Overview of Foreign System Interfaces

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In the broadest sense, the purpose of Foreign System Interfaces (FSI) is to enable information sharing across disparate systems, such as Cerner systems and non-Cerner systems.

Foreign System Interfaces includes three primary solutions: External Systems Inbound (ESI), External Systems Outbound (ESO), and Open Engine. Each of these solutions is described in the following sections.

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.

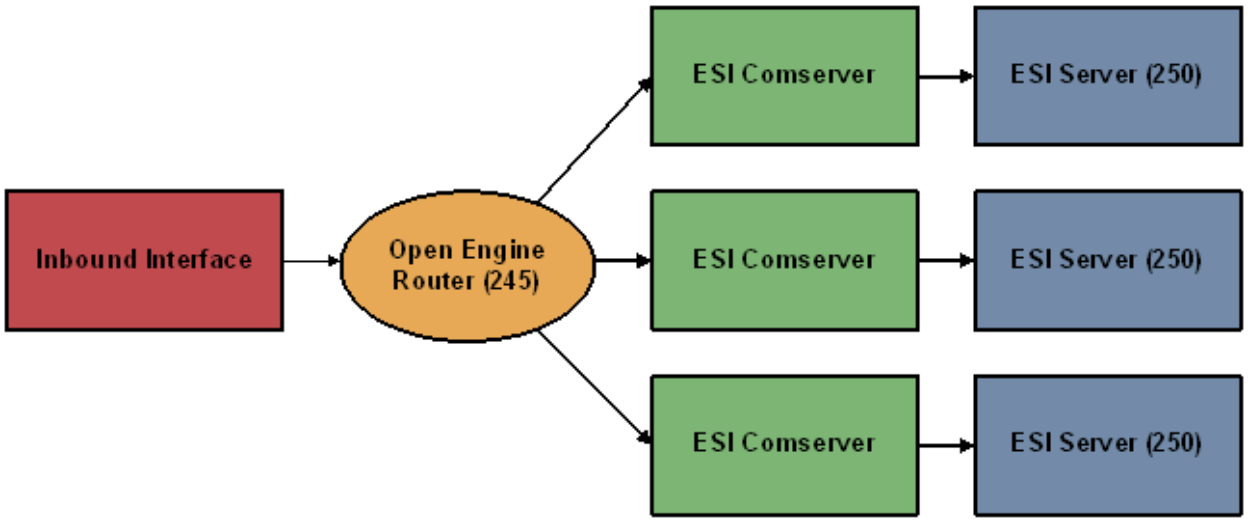
External Systems Inbound

External Systems Inbound (ESI) acts as the gatekeeper for data inbound to *Cerner Millennium* from a non-Cerner system. ESI allows data from a variety of disparate sources to be written seamlessly to the *Cerner Millennium* database.

ESI performs data validation, translation, and matches and reconciles the incoming data with existing database records. ESI is controlled using SI Manager (SI_Manager.exe), which is discussed in more detail in the Configure ESI With SI Manager Reference page. Each external system providing data is configured separately. Configuration options determine data matching, data translation, and the parameters for updating.

Complete Transaction Handling

The Open Engine Universal Interface accepts *HL7* delimited messages from external systems, unpacks the external data into a Cerner interface common request package and sends the request to the ESI connectivity server. The CPM ESI server (SCP 250) ensures and commits the data to the *Cerner Millennium* database and returns an acknowledgment to the ESI Communication server (Comserver).



The inbound interface includes multiple ESI comservers in its route configuration. An internal algorithm, in conjunction with a designated field within each transaction, determines to which server the inbound comserver routes a given transaction. In this fashion, multiple ESI servers share the processing load equally.

ESI Servers

ESI uses two primary servers to perform its tasks.

CPM ESI server: The CPM ESI server receives transactions from external systems via the Open Engine comservers, translates the data, and then inserts and updates it into the *Cerner Millennium* database. For more detailed information, see the CPM ESI Server Reference page.

The Foreign System Interfaces Order Grouper server (SCP 255): The Foreign System Interfaces Order Grouper server receives orders from the CPM ESI server and stores them temporarily under the order's encounter.

External Systems Outbound

External Systems Outbound (ESO) performs event-driven tasks to collect data from the *Cerner Millennium* database repository for transmission to a non-Cerner system. Client-server architecture is used to collect requests from client applications, which can be *Cerner Millennium* back-end servers or front-end applications. The ESO servers commit client requests to disk queues that are part of the Cerner Common Queuing Model (CQM). ESO depends on Open Engine services to finalize message formatting and transmit the messages to the external systems.

Outbound Event Reliability

Transaction reliability is provided by disk queues used to store the outbound triggers and their resulting, formatted *HL7* messages at each processing stage. As the outbound trigger progresses through the linear ESO data path, it is committed to a disk queue each step of the way. This way, if a failure occurs in one of the processing servers, the processing of the outbound trigger can be resumed right where it was left off.

Retransmission of Outbound Event

Each queue has the potential for retransmission of an outbound trigger. With this feature, an outbound event can be replayed at any point along the linear ESO data path.

Data Retrieval

Data retrieval is the ability to retrieve data from the database using *Discern Explorer*(CCL) scripts and domain server calls instead of hard coding. This reduces any required knowledge of the data and results in a generic and flexible model for processing outbound events.

Open Engine

An interface engine allows information in the form of messages, records, or transactions to be easily exchanged, routed, and translated between disparate systems and applications.

Open Engine (OEN) is an interface application that gives developers the tools to build interfaces rather than wrestle with traditional point-to-point custom programming. Open Engine allows Cerner associates and clients to build, maintain, and monitor system-to-system interfaces. This Application Gateway System, or toolkit, provides advanced communication services, message formatting functions, intelligent message routing, and system management features as they relate to system-to-system interfaces.

Open Engine Features

Open Engine provides support for the following features:

- Communications services
- Message formatting
- Intelligent message routing and queuing
- Message and event logging services
- Monitor and control utilities

Communications Services

Open Engine supports TCP/IP and Asynchronous (via terminal server) communications protocols.

Message Formatting

Interface developers have numerous formatting features available with Open Engine, including data mapping and data translation.

Intelligent Message Routing and Queuing

Using Open Engine's custom routing feature, you can configure the rules for determining the unique routing of a message based upon the message content. Also, store and forward capabilities are available in the event a target system is unable to receive messages.

Message and Event Logging Services

In the event a target system indicates the non-receipt of messages, Open Engine, through its Logging Services, can replay the original transaction. Logging Services also allows users to identify which transactions received a negative acknowledgment and may need to be re-sent.

Monitor and Control Utilities

You can view the current state of configured processes using Open Engine's Controller screen. From this screen, you can also go to a particular process configuration, start System Message Viewer, or Cerner's Enterprise Manager, and monitor the entire system.

Open Engine Servers

Open Engine uses three primary servers to perform its tasks:

- OEN Controller server (SCP 240). The OEN Controller server provides Open Engine users with a single application control point for Open Engine processes. The OEN Controller is primarily used by OpenView (OpenView.exe), a front-end, graphical interface application used to configure, start, stop, and monitor interfaces. OpenView sends and receives all of its data through the OEN Controller. The request is sent from OpenView to the OEN Controller which in turn passes the request to SCP. The results of the request are then sent back through the OEN Controller to OpenView. For detailed information, see the OEN Controller Server (SCP 240).
- OEN Router server (SCP 245). The OEN Router server, sometimes called the Router, is responsible for keeping track of transaction statistics. This server is notified every time a message is enqueued or dequeued from all the comservers. This allows utilities such as OpenView or OEN_QUERY_CLIENT to retrieve valuable information quickly without the overhead of reading the database. For detailed information, see the OEN Router Server (SCP 245).
- OEN Interface Debugger server (SCP 243). The OEN Interface Debugger server is used to develop and debug interface routing and formatting scripts. This server is another instance of the OEN Router server with a different binding. It is not used in the daily operations of Open Engine and is used primarily to debug formatting scripts. For detailed information, see the OEN Interface Debugger Server (SCP 243).

Applications

Foreign System Interfaces consists of the following applications:

- OpenView (OpenView)
- SI_Manager (SI_Manager)

Open Port Monitoring/Troubleshooting Methods