



HEALINT

Migraine App Technical Specification

Version 0.11
April 17, 2014

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Change History

Version	Changes
0.9	<ul style="list-style-type: none">• Updated HEAD /v1/authTokens/\${id} in profile service to take 2 query parameters appld & userID• Updated GET /v1/accessCode/\${code} in profile service to /v1/accessCode/\${code}• Updated DELETE /v1/successCodes/\${code} in profile service to DELETE /v1/accessCodes/\${code}• Removed The optional parameter accessCode from POST /v1/users in profile service• Removed the JSON support for POST /v1/users in profile service• Added POST /v1/accessCodes/\${code}/user in profile service to create a new user using an access code• Updated the overall architecture section to explicitly list supported formats and HTTP response codes
0.10	<ul style="list-style-type: none">• Updated the “When” column for status codes 400 and 406.
0.11	<ul style="list-style-type: none">• Update specifications of all the URIs of the event service. The userID is now passed as a query parameter instead of being part of the URI.

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Overall Architecture

The diagram below shows a high level architecture. Each of the components below will be described in a separate section.

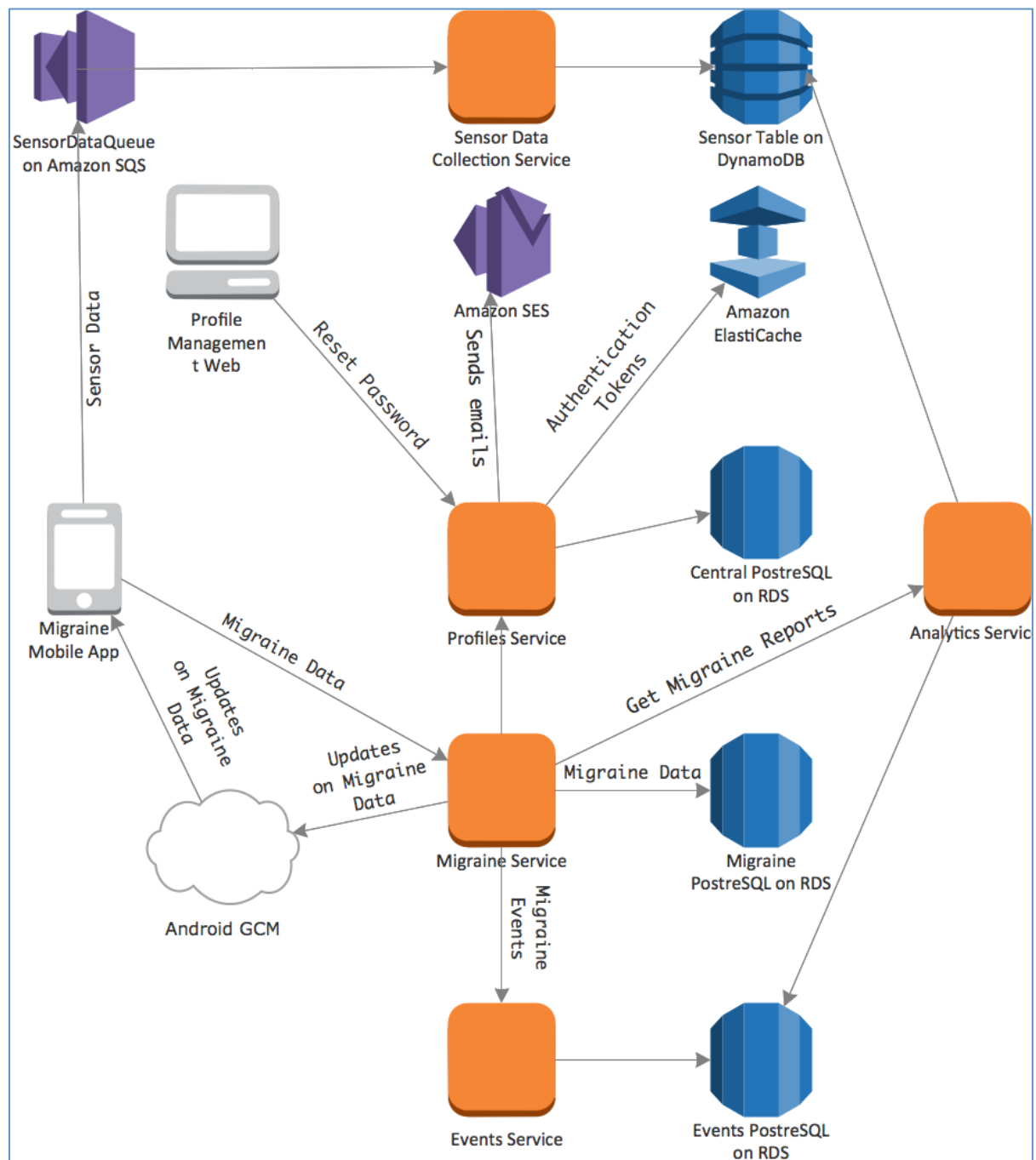


Figure 1 - Migraine Mobile App Architecture

There are also 3 other clients: Doctors web, Admin web, and Profile Management web interfaces. The following 2 diagrams show architecture components that interaction with these clients.

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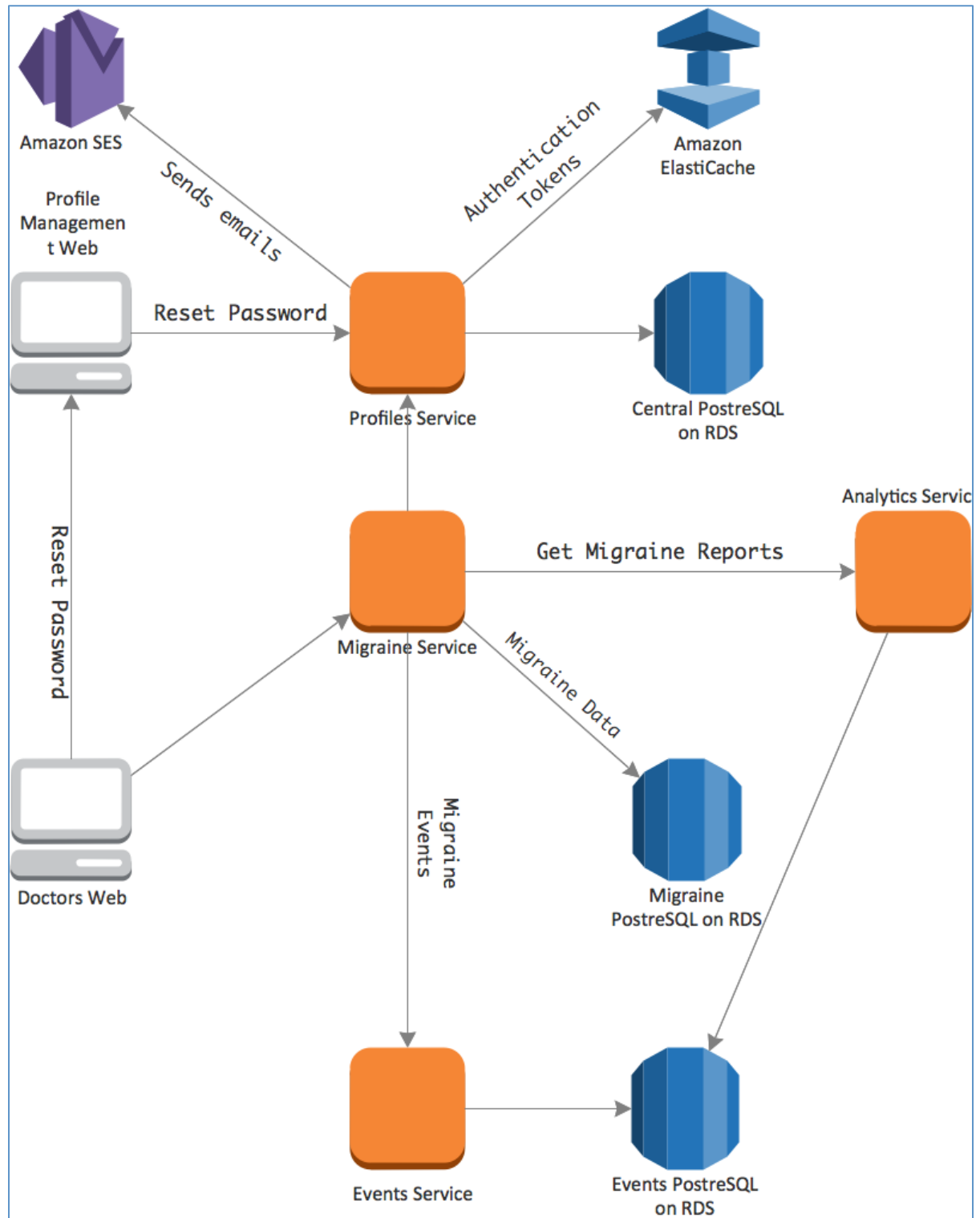


Figure 2 - Doctors Web Architecture

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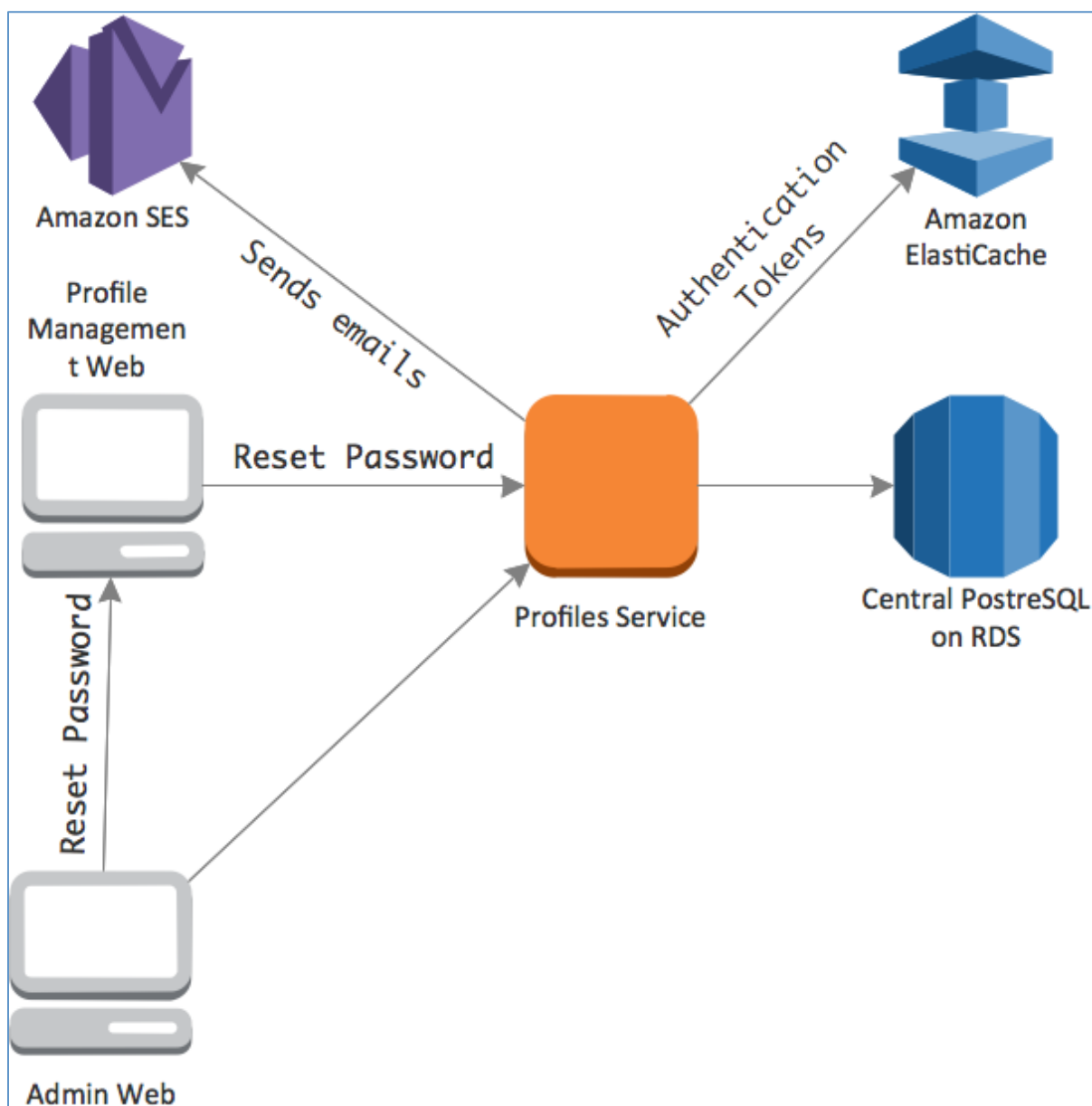


Figure 3 - Admin Web Architecture

Backend REST services support only 2 types of formats HTML and JSON. Not all operations support the 2 formats, the table in each services specifies which format is supported for each operation. Clients that prefer using JSON format for communication must send the HTTP accept header and specify JSON as the first accepted MIME format.

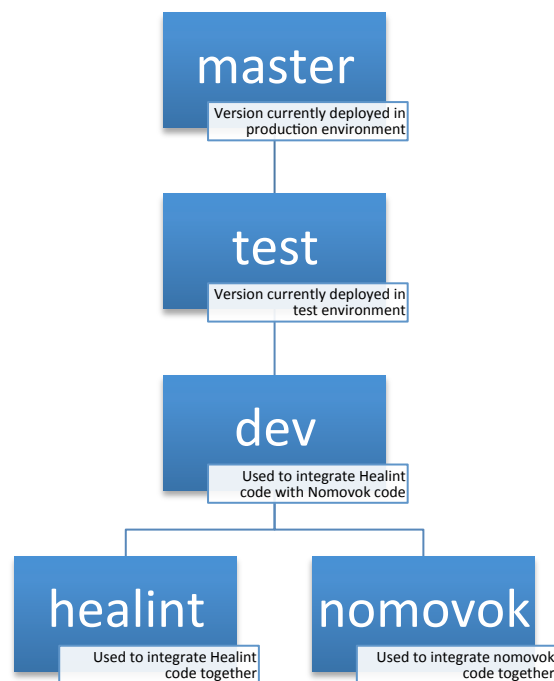
Additionally, the backend services respond with different HTTP status codes depending on the outcome of processing requests. The following table lists the error HTTP status codes that could be returned.

HTTP Status Code	When
400	If the request has an invalid syntax.
401	If the request requires the user to be authenticated but the request doesn't contain the

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	authentication header either is the session cookie or in the HTTP header
403	If the request requires the user to have a specific role that she doesn't have
404	If the request is requesting a resource/entity that cannot be found
405	If the request's HTTP method is not supported. Should be returned automatically by the play framework
406	If the requested response format based on the HTTP accept header is missing or not supported by this operation. For example, the operation only supports HTTP but the client is requesting JSON or vice versa
408	The service requires communication with an external service but that communication has timed out
411	If the length is not specified in the HTTP request. Should be returned automatically by the HTTP server
414	If the request URI is too long. Should be returned automatically by the HTTP server
419	If the authentication token provided in the request has expired
422	If the request cannot be processed due to semantic errors. For example, validation errors while creating or updating a resource/entity

During the development, we will use git for source control management. We define a general overview of the branching in all our git repositories.



Some branches are restricted to persons to ensure quality

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Branch	Responsibility of	Comment
nomovok	Ly / Chau (for iteration 2)	Developers create pull to submit code upwards
healint	Ali	After code has passed quality checks and unit tested
dev	Ali	After code has been deployed to development environment and checked by developers
test	Ali	After code has been tested on the Test environment and tested
master	Ali	

The checklist provided as a result of the PoC code review shall be used for code checks.

Migraine Mobile App

This is the mobile application that patients use. Specification of user stories and GUI are described as cards in the project's Trello board. The mobile app has a Sensors Data Collection Service as part of the application that collects sensor data over time and communicates with Amazon SQS over SSL. This background service will be developed by Healint and integrated in the application.

The following are general requirements for the app:

1. The App should support Android phones Gingerbread (V2.3 API 10) onwards.
2. The App should support screen sizes with resolutions between 480 X 800 mdpi and 1080 X 1920 xdpi.
3. Google Analytics should be integrated in the app. Every action from users on a UI control button should be tracked by a custom event. As described here (<https://developers.google.com/analytics/devguides/collection/android/v3/events>) However, Strings should be retrieved from resources file and not written in the code as in the example. Reporting uncaught exceptions should be disabled as we plan to use HockeyApp for that.
4. Crash reporting will be done with HockeyApp
5. UserVoice should be integrated
6. SQLite database will be used for storing information. No local files will be stored separately without approval from Healint.
7. Upon logging in for the first time, the app retrieves all user data from the server and stores it locally in SQLite database. The app also stores the authentication token in a SharedPreferences so it doesn't need to prompt the user to login again unless the server returned an authentication or authorization error as a response for one of the requests.
8. The server through Android GCM sends updates to the data. Upon receipt of such update, the app should update SQLite database and any application ui and update any ui if the app is running.
9. Updates to the data on the app are stored in the SQLite and sent the server if there is Internet connectivity. Otherwise, it will be sent to the server when the app starts again or when a GCM notification is received from the server.

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10. In case of conflicts between local updates and server updates, the newest change overrides the older one. All records in the app will have a "Last Modified" timestamp to indicate when the update occurred.
11. The application should have the ant build capability functional
12. When the application is imported to ADT with eclipse, there should be no warnings. If the dev team thinks that they shouldn't resolve the warning, they should communicate that with Healint.
13. All names used in the application should follow Java Naming Conventions.
14. Java Classes, variables and JSON objects representing objects in backend should have the same names as specified in backend specifications spreadsheets.
15. There should be NO String values stored written in Java Classes. All Strings should be in strings.xml and read the resources object
16. Mobile app should have a test suite that tests the app automatically either in isolation or with the service layer.
17. Charts will be drawn using ShinobiCharts
18. Follow the quality of code checklist provided during POC (see Quality of code checklist.pdf)

During the signup or login process, the app checks the difference of time between the phone and the server. If the difference is more than 5 minutes time zone adjusted, a warning should be shown to the user asking him to correct the phone time. The difference that triggers this message should be a configuration parameter not hard coded.

Sensor Data Collection Service

This service is developed by Healint to collect sensor data from devices.

Migraine Service

This is the main Migraine service that handles requests from Migraine Mobile App, Doctors Web Interface. The following are general requirements for the app:

1. Play framework should be used.
2. All Communication to the Migraine service must be done over https, except the landing page of the doctor web interface.
3. The Service layer should have a test suite to test it in isolation or with integration with any or all of Profile service, Events Service, or Migraine Database
4. All resources in the app return either JSON response or HTML response depending on the HTTP Accept header.
5. The signature of the authentication token is verified and the user roles in the token are checked before processing requests that access resources that need specific roles as per the table below. More details about the authentication token are described in the Profile service section.
6. All PUT, POST, and DELETE operations (Except the login and signup) need extra security check that is done by calling validateToken operation on the Profile service after the regular security check that is described in point 5.

The following is the list of all REST resources in the app:

URI	Method	Parameters	Required Roles	Doctors Web HTML Response	Mobile App JSON Response
/v1/time	GET	None	None	Not applicable	Current time in UTC as recorded by

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					the server
/v1/login	GET	< Optional > nextPage: the uri of the page to send in the next POST request	None	Login page	Not applicable
/v1/login	POST	email and password as parameters in the post body < Optional > nextPage: the uri of the page to redirect to after login	None	Authentication token as a Session cookie and HTTP redirect response to /v1/patients and passing doctorId if the user has the MIGRAINE_DOCTOR Role. Otherwise, return authorization error response code.	Authentication token and signature
/v1/login/reset	GET	None	None	The password reset page	None
/v1/login/reset	POST	Email of the user to reset the password for	NONE	Password Reset Success page or Reset page again with error message	Confirmation of success or error
/v1/patients	GET	doctorId	MIGRAINE_DOCTOR	List of patients managed by this doctor	Not applicable
/v1/patients	POST	New patient information and Access Code to apply	NONE	Not applicable	New patient details

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/v1/patients/\${id}	GET	None	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	Not applicable	Patient profile.
/v1/patients/\${id}	PUT	Update patient information	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	Not applicable	Confirmation of success
/v1/patients/\${id}	DELETE	None	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	Not applicable	Confirmation of deleting patient profile. Id of the currently logged in patient must match the id in the uri
/v1/patients/\${id}/migraines	GET	None	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	None	Summary of journal entry for the user
/v1/patients/\${id}/migraines	POST	New event information	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	Not applicable	Confirmation of success
/v1/patients/\${id}/migraines/\${id}	GET	None	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	None	Details of migraine event
/v1/patients/\${id}/migraines/\${id}	PUT	Update event details	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	Not applicable	Confirmation of success
/v1/patients/\${id}/migraines/\${id}	DELETE	None	MIGRAINE_PATIENT and Id of	Not applicable	Confirmation

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id}	E		currently logged patient must match the id in the uri		n of success
/v1/patients/\${id}/triggers	GET	None	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	Not applicable	List of triggers. Includes static and personal triggers
/v1/patients/\${id}/triggers	POST	New trigger details	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	Not applicable	Confirmation of success
/v1/patients/\${id}/reliefActions	GET	None	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	Not applicable	List of relief actions. Includes static and personal relief actions
/v1/patients/\${id}/reliefActions	POST	New relief action details	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	Not applicable	Confirmation of success
/v1/patients/\${id}/reliefMedications	GET	None	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	Not applicable	List of relief medications. Includes static and personal relief medications
/v1/patients/\${id}/reliefMedications	POST	New relief medication details	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	Not applicable	Confirmation of success
/v1/patients/\${id}/affectedActivities	GET	None	MIGRAINE_PATIENT and Id of currently logged patient must match the id in	Not applicable	List of affected activities. Includes static and personal

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			the uri		affected activities
/v1/patients/\${id}/affectedActivities	POST	New affected activity details	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	Not applicable	Confirmation of success
/v1/patients/\${id}/symptoms	GET	None	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	Not applicable	List of symptoms. Includes static and personal symptoms
/v1/patients/\${id}/symptoms	POST	New affected activity details	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	Not applicable	Confirmation of success
/v1/patients/\${id}/auras	GET	None	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	Not applicable	List of auras. Includes static and personal symptoms
/v1/patients/\${id}/auras	POST	New affected activity details	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	Not applicable	Confirmation of success
/v1/patients/\${id}/locations	POST	New location details	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	Not applicable	Confirmation of success
/v1/patients/\${id}/locations	GET	None	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	Not applicable	List of locations.
/v1/patients/\${id}/device	POST	Details of device	MIGRAINE_PATIENT and Id of	Not applicable	Confirmation

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		and GCM registration	currently logged patient must match the id in the uri		n of success
/v1/patients/\${id}/device	DELETE	None	MIGRAINE_PATIENT and Id of currently logged patient must match the id in the uri	Not applicable	Confirmation of success
/v1/doctors/\${docId}/\${patientId}	POST	None	MIGRAINE_DOCTOR		
/v1/accessCodes/\${code}	GET	Access Code	None	Not applicable	Access Code details

Events Service

Communications with the events service is only done on HTTPS with SSL mutual authentication enabled (Requires using Apache httpd as a reverse proxy for play server). User authentication and authorization for event requests is the responsibility of the calling service not the events service.

This service is only accessible by Healint servers and doesn't accept any connections from public Internet.

URI	Method	Parameters	Mobile App JSON Response
/v1/events/	GET	<p><Required> userId: the id of the user</p> <p>< Optional > startId: parameter specifying an event id to start from.</p> <p>< Optional > startTime: optional parameter specifying the time of the event to start from.</p> <p>Note: The startId and startEvent are exclusive. i.e. The event with the exact startId and startTime will not be return in the response.</p> <p>< Optional > limit: the maximum number of events to return</p> <p>< Optional > attributes: the name of event attributes to return</p>	<p>All the user's events regardless of the event type in descending order by time</p> <p>< Optional > endId: The id of the last event returned if more results are available</p> <p>< Optional > endTime: The time of the last event return if more results are available</p> <p>To fetch next set of items, caller should call the operation again with startId = endId from response and startTime = endTiem from response</p>

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/v1/events/{eventType}	GET	<p>< Required > eventType:</p> <p>< Optional > startId: parameter specifying an event id to start from.</p> <p>< Optional > startTime: optional parameter specifying the time of the event to start from.</p> <p>Note: The startId and startEvent are exclusive. i.e. The event with the exact startId and startTime will not be return in the response.</p> <p>< Optional > limit: the maximum number of events to return</p> <p>< Optional > attributes: the name of event attributes to return</p>	<p>The user's events that are of the specified type in descending order by time</p> <p>< Optional > endId : The id of the last event returned if more results are available</p> <p>< Optional > endTime: The time of the last event return if more results are available</p> <p>To fetch next set of items, caller should call the operation again with startId = endId from response and startTime = endTiem from response</p>
/v1/events/{time}	GET	<p>< Required > userId: The id of the user</p> <p>< Optional > attributes: the names of attributes to return</p>	The details of the event specified
/v1/events	POST	Details of a new event	Confirmation of success or an error of the app has an event recorded for the specified user and application in the same millisecond
/v1/events/{time}	PUT	Update details of an event	Confirmation of success. It is not possible to update the event time. If this is needed, the app should delete the old event and create a new one.
/v1/events/{time}	DELETE	< Required > userId: the id of the user	Confirmation of success

Profile service

This service is responsible for Authentication, Authorization, and Auditing. Currently, only Authentication and Authorization will be implemented. Communication with this service is only done over HTTPS. Only one authentication token is allowed per user per application. Authentication tokens do not have a time limitation and are stored in Amazon ElastiCache. when the user login to an application, the new authentication token replaces the old one (if it exists) in ElastiCache. Authentication token ids are generated using the Java's UUID class.

URI	Method	Parameters	Admin Web HTML	Mobile App JSON
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			Response	Response
/v1/login	GET	<p>< Optional > nextPage the nextPage parameter to pass to the next call of POST /v1/login</p> <p>< Optional > Error Message to show</p>	Login page	Not applicable
/v1/login	POST	<p>email and password, and application id as parameters in the post body</p> <p>< Optional > nextPage: the uri of the page to redirect to after login</p>	Authentication token as a Session cookie and HTTP redirect response to /v1/users	Authentication token and signature
/v1/login/reset	POST	Email to reset	Not applicable	Confirmation of success
/v1/login/\${resetToken}	GET		Password reset page	Not applicable
/v1/login/\${resetToken}	POST	New password	Password reset success page	Not applicable
/v1/tokens/\${id}	GET	None	Not applicable	Authentication token details or error if the token is not valid.
/v1/users	GET	<p>< Optional > startId: specified the id of the first user. This parameter is exclusive. i.e. the user with this specific parameter will not be returned in the response</p> <p><Optional > limit: maximum number of users to return</p> <p><Optional > sort: attribute to sort by</p> <p>< Optional > order: asc or desc</p> <p>< Optional > filter</p>	User management page listing users returned from the query	List of users returned from the query

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		<p>attributes</p> <p>< Optional > error: an error message to display</p> <p>< Optional > success: a success message to display</p> <p>< Optional > notice: a notice message to display</p>		
/v1/users/\${id}	GET	None	User information page	User details
/v1/users/new	GET	None	New user page	Not applicable
/v1/users	POST	New user details	Redirects to /v1/users with success message	Not applicable
/v1/users/\${id}	PUT	Updated user details	Redirects to /v1/users with success message	Confirmation of success
/v1/users/\${id}	DELETE	None	Redirects to /v1/users with success message	Confirmation of success
/v1/roles	GET	<p>< Optional > success: a success message to display</p> <p>< Optional > error: an error message to display</p> <p>< Optional> notice: a notice message to display</p>	Page displaying all roles	List of roles
/v1/roles/new	GET	None	Page to create a new role	Not applicable
/v1/roles/\${id}	GET	None	Page to view role details	Role details
/v1/roles	POST	New role details	Redirects to /v1/roles with success message	Confirmation of success and the id of the new role
/v1/roles/\${id}	PUT	None	Redirects to /v1/roles with	Confirmation of success

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			success message	
/v1/roles/{id}	DELETE	None	Redirects to /v1/roles with success message	Confirmation of success
/v1/countries	GET	<p>< Optional > success: success message to display</p> <p>< Optional > error: error message to display</p> <p>< Optional > notice: a notice message to display</p>	Page displaying list of countries	List of countries
/v1/countries/{id}	GET	None	Page displaying country details	Country details
/v1/countries/new	GET	None	Page to create a new country	Not applicable
/v1/countries	POST	New country details	Redirects to /v1/countries with a success message	Not applicable
/v1/countries/{id}	PUT	Updated country details	Redirects to /v1/countries with a success message	Not applicable
/v1/countries/{id}	DELETE	None	Redirects to /v1/countries with a success message	Not applicable
/v1/accessCodes	GET	<p>< Optional > startId: specified the id of the first access code. This parameter is exclusive. i.e. the access code with this specific parameter will not be returned in the response</p> <p><Optional > limit: maximum number of access codes to return</p> <p><Optional > sort: attribute to sort by</p> <p>< Optional > order:</p>	Page listing access codes	Not applicable

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		asc or desc < Optional > filter attributes < Optional > error: an error message to display < Optional > success: a success message to display < Optional > notice: a notice message to display < Optional > download: link to a file to automatically start downloading after the page is displayed		
/v1/accessCode/new	GET	None	Page to generate access codes	Not applicable
/v1/accessCodes	POST	Access code details and the number of access codes to generate	Redirects to /v1/accessCodes with success message and a download parameter to a PDF file	Not applicable
/v1/accessCodes/\${code}	GET	None	Access code details page	Access Code details
/v1/accessCodes/\${code}	PUT	Updated accessCode details	Redirects to /v1/accessCodes with success message	Not applicable
/v1/accessCodes/\${code}	DELETE	None	Redirects to /v1/accessCodes with success message	Not applicable
/v1/accessCodes/\${code}/user	POST	New User Details	Not applicable	New patient details
/v1/hospitals	GET	< Optional > startId: specified the id of the first hospital. This parameter is	Page displaying list of hospitals	List of hospitals

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		<p>exclusive. i.e. the hospital with this specific parameter will not be returned in the response</p> <p><Optional > limit: maximum number of hospitals to return</p> <p><Optional > sort: attribute to sort by</p> <p>< Optional > order: asc or desc</p> <p>< Optional > filter attributes</p> <p>< Optional > error: an error message to display</p> <p>< Optional > success: a success message to display</p> <p>< Optional > notice: a notice message to display</p>		
/v1/hospitals/\${id}	GET	None	Hospital details page	Hospital details
/v1/hospitals/new	GET	None	New hospital page	Not applicable
/v1/hospitals	POST	New hospital details	Redirect to /v1/hospitals with success message	Not applicable
/v1/hospitals/\${id}	PUT	Update hospitals details	Redirects to /v1/hospitals with success message	Not applicable
/v1/hospitals/\${id}	DELETE	None	Redirects to /v1/hospitals with success message	Not applicable
/v1/authTokens/\${id}	HEAD	AppId and UserId as Query Parameters	Not applicable	Status code 204 if the authentication token is still valid in the Elasticache or 404 if it is not.

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The authentication token that is returned or validated by some of the previously mentioned operations consists of the following:

- 1- tokenId
- 2- userId
- 3- appId
- 4- userRoles and their expiry dates if any
- 5- Timestamp at which the token was generated

Only users with ADMIN role are allowed to create new users with specific roles, create new roles, and generate access codes, add/edit/delete countries and hospitals. A new user can signup and specify an access code to grant himself/herself a role automatically.

Items in all drop down boxes in the wireframe should be sorted alphabetically.

Drop boxes specifying a doctor are populated with users who have the role DOCTOR.

It is not possible to delete or rename the roles ADMIN and DOCTOR.