Enterprise Messaging Infrastructure

Veteran Interoperability and Integrations

Resident Assessment Instrument

Minimum Data Set (RAI/MDS)

Message Flow

Service Integration Design Document



Department of Veterans Affairs

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Version 1.0

Revision History

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# Introduction

The Resident Assessment Instrument/Minimum Data Set (RAI/MDS) is a standardized assessment and treatment planning process designed to identify the functional and healthcare needs of the Veteran and to help develop a plan of care where services are individualized to meet the needs of each resident. The Veteran’s Administration (VA) Community Living Centers (CLCs) offer a dynamic array of short-stay and long-stay non-acute services for Veterans who are medically and psychiatrically stable. Caribou CLC Suite is the application used by VA Geriatrics and Extended Care (G&EC) Services for the RAI/MDS. VA Enterprise Messaging Infrastructure (eMI) and a Veterans Affairs Information Systems and Technology Architecture (VistA) Service Oriented Architecture (VSOA) layer will facilitate communications between VistA and Caribou CLC Suites.

## Purpose

The purpose of the Service Integration Design Document (SIDD) is to outline the integration details for RAI/MDS including the message flow, transport protocol, operations, service registry requirements and service governance.

## Scope

The scope of this Service Integration Design Document (SIDD) is to address interoperability between VistA, Caribou CLC Suites, RAI/MDs, and eMI.

The scope items include, but are not limited to:

1. Message Types
2. Validation
3. Ports and Protocol
4. Transformation
5. Error Handling
6. Routing
7. Security

The details of the above are described in the following sections. The common architectural specifications, such as security, logging, exception handling, and detailed architecture of eMI, VistA, Caribou CLC Suites, and RAI/MDs are not in the scope of this document.

## Audience

This document provides implementation details for project owners and serves as a blueprint for managers, architects, developers, and testers building the system. It is assumed that the readers have a moderate knowledge of Message Broker and RESTFul services.

## References

eMI Software Design Document is accessible on the VA eMI SharePoint site.

# Interface Requirements

Table 1 lists the software interfaces that are implemented.

Table 1 - Logical High-Level Message Transmission Flows

| Application | Interface |
| --- | --- |
| VSOA 🡪 eMI | Utilizes RESTFul web service messaging endpoint to transmit a Web Service call over HTTPS transport protocol to an eMI web service messaging endpoint. |
| eMI 🡪 Caribou CLC | Utilizes RESTFul web service messaging endpoint to relay a request over HTTPS transport protocol to Caribou CLC Suite. |
| Caribou CLC 🡪 eMI | Caribou CLC responds to the request from eMI over HTTPS transport protocol with a Web Service RESTFul message payload. |
| eMI 🡪 VSOA | eMI relays response payload over HTTPS transport protocol back to VSOA |

## Business Unit

Data moves between eMI, VSOA, and Caribou CLC. Table 2 and table 3 list the point of contact (POC) information for those systems

Table 2 - Caribou Business Unit

| Caribou CLC Suite Business Unit | |
| --- | --- |
| Agency | Veteran’s Administration |
| Receiving Application | Caribou CLC Suite |
| POC Name |  |
| Title | Chief Architect |
| Address |  |

Table 3 - VistA Business Unit

| VistA Business Unit | |
| --- | --- |
| Agency | Veteran’s Administration |
| Sending Application | VSOA |
| POC Name |  |
| Title | Principle Architect and Manager |
| Address |  |

## 

## Service Level Agreement Metrics

Table 4 lists the Service Level Agreement (SLA) metrics for the RAI/MDS service interface.

Table 4 - SLA Metrics

| SLA Type | SLA Data |
| --- | --- |
| Number of messages/day | 850 messages |
| Average Message size | 50 kilobytes (kb) to 10 megabytes (MB) |
| Data Type | RESTFul Web Service |
| Throughput | .01 messages per second |

## Message Type Metrics

Table 5 lists the message metrics based on message types.

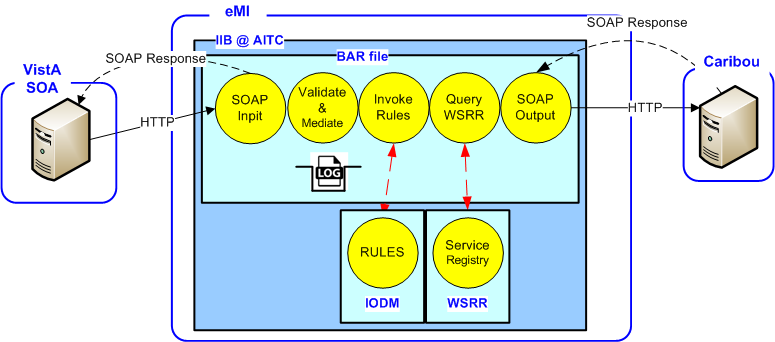
Table 5 - Message Type Metrics

| Message Type | Estimated Message Size in kb |
| --- | --- |
| RESTFul Web Service | 50 kb to 10 MB |

Logical System Overview

The eMI system provides connectivity for service consumers and providers in and out of the VA. This document provides details, in particular, for the integration of Caribou CLC Suite and VistA SOA Suite (VSOA).

Figure 1 -VSOA-eMI-Caribou Logical system Overview

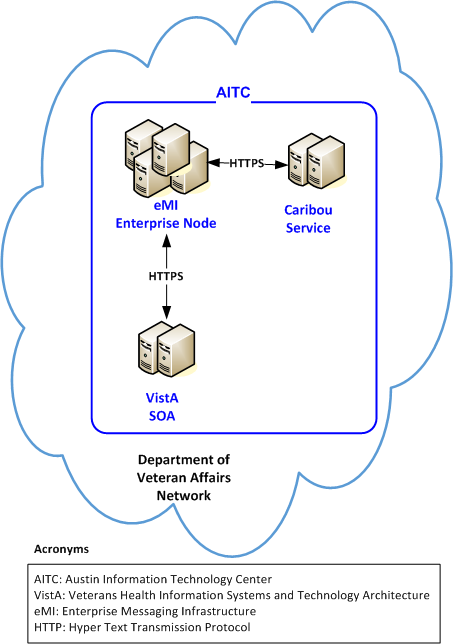


1. The VSOA service initiates a RESTFul Web Service call to RAI/MDS message flow hosted on eMI instance at AITC.
2. The eMI RAI/MDS message flow validates input data for data compliance.
3. The eMI RAI/MDS message flow mediates input data if necessary to conform to Caribou Service Definition.
4. The eMI RAI/MDS message flow invokes routing rules to route to Caribou system.
5. The eMI RAI/MDS message flow queries WebSphere Service Registry and Repository (WSRR) for Caribou Service Endpoint that includes server name and port.
6. The eMI RAI/MDS message flow forward a RESTFul Web Service call to Caribou Service.

## Logical Deployment Overview

The eMI message broker hosts the message flow that listens on a configurable port for RESTFul Web Service call from VSOA and Caribou Service over Hyper Text Transmission Protocol (HTTPS). Figure 2, shows the boundaries, gateway, and locations of sending and receiving systems.

Figure 2 - VSOA - Caribou - eMI Logical Deployment View

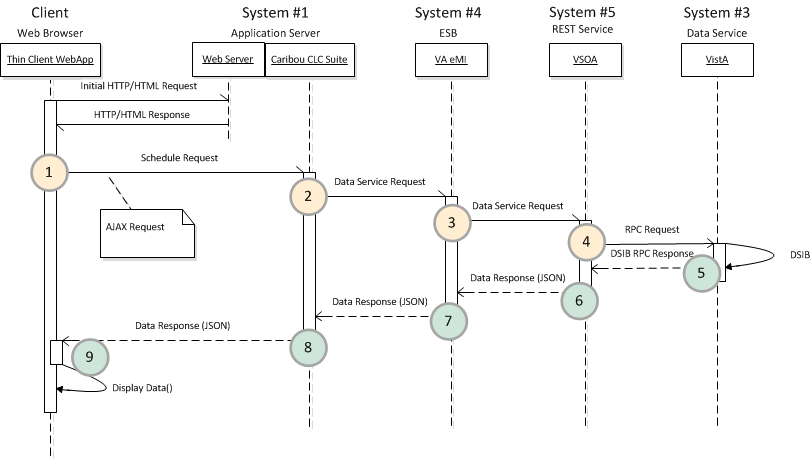


## RAI/MDS - eMI Interface Requirements

1. The eMI system shall exchange data between VSOA and Caribou Services.
2. The eMI system shall receive data request and response via HTTPS from VSOA.
3. The eMI system shall receive data request and response via HTTPS from Caribou Service.
4. The eMI system shall interface with VSOA and Caribou system through RAI/MDS Message Flow using Caribou Service and VSOA Service Description defined in the Interface Control Document.
5. The eMI system shall ensure a secured connection with VSOA and Caribou CLC Suite by means of two-way Secure Sockets Layer (SSL) encryption.

# Nominal RAI/MDS Message Flow

Figure 3 - Nominal RAI/MDS Message Flow



1. Caribou CLC Suite (Application Server) receives the request and forwards the request to eMI via HTTP.
2. eMI Server receives the request and processes the request by locating the VSOA service provider and forwarding the request to be handled by the VSOA service provider.
3. VSOA receives the eMI request and inspects and maps the request to a VistA RPC session and invokes the VistA RPC method mapped to the given web service request.
4. VistA receives the request via RPC invocation.
5. Upon receipt of the JSON formatted response, VSOA returns the response to eMI.
6. eMI responds to Caribou CLC Suite with JSON formatted response.
7. Caribou CLC Suite Application Server receives the VA eMI response and completes the data service request by providing the response to the Thin Client.

# RAI/MDS Message Flow Design

The following section refers to the RAI/MDS design aspects.

## Architecture Deviations

There are no architectural deviations.

## Pattern

The RAI/MDS message flows are based on the IBM Service Proxy pattern. See section 5 for a detailed explanation of the flow.

## Protocol

The RAI/MDS integration service uses the protocols described in Tables 6, 7, 8 and 9 to interface with the sending and receiving systems.

Table 6 - Caribou CLC Suite to eMI Interface

| Caribou to eMI | |
| --- | --- |
| Protocol: | HTTP over TLS |
| Message Type: | JSON |
| Caribou CLC Hostname: | TBD |
| eMI Hostname: | Austin Information Technology Center (AITC) Load balancer: |

Table 7 - eMI to VSOA Interface

| eMI To VSOA | |
| --- | --- |
| Protocol: | HTTP over TLS |
| Message Type: | JSON |
| eMI Hostname: | AITC Message brokers |
| VSOA Hostname: | TBD |

Table 8 - VSOA to eMI Interface

| VSOA to eMI | |
| --- | --- |
| Protocol: | HTTP over TLS |
| Message Type: | JSON |
| VSOA Hostname: | TBD |
| eMI Hostname: | AITC Load balancer |

Table 9 - eMI to Caribou CLC Interface

| eMI to Caribou CLC Suite | |
| --- | --- |
| Protocol: | HTTP over TLS |
| Message Type: | JSON |
| eMI Hostname: | AITC Message brokers |
| Caribou CLC Hostname: | TBD |

## Message Routing

Requests to the eMI RAI/MDS Message Flow are routed by means of dynamic WSRR RESTFul Service endpoint lookup. The destination URL for the Caribou service provider is obtained from the WSRR governance repository. Subsequently, the message flow uses the destination URL to route the inbound request to the proper RESTFul endpoint.

## Transformation

The following sections document the various transformations for the eMI RAI/MDS message flow.

### Protocol Transformation

Protocol transformation is not applicable to the eMI RAI/MDS message flow.

### Protocol Transformation

Data transformation is not applicable to the eMI RAI/MDS message flow.

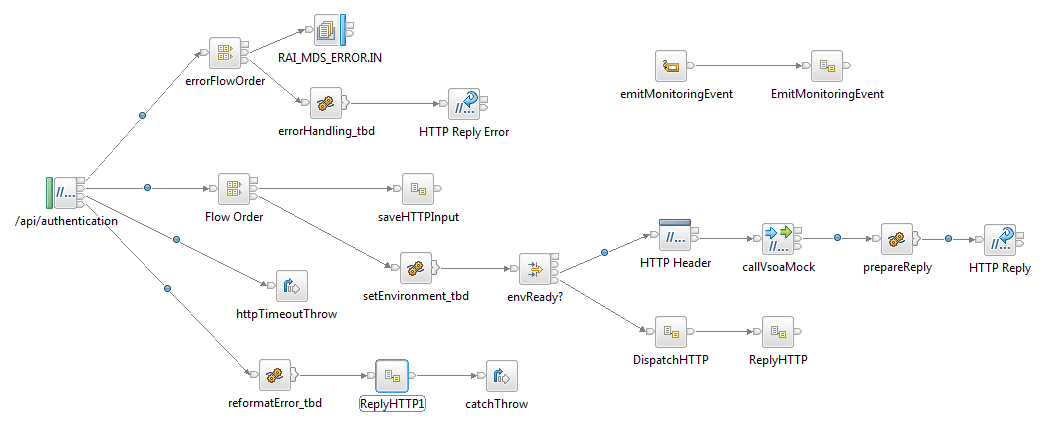
# Implementation Details

For the eMI RAI/MDS message flow, there is only one component that runs on the eMI Enterprise Node at AITC, which receives data requests from VA systems inside the VA network.

## RAI/MDS Message Flow

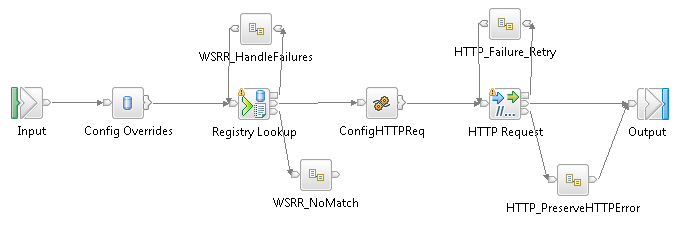
The eMI RAI/MDS Message Flow is implemented using one primary message flow and several subflows from the eMI Services Library. The RAI/MDS Message Flow uses a common message flow pattern that proxies RESTful (GET) API to VSAO and Caribou Web Service. It leverages the eMI Services Library to look up endpoints and consume the target service, and it leverages common error handling and logging mechanisms. It preserves the global, parent and local transaction ids, and query string, which enable the detailed level auditing of transactions. Additionally, it is the central place where all the errors are reformatted and sent back to the consumer based on the error code dictionary. The flow is described in detail below

Figure 4 - RAI/MDS Main Flow



The RAI/MDS Main flow is used to set up environment variables, to process request/response, and to handle exception.

Figure 5 - DispatchHTTP Sub flow



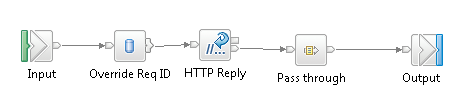
DispatchHTTPSubflow

The Dispatch HTTP subflow is used to retrieve the target service endpoint URL from WSRR and consume the associated service. Should an error occur while connecting to WSRR or the target service, the subflow is designed to perform a retry based on user-defined properties. Any error that occurs after successful connection to WSRR or the target service is re-thrown to the main flow, formatted to the canonical model, and sent to consumer.

## Receiver Flows

RAI/MDS message flow use sub flows to handle responses coming from VSOA and Caribou CLC Suite using synchronous RESTFul web service endpoints. Each response from the service provider is processed within the same HTTP request/response cycle as the associated request.

Figure 6 – ReplyHTTP Subflow



ReplyHTTPSubflow

## Error Handling Flows

The RAI/MDS message flow leverages common error handling mechanisms defined in the eMI Services Library. Details of the eMI Services Libraries are documented in the eMI SDD.

## Project Configuration File

The RAI/MDS message flow will leverage a project configuration file for project configurable parameters.

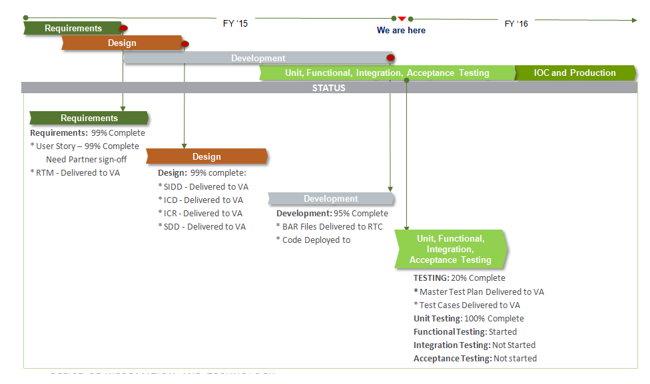
## Queue Details

TBD

# Timeline

Figure 7 shows the timeline for the eMI RAI/MDS Message Flow Implementation

Figure 7 - Implementation Timeline



# Acronyms

Table 10 - Acronyms

| Abbreviation/Term | Definition |
| --- | --- |
| AITC | Austin Information Technology Center |
| DES | Data Exchange Service |
| DMIX | Defense Medical Information Exchange |
| DoD | Department of Defense |
| eMI | Enterprise Messaging Infrastructure |
| ESS | Enterprise Shared Service |
| IIB | IBM Integration Bus |
| LOINC | Logical Observation Identifiers Names and Codes |
| QoS | Quality of Service |
| SDD | System Design Document |
| SIDD | Service Integration Design Document |
| SLA | Service Level Agreement |
| SOA | Service Oriented Architecture |
| SSL | Secure Sockets Layer |
| VA | Veterans Affairs |
| VII | Veterans Interoperability and Integration |
| WSRR | WebSphere Service Registry Repository |

1. Architecture Design Decisions

The eMI RAI/MDS message flow has not deviated from any recommended or standard patterns defined by IBM or Enterprise Shared Services.

1. Message Flow Documentation

The following PDF attachment contains the documentation generated by the IBM Integration Bus Toolkit for the RAI/MDS message flow:

1. Message Mapping

The RAI/MDS ICD document attached here describes Caribou and VSOA RESTFul API, which the eMI RAI/MDS message flow supports.

1. Outstanding Issues

The RAI/MDS Message Flow does not have any outstanding issues.

1. Approval Signature

REVIEW DATE:

Signed: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Integrated Project Team (IPT) Chair Date

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IT Program Manager Date

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Project Manager Date