Speech Recognition For live speech using python and IBM’s Bluemix

Objective: This project aims to analyze the sentiment the sentiment of live speech and plot a live graph.

Applications used: python, IBM’s Bluemix (Node Red).

Pre-Requisites: Knowledge in Python Programming Language.

A machine with Python installed.

Active Internet Connection.

Explanation: We have used Google’s speech recognition API to recognize the live speech. One is free to use any other method for speech recognition. We have used Bluemix to plot the live graph of sentiment. One could use any other application to do so. Since Bluemix offers a graphical interface , if one wants it to be done in programming interface alone feel free to check out dash, bokeh also.

Code:

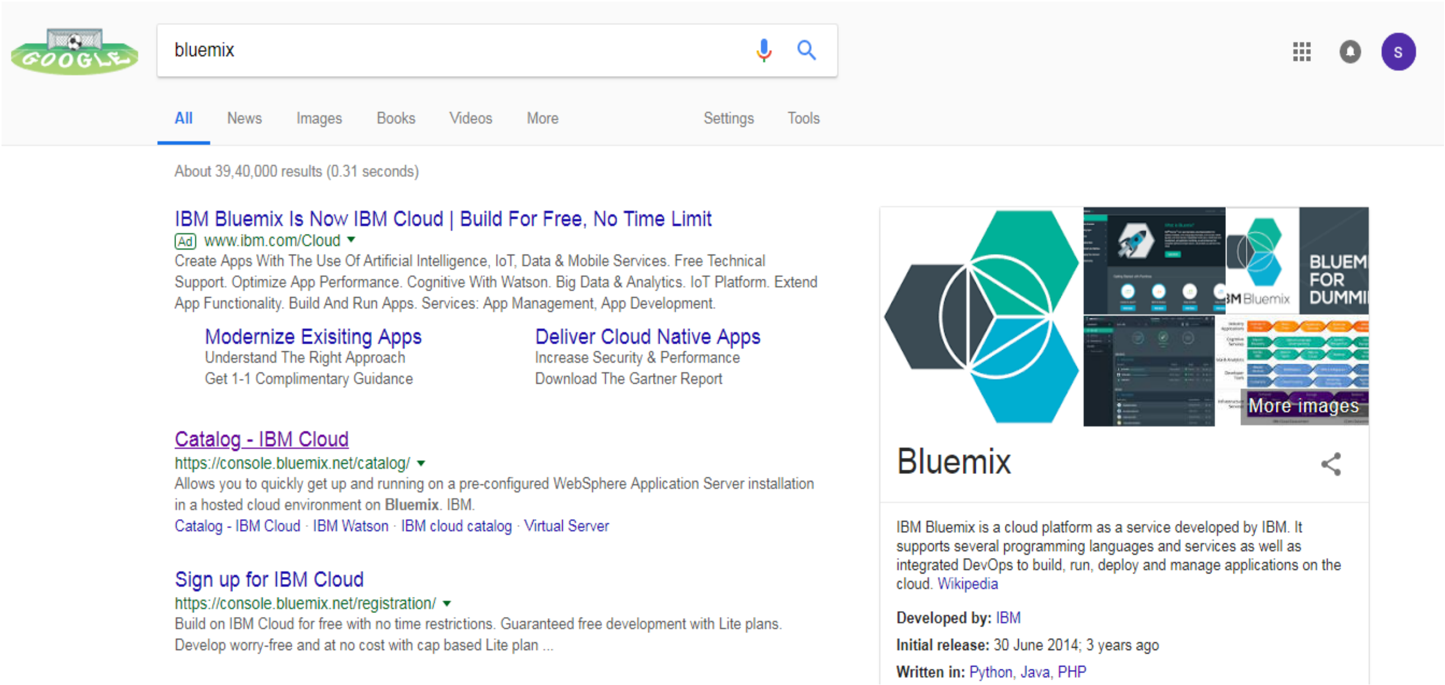
```
import speech recognition as sr

# This is for accessing the speech recognition module.

import paho.wqtt.client as mq

# This is for taking the information to plot a live graph in Bluemix.

from textblob import TextBlob

# This is for Accessing the textblob module that has the sentiment analysis part.

r=sr.recognizer()

while(1==1):

# The while loop will loop until the input speech is “DONE”

    with sr.Microphone as source:

        audio=r.listen(source,phrase_time_limit=10)

        #This detects the audio using the microphone as a source and it listens for 10 seconds.

        text=r.recognize_google(audio)

        # This then converts the speech to text using Google’s speech recognition API.

        if(text=="done"):

            break
```

```
alim=TextBlob(text)

#We convert the text to a TextBlob object to perform sentiment analysis.

c=mq.Client()

c.connect('iot.eclipse.org',1883)

c.publish('emotion/team4',alim.sentiment.polarity)

c.disconnect()

# The above 4 lines of code connects to IBM’s Bluemix and plots using Node-Red with the above credentials
```

Creating the Node Red Application.

Step 1:

Search for Bluemix and a window like this will appear.



About 39,40,000 results (0.31 seconds)

IBM Bluemix Is Now IBM Cloud | Build For Free, No Time Limit
Ad www.ibm.com/Cloud
Create Apps With The Use Of Artificial Intelligence, IoT, Data & Mobile Services. Free Technical Support. Optimize App Performance. Cognitive With Watson. Big Data & Analytics. IoT Platform. Extend App Functionality. Build And Run Apps. Services: App Management, App Development.

Modernize Exisiting Apps
Understand The Right Approach
Get 1-1 Complimentary Guidance

Deliver Cloud Native Apps
Increase Security & Performance
Download The Gartner Report

Catalog - IBM Cloud
https://console.bluemix.net/catalog/
Allows you to quickly get up and running on a pre-configured WebSphere Application Server installation in a hosted cloud environment on **Bluemix**. IBM.
Catalog - IBM Cloud · IBM Watson · IBM cloud catalog · Virtual Server

Sign up for IBM Cloud
https://console.bluemix.net/registration/
Build on IBM Cloud for free with no time restrictions. Guaranteed free development with Lite plans. Develop worry-free and at no cost with cap based Lite plan ...

Bluemix

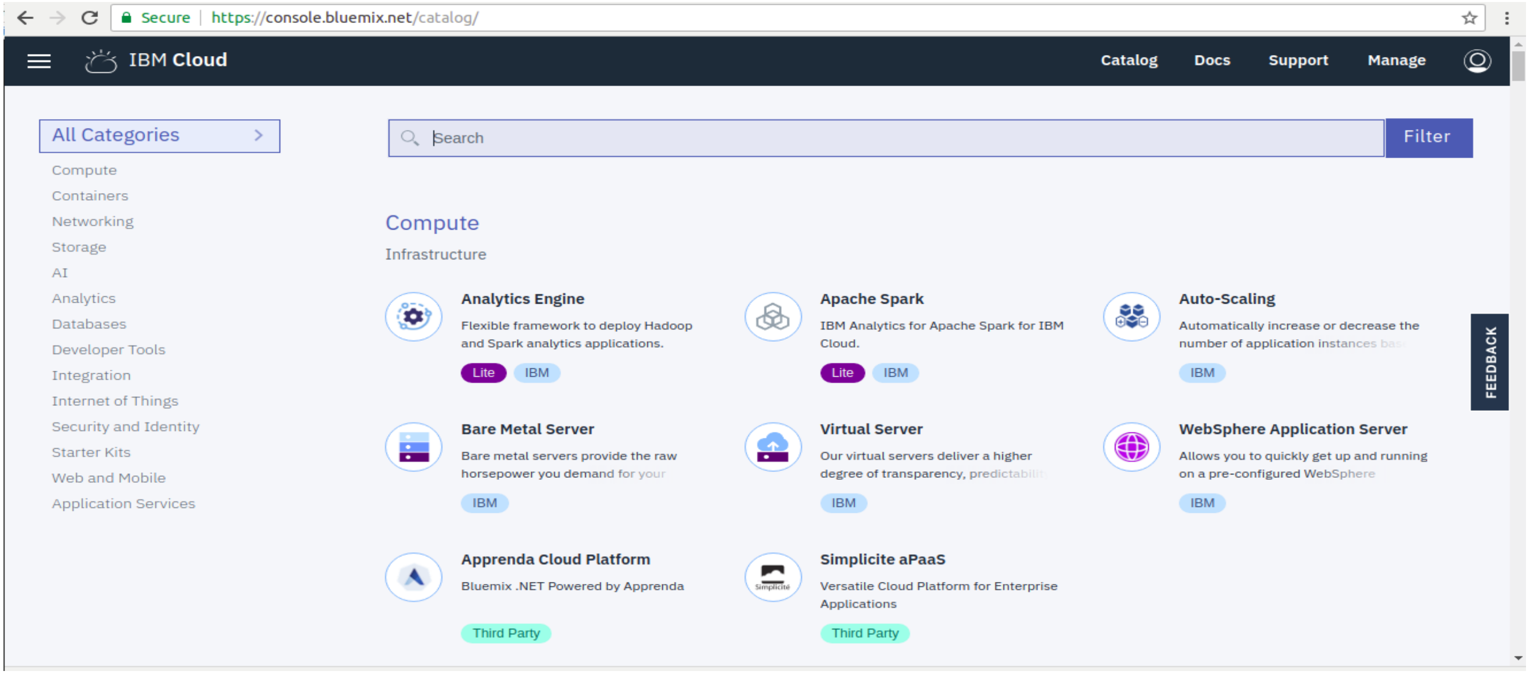
IBM Bluemix is a cloud platform as a service developed by IBM. It supports several programming languages and services as well as integrated DevOps to build, run, deploy and manage applications on the cloud. Wikipedia

Developed by: IBM
Initial release: 30 June 2014; 3 years ago
Written in: Python, Java, PHP

Step 2:

Click on Catalog-IBM Cloud

Now in the search bar search for Node-RED and click on Node-RED Starter



Compute

Infrastructure

Analytics Engine
Flexible framework to deploy Hadoop and Spark analytics applications.
Lite IBM

Apache Spark
IBM Analytics for Apache Spark for IBM Cloud.
Lite IBM

Auto-Scaling
Automatically increase or decrease the number of application instances bas
IBM

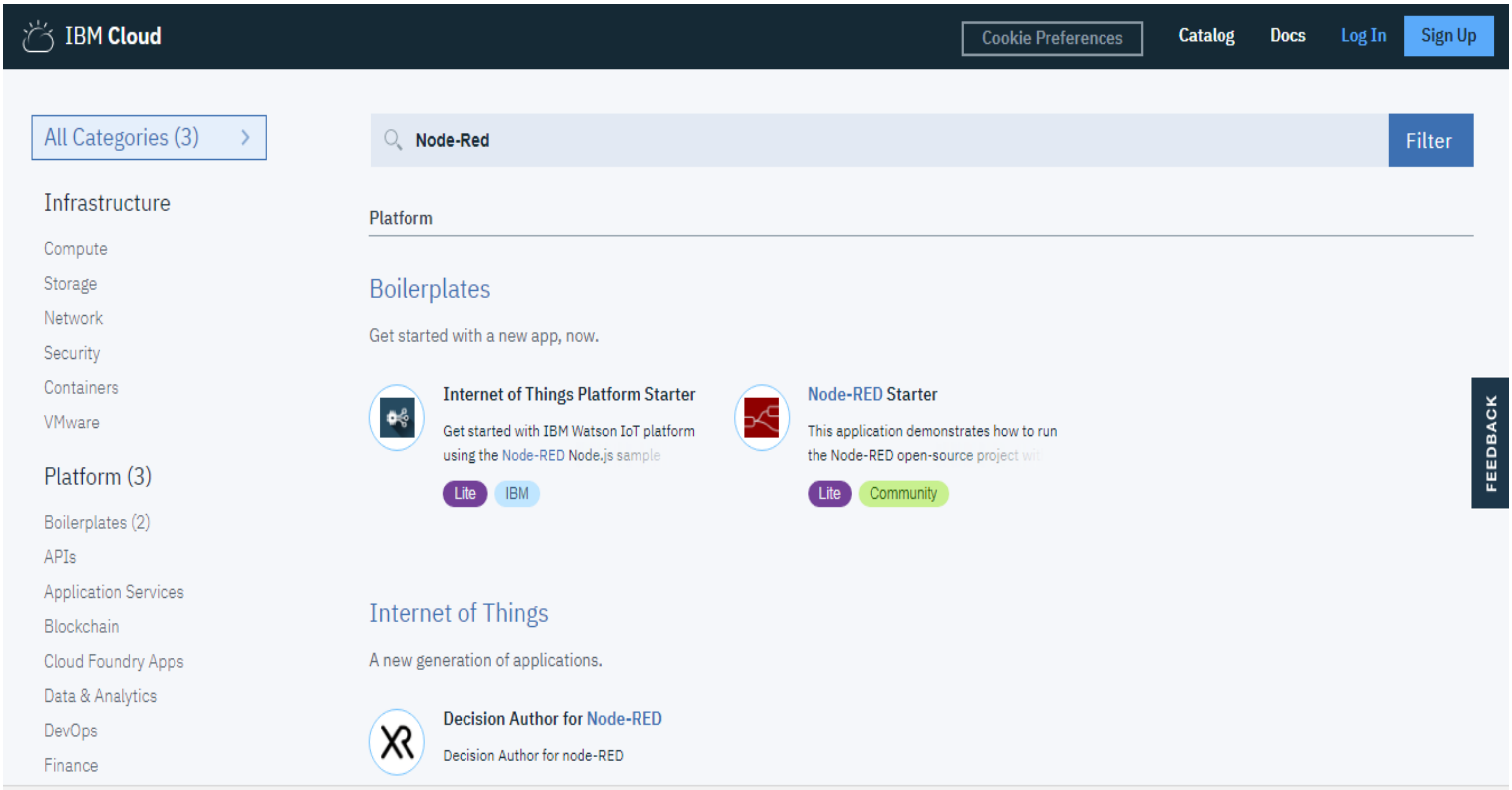
Bare Metal Server
Bare metal servers provide the raw horsepower you demand for your
IBM

Virtual Server
Our virtual servers deliver a higher degree of transparency, predictabilit
IBM

WebSphere Application Server
Allows you to quickly get up and running on a pre-configured WebSphere
IBM

Apprenda Cloud Platform
Bluemix .NET Powered by Apprenda
Third Party

Simplicite aPaaS
Versatile Cloud Platform for Enterprise Applications
Third Party



Node-Red

Platform

Boilerplates

Get started with a new app, now.

Internet of Things Platform Starter

Get started with IBM Watson IoT platform using the Node-RED Node.js sample

Lite IBM

Node-RED Starter

This application demonstrates how to run the Node-RED open-source project wi

Lite Community

Internet of Things

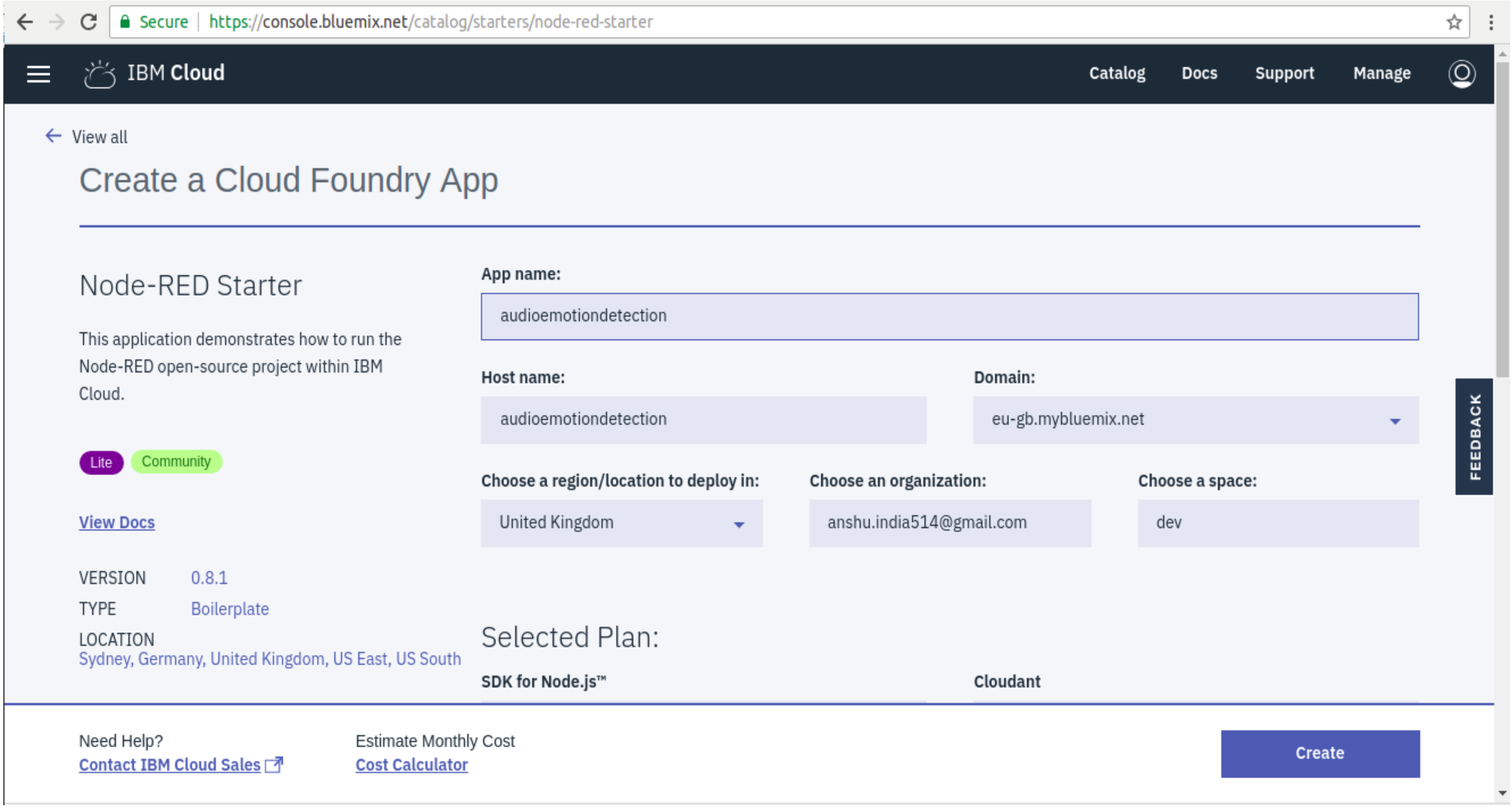
A new generation of applications.

Decision Author for Node-RED

Decision Author for node-RED

Step 3:

Open Node-RED Starter and create an Application with credentials.


Secure
https://console.bluemix.net/catalog/starters/node-red-starter
IBM Cloud
Catalog
Docs
Support
Manage
View all
FEEDBACK
Create

Create a Cloud Foundry App

Node-RED Starter

This application demonstrates how to run the Node-RED open-source project within IBM Cloud.

Lite Community

View Docs

VERSION	0.8.1
TYPE	Boilerplate
LOCATION	Sydney, Germany, United Kingdom, US East, US South

App name: audioemotiondetection

Host name: audioemotiondetection

Domain: eu-gb.mybluemix.net

Choose a region/location to deploy in: United Kingdom

Choose an organization: anshu.india514@gmail.com

Choose a space: dev

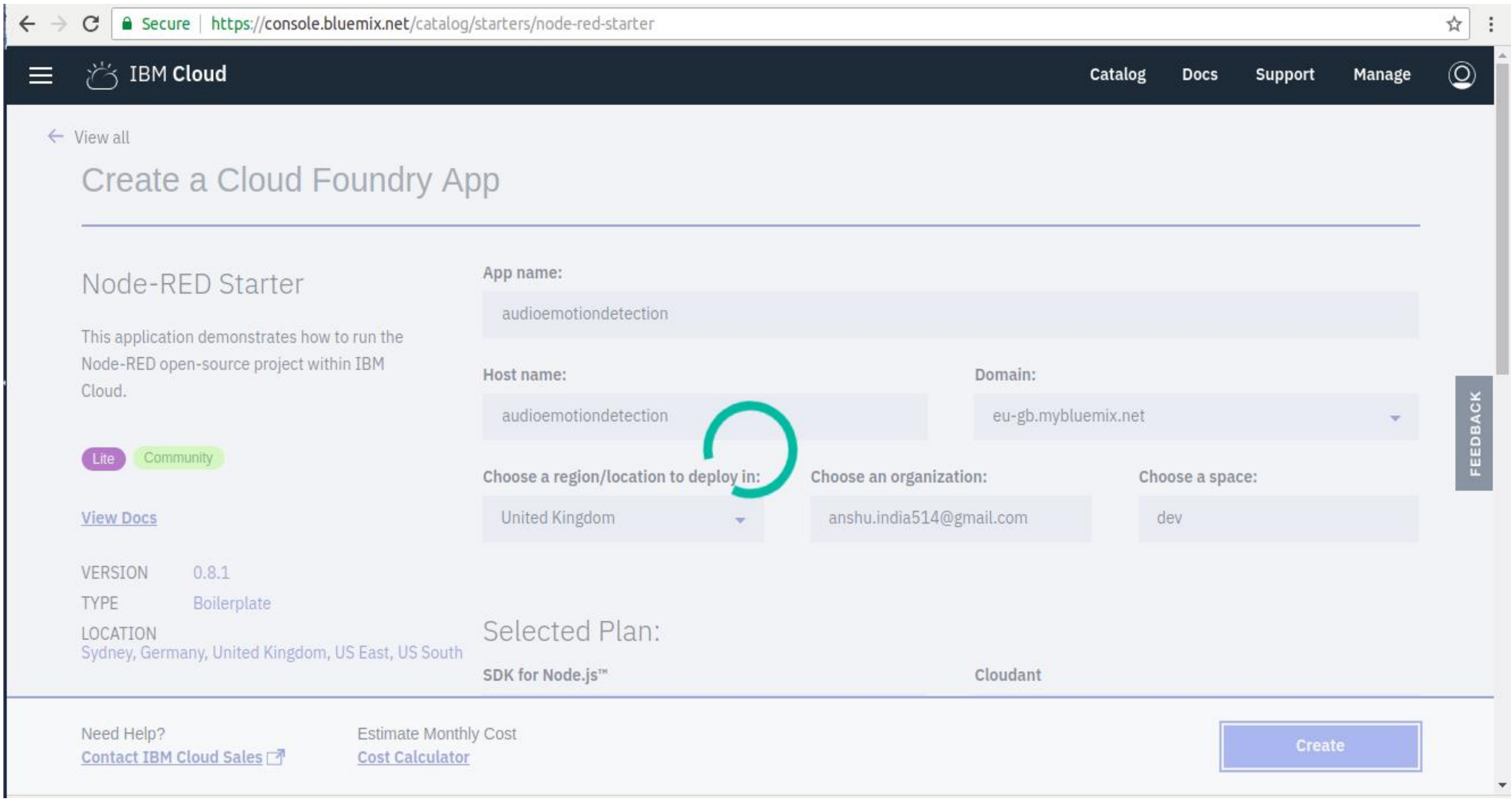
Selected Plan:

SDK for Node.js™

Cloudant

Need Help?
Contact IBM Cloud Sales

Estimate Monthly Cost
Cost Calculator



Secure | https://console.bluemix.net/catalog/starters/node-red-starter
IBM Cloud
Catalog
Docs
Support
Manage
FEEDBACK

View all

Create a Cloud Foundry App

Node-RED Starter

This application demonstrates how to run the Node-RED open-source project within IBM Cloud.

Lite Community

View Docs

VERSION 0.8.1

TYPE Boilerplate

LOCATION Sydney, Germany, United Kingdom, US East, US South

App name: audioemotiondetection

Host name: audioemotiondetection

Domain: eu-gb.mybluemix.net

Choose a region/location to deploy in: United Kingdom

Choose an organization: anshu.india514@gmail.com

Choose a space: dev

Selected Plan:

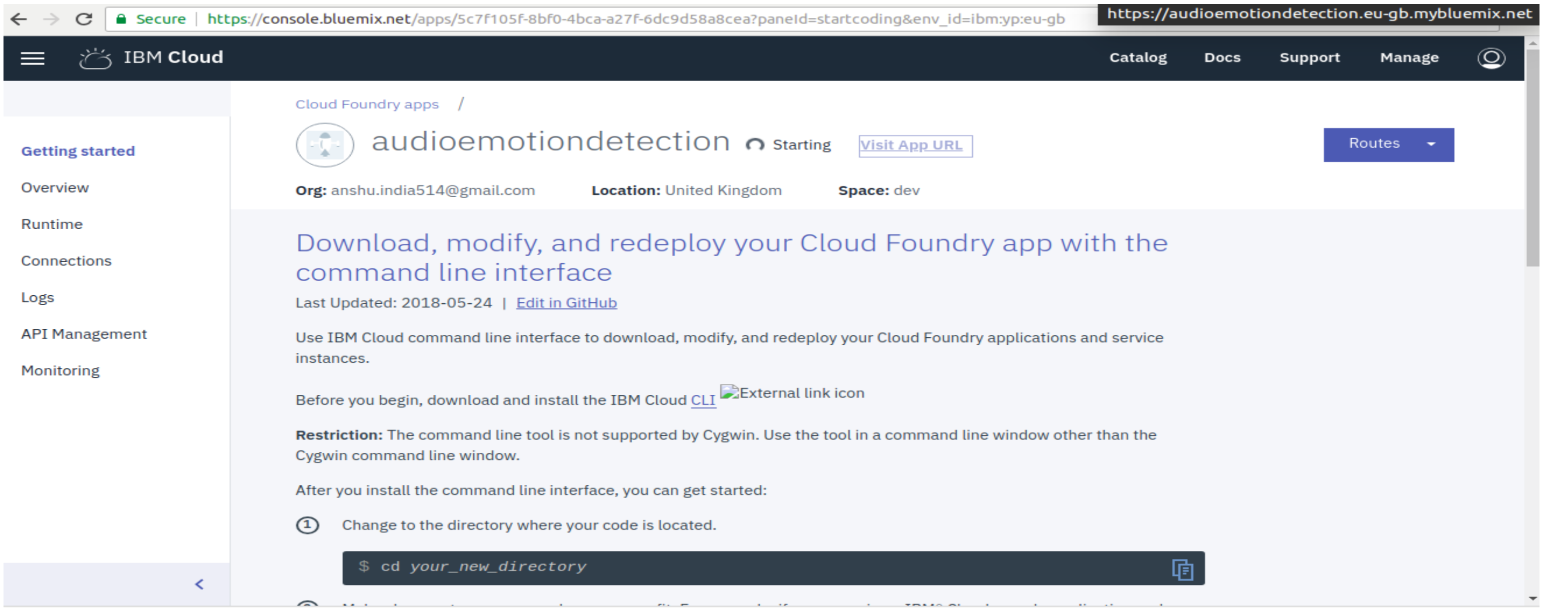
SDK for Node.js™

Cloudant

Need Help?
Contact IBM Cloud Sales

Estimate Monthly Cost
Cost Calculator

Step 4: Once created you will get a window like this:



Secure | https://console.bluemix.net/apps/5c7f105f-8bf0-4bca-a27f-6dc9d58a8cea?paneId=startcoding&env_id=ibm:yp:eu-gb
https://audioemotiondetection.eu-gb.mybluemix.net
IBM Cloud
Catalog
Docs
Support
Manage
Getting started
Overview
Runtime
Connections
Logs
API Management
Monitoring
Cloud Foundry apps /
Routes

audioemotiondetection Starting Visit App URL

Org: anshu.india514@gmail.com **Location:** United Kingdom **Space:** dev

Download, modify, and redeploy your Cloud Foundry app with the command line interface

Last Updated: 2018-05-24 | Edit in GitHub

Use IBM Cloud command line interface to download, modify, and redeploy your Cloud Foundry applications and service instances.

Before you begin, download and install the IBM Cloud CLI External link icon

Restriction: The command line tool is not supported by Cygwin. Use the tool in a command line window other than the Cygwin command line window.

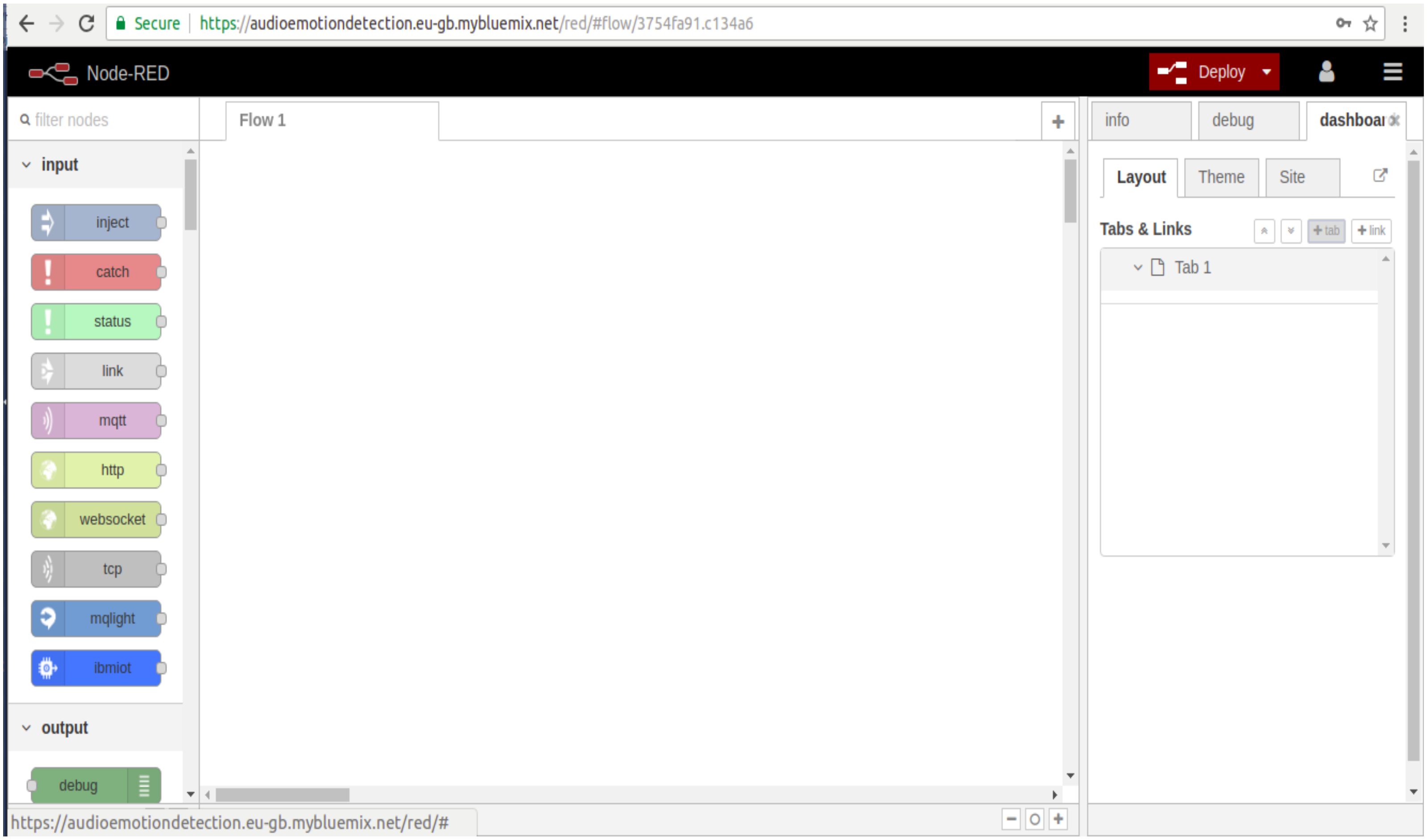
After you install the command line interface, you can get started:

1. Change to the directory where your code is located.

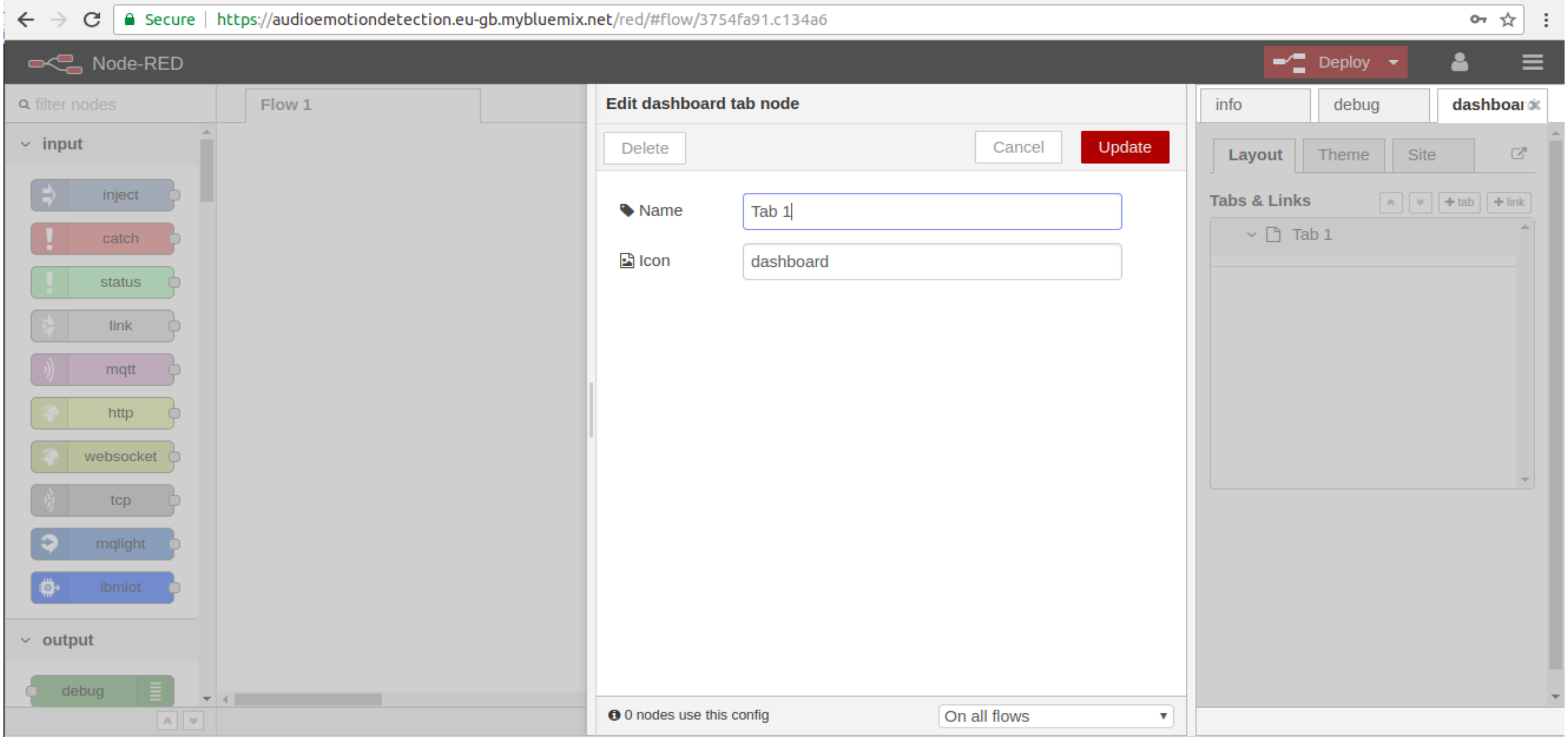
```
$ cd your_new_directory
```

Step 5: This works as drag and drop. We need to configure our application

Initially it would look like>



Now change the details to start working with the application



https://audioemotiondetection.eu-gb.mybluemix.net/red/#flow/3754fa91.c134a6

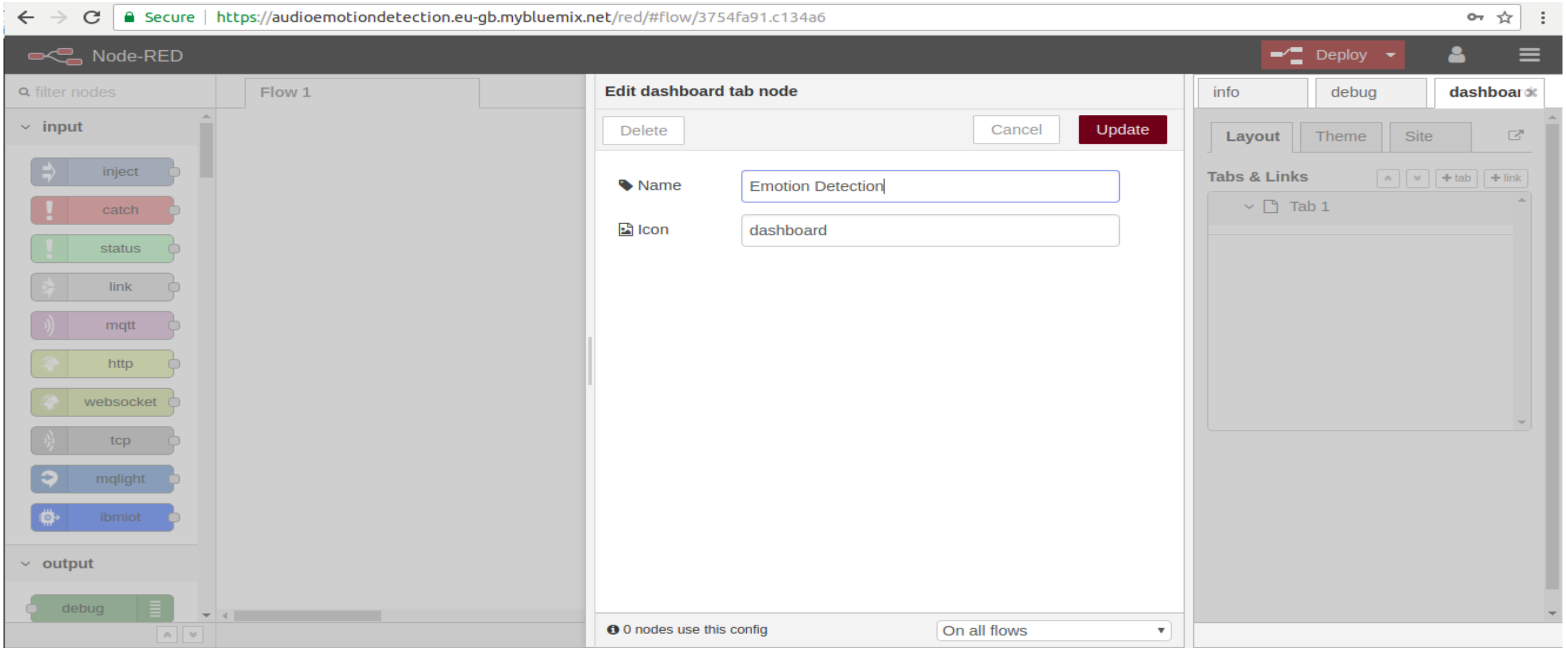
Edit dashboard tab node

Name: Tab 1

Icon: dashboard

0 nodes use this config

On all flows



https://audioemotiondetection.eu-gb.mybluemix.net/red/#flow/3754fa91.c134a6

Edit dashboard tab node

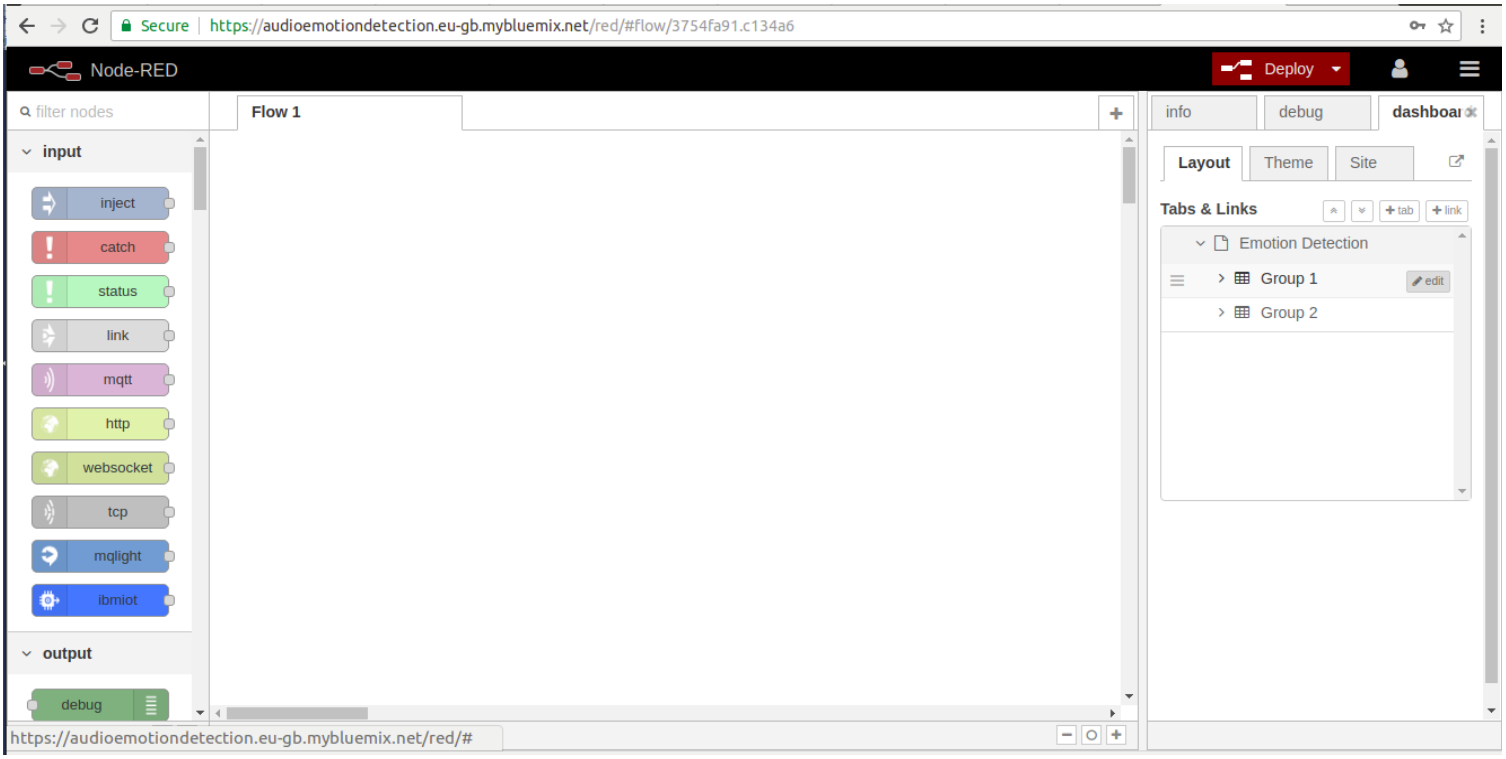
Name: Emotion Detection

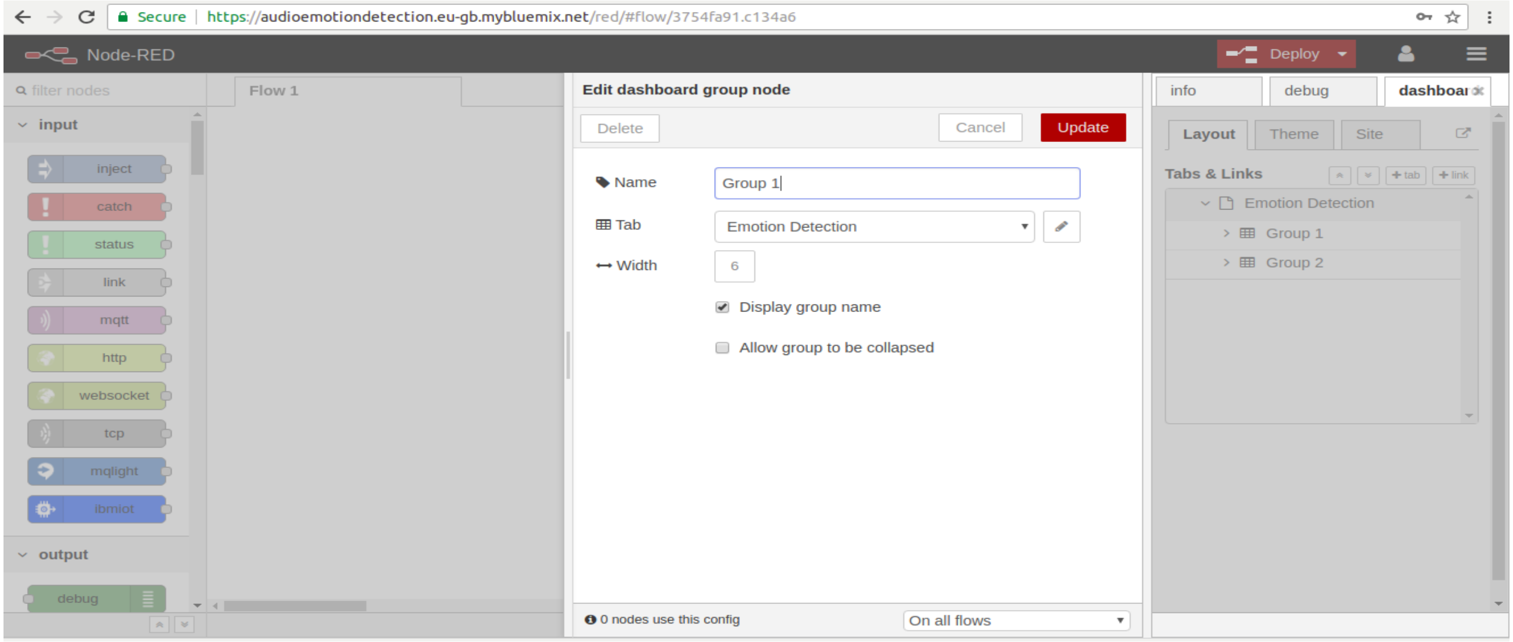
Icon: dashboard

0 nodes use this config

On all flows

Now create two groups and edit each group .One for history of the speech and another for a current sentiment





Edit dashboard group node

Name: Group 1

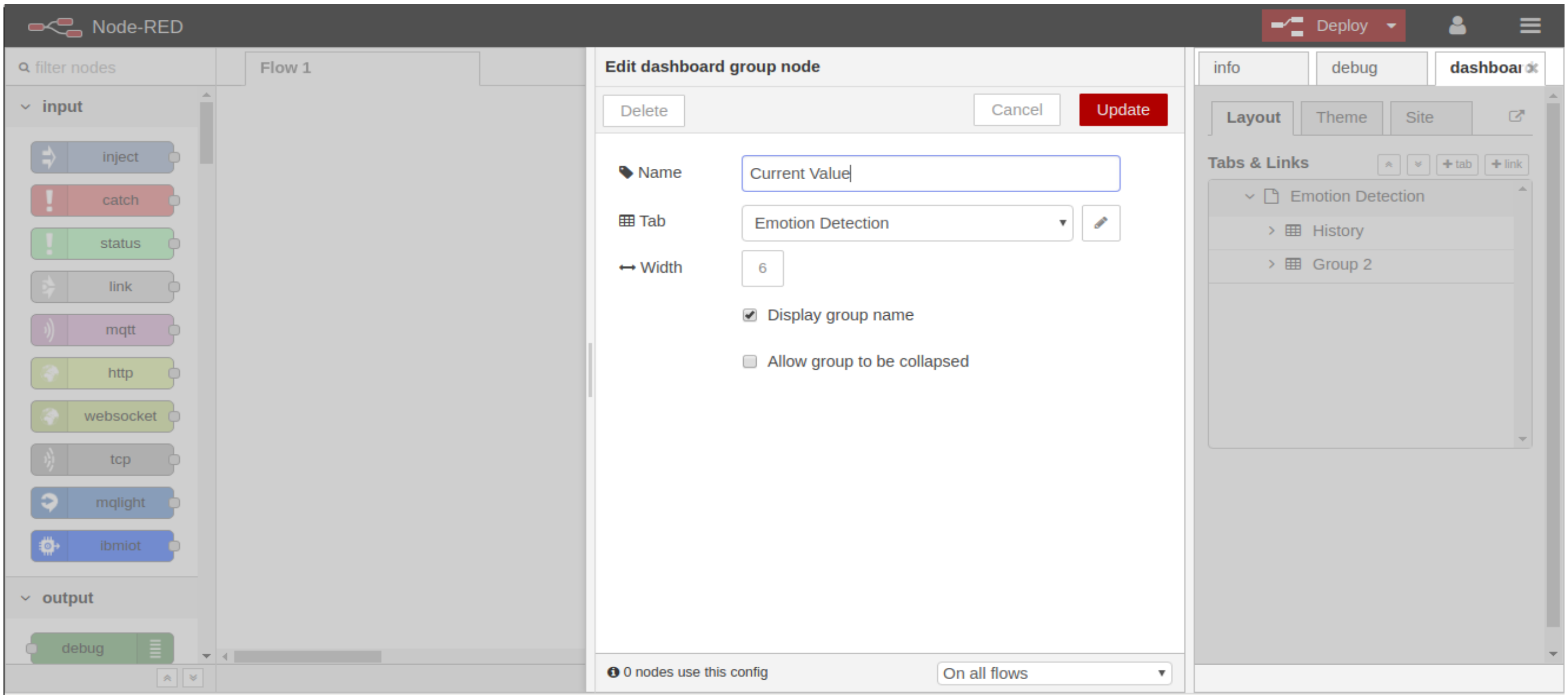
Tab: Emotion Detection

Width: 6

☑ Display group name

☐ Allow group to be collapsed

0 nodes use this config — On all flows



Edit dashboard group node

Delete Cancel Update

Name: Current Value

Tab: Emotion Detection

Width: 6

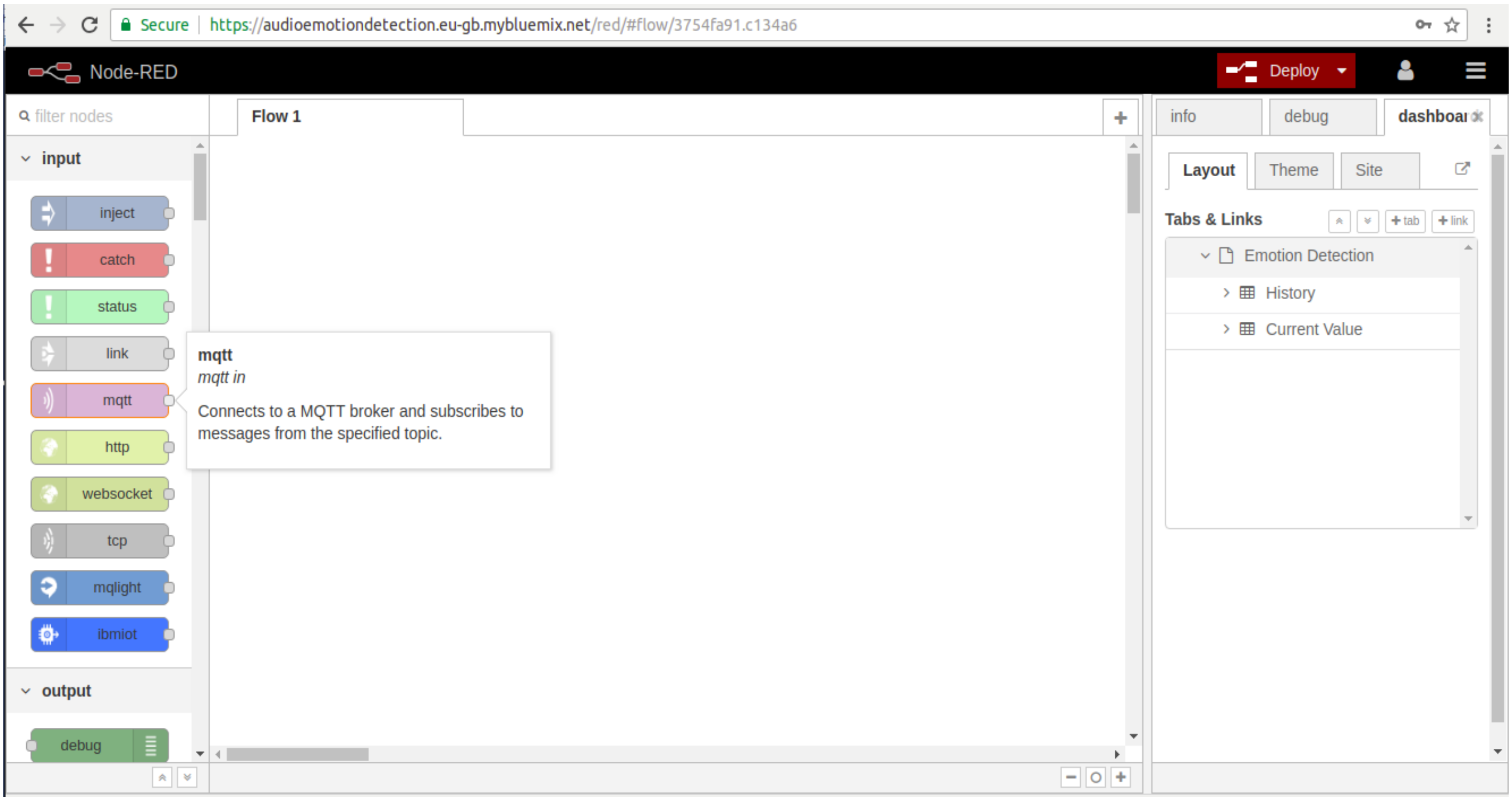
☑ Display group name

□ Allow group to be collapsed

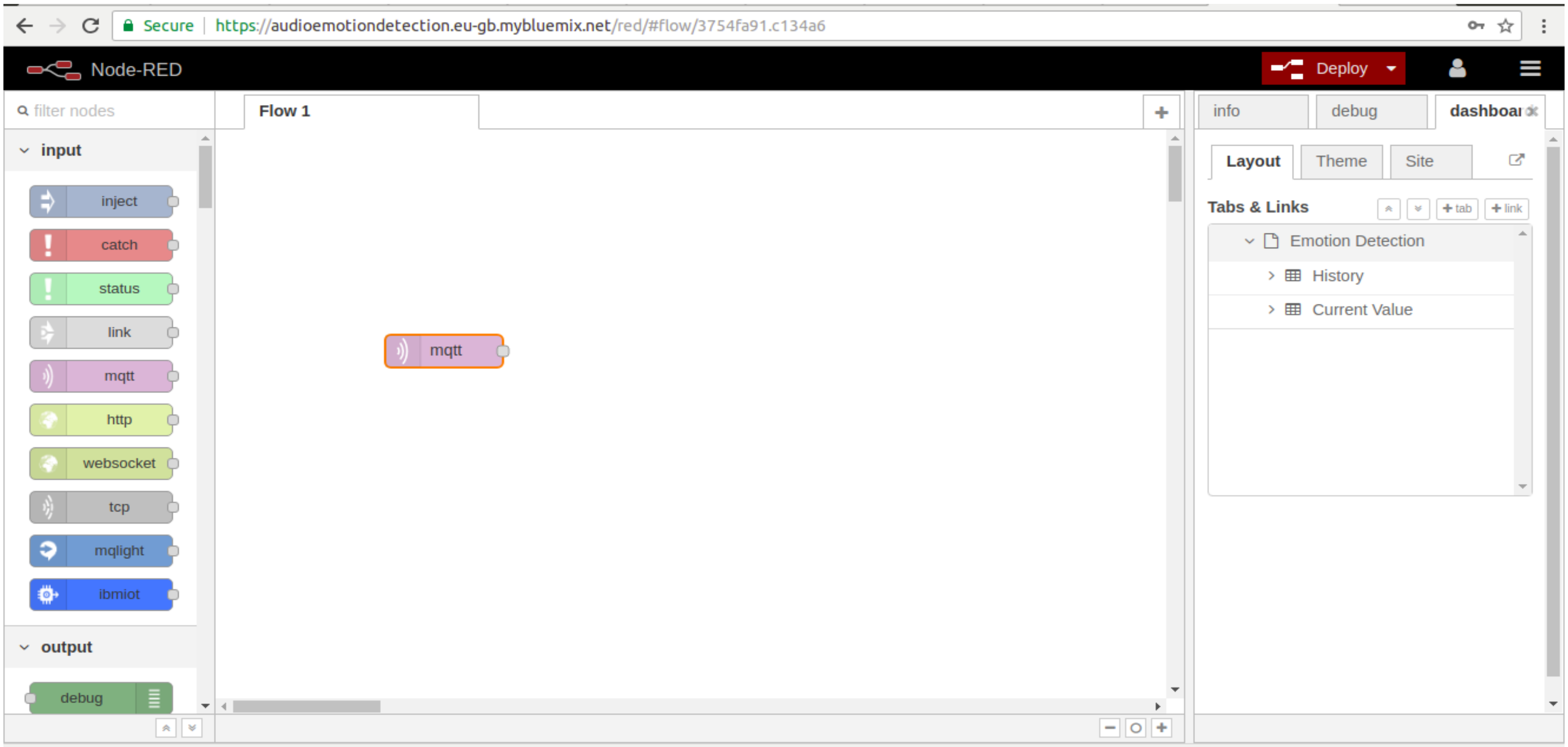
0 nodes use this config

On all flows

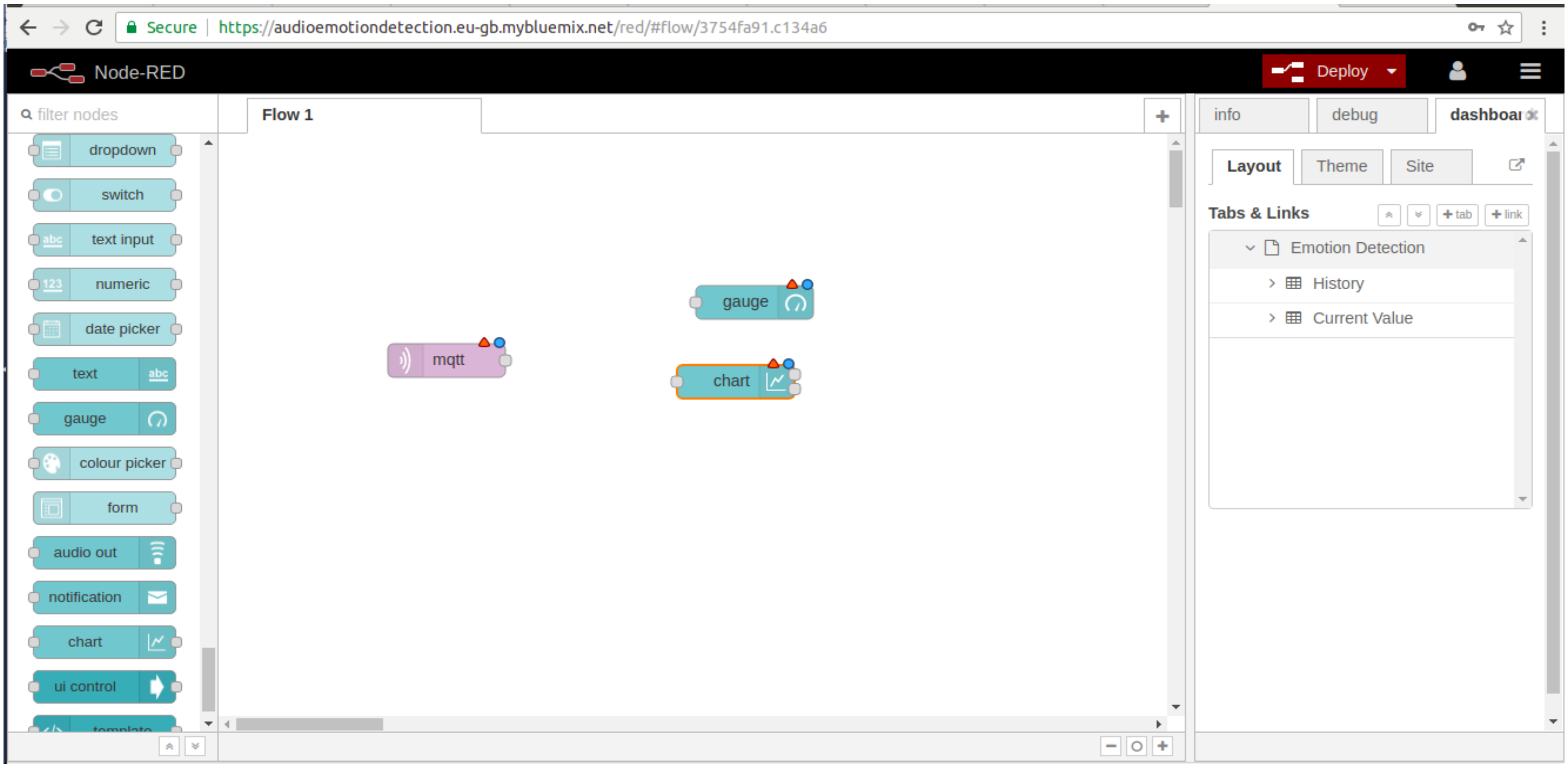
Step 6: Drag and drop mqtt


Secure | https://audioemotiondetection.eu-gb.mybluemix.net/red/#flow/3754fa91.c134a6

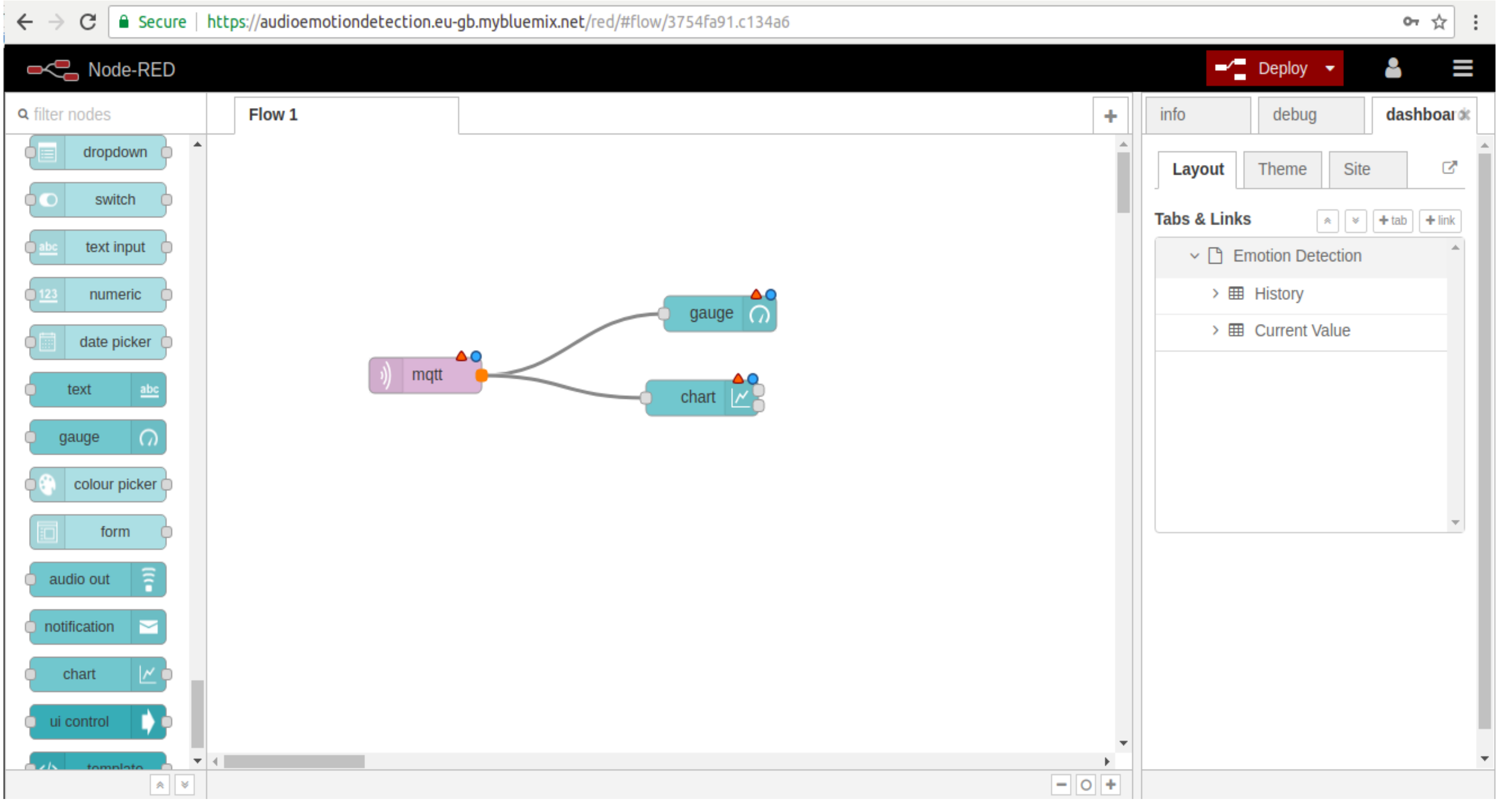
mqtt
mqtt in
Connects to a MQTT broker and subscribes to messages from the specified topic.



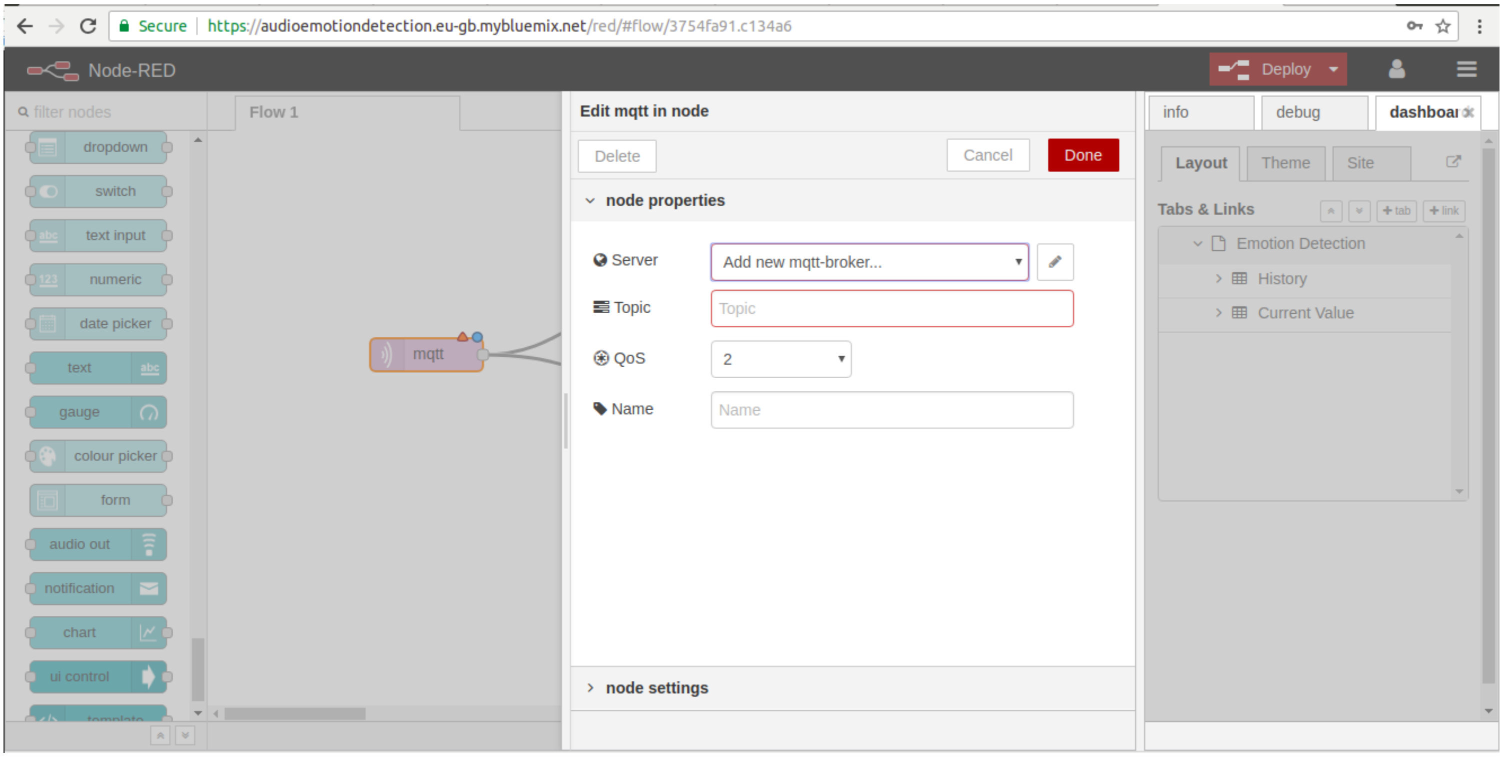
Step 7: Drag and drop guage and chart also the same way.



Step 8: Connect Them


https://audioemotiondetection.eu-gb.mybluemix.net/red/#flow/3754fa91.c134a6

Step 9 Edit their properties like the way we need for deployment


https://audioemotiondetection.eu-gb.mybluemix.net/red/#flow/3754fa91.c134a6

Edit mqtt in node

node properties

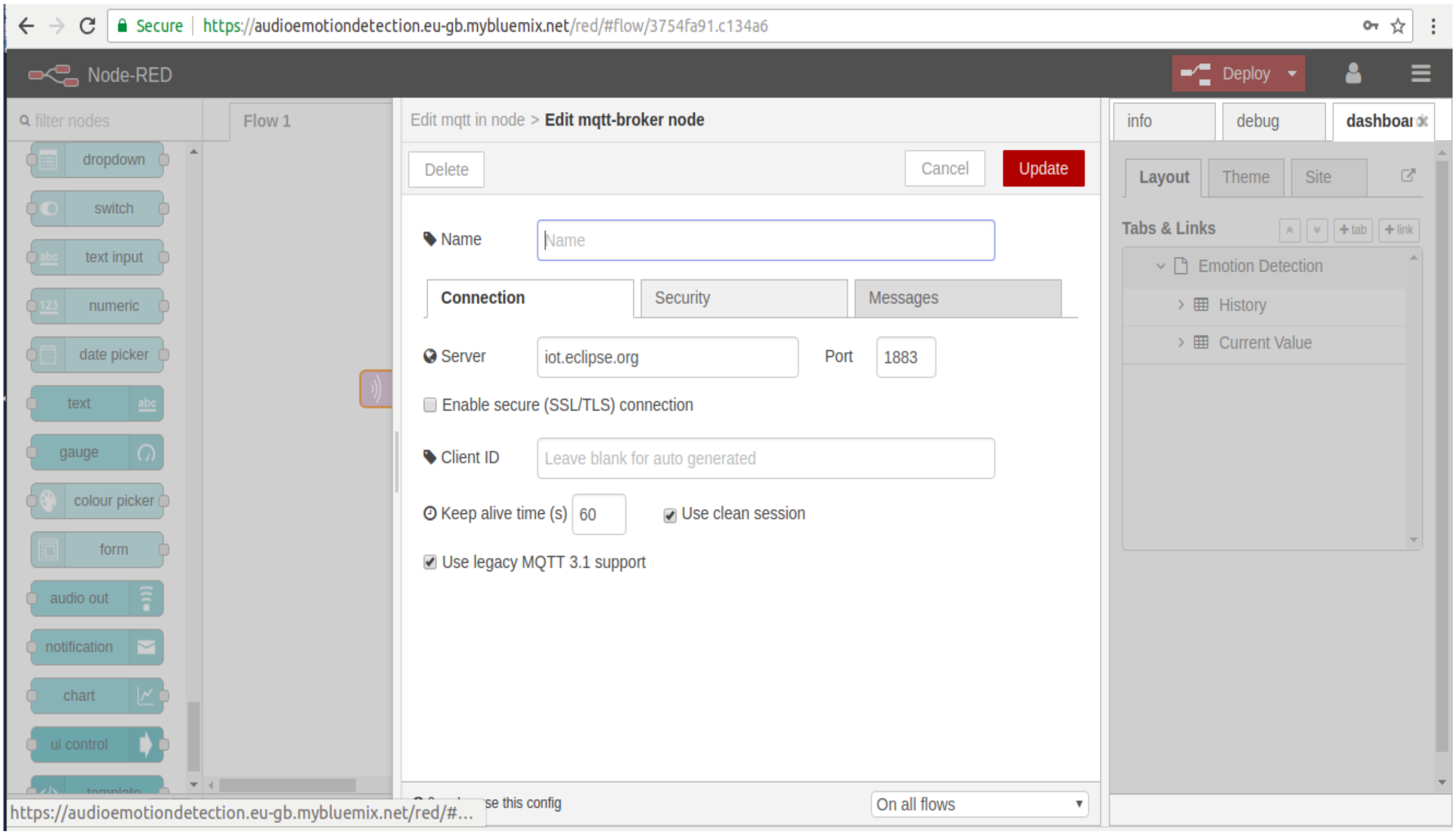
Server: Add new mqtt-broker...

Topic: Topic

QoS: 2

Name: Name

node settings



Edit mqtt in node > **Edit mqtt-broker node**

Name: Name

Server: iot.eclipse.org Port: 1883

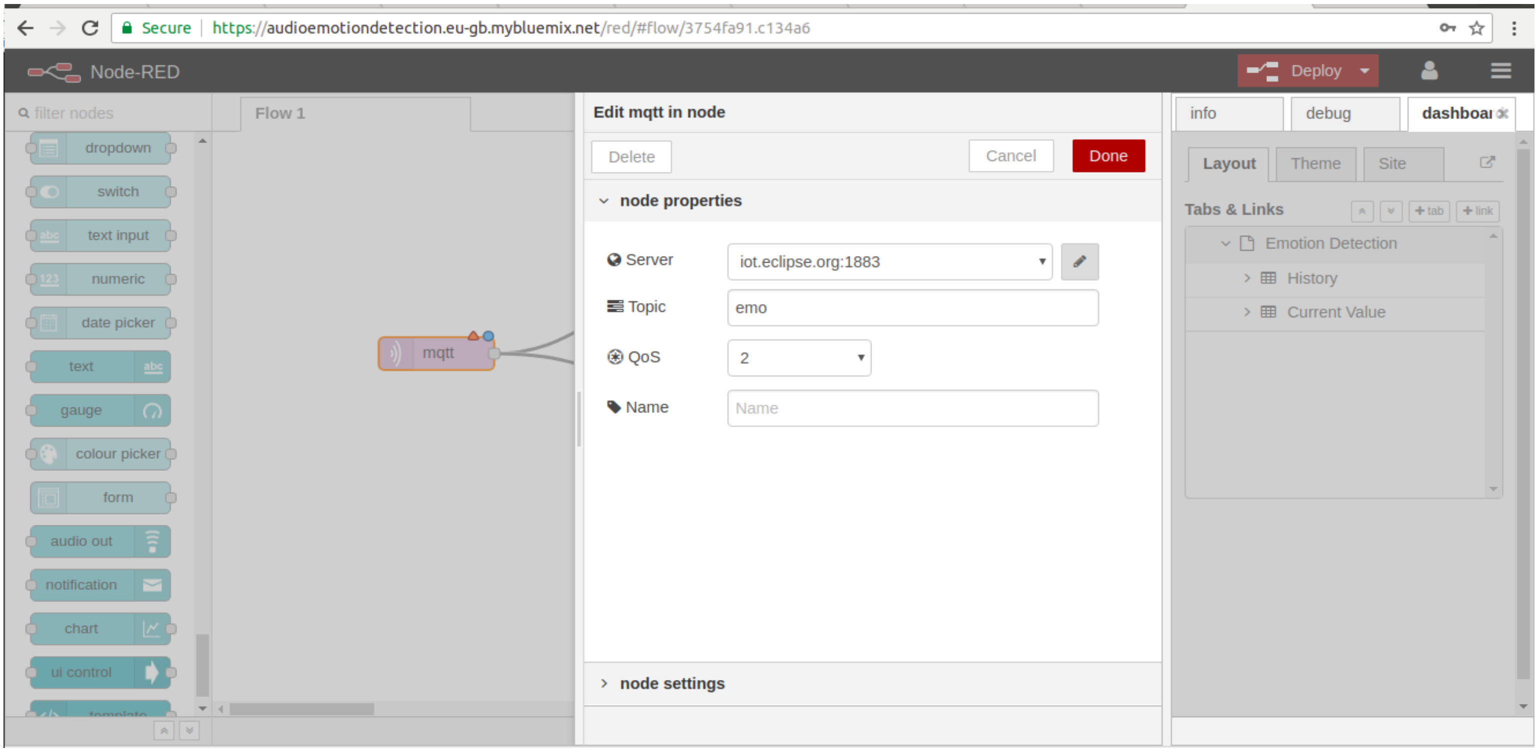
□ Enable secure (SSL/TLS) connection

Client ID: Leave blank for auto generated

Keep alive time (s): 60 ☑ Use clean session

☑ Use legacy MQTT 3.1 support

On all flows



Edit mqtt in node

node properties

Server: iot.eclipse.org:1883

Topic: emo

QoS: 2

Name: Name

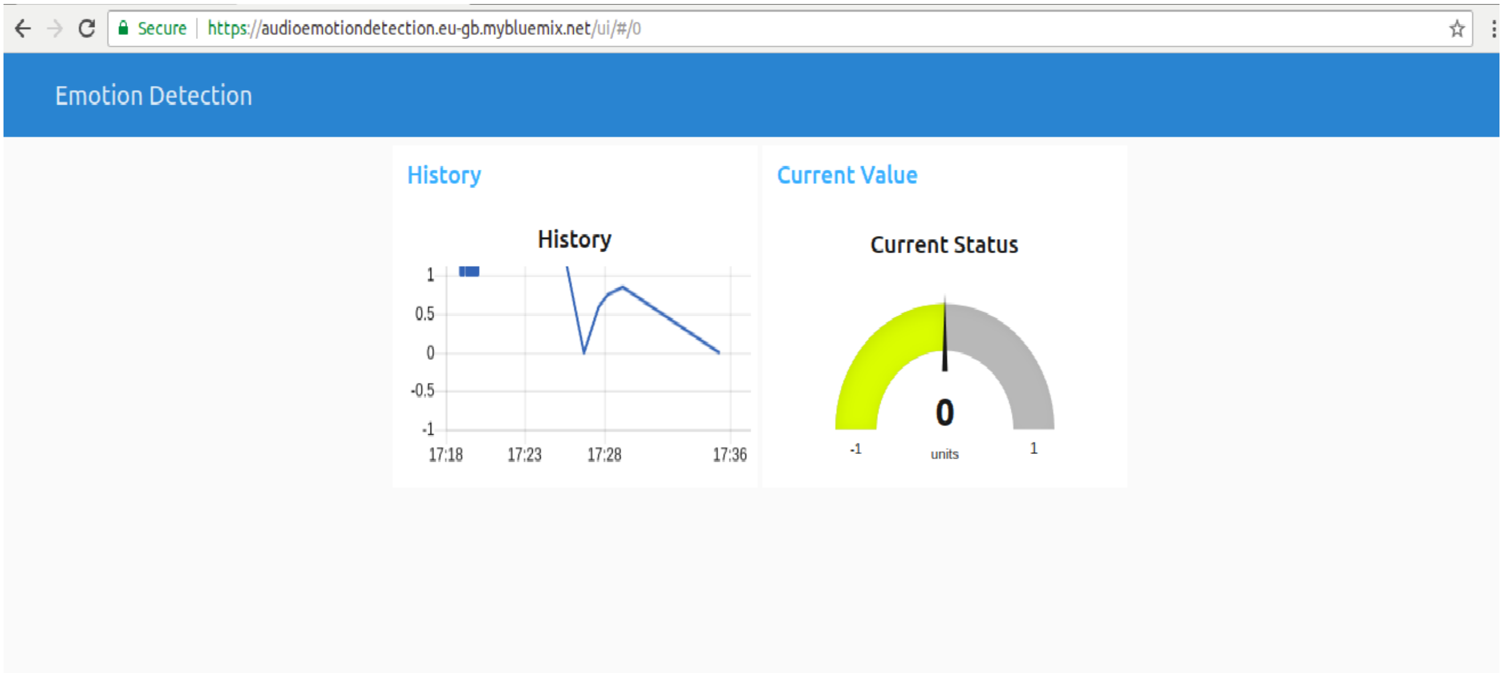
node settings

Done! We have created the application. All we need to do is to deploy the app to work. This app could be accessed by the commands mentioned in the code.

Results:

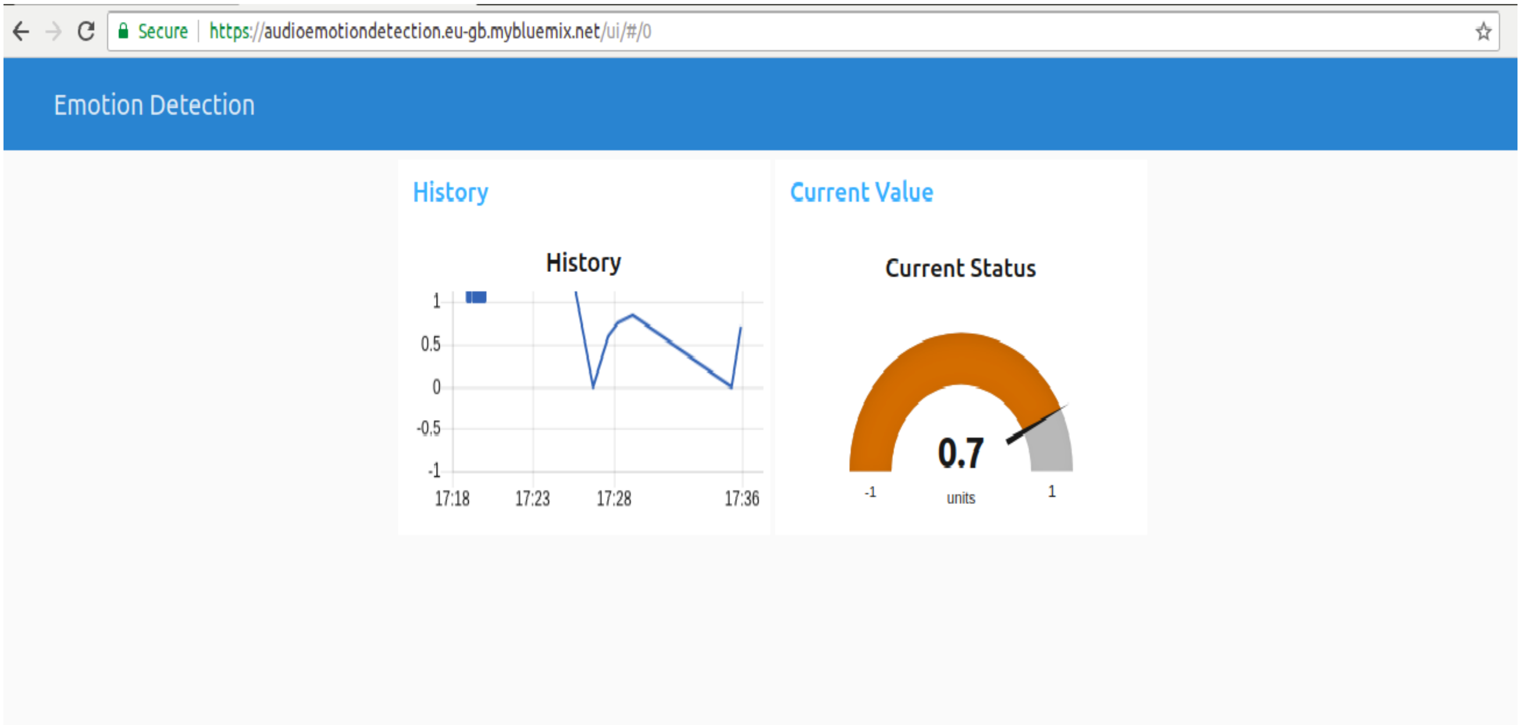
1. Speech Detected: hi how are you

Polarity: 0



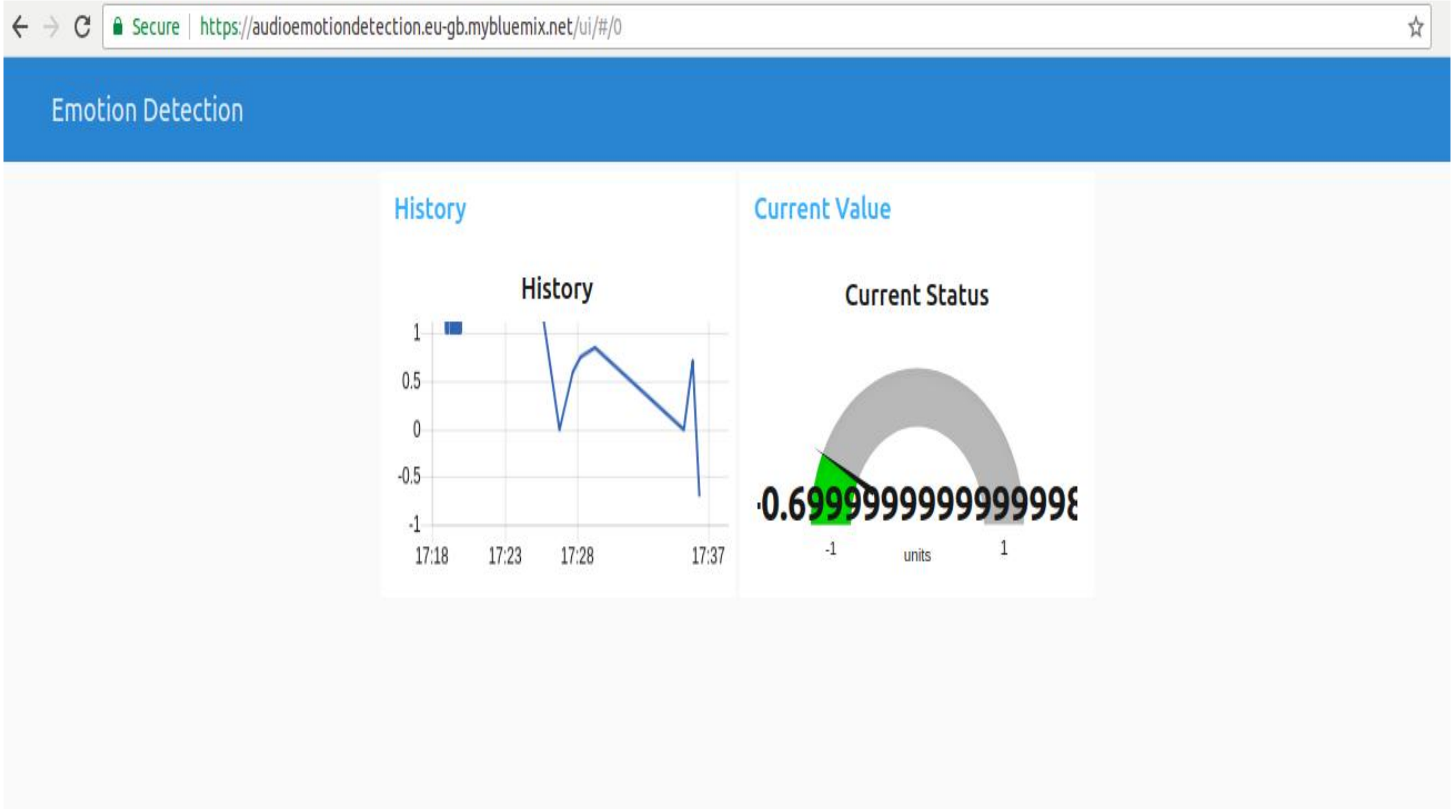
2. Speech Detected: good people are good

Polarity: 0.7



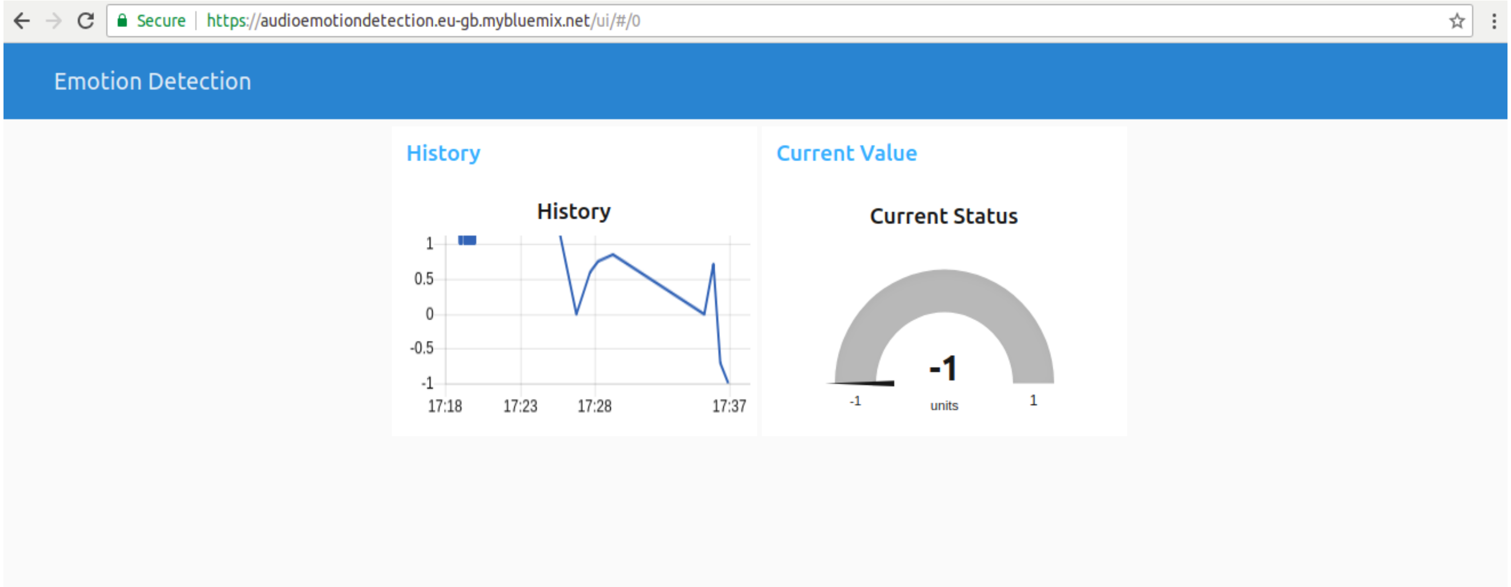
3. Speech Detected: bad people bad work bad

Polarity:-0.6999



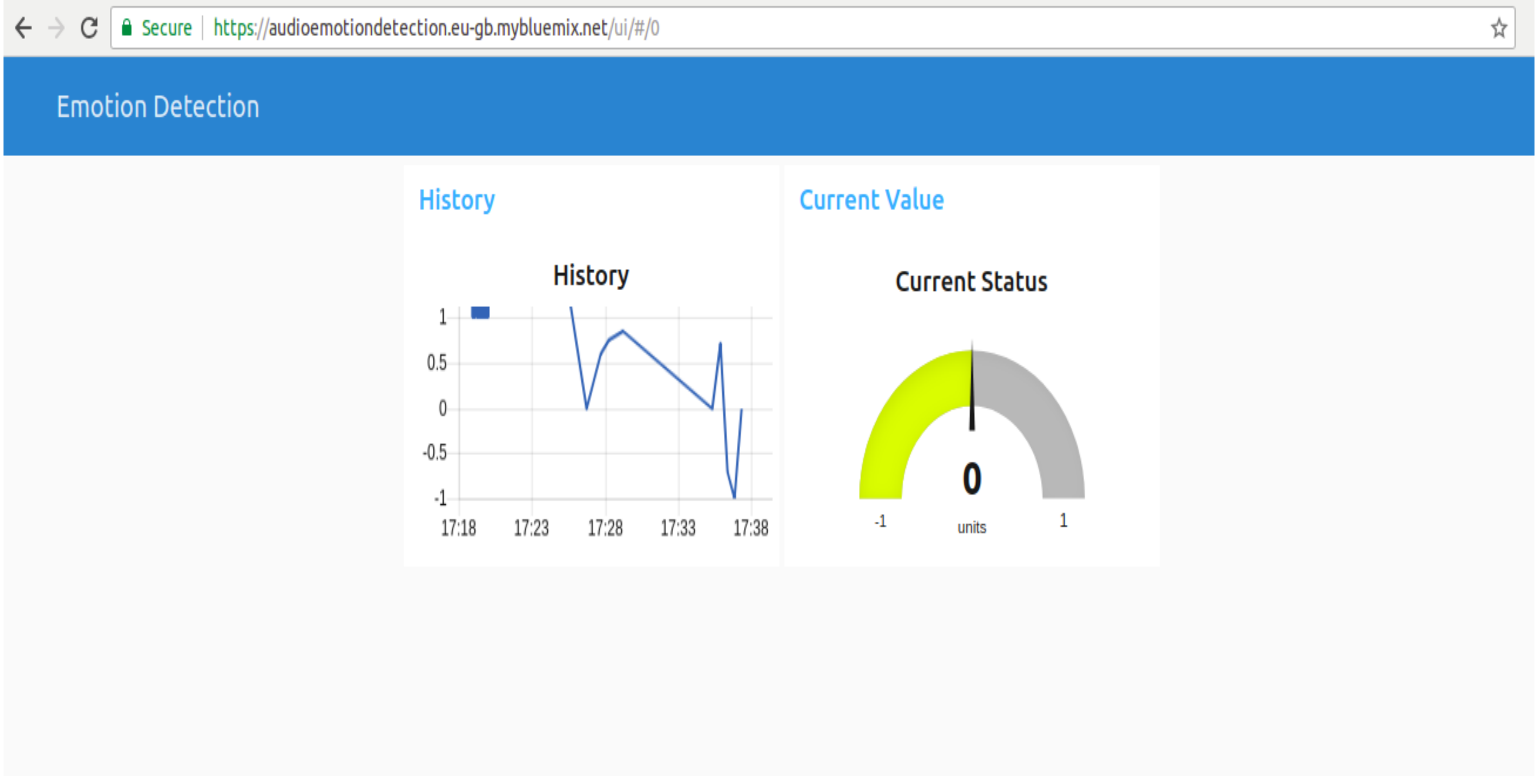
4. Speech Detected: Worst note on a worst guy

Polarity:-1



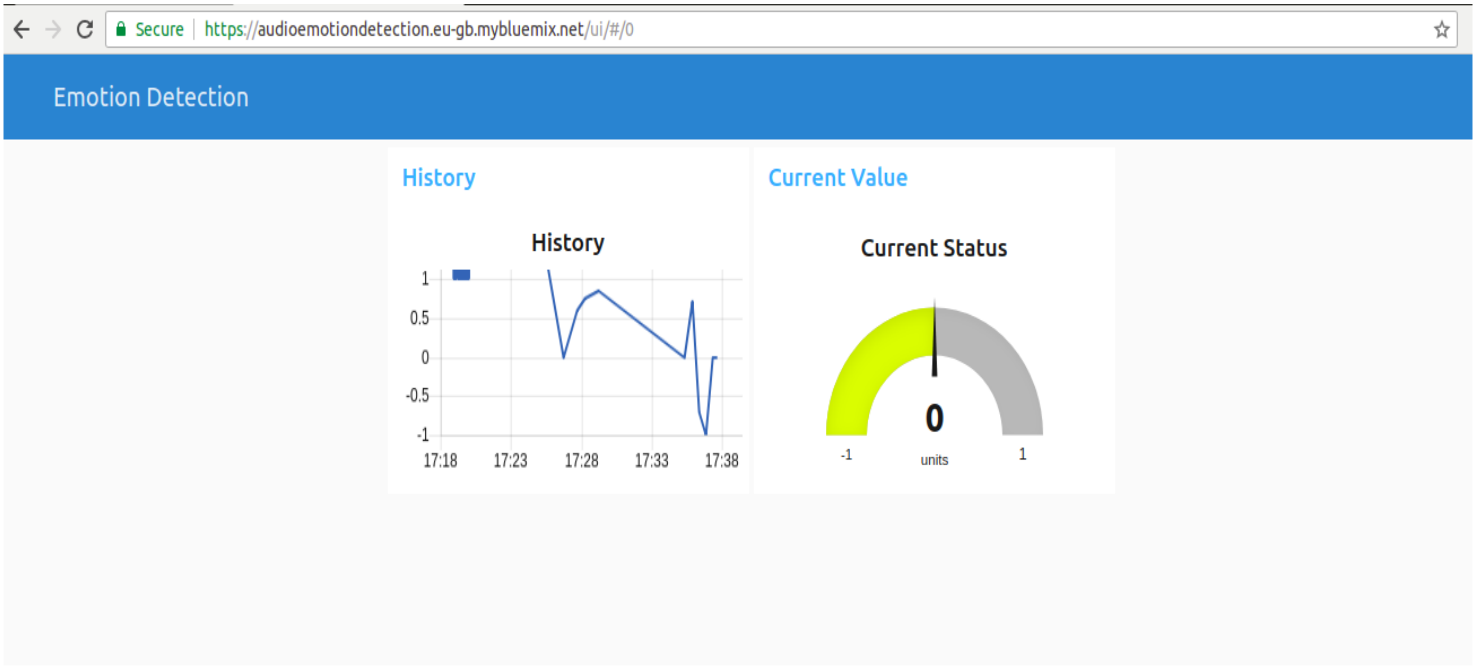
5. Speech Detected: have some time

Polarity: 0



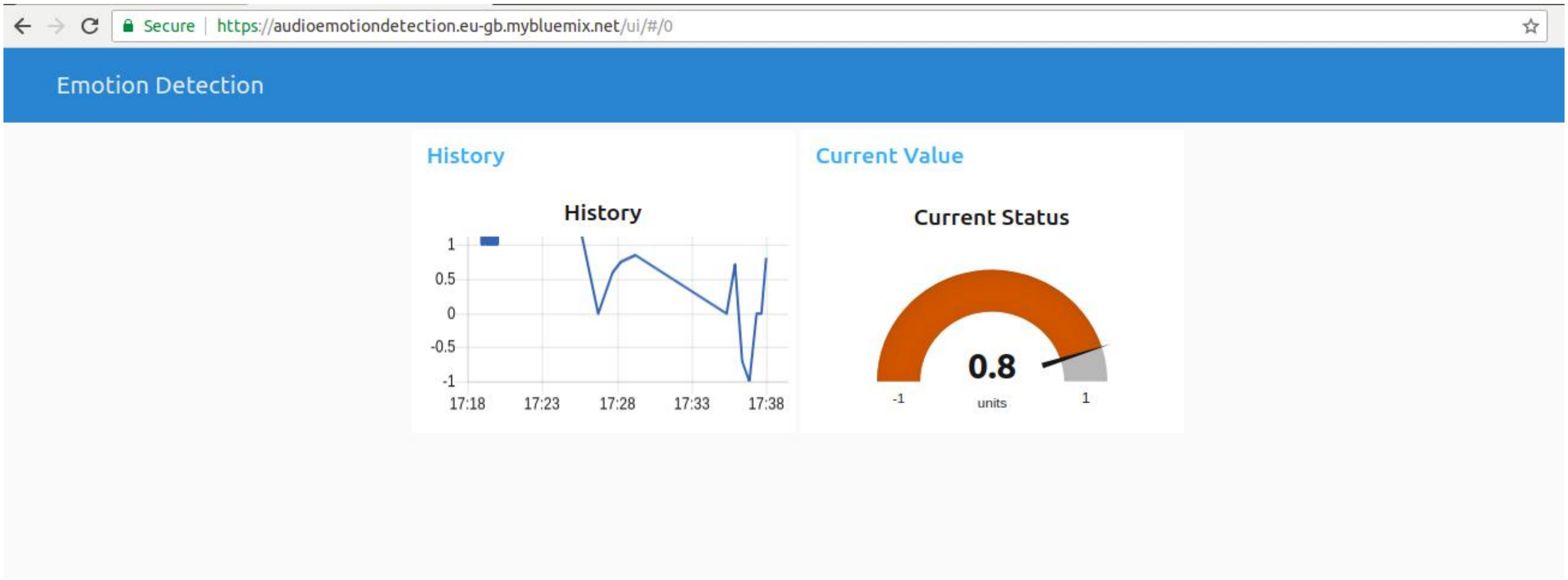
6. Speech Detected: People are furious.

Polarity: 0



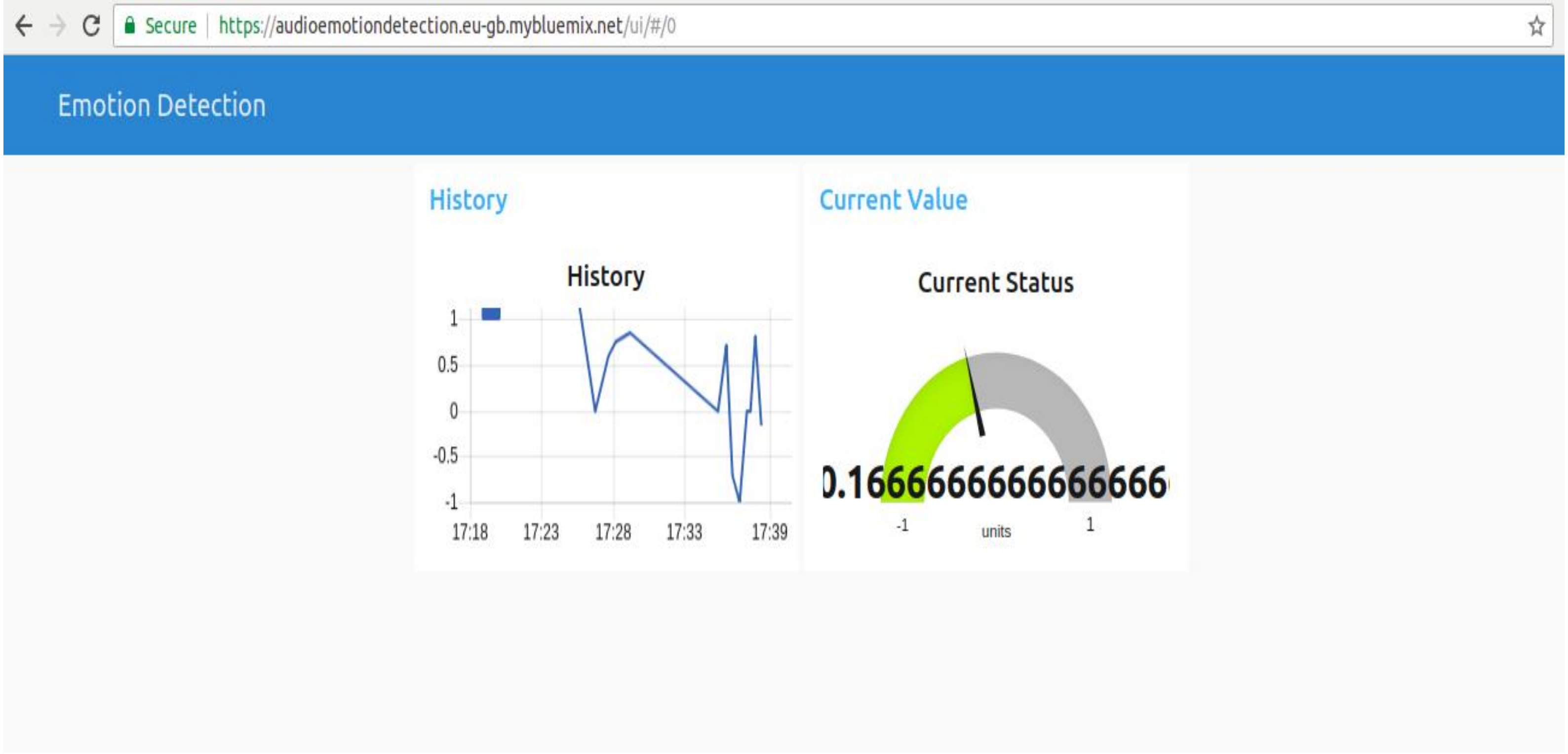
7. Speech Detected: wonderful methods for a great nation

Polarity: 0.8



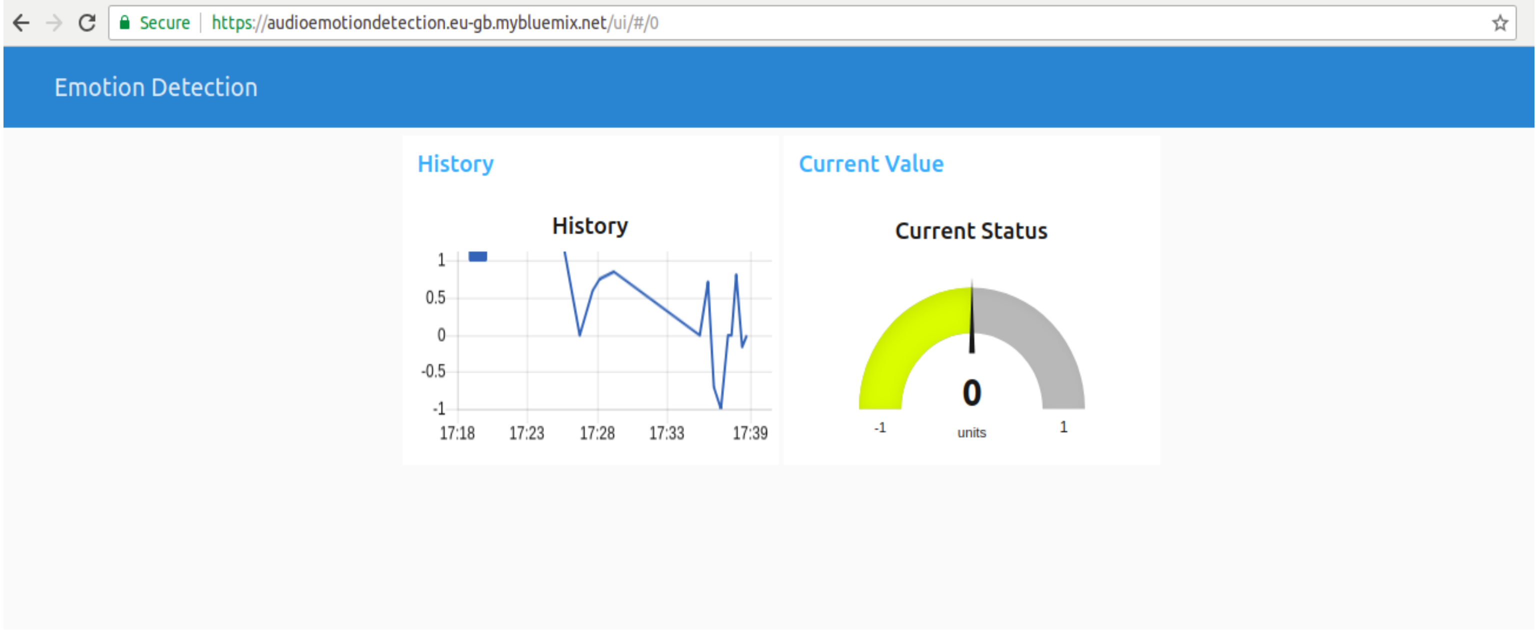
8. Speech Detected: men in black dress

Polarity: -0.1666



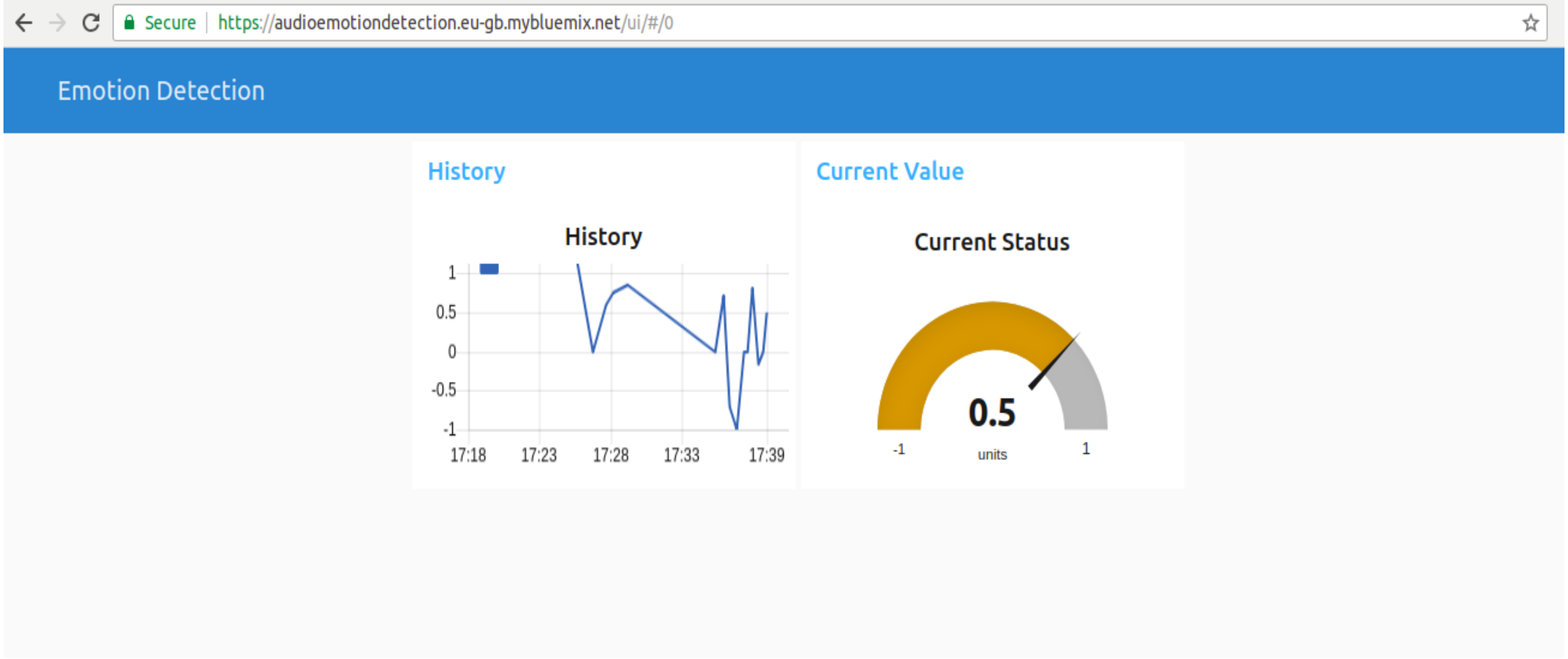
9. Speech Detected: men in uniform

Polarity: 0



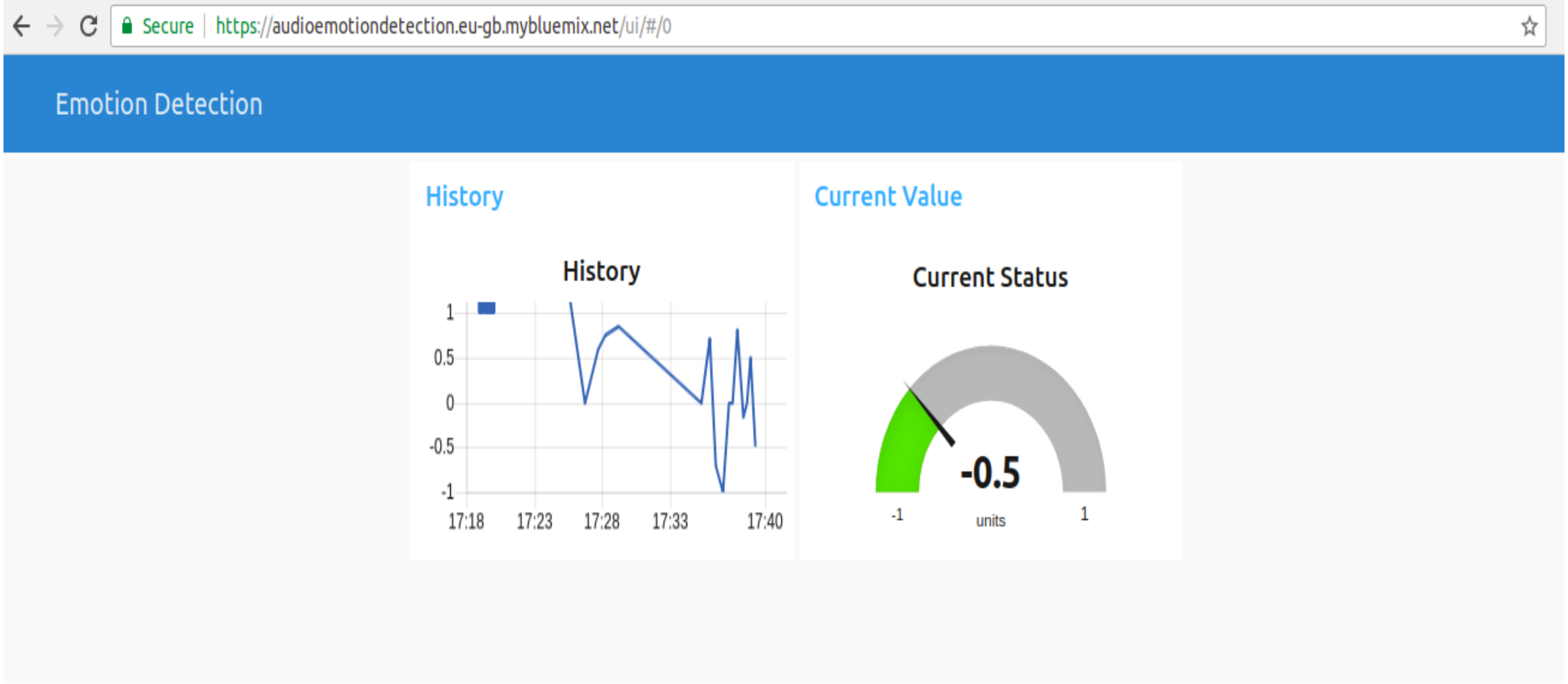
10. Speech Detected: love is care

Polarity: 0.5



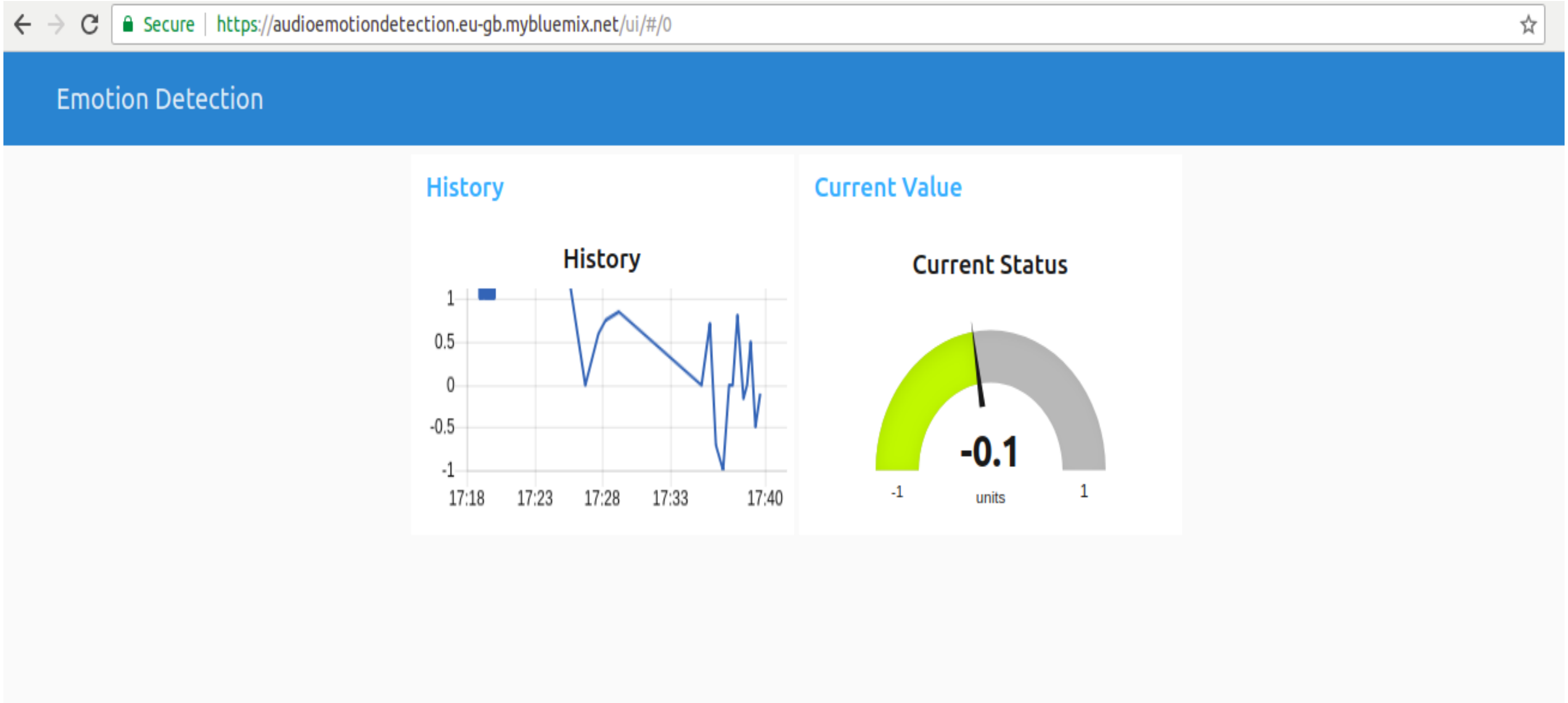
11. Speech Detected: He is careless

Polarity:-0.5



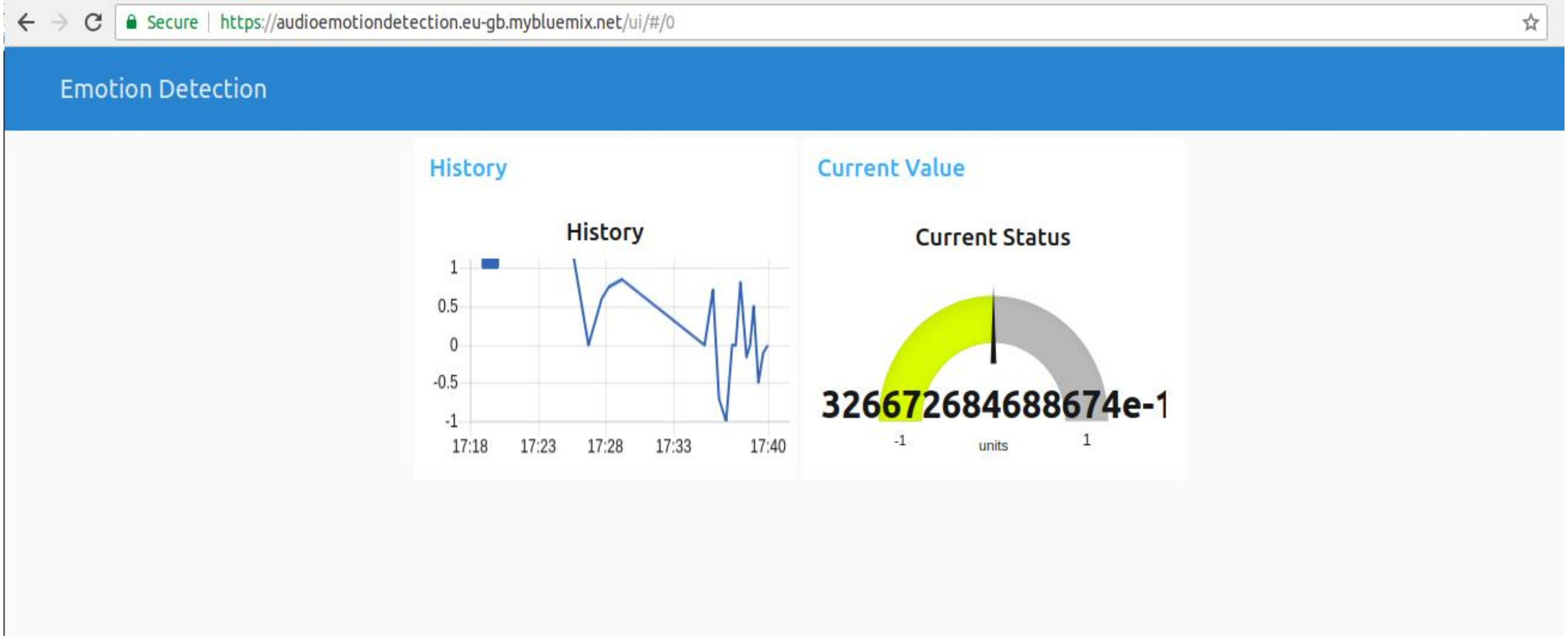
12. Speech Detected: I am careful

Polarity: -0.1



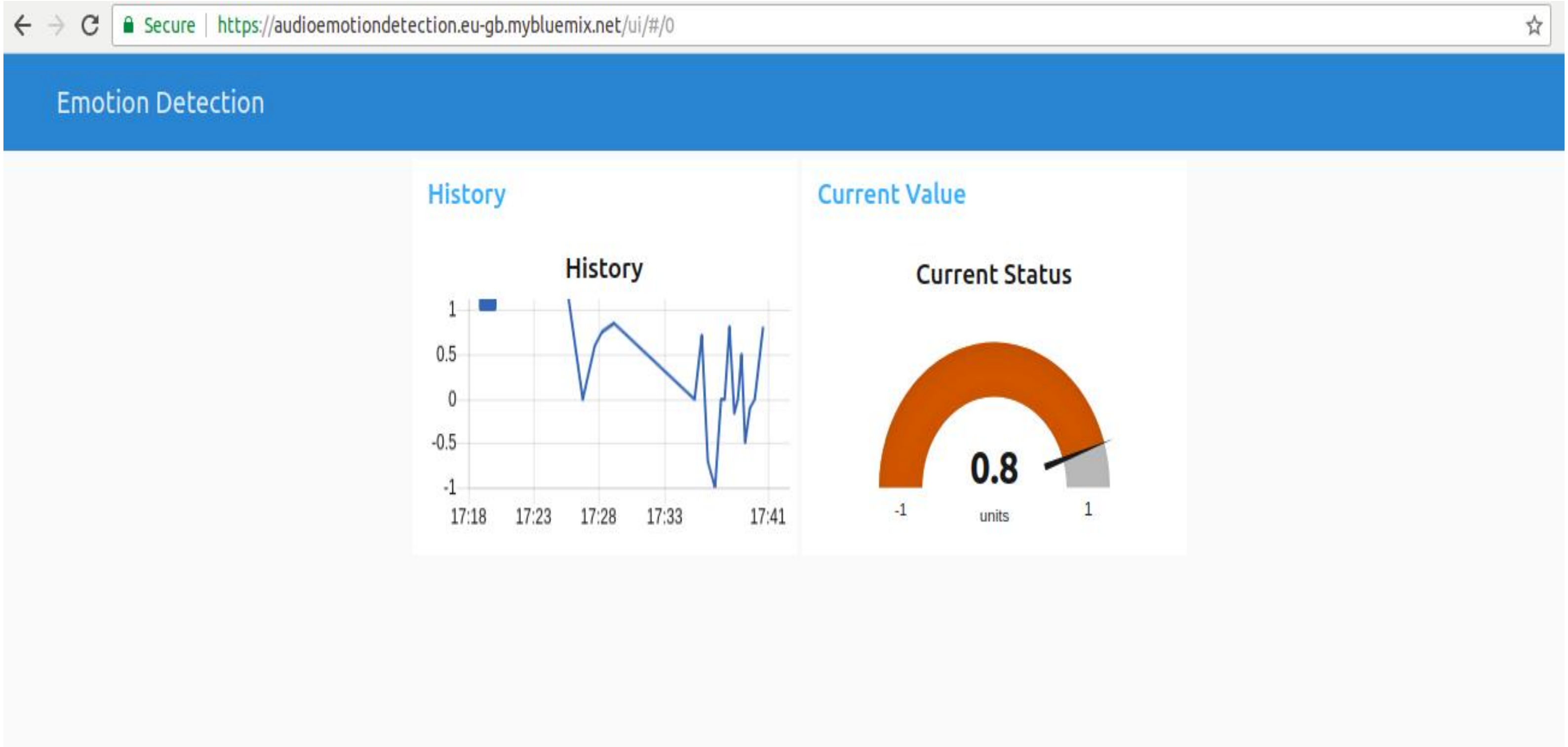
13. Speech Detected: he is cheerful mad bad

Polarity: ~0



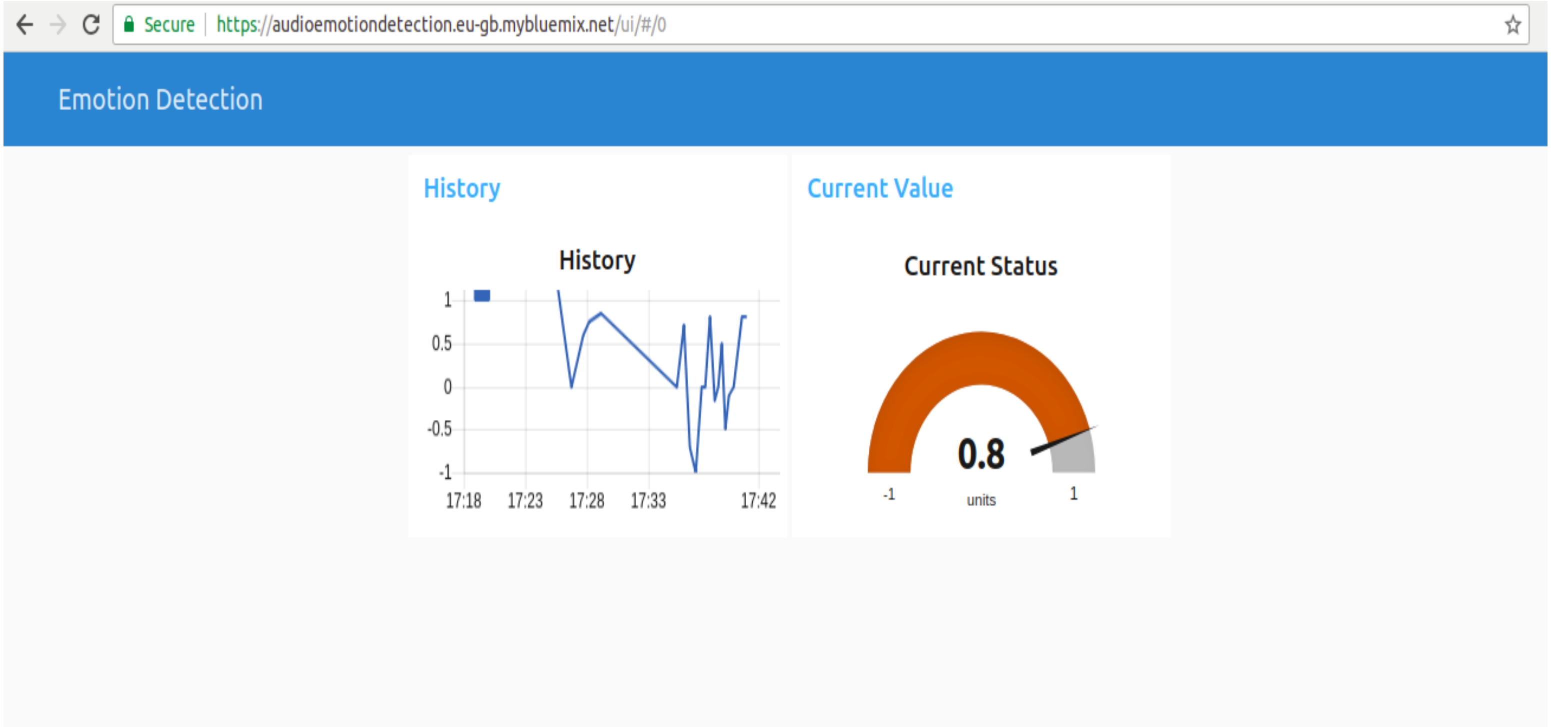
14. Speech Detected: happy one two three

Polarity: 0.8



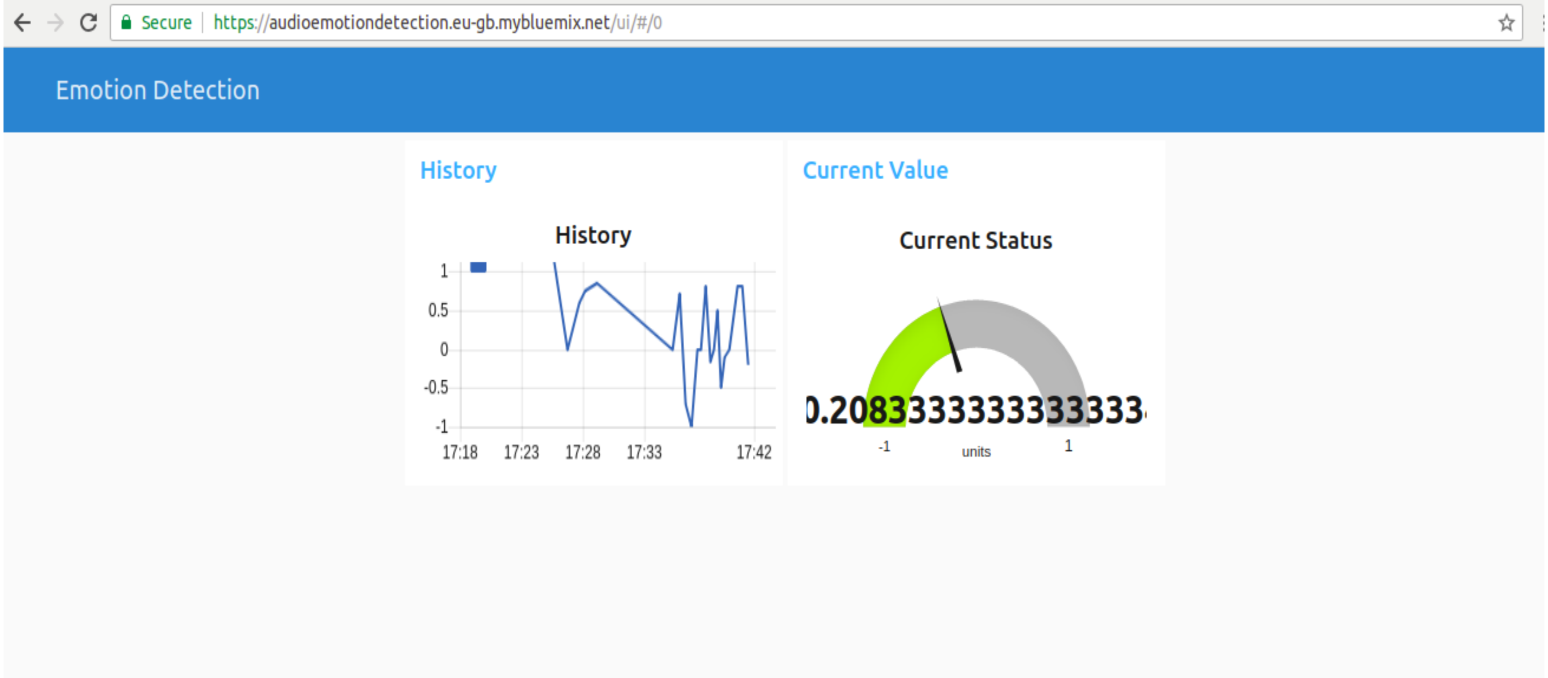
15. Speech Detected: cheer for a team that is happy

Polarity: 0.8



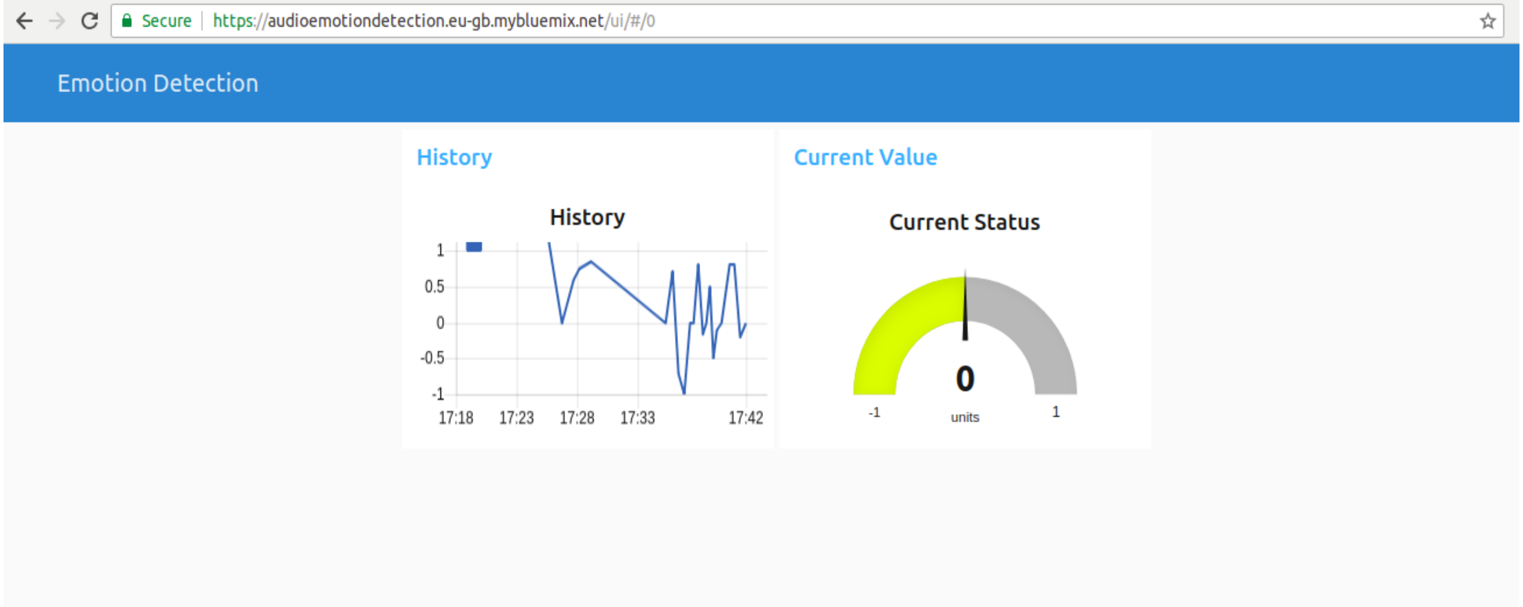
16. Speech Detected: love is mad and blind.

Polarity: -0.208



17. Speech Detected: hello then bye

Polarity: 0



Conclusion: We have seen the results and also the history of emotions detected that is plotted in the graph.

Improvements are possible in this project .We may train our own kernel for the sentence sentiment and also we can use this for lie detection by training our own kernel and then finding subjectivity to the dataset.