Overview of CPM ESI Server

The CPM ESI server (SCP 250) receives transactions from external systems through the Open Engine COM servers, translates the data, and then inserts and updates it into the *Cerner Millennium* database.

Operating Dependencies

Operating dependencies are the set of conditions that must be in place for a server to function correctly. This section describes the operating dependencies for the CPM ESI server (SCP 250). *Cerner Millennium* servers interact with each other in a variety of ways, and depend on each other to process units of work. For a high-level view of this server's interactions with other *Cerner Millennium* servers and other elements of the *Cerner Millennium* architecture, see the requests diagram below.

Server Control Panel

The Server Control Panel (scp) allows you to start and stop servers, and change the properties of servers. SCP (scp) allows you to view the number of instances of a server that are running and the state of those servers.

Server Definition - OpenVMS

The **show** command at the SCP (scp) prompt displays the definition of the indicated server on an *OpenVMS* system.

Server Definition - AIX or HP-UX

The **show** command at the SCP (scp) prompt displays the definition of the indicated server on an *AIX* or an HP-UX system.

Services

A service may be a shared service (SHR), which is a connectionless service. In a shared service, clients deposit messages in a queue that is shared by one or more servers offering the same service. In a connection-based (CON) service, clients are required to establish a physical link with a server offering the service. Queue (QUE) services process transactions asynchronously from the client process. Queue-based messaging implements a time independent, message-driven delivery model.

The CPM ESI server performs the following services.

Service Name	SCP Server Entry Number	Shared Service (SHR), Connection (CON) and Queue (QUE)
CPM_ESI	250	SHR

Server Properties

Most parameters for a server are specified in SCP. The following table contains server properties for the CPM ESI server:

Property Name	Description	Default Value	Valid Values	Required? (Y/N)
Startup Script	If this property is left blank, the server defaults to the script CPMSTARTUP. This script defines and sets up various parameters. Common scripts include CPMSTARTUP (Default used for most servers), CPMSTARTUP_TEST (used to test or debug servers), and CPMSTARTUP_DEBUG (used to debug servers and activates a number of CCL trace options).	ESI (If left blank, the server uses CPMSTARTUP)	esi esidbg	Y N
LogLevel	Controls the messages written to the system.mlg file and to the server's private .mlg file.	2	0 - 5	N

Activity_dt_reconcile_flag	If this property is set to 1, the reconcile process uses the last activity date (if available) on each person to determine the to person.	0	0, 1	N
Audit_flag	The audit_flag property controls the writing of the aud_<message control id>.dat file for a transaction. A value of 2 also logs the call to the PM_ESI_AUDIT script.	0 (if not defined, the default value of audit_flag = 1)	0 - 2	N
Auth_to_unauth_match_flag	The auth_to_unauth_match_flag controls whether authentic to unauthentic person match logic is used.	1	0, 1	N
Cycle_page_limit	Sets how closely the memory usage of the CPM ESI server is allowed to get to its maximum amount before the server cycles. This guards against memory leaks causing the server to abnormally terminate while processing a transaction. Note that a default value of 10000 is used if this property is not defined.	10000		N
Debuglogging	Controls the amount of logging to the CMB_TEMP, for example, CMB_1274_01.out file. A value of 0 provides the least amount of logging, and a value of 4 provides the most.	0	0-4	N
Grouper_time	Sets the value of the time frame, in seconds, for grouping orders, and it is sent to Foreign System Interfaces Order Grouper server (FSI_Grouper.exe). This property can be overridden by a contributor system-specific setting configured in System Integration Manager (SI_Manager.exe). For more information on order grouping functionality, see the *Cerner Millennium* Order Grouping Functionality section in the HL7 Universal Interface Specifications, the Unit 9i - Order Message Processing Inbound Reference Page.	90	0 (zero) to a much higher value than would be reasonable to set the grouper_time property to.	N
Grouper_nbr	Determines the maximum number of orders Foreign System Interfaces Order Grouper server holds. This property can be overridden by a contributor system-specific setting configured in System Integration Manager. For more information on order grouping functionality, see the *Cerner Millennium* Order Grouping Functionality section in the HL7 Universal Interface Specifications, see the Unit 9i - Order Message Processing Inbound Reference Page.	10	0 (zero) to a much higher value than would be reasonable to set the grouper_nbr property to.	N
Logstat_flag	Controls the amount of logging written to the cer_log:esi_<date>.out and .err files.	0	0 -3	N
Logtable_flag	Controls the amount of logging written to the ESI_LOG table.	0	0 - 2	N
Msgview_flag	Controls the amount of logging written to the server's private .mlg file.	0	0, 1	N
No_aof_flag	Controls whether a code_value and its associated code_value_alias row is written when an alias is not found for an extendible code_set. A value of 0 enables add-on-the-fly, and a value of 1 disables it.	0	0, 1	N
Paging File Limit	*OpenVMS* only: This property sets the VMS Paging File Limit for the CPM ESI server (SCP 250). It is not recommended to set this less than 600000.	600000		Y
Profile_flag	Controls whether certain *Cerner Health Information Management* coded information is written.	0	0, 1	N
Trigger_flag	Controls whether the PM transaction processing is called to capture a snapshot of the person and encounter before update. Control transaction to message Center	0	0, 1	N

System Logicals and Environment Variables

A list of common logicals or environment variables used by common runtime libraries and supporting services can be found on the Millennium Logical Definitions Reference Reference Page.

The following table lists additional logicals or environment variables that may be used to control functionality of the CPM ESI server (SCP 250):

Logical or Environment Variable Name	Description	Valid Values	Recommended
CPM_GLOBAL_LOGGING	This parameter, when defined (any value) disables any logging done through the CrmLogMessage API. This API is generally used to capture the request and reply data that was sent to a script or a server for processing. This data is written to a file in the cer_log directory. For ESI, this logical must be set to create the reqloghl7.dat and the <script name>.dat files. This is a debug feature. This is defined at the group level for all client site domains. Unlike other properties, this parameter is evaluated each time the API is called so it is not necessary to cycle a server for this to take effect.	ON, ENABLED, OFF	OFF
CPM_GLOBAL_STATE	This parameter, when defined (any value), instructs servers to update a logical or environment variable specifically for each instance of the server, containing state information. The logical/environment variable is SRV<server_domain_instance_number><*server_instance*><bus_instance> and can be viewed with the following commands: VMS: **$getlog "srv<server_domain_instance_number><*server_instance*>***<bus_instance> ", \\\\\\\\\\\\\\\\ or **$ show log srv<server_domain_instance_number>**_		

For example, to display this information for the CPM Script server (SCP 51) for server instance one, bus zero:

AIX:

For example, to display this information for the CPM Script server (SCP 51) for bus instance one, bus zero:

CPM_GLOBAL_TIMING	This parameter, when defined (any value), instructs servers to write performance metrics to the CRMTIMER.MLG file for each request processed. Generally this should NOT be on for production domains. This is useful if a site is trying to track any periods where servers might slow down.	ON	Undefined
CRMTIMERENABLED	This parameter, when defined (any value), captures performance metrics for requests sent to servers. This would include servers that are acting as clients or any application that is issuing CRM API calls. This should NOT be defined for most domains.	ON	Undefined
TIMING_ON_<server_domain_instance_number>	This parameter, when defined (any value), uses functionally the same as CPM_GLOBAL_TIMING except it applies to only one server.	ON	Undefined

RDBMS

The CPM ESI server (SCP 250) accesses the following tables:

Tables
CHARGE_EVENT_ALIAS
CODE_VALUE
CONTRIBUTOR_SYSTEM

ESI_ALIAS_TRANS
ESI_ENSURE_PARMS
ESI_LOG
LONG_TEXT
MATCH_TAG_PARMS
NOMENCLATURE

Person Management Tables
ADDRESS
ALLERGY
DIAGNOSIS
ENCNTR_ACCIDENT
ENCNTR_DOMAIN
ENCNTR_FINANCIAL_HIST
ENCNTR_INFO
ENCNTR_LOC_HIST
ENCNTR_PERSON_RELTN
ENCNTR_PLAN_RELTN
ENCNTR_PLAN_RELTN_R
ENCNTR_PRSNL_GRP_RELTN
ENCNTR_PRSNL_RELTN
ENCOUNTER
ENCOUNTER_TYPE_PARMS
HEALTH_PLAN
ORGANIZATION
ORGANIZATION_ALIAS
PERSON

PERSON_ALIAS
PERSON_INFO
PERSON_MATCH_REV
PERSON_NAME
PERSON_ORG_RELTN
PERSON_PATIENT
PERSON_PERSON_RELTN
PERSON_PLAN_RELTN
PERSON_PRSNL_RELTN
PHONE
PM_TRANSACTION
PROC_MODIFIER
PROCEDURE
PRSNL_ALIAS
SERVICE_CATEGORY_HIST

PowerChart Office Tables
PROBLEM
PROBLEM_COMMENT
PROBLEM_DISCIPLINE
PROBLEM_PRSNL_R

Cerner Health Information Management Tables
ABSTRACT_DATA
ABSTRACTING
CODING
DRG
DRG_ENCNTR_EXTENSION

MEDIA_ALIAS
MEDIA_MASTER
MEDIA_MOVEMENT

OAF Tables
AUTH_DETAIL
AUTHORIZATION
ENCNTR_PLAN_AUTH_R

Code Sets

The following table lists the Code Sets required by this server:

Code Set Number	Code Set Name	CDF Meaning
73	Contributor Source	APS01, DEFAULT, HLA01, RAD01
89	Contributor System	POWERCHART
314	Match Function Code	AUTHCMB, ENCNTRMATCH, GT1PERSMATCH, INSPERSMATCH, NK1PERSMATCH, OPFMATCH, ORDERMATCH, ORGMATCH, PRSNLMATCH, SCHEDMATCH, UNAUTHCMB, VALAUTH, VALMERGE, VALUNAUTH
315	Match Field	ACCESSIONNBR, ALIAS, DOB, FILLERORDID, FNAME, INTACCESS, INTACCESSID, INTACCESSNBR, INTCONTAINID, INTORDERID, INTPERSID, LNAME, MNAME, NAME, PLACERORDID, SEX
316	Match Validation	MATCHCONS, MATCHOPTCALL, MATCHOPTL, MATCHREQD, MATCHREQWENC, MATCHREQWPER, WARNBOTH, WARNMISMAT, WARNMISSING
318	ESI Task	A01, A02, A03, A04, A05, A06, A07, A08, A09, A10, A11, A12, A13, A14, A15, A16, A17, A18, A19, A20, A21, A22, A23, A24, A25, A26, A27, A28, A29, A30, A31, A32, A33, A34, A35, A36, A37, ALL, ALLADTS, ALLBAR, ALLBARS, ALLORDERS, ALLRESULTS, ALLSCHEDULES, DFTBILLCHG, DFTCHG, DFTPHMCHG, DFTUNBILLCHG, O01, O02, R01, R02, R03, S01, S02, S03, S04, S05, S06, S07, S08, S09, S10, S11, S12, S13, S14, S15, S16, S17, S18, S19, S20, S21, S22, S23, S24, S26, Z01, ZB1, ZB2, ZBB, ZBP, ZBT
325	ESI Alias Filter	LZERO, TSPACE
326	ESI Ensure Type	ADD, DELETE, EXISTS, NONE, ORUCOMPLETE, REPLACE, UPDATE, UPTNOADD
381	ESI Encntr Prsnl Reltn Expire Rule	ADMPLUS, DISCHPLUS

14093	ESI Org Alias Cd	MSHFAC, MSHFACRECV, PV1PATFAC, PV1SERVFAC
14128	Prsnl Proc Opt Cd	FTVALENS, PRSNLFT, PRSNLVALENS, PRSNLVALFT, SKIPPRSNL
15769	ESI Special Alias Processing	OCFORDER, PROVANDVER, REFLAB, RLIPOSTDNR, RLIPOSTTNP, RLISKIPDTA
16089	ESI Res Proc	APCASE, NOPERFDATE, OCFORDER, RADTRANSPROC, TRANSFUSED, TRANSREQ, TRUNCREFRNG
17089	Order Control Codes for ESI	AF, ALLORDCTRL, CA, CH, CM, CN, CR, DC, DE, DF, DR, FU, HD, HR, LI, NA, NW, OC, OD, OE, OF, OH, OK, OR, PA, RE, RF, RL, RO, RP, RQ, RR, RU, SC, SN, SR, SS, UA, UC, UD, UF, UH, UM, UN, UR, UX, XO, XR, XX
18089	ESI OBX Processing	ABSTRACT, CULTSTAT, EDEF, EDESC, EDISP, MBOTAG, NOSUSCHART, ORGOCCUR, RPPARENT
18229	Foreign System Interfaces Yes No Ind	NO, YES
18749	Event Alias Type	CE_ACCESSION
20109	ESI Insurance Address & Phone Processing	EMPPLANRELTN, ENCPLANRELTN, HEALTHPLAN, INSURANCEORG
20389	ESI Pharmacy Processing	RXCCUSTIV

Blood Bank (BBT) Specific

Code Set Number	Code Set Name	CDF Meaning
16089	ESI Res Proc	ABO, ABORH, ANTIBODY, ANTIGEN, RH

HLA Specific

Code Set Number	Code Set Name	CDF Meaning
73	Contributor Source	HLA01
16089	ESI Res Proc	HLAANTIBODY, HLABPRA, HLADILUTION, HLAMETHOD, HLAREACTION, HLASCPECSTOR, HLATPRA
18089	ESI OBX Processing	HLABEGINAB, HLAEVENT

Discern Explorer (CCL) Scripts

The following table lists all *Discern Explorer* scripts that are executed during request handling.

Script Name	Related Request Number	Bound to Server (SCP Entry ID)	Purpose
APS_UPLOAD_CREATE_CASE	200293	51	Populates AP tables for history upload.
APS_UPLOAD_VALIDATE_CASE	200292	51	Validates accession number for AP history upload.
BBT_ADD_BLOOD_BANK_COMMENT	225173	51	Adds comment for blood bank history upload.
BBT_ADD_HIST_PERSON_ABDY	225445	51	Adds person antibody information for blood bank history upload.
BBT_ADD_HIST_PERSON_ABORH	225443	51	Adds person ABO and RH information for blood bank history upload.
BBT_ADD_HIST_PERSON_ANTIGEN	225446	51	Adds person antigen information for blood bank history upload.
BBT_ADD_HIST_PERSON_COMMENTS	225598	51	Adds person comment information for blood bank history upload.
BBT_ADD_HIST_PERSON_TRANS_REQ	225444	51	Adds person transfusion requirement information for blood bank history upload.
BBT_ADD_HIST_PRODUCT	225514	51	Adds product information for blood bank history upload.
CPS_ENS_PROBLEM	963005	51	Updates or adds problems.
ESI_ADD_LOG_TABLE	1200040	104	Adds entry to ESI_LOG table.
ESO_ADD_CQM_DOWNTIME	1210260	51	Supports downtime for CQM Server.
ESO_GET_ORDER_SELECTION	1210250	51	Suppresses orders in the ORM servers from going outbound in an outbound orders interface.
HIM_ENS_CODING	1190003	51	Adds and updates coding rows.
HIM_MATCH_AND_TAG	1180024	51	Checks whether a result message goes through ProFile special processing.
HIM_UPDATE_ABSTRACT_DATA	1190001	51	Updates abstract data rows.
HIM_UPLOAD_CODING_RESULTS	1190002	51	Adds and updates DRG rows.
HIM_UPLOAD_MEDIA	1190000	51	Creates media (patient charts) from an upload.
HLA_ADD_PERSON_PERSON_RELTN2	1065282	51	Inserts a row into the PERSON_PERSON_RELTN table.
HLA_ENS_PERSON_AB_SCREEN	1065223	51	Checks for the existance of a duplicate person_hla_ab_screen record and either inserts a new record or updates the existing one. It also creates or updates person_hla_ab_spec records as needed and creates or updates a long_text record if comments are populated.
HLA_ENS_PERSON_HLA_TYPE	1065222	51	Checks for the existance of a Duplicate person_hla_type record and either inserts a new record or updates the existing one. It also creates or updates a long_text record if comments are populated.
HLA_ENS_TRANSPLANT_CANDIDATE	1065405	51	Inserts or updates person_transplant_candidate records.

OAF_ENS_AUTH_INFO	4130080	51	Updates OAF authorization information.
OMF_UB92_FROM_ESI	950172	51	Adds or updates omf_revenue_st records.
OMF_ZHF_FROM_ESI	950173	51	Adds or updates hf_value_added_extension records.
ORM_DUP_CHECK_IND	500173	51	Displays duplicate checking info at the Order Catalog Item level for a list of items and their respective request dates/times.
ORM_GET_CS_ORDERABLE	500176	51	Gets catalog code for a Care Set orderable item.
ORM_GET_CS_ORDERABLES_ORD_ID	500181	51	Retreives orderable items by order ID.
ORM_GET_ORD_SENT_DETAIL	120000	51	Retreives order details for sent order.
PHA_GET_ITEM_BY_IDENTIFIER	380820	51	Returns medication_definition item_id when passed identifier_type_cd, and value.
PM_ADD_PERSON_MATCH_REV	114390	51	Adds person match review record.
PM_ENS_ADDRESS	101001	51	Adds address record.
PM_ENS_ALLERGY	101706	51	Adds allergy record.
PM_ENS_DIAGNOSIS	101705	51	Adds diagnosis record.
PM_ENS_DM_TRANS_ACTIVITY	101209	51	Adds dm transaction activity record.
PM_ENS_DM_TRANS_DATA	101207	51	Adds dm transaction data record.
PM_ENS_DM_TRANS_KEY	101208	51	Adds dm transaction key record.
PM_ENS_ENCNTR_ACCIDENT	101303	51	Adds encounter accident record.
PM_ENS_ENCNTR_ALIAS	101302	51	Adds encounter alias record.
PM_ENS_ENCNTR_DOMAIN	101309	51	Adds encounter domain record.
PM_ENS_ENCNTR_INFO	101310	51	Adds encounter info record.
PM_ENS_ENCNTR_LOC_HIST	101304	51	Adds encounter location history record.
PM_ENS_ENCNTR_ORG_RELTN	101313	51	Adds encounter organization relation record.
PM_ENS_ENCNTR_PERSON_RELTN	101306	51	Adds encounter person relation record.
PM_ENS_ENCNTR_PLAN_RELTN	101314	51	Adds encounter plan relation record.
PM_ENS_ENCNTR_PRSNL_GRP_RELTN	115026	51	Adds encounter personnel group relation record.
PM_ENS_ENCNTR_RELTN_W_PRSNL	100305	104	Adds encounter relation with personnel record.
PM_ENS_ENCOUNTER	101301	51	Adds encounter record.

PM_ENS_HEALTH_PLAN	101601	51	Adds health plan record.
PM_ENS_HEALTH_PLAN_ALIAS	101602	51	Adds health plan alias record.
PM_ENS_NOMENCLATURE	101703	51	Adds nomenclature record.
PM_ENS_ORG_PLAN_RELTN	101409	51	Adds organization plan relation record.
PM_ENS_ORGANIZATION	101401	51	Adds organization record.
PM_ENS_ORGANIZATION_ALIAS	101402	51	Adds organization alias record.
PM_ENS_PERSON	101101	51	Adds person record.
PM_ENS_PERSON_ALIAS	101102	51	Adds person alias record.
PM_ENS_PERSON_INFO	101107	51	Adds person info record.
PM_ENS_PERSON_NAME	101103	51	Adds person name record.
PM_ENS_PERSON_ORG_RELTN	101113	51	Adds person organization relation record.
PM_ENS_PERSON_PATIENT	101104	51	Adds person patient record.
PM_ENS_PERSON_PLAN_RELTN	101114	51	Adds person plan relation record.
PM_ENS_PERSON_RELTN_W_PRSNL	100306	104	Adds person relation with personnel record.
PM_ENS_PHONE	101002	51	Adds phone record.
PM_ENS_PROCEDURE	101701	51	Adds procedure record.
PM_ENS_PRSNL	101201	51	Adds personnel record.
PM_ENS_PRSNL_ALIAS	101202	51	Adds personnel alias record.
PM_ENS_PRSNL_GROUP_RELTN	101205	51	Adds personnel group relation record.
PM_ENS_PRSNL_ORG_RELTN	114393	51	Adds personnel organization relation record.
PM_ENS_TRANSACTION	101131	51	Adds pm_transaction record.
PM_ENS_USER_DEFINED	119959	51	Adds user-defined record.
PM_ESI_LOCATION	119956	51	Adds ESI location record.
PM_ESI_STATISTIC	119958	51	Adds ESI statistic record.
PM_MATCH_PERSON	119995	51	Checks for existing person record.
PM_MATCH_RELATION	101175	51	Checks for existing relation record.

PM_MERGE_PERSON	119902	104	Merges persons together.
PM_PERSON_RECONCILE	119996	48	Tries to reconcile new person with an existing person.
PM_RMV_INSURANCES	101320	51	Removes insurance records.
PM_VAL_ENCOUNTER	100301	104	Checks for existing encounter record.
PM_VAL_HEALTH_PLAN	100601	51	Checks for existing health plan record.
PM_VAL_HEALTH_PLAN_ALIAS	114358	51	Checks for existing health plan alias record.
PM_VAL_NOMENCLATURE	100703	51	Checks for existing nomenclature record.
PM_VAL_ORGANIZATION	100401	51	Checks for existing organization record.
RAD_ADD_UPLOAD_EXAMS	480012	51	Adds exam information to *RadNet* tables for history upload.
RAD_GET_INTERFACE_REF_NBRS	480016	51	Retrieves reference number to update clinical events created by *RadNet* for dictation and transcription messages.
RAD_UPD_REPORT_INTERFACE	480015	51	Updates *RadNet* report tables for dictation and transcription messages.
RX_FSI_GET_ITEM_BY_IDENTIFIER	380830	51	Displays medication_definition item_id, catalog_cd and possible TNF_ID when passed identifier_type_cd, and value.
RX_GET_NEXT_TNF	380021	51	Gets the next tnf ID from the bucket.
SCH_FSI_APPT	651200	51	Adds a new row to the sch_appt_type table.

Server Interactions

Processes making requests to the CPM ESI server (SCP 250) as well as requests made to other servers by the CPM ESI server (SCP 250) are documented below.

Requests Made to the CPM ESI Server (SCP 250)

The table below displays requests made to the CPM ESI server (SCP 250).

Sender of Request (Server/ Application)	Request Number	Request Description	Synch (S) or Asynch (A)	Steps Performed by CPM ESI Server	Data Returned to the Sender
Open Engine (Comserver)	1200002	Oeocfmfnmfn	S	1. Add new or update existing doctor personnel 2. Update or add demographics for person 3. Commit data	Status Block
Open Engine (Comserver)	1200003	Oeocfadtadt	S	1. Process person and encounter information 2. Commit data	Status Block

Open Engine (Comserver)	1200004	Oeocformorm	S	1. Process person and encounter information 2. Commit data 3. Call Order Server with order information	Status Block
Open Engine (Comserver)	1200005	Oeocforuoru	S	1. Process person and encounter information 2. Commit data 3. Call Clinical Event Server with event information	Status Block
Open Engine (Comserver)	1200006	Oeocfrderde	S	1. Process person and encounter information 2. Commit data 3. Call Order Server with order information	Status Block
Open Engine (Comserver)	1200007	Ocfmdmmdm	S	1. Process person and encounter information 2. Commit data 3. Call Clinical Event Server with event information	Status Block
Open Engine (Comserver)	1200008	Oeocfzbhzbh	S	1. Process person and encounter information 2. Commit data 3. Process Blood Bank history upload information 4. Commit data	Status Block
Open Engine (Comserver)	1200009	Oeocfzdmzdm	S	1. Process person and encounter information 2. Commit data 3. Call Clinical Event Server with event information	Status Block
Open Engine (Comserver)	1200010	Oeocfzdmold	S	1. Process person and encounter information 2. Commit data 3. Call Clinical Event Server with event information	Status Block
Open Engine (Comserver)	1200012	oeocforrorr	S	1. Process person and encounter information 2. Commit data 3. Call Order Server with order information	Status Block
Open Engine (Comserver)	1200018	Oeocfbarbar	S	1. Verify BAR message type 2. Validate ALLBARS ensure type on ESI Ensure Parms. 3. Process person and encounter information. 4. Commit data. 5. If P01 message trigger. 6. If ZU1 segments, populate OMF_UB92_FROM_ESI request and call script 7. If ZHF segments, populate OMF_ZHF_FROM_ESI request and call script.	Status Block

Open Engine (Comserver)	1200019	Oeocfdftdft	S	1. Verify DFT message type. 2. Validate DFTBILLCHG or DFTUNBILLCHG on ESI Ensure Parms. 3. Process person and encounter information. 4. Commit data. 5. If P03 message trigger, call AFC server with charge information.	Status Block

Requests Made to Other Servers by CPM ESI

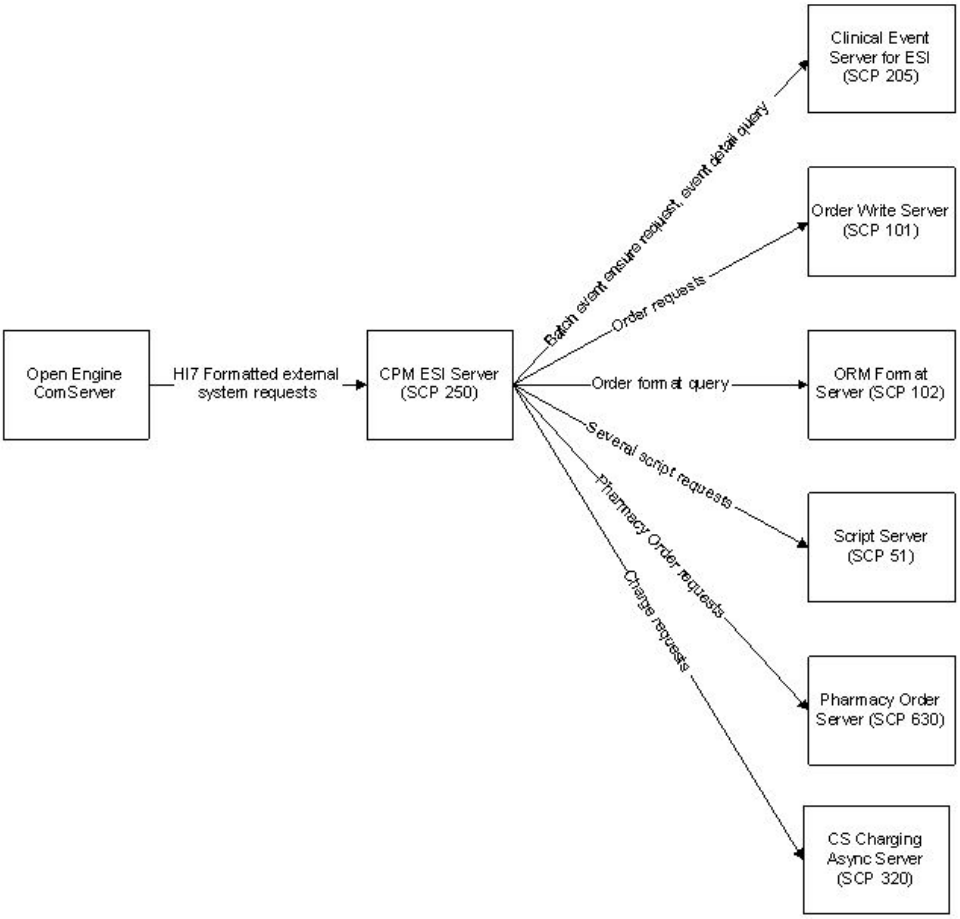
The table below displays requests made to other servers by the CPM ESI server (SCP 250).

Recipient of Request (Client or Server Application)	Request Number	Request Description	Synch (S) or Asynch (A)	Data Returned to the CPM ESI Server	Actions Performed by CPM ESI Server if Recipient Server is not Available
Order Write server	560209	ORM.OrderCancelByEncntr	A	N/A	The server logs a warning in Message Log Viewer.
ORM Format server	560000	ORM.FmtQuery	S	Order details	The server displays a retry error.
Pharmacy Order server	360015	PHA.PyxisDispense	S	Status of the request	The server displays a failure message.
CPM Script	250074	GLB_UPD_LAB_RESULTS	S	Script reply status	The server displays a failure message.
Clinical Event server	1000071	Event_batch_ensure	S	Reply status including	The server logs a failure message.
CS Charging Async server	951093	cs_srvasync.cs_entryevent	A		The server logs a retry message.

Requests Diagram

The following diagram depicts the requests made to and by the CPM ESI server (SCP 250).

The Pharmacy Order (SCP 630) server is obsolete. Instead use the Pharmacy Inbound Dispense (SCP 640) server and related request.



Troubleshooting This Server

This section explains how this server processes transactions and how you troubleshoot issues with those transactions, gives the locations this server uses to log errors and the common errors this server might log, and provides tips on troubleshooting issues you might see with this server.

Troubleshooting Transactions

In *Cerner Millennium*, an application server can accept either request-reply (RR) transactions or reliable datagram model (RDM) transactions, but not both.

A request-reply server accepts a request message from client applications and displays a reply message directly to the client in a synchronous transaction. An RDM server processes transactions asynchronously, retrieving the transaction from a queue but sending no verification to the client application.

This server is a request-reply server. The following section provides more information on troubleshooting this type of server.

Monitoring Shared Services

When a server instance starts and it offers a shared service it registers that service with the Shared Service Proxy. The Shared Service Proxy handles all requests to the service on the node for a given domain. The Shared Service Proxy manages a queue of these transactions in memory.

> **Note**
>
> These volatile queues are different from the queues stored by the Persistent Messaging subsystem.

Use Shared Service Monitor (MON_SS.exe) to view shared service queues in a domain. Shared Service Monitor (MON_SS) reports the depth of queues and the number of messages going through the service.

Shared Service Monitor is useful for diagnosing a server that becomes unresponsive or processes transactions slowly. By running Shared Service Monitor you can see what services on the system are not keeping up with their requests from the client applications.

For more information, see the Shared Service Monitor Utility Reference page.

If a service cannot keep up with the queue of requests, that may be an indication that you need to start additional instances of the server. If additional instances do not alleviate the issue, it may indicate a problem with the server itself or with the transaction it is processing.

Locating and Understanding Error Logging

This server makes use of the logging options described below.

Message Log Viewer

Each server has the ability to write to .mlg files. These files can be viewed with Message Log Viewer (MsgView.exe, local node) or System Message Viewer (SystemMessageViewer.exe, PC GUI). There is a .mlg file for each server and one system.mlg file used by all servers. The system.mlg file contains only error, warning and audit level messages. The server-specific .mlg files contain error, warning, audit and, depending on the log level, info and debug information. The log level is controlled by setting the LogLevel property to a number between 0 and 4. Following are the standard logging levels for servers:

- 0 - error
- 1 - warning
- 2 - audit (default)
- 3 - info
- 4 - debug

The following table details errors that may be logged to Message Log Viewer by the CPM ESI server. The Event Key is displayed in the Event element of a particular message in Message Log Viewer and may be used to search the table in Message Log Viewer to find a specific error. The Event Key is also displayed when the dir Message Log Viewer command is issued. Because the number of characters in the Event Key is limited, the Event Name more fully describes the information from the Event Key. Text describes the error and displays in Message Log Viewer under the <text> heading. User Text displays the suggested action the user should take to resolve the issue, and Admin Text displays the suggested action the system administrator should take to resolve the issue.

Event Key	Event Name	Text	User Text	Admin Text
CPM_esi_Startup		Error occured valiging TDB Entries		
CPM_esi_Startup		new CodeVal() failed in CPM_esi_StartUp()		
CPM_esi_Startup		codeVal->ok() failed in CPM_esi_StartUp()		
CPM_esi_Startup		new AuditHashTable() failed in CPM_esi_StartUp()		
CPM_esi_Startup		auditTable->valid() failed		
CPM_esi_Startup		new ReqFieldHashTable() failed		
esi_Step::GetBbEnsureType		Too many rows returned by query, could not determine table for GetBbtEnsureType		
OrderReq::ProcessOrc		Missing Orc segment		
ESI_RLI_Results::objectInit		DbOpen Failed - now exiting		
ESI_RLI_Results::objectInit		Failure on SrvSelectMessage(250070) - now exiting		
ESI_RLI_Results::objectInit		Failure on SrvSelectMessage(257527) - now exiting		
ESI_RLI_Results::objectInit		Failure on App/Task(250008/250011) - now exiting		
ESI_RLI_Results::getOrdersByAccn		DbExecScript failure on Step250070		
ESI_RLI_Results::getOrdersByAccnAndId		DbExecScript failure on Step250070		

FetchTableVal		Error for following selection `select_request`		
FetchTableVal2		Error - no field match for value `select_request`		
EsiScriptProcessing::getRequest		Missing TDB Entry for Script `req_num`		
ESI_STAT_FAILURE		Failure, `msgId`, `msgType`, `msgTrigger`, {msgCtrlId}}, `beginDtTm`, `endDtTm`, `errorMsg`		
ESI_STAT_TERMINATE		Terminate, `msgId`, `msgType`, `msgTrigger`, {msgCtrlId}}, `beginDtTm`, `endDtTm`, `errorMsg`		

Server-Specific .Out and .Err Files

The server-specific standard out and standard error files are in the cmb_temp directory.

These files contain information that has been redefined through stdout and stderr as defined by the C++ runtime modules. This information is generated by printf and cout statements placed in the code by the developer and can vary in content, quantity and quality.

When a process is started, an .out or a .err file is created in the cmb_temp directory and then deleted. Statements generated by the .com or the .ksh file are included in these files and can be helpful in troubleshooting environmental or image loading problems. Some servers may generate more information if the LogLevel property is set to 4.

Viewing .Out and .Err Files on AIX or HP-UX

To view the files on *AIX* or HP-UX, enter commands similar to the following, where *entryid* is the SCP entry number for the server and *instance* is the server instance number:

Viewing .Out and .Err Files on OpenVMS

On OpenVMS, as long as the server instance that wrote the file is still running, it has the file locked and you cannot open it directly. Complete the following steps to view the contents of a .out or .err file:

1. Set your current working directory to the cmb_temp logical directory to simplify the commands in the steps below. To set your current working directory to the cmb_temp logical directory, enter the following command:
2. Use the OpenVMS "backup" command to copy the contents to a file that is not locked. Enter a command similar to the following, where *entryid* is the SCP entry number for the server and *instance* is the server instance number:

   For example, to create a backup of the .out file for instance 01 of the CPM Script server (SCP 051), enter the following command:
3. To view the files on OpenVMS, enter commands similar to the following, where *entryid* is the SCP entry number for the server and *instance* is the server instance number:

   For example, to view a backup of the .out file for instance 01 of the CPM Script server (SCP 051), enter the following command:

Discern Explorer (CCL) Runtime Log Files

Runtime log files are *Discern Explorer* (CCL) run-time log files that are created by all processes that connect to *Discern Explorer* (CCL). The level of detail in the run-time log files is dependent on settings used during connection to *Discern Explorer* (CCL). By default, the cpmstartup CCL script is invoked for each server that connects to the RDBMS.

More detailed information is logged to the *Discern Explorer* (CCL) run-time log files when cpmstartup_test or cpmstartup_debug is used for the server startup. To start the server through the cpmstartup_test script, set the property as follows:

This is displayed in the properties section after a "show entryid"
command as follows:

Setting the Startup Script property to **debug** also increases the level of detail in the log file, but test is useful for most troubleshooting purposes.

The cpmstartup_test script turns on call echo statements from *Discern Explorer* (CCL). Cpmstartup_debug turns on call echoes as well as echo record, which dumps any internal record structures to the runtime log file.

CCL messages logged in the runtime log files can be found in the Troubleshoot Discern Explorer Reference Page. For information about viewing a server's runtime log file, see the Troubleshoot Cerner Millennium Back-End Servers Reference Page.

Basic Troubleshooting for this Server

The Troubleshoot Cerner Millennium Back-End Servers Reference page serves as a guide to troubleshooting servers using the layered approach.

Effects on Other Servers and Applications

When one server encounters a problem, the symptom may be experienced in a client application or another server. The following table lists other applications, functionality, or servers that can be affected if the CPM ESI server is not available:

Affected Applications or Servers	Symptom Experienced
Open Engine COM servers (OEN_SrvCom)	COM server logs an error indicating that the message it is sending cannot be de-queued. The COM server then performs its recovery step for that error. By default, the COM server's recovery step is to terminate.

Troubleshooting Steps for the CPM ESI Server (SCP 250)

Follow the steps below when working through an issue with the CPM ESI server (SCP 250).

> **Note**
>
> The most common problem is a failed transaction.

1. Set the Debuglogging property to **4** in SCP and cycle the ESI Server (SCP 250).
2. Identify the bad transaction and send it again.
3. Find the processing of the transaction in the cmb_1274_*.out file and find the error message logged.
4. Refer to error references to determine the cause of the error message.
5. Fix the problem indicated by the error message.
6. When the issue is finished set the Debuglogging property back to the previous value before beginning the troubleshooting process.

Recovery

The CPM ESI server (SCP 250) commits data at various points in processing. Care has been taken to make sure that data is committed in a way that does not cause data issues if the server terminates during processing. After fixing the problem that caused the server to terminate, you usually only need to re-send the transaction that was in process when it terminated.

Other Useful Utilities

The *Discern Explorer* (CCL) utilities listed below may be useful when troubleshooting. The ESI_CONFIG_AUDIT, ESI_LOG, ESI_AUDIT, and ESI_CODE_VALUES can be accessed through the ESI_MENU utility.

Utility	Description
ESI_CONFIG_AUDIT	Provides a back-end tool that shows the configuration of contributor systems feeding the CPM ESI server. This is useful when SI Manager (SIManager.exe) or the ESI Configuration Tool (ESIConfigTool.exe) is not available on the front end. Note that this tool is an audit only and does not provide any ability to alter a feed configuration.
ESI_AUDIT	Provides several options to view transactions and identify performance numbers for different contributor systems.
ESI_LOG	Provides an audit of each transaction processed based on the logtable_flag setting. It also provides various reports.

ESI_CODE_VALUES	Displays the code values added by ESI.
ESI_STATISTICS	Provides various statistics captured by ESI on a given day, for example, number of persons add and updated.

Configuration Caching Errors

In order to perform alias translations and to improve system performance, the CPM ESI Server builds a cache of aliases by performing SELECTs and JOINs against such tables as: Code Value, ESI Alias Trans, ESI Ensure Parms, Contributor system, and Match Tag Parms. In rare instances an error can lock a row, which causes the SELECT query to display an error. The ORA-4021 *Oracle* error was first noted, but it can occur with any error displayed as a failure to the calling SELECT statement. If the locked row occurs on the ESI Alias Trans table, the system cannot perform matching on the person or the encounter. The system assumes a new person or encounter is being sent inbound, and it writes a new row to the database.

The system is hardened against all SELECT errors that display a failure. Instead of continuing, the server logs an error in Message Viewer (MSGView.exe) and stops processing. This action allows you to resolve the error and to restart the server. An error could be written to Message Viewer (MSGView.exe) like the example below.

```
Error in EsiHashTable::RefreshHash. Exiting Server
```

This message indicates the error was in the EsiHashTable::RefreshHash method, and the server plans to exit or stop functioning.

Maximizing Performance

There are several things about a server that can affect performance and stability. The settings defined for a server affect performance, so an awareness of the amount of logging and additional processing that a server is doing is beneficial. Recommendations for settings that can maximize the performance of this server are detailed in this section.

CPU and Memory

There are several things about a server that can affect performance and stability. The settings defined for a server affect performance. Thus being aware of the amount of logging and additional processing that a server is doing is beneficial. Recommendations for settings that can maximize the performance of this server are detailed in this section.

Cache

Table	Cached on Startup	Cached Over Time
ABSTRACT_FIELD_DEF	X	
BILL_ITEM	X	
CODE_VALUE	X	X
CODE_VALUE_ALIAS*	X	X
CODE_VALUE_EXTENSION**	X	X
CONTRIBUTOR_SYSTEM	X	
ESI_ALIAS_TRANS	X	
ESI_ENSURE_PARMS	X	
MATCH_REAL_PERSON	X	
MATCH_TAG_PARMS	X	

OE_FIELD_MEANING	X	
ORDER_ENTRY_FORMAT	X	
PERS_MATCH_TAG_PARMS	X	
QRY_UNIQUE_ID	X	
V500_EVENT_CODE	X	

Only the following code sets are cached: 4, 13, 14, 21,23, 24, 25, 40, 43, 48, 54, 63, 65, 72, 87, 93, 103, 120, 212, 213, 222, 261, 302, 309, 314, 315, 316, 317, 318, 320, 324, 331, 333, 338, 339, 350, 351, 353, 355, 362, 370, 382, 396, 400, 401, 754, 1004, 1901, 1902, 6004, 14093, 14113, 14128, 14232, 15769, 17829

*Code sets cached: 1, 2, 3, 4, 8, 9, 14, 15, 19, 20, 23, 24, 25, 27, 32, 36, 38, 40, 43, 49, 50, 52, 53, 54, 57, 59, 60, 61, 63, 66, 67, 72, 73, 74, 87, 89, 200, 212, 213, 220, 267, 289, 302, 319, 320, 323, 333, 339, 348, 349, 351, 354, 367, 374, 386, 387, 400, 401, 1004, 1011, 1021, 1095, 1901, 1902, 1905, 2051, 2052, 2053, 2054, 4001, 4003, 6003, 6004, 6010, 14003

**Code sets cached: 356, 17829, 18309

Logging

The system messages logged by this server can slow the performance of the system. Logging increases the amount of I/O on the system and decreases the amount of available drive space.

As a general rule, minimize logging by the CPM ESI server using SCP controls. For a production environment, apply the following rules or performance may be an issue. The SCP entry that follows these rules is 250.

1. Set the **debuglogging** property to 0. This stops the cout logging to the CMB_TEMP:**.OUT (VMS) or $cmb_temp/**.out (*AIX* or HP-UX) files.
2. Set the **msgview** property to 0. This stops all logging except errors in the system.mlg file for the CPM ESI server.
3. Change any Startup Script=esidbg to Startup Script=esi. This disables the script CALL ECHO statements from logging to the SRVRTL files.

Considerations for Multiple-Node and Multiple-Instance Usage

Server Capability

The CPM ESI server (SCP 250) can run on one or more nodes, with each node having one or more instances of the server, per domain. This is normally done in combination with multiple Open Engine COM servers in a load balancing configuration.

Single Node / Single Instance	Single Node / Multiple Instance	Multiple Node / Single Instance	Multiple Node / Multiple Instance
			Current State

System Maintenance

System maintenance affects the performance and stability of the system. The following topics describe the types of system maintenance tasks related to this server.

Purge Programs

The following purge programs are required for the CPM ESI server (SCP 250):

Program	Frequency	Description
Esi_purge_log_table	As needed	This program purges the ESI_LOG table of records greater than the number of days old specified. The default is four days old.

Audits and Reports

The following audits and reports can be used:

Audit or Report	Frequency	Description
ESI_AUDIT	As needed	This audit provides information useful for troubleshooting problems and performance issues.

Other Maintenance Tasks

No additional maintenance tasks required for the CPM ESI server (SCP 250).