

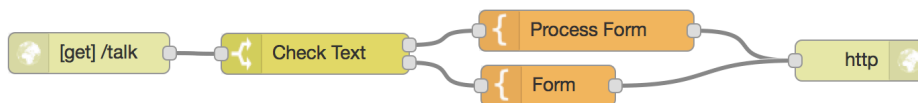
Text to Speech in Node-RED

Hands-On Lab

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Add a web endpoint to convert text to audio
(see *Add Text to Speech in Node-RED*)



Create a webpage to input text and play audio
(see *Creating an Interactive Web UI*)



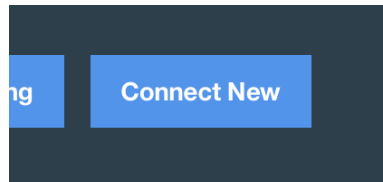
A digital copy of this lab and code snippets can be found at:
<http://ibm.biz/node-red-text-to-speech>



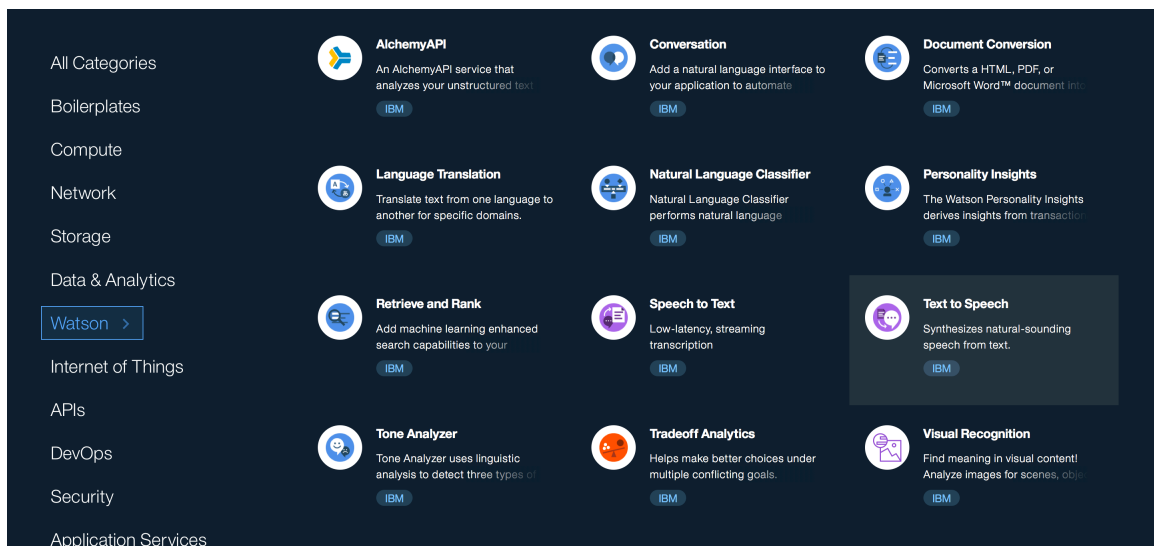
Add Text to Speech Service in IBM Bluemix

The Text to Speech node in Node-RED requires API credentials. In this section, we will create and bind the Text to Speech IBM Watson service to the Node-RED application.

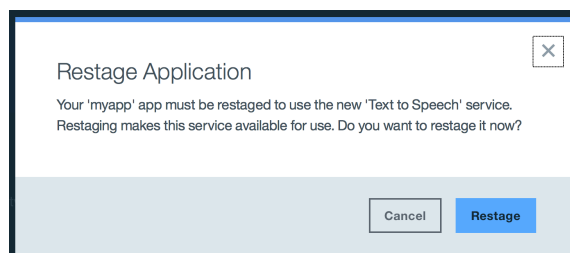
1. Go to the Connections tab under the application overview for your Node-RED application in the IBM Bluemix dashboard and click on **Connect New**.



1. Click the **Text to Speech** node under the Watson section. You can use the default values, or customize the name. Click on **Create**.




2. IBM Bluemix will prompt to restage the application. Click on **Restage**. The application will restart and include the new service credentials in the environment.

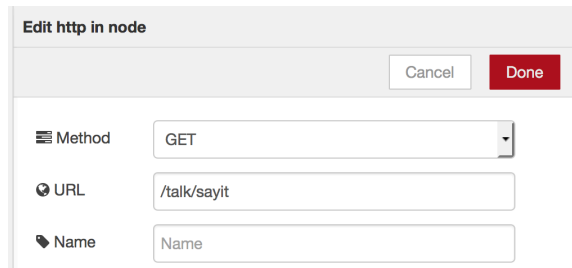


3. When the application has finished restaging, open the Node-RED Flow Editor. If Node-RED is already open, refresh the page.

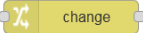
Add Text to Speech in Node-RED

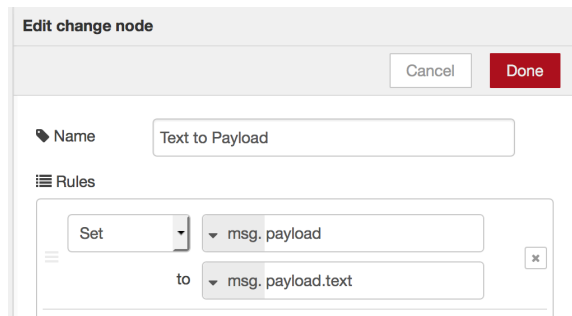
In this section, we will use the IBM Watson Text to Speech service to produce a .wav audio file from input text through a simple web endpoint generated using a Node-RED flow.

1. Add a  node as shown below to collect the incoming speech request.




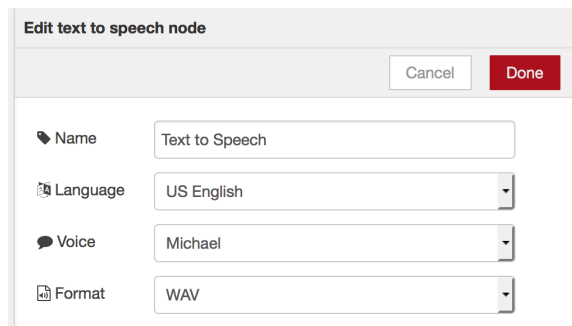
The 'Edit http in node' dialog shows the configuration for an HTTP node. The Method is set to GET, the URL is /talk/sayit, and the Name is Name. There are Cancel and Done buttons at the top right.

2. Add a  node as shown below to extract the query parameter msg.payload.text and set it as the msg.payload. When invoked with query parameters such as ?text=Hello, the text will be placed into the msg.payload object.




The 'Edit change node' dialog shows the configuration for a change node. The Name is Text to Payload. The Rules section shows a rule where 'Set' is applied to 'msg.payload' with the value 'msg.payload.text'.

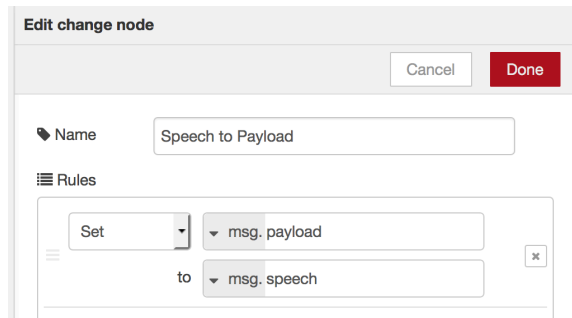
3. Now add a  node as shown below. This node will generate the binary wav stream content and put it in the msg.speech property.



The 'Edit text to speech node' dialog shows the configuration for a text to speech node. The Name is Text to Speech, the Language is US English, the Voice is Michael, and the Format is WAV. There are Cancel and Done buttons at the top right.

You can change the language, the voice, or the format of the audio that is returned.

4. Add another  **change** node as shown below to extract the **msg.speech** and place it in **msg.payload**.




Dialog: Edit change node

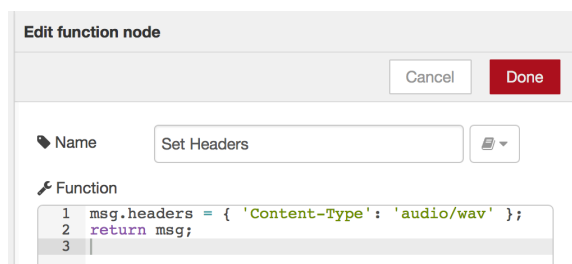
Name: Speech to Payload

Rules:

- Set
- msg.payload
- to
- msg.speech

5. Add a  **function** node as shown below to add the appropriate audio HTTP headers to the response.

```
msg.headers = { 'Content-Type': 'audio/wav' };  
return msg;
```




Dialog: Edit function node

Name: Set Headers


Function:

```
1 msg.headers = { 'Content-Type': 'audio/wav' };  
2 return msg;  
3
```

We set the HTTP response headers by setting the **msg.headers** to the Content Type of audio/wav. This is required in order to let browsers know that this is an audio file and not HTML.

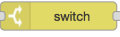
6. Finally, add a  **http response** node. This node will simply return what's in **msg.payload** to the HTTP response. The completed flow should look like the flow shown below:

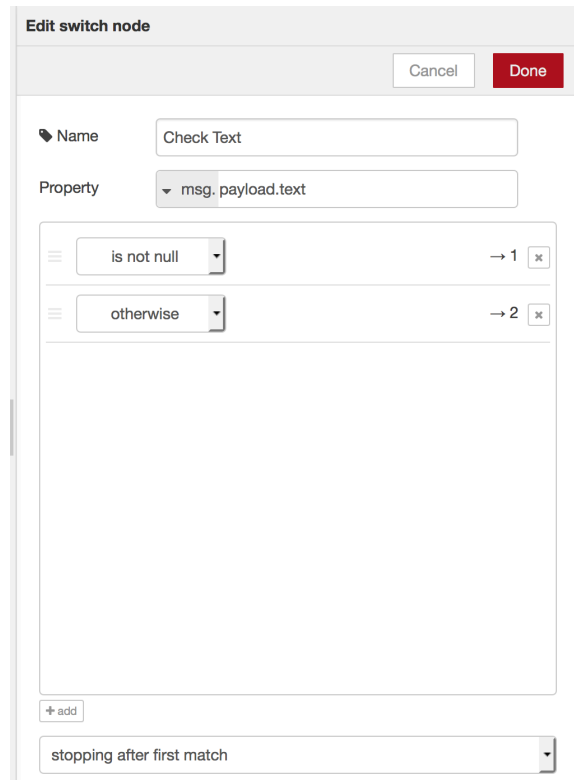


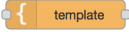
7. Click on  **Deploy** to save the changes. Test the flow by opening the application URL, appended with **/talk/sayit?text=Hello** as shown below.

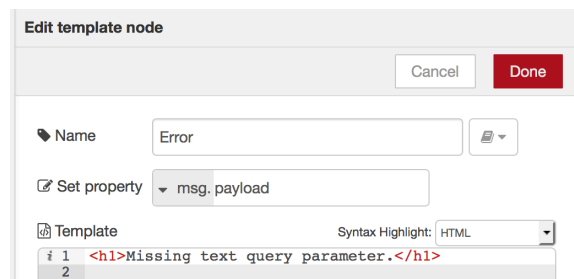
`https://_____.mybluemix.net/talk/sayit?text=Hello`

This should prompt you to save a file. Depending on how your browser is configured, it may download the audio file or play it within the browser. Either way, play it and you should hear the text.

8. This flow has a caveat, however. The flow will fail when the text query parameter is not set. Add a  node as shown below to check if the text query parameter is present.




9. You'll notice that adding the second otherwise rule has created a second output handle for the switch node. Add a  node with the error message shown below.



10. Connect the nodes together as shown below.



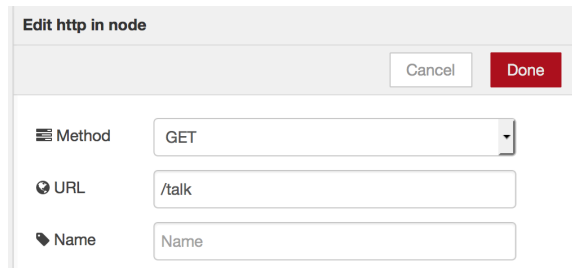
11. Click on  to save the changes. Test the flow by opening a browser and going to the application URL, appended with the following endpoints:

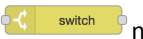
https://_____.mybluemix.net/talk/sayit?text=Hello (plays the audio with Hello)
 https://_____.mybluemix.net/talk/sayit (displays error message)

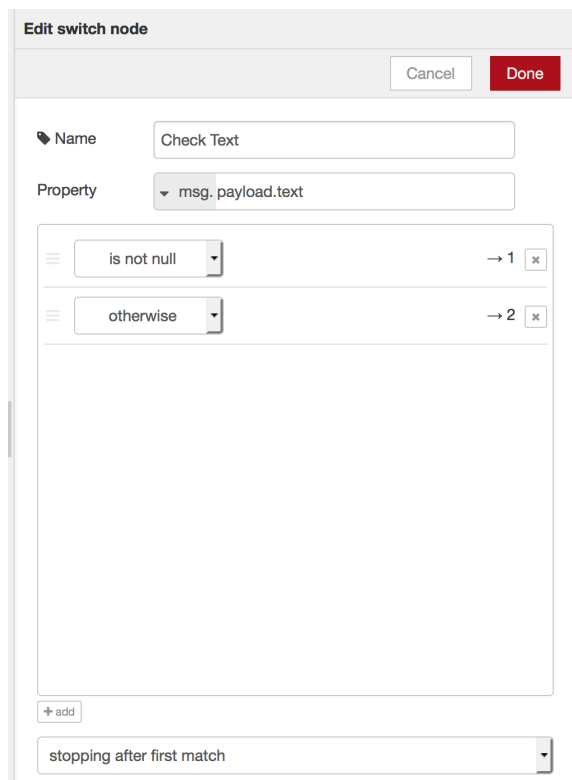
Creating an Interactive Web UI

In this section, we will create a simple webpage that displays an input textbox for the user to enter text. When the form is submitted, the text will be played via audio.

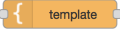
1. Add a  node as shown below.

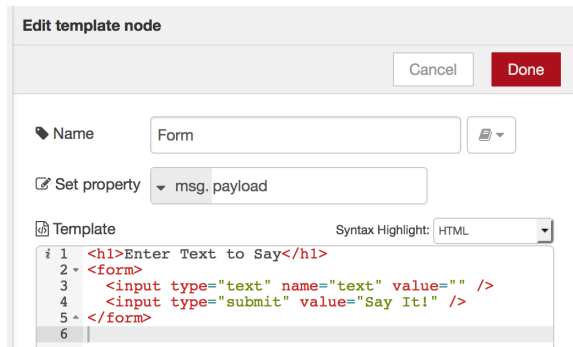


2. Add a  node to branch the flow depending whether text input is submitted.



When the form is submitted and the text parameter is present, proceed with the first flow. Otherwise, the blank form (flow #2) will be used.

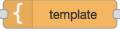
3. Add a  node with the HTML shown below.

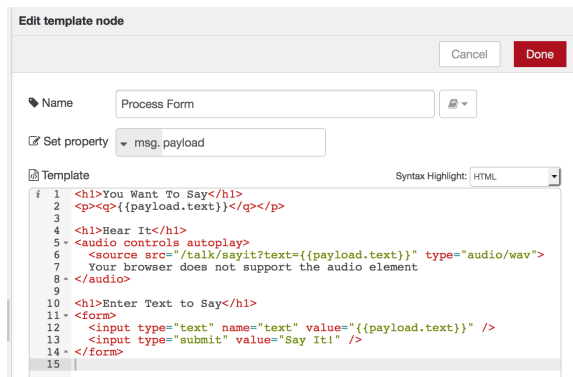


```
1 <h1>Enter Text to Say</h1>
2 <form>
3   <input type="text" name="text" value="" />
4   <input type="submit" value="Say It!" />
5 </form>
6
```



Get the code:
ibm.biz/Bd4vtc

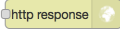
4. Add a  node with the HTML shown below.

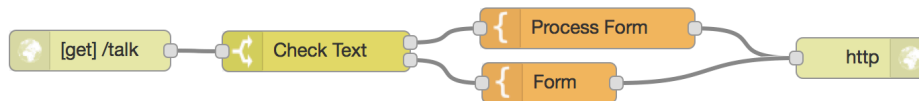


```
1 <h1>You Want To Say</h1>
2 <p><q>{{payload.text}}</q></p>
3
4 <h1>Hear It</h1>
5 <audio controls autoplay>
6   <source src="/talk/sayit?text={{payload.text}}" type="audio/wav">
7   Your browser does not support the audio element
8 </audio>
9
10 <h1>Enter Text to Say</h1>
11 <form>
12   <input type="text" name="text" value="{{payload.text}}" />
13   <input type="submit" value="Say It!" />
14 </form>
15
```



Get the code:
ibm.biz/Bd4vtx

5. Add a  and connect the nodes together as follows:



6. Click  to save the changes. Test the flow by opening the application URL in the browser, appended with /talk.

https://_____.mybluemix.net/talk