# VAR Utility v1.0.0 - System Design Document (SDD) Addendum

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# ****Mobile Application System Design Document (SDD) Addendum****

The System Design Document (SDD) is a dual-use document that provides the conceptual design as well as the as-built design. This document will be updated as the product is built, to reflect the as-built product. Per the Project Management Accountability System (PMAS) Guide, the SDD with conceptual design is required prior to the Milestone 1 Review. The as-built for each delivery must be incorporated prior to the Milestone 2 Review.

# ****Mobile Application Information****

Project Increment / Release Designation: VAR Utility Application

Product Version:  1.0.0

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Veteran** | **Care Giver** | **Provider** | **Public** |
| Intended Audience for Mobile Application |  |  | X (Scheduling Clerks) |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Question** | **Yes** | **No** | **If Yes, what information / data** | **If yes, then identify any consumer or source system(s) for the data** |
| Does the user enter information or data into the mobile application? | X |  | Custom Messages, Request and Direct Scheduling Eligibility Criteria | VAR Utility Services (MongoDB) |
| Does Mobile Application store information or data entered by the User? If yes, where is it stored? | X |  | Custom Messages, Request and Direct Scheduling Eligibility Criteria | VAR Utility Services (MongoDB) |
| Does Mobile Application transmit/push data entered outside of the VAMF to VA? |  | X |  |  |
| Does Mobile Application pull data from a VA Database (external to VAMF)? |  | X |  |  |
| Does the Mobile Application store in the VAMF or on the device data pulled from a VA Database? |  | X |  |  |

**This application can be classified as one of the following:**

|  |  |
| --- | --- |
| **Mobile Application Classification (Only one box may be checked)** | **Mark with X** |
| 1 – Very Low: Mobile Application does not use VA Resource |  |
| 2 – Low: Read only access to VA Resource(s) (No PII / PHI) |  |
| 3 – Medium: Write access to VA Resource(s) | X |
| 4 – High: Read and/or Write access of sensitive data to VA Resource(s) (Includes PII/PHI/other sensitive) |  |

# ****Application Design****

## ****Design Principles and Patterns****

* Single Page Application - Single Page Application design pattern will be leveraged.
* Application Specific Dependencies - External REST service dependencies are managed through application specific resource directory (resource-directory.json) packaged with the application.  Each REST service endpoint is defined with a "title" and "href".  For convenience, all the dependencies are identified in the VAMF Interfaces section.
* REST Conventions - The application works with data using HTTP verbs.  GET is used for retrieving data, POST is used for creating or processing data, PUT is used for updating data and DELETE is used for deleting data.
* Exception Handling using HTTP standards - Exception handling is performed based on HTTP status codes.  Bad Request (status code 400) is handled at the Model or Resource level.  Internal Server Error (status code 500) is handled globally within the application.
* Leveraging common VAMF Services such as Authorization Services and Metric Services.

## ****Veteran Appointment Requests (VAR) Utility Application****

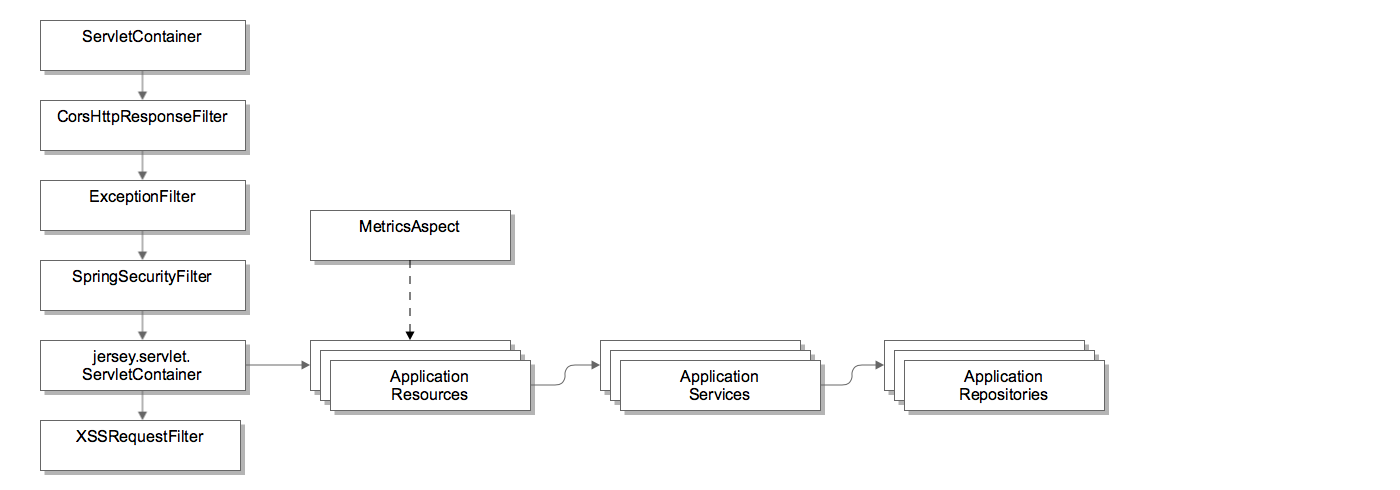
The **VAR Utility** application provides Facility Administrators the ability to configure the following items for a Facility.  Configurations affect all subdivisions of the Facility.  Configuration values are stored in the VAR Utility database in MongoDB.  In operation, the **VAR** application reads the configured values from MongoDB, and sets the veterans eligibility accordingly.

1. **Direct Booking Eligibility Criteria**:  configures the criteria governing the eligibility of veterans to schedule an appointment directly.
2. **Request Eligibility Criteria**:  configures the criteria governing the eligibility of veterans to request an appointment.

## ****Conceptual Perspective****

The Component diagram below depicts the chief components of the **VAR Utility** application.  Description of each component is provided in the accompanying table.

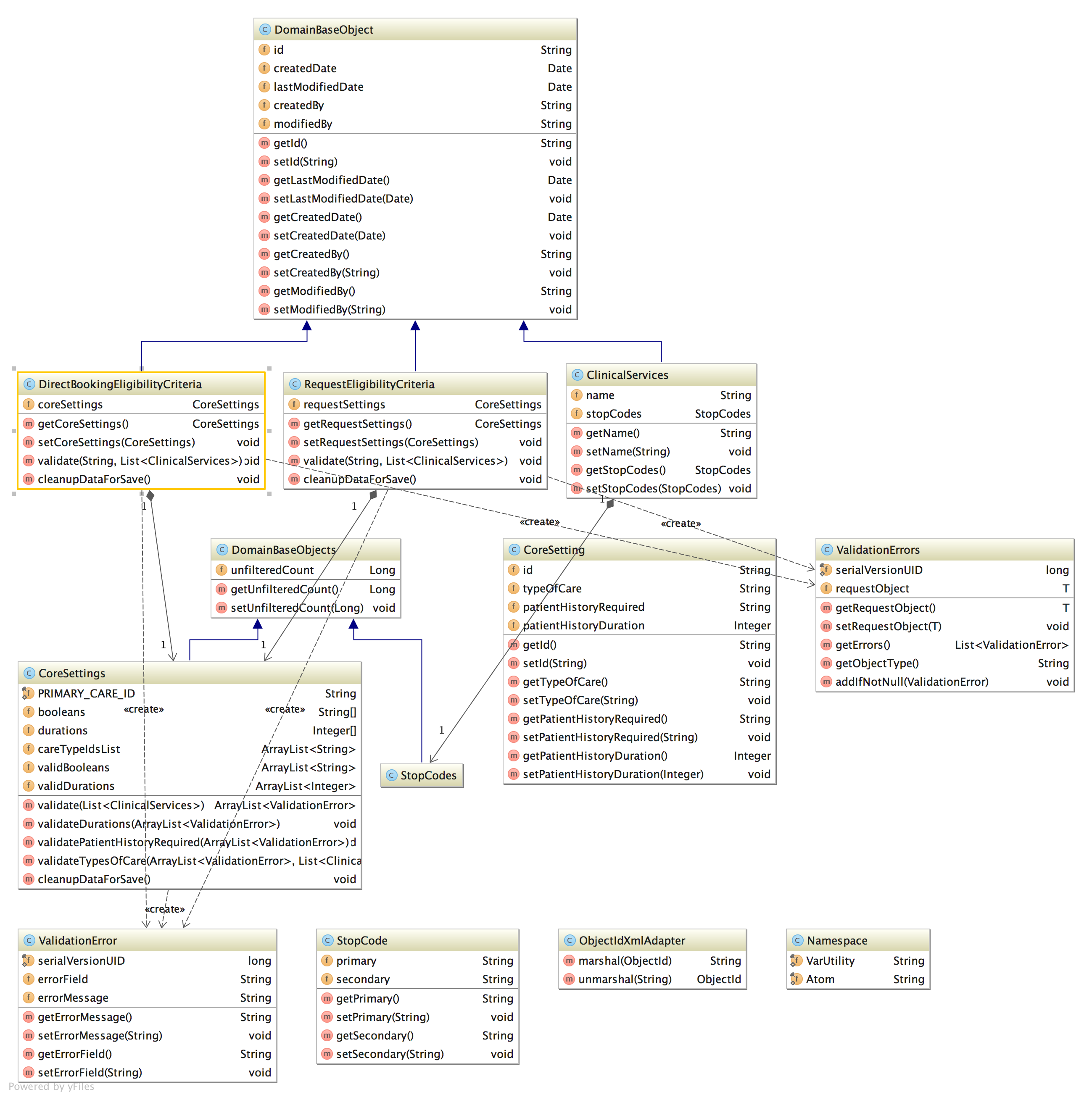
### ****Component Diagram****

****

|  |  |
| --- | --- |
| **ServletContainer** | ServletContainer provides the runtime for the Jersey Servlet acting as the entry point for HTTP requests. |
| **CorsHttpResponseFilter** | CORSHttpResponseFilter adds headers to support Cross-Origin Resource Sharing allowing invocation of ajax calls from multiple domains. Fully qualified domain with scheme will be configured for Production. |
| **ExceptionFilter** | ExceptionFilter captures runtime exceptions and returns 500 HTTP responses without a Java stack trace based on WASA recommendations. |
| **SpringSecurityFilter** | SpringSecurityFilter (DelegatingFilterProxy) is used for role-based access control and authorization. |
| **jersey.servlet.ServletContainer** | jersey.servlet.ServletContainer is the Jersey Framework's servlet that provide a framework to expose the REST resources and handle request/response processing. |
| **XSSRequestFilter** | XSSRequestFilter checks for Cross Site Scripting in Query Parameters, Headers and Cookies. It uses Jsoup library and uses whitelist mechanism to identify the malicious code. |
| **Metrics Aspect** | MetricsAspect uses Metrics library to capture REST calls metrics and publishes metrics results to a Beanstalk message queue. |
| **Application Resources** | Application Resources implement the REST endpoints for the application. Multiple Application Resources are implemented for different Domain objects involved. Additional details on each Application Resource are provided in the following sections. |
| **Application Services** | Application Services implement the Service layer and delegate the persistence implementation to the Application Repositories. Multiple Application Services are implemented, one for each Domain object involved. |
| **Application Repositories** | Application Repositories provide the abstraction to the persistence data stored in MongoDB. |

The Class diagram below provides a high-level classification of objects used in the **VAR Utility** application.  The two main objects are the **DirectBookingEligibilityCriteria** and **RequestEligibilityCriteria** which encompass the main objective of the application.

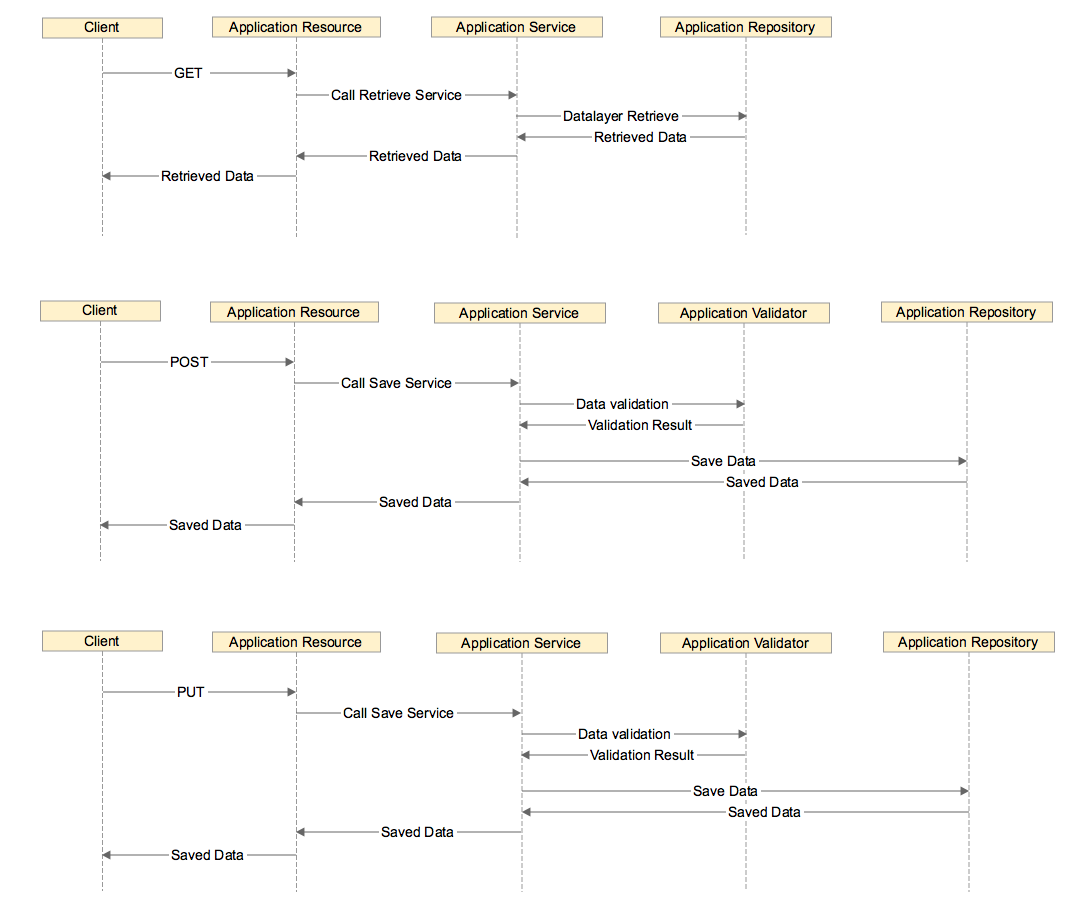
### ****Class Diagram****

****

## ****Logical Perspective****

Generic Sequence diagrams for REST calls are depicted below for each REST operation.  Only GET, POST, and PUT operations are implemented.  DELETE operation is not used in this application.  The accompanying table below that provide details on each call.

### ****Sequence Diagram****

****

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **REST Method** | **Application Resource** | **Application Service** | **Application Repository** | **Retrieve Service** | **Retrieve Datalayer** |
| GET | DirectBookingEligibilityCriteriaResource | DirectBookingEligibilityCriteriaService | DirectBookingEligibilityCriteriaRepository | fetchDirectBookingEligibiltyCriteria() | directBookingEligibilityCriteriaRepository.findById() |
| GET | RequestEligibilityCriteriaResource | RequestEligibilityCriteriaService | RequestEligibilityCriteriaRepository | fetchRequestEligibiltyCriteria() | requestEligibilityCriteriaRepository.findById() |

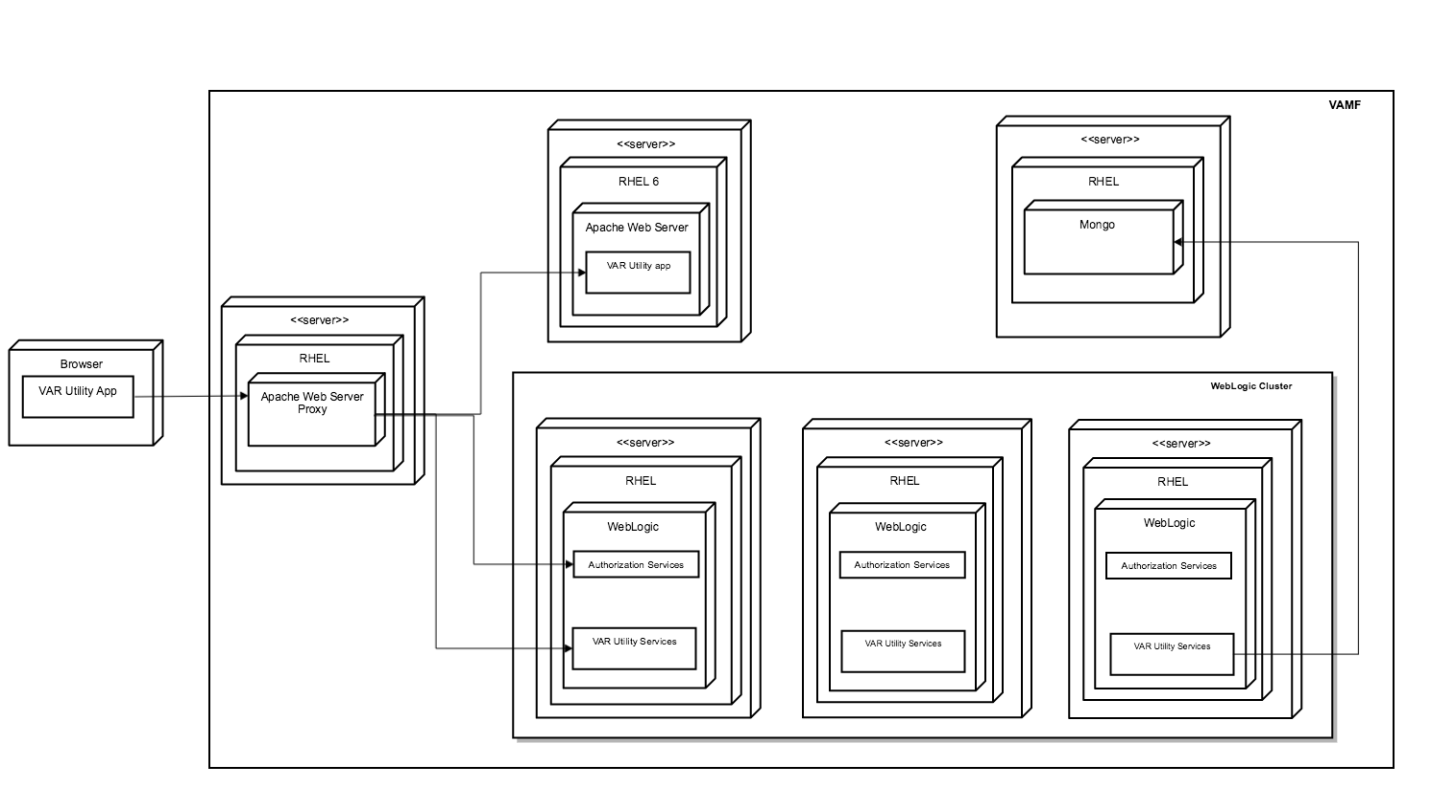
|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **REST Method** | **Application Resource** | **Application Service** | **Application Validator** | **Application Repository** | **Save Service** | **Validate Data** | **Save Datalayer** |
| POST | DirectBookingEligibilityCriteriaResource | DirectBookingEligibilityCriteriaService | CoreSettings | DirectBookingEligibilityCriteriaRepository | save() | CoreSettings.validate() | directBookingEligibilityCriteriaRepository.save() |
| POST | DirectBookingEligibilityCriteriaResource | DirectBookingEligibilityCriteriaService | CoreSettings | RequestEligibilityCriteriaRepository | save() | CoreSettings.validate() | requestEligibilityCriteriaRepository.save() |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **REST Method** | **Application Resource** | **Application Service** | **Application Validator** | **Application Repository** | **Save Service** | **Validate Data** | **Save Datalayer** |
| PUT | DirectBookingEligibilityCriteriaResource | DirectBookingEligibilityCriteriaService | CoreSettings | DirectBookingEligibilityCriteriaRepository | save() | CoreSettings.validate() | directBookingEligibilityCriteriaRepository.save() |
| PUT | DirectBookingEligibilityCriteriaResource | DirectBookingEligibilityCriteriaService | CoreSettings | RequestEligibilityCriteriaRepository | save() | CoreSettings.validate() | requestEligibilityCriteriaRepository.save() |

## ****Physical Perspective****

Deployment of the **VAR Utility** application is depicted in the Deployment diagram below.  The application front-end code runs in the client browser, and the application backend code is deployed into a Weblogic cluster as depicted by the multiple overlapping layers.

### ****Deployment Diagram****

****

## ****VAR Utility Modules****

The VAR Utility application features are implemented as modules.  Application modules are described below with a high-level description.  Detailed requirements are defined in the User Stories.

### ****Sites (Facilities) Supporting VAR****

The **siteSupportingVAR** collection holds a list of Sites (Facilities) registered as supporting the VAR application.  Currently this collection is populated and maintained by importing a json document into MongoDB.  No UI component is implemented.  The **siteSupportingVAR** collection data structure is illustrated below.   A sample [**sites-supporting-var.json**](file:///C:\download\attachments\52429468\sites-supporting-var.json%3fversion=1&modificationDate=1469630771000&api=v2) file is provided here.

**SiteSupportingVAR**

{

\_id: Site (Facility) ID Primary Key

name: Site name

}

### ****Clinical Services****

This is the list of all clinical services supported by VAR.  Clinical services are stored in the **clinical-services** collection in MongoDB.  Currently this collection is populated and maintained by importing a json document into MongoDB.  No UI component is implemented. The **clinical-services** collection data structure is illustrated below.  A sample [**clinical-services.json**](file:///C:\download\attachments\52429468\clinical-services.json%3fversion=3&modificationDate=1470660300000&api=v2) file is provided here.

**Clinical Services Collection**

{

\_id: Clinical Service ID Primary Key

name: Clinical Service Name

stopCodes: [

{

primary: Primary Stop Code

secondary: Secondary Stop Code

},

...

...

]

submittedRequestLimit: Submitted Request Limit

}

### ****Direct Booking Eligibility Criteria****

Direct booking eligibility criteria defines the conditions allowing patients to directly book appointments with VA using the VAR app.  Direct booking eligibility criteria is stored in the **directBookingEligibilityCriteria** collection in MongoDB.   The **directBookingEligibilityCriteria** collection data structure is illustrated below.

**Direct Booking Eligibility Criteria**

{

\_id: Site ID. The Facility (Site) ID is used as Primary Key

coreSettings: [

{

id: Clinical Service (Type of Care) ID,

typeOfCare: Clinical Service Name,

patientHistoryRequired: "Yes", "No", "", or null. NOTE: "" or null means this Clinical Service is not supported in this Facility.

patientHistoryDuration: Integer - Number of days

},

...

...

]

lastModifiedDate: Date of last modification

modifiedBy: Modification User

}

### ****Request Eligibility Criteria****

Request eligibility criteria defines the conditions allowing patients to request appointments with VA using the VAR app.  Request eligibility criteria is stored in the **requestEligibilityCriteria** collection in MongoDB.   The **requestEligibilityCriteria** collection data structure is illustrated below.

**Request Eligibility Criteria**

{

\_id: Site ID. The Facility (Site) ID is used as Primary Key

requestSettings: [

{

id: Clinical Service (Type of Care) ID,

typeOfCare: Clinical Service Name,

patientHistoryRequired: "Yes", "No", "", or null. NOTE: "" or null means this Clinical Service is not supported in this Facility.

patientHistoryDuration: Integer - Number of days

},

...

...

]

lastModifiedDate: Date of last modification

modifiedBy: Modification User

}

## ****Data Architecture/Dictionary****

Class Diagram describes the object model used by the NoSQL database. Below is a listing of the NoSQL data collections stored.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **#** | **NoSQL Collection** | **Description of data collection** | **Source of data** | **Structure** | **Max capacity for entire collection** |
| 1 | var-utility.siteSupportingVAR | Sites allowed for VAR application | Pre-defined and imported using mongoimport utility | [**sites-supporting-var.json**](file:///C:\download\attachments\52429468\sites-supporting-var.json%3fversion=1&modificationDate=1469630771000&api=v2) | < 100KB |
| 2 | var-utility.clinical-services | Clinical Services supported by VAR application | Pre-defined and imported using mongoimport utility | [**clinical-services.json**](file:///C:\download\attachments\52429468\clinical-services.json%3fversion=3&modificationDate=1470660300000&api=v2) | < 100 KB |
| 3 | var-utility.directBookingEligibilityCriteria | Criteria for defining direct booking eligibility rules | Scheduler entry through VAR Utility app | [direct-booking-eligibility-criteria.json](file:///C:\download\attachments\52429468\direct-booking-eligibility-criteria.json%3fversion=4&modificationDate=1470687433000&api=v2) | not more than 1 MB |
| 4 | var-utility.requestEligibilityCriteria | Criteria for defining request eligibility rules | Scheduler entry through VAR Utility app | [request-eligibility-criteria.json](file:///C:\download\attachments\52429468\request-eligibility-criteria.json%3fversion=4&modificationDate=1470687406000&api=v2) | not more than 1 MB |

## ****Supported Devices****

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Device's OS** | **Native** | **Hybrid** | **Web-Only** | **OS version supported** | **Targeted devices (iPhone, iPad, Samsung model...)** | **Estimated Storage Required for Device** |
| Windows |  |  | X | Windows 7 | IE 11 |  |

## ****Technology Stack (Front-End)****

|  |  |  |
| --- | --- | --- |
| **Technologies, Libraries and Tools Used in the Application** | **Version** | **On the TRM? (If not, provide a link to the waiver)** |
| HTML5 | 5 | [Yes](http://www.va.gov/TRM/StandardPage.asp?tid=5201&tab=2) |
| CSS | 3 | [Yes](http://www.va.gov/TRM/StandardPage.asp?tid=5194&tab=2) |
| Angular | 1.3.5 | [Yes](http://www.va.gov/TRM/ToolPage.asp?tid=7842&tab=2) |
| AngularUI (ui-router) | 0.2.15 | [Yes](http://www.va.gov/TRM/ToolPage.asp?tid=8985&tab=2) |
| UI-Bootstrap | 0.12.1 | [No](http://www.va.gov/TRM/ToolPage.asp?tid=8455&tab=2) (pending decision from VA PM, as issues were found in upgrading to 0.13.0) |
| jQuery | 1.11.1 | [Yes](http://www.va.gov/TRM/ToolPage.asp?tid=6706&tab=2) |
| Lo-Dash | 2.4.2 | [Yes](http://www.va.gov/TRM/ToolPage.asp?tid=8036&tab=2) |
| Moment | 2.10.6 | [Yes](http://www.va.gov/TRM/ToolPage.asp?tid=8855&tab=2) |
| RequireJS | 2.1.14 | [Yes](http://www.va.gov/TRM/ToolPage.asp?tid=8043&tab=2) |

## ****Technology Stack (Back-End)****

|  |  |  |
| --- | --- | --- |
| **Technologies,** **Libraries and Tools Used in the Application** | **Version** | **On the TRM? (If not, provide a link to the waiver)** |
| Java | 7 | Yes |
| Spring Framework | 4.2.5 | Yes |
| Jersey | 2.22.2 | Yes |
| Mongo | 3.x | Yes |

## ****VA Interfaces - Existing****

## Authorization Services 4.3.x

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Interface Name (incl. version number)** | **Data Used by Mobile App** | **Source of Data** | **Data Retrieved - provide specific data elements used by this app** | **Title (resource-directory)** | **Endpoint** | **Notes/References** |
| OAuth Token - Authorization Services v4.3.x | OAuth Token | Authorization Services | [oauth-token.json](file:///C:\download\attachments\52429468\oauth-token.json%3fversion=1&modificationDate=1470660483000&api=v2) | oauth-token | **/AuthorizationServices/oauth/token** |  |
| Resource Last Accessed Time - Authorization Services v4.3.x | Resource Last Accessed Time | Authorization Services | [resource-last-access-time.json](file:///C:\download\attachments\52429468\resource-last-access-time.json%3fversion=1&modificationDate=1470660499000&api=v2) | resource-last-accessed-time | **/AuthorizationServices/rest/resourceLastAccessedTime** |  |

## ****Interfaces – New****

The following REST Services will be created to support **VAR Utility** app.

### ****DirectBookingEligibilityCriteriaResource****

**DirectBookingEligibilityCriteriaResource** exposes REST endpoints to configure the Direct Booking Eligibility Criteria for all Clinical Services supported at the Facility.

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **End Point** | **Sample Data** | **Sample Payload** |
| GET | /VarUtilityServices/v1/rest/direct-booking-eligibility-criteria/site/{site-code} | [direct-booking-eligibility-criteria.json](file:///C:\download\attachments\52429468\direct-booking-eligibility-criteria.json%3fversion=4&modificationDate=1470687433000&api=v2) |  |
| POST | /VarUtilityServices/v1/rest/direct-booking-eligibility-criteria/site/{site-code} |  | [direct-booking-eligibility-criteria-payload.json](file:///C:\\download\\attachments\\52429468\\direct-booking-eligibility-criteria-payload.json%3fversion=2&modificationDate=1470660701000&api=v2) |
| PUT | /VarUtilityServices/v1/rest/direct-booking-eligibility-criteria/site/{site-code}/id/{id} |  | [direct-booking-eligibility-criteria-payload.json](file:///C:\download\attachments\52429468\direct-booking-eligibility-criteria-payload.json%3fversion=2&modificationDate=1470660701000&api=v2) |

**Parameters**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Description** | **Parameter Type** | **Data Type** | **Valid Values** |
| site-code | VistA Site Code | Path | 3-digit Facility ID or Site Code | This should match Site Code of the logged in user |
| id | The Clinical Service ID | Path | 3-digit Clinical Service ID | Valid Clinical Services ID |

#### ****Responses****

|  |  |
| --- | --- |
| **HTTP Status Code** | **Description** |
| 200 | Success |
| 403 | Access Denied |
| 503 | Service Unavailable |

### ****RequestEligibilityCriteriaResource****

**RequestEligibilityCriteriaResource** exposes REST endpoints to configure the Request Eligibility Criteria for all Clinical Services supported at the Facility.

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **End Point** | **Sample Data** | **Sample Payload** |
| GET | /VarUtilityServices/v1/rest/request-eligibility-criteria/site/{site-code} | [request-eligibility-criteria.json](file:///C:\download\attachments\52429468\request-eligibility-criteria.json%3fversion=4&modificationDate=1470687406000&api=v2) |  |
| POST | /VarUtilityServices/v1/rest/request-eligibility-criteria/site/{site-code} |  | [request-eligibility-criteria-payload.json](file:///C:\download\attachments\52429468\request-eligibility-criteria-payload.json%3fversion=1&modificationDate=1470660617000&api=v2) |
| PUT | /VarUtilityServices/v1/rest/request-eligibility-criteria/site/{site-code}/id/{id} |  | [request-eligibility-criteria-payload.json](file:///C:\download\attachments\52429468\request-eligibility-criteria-payload.json%3fversion=1&modificationDate=1470660617000&api=v2) |

**Parameters**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Parameter** | **Description** | **Parameter Type** | **Data Type** | **Valid Values** |
| site-code | VistA Site Code | Path | 3-digit Facility ID or Site Code | This should match Site Code of the logged in user |
| id | The Clinical Service ID | Path | 3-digit Clinical Service ID | Valid Clinical Services ID |

#### ****Responses****

|  |  |
| --- | --- |
| **HTTP Status Code** | **Description** |
| 200 | Success |
| 403 | Access Denied |
| 503 | Service Unavailable |

## ****Non-Functional Requirements****

### ****Security****

All the staff specific REST endpoints are secured and it will be enforced using Spring Security. Access to the services will be granted to the calls that contain OAuth2.0 Access Token in the Authorization Header. User's roles will be checked against the configured roles using Access Decision Managers.

### ****Capacity Requirements****

Expected concurrent and maximum size of the user base

|  |  |
| --- | --- |
| **User Category** | **Concurrent Requests** |
| Scheduling Clerks | 50 |