changed after this phase.

Update Specification

Throughout the interface installation, it is highly likely that updates will need to be made to the specifications. During the specification meeting someone should be identified to keep track of changes, typically this is the assigned FSI-SA. This includes interface modifications as well as scripting modifications. The specifications are the documentation of why the interfaces were designed in their specific manner. Unique characteristics and details need to be documented in the site specifications. It is important for the specifications to be up-to-date and accurate, as they can be used as a key troubleshooting tool in the future once the interface is in production.

E5 – System Setup

The following steps are dependent on other build steps outside of FSI. If these steps are not complete, the FSI-SA needs to contact the Project Manager, so they can assist in getting these complete. FSI is very dependent on the build, so if it falls behind, the interface implementation and testing can be delayed.

E5 – FSI Determine required Packages

Before significant build has been completed, the proper code level should be validated to make sure it can provide all the core interface functionality requested by the organization in the specification. If code is needed, the Production or Service Package needs to be identified and communicated to the person responsible for installing them. Cerner Knowledge Network (CKN) has information to assist in determining if additional packages are needed. This is a very important step, because if skipped, this can cause significant delays later in the project.

Cerner's responsibility: It is important that the FSI-SA work with the System Engineer as well as your organization in making sure all needed functionality is provided with the code release in build, or plans are in place to get that code installed.

E5 – FSI Process Configuration

The configuration process includes building all interface communication servers to process inbound and outbound transaction. This includes building the TCP/IP, ESI, Disk, and CCL comservers that are needed. The appropriate resources are asked to provide port numbers and IP addresses.

Your organization's responsibility: Provide port and IP addresses for connectivity. Open Engine organizations may want to participate in this configuration process.

Cerner's responsibility: Confirm the number and type of processes needed. It is the responsibility of the FSI-SA to ensure the configuration of the comservers is complete.

E6 – Configure ESI

The ESI server and the ESI Config tool must be configured for information to post to the Cerner database.

The ESI Config tool is a front-end graphical interface application used to establish the rules for each contributor system (sending application) that feeds data into the *Cerner Millennium* environment. The ESI Config tool is used to set the tables the ESI server uses to control interpretation and validation of patient identifiers for the person matching and reconciliation process.

Configuration with the ESI Config tool cannot be complete until much of the Core configuration is complete (such as organizations, facilities, alias pools). If the Core configuration is behind, this can cause delays in the interface configuration.

Your organization's responsibility: Your organization is responsible for making sure you understand the setup of ESI Config, how it affects the database, and some may want to assist in the configuration.

Cerner's responsibility: Cerner (between the FSI-SA and the Application Specialist) should set up and be able to answer questions about ESI configuration and provide information and documentation for the set up of the ESI Config tool for each contributor system.

E5 – FSI Configure ESO

The ESO servers and the ESO configuration need to be configured and the corresponding database tasks need to be completed before this step can be completed. ESI configuration for the correct contributing system is required before ESO can be created. The setup of ESO takes place in ESO_INIT_OUTBOUND. The appropriate servers needed for processing outbound transactions need to be activated.

Your organization's responsibility: It is the responsibility of your organization to make available resources to learn how to navigate ESO_INIT_OUTBOUND and to start and stop servers.

Cerner's responsibility: Cerner is responsible for configuration, documentation, and training regarding the interface set up, ESO_INIT_OUTBOUND configuration, and what ESO servers are related to the process.

E5 – FSI Connectivity Test

To conduct connectivity testing, the sending system should transmit a transaction and validate that acknowledgment protocols function according to the specification.

Your organization's responsibility: It is the responsibility of the your organization to ensure the vendor is prepared for connectivity testing and available to work with the FSI-SA.

Cerner's responsibility: It is the responsibility of the FSI-SA to ensure that this step is complete and to engage the appropriate resources from Cerner and your organization if there are connectivity issues.

E6 – FSI Script Development & Build

In many cases, scripting is needed for formatting and filtering of transactions. In this step, the baseline scripts are created by the FSI-SA. These scripts can be any of the following types of scripts: Route, Modify Object, Map-to-Library, Map-from-library, Modify Original Scripts, Type, and ACK Scripts.

Open Port: It is the responsibility of Cerner FSI-SA to do scripting.

Open Engine: It is the responsibility of your organization to actively participate and help with scripting.

E9 – FSI Transaction Unit Test

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The interface unit test includes testing of every type and trigger sent to and from each interface to validate it posts cleanly to the database. Your organization may further define an interface unit test to include specific HL7 segments and fields as part of the test. The unit test is NOT designed to test core build and aliases for completeness. The interface should process each interface event and successfully post the data to the receiving system's database. Ability to view the information, as expected, in the target application is part of the unit testing process. For testing to be done a certain amount of the application build needs to be complete.



Note

If the transaction fails, determine the cause and document the corrective action. Establish timelines and accountability.

Your organization & Cerner's Responsibility: It is the responsibility of both your organization and Cerner to work together to unit test the interfaces, provide troubleshooting for the issues that arise during testing and validate the information is posting correctly in the receiving database.

E11 – FSI Education Event

Once an interface is Unit Tested, members of your organization's staff who are responsible for the monitoring and maintenance of the interfaces should attend an education event on how to monitor, maintain and troubleshooting the interfaces.

The educational material should include information about any of the following topics that pertain to the interfaces on site:

- ESI and ESO configurations
- Process names and IDs
- Process flows from comservers to ESI and ESO servers (to include hold and filtering functionality)
- Identification of customized scripts and basic description of the script functionality (to include ESO_GET_XXX_SELECTION and suppression scripts)
- Basic troubleshooting tips which would assist in finding problems (for example, if additional transaction filtering is occurring at the comserver level based upon aliasing values).

Your organization's responsibility: It is your organization's responsibility to provide the appropriate people to be in attendance for the educational event. This includes a minimum of one main interface resource, and a back-up person is highly suggested.

Cerner's Responsibility: It is Cerner's responsibility to provide a FSI-SA to conduct the training event. The training should include ways to monitor, maintain, and troubleshoot interfaces. It should also include the site-specific configuration for each of the interfaces and any other significant interface functionality being used at this organization's site.

E13 – FSI & Application Integration Test

Integration Testing involves the execution, validation, review, and approval (or rejection) of the system test plans developed during and after the System Testing discussions. Extended onsite Cerner support services for Integration Testing are available on a contract basis.

An organized integration test is required for all areas within the Cerner system. Sample test plans are located in the CIM Tool. After modification, and to become site-specific, the system test plans should become a permanent part of the organization's validation documentation. The test plans directly impact other activities such as user training, parallel testing, and conversion.

Adequate time should be allowed to execute each test plan in order to ensure that database adjustments can be made when necessary without adversely affecting other areas of the implementation process. FSI and Operations testing are included as part of the integration test.

Your organization's responsibility: Your organization should be taking an active roll in troubleshooting and be the first point of contact with interface issues and engage the Cerner FSI-SA whenever needed. You are responsible for all validation documentation and storage of documentation for any inspection purposes.

Cerner's Responsibility: To assist you with troubleshooting and to actively work towards a resolution and successful integration testing.

E15 – FSI Benchmarking for Uploads

This step is performance and volume testing for uploads, if applicable (not all sites have uploads). The uploads are turned on to see how much time should be allowed for uploading the required number of transactions. This will also help to pinpoint any performance issues and assist in the decision of how much, if any, history needs to be uploaded prior to go live.

Your organization & Cerner's responsibility: Everyone involved should work to make sure problems encountered are documented. Also, the System Engineer

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should monitor the system during the test upload to find areas where performance could be improved (such as turning logging down, adjusting instances of servers, and so on).

E16 – Conversion Readiness Assessment

A checklist is filled out by the FSI-SA to evaluate and validate the advancement of the interface development. This includes validating that the interface design, database configuration/build, system testing, operations, and user training for interfaces is complete.

E16 – FSI History Uploads

This is the step where the actual uploads are turned on to populate the production database. Prior to this step it should be determined how long takes for the history uploads to process. It is recommended that a trial run be performed in an environment separate from production to validate build and performance.

If this is a new install, the production environment should be treated like a live environment once the history feed has been turned on. This means configuration is now being done in the build environment, with dual maintenance into the production domain, and a change control policy is in effect.

E18 – FSI Interface Activation

This is equivalent to a conversion. There are some interfaces that might need to be turned on prior to the product conversion to have data in the database. This step needs to be evaluated and put into the project plan. Most interfaces are activated at the same time as the product goes live. It is important to have the resources that are needed for activation of the interfaces.

Your organization & Cerner's responsibility: It is the responsibility of everyone involved to have the appropriate staffing available for interface support. It is also everyone's responsibility to work together to get timely resolutions for any interface issue that result.

Cerner's Responsibility: To provide you with the appropriate support and documentation to be able to maintain the interfaces through and after conversion (for example, failed transactions).

E19 – FSI IMS Interface Management System Turnover

At the completion of the 14-day post-conversion support period, a formal Transition Call is conducted to officially introduce the services available to a production Client. These services include access to the Immediate Answer Center (IAC), the Immediate Response Center (IRC), and regular visits from the Client Manager (CM).

Following the transition to Client Services, you have successfully completed your Clinical Implementation Project and can look forward to deriving the process and operational benefits of the Cerner solution.

The FSI-SA is responsible for making sure that the IMS (Inventory Management System) turnover forms, specifications documents, and any other documents that would be site-specific are completed in full and placed in the appropriate organization folders.

E20 – Post Conversion Audit

The purpose of the Post Conversion Audit is to assess user satisfaction, understand current use of the solution, and discuss any process issues. The Post Conversion Audit is typically conducted eight weeks following conversion to allow time for the users to gain comfort with application and associated process changes in the clinical environment. During the Post Conversion Audit, recommendations are made to optimize design and use of the system and to address process issues that impact the overall effectiveness of clinical operations.

Associated with the post conversion audit is a paper-based survey that it is the responsibility of the FSI-SA to print and deliver to the organization's Project Manager. Once this survey is completed, it needs to be faxed to the Knowledge Manager for FSI System Integration. Currently, this is Erin Foust, efoust@cerner.com.

Terminology

ESI – External Systems Inbound. Cerner's process for receiving interfaced data from a foreign system.

ESI Config Tool. Used to set up configurations for the ESI processing.

ESO – External Systems Outbound. Cerner's process for sending interfaced data to a foreign system.

ESO_INIT_OUTBOUND. Tool used to set up configurations for the ESO processing.

FSI – Foreign System Interface. The point of interaction or communication between two different computer systems. A non-*Cerner Millennium* system is considered to be a foreign system.

FSI-SA – Foreign System Interface, System Analysts. The FSI System Analyst is responsible for the development and installation of the Foreign System Interface feeds between Cerner and the foreign system.

IA – Interface Architect. The Interface Architect is responsible for the planning and oversight of interface installation at the sites. The Interface Architect coordinates interface design and implementation activities, and provides assistance and guidance in the overall project design and implementation activities.

OpenView. OpenView is a graphical interface server application providing platform-independent interfacing between computer systems in a health care environment. OpenView supports data exchange among disparate computer systems, providing timely access to demographics, clinical results, and financial data.