Node-RED Visual Programming Twitter Workshop

Download this PDF and Node-RED flows at

https://github.com/johnwalicki/Node-RED-Twitter-Workshop

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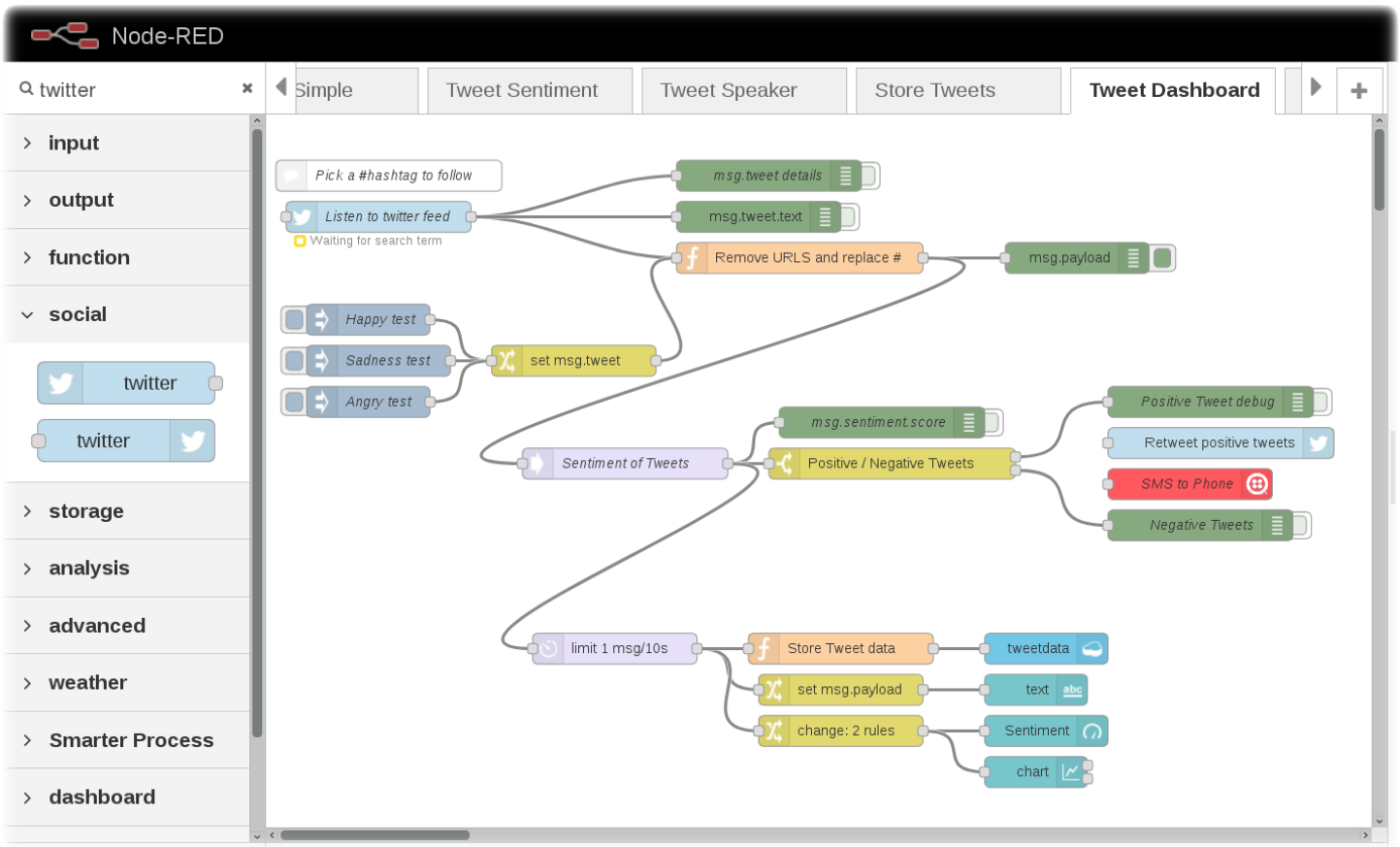
Table of Contents

Topics covered: Node-RED, IBM Cloud, Twitter, Sentiment, Watson Tone Analyzer, Watson Visual Recognition, Watson Text to Speech and Cloudant.

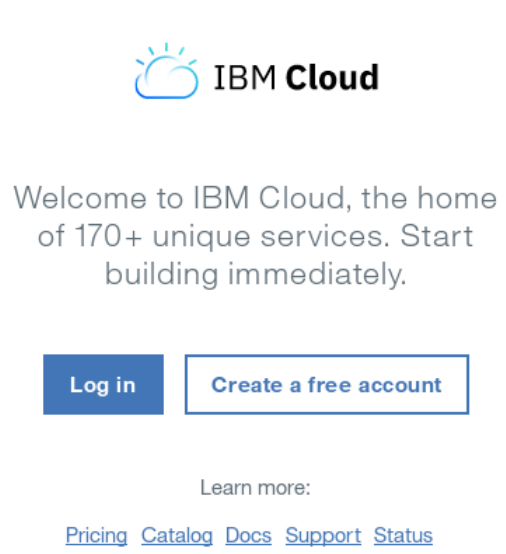
In this lab, we will learn about Node-RED by creating example flows that manipulate Tweets. Node-RED is a programming tool for wiring together hardware devices, APIs and online services in new and interesting ways. It provides a browser-based editor that makes it easy to wire together flows using the wide range of nodes in the palette that can be deployed to its runtime in a single-click.



Section 1 – Log into your IBM Cloud Account

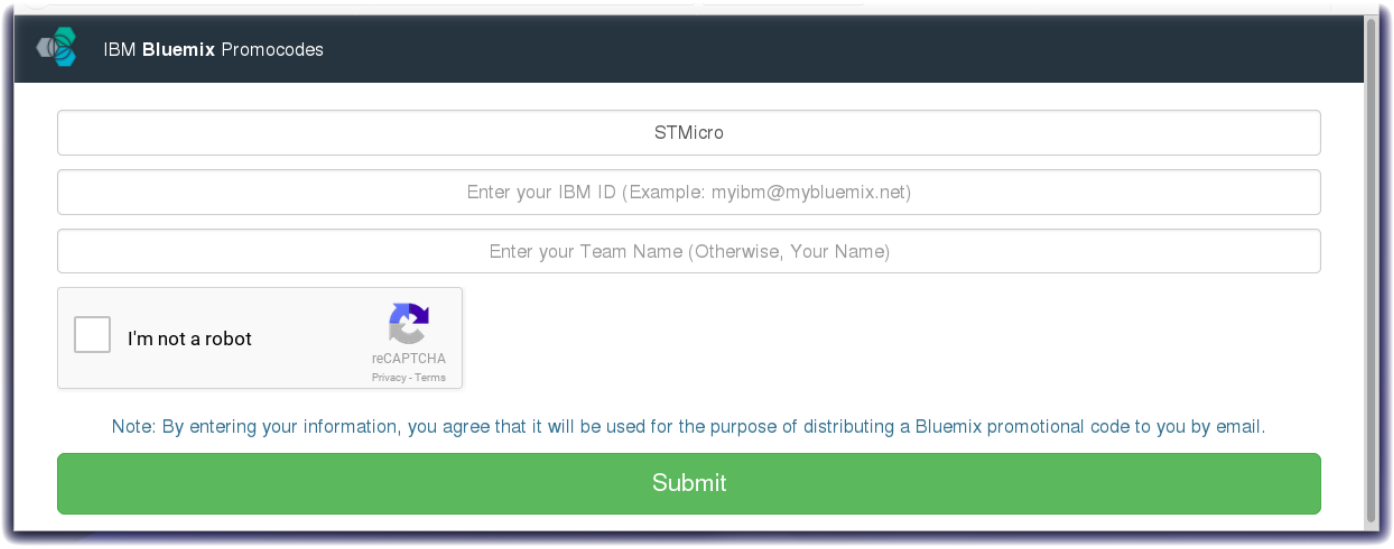
Step 1 – Login to your Free Account on IBM Cloud

- In a new browser tab, goto http://bluemix.net and click “Log in”



Step 2 – Get a Promocode to extend your IBM Cloud Trial Account

- Workshop attendees can apply a Promocode to their IBM Cloud account and extend the duration of the Trial period, add additional Services and increase the memory of your IBM Cloud Foundry applications.
- Visit **http://promocodes.mybluemix.net**
- Enter **Developer Slam** as the Event Name (Case sensitive)

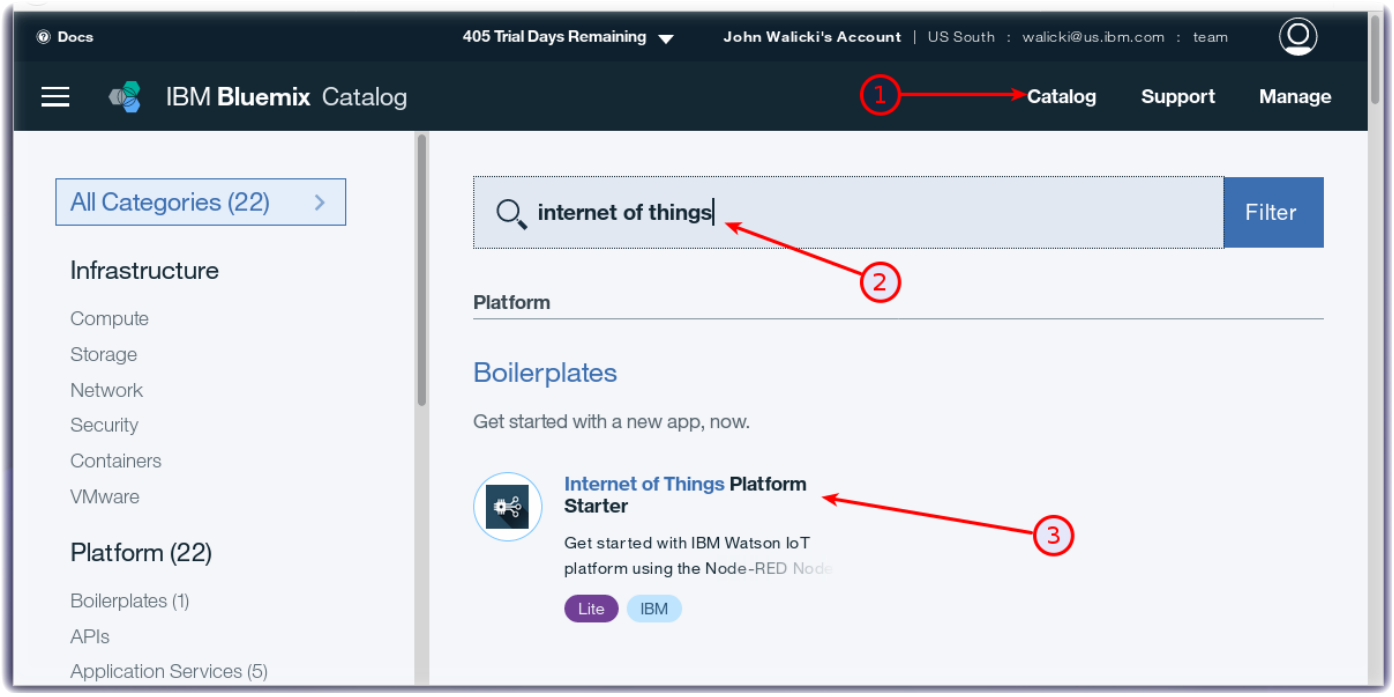


Section 2 – Create an Internet of Things Starter App

Step 1 – Create an IoT Starter Application

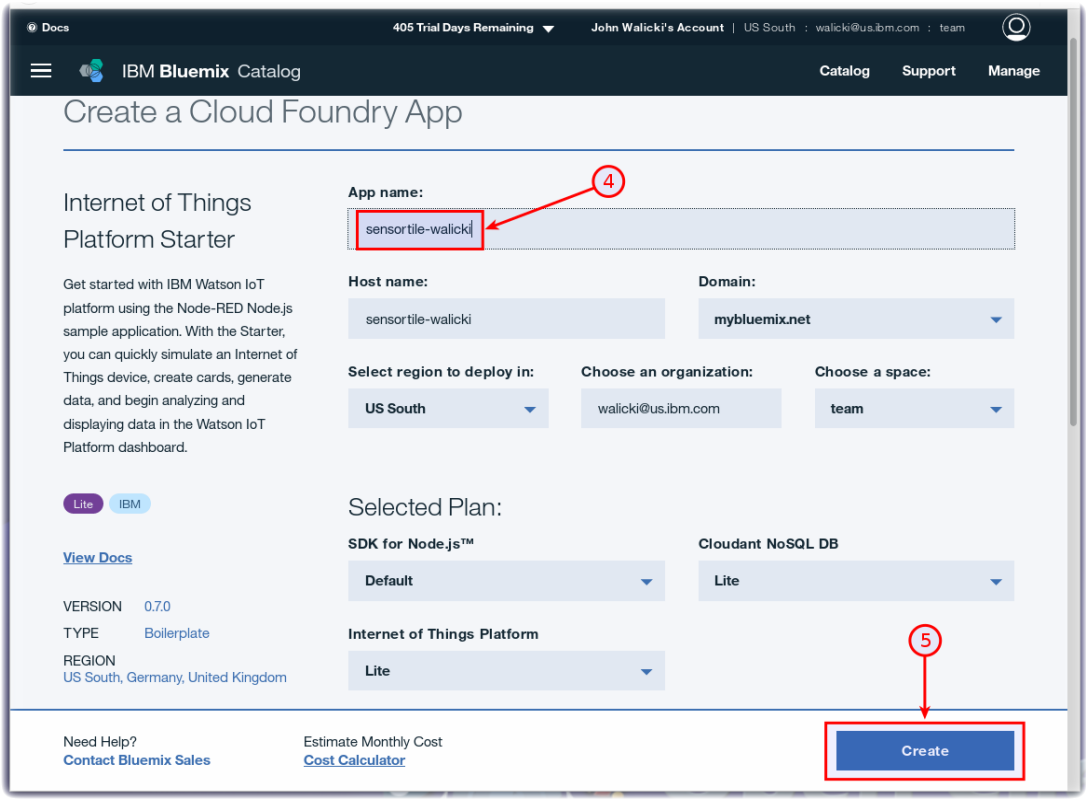
There are two Starter applications in the IBM Cloud Catalog that are preprovisioned with Node-RED. The **Node-RED Starter** and the **Internet of Things Platform Starter**. In this Section we will create an IoT Starter Application to analyze tweets from your Twitter feed.

- Click on the **Catalog** (1) and search for '**internet of things**' (2)
- The **Internet of Things Platform Starter** (3) boilerplate is a pattern with pre-assembled services that work together. The Internet of Things Platform Starter includes a Node-RED Node.js web server, Cloudant database to store the sensor data, and the IoT platform service so you can connect devices.



- Name your application something unique (1). If you choose ***myapp***, your application will be located at http://***myapp***.mybluemix.net There can only be one "***myapp***" application and URL registered in IBM Cloud.

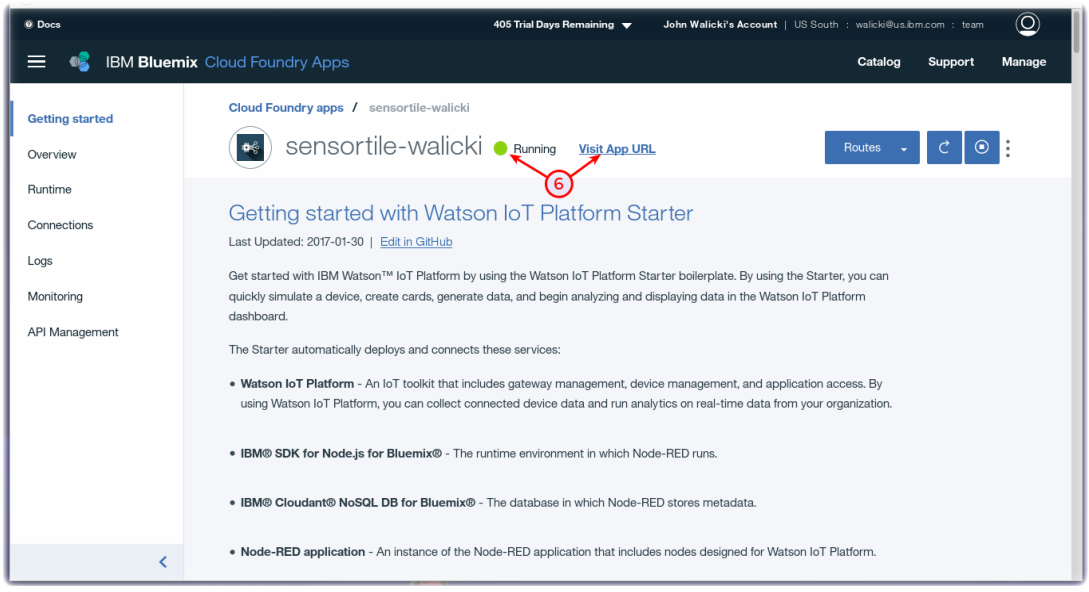
- Give the application a unique name (4) - eg. **devslam-yourname**



- Press the **Create** button (5).
- IBM Cloud will create an application in your account based on the services in the boilerplate. This is called staging an application. It can take a few minutes for this process to complete. While you wait, you can click on the **Logs** tab and see activity logs from the platform and Node.js runtime.

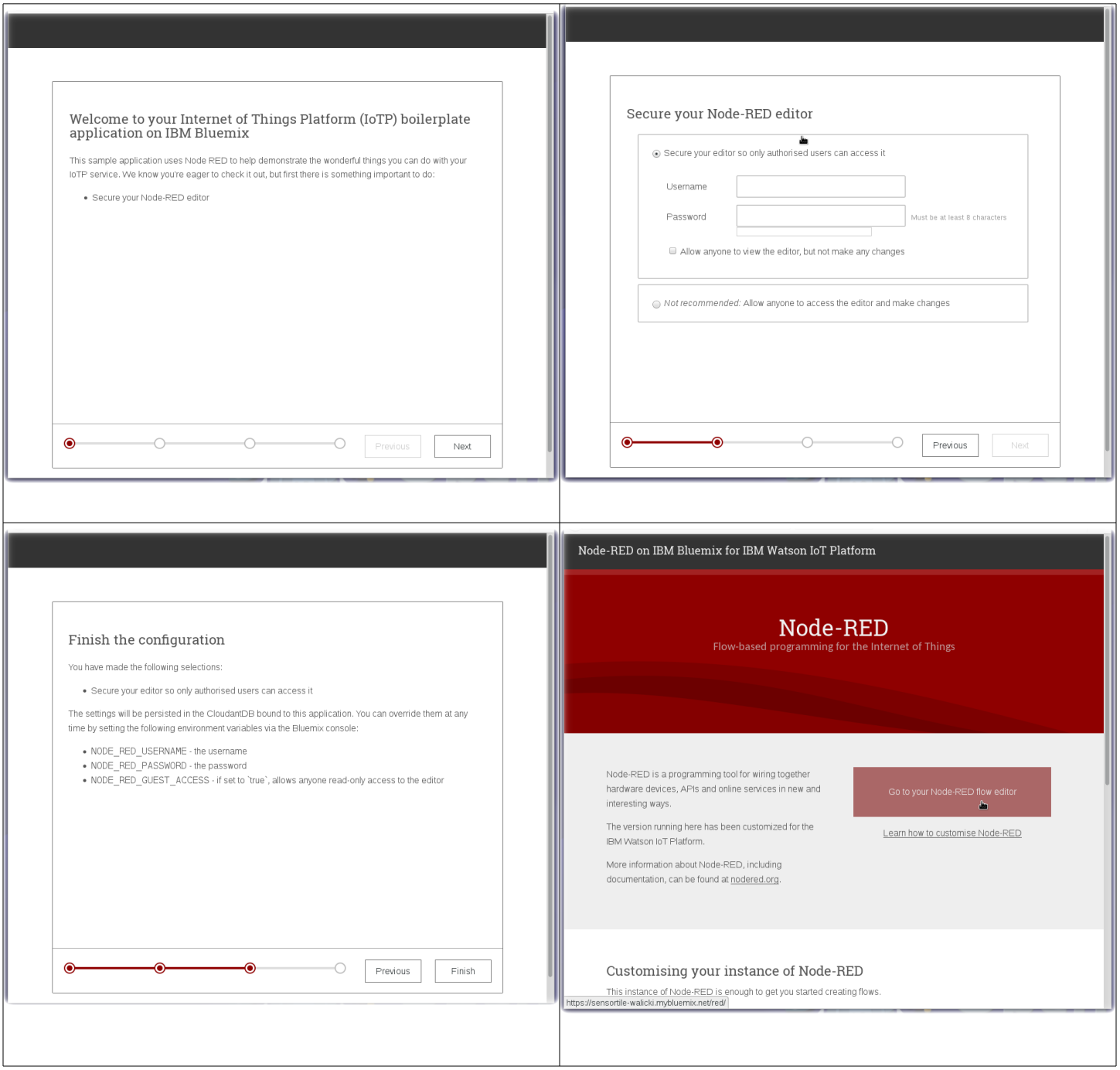
Step 2 - Launch the IoT Starter Application

- Once the Green "**Running**" icon appears, Click the **Visit App URL** link (6).

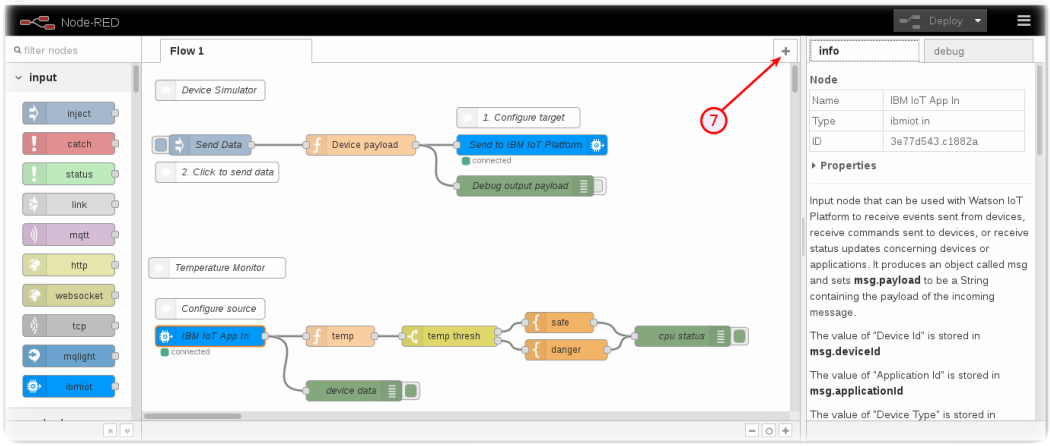


Step 3 – Open the Node-RED visual programming editor

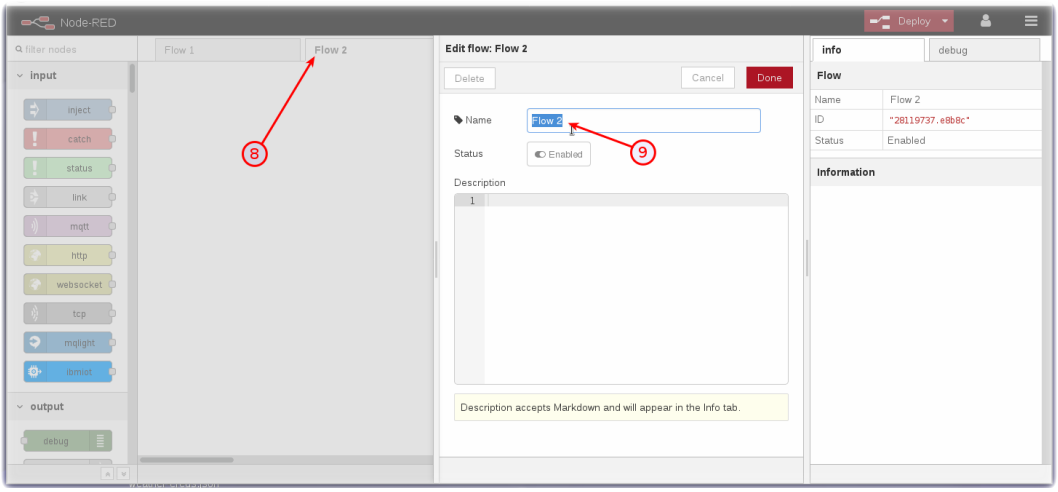
- A new browser tab will open to the Node-RED start page. Node-RED is an open-source Node.js application that provides a visual programming editor that makes it easy to wire together flows. Select a username / password to access the Node-RED editor. Remember your username / password. Click the red button **Go to your Node-RED flow editor** to launch the editor.



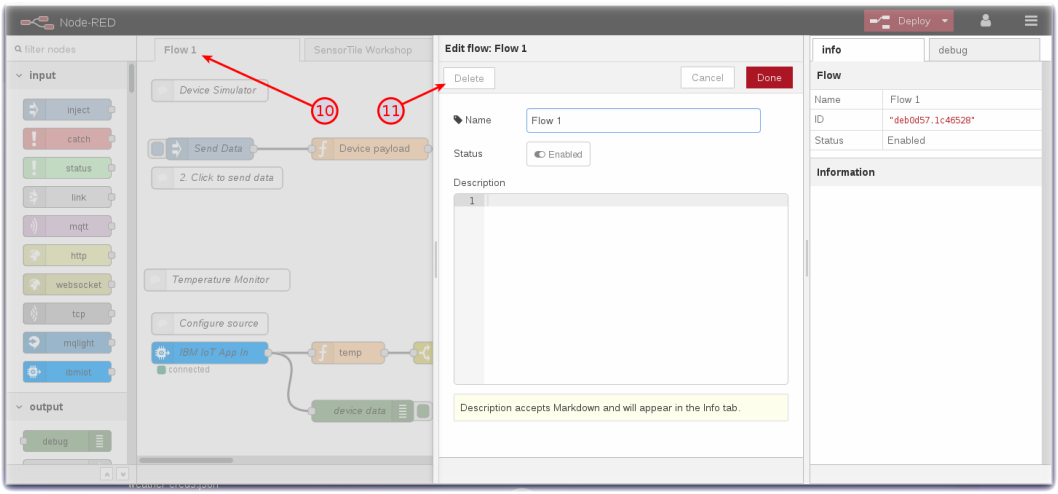
- The Node-RED Visual Programming Editor will open with a default flow.
- On the left side is a palette of nodes that you can drag onto the flow.
- You can wire nodes together to create a program.
- The sample IoT Starter flow is not applicable to this workshop and can be deleted.



- Click the **+** icon (7) to add a new tab. Click on the **Flow 2** tab header (8).
- Rename this tab from **Flow 2** to **Twitter DevSlam** (9)



- Click on the **Flow 1** tab header (10). Press the **Delete** button. (11)

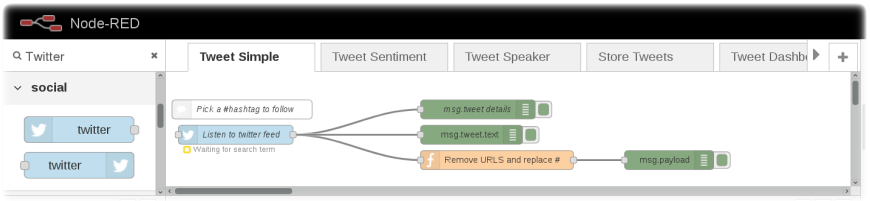


Section 3– Watch a Twitter Feed

In this Section you will create a simple flow that watches a Twitter feed.

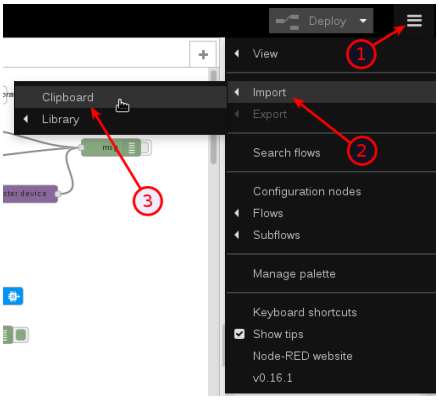
Step 1 – Create a Twitter flow

- This flow can be pasted into Node-RED:

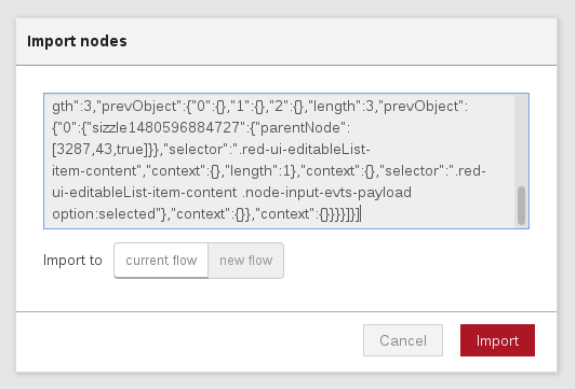


Get the Code:
https://github.com/johnwalicki/Node-RED-Twitter-Workshop/blob/master/flows/Tweet-Simple.json

- First, open the "Get the Code" URL listed above. If you click on the **Raw** button on the github page, it is easy to **Ctrl-A** to Select All text for the flow and **Ctrl-C** to copy it to your Clipboard.
- Click on the Node-RED Menu (1), then Import (2), then Clipboard (3).



- Paste the text of the flow into the **Import nodes** dialog and press the red **Import** button.

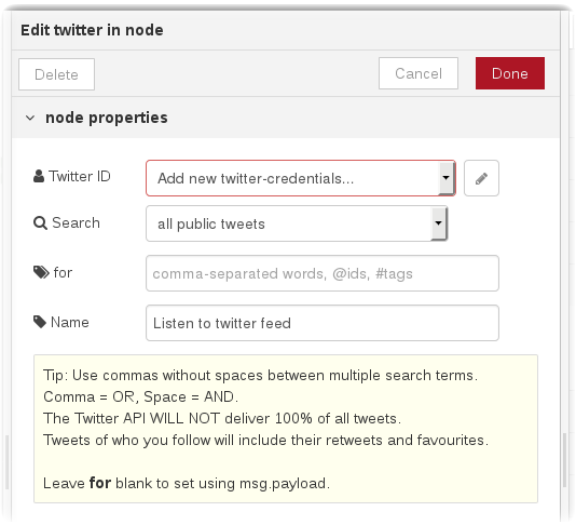


- Click on the 

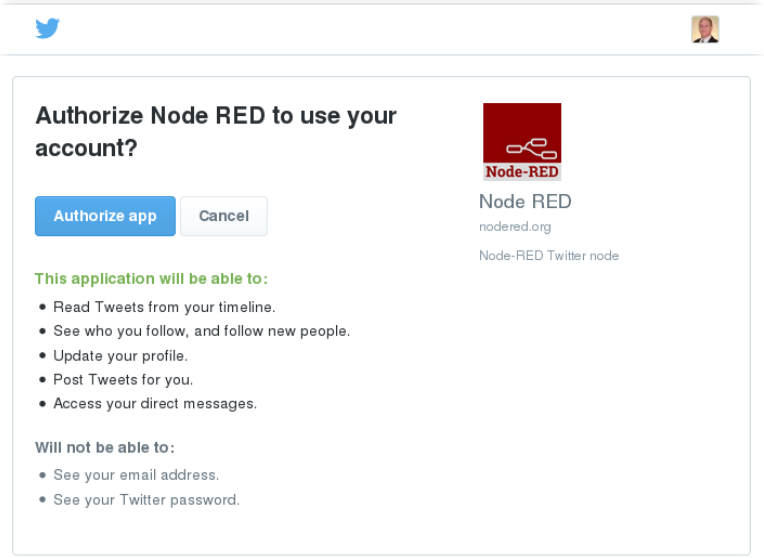
button in the top right of the screen to save and deploy your changes.
- The flow creates a Twitter node, several debug nodes and a function node to remove short URLs and replace "#" with the word "hashtag".

Step 2 – Configure the Twitter Node

- Double click on the Twitter node to open the **node properties** configuration panel.
- Click on the Pencil button to **Add new twitter-credentials...**



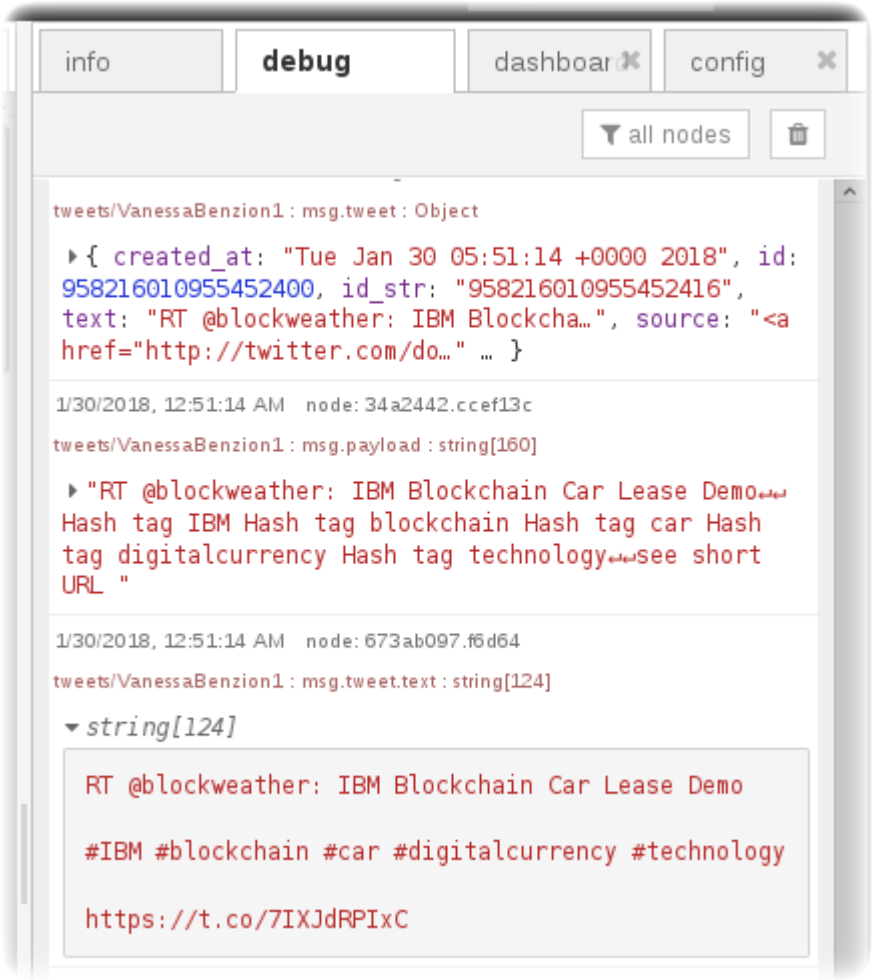
- Press the “Click here to authenticate with Twitter” button.
- Authorize Node-RED to access your Twitter account by pressing the **Authorize app** button.



- Enter your **Twitter ID** and press the **Add** button
- Select fun hashtags to follow - **#jumpstart_NY, #IBM, @nodered**
- **Beware** of following political leaders because you will quickly hit the Rate Limit for Twitter and your account will be deactivated for several minutes.
- In subsequent flows, you will be able to use the dropdown to re-select your Twitter account.
- Click on the 

button in the top right of the screen to save and deploy your changes.
- Turn to the **debug** tab in the Node-RED sidebar.

- Observe the full msg.tweet details – a single 152 character tweet also contains lots and lots of metadata in a msg.tweet JSON object.
- msg.tweet.text contains the actual tweet.

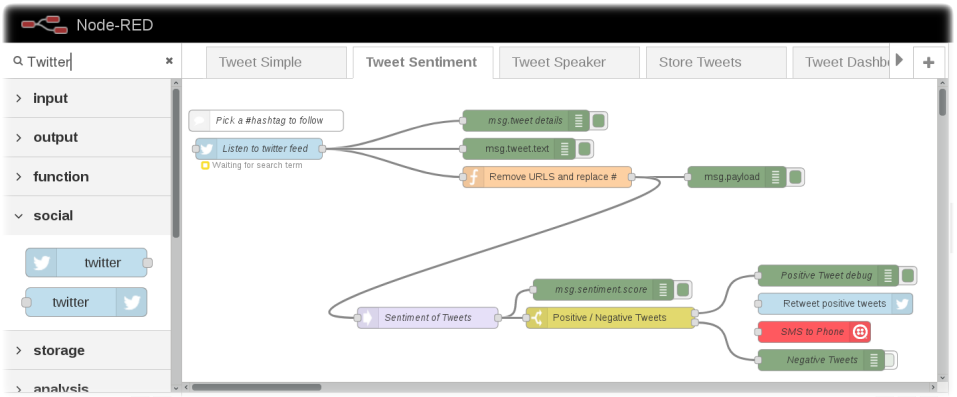


Section 4– Perform Sentiment Analysis of Tweets

In this Section you will create a a flow that determines the Sentiment of a tweet

Step 1 – Create a Twitter flow

- This flow can be pasted into Node-RED:



Get the Code:
https://github.com/johnwalicki/Node-RED-Twitter-Workshop/blob/master/flows/Tweet-Sentiment.json

- Open the "Get the Code" URL listed above. If you click on the **Raw** button on the github page, it is easy to **Ctrl-A** to Select All text for the flow and **Ctrl-C** to copy it to your Clipboard.
- Click on the Node-RED Menu (1), then Import (2), then Clipboard (3).
- Paste the text of the flow into the **Import nodes** dialog and press the red **Import** button.
- Click on the 

button in the top right of the screen to save and deploy your changes.
- The flow extends the Twitter node to call the Sentiment node. You could retweet positive tweets or send SMS messages when someone has complaints about your product or service.

Step 2 – Sentiment Node

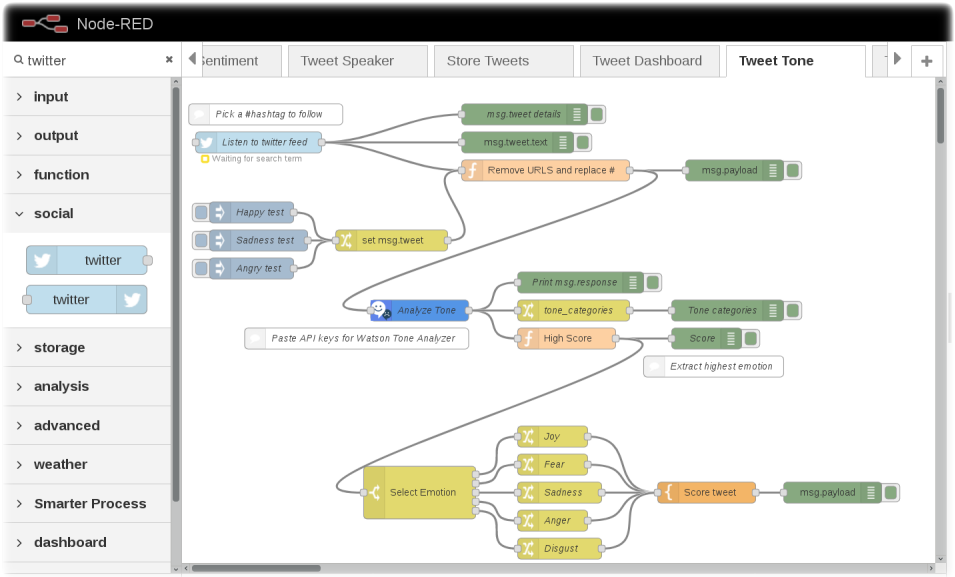
- The Sentiment Node returns an AFINN-111 sentiment score.
- The score typically ranges from -5 to +5, but can go higher and lower.
- Depending on the corner of the Twitter Universe you follow, sentiment scores can get very interesting.

Section 5– Perform Tone Analysis of Tweets

In this Section you will create a flow that performs Tone Analysis of Tweets using the Watson Tone Analyzer service.

Step 1 – Create a Twitter flow

- This flow can be pasted into Node-RED:



Get the Code:
https://github.com/johnwalicki/Node-RED-Twitter-Workshop/blob/master/flows/Tweet-Tone.json

- Open the "Get the Code" URL listed above. If you click on the **Raw** button on the github page, it is easy to **Ctrl-A** to Select All text for the flow and **Ctrl-C** to copy it to your Clipboard.
- Click on the Node-RED Menu (1), then Import (2), then Clipboard (3).
- Paste the text of the flow into the **Import nodes** dialog and press the red **Import** button.
- Click on the 

button in the top right of the screen to save and deploy your changes.
- The flow extends the Twitter node to call the Watson Tone Analyzer service instead of the Sentiment score.

Step 2 – Watson Tone Analyzer

- Watson Tone Analyzer can be used to conduct social listening. Analyze emotions and tones in what people write online, like tweets or reviews. Predict whether they are happy, sad, confident, and more.
- To enable the Watson Tone Analyzer service within your Node-RED Application, you will to add an additional service to your IoT Starter Application and restage your Cloud Foundry application.
- Return to the IBM Cloud Dashboard
  - https://console.bluemix.net/dashboard/apps

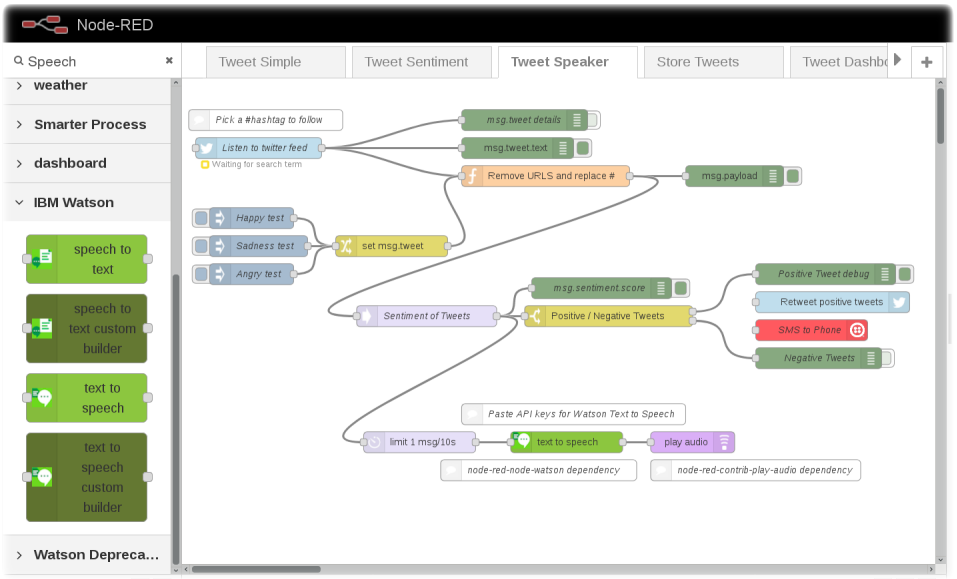
- Open your IoT Starter App and select Connections from the left navigation.
- Click on the **Create connection** button.
- In the Search box enter **Tone**
- Press the **Connect** button
- TIP: Don't press the Restage button yet. Instead of restaging your application immediately, you can add all of the services at once and restage a single time. Press the Cancel button on the dialog. Use the Search box to search for
    - Watson Visual Recognition
    - Watson Text to Speech
- Add these three Watson Cognitive services. After you connect the third service, press the Restage button. Your CF application will rebuild/restart with the additional services.

Section 6– Speak Tweets with Watson Text to Speech

In this Section you will create a flow that speaks tweets using the Watson Text to Speech service.

Step 1 – Create a Twitter flow

- This flow can be pasted into Node-RED:



Get the Code:
https://github.com/johnwalicki/Node-RED-Twitter-Workshop/blob/master/flows/Tweet-Speaker.json

- Open the “Get the Code” URL listed above. If you click on the **Raw** button on the github page, it is easy to **Ctrl-A** to Select All text for the flow and **Ctrl-C** to copy it to your Clipboard.
- Click on the Node-RED Menu (1), then Import (2), then Clipboard (3).
- Paste the text of the flow into the **Import nodes** dialog and press the red **Import** button.
- Click on the 

button in the top right of the screen to save and deploy your changes.
- The flow extends the Twitter flow to translate the Tweet Text to speech.

Step 2 – Configure Watson Text to Speech

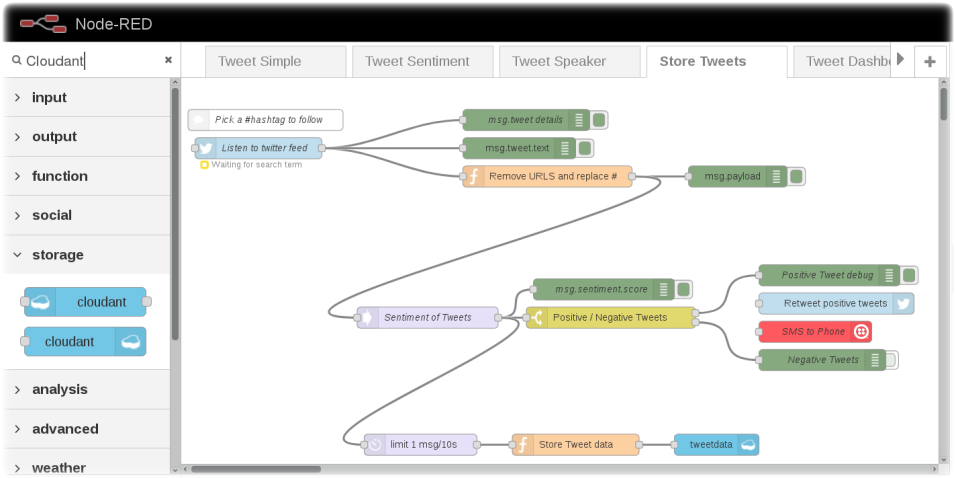
- If you did not bind the Watson Text to Speech service in Section 5, follow those instructions now.
- You will also need to add the **node-red-contrib-play-audio** package using the Node-RED **Manage Palette**.
- Configure the **Watson Text to Speech** node to speak with different voices.

Section 7– Store Tweets in a Cloudant Database

In this Section you will create a flow that stores tweets and sentiment scores in a Cloudant database for later historical analysis.

Step 1 – Create a Twitter flow

- This flow can be pasted into Node-RED:



Get the Code:
https://github.com/johnwalicki/Node-RED-Twitter-Workshop/blob/master/flows/Tweet-Store.json

- First, open the "Get the Code" URL listed above. If you click on the **Raw** button on the github page, it is easy to **Ctrl-A** to Select All text for the flow and **Ctrl-C** to copy it to your Clipboard.
- Click on the Node-RED Menu (1), then Import (2), then Clipboard (3).
- Paste the text of the flow into the **Import nodes** dialog and press the red **Import** button.
- Click on the 

button in the top right of the screen to save and deploy your changes.
- The flow stores Tweets and sentiment scores in a Cloudant database for analysis in the future.

Step 2 – Open your Cloudant Database service

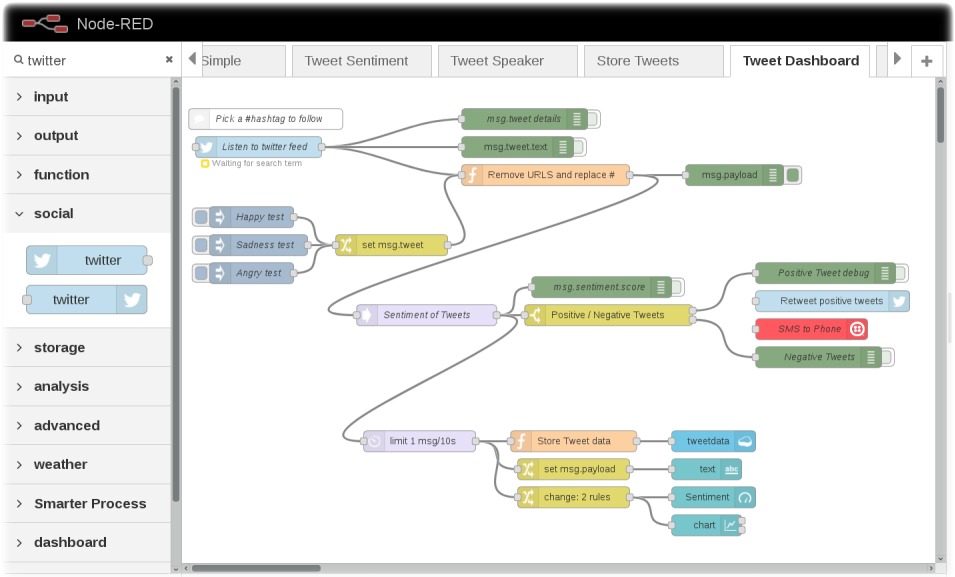
- Click on the IBM Cloud Dashboard

Section 8– Node-RED Twitter History Dashboard

In this Section you will create a flow that creates a Node-RED Dashboard that charts Twitter hashtag Sentiment history.

Step 1 – Create a Twitter flow

- This flow can be pasted into Node-RED:



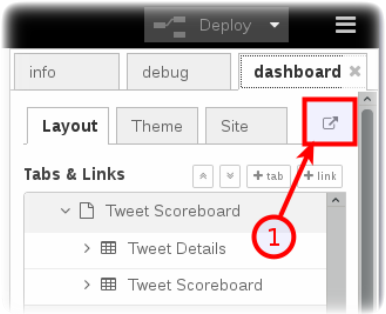
Get the Code:
https://github.com/johnwalicki/Node-RED-Twitter-Workshop/blob/master/flows/Tweet-Dashboard.json

- First, open the "Get the Code" URL listed above. If you click on the **Raw** button on the github page, it is easy to **Ctrl-A** to Select All text for the flow and **Ctrl-C** to copy it to your Clipboard.
- Click on the Node-RED Menu (1), then Import (2), then Clipboard (3).
- Paste the text of the flow into the **Import nodes** dialog and press the red **Import** button.
- Click on the 

button in the top right of the screen to save and deploy your changes.
- The flow creates a Node-RED dashboard that charts the historical sentiment history.

Step 2 – Node-RED Dashboard nodes

- You will also need to add the **node-red-dashboard** package using the Node-RED **Manage Palette**.
- Open the Node-RED Dashboard by turning to the dashboard side panel and pressing the launch button.

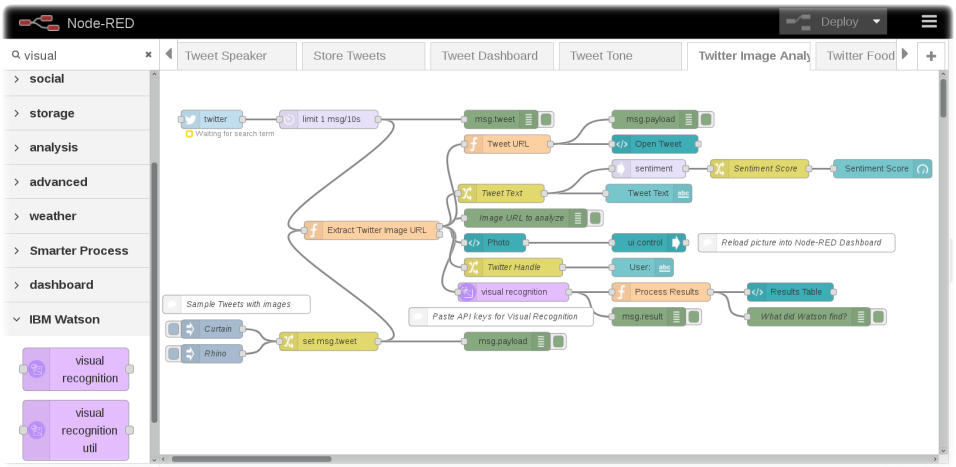


Section 9– Tweet Image Analysis with Watson Visual

In this Section you will create a dashboard that performs image analysis of picture URLs contained in tweets using the Watson Visual Recognition service.

Step 1 – Create a Twitter flow

- This flow can be pasted into Node-RED:



Get the Code:
https://github.com/johnwalicki/Node-RED-Twitter-Workshop/blob/master/flows/Tweet-VisualRecognition.json

- First, open the "Get the Code" URL listed above. If you click on the **Raw** button on the github page, it is easy to **Ctrl-A** to Select All text for the flow and **Ctrl-C** to copy it to your Clipboard.
- Click on the Node-RED Menu (1), then Import (2), then Clipboard (3).
- Paste the text of the flow into the **Import nodes** dialog and press the red **Import** button.
- Click on the 

button in the top right of the screen to save and deploy your changes.
- The flow creates a Node-RED dashboard that displays the output of Watson Visual Recognition image analysis.

Step 2 – Watson Visual Recognition

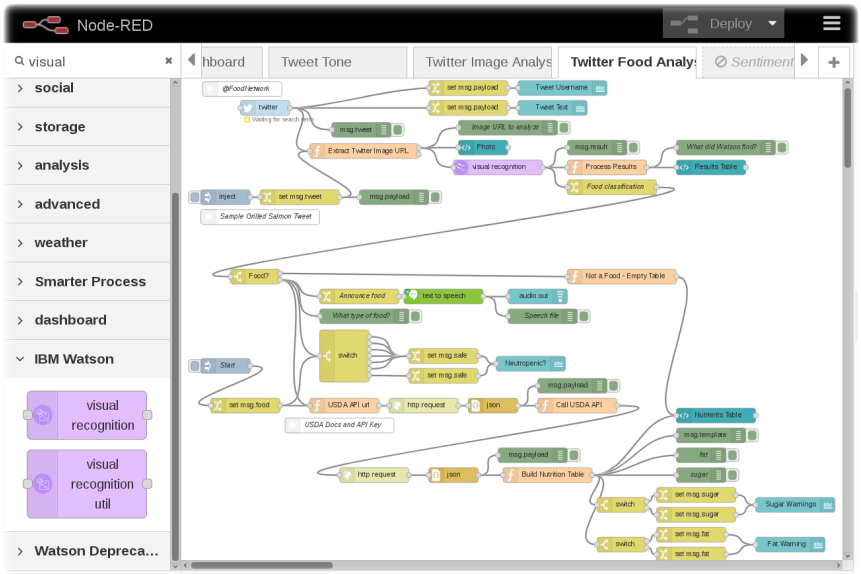
- If you did not bind the Watson Visual Recognition service in Section 5, follow those instructions now.
- You will also need to add the **node-red-dashboard** package using the Node-RED **Manage Palette**.
- Open the Node-RED Dashboard by turning to the dashboard side panel and pressing the launch button.
- The flow extracts the URL of the picture in the Tweet and passes that to Watson Visual Recogntion for analysis. The response scores are displayed in a table.

Section 10 – Nutrition Image Analysis with Watson

Bonus Section - This Section shows you how to create a Node-RED dashboard that performs image analysis of tweet picture URLs containing food by calling the Watson Visual Recognition custom Food classifier. Once Watson identifies the food, call an USDA RESTful API to retrieve Nutrition and Ingredient details.

Step 1 – Create a Twitter flow

- This flow can be pasted into Node-RED:



- Get the Code: https://github.com/johnwalicki/Node-RED-Twitter-Workshop/blob/master/flows/Tweet-NutritionAnalyzer.json

- First, open the "Get the Code" URL listed above. If you click on the **Raw** button on the github page, it is easy to **Ctrl-A** to Select All text for the flow and **Ctrl-C** to copy it to your Clipboard.
- Click on the Node-RED Menu (1), then Import (2), then Clipboard (3).
- Paste the text of the flow into the **Import nodes** dialog and press the red **Import** button.
- Click on the 

button in the top right of the screen to save and deploy your changes.
- The flow creates a Node-RED Dashboard that .

Step 2 – Watson Visual Recognition Food Classifier

- If you did not bind the Watson Visual Recognition service in Section 5, follow those instructions now.
- Open the Node-RED Dashboard by turning to the dashboard side panel and pressing the launch button.
- The flow extracts the URL of the picture in the Tweet and passes that to Watson Visual Recogntion Food classifier for analysis. If the image is food, several USDA API calls are made to determine nutritional values and ingredients.

- Congratulations! You have completed the workshop.

References

In this final section, we will challenge the workshop attendee to implement other projects using Node-RED.

There are many recipes available at:

https://developer.ibm.com/recipes

https://flows.nodered.org