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## Textual Notifications Using Node.JS and Cloud Ant

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**ABSTRACT:** Admin pages for managing Textual Notifications Publishers. Allows for easier adding, removing, updating the publisher information and seeing current numbers of notifications sent etc. There is a better way to capture the attention of your customers than using traditional email. A platform which ensures that your communications are not lost or overlooked. 'Textual Notifications using Node.js' gives every customer a unified view of their products & services in a multi-platform view. Using single sign on, customers receive and interact with notifications which are meaningful to them. There is no need to send mass emails anymore; Textual Notifications will send your customer's notifications enabling them to take action as soon as they log in. Only white listed users, who are given the admin rights, would be able to access this tool and maintain it.

**KEYWORDS:** Node JS, Cloud Ant, PSP, RSS, Angular JS.

### I. INTRODUCTION

The Textual notifications tool will provide support notifications to subscribers with new or updated System support information. Information covers a broad range of materials, including software knowledgebase documents, Preventive Service Planning information (PSPs), Fix information, Security advisories, and more. Users may have multiple subscriptions. Users are notified via email, web folder and/or syndication feeds (RSS, Atom) that new or updated content is available. A link to the actual content is provided. It provides a new technology platform for future enhancements.

The Textual notifications tool provides the following new features for support notifications

- Ability to create multiple subscriptions with different topics and notification options.
- Ability to create and name multiple folders to organize your subscriptions.
- Ability to specify weekly or daily notifications when a topic is updated.
- Ability to access the PTF Cover Letters directly from links in the email.
- Ability to choose notification delivery methods; viewing a concise list on-line, email and/or syndication feeds (RSS, Atom).
- Ability to save notification options and other personal preferences. Selections will be applied automatically to future subscriptions.
- Ability to send notifications in 16 different native translation languages.
- Ability to send notifications for 1 million users without any error/loss.
- Ability to activate and de-activate publishers from sending notifications.
- Publisher Admin tool is a part of Notifications which can be accessed only by few people who have the admin level privileges. This tool is built using new technologies like Node JS and Angular JS with support of Cloud ant for the backend database.

### II. RELATED WORK

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## 1. Node JS

Node.js is an open-source, cross-platform JavaScript runtime environment for developing a diverse variety of tools and applications.

Node.js is a very powerful JavaScript-based framework/platform built on Google Chrome's JavaScript V8 Engine. It is used to develop I/O intensive web applications like video streaming sites, single-page applications, and other web applications. Node.js is open source, completely free, and used by thousands of developers around the world. Node.js has an event-driven architecture capable of asynchronous I/O. These design choices aim to optimize throughput and scalability in Web applications with many input/output operations, as well as for real-time Web applications (e.g., real-time communication programs and browser games).

Node.js Event Loop

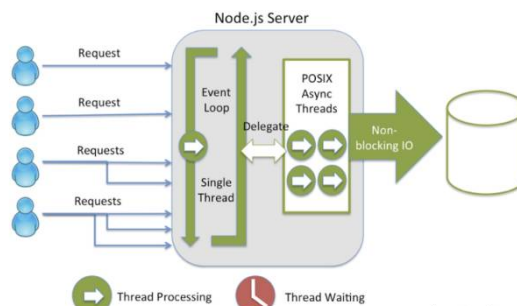


FIGURE 1: NODE.JS ARCHITECTURE

## 2. Angular JS

AngularJS is a JavaScript framework. It can be added to an HTML page with a `<script>` tag. AngularJS extends HTML attributes with Directives, and binds data to HTML with Expressions. It is a library written in JavaScript. AngularJS is distributed as a JavaScript file, and can be added to a web page with a script tag:

```
<script src="https://ajax.googleapis.com/ajax/libs/angularjs/1.4.8/angular.min.js"></script>
```

AngularJS extends HTML with ng-directives. The ng-app directive defines an AngularJS application. The ng-model directive binds the value of HTML controls (input, select and text area) to application data. The ng-bind directive binds application data to the HTML view.

```
<!DOCTYPE html>
```

```
<html>
```

```
<script src="https://ajax.googleapis.com/ajax/libs/angularjs/1.4.8/angular.min.js"></script>
```

```
<body>
```

```
<div ng-app="">
```

```
<p>Name: <input type="text" ng-model="name"></p>
```

```
<p ng-bind="name"></p>
```



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</div>

</body>

</html>

AngularJS starts automatically when the web page has loaded. The ng-app directive tells Angular JS that the <div> element is the "owner" of an AngularJS application. The ng-model directive binds the value of the input field to the application variable name. The ng-bind directive binds the innerHTML of the <p> element to the application variable name.

### 3. Cloud ant

Cloudant is an IBM software product, which is primarily delivered as a cloud-based service. Cloudant is an open source non-relational, distributed database service of the same name.

Cloudant is based on the Apache-backed CouchDB project and the open source BigCouch project. Cloudant's service provides integrated data management, search, and analytics engine designed for web applications. Cloudant scales databases on the CouchDB framework and provides hosting, administrative tools, analytics and commercial support for CouchDB and BigCouch.

## III. PROPOSED ALGORITHM

### A. Design Considerations:

SOFTWARE REQUIREMENT IS ILLUSTRATED AS BELOW

IDENTITY NAME	VERSION
OPERATING SYSTEM	Windows, Linux or MacOS
Technology	Node.js, AngularJS, Cloudant, HTML-CSS and BlueMix
IDE	Sublime Text Editor or Visual Studio Code
PROGRAMMING LANGUAGE	Javascript and NoSQL Database

TABLE 1: SOFTWARE REQUIREMENT

HARDWARE REQUIREMENT IS ILLUSTRATED AS BELOW

IDENTITY NAME	CAPACITY / NAME
PROCESSOR	Dual Core 1.1 G Hz
RAM	8 GB
HARD DISK	100 GB)

TABLE 2: HARDWARE REQUIREMENT

Table 2 will demonstrate the complete hardware process involved in this demonstration and it is clearly stated that the computation will depend upon the processors computing speed. If it is Intel-5 processor it will process fast than Intel Intel-3 but here, it is used Intel-3 and it will compute by the speed of 2.3 Ghz.

The primary memory will play a vital role. Here; 8 GB of RAM is used to process this computation only on the local machine. If primary memory is not sufficient or it is overhauled with the existing system calls and existed processes then swap area will be used as primary and linked as the intermediate source for the computation as RAM. Once the application is deployed on Blue mix server (cloud service), it makes use of the underlying hardware



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and hence the computation speed is distributed across various hardware machines connected to the Internet which helps in processing the request in a much better and faster response time.

## B. Description of the Proposed Algorithm:

Eventually Notifications could be the main communication hub for various customers. They could sign up for newsletters for products here (using the IBM MyNotifications infrastructure) and specify how they get their own notifications (maybe via web as it is, via email, or via some mobile app). This would give the user one single place to manage exactly how any product owner contacts them, on their own terms.

This would obviously have problems we would need to think about, for example we would be very much mission critical, but it would give an amazing user experience if people could control what they get and how, Facebook style. As we have seen notifications on mobile platforms becoming enabled with custom actions per notification, I would also like to see this become the case within MyIBM. So currently a user can action or dismiss a notification from the New list, and action, restore or delete from the archive. Imagine if the user could have a notification telling them they need to renew their subscription, and be able to and more information by clicking on it, or click one button to renew straight from the notification center.

## System Design

It consists of detailed view on system analysis and development process, the major objective of this chapter is to provide a detailed view on system behavior and modeling from beginning to the end. It consists of architectural diagram, analysis and extraction.

## Architecture Diagram

The architecture diagram is as shown below:

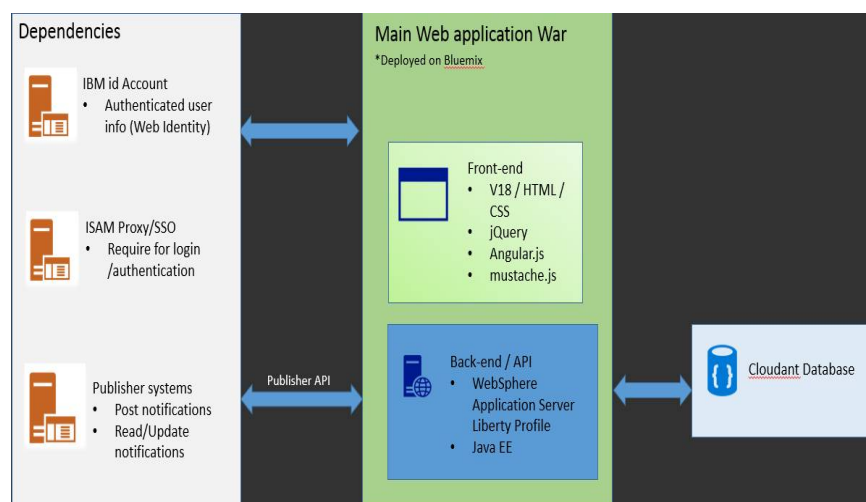


Figure 2: Architecture Diagram

Above diagram in Figure 2 describes each step of processing, computing and rendering the meaningful information and patterns which can be used to predict the result.



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## End user flow



## Publisher flow:



## II. PSEUDO CODE

Step 1: The Publisher will be provided with the below screen to enter his/her **ClientID** and **Client Secret Key**.

Step 2: Once we enter the Client id and Secret key, click on **Validate publisher** button.

Step 3: Once the details are fetched, the Publisher will be presented with an option where the Products are listed. He/she can choose from the given product list and click on **Submit** button.

Step 4: The Publisher will be provided with 2 options.

1. **Registered Users** - Send notification to already sent users registered under it.

2. **Custom Users** - Send notifications to New Users.

Step 5: When Custom Users option is selected, the publisher will be provided with an additional Input text field where they can enter Multiple IUI's in a comma (,) separated manner.

e.g: ABCDEFGHIJ, QRSTUVWXYZ

URL text field is optional.

Click on Add message button and Publisher can choose an option to enter a message in 32 different country languages.

e.g: In US English.

Step 6: Click on **Send** button to send the Notification to users.

Once the message is sent, the publisher will be provided with a success message.

Step 7: if any error, then an error message is displayed to the Publisher.

Step 8: End.

## III. SIMULATION RESULTS

The Figure 3 shows the overview of logging, filters, validation, cronjob, exceptions and unit test cases. This figure gives an overall view of the paper.

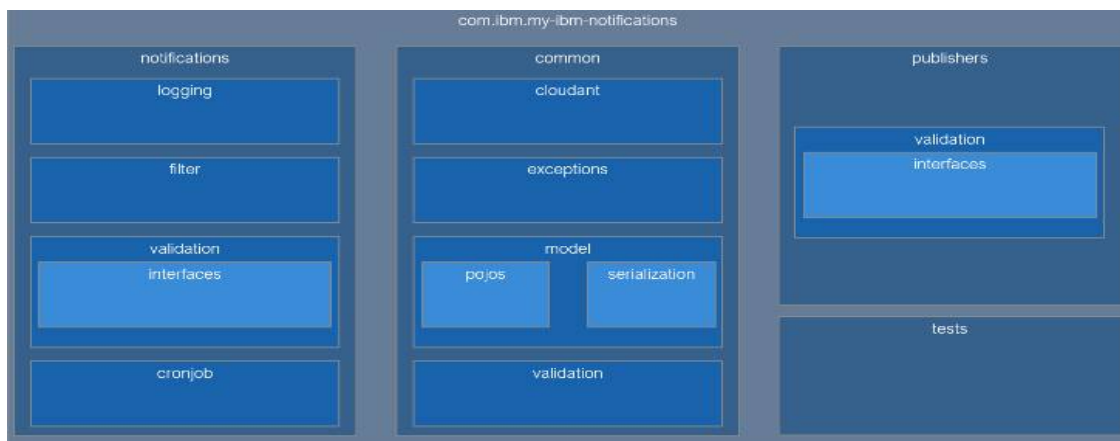


Figure 3: Generalized Implementation

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The Figure 4 shows the Cloudant exceptions and model concept and describes their important attributes in a brief manner.

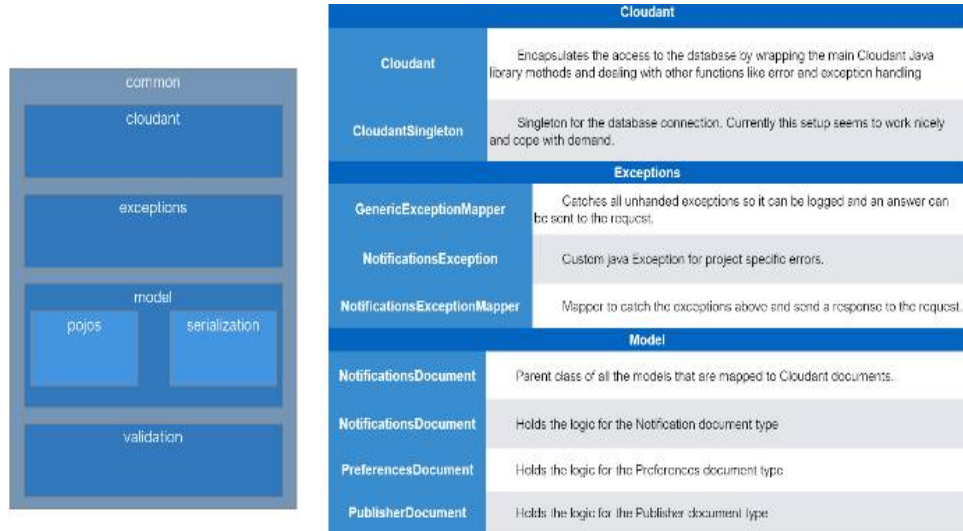


Figure 4: Cloudant Overview

The Figure 5 refers to various Serialization and Validation attributes with a brief description as shown below.

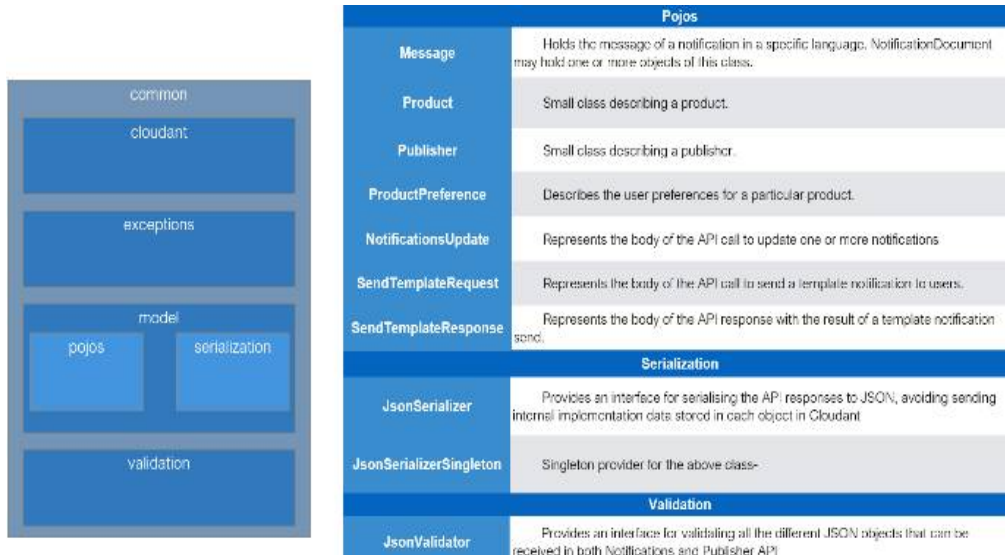


Figure 5: CloudantPojo Class



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The Figure 6 describes about the Notifications Interface which has the Health-Check and API validation interfaces embedded in it.

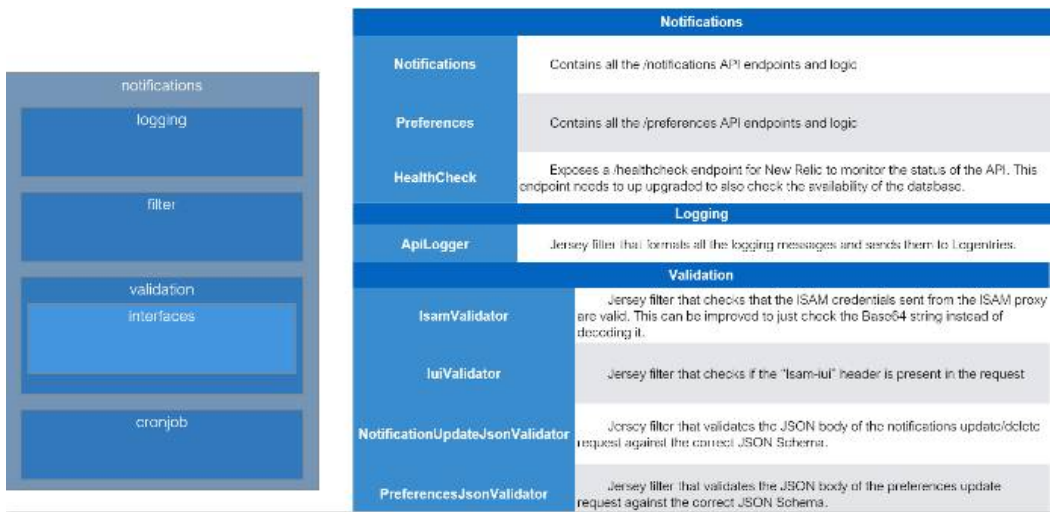


Figure 6: Notifications Interface

The Figure 7 describes about the Publishers Interface which has the Template validation and Publisher API validation interfaces embedded in it.



Figure 7: Publishers Interface

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The Figure 8 describes various dependencies required for the implementation of these classes



Dependencies	
JZEE 7	The back end is built using JZEE 7
Jax-RS (Jersey)	Used for RESTful API development
JUnit 4.12	Framework for unit testing
Mockito 2.0.0.1	Testing tool for mocking dependencies
Cloudant Client 2.3.0	Cloudant API wrapper in Java for accessing the database
Gson 2.2.4	Library for manipulating JSON in Java
Jason Schema Validator 2.2.6	Used for the validation of the JSON inputs of the Notifications and Publisher APIs
Log4j 2.6	Logger library that is configured to send the logs to Logentries
Log entries Appender "Gnoain" 1.33	This is a <b>custom fork</b> of the Logentries appender that solves an issue with the connection with Logentries.
Commons Codec, Collections, io and lang	Apache commons helper libraries

IMPORTANT
This project started as a very simple API and no dependency management tool was used. It has grown and now it screams for a dependency management tool (Maven, Ivy, etc.). That would be a great improvement.

Figure 8: Dependencies

## IV. CONCLUSION AND FUTURE WORK

In this paper, we are aiming to provide product owners with effective methods to deal with their customer(s) in a very presentable manner and easy implementation. We have been asked about email notifications. We have been avoiding this due to the fact that it will start to make notifications mission critical, however we will need to do this eventually as it makes perfect sense. My thoughts were that we could expand preferences and allow users to say I want this kind of notification sent to me via email, but those other ones can just show up in the notification center, or maybe something like send me a weekly digest of my notification via email (this looks like it will be the nicest first stab at it).

**Notification taxonomy** has been an ongoing issue for me it is very hard to classify notifications. It would be nice if we could classify every notification possible within a set as it would allow us to get usage status ourselves and maybe surface this to our users when we expand on preferences (think: I only want to see outage alerts from Blue mix).

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